


The wargame package

Christian Holm Christensen

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Abstract

This package provides tools to typesetting manuals, board, and counters for wargames using \LaTeX .
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1 Introduction

This package provides tools for typesetting classic, hex-based wargames. The package allows an author to design a board, or map, comprised of hex, using a relatively simple interface. Units are typeset using a similar interface. Unit types are identified using the NATO Joint Military Symbolology [2] standard.

This document is meant as a reference manual (although far from complete). A separate tutorial is available, and may be the best starting point.

2 Hex Boards

The package provides a number of facilities to set-up a board comprised of hexagon fields (“hexes”).

2.1 Placing hexes

A hex can be added to the current `tikzpicture` using the macro `\hex`. It takes up to 4 arguments

```
\hex[⟨key-value-pairs⟩](⟨location⟩)(⟨name⟩)
```

The `⟨key-value-pairs⟩` specify the hex. Valid options are

`terrain=⟨terrain-keys⟩` specifies the terrain of the hex. More on in this in Section 2.5.

`ridges=⟨ridges-keys⟩` specifies where ridges are drawn in the hex. Section 2.6.

`label=⟨label-keys⟩` specifies the how to output the hex label, if any. This is expanded upon in Section 2.7.

`town=⟨town-keys⟩` specifies that a town (or similar) is present in the hex. The various keys are described in Section 2.8.

`bevel=⟨bevel-keys⟩` specifies that a bevel should be added to the hex. The various keys are described in Section 2.2.

`extra=⟨extra-keyx⟩` and `extra clipped=⟨extra-keyx⟩` allows the user to put custom graphics in the hexes. See also Section 2.9 for more.

`row=⟨row⟩` and `column=⟨column⟩` Keys to set hex coordinates. Mainly used when using `\node` rather than `\hex`. These coordinates should be specified in the `hex cs` coordinate system (Section 2.4).

any style key defined for TikZ pictures.

The `⟨location⟩` argument specifies the coordinates, in the hex coordinate system where to put the hex. More about the coordinate system is given in Section 2.4. Note, the numbers by default starts from the lower-left corner, but can be changed via options.

The elements are rendered in the following order

1. The terrain, clipped to the hex shape.
2. The hex, including circumference and fill
3. The ridges, if any
4. The label, if any
5. Extra graphics clipped to the hex
6. Bevel if selected
7. Town, if any
8. Extra graphics which may extend beyond the confines of the hex.

Figure 1 illustrates some of the components of a hex. The hexes are 2 unit lengths wide. Typically, the unit length is one centimetre, which means the hexes are roughly $2\text{ cm} \times 1.86\text{ cm}$ — or roughly $3/4'' \times 3/4''$ — big. This allows the hexes to fit chits (see Section ??) of size $12\text{ mm} \times 12\text{ mm}$ — or roughly $1/2'' \times 1/2''$ — nicely. If one wants larger chits or hexes one should take care to scale both by a similar amount.

Note that the macro `\hex` is really a short hand for TikZ's `\node` macro, but with preset options. An alternative to using the `\hex` macro is to do

```
\node[hex={⟨key-value-pairs⟩}] (⟨name⟩) at (⟨location⟩);
```

This can be useful when placing explanatory graphics or the like. The main difference between using `\hex` and the raw `\node[hex=...]` is that the former can automatically generate labels and set shape coordinates in the picture. If you want that for your board, it is recommended to use `\hex`. For example, if one does

```
\begin{tikzpicture}[
  every hex={label={auto=alpha column}},
  hex/labels is name=true]
```

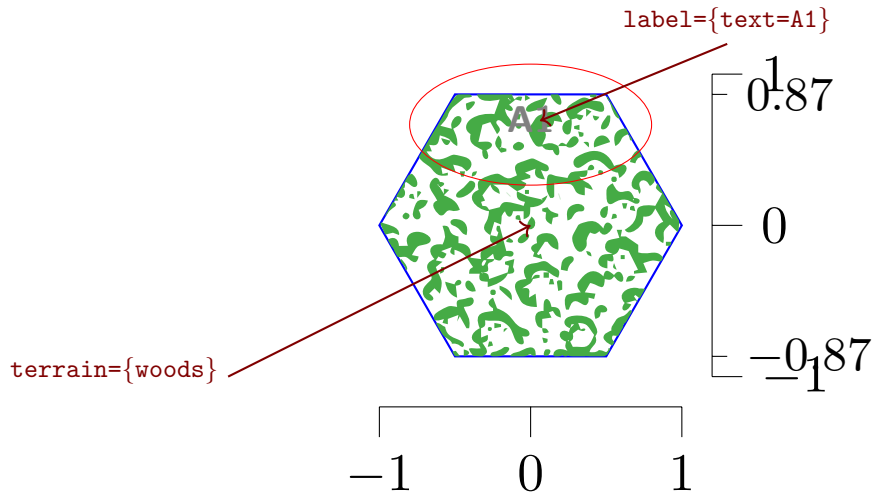


Figure 1: Hex parts. The bar on the bottom and to the right indicate two units of length.

```
\hex(c=1,r=1);
\end{tikzpicture}
```

then one can refer to the location of the hex by its label i.e., (A1). Since the hex is really a *TikZ* node, we can also use anchors defined for `hex` node shape, such as (A1.west), (A1.north edge), and so on. This is not possible if one uses the `\node` macro.

2.2 Hex bevels

A bevel (or “shadow-effect”) can be added to hexes using the key `bevel`, with a value that specifies where the light comes from (e.g., north west or NW). The percentage of the half width of a chit of the bevel can be specified by the key `bevel fraction` (default 10%).

2.3 Styling hexes

Typical *TikZ* options can be passed to the `\hex` macro. For example, if you want to draw the hex borders in red, simply pass `draw=red` in the [*optional*] arguments to `\hex`. Individual parts of the hexes can be styled separately. the default style used by `\hex` is `tikz/hex/hex`. Users can redefine this style to suit their needs. If one does not want to change the default style, or pass the same argument to all `\hex`s one can define the style `tikz/every hex`. For example, if one wants to auto label all hexes, one can do

```
\begin{tikzpicture}
  \begin{scope}[every hex/.style={label=auto}]
    % Hexes
  \end{scope}
\end{tikzpicture}
```

For example, to render only the corners of the hexes, as popular among some designers, one can do

```
every hex/.style={
  dash pattern=on .2cm off .6cm on .2cm off 0cm
},
```

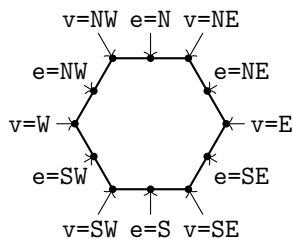
Note that the dash pattern should be 1cm long and the last element should be off 0cm so the dash pattern is started afresh on each hex edge.

2.4 Hex coordinate system

The package defines a coordinate system based on hexes. The centre of a hex is specified as $\langle column \rangle$ - $\langle row \rangle$ pairs, while vertexes and mid-point on edges can be specified separately. The syntax of the coordinates is

```
(hex cs:row= $\langle hex\text{-}row \rangle$ ,column= $\langle hex\text{-}column \rangle$ ,vertex= $\langle vertex \rangle$ ,edge= $\langle edge \rangle$ )
```

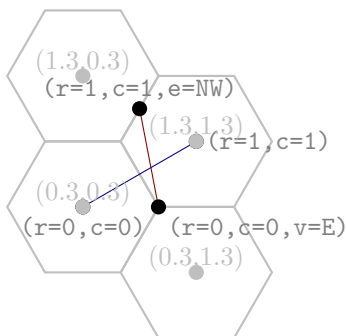
where $\langle vertex \rangle$ and $\langle edge \rangle$ are optional. The hex row and column defaults both to 0 and can be decimal numbers. The row, column, vertex, and edge keywords may be shortened to r, c, v, and e, respectively. Possible vertexes and edges are listed in Table 1.



vertex=	Angle	edge=	Angle
east	E	north east	NE 30°
north east	NE	north	N 90°
north west	NW	north west	NW 150°
west	W	south west	SW 210°
south west	SW	south	S 270°
south east	SE	south east	SE 330°

Table 1: Vertex and edge positions

In Figure 2 is an example of a picture drawn in this coordinate system.



Hexes and lines drawn with

```
\hex(0,0)\hex(0,1)\hex(1,0)\hex(1,1)
\draw[blue!50!black] (hex cs:r=0,c=0) --
(hex cs:r=1,c=1);
\draw[red!50!black] (hex cs:r=0,c=0,vertex=E) --
(hex cs:r=1,c=1,edge=NW);
\fill[lightgray](hex cs:r= .3,c= .3) circle(0.1);
\fill[lightgray](hex cs:r=1.3,c= .3) circle(0.1);
\fill[lightgray](hex cs:r=0.3,c=1.3) circle(0.1);
\fill[lightgray](hex cs:r=1.3,c=1.3) circle(0.1);
```

Figure 2: Hex coordinate system

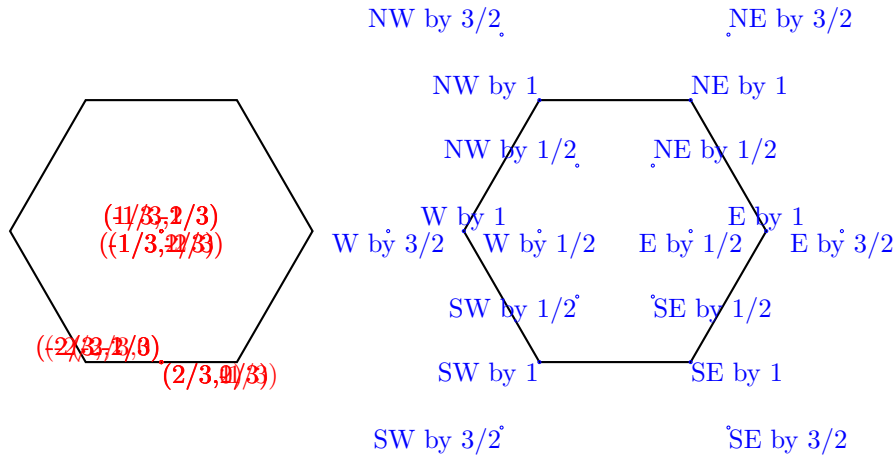


Figure 3: Relative coordinates

Important: When the horizontal distance to the centre of a hex becomes less than $-\cos 60^\circ$ or larger than $b - \cos 60^\circ$ we effectively have a new hex column, and the coordinates are shifted upward or downward for smaller or larger numbers. Figure ?? illustrates. this. This can make it a little hard to specify coordinates relative to a hex centre. Alternatively one may use vertex or edge specifications together with a relative offset in those directions. If one require even more flexibility, one can use the TikZ library `calc` to add arbitrary offsets, e.g.,

```
\coordinate at ($hex cs:c=1,r=10)+(.2,.2)$);
```

2.5 Terrains

Terrains are rendered using tile images or TikZ pictures. The available terrains are shown in Tables 2 and 3. Users can provide their own tile images and select those via `terrain={image=<image>}` or defined TikZ pictures and select those via `terrain={pic=<pic-name>}`. In all cases, the terrain graphics is clipped to the hex.

The terrain of a hex is selected via the multi-valued key `terrain`. Sub-keys of this key are

`image=<graphics-file>` Specifies terrain tile image *<graphics-file>*.

`pic=<picture-key>` Specifies terrain tile TikZ picture.

`code=<tikz-code>` Any valid TikZ code

`clip=<path(s)>` TikZ path specification to clip the terrain within the hex.

The terrain can be clipped by the sub-key `clip`. This can be useful if the game specifies movement costs in terms of hex-edge crossing, for example *First Blood* [1]. In that case, a hex may be, for example, a jungle hex, but some edges a clear. Thus movements across such an edge would count as moving into clear territory while moving over other edges will count as moving into a jungle. This is, of course, not how most games count movement costs, but this package nonetheless facilitates such rules. Table 4 shows a few examples of predefined clippings of terrain.

Users can define TikZ pictures that specify clipping paths as needed. For example, one could add clipping to the terrain to ensure that other graphics in the hex stands out.

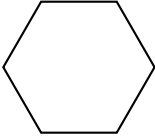
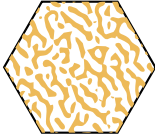
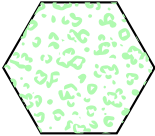

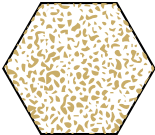
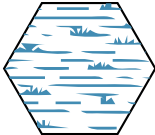

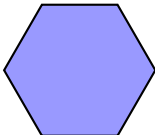
Symbol	Name	terrain={image=<image>}	Symbol	Name	terrain={image=<image>}
	Clear			Beach	{image=wargame.beach}
	Light woods	{image=wargame.light_woods}		Woods	{image=wargame.woods}
	Rough	{image=wargame.rough}		Swamp	{image=wargame.swamp}
	Mountains	{image=wargame.mountains}		Sea	{image=wargame.sea}

Table 2: Terrains specified via tile images


Symbol	Name	terrain={pic=<image>}
	Mountains	{pic=hex/terrain/mountain,line width=3pt}

Table 3: Terrains specified via TikZ pictures


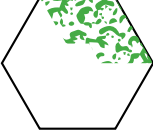
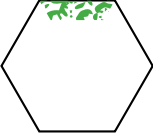

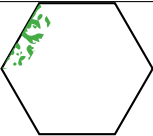

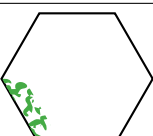
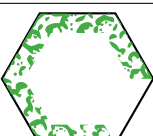
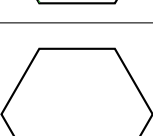
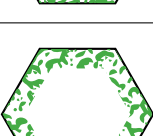
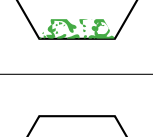
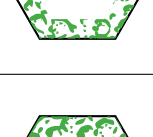
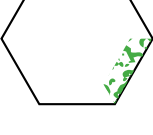

Symbol	terrain={clip=,...}	Symbol	terrain={clip=,...}
	{hex/sextant=NE}		{hex/large sextant=NE,hex/large sextant=N}
	{hex/sextant=N}		{hex/sextant=NE, hex/sextant=N, hex/sextant=NW}
	{hex/sextant=NW}		{hex/sextant=NE, hex/sextant=N, hex/sextant=NW, hex/sextant=SW}
	{hex/sextant=SW}		{hex/sextant=NE, hex/sextant=N, hex/sextant=NW, hex/sextant=SW, hex/sextant=S}
	{hex/sextant=S}		{hex/sextant=NE, hex/sextant=N, hex/sextant=NW, hex/sextant=SW, hex/sextant=S, hex/sextant=SE}
	{hex/sextant=SE}		{hex/sextant=NE, hex/sextant=N, hex/sextant=NW, hex/sextant=SW, hex/sextant=S, hex/sextant=SE, hex/sextant=C}
	{hex/sextant=C}		{hex/sextant=NE, hex/sextant=N, hex/sextant=S, hex/sextant=SE, hex/sextant=C}

Table 4: Terrain clipped via clip sub-key

2.5.1 Styling terrains

Terrains use the key `tikz/hex/terrain` to render the terrains. This is mainly useful for terrains made from `TikZ` pictures.

2.6 Ridges

Ridges, or hill or mountain slopes, can be added to a hex via the keyword `ridges`. The keyword takes a list of hex edges and generates symbology for the ridge on the chosen edges. Note that the edges does not have to be continuous, as illustrated in the bottom right of Table 5, nor in any particular order. The edges are specified as compass direction

```
north east, north, north west, south west, south, south east.  
NE, N, NW, SW, S, SE
```

Table 5 shows some examples.

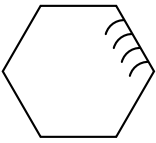
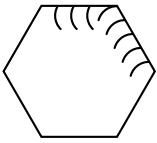
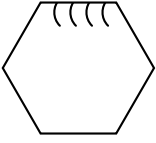

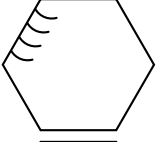

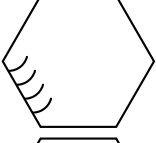

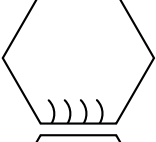

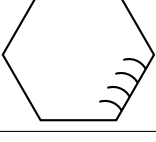
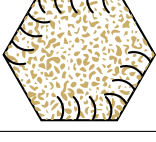
Symbol	ridges=	Symbol	ridges=
	NE		NE,N
	N		NE,N,NW
	NW		NE,N,NW,SW
	SW		NE,N,NW,SW,S,line width=3pt
	S		NE,N,NW,SW,S,SE,color=brown!70!black
	SE		N,S,NW,SE

Table 5: Ridges

2.6.1 Styling ridges

Every ridge is drawn with the style `tikz/hex/ridges`. Users can customise this style. The default is to draw thin black wave lines (TikZ decoration `waves`). The default style also takes care to auto scale line widths.

2.7 Labels

Labels can be placed on the hexes via the keyword `label`. The label can either be auto-generated or given explicitly. Table 6 shows the various choices.

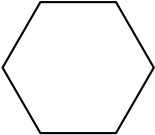
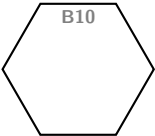
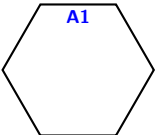
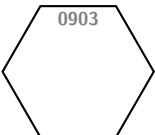
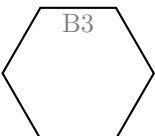

Symbol	Name	Column/Row	label=
	No label	n/a	<code>none</code>
	User specified	n/a	<code>text=B10</code>
	User specified	n/a	<code>{color=blue,text=A1}</code>
	Two-digit, zero padded numbers	9/3	<code>auto</code>
	Column letter, number row	2/3	<code>{auto=alpha column,font=\noexpand\rmfamily}</code> †
	Two letter column, two digit row	6/24	<code>{auto=alpha 2 column,anchor=north east}</code>

Table 6: Labels

†When specifying macros as key values in the options, for example the value `\rmfamily` for the key `font` above, we have to put a `\noexpand` in front if the macro. This is to prevent early expansion of the macro, which would cause errors. A minor nuisance.

The option `auto=inv y x plus 1` will label the rows inversely, and add one to the column number. This requires that the key `tikz/max hex row` has been set to the largest row number used.

In addition to the sub-keys `none`, `auto`, and `text`, one can also specify the following keys

`place=<coordinates>` specifies the Location of label within the hex. The anchor point of the text will be placed at

this point.

[`{/}`] **options**] at the start of the option (but inside braces `{...}`) can be used to give additional style options.

2.7.1 Styling labels

All labels use the style `tikz/hex/label`. By default, this places the label at the top of the hex, and renders the text as gray script sized text. Users can customise this style. If a user does not want to change the default style, or want to pass the same option to all labels, then one can set the key `tikz/every label` to those options.

2.8 Towns

Towns in hexes are made via the key `town`. This key takes several sub-keys, as illustrated in Table 7

Symbol	town=	Symbol	town=
			<code>{name=Copenhagen}</code>
	<code>{pic=hex/town/city}</code>		<code>{red,pic=hex/town/city}</code>
	<code>{fill=red}</code>		<code>{name=London}</code>
	<code>{red,name=Paris}</code>		<code>{above=0.8,name=Berlin}</code>
	<code>{place={(.2,.2)}}</code>		<code>{font=\noexpand\itshape,name=Amsterdam}</code> †

Table 7: Towns

†When specifying macros as key values in the options, for example the value `\rmfamily` for the key `font` above, we have to put a `\noexpand` in front if the macro. This is to prevent early expansion of the macro, which would cause errors. A minor nuisance.

The sub-keys available for the `town` key are

`pic=⟨town-pic⟩` The name of a TikZ picture. Currently defined are `hex/town/town` and `hex/town/city`. Users can provide alternate definitions or new types by defining TikZ pictures.

`place=⟨coordinates⟩` Location of label within the hex. The anchor point of the text will be placed at this point.

name=*<name>* Name of town

2.8.1 Styling towns

Towns uses two styles: `tikz/hex/town` for the town graphics, and `tikz/hex/town name` for the name of the town. In addition, a user may set the key `tikz/every hex town` to contain options to be passed to all towns.

2.9 Extra graphics for hexes

Additional graphics for hexes can be added by the two keys `extra` and `extra clipped`. The difference between the two are that graphics specified by `extra clipped` are clipped (restricted) to the hex, while graphics given by `extra` may extend beyond the hex. Both keys accept a comma separated list of arguments, where each element has the syntax

```
[<options>](<placement>)<picture>
```

Both *<options>* and *<placement>* are optional, and specifies keys to draw *<picture>* with and the relative location in the hex, respectively. The required argument *<picture>* must name a TikZ picture, for example `hex/fortress`. This can be useful for marking hexes on the board. For example to mark a set-up hex for one faction of the game.

One could for example define the following pictures to define set-up points for a Sovjet and German faction

```
setup/sovjet/.pic={
  \path[fill=red,draw=yellow,pic actions]
    ( 90:.4)--(126:.15)--
    (162:.4)--(198:.15)--
    (234:.4)--(270:.15)--
    (306:.4)--(342:.15)--
    ( 18:.4)--( 54:.15)--cycle;},
setup/german/.pic={
  \path[fill,pic actions]
    (-.4, -.1) rectangle(.4,.1)
    (-.1, -.4) rectangle(.1,.4);
  \path[draw,pic actions]
    (-.4,-.2) -- (-.2,-.2) -- (-.2,-.4)
    (-.4, .2) -- (-.2, .2) -- (-.2, .4)
    (.4, .2) -- (.2, .2) -- (.2, .4)
    (.4,-.2) -- (.2,-.2) -- (.2,-.4);}
foo/large/.pic={
  \path[fill=gray,pic actions] (-1,-.5) rectangle(1,.5);},
}
```

We can place extra graphics in hexes as shown in Table 8.

To finish off this part on hexes and what we can do with those, we generate a map in Figure 4.

2.10 Rivers, borders, and roads

Rivers and borders follow the hex sides and are added to the current `tikzpicture` using `\river` and `\border` macros respectively. They are specified as regular TikZ paths. It is useful to utilise the hex coordinate system for this.

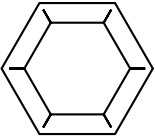

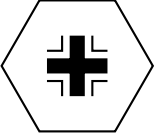


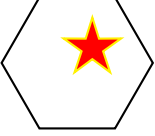
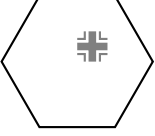
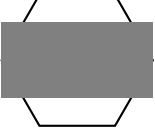
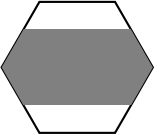
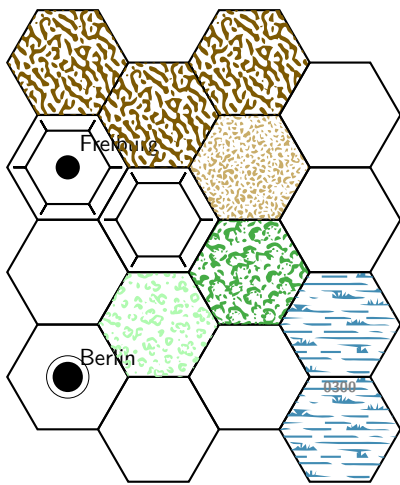
Symbol	extra=
	hex/fortress
	setup/sovjet
	setup/german
	{setup/german,hex/fortress} [†]
	{[line width=2pt,brown] fortress 2} [‡]
	{[shift={(.2,.2)}] setup/sovjet} [‡]
	{[shift={(.2,.2)},scale=.5,color=gray] setup/german} [‡]
	foo/large
Symbol	extra clipped=
	foo/large

Table 8: Hex extra graphics. Note that in the last line we use the graphics `foo/large` with `extra clipped` (compare to line just above) to restrict the graphics to the hex.

[†]When specifying more than one item, the list must be enclosed in braces (`{...}`)

[‡]When an item in the list of `extra` contains a comma (`,`), for example in a list of graphics options, then we need to enclose the inner list *and* the whole list in braces (`{...}`) to protect against unwanted expansion.



```

\hex[town={pic=hex/town/city,name=Berlin}] (r=0,c=0)
\hex[] (r=0,c=1)
\hex[] (r=0,c=2)
\hex[terrain={swamp},label=auto] (r=0,c=3)
\hex[] (r=1,c=0)
\hex[terrain={light woods}] (r=1,c=1)
\hex[terrain={woods}] (r=1,c=2)
\hex[terrain={swamp}] (r=1,c=3)
\hex[town={name=Freiburg},extra=hex/fortress] (r=2,c=0)
\hex[extra=hex/fortress] (r=2,c=1)
\hex[terrain={rough}] (r=2,c=2)
\hex[] (r=2,c=3)
\hex[terrain={mountains}] (r=3,c=0)
\hex[terrain={mountains}] (r=3,c=1)
\hex[terrain={mountains}] (r=3,c=2)
\hex[] (r=3,c=3)

```

Figure 4: Placing hexes

```

\river[options] path;
\border[options] path;

```

Rivers are essentially borders, but are randomized to give a more aesthetically pleasing output.

Roads and railroads typically go from hex-center to hex-center, and are added using the macro `\road`. The road or railroad is specified via a regular TikZ path.

```

\road[options] path;
\railroad[options] path;

```

Towns and cities conveniently serve as places to split up a road at.

2.10.1 Styling paths

Rivers, roads, railroads, and borders are styled by `hex/river`, `hex/road`, `hex/railroad`, and `border`, respectively, and the keys `every hex river`, `every hex road`, `every hex railroad`, and `every hex border` will also be applied. The latter can be defined by the user.

2.11 Board clipping and frame

In the river, border, and road example above, the roads extend beyond the hexes, which does not look very nice. One way to deal with this, is to draw a clipping box around the hexes

This technique works fine for examples in a manual, it has a somewhat displeasing effect for a full board. The package therefore defines the macro `\boardclip` which clips the graphics according to the defined hexes.

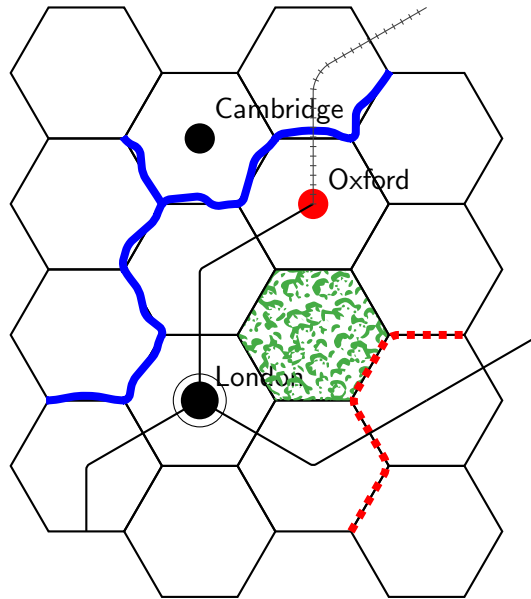


Figure 5: Adding rivers, borders, and roads

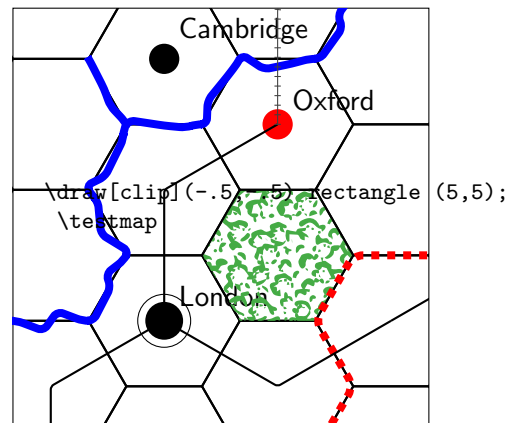
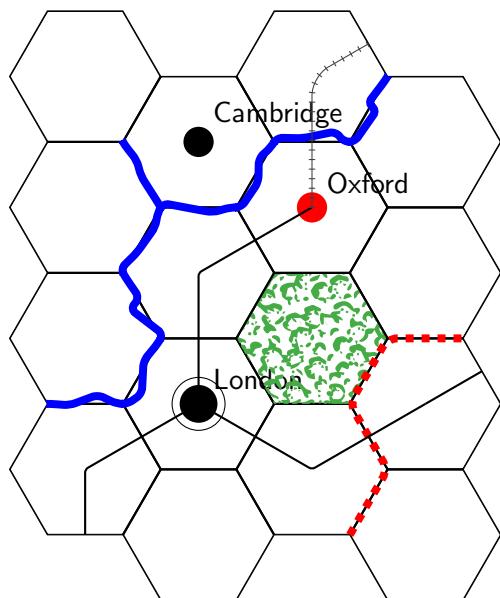


Figure 6: Clipping for a manual using a TikZ `\draw[clip]` command.

```
\boardclip(<lower-left>)(<upper-right>){<options>}
```

A clipping path of that spans from the hex at $\langle lower-left \rangle$ to $\langle upper-right \rangle$. Note, that both of these arguments should only specify the column and row keys. If $\langle options \rangle$ is non-empty, then the clipping path is drawn with those options.



```
\begin{scope}
\boardclip(c=0,r=0)(c=3,r=3){}
\testmap
\end{scope}
```

Figure 7: Snug-fit clipping of board using the macro `\boardclip`

This is particularly useful together with the `\boardframe` macro. This macro will put a frame around the board, optionally with a margin.

```
\boardframe[<margin>](<lower-left>)upper-right
```

where $\langle lower-left \rangle$ and $\langle upper-right \rangle$ are as for `\boardclip`. The $\langle margin \rangle$ must be a number, and specifies an optional margin around the hexes, The argument $\langle options \rangle$ specifies how the frame is drawn. The idea is to first draw the frame, then the clipping shape, and then the hexes. One should take care to use the $\langle options \rangle$ argument to `\boardclip` to specify a default background color. The frame is drawn with the style `hex/board frame`

The `\boardframe` macro prints the position of the rectangle to the log output, if one needs to do some more stuff around the board.

2.12 Constructing the physical board

If the board is not too large, so that it may fit on a paper format that can easily be printed (say A4, A3, Letter, or Tabloid), one can simply print the board and glue it onto a sturdy surface (say 1½ mm poster carton). However, if the board is large, meaning it does not fit on a piece of printable paper, then one has two options.

Either scale the board down so that it fits. Use the TikZ key `scale=⟨factor⟩` as an argument to the `tikzpicture` environment in which you create the board. In this case, you should make sure you also scale the chits by the

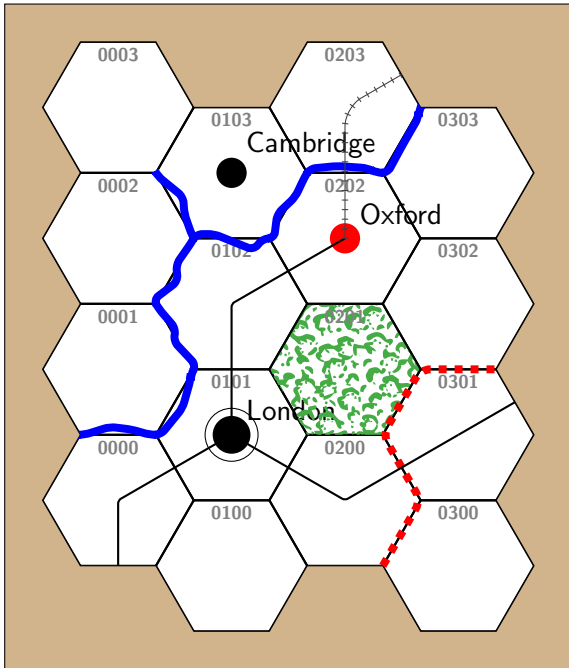


Figure 8: Combining a frame and clipping

same *factor*), again via the `scale` key.

Or you can split the board over several pages. The package provides a number of tools to help with this.

2.12.1 Split the board over multiple sheets

First, make sure you produce a standalone PDF of the board only.

```
\documentclass{standalone}
\usepackage{wargame}
\begin{tikzpicture}[scale=SCALE]
  % Define the board here.
\end{tikzpicture}
```

and that you have created this PDF — say `board.pdf`.

Next, prepare another document in which we will do the calculations. For example

```
\documentclass[11pt]{standalone}
\usepackage{wargame}
\begin{document}
\splitboard{paper=letter,margin=.7,ncol=2,nrow=2,overlap=1}
\end{document}
```

to calculate the split of `board.pdf` over 2×2 letter paper sheets, with a non-printable margin of 7mm, and an overlap between the segments of 1cm.

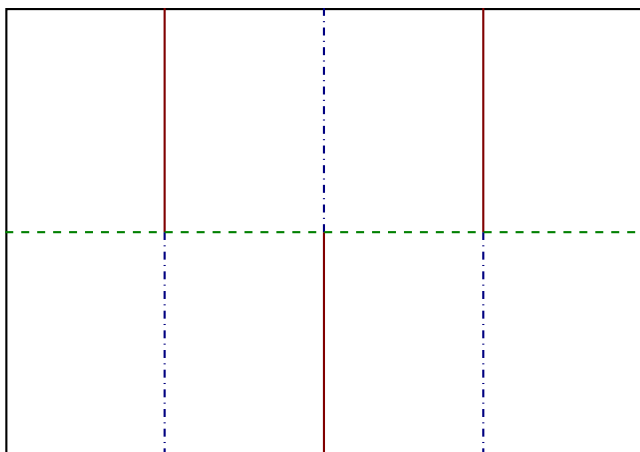
The possible keys for the `\splitboard` macro are

- `paper= $\langle format \rangle$` : Specifies the paper format. One of `a4`, `a3`, `letter`, `tabloid`. Default is `a4`.
- `landscape`: Sets the paper format to be in landscape mode (default is portrait).
- `margin= $\langle size in centimetres \rangle$` : Size of margins on each sheet in centimetres *without* unit. That is put 0.6 for 6mm, *not* 6mm. Default is 0.6. This should be *slightly* larger (by roughly 5%) than the *least* margin required by the printer used. *Must* be given *before* `paper` to have any effect.
- `ncol= $\langle number of columns \rangle$` : Sets the number of columns of sheets.
- `nrow= $\langle number of rows \rangle$` : Set the number of rows of sheets.
- `overlap= $\langle size in centimetres \rangle$` : Sets the size of the overlap between sheets in centimetres *without* unit. That is put 2 for 2cm, *not* 2cm. Default is 2.
- `image= $\langle image file name \rangle$` : File name of the board image (a PDF). Default is `board`
- `output= $\langle output file name \rangle$` : File name (without `.tex` ending) to write calculated split to.
- `standalone`: Boolean flag. If true, then output file will be a standalone document (i.e., has a `\documentclass`).
- `scale= $\langle scale \rangle$` : Set scale of board.

The macro will produce a file named $\langle output file name \rangle.tex$ which can be included in another document to generate the split board PDF. Crop marks will be added to the board segments to make it easier to align the parts.

2.12.2 Foldable board

To make a fold-able board use for example the below template to create grooves and cuts.



- Cut through carton
- - - - - Cut groove ($\frac{1}{2}$ through) in carton on *back* side
- - - - - Cut groove ($\frac{1}{2}$ through) in carton on *front* side

This will fold the board down to a fourth of the size of the full map. For example, if the board is A1 (84 cm × 59.4 cm) it will fold down to A4 (21 cm × 29.7 cm) for easier storage.

3 Chits

Chits, or playing counters¹, can be made with the macro `\chit`. The syntax for rendering a chit is

```
\chit[⟨key-value-pairs⟩](⟨location⟩)(⟨name⟩)
```

Figure 9 shows an example of a chit.

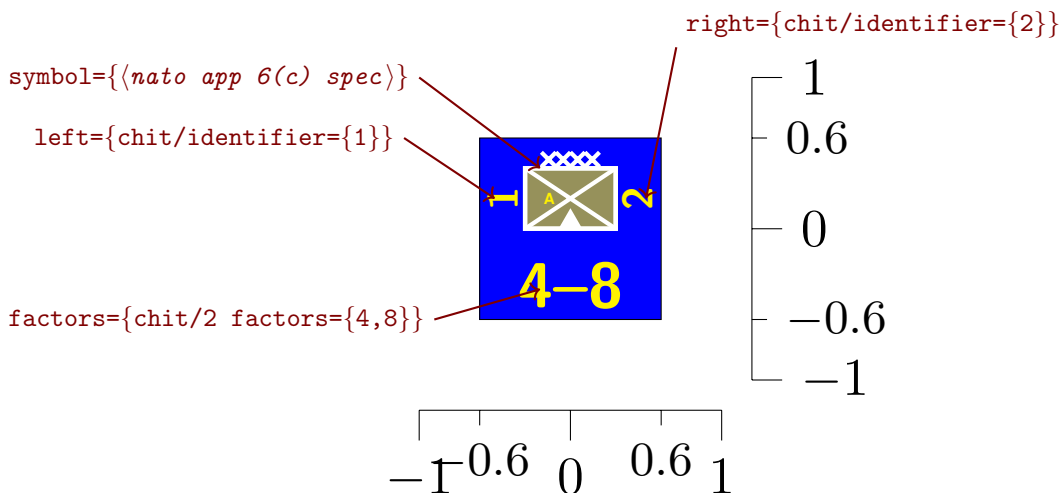


Figure 9: An example of a chit. The lines below and to the right shows two unit lengths. Other global options used are `color=white` to set the foreground colour, `fill=blue` for the background, and `text=yellow` to set the font colour to yellow. The `symbol` key also contains `frame={fill=yellow!50!black}` to set the frame fill colour, and `ultra thick` to set the line width of the NATO App6(C) symbol. Note that the line width is automatically scaled.

The example in Figure 9 shows an infantry mountaineer army unit with attack factor 4, and movement factor 8. The NATO App6(c) symbol is given in terms of keywords for the `\natoapp` macro (see Section 4). The other parts of the chit (`factors`, `left`, `right`, and `below`) are rendered onto the chit via `TikZ` pictures. This allows for a great deal of flexibility in generating chits. For example, above we use the pictures `chit/identifier` and `chit/2 factors` to render the left- and right-hand identifiers, and the factors, respectively.

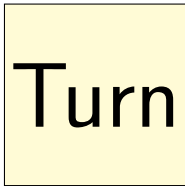
Full frame chits — that is chits which are not typically designating units or faction specific chits, e.g., a turn marker — can be made by using the key `full`. In that case, all other keys (`symbol`, `factors`, `left`, `right`, and `below`) are ignored. Figure 10 shows such an example.

The size of the chits are 1.2×1.2 unit lengths squared. This is tuned so that the chits will fit within the hexes produced by the `\hex` command (see Section). In Figure 11 we illustrate this. Typically the unit is one centimetre. which means the chits are $12\text{mm} \times 12\text{mm}$ — or roughly $1/2'' \times 1/2''$, which is a fairly good size for most games.

Just as `\hex` is really a wrapper around `TikZ`'s `\node` macro, so it is with `\chit`. This means that an alternative way of making a chit is to do

```
\node[chit={⟨key-value-pairs⟩}](⟨name⟩) at (⟨location⟩);
```

¹Since `TEX` has the concept of counters as in `\count` and `LATEX`'s `\newcounter`, we choose the name 'chit' for playing pieces instead.



chit made with

```
\tikzset{
  wg/big text/.pic={
    \node[font=\sffamily\fontsize{18}{0}%
      \selectfont]{#1};}
}
\tikz{
  \chit[full={wg/big text={Turn}},
    black,fill=yellow!20!white](0,0)}
\end{tikzpicture}
```

Figure 10: An example of a full-frame chit.

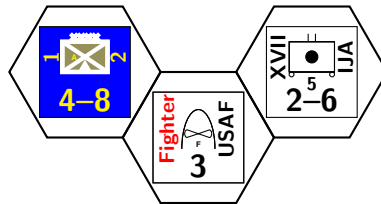


Figure 11: Example of chits fit within hexes.

Since chits are really `TikZ` nodes we can use anchors on the chit. Unlike for `\hex` where there are additional features available when using the dedicated macro, there really isn't much difference between `\chit` and `\node[chit=...]`.

3.1 Styling chits

Typical `TikZ` options can be passed to the `\chit` macro. For example, if you want to draw the chit with a red foreground, simply pass `draw=red` in the `[<optional>]` arguments to `\chits`. Individual parts of the hexes can be styled separately.

Important: To set the colours of the various elements, one should use

`color=<foreground and text>` Selects the foreground colour of lines, text, and so on, including for the NATO App6(C) symbol.

`fill=<background>` Selects the background colour of the full chit. By default this is transparent.

`text=<text foreground>` Selects the colour used for text in the chit. This overrides `color` for text.

`draw=<foreground>` This sets the colour for foreground elements, excluding text.

`TikZ` allows one to pass a `<colour>` as arguments for drawing and understands that as giving the foreground and text colours. However, that key is *deprecated* for this library, as it does not properly propagate through².

²The colour `pgfstrokecolor` is not modified by that.

The styles used by the `left`, `right`, `setup`, `factors`, and `symbol` elements are `tikz/chit/left`, `tikz/chit/right`, `tikz/setup`, `tikz/factors`, and `tikz/symbol` respectively. A user can redefine these to change the appearance of the chits. For example, one could make the symbol larger by setting a different `scale`, move the factors to the side by changing `shift`, and so on.

Pictures used by these elements are also styled by similar keys. For example, the picture `chit/identifier` is styled by `tikz/chit/identifier`.

A bevel (or “shadow-effect”) can be added to chits using the key `bevel`, with a value that specifies where the light comes from (e.g., north west or NW). The percentage of the half width of a chit of the bevel can be specified by the key `bevel fraction` (default 10%). This can be used for both symbol or full chits.

In addition, one can define the key `tikz/every chit` to be the default options for all chits.

By default, the outer “frame” of a chit is drawn with the same graphics options as the chit it self (i.e., same fill and stroke colour). To change that, one can pass `frame={\langle options \rangle}` as part of the chit options.

3.2 Defining preset chit types

One can conveniently pre-define some chit styles. For example, given the style definition

```
\tikzset{
  my chit/.style={/chit/symbol={[
    faction=friendly,
    command=land,
    main=armoured]},
    /chit/left={chit/identifier={Mine}},
    /chit/factors={chit/2 factors={2,4}}}}
```

We can use that to make different chits with some commonalities defined by that style. For example



where, in the second example, we have passed additional options to `\chit`. Note that we *must* give the full path to the `chit` keys when defining a style like this.

4 NATO App 6(c) symbols

The NATO markers are designed to fit within the template shown in Figure 12. The template serves as a placement guide of the various parts of the NATO marker as illustrated in Figure 13.

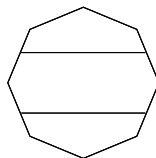


Figure 12: Template for NATO symbols

```
\natoapp[<key-value-pairs>](<location>)(<name>)
```

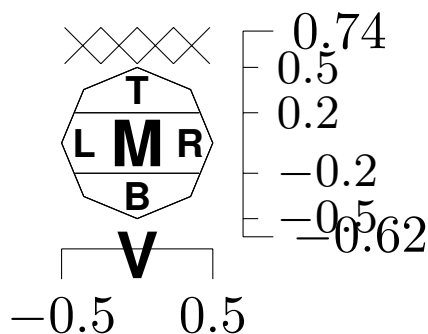
where all arguments are optional. Keys are defined to fill in the various parts of the markers. These keys are

`faction=<faction>` Selects the faction used for the symbol. See also Section 4.1.

`command=<command>` Selects the command used for the symbol. See also Section 4.1.

`main=<mains>` Specifies the main symbol(s). This can be a comma separated list of specifiers (delimited by braces $\{first, second, \dots\}$), and each symbol can be preceded by an optional argument to shift, scale, rotate, etc., the individual symbols. .

`left=<lefts>`, `right=<rights>`, `top=<tops>`, `bottom=<bottoms>`, `below=<belows>` Specifies the left-, right-hand, top, bottom, and lower symbol(s). The format of the arguments $\langle lefts \rangle$, $\langle rights \rangle$, $\langle tops \rangle$, $\langle bottoms \rangle$, and $\langle belows \rangle$ has the same format as $\langle mains \rangle$.



The figure is typeset by

```
\natoapp[faction=none,
command=base,
echelon=army,
main={text=M},
top={text=T},
bottom={text=B},
left={text=L},
right={text=R},
below={text=V}]
```

Figure 13: Main keys of `\natoapp`. The bottom and right hand bars indicate one unit of length.

Other keys are available to further customise the appearance of the symbols

`echelon=<size>` The size of the unit described. Possible values are `team`, `squad`, `section`, `platoon`, `company`, `battalion`, `regiment`, `brigade`, `division`, `corps`, `army`, `army group`, `theatre`, and `command`.

`frame=<keys>` Extra keys for frame.

4.1 Faction and Command Selection

Table 9 shows the various bases used for the various *faction/command* combinations. Also shown in the table is the base template for main identifiers.

<i><command></i>	<i><faction></i>			
	friendly	hostile	neutral	unknown
air				
land				
equipment				
installation				
sea surface				
sub surface				
space				
activity				

Table 9: Frames for various combinations of *<faction>* and *<command>* combinations. These are drawn with the `pic` given by `natoapp6c/<faction>/<command>` with the options `draw=blue,fill=<faction>`. If no `fill` is specified, then the background will be transparent. Note, the template for main identifiers is also shown on top of each frame.

The fill color of the frame is set by the key `frame`. If this is or contains the special value `faction`, then the frame fill colour will be the standard for the faction as illustrated in figure 14.

Elements of the frame can be controlled by the key `frame`.

`frame=<keys>` Additional keys to pass to the frame drawing. The special option `faction` will make the frame be filled with the standard faction color.

Table 10 illustrates this.

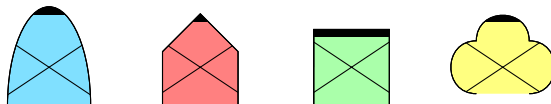


Figure 14: Illustration of using the special value `fraction` for the `frame` key

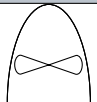

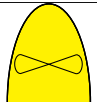
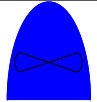

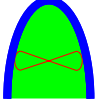
Example	<code>frame={color,...}</code>	<code>frame={fill,...}</code>	<code>frame={draw,...}</code>	<code>frame={line width,...}</code>
				
	red			thick
		yellow		thin
			blue	
		pink	magenta	
	red	green	blue	ultra thick

Table 10: Illustration of frame colour choices

4.2 Unit Size (echelon)

The size of a unit a marker represents is given by the `echelon` keyword. Table 11 shows the various markers and approximate unit sizes.

4.3 Unit type identification

See Table 12.

References

- [1] Hanover,C., Hendrix,C.E., & Llewelyn,S., *First Blood*, 1997, <https://grognard.com/fb/>. See also implementation using this package at https://gitlab.com/wargames_tex/firstblood_tex.
- [2] *NATO Joint Military Symbology*, APP-6(C), May 2011, https://en.wikipedia.org/wiki/NATO_Joint_Military_Symbology.
- [3] *NATO Joint Military Symbology*, APP-6(D), October 2017, <https://nso.nato.int/nso/nsdd/main/standards/ap-details/1912/EN>
- [4] `milsymb` package, <https://www.ctan.org/pkg/MilSymb>.

5 Implementation

5.1 The wargame package

First, package identification

```
1 \ProvidesPackage{wargame}
```

Then needed packages

```
2 \RequirePackage[svgnames]{xcolor}
3 \RequirePackage{tikz}
```

A switch to include terrain pictures (which take a lot of memory for some reason).

```
4 \@ifundefined{ifhex@terrain@pic}{%
5   \newif\ifhex@terrain@pic
6   \hex@terrain@picfalse}{}
```

Options

```
7 \DeclareOption{notterrainpic}{%
8   \hex@terrain@picfalse}
9 \DeclareOption{terrainpic}{%
10  \hex@terrain@pictrue}
11 \ProcessOptions\relax
```

Finally, the used TikZ libraries

```
12 \usetikzlibrary{wargame.hex,wargame.natoapp6c,wargame.chit}
```















Example	echelon	Approx. size	Sub-units	Officer
	team	3-5	none	Corporal or Sergeant
	squad	5-10	1-2 teams	Sergeant
	section	7-13	2-3 teams	Sergeant
	platoon	25-40	Several squads/sections	Second Lieutenant
	company	60-250	Several platoons	Captain
	battalion	300-1000	2-6 companies	Lieutenant colonel
	regiment	500-2000	3-7 battalions	Colonel
	brigade	2000-5000	Several battalions	Colonel
	division	10000-20000	Several brigades/regiments	Major General
	corps	30000-60000	Several divisions	Lieutenant General
	army	100000	Several corps (5-10 divisions)	General
	army group	120000-500000	Several armies	Field Marshal
	theatre	250000+	Several army groups	Field Marshal
	command		Not a unit size, but designator	

Table 11: Illustration of echelon values. Approximate sizes and command officer titles are typical modern day United States of America army values and identifiers. Historically the unit sizes have changed, as has officer titles. Furthermore, both the unit sizes, names, and command officer titles may vary from country to country, even across command.

Symbol	Type & Abbreviation	
	Air assault	AA
	Air defence	ADA
	Airborne	AB
	Amphibious	AM
	Anti tank/armoured	AT
	Armoured	AR
	Chemical biological radiological nuclear	CB
	Combined arms	CAR
	Engineer	ENG
	Field artillery	FA
	Infantry	IN ³
	Mechanised infantry	M
	Mountaineer	MTN
	Naval	N
	Reconnaissance	REC
	Special Operations Forces	SOF
Symbol	Echelon & Abbreviation	
XXXXXX	Army group	AG
XXXXX	Army	A
XXX	Corps	-
XX	Division	D ⁴
X	Brigade	BD
	Regiment	REGT
	Battalion	BN
	Company	COY
●●●	Platoon	PLT
●●	Section	
●	Squad	

Table 12: Some abbreviations of unit type identifications

5.2 The wargame.util TikZ library

This library contains some utilities for use in the other libraries.

5.2.1 Miscellaneous macros

```
\wargamelogo
```

This will produce the logo for this package.



```
13 \tikzset{
14   wargame logo text/.style={
15     font=\sffamily\bfseries\fontsize{12}{14}\selectfont,
16     scale=2.8,
17     inner sep=0,
18     text width=1.8cm,
19     transform shape,
20     align=center},
21   wargame logo text content/.store in=\wg@logo@text@content,
22   wargame logo text content={{\huge\LaTeX} wargame},
23   wargame logo chit/.style={
24     chit={symbol={
25       faction=friendly,
26       command=land,
27       echelon=division,
28       main=infantry}},
29     factors={chit/2 factors={4,3}},
30     left={chit/identifier=III},
31     right={chit/small identifier={10\textsuperscript{th}}},
32     color=white,
33     fill=red!50!black
34   }
35 },
36   wargame logo/.style={
37     transform shape,
38     every hex/.style={fill=gray!5!white,draw=gray!75!black},
39     hex/first row is=0,
40     hex/first column is=0,
```

```

41 hex/short top columns=none,
42 hex/short bottom columns=none,
43 hex/row direction is=normal,
44 hex/column direction is=normal
45 }
46 }
47 \newcommand\wargamelogo[1][]{%
48 \begin{scope}[wargame logo,#1]
49 \node[hex={fill=gray!30!white}] (logo center) at (hex cs:c=0,r=0) {};
50 \node[hex={terrain=light woods}] (logo light woods) at (hex cs:c=0,r=1) {};
51 \node[hex={terrain=city}] (logo city) at (hex cs:c=0,r=-1) {};
52 \node[hex={terrain=woods}] (logo woods) at (hex cs:c=-1,r=0) {};
53 \node[hex={terrain=mountains}] (logo mountains) at (hex cs:c=-1,r=1) {};
54 \node[hex={terrain=beach}] (logo beach) at (hex cs:c=1,r=1) {};
55 \node[hex={terrain=swamp}] (logo swamp) at (hex cs:c=1,r=0) {};
56 \node[wargame logo chit] (logo chit) at (hex cs:) {};
57 \node[wargame logo text] (logo text) {\wg@logo@text@content};
58 \end{scope}}

```

\wg@dbg

Debugging support. The counter `\wargamedbglvl` sets the debug level. The package code then uses `\wg@dbg` to print out debugging messages. This macro takes two arguments — the first is the *least* debug level at which the message is printed, and the second is the message it self.

```

59 \newcount\wargamedbglvl\wargamedbglvl=0
60 \def\wg@dbg#1#2{%
61 \ifnum#1>\wargamedbglvl\relax\else\message{^^J#2}\fi}

```

\wg@addto@macro

The macro `\wg@addto@macro{<macro>}{<other>}` adds the definition of the macro `<other>` to the macro `<macro>`. This uses the `\toks` trick of storing the *tokens* of the definition of a `<macro>` and `<other>` into `@` and expanding that token into the definition of `<macro>`. Effectively, this means that the top-level definition of `<macro>` and `<other>` are expanded (i.e., macros used in the definition of either macro is *not* expanded) and then that becomes the new definition of `<macro>`.

We will use this macro to do *shallow* definitions of macros to contain keys and such.

```

62 \long\def\wg@addto@macro#1#2{%
63 \begingroup
64 \toks@\expandafter\expandafter\expandafter{\expandafter#1#2}%
65 \xdef#1{\the\toks@}%
66 \endgroup}

```

\wg@sub@anchor

Get anchor from sub node. We cannot use `\pgfpointanchor` since that returns the anchor coordinates in the global coordinate system.


```

67 \def\wg@sub@nchor#1#2{%
68   \wg@dbg{3}{^^JGet '#2' in '#1'}%
69   \@ifundefined{pgf@sh@ns@#1}{%
70     \pgf@x=0cm\pgf@y=0cm}{%
71     \pgf@process{%
72       \csname pgf@sh@ma@#1\endcsname% MW
73       \csname pgf@sh@np@#1\endcsname%
74       \pgf@sh@reanchor{\csname pgf@sh@ns@#1\endcsname}{#2}}}%
75   \wg@dbg{10}{-> \the\pgf@x,\the\pgf@y}%
76 }

```

Scratch dimensions

```

77 \newdimen\wg@tmpa
78 \newdimen\wg@tmpb
79 \newdimen\wg@tmpc
80 \newdimen\wg@tmpd

```

Macro to easy restore a saved path

```

81 \def\settosave#1{
82   \pgfsyssoftpath@setcurrentpath{#1}}

```

5.2.2 Pictures in compound nodes

`\wg@pic`

The macro `\wg@pic` will render a `pic`. This is used by the `natoapp6cs`, `chit`, and `hex` node shapes extensively.

The arguments are

1. Prefix
2. Position
3. Fixed options
4. User options
5. Picture.

That is, the macro expects calls like

```
\wg@pic[<options>]<picture>\@endwg@pic{<prefix>}{<position>}{<options>}
```

Note the `\@endwg@pic` at the end of the call to swallow up `<picture>`. Typically this macro is used as

```
\edef\args{<something>} \expandafter\wg@pic\args\@endwg@pic{<prefix>}{<position>}{<options>}
```

where `<something>` typically expands to `[<user option>]<picture>`

First, the top-level macro `\wg@pic` that looks for user options.

```

83 \def\wg@pic{%
84   \@ifnextchar[{\wg@@pic}{\wg@@pic[]}%
85 }

```

This macro then forwards to `\wg@@pic` to gobble up $\langle picture \rangle$.

1. User options

2. Arguments

```
86 \def\wg@@pic[#1]#2\endwg@pic{%
87   \wg@dbg{2}{Options: '#1', picture: '#2'}%
88   \wg@@pic{#1}{#2}%
89 }
```

1. User options

2. Arguments

3. Prefix

4. Coordinates

5. Fixed options

```
90 \def\wg@@@pic#1#2#3#4#5{%
91   \ifx|#2|\wg@dbg{3}{No picture given}%
92   \else%
93     \wg@dbg{3}{^^JWG Pic:
94       ^^J User options:  #1
95       ^^J Picture:      #2
96       ^^J Prefix:       #3
97       ^^J Coordinates:  #4
98       ^^J Fixed options: #5}%
99   % \wg@dbg{2}{\string\pic[#5,#1] at (#4) {#3#2}}%
100  \pic[#5,#1] at (#4) {#3#2};%
101  \ifwg@s@ve%
102    \pgf@relevantforpicturesizetrue%
103    \begin{getbb1}%
104      \pic[draw=none,fill=none,transform shape] at (#4) {#3#2};%
105    \end{getbb1}%
106    \wg@dbg{5}{Clipping to local bounding box}%
107    \clip (L.south west) rectangle (L.north east);%
108    \pgf@relevantforpicturesizefalse \global\wg@s@vefalse%
109  \fi
110  \fi%
111  \wg@dbg{3}{End of WG Pic}
112 }
```

`\wg@pic@all`

This macro sets all pictures in a list.

1. List

2. Prefix

3. Position

4. Styles

```
113 \def\wg@pic@all#1#2#3#4{%
114   \wg@dbg{2}{WG picture loop
115     ^^J List:   \meaning#1
116     ^^J Prefix: '#2'
117     ^^J Position: '#3'
118     ^^J Styles: '#4'}
119   \foreach \p in #1{%
120     \wg@dbg{2}{WG picture element: \meaning\p}%
121     \expandafter\wg@pic\p\@endwg@pic {#2}{#3}{#4}%
122   }%
123 }
```

5.2.3 Nodes in compound nodes

`\wg@node`

The macro `\wg@node` will render a node. This can be used by the `natoapp6cs`, `chit`, and `hex` node shapes.

The arguments are

1. Prefix
2. Position
3. Fixed options
4. User options
5. Body.

That is, the macro expects calls like

```
\wg@node[<options>]<body>\@endwg@node{<prefix>}{<position>}{<options>}
```

Note the `\@endwg@node` at the end of the call to swallow up *<body>*. Typically this macro is used as

```
\edef\args{<something>} \expandafter\wg@node\args\@endwg@node{<prefix>}{<position>}{<options>}
```

where *<something>* typically expands to [*<user option>*]*<body>*

First, the top-level macro `\wg@node` that looks for user options.

```
124 \def\wg@node{%
125   \@ifnextchar[{\wg@@node}{\wg@@node []}%
126 }
```

This macro then forwards to `\wg@@node` to gobble up *<body>*.

1. User options
2. Arguments

```

127 \def\wg@@node[#1]#2\endwg@node{%
128   \wg@dbg{2}{Options: '#1', body: '#2'}%
129   \wg@@node{#1}{#2}%
130 }

```

1. User options
2. Arguments
3. Prefix
4. Coordinates
5. Fixed options

```

131 \def\wg@@node#1#2#3#4#5{%
132   \ifx|#2|\wg@dbg{3}{No body given}%
133   \else%
134     \wg@dbg{3}{^^JWG Pic:
135       ^^J User options: #1
136       ^^J Body: #2
137       ^^J Prefix: #3
138       ^^J Coordinates: #4
139       ^^J Fixed options: #5}%
140   % \wg@dbg{2}{\string\pic[#5,#1] at (#4) {#3#2}}%
141   \node[#5,#1] at (#4) {#3#2};%
142   \fi%
143   \wg@dbg{3}{End of WG Node}
144 }

```

\wg@node@all

This macro sets all pictures in a list.

1. List
2. Prefix
3. Position
4. Styles

```

145 \def\wg@node@all#1#2#3#4{%
146   \wg@dbg{2}{WG picture loop
147     ^^J List: \meaning#1
148     ^^J Prefix: '#2'
149     ^^J Position: '#3'
150     ^^J Styles: '#4'}
151   \foreach \p in #1{%
152     \wg@dbg{2}{WG picture element: \meaning\p}%
153     \expandafter\wg@node\p\endwg@node {#2}{#3}{#4}%
154   }%
155 }

```

5.2.4 Bounding boxes

Bounding box dimensions

```
156 \newdimen\wg@bb@minx
157 \newdimen\wg@bb@miny
158 \newdimen\wg@bb@maxx
159 \newdimen\wg@bb@maxy
```

Enable or disable bounding box tracking

```
160 \newif\ifwg@notrelevantforpathsize\wg@notrelevantforpathsizefalse
```

wg@resetbb

Reset the bounding box tracking dimensions

```
161 \def\wg@resetbb{%
162   \global\wg@bb@minx=16000pt\relax%
163   \global\wg@bb@miny=16000pt\relax%
164   \global\wg@bb@maxx=-16000pt\relax%
165   \global\wg@bb@maxy=-16000pt\relax%
166 }
```

\old@pgf@protocolsize

Save PGF's bounding box algorithm

```
167 \let\old@pgf@protocolsize\pgf@protocolsizes
```

\wg@protocolsizes

Our bounding box algorithm

```
168 \def\wg@protocolsizes#1#2{%
169   \old@pgf@protocolsize{#1}{#2}
170   \ifwg@notrelevantforpathsize\else%
171   \ifdim#1<\wg@bb@minx\global\wg@bb@minx#1\fi%
172   \ifdim#1>\wg@bb@maxx\global\wg@bb@maxx#1\fi%
173   \ifdim#2<\wg@bb@miny\global\wg@bb@miny#2\fi%
174   \ifdim#2>\wg@bb@maxy\global\wg@bb@maxy#2\fi%
175   \fi
176 }
```

getbb1 (*env.*) Environment that tracks the local bounding box

```
177 \newenvironment{getbb1}{%
178   \wg@resetbb%
179   \wg@notrelevantforpathsizefalse%
180   \global\let\pgf@protocolsizes\wg@protocolsizes}%
181 \gdef\pgf@sh@ns@L{rectangle}
```

```

182 \gdef\pgf@sh@np@L{%
183   \def\southwest{\pgfqpoint{\the\wg@bb@minx}{\the\wg@bb@miny}}%
184   \def\northeast{\pgfqpoint{\the\wg@bb@maxx}{\the\wg@bb@maxy}}%
185 }
186 \gdef\pgf@sh@nt@L{{1}{0}{0}{1}{0pt}{0pt}}
187 \gdef\pgf@sh@pi@L{\pgfpictureid}
188 \global\let\pgf@protocolsizes\old@pgf@protocolsize
189 }

```

`getbb` (*env.*) Environment to track global bounding box

```

190 \newenvironment{getbb}{%
191   \wg@resetbb%
192   \wg@notrelevantforpathsizefalse%
193   \global\let\pgf@protocolsizes\wg@protocolsizes}%
194 \gdef\pgf@sh@ns@M{rectangle}
195 \gdef\pgf@sh@np@M{%
196   \def\southwest{\pgfqpoint{\the\wg@bb@minx}{\the\wg@bb@miny}}%
197   \def\northeast{\pgfqpoint{\the\wg@bb@maxx}{\the\wg@bb@maxy}}%
198 }
199 \gdef\pgf@sh@nt@M{{1}{0}{0}{1}{0pt}{0pt}}
200 % \pgfgettransform\pgf@temp%
201 % \xdef\pgf@sh@nt@M{\pgf@temp}
202 % \pgfgettransformentries{\wg@tmp@a}{\wg@tmp@b}{\wg@tmp@c}{\wg@tmp@d}{\pgf@temp}{\pgf@temp}
203 % \message{^^JTransform of M: \meaning\pgf@temp}
204 % \xdef\pgf@sh@nt@M{{\wg@tmp@a}{\wg@tmp@b}{\wg@tmp@c}{\wg@tmp@d}{0pt}{0pt}}%
205 % \message{^^JTransform of M: \meaning\pgf@sh@nt@M}
206 \gdef\pgf@sh@pi@M{\pgfpictureid}
207 \global\let\pgf@protocolsizes\old@pgf@protocolsize
208 }

```

5.2.5 Some utilities to get bounding boxes and the like

All coordinates, and such are recorded in centimetres. It is worth remembering that the Tikz coordinate system has the y axis point upward, while typical image software has the y axis point down. `pdftocairo` typically assumes a 150 PPI (pixels-per-inch) resolution.

That means that scaling factor becomes

$$\frac{150\text{pixel}}{2.54\text{cm}} = 59.055 \frac{\text{pixel}}{\text{cm}}$$

Since we want to write all dimensions in centimetres, we need to be able to convert `pt` dimensions to centimetres. We make two macros to do that for us.

The exact definition of `1pt` is

$$1\text{pt} = \frac{249}{250}12'' \frac{1}{864} = \frac{83}{6000}1'' = 0.03513\bar{6}$$

```

209 % 2.54 / 72.27 = .03514598035145980351
210 % \def\wg@pt@to@cm#1{\pgfmathparse{#1 * 0.0351460}}
211 \def\wg@pt@to@cm#1{\pgfmathparse{#1 * 0.0351367}}
212 \def\ptpoint@to@cm#1#2{%

```

```

213 \wg@pt@to@cm{#1}\edef\x{\pgfmathresult}%
214 \wg@pt@to@cm{#2}\edef\y{\pgfmathresult}}

```

The next macro gets an anchors coordinates and stores them (in units of centimetres) in `\tmp@x` and `\tmp@y`

```

215 \def\wg@get@nchor#1#2{%
216 \wg@dbg{2}{Get anchor coordinates #1.#2}
217 \pgfpointanchor{#1}{#2}%
218 \wg@dbg{2}{ '\the\pgf@x', '\the\pgf@y' }
219 \pgfgetlastxy\tmp@x\tmp@y%
220 \wg@dbg{2}{ '\tmp@x', '\tmp@y' }
221 \wg@pt@to@cm{\tmp@x}\edef\tmp@x{\pgfmathresult}
222 \wg@pt@to@cm{\tmp@y}\edef\tmp@y{\pgfmathresult}
223 }

```

This does the same as above, but transform to the global coordinate system.

```

224 \def\wg@get@global@nchor#1#2{%
225 \pgfpointanchor{#1}{#2}%
226 \pgfgetlastxy\tmp@x\tmp@y%
227 \pgfpointtransformed{\pgfpoint{\tmp@x}{\tmp@y}}
228 \pgf@xa=\pgf@x
229 \pgf@ya=\pgf@y
230 %% \message{^^JAnchor #1.#2 @ (\the\pgf@xa,\the\pgf@ya)}
231 \wg@pt@to@cm{\the\pgf@xa}\edef\tmp@x{\pgfmathresult}
232 \wg@pt@to@cm{\the\pgf@ya}\edef\tmp@y{\pgfmathresult}
233 }

```

This records the bounding box given by a named node. The result is stored in the macros `\llx`, `\lly`, `\urx`, and `\ury`.

```

234 \def\wg@get@bb#1{%
235 \wg@get@nchor{#1}{south west}
236 \edef\llx{\tmp@x}
237 \edef\lly{\tmp@y}
238 \wg@get@nchor{#1}{north east}
239 \edef\urx{\tmp@x}
240 \edef\ury{\tmp@y}
241 }
242 \def\wg@logbb#1{%
243 \wg@get@bb{#1}%
244 \message{^^J'#1' BB: (\llx,\lly) x (\urx,\ury)^^J}}

```

5.2.6 Other Tikz utilities

tikz/reverseclip

A reverse clipping path. This is used to cut out stuff outside of path defined.

```

245 \tikzstyle{reverseclip}=[insert path={(current bounding box.north east) --
246 (current bounding box.south east) --
247 (current bounding box.south west) --
248 (current bounding box.north west) --
249 (current bounding box.north east)}}

```

tikz/clip even odd rule

A reverse clipping path

```
250 \tikzset{
251   clip even odd rule/.code={\pgfseteorule}, % Credit to Andrew Stacey
252 }
```

tikz/invclip

Inverse clipping. This should be an option *after* the path to do the inverse clipping by. This works by adding a *large* (page) path to the current path, and then use that as clipping.

```
253 \tikzset{
254   invclip/.style={
255     clip,insert path=
256     [clip even odd rule]{
257       [reset cm](-\maxdimen,-\maxdimen)rectangle(\maxdimen,\maxdimen)
258     }
259   },
260 }
```

save clip

An option for use with sub-elements of NATO App 6(c) or chit nodes. This will save the current path as a clipping path for the next paths to be drawn in the sub-element

```
261 \newif\ifwg@s@ve\wg@s@vefalse
262 \tikzset{
263   save clip/.is choice,
264   save clip/true/.code={\global\wg@s@vetrue},
265   save clip/false/.code={\global\wg@s@vefalse},
266   save clip/.default={true},
267   save clip/.initial={false},
268 }
```

scale line widths

Scales any line width specified in the node options.

Use like

```
\tikzset{
  some/.style={
    scale line widths,
    line width=1pt}
}
```


Note that the order is important.

```

269 %      Save pgf rounded corners macro
270 %      \let\wg@pgfsetcornersarced\pgfsetcornersarced
271 \def\wg@setcornersarched#1{%
272   \ifx|#1|\else%
273   \edef\pgf@corner@arc{#{1}{#1}}%
274   \pgf@arccornerstrue%
275   \ifdim#1=0pt%
276     \pgf@arccornersfalse%
277     \fi\fi}
278 \newdimen\wg@lw@scaled\wg@lw@scaled=1pt
279 \def\wg@getscale{%
280   \pgfgettransformentries{%
281     \wg@jaca}{%
282     \wg@jacb}{%
283     \wg@jacc}{%
284     \wg@jacd}{%
285     \wg@tmp}{%
286     \wg@tmp}%
287   \pgfmathsetmacro{\wg@jac}{sqrt(abs(\wg@jaca*\wg@jacd-\wg@jacb*\wg@jacc))}%
288   \wg@dbg{4}{Scale is \wg@jac}
289   \xdef\wg@scale{\wg@jac}}
290 \def\wg@scaled#1{%
291   \wg@getscale%
292   \wg@dbg{4}{Scaling #1 by \wg@scale}
293   \pgfmathsetmacro{\wg@tmp}{\wg@scale*#1}%
294   \xdef\wg@tmp{\wg@tmp}%
295   \xdef\wg@lw@scale{\wg@tmp}%
296   \wg@dbg{4}{Scaled #1 -> \wg@tmp}}
297 %% \message{^^JRounded corners: \meaning\pgfsetcornersarced}
298 \tikzset{
299   %% Get current scale and store in \wg@scale
300   get scale/.code={\wg@getscale},
301   scale line widths/.style={%
302     /utils/exec=\def\tikz@semiaddlinewidth##1{%
303       \wg@scaled{##1}
304       \wg@lw@scaled=\wg@tmp pt
305       \tikz@adoption{\pgfsetlinewidth{\wg@lw@scaled}}%
306       \wg@dbg{4}{Added scaled option \wg@tmp}
307       \pgfmathsetlength\pgflinewidth{\wg@tmp pt}
308       \wg@dbg{4}{Did set line width \wg@tmp pt}
309     }
310   },
311   scale rounded corners/.style={%
312     /utils/exec=\def\pgfsetcornersarced##1{%
313       \pgf@process{##1}%
314       \pgf@xa=\pgf@x%
315       \wg@scaled{\the\pgf@xa}%
316       % \tikz@adoption{\wg@setcornersarched{\wg@tmp pt}}%
317       \wg@dbg{4}{Scaled rounded corners: \the\pgf@xa -> \wg@tmp}%
318       \wg@setcornersarched{\wg@tmp pt}%
319     }
320   },

```

```

321 relative line width/.style={%
322 /utils/exec=\def\tikz@semiaddlinewidth##1{%
323   \wg@dbg{4}{Relative line width #1 times ##1}%
324   \pgfmathsetmacro{\wg@lv}{#1*##1}%
325   \tikz@addoption{\pgfsetlinewidth{\wg@lv pt}}%
326   \pgfmathsetlength\pgflinewidth{\wg@lv pt}}
327 }

```

sub pic actions

This is key that propagates actions to sub pictures of pictures. The normal `pic actions` cannot be used as it causes an infinite loop.

```

328 \tikzset{
329   sub pic actions/.code={%
330     \tikz@picmode%
331     \edef\opts{%
332       \iftikz@mode@draw draw,\else draw=none,\fi
333       \iftikz@mode@fill fill\else fill=none\fi}
334     \wg@dbg{5}{^^JSub Mode: \meaning\tikz@picmode \meaning\opts}
335     \pgfset{/tikz/.cd}
336     \pgfkeysalsofrom{\opts}
337   }}

```

wg/debug show

Show debugging information

```

338 \tikzset{
339   wg/debug show/.code={%
340     \extractcolorspec{pgfstrokelcolor}{\wg@tmp@fg}
341     \def\wg@tmp@bg{none}
342     \@ifundefinedcolor{pgffillcolor}{}{
343       \extractcolorspec{pgffillcolor}{\wg@tmp@bg}}
344     \beginpgfgroup
345     \tikz@mode
346     \wargamedbglvl=#1
347     \wg@dbg{3}{Drawing with w/stroke '\wg@tmp@fg'
348       (\tikz@strokecolor,\iftikz@mode@draw\else not\space\fi drawing)
349       and fill '\wg@tmp@bg' (\tikz@fillcolor,\iftikz@mode@fill\else
350       not\space\fi filling)}
351     \endpgfgroup
352   }
353 }

```

5.2.7 Random IDs

This macro sets the macro `\wg@uuid` to some random hex number.

```

354 \def\wg@random@id{%
355   \def\wg@uuid{}

```

```

356 \foreach \i in {1,...,8}{%
357   \pgfmathparse{Hex(random(0,15))}
358   \xdef\wg@uuid{\wg@uuid\pgfmathresult}}

```

5.2.8 VASSAL icons

Some icons that may be useful in VASSAL. We put them here so they may be used in manuals and the like too.

First, the line style

```

359 \tikzset{
360   trash can line/.style={scale line widths,scale rounded corners,
361     line width=.5mm,->},
362 }

```

Then, the body and lid of a trash can.

```

363 \tikzset{
364   trash can body/.pic={%
365     \path[fill=black,scale line widths,scale rounded corners,
366       rounded corners=.05cm]
367       (-.3,.2) ---+ (.6,0) ---+ (-.1,-.7) ---+ (-.4,0) --cycle;
368     \path[fill=white]
369       (-.025,-.4) arc(180:360:.025) ---+ ( 0,.5) arc(0:180:.025) --cycle;
370     \path[fill=white]
371       (-.125,-.4) arc(180:360:.025) ---+ (-.07,.5) arc(0:180:.025) --cycle;
372     \path[fill=white]
373       ( .075,-.4) arc(180:360:.025) ---+ ( .07,.5) arc(0:180:.025) --cycle;
374   },
375   trash can lid/.pic={%
376     \path[fill=black,scale line widths,scale rounded corners,
377       rounded corners=.05cm]
378       (-.35,.23) ---+ (.7,0) ---+ (-.07,.07) ---+ (-.56,0) --cycle;
379     \path[fill=black]
380       (-.15,.3) ---+ (.05,0) ---+ (0,.05) ---+ (.2,0) ---+ (0,-.05)
381       ---+ (.05,0) ---+ (0,.05) arc(0:90:.05) ---+ (-.2,0) arc(90:180:.05)
382       --cycle;
383   },
384 }

```

Then, a closed and open trash can

```

385 \tikzset{
386   trash can/.pic={
387     \pic{trash can body};
388     \pic{trash can lid};
389   },
390   trash can open/.pic={
391     \pic{trash can body};
392     \pic[rotate=-30] at (0,.1) {trash can lid};
393   },
394 }

```

Now we can use that to generate some useful icons.

```

395 \tikzset{
396   eliminate icon/.pic={
397     \pic{trash can open};
398     \draw[trash can line,color=red!50!black]
399     (-.5,.2) to[looseness=1.5] (-.1,.23);
400   },
401   restore icon/.pic={
402     \pic{trash can open};
403     \draw[trash can line,<,color=green!50!black]
404     (-.5,.2) to[looseness=1.5] (-.1,.23);
405   },
406   pool icon/.pic={
407     \pic{trash can};
408   },
409 }

```

These icons does not use the trash can picture.

```

410 \tikzset{
411   flip icon/.pic={
412     \draw[scale line widths,scale rounded corners,
413     line width=1mm,->,color=blue!50!black]
414     (-.5,-.5) arc(180:0:.5);% (.5,-.5);
415   },
416   pics/oob icon/.style n args={2}{code={%
417     \begin{scope}[box/.style args={##1,##2,##3,##4}{
418       minimum width=##1cm,
419       minimum height=##2cm,
420       fill=##3,
421       anchor=##4,
422       draw=gray!50!black,
423       scale line widths,
424       line width=.5pt,
425       transform shape},
426     under/.style={
427       below=.05cm of ##1}
428     ]
429     \node[box={.5,.2,##1,north west,fill=##1}] (r1) at (.05,.45) {};
430     \node[under=r1.south west,box={.3,.25,##1,north west}] (r2) {};
431     \node[under=r2.south west,box={.2,.3, ##1,north west}] (r3) {};
432     \node[box={.2,.4,##2,north east}] (l1) at (-.05,.45) {};
433   \end{scope}
434   }
435 }
436 }

```

5.3 The wgexport class

This document class is used for exporting game component to be used in a VASSAL module libraries.

Class identification and load wargame package

```

437 \ProvidesClass{wgexport}
438 \PassOptionsToClass{multi=tikzpicture,varwidth=false}{standalone}

```

```

439 \DeclareOption{notterrainpic}{%
440   \PassOptionsToPackage{\CurrentOption}{wargame}}
441 \DeclareOption{terrainpic}{%
442   \PassOptionsToPackage{\CurrentOption}{wargame}}
443 \DeclareOption*{%
444   \PassOptionsToClass{\CurrentOption}{standalone}}
445 \ProcessOptions\relax
446 \LoadClass{standalone}
447 \RequirePackage{wargame}

```

We need a few utilities before we get to the actual environment. First, we need a tools to write out literal left and right curly braces. We do a bit of catcode hackery to accomplish that.

```

448 \begingroup
449 \catcode'\^^I=12
450 \def\@tabchar{^^I}
451 \catcode'<=1 \catcode'>=2
452 \catcode'_{=12 \catcode'}=12
453 \gdef\@lbchar{<}
454 \gdef\@rbchar{>}
455 \endgroup

```

Above, we temporarily set the tab, and left and right curly brace characters to be regular letters (12), and the catcodes of less than and greater than to be those of left and right curly braces respectively. We then define the macros \@tabchar, \@lbchar, and \@rbchar to produce literal characters. L^AT_EX already has \@percentchar.

Everything we do should go inside this environment. The single optional argument is the file name stem of the output JSON file.

```

456 \newenvironment{imagelist}[1][\jobname]{%
457   \newwrite\mk@out%
458   \def\mk@i{ }%
459   \def\mk@w{\immediate\write\mk@out}%
460   \immediate\openout\mk@out=#1.json
461   \mk@w{ [ }
462 }{
463   \mk@w{\mk@i \@lbchar "name":"End of list", "category": "<<eol>>",
464     "subcategory": "" \@rbchar }
465   \mk@w{ ] }
466   \immediate\closeout\mk@out
467 }

```

Precede all images (tikzpicture) with this command

First argument is the name of the image. This can be anything. Note that for counters, if the name ends in `flipped` then it is considered the backside of a counter.

Second argument is the type of image. Recognised types are

- `board` for boards
- `oob` for OOBs
- `chart` for charts
- `counter` for counters

- `front` for front page

Other types can be used, and the images will be exported, but the Python script pays no particular attention to those then. Use for example to prepare images for help or the like.

The third argument is the sub type. This is most relevant for the counters. Sub types can be anything, but since the counters will receive different prototypes based on the sub type, it makes sense to divide into sub types a la

- `factions`
- `common markers`

The faction sub types should just be the name of the faction. E.g., `Allies`, `Axis`, `Soviet`, `NATO`, `Warsaw Pact`. Spaces should not matter.

For common markers, there are a few names that are recognised specifically by the Python script. These are

- `common`
- `all`
- `marker`
- `markers`

Counters that has these sub-types will no be considered to belong to any faction.

Note that the Python script uses the faction names to guess the players of the game, and uses them in several places.

```

468 \def\info{%
469   \ifstar{\@@info{,}}{\@@info{\@rbchar,}}
470 \def\@@info#1#2#3#4{%
471   \chit@dbg{2}{Making image '#2' of type '#3'/'#4' on page \thepage}%
472   \mk@w{ \@lbchar}%
473   \mk@w{ \space "name": "#2",}%
474   \mk@w{ \space "category": "#3",}%
475   \mk@w{ \space "subcategory": "#4", }%
476   \mk@w{ \space "number": \thepage #1}%
477   \let\oldmk@i\mk@i%
478   \ifx#1,\relax\edef\mk@i{\mk@i\space\space}\fi}
479 \def\end@info{%
480   \let\mk@i\oldmk@i%
481   \mk@w{ \space \@rbchar,}}

```

Make separate images for each counter (single sided).

```

482 \newcommand\chitimages[2][ ]{%
483   \begingroup%
484   \let\chit@report\do@chit@report%
485   \let\natoapp@report\do@natoapp@report%
486   \chit@dbg{2}{chits to make images of '#2'}%
487   \foreach[count=\ti from 0] \t/\x in #2{%
488     \chit@dbg{2}{^^JRow: '\t' ('\x')}
489     \ifx\t\empty\else% Ignore empty rows

```

```

490 \chit@dbg{5}{^^JSubcategory: '\x' (default '#1')}
491 % Take sub-category or default
492 \ifx\t\x\def\x{#1}\else\ifx\x\empty\def\x{#1}\fi\fi
493 \foreach \u/\m in \t{%
494   \ifx\u\empty\else% Ignore empty cells
495     \ifx\u\chit@blank\else%
496       \chit@dbg{2}{Next chit '\u' with possible multiplicity '\m'}%
497       \ifx\m\@empty\def\m{1}\fi% If not multiplicity defined
498       \ifx\u\m\def\m{1}\fi% If the same as unit
499       \chit@dbg{2}{Next chit '\u' multiplicity '\m'}%
500       %% We only make one copy of the chit, since we can duplicate
501       %% it in VASSAL
502       \info*{\u}{counter}{\x}
503       \begin{tikzpicture}
504         \chit[\u=\ti]%
505       \end{tikzpicture}
506     \end@info%
507     %% \foreach \n in {1,...,\m}{% Make a number of copies
508     %%   \ifx\u\chit@blank%
509     %%     \chit@dbg{3}{Ignoring blank chit:\u}%
510     %%   \else%
511     %%     \info{\u}{counter}{#2}
512     %%     \begin{tikzpicture}
513     %%       \chit[\u=\ti](\c,\r)%
514     %%     \end{tikzpicture}
515     %%   \fi%
516     %% }%
517   \fi%
518 }%
519 }%
520 \chit@dbg{2}{End of inner loop}%
521 \fi%
522 }%
523 \chit@dbg{2}{End of outer loop}%
524 \endgroup%
525 }

```

Make separate images for each counter (double sided). The back-side counters must be defined by append ‘ flipped’ the front face name

```

526 \newcommand\doublechitimages[2] [] {%
527   \begin{group}%
528   \let\chit@report\do@chit@report%
529   \let\natoapp@report\do@natoapp@report%
530   \foreach[count=\ti from 0] \t/\x in #2{%
531     \ifx\t\empty\else% Ignore empty rows
532     \chit@dbg{5}{^^JSubcategory: '\x' (default '#1')}
533     % Take sub-category or default
534     \ifx\t\x\def\x{#1}\else\ifx\x\empty\def\x{#1}\fi\fi
535     \foreach \u/\m in \t{%
536       \ifx\u\empty\else% Ignore empty cells
537       \ifx\u\chit@blank\else%
538         \chit@dbg{2}{Next chit '\u' with possible multiplicity '\m'}%
539         \ifx\m\@empty\def\m{1}\fi% If not multiplicity defined

```

```

540     \ifx\u\m\def\m{1}\fi% If the same as unit
541     \chit@dbg{2}{Next chit '\u' multiplicity '\m'}%
542     %% Flipped chit
543     \edef\s{\u\space flipped}%
544     %% We only make one copy of the chit, since we can duplicate
545     %% it in VASSAL
546     \info*{\u}{counter}{\x}%
547     \begin{tikzpicture}%
548         \chit[\u=\ti]%
549     \end{tikzpicture}%
550     \end@info%
551     \info*{\s}{counter}{\x}%
552     \begin{tikzpicture}%
553         \chit[\s=\ti]%
554     \end{tikzpicture}%
555     \end@info%
556     %% \foreach \n in {1,...,\m}{% Make a number of copies
557     %%     \ifx\u\chit@blank%
558     %%         \chit@dbg{3}{Ignoring blank chit:\u}%
559     %%     \else%
560     %%         \info{\u}{counter}{#2}
561     %%         \begin{tikzpicture}
562     %%             \chit[\u=\ti](\c,\r)%
563     %%         \end{tikzpicture}
564     %%     \fi%
565     %% }%
566     \fi%
567     \fi%
568     }%
569     \fi%
570     }%
571     \endgroup%
572 }

```

Special for boards, we have the environment `boardimage`. Like `\info` we must specify the name and sub-category of the board, but the category is assumed to be `board` (though the optional argument can specify a different category).

Within this environment some specific styles are defined that allows the user to specify VASSAL zones on the board. For this to work properly, the parent `tikzpicture` *must* have the style `zoned`. This style will record the bounding box of the picture which we will need to calculate VASSAL coordinates later on.

Other styles are `zone scope`, to be applied to `scopes` in the picture, and `zone path` to be applied to `paths` (or `\draw`, `\fill`, or the like) in the picture. These will record coordinates of these elements inside the picture. The Python script will then define VASSAL zones based on these coordinates.

For `zone scope` applied to a `scope`, what is recorded are

- The current coordinate transformation matrix
- The current translation
- The bounding box, within the current transformation and translation.

To define a zone in the board, simply enclose it in a


```

\begin{scope}[zone scope=name]
...
\end{scope}

```

The $\langle name \rangle$ will be the name of the scope. If this contains the sub-string `hex` (upper, lower, or mixed case), then the zone will get a hex grid with numbering attached to it.

If the $\langle name \rangle$ contains the sub-string `turn` (any case), then it is assumed to be a turn track and a rectangular grid will be attached. The column and row separator will be set to `T`, so that it won't collide with the main zone. Similar if $\langle name \rangle$ contains `oob`, except the separator is set to `O`.

If $\langle name \rangle$ contains the sub-string `pool`, then it is assumed to be a pool of counters, and *no* grid is attached.

For `zone path` applied to a `path`, what is recorded is the path coordinates (as straight line segments) in the global coordinate system.

Both styles take one argument — the name of the zone. If that name contains the sub-string `hex` anywhere in the name, then the zone is assumed to contain a hex grid. Otherwise, a rectangular grid (of fixed size) will be applied to it.

The environment `boardimage` also records the coordinate options currently in use (keys `hex/first row is`, `hex/row direction is`, and so on), as well as the current label option (as defined by `every hex` or `every hex node`).

The information extracted is written to the `\jobname.json` file as a sub-object (with name given by the first optional argument) of the image object. In that way, we can later on easily get the information from our catalogue of images.

Note, the styles `zoned`, `zone scope`, and `zone path` are defined in `wargame` to be dummies so that one can have them in the definition of the board without impact.

```

573 \def\mk@transform{%
574   \pgfgettransformentries{\mxx}{\mxy}{\myx}{\myy}{\ptdx}{\ptdy}
575   \wg@pt@to@cm{\ptdx}\edef\dx{\pgfmathresult}
576   \wg@pt@to@cm{\ptdy}\edef\dy{\pgfmathresult}
577   \mk@w{ \mk@i "xx": \mxx,}
578   \mk@w{ \mk@i "xy": \mxy,}
579   \mk@w{ \mk@i "yx": \myx,}
580   \mk@w{ \mk@i "yy": \myy,}
581   \mk@w{ \mk@i "dx": \dx,}
582   \mk@w{ \mk@i "dy": \dy,}
583 }

584 \def\mk@bb#1{%
585   \wg@get@bb{#1}
586   \mk@w{ \mk@i "lower left": [\llx,\lly],}
587   \mk@w{ \mk@i "upper right": [\urx,\ury],}
588   \begingroup
589     \wg@get@global@nchor{#1}{south west}
590     \mk@w{ \mk@i "global lower left": [\tmp@x,\tmp@y],}
591     \wg@get@global@nchor{#1}{north east}
592     \mk@w{ \mk@i "global upper right": [\tmp@x,\tmp@y]}
593   \endgroup
594 }

595 \def\mk@pos#1(#2){%
596   \wg@dbg{10}{^^JMarking '#2' with '#1' - start}
597   \coordinate[transform shape] (tmp) at (#2) {};
598   \wg@get@nchor{tmp}{center}

```

```

599 \wg@dbg{3}{^^JMarking '#2' with '#1' - '\tmp@x',\tmp@y'}
600 \tikzset{zone point={#1}{\tmp@x}{\tmp@y}}
601 }

```

For the key zone path to work, we need to be able to record the path as it moves along. To that end, we make a custom decoration that will do that for us, and, once the path is finished, write the path to our JSON file.

```

602 \pgfdeclaredecoration{record path construction}{initial}{%
603 \state{initial}[width=0pt,next state=more]{
604 \beginpgfgroup
605 \pgf@decorate@inputsegment@first
606 \ptpoint@to@cm{\the\pgf@x}{\the\pgf@y}
607 \xdef\wg@path{[\x,\y]}
608 \endpgfgroup
609 }%
610 \state{more}[width=\pgfdecoratedinputsegmentremainingdistance]{%
611 \beginpgfgroup
612 \pgf@decorate@inputsegment@last
613 \ptpoint@to@cm{\the\pgf@x}{\the\pgf@y}
614 \xdef\wg@path{\wg@path, [\x,\y]}
615 \endpgfgroup
616 }
617 \state{final}{%
618 \beginpgfgroup
619 \pgf@decorate@inputsegment@last
620 \ptpoint@to@cm{\the\pgf@x}{\the\pgf@y}
621 \xdef\wg@path{\wg@path, [\x,\y]}
622 \endpgfgroup
623 \mk@w{ \mk@i "zone path \wg@record@path@name": \@lbchar}
624 \mk@w{ \mk@i\space "path": [\wg@path] \@rbchar,}
625 }
626 }%

```

Now we can make our environment

The first thing we do is to use the `\info` macro to mark the image. Then we open our JSON file. We make a short-hand macro for writing to that file. The macro `\bd@i` records the current indentation (which is important in JSON)

```

627 \newenvironment{boardimage}[3][board]{%
628 \def\bd@n{#2}
629 \newcount\mk@point
630 \mk@point=0
631 \let\oomk@i\mk@i%
632 \let\markpos\mk@pos%

```

Then, to extract the label option, we make a dummy node with the styles `every hex` and `every hex node`, so we can extract that option.

```

633 \info{dummy}{<<dummy>>}{}%
634 %\tikz{}%
635 \tikz{\scoped[%
636 every hex/.try, every hex node/.try,
637 ]}%
638 \def\hex@col{0}%

```

```

639     \def\hex@row{0}%
640     \node[hex,inner sep=0,outer sep=0]{%
641       \message{^^JHex label: '\meaning\hex@label'}%
642       \global\let\mk@label\hex@label}}}%

```

The next thing we do is to make an object. The first things we put in are the units used (“cm”), and the grid options.

```

643 \info*{#2}{#1}{#3}%
644 \mk@w{ \mk@i "zones": \@lbchar}%
645 \edef\mk@i{\mk@i\space}
646 %% Everything is made into centimeters
647 \mk@w{ \mk@i "units": "cm",}
648 \hex@dbg{0}{Label: '\meaning\mk@label'}
649 \@ifundefined{mk@label}{\mk@w{ \mk@i "labels": "\mk@label",}}%
650 %% Write out coordinate options as "coords" object
651 \mk@w{ \mk@i "coords": \@lbchar}%
652 \mk@w{ \mk@i "row": \@lbchar}%
653 \mk@w{ \mk@i\space "offset": \hex@coords@row@off,}%
654 \mk@w{ \mk@i\space "factor": \hex@coords@row@fac \@rbchar,}%
655 \mk@w{ \mk@i "column": \@lbchar}%
656 \mk@w{ \mk@i\space "offset": \hex@coords@col@off,}%
657 \mk@w{ \mk@i\space "factor": \hex@coords@col@fac,}%
658 \mk@w{ \mk@i\space "top short": "\hex@top@short@col",}%
659 \mk@w{ \mk@i\space "bottom short": "\hex@bot@short@col" \@rbchar}%
660 \mk@w{ \mk@i \@rbchar,}%

```

We then monkey-patch `\boardframe` to also output coordinates to our JSON file. Note that this will probably be embedded in a different object.

```

661 %%
662 \let\oldbo@rdframe\bo@rdframe%
663 \def\bo@rdframe[##1](##2)(##3){%
664   \oldbo@rdframe[##1](##2)(##3)%
665   \mk@w{ \mk@i "board frame": \@lbchar}
666   \mk@w{ \mk@i\space "lower left": [\llx,\lly],}
667   \mk@w{ \mk@i\space "upper right": [\urx,\ury],}
668   \mk@w{ \mk@i\space "margin": \margin,}
669   \mk@w{ \mk@i\space "width": \w,}
670   \mk@w{ \mk@i\space "height": \h \@rbchar,}%

```

Next, we make the style `zoned` to be applied to the `tikzpicture` environment. This records the bounding box of the full picture.

```

671 \tikzset{
672   zoned/.code={% Apply to whole picture
673     \pgfkeys{%
674       % This needs to be done in the picture!
675       /tikz/execute at end picture={%
676         \mk@w{ \mk@i "zoned": \@lbchar}
677         \mk@transform%
678         \mk@bb{current bounding box}
679         \mk@w{ \mk@i \@rbchar,}
680       }
681     }
682   },

```

The next style is the `zone scope`. At the start of the scope we record the current transformation matrix. Then we install a handler to extract the bounding box at the end of the scope. Note that we increase indentation here.

```

683 zone scope/.code={%
684   \mk@w{ \mk@i"zone scope ##1": \@lbchar}
685   \let\omk@i\mk@i
686   \edef\mk@i{\mk@i\space}
687   \mk@transform%
688   %\bd@w{ \@rbchar,}
689   \gdef\wg@export@box{##1}%
690   \pgfkeys{%
691     /tikz/local bounding box=wg export box,
692     /tikz/execute at end scope={
693       \mk@bb{wg export box}
694       \let\mk@i\omk@i
695       \mk@w{ \mk@i\@rbchar,}},
696   } % pgfkeys
697 }, % zone scope

```

The next style gets the global coordinates of the current (0,0) point - f.ex. in a node - and outputs that

```

698 zone point/.code n args={3}{
699   \pgf@xa=##2 cm
700   \pgf@ya=##3 cm
701   \pgfpointtransformed{\pgfpoint{\pgf@xa}{\pgf@ya}}
702   % \pgfpointtransformed{\pgfpoint{0pt}{0pt}}
703   \pgf@xa=\pgf@x
704   \pgf@ya=\pgf@y
705   \wg@pt@to@cm{\the\pgf@xa}\edef\px{\pgfmathresult}
706   \wg@pt@to@cm{\the\pgf@ya}\edef\py{\pgfmathresult}
707   \advance\mk@point1
708   \global\mk@point=\mk@point
709   \mk@w{ \mk@i "point\the\mk@point": \@lbchar "name": "##1", "type": "point", "coords": [\px,\py]
710     \@rbchar, }
711   %\message{^^JZone point \the\mk@point\space ##1: ##2,##3 -> \px,\py}
712 },
713 zone oob point/.code n args={3}{
714   \pgf@xa=##2 cm
715   \pgf@ya=##3 cm
716   \advance\pgf@xa.1cm
717   \advance\pgf@ya.1cm
718   \pgfpointtransformed{\pgfpoint{\pgf@xa}{\pgf@ya}}
719   % \pgfpointtransformed{\pgfpoint{0pt}{0pt}}
720   \pgf@xa=\pgf@x
721   \pgf@ya=\pgf@y
722   \wg@pt@to@cm{\the\pgf@xa}\edef\px{\pgfmathresult}
723   \wg@pt@to@cm{\the\pgf@ya}\edef\py{\pgfmathresult}
724   \advance\mk@point1
725   \global\mk@point=\mk@point
726   \mk@w{ \mk@i "point\the\mk@point": \@lbchar "name": "##1",
727     "parent": "\wg@export@box", "type": "point", "coords": [\px,\py]
728     \@rbchar, }
729   %\message{^^JZone point \the\mk@point\space ##1: ##2,##3 -> \px,\py}
730 },

```

```

731 zone global point/.code n args={3}{
732   \advance\mk@point1
733   \global\mk@point=\mk@point
734   \mk@w{ \mk@i "point\the\mk@point": \@lbchar "name": "##1", "type": "point", "coords": [\px,\py]
735     \@rbchar, }
736 },

```

The `zone path` style is a bit more simple, but only because the bulk of the work is done in a decoration. We need to be able to pass a name to that decoration, so we make a key for that. The user need not think about that though.

```

737 /pgf/decoration/record path name/.store in=\wg@record@path@name,
738 zone path/.style={%
739   postaction={decorate,decoration={
740     record path construction,
741     record path name=##1}}
742 } % zone path
743 }% tikzset
744 }

```

That finishes the first part of the environment. At the end of the environment, we simply write the name of the picture, and close our JSON output.

```

745 {%
746   \mk@w{ \mk@i "name": "\bd@n" }%
747   \let\mk@i\oomk@i%
748   \mk@w{ \mk@i \@rbchar}%
749   \end@info%
750 }

```

Make battle markers. Mandatory argument is how many markers, optional is the group to add the markers to.

```

751 \def\wg@gennumberm@rkers#1#2#3{
752   \message{^^JNumbered markers: Type='#1' Max='#2' Category='#3'}
753   \def\markers{}
754   \def\keys{}
755   \foreach \i in {1,...,#2}{%
756     \xdef\keys{/tikz/#1 \i/.style={/tikz/#1=\i},\keys}
757     \xdef\markers{\markers,#1 \i}}
758   {%
759     \nopagecolor\pgfkeysalsofrom{\keys}\chitimages[#3]{\markers}}%
760   \tikzset{
761     wg hidden unit/.pic={},
762     wg hidden unit/.style={
763       chit={
764         frame={draw=none,fill=none},
765         full=wg hidden unit}}
766   \DeclareRobustCommand\battlemarkers[2][BattleMarkers]{%
767     \wg@gennumberm@rkers{battle marker}{#2}{#1}%
768     \message{^^JMake a hidden unit and add to Markers category}
769     {%
770       \nopagecolor%
771       \chitimages[Markers]{\wg hidden unit}%
772       %
773       \info{battle-marker-icon}{icon}{}}%

```

```

774 \tikz[scale=.7,transform shape]{\pic{battle marker=0};}%
775 \info{clear-battles-icon}{icon}{}
776 \tikz[scale=.4,transform shape]{%
777 \pic{eliminate icon};
778 \pic[scale=.7,transform shape] at (-.3,0) {battle marker=0};}%
779 }%
780 }

```

Make odds markers. Mandatory argument is a list of odds and fill colours. Optional is the group to add the markers to.

```

781 \def\wg@gencolorm@rkers#1#2#3{%
782 \def\markers{}
783 \def\keys{}
784 \foreach \o/\f in {#2}{%
785 \ifx\o\f\def\f{white}\fi%
786 \message{^^Jodds marker '#1 \o' w/fill '\f'}%
787 \xdef\keys{/tikz/#1 \o/.style={/tikz/#1={\o,\f}},\keys}
788 \xdef\markers{\markers,#1 \o}}
789 {\nopagecolor\pgfkeysalsofrom{\keys}\chitimages[#3]{\markers}}}%
790 \DeclareRobustCommand\oddsmarkers[2][OddsMarkers]{%
791 \wg@gencolorm@rkers{odds marker}{#2}{#1}%
792 \info{odds-battles-icon}{icon}{}
793 \tikz[scale=.5,transform shape]{\pic{odds marker={?:?,white}}}}
794 \info{resolve-battles-icon}{icon}{}
795 \tikz[scale=.3,transform shape]{%
796 \pic{dice};
797 \pic[scale=1.2,transform shape] at (-.2,-.2) {battle marker=0};}%
798 }

```

Make results markers. Mandatory argument is a list of results and fill colours. Optional is the group to add the markers to.

```

799 \DeclareRobustCommand\resultmarkers[2][ResultMarkers]{%
800 \wg@gencolorm@rkers{result marker}{#2}{#1}}

```

Common icons used by many modules

```

801 \DeclareRobustCommand\commonicons[2]{%
802 \begingroup%
803 \nopagecolor%
804 \tikzset{icon/.style={scale=.4,transform shape}}}%
805 %
806 \info{pool-icon}{icon}{}
807 \tikz[icon]{\pic{pool icon};}
808 %
809 \info{oob-icon}{icon}{}%
810 \tikz[icon]{\pic{oob icon={#1}{#2}};}%
811 %
812 \info{flip-icon}{icon}{}%
813 \tikz[icon]{\pic{flip icon};}%
814 %
815 \info{eliminate-icon}{icon}{}%
816 \tikz[icon]{\pic{eliminate icon};}%

```

```

817 %
818 \info{restore-icon}{icon}{}%
819 \tikz[icon]{\pic{restore icon};}%
820 %
821 \info{dice-icon}{icon}{}%
822 \tikz[icon,scale=.9]{\pic{dice};}%
823 %
824 \info{unit-icon}{icon}{}%
825 \tikz[icon,scale=.7]{%
826   \chit[fill=#1,
827     symbol={[
828       scale line widths,
829       line width=1pt,
830       faction=friend,
831       command=land,
832       main=infantry,
833       scale=1.3](0,-.15)}]}%
834 \endgroup%
835 }

```

5.3.1 Making dice

```
\dice[<tikz-options>][<node-options>]{<name>}{<name>}{<list>}
```

1. *<tikz-options>*
2. *<node-options>*
3. *<name>* - an identifier - e.g., the same as *<shape>*.
4. *<shape>* - one of d4, d6, d8, d10, d12, or d20.
5. *<list>* - list of pairs *<value>/<printed>*, where *<value>* is the value, and *<printed>* is the shown value. If *<printed>* is left out, then *<value>* is used.

```

836 \def\dice{%
837   \ifnextchar[{\wg@dice}{\wg@dice[]}%
838 }
839 \def\wg@dice[#1]{%
840   \ifnextchar[{\wg@@dice{#1}}{\wg@@dice{#1}[] }%
841 }
842 \def\wg@@dice#1[#2]#3#4#5{%
843   \foreach \v/\p in {#5}{%
844     \info{#3-\v}{die-roll}{#3}
845     \tikz[#1]{
846       \node[shape=#4,transform shape,draw=none,fill=black,opacity=.5]
847       at (.05,-.03){};
848       \node[shape=#4,#2,transform shape]{\p};}}

```

5.3.2 Hooks into chits, etc.

TO BE DONE: We could add hook the hex shape that would allow us to write out the settings for each of these. This would allow us to make data files that contain the information available in the L^AT_EX code.

If one then assumed that for example the upper left corner holds the start-up hex, then one could use that information. The code below exports the chit information to the JSON file. Together with the battle, odds, and result markers stuff above, this allows the exporter to almost automatically set up battle odds and result calculations. The fields exported are

- Left and right identifiers
- Upper left, upper right, lower left, and lower right identifiers. (some care must be taken if these contains graphics and not just text.)
- Factors
 - Faction, command, echelon
 - Mains
 - Left, right, top, and bottom attributes and modifiers
 - Below attribute

The exporter can set up prototypes for NATO types, echelons, etc. The exporter can also set factors as marks on the units.

```

849 \tikzset{
850   zone turn/.store in=\zone@turn,
851   zone mult/.store in=\zone@mult
852 }
853 \def\@chit@rep@line#1#2{%
854   \ifundefined{#2}{-}{
855     \edef\wg@chit@tmp{\csname #2\endcsname}
856     {\escapechar=' /
857       \xdef\tmp{\detokenize\expandafter{\wg@chit@tmp} \@empty}}
858     % \message{^^J\meaning\@tmp -> \meaning\tmp}
859     \mk@w{ \mk@i\space "#1": "\tmp",}}
860
861 \def\do@chit@report{%
862   \chit@dbg{3}{Start of Chit Report}
863   \mk@w{ \mk@i "chit": \@lbchar}
864   \chit@dbg{3}{Report - ID}
865   \ifundefined{id}{-}{\mk@w{ \mk@i\space "id":      "\id", }}%
866   \chit@dbg{3}{Report - Symbol: '\meaning\chit@symbol'}
867   \ifundefined{chit@symbol}{-}{\mk@w{ \mk@i\space "symbol": "true", }}%
868   \chit@dbg{3}{Report - Full: '\meaning\chit@full'}
869   \@chit@rep@line{full}{chit@full}
870   \chit@dbg{3}{Report - Factors: '\meaning\chit@factors'}
871   \@chit@rep@line{factors}{chit@factors}%
872   \chit@dbg{3}{Report - Left: '\meaning\chit@left'}
873   \@chit@rep@line{left}{chit@left}%
874   \chit@dbg{3}{Report - Right: : '\meaning\chit@right'}
875   \@chit@rep@line{right}{chit@right}%
876   \chit@dbg{3}{Report - Upper left: '\meaning\chit@upper@left'}
877   \@chit@rep@line{upper left}{chit@upper@left}%
878   \chit@dbg{3}{Report - Lower left: '\meaning\chit@lower@left'}

```



```

879 \@chit@rep@line{lower left}{chit@lower@left}%
880 \chit@dbg{3}{Report - Upper right: '\meaning\chit@upper@right}
881 \@chit@rep@line{upper right}{chit@upper@right}%
882 \chit@dbg{3}{Report - Lower right: '\meaning\chit@lower@right'}
883 \@chit@rep@line{lower right}{chit@lower@right}%
884 \chit@dbg{3}{Report - End comma}
885 \mk@w{ \mk@i\space "end": 0}
886 \@ifundefined{chit@symbol}{
887   \mk@w{ \mk@i \@rbchar }
888 }{
889   \mk@w{ \mk@i \@rbchar, }% NATOAPP6c will follow
890 }%
891 \chit@dbg{3}{End of Chit Report}
892 }

```

Report out NATO App6 symbol settings

```

893 \def\do@natoapp@report{%
894   \mk@w{ \mk@i "natoapp6c": \@lbchar}
895   \@chit@rep@line{id}{\id}
896   \@chit@rep@line{faction}{natoapp@fac}
897   \@chit@rep@line{command}{natoapp@cmd}
898   \@chit@rep@line{echelon}{natoapp@ech}
899   \@chit@rep@line{main}{natoapp@main}
900   \@chit@rep@line{left}{natoapp@left}
901   \@chit@rep@line{right}{natoapp@right}
902   \@chit@rep@line{upper}{natoapp@upper}
903   \@chit@rep@line{lower}{natoapp@lower}
904   \@chit@rep@line{below}{natoapp@below}
905   \mk@w{ \mk@i\space "end": 0}
906   \mk@w{ \mk@i \@rbchar}
907 }

```

5.4 The wargame.hex TikZ library

Used TikZ libraries

```

908 \RequirePackage{alphalph}
909 \usetikzlibrary{calc}
910 \usetikzlibrary{arrows.meta}
911 \usetikzlibrary{arrows}
912 \usetikzlibrary{shapes.geometric}
913 \usetikzlibrary{shapes.symbols}
914 \usetikzlibrary{shapes.arrows}
915 \usetikzlibrary{decorations}
916 \usetikzlibrary{decorations.pathmorphing}
917 \usetikzlibrary{decorations.pathreplacing}
918 \usetikzlibrary{decorations.markings}
919 \usetikzlibrary{wargame.util}

```

\@ifempty

This is a utility macro we will use below.

```
920 \def\@ifempty#1{\def\temp{#1}\ifx\temp\@empty}
```

5.4.1 Debugging

The counter `\hexdbglvl` sets the debug level, and the macro `\hex@dbg` prints out (conditionally) debug messages.

```
\hexdbglvl
\hex@dbg
```

```
921 \newcount\hexdbglvl\hexdbglvl=\wargamedbglvl
922 \def\hex@dbg#1#2{%
923   \ifnum#1>\hexdbglvl\relax\else\message{^^J#2}\fi}
```

5.4.2 Suppress terrain pictures

```
924 \@ifundefined{ifhex@terrain@pic}{%
925   \newif\ifhex@terrain@pic
926   \hex@terrain@pictrue}{%
927 \def\markpos#1(#2){}
```

5.4.3 Hex coordinate system

```
\hex@xx
\hex@yy
```

Some offsets along x and y due to offset of every second hex column.

$$\delta_x = \cos 60^\circ$$

$$\delta_y = \sin 60^\circ$$

These numbers are calculated once here and then used several times in the following code.

```
928 \pgfmathparse{\cos(60)} \xdef\hex@xx{\pgfmathresult}
929 \pgfmathparse{\sin(60)} \xdef\hex@yy{\pgfmathresult}
930 \pgfmathparse{\hex@yy*\cos(30)}\xdef\hex@e@xx{\pgfmathresult}
931 \pgfmathparse{\hex@yy*\sin(30)}\xdef\hex@e@yy{\pgfmathresult}
932 \newdimen\hex@radius\hex@radius=1cm
933 \newdimen\hex@dx \expandafter\hex@dx=\hex@xx cm
934 \newdimen\hex@dy \expandafter\hex@dy=\hex@yy cm
935 \newdimen\hex@e@dx \expandafter\hex@e@dx=\hex@e@xx cm
936 \newdimen\hex@e@dy \expandafter\hex@e@dy=\hex@e@yy cm
937
```

Some code we need for some options

```
938 \newif\ifhex@label@is@name\hex@label@is@namefalse
```

```

939 \def\hex@short@col{isfalse}
940 \def\hex@got@short{isfalse}
941 \pgfmathdeclarefunction{isfalse}{1}{%
942   \begingroup
943   \def\pgfmathresult{0}%
944   \pgfmath@smuggleone\pgfmathresult
945   \endgroup}
946 \pgfmathdeclarefunction{istrue}{1}{%
947   \begingroup
948   \def\pgfmathresult{1}%
949   \pgfmath@smuggleone\pgfmathresult
950   \endgroup}

```

What follows is a way to configure the hex coordinate system. For example, if the rows goes down, then we can flag that, but still add hexes straightforwardly. Similar for columns. We can also specify that the first row or column has number 1 (instead of 0). Since this is dealt with a the coordinate level, it means most of the rest of the code is agnostic to these choices.

Which is the first coordinate (0 or 1)

```

951 \tikzset{
952   hex/first row is/.is choice,
953   hex/first row is/0/.code={\def\hex@coords@row@off{0}},
954   hex/first row is/1/.code={\def\hex@coords@row@off{-1}},
955   hex/first row is=0,
956   hex/first column is/.is choice,
957   hex/first column is/0/.code={\def\hex@coords@col@off{0}},
958   hex/first column is/1/.code={\def\hex@coords@col@off{-1}},
959   hex/first column is=0,
960   hex/first row and column are/.is choice,
961   hex/first row and column are/0/.style={
962     hex/first row is=0,%
963     hex/first column is=0},
964   hex/first row and column are/1/.style={
965     hex/first row is=1,%
966     hex/first column is=1},

```

Which way does the column and row numbers go

```

967   hex/row direction is/.is choice,
968   hex/row direction is/normal/.code={\def\hex@coords@row@fac{1}},
969   hex/row direction is/reversed/.code={\def\hex@coords@row@fac{-1}},
970   hex/row direction is/up/.style={hex/row direction is=normal},
971   hex/row direction is/down/.style={hex/row direction is=reversed},
972   hex/row direction is/positive/.style={hex/row direction is=normal},
973   hex/row direction is/negative/.style={hex/row direction is=reversed},
974   hex/row direction is=normal,
975   hex/column direction is/.is choice,
976   hex/column direction is/normal/.code={\def\hex@coords@col@fac{1}},
977   hex/column direction is/reversed/.code={\def\hex@coords@col@fac{-1}},
978   hex/column direction is/right/.style={hex/column direction is=normal},
979   hex/column direction is/left/.style={hex/column direction is=reversed},
980   hex/column direction is/positive/.style={hex/column direction is=normal},
981   hex/column direction is/negative/.style={hex/column direction is=reversed},
982   hex/column direction is=normal,

```

Make labels names of shapes of the hexes so we can use labels to place stuff

```
983 hex/label is name/.is if=hex@label@is@name,
```

If we have uneven number of rows in some columns.

```
984 hex/short bottom columns/.is choice,
985 hex/short bottom columns/odd/.code={%
986   \def\hex@bot@short@col{isodd}
987   \def\hex@got@bot@short{istrue}
988   \hex@dbg{4}{Short columns (odd): \meaning\hex@bot@short@col}},
989 hex/short bottom columns/even/.code={
990   \def\hex@bot@short@col{iseven}
991   \def\hex@got@bot@short{istrue}
992   \hex@dbg{4}{Short column (even): \meaning\hex@bot@short@col}},
993 hex/short bottom columns/none/.code={
994   \def\hex@bot@short@col{isfalse}
995   \def\hex@got@bot@short{isfalse}
996   \hex@dbg{4}{Short columns (none): \meaning\hex@bot@short@col}},
997 hex/short bottom columns=none,
998 hex/short columns/.forward to=hex/short bottom columns,
999 hex/short top columns/.is choice,
1000 hex/short top columns/odd/.code={%
1001   \def\hex@top@short@col{isodd}
1002   \def\hex@got@top@short{istrue}
1003   \hex@dbg{4}{Short columns (odd): \meaning\hex@top@short@col}},
1004 hex/short top columns/even/.code={
1005   \def\hex@top@short@col{iseven}
1006   \def\hex@got@top@short{istrue}
1007   \hex@dbg{4}{Short column (even): \meaning\hex@top@short@col}},
1008 hex/short top columns/none/.code={
1009   \def\hex@top@short@col{isfalse}
1010   \def\hex@got@top@short{isfalse}
1011   \hex@dbg{4}{Short columns (none): \meaning\hex@top@short@col}},
1012 hex/short top columns=none,
1013 }
1014 \message{^^JInitial hex coordinate setup:
1015 Rows: factor=\hex@coords@row@fac, offset=\hex@coords@row@off
1016 Columns: factor=\hex@coords@col@fac, offset=\hex@coords@col@off}
```

```
hex/coords/column
hex/coords/row
hex/coords/vertex
hex/coords/edge
hex/coords/offset
```

We define the keys for hexagon coordinates. These are the `row`, `column`, possible `vertex` or `edge`. Vertexes and edges are defined as multiple-choice. `offset` specifies the offset from the centre in the direction of a vertex or edge. By default, the offset is one, meaning all the way to the vertex or edge.

The key `inverse row` specifies that the rows are given from the top down, but coordinates should be calculated as if the row was negative. This (should) allow us to design boards where rows increase downward, while still keeping the interface and remaining code somewhat reasonable and agnostic.

Similarly, the key column 1, will allow us to start the columns with 1.

```

1017 \tikzset{
1018   /hex/coords/.cd,
1019   column/.store in=\hex@col,
1020   c/.store in=\hex@col,
1021   row/.store in=\hex@row,
1022   r/.store in=\hex@row,
1023   offset/.store in=\hex@off,
1024   o/.store in=\hex@off,
1025   vertex/.is choice,
1026   vertex/none/.code={\global\let\hex@vtx\@empty},
1027   vertex/east/.code={\def\hex@vtx{0}},
1028   vertex/north east/.code={\def\hex@vtx{60}},
1029   vertex/north west/.code={\def\hex@vtx{120}},
1030   vertex/west/.code={\def\hex@vtx{180}},
1031   vertex/south west/.code={\def\hex@vtx{240}},
1032   vertex/south east/.code={\def\hex@vtx{300}},
1033   vertex/E/.code={\def\hex@vtx{0}},
1034   vertex/NE/.code={\def\hex@vtx{60}},
1035   vertex/NW/.code={\def\hex@vtx{120}},
1036   vertex/W/.code={\def\hex@vtx{180}},
1037   vertex/SW/.code={\def\hex@vtx{240}},
1038   vertex/SE/.code={\def\hex@vtx{300}},
1039   vertex/.default=none,
1040   v/.forward to=/hex/coords/vertex=#1,
1041   edge/.is choice,
1042   edge/none/.code={\global\let\hex@edg\@empty},
1043   edge/north east/.code={\def\hex@edg{30}},
1044   edge/north/.code={\def\hex@edg{90}},
1045   edge/north west/.code={\def\hex@edg{150}},
1046   edge/south west/.code={\def\hex@edg{210}},
1047   edge/south/.code={\def\hex@edg{270}},
1048   edge/south east/.code={\def\hex@edg{330}},
1049   edge/NE/.code={\def\hex@edg{30}},
1050   edge/N/.code={\def\hex@edg{90}},
1051   edge/NW/.code={\def\hex@edg{150}},
1052   edge/SW/.code={\def\hex@edg{210}},
1053   edge/S/.code={\def\hex@edg{270}},
1054   edge/SE/.code={\def\hex@edg{330}},
1055   edge/.default=none,
1056   e/.forward to=/hex/coords/edge,
1057 }

```

`\hex@coords@reset`

This macro resets the hex coordinates to default values. That is row and column 0, no vertex or edge.

```

1058 \def\hex@coords@reset{%
1059   \tikzset{%
1060     /hex/coords/.cd,
1061     column=0,
1062     row=0,

```

```

1063     edge=none,
1064     vertex=none,
1065     offset=1}}

```

The following calculates the Cartesian coordinates from Hex coordinates

```
(cs:hex column= $\langle C \rangle$ ,row= $\langle R \rangle$ ,vertex= $\langle V \rangle$ ,edge= $\langle E \rangle$ )
```

Given the hexagon column C and row R with hexagon radius r , the centre of the hexagon is at

$$\begin{aligned}
 x &= 2C \frac{3}{4} r \\
 y &= r(R - (C \% 2) \sin 60^\circ)
 \end{aligned}$$

If $\langle V \rangle$ or $\langle E \rangle$ are given, then these are added to the centre point.

Note, C and R may be fractional numbers, which will specify a point inside a hex.

We set-up the translation to Cartesian coordinates. First thing is to reset keys in `/hex/coords`, and then parse out the keys given.

```

1066 \def\hex@coords@conv#1{%
1067   \hex@coords@reset%
1068   \tikzset{/hex/coords/.cd, #1}%

```

Then we calculate the x coordinate and set the dimension `\pgf@x`. We do this by

$$x = c_e \frac{3}{2} ,$$

where

$$c_e = f_c(c + o_c) ,$$

is the effective column (stored in `\hex@eff@col`) calculated from is the direction factor f_c (set by `hex/column direction is`) and the offset o_c (set by `hex/first column is`).

```

1069 \pgfmathparse{int(\hex@coords@col@fac*(\hex@col+\hex@coords@col@off))}%
1070 \xdef\hex@eff@col{\pgfmathresult}%
1071 \hex@dbg{2}{Effective column: \hex@coords@col@fac * (\hex@col +
1072   \hex@coords@col@off) -> \hex@eff@col}%
1073 \pgfmathparse{\hex@eff@col*1.5}%
1074 \xdef\hex@x{\pgfmathresult}%

```

And then for the y coordinate and set the dimension `\pgf@y`.

$$y = 2(r_e - c_e \bmod 2) \cos 60^\circ ,$$

where

$$r_e = 2f_r(r + o_r) - (c + o_c) \bmod 2 ,$$

is the effective row (stored as `\hex@eff@row`) calculated from the the direction factor f_r (set by `hex/row direction is`) and the offset o_r (set by `hex/first row is`).

```

1075 \pgfmathparse{int(\hex@coords@row@fac*(\hex@row+\hex@coords@row@off))}%
1076 \xdef\hex@eff@row{\pgfmathresult}%
1077 \hex@dbg{2}{Effective row: \hex@coords@row@fac * (\hex@row +
1078   \hex@coords@row@off) -> \hex@eff@row}%
1079 \pgfmathparse{(2*\hex@eff@row-mod(round((\hex@col+\hex@coords@col@off)),2))*\hex@yy}%
1080 \pgfmathparse{(2*\hex@eff@row-mod(abs(round(\hex@col+\hex@coords@col@off)),2))*\hex@yy}%
1081 \xdef\hex@y{\pgfmathresult}%

```

If we have a vertex specification add that location to the current coordinates. If not, set the point.

```

1082 \ifx\hex@vtx\@empty\else%
1083   \pgfmathparse{\hex@x+\hex@off*cos(\hex@vtx)}\xdef\hex@x{\pgfmathresult}
1084   \pgfmathparse{\hex@y+\hex@off*sin(\hex@vtx)}\xdef\hex@y{\pgfmathresult}
1085 \fi%
1086 % \ifx\hex@vtx\@empty\pgfpointxy{\hex@x}{\hex@y}\else%
1087 % \pgfpointadd{\pgfpointxy{\hex@x}{\hex@y}}{%
1088 %   \pgfpointscale{\hex@off}{\pgfpointpolarxy{\hex@vtx}{1}}}\fi%

```

If we have an edge specification add that location to the current coordinates.

```

1089 \ifx\hex@edg\@empty\else%
1090   \pgfmathparse{\hex@x+\hex@off*\hex@yy*cos(\hex@edg)}%
1091   \xdef\hex@x{\pgfmathresult}%
1092   \pgfmathparse{\hex@y+\hex@off*\hex@yy*sin(\hex@edg)}%
1093   \xdef\hex@y{\pgfmathresult}%
1094 \fi%
1095 % \ifx\hex@edg\@empty\else%
1096 % \pgfpointadd{\pgfpointxy{\hex@x}{\hex@y}}{%
1097 %   \pgfpointscale{\hex@off}{\pgfpointpolarxy{\hex@edg}{\hex@yy}}}\fi

```

For debugging, we can print out stuff.

```

1098 \pgfpointxy{\hex@x}{\hex@y}
1099 \hex@dbg{2}{Hex coordinates: #1
1100   ^^J c=' \hex@col'
1101   ^^J r=' \hex@row'
1102   ^^J v=' \hex@vtx'
1103   ^^J e=' \hex@edg'
1104   ^^J o=' \hex@off'
1105   ^^J x=' \hex@x'
1106   ^^J y=' \hex@y' }%
1107 \global\let\hex@x\hex@x%
1108 \global\let\hex@y\hex@y%
1109 \global\let\hex@row\hex@row%
1110 \global\let\hex@col\hex@col%
1111 }
1112 \tikzdeclarecoordinatesystem{hex}{%
1113   \hex@coords@conv{#1}}

```

5.4.4 Hexes

In this part, we make macros etc. for the hexes.

A hex shape. We make a node of this shape if we are to give a name to the hex added. We add a bunch of anchors to it so we may easily refer to it. This is also where we actual fill stuff into the hex, such as terrain and so on.

```

1114 \tikzset{%
1115   /hex/.cd,
1116   bev/.store in=\hex@bevel,          bev/.initial=,
1117   bevel fraction/.store in=\hex@bevel@frac,bevel fraction/.initial=10,
1118   bevel/.is choice,
1119   bevel/none/.style      = {/hex/bev=},
1120   bevel/north west/.style = {/hex/bev=1},
1121   bevel/north east/.style = {/hex/bev=2},
1122   bevel/south west/.style = {/hex/bev=3},
1123   bevel/south east/.style = {/hex/bev=4},
1124   bevel/NW/.style        = {/hex/bev=1},
1125   bevel/NE/.style        = {/hex/bev=2},
1126   bevel/SW/.style        = {/hex/bev=3},
1127   bevel/SE/.style        = {/hex/bev=4},
1128   bevel/.default         = {north west},
1129 }
1130 \def\hex@bevel@frac{10}
1131 \tikzset{
1132   hex/bevel highlight/.style={fill=white,opacity=.25},
1133   hex/bevel shadow/.style={fill=black,opacity=.25},
1134 }

1135 \newdimen\wg@tmpe
1136 \newdimen\wg@tmpf
1137 \newdimen\wg@tmpg
1138 \def\hex@bevel@path#1{%
1139   \scope[#1]
1140   \wg@tmpe=\wg@tmpa\multiply\wg@tmpe by \hex@bevel@frac
1141   \wg@tmpf=\wg@tmpb\multiply\wg@tmpf by \hex@bevel@frac
1142   \wg@tmpg=\wg@tmpc\multiply\wg@tmpg by \hex@bevel@frac
1143   \divide\wg@tmpe100
1144   \divide\wg@tmpf100
1145   \divide\wg@tmpg100
1146   % Start
1147   \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
1148   % Left
1149   \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{\wg@tmpb}}%
1150   % Left-down
1151   \pgfpathlineto{\pgfqpoint{\wg@tmpc}{\wg@tmpd}}%
1152   % Right down
1153   \wg@tmpa=-\wg@tmpa%
1154   \wg@tmpb=-\wg@tmpb%
1155   \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
1156   % Up, in
1157   \advance\wg@tmpa\wg@tmpe%
1158   \advance\wg@tmpb\wg@tmpf%
1159   \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
1160   % Left-down, in
1161   \advance\wg@tmpc-\wg@tmpg
1162   \pgfpathlineto{\pgfqpoint{\wg@tmpc}{\wg@tmpd}}%
1163   % Left, down in

```



```

1164 \advance\wg@tmpb-\wg@tmpf\wg@tmpb-\wg@tmpb%
1165 \advance\wg@tmpb-\wg@tmpf
1166 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
1167 % Start, down in
1168 \advance\wg@tmpa-\wg@tmpe\wg@tmpa-\wg@tmpa%
1169 \advance\wg@tmpa-\wg@tmpe
1170 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
1171 % %
1172 \pgfclosepath%
1173 \pgfusepath{fill}
1174 \endscope}%

1175 \hex@dbg{5}{Base vertex: \hex@xx,\hex@yy}
1176 \hex@dbg{5}{Base edges: \hex@e@xx,\hex@e@yy}
1177 \pgfdeclareshape{hex/hex}{%
1178 \saveddimen\radius{\pgf@x=\hex@radius}
1179 \savedanchor{\east}{\pgfqpoint{\hex@radius}{0cm}}
1180 \savedanchor{\west}{\pgfqpoint{-\hex@radius}{0cm}}
1181 \savedanchor{\northeast}{\pgfqpoint{\hex@dx}{\hex@dy}}
1182 \savedanchor{\northwest}{\pgfqpoint{-\hex@dx}{\hex@dy}}
1183 \savedanchor{\southwest}{\pgfqpoint{-\hex@dx}{-\hex@dy}}
1184 \savedanchor{\southeast}{\pgfqpoint{\hex@dx}{-\hex@dy}}
1185 \savedanchor{\northedge}{\pgfqpoint{0cm}{\hex@dy}}
1186 \savedanchor{\southedge}{\pgfqpoint{0cm}{-\hex@dy}}
1187 \savedanchor{\northeastedge}{\pgfqpoint{\hex@e@dx}{\hex@e@dy}}
1188 \savedanchor{\northwestedge}{\pgfqpoint{-\hex@e@dx}{\hex@e@dy}}
1189 \savedanchor{\southwestedge}{\pgfqpoint{-\hex@e@dx}{-\hex@e@dy}}
1190 \savedanchor{\southeastedge}{\pgfqpoint{\hex@e@dx}{-\hex@e@dy}}
1191 \savedmacro\init{%
1192 \def\hexpath{%
1193 \pgfpathmoveto{\east}%
1194 \pgfpathlineto{\northeast}%
1195 \pgfpathlineto{\northwest}%
1196 \pgfpathlineto{\west}%
1197 \pgfpathlineto{\southwest}%
1198 \pgfpathlineto{\southeast}%
1199 \pgfpathclose}
1200 }

```

These are the actual user callable anchors. We make anchors for each vertex and mid points on each edge.

```

1201 %%
1202 \anchor{center}{\pgfpointorigin}
1203 \anchor{east}{\east}
1204 \anchor{west}{\west}
1205 \anchor{north east}{\northeast}
1206 \anchor{north west}{\northwest}
1207 \anchor{south west}{\southwest}
1208 \anchor{south east}{\southeast}
1209 \anchor{north edge}{\northedge}
1210 \anchor{south edge}{\southedge}
1211 \anchor{north east edge}{\northeastedge}
1212 \anchor{north west edge}{\northwestedge}
1213 \anchor{south west edge}{\southwestedge}

```

```
1214 \anchor{south east edge}{\southeastedge}
```

Next we make some short hand aliases for each of these anchors.

```
1215 \anchor{E}{\east}
1216 \anchor{W}{\west}
1217 \anchor{NE}{\northeast}
1218 \anchor{NW}{\northwest}
1219 \anchor{SW}{\southwest}
1220 \anchor{SE}{\southeast}
1221 \anchor{N edge}{\northeadge}
1222 \anchor{S edge}{\southedge}
1223 \anchor{NE edge}{\northeastedge}
1224 \anchor{NW edge}{\northwestedge}
1225 \anchor{SW edge}{\southwestedge}
1226 \anchor{SE edge}{\southeastedge}
```

The next part is commented out because its not obvious we'll use these.

```
1227 %%
1228 \savedanchor{\chitnorth}{\pgfqpoint{ 0cm}{ 0.6cm}}
1229 \savedanchor{\chitsouth}{\pgfqpoint{ 0cm}{ -0.6cm}}
1230 \savedanchor{\chiteast}{\pgfqpoint{ 0.6cm}{ 0cm}}
1231 \savedanchor{\chitwest}{\pgfqpoint{-0.6cm}{ 0cm}}
1232 \savedanchor{\chitnortheast}{\pgfqpoint{ 0.6cm}{ 0.6cm}}
1233 \savedanchor{\chitnorthwest}{\pgfqpoint{-0.6cm}{ 0.6cm}}
1234 \savedanchor{\chitsouthwest}{\pgfqpoint{-0.6cm}{-0.6cm}}
1235 \savedanchor{\chitsoutheast}{\pgfqpoint{ 0.6cm}{-0.6cm}}
1236 %
1237 \anchor{chit north}{\chitnorth}
1238 \anchor{chit south}{\chitsouth}
1239 \anchor{chit east}{\chiteast}
1240 \anchor{chit west}{\chitwest}
1241 \anchor{chit north east}{\chitnortheast}
1242 \anchor{chit north west}{\chitnorthwest}
1243 \anchor{chit south west}{\chitsouthwest}
1244 \anchor{chit south east}{\chitsoutheast}
1245 %
1246 \anchor{chit N}{\chitnorth}
1247 \anchor{chit S}{\chitsouth}
1248 \anchor{chit E}{\chiteast}
1249 \anchor{chit W}{\chitwest}
1250 \anchor{chit NE}{\chitnortheast}
1251 \anchor{chit NW}{\chitnorthwest}
1252 \anchor{chit SW}{\chitsouthwest}
1253 \anchor{chit SE}{\chitsoutheast}
1254 %
```

The background path. This path may be drawn when the node is drawn. However, we will do most of the work in the `\behindbackgroundpath` which gets drawn *after* this path.

```
1255 \backgroundpath{\init\hexpath}
```

The *behind* background path, where we do most of the work.

```

1256 \behindforegroundpath{%
1257   \hex@dbg{2}{Hex behind foreground path:
1258   ^^JTerrain:      '\meaning\hex@terrain'
1259   ^^JRidges:      '\meaning\hex@ridges'
1260   ^^JTown:        '\meaning\hex@town'
1261   ^^JExtra clipped: '\meaning\hex@extra@clip'
1262   ^^JLabel:       '\meaning\hex@label'
1263   ^^JExtra:       '\meaning\hex@extra'
1264   ^^JLast node name: '\meaning\tikzlastnode'
1265   ^^JHex row:     '\meaning\hex@row'
1266   ^^JHex col:     '\meaning\hex@col'
1267 }%
1268 \init%

```

We start a scope and clip to the hex path first.

```

1269 \scope%
1270   \hexpath%
1271   \pgfusepath{clip}%

```

Anything inside this scope is clipped to the hex path. The next step is to see if we have a specified terrain for the hex.

```

1272   \@ifundefined{hex@terrain}{\let\hex@terrain\empty}{}%
1273   \ifx\hex@terrain\empty\else\hex@do@terrain\fi%

```

This concludes the processing of the terrain of the hex. Next, we must see if the user specified ridges.

```

1274   \@ifundefined{hex@ridges}{\let\hex@ridges\empty}{}%
1275   \ifx\hex@ridges\empty\else\hex@do@ridges\fi%

```

This concludes the processing of the ridges of the hex. Next, we should process any extra (clipped) stuff specified. The user may pass options to each picture by preceding it with [*options*].

```

1276   \@ifundefined{hex@extra@clip}{\let\hex@extra@clip\empty}{}
1277   \ifx\hex@extra@clip\empty\else%
1278     \hex@dbg{5}{Extra clipped: '\meaning\hex@extra'}
1279     \pgfpointorigin\wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
1280     \wg@pic@all{\hex@extra@clip}{\the\wg@tmpa,\the\wg@tmpb}{}%
1281   \fi%

```

This concludes the extra stuff put in the hex. Next, we should place the label if specified. Note, we may know the hex row and column at this point, stored in `\hex@row` and `\hex@column`, respectively. We may want to name the generated node from these if the user specified that option (perhaps use `\pgfnoderename` or similar).

```

1282   \@ifundefined{hex@label}{\let\hex@label\empty}{}
1283   \ifx\hex@label\empty\else\hex@do@label\fi%

1284   \@ifundefined{hex@bevel}{\let\hex@bevel\empty}{}
1285   \ifx\hex@bevel\empty\else%
1286     \northeast
1287     \wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
1288     \west
1289     \wg@tmpc=\pgf@x\wg@tmpd=\pgf@y%
1290     \ifcase\hex@bevel\relax
1291     \or%1

```

```

1292 \or\wg@tmpa=-\wg@tmpa\wg@tmpc=-\wg@tmpc%2
1293 \or\wg@tmpb=-\wg@tmpb\wg@tmpd=-\wg@tmpd%3
1294 \or% 4
1295 \wg@tmpa=-\wg@tmpa\wg@tmpc=-\wg@tmpc%
1296 \wg@tmpb=-\wg@tmpb\wg@tmpd=-\wg@tmpd%
1297 \fi
1298 \hex@bevel@path{chit/bevel highlight}
1299 \northeast
1300 \wg@tmpa=-\pgf@x\wg@tmpb=-\pgf@y%
1301 \west
1302 \wg@tmpc=-\pgf@x\wg@tmpd=-\pgf@y%
1303 \ifcase\hex@bevel\relax
1304 \or%1
1305 \or\wg@tmpa=-\wg@tmpa\wg@tmpc=-\wg@tmpc%2
1306 \or\wg@tmpb=-\wg@tmpb\wg@tmpd=-\wg@tmpd%3
1307 \or% 4
1308 \wg@tmpa=-\wg@tmpa\wg@tmpc=-\wg@tmpc%
1309 \wg@tmpb=-\wg@tmpb\wg@tmpd=-\wg@tmpd%
1310 \fi
1311 \hex@bevel@path{chit/bevel shadow}
1312 \fi
1313 \endscope%

```

This concludes the label processing, and stuff that should be clipped to the hex shape. If the user specified a town, we can now make that.

```

1314 \@ifundefined{hex@town}{\let\hex@town\empty}{}
1315 \@ifundefined{hex@c@pic}{\let\hex@c@pic\empty}{}
1316 \ifx\hex@town\empty\else\hex@do@town\fi%

```

We can now add extra (non-clipped) stuff. We assume that extra stuff is pictures. The user may pass options to each picture by preceding it with [*options*].

```

1317 \@ifundefined{hex@extra}{\let\hex@extra\empty}{}
1318 \ifx\hex@extra\empty\else%
1319 \hex@dbg{5}{Extra: '\meaning\hex@extra'}
1320 \pgfpointright\wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
1321 \wg@pic@all{\hex@extra}{\the\wg@tmpa,\the\wg@tmpb}{}%
1322 \fi%
1323 }
1324 }

```

```

/hex/terrain
/hex/town
/hex/label
/hex/ridges
/hex/extra
/hex/extra clipped

```

Next, we set up the name space for hex keys. This is the top level name space for hexes. Sub keys `terrain`, `ridges`, `town`, `extra`, `label`, and `extra clipped`, store their arguments in macros and we expand these later on. This allows us to scope some of the keys given to those specific parts.

Define keys for hexagon options. These are

Name	Description
<code>terrain</code>	Terrain
<code>label</code>	Label on hex
<code>town</code>	Town in hex. Optionally with a name
<code>ridges</code>	Ridge markings on hex
<code>extra</code>	More
<code>extra clipped</code>	More clipped to hex

```

1325 \tikzset{%
1326   /hex/.search also={/tikz},%
1327   /hex/.cd,%
1328   terrain/.store in=\hex@terrain,%
1329   ridges/.store in=\hex@ridges,%
1330   town/.store in=\hex@town,%
1331   extra/.store in=\hex@extra,%
1332   label/.store in=\hex@label,%
1333   extra clipped/.store in=\hex@extra@clip%
1334 }

```

hex

The next key is the real work horse of the show. Specifying the `hex` key to a node effectively creates a hex for us. Now, there are some things we cannot do outright in the node shape code. For example, we cannot set the name of the node created from the shape code. Therefore, the use of `\hex` is often the right choice.

```

1335 \tikzset{%
1336   hex/hex/.style={
1337     transform shape,
1338     anchor=center,
1339     draw=pgfstrokecolor,
1340     fill=none,
1341     thick,
1342     solid},
1343   hex/.code={%
1344     \hex@dbg{1}{=== Hex with options: '#1'}%
1345     \pgfkeys{/tikz/transform shape,/tikz/shape=hex/hex}
1346     \pgfkeys{/hex/.cd,/tikz/hex/hex,/tikz/every hex/.try,#1}}

```

The first thing is to set the default graphics options. The key `every hex` can be set to hex options to be used for all hexes. For example, if one want to label all hexes with an auto-generated label, one can do

```
\tikzset{every hex/.style={label={auto=numbered}}}
```

This, coupled with the `hex/label is name` option allows us to set up the board with really minimal effort. We can then use the board coordinates when placing units, and other things.

Now we have set up these tools we can go on and define the user facing macro.

```
\hex
\hex@
\hex@@
```

This will add a hex to the output graphics. Note, the macro need not be followed by a semi-colon (;).

First argument is optional options.

```
1347 \def\hex{%
1348   \@ifnextchar[{\hex@}{\hex@[]}%]
1349 }
```

Second optional argument is the coordinates. These should be given in the hex coordinate system.

```
1350 \def\hex@[#1]{%
1351   \@ifnextchar({\hex@@{#1}}{%
1352     \hex@@{#1}(c=0,r=0)}%)
1353 }
```

Third argument is the name to be used.

```
1354 \def\hex@@#1(#2){%
1355   \@ifnextchar({\hex@@@{#1}{#2}}{\hex@@@{#1}{#2}()})%
1356 }
```

Now for the real work-horse. First thing is to reset keys and parse them out from the arguments.

```
1357 %      Third argument is name
1358 \def\hex@@@#1#2(#3){%
1359   \node[hex={#1}] (tmp) at (hex cs:#2) {};%
1360   \hex@dbg{8}{=== Label text: '\meaning\hex@l@text'}
1361   \ifx|#3|\relax%
1362     \ifundefined{hex@l@text}{%
1363       \hex@dbg{8}{=== Label text of hex (#2) not defined}%
1364       \let\hex@l@text\empty%
1365     }{}
1366     \ifhex@label@is@name%
1367       \hex@dbg{5}{=== Use label text of hex (#2) as name}%
1368       \ifx\hex@l@text\empty%
1369         \hex@dbg{8}{=== Argh! Label text is empty! '\meaning\hex@l@text'}
1370       \else%
1371         \hex@dbg{3}{=== Renaming hex to label text '\hex@l@text'}
1372         \pgfnoderename{\hex@l@text}{tmp}%
1373       \fi%
1374     \fi%
1375   \else%
1376     \hex@dbg{3}{=== Renaming hex to user defined name '#3'}%
1377     \pgfnoderename{#3}{tmp}%
1378   \fi%
1379   \@ifnextchar;{\@gobble}{}%
1380 }
```

5.4.5 Terrain

With the above main routine for making hexes, we turn to decorating a hex with a terrain.

```
hex/terrain/image
hex/terrain/pic
hex/terrain/code
hex/terrain/clip
```

We make the namespace `/hex/terrain` to hold the specific terrain keys. Keys used by terrain identifiers are

Name	Description
<code>image</code>	Terrain tile image
<code>pic</code>	Terrain TikZ picture
<code>code</code>	Arbitrary TikZ code
<code>clip</code>	TikZ path to clip terrain

Now, we have the keys we'll need for selecting the terrain. These live in the namespace `/hex/terrain`, and we can select between pictures or images (external graphics files) for making the terrain. We define some short hands to easily select the common terrains.

```
1381 \tikzset{%
1382 /hex/terrain/.search also={/tikz},%
1383 /hex/terrain/.cd,%
1384 pic/.store in=\hex@t@pic,%
1385 image/.store in=\hex@t@image,%
1386 code/.store in=\hex@t@code,%
1387 clip/.store in=\hex@t@clip,%
1388 pic/.default=,
1389 image/.default=,
1390 code/.default=,
1391 clip/.default=,
1392 }
1393 \iffalse
1394 \tikzset{
1395 /hex/terrain/.cd,%
1396 beach/.style={pic=hex/terrain/beach},
1397 light woods/.style={pic=hex/terrain/light woods},
1398 woods/.style={pic=hex/terrain/woods},
1399 swamp/.style={pic=hex/terrain/swamp},
1400 rough/.style={pic=hex/terrain/rough},
1401 mountains/.style={pic=hex/terrain/mountains},
1402 village/.style={pic=hex/terrain/village},
1403 town/.style={pic=hex/terrain/town},
1404 city/.style={pic=hex/terrain/city},
1405 }
1406 \else
1407 \tikzset{
1408 /hex/terrain/.cd,%
1409 beach/.style={image=wargame.beach},
1410 light woods/.style={image=wargame.light_woods},
1411 woods/.style={image=wargame.woods},
1412 swamp/.style={image=wargame.swamp},
1413 rough/.style={image=wargame.rough},
1414 mountains/.style={image=wargame.mountains},
1415 village/.style={image=wargame.village},
```

```

1416 town/.style={image=wargame.town},
1417 city/.style={image=wargame.city},
1418 }
1419 \fi

```

Before we go on, we define the macro that actually generates the terrain of a hex.

\hex@do@terrain

If we do have a terrain specified, we start a new scope, this time to clip the terrain by the clipping path specified by `hex={terrain={clip=...}}`. The first thing into the new scope is to process the keys specified in `hex={terrain=...}`. This will set the terrain and the clipping of the terrain.

```

1420 \def\hex@do@terrain{%
1421   \hex@dbg{5}{Terrain: \meaning\hex@terrain}%
1422   \edef\hex@t@tmp{[/hex/terrain/.cd,\hex@terrain]}%
1423   \expandafter\scope\hex@t@tmp% Scope for terrain clipping.
1424   \hex@dbg{5}{Terrain:
1425     ^^J pic: \meaning\hex@t@pic
1426     ^^J image: \meaning\hex@t@image
1427     ^^J code: \meaning\hex@t@code
1428     ^^J clip: \meaning\hex@t@clip}

```

We check to see if we have any clipping pictures. If so, we process these in turn and append the soft path to a macro. Once this is done, we use the soft path as a clipping path for the rest of the (terrain) scope.

```

1429   \ifundefined{hex@t@clip}{\let\hex@t@clip\empty}{}
1430   \ifx\hex@t@clip\empty\else%
1431     \edef\hex@t@cc{\hex@t@clip}%
1432     \def\hex@t@c{}
1433     \foreach \c in \hex@t@cc{%
1434       \hex@dbg{5}{Clipping to ‘\c’}
1435       \expandafter\wg@pic\c\@endwg@pic {}{\wg@tmpa,\wg@tmpb}{%
1436         save path=\hex@t@tmp}%
1437       \wg@addto@macro\hex@t@c\hex@t@tmp % Append to clipping
1438     }%
1439     \pgfsyssoftpath@setcurrentpath{\hex@t@c}% Set path
1440     \clip;% Clip to the path
1441   \fi % End of clipping terrain

```

We’re now ready to make the terrain. First, we check to see if the relevant storage macros are undefined and if so, `\let` them to `\empty` so that we can deal more easily with the various cases.

```

1442   %% Now switch between how to draw the terrain. If some of the
1443   %% macros are undefined, define them to be empty
1444   \@ifundefined{hex@t@pic}{\let\hex@t@pic\empty}{}
1445   \@ifundefined{hex@t@image}{\let\hex@t@image\empty}{}
1446   \@ifundefined{hex@t@code}{\let\hex@t@code\empty}{}
1447   \@ifundefined{hex@t@code}{\let\hex@t@code\empty}{}
1448   \ifx\hex@t@code\empty\else\hex@t@code\fi%

```

First we check if we have not got terrain images, but terrain pictures. If we have that, we process these in turn. Note, the user can give options to each terrain picture by preceding the picture name with `[{options}]`.


```

1449 % If we have no image, check if we have pictures.
1450 \ifx\hex@t@image\empty%
1451 \hex@dbg{8}{No terrain images}%
1452 \ifx\hex@t@pic\empty\else%
1453 % We have pictures
1454 \hex@dbg{5}{Terrain pictures}%
1455 \pgfpointorigin\wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
1456 \foreach \i in \hex@t@pic{%
1457 \wg@pic@all{\i}{\the\wg@tmpa,\the\wg@tmpb}{}}%
1458 \fi% We have pictures.

```

If the user specified images rather than pictures, then we process these in turn. Again, the user can specify options to each terrain image by preceding the image file name with [*options*].

```

1459 \else % We have images
1460 \hex@dbg{5}{Terrain images}%
1461 \pgfpointorigin\wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
1462 \foreach \i in \hex@t@image{%
1463 \hex@dbg{10}{Terrain image: '\meaning{i}'}
1464 \expandafter\wg@node{%
1465 \includegraphics[width=2cm]{\i}\endwg@node %
1466 }{\wg@tmpa,\wg@tmpb}{%
1467 shape=rectangle,%
1468 anchor=center,%
1469 transform shape,%
1470 draw=none}%
1471 }
1472 \fi%
1473 \endscope% End of terrain scope
1474 }% End of terrain

```

Next, we define some example clippings of the terrain images. Specifically, we make clippings to sextants. We do this by first defining a macro.

`\hex@make@sextants`

When executed this macro will generate some paths that will clip to sextants. The first argument is the inner radius of the sextant and the second argument is the (possible empty) prefix to put in front of the `sextant` name.

```

1475 \def\hex@x@r{.7}
1476 \def\hex@make@sextants#1#2{%
1477 \tikzset{%
1478 pics/hex/#2sextant/.is choice,
1479 pics/hex/#2sextant/north east/.style={
1480 code={
1481 \path[pic actions]( 0:1)--( 60:1)--( 60:#1)--( 0:#1)--cycle;}},
1482 pics/hex/#2sextant/north/.style={
1483 code={
1484 \path[pic actions]( 60:1)--(120:1)--(120:#1)--( 60:#1)--cycle;}},
1485 pics/hex/#2sextant/north west/.style={
1486 code={
1487 \path[pic actions](120:1)--(180:1)--(180:#1)--(120:#1)--cycle;}},
1488 pics/hex/#2sextant/south west/.style={

```

```

1489     code={
1490         \path[pic actions](180:1)--(240:1)--(240:#1)--(180:#1)--cycle;}},
1491 pics/hex/#2sextant/south/.style={
1492     code={
1493         \path[pic actions](240:1)--(300:1)--(300:#1)--(240:#1)--cycle;}},
1494 pics/hex/#2sextant/south east/.style={
1495     code={
1496         \path[pic actions](300:1)--(360:1)--(360:#1)--(300:#1)--cycle;}},
1497 pics/hex/#2sextant/center/.style={
1498     code={
1499         \path[pic actions]
1500         (0:#1)--
1501         (60:#1)--
1502         (120:#1)--
1503         (180:#1)--
1504         (240:#1)--
1505         (300:#1)--cycle;}},
1506 pics/hex/#2sextant/NE/.style=hex/#2sextant/north east,
1507 pics/hex/#2sextant/NE/.style=hex/#2sextant/north east,
1508 pics/hex/#2sextant/N/.style=hex/#2sextant/north,
1509 pics/hex/#2sextant/NW/.style=hex/#2sextant/north west,
1510 pics/hex/#2sextant/SW/.style=hex/#2sextant/south west,
1511 pics/hex/#2sextant/S/.style=hex/#2sextant/south,
1512 pics/hex/#2sextant/SE/.style=hex/#2sextant/south east,
1513 pics/hex/#2sextant/C/.style=hex/#2sextant/center,
1514 }
1515 }

1516 \hex@make@sextants{.7}{-}
1517 \hex@make@sextants{.3}{large }
1518 \hex@make@sextants{0}{full }

```

Next, we define some styles for styling the terrain pictures. Users can change these styles (e.g., by appending to them) to change say the colour of the terrain graphics.

hex/terrain/beach

The style for beach hexes. The pattern is filled with a yellowish colour, and drawing of the outline is disabled.

```

1519 \tikzset{
1520     hex/terrain/beach/.style={%
1521         fill={rgb,100:red,93;green,73;blue,35},%
1522         draw=none%
1523     }%
1524 }

```

hex/terrain/beach

Now for the actual patterns. We go in the same order as above — i.e, we start with the beach pattern. This is rather long.



```
1525 \ifhex@terrain@pic
1526 \tikzset{
1527   hex/terrain/beach/.pic={
1528     \path[hex/terrain/beach,pic actions,draw=none]
1529       (-0.4931, 0.8848)
1530       -- (-0.4998, 0.8734)
1531       .. controls (-0.4908, 0.8731) and (-0.4813, 0.8762) .. (-0.4762, 0.8847)
1532       --cycle
1533       (-0.4032, 0.8841)
1534       .. controls (-0.4004, 0.8804) and (-0.3988, 0.8794) .. (-0.3956, 0.8745)
1535       .. controls (-0.3760, 0.8443) and (-0.3811, 0.8330) .. (-0.3456, 0.8112)
1536       .. controls (-0.3250, 0.7986) and (-0.2712, 0.7770) .. (-0.2531, 0.8032)
1537       .. controls (-0.2294, 0.8375) and (-0.2984, 0.8503) .. (-0.3193, 0.8690)
1538       .. controls (-0.3243, 0.8735) and (-0.3281, 0.8785) .. (-0.3321, 0.8835)
1539       --cycle
1540       (-0.2462, 0.8828)
1541       .. controls (-0.2425, 0.8681) and (-0.2383, 0.8546) .. (-0.2293, 0.8461)
1542       .. controls (-0.2102, 0.8280) and (-0.1892, 0.8390) .. (-0.1859, 0.8669)
1543       .. controls (-0.1854, 0.8711) and (-0.1871, 0.8772) .. (-0.1875, 0.8822)
1544       --cycle
1545       (-0.0997, 0.8815)
1546       .. controls (-0.0971, 0.8706) and (-0.0941, 0.8597) .. (-0.0907, 0.8493)
1547       -- (-0.0570, 0.8578)
1548       .. controls (-0.0570, 0.8629) and (-0.0560, 0.8730) .. (-0.0553, 0.8812)
1549       --cycle
1550       ( 0.0213, 0.8805)
1551       .. controls ( 0.0222, 0.8725) and ( 0.0235, 0.8650) .. ( 0.0262, 0.8587)
1552       .. controls ( 0.0391, 0.8281) and ( 0.0706, 0.8199) .. ( 0.0917, 0.7894)
1553       .. controls ( 0.1112, 0.7609) and ( 0.1058, 0.7286) .. ( 0.1050, 0.6961)
1554       -- ( 0.1731, 0.7216)
1555       -- ( 0.1203, 0.8649)
1556       -- ( 0.1097, 0.8797)
1557       --cycle
1558       ( 0.2978, 0.8781)
1559       .. controls ( 0.2985, 0.8773) and ( 0.3002, 0.8756) .. ( 0.3008, 0.8749)
1560       .. controls ( 0.2854, 0.8687) and ( 0.2549, 0.8572) .. ( 0.2421, 0.8487)
1561       .. controls ( 0.2026, 0.8224) and ( 0.1905, 0.7567) .. ( 0.2046, 0.7132)
1562       .. controls ( 0.2146, 0.6819) and ( 0.2330, 0.6680) .. ( 0.2394, 0.6280)
1563       .. controls ( 0.2413, 0.6160) and ( 0.2468, 0.5527) .. ( 0.2446, 0.5437)
1564       .. controls ( 0.2396, 0.5232) and ( 0.2211, 0.5122) .. ( 0.2231, 0.4913)
1565       .. controls ( 0.2261, 0.4603) and ( 0.2686, 0.4388) .. ( 0.2891, 0.4194)
1566       .. controls ( 0.3020, 0.4071) and ( 0.3136, 0.3895) .. ( 0.3281, 0.3799)
1567       .. controls ( 0.3688, 0.3533) and ( 0.3905, 0.3863) .. ( 0.4199, 0.3902)
1568       .. controls ( 0.4350, 0.3921) and ( 0.4560, 0.3849) .. ( 0.4710, 0.3812)
1569       -- ( 0.4795, 0.4067)
1570       -- ( 0.4965, 0.4067)
1571       .. controls ( 0.5008, 0.3961) and ( 0.5009, 0.3893) .. ( 0.5112, 0.3811)
1572       .. controls ( 0.5112, 0.3811) and ( 0.6172, 0.3385) .. ( 0.6481, 0.3037)
```

```

1573 .. controls ( 0.6729, 0.2758) and ( 0.6641, 0.2532) .. ( 0.6667, 0.2206)
1574 -- ( 0.7004, 0.2206)
1575 .. controls ( 0.7839, 0.2118) and ( 0.7047, 0.0740) .. ( 0.7057, 0.0568)
1576 .. controls ( 0.7067, 0.0396) and ( 0.7865,-0.0424) .. ( 0.8032,-0.0520)
1577 .. controls ( 0.8251,-0.0644) and ( 0.8703,-0.0686) .. ( 0.8572,-0.0293)
1578 .. controls ( 0.8518,-0.0131) and ( 0.7996, 0.0474) .. ( 0.7843, 0.0564)
1579 .. controls ( 0.7724, 0.0633) and ( 0.7645, 0.0636) .. ( 0.7518, 0.0664)
1580 .. controls ( 0.7688, 0.1093) and ( 0.7993, 0.1905) .. ( 0.7930, 0.2362)
1581 .. controls ( 0.7869, 0.2804) and ( 0.7252, 0.2982) .. ( 0.6946, 0.3268)
1582 .. controls ( 0.6664, 0.3531) and ( 0.6746, 0.3662) .. ( 0.6323, 0.3966)
1583 .. controls ( 0.5760, 0.4371) and ( 0.5386, 0.4324) .. ( 0.5250, 0.4601)
1584 .. controls ( 0.5090, 0.4927) and ( 0.5578, 0.6035) .. ( 0.5969, 0.5911)
1585 .. controls ( 0.6199, 0.5839) and ( 0.6224, 0.5471) .. ( 0.6341, 0.5291)
1586 .. controls ( 0.6488, 0.5064) and ( 0.7020, 0.4614) .. ( 0.7263, 0.4493)
1587 -- ( 0.7373, 0.4768)
1588 -- ( 0.6866, 0.5671)
1589 -- ( 0.6756, 0.5720)
1590 -- ( 0.6766, 0.5850)
1591 -- ( 0.6331, 0.6627)
1592 .. controls ( 0.6280, 0.6613) and ( 0.6239, 0.6599) .. ( 0.6157, 0.6589)
1593 -- ( 0.5646, 0.6589)
1594 .. controls ( 0.5375, 0.6557) and ( 0.5277, 0.6432) .. ( 0.4965, 0.6489)
1595 .. controls ( 0.4716, 0.6520) and ( 0.4306, 0.6774) .. ( 0.4104, 0.6489)
1596 .. controls ( 0.3809, 0.6093) and ( 0.4627, 0.6240) .. ( 0.4837, 0.5772)
1597 .. controls ( 0.4958, 0.5502) and ( 0.4652, 0.4811) .. ( 0.4429, 0.4648)
1598 -- ( 0.3523, 0.4350)
1599 .. controls ( 0.3178, 0.4372) and ( 0.3207, 0.4766) .. ( 0.3153, 0.5004)
1600 .. controls ( 0.3090, 0.5282) and ( 0.2968, 0.5398) .. ( 0.2922, 0.5684)
1601 .. controls ( 0.2896, 0.6035) and ( 0.3061, 0.6276) .. ( 0.2922, 0.6621)
1602 .. controls ( 0.2756, 0.6961) and ( 0.2422, 0.7190) .. ( 0.2525, 0.7640)
1603 .. controls ( 0.2650, 0.8188) and ( 0.3165, 0.7932) .. ( 0.3324, 0.8417)
1604 .. controls ( 0.3359, 0.8522) and ( 0.3385, 0.8648) .. ( 0.3399, 0.8778)
1605 --cycle
1606 ( 0.4261, 0.8770)
1607 -- ( 0.4333, 0.8493)
1608 -- ( 0.4845, 0.7440)
1609 .. controls ( 0.4963, 0.7304) and ( 0.5450, 0.6930) .. ( 0.5630, 0.6989)
1610 .. controls ( 0.5735, 0.7024) and ( 0.5838, 0.7169) .. ( 0.5932, 0.7337)
1611 -- ( 0.5612, 0.7909)
1612 .. controls ( 0.5537, 0.7875) and ( 0.5468, 0.7852) .. ( 0.5403, 0.7864)
1613 .. controls ( 0.5078, 0.7926) and ( 0.5191, 0.8406) .. ( 0.5145, 0.8567)
1614 .. controls ( 0.5121, 0.8651) and ( 0.5076, 0.8710) .. ( 0.5025, 0.8764)
1615 --cycle
1616 ( 0.3773, 0.8153)
1617 .. controls ( 0.3625, 0.7892) and ( 0.2993, 0.7161) .. ( 0.3316, 0.6877)
1618 .. controls ( 0.3432, 0.6774) and ( 0.3866, 0.6728) .. ( 0.4029, 0.6706)
1619 -- ( 0.3973, 0.7472)
1620 -- ( 0.4029, 0.8153)
1621 --cycle
1622 (-0.4224, 0.8088)
1623 .. controls (-0.4416, 0.8077) and (-0.4585, 0.7826) .. (-0.4275, 0.7562)
1624 -- (-0.3971, 0.7387)
1625 .. controls (-0.4780, 0.6942) and (-0.4752, 0.6640) .. (-0.4591, 0.5855)

```

```

1626 .. controls (-0.4391, 0.4887) and (-0.4527, 0.5347) .. (-0.4103, 0.4493)
1627 .. controls (-0.3870, 0.4026) and (-0.4070, 0.3747) .. (-0.3460, 0.3642)
1628 -- (-0.3352, 0.4823)
1629 .. controls (-0.3409, 0.5024) and (-0.3617, 0.5113) .. (-0.3739, 0.5281)
1630 -- (-0.4164, 0.6287)
1631 .. controls (-0.4188, 0.6375) and (-0.4186, 0.6444) .. (-0.4164, 0.6528)
1632 .. controls (-0.4067, 0.6807) and (-0.3521, 0.7255) .. (-0.3274, 0.6931)
1633 .. controls (-0.3070, 0.6694) and (-0.3336, 0.6432) .. (-0.3274, 0.6221)
1634 .. controls (-0.3249, 0.6055) and (-0.3059, 0.6028) .. (-0.2950, 0.6162)
1635 .. controls (-0.2867, 0.6265) and (-0.2838, 0.6558) .. (-0.2829, 0.6692)
1636 .. controls (-0.2775, 0.7444) and (-0.3333, 0.7652) .. (-0.3955, 0.7472)
1637 .. controls (-0.3950, 0.7586) and (-0.3916, 0.7684) .. (-0.3955, 0.7803)
1638 .. controls (-0.3986, 0.8016) and (-0.4109, 0.8096) .. (-0.4224, 0.8088)
1639 --cycle
1640 (-0.1391, 0.8077)
1641 .. controls (-0.1634, 0.8024) and (-0.1582, 0.7647) .. (-0.1487, 0.7492)
1642 .. controls (-0.1306, 0.7190) and (-0.1004, 0.7270) .. (-0.0652, 0.7073)
1643 -- (-0.0226, 0.6801)
1644 -- ( 0.0282, 0.6560)
1645 .. controls ( 0.0622, 0.6331) and ( 0.0955, 0.5639) .. ( 0.1219, 0.5259)
1646 .. controls ( 0.2125, 0.5714) and ( 0.1427, 0.6114) .. ( 0.1219, 0.6453)
1647 -- ( 0.1054, 0.6768)
1648 .. controls ( 0.0862, 0.7028) and ( 0.0448, 0.7080) .. ( 0.0115, 0.7299)
1649 .. controls (-0.0377, 0.7622) and (-0.0173, 0.7726) .. (-0.0822, 0.7918)
1650 .. controls (-0.0961, 0.7958) and (-0.1270, 0.8103) .. (-0.1391, 0.8077)
1651 --cycle
1652 (-0.5460, 0.7940)
1653 -- (-0.5911, 0.7166)
1654 .. controls (-0.5649, 0.7015) and (-0.5397, 0.7188) .. (-0.5308, 0.7556)
1655 .. controls (-0.5251, 0.7788) and (-0.5335, 0.7873) .. (-0.5460, 0.7940)
1656 --cycle
1657 (-0.2382, 0.7423)
1658 .. controls (-0.2453, 0.7424) and (-0.2512, 0.7383) .. (-0.2550, 0.7274)
1659 .. controls (-0.2635, 0.7026) and (-0.2353, 0.6726) .. (-0.2229, 0.6536)
1660 .. controls (-0.2031, 0.6234) and (-0.2020, 0.6105) .. (-0.1928, 0.5770)
1661 .. controls (-0.1763, 0.5803) and (-0.1499, 0.5890) .. (-0.1342, 0.5831)
1662 .. controls (-0.1112, 0.5745) and (-0.1047, 0.5481) .. (-0.0866, 0.5338)
1663 -- (-0.0397, 0.5102)
1664 -- ( 0.0664, 0.4219)
1665 .. controls ( 0.0874, 0.3954) and ( 0.0785, 0.3655) .. ( 0.1070, 0.3502)
1666 .. controls ( 0.1367, 0.3343) and ( 0.1690, 0.3592) .. ( 0.1732, 0.3899)
1667 .. controls ( 0.1755, 0.4075) and ( 0.1545, 0.4554) .. ( 0.1475, 0.4748)
1668 .. controls ( 0.0838, 0.4666) and ( 0.0509, 0.4836) .. ( 0.0454, 0.5515)
1669 .. controls (-0.0576, 0.5778) and (-0.0955, 0.6323) .. (-0.1754, 0.6949)
1670 .. controls (-0.1861, 0.7034) and (-0.2171, 0.7418) .. (-0.2382, 0.7423)
1671 --cycle
1672 (-0.5068, 0.6706)
1673 .. controls (-0.5119, 0.6724) and (-0.5194, 0.6726) .. (-0.5299, 0.6701)
1674 .. controls (-0.5512, 0.6413) and (-0.5242, 0.6333) .. (-0.5102, 0.6400)
1675 .. controls (-0.4981, 0.6457) and (-0.4916, 0.6653) .. (-0.5068, 0.6706)
1676 --cycle
1677 (-0.6356, 0.6402)
1678 -- (-0.6681, 0.5845)

```

```

1679 -- (-0.6588, 0.5684)
1680 .. controls (-0.6473, 0.5521) and (-0.6323, 0.5371) .. (-0.6265, 0.5174)
1681 .. controls (-0.6174, 0.4865) and (-0.6614, 0.4161) .. (-0.6950, 0.4206)
1682 .. controls (-0.7111, 0.4226) and (-0.7174, 0.4376) .. (-0.7460, 0.4507)
1683 -- (-0.7632, 0.4212)
1684 .. controls (-0.7629, 0.4042) and (-0.7611, 0.3875) .. (-0.7546, 0.3789)
1685 .. controls (-0.7424, 0.3626) and (-0.7129, 0.3612) .. (-0.6966, 0.3297)
1686 .. controls (-0.6823, 0.3022) and (-0.6963, 0.2741) .. (-0.6808, 0.2598)
1687 .. controls (-0.6602, 0.2410) and (-0.6495, 0.2720) .. (-0.6484, 0.2878)
1688 .. controls (-0.6461, 0.3229) and (-0.6488, 0.4046) .. (-0.6080, 0.4204)
1689 .. controls (-0.5750, 0.4330) and (-0.4980, 0.3514) .. (-0.4929, 0.3217)
1690 .. controls (-0.4895, 0.3019) and (-0.5044, 0.2671) .. (-0.4860, 0.2550)
1691 .. controls (-0.4691, 0.2439) and (-0.4582, 0.2679) .. (-0.4535, 0.2796)
1692 .. controls (-0.4450, 0.3015) and (-0.4273, 0.3562) .. (-0.4401, 0.3771)
1693 .. controls (-0.4495, 0.3922) and (-0.5019, 0.4172) .. (-0.5296, 0.4507)
1694 .. controls (-0.5656, 0.4941) and (-0.5734, 0.5631) .. (-0.5973, 0.6021)
1695 .. controls (-0.6099, 0.6226) and (-0.6226, 0.6316) .. (-0.6356, 0.6402)
1696 --cycle
1697 ( 0.2242, 0.6110)
1698 -- ( 0.1816, 0.6025)
1699 -- ( 0.1816, 0.5855)
1700 .. controls ( 0.2117, 0.5815) and ( 0.2140, 0.5821) .. ( 0.2242, 0.6110)
1701 --cycle
1702 ( 0.3924, 0.6049)
1703 .. controls ( 0.3895, 0.6048) and ( 0.3860, 0.6036) .. ( 0.3820, 0.6011)
1704 .. controls ( 0.3535, 0.5835) and ( 0.3670, 0.5238) .. ( 0.3773, 0.5004)
1705 -- ( 0.3944, 0.5004)
1706 -- ( 0.4061, 0.5429)
1707 .. controls ( 0.4082, 0.5540) and ( 0.4130, 0.6056) .. ( 0.3924, 0.6049)
1708 --cycle
1709 (-0.2864, 0.5940)
1710 .. controls (-0.2904, 0.5793) and (-0.2950, 0.5676) .. (-0.2919, 0.5518)
1711 .. controls (-0.2769, 0.4768) and (-0.1616, 0.5041) .. (-0.2162, 0.5623)
1712 .. controls (-0.2236, 0.5702) and (-0.2346, 0.5747) .. (-0.2443, 0.5790)
1713 --cycle
1714 (-0.7010, 0.5280)
1715 -- (-0.7269, 0.4835)
1716 .. controls (-0.7207, 0.4876) and (-0.7144, 0.4952) .. (-0.7081, 0.5094)
1717 --cycle
1718 (-0.0992, 0.4748)
1719 -- (-0.2099, 0.4556)
1720 -- (-0.2888, 0.3790)
1721 -- (-0.3460, 0.3557)
1722 -- (-0.3389, 0.3218)
1723 .. controls (-0.3310, 0.2959) and (-0.3026, 0.2636) .. (-0.2781, 0.2927)
1724 .. controls (-0.2745, 0.2971) and (-0.2504, 0.3947) .. (-0.1948, 0.3764)
1725 .. controls (-0.1607, 0.3651) and (-0.1697, 0.2984) .. (-0.1588, 0.2536)
1726 -- (-0.1503, 0.2536)
1727 -- (-0.1503, 0.2450)
1728 -- (-0.1163, 0.2366)
1729 .. controls (-0.0968, 0.3059) and (-0.1262, 0.3371) .. (-0.1239, 0.3982)
1730 .. controls (-0.1229, 0.4261) and (-0.1067, 0.4484) .. (-0.0992, 0.4748)
1731 --cycle

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1732 (-0.1503, 0.2450)
1733 -- (-0.1588, 0.2536)
1734 .. controls (-0.2292, 0.2544) and (-0.2730, 0.2893) .. (-0.2677, 0.2195)
1735 -- (-0.2609, 0.1855)
1736 .. controls (-0.2393, 0.1890) and (-0.2005, 0.2039) .. (-0.1909, 0.1753)
1737 .. controls (-0.1709, 0.1163) and (-0.2582, 0.0953) .. (-0.2387, 0.0533)
1738 .. controls (-0.2275, 0.0292) and (-0.1430, 0.0537) .. (-0.1361, 0.0692)
1739 .. controls (-0.1250, 0.0859) and (-0.1359, 0.1083) .. (-0.1361, 0.1259)
1740 .. controls (-0.1437, 0.1788) and (-0.1186, 0.1766) .. (-0.1503, 0.2450)
1741 --cycle
1742 ( 0.7348, 0.4408)
1743 .. controls ( 0.7113, 0.3774) and ( 0.7569, 0.3513) .. ( 0.7901, 0.3824)
1744 -- ( 0.7585, 0.4390)
1745 --cycle
1746 ( 0.2071, 0.4153)
1747 .. controls ( 0.1984, 0.3706) and ( 0.2118, 0.3204) .. ( 0.2582, 0.3046)
1748 .. controls ( 0.2685, 0.3631) and ( 0.2706, 0.3931) .. ( 0.2071, 0.4153)
1749 --cycle
1750 (-0.0567, 0.3982)
1751 .. controls (-0.0558, 0.3230) and (-0.0460, 0.3456) .. (-0.0210, 0.2876)
1752 -- ( 0.0067, 0.1940)
1753 .. controls ( 0.0180, 0.1513) and ( 0.0026, 0.1332) .. ( 0.0454, 0.1089)
1754 -- ( 0.0767, 0.1940)
1755 -- ( 0.0546, 0.2621)
1756 -- ( 0.0406, 0.3185)
1757 -- (-0.0258, 0.3896)
1758 --cycle
1759 (-0.7969, 0.3634)
1760 -- (-0.8570, 0.2602)
1761 .. controls (-0.8515, 0.2550) and (-0.8469, 0.2514) .. (-0.8414, 0.2450)
1762 .. controls (-0.8020, 0.1990) and (-0.8201, 0.1971) .. (-0.7629, 0.1540)
1763 .. controls (-0.7462, 0.1414) and (-0.7054, 0.1023) .. (-0.6834, 0.1181)
1764 .. controls (-0.6662, 0.1304) and (-0.6813, 0.1625) .. (-0.6882, 0.1768)
1765 .. controls (-0.7213, 0.2456) and (-0.7865, 0.2417) .. (-0.8004, 0.2965)
1766 .. controls (-0.8052, 0.3154) and (-0.7990, 0.3413) .. (-0.7969, 0.3634)
1767 --cycle
1768 ( 0.8244, 0.3214)
1769 .. controls ( 0.8136, 0.3128) and ( 0.8080, 0.2984) .. ( 0.8114, 0.2706)
1770 .. controls ( 0.8314, 0.2739) and ( 0.8424, 0.2735) .. ( 0.8526, 0.2710)
1771 --cycle
1772 ( 0.5015, 0.3207)
1773 .. controls ( 0.4943, 0.3196) and ( 0.4861, 0.3171) .. ( 0.4766, 0.3130)
1774 .. controls ( 0.4611, 0.2827) and ( 0.4839, 0.2747) .. ( 0.5028, 0.2521)
1775 -- ( 0.5376, 0.1972)
1776 .. controls ( 0.5529, 0.1772) and ( 0.5728, 0.1698) .. ( 0.5845, 0.1426)
1777 .. controls ( 0.5979, 0.1115) and ( 0.5837, 0.0732) .. ( 0.5987, 0.0532)
1778 .. controls ( 0.6095, 0.0384) and ( 0.6236, 0.0428) .. ( 0.6350, 0.0532)
1779 .. controls ( 0.6681, 0.0842) and ( 0.6456, 0.1087) .. ( 0.6482, 0.1429)
1780 .. controls ( 0.6481, 0.1614) and ( 0.6596, 0.1802) .. ( 0.6482, 0.1967)
1781 .. controls ( 0.6390, 0.2131) and ( 0.5992, 0.2239) .. ( 0.5768, 0.2483)
1782 .. controls ( 0.5547, 0.2722) and ( 0.5524, 0.3288) .. ( 0.5015, 0.3207)
1783 --cycle
1784 (-0.5678, 0.3115)

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1785 .. controls (-0.5832, 0.3118) and (-0.6140, 0.2810) .. (-0.6269, 0.2706)
1786 .. controls (-0.6185, 0.2412) and (-0.5926, 0.1953) .. (-0.5973, 0.1685)
1787 .. controls (-0.6029, 0.1373) and (-0.6320, 0.1239) .. (-0.6369, 0.0996)
1788 .. controls (-0.6406, 0.0816) and (-0.6303, 0.0652) .. (-0.6237, 0.0493)
1789 .. controls (-0.6147, 0.0275) and (-0.6000,-0.0443) .. (-0.5641,-0.0258)
1790 .. controls (-0.5134,-0.0018) and (-0.5902, 0.0606) .. (-0.5641, 0.1074)
1791 .. controls (-0.5332, 0.1697) and (-0.4913, 0.1444) .. (-0.4481, 0.1593)
1792 .. controls (-0.3913, 0.1792) and (-0.3439, 0.2446) .. (-0.3545, 0.3046)
1793 -- (-0.4568, 0.2201)
1794 -- (-0.5588, 0.2201)
1795 .. controls (-0.5549, 0.2390) and (-0.5305, 0.3109) .. (-0.5678, 0.3115)
1796 --cycle
1797 ( 0.2243, 0.2813)
1798 -- ( 0.1631, 0.2450)
1799 -- ( 0.0965, 0.2281)
1800 -- ( 0.1689, 0.1131)
1801 -- ( 0.2065, 0.0861)
1802 .. controls ( 0.2453, 0.0564) and ( 0.2384, 0.0410) .. ( 0.2923, 0.0323)
1803 -- ( 0.2988,-0.0188)
1804 .. controls ( 0.2994,-0.0695) and ( 0.2657,-0.0796) .. ( 0.2249,-0.0579)
1805 .. controls ( 0.1337,-0.0093) and ( 0.1545, 0.0219) .. ( 0.1102, 0.0744)
1806 .. controls ( 0.0914, 0.0967) and ( 0.0807, 0.1010) .. ( 0.0539, 0.1089)
1807 .. controls ( 0.0562, 0.0613) and ( 0.0756,-0.0434) .. ( 0.0403,-0.0825)
1808 .. controls ( 0.0293,-0.0948) and (-0.0336,-0.1168) .. (-0.0567,-0.1294)
1809 .. controls (-0.0615,-0.1087) and (-0.0777,-0.0729) .. (-0.0703,-0.0546)
1810 .. controls (-0.0586,-0.0251) and ( 0.0562, 0.0040) .. (-0.0152, 0.0389)
1811 -- (-0.0397, 0.0480)
1812 -- (-0.0737, 0.0578)
1813 .. controls (-0.0806, 0.0391) and (-0.0849, 0.0192) .. (-0.1018, 0.0068)
1814 .. controls (-0.1154,-0.0032) and (-0.1352,-0.0018) .. (-0.1438,-0.0212)
1815 .. controls (-0.1562,-0.0491) and (-0.1117,-0.1243) .. (-0.0874,-0.1373)
1816 .. controls (-0.0745,-0.1434) and (-0.0687,-0.1394) .. (-0.0567,-0.1373)
1817 .. controls (-0.0358,-0.2033) and (-0.0062,-0.1612) .. ( 0.0370,-0.1500)
1818 -- ( 0.1050,-0.1379)
1819 .. controls ( 0.0882,-0.0871) and ( 0.0808,-0.0999) .. ( 0.0965,-0.0443)
1820 .. controls ( 0.1454,-0.0619) and ( 0.1336,-0.0743) .. ( 0.1664,-0.0940)
1821 .. controls ( 0.1897,-0.1081) and ( 0.2226,-0.1052) .. ( 0.2361,-0.1388)
1822 .. controls ( 0.2495,-0.1724) and ( 0.2245,-0.1963) .. ( 0.2412,-0.2584)
1823 .. controls ( 0.2526,-0.2569) and ( 0.2622,-0.2548) .. ( 0.2735,-0.2584)
1824 .. controls ( 0.2987,-0.2708) and ( 0.3225,-0.3241) .. ( 0.3212,-0.3506)
1825 .. controls ( 0.3203,-0.3711) and ( 0.3053,-0.3950) .. ( 0.3008,-0.4443)
1826 -- ( 0.2497,-0.4187)
1827 .. controls ( 0.2599,-0.4479) and ( 0.2621,-0.4475) .. ( 0.2905,-0.4528)
1828 .. controls ( 0.2877,-0.4715) and ( 0.2799,-0.4998) .. ( 0.2905,-0.5182)
1829 .. controls ( 0.2991,-0.5392) and ( 0.3228,-0.5357) .. ( 0.3346,-0.5182)
1830 .. controls ( 0.3506,-0.4943) and ( 0.3355,-0.4515) .. ( 0.3532,-0.4203)
1831 .. controls ( 0.3716,-0.3881) and ( 0.4096,-0.3844) .. ( 0.4084,-0.3499)
1832 .. controls ( 0.4074,-0.3241) and ( 0.3866,-0.3087) .. ( 0.3728,-0.2897)
1833 -- ( 0.3426,-0.2337)
1834 -- ( 0.2989,-0.1879)
1835 .. controls ( 0.2810,-0.1587) and ( 0.2976,-0.1327) .. ( 0.3187,-0.1323)
1836 .. controls ( 0.3342,-0.1319) and ( 0.3489,-0.1451) .. ( 0.3603,-0.1541)
1837 .. controls ( 0.3817,-0.1712) and ( 0.4026,-0.1894) .. ( 0.4144,-0.2146)

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1838 .. controls ( 0.4299,-0.2477) and ( 0.4289,-0.2977) .. ( 0.4712,-0.3110)
1839 .. controls ( 0.4957,-0.3188) and ( 0.5167,-0.3024) .. ( 0.5044,-0.2753)
1840 .. controls ( 0.4967,-0.2585) and ( 0.4769,-0.2471) .. ( 0.4676,-0.2227)
1841 .. controls ( 0.4582,-0.1981) and ( 0.4681,-0.1743) .. ( 0.4488,-0.1492)
1842 .. controls ( 0.4286,-0.1227) and ( 0.3809,-0.1095) .. ( 0.3621,-0.0696)
1843 .. controls ( 0.3402,-0.0230) and ( 0.3896, 0.0270) .. ( 0.3092, 0.0408)
1844 -- ( 0.3532, 0.1933)
1845 -- ( 0.3944, 0.2536)
1846 -- ( 0.3433, 0.2765)
1847 --cycle
1848 ( 0.2497, 0.2450)
1849 -- ( 0.2782, 0.2025)
1850 .. controls ( 0.2843, 0.1911) and ( 0.2884, 0.1815) .. ( 0.2900, 0.1685)
1851 .. controls ( 0.3021, 0.0654) and ( 0.1495, 0.1479) .. ( 0.2135, 0.2245)
1852 .. controls ( 0.2246, 0.2378) and ( 0.2346, 0.2396) .. ( 0.2497, 0.2450)
1853 --cycle
1854 ( 0.8836, 0.2157)
1855 .. controls ( 0.8688, 0.2061) and ( 0.8571, 0.1889) .. ( 0.8687, 0.1736)
1856 .. controls ( 0.8785, 0.1608) and ( 0.8967, 0.1613) .. ( 0.9161, 0.1578)
1857 --cycle
1858 (-0.3035, 0.1940)
1859 .. controls (-0.3340, 0.1390) and (-0.3508, 0.1491) .. (-0.3624, 0.1300)
1860 .. controls (-0.3738, 0.1112) and (-0.3588, 0.0896) .. (-0.3288, 0.0972)
1861 .. controls (-0.2842, 0.1084) and (-0.2392, 0.1714) .. (-0.3035, 0.1940)
1862 --cycle
1863 ( 0.4710, 0.1940)
1864 .. controls ( 0.4330, 0.1525) and ( 0.3961, 0.1447) .. ( 0.4114, 0.0833)
1865 .. controls ( 0.4294, 0.0897) and ( 0.4596, 0.1056) .. ( 0.4776, 0.0984)
1866 .. controls ( 0.5010, 0.0888) and ( 0.5182, 0.0420) .. ( 0.4925, 0.0231)
1867 .. controls ( 0.4698, 0.0064) and ( 0.4500, 0.0299) .. ( 0.3944, 0.0153)
1868 .. controls ( 0.4243,-0.0189) and ( 0.4618,-0.0333) .. ( 0.4765,-0.0621)
1869 .. controls ( 0.4928,-0.0939) and ( 0.4729,-0.1183) .. ( 0.4881,-0.1406)
1870 .. controls ( 0.4977,-0.1549) and ( 0.5241,-0.1630) .. ( 0.5425,-0.1894)
1871 .. controls ( 0.5557,-0.2085) and ( 0.5562,-0.2282) .. ( 0.5657,-0.2485)
1872 -- ( 0.6122,-0.3251)
1873 .. controls ( 0.6335,-0.3720) and ( 0.6160,-0.3973) .. ( 0.6323,-0.4443)
1874 .. controls ( 0.6532,-0.5042) and ( 0.6754,-0.5231) .. ( 0.6973,-0.5440)
1875 -- ( 0.7289,-0.4899)
1876 .. controls ( 0.7138,-0.4739) and ( 0.6992,-0.4579) .. ( 0.6886,-0.4358)
1877 -- ( 0.6489,-0.2690)
1878 .. controls ( 0.6485,-0.2445) and ( 0.6654,-0.2180) .. ( 0.6598,-0.2002)
1879 .. controls ( 0.6522,-0.1752) and ( 0.6202,-0.1899) .. ( 0.5938,-0.1612)
1880 .. controls ( 0.5619,-0.1263) and ( 0.5907,-0.0980) .. ( 0.5797,-0.0720)
1881 .. controls ( 0.5714,-0.0525) and ( 0.5434,-0.0441) .. ( 0.5374,-0.0184)
1882 .. controls ( 0.5319, 0.0056) and ( 0.5522, 0.0300) .. ( 0.5533, 0.0578)
1883 .. controls ( 0.5548, 0.0943) and ( 0.4981, 0.1701) .. ( 0.4710, 0.1940)
1884 --cycle
1885 (-0.9001, 0.1862)
1886 -- (-0.9386, 0.1201)
1887 .. controls (-0.9374, 0.1181) and (-0.9371, 0.1158) .. (-0.9356, 0.1139)
1888 .. controls (-0.9242, 0.0996) and (-0.9046, 0.0893) .. (-0.8911, 0.0660)
1889 .. controls (-0.8684, 0.0268) and (-0.8960, 0.0297) .. (-0.8592,-0.0296)
1890 .. controls (-0.8262,-0.0830) and (-0.8655,-0.1092) .. (-0.7971,-0.1209)

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1891 -- (-0.7875, 0.0068)
1892 -- (-0.8579, 0.1174)
1893 --cycle
1894 (-0.4453, 0.0979)
1895 .. controls (-0.4922, 0.0916) and (-0.4988, 0.0347) .. (-0.4759, 0.0116)
1896 .. controls (-0.4491,-0.0149) and (-0.4165, 0.0208) .. (-0.3900, 0.0116)
1897 .. controls (-0.3555,-0.0011) and (-0.3800,-0.0410) .. (-0.3751,-0.0698)
1898 -- (-0.3537,-0.1294)
1899 .. controls (-0.3428,-0.1879) and (-0.4042,-0.1777) .. (-0.3801,-0.2656)
1900 .. controls (-0.3617,-0.2531) and (-0.3352,-0.2292) .. (-0.3122,-0.2330)
1901 .. controls (-0.2845,-0.2375) and (-0.2669,-0.2694) .. (-0.2543,-0.2911)
1902 .. controls (-0.2183,-0.3533) and (-0.2004,-0.3613) .. (-0.2184,-0.4358)
1903 .. controls (-0.3300,-0.4097) and (-0.2723,-0.5065) .. (-0.2483,-0.5549)
1904 -- (-0.2129,-0.6314)
1905 .. controls (-0.2017,-0.6508) and (-0.1900,-0.6661) .. (-0.1670,-0.6712)
1906 .. controls (-0.1211,-0.6813) and (-0.1100,-0.6527) .. (-0.1163,-0.6145)
1907 .. controls (-0.1327,-0.6119) and (-0.1427,-0.6118) .. (-0.1568,-0.6009)
1908 .. controls (-0.1780,-0.5845) and (-0.2123,-0.5041) .. (-0.2042,-0.4783)
1909 .. controls (-0.1947,-0.4484) and (-0.1575,-0.4121) .. (-0.1333,-0.3932)
1910 -- (-0.1527,-0.3251)
1911 -- (-0.1588,-0.2656)
1912 .. controls (-0.2187,-0.2715) and (-0.2083,-0.2536) .. (-0.2457,-0.2163)
1913 .. controls (-0.2684,-0.1935) and (-0.2911,-0.1886) .. (-0.2996,-0.1546)
1914 -- (-0.2996,-0.1209)
1915 -- (-0.3232,-0.0698)
1916 .. controls (-0.3283,-0.0435) and (-0.3124,-0.0260) .. (-0.3175,-0.0041)
1917 .. controls (-0.3251, 0.0283) and (-0.3891, 0.0917) .. (-0.4227, 0.0973)
1918 .. controls (-0.4311, 0.0987) and (-0.4386, 0.0989) .. (-0.4453, 0.0979)
1919 --cycle
1920 (-0.1163,-0.6145)
1921 -- (-0.0812,-0.6009)
1922 -- (-0.0509,-0.4868)
1923 -- (-0.0567,-0.4528)
1924 .. controls (-0.1227,-0.4845) and (-0.1350,-0.5483) .. (-0.1163,-0.6145)
1925 --cycle
1926 ( 0.9165, 0.0573)
1927 .. controls ( 0.8982, 0.0512) and ( 0.8800, 0.0260) .. ( 0.8880,-0.0013)
1928 .. controls ( 0.8973,-0.0334) and ( 0.9330,-0.0408) .. ( 0.9466,-0.0703)
1929 .. controls ( 0.9528,-0.0838) and ( 0.9514,-0.0964) .. ( 0.9506,-0.1091)
1930 -- ( 1.0000,-0.0243)
1931 .. controls ( 0.9816,-0.0179) and ( 0.9678,-0.0119) .. ( 0.9563, 0.0077)
1932 .. controls ( 0.9465, 0.0244) and ( 0.9476, 0.0488) .. ( 0.9340, 0.0564)
1933 .. controls ( 0.9288, 0.0593) and ( 0.9227, 0.0593) .. ( 0.9165, 0.0573)
1934 --cycle
1935 (-0.7064, 0.0069)
1936 .. controls (-0.7128, 0.0077) and (-0.7187, 0.0075) .. (-0.7237, 0.0061)
1937 .. controls (-0.7255, 0.0030) and (-0.7310, 0.0025) .. (-0.7316,-0.0115)
1938 .. controls (-0.7321,-0.0230) and (-0.7071,-0.1058) .. (-0.6984,-0.1096)
1939 .. controls (-0.6872,-0.1176) and (-0.6721,-0.1116) .. (-0.6609,-0.1096)
1940 .. controls (-0.6502,-0.1046) and (-0.6316,-0.0986) .. (-0.6242,-0.0900)
1941 .. controls (-0.5901,-0.0507) and (-0.6615, 0.0017) .. (-0.7064, 0.0069)
1942 --cycle
1943 (-1.0000, 0.0068)

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1944 -- (-1.0000, 0.0020)
1945 -- (-0.9548,-0.0788)
1946 .. controls (-0.9170,-0.0310) and (-0.9342,-0.0158) .. (-1.0000, 0.0068)
1947 --cycle
1948 (-0.2643, 0.0054)
1949 .. controls (-0.2853,-0.0295) and (-0.2523,-0.0713) .. (-0.2182,-0.0843)
1950 .. controls (-0.2024,-0.0902) and (-0.1781,-0.0944) .. (-0.1687,-0.0757)
1951 .. controls (-0.1530,-0.0441) and (-0.2378, 0.0095) .. (-0.2643, 0.0054)
1952 --cycle
1953 ( 0.6299,-0.0102)
1954 .. controls ( 0.6155,-0.0145) and ( 0.6071,-0.0342) .. ( 0.6128,-0.0510)
1955 .. controls ( 0.6198,-0.0721) and ( 0.6440,-0.0790) .. ( 0.6606,-0.0986)
1956 .. controls ( 0.6738,-0.1143) and ( 0.6761,-0.1328) .. ( 0.6948,-0.1437)
1957 .. controls ( 0.7092,-0.1520) and ( 0.7311,-0.1484) .. ( 0.7401,-0.1664)
1958 .. controls ( 0.7461,-0.1784) and ( 0.7351,-0.2363) .. ( 0.7348,-0.2570)
1959 .. controls ( 0.7336,-0.3524) and ( 0.7289,-0.3324) .. ( 0.7620,-0.4187)
1960 .. controls ( 0.7631,-0.4216) and ( 0.7642,-0.4246) .. ( 0.7652,-0.4275)
1961 -- ( 0.8003,-0.3672)
1962 .. controls ( 0.7976,-0.3636) and ( 0.7942,-0.3606) .. ( 0.7918,-0.3568)
1963 .. controls ( 0.7778,-0.3349) and ( 0.7645,-0.2537) .. ( 0.7970,-0.2417)
1964 .. controls ( 0.8206,-0.2330) and ( 0.8347,-0.2671) .. ( 0.8432,-0.2822)
1965 -- ( 0.8469,-0.2872)
1966 -- ( 0.8787,-0.2326)
1967 -- ( 0.8594,-0.1993)
1968 .. controls ( 0.8496,-0.1847) and ( 0.7996,-0.1314) .. ( 0.7847,-0.1281)
1969 .. controls ( 0.7712,-0.1229) and ( 0.7642,-0.1268) .. ( 0.7518,-0.1281)
1970 .. controls ( 0.7451,-0.1148) and ( 0.7397,-0.1014) .. ( 0.7293,-0.0886)
1971 -- ( 0.6461,-0.0117)
1972 .. controls ( 0.6402,-0.0090) and ( 0.6347,-0.0087) .. ( 0.6299,-0.0102)
1973 --cycle
1974 (-0.5178,-0.0844)
1975 .. controls (-0.5451,-0.0820) and (-0.5852,-0.0947) .. (-0.5902,-0.1144)
1976 .. controls (-0.6007,-0.1557) and (-0.5621,-0.1731) .. (-0.5414,-0.1997)
1977 .. controls (-0.5274,-0.2177) and (-0.5229,-0.2355) .. (-0.5044,-0.2525)
1978 .. controls (-0.4888,-0.2669) and (-0.4706,-0.2705) .. (-0.4543,-0.2923)
1979 .. controls (-0.4420,-0.3087) and (-0.4220,-0.3707) .. (-0.4141,-0.3932)
1980 .. controls (-0.3620,-0.3875) and (-0.3060,-0.4031) .. (-0.3060,-0.3592)
1981 .. controls (-0.3060,-0.3272) and (-0.3358,-0.3272) .. (-0.3716,-0.3008)
1982 .. controls (-0.4367,-0.2529) and (-0.4253,-0.2451) .. (-0.4621,-0.1914)
1983 .. controls (-0.4700,-0.1800) and (-0.4814,-0.1685) .. (-0.4867,-0.1556)
1984 .. controls (-0.4970,-0.1308) and (-0.4804,-0.1088) .. (-0.4966,-0.0923)
1985 .. controls (-0.5011,-0.0877) and (-0.5087,-0.0853) .. (-0.5178,-0.0844)
1986 --cycle
1987 (-0.4165,-0.0846)
1988 .. controls (-0.4357,-0.0807) and (-0.4622,-0.1075) .. (-0.4395,-0.1440)
1989 .. controls (-0.4316,-0.1566) and (-0.4254,-0.1571) .. (-0.4141,-0.1634)
1990 .. controls (-0.4094,-0.1522) and (-0.4042,-0.1415) .. (-0.4019,-0.1294)
1991 .. controls (-0.3960,-0.1004) and (-0.4049,-0.0870) .. (-0.4165,-0.0846)
1992 --cycle
1993 (-0.9358,-0.1125)
1994 -- (-0.8813,-0.2098)
1995 .. controls (-0.8768,-0.1903) and (-0.8656,-0.1673) .. (-0.8723,-0.1485)
1996 .. controls (-0.8801,-0.1269) and (-0.9022,-0.1274) .. (-0.9358,-0.1125)

```

```

1997 --cycle
1998 ( 0.1455,-0.1458)
1999 .. controls ( 0.1402,-0.1449) and ( 0.1336,-0.1452) .. ( 0.1255,-0.1471)
2000 .. controls ( 0.0901,-0.1850) and ( 0.1064,-0.2454) .. ( 0.1360,-0.2301)
2001 .. controls ( 0.1569,-0.2194) and ( 0.1827,-0.1522) .. ( 0.1455,-0.1458)
2002 --cycle
2003 (-0.1477,-0.1474)
2004 .. controls (-0.1646,-0.1458) and (-0.1813,-0.1543) .. (-0.1847,-0.1659)
2005 .. controls (-0.1889,-0.1806) and (-0.1612,-0.2953) .. (-0.1163,-0.2315)
2006 -- (-0.0420,-0.4418)
2007 .. controls (-0.0291,-0.4661) and (-0.0068,-0.4600) .. ( 0.0136,-0.4880)
2008 .. controls ( 0.0294,-0.5097) and ( 0.0259,-0.5331) .. ( 0.0419,-0.5487)
2009 .. controls ( 0.0694,-0.5755) and ( 0.1462,-0.5710) .. ( 0.1798,-0.6001)
2010 -- ( 0.2188,-0.6436)
2011 .. controls ( 0.2392,-0.6605) and ( 0.2566,-0.6577) .. ( 0.2804,-0.6838)
2012 .. controls ( 0.3122,-0.7186) and ( 0.3037,-0.7586) .. ( 0.3603,-0.7592)
2013 .. controls ( 0.3537,-0.7217) and ( 0.3358,-0.6781) .. ( 0.3603,-0.6427)
2014 .. controls ( 0.3743,-0.6222) and ( 0.3978,-0.6232) .. ( 0.4032,-0.6039)
2015 .. controls ( 0.4084,-0.5852) and ( 0.3901,-0.5654) .. ( 0.3712,-0.5741)
2016 .. controls ( 0.3573,-0.5804) and ( 0.3558,-0.5936) .. ( 0.3518,-0.6044)
2017 .. controls ( 0.3319,-0.6046) and ( 0.2996,-0.6092) .. ( 0.2842,-0.6044)
2018 .. controls ( 0.2568,-0.5917) and ( 0.2515,-0.5648) .. ( 0.2231,-0.5501)
2019 .. controls ( 0.1960,-0.5359) and ( 0.1632,-0.5421) .. ( 0.1413,-0.5292)
2020 -- ( 0.0626,-0.4601)
2021 .. controls ( 0.0525,-0.4430) and ( 0.0547,-0.4207) .. ( 0.0440,-0.4065)
2022 .. controls ( 0.0320,-0.3906) and ( 0.0076,-0.3898) .. (-0.0104,-0.3714)
2023 .. controls (-0.0515,-0.3289) and ( 0.0146,-0.2721) .. (-0.0737,-0.2358)
2024 .. controls (-0.0903,-0.2290) and (-0.0917,-0.2313) .. (-0.1098,-0.2315)
2025 -- (-0.1098,-0.1892)
2026 .. controls (-0.1137,-0.1607) and (-0.1308,-0.1491) .. (-0.1477,-0.1474)
2027 --cycle
2028 (-0.7679,-0.1481)
2029 .. controls (-0.8119,-0.1523) and (-0.8157,-0.2051) .. (-0.8303,-0.2401)
2030 -- (-0.8453,-0.2740)
2031 -- (-0.8299,-0.3015)
2032 .. controls (-0.7861,-0.2968) and (-0.8116,-0.2403) .. (-0.7732,-0.2278)
2033 .. controls (-0.7561,-0.2223) and (-0.7349,-0.2415) .. (-0.7204,-0.2497)
2034 .. controls (-0.6711,-0.2774) and (-0.6473,-0.2864) .. (-0.6524,-0.3506)
2035 -- (-0.6787,-0.3422)
2036 .. controls (-0.6786,-0.3475) and (-0.6826,-0.3544) .. (-0.6787,-0.3655)
2037 .. controls (-0.6635,-0.4244) and (-0.5943,-0.3658) .. (-0.5763,-0.3760)
2038 .. controls (-0.5586,-0.3861) and (-0.5497,-0.4251) .. (-0.5357,-0.4418)
2039 .. controls (-0.5118,-0.4701) and (-0.4694,-0.4662) .. (-0.4504,-0.5047)
2040 .. controls (-0.4231,-0.5599) and (-0.4535,-0.6772) .. (-0.4451,-0.7421)
2041 .. controls (-0.4389,-0.7901) and (-0.4023,-0.8005) .. (-0.3912,-0.8443)
2042 .. controls (-0.3883,-0.8558) and (-0.3874,-0.8667) .. (-0.3869,-0.8774)
2043 -- (-0.3386,-0.8778)
2044 .. controls (-0.3371,-0.8645) and (-0.3342,-0.8523) .. (-0.3394,-0.8358)
2045 .. controls (-0.3448,-0.8167) and (-0.3914,-0.7567) .. (-0.3962,-0.6996)
2046 .. controls (-0.4039,-0.6074) and (-0.3294,-0.5871) .. (-0.3545,-0.4954)
2047 -- (-0.3886,-0.5039)
2048 -- (-0.4196,-0.4442)
2049 -- (-0.4864,-0.4090)

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2050 -- (-0.5345,-0.3241)
2051 -- (-0.6106,-0.2802)
2052 -- (-0.6106,-0.1975)
2053 .. controls (-0.6301,-0.2027) and (-0.6486,-0.2101) .. (-0.6694,-0.2022)
2054 .. controls (-0.7004,-0.1904) and (-0.7133,-0.1559) .. (-0.7464,-0.1495)
2055 .. controls (-0.7544,-0.1479) and (-0.7616,-0.1475) .. (-0.7679,-0.1481)
2056 --cycle
2057 ( 0.0029,-0.2060)
2058 .. controls (-0.0139,-0.2731) and ( 0.0196,-0.2608) .. ( 0.0476,-0.3014)
2059 .. controls ( 0.0682,-0.3314) and ( 0.0511,-0.3569) .. ( 0.0750,-0.3784)
2060 .. controls ( 0.0974,-0.3988) and ( 0.1304,-0.3876) .. ( 0.1549,-0.4019)
2061 .. controls ( 0.1795,-0.4164) and ( 0.1878,-0.4529) .. ( 0.1987,-0.4783)
2062 .. controls ( 0.2461,-0.4539) and ( 0.2519,-0.4021) .. ( 0.2180,-0.3618)
2063 .. controls ( 0.1964,-0.3362) and ( 0.1652,-0.3426) .. ( 0.1414,-0.3257)
2064 .. controls ( 0.1198,-0.3103) and ( 0.1183,-0.2881) .. ( 0.1007,-0.2689)
2065 .. controls ( 0.0838,-0.2504) and ( 0.0265,-0.2166) .. ( 0.0029,-0.2060)
2066 --cycle
2067 ( 0.2327,-0.2826)
2068 .. controls ( 0.1961,-0.2955) and ( 0.1961,-0.3123) .. ( 0.2327,-0.3251)
2069 --cycle
2070 (-0.7548,-0.3137)
2071 .. controls (-0.7774,-0.3164) and (-0.7890,-0.3323) .. (-0.7986,-0.3573)
2072 -- (-0.7759,-0.3979)
2073 .. controls (-0.7735,-0.3968) and (-0.7711,-0.3964) .. (-0.7688,-0.3946)
2074 -- (-0.7205,-0.3166)
2075 .. controls (-0.7341,-0.3135) and (-0.7454,-0.3126) .. (-0.7548,-0.3137)
2076 --cycle
2077 ( 0.4114,-0.3847)
2078 .. controls ( 0.4216,-0.4136) and ( 0.4238,-0.4142) .. ( 0.4540,-0.4102)
2079 -- ( 0.4540,-0.3932)
2080 --cycle
2081 ( 0.5395,-0.3997)
2082 .. controls ( 0.5263,-0.3990) and ( 0.5044,-0.4032) .. ( 0.4625,-0.4018)
2083 -- ( 0.4780,-0.4954)
2084 .. controls ( 0.4757,-0.5287) and ( 0.4518,-0.5542) .. ( 0.4648,-0.5776)
2085 .. controls ( 0.4852,-0.6142) and ( 0.5202,-0.5603) .. ( 0.5614,-0.5929)
2086 .. controls ( 0.5752,-0.6038) and ( 0.6063,-0.6359) .. ( 0.6275,-0.6638)
2087 -- ( 0.6570,-0.6132)
2088 .. controls ( 0.6460,-0.6042) and ( 0.6347,-0.5954) .. ( 0.6268,-0.5865)
2089 -- ( 0.5937,-0.5346)
2090 .. controls ( 0.5648,-0.5023) and ( 0.5031,-0.4880) .. ( 0.5646,-0.4273)
2091 .. controls ( 0.5574,-0.4062) and ( 0.5528,-0.4005) .. ( 0.5395,-0.3997)
2092 --cycle
2093 (-0.6609,-0.4273)
2094 .. controls (-0.7027,-0.4247) and (-0.7300,-0.4414) .. (-0.7397,-0.4624)
2095 -- (-0.7047,-0.5249)
2096 .. controls (-0.7013,-0.5263) and (-0.6989,-0.5282) .. (-0.6950,-0.5294)
2097 .. controls (-0.6935,-0.4878) and (-0.6933,-0.4806) .. (-0.6609,-0.4528)
2098 --cycle
2099 (-0.5689,-0.4528)
2100 .. controls (-0.6368,-0.4677) and (-0.6352,-0.5020) .. (-0.6354,-0.5634)
2101 -- (-0.5757,-0.6071)
2102 -- (-0.5162,-0.6826)

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2103 .. controls (-0.5073,-0.6508) and (-0.5037,-0.6125) .. (-0.5241,-0.5838)
2104 .. controls (-0.5384,-0.5639) and (-0.5622,-0.5584) .. (-0.5689,-0.5361)
2105 .. controls (-0.5775,-0.5167) and (-0.5648,-0.4918) .. (-0.5689,-0.4528)
2106 --cycle
2107 (-0.6354,-0.5634)
2108 .. controls (-0.6583,-0.5576) and (-0.6713,-0.5579) .. (-0.6839,-0.5619)
2109 -- (-0.6487,-0.6248)
2110 .. controls (-0.6395,-0.6053) and (-0.6326,-0.5852) .. (-0.6354,-0.5634)
2111 --cycle
2112 (-0.0056,-0.5890)
2113 .. controls (-0.0554,-0.6155) and (-0.0426,-0.6370) .. (-0.0606,-0.6818)
2114 -- (-0.1199,-0.7847)
2115 .. controls (-0.1298,-0.8015) and (-0.1531,-0.8317) .. (-0.1499,-0.8510)
2116 .. controls (-0.1482,-0.8615) and (-0.1397,-0.8702) .. (-0.1295,-0.8795)
2117 -- (-0.0507,-0.8802)
2118 .. controls (-0.0629,-0.8583) and (-0.0745,-0.8380) .. (-0.0742,-0.8358)
2119 .. controls (-0.0792,-0.8239) and (-0.0776,-0.8135) .. (-0.0742,-0.8027)
2120 .. controls (-0.0460,-0.7520) and ( 0.0016,-0.7834) .. ( 0.0277,-0.7780)
2121 .. controls ( 0.0760,-0.7679) and ( 0.1284,-0.6914) .. ( 0.1207,-0.6405)
2122 .. controls ( 0.1150,-0.6017) and ( 0.0841,-0.6082) .. ( 0.0711,-0.6267)
2123 .. controls ( 0.0620,-0.6397) and ( 0.0556,-0.7141) .. ( 0.0539,-0.7336)
2124 .. controls (-0.0413,-0.7085) and ( 0.0139,-0.6637) .. (-0.0056,-0.5890)
2125 --cycle
2126 ( 0.4284,-0.6571)
2127 .. controls ( 0.4285,-0.7307) and ( 0.4284,-0.7652) .. ( 0.5135,-0.7336)
2128 .. controls ( 0.5170,-0.7469) and ( 0.5220,-0.7585) .. ( 0.5179,-0.7726)
2129 .. controls ( 0.5091,-0.8019) and ( 0.4473,-0.8546) .. ( 0.4851,-0.8847)
2130 -- ( 0.4987,-0.8848)
2131 -- ( 0.5768,-0.7509)
2132 .. controls ( 0.5767,-0.7509) and ( 0.5767,-0.7507) .. ( 0.5767,-0.7507)
2133 .. controls ( 0.5412,-0.6652) and ( 0.5083,-0.6726) .. ( 0.4284,-0.6571)
2134 --cycle
2135 (-0.2914,-0.6672)
2136 .. controls (-0.2998,-0.6666) and (-0.3106,-0.6686) .. (-0.3250,-0.6743)
2137 .. controls (-0.3545,-0.7128) and (-0.3081,-0.7358) .. (-0.2850,-0.7678)
2138 .. controls (-0.2710,-0.7873) and (-0.2601,-0.8137) .. (-0.2351,-0.8216)
2139 .. controls (-0.2083,-0.8301) and (-0.1916,-0.8105) .. (-0.1960,-0.7845)
2140 .. controls (-0.2008,-0.7566) and (-0.2232,-0.7418) .. (-0.2396,-0.7216)
2141 .. controls (-0.2612,-0.6950) and (-0.2660,-0.6690) .. (-0.2914,-0.6672)
2142 --cycle
2143 (-0.5641,-0.6998)
2144 .. controls (-0.5850,-0.6984) and (-0.5808,-0.7367) .. (-0.5766,-0.7507)
2145 .. controls (-0.5748,-0.7566) and (-0.5723,-0.7598) .. (-0.5702,-0.7648)
2146 -- (-0.5492,-0.8022)
2147 .. controls (-0.5310,-0.8247) and (-0.5120,-0.8367) .. (-0.5052,-0.8613)
2148 .. controls (-0.5044,-0.8642) and (-0.5062,-0.8717) .. (-0.5063,-0.8763)
2149 -- (-0.4585,-0.8767)
2150 .. controls (-0.4596,-0.7984) and (-0.5013,-0.7963) .. (-0.5234,-0.7583)
2151 .. controls (-0.5344,-0.7394) and (-0.5352,-0.7120) .. (-0.5535,-0.7030)
2152 .. controls (-0.5576,-0.7010) and (-0.5611,-0.7000) .. (-0.5641,-0.6998)
2153 --cycle
2154 ( 0.1990,-0.7341)
2155 .. controls ( 0.1094,-0.7768) and ( 0.2330,-0.8330) .. ( 0.2586,-0.8828)

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```

2156 -- ( 0.3183,-0.8833)
2157 .. controls ( 0.3165,-0.8684) and ( 0.3066,-0.8565) .. ( 0.2991,-0.8428)
2158 .. controls ( 0.2762,-0.8010) and ( 0.2508,-0.7418) .. ( 0.1990,-0.7341)
2159 --cycle
2160 ( 0.3603,-0.7592)
2161 -- ( 0.3859,-0.8188)
2162 .. controls ( 0.4178,-0.7853) and ( 0.4108,-0.7527) .. ( 0.3603,-0.7592)
2163 --cycle
2164 ( 0.4369,-0.8443)
2165 .. controls ( 0.4147,-0.8480) and ( 0.3837,-0.8661) .. ( 0.3628,-0.8837)
2166 -- ( 0.4240,-0.8842)
2167 .. controls ( 0.4307,-0.8690) and ( 0.4358,-0.8541) .. ( 0.4369,-0.8443)
2168 --cycle
2169 (-0.3205,-0.8528)
2170 -- (-0.3266,-0.8779)
2171 -- (-0.2773,-0.8783)
2172 .. controls (-0.2800,-0.8719) and (-0.2850,-0.8655) .. (-0.2963,-0.8600)
2173 --cycle
2174 ( 0.1093,-0.8568)
2175 .. controls ( 0.0964,-0.8568) and ( 0.0834,-0.8587) .. ( 0.0710,-0.8600)
2176 .. controls ( 0.0605,-0.8611) and ( 0.0403,-0.8617) .. ( 0.0312,-0.8664)
2177 .. controls ( 0.0240,-0.8701) and ( 0.0203,-0.8751) .. ( 0.0184,-0.8808)
2178 -- ( 0.1002,-0.8815)
2179 -- ( 0.1050,-0.8698)
2180 -- ( 0.1085,-0.8815)
2181 -- ( 0.1641,-0.8820)
2182 .. controls ( 0.1606,-0.8757) and ( 0.1553,-0.8698) .. ( 0.1463,-0.8649)
2183 .. controls ( 0.1347,-0.8586) and ( 0.1221,-0.8568) .. ( 0.1093,-0.8568)
2184 --cycle
2185 ;
2186 }
2187 }
2188 \fi

```

hex/terrain/light woods

The draw style for light woods. The pattern is filled with light green, and outline is not drawn.

```

2189 \tikzset{
2190   hex/terrain/light woods/.style={
2191     draw=none,
2192     fill={rgb,100:red,69;green,98;blue,69}
2193   }
2194 }

```

hex/terrain/light woods

Next, we have light woods.



```
2195 \ifhex@terrain@pic
2196 \tikzset{
2197   hex/terrain/light woods/.pic={
2198     \path[hex/terrain/light woods,pic actions,draw=none]
2199       (-0.4795, 0.8736)
2200       -- (-0.5104, 0.8207)
2201       .. controls (-0.5041, 0.8191) and (-0.4967, 0.8182) .. (-0.4854, 0.8192)
2202       -- (-0.4770, 0.8108)
2203       -- (-0.4854, 0.7856)
2204       -- (-0.5190, 0.8023)
2205       .. controls (-0.5219, 0.7975) and (-0.5245, 0.7958) .. (-0.5272, 0.7916)
2206       -- (-0.5881, 0.6872)
2207       .. controls (-0.5849, 0.6876) and (-0.5819, 0.6876) .. (-0.5782, 0.6885)
2208       .. controls (-0.5524, 0.6946) and (-0.5387, 0.7153) .. (-0.5182, 0.7298)
2209       .. controls (-0.4841, 0.7540) and (-0.4420, 0.7539) .. (-0.4346, 0.7864)
2210       .. controls (-0.4295, 0.8088) and (-0.4470, 0.8265) .. (-0.4572, 0.8444)
2211       .. controls (-0.4631, 0.8549) and (-0.4670, 0.8646) .. (-0.4707, 0.8736)
2212       --cycle
2213       (-0.3185, 0.8722)
2214       .. controls (-0.3478, 0.8487) and (-0.3526, 0.8080) .. (-0.3290, 0.7808)
2215       .. controls (-0.3140, 0.7633) and (-0.2394, 0.7433) .. (-0.2165, 0.7459)
2216       .. controls (-0.1895, 0.7488) and (-0.1787, 0.7643) .. (-0.1561, 0.7725)
2217       .. controls (-0.1380, 0.7791) and (-0.1179, 0.7766) .. (-0.1025, 0.7906)
2218       .. controls (-0.0719, 0.8182) and (-0.0936, 0.8427) .. (-0.1240, 0.8528)
2219       -- (-0.1323, 0.8192)
2220       -- (-0.1912, 0.8359)
2221       .. controls (-0.1985, 0.8023) and (-0.1999, 0.7965) .. (-0.2332, 0.7856)
2222       .. controls (-0.2512, 0.8363) and (-0.2775, 0.8009) .. (-0.2909, 0.8240)
2223       .. controls (-0.2975, 0.8355) and (-0.2884, 0.8535) .. (-0.2756, 0.8719)
2224       --cycle
2225       (-0.1660, 0.8709)
2226       .. controls (-0.1609, 0.8538) and (-0.1460, 0.8596) .. (-0.1371, 0.8707)
2227       --cycle
2228       ( 0.0768, 0.8689)
2229       .. controls ( 0.0767, 0.8688) and ( 0.0765, 0.8686) .. ( 0.0764, 0.8685)
2230       .. controls ( 0.0704, 0.8503) and ( 0.0779, 0.7592) .. ( 0.1533, 0.7700)
2231       .. controls ( 0.1955, 0.7761) and ( 0.1956, 0.8018) .. ( 0.1871, 0.8359)
2232       -- ( 0.1366, 0.8108)
2233       -- ( 0.1510, 0.8683)
2234       --cycle
2235       ( 0.1840, 0.8680)
2236       .. controls ( 0.1910, 0.8650) and ( 0.1993, 0.8662) .. ( 0.2081, 0.8678)
2237       --cycle
2238       ( 0.2214, 0.8677)
2239       -- ( 0.2459, 0.7939)
2240       .. controls ( 0.1903, 0.7716) and ( 0.2267, 0.7399) .. ( 0.2534, 0.7490)
2241       .. controls ( 0.2925, 0.7624) and ( 0.2842, 0.8066) .. ( 0.2735, 0.8359)
2242       .. controls ( 0.2690, 0.8483) and ( 0.2655, 0.8586) .. ( 0.2619, 0.8674)
```



```

2243 --cycle
2244 ( 0.4057, 0.8661)
2245 .. controls ( 0.4149, 0.8349) and ( 0.4483, 0.8068) .. ( 0.4873, 0.8349)
2246 .. controls ( 0.4993, 0.8436) and ( 0.5001, 0.8496) .. ( 0.5065, 0.8612)
2247 .. controls ( 0.5170, 0.8447) and ( 0.5269, 0.8297) .. ( 0.5405, 0.8189)
2248 -- ( 0.5145, 0.8652)
2249 --cycle
2250 (-0.0288, 0.8391)
2251 .. controls (-0.0335, 0.8388) and (-0.0390, 0.8377) .. (-0.0453, 0.8356)
2252 .. controls (-0.0698, 0.8019) and (-0.0347, 0.7882) .. (-0.0173, 0.7966)
2253 .. controls ( 0.0001, 0.8052) and ( 0.0042, 0.8413) .. (-0.0288, 0.8391)
2254 --cycle
2255 ( 0.3888, 0.7856)
2256 -- ( 0.3719, 0.7687)
2257 -- ( 0.3719, 0.7604)
2258 -- ( 0.3888, 0.7435)
2259 -- ( 0.3972, 0.7435)
2260 -- ( 0.4140, 0.7604)
2261 --cycle
2262 (-0.0821, 0.7138)
2263 .. controls (-0.0999, 0.7158) and (-0.1171, 0.7050) .. (-0.1211, 0.6922)
2264 .. controls (-0.1297, 0.6650) and (-0.0695, 0.6250) .. (-0.0468, 0.6186)
2265 .. controls (-0.0352, 0.6169) and (-0.0107, 0.6175) .. ( 0.0022, 0.6186)
2266 .. controls (-0.0326, 0.5765) and (-0.0411, 0.5767) .. (-0.0909, 0.5922)
2267 .. controls (-0.0924, 0.5799) and (-0.0959, 0.5731) .. (-0.0909, 0.5597)
2268 .. controls (-0.0591, 0.4605) and ( 0.1221, 0.6255) .. ( 0.0020, 0.6581)
2269 .. controls (-0.0090, 0.6597) and (-0.0281, 0.6592) .. (-0.0399, 0.6581)
2270 .. controls (-0.0462, 0.6969) and (-0.0645, 0.7118) .. (-0.0821, 0.7138)
2271 --cycle
2272 ( 0.3704, 0.7106)
2273 .. controls ( 0.3510, 0.7072) and ( 0.3332, 0.6943) .. ( 0.3224, 0.6679)
2274 .. controls ( 0.3172, 0.6530) and ( 0.3220, 0.6121) .. ( 0.3224, 0.5922)
2275 -- ( 0.3056, 0.6154)
2276 .. controls ( 0.2531, 0.6742) and ( 0.2322, 0.5554) .. ( 0.2966, 0.5454)
2277 .. controls ( 0.3239, 0.5412) and ( 0.3417, 0.5630) .. ( 0.3972, 0.5670)
2278 .. controls ( 0.4005, 0.5473) and ( 0.4019, 0.5314) .. ( 0.4237, 0.5231)
2279 .. controls ( 0.4541, 0.5116) and ( 0.4961, 0.5392) .. ( 0.4841, 0.5736)
2280 .. controls ( 0.4794, 0.5870) and ( 0.4556, 0.5991) .. ( 0.4331, 0.6106)
2281 .. controls ( 0.4972, 0.6497) and ( 0.4277, 0.7210) .. ( 0.3704, 0.7106)
2282 --cycle
2283 (-0.4679, 0.7004)
2284 .. controls (-0.5116, 0.6983) and (-0.4629, 0.6153) .. (-0.4266, 0.6632)
2285 .. controls (-0.4200, 0.6718) and (-0.4201, 0.6786) .. (-0.4182, 0.6846)
2286 -- (-0.4434, 0.6958)
2287 .. controls (-0.4536, 0.6993) and (-0.4618, 0.7007) .. (-0.4679, 0.7004)
2288 --cycle
2289 ( 0.5653, 0.7002)
2290 .. controls ( 0.5661, 0.6911) and ( 0.5658, 0.6799) .. ( 0.5704, 0.6702)
2291 .. controls ( 0.5856, 0.6381) and ( 0.6183, 0.6504) .. ( 0.6246, 0.6688)
2292 -- ( 0.6102, 0.6944)
2293 .. controls ( 0.6066, 0.6965) and ( 0.6036, 0.6986) .. ( 0.5984, 0.7002)
2294 .. controls ( 0.5884, 0.7016) and ( 0.5757, 0.7012) .. ( 0.5653, 0.7002)
2295 --cycle

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2296 ( 0.1310, 0.6925)
2297 .. controls ( 0.1003, 0.6568) and ( 0.1392, 0.6414) .. ( 0.1582, 0.6530)
2298 .. controls ( 0.1772, 0.6646) and ( 0.1778, 0.7030) .. ( 0.1310, 0.6925)
2299 --cycle
2300 (-0.3425, 0.6846)
2301 .. controls (-0.3485, 0.6703) and (-0.3540, 0.6584) .. (-0.3564, 0.6427)
2302 .. controls (-0.3714, 0.5438) and (-0.2673, 0.5839) .. (-0.3103, 0.6583)
2303 .. controls (-0.3198, 0.6747) and (-0.3272, 0.6765) .. (-0.3425, 0.6846)
2304 --cycle
2305 (-0.1828, 0.6763)
2306 .. controls (-0.2468, 0.6411) and (-0.2396, 0.5532) .. (-0.1659, 0.5602)
2307 .. controls (-0.1273, 0.5639) and (-0.0946, 0.6066) .. (-0.1492, 0.6258)
2308 -- (-0.1828, 0.6006)
2309 --cycle
2310 ( 0.3972, 0.6763)
2311 -- ( 0.4287, 0.6131)
2312 .. controls ( 0.4206, 0.6173) and ( 0.4113, 0.6217) .. ( 0.4056, 0.6258)
2313 -- ( 0.3719, 0.6006)
2314 .. controls ( 0.3635, 0.6415) and ( 0.3652, 0.6489) .. ( 0.3972, 0.6763)
2315 --cycle
2316 ( 0.5737, 0.6319)
2317 -- ( 0.5485, 0.6258)
2318 .. controls ( 0.5516, 0.6201) and ( 0.5520, 0.6138) .. ( 0.5614, 0.6043)
2319 .. controls ( 0.6074, 0.5569) and ( 0.6453, 0.6371) .. ( 0.5737, 0.6319)
2320 --cycle
2321 (-0.6211, 0.6305)
2322 -- (-0.6755, 0.5370)
2323 -- (-0.6787, 0.5166)
2324 .. controls (-0.6809, 0.5180) and (-0.6832, 0.5188) .. (-0.6854, 0.5203)
2325 -- (-0.7191, 0.4623)
2326 -- (-0.7291, 0.4073)
2327 .. controls (-0.7367, 0.4126) and (-0.7403, 0.4136) .. (-0.7456, 0.4169)
2328 -- (-0.7651, 0.3834)
2329 .. controls (-0.7455, 0.3798) and (-0.7239, 0.3727) .. (-0.7052, 0.3845)
2330 .. controls (-0.6739, 0.3993) and (-0.6763, 0.4662) .. (-0.6703, 0.4998)
2331 .. controls (-0.6178, 0.4665) and (-0.6044, 0.4826) .. (-0.5611, 0.5204)
2332 .. controls (-0.5440, 0.5353) and (-0.5267, 0.5491) .. (-0.5345, 0.5748)
2333 .. controls (-0.5466, 0.6149) and (-0.5841, 0.6243) .. (-0.6211, 0.6305)
2334 --cycle
2335 (-0.6450, 0.5670)
2336 -- (-0.5862, 0.5670)
2337 .. controls (-0.6029, 0.5328) and (-0.6086, 0.5274) .. (-0.6450, 0.5166)
2338 --cycle
2339 ( 0.5940, 0.5141)
2340 .. controls ( 0.5876, 0.5135) and ( 0.5814, 0.5119) .. ( 0.5737, 0.5105)
2341 .. controls ( 0.5529, 0.5005) and ( 0.5203, 0.4878) .. ( 0.5123, 0.4644)
2342 .. controls ( 0.5022, 0.4349) and ( 0.5312, 0.3332) .. ( 0.5982, 0.3551)
2343 .. controls ( 0.6173, 0.3612) and ( 0.6614, 0.3963) .. ( 0.6651, 0.4168)
2344 .. controls ( 0.6700, 0.4432) and ( 0.6406, 0.5019) .. ( 0.6149, 0.5105)
2345 .. controls ( 0.6066, 0.5139) and ( 0.6003, 0.5146) .. ( 0.5940, 0.5141)
2346 --cycle
2347 ( 0.0525, 0.5036)
2348 .. controls ( 0.0223, 0.5016) and ( 0.0014, 0.4715) .. (-0.0147, 0.4493)

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2349 .. controls (-0.0480, 0.4823) and (-0.1271, 0.5502) .. (-0.1240, 0.4493)
2350 -- (-0.0819, 0.4661)
2351 .. controls (-0.0631, 0.4289) and ( 0.0054, 0.3259) .. ( 0.0443, 0.3176)
2352 .. controls ( 0.1031, 0.3051) and ( 0.1431, 0.3862) .. ( 0.0694, 0.3989)
2353 .. controls ( 0.0551, 0.3118) and ( 0.0044, 0.4056) .. ( 0.0316, 0.4326)
2354 .. controls ( 0.0741, 0.4748) and ( 0.1233, 0.3699) .. ( 0.1388, 0.4261)
2355 .. controls ( 0.1477, 0.4584) and ( 0.0813, 0.5057) .. ( 0.0525, 0.5036)
2356 --cycle
2357 ( 0.6073, 0.4745)
2358 -- ( 0.6242, 0.4241)
2359 -- ( 0.5569, 0.3989)
2360 -- ( 0.5569, 0.4493)
2361 --cycle
2362 (-0.3498, 0.4626)
2363 .. controls (-0.3744, 0.4586) and (-0.3998, 0.4069) .. (-0.3941, 0.3847)
2364 .. controls (-0.3893, 0.3661) and (-0.3650, 0.3651) .. (-0.3503, 0.3798)
2365 -- (-0.3257, 0.4157)
2366 .. controls (-0.3295, 0.3698) and (-0.2940, 0.3485) .. (-0.2697, 0.3592)
2367 .. controls (-0.2492, 0.3684) and (-0.2611, 0.3898) .. (-0.2697, 0.4024)
2368 .. controls (-0.2865, 0.4277) and (-0.3149, 0.4682) .. (-0.3498, 0.4626)
2369 --cycle
2370 ( 0.7488, 0.4472)
2371 .. controls ( 0.7446, 0.4429) and ( 0.7413, 0.4378) .. ( 0.7395, 0.4315)
2372 .. controls ( 0.7338, 0.4111) and ( 0.7612, 0.3277) .. ( 0.8087, 0.3352)
2373 .. controls ( 0.8094, 0.3354) and ( 0.8102, 0.3361) .. ( 0.8109, 0.3364)
2374 --cycle
2375 (-0.1492, 0.4409)
2376 .. controls (-0.1577, 0.3701) and (-0.1298, 0.3577) .. (-0.0651, 0.3568)
2377 .. controls (-0.0461, 0.3027) and (-0.0025, 0.3462) .. (-0.0567, 0.3652)
2378 -- (-0.0567, 0.3568)
2379 -- (-0.0651, 0.3652)
2380 -- (-0.0567, 0.3652)
2381 -- (-0.0567, 0.3989)
2382 -- (-0.0988, 0.3905)
2383 .. controls (-0.1116, 0.4252) and (-0.1112, 0.4344) .. (-0.1492, 0.4409)
2384 --cycle
2385 ( 0.2869, 0.4351)
2386 .. controls ( 0.2475, 0.4293) and ( 0.2234, 0.3681) .. ( 0.2795, 0.3485)
2387 -- ( 0.3048, 0.3905)
2388 .. controls ( 0.3028, 0.3760) and ( 0.3013, 0.3442) .. ( 0.3278, 0.3583)
2389 .. controls ( 0.3557, 0.3731) and ( 0.3437, 0.4227) .. ( 0.3046, 0.4338)
2390 .. controls ( 0.2985, 0.4356) and ( 0.2925, 0.4359) .. ( 0.2869, 0.4351)
2391 --cycle
2392 (-0.5352, 0.4038)
2393 .. controls (-0.5519, 0.4042) and (-0.5689, 0.3932) .. (-0.5778, 0.3652)
2394 -- (-0.5358, 0.3652)
2395 -- (-0.5442, 0.3149)
2396 -- (-0.6030, 0.3401)
2397 .. controls (-0.6099, 0.3078) and (-0.5933, 0.2580) .. (-0.5523, 0.2636)
2398 .. controls (-0.5251, 0.2673) and (-0.4980, 0.3070) .. (-0.4910, 0.3316)
2399 .. controls (-0.4799, 0.3705) and (-0.5072, 0.4030) .. (-0.5352, 0.4038)
2400 --cycle
2401 ( 0.4056, 0.3989)

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2402 .. controls ( 0.4011, 0.3650) and ( 0.4064, 0.3627) .. ( 0.4392, 0.3568)
2403 .. controls ( 0.4340, 0.3865) and ( 0.4336, 0.3876) .. ( 0.4056, 0.3989)
2404 --cycle
2405 (-0.2248, 0.3737)
2406 -- (-0.2164, 0.3401)
2407 -- (-0.1828, 0.3568)
2408 --cycle
2409 ( 0.4558, 0.3414)
2410 .. controls ( 0.4424, 0.3419) and ( 0.4339, 0.3363) .. ( 0.4224, 0.3316)
2411 -- ( 0.4340, 0.2885)
2412 .. controls ( 0.4635, 0.2154) and ( 0.5405, 0.3381) .. ( 0.4558, 0.3414)
2413 --cycle
2414 (-0.3179, 0.3382)
2415 .. controls (-0.3270, 0.3401) and (-0.3357, 0.3403) .. (-0.3425, 0.3381)
2416 .. controls (-0.3762, 0.3275) and (-0.3957, 0.2970) .. (-0.4013, 0.2644)
2417 -- (-0.3341, 0.2892)
2418 .. controls (-0.3207, 0.2121) and (-0.2456, 0.2402) .. (-0.2545, 0.2892)
2419 .. controls (-0.2586, 0.3110) and (-0.2906, 0.3324) .. (-0.3179, 0.3382)
2420 --cycle
2421 ( 0.3611, 0.3359)
2422 .. controls ( 0.3110, 0.3372) and ( 0.2179, 0.3015) .. ( 0.2626, 0.2392)
2423 -- ( 0.2207, 0.2056)
2424 -- ( 0.2123, 0.2308)
2425 -- ( 0.1955, 0.2308)
2426 .. controls ( 0.1691, 0.1342) and ( 0.2461, 0.1660) .. ( 0.2711, 0.1678)
2427 .. controls ( 0.3105, 0.1704) and ( 0.3525, 0.1635) .. ( 0.3836, 0.2013)
2428 .. controls ( 0.4000, 0.2213) and ( 0.3935, 0.2469) .. ( 0.3552, 0.2434)
2429 .. controls ( 0.3256, 0.2408) and ( 0.3193, 0.2282) .. ( 0.3048, 0.2056)
2430 .. controls ( 0.2927, 0.2510) and ( 0.2970, 0.2476) .. ( 0.3131, 0.2897)
2431 -- ( 0.3552, 0.2728)
2432 -- ( 0.3636, 0.2980)
2433 -- ( 0.3719, 0.2644)
2434 .. controls ( 0.4287, 0.2825) and ( 0.4092, 0.3226) .. ( 0.3795, 0.3331)
2435 .. controls ( 0.3746, 0.3349) and ( 0.3683, 0.3357) .. ( 0.3611, 0.3359)
2436 --cycle
2437 (-0.7326, 0.3304)
2438 .. controls (-0.7558, 0.2996) and (-0.7303, 0.2839) .. (-0.7147, 0.2917)
2439 .. controls (-0.6982, 0.3000) and (-0.6941, 0.3349) .. (-0.7326, 0.3304)
2440 --cycle
2441 ( 0.5316, 0.3064)
2442 .. controls ( 0.5417, 0.2779) and ( 0.5439, 0.2772) .. ( 0.5737, 0.2813)
2443 .. controls ( 0.5591, 0.3056) and ( 0.5600, 0.3049) .. ( 0.5316, 0.3064)
2444 --cycle
2445 ( 0.7063, 0.2870)
2446 .. controls ( 0.6995, 0.2880) and ( 0.6923, 0.2874) .. ( 0.6840, 0.2844)
2447 .. controls ( 0.6531, 0.2731) and ( 0.6307, 0.2270) .. ( 0.6242, 0.1972)
2448 -- ( 0.6914, 0.2056)
2449 -- ( 0.6914, 0.2475)
2450 -- ( 0.7166, 0.2139)
2451 -- ( 0.7670, 0.2224)
2452 -- ( 0.7670, 0.1887)
2453 -- ( 0.8091, 0.1804)
2454 -- ( 0.7755, 0.1047)

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2455 -- ( 0.8343, 0.1131)
2456 .. controls ( 0.8409, 0.1435) and ( 0.8409, 0.1473) .. ( 0.8679, 0.1636)
2457 .. controls ( 0.8652, 0.1490) and ( 0.8470, 0.0581) .. ( 0.8896, 0.0809)
2458 .. controls ( 0.9211, 0.0965) and ( 0.9103, 0.1720) .. ( 0.8896, 0.1909)
2459 .. controls ( 0.8668, 0.2094) and ( 0.8421, 0.2029) .. ( 0.8174, 0.1972)
2460 .. controls ( 0.8135, 0.2098) and ( 0.8137, 0.2162) .. ( 0.8041, 0.2272)
2461 .. controls ( 0.7922, 0.2408) and ( 0.7748, 0.2458) .. ( 0.7601, 0.2552)
2462 .. controls ( 0.7419, 0.2667) and ( 0.7266, 0.2841) .. ( 0.7063, 0.2870)
2463 --cycle
2464 ( 0.6242, 0.1972)
2465 .. controls ( 0.6061, 0.1985) and ( 0.5845, 0.2023) .. ( 0.5690, 0.1902)
2466 .. controls ( 0.5426, 0.1695) and ( 0.5550, 0.1248) .. ( 0.5909, 0.1110)
2467 .. controls ( 0.6168, 0.1011) and ( 0.6421, 0.1125) .. ( 0.6679, 0.1215)
2468 .. controls ( 0.6663, 0.1076) and ( 0.6658, 0.0850) .. ( 0.6679, 0.0720)
2469 .. controls ( 0.6961,-0.0135) and ( 0.8163, 0.0895) .. ( 0.7250, 0.1215)
2470 -- ( 0.6998, 0.0795)
2471 -- ( 0.7166, 0.1299)
2472 -- ( 0.6830, 0.1804)
2473 -- ( 0.6578, 0.1636)
2474 --cycle
2475 ( 0.0950, 0.2671)
2476 .. controls ( 0.0367, 0.2427) and ( 0.0851, 0.1985) .. ( 0.1112, 0.2040)
2477 .. controls ( 0.1427, 0.2110) and ( 0.1597, 0.2672) .. ( 0.0950, 0.2671)
2478 --cycle
2479 (-0.0988, 0.2609)
2480 .. controls (-0.1426, 0.2672) and (-0.2761, 0.1879) .. (-0.1828, 0.1551)
2481 -- (-0.1743, 0.1972)
2482 -- (-0.1240, 0.1804)
2483 -- (-0.0904, 0.2308)
2484 -- (-0.1071, 0.1720)
2485 .. controls (-0.0221, 0.1543) and (-0.0435, 0.2528) .. (-0.0988, 0.2609)
2486 --cycle
2487 (-0.8142, 0.2071)
2488 .. controls (-0.8258, 0.2070) and (-0.8375, 0.2012) .. (-0.8466, 0.1869)
2489 .. controls (-0.8534, 0.1760) and (-0.8533, 0.1669) .. (-0.8551, 0.1551)
2490 -- (-0.7963, 0.1636)
2491 -- (-0.8132, 0.1215)
2492 .. controls (-0.8020, 0.1234) and (-0.7923, 0.1232) .. (-0.7821, 0.1301)
2493 .. controls (-0.7447, 0.1557) and (-0.7793, 0.2072) .. (-0.8142, 0.2071)
2494 --cycle
2495 (-0.2584, 0.2056)
2496 -- (-0.2584, 0.1636)
2497 .. controls (-0.2445, 0.1848) and (-0.2445, 0.1843) .. (-0.2584, 0.2056)
2498 --cycle
2499 (-0.7132, 0.1953)
2500 .. controls (-0.7373, 0.1910) and (-0.7568, 0.1647) .. (-0.7459, 0.1215)
2501 -- (-0.6955, 0.1551)
2502 .. controls (-0.7015, 0.1043) and (-0.7057, 0.0835) .. (-0.6450, 0.0963)
2503 -- (-0.6535, 0.0711)
2504 .. controls (-0.5898, 0.0580) and (-0.5907, 0.1071) .. (-0.6081, 0.1249)
2505 .. controls (-0.6203, 0.1374) and (-0.6375, 0.1370) .. (-0.6535, 0.1383)
2506 .. controls (-0.6607, 0.1823) and (-0.6892, 0.1997) .. (-0.7132, 0.1953)
2507 --cycle

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2508 (-0.4097, 0.1720)
2509 -- (-0.3845, 0.1215)
2510 -- (-0.4097, 0.0963)
2511 -- (-0.4349, 0.1047)
2512 .. controls (-0.4598,-0.0134) and (-0.2772, 0.1076) .. (-0.3690, 0.1621)
2513 .. controls (-0.3821, 0.1699) and (-0.3951, 0.1703) .. (-0.4097, 0.1720)
2514 --cycle
2515 ( 0.4374, 0.1711)
2516 .. controls ( 0.4200, 0.1682) and ( 0.4016, 0.1543) .. ( 0.3888, 0.1299)
2517 -- ( 0.4477, 0.1299)
2518 .. controls ( 0.4703, 0.1056) and ( 0.4891, 0.1252) .. ( 0.4798, 0.1463)
2519 .. controls ( 0.4711, 0.1661) and ( 0.4548, 0.1741) .. ( 0.4374, 0.1711)
2520 --cycle
2521 (-0.4594, 0.1707)
2522 .. controls (-0.4648, 0.1719) and (-0.4705, 0.1718) .. (-0.4752, 0.1698)
2523 .. controls (-0.4878, 0.1646) and (-0.4954, 0.1508) .. (-0.4982, 0.1382)
2524 .. controls (-0.5096, 0.0875) and (-0.4448, 0.0609) .. (-0.4602, 0.1299)
2525 .. controls (-0.4304, 0.1504) and (-0.4433, 0.1669) .. (-0.4594, 0.1707)
2526 --cycle
2527 (-0.0230, 0.1592)
2528 .. controls (-0.0727, 0.1609) and (-0.0799, 0.1002) .. (-0.1492, 0.0795)
2529 -- (-0.1576, 0.0374)
2530 .. controls (-0.1940, 0.0779) and (-0.1965, 0.0894) .. (-0.2500, 0.0711)
2531 -- (-0.2584, 0.0795)
2532 -- (-0.2332, 0.1383)
2533 .. controls (-0.2779, 0.1347) and (-0.3158, 0.0997) .. (-0.2855, 0.0563)
2534 .. controls (-0.2695, 0.0332) and (-0.2481, 0.0337) .. (-0.2256, 0.0248)
2535 .. controls (-0.1803, 0.0069) and (-0.1541,-0.0311) .. (-0.1155, 0.0290)
2536 .. controls (-0.0607, 0.0067) and (-0.0553,-0.0150) .. (-0.0307,-0.0232)
2537 .. controls ( 0.0157,-0.0389) and ( 0.0524, 0.0035) .. ( 0.0442, 0.0543)
2538 .. controls ( 0.0843, 0.0613) and ( 0.1010, 0.0937) .. ( 0.0727, 0.1263)
2539 .. controls ( 0.0598, 0.1414) and (-0.0030, 0.1586) .. (-0.0230, 0.1592)
2540 --cycle
2541 (-0.0230, 0.1215)
2542 -- ( 0.0442, 0.1131)
2543 .. controls ( 0.0289, 0.0705) and ( 0.0228, 0.0356) .. (-0.0230, 0.0207)
2544 .. controls (-0.0339, 0.0543) and (-0.0383, 0.0572) .. (-0.0735, 0.0543)
2545 -- (-0.0819, 0.0627)
2546 --cycle
2547 (-0.8973, 0.1131)
2548 .. controls (-0.9051, 0.0492) and (-0.8679, 0.0676) .. (-0.8321, 0.0457)
2549 .. controls (-0.7996, 0.0258) and (-0.7906,-0.0272) .. (-0.7039,-0.0046)
2550 .. controls (-0.6977,-0.0167) and (-0.6964,-0.0237) .. (-0.6846,-0.0331)
2551 .. controls (-0.6146,-0.0891) and (-0.5741, 0.0485) .. (-0.6619, 0.0396)
2552 .. controls (-0.6723, 0.0384) and (-0.6856, 0.0326) .. (-0.6955, 0.0290)
2553 .. controls (-0.7145, 0.0487) and (-0.7442, 0.0435) .. (-0.7712, 0.0459)
2554 -- (-0.7771, 0.0746)
2555 --cycle
2556 ( 0.7839, 0.0627)
2557 .. controls ( 0.7798, 0.0513) and ( 0.7748, 0.0421) .. ( 0.7752, 0.0292)
2558 .. controls ( 0.7776,-0.0409) and ( 0.8888, 0.0073) .. ( 0.8169, 0.0493)
2559 .. controls ( 0.8064, 0.0555) and ( 0.7952, 0.0587) .. ( 0.7839, 0.0627)
2560 --cycle

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2561 ( 0.6399, 0.0543)
2562 .. controls ( 0.6341, 0.0555) and ( 0.6275, 0.0553) .. ( 0.6207, 0.0536)
2563 .. controls ( 0.5899, 0.0092) and ( 0.6489,-0.0145) .. ( 0.6606, 0.0149)
2564 .. controls ( 0.6690, 0.0359) and ( 0.6576, 0.0510) .. ( 0.6399, 0.0543)
2565 --cycle
2566 ( 0.2228, 0.0528)
2567 .. controls ( 0.1887, 0.0319) and ( 0.2131,-0.0076) .. ( 0.2361,-0.0078)
2568 .. controls ( 0.2619,-0.0080) and ( 0.2726, 0.0432) .. ( 0.2228, 0.0528)
2569 --cycle
2570 ( 0.4509, 0.0479)
2571 .. controls ( 0.4394, 0.0460) and ( 0.4290, 0.0332) .. ( 0.4224, 0.0038)
2572 .. controls ( 0.3826, 0.0304) and ( 0.3797, 0.0371) .. ( 0.3300, 0.0301)
2573 .. controls ( 0.3175, 0.0283) and ( 0.3021, 0.0266) .. ( 0.2915, 0.0192)
2574 .. controls ( 0.2691, 0.0036) and ( 0.2444,-0.0690) .. ( 0.3552,-0.0718)
2575 -- ( 0.3131,-0.0046)
2576 .. controls ( 0.3436,-0.0165) and ( 0.3418,-0.0171) .. ( 0.3719,-0.0046)
2577 .. controls ( 0.3961,-0.0513) and ( 0.4113,-0.0431) .. ( 0.4560,-0.0298)
2578 -- ( 0.4560, 0.0038)
2579 -- ( 0.4812,-0.0466)
2580 .. controls ( 0.4281,-0.0863) and ( 0.4953,-0.1091) .. ( 0.5137,-0.0706)
2581 .. controls ( 0.5296,-0.0376) and ( 0.4853, 0.0538) .. ( 0.4509, 0.0479)
2582 --cycle
2583 (-0.9381, 0.0440)
2584 .. controls (-0.9573, 0.0465) and (-0.9752, 0.0361) .. (-0.9800, 0.0016)
2585 -- (-0.9774,-0.0032)
2586 -- (-0.9308, 0.0123)
2587 .. controls (-0.9260, 0.0012) and (-0.9218,-0.0135) .. (-0.9103,-0.0200)
2588 .. controls (-0.8939,-0.0290) and (-0.8783,-0.0112) .. (-0.8895, 0.0115)
2589 .. controls (-0.8962, 0.0252) and (-0.9176, 0.0414) .. (-0.9381, 0.0440)
2590 --cycle
2591 ( 0.9435, 0.0207)
2592 -- ( 0.9184, 0.0123)
2593 -- ( 0.9435,-0.0046)
2594 --cycle
2595 ( 0.8999,-0.0129)
2596 .. controls ( 0.9000,-0.0216) and ( 0.8974,-0.0282) .. ( 0.8999,-0.0376)
2597 .. controls ( 0.9043,-0.0955) and ( 0.9800,-0.0453) .. ( 0.9254,-0.0191)
2598 .. controls ( 0.9173,-0.0151) and ( 0.9098,-0.0148) .. ( 0.8999,-0.0129)
2599 --cycle
2600 (-0.5187,-0.0249)
2601 .. controls (-0.5448,-0.0284) and (-0.5586,-0.0592) .. (-0.5611,-0.0886)
2602 -- (-0.5022,-0.0718)
2603 .. controls (-0.5038,-0.1199) and (-0.4832,-0.1244) .. (-0.4434,-0.1054)
2604 -- (-0.4349,-0.1139)
2605 -- (-0.5106,-0.1811)
2606 -- (-0.5442,-0.1475)
2607 -- (-0.5274,-0.1139)
2608 .. controls (-0.5482,-0.1103) and (-0.5717,-0.1068) .. (-0.5806,-0.1326)
2609 .. controls (-0.5943,-0.1714) and (-0.5235,-0.2179) .. (-0.5014,-0.2194)
2610 .. controls (-0.4612,-0.2223) and (-0.4187,-0.1658) .. (-0.4108,-0.1306)
2611 .. controls (-0.4075,-0.1185) and (-0.4054,-0.1026) .. (-0.4108,-0.0911)
2612 .. controls (-0.4193,-0.0753) and (-0.4422,-0.0688) .. (-0.4571,-0.0576)
2613 -- (-0.4884,-0.0315)

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2614 .. controls (-0.4999,-0.0256) and (-0.5100,-0.0237) .. (-0.5187,-0.0249)
2615 --cycle
2616 ( 0.2098,-0.0382)
2617 .. controls ( 0.1959,-0.0434) and ( 0.1851,-0.0663) .. ( 0.1925,-0.0882)
2618 .. controls ( 0.2035,-0.1206) and ( 0.2830,-0.1639) .. ( 0.2964,-0.0882)
2619 .. controls ( 0.2773,-0.0896) and ( 0.2586,-0.0934) .. ( 0.2447,-0.0768)
2620 .. controls ( 0.2363,-0.0666) and ( 0.2352,-0.0463) .. ( 0.2242,-0.0396)
2621 .. controls ( 0.2194,-0.0367) and ( 0.2145,-0.0365) .. ( 0.2098,-0.0382)
2622 --cycle
2623 (-0.2960,-0.0452)
2624 .. controls (-0.3231,-0.0465) and (-0.3530,-0.0602) .. (-0.3592,-0.0683)
2625 .. controls (-0.3758,-0.0903) and (-0.3560,-0.1221) .. (-0.3845,-0.1979)
2626 -- (-0.4013,-0.1727)
2627 -- (-0.4182,-0.1727)
2628 .. controls (-0.4336,-0.2291) and (-0.4124,-0.2782) .. (-0.3803,-0.2577)
2629 .. controls (-0.3601,-0.2446) and (-0.3538,-0.2099) .. (-0.3392,-0.1970)
2630 .. controls (-0.3137,-0.1743) and (-0.2596,-0.2064) .. (-0.2752,-0.1306)
2631 -- (-0.3257,-0.1558)
2632 -- (-0.3341,-0.1475)
2633 -- (-0.3341,-0.0970)
2634 -- (-0.2500,-0.0970)
2635 .. controls (-0.2447,-0.0551) and (-0.2689,-0.0439) .. (-0.2960,-0.0452)
2636 --cycle
2637 ( 0.6563,-0.0662)
2638 .. controls ( 0.6458,-0.0662) and ( 0.6374,-0.0668) .. ( 0.6332,-0.0685)
2639 .. controls ( 0.5970,-0.0835) and ( 0.6057,-0.1189) .. ( 0.6332,-0.1391)
2640 -- ( 0.6493,-0.0970)
2641 -- ( 0.6662,-0.0970)
2642 .. controls ( 0.6850,-0.1248) and ( 0.6940,-0.1204) .. ( 0.7250,-0.1139)
2643 -- ( 0.7081,-0.1475)
2644 .. controls ( 0.7837,-0.1829) and ( 0.7876,-0.1033) .. ( 0.7490,-0.0804)
2645 .. controls ( 0.7374,-0.0735) and ( 0.6877,-0.0664) .. ( 0.6563,-0.0662)
2646 --cycle
2647 ( 0.7081,-0.1475)
2648 .. controls ( 0.6742,-0.1429) and ( 0.6720,-0.1483) .. ( 0.6662,-0.1811)
2649 .. controls ( 0.6162,-0.1289) and ( 0.6115,-0.1833) .. ( 0.6244,-0.2044)
2650 .. controls ( 0.6426,-0.2346) and ( 0.6823,-0.2320) .. ( 0.7016,-0.2044)
2651 .. controls ( 0.7147,-0.1858) and ( 0.7107,-0.1681) .. ( 0.7081,-0.1475)
2652 --cycle
2653 ( 0.0544,-0.0769)
2654 .. controls ( 0.0466,-0.0773) and ( 0.0382,-0.0797) .. ( 0.0297,-0.0845)
2655 -- (-0.0147,-0.1139)
2656 .. controls (-0.0057,-0.1396) and (-0.0069,-0.1385) .. ( 0.0189,-0.1475)
2657 .. controls (-0.0074,-0.2147) and ( 0.0346,-0.2081) .. ( 0.0553,-0.1870)
2658 .. controls ( 0.0667,-0.1752) and ( 0.0961,-0.1299) .. ( 0.0958,-0.1139)
2659 .. controls ( 0.0955,-0.0925) and ( 0.0776,-0.0759) .. ( 0.0544,-0.0769)
2660 --cycle
2661 ( 0.3572,-0.0881)
2662 .. controls ( 0.3447,-0.0867) and ( 0.3392,-0.1053) .. ( 0.3450,-0.1208)
2663 .. controls ( 0.3587,-0.1579) and ( 0.4169,-0.1493) .. ( 0.4239,-0.1208)
2664 .. controls ( 0.4287,-0.1010) and ( 0.4113,-0.0745) .. ( 0.3888,-0.0970)
2665 -- ( 0.3719,-0.0970)
2666 .. controls ( 0.3663,-0.0912) and ( 0.3613,-0.0886) .. ( 0.3572,-0.0881)

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2667 --cycle
2668 ( 0.7250,-0.1054)
2669 -- ( 0.7333,-0.1054)
2670 -- ( 0.7333,-0.1139)
2671 --cycle
2672 (-0.7357,-0.1221)
2673 .. controls (-0.7405,-0.1203) and (-0.7472,-0.1201) .. (-0.7562,-0.1227)
2674 .. controls (-0.7721,-0.1527) and (-0.7463,-0.1606) .. (-0.7339,-0.1532)
2675 .. controls (-0.7244,-0.1475) and (-0.7214,-0.1275) .. (-0.7357,-0.1221)
2676 --cycle
2677 (-0.8606,-0.1378)
2678 .. controls (-0.8718,-0.1386) and (-0.8832,-0.1446) .. (-0.8941,-0.1518)
2679 -- (-0.8728,-0.1897)
2680 -- (-0.8468,-0.1811)
2681 -- (-0.8613,-0.2102)
2682 -- (-0.8317,-0.2631)
2683 .. controls (-0.7953,-0.2270) and (-0.7967,-0.1536) .. (-0.8471,-0.1391)
2684 .. controls (-0.8514,-0.1378) and (-0.8560,-0.1374) .. (-0.8606,-0.1378)
2685 --cycle
2686 ( 0.9187,-0.1555)
2687 .. controls ( 0.9083,-0.1585) and ( 0.8971,-0.1627) .. ( 0.8847,-0.1675)
2688 .. controls ( 0.8669,-0.1743) and ( 0.8469,-0.1785) .. ( 0.8399,-0.1989)
2689 .. controls ( 0.8307,-0.2247) and ( 0.8481,-0.2329) .. ( 0.8679,-0.2399)
2690 -- ( 0.8847,-0.2063)
2691 .. controls ( 0.8863,-0.2068) and ( 0.8871,-0.2069) .. ( 0.8886,-0.2074)
2692 --cycle
2693 ( 0.8679,-0.2399)
2694 .. controls ( 0.8663,-0.2432) and ( 0.8651,-0.2468) .. ( 0.8637,-0.2502)
2695 -- ( 0.8693,-0.2405)
2696 .. controls ( 0.8687,-0.2402) and ( 0.8685,-0.2401) .. ( 0.8679,-0.2399)
2697 --cycle
2698 ( 0.4392,-0.1558)
2699 -- ( 0.4332,-0.1807)
2700 .. controls ( 0.4281,-0.2431) and ( 0.5089,-0.2120) .. ( 0.4618,-0.1688)
2701 .. controls ( 0.4519,-0.1597) and ( 0.4457,-0.1593) .. ( 0.4392,-0.1558)
2702 --cycle
2703 (-0.6846,-0.1952)
2704 .. controls (-0.6966,-0.1951) and (-0.7082,-0.2013) .. (-0.7157,-0.2171)
2705 .. controls (-0.7203,-0.2268) and (-0.7199,-0.2378) .. (-0.7207,-0.2483)
2706 -- (-0.6787,-0.2399)
2707 -- (-0.6703,-0.2735)
2708 .. controls (-0.6096,-0.2523) and (-0.6488,-0.1955) .. (-0.6846,-0.1952)
2709 --cycle
2710 (-0.1120,-0.2035)
2711 .. controls (-0.1188,-0.2048) and (-0.1255,-0.2071) .. (-0.1323,-0.2089)
2712 .. controls (-0.1785,-0.2217) and (-0.2021,-0.2285) .. (-0.1912,-0.2819)
2713 -- (-0.0988,-0.2483)
2714 -- (-0.0651,-0.2740)
2715 .. controls (-0.0333,-0.3228) and (-0.0165,-0.2917) .. (-0.0209,-0.2740)
2716 .. controls (-0.0243,-0.2616) and (-0.0384,-0.2481) .. (-0.0474,-0.2386)
2717 .. controls (-0.0590,-0.2264) and (-0.0744,-0.2085) .. (-0.0911,-0.2040)
2718 .. controls (-0.0982,-0.2021) and (-0.1052,-0.2023) .. (-0.1120,-0.2035)
2719 --cycle

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2720 ( 0.1647,-0.2053)
2721 .. controls ( 0.1471,-0.2058) and ( 0.1297,-0.2092) .. ( 0.1164,-0.2148)
2722 .. controls ( 0.0833,-0.2632) and ( 0.1207,-0.3872) .. ( 0.1933,-0.3346)
2723 .. controls ( 0.2031,-0.3275) and ( 0.2109,-0.3165) .. ( 0.2178,-0.3068)
2724 .. controls ( 0.2722,-0.2297) and ( 0.2177,-0.2039) .. ( 0.1647,-0.2053)
2725 --cycle
2726 ( 0.3262,-0.2328)
2727 .. controls ( 0.3073,-0.2617) and ( 0.3314,-0.2707) .. ( 0.3420,-0.2638)
2728 .. controls ( 0.3522,-0.2572) and ( 0.3585,-0.2285) .. ( 0.3262,-0.2328)
2729 --cycle
2730 ( 0.1534,-0.2399)
2731 -- ( 0.2039,-0.2483)
2732 -- ( 0.1534,-0.2987)
2733 --cycle
2734 ( 0.5217,-0.2636)
2735 .. controls ( 0.5071,-0.2632) and ( 0.4918,-0.2708) .. ( 0.4798,-0.2909)
2736 .. controls ( 0.4713,-0.3051) and ( 0.4736,-0.3094) .. ( 0.4728,-0.3240)
2737 -- ( 0.4812,-0.3240)
2738 -- ( 0.4812,-0.3324)
2739 -- ( 0.5232,-0.2987)
2740 -- ( 0.5232,-0.3492)
2741 .. controls ( 0.6028,-0.3358) and ( 0.5655,-0.2645) .. ( 0.5217,-0.2636)
2742 --cycle
2743 ( 0.4812,-0.3324)
2744 -- ( 0.4728,-0.3240)
2745 .. controls ( 0.4525,-0.3209) and ( 0.4056,-0.3074) .. ( 0.3892,-0.3106)
2746 .. controls ( 0.3596,-0.3163) and ( 0.3503,-0.3437) .. ( 0.3892,-0.3660)
2747 -- ( 0.3972,-0.3407)
2748 .. controls ( 0.4281,-0.3611) and ( 0.4279,-0.3612) .. ( 0.4644,-0.3576)
2749 -- ( 0.4560,-0.4080)
2750 .. controls ( 0.5104,-0.3986) and ( 0.5053,-0.3736) .. ( 0.4812,-0.3324)
2751 --cycle
2752 ( 0.7282,-0.2775)
2753 .. controls ( 0.7176,-0.2768) and ( 0.7066,-0.2782) .. ( 0.6965,-0.2822)
2754 .. controls ( 0.6458,-0.3532) and ( 0.7574,-0.3899) .. ( 0.7782,-0.3306)
2755 .. controls ( 0.7887,-0.3013) and ( 0.7602,-0.2797) .. ( 0.7282,-0.2775)
2756 --cycle
2757 (-0.2465,-0.2903)
2758 .. controls (-0.2987,-0.3042) and (-0.2344,-0.4071) .. (-0.2306,-0.4102)
2759 .. controls (-0.1938,-0.4396) and (-0.1663,-0.4010) .. (-0.1299,-0.4027)
2760 .. controls (-0.1140,-0.4034) and (-0.0666,-0.4182) .. (-0.0557,-0.3820)
2761 .. controls (-0.0504,-0.3644) and (-0.0676,-0.3334) .. (-0.0988,-0.3744)
2762 -- (-0.1181,-0.3407)
2763 -- (-0.1308,-0.3168)
2764 .. controls (-0.1675,-0.2582) and (-0.1759,-0.3435) .. (-0.1781,-0.3492)
2765 .. controls (-0.1841,-0.3653) and (-0.1898,-0.3700) .. (-0.1996,-0.3828)
2766 -- (-0.2164,-0.2903)
2767 .. controls (-0.2291,-0.2881) and (-0.2389,-0.2883) .. (-0.2465,-0.2903)
2768 --cycle
2769 (-0.5947,-0.3156)
2770 -- (-0.6030,-0.3407)
2771 -- (-0.5778,-0.3240)
2772 --cycle

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2773 (-0.0014,-0.3194)
2774 .. controls (-0.0278,-0.3131) and (-0.0544,-0.3497) .. (-0.0058,-0.3694)
2775 .. controls ( 0.0049,-0.3738) and ( 0.0162,-0.3735) .. ( 0.0273,-0.3744)
2776 .. controls ( 0.0265,-0.3636) and ( 0.0269,-0.3522) .. ( 0.0223,-0.3420)
2777 .. controls ( 0.0163,-0.3283) and ( 0.0074,-0.3214) .. (-0.0014,-0.3194)
2778 --cycle
2779 (-0.6508,-0.3284)
2780 .. controls (-0.6656,-0.3290) and (-0.6816,-0.3373) .. (-0.6955,-0.3576)
2781 .. controls (-0.7159,-0.3441) and (-0.7363,-0.3292) .. (-0.7624,-0.3378)
2782 .. controls (-0.7705,-0.3405) and (-0.7771,-0.3450) .. (-0.7829,-0.3501)
2783 -- (-0.7599,-0.3912)
2784 -- (-0.7543,-0.3744)
2785 -- (-0.6619,-0.4164)
2786 -- (-0.6619,-0.3660)
2787 -- (-0.6367,-0.4164)
2788 .. controls (-0.5723,-0.3945) and (-0.6064,-0.3266) .. (-0.6508,-0.3284)
2789 --cycle
2790 (-0.5287,-0.3512)
2791 .. controls (-0.5489,-0.3498) and (-0.5690,-0.3591) .. (-0.5764,-0.3751)
2792 .. controls (-0.5966,-0.4192) and (-0.5398,-0.3912) .. (-0.5274,-0.3828)
2793 -- (-0.5190,-0.4500)
2794 -- (-0.5358,-0.4333)
2795 -- (-0.5358,-0.4248)
2796 -- (-0.5611,-0.4248)
2797 .. controls (-0.5664,-0.4641) and (-0.5605,-0.4735) .. (-0.5442,-0.5088)
2798 -- (-0.5274,-0.5088)
2799 .. controls (-0.4972,-0.4701) and (-0.4647,-0.4466) .. (-0.4806,-0.3915)
2800 .. controls (-0.4882,-0.3649) and (-0.5085,-0.3527) .. (-0.5287,-0.3512)
2801 --cycle
2802 ( 0.5485,-0.3594)
2803 .. controls ( 0.5504,-0.3686) and ( 0.5513,-0.3797) .. ( 0.5560,-0.3899)
2804 .. controls ( 0.5831,-0.4490) and ( 0.6446,-0.3809) .. ( 0.5811,-0.3594)
2805 .. controls ( 0.5706,-0.3579) and ( 0.5594,-0.3583) .. ( 0.5485,-0.3594)
2806 --cycle
2807 ( 0.3311,-0.3646)
2808 .. controls ( 0.3201,-0.3659) and ( 0.3103,-0.3791) .. ( 0.3084,-0.3917)
2809 .. controls ( 0.3035,-0.4255) and ( 0.3481,-0.5315) .. ( 0.4140,-0.4669)
2810 .. controls ( 0.4439,-0.4932) and ( 0.4962,-0.5278) .. ( 0.5388,-0.5107)
2811 .. controls ( 0.5684,-0.4989) and ( 0.5806,-0.4516) .. ( 0.5232,-0.4333)
2812 -- ( 0.5232,-0.4669)
2813 .. controls ( 0.4932,-0.4550) and ( 0.4949,-0.4563) .. ( 0.4644,-0.4669)
2814 -- ( 0.4560,-0.4248)
2815 -- ( 0.4224,-0.4417)
2816 -- ( 0.3888,-0.4080)
2817 -- ( 0.3617,-0.4500)
2818 -- ( 0.3617,-0.4080)
2819 .. controls ( 0.3546,-0.3735) and ( 0.3422,-0.3632) .. ( 0.3311,-0.3646)
2820 --cycle
2821 ( 0.0862,-0.3828)
2822 .. controls ( 0.0086,-0.4104) and ( 0.1258,-0.4856) .. ( 0.1453,-0.4236)
2823 .. controls ( 0.1495,-0.4116) and ( 0.1465,-0.4028) .. ( 0.1453,-0.3912)
2824 -- ( 0.0946,-0.4080)
2825 --cycle

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2826 (-0.3761,-0.4056)
2827 .. controls (-0.4460,-0.4310) and (-0.4022,-0.4833) .. (-0.3686,-0.4756)
2828 .. controls (-0.3385,-0.4686) and (-0.3150,-0.4102) .. (-0.3761,-0.4056)
2829 --cycle
2830 (-0.1407,-0.4164)
2831 .. controls (-0.1510,-0.4360) and (-0.1606,-0.4518) .. (-0.1524,-0.4748)
2832 .. controls (-0.1401,-0.5093) and (-0.0958,-0.5218) .. (-0.0687,-0.4961)
2833 .. controls (-0.0363,-0.4652) and (-0.0685,-0.4086) .. (-0.0988,-0.4753)
2834 --cycle
2835 (-0.7345,-0.4223)
2836 .. controls (-0.7375,-0.4223) and (-0.7393,-0.4233) .. (-0.7417,-0.4237)
2837 -- (-0.7259,-0.4519)
2838 -- (-0.7123,-0.4248)
2839 .. controls (-0.7212,-0.4230) and (-0.7284,-0.4222) .. (-0.7345,-0.4223)
2840 --cycle
2841 (-0.6450,-0.4333)
2842 -- (-0.6283,-0.4753)
2843 -- (-0.6959,-0.5053)
2844 -- (-0.6728,-0.5467)
2845 .. controls (-0.6597,-0.5415) and (-0.6464,-0.5310) .. (-0.6353,-0.5238)
2846 .. controls (-0.6229,-0.5161) and (-0.6029,-0.5082) .. (-0.5949,-0.4962)
2847 .. controls (-0.5673,-0.4552) and (-0.6118,-0.4359) .. (-0.6450,-0.4333)
2848 --cycle
2849 ( 0.7515,-0.4421)
2850 .. controls ( 0.7404,-0.4518) and ( 0.7330,-0.4660) .. ( 0.7289,-0.4814)
2851 -- ( 0.7518,-0.4421)
2852 .. controls ( 0.7518,-0.4422) and ( 0.7516,-0.4421) .. ( 0.7515,-0.4421)
2853 --cycle
2854 (-0.7203,-0.4618)
2855 -- (-0.7004,-0.4973)
2856 .. controls (-0.6944,-0.4774) and (-0.6993,-0.4695) .. (-0.7203,-0.4618)
2857 --cycle
2858 ( 0.1694,-0.4873)
2859 .. controls ( 0.1182,-0.4851) and ( 0.0606,-0.5165) .. ( 0.1114,-0.5509)
2860 .. controls ( 0.1043,-0.5681) and ( 0.0968,-0.5809) .. ( 0.1030,-0.6004)
2861 .. controls ( 0.1160,-0.6424) and ( 0.2092,-0.6560) .. ( 0.1955,-0.5761)
2862 -- ( 0.1450,-0.6013)
2863 -- ( 0.1199,-0.5425)
2864 -- ( 0.1282,-0.5341)
2865 .. controls ( 0.1602,-0.5459) and ( 0.1584,-0.5438) .. ( 0.1871,-0.5257)
2866 .. controls ( 0.1977,-0.5856) and ( 0.2311,-0.5564) .. ( 0.2301,-0.5337)
2867 .. controls ( 0.2287,-0.5019) and ( 0.2002,-0.4885) .. ( 0.1694,-0.4873)
2868 --cycle
2869 ( 0.3143,-0.5168)
2870 .. controls ( 0.2653,-0.5233) and ( 0.3123,-0.5809) .. ( 0.3334,-0.5398)
2871 .. controls ( 0.3375,-0.5319) and ( 0.3370,-0.5251) .. ( 0.3384,-0.5168)
2872 --cycle
2873 ( 0.5821,-0.5172)
2874 -- ( 0.5905,-0.5425)
2875 .. controls ( 0.5223,-0.5546) and ( 0.5461,-0.6299) .. ( 0.5965,-0.6187)
2876 .. controls ( 0.6116,-0.6153) and ( 0.6642,-0.5952) .. ( 0.6693,-0.5808)
2877 .. controls ( 0.6859,-0.5354) and ( 0.6147,-0.5138) .. ( 0.5821,-0.5172)
2878 --cycle

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2879 (-0.2667,-0.5315)
2880 .. controls (-0.3091,-0.5364) and (-0.3818,-0.5868) .. (-0.3173,-0.6098)
2881 .. controls (-0.3409,-0.7049) and (-0.2257,-0.7182) .. (-0.2332,-0.6265)
2882 -- (-0.2752,-0.6434)
2883 -- (-0.3173,-0.6013)
2884 .. controls (-0.2964,-0.5962) and (-0.2716,-0.5851) .. (-0.2511,-0.5945)
2885 .. controls (-0.2356,-0.6015) and (-0.2239,-0.6203) .. (-0.2131,-0.6252)
2886 .. controls (-0.1929,-0.6345) and (-0.1822,-0.6134) .. (-0.1883,-0.5942)
2887 .. controls (-0.1944,-0.5749) and (-0.2315,-0.5384) .. (-0.2508,-0.5323)
2888 .. controls (-0.2552,-0.5310) and (-0.2606,-0.5308) .. (-0.2667,-0.5315)
2889 --cycle
2890 ( 0.5989,-0.5509)
2891 -- ( 0.6073,-0.5509)
2892 -- ( 0.6073,-0.5593)
2893 --cycle
2894 (-0.0485,-0.5624)
2895 .. controls (-0.0662,-0.5623) and (-0.0842,-0.5741) .. (-0.0904,-0.6098)
2896 -- (-0.0483,-0.6013)
2897 .. controls (-0.0229,-0.6296) and ( 0.0007,-0.6067) .. (-0.0083,-0.5860)
2898 .. controls (-0.0134,-0.5744) and (-0.0308,-0.5625) .. (-0.0485,-0.5624)
2899 --cycle
2900 (-0.4918,-0.5707)
2901 .. controls (-0.5107,-0.5708) and (-0.5309,-0.5802) .. (-0.5442,-0.6013)
2902 -- (-0.5778,-0.5846)
2903 -- (-0.5862,-0.6181)
2904 .. controls (-0.5249,-0.6353) and (-0.5439,-0.6523) .. (-0.4854,-0.6098)
2905 -- (-0.4937,-0.6770)
2906 -- (-0.5442,-0.6854)
2907 -- (-0.5442,-0.7022)
2908 .. controls (-0.4313,-0.7520) and (-0.4409,-0.6069) .. (-0.4465,-0.5962)
2909 .. controls (-0.4550,-0.5800) and (-0.4728,-0.5707) .. (-0.4918,-0.5707)
2910 --cycle
2911 ( 0.3300,-0.5846)
2912 -- ( 0.3300,-0.6098)
2913 -- ( 0.3552,-0.6098)
2914 -- ( 0.3552,-0.5846)
2915 --cycle
2916 ( 0.3726,-0.6221)
2917 .. controls ( 0.2948,-0.6226) and ( 0.2995,-0.7351) .. ( 0.3726,-0.7632)
2918 .. controls ( 0.4265,-0.7841) and ( 0.4818,-0.7181) .. ( 0.4056,-0.6938)
2919 -- ( 0.3719,-0.7275)
2920 -- ( 0.3719,-0.7027)
2921 .. controls ( 0.3796,-0.6524) and ( 0.4200,-0.6879) .. ( 0.4450,-0.6792)
2922 .. controls ( 0.4638,-0.6728) and ( 0.4659,-0.6470) .. ( 0.4510,-0.6352)
2923 .. controls ( 0.4434,-0.6293) and ( 0.3843,-0.6220) .. ( 0.3726,-0.6221)
2924 --cycle
2925 ( 0.0022,-0.6349)
2926 -- ( 0.0189,-0.6686)
2927 -- ( 0.0189,-0.6349)
2928 --cycle
2929 (-0.1244,-0.6794)
2930 .. controls (-0.1314,-0.6810) and (-0.1382,-0.6846) .. (-0.1441,-0.6904)
2931 .. controls (-0.1605,-0.7066) and (-0.1526,-0.7279) .. (-0.1607,-0.7464)

```

```

2932 -- (-0.1786,-0.7721)
2933 .. controls (-0.1852,-0.7840) and (-0.1929,-0.8079) .. (-0.1728,-0.8122)
2934 .. controls (-0.1636,-0.8142) and (-0.1224,-0.7844) .. (-0.1071,-0.7778)
2935 -- (-0.1155,-0.7106)
2936 -- (-0.0735,-0.7275)
2937 .. controls (-0.0800,-0.6898) and (-0.1033,-0.6748) .. (-0.1244,-0.6794)
2938 --cycle
2939 ( 0.1863,-0.6829)
2940 .. controls ( 0.1792,-0.6828) and ( 0.1712,-0.6837) .. ( 0.1618,-0.6854)
2941 -- ( 0.1618,-0.7022)
2942 -- ( 0.2123,-0.7442)
2943 -- ( 0.1282,-0.7190)
2944 .. controls ( 0.1336,-0.7372) and ( 0.1344,-0.7442) .. ( 0.1476,-0.7594)
2945 .. controls ( 0.1538,-0.7664) and ( 0.1626,-0.7738) .. ( 0.1704,-0.7788)
2946 .. controls ( 0.2127,-0.8054) and ( 0.2462,-0.7806) .. ( 0.2481,-0.7530)
2947 .. controls ( 0.2492,-0.7403) and ( 0.2417,-0.7279) .. ( 0.2353,-0.7175)
2948 .. controls ( 0.2199,-0.6926) and ( 0.2075,-0.6832) .. ( 0.1863,-0.6829)
2949 --cycle
2950 ( 0.5905,-0.6889)
2951 .. controls ( 0.5769,-0.6869) and ( 0.5692,-0.6908) .. ( 0.5569,-0.6938)
2952 -- ( 0.5569,-0.7106)
2953 -- ( 0.5821,-0.7190)
2954 .. controls ( 0.5823,-0.7234) and ( 0.5836,-0.7260) .. ( 0.5844,-0.7296)
2955 -- ( 0.6046,-0.6948)
2956 .. controls ( 0.6001,-0.6927) and ( 0.5958,-0.6898) .. ( 0.5905,-0.6889)
2957 --cycle
2958 (-0.0391,-0.7245)
2959 .. controls (-0.0667,-0.7229) and (-0.0839,-0.7453) .. (-0.0753,-0.7947)
2960 .. controls (-0.0651,-0.8529) and (-0.0367,-0.8483) .. (-0.0106,-0.8698)
2961 -- ( 0.0547,-0.8704)
2962 .. controls ( 0.0548,-0.8616) and ( 0.0567,-0.8516) .. ( 0.0610,-0.8367)
2963 -- ( 0.0189,-0.8367)
2964 .. controls ( 0.0024,-0.8190) and ( 0.0000,-0.8231) .. (-0.0230,-0.8283)
2965 .. controls (-0.0380,-0.7923) and (-0.0454,-0.7840) .. (-0.0399,-0.7442)
2966 -- (-0.0230,-0.7442)
2967 -- (-0.0147,-0.7778)
2968 -- ( 0.0694,-0.7778)
2969 -- ( 0.0525,-0.8199)
2970 -- ( 0.1424,-0.8295)
2971 .. controls ( 0.1612,-0.8227) and ( 0.1619,-0.8006) .. ( 0.1424,-0.7877)
2972 .. controls ( 0.1265,-0.7801) and ( 0.1112,-0.7837) .. ( 0.0946,-0.7877)
2973 .. controls ( 0.0866,-0.7388) and ( 0.0598,-0.7228) .. ( 0.0189,-0.7526)
2974 .. controls (-0.0021,-0.7351) and (-0.0224,-0.7255) .. (-0.0391,-0.7245)
2975 --cycle
2976 (-0.5605,-0.7471)
2977 -- (-0.5242,-0.8116)
2978 .. controls (-0.5223,-0.8116) and (-0.5211,-0.8114) .. (-0.5190,-0.8115)
2979 -- (-0.5201,-0.8191)
2980 -- (-0.4998,-0.8552)
2981 .. controls (-0.4770,-0.8370) and (-0.4696,-0.8098) .. (-0.4974,-0.7815)
2982 --cycle
2983 (-0.3761,-0.7611)
2984 -- (-0.3845,-0.7694)

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2985 -- (-0.3845,-0.7863)
2986 -- (-0.3761,-0.7947)
2987 -- (-0.3593,-0.7947)
2988 -- (-0.3508,-0.7863)
2989 -- (-0.3508,-0.7694)
2990 -- (-0.3593,-0.7611)
2991 --cycle
2992 ( 0.3384,-0.8347)
2993 .. controls ( 0.3106,-0.8395) and ( 0.2888,-0.8533) .. ( 0.2775,-0.8723)
2994 -- ( 0.3442,-0.8729)
2995 -- ( 0.3467,-0.8702)
2996 -- ( 0.3561,-0.8730)
2997 -- ( 0.4348,-0.8736)
2998 .. controls ( 0.4345,-0.8731) and ( 0.4345,-0.8727) .. ( 0.4341,-0.8721)
2999 .. controls ( 0.4186,-0.8512) and ( 0.3640,-0.8304) .. ( 0.3384,-0.8347)
3000 --cycle
3001 (-0.0904,-0.8535)
3002 .. controls (-0.1018,-0.8579) and (-0.1087,-0.8586) .. (-0.1185,-0.8680)
3003 .. controls (-0.1188,-0.8683) and (-0.1189,-0.8687) .. (-0.1192,-0.8690)
3004 -- (-0.0904,-0.8692)
3005 --cycle
3006 (-0.3081,-0.8645)
3007 .. controls (-0.3140,-0.8641) and (-0.3192,-0.8651) .. (-0.3238,-0.8672)
3008 -- (-0.2954,-0.8675)
3009 .. controls (-0.2996,-0.8660) and (-0.3039,-0.8648) .. (-0.3081,-0.8645)
3010 --cycle
3011 ;
3012 }
3013 }
3014 \fi

```

hex/terrain/woods

The style for woods. The pattern is filled with a darker green, and outlines are not drawn.

```

3015 \tikzset{
3016 hex/terrain/woods/.style={
3017 draw=none,
3018 fill={rgb,100:red,27;green,67;blue,27}
3019 }
3020 }

```

hex/terrain/woods

Regular woods.



```

3021 \ifhex@terrain@pic

```

```

3022 \tikzset{
3023   hex/terrain/woods/.pic={
3024     \path[hex/terrain/woods,pic actions,draw=none]
3025       (-0.2656, 0.8694)
3026     .. controls (-0.3133, 0.8640) and (-0.3608, 0.8400) .. (-0.3541, 0.8219)
3027     .. controls (-0.3417, 0.7629) and (-0.2512, 0.7779) .. (-0.2082, 0.7875)
3028     -- (-0.2424, 0.6937)
3029     .. controls (-0.2916, 0.7000) and (-0.3535, 0.6915) .. (-0.3950, 0.6606)
3030     .. controls (-0.4299, 0.6330) and (-0.4373, 0.5909) .. (-0.3950, 0.5657)
3031     .. controls (-0.4092, 0.5022) and (-0.3694, 0.4908) .. (-0.3191, 0.4633)
3032     .. controls (-0.3291, 0.3852) and (-0.2535, 0.3866) .. (-0.2935, 0.4633)
3033     .. controls (-0.2488, 0.4801) and (-0.2488, 0.5071) .. (-0.2778, 0.5156)
3034     .. controls (-0.2888, 0.5201) and (-0.3300, 0.5153) .. (-0.3447, 0.5156)
3035     -- (-0.3191, 0.6255)
3036     -- (-0.2680, 0.6425)
3037     -- (-0.2253, 0.5657)
3038     .. controls (-0.2136, 0.5780) and (-0.2023, 0.5853) .. (-0.2092, 0.6046)
3039     .. controls (-0.2132, 0.6161) and (-0.2403, 0.6366) .. (-0.2260, 0.6502)
3040     .. controls (-0.2044, 0.6711) and (-0.1779, 0.6203) .. (-0.1564, 0.6147)
3041     .. controls (-0.1363, 0.6094) and (-0.1262, 0.6240) .. (-0.1328, 0.6430)
3042     .. controls (-0.1449, 0.6778) and (-0.1661, 0.6737) .. (-0.1741, 0.7278)
3043     .. controls (-0.1213, 0.6943) and (-0.1063, 0.7287) .. (-0.1485, 0.7534)
3044     -- (-0.1058, 0.7875)
3045     -- (-0.0718, 0.7789)
3046     -- (-0.0633, 0.8046)
3047     .. controls (-0.0937, 0.8085) and (-0.0917, 0.8079) .. (-0.1143, 0.7875)
3048     -- (-0.1311, 0.8194)
3049     .. controls (-0.0764, 0.8223) and (-0.0450, 0.8485) .. (-0.0671, 0.8554)
3050     .. controls (-0.1156, 0.8701) and (-0.1015, 0.8233) .. (-0.1806, 0.8398)
3051     .. controls (-0.1900, 0.8580) and (-0.2089, 0.8664) .. (-0.2307, 0.8694)
3052     --cycle
3053     ( 0.3814, 0.8694)
3054     .. controls ( 0.3767, 0.8683) and ( 0.3712, 0.8666) .. ( 0.3632, 0.8643)
3055     -- ( 0.3974, 0.8387)
3056     .. controls ( 0.3974, 0.8591) and ( 0.3972, 0.8674) .. ( 0.3911, 0.8694)
3057     --cycle
3058     (-0.2452, 0.8541)
3059     .. controls (-0.2324, 0.8571) and (-0.2266, 0.8501) .. (-0.2079, 0.8422)
3060     -- (-0.2167, 0.8284)
3061     .. controls (-0.2397, 0.8309) and (-0.2848, 0.8202) .. (-0.2983, 0.8284)
3062     .. controls (-0.3215, 0.8378) and (-0.2860, 0.8342) .. (-0.2614, 0.8473)
3063     .. controls (-0.2547, 0.8509) and (-0.2496, 0.8531) .. (-0.2452, 0.8541)
3064     --cycle
3065     (-0.4331, 0.8427)
3066     .. controls (-0.4534, 0.8538) and (-0.5066, 0.7937) .. (-0.5170, 0.7773)
3067     .. controls (-0.5802, 0.6871) and (-0.6279, 0.5503) .. (-0.6704, 0.5650)
3068     .. controls (-0.6703, 0.5117) and (-0.7322, 0.4917) .. (-0.7340, 0.4547)
3069     .. controls (-0.7365, 0.4053) and (-0.6948, 0.3832) .. (-0.6621, 0.3593)
3070     .. controls (-0.6271, 0.3335) and (-0.6254, 0.2860) .. (-0.5409, 0.3014)
3071     -- (-0.5409, 0.3184)
3072     -- (-0.5750, 0.3099)
3073     -- (-0.5836, 0.3524)
3074     -- (-0.4898, 0.3184)

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3075 -- (-0.5068, 0.3696)
3076 .. controls (-0.4593, 0.3586) and (-0.4552, 0.3659) .. (-0.4214, 0.3269)
3077 .. controls (-0.3754, 0.3528) and (-0.3794, 0.4022) .. (-0.4295, 0.4177)
3078 .. controls (-0.4450, 0.4224) and (-0.4931, 0.4354) .. (-0.5068, 0.4333)
3079 .. controls (-0.5383, 0.4284) and (-0.6200, 0.3557) .. (-0.6774, 0.4548)
3080 -- (-0.6432, 0.4548)
3081 -- (-0.6603, 0.4975)
3082 .. controls (-0.6019, 0.4851) and (-0.6021, 0.5053) .. (-0.5921, 0.5572)
3083 .. controls (-0.4969, 0.5307) and (-0.5431, 0.5224) .. (-0.4812, 0.4890)
3084 .. controls (-0.4749, 0.5293) and (-0.4896, 0.5637) .. (-0.5068, 0.5998)
3085 .. controls (-0.4948, 0.6064) and (-0.4850, 0.6107) .. (-0.4746, 0.6204)
3086 .. controls (-0.4177, 0.6740) and (-0.4877, 0.7151) .. (-0.5154, 0.6423)
3087 .. controls (-0.5225, 0.6240) and (-0.5189, 0.6174) .. (-0.5154, 0.5998)
3088 -- (-0.5889, 0.6190)
3089 .. controls (-0.5889, 0.6190) and (-0.5470, 0.6607) .. (-0.5396, 0.6879)
3090 .. controls (-0.5254, 0.7392) and (-0.4740, 0.7624) .. (-0.4378, 0.7960)
3091 .. controls (-0.4256, 0.8071) and (-0.3322, 0.7872) .. (-0.4331, 0.8427)
3092 --cycle
3093 ( 0.1374, 0.8418)
3094 .. controls ( 0.1320, 0.8428) and ( 0.1261, 0.8424) .. ( 0.1202, 0.8403)
3095 .. controls ( 0.1031, 0.8066) and ( 0.1641, 0.7460) .. ( 0.1812, 0.7545)
3096 .. controls ( 0.1999, 0.7639) and ( 0.1758, 0.8354) .. ( 0.1374, 0.8418)
3097 --cycle
3098 (-0.0462, 0.8217)
3099 -- (-0.0462, 0.7789)
3100 -- (-0.0121, 0.7961)
3101 --cycle
3102 ( 0.3717, 0.8217)
3103 -- ( 0.3717, 0.8046)
3104 -- ( 0.4059, 0.7961)
3105 -- ( 0.4144, 0.8217)
3106 --cycle
3107 ( 0.4898, 0.8122)
3108 .. controls ( 0.4741, 0.8124) and ( 0.4748, 0.7893) .. ( 0.4981, 0.7754)
3109 .. controls ( 0.5017, 0.7550) and ( 0.5313, 0.6452) .. ( 0.5686, 0.6689)
3110 .. controls ( 0.5928, 0.6844) and ( 0.5339, 0.7103) .. ( 0.5653, 0.7412)
3111 .. controls ( 0.5710, 0.7471) and ( 0.5728, 0.7507) .. ( 0.5731, 0.7536)
3112 -- ( 0.5703, 0.7583)
3113 .. controls ( 0.5582, 0.7647) and ( 0.5121, 0.7531) .. ( 0.5343, 0.7796)
3114 .. controls ( 0.5145, 0.8036) and ( 0.4992, 0.8122) .. ( 0.4898, 0.8122)
3115 --cycle
3116 ( 0.3291, 0.7997)
3117 .. controls ( 0.3112, 0.7975) and ( 0.2934, 0.7843) .. ( 0.2780, 0.7757)
3118 .. controls ( 0.2235, 0.7455) and ( 0.1913, 0.7199) .. ( 0.2438, 0.6595)
3119 .. controls ( 0.2287, 0.6542) and ( 0.2176, 0.6521) .. ( 0.2063, 0.6389)
3120 .. controls ( 0.1704, 0.5968) and ( 0.2192, 0.5413) .. ( 0.2430, 0.5712)
3121 .. controls ( 0.2494, 0.5791) and ( 0.2509, 0.6061) .. ( 0.2523, 0.6170)
3122 .. controls ( 0.2545, 0.6376) and ( 0.2547, 0.6388) .. ( 0.2523, 0.6595)
3123 -- ( 0.2865, 0.6681)
3124 .. controls ( 0.3094, 0.6426) and ( 0.3194, 0.6608) .. ( 0.3291, 0.6852)
3125 -- ( 0.2865, 0.6937)
3126 .. controls ( 0.3061, 0.7101) and ( 0.3276, 0.7308) .. ( 0.3547, 0.7322)
3127 .. controls ( 0.3792, 0.7335) and ( 0.4787, 0.6707) .. ( 0.4596, 0.7446)

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3128 .. controls ( 0.4487, 0.7866) and ( 0.4132, 0.7751) .. ( 0.3912, 0.7800)
3129 .. controls ( 0.3681, 0.7853) and ( 0.3549, 0.8026) .. ( 0.3291, 0.7997)
3130 --cycle
3131 ( 0.0971, 0.7996)
3132 .. controls ( 0.0971, 0.7996) and (-0.0371, 0.7713) .. (-0.0393, 0.7247)
3133 .. controls (-0.0408, 0.6927) and ( 0.0217, 0.7175) .. ( 0.0521, 0.7277)
3134 .. controls ( 0.0789, 0.7366) and ( 0.0971, 0.7996) .. ( 0.0971, 0.7996)
3135 --cycle
3136 (-0.1571, 0.7961)
3137 -- (-0.1485, 0.7961)
3138 -- (-0.1485, 0.7875)
3139 -- (-0.1400, 0.7875)
3140 -- (-0.1400, 0.7789)
3141 -- (-0.1485, 0.7875)
3142 --cycle
3143 (-0.3689, 0.7733)
3144 .. controls (-0.3791, 0.7835) and (-0.4247, 0.7612) .. (-0.4247, 0.7612)
3145 .. controls (-0.4247, 0.7612) and (-0.4258, 0.7138) .. (-0.4104, 0.7184)
3146 .. controls (-0.3965, 0.7227) and (-0.3586, 0.7631) .. (-0.3689, 0.7733)
3147 --cycle
3148 ( 0.3462, 0.7278)
3149 -- ( 0.3462, 0.6766)
3150 -- ( 0.3804, 0.7107)
3151 --cycle
3152 ( 0.1142, 0.7077)
3153 .. controls ( 0.1016, 0.7065) and ( 0.0878, 0.7029) .. ( 0.0733, 0.6974)
3154 .. controls ( 0.0595, 0.6920) and ( 0.0449, 0.6883) .. ( 0.0332, 0.6789)
3155 .. controls ( 0.0192, 0.6678) and ( 0.0113, 0.6500) .. ( 0.0014, 0.6354)
3156 .. controls (-0.0079, 0.6219) and (-0.0221, 0.6074) .. (-0.0243, 0.5905)
3157 .. controls (-0.0267, 0.5713) and ( 0.0128, 0.4923) .. ( 0.0326, 0.4877)
3158 .. controls ( 0.0455, 0.4824) and ( 0.0530, 0.4866) .. ( 0.0647, 0.4877)
3159 .. controls ( 0.0870, 0.4591) and ( 0.0975, 0.4638) .. ( 0.1331, 0.4633)
3160 .. controls ( 0.1499, 0.4110) and ( 0.1908, 0.4198) .. ( 0.1671, 0.4890)
3161 .. controls ( 0.1267, 0.5142) and ( 0.1094, 0.5105) .. ( 0.0647, 0.4975)
3162 .. controls ( 0.0889, 0.5509) and ( 0.0981, 0.5486) .. ( 0.0733, 0.6084)
3163 .. controls ( 0.1221, 0.6144) and ( 0.1333, 0.6047) .. ( 0.1415, 0.6510)
3164 -- ( 0.1927, 0.6425)
3165 .. controls ( 0.1814, 0.6932) and ( 0.1526, 0.7111) .. ( 0.1142, 0.7077)
3166 --cycle
3167 ( 0.1671, 0.4890)
3168 -- ( 0.2182, 0.4890)
3169 .. controls ( 0.2474, 0.4580) and ( 0.2982, 0.5061) .. ( 0.2981, 0.5238)
3170 .. controls ( 0.2981, 0.5425) and ( 0.2721, 0.5720) .. ( 0.2418, 0.5318)
3171 -- ( 0.2182, 0.4975)
3172 .. controls ( 0.1923, 0.5152) and ( 0.1850, 0.5158) .. ( 0.1671, 0.4890)
3173 --cycle
3174 (-0.1058, 0.6937)
3175 -- (-0.0973, 0.6595)
3176 -- (-0.0802, 0.6595)
3177 -- (-0.0718, 0.6937)
3178 --cycle
3179 ( 0.3889, 0.6852)
3180 .. controls ( 0.3954, 0.6469) and ( 0.4108, 0.6416) .. ( 0.4314, 0.6766)

```

```

3181 --cycle
3182 ( 0.4826, 0.6852)
3183 -- ( 0.4562, 0.6475)
3184 .. controls ( 0.4460, 0.6335) and ( 0.4249, 0.5852) .. ( 0.4639, 0.5976)
3185 .. controls ( 0.4953, 0.6076) and ( 0.5058, 0.6583) .. ( 0.4998, 0.6852)
3186 --cycle
3187 (-0.0879, 0.6326)
3188 .. controls (-0.1189, 0.6139) and (-0.0956, 0.5976) .. (-0.0822, 0.6003)
3189 .. controls (-0.0699, 0.6027) and (-0.0544, 0.6253) .. (-0.0879, 0.6326)
3190 --cycle
3191 ( 0.3034, 0.6255)
3192 -- ( 0.2694, 0.6170)
3193 -- ( 0.2694, 0.5998)
3194 -- ( 0.3034, 0.5913)
3195 --cycle
3196 ( 0.6085, 0.6015)
3197 .. controls ( 0.5969, 0.6043) and ( 0.5796, 0.6004) .. ( 0.5688, 0.5964)
3198 .. controls ( 0.5189, 0.5780) and ( 0.5216, 0.5317) .. ( 0.5338, 0.4890)
3199 .. controls ( 0.5892, 0.5200) and ( 0.5513, 0.5451) .. ( 0.6191, 0.5657)
3200 .. controls ( 0.6318, 0.5296) and ( 0.6176, 0.4979) .. ( 0.6703, 0.5572)
3201 .. controls ( 0.6580, 0.5662) and ( 0.6196, 0.5989) .. ( 0.6085, 0.6015)
3202 --cycle
3203 ( 0.6703, 0.5572)
3204 .. controls ( 0.6650, 0.4639) and ( 0.7377, 0.4434) .. ( 0.6703, 0.5572)
3205 --cycle
3206 ( 0.2950, 0.5828)
3207 -- ( 0.3034, 0.5487)
3208 -- ( 0.3206, 0.5487)
3209 -- ( 0.3291, 0.5572)
3210 -- ( 0.3291, 0.5743)
3211 --cycle
3212 (-0.2167, 0.5572)
3213 .. controls (-0.2524, 0.4984) and (-0.2378, 0.4949) .. (-0.1997, 0.4463)
3214 -- (-0.1656, 0.4548)
3215 -- (-0.1656, 0.4719)
3216 -- (-0.1997, 0.4804)
3217 -- (-0.1997, 0.4719)
3218 -- (-0.2082, 0.4804)
3219 -- (-0.1997, 0.4804)
3220 .. controls (-0.1944, 0.5170) and (-0.1913, 0.5288) .. (-0.2167, 0.5572)
3221 --cycle
3222 ( 0.4528, 0.5567)
3223 .. controls ( 0.4208, 0.5591) and ( 0.3875, 0.5291) .. ( 0.3974, 0.4804)
3224 -- ( 0.4998, 0.5146)
3225 .. controls ( 0.4909, 0.5422) and ( 0.4721, 0.5552) .. ( 0.4528, 0.5567)
3226 --cycle
3227 (-0.5836, 0.5401)
3228 .. controls (-0.5724, 0.5036) and (-0.5428, 0.4697) .. (-0.5238, 0.5231)
3229 --cycle
3230 (-0.0890, 0.5163)
3231 .. controls (-0.1486, 0.4959) and (-0.1212, 0.4523) .. (-0.0806, 0.4615)
3232 .. controls (-0.0429, 0.4702) and (-0.0388, 0.5108) .. (-0.0890, 0.5163)
3233 --cycle

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3234 ( 0.3494, 0.5160)
3235 .. controls ( 0.3442, 0.5162) and ( 0.3376, 0.5157) .. ( 0.3291, 0.5146)
3236 -- ( 0.3632, 0.4804)
3237 .. controls ( 0.3666, 0.5059) and ( 0.3648, 0.5149) .. ( 0.3494, 0.5160)
3238 --cycle
3239 ( 0.6832, 0.4635)
3240 .. controls ( 0.6577, 0.4592) and ( 0.6354, 0.4224) .. ( 0.6277, 0.3866)
3241 -- ( 0.6618, 0.3781)
3242 .. controls ( 0.6758, 0.4215) and ( 0.6897, 0.4164) .. ( 0.7299, 0.4293)
3243 .. controls ( 0.7150, 0.4573) and ( 0.6984, 0.4662) .. ( 0.6832, 0.4635)
3244 --cycle
3245 ( 0.3846, 0.4569)
3246 .. controls ( 0.3643, 0.4547) and ( 0.3427, 0.4484) .. ( 0.3206, 0.4379)
3247 .. controls ( 0.2993, 0.4278) and ( 0.2743, 0.4198) .. ( 0.2665, 0.3948)
3248 .. controls ( 0.2602, 0.3747) and ( 0.2710, 0.3497) .. ( 0.2940, 0.3491)
3249 .. controls ( 0.3208, 0.3484) and ( 0.3628, 0.4037) .. ( 0.4059, 0.3999)
3250 .. controls ( 0.4648, 0.3948) and ( 0.4817, 0.3238) .. ( 0.5508, 0.3184)
3251 -- ( 0.5594, 0.2842)
3252 .. controls ( 0.6325, 0.3301) and ( 0.6184, 0.4000) .. ( 0.5253, 0.3610)
3253 .. controls ( 0.4966, 0.4310) and ( 0.4457, 0.4630) .. ( 0.3846, 0.4569)
3254 --cycle
3255 ( 0.0020, 0.4093)
3256 .. controls (-0.0096, 0.4099) and (-0.0218, 0.4039) .. (-0.0547, 0.3920)
3257 .. controls (-0.0742, 0.3851) and (-0.1009, 0.3815) .. (-0.1085, 0.3591)
3258 .. controls (-0.1143, 0.3413) and (-0.1036, 0.3179) .. (-0.0973, 0.3014)
3259 .. controls (-0.1114, 0.2946) and (-0.1334, 0.2825) .. (-0.1485, 0.2820)
3260 .. controls (-0.1767, 0.2809) and (-0.1949, 0.3055) .. (-0.2182, 0.3110)
3261 .. controls (-0.2417, 0.3165) and (-0.3307, 0.2833) .. (-0.3437, 0.2635)
3262 .. controls (-0.3530, 0.2471) and (-0.3474, 0.2253) .. (-0.3437, 0.2075)
3263 .. controls (-0.4324, 0.1756) and (-0.3706, 0.0831) .. (-0.2765, 0.0710)
3264 .. controls (-0.2795, 0.0550) and (-0.2801, 0.0364) .. (-0.2860, 0.0213)
3265 .. controls (-0.2997,-0.0142) and (-0.3382,-0.0416) .. (-0.2680,-0.0825)
3266 -- (-0.2424, 0.0027)
3267 -- (-0.1997,-0.0143)
3268 .. controls (-0.1918, 0.0295) and (-0.2082, 0.0371) .. (-0.1741, 0.0710)
3269 .. controls (-0.1600, 0.0270) and (-0.1316, 0.0212) .. (-0.1230, 0.0710)
3270 -- (-0.0547, 0.0710)
3271 -- (-0.0547, 0.0198)
3272 .. controls (-0.0089, 0.0346) and (-0.0127, 0.0528) .. (-0.0121, 0.0966)
3273 .. controls ( 0.0434, 0.0981) and ( 0.0809, 0.1179) .. ( 0.0988, 0.1733)
3274 -- ( 0.0561, 0.1477)
3275 -- ( 0.0647, 0.1477)
3276 -- ( 0.0647, 0.1392)
3277 -- ( 0.0561, 0.1477)
3278 -- (-0.0333, 0.1681)
3279 -- (-0.0973, 0.1990)
3280 .. controls (-0.1035, 0.1519) and (-0.0915, 0.1406) .. (-0.0462, 0.1307)
3281 -- (-0.0547, 0.1051)
3282 .. controls (-0.0809, 0.1134) and (-0.1575, 0.1376) .. (-0.1816, 0.1275)
3283 .. controls (-0.1979, 0.1207) and (-0.2008, 0.1105) .. (-0.2082, 0.0966)
3284 -- (-0.2765, 0.0796)
3285 .. controls (-0.2913, 0.1042) and (-0.2904, 0.1037) .. (-0.3191, 0.1051)
3286 -- (-0.3277, 0.1307)

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3287 -- (-0.3020, 0.1392)
3288 -- (-0.3191, 0.1733)
3289 -- (-0.2680, 0.2416)
3290 .. controls (-0.2555, 0.2025) and (-0.2434, 0.1999) .. (-0.2082, 0.1819)
3291 .. controls (-0.2103, 0.2198) and (-0.2204, 0.2217) .. (-0.2509, 0.2416)
3292 -- (-0.1571, 0.2416)
3293 -- (-0.0973, 0.1990)
3294 .. controls (-0.0622, 0.2159) and (-0.0506, 0.2107) .. (-0.0376, 0.2501)
3295 -- (-0.0718, 0.2672)
3296 -- (-0.0121, 0.2842)
3297 -- (-0.0121, 0.3014)
3298 -- (-0.0462, 0.3184)
3299 -- ( 0.0221, 0.3439)
3300 .. controls ( 0.0070, 0.2950) and ( 0.0355, 0.2771) .. ( 0.0818, 0.2757)
3301 -- ( 0.0561, 0.3354)
3302 .. controls ( 0.1139, 0.3092) and ( 0.1160, 0.3517) .. ( 0.0949, 0.3683)
3303 -- ( 0.0561, 0.3859)
3304 .. controls ( 0.0248, 0.4010) and ( 0.0136, 0.4085) .. ( 0.0020, 0.4093)
3305 --cycle
3306 (-0.2680,-0.0825)
3307 .. controls (-0.2752,-0.1245) and (-0.2656,-0.1332) .. (-0.2253,-0.1423)
3308 .. controls (-0.2780,-0.1694) and (-0.3487,-0.1517) .. (-0.3277,-0.2360)
3309 -- (-0.3958,-0.2275)
3310 .. controls (-0.3850,-0.1662) and (-0.4133,-0.1372) .. (-0.4727,-0.1337)
3311 -- (-0.4727,-0.0910)
3312 .. controls (-0.5590,-0.0763) and (-0.5042,-0.0134) .. (-0.5750,-0.0228)
3313 .. controls (-0.5589,-0.0849) and (-0.5477,-0.0819) .. (-0.5750,-0.1423)
3314 .. controls (-0.6476,-0.1314) and (-0.6815,-0.1792) .. (-0.6262,-0.2360)
3315 .. controls (-0.6614,-0.2507) and (-0.6863,-0.2704) .. (-0.6674,-0.3120)
3316 .. controls (-0.6596,-0.3292) and (-0.6399,-0.3442) .. (-0.6461,-0.3629)
3317 .. controls (-0.6528,-0.3836) and (-0.7224,-0.4151) .. (-0.6960,-0.4711)
3318 .. controls (-0.6692,-0.5273) and (-0.5938,-0.5008) .. (-0.6603,-0.4579)
3319 -- (-0.6262,-0.4237)
3320 -- (-0.5921,-0.4579)
3321 .. controls (-0.5645,-0.3552) and (-0.5902,-0.3724) .. (-0.6177,-0.2872)
3322 -- (-0.5750,-0.2531)
3323 -- (-0.6177,-0.2446)
3324 -- (-0.6006,-0.2190)
3325 .. controls (-0.5707,-0.2398) and (-0.5626,-0.2347) .. (-0.5494,-0.2019)
3326 -- (-0.5836,-0.1848)
3327 -- (-0.5153,-0.1592)
3328 .. controls (-0.5297,-0.1903) and (-0.5326,-0.1983) .. (-0.4983,-0.2105)
3329 -- (-0.4983,-0.1763)
3330 .. controls (-0.4268,-0.1951) and (-0.4189,-0.2337) .. (-0.3789,-0.2872)
3331 .. controls (-0.4036,-0.3020) and (-0.4028,-0.3012) .. (-0.4044,-0.3299)
3332 -- (-0.3362,-0.3299)
3333 .. controls (-0.3465,-0.3786) and (-0.3284,-0.3796) .. (-0.2850,-0.3811)
3334 -- (-0.2850,-0.4151)
3335 .. controls (-0.2401,-0.4035) and (-0.1731,-0.3767) .. (-0.1571,-0.3299)
3336 .. controls (-0.1233,-0.3324) and (-0.1022,-0.3221) .. (-0.1230,-0.2872)
3337 -- (-0.1143,-0.2360)
3338 -- (-0.1741,-0.2531)
3339 -- (-0.1741,-0.2701)

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3340 -- (-0.1485,-0.2787)
3341 -- (-0.1571,-0.3214)
3342 -- (-0.2765,-0.3640)
3343 .. controls (-0.2785,-0.3286) and (-0.2853,-0.3271) .. (-0.3191,-0.3214)
3344 -- (-0.3191,-0.3299)
3345 -- (-0.3277,-0.3214)
3346 -- (-0.3191,-0.3214)
3347 .. controls (-0.3191,-0.3214) and (-0.2922,-0.3221) .. (-0.2850,-0.3128)
3348 .. controls (-0.2781,-0.3038) and (-0.2850,-0.2787) .. (-0.2850,-0.2787)
3349 .. controls (-0.2850,-0.2462) and (-0.2522,-0.2669) .. (-0.2424,-0.2360)
3350 -- (-0.2935,-0.2360)
3351 -- (-0.2509,-0.2019)
3352 -- (-0.2424,-0.2360)
3353 .. controls (-0.1852,-0.2624) and (-0.2046,-0.2259) .. (-0.1740,-0.2170)
3354 .. controls (-0.1599,-0.2119) and (-0.1427,-0.2266) .. (-0.1281,-0.2170)
3355 .. controls (-0.1166,-0.2109) and (-0.1070,-0.1747) .. (-0.1656,-0.1848)
3356 -- (-0.2082,-0.0228)
3357 -- (-0.2253,-0.0228)
3358 .. controls (-0.2307,-0.0463) and (-0.2347,-0.0485) .. (-0.2167,-0.0654)
3359 -- (-0.2253,-0.0910)
3360 --cycle
3361 ( 0.7385, 0.3781)
3362 .. controls ( 0.7464, 0.3334) and ( 0.7712, 0.3235) .. ( 0.7897, 0.3696)
3363 --cycle
3364 ( 0.3825, 0.3684)
3365 .. controls ( 0.3722, 0.3709) and ( 0.3598, 0.3638) .. ( 0.3547, 0.3341)
3366 -- ( 0.3712, 0.3341)
3367 .. controls ( 0.4107, 0.3328) and ( 0.3998, 0.3641) .. ( 0.3825, 0.3684)
3368 --cycle
3369 ( 0.3547, 0.3341)
3370 -- ( 0.3034, 0.3280)
3371 .. controls ( 0.2587, 0.3223) and ( 0.2449, 0.3331) .. ( 0.2267, 0.2842)
3372 -- ( 0.1515, 0.2970)
3373 .. controls ( 0.1395, 0.3001) and ( 0.1217, 0.3113) .. ( 0.1096, 0.3062)
3374 .. controls ( 0.0947, 0.3000) and ( 0.0955, 0.2804) .. ( 0.0944, 0.2671)
3375 .. controls ( 0.0897, 0.2118) and ( 0.0889, 0.2059) .. ( 0.1158, 0.1563)
3376 -- ( 0.1331, 0.1563)
3377 -- ( 0.1415, 0.1648)
3378 -- ( 0.1415, 0.2501)
3379 -- ( 0.2449, 0.2446)
3380 .. controls ( 0.2870, 0.2248) and ( 0.2549, 0.1801) .. ( 0.3376, 0.1733)
3381 -- ( 0.3376, 0.2245)
3382 -- ( 0.3889, 0.2075)
3383 .. controls ( 0.3692, 0.2680) and ( 0.3319, 0.2493) .. ( 0.3034, 0.2928)
3384 .. controls ( 0.3440, 0.2858) and ( 0.3561, 0.2934) .. ( 0.3547, 0.3341)
3385 --cycle
3386 ( 0.4285, 0.3341)
3387 .. controls ( 0.4111, 0.3048) and ( 0.4418, 0.2997) .. ( 0.4508, 0.3082)
3388 .. controls ( 0.4603, 0.3170) and ( 0.4582, 0.3376) .. ( 0.4285, 0.3341)
3389 --cycle
3390 ( 0.7199, 0.3309)
3391 .. controls ( 0.7120, 0.3311) and ( 0.7041, 0.3301) .. ( 0.6963, 0.3276)
3392 .. controls ( 0.6516, 0.3141) and ( 0.5998, 0.2127) .. ( 0.6788, 0.2075)

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3393 -- ( 0.6874, 0.1819)
3394 .. controls ( 0.6908, 0.1882) and ( 0.6948, 0.1871) .. ( 0.6958, 0.2009)
3395 .. controls ( 0.6967, 0.2152) and ( 0.6850, 0.2341) .. ( 0.6875, 0.2482)
3396 .. controls ( 0.6912, 0.2697) and ( 0.7185, 0.2790) .. ( 0.7404, 0.2558)
3397 -- ( 0.7556, 0.2330)
3398 .. controls ( 0.8209, 0.2699) and ( 0.7743, 0.3292) .. ( 0.7199, 0.3309)
3399 --cycle
3400 (-0.4641, 0.3269)
3401 -- (-0.4556, 0.2928)
3402 -- (-0.4386, 0.2928)
3403 -- (-0.4300, 0.3269)
3404 --cycle
3405 (-0.3532, 0.3269)
3406 .. controls (-0.3838, 0.3252) and (-0.3857, 0.3233) .. (-0.3874, 0.2928)
3407 .. controls (-0.3613, 0.3019) and (-0.3623, 0.3007) .. (-0.3532, 0.3269)
3408 --cycle
3409 (-0.7723, 0.3114)
3410 .. controls (-0.9303, 0.2491) and (-0.8236, 0.1766) .. (-0.9066, 0.1318)
3411 .. controls (-0.9222, 0.1231) and (-0.9315, 0.1156) .. (-0.9385, 0.1084)
3412 -- (-0.9505, 0.0875)
3413 .. controls (-0.9537, 0.0757) and (-0.9542, 0.0621) .. (-0.9542, 0.0410)
3414 -- (-0.9333, 0.0454)
3415 .. controls (-0.9116, 0.1020) and (-0.8383, 0.0970) .. (-0.8943, 0.1349)
3416 .. controls (-0.8577, 0.1472) and (-0.8473, 0.1249) .. (-0.8748, 0.1652)
3417 -- (-0.8414, 0.1559)
3418 .. controls (-0.8055, 0.1614) and (-0.8119, 0.2075) .. (-0.8279, 0.2170)
3419 .. controls (-0.8020, 0.2197) and (-0.8300, 0.2698) .. (-0.8062, 0.2572)
3420 .. controls (-0.7862, 0.2467) and (-0.7713, 0.2258) .. (-0.7547, 0.2261)
3421 .. controls (-0.7211, 0.2267) and (-0.7384, 0.2895) .. (-0.7723, 0.3114)
3422 --cycle
3423 ( 0.5167, 0.2928)
3424 -- ( 0.5083, 0.2842)
3425 -- ( 0.5083, 0.2672)
3426 -- ( 0.5167, 0.2587)
3427 -- ( 0.5338, 0.2587)
3428 -- ( 0.5423, 0.2672)
3429 -- ( 0.5423, 0.2842)
3430 -- ( 0.5338, 0.2928)
3431 --cycle
3432 ( 0.8233, 0.2914)
3433 .. controls ( 0.8159, 0.2897) and ( 0.8101, 0.2823) .. ( 0.8101, 0.2664)
3434 .. controls ( 0.8101, 0.2592) and ( 0.7901, 0.2245) .. ( 0.7943, 0.2184)
3435 .. controls ( 0.8010, 0.2085) and ( 0.8177, 0.1916) .. ( 0.8341, 0.1843)
3436 -- ( 0.7897, 0.1051)
3437 .. controls ( 0.7638, 0.1109) and ( 0.6977, 0.1143) .. ( 0.6790, 0.0913)
3438 .. controls ( 0.6678, 0.0772) and ( 0.6727, 0.0528) .. ( 0.6644, 0.0283)
3439 .. controls ( 0.6511,-0.0104) and ( 0.6263,-0.0275) .. ( 0.5936,-0.0484)
3440 .. controls ( 0.5977,-0.0521) and ( 0.6009,-0.0593) .. ( 0.6125,-0.0633)
3441 .. controls ( 0.6432,-0.0738) and ( 0.6954,-0.0310) .. ( 0.7067,-0.0043)
3442 .. controls ( 0.7123, 0.0088) and ( 0.7121, 0.0229) .. ( 0.7130, 0.0368)
3443 .. controls ( 0.7585, 0.0333) and ( 0.7707, 0.0484) .. ( 0.7897, 0.0881)
3444 -- ( 0.8409, 0.0027)
3445 .. controls ( 0.7828,-0.0157) and ( 0.7583,-0.0941) .. ( 0.8409,-0.1337)

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3446 .. controls ( 0.8561,-0.0647) and ( 0.8176,-0.0742) .. ( 0.8836,-0.0143)
3447 -- ( 0.9348,-0.0654)
3448 .. controls ( 0.9443,-0.0311) and ( 0.9398,-0.0319) .. ( 0.9430,-0.0008)
3449 .. controls ( 0.9475, 0.0433) and ( 0.9603, 0.0556) .. ( 0.8921, 0.0796)
3450 -- ( 0.8836, 0.0710)
3451 -- ( 0.8836, 0.0540)
3452 -- ( 0.9006, 0.0198)
3453 .. controls ( 0.8705, 0.0555) and ( 0.8589, 0.0671) .. ( 0.8494, 0.1137)
3454 -- ( 0.8921, 0.0881)
3455 .. controls ( 0.9100, 0.1275) and ( 0.9093, 0.1211) .. ( 0.9077, 0.1641)
3456 .. controls ( 0.8502, 0.2199) and ( 0.8502, 0.2055) .. ( 0.8245, 0.2294)
3457 .. controls ( 0.8511, 0.2387) and ( 0.8571, 0.2533) .. ( 0.8546, 0.2660)
3458 -- ( 0.8445, 0.2834)
3459 .. controls ( 0.8380, 0.2892) and ( 0.8301, 0.2928) .. ( 0.8233, 0.2914)
3460 --cycle
3461 (-0.6221, 0.2851)
3462 .. controls (-0.6403, 0.2814) and (-0.6578, 0.2533) .. (-0.6578, 0.2330)
3463 .. controls (-0.6578, 0.2083) and (-0.6228, 0.1685) .. (-0.6090, 0.1392)
3464 .. controls (-0.6712, 0.1174) and (-0.6013, 0.0486) .. (-0.5914, 0.0454)
3465 .. controls (-0.5625, 0.0361) and (-0.5594, 0.0690) .. (-0.5384, 0.0751)
3466 .. controls (-0.5161, 0.0820) and (-0.5142, 0.0619) .. (-0.4641, 0.0796)
3467 .. controls (-0.4838, 0.1372) and (-0.5135, 0.1504) .. (-0.5665, 0.1733)
3468 -- (-0.5323, 0.2075)
3469 -- (-0.5665, 0.2160)
3470 -- (-0.5665, 0.1819)
3471 -- (-0.5921, 0.2245)
3472 -- (-0.6006, 0.2330)
3473 -- (-0.6090, 0.2416)
3474 -- (-0.6006, 0.2416)
3475 -- (-0.6006, 0.2330)
3476 -- (-0.5921, 0.2330)
3477 -- (-0.5921, 0.2245)
3478 .. controls (-0.5591, 0.2361) and (-0.5513, 0.2585) .. (-0.5921, 0.2587)
3479 .. controls (-0.5999, 0.2809) and (-0.6112, 0.2874) .. (-0.6221, 0.2851)
3480 --cycle
3481 (-0.4001, 0.2659)
3482 -- (-0.4398, 0.2231)
3483 -- (-0.4713, 0.1989)
3484 .. controls (-0.5030, 0.1708) and (-0.4873, 0.1496) .. (-0.4486, 0.1607)
3485 .. controls (-0.4215, 0.1683) and (-0.3832, 0.1951) .. (-0.3704, 0.2199)
3486 .. controls (-0.3565, 0.2464) and (-0.3702, 0.2690) .. (-0.4001, 0.2659)
3487 --cycle
3488 ( 0.5167, 0.2501)
3489 .. controls ( 0.4726, 0.2275) and ( 0.4751, 0.2109) .. ( 0.4771, 0.1648)
3490 .. controls ( 0.4776, 0.1495) and ( 0.4771, 0.1247) .. ( 0.4946, 0.1178)
3491 .. controls ( 0.5149, 0.1096) and ( 0.5288, 0.1359) .. ( 0.5681, 0.1435)
3492 .. controls ( 0.6164, 0.1530) and ( 0.6391, 0.1274) .. ( 0.6568, 0.1214)
3493 .. controls ( 0.6669, 0.1180) and ( 0.6795, 0.1163) .. ( 0.6862, 0.1272)
3494 .. controls ( 0.7003, 0.1512) and ( 0.6673, 0.1556) .. ( 0.6532, 0.1563)
3495 .. controls ( 0.6261, 0.2314) and ( 0.5966, 0.1859) .. ( 0.5605, 0.1960)
3496 .. controls ( 0.5390, 0.2022) and ( 0.5268, 0.2319) .. ( 0.5167, 0.2501)
3497 --cycle
3498 (-0.0462, 0.2075)

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3499 -- (-0.0462, 0.1819)
3500 -- (-0.0206, 0.1819)
3501 -- (-0.0206, 0.2075)
3502 --cycle
3503 (-0.7371, 0.1990)
3504 -- (-0.7371, 0.1563)
3505 -- (-0.7115, 0.1905)
3506 -- (-0.7200, 0.1990)
3507 --cycle
3508 (-0.1656, 0.1905)
3509 -- (-0.1400, 0.1648)
3510 --cycle
3511 (-0.7797, 0.1819)
3512 -- (-0.7883, 0.1733)
3513 -- (-0.7883, 0.1563)
3514 -- (-0.7542, 0.1477)
3515 -- (-0.7627, 0.1819)
3516 --cycle
3517 ( 0.1671, 0.1819)
3518 -- ( 0.1841, 0.1477)
3519 --cycle
3520 ( 0.6447, 0.1477)
3521 -- ( 0.6532, 0.1477)
3522 -- ( 0.6532, 0.1392)
3523 --cycle
3524 (-0.7081, 0.1437)
3525 .. controls (-0.7387, 0.1429) and (-0.7462, 0.1254) .. (-0.7593, 0.0844)
3526 .. controls (-0.7628, 0.0670) and (-0.7720, 0.0499) .. (-0.7593, 0.0321)
3527 .. controls (-0.7496, 0.0145) and (-0.7241, 0.0137) .. (-0.7173, 0.0321)
3528 .. controls (-0.7114, 0.0479) and (-0.7222, 0.0657) .. (-0.7285, 0.0796)
3529 .. controls (-0.6938, 0.0968) and (-0.6811, 0.1011) .. (-0.6688, 0.1392)
3530 .. controls (-0.6852, 0.1425) and (-0.6979, 0.1439) .. (-0.7081, 0.1437)
3531 --cycle
3532 ( 0.8921, 0.1392)
3533 -- ( 0.9006, 0.1392)
3534 -- ( 0.9006, 0.1307)
3535 --cycle
3536 ( 0.5765, 0.1222)
3537 -- ( 0.5850, 0.0881)
3538 -- ( 0.6021, 0.0881)
3539 -- ( 0.6106, 0.1222)
3540 --cycle
3541 ( 0.2872, 0.1175)
3542 .. controls ( 0.2767, 0.1166) and ( 0.2651, 0.1135) .. ( 0.2533, 0.1071)
3543 .. controls ( 0.2151, 0.0867) and ( 0.2220, 0.0479) .. ( 0.2267, 0.0113)
3544 .. controls ( 0.2625, 0.0237) and ( 0.2504, 0.0254) .. ( 0.2701, 0.0519)
3545 .. controls ( 0.2958, 0.0863) and ( 0.3249, 0.0559) .. ( 0.3338, 0.0822)
3546 .. controls ( 0.3402, 0.1009) and ( 0.3185, 0.1198) .. ( 0.2872, 0.1175)
3547 --cycle
3548 ( 0.4845, 0.1051)
3549 .. controls ( 0.4706, 0.1009) and ( 0.4616, 0.0995) .. ( 0.4512, 0.0905)
3550 .. controls ( 0.4040, 0.0493) and ( 0.4796,-0.0172) .. ( 0.4845, 0.0710)
3551 .. controls ( 0.4877, 0.0867) and ( 0.4856, 0.0907) .. ( 0.4845, 0.1051)

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```

3552  --cycle
3553  ( 0.6362, 0.1051)
3554  -- ( 0.6277, 0.0966)
3555  -- ( 0.6277, 0.0796)
3556  -- ( 0.6618, 0.0710)
3557  -- ( 0.6532, 0.1051)
3558  --cycle
3559  ( 0.0988, 0.0966)
3560  -- ( 0.0647, 0.0881)
3561  -- ( 0.0647, 0.0710)
3562  -- ( 0.0902, 0.0625)
3563  .. controls ( 0.0813, 0.0194) and ( 0.0842, 0.0065) .. ( 0.1244,-0.0143)
3564  -- ( 0.1331, 0.0283)
3565  -- ( 0.1671, 0.0368)
3566  -- ( 0.1671, 0.0540)
3567  .. controls ( 0.1326, 0.0659) and ( 0.1186, 0.0637) .. ( 0.0988, 0.0966)
3568  --cycle
3569  (-0.8125, 0.0621)
3570  .. controls (-0.8490, 0.0401) and (-0.8237, 0.0162) .. (-0.8062, 0.0190)
3571  .. controls (-0.7883, 0.0219) and (-0.7704, 0.0544) .. (-0.8125, 0.0621)
3572  --cycle
3573  ( 0.5167, 0.0540)
3574  -- ( 0.5083, 0.0198)
3575  -- ( 0.5423, 0.0283)
3576  -- ( 0.5423, 0.0454)
3577  -- ( 0.5338, 0.0540)
3578  --cycle
3579  (-0.0973, 0.0454)
3580  -- (-0.1058, 0.0368)
3581  -- (-0.1058, 0.0198)
3582  -- (-0.0718, 0.0113)
3583  -- (-0.0802, 0.0454)
3584  --cycle
3585  (-0.0035, 0.0368)
3586  -- (-0.0210, 0.0109)
3587  .. controls (-0.0655,-0.0708) and ( 0.0385,-0.0566) .. ( 0.0166, 0.0109)
3588  .. controls ( 0.0120, 0.0245) and ( 0.0056, 0.0275) .. (-0.0035, 0.0368)
3589  --cycle
3590  (-0.4977, 0.0207)
3591  .. controls (-0.5147, 0.0204) and (-0.5312, 0.0080) .. (-0.5211,-0.0096)
3592  .. controls (-0.5118,-0.0261) and (-0.4926,-0.0166) .. (-0.4645,-0.0487)
3593  .. controls (-0.4440,-0.0720) and (-0.4524,-0.0706) .. (-0.4214,-0.0825)
3594  .. controls (-0.4050,-0.0235) and (-0.4308, 0.0217) .. (-0.4977, 0.0207)
3595  --cycle
3596  ( 0.3756, 0.0075)
3597  .. controls ( 0.3646, 0.0069) and ( 0.3522, 0.0045) .. ( 0.3376, 0.0002)
3598  .. controls ( 0.3227,-0.0042) and ( 0.3054,-0.0075) .. ( 0.2946,-0.0193)
3599  -- ( 0.2742,-0.0568)
3600  .. controls ( 0.2649,-0.0745) and ( 0.2554,-0.0861) .. ( 0.2571,-0.1073)
3601  .. controls ( 0.2601,-0.1471) and ( 0.2967,-0.2295) .. ( 0.3408,-0.1666)
3602  .. controls ( 0.3653,-0.1317) and ( 0.3284,-0.1299) .. ( 0.3717,-0.0654)
3603  .. controls ( 0.4033,-0.0789) and ( 0.4049,-0.0788) .. ( 0.4314,-0.0568)
3604  .. controls ( 0.4664,-0.1165) and ( 0.5153,-0.0409) .. ( 0.5152,-0.0308)

```

```

3605 .. controls ( 0.5148,-0.0111) and ( 0.4690, 0.0277) .. ( 0.4571,-0.0399)
3606 .. controls ( 0.4280,-0.0054) and ( 0.4082, 0.0095) .. ( 0.3756, 0.0075)
3607 --cycle
3608 (-0.9801, 0.0047)
3609 -- (-0.9427,-0.0792)
3610 -- (-0.8931,-0.0669)
3611 -- (-0.8538,-0.0818)
3612 .. controls (-0.8464,-0.0219) and (-0.9339,-0.0180) .. (-0.9801, 0.0047)
3613 --cycle
3614 ( 0.5423,-0.0484)
3615 -- ( 0.5594,-0.0997)
3616 .. controls ( 0.5416,-0.1040) and ( 0.4986,-0.1096) .. ( 0.4864,-0.1181)
3617 .. controls ( 0.4658,-0.1324) and ( 0.4601,-0.1677) .. ( 0.4793,-0.1854)
3618 .. controls ( 0.4883,-0.1938) and ( 0.5053,-0.1981) .. ( 0.5167,-0.2019)
3619 .. controls ( 0.4933,-0.2045) and ( 0.4609,-0.2005) .. ( 0.4427,-0.2156)
3620 .. controls ( 0.4166,-0.2372) and ( 0.4089,-0.2872) .. ( 0.4826,-0.2957)
3621 -- ( 0.4826,-0.2446)
3622 .. controls ( 0.5217,-0.2597) and ( 0.5287,-0.2486) .. ( 0.5167,-0.2105)
3623 .. controls ( 0.5424,-0.2023) and ( 0.5512,-0.1934) .. ( 0.5594,-0.1677)
3624 -- ( 0.6191,-0.1848)
3625 -- ( 0.6788,-0.3042)
3626 -- ( 0.6532,-0.3128)
3627 -- ( 0.6532,-0.3299)
3628 -- ( 0.7385,-0.3214)
3629 -- ( 0.7130,-0.2617)
3630 .. controls ( 0.7337,-0.2558) and ( 0.7608,-0.2439) .. ( 0.7812,-0.2454)
3631 .. controls ( 0.7973,-0.2453) and ( 0.8226,-0.2581) .. ( 0.8346,-0.2454)
3632 .. controls ( 0.8523,-0.2285) and ( 0.8216,-0.2043) .. ( 0.8067,-0.1989)
3633 .. controls ( 0.7691,-0.1854) and ( 0.7439,-0.2093) .. ( 0.6805,-0.1933)
3634 -- ( 0.6805,-0.1448)
3635 -- ( 0.6017,-0.0907)
3636 -- ( 0.5680,-0.0907)
3637 -- ( 0.5765,-0.0484)
3638 --cycle
3639 (-0.7372,-0.0610)
3640 .. controls (-0.7812,-0.0612) and (-0.8222,-0.0885) .. (-0.7969,-0.1508)
3641 -- (-0.8546,-0.1518)
3642 .. controls (-0.8578,-0.0809) and (-0.9199,-0.0961) .. (-0.9322,-0.1220)
3643 -- (-0.9145,-0.1528)
3644 .. controls (-0.9119,-0.1539) and (-0.9110,-0.1554) .. (-0.9080,-0.1566)
3645 .. controls (-0.8746,-0.1628) and (-0.8911,-0.2081) .. (-0.8709,-0.2184)
3646 .. controls (-0.8479,-0.2301) and (-0.8289,-0.2160) .. (-0.8075,-0.2238)
3647 .. controls (-0.7880,-0.2309) and (-0.7418,-0.2959) .. (-0.7285,-0.2190)
3648 -- (-0.7712,-0.2105)
3649 .. controls (-0.7608,-0.1935) and (-0.7474,-0.1633) .. (-0.7309,-0.1535)
3650 .. controls (-0.7132,-0.1433) and (-0.6647,-0.1458) .. (-0.6532,-0.1225)
3651 .. controls (-0.6410,-0.0974) and (-0.6763,-0.0776) .. (-0.6945,-0.0697)
3652 .. controls (-0.7075,-0.0641) and (-0.7225,-0.0610) .. (-0.7372,-0.0610)
3653 --cycle
3654 ( 0.0790,-0.0703)
3655 .. controls ( 0.0586,-0.0724) and ( 0.0391,-0.0799) .. ( 0.0314,-0.0938)
3656 .. controls ( 0.0258,-0.1059) and ( 0.0293,-0.1207) .. ( 0.0314,-0.1337)
3657 .. controls (-0.0051,-0.1451) and (-0.0235,-0.1672) .. ( 0.0136,-0.1933)

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3658 -- ( 0.0050,-0.2190)
3659 -- ( 0.0647,-0.2360)
3660 -- ( 0.0561,-0.2019)
3661 -- ( 0.0391,-0.2105)
3662 -- ( 0.0307,-0.2019)
3663 -- ( 0.0818,-0.1251)
3664 -- ( 0.0988,-0.1251)
3665 .. controls ( 0.1190,-0.1566) and ( 0.1311,-0.1660) .. ( 0.1671,-0.1763)
3666 .. controls ( 0.1712,-0.1381) and ( 0.1680,-0.1029) .. ( 0.1325,-0.0792)
3667 .. controls ( 0.1208,-0.0715) and ( 0.0994,-0.0682) .. ( 0.0790,-0.0703)
3668 --cycle
3669 (-0.0347,-0.0729)
3670 .. controls (-0.0400,-0.0723) and (-0.0465,-0.0725) .. (-0.0547,-0.0739)
3671 .. controls (-0.1154,-0.1097) and (-0.0914,-0.1419) .. (-0.0629,-0.1331)
3672 .. controls (-0.0318,-0.1235) and ( 0.0014,-0.0769) .. (-0.0347,-0.0729)
3673 --cycle
3674 (-0.1485,-0.0997)
3675 -- (-0.1656,-0.1166)
3676 -- (-0.1656,-0.1251)
3677 .. controls (-0.1656,-0.1251) and (-0.1284,-0.1383) .. (-0.1230,-0.1251)
3678 .. controls (-0.1184,-0.1140) and (-0.1485,-0.0997) .. (-0.1485,-0.0997)
3679 --cycle
3680 ( 0.8579,-0.1251)
3681 -- ( 0.8579,-0.1508)
3682 -- ( 0.8921,-0.1508)
3683 -- ( 0.8921,-0.1251)
3684 --cycle
3685 ( 0.3462,-0.1848)
3686 .. controls ( 0.3553,-0.2111) and ( 0.3541,-0.2099) .. ( 0.3804,-0.2190)
3687 .. controls ( 0.3789,-0.1929) and ( 0.3722,-0.1863) .. ( 0.3462,-0.1848)
3688 --cycle
3689 ( 0.5680,-0.2105)
3690 -- ( 0.5680,-0.2360)
3691 -- ( 0.5936,-0.2360)
3692 -- ( 0.5936,-0.2105)
3693 --cycle
3694 ( 0.2429,-0.2175)
3695 .. controls ( 0.2301,-0.2183) and ( 0.2146,-0.2250) .. ( 0.2042,-0.2351)
3696 .. controls ( 0.1851,-0.2515) and ( 0.1867,-0.2802) .. ( 0.1841,-0.3042)
3697 -- ( 0.2267,-0.3128)
3698 .. controls ( 0.2366,-0.2535) and ( 0.2673,-0.2625) .. ( 0.2665,-0.2351)
3699 .. controls ( 0.2661,-0.2218) and ( 0.2558,-0.2167) .. ( 0.2429,-0.2175)
3700 --cycle
3701 (-0.8394,-0.2360)
3702 .. controls (-0.8657,-0.2452) and (-0.8037,-0.2814) .. (-0.8128,-0.3076)
3703 .. controls (-0.7841,-0.3060) and (-0.8155,-0.2595) .. (-0.8394,-0.2360)
3704 --cycle
3705 (-0.3106,-0.2446)
3706 .. controls (-0.3061,-0.2411) and (-0.2935,-0.2446) .. (-0.2935,-0.2446)
3707 .. controls (-0.2935,-0.2446) and (-0.3063,-0.2847) .. (-0.3191,-0.2787)
3708 .. controls (-0.3297,-0.2736) and (-0.3199,-0.2518) .. (-0.3106,-0.2446)
3709 --cycle
3710 ( 0.0809,-0.2495)

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3711 .. controls ( 0.0629,-0.2468) and ( 0.0475,-0.2563) .. ( 0.0307,-0.2602)
3712 .. controls ( 0.0102,-0.2651) and (-0.0913,-0.2616) .. (-0.0376,-0.3640)
3713 .. controls (-0.1141,-0.3685) and (-0.1262,-0.4016) .. (-0.0926,-0.4664)
3714 .. controls (-0.0856,-0.4795) and (-0.0758,-0.5040) .. (-0.0668,-0.5138)
3715 .. controls (-0.0449,-0.5377) and ( 0.0001,-0.5440) .. ( 0.0307,-0.5431)
3716 -- ( 0.0221,-0.4579)
3717 -- (-0.0206,-0.4833)
3718 .. controls (-0.0180,-0.4388) and (-0.0055,-0.4140) .. (-0.0633,-0.4237)
3719 .. controls (-0.0215,-0.3935) and (-0.0083,-0.4022) .. ( 0.0050,-0.3640)
3720 -- ( 0.0476,-0.3555)
3721 -- ( 0.0476,-0.3384)
3722 .. controls ( 0.0149,-0.3341) and ( 0.0150,-0.3375) .. (-0.0035,-0.3640)
3723 .. controls (-0.0031,-0.3175) and ( 0.0507,-0.3021) .. ( 0.0895,-0.3132)
3724 .. controls ( 0.0967,-0.3153) and ( 0.1020,-0.3182) .. ( 0.1069,-0.3214)
3725 -- ( 0.0733,-0.3214)
3726 -- ( 0.0733,-0.3555)
3727 -- ( 0.1073,-0.3555)
3728 -- ( 0.1073,-0.3217)
3729 .. controls ( 0.1209,-0.3306) and ( 0.1314,-0.3431) .. ( 0.1671,-0.3555)
3730 .. controls ( 0.1861,-0.3011) and ( 0.1658,-0.3044) .. ( 0.1276,-0.2793)
3731 .. controls ( 0.1121,-0.2692) and ( 0.1003,-0.2524) .. ( 0.0809,-0.2495)
3732 --cycle
3733 ( 0.5253,-0.2617)
3734 .. controls ( 0.5159,-0.2894) and ( 0.5137,-0.2935) .. ( 0.5423,-0.3042)
3735 --cycle
3736 (-0.5836,-0.2872)
3737 -- (-0.5921,-0.3299)
3738 .. controls (-0.5632,-0.3196) and (-0.5624,-0.3175) .. (-0.5665,-0.2872)
3739 --cycle
3740 ( 0.4825,-0.3113)
3741 .. controls ( 0.4709,-0.3098) and ( 0.4621,-0.3187) .. ( 0.4571,-0.3470)
3742 .. controls ( 0.4065,-0.2945) and ( 0.3565,-0.3080) .. ( 0.3141,-0.3613)
3743 .. controls ( 0.3029,-0.3754) and ( 0.2880,-0.3874) .. ( 0.2903,-0.4075)
3744 .. controls ( 0.2921,-0.4247) and ( 0.3027,-0.4361) .. ( 0.3120,-0.4493)
3745 .. controls ( 0.2945,-0.4516) and ( 0.2350,-0.4574) .. ( 0.2234,-0.4665)
3746 .. controls ( 0.2011,-0.4843) and ( 0.2099,-0.5378) .. ( 0.2182,-0.5602)
3747 -- ( 0.2352,-0.5602)
3748 .. controls ( 0.2421,-0.5417) and ( 0.2492,-0.5116) .. ( 0.2706,-0.5071)
3749 .. controls ( 0.3048,-0.4961) and ( 0.3439,-0.5674) .. ( 0.3618,-0.5071)
3750 -- ( 0.3618,-0.4833)
3751 -- ( 0.3974,-0.4919)
3752 -- ( 0.4059,-0.4579)
3753 -- ( 0.3376,-0.4493)
3754 -- ( 0.3717,-0.3896)
3755 .. controls ( 0.4306,-0.3991) and ( 0.4623,-0.4570) .. ( 0.4656,-0.3640)
3756 .. controls ( 0.4971,-0.3707) and ( 0.5062,-0.3751) .. ( 0.5253,-0.3470)
3757 -- ( 0.5451,-0.3694)
3758 .. controls ( 0.6171,-0.4271) and ( 0.5795,-0.2610) .. ( 0.5253,-0.3384)
3759 .. controls ( 0.5089,-0.3248) and ( 0.4943,-0.3128) .. ( 0.4825,-0.3113)
3760 --cycle
3761 ( 0.6371,-0.3426)
3762 .. controls ( 0.6165,-0.3414) and ( 0.6075,-0.3499) .. ( 0.6021,-0.3811)
3763 .. controls ( 0.6375,-0.3781) and ( 0.6440,-0.3786) .. ( 0.6618,-0.3470)

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3764 .. controls ( 0.6521,-0.3447) and ( 0.6439,-0.3431) .. ( 0.6371,-0.3426)
3765 --cycle
3766 ( 0.1158,-0.3640)
3767 -- ( 0.1073,-0.3981)
3768 -- ( 0.1415,-0.3981)
3769 -- ( 0.1331,-0.3640)
3770 --cycle
3771 (-0.4660,-0.3701)
3772 .. controls (-0.4757,-0.3670) and (-0.4894,-0.3727) .. (-0.4983,-0.3981)
3773 -- (-0.5580,-0.3811)
3774 .. controls (-0.5508,-0.4276) and (-0.5277,-0.4685) .. (-0.4812,-0.4833)
3775 -- (-0.4898,-0.4066)
3776 .. controls (-0.4444,-0.4042) and (-0.4498,-0.3750) .. (-0.4660,-0.3701)
3777 --cycle
3778 ( 0.1671,-0.3724)
3779 -- ( 0.1585,-0.3811)
3780 -- ( 0.1671,-0.4407)
3781 -- ( 0.1927,-0.4322)
3782 -- ( 0.1927,-0.3811)
3783 -- ( 0.1841,-0.3724)
3784 --cycle
3785 (-0.4061,-0.3746)
3786 .. controls (-0.4337,-0.3682) and (-0.4432,-0.4275) .. (-0.3933,-0.4421)
3787 .. controls (-0.3807,-0.4474) and (-0.3733,-0.4433) .. (-0.3617,-0.4421)
3788 .. controls (-0.3654,-0.4287) and (-0.3677,-0.4184) .. (-0.3740,-0.4070)
3789 .. controls (-0.3858,-0.3861) and (-0.3969,-0.3767) .. (-0.4061,-0.3746)
3790 --cycle
3791 (-0.2091,-0.4066)
3792 -- (-0.2091,-0.4298)
3793 -- (-0.1315,-0.5004)
3794 .. controls (-0.1221,-0.4446) and (-0.1606,-0.4228) .. (-0.2091,-0.4066)
3795 --cycle
3796 ( 0.6634,-0.4202)
3797 .. controls ( 0.6063,-0.4164) and ( 0.5403,-0.4628) .. ( 0.5936,-0.5175)
3798 .. controls ( 0.5533,-0.5676) and ( 0.6039,-0.5913) .. ( 0.6362,-0.5261)
3799 -- ( 0.6021,-0.5175)
3800 -- ( 0.6618,-0.5004)
3801 -- ( 0.6874,-0.5261)
3802 -- ( 0.6532,-0.4749)
3803 -- ( 0.6618,-0.4664)
3804 .. controls ( 0.6767,-0.4763) and ( 0.6924,-0.4939) .. ( 0.7031,-0.4938)
3805 .. controls ( 0.7482,-0.4516) and ( 0.7588,-0.4217) .. ( 0.6869,-0.4249)
3806 .. controls ( 0.6795,-0.4222) and ( 0.6716,-0.4207) .. ( 0.6634,-0.4202)
3807 --cycle
3808 (-0.2595,-0.4322)
3809 -- (-0.2680,-0.4407)
3810 -- (-0.2680,-0.4579)
3811 -- (-0.2595,-0.4664)
3812 -- (-0.2424,-0.4664)
3813 -- (-0.2338,-0.4579)
3814 -- (-0.2338,-0.4407)
3815 -- (-0.2424,-0.4322)
3816 --cycle

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3817 (-0.3947,-0.4820)
3818 .. controls (-0.4064,-0.4819) and (-0.4202,-0.4884) .. (-0.4300,-0.4906)
3819 .. controls (-0.4705,-0.5000) and (-0.4926,-0.4888) .. (-0.4812,-0.5431)
3820 .. controls (-0.4962,-0.5405) and (-0.5172,-0.5356) .. (-0.5319,-0.5380)
3821 .. controls (-0.5497,-0.5409) and (-0.6218,-0.5786) .. (-0.6276,-0.5954)
3822 .. controls (-0.6443,-0.6458) and (-0.5896,-0.6294) .. (-0.5665,-0.6198)
3823 -- (-0.5750,-0.6455)
3824 -- (-0.5409,-0.6540)
3825 -- (-0.5409,-0.6198)
3826 -- (-0.4727,-0.5943)
3827 -- (-0.4812,-0.6370)
3828 -- (-0.4641,-0.6028)
3829 -- (-0.4214,-0.6796)
3830 -- (-0.4044,-0.6796)
3831 .. controls (-0.3922,-0.6110) and (-0.4199,-0.5974) .. (-0.4386,-0.5431)
3832 -- (-0.4053,-0.5384)
3833 .. controls (-0.3682,-0.5271) and (-0.3698,-0.4934) .. (-0.3840,-0.4848)
3834 .. controls (-0.3872,-0.4829) and (-0.3908,-0.4821) .. (-0.3947,-0.4820)
3835 --cycle
3836 (-0.2509,-0.4833)
3837 .. controls (-0.2897,-0.5056) and (-0.2886,-0.5289) .. (-0.2509,-0.5516)
3838 -- (-0.2509,-0.5688)
3839 .. controls (-0.3046,-0.5780) and (-0.3807,-0.5721) .. (-0.3362,-0.6796)
3840 .. controls (-0.3905,-0.7060) and (-0.4127,-0.7567) .. (-0.3447,-0.7820)
3841 -- (-0.3305,-0.8084)
3842 .. controls (-0.3952,-0.8150) and (-0.4330,-0.7851) .. (-0.3796,-0.8551)
3843 .. controls (-0.3707,-0.8560) and (-0.2665,-0.8846) .. (-0.3191,-0.8587)
3844 .. controls (-0.2670,-0.8376) and (-0.2955,-0.8083) .. (-0.3191,-0.7735)
3845 .. controls (-0.2852,-0.7626) and (-0.2805,-0.7579) .. (-0.2850,-0.7222)
3846 -- (-0.3277,-0.7393)
3847 -- (-0.3277,-0.6796)
3848 .. controls (-0.2965,-0.6680) and (-0.3000,-0.6597) .. (-0.3020,-0.6285)
3849 .. controls (-0.2349,-0.6402) and (-0.2059,-0.6119) .. (-0.1513,-0.6666)
3850 .. controls (-0.1144,-0.7033) and (-0.1214,-0.7764) .. (-0.0716,-0.7828)
3851 .. controls (-0.0398,-0.7870) and (-0.0581,-0.7438) .. (-0.0633,-0.7307)
3852 .. controls (-0.0105,-0.7419) and (-0.0101,-0.7107) .. (-0.0259,-0.6944)
3853 .. controls (-0.0416,-0.6781) and (-0.0638,-0.6847) .. (-0.0920,-0.6613)
3854 .. controls (-0.1363,-0.6245) and (-0.1312,-0.5893) .. (-0.2253,-0.5516)
3855 --cycle
3856 ( 0.0893,-0.4928)
3857 .. controls ( 0.0854,-0.4941) and ( 0.0816,-0.4977) .. ( 0.0781,-0.5045)
3858 .. controls ( 0.0717,-0.5167) and ( 0.0733,-0.5538) .. ( 0.0733,-0.5688)
3859 .. controls (-0.0068,-0.5661) and ( 0.0229,-0.6522) .. ( 0.0360,-0.6661)
3860 .. controls ( 0.0456,-0.6761) and ( 0.0531,-0.6759) .. ( 0.0647,-0.6796)
3861 -- ( 0.0647,-0.6198)
3862 -- ( 0.1244,-0.6113)
3863 -- ( 0.1073,-0.5773)
3864 -- ( 0.1331,-0.5688)
3865 .. controls ( 0.1502,-0.5983) and ( 0.1514,-0.6011) .. ( 0.1841,-0.6113)
3866 .. controls ( 0.1815,-0.5647) and ( 0.1767,-0.5414) .. ( 0.1244,-0.5431)
3867 -- ( 0.1174,-0.5185)
3868 .. controls ( 0.1127,-0.5047) and ( 0.1008,-0.4886) .. ( 0.0893,-0.4928)
3869 --cycle

```

```

3870 ( 0.0647,-0.6796)
3871 .. controls ( 0.0651,-0.7162) and ( 0.0755,-0.7152) .. ( 0.1073,-0.7052)
3872 .. controls ( 0.0927,-0.6800) and ( 0.0939,-0.6798) .. ( 0.0647,-0.6796)
3873 --cycle
3874 ( 0.4429,-0.5307)
3875 .. controls ( 0.4305,-0.5311) and ( 0.4171,-0.5380) .. ( 0.4059,-0.5558)
3876 .. controls ( 0.3999,-0.5655) and ( 0.3989,-0.5750) .. ( 0.3994,-0.5861)
3877 .. controls ( 0.3998,-0.5978) and ( 0.4033,-0.6088) .. ( 0.4059,-0.6198)
3878 .. controls ( 0.4351,-0.6096) and ( 0.4347,-0.6075) .. ( 0.4400,-0.5773)
3879 .. controls ( 0.5088,-0.5860) and ( 0.4802,-0.5296) .. ( 0.4429,-0.5307)
3880 --cycle
3881 ( 0.6296,-0.5636)
3882 .. controls ( 0.6201,-0.5648) and ( 0.6129,-0.5872) .. ( 0.5850,-0.6007)
3883 .. controls ( 0.5662,-0.6071) and ( 0.5466,-0.6101) .. ( 0.5358,-0.6303)
3884 .. controls ( 0.5238,-0.6524) and ( 0.5014,-0.6717) .. ( 0.5092,-0.6929)
3885 .. controls ( 0.4879,-0.7051) and ( 0.4594,-0.7105) .. ( 0.4574,-0.7383)
3886 .. controls ( 0.4557,-0.7622) and ( 0.5198,-0.8058) .. ( 0.5459,-0.7885)
3887 .. controls ( 0.5602,-0.7791) and ( 0.4924,-0.7612) .. ( 0.5176,-0.7262)
3888 -- ( 0.5713,-0.7309)
3889 .. controls ( 0.6461,-0.7123) and ( 0.5265,-0.6556) .. ( 0.6262,-0.6344)
3890 .. controls ( 0.6303,-0.6340) and ( 0.6389,-0.6314) .. ( 0.6474,-0.6278)
3891 -- ( 0.6629,-0.6006)
3892 .. controls ( 0.6611,-0.5976) and ( 0.6583,-0.5944) .. ( 0.6541,-0.5908)
3893 .. controls ( 0.6418,-0.5698) and ( 0.6353,-0.5628) .. ( 0.6296,-0.5636)
3894 --cycle
3895 ( 0.2723,-0.5991)
3896 .. controls ( 0.2592,-0.6003) and ( 0.2468,-0.6028) .. ( 0.2363,-0.6064)
3897 .. controls ( 0.1997,-0.6189) and ( 0.1915,-0.6622) .. ( 0.2438,-0.6796)
3898 -- ( 0.2524,-0.6540)
3899 -- ( 0.2694,-0.6540)
3900 -- ( 0.2438,-0.6796)
3901 -- ( 0.2352,-0.7052)
3902 .. controls ( 0.1815,-0.6689) and ( 0.1445,-0.7418) .. ( 0.2182,-0.7649)
3903 .. controls ( 0.2103,-0.7956) and ( 0.2084,-0.7983) .. ( 0.2267,-0.8246)
3904 .. controls ( 0.1155,-0.7748) and ( 0.1095,-0.9097) .. ( 0.1942,-0.8505)
3905 -- ( 0.2141,-0.8675)
3906 .. controls ( 0.2535,-0.8323) and ( 0.2056,-0.8655) .. ( 0.2756,-0.8643)
3907 -- ( 0.2903,-0.8720)
3908 -- ( 0.3279,-0.8720)
3909 -- ( 0.3427,-0.8612)
3910 .. controls ( 0.3869,-0.8663) and ( 0.4661,-0.8748) .. ( 0.4741,-0.8502)
3911 .. controls ( 0.5431,-0.8855) and ( 0.5233,-0.7888) .. ( 0.5039,-0.8143)
3912 .. controls ( 0.4752,-0.7958) and ( 0.5046,-0.8131) .. ( 0.4741,-0.8331)
3913 .. controls ( 0.3949,-0.7997) and ( 0.4522,-0.8406) .. ( 0.3683,-0.8327)
3914 .. controls ( 0.3744,-0.7942) and ( 0.4288,-0.7829) .. ( 0.4051,-0.7307)
3915 .. controls ( 0.4260,-0.7007) and ( 0.4185,-0.6946) .. ( 0.4051,-0.6626)
3916 .. controls ( 0.3990,-0.6503) and ( 0.3940,-0.6359) .. ( 0.3839,-0.6265)
3917 .. controls ( 0.3585,-0.6027) and ( 0.3119,-0.5953) .. ( 0.2723,-0.5991)
3918 --cycle
3919 (-0.2424,-0.6455)
3920 -- (-0.2424,-0.6796)
3921 -- (-0.1997,-0.6711)
3922 -- (-0.1997,-0.6540)

```



```

3923 --cycle
3924 ( 0.2950,-0.6455)
3925 .. controls ( 0.3615,-0.6477) and ( 0.3567,-0.6705) .. ( 0.3974,-0.7222)
3926 .. controls ( 0.3592,-0.8249) and ( 0.3353,-0.7947) .. ( 0.2609,-0.7990)
3927 -- ( 0.2438,-0.7649)
3928 .. controls ( 0.2681,-0.7474) and ( 0.2638,-0.7424) .. ( 0.2609,-0.7137)
3929 -- ( 0.2950,-0.6881)
3930 .. controls ( 0.3035,-0.6916) and ( 0.3102,-0.6959) .. ( 0.3198,-0.6974)
3931 .. controls ( 0.3496,-0.7020) and ( 0.3487,-0.6665) .. ( 0.3120,-0.6881)
3932 --cycle
3933 (-0.6122,-0.6460)
3934 .. controls (-0.6202,-0.6484) and (-0.6222,-0.6534) .. (-0.6220,-0.6591)
3935 -- (-0.6084,-0.6829)
3936 .. controls (-0.6039,-0.6880) and (-0.6001,-0.6940) .. (-0.5958,-0.6974)
3937 .. controls (-0.5822,-0.7078) and (-0.5979,-0.7175) .. (-0.5836,-0.7137)
3938 -- (-0.5557,-0.7397)
3939 .. controls (-0.5863,-0.7181) and (-0.4852,-0.7770) .. (-0.5233,-0.7812)
3940 .. controls (-0.4643,-0.7650) and (-0.4542,-0.8172) .. (-0.4400,-0.7940)
3941 .. controls (-0.4310,-0.7794) and (-0.4454,-0.7672) .. (-0.4569,-0.7609)
3942 .. controls (-0.5042,-0.7356) and (-0.5468,-0.7364) .. (-0.5580,-0.6711)
3943 .. controls (-0.5740,-0.6662) and (-0.5960,-0.6410) .. (-0.6122,-0.6460)
3944 --cycle
3945 (-0.2799,-0.6723)
3946 .. controls (-0.2946,-0.6977) and (-0.2726,-0.7009) .. (-0.2645,-0.6954)
3947 .. controls (-0.2563,-0.6899) and (-0.2508,-0.6683) .. (-0.2799,-0.6723)
3948 --cycle
3949 (-0.1741,-0.6796)
3950 -- (-0.1826,-0.6881)
3951 -- (-0.1826,-0.7052)
3952 -- (-0.1571,-0.6796)
3953 --cycle
3954 ( 0.0647,-0.7393)
3955 -- ( 0.0733,-0.7735)
3956 -- ( 0.0902,-0.7735)
3957 -- ( 0.0988,-0.7649)
3958 -- ( 0.0988,-0.7478)
3959 --cycle
3960 ( 0.2267,-0.7564)
3961 -- ( 0.2352,-0.7564)
3962 -- ( 0.2352,-0.7649)
3963 --cycle
3964 (-0.2765,-0.7649)
3965 -- (-0.2850,-0.7990)
3966 -- (-0.2509,-0.7905)
3967 -- (-0.2595,-0.7649)
3968 --cycle
3969 (-0.1620,-0.7999)
3970 .. controls (-0.1665,-0.7994) and (-0.1723,-0.7994) .. (-0.1792,-0.8003)
3971 .. controls (-0.2378,-0.8436) and (-0.2549,-0.8217) .. (-0.2658,-0.8441)
3972 .. controls (-0.2799,-0.8733) and (-0.2098,-0.8685) .. (-0.1746,-0.8466)
3973 .. controls (-0.1557,-0.8347) and (-0.1302,-0.8033) .. (-0.1620,-0.7999)
3974 --cycle
3975 (-0.0021,-0.8033)

```

```

3976 .. controls (-0.0289,-0.7979) and (-0.0697,-0.8240) .. (-0.0817,-0.8284)
3977 .. controls (-0.1018,-0.8361) and (-0.1245,-0.8333) .. (-0.1384,-0.8539)
3978 .. controls (-0.1534,-0.8760) and (-0.1093,-0.8641) .. (-0.0866,-0.8639)
3979 .. controls (-0.0704,-0.8637) and (-0.0573,-0.8695) .. (-0.0331,-0.8549)
3980 .. controls ( 0.0004,-0.8348) and (-0.0157,-0.8559) .. ( 0.0221,-0.8587)
3981 .. controls ( 0.0252,-0.8212) and ( 0.0141,-0.8066) .. (-0.0021,-0.8033)
3982 --cycle
3983 ( 0.1096,-0.8160)
3984 .. controls ( 0.1044,-0.8138) and ( 0.0965,-0.8137) .. ( 0.0850,-0.8167)
3985 .. controls ( 0.0624,-0.8514) and ( 0.0794,-0.8648) .. ( 0.0988,-0.8546)
3986 .. controls ( 0.1148,-0.8462) and ( 0.1249,-0.8224) .. ( 0.1096,-0.8160)
3987 --cycle
3988 (-0.4386,-0.8161)
3989 -- (-0.4386,-0.8587)
3990 .. controls (-0.3929,-0.8508) and (-0.3929,-0.8240) .. (-0.4386,-0.8161)
3991 --cycle
3992 (-0.4898,-0.8246)
3993 -- (-0.5227,-0.8312)
3994 -- (-0.5082,-0.8563)
3995 .. controls (-0.5034,-0.8573) and (-0.4999,-0.8586) .. (-0.4898,-0.8587)
3996 -- (-0.4878,-0.8720)
3997 -- (-0.4837,-0.8720)
3998 -- (-0.4565,-0.8673)
3999 --cycle
4000 ;
4001 }
4002 }
4003 \fi

```

hex/terrain/swamp

The pattern for swamps. The pattern is filled with a light blue.

```

4004 \tikzset{
4005   hex/terrain/swamp/.style={
4006     draw=none,
4007     fill={rgb,100:red,26;green,55;blue,70}
4008   }
4009 }

```

hex/terrain/swamp

Swamps. This is probably the shortest of the terrain patterns.



```

4010 \ifhex@terrain@pic
4011 \tikzset{
4012   hex/terrain/swamp/.pic={

```

```

4013 \path[hex/terrain/swamp,pic actions,draw=none]
4014 (-0.5026, 0.8699)
4015 -- (-0.5041, 0.8672)
4016 .. controls (-0.3586, 0.8441) and (-0.1148, 0.8722) .. ( 0.0006, 0.8697)
4017 -- ( 0.2386, 0.8529)
4018 -- ( 0.2386, 0.8699)
4019 --cycle
4020 ( 0.4257, 0.8699)
4021 -- ( 0.4257, 0.8529)
4022 -- ( 0.5112, 0.8558)
4023 -- ( 0.5033, 0.8699)
4024 --cycle
4025 ( 0.3067, 0.8359)
4026 -- ( 0.2897, 0.7848)
4027 -- ( 0.2726, 0.8188)
4028 -- ( 0.2556, 0.8188)
4029 -- ( 0.2217, 0.7509)
4030 -- ( 0.5719, 0.7509)
4031 -- ( 0.5621, 0.7679)
4032 -- ( 0.5617, 0.7679)
4033 -- ( 0.3746, 0.7848)
4034 -- ( 0.3746, 0.8359)
4035 --cycle
4036 (-0.3225, 0.7848)
4037 -- (-0.3225, 0.7509)
4038 -- ( 0.0856, 0.7509)
4039 -- ( 0.0856, 0.7848)
4040 --cycle
4041 (-0.5555, 0.7782)
4042 -- (-0.5713, 0.7509)
4043 -- (-0.5097, 0.7509)
4044 --cycle
4045 ( 0.2789, 0.6696)
4046 .. controls ( 0.2234, 0.6713) and ( 0.1659, 0.6658) .. ( 0.1195, 0.6658)
4047 -- (-0.6117, 0.6658)
4048 -- (-0.6117, 0.6318)
4049 -- ( 0.4257, 0.6318)
4050 .. controls ( 0.3878, 0.6597) and ( 0.3344, 0.6681) .. ( 0.2789, 0.6696)
4051 --cycle
4052 ( 0.6297, 0.6318)
4053 -- ( 0.6297, 0.5468)
4054 -- ( 0.5617, 0.5807)
4055 .. controls ( 0.5449, 0.5387) and ( 0.5194, 0.5474) .. ( 0.4764, 0.5468)
4056 -- ( 0.2047, 0.5468)
4057 .. controls ( 0.2857, 0.5146) and ( 0.5508, 0.5135) .. ( 0.7089, 0.5136)
4058 -- ( 0.6740, 0.5740)
4059 -- ( 0.6638, 0.5637)
4060 --cycle
4061 (-0.6684, 0.5591)
4062 .. controls (-0.6731, 0.5588) and (-0.6784, 0.5577) .. (-0.6832, 0.5571)
4063 -- (-0.6990, 0.5298)
4064 -- (-0.5777, 0.5298)
4065 .. controls (-0.6139, 0.5561) and (-0.6407, 0.5608) .. (-0.6684, 0.5591)

```

```

4066  --cycle
4067  (-0.3396, 0.5468)
4068  .. controls (-0.2194, 0.4991) and (-0.1285, 0.5826) .. (-0.0845, 0.4447)
4069  -- (-0.1525, 0.4957)
4070  -- (-0.1525, 0.4277)
4071  .. controls (-0.0482, 0.4023) and ( 0.2732, 0.3989) .. ( 0.3746, 0.4277)
4072  .. controls ( 0.2597, 0.4733) and ( 0.2397, 0.4045) .. ( 0.1026, 0.4957)
4073  -- ( 0.0686, 0.4617)
4074  -- ( 0.0516, 0.4617)
4075  -- ( 0.0686, 0.5298)
4076  -- ( 0.0006, 0.4447)
4077  -- ( 0.0006, 0.5468)
4078  --cycle
4079  (-0.0675, 0.5127)
4080  -- (-0.0164, 0.5127)
4081  -- (-0.0505, 0.4447)
4082  --cycle
4083  (-0.7435, 0.4527)
4084  -- (-0.7580, 0.4277)
4085  -- (-0.6797, 0.4277)
4086  .. controls (-0.6982, 0.4394) and (-0.7200, 0.4471) .. (-0.7435, 0.4527)
4087  --cycle
4088  (-0.5266, 0.4447)
4089  .. controls (-0.4681, 0.4018) and (-0.4413, 0.4086) .. (-0.3736, 0.4277)
4090  --cycle
4091  ( 0.5787, 0.4277)
4092  -- ( 0.5447, 0.3257)
4093  -- ( 0.5108, 0.3257)
4094  -- ( 0.4597, 0.4107)
4095  -- ( 0.4597, 0.3257)
4096  -- ( 0.4257, 0.3937)
4097  -- ( 0.4087, 0.3257)
4098  -- ( 0.2897, 0.3257)
4099  .. controls ( 0.3725, 0.2928) and ( 0.6913, 0.3087) .. ( 0.7998, 0.3087)
4100  .. controls ( 0.7426, 0.3376) and ( 0.7264, 0.3382) .. ( 0.6638, 0.3257)
4101  -- ( 0.6638, 0.3767)
4102  -- ( 0.5787, 0.3257)
4103  --cycle
4104  (-0.7817, 0.3257)
4105  -- (-0.7137, 0.2407)
4106  -- (-0.7988, 0.2746)
4107  .. controls (-0.8162, 0.2534) and (-0.8404, 0.2432) .. (-0.8672, 0.2385)
4108  -- (-0.8857, 0.2066)
4109  -- (-0.6627, 0.2066)
4110  .. controls (-0.5059, 0.2059) and (-0.2690, 0.1655) .. (-0.1185, 0.2066)
4111  .. controls (-0.2358, 0.2532) and (-0.4834, 0.1773) .. (-0.5607, 0.2746)
4112  -- (-0.6287, 0.2237)
4113  -- (-0.6457, 0.2407)
4114  .. controls (-0.5823, 0.3108) and (-0.5667, 0.3074) .. (-0.4756, 0.3087)
4115  --cycle
4116  ( 0.8338, 0.2576)
4117  -- ( 0.7998, 0.2066)
4118  -- ( 0.8906, 0.1990)

```

```

4119 -- ( 0.8567, 0.2576)
4120 --cycle
4121 (-0.0164, 0.2237)
4122 .. controls ( 0.0715, 0.1799) and ( 0.3189, 0.1896) .. ( 0.4257, 0.1896)
4123 -- ( 0.4257, 0.2237)
4124 --cycle
4125 (-0.2716, 0.1216)
4126 -- (-0.2716, 0.0876)
4127 -- ( 0.1501, 0.0876)
4128 -- ( 0.1434, 0.1042)
4129 -- ( 0.0345, 0.1216)
4130 --cycle
4131 ( 0.1501, 0.0876)
4132 -- ( 0.1536, 0.0789)
4133 -- ( 0.1536, 0.0876)
4134 --cycle
4135 ( 0.1536, 0.0789)
4136 -- ( 0.1536, 0.0196)
4137 -- ( 0.0856, 0.0534)
4138 -- ( 0.0686,-0.0145)
4139 -- ( 0.7658,-0.0145)
4140 .. controls ( 0.6332, 0.0380) and ( 0.4479,-0.0524) .. ( 0.3406, 0.0534)
4141 -- ( 0.3236, 0.0534)
4142 -- ( 0.2897, 0.0196)
4143 -- ( 0.2897, 0.0876)
4144 -- ( 0.2556, 0.0196)
4145 -- ( 0.2386, 0.0876)
4146 -- ( 0.1705, 0.0365)
4147 --cycle
4148 ( 0.3917, 0.1216)
4149 -- ( 0.3917, 0.0876)
4150 -- ( 0.8678, 0.0876)
4151 .. controls ( 0.7768, 0.1266) and ( 0.5022, 0.1216) .. ( 0.3917, 0.1216)
4152 --cycle
4153 (-0.9351, 0.1208)
4154 -- (-0.9518, 0.0921)
4155 -- (-0.9518, 0.0876)
4156 -- (-0.6117, 0.1045)
4157 --cycle
4158 (-0.9144, 0.0213)
4159 .. controls (-0.9468, 0.0204) and (-0.9775, 0.0109) .. (-0.9996,-0.0116)
4160 -- (-0.9982,-0.0141)
4161 -- (-0.8158, 0.0026)
4162 .. controls (-0.8449, 0.0142) and (-0.8804, 0.0222) .. (-0.9144, 0.0213)
4163 --cycle
4164 (-0.6287, 0.0196)
4165 .. controls (-0.5470,-0.0404) and (-0.2796,-0.0145) .. (-0.1695,-0.0145)
4166 -- (-0.1695, 0.0196)
4167 --cycle
4168 (-0.9488,-0.0996)
4169 -- (-0.9292,-0.1335)
4170 -- (-0.4756,-0.1335)
4171 -- (-0.4756,-0.0996)

```

```

4172 --cycle
4173 (-0.2886,-0.0996)
4174 -- (-0.2886,-0.1335)
4175 -- ( 0.2726,-0.1335)
4176 .. controls ( 0.2164,-0.0920) and ( 0.1871,-0.0997) .. ( 0.1195,-0.0996)
4177 --cycle
4178 ( 0.5478,-0.1025)
4179 .. controls ( 0.5070,-0.1018) and ( 0.4651,-0.1086) .. ( 0.4257,-0.1165)
4180 -- ( 0.6638,-0.1335)
4181 .. controls ( 0.6286,-0.1113) and ( 0.5887,-0.1031) .. ( 0.5478,-0.1025)
4182 --cycle
4183 ( 0.8928,-0.1132)
4184 .. controls ( 0.8481,-0.1114) and ( 0.8007,-0.1165) .. ( 0.7658,-0.1165)
4185 -- ( 0.9264,-0.1394)
4186 -- ( 0.9384,-0.1186)
4187 .. controls ( 0.9238,-0.1157) and ( 0.9087,-0.1137) .. ( 0.8928,-0.1132)
4188 --cycle
4189 (-0.2982,-0.2002)
4190 .. controls (-0.3469,-0.2010) and (-0.3950,-0.2053) .. (-0.4416,-0.2185)
4191 -- (-0.0505,-0.2355)
4192 -- ( 0.7827,-0.2355)
4193 .. controls ( 0.6739,-0.1909) and ( 0.4335,-0.2017) .. ( 0.3067,-0.2016)
4194 -- (-0.1525,-0.2016)
4195 .. controls (-0.2005,-0.2016) and (-0.2496,-0.1992) .. (-0.2982,-0.2002)
4196 --cycle
4197 (-0.8328,-0.2016)
4198 .. controls (-0.7894,-0.2498) and (-0.7244,-0.2355) .. (-0.6627,-0.2355)
4199 -- (-0.6627,-0.3034)
4200 -- (-0.6967,-0.2696)
4201 -- (-0.7137,-0.2696)
4202 .. controls (-0.7385,-0.3064) and (-0.7772,-0.3191) .. (-0.8200,-0.3227)
4203 -- (-0.8113,-0.3377)
4204 .. controls (-0.6682,-0.3440) and (-0.4684,-0.3376) .. (-0.3906,-0.3376)
4205 -- (-0.4586,-0.2696)
4206 -- (-0.5266,-0.3034)
4207 -- (-0.5097,-0.2355)
4208 -- (-0.5607,-0.3206)
4209 -- (-0.5777,-0.2355)
4210 -- (-0.6457,-0.3034)
4211 -- (-0.6287,-0.2185)
4212 --cycle
4213 ( 0.8169,-0.2866)
4214 -- ( 0.7489,-0.3206)
4215 .. controls ( 0.7652,-0.3284) and ( 0.7871,-0.3345) .. ( 0.8114,-0.3386)
4216 -- ( 0.8324,-0.3020)
4217 --cycle
4218 ( 0.2076,-0.3170)
4219 .. controls ( 0.0913,-0.3168) and (-0.0288,-0.3206) .. (-0.0845,-0.3206)
4220 -- ( 0.2509,-0.3621)
4221 -- ( 0.2897,-0.4056)
4222 -- ( 0.2556,-0.3716)
4223 -- ( 0.2386,-0.3716)
4224 -- ( 0.2386,-0.4566)

```

```

4225 -- ( 0.4257,-0.4566)
4226 -- ( 0.3746,-0.3716)
4227 -- ( 0.3067,-0.4226)
4228 -- ( 0.3067,-0.3547)
4229 -- ( 0.4766,-0.3376)
4230 .. controls ( 0.4363,-0.3215) and ( 0.3237,-0.3172) .. ( 0.2076,-0.3170)
4231 --cycle
4232 (-0.7622,-0.4226)
4233 -- (-0.7427,-0.4566)
4234 -- (-0.5607,-0.4566)
4235 -- (-0.5607,-0.4226)
4236 --cycle
4237 (-0.3396,-0.4226)
4238 -- (-0.3396,-0.4566)
4239 -- (-0.0164,-0.4566)
4240 -- (-0.0164,-0.4226)
4241 --cycle
4242 ( 0.5787,-0.4226)
4243 .. controls ( 0.6179,-0.4661) and ( 0.6835,-0.4595) .. ( 0.7407,-0.4607)
4244 -- ( 0.7528,-0.4400)
4245 .. controls ( 0.6947,-0.4396) and ( 0.6370,-0.4368) .. ( 0.5787,-0.4226)
4246 --cycle
4247 (-0.2496,-0.5239)
4248 .. controls (-0.2827,-0.5212) and (-0.3176,-0.5246) .. (-0.3566,-0.5246)
4249 -- (-0.7034,-0.5246)
4250 -- (-0.6873,-0.5524)
4251 .. controls (-0.6429,-0.5639) and (-0.5972,-0.5587) .. (-0.5436,-0.5587)
4252 -- (-0.1525,-0.5587)
4253 .. controls (-0.1848,-0.5349) and (-0.2163,-0.5263) .. (-0.2496,-0.5239)
4254 --cycle
4255 (-0.0164,-0.5417)
4256 .. controls ( 0.0514,-0.5917) and ( 0.1065,-0.5717) .. ( 0.1876,-0.5736)
4257 .. controls ( 0.2932,-0.5761) and ( 0.5300,-0.5848) .. ( 0.6766,-0.5720)
4258 -- ( 0.6872,-0.5538)
4259 -- ( 0.4937,-0.5417)
4260 --cycle
4261 (-0.6255,-0.6593)
4262 -- (-0.6248,-0.6607)
4263 -- (-0.6117,-0.6607)
4264 --cycle
4265 (-0.5777,-0.6607)
4266 -- (-0.5777,-0.7287)
4267 -- (-0.5856,-0.7287)
4268 -- (-0.5659,-0.7627)
4269 -- (-0.3906,-0.7627)
4270 -- (-0.1695,-0.7627)
4271 -- (-0.4246,-0.7287)
4272 -- (-0.4076,-0.6607)
4273 -- (-0.4416,-0.7287)
4274 -- (-0.4756,-0.7287)
4275 -- (-0.4756,-0.6607)
4276 -- (-0.5097,-0.6607)
4277 -- (-0.5097,-0.7287)

```

```

4278 --cycle
4279 ( 0.0686,-0.7457)
4280 .. controls ( 0.1464,-0.8028) and ( 0.3428,-0.7798) .. ( 0.4427,-0.7798)
4281 -- ( 0.4427,-0.7457)
4282 --cycle
4283 (-0.3736,-0.8478)
4284 -- (-0.3736,-0.8722)
4285 -- (-0.2203,-0.8722)
4286 .. controls (-0.2708,-0.8419) and (-0.3097,-0.8478) .. (-0.3736,-0.8478)
4287 --cycle
4288 (-0.0172,-0.8544)
4289 .. controls (-0.0398,-0.8556) and (-0.0623,-0.8586) .. (-0.0845,-0.8648)
4290 .. controls (-0.0753,-0.8684) and (-0.0664,-0.8700) .. (-0.0573,-0.8722)
4291 -- ( 0.5033,-0.8722)
4292 -- ( 0.5088,-0.8626)
4293 .. controls ( 0.3892,-0.8602) and ( 0.2527,-0.8649) .. ( 0.1876,-0.8648)
4294 .. controls ( 0.1186,-0.8647) and ( 0.0502,-0.8509) .. (-0.0172,-0.8544)
4295 --cycle
4296 ;
4297 }
4298 }
4299 \fi

```

hex/terrain/rough

The style for rough hexes. The pattern is filled with a light brown, and outlines are not drawn.

```

4300 \tikzset{
4301   hex/terrain/rough/.style={
4302     draw=none,
4303     fill={rgb,100:red,79;green,68;blue,41}
4304   }
4305 }

```

hex/terrain/rough

Roughs. Again, a bit long.



```

4306 \ifhex@terrain@pic
4307 \tikzset{
4308   hex/terrain/rough/.pic={
4309     \path[hex/terrain/rough,pic actions,draw=none]
4310       (-0.2701, 0.8873)
4311       .. controls (-0.2982, 0.8927) and (-0.3250, 0.8675) .. (-0.3296, 0.8537)
4312       .. controls (-0.3363, 0.8337) and (-0.3058, 0.8263) .. (-0.2820, 0.8610)
4313       .. controls (-0.2717, 0.8450) and (-0.2591, 0.8228) .. (-0.2441, 0.8112)

```



```

4314 .. controls (-0.2057, 0.7817) and (-0.1394, 0.7709) .. (-0.1208, 0.8270)
4315 -- (-0.2226, 0.8355)
4316 .. controls (-0.2359, 0.8698) and (-0.2532, 0.8840) .. (-0.2701, 0.8873)
4317 --cycle
4318 (-0.1081, 0.8792)
4319 .. controls (-0.1371, 0.8680) and (-0.1265, 0.8900) .. (-0.1377, 0.8610)
4320 .. controls (-0.1121, 0.8691) and (-0.1163, 0.8536) .. (-0.1081, 0.8792)
4321 --cycle
4322 ( 0.1762, 0.8752)
4323 -- ( 0.1761, 0.8710)
4324 .. controls ( 0.1746, 0.8556) and ( 0.1707, 0.8704) .. ( 0.1822, 0.8575)
4325 .. controls ( 0.1958, 0.8423) and ( 0.2514, 0.8065) .. ( 0.2435, 0.8694)
4326 --cycle
4327 ( 0.3216, 0.8740)
4328 .. controls ( 0.3061, 0.8744) and ( 0.2932, 0.8668) .. ( 0.2896, 0.8414)
4329 .. controls ( 0.2869, 0.8222) and ( 0.3049, 0.8110) .. ( 0.3122, 0.7930)
4330 -- ( 0.3292, 0.7930)
4331 -- ( 0.3377, 0.8440)
4332 -- ( 0.3874, 0.8438)
4333 -- ( 0.3702, 0.8584)
4334 .. controls ( 0.3556, 0.8652) and ( 0.3372, 0.8736) .. ( 0.3216, 0.8740)
4335 --cycle
4336 ( 0.4696, 0.8697)
4337 .. controls ( 0.4362, 0.8687) and ( 0.4116, 0.8113) .. ( 0.4594, 0.7865)
4338 -- ( 0.4565, 0.8238)
4339 -- ( 0.5034, 0.8485)
4340 .. controls ( 0.4927, 0.8641) and ( 0.4807, 0.8700) .. ( 0.4696, 0.8697)
4341 --cycle
4342 (-0.0783, 0.8695)
4343 -- (-0.0698, 0.8185)
4344 -- (-0.0528, 0.8185)
4345 .. controls (-0.0488, 0.8507) and (-0.0499, 0.8533) .. (-0.0783, 0.8695)
4346 --cycle
4347 ( 0.0321, 0.8695)
4348 .. controls (-0.0074, 0.8534) and (-0.0195, 0.8453) .. (-0.0104, 0.8015)
4349 .. controls ( 0.0252, 0.8183) and ( 0.0356, 0.8295) .. ( 0.0321, 0.8695)
4350 --cycle
4351 (-0.4155, 0.8596)
4352 .. controls (-0.4417, 0.8307) and (-0.4165, 0.8213) .. (-0.4032, 0.8284)
4353 .. controls (-0.3903, 0.8353) and (-0.3789, 0.8639) .. (-0.4155, 0.8596)
4354 --cycle
4355 (-0.4857, 0.8525)
4356 .. controls (-0.4972, 0.8321) and (-0.5172, 0.8207) .. (-0.5389, 0.8116)
4357 -- (-0.5595, 0.7763)
4358 .. controls (-0.5377, 0.7748) and (-0.5144, 0.7944) .. (-0.4942, 0.8100)
4359 -- (-0.4857, 0.7845)
4360 .. controls (-0.4503, 0.8051) and (-0.4552, 0.8169) .. (-0.4688, 0.8525)
4361 --cycle
4362 ( 0.1002, 0.8511)
4363 .. controls ( 0.0869, 0.8528) and ( 0.0769, 0.8478) .. ( 0.0696, 0.8260)
4364 -- ( 0.1509, 0.8185)
4365 -- ( 0.1509, 0.8355)
4366 .. controls ( 0.1302, 0.8408) and ( 0.1135, 0.8493) .. ( 0.1002, 0.8511)

```

```

4367 --cycle
4368 ( 0.2485, 0.8268)
4369 .. controls ( 0.2378, 0.8296) and ( 0.2250, 0.8213) .. ( 0.2103, 0.7930)
4370 .. controls ( 0.2410, 0.7676) and ( 0.2451, 0.7555) .. ( 0.2867, 0.7591)
4371 .. controls ( 0.2791, 0.7861) and ( 0.2665, 0.8220) .. ( 0.2485, 0.8268)
4372 --cycle
4373 (-0.3754, 0.8100)
4374 -- (-0.3754, 0.7930)
4375 -- (-0.3330, 0.7930)
4376 -- (-0.3330, 0.8100)
4377 --cycle
4378 ( 0.5066, 0.8010)
4379 -- ( 0.5131, 0.7667)
4380 -- ( 0.5443, 0.7538)
4381 -- ( 0.5566, 0.7611)
4382 -- ( 0.5392, 0.7958)
4383 --cycle
4384 (-0.4008, 0.7930)
4385 -- (-0.4348, 0.7591)
4386 --cycle
4387 ( 0.1509, 0.7930)
4388 -- ( 0.1254, 0.7676)
4389 .. controls ( 0.1432, 0.7361) and ( 0.1497, 0.7365) .. ( 0.1849, 0.7336)
4390 .. controls ( 0.1820, 0.7688) and ( 0.1824, 0.7753) .. ( 0.1509, 0.7930)
4391 --cycle
4392 ( 0.0301, 0.7854)
4393 .. controls ( 0.0240, 0.7861) and ( 0.0162, 0.7858) .. ( 0.0066, 0.7845)
4394 -- ( 0.0490, 0.7421)
4395 .. controls ( 0.0527, 0.7709) and ( 0.0486, 0.7831) .. ( 0.0301, 0.7854)
4396 --cycle
4397 (-0.2757, 0.7847)
4398 .. controls (-0.2819, 0.7857) and (-0.2896, 0.7857) .. (-0.2990, 0.7845)
4399 -- (-0.2820, 0.7411)
4400 .. controls (-0.3010, 0.7423) and (-0.3576, 0.7485) .. (-0.3704, 0.7411)
4401 .. controls (-0.3832, 0.7314) and (-0.3819, 0.7137) .. (-0.3644, 0.7089)
4402 .. controls (-0.3522, 0.7029) and (-0.3199, 0.7069) .. (-0.3075, 0.7089)
4403 .. controls (-0.2647, 0.7227) and (-0.2326, 0.7776) .. (-0.2757, 0.7847)
4404 --cycle
4405 ( 0.3631, 0.7676)
4406 -- ( 0.3122, 0.7479)
4407 .. controls ( 0.3064, 0.6995) and ( 0.3021, 0.7030) .. ( 0.3546, 0.7166)
4408 .. controls ( 0.3550, 0.6777) and ( 0.3499, 0.6644) .. ( 0.3886, 0.6488)
4409 .. controls ( 0.3854, 0.7398) and ( 0.3467, 0.6989) .. ( 0.3631, 0.7676)
4410 --cycle
4411 ( 0.5753, 0.7676)
4412 .. controls ( 0.5837, 0.7354) and ( 0.5927, 0.7219) .. ( 0.6097, 0.7131)
4413 -- ( 0.5796, 0.7669)
4414 .. controls ( 0.5781, 0.7670) and ( 0.5768, 0.7674) .. ( 0.5753, 0.7676)
4415 --cycle
4416 (-0.5536, 0.7591)
4417 -- (-0.5706, 0.7082)
4418 -- (-0.5621, 0.6997)
4419 -- (-0.5027, 0.6997)

```

```

4420 .. controls (-0.5136, 0.7365) and (-0.5192, 0.7422) .. (-0.5536, 0.7591)
4421 --cycle
4422 (-0.1361, 0.7534)
4423 .. controls (-0.1512, 0.7509) and (-0.1612, 0.7304) .. (-0.1462, 0.6912)
4424 -- (-0.0953, 0.7082)
4425 .. controls (-0.1007, 0.7406) and (-0.1210, 0.7560) .. (-0.1361, 0.7534)
4426 --cycle
4427 (-0.4655, 0.7519)
4428 .. controls (-0.4811, 0.7476) and (-0.4887, 0.7146) .. (-0.4551, 0.6911)
4429 .. controls (-0.4447, 0.6838) and (-0.4376, 0.6846) .. (-0.4263, 0.6827)
4430 -- (-0.4362, 0.7201)
4431 .. controls (-0.4440, 0.7466) and (-0.4562, 0.7544) .. (-0.4655, 0.7519)
4432 --cycle
4433 (-0.2311, 0.7421)
4434 -- (-0.2480, 0.7082)
4435 -- (-0.1971, 0.6827)
4436 -- (-0.2141, 0.7421)
4437 --cycle
4438 ( 0.4819, 0.7421)
4439 -- ( 0.5244, 0.7082)
4440 -- ( 0.5329, 0.7166)
4441 -- ( 0.5329, 0.7336)
4442 --cycle
4443 ( 0.4140, 0.7336)
4444 .. controls ( 0.4091, 0.6951) and ( 0.4180, 0.6863) .. ( 0.4565, 0.6912)
4445 --cycle
4446 ( 0.1000, 0.7166)
4447 .. controls ( 0.0969, 0.7064) and ( 0.0893, 0.6845) .. ( 0.0896, 0.6747)
4448 .. controls ( 0.0911, 0.6142) and ( 0.1603, 0.6571) .. ( 0.1849, 0.6658)
4449 -- ( 0.2260, 0.6725)
4450 .. controls ( 0.2381, 0.6766) and ( 0.2515, 0.6891) .. ( 0.2429, 0.7019)
4451 .. controls ( 0.2330, 0.7185) and ( 0.1897, 0.7058) .. ( 0.1756, 0.7019)
4452 -- ( 0.1339, 0.6827)
4453 --cycle
4454 ( 0.0321, 0.7082)
4455 -- (-0.0019, 0.6318)
4456 .. controls ( 0.0528, 0.6362) and ( 0.0992, 0.6731) .. ( 0.0321, 0.7082)
4457 --cycle
4458 ( 0.5074, 0.6997)
4459 .. controls ( 0.5090, 0.6563) and ( 0.5107, 0.6351) .. ( 0.5584, 0.6572)
4460 --cycle
4461 (-0.6116, 0.6867)
4462 -- (-0.6413, 0.6359)
4463 .. controls (-0.6321, 0.6229) and (-0.6158, 0.6171) .. (-0.6009, 0.6289)
4464 .. controls (-0.5820, 0.6437) and (-0.5846, 0.6623) .. (-0.5876, 0.6827)
4465 --cycle
4466 (-0.3414, 0.6742)
4467 .. controls (-0.3515, 0.6371) and (-0.3559, 0.6083) .. (-0.3075, 0.6148)
4468 -- (-0.3245, 0.6742)
4469 --cycle
4470 (-0.5112, 0.6657)
4471 -- (-0.5112, 0.6318)
4472 -- (-0.4772, 0.6233)

```

```

4473 -- (-0.5027, 0.5893)
4474 -- (-0.5027, 0.5808)
4475 -- (-0.4857, 0.5638)
4476 .. controls (-0.4400, 0.6074) and (-0.4373, 0.6597) .. (-0.5112, 0.6657)
4477 --cycle
4478 (-0.2905, 0.6657)
4479 .. controls (-0.2682, 0.6064) and (-0.2058, 0.5997) .. (-0.2141, 0.6657)
4480 --cycle
4481 (-0.0953, 0.6488)
4482 -- (-0.1547, 0.6403)
4483 -- (-0.1377, 0.5553)
4484 -- (-0.1208, 0.5553)
4485 .. controls (-0.0926, 0.5982) and (-0.0954, 0.5977) .. (-0.0953, 0.6488)
4486 --cycle
4487 ( 0.0915, 0.6403)
4488 .. controls ( 0.0497, 0.6269) and ( 0.0505, 0.6133) .. ( 0.0490, 0.5723)
4489 .. controls ( 0.0796, 0.5913) and ( 0.0822, 0.6066) .. ( 0.0915, 0.6403)
4490 --cycle
4491 ( 0.4310, 0.6403)
4492 .. controls ( 0.4211, 0.6043) and ( 0.4125, 0.5931) .. ( 0.4480, 0.5723)
4493 -- ( 0.4819, 0.6148)
4494 -- ( 0.4819, 0.6318)
4495 --cycle
4496 ( 0.5838, 0.6403)
4497 .. controls ( 0.5923, 0.5846) and ( 0.5925, 0.5918) .. ( 0.6362, 0.5668)
4498 -- ( 0.6521, 0.5663)
4499 -- ( 0.6615, 0.5890)
4500 .. controls ( 0.6340, 0.6304) and ( 0.6328, 0.6347) .. ( 0.5838, 0.6403)
4501 --cycle
4502 ( 0.2018, 0.6233)
4503 -- ( 0.2018, 0.5808)
4504 -- ( 0.2358, 0.5808)
4505 .. controls ( 0.2306, 0.6108) and ( 0.2301, 0.6119) .. ( 0.2018, 0.6233)
4506 --cycle
4507 ( 0.3200, 0.6175)
4508 .. controls ( 0.3147, 0.6171) and ( 0.3095, 0.6162) .. ( 0.3037, 0.6159)
4509 -- ( 0.3144, 0.5906)
4510 .. controls ( 0.3494, 0.5385) and ( 0.3913, 0.6066) .. ( 0.3367, 0.6159)
4511 .. controls ( 0.3306, 0.6176) and ( 0.3252, 0.6178) .. ( 0.3200, 0.6175)
4512 --cycle
4513 ( 0.1254, 0.6148)
4514 -- ( 0.1169, 0.5553)
4515 -- ( 0.1339, 0.5553)
4516 -- ( 0.1594, 0.5808)
4517 --cycle
4518 (-0.0188, 0.6063)
4519 .. controls (-0.0629, 0.5361) and (-0.0925, 0.5785) .. (-0.1038, 0.5044)
4520 -- (-0.0528, 0.4875)
4521 .. controls (-0.0307, 0.5232) and (-0.0275, 0.5285) .. ( 0.0151, 0.5299)
4522 .. controls ( 0.0257, 0.5724) and ( 0.0206, 0.5860) .. (-0.0188, 0.6063)
4523 --cycle
4524 (-0.2820, 0.5893)
4525 .. controls (-0.2753, 0.5073) and (-0.2107, 0.5185) .. (-0.1801, 0.5808)

```

```

4526 --cycle
4527 ( 0.5244, 0.5893)
4528 .. controls ( 0.5408, 0.5621) and ( 0.5447, 0.5620) .. ( 0.5753, 0.5553)
4529 .. controls ( 0.5625, 0.5873) and ( 0.5579, 0.5867) .. ( 0.5244, 0.5893)
4530 --cycle
4531 (-0.4023, 0.5839)
4532 .. controls (-0.4095, 0.5826) and (-0.4161, 0.5794) .. (-0.4210, 0.5751)
4533 .. controls (-0.4340, 0.5638) and (-0.4334, 0.5376) .. (-0.4348, 0.5214)
4534 .. controls (-0.3835, 0.5433) and (-0.4044, 0.5361) .. (-0.3499, 0.5299)
4535 .. controls (-0.3537, 0.5756) and (-0.3808, 0.5879) .. (-0.4023, 0.5839)
4536 --cycle
4537 (-0.6717, 0.5836)
4538 -- (-0.7007, 0.5338)
4539 .. controls (-0.6810, 0.5286) and (-0.6639, 0.5441) .. (-0.6717, 0.5836)
4540 --cycle
4541 (-0.5683, 0.5760)
4542 .. controls (-0.5775, 0.5769) and (-0.5875, 0.5722) .. (-0.6045, 0.5638)
4543 -- (-0.5876, 0.5214)
4544 -- (-0.5367, 0.5553)
4545 .. controls (-0.5506, 0.5688) and (-0.5590, 0.5752) .. (-0.5683, 0.5760)
4546 --cycle
4547 ( 0.2527, 0.5638)
4548 -- ( 0.2782, 0.5129)
4549 -- ( 0.2867, 0.5129)
4550 -- ( 0.3037, 0.5299)
4551 .. controls ( 0.2852, 0.5566) and ( 0.2848, 0.5585) .. ( 0.2527, 0.5638)
4552 --cycle
4553 ( 0.6946, 0.5616)
4554 .. controls ( 0.6944, 0.5600) and ( 0.6921, 0.5548) .. ( 0.6787, 0.5413)
4555 -- ( 0.6878, 0.5061)
4556 .. controls ( 0.6794, 0.4976) and ( 0.6747, 0.5161) .. ( 0.6694, 0.5045)
4557 -- ( 0.6262, 0.5469)
4558 .. controls ( 0.6001, 0.4510) and ( 0.6708, 0.4762) .. ( 0.6776, 0.4804)
4559 .. controls ( 0.6913, 0.4889) and ( 0.7003, 0.4848) .. ( 0.7078, 0.4982)
4560 -- ( 0.7283, 0.4862)
4561 -- ( 0.7151, 0.5087)
4562 -- ( 0.6995, 0.5381)
4563 .. controls ( 0.6915, 0.5505) and ( 0.6933, 0.5583) .. ( 0.6948, 0.5614)
4564 --cycle
4565 ( 0.1764, 0.5469)
4566 .. controls ( 0.1765, 0.5023) and ( 0.1718, 0.4964) .. ( 0.2018, 0.4620)
4567 -- ( 0.2443, 0.4790)
4568 .. controls ( 0.2287, 0.5015) and ( 0.2286, 0.4995) .. ( 0.2018, 0.4960)
4569 -- ( 0.1934, 0.5044)
4570 -- ( 0.1934, 0.5469)
4571 --cycle
4572 ( 0.3971, 0.5384)
4573 -- ( 0.4056, 0.5044)
4574 -- ( 0.4649, 0.4875)
4575 -- ( 0.4904, 0.5384)
4576 -- ( 0.4395, 0.5214)
4577 --cycle
4578 ( 0.5668, 0.5384)

```

```

4579 .. controls ( 0.5368, 0.5332) and ( 0.5357, 0.5327) .. ( 0.5244, 0.5044)
4580 -- ( 0.5329, 0.4960)
4581 -- ( 0.5668, 0.5044)
4582 -- ( 0.5499, 0.4620)
4583 .. controls ( 0.5250, 0.4718) and ( 0.5240, 0.4756) .. ( 0.5074, 0.4535)
4584 -- ( 0.5584, 0.4280)
4585 .. controls ( 0.6164, 0.4608) and ( 0.5800, 0.4918) .. ( 0.5668, 0.5384)
4586 --cycle
4587 ( 0.0770, 0.5310)
4588 .. controls ( 0.0682, 0.5304) and ( 0.0588, 0.5222) .. ( 0.0538, 0.5053)
4589 .. controls ( 0.0343, 0.4401) and ( 0.0794, 0.3794) .. ( 0.1169, 0.4450)
4590 -- ( 0.0830, 0.4535)
4591 .. controls ( 0.0904, 0.4711) and ( 0.1010, 0.4920) .. ( 0.0968, 0.5117)
4592 .. controls ( 0.0941, 0.5249) and ( 0.0858, 0.5317) .. ( 0.0770, 0.5310)
4593 --cycle
4594 (-0.3075, 0.5299)
4595 -- (-0.3414, 0.4790)
4596 -- (-0.3330, 0.4705)
4597 .. controls (-0.2926, 0.4813) and (-0.2724, 0.4931) .. (-0.3075, 0.5299)
4598 --cycle
4599 (-0.6105, 0.5210)
4600 .. controls (-0.6292, 0.5286) and (-0.6359, 0.5102) .. (-0.6385, 0.4790)
4601 -- (-0.5876, 0.5044)
4602 .. controls (-0.5967, 0.5132) and (-0.6043, 0.5185) .. (-0.6105, 0.5210)
4603 --cycle
4604 (-0.6810, 0.5129)
4605 .. controls (-0.6924, 0.5121) and (-0.7036, 0.5121) .. (-0.7147, 0.5086)
4606 .. controls (-0.7151, 0.5085) and (-0.7153, 0.5083) .. (-0.7157, 0.5081)
4607 -- (-0.7430, 0.4612)
4608 .. controls (-0.7297, 0.4478) and (-0.7007, 0.4457) .. (-0.6860, 0.4801)
4609 .. controls (-0.6815, 0.4906) and (-0.6819, 0.5019) .. (-0.6810, 0.5129)
4610 --cycle
4611 (-0.1462, 0.5129)
4612 .. controls (-0.1949, 0.5129) and (-0.2098, 0.5207) .. (-0.2480, 0.4875)
4613 -- (-0.2480, 0.4790)
4614 -- (-0.2311, 0.4620)
4615 -- (-0.1801, 0.4790)
4616 -- (-0.1801, 0.4535)
4617 -- (-0.1462, 0.4535)
4618 --cycle
4619 ( 0.0066, 0.5044)
4620 -- (-0.0019, 0.4620)
4621 .. controls (-0.0908, 0.4424) and (-0.0252, 0.3738) .. ( 0.0185, 0.4370)
4622 .. controls ( 0.0238, 0.4448) and ( 0.0272, 0.4527) .. ( 0.0290, 0.4620)
4623 .. controls ( 0.0322, 0.4784) and ( 0.0277, 0.4893) .. ( 0.0236, 0.5044)
4624 --cycle
4625 (-0.5118, 0.4944)
4626 .. controls (-0.5315, 0.4962) and (-0.5506, 0.4944) .. (-0.5676, 0.4798)
4627 .. controls (-0.5973, 0.4546) and (-0.5662, 0.4306) .. (-0.5676, 0.4033)
4628 .. controls (-0.5682, 0.3806) and (-0.5896, 0.3679) .. (-0.5934, 0.3509)
4629 .. controls (-0.6001, 0.3209) and (-0.5656, 0.2986) .. (-0.5452, 0.2838)
4630 -- (-0.5621, 0.2498)
4631 -- (-0.5282, 0.2498)

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4632 .. controls (-0.5165, 0.2920) and (-0.5111, 0.3040) .. (-0.5536, 0.3262)
4633 .. controls (-0.5263, 0.3959) and (-0.5223, 0.3799) .. (-0.5452, 0.4535)
4634 -- (-0.4857, 0.4705)
4635 -- (-0.4518, 0.4535)
4636 -- (-0.4518, 0.4875)
4637 .. controls (-0.4715, 0.4873) and (-0.4920, 0.4926) .. (-0.5118, 0.4944)
4638 --cycle
4639 ( 0.3588, 0.4802)
4640 .. controls ( 0.3533, 0.4806) and ( 0.3465, 0.4801) .. ( 0.3377, 0.4790)
4641 -- ( 0.3801, 0.4365)
4642 -- ( 0.3886, 0.4450)
4643 .. controls ( 0.3795, 0.4694) and ( 0.3752, 0.4789) .. ( 0.3588, 0.4802)
4644 --cycle
4645 (-0.3923, 0.4620)
4646 .. controls (-0.3995, 0.4156) and (-0.3752, 0.3562) .. (-0.3330, 0.3347)
4647 -- (-0.3245, 0.3431)
4648 -- (-0.3172, 0.4229)
4649 -- (-0.3754, 0.4620)
4650 --cycle
4651 ( 0.1254, 0.4620)
4652 .. controls ( 0.1311, 0.4303) and ( 0.1371, 0.3466) .. ( 0.1909, 0.3657)
4653 .. controls ( 0.2082, 0.3718) and ( 0.2132, 0.3929) .. ( 0.2274, 0.4041)
4654 .. controls ( 0.2376, 0.4123) and ( 0.2569, 0.4158) .. ( 0.2697, 0.4196)
4655 .. controls ( 0.2404, 0.4707) and ( 0.2211, 0.4375) .. ( 0.1594, 0.4196)
4656 --cycle
4657 ( 0.6347, 0.4620)
4658 .. controls ( 0.5865, 0.3970) and ( 0.5594, 0.4145) .. ( 0.5753, 0.3516)
4659 .. controls ( 0.6248, 0.3639) and ( 0.6190, 0.3659) .. ( 0.6687, 0.3516)
4660 .. controls ( 0.6624, 0.3942) and ( 0.6392, 0.4050) .. ( 0.6772, 0.4280)
4661 --cycle
4662 (-0.2735, 0.4535)
4663 .. controls (-0.2776, 0.4212) and (-0.2764, 0.4187) .. (-0.2480, 0.4026)
4664 -- (-0.2565, 0.4535)
4665 --cycle
4666 ( 0.4565, 0.4535)
4667 -- ( 0.4395, 0.4365)
4668 -- ( 0.4395, 0.4280)
4669 -- ( 0.4565, 0.4111)
4670 -- ( 0.4649, 0.4111)
4671 -- ( 0.4819, 0.4280)
4672 --cycle
4673 ( 0.7558, 0.4524)
4674 .. controls ( 0.7494, 0.4473) and ( 0.7430, 0.4394) .. ( 0.7366, 0.4280)
4675 .. controls ( 0.7552, 0.4225) and ( 0.7653, 0.4183) .. ( 0.7753, 0.4176)
4676 --cycle
4677 (-0.4518, 0.4450)
4678 -- (-0.4772, 0.4365)
4679 -- (-0.4518, 0.4196)
4680 --cycle
4681 (-0.6423, 0.4300)
4682 .. controls (-0.6532, 0.4307) and (-0.6637, 0.4304) .. (-0.6690, 0.4274)
4683 .. controls (-0.6866, 0.4158) and (-0.6850, 0.3910) .. (-0.6630, 0.3848)
4684 -- (-0.6130, 0.3848)

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4685 -- (-0.6130, 0.4274)
4686 .. controls (-0.6201, 0.4279) and (-0.6314, 0.4294) .. (-0.6423, 0.4300)
4687 --cycle
4688 ( 0.7111, 0.4196)
4689 -- ( 0.7451, 0.3771)
4690 .. controls ( 0.7399, 0.4071) and ( 0.7394, 0.4082) .. ( 0.7111, 0.4196)
4691 --cycle
4692 (-0.7404, 0.4111)
4693 -- (-0.7574, 0.3347)
4694 -- (-0.7065, 0.3262)
4695 -- (-0.7234, 0.4111)
4696 --cycle
4697 (-0.1547, 0.4111)
4698 -- (-0.1462, 0.3601)
4699 -- (-0.1038, 0.3856)
4700 .. controls (-0.0885, 0.3562) and (-0.0864, 0.3520) .. (-0.0528, 0.3516)
4701 -- (-0.0783, 0.4026)
4702 --cycle
4703 ( 0.3886, 0.4111)
4704 .. controls ( 0.3213, 0.4055) and ( 0.3289, 0.3610) .. ( 0.3801, 0.3347)
4705 --cycle
4706 ( 0.3801, 0.3347)
4707 -- ( 0.3801, 0.3262)
4708 -- ( 0.3631, 0.3092)
4709 -- ( 0.3801, 0.2753)
4710 -- ( 0.3971, 0.2753)
4711 .. controls ( 0.4050, 0.3067) and ( 0.4083, 0.3157) .. ( 0.3801, 0.3347)
4712 --cycle
4713 ( 0.5074, 0.4026)
4714 -- ( 0.4565, 0.3516)
4715 .. controls ( 0.4935, 0.3518) and ( 0.5571, 0.3505) .. ( 0.5074, 0.4026)
4716 --cycle
4717 (-0.4348, 0.3941)
4718 -- (-0.4433, 0.3856)
4719 -- (-0.4348, 0.3516)
4720 -- (-0.4008, 0.3856)
4721 --cycle
4722 (-0.5112, 0.3856)
4723 -- (-0.5027, 0.3347)
4724 -- (-0.4518, 0.3856)
4725 --cycle
4726 ( 0.0405, 0.3856)
4727 .. controls ( 0.0481, 0.3444) and ( 0.0444, 0.3224) .. ( 0.0830, 0.3007)
4728 -- ( 0.1169, 0.3686)
4729 --cycle
4730 ( 0.2586, 0.3821)
4731 .. controls ( 0.2327, 0.3759) and ( 0.2165, 0.3319) .. ( 0.2699, 0.3440)
4732 -- ( 0.2952, 0.3516)
4733 .. controls ( 0.2928, 0.3578) and ( 0.2924, 0.3646) .. ( 0.2856, 0.3722)
4734 .. controls ( 0.2770, 0.3820) and ( 0.2672, 0.3842) .. ( 0.2586, 0.3821)
4735 --cycle
4736 (-0.2650, 0.3686)
4737 .. controls (-0.2695, 0.3349) and (-0.2648, 0.3302) .. (-0.2311, 0.3347)

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4738 --cycle
4739 ( 0.8037, 0.3670)
4740 .. controls ( 0.7958, 0.3549) and ( 0.8002, 0.3405) .. ( 0.8215, 0.3262)
4741 -- ( 0.8225, 0.3334)
4742 --cycle
4743 (-0.0104, 0.3601)
4744 -- (-0.0273, 0.3007)
4745 -- (-0.0698, 0.3007)
4746 .. controls (-0.0385, 0.2465) and ( 0.0057, 0.2824) .. ( 0.0066, 0.3601)
4747 --cycle
4748 (-0.4348, 0.3431)
4749 -- (-0.4348, 0.3007)
4750 .. controls (-0.4123, 0.3163) and (-0.4143, 0.3163) .. (-0.4178, 0.3431)
4751 --cycle
4752 (-0.8185, 0.3317)
4753 -- (-0.8365, 0.3007)
4754 -- (-0.7998, 0.3007)
4755 -- (-0.7998, 0.3177)
4756 --cycle
4757 ( 0.4649, 0.3315)
4758 .. controls ( 0.4219, 0.3238) and ( 0.4094, 0.2904) .. ( 0.4395, 0.2583)
4759 -- ( 0.4565, 0.2922)
4760 -- ( 0.5414, 0.2922)
4761 -- ( 0.5414, 0.3092)
4762 .. controls ( 0.5190, 0.3194) and ( 0.4902, 0.3361) .. ( 0.4649, 0.3315)
4763 --cycle
4764 (-0.6388, 0.3309)
4765 .. controls (-0.6527, 0.3328) and (-0.6597, 0.3256) .. (-0.6674, 0.3156)
4766 -- (-0.6895, 0.2838)
4767 .. controls (-0.6839, 0.2742) and (-0.6820, 0.2649) .. (-0.6700, 0.2597)
4768 .. controls (-0.6290, 0.2418) and (-0.5917, 0.3244) .. (-0.6388, 0.3309)
4769 --cycle
4770 (-0.1462, 0.3262)
4771 .. controls (-0.1623, 0.2693) and (-0.1610, 0.2418) .. (-0.0953, 0.2498)
4772 -- (-0.1292, 0.3262)
4773 --cycle
4774 ( 0.2103, 0.3262)
4775 -- ( 0.1849, 0.2753)
4776 .. controls ( 0.2243, 0.2757) and ( 0.2321, 0.2881) .. ( 0.2273, 0.3262)
4777 --cycle
4778 ( 0.3292, 0.3262)
4779 -- ( 0.2782, 0.2668)
4780 -- ( 0.2782, 0.2498)
4781 -- ( 0.3390, 0.2109)
4782 .. controls ( 0.3506, 0.1937) and ( 0.3360, 0.1683) .. ( 0.3513, 0.1579)
4783 .. controls ( 0.3686, 0.1461) and ( 0.4096, 0.1877) .. ( 0.3631, 0.2073)
4784 -- ( 0.3801, 0.2243)
4785 -- ( 0.3377, 0.2583)
4786 -- ( 0.3546, 0.3007)
4787 --cycle
4788 ( 0.6941, 0.3262)
4789 -- ( 0.6941, 0.2838)
4790 -- ( 0.7111, 0.2838)

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4791 -- ( 0.7111, 0.3262)
4792 --cycle
4793 ( 0.7706, 0.3177)
4794 -- ( 0.7366, 0.3092)
4795 -- ( 0.7366, 0.2922)
4796 -- ( 0.7451, 0.2838)
4797 -- ( 0.7621, 0.2838)
4798 --cycle
4799 (-0.7913, 0.3092)
4800 -- (-0.7828, 0.2583)
4801 -- (-0.7658, 0.2583)
4802 -- (-0.7574, 0.2668)
4803 -- (-0.7743, 0.3092)
4804 --cycle
4805 ( 0.6093, 0.3092)
4806 -- ( 0.5838, 0.2413)
4807 -- ( 0.6093, 0.2668)
4808 -- ( 0.6347, 0.2583)
4809 -- ( 0.6432, 0.3092)
4810 --cycle
4811 (-0.3494, 0.3079)
4812 .. controls (-0.4142, 0.2885) and (-0.3452, 0.2195) .. (-0.3258, 0.2842)
4813 -- (-0.3258, 0.3079)
4814 --cycle
4815 ( 0.1084, 0.3007)
4816 .. controls ( 0.1005, 0.2885) and ( 0.0956, 0.2764) .. ( 0.0807, 0.2708)
4817 .. controls ( 0.0663, 0.2653) and ( 0.0431, 0.2752) .. ( 0.0335, 0.2617)
4818 .. controls ( 0.0200, 0.2427) and ( 0.0540, 0.2322) .. ( 0.0660, 0.2298)
4819 .. controls ( 0.1034, 0.2226) and ( 0.1204, 0.2407) .. ( 0.1509, 0.2583)
4820 --cycle
4821 (-0.2201, 0.2946)
4822 .. controls (-0.2487, 0.2922) and (-0.2701, 0.2767) .. (-0.2990, 0.2583)
4823 -- (-0.2565, 0.2073)
4824 -- (-0.1886, 0.2922)
4825 .. controls (-0.2003, 0.2947) and (-0.2106, 0.2954) .. (-0.2201, 0.2946)
4826 --cycle
4827 (-0.4772, 0.2583)
4828 .. controls (-0.5022, 0.2481) and (-0.5267, 0.2367) .. (-0.5427, 0.2138)
4829 .. controls (-0.5681, 0.1773) and (-0.5547, 0.1549) .. (-0.5112, 0.1575)
4830 .. controls (-0.4976, 0.1584) and (-0.4899, 0.1613) .. (-0.4772, 0.1649)
4831 -- (-0.4688, 0.1564)
4832 -- (-0.4688, 0.1225)
4833 -- (-0.4518, 0.1225)
4834 .. controls (-0.4302, 0.1774) and (-0.4489, 0.1866) .. (-0.5027, 0.1988)
4835 --cycle
4836 (-0.4433, 0.2583)
4837 -- (-0.4348, 0.2073)
4838 -- (-0.4263, 0.2073)
4839 -- (-0.4093, 0.2243)
4840 -- (-0.4263, 0.2583)
4841 --cycle
4842 (-0.8446, 0.2512)
4843 .. controls (-0.8626, 0.2459) and (-0.8672, 0.2066) .. (-0.8677, 0.1903)

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4844 .. controls (-0.8362, 0.1909) and (-0.8333, 0.1924) .. (-0.8168, 0.1649)
4845 -- (-0.7913, 0.1734)
4846 .. controls (-0.7979, 0.1888) and (-0.8118, 0.2347) .. (-0.8218, 0.2431)
4847 .. controls (-0.8311, 0.2510) and (-0.8386, 0.2530) .. (-0.8446, 0.2512)
4848 --cycle
4849 (-0.6130, 0.2498)
4850 -- (-0.6385, 0.1988)
4851 .. controls (-0.5969, 0.2023) and (-0.5781, 0.2132) .. (-0.6130, 0.2498)
4852 --cycle
4853 ( 0.7209, 0.2469)
4854 .. controls ( 0.7057, 0.2498) and ( 0.6918, 0.2452) .. ( 0.6875, 0.2241)
4855 .. controls ( 0.6832, 0.1844) and ( 0.7333, 0.1800) .. ( 0.6875, 0.1309)
4856 .. controls ( 0.6935, 0.1147) and ( 0.6966, 0.1050) .. ( 0.7123, 0.0936)
4857 .. controls ( 0.7287, 0.0815) and ( 0.7996, 0.0650) .. ( 0.8166, 0.0782)
4858 .. controls ( 0.8441, 0.0997) and ( 0.8443, 0.1468) .. ( 0.7875, 0.1564)
4859 -- ( 0.8130, 0.1055)
4860 -- ( 0.7706, 0.0970)
4861 .. controls ( 0.7537, 0.1222) and ( 0.7493, 0.1200) .. ( 0.7196, 0.1225)
4862 -- ( 0.7621, 0.2241)
4863 .. controls ( 0.7526, 0.2335) and ( 0.7361, 0.2440) .. ( 0.7209, 0.2469)
4864 --cycle
4865 ( 0.5029, 0.2452)
4866 .. controls ( 0.4837, 0.2409) and ( 0.4663, 0.2223) .. ( 0.4749, 0.2012)
4867 .. controls ( 0.4861, 0.1737) and ( 0.5371, 0.1377) .. ( 0.5668, 0.1819)
4868 .. controls ( 0.5276, 0.2081) and ( 0.5495, 0.2337) .. ( 0.5218, 0.2442)
4869 .. controls ( 0.5159, 0.2464) and ( 0.5093, 0.2466) .. ( 0.5029, 0.2452)
4870 --cycle
4871 (-0.7065, 0.2328)
4872 .. controls (-0.7174, 0.2318) and (-0.7287, 0.2323) .. (-0.7391, 0.2277)
4873 .. controls (-0.7803, 0.2096) and (-0.7474, 0.1632) .. (-0.7171, 0.2086)
4874 --cycle
4875 (-0.0188, 0.2328)
4876 .. controls (-0.0280, 0.2283) and (-0.0341, 0.2273) .. (-0.0430, 0.2197)
4877 .. controls (-0.1097, 0.1629) and ( 0.0304, 0.1216) .. (-0.0010, 0.2037)
4878 --cycle
4879 ( 0.2612, 0.2328)
4880 -- ( 0.1849, 0.2073)
4881 .. controls ( 0.2210, 0.1548) and ( 0.2532, 0.1800) .. ( 0.2612, 0.2328)
4882 --cycle
4883 (-0.3330, 0.2243)
4884 -- (-0.3958, 0.1938)
4885 .. controls (-0.4203, 0.1689) and (-0.3928, 0.1505) .. (-0.4518, 0.0970)
4886 -- (-0.4518, 0.0800)
4887 .. controls (-0.4010, 0.0738) and (-0.3851, 0.1024) .. (-0.3754, 0.1479)
4888 .. controls (-0.3297, 0.1544) and (-0.3165, 0.1646) .. (-0.2990, 0.2073)
4889 --cycle
4890 (-0.1971, 0.2243)
4891 -- (-0.2056, 0.1479)
4892 -- (-0.1462, 0.1394)
4893 -- (-0.1462, 0.1564)
4894 -- (-0.1801, 0.2243)
4895 --cycle
4896 ( 0.8384, 0.2243)

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4897 .. controls ( 0.8324, 0.1770) and ( 0.8519, 0.1318) .. ( 0.8979, 0.1140)
4898 -- ( 0.9064, 0.1225)
4899 .. controls ( 0.8952, 0.1805) and ( 0.8898, 0.1922) .. ( 0.8384, 0.2243)
4900 --cycle
4901 ( 0.0151, 0.2073)
4902 -- ( 0.0151, 0.1903)
4903 -- ( 0.0405, 0.1819)
4904 -- ( 0.0405, 0.1479)
4905 -- ( 0.0575, 0.1479)
4906 -- ( 0.0575, 0.1564)
4907 -- ( 0.0745, 0.1734)
4908 .. controls ( 0.0548, 0.2031) and ( 0.0517, 0.2101) .. ( 0.0151, 0.2073)
4909 --cycle
4910 ( 0.6262, 0.2073)
4911 -- ( 0.6347, 0.1734)
4912 -- ( 0.6517, 0.1734)
4913 -- ( 0.6602, 0.1819)
4914 -- ( 0.6602, 0.1988)
4915 --cycle
4916 ( 0.7621, 0.2073)
4917 -- ( 0.7621, 0.1649)
4918 .. controls ( 0.7903, 0.1763) and ( 0.7908, 0.1774) .. ( 0.7960, 0.2073)
4919 --cycle
4920 (-0.8988, 0.1938)
4921 -- (-0.9014, 0.1893)
4922 .. controls (-0.9006, 0.1906) and (-0.8994, 0.1914) .. (-0.8988, 0.1930)
4923 .. controls (-0.8987, 0.1933) and (-0.8989, 0.1936) .. (-0.8988, 0.1938)
4924 --cycle
4925 (-0.1292, 0.1903)
4926 -- (-0.1292, 0.1479)
4927 -- (-0.0953, 0.1819)
4928 --cycle
4929 ( 0.2952, 0.1903)
4930 .. controls ( 0.2890, 0.1611) and ( 0.2867, 0.1567) .. ( 0.3122, 0.1394)
4931 -- ( 0.3122, 0.1903)
4932 --cycle
4933 (-0.6895, 0.1819)
4934 -- (-0.6895, 0.1479)
4935 -- (-0.6640, 0.1564)
4936 -- (-0.6640, 0.1734)
4937 -- (-0.6725, 0.1819)
4938 --cycle
4939 ( 0.1480, 0.1735)
4940 .. controls ( 0.1310, 0.1697) and ( 0.1252, 0.1423) .. ( 0.1594, 0.1225)
4941 -- ( 0.1849, 0.1479)
4942 .. controls ( 0.1726, 0.1694) and ( 0.1583, 0.1757) .. ( 0.1480, 0.1735)
4943 --cycle
4944 (-0.6300, 0.1734)
4945 .. controls (-0.6429, 0.1238) and (-0.6284, 0.1142) .. (-0.5876, 0.0885)
4946 -- (-0.6215, 0.0461)
4947 -- (-0.6640, 0.0800)
4948 .. controls (-0.6670, 0.0697) and (-0.6746, 0.0478) .. (-0.6743, 0.0381)
4949 .. controls (-0.6736, 0.0066) and (-0.6456, 0.0044) .. (-0.6219, 0.0135)

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4950 .. controls (-0.5925, 0.0247) and (-0.5281, 0.0777) .. (-0.5319, 0.1120)
4951 .. controls (-0.5350, 0.1399) and (-0.5677, 0.1315) .. (-0.5853, 0.1410)
4952 .. controls (-0.5998, 0.1487) and (-0.6048, 0.1603) .. (-0.6130, 0.1734)
4953 --cycle
4954 (-0.6640, 0.0800)
4955 .. controls (-0.6595, 0.1137) and (-0.6643, 0.1185) .. (-0.6980, 0.1140)
4956 --cycle
4957 (-0.2565, 0.1734)
4958 -- (-0.3584, 0.1309)
4959 -- (-0.3330, 0.0800)
4960 -- (-0.2990, 0.1140)
4961 .. controls (-0.2519, 0.1142) and (-0.2453, 0.1302) .. (-0.2565, 0.1734)
4962 --cycle
4963 ( 0.2271, 0.1407)
4964 .. controls ( 0.1925, 0.1328) and ( 0.1533, 0.0767) .. ( 0.2190, 0.0890)
4965 -- ( 0.2612, 0.0970)
4966 .. controls ( 0.2604, 0.1073) and ( 0.2611, 0.1186) .. ( 0.2562, 0.1281)
4967 .. controls ( 0.2497, 0.1405) and ( 0.2386, 0.1433) .. ( 0.2271, 0.1407)
4968 --cycle
4969 (-0.0698, 0.1394)
4970 .. controls (-0.0981, 0.1280) and (-0.0986, 0.1270) .. (-0.1038, 0.0970)
4971 -- (-0.0698, 0.0970)
4972 --cycle
4973 ( 0.3971, 0.1394)
4974 -- ( 0.3971, 0.1225)
4975 -- ( 0.4056, 0.1140)
4976 -- ( 0.4395, 0.1225)
4977 -- ( 0.4395, 0.1394)
4978 --cycle
4979 ( 0.6090, 0.1316)
4980 .. controls ( 0.5968, 0.1320) and ( 0.5847, 0.1313) .. ( 0.5753, 0.1309)
4981 .. controls ( 0.5937, 0.1034) and ( 0.6031, 0.1066) .. ( 0.6347, 0.1055)
4982 .. controls ( 0.5863, 0.0654) and ( 0.5849, 0.0269) .. ( 0.6432,-0.0049)
4983 -- ( 0.6262, 0.0461)
4984 -- ( 0.6488, 0.0715)
4985 .. controls ( 0.6828, 0.1212) and ( 0.6456, 0.1307) .. ( 0.6090, 0.1316)
4986 --cycle
4987 (-0.9354, 0.1309)
4988 -- (-0.9422, 0.1193)
4989 -- (-0.9356, 0.0800)
4990 -- (-0.8847, 0.0970)
4991 -- (-0.8847, 0.1309)
4992 --cycle
4993 (-0.8507, 0.1309)
4994 .. controls (-0.8417, 0.0965) and (-0.8401, 0.0890) .. (-0.8083, 0.0715)
4995 .. controls (-0.8126, 0.1087) and (-0.8139, 0.1187) .. (-0.8507, 0.1309)
4996 --cycle
4997 ( 0.1084, 0.1309)
4998 -- ( 0.0575, 0.1225)
4999 .. controls ( 0.0537, 0.0923) and ( 0.0510, 0.0922) .. ( 0.0236, 0.0800)
5000 .. controls ( 0.0578, 0.0292) and ( 0.1015, 0.0713) .. ( 0.1084, 0.1309)
5001 --cycle
5002 ( 0.4819, 0.1309)

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5003 -- ( 0.5028, 0.0739)
5004 -- ( 0.4819,-0.0049)
5005 .. controls ( 0.4993,-0.0102) and ( 0.5299,-0.0233) .. ( 0.5472,-0.0163)
5006 .. controls ( 0.5677,-0.0081) and ( 0.5663, 0.0195) .. ( 0.5644, 0.0376)
5007 .. controls ( 0.5592, 0.0860) and ( 0.5308, 0.1235) .. ( 0.4819, 0.1309)
5008 --cycle
5009 ( 0.3461, 0.1140)
5010 .. controls ( 0.3108, 0.0951) and ( 0.3082, 0.0849) .. ( 0.3037, 0.0461)
5011 .. controls ( 0.3481, 0.0535) and ( 0.3552, 0.0713) .. ( 0.3461, 0.1140)
5012 --cycle
5013 (-0.4857, 0.0970)
5014 .. controls (-0.5241, 0.0326) and (-0.4983, 0.0214) .. (-0.4348, 0.0206)
5015 .. controls (-0.4420,-0.0343) and (-0.4036,-0.0413) .. (-0.3728,-0.0186)
5016 .. controls (-0.3557,-0.0061) and (-0.3442, 0.0265) .. (-0.3330, 0.0461)
5017 .. controls (-0.3807, 0.0916) and (-0.3834, 0.0423) .. (-0.3839, 0.0036)
5018 --cycle
5019 (-0.2480, 0.0970)
5020 -- (-0.2480, 0.0800)
5021 -- (-0.2056, 0.0800)
5022 -- (-0.2056, 0.0970)
5023 --cycle
5024 (-0.1292, 0.0970)
5025 -- (-0.1462, 0.0800)
5026 -- (-0.1462, 0.0715)
5027 -- (-0.1292, 0.0546)
5028 -- (-0.1208, 0.0546)
5029 -- (-0.1038, 0.0715)
5030 --cycle
5031 ( 0.3801, 0.0800)
5032 -- ( 0.3801, 0.0206)
5033 -- ( 0.3971, 0.0206)
5034 -- ( 0.4056, 0.0291)
5035 -- ( 0.4140, 0.0800)
5036 --cycle
5037 ( 0.4225, 0.0800)
5038 .. controls ( 0.4316, 0.0456) and ( 0.4332, 0.0381) .. ( 0.4649, 0.0206)
5039 .. controls ( 0.4618, 0.0591) and ( 0.4606, 0.0679) .. ( 0.4225, 0.0800)
5040 --cycle
5041 ( 0.8809, 0.0759)
5042 .. controls ( 0.8722, 0.0759) and ( 0.8634, 0.0659) .. ( 0.8554, 0.0461)
5043 -- ( 0.9064, 0.0461)
5044 .. controls ( 0.8984, 0.0659) and ( 0.8897, 0.0759) .. ( 0.8809, 0.0759)
5045 --cycle
5046 ( 0.1413, 0.0752)
5047 .. controls ( 0.1324, 0.0761) and ( 0.1215, 0.0749) .. ( 0.1084, 0.0715)
5048 .. controls ( 0.1253, 0.0362) and ( 0.1326, 0.0290) .. ( 0.1679, 0.0121)
5049 .. controls ( 0.1762, 0.0511) and ( 0.1679, 0.0726) .. ( 0.1413, 0.0752)
5050 --cycle
5051 (-0.7409, 0.0649)
5052 .. controls (-0.7448, 0.0648) and (-0.7485, 0.0639) .. (-0.7518, 0.0618)
5053 .. controls (-0.7690, 0.0508) and (-0.7544,-0.0147) .. (-0.7438,-0.0279)
5054 .. controls (-0.7341,-0.0398) and (-0.7273,-0.0409) .. (-0.7149,-0.0473)
5055 -- (-0.7065, 0.0546)

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5056 .. controls (-0.7159, 0.0583) and (-0.7292, 0.0653) .. (-0.7409, 0.0649)
5057 --cycle
5058 ( 0.9762, 0.0591)
5059 -- ( 0.9564, 0.0203)
5060 .. controls ( 0.9517,-0.0013) and ( 0.9637,-0.0270) .. ( 0.9761,-0.0510)
5061 -- ( 0.9997,-0.0105)
5062 .. controls ( 1.0000,-0.0010) and ( 1.0000, 0.0075) .. ( 0.9998, 0.0171)
5063 --cycle
5064 (-0.1717, 0.0546)
5065 .. controls (-0.2038, 0.0492) and (-0.2042, 0.0472) .. (-0.2226, 0.0206)
5066 -- (-0.1717, 0.0206)
5067 --cycle
5068 ( 0.7281, 0.0546)
5069 -- ( 0.6687, 0.0461)
5070 -- ( 0.6687, 0.0291)
5071 .. controls ( 0.7027, 0.0233) and ( 0.7100, 0.0245) .. ( 0.7281, 0.0546)
5072 --cycle
5073 (-0.9726, 0.0477)
5074 .. controls (-0.9758, 0.0477) and (-0.9806, 0.0473) .. (-0.9843, 0.0471)
5075 -- (-1.0000, 0.0201)
5076 -- (-0.9912, 0.0044)
5077 -- (-0.9696, 0.0206)
5078 -- (-0.9448,-0.0784)
5079 -- (-0.9432,-0.0812)
5080 -- (-0.8422,-0.0728)
5081 -- (-0.8677,-0.0982)
5082 -- (-0.8677,-0.1322)
5083 .. controls (-0.8159,-0.1280) and (-0.7904,-0.1016) .. (-0.8308,-0.0569)
5084 .. controls (-0.8618,-0.0226) and (-0.8917,-0.0142) .. (-0.9356,-0.0049)
5085 .. controls (-0.9393, 0.0402) and (-0.9477, 0.0479) .. (-0.9726, 0.0477)
5086 --cycle
5087 (-0.0273, 0.0430)
5088 .. controls (-0.1037, 0.0283) and (-0.0659,-0.0617) .. (-0.0043, 0.0049)
5089 .. controls ( 0.0066, 0.0167) and ( 0.0086, 0.0240) .. ( 0.0151, 0.0376)
5090 .. controls ( 0.0001, 0.0416) and (-0.0110, 0.0461) .. (-0.0273, 0.0430)
5091 --cycle
5092 ( 0.2361, 0.0409)
5093 .. controls ( 0.2189, 0.0454) and ( 0.2022, 0.0366) .. ( 0.2018, 0.0036)
5094 .. controls ( 0.2379, 0.0017) and ( 0.2409,-0.0057) .. ( 0.2527,-0.0388)
5095 .. controls ( 0.2946,-0.0103) and ( 0.2647, 0.0336) .. ( 0.2361, 0.0409)
5096 --cycle
5097 (-0.2852, 0.0389)
5098 .. controls (-0.3005, 0.0379) and (-0.3023, 0.0289) .. (-0.2990, 0.0036)
5099 -- (-0.2650, 0.0376)
5100 .. controls (-0.2735, 0.0387) and (-0.2801, 0.0393) .. (-0.2852, 0.0389)
5101 --cycle
5102 ( 0.3037, 0.0291)
5103 .. controls ( 0.3231,-0.0055) and ( 0.3338,-0.0035) .. ( 0.3716,-0.0049)
5104 .. controls ( 0.3519, 0.0279) and ( 0.3402, 0.0269) .. ( 0.3037, 0.0291)
5105 --cycle
5106 (-0.8206, 0.0192)
5107 .. controls (-0.8430,-0.0126) and (-0.8179,-0.0291) .. (-0.8045,-0.0204)
5108 .. controls (-0.7923,-0.0127) and (-0.7854, 0.0239) .. (-0.8206, 0.0192)

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5109  --cycle
5110  (-0.1371, 0.0134)
5111  .. controls (-0.1438, 0.0114) and (-0.1493, 0.0019) .. (-0.1547,-0.0134)
5112  -- (-0.1123,-0.0049)
5113  .. controls (-0.1224, 0.0099) and (-0.1303, 0.0154) .. (-0.1371, 0.0134)
5114  --cycle
5115  ( 0.7536, 0.0121)
5116  -- ( 0.7111, 0.0036)
5117  -- ( 0.7111,-0.0304)
5118  .. controls ( 0.7469,-0.0274) and ( 0.7588,-0.0268) .. ( 0.7536, 0.0121)
5119  --cycle
5120  ( 0.0750, 0.0106)
5121  .. controls ( 0.0661, 0.0093) and ( 0.0570, 0.0067) .. ( 0.0490, 0.0036)
5122  .. controls ( 0.0651,-0.0248) and ( 0.0680,-0.0250) .. ( 0.1000,-0.0304)
5123  .. controls ( 0.0590,-0.0732) and ( 0.0241,-0.0913) .. ( 0.0745,-0.1492)
5124  .. controls ( 0.1110,-0.1331) and ( 0.1272,-0.1362) .. ( 0.1424,-0.0982)
5125  -- ( 0.1339,-0.0897)
5126  -- ( 0.1000,-0.0982)
5127  .. controls ( 0.1057,-0.0835) and ( 0.1261,-0.0416) .. ( 0.1266,-0.0304)
5128  .. controls ( 0.1284, 0.0069) and ( 0.1019, 0.0144) .. ( 0.0750, 0.0106)
5129  --cycle
5130  (-0.2311, 0.0036)
5131  -- (-0.2311,-0.0049)
5132  -- (-0.2480,-0.0219)
5133  .. controls (-0.2373,-0.0386) and (-0.2259,-0.0581) .. (-0.2054,-0.0643)
5134  .. controls (-0.1781,-0.0725) and (-0.1665,-0.0457) .. (-0.1984,-0.0158)
5135  .. controls (-0.2100,-0.0050) and (-0.2177,-0.0027) .. (-0.2311, 0.0036)
5136  --cycle
5137  ( 0.8469, 0.0036)
5138  .. controls ( 0.8030,-0.0174) and ( 0.7970,-0.0343) .. ( 0.7706,-0.0728)
5139  .. controls ( 0.7934,-0.1060) and ( 0.7994,-0.1083) .. ( 0.8384,-0.0982)
5140  -- ( 0.8384,-0.0813)
5141  -- ( 0.8130,-0.0728)
5142  -- ( 0.8130,-0.0558)
5143  .. controls ( 0.8448,-0.0370) and ( 0.8501,-0.0340) .. ( 0.8469, 0.0036)
5144  --cycle
5145  (-0.4603,-0.0049)
5146  .. controls (-0.4831,-0.0157) and (-0.5088,-0.0301) .. (-0.5182,-0.0557)
5147  .. controls (-0.5278,-0.0816) and (-0.5057,-0.0969) .. (-0.4907,-0.0883)
5148  .. controls (-0.4763,-0.0802) and (-0.4829,-0.0617) .. (-0.4518,-0.0304)
5149  -- (-0.4518,-0.0134)
5150  --cycle
5151  ( 0.4264,-0.0112)
5152  .. controls ( 0.3999,-0.0108) and ( 0.3834,-0.0280) .. ( 0.4056,-0.0728)
5153  -- ( 0.4565,-0.0558)
5154  -- ( 0.4649,-0.1237)
5155  -- ( 0.4819,-0.1237)
5156  -- ( 0.5074,-0.0558)
5157  .. controls ( 0.4895,-0.0297) and ( 0.4529,-0.0116) .. ( 0.4264,-0.0112)
5158  --cycle
5159  (-0.5706,-0.0134)
5160  -- (-0.6045,-0.0388)
5161  .. controls (-0.6509,-0.0147) and (-0.6809,-0.0236) .. (-0.6725,-0.0813)

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5162 -- (-0.6980,-0.0897)
5163 .. controls (-0.6821,-0.1195) and (-0.6788,-0.1210) .. (-0.6470,-0.1322)
5164 .. controls (-0.6222,-0.0713) and (-0.6544,-0.0848) .. (-0.6130,-0.0473)
5165 .. controls (-0.5953,-0.0788) and (-0.5888,-0.0784) .. (-0.5536,-0.0813)
5166 --cycle
5167 ( 0.1679,-0.0219)
5168 .. controls ( 0.1573,-0.0941) and ( 0.2349,-0.1063) .. ( 0.2526,-0.0847)
5169 .. controls ( 0.2609,-0.0744) and ( 0.2602,-0.0596) .. ( 0.2612,-0.0473)
5170 --cycle
5171 (-0.3112,-0.0274)
5172 .. controls (-0.3586,-0.0281) and (-0.4163,-0.0558) .. (-0.4212,-0.0609)
5173 .. controls (-0.4295,-0.0692) and (-0.4319,-0.0787) .. (-0.4327,-0.0899)
5174 -- (-0.4327,-0.1492)
5175 -- (-0.4327,-0.2086)
5176 .. controls (-0.3777,-0.1999) and (-0.3244,-0.1312) .. (-0.4008,-0.1067)
5177 -- (-0.3823,-0.0879)
5178 .. controls (-0.3347,-0.0526) and (-0.3277,-0.1099) .. (-0.2903,-0.1163)
5179 .. controls (-0.2612,-0.1213) and (-0.2444,-0.0914) .. (-0.2507,-0.0659)
5180 .. controls (-0.2581,-0.0362) and (-0.2828,-0.0269) .. (-0.3112,-0.0274)
5181 --cycle
5182 ( 0.9234,-0.0304)
5183 -- ( 0.9149,-0.0643)
5184 -- ( 0.9488,-0.0558)
5185 -- ( 0.9488,-0.0388)
5186 -- ( 0.9403,-0.0304)
5187 --cycle
5188 ( 0.6406,-0.0369)
5189 .. controls ( 0.6333,-0.0375) and ( 0.6251,-0.0419) .. ( 0.6177,-0.0522)
5190 .. controls ( 0.6105,-0.0620) and ( 0.6112,-0.0704) .. ( 0.6093,-0.0799)
5191 -- ( 0.6342,-0.0799)
5192 .. controls ( 0.6760,-0.0673) and ( 0.6625,-0.0350) .. ( 0.6406,-0.0369)
5193 --cycle
5194 (-0.0016,-0.0449)
5195 .. controls (-0.0461,-0.0548) and (-0.0410,-0.0663) .. (-0.0297,-0.1043)
5196 .. controls (-0.0250,-0.1199) and (-0.0232,-0.1440) .. (-0.0016,-0.1422)
5197 .. controls ( 0.0349,-0.1392) and ( 0.0554,-0.0537) .. (-0.0016,-0.0449)
5198 --cycle
5199 (-0.1123,-0.0473)
5200 -- (-0.1208,-0.1067)
5201 .. controls (-0.0719,-0.1062) and (-0.0661,-0.0635) .. (-0.1123,-0.0473)
5202 --cycle
5203 ( 0.3037,-0.0473)
5204 .. controls ( 0.3198,-0.0756) and ( 0.3223,-0.0769) .. ( 0.3546,-0.0728)
5205 .. controls ( 0.3383,-0.0447) and ( 0.3358,-0.0446) .. ( 0.3037,-0.0473)
5206 --cycle
5207 ( 0.5329,-0.0473)
5208 .. controls ( 0.5004,-0.0966) and ( 0.4981,-0.1266) .. ( 0.5668,-0.1322)
5209 -- ( 0.5499,-0.0473)
5210 --cycle
5211 (-0.1632,-0.0728)
5212 -- (-0.1462,-0.1067)
5213 -- (-0.1462,-0.0728)
5214 --cycle

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5215 ( 0.7090,-0.0817)
5216 .. controls ( 0.6987,-0.0843) and ( 0.6911,-0.0952) .. ( 0.6894,-0.1068)
5217 .. controls ( 0.6863,-0.1276) and ( 0.7043,-0.1387) .. ( 0.7111,-0.1831)
5218 .. controls ( 0.7499,-0.1786) and ( 0.7602,-0.1760) .. ( 0.7791,-0.1407)
5219 -- ( 0.7196,-0.1322)
5220 -- ( 0.7451,-0.1068)
5221 .. controls ( 0.7324,-0.0850) and ( 0.7193,-0.0791) .. ( 0.7090,-0.0817)
5222 --cycle
5223 ( 0.9485,-0.0984)
5224 .. controls ( 0.9284,-0.1094) and ( 0.8781,-0.1542) .. ( 0.8706,-0.1754)
5225 .. controls ( 0.8655,-0.1897) and ( 0.8704,-0.2051) .. ( 0.8817,-0.2131)
5226 --cycle
5227 (-0.9323,-0.1007)
5228 -- (-0.9101,-0.1405)
5229 .. controls (-0.9101,-0.1287) and (-0.9146,-0.1173) .. (-0.9187,-0.1067)
5230 --cycle
5231 (-0.0528,-0.1067)
5232 .. controls (-0.0616,-0.1167) and (-0.0681,-0.1217) .. (-0.0735,-0.1348)
5233 .. controls (-0.0802,-0.1513) and (-0.0835,-0.2032) .. (-0.0603,-0.2082)
5234 .. controls (-0.0462,-0.2108) and (-0.0167,-0.1971) .. (-0.0603,-0.1577)
5235 .. controls (-0.0459,-0.1339) and (-0.0396,-0.1326) .. (-0.0528,-0.1067)
5236 --cycle
5237 (-0.4876,-0.1114)
5238 .. controls (-0.4992,-0.1127) and (-0.5150,-0.1170) .. (-0.5367,-0.1237)
5239 -- (-0.5367,-0.1577)
5240 -- (-0.4433,-0.1916)
5241 .. controls (-0.4544,-0.1299) and (-0.4526,-0.1074) .. (-0.4876,-0.1114)
5242 --cycle
5243 (-0.7635,-0.1120)
5244 .. controls (-0.7788,-0.1114) and (-0.7890,-0.1295) .. (-0.7913,-0.1577)
5245 -- (-0.7574,-0.1577)
5246 .. controls (-0.7442,-0.2093) and (-0.7301,-0.2080) .. (-0.6810,-0.2086)
5247 -- (-0.6810,-0.1746)
5248 -- (-0.7149,-0.1916)
5249 .. controls (-0.7175,-0.1714) and (-0.7177,-0.1520) .. (-0.7311,-0.1350)
5250 .. controls (-0.7433,-0.1194) and (-0.7544,-0.1124) .. (-0.7635,-0.1120)
5251 --cycle
5252 (-0.2082,-0.1145)
5253 .. controls (-0.2215,-0.1126) and (-0.2378,-0.1199) .. (-0.2495,-0.1410)
5254 .. controls (-0.2530,-0.1510) and (-0.2546,-0.1612) .. (-0.2495,-0.1721)
5255 .. controls (-0.2475,-0.1840) and (-0.2388,-0.1913) .. (-0.2311,-0.2001)
5256 .. controls (-0.2202,-0.1931) and (-0.2111,-0.1884) .. (-0.2020,-0.1785)
5257 .. controls (-0.1722,-0.1464) and (-0.1860,-0.1177) .. (-0.2082,-0.1145)
5258 --cycle
5259 ( 0.4225,-0.1152)
5260 -- ( 0.3631,-0.1492)
5261 -- ( 0.3801,-0.1831)
5262 .. controls ( 0.4160,-0.1656) and ( 0.4276,-0.1565) .. ( 0.4225,-0.1152)
5263 --cycle
5264 (-0.5925,-0.1174)
5265 .. controls (-0.6021,-0.1151) and (-0.6144,-0.1208) .. (-0.6203,-0.1336)
5266 .. controls (-0.6283,-0.1508) and (-0.6192,-0.1674) .. (-0.6130,-0.1831)
5267 -- (-0.5961,-0.1831)

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5268 .. controls (-0.5903,-0.1723) and (-0.5831,-0.1615) .. (-0.5803,-0.1494)
5269 .. controls (-0.5758,-0.1301) and (-0.5828,-0.1197) .. (-0.5925,-0.1174)
5270 --cycle
5271 ( 0.2952,-0.1237)
5272 -- ( 0.3292,-0.1746)
5273 -- ( 0.3377,-0.1746)
5274 -- ( 0.3546,-0.1577)
5275 .. controls ( 0.3339,-0.1275) and ( 0.3315,-0.1266) .. ( 0.2952,-0.1237)
5276 --cycle
5277 ( 0.1832,-0.1240)
5278 .. controls ( 0.1608,-0.1263) and ( 0.1298,-0.1544) .. ( 0.1254,-0.2086)
5279 .. controls ( 0.1747,-0.2011) and ( 0.2191,-0.1503) .. ( 0.2015,-0.1301)
5280 .. controls ( 0.1972,-0.1252) and ( 0.1907,-0.1232) .. ( 0.1832,-0.1240)
5281 --cycle
5282 (-0.3330,-0.1407)
5283 .. controls (-0.3325,-0.1552) and (-0.3330,-0.1683) .. (-0.3280,-0.1824)
5284 .. controls (-0.3221,-0.1993) and (-0.2907,-0.2626) .. (-0.2674,-0.2496)
5285 .. controls (-0.2290,-0.2283) and (-0.2939,-0.1556) .. (-0.3330,-0.1407)
5286 --cycle
5287 (-0.8677,-0.1492)
5288 .. controls (-0.8906,-0.2074) and (-0.8704,-0.2079) .. (-0.8168,-0.2086)
5289 -- (-0.8168,-0.2341)
5290 -- (-0.7828,-0.2341)
5291 .. controls (-0.7876,-0.1754) and (-0.8159,-0.1679) .. (-0.8677,-0.1492)
5292 --cycle
5293 ( 0.6507,-0.1523)
5294 .. controls ( 0.6150,-0.1514) and ( 0.5790,-0.1648) .. ( 0.5634,-0.2019)
5295 .. controls ( 0.5467,-0.2418) and ( 0.5701,-0.2915) .. ( 0.6347,-0.2595)
5296 -- ( 0.5923,-0.2426)
5297 .. controls ( 0.6167,-0.1901) and ( 0.6349,-0.1909) .. ( 0.6857,-0.1746)
5298 -- ( 0.6857,-0.1577)
5299 .. controls ( 0.6745,-0.1545) and ( 0.6627,-0.1526) .. ( 0.6507,-0.1523)
5300 --cycle
5301 ( 0.4992,-0.1530)
5302 .. controls ( 0.4893,-0.1544) and ( 0.4788,-0.1613) .. ( 0.4723,-0.1757)
5303 .. controls ( 0.4601,-0.2024) and ( 0.4716,-0.2265) .. ( 0.4819,-0.2510)
5304 -- ( 0.4310,-0.2510)
5305 .. controls ( 0.4659,-0.3129) and ( 0.5002,-0.2692) .. ( 0.5329,-0.2341)
5306 .. controls ( 0.5195,-0.1890) and ( 0.5320,-0.1766) .. ( 0.5232,-0.1628)
5307 .. controls ( 0.5186,-0.1555) and ( 0.5091,-0.1515) .. ( 0.4992,-0.1530)
5308 --cycle
5309 (-0.1462,-0.1577)
5310 -- (-0.1462,-0.2001)
5311 -- (-0.1292,-0.2001)
5312 -- (-0.1292,-0.1577)
5313 --cycle
5314 ( 0.0490,-0.1577)
5315 -- ( 0.0066,-0.1831)
5316 -- ( 0.0066,-0.2001)
5317 .. controls ( 0.0224,-0.2077) and ( 0.0639,-0.2307) .. ( 0.0802,-0.2267)
5318 .. controls ( 0.1236,-0.2159) and ( 0.0615,-0.1657) .. ( 0.0490,-0.1577)
5319 --cycle
5320 ( 0.2527,-0.1577)

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5321 -- ( 0.2358,-0.1746)
5322 -- ( 0.2273,-0.1746)
5323 -- ( 0.2273,-0.1916)
5324 .. controls ( 0.2817,-0.2389) and ( 0.2612,-0.2548) .. ( 0.3207,-0.2595)
5325 -- ( 0.2952,-0.2341)
5326 .. controls ( 0.2952,-0.1946) and ( 0.2813,-0.1829) .. ( 0.2527,-0.1577)
5327 --cycle
5328 ( 0.4124,-0.1906)
5329 .. controls ( 0.3901,-0.1934) and ( 0.3801,-0.2077) .. ( 0.3631,-0.2341)
5330 .. controls ( 0.4031,-0.2391) and ( 0.4075,-0.2303) .. ( 0.4395,-0.2086)
5331 -- ( 0.4395,-0.1916)
5332 .. controls ( 0.4286,-0.1900) and ( 0.4198,-0.1897) .. ( 0.4124,-0.1906)
5333 --cycle
5334 (-0.5282,-0.1916)
5335 -- (-0.5536,-0.2001)
5336 -- (-0.5282,-0.2171)
5337 --cycle
5338 (-0.6045,-0.2001)
5339 .. controls (-0.6700,-0.2056) and (-0.6485,-0.2287) .. (-0.6330,-0.2741)
5340 .. controls (-0.6243,-0.2991) and (-0.6268,-0.3013) .. (-0.6130,-0.3274)
5341 .. controls (-0.5769,-0.3048) and (-0.5602,-0.2946) .. (-0.5536,-0.2510)
5342 -- (-0.6045,-0.2510)
5343 --cycle
5344 (-0.3584,-0.2086)
5345 .. controls (-0.3921,-0.2259) and (-0.3939,-0.2318) .. (-0.4008,-0.2680)
5346 .. controls (-0.4235,-0.2397) and (-0.4237,-0.2318) .. (-0.4603,-0.2256)
5347 -- (-0.4603,-0.2850)
5348 .. controls (-0.4267,-0.2892) and (-0.3194,-0.3199) .. (-0.3429,-0.2424)
5349 --cycle
5350 ( 0.7960,-0.2086)
5351 -- ( 0.8384,-0.2510)
5352 .. controls ( 0.8428,-0.2169) and ( 0.8301,-0.2042) .. ( 0.7960,-0.2086)
5353 --cycle
5354 ( 0.1928,-0.2162)
5355 .. controls ( 0.1816,-0.2174) and ( 0.1689,-0.2258) .. ( 0.1598,-0.2322)
5356 .. controls ( 0.1191,-0.2606) and ( 0.1214,-0.2831) .. ( 0.1339,-0.3274)
5357 -- ( 0.1509,-0.3274)
5358 .. controls ( 0.1561,-0.3114) and ( 0.1614,-0.2848) .. ( 0.1729,-0.2730)
5359 .. controls ( 0.1867,-0.2591) and ( 0.2098,-0.2594) .. ( 0.2174,-0.2461)
5360 .. controls ( 0.2253,-0.2321) and ( 0.2130,-0.2142) .. ( 0.1928,-0.2162)
5361 --cycle
5362 (-0.1905,-0.2188)
5363 .. controls (-0.1970,-0.2195) and (-0.2037,-0.2233) .. (-0.2087,-0.2284)
5364 .. controls (-0.2248,-0.2451) and (-0.2297,-0.2881) .. (-0.2311,-0.3104)
5365 -- (-0.1801,-0.3104)
5366 .. controls (-0.1960,-0.2531) and (-0.1611,-0.2530) .. (-0.1738,-0.2284)
5367 .. controls (-0.1778,-0.2206) and (-0.1840,-0.2181) .. (-0.1905,-0.2188)
5368 --cycle
5369 (-0.5112,-0.2256)
5370 -- (-0.5112,-0.2595)
5371 -- (-0.4772,-0.2595)
5372 -- (-0.4772,-0.2256)
5373 --cycle

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5374 ( 0.7451,-0.2256)
5375 -- ( 0.6687,-0.2341)
5376 -- ( 0.6602,-0.2426)
5377 .. controls ( 0.6862,-0.3159) and ( 0.7361,-0.2848) .. ( 0.7451,-0.2256)
5378 --cycle
5379 (-0.8578,-0.2336)
5380 -- (-0.8203,-0.3006)
5381 .. controls (-0.7747,-0.3108) and (-0.8112,-0.2349) .. (-0.8578,-0.2336)
5382 --cycle
5383 (-0.0280,-0.2369)
5384 .. controls (-0.0529,-0.2386) and (-0.0646,-0.2625) .. (-0.0273,-0.3019)
5385 -- ( 0.0236,-0.2595)
5386 .. controls ( 0.0068,-0.2430) and (-0.0130,-0.2359) .. (-0.0280,-0.2369)
5387 --cycle
5388 (-0.7234,-0.2510)
5389 .. controls (-0.7141,-0.2750) and (-0.7050,-0.2842) .. (-0.6810,-0.2935)
5390 -- (-0.6725,-0.2850)
5391 .. controls (-0.6853,-0.2530) and (-0.6899,-0.2536) .. (-0.7234,-0.2510)
5392 --cycle
5393 ( 0.0504,-0.2510)
5394 -- ( 0.0504,-0.2760)
5395 .. controls ( 0.0689,-0.3381) and ( 0.1243,-0.2780) .. ( 0.0804,-0.2561)
5396 .. controls ( 0.0707,-0.2513) and ( 0.0594,-0.2519) .. ( 0.0504,-0.2510)
5397 --cycle
5398 (-0.1292,-0.2595)
5399 -- (-0.1462,-0.2765)
5400 -- (-0.1038,-0.3274)
5401 -- (-0.0953,-0.3274)
5402 -- (-0.0783,-0.3104)
5403 --cycle
5404 ( 0.7877,-0.2632)
5405 .. controls ( 0.7523,-0.2682) and ( 0.7335,-0.3052) .. ( 0.7960,-0.3359)
5406 .. controls ( 0.8015,-0.3335) and ( 0.8068,-0.3333) .. ( 0.8122,-0.3324)
5407 -- ( 0.8442,-0.2774)
5408 .. controls ( 0.8248,-0.2696) and ( 0.8026,-0.2612) .. ( 0.7877,-0.2632)
5409 --cycle
5410 ( 0.5329,-0.2765)
5411 .. controls ( 0.5358,-0.3116) and ( 0.5353,-0.3182) .. ( 0.5668,-0.3359)
5412 .. controls ( 0.5639,-0.3008) and ( 0.5644,-0.2942) .. ( 0.5329,-0.2765)
5413 --cycle
5414 ( 0.3385,-0.2820)
5415 .. controls ( 0.3148,-0.2878) and ( 0.2673,-0.3492) .. ( 0.3385,-0.3614)
5416 -- ( 0.3122,-0.4038)
5417 .. controls ( 0.3574,-0.4463) and ( 0.3787,-0.4004) .. ( 0.3701,-0.3806)
5418 .. controls ( 0.3644,-0.3672) and ( 0.3492,-0.3602) .. ( 0.3377,-0.3529)
5419 -- ( 0.3886,-0.3019)
5420 .. controls ( 0.3746,-0.2928) and ( 0.3572,-0.2777) .. ( 0.3385,-0.2820)
5421 --cycle
5422 (-0.3075,-0.2850)
5423 -- (-0.3669,-0.3359)
5424 .. controls (-0.3237,-0.3346) and (-0.3194,-0.3327) .. (-0.2820,-0.3104)
5425 --cycle
5426 ( 0.6347,-0.2850)

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5427 -- ( 0.6093,-0.3359)
5428 -- ( 0.6687,-0.3359)
5429 .. controls ( 0.6634,-0.3038) and ( 0.6614,-0.3034) .. ( 0.6347,-0.2850)
5430 --cycle
5431 ( 0.2482,-0.2927)
5432 .. controls ( 0.2430,-0.2922) and ( 0.2370,-0.2926) .. ( 0.2301,-0.2942)
5433 .. controls ( 0.1967,-0.3336) and ( 0.2478,-0.3609) .. ( 0.2647,-0.3515)
5434 .. controls ( 0.2796,-0.3431) and ( 0.2843,-0.2960) .. ( 0.2482,-0.2927)
5435 --cycle
5436 (-0.5371,-0.2933)
5437 .. controls (-0.5481,-0.2970) and (-0.5577,-0.3098) .. (-0.5621,-0.3359)
5438 -- (-0.5112,-0.3869)
5439 .. controls (-0.4600,-0.3526) and (-0.5043,-0.2822) .. (-0.5371,-0.2933)
5440 --cycle
5441 (-0.4433,-0.3019)
5442 .. controls (-0.4430,-0.3328) and (-0.4401,-0.3356) .. (-0.4093,-0.3359)
5443 -- (-0.4263,-0.3019)
5444 --cycle
5445 ( 0.0236,-0.3104)
5446 -- ( 0.0066,-0.3274)
5447 -- ( 0.0066,-0.3359)
5448 -- ( 0.0236,-0.3529)
5449 -- ( 0.0321,-0.3529)
5450 -- ( 0.0490,-0.3359)
5451 --cycle
5452 ( 0.4140,-0.3104)
5453 -- ( 0.4140,-0.3274)
5454 -- ( 0.4565,-0.3274)
5455 -- ( 0.4565,-0.3104)
5456 --cycle
5457 (-0.6555,-0.3189)
5458 .. controls (-0.7282,-0.3463) and (-0.7047,-0.4238) .. (-0.6385,-0.3614)
5459 --cycle
5460 (-0.7635,-0.3203)
5461 .. controls (-0.7897,-0.3491) and (-0.7645,-0.3586) .. (-0.7512,-0.3515)
5462 .. controls (-0.7383,-0.3446) and (-0.7269,-0.3159) .. (-0.7635,-0.3203)
5463 --cycle
5464 (-0.1547,-0.3359)
5465 .. controls (-0.2375,-0.3951) and (-0.1886,-0.3975) .. (-0.2106,-0.4536)
5466 .. controls (-0.2221,-0.4826) and (-0.2548,-0.4886) .. (-0.2435,-0.5309)
5467 .. controls (-0.2373,-0.5540) and (-0.1692,-0.6520) .. (-0.1548,-0.5893)
5468 .. controls (-0.1503,-0.5696) and (-0.1713,-0.5323) .. (-0.1801,-0.5141)
5469 -- (-0.2141,-0.5141)
5470 -- (-0.1801,-0.4836)
5471 -- (-0.1632,-0.3784)
5472 -- (-0.1292,-0.3614)
5473 --cycle
5474 ( 0.5838,-0.3444)
5475 -- ( 0.6178,-0.3869)
5476 .. controls ( 0.6126,-0.3569) and ( 0.6121,-0.3558) .. ( 0.5838,-0.3444)
5477 --cycle
5478 (-0.5876,-0.3529)
5479 -- (-0.5876,-0.3869)

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5480 -- (-0.5536,-0.3869)
5481 --cycle
5482 (-0.3075,-0.3529)
5483 .. controls (-0.3075,-0.4259) and (-0.3150,-0.4459) .. (-0.2480,-0.4378)
5484 .. controls (-0.2520,-0.3893) and (-0.2634,-0.3741) .. (-0.3075,-0.3529)
5485 --cycle
5486 ( 0.0745,-0.3529)
5487 .. controls ( 0.0603,-0.3977) and ( 0.0512,-0.3786) .. ( 0.0066,-0.3869)
5488 .. controls ( 0.0321,-0.4377) and ( 0.0562,-0.4373) .. ( 0.1084,-0.4378)
5489 -- ( 0.1254,-0.3614)
5490 --cycle
5491 ( 0.1868,-0.3534)
5492 .. controls ( 0.1605,-0.3550) and ( 0.1563,-0.3921) .. ( 0.1681,-0.4095)
5493 .. controls ( 0.1887,-0.4397) and ( 0.2596,-0.3970) .. ( 0.2782,-0.3784)
5494 .. controls ( 0.2016,-0.3640) and ( 0.2352,-0.3656) .. ( 0.1995,-0.3551)
5495 .. controls ( 0.1948,-0.3537) and ( 0.1906,-0.3532) .. ( 0.1868,-0.3534)
5496 --cycle
5497 (-0.0650,-0.3585)
5498 .. controls (-0.0712,-0.3584) and (-0.0783,-0.3594) .. (-0.0865,-0.3617)
5499 .. controls (-0.1407,-0.4045) and (-0.1029,-0.4414) .. (-0.0731,-0.4301)
5500 .. controls (-0.0250,-0.4118) and (-0.0217,-0.3591) .. (-0.0650,-0.3585)
5501 --cycle
5502 (-0.4008,-0.3614)
5503 -- (-0.3584,-0.4293)
5504 .. controls (-0.3814,-0.4389) and (-0.3792,-0.4389) .. (-0.3839,-0.4632)
5505 .. controls (-0.3078,-0.4504) and (-0.3334,-0.3529) .. (-0.4008,-0.3614)
5506 --cycle
5507 ( 0.7706,-0.3784)
5508 -- ( 0.6689,-0.4004)
5509 -- ( 0.6602,-0.4378)
5510 .. controls ( 0.6990,-0.4346) and ( 0.7019,-0.4328) .. ( 0.7281,-0.4038)
5511 .. controls ( 0.7344,-0.4232) and ( 0.7382,-0.4373) .. ( 0.7461,-0.4460)
5512 -- ( 0.7747,-0.3969)
5513 --cycle
5514 (-0.7404,-0.3869)
5515 -- (-0.7574,-0.4038)
5516 .. controls (-0.7352,-0.4249) and (-0.7368,-0.4246) .. (-0.7065,-0.4208)
5517 -- (-0.7065,-0.4038)
5518 --cycle
5519 ( 0.3971,-0.3953)
5520 -- ( 0.3801,-0.4378)
5521 -- ( 0.4140,-0.4378)
5522 -- ( 0.4140,-0.3953)
5523 --cycle
5524 (-0.6640,-0.4038)
5525 .. controls (-0.6429,-0.4478) and (-0.6261,-0.4537) .. (-0.5876,-0.4802)
5526 -- (-0.5367,-0.4378)
5527 .. controls (-0.5592,-0.4163) and (-0.5680,-0.4098) .. (-0.5876,-0.4378)
5528 .. controls (-0.6195,-0.4110) and (-0.6224,-0.4072) .. (-0.6640,-0.4038)
5529 --cycle
5530 (-0.4603,-0.4038)
5531 -- (-0.4603,-0.4378)
5532 -- (-0.4263,-0.4378)

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5533 -- (-0.4263,-0.4038)
5534 --cycle
5535 ( 0.5584,-0.4038)
5536 .. controls ( 0.5189,-0.4043) and ( 0.5111,-0.4167) .. ( 0.5159,-0.4548)
5537 -- ( 0.5329,-0.4548)
5538 --cycle
5539 ( 0.6093,-0.4123)
5540 -- ( 0.6008,-0.4378)
5541 -- ( 0.6262,-0.4378)
5542 --cycle
5543 ( 0.2273,-0.4293)
5544 -- ( 0.2273,-0.4632)
5545 -- ( 0.2612,-0.4632)
5546 -- ( 0.2612,-0.4293)
5547 --cycle
5548 ( 0.1339,-0.4378)
5549 .. controls ( 0.1294,-0.4715) and ( 0.1342,-0.4762) .. ( 0.1679,-0.4717)
5550 --cycle
5551 (-0.1337,-0.4435)
5552 .. controls (-0.1394,-0.4438) and (-0.1452,-0.4454) .. (-0.1547,-0.4474)
5553 -- (-0.1547,-0.4632)
5554 -- (-0.1038,-0.4972)
5555 -- (-0.1547,-0.5057)
5556 .. controls (-0.1508,-0.5315) and (-0.1180,-0.5928) .. (-0.0833,-0.5723)
5557 .. controls (-0.0768,-0.5684) and (-0.0244,-0.4827) .. (-0.1123,-0.4474)
5558 .. controls (-0.1220,-0.4442) and (-0.1279,-0.4432) .. (-0.1337,-0.4435)
5559 --cycle
5560 (-0.0033,-0.4457)
5561 .. controls (-0.0284,-0.4445) and (-0.0459,-0.4662) .. (-0.0273,-0.5141)
5562 -- ( 0.0660,-0.5141)
5563 .. controls ( 0.0545,-0.4708) and ( 0.0219,-0.4468) .. (-0.0033,-0.4457)
5564 --cycle
5565 (-0.7383,-0.4470)
5566 -- (-0.7101,-0.4972)
5567 .. controls (-0.7099,-0.4756) and (-0.7233,-0.4577) .. (-0.7383,-0.4470)
5568 --cycle
5569 (-0.4942,-0.4548)
5570 -- (-0.4857,-0.5065)
5571 .. controls (-0.4998,-0.5043) and (-0.5212,-0.5004) .. (-0.5329,-0.5065)
5572 .. controls (-0.5629,-0.5229) and (-0.5515,-0.5662) .. (-0.5329,-0.5843)
5573 .. controls (-0.5068,-0.6075) and (-0.4879,-0.6033) .. (-0.4603,-0.5906)
5574 .. controls (-0.4787,-0.5639) and (-0.4791,-0.5620) .. (-0.5112,-0.5566)
5575 -- (-0.5112,-0.5396)
5576 .. controls (-0.4518,-0.5306) and (-0.4206,-0.4773) .. (-0.4942,-0.4548)
5577 --cycle
5578 ( 0.3377,-0.4548)
5579 .. controls ( 0.3023,-0.4717) and ( 0.2951,-0.4788) .. ( 0.2782,-0.5141)
5580 .. controls ( 0.3342,-0.5180) and ( 0.3822,-0.5526) .. ( 0.3886,-0.4717)
5581 -- ( 0.3631,-0.4972)
5582 --cycle
5583 ( 0.5663,-0.4671)
5584 .. controls ( 0.5583,-0.4668) and ( 0.5478,-0.4680) .. ( 0.5329,-0.4717)
5585 -- ( 0.5329,-0.4887)

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5586 .. controls ( 0.5814,-0.5209) and ( 0.6607,-0.5778) .. ( 0.6687,-0.4802)
5587 -- ( 0.6201,-0.4852)
5588 .. controls ( 0.5908,-0.4828) and ( 0.5901,-0.4680) .. ( 0.5663,-0.4671)
5589 --cycle
5590 (-0.6640,-0.4802)
5591 .. controls (-0.6763,-0.5067) and (-0.6845,-0.5204) .. (-0.6886,-0.5355)
5592 -- (-0.6647,-0.5782)
5593 -- (-0.5876,-0.5396)
5594 .. controls (-0.6003,-0.5515) and (-0.6232,-0.5710) .. (-0.6310,-0.5860)
5595 .. controls (-0.6373,-0.5982) and (-0.6388,-0.6155) .. (-0.6360,-0.6294)
5596 -- (-0.6224,-0.6537)
5597 .. controls (-0.5951,-0.6768) and (-0.5385,-0.6561) .. (-0.5112,-0.6415)
5598 .. controls (-0.5400,-0.5996) and (-0.5579,-0.6048) .. (-0.6045,-0.6161)
5599 -- (-0.5621,-0.5651)
5600 -- (-0.5621,-0.5566)
5601 -- (-0.5791,-0.5481)
5602 -- (-0.5621,-0.5141)
5603 --cycle
5604 ( 0.1000,-0.4802)
5605 -- ( 0.0745,-0.5396)
5606 .. controls ( 0.1186,-0.5345) and ( 0.1548,-0.5114) .. ( 0.1000,-0.4802)
5607 --cycle
5608 ( 0.2188,-0.4802)
5609 -- ( 0.2358,-0.5141)
5610 -- ( 0.2358,-0.4802)
5611 --cycle
5612 ( 0.4310,-0.4802)
5613 -- ( 0.4140,-0.5311)
5614 -- ( 0.4140,-0.5396)
5615 -- ( 0.4310,-0.5566)
5616 .. controls ( 0.4679,-0.5313) and ( 0.4644,-0.5230) .. ( 0.4649,-0.4802)
5617 --cycle
5618 ( 0.7111,-0.4802)
5619 -- ( 0.7111,-0.5059)
5620 -- ( 0.7261,-0.4802)
5621 --cycle
5622 (-0.3414,-0.4972)
5623 .. controls (-0.3911,-0.5256) and (-0.3704,-0.5729) .. (-0.3075,-0.5566)
5624 -- (-0.3075,-0.5396)
5625 --cycle
5626 (-0.4348,-0.5057)
5627 -- (-0.4348,-0.5736)
5628 .. controls (-0.4068,-0.5549) and (-0.4098,-0.5369) .. (-0.4008,-0.5057)
5629 --cycle
5630 ( 0.1509,-0.5311)
5631 -- ( 0.1254,-0.5736)
5632 -- ( 0.1849,-0.5651)
5633 --cycle
5634 ( 0.2273,-0.5311)
5635 -- ( 0.2103,-0.5975)
5636 .. controls ( 0.1971,-0.5957) and ( 0.1843,-0.5904) .. ( 0.1705,-0.5975)
5637 .. controls ( 0.1304,-0.6124) and ( 0.1679,-0.7346) .. ( 0.2142,-0.6893)
5638 .. controls ( 0.2226,-0.6812) and ( 0.2236,-0.6741) .. ( 0.2273,-0.6670)

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5639 -- ( 0.1849,-0.6330)
5640 .. controls ( 0.2427,-0.6183) and ( 0.2598,-0.5884) .. ( 0.2443,-0.5311)
5641 --cycle
5642 ( 0.5074,-0.5311)
5643 .. controls ( 0.5252,-0.5626) and ( 0.5317,-0.5622) .. ( 0.5668,-0.5651)
5644 .. controls ( 0.5491,-0.5336) and ( 0.5426,-0.5340) .. ( 0.5074,-0.5311)
5645 --cycle
5646 ( 0.0269,-0.5388)
5647 .. controls ( 0.0166,-0.5396) and ( 0.0072,-0.5496) .. ( 0.0090,-0.5738)
5648 -- ( 0.0151,-0.5991)
5649 .. controls ( 0.0222,-0.5954) and ( 0.0287,-0.5947) .. ( 0.0377,-0.5860)
5650 .. controls ( 0.0637,-0.5611) and ( 0.0441,-0.5373) .. ( 0.0269,-0.5388)
5651 --cycle
5652 ( 0.2782,-0.5481)
5653 -- ( 0.2612,-0.5821)
5654 -- ( 0.3122,-0.6245)
5655 .. controls ( 0.3120,-0.5837) and ( 0.3197,-0.5648) .. ( 0.2782,-0.5481)
5656 --cycle
5657 (-0.2820,-0.5566)
5658 .. controls (-0.2791,-0.5918) and (-0.2795,-0.5983) .. (-0.2480,-0.6161)
5659 .. controls (-0.2450,-0.5789) and (-0.2492,-0.5737) .. (-0.2820,-0.5566)
5660 --cycle
5661 ( 0.3631,-0.5651)
5662 .. controls ( 0.3595,-0.5776) and ( 0.3566,-0.5855) .. ( 0.3557,-0.5990)
5663 .. controls ( 0.3500,-0.6875) and ( 0.4541,-0.6501) .. ( 0.3934,-0.5846)
5664 .. controls ( 0.3826,-0.5729) and ( 0.3761,-0.5717) .. ( 0.3631,-0.5651)
5665 --cycle
5666 ( 0.4330,-0.5736)
5667 -- ( 0.4330,-0.6379)
5668 .. controls ( 0.4274,-0.6731) and ( 0.3959,-0.6885) .. ( 0.4395,-0.7179)
5669 .. controls ( 0.4751,-0.6405) and ( 0.4954,-0.6629) .. ( 0.4480,-0.5736)
5670 --cycle
5671 ( 0.5329,-0.5821)
5672 .. controls ( 0.5362,-0.6232) and ( 0.5740,-0.6869) .. ( 0.6222,-0.6585)
5673 -- ( 0.6513,-0.6086)
5674 .. controls ( 0.6095,-0.6116) and ( 0.5939,-0.6354) .. ( 0.5668,-0.5821)
5675 --cycle
5676 ( 0.1000,-0.5906)
5677 -- ( 0.0830,-0.6245)
5678 -- ( 0.0575,-0.6161)
5679 .. controls ( 0.0477,-0.6898) and ( 0.1617,-0.6541) .. ( 0.1000,-0.5906)
5680 --cycle
5681 (-0.3245,-0.5991)
5682 .. controls (-0.3790,-0.5920) and (-0.3824,-0.6312) .. (-0.3839,-0.6754)
5683 -- (-0.3245,-0.6161)
5684 --cycle
5685 (-0.4348,-0.6076)
5686 -- (-0.4603,-0.6670)
5687 -- (-0.4942,-0.6585)
5688 -- (-0.5027,-0.6670)
5689 .. controls (-0.4589,-0.7510) and (-0.3531,-0.6544) .. (-0.4348,-0.6076)
5690 --cycle
5691 (-0.1377,-0.6076)

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5692 .. controls (-0.1554,-0.6464) and (-0.1574,-0.6512) .. (-0.1292,-0.6839)
5693 -- (-0.1208,-0.6839)
5694 -- (-0.1038,-0.6670)
5695 -- (-0.1208,-0.6076)
5696 --cycle
5697 (-0.0698,-0.6161)
5698 -- (-0.0698,-0.6330)
5699 -- (-0.0019,-0.6330)
5700 -- (-0.0019,-0.6161)
5701 --cycle
5702 (-0.2735,-0.6330)
5703 .. controls (-0.3246,-0.6408) and (-0.3550,-0.6906) .. (-0.3754,-0.7356)
5704 -- (-0.3510,-0.7356)
5705 -- (-0.2786,-0.6658)
5706 --cycle
5707 (-0.1971,-0.6330)
5708 .. controls (-0.2393,-0.6535) and (-0.2774,-0.6931) .. (-0.2226,-0.7264)
5709 --cycle
5710 ( 0.2782,-0.6415)
5711 -- ( 0.2612,-0.6585)
5712 .. controls ( 0.2834,-0.6795) and ( 0.2819,-0.6792) .. ( 0.3122,-0.6754)
5713 -- ( 0.3122,-0.6585)
5714 --cycle
5715 ( 0.5244,-0.6630)
5716 .. controls ( 0.5103,-0.6630) and ( 0.4934,-0.6765) .. ( 0.4819,-0.6839)
5717 .. controls ( 0.4916,-0.7019) and ( 0.4915,-0.7036) .. ( 0.5078,-0.7175)
5718 -- ( 0.5293,-0.7332)
5719 .. controls ( 0.6028,-0.7786) and ( 0.5789,-0.6636) .. ( 0.5244,-0.6630)
5720 --cycle
5721 (-0.0698,-0.6839)
5722 -- (-0.0613,-0.7433)
5723 -- (-0.0528,-0.7518)
5724 .. controls (-0.0005,-0.7307) and (-0.0190,-0.6844) .. (-0.0698,-0.6839)
5725 --cycle
5726 ( 0.1339,-0.6839)
5727 .. controls ( 0.0648,-0.6945) and ( 0.0512,-0.7734) .. ( 0.1169,-0.7943)
5728 .. controls ( 0.1059,-0.7314) and ( 0.1116,-0.7410) .. ( 0.1339,-0.6839)
5729 --cycle
5730 ( 0.3546,-0.6839)
5731 .. controls ( 0.3575,-0.7191) and ( 0.3571,-0.7256) .. ( 0.3886,-0.7433)
5732 -- ( 0.3716,-0.6839)
5733 --cycle
5734 ( 0.3886,-0.7433)
5735 -- ( 0.3886,-0.7603)
5736 -- ( 0.3546,-0.7943)
5737 -- ( 0.3631,-0.7943)
5738 -- ( 0.3801,-0.8113)
5739 .. controls ( 0.4252,-0.7878) and ( 0.4333,-0.7840) .. ( 0.4140,-0.7349)
5740 --cycle
5741 (-0.5653,-0.6922)
5742 .. controls (-0.5767,-0.6913) and (-0.5873,-0.6939) .. (-0.5981,-0.6969)
5743 -- (-0.5741,-0.7399)
5744 .. controls (-0.5528,-0.7446) and (-0.5350,-0.7433) .. (-0.5027,-0.7433)

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5745 .. controls (-0.5172,-0.7077) and (-0.5409,-0.6942) .. (-0.5653,-0.6922)
5746 --cycle
5747 (-0.1547,-0.7099)
5748 .. controls (-0.1719,-0.7103) and (-0.1811,-0.7133) .. (-0.1971,-0.7179)
5749 .. controls (-0.1923,-0.7317) and (-0.1881,-0.7454) .. (-0.1792,-0.7574)
5750 .. controls (-0.1162,-0.8422) and (-0.0444,-0.7079) .. (-0.1547,-0.7099)
5751 --cycle
5752 (-0.4348,-0.7179)
5753 .. controls (-0.4394,-0.7549) and (-0.4359,-0.7636) .. (-0.4008,-0.7773)
5754 --cycle
5755 ( 0.2358,-0.7179)
5756 -- ( 0.2358,-0.7349)
5757 -- ( 0.3037,-0.7349)
5758 -- ( 0.3037,-0.7179)
5759 --cycle
5760 ( 0.4649,-0.7179)
5761 -- ( 0.4734,-0.7858)
5762 .. controls ( 0.4612,-0.7900) and ( 0.4516,-0.7918) .. ( 0.4409,-0.8004)
5763 .. controls ( 0.3964,-0.8360) and ( 0.4585,-0.8927) .. ( 0.4819,-0.8198)
5764 -- ( 0.5159,-0.8283)
5765 .. controls ( 0.5142,-0.8359) and ( 0.5131,-0.8417) .. ( 0.5125,-0.8468)
5766 -- ( 0.5398,-0.8000)
5767 .. controls ( 0.5329,-0.7638) and ( 0.5138,-0.7350) .. ( 0.4649,-0.7179)
5768 --cycle
5769 ( 0.2103,-0.7264)
5770 -- ( 0.1509,-0.7349)
5771 -- ( 0.1509,-0.7688)
5772 .. controls ( 0.1894,-0.7657) and ( 0.1982,-0.7645) .. ( 0.2103,-0.7264)
5773 --cycle
5774 (-0.2905,-0.7349)
5775 .. controls (-0.3009,-0.7717) and (-0.3009,-0.7829) .. (-0.2905,-0.8198)
5776 -- (-0.2480,-0.8028)
5777 -- (-0.2311,-0.8367)
5778 .. controls (-0.1820,-0.7845) and (-0.2454,-0.7805) .. (-0.2735,-0.7349)
5779 --cycle
5780 (-0.0019,-0.7349)
5781 .. controls (-0.0202,-0.7845) and (-0.0471,-0.8007) .. (-0.0358,-0.8537)
5782 -- ( 0.0066,-0.8113)
5783 -- ( 0.0236,-0.8113)
5784 .. controls ( 0.0412,-0.8384) and ( 0.0421,-0.8410) .. ( 0.0745,-0.8367)
5785 .. controls ( 0.0599,-0.7914) and ( 0.0500,-0.7437) .. (-0.0019,-0.7349)
5786 --cycle
5787 (-0.5282,-0.7688)
5788 .. controls (-0.5349,-0.8205) and (-0.5012,-0.8219) .. (-0.4603,-0.8113)
5789 -- (-0.4603,-0.7943)
5790 --cycle
5791 ( 0.3122,-0.7688)
5792 -- ( 0.3037,-0.7773)
5793 .. controls ( 0.3122,-0.8236) and ( 0.3093,-0.8598) .. ( 0.3608,-0.8698)
5794 -- ( 0.3628,-0.8698)
5795 -- ( 0.3292,-0.7688)
5796 --cycle
5797 (-0.3584,-0.7858)

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```

5798 -- (-0.3770,-0.8622)
5799 .. controls (-0.3770,-0.8627) and (-0.3768,-0.8631) .. (-0.3768,-0.8636)
5800 -- (-0.3401,-0.8639)
5801 -- (-0.3245,-0.7858)
5802 --cycle
5803 ( 0.2612,-0.7858)
5804 .. controls ( 0.2125,-0.7858) and ( 0.1976,-0.7780) .. ( 0.1594,-0.8113)
5805 .. controls ( 0.2029,-0.8570) and ( 0.2552,-0.8596) .. ( 0.2612,-0.7858)
5806 --cycle
5807 (-0.1292,-0.7943)
5808 -- (-0.1886,-0.8537)
5809 .. controls (-0.1453,-0.8604) and (-0.1341,-0.8487) .. (-0.1038,-0.8198)
5810 --cycle
5811 (-0.4348,-0.8367)
5812 -- (-0.4479,-0.8630)
5813 -- (-0.4228,-0.8632)
5814 .. controls (-0.4191,-0.8583) and (-0.4180,-0.8505) .. (-0.4178,-0.8367)
5815 --cycle
5816 (-0.0783,-0.8452)
5817 .. controls (-0.0928,-0.8536) and (-0.0996,-0.8588) .. (-0.1026,-0.8659)
5818 -- (-0.0748,-0.8661)
5819 -- (-0.0698,-0.8537)
5820 --cycle
5821 ( 0.1503,-0.8501)
5822 .. controls ( 0.1440,-0.8514) and ( 0.1387,-0.8545) .. ( 0.1353,-0.8602)
5823 .. controls ( 0.1334,-0.8621) and ( 0.1330,-0.8649) .. ( 0.1333,-0.8679)
5824 -- ( 0.2103,-0.8685)
5825 -- ( 0.2103,-0.8602)
5826 .. controls ( 0.1968,-0.8575) and ( 0.1690,-0.8460) .. ( 0.1503,-0.8501)
5827 --cycle
5828 (-0.2396,-0.8622)
5829 -- (-0.2421,-0.8647)
5830 -- (-0.2217,-0.8649)
5831 .. controls (-0.2221,-0.8638) and (-0.2222,-0.8633) .. (-0.2226,-0.8622)
5832 --cycle
5833 ( 0.2867,-0.8622)
5834 .. controls ( 0.2782,-0.8636) and ( 0.2734,-0.8665) .. ( 0.2676,-0.8690)
5835 -- ( 0.2859,-0.8691)
5836 --cycle
5837 ( 0.3942,-0.8639)
5838 .. controls ( 0.3909,-0.8650) and ( 0.3884,-0.8678) .. ( 0.3855,-0.8700)
5839 -- ( 0.4192,-0.8703)
5840 .. controls ( 0.4168,-0.8684) and ( 0.4154,-0.8656) .. ( 0.4124,-0.8643)
5841 .. controls ( 0.4062,-0.8618) and ( 0.4000,-0.8619) .. ( 0.3942,-0.8639)
5842 --cycle
5843 ;
5844 }
5845 }
5846 \fi

```

hex/terrain/mountains

The style for mountains. The pattern is filled with a darker brown, and outlines are not drawn. Note that the mountain

pattern is the same as the beach pattern, just with a different colour.

```

5847 \tikzset{
5848   hex/terrain/mountains/.style={
5849     draw=none,
5850     fill={rgb,100:red,49;green,35;blue,1}
5851   }
5852 }

```

hex/terrain/mountains

And the mountains pattern. This is the same as the beach pattern, only filled with a darker brown colour.



```

5853 \ifhex@terrain@pic
5854 \tikzset{
5855   hex/terrain/mountains/.pic={
5856     \path[hex/terrain/mountains,pic actions,draw=none]
5857       (-0.4931, 0.8848)
5858     -- (-0.4998, 0.8734)
5859     .. controls (-0.4908, 0.8731) and (-0.4813, 0.8762) .. (-0.4762, 0.8847)
5860     --cycle
5861     (-0.4032, 0.8841)
5862     .. controls (-0.4004, 0.8804) and (-0.3988, 0.8794) .. (-0.3956, 0.8745)
5863     .. controls (-0.3760, 0.8443) and (-0.3811, 0.8330) .. (-0.3456, 0.8112)
5864     .. controls (-0.3250, 0.7986) and (-0.2712, 0.7770) .. (-0.2531, 0.8032)
5865     .. controls (-0.2294, 0.8375) and (-0.2984, 0.8503) .. (-0.3193, 0.8690)
5866     .. controls (-0.3243, 0.8735) and (-0.3281, 0.8785) .. (-0.3321, 0.8835)
5867     --cycle
5868     (-0.2462, 0.8828)
5869     .. controls (-0.2425, 0.8681) and (-0.2383, 0.8546) .. (-0.2293, 0.8461)
5870     .. controls (-0.2102, 0.8280) and (-0.1892, 0.8390) .. (-0.1859, 0.8669)
5871     .. controls (-0.1854, 0.8711) and (-0.1871, 0.8772) .. (-0.1875, 0.8822)
5872     --cycle
5873     (-0.0997, 0.8815)
5874     .. controls (-0.0971, 0.8706) and (-0.0941, 0.8597) .. (-0.0907, 0.8493)
5875     -- (-0.0570, 0.8578)
5876     .. controls (-0.0570, 0.8629) and (-0.0560, 0.8730) .. (-0.0553, 0.8812)
5877     --cycle
5878     ( 0.0213, 0.8805)
5879     .. controls ( 0.0222, 0.8725) and ( 0.0235, 0.8650) .. ( 0.0262, 0.8587)
5880     .. controls ( 0.0391, 0.8281) and ( 0.0706, 0.8199) .. ( 0.0917, 0.7894)
5881     .. controls ( 0.1112, 0.7609) and ( 0.1058, 0.7286) .. ( 0.1050, 0.6961)
5882     -- ( 0.1731, 0.7216)
5883     -- ( 0.1203, 0.8649)
5884     -- ( 0.1097, 0.8797)
5885     --cycle
5886     ( 0.2978, 0.8781)

```

```

5887 .. controls ( 0.2985, 0.8773) and ( 0.3002, 0.8756) .. ( 0.3008, 0.8749)
5888 .. controls ( 0.2854, 0.8687) and ( 0.2549, 0.8572) .. ( 0.2421, 0.8487)
5889 .. controls ( 0.2026, 0.8224) and ( 0.1905, 0.7567) .. ( 0.2046, 0.7132)
5890 .. controls ( 0.2146, 0.6819) and ( 0.2330, 0.6680) .. ( 0.2394, 0.6280)
5891 .. controls ( 0.2413, 0.6160) and ( 0.2468, 0.5527) .. ( 0.2446, 0.5437)
5892 .. controls ( 0.2396, 0.5232) and ( 0.2211, 0.5122) .. ( 0.2231, 0.4913)
5893 .. controls ( 0.2261, 0.4603) and ( 0.2686, 0.4388) .. ( 0.2891, 0.4194)
5894 .. controls ( 0.3020, 0.4071) and ( 0.3136, 0.3895) .. ( 0.3281, 0.3799)
5895 .. controls ( 0.3688, 0.3533) and ( 0.3905, 0.3863) .. ( 0.4199, 0.3902)
5896 .. controls ( 0.4350, 0.3921) and ( 0.4560, 0.3849) .. ( 0.4710, 0.3812)
5897 -- ( 0.4795, 0.4067)
5898 -- ( 0.4965, 0.4067)
5899 .. controls ( 0.5008, 0.3961) and ( 0.5009, 0.3893) .. ( 0.5112, 0.3811)
5900 .. controls ( 0.5112, 0.3811) and ( 0.6172, 0.3385) .. ( 0.6481, 0.3037)
5901 .. controls ( 0.6729, 0.2758) and ( 0.6641, 0.2532) .. ( 0.6667, 0.2206)
5902 -- ( 0.7004, 0.2206)
5903 .. controls ( 0.7839, 0.2118) and ( 0.7047, 0.0740) .. ( 0.7057, 0.0568)
5904 .. controls ( 0.7067, 0.0396) and ( 0.7865,-0.0424) .. ( 0.8032,-0.0520)
5905 .. controls ( 0.8251,-0.0644) and ( 0.8703,-0.0686) .. ( 0.8572,-0.0293)
5906 .. controls ( 0.8518,-0.0131) and ( 0.7996, 0.0474) .. ( 0.7843, 0.0564)
5907 .. controls ( 0.7724, 0.0633) and ( 0.7645, 0.0636) .. ( 0.7518, 0.0664)
5908 .. controls ( 0.7688, 0.1093) and ( 0.7993, 0.1905) .. ( 0.7930, 0.2362)
5909 .. controls ( 0.7869, 0.2804) and ( 0.7252, 0.2982) .. ( 0.6946, 0.3268)
5910 .. controls ( 0.6664, 0.3531) and ( 0.6746, 0.3662) .. ( 0.6323, 0.3966)
5911 .. controls ( 0.5760, 0.4371) and ( 0.5386, 0.4324) .. ( 0.5250, 0.4601)
5912 .. controls ( 0.5090, 0.4927) and ( 0.5578, 0.6035) .. ( 0.5969, 0.5911)
5913 .. controls ( 0.6199, 0.5839) and ( 0.6224, 0.5471) .. ( 0.6341, 0.5291)
5914 .. controls ( 0.6488, 0.5064) and ( 0.7020, 0.4614) .. ( 0.7263, 0.4493)
5915 -- ( 0.7373, 0.4768)
5916 -- ( 0.6866, 0.5671)
5917 -- ( 0.6756, 0.5720)
5918 -- ( 0.6766, 0.5850)
5919 -- ( 0.6331, 0.6627)
5920 .. controls ( 0.6280, 0.6613) and ( 0.6239, 0.6599) .. ( 0.6157, 0.6589)
5921 -- ( 0.5646, 0.6589)
5922 .. controls ( 0.5375, 0.6557) and ( 0.5277, 0.6432) .. ( 0.4965, 0.6489)
5923 .. controls ( 0.4716, 0.6520) and ( 0.4306, 0.6774) .. ( 0.4104, 0.6489)
5924 .. controls ( 0.3809, 0.6093) and ( 0.4627, 0.6240) .. ( 0.4837, 0.5772)
5925 .. controls ( 0.4958, 0.5502) and ( 0.4652, 0.4811) .. ( 0.4429, 0.4648)
5926 -- ( 0.3523, 0.4350)
5927 .. controls ( 0.3178, 0.4372) and ( 0.3207, 0.4766) .. ( 0.3153, 0.5004)
5928 .. controls ( 0.3090, 0.5282) and ( 0.2968, 0.5398) .. ( 0.2922, 0.5684)
5929 .. controls ( 0.2896, 0.6035) and ( 0.3061, 0.6276) .. ( 0.2922, 0.6621)
5930 .. controls ( 0.2756, 0.6961) and ( 0.2422, 0.7190) .. ( 0.2525, 0.7640)
5931 .. controls ( 0.2650, 0.8188) and ( 0.3165, 0.7932) .. ( 0.3324, 0.8417)
5932 .. controls ( 0.3359, 0.8522) and ( 0.3385, 0.8648) .. ( 0.3399, 0.8778)
5933 --cycle
5934 ( 0.4261, 0.8770)
5935 -- ( 0.4333, 0.8493)
5936 -- ( 0.4845, 0.7440)
5937 .. controls ( 0.4963, 0.7304) and ( 0.5450, 0.6930) .. ( 0.5630, 0.6989)
5938 .. controls ( 0.5735, 0.7024) and ( 0.5838, 0.7169) .. ( 0.5932, 0.7337)
5939 -- ( 0.5612, 0.7909)

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```

5940 .. controls ( 0.5537, 0.7875) and ( 0.5468, 0.7852) .. ( 0.5403, 0.7864)
5941 .. controls ( 0.5078, 0.7926) and ( 0.5191, 0.8406) .. ( 0.5145, 0.8567)
5942 .. controls ( 0.5121, 0.8651) and ( 0.5076, 0.8710) .. ( 0.5025, 0.8764)
5943 --cycle
5944 ( 0.3773, 0.8153)
5945 .. controls ( 0.3625, 0.7892) and ( 0.2993, 0.7161) .. ( 0.3316, 0.6877)
5946 .. controls ( 0.3432, 0.6774) and ( 0.3866, 0.6728) .. ( 0.4029, 0.6706)
5947 -- ( 0.3973, 0.7472)
5948 -- ( 0.4029, 0.8153)
5949 --cycle
5950 (-0.4224, 0.8088)
5951 .. controls (-0.4416, 0.8077) and (-0.4585, 0.7826) .. (-0.4275, 0.7562)
5952 -- (-0.3971, 0.7387)
5953 .. controls (-0.4780, 0.6942) and (-0.4752, 0.6640) .. (-0.4591, 0.5855)
5954 .. controls (-0.4391, 0.4887) and (-0.4527, 0.5347) .. (-0.4103, 0.4493)
5955 .. controls (-0.3870, 0.4026) and (-0.4070, 0.3747) .. (-0.3460, 0.3642)
5956 -- (-0.3352, 0.4823)
5957 .. controls (-0.3409, 0.5024) and (-0.3617, 0.5113) .. (-0.3739, 0.5281)
5958 -- (-0.4164, 0.6287)
5959 .. controls (-0.4188, 0.6375) and (-0.4186, 0.6444) .. (-0.4164, 0.6528)
5960 .. controls (-0.4067, 0.6807) and (-0.3521, 0.7255) .. (-0.3274, 0.6931)
5961 .. controls (-0.3070, 0.6694) and (-0.3336, 0.6432) .. (-0.3274, 0.6221)
5962 .. controls (-0.3249, 0.6055) and (-0.3059, 0.6028) .. (-0.2950, 0.6162)
5963 .. controls (-0.2867, 0.6265) and (-0.2838, 0.6558) .. (-0.2829, 0.6692)
5964 .. controls (-0.2775, 0.7444) and (-0.3333, 0.7652) .. (-0.3955, 0.7472)
5965 .. controls (-0.3950, 0.7586) and (-0.3916, 0.7684) .. (-0.3955, 0.7803)
5966 .. controls (-0.3986, 0.8016) and (-0.4109, 0.8096) .. (-0.4224, 0.8088)
5967 --cycle
5968 (-0.1391, 0.8077)
5969 .. controls (-0.1634, 0.8024) and (-0.1582, 0.7647) .. (-0.1487, 0.7492)
5970 .. controls (-0.1306, 0.7190) and (-0.1004, 0.7270) .. (-0.0652, 0.7073)
5971 -- (-0.0226, 0.6801)
5972 -- ( 0.0282, 0.6560)
5973 .. controls ( 0.0622, 0.6331) and ( 0.0955, 0.5639) .. ( 0.1219, 0.5259)
5974 .. controls ( 0.2125, 0.5714) and ( 0.1427, 0.6114) .. ( 0.1219, 0.6453)
5975 -- ( 0.1054, 0.6768)
5976 .. controls ( 0.0862, 0.7028) and ( 0.0448, 0.7080) .. ( 0.0115, 0.7299)
5977 .. controls (-0.0377, 0.7622) and (-0.0173, 0.7726) .. (-0.0822, 0.7918)
5978 .. controls (-0.0961, 0.7958) and (-0.1270, 0.8103) .. (-0.1391, 0.8077)
5979 --cycle
5980 (-0.5460, 0.7940)
5981 -- (-0.5911, 0.7166)
5982 .. controls (-0.5649, 0.7015) and (-0.5397, 0.7188) .. (-0.5308, 0.7556)
5983 .. controls (-0.5251, 0.7788) and (-0.5335, 0.7873) .. (-0.5460, 0.7940)
5984 --cycle
5985 (-0.2382, 0.7423)
5986 .. controls (-0.2453, 0.7424) and (-0.2512, 0.7383) .. (-0.2550, 0.7274)
5987 .. controls (-0.2635, 0.7026) and (-0.2353, 0.6726) .. (-0.2229, 0.6536)
5988 .. controls (-0.2031, 0.6234) and (-0.2020, 0.6105) .. (-0.1928, 0.5770)
5989 .. controls (-0.1763, 0.5803) and (-0.1499, 0.5890) .. (-0.1342, 0.5831)
5990 .. controls (-0.1112, 0.5745) and (-0.1047, 0.5481) .. (-0.0866, 0.5338)
5991 -- (-0.0397, 0.5102)
5992 -- ( 0.0664, 0.4219)

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5993 .. controls ( 0.0874, 0.3954) and ( 0.0785, 0.3655) .. ( 0.1070, 0.3502)
5994 .. controls ( 0.1367, 0.3343) and ( 0.1690, 0.3592) .. ( 0.1732, 0.3899)
5995 .. controls ( 0.1755, 0.4075) and ( 0.1545, 0.4554) .. ( 0.1475, 0.4748)
5996 .. controls ( 0.0838, 0.4666) and ( 0.0509, 0.4836) .. ( 0.0454, 0.5515)
5997 .. controls (-0.0576, 0.5778) and (-0.0955, 0.6323) .. (-0.1754, 0.6949)
5998 .. controls (-0.1861, 0.7034) and (-0.2171, 0.7418) .. (-0.2382, 0.7423)
5999 --cycle
6000 (-0.5068, 0.6706)
6001 .. controls (-0.5119, 0.6724) and (-0.5194, 0.6726) .. (-0.5299, 0.6701)
6002 .. controls (-0.5512, 0.6413) and (-0.5242, 0.6333) .. (-0.5102, 0.6400)
6003 .. controls (-0.4981, 0.6457) and (-0.4916, 0.6653) .. (-0.5068, 0.6706)
6004 --cycle
6005 (-0.6356, 0.6402)
6006 -- (-0.6681, 0.5845)
6007 -- (-0.6588, 0.5684)
6008 .. controls (-0.6473, 0.5521) and (-0.6323, 0.5371) .. (-0.6265, 0.5174)
6009 .. controls (-0.6174, 0.4865) and (-0.6614, 0.4161) .. (-0.6950, 0.4206)
6010 .. controls (-0.7111, 0.4226) and (-0.7174, 0.4376) .. (-0.7460, 0.4507)
6011 -- (-0.7632, 0.4212)
6012 .. controls (-0.7629, 0.4042) and (-0.7611, 0.3875) .. (-0.7546, 0.3789)
6013 .. controls (-0.7424, 0.3626) and (-0.7129, 0.3612) .. (-0.6966, 0.3297)
6014 .. controls (-0.6823, 0.3022) and (-0.6963, 0.2741) .. (-0.6808, 0.2598)
6015 .. controls (-0.6602, 0.2410) and (-0.6495, 0.2720) .. (-0.6484, 0.2878)
6016 .. controls (-0.6461, 0.3229) and (-0.6488, 0.4046) .. (-0.6080, 0.4204)
6017 .. controls (-0.5750, 0.4330) and (-0.4980, 0.3514) .. (-0.4929, 0.3217)
6018 .. controls (-0.4895, 0.3019) and (-0.5044, 0.2671) .. (-0.4860, 0.2550)
6019 .. controls (-0.4691, 0.2439) and (-0.4582, 0.2679) .. (-0.4535, 0.2796)
6020 .. controls (-0.4450, 0.3015) and (-0.4273, 0.3562) .. (-0.4401, 0.3771)
6021 .. controls (-0.4495, 0.3922) and (-0.5019, 0.4172) .. (-0.5296, 0.4507)
6022 .. controls (-0.5656, 0.4941) and (-0.5734, 0.5631) .. (-0.5973, 0.6021)
6023 .. controls (-0.6099, 0.6226) and (-0.6226, 0.6316) .. (-0.6356, 0.6402)
6024 --cycle
6025 ( 0.2242, 0.6110)
6026 -- ( 0.1816, 0.6025)
6027 -- ( 0.1816, 0.5855)
6028 .. controls ( 0.2117, 0.5815) and ( 0.2140, 0.5821) .. ( 0.2242, 0.6110)
6029 --cycle
6030 ( 0.3924, 0.6049)
6031 .. controls ( 0.3895, 0.6048) and ( 0.3860, 0.6036) .. ( 0.3820, 0.6011)
6032 .. controls ( 0.3535, 0.5835) and ( 0.3670, 0.5238) .. ( 0.3773, 0.5004)
6033 -- ( 0.3944, 0.5004)
6034 -- ( 0.4061, 0.5429)
6035 .. controls ( 0.4082, 0.5540) and ( 0.4130, 0.6056) .. ( 0.3924, 0.6049)
6036 --cycle
6037 (-0.2864, 0.5940)
6038 .. controls (-0.2904, 0.5793) and (-0.2950, 0.5676) .. (-0.2919, 0.5518)
6039 .. controls (-0.2769, 0.4768) and (-0.1616, 0.5041) .. (-0.2162, 0.5623)
6040 .. controls (-0.2236, 0.5702) and (-0.2346, 0.5747) .. (-0.2443, 0.5790)
6041 --cycle
6042 (-0.7010, 0.5280)
6043 -- (-0.7269, 0.4835)
6044 .. controls (-0.7207, 0.4876) and (-0.7144, 0.4952) .. (-0.7081, 0.5094)
6045 --cycle

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6046      (-0.0992, 0.4748)
6047      -- (-0.2099, 0.4556)
6048      -- (-0.2888, 0.3790)
6049      -- (-0.3460, 0.3557)
6050      -- (-0.3389, 0.3218)
6051      .. controls (-0.3310, 0.2959) and (-0.3026, 0.2636) .. (-0.2781, 0.2927)
6052      .. controls (-0.2745, 0.2971) and (-0.2504, 0.3947) .. (-0.1948, 0.3764)
6053      .. controls (-0.1607, 0.3651) and (-0.1697, 0.2984) .. (-0.1588, 0.2536)
6054      -- (-0.1503, 0.2536)
6055      -- (-0.1503, 0.2450)
6056      -- (-0.1163, 0.2366)
6057      .. controls (-0.0968, 0.3059) and (-0.1262, 0.3371) .. (-0.1239, 0.3982)
6058      .. controls (-0.1229, 0.4261) and (-0.1067, 0.4484) .. (-0.0992, 0.4748)
6059      --cycle
6060      (-0.1503, 0.2450)
6061      -- (-0.1588, 0.2536)
6062      .. controls (-0.2292, 0.2544) and (-0.2730, 0.2893) .. (-0.2677, 0.2195)
6063      -- (-0.2609, 0.1855)
6064      .. controls (-0.2393, 0.1890) and (-0.2005, 0.2039) .. (-0.1909, 0.1753)
6065      .. controls (-0.1709, 0.1163) and (-0.2582, 0.0953) .. (-0.2387, 0.0533)
6066      .. controls (-0.2275, 0.0292) and (-0.1430, 0.0537) .. (-0.1361, 0.0692)
6067      .. controls (-0.1250, 0.0859) and (-0.1359, 0.1083) .. (-0.1361, 0.1259)
6068      .. controls (-0.1437, 0.1788) and (-0.1186, 0.1766) .. (-0.1503, 0.2450)
6069      --cycle
6070      ( 0.7348, 0.4408)
6071      .. controls ( 0.7113, 0.3774) and ( 0.7569, 0.3513) .. ( 0.7901, 0.3824)
6072      -- ( 0.7585, 0.4390)
6073      --cycle
6074      ( 0.2071, 0.4153)
6075      .. controls ( 0.1984, 0.3706) and ( 0.2118, 0.3204) .. ( 0.2582, 0.3046)
6076      .. controls ( 0.2685, 0.3631) and ( 0.2706, 0.3931) .. ( 0.2071, 0.4153)
6077      --cycle
6078      (-0.0567, 0.3982)
6079      .. controls (-0.0558, 0.3230) and (-0.0460, 0.3456) .. (-0.0210, 0.2876)
6080      -- ( 0.0067, 0.1940)
6081      .. controls ( 0.0180, 0.1513) and ( 0.0026, 0.1332) .. ( 0.0454, 0.1089)
6082      -- ( 0.0767, 0.1940)
6083      -- ( 0.0546, 0.2621)
6084      -- ( 0.0406, 0.3185)
6085      -- (-0.0258, 0.3896)
6086      --cycle
6087      (-0.7969, 0.3634)
6088      -- (-0.8570, 0.2602)
6089      .. controls (-0.8515, 0.2550) and (-0.8469, 0.2514) .. (-0.8414, 0.2450)
6090      .. controls (-0.8020, 0.1990) and (-0.8201, 0.1971) .. (-0.7629, 0.1540)
6091      .. controls (-0.7462, 0.1414) and (-0.7054, 0.1023) .. (-0.6834, 0.1181)
6092      .. controls (-0.6662, 0.1304) and (-0.6813, 0.1625) .. (-0.6882, 0.1768)
6093      .. controls (-0.7213, 0.2456) and (-0.7865, 0.2417) .. (-0.8004, 0.2965)
6094      .. controls (-0.8052, 0.3154) and (-0.7990, 0.3413) .. (-0.7969, 0.3634)
6095      --cycle
6096      ( 0.8244, 0.3214)
6097      .. controls ( 0.8136, 0.3128) and ( 0.8080, 0.2984) .. ( 0.8114, 0.2706)
6098      .. controls ( 0.8314, 0.2739) and ( 0.8424, 0.2735) .. ( 0.8526, 0.2710)

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6099  --cycle
6100  ( 0.5015, 0.3207)
6101  .. controls ( 0.4943, 0.3196) and ( 0.4861, 0.3171) .. ( 0.4766, 0.3130)
6102  .. controls ( 0.4611, 0.2827) and ( 0.4839, 0.2747) .. ( 0.5028, 0.2521)
6103  -- ( 0.5376, 0.1972)
6104  .. controls ( 0.5529, 0.1772) and ( 0.5728, 0.1698) .. ( 0.5845, 0.1426)
6105  .. controls ( 0.5979, 0.1115) and ( 0.5837, 0.0732) .. ( 0.5987, 0.0532)
6106  .. controls ( 0.6095, 0.0384) and ( 0.6236, 0.0428) .. ( 0.6350, 0.0532)
6107  .. controls ( 0.6681, 0.0842) and ( 0.6456, 0.1087) .. ( 0.6482, 0.1429)
6108  .. controls ( 0.6481, 0.1614) and ( 0.6596, 0.1802) .. ( 0.6482, 0.1967)
6109  .. controls ( 0.6390, 0.2131) and ( 0.5992, 0.2239) .. ( 0.5768, 0.2483)
6110  .. controls ( 0.5547, 0.2722) and ( 0.5524, 0.3288) .. ( 0.5015, 0.3207)
6111  --cycle
6112  (-0.5678, 0.3115)
6113  .. controls (-0.5832, 0.3118) and (-0.6140, 0.2810) .. (-0.6269, 0.2706)
6114  .. controls (-0.6185, 0.2412) and (-0.5926, 0.1953) .. (-0.5973, 0.1685)
6115  .. controls (-0.6029, 0.1373) and (-0.6320, 0.1239) .. (-0.6369, 0.0996)
6116  .. controls (-0.6406, 0.0816) and (-0.6303, 0.0652) .. (-0.6237, 0.0493)
6117  .. controls (-0.6147, 0.0275) and (-0.6000,-0.0443) .. (-0.5641,-0.0258)
6118  .. controls (-0.5134,-0.0018) and (-0.5902, 0.0606) .. (-0.5641, 0.1074)
6119  .. controls (-0.5332, 0.1697) and (-0.4913, 0.1444) .. (-0.4481, 0.1593)
6120  .. controls (-0.3913, 0.1792) and (-0.3439, 0.2446) .. (-0.3545, 0.3046)
6121  -- (-0.4568, 0.2201)
6122  -- (-0.5588, 0.2201)
6123  .. controls (-0.5549, 0.2390) and (-0.5305, 0.3109) .. (-0.5678, 0.3115)
6124  --cycle
6125  ( 0.2243, 0.2813)
6126  -- ( 0.1631, 0.2450)
6127  -- ( 0.0965, 0.2281)
6128  -- ( 0.1689, 0.1131)
6129  -- ( 0.2065, 0.0861)
6130  .. controls ( 0.2453, 0.0564) and ( 0.2384, 0.0410) .. ( 0.2923, 0.0323)
6131  -- ( 0.2988,-0.0188)
6132  .. controls ( 0.2994,-0.0695) and ( 0.2657,-0.0796) .. ( 0.2249,-0.0579)
6133  .. controls ( 0.1337,-0.0093) and ( 0.1545, 0.0219) .. ( 0.1102, 0.0744)
6134  .. controls ( 0.0914, 0.0967) and ( 0.0807, 0.1010) .. ( 0.0539, 0.1089)
6135  .. controls ( 0.0562, 0.0613) and ( 0.0756,-0.0434) .. ( 0.0403,-0.0825)
6136  .. controls ( 0.0293,-0.0948) and (-0.0336,-0.1168) .. (-0.0567,-0.1294)
6137  .. controls (-0.0615,-0.1087) and (-0.0777,-0.0729) .. (-0.0703,-0.0546)
6138  .. controls (-0.0586,-0.0251) and ( 0.0562, 0.0040) .. (-0.0152, 0.0389)
6139  -- (-0.0397, 0.0480)
6140  -- (-0.0737, 0.0578)
6141  .. controls (-0.0806, 0.0391) and (-0.0849, 0.0192) .. (-0.1018, 0.0068)
6142  .. controls (-0.1154,-0.0032) and (-0.1352,-0.0018) .. (-0.1438,-0.0212)
6143  .. controls (-0.1562,-0.0491) and (-0.1117,-0.1243) .. (-0.0874,-0.1373)
6144  .. controls (-0.0745,-0.1434) and (-0.0687,-0.1394) .. (-0.0567,-0.1373)
6145  .. controls (-0.0358,-0.2033) and (-0.0062,-0.1612) .. ( 0.0370,-0.1500)
6146  -- ( 0.1050,-0.1379)
6147  .. controls ( 0.0882,-0.0871) and ( 0.0808,-0.0999) .. ( 0.0965,-0.0443)
6148  .. controls ( 0.1454,-0.0619) and ( 0.1336,-0.0743) .. ( 0.1664,-0.0940)
6149  .. controls ( 0.1897,-0.1081) and ( 0.2226,-0.1052) .. ( 0.2361,-0.1388)
6150  .. controls ( 0.2495,-0.1724) and ( 0.2245,-0.1963) .. ( 0.2412,-0.2584)
6151  .. controls ( 0.2526,-0.2569) and ( 0.2622,-0.2548) .. ( 0.2735,-0.2584)

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6152 .. controls ( 0.2987,-0.2708) and ( 0.3225,-0.3241) .. ( 0.3212,-0.3506)
6153 .. controls ( 0.3203,-0.3711) and ( 0.3053,-0.3950) .. ( 0.3008,-0.4443)
6154 -- ( 0.2497,-0.4187)
6155 .. controls ( 0.2599,-0.4479) and ( 0.2621,-0.4475) .. ( 0.2905,-0.4528)
6156 .. controls ( 0.2877,-0.4715) and ( 0.2799,-0.4998) .. ( 0.2905,-0.5182)
6157 .. controls ( 0.2991,-0.5392) and ( 0.3228,-0.5357) .. ( 0.3346,-0.5182)
6158 .. controls ( 0.3506,-0.4943) and ( 0.3355,-0.4515) .. ( 0.3532,-0.4203)
6159 .. controls ( 0.3716,-0.3881) and ( 0.4096,-0.3844) .. ( 0.4084,-0.3499)
6160 .. controls ( 0.4074,-0.3241) and ( 0.3866,-0.3087) .. ( 0.3728,-0.2897)
6161 -- ( 0.3426,-0.2337)
6162 -- ( 0.2989,-0.1879)
6163 .. controls ( 0.2810,-0.1587) and ( 0.2976,-0.1327) .. ( 0.3187,-0.1323)
6164 .. controls ( 0.3342,-0.1319) and ( 0.3489,-0.1451) .. ( 0.3603,-0.1541)
6165 .. controls ( 0.3817,-0.1712) and ( 0.4026,-0.1894) .. ( 0.4144,-0.2146)
6166 .. controls ( 0.4299,-0.2477) and ( 0.4289,-0.2977) .. ( 0.4712,-0.3110)
6167 .. controls ( 0.4957,-0.3188) and ( 0.5167,-0.3024) .. ( 0.5044,-0.2753)
6168 .. controls ( 0.4967,-0.2585) and ( 0.4769,-0.2471) .. ( 0.4676,-0.2227)
6169 .. controls ( 0.4582,-0.1981) and ( 0.4681,-0.1743) .. ( 0.4488,-0.1492)
6170 .. controls ( 0.4286,-0.1227) and ( 0.3809,-0.1095) .. ( 0.3621,-0.0696)
6171 .. controls ( 0.3402,-0.0230) and ( 0.3896, 0.0270) .. ( 0.3092, 0.0408)
6172 -- ( 0.3532, 0.1933)
6173 -- ( 0.3944, 0.2536)
6174 -- ( 0.3433, 0.2765)
6175 --cycle
6176 ( 0.2497, 0.2450)
6177 -- ( 0.2782, 0.2025)
6178 .. controls ( 0.2843, 0.1911) and ( 0.2884, 0.1815) .. ( 0.2900, 0.1685)
6179 .. controls ( 0.3021, 0.0654) and ( 0.1495, 0.1479) .. ( 0.2135, 0.2245)
6180 .. controls ( 0.2246, 0.2378) and ( 0.2346, 0.2396) .. ( 0.2497, 0.2450)
6181 --cycle
6182 ( 0.8836, 0.2157)
6183 .. controls ( 0.8688, 0.2061) and ( 0.8571, 0.1889) .. ( 0.8687, 0.1736)
6184 .. controls ( 0.8785, 0.1608) and ( 0.8967, 0.1613) .. ( 0.9161, 0.1578)
6185 --cycle
6186 (-0.3035, 0.1940)
6187 .. controls (-0.3340, 0.1390) and (-0.3508, 0.1491) .. (-0.3624, 0.1300)
6188 .. controls (-0.3738, 0.1112) and (-0.3588, 0.0896) .. (-0.3288, 0.0972)
6189 .. controls (-0.2842, 0.1084) and (-0.2392, 0.1714) .. (-0.3035, 0.1940)
6190 --cycle
6191 ( 0.4710, 0.1940)
6192 .. controls ( 0.4330, 0.1525) and ( 0.3961, 0.1447) .. ( 0.4114, 0.0833)
6193 .. controls ( 0.4294, 0.0897) and ( 0.4596, 0.1056) .. ( 0.4776, 0.0984)
6194 .. controls ( 0.5010, 0.0888) and ( 0.5182, 0.0420) .. ( 0.4925, 0.0231)
6195 .. controls ( 0.4698, 0.0064) and ( 0.4500, 0.0299) .. ( 0.3944, 0.0153)
6196 .. controls ( 0.4243,-0.0189) and ( 0.4618,-0.0333) .. ( 0.4765,-0.0621)
6197 .. controls ( 0.4928,-0.0939) and ( 0.4729,-0.1183) .. ( 0.4881,-0.1406)
6198 .. controls ( 0.4977,-0.1549) and ( 0.5241,-0.1630) .. ( 0.5425,-0.1894)
6199 .. controls ( 0.5557,-0.2085) and ( 0.5562,-0.2282) .. ( 0.5657,-0.2485)
6200 -- ( 0.6122,-0.3251)
6201 .. controls ( 0.6335,-0.3720) and ( 0.6160,-0.3973) .. ( 0.6323,-0.4443)
6202 .. controls ( 0.6532,-0.5042) and ( 0.6754,-0.5231) .. ( 0.6973,-0.5440)
6203 -- ( 0.7289,-0.4899)
6204 .. controls ( 0.7138,-0.4739) and ( 0.6992,-0.4579) .. ( 0.6886,-0.4358)

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6205 -- ( 0.6489,-0.2690)
6206 .. controls ( 0.6485,-0.2445) and ( 0.6654,-0.2180) .. ( 0.6598,-0.2002)
6207 .. controls ( 0.6522,-0.1752) and ( 0.6202,-0.1899) .. ( 0.5938,-0.1612)
6208 .. controls ( 0.5619,-0.1263) and ( 0.5907,-0.0980) .. ( 0.5797,-0.0720)
6209 .. controls ( 0.5714,-0.0525) and ( 0.5434,-0.0441) .. ( 0.5374,-0.0184)
6210 .. controls ( 0.5319, 0.0056) and ( 0.5522, 0.0300) .. ( 0.5533, 0.0578)
6211 .. controls ( 0.5548, 0.0943) and ( 0.4981, 0.1701) .. ( 0.4710, 0.1940)
6212 --cycle
6213 (-0.9001, 0.1862)
6214 -- (-0.9386, 0.1201)
6215 .. controls (-0.9374, 0.1181) and (-0.9371, 0.1158) .. (-0.9356, 0.1139)
6216 .. controls (-0.9242, 0.0996) and (-0.9046, 0.0893) .. (-0.8911, 0.0660)
6217 .. controls (-0.8684, 0.0268) and (-0.8960, 0.0297) .. (-0.8592,-0.0296)
6218 .. controls (-0.8262,-0.0830) and (-0.8655,-0.1092) .. (-0.7971,-0.1209)
6219 -- (-0.7875, 0.0068)
6220 -- (-0.8579, 0.1174)
6221 --cycle
6222 (-0.4453, 0.0979)
6223 .. controls (-0.4922, 0.0916) and (-0.4988, 0.0347) .. (-0.4759, 0.0116)
6224 .. controls (-0.4491,-0.0149) and (-0.4165, 0.0208) .. (-0.3900, 0.0116)
6225 .. controls (-0.3555,-0.0011) and (-0.3800,-0.0410) .. (-0.3751,-0.0698)
6226 -- (-0.3537,-0.1294)
6227 .. controls (-0.3428,-0.1879) and (-0.4042,-0.1777) .. (-0.3801,-0.2656)
6228 .. controls (-0.3617,-0.2531) and (-0.3352,-0.2292) .. (-0.3122,-0.2330)
6229 .. controls (-0.2845,-0.2375) and (-0.2669,-0.2694) .. (-0.2543,-0.2911)
6230 .. controls (-0.2183,-0.3533) and (-0.2004,-0.3613) .. (-0.2184,-0.4358)
6231 .. controls (-0.3300,-0.4097) and (-0.2723,-0.5065) .. (-0.2483,-0.5549)
6232 -- (-0.2129,-0.6314)
6233 .. controls (-0.2017,-0.6508) and (-0.1900,-0.6661) .. (-0.1670,-0.6712)
6234 .. controls (-0.1211,-0.6813) and (-0.1100,-0.6527) .. (-0.1163,-0.6145)
6235 .. controls (-0.1327,-0.6119) and (-0.1427,-0.6118) .. (-0.1568,-0.6009)
6236 .. controls (-0.1780,-0.5845) and (-0.2123,-0.5041) .. (-0.2042,-0.4783)
6237 .. controls (-0.1947,-0.4484) and (-0.1575,-0.4121) .. (-0.1333,-0.3932)
6238 -- (-0.1527,-0.3251)
6239 -- (-0.1588,-0.2656)
6240 .. controls (-0.2187,-0.2715) and (-0.2083,-0.2536) .. (-0.2457,-0.2163)
6241 .. controls (-0.2684,-0.1935) and (-0.2911,-0.1886) .. (-0.2996,-0.1546)
6242 -- (-0.2996,-0.1209)
6243 -- (-0.3232,-0.0698)
6244 .. controls (-0.3283,-0.0435) and (-0.3124,-0.0260) .. (-0.3175,-0.0041)
6245 .. controls (-0.3251, 0.0283) and (-0.3891, 0.0917) .. (-0.4227, 0.0973)
6246 .. controls (-0.4311, 0.0987) and (-0.4386, 0.0989) .. (-0.4453, 0.0979)
6247 --cycle
6248 (-0.1163,-0.6145)
6249 -- (-0.0812,-0.6009)
6250 -- (-0.0509,-0.4868)
6251 -- (-0.0567,-0.4528)
6252 .. controls (-0.1227,-0.4845) and (-0.1350,-0.5483) .. (-0.1163,-0.6145)
6253 --cycle
6254 ( 0.9165, 0.0573)
6255 .. controls ( 0.8982, 0.0512) and ( 0.8800, 0.0260) .. ( 0.8880,-0.0013)
6256 .. controls ( 0.8973,-0.0334) and ( 0.9330,-0.0408) .. ( 0.9466,-0.0703)
6257 .. controls ( 0.9528,-0.0838) and ( 0.9514,-0.0964) .. ( 0.9506,-0.1091)

```

```

6258 -- ( 1.0000,-0.0243)
6259 .. controls ( 0.9816,-0.0179) and ( 0.9678,-0.0119) .. ( 0.9563, 0.0077)
6260 .. controls ( 0.9465, 0.0244) and ( 0.9476, 0.0488) .. ( 0.9340, 0.0564)
6261 .. controls ( 0.9288, 0.0593) and ( 0.9227, 0.0593) .. ( 0.9165, 0.0573)
6262 --cycle
6263 (-0.7064, 0.0069)
6264 .. controls (-0.7128, 0.0077) and (-0.7187, 0.0075) .. (-0.7237, 0.0061)
6265 .. controls (-0.7255, 0.0030) and (-0.7310, 0.0025) .. (-0.7316,-0.0115)
6266 .. controls (-0.7321,-0.0230) and (-0.7071,-0.1058) .. (-0.6984,-0.1096)
6267 .. controls (-0.6872,-0.1176) and (-0.6721,-0.1116) .. (-0.6609,-0.1096)
6268 .. controls (-0.6502,-0.1046) and (-0.6316,-0.0986) .. (-0.6242,-0.0900)
6269 .. controls (-0.5901,-0.0507) and (-0.6615, 0.0017) .. (-0.7064, 0.0069)
6270 --cycle
6271 (-1.0000, 0.0068)
6272 -- (-1.0000, 0.0020)
6273 -- (-0.9548,-0.0788)
6274 .. controls (-0.9170,-0.0310) and (-0.9342,-0.0158) .. (-1.0000, 0.0068)
6275 --cycle
6276 (-0.2643, 0.0054)
6277 .. controls (-0.2853,-0.0295) and (-0.2523,-0.0713) .. (-0.2182,-0.0843)
6278 .. controls (-0.2024,-0.0902) and (-0.1781,-0.0944) .. (-0.1687,-0.0757)
6279 .. controls (-0.1530,-0.0441) and (-0.2378, 0.0095) .. (-0.2643, 0.0054)
6280 --cycle
6281 ( 0.6299,-0.0102)
6282 .. controls ( 0.6155,-0.0145) and ( 0.6071,-0.0342) .. ( 0.6128,-0.0510)
6283 .. controls ( 0.6198,-0.0721) and ( 0.6440,-0.0790) .. ( 0.6606,-0.0986)
6284 .. controls ( 0.6738,-0.1143) and ( 0.6761,-0.1328) .. ( 0.6948,-0.1437)
6285 .. controls ( 0.7092,-0.1520) and ( 0.7311,-0.1484) .. ( 0.7401,-0.1664)
6286 .. controls ( 0.7461,-0.1784) and ( 0.7351,-0.2363) .. ( 0.7348,-0.2570)
6287 .. controls ( 0.7336,-0.3524) and ( 0.7289,-0.3324) .. ( 0.7620,-0.4187)
6288 .. controls ( 0.7631,-0.4216) and ( 0.7642,-0.4246) .. ( 0.7652,-0.4275)
6289 -- ( 0.8003,-0.3672)
6290 .. controls ( 0.7976,-0.3636) and ( 0.7942,-0.3606) .. ( 0.7918,-0.3568)
6291 .. controls ( 0.7778,-0.3349) and ( 0.7645,-0.2537) .. ( 0.7970,-0.2417)
6292 .. controls ( 0.8206,-0.2330) and ( 0.8347,-0.2671) .. ( 0.8432,-0.2822)
6293 -- ( 0.8469,-0.2872)
6294 -- ( 0.8787,-0.2326)
6295 -- ( 0.8594,-0.1993)
6296 .. controls ( 0.8496,-0.1847) and ( 0.7996,-0.1314) .. ( 0.7847,-0.1281)
6297 .. controls ( 0.7712,-0.1229) and ( 0.7642,-0.1268) .. ( 0.7518,-0.1281)
6298 .. controls ( 0.7451,-0.1148) and ( 0.7397,-0.1014) .. ( 0.7293,-0.0886)
6299 -- ( 0.6461,-0.0117)
6300 .. controls ( 0.6402,-0.0090) and ( 0.6347,-0.0087) .. ( 0.6299,-0.0102)
6301 --cycle
6302 (-0.5178,-0.0844)
6303 .. controls (-0.5451,-0.0820) and (-0.5852,-0.0947) .. (-0.5902,-0.1144)
6304 .. controls (-0.6007,-0.1557) and (-0.5621,-0.1731) .. (-0.5414,-0.1997)
6305 .. controls (-0.5274,-0.2177) and (-0.5229,-0.2355) .. (-0.5044,-0.2525)
6306 .. controls (-0.4888,-0.2669) and (-0.4706,-0.2705) .. (-0.4543,-0.2923)
6307 .. controls (-0.4420,-0.3087) and (-0.4220,-0.3707) .. (-0.4141,-0.3932)
6308 .. controls (-0.3620,-0.3875) and (-0.3060,-0.4031) .. (-0.3060,-0.3592)
6309 .. controls (-0.3060,-0.3272) and (-0.3358,-0.3272) .. (-0.3716,-0.3008)
6310 .. controls (-0.4367,-0.2529) and (-0.4253,-0.2451) .. (-0.4621,-0.1914)

```

```

6311 .. controls (-0.4700,-0.1800) and (-0.4814,-0.1685) .. (-0.4867,-0.1556)
6312 .. controls (-0.4970,-0.1308) and (-0.4804,-0.1088) .. (-0.4966,-0.0923)
6313 .. controls (-0.5011,-0.0877) and (-0.5087,-0.0853) .. (-0.5178,-0.0844)
6314 --cycle
6315 (-0.4165,-0.0846)
6316 .. controls (-0.4357,-0.0807) and (-0.4622,-0.1075) .. (-0.4395,-0.1440)
6317 .. controls (-0.4316,-0.1566) and (-0.4254,-0.1571) .. (-0.4141,-0.1634)
6318 .. controls (-0.4094,-0.1522) and (-0.4042,-0.1415) .. (-0.4019,-0.1294)
6319 .. controls (-0.3960,-0.1004) and (-0.4049,-0.0870) .. (-0.4165,-0.0846)
6320 --cycle
6321 (-0.9358,-0.1125)
6322 -- (-0.8813,-0.2098)
6323 .. controls (-0.8768,-0.1903) and (-0.8656,-0.1673) .. (-0.8723,-0.1485)
6324 .. controls (-0.8801,-0.1269) and (-0.9022,-0.1274) .. (-0.9358,-0.1125)
6325 --cycle
6326 ( 0.1455,-0.1458)
6327 .. controls ( 0.1402,-0.1449) and ( 0.1336,-0.1452) .. ( 0.1255,-0.1471)
6328 .. controls ( 0.0901,-0.1850) and ( 0.1064,-0.2454) .. ( 0.1360,-0.2301)
6329 .. controls ( 0.1569,-0.2194) and ( 0.1827,-0.1522) .. ( 0.1455,-0.1458)
6330 --cycle
6331 (-0.1477,-0.1474)
6332 .. controls (-0.1646,-0.1458) and (-0.1813,-0.1543) .. (-0.1847,-0.1659)
6333 .. controls (-0.1889,-0.1806) and (-0.1612,-0.2953) .. (-0.1163,-0.2315)
6334 -- (-0.0420,-0.4418)
6335 .. controls (-0.0291,-0.4661) and (-0.0068,-0.4600) .. ( 0.0136,-0.4880)
6336 .. controls ( 0.0294,-0.5097) and ( 0.0259,-0.5331) .. ( 0.0419,-0.5487)
6337 .. controls ( 0.0694,-0.5755) and ( 0.1462,-0.5710) .. ( 0.1798,-0.6001)
6338 -- ( 0.2188,-0.6436)
6339 .. controls ( 0.2392,-0.6605) and ( 0.2566,-0.6577) .. ( 0.2804,-0.6838)
6340 .. controls ( 0.3122,-0.7186) and ( 0.3037,-0.7586) .. ( 0.3603,-0.7592)
6341 .. controls ( 0.3537,-0.7217) and ( 0.3358,-0.6781) .. ( 0.3603,-0.6427)
6342 .. controls ( 0.3743,-0.6222) and ( 0.3978,-0.6232) .. ( 0.4032,-0.6039)
6343 .. controls ( 0.4084,-0.5852) and ( 0.3901,-0.5654) .. ( 0.3712,-0.5741)
6344 .. controls ( 0.3573,-0.5804) and ( 0.3558,-0.5936) .. ( 0.3518,-0.6044)
6345 .. controls ( 0.3319,-0.6046) and ( 0.2996,-0.6092) .. ( 0.2842,-0.6044)
6346 .. controls ( 0.2568,-0.5917) and ( 0.2515,-0.5648) .. ( 0.2231,-0.5501)
6347 .. controls ( 0.1960,-0.5359) and ( 0.1632,-0.5421) .. ( 0.1413,-0.5292)
6348 -- ( 0.0626,-0.4601)
6349 .. controls ( 0.0525,-0.4430) and ( 0.0547,-0.4207) .. ( 0.0440,-0.4065)
6350 .. controls ( 0.0320,-0.3906) and ( 0.0076,-0.3898) .. (-0.0104,-0.3714)
6351 .. controls (-0.0515,-0.3289) and ( 0.0146,-0.2721) .. (-0.0737,-0.2358)
6352 .. controls (-0.0903,-0.2290) and (-0.0917,-0.2313) .. (-0.1098,-0.2315)
6353 -- (-0.1098,-0.1892)
6354 .. controls (-0.1137,-0.1607) and (-0.1308,-0.1491) .. (-0.1477,-0.1474)
6355 --cycle
6356 (-0.7679,-0.1481)
6357 .. controls (-0.8119,-0.1523) and (-0.8157,-0.2051) .. (-0.8303,-0.2401)
6358 -- (-0.8453,-0.2740)
6359 -- (-0.8299,-0.3015)
6360 .. controls (-0.7861,-0.2968) and (-0.8116,-0.2403) .. (-0.7732,-0.2278)
6361 .. controls (-0.7561,-0.2223) and (-0.7349,-0.2415) .. (-0.7204,-0.2497)
6362 .. controls (-0.6711,-0.2774) and (-0.6473,-0.2864) .. (-0.6524,-0.3506)
6363 -- (-0.6787,-0.3422)

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```

6364 .. controls (-0.6786,-0.3475) and (-0.6826,-0.3544) .. (-0.6787,-0.3655)
6365 .. controls (-0.6635,-0.4244) and (-0.5943,-0.3658) .. (-0.5763,-0.3760)
6366 .. controls (-0.5586,-0.3861) and (-0.5497,-0.4251) .. (-0.5357,-0.4418)
6367 .. controls (-0.5118,-0.4701) and (-0.4694,-0.4662) .. (-0.4504,-0.5047)
6368 .. controls (-0.4231,-0.5599) and (-0.4535,-0.6772) .. (-0.4451,-0.7421)
6369 .. controls (-0.4389,-0.7901) and (-0.4023,-0.8005) .. (-0.3912,-0.8443)
6370 .. controls (-0.3883,-0.8558) and (-0.3874,-0.8667) .. (-0.3869,-0.8774)
6371 -- (-0.3386,-0.8778)
6372 .. controls (-0.3371,-0.8645) and (-0.3342,-0.8523) .. (-0.3394,-0.8358)
6373 .. controls (-0.3448,-0.8167) and (-0.3914,-0.7567) .. (-0.3962,-0.6996)
6374 .. controls (-0.4039,-0.6074) and (-0.3294,-0.5871) .. (-0.3545,-0.4954)
6375 -- (-0.3886,-0.5039)
6376 -- (-0.4196,-0.4442)
6377 -- (-0.4864,-0.4090)
6378 -- (-0.5345,-0.3241)
6379 -- (-0.6106,-0.2802)
6380 -- (-0.6106,-0.1975)
6381 .. controls (-0.6301,-0.2027) and (-0.6486,-0.2101) .. (-0.6694,-0.2022)
6382 .. controls (-0.7004,-0.1904) and (-0.7133,-0.1559) .. (-0.7464,-0.1495)
6383 .. controls (-0.7544,-0.1479) and (-0.7616,-0.1475) .. (-0.7679,-0.1481)
6384 --cycle
6385 ( 0.0029,-0.2060)
6386 .. controls (-0.0139,-0.2731) and ( 0.0196,-0.2608) .. ( 0.0476,-0.3014)
6387 .. controls ( 0.0682,-0.3314) and ( 0.0511,-0.3569) .. ( 0.0750,-0.3784)
6388 .. controls ( 0.0974,-0.3988) and ( 0.1304,-0.3876) .. ( 0.1549,-0.4019)
6389 .. controls ( 0.1795,-0.4164) and ( 0.1878,-0.4529) .. ( 0.1987,-0.4783)
6390 .. controls ( 0.2461,-0.4539) and ( 0.2519,-0.4021) .. ( 0.2180,-0.3618)
6391 .. controls ( 0.1964,-0.3362) and ( 0.1652,-0.3426) .. ( 0.1414,-0.3257)
6392 .. controls ( 0.1198,-0.3103) and ( 0.1183,-0.2881) .. ( 0.1007,-0.2689)
6393 .. controls ( 0.0838,-0.2504) and ( 0.0265,-0.2166) .. ( 0.0029,-0.2060)
6394 --cycle
6395 ( 0.2327,-0.2826)
6396 .. controls ( 0.1961,-0.2955) and ( 0.1961,-0.3123) .. ( 0.2327,-0.3251)
6397 --cycle
6398 (-0.7548,-0.3137)
6399 .. controls (-0.7774,-0.3164) and (-0.7890,-0.3323) .. (-0.7986,-0.3573)
6400 -- (-0.7759,-0.3979)
6401 .. controls (-0.7735,-0.3968) and (-0.7711,-0.3964) .. (-0.7688,-0.3946)
6402 -- (-0.7205,-0.3166)
6403 .. controls (-0.7341,-0.3135) and (-0.7454,-0.3126) .. (-0.7548,-0.3137)
6404 --cycle
6405 ( 0.4114,-0.3847)
6406 .. controls ( 0.4216,-0.4136) and ( 0.4238,-0.4142) .. ( 0.4540,-0.4102)
6407 -- ( 0.4540,-0.3932)
6408 --cycle
6409 ( 0.5395,-0.3997)
6410 .. controls ( 0.5263,-0.3990) and ( 0.5044,-0.4032) .. ( 0.4625,-0.4018)
6411 -- ( 0.4780,-0.4954)
6412 .. controls ( 0.4757,-0.5287) and ( 0.4518,-0.5542) .. ( 0.4648,-0.5776)
6413 .. controls ( 0.4852,-0.6142) and ( 0.5202,-0.5603) .. ( 0.5614,-0.5929)
6414 .. controls ( 0.5752,-0.6038) and ( 0.6063,-0.6359) .. ( 0.6275,-0.6638)
6415 -- ( 0.6570,-0.6132)
6416 .. controls ( 0.6460,-0.6042) and ( 0.6347,-0.5954) .. ( 0.6268,-0.5865)

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6417 -- ( 0.5937,-0.5346)
6418 .. controls ( 0.5648,-0.5023) and ( 0.5031,-0.4880) .. ( 0.5646,-0.4273)
6419 .. controls ( 0.5574,-0.4062) and ( 0.5528,-0.4005) .. ( 0.5395,-0.3997)
6420 --cycle
6421 (-0.6609,-0.4273)
6422 .. controls (-0.7027,-0.4247) and (-0.7300,-0.4414) .. (-0.7397,-0.4624)
6423 -- (-0.7047,-0.5249)
6424 .. controls (-0.7013,-0.5263) and (-0.6989,-0.5282) .. (-0.6950,-0.5294)
6425 .. controls (-0.6935,-0.4878) and (-0.6933,-0.4806) .. (-0.6609,-0.4528)
6426 --cycle
6427 (-0.5689,-0.4528)
6428 .. controls (-0.6368,-0.4677) and (-0.6352,-0.5020) .. (-0.6354,-0.5634)
6429 -- (-0.5757,-0.6071)
6430 -- (-0.5162,-0.6826)
6431 .. controls (-0.5073,-0.6508) and (-0.5037,-0.6125) .. (-0.5241,-0.5838)
6432 .. controls (-0.5384,-0.5639) and (-0.5622,-0.5584) .. (-0.5689,-0.5361)
6433 .. controls (-0.5775,-0.5167) and (-0.5648,-0.4918) .. (-0.5689,-0.4528)
6434 --cycle
6435 (-0.6354,-0.5634)
6436 .. controls (-0.6583,-0.5576) and (-0.6713,-0.5579) .. (-0.6839,-0.5619)
6437 -- (-0.6487,-0.6248)
6438 .. controls (-0.6395,-0.6053) and (-0.6326,-0.5852) .. (-0.6354,-0.5634)
6439 --cycle
6440 (-0.0056,-0.5890)
6441 .. controls (-0.0554,-0.6155) and (-0.0426,-0.6370) .. (-0.0606,-0.6818)
6442 -- (-0.1199,-0.7847)
6443 .. controls (-0.1298,-0.8015) and (-0.1531,-0.8317) .. (-0.1499,-0.8510)
6444 .. controls (-0.1482,-0.8615) and (-0.1397,-0.8702) .. (-0.1295,-0.8795)
6445 -- (-0.0507,-0.8802)
6446 .. controls (-0.0629,-0.8583) and (-0.0745,-0.8380) .. (-0.0742,-0.8358)
6447 .. controls (-0.0792,-0.8239) and (-0.0776,-0.8135) .. (-0.0742,-0.8027)
6448 .. controls (-0.0460,-0.7520) and ( 0.0016,-0.7834) .. ( 0.0277,-0.7780)
6449 .. controls ( 0.0760,-0.7679) and ( 0.1284,-0.6914) .. ( 0.1207,-0.6405)
6450 .. controls ( 0.1150,-0.6017) and ( 0.0841,-0.6082) .. ( 0.0711,-0.6267)
6451 .. controls ( 0.0620,-0.6397) and ( 0.0556,-0.7141) .. ( 0.0539,-0.7336)
6452 .. controls (-0.0413,-0.7085) and ( 0.0139,-0.6637) .. (-0.0056,-0.5890)
6453 --cycle
6454 ( 0.4284,-0.6571)
6455 .. controls ( 0.4285,-0.7307) and ( 0.4284,-0.7652) .. ( 0.5135,-0.7336)
6456 .. controls ( 0.5170,-0.7469) and ( 0.5220,-0.7585) .. ( 0.5179,-0.7726)
6457 .. controls ( 0.5091,-0.8019) and ( 0.4473,-0.8546) .. ( 0.4851,-0.8847)
6458 -- ( 0.4987,-0.8848)
6459 -- ( 0.5768,-0.7509)
6460 .. controls ( 0.5767,-0.7509) and ( 0.5767,-0.7507) .. ( 0.5767,-0.7507)
6461 .. controls ( 0.5412,-0.6652) and ( 0.5083,-0.6726) .. ( 0.4284,-0.6571)
6462 --cycle
6463 (-0.2914,-0.6672)
6464 .. controls (-0.2998,-0.6666) and (-0.3106,-0.6686) .. (-0.3250,-0.6743)
6465 .. controls (-0.3545,-0.7128) and (-0.3081,-0.7358) .. (-0.2850,-0.7678)
6466 .. controls (-0.2710,-0.7873) and (-0.2601,-0.8137) .. (-0.2351,-0.8216)
6467 .. controls (-0.2083,-0.8301) and (-0.1916,-0.8105) .. (-0.1960,-0.7845)
6468 .. controls (-0.2008,-0.7566) and (-0.2232,-0.7418) .. (-0.2396,-0.7216)
6469 .. controls (-0.2612,-0.6950) and (-0.2660,-0.6690) .. (-0.2914,-0.6672)

```

```

6470 --cycle
6471 (-0.5641,-0.6998)
6472 .. controls (-0.5850,-0.6984) and (-0.5808,-0.7367) .. (-0.5766,-0.7507)
6473 .. controls (-0.5748,-0.7566) and (-0.5723,-0.7598) .. (-0.5702,-0.7648)
6474 -- (-0.5492,-0.8022)
6475 .. controls (-0.5310,-0.8247) and (-0.5120,-0.8367) .. (-0.5052,-0.8613)
6476 .. controls (-0.5044,-0.8642) and (-0.5062,-0.8717) .. (-0.5063,-0.8763)
6477 -- (-0.4585,-0.8767)
6478 .. controls (-0.4596,-0.7984) and (-0.5013,-0.7963) .. (-0.5234,-0.7583)
6479 .. controls (-0.5344,-0.7394) and (-0.5352,-0.7120) .. (-0.5535,-0.7030)
6480 .. controls (-0.5576,-0.7010) and (-0.5611,-0.7000) .. (-0.5641,-0.6998)
6481 --cycle
6482 ( 0.1990,-0.7341)
6483 .. controls ( 0.1094,-0.7768) and ( 0.2330,-0.8330) .. ( 0.2586,-0.8828)
6484 -- ( 0.3183,-0.8833)
6485 .. controls ( 0.3165,-0.8684) and ( 0.3066,-0.8565) .. ( 0.2991,-0.8428)
6486 .. controls ( 0.2762,-0.8010) and ( 0.2508,-0.7418) .. ( 0.1990,-0.7341)
6487 --cycle
6488 ( 0.3603,-0.7592)
6489 -- ( 0.3859,-0.8188)
6490 .. controls ( 0.4178,-0.7853) and ( 0.4108,-0.7527) .. ( 0.3603,-0.7592)
6491 --cycle
6492 ( 0.4369,-0.8443)
6493 .. controls ( 0.4147,-0.8480) and ( 0.3837,-0.8661) .. ( 0.3628,-0.8837)
6494 -- ( 0.4240,-0.8842)
6495 .. controls ( 0.4307,-0.8690) and ( 0.4358,-0.8541) .. ( 0.4369,-0.8443)
6496 --cycle
6497 (-0.3205,-0.8528)
6498 -- (-0.3266,-0.8779)
6499 -- (-0.2773,-0.8783)
6500 .. controls (-0.2800,-0.8719) and (-0.2850,-0.8655) .. (-0.2963,-0.8600)
6501 --cycle
6502 ( 0.1093,-0.8568)
6503 .. controls ( 0.0964,-0.8568) and ( 0.0834,-0.8587) .. ( 0.0710,-0.8600)
6504 .. controls ( 0.0605,-0.8611) and ( 0.0403,-0.8617) .. ( 0.0312,-0.8664)
6505 .. controls ( 0.0240,-0.8701) and ( 0.0203,-0.8751) .. ( 0.0184,-0.8808)
6506 -- ( 0.1002,-0.8815)
6507 -- ( 0.1050,-0.8698)
6508 -- ( 0.1085,-0.8815)
6509 -- ( 0.1641,-0.8820)
6510 .. controls ( 0.1606,-0.8757) and ( 0.1553,-0.8698) .. ( 0.1463,-0.8649)
6511 .. controls ( 0.1347,-0.8586) and ( 0.1221,-0.8568) .. ( 0.1093,-0.8568)
6512 --cycle
6513 ;
6514 }
6515 }
6516 \fi

```

```

hex/terrain/town/road
hex/terrain/town/small road
hex/terrain/town/house

```

For villages, towns, and cities, we need three styles: one for houses, and separate styles for regular and small roads. Note that we draw using the stroke colour for roads and houses.



```

6517 \ifhex@terrain@pic
6518 \tikzset{
6519   hex/terrain/town/road/.style={
6520     fill=none,
6521     draw=gray!50!black,
6522     scale line widths,
6523     line width=.3mm
6524   },
6525   hex/terrain/town/small road/.style={
6526     fill=none,
6527     draw=gray!75!black,
6528     scale line widths,
6529     line width=.15mm
6530   },
6531   hex/terrain/town/post road/.style={
6532     fill=none
6533   },
6534   hex/terrain/town/house/.style={
6535     draw=none,
6536     fill=gray!75!black,
6537   }
6538 }

```

hex/terrain/village

Now for village, town, and city patterns.

```

6539 \tikzset{
6540   hex/terrain/village/.pic={
6541     \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6542     ( 0.0073, 0.8700)
6543     -- ( 0.3952, 0.3373)
6544     -- ( 0.3884, 0.2029)
6545     -- ( 0.3555, 0.1378)
6546     -- ( 0.3751, 0.0880)
6547     -- ( 0.2513,-0.1997)
6548     -- ( 0.1396,-0.4505)
6549     -- ( 0.0641,-0.6512)
6550     -- ( 0.0070,-0.8700)
6551     -- ( 0.0070,-0.8700)
6552     ;
6553     \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6554     ( 0.7575, 0.4367)
6555     -- ( 0.3945, 0.3375)

```

```

6556 -- ( 0.3945, 0.3375)
6557 ;
6558 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6559 (-0.1900,-0.0806)
6560 -- (-0.1155, 0.1588)
6561 ;
6562 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6563 (-0.1308, 0.1580)
6564 -- (-0.7603, 0.4394)
6565 ;
6566 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6567 (-0.6615,-0.2309)
6568 -- (-0.6777,-0.3255)
6569 -- (-0.7607,-0.4327)
6570 ;
6571 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6572 (-0.6676,-0.2405)
6573 -- (-0.4599,-0.1067)
6574 -- (-0.1877,-0.0679)
6575 ;
6576 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6577 ( 0.2082,-0.3003)
6578 -- ( 0.4578,-0.4855)
6579 -- ( 0.5914,-0.3675)
6580 -- ( 0.7607,-0.4420)
6581 ;
6582 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6583 ( 0.3827, 0.1864)
6584 -- (-0.1290, 0.1576)
6585 ;
6586 \path[hex/terrain/town/house,pic actions]
6587 ( 0.2259, 0.4898)
6588 -- ( 0.2453, 0.4680)
6589 -- ( 0.2052, 0.4324)
6590 -- ( 0.1858, 0.4542)
6591 --cycle
6592 ;
6593 \path[hex/terrain/town/house,pic actions]
6594 ( 0.2259, 0.4898)
6595 -- ( 0.2453, 0.4680)
6596 -- ( 0.2052, 0.4324)
6597 -- ( 0.1858, 0.4542)
6598 --cycle
6599 ;
6600 \path[hex/terrain/town/house,pic actions]
6601 (-0.1978, 0.1663)
6602 -- (-0.1534, 0.1549)
6603 -- (-0.1685, 0.0960)
6604 -- (-0.2130, 0.1074)
6605 --cycle
6606 ;
6607 \path[hex/terrain/town/house,pic actions]
6608 (-0.1978, 0.1663)

```

```

6609 -- (-0.1534, 0.1549)
6610 -- (-0.1685, 0.0960)
6611 -- (-0.2130, 0.1074)
6612 --cycle
6613 ;
6614 \path[hex/terrain/town/house,pic actions]
6615 ( 0.5127,-0.3559)
6616 -- ( 0.5341,-0.3759)
6617 -- ( 0.4975,-0.4151)
6618 -- ( 0.4761,-0.3951)
6619 --cycle
6620 ;
6621 \path[hex/terrain/town/house,pic actions]
6622 ( 0.5127,-0.3559)
6623 -- ( 0.5341,-0.3759)
6624 -- ( 0.4975,-0.4151)
6625 -- ( 0.4761,-0.3951)
6626 --cycle
6627 ;
6628 \path[hex/terrain/town/house,pic actions]
6629 ( 0.2761, 0.3992)
6630 -- ( 0.2947, 0.3765)
6631 -- ( 0.2533, 0.3425)
6632 -- ( 0.2347, 0.3651)
6633 --cycle
6634 ;
6635 \path[hex/terrain/town/house,pic actions]
6636 ( 0.2761, 0.3992)
6637 -- ( 0.2947, 0.3765)
6638 -- ( 0.2533, 0.3425)
6639 -- ( 0.2347, 0.3651)
6640 --cycle
6641 ;
6642 \path[hex/terrain/town/house,pic actions]
6643 ( 0.3227, 0.3548)
6644 -- ( 0.3421, 0.3329)
6645 -- ( 0.3020, 0.2974)
6646 -- ( 0.2826, 0.3192)
6647 --cycle
6648 ;
6649 \path[hex/terrain/town/house,pic actions]
6650 ( 0.3227, 0.3548)
6651 -- ( 0.3421, 0.3329)
6652 -- ( 0.3020, 0.2974)
6653 -- ( 0.2826, 0.3192)
6654 --cycle
6655 ;
6656 \path[hex/terrain/town/house,pic actions]
6657 ( 0.2901, 0.6234)
6658 -- ( 0.3088, 0.6008)
6659 -- ( 0.2674, 0.5667)
6660 -- ( 0.2487, 0.5893)
6661 --cycle

```

```

6662 ;
6663 \path[hex/terrain/town/house,pic actions]
6664 ( 0.2901, 0.6234)
6665 -- ( 0.3088, 0.6008)
6666 -- ( 0.2674, 0.5667)
6667 -- ( 0.2487, 0.5893)
6668 --cycle
6669 ;
6670 \path[hex/terrain/town/house,pic actions]
6671 (-0.3456, 0.2854)
6672 -- (-0.3335, 0.3120)
6673 -- (-0.2847, 0.2898)
6674 -- (-0.2968, 0.2632)
6675 --cycle
6676 ;
6677 \path[hex/terrain/town/house,pic actions]
6678 (-0.3456, 0.2854)
6679 -- (-0.3335, 0.3120)
6680 -- (-0.2847, 0.2898)
6681 -- (-0.2968, 0.2632)
6682 --cycle
6683 ;
6684 \path[hex/terrain/town/house,pic actions]
6685 (-0.6678,-0.1369)
6686 -- (-0.6492,-0.1143)
6687 -- (-0.6078,-0.1484)
6688 -- (-0.6264,-0.1710)
6689 --cycle
6690 ;
6691 \path[hex/terrain/town/house,pic actions]
6692 (-0.6678,-0.1369)
6693 -- (-0.6492,-0.1143)
6694 -- (-0.6078,-0.1484)
6695 -- (-0.6264,-0.1710)
6696 --cycle
6697 ;
6698 \path[hex/terrain/town/house,pic actions]
6699 ( 0.4610, 0.0967)
6700 -- ( 0.4896, 0.0909)
6701 -- ( 0.4790, 0.0384)
6702 -- ( 0.4503, 0.0442)
6703 --cycle
6704 ;
6705 \path[hex/terrain/town/house,pic actions]
6706 ( 0.4610, 0.0967)
6707 -- ( 0.4896, 0.0909)
6708 -- ( 0.4790, 0.0384)
6709 -- ( 0.4503, 0.0442)
6710 --cycle
6711 ;
6712 \path[hex/terrain/town/house,pic actions]
6713 ( 0.2924,-0.1375)
6714 -- ( 0.3110,-0.0955)

```

```

6715 -- ( 0.3667,-0.1202)
6716 -- ( 0.3481,-0.1621)
6717 --cycle
6718 ;
6719 \path[hex/terrain/town/house,pic actions]
6720 ( 0.2924,-0.1375)
6721 -- ( 0.3110,-0.0955)
6722 -- ( 0.3667,-0.1202)
6723 -- ( 0.3481,-0.1621)
6724 --cycle
6725 ;
6726 \path[hex/terrain/town/house,pic actions]
6727 ( 0.5094, 0.3292)
6728 -- ( 0.5505, 0.3494)
6729 -- ( 0.5773, 0.2947)
6730 -- ( 0.5362, 0.2746)
6731 --cycle
6732 ;
6733 \path[hex/terrain/town/house,pic actions]
6734 ( 0.5094, 0.3292)
6735 -- ( 0.5505, 0.3494)
6736 -- ( 0.5773, 0.2947)
6737 -- ( 0.5362, 0.2746)
6738 --cycle
6739 ;
6740 \path[hex/terrain/town/house,pic actions]
6741 (-0.1323, 0.2640)
6742 -- (-0.0890, 0.2489)
6743 -- (-0.1092, 0.1914)
6744 -- (-0.1524, 0.2065)
6745 --cycle
6746 ;
6747 \path[hex/terrain/town/house,pic actions]
6748 (-0.1323, 0.2640)
6749 -- (-0.0890, 0.2489)
6750 -- (-0.1092, 0.1914)
6751 -- (-0.1524, 0.2065)
6752 --cycle
6753 ;
6754 \path[hex/terrain/town/house,pic actions]
6755 ( 0.4115,-0.5373)
6756 -- ( 0.4390,-0.5006)
6757 -- ( 0.4877,-0.5372)
6758 -- ( 0.4601,-0.5739)
6759 --cycle
6760 ;
6761 \path[hex/terrain/town/house,pic actions]
6762 ( 0.4115,-0.5373)
6763 -- ( 0.4390,-0.5006)
6764 -- ( 0.4877,-0.5372)
6765 -- ( 0.4601,-0.5739)
6766 --cycle
6767 ;

```

```

6768 \path[hex/terrain/town/house,pic actions]
6769 ( 0.3095, 0.1272)
6770 -- ( 0.3519, 0.1095)
6771 -- ( 0.3284, 0.0533)
6772 -- ( 0.2861, 0.0710)
6773 --cycle
6774 ;
6775 \path[hex/terrain/town/house,pic actions]
6776 ( 0.3095, 0.1272)
6777 -- ( 0.3519, 0.1095)
6778 -- ( 0.3284, 0.0533)
6779 -- ( 0.2861, 0.0710)
6780 --cycle
6781 ;
6782 \path[hex/terrain/town/house,pic actions]
6783 ( 0.2904, 0.2714)
6784 -- ( 0.3361, 0.2681)
6785 -- ( 0.3318, 0.2074)
6786 -- ( 0.2861, 0.2106)
6787 --cycle
6788 ;
6789 \path[hex/terrain/town/house,pic actions]
6790 ( 0.2904, 0.2714)
6791 -- ( 0.3361, 0.2681)
6792 -- ( 0.3318, 0.2074)
6793 -- ( 0.2861, 0.2106)
6794 --cycle
6795 ;
6796 \path[hex/terrain/town/house,pic actions]
6797 ( 0.4665, 0.4396)
6798 -- ( 0.4868, 0.3985)
6799 -- ( 0.4321, 0.3716)
6800 -- ( 0.4119, 0.4127)
6801 --cycle
6802 ;
6803 \path[hex/terrain/town/house,pic actions]
6804 ( 0.4665, 0.4396)
6805 -- ( 0.4868, 0.3985)
6806 -- ( 0.4321, 0.3716)
6807 -- ( 0.4119, 0.4127)
6808 --cycle
6809 ;
6810 \path[hex/terrain/town/house,pic actions]
6811 ( 0.4187, 0.2523)
6812 -- ( 0.4643, 0.2574)
6813 -- ( 0.4711, 0.1969)
6814 -- ( 0.4256, 0.1917)
6815 --cycle
6816 ;
6817 \path[hex/terrain/town/house,pic actions]
6818 ( 0.4187, 0.2523)
6819 -- ( 0.4643, 0.2574)
6820 -- ( 0.4711, 0.1969)

```



```

6821 -- ( 0.4256, 0.1917)
6822 --cycle
6823 ;
6824 \path[hex/terrain/town/house,pic actions]
6825 ( 0.3746, 0.1600)
6826 -- ( 0.4021, 0.1699)
6827 -- ( 0.4204, 0.1195)
6828 -- ( 0.3929, 0.1095)
6829 --cycle
6830 ;
6831 \path[hex/terrain/town/house,pic actions]
6832 ( 0.3746, 0.1600)
6833 -- ( 0.4021, 0.1699)
6834 -- ( 0.4204, 0.1195)
6835 -- ( 0.3929, 0.1095)
6836 --cycle
6837 ;
6838 }
6839 }
6840 \fi

```

hex/terrain/town

A town.



```

6841 \ifhex@terrain@pic
6842 \tikzset{
6843   hex/terrain/town/.pic={
6844     \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
6845       ( 0.1432,-0.4518)
6846       -- (-0.0320,-0.2906)
6847       -- ( 0.0745,-0.0351)
6848       -- ( 0.1130,-0.0387)
6849       ;
6850     \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
6851       ( 0.0729,-0.0352)
6852       -- (-0.1716, 0.0254)
6853       ;
6854     \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
6855       (-0.2493, 0.5648)
6856       -- (-0.2192, 0.4501)
6857       ;
6858     \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
6859       ( 0.0677,-0.6538)
6860       -- ( 0.1754,-0.7052)
6861       -- ( 0.4358,-0.4688)
6862       ;

```

```

6863 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
6864 ( 0.0439,-0.3617)
6865 -- (-0.0921,-0.5012)
6866 -- (-0.2865,-0.3243)
6867 -- (-0.4420,-0.4608)
6868 -- (-0.5795,-0.4446)
6869 -- (-0.6421,-0.3520)
6870 ;
6871 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
6872 ( 0.0622,-0.6515)
6873 -- (-0.0316,-0.6176)
6874 -- (-0.0221,-0.5364)
6875 ;
6876 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
6877 ( 0.0048,-0.2069)
6878 -- (-0.1945,-0.1818)
6879 -- (-0.2278,-0.2247)
6880 -- (-0.5051,-0.1356)
6881 ;
6882 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
6883 (-0.3383, 0.0449)
6884 -- (-0.2189, 0.4510)
6885 ;
6886 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6887 ( 0.0073, 0.8700)
6888 -- ( 0.3952, 0.3373)
6889 -- ( 0.3884, 0.2029)
6890 -- ( 0.3555, 0.1378)
6891 -- ( 0.3751, 0.0880)
6892 -- ( 0.2513,-0.1997)
6893 -- ( 0.1396,-0.4505)
6894 -- ( 0.0641,-0.6512)
6895 -- ( 0.0070,-0.8700)
6896 -- ( 0.0070,-0.8700)
6897 ;
6898 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6899 ( 0.7575, 0.4367)
6900 -- ( 0.3945, 0.3375)
6901 -- ( 0.3945, 0.3375)
6902 ;
6903 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6904 (-0.1900,-0.0806)
6905 -- (-0.0751, 0.3938)
6906 -- (-0.0765, 0.3925)
6907 ;
6908 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6909 (-0.1308, 0.1580)
6910 -- (-0.7603, 0.4394)
6911 ;
6912 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6913 (-0.7139,-0.1526)
6914 -- (-0.6147,-0.3362)
6915 -- (-0.7607,-0.4327)

```

```

6916 ;
6917 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6918 (-0.6676,-0.2405)
6919 -- (-0.4599,-0.1067)
6920 -- (-0.1877,-0.0679)
6921 ;
6922 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6923 ( 0.2082,-0.3003)
6924 -- ( 0.4578,-0.4855)
6925 -- ( 0.5914,-0.3675)
6926 -- ( 0.7607,-0.4420)
6927 ;
6928 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
6929 ( 0.3827, 0.1864)
6930 -- (-0.1290, 0.1576)
6931 ;
6932 \path[hex/terrain/town/house,pic actions]
6933 (-0.4493,-0.3075)
6934 -- (-0.4043,-0.2868)
6935 -- (-0.3710,-0.3593)
6936 -- (-0.4160,-0.3799)
6937 --cycle
6938 ;
6939 \path[hex/terrain/town/house,pic actions]
6940 (-0.4493,-0.3075)
6941 -- (-0.4043,-0.2868)
6942 -- (-0.3710,-0.3593)
6943 -- (-0.4160,-0.3799)
6944 --cycle
6945 ;
6946 \path[hex/terrain/town/house,pic actions]
6947 (-0.5264,-0.1066)
6948 -- (-0.5514,-0.0681)
6949 -- (-0.5002,-0.0349)
6950 -- (-0.4753,-0.0733)
6951 --cycle
6952 ;
6953 \path[hex/terrain/town/house,pic actions]
6954 (-0.5264,-0.1066)
6955 -- (-0.5514,-0.0681)
6956 -- (-0.5002,-0.0349)
6957 -- (-0.4753,-0.0733)
6958 --cycle
6959 ;
6960 \path[hex/terrain/town/house,pic actions]
6961 (-0.1978, 0.1663)
6962 -- (-0.1534, 0.1549)
6963 -- (-0.1685, 0.0960)
6964 -- (-0.2130, 0.1074)
6965 --cycle
6966 ;
6967 \path[hex/terrain/town/house,pic actions]
6968 (-0.1978, 0.1663)

```

```

6969 -- (-0.1534, 0.1549)
6970 -- (-0.1685, 0.0960)
6971 -- (-0.2130, 0.1074)
6972 --cycle
6973 ;
6974 \path[hex/terrain/town/house,pic actions]
6975 ( 0.2259, 0.4898)
6976 -- ( 0.2453, 0.4680)
6977 -- ( 0.2052, 0.4324)
6978 -- ( 0.1858, 0.4542)
6979 --cycle
6980 ;
6981 \path[hex/terrain/town/house,pic actions]
6982 ( 0.2259, 0.4898)
6983 -- ( 0.2453, 0.4680)
6984 -- ( 0.2052, 0.4324)
6985 -- ( 0.1858, 0.4542)
6986 --cycle
6987 ;
6988 \path[hex/terrain/town/house,pic actions]
6989 (-0.0986, 0.2553)
6990 -- (-0.0882, 0.2827)
6991 -- (-0.0380, 0.2637)
6992 -- (-0.0484, 0.2363)
6993 --cycle
6994 ;
6995 \path[hex/terrain/town/house,pic actions]
6996 (-0.0986, 0.2553)
6997 -- (-0.0882, 0.2827)
6998 -- (-0.0380, 0.2637)
6999 -- (-0.0484, 0.2363)
7000 --cycle
7001 ;
7002 \path[hex/terrain/town/house,pic actions]
7003 ( 0.0834, 0.2379)
7004 -- ( 0.0888, 0.2667)
7005 -- ( 0.1415, 0.2566)
7006 -- ( 0.1361, 0.2279)
7007 --cycle
7008 ;
7009 \path[hex/terrain/town/house,pic actions]
7010 ( 0.0834, 0.2379)
7011 -- ( 0.0888, 0.2667)
7012 -- ( 0.1415, 0.2566)
7013 -- ( 0.1361, 0.2279)
7014 --cycle
7015 ;
7016 \path[hex/terrain/town/house,pic actions]
7017 (-0.0207,-0.0604)
7018 -- (-0.0103,-0.0331)
7019 -- ( 0.0398,-0.0521)
7020 -- ( 0.0294,-0.0794)
7021 --cycle

```

```

7022 ;
7023 \path[hex/terrain/town/house,pic actions]
7024 (-0.0207,-0.0604)
7025 -- (-0.0103,-0.0331)
7026 -- ( 0.0398,-0.0521)
7027 -- ( 0.0294,-0.0794)
7028 --cycle
7029 ;
7030 \path[hex/terrain/town/house,pic actions]
7031 ( 0.3580,-0.4608)
7032 -- ( 0.3837,-0.4748)
7033 -- ( 0.3581,-0.5219)
7034 -- ( 0.3324,-0.5080)
7035 --cycle
7036 ;
7037 \path[hex/terrain/town/house,pic actions]
7038 ( 0.3580,-0.4608)
7039 -- ( 0.3837,-0.4748)
7040 -- ( 0.3581,-0.5219)
7041 -- ( 0.3324,-0.5080)
7042 --cycle
7043 ;
7044 \path[hex/terrain/town/house,pic actions]
7045 ( 0.5127,-0.3559)
7046 -- ( 0.5341,-0.3759)
7047 -- ( 0.4975,-0.4151)
7048 -- ( 0.4761,-0.3951)
7049 --cycle
7050 ;
7051 \path[hex/terrain/town/house,pic actions]
7052 ( 0.5127,-0.3559)
7053 -- ( 0.5341,-0.3759)
7054 -- ( 0.4975,-0.4151)
7055 -- ( 0.4761,-0.3951)
7056 --cycle
7057 ;
7058 \path[hex/terrain/town/house,pic actions]
7059 ( 0.2118,-0.3884)
7060 -- ( 0.2245,-0.3620)
7061 -- ( 0.2728,-0.3854)
7062 -- ( 0.2600,-0.4118)
7063 --cycle
7064 ;
7065 \path[hex/terrain/town/house,pic actions]
7066 ( 0.2118,-0.3884)
7067 -- ( 0.2245,-0.3620)
7068 -- ( 0.2728,-0.3854)
7069 -- ( 0.2600,-0.4118)
7070 --cycle
7071 ;
7072 \path[hex/terrain/town/house,pic actions]
7073 ( 0.1651,-0.4740)
7074 -- ( 0.1775,-0.4475)

```

```

7075 -- ( 0.2260,-0.4702)
7076 -- ( 0.2137,-0.4968)
7077 --cycle
7078 ;
7079 \path[hex/terrain/town/house,pic actions]
7080 ( 0.1651,-0.4740)
7081 -- ( 0.1775,-0.4475)
7082 -- ( 0.2260,-0.4702)
7083 -- ( 0.2137,-0.4968)
7084 --cycle
7085 ;
7086 \path[hex/terrain/town/house,pic actions]
7087 ( 0.2834,-0.4196)
7088 -- ( 0.2957,-0.3932)
7089 -- ( 0.3443,-0.4159)
7090 -- ( 0.3319,-0.4423)
7091 --cycle
7092 ;
7093 \path[hex/terrain/town/house,pic actions]
7094 ( 0.2834,-0.4196)
7095 -- ( 0.2957,-0.3932)
7096 -- ( 0.3443,-0.4159)
7097 -- ( 0.3319,-0.4423)
7098 --cycle
7099 ;
7100 \path[hex/terrain/town/house,pic actions]
7101 ( 0.1447,-0.5170)
7102 -- ( 0.1555,-0.4899)
7103 -- ( 0.2053,-0.5096)
7104 -- ( 0.1945,-0.5368)
7105 --cycle
7106 ;
7107 \path[hex/terrain/town/house,pic actions]
7108 ( 0.1447,-0.5170)
7109 -- ( 0.1555,-0.4899)
7110 -- ( 0.2053,-0.5096)
7111 -- ( 0.1945,-0.5368)
7112 --cycle
7113 ;
7114 \path[hex/terrain/town/house,pic actions]
7115 ( 0.0154,-0.5671)
7116 -- ( 0.0244,-0.5392)
7117 -- ( 0.0754,-0.5558)
7118 -- ( 0.0664,-0.5836)
7119 --cycle
7120 ;
7121 \path[hex/terrain/town/house,pic actions]
7122 ( 0.0154,-0.5671)
7123 -- ( 0.0244,-0.5392)
7124 -- ( 0.0754,-0.5558)
7125 -- ( 0.0664,-0.5836)
7126 --cycle
7127 ;

```

```

7128 \path[hex/terrain/town/house,pic actions]
7129 (-0.2958,-0.3614)
7130 -- (-0.2707,-0.3764)
7131 -- (-0.2983,-0.4224)
7132 -- (-0.3234,-0.4073)
7133 --cycle
7134 ;
7135 \path[hex/terrain/town/house,pic actions]
7136 (-0.2958,-0.3614)
7137 -- (-0.2707,-0.3764)
7138 -- (-0.2983,-0.4224)
7139 -- (-0.3234,-0.4073)
7140 --cycle
7141 ;
7142 \path[hex/terrain/town/house,pic actions]
7143 (-0.3024,-0.2385)
7144 -- (-0.2753,-0.2491)
7145 -- (-0.2948,-0.2990)
7146 -- (-0.3220,-0.2883)
7147 --cycle
7148 ;
7149 \path[hex/terrain/town/house,pic actions]
7150 (-0.3024,-0.2385)
7151 -- (-0.2753,-0.2491)
7152 -- (-0.2948,-0.2990)
7153 -- (-0.3220,-0.2883)
7154 --cycle
7155 ;
7156 \path[hex/terrain/town/house,pic actions]
7157 (-0.5719,-0.2295)
7158 -- (-0.5577,-0.2550)
7159 -- (-0.6045,-0.2811)
7160 -- (-0.6187,-0.2556)
7161 --cycle
7162 ;
7163 \path[hex/terrain/town/house,pic actions]
7164 (-0.5719,-0.2295)
7165 -- (-0.5577,-0.2550)
7166 -- (-0.6045,-0.2811)
7167 -- (-0.6187,-0.2556)
7168 --cycle
7169 ;
7170 \path[hex/terrain/town/house,pic actions]
7171 (-0.5909,-0.3922)
7172 -- (-0.5677,-0.3744)
7173 -- (-0.5351,-0.4170)
7174 -- (-0.5584,-0.4348)
7175 --cycle
7176 ;
7177 \path[hex/terrain/town/house,pic actions]
7178 (-0.5909,-0.3922)
7179 -- (-0.5677,-0.3744)
7180 -- (-0.5351,-0.4170)

```

```

7181 -- (-0.5584,-0.4348)
7182 --cycle
7183 ;
7184 \path[hex/terrain/town/house,pic actions]
7185 (-0.4367,-0.3858)
7186 -- (-0.4233,-0.4119)
7187 -- (-0.4709,-0.4364)
7188 -- (-0.4843,-0.4105)
7189 --cycle
7190 ;
7191 \path[hex/terrain/town/house,pic actions]
7192 (-0.4367,-0.3858)
7193 -- (-0.4233,-0.4119)
7194 -- (-0.4709,-0.4364)
7195 -- (-0.4843,-0.4105)
7196 --cycle
7197 ;
7198 \path[hex/terrain/town/house,pic actions]
7199 (-0.6605,-0.4272)
7200 -- (-0.6489,-0.4540)
7201 -- (-0.6982,-0.4752)
7202 -- (-0.7097,-0.4483)
7203 --cycle
7204 ;
7205 \path[hex/terrain/town/house,pic actions]
7206 (-0.6605,-0.4272)
7207 -- (-0.6489,-0.4540)
7208 -- (-0.6982,-0.4752)
7209 -- (-0.7097,-0.4483)
7210 --cycle
7211 ;
7212 \path[hex/terrain/town/house,pic actions]
7213 ( 0.2694,-0.2379)
7214 -- ( 0.2777,-0.2098)
7215 -- ( 0.3291,-0.2250)
7216 -- ( 0.3209,-0.2530)
7217 --cycle
7218 ;
7219 \path[hex/terrain/town/house,pic actions]
7220 ( 0.2694,-0.2379)
7221 -- ( 0.2777,-0.2098)
7222 -- ( 0.3291,-0.2250)
7223 -- ( 0.3209,-0.2530)
7224 --cycle
7225 ;
7226 \path[hex/terrain/town/house,pic actions]
7227 ( 0.1131,-0.3134)
7228 -- ( 0.1237,-0.2861)
7229 -- ( 0.1737,-0.3055)
7230 -- ( 0.1630,-0.3328)
7231 --cycle
7232 ;
7233 \path[hex/terrain/town/house,pic actions]

```



```

7234 ( 0.1131,-0.3134)
7235 -- ( 0.1237,-0.2861)
7236 -- ( 0.1737,-0.3055)
7237 -- ( 0.1630,-0.3328)
7238 --cycle
7239 ;
7240 \path[hex/terrain/town/house,pic actions]
7241 ( 0.1931,-0.0936)
7242 -- ( 0.2058,-0.0673)
7243 -- ( 0.2541,-0.0904)
7244 -- ( 0.2415,-0.1168)
7245 --cycle
7246 ;
7247 \path[hex/terrain/town/house,pic actions]
7248 ( 0.1931,-0.0936)
7249 -- ( 0.2058,-0.0673)
7250 -- ( 0.2541,-0.0904)
7251 -- ( 0.2415,-0.1168)
7252 --cycle
7253 ;
7254 \path[hex/terrain/town/house,pic actions]
7255 ( 0.1779, 0.1198)
7256 -- ( 0.1984, 0.0990)
7257 -- ( 0.1603, 0.0613)
7258 -- ( 0.1398, 0.0821)
7259 --cycle
7260 ;
7261 \path[hex/terrain/town/house,pic actions]
7262 ( 0.1779, 0.1198)
7263 -- ( 0.1984, 0.0990)
7264 -- ( 0.1603, 0.0613)
7265 -- ( 0.1398, 0.0821)
7266 --cycle
7267 ;
7268 \path[hex/terrain/town/house,pic actions]
7269 ( 0.2761, 0.3992)
7270 -- ( 0.2947, 0.3765)
7271 -- ( 0.2533, 0.3425)
7272 -- ( 0.2347, 0.3651)
7273 --cycle
7274 ;
7275 \path[hex/terrain/town/house,pic actions]
7276 ( 0.2761, 0.3992)
7277 -- ( 0.2947, 0.3765)
7278 -- ( 0.2533, 0.3425)
7279 -- ( 0.2347, 0.3651)
7280 --cycle
7281 ;
7282 \path[hex/terrain/town/house,pic actions]
7283 ( 0.3227, 0.3548)
7284 -- ( 0.3421, 0.3329)
7285 -- ( 0.3020, 0.2974)
7286 -- ( 0.2826, 0.3192)

```

```

7287 --cycle
7288 ;
7289 \path[hex/terrain/town/house,pic actions]
7290 ( 0.3227, 0.3548)
7291 -- ( 0.3421, 0.3329)
7292 -- ( 0.3020, 0.2974)
7293 -- ( 0.2826, 0.3192)
7294 --cycle
7295 ;
7296 \path[hex/terrain/town/house,pic actions]
7297 (-0.2473, 0.2770)
7298 -- (-0.2380, 0.3048)
7299 -- (-0.1871, 0.2879)
7300 -- (-0.1964, 0.2601)
7301 --cycle
7302 ;
7303 \path[hex/terrain/town/house,pic actions]
7304 (-0.2473, 0.2770)
7305 -- (-0.2380, 0.3048)
7306 -- (-0.1871, 0.2879)
7307 -- (-0.1964, 0.2601)
7308 --cycle
7309 ;
7310 \path[hex/terrain/town/house,pic actions]
7311 (-0.1395, 0.3602)
7312 -- (-0.1127, 0.3488)
7313 -- (-0.1335, 0.2995)
7314 -- (-0.1604, 0.3109)
7315 --cycle
7316 ;
7317 \path[hex/terrain/town/house,pic actions]
7318 (-0.1395, 0.3602)
7319 -- (-0.1127, 0.3488)
7320 -- (-0.1335, 0.2995)
7321 -- (-0.1604, 0.3109)
7322 --cycle
7323 ;
7324 \path[hex/terrain/town/house,pic actions]
7325 ( 0.2901, 0.6234)
7326 -- ( 0.3088, 0.6008)
7327 -- ( 0.2674, 0.5667)
7328 -- ( 0.2487, 0.5893)
7329 --cycle
7330 ;
7331 \path[hex/terrain/town/house,pic actions]
7332 ( 0.2901, 0.6234)
7333 -- ( 0.3088, 0.6008)
7334 -- ( 0.2674, 0.5667)
7335 -- ( 0.2487, 0.5893)
7336 --cycle
7337 ;
7338 \path[hex/terrain/town/house,pic actions]
7339 (-0.3456, 0.2854)

```

```

7340 -- (-0.3335, 0.3120)
7341 -- (-0.2847, 0.2898)
7342 -- (-0.2968, 0.2632)
7343 --cycle
7344 ;
7345 \path[hex/terrain/town/house,pic actions]
7346 (-0.3456, 0.2854)
7347 -- (-0.3335, 0.3120)
7348 -- (-0.2847, 0.2898)
7349 -- (-0.2968, 0.2632)
7350 --cycle
7351 ;
7352 \path[hex/terrain/town/house,pic actions]
7353 (-0.3040, 0.3746)
7354 -- (-0.2919, 0.4012)
7355 -- (-0.2431, 0.3791)
7356 -- (-0.2552, 0.3524)
7357 --cycle
7358 ;
7359 \path[hex/terrain/town/house,pic actions]
7360 (-0.3040, 0.3746)
7361 -- (-0.2919, 0.4012)
7362 -- (-0.2431, 0.3791)
7363 -- (-0.2552, 0.3524)
7364 --cycle
7365 ;
7366 \path[hex/terrain/town/house,pic actions]
7367 (-0.7420,-0.2456)
7368 -- (-0.7302,-0.2189)
7369 -- (-0.6812,-0.2407)
7370 -- (-0.6930,-0.2674)
7371 --cycle
7372 ;
7373 \path[hex/terrain/town/house,pic actions]
7374 (-0.7420,-0.2456)
7375 -- (-0.7302,-0.2189)
7376 -- (-0.6812,-0.2407)
7377 -- (-0.6930,-0.2674)
7378 --cycle
7379 ;
7380 \path[hex/terrain/town/house,pic actions]
7381 (-0.6678,-0.1369)
7382 -- (-0.6492,-0.1143)
7383 -- (-0.6078,-0.1484)
7384 -- (-0.6264,-0.1710)
7385 --cycle
7386 ;
7387 \path[hex/terrain/town/house,pic actions]
7388 (-0.6678,-0.1369)
7389 -- (-0.6492,-0.1143)
7390 -- (-0.6078,-0.1484)
7391 -- (-0.6264,-0.1710)
7392 --cycle

```

```

7393 ;
7394 \path[hex/terrain/town/house,pic actions]
7395 (-0.2252,-0.0023)
7396 -- (-0.1960,-0.0023)
7397 -- (-0.1960,-0.0559)
7398 -- (-0.2252,-0.0559)
7399 --cycle
7400 ;
7401 \path[hex/terrain/town/house,pic actions]
7402 (-0.2252,-0.0023)
7403 -- (-0.1960,-0.0023)
7404 -- (-0.1960,-0.0559)
7405 -- (-0.2252,-0.0559)
7406 --cycle
7407 ;
7408 \path[hex/terrain/town/house,pic actions]
7409 (-0.0041,-0.2944)
7410 -- ( 0.0064,-0.2671)
7411 -- ( 0.0564,-0.2862)
7412 -- ( 0.0460,-0.3135)
7413 --cycle
7414 ;
7415 \path[hex/terrain/town/house,pic actions]
7416 (-0.0041,-0.2944)
7417 -- ( 0.0064,-0.2671)
7418 -- ( 0.0564,-0.2862)
7419 -- ( 0.0460,-0.3135)
7420 --cycle
7421 ;
7422 \path[hex/terrain/town/house,pic actions]
7423 (-0.1877,-0.2296)
7424 -- (-0.1764,-0.2026)
7425 -- (-0.1270,-0.2233)
7426 -- (-0.1383,-0.2503)
7427 --cycle
7428 ;
7429 \path[hex/terrain/town/house,pic actions]
7430 (-0.1877,-0.2296)
7431 -- (-0.1764,-0.2026)
7432 -- (-0.1270,-0.2233)
7433 -- (-0.1383,-0.2503)
7434 --cycle
7435 ;
7436 \path[hex/terrain/town/house,pic actions]
7437 (-0.1170,-0.3014)
7438 -- (-0.1067,-0.2740)
7439 -- (-0.0566,-0.2928)
7440 -- (-0.0668,-0.3202)
7441 --cycle
7442 ;
7443 \path[hex/terrain/town/house,pic actions]
7444 (-0.1170,-0.3014)
7445 -- (-0.1067,-0.2740)

```

```

7446 -- (-0.0566,-0.2928)
7447 -- (-0.0668,-0.3202)
7448 --cycle
7449 ;
7450 \path[hex/terrain/town/house,pic actions]
7451 (-0.0719,-0.3499)
7452 -- (-0.0428,-0.3468)
7453 -- (-0.0371,-0.4001)
7454 -- (-0.0661,-0.4032)
7455 --cycle
7456 ;
7457 \path[hex/terrain/town/house,pic actions]
7458 (-0.0719,-0.3499)
7459 -- (-0.0428,-0.3468)
7460 -- (-0.0371,-0.4001)
7461 -- (-0.0661,-0.4032)
7462 --cycle
7463 ;
7464 \path[hex/terrain/town/house,pic actions]
7465 ( 0.4610, 0.0967)
7466 -- ( 0.4896, 0.0909)
7467 -- ( 0.4790, 0.0384)
7468 -- ( 0.4503, 0.0442)
7469 --cycle
7470 ;
7471 \path[hex/terrain/town/house,pic actions]
7472 ( 0.4610, 0.0967)
7473 -- ( 0.4896, 0.0909)
7474 -- ( 0.4790, 0.0384)
7475 -- ( 0.4503, 0.0442)
7476 --cycle
7477 ;
7478 \path[hex/terrain/town/house,pic actions]
7479 (-0.1944,-0.4810)
7480 -- (-0.1500,-0.4925)
7481 -- (-0.1653,-0.5515)
7482 -- (-0.2097,-0.5399)
7483 --cycle
7484 ;
7485 \path[hex/terrain/town/house,pic actions]
7486 (-0.1944,-0.4810)
7487 -- (-0.1500,-0.4925)
7488 -- (-0.1653,-0.5515)
7489 -- (-0.2097,-0.5399)
7490 --cycle
7491 ;
7492 \path[hex/terrain/town/house,pic actions]
7493 ( 0.2924,-0.1375)
7494 -- ( 0.3110,-0.0955)
7495 -- ( 0.3667,-0.1202)
7496 -- ( 0.3481,-0.1621)
7497 --cycle
7498 ;

```

```

7499 \path[hex/terrain/town/house,pic actions]
7500 ( 0.2924,-0.1375)
7501 -- ( 0.3110,-0.0955)
7502 -- ( 0.3667,-0.1202)
7503 -- ( 0.3481,-0.1621)
7504 --cycle
7505 ;
7506 \path[hex/terrain/town/house,pic actions]
7507 (-0.3062, 0.5810)
7508 -- (-0.2635, 0.5641)
7509 -- (-0.2859, 0.5075)
7510 -- (-0.3285, 0.5243)
7511 --cycle
7512 ;
7513 \path[hex/terrain/town/house,pic actions]
7514 (-0.3062, 0.5810)
7515 -- (-0.2635, 0.5641)
7516 -- (-0.2859, 0.5075)
7517 -- (-0.3285, 0.5243)
7518 --cycle
7519 ;
7520 \path[hex/terrain/town/house,pic actions]
7521 ( 0.0310,-0.4661)
7522 -- ( 0.0449,-0.4224)
7523 -- ( 0.1029,-0.4409)
7524 -- ( 0.0889,-0.4846)
7525 --cycle
7526 ;
7527 \path[hex/terrain/town/house,pic actions]
7528 ( 0.0310,-0.4661)
7529 -- ( 0.0449,-0.4224)
7530 -- ( 0.1029,-0.4409)
7531 -- ( 0.0889,-0.4846)
7532 --cycle
7533 ;
7534 \path[hex/terrain/town/house,pic actions]
7535 ( 0.1523,-0.2013)
7536 -- ( 0.1718,-0.1598)
7537 -- ( 0.2270,-0.1857)
7538 -- ( 0.2075,-0.2272)
7539 --cycle
7540 ;
7541 \path[hex/terrain/town/house,pic actions]
7542 ( 0.1523,-0.2013)
7543 -- ( 0.1718,-0.1598)
7544 -- ( 0.2270,-0.1857)
7545 -- ( 0.2075,-0.2272)
7546 --cycle
7547 ;
7548 \path[hex/terrain/town/house,pic actions]
7549 ( 0.0857,-0.3676)
7550 -- ( 0.1052,-0.3261)
7551 -- ( 0.1603,-0.3520)

```

```

7552    -- ( 0.1409,-0.3935)
7553    --cycle
7554    ;
7555    \path[hex/terrain/town/house,pic actions]
7556    ( 0.0857,-0.3676)
7557    -- ( 0.1052,-0.3261)
7558    -- ( 0.1603,-0.3520)
7559    -- ( 0.1409,-0.3935)
7560    --cycle
7561    ;
7562    \path[hex/terrain/town/house,pic actions]
7563    ( 0.0204,-0.2046)
7564    -- ( 0.0398,-0.1631)
7565    -- ( 0.0950,-0.1890)
7566    -- ( 0.0755,-0.2305)
7567    --cycle
7568    ;
7569    \path[hex/terrain/town/house,pic actions]
7570    ( 0.0204,-0.2046)
7571    -- ( 0.0398,-0.1631)
7572    -- ( 0.0950,-0.1890)
7573    -- ( 0.0755,-0.2305)
7574    --cycle
7575    ;
7576    \path[hex/terrain/town/house,pic actions]
7577    ( 0.5094, 0.3292)
7578    -- ( 0.5505, 0.3494)
7579    -- ( 0.5773, 0.2947)
7580    -- ( 0.5362, 0.2746)
7581    --cycle
7582    ;
7583    \path[hex/terrain/town/house,pic actions]
7584    ( 0.5094, 0.3292)
7585    -- ( 0.5505, 0.3494)
7586    -- ( 0.5773, 0.2947)
7587    -- ( 0.5362, 0.2746)
7588    --cycle
7589    ;
7590    \path[hex/terrain/town/house,pic actions]
7591    (-0.0647, 0.4710)
7592    -- (-0.0215, 0.4559)
7593    -- (-0.0416, 0.3984)
7594    -- (-0.0848, 0.4135)
7595    --cycle
7596    ;
7597    \path[hex/terrain/town/house,pic actions]
7598    (-0.0647, 0.4710)
7599    -- (-0.0215, 0.4559)
7600    -- (-0.0416, 0.3984)
7601    -- (-0.0848, 0.4135)
7602    --cycle
7603    ;
7604    \path[hex/terrain/town/house,pic actions]

```

```

7605 (-0.1476,-0.3704)
7606 -- (-0.1403,-0.3251)
7607 -- (-0.0802,-0.3347)
7608 -- (-0.0873,-0.3799)
7609 --cycle
7610 ;
7611 \path[hex/terrain/town/house,pic actions]
7612 (-0.1476,-0.3704)
7613 -- (-0.1403,-0.3251)
7614 -- (-0.0802,-0.3347)
7615 -- (-0.0873,-0.3799)
7616 --cycle
7617 ;
7618 \path[hex/terrain/town/house,pic actions]
7619 (-0.0755, 0.3210)
7620 -- (-0.0531, 0.3610)
7621 -- ( 0.0001, 0.3312)
7622 -- (-0.0224, 0.2912)
7623 --cycle
7624 ;
7625 \path[hex/terrain/town/house,pic actions]
7626 (-0.0755, 0.3210)
7627 -- (-0.0531, 0.3610)
7628 -- ( 0.0001, 0.3312)
7629 -- (-0.0224, 0.2912)
7630 --cycle
7631 ;
7632 \path[hex/terrain/town/house,pic actions]
7633 (-0.1354, 0.0442)
7634 -- (-0.1129, 0.0842)
7635 -- (-0.0599, 0.0544)
7636 -- (-0.0823, 0.0144)
7637 --cycle
7638 ;
7639 \path[hex/terrain/town/house,pic actions]
7640 (-0.1354, 0.0442)
7641 -- (-0.1129, 0.0842)
7642 -- (-0.0599, 0.0544)
7643 -- (-0.0823, 0.0144)
7644 --cycle
7645 ;
7646 \path[hex/terrain/town/house,pic actions]
7647 (-0.1672,-0.0608)
7648 -- (-0.1524,-0.0175)
7649 -- (-0.0948,-0.0371)
7650 -- (-0.1096,-0.0805)
7651 --cycle
7652 ;
7653 \path[hex/terrain/town/house,pic actions]
7654 (-0.1672,-0.0608)
7655 -- (-0.1524,-0.0175)
7656 -- (-0.0948,-0.0371)
7657 -- (-0.1096,-0.0805)

```



```

7658  --cycle
7659  ;
7660  \path[hex/terrain/town/house,pic actions]
7661  ( 0.0920,-0.6296)
7662  -- ( 0.1069,-0.5863)
7663  -- ( 0.1645,-0.6060)
7664  -- ( 0.1497,-0.6493)
7665  --cycle
7666  ;
7667  \path[hex/terrain/town/house,pic actions]
7668  ( 0.0920,-0.6296)
7669  -- ( 0.1069,-0.5863)
7670  -- ( 0.1645,-0.6060)
7671  -- ( 0.1497,-0.6493)
7672  --cycle
7673  ;
7674  \path[hex/terrain/town/house,pic actions]
7675  ( 0.4115,-0.5373)
7676  -- ( 0.4390,-0.5006)
7677  -- ( 0.4877,-0.5372)
7678  -- ( 0.4601,-0.5739)
7679  --cycle
7680  ;
7681  \path[hex/terrain/town/house,pic actions]
7682  ( 0.4115,-0.5373)
7683  -- ( 0.4390,-0.5006)
7684  -- ( 0.4877,-0.5372)
7685  -- ( 0.4601,-0.5739)
7686  --cycle
7687  ;
7688  \path[hex/terrain/town/house,pic actions]
7689  ( 0.3095, 0.1272)
7690  -- ( 0.3519, 0.1095)
7691  -- ( 0.3284, 0.0533)
7692  -- ( 0.2861, 0.0710)
7693  --cycle
7694  ;
7695  \path[hex/terrain/town/house,pic actions]
7696  ( 0.3095, 0.1272)
7697  -- ( 0.3519, 0.1095)
7698  -- ( 0.3284, 0.0533)
7699  -- ( 0.2861, 0.0710)
7700  --cycle
7701  ;
7702  \path[hex/terrain/town/house,pic actions]
7703  (-0.3558, 0.0291)
7704  -- (-0.3124, 0.0144)
7705  -- (-0.3318,-0.0433)
7706  -- (-0.3753,-0.0287)
7707  --cycle
7708  ;
7709  \path[hex/terrain/town/house,pic actions]
7710  (-0.3558, 0.0291)

```

```

7711 -- (-0.3124, 0.0144)
7712 -- (-0.3318,-0.0433)
7713 -- (-0.3753,-0.0287)
7714 --cycle
7715 ;
7716 \path[hex/terrain/town/house,pic actions]
7717 ( 0.2904, 0.2714)
7718 -- ( 0.3361, 0.2681)
7719 -- ( 0.3318, 0.2074)
7720 -- ( 0.2861, 0.2106)
7721 --cycle
7722 ;
7723 \path[hex/terrain/town/house,pic actions]
7724 ( 0.2904, 0.2714)
7725 -- ( 0.3361, 0.2681)
7726 -- ( 0.3318, 0.2074)
7727 -- ( 0.2861, 0.2106)
7728 --cycle
7729 ;
7730 \path[hex/terrain/town/house,pic actions]
7731 (-0.0124, 0.1558)
7732 -- ( 0.0333, 0.1525)
7733 -- ( 0.0290, 0.0918)
7734 -- (-0.0167, 0.0950)
7735 --cycle
7736 ;
7737 \path[hex/terrain/town/house,pic actions]
7738 (-0.0124, 0.1558)
7739 -- ( 0.0333, 0.1525)
7740 -- ( 0.0290, 0.0918)
7741 -- (-0.0167, 0.0950)
7742 --cycle
7743 ;
7744 \path[hex/terrain/town/house,pic actions]
7745 ( 0.4665, 0.4396)
7746 -- ( 0.4868, 0.3985)
7747 -- ( 0.4321, 0.3716)
7748 -- ( 0.4119, 0.4127)
7749 --cycle
7750 ;
7751 \path[hex/terrain/town/house,pic actions]
7752 ( 0.4665, 0.4396)
7753 -- ( 0.4868, 0.3985)
7754 -- ( 0.4321, 0.3716)
7755 -- ( 0.4119, 0.4127)
7756 --cycle
7757 ;
7758 \path[hex/terrain/town/house,pic actions]
7759 (-0.2433,-0.1480)
7760 -- (-0.2141,-0.1472)
7761 -- (-0.2127,-0.2008)
7762 -- (-0.2419,-0.2015)
7763 --cycle

```

```

7764 ;
7765 \path[hex/terrain/town/house,pic actions]
7766 (-0.2433,-0.1480)
7767 -- (-0.2141,-0.1472)
7768 -- (-0.2127,-0.2008)
7769 -- (-0.2419,-0.2015)
7770 --cycle
7771 ;
7772 \path[hex/terrain/town/house,pic actions]
7773 ( 0.4187, 0.2523)
7774 -- ( 0.4643, 0.2574)
7775 -- ( 0.4711, 0.1969)
7776 -- ( 0.4256, 0.1917)
7777 --cycle
7778 ;
7779 \path[hex/terrain/town/house,pic actions]
7780 ( 0.4187, 0.2523)
7781 -- ( 0.4643, 0.2574)
7782 -- ( 0.4711, 0.1969)
7783 -- ( 0.4256, 0.1917)
7784 --cycle
7785 ;
7786 \path[hex/terrain/town/house,pic actions]
7787 (-0.2599,-0.2379)
7788 -- (-0.2164,-0.2525)
7789 -- (-0.2358,-0.3102)
7790 -- (-0.2793,-0.2955)
7791 --cycle
7792 ;
7793 \path[hex/terrain/town/house,pic actions]
7794 (-0.2599,-0.2379)
7795 -- (-0.2164,-0.2525)
7796 -- (-0.2358,-0.3102)
7797 -- (-0.2793,-0.2955)
7798 --cycle
7799 ;
7800 \path[hex/terrain/town/house,pic actions]
7801 ( 0.0167, 0.0438)
7802 -- ( 0.0385, 0.0365)
7803 -- ( 0.0301, 0.0113)
7804 -- ( 0.0082, 0.0187)
7805 --cycle
7806 ;
7807 \path[hex/terrain/town/house,pic actions]
7808 ( 0.0167, 0.0438)
7809 -- ( 0.0385, 0.0365)
7810 -- ( 0.0301, 0.0113)
7811 -- ( 0.0082, 0.0187)
7812 --cycle
7813 ;
7814 \path[hex/terrain/town/house,pic actions]
7815 (-0.2901,-0.1193)
7816 -- (-0.2450,-0.1273)

```

```

7817 -- (-0.2556,-0.1872)
7818 -- (-0.3008,-0.1792)
7819 --cycle
7820 ;
7821 \path[hex/terrain/town/house,pic actions]
7822 (-0.2901,-0.1193)
7823 -- (-0.2450,-0.1273)
7824 -- (-0.2556,-0.1872)
7825 -- (-0.3008,-0.1792)
7826 --cycle
7827 ;
7828 \path[hex/terrain/town/house,pic actions]
7829 ( 0.1275,-0.0001)
7830 -- ( 0.1734,-0.0022)
7831 -- ( 0.1707,-0.0630)
7832 -- ( 0.1248,-0.0610)
7833 --cycle
7834 ;
7835 \path[hex/terrain/town/house,pic actions]
7836 ( 0.1275,-0.0001)
7837 -- ( 0.1734,-0.0022)
7838 -- ( 0.1707,-0.0630)
7839 -- ( 0.1248,-0.0610)
7840 --cycle
7841 ;
7842 \path[hex/terrain/town/house,pic actions]
7843 (-0.0645,-0.5272)
7844 -- (-0.0415,-0.5245)
7845 -- (-0.0383,-0.5509)
7846 -- (-0.0612,-0.5536)
7847 --cycle
7848 ;
7849 \path[hex/terrain/town/house,pic actions]
7850 (-0.0645,-0.5272)
7851 -- (-0.0415,-0.5245)
7852 -- (-0.0383,-0.5509)
7853 -- (-0.0612,-0.5536)
7854 --cycle
7855 ;
7856 \path[hex/terrain/town/house,pic actions]
7857 (-0.3209, 0.2176)
7858 -- (-0.2989, 0.2105)
7859 -- (-0.3069, 0.1853)
7860 -- (-0.3289, 0.1923)
7861 --cycle
7862 ;
7863 \path[hex/terrain/town/house,pic actions]
7864 (-0.3209, 0.2176)
7865 -- (-0.2989, 0.2105)
7866 -- (-0.3069, 0.1853)
7867 -- (-0.3289, 0.1923)
7868 --cycle
7869 ;

```

```

7870 \path[hex/terrain/town/house,pic actions]
7871 ( 0.3746, 0.1600)
7872 -- ( 0.4021, 0.1699)
7873 -- ( 0.4204, 0.1195)
7874 -- ( 0.3929, 0.1095)
7875 --cycle
7876 ;
7877 \path[hex/terrain/town/house,pic actions]
7878 ( 0.3746, 0.1600)
7879 -- ( 0.4021, 0.1699)
7880 -- ( 0.4204, 0.1195)
7881 -- ( 0.3929, 0.1095)
7882 --cycle
7883 ;
7884 }
7885 }
7886 \fi

```

hex/terrain/city

And finally a city



```

7887 \ifhex@terrain@pic
7888 \tikzset{
7889   hex/terrain/city/.pic={
7890     \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7891     ( 0.6475, 0.4068)
7892     -- ( 0.7314,-0.0575)
7893     -- ( 0.7314,-0.0575)
7894     ;
7895     \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7896     ( 0.3200,-0.0497)
7897     -- ( 0.7360,-0.0572)
7898     -- ( 0.9222,-0.0903)
7899     -- ( 0.7082,-0.4210)
7900     ;
7901     \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7902     ( 0.3828, 0.1855)
7903     -- ( 0.0279, 0.1945)
7904     ;
7905     \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7906     ( 0.0433, 0.3473)
7907     -- ( 0.0217, 0.1444)
7908     ;
7909     \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7910     ( 0.1413, 0.1884)
7911     -- ( 0.3369,-0.0066)
7912     ;

```

```

7913 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7914 (-0.1278, 0.7257)
7915 -- (-0.2203, 0.4496)
7916 ;
7917 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7918 ( 0.1602, 0.6526)
7919 -- ( 0.0382, 0.6110)
7920 -- (-0.1527, 0.6534)
7921 ;
7922 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7923 (-0.1688, 0.6051)
7924 -- (-0.4768, 0.7222)
7925 ;
7926 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7927 ( 0.3602,-0.4159)
7928 .. controls ( 0.4139,-0.2355) and ( 0.4139,-0.2352) .. ( 0.4139,-0.2352)
7929 -- ( 0.4838,-0.2184)
7930 -- ( 0.5251,-0.0570)
7931 ;
7932 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7933 ( 0.5443,-0.6880)
7934 -- ( 0.5887,-0.5618)
7935 -- ( 0.4781,-0.4650)
7936 -- ( 0.4781,-0.4650)
7937 ;
7938 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7939 ( 0.0671,-0.6564)
7940 -- ( 0.2799,-0.7025)
7941 -- ( 0.4360,-0.4711)
7942 ;
7943 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7944 ( 0.2023,-0.8374)
7945 -- ( 0.2231,-0.6909)
7946 ;
7947 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7948 ( 0.0433,-0.3639)
7949 -- (-0.0931,-0.5036)
7950 -- (-0.3798,-0.4049)
7951 -- (-0.4436,-0.4630)
7952 -- (-0.5468,-0.5027)
7953 -- (-0.6442,-0.3540)
7954 ;
7955 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7956 (-0.3296,-0.7486)
7957 -- (-0.3153,-0.6107)
7958 -- (-0.4388,-0.4598)
7959 ;
7960 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7961 (-0.3247,-0.6883)
7962 -- (-0.0201,-0.7169)
7963 -- ( 0.0501,-0.7042)
7964 ;
7965 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]

```

```

7966 ( 0.0616,-0.6541)
7967 -- (-0.0427,-0.6505)
7968 -- (-0.0229,-0.5387)
7969 ;
7970 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7971 ( 0.0040,-0.2086)
7972 -- (-0.1956,-0.1835)
7973 -- (-0.2290,-0.2265)
7974 -- (-0.5068,-0.1372)
7975 ;
7976 \path[hex/terrain/town/small road,pic actions,hex/terrain/town/post road]
7977 (-0.3396, 0.0437)
7978 -- (-0.2201, 0.4506)
7979 ;
7980 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
7981 ( 0.0066, 0.8705)
7982 -- ( 0.3952, 0.3367)
7983 -- ( 0.3885, 0.2021)
7984 -- ( 0.3555, 0.1368)
7985 -- ( 0.3751, 0.0869)
7986 -- ( 0.2511,-0.2014)
7987 -- ( 0.1393,-0.4528)
7988 -- ( 0.0636,-0.6538)
7989 -- ( 0.0063,-0.8731)
7990 -- ( 0.0063,-0.8731)
7991 ;
7992 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
7993 ( 0.1775, 0.6355)
7994 -- ( 0.4288, 0.7459)
7995 -- ( 0.5543, 0.5148)
7996 -- ( 0.5543, 0.5148)
7997 ;
7998 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
7999 ( 0.7584, 0.4363)
8000 -- ( 0.3946, 0.3369)
8001 -- ( 0.3946, 0.3369)
8002 ;
8003 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
8004 ( 0.1428,-0.4540)
8005 -- (-0.0329,-0.2925)
8006 -- ( 0.0739,-0.0364)
8007 -- ( 0.1645,-0.0483)
8008 ;
8009 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
8010 ( 0.0723,-0.0367)
8011 -- (-0.5150, 0.0791)
8012 ;
8013 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
8014 (-0.1911,-0.0821)
8015 -- (-0.0760, 0.3934)
8016 -- (-0.0774, 0.3920)
8017 ;
8018 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]

```

```

8019 ( 0.0439, 0.3452)
8020 -- (-0.3449, 0.4978)
8021 -- (-0.4614, 0.2954)
8022 -- (-0.4614, 0.2954)
8023 ;
8024 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
8025 (-0.4152, 0.2683)
8026 -- (-0.7626, 0.4390)
8027 -- (-0.7626, 0.4390)
8028 ;
8029 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
8030 (-0.5846, 0.3486)
8031 -- (-0.8106,-0.1286)
8032 -- (-0.7727,-0.2079)
8033 -- (-0.7053,-0.1745)
8034 ;
8035 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
8036 (-0.7161,-0.1542)
8037 -- (-0.6166,-0.3381)
8038 -- (-0.7630,-0.4349)
8039 ;
8040 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
8041 (-0.6697,-0.2422)
8042 -- (-0.4615,-0.1081)
8043 -- (-0.4615,-0.1081)
8044 ;
8045 \path[hex/terrain/town/road,pic actions,hex/terrain/town/post road]
8046 ( 0.2080,-0.3022)
8047 -- ( 0.4581,-0.4878)
8048 -- ( 0.5919,-0.3695)
8049 -- ( 0.7615,-0.4441)
8050 ;
8051 \path[hex/terrain/town/house,pic actions]
8052 ( 0.1146, 0.0405)
8053 -- ( 0.1598, 0.0323)
8054 -- ( 0.1489,-0.0277)
8055 -- ( 0.1036,-0.0196)
8056 --cycle
8057 ;
8058 \path[hex/terrain/town/house,pic actions]
8059 ( 0.1146, 0.0405)
8060 -- ( 0.1598, 0.0323)
8061 -- ( 0.1489,-0.0277)
8062 -- ( 0.1036,-0.0196)
8063 --cycle
8064 ;
8065 \path[hex/terrain/town/house,pic actions]
8066 (-0.0844, 0.4998)
8067 -- (-0.0599, 0.4835)
8068 -- (-0.0898, 0.4389)
8069 -- (-0.1141, 0.4551)
8070 --cycle
8071 ;

```



```

8072 \path[hex/terrain/town/house,pic actions]
8073 (-0.0844, 0.4998)
8074 -- (-0.0599, 0.4835)
8075 -- (-0.0898, 0.4389)
8076 -- (-0.1141, 0.4551)
8077 --cycle
8078 ;
8079 \path[hex/terrain/town/house,pic actions]
8080 (-0.6143,-0.0454)
8081 -- (-0.6005,-0.0196)
8082 -- (-0.5531,-0.0447)
8083 -- (-0.5668,-0.0707)
8084 --cycle
8085 ;
8086 \path[hex/terrain/town/house,pic actions]
8087 (-0.6143,-0.0454)
8088 -- (-0.6005,-0.0196)
8089 -- (-0.5531,-0.0447)
8090 -- (-0.5668,-0.0707)
8091 --cycle
8092 ;
8093 \path[hex/terrain/town/house,pic actions]
8094 (-0.3809,-0.0792)
8095 -- (-0.3371,-0.0929)
8096 -- (-0.3553,-0.1511)
8097 -- (-0.3991,-0.1375)
8098 --cycle
8099 ;
8100 \path[hex/terrain/town/house,pic actions]
8101 (-0.3809,-0.0792)
8102 -- (-0.3371,-0.0929)
8103 -- (-0.3553,-0.1511)
8104 -- (-0.3991,-0.1375)
8105 --cycle
8106 ;
8107 \path[hex/terrain/town/house,pic actions]
8108 (-0.5133, 0.1838)
8109 -- (-0.4733, 0.1613)
8110 -- (-0.5032, 0.1081)
8111 -- (-0.5433, 0.1307)
8112 --cycle
8113 ;
8114 \path[hex/terrain/town/house,pic actions]
8115 (-0.5133, 0.1838)
8116 -- (-0.4733, 0.1613)
8117 -- (-0.5032, 0.1081)
8118 -- (-0.5433, 0.1307)
8119 --cycle
8120 ;
8121 \path[hex/terrain/town/house,pic actions]
8122 (-0.3878, 0.1398)
8123 -- (-0.3421, 0.1442)
8124 -- (-0.3362, 0.0834)

```

```

8125 -- (-0.3819, 0.0790)
8126 --cycle
8127 ;
8128 \path[hex/terrain/town/house,pic actions]
8129 (-0.3878, 0.1398)
8130 -- (-0.3421, 0.1442)
8131 -- (-0.3362, 0.0834)
8132 -- (-0.3819, 0.0790)
8133 --cycle
8134 ;
8135 \path[hex/terrain/town/house,pic actions]
8136 (-0.5622, 0.0806)
8137 -- (-0.5234, 0.0560)
8138 -- (-0.5559, 0.0044)
8139 -- (-0.5948, 0.0290)
8140 --cycle
8141 ;
8142 \path[hex/terrain/town/house,pic actions]
8143 (-0.5622, 0.0806)
8144 -- (-0.5234, 0.0560)
8145 -- (-0.5559, 0.0044)
8146 -- (-0.5948, 0.0290)
8147 --cycle
8148 ;
8149 \path[hex/terrain/town/house,pic actions]
8150 (-0.6218, 0.1903)
8151 -- (-0.6097, 0.2346)
8152 -- (-0.5508, 0.2185)
8153 -- (-0.5629, 0.1742)
8154 --cycle
8155 ;
8156 \path[hex/terrain/town/house,pic actions]
8157 (-0.6218, 0.1903)
8158 -- (-0.6097, 0.2346)
8159 -- (-0.5508, 0.2185)
8160 -- (-0.5629, 0.1742)
8161 --cycle
8162 ;
8163 \path[hex/terrain/town/house,pic actions]
8164 (-0.2884, 0.7423)
8165 -- (-0.2596, 0.7372)
8166 -- (-0.2691, 0.6843)
8167 -- (-0.2980, 0.6895)
8168 --cycle
8169 ;
8170 \path[hex/terrain/town/house,pic actions]
8171 (-0.2884, 0.7423)
8172 -- (-0.2596, 0.7372)
8173 -- (-0.2691, 0.6843)
8174 -- (-0.2980, 0.6895)
8175 --cycle
8176 ;
8177 \path[hex/terrain/town/house,pic actions]

```

```

8178 ( 0.1219, 0.8731)
8179 -- ( 0.1475, 0.8350)
8180 -- ( 0.0970, 0.8008)
8181 -- ( 0.0712, 0.8389)
8182 --cycle
8183 ;
8184 \path[hex/terrain/town/house,pic actions]
8185 ( 0.1219, 0.8731)
8186 -- ( 0.1475, 0.8350)
8187 -- ( 0.0970, 0.8008)
8188 -- ( 0.0712, 0.8389)
8189 --cycle
8190 ;
8191 \path[hex/terrain/town/house,pic actions]
8192 ( 0.3659, 0.5557)
8193 -- ( 0.3913, 0.5175)
8194 -- ( 0.3405, 0.4837)
8195 -- ( 0.3150, 0.5219)
8196 --cycle
8197 ;
8198 \path[hex/terrain/town/house,pic actions]
8199 ( 0.3659, 0.5557)
8200 -- ( 0.3913, 0.5175)
8201 -- ( 0.3405, 0.4837)
8202 -- ( 0.3150, 0.5219)
8203 --cycle
8204 ;
8205 \path[hex/terrain/town/house,pic actions]
8206 ( 0.0626, 0.4298)
8207 -- ( 0.0896, 0.4184)
8208 -- ( 0.0686, 0.3690)
8209 -- ( 0.0416, 0.3804)
8210 --cycle
8211 ;
8212 \path[hex/terrain/town/house,pic actions]
8213 ( 0.0626, 0.4298)
8214 -- ( 0.0896, 0.4184)
8215 -- ( 0.0686, 0.3690)
8216 -- ( 0.0416, 0.3804)
8217 --cycle
8218 ;
8219 \path[hex/terrain/town/house,pic actions]
8220 (-0.4510,-0.3094)
8221 -- (-0.4058,-0.2887)
8222 -- (-0.3725,-0.3614)
8223 -- (-0.4176,-0.3821)
8224 --cycle
8225 ;
8226 \path[hex/terrain/town/house,pic actions]
8227 (-0.4510,-0.3094)
8228 -- (-0.4058,-0.2887)
8229 -- (-0.3725,-0.3614)
8230 -- (-0.4176,-0.3821)

```

```

8231  --cycle
8232  ;
8233  \path[hex/terrain/town/house,pic actions]
8234  (-0.5282,-0.1080)
8235  -- (-0.5533,-0.0695)
8236  -- (-0.5021,-0.0363)
8237  -- (-0.4770,-0.0749)
8238  --cycle
8239  ;
8240  \path[hex/terrain/town/house,pic actions]
8241  (-0.5282,-0.1080)
8242  -- (-0.5533,-0.0695)
8243  -- (-0.5021,-0.0363)
8244  -- (-0.4770,-0.0749)
8245  --cycle
8246  ;
8247  \path[hex/terrain/town/house,pic actions]
8248  ( 0.0108,-0.2602)
8249  -- ( 0.0173,-0.2316)
8250  -- ( 0.0696,-0.2435)
8251  -- ( 0.0632,-0.2721)
8252  --cycle
8253  ;
8254  \path[hex/terrain/town/house,pic actions]
8255  ( 0.0108,-0.2602)
8256  -- ( 0.0173,-0.2316)
8257  -- ( 0.0696,-0.2435)
8258  -- ( 0.0632,-0.2721)
8259  --cycle
8260  ;
8261  \path[hex/terrain/town/house,pic actions]
8262  (-0.1989, 0.1654)
8263  -- (-0.1544, 0.1540)
8264  -- (-0.1696, 0.0948)
8265  -- (-0.2141, 0.1063)
8266  --cycle
8267  ;
8268  \path[hex/terrain/town/house,pic actions]
8269  (-0.1989, 0.1654)
8270  -- (-0.1544, 0.1540)
8271  -- (-0.1696, 0.0948)
8272  -- (-0.2141, 0.1063)
8273  --cycle
8274  ;
8275  \path[hex/terrain/town/house,pic actions]
8276  (-0.0216,-0.0407)
8277  -- ( 0.0230,-0.0521)
8278  -- ( 0.0078,-0.1112)
8279  -- (-0.0368,-0.0997)
8280  --cycle
8281  ;
8282  \path[hex/terrain/town/house,pic actions]
8283  (-0.0216,-0.0407)

```

```

8284 -- ( 0.0230,-0.0521)
8285 -- ( 0.0078,-0.1112)
8286 -- (-0.0368,-0.0997)
8287 --cycle
8288 ;
8289 \path[hex/terrain/town/house,pic actions]
8290 ( 0.1936, 0.5180)
8291 -- ( 0.2045, 0.4909)
8292 -- ( 0.1547, 0.4709)
8293 -- ( 0.1437, 0.4981)
8294 --cycle
8295 ;
8296 \path[hex/terrain/town/house,pic actions]
8297 ( 0.1936, 0.5180)
8298 -- ( 0.2045, 0.4909)
8299 -- ( 0.1547, 0.4709)
8300 -- ( 0.1437, 0.4981)
8301 --cycle
8302 ;
8303 \path[hex/terrain/town/house,pic actions]
8304 (-0.1903, 0.4858)
8305 -- (-0.1678, 0.5258)
8306 -- (-0.1146, 0.4960)
8307 -- (-0.1371, 0.4559)
8308 --cycle
8309 ;
8310 \path[hex/terrain/town/house,pic actions]
8311 (-0.1903, 0.4858)
8312 -- (-0.1678, 0.5258)
8313 -- (-0.1146, 0.4960)
8314 -- (-0.1371, 0.4559)
8315 --cycle
8316 ;
8317 \path[hex/terrain/town/house,pic actions]
8318 ( 0.1470, 0.3493)
8319 -- ( 0.1689, 0.3567)
8320 -- ( 0.1775, 0.3315)
8321 -- ( 0.1555, 0.3241)
8322 --cycle
8323 ;
8324 \path[hex/terrain/town/house,pic actions]
8325 ( 0.1470, 0.3493)
8326 -- ( 0.1689, 0.3567)
8327 -- ( 0.1775, 0.3315)
8328 -- ( 0.1555, 0.3241)
8329 --cycle
8330 ;
8331 \path[hex/terrain/town/house,pic actions]
8332 ( 0.1892, 0.2562)
8333 -- ( 0.2118, 0.2510)
8334 -- ( 0.2058, 0.2251)
8335 -- ( 0.1833, 0.2303)
8336 --cycle

```

```

8337 ;
8338 \path[hex/terrain/town/house,pic actions]
8339 ( 0.1892, 0.2562)
8340 -- ( 0.2118, 0.2510)
8341 -- ( 0.2058, 0.2251)
8342 -- ( 0.1833, 0.2303)
8343 --cycle
8344 ;
8345 \path[hex/terrain/town/house,pic actions]
8346 ( 0.8016, 0.0292)
8347 -- ( 0.8235, 0.0367)
8348 -- ( 0.8321, 0.0116)
8349 -- ( 0.8103, 0.0040)
8350 --cycle
8351 ;
8352 \path[hex/terrain/town/house,pic actions]
8353 ( 0.8016, 0.0292)
8354 -- ( 0.8235, 0.0367)
8355 -- ( 0.8321, 0.0116)
8356 -- ( 0.8103, 0.0040)
8357 --cycle
8358 ;
8359 \path[hex/terrain/town/house,pic actions]
8360 ( 0.7392, 0.1737)
8361 -- ( 0.7609, 0.1816)
8362 -- ( 0.7702, 0.1568)
8363 -- ( 0.7485, 0.1487)
8364 --cycle
8365 ;
8366 \path[hex/terrain/town/house,pic actions]
8367 ( 0.7392, 0.1737)
8368 -- ( 0.7609, 0.1816)
8369 -- ( 0.7702, 0.1568)
8370 -- ( 0.7485, 0.1487)
8371 --cycle
8372 ;
8373 \path[hex/terrain/town/house,pic actions]
8374 ( 0.3736, 0.7805)
8375 -- ( 0.3937, 0.7921)
8376 -- ( 0.4071, 0.7691)
8377 -- ( 0.3870, 0.7575)
8378 --cycle
8379 ;
8380 \path[hex/terrain/town/house,pic actions]
8381 ( 0.3736, 0.7805)
8382 -- ( 0.3937, 0.7921)
8383 -- ( 0.4071, 0.7691)
8384 -- ( 0.3870, 0.7575)
8385 --cycle
8386 ;
8387 \path[hex/terrain/town/house,pic actions]
8388 (-0.4808,-0.6251)
8389 -- (-0.4706,-0.6459)

```

```

8390 -- (-0.4946,-0.6576)
8391 -- (-0.5047,-0.6368)
8392 --cycle
8393 ;
8394 \path[hex/terrain/town/house,pic actions]
8395 (-0.4808,-0.6251)
8396 -- (-0.4706,-0.6459)
8397 -- (-0.4946,-0.6576)
8398 -- (-0.5047,-0.6368)
8399 --cycle
8400 ;
8401 \path[hex/terrain/town/house,pic actions]
8402 (-0.4514,-0.6075)
8403 -- (-0.4393,-0.6272)
8404 -- (-0.4620,-0.6412)
8405 -- (-0.4740,-0.6215)
8406 --cycle
8407 ;
8408 \path[hex/terrain/town/house,pic actions]
8409 (-0.4514,-0.6075)
8410 -- (-0.4393,-0.6272)
8411 -- (-0.4620,-0.6412)
8412 -- (-0.4740,-0.6215)
8413 --cycle
8414 ;
8415 \path[hex/terrain/town/house,pic actions]
8416 (-0.2390,-0.7174)
8417 -- (-0.2175,-0.7260)
8418 -- (-0.2273,-0.7508)
8419 -- (-0.2489,-0.7421)
8420 --cycle
8421 ;
8422 \path[hex/terrain/town/house,pic actions]
8423 (-0.2390,-0.7174)
8424 -- (-0.2175,-0.7260)
8425 -- (-0.2273,-0.7508)
8426 -- (-0.2489,-0.7421)
8427 --cycle
8428 ;
8429 \path[hex/terrain/town/house,pic actions]
8430 (-0.2386,-0.5506)
8431 -- (-0.2108,-0.5598)
8432 -- (-0.2277,-0.6108)
8433 -- (-0.2555,-0.6015)
8434 --cycle
8435 ;
8436 \path[hex/terrain/town/house,pic actions]
8437 (-0.2386,-0.5506)
8438 -- (-0.2108,-0.5598)
8439 -- (-0.2277,-0.6108)
8440 -- (-0.2555,-0.6015)
8441 --cycle
8442 ;

```

```

8443 \path[hex/terrain/town/house,pic actions]
8444 (-0.3574, 0.2226)
8445 -- (-0.3530, 0.2515)
8446 -- (-0.2999, 0.2435)
8447 -- (-0.3043, 0.2145)
8448 --cycle
8449 ;
8450 \path[hex/terrain/town/house,pic actions]
8451 (-0.3574, 0.2226)
8452 -- (-0.3530, 0.2515)
8453 -- (-0.2999, 0.2435)
8454 -- (-0.3043, 0.2145)
8455 --cycle
8456 ;
8457 \path[hex/terrain/town/house,pic actions]
8458 (-0.3315, 0.3242)
8459 -- (-0.3271, 0.3532)
8460 -- (-0.2740, 0.3451)
8461 -- (-0.2783, 0.3162)
8462 --cycle
8463 ;
8464 \path[hex/terrain/town/house,pic actions]
8465 (-0.3315, 0.3242)
8466 -- (-0.3271, 0.3532)
8467 -- (-0.2740, 0.3451)
8468 -- (-0.2783, 0.3162)
8469 --cycle
8470 ;
8471 \path[hex/terrain/town/house,pic actions]
8472 ( 0.2256, 0.4895)
8473 -- ( 0.2451, 0.4676)
8474 -- ( 0.2049, 0.4320)
8475 -- ( 0.1854, 0.4539)
8476 --cycle
8477 ;
8478 \path[hex/terrain/town/house,pic actions]
8479 ( 0.2256, 0.4895)
8480 -- ( 0.2451, 0.4676)
8481 -- ( 0.2049, 0.4320)
8482 -- ( 0.1854, 0.4539)
8483 --cycle
8484 ;
8485 \path[hex/terrain/town/house,pic actions]
8486 ( 0.1717, 0.5777)
8487 -- ( 0.1903, 0.5551)
8488 -- ( 0.1488, 0.5210)
8489 -- ( 0.1302, 0.5436)
8490 --cycle
8491 ;
8492 \path[hex/terrain/town/house,pic actions]
8493 ( 0.1717, 0.5777)
8494 -- ( 0.1903, 0.5551)
8495 -- ( 0.1488, 0.5210)

```



```

8496 -- ( 0.1302, 0.5436)
8497 --cycle
8498 ;
8499 \path[hex/terrain/town/house,pic actions]
8500 (-0.0995, 0.2545)
8501 -- (-0.0891, 0.2819)
8502 -- (-0.0389, 0.2629)
8503 -- (-0.0492, 0.2355)
8504 --cycle
8505 ;
8506 \path[hex/terrain/town/house,pic actions]
8507 (-0.0995, 0.2545)
8508 -- (-0.0891, 0.2819)
8509 -- (-0.0389, 0.2629)
8510 -- (-0.0492, 0.2355)
8511 --cycle
8512 ;
8513 \path[hex/terrain/town/house,pic actions]
8514 ( 0.0828, 0.2371)
8515 -- ( 0.0883, 0.2659)
8516 -- ( 0.1411, 0.2559)
8517 -- ( 0.1357, 0.2271)
8518 --cycle
8519 ;
8520 \path[hex/terrain/town/house,pic actions]
8521 ( 0.0828, 0.2371)
8522 -- ( 0.0883, 0.2659)
8523 -- ( 0.1411, 0.2559)
8524 -- ( 0.1357, 0.2271)
8525 --cycle
8526 ;
8527 \path[hex/terrain/town/house,pic actions]
8528 (-0.1049, 0.1819)
8529 -- (-0.0945, 0.2094)
8530 -- (-0.0443, 0.1904)
8531 -- (-0.0546, 0.1629)
8532 --cycle
8533 ;
8534 \path[hex/terrain/town/house,pic actions]
8535 (-0.1049, 0.1819)
8536 -- (-0.0945, 0.2094)
8537 -- (-0.0443, 0.1904)
8538 -- (-0.0546, 0.1629)
8539 --cycle
8540 ;
8541 \path[hex/terrain/town/house,pic actions]
8542 (-0.0889,-0.0631)
8543 -- (-0.0785,-0.0357)
8544 -- (-0.0283,-0.0549)
8545 -- (-0.0388,-0.0823)
8546 --cycle
8547 ;
8548 \path[hex/terrain/town/house,pic actions]

```

```

8549      (-0.0889,-0.0631)
8550      -- (-0.0785,-0.0357)
8551      -- (-0.0283,-0.0549)
8552      -- (-0.0388,-0.0823)
8553      --cycle
8554      ;
8555      \path[hex/terrain/town/house,pic actions]
8556      (-0.2282,-0.7907)
8557      -- (-0.1823,-0.7907)
8558      -- (-0.1823,-0.8518)
8559      -- (-0.2282,-0.8518)
8560      --cycle
8561      ;
8562      \path[hex/terrain/town/house,pic actions]
8563      (-0.2282,-0.7907)
8564      -- (-0.1823,-0.7907)
8565      -- (-0.1823,-0.8518)
8566      -- (-0.2282,-0.8518)
8567      --cycle
8568      ;
8569      \path[hex/terrain/town/house,pic actions]
8570      ( 0.2275,-0.7989)
8571      -- ( 0.2734,-0.7989)
8572      -- ( 0.2734,-0.8599)
8573      -- ( 0.2275,-0.8599)
8574      --cycle
8575      ;
8576      \path[hex/terrain/town/house,pic actions]
8577      ( 0.2275,-0.7989)
8578      -- ( 0.2734,-0.7989)
8579      -- ( 0.2734,-0.8599)
8580      -- ( 0.2275,-0.8599)
8581      --cycle
8582      ;
8583      \path[hex/terrain/town/house,pic actions]
8584      ( 0.2516,-0.7126)
8585      -- ( 0.2808,-0.7126)
8586      -- ( 0.2808,-0.7663)
8587      -- ( 0.2516,-0.7663)
8588      --cycle
8589      ;
8590      \path[hex/terrain/town/house,pic actions]
8591      ( 0.2516,-0.7126)
8592      -- ( 0.2808,-0.7126)
8593      -- ( 0.2808,-0.7663)
8594      -- ( 0.2516,-0.7663)
8595      --cycle
8596      ;
8597      \path[hex/terrain/town/house,pic actions]
8598      ( 0.1669,-0.7129)
8599      -- ( 0.1954,-0.7199)
8600      -- ( 0.1826,-0.7721)
8601      -- ( 0.1542,-0.7650)

```

```

8602  --cycle
8603  ;
8604  \path[hex/terrain/town/house,pic actions]
8605  ( 0.1669,-0.7129)
8606  -- ( 0.1954,-0.7199)
8607  -- ( 0.1826,-0.7721)
8608  -- ( 0.1542,-0.7650)
8609  --cycle
8610  ;
8611  \path[hex/terrain/town/house,pic actions]
8612  ( 0.1222,-0.7854)
8613  -- ( 0.1514,-0.7854)
8614  -- ( 0.1514,-0.8390)
8615  -- ( 0.1222,-0.8390)
8616  --cycle
8617  ;
8618  \path[hex/terrain/town/house,pic actions]
8619  ( 0.1222,-0.7854)
8620  -- ( 0.1514,-0.7854)
8621  -- ( 0.1514,-0.8390)
8622  -- ( 0.1222,-0.8390)
8623  --cycle
8624  ;
8625  \path[hex/terrain/town/house,pic actions]
8626  ( 0.3031,-0.7156)
8627  -- ( 0.3325,-0.7156)
8628  -- ( 0.3325,-0.7693)
8629  -- ( 0.3031,-0.7693)
8630  --cycle
8631  ;
8632  \path[hex/terrain/town/house,pic actions]
8633  ( 0.3031,-0.7156)
8634  -- ( 0.3325,-0.7156)
8635  -- ( 0.3325,-0.7693)
8636  -- ( 0.3031,-0.7693)
8637  --cycle
8638  ;
8639  \path[hex/terrain/town/house,pic actions]
8640  ( 0.3574,-0.7174)
8641  -- ( 0.3867,-0.7174)
8642  -- ( 0.3867,-0.7712)
8643  -- ( 0.3574,-0.7712)
8644  --cycle
8645  ;
8646  \path[hex/terrain/town/house,pic actions]
8647  ( 0.3574,-0.7174)
8648  -- ( 0.3867,-0.7174)
8649  -- ( 0.3867,-0.7712)
8650  -- ( 0.3574,-0.7712)
8651  --cycle
8652  ;
8653  \path[hex/terrain/town/house,pic actions]
8654  ( 0.3742,-0.8016)

```

```

8655 -- ( 0.4036,-0.8016)
8656 -- ( 0.4036,-0.8554)
8657 -- ( 0.3742,-0.8554)
8658 --cycle
8659 ;
8660 \path[hex/terrain/town/house,pic actions]
8661 ( 0.3742,-0.8016)
8662 -- ( 0.4036,-0.8016)
8663 -- ( 0.4036,-0.8554)
8664 -- ( 0.3742,-0.8554)
8665 --cycle
8666 ;
8667 \path[hex/terrain/town/house,pic actions]
8668 ( 0.4107,-0.8072)
8669 -- ( 0.4400,-0.8072)
8670 -- ( 0.4400,-0.8610)
8671 -- ( 0.4107,-0.8610)
8672 --cycle
8673 ;
8674 \path[hex/terrain/town/house,pic actions]
8675 ( 0.4107,-0.8072)
8676 -- ( 0.4400,-0.8072)
8677 -- ( 0.4400,-0.8610)
8678 -- ( 0.4107,-0.8610)
8679 --cycle
8680 ;
8681 \path[hex/terrain/town/house,pic actions]
8682 ( 0.4612,-0.7886)
8683 -- ( 0.4905,-0.7886)
8684 -- ( 0.4905,-0.8423)
8685 -- ( 0.4612,-0.8423)
8686 --cycle
8687 ;
8688 \path[hex/terrain/town/house,pic actions]
8689 ( 0.4612,-0.7886)
8690 -- ( 0.4905,-0.7886)
8691 -- ( 0.4905,-0.8423)
8692 -- ( 0.4612,-0.8423)
8693 --cycle
8694 ;
8695 \path[hex/terrain/town/house,pic actions]
8696 ( 0.5733,-0.6570)
8697 -- ( 0.6007,-0.6675)
8698 -- ( 0.5814,-0.7176)
8699 -- ( 0.5540,-0.7071)
8700 --cycle
8701 ;
8702 \path[hex/terrain/town/house,pic actions]
8703 ( 0.5733,-0.6570)
8704 -- ( 0.6007,-0.6675)
8705 -- ( 0.5814,-0.7176)
8706 -- ( 0.5540,-0.7071)
8707 --cycle

```

```

8708 ;
8709 \path[hex/terrain/town/house,pic actions]
8710 ( 0.6698,-0.4454)
8711 -- ( 0.6958,-0.4589)
8712 -- ( 0.6710,-0.5065)
8713 -- ( 0.6450,-0.4930)
8714 --cycle
8715 ;
8716 \path[hex/terrain/town/house,pic actions]
8717 ( 0.6698,-0.4454)
8718 -- ( 0.6958,-0.4589)
8719 -- ( 0.6710,-0.5065)
8720 -- ( 0.6450,-0.4930)
8721 --cycle
8722 ;
8723 \path[hex/terrain/town/house,pic actions]
8724 ( 0.5789,-0.4658)
8725 -- ( 0.6009,-0.4851)
8726 -- ( 0.5654,-0.5254)
8727 -- ( 0.5434,-0.5061)
8728 --cycle
8729 ;
8730 \path[hex/terrain/town/house,pic actions]
8731 ( 0.5789,-0.4658)
8732 -- ( 0.6009,-0.4851)
8733 -- ( 0.5654,-0.5254)
8734 -- ( 0.5434,-0.5061)
8735 --cycle
8736 ;
8737 \path[hex/terrain/town/house,pic actions]
8738 ( 0.6025,-0.4876)
8739 -- ( 0.6259,-0.5054)
8740 -- ( 0.5934,-0.5481)
8741 -- ( 0.5701,-0.5304)
8742 --cycle
8743 ;
8744 \path[hex/terrain/town/house,pic actions]
8745 ( 0.6025,-0.4876)
8746 -- ( 0.6259,-0.5054)
8747 -- ( 0.5934,-0.5481)
8748 -- ( 0.5701,-0.5304)
8749 --cycle
8750 ;
8751 \path[hex/terrain/town/house,pic actions]
8752 ( 0.6466,-0.5044)
8753 -- ( 0.6729,-0.5172)
8754 -- ( 0.6493,-0.5654)
8755 -- ( 0.6230,-0.5526)
8756 --cycle
8757 ;
8758 \path[hex/terrain/town/house,pic actions]
8759 ( 0.6466,-0.5044)
8760 -- ( 0.6729,-0.5172)

```

```

8761 -- ( 0.6493,-0.5654)
8762 -- ( 0.6230,-0.5526)
8763 --cycle
8764 ;
8765 \path[hex/terrain/town/house,pic actions]
8766 ( 0.4854,-0.5939)
8767 -- ( 0.5002,-0.5686)
8768 -- ( 0.5466,-0.5955)
8769 -- ( 0.5320,-0.6208)
8770 --cycle
8771 ;
8772 \path[hex/terrain/town/house,pic actions]
8773 ( 0.4854,-0.5939)
8774 -- ( 0.5002,-0.5686)
8775 -- ( 0.5466,-0.5955)
8776 -- ( 0.5320,-0.6208)
8777 --cycle
8778 ;
8779 \path[hex/terrain/town/house,pic actions]
8780 ( 0.4577,-0.6299)
8781 -- ( 0.4750,-0.6063)
8782 -- ( 0.5183,-0.6380)
8783 -- ( 0.5010,-0.6617)
8784 --cycle
8785 ;
8786 \path[hex/terrain/town/house,pic actions]
8787 ( 0.4577,-0.6299)
8788 -- ( 0.4750,-0.6063)
8789 -- ( 0.5183,-0.6380)
8790 -- ( 0.5010,-0.6617)
8791 --cycle
8792 ;
8793 \path[hex/terrain/town/house,pic actions]
8794 ( 0.4354,-0.6506)
8795 -- ( 0.4568,-0.6305)
8796 -- ( 0.4935,-0.6697)
8797 -- ( 0.4721,-0.6898)
8798 --cycle
8799 ;
8800 \path[hex/terrain/town/house,pic actions]
8801 ( 0.4354,-0.6506)
8802 -- ( 0.4568,-0.6305)
8803 -- ( 0.4935,-0.6697)
8804 -- ( 0.4721,-0.6898)
8805 --cycle
8806 ;
8807 \path[hex/terrain/town/house,pic actions]
8808 ( 0.3580,-0.4631)
8809 -- ( 0.3837,-0.4771)
8810 -- ( 0.3581,-0.5243)
8811 -- ( 0.3323,-0.5103)
8812 --cycle
8813 ;

```

```

8814 \path[hex/terrain/town/house,pic actions]
8815 ( 0.3580,-0.4631)
8816 -- ( 0.3837,-0.4771)
8817 -- ( 0.3581,-0.5243)
8818 -- ( 0.3323,-0.5103)
8819 --cycle
8820 ;
8821 \path[hex/terrain/town/house,pic actions]
8822 ( 0.5131,-0.3580)
8823 -- ( 0.5345,-0.3780)
8824 -- ( 0.4978,-0.4172)
8825 -- ( 0.4763,-0.3972)
8826 --cycle
8827 ;
8828 \path[hex/terrain/town/house,pic actions]
8829 ( 0.5131,-0.3580)
8830 -- ( 0.5345,-0.3780)
8831 -- ( 0.4978,-0.4172)
8832 -- ( 0.4763,-0.3972)
8833 --cycle
8834 ;
8835 \path[hex/terrain/town/house,pic actions]
8836 ( 0.2116,-0.3904)
8837 -- ( 0.2243,-0.3641)
8838 -- ( 0.2726,-0.3875)
8839 -- ( 0.2598,-0.4139)
8840 --cycle
8841 ;
8842 \path[hex/terrain/town/house,pic actions]
8843 ( 0.2116,-0.3904)
8844 -- ( 0.2243,-0.3641)
8845 -- ( 0.2726,-0.3875)
8846 -- ( 0.2598,-0.4139)
8847 --cycle
8848 ;
8849 \path[hex/terrain/town/house,pic actions]
8850 ( 0.1786,-0.4343)
8851 -- ( 0.1889,-0.4069)
8852 -- ( 0.2391,-0.4259)
8853 -- ( 0.2289,-0.4532)
8854 --cycle
8855 ;
8856 \path[hex/terrain/town/house,pic actions]
8857 ( 0.1786,-0.4343)
8858 -- ( 0.1889,-0.4069)
8859 -- ( 0.2391,-0.4259)
8860 -- ( 0.2289,-0.4532)
8861 --cycle
8862 ;
8863 \path[hex/terrain/town/house,pic actions]
8864 ( 0.1647,-0.4763)
8865 -- ( 0.1772,-0.4497)
8866 -- ( 0.2258,-0.4725)

```

```

8867 -- ( 0.2134,-0.4990)
8868 --cycle
8869 ;
8870 \path[hex/terrain/town/house,pic actions]
8871 ( 0.1647,-0.4763)
8872 -- ( 0.1772,-0.4497)
8873 -- ( 0.2258,-0.4725)
8874 -- ( 0.2134,-0.4990)
8875 --cycle
8876 ;
8877 \path[hex/terrain/town/house,pic actions]
8878 ( 0.2335,-0.5197)
8879 -- ( 0.2460,-0.4932)
8880 -- ( 0.2946,-0.5160)
8881 -- ( 0.2821,-0.5425)
8882 --cycle
8883 ;
8884 \path[hex/terrain/town/house,pic actions]
8885 ( 0.2335,-0.5197)
8886 -- ( 0.2460,-0.4932)
8887 -- ( 0.2946,-0.5160)
8888 -- ( 0.2821,-0.5425)
8889 --cycle
8890 ;
8891 \path[hex/terrain/town/house,pic actions]
8892 ( 0.2832,-0.4218)
8893 -- ( 0.2956,-0.3952)
8894 -- ( 0.3443,-0.4180)
8895 -- ( 0.3318,-0.4445)
8896 --cycle
8897 ;
8898 \path[hex/terrain/town/house,pic actions]
8899 ( 0.2832,-0.4218)
8900 -- ( 0.2956,-0.3952)
8901 -- ( 0.3443,-0.4180)
8902 -- ( 0.3318,-0.4445)
8903 --cycle
8904 ;
8905 \path[hex/terrain/town/house,pic actions]
8906 ( 0.2064,-0.6136)
8907 -- ( 0.2189,-0.5871)
8908 -- ( 0.2675,-0.6099)
8909 -- ( 0.2551,-0.6364)
8910 --cycle
8911 ;
8912 \path[hex/terrain/town/house,pic actions]
8913 ( 0.2064,-0.6136)
8914 -- ( 0.2189,-0.5871)
8915 -- ( 0.2675,-0.6099)
8916 -- ( 0.2551,-0.6364)
8917 --cycle
8918 ;
8919 \path[hex/terrain/town/house,pic actions]

```



```

8920 ( 0.1443,-0.5195)
8921 -- ( 0.1550,-0.4922)
8922 -- ( 0.2050,-0.5120)
8923 -- ( 0.1942,-0.5392)
8924 --cycle
8925 ;
8926 \path[hex/terrain/town/house,pic actions]
8927 ( 0.1443,-0.5195)
8928 -- ( 0.1550,-0.4922)
8929 -- ( 0.2050,-0.5120)
8930 -- ( 0.1942,-0.5392)
8931 --cycle
8932 ;
8933 \path[hex/terrain/town/house,pic actions]
8934 ( 0.3128,-0.5333)
8935 -- ( 0.3394,-0.5455)
8936 -- ( 0.3173,-0.5943)
8937 -- ( 0.2906,-0.5823)
8938 --cycle
8939 ;
8940 \path[hex/terrain/town/house,pic actions]
8941 ( 0.3128,-0.5333)
8942 -- ( 0.3394,-0.5455)
8943 -- ( 0.3173,-0.5943)
8944 -- ( 0.2906,-0.5823)
8945 --cycle
8946 ;
8947 \path[hex/terrain/town/house,pic actions]
8948 ( 0.1781,-0.6526)
8949 -- ( 0.1883,-0.6250)
8950 -- ( 0.2386,-0.6435)
8951 -- ( 0.2286,-0.6710)
8952 --cycle
8953 ;
8954 \path[hex/terrain/town/house,pic actions]
8955 ( 0.1781,-0.6526)
8956 -- ( 0.1883,-0.6250)
8957 -- ( 0.2386,-0.6435)
8958 -- ( 0.2286,-0.6710)
8959 --cycle
8960 ;
8961 \path[hex/terrain/town/house,pic actions]
8962 ( 0.0147,-0.5695)
8963 -- ( 0.0238,-0.5417)
8964 -- ( 0.0749,-0.5582)
8965 -- ( 0.0658,-0.5861)
8966 --cycle
8967 ;
8968 \path[hex/terrain/town/house,pic actions]
8969 ( 0.0147,-0.5695)
8970 -- ( 0.0238,-0.5417)
8971 -- ( 0.0749,-0.5582)
8972 -- ( 0.0658,-0.5861)

```

```

8973 --cycle
8974 ;
8975 \path[hex/terrain/town/house,pic actions]
8976 ( 0.0205,-0.5124)
8977 -- ( 0.0287,-0.4843)
8978 -- ( 0.0803,-0.4994)
8979 -- ( 0.0720,-0.5275)
8980 --cycle
8981 ;
8982 \path[hex/terrain/town/house,pic actions]
8983 ( 0.0205,-0.5124)
8984 -- ( 0.0287,-0.4843)
8985 -- ( 0.0803,-0.4994)
8986 -- ( 0.0720,-0.5275)
8987 --cycle
8988 ;
8989 \path[hex/terrain/town/house,pic actions]
8990 (-0.0719,-0.6560)
8991 -- (-0.0678,-0.6849)
8992 -- (-0.1209,-0.6925)
8993 -- (-0.1250,-0.6635)
8994 --cycle
8995 ;
8996 \path[hex/terrain/town/house,pic actions]
8997 (-0.0719,-0.6560)
8998 -- (-0.0678,-0.6849)
8999 -- (-0.1209,-0.6925)
9000 -- (-0.1250,-0.6635)
9001 --cycle
9002 ;
9003 \path[hex/terrain/town/house,pic actions]
9004 (-0.1330,-0.6411)
9005 -- (-0.1375,-0.6700)
9006 -- (-0.1906,-0.6618)
9007 -- (-0.1861,-0.6329)
9008 --cycle
9009 ;
9010 \path[hex/terrain/town/house,pic actions]
9011 (-0.1330,-0.6411)
9012 -- (-0.1375,-0.6700)
9013 -- (-0.1906,-0.6618)
9014 -- (-0.1861,-0.6329)
9015 --cycle
9016 ;
9017 \path[hex/terrain/town/house,pic actions]
9018 (-0.0334,-0.7381)
9019 -- (-0.0042,-0.7381)
9020 -- (-0.0042,-0.7917)
9021 -- (-0.0334,-0.7917)
9022 --cycle
9023 ;
9024 \path[hex/terrain/town/house,pic actions]
9025 (-0.0334,-0.7381)

```

```

9026 -- (-0.0042,-0.7381)
9027 -- (-0.0042,-0.7917)
9028 -- (-0.0334,-0.7917)
9029 --cycle
9030 ;
9031 \path[hex/terrain/town/house,pic actions]
9032 (-0.0998,-0.7315)
9033 -- (-0.0706,-0.7315)
9034 -- (-0.0706,-0.7852)
9035 -- (-0.0998,-0.7852)
9036 --cycle
9037 ;
9038 \path[hex/terrain/town/house,pic actions]
9039 (-0.0998,-0.7315)
9040 -- (-0.0706,-0.7315)
9041 -- (-0.0706,-0.7852)
9042 -- (-0.0998,-0.7852)
9043 --cycle
9044 ;
9045 \path[hex/terrain/town/house,pic actions]
9046 (-0.2018,-0.7234)
9047 -- (-0.1730,-0.7180)
9048 -- (-0.1631,-0.7708)
9049 -- (-0.1919,-0.7762)
9050 --cycle
9051 ;
9052 \path[hex/terrain/town/house,pic actions]
9053 (-0.2018,-0.7234)
9054 -- (-0.1730,-0.7180)
9055 -- (-0.1631,-0.7708)
9056 -- (-0.1919,-0.7762)
9057 --cycle
9058 ;
9059 \path[hex/terrain/town/house,pic actions]
9060 (-0.2956,-0.7184)
9061 -- (-0.2667,-0.7229)
9062 -- (-0.2750,-0.7760)
9063 -- (-0.3039,-0.7714)
9064 --cycle
9065 ;
9066 \path[hex/terrain/town/house,pic actions]
9067 (-0.2956,-0.7184)
9068 -- (-0.2667,-0.7229)
9069 -- (-0.2750,-0.7760)
9070 -- (-0.3039,-0.7714)
9071 --cycle
9072 ;
9073 \path[hex/terrain/town/house,pic actions]
9074 (-0.1661,-0.8014)
9075 -- (-0.1372,-0.8060)
9076 -- (-0.1454,-0.8590)
9077 -- (-0.1744,-0.8545)
9078 --cycle

```

```

9079 ;
9080 \path[hex/terrain/town/house,pic actions]
9081 (-0.1661,-0.8014)
9082 -- (-0.1372,-0.8060)
9083 -- (-0.1454,-0.8590)
9084 -- (-0.1744,-0.8545)
9085 --cycle
9086 ;
9087 \path[hex/terrain/town/house,pic actions]
9088 (-0.1269,-0.8074)
9089 -- (-0.0977,-0.8054)
9090 -- (-0.0940,-0.8590)
9091 -- (-0.1232,-0.8610)
9092 --cycle
9093 ;
9094 \path[hex/terrain/town/house,pic actions]
9095 (-0.1269,-0.8074)
9096 -- (-0.0977,-0.8054)
9097 -- (-0.0940,-0.8590)
9098 -- (-0.1232,-0.8610)
9099 --cycle
9100 ;
9101 \path[hex/terrain/town/house,pic actions]
9102 (-0.2787,-0.7975)
9103 -- (-0.2495,-0.7956)
9104 -- (-0.2459,-0.8492)
9105 -- (-0.2751,-0.8511)
9106 --cycle
9107 ;
9108 \path[hex/terrain/town/house,pic actions]
9109 (-0.2787,-0.7975)
9110 -- (-0.2495,-0.7956)
9111 -- (-0.2459,-0.8492)
9112 -- (-0.2751,-0.8511)
9113 --cycle
9114 ;
9115 \path[hex/terrain/town/house,pic actions]
9116 (-0.3966,-0.5592)
9117 -- (-0.3802,-0.5834)
9118 -- (-0.4246,-0.6135)
9119 -- (-0.4411,-0.5892)
9120 --cycle
9121 ;
9122 \path[hex/terrain/town/house,pic actions]
9123 (-0.3966,-0.5592)
9124 -- (-0.3802,-0.5834)
9125 -- (-0.4246,-0.6135)
9126 -- (-0.4411,-0.5892)
9127 --cycle
9128 ;
9129 \path[hex/terrain/town/house,pic actions]
9130 (-0.4189,-0.5000)
9131 -- (-0.4033,-0.5248)

```

```

9132 -- (-0.4488,-0.5534)
9133 -- (-0.4644,-0.5286)
9134 --cycle
9135 ;
9136 \path[hex/terrain/town/house,pic actions]
9137 (-0.4189,-0.5000)
9138 -- (-0.4033,-0.5248)
9139 -- (-0.4488,-0.5534)
9140 -- (-0.4644,-0.5286)
9141 --cycle
9142 ;
9143 \path[hex/terrain/town/house,pic actions]
9144 (-0.3561,-0.4332)
9145 -- (-0.3310,-0.4483)
9146 -- (-0.3586,-0.4944)
9147 -- (-0.3837,-0.4793)
9148 --cycle
9149 ;
9150 \path[hex/terrain/town/house,pic actions]
9151 (-0.3561,-0.4332)
9152 -- (-0.3310,-0.4483)
9153 -- (-0.3586,-0.4944)
9154 -- (-0.3837,-0.4793)
9155 --cycle
9156 ;
9157 \path[hex/terrain/town/house,pic actions]
9158 (-0.3120,-0.4787)
9159 -- (-0.2896,-0.4976)
9160 -- (-0.3241,-0.5386)
9161 -- (-0.3466,-0.5198)
9162 --cycle
9163 ;
9164 \path[hex/terrain/town/house,pic actions]
9165 (-0.3120,-0.4787)
9166 -- (-0.2896,-0.4976)
9167 -- (-0.3241,-0.5386)
9168 -- (-0.3466,-0.5198)
9169 --cycle
9170 ;
9171 \path[hex/terrain/town/house,pic actions]
9172 (-0.2660,-0.5113)
9173 -- (-0.2456,-0.5323)
9174 -- (-0.2840,-0.5697)
9175 -- (-0.3045,-0.5487)
9176 --cycle
9177 ;
9178 \path[hex/terrain/town/house,pic actions]
9179 (-0.2660,-0.5113)
9180 -- (-0.2456,-0.5323)
9181 -- (-0.2840,-0.5697)
9182 -- (-0.3045,-0.5487)
9183 --cycle
9184 ;

```

```

9185 \path[hex/terrain/town/house,pic actions]
9186 (-0.3939,-0.2212)
9187 -- (-0.3666,-0.2319)
9188 -- (-0.3863,-0.2819)
9189 -- (-0.4135,-0.2712)
9190 --cycle
9191 ;
9192 \path[hex/terrain/town/house,pic actions]
9193 (-0.3939,-0.2212)
9194 -- (-0.3666,-0.2319)
9195 -- (-0.3863,-0.2819)
9196 -- (-0.4135,-0.2712)
9197 --cycle
9198 ;
9199 \path[hex/terrain/town/house,pic actions]
9200 (-0.3038,-0.2403)
9201 -- (-0.2765,-0.2509)
9202 -- (-0.2961,-0.3010)
9203 -- (-0.3234,-0.2902)
9204 --cycle
9205 ;
9206 \path[hex/terrain/town/house,pic actions]
9207 (-0.3038,-0.2403)
9208 -- (-0.2765,-0.2509)
9209 -- (-0.2961,-0.3010)
9210 -- (-0.3234,-0.2902)
9211 --cycle
9212 ;
9213 \path[hex/terrain/town/house,pic actions]
9214 (-0.3532,-0.2251)
9215 -- (-0.3255,-0.2346)
9216 -- (-0.3428,-0.2854)
9217 -- (-0.3705,-0.2760)
9218 --cycle
9219 ;
9220 \path[hex/terrain/town/house,pic actions]
9221 (-0.3532,-0.2251)
9222 -- (-0.3255,-0.2346)
9223 -- (-0.3428,-0.2854)
9224 -- (-0.3705,-0.2760)
9225 --cycle
9226 ;
9227 \path[hex/terrain/town/house,pic actions]
9228 (-0.3482,-0.3198)
9229 -- (-0.3204,-0.3293)
9230 -- (-0.3377,-0.3801)
9231 -- (-0.3655,-0.3706)
9232 --cycle
9233 ;
9234 \path[hex/terrain/town/house,pic actions]
9235 (-0.3482,-0.3198)
9236 -- (-0.3204,-0.3293)
9237 -- (-0.3377,-0.3801)

```

```

9238 -- (-0.3655,-0.3706)
9239 --cycle
9240 ;
9241 \path[hex/terrain/town/house,pic actions]
9242 (-0.5006,-0.1767)
9243 -- (-0.4737,-0.1885)
9244 -- (-0.4953,-0.2376)
9245 -- (-0.5221,-0.2258)
9246 --cycle
9247 ;
9248 \path[hex/terrain/town/house,pic actions]
9249 (-0.5006,-0.1767)
9250 -- (-0.4737,-0.1885)
9251 -- (-0.4953,-0.2376)
9252 -- (-0.5221,-0.2258)
9253 --cycle
9254 ;
9255 \path[hex/terrain/town/house,pic actions]
9256 (-0.5739,-0.2312)
9257 -- (-0.5595,-0.2568)
9258 -- (-0.6065,-0.2830)
9259 -- (-0.6207,-0.2575)
9260 --cycle
9261 ;
9262 \path[hex/terrain/town/house,pic actions]
9263 (-0.5739,-0.2312)
9264 -- (-0.5595,-0.2568)
9265 -- (-0.6065,-0.2830)
9266 -- (-0.6207,-0.2575)
9267 --cycle
9268 ;
9269 \path[hex/terrain/town/house,pic actions]
9270 (-0.5929,-0.3943)
9271 -- (-0.5696,-0.3765)
9272 -- (-0.5369,-0.4192)
9273 -- (-0.5602,-0.4370)
9274 --cycle
9275 ;
9276 \path[hex/terrain/town/house,pic actions]
9277 (-0.5929,-0.3943)
9278 -- (-0.5696,-0.3765)
9279 -- (-0.5369,-0.4192)
9280 -- (-0.5602,-0.4370)
9281 --cycle
9282 ;
9283 \path[hex/terrain/town/house,pic actions]
9284 (-0.5005,-0.3312)
9285 -- (-0.4775,-0.3129)
9286 -- (-0.4441,-0.3550)
9287 -- (-0.4670,-0.3733)
9288 --cycle
9289 ;
9290 \path[hex/terrain/town/house,pic actions]

```

```

9291      (-0.5005,-0.3312)
9292      -- (-0.4775,-0.3129)
9293      -- (-0.4441,-0.3550)
9294      -- (-0.4670,-0.3733)
9295      --cycle
9296      ;
9297      \path[hex/terrain/town/house,pic actions]
9298      (-0.5523,-0.3618)
9299      -- (-0.5293,-0.3436)
9300      -- (-0.4960,-0.3857)
9301      -- (-0.5189,-0.4038)
9302      --cycle
9303      ;
9304      \path[hex/terrain/town/house,pic actions]
9305      (-0.5523,-0.3618)
9306      -- (-0.5293,-0.3436)
9307      -- (-0.4960,-0.3857)
9308      -- (-0.5189,-0.4038)
9309      --cycle
9310      ;
9311      \path[hex/terrain/town/house,pic actions]
9312      (-0.4383,-0.3880)
9313      -- (-0.4249,-0.4140)
9314      -- (-0.4726,-0.4386)
9315      -- (-0.4861,-0.4126)
9316      --cycle
9317      ;
9318      \path[hex/terrain/town/house,pic actions]
9319      (-0.4383,-0.3880)
9320      -- (-0.4249,-0.4140)
9321      -- (-0.4726,-0.4386)
9322      -- (-0.4861,-0.4126)
9323      --cycle
9324      ;
9325      \path[hex/terrain/town/house,pic actions]
9326      (-0.6626,-0.4293)
9327      -- (-0.6510,-0.4562)
9328      -- (-0.7003,-0.4775)
9329      -- (-0.7119,-0.4506)
9330      --cycle
9331      ;
9332      \path[hex/terrain/town/house,pic actions]
9333      (-0.6626,-0.4293)
9334      -- (-0.6510,-0.4562)
9335      -- (-0.7003,-0.4775)
9336      -- (-0.7119,-0.4506)
9337      --cycle
9338      ;
9339      \path[hex/terrain/town/house,pic actions]
9340      (-0.6449,-0.4759)
9341      -- (-0.6280,-0.4998)
9342      -- (-0.6717,-0.5309)
9343      -- (-0.6887,-0.5069)

```



```

9344 --cycle
9345 ;
9346 \path[hex/terrain/town/house,pic actions]
9347 (-0.6449,-0.4759)
9348 -- (-0.6280,-0.4998)
9349 -- (-0.6717,-0.5309)
9350 -- (-0.6887,-0.5069)
9351 --cycle
9352 ;
9353 \path[hex/terrain/town/house,pic actions]
9354 (-0.5766,-0.5683)
9355 -- (-0.5643,-0.5948)
9356 -- (-0.6130,-0.6174)
9357 -- (-0.6254,-0.5909)
9358 --cycle
9359 ;
9360 \path[hex/terrain/town/house,pic actions]
9361 (-0.5766,-0.5683)
9362 -- (-0.5643,-0.5948)
9363 -- (-0.6130,-0.6174)
9364 -- (-0.6254,-0.5909)
9365 --cycle
9366 ;
9367 \path[hex/terrain/town/house,pic actions]
9368 (-0.4733,-0.5728)
9369 -- (-0.4590,-0.5983)
9370 -- (-0.5061,-0.6244)
9371 -- (-0.5202,-0.5988)
9372 --cycle
9373 ;
9374 \path[hex/terrain/town/house,pic actions]
9375 (-0.4733,-0.5728)
9376 -- (-0.4590,-0.5983)
9377 -- (-0.5061,-0.6244)
9378 -- (-0.5202,-0.5988)
9379 --cycle
9380 ;
9381 \path[hex/terrain/town/house,pic actions]
9382 (-0.4272,-0.6520)
9383 -- (-0.4128,-0.6774)
9384 -- (-0.4595,-0.7039)
9385 -- (-0.4740,-0.6785)
9386 --cycle
9387 ;
9388 \path[hex/terrain/town/house,pic actions]
9389 (-0.4272,-0.6520)
9390 -- (-0.4128,-0.6774)
9391 -- (-0.4595,-0.7039)
9392 -- (-0.4740,-0.6785)
9393 --cycle
9394 ;
9395 \path[hex/terrain/town/house,pic actions]
9396 (-0.5374,-0.6782)

```

```

9397 -- (-0.5236,-0.7040)
9398 -- (-0.5710,-0.7292)
9399 -- (-0.5848,-0.7034)
9400 --cycle
9401 ;
9402 \path[hex/terrain/town/house,pic actions]
9403 (-0.5374,-0.6782)
9404 -- (-0.5236,-0.7040)
9405 -- (-0.5710,-0.7292)
9406 -- (-0.5848,-0.7034)
9407 --cycle
9408 ;
9409 \path[hex/terrain/town/house,pic actions]
9410 (-0.5214,-0.7131)
9411 -- (-0.5038,-0.7365)
9412 -- (-0.5468,-0.7687)
9413 -- (-0.5644,-0.7453)
9414 --cycle
9415 ;
9416 \path[hex/terrain/town/house,pic actions]
9417 (-0.5214,-0.7131)
9418 -- (-0.5038,-0.7365)
9419 -- (-0.5468,-0.7687)
9420 -- (-0.5644,-0.7453)
9421 --cycle
9422 ;
9423 \path[hex/terrain/town/house,pic actions]
9424 ( 0.2847,-0.1917)
9425 -- ( 0.2954,-0.1644)
9426 -- ( 0.3454,-0.1841)
9427 -- ( 0.3347,-0.2114)
9428 --cycle
9429 ;
9430 \path[hex/terrain/town/house,pic actions]
9431 ( 0.2847,-0.1917)
9432 -- ( 0.2954,-0.1644)
9433 -- ( 0.3454,-0.1841)
9434 -- ( 0.3347,-0.2114)
9435 --cycle
9436 ;
9437 \path[hex/terrain/town/house,pic actions]
9438 ( 0.2692,-0.2397)
9439 -- ( 0.2775,-0.2116)
9440 -- ( 0.3291,-0.2268)
9441 -- ( 0.3208,-0.2548)
9442 --cycle
9443 ;
9444 \path[hex/terrain/town/house,pic actions]
9445 ( 0.2692,-0.2397)
9446 -- ( 0.2775,-0.2116)
9447 -- ( 0.3291,-0.2268)
9448 -- ( 0.3208,-0.2548)
9449 --cycle

```

```

9450 ;
9451 \path[hex/terrain/town/house,pic actions]
9452 ( 0.2587,-0.2944)
9453 -- ( 0.2585,-0.2651)
9454 -- ( 0.3123,-0.2648)
9455 -- ( 0.3125,-0.2941)
9456 --cycle
9457 ;
9458 \path[hex/terrain/town/house,pic actions]
9459 ( 0.2587,-0.2944)
9460 -- ( 0.2585,-0.2651)
9461 -- ( 0.3123,-0.2648)
9462 -- ( 0.3125,-0.2941)
9463 --cycle
9464 ;
9465 \path[hex/terrain/town/house,pic actions]
9466 ( 0.1269,-0.2581)
9467 -- ( 0.1359,-0.2303)
9468 -- ( 0.1871,-0.2468)
9469 -- ( 0.1780,-0.2746)
9470 --cycle
9471 ;
9472 \path[hex/terrain/town/house,pic actions]
9473 ( 0.1269,-0.2581)
9474 -- ( 0.1359,-0.2303)
9475 -- ( 0.1871,-0.2468)
9476 -- ( 0.1780,-0.2746)
9477 --cycle
9478 ;
9479 \path[hex/terrain/town/house,pic actions]
9480 ( 0.1127,-0.3153)
9481 -- ( 0.1232,-0.2880)
9482 -- ( 0.1733,-0.3074)
9483 -- ( 0.1626,-0.3348)
9484 --cycle
9485 ;
9486 \path[hex/terrain/town/house,pic actions]
9487 ( 0.1127,-0.3153)
9488 -- ( 0.1232,-0.2880)
9489 -- ( 0.1733,-0.3074)
9490 -- ( 0.1626,-0.3348)
9491 --cycle
9492 ;
9493 \path[hex/terrain/town/house,pic actions]
9494 ( 0.1928,-0.0951)
9495 -- ( 0.2055,-0.0687)
9496 -- ( 0.2539,-0.0920)
9497 -- ( 0.2412,-0.1184)
9498 --cycle
9499 ;
9500 \path[hex/terrain/town/house,pic actions]
9501 ( 0.1928,-0.0951)
9502 -- ( 0.2055,-0.0687)

```

```

9503 -- ( 0.2539,-0.0920)
9504 -- ( 0.2412,-0.1184)
9505 --cycle
9506 ;
9507 \path[hex/terrain/town/house,pic actions]
9508 ( 0.2202,-0.0375)
9509 -- ( 0.2335,-0.0113)
9510 -- ( 0.2814,-0.0356)
9511 -- ( 0.2682,-0.0617)
9512 --cycle
9513 ;
9514 \path[hex/terrain/town/house,pic actions]
9515 ( 0.2202,-0.0375)
9516 -- ( 0.2335,-0.0113)
9517 -- ( 0.2814,-0.0356)
9518 -- ( 0.2682,-0.0617)
9519 --cycle
9520 ;
9521 \path[hex/terrain/town/house,pic actions]
9522 ( 0.2582, 0.0509)
9523 -- ( 0.2736, 0.0259)
9524 -- ( 0.2278,-0.0022)
9525 -- ( 0.2125, 0.0227)
9526 --cycle
9527 ;
9528 \path[hex/terrain/town/house,pic actions]
9529 ( 0.2582, 0.0509)
9530 -- ( 0.2736, 0.0259)
9531 -- ( 0.2278,-0.0022)
9532 -- ( 0.2125, 0.0227)
9533 --cycle
9534 ;
9535 \path[hex/terrain/town/house,pic actions]
9536 ( 0.2111, 0.0849)
9537 -- ( 0.2307, 0.0632)
9538 -- ( 0.1908, 0.0273)
9539 -- ( 0.1712, 0.0490)
9540 --cycle
9541 ;
9542 \path[hex/terrain/town/house,pic actions]
9543 ( 0.2111, 0.0849)
9544 -- ( 0.2307, 0.0632)
9545 -- ( 0.1908, 0.0273)
9546 -- ( 0.1712, 0.0490)
9547 --cycle
9548 ;
9549 \path[hex/terrain/town/house,pic actions]
9550 ( 0.1776, 0.1187)
9551 -- ( 0.1982, 0.0978)
9552 -- ( 0.1599, 0.0601)
9553 -- ( 0.1394, 0.0810)
9554 --cycle
9555 ;

```

```

9556 \path[hex/terrain/town/house,pic actions]
9557 ( 0.1776, 0.1187)
9558 -- ( 0.1982, 0.0978)
9559 -- ( 0.1599, 0.0601)
9560 -- ( 0.1394, 0.0810)
9561 --cycle
9562 ;
9563 \path[hex/terrain/town/house,pic actions]
9564 ( 0.2760, 0.3987)
9565 -- ( 0.2946, 0.3760)
9566 -- ( 0.2531, 0.3420)
9567 -- ( 0.2345, 0.3646)
9568 --cycle
9569 ;
9570 \path[hex/terrain/town/house,pic actions]
9571 ( 0.2760, 0.3987)
9572 -- ( 0.2946, 0.3760)
9573 -- ( 0.2531, 0.3420)
9574 -- ( 0.2345, 0.3646)
9575 --cycle
9576 ;
9577 \path[hex/terrain/town/house,pic actions]
9578 ( 0.3226, 0.3543)
9579 -- ( 0.3420, 0.3323)
9580 -- ( 0.3018, 0.2967)
9581 -- ( 0.2824, 0.3185)
9582 --cycle
9583 ;
9584 \path[hex/terrain/town/house,pic actions]
9585 ( 0.3226, 0.3543)
9586 -- ( 0.3420, 0.3323)
9587 -- ( 0.3018, 0.2967)
9588 -- ( 0.2824, 0.3185)
9589 --cycle
9590 ;
9591 \path[hex/terrain/town/house,pic actions]
9592 (-0.2277, 0.3599)
9593 -- (-0.2171, 0.3872)
9594 -- (-0.1671, 0.3676)
9595 -- (-0.1777, 0.3404)
9596 --cycle
9597 ;
9598 \path[hex/terrain/town/house,pic actions]
9599 (-0.2277, 0.3599)
9600 -- (-0.2171, 0.3872)
9601 -- (-0.1671, 0.3676)
9602 -- (-0.1777, 0.3404)
9603 --cycle
9604 ;
9605 \path[hex/terrain/town/house,pic actions]
9606 (-0.1722, 0.5368)
9607 -- (-0.1616, 0.5642)
9608 -- (-0.1116, 0.5446)

```

```

9609    -- (-0.1223, 0.5174)
9610    --cycle
9611    ;
9612    \path[hex/terrain/town/house,pic actions]
9613    (-0.1722, 0.5368)
9614    -- (-0.1616, 0.5642)
9615    -- (-0.1116, 0.5446)
9616    -- (-0.1223, 0.5174)
9617    --cycle
9618    ;
9619    \path[hex/terrain/town/house,pic actions]
9620    (-0.2400, 0.3081)
9621    -- (-0.2307, 0.3359)
9622    -- (-0.1797, 0.3189)
9623    -- (-0.1890, 0.2912)
9624    --cycle
9625    ;
9626    \path[hex/terrain/town/house,pic actions]
9627    (-0.2400, 0.3081)
9628    -- (-0.2307, 0.3359)
9629    -- (-0.1797, 0.3189)
9630    -- (-0.1890, 0.2912)
9631    --cycle
9632    ;
9633    \path[hex/terrain/town/house,pic actions]
9634    (-0.2735, 0.1997)
9635    -- (-0.2631, 0.2270)
9636    -- (-0.2129, 0.2080)
9637    -- (-0.2233, 0.1807)
9638    --cycle
9639    ;
9640    \path[hex/terrain/town/house,pic actions]
9641    (-0.2735, 0.1997)
9642    -- (-0.2631, 0.2270)
9643    -- (-0.2129, 0.2080)
9644    -- (-0.2233, 0.1807)
9645    --cycle
9646    ;
9647    \path[hex/terrain/town/house,pic actions]
9648    (-0.3047, 0.1045)
9649    -- (-0.2975, 0.1329)
9650    -- (-0.2455, 0.1200)
9651    -- (-0.2525, 0.0915)
9652    --cycle
9653    ;
9654    \path[hex/terrain/town/house,pic actions]
9655    (-0.3047, 0.1045)
9656    -- (-0.2975, 0.1329)
9657    -- (-0.2455, 0.1200)
9658    -- (-0.2525, 0.0915)
9659    --cycle
9660    ;
9661    \path[hex/terrain/town/house,pic actions]

```

```

9662      (-0.1406, 0.3596)
9663      -- (-0.1136, 0.3482)
9664      -- (-0.1345, 0.2988)
9665      -- (-0.1615, 0.3102)
9666      --cycle
9667      ;
9668      \path[hex/terrain/town/house,pic actions]
9669      (-0.1406, 0.3596)
9670      -- (-0.1136, 0.3482)
9671      -- (-0.1345, 0.2988)
9672      -- (-0.1615, 0.3102)
9673      --cycle
9674      ;
9675      \path[hex/terrain/town/house,pic actions]
9676      (-0.0597, 0.5878)
9677      -- (-0.0327, 0.5763)
9678      -- (-0.0536, 0.5269)
9679      -- (-0.0806, 0.5383)
9680      --cycle
9681      ;
9682      \path[hex/terrain/town/house,pic actions]
9683      (-0.0597, 0.5878)
9684      -- (-0.0327, 0.5763)
9685      -- (-0.0536, 0.5269)
9686      -- (-0.0806, 0.5383)
9687      --cycle
9688      ;
9689      \path[hex/terrain/town/house,pic actions]
9690      (-0.0206, 0.5864)
9691      -- ( 0.0064, 0.5749)
9692      -- (-0.0146, 0.5255)
9693      -- (-0.0416, 0.5369)
9694      --cycle
9695      ;
9696      \path[hex/terrain/town/house,pic actions]
9697      (-0.0206, 0.5864)
9698      -- ( 0.0064, 0.5749)
9699      -- (-0.0146, 0.5255)
9700      -- (-0.0416, 0.5369)
9701      --cycle
9702      ;
9703      \path[hex/terrain/town/house,pic actions]
9704      (-0.1653, 0.2738)
9705      -- (-0.1360, 0.2738)
9706      -- (-0.1360, 0.2200)
9707      -- (-0.1653, 0.2200)
9708      --cycle
9709      ;
9710      \path[hex/terrain/town/house,pic actions]
9711      (-0.1653, 0.2738)
9712      -- (-0.1360, 0.2738)
9713      -- (-0.1360, 0.2200)
9714      -- (-0.1653, 0.2200)

```

```

9715 --cycle
9716 ;
9717 \path[hex/terrain/town/house,pic actions]
9718 (-0.1782, 0.2207)
9719 -- (-0.1501, 0.2122)
9720 -- (-0.1657, 0.1608)
9721 -- (-0.1937, 0.1693)
9722 --cycle
9723 ;
9724 \path[hex/terrain/town/house,pic actions]
9725 (-0.1782, 0.2207)
9726 -- (-0.1501, 0.2122)
9727 -- (-0.1657, 0.1608)
9728 -- (-0.1937, 0.1693)
9729 --cycle
9730 ;
9731 \path[hex/terrain/town/house,pic actions]
9732 (-0.2343, 0.0622)
9733 -- (-0.2239, 0.0896)
9734 -- (-0.1737, 0.0706)
9735 -- (-0.1840, 0.0432)
9736 --cycle
9737 ;
9738 \path[hex/terrain/town/house,pic actions]
9739 (-0.2343, 0.0622)
9740 -- (-0.2239, 0.0896)
9741 -- (-0.1737, 0.0706)
9742 -- (-0.1840, 0.0432)
9743 --cycle
9744 ;
9745 \path[hex/terrain/town/house,pic actions]
9746 (-0.1289, 0.0933)
9747 -- (-0.1186, 0.1207)
9748 -- (-0.0683, 0.1017)
9749 -- (-0.0787, 0.0743)
9750 --cycle
9751 ;
9752 \path[hex/terrain/town/house,pic actions]
9753 (-0.1289, 0.0933)
9754 -- (-0.1186, 0.1207)
9755 -- (-0.0683, 0.1017)
9756 -- (-0.0787, 0.0743)
9757 --cycle
9758 ;
9759 \path[hex/terrain/town/house,pic actions]
9760 ( 0.2223, 0.7399)
9761 -- ( 0.2483, 0.7532)
9762 -- ( 0.2727, 0.7054)
9763 -- ( 0.2467, 0.6920)
9764 --cycle
9765 ;
9766 \path[hex/terrain/town/house,pic actions]
9767 ( 0.2223, 0.7399)

```



```

9768 -- ( 0.2483, 0.7532)
9769 -- ( 0.2727, 0.7054)
9770 -- ( 0.2467, 0.6920)
9771 --cycle
9772 ;
9773 \path[hex/terrain/town/house,pic actions]
9774 ( 0.5440, 0.7476)
9775 -- ( 0.5576, 0.7217)
9776 -- ( 0.5102, 0.6965)
9777 -- ( 0.4965, 0.7224)
9778 --cycle
9779 ;
9780 \path[hex/terrain/town/house,pic actions]
9781 ( 0.5440, 0.7476)
9782 -- ( 0.5576, 0.7217)
9783 -- ( 0.5102, 0.6965)
9784 -- ( 0.4965, 0.7224)
9785 --cycle
9786 ;
9787 \path[hex/terrain/town/house,pic actions]
9788 ( 0.5919, 0.6377)
9789 -- ( 0.6068, 0.6125)
9790 -- ( 0.5604, 0.5853)
9791 -- ( 0.5456, 0.6106)
9792 --cycle
9793 ;
9794 \path[hex/terrain/town/house,pic actions]
9795 ( 0.5919, 0.6377)
9796 -- ( 0.6068, 0.6125)
9797 -- ( 0.5604, 0.5853)
9798 -- ( 0.5456, 0.6106)
9799 --cycle
9800 ;
9801 \path[hex/terrain/town/house,pic actions]
9802 ( 0.6224, 0.5979)
9803 -- ( 0.6382, 0.5732)
9804 -- ( 0.5930, 0.5443)
9805 -- ( 0.5772, 0.5690)
9806 --cycle
9807 ;
9808 \path[hex/terrain/town/house,pic actions]
9809 ( 0.6224, 0.5979)
9810 -- ( 0.6382, 0.5732)
9811 -- ( 0.5930, 0.5443)
9812 -- ( 0.5772, 0.5690)
9813 --cycle
9814 ;
9815 \path[hex/terrain/town/house,pic actions]
9816 ( 0.4104, 0.6743)
9817 -- ( 0.4255, 0.6491)
9818 -- ( 0.3795, 0.6215)
9819 -- ( 0.3644, 0.6466)
9820 --cycle

```

```

9821 ;
9822 \path[hex/terrain/town/house,pic actions]
9823 ( 0.4104, 0.6743)
9824 -- ( 0.4255, 0.6491)
9825 -- ( 0.3795, 0.6215)
9826 -- ( 0.3644, 0.6466)
9827 --cycle
9828 ;
9829 \path[hex/terrain/town/house,pic actions]
9830 ( 0.4437, 0.6203)
9831 -- ( 0.4592, 0.5954)
9832 -- ( 0.4136, 0.5671)
9833 -- ( 0.3981, 0.5918)
9834 --cycle
9835 ;
9836 \path[hex/terrain/town/house,pic actions]
9837 ( 0.4437, 0.6203)
9838 -- ( 0.4592, 0.5954)
9839 -- ( 0.4136, 0.5671)
9840 -- ( 0.3981, 0.5918)
9841 --cycle
9842 ;
9843 \path[hex/terrain/town/house,pic actions]
9844 ( 0.5275, 0.4892)
9845 -- ( 0.5449, 0.4656)
9846 -- ( 0.5018, 0.4337)
9847 -- ( 0.4844, 0.4571)
9848 --cycle
9849 ;
9850 \path[hex/terrain/town/house,pic actions]
9851 ( 0.5275, 0.4892)
9852 -- ( 0.5449, 0.4656)
9853 -- ( 0.5018, 0.4337)
9854 -- ( 0.4844, 0.4571)
9855 --cycle
9856 ;
9857 \path[hex/terrain/town/house,pic actions]
9858 ( 0.2900, 0.6234)
9859 -- ( 0.3087, 0.6008)
9860 -- ( 0.2671, 0.5666)
9861 -- ( 0.2485, 0.5892)
9862 --cycle
9863 ;
9864 \path[hex/terrain/town/house,pic actions]
9865 ( 0.2900, 0.6234)
9866 -- ( 0.3087, 0.6008)
9867 -- ( 0.2671, 0.5666)
9868 -- ( 0.2485, 0.5892)
9869 --cycle
9870 ;
9871 \path[hex/terrain/town/house,pic actions]
9872 ( 0.3295, 0.5855)
9873 -- ( 0.3477, 0.5626)

```

```

9874      -- ( 0.3058, 0.5291)
9875      -- ( 0.2875, 0.5519)
9876      --cycle
9877      ;
9878      \path[hex/terrain/town/house,pic actions]
9879      ( 0.3295, 0.5855)
9880      -- ( 0.3477, 0.5626)
9881      -- ( 0.3058, 0.5291)
9882      -- ( 0.2875, 0.5519)
9883      --cycle
9884      ;
9885      \path[hex/terrain/town/house,pic actions]
9886      ( 0.3915, 0.5035)
9887      -- ( 0.4098, 0.4807)
9888      -- ( 0.3680, 0.4471)
9889      -- ( 0.3497, 0.4699)
9890      --cycle
9891      ;
9892      \path[hex/terrain/town/house,pic actions]
9893      ( 0.3915, 0.5035)
9894      -- ( 0.4098, 0.4807)
9895      -- ( 0.3680, 0.4471)
9896      -- ( 0.3497, 0.4699)
9897      --cycle
9898      ;
9899      \path[hex/terrain/town/house,pic actions]
9900      ( 0.4274, 0.4691)
9901      -- ( 0.4472, 0.4474)
9902      -- ( 0.4075, 0.4112)
9903      -- ( 0.3878, 0.4327)
9904      --cycle
9905      ;
9906      \path[hex/terrain/town/house,pic actions]
9907      ( 0.4274, 0.4691)
9908      -- ( 0.4472, 0.4474)
9909      -- ( 0.4075, 0.4112)
9910      -- ( 0.3878, 0.4327)
9911      --cycle
9912      ;
9913      \path[hex/terrain/town/house,pic actions]
9914      ( 0.0465, 0.7243)
9915      -- ( 0.0751, 0.7305)
9916      -- ( 0.0864, 0.6779)
9917      -- ( 0.0578, 0.6717)
9918      --cycle
9919      ;
9920      \path[hex/terrain/town/house,pic actions]
9921      ( 0.0465, 0.7243)
9922      -- ( 0.0751, 0.7305)
9923      -- ( 0.0864, 0.6779)
9924      -- ( 0.0578, 0.6717)
9925      --cycle
9926      ;

```

```

9927 \path[hex/terrain/town/house,pic actions]
9928 (-0.0312, 0.7116)
9929 -- (-0.0338, 0.7407)
9930 -- ( 0.0197, 0.7456)
9931 -- ( 0.0223, 0.7164)
9932 --cycle
9933 ;
9934 \path[hex/terrain/town/house,pic actions]
9935 (-0.0312, 0.7116)
9936 -- (-0.0338, 0.7407)
9937 -- ( 0.0197, 0.7456)
9938 -- ( 0.0223, 0.7164)
9939 --cycle
9940 ;
9941 \path[hex/terrain/town/house,pic actions]
9942 (-0.1044, 0.7143)
9943 -- (-0.1084, 0.7434)
9944 -- (-0.0552, 0.7507)
9945 -- (-0.0512, 0.7216)
9946 --cycle
9947 ;
9948 \path[hex/terrain/town/house,pic actions]
9949 (-0.1044, 0.7143)
9950 -- (-0.1084, 0.7434)
9951 -- (-0.0552, 0.7507)
9952 -- (-0.0512, 0.7216)
9953 --cycle
9954 ;
9955 \path[hex/terrain/town/house,pic actions]
9956 (-0.1250, 0.6753)
9957 -- (-0.1169, 0.7034)
9958 -- (-0.0653, 0.6887)
9959 -- (-0.0733, 0.6605)
9960 --cycle
9961 ;
9962 \path[hex/terrain/town/house,pic actions]
9963 (-0.1250, 0.6753)
9964 -- (-0.1169, 0.7034)
9965 -- (-0.0653, 0.6887)
9966 -- (-0.0733, 0.6605)
9967 --cycle
9968 ;
9969 \path[hex/terrain/town/house,pic actions]
9970 (-0.2293, 0.7263)
9971 -- (-0.2016, 0.7170)
9972 -- (-0.2185, 0.6660)
9973 -- (-0.2463, 0.6753)
9974 --cycle
9975 ;
9976 \path[hex/terrain/town/house,pic actions]
9977 (-0.2293, 0.7263)
9978 -- (-0.2016, 0.7170)
9979 -- (-0.2185, 0.6660)

```

```

9980 -- (-0.2463, 0.6753)
9981 --cycle
9982 ;
9983 \path[hex/terrain/town/house,pic actions]
9984 (-0.4164, 0.8019)
9985 -- (-0.3886, 0.7926)
9986 -- (-0.4056, 0.7417)
9987 -- (-0.4335, 0.7510)
9988 --cycle
9989 ;
9990 \path[hex/terrain/town/house,pic actions]
9991 (-0.4164, 0.8019)
9992 -- (-0.3886, 0.7926)
9993 -- (-0.4056, 0.7417)
9994 -- (-0.4335, 0.7510)
9995 --cycle
9996 ;
9997 \path[hex/terrain/town/house,pic actions]
9998 (-0.3769, 0.7827)
9999 -- (-0.3486, 0.7746)
10000 -- (-0.3636, 0.7230)
10001 -- (-0.3918, 0.7311)
10002 --cycle
10003 ;
10004 \path[hex/terrain/town/house,pic actions]
10005 (-0.3769, 0.7827)
10006 -- (-0.3486, 0.7746)
10007 -- (-0.3636, 0.7230)
10008 -- (-0.3918, 0.7311)
10009 --cycle
10010 ;
10011 \path[hex/terrain/town/house,pic actions]
10012 (-0.2690, 0.8085)
10013 -- (-0.2696, 0.8379)
10014 -- (-0.2159, 0.8389)
10015 -- (-0.2153, 0.8097)
10016 --cycle
10017 ;
10018 \path[hex/terrain/town/house,pic actions]
10019 (-0.2690, 0.8085)
10020 -- (-0.2696, 0.8379)
10021 -- (-0.2159, 0.8389)
10022 -- (-0.2153, 0.8097)
10023 --cycle
10024 ;
10025 \path[hex/terrain/town/house,pic actions]
10026 (-0.0864, 0.8532)
10027 -- (-0.0767, 0.8256)
10028 -- (-0.1273, 0.8076)
10029 -- (-0.1371, 0.8352)
10030 --cycle
10031 ;
10032 \path[hex/terrain/town/house,pic actions]

```

```

10033      (-0.0864, 0.8532)
10034      -- (-0.0767, 0.8256)
10035      -- (-0.1273, 0.8076)
10036      -- (-0.1371, 0.8352)
10037      --cycle
10038      ;
10039      \path[hex/terrain/town/house,pic actions]
10040      (-0.3699, 0.6041)
10041      -- (-0.3425, 0.5939)
10042      -- (-0.3609, 0.5436)
10043      -- (-0.3885, 0.5537)
10044      --cycle
10045      ;
10046      \path[hex/terrain/town/house,pic actions]
10047      (-0.3699, 0.6041)
10048      -- (-0.3425, 0.5939)
10049      -- (-0.3609, 0.5436)
10050      -- (-0.3885, 0.5537)
10051      --cycle
10052      ;
10053      \path[hex/terrain/town/house,pic actions]
10054      (-0.4770, 0.6412)
10055      -- (-0.4500, 0.6299)
10056      -- (-0.4707, 0.5804)
10057      -- (-0.4978, 0.5918)
10058      --cycle
10059      ;
10060      \path[hex/terrain/town/house,pic actions]
10061      (-0.4770, 0.6412)
10062      -- (-0.4500, 0.6299)
10063      -- (-0.4707, 0.5804)
10064      -- (-0.4978, 0.5918)
10065      --cycle
10066      ;
10067      \path[hex/terrain/town/house,pic actions]
10068      (-0.4348, 0.4860)
10069      -- (-0.4060, 0.4806)
10070      -- (-0.4159, 0.4278)
10071      -- (-0.4447, 0.4332)
10072      --cycle
10073      ;
10074      \path[hex/terrain/town/house,pic actions]
10075      (-0.4348, 0.4860)
10076      -- (-0.4060, 0.4806)
10077      -- (-0.4159, 0.4278)
10078      -- (-0.4447, 0.4332)
10079      --cycle
10080      ;
10081      \path[hex/terrain/town/house,pic actions]
10082      (-0.4771, 0.4952)
10083      -- (-0.4520, 0.4800)
10084      -- (-0.4799, 0.4341)
10085      -- (-0.5050, 0.4493)

```

```

10086  --cycle
10087  ;
10088  \path[hex/terrain/town/house,pic actions]
10089  (-0.4771, 0.4952)
10090  -- (-0.4520, 0.4800)
10091  -- (-0.4799, 0.4341)
10092  -- (-0.5050, 0.4493)
10093  --cycle
10094  ;
10095  \path[hex/terrain/town/house,pic actions]
10096  (-0.5175, 0.4232)
10097  -- (-0.4917, 0.4092)
10098  -- (-0.5176, 0.3620)
10099  -- (-0.5433, 0.3761)
10100  --cycle
10101  ;
10102  \path[hex/terrain/town/house,pic actions]
10103  (-0.5175, 0.4232)
10104  -- (-0.4917, 0.4092)
10105  -- (-0.5176, 0.3620)
10106  -- (-0.5433, 0.3761)
10107  --cycle
10108  ;
10109  \path[hex/terrain/town/house,pic actions]
10110  (-0.5739, 0.5614)
10111  -- (-0.5487, 0.5464)
10112  -- (-0.5762, 0.5003)
10113  -- (-0.6013, 0.5152)
10114  --cycle
10115  ;
10116  \path[hex/terrain/town/house,pic actions]
10117  (-0.5739, 0.5614)
10118  -- (-0.5487, 0.5464)
10119  -- (-0.5762, 0.5003)
10120  -- (-0.6013, 0.5152)
10121  --cycle
10122  ;
10123  \path[hex/terrain/town/house,pic actions]
10124  (-0.6244, 0.4780)
10125  -- (-0.5977, 0.4661)
10126  -- (-0.6195, 0.4170)
10127  -- (-0.6463, 0.4289)
10128  --cycle
10129  ;
10130  \path[hex/terrain/town/house,pic actions]
10131  (-0.6244, 0.4780)
10132  -- (-0.5977, 0.4661)
10133  -- (-0.6195, 0.4170)
10134  -- (-0.6463, 0.4289)
10135  --cycle
10136  ;
10137  \path[hex/terrain/town/house,pic actions]
10138  (-0.6236, 0.1401)

```

```

10139 -- (-0.6192, 0.1691)
10140 -- (-0.5661, 0.1611)
10141 -- (-0.5705, 0.1321)
10142 --cycle
10143 ;
10144 \path[hex/terrain/town/house,pic actions]
10145 (-0.6236, 0.1401)
10146 -- (-0.6192, 0.1691)
10147 -- (-0.5661, 0.1611)
10148 -- (-0.5705, 0.1321)
10149 --cycle
10150 ;
10151 \path[hex/terrain/town/house,pic actions]
10152 (-0.3872, 0.3590)
10153 -- (-0.3829, 0.3880)
10154 -- (-0.3297, 0.3800)
10155 -- (-0.3341, 0.3510)
10156 --cycle
10157 ;
10158 \path[hex/terrain/town/house,pic actions]
10159 (-0.3872, 0.3590)
10160 -- (-0.3829, 0.3880)
10161 -- (-0.3297, 0.3800)
10162 -- (-0.3341, 0.3510)
10163 --cycle
10164 ;
10165 \path[hex/terrain/town/house,pic actions]
10166 (-0.6525, 0.1021)
10167 -- (-0.6404, 0.1288)
10168 -- (-0.5915, 0.1066)
10169 -- (-0.6036, 0.0799)
10170 --cycle
10171 ;
10172 \path[hex/terrain/town/house,pic actions]
10173 (-0.6525, 0.1021)
10174 -- (-0.6404, 0.1288)
10175 -- (-0.5915, 0.1066)
10176 -- (-0.6036, 0.0799)
10177 --cycle
10178 ;
10179 \path[hex/terrain/town/house,pic actions]
10180 (-0.4323, 0.3237)
10181 -- (-0.4202, 0.3503)
10182 -- (-0.3713, 0.3280)
10183 -- (-0.3834, 0.3014)
10184 --cycle
10185 ;
10186 \path[hex/terrain/town/house,pic actions]
10187 (-0.4323, 0.3237)
10188 -- (-0.4202, 0.3503)
10189 -- (-0.3713, 0.3280)
10190 -- (-0.3834, 0.3014)
10191 --cycle

```



```

10192 ;
10193 \path[hex/terrain/town/house,pic actions]
10194 (-0.3470, 0.2846)
10195 -- (-0.3349, 0.3113)
10196 -- (-0.2859, 0.2891)
10197 -- (-0.2981, 0.2624)
10198 --cycle
10199 ;
10200 \path[hex/terrain/town/house,pic actions]
10201 (-0.3470, 0.2846)
10202 -- (-0.3349, 0.3113)
10203 -- (-0.2859, 0.2891)
10204 -- (-0.2981, 0.2624)
10205 --cycle
10206 ;
10207 \path[hex/terrain/town/house,pic actions]
10208 (-0.3053, 0.3741)
10209 -- (-0.2932, 0.4008)
10210 -- (-0.2443, 0.3786)
10211 -- (-0.2564, 0.3519)
10212 --cycle
10213 ;
10214 \path[hex/terrain/town/house,pic actions]
10215 (-0.3053, 0.3741)
10216 -- (-0.2932, 0.4008)
10217 -- (-0.2443, 0.3786)
10218 -- (-0.2564, 0.3519)
10219 --cycle
10220 ;
10221 \path[hex/terrain/town/house,pic actions]
10222 (-0.6751, 0.0465)
10223 -- (-0.6666, 0.0746)
10224 -- (-0.6152, 0.0590)
10225 -- (-0.6237, 0.0310)
10226 --cycle
10227 ;
10228 \path[hex/terrain/town/house,pic actions]
10229 (-0.6751, 0.0465)
10230 -- (-0.6666, 0.0746)
10231 -- (-0.6152, 0.0590)
10232 -- (-0.6237, 0.0310)
10233 --cycle
10234 ;
10235 \path[hex/terrain/town/house,pic actions]
10236 (-0.7316,-0.0595)
10237 -- (-0.7215,-0.0320)
10238 -- (-0.6711,-0.0505)
10239 -- (-0.6812,-0.0780)
10240 --cycle
10241 ;
10242 \path[hex/terrain/town/house,pic actions]
10243 (-0.7316,-0.0595)
10244 -- (-0.7215,-0.0320)

```

```

10245 -- (-0.6711,-0.0505)
10246 -- (-0.6812,-0.0780)
10247 --cycle
10248 ;
10249 \path[hex/terrain/town/house,pic actions]
10250 (-0.7748,-0.1355)
10251 -- (-0.7629,-0.1088)
10252 -- (-0.7138,-0.1305)
10253 -- (-0.7257,-0.1573)
10254 --cycle
10255 ;
10256 \path[hex/terrain/town/house,pic actions]
10257 (-0.7748,-0.1355)
10258 -- (-0.7629,-0.1088)
10259 -- (-0.7138,-0.1305)
10260 -- (-0.7257,-0.1573)
10261 --cycle
10262 ;
10263 \path[hex/terrain/town/house,pic actions]
10264 (-0.6698,-0.1385)
10265 -- (-0.6512,-0.1159)
10266 -- (-0.6098,-0.1501)
10267 -- (-0.6284,-0.1727)
10268 --cycle
10269 ;
10270 \path[hex/terrain/town/house,pic actions]
10271 (-0.6698,-0.1385)
10272 -- (-0.6512,-0.1159)
10273 -- (-0.6098,-0.1501)
10274 -- (-0.6284,-0.1727)
10275 --cycle
10276 ;
10277 \path[hex/terrain/town/house,pic actions]
10278 (-0.3325,-0.1175)
10279 -- (-0.3067,-0.1313)
10280 -- (-0.3320,-0.1787)
10281 -- (-0.3579,-0.1649)
10282 --cycle
10283 ;
10284 \path[hex/terrain/town/house,pic actions]
10285 (-0.3325,-0.1175)
10286 -- (-0.3067,-0.1313)
10287 -- (-0.3320,-0.1787)
10288 -- (-0.3579,-0.1649)
10289 --cycle
10290 ;
10291 \path[hex/terrain/town/house,pic actions]
10292 (-0.4097,-0.0630)
10293 -- (-0.3827,-0.0741)
10294 -- (-0.4031,-0.1238)
10295 -- (-0.4302,-0.1127)
10296 --cycle
10297 ;

```

```

10298 \path[hex/terrain/town/house,pic actions]
10299 (-0.4097,-0.0630)
10300 -- (-0.3827,-0.0741)
10301 -- (-0.4031,-0.1238)
10302 -- (-0.4302,-0.1127)
10303 --cycle
10304 ;
10305 \path[hex/terrain/town/house,pic actions]
10306 (-0.3028, 0.0016)
10307 -- (-0.2734, 0.0016)
10308 -- (-0.2734,-0.0522)
10309 -- (-0.3028,-0.0522)
10310 --cycle
10311 ;
10312 \path[hex/terrain/town/house,pic actions]
10313 (-0.3028, 0.0016)
10314 -- (-0.2734, 0.0016)
10315 -- (-0.2734,-0.0522)
10316 -- (-0.3028,-0.0522)
10317 --cycle
10318 ;
10319 \path[hex/terrain/town/house,pic actions]
10320 (-0.2492,-0.0037)
10321 -- (-0.2198,-0.0037)
10322 -- (-0.2198,-0.0574)
10323 -- (-0.2492,-0.0574)
10324 --cycle
10325 ;
10326 \path[hex/terrain/town/house,pic actions]
10327 (-0.2492,-0.0037)
10328 -- (-0.2198,-0.0037)
10329 -- (-0.2198,-0.0574)
10330 -- (-0.2492,-0.0574)
10331 --cycle
10332 ;
10333 \path[hex/terrain/town/house,pic actions]
10334 (-0.4151, 0.0294)
10335 -- (-0.3858, 0.0294)
10336 -- (-0.3858,-0.0243)
10337 -- (-0.4151,-0.0243)
10338 --cycle
10339 ;
10340 \path[hex/terrain/town/house,pic actions]
10341 (-0.4151, 0.0294)
10342 -- (-0.3858, 0.0294)
10343 -- (-0.3858,-0.0243)
10344 -- (-0.4151,-0.0243)
10345 --cycle
10346 ;
10347 \path[hex/terrain/town/house,pic actions]
10348 (-0.4687, 0.0340)
10349 -- (-0.4394, 0.0340)
10350 -- (-0.4394,-0.0197)

```

```

10351 -- (-0.4687,-0.0197)
10352 --cycle
10353 ;
10354 \path[hex/terrain/town/house,pic actions]
10355 (-0.4687, 0.0340)
10356 -- (-0.4394, 0.0340)
10357 -- (-0.4394,-0.0197)
10358 -- (-0.4687,-0.0197)
10359 --cycle
10360 ;
10361 \path[hex/terrain/town/house,pic actions]
10362 (-0.5170, 0.0545)
10363 -- (-0.4876, 0.0545)
10364 -- (-0.4876, 0.0008)
10365 -- (-0.5170, 0.0008)
10366 --cycle
10367 ;
10368 \path[hex/terrain/town/house,pic actions]
10369 (-0.5170, 0.0545)
10370 -- (-0.4876, 0.0545)
10371 -- (-0.4876, 0.0008)
10372 -- (-0.5170, 0.0008)
10373 --cycle
10374 ;
10375 \path[hex/terrain/town/house,pic actions]
10376 (-0.4695, 0.1540)
10377 -- (-0.4413, 0.1461)
10378 -- (-0.4557, 0.0943)
10379 -- (-0.4839, 0.1022)
10380 --cycle
10381 ;
10382 \path[hex/terrain/town/house,pic actions]
10383 (-0.4695, 0.1540)
10384 -- (-0.4413, 0.1461)
10385 -- (-0.4557, 0.0943)
10386 -- (-0.4839, 0.1022)
10387 --cycle
10388 ;
10389 \path[hex/terrain/town/house,pic actions]
10390 (-0.4511, 0.2320)
10391 -- (-0.4227, 0.2241)
10392 -- (-0.4372, 0.1724)
10393 -- (-0.4654, 0.1803)
10394 --cycle
10395 ;
10396 \path[hex/terrain/town/house,pic actions]
10397 (-0.4511, 0.2320)
10398 -- (-0.4227, 0.2241)
10399 -- (-0.4372, 0.1724)
10400 -- (-0.4654, 0.1803)
10401 --cycle
10402 ;
10403 \path[hex/terrain/town/house,pic actions]

```

```

10404      (-0.4191, 0.1396)
10405      -- (-0.3904, 0.1335)
10406      -- (-0.4017, 0.0809)
10407      -- (-0.4304, 0.0871)
10408      --cycle
10409      ;
10410      \path[hex/terrain/town/house,pic actions]
10411      (-0.4191, 0.1396)
10412      -- (-0.3904, 0.1335)
10413      -- (-0.4017, 0.0809)
10414      -- (-0.4304, 0.0871)
10415      --cycle
10416      ;
10417      \path[hex/terrain/town/house,pic actions]
10418      (-0.0048,-0.2963)
10419      -- ( 0.0056,-0.2689)
10420      -- ( 0.0558,-0.2881)
10421      -- ( 0.0453,-0.3155)
10422      --cycle
10423      ;
10424      \path[hex/terrain/town/house,pic actions]
10425      (-0.0048,-0.2963)
10426      -- ( 0.0056,-0.2689)
10427      -- ( 0.0558,-0.2881)
10428      -- ( 0.0453,-0.3155)
10429      --cycle
10430      ;
10431      \path[hex/terrain/town/house,pic actions]
10432      ( 0.0804,-0.1001)
10433      -- ( 0.0908,-0.0728)
10434      -- ( 0.1410,-0.0919)
10435      -- ( 0.1305,-0.1192)
10436      --cycle
10437      ;
10438      \path[hex/terrain/town/house,pic actions]
10439      ( 0.0804,-0.1001)
10440      -- ( 0.0908,-0.0728)
10441      -- ( 0.1410,-0.0919)
10442      -- ( 0.1305,-0.1192)
10443      --cycle
10444      ;
10445      \path[hex/terrain/town/house,pic actions]
10446      (-0.1027,-0.2588)
10447      -- (-0.0979,-0.2299)
10448      -- (-0.0449,-0.2387)
10449      -- (-0.0498,-0.2676)
10450      --cycle
10451      ;
10452      \path[hex/terrain/town/house,pic actions]
10453      (-0.1027,-0.2588)
10454      -- (-0.0979,-0.2299)
10455      -- (-0.0449,-0.2387)
10456      -- (-0.0498,-0.2676)

```

```

10457 --cycle
10458 ;
10459 \path[hex/terrain/town/house,pic actions]
10460 (-0.1889,-0.2314)
10461 -- (-0.1776,-0.2043)
10462 -- (-0.1281,-0.2251)
10463 -- (-0.1394,-0.2521)
10464 --cycle
10465 ;
10466 \path[hex/terrain/town/house,pic actions]
10467 (-0.1889,-0.2314)
10468 -- (-0.1776,-0.2043)
10469 -- (-0.1281,-0.2251)
10470 -- (-0.1394,-0.2521)
10471 --cycle
10472 ;
10473 \path[hex/terrain/town/house,pic actions]
10474 (-0.1180,-0.3033)
10475 -- (-0.1077,-0.2759)
10476 -- (-0.0575,-0.2947)
10477 -- (-0.0677,-0.3221)
10478 --cycle
10479 ;
10480 \path[hex/terrain/town/house,pic actions]
10481 (-0.1180,-0.3033)
10482 -- (-0.1077,-0.2759)
10483 -- (-0.0575,-0.2947)
10484 -- (-0.0677,-0.3221)
10485 --cycle
10486 ;
10487 \path[hex/terrain/town/house,pic actions]
10488 (-0.2120,-0.2801)
10489 -- (-0.2010,-0.2529)
10490 -- (-0.1512,-0.2729)
10491 -- (-0.1622,-0.3002)
10492 --cycle
10493 ;
10494 \path[hex/terrain/town/house,pic actions]
10495 (-0.2120,-0.2801)
10496 -- (-0.2010,-0.2529)
10497 -- (-0.1512,-0.2729)
10498 -- (-0.1622,-0.3002)
10499 --cycle
10500 ;
10501 \path[hex/terrain/town/house,pic actions]
10502 (-0.2265,-0.3343)
10503 -- (-0.2161,-0.3069)
10504 -- (-0.1659,-0.3259)
10505 -- (-0.1762,-0.3533)
10506 --cycle
10507 ;
10508 \path[hex/terrain/town/house,pic actions]
10509 (-0.2265,-0.3343)

```

```

10510  -- (-0.2161,-0.3069)
10511  -- (-0.1659,-0.3259)
10512  -- (-0.1762,-0.3533)
10513  --cycle
10514  ;
10515  \path[hex/terrain/town/house,pic actions]
10516  (-0.0728,-0.3520)
10517  -- (-0.0436,-0.3488)
10518  -- (-0.0379,-0.4022)
10519  -- (-0.0670,-0.4054)
10520  --cycle
10521  ;
10522  \path[hex/terrain/town/house,pic actions]
10523  (-0.0728,-0.3520)
10524  -- (-0.0436,-0.3488)
10525  -- (-0.0379,-0.4022)
10526  -- (-0.0670,-0.4054)
10527  --cycle
10528  ;
10529  \path[hex/terrain/town/house,pic actions]
10530  ( 0.3598,-0.6299)
10531  -- ( 0.3752,-0.6051)
10532  -- ( 0.4209,-0.6334)
10533  -- ( 0.4054,-0.6583)
10534  --cycle
10535  ;
10536  \path[hex/terrain/town/house,pic actions]
10537  ( 0.3598,-0.6299)
10538  -- ( 0.3752,-0.6051)
10539  -- ( 0.4209,-0.6334)
10540  -- ( 0.4054,-0.6583)
10541  --cycle
10542  ;
10543  \path[hex/terrain/town/house,pic actions]
10544  ( 0.3284,-0.6582)
10545  -- ( 0.3482,-0.6365)
10546  -- ( 0.3879,-0.6727)
10547  -- ( 0.3681,-0.6944)
10548  --cycle
10549  ;
10550  \path[hex/terrain/town/house,pic actions]
10551  ( 0.3284,-0.6582)
10552  -- ( 0.3482,-0.6365)
10553  -- ( 0.3879,-0.6727)
10554  -- ( 0.3681,-0.6944)
10555  --cycle
10556  ;
10557  \path[hex/terrain/town/house,pic actions]
10558  (-0.8159,-0.3188)
10559  -- (-0.7892,-0.3067)
10560  -- (-0.7670,-0.3556)
10561  -- (-0.7937,-0.3677)
10562  --cycle

```

```

10563 ;
10564 \path[hex/terrain/town/house,pic actions]
10565 (-0.8159,-0.3188)
10566 -- (-0.7892,-0.3067)
10567 -- (-0.7670,-0.3556)
10568 -- (-0.7937,-0.3677)
10569 --cycle
10570 ;
10571 \path[hex/terrain/town/house,pic actions]
10572 (-0.8755, 0.1805)
10573 -- (-0.8623, 0.2066)
10574 -- (-0.8144, 0.1824)
10575 -- (-0.8276, 0.1562)
10576 --cycle
10577 ;
10578 \path[hex/terrain/town/house,pic actions]
10579 (-0.8755, 0.1805)
10580 -- (-0.8623, 0.2066)
10581 -- (-0.8144, 0.1824)
10582 -- (-0.8276, 0.1562)
10583 --cycle
10584 ;
10585 \path[hex/terrain/town/house,pic actions]
10586 (-0.9400, 0.0507)
10587 -- (-0.9275, 0.0771)
10588 -- (-0.8789, 0.0541)
10589 -- (-0.8916, 0.0276)
10590 --cycle
10591 ;
10592 \path[hex/terrain/town/house,pic actions]
10593 (-0.9400, 0.0507)
10594 -- (-0.9275, 0.0771)
10595 -- (-0.8789, 0.0541)
10596 -- (-0.8916, 0.0276)
10597 --cycle
10598 ;
10599 \path[hex/terrain/town/house,pic actions]
10600 (-0.9500,-0.0171)
10601 -- (-0.9467, 0.0120)
10602 -- (-0.8934, 0.0060)
10603 -- (-0.8966,-0.0232)
10604 --cycle
10605 ;
10606 \path[hex/terrain/town/house,pic actions]
10607 (-0.9500,-0.0171)
10608 -- (-0.9467, 0.0120)
10609 -- (-0.8934, 0.0060)
10610 -- (-0.8966,-0.0232)
10611 --cycle
10612 ;
10613 \path[hex/terrain/town/house,pic actions]
10614 (-0.0374, 0.6594)
10615 -- (-0.0376, 0.6887)

```



```

10616 -- ( 0.0161, 0.6890)
10617 -- ( 0.0162, 0.6598)
10618 --cycle
10619 ;
10620 \path[hex/terrain/town/house,pic actions]
10621 (-0.0374, 0.6594)
10622 -- (-0.0376, 0.6887)
10623 -- ( 0.0161, 0.6890)
10624 -- ( 0.0162, 0.6598)
10625 --cycle
10626 ;
10627 \path[hex/terrain/town/house,pic actions]
10628 ( 0.1600, 0.8267)
10629 -- ( 0.1793, 0.8046)
10630 -- ( 0.1388, 0.7692)
10631 -- ( 0.1195, 0.7913)
10632 --cycle
10633 ;
10634 \path[hex/terrain/town/house,pic actions]
10635 ( 0.1600, 0.8267)
10636 -- ( 0.1793, 0.8046)
10637 -- ( 0.1388, 0.7692)
10638 -- ( 0.1195, 0.7913)
10639 --cycle
10640 ;
10641 \path[hex/terrain/town/house,pic actions]
10642 ( 0.4284, 0.3107)
10643 -- ( 0.4572, 0.3163)
10644 -- ( 0.4672, 0.2634)
10645 -- ( 0.4384, 0.2580)
10646 --cycle
10647 ;
10648 \path[hex/terrain/town/house,pic actions]
10649 ( 0.4284, 0.3107)
10650 -- ( 0.4572, 0.3163)
10651 -- ( 0.4672, 0.2634)
10652 -- ( 0.4384, 0.2580)
10653 --cycle
10654 ;
10655 \path[hex/terrain/town/house,pic actions]
10656 ( 0.4721, 0.3149)
10657 -- ( 0.5003, 0.3230)
10658 -- ( 0.5151, 0.2714)
10659 -- ( 0.4870, 0.2633)
10660 --cycle
10661 ;
10662 \path[hex/terrain/town/house,pic actions]
10663 ( 0.4721, 0.3149)
10664 -- ( 0.5003, 0.3230)
10665 -- ( 0.5151, 0.2714)
10666 -- ( 0.4870, 0.2633)
10667 --cycle
10668 ;

```

```

10669 \path[hex/terrain/town/house,pic actions]
10670 ( 0.5761, 0.3388)
10671 -- ( 0.6049, 0.3443)
10672 -- ( 0.6150, 0.2916)
10673 -- ( 0.5862, 0.2860)
10674 --cycle
10675 ;
10676 \path[hex/terrain/town/house,pic actions]
10677 ( 0.5761, 0.3388)
10678 -- ( 0.6049, 0.3443)
10679 -- ( 0.6150, 0.2916)
10680 -- ( 0.5862, 0.2860)
10681 --cycle
10682 ;
10683 \path[hex/terrain/town/house,pic actions]
10684 ( 0.6283, 0.3369)
10685 -- ( 0.6567, 0.3296)
10686 -- ( 0.6432, 0.2775)
10687 -- ( 0.6148, 0.2849)
10688 --cycle
10689 ;
10690 \path[hex/terrain/town/house,pic actions]
10691 ( 0.6283, 0.3369)
10692 -- ( 0.6567, 0.3296)
10693 -- ( 0.6432, 0.2775)
10694 -- ( 0.6148, 0.2849)
10695 --cycle
10696 ;
10697 \path[hex/terrain/town/house,pic actions]
10698 ( 0.5378, 0.2581)
10699 -- ( 0.5670, 0.2616)
10700 -- ( 0.5734, 0.2083)
10701 -- ( 0.5443, 0.2047)
10702 --cycle
10703 ;
10704 \path[hex/terrain/town/house,pic actions]
10705 ( 0.5378, 0.2581)
10706 -- ( 0.5670, 0.2616)
10707 -- ( 0.5734, 0.2083)
10708 -- ( 0.5443, 0.2047)
10709 --cycle
10710 ;
10711 \path[hex/terrain/town/house,pic actions]
10712 ( 0.4853, 0.2500)
10713 -- ( 0.5140, 0.2555)
10714 -- ( 0.5241, 0.2028)
10715 -- ( 0.4953, 0.1973)
10716 --cycle
10717 ;
10718 \path[hex/terrain/town/house,pic actions]
10719 ( 0.4853, 0.2500)
10720 -- ( 0.5140, 0.2555)
10721 -- ( 0.5241, 0.2028)

```

```

10722 -- ( 0.4953, 0.1973)
10723 --cycle
10724 ;
10725 \path[hex/terrain/town/house,pic actions]
10726 ( 0.4028, 0.0895)
10727 -- ( 0.4321, 0.0895)
10728 -- ( 0.4321, 0.0358)
10729 -- ( 0.4028, 0.0358)
10730 --cycle
10731 ;
10732 \path[hex/terrain/town/house,pic actions]
10733 ( 0.4028, 0.0895)
10734 -- ( 0.4321, 0.0895)
10735 -- ( 0.4321, 0.0358)
10736 -- ( 0.4028, 0.0358)
10737 --cycle
10738 ;
10739 \path[hex/terrain/town/house,pic actions]
10740 ( 0.4612, 0.0957)
10741 -- ( 0.4899, 0.0898)
10742 -- ( 0.4793, 0.0371)
10743 -- ( 0.4506, 0.0430)
10744 --cycle
10745 ;
10746 \path[hex/terrain/town/house,pic actions]
10747 ( 0.4612, 0.0957)
10748 -- ( 0.4899, 0.0898)
10749 -- ( 0.4793, 0.0371)
10750 -- ( 0.4506, 0.0430)
10751 --cycle
10752 ;
10753 \path[hex/terrain/town/house,pic actions]
10754 ( 0.5422,-0.0041)
10755 -- ( 0.5437,-0.0333)
10756 -- ( 0.4900,-0.0361)
10757 -- ( 0.4885,-0.0068)
10758 --cycle
10759 ;
10760 \path[hex/terrain/town/house,pic actions]
10761 ( 0.5422,-0.0041)
10762 -- ( 0.5437,-0.0333)
10763 -- ( 0.4900,-0.0361)
10764 -- ( 0.4885,-0.0068)
10765 --cycle
10766 ;
10767 \path[hex/terrain/town/house,pic actions]
10768 ( 0.6654,-0.0050)
10769 -- ( 0.6664,-0.0343)
10770 -- ( 0.6128,-0.0361)
10771 -- ( 0.6117,-0.0068)
10772 --cycle
10773 ;
10774 \path[hex/terrain/town/house,pic actions]

```

```

10775 ( 0.6654,-0.0050)
10776 -- ( 0.6664,-0.0343)
10777 -- ( 0.6128,-0.0361)
10778 -- ( 0.6117,-0.0068)
10779 --cycle
10780 ;
10781 \path[hex/terrain/town/house,pic actions]
10782 ( 0.7573, 0.2817)
10783 -- ( 0.7646, 0.2533)
10784 -- ( 0.7124, 0.2402)
10785 -- ( 0.7053, 0.2686)
10786 --cycle
10787 ;
10788 \path[hex/terrain/town/house,pic actions]
10789 ( 0.7573, 0.2817)
10790 -- ( 0.7646, 0.2533)
10791 -- ( 0.7124, 0.2402)
10792 -- ( 0.7053, 0.2686)
10793 --cycle
10794 ;
10795 \path[hex/terrain/town/house,pic actions]
10796 ( 0.7393, 0.3502)
10797 -- ( 0.7456, 0.3216)
10798 -- ( 0.6931, 0.3101)
10799 -- ( 0.6868, 0.3387)
10800 --cycle
10801 ;
10802 \path[hex/terrain/town/house,pic actions]
10803 ( 0.7393, 0.3502)
10804 -- ( 0.7456, 0.3216)
10805 -- ( 0.6931, 0.3101)
10806 -- ( 0.6868, 0.3387)
10807 --cycle
10808 ;
10809 \path[hex/terrain/town/house,pic actions]
10810 ( 0.8114, 0.0963)
10811 -- ( 0.8188, 0.0679)
10812 -- ( 0.7668, 0.0543)
10813 -- ( 0.7594, 0.0826)
10814 --cycle
10815 ;
10816 \path[hex/terrain/town/house,pic actions]
10817 ( 0.8114, 0.0963)
10818 -- ( 0.8188, 0.0679)
10819 -- ( 0.7668, 0.0543)
10820 -- ( 0.7594, 0.0826)
10821 --cycle
10822 ;
10823 \path[hex/terrain/town/house,pic actions]
10824 ( 0.8247,-0.0115)
10825 -- ( 0.8312,-0.0401)
10826 -- ( 0.7788,-0.0521)
10827 -- ( 0.7723,-0.0235)

```

```

10828  --cycle
10829  ;
10830  \path[hex/terrain/town/house,pic actions]
10831  ( 0.8247,-0.0115)
10832  -- ( 0.8312,-0.0401)
10833  -- ( 0.7788,-0.0521)
10834  -- ( 0.7723,-0.0235)
10835  --cycle
10836  ;
10837  \path[hex/terrain/town/house,pic actions]
10838  ( 0.9279, 0.0392)
10839  -- ( 0.9358, 0.0110)
10840  -- ( 0.8842,-0.0036)
10841  -- ( 0.8762, 0.0245)
10842  --cycle
10843  ;
10844  \path[hex/terrain/town/house,pic actions]
10845  ( 0.9279, 0.0392)
10846  -- ( 0.9358, 0.0110)
10847  -- ( 0.8842,-0.0036)
10848  -- ( 0.8762, 0.0245)
10849  --cycle
10850  ;
10851  \path[hex/terrain/town/house,pic actions]
10852  ( 0.9473,-0.0199)
10853  -- ( 0.9500,-0.0490)
10854  -- ( 0.8965,-0.0540)
10855  -- ( 0.8939,-0.0248)
10856  --cycle
10857  ;
10858  \path[hex/terrain/town/house,pic actions]
10859  ( 0.9473,-0.0199)
10860  -- ( 0.9500,-0.0490)
10861  -- ( 0.8965,-0.0540)
10862  -- ( 0.8939,-0.0248)
10863  --cycle
10864  ;
10865  \path[hex/terrain/town/house,pic actions]
10866  ( 0.8832, 0.1513)
10867  -- ( 0.8949, 0.1245)
10868  -- ( 0.8456, 0.1031)
10869  -- ( 0.8339, 0.1300)
10870  --cycle
10871  ;
10872  \path[hex/terrain/town/house,pic actions]
10873  ( 0.8832, 0.1513)
10874  -- ( 0.8949, 0.1245)
10875  -- ( 0.8456, 0.1031)
10876  -- ( 0.8339, 0.1300)
10877  --cycle
10878  ;
10879  \path[hex/terrain/town/house,pic actions]
10880  ( 0.8604, 0.2135)

```

```

10881 -- ( 0.8734, 0.1872)
10882 -- ( 0.8254, 0.1634)
10883 -- ( 0.8123, 0.1896)
10884 --cycle
10885 ;
10886 \path[hex/terrain/town/house,pic actions]
10887 ( 0.8604, 0.2135)
10888 -- ( 0.8734, 0.1872)
10889 -- ( 0.8254, 0.1634)
10890 -- ( 0.8123, 0.1896)
10891 --cycle
10892 ;
10893 \path[hex/terrain/town/house,pic actions]
10894 ( 0.7675, 0.2368)
10895 -- ( 0.7736, 0.2082)
10896 -- ( 0.7210, 0.1970)
10897 -- ( 0.7150, 0.2257)
10898 --cycle
10899 ;
10900 \path[hex/terrain/town/house,pic actions]
10901 ( 0.7675, 0.2368)
10902 -- ( 0.7736, 0.2082)
10903 -- ( 0.7210, 0.1970)
10904 -- ( 0.7150, 0.2257)
10905 --cycle
10906 ;
10907 \path[hex/terrain/town/house,pic actions]
10908 ( 0.7696,-0.1796)
10909 -- ( 0.7978,-0.1875)
10910 -- ( 0.7835,-0.2392)
10911 -- ( 0.7552,-0.2314)
10912 --cycle
10913 ;
10914 \path[hex/terrain/town/house,pic actions]
10915 ( 0.7696,-0.1796)
10916 -- ( 0.7978,-0.1875)
10917 -- ( 0.7835,-0.2392)
10918 -- ( 0.7552,-0.2314)
10919 --cycle
10920 ;
10921 \path[hex/terrain/town/house,pic actions]
10922 ( 0.7546,-0.0830)
10923 -- ( 0.7838,-0.0830)
10924 -- ( 0.7838,-0.1367)
10925 -- ( 0.7546,-0.1367)
10926 --cycle
10927 ;
10928 \path[hex/terrain/town/house,pic actions]
10929 ( 0.7546,-0.0830)
10930 -- ( 0.7838,-0.0830)
10931 -- ( 0.7838,-0.1367)
10932 -- ( 0.7546,-0.1367)
10933 --cycle

```

```

10934 ;
10935 \path[hex/terrain/town/house,pic actions]
10936 ( 0.7114,-0.1735)
10937 -- ( 0.7402,-0.1784)
10938 -- ( 0.7313,-0.2313)
10939 -- ( 0.7024,-0.2265)
10940 --cycle
10941 ;
10942 \path[hex/terrain/town/house,pic actions]
10943 ( 0.7114,-0.1735)
10944 -- ( 0.7402,-0.1784)
10945 -- ( 0.7313,-0.2313)
10946 -- ( 0.7024,-0.2265)
10947 --cycle
10948 ;
10949 \path[hex/terrain/town/house,pic actions]
10950 ( 0.6398,-0.0896)
10951 -- ( 0.6691,-0.0896)
10952 -- ( 0.6691,-0.1433)
10953 -- ( 0.6398,-0.1433)
10954 --cycle
10955 ;
10956 \path[hex/terrain/town/house,pic actions]
10957 ( 0.6398,-0.0896)
10958 -- ( 0.6691,-0.0896)
10959 -- ( 0.6691,-0.1433)
10960 -- ( 0.6398,-0.1433)
10961 --cycle
10962 ;
10963 \path[hex/terrain/town/house,pic actions]
10964 ( 0.5390,-0.1093)
10965 -- ( 0.5377,-0.0801)
10966 -- ( 0.5913,-0.0776)
10967 -- ( 0.5927,-0.1069)
10968 --cycle
10969 ;
10970 \path[hex/terrain/town/house,pic actions]
10971 ( 0.5390,-0.1093)
10972 -- ( 0.5377,-0.0801)
10973 -- ( 0.5913,-0.0776)
10974 -- ( 0.5927,-0.1069)
10975 --cycle
10976 ;
10977 \path[hex/terrain/town/house,pic actions]
10978 ( 0.5171,-0.2250)
10979 -- ( 0.5252,-0.1968)
10980 -- ( 0.5767,-0.2117)
10981 -- ( 0.5687,-0.2399)
10982 --cycle
10983 ;
10984 \path[hex/terrain/town/house,pic actions]
10985 ( 0.5171,-0.2250)
10986 -- ( 0.5252,-0.1968)

```

```

10987 -- ( 0.5767,-0.2117)
10988 -- ( 0.5687,-0.2399)
10989 --cycle
10990 ;
10991 \path[hex/terrain/town/house,pic actions]
10992 ( 0.5024,-0.2807)
10993 -- ( 0.5066,-0.2517)
10994 -- ( 0.5597,-0.2597)
10995 -- ( 0.5555,-0.2887)
10996 --cycle
10997 ;
10998 \path[hex/terrain/town/house,pic actions]
10999 ( 0.5024,-0.2807)
11000 -- ( 0.5066,-0.2517)
11001 -- ( 0.5597,-0.2597)
11002 -- ( 0.5555,-0.2887)
11003 --cycle
11004 ;
11005 \path[hex/terrain/town/house,pic actions]
11006 ( 0.6783,-0.2717)
11007 -- ( 0.7056,-0.2824)
11008 -- ( 0.6858,-0.3324)
11009 -- ( 0.6585,-0.3216)
11010 --cycle
11011 ;
11012 \path[hex/terrain/town/house,pic actions]
11013 ( 0.6783,-0.2717)
11014 -- ( 0.7056,-0.2824)
11015 -- ( 0.6858,-0.3324)
11016 -- ( 0.6585,-0.3216)
11017 --cycle
11018 ;
11019 \path[hex/terrain/town/house,pic actions]
11020 ( 0.4010,-0.3903)
11021 -- ( 0.4019,-0.3609)
11022 -- ( 0.4556,-0.3627)
11023 -- ( 0.4547,-0.3921)
11024 --cycle
11025 ;
11026 \path[hex/terrain/town/house,pic actions]
11027 ( 0.4010,-0.3903)
11028 -- ( 0.4019,-0.3609)
11029 -- ( 0.4556,-0.3627)
11030 -- ( 0.4547,-0.3921)
11031 --cycle
11032 ;
11033 \path[hex/terrain/town/house,pic actions]
11034 ( 0.6576,-0.1610)
11035 -- ( 0.6852,-0.1708)
11036 -- ( 0.6672,-0.2214)
11037 -- ( 0.6396,-0.2116)
11038 --cycle
11039 ;

```



```

11040 \path[hex/terrain/town/house,pic actions]
11041 ( 0.6576,-0.1610)
11042 -- ( 0.6852,-0.1708)
11043 -- ( 0.6672,-0.2214)
11044 -- ( 0.6396,-0.2116)
11045 --cycle
11046 ;
11047 \path[hex/terrain/town/house,pic actions]
11048 ( 0.4024,-0.7175)
11049 -- ( 0.4484,-0.7175)
11050 -- ( 0.4484,-0.7785)
11051 -- ( 0.4024,-0.7785)
11052 --cycle
11053 ;
11054 \path[hex/terrain/town/house,pic actions]
11055 ( 0.4024,-0.7175)
11056 -- ( 0.4484,-0.7175)
11057 -- ( 0.4484,-0.7785)
11058 -- ( 0.4024,-0.7785)
11059 --cycle
11060 ;
11061 \path[hex/terrain/town/house,pic actions]
11062 (-0.3999,-0.7917)
11063 -- (-0.3540,-0.7917)
11064 -- (-0.3540,-0.8527)
11065 -- (-0.3999,-0.8527)
11066 --cycle
11067 ;
11068 \path[hex/terrain/town/house,pic actions]
11069 (-0.3999,-0.7917)
11070 -- (-0.3540,-0.7917)
11071 -- (-0.3540,-0.8527)
11072 -- (-0.3999,-0.8527)
11073 --cycle
11074 ;
11075 \path[hex/terrain/town/house,pic actions]
11076 (-0.7770,-0.2886)
11077 -- (-0.7319,-0.2679)
11078 -- (-0.6985,-0.3406)
11079 -- (-0.7437,-0.3613)
11080 --cycle
11081 ;
11082 \path[hex/terrain/town/house,pic actions]
11083 (-0.7770,-0.2886)
11084 -- (-0.7319,-0.2679)
11085 -- (-0.6985,-0.3406)
11086 -- (-0.7437,-0.3613)
11087 --cycle
11088 ;
11089 \path[hex/terrain/town/house,pic actions]
11090 (-0.1783,-0.5367)
11091 -- (-0.1339,-0.5483)
11092 -- (-0.1492,-0.6074)

```

```

11093 -- (-0.1937,-0.5958)
11094 --cycle
11095 ;
11096 \path[hex/terrain/town/house,pic actions]
11097 (-0.1783,-0.5367)
11098 -- (-0.1339,-0.5483)
11099 -- (-0.1492,-0.6074)
11100 -- (-0.1937,-0.5958)
11101 --cycle
11102 ;
11103 \path[hex/terrain/town/house,pic actions]
11104 ( 0.3106,-0.7770)
11105 -- ( 0.3564,-0.7770)
11106 -- ( 0.3564,-0.8380)
11107 -- ( 0.3106,-0.8380)
11108 --cycle
11109 ;
11110 \path[hex/terrain/town/house,pic actions]
11111 ( 0.3106,-0.7770)
11112 -- ( 0.3564,-0.7770)
11113 -- ( 0.3564,-0.8380)
11114 -- ( 0.3106,-0.8380)
11115 --cycle
11116 ;
11117 \path[hex/terrain/town/house,pic actions]
11118 (-0.0626,-0.7954)
11119 -- (-0.0196,-0.8113)
11120 -- (-0.0406,-0.8686)
11121 -- (-0.0837,-0.8527)
11122 --cycle
11123 ;
11124 \path[hex/terrain/town/house,pic actions]
11125 (-0.0626,-0.7954)
11126 -- (-0.0196,-0.8113)
11127 -- (-0.0406,-0.8686)
11128 -- (-0.0837,-0.8527)
11129 --cycle
11130 ;
11131 \path[hex/terrain/town/house,pic actions]
11132 ( 0.0570,-0.7843)
11133 -- ( 0.1025,-0.7910)
11134 -- ( 0.0936,-0.8514)
11135 -- ( 0.0481,-0.8446)
11136 --cycle
11137 ;
11138 \path[hex/terrain/town/house,pic actions]
11139 ( 0.0570,-0.7843)
11140 -- ( 0.1025,-0.7910)
11141 -- ( 0.0936,-0.8514)
11142 -- ( 0.0481,-0.8446)
11143 --cycle
11144 ;
11145 \path[hex/terrain/town/house,pic actions]

```

```

11146 ( 0.0906,-0.6908)
11147 -- ( 0.1345,-0.7046)
11148 -- ( 0.1161,-0.7629)
11149 -- ( 0.0723,-0.7490)
11150 --cycle
11151 ;
11152 \path[hex/terrain/town/house,pic actions]
11153 ( 0.0906,-0.6908)
11154 -- ( 0.1345,-0.7046)
11155 -- ( 0.1161,-0.7629)
11156 -- ( 0.0723,-0.7490)
11157 --cycle
11158 ;
11159 \path[hex/terrain/town/house,pic actions]
11160 (-0.4731,-0.7998)
11161 -- (-0.4283,-0.7899)
11162 -- (-0.4151,-0.8496)
11163 -- (-0.4600,-0.8595)
11164 --cycle
11165 ;
11166 \path[hex/terrain/town/house,pic actions]
11167 (-0.4731,-0.7998)
11168 -- (-0.4283,-0.7899)
11169 -- (-0.4151,-0.8496)
11170 -- (-0.4600,-0.8595)
11171 --cycle
11172 ;
11173 \path[hex/terrain/town/house,pic actions]
11174 ( 0.4125,-0.0879)
11175 -- ( 0.4578,-0.0951)
11176 -- ( 0.4483,-0.1553)
11177 -- ( 0.4029,-0.1481)
11178 --cycle
11179 ;
11180 \path[hex/terrain/town/house,pic actions]
11181 ( 0.4125,-0.0879)
11182 -- ( 0.4578,-0.0951)
11183 -- ( 0.4483,-0.1553)
11184 -- ( 0.4029,-0.1481)
11185 --cycle
11186 ;
11187 \path[hex/terrain/town/house,pic actions]
11188 ( 0.2078, 0.8568)
11189 -- ( 0.2536, 0.8583)
11190 -- ( 0.2555, 0.7973)
11191 -- ( 0.2097, 0.7958)
11192 --cycle
11193 ;
11194 \path[hex/terrain/town/house,pic actions]
11195 ( 0.2078, 0.8568)
11196 -- ( 0.2536, 0.8583)
11197 -- ( 0.2555, 0.7973)
11198 -- ( 0.2097, 0.7958)

```

```

11199  --cycle
11200  ;
11201  \path[hex/terrain/town/house,pic actions]
11202  ( 0.5829,-0.2493)
11203  -- ( 0.6289,-0.2493)
11204  -- ( 0.6289,-0.3104)
11205  -- ( 0.5829,-0.3104)
11206  --cycle
11207  ;
11208  \path[hex/terrain/town/house,pic actions]
11209  ( 0.5829,-0.2493)
11210  -- ( 0.6289,-0.2493)
11211  -- ( 0.6289,-0.3104)
11212  -- ( 0.5829,-0.3104)
11213  --cycle
11214  ;
11215  \path[hex/terrain/town/house,pic actions]
11216  ( 0.2923,-0.1390)
11217  -- ( 0.3109,-0.0970)
11218  -- ( 0.3667,-0.1218)
11219  -- ( 0.3481,-0.1638)
11220  --cycle
11221  ;
11222  \path[hex/terrain/town/house,pic actions]
11223  ( 0.2923,-0.1390)
11224  -- ( 0.3109,-0.0970)
11225  -- ( 0.3667,-0.1218)
11226  -- ( 0.3481,-0.1638)
11227  --cycle
11228  ;
11229  \path[hex/terrain/town/house,pic actions]
11230  ( 0.6866,-0.0789)
11231  -- ( 0.7324,-0.0789)
11232  -- ( 0.7324,-0.1400)
11233  -- ( 0.6866,-0.1400)
11234  --cycle
11235  ;
11236  \path[hex/terrain/town/house,pic actions]
11237  ( 0.6866,-0.0789)
11238  -- ( 0.7324,-0.0789)
11239  -- ( 0.7324,-0.1400)
11240  -- ( 0.6866,-0.1400)
11241  --cycle
11242  ;
11243  \path[hex/terrain/town/house,pic actions]
11244  ( 0.8206,-0.0922)
11245  -- ( 0.8649,-0.1044)
11246  -- ( 0.8487,-0.1632)
11247  -- ( 0.8045,-0.1511)
11248  --cycle
11249  ;
11250  \path[hex/terrain/town/house,pic actions]
11251  ( 0.8206,-0.0922)

```

```

11252  -- ( 0.8649,-0.1044)
11253  -- ( 0.8487,-0.1632)
11254  -- ( 0.8045,-0.1511)
11255  --cycle
11256  ;
11257  \path[hex/terrain/town/house,pic actions]
11258  (-0.3075, 0.5809)
11259  -- (-0.2648, 0.5640)
11260  -- (-0.2872, 0.5072)
11261  -- (-0.3299, 0.5241)
11262  --cycle
11263  ;
11264  \path[hex/terrain/town/house,pic actions]
11265  (-0.3075, 0.5809)
11266  -- (-0.2648, 0.5640)
11267  -- (-0.2872, 0.5072)
11268  -- (-0.3299, 0.5241)
11269  --cycle
11270  ;
11271  \path[hex/terrain/town/house,pic actions]
11272  (-0.7746, 0.3900)
11273  -- (-0.7312, 0.3750)
11274  -- (-0.7511, 0.3173)
11275  -- (-0.7945, 0.3322)
11276  --cycle
11277  ;
11278  \path[hex/terrain/town/house,pic actions]
11279  (-0.7746, 0.3900)
11280  -- (-0.7312, 0.3750)
11281  -- (-0.7511, 0.3173)
11282  -- (-0.7945, 0.3322)
11283  --cycle
11284  ;
11285  \path[hex/terrain/town/house,pic actions]
11286  (-0.8224, 0.3024)
11287  -- (-0.7807, 0.2831)
11288  -- (-0.8064, 0.2277)
11289  -- (-0.8481, 0.2470)
11290  --cycle
11291  ;
11292  \path[hex/terrain/town/house,pic actions]
11293  (-0.8224, 0.3024)
11294  -- (-0.7807, 0.2831)
11295  -- (-0.8064, 0.2277)
11296  -- (-0.8481, 0.2470)
11297  --cycle
11298  ;
11299  \path[hex/terrain/town/house,pic actions]
11300  (-0.7172, 0.2999)
11301  -- (-0.6959, 0.3406)
11302  -- (-0.6418, 0.3122)
11303  -- (-0.6632, 0.2715)
11304  --cycle

```

```

11305 ;
11306 \path[hex/terrain/town/house,pic actions]
11307 (-0.7172, 0.2999)
11308 -- (-0.6959, 0.3406)
11309 -- (-0.6418, 0.3122)
11310 -- (-0.6632, 0.2715)
11311 --cycle
11312 ;
11313 \path[hex/terrain/town/house,pic actions]
11314 (-0.7505, 0.2368)
11315 -- (-0.7273, 0.2764)
11316 -- (-0.6746, 0.2456)
11317 -- (-0.6979, 0.2060)
11318 --cycle
11319 ;
11320 \path[hex/terrain/town/house,pic actions]
11321 (-0.7505, 0.2368)
11322 -- (-0.7273, 0.2764)
11323 -- (-0.6746, 0.2456)
11324 -- (-0.6979, 0.2060)
11325 --cycle
11326 ;
11327 \path[hex/terrain/town/house,pic actions]
11328 (-0.7726, 0.1668)
11329 -- (-0.7521, 0.2080)
11330 -- (-0.6975, 0.1808)
11331 -- (-0.7180, 0.1396)
11332 --cycle
11333 ;
11334 \path[hex/terrain/town/house,pic actions]
11335 (-0.7726, 0.1668)
11336 -- (-0.7521, 0.2080)
11337 -- (-0.6975, 0.1808)
11338 -- (-0.7180, 0.1396)
11339 --cycle
11340 ;
11341 \path[hex/terrain/town/house,pic actions]
11342 (-0.8067, 0.1033)
11343 -- (-0.7877, 0.1452)
11344 -- (-0.7322, 0.1199)
11345 -- (-0.7512, 0.0781)
11346 --cycle
11347 ;
11348 \path[hex/terrain/town/house,pic actions]
11349 (-0.8067, 0.1033)
11350 -- (-0.7877, 0.1452)
11351 -- (-0.7322, 0.1199)
11352 -- (-0.7512, 0.0781)
11353 --cycle
11354 ;
11355 \path[hex/terrain/town/house,pic actions]
11356 (-0.8292, 0.0434)
11357 -- (-0.8106, 0.0854)

```

```

11358 -- (-0.7548, 0.0608)
11359 -- (-0.7733, 0.0188)
11360 --cycle
11361 ;
11362 \path[hex/terrain/town/house,pic actions]
11363 (-0.8292, 0.0434)
11364 -- (-0.8106, 0.0854)
11365 -- (-0.7548, 0.0608)
11366 -- (-0.7733, 0.0188)
11367 --cycle
11368 ;
11369 \path[hex/terrain/town/house,pic actions]
11370 (-0.8479,-0.0238)
11371 -- (-0.8336, 0.0199)
11372 -- (-0.7757, 0.0009)
11373 -- (-0.7899,-0.0427)
11374 --cycle
11375 ;
11376 \path[hex/terrain/town/house,pic actions]
11377 (-0.8479,-0.0238)
11378 -- (-0.8336, 0.0199)
11379 -- (-0.7757, 0.0009)
11380 -- (-0.7899,-0.0427)
11381 --cycle
11382 ;
11383 \path[hex/terrain/town/house,pic actions]
11384 (-0.9015,-0.0795)
11385 -- (-0.8746,-0.0423)
11386 -- (-0.8252,-0.0782)
11387 -- (-0.8521,-0.1153)
11388 --cycle
11389 ;
11390 \path[hex/terrain/town/house,pic actions]
11391 (-0.9015,-0.0795)
11392 -- (-0.8746,-0.0423)
11393 -- (-0.8252,-0.0782)
11394 -- (-0.8521,-0.1153)
11395 --cycle
11396 ;
11397 \path[hex/terrain/town/house,pic actions]
11398 (-0.5616,-0.6142)
11399 -- (-0.5431,-0.6563)
11400 -- (-0.5990,-0.6808)
11401 -- (-0.6175,-0.6387)
11402 --cycle
11403 ;
11404 \path[hex/terrain/town/house,pic actions]
11405 (-0.5616,-0.6142)
11406 -- (-0.5431,-0.6563)
11407 -- (-0.5990,-0.6808)
11408 -- (-0.6175,-0.6387)
11409 --cycle
11410 ;

```

```

11411 \path[hex/terrain/town/house,pic actions]
11412 (-0.0094,-0.6230)
11413 -- ( 0.0047,-0.5793)
11414 -- ( 0.0627,-0.5978)
11415 -- ( 0.0487,-0.6416)
11416 --cycle
11417 ;
11418 \path[hex/terrain/town/house,pic actions]
11419 (-0.0094,-0.6230)
11420 -- ( 0.0047,-0.5793)
11421 -- ( 0.0627,-0.5978)
11422 -- ( 0.0487,-0.6416)
11423 --cycle
11424 ;
11425 \path[hex/terrain/town/house,pic actions]
11426 ( 0.0303,-0.4683)
11427 -- ( 0.0443,-0.4246)
11428 -- ( 0.1024,-0.4432)
11429 -- ( 0.0884,-0.4869)
11430 --cycle
11431 ;
11432 \path[hex/terrain/town/house,pic actions]
11433 ( 0.0303,-0.4683)
11434 -- ( 0.0443,-0.4246)
11435 -- ( 0.1024,-0.4432)
11436 -- ( 0.0884,-0.4869)
11437 --cycle
11438 ;
11439 \path[hex/terrain/town/house,pic actions]
11440 (-0.2507,-0.3956)
11441 -- (-0.2367,-0.3518)
11442 -- (-0.1786,-0.3704)
11443 -- (-0.1926,-0.4142)
11444 --cycle
11445 ;
11446 \path[hex/terrain/town/house,pic actions]
11447 (-0.2507,-0.3956)
11448 -- (-0.2367,-0.3518)
11449 -- (-0.1786,-0.3704)
11450 -- (-0.1926,-0.4142)
11451 --cycle
11452 ;
11453 \path[hex/terrain/town/house,pic actions]
11454 (-0.3208,-0.3936)
11455 -- (-0.3069,-0.3498)
11456 -- (-0.2487,-0.3684)
11457 -- (-0.2627,-0.4122)
11458 --cycle
11459 ;
11460 \path[hex/terrain/town/house,pic actions]
11461 (-0.3208,-0.3936)
11462 -- (-0.3069,-0.3498)
11463 -- (-0.2487,-0.3684)

```



```

11464 -- (-0.2627,-0.4122)
11465 --cycle
11466 ;
11467 \path[hex/terrain/town/house,pic actions]
11468 ( 0.1634,-0.1430)
11469 -- ( 0.1790,-0.0997)
11470 -- ( 0.2365,-0.1205)
11471 -- ( 0.2209,-0.1637)
11472 --cycle
11473 ;
11474 \path[hex/terrain/town/house,pic actions]
11475 ( 0.1634,-0.1430)
11476 -- ( 0.1790,-0.0997)
11477 -- ( 0.2365,-0.1205)
11478 -- ( 0.2209,-0.1637)
11479 --cycle
11480 ;
11481 \path[hex/terrain/town/house,pic actions]
11482 ( 0.1520,-0.2030)
11483 -- ( 0.1715,-0.1614)
11484 -- ( 0.2268,-0.1873)
11485 -- ( 0.2072,-0.2289)
11486 --cycle
11487 ;
11488 \path[hex/terrain/town/house,pic actions]
11489 ( 0.1520,-0.2030)
11490 -- ( 0.1715,-0.1614)
11491 -- ( 0.2268,-0.1873)
11492 -- ( 0.2072,-0.2289)
11493 --cycle
11494 ;
11495 \path[hex/terrain/town/house,pic actions]
11496 ( 0.0852,-0.3696)
11497 -- ( 0.1047,-0.3280)
11498 -- ( 0.1600,-0.3540)
11499 -- ( 0.1404,-0.3956)
11500 --cycle
11501 ;
11502 \path[hex/terrain/town/house,pic actions]
11503 ( 0.0852,-0.3696)
11504 -- ( 0.1047,-0.3280)
11505 -- ( 0.1600,-0.3540)
11506 -- ( 0.1404,-0.3956)
11507 --cycle
11508 ;
11509 \path[hex/terrain/town/house,pic actions]
11510 ( 0.0197,-0.2063)
11511 -- ( 0.0392,-0.1647)
11512 -- ( 0.0944,-0.1907)
11513 -- ( 0.0750,-0.2323)
11514 --cycle
11515 ;
11516 \path[hex/terrain/town/house,pic actions]

```

```

11517 ( 0.0197,-0.2063)
11518 -- ( 0.0392,-0.1647)
11519 -- ( 0.0944,-0.1907)
11520 -- ( 0.0750,-0.2323)
11521 --cycle
11522 ;
11523 \path[hex/terrain/town/house,pic actions]
11524 ( 0.3100, 0.7769)
11525 -- ( 0.3513, 0.7971)
11526 -- ( 0.3781, 0.7423)
11527 -- ( 0.3369, 0.7221)
11528 --cycle
11529 ;
11530 \path[hex/terrain/town/house,pic actions]
11531 ( 0.3100, 0.7769)
11532 -- ( 0.3513, 0.7971)
11533 -- ( 0.3781, 0.7423)
11534 -- ( 0.3369, 0.7221)
11535 --cycle
11536 ;
11537 \path[hex/terrain/town/house,pic actions]
11538 ( 0.5097, 0.3286)
11539 -- ( 0.5510, 0.3488)
11540 -- ( 0.5778, 0.2940)
11541 -- ( 0.5366, 0.2738)
11542 --cycle
11543 ;
11544 \path[hex/terrain/town/house,pic actions]
11545 ( 0.5097, 0.3286)
11546 -- ( 0.5510, 0.3488)
11547 -- ( 0.5778, 0.2940)
11548 -- ( 0.5366, 0.2738)
11549 --cycle
11550 ;
11551 \path[hex/terrain/town/house,pic actions]
11552 ( 0.4014, 0.8173)
11553 -- ( 0.4429, 0.8369)
11554 -- ( 0.4689, 0.7817)
11555 -- ( 0.4274, 0.7621)
11556 --cycle
11557 ;
11558 \path[hex/terrain/town/house,pic actions]
11559 ( 0.4014, 0.8173)
11560 -- ( 0.4429, 0.8369)
11561 -- ( 0.4689, 0.7817)
11562 -- ( 0.4274, 0.7621)
11563 --cycle
11564 ;
11565 \path[hex/terrain/town/house,pic actions]
11566 ( 0.2627, 0.7599)
11567 -- ( 0.3055, 0.7765)
11568 -- ( 0.3276, 0.7196)
11569 -- ( 0.2848, 0.7030)

```

```

11570  --cycle
11571  ;
11572  \path[hex/terrain/town/house,pic actions]
11573  ( 0.2627, 0.7599)
11574  -- ( 0.3055, 0.7765)
11575  -- ( 0.3276, 0.7196)
11576  -- ( 0.2848, 0.7030)
11577  --cycle
11578  ;
11579  \path[hex/terrain/town/house,pic actions]
11580  ( 0.1763, 0.7193)
11581  -- ( 0.2174, 0.7400)
11582  -- ( 0.2448, 0.6855)
11583  -- ( 0.2038, 0.6648)
11584  --cycle
11585  ;
11586  \path[hex/terrain/town/house,pic actions]
11587  ( 0.1763, 0.7193)
11588  -- ( 0.2174, 0.7400)
11589  -- ( 0.2448, 0.6855)
11590  -- ( 0.2038, 0.6648)
11591  --cycle
11592  ;
11593  \path[hex/terrain/town/house,pic actions]
11594  (-0.0655, 0.4707)
11595  -- (-0.0222, 0.4555)
11596  -- (-0.0424, 0.3979)
11597  -- (-0.0858, 0.4131)
11598  --cycle
11599  ;
11600  \path[hex/terrain/town/house,pic actions]
11601  (-0.0655, 0.4707)
11602  -- (-0.0222, 0.4555)
11603  -- (-0.0424, 0.3979)
11604  -- (-0.0858, 0.4131)
11605  --cycle
11606  ;
11607  \path[hex/terrain/town/house,pic actions]
11608  ( 0.0019, 0.5606)
11609  -- ( 0.0452, 0.5454)
11610  -- ( 0.0251, 0.4878)
11611  -- (-0.0183, 0.5030)
11612  --cycle
11613  ;
11614  \path[hex/terrain/town/house,pic actions]
11615  ( 0.0019, 0.5606)
11616  -- ( 0.0452, 0.5454)
11617  -- ( 0.0251, 0.4878)
11618  -- (-0.0183, 0.5030)
11619  --cycle
11620  ;
11621  \path[hex/terrain/town/house,pic actions]
11622  ( 0.0634, 0.0555)

```

```

11623 -- ( 0.1067, 0.0403)
11624 -- ( 0.0865,-0.0174)
11625 -- ( 0.0432,-0.0022)
11626 --cycle
11627 ;
11628 \path[hex/terrain/town/house,pic actions]
11629 ( 0.0634, 0.0555)
11630 -- ( 0.1067, 0.0403)
11631 -- ( 0.0865,-0.0174)
11632 -- ( 0.0432,-0.0022)
11633 --cycle
11634 ;
11635 \path[hex/terrain/town/house,pic actions]
11636 (-0.0445, 0.0687)
11637 -- (-0.0010, 0.0535)
11638 -- (-0.0213,-0.0041)
11639 -- (-0.0646, 0.0110)
11640 --cycle
11641 ;
11642 \path[hex/terrain/town/house,pic actions]
11643 (-0.0445, 0.0687)
11644 -- (-0.0010, 0.0535)
11645 -- (-0.0213,-0.0041)
11646 -- (-0.0646, 0.0110)
11647 --cycle
11648 ;
11649 \path[hex/terrain/town/house,pic actions]
11650 ( 0.0541, 0.5519)
11651 -- ( 0.0966, 0.5344)
11652 -- ( 0.0732, 0.4779)
11653 -- ( 0.0308, 0.4956)
11654 --cycle
11655 ;
11656 \path[hex/terrain/town/house,pic actions]
11657 ( 0.0541, 0.5519)
11658 -- ( 0.0966, 0.5344)
11659 -- ( 0.0732, 0.4779)
11660 -- ( 0.0308, 0.4956)
11661 --cycle
11662 ;
11663 \path[hex/terrain/town/house,pic actions]
11664 ( 0.0096, 0.8274)
11665 -- ( 0.0163, 0.7820)
11666 -- (-0.0441, 0.7731)
11667 -- (-0.0508, 0.8185)
11668 --cycle
11669 ;
11670 \path[hex/terrain/town/house,pic actions]
11671 ( 0.0096, 0.8274)
11672 -- ( 0.0163, 0.7820)
11673 -- (-0.0441, 0.7731)
11674 -- (-0.0508, 0.8185)
11675 --cycle

```

```

11676 ;
11677 \path[hex/terrain/town/house,pic actions]
11678 (-0.0878, 0.6237)
11679 -- (-0.0810, 0.5783)
11680 -- (-0.1415, 0.5693)
11681 -- (-0.1482, 0.6147)
11682 --cycle
11683 ;
11684 \path[hex/terrain/town/house,pic actions]
11685 (-0.0878, 0.6237)
11686 -- (-0.0810, 0.5783)
11687 -- (-0.1415, 0.5693)
11688 -- (-0.1482, 0.6147)
11689 --cycle
11690 ;
11691 \path[hex/terrain/town/house,pic actions]
11692 (-0.0678, 0.8193)
11693 -- (-0.0575, 0.7745)
11694 -- (-0.1168, 0.7608)
11695 -- (-0.1273, 0.8055)
11696 --cycle
11697 ;
11698 \path[hex/terrain/town/house,pic actions]
11699 (-0.0678, 0.8193)
11700 -- (-0.0575, 0.7745)
11701 -- (-0.1168, 0.7608)
11702 -- (-0.1273, 0.8055)
11703 --cycle
11704 ;
11705 \path[hex/terrain/town/house,pic actions]
11706 (-0.1958, 0.8007)
11707 -- (-0.1517, 0.7877)
11708 -- (-0.1688, 0.7292)
11709 -- (-0.2129, 0.7420)
11710 --cycle
11711 ;
11712 \path[hex/terrain/town/house,pic actions]
11713 (-0.1958, 0.8007)
11714 -- (-0.1517, 0.7877)
11715 -- (-0.1688, 0.7292)
11716 -- (-0.2129, 0.7420)
11717 --cycle
11718 ;
11719 \path[hex/terrain/town/house,pic actions]
11720 ( 0.6001, 0.0672)
11721 -- ( 0.6452, 0.0758)
11722 -- ( 0.6566, 0.0159)
11723 -- ( 0.6115, 0.0072)
11724 --cycle
11725 ;
11726 \path[hex/terrain/town/house,pic actions]
11727 ( 0.6001, 0.0672)
11728 -- ( 0.6452, 0.0758)

```

```

11729 -- ( 0.6566, 0.0159)
11730 -- ( 0.6115, 0.0072)
11731 --cycle
11732 ;
11733 \path[hex/terrain/town/house,pic actions]
11734 ( 0.8357, 0.2798)
11735 -- ( 0.8514, 0.2365)
11736 -- ( 0.7940, 0.2158)
11737 -- ( 0.7783, 0.2591)
11738 --cycle
11739 ;
11740 \path[hex/terrain/town/house,pic actions]
11741 ( 0.8357, 0.2798)
11742 -- ( 0.8514, 0.2365)
11743 -- ( 0.7940, 0.2158)
11744 -- ( 0.7783, 0.2591)
11745 --cycle
11746 ;
11747 \path[hex/terrain/town/house,pic actions]
11748 ( 0.4450, 0.0292)
11749 -- ( 0.4606,-0.0141)
11750 -- ( 0.4032,-0.0348)
11751 -- ( 0.3876, 0.0085)
11752 --cycle
11753 ;
11754 \path[hex/terrain/town/house,pic actions]
11755 ( 0.4450, 0.0292)
11756 -- ( 0.4606,-0.0141)
11757 -- ( 0.4032,-0.0348)
11758 -- ( 0.3876, 0.0085)
11759 --cycle
11760 ;
11761 \path[hex/terrain/town/house,pic actions]
11762 ( 0.9043, 0.1125)
11763 -- ( 0.9184, 0.0687)
11764 -- ( 0.8603, 0.0500)
11765 -- ( 0.8462, 0.0937)
11766 --cycle
11767 ;
11768 \path[hex/terrain/town/house,pic actions]
11769 ( 0.9043, 0.1125)
11770 -- ( 0.9184, 0.0687)
11771 -- ( 0.8603, 0.0500)
11772 -- ( 0.8462, 0.0937)
11773 --cycle
11774 ;
11775 \path[hex/terrain/town/house,pic actions]
11776 ( 0.7148,-0.2814)
11777 -- ( 0.7591,-0.2935)
11778 -- ( 0.7430,-0.3524)
11779 -- ( 0.6987,-0.3402)
11780 --cycle
11781 ;

```

```

11782 \path[hex/terrain/town/house,pic actions]
11783 ( 0.7148,-0.2814)
11784 -- ( 0.7591,-0.2935)
11785 -- ( 0.7430,-0.3524)
11786 -- ( 0.6987,-0.3402)
11787 --cycle
11788 ;
11789 \path[hex/terrain/town/house,pic actions]
11790 ( 0.5891,-0.1425)
11791 -- ( 0.5806,-0.1876)
11792 -- ( 0.5207,-0.1764)
11793 -- ( 0.5291,-0.1313)
11794 --cycle
11795 ;
11796 \path[hex/terrain/town/house,pic actions]
11797 ( 0.5891,-0.1425)
11798 -- ( 0.5806,-0.1876)
11799 -- ( 0.5207,-0.1764)
11800 -- ( 0.5291,-0.1313)
11801 --cycle
11802 ;
11803 \path[hex/terrain/town/house,pic actions]
11804 ( 0.5865, 0.0684)
11805 -- ( 0.5782, 0.0233)
11806 -- ( 0.5181, 0.0345)
11807 -- ( 0.5266, 0.0796)
11808 --cycle
11809 ;
11810 \path[hex/terrain/town/house,pic actions]
11811 ( 0.5865, 0.0684)
11812 -- ( 0.5782, 0.0233)
11813 -- ( 0.5181, 0.0345)
11814 -- ( 0.5266, 0.0796)
11815 --cycle
11816 ;
11817 \path[hex/terrain/town/house,pic actions]
11818 ( 0.4044,-0.3422)
11819 -- ( 0.4189,-0.2987)
11820 -- ( 0.4768,-0.3180)
11821 -- ( 0.4623,-0.3616)
11822 --cycle
11823 ;
11824 \path[hex/terrain/town/house,pic actions]
11825 ( 0.4044,-0.3422)
11826 -- ( 0.4189,-0.2987)
11827 -- ( 0.4768,-0.3180)
11828 -- ( 0.4623,-0.3616)
11829 --cycle
11830 ;
11831 \path[hex/terrain/town/house,pic actions]
11832 ( 0.4665,-0.7188)
11833 -- ( 0.5125,-0.7188)
11834 -- ( 0.5125,-0.7799)

```

```

11835 -- ( 0.4665,-0.7799)
11836 --cycle
11837 ;
11838 \path[hex/terrain/town/house,pic actions]
11839 ( 0.4665,-0.7188)
11840 -- ( 0.5125,-0.7188)
11841 -- ( 0.5125,-0.7799)
11842 -- ( 0.4665,-0.7799)
11843 --cycle
11844 ;
11845 \path[hex/terrain/town/house,pic actions]
11846 (-0.1285,-0.5747)
11847 -- (-0.0826,-0.5747)
11848 -- (-0.0826,-0.6356)
11849 -- (-0.1285,-0.6356)
11850 --cycle
11851 ;
11852 \path[hex/terrain/town/house,pic actions]
11853 (-0.1285,-0.5747)
11854 -- (-0.0826,-0.5747)
11855 -- (-0.0826,-0.6356)
11856 -- (-0.1285,-0.6356)
11857 --cycle
11858 ;
11859 \path[hex/terrain/town/house,pic actions]
11860 (-0.2861,-0.6694)
11861 -- (-0.2789,-0.6240)
11862 -- (-0.2186,-0.6336)
11863 -- (-0.2258,-0.6789)
11864 --cycle
11865 ;
11866 \path[hex/terrain/town/house,pic actions]
11867 (-0.2861,-0.6694)
11868 -- (-0.2789,-0.6240)
11869 -- (-0.2186,-0.6336)
11870 -- (-0.2258,-0.6789)
11871 --cycle
11872 ;
11873 \path[hex/terrain/town/house,pic actions]
11874 (-0.1486,-0.3725)
11875 -- (-0.1414,-0.3271)
11876 -- (-0.0811,-0.3367)
11877 -- (-0.0883,-0.3820)
11878 --cycle
11879 ;
11880 \path[hex/terrain/town/house,pic actions]
11881 (-0.1486,-0.3725)
11882 -- (-0.1414,-0.3271)
11883 -- (-0.0811,-0.3367)
11884 -- (-0.0883,-0.3820)
11885 --cycle
11886 ;
11887 \path[hex/terrain/town/house,pic actions]

```



```

11888 (-0.3576,-0.5916)
11889 -- (-0.3319,-0.6297)
11890 -- (-0.3826,-0.6638)
11891 -- (-0.4082,-0.6256)
11892 --cycle
11893 ;
11894 \path[hex/terrain/town/house,pic actions]
11895 (-0.3576,-0.5916)
11896 -- (-0.3319,-0.6297)
11897 -- (-0.3826,-0.6638)
11898 -- (-0.4082,-0.6256)
11899 --cycle
11900 ;
11901 \path[hex/terrain/town/house,pic actions]
11902 (-0.5468,-0.2716)
11903 -- (-0.5213,-0.3098)
11904 -- (-0.5719,-0.3438)
11905 -- (-0.5976,-0.3056)
11906 --cycle
11907 ;
11908 \path[hex/terrain/town/house,pic actions]
11909 (-0.5468,-0.2716)
11910 -- (-0.5213,-0.3098)
11911 -- (-0.5719,-0.3438)
11912 -- (-0.5976,-0.3056)
11913 --cycle
11914 ;
11915 \path[hex/terrain/town/house,pic actions]
11916 (-0.4969,-0.5222)
11917 -- (-0.4767,-0.5634)
11918 -- (-0.5315,-0.5902)
11919 -- (-0.5518,-0.5490)
11920 --cycle
11921 ;
11922 \path[hex/terrain/town/house,pic actions]
11923 (-0.4969,-0.5222)
11924 -- (-0.4767,-0.5634)
11925 -- (-0.5315,-0.5902)
11926 -- (-0.5518,-0.5490)
11927 --cycle
11928 ;
11929 \path[hex/terrain/town/house,pic actions]
11930 (-0.3963,-0.6922)
11931 -- (-0.3778,-0.7343)
11932 -- (-0.4338,-0.7588)
11933 -- (-0.4522,-0.7168)
11934 --cycle
11935 ;
11936 \path[hex/terrain/town/house,pic actions]
11937 (-0.3963,-0.6922)
11938 -- (-0.3778,-0.7343)
11939 -- (-0.4338,-0.7588)
11940 -- (-0.4522,-0.7168)

```

```

11941 --cycle
11942 ;
11943 \path[hex/terrain/town/house,pic actions]
11944 (-0.6145,-0.5157)
11945 -- (-0.5944,-0.5570)
11946 -- (-0.6493,-0.5836)
11947 -- (-0.6694,-0.5423)
11948 --cycle
11949 ;
11950 \path[hex/terrain/town/house,pic actions]
11951 (-0.6145,-0.5157)
11952 -- (-0.5944,-0.5570)
11953 -- (-0.6493,-0.5836)
11954 -- (-0.6694,-0.5423)
11955 --cycle
11956 ;
11957 \path[hex/terrain/town/house,pic actions]
11958 (-0.8791,-0.2053)
11959 -- (-0.8402,-0.1810)
11960 -- (-0.8079,-0.2327)
11961 -- (-0.8468,-0.2571)
11962 --cycle
11963 ;
11964 \path[hex/terrain/town/house,pic actions]
11965 (-0.8791,-0.2053)
11966 -- (-0.8402,-0.1810)
11967 -- (-0.8079,-0.2327)
11968 -- (-0.8468,-0.2571)
11969 --cycle
11970 ;
11971 \path[hex/terrain/town/house,pic actions]
11972 (-0.9144, 0.1039)
11973 -- (-0.8919, 0.1439)
11974 -- (-0.8388, 0.1140)
11975 -- (-0.8613, 0.0740)
11976 --cycle
11977 ;
11978 \path[hex/terrain/town/house,pic actions]
11979 (-0.9144, 0.1039)
11980 -- (-0.8919, 0.1439)
11981 -- (-0.8388, 0.1140)
11982 -- (-0.8613, 0.0740)
11983 --cycle
11984 ;
11985 \path[hex/terrain/town/house,pic actions]
11986 (-0.4095, 0.2277)
11987 -- (-0.3639, 0.2229)
11988 -- (-0.3703, 0.1622)
11989 -- (-0.4159, 0.1670)
11990 --cycle
11991 ;
11992 \path[hex/terrain/town/house,pic actions]
11993 (-0.4095, 0.2277)

```

```

11994 -- (-0.3639, 0.2229)
11995 -- (-0.3703, 0.1622)
11996 -- (-0.4159, 0.1670)
11997 --cycle
11998 ;
11999 \path[hex/terrain/town/house,pic actions]
12000 (-0.3590, 0.4200)
12001 -- (-0.3365, 0.4600)
12002 -- (-0.2833, 0.4302)
12003 -- (-0.3058, 0.3901)
12004 --cycle
12005 ;
12006 \path[hex/terrain/town/house,pic actions]
12007 (-0.3590, 0.4200)
12008 -- (-0.3365, 0.4600)
12009 -- (-0.2833, 0.4302)
12010 -- (-0.3058, 0.3901)
12011 --cycle
12012 ;
12013 \path[hex/terrain/town/house,pic actions]
12014 (-0.0764, 0.3204)
12015 -- (-0.0539, 0.3604)
12016 -- (-0.0007, 0.3306)
12017 -- (-0.0232, 0.2905)
12018 --cycle
12019 ;
12020 \path[hex/terrain/town/house,pic actions]
12021 (-0.0764, 0.3204)
12022 -- (-0.0539, 0.3604)
12023 -- (-0.0007, 0.3306)
12024 -- (-0.0232, 0.2905)
12025 --cycle
12026 ;
12027 \path[hex/terrain/town/house,pic actions]
12028 (-0.1364, 0.0430)
12029 -- (-0.1139, 0.0831)
12030 -- (-0.0607, 0.0532)
12031 -- (-0.0832, 0.0131)
12032 --cycle
12033 ;
12034 \path[hex/terrain/town/house,pic actions]
12035 (-0.1364, 0.0430)
12036 -- (-0.1139, 0.0831)
12037 -- (-0.0607, 0.0532)
12038 -- (-0.0832, 0.0131)
12039 --cycle
12040 ;
12041 \path[hex/terrain/town/house,pic actions]
12042 (-0.1269, 0.1239)
12043 -- (-0.1149, 0.1681)
12044 -- (-0.0560, 0.1521)
12045 -- (-0.0681, 0.1078)
12046 --cycle

```

```

12047 ;
12048 \path[hex/terrain/town/house,pic actions]
12049 (-0.1269, 0.1239)
12050 -- (-0.1149, 0.1681)
12051 -- (-0.0560, 0.1521)
12052 -- (-0.0681, 0.1078)
12053 --cycle
12054 ;
12055 \path[hex/terrain/town/house,pic actions]
12056 (-0.6443,-0.1022)
12057 -- (-0.6321,-0.0579)
12058 -- (-0.5733,-0.0740)
12059 -- (-0.5854,-0.1183)
12060 --cycle
12061 ;
12062 \path[hex/terrain/town/house,pic actions]
12063 (-0.6443,-0.1022)
12064 -- (-0.6321,-0.0579)
12065 -- (-0.5733,-0.0740)
12066 -- (-0.5854,-0.1183)
12067 --cycle
12068 ;
12069 \path[hex/terrain/town/house,pic actions]
12070 (-0.6032, 0.2357)
12071 -- (-0.5912, 0.2800)
12072 -- (-0.5323, 0.2639)
12073 -- (-0.5443, 0.2196)
12074 --cycle
12075 ;
12076 \path[hex/terrain/town/house,pic actions]
12077 (-0.6032, 0.2357)
12078 -- (-0.5912, 0.2800)
12079 -- (-0.5323, 0.2639)
12080 -- (-0.5443, 0.2196)
12081 --cycle
12082 ;
12083 \path[hex/terrain/town/house,pic actions]
12084 (-0.7230, 0.0020)
12085 -- (-0.7026, 0.0432)
12086 -- (-0.6479, 0.0162)
12087 -- (-0.6682,-0.0250)
12088 --cycle
12089 ;
12090 \path[hex/terrain/town/house,pic actions]
12091 (-0.7230, 0.0020)
12092 -- (-0.7026, 0.0432)
12093 -- (-0.6479, 0.0162)
12094 -- (-0.6682,-0.0250)
12095 --cycle
12096 ;
12097 \path[hex/terrain/town/house,pic actions]
12098 (-0.5055, 0.2596)
12099 -- (-0.4629, 0.2423)

```

```

12100 -- (-0.4859, 0.1858)
12101 -- (-0.5285, 0.2031)
12102 --cycle
12103 ;
12104 \path[hex/terrain/town/house,pic actions]
12105 (-0.5055, 0.2596)
12106 -- (-0.4629, 0.2423)
12107 -- (-0.4859, 0.1858)
12108 -- (-0.5285, 0.2031)
12109 --cycle
12110 ;
12111 \path[hex/terrain/town/house,pic actions]
12112 ( 0.1337, 0.3296)
12113 -- ( 0.1283, 0.2840)
12114 -- ( 0.0677, 0.2911)
12115 -- ( 0.0731, 0.3367)
12116 --cycle
12117 ;
12118 \path[hex/terrain/town/house,pic actions]
12119 ( 0.1337, 0.3296)
12120 -- ( 0.1283, 0.2840)
12121 -- ( 0.0677, 0.2911)
12122 -- ( 0.0731, 0.3367)
12123 --cycle
12124 ;
12125 \path[hex/terrain/town/house,pic actions]
12126 ( 0.1476, 0.4414)
12127 -- ( 0.1506, 0.3955)
12128 -- ( 0.0897, 0.3916)
12129 -- ( 0.0867, 0.4375)
12130 --cycle
12131 ;
12132 \path[hex/terrain/town/house,pic actions]
12133 ( 0.1476, 0.4414)
12134 -- ( 0.1506, 0.3955)
12135 -- ( 0.0897, 0.3916)
12136 -- ( 0.0867, 0.4375)
12137 --cycle
12138 ;
12139 \path[hex/terrain/town/house,pic actions]
12140 ( 0.0539,-0.1542)
12141 -- ( 0.0687,-0.1107)
12142 -- ( 0.1264,-0.1304)
12143 -- ( 0.1116,-0.1738)
12144 --cycle
12145 ;
12146 \path[hex/terrain/town/house,pic actions]
12147 ( 0.0539,-0.1542)
12148 -- ( 0.0687,-0.1107)
12149 -- ( 0.1264,-0.1304)
12150 -- ( 0.1116,-0.1738)
12151 --cycle
12152 ;

```

```

12153 \path[hex/terrain/town/house,pic actions]
12154 (-0.0962,-0.1436)
12155 -- (-0.0814,-0.1001)
12156 -- (-0.0237,-0.1198)
12157 -- (-0.0385,-0.1633)
12158 --cycle
12159 ;
12160 \path[hex/terrain/town/house,pic actions]
12161 (-0.0962,-0.1436)
12162 -- (-0.0814,-0.1001)
12163 -- (-0.0237,-0.1198)
12164 -- (-0.0385,-0.1633)
12165 --cycle
12166 ;
12167 \path[hex/terrain/town/house,pic actions]
12168 (-0.1683,-0.0622)
12169 -- (-0.1535,-0.0188)
12170 -- (-0.0958,-0.0385)
12171 -- (-0.1106,-0.0820)
12172 --cycle
12173 ;
12174 \path[hex/terrain/town/house,pic actions]
12175 (-0.1683,-0.0622)
12176 -- (-0.1535,-0.0188)
12177 -- (-0.0958,-0.0385)
12178 -- (-0.1106,-0.0820)
12179 --cycle
12180 ;
12181 \path[hex/terrain/town/house,pic actions]
12182 (-0.1842,-0.1310)
12183 -- (-0.1694,-0.0876)
12184 -- (-0.1116,-0.1073)
12185 -- (-0.1264,-0.1508)
12186 --cycle
12187 ;
12188 \path[hex/terrain/town/house,pic actions]
12189 (-0.1842,-0.1310)
12190 -- (-0.1694,-0.0876)
12191 -- (-0.1116,-0.1073)
12192 -- (-0.1264,-0.1508)
12193 --cycle
12194 ;
12195 \path[hex/terrain/town/house,pic actions]
12196 ( 0.1167,-0.5813)
12197 -- ( 0.1315,-0.5379)
12198 -- ( 0.1892,-0.5576)
12199 -- ( 0.1744,-0.6011)
12200 --cycle
12201 ;
12202 \path[hex/terrain/town/house,pic actions]
12203 ( 0.1167,-0.5813)
12204 -- ( 0.1315,-0.5379)
12205 -- ( 0.1892,-0.5576)

```

```

12206 -- ( 0.1744,-0.6011)
12207 --cycle
12208 ;
12209 \path[hex/terrain/town/house,pic actions]
12210 ( 0.0916,-0.6322)
12211 -- ( 0.1064,-0.5888)
12212 -- ( 0.1642,-0.6085)
12213 -- ( 0.1493,-0.6520)
12214 --cycle
12215 ;
12216 \path[hex/terrain/town/house,pic actions]
12217 ( 0.0916,-0.6322)
12218 -- ( 0.1064,-0.5888)
12219 -- ( 0.1642,-0.6085)
12220 -- ( 0.1493,-0.6520)
12221 --cycle
12222 ;
12223 \path[hex/terrain/town/house,pic actions]
12224 ( 0.3791,-0.5978)
12225 -- ( 0.3941,-0.5544)
12226 -- ( 0.4518,-0.5741)
12227 -- ( 0.4369,-0.6176)
12228 --cycle
12229 ;
12230 \path[hex/terrain/town/house,pic actions]
12231 ( 0.3791,-0.5978)
12232 -- ( 0.3941,-0.5544)
12233 -- ( 0.4518,-0.5741)
12234 -- ( 0.4369,-0.6176)
12235 --cycle
12236 ;
12237 \path[hex/terrain/town/house,pic actions]
12238 ( 0.4116,-0.5397)
12239 -- ( 0.4392,-0.5029)
12240 -- ( 0.4880,-0.5396)
12241 -- ( 0.4604,-0.5764)
12242 --cycle
12243 ;
12244 \path[hex/terrain/town/house,pic actions]
12245 ( 0.4116,-0.5397)
12246 -- ( 0.4392,-0.5029)
12247 -- ( 0.4880,-0.5396)
12248 -- ( 0.4604,-0.5764)
12249 --cycle
12250 ;
12251 \path[hex/terrain/town/house,pic actions]
12252 ( 0.2218,-0.5853)
12253 -- ( 0.2366,-0.5418)
12254 -- ( 0.2944,-0.5615)
12255 -- ( 0.2796,-0.6051)
12256 --cycle
12257 ;
12258 \path[hex/terrain/town/house,pic actions]

```

```

12259 ( 0.2218,-0.5853)
12260 -- ( 0.2366,-0.5418)
12261 -- ( 0.2944,-0.5615)
12262 -- ( 0.2796,-0.6051)
12263 --cycle
12264 ;
12265 \path[hex/terrain/town/house,pic actions]
12266 ( 0.3094, 0.1262)
12267 -- ( 0.3519, 0.1085)
12268 -- ( 0.3284, 0.0522)
12269 -- ( 0.2860, 0.0698)
12270 --cycle
12271 ;
12272 \path[hex/terrain/town/house,pic actions]
12273 ( 0.3094, 0.1262)
12274 -- ( 0.3519, 0.1085)
12275 -- ( 0.3284, 0.0522)
12276 -- ( 0.2860, 0.0698)
12277 --cycle
12278 ;
12279 \path[hex/terrain/town/house,pic actions]
12280 ( 0.2797, 0.1784)
12281 -- ( 0.3041, 0.1395)
12282 -- ( 0.2524, 0.1070)
12283 -- ( 0.2280, 0.1459)
12284 --cycle
12285 ;
12286 \path[hex/terrain/town/house,pic actions]
12287 ( 0.2797, 0.1784)
12288 -- ( 0.3041, 0.1395)
12289 -- ( 0.2524, 0.1070)
12290 -- ( 0.2280, 0.1459)
12291 --cycle
12292 ;
12293 \path[hex/terrain/town/house,pic actions]
12294 ( 0.7950, 0.1548)
12295 -- ( 0.8065, 0.1103)
12296 -- ( 0.7475, 0.0949)
12297 -- ( 0.7359, 0.1394)
12298 --cycle
12299 ;
12300 \path[hex/terrain/town/house,pic actions]
12301 ( 0.7950, 0.1548)
12302 -- ( 0.8065, 0.1103)
12303 -- ( 0.7475, 0.0949)
12304 -- ( 0.7359, 0.1394)
12305 --cycle
12306 ;
12307 \path[hex/terrain/town/house,pic actions]
12308 ( 0.5739, 0.6926)
12309 -- ( 0.5961, 0.6525)
12310 -- ( 0.5427, 0.6229)
12311 -- ( 0.5205, 0.6632)

```



```

12312  --cycle
12313  ;
12314  \path[hex/terrain/town/house,pic actions]
12315  ( 0.5739, 0.6926)
12316  -- ( 0.5961, 0.6525)
12317  -- ( 0.5427, 0.6229)
12318  -- ( 0.5205, 0.6632)
12319  --cycle
12320  ;
12321  \path[hex/terrain/town/house,pic actions]
12322  ( 0.6499, 0.5535)
12323  -- ( 0.6714, 0.5129)
12324  -- ( 0.6174, 0.4844)
12325  -- ( 0.5959, 0.5250)
12326  --cycle
12327  ;
12328  \path[hex/terrain/town/house,pic actions]
12329  ( 0.6499, 0.5535)
12330  -- ( 0.6714, 0.5129)
12331  -- ( 0.6174, 0.4844)
12332  -- ( 0.5959, 0.5250)
12333  --cycle
12334  ;
12335  \path[hex/terrain/town/house,pic actions]
12336  (-0.4994, 0.7998)
12337  -- (-0.4558, 0.8143)
12338  -- (-0.4364, 0.7565)
12339  -- (-0.4800, 0.7419)
12340  --cycle
12341  ;
12342  \path[hex/terrain/town/house,pic actions]
12343  (-0.4994, 0.7998)
12344  -- (-0.4558, 0.8143)
12345  -- (-0.4364, 0.7565)
12346  -- (-0.4800, 0.7419)
12347  --cycle
12348  ;
12349  \path[hex/terrain/town/house,pic actions]
12350  (-0.3350, 0.7630)
12351  -- (-0.2917, 0.7475)
12352  -- (-0.3125, 0.6901)
12353  -- (-0.3558, 0.7057)
12354  --cycle
12355  ;
12356  \path[hex/terrain/town/house,pic actions]
12357  (-0.3350, 0.7630)
12358  -- (-0.2917, 0.7475)
12359  -- (-0.3125, 0.6901)
12360  -- (-0.3558, 0.7057)
12361  --cycle
12362  ;
12363  \path[hex/terrain/town/house,pic actions]
12364  (-0.4472, 0.6282)

```

```

12365 -- (-0.4040, 0.6124)
12366 -- (-0.4252, 0.5551)
12367 -- (-0.4683, 0.5710)
12368 --cycle
12369 ;
12370 \path[hex/terrain/town/house,pic actions]
12371 (-0.4472, 0.6282)
12372 -- (-0.4040, 0.6124)
12373 -- (-0.4252, 0.5551)
12374 -- (-0.4683, 0.5710)
12375 --cycle
12376 ;
12377 \path[hex/terrain/town/house,pic actions]
12378 (-0.5200, 0.6603)
12379 -- (-0.4792, 0.6394)
12380 -- (-0.5070, 0.5851)
12381 -- (-0.5480, 0.6061)
12382 --cycle
12383 ;
12384 \path[hex/terrain/town/house,pic actions]
12385 (-0.5200, 0.6603)
12386 -- (-0.4792, 0.6394)
12387 -- (-0.5070, 0.5851)
12388 -- (-0.5480, 0.6061)
12389 --cycle
12390 ;
12391 \path[hex/terrain/town/house,pic actions]
12392 (-0.5301, 0.5359)
12393 -- (-0.4915, 0.5109)
12394 -- (-0.5247, 0.4597)
12395 -- (-0.5633, 0.4846)
12396 --cycle
12397 ;
12398 \path[hex/terrain/town/house,pic actions]
12399 (-0.5301, 0.5359)
12400 -- (-0.4915, 0.5109)
12401 -- (-0.5247, 0.4597)
12402 -- (-0.5633, 0.4846)
12403 --cycle
12404 ;
12405 \path[hex/terrain/town/house,pic actions]
12406 (-0.6860, 0.5063)
12407 -- (-0.6426, 0.4914)
12408 -- (-0.6624, 0.4337)
12409 -- (-0.7058, 0.4486)
12410 --cycle
12411 ;
12412 \path[hex/terrain/town/house,pic actions]
12413 (-0.6860, 0.5063)
12414 -- (-0.6426, 0.4914)
12415 -- (-0.6624, 0.4337)
12416 -- (-0.7058, 0.4486)
12417 --cycle

```

```

12418 ;
12419 \path[hex/terrain/town/house,pic actions]
12420 (-0.5849, 0.4574)
12421 -- (-0.5414, 0.4425)
12422 -- (-0.5613, 0.3847)
12423 -- (-0.6047, 0.3997)
12424 --cycle
12425 ;
12426 \path[hex/terrain/town/house,pic actions]
12427 (-0.5849, 0.4574)
12428 -- (-0.5414, 0.4425)
12429 -- (-0.5613, 0.3847)
12430 -- (-0.6047, 0.3997)
12431 --cycle
12432 ;
12433 \path[hex/terrain/town/house,pic actions]
12434 (-0.4531,-0.1794)
12435 -- (-0.4094,-0.1941)
12436 -- (-0.4289,-0.2518)
12437 -- (-0.4725,-0.2372)
12438 --cycle
12439 ;
12440 \path[hex/terrain/town/house,pic actions]
12441 (-0.4531,-0.1794)
12442 -- (-0.4094,-0.1941)
12443 -- (-0.4289,-0.2518)
12444 -- (-0.4725,-0.2372)
12445 --cycle
12446 ;
12447 \path[hex/terrain/town/house,pic actions]
12448 (-0.3573, 0.0277)
12449 -- (-0.3138, 0.0131)
12450 -- (-0.3333,-0.0447)
12451 -- (-0.3768,-0.0300)
12452 --cycle
12453 ;
12454 \path[hex/terrain/town/house,pic actions]
12455 (-0.3573, 0.0277)
12456 -- (-0.3138, 0.0131)
12457 -- (-0.3333,-0.0447)
12458 -- (-0.3768,-0.0300)
12459 --cycle
12460 ;
12461 \path[hex/terrain/town/house,pic actions]
12462 ( 0.3354,-0.4695)
12463 -- ( 0.3141,-0.5101)
12464 -- ( 0.2601,-0.4816)
12465 -- ( 0.2815,-0.4410)
12466 --cycle
12467 ;
12468 \path[hex/terrain/town/house,pic actions]
12469 ( 0.3354,-0.4695)
12470 -- ( 0.3141,-0.5101)

```

```

12471 -- ( 0.2601,-0.4816)
12472 -- ( 0.2815,-0.4410)
12473 --cycle
12474 ;
12475 \path[hex/terrain/town/house,pic actions]
12476 ( 0.6206,-0.4111)
12477 -- ( 0.6599,-0.4350)
12478 -- ( 0.6281,-0.4872)
12479 -- ( 0.5889,-0.4632)
12480 --cycle
12481 ;
12482 \path[hex/terrain/town/house,pic actions]
12483 ( 0.6206,-0.4111)
12484 -- ( 0.6599,-0.4350)
12485 -- ( 0.6281,-0.4872)
12486 -- ( 0.5889,-0.4632)
12487 --cycle
12488 ;
12489 \path[hex/terrain/town/house,pic actions]
12490 ( 0.6061,-0.5834)
12491 -- ( 0.6495,-0.5984)
12492 -- ( 0.6296,-0.6561)
12493 -- ( 0.5861,-0.6411)
12494 --cycle
12495 ;
12496 \path[hex/terrain/town/house,pic actions]
12497 ( 0.6061,-0.5834)
12498 -- ( 0.6495,-0.5984)
12499 -- ( 0.6296,-0.6561)
12500 -- ( 0.5861,-0.6411)
12501 --cycle
12502 ;
12503 \path[hex/terrain/town/house,pic actions]
12504 ( 0.2902, 0.2707)
12505 -- ( 0.3361, 0.2673)
12506 -- ( 0.3317, 0.2065)
12507 -- ( 0.2859, 0.2098)
12508 --cycle
12509 ;
12510 \path[hex/terrain/town/house,pic actions]
12511 ( 0.2902, 0.2707)
12512 -- ( 0.3361, 0.2673)
12513 -- ( 0.3317, 0.2065)
12514 -- ( 0.2859, 0.2098)
12515 --cycle
12516 ;
12517 \path[hex/terrain/town/house,pic actions]
12518 ( 0.2215, 0.2766)
12519 -- ( 0.2673, 0.2733)
12520 -- ( 0.2630, 0.2124)
12521 -- ( 0.2172, 0.2157)
12522 --cycle
12523 ;

```

```

12524 \path[hex/terrain/town/house,pic actions]
12525 ( 0.2215, 0.2766)
12526 -- ( 0.2673, 0.2733)
12527 -- ( 0.2630, 0.2124)
12528 -- ( 0.2172, 0.2157)
12529 --cycle
12530 ;
12531 \path[hex/terrain/town/house,pic actions]
12532 (-0.0159, 0.4498)
12533 -- ( 0.0299, 0.4466)
12534 -- ( 0.0256, 0.3857)
12535 -- (-0.0202, 0.3889)
12536 --cycle
12537 ;
12538 \path[hex/terrain/town/house,pic actions]
12539 (-0.0159, 0.4498)
12540 -- ( 0.0299, 0.4466)
12541 -- ( 0.0256, 0.3857)
12542 -- (-0.0202, 0.3889)
12543 --cycle
12544 ;
12545 \path[hex/terrain/town/house,pic actions]
12546 ( 0.0377, 0.1701)
12547 -- ( 0.0835, 0.1668)
12548 -- ( 0.0791, 0.1060)
12549 -- ( 0.0333, 0.1092)
12550 --cycle
12551 ;
12552 \path[hex/terrain/town/house,pic actions]
12553 ( 0.0377, 0.1701)
12554 -- ( 0.0835, 0.1668)
12555 -- ( 0.0791, 0.1060)
12556 -- ( 0.0333, 0.1092)
12557 --cycle
12558 ;
12559 \path[hex/terrain/town/house,pic actions]
12560 ( 0.0944, 0.1648)
12561 -- ( 0.1403, 0.1657)
12562 -- ( 0.1415, 0.1047)
12563 -- ( 0.0955, 0.1038)
12564 --cycle
12565 ;
12566 \path[hex/terrain/town/house,pic actions]
12567 ( 0.0944, 0.1648)
12568 -- ( 0.1403, 0.1657)
12569 -- ( 0.1415, 0.1047)
12570 -- ( 0.0955, 0.1038)
12571 --cycle
12572 ;
12573 \path[hex/terrain/town/house,pic actions]
12574 ( 0.2434, 0.4429)
12575 -- ( 0.2698, 0.4054)
12576 -- ( 0.2199, 0.3702)

```

```

12577 -- ( 0.1935, 0.4077)
12578 --cycle
12579 ;
12580 \path[hex/terrain/town/house,pic actions]
12581 ( 0.2434, 0.4429)
12582 -- ( 0.2698, 0.4054)
12583 -- ( 0.2199, 0.3702)
12584 -- ( 0.1935, 0.4077)
12585 --cycle
12586 ;
12587 \path[hex/terrain/town/house,pic actions]
12588 ( 0.4777, 0.5914)
12589 -- ( 0.4980, 0.5501)
12590 -- ( 0.4432, 0.5232)
12591 -- ( 0.4229, 0.5644)
12592 --cycle
12593 ;
12594 \path[hex/terrain/town/house,pic actions]
12595 ( 0.4777, 0.5914)
12596 -- ( 0.4980, 0.5501)
12597 -- ( 0.4432, 0.5232)
12598 -- ( 0.4229, 0.5644)
12599 --cycle
12600 ;
12601 \path[hex/terrain/town/house,pic actions]
12602 ( 0.4936, 0.5331)
12603 -- ( 0.5191, 0.4949)
12604 -- ( 0.4683, 0.4611)
12605 -- ( 0.4428, 0.4993)
12606 --cycle
12607 ;
12608 \path[hex/terrain/town/house,pic actions]
12609 ( 0.4936, 0.5331)
12610 -- ( 0.5191, 0.4949)
12611 -- ( 0.4683, 0.4611)
12612 -- ( 0.4428, 0.4993)
12613 --cycle
12614 ;
12615 \path[hex/terrain/town/house,pic actions]
12616 ( 0.4667, 0.4393)
12617 -- ( 0.4871, 0.3980)
12618 -- ( 0.4323, 0.3711)
12619 -- ( 0.4120, 0.4123)
12620 --cycle
12621 ;
12622 \path[hex/terrain/town/house,pic actions]
12623 ( 0.4667, 0.4393)
12624 -- ( 0.4871, 0.3980)
12625 -- ( 0.4323, 0.3711)
12626 -- ( 0.4120, 0.4123)
12627 --cycle
12628 ;
12629 \path[hex/terrain/town/house,pic actions]

```

```

12630 (-0.2446,-0.1495)
12631 -- (-0.2153,-0.1488)
12632 -- (-0.2138,-0.2024)
12633 -- (-0.2431,-0.2032)
12634 --cycle
12635 ;
12636 \path[hex/terrain/town/house,pic actions]
12637 (-0.2446,-0.1495)
12638 -- (-0.2153,-0.1488)
12639 -- (-0.2138,-0.2024)
12640 -- (-0.2431,-0.2032)
12641 --cycle
12642 ;
12643 \path[hex/terrain/town/house,pic actions]
12644 (-0.1018, 0.2179)
12645 -- (-0.0915, 0.2454)
12646 -- (-0.0412, 0.2264)
12647 -- (-0.0516, 0.1989)
12648 --cycle
12649 ;
12650 \path[hex/terrain/town/house,pic actions]
12651 (-0.1018, 0.2179)
12652 -- (-0.0915, 0.2454)
12653 -- (-0.0412, 0.2264)
12654 -- (-0.0516, 0.1989)
12655 --cycle
12656 ;
12657 \path[hex/terrain/town/house,pic actions]
12658 ( 0.4189, 0.2515)
12659 -- ( 0.4645, 0.2567)
12660 -- ( 0.4714, 0.1960)
12661 -- ( 0.4257, 0.1909)
12662 --cycle
12663 ;
12664 \path[hex/terrain/town/house,pic actions]
12665 ( 0.4189, 0.2515)
12666 -- ( 0.4645, 0.2567)
12667 -- ( 0.4714, 0.1960)
12668 -- ( 0.4257, 0.1909)
12669 --cycle
12670 ;
12671 \path[hex/terrain/town/house,pic actions]
12672 ( 0.5784, 0.2650)
12673 -- ( 0.6240, 0.2702)
12674 -- ( 0.6308, 0.2095)
12675 -- ( 0.5852, 0.2043)
12676 --cycle
12677 ;
12678 \path[hex/terrain/town/house,pic actions]
12679 ( 0.5784, 0.2650)
12680 -- ( 0.6240, 0.2702)
12681 -- ( 0.6308, 0.2095)
12682 -- ( 0.5852, 0.2043)

```

```

12683  --cycle
12684  ;
12685  \path[hex/terrain/town/house,pic actions]
12686  ( 0.5509, 0.4874)
12687  -- ( 0.5966, 0.4925)
12688  -- ( 0.6034, 0.4319)
12689  -- ( 0.5577, 0.4267)
12690  --cycle
12691  ;
12692  \path[hex/terrain/town/house,pic actions]
12693  ( 0.5509, 0.4874)
12694  -- ( 0.5966, 0.4925)
12695  -- ( 0.6034, 0.4319)
12696  -- ( 0.5577, 0.4267)
12697  --cycle
12698  ;
12699  \path[hex/terrain/town/house,pic actions]
12700  ( 0.1390, 0.6195)
12701  -- ( 0.1654, 0.5820)
12702  -- ( 0.1155, 0.5468)
12703  -- ( 0.0890, 0.5843)
12704  --cycle
12705  ;
12706  \path[hex/terrain/town/house,pic actions]
12707  ( 0.1390, 0.6195)
12708  -- ( 0.1654, 0.5820)
12709  -- ( 0.1155, 0.5468)
12710  -- ( 0.0890, 0.5843)
12711  --cycle
12712  ;
12713  \path[hex/terrain/town/house,pic actions]
12714  (-0.1780,-0.4082)
12715  -- (-0.1533,-0.3695)
12716  -- (-0.1018,-0.4023)
12717  -- (-0.1265,-0.4410)
12718  --cycle
12719  ;
12720  \path[hex/terrain/town/house,pic actions]
12721  (-0.1780,-0.4082)
12722  -- (-0.1533,-0.3695)
12723  -- (-0.1018,-0.4023)
12724  -- (-0.1265,-0.4410)
12725  --cycle
12726  ;
12727  \path[hex/terrain/town/house,pic actions]
12728  (-0.2611,-0.2396)
12729  -- (-0.2175,-0.2543)
12730  -- (-0.2370,-0.3121)
12731  -- (-0.2805,-0.2974)
12732  --cycle
12733  ;
12734  \path[hex/terrain/town/house,pic actions]
12735  (-0.2611,-0.2396)

```



```

12736 -- (-0.2175,-0.2543)
12737 -- (-0.2370,-0.3121)
12738 -- (-0.2805,-0.2974)
12739 --cycle
12740 ;
12741 \path[hex/terrain/town/house,pic actions]
12742 ( 0.1640,-0.8299)
12743 -- ( 0.1872,-0.8299)
12744 -- ( 0.1872,-0.8565)
12745 -- ( 0.1640,-0.8565)
12746 --cycle
12747 ;
12748 \path[hex/terrain/town/house,pic actions]
12749 ( 0.1640,-0.8299)
12750 -- ( 0.1872,-0.8299)
12751 -- ( 0.1872,-0.8565)
12752 -- ( 0.1640,-0.8565)
12753 --cycle
12754 ;
12755 \path[hex/terrain/town/house,pic actions]
12756 (-0.1330,-0.7413)
12757 -- (-0.1099,-0.7413)
12758 -- (-0.1099,-0.7679)
12759 -- (-0.1330,-0.7679)
12760 --cycle
12761 ;
12762 \path[hex/terrain/town/house,pic actions]
12763 (-0.1330,-0.7413)
12764 -- (-0.1099,-0.7413)
12765 -- (-0.1099,-0.7679)
12766 -- (-0.1330,-0.7679)
12767 --cycle
12768 ;
12769 \path[hex/terrain/town/house,pic actions]
12770 (-0.3280,-0.8061)
12771 -- (-0.3049,-0.8061)
12772 -- (-0.3049,-0.8327)
12773 -- (-0.3280,-0.8327)
12774 --cycle
12775 ;
12776 \path[hex/terrain/town/house,pic actions]
12777 (-0.3280,-0.8061)
12778 -- (-0.3049,-0.8061)
12779 -- (-0.3049,-0.8327)
12780 -- (-0.3280,-0.8327)
12781 --cycle
12782 ;
12783 \path[hex/terrain/town/house,pic actions]
12784 (-0.7302,-0.0754)
12785 -- (-0.7099,-0.0866)
12786 -- (-0.7228,-0.1099)
12787 -- (-0.7430,-0.0988)
12788 --cycle

```

```

12789 ;
12790 \path[hex/terrain/town/house,pic actions]
12791 (-0.7302,-0.0754)
12792 -- (-0.7099,-0.0866)
12793 -- (-0.7228,-0.1099)
12794 -- (-0.7430,-0.0988)
12795 --cycle
12796 ;
12797 \path[hex/terrain/town/house,pic actions]
12798 (-0.0147, 0.1985)
12799 -- ( 0.0078, 0.1934)
12800 -- ( 0.0020, 0.1675)
12801 -- (-0.0206, 0.1726)
12802 --cycle
12803 ;
12804 \path[hex/terrain/town/house,pic actions]
12805 (-0.0147, 0.1985)
12806 -- ( 0.0078, 0.1934)
12807 -- ( 0.0020, 0.1675)
12808 -- (-0.0206, 0.1726)
12809 --cycle
12810 ;
12811 \path[hex/terrain/town/house,pic actions]
12812 ( 0.7613, 0.0272)
12813 -- ( 0.7841, 0.0313)
12814 -- ( 0.7889, 0.0050)
12815 -- ( 0.7661, 0.0009)
12816 --cycle
12817 ;
12818 \path[hex/terrain/town/house,pic actions]
12819 ( 0.7613, 0.0272)
12820 -- ( 0.7841, 0.0313)
12821 -- ( 0.7889, 0.0050)
12822 -- ( 0.7661, 0.0009)
12823 --cycle
12824 ;
12825 \path[hex/terrain/town/house,pic actions]
12826 ( 0.0160, 0.0427)
12827 -- ( 0.0379, 0.0352)
12828 -- ( 0.0294, 0.0100)
12829 -- ( 0.0075, 0.0174)
12830 --cycle
12831 ;
12832 \path[hex/terrain/town/house,pic actions]
12833 ( 0.0160, 0.0427)
12834 -- ( 0.0379, 0.0352)
12835 -- ( 0.0294, 0.0100)
12836 -- ( 0.0075, 0.0174)
12837 --cycle
12838 ;
12839 \path[hex/terrain/town/house,pic actions]
12840 ( 0.3515,-0.2403)
12841 -- ( 0.3743,-0.2442)

```

```

12842 -- ( 0.3697,-0.2705)
12843 -- ( 0.3469,-0.2665)
12844 --cycle
12845 ;
12846 \path[hex/terrain/town/house,pic actions]
12847 ( 0.3515,-0.2403)
12848 -- ( 0.3743,-0.2442)
12849 -- ( 0.3697,-0.2705)
12850 -- ( 0.3469,-0.2665)
12851 --cycle
12852 ;
12853 \path[hex/terrain/town/house,pic actions]
12854 ( 0.0718, 0.3637)
12855 -- ( 0.0933, 0.3723)
12856 -- ( 0.1032, 0.3476)
12857 -- ( 0.0817, 0.3390)
12858 --cycle
12859 ;
12860 \path[hex/terrain/town/house,pic actions]
12861 ( 0.0718, 0.3637)
12862 -- ( 0.0933, 0.3723)
12863 -- ( 0.1032, 0.3476)
12864 -- ( 0.0817, 0.3390)
12865 --cycle
12866 ;
12867 \path[hex/terrain/town/house,pic actions]
12868 (-0.2555, 0.2647)
12869 -- (-0.2413, 0.2902)
12870 -- (-0.1944, 0.2641)
12871 -- (-0.2086, 0.2385)
12872 --cycle
12873 ;
12874 \path[hex/terrain/town/house,pic actions]
12875 (-0.2555, 0.2647)
12876 -- (-0.2413, 0.2902)
12877 -- (-0.1944, 0.2641)
12878 -- (-0.2086, 0.2385)
12879 --cycle
12880 ;
12881 \path[hex/terrain/town/house,pic actions]
12882 (-0.2832, 0.1509)
12883 -- (-0.2826, 0.1802)
12884 -- (-0.2289, 0.1792)
12885 -- (-0.2295, 0.1498)
12886 --cycle
12887 ;
12888 \path[hex/terrain/town/house,pic actions]
12889 (-0.2832, 0.1509)
12890 -- (-0.2826, 0.1802)
12891 -- (-0.2289, 0.1792)
12892 -- (-0.2295, 0.1498)
12893 --cycle
12894 ;

```

```

12895 \path[hex/terrain/town/house,pic actions]
12896 (-0.5694, 0.6977)
12897 -- (-0.5248, 0.6870)
12898 -- (-0.5390, 0.6277)
12899 -- (-0.5837, 0.6384)
12900 --cycle
12901 ;
12902 \path[hex/terrain/town/house,pic actions]
12903 (-0.5694, 0.6977)
12904 -- (-0.5248, 0.6870)
12905 -- (-0.5390, 0.6277)
12906 -- (-0.5837, 0.6384)
12907 --cycle
12908 ;
12909 \path[hex/terrain/town/house,pic actions]
12910 (-0.6046, 0.6071)
12911 -- (-0.5747, 0.5723)
12912 -- (-0.6210, 0.5326)
12913 -- (-0.6509, 0.5674)
12914 --cycle
12915 ;
12916 \path[hex/terrain/town/house,pic actions]
12917 (-0.6046, 0.6071)
12918 -- (-0.5747, 0.5723)
12919 -- (-0.6210, 0.5326)
12920 -- (-0.6509, 0.5674)
12921 --cycle
12922 ;
12923 \path[hex/terrain/town/house,pic actions]
12924 (-0.2915,-0.1208)
12925 -- (-0.2462,-0.1288)
12926 -- (-0.2569,-0.1889)
12927 -- (-0.3021,-0.1809)
12928 --cycle
12929 ;
12930 \path[hex/terrain/town/house,pic actions]
12931 (-0.2915,-0.1208)
12932 -- (-0.2462,-0.1288)
12933 -- (-0.2569,-0.1889)
12934 -- (-0.3021,-0.1809)
12935 --cycle
12936 ;
12937 \path[hex/terrain/town/house,pic actions]
12938 ( 0.1636, 0.0236)
12939 -- ( 0.2095, 0.0215)
12940 -- ( 0.2067,-0.0394)
12941 -- ( 0.1608,-0.0374)
12942 --cycle
12943 ;
12944 \path[hex/terrain/town/house,pic actions]
12945 ( 0.1636, 0.0236)
12946 -- ( 0.2095, 0.0215)
12947 -- ( 0.2067,-0.0394)

```

```

12948 -- ( 0.1608,-0.0374)
12949 --cycle
12950 ;
12951 \path[hex/terrain/town/house,pic actions]
12952 (-0.0653,-0.5296)
12953 -- (-0.0423,-0.5269)
12954 -- (-0.0391,-0.5533)
12955 -- (-0.0621,-0.5560)
12956 --cycle
12957 ;
12958 \path[hex/terrain/town/house,pic actions]
12959 (-0.0653,-0.5296)
12960 -- (-0.0423,-0.5269)
12961 -- (-0.0391,-0.5533)
12962 -- (-0.0621,-0.5560)
12963 --cycle
12964 ;
12965 \path[hex/terrain/town/house,pic actions]
12966 (-0.3393, 0.1912)
12967 -- (-0.3173, 0.1843)
12968 -- (-0.3254, 0.1589)
12969 -- (-0.3474, 0.1659)
12970 --cycle
12971 ;
12972 \path[hex/terrain/town/house,pic actions]
12973 (-0.3393, 0.1912)
12974 -- (-0.3173, 0.1843)
12975 -- (-0.3254, 0.1589)
12976 -- (-0.3474, 0.1659)
12977 --cycle
12978 ;
12979 \path[hex/terrain/town/house,pic actions]
12980 (-0.2247, 0.5875)
12981 -- (-0.2027, 0.5801)
12982 -- (-0.2113, 0.5549)
12983 -- (-0.2332, 0.5623)
12984 --cycle
12985 ;
12986 \path[hex/terrain/town/house,pic actions]
12987 (-0.2247, 0.5875)
12988 -- (-0.2027, 0.5801)
12989 -- (-0.2113, 0.5549)
12990 -- (-0.2332, 0.5623)
12991 --cycle
12992 ;
12993 \path[hex/terrain/town/house,pic actions]
12994 ( 0.3747, 0.1590)
12995 -- ( 0.4022, 0.1690)
12996 -- ( 0.4206, 0.1185)
12997 -- ( 0.3930, 0.1085)
12998 --cycle
12999 ;
13000 \path[hex/terrain/town/house,pic actions]

```

```

13001    ( 0.3747, 0.1590)
13002    -- ( 0.4022, 0.1690)
13003    -- ( 0.4206, 0.1185)
13004    -- ( 0.3930, 0.1085)
13005    --cycle
13006    ;
13007  }
13008 }
13009 \fi

```

hex/terrain/mountain

This is an example of a terrain picture.

```

13010 \tikzset{
13011   hex/terrain/mountain/.pic={%
13012     \path[draw=black,fill=white] (0,0) -- (.3,.9)--(.45,0) -- cycle;
13013     \path[draw=black,fill=lightgray,pic actions]
13014       (-.6 ,-.9) --
13015       (-.3 , .3) --
13016       ( 0,  0) --
13017       ( .45, 0) --
13018       ( .6 , -.9) -- cycle;
13019   }
13020 }

```

hex/terrain/tree

```

13021 \tikzset{
13022   hex/terrain/tree/.pic={
13023     \path[draw,very thick,pic actions]
13024       (-.15,.0)
13025       arc (269:135:.1)
13026       arc (215: 90:.1)
13027       arc (180: 45:.1)
13028       arc (135:  0:.1)
13029       arc ( 90:-45:.1)
13030       arc ( 45:-90:.1)
13031       (-.15,.025)
13032       arc (60:-60:.25)
13033       arc (150:30:.075)
13034       arc (150:30:.075)
13035       arc (150:30:.075)
13036       arc (-120:-240:.25);
13037
13038   }
13039 }

```

5.4.6 Ridges

A hex can be decorated with up to 6 ridges — one for each edge of the hexagon. The first thing is to set up the graphics style to use for the ridges. We use the `wave` decoration.

If rounded corners are set for ridges, (e.g., via `every hex ridges`), then it should be 0pt or 4pt (roughly 2mm) or larger. Otherwise, one will get a “dimension too large” error.

```

13040 \tikzset{%
13041   hex/ridges pre/.style={
13042     line cap=round,
13043     draw=pgfstrokecolor,
13044     solid,
13045     /hex/ridges/.cd,%
13046     radius=0.85,%
13047     n=4,
13048     R=.25,
13049   },
13050   hex/ridges/.style={
13051     get scale,
13052     decoration={
13053       path has corners=true,
13054       waves,
13055       radius=\wg@scale\hex@r@R,
13056       segment length=\wg@scale\hex@r@s,
13057     },
13058     decorate}}

```

To properly set up the ridges, we need to concatenate ridge paths in order. To facilitate that, we define 6 `\ifs` — one for each edge.

```

13059 \newif\ifhex@r@ne
13060 \newif\ifhex@r@n
13061 \newif\ifhex@r@nw
13062 \newif\ifhex@r@sw
13063 \newif\ifhex@r@s
13064 \newif\ifhex@r@se

```

Next is the keys for each edge. These will set the above `\ifs` to `true`. We put these into the family `/hex/r` so that we can parse them separately.

```

13065 \tikzset{%
13066   /hex/ridges/.search also={/tikz},
13067   /hex/ridges/.cd,
13068   north east/.is if=hex@r@ne,
13069   north/.is if=hex@r@n,
13070   north west/.is if=hex@r@nw,
13071   south west/.is if=hex@r@sw,
13072   south/.is if=hex@r@s,
13073   south east/.is if=hex@r@se,
13074   radius/.store in=\hex@r@r,
13075   curve radius/.store in=\hex@r@w,
13076   NE/.is if=hex@r@ne,
13077   N/.is if=hex@r@n,
13078   NW/.is if=hex@r@nw,
13079   SW/.is if=hex@r@sw,
13080   S/.is if=hex@r@s,
13081   SE/.is if=hex@r@se,
13082   r/.store in=\hex@r@r,

```

```

13083 n/.store in=\hex@r@n,
13084 R/.store in=\hex@r@w,
13085 }

```

\hex@do@ridges

This is the macro that actually generates the ridge. We use the same PGF filtered key parsing trick as above. Note that the routine below is handcrafted since it is relatively simple.

```

13086 \newdimen\hex@r@s
13087 \newdimen\hex@r@R
13088 \def\hex@do@ridges{%
13089   \edef\hex@r@tmp{[
13090     hex/ridges pre,
13091     /tikz/every hex ridges/.try,
13092     \hex@ridges]}
13093   \expandafter\scope\hex@r@tmp%
13094     \hex@dbg{3}{Ridges: ‘\meaning\hex@ridges’, ‘\meaning\hex@r@tmp’
13095     ^^Jnorth east=\ifhex@r@ne yes\else no\fi
13096     ^^Jnorth      =\ifhex@r@n  yes\else no\fi
13097     ^^Jnorth west=\ifhex@r@nw yes\else no\fi
13098     ^^Jsouth west=\ifhex@r@sw yes\else no\fi
13099     ^^Jsouth      =\ifhex@r@s  yes\else no\fi
13100     ^^Jsouth east=\ifhex@r@se yes\else no\fi
13101     ^^Jradius     =\hex@r@r
13102     ^^Jn          =\hex@r@n
13103   ]}
13104   \pgfmathparse{\hex@r@r/\hex@r@n}\xdef\hex@r@t{\pgfmathresult}
13105   \hex@r@s=\hex@r@t cm
13106   \hex@r@R=\hex@r@w cm
13107   \def\hex@r@p{}
13108   % Hand written algorithm
13109   \ifhex@r@ne
13110     \ifhex@r@se
13111       \xdef\hex@r@p{(0:\hex@r@r)--(60:\hex@r@r)}
13112     \else
13113       \xdef\hex@r@p{($ (0:\hex@r@r)+(-60:\hex@r@t/2)$)--(60:\hex@r@r)}
13114     \fi
13115     \hex@dbg{4}{Ridge along north east edge: ‘\hex@r@p’}
13116   \fi
13117   \ifhex@r@n
13118     \ifhex@r@ne\else
13119       \xdef\hex@r@p{\hex@r@p ($ ( 60:\hex@r@r)+(0:\hex@r@t/2)$)}
13120     \fi
13121     \xdef\hex@r@p{\hex@r@p --(120:\hex@r@r)}
13122     \hex@dbg{4}{Ridge along north edge: ‘\hex@r@p’}
13123   \fi
13124   \ifhex@r@nw
13125     \ifhex@r@n\else
13126       \xdef\hex@r@p{\hex@r@p ($ (120:\hex@r@r)+(60:\hex@r@t/2)$)}
13127     \fi
13128     \xdef\hex@r@p{\hex@r@p --(180:\hex@r@r)}
13129     \hex@dbg{4}{Ridge along north west: ‘\hex@r@p’}

```



```

13130 \fi
13131 \ifhex@r@sw
13132 \ifhex@r@nw\else
13133 \xdef\hex@r@p{\hex@r@p {$(180:\hex@r@r)+(120:\hex@r@t/2)$}}
13134 \fi
13135 \ifhex@r@s
13136 \xdef\hex@r@p{\hex@r@p --(240:\hex@r@r)}
13137 \else
13138 \xdef\hex@r@p{\hex@r@p --(240:\hex@r@r)}
13139 \fi
13140 \hex@dbg{4}{Ridge along south west: '\hex@r@p'}
13141 \fi
13142 \ifhex@r@s
13143 \ifhex@r@sw\else
13144 \xdef\hex@r@p{\hex@r@p {$(240:\hex@r@r)+(-\hex@r@t/2,0)$}}
13145 \fi
13146 \ifhex@r@se
13147 \xdef\hex@r@p{\hex@r@p --(300:\hex@r@r)}
13148 \else
13149 \xdef\hex@r@p{\hex@r@p --(300.5:\hex@r@r)}
13150 \fi
13151 \hex@dbg{4}{Ridge along south: '\hex@r@p'}
13152 \fi
13153 \ifhex@r@se
13154 \ifhex@r@s\else
13155 \xdef\hex@r@p{\hex@r@p {$(300:\hex@r@r)+(-120:\hex@r@t/2)$}}
13156 \fi
13157 \ifhex@r@ne
13158 \xdef\hex@r@p{\hex@r@p --cycle}
13159 \else
13160 \xdef\hex@r@p{\hex@r@p --(.5:\hex@r@r)}
13161 \fi
13162 \hex@dbg{4}{Ridge along se: '\hex@r@p'}
13163 \fi
13164 \hex@dbg{3}{ Ridges path: \hex@r@p}
13165 % \draw[red] \hex@r@p;
13166 \draw[hex/ridges] \hex@r@p;
13167 \endscope% End of ridges scope
13168 }

```

5.4.7 Towns

Similar to above, we define a namespace and family for towns. First thing is the graphics style for towns.

```

13169 \tikzset{%
13170 hex/town/.style={
13171 scale line widths,
13172 solid,
13173 thin,
13174 fill=pgfstrokecolor,
13175 color=pgfstrokecolor},
13176 hex/town name/.style={
13177 transform shape,

```

```

13178   shape=rectangle,
13179   above right=.1,
13180   color=pgfstrokecolor,
13181   font=\sffamily\fontsize{11}{13}\selectfont}
13182 }

```

Next is the namespace for dealing with towns.

```

13183 \tikzset{%
13184   /hex/town/.search also={/tikz},%
13185   /hex/town/.cd,
13186   pic/.store in=\hex@c@pic,
13187   type/.store in=\hex@c@pic,
13188   place/.store in=\hex@c@pos,
13189   location/.store in=\hex@c@pos,
13190   name/.store in=\hex@c@name,
13191   village/.style={pic=hex/town/village},
13192   town/.style={pic=hex/town/town},
13193   city/.style={pic=hex/town/city}
13194 }

```

And some pictures for making the towns.

```

13195 \tikzset{%
13196   hex/town/village/.pic={\path[fill,solid,pic actions] circle(.1);},
13197   hex/town/town/.pic={\path[fill,solid,pic actions] circle(.2);},
13198   hex/town/city/.pic={%
13199     \path[fill,solid,pic actions] circle(.25);
13200     \path[draw,solid,pic actions] circle(.35);}
13201 }

```

\hex@do@town

The macro to make the towns. This uses same tricks as above.

```

13202 \def\hex@c@nameparse{%
13203   \ifnextchar[{\hex@c@namep@rse}{\hex@c@namep@rse[]}%]
13204 }
13205 \def\hex@c@namep@rse[#1]#2\endhex@c@nameparse{%
13206   \def\hex@c@node{node[shape=rectangle,hex/town name,#1]{#2}}
13207
13208 \def\hex@do@town{%
13209   \edef\hex@c@tmp{[
13210     /hex/town/.cd,%
13211     town,%
13212     /tikz/hex/town,%
13213     /tikz/every hex town/.try,
13214     \hex@town]}
13215   \expandafter\scope\hex@c@tmp%
13216     \ifx\hex@c@pic\empty\else%
13217       \@ifundefined{hex@c@pos}{\let\hex@c@pos\empty}{-}
13218       \@ifundefined{hex@c@name}{\let\hex@c@name\empty}{-}
13219     \expandafter\hex@c@nameparse\hex@c@name\endhex@c@nameparse%

```

```

13220     \ifx\hex@c@pos\empty\def\hex@c@pos{(0,0)}\fi
13221     \hex@dbg{2}{Town:
13222         ^^J text=\hex@c@name
13223         ^^J pic=\hex@c@pic
13224         ^^J place=\hex@c@pos
13225         ^^J node=\hex@c@node
13226     }
13227     \filldraw \hex@c@pos pic{\hex@c@pic} \hex@c@node;
13228     \fi%
13229 \endscope%
13230 }

```

5.4.8 Labels

Like terrains, we will set up some macros for dealing with labels.

To process coordinates and turn them into labels, we set up two counters.

```

13231 \newcounter{hex@l@c}
13232 \newcounter{hex@l@r}

```

In case we want to invert the row axis, we set-up a key to set the maximum row number.

```

13233 \def\hex@max@row{-1}
13234 \tikzset{
13235     max hex row/.store in=\hex@max@row,
13236 }

```

Again, we will make a separate namespace/family for the handling labels. We also define a counter which we will use to typeset alphabetic column numbers.

First a graphics style.

```

13237 \tikzset{%
13238     hex/label/.style={%
13239         draw=none,%
13240         shape=rectangle,%
13241         anchor=north,%
13242         color=gray,%
13243         font=\sffamily\bfseries\scriptsize,%
13244         inner sep=0},
13245 }

```

Next, the choices of how to make a label. These are put in the `/hex/label` family to make it easy to parse out only these keys. This uses some macros defined below. Note, this uses the macros `\hex@col` and `\hex@row` defined by the hex coordinate system.

```

13246 \tikzset{%
13247     /hex/label/.search also={/tikz},
13248     /hex/label/.cd,
13249     none/.code={\global\let\hex@l@text\@empty},
13250     auto/.is choice,
13251     auto/none/.code={\global\let\hex@l@text\@empty},
13252     auto/numbers/.code={%
13253         \hex@l@abs%

```

```

13254 \xdef\hex@l@text{%
13255   \hex@l@n@pad{\the\c@hex@l@c}%
13256   \hex@l@n@pad{\the\c@hex@l@r}}},
13257 auto/alpha column/.code={%
13258   \xdef\hex@l@text{%
13259     \ifnum0>\hex@col\AlphAlph{-\hex@col}\else\AlphAlph{\hex@col}\fi%
13260     \hex@row}},
13261 auto/alpha 2 column/.code={%
13262   \hex@l@abs%
13263   \advance\c@hex@l@c27\relax%
13264   \xdef\hex@l@text{%
13265     \AlphAlph{\value{hex@l@c}}%
13266     \hex@l@n@pad{\hex@row}}},
13267 auto/inv y x plus 1/.code={%
13268   \hex@dbg{3}{Inverse row, add one to column with arg '#1'}
13269   \let\hex@l@text\@empty%
13270   \ifnum\hex@max@row>0%
13271     \pgfmathtruncatemacro{\hex@l@row}{\hex@max@row-\hex@row}
13272     \pgfmathtruncatemacro{\hex@l@col}{1+\hex@col}
13273     \xdef\hex@l@text{%
13274       \hex@l@n@pad{\hex@l@col}%
13275       \hex@l@n@pad{\hex@l@row}}
13276   \else\message{Max row number not set}\fi},
13277 auto/x and y plus 1/.code={%
13278   \hex@dbg{3}{Inverse row, add one to column with arg '#1'}
13279   \pgfmathtruncatemacro{\hex@l@row}{1+\hex@row}
13280   \pgfmathtruncatemacro{\hex@l@col}{1+\hex@col}
13281   \xdef\hex@l@text{%
13282     \hex@l@n@pad{\hex@l@col}%
13283     \hex@l@n@pad{\hex@l@row}}},
13284 auto/.default=numbers,
13285 %text/.store in=\hex@l@text,
13286 text/.code={\gdef\hex@l@text{#1}},
13287 place/.store in=\hex@l@pos,
13288 location/.forward to=/hex/label/place,
13289 rotate/.store in=\hex@l@rot
13290 }

```

\hex@l@abs

This takes the absolute value of row and column numbers.

```

13291 \def\hex@l@abs{
13292   \setcounter{hex@l@c}{\hex@col}
13293   \setcounter{hex@l@r}{\hex@row}
13294   \expandafter\ifnum\value{hex@l@c}<0\multiply\c@hex@l@c by-1\fi%
13295   \expandafter\ifnum\value{hex@l@r}<0\multiply\c@hex@l@r by-1\fi%
13296   % \hex@dbg{0}{\hex@col->\the\c@hex@l@c\space\hex@row->\the\c@hex@l@r}
13297 }

```

\hex@l@n@pad

This will pad a number with a 0 if the number is smaller than 10.

```
13298 \long\def\hex@l@n@pad#1{%
13299 \ifnum#1<10 0\fi%
13300 #1}
```

\hex@do@label

This macro puts in the label. First, we reset label keys, then we read in the keys from the argument. If this results in the macro `\hex@l@text` to be non-empty, then we set the label via a `TikZ` node.

```
13301 \def\hex@do@label{%
13302 \hex@dbg{1}{Hex label: '\meaning\hex@label'}%
13303 \edef\hex@l@tmp{[%
13304 /hex/label/.cd,%
13305 rotate=0,%
13306 place={(90:.8)},%
13307 /tikz/hex/label/.try,%
13308 /tikz/every hex label/.try,%
13309 \hex@label]}%
13310 \expandafter\scope\hex@l@tmp%
13311 \hex@dbg{1}{Label:
13312 ^^J Text: '\meaning\hex@l@text'
13313 ^^J Location: '\meaning\hex@l@pos'
13314 ^^J Rotation: '\meaning\hex@l@rot'
13315 }%
13316 \@ifundefined{hex@l@text}{\let\hex@l@text\empty}{}%
13317 \ifx\hex@l@text\empty\else%
13318 \node[rotate=\hex@l@rot] at \hex@l@pos {\hex@l@text};%
13319 \fi%
13320 \endscope%
13321 }
```

5.4.9 Extra graphics

To make the interface a bit more flexible we allow for adding arbitrary stuff to the hexes. Some examples of pictures to add in the extra stuff.

hex/fortress

Draw a fortress. An example of a extra graphics entity.

```
13322 \tikzset{%
13323 hex/fortress/.pic={
13324 \path[draw,solid,pic actions]
13325 (0: .9) --
13326 (0: .7) --
13327 (60: .7) -- ( 60:.9) -- ( 60:.7) --
13328 (120:.7) -- (120:.9) -- (120:.7) --
13329 (180:.7) -- (180:.9) -- (180:.7) --
13330 (240:.7) -- (240:.9) -- (240:.7) --
```

```

13331    (300:.7) -- (300:.9) -- (300:.7) --
13332    (0: .7) -- cycle;}}

```

hex/fortress 2

Draw a fortress. An example of a extra graphics entity.

```

13333 \tikzset{
13334   hex/fortress 2/.pic={%
13335     \draw[pic actions,transform shape] (0:0.64)
13336     foreach \a in {15,45,...,345}{
13337       --(\a:0.64)
13338       --(\a:0.80)
13339       --(\a+15:0.80)
13340       --(\a+15:0.64)}
13341     --cycle;
13342   },
13343 }

```

5.4.10 Some macros

```

13344 \DeclareRobustCommand\fortmark[1] [scale=.25]{\tikz[#1,transform shape]{%
13345   \pic{hex/fortress 2}}}
13346 \providecommand\terrainmark[2] [scale=.2]{%
13347   \tikz[#1]{\hex[label=,terrain=#2]}}
13348 \providecommand\clearhex[1] [scale=.2]{\tikz[#1]{\hex[label=]}}
13349 \providecommand\woodshex[1] [scale=.2]{\terrainmark[#1]{woods}}
13350 \providecommand\mountainhex[1] [scale=.2]{\terrainmark[#1]{mountains}}
13351 \providecommand\cityhex[1] [scale=.2]{\terrainmark[#1]{city}}
13352 \providecommand\beachhex[1] [scale=.2]{\terrainmark[#1]{beach}}
13353 \providecommand\seahex[1] [scale=.2]{\tikz[#1]{\hex[label=,fill=sea]}}
13354 \providecommand\riverhex[1] [scale=.2]{%
13355   \tikz[#1]{%
13356     \hex[label=](c=0,r=0)%
13357     \river[] (hex cs:e=SW)--(hex cs:e=NE);}}
13358 \providecommand\roadhex[1] [scale=.2]{%
13359   \tikz[#1]{%
13360     \hex[label=](c=0,r=0)%
13361     \road(hex cs:e=SW)--(hex cs:e=NE);}}

```

5.4.11 Edges, borders, roads, rivers, and so on

Styles of drawing edges, borders, rivers, roads, and railroads.

```

13362 % A decoration to extract outline of a path
13363 \pgfdeclaredecoration{outline}{init}
13364 {%
13365   \state{init}[next state=tick,width=0pt]{
13366     \xdef\outlinerev{}}
13367   \state{tick}[%
13368     width=+\pgfdecorationsegmentlength]%
13369   {

```

```

13370 \pgfpathlineto{\pgfpointadd{\pgfpointorigin}{
13371 \pgfpointpolar{\pgfdecorationsegmentangle}{
13372 +\pgfdecorationsegmentamplitude}}}
13373 \pgf@xa=\pgf@x
13374 \pgf@ya=\pgf@y
13375 \message{^^J\the\pgf@x,\the\pgf@y}
13376 \pgfpointadd{\pgfpointorigin}{
13377 \pgfpointpolar{-\pgfdecorationsegmentangle}{
13378 \pgfdecorationsegmentamplitude}}
13379 \pgfpointtransformed{\pgfpoint{\pgf@x}{\pgf@y}}%
13380 \message{^^J\the\pgf@x,\the\pgf@y}
13381 \xdef\outlinerev{\the\pgf@x/\the\pgf@y,\outlinerev}
13382 \pgf@x=\pgf@xa
13383 \pgf@y=\pgf@ya
13384 }%
13385 \state{final}
13386 {
13387 \pgfpathlineto{\pgfpointdecoratedpathlast}
13388 \foreach \x/\y in \outlinerev{
13389 \ifx\x\empty\else
13390 \ifx\y\empty\else
13391 \pgf@xa=\x
13392 \pgf@ya=\y
13393 \pgf@nlt@lineto{\pgf@xa}{\pgf@ya}
13394 \fi
13395 \fi
13396 }
13397 }%
13398 }%

```

A decoration to make a fortification line

```

13399 \pgfdeclaredecoration{fortification}{initial}
13400 {
13401 \state{initial}[width=4\pgflinewidth]
13402 {
13403 \pgfpathlineto{\pgfpoint{2\pgflinewidth}{0}}
13404 \pgfpathlineto{\pgfpoint{2\pgflinewidth}{2\pgflinewidth}}
13405 \pgfpathlineto{\pgfpoint{4\pgflinewidth}{2\pgflinewidth}}
13406 \pgfpathlineto{\pgfpoint{4\pgflinewidth}{0}}
13407 }
13408 \state{final}
13409 {
13410 \pgfpathlineto{\pgfpointdecoratedpathlast}
13411 }
13412 }

```

Roads, railroads, rivers, borders.

```

13413 \tikzset{
13414 hex/road/.style={
13415 rounded corners=3\pgflinewidth,% .25cm,
13416 color=black,
13417 transform shape,

```

```

13418     scale line widths,
13419     thick,
13420     every hex road/.try,
13421 },
13422 hex/railroad/.style={
13423     %scale line widths,
13424     rounded corners=.25cm,
13425     color=gray!50!black,
13426     transform shape,
13427     every hex railroad/.try,
13428     postaction={draw,decorate},
13429     decoration={ticks,
13430         segment length=9\pgflinewidth,
13431         amplitude=3\pgflinewidth,%.1cm
13432     }
13433 },
13434 hex/river/.style={
13435     color=blue,
13436     scale line widths,
13437     scale rounded corners,
13438     line width=3pt,
13439     transform shape,
13440     every hex river/.try,
13441     decorate,
13442     decoration={random steps,
13443         segment length=3\pgflinewidth,
13444         amplitude=1.5\pgflinewidth,
13445         pre=lineto,
13446         post=lineto,
13447         pre length=.5\pgflinewidth,
13448         post length=.5\pgflinewidth},
13449     rounded corners=.75\pgflinewidth},
13450 hex/border/.style={
13451     color=gray,
13452     dashed,
13453     transform shape,
13454     scale line widths,
13455     very thick,
13456     rounded corners=3\pgflinewidth,
13457     every hex border/.try
13458 },
13459 %
13460 % Fortification line
13461 %
13462 hex/fortified line/.style={
13463     draw=brown!50!black,
13464     scale line widths,
13465     line width=2pt,
13466     every hex fortification line/.try,
13467     decoration={fortification,raise=-2\pgflinewidth},
13468     decorate},
13469 % every river/.style={},
13470 % every road/.style={},

```



```

13471 % every railroad/.style={},
13472 % every border/.style={},
13473 }

```

```

\road
\railroad
\river
\border

```

```

13474 \def\road{%
13475 %\hex@dbg{3}{Road}
13476 \@ifnextchar[{\road@}{\road@[]}%]
13477 }
13478 \def\road@[#1]{\draw[hex/road,every hex road/.try,#1]}
13479 \def\railroad{%
13480 %\hex@dbg{3}{Rail road}
13481 \@ifnextchar[{\railroad@}{\railroad@[]}%]
13482 }
13483 \def\railroad@[#1]{\draw[hex/railroad,every hex railroad/.try,#1]}
13484 \def\river{%
13485 %\hex@dbg{3}{River}
13486 \@ifnextchar[{\river@}{\river@[]}%]
13487 }
13488 \def\river@[#1]{\draw[hex/river,#1]}
13489 \def\border{%
13490 %\hex@dbg{3}{Border}
13491 \@ifnextchar[{\border@}{\border@[]}%]
13492 }
13493 \def\border@[#1]{\draw[hex/border,every hex border/.try,#1]}
13494 \def\fortifiedline{%
13495 \@ifnextchar[{\fortifiedline@}{\fortifiedline@[]}%]
13496 }%
13497 \def\fortifiedline@[#1]{%
13498 \draw[hex/fortified line,every hex fortified line/.try,#1]}

```

5.4.12 Other paths

```
\shiftScalePath
```

Shifts and scales a path and defines a macro to contain the path

```
\shiftScalePath{<macro>}{<relative-coordinates>}
```

where *<relative-coordinates>* is a comma separated list of relative coordinates (to the lower-left and upper-right corners)

```
<x>/<y>
```

Note, this requires that `\boardXmin`, `\boardYmin` and `\boardXmax`, `\boardYmax` is defined. This can be done using the `\boardframe` macro.

```
13499 \def\shiftScalePath#1#2{%
```

```

13500 \let\tmp@path\@undefined%
13501 \foreach \x/\y in {#2}{%
13502   \pgfmathparse{\x*\boardW+\boardXmin}\xdef\tmp@x{\pgfmathresult}%
13503   \pgfmathparse{\y*\boardH+\boardYmin}\xdef\tmp@y{\pgfmathresult}%
13504   \@ifundefined{tmp@path}{\def\tmp@path{}}{\xdef\tmp@path{\tmp@path--}}%
13505   \xdef\tmp@path{\tmp@path(\tmp@x,\tmp@y)}%
13506 \expandafter\xdef\csname #1\endcsname{\tmp@path}}

```

5.4.13 Move, attacks, retreats from hex to hex

```
\hex@getscale
```

Get current scaling factor.

```

13507 \def\hex@getscale#1{%
13508   \begingroup
13509   \pgfgettransformentries{%
13510     \scaleA}{%
13511     \scaleB}{%
13512     \scaleC}{%
13513     \scaleD}{%
13514     \whatevs}{%
13515     \whatevs}%
13516   \pgfmathsetmacro{#1}{sqrt(abs(\scaleA*\scaleD-\scaleB*\scaleC))}%
13517   \expandafter
13518   \endgroup
13519   \expandafter\def\expandafter#1\expandafter{#1}%
13520 }

```

Key to get the scale

```

13521 \tikzset{%
13522   hex/get scale/.code={
13523     \hex@getscale{\hex@scale}},
13524 }

```

Style for moves. Use like

```
\path[move] <coordinates>;
```

```

13525 \tikzset{%
13526   % Argument is colour
13527   hex/move/.style={
13528     hex/get scale,
13529     decorate,
13530     decoration={
13531       markings,
13532       mark=between positions 0 and 1 step 0.75*\hex@scale*\hex@dy with {
13533         \node [single arrow,
13534           single arrow head extend=.1*\hex@scale*\hex@dy,
13535           fill=#1,
13536           inner sep=0.05*\hex@scale*\hex@dy,
13537           minimum width=0.02*\hex@scale*\hex@dy,

```

```

13538             minimum height=\hex@scale*\hex@dy/2,
13539             transform shape]{};
13540         }
13541     },
13542 },

```

A short move style

```
\path[short move] <coordinates>;
```

```

13543 % Argument is colour
13544 hex/short move/.style={
13545     hex/get scale,
13546     decorate,
13547     decoration={
13548         markings,
13549         mark=between positions 0 and 1 step 0.5*\hex@scale*\hex@dy with {
13550             \node [single arrow,
13551                 single arrow head extend=.1*\hex@scale*\hex@dy,
13552                 fill=#1,
13553                 inner sep=0.05*\hex@scale*\hex@dy,
13554                 minimum width=0.02*\hex@scale*\hex@dy,
13555                 minimum height=\hex@scale*\hex@dy/3,
13556                 transform shape]{};
13557         }
13558     },
13559 },

```

A short move style

```
\path[long move] <coordinates>;
```

```

13560 % Argument is colour
13561 hex/long move/.style={
13562     hex/get scale,
13563     transform shape,
13564     decorate,
13565     decoration={
13566         markings,
13567         mark=between positions 0 and -.7*\hex@scale*\hex@dy
13568         step 2*\hex@scale*\hex@dy with {
13569             \node [single arrow,
13570                 single arrow head extend=3pt,
13571                 fill=#1,
13572                 anchor=west,
13573                 inner sep=\hex@scale*.25mm,
13574                 outer sep=.3*\hex@scale*\hex@dy,
13575                 minimum width=0.02*\hex@scale*\hex@dy,
13576                 minimum height=1.4*\hex@scale*\hex@dy,
13577                 transform shape]{};
13578         }
13579     },
13580 },

```

A short move style

```
\path[move with start] <coordinates>;
```

```
13581 % Argument is colour
13582 hex/move with start/.style={
13583   hex/get scale,
13584   decorate,
13585   decoration={
13586     markings,
13587     mark=at position 0 with {
13588       \node [inner sep=0,
13589         circle,
13590         minimum size=\hex@scale*5mm,
13591         fill=#1,
13592         transform shape] {};},
13593     mark=between positions 0 and 1 step 0.75*\hex@scale*\hex@dy with {
13594       \node [single arrow,
13595         single arrow head extend=.1*\hex@scale*\hex@dy,
13596         fill=#1,
13597         inner sep=0.05*\hex@scale*\hex@dy,
13598         minimum width=0.02*\hex@scale*\hex@dy,
13599         minimum height=\hex@scale*\hex@dy/2,
13600         transform shape]{};
13601     }
13602   },
13603 },
13604 % Default fill colour is black
13605 hex/move/.default=black,
13606 hex/move with start/.default=black,
13607 hex/short move/.default=black,
13608 hex/long move/.default=black,
13609 % Arguments are draw and fill color
```

A move cost style

```
\path[move] ... (coordinate) node[hex/move cost] ...;
```

```
13610 hex/move cost/.style 2 args={
13611   minimum size=1mm,
13612   inner sep=0.1mm,
13613   circle,
13614   fill=#2,
13615   transform shape,
13616   text=#1,
13617   font=\sffamily\bfseries\fontsize{14.4}{17}\selectfont},
13618 hex/move cost/.default={black}{none},
13619 % Argument is fill colour
```

A short line style for retreats, advances, and so on

```
\path[short line] (start)--(end);
```

```
13620 hex/short line/.style={%
13621   hex/get scale,
13622   inherit options/.code={\csname tikz@options\endcsname},
13623   inherit options,
```

```

13624   decorate,
13625   decoration={
13626     markings,
13627     mark=between positions \hex@scale*\hex@dy
13628     and 1 step 2*\hex@scale*\hex@dy with {
13629       \node [single arrow,draw=black,fill=#1,
13630         single arrow head extend=\hex@scale*3pt,
13631         inner sep=1mm,
13632         minimum width=0.75*\hex@scale*\hex@dy,
13633         minimum height=\hex@scale*\hex@dy,
13634         transform shape]{};
13635     }
13636   },
13637 },

```

An attack indication style

```
\path[attack] (start)--(end);
```

```

13638 % Argument is fill color
13639 hex/attack/.style={
13640   hex/get scale,
13641   inherit options/.code={\csname tikz@options\endcsname},
13642   inherit options,
13643   decorate,
13644   decoration={
13645     markings,
13646     mark=between positions \hex@scale*\hex@dy
13647     and 1 step 2*\hex@scale*\hex@dy with {
13648       \node [regular polygon,
13649         fill=#1,
13650         draw=#1,
13651         regular polygon sides=3,
13652         inner sep=0,
13653         minimum size=0.75*\hex@scale*\hex@dy,
13654         rotate=-90,
13655         transform shape]{};
13656     }
13657   },
13658 },

```

Short hands

```
\path[attack] (start)--(end);
```

```

13659 % Default colour is red for attacks
13660 hex/attack/.default=red!70!black,
13661 %%
13662 hex/retreat/.style={hex/short line=#1},
13663 hex/retreat/.default=white,
13664 %%
13665 hex/advance/.style={hex/short line=#1},
13666 hex/advance/.default={green!70!black},
13667 }

```

5.4.14 Board clipping and frame

```
\boardframe
```

Define the bounding box around the board

```
\boardframe[margin](lower-left)(upper-right){margin}
```

where *lower-left* and *upper-right* specifies the lower left and upper right hexes (inclusive) of the board.

```
13668 \def\boardframe{%
13669   \@ifnextchar[{\bo@rdframe}{\bo@rdframe[0]}%]
13670 }
```

Below is our new implementation of `\boardframe`. This is split into parts.

First, a macro that will define the path around rectangular placed hexes. This takes 4 mandatory arguments: lower left column and row, and upper right column and row, in that order. It also accepts an optional argument. If this is not empty, then it is assumed to be a style to apply, and hexes will be drawn using that style. The style will be passed the hex coordinates and can react accordingly.

```
13671 \def\bo@rdframe{
13672   \@ifnextchar[{\bo@rdframe}{\bo@rdframe[]}%]
13673 }
13674 \def\bo@rdframe@u(#1)#2#3#4#5{
13675   \hex@coords@conv{#1}
13676   % \hex@dbg{0}{#1 -> '\hex@x', '\hex@y'}
13677   \pgfmathparse{min(#2, \hex@x)}\xdef#2{\pgfmathresult}
13678   \pgfmathparse{min(#3, \hex@y)}\xdef#3{\pgfmathresult}
13679   \pgfmathparse{max(#4, \hex@x)}\xdef#4{\pgfmathresult}
13680   \pgfmathparse{max(#5, \hex@y)}\xdef#5{\pgfmathresult}
13681   \hex@dbg{2}{#1 -> ll='#2', '#3', ur='#4', '#5'}
13682 }
13683 \def\bo@rdframe@[#1]#2#3#4#5{
13684   % Define rtmp and a ctmp to by directions
13685   \pgfmathparse{int(\hex@coords@row@fac)}\edef\rtmp{\pgfmathresult}
13686   \pgfmathparse{int(\hex@coords@col@fac)}\edef\ctmp{\pgfmathresult}
13687   % Define vertices for path
13688   \def\ctfv{SW}
13689   \def\ctsv{SE}
13690   \def\cbfv{NE}
13691   \def\cbsv{NW}
13692   \def\rrfv{E}
13693   \def\rrsv{NE}
13694   \def\rlfv{W}
13695   \def\rlsv{SW}
13696   % Swap around some definitions based on the row direction
13697   \ifnum\rtmp<0
13698     \let\max@short\hex@bot@short@col
13699     \let\min@short\hex@top@short@col
13700     \let\swp\ctfv\let\ctfv\cbsv\let\cbsv\swp
13701     \let\swp\ctsv\let\ctsv\cbfv\let\cbfv\swp
13702     \def\rrsv{SE}
13703     \def\rlsv{NW}
```

```

13704 \else
13705   \let\max@short\hex@top@short@col
13706   \let\min@short\hex@bot@short@col
13707 \fi
13708 % Swap around some definitions based on the column direction
13709 \ifnum\ctmp<0
13710   \let\swp\ctfv\let\ctfv\ctsv\let\ctsv\swp
13711   \let\swp\cbfv\let\cbfv\csv\let\csv\swp
13712   \let\swp\rrfv\let\rrfv\rlsv\let\rlsv\swp
13713   \let\swp\rsv\let\rsv\rlfv\let\rlfv\swp
13714 \fi
13715 % Define tmp = 0 if no shorts, 1 if top short, 2 if both
13716 \pgfmathparse{ifthenelse(\hex@got@top@short,
13717   ifthenelse(\hex@got@bot@short,2,1),0)}\edef\tmp{\pgfmathresult}
13718 % If top-short, set factors
13719 \ifnum\tmp=1
13720   \def\mnf{-1}
13721   \def\mxf{-1}
13722   \def\mnn{}
13723   \def\mxn{}
13724 % If both short, set factors
13725 \else\ifnum\tmp=2
13726   \def\mnf{\rtmp}
13727   \def\mxf{(-\rtmp)}
13728   % If inverse rows, set factors
13729   \ifnum\rtmp<0
13730     \def\mnn{}
13731     \def\mxn{not}
13732   \else
13733     \def\mnn{not}
13734     \def\mxn{}
13735   \fi
13736 % If none is short
13737 \else
13738   \def\mnf{1}
13739   \def\mxf{1}
13740   \def\mnn{not}
13741   \def\mxn{not}
13742 \fi\fi
13743 % Define row@mn to give least row of column
13744 \def\row@mn##1{%
13745   \pgfmathparse{int(#3+\mnf*
13746     \hex@coords@row@fac*\min@short(##1)*
13747     \mnn(\min@short(\hex@coords@col@off)))}
13748   \edef\lr{\pgfmathresult}}
13749 % Define row@mx to give largest row of column
13750 \def\row@mx##1{%
13751   \pgfmathparse{int(#5+\mxf*
13752     \hex@coords@row@fac*\max@short(##1)*
13753     \mxn(\max@short(\hex@coords@col@off)))}
13754   \edef\ur{\pgfmathresult}}
13755 %
13756 %

```

```

13757 % Below defines a path around the perimeter of the hexes.
13758 %
13759 \def\@llx{10000}
13760 \def\@lly{10000}
13761 \def\@urx{-10000}
13762 \def\@ury{-10000}
13763 % Start with an empty path
13764 \def\p{}
13765 % Loop across least row (can be top if \rtmp<0)
13766 \foreach \c in {#2,...,#4}{%
13767   \row@mn{\c}
13768   \row@mx{\c}
13769   % \message{^^JColumn: '\c' -> '\lr','\ur' (#3,#5)}
13770 }
13771 \foreach \c in {#2,...,#4}{%
13772   \row@mn{\c}
13773   \xdef\p{\p
13774     (hex cs:c=\c,r=\lr,v=\ctfv)--
13775     (hex cs:c=\c,r=\lr,v=\ctsv)--}
13776   \bo@rdfr@me@c(c=\c,r=\lr,v=\ctfv)\@llx\@lly\@urx\@ury
13777   \bo@rdfr@me@c(c=\c,r=\lr,v=\ctsv)\@llx\@lly\@urx\@ury
13778 }
13779 % Go up (down if \rtmp<0) right side
13780 \row@mn{#4}
13781 \row@mx{#4}
13782 \foreach \r in {\lr,...,\ur}{%
13783   \xdef\p{\p
13784     (hex cs:c=#4,r=\r,v=\rrfv)--
13785     (hex cs:c=#4,r=\r,v=\rrsv)--}
13786   \bo@rdfr@me@c(c=#4,r=\r,v=\rrfv)\@llx\@lly\@urx\@ury
13787   \bo@rdfr@me@c(c=#4,r=\r,v=\rrsv)\@llx\@lly\@urx\@ury
13788 }
13789 % Go across largest row (can be bottom if \rtmp<0)
13790 \foreach \c in {#4,...,#2}{%
13791   \row@mx{\c}
13792   % \message{^^JColumn: '\c', max:'\ur'}
13793   \xdef\p{\p
13794     (hex cs:c=\c,r=\ur,v=\cbfv)--
13795     (hex cs:c=\c,r=\ur,v=\cbsv)--}
13796   \bo@rdfr@me@c(c=\c,r=\ur,v=\cbfv)\@llx\@lly\@urx\@ury
13797   \bo@rdfr@me@c(c=\c,r=\ur,v=\cbsv)\@llx\@lly\@urx\@ury
13798 }
13799 % Go up (down if \rtmp<0) left side.
13800 \row@mn{#2}
13801 \row@mx{#2}
13802 \foreach \r in {\ur,...,\lr}{%
13803   \xdef\p{\p
13804     (hex cs:c=#2,r=\r,v=\rlfv)--
13805     (hex cs:c=#2,r=\r,v=\rlsv)--}
13806   \bo@rdfr@me@c(c=#2,r=\r,v=\rlfv)\@llx\@lly\@urx\@ury
13807   \bo@rdfr@me@c(c=#2,r=\r,v=\rlsv)\@llx\@lly\@urx\@ury
13808 }
13809 % End path with cycle

```



```

13810 \edef\p{\p cycle}
13811 % Define global path
13812 \global\let\hex@board@path\p
13813 \hex@dbg{3}{Hex board path: '\meaning\hex@board@path'}
13814 % If an optional argument was given, then use that to actually make
13815 % hexes.
13816 \ifx|#1|\else
13817   \foreach[count=\nc] \c in {#2,...,#4}{%
13818     \row@mn{\c}
13819     \row@mx{\c}
13820     \foreach \r in {\lr,...,\ur}{%
13821       \hex[#1={\c,\r}](c=\c,r=\r)
13822     }
13823   }
13824 \fi
13825 }

```

This is a no operations style used as default for the macro `\boardhexes` below.

```

13826 \tikzset{%
13827   /hex/board/no op/.style args={#1,#2}{}}

```

This macro will make the actual hexes using the specified, optional, style. It builds on `\bo@rdfr@me` above.

```

13828 \def\boardhexes{%
13829   \@ifnextchar[{\bo@rdhexes}{\bo@rdhexes[board/no op]}%]
13830 }
13831 \def\bo@rdhexes[#1](#2)(#3){%
13832   \hex@coords@conv{#2}
13833   \edef\llc{\hex@col}
13834   \edef\llr{\hex@row}
13835   \hex@coords@conv{#3}
13836   \edef\urc{\hex@col}
13837   \edef\urr{\hex@row}
13838   \bo@rdfr@me[#1]{\llc}{\llr}{\urc}{\urr}}

```

Creates a board frame using `\bo@rdfr@me`.

```

13839 \tikzset{board frame bb/.code={
13840   \pgfkeys{
13841     %/tikz/local bounding box=tmp board frame,
13842     /tikz/transform shape,
13843     /tikz/execute at end scope={%
13844       % \hex@dbg{1}{Getting board frame BB}
13845       %\wg@get@bb{tmp board frame}
13846       \global\let\llx\@llx
13847       \global\let\lly\@lly
13848       \global\let\urx\@urx
13849       \global\let\ury\@ury
13850       % \hex@dbg{0}{Board bounding box (\llx,\lly)x(\urx,\ury)}
13851     }}}
13852
13853 \def\bo@rdframe[#1](#2)(#3){%
13854   \hex@coords@conv{#2}

```

```

13855 \edef\llc{\hex@col}
13856 \edef\llr{\hex@row}
13857 %
13858 \hex@coords@conv{#3}
13859 \edef\urc{\hex@col}
13860 \edef\urr{\hex@row}
13861 %
13862 \def\margin{#1}
13863 %
13864 % This will store the bounding box in tmp node 'board frame'
13865 \bo@rdr@me{\llc}{\llr}{\urc}{\urr}%
13866 \begin{scope}[board frame bb]
13867 \expandafter\path\hex@board@path;
13868 \end{scope}
13869 \hex@dbg{1}{Board frame LL: -> '\llx','\lly'}
13870 \pgfmathparse{\llx+ifthenelse(\llx<0,-1,1)*\margin}\edef\llx{\pgfmathresult}
13871 \pgfmathparse{\lly+ifthenelse(\lly<0,-1,1)*\margin}\edef\lly{\pgfmathresult}
13872 %
13873 \hex@dbg{1}{Board frame UR: -> '\urx','\ury'}
13874 \pgfmathparse{\urx+ifthenelse(\urx<0,-1,1)*\margin}\edef\urx{\pgfmathresult}
13875 \pgfmathparse{\ury+ifthenelse(\ury<0,-1,1)*\margin}\edef\ury{\pgfmathresult}
13876 %
13877 \pgfmathparse{\urx-\llx}\edef\w{\pgfmathresult}
13878 \pgfmathparse{\ury-\lly}\edef\h{\pgfmathresult}
13879 %% Print to the log
13880 \hex@dbg{0}{Board Frame: (\llx,\lly)x(\urx,\ury) (\w x\h) (\llc,\llr)x(\urc,\urr)}
13881 %% Possibly draw
13882 \draw[hex/board frame/.try](\llx,\lly) rectangle(\urx,\ury);
13883 %% Store macros
13884 \xdef\boardXmin{\llx}%
13885 \xdef\boardYmin{\lly}%
13886 \xdef\boardXmax{\urx}%
13887 \xdef\boardYmax{\ury}%
13888 }

```

\boardclip

Clip the board to not show incomplete hexes

\boardclip{<nx>}{<ny>}{<preaction>}

```

13889 \def\boardpath{#1}{#2}{
13890 \hex@coords@reset%
13891 \tikzset{/hex/coords/.cd, #1}
13892 \edef\llc{\hex@col}
13893 \edef\llr{\hex@row}
13894 %%
13895 \hex@coords@reset%
13896 \tikzset{/hex/coords/.cd, #2}
13897 \edef\urc{\hex@col}
13898 \edef\urr{\hex@row}
13899
13900 % This will store the bounding box in tmp node 'board frame'

```

```

13901 \bordfr@me{\llc}{\llr}{\urc}{\urr}%
13902 %% Use the path to extract the bounding box
13903 %\begin{scope}[local bounding box=board frame]
13904 % \expandafter\path\hex@board@path;
13905 %\end{scope}
13906 \global\let\hexboardpath\hex@board@path
13907 }
13908

13909 \def\boardclip(#1)(#2)#3{%
13910 \boardpath(#1)(#2)
13911 \draw \ifx|#3|\else[preaction={#3}]\fi%
13912 [clip] \hexboardpath;
13913 }
13914

```

`\debuggrid`

Show a debug grid. This requires `\boardframe`.

```

13915 \def\debuggrid{%
13916 \foreach \i in {0,0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8,0.9,1} {%
13917 \pgfmathparse{\i*\boardW+\boardXmin}%
13918 \edef\debug@x{\pgfmathresult}%
13919 \draw [very thin,gray] (\debug@x,\boardYmin) --
13920 (\debug@x,\boardYmax) node [below,rotate=90] at
13921 (\debug@x,\boardYmin) {\i}; }%
13922 \foreach \i in {0,0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8,0.9,1} {%
13923 \pgfmathparse{\i*\boardH+\boardYmin}%
13924 \edef\debug@x{\pgfmathresult}%
13925 \draw [very thin,gray] (\boardXmin,\debug@x) --
13926 (\boardXmax,\debug@x) node [left,rotate=90] at
13927 (\boardXmin,\debug@x) {\i}; } }

```

Some dummy styles. These will be defined by the export class to facilitate getting information from the board.

```

13928 \tikzset{%
13929 zoned/.style={},
13930 zone scope/.style={},
13931 zone path/.style={}
13932 }

```

5.4.15 Board splitting

`\splitboard`

Calculates how to split a board into sheets of paper.

`\splitboard[options]`

where options are

- `paper=format`: Specifies the paper format. One of `a4`, `a3`, `letter`, `tabloid`. Default is `a4`.

- **landscape**: Sets the paper format to be in landscape mode (default is portrait).
- **margin**= $\langle size\ in\ centimetres \rangle$: Size of margins on each sheet in centimetres *without* unit. That is put 0.6 for 6mm, *not* 6mm. Default is 0.6. This should be *slightly* larger (by roughly 5%) than the *least* margin required by the printer used. *Must* be given *before* **paper** to have any effect.
- **ncol**= $\langle number\ of\ columns \rangle$: Sets the number of columns of sheets.
- **nrow**= $\langle number\ of\ rows \rangle$: Set the number of rows of sheets.
- **overlap**= $\langle size\ in\ centimetres \rangle$: Sets the size of the overlap between sheets in centimetres *without* unit. That is put 2 for 2cm, *not* 2cm. Default is 2.
- **image**= $\langle file\ name \rangle$: File name of the board image (a PDF). Default is **board**
- **output**= $\langle file\ name \rangle$: File name (without **.tex** ending) to write calculated split to.
- **standalone**: Boolean flag. If true, then output file will be a standalone document (i.e., has a **\documentclass**).
- **scale**= $\langle scale \rangle$: Set scale of board.

The macro will produce a file named `\jobname_out.tex` which can be included in another document to generate the split board PDF.

To use, make, for example, the file `calcsplit.tex` with the content

```
\documentclass[11pt]{standalone}
\usepackage{wargame}
\usepackage{mystyle}
\begin{document}
\splitboard{paper=letter,margin=.7,ncol=2,nrow=2,overlap=1}
\end{document}
```

to calculate the split of `board.pdf` over 2×2 letter paper sheets, with a non-printable margin of 7mm, and an overlap between the segments of 1cm.

The final split document can then be

```
\documentclass[11pt]{article}
\usepackage[letterpaper,margin=7mm]{geometry}
\begin{document}
\input{calcsplit_out}
\end{document}
```

If you need to scale down the board, define the style `board scale`. E.g.,

```
\tikzset{board scale/.style={scale=.9}}
```

Styles used for drawing things.

```
13933 \tikzset{%
```

```

13934 % Margin must be <1cm
13935 split/paper outline/.style={
13936   shape=rectangle,
13937   draw=red!50!black,
13938   line width=.5mm},
13939 split/effective outline/.style={
13940   shape=rectangle,
13941   draw=green!50!black,
13942   dashed,
13943   line width=.5mm},
13944 split/board outline/.style={%
13945   draw=magenta,
13946   line width=.5mm,
13947   dotted},
13948 }

```

A scratch dimension used

```
13949 \newdimen\split@tmp
```

Get upper right and lower left corners of node. Argument is node name.

```

13950 \def\split@getem#1{%
13951   \draw (#1.north east);%
13952   \pgfgetlastxy{\split@ulx}{\split@uly}%
13953   \xdef\split@ulx{\split@ulx}%
13954   \xdef\split@ulx{\split@ulx}%
13955   \draw (#1.south west);%
13956   \pgfgetlastxy{\split@lrx}{\split@lry}%
13957   \xdef\split@lrx{\split@lrx}%
13958   \xdef\split@lry{\split@lry}%
13959 }

```

Get board dimensions. Argument is node name.

```

13960 \def\split@getboard#1{%
13961   \split@getem{#1}%
13962   \xdef\split@bulx{\split@ulx}%
13963   \xdef\split@buly{\split@uly}%
13964   \xdef\split@blrx{\split@lrx}%
13965   \xdef\split@blry{\split@lry}%
13966   \split@w{\@percentchar\space Board:
13967     (\split@bulx,\split@buly)(\split@blrx,\split@blry)}}

```

Adjust placement of markers and cut lines.

1. Dimension to adjust
2. Overlap dimension (with units)

```

13968 \def\split@adj#1#2{%
13969   \split@tmp=#2%
13970   \divide\split@tmp by 2%
13971   \advance\split@tmp by #1%
13972   \edef\t{\the\split@tmp}}

```

Get initial offset in a direction.

1. Number of segments in direction
2. Overlap in centimetres (without unit)
3. Effective size, in centimetres (without unit), of sheets in direction
4. Full size, in centimetres (without unit), of board in direction.

```
13973 \def\split@get@init#1#2#3#4{%
13974   \pgfmathparse{((#1 * #3 - (#1 - 1) * #2) - #4)/2}%
13975   \xdef\split@off{\pgfmathresult}%
13976   \hex@dbg{2}{((#1 * #3 - (#1 - 1) * #2) - #4)/2 -> '\split@off'}}
```

Get initial offset of first segment.

1. Number of rows
2. Number of columns
3. Overlap in centimetres (without unit)
4. Effective height, in centimetres (without unit), of sheets
5. Effective width, in centimetres (without unit), of sheets
6. Full height, in centimetres (without unit), of board
7. Full width, in centimetres (without unit), of board

```
13977 \def\split@get@init#1#2#3#4#5#6#7{%
13978   \split@get@init{#1}{#3}{#4}{#6}\xdef\dy{\split@off cm}
13979   \split@get@init{#2}{#3}{#5}{#7}\xdef\dx{\split@off cm}}
```

Get coordinates of a segment

1. Column number
2. Row number
3. Overlap, in centimetres (without unit)

```
13980 \def\split@get@coords#1#2#3{%
13981   \hex@dbg{2}{Getting coords 'c#1r#2'}%
13982   \split@getem{c#1r#2}%
13983   \edef\sulx{\split@ulx}%
13984   \edef\suly{\split@uly}%
13985   \edef\slrx{\split@lrx}%
13986   \edef\slry{\split@lry}%
13987   \edef\mlx{\split@blrx}%
13988   \edef\mrx{\split@bulx}%
13989   \edef\mty{\split@buly}%
13990   \edef\mby{\split@blry}%
13991   \pgfmathparse{int(#1-1)}\edef\pc{\pgfmathresult}%
```

```

13992 \pgfmathparse{int(#2-1)}\edef\pr{\pgfmathresult}%
13993 \pgfmathparse{int(#1+1)}\edef\nc{\pgfmathresult}%
13994 \pgfmathparse{int(#2+1)}\edef\nr{\pgfmathresult}%
13995 \pgfutil@ifundefined{pgf@sh@ns@c\pc r#2}{}{% Left
13996   \hex@dbg{3}{\space Getting left 'c\pc r#2'}%
13997   \split@getem{c\pc r#2}\split@adj{\split@ulx}{-#3}\edef\mlx{\t}}%
13998 \pgfutil@ifundefined{pgf@sh@ns@c\nc r#2}{}{% Right
13999   \hex@dbg{3}{\space Getting right 'c\nc r#2'}%
14000   \split@getem{c\nc r#2}\split@adj{\split@lrx}{#3}\edef\mrx{\t}}%
14001 \pgfutil@ifundefined{pgf@sh@ns@c#1r\pr}{}{% Above
14002   \hex@dbg{3}{\space Getting above 'c#1 r\pr'}%
14003   \split@getem{c#1r\pr}\split@adj{\split@lry}{#3} \edef\mty{\t}}%
14004 \pgfutil@ifundefined{pgf@sh@ns@c#1r\nr}{}{% Below
14005   \hex@dbg{3}{\space Getting below 'c#1 r\nr'}%
14006   \split@getem{c#1r\nr}\split@adj{\split@uly}{-#3}\edef\mby{\t}}%
14007 \draw[fill=red] (\mlx,\mty) circle(.2);%
14008 \draw[fill=green] (\mrx,\mty) circle(.4);%
14009 \draw[fill=blue] (\mlx,\mby) circle(.6);%
14010 \draw[fill=cyan] (\mrx,\mby) circle(.8);%
14011 \split@w{%
14012   \@percentchar^^J%
14013   \string\segment(\sulx,\suly)(\slrx,\slry){\mlx}{\mrx}{\mby}{\mty}
14014   \@percentchar\space c#1r#2}
14015 }

```

Stream to write to

```
14016 \newwrite\split@calcout
```

Short-hand for write outs.

```
14017 \def\split@w{\immediate\write\split@calcout}
```

Open stream and set-up

```

14018 \def\split@header#1{%
14019   \immediate\openout\split@calcout=#1.tex
14020   \ifsplit@standalone
14021     \pgfmathparse{\split@margin*.95}\edef\tmp{\pgfmathresult}
14022     \split@w{\@percentchar\@percentchar\space These are made with
14023       'calcsplit' with '-jobname \jobname'}
14024     \split@w{
14025       ^^J\string\documentclass[twoside]{article}
14026       ^^J\string\usepackage{geometry}
14027       ^^J\string\geometry{papersize={\the\paperwidth,\the\paperheight},margin=\tmp cm}
14028       ^^J\string\usepackage{wargame}
14029       ^^J\string\setlength{\string\parindent}{0pt}
14030       ^^J\string\setlength{\string\parskip}{0pt}
14031       ^^J\string\begin{document}
14032       ^^J\string\ignorespaces\@percentchar}
14033     \fi
14034     \split@w{\string\def\string\boardfile{\split@img}\@percentchar}
14035     \split@w{\string\def\string\boardscale{\split@scale}\@percentchar}
14036 }

```

Write final stuff and close stream

```

14037 \def\split@footer{%
14038   \ifsplit@standalone
14039   \split@w{^^J\string\end{document}}
14040   \fi
14041   \split@w{^^J\@percentchar\@percentchar End of '\jobname'^^J}
14042   \immediate\closeout\split@calcout
14043 }

```

Initial calculations. This draws the board and then extracts the dimensions of the board. It also defines some styles for drawing the board segments.

```

14044 \def\split@init#1{%
14045   \node[scale=\split@scale,
14046     inner sep=0pt,
14047     outer sep=0pt,
14048     anchor=north west,
14049     transform shape](b){\includegraphics{#1}};
14050   \split@getboard{b}
14051   %x
14052   \split@tmp=\split@blrx cm\advance\split@tmp by -\split@bulx%
14053   \wg@pt@to@cm{\split@tmp}\edef\split@bw{\pgfmathresult}%
14054   \pgfmathparse{abs(\split@bw)}\edef\split@bw{\pgfmathresult}%
14055   %
14056   \split@tmp=\split@buly cm\advance\split@tmp by -\split@blry%
14057   \wg@pt@to@cm{\split@tmp}\edef\split@bh{\pgfmathresult}%
14058   \pgfmathparse{abs(\split@bh)}\edef\split@bh{\pgfmathresult}%
14059   %
14060   \wg@pt@to@cm{\paperwidth}\edef\split@pw{\pgfmathresult}%
14061   \wg@pt@to@cm{\paperheight}\edef\split@ph{\pgfmathresult}%
14062   %
14063   \wg@pt@to@cm{\textwidth}\edef\split@ew{\pgfmathresult}%
14064   \wg@pt@to@cm{\textheight}\edef\split@eh{\pgfmathresult}%
14065   %
14066   \hex@dbg{1}{Board:
14067     (\split@bulx,\split@buly)(\split@blrx,\split@blry) \split@bw x\split@bh
14068     ^^JPaper: \split@pw x\split@ph
14069     ^^JEffective: \split@ew x\split@eh
14070   }
14071   \tikzset{
14072     split/paper size/.style={
14073       shape=rectangle,
14074       minimum width=\paperwidth,
14075       minimum height=\paperheight,
14076       split/paper outline,
14077     },
14078     split/effective size/.style={
14079       shape=rectangle,
14080       minimum width=\textwidth,
14081       minimum height=\textheight,
14082       split/effective outline},
14083     split/board size/.style={
14084       shape=rectangle,

```



```

14085     minimum width=\split@bw cm,
14086     minimum height=\split@bh cm,
14087     split/board outline}}
14088 \node[board/.try,split/board size,anchor=north west] {};
14089 }

```

Calculate effective sheet sizes from sheet dimensions and the defined margin.

```

14090 \def\split@text@dim#1{%
14091   \textwidth=\paperwidth%
14092   \textheight=\paperheight%
14093   \advance\textwidth by -#1cm%
14094   \advance\textwidth by -#1cm%
14095   \advance\textheight by -#1cm%
14096   \advance\textheight by -#1cm%
14097   \global\textwidth=\textwidth%
14098   \global\textheight=\textheight%
14099 }

```

Options for the `\splitboard` macro.

```

14100 \newif\ifsplit@standalone\split@standalonetrue
14101 \tikzset{%
14102   split/.search also={/tikz},%
14103   split/.cd,%
14104   margin/.store in=\split@margin,
14105   paper/.is choice,%
14106   paper/a4/.code={%
14107     \hex@dbg{3}{A4 paper for split}%
14108     \global\paperwidth=21cm%
14109     \global\paperheight=29.7cm%
14110     \split@text@dim{\split@margin}},
14111   paper/a3/.code={%
14112     \hex@dbg{3}{A3 paper for split}%
14113     \global\paperheight=42cm%
14114     \global\paperwidth=29.7cm%
14115     \split@text@dim{\split@margin}},
14116   paper/letter/.code={%
14117     \hex@dbg{3}{Letter paper for split}
14118     \paperheight=27.9cm,%
14119     \paperwidth=21.6cm,%
14120     \split@text@dim{\split@margin}},%
14121   paper/tabloid/.code={%
14122     \hex@dbg{3}{Tabloid paper for split}%
14123     \paperheight=43.2cm,%
14124     \paperwidth=27.9cm,%
14125     \split@text@dim{\split@margin}},
14126   landscape/.code={%
14127     \hex@dbg{3}{Landscape option for split}
14128     \split@tmp=\paperheight
14129     \global\paperheight=\paperwidth
14130     \global\paperwidth=\split@tmp
14131     \split@tmp=\textheight
14132     \global\textheight=\textwidth

```

```

14133   \global\textwidth=\split@tmp},
14134   standalone/.is if=split@standalone,
14135   scale/.store in=\split@scale,
14136   output/.store in=\split@out,
14137   ncol/.store in=\split@ncol,
14138   nrow/.store in=\split@nrow,
14139   overlap/.store in=\split@ov, % Centimeter, no unit
14140   image/.store in=\split@img,
14141   paper/.default=a4, paper/.initial=a4,
14142   margin/.default=.6, margin/.initial=.6,
14143   ncol/.default=0, ncol/.initial=0,
14144   nrow/.default=0, nrow/.initial=0,
14145   overlap/.default=2, overlap/.initial=2,
14146   image/.default=board, image/.initial=board,
14147   output/.default=\jobname_out,
14148   standalone/.default=true,
14149   scale/.default=1,
14150 }

```

The actual macro. The argument is key-value pairs of options.

```

14151 \def\splitboard#1{%
14152   \pgfkeys{/tikz/split/.cd,%
14153     standalone,%
14154     output,%
14155     margin,%
14156     paper,%
14157     image,%
14158     overlap,%
14159     scale,%
14160     ncol,%
14161     nrow,%
14162     #1}
14163   \hex@dbg{1}{%
14164     Paper:      '\the\paperwidth'x'\the\paperheight'
14165     ^^JEffective: '\the\textwidth'x'\the\textheight'
14166     ^^JNcols:   '\split@ncol'
14167     ^^JNrows:   '\split@nrow'
14168     ^^JOverlap: '\split@ov' cm}
14169   \split@header{\split@out}
14170   \begin{tikzpicture}
14171     \split@init{\split@img}
14172     \split@getinit{%
14173       \split@nrow}{%
14174       \split@ncol}{%
14175       \split@ov}{\split@eh}{\split@ew}{\split@bh}{\split@bw}
14176   \node[split/effective size,
14177     above left=\dy and \dx of b.north west,
14178     anchor=north west] (c1r1) {};
14179   \node[split/paper size] at (c1r1) {};
14180   %
14181   \foreach \r [remember=\r as \pr (initially 0)] in {1,...,\split@nrow}{%
14182     \ifnum\r>1
14183       \hex@dbg{3}{Placing first column of row '\r'}

```

```

14184     \node[split/effective size,
14185     below=-\split@ov cm of c1r\pr.south west,anchor=north west] (c1r\r){};
14186     \node[split/paper size] at (c1r\r) {};
14187     \fi
14188     \foreach \c [remember=\c as \pc (initially 1)] in {2,...,\split@ncol}{%
14189     \ifnum\c>\split@ncol\else%
14190     \ifnum\c>\pc
14191     \hex@dbg{3}{Placing column ‘\c’ (‘\pc’) of row ‘\r’}
14192     \node[split/effective size,
14193     right=-\split@ov cm of c\pc r\r.north east,anchor=north west]
14194     (c\c r\r) {};
14195     \node[split/paper size] at (c\c r\r) {};
14196     \fi
14197     \fi
14198     }
14199     }
14200     \foreach \r [remember=\r as \pr (initially 0)] in {1,...,\split@nrow}{%
14201     \foreach \c [remember=\c as \pc (initially 0)] in {1,...,\split@ncol}{%
14202     \split@getcoords{\c}{\r}{\split@ov cm}}
14203     \end{tikzpicture}
14204     \split@footer
14205     }

```

Macro used by the written file.

1. first coordinate (e.g., (hex ak:c=C,r=17))
2. second coordinate (e.g., (hex ak:c=M,r=33))
3. Crop mark left
4. Crop mark right
5. Crop mark bottom
6. Crop mark top

```

14206 \def\segment(#1)(#2)#3#4#5#6{%
14207 \begin{tikzpicture}%
14208 \begin{scope}
14209 \clip (#1) rectangle (#2);
14210 \node[scale=\boardscale,
14211 inner sep=0pt,
14212 outer sep=0pt,
14213 anchor=north west,
14214 transform shape]{\includegraphics{\boardfile}};
14215 \end{scope}
14216 \pgfinterruptboundingbox
14217 \draw(#3,#6)--++( 0.0, 0.3);
14218 \draw(#3,#6)--++(-0.3, 0.0);
14219 \draw(#3,#5)--++( 0.0,-0.3);
14220 \draw(#3,#5)--++(-0.3, 0.0);
14221 \draw(#4,#6)--++( 0.0, 0.3);
14222 \draw(#4,#6)--++( 0.3, 0.0);
14223 \draw(#4,#5)--++( 0.0,-0.3);

```

```

14224 \draw(#4,#5)--++( 0.3, 0.0);
14225 \endpgfinterruptboundingbox
14226 \end{tikzpicture}%
14227 \cleardoublepage}%

```

5.5 The wargame.chit TikZ library

We define the library for making chits. We load the hex TikZ `wargame.natoapp6c` library and the `amsmath` and `amstext` packages as we need those.

```

14228 \RequirePackage{amsmath}
14229 \RequirePackage{amstext}
14230 \usetikzlibrary{wargame.util,wargame.natoapp6c,math}

```

5.5.1 Debugging

```

\chitdbglvl
\chit@dbg

```

Some macros for debugging. Similar to what we have in `wargame.hex` (see Section 5.4).

```

14231 \newcount\chitdbglvl\chitdbglvl=\wargamedbglvl
14232 \def\chit@dbg#1#2{%
14233 \ifnum#1>\chitdbglvl\relax\else\message{^^J#2}\fi}

```

5.5.2 The chit key namespace

Some stuff to consider wrt. line widths. Setting the line width in the `chit` scope overrides frame settings. The frame stroke can be larger but not smaller. Setting the stroke width in the symbol scope sets it for the symbol only. Thus, to get a thin border, we need to

- Set a small line width in the top `chit` scope.
- Possible set a larger line width in the frame sub-scope.
- Set a larger line width in the symbol sub-scope.

I do not know why this is.

```

/chit/full
/chit/symbol
/chit/left
/chit/right
/chit/upper left
/chit/upper right
/chit/lower left
/chit/lower right
/chit/factors
/chit/extra
/chit/setup
/chit/bevel
/chit/id

```

The parts of a chit

```

14234 \newif\ifchit@clip\chit@cliptrue
14235 \tikzset{%
14236 /chit/.search also={/tikz},
14237 /chit/.cd,
14238 full/.store in=\chit@full, full/.initial=,%
14239 symbol/.store in=\chit@symbol, symbol/.initial=,%
14240 left/.store in=\chit@left, left/.initial=,%
14241 unique/.style={/chit/left={#1}},%
14242 right/.store in=\chit@right, right/.initial=,%
14243 parent/.style={/chit/right={#1}},%
14244 upper left/.store in=\chit@upper@left, upper left/.initial=,%
14245 upper right/.store in=\chit@upper@right, upper right/.initial=,%
14246 lower left/.store in=\chit@lower@left, lower left/.initial=,%
14247 lower right/.store in=\chit@lower@right, lower right/.initial=,%
14248 factors/.store in=\chit@factors, factors/.initial=,%
14249 setup/.store in=\chit@setup, setup/.initial=,%
14250 id/.store in=\chit@id, id/.initial=,%
14251 frame/.store in=\chit@frame, frame/.initial=,%
14252 extra/.store in=\chit@extra, extra/.initial=,%
14253 bev/.store in=\chit@bevel, bev/.initial=,
14254 bevel fraction/.store in=\chit@bevel@frac,bevel fraction/.initial=10,
14255 bevel/.is choice,
14256 bevel/none/.style = {/chit/bev=},
14257 bevel/north west/.style = {/chit/bev=1},
14258 bevel/north east/.style = {/chit/bev=2},
14259 bevel/south west/.style = {/chit/bev=3},
14260 bevel/south east/.style = {/chit/bev=4},
14261 bevel/NW/.style = {/chit/bev=1},
14262 bevel/NE/.style = {/chit/bev=2},
14263 bevel/SW/.style = {/chit/bev=3},
14264 bevel/SE/.style = {/chit/bev=4},
14265 bevel/.default = north west,
14266 clip/.is if=chit@clip%
14267 }

```

```

/tikz/chit/full
/tikz/chit/symbol
/tikz/chit/left
/tikz/chit/right
/tikz/chit/upper left
/tikz/chit/upper right
/tikz/chit/lower left
/tikz/chit/lower right
/tikz/chit/factors
/tikz/chit/setup
/tikz/chit/id

```

Styles of each element in a chit. Users may override these at their own peril. That is, it is OK to override them, but the user should be careful.

```

14268 \tikzset{
14269   chit/symbol/.style={scale=.4,transform shape},
14270   chit/parts/.style={shape=rectangle,transform shape},
14271   chit/factors/.style={chit/parts,anchor=south},
14272   chit/left/.style={chit/parts,anchor=south,rotate=90},
14273   chit/right/.style={chit/parts,anchor=north,rotate=90},
14274   chit/upper left/.style={chit/parts,anchor=north west},
14275   chit/upper right/.style={chit/parts,anchor=north east},
14276   chit/lower left/.style={chit/parts,anchor=south west},
14277   chit/lower right/.style={chit/parts,anchor=south east},
14278   chit/setup/.style={chit/parts},
14279   chit/full/.style={chit/parts},
14280   chit/frame/.try={draw=pgfstrokecolor},
14281   chit/bevel highlight/.style={fill=white,opacity=.25},
14282   chit/bevel shadow/.style={fill=black,opacity=.25},
14283 }
14284 \def\chit@bevel@frac{10}
14285 \newif\ifchit@draw@frame\chit@draw@frametrue
14286 \tikzset{
14287   chit/frame style/.search also={/tikz},
14288   chit/frame style/.cd,
14289   none/.code={\chit@draw@framefalse},
14290   draw/.code={%
14291     \chit@dbg{2}{Frame draw option '#1'}
14292     \edef\tikz@temp{#1}%
14293     \ifx\tikz@temp\tikz@nonetext%
14294       \chit@draw@framefalse%
14295     \else%
14296       \chit@draw@frametrue%
14297       \tikzset{/tikz/draw=#1}
14298     \fi
14299   }
14300 }
14301

```

5.5.3 The chit styles

```
/tikz/chit
```

This key sets up a node to make a chit. The key takes a single argument which in turn must contain key–value pairs in the /chit (or /tikz) namespace(s). We set the `shape` parameter of the node, and calls the passed keys in the /chit namespace to set-up elements of the chit.

```
14302 \tikzset{%
14303   chit/.code={%
14304     \pgfkeys{/tikz/transform shape,/tikz/shape=chit}
14305     \pgfkeys{/chit/.cd,#1}}
```

We define a counter to set-up unique names for chit nodes.

```
14306 \newcounter{chit@id}\setcounter{chit@id}{0}
```

5.5.4 The \chit shape

```
\chit@n@to
\@chit@n@to
\@@chit@n@to
\@chit@n@to@
```

These macros puts the NATO App6(c) symbol into a chit. The first macro takes the identifier and position of the symbol, and then scans for options. If no options are given, then we go directly to the rendering (`\@chit@n@to@`). Otherwise, we may also need to scan for an offset given as ($\langle\delta-x,\delta-y\rangle$).

```
14307 \def\chit@n@to#1#2{%
14308   %% Without a following start square bracket '[' by-pass to final
14309   \chit@dbg{1}{Chit NATO App6(c) first step '#1' '#2'}
14310   \@ifnextchar[{%
14311     \%message{^^JStart square bracket}%
14312     \@chit@n@to{#1}{#2}}{%
14313     \%message{^^JNo start square bracket}%
14314     \@chit@n@to@{#1}{#2}}%]]
14315 }
```

The following macro is called if we had no options.

```
14316 \def\@chit@n@to@#1#2#3\end@chit@n@to{%
14317   \chit@dbg{1}{Chit NATO App6(c) w/o offset:
14318     ^^J Options: #3
14319     ^^J ID:      #1
14320     ^^J Position: #2}
14321   \node[chit/symbol,natoapp6c={#3,id=#1}] (#1) at (#2) {};
14322   \chit@dbg{4}{Chit NATO App6(c) ended}%
14323 }
```

This is called if we had an option-like argument. Check if we have an offset

```
14324 \def\@chit@n@to#1#2[#3]{%
14325   \chit@dbg{1}{Chit NATO App6(c) second step '#1' '#2' '#3'}
```

```

14326 \@@ifnextchar({\@@chit@n@to{#1}{#2}{#3}}{\@@chit@n@to{#1}{#2}{#3}(0,0)}%)
14327 }

```

This called if we had option-like argument.

```

14328 \def\@@chit@n@to#1#2#3(#4)\@end@chit@n@to{%
14329 \chit@dbg{1}{Chit NATO App6(c) w/offset:
14330 ^^J Options: #3
14331 ^^J ID: #1
14332 ^^J Position: #2
14333 ^^J Offset: #4}
14334 \node[chit/symbol,natoapp6c={#3,id=#1}] (#1) at ($(#2)+(#4)$) {};}

```

```

\chit@tr@ns@nchor
\chit@nchor

```

Get anchor of sub-symbol element in chit. We need to do this, because the symbol is translated and scaled.

```

14335 \def\chit@tr@ns@nchor#1{%
14336 \pgf@x=0.4\pgf@x%
14337 \pgf@y=0.4\pgf@y\advance\pgf@y#1}

14338 \def\chit@nchor#1#2#3{%
14339 \wg@sub@nchor{#1}{#2}
14340 \chit@tr@ns@nchor{#3}}
14341 \def\chit@report{}
14342 \tikzset{
14343 zone turn/.style={},
14344 zone mult/.style={}
14345 }

```

Now follows the actual chit shape. This is rather long, so we will break it up a bit

```

14346 \def\chit@bevel@path#1{
14347 \scope[#1]
14348 \wg@tmpc=\wg@tmpa\multiply\wg@tmpc by \chit@bevel@frac
14349 \wg@tmpd=\wg@tmpb\multiply\wg@tmpd by \chit@bevel@frac
14350 \divide\wg@tmpc100
14351 \divide\wg@tmpd100
14352 \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14353 % Move down along edge
14354 \wg@tmpb=-\wg@tmpb
14355 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14356 % Move left along edge
14357 \wg@tmpa=-\wg@tmpa
14358 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14359 % Move in and up
14360 \advance\wg@tmpa\wg@tmpc%
14361 \advance\wg@tmpb\wg@tmpd%
14362 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14363 % Move right, but in
14364 \advance\wg@tmpa-\wg@tmpc\wg@tmpa=-\wg@tmpa%
14365 \advance\wg@tmpa-\wg@tmpc%
14366 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%

```



```

14367 % Move up but down
14368 \advance\wg@tmpb-\wg@tmpd\wg@tmpb=-\wg@tmpb%
14369 \advance\wg@tmpb-\wg@tmpd%
14370 \pgfpathlineto{\pgfpoint{\wg@tmpa}{\wg@tmpb}}%
14371 \pgfclosepath%
14372 \pgfusepath{fill}
14373 \endscope
14374 }
14375

```

The first thing is we declare some saved anchors. These are computed (and defined as internal macros) when the shape is instantiated. The anchors give the centre and north east corner of the node, the place to put the NATO App6(c) symbol and factors. We also set a dimension for the margins (corner and factors elements).

```

14376 \pgfdeclareshape{chit}{
14377 \savedanchor\center{\pgf@x=0cm\pgf@y=0cm}
14378 \savedanchor\northeast{\pgf@x=0.6cm\pgf@y=0.6cm}
14379 \savedanchor\symbol{\pgf@x=0cm\pgf@y=0.2cm}
14380 \savedanchor\factors{\pgf@x=0cm\pgf@y=-0.5cm}
14381 \saveddimen\margin{\pgf@x=0.04cm}

```

Next, we define some saved macros. These are called (and declares internal macros) when the shape is instantiated. We define macros for the identifier,

```

14382 \savedmacro\id{%
14383 \chit@dbg{4}{Chit ID: \meaning\chit@id}%
14384 \@ifundefined{chit@id}{\let\chit@id\pgfutil@empty}{}%
14385 \ifx\chit@id\pgfutil@empty%
14386 \wg@r@ndom@id%
14387 \edef\id{chit\wg@uuid}%
14388 \else%
14389 \edef\id{\chit@id}%
14390 \fi%
14391 \chit@dbg{4}{Chit ID stored: \meaning\chit@id}
14392 }
14393 \savedmacro\chitframeopt{%
14394 \let\chitframeopt\pgfutil@empty%
14395 \@ifundefined{chit@frame}{}{%
14396 \edef\chitframeopt{\chit@frame}}
14397 \chit@dbg{3}{Chit Frame options: \meaning\chitframeopt}%
14398 }

```

We define the regular anchors of the shape. That is, the centre, corners, and edges.

```

14399 \anchor{center}{\center}
14400 \anchor{north east}{\northeast}
14401 \anchor{north west}{\northeast\pgf@x=-\pgf@x}
14402 \anchor{south west}{\northeast\pgf@x=-\pgf@x\pgf@y=-\pgf@y}
14403 \anchor{south east}{\northeast\pgf@y=-\pgf@y}
14404 \anchor{north} {\northeast\pgf@x=0cm}
14405 \anchor{south} {\northeast\pgf@x=0cm\pgf@y=-\pgf@y}
14406 \anchor{east} {\northeast\pgf@y=0cm}
14407 \anchor{west} {\northeast\pgf@x=-\pgf@x\pgf@y=0cm}

```

Next, we want to be able to reference the symbol anchors too. So we define these anchors from the embedded node anchors. Note, these anchors will not exist if the chit is made with `full=<args>`.

```

14408 \anchor{symbol north east}{\chit@nchor{M\id symbol}{north east}{0.2cm}}
14409 \anchor{symbol north west}{\chit@nchor{M\id symbol}{north west}{0.2cm}}
14410 \anchor{symbol south east}{\chit@nchor{M\id symbol}{south east}{0.2cm}}
14411 \anchor{symbol south west}{\chit@nchor{M\id symbol}{south west}{0.2cm}}
14412 \anchor{symbol north}      {\chit@nchor{M\id symbol}{north}{0.2cm}}
14413 \anchor{symbol west}      {\chit@nchor{M\id symbol}{west}{0.2cm}}
14414 \anchor{symbol south}     {\chit@nchor{M\id symbol}{south}{0.2cm}}
14415 \anchor{symbol east}     {\chit@nchor{M\id symbol}{east}{0.2cm}}
14416 \anchor{symbol upper}    {\chit@nchor{M\id symbol}{upper}{0.2cm}}
14417 \anchor{symbol lower}    {\chit@nchor{M\id symbol}{lower}{0.2cm}}
14418 \anchor{symbol left}     {\chit@nchor{M\id symbol}{left}{0.2cm}}
14419 \anchor{symbol right}    {\chit@nchor{M\id symbol}{right}{0.2cm}}
14420 \anchor{symbol echelon}  {\chit@nchor{M\id symbol}{north}{0.2cm}}
14421 \anchor{symbol below}   {\chit@nchor{M\id symbol}{south}{0.1cm}}

```

Some anchors to sub-elements. Some of them only exists if we have NATO App6(c) symbol in the chit.

```

14422 \anchor{symbol}      {\symbol}
14423 \anchor{factors}    {\factors}
14424 \anchor{left}      {\chit@nchor{M\id symbol}{west}{.2cm}\advance\pgf@x-\margin}
14425 \anchor{right}    {\chit@nchor{M\id symbol}{east}{.2cm}\advance\pgf@x+\margin}
14426 \anchor{upper right} {%
14427   \northeast \advance\pgf@x-\margin \advance\pgf@y-\margin%
14428 }
14429 \anchor{upper left}{
14430   \northeast \advance\pgf@x-\margin \advance\pgf@y-\margin \pgf@x=-\pgf@x%
14431 }
14432 \anchor{lower right} {%
14433   \northeast \advance\pgf@x-\margin \advance\pgf@y-\margin \pgf@y=-\pgf@y%
14434 }
14435 \anchor{lower left}{
14436   \northeast \advance\pgf@x-\margin \advance\pgf@y-\margin%
14437   \pgf@x=-\pgf@x \pgf@y=-\pgf@y%
14438 }

```

Now for the actual path. For the background path, we simply specify the frame. This is so that this will get drawn (and possibly filled) using the appropriate options.

```

14439 \backgroundpath{%
14440   %% This is the outline of the chit only. The rest of the chit is
14441   %% made on the foreground "path".
14442   \chit@dbg{1}{Chit drawing background path}
14443   \northeast%
14444   \wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
14445   \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14446   \wg@tmpa=-\wg@tmpa \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14447   \wg@tmpb=-\wg@tmpb \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14448   \wg@tmpa=-\wg@tmpa \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14449   \pgfclosepath
14450 }

```

Finally, we make the foreground rendered path. This is where we do the most stuff. We do it in the *behind* foreground path so that we can ensure things are drawn the way we want it.

The first thing is to set-up the clipping to the chit frame.

```

14451 \behindforegroundpath{%
14452   \chit@dbg{1}{Chit drawing foreground path}
14453   % \chit@dbg{4}{%
14454   %   Chit foreground: \meaning\id
14455   %   ^^J ID (set):    \meaning\chit@id
14456   %   ^^J Symbol:     \meaning\chit@symbol
14457   %   ^^J Full:       \meaning\chit@full
14458   %   ^^J Factors:    \meaning\chit@factors
14459   %   ^^J Left:      \meaning\chit@left
14460   %   ^^J Right:     \meaning\chit@right
14461   %   ^^J Upper left: \meaning\chit@upper@left
14462   %   ^^J Lower left: \meaning\chit@lower@left
14463   %   ^^J Upper right: \meaning\chit@upper@right
14464   %   ^^J Lower right: \meaning\chit@lower@right
14465   %   ^^J Extra:      \meaning\chit@extra
14466   %   ^^J Bevel:      \meaning\chit@bevel
14467   %   ^^J Frame:      \meaning\chit@frame}
14468   \chit@dbg{1}{Chit report}
14469   \chit@report{}
14470   \chit@dbg{1}{Chit start scope}
14471   \pgfscope
14472   %
14473   \ifchit@clip%
14474     \chit@dbg{1}{Chit clip path}
14475     \northeast%
14476     \wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
14477     \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14478     \wg@tmpa=-\wg@tmpa \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14479     \wg@tmpb=-\wg@tmpb \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14480     \wg@tmpa=-\wg@tmpa \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14481     \pgfclosepath%
14482     \pgfusepath{clip}%
14483   \fi%

```

If we do not have the symbol key set, then we set the full key as a picture.

```

14484 \@ifundefined{chit@symbol}{%
14485   %% Draw full stuff
14486   \@ifundefined{chit@full}{-%
14487     \chit@dbg{1}{Chit draw full image: '\meaning\chit@full'}
14488     \center\wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
14489     \wg@pic=all{\chit@full}{\the\wg@tmpa,\the\wg@tmpb}{chit/full}}%
14490   }-% With NATO symbol

```

Otherwise, we put in a node with shape `natoapp6c` and pass the symbol key–value pairs as options.

```

14491 \chit@dbg{1}{Chit draw symbol image}
14492 \edef\symid{\id symbol}%
14493 \symbol%
14494 \edef\args{\symid}{\the\pgf@x,\the\pgf@y}\chit@symbol}%

```

```

14495 \chit@dbg{6}{Arguments to chit NATO symbol: \meaning\args}%
14496 \chit@dbg{1}{Chit draw nato image}
14497 \expandafter\chit@n@to\args\@end@chit@n@to%
14498 \chit@dbg{6}{After making NATO symbol in chit}%

```

Having made the NATO App6(c) symbol, which we gave the node name $\langle id \rangle$ symbol where $\langle id \rangle$ is the ID of this chit, we can make the rest of the chit elements. These are the left and right elements, which are set west and east of the symbol, respectively; the factors; and the four corner elements.

If the respective elements have not been specified, we do not make them.

First the left and right elements. Note that these uses the anchors of the embedded natoapp6c node for placement.

```

14499 % Put in left of symbol
14500 \@ifundefined{chit@left}{}{%
14501 \chit@dbg{1}{Chit draw left: '\meaning\chit@left'}
14502 \begin{scope}[]
14503 \pgfpointanchor{\symid}{west}%
14504 \wg@tmpa=\pgf@x\advance\wg@tmpa-\margin%
14505 \wg@tmpb=\pgf@y%
14506 \wg@pic@all{\chit@left}{}{\the\wg@tmpa,\the\wg@tmpb}{chit/left}%
14507 \end{scope}}%
14508 % Put in right of symbol
14509 \@ifundefined{chit@right}{}{%
14510 \chit@dbg{1}{Chit draw left: '\meaning\chit@right'}
14511 \begin{scope}[]
14512 \pgfpointanchor{\symid}{east}%
14513 \wg@tmpa=\pgf@x\advance\wg@tmpa+\margin%
14514 \wg@tmpb=\pgf@y%
14515 \wg@pic@all{\chit@right}{}{\the\wg@tmpa,\the\wg@tmpb}{chit/right}%
14516 \end{scope}}%

```

Next, we want to put in the corner elements. But before we do that, we use our saved anchors and dimensions to calculate the coordinates. Note that the corner elements are anchored to the corners (plus margin) of the chit frame.

```

14517 % Get coordinates
14518 \northeast%
14519 \wg@tmpa=\pgf@x%
14520 \wg@tmpb=\pgf@y%
14521 \advance\wg@tmpa-\margin%
14522 \advance\wg@tmpb-\margin%

```

With the coordinates extracted, we set the four corner elements. Note, for the anchoring to work, we should specify pictures that have anchors (e.g., nodes). If not, we must take care to give offsets or the like.

```

14523 % Put in upper left corner
14524 \@ifundefined{chit@upper@left}{}{%
14525 \chit@dbg{1}{Chit draw upper left: '\meaning\chit@upper@left'}
14526 \begin{scope}[]
14527 \wg@pic@all{\chit@upper@left}{}{-\the\wg@tmpa,\the\wg@tmpb}{%
14528 chit/upper left}%
14529 \end{scope}}
14530 % Put in upper right corner
14531 \@ifundefined{chit@upper@right}{}{%
14532 \chit@dbg{1}{Chit draw upper right: '\meaning\chit@upper@right'}

```

```

14533     \begin{scope}[]
14534         \wg@pic@all{\chit@upper@right}{-}{\the\wg@tmpa,\the\wg@tmpb}{-}{%
14535             chit/upper right}%
14536     \end{scope}}
14537 % Put in lower left corner
14538 \@ifundefined{chit@lower@left}{-}{%
14539     \chit@dbg{1}{Chit draw lower left: '\meaning\chit@lower@left'}
14540     \begin{scope}[]
14541         \wg@pic@all{\chit@lower@left}{-}{-\the\wg@tmpa,-\the\wg@tmpb}{-}{%
14542             chit/lower left}%
14543     \end{scope}}
14544 % Put in lower right corner
14545 \@ifundefined{chit@lower@right}{-}{%
14546     \chit@dbg{1}{Chit draw lower right: '\meaning\chit@lower@right'}
14547     \begin{scope}[]
14548         \wg@pic@all{\chit@lower@right}{-}{\the\wg@tmpa,-\the\wg@tmpb}{-}{%
14549             chit/lower right}%
14550     \end{scope}}

```

Finally, we put in the unit factors. They are put at the bottom of the chit frame (plus margin) and are typically anchored to the south anchor of the element. Note, we can put in several factors if need be.

```

14551 % Put in factors
14552 \@ifundefined{chit@factors}{-}{%
14553     \chit@dbg{1}{Chit draw factors: '\meaning\chit@factors'}
14554     \advance\wg@tmpb-\margin%
14555     \begin{scope}[]
14556         \wg@pic@all{\chit@factors}{-}{0,-\the\wg@tmpb}{chit/factors}%
14557     \end{scope}}%
14558 % Put in extra
14559 \@ifundefined{chit@extra}{-}{%
14560     \chit@dbg{1}{Chit draw extra: '\meaning\chit@extra'}
14561     \begin{scope}[]
14562         \wg@pic@all{\chit@extra}{-}{0,0}{chit/factors}%
14563     \end{scope}}%
14564 }% End of full or symbol
14565 \endpgfscope%
14566 % Make bevel?
14567 \@ifundefined{chit@bevel}{\let\chit@bevel\empty}{-}{
14568 \ifx\chit@bevel\empty\else%
14569     \chit@dbg{1}{Chit draw bevel}
14570     %% South east bevel
14571     \northeast%
14572     \wg@tmpa=-\pgf@x\wg@tmpb=-\pgf@y%
14573     \ifcase\chit@bevel\relax%
14574     \or% 1
14575     \or\wg@tmpa=-\wg@tmpa% 2
14576     \or\wg@tmpb=-\wg@tmpb% 3
14577     \or\wg@tmpa=-\wg@tmpa\wg@tmpb=-\wg@tmpb%4
14578     \fi
14579     \chit@bevel@path{chit/bevel highlight}
14580     %% North west bevel
14581     \northeast%
14582     \wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%

```

```

14583     \ifcase\chit@bevel\relax%
14584     \or% 1
14585     \or\wg@tmpa=-\wg@tmpa% 2
14586     \or\wg@tmpb=-\wg@tmpb% 3
14587     \or\wg@tmpa=-\wg@tmpa\wg@tmpb=-\wg@tmpb%4
14588     \fi
14589     \chit@bevel@path{chit/bevel shadow}
14590   \fi
14591   % Draw frame?
14592   \chit@dbg{1}{Chit draw frame: '\meaning\chitframeopt'}
14593   \edef\tmp@opt{[chit/frame style/.cd,chit/frame/.try,\chitframeopt]}
14594   \chit@dbg{1}{Chit draw frame: '\meaning\tmp@opt}
14595   \expandafter\scope\tmp@opt
14596     \northeast%
14597     \wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
14598     \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14599     \wg@tmpa=-\wg@tmpa \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14600     \wg@tmpb=-\wg@tmpb \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14601     \wg@tmpa=-\wg@tmpa \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
14602     \pgfclosepath%
14603     \chit@dbg{3}{Line width for frame: '\the\pgflinewidth'}
14604     \ifchit@draw@frame\pgfusepath{stroke}\fi%
14605     \chit@draw@frametrue%
14606     %\iftikz@mode@fill\pgfusepath{fill}\fi%
14607   \endscope%
14608   \chit@dbg{1}{Chit end of shape}
14609 }
14610 }

```

5.5.5 The `\chit` wrapper macro

```

\chit
\chit@
\chit@@

```

The macro to make the chits. This is a wrapper around a `node` with shape `chit`. The syntax of this macro is

```

\chit[<chit options>](<position>)(<identifier>);

```

Note that the trailing semi-colon is optional. Here *<chit options>* are any key-value pairs in the `/chit` (and `/tikz`) namespace.

The first macro parses for options.

```

14611 \def\chit{%
14612   \chit@dbg{5}{Chit}
14613   \@ifnextchar[{\chit@}{\chit@[]}%]
14614 }

```

Parse for coordinates.

```

14615 \def\chit@[#1]{%
14616   \chit@dbg{5}{Chit second: '#1'}
14617   \@ifnextchar({\chit@@{#1}}{\chit@@{#1}(0,0)}%}

```

```
14618 }
```

Parse for name.

```
14619 \def\chit@@#1(#2){%
14620 \@ifnextchar({\chit@@#1}{#2}){\chit@@#1}{#2}()}%
14621 }
```

The work horse. This simply makes a `\node` with the shape `chit`. Note, we allow for a trailing semi-colon (`;`) to have a similar feel to other `TikZ` macros.

```
14622 \def\chit@@#1#2(#3){%
14623 \chit@dbg{5}{Chit final:
14624 ^^J Options: #1
14625 ^^J Position: #2
14626 ^^J Name: '#3'}
14627 \let\name\pgfutil@empty%
14628 \chit@dbg{1}{=== Before chit node}%
14629 \node[chit={every chit/.try,id=#3,#1}] (tmp) at (#2) {}%
14630 \chit@dbg{2}{=== After chit node}%
14631 \ifx|#3|\relax%
14632 \else%
14633 \chit@dbg{3}{=== Renaming chit to user defined name '#3'}%
14634 \pgfnoderename{#3}{tmp}%
14635 \fi%
14636 \@ifnextchar;{\@gobble}{}%
14637 }
```

5.5.6 Predefined chit element pictures

```
14638 \DeclareRobustCommand\chit@sep[2] [/]{%
14639 \foreach[count=\is] \s in {#2}{%
14640 \ifnum\is>1\relax#1\fi%
14641 \s}}
```

```
/tikz/pics/chit/1 factor
/tikz/pics/chit/2 factors
/tikz/pics/chit/2 factors artillery
/tikz/pics/chit/3 factors
/tikz/pics/chit/4 factors
/tikz/pics/chit/identifier
/tikz/pics/chit/small identifier
/tikz/pics/chit/identifier macro
```

These pictures can be used as the value of `chit` keys.

```
14642 \tikzset{%
14643 chit/1 factor/.pic={
14644 \chit@dbg{4}{ Chit 1 factor: #1}%
14645 \node[chit/factor,chit/1 factor,pic actions]{#1};},
14646 pics/chit/2 factors/.style args={#1,#2}{%
14647 code={%
14648 \chit@dbg{4}{ Chit 2 factors: #1 and #2}%
14649 \node[chit/factor,chit/2 factors,pic actions]{#1--#2};}},
```

```

14650 pics/chit/2 factors artillery/.style args={#1,#2,#3}{%
14651   code={
14652     \chit@dbg{4}{ Chit 2 factors w/artillery: '#1' '#2' '#3'}%
14653     \node[chit/factor,chit/2 factors]{%
14654       {#1}$\overset{\text{\scriptsize #3}}{\text{--}}$#2}};},
14655 pics/chit/3 factors/.style args={#1,#2,#3}{%
14656   code={
14657     \chit@dbg{4}{ Chit 3 factors: '#1' '#2' '#3'}%
14658     \node[chit/factor,chit/3 factors]{#1-#2-#3}};},
14659 pics/chit/4 factors/.style args={#1,#2,#3,#4}{%
14660   code={
14661     \chit@dbg{4}{ Chit 3 factors: '#1' '#2' '#3' '#4'}%
14662     \node[chit/factor,chit/4 factors]{#1-#2-#3-#4}};},
14663 chit/identifier/.pic={
14664   \chit@dbg{4}{ Chit identifier: '#1'}%
14665   \node[chit/identifier,pic actions]{#1};
14666 },
14667 chit/identifiers/.pic={
14668   \chit@dbg{4}{ Chit identifiers: '#1'}%
14669   \node[chit/identifier,pic actions]{\chit@sep{#1}};
14670 },
14671 chit/small identifier/.pic={
14672   \chit@dbg{4}{ Chit small identifier: '#1'}%
14673   \node[chit/small identifier,pic actions]{#1};
14674 },
14675 chit/small identifiers/.pic={
14676   \chit@dbg{4}{ Chit small identifiers: '#1'}%
14677   \node[chit/small identifier,pic actions]{\chit@sep{#1}};
14678 },
14679 chit/identifier macro/.pic={%
14680   \chit@dbg{4}{ Chit identifier macro: \meaning#1}
14681   \edef\chit@i@tmp{#1}
14682   \node[chit/identifier,pic actions]{\chit@i@tmp}};},
14683 }

```

```

/tikz/chit/factor
/tikz/chit/1 factor
/tikz/chit/2 factors
/tikz/chit/3 factors
/tikz/chit/4 factors
/tikz/chit/identifier
/tikz/chit/small identifier

```

Styles used by the above pictures. Users can change these as they see fit.

```

14684 \tikzset{%
14685   chit/factor/.style={
14686     shape=rectangle,
14687     font=\sffamily\bfseries\fontsize{12}{14}\selectfont,
14688     anchor=base,
14689     inner sep=0,
14690     %text=pgfstrokecolor,
14691     draw=none,

```



```

14692     fill=none,
14693     transform shape,
14694   },
14695   chit/1 factor/.style={},
14696   chit/2 factors/.style={},
14697   chit/3 factors/.style={},
14698   chit/4 factors/.style={text/.append style=\fontsize{10}{12}\selectfont},
14699   chit/identifier/.style={
14700     shape=rectangle,
14701     font=\sffamily\bfseries\fontsize{8}{9}\selectfont,
14702     inner sep=0,
14703     % text=pgfstrokecolor,
14704     draw=none,
14705     fill=none,
14706     transform shape,
14707   },
14708   chit/small identifier/.style={
14709     shape=rectangle,
14710     font=\sffamily\bfseries\fontsize{6}{7}\selectfont,
14711     inner sep=0,
14712     % text=pgfstrokecolor,
14713     draw=none,
14714     fill=none,
14715     transform shape,
14716   },
14717 }

```

5.5.7 Modifications to chits

These defines overlays one can add on top of chits, for example to shade a chit, put a semi-transparent red cover to indicate elimination, and similar.

```

14718 \tikzset{
14719   pics/chit/shade/.style={
14720     code={%
14721       \path[fill=white,opacity=#1,pic actions] (-.6,-.6) rectangle(.6,.6);}},
14722   pics/chit/eliminate/.style={
14723     code={%
14724       \path[fill=red,opacity=#1,pic actions] (-.6,-.6) rectangle(.6,.6);}},
14725   pics/chit/shade/.default=0.5,
14726   pics/chit/eliminate/.default=0.25,
14727   dummy chit/.style={draw=none,fill=none,chit={}},
14728 }
14729 \def\shadechit{%
14730   \@ifnextchar[{\sh@dechit}{\sh@dechit[.5]}}
14731 }
14732 \def\eliminatechit{%
14733   \@ifnextchar[{\elimin@techit}{\elimin@techit[.25]}}
14734 }
14735 \def\sh@dechit[#1](#2){%
14736   % \message{^^JShading chit with opacity '#1'}%
14737   \pic[transform shape] at (#2) {chit/shade=#1};%
14738   \@ifnextchar;{\@gobble}{}}
14739 \def\elimin@techit[#1](#2){%

```

```

14740 \pic[transform shape] at (#2) {chit/eliminate=#1};%
14741 \@ifnextchar;{\@gobble{}}

```

5.5.8 Stacking of chits

Stacking of chits. The key `chit/stack` direction sets the default direction to make the stack in.

```

14742 % offset, location, direction, list
14743 \tikzset{%
14744   chit/stack direction/.store in=\chit@stack@dir,
14745   chit/stack direction/.initial={(.3,.3)},
14746 }

```

Now the code

```

14747 \def\chit@stack@dir{(.3,.3)}
14748 \def\stackchits(#1){%
14749   \@ifnextchar({\st@ckchits{#1}}{\st@ckchits{#1}(.3,.3)}%)
14750 }
14751 \def\st@ckchits#1(#2)#3{%
14752   \chit@dbg{2}{Stacking chits '#1', '#2', '#3'}%
14753   \edef\xy{#1}%
14754   \chit@dbg{4}{Stack start at \xy}%
14755   \foreach[count=\i from 0] \c/\o in {#3} {%
14756     \ifx\c\empty\else%
14757       \edef\ccc{\c}%
14758       \chit@dbg{2}{Adding \meaning\ccc\space to stack at (\xy)' '\o'}%
14759       \expandafter\ccc(\xy)%
14760       %%
14761     \ifx\c\o\else%
14762       %\chit@dbg{0}{Option: \o}
14763       \edef\ccc{\o}%
14764       \expandafter\ccc(\xy)%
14765     \fi
14766     \expandafter\ccc(\xy)%
14767     \tikzmath{%
14768       coordinate \cc;%
14769       \cc = (\xy) + (#2);}
14770     \xdef\xy{\cc}%
14771   \fi%
14772 }%
14773 \@ifnextchar;{\@gobble{}}%
14774 }

```

5.5.9 Making order of battle charts

Macros for making OOBs

Style for turns

```

14775 \tikzset{
14776   chit/oob turn/.pic={\node[pic actions]{#1};}

```

current c, current r, n-columns, cell size, y

```
14777 \def\chit@oob@cellupdate(#1,#2)#3#4#5{%
14778 \edef\f{\ifwg@oob@inv-1\else1\fi}%
14779 \chit@dbg{1}{ \space Cell update 'c=#1|' vs '#4'*('#3'-1)}
14780 \pgfmathparse{int(ifthenelse(abs(#1)>=#4*(#3-1),#5-1,#5))}%
14781 \xdef#5{\pgfmathresult}
14782 \pgfmathparse{ifthenelse(abs(#1)>=#4*(#3-1),#2-#4,#2)}%
14783 \xdef#2{\pgfmathresult}%
14784 \pgfmathparse{ifthenelse(abs(#1)>=#4*(#3-1),0,#1+\f*#4)}%
14785 \xdef#1{\pgfmathresult}%
14786 \chit@dbg{1}{ \space\space-> '\string#5'=#5 '\string#2'=#2 '\string#1'=#1}
14787 }
```

current c, current r, cell size, extra vertical spacing

```
14788 \def\chit@oob@rowupdate(#1,#2)#3#4{%
14789 \chit@dbg{2}{ Row update c='#1',r='#2',s='#3',e='#4'}
14790 %\pgfmathparse{ifthenelse(#1>0,#2-#3,#2)}%
14791 \pgfmathparse{#2-#3)}%
14792 \xdef#2{\pgfmathresult}%
14793 %\xdef#1{0}
14794 \chit@dbg{2}{ \space\space-> update '\string#2'=#2}
14795 }
```

current c, current r, cell size, extra spacing

```
14796 \def\chit@oob@turnupdate(#1,#2)#3#4{%
14797 \chit@dbg{2}{ Turn update c='#1',r='#2',s='#3',e='#4'}
14798 %\pgfmathparse{#2-ifthenelse(#1>0,#3,0)-#4)}%
14799 \pgfmathparse{#2-#4-ifthenelse(abs(#1)>0.0001,#3,0)}
14800 \xdef#2{\pgfmathresult}%
14801 \xdef#1{0}%
14802 \chit@dbg{2}{ \space\space-> update '\string#1'=#1,'\string#2'=#2}
14803 }
```

chit list, n-colls, cell size, extra vertical spacing

This expects a list of lists of chits, one list per turn; the maximum number of columns; the size of cells, extra spacing between turns.

Note, the list of lists leaf elements should be styles for the chits.

This depends on the Tikz pic `chit/oob turn` which takes the number as argument.

```
14804 \newif\ifwg@oob@inv\wg@oob@invfalse
14805 \def\chit@oob@spacer{hspace}
14806 \def\wg@star@oob{\wg@oob@invtrue\wg@oob}
14807 \def\wg@nostar@oob{\wg@oob@invfalse\wg@oob}
14808 \def\oob{%
14809 \@ifstar{\wg@star@oob%
14810 }{\wg@nostar@oob%
14811 }%
14812 }
```

The inner macro of `\oob`. The arguments are

1. The list of lists of chits styles
2. The maximum number of columns
3. The width of each cell
4. Additional row spacing between turns

```

14813 \def\wg@oob#1#2#3#4{
14814   \def\r{0}
14815   \chit@dbg{2}{00B: '#1'}
14816   \foreach[count=\ti from 0] \t/\y in #1{
14817     \xdef\o{\r}
14818     \def\c{0}
14819     \ifx\t\y\def\y{0}\fi
14820     \chit@dbg{2}{Turn \ti\space(\r,\t,y=y):'}
14821     \ifwg@oob@inv%
14822       \pic[transform shape] at (.5*#3,\r) {chit/oob turn=\ti};% was dx=0.5
14823     \else
14824       \pic[transform shape] at (-.5*#3,\r) {chit/oob turn=\ti};% was dx=-0.5
14825     \fi%
14826     \ifx\t\empty\else%
14827       \foreach \u/\m in \t{
14828         %% \chit@dbg{2}{ '\u'='m'}
14829         \ifx\u\empty\else
14830           \ifx\m\empty\def\m{1}\fi
14831           \ifx\u\m\def\m{1}\fi
14832           \foreach \n in {1,...,\m}{%
14833             \chit@dbg{2}{00B Chit is '\u'}%
14834             \ifx\u\chit@oob@spacer%
14835               \chit@dbg{3}{Chit '\u' is spacer '\chit@oob@spacer'}
14836               \pgfmathparse{\c+#4}%
14837               \xdef\c{\pgfmathresult}%
14838             \else
14839               \ifnum\chitdbglvl>2%
14840                 \node[minimum width=#3cm,minimum height=#3cm,
14841                   draw,transform shape] at (\c,\r) {};
14842               \fi
14843               \ifx\u\chit@blank\else%
14844                 \chit[\u=\ti,zone oob point={\u}{\c}{\r}](\c,\r);%
14845               \fi%
14846               \chit@oob@cellupdate(\c,\r){#2}{#3}{\y}
14847             \fi
14848           }
14849         \fi
14850       }
14851     \fi
14852     \chit@dbg{1}{ End of chits in turn
14853       \ti\space(c='\c',r='\r',o='\o',y='\y')}
14854     % IF no units where given, then we force \c to be non-zero so that
14855     % \chit@oob@turnupdate increments the row
14856     \ifx\t\empty
14857       \def\c{#3}
14858     \chit@dbg{2}{ Turn is empty, set c='\c'}

```

```

14859 \fi
14860 %\ifnum\y<0% No explicit number of rows given
14861 % \def\c{#3}
14862 % \chit@dbg{2}{ No explicit number of rows given, set c='\c'}
14863 %\fi
14864 % In case the user gave and explicit number of rows, add the rows
14865 % that are missing. \y is initially set to the number of
14866 % requested rows, and then decremented every time we go down one
14867 % row. So if the number of rows we did so far is N, and the
14868 % requested number of rows is M, then the loop below adds M-N
14869 % rows.
14870 \ifnum\y>0%
14871 \chit@dbg{2}{ Looping rows from 2 to \y, break when row > \y}%
14872 \foreach \rr in {2,...,\y}{
14873   %\ifnum\rr>\y% A little funny, but \y can be negative!
14874   % \chit@dbg{2}{ \space Breaking loop \rr\space > \y}%
14875   % \breakforeach%
14876   %\else%
14877   \chit@oob@rowupdate(\c,\r){#3}{#4}
14878   %\fi
14879 }
14880 \fi
14881 % This will zero \c. However, if on entry |\c|>0, then we also
14882 % increment the row
14883 \chit@oob@turnupdate(\c,\r){#3}{#4}
14884 \chit@dbg{2}{End of turn \ti\space(c='\c',r='\r',o='\o',y='\y')}
14885 }
14886 \chit@dbg{3}{End of OOB (c='\c',r='\r',y='\y')}
14887 \@ifnextchar;{\@gobble}{}

```

5.5.10 Table of chits

```

14888 \tikzset{
14889   chit/cell background/.style={fill=black},
14890   blank chit/.style={/chit/frame={draw=none,fill=none}},
14891 }

```

These macros are used when we set tables of chits. This allows us to define blank spaces in the table by giving the element `blank chit`.

```

14892 \def\chit@blank{blank chit}
14893 \def\chit@cellbg(#1,#2)#3{%
14894   \draw[chit/cell background](#1-#3/2,#2-#3/2) rectangle++(#3,#3);
14895 }

```

`\ifchits@reset`

This ‘if’ controls whether to reset the coordinates to the origin when `\chits` is called. If true, then reset for a new table.

```

14896 \newif\ifchits@reset\chits@resettrue

```

```

\chits
\@chits
\chit@sng@cellupdate

```

```

14897 \def\chit@sng@cellupdate(#1,#2)#3#4{%
14898 \chit@dbg{2}{Current '#1' vs '#4'*('#3'+1)}
14899 \pgfmathparse{ifthenelse(#1>=#4*(#3-1),#2-#4,#2)}%
14900 \xdef#2{\pgfmathresult}%
14901 \pgfmathparse{ifthenelse(#1>=#4*(#3-1),0,#1+#4)}%
14902 \xdef#1{\pgfmathresult}%
14903 }

```

The starred version (`\chits*`) of this macro continues the previously set chit table.

```

14904 \def\chits{%
14905 \ifstar{\chits@resetfalse\@chits}{\chits@resettrue\@chits}}
14906 \def\@chits#1#2#3{
14907 \ifchits@reset
14908 \def\r{0}%
14909 \def\c{0}%
14910 \fi
14911 \chit@dbg{1}{Chits to make: #1}%
14912 \foreach[count=\ti from 0] \t/\x in #1{%
14913 \chit@dbg{2}{Turn '\t' with option '\x'}
14914 \ifx\t\empty\else%
14915 \foreach \u/\m in \t{%
14916 \ifx\u\empty\else%
14917 \chit@dbg{2}{Next chit '\u' with possible multiplicity '\m'}%
14918 \ifx\m\empty\def\m{1}\fi%
14919 \ifx\u\m\def\m{1}\fi%
14920 \chit@dbg{2}{Next chit '\u' multiplicity '\m'}%
14921 \foreach \n in {1,...,\m}{%
14922 \ifx\u\chit@blank%
14923 \chit@dbg{3}{Ignoring blank chit:\u}%
14924 \else%
14925 \chit@cellbg(\c,\r){#3}%
14926 \chit[\u=\ti](\c,\r)%
14927 \chit@sng@cellupdate(\c,\r){#2}{#3}%
14928 \fi%
14929 }%
14930 \fi%
14931 }%
14932 \fi%
14933 }%
14934 \ifnextchar;{\@gobble{}}

```

```

\doublechits
\@doublechits
\chit@dbl@cellupdate
\chit@dbl@flip

```

1. coordinates
2. coordinates

3. cell-size

```
14935 \def\chit@dbl@flip(#1,#2)#3{%
14936   \pgfmathparse{-#1}%
14937   \xdef\mc{\pgfmathresult}%
14938 }
```

1. coordinates
2. coordinates
3. Number of columns
4. cell-size

```
14939 \def\chit@dbl@cellupdate(#1,#2)#3#4{%
14940   \pgfmathparse{ifthenelse(#1<=#4/2,#2,#4+#2)}%
14941   \xdef#2{\pgfmathresult}%
14942   \pgfmathparse{ifthenelse(#1<=#4/2,#4+#1,-(#3-.5)*#4)}%
14943   \xdef#1{\pgfmathresult}%
14944 }
```

1. List of list of keys
2. Number of columns
3. size of each cell

The starred version (`\doublechits*`) of this macro continues the previously set `chit` table.

```
14945 \def\doublechits{%
14946   \@ifstar{\chits@resetfalse\@doublechits}{\chits@resettrue\@doublechits}}

14947 \def\@doublechits#1#2#3{%
14948   \chit@dbg{1}{Setting double-sided chits: #1}
14949   \ifchits@reset
14950     \pgfmathparse{-(#2-.5)*#3}
14951     \xdef\c{\pgfmathresult}
14952     \def\r{0}
14953   \fi
14954
14955   \foreach[count=\ti from 0] \t/\x in #1{
14956     \ifx\t\empty\else%
14957       \foreach \u/\m in \t{
14958         \ifx\u\empty\else
14959           \ifx\m\empty\def\m{1}\else%
14960             \ifx\u\m\def\m{1}\fi\fi
14961           \chit@dbg{2}{'\u'='\m' (\c,\r)}
14962           \foreach \n in {1,...,\m}{%
14963             \ifx\u\chit@blank
14964               \chit@dbg{3}{Ignoring blank chit:\u}
14965             \else
14966               \chit@cellbg(\c,\r){#3}
14967               \chit[\u=\ti](\c,\r)
```

```

14968         \chit@dbl@flip(\c,\r){#3}
14969         \chit@cellbg(\mc,\r){#3}
14970         \chit[\u\space flipped=\ti,zone turn=\t,zone mult=\n](\mc,\r)
14971         \chit@dbl@cellupdate(\c,\r){#2}{#3}
14972     \fi
14973 }
14974 \fi
14975 }
14976 \fi
14977 }
14978 \draw[dashed](0,-3*#3/4)--(0,\r-#3/4);%
14979 \draw[dashed,<-] (#3/5,-2*#3/3)--(#3/2,-2*#3/3) node[transform shape,anchor=west]{Back};%
14980 \draw[dashed,<-] (-#3/5,-2*#3/3)--(-#3/2,-2*#3/3) node[transform shape,anchor=east]{Front};%
14981 \@ifnextchar{\@gobble}{}

```

5.5.11 Battle markers

Takes 1 arguments - the identifier.

Define every battle marker to change the style.

```

14982 \tikzset{%
14983   battle marker/.pic={
14984     \node[shape=circle,
14985       font=\sffamily\bfseries,
14986       inner sep=0pt,
14987       minimum size=5mm,
14988       draw=black,
14989       fill=yellow!85!black,
14990       every battle marker/.try] at (-.3,.3) {%
14991       \ifnum#1>0\relax #1\fi%
14992     };
14993   },
14994   battle marker/.style={
14995     chit={full={battle marker=#1},frame={draw=none}}},
14996 }

```

Takes two arguments - the odds and the fill colour. The latter is useful to differentiate the severity of an attack.

Define every odds marker to change the style.

```

14997 \tikzset{%
14998   pics/odds marker/.style args={#1,#2}{
14999     code={
15000       \node[shape=circle,
15001         font=\sffamily\bfseries\large,
15002         inner sep=0pt,
15003         minimum size=8mm,
15004         draw=black,
15005         fill=#2,
15006         every odds marker/.try] at (.2,-.2) {#1};
15007     }
15008   },
15009   odds marker/.style args={#1,#2}{

```



```

15010   chit={full={odds marker={#1,#2}},frame={draw=none}}},
15011 }

```

Takes two arguments - the result and the fill colour. The latter is useful to differentiate the severity of an attack. Define every result marker to change the style.

```

15012 \tikzset{
15013   pics/result marker/.style args={#1,#2}{
15014     code={
15015       \message{^^JResults marker #1 (#2)}
15016       \node[shape=circle,
15017         font=\sffamily\bfseries\large,
15018         inner sep=0pt,
15019         minimum size=8mm,
15020         draw=black,
15021         fill=#2,
15022         every result marker/.try] at (0,0) {#1};}},
15023   result marker/.style args={#1,#2}{
15024     chit={full={result marker={#1,#2}},frame={draw=none}}}
15025 }

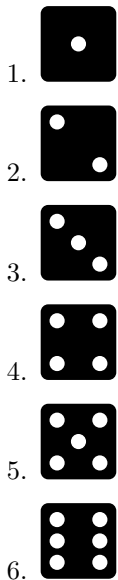
```

5.5.12 Dice

First, a regular 6-sided dice with configurable number of dots. Use like

```
\pic[<pic options>]{dice=<eyes>}
```

For example:



```

15026 \tikzset{
15027   dice bg/.style={
15028     % /utils/exec={

```

```

15029 % \pgfgettransformentries{%
15030 %   \wg@jaca}{%
15031 %   \wg@jacb}{%
15032 %   \wg@jacc}{%
15033 %   \wg@jacd}{%
15034 %   \wg@tmp}{%
15035 %   \wg@tmp}%
15036 % \pgfmathsetmacro{\wg@tmp}{%
15037 %   sqrt(abs(\wg@jaca*\wg@jacd-\wg@jacb*\wg@jacc))}
15038 % \xdef\wg@tmp{\wg@tmp}},%
15039 fill=black,
15040 draw=none,
15041 minimum width=1cm,
15042 minimum height=1cm,
15043 scale rounded corners,
15044 rounded corners=.1cm,
15045 inner sep=0pt,
15046 transform shape},
15047 dice fg/.style={
15048   fill=white,
15049   shape=circle,
15050   inner sep=0pt,
15051   minimum size=.2cm,
15052   transform shape},
15053 pics/dice/.style={
15054   code={
15055     \node[dice bg] (dice bg) {};
15056     \ifodd#1\node[dice fg] at (dice bg) {};\fi
15057     \ifnum#1>1%
15058     \node[dice fg] at ($(dice bg)+(-45:.4)$){};%
15059     \node[dice fg] at ($(dice bg)+(135:.4)$){};%
15060     \fi%
15061     \ifnum#1>3%
15062     \node[dice fg] at ($(dice bg)+( 45:.4)$){};%
15063     \node[dice fg] at ($(dice bg)+(-135:.4)$){};%
15064     \fi%
15065     \ifnum#1=6%
15066     \node[dice fg] at ($(dice bg)+(-.282,0)$){};
15067     \node[dice fg] at ($(dice bg)+(.282,0)$){};
15068     \fi
15069   }
15070 },
15071 pics/dice/.default=3
15072 }
15073 \newcommand\dicemark[2][scale=.5]{%
15074   \tikz[baseline={($(dice bg.south east)!.25!(dice bg.north east)$)},#1]{
15075     \pic[transform shape]{dice=3};}}

```

Now some shapes of different dice. This was originally done by [David Carlisle](#). Usage is for example

```
\node[shape=dice],node options] {value};
```

where *dice* is one of d4, d6, d8, d10, d12, or d20.

Tetrahedron



```
15076 \pgfdeclareshape{d4}{
15077   \anchor{center}{\pgfpointorigin}    % within the node, (0,0) is the center
15078   \anchor{text}{
15079     % this is used to center the text in the node
15080     \pgfpoint{-.5\wd\pgfnodeparttextbox}{-.5\ht\pgfnodeparttextbox}}
15081   \backgroundpath{ % draw border
15082     \pgfpathmoveto{\pgfpoint{0cm}{.4cm}}
15083     \pgfpathlineto{\pgfpoint{.433cm}{-.35cm}}
15084     \pgfpathlineto{\pgfpoint{-.433cm}{-.35cm}}
15085     \pgfpathlineto{\pgfpoint{0cm}{.4cm}}
15086     % \pgfusepath{draw} %draw border
15087     % \pgfusepath{draw} %draw rectangle
15088   }}
```

Cubic



```
15089 \pgfdeclareshape{d6}{
15090   \anchor{center}{\pgfpointorigin}    % within the node, (0,0) is the center
15091   \anchor{text}{
15092     % this is used to center the text in the node
15093     \pgfpoint{-.5\wd\pgfnodeparttextbox}{-.5\ht\pgfnodeparttextbox}}
15094   \backgroundpath{ % draw border
15095     \pgfpathrectanglecorners{\pgfpoint{.4cm}{.4cm}}{\pgfpoint{-.4cm}{-.4cm}}
15096     % \pgfusepath{draw} %draw rectangle
15097   }}
```

Octahedron



```
15098 \pgfdeclareshape{d8}{
15099   \anchor{center}{\pgfpointorigin}    % within the node, (0,0) is the center
15100   \anchor{text}{
15101     % this is used to center the text in the node
15102     \pgfpoint{-.5\wd\pgfnodeparttextbox}{-.5\ht\pgfnodeparttextbox}}
15103   \backgroundpath{ % draw border
15104     \pgfpathmoveto{\pgfpoint{0cm}{.5cm}}
15105     \pgfpathlineto{\pgfpoint{.433cm}{.25cm}}
15106     \pgfpathlineto{\pgfpoint{.433cm}{-.25cm}}
15107     \pgfpathlineto{\pgfpoint{0cm}{-.5cm}}
15108     \pgfpathlineto{\pgfpoint{-.433cm}{-.25cm}}
15109     \pgfpathlineto{\pgfpoint{-.433cm}{.25cm}}
15110     \pgfpathlineto{\pgfpoint{0cm}{.5cm}}
15111     \pgfpathlineto{\pgfpoint{.433cm}{-.25cm}}
15112     \pgfpathlineto{\pgfpoint{-.433cm}{-.25cm}}
15113     \pgfpathlineto{\pgfpoint{0cm}{.5cm}}
15114     % \pgfusepath{draw} %draw interior
15115   }}
```

Decahedron



```
15116 \pgfdeclareshape{d10}{
15117   \anchor{center}{\pgfpointorigin}    % within the node, (0,0) is the center
15118   \anchor{text}{
15119     % this is used to center the text in the node
15120     \pgfpoint{-.5\wd\pgfnodeparttextbox}{-.5\ht\pgfnodeparttextbox}}
15121   \backgroundpath{ % draw border
15122     \pgfpathmoveto{\pgfpoint{0cm}{.5cm}}
15123     \pgfpathlineto{\pgfpoint{.294cm}{-.154cm}}
15124     \pgfpathlineto{\pgfpoint{0cm}{-.3cm}}
15125     \pgfpathlineto{\pgfpoint{-.294cm}{-.154cm}}
15126     \pgfpathlineto{\pgfpoint{0cm}{.5cm}}
15127     \pgfpathlineto{\pgfpoint{.475cm}{.1cm}}
15128     \pgfpathlineto{\pgfpoint{.475cm}{-.1cm}}
15129     \pgfpathlineto{\pgfpoint{0cm}{-.5cm}}
15130     \pgfpathlineto{\pgfpoint{-.475cm}{-.1cm}}
15131     \pgfpathlineto{\pgfpoint{-.475cm}{.1cm}}
15132     \pgfpathlineto{\pgfpoint{0cm}{.5cm}}
15133     \pgfpathmoveto{\pgfpoint{.294cm}{-.154cm}}
15134     \pgfpathlineto{\pgfpoint{.475cm}{-.1cm}}
15135     \pgfpathmoveto{\pgfpoint{-.475cm}{-.1cm}}
15136     \pgfpathlineto{\pgfpoint{-.294cm}{-.154cm}}
15137     \pgfpathmoveto{\pgfpoint{0cm}{-.5cm}}
15138     \pgfpathlineto{\pgfpoint{0cm}{-.3cm}}
15139     % \pgfusepath{draw} %draw interior
15140   }}
```

Dodecahedron



```
15141 \pgfdeclareshape{d12}{
15142   \anchor{center}{\pgfpointorigin}    % within the node, (0,0) is the center
15143   \anchor{text}{ % this is used to center the text in the node
15144     \pgfpoint{-.5\wd\pgfnodeparttextbox}{-.5\ht\pgfnodeparttextbox}}
15145   \backgroundpath{ % draw border
15146     \pgfpathmoveto{\pgfpoint{0cm}{.5cm}}
15147     \pgfpathlineto{\pgfpoint{0.294cm}{.405cm}}
15148     \pgfpathlineto{\pgfpoint{.475cm}{.173cm}}
15149     \pgfpathlineto{\pgfpoint{.475cm}{-.173cm}}
15150     \pgfpathlineto{\pgfpoint{.294cm}{-.405cm}}
15151     \pgfpathlineto{\pgfpoint{0cm}{-.5cm}}
15152     \pgfpathlineto{\pgfpoint{-.294cm}{-.405cm}}
15153     \pgfpathlineto{\pgfpoint{-.475cm}{-.173cm}}
15154     \pgfpathlineto{\pgfpoint{-.475cm}{.173cm}}
15155     \pgfpathlineto{\pgfpoint{-.294cm}{.405cm}}
15156     \pgfpathlineto{\pgfpoint{0cm}{.5cm}}
15157     \pgfpathlineto{\pgfpoint{0cm}{.349cm}}
15158     \pgfpathlineto{\pgfpoint{.332cm}{.108cm}}
15159     \pgfpathlineto{\pgfpoint{.205cm}{-.282cm}}
15160     \pgfpathlineto{\pgfpoint{-.205cm}{-.282cm}}
```

```

15161 \pgfpathlineto{\pgfpoint{-.332cm}{.108cm}}
15162 \pgfpathlineto{\pgfpoint{0cm}{.349cm}}
15163 \pgfpathmoveto{\pgfpoint{.475cm}{.173cm}}
15164 \pgfpathlineto{\pgfpoint{.332cm}{.108cm}}
15165 \pgfpathmoveto{\pgfpoint{.294cm}{-.405cm}}
15166 \pgfpathlineto{\pgfpoint{.205cm}{-.282cm}}
15167 \pgfpathmoveto{\pgfpoint{-.294cm}{-.405cm}}
15168 \pgfpathlineto{\pgfpoint{-.205cm}{-.282cm}}
15169 \pgfpathmoveto{\pgfpoint{-.475cm}{.173cm}}
15170 \pgfpathlineto{\pgfpoint{-.332cm}{.108cm}}
15171 % \pgfusepath{draw} %draw interior
15172 }}

```



Icosohedron

```

15173 \pgfdeclareshape{d20}{
15174 \anchor{center}{\pgfpointorigin} % within the node, (0,0) is the center
15175 \anchor{text}{ % this is used to center the text in the node
15176 \pgfpoint{-.5\wd\pgfnodeparttextbox}{-.5\ht\pgfnodeparttextbox}}
15177 \backgroundpath{ % draw border
15178 \pgfpathmoveto{\pgfpoint{0cm}{.5cm}}
15179 \pgfpathlineto{\pgfpoint{.454cm}{.262cm}}
15180 \pgfpathlineto{\pgfpoint{.454cm}{-.262cm}}
15181 \pgfpathlineto{\pgfpoint{0cm}{-.5cm}}
15182 \pgfpathlineto{\pgfpoint{-.454cm}{-.262cm}}
15183 \pgfpathlineto{\pgfpoint{-.454cm}{.262cm}}
15184 \pgfpathlineto{\pgfpoint{0cm}{.5cm}}
15185 \pgfpathlineto{\pgfpoint{0cm}{.292cm}}
15186 \pgfpathlineto{\pgfpoint{.253cm}{-.146cm}}
15187 \pgfpathlineto{\pgfpoint{-.253cm}{-.146cm}}
15188 \pgfpathlineto{\pgfpoint{0cm}{.292cm}}
15189 \pgfpathlineto{\pgfpoint{.454cm}{.262cm}}
15190 \pgfpathlineto{\pgfpoint{.253cm}{-.146cm}}
15191 \pgfpathlineto{\pgfpoint{0cm}{-.5cm}}
15192 \pgfpathlineto{\pgfpoint{-.253cm}{-.146cm}}
15193 \pgfpathlineto{\pgfpoint{-.454cm}{.262cm}}
15194 \pgfpathlineto{\pgfpoint{0cm}{.292cm}}
15195 \pgfpathmoveto{\pgfpoint{.454cm}{-.262cm}}
15196 \pgfpathlineto{\pgfpoint{.253cm}{-.146cm}}
15197 \pgfpathmoveto{\pgfpoint{-.454cm}{-.262cm}}
15198 \pgfpathlineto{\pgfpoint{-.253cm}{-.146cm}}
15199 % \pgfusepath{draw} %draw interior
15200 }}

```

5.5.13 Some utilities

Game turn marker

```

15201 \tikzset{
15202 chit/text base/.style={
15203 shape=rectangle,

```

```

15204     inner sep=0pt,
15205     align=center,
15206     text width=1.1cm},
15207 chit/number/.style={
15208     chit/text base,
15209     font=\sffamily\bfseries\fontsize{12}{14}\selectfont},
15210 chit/game turn/.style={
15211     chit/text base,
15212     font=\sffamily\bfseries},
15213 chit/text/.style={
15214     chit/text base,
15215     font=\sffamily\bfseries},
15216 chit/small text/.style={
15217     chit/text base,
15218     font=\sffamily\bfseries\fontsize{9}{10}\selectfont},
15219 chit/number/.pic={\node[chit/number]{#1};},
15220 chit/game turn/.pic={\node[chit/game turn]{Game\\Turn};},
15221 chit/text/.pic={\node[chit/text]{#1};},
15222 chit/small text/.pic={\node[chit/small text]{#1};},
15223 game turn chit/.style={
15224     /chit/full={chit/game turn},
15225     color=black,
15226     fill=white},
15227 game turn chit flipped/.style={game turn chit},
15228 dummy chit/.style={fill=white},
15229 }

```

Marks of chits

```

15230 \providecommand\chitmark[2] [] {\tikz[scale=.25,#1]{\chit[#2]}}

```

Stacking mark

```

15231 \tikzset{
15232     wg stacking/.style={fill=white,
15233     /chit/symbol={[faction=friendly,command=land]}}},
15234 }
15235 \DeclareRobustCommand\stackmark[1] [] {%
15236     \tikz[baseline=(current bounding box.center),scale=.3,#1]{
15237     \stackchits(0,0)(.3,-.3){%
15238     \noexpand\chit[wg stacking],
15239     \noexpand\chit[wg stacking],
15240     \noexpand\chit[wg stacking]}}}

```

ZOC mark

```

15241 \DeclareRobustCommand\zocmark[1] [] {%
15242     \tikz[baseline=(current bounding box.center)!.5!(current bounding box.south$),scale=.1,#1]{%
15243     \begin{scope}[hex/first row and column are=0,
15244     hex/row direction is=normal,
15245     hex/column direction is=normal,
15246     hex/short columns=none]
15247     \hex[label=,fill=gray](c=1,r=1)%
15248     \hex[label=,fill=white](c=1,r=2)%

```

```

15249     \hex[label=,fill=white](c=1,r=0)%
15250     \hex[label=,fill=white](c=0,r=0)%
15251     \hex[label=,fill=white](c=0,r=1)%
15252     \hex[label=,fill=white](c=2,r=1)%
15253     \hex[label=,fill=white](c=2,r=0)
15254     \end{scope}}}
```

Dummy implementations of zones hooks when exporting. Here, these do nothing, but in the `wgexport` class these are re-implemented.

```

15255 \tikzset{
15256   zone point/.code n args={3}{},
15257   zone oob point/.code n args={3}{}}
```

5.6 The `wargame.natoapp6c` TikZ library

In this section we define the code for the Tikz library. The library defines a number of `pic` keys we can use to draw various parts of a marker. The markers conform to NATO App 6(c) specification. The implementation here is heavily inspired by the package `milsymb` [4] available at CTAN.

5.6.1 Debugging

```

\natoappdbglvl
\n@to@pp@dbg
```

Set the debug level, and make debug message.

```





15258 \usetikzlibrary{wargame.util}
15259 \usetikzlibrary{calc}
15260 \usetikzlibrary{arrows.meta}
15261 \usetikzlibrary{shapes.symbols}
15262 \usetikzlibrary{positioning,intersections}
15263 \newcount\natoappdbglvl\natoappdbglvl=\wargamedbglvl
15264 \def\n@to@pp@dbg#1#2{%
15265   \ifnum#1>\natoappdbglvl\relax\else\message{^^J#2}\fi}
```

5.6.2 Colours

```

\c@friendly
\c@hostile
\c@neutral
\c@unknown
```

Define standard colours for marker affiliations.

Name	
friendly	
hostile	
neutral	
unknown	

```

15266 \definecolor{friendly}{RGB}{128, 224, 255}
15267 \definecolor{hostile}{RGB}{255, 128, 128}
15268 \definecolor{neutral}{RGB}{170, 255, 170}
15269 \definecolor{unknown}{RGB}{255, 255, 128}
15270 \tikzset{%
15271   faction/.code={%
15272     \ifundefined{natoapp@fac}{%
15273       }\tikzset{fill=\natoapp@fac}}}}

```

5.6.3 Some dimensions

We define a number of dimensions which we will use in the following. They provide a rough parameterisation of the node shapes, but shouldn't really be changed. We have them here so that the code uses as few hard coded numbers as possible.

The dimensions are

- Installation 'hat' x coordinate
- Installation 'hat' height
- Activity width of boxes
- Height of space bar
- Radius of the symbol

```

15274 \newdimen\n@to@pp@inst@x\n@to@pp@inst@x=0.2cm
15275 \newdimen\n@to@pp@inst@h\n@to@pp@inst@h=0.15cm
15276 \newdimen\n@to@pp@act@w\n@to@pp@act@w=0.15cm
15277 \newdimen\n@to@pp@space@h\n@to@pp@space@h=0.1cm
15278 \newdimen\n@to@pp@r\n@to@pp@r=0.5cm

```

5.6.4 Some utilities

`\n@to@pp@isclip`

This detects if we're in a node that is being used for clipping

```

15279 %\def\n@to@pp@cliptoken{clip}
15280 %\def\n@to@pp@isclip{FF\fi%
15281 % \message{^^Jclip is \meaning\pgf@up@clip}%
15282 % \ifx\pgf@up@clip\n@to@pp@cliptoken}
15283 \newif\ifn@to@pp@isclip\n@to@pp@isclipfalse

```

`\n@to@pp@saved@fill@color` `\n@to@pp@saved@stroke@color`

Macros to hold saved colours.

```

15284 \let\n@to@pp@saved@stroke@color\relax
15285 \let\n@to@pp@saved@fill@color\relax

```



```
\n@to@pp@stroke@to@fill
\n@to@pp@restore@fill
```

Macro to get stroke and fill colours and set the fill colour to the stroke colour, and to restore to the old setting. This is used by the frame shapes below to make sure that filled elements of the frame uses the same colour as the for strokes.

```
15286 \newcommand\n@to@pp@stroke@to@fill{%
15287 %
15288 \expandafter\let\expandafter\n@to@pp@sav@stroke@color%
15289 \csname\string\color@pgfstrokecolor\endcsname%
15290 %
15291 \expandafter\let\expandafter\n@to@pp@sav@fill@color%
15292 \csname\string\color@pgffillcolor\endcsname%
15293 %
15294 \expandafter\pgf@setfillcolor\n@to@pp@sav@stroke@color%
15295 %
15296 % \message{^^J=== Set fill to stroke color
15297 % ^^J Old fill: \meaning\n@to@pp@sav@fill@color
15298 % ^^J Old stroke: \meaning\n@to@pp@sav@stroke@color}
15299 }

15300 \newcommand\n@to@pp@restore@fill{%
15301 % \message{^^J=== Restore fill color
15302 % ^^J Old fill: \meaning\n@to@pp@sav@fill@color
15303 % ^^J Old stroke: \meaning\n@to@pp@sav@stroke@color}
15304 %
15305 \ifx\n@to@pp@sav@fill@color\relax\else%
15306 \expandafter\pgf@setfillcolor\n@to@pp@sav@fill@color%
15307 \fi%
15308 \global\let\n@to@pp@sav@fill@color\relax
15309 \global\let\n@to@pp@sav@stroke@color\relax
15310 }
```

We also make an environment, just to simplify the use

```
15311 \newenvironment{n@to@pp@stroke@to@fill}{%
15312 \pgfscope%
15313 \n@to@pp@stroke@to@fill%
15314 }{%
15315 \n@to@pp@restore@fill%
15316 \endpgfscope%
15317 }
```

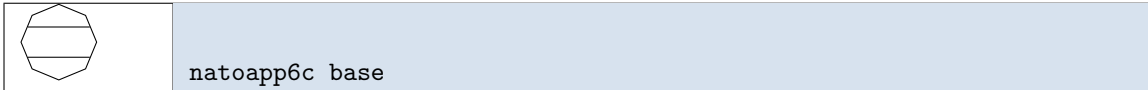
5.6.5 Faction names as macros

```
15318 \def\n@to@pp@friendly{friendly}
15319 \def\n@to@pp@hostile{hostile}
15320 \def\n@to@pp@neutral{neutral}
15321 \def\n@to@pp@unknown{unknown}
```

5.6.6 Node shapes

Here we define bases for all commands and affiliations. These are defined as node shapes. This means we will render the NATO App6(c) symbols as nodes with embedded nodes of the relevant shape.

First, the generic bounding box symbol for all markers.



Place-holder symbol. This shape will form the basis of many of the other frame shapes. We define the relevant sizes and anchors.

```

15322 \pgfdeclareshape{natoapp6c base}{%
15323   \saveddimen\radius{\pgf@x=\n@to@pp@r}
15324   \saveddimen\liney{\pgf@x=.2cm}
15325   \saveddimen\linex{\pgf@x=0.41cm}
15326   \savedanchor\center{\pgf@x=0cm\pgf@y=0cm}
15327   \savedanchor\upper{\pgf@x=0cm\pgf@y=0.35cm}
15328   \anchor{north east}{\pgf@x=\radius\pgf@y=\radius}
15329   \anchor{south west}{\pgf@x=-\radius\pgf@y=-\radius}
15330   \anchor{north west}{\pgf@x=-\radius\pgf@y=\radius}
15331   \anchor{south east}{\pgf@x=\radius\pgf@y=-\radius}
15332   \anchor{south}{\pgf@x=0cm\pgf@y=-\radius}
15333   \anchor{north}{\pgf@x=0cm\pgf@y=\radius}
15334   \anchor{west}{\pgf@x=-\radius\pgf@y=0cm}
15335   \anchor{east}{\pgf@x=\radius\pgf@y=0cm}
15336   \anchor{center}{\center}
15337   \anchor{upper}{\upper}
15338   \anchor{lower}{\upper\pgf@y=-\pgf@y}
15339   \anchor{left}{\upper\pgf@x=-\pgf@y\pgf@y=0cm}
15340   \anchor{right}{\upper\pgf@x=\pgf@y\pgf@y=0cm}
15341   \savedmacro\init{
15342     \def\octagon{%
15343       \pgfpathmoveto{\pgfpointpolar{0}{\radius}}%
15344       \pgfpathlineto{\pgfpointpolar{45}{\radius}}%
15345       \pgfpathlineto{\pgfpointpolar{90}{\radius}}%
15346       \pgfpathlineto{\pgfpointpolar{135}{\radius}}%
15347       \pgfpathlineto{\pgfpointpolar{180}{\radius}}%
15348       \pgfpathlineto{\pgfpointpolar{225}{\radius}}%
15349       \pgfpathlineto{\pgfpointpolar{270}{\radius}}%
15350       \pgfpathlineto{\pgfpointpolar{315}{\radius}}%
15351       \pgfpathclose}
15352     \def\topline{%
15353       \pgfpathmoveto{\pgfpoint{\linex}{\liney}}%
15354       \pgfpathlineto{\pgfpoint{-\linex}{\liney}}}
15355     \def\bottomline{%
15356       \pgfpathmoveto{\pgfpoint{\linex}{-\liney}}%
15357       \pgfpathlineto{\pgfpoint{-\linex}{-\liney}}}
15358   }
15359   \backgroundpath{%
15360     \init%

```

```

15361 \octagon}
15362 \behindforegroundpath{%
15363 \init%
15364 \octagon%
15365 \pgfusepath{stroke}%
15366 \topline%
15367 \pgfusepath{stroke}%
15368 \bottomline%
15369 \pgfusepath{stroke}%
15370 }
15371 }

```

5.6.7 ‘Friendly’ node shapes



Macro for friendly air shape

```

15372 \def\n@to@friendly@air{%
15373 \southeast \wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
15374 \pgfpathmoveto{\pgfqpoint{-\wg@tmpa}{\wg@tmpb}}%
15375 \cntrl \wg@tmpb=\pgf@y%
15376 \pgfpatharc{180}{0}{\wg@tmpa and \wg@tmpb}}

```

The friendly air command.

```

15377 \pgfdeclareshape{natoapp6c friendly air}{%
15378 \inheritsavedanchors[from=natoapp6c base]
15379 \savedanchor\southeast{%
15380 \pgf@x=1.1\n@to@pp@r%
15381 \pgf@y=-\n@to@pp@r}
15382 \savedanchor\cntrl{\pgf@x=0cm\pgf@y=2.6\n@to@pp@r}
15383 \savedanchor\north{\pgf@x=0cm\pgf@y=1.6\n@to@pp@r}
15384 \anchor{south east}{\southeast}
15385 \anchor{south west}{\southeast\pgf@x=-\pgf@x}
15386 \anchor{north east}{\southeast\wg@tmpa=\pgf@x\north\pgf@x=\wg@tmpa}
15387 \anchor{north west}{\southeast\wg@tmpa=\pgf@x\north\pgf@x=-\wg@tmpa}
15388 \anchor{north}{\north}
15389 \anchor{east}{%
15390 \north\wg@tmpb\pgf@y%
15391 \southeast\wg@tmpc=\pgf@y\wg@tmpa=\pgf@x%
15392 \advance\wg@tmpb-\wg@tmpc
15393 \divide\wg@tmpb2%
15394 \advance\wg@tmpb\wg@tmpc%
15395 \pgf@x=\wg@tmpa%
15396 \pgf@y=\wg@tmpb}
15397 \anchor{west}{%
15398 \north\wg@tmpb\pgf@y%
15399 \southeast\wg@tmpc=\pgf@y\wg@tmpa=\pgf@x%
15400 \advance\wg@tmpb-\wg@tmpc

```

```

15401 \divide\wg@tmpb2%
15402 \advance\wg@tmpb\wg@tmpc%
15403 \pgf@x=-\wg@tmpa%
15404 \pgf@y=\wg@tmpb}
15405 \anchor{south}{\southeast\pgf@x=0cm}
15406 \inheritanchor[from=natoapp6c base]{upper}
15407 \inheritanchor[from=natoapp6c base]{lower}
15408 \inheritanchor[from=natoapp6c base]{left}
15409 \inheritanchor[from=natoapp6c base]{right}
15410 \inheritanchor[from=natoapp6c base]{center}
15411 \backgroundpath{%
15412 \n@to@friendly@ir%
15413 }
15414 \behindforegroundpath{%
15415 \n@to@friendly@ir%
15416 \pgfusepath{stroke}%
15417 }
15418 }

```



Macro for friendly land command

```

15419 \def\n@to@friendly@l@nd{%
15420 \northeast \wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
15421 \pgfpathmoveto{\pgfpoint{ \wg@tmpa}{ \wg@tmpb}}%
15422 \pgfpathlineto{\pgfpoint{-\wg@tmpa}{ \wg@tmpb}}%
15423 \pgfpathlineto{\pgfpoint{-\wg@tmpa}{-\wg@tmpb}}%
15424 \pgfpathlineto{\pgfpoint{ \wg@tmpa}{-\wg@tmpb}}%
15425 \pgfclosepath}

```

The friendly land command. The most used command frame.

```

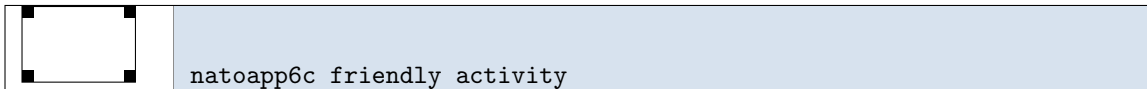
15426 \pgfdeclareshape{natoapp6c friendly land}{%
15427 \inheritsavedanchors[from=natoapp6c base]
15428 \savedanchor\northeast{%
15429 \pgf@x=1.5\n@to@pp@r%
15430 \pgf@y=\n@to@pp@r}
15431 \anchor{north east}{\northeast}
15432 \anchor{north west}{\northeast\pgf@x=-\pgf@x}
15433 \anchor{south east}{\northeast\pgf@y=-\pgf@y}
15434 \anchor{south west}{\northeast\pgf@x=-\pgf@x\pgf@y=-\pgf@y}
15435 \anchor{north}{\northeast\pgf@x=0cm}
15436 \anchor{south}{\northeast\pgf@x=0cm\pgf@y=-\pgf@y}
15437 \anchor{east}{\northeast\pgf@y=0cm}
15438 \anchor{west}{\northeast\pgf@x=-\pgf@x\pgf@y=0cm}
15439 \inheritanchor[from=natoapp6c base]{upper}
15440 \inheritanchor[from=natoapp6c base]{lower}
15441 \inheritanchor[from=natoapp6c base]{left}
15442 \inheritanchor[from=natoapp6c base]{right}
15443 \inheritanchor[from=natoapp6c base]{center}

```

```

15444 \backgroundpath{%
15445   \n@to@friendly@l@nd%
15446 }
15447 \behindforegroundpath{%
15448   \n@to@friendly@l@nd%
15449   \pgfusepath{stroke}%
15450 }
15451 }

```



The friendly activity command. Similar to land command, but with boxes in the corners.

```

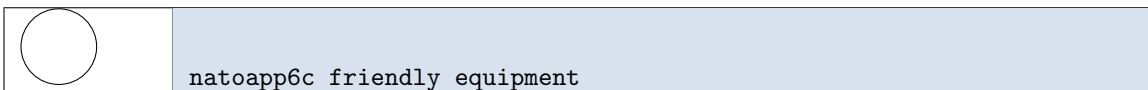
15452 \pgfdeclareshape{natoapp6c friendly activity}{%
15453   \inheritsavedanchors[from=natoapp6c friendly land]
15454   \inheritanchor[from=natoapp6c friendly land]{center}
15455   \inheritanchor[from=natoapp6c friendly land]{inner north east}
15456   \inheritanchor[from=natoapp6c friendly land]{inner north west}
15457   \inheritanchor[from=natoapp6c friendly land]{inner south west}
15458   \inheritanchor[from=natoapp6c friendly land]{inner south east}
15459   \inheritanchor[from=natoapp6c friendly land]{north east}
15460   \inheritanchor[from=natoapp6c friendly land]{north west}
15461   \inheritanchor[from=natoapp6c friendly land]{south east}
15462   \inheritanchor[from=natoapp6c friendly land]{south west}
15463   \inheritanchor[from=natoapp6c friendly land]{north}
15464   \inheritanchor[from=natoapp6c friendly land]{west}
15465   \inheritanchor[from=natoapp6c friendly land]{east}
15466   \inheritanchor[from=natoapp6c friendly land]{south}
15467   \inheritanchor[from=natoapp6c friendly land]{upper}
15468   \inheritanchor[from=natoapp6c friendly land]{lower}
15469   \inheritanchor[from=natoapp6c friendly land]{left}
15470   \inheritanchor[from=natoapp6c friendly land]{right}
15471   \inheritanchor[from=natoapp6c friendly land]{center}
15472   \inheritbackgroundpath[from=natoapp6c friendly land]
15473   \behindforegroundpath{
15474     \begin{n@to@pp@stroketo@fill}
15475       \n@to@friendly@l@nd%
15476       \pgfusepath{stroke}
15477       %
15478       \northeast \wg@tmpa=\pgf@x\wg@tmpb\pgf@y%
15479       \wg@tmpc=\wg@tmpa\advance\wg@tmpc-\n@to@pp@act@w
15480       \wg@tmpd=\wg@tmpb\advance\wg@tmpd-\n@to@pp@act@w
15481       %
15482       \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
15483       \pgfpathlineto{\pgfqpoint{\wg@tmpc}{\wg@tmpb}}%
15484       \pgfpathlineto{\pgfqpoint{\wg@tmpc}{\wg@tmpd}}%
15485       \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpd}}%
15486       \pgfclosepath
15487       %
15488       \pgfusepath{fill}%
15489       \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{-\wg@tmpd}}%

```

```

15490 \pgfpathlineto{\pgfqpoint{\wg@tmpc}{-\wg@tmpd}}%
15491 \pgfpathlineto{\pgfqpoint{\wg@tmpc}{-\wg@tmpb}}%
15492 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{-\wg@tmpb}}%
15493 \pgfclosepath
15494 \pgfusepath{fill}%
15495 %
15496 \pgfpathmoveto{\pgfqpoint{-\wg@tmpc}{\wg@tmpb}}%
15497 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{\wg@tmpb}}%
15498 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{\wg@tmpd}}%
15499 \pgfpathlineto{\pgfqpoint{-\wg@tmpc}{\wg@tmpd}}%
15500 \pgfclosepath
15501 \pgfusepath{fill}%
15502 %
15503 \pgfpathmoveto{\pgfqpoint{-\wg@tmpc}{-\wg@tmpd}}%
15504 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{-\wg@tmpd}}%
15505 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{-\wg@tmpb}}%
15506 \pgfpathlineto{\pgfqpoint{-\wg@tmpc}{-\wg@tmpb}}%
15507 \pgfclosepath
15508 \pgfusepath{fill}%
15509 \end{n@to@pp@stroketofill}
15510 }
15511 }

```



The friendly equipment command. A circle.

```

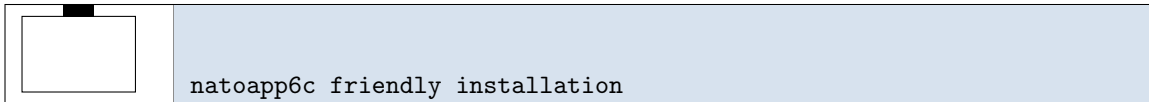
15512 \pgfdeclareshape{natoapp6c friendly equipment}{%
15513 \inheritsavedanchors[from=natoapp6c base]
15514 \savedanchor\northeast{%
15515 \pgf@x=\n@to@pp@r%
15516 \pgf@y=\n@to@pp@r}
15517 \anchor{north east}{\northeast}
15518 \anchor{north west}{\northeast\pgf@x=-\pgf@x}
15519 \anchor{south east}{\northeast\pgf@y=-\pgf@y}
15520 \anchor{south west}{\northeast\pgf@x=-\pgf@x\pgf@y=-\pgf@y}
15521 \anchor{north}{\northeast\pgf@x=0cm}
15522 \anchor{south}{\northeast\pgf@x=0cm\pgf@y=-\pgf@y}
15523 \anchor{east}{\northeast\pgf@y=0cm}
15524 \anchor{west}{\northeast\pgf@x=-\pgf@x\pgf@y=0cm}
15525 \inheritanchor[from=natoapp6c base]{upper}
15526 \inheritanchor[from=natoapp6c base]{lower}
15527 \inheritanchor[from=natoapp6c base]{left}
15528 \inheritanchor[from=natoapp6c base]{right}
15529 \inheritanchor[from=natoapp6c base]{center}
15530 \backgroundpath{%
15531 \northeast\wg@tmpa\pgf@x%
15532 \pgfpathcircle{\pgfqpoint{0cm}{0cm}}{\wg@tmpa}
15533 }
15534 \behindforegroundpath{%
15535 \northeast\wg@tmpa\pgf@x%

```

```

15536 \pgfpathcircle{\pgfqpoint{0cm}{0cm}}{\wg@tmpa}
15537 \pgfusepath{stroke}%
15538 }
15539 }

```



The friendly installation command. Similar to the land command, but with a ‘hat’ on top.

```

15540 \pgfdeclareshape{natoapp6c friendly installation}{%
15541 \inheritshadedanchors[from=natoapp6c friendly land]
15542 \inheritanchor[from=natoapp6c friendly land]{center}
15543 \inheritanchor[from=natoapp6c friendly land]{inner north east}
15544 \inheritanchor[from=natoapp6c friendly land]{inner north west}
15545 \inheritanchor[from=natoapp6c friendly land]{inner south west}
15546 \inheritanchor[from=natoapp6c friendly land]{inner south east}
15547 \inheritanchor[from=natoapp6c friendly land]{north east}
15548 \inheritanchor[from=natoapp6c friendly land]{north west}
15549 \inheritanchor[from=natoapp6c friendly land]{south east}
15550 \inheritanchor[from=natoapp6c friendly land]{south west}
15551 \inheritanchor[from=natoapp6c friendly land]{north}
15552 \inheritanchor[from=natoapp6c friendly land]{west}
15553 \inheritanchor[from=natoapp6c friendly land]{east}
15554 \inheritanchor[from=natoapp6c friendly land]{south}
15555 \inheritanchor[from=natoapp6c friendly land]{upper}
15556 \inheritanchor[from=natoapp6c friendly land]{lower}
15557 \inheritanchor[from=natoapp6c friendly land]{left}
15558 \inheritanchor[from=natoapp6c friendly land]{right}
15559 \inheritanchor[from=natoapp6c friendly land]{center}
15560 \inheritbackgroundpath[from=natoapp6c friendly land]
15561 \behindforegroundpath{
15562 \begin{n@to@pp@stroketo@fill}
15563 \n@to@friendly@l@nd%
15564 \pgfusepath{stroke}
15565 %
15566 \northeast \wg@tmpa=\pgf@y%
15567 \wg@tmpb=\wg@tmpa\advance\wg@tmpb\n@to@pp@inst@h%
15568 %
15569 \pgfpathmoveto{\pgfqpoint{ \n@to@pp@inst@x}{\wg@tmpb}}%
15570 \pgfpathlineto{\pgfqpoint{-\n@to@pp@inst@x}{\wg@tmpb}}%
15571 \pgfpathlineto{\pgfqpoint{-\n@to@pp@inst@x}{\wg@tmpa}}%
15572 \pgfpathlineto{\pgfqpoint{ \n@to@pp@inst@x}{\wg@tmpa}}%
15573 \pgfclosepath
15574 \pgfusepath{fill}%
15575 \end{n@to@pp@stroketo@fill}
15576 }
15577 }

```



natoapp6c friendly sea surface

The friendly sea surface command. Same as equipment command.

```
15578 \pgfdeclareshape{natoapp6c friendly sea surface}{%
15579   \inheritsavedanchors[from=natoapp6c friendly equipment]
15580   \inheritanchor[from=natoapp6c friendly equipment]{inner north east}
15581   \inheritanchor[from=natoapp6c friendly equipment]{inner north west}
15582   \inheritanchor[from=natoapp6c friendly equipment]{inner south west}
15583   \inheritanchor[from=natoapp6c friendly equipment]{inner south east}
15584   \inheritanchor[from=natoapp6c friendly equipment]{north east}
15585   \inheritanchor[from=natoapp6c friendly equipment]{north west}
15586   \inheritanchor[from=natoapp6c friendly equipment]{south east}
15587   \inheritanchor[from=natoapp6c friendly equipment]{south west}
15588   \inheritanchor[from=natoapp6c friendly equipment]{north}
15589   \inheritanchor[from=natoapp6c friendly equipment]{west}
15590   \inheritanchor[from=natoapp6c friendly equipment]{east}
15591   \inheritanchor[from=natoapp6c friendly equipment]{south}
15592   \inheritanchor[from=natoapp6c friendly equipment]{upper}
15593   \inheritanchor[from=natoapp6c friendly equipment]{lower}
15594   \inheritanchor[from=natoapp6c friendly equipment]{left}
15595   \inheritanchor[from=natoapp6c friendly equipment]{right}
15596   \inheritanchor[from=natoapp6c friendly equipment]{center}
15597   \inheritbackgroundpath[from=natoapp6c friendly equipment]
15598   \inheritbehindforegroundpath[from=natoapp6c friendly equipment]
15599 }
```



natoapp6c friendly space

The friendly space command. Similar to air command, but with a bar on top.

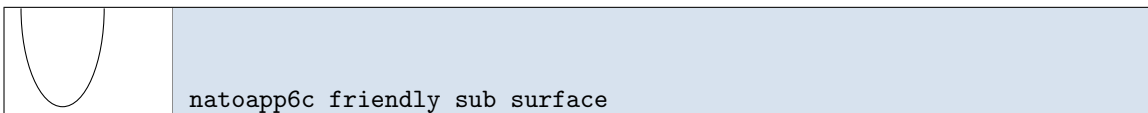
```
15600 \pgfdeclareshape{natoapp6c friendly space}{%
15601   \inheritsavedanchors[from=natoapp6c friendly air]
15602   \inheritanchor[from=natoapp6c friendly air]{north east}
15603   \inheritanchor[from=natoapp6c friendly air]{north west}
15604   \inheritanchor[from=natoapp6c friendly air]{south east}
15605   \inheritanchor[from=natoapp6c friendly air]{south west}
15606   \inheritanchor[from=natoapp6c friendly air]{north}
15607   \inheritanchor[from=natoapp6c friendly air]{west}
15608   \inheritanchor[from=natoapp6c friendly air]{east}
15609   \inheritanchor[from=natoapp6c friendly air]{south}
15610   \inheritanchor[from=natoapp6c friendly air]{upper}
15611   \inheritanchor[from=natoapp6c friendly air]{lower}
15612   \inheritanchor[from=natoapp6c friendly air]{left}
15613   \inheritanchor[from=natoapp6c friendly air]{right}
15614   \inheritanchor[from=natoapp6c friendly air]{center}
15615   \inheritbackgroundpath[from=natoapp6c friendly air]
15616   \behindforegroundpath{%
15617     \begin{n@to@pp@stroketo@fill}
```



```

15618 \n@to@friendly@ir%
15619 \pgfusepath{stroke,clip}%
15620 %
15621 \cntrl\wg@tmpa=\pgf@y%
15622 \north\wg@tmpb=\pgf@y
15623 \advance\wg@tmpb-\n@to@pp@space@h
15624 %
15625 \pgfpathmoveto{\pgfqpoint{ \n@to@pp@r}{\wg@tmpa}}%
15626 \pgfpathlineto{\pgfqpoint{-\n@to@pp@r}{\wg@tmpa}}%
15627 \pgfpathlineto{\pgfqpoint{-\n@to@pp@r}{\wg@tmpb}}%
15628 \pgfpathlineto{\pgfqpoint{ \n@to@pp@r}{\wg@tmpb}}%
15629 \pgfclosepath%
15630 \pgfusepath{fill}%
15631 \end{n@to@pp@stroketo@fill}
15632 }
15633 }

```



Macro for friendly sub surface command

```

15634 \def\n@to@friendly@sub{%
15635 \northeast \wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
15636 \pgfpathmoveto{\pgfqpoint{-\wg@tmpa}{\wg@tmpb}}%
15637 \cntrl \wg@tmpb=\pgf@y%
15638 \pgfpatharc{180}{0}{\wg@tmpa and \wg@tmpb}}

```

The friendly sub surface command.

```

15639 \pgfdeclareshape{natoapp6c friendly sub surface}{%
15640 \inheritsavedanchors[from=natoapp6c base]
15641 \savedanchor\northeast{%
15642 \pgf@x=1.1\n@to@pp@r%
15643 \pgf@y=\n@to@pp@r}
15644 \savedanchor\cntrl{\pgf@x=0cm\pgf@y=-2.6\n@to@pp@r}
15645 \savedanchor\south{\pgf@x=0cm\pgf@y=-1.6\n@to@pp@r}
15646 \anchor{north east}{\northeast}
15647 \anchor{north west}{\northeast\pgf@x=-\pgf@x}
15648 \anchor{south east}{\northeast\wg@tmpa=\pgf@x\south\pgf@x=\wg@tmpa}
15649 \anchor{south west}{\northeast\wg@tmpa=\pgf@x\south\pgf@x=-\wg@tmpa}
15650 \anchor{south}{\south}
15651 \anchor{east}{
15652 \northeast\wg@tmpb=\pgf@y\wg@tmpa=\pgf@x%
15653 \south\wg@tmpc\pgf@y%
15654 \advance\wg@tmpb-\wg@tmpc
15655 \divide\wg@tmpb2%
15656 \advance\wg@tmpb\wg@tmpc%
15657 \pgf@x=\wg@tmpa%
15658 \pgf@y=\wg@tmpb}
15659 \anchor{west}{

```

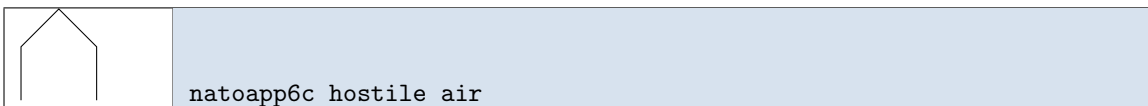
```

15660 \northeast\wg@tmpb=\pgf@y\wg@tmpa=\pgf@x%
15661 \south\wg@tmpc\pgf@y%
15662 \advance\wg@tmpb-\wg@tmpc
15663 \divide\wg@tmpb2%
15664 \advance\wg@tmpb\wg@tmpc%
15665 \pgf@x=-\wg@tmpa%
15666 \pgf@y=\wg@tmpb}
15667 \anchor{north}{\northeast\pgf@x=0cm}
15668 \inheritanchor[from=natoapp6c base]{upper}
15669 \inheritanchor[from=natoapp6c base]{lower}
15670 \inheritanchor[from=natoapp6c base]{left}
15671 \inheritanchor[from=natoapp6c base]{right}
15672 \inheritanchor[from=natoapp6c base]{center}
15673 \backgroundpath{%
15674 \n@to@friendly@sub%
15675 }
15676 \behindforegroundpath{%
15677 \n@to@friendly@sub%
15678 \pgfusepath{stroke}%
15679 }
15680 }

15681 \pgfdeclareshape{natoapp6c friendly none}{%
15682 \inheritsavedanchors[from=natoapp6c base]
15683 \savedanchor\northeast{%
15684 \pgf@x=1.5\n@to@pp@r%
15685 \pgf@y=\n@to@pp@r}
15686 \anchor{north east}{\northeast}
15687 \anchor{north west}{\northeast\pgf@x=-\pgf@x}
15688 \anchor{south east}{\northeast\pgf@y=-\pgf@y}
15689 \anchor{south west}{\northeast\pgf@x=-\pgf@x\pgf@y=-\pgf@y}
15690 \anchor{north}{\northeast\pgf@x=0cm}
15691 \anchor{south}{\northeast\pgf@x=0cm\pgf@y=-\pgf@y}
15692 \anchor{east}{\northeast\pgf@y=0cm}
15693 \anchor{west}{\northeast\pgf@x=-\pgf@x\pgf@y=0cm}
15694 \inheritanchor[from=natoapp6c base]{upper}
15695 \inheritanchor[from=natoapp6c base]{lower}
15696 \inheritanchor[from=natoapp6c base]{left}
15697 \inheritanchor[from=natoapp6c base]{right}
15698 \inheritanchor[from=natoapp6c base]{center}
15699 \backgroundpath{}
15700 \behindforegroundpath{}
15701 }

```

5.6.8 ‘Hostile’ node shapes



The hostile air command

Macro for hostile air shape

```
15702 \def\n@to@hostile@@ir{%
15703 \southeast \wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
15704 \cntrl \wg@tmpc=\pgf@y%
15705 \north \wg@tmpd=\pgf@y%
15706 \pgfpathmoveto{\pgfpoint{-\wg@tmpa}{\wg@tmpb}}%
15707 \pgfpathlineto{\pgfpoint{-\wg@tmpa}{\wg@tmpc}}%
15708 \pgfpathlineto{\pgfpoint{ 0cm}{\wg@tmpd}}%
15709 \pgfpathlineto{\pgfpoint{\wg@tmpa}{\wg@tmpc}}%
15710 \pgfpathlineto{\pgfpoint{\wg@tmpa}{\wg@tmpb}}%
15711 }
```

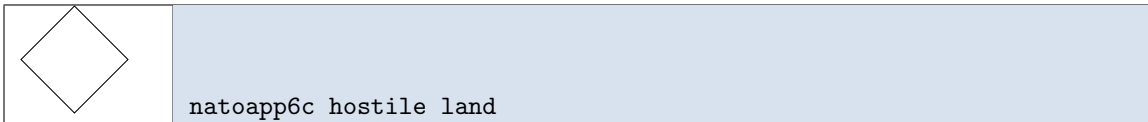
The hostile air command.

```
15712 \pgfdeclareshape{natoapp6c hostile air}{%
15713 \inheritsavedanchors[from=natoapp6c base]
15714 \savedanchor\southeast{%
15715 \pgf@x=\n@to@pp@r%
15716 \pgf@y=-\n@to@pp@r}
15717 \savedanchor\cntrl{%
15718 \pgf@x=\n@to@pp@r%
15719 \pgf@y=0.414\n@to@pp@r% (sqrt(2)-1)
15720 }
15721 \savedanchor\north{\pgf@x=0cm\pgf@y=1.414\n@to@pp@r}
15722 \anchor{south east}{\southeast}
15723 \anchor{south west}{\southeast\pgf@x=-\pgf@x}
15724 \anchor{north east}{\southeast\wg@tmpa=\pgf@x\north\pgf@x=\wg@tmpa}
15725 \anchor{north west}{\southeast\wg@tmpa=\pgf@x\north\pgf@x=-\wg@tmpa}
15726 \anchor{north}{\north}
15727 \anchor{east}{%
15728 \north\wg@tmpb\pgf@y%
15729 \southeast\wg@tmpc=\pgf@y\wg@tmpa=\pgf@x%
15730 \advance\wg@tmpb-\wg@tmpc
15731 \divide\wg@tmpb2%
15732 \advance\wg@tmpb\wg@tmpc%
15733 \pgf@x=\wg@tmpa%
15734 \pgf@y=\wg@tmpb}
15735 \anchor{west}{%
15736 \north\wg@tmpb\pgf@y%
15737 \southeast\wg@tmpc=\pgf@y\wg@tmpa=\pgf@x%
15738 \advance\wg@tmpb-\wg@tmpc
15739 \divide\wg@tmpb2%
15740 \advance\wg@tmpb\wg@tmpc%
15741 \pgf@x=-\wg@tmpa%
15742 \pgf@y=\wg@tmpb}
15743 \anchor{south}{\southeast\pgf@x=0cm}
15744 \inheritanchor[from=natoapp6c base]{upper}
15745 \inheritanchor[from=natoapp6c base]{lower}
15746 \inheritanchor[from=natoapp6c base]{left}
15747 \inheritanchor[from=natoapp6c base]{right}
15748 \inheritanchor[from=natoapp6c base]{center}
15749 \backgroundpath{%
15750 \n@to@hostile@@ir%
```

```

15751 }
15752 \behindforegroundpath{%
15753   \n@to@hostile@0ir%
15754   \pgfusepath{stroke}%
15755 }
15756 }

```



Macro for hostile land command

```

15757 \def\n@to@hostile@1@nd{%
15758   \northeast \wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
15759   \pgfpathmoveto{\pgfpoint{ \wg@tmpa}{ 0cm}}%
15760   \pgfpathlineto{\pgfpoint{ 0cm}{ \wg@tmpb}}%
15761   \pgfpathlineto{\pgfpoint{-\wg@tmpa}{ 0cm}}%
15762   \pgfpathlineto{\pgfpoint{ 0cm}{-\wg@tmpb}}%
15763   \pgfclosepath}

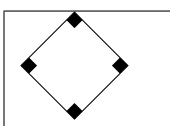
```

The hostile land command.

```

15764 \pgfdeclareshape{natoapp6c hostile land}{%
15765   \inheritsavedanchors[from=natoapp6c base]
15766   \savedanchor\northeast{%
15767     \pgf@x=1.414\n@to@pp@r%
15768     \pgf@y=1.414\n@to@pp@r}
15769   \anchor{north east}{\northeast}
15770   \anchor{north west}{\northeast\pgf@x=-\pgf@x}
15771   \anchor{south east}{\northeast\pgf@y=-\pgf@y}
15772   \anchor{south west}{\northeast\pgf@x=-\pgf@x\pgf@y=-\pgf@y}
15773   \anchor{north}{\northeast\pgf@x=0cm}
15774   \anchor{south}{\northeast\pgf@x=0cm\pgf@y=-\pgf@y}
15775   \anchor{east}{\northeast\pgf@y=0cm}
15776   \anchor{west}{\northeast\pgf@x=-\pgf@x\pgf@y=0cm}
15777   \inheritanchor[from=natoapp6c base]{upper}
15778   \inheritanchor[from=natoapp6c base]{lower}
15779   \inheritanchor[from=natoapp6c base]{left}
15780   \inheritanchor[from=natoapp6c base]{right}
15781   \inheritanchor[from=natoapp6c base]{center}
15782   \backgroundpath{%
15783     \n@to@hostile@1@nd%
15784   }
15785   \behindforegroundpath{%
15786     \n@to@hostile@1@nd%
15787     \pgfusepath{stroke}%
15788   }
15789 }

```



natoapp6c hostile activity

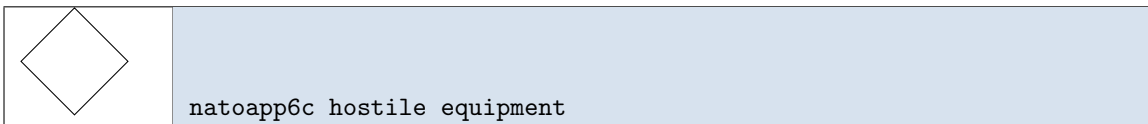
The hostile activity command. Similar to land command, but with boxes in the corners.

```
15790 \pgfdeclareshape{natoapp6c hostile activity}{%
15791   \inheritssavedanchors[from=natoapp6c hostile land]
15792   \inheritanchor[from=natoapp6c hostile land]{center}
15793   \inheritanchor[from=natoapp6c hostile land]{inner north east}
15794   \inheritanchor[from=natoapp6c hostile land]{inner north west}
15795   \inheritanchor[from=natoapp6c hostile land]{inner south west}
15796   \inheritanchor[from=natoapp6c hostile land]{inner south east}
15797   \inheritanchor[from=natoapp6c hostile land]{north east}
15798   \inheritanchor[from=natoapp6c hostile land]{north west}
15799   \inheritanchor[from=natoapp6c hostile land]{south east}
15800   \inheritanchor[from=natoapp6c hostile land]{south west}
15801   \inheritanchor[from=natoapp6c hostile land]{north}
15802   \inheritanchor[from=natoapp6c hostile land]{west}
15803   \inheritanchor[from=natoapp6c hostile land]{east}
15804   \inheritanchor[from=natoapp6c hostile land]{south}
15805   \inheritanchor[from=natoapp6c hostile land]{upper}
15806   \inheritanchor[from=natoapp6c hostile land]{lower}
15807   \inheritanchor[from=natoapp6c hostile land]{left}
15808   \inheritanchor[from=natoapp6c hostile land]{right}
15809   \inheritanchor[from=natoapp6c hostile land]{center}
15810   \inheritbackgroundpath[from=natoapp6c hostile land]
15811   \behindforegroundpath{
15812     \begin{n@to@pp@stroketo@fill}
15813       \n@to@hostile@l@nd%
15814       \pgfusepath{stroke}
15815       %
15816       \northeast \wg@tmpb=\pgf@y%
15817       \wg@tmpa=0.707\n@to@pp@act@w
15818       \wg@tmpc=\wg@tmpb\advance\wg@tmpc-1.414\n@to@pp@act@w
15819       \wg@tmpd=\wg@tmpb\advance\wg@tmpd-\wg@tmpa
15820       %
15821       \pgfpathmoveto{\pgfpoint{ \wg@tmpa}{\wg@tmpd}}%
15822       \pgfpathlineto{\pgfpoint{ 0cm}{\wg@tmpb}}%
15823       \pgfpathlineto{\pgfpoint{-\wg@tmpa}{\wg@tmpd}}%
15824       \pgfpathlineto{\pgfpoint{ 0cm}{\wg@tmpc}}%
15825       \pgfclosepath
15826       \pgfusepath{fill}%
15827       %
15828       \pgfpathmoveto{\pgfpoint{-\wg@tmpc}{0cm}}%
15829       \pgfpathlineto{\pgfpoint{-\wg@tmpd}{\wg@tmpa}}%
15830       \pgfpathlineto{\pgfpoint{-\wg@tmpb}{0cm}}%
15831       \pgfpathlineto{\pgfpoint{-\wg@tmpd}{-\wg@tmpa}}%
15832       \pgfclosepath
15833       \pgfusepath{fill}%
15834       %
15835       \pgfpathmoveto{\pgfpoint{ \wg@tmpa}{-\wg@tmpd}}%
15836       \pgfpathlineto{\pgfpoint{ 0cm}{-\wg@tmpc}}%
```

```

15837 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{-\wg@tmpd}}%
15838 \pgfpathlineto{\pgfqpoint{0cm}{-\wg@tmpb}}%
15839 \pgfclosepath
15840 \pgfusepath{fill}%
15841 %
15842 \pgfpathmoveto{\pgfqpoint{\wg@tmpb}{0cm}}%
15843 \pgfpathlineto{\pgfqpoint{\wg@tmpd}{\wg@tmpa}}%
15844 \pgfpathlineto{\pgfqpoint{\wg@tmpc}{0cm}}%
15845 \pgfpathlineto{\pgfqpoint{\wg@tmpd}{-\wg@tmpa}}%
15846 \pgfclosepath
15847 \pgfusepath{fill}%
15848 \end{n@to@pp@stroketo@fill}
15849 }
15850 }

```

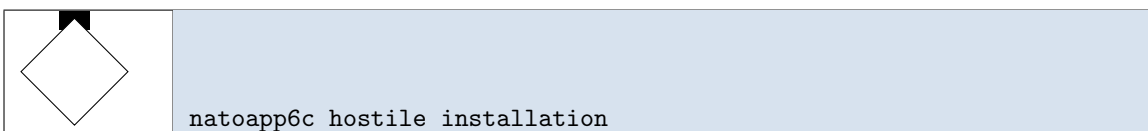


The hostile equipment command. Same as land command.

```

15851 \pgfdeclareshape{natoapp6c hostile equipment}{%
15852 \inheritssavedanchors[from=natoapp6c hostile land]
15853 \inheritanchor[from=natoapp6c hostile land]{inner north east}
15854 \inheritanchor[from=natoapp6c hostile land]{inner north west}
15855 \inheritanchor[from=natoapp6c hostile land]{inner south west}
15856 \inheritanchor[from=natoapp6c hostile land]{inner south east}
15857 \inheritanchor[from=natoapp6c hostile land]{north east}
15858 \inheritanchor[from=natoapp6c hostile land]{north west}
15859 \inheritanchor[from=natoapp6c hostile land]{south east}
15860 \inheritanchor[from=natoapp6c hostile land]{south west}
15861 \inheritanchor[from=natoapp6c hostile land]{north}
15862 \inheritanchor[from=natoapp6c hostile land]{west}
15863 \inheritanchor[from=natoapp6c hostile land]{east}
15864 \inheritanchor[from=natoapp6c hostile land]{south}
15865 \inheritanchor[from=natoapp6c hostile land]{upper}
15866 \inheritanchor[from=natoapp6c hostile land]{lower}
15867 \inheritanchor[from=natoapp6c hostile land]{left}
15868 \inheritanchor[from=natoapp6c hostile land]{right}
15869 \inheritanchor[from=natoapp6c hostile land]{center}
15870 \inheritbackgroundpath[from=natoapp6c hostile land]
15871 \inheritbehindforegroundpath[from=natoapp6c hostile land]
15872 }

```

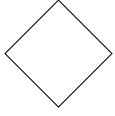


The hostile installation command. Similar to land command, but with a 'hat' on top.

```

15873 \pgfdeclareshape{natoapp6c hostile installation}{%
15874   \inheritshapedanchors[from=natoapp6c hostile land]
15875   \inheritanchor[from=natoapp6c hostile land]{center}
15876   \inheritanchor[from=natoapp6c hostile land]{inner north east}
15877   \inheritanchor[from=natoapp6c hostile land]{inner north west}
15878   \inheritanchor[from=natoapp6c hostile land]{inner south west}
15879   \inheritanchor[from=natoapp6c hostile land]{inner south east}
15880   \inheritanchor[from=natoapp6c hostile land]{north east}
15881   \inheritanchor[from=natoapp6c hostile land]{north west}
15882   \inheritanchor[from=natoapp6c hostile land]{south east}
15883   \inheritanchor[from=natoapp6c hostile land]{south west}
15884   \inheritanchor[from=natoapp6c hostile land]{north}
15885   \inheritanchor[from=natoapp6c hostile land]{west}
15886   \inheritanchor[from=natoapp6c hostile land]{east}
15887   \inheritanchor[from=natoapp6c hostile land]{south}
15888   \inheritanchor[from=natoapp6c hostile land]{upper}
15889   \inheritanchor[from=natoapp6c hostile land]{lower}
15890   \inheritanchor[from=natoapp6c hostile land]{left}
15891   \inheritanchor[from=natoapp6c hostile land]{right}
15892   \inheritanchor[from=natoapp6c hostile land]{center}
15893   \inheritbackgroundpath[from=natoapp6c hostile land]
15894   \behindforegroundpath{
15895     \begin{n@to@pp@stroketofill}
15896       \n@to@hostile@l@nd%
15897       \pgfusepath{stroke}
15898       %
15899       \northeast \wg@tmpa=\pgf@x\wg@tmpb\pgf@y%
15900       \wg@tmpc=\wg@tmpb
15901       \advance\wg@tmpc\n@to@pp@inst@h%
15902       \advance\wg@tmpc-0.05cm%
15903       %
15904       \pgfpathmoveto{\pgfqpoint{ \wg@tmpa}{0cm}}
15905       \pgfpathlineto{\pgfqpoint{ \wg@tmpa}{\wg@tmpc}}
15906       \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{\wg@tmpc}}
15907       \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{0cm}}
15908       \pgfpathlineto{\pgfqpoint{ 0cm}{\wg@tmpb}}
15909       \pgfclosepath%
15910       \pgfusepath{clip}
15911       %
15912       \wg@tmpd=\wg@tmpb%
15913       \advance\wg@tmpd-\n@to@pp@inst@h%
15914       %
15915       \pgfpathmoveto{\pgfqpoint{ \n@to@pp@inst@x}{\wg@tmpc}}%
15916       \pgfpathlineto{\pgfqpoint{-\n@to@pp@inst@x}{\wg@tmpc}}%
15917       \pgfpathlineto{\pgfqpoint{-\n@to@pp@inst@x}{\wg@tmpd}}%
15918       \pgfpathlineto{\pgfqpoint{ \n@to@pp@inst@x}{\wg@tmpd}}%
15919       \pgfclosepath
15920       \pgfusepath{fill}%
15921     \end{n@to@pp@stroketofill}
15922   }
15923 }

```



natoapp6c hostile sea surface

The hostile sea surface command. Same as land command

```
15924 \pgfdeclareshape{natoapp6c hostile sea surface}{%
15925 \inheritssavedanchors[from=natoapp6c hostile equipment]
15926 \inheritanchor[from=natoapp6c hostile equipment]{inner north east}
15927 \inheritanchor[from=natoapp6c hostile equipment]{inner north west}
15928 \inheritanchor[from=natoapp6c hostile equipment]{inner south west}
15929 \inheritanchor[from=natoapp6c hostile equipment]{inner south east}
15930 \inheritanchor[from=natoapp6c hostile equipment]{north east}
15931 \inheritanchor[from=natoapp6c hostile equipment]{north west}
15932 \inheritanchor[from=natoapp6c hostile equipment]{south east}
15933 \inheritanchor[from=natoapp6c hostile equipment]{south west}
15934 \inheritanchor[from=natoapp6c hostile equipment]{north}
15935 \inheritanchor[from=natoapp6c hostile equipment]{west}
15936 \inheritanchor[from=natoapp6c hostile equipment]{east}
15937 \inheritanchor[from=natoapp6c hostile equipment]{south}
15938 \inheritanchor[from=natoapp6c hostile equipment]{upper}
15939 \inheritanchor[from=natoapp6c hostile equipment]{lower}
15940 \inheritanchor[from=natoapp6c hostile equipment]{left}
15941 \inheritanchor[from=natoapp6c hostile equipment]{right}
15942 \inheritanchor[from=natoapp6c hostile equipment]{center}
15943 \inheritbackgroundpath[from=natoapp6c hostile equipment]
15944 \inheritbehindforegroundpath[from=natoapp6c hostile equipment]
15945 }
```



natoapp6c hostile space

The hostile space command. Similar to air command, but with bar on top.

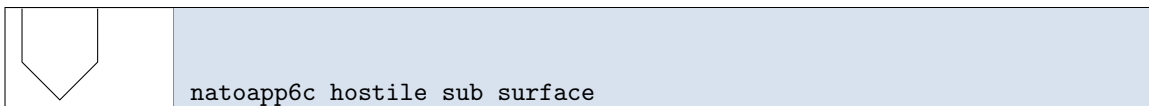
```
15946 \pgfdeclareshape{natoapp6c hostile space}{%
15947 \inheritssavedanchors[from=natoapp6c hostile air]
15948 \inheritanchor[from=natoapp6c hostile air]{north east}
15949 \inheritanchor[from=natoapp6c hostile air]{north west}
15950 \inheritanchor[from=natoapp6c hostile air]{south east}
15951 \inheritanchor[from=natoapp6c hostile air]{south west}
15952 \inheritanchor[from=natoapp6c hostile air]{north}
15953 \inheritanchor[from=natoapp6c hostile air]{west}
15954 \inheritanchor[from=natoapp6c hostile air]{east}
15955 \inheritanchor[from=natoapp6c hostile air]{south}
15956 \inheritanchor[from=natoapp6c hostile air]{upper}
15957 \inheritanchor[from=natoapp6c hostile air]{lower}
15958 \inheritanchor[from=natoapp6c hostile air]{left}
15959 \inheritanchor[from=natoapp6c hostile air]{right}
15960 \inheritanchor[from=natoapp6c hostile air]{center}
15961 \inheritbackgroundpath[from=natoapp6c hostile air]
15962 \behindforegroundpath{%
```



```

15963 \begin{n@to@pp@stroketofill}
15964 \n@to@hostile@ir%
15965 \pgfusepath{stroke,clip}%
15966 %
15967 \north\wg@tmpa=\pgf@y\wg@tmpb=\pgf@y
15968 \advance\wg@tmpb-\n@to@pp@spaceh
15969 %
15970 \pgfpathmoveto{\pgfqpoint{ \n@to@pp@r}{\wg@tmpa}}%
15971 \pgfpathlineto{\pgfqpoint{-\n@to@pp@r}{\wg@tmpa}}%
15972 \pgfpathlineto{\pgfqpoint{-\n@to@pp@r}{\wg@tmpb}}%
15973 \pgfpathlineto{\pgfqpoint{ \n@to@pp@r}{\wg@tmpb}}%
15974 \pgfclosepath%
15975 \pgfusepath{fill}%
15976 \end{n@to@pp@stroketofill}
15977 }
15978 }

```



Macro for hostile sub surface command

```

15979 \def\n@to@hostile@sub{%
15980 \northeast \wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
15981 \cntrl \wg@tmpc=\pgf@y%
15982 \south \wg@tmpd=\pgf@y%
15983 \pgfpathmoveto{\pgfqpoint{-\wg@tmpa}{\wg@tmpb}}%
15984 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{\wg@tmpc}}%
15985 \pgfpathlineto{\pgfqpoint{ 0cm}{\wg@tmpd}}%
15986 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpc}}%
15987 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
15988 }

```

The hostile sub surface command

```

15989 \pgfdeclareshape{natoapp6c hostile sub surface}{%
15990 \inheritsavedanchors[from=natoapp6c base]
15991 \savedanchor\northeast{%
15992 \pgf@x=\n@to@pp@r%
15993 \pgf@y=\n@to@pp@r}
15994 \savedanchor\cntrl{\pgf@x=\n@to@pp@r\pgf@y=-0.414\n@to@pp@r}
15995 \savedanchor\south{\pgf@x=0cm\pgf@y=-1.414\n@to@pp@r}
15996 \anchor{north east}{\northeast}
15997 \anchor{north west}{\northeast\pgf@x=-\pgf@x}
15998 \anchor{south east}{\northeast\wg@tmpa=\pgf@x\south\pgf@x=\wg@tmpa}
15999 \anchor{south west}{\northeast\wg@tmpa=\pgf@x\south\pgf@x=-\wg@tmpa}
16000 \anchor{south}{\south}
16001 \anchor{east}{
16002 \northeast\wg@tmpb=\pgf@y\wg@tmpa=\pgf@x%
16003 \south\wg@tmpc\pgf@y%
16004 \advance\wg@tmpb-\wg@tmpc
16005 \divide\wg@tmpb2%

```

```

16006 \advance\wg@tmpb\wg@tmpc%
16007 \pgf@x=\wg@tmpa%
16008 \pgf@y=\wg@tmpb}
16009 \anchor{west}{
16010 \northeast\wg@tmpb=\pgf@y\wg@tmpa=\pgf@x%
16011 \south\wg@tmpc\pgf@y%
16012 \advance\wg@tmpb-\wg@tmpc
16013 \divide\wg@tmpb2%
16014 \advance\wg@tmpb\wg@tmpc%
16015 \pgf@x=-\wg@tmpa%
16016 \pgf@y=\wg@tmpb}
16017 \anchor{north}{\northeast\pgf@x=0cm}
16018 \inheritanchor[from=natoapp6c base]{upper}
16019 \inheritanchor[from=natoapp6c base]{lower}
16020 \inheritanchor[from=natoapp6c base]{left}
16021 \inheritanchor[from=natoapp6c base]{right}
16022 \inheritanchor[from=natoapp6c base]{center}
16023 \backgroundpath{%
16024 \n@to@hostile@sub%
16025 }
16026 \behindforegroundpath{%
16027 \n@to@hostile@sub%
16028 \pgfusepath{stroke}%
16029 }
16030 }

```

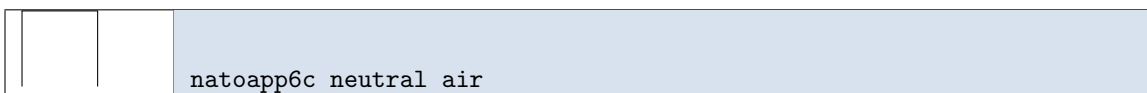
5.6.9 ‘Neutral’ node shapes

Macro for neutral shapes

```

16031 \def\n@to@pp@neutr@l@init{%
16032 \northeast\wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
16033 \def\n@to@pp@neutr@l@left {\pgflineto{\pgfqpoint{-\wg@tmpa}{-\wg@tmpb}}}%
16034 \def\n@to@pp@neutr@l@right {\pgflineto{\pgfqpoint{ \wg@tmpa}{ \wg@tmpb}}}%
16035 \def\n@to@pp@neutr@l@top {\pgflineto{\pgfqpoint{-\wg@tmpa}{ \wg@tmpb}}}%
16036 \def\n@to@pp@neutr@l@bottom{\pgflineto{\pgfqpoint{ \wg@tmpa}{-\wg@tmpb}}}%
16037 \def\n@to@pp@neutr@l@nw {\pgfmoveto{\pgfqpoint{-\wg@tmpa}{ \wg@tmpb}}}%
16038 \def\n@to@pp@neutr@l@ne {\pgfmoveto{\pgfqpoint{ \wg@tmpa}{ \wg@tmpb}}}%
16039 \def\n@to@pp@neutr@l@se {\pgfmoveto{\pgfqpoint{ \wg@tmpa}{-\wg@tmpb}}}%
16040 \def\n@to@pp@neutr@l@sw {\pgfmoveto{\pgfqpoint{-\wg@tmpa}{-\wg@tmpb}}}%
16041 }

```



The neutral air command

```

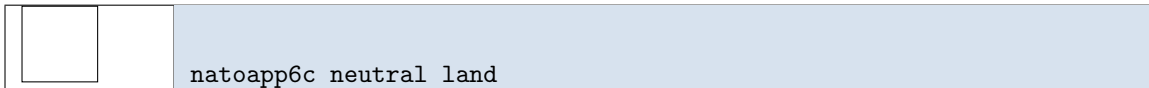
16042 \pgfdeclareshape{natoapp6c neutral air}{%
16043 \inheritssavedanchors[from=natoapp6c base]
16044 \savedanchor\northeast{\pgf@x=\n@to@pp@r\pgf@y=\n@to@pp@r}
16045 \anchor{north east}{\northeast}

```

```

16046 \anchor{north west}{\northeast\pgf@x=-\pgf@x}
16047 \anchor{south east}{\northeast\pgf@y=-\pgf@y}
16048 \anchor{south west}{\northeast\pgf@x=-\pgf@x\pgf@y=-\pgf@y}
16049 \anchor{north}{\northeast\pgf@x=0cm}
16050 \anchor{east}{\northeast\pgf@y=0cm}
16051 \anchor{west}{\northeast\pgf@x=-\pgf@x\pgf@y=0cm}
16052 \anchor{south}{\northeast\pgf@x=0cm\pgf@y=-\pgf@y}
16053 \inheritanchor[from=natoapp6c base]{upper}
16054 \inheritanchor[from=natoapp6c base]{lower}
16055 \inheritanchor[from=natoapp6c base]{left}
16056 \inheritanchor[from=natoapp6c base]{right}
16057 \inheritanchor[from=natoapp6c base]{center}
16058 \backgroundpath{%
16059   \n@to@pp@neutr@l@init%
16060   \n@to@pp@neutr@l@se
16061   \n@to@pp@neutr@l@right%
16062   \n@to@pp@neutr@l@top%
16063   \n@to@pp@neutr@l@left%
16064 }
16065 \behindforegroundpath{%
16066   \n@to@pp@neutr@l@init%
16067   \n@to@pp@neutr@l@se
16068   \n@to@pp@neutr@l@right%
16069   \n@to@pp@neutr@l@top%
16070   \n@to@pp@neutr@l@left%
16071   \pgfusepath{stroke}%
16072 }
16073 }

```



The neutral land command

```

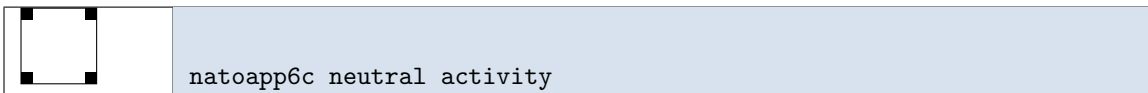
16074 \pgfdeclareshape{natoapp6c neutral land}{%
16075   \inheritshapedanchors[from=natoapp6c neutral air]
16076   \inheritanchor[from=natoapp6c neutral air]{north east}
16077   \inheritanchor[from=natoapp6c neutral air]{north west}
16078   \inheritanchor[from=natoapp6c neutral air]{south east}
16079   \inheritanchor[from=natoapp6c neutral air]{south west}
16080   \inheritanchor[from=natoapp6c neutral air]{north}
16081   \inheritanchor[from=natoapp6c neutral air]{west}
16082   \inheritanchor[from=natoapp6c neutral air]{east}
16083   \inheritanchor[from=natoapp6c neutral air]{south}
16084   \inheritanchor[from=natoapp6c neutral air]{upper}
16085   \inheritanchor[from=natoapp6c neutral air]{lower}
16086   \inheritanchor[from=natoapp6c neutral air]{left}
16087   \inheritanchor[from=natoapp6c neutral air]{right}
16088   \inheritanchor[from=natoapp6c neutral air]{center}
16089   \backgroundpath{%
16090     \n@to@pp@neutr@l@init%
16091     \n@to@pp@neutr@l@ne

```

```

16092 \n@to@pp@neutr@l@top%
16093 \n@to@pp@neutr@l@left%
16094 \n@to@pp@neutr@l@bottom%
16095 \pgfclosepath
16096 }
16097 \behindforegroundpath{
16098 \n@to@pp@neutr@l@init%
16099 \n@to@pp@neutr@l@ne
16100 \n@to@pp@neutr@l@top%
16101 \n@to@pp@neutr@l@left%
16102 \n@to@pp@neutr@l@bottom%
16103 \pgfclosepath
16104 \pgfusepath{stroke}%
16105 }
16106 }

```



The neutral activity command. Similar to land command but with boxes added in the corners.

```

16107 \pgfdeclareshape{natoapp6c neutral activity}{%
16108 \inheritavedanchors[from=natoapp6c neutral land]
16109 \inheritanchor[from=natoapp6c neutral land]{center}
16110 \inheritanchor[from=natoapp6c neutral land]{inner north east}
16111 \inheritanchor[from=natoapp6c neutral land]{inner north west}
16112 \inheritanchor[from=natoapp6c neutral land]{inner south west}
16113 \inheritanchor[from=natoapp6c neutral land]{inner south east}
16114 \inheritanchor[from=natoapp6c neutral land]{north east}
16115 \inheritanchor[from=natoapp6c neutral land]{north west}
16116 \inheritanchor[from=natoapp6c neutral land]{south east}
16117 \inheritanchor[from=natoapp6c neutral land]{south west}
16118 \inheritanchor[from=natoapp6c neutral land]{north}
16119 \inheritanchor[from=natoapp6c neutral land]{west}
16120 \inheritanchor[from=natoapp6c neutral land]{east}
16121 \inheritanchor[from=natoapp6c neutral land]{south}
16122 \inheritanchor[from=natoapp6c neutral land]{upper}
16123 \inheritanchor[from=natoapp6c neutral land]{lower}
16124 \inheritanchor[from=natoapp6c neutral land]{left}
16125 \inheritanchor[from=natoapp6c neutral land]{right}
16126 \inheritanchor[from=natoapp6c neutral land]{center}
16127 \inheritbackgroundpath[from=natoapp6c neutral land]
16128 \behindforegroundpath{
16129 \begin{n@to@pp@stroketofill}
16130 \n@to@pp@neutr@l@init%
16131 \n@to@pp@neutr@l@ne
16132 \n@to@pp@neutr@l@top%
16133 \n@to@pp@neutr@l@left%
16134 \n@to@pp@neutr@l@bottom%
16135 \pgfclosepath
16136 \pgfusepath{stroke}
16137 %

```

```

16138 \northeast \wg@tmpa=\pgf@x\wg@tmpb\pgf@y%
16139 \wg@tmpc=\wg@tmpa\advance\wg@tmpc-\n@to@pp@act@w
16140 \wg@tmpd=\wg@tmpb\advance\wg@tmpd-\n@to@pp@act@w
16141 %
16142 \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
16143 \pgfpathlineto{\pgfqpoint{\wg@tmpc}{\wg@tmpb}}%
16144 \pgfpathlineto{\pgfqpoint{\wg@tmpc}{\wg@tmpd}}%
16145 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpd}}%
16146 \pgfclosepath
16147 \pgfusepath{fill}%
16148 %
16149 \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{-\wg@tmpd}}%
16150 \pgfpathlineto{\pgfqpoint{\wg@tmpc}{-\wg@tmpd}}%
16151 \pgfpathlineto{\pgfqpoint{\wg@tmpc}{-\wg@tmpb}}%
16152 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{-\wg@tmpb}}%
16153 \pgfclosepath
16154 \pgfusepath{fill}%
16155 %
16156 \pgfpathmoveto{\pgfqpoint{-\wg@tmpc}{\wg@tmpb}}%
16157 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{\wg@tmpb}}%
16158 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{\wg@tmpd}}%
16159 \pgfpathlineto{\pgfqpoint{-\wg@tmpc}{\wg@tmpd}}%
16160 \pgfclosepath
16161 \pgfusepath{fill}%
16162 %
16163 \pgfpathmoveto{\pgfqpoint{-\wg@tmpc}{-\wg@tmpd}}%
16164 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{-\wg@tmpd}}%
16165 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{-\wg@tmpb}}%
16166 \pgfpathlineto{\pgfqpoint{-\wg@tmpc}{-\wg@tmpb}}%
16167 \pgfclosepath
16168 \pgfusepath{fill}%
16169 \end{n@to@pp@stroketo@fill}
16170 }
16171 }

```

	natoapp6c neutral equipment
--	-----------------------------

The neutral equipment command. Same as land command

```

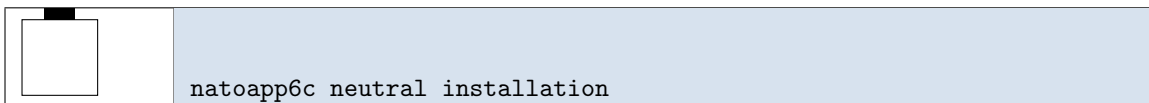
16172 \pgfdeclareshape{natoapp6c neutral equipment}{%
16173 \inheritshadedanchors[from=natoapp6c neutral land]
16174 \inheritanchors[from=natoapp6c neutral land]{center}
16175 \inheritanchors[from=natoapp6c neutral land]{inner north east}
16176 \inheritanchors[from=natoapp6c neutral land]{inner north west}
16177 \inheritanchors[from=natoapp6c neutral land]{inner south west}
16178 \inheritanchors[from=natoapp6c neutral land]{inner south east}
16179 \inheritanchors[from=natoapp6c neutral land]{north east}
16180 \inheritanchors[from=natoapp6c neutral land]{north west}
16181 \inheritanchors[from=natoapp6c neutral land]{south east}
16182 \inheritanchors[from=natoapp6c neutral land]{south west}
16183 \inheritanchors[from=natoapp6c neutral land]{north}

```

```

16184 \inheritanchor[from=natoapp6c neutral land]{west}
16185 \inheritanchor[from=natoapp6c neutral land]{east}
16186 \inheritanchor[from=natoapp6c neutral land]{south}
16187 \inheritanchor[from=natoapp6c neutral land]{upper}
16188 \inheritanchor[from=natoapp6c neutral land]{lower}
16189 \inheritanchor[from=natoapp6c neutral land]{left}
16190 \inheritanchor[from=natoapp6c neutral land]{right}
16191 \inheritanchor[from=natoapp6c neutral land]{center}
16192 \inheritbackgroundpath[from=natoapp6c neutral land]
16193 \inheritbehindbackgroundpath[from=natoapp6c neutral land]
16194 }

```



The neutral installation command. Similar to land command but with a ‘hat’ on top.

```

16195 \pgfdeclareshape{natoapp6c neutral installation}{%
16196 \inheritsavedanchors[from=natoapp6c neutral land]
16197 \inheritanchor[from=natoapp6c neutral land]{center}
16198 \inheritanchor[from=natoapp6c neutral land]{inner north east}
16199 \inheritanchor[from=natoapp6c neutral land]{inner north west}
16200 \inheritanchor[from=natoapp6c neutral land]{inner south west}
16201 \inheritanchor[from=natoapp6c neutral land]{inner south east}
16202 \inheritanchor[from=natoapp6c neutral land]{north east}
16203 \inheritanchor[from=natoapp6c neutral land]{north west}
16204 \inheritanchor[from=natoapp6c neutral land]{south east}
16205 \inheritanchor[from=natoapp6c neutral land]{south west}
16206 \inheritanchor[from=natoapp6c neutral land]{north}
16207 \inheritanchor[from=natoapp6c neutral land]{west}
16208 \inheritanchor[from=natoapp6c neutral land]{east}
16209 \inheritanchor[from=natoapp6c neutral land]{south}
16210 \inheritanchor[from=natoapp6c neutral land]{upper}
16211 \inheritanchor[from=natoapp6c neutral land]{lower}
16212 \inheritanchor[from=natoapp6c neutral land]{left}
16213 \inheritanchor[from=natoapp6c neutral land]{right}
16214 \inheritanchor[from=natoapp6c neutral land]{center}
16215 \inheritbackgroundpath[from=natoapp6c neutral land]
16216 \behindforegroundpath{
16217 \begin{n@to@pp@stroketo@fill}
16218 \n@to@pp@neutr@l@init%
16219 \n@to@pp@neutr@l@ne
16220 \n@to@pp@neutr@l@top%
16221 \n@to@pp@neutr@l@left%
16222 \n@to@pp@neutr@l@bottom%
16223 \pgfclosepath
16224 \pgfusepath{stroke}
16225 %
16226 \northeast \wg@tmpa=\pgf@y%
16227 \wg@tmpb=\wg@tmpa\advance\wg@tmpb\n@to@pp@inst@h%
16228 %
16229 \pgfpathmoveto{\pgfqpoint{ \n@to@pp@inst@x}{\wg@tmpb}}%

```

```

16230 \pgfpathlineto{\pgfqpoint{-\n@to@pp@inst@x}{\wg@tmpb}}%
16231 \pgfpathlineto{\pgfqpoint{-\n@to@pp@inst@x}{\wg@tmpa}}%
16232 \pgfpathlineto{\pgfqpoint{ \n@to@pp@inst@x}{\wg@tmpa}}%
16233 \pgfclosepath
16234 \pgfusepath{fill}%
16235 \end{n@to@pp@stroketo@fill}
16236 }
16237 }

```

	natoapp6c neutral sea surface
--	-------------------------------

The neutral sea surface command. Same as land command.

```

16238 \pgfdeclareshape{natoapp6c neutral sea surface}{%
16239 \inheritssavedanchors[from=natoapp6c neutral equipment]
16240 \inheritanchor[from=natoapp6c neutral equipment]{inner north east}
16241 \inheritanchor[from=natoapp6c neutral equipment]{inner north west}
16242 \inheritanchor[from=natoapp6c neutral equipment]{inner south west}
16243 \inheritanchor[from=natoapp6c neutral equipment]{inner south east}
16244 \inheritanchor[from=natoapp6c neutral equipment]{north east}
16245 \inheritanchor[from=natoapp6c neutral equipment]{north west}
16246 \inheritanchor[from=natoapp6c neutral equipment]{south east}
16247 \inheritanchor[from=natoapp6c neutral equipment]{south west}
16248 \inheritanchor[from=natoapp6c neutral equipment]{north}
16249 \inheritanchor[from=natoapp6c neutral equipment]{west}
16250 \inheritanchor[from=natoapp6c neutral equipment]{east}
16251 \inheritanchor[from=natoapp6c neutral equipment]{south}
16252 \inheritanchor[from=natoapp6c neutral equipment]{upper}
16253 \inheritanchor[from=natoapp6c neutral equipment]{lower}
16254 \inheritanchor[from=natoapp6c neutral equipment]{left}
16255 \inheritanchor[from=natoapp6c neutral equipment]{right}
16256 \inheritanchor[from=natoapp6c neutral equipment]{center}
16257 \inheritbackgroundpath[from=natoapp6c neutral equipment]
16258 \inheritbehindforegroundpath[from=natoapp6c neutral equipment]
16259 }

```

	natoapp6c neutral space
--	-------------------------

The neutral space command. Similar to air command but with a bar.

```

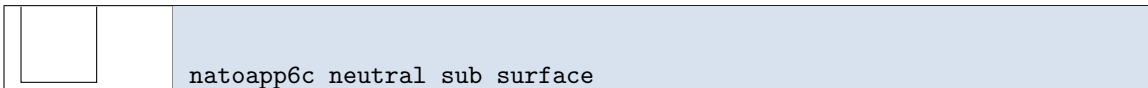
16260 \pgfdeclareshape{natoapp6c neutral space}{%
16261 \inheritssavedanchors[from=natoapp6c neutral air]
16262 \inheritanchor[from=natoapp6c neutral air]{north east}
16263 \inheritanchor[from=natoapp6c neutral air]{north west}
16264 \inheritanchor[from=natoapp6c neutral air]{south east}
16265 \inheritanchor[from=natoapp6c neutral air]{south west}
16266 \inheritanchor[from=natoapp6c neutral air]{north}
16267 \inheritanchor[from=natoapp6c neutral air]{west}

```

```

16268 \inheritanchor[from=natoapp6c neutral air]{east}
16269 \inheritanchor[from=natoapp6c neutral air]{south}
16270 \inheritanchor[from=natoapp6c neutral air]{upper}
16271 \inheritanchor[from=natoapp6c neutral air]{lower}
16272 \inheritanchor[from=natoapp6c neutral air]{left}
16273 \inheritanchor[from=natoapp6c neutral air]{right}
16274 \inheritanchor[from=natoapp6c neutral air]{center}
16275 \inheritbackgroundpath[from=natoapp6c neutral air]
16276 \behindforegroundpath{%
16277   \begin{n@to@pp@stroketo@fill}
16278     \n@to@pp@neutr@l@init%
16279     \n@to@pp@neutr@l@se
16280     \n@to@pp@neutr@l@right%
16281     \n@to@pp@neutr@l@top%
16282     \n@to@pp@neutr@l@left%
16283     \pgfusepath{stroke}%
16284     %
16285     \n@to@pp@neutr@l@ne
16286     \n@to@pp@neutr@l@top%
16287     \northeast\wg@tmpa=\pgf@x\wg@tmpb=\pgf@y%
16288     \advance\wg@tmpb-\n@to@pp@space@h
16289     %
16290     \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{\wg@tmpc}}%
16291     \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{\wg@tmpb}}%
16292     \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
16293     \pgfclosepath%
16294     \pgfusepath{fill}%
16295   \end{n@to@pp@stroketo@fill}
16296 }
16297 }

```



The neutral sub surface command

```

16298 \pgfdeclareshape{natoapp6c neutral sub surface}{%
16299   \inheritsavedanchors[from=natoapp6c neutral air]
16300   \inheritanchor[from=natoapp6c neutral air]{north east}
16301   \inheritanchor[from=natoapp6c neutral air]{north west}
16302   \inheritanchor[from=natoapp6c neutral air]{south east}
16303   \inheritanchor[from=natoapp6c neutral air]{south west}
16304   \inheritanchor[from=natoapp6c neutral air]{north}
16305   \inheritanchor[from=natoapp6c neutral air]{west}
16306   \inheritanchor[from=natoapp6c neutral air]{east}
16307   \inheritanchor[from=natoapp6c neutral air]{south}
16308   \inheritanchor[from=natoapp6c neutral air]{upper}
16309   \inheritanchor[from=natoapp6c neutral air]{lower}
16310   \inheritanchor[from=natoapp6c neutral air]{left}
16311   \inheritanchor[from=natoapp6c neutral air]{right}
16312   \inheritanchor[from=natoapp6c neutral air]{center}
16313   \backgroundpath{%

```



```

16314 \n@to@pp@neutr@l@init%
16315 \n@to@pp@neutr@l@nw
16316 \n@to@pp@neutr@l@left%
16317 \n@to@pp@neutr@l@bottom%
16318 \n@to@pp@neutr@l@right%
16319 }
16320 \behindforegroundpath{%
16321 \n@to@pp@neutr@l@init%
16322 \n@to@pp@neutr@l@nw
16323 \n@to@pp@neutr@l@left%
16324 \n@to@pp@neutr@l@bottom%
16325 \n@to@pp@neutr@l@right%
16326 \pgfusepath{stroke}%
16327 }
16328 }

```

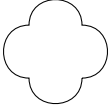
5.6.10 ‘Unknown’ node shapes

Macro to define unknown path elements

```

16329 \def\n@to@pp@unknown@init{%
16330 \def\n@to@pp@unknown@top{%
16331 \innernortheast \wg@tmpa=\pgf@x%
16332 \cntrlnortheast \wg@tmpb=\pgf@x%
16333 \pgfpathcurveto{%
16334 \pgfqpoint{ \wg@tmpa}{\wg@tmpb}}{%
16335 \pgfqpoint{-\wg@tmpa}{\wg@tmpb}}{%
16336 \pgfqpoint{-\wg@tmpa}{\wg@tmpa}}}
16337 \def\n@to@pp@unknown@left{%
16338 \innernortheast \wg@tmpa=\pgf@x%
16339 \cntrlnortheast \wg@tmpb=\pgf@x%
16340 \pgfpathcurveto{%
16341 \pgfqpoint{-\wg@tmpb}{ \wg@tmpa}}{%
16342 \pgfqpoint{-\wg@tmpb}{-\wg@tmpa}}{%
16343 \pgfqpoint{-\wg@tmpa}{-\wg@tmpa}}}
16344 \def\n@to@pp@unknown@bottom{%
16345 \innernortheast \wg@tmpa=\pgf@x%
16346 \cntrlnortheast \wg@tmpb=\pgf@x%
16347 \pgfpathcurveto{%
16348 \pgfqpoint{-\wg@tmpa}{-\wg@tmpb}}{%
16349 \pgfqpoint{ \wg@tmpa}{-\wg@tmpb}}{%
16350 \pgfqpoint{ \wg@tmpa}{-\wg@tmpa}}}
16351 \def\n@to@pp@unknown@right{%
16352 \innernortheast \wg@tmpa=\pgf@x%
16353 \cntrlnortheast \wg@tmpb=\pgf@x%
16354 \pgfpathcurveto{%
16355 \pgfqpoint{ \wg@tmpb}{-\wg@tmpa}}{%
16356 \pgfqpoint{ \wg@tmpb}{ \wg@tmpa}}{%
16357 \pgfqpoint{ \wg@tmpa}{ \wg@tmpa}}}
16358 }

```



natoapp6c unknown land

The unknown land command

```
16359 \pgfdeclareshape{natoapp6c unknown land}{%
16360 \inheritsavedanchors[from=natoapp6c base]
16361 \savedanchor\innernortheast{\pgf@x=.7\n@to@pp@r\pgf@y=.7\n@to@pp@r}
16362 \savedanchor\cntrlnortheast{\pgf@x=1.6\n@to@pp@r\pgf@y=1.6\n@to@pp@r}
16363 \savedanchor\northeast{\pgf@x=1.4\n@to@pp@r\pgf@y=1.4\n@to@pp@r}
16364 \anchor{inner north east}{\innernortheast}
16365 \anchor{inner north west}{\innernortheast\pgf@x=-\pgf@x}
16366 \anchor{inner south west}{\innernortheast\pgf@x=-\pgf@x\pgf@y=-\pgf@y}
16367 \anchor{inner south east}{\innernortheast\pgf@y=-\pgf@y}
16368 \anchor{north east}{\northeast}
16369 \anchor{north west}{\northeast\pgf@x=-\pgf@x}
16370 \anchor{south west}{\northeast\pgf@x=-\pgf@x\pgf@y=-\pgf@y}
16371 \anchor{south east}{\northeast\pgf@y=-\pgf@y}
16372 \anchor{north}{\northeast\pgf@x=0cm}
16373 \anchor{east}{\northeast\pgf@y=0cm}
16374 \anchor{south}{\northeast\pgf@x=0cm\pgf@y=-\pgf@y}
16375 \anchor{west}{\northeast\pgf@x=-\pgf@x\pgf@y=0cm}
16376 \inheritanchor[from=natoapp6c base]{center}
16377 \inheritanchor[from=natoapp6c base]{upper}
16378 \inheritanchor[from=natoapp6c base]{lower}
16379 \inheritanchor[from=natoapp6c base]{left}
16380 \inheritanchor[from=natoapp6c base]{right}
16381 \backgroundpath{%
16382 \n@to@pp@unknown@init
16383 \innernortheast \wg@tmpa=\pgf@x%
16384 \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{-\wg@tmpa}}%
16385 \n@to@pp@unknown@right %
16386 \n@to@pp@unknown@top %
16387 \n@to@pp@unknown@left %
16388 \n@to@pp@unknown@bottom%
16389 }
16390 \behindforegroundpath{%
16391 \n@to@pp@unknown@init
16392 \innernortheast \wg@tmpa=\pgf@x%
16393 \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{-\wg@tmpa}}%
16394 \n@to@pp@unknown@right %
16395 \n@to@pp@unknown@top %
16396 \n@to@pp@unknown@left %
16397 \n@to@pp@unknown@bottom%
16398 \pgfusepath{stroke}}
16399 }
```



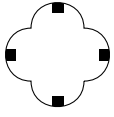
natoapp6c unknown air

The unknown air command. To consider: Should clipping path extend below the actual symbol to include that part of the base symbol?

```

16400 \pgfdeclareshape{natoapp6c unknown air}{%
16401   \inheritavedanchors[from=natoapp6c unknown land]
16402   \inheritanchor[from=natoapp6c unknown land]{inner north east}
16403   \inheritanchor[from=natoapp6c unknown land]{inner north west}
16404   \inheritanchor[from=natoapp6c unknown land]{inner south west}
16405   \inheritanchor[from=natoapp6c unknown land]{inner south east}
16406   \inheritanchor[from=natoapp6c unknown land]{north east}
16407   \inheritanchor[from=natoapp6c unknown land]{north west}
16408   \inheritanchor[from=natoapp6c unknown land]{north}
16409   \inheritanchor[from=natoapp6c unknown land]{west}
16410   \inheritanchor[from=natoapp6c unknown land]{east}
16411   \inheritanchor[from=natoapp6c unknown land]{upper}
16412   \inheritanchor[from=natoapp6c unknown land]{lower}
16413   \inheritanchor[from=natoapp6c unknown land]{left}
16414   \inheritanchor[from=natoapp6c unknown land]{right}
16415   \inheritanchor[from=natoapp6c unknown land]{center}
16416   \anchor{south}{\innernortheast\pgf@x=0cm\pgf@y=-\pgf@y}
16417   \anchor{south east}{
16418     \northeast\wg@tmpa=\pgf@x
16419     \innernortheast\pgf@y=-\pgf@y
16420     \pgf@x=\wg@tmpa}
16421   \anchor{south west}{
16422     \northeast\wg@tmpa=\pgf@x
16423     \innernortheast\pgf@y=-\pgf@y
16424     \pgf@x=-\wg@tmpa}
16425   \backgroundpath{%
16426     \n@to@pp@unknown@init
16427     \innernortheast \wg@tmpa=\pgf@x%
16428     \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{-\wg@tmpa}}%
16429     \n@to@pp@unknown@right %
16430     \n@to@pp@unknown@top %
16431     \n@to@pp@unknown@left %
16432     \ifn@to@pp@isclip
16433     \pgfpathlineto{\pgfqpoint{0cm}{-\radius}}
16434     \pgfpathclose
16435     \fi
16436   }
16437   \behindforegroundpath{%
16438     \n@to@pp@unknown@init
16439     \innernortheast \wg@tmpa=\pgf@x%
16440     \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{-\wg@tmpa}}%
16441     \n@to@pp@unknown@right %
16442     \n@to@pp@unknown@top %
16443     \n@to@pp@unknown@left %
16444     \pgfusepath{stroke}%
16445   }
16446 }

```



natoapp6c unknown activity

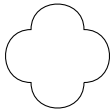
The unknown activity command. Similar to land command, but with boxes in the the ‘corners’.

```
16447 \pgfdeclareshape{natoapp6c unknown activity}{%
16448   \inheritshadedanchors[from=natoapp6c unknown land]
16449   \inheritanchor[from=natoapp6c unknown land]{inner north east}
16450   \inheritanchor[from=natoapp6c unknown land]{inner north west}
16451   \inheritanchor[from=natoapp6c unknown land]{inner south west}
16452   \inheritanchor[from=natoapp6c unknown land]{inner south east}
16453   \inheritanchor[from=natoapp6c unknown land]{north east}
16454   \inheritanchor[from=natoapp6c unknown land]{north west}
16455   \inheritanchor[from=natoapp6c unknown land]{south east}
16456   \inheritanchor[from=natoapp6c unknown land]{south west}
16457   \inheritanchor[from=natoapp6c unknown land]{north}
16458   \inheritanchor[from=natoapp6c unknown land]{west}
16459   \inheritanchor[from=natoapp6c unknown land]{east}
16460   \inheritanchor[from=natoapp6c unknown land]{south}
16461   \inheritanchor[from=natoapp6c unknown land]{upper}
16462   \inheritanchor[from=natoapp6c unknown land]{lower}
16463   \inheritanchor[from=natoapp6c unknown land]{left}
16464   \inheritanchor[from=natoapp6c unknown land]{right}
16465   \inheritanchor[from=natoapp6c unknown land]{center}
16466   \inheritbackgroundpath[from=natoapp6c unknown land]
16467   \behindforegroundpath{
16468     \n@to@pp@unknown@init
16469     \innernortheast \wg@tmpa=\pgf@x%
16470     \begin{n@to@pp@stroketofill}
16471       \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{-\wg@tmpa}}%
16472       \n@to@pp@unknown@right %
16473       \n@to@pp@unknown@top %
16474       \n@to@pp@unknown@left %
16475       \n@to@pp@unknown@bottom%
16476       \pgfusepath{stroke,clip}
16477       %
16478       \northeast\wg@tmpa\pgf@x
16479       \advance\wg@tmpa0.005cm
16480       \wg@tmpb=\wg@tmpa
16481       \advance\wg@tmpb-\n@to@pp@act@w
16482       \wg@tmpc=\n@to@pp@act@w
16483       \divide\wg@tmpc2
16484       %
16485       \pgfpathmoveto{\pgfqpoint{ \wg@tmpc}{\wg@tmpa}}%
16486       \pgfpathlineto{\pgfqpoint{-\wg@tmpc}{\wg@tmpa}}%
16487       \pgfpathlineto{\pgfqpoint{-\wg@tmpc}{\wg@tmpb}}%
16488       \pgfpathlineto{\pgfqpoint{ \wg@tmpc}{\wg@tmpb}}%
16489       \pgfclosepath%
16490       \pgfusepath{fill}
16491       %
16492       \pgfpathmoveto{\pgfqpoint{ \wg@tmpc}{-\wg@tmpb}}%
16493       \pgfpathlineto{\pgfqpoint{-\wg@tmpc}{-\wg@tmpb}}%
```

```

16494 \pgfpathlineto{\pgfqpoint{-\wg@tmpc}{-\wg@tmpa}}%
16495 \pgfpathlineto{\pgfqpoint{ \wg@tmpc}{-\wg@tmpa}}%
16496 \pgfclosepath%
16497 \pgfusepath{fill}
16498 %
16499 \pgfpathmoveto{\pgfqpoint{ \wg@tmpa}{ \wg@tmpc}}%
16500 \pgfpathlineto{\pgfqpoint{ \wg@tmpb}{ \wg@tmpc}}%
16501 \pgfpathlineto{\pgfqpoint{ \wg@tmpb}{-\wg@tmpc}}%
16502 \pgfpathlineto{\pgfqpoint{ \wg@tmpa}{-\wg@tmpc}}%
16503 \pgfclosepath%
16504 \pgfusepath{fill}
16505 %
16506 \pgfpathmoveto{\pgfqpoint{-\wg@tmpb}{ \wg@tmpc}}%
16507 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{ \wg@tmpc}}%
16508 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{-\wg@tmpc}}%
16509 \pgfpathlineto{\pgfqpoint{-\wg@tmpb}{-\wg@tmpc}}%
16510 \pgfclosepath%
16511 \pgfusepath{fill}
16512 \end{n@to@pp@stroketo@fill}
16513 }
16514 }

```



natoapp6c unknown equipment

The unknown equipment command. Same as land command.

```

16515 \pgfdeclareshape{natoapp6c unknown equipment}{%
16516 \inheritssavedanchors[from=natoapp6c unknown land]
16517 \inheritanchor[from=natoapp6c unknown land]{inner north east}
16518 \inheritanchor[from=natoapp6c unknown land]{inner north west}
16519 \inheritanchor[from=natoapp6c unknown land]{inner south west}
16520 \inheritanchor[from=natoapp6c unknown land]{inner south east}
16521 \inheritanchor[from=natoapp6c unknown land]{north east}
16522 \inheritanchor[from=natoapp6c unknown land]{north west}
16523 \inheritanchor[from=natoapp6c unknown land]{south east}
16524 \inheritanchor[from=natoapp6c unknown land]{south west}
16525 \inheritanchor[from=natoapp6c unknown land]{north}
16526 \inheritanchor[from=natoapp6c unknown land]{west}
16527 \inheritanchor[from=natoapp6c unknown land]{east}
16528 \inheritanchor[from=natoapp6c unknown land]{south}
16529 \inheritanchor[from=natoapp6c unknown land]{upper}
16530 \inheritanchor[from=natoapp6c unknown land]{lower}
16531 \inheritanchor[from=natoapp6c unknown land]{left}
16532 \inheritanchor[from=natoapp6c unknown land]{right}
16533 \inheritanchor[from=natoapp6c unknown land]{center}
16534 \inheritbackgroundpath[from=natoapp6c unknown land]
16535 \inheritbehindforegroundpath[from=natoapp6c unknown land]
16536 }

```



natoapp6c unknown installation

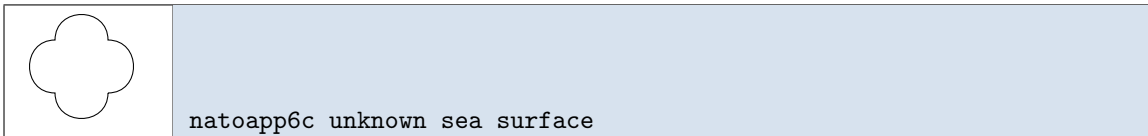
The unknown installation command. Similar to land command, but with a ‘hat’ on top. Note, NATO App6(d) makes the ‘hat’ lower part disconnected from the main symbol. I find that ugly, so we do it like NATO App6(c).

```
16537 \pgfdeclareshape{natoapp6c unknown installation}{%
16538 \inheritshapedanchors[from=natoapp6c unknown land]
16539 \inheritanchors[from=natoapp6c unknown land]{center}
16540 \inheritanchors[from=natoapp6c unknown land]{inner north east}
16541 \inheritanchors[from=natoapp6c unknown land]{inner north west}
16542 \inheritanchors[from=natoapp6c unknown land]{inner south west}
16543 \inheritanchors[from=natoapp6c unknown land]{inner south east}
16544 \inheritanchors[from=natoapp6c unknown land]{north east}
16545 \inheritanchors[from=natoapp6c unknown land]{north west}
16546 \inheritanchors[from=natoapp6c unknown land]{south east}
16547 \inheritanchors[from=natoapp6c unknown land]{south west}
16548 \inheritanchors[from=natoapp6c unknown land]{north}
16549 \inheritanchors[from=natoapp6c unknown land]{west}
16550 \inheritanchors[from=natoapp6c unknown land]{east}
16551 \inheritanchors[from=natoapp6c unknown land]{south}
16552 \inheritanchors[from=natoapp6c unknown land]{upper}
16553 \inheritanchors[from=natoapp6c unknown land]{lower}
16554 \inheritanchors[from=natoapp6c unknown land]{left}
16555 \inheritanchors[from=natoapp6c unknown land]{right}
16556 \inheritanchors[from=natoapp6c unknown land]{center}
16557 \inheritbackgroundpath[from=natoapp6c unknown land]
16558 \behindforegroundpath{
16559 \n@to@pp@unknown@init
16560 \innernortheast \wg@tmpa=\pgf@x%
16561
16562 \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{-\wg@tmpa}}%
16563 \n@to@pp@unknown@right %
16564 \n@to@pp@unknown@top %
16565 \n@to@pp@unknown@left %
16566 \n@to@pp@unknown@bottom%
16567 \pgfusepath{stroke}
16568 %
16569 \begin{n@to@pp@stroketo@fill}
16570 \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{\wg@tmpa}}%
16571 \n@to@pp@unknown@top %
16572 %
16573 \northeast\wg@tmpb=\pgf@y\wg@tmpc=\pgf@y%
16574 \advance\wg@tmpb\n@to@pp@inst@h%
16575 \advance\wg@tmpb-0.05cm%
16576 \advance\wg@tmpc-\n@to@pp@inst@h%
16577 \advance\wg@tmpc-\n@to@pp@inst@h%
16578 %
16579 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{\wg@tmpb}}%
16580 \pgfpathlineto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
16581 \pgfclosepath%
16582 \pgfusepath{clip}%
```

```

16583 %
16584 \pgfpathmoveto{\pgfqpoint{ \n@to@pp@inst@x}{\wg@tmpb}}%
16585 \pgfpathlineto{\pgfqpoint{-\n@to@pp@inst@x}{\wg@tmpb}}%
16586 \pgfpathlineto{\pgfqpoint{-\n@to@pp@inst@x}{\wg@tmpc}}%
16587 \pgfpathlineto{\pgfqpoint{ \n@to@pp@inst@x}{\wg@tmpc}}%
16588 \pgfclosepath%
16589 \pgfusepath{fill}%
16590 \end{n@to@pp@stroketo@fill}
16591 }
16592 }

```



The unknown sea surface command. Same as land command

```

16593 \pgfdeclareshape{natoapp6c unknown sea surface}{%
16594 \inheritssavedanchors[from=natoapp6c unknown land]
16595 \inheritanchor[from=natoapp6c unknown land]{inner north east}
16596 \inheritanchor[from=natoapp6c unknown land]{inner north west}
16597 \inheritanchor[from=natoapp6c unknown land]{inner south west}
16598 \inheritanchor[from=natoapp6c unknown land]{inner south east}
16599 \inheritanchor[from=natoapp6c unknown land]{north east}
16600 \inheritanchor[from=natoapp6c unknown land]{north west}
16601 \inheritanchor[from=natoapp6c unknown land]{south east}
16602 \inheritanchor[from=natoapp6c unknown land]{south west}
16603 \inheritanchor[from=natoapp6c unknown land]{north}
16604 \inheritanchor[from=natoapp6c unknown land]{west}
16605 \inheritanchor[from=natoapp6c unknown land]{east}
16606 \inheritanchor[from=natoapp6c unknown land]{south}
16607 \inheritanchor[from=natoapp6c unknown land]{upper}
16608 \inheritanchor[from=natoapp6c unknown land]{lower}
16609 \inheritanchor[from=natoapp6c unknown land]{left}
16610 \inheritanchor[from=natoapp6c unknown land]{right}
16611 \inheritanchor[from=natoapp6c unknown land]{center}
16612 \inheritbackgroundpath[from=natoapp6c unknown land]
16613 \inheritbehindforegroundpath[from=natoapp6c unknown land]
16614 }

```



The unknown space command. Similar to air command, but with a top bar.

```

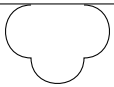
16615 \pgfdeclareshape{natoapp6c unknown space}{%
16616 \inheritssavedanchors[from=natoapp6c unknown air]
16617 \inheritanchor[from=natoapp6c unknown air]{inner north east}
16618 \inheritanchor[from=natoapp6c unknown air]{inner north west}

```

```

16619 \inheritanchor[from=natoapp6c unknown air]{inner south west}
16620 \inheritanchor[from=natoapp6c unknown air]{inner south east}
16621 \inheritanchor[from=natoapp6c unknown air]{north east}
16622 \inheritanchor[from=natoapp6c unknown air]{north west}
16623 \inheritanchor[from=natoapp6c unknown air]{south east}
16624 \inheritanchor[from=natoapp6c unknown air]{south west}
16625 \inheritanchor[from=natoapp6c unknown air]{north}
16626 \inheritanchor[from=natoapp6c unknown air]{west}
16627 \inheritanchor[from=natoapp6c unknown air]{east}
16628 \inheritanchor[from=natoapp6c unknown air]{south}
16629 \inheritanchor[from=natoapp6c unknown air]{upper}
16630 \inheritanchor[from=natoapp6c unknown air]{lower}
16631 \inheritanchor[from=natoapp6c unknown air]{left}
16632 \inheritanchor[from=natoapp6c unknown air]{right}
16633 \inheritanchor[from=natoapp6c unknown air]{center}
16634 \inheritbackgroundpath[from=natoapp6c unknown air]
16635 \behindforegroundpath{%
16636   \n@to@pp@unknown@init
16637   \innernortheast \wg@tmpa=\pgf@x%
16638   \begin{n@to@pp@stroketo@fill}
16639     \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{-\wg@tmpa}}%
16640     \n@to@pp@unknown@right %
16641     \n@to@pp@unknown@top %
16642     \n@to@pp@unknown@left %
16643     \pgfusepath{stroke,clip}%
16644     %
16645     \northeast\wg@tmpa=\pgf@y\wg@tmpb=\pgf@y
16646     \advance\wg@tmpb-\n@to@pp@space@h
16647     %
16648     \pgfpathmoveto{\pgfqpoint{ \radius}{\wg@tmpa}}%
16649     \pgfpathlineto{\pgfqpoint{-\radius}{\wg@tmpa}}%
16650     \pgfpathlineto{\pgfqpoint{-\radius}{\wg@tmpb}}%
16651     \pgfpathlineto{\pgfqpoint{ \radius}{\wg@tmpb}}%
16652     \pgfclosepath%
16653     \pgfusepath{fill}%
16654   \end{n@to@pp@stroketo@fill}
16655 }
16656 }

```



natoapp6c unknown sub surface

The unknown sub surface command.

```

16657 \pgfdeclareshape{natoapp6c unknown sub surface}{%
16658   \inheritssavedanchors[from=natoapp6c unknown land]
16659   \inheritanchor[from=natoapp6c unknown land]{inner north east}
16660   \inheritanchor[from=natoapp6c unknown land]{inner north west}
16661   \inheritanchor[from=natoapp6c unknown land]{inner south west}
16662   \inheritanchor[from=natoapp6c unknown land]{inner south east}
16663   \inheritanchor[from=natoapp6c unknown land]{south east}
16664   \inheritanchor[from=natoapp6c unknown land]{south west}

```



```

16665 \inheritanchor[from=natoapp6c unknown land]{south}
16666 \inheritanchor[from=natoapp6c unknown land]{west}
16667 \inheritanchor[from=natoapp6c unknown land]{east}
16668 \inheritanchor[from=natoapp6c unknown land]{upper}
16669 \inheritanchor[from=natoapp6c unknown land]{lower}
16670 \inheritanchor[from=natoapp6c unknown land]{left}
16671 \inheritanchor[from=natoapp6c unknown land]{right}
16672 \inheritanchor[from=natoapp6c unknown land]{center}
16673 \anchor{north}{\innernortheast\pgf@x=0cm}
16674 \anchor{north east}{
16675   \northeast\wg@tmpa=\pgf@x
16676   \innernortheast\pgf@y=\pgf@y
16677   \pgf@x=\wg@tmpa}
16678 \anchor{north west}{
16679   \northeast\wg@tmpa=\pgf@x
16680   \innernortheast\pgf@y=\pgf@y
16681   \pgf@x=-\wg@tmpa}
16682 \backgroundpath{%
16683   \n@to@pp@unknown@init
16684   \innernortheast \wg@tmpa=\pgf@x%
16685   \pgfpathmoveto{\pgfqpoint{-\wg@tmpa}{\wg@tmpa}}%
16686   \n@to@pp@unknown@left %
16687   \n@to@pp@unknown@bottom %
16688   \n@to@pp@unknown@right %
16689   \ifn@to@pp@isclip
16690   \pgfpathlineto{\pgfqpoint{0cm}{\radius}}
16691   \pgfpathclose
16692   \fi
16693 }
16694 \behindforegroundpath{%
16695   \n@to@pp@unknown@init
16696   \innernortheast \wg@tmpa=\pgf@x%
16697   \pgfpathmoveto{\pgfqpoint{-\wg@tmpa}{\wg@tmpa}}%
16698   \n@to@pp@unknown@left %
16699   \n@to@pp@unknown@bottom %
16700   \n@to@pp@unknown@right %
16701   \pgfusepath{stroke}}
16702 }

```

5.6.11 Echelons

Dimensions

```

16703 \def\n@to@pp@e@y{.12}
16704 \def\n@to@pp@e@yy{.24}

```

Paths as macros

```

16705 \def\n@to@pp@e@d#1{($(#1*\n@to@pp@e@y,0)$) circle(0.09)}
16706 \def\n@to@pp@e@b#1{%
16707   ($(#1*\n@to@pp@e@y,-\n@to@pp@e@y)$) -- ($(#1*\n@to@pp@e@y,\n@to@pp@e@y)$)}
16708 \def\n@to@pp@e@x#1{%
16709   ($(-\n@to@pp@e@y,-\n@to@pp@e@y)+(#1*\n@to@pp@e@y,0)$)--

```

```

16710 ++(\n@to@pp@e@yy, \n@to@pp@e@yy)
16711 ($(-\n@to@pp@e@y, \n@to@pp@e@y)+(#1*\n@to@pp@e@y,0)$)--
16712 ++(\n@to@pp@e@yy, -\n@to@pp@e@yy)}

```

Pictures

```

16713 \tikzset{
16714   pics/natoapp6c/s/echelon/.is choice,
16715   pics/natoapp6c/s/echelon/squad/.style={code={
16716     \path[draw,fill=pgfstrokecolor,pic actions]
16717     \foreach \o in {0}{\n@to@pp@e@d{\o}};}},
16718   pics/natoapp6c/s/echelon/section/.style={code={
16719     \path[draw,fill=pgfstrokecolor,pic actions]
16720     \foreach \o in {-1,1}{\n@to@pp@e@d{\o}};}},
16721   pics/natoapp6c/s/echelon/platoon/.style={code={
16722     \path[draw,fill=pgfstrokecolor,pic actions]
16723     \foreach \o in {-2,0,2}{\n@to@pp@e@d{\o}};}},
16724   pics/natoapp6c/s/echelon/company/.style={code={
16725     \path[draw,pic actions]
16726     \foreach \o in {0}{\n@to@pp@e@b{\o}};}},
16727   pics/natoapp6c/s/echelon/battalion/.style={code={
16728     \path[draw,pic actions]
16729     \foreach \o in {-1,1}{\n@to@pp@e@b{\o}};}},
16730   pics/natoapp6c/s/echelon/regiment/.style={code={
16731     \path[draw,pic actions]
16732     \foreach \o in {-2,0,2}{\n@to@pp@e@b{\o}};}},
16733   pics/natoapp6c/s/echelon/brigade/.style={code={
16734     \path[draw,pic actions]
16735     \foreach \o in {0}{\n@to@pp@e@x{\o}};}},
16736   pics/natoapp6c/s/echelon/division/.style={code={
16737     \path[draw,pic actions]
16738     \foreach \o in {-1,1}{\n@to@pp@e@x{\o}};}},
16739   pics/natoapp6c/s/echelon/corps/.style={code={
16740     \path[draw,pic actions]
16741     \foreach \o in {-2,0,2}{\n@to@pp@e@x{\o}};}},
16742   pics/natoapp6c/s/echelon/army/.style={code={
16743     \path[draw,pic actions]
16744     \foreach \o in {-3,-1,1,3}{\n@to@pp@e@x{\o}};}},
16745   pics/natoapp6c/s/echelon/army group/.style={code={
16746     \path[draw,pic actions]
16747     \foreach \o in {-4,-2,0,2,4}{\n@to@pp@e@x{\o}};}},
16748   pics/natoapp6c/s/echelon/theatre/.style={code={
16749     \path[draw,pic actions]
16750     \foreach \o in {-5,-3,-1,1,3,5}{\n@to@pp@e@x{\o}};}},
16751   pics/natoapp6c/s/echelon/command/.style={code={
16752     \path[draw,pic actions]
16753     (-.3,-.1) -- (-.3,.1) (-.4, 0) -- (-.2, 0)
16754     (.3,-.1) -- (.3,.1) (.4, 0) -- (.2, 0)};}},
16755   pics/natoapp6c/s/echelon/dummy/.style={code={%
16756     \path[draw,pic actions] (M.north west) rectangle
16757     ($(M.north east)+(0,.1)$)};}},
16758 }

```

5.6.12 Text on symbols

```
/tikz/natoapp6c/normal text
/tikz/natoapp6c/squashed text
/tikz/natoapp6c/small text
/tikz/natoapp6c/small squashed text
```

NATO App6 does not specify any particular font for text symbols (main, modifiers, or amplifiers) but here we choose to use \TeX Gyro Heros (a Gothic font, i.e., Helvetica-like).

```
16759 \newcommand\n@to@ppfont[2][b]{%
16760   \fontencoding{T1}\fontfamily{qhv}\fontseries{#1}\fontsize{#2}{0}\selectfont}
16761 \tikzset{%
16762   natoapp6c/text/.style={%
16763     shape=rectangle,%
16764     draw=none,%
16765     fill=none,%
16766     transform shape,%
16767     anchor=center},
16768   natoapp6c/normal text/.style={font=\n@to@ppfont{12}},
16769   natoapp6c/squashed text/.style={font=\n@to@ppfont[bc]{12}},
16770   natoapp6c/small text/.style={font=\n@to@ppfont{10}},
16771   natoapp6c/squashed small text/.style={font=\n@to@ppfont[bc]{10}},
16772 }
```

```
\n@to@pp@text@normal
\n@to@pp@text@squashed
\n@to@pp@text@small
\n@to@pp@text@smallsquashed
```

These macros are short-hands for making a node at (0,0) in the local scope.

```
16773 \newcommand\n@to@pp@text@normal[2] [] {%
16774   \node[natoapp6c/text,natoapp6c/normal text,#1]{#2}}
16775 \newcommand\n@to@pp@text@squashed[2] [] {%
16776   \node[natoapp6c/text,natoapp6c/squashed text,#1]{#2}}
16777 \newcommand\n@to@pp@text@small[2] [] {%
16778   \node[natoapp6c/text,natoapp6c/small text,#1]{#2}}
16779 \newcommand\n@to@pp@text@smallsquashed[2] [] {%
16780   \node[natoapp6c/text,natoapp6c/squashed small text,#1]{#2}}
```

5.6.13 Text natoapp6c namespace

```
/natoapp6c
```

Here, we set up the key path /natoapp6c

```
16781 \def\natoapp@report{}
16782 \tikzset{
16783   /natoapp6c/.search also={/tikz},
16784   /natoapp6c/.cd,
```

```
16785 }
```

Choices of *faction*, *command*, and *echelon*

```
natoapp6c/id
natoapp6c/fac
natoapp6c/cmd
natoapp6c/ech
```

The keys `id`, `specfac`, `cmd`, and `ech` are internal keys used to store the choice of *faction*, *command*, and *echelon*, respectively, in.

```
16786 \tikzset{
16787 /natoapp6c/.cd,
16788 id/.store in=\natoapp@id,
16789 fac/.store in=\natoapp@fac,
16790 cmd/.store in=\natoapp@cmd,
16791 ech/.store in=\natoapp@ech,
16792 }
```

```
natoapp6c/faction
```

Choice of *faction*. This is limited to predefined values. The choice is stored in the key `natoapp6c/fac`.

```
16793 \tikzset{
16794 /natoapp6c/.cd,
16795 faction/.is choice,
16796 faction/none/.code={\let\natoapp@fac\undefined},
16797 faction/friendly/.style={fac=friendly},
16798 faction/friend/.style={fac=friendly},
16799 faction/hostile/.style={fac=hostile},
16800 faction/enemy/.style={fac=hostile},
16801 faction/neutral/.style={fac=neutral},
16802 faction/unknown/.style={fac=unknown},
16803 faction/?/.style={fac=unknown},
16804 faction/.initial=friendly,
16805 }
```

```
natoapp6c/command
```

Choice of *command*. This is limited to predefined values. The choice is stored in the key `natoapp6c/cmd`.

```
16806 \tikzset{
16807 /natoapp6c/.cd,
16808 command/.is choice,
16809 command/base/.style={cmd=base},
16810 command/activity/.style={cmd=activity},
16811 command/air/.style={cmd=air},
16812 command/missile/.style={cmd=air},
16813 command/equipment/.style={cmd=equipment},
16814 command/installation/.style={cmd=installation},
```

```

16815 command/land/.style={cmd=land},
16816 command/sea surface/.style={cmd=sea surface},
16817 command/space/.style={cmd=space},
16818 command/sub surface/.style={cmd=sub surface},
16819 command/sea mine/.style={cmd=sub surface},
16820 command/none/.style={cmd=none},
16821 }

```

natoapp6c/echolon

Unit size. The choice is limited to one of the below. The choice is stored in the key `natoapp6c/ech`.

```

16822 \tikzset{
16823   /natoapp6c/.cd,
16824   echolon/.is choice,
16825   echolon/none/.style={ech=},
16826   echolon/team/.style={ech=},
16827   echolon/squad/.style={ech=squad},
16828   echolon/section/.style={ech=section},
16829   echolon/platoon/.style={ech=platoon},
16830   echolon/company/.style={ech=company},
16831   echolon/battalion/.style={ech=battalion},
16832   echolon/regiment/.style={ech=regiment},
16833   echolon/brigade/.style={ech=brigade},
16834   echolon/division/.style={ech=division},
16835   echolon/corps/.style={ech=corps},
16836   echolon/army/.style={ech=army},
16837   echolon/army group/.style={ech=army group},
16838   echolon/theatre/.style={ech=theatre},
16839   echolon/command/.style={ech=command},
16840   echolon/dummy/.style={ech=dummy},
16841 }

```

```

natoapp6c/main
natoapp6c/left
natoapp6c/right
natoapp6c/top
natoapp6c/bottom
natoapp6c/below
natoapp6c/frame

```

```

\natoapp@main
\natoapp@left
\natoapp@right
\natoapp@upper
\natoapp@lower
\natoapp@below

```

The various parts of the symbols. The keys `upper` and `lower` are aliases for `top` and `bottom`, respectively. The choices

are stored in macros

```
16842 \newif\ifnatoapp@decoy\natoapp@decoyfalse
16843 \tikzset{
16844   /natoapp6c/.cd,
16845   main/.store in=\natoapp@main,   main/.initial=,%
16846   left/.store in=\natoapp@left,   left/.initial=,%
16847   right/.store in=\natoapp@right, right/.initial=,%
16848   upper/.store in=\natoapp@upper, upper/.initial=,%
16849   lower/.store in=\natoapp@lower, lower/.initial=,%
16850   top/.store in=\natoapp@upper,%
16851   bottom/.store in=\natoapp@lower,%
16852   below/.store in=\natoapp@below, below/.initial=,%
16853   frame/.store in=\natoapp@frame, frame/.initial=,%
16854   decoy/.is if=natoapp@decoy,%
16855 }
```

```
/tikz/natoapp6c/main
/tikz/natoapp6c/modifiers
/tikz/natoapp6c/lower
/tikz/natoapp6c/upper
/tikz/natoapp6c/left
/tikz/natoapp6c/right
/tikz/natoapp6c/echelon
/tikz/natoapp6c/below
```

Styles used by the various parts of the symbol.

```
16856 \tikzset{
16857   natoapp6c/parts/.style={
16858     scale line widths,
16859     draw,
16860     shape=rectangle,
16861     transform shape},
16862   natoapp6c/main/.style={natoapp6c/parts},
16863   natoapp6c/modifiers/.style={natoapp6c/parts,scale=.6},
16864   natoapp6c/lower/.style={natoapp6c/parts},
16865   natoapp6c/upper/.style={natoapp6c/parts},
16866   natoapp6c/left/.style={natoapp6c/parts},
16867   natoapp6c/right/.style={natoapp6c/parts},
16868   natoapp6c/echelon/.style={natoapp6c/parts},
16869   natoapp6c/below/.style={natoapp6c/parts}
16870 }
```

5.6.14 The natoapp6c styles

```
/tikz/natoapp6c
```

This key sets up a node to make a NATO App6(c) symbol. The key takes a single argument which in turn must contain key–value pairs in the /natoapp6c (or /tikz) namespace(s). We set the `shape` parameter of the node, and

calls the passed keys in the /natoapp6c namespace to set-up elements of the chit.

```
16871 \tikzset{%
16872   natoapp6c/.code={%
16873     \pgfkeys{/tikz/transform shape,/tikz/shape=natoapp6c}
16874     \pgfkeys{/natoapp6c/.cd,#1}}
```

We define a counter to set-up unique names for symbol nodes.

```
16875 \newcounter{natoappid}\setcounter{natoappid}{0}
```

5.6.15 The \natoapp6c shape

```
\ifn@to@pp@below
\ifn@to@pp@mod
```

We define an \if to allow us to detect if something is rendered below the frame

```
16876 \newif\ifn@to@pp@below\n@to@pp@belowfalse%
16877 \newif\ifn@to@pp@mod\n@to@pp@modfalse%
```



natoapp6c

Next, we define the mother shape of NATO App6(c) nodes. This is a composite node with sub-nodes for the various parts (including the frame) of the symbol.

It is quite complex so we will go through the implementation in bits.

First, we make some saved anchors (the centre) and macros (identifier, frame type, and frame options).

```
16878 \pgfdeclareshape{natoapp6c}{%
16879   \savedanchor\center{\pgf@x=0cm\pgf@y=0cm}
16880   \savedmacro\id{%
16881     \n@to@pp@dbg{3}{NATO App6(c) id (set): \meaning\natoapp@id}
16882     \@ifundefined{natoapp@id}{\let\natoapp@id\pgfutil@empty}{}%
16883     \ifx\natoapp@id\pgfutil@empty\relax%
16884       \wg@r@ndom@id%
16885       \edef\id{natoapp6c\wg@uuid}%
16886     \else%
16887       \edef\id{\natoapp@id}%
16888     \fi%
16889     \n@to@pp@dbg{3}{NATO App6(c) id: \meaning\id}}
16890   \savedmacro\frameshape{%
16891     \let\frameshape\pgfutil@empty%
16892     \@ifundefined{natoapp@cmd}{\def\frameshape{base}}{%
16893       \edef\frameshape{\natoapp@cmd}
16894       \@ifundefined{natoapp@fac}{\def\frameshape{base}}{%
16895         \edef\frameshape{\natoapp@fac\space\frameshape}}}
16896     \n@to@pp@dbg{3}{NATO App6(c) frame shape: \meaning\frameshape}}
16897   \savedmacro\frameopt{%
16898     \let\frameopt\pgfutil@empty%
```

```

16899 \ifundefined{natoapp@frame}{}{%
16900 \edef\frameopt{\natoapp@frame}}
16901 \n@to@pp@dbg{3}{NATO App6(c) Frame options: \meaning\frameopt}%
16902 }

```

Then we define a number of regular anchors

```

16903 \anchor{center} {\center}

```

The remaining anchors depend on the shape being used. We reference the anchors of the embedded node of the frame.

```

16904 \anchor{north east}{\wg@sub@nchor{M\id}{north east}}
16905 \anchor{north west}{\wg@sub@nchor{M\id}{north west}}
16906 \anchor{south east}{\wg@sub@nchor{M\id}{south east}}
16907 \anchor{south west}{\wg@sub@nchor{M\id}{south west}}
16908 \anchor{north} {\wg@sub@nchor{M\id}{north}}
16909 \anchor{west} {\wg@sub@nchor{M\id}{west}}
16910 \anchor{south} {\wg@sub@nchor{M\id}{south}}
16911 \anchor{east} {\wg@sub@nchor{M\id}{east}}
16912 \anchor{upper} {\wg@sub@nchor{M\id}{upper}}
16913 \anchor{lower} {\wg@sub@nchor{M\id}{lower}}
16914 \anchor{left} {\wg@sub@nchor{M\id}{left}}
16915 \anchor{right} {\wg@sub@nchor{M\id}{right}}

```

The next two anchors are a little funny.

```

16916 \anchor{echelon} {%
16917 \n@to@pp@dbg{3}{NATO App6(c) get echelon anchor}%
16918 \wg@sub@nchor{M\id}{north}%
16919 \wg@tmpa=\n@to@pp@e@y cm%
16920 \advance\pgf@y\wg@tmpa%
16921 }%
16922 \anchor{below} {%
16923 \n@to@pp@dbg{3}{NATO App6(c) get below anchor}%
16924 \wg@sub@nchor{M\id}{south}
16925 \wg@tmpa=\n@to@pp@e@yy cm%
16926 \advance\pgf@y-\wg@tmpa}

```

All right, so time to make the actual frame. Note that we do this in a ‘behind’ path so we can actually draw stuff. First, we flag that we’re not in a modifier, nor in the ‘below’ part.

```

16927 \behindbackgroundpath{%
16928 \n@to@pp@dbg{3}{NATO App6(c) background path: \meaning\id
16929 ^^J ID: \meaning\natoapp@id
16930 ^^J Faction: \meaning\natoapp@fac
16931 ^^J Command: \meaning\natoapp@cmd
16932 ^^J Echelon: \meaning\natoapp@ech
16933 ^^J Main: \meaning\natoapp@main
16934 ^^J Left: \meaning\natoapp@left
16935 ^^J Right: \meaning\natoapp@right
16936 ^^J Upper: \meaning\natoapp@upper
16937 ^^J Lower: \meaning\natoapp@lower
16938 ^^J Below: \meaning\natoapp@below
16939 ^^J Shape: \meaning\frameshape
16940 ^^J Options: \meaning\frameopt}

```



```

16941 \natoapp@report
16942 \n@to@pp@modfalse
16943 \n@to@pp@belowfalse

```

If the symbol is empty, then do nothing.

```

16944 \ifx\frameshape\pgfutil@empty%
16945 \n@to@pp@dbg{2}{NATO App6(c) has no frame!}
16946 \else

```

We start a scope because we want to do some clipping here. Then, we use the frame to clip the remaining part. Note that we do this via a node which we give the identifier M. Various elements of the symbol can then refer to this shape to define paths, etc.

```

16947 \begin{scope}
16948 \pgfinterruptboundingbox
16949 %% Clip to shape in scope
16950 %% \message{^^JClipping to NATO App6(c) shape}
16951 \n@to@pp@iscliptrue%
16952 \n@to@pp@dbg{2}{NATO App6(c) frame node M (clip)}
16953 \pgfnode{natoapp6c \frameshape}{center}{-}{M}{\pgfusepath{clip}}
16954 \n@to@pp@isclipfalse%

```

Next, we should see if we need to fill the frame. We do that by expanding the passed `frame` key-values in a scope, and *then* get the fill colour.

```

16955 %% Start new scope including frame key options
16956 \edef\tmp@opt{[\frameshape]}
16957 \expandafter\scope\tmp@opt
16958 % Get fill color {possibly from frame key}
16959 \expandafter\let\expandafter\tmp@fill%
16960 \csname\string\color@pgffillcolor\endcsname%

```

If the fill colour is not `\relax`, then we fill the frame. Note that this is done in the background, so when we draw in the foreground we will render on top of the fill.

```

16961 % Check if we need to fill shape (fill colour us not \relax)
16962 \ifx\tmp@fill\relax\else%
16963 \n@to@pp@dbg{2}{NATO App6(c) frame fill}
16964 \pgfnode{natoapp6c \frameshape}{center}{-}{-}{\pgfusepath{fill}}%
16965 \fi%
16966 % End the fill scope
16967 \endscope%

```

Now we need to render some of the elements of the symbol. We start with the main elements. We can specify many main elements (to make composite symbols).

```

16968 % Render mains
16969 \@ifundefined{natoapp@main}{-}{
16970 \n@to@pp@dbg{2}{NATO App6(c) mains: \meaning\natoapp@main}
16971 \begin{scope}[natoapp6c/main]
16972 \wg@pic@all{\natoapp@main}{natoapp6c/s/}{M.center}{natoapp6c/main}%
16973 \end{scope}}%
16974 % Modifiers flagged

```

The next thing is to render the various modifiers. We start by flagging this globally.

```
16975     \n@to@pp@modtrue
16976     \n@to@pp@dbg{2}{NATO App6(c) modifiers}
```

Below we render the lower, upper, left, and right elements. This is all done in the same way. Note that the elements positions are dictated by anchors of the frame shape (via shape identifier M).

```
16977     % Render lowers
16978     \@ifundefined{natoapp@lower}{}{-%
16979         \begin{scope}%
16980             \wg@pic@all{\natoapp@lower}{natoapp6c/s/}{M.lower}{%
16981                 natoapp6c/modifiers,natoapp6c/lower}%
16982         \end{scope}}%
16983     % Render uppers
16984     \@ifundefined{natoapp@upper}{}{-%
16985         \begin{scope}[]
16986             \wg@pic@all{\natoapp@upper}{natoapp6c/s/}{M.upper}{%
16987                 natoapp6c/modifiers,natoapp6c/upper}%
16988         \end{scope}}%
16989     % Render lefts
16990     \@ifundefined{natoapp@left}{}{-%
16991         \begin{scope}[]
16992             \wg@pic@all{\natoapp@left}{natoapp6c/s/}{M.left}{%
16993                 natoapp6c/modifiers,natoapp6c/left}%
16994         \end{scope}}%
16995     % Render rights
16996     \@ifundefined{natoapp@right}{}{-%
16997         \begin{scope}[]
16998             \wg@pic@all{\natoapp@right}{natoapp6c/s/}{M.right}{%
16999                 natoapp6c/modifiers,natoapp6c/right}%
17000         \end{scope}}%
17001     % Modifiers end
17002     \n@to@pp@modfalse%
17003     \endpgfinterruptboundingbox
17004 \end{scope}%
17005 \fi%
17006 }
```

That concludes rendering most of the symbol. We have not put in the echelon, below element, or drawn the frame yet. That we will do on the foreground path.

In the foreground ‘behind’ path we render the echelon, below element, and draw the frame.

```
17007 \behindforegroundpath{%
17008     \n@to@pp@dbg{2}{NATO App6(c) foreground path:
17009         ^^J Echelon: \meaning\natoapp@ech
17010         ^^J Symbol: \meaning\frameshape
17011         ^^J Below: \meaning\natoapp@below
17012         ^^J Frame: \meaning\frameopt}
17013     %
```

We check if we have a frame. If not, stop.

```

17014 \ifx\frameshape\pgfutil@empty%
17015 \n@to@pp@dbg{2}{NATO App6(c) has no frame shape!}%
17016 \else%

```

We want to draw the rest of the symbol as a part of the frame, so we expand the `frame` options in a scope.

```

17017
17018 \edef\tmp@opt{[\frameopt]}
17019 \expandafter\scope\tmp@opt

```

First thing in this scope is to draw the actual frame. Again, this is done via a node with the right shape. Note that we label this node as $M(id)$ so we way refer to it later on.

```

17020 \n@to@pp@dbg{2}{NATO App6(c) inner node 'M{id' ===}
17021 \pgfnode{natoapp6c \frameshape}{center}{M{id}{\pgfusepath{stroke}}

```

If the user gave an echelon, then put that in. Note that echelons are limited to predefined values.

```

17022 % Put in the echelon
17023 \@ifundefined{natoapp@ech}{-}{%
17024 \ifx\natoapp@ech\pgfutil@empty\else%
17025 \def\args{echelon=\natoapp@ech}
17026 \expandafter\wg@pic\args\endwg@pic%
17027 {natoapp6c/s/}{$(M.north)+(0,1.2*\n@to@pp@e@y)}${natoapp6c/echelon}
17028 \fi%
17029 }

```

If the user want something under the frame, put that in.

```

17030 % Put in stuff below main
17031 \@ifundefined{natoapp@below}{-}{%
17032 \n@to@pp@belowtrue
17033 \begin{scope}
17034 \wg@pic@all{\natoapp@below}{natoapp6c/s/}{%
17035 $(M.south)+(0,-\n@to@pp@e@y)}${%
17036 natoapp6c/below}%
17037 \end{scope}%
17038 \n@to@pp@belowfalse}

```

If the decoy flag was set, we draw that.

```

17039 \ifnatoapp@decoy%
17040 \scope[dash pattern=on 3\pgflinewidth off 2\pgflinewidth]%
17041 \n@to@pp@dbg{1}{Drawing decoy modifier}%
17042 \wg@sub@nchor{M{id}{north east}
17043 \wg@tmpa=\pgf@x%
17044 \wg@tmpb=\pgf@y%
17045 \pgfpathmoveto{\pgfqpoint{\wg@tmpa}{\wg@tmpb}}%
17046 \wg@tmpc=\n@to@pp@e@yy cm%
17047 \advance\wg@tmpc\n@to@pp@e@yy cm%
17048 \advance\wg@tmpc\wg@tmpb%
17049 \pgfpathlineto{\pgfqpoint{0cm}{\wg@tmpc}}%
17050 \pgfpathlineto{\pgfqpoint{-\wg@tmpa}{\wg@tmpb}}%
17051 \pgfusepath{stroke}%
17052 \endscope%

```

```

17053   \fi%
17054   \endscope%
17055   \fi%
17056 }
17057 }

```

That finished the shape for NATO App6(c) symbols. We could stop here, but for convenience we define a wrapper macro.

5.6.16 The `\natoapp` wrapper macro

`\natoapp`

This is a wrapper macro for inserting a node with a NATO App6(c) symbol in it. The syntax of the macro is

```
\natoapp[{natoapp6c options}]({position})({identifier});
```

Note that the trailing semi-colon (;) is optional.

This macro forwards to `\n@toapp`.

```

17058 \newcommand\natoapp[1] [] {%
17059   \n@to@pp@dbg{2}{NATO App6(c) macro -> '#1'}
17060   \tikzset{/natoapp6c/.cd,faction=friendly,command=land}%
17061   \@ifnextchar({\n@toapp{#1}}{\n@toapp{#1}(0,0)}{)}%
17062 }

```

`\n@toapp`

This macro takes care to parse the location argument — if any. It forwards to `\n@to@pp`.

```

17063 \def\n@toapp#1(#2){%
17064   \n@to@pp@dbg{2}{NATO App6(c) second macro -> '#1', '#2'}
17065   \@ifnextchar({\n@to@pp{#1}{#2}}{\n@to@pp{#1}{#2}()}{)}%
17066 }

```

`\n@to@pp`

This is the main work-horse of the wrapper. It makes a node with the shape `natoapp6c` passing the relevant parameters. The syntax of the macro is

```

17067 \def\n@to@pp#1#2(#3){%
17068   %\let\name\pgfutil@empty%
17069   %\ifx|#3|\else\edef\name{(#3)}\fi%
17070   %\n@to@pp@dbg{3}{Arguments: #1}%
17071   %\edef\args{[natoapp6c={#1},transform shape] \name at (#2) {}}
17072   %\expandafter\node\args;%
17073   \node[draw,transform shape,natoapp6c={#1}] (#3) at (#2) {};%
17074   \@ifnextchar;{\@gobble}{}

```

5.6.17 Macros for markings

`\natoappmark`

A macro for making NATO App6(c) markings.

```
17075 \providecommand\natoappmark[2] [] {%
17076   \tikz[transform shape,
17077     scale=.25,
17078     baseline=(natoapp6c mark.south east),
17079     natoapp6c mark/.try,
17080     #1]{%1
17081     \node[draw,transform
17082       shape,natoapp6c={faction=friendly,command=land,
17083         main=#2}] (natoapp6c mark){}}
17084 % \natoapp[faction=friendly,command=land,main=#2] (0,0) (natoapp6c mark)}}
```

`\echelonmark`

```
17085 \providecommand\echelonmark[2] [] {\tikz[transform shape,scale=.5,#1]{%
17086   \pic[scale line widths,line width=1pt] {natoapp6c/s/echelon=#2};}}
```

Some specific NATO App6(c) markers.

```
17087 \DeclareRobustCommand\armouredmark[1] [] {\natoappmark[#1]{armoured}}
17088 \DeclareRobustCommand\infantrymark[1] [] {\natoappmark[#1]{infantry}}
17089 \DeclareRobustCommand\artillerymark[1] [] {%
17090   \natoappmark[#1]{\{fill=pgfstrokecolor}artillery}}
17091 \DeclareRobustCommand\combinedmark[1] [] {\natoappmark[#1]{combined arms}}
17092 \DeclareRobustCommand\pgmark[1] []      {\natoappmark[#1]{armoured,infantry}}
17093 \DeclareRobustCommand\reconnaissancemark[1] [] {\natoappmark[#1]{reconnaissance}}
17094 \DeclareRobustCommand\corpsmark[1] [] {\natoappmark[#1]{,echelon=corps}}
17095 \DeclareRobustCommand\divisionmark[1] [] {\natoappmark[#1]{,echelon=division}}
17096 \DeclareRobustCommand\brigademark[1] [] {\natoappmark[#1]{,echelon=brigade}}
17097 \DeclareRobustCommand\regimentmark[1] [] {\natoappmark[#1]{,echelon=regiment}}
17098 \DeclareRobustCommand\sofmark[1] []      {\natoappmark[#1]{infantry,text=SOF}}
17099 \DeclareRobustCommand\mountaineermark[1] [] {%
17100   \natoappmark[#1]{infantry,lower=mountain}}
17101 \DeclareRobustCommand\airbornemark[1] [] {%
17102   \natoappmark[#1]{infantry,lower=airborne}}
17103 \DeclareRobustCommand\amphibiousmark[1] [] {\natoappmark[#1]{,lower=amphibious}}
17104 \DeclareRobustCommand\airassaultmark[1] [] {%
17105   \natoappmark[#1]{infantry,upper=air assault}}
```

5.6.18 Utility macros used in the symbols

Here, we define the main symbols used when making markers. Since some of these symbols share code, we will create some regular \TeX macros to hold the path definitions. This is by far the simplest way of storing just the path specifications.

\testpath

```
17106 \def\testpath#1{\csname n@toapp@#1\endcsname}
```

Corps support for friendly, hostile, neutral, and unknown factions.

\n@toapp@corps@sup@friendly
\n@toapp@corps@sup@hostile
\n@toapp@corps@sup@neutral
\n@toapp@corps@sup@unknown

```
17107 \def\n@toapp@corps@sup@friendly{(.75,.5)--(.5,0)--(.75,-.5)}
17108 % (M.north east)--(M.east-.25,0)--(M.south east)}
17109 \def\n@toapp@corps@sup@hostile{(.95,.5)--(.45,0)--(.95,-.5)}
17110 \def\n@toapp@corps@sup@neutral{(.5,.5)--(.35,0)--(.5,-.5)}
17111 \def\n@toapp@corps@sup@unknown{(.75,.5)--(.5,0)--(.75,-.5)}
```

Corps support, base

\n@toapp@corps@support

```
17112 \def\n@toapp@corps@support#1{
17113 \ifx\n@toapp@friendly#1\n@toapp@corps@sup@friendly%
17114 \else\ifx\n@toapp@hostile#1\n@toapp@corps@sup@hostile%
17115 \else\ifx\n@toapp@neutral#1\n@toapp@corps@sup@neutral%
17116 \else\ifx\n@toapp@unknown#1\n@toapp@corps@sup@unknown%
17117 \fi\fi\fi\fi}
```



natoapp6c/s/TBD

Special placeholder for symbols To Be Done.

```
17118 \tikzset{
17119 natoapp6c/s/TBD/.pic={\n@toapp@text@normal{\color{magenta}TBD}};}
17120 }
```

5.6.19 Symbols used when defining weaponry



natoapp6c/s/weapon

```
17121 \tikzset{
17122 pics/natoapp6c/s/weapon/.is choice,
17123 pics/natoapp6c/s/weapon/base/.style={
17124 code={\path [pic actions] (0,-0.2)--(0,.2);}},
17125 pics/natoapp6c/s/weapon/top/.style={
17126 code={\path [pic actions] (0,.2)--(0,.35);}},
17127 pics/natoapp6c/s/weapon/bottom/.style={
17128 code={\path [pic actions] (0,-.35)--(0,-.2);}},
```

```

17129 pics/natoapp6c/s/weapon/rifle/.style={
17130   code={\path [pic actions] (0.2, 0.1)--(0, 0.35)--(-0.2,0.1);}},
17131 pics/natoapp6c/s/weapon/machine gun/.style={
17132   code={\path [pic actions] (0.2, -0.35)--(-0.2, -0.35);}},
17133 pics/natoapp6c/s/weapon/grenade launcher/.style={
17134   code={\path [pic actions] (0,0) circle (0.1);}},
17135 pics/natoapp6c/s/weapon/missile launcher/.style={
17136   code={%
17137     \path [pic actions] (0.2, 0.15)
17138     to[out=90,in=90,looseness=1.75] (-0.2, 0.15);}},
17139 pics/natoapp6c/s/weapon/non lethal/.style={
17140   code={\path [pic actions] (-.2,.35) -- (.2,.35);}},
17141 pics/natoapp6c/s/weapon/multi fire/.style={
17142   code={\path[pic actions] (.2,-.2)--(.2, .2) (-.2,-.2)--(-.2,0.2);}},
17143 pics/natoapp6c/s/weapon/air defence/.style={
17144   code={%
17145     \path[pic actions] (0.2, -0.4)
17146     to[out=90,in=90,looseness=1.7] (-0.2, -0.4) -- cycle;}},
17147 pics/natoapp6c/s/weapon/anti tank/.style={
17148   code={\path[pic actions] (0.2, -0.4)--(0,-0.2)--(-0.2,-0.4);}},
17149 pics/natoapp6c/s/weapon/full/.style={
17150   code={%
17151     \pic[draw]{natoapp6c/s/weapon=base};
17152     \pic[draw]{natoapp6c/s/weapon=top};
17153     \pic[draw]{natoapp6c/s/weapon=bottom};}},
17154 pics/natoapp6c/s/weapon/.default=full
17155 }

```



natoapp6c/s/type

(Weight) class of weapons: light, medium, heavy

```

17156 \tikzset{
17157   pics/natoapp6c/s/type/.is choice,
17158   pics/natoapp6c/s/type/light/.style={
17159     code={\path [fill=pgfstrokecolor,pic actions] (-0.2, -0.12) rectangle (.2,-.08);}},
17160   pics/natoapp6c/s/type/medium/.style={
17161     code={
17162       \path [fill=pgfstrokecolor,pic actions]
17163       (-0.2, -0.12) rectangle (.2,-.08)
17164       (-0.2, -0.22) rectangle (.2,-.18);}},
17165   pics/natoapp6c/s/type/heavy/.style={
17166     code={
17167       \path [fill=pgfstrokecolor,pic actions]
17168       (-0.2, -0.12) rectangle (.2,-.08)
17169       (-0.2, -0.22) rectangle (.2,-.18)
17170       (-0.2, -0.32) rectangle (.2,-.28);}},
17171   pics/natoapp6c/s/type/vlight/.style={
17172     code={\path [fill=pgfstrokecolor,pic actions]
17173     (-.025,-0.2) rectangle (.025,.2);}},
17174   pics/natoapp6c/s/type/vmedium/.style={
17175     code={\path [fill=pgfstrokecolor,pic actions]

```


```

17176      (-.075,-0.2) rectangle (-.025,.2)
17177      (.025, -0.2) rectangle (.075,.2);}},
17178  pics/natoapp6c/s/type/vheavy/.style={
17179    code={\path [fill=pgfstrokecolor,pic actions]
17180      (-.125,-0.2) rectangle (-.075,.2)
17181      (-.025,-0.2) rectangle (.025,.2)
17182      (.075,-0.2) rectangle (.125,.2);}},
17183  pics/natoapp6c/s/type/.default=light,
17184 }

```

5.6.20 The symbols


Next, we define all the symbols. Note that we define them all as if they are in the main section of the symbol, since top, bottom, and below symbols are automatically scaled.

	natoapp6c/s/above corps support
---	---------------------------------

```

17185 \tikzset{%
17186  natoapp6c/s/above corps support/.pic={%
17187    \def\n@toapp@path{\n@toapp@corps@support{\natoapp@fac}}
17188    \expandafter\path[draw] \n@toapp@path;
17189    \expandafter\path[draw,xscale=-1] \n@toapp@path;},
17190 }

```

	natoapp6c/s/air assault with organic lift
---	---

```

17191 \tikzset{%
17192  natoapp6c/s/air assault with organic lift/.pic={%
17193    \ifx\n@toapp@hostile\natoapp@fac%
17194    \def\n@toapp@path{(-.75,-.2)--(-.15,-.2)--(0,-.5)--(.15,-.2)--(.75,-.2)}
17195    \else
17196    \def\n@toapp@path{(-.75,-.2)--(-.1,-.2)--(0,-.325)--(.1,-.2)--(.75,-.2)}
17197    \fi
17198    \path[draw] \n@toapp@path;},
17199 }

```

	natoapp6c/s/air decoy
---	-----------------------

```

17200 \tikzset{%
17201  natoapp6c/s/air decoy/.pic={%
17202    \pic[pic actions]{natoapp6c/s/decoy};
17203    \path[fill=pgfstrokecolor,pic actions] (0.4, -0.2) rectangle (-0.4, -0.15);},
17204 }

```

	natoapp6c/s/air assault
---	-------------------------


```

17205 \tikzset{%
17206   natoapp6c/s/air assault/.pic={%
17207     \path[draw] ([shift={({150:.4})}0,-.1)--(0,-.1)--([shift={({30:.4})}0,-.1);},
17208 }

```



natoapp6c/s/air defence

```

17209 \tikzset{%
17210   natoapp6c/s/air defence/.pic={%
17211     \ifx\natoapp@fac\n@to@pp@friendly%
17212     \def\n@toapp@opt{[out=90,in=90,looseness=.675]}%
17213     \else\ifx\natoapp@fac\n@to@pp@neutral%
17214     \def\n@toapp@opt{[out=90,in=90,looseness=1]}%
17215     \else%
17216     \def\n@toapp@opt{[out=45,in=135,looseness=1.5]}%
17217     \fi\fi%
17218     \edef\n@toapp@path{(M.south west) to\n@toapp@opt (M.south east)}
17219     \path[draw] \n@toapp@path;},
17220 }

```



natoapp6c/s/air strip

```

17221 \tikzset{%
17222   natoapp6c/s/air strip/.pic={%
17223     \path[fill=pgfstrokecolor] (-.4,-.1) rectangle(.4,0);
17224     \path[rotate=45,fill=pgfstrokecolor] (-.4,0) rectangle (.4,.1);
17225   }
17226 }

```



natoapp6c/s/air traffic

```

17227 \tikzset{%
17228   natoapp6c/s/air traffic/.pic={
17229     \path[fill=pgfstrokecolor]
17230     (0.33,0.21)--
17231     (0.33, -0.21)--
17232     (-0.33, 0.21)--
17233     (-0.33,-0.21)--
17234     cycle;},
17235 }

```



natoapp6c/s/airship

```

17236 \tikzset{%
17237   natoapp6c/s/airship/.pic={%
17238     % \path (0.45, 0.175) rectangle (-0.45, -0.175);

```

```

17239 \path[pic actions] (0, 0) ellipse (0.45 and 0.15);
17240 \begin{scope}
17241 \clip (0, 0) ellipse (0.45 and 0.15) [reverseclip];
17242 \path[pic actions]
17243 (0.2,0)--(0.3,0.175)--(0.4,0.175)--(0.375,0)
17244 --(0.4,-0.175)--(0.3, -0.175)--cycle;
17245 \end{scope}},
17246 }

```



natoapp6c/s/airborne

```

17247 \tikzset{%
17248 natoapp6c/s/airborne/.pic={%
17249 \ifx\n@to@pp@neutral\natoapp@fac%
17250 \draw (0,-0.05) arc(0:180:0.15);
17251 \draw (0,-0.05) arc(180:0:0.15);
17252 \else%
17253 \draw (0,-0.05) arc(0:180:0.2);
17254 \draw (0,-0.05) arc(180:0:0.2);
17255 \fi},
17256 }

```



natoapp6c/s/ammunition

```

17257 \tikzset{%
17258 natoapp6c/s/ammunition/.pic={\path[draw]
17259 (0.175,-0.175)--(-0.175,-0.175)
17260 (0.125,-0.175)--(0.125, 0) to[out=90,in=90,looseness=2.75]
17261 (-0.125, 0)--(-0.125, -0.175)};},
17262 }

```



natoapp6c/s/amphibious

```

17263 \tikzset{%
17264 natoapp6c/s/amphibious/.pic={
17265 \def\n@to@pp@tmp{0}
17266 \ifn@to@pp@below\def\n@to@pp@tmp{-1}\fi
17267 \ifn@to@pp@mod
17268 \path[draw,shift={(0,\n@to@pp@tmp)}](1.21,0)
17269 to[out=-90,in=-90,looseness=2.25](1.05,0)
17270 to[out=90,in=90,looseness=2.25](0.89,0)
17271 to[out=-90,in=-90,looseness=2.25](0.73,0)
17272 to[out=90,in=90,looseness=2.25](0.57,0)
17273 to[out=-90,in=-90,looseness=2.25](0.41,0)
17274 to[out=90,in=90,looseness=2.25](0.25,0)
17275 to[out=-90,in=-90,looseness=2.25](0.08,0)
17276 to[out=90,in=90,looseness=2.25](-0.08,0)
17277 to[out=-90,in=-90,looseness=2.25](-0.25,0)

```

```

17278 to[out= 90,in= 90, looseness=2.25] (-0.41, 0)
17279 to[out=-90,in=-90, looseness=2.25] (-0.57, 0)
17280 to[out= 90,in= 90, looseness=2.25] (-0.73, 0)
17281 to[out=-90,in=-90, looseness=2.25] (-0.89, 0)
17282 to[out= 90,in= 90, looseness=2.25] (-1.05, 0)
17283 to[out=-90,in=-90, looseness=2.25] (-1.21, 0)
17284 \else
17285 \path[draw,shift={(0,\n@to@pp@tmp})](0.73, 0)
17286 to[out= 90,in= 90, looseness=2.25] (0.57, 0)
17287 to[out=-90,in=-90, looseness=2.25] (0.41, 0)
17288 to[out= 90,in= 90, looseness=2.25] (0.25, 0)
17289 to[out=-90,in=-90, looseness=2.25] (0.08, 0)
17290 to[out= 90,in= 90, looseness=2.25] (-0.08, 0)
17291 to[out=-90,in=-90, looseness=2.25] (-0.25, 0)
17292 to[out= 90,in= 90, looseness=2.25] (-0.41, 0)
17293 to[out=-90,in=-90, looseness=2.25] (-0.57, 0)
17294 to[out= 90,in= 90, looseness=2.25] (-0.73, 0)
17295 \fi
17296 ;
17297 },
17298 }

```



natoapp6c/s/amphibious warfare ship

```

17299 \tikzset{%
17300 natoapp6c/s/amphibious warfare ship/.pic={
17301 \pic{natoapp6c/s/warfare vessel};
17302 \path[draw,fill=pgfstrokecolor]
17303 (0.15, 0.05) --
17304 (0.15, 0.2) --
17305 (-0.15, 0.2) --
17306 (-0.15, 0.05) -- cycle
17307 (0, -0.2) rectangle (0.25, -0.175);},
17308 }

```



natoapp6c/s/analysis

```

17309 \tikzset{%
17310 natoapp6c/s/analysis/.pic={
17311 \path[pic actions]
17312 (-0.3,-0.2)--(0.3,-0.2)--(0, -0.4)--cycle (0,-0.2)--(0,0.4);},
17313 }

```



natoapp6c/s/arrest

```

17314 \tikzset{%
17315 natoapp6c/s/arrest/.pic={
17316 \path[pic actions] circle(0.2);

```

```

17317 \pic[scale=.8]{natoapp6c/s/individual};},
17318 }

```



natoapp6c/s/artillery

```

17319 \tikzset{%
17320 natoapp6c/s/artillery/.pic={
17321 \path[pic actions] circle(0.2);},
17322 }

```



natoapp6c/s/anti tank anti armour

```

17323 \tikzset{%
17324 natoapp6c/s/anti tank anti armour/.pic={%
17325 \ifx\natoapp@fac\n@to@pp@unknown%
17326 \path[draw,pic actions] (225:.5)--(M.north)--(315:.5);
17327 \else%
17328 \path[draw,pic actions] (M.south west)--(M.north)--(M.south east);%
17329 \fi},
17330 }

```



natoapp6c/s/antenna

```

17331 \tikzset{%
17332 natoapp6c/s/antenna/.pic={\path[draw]
17333 (0, -0.3) -- (0, 0.3) (-0.125, 0.3) -- (0, 0.2) -- (0.125, 0.3);},
17334 }

```



natoapp6c/s/armoured

```

17335 \tikzset{%
17336 natoapp6c/s/armoured/.pic={\path[draw]
17337 (-0.275,0.2) arc(90:270:0.2)--(0.275, -0.2) arc(270:450:0.2)--cycle;},
17338 }

```



natoapp6c/s/armoured fighting vehicle

```

17339 \tikzset{%
17340 natoapp6c/s/armoured fighting vehicle/.pic={
17341 \path[fill=pgfstrokelcolor] (-.4,-.2) rectangle (-.3,.2) (.3,-.2) rectangle (.4,.2);
17342 \path[pic actions] (-.3,0) -- (0,.2) -- (.3,0) -- (0,-.2) -- cycle;},
17343 }

```



natoapp6c/s/armoured personnel carrier

```
17344 \tikzset{%
17345   natoapp6c/s/armoured personnel carrier/.pic={
17346     \pic[sub pic actions,draw]{natoapp6c/s/vehicle};
17347     \path[pic actions] (.35,.15)--(0,.3)--(-.35,.15);},
17348 }
```



natoapp6c/s/arctic

```
17349 \tikzset{%
17350   natoapp6c/s/arctic/.pic={
17351     \draw (-0.325,0.135) arc(180:270:0.075 and 0.15) --
17352       +(0.5, 0) arc(-90:0:0.075 and 0.15);},
17353 }
```



natoapp6c/s/automobile

```
17354 \tikzset{%
17355   natoapp6c/s/automobile/.pic={
17356     \begin{scope}
17357       \clip (0.2,-0.15) circle(0.05) (-0.2,-0.15) circle(0.05) [reverseclip];
17358       \path[pic actions]
17359         (0.3, -0.15) --
17360         (-0.3, -0.15) --
17361         (-0.3, 0.025) --
17362         (-0.1, 0.025) --
17363         (-0.1, 0.2) --
17364         ( 0.1, 0.2) --
17365         ( 0.1, 0.025) --
17366         ( 0.3, 0.025) -- cycle
17367         ( 0.075, 0.025) rectangle (-0.075, 0.175);
17368     \end{scope}
17369     \path[pic actions]
17370       ( 0.2, -0.15) circle (0.05)
17371       (-0.2, -0.15) circle (0.05);
17372   },
17373 }
```




natoapp6c/s/balloon

```
17374 \tikzset{%
17375   natoapp6c/s/balloon/.pic={%
17376     \path[pic actions] (0, 0.025) circle (0.175);
17377     \begin{scope}
17378       \clip (0, 0.025) circle (0.175) [reverseclip];
17379       \path[pic actions] (-0.05,0) rectangle (0.05,-0.2)--(0.05,0);
```

```

17380 \end{scope}},
17381 }


```

	natoapp6c/s/bar
---	-----------------

```

17382 \tikzset{
17383   natoapp6c/s/bar/.pic={
17384     \path[fill=pgfstrokecolor] (-.3,-.1) rectangle (.3,.1);},
17385 }


```

	natoapp6c/s/base
---	------------------

```

17386 \tikzset{
17387   natoapp6c/s/base/.pic={
17388     \path[pic actions] circle(.2);
17389     \path[pic actions]
17390       (-.2,0) -- (.2,0)
17391       ( 0,-.2) -- (0 ,.2)
17392       (225:.2) -- (45:.2)
17393       (135:.2) -- (-45:.2);
17394   }
17395 }


```

	natoapp6c/s/bicycle equipped
---	------------------------------

```

17396 \tikzset{%
17397   natoapp6c/s/bicycle equipped/.pic={\draw(0,0) circle(.1);},
17398 }

```

	natoapp6c/s/boat
---	------------------

```

17399 \tikzset{%
17400   natoapp6c/s/boat/.pic={
17401     \path[pic actions]
17402       (-0.2, -0.2) --
17403       ( 0.2, -0.2) --
17404       ( 0.35, 0.05) --
17405       (-0.15, 0.05) --
17406       (-0.075, 0.2) --
17407       (-0.175, 0.2) --
17408       (-0.25, 0.05) --
17409       (-0.35, 0.05) --
17410     cycle;},
17411 }

```



natoapp6c/s/booby trap

```

17412 \tikzset{%
17413   natoapp6c/s/booby trap/.pic={
17414     \path[draw] (0, -0.2) ellipse(0.2 and 0.065);
17415     \begin{scope}
17416       \clip (0, -0.2) ellipse(0.2 and 0.065) [reverseclip];
17417       \path[draw] (-0.2, -0.2) -- (0, 0.2) -- (0.2, -0.2);
17418     \end{scope}}},
17419 }

```



natoapp6c/s/bottomed

```

17420 \tikzset{%
17421   natoapp6c/s/bottomed/.pic={
17422     \path[draw,fill=pgfstrokecolor] (-0.33,.1) rectangle(0.33,.2);},
17423 }

```



natoapp6c/s/bridge

```

17424 \tikzset{%
17425   pics/natoapp6c/s/bridge/.is choice,
17426   pics/natoapp6c/s/bridge/none/.style={
17427     code={\path[pic actions]
17428       (0.35,-0.15)--(0.25,-0.05)--(-0.25,-0.05)--(-0.35,-0.15)
17429       (0.35, 0.15)--(0.25, 0.05)--(-0.25, 0.05)--(-0.35, 0.15);}},
17430   pics/natoapp6c/s/bridge/fixed/.style={
17431     code={\pic{natoapp6c/s/bridge};\pic{natoapp6c/s/type=vlight};}},
17432   pics/natoapp6c/s/bridge/folding/.style={
17433     code={\pic{natoapp6c/s/bridge=none};
17434       \path[draw] (.1,-.2) -- (-.1,-.2) -- (-.1,.2) -- (.1,.2);}},
17435   pics/natoapp6c/s/bridge/hollow/.style={
17436     code={\pic{natoapp6c/s/bridge=none};
17437       \path[draw] (.1,-.2) -- (-.1,-.2) -- (-.1,.2) -- (.1,.2) -- cycle;}},
17438   pics/natoapp6c/s/bridge/.default=none,
17439 }

```



natoapp6c/s/capsule

```

17440 \tikzset{%
17441   natoapp6c/s/capsule/.pic={
17442     \path[pic actions]
17443     ($(0.25, -0.2)!0.1!(0, 0.5)$) --
17444     ($(0.25, -0.2)!0.5!(0, 0.5)$) to[in=75, out=105, looseness=0.75]
17445     ($(0, 0.5)!0.5!(-0.25, -0.2)$) --
17446     ($(0, 0.5)!0.9!(-0.25, -0.2)$) to[in=285, out=255, looseness=0.55]
17447     cycle;},
17448 }

```



natoapp6c/s/carrier

```

17449 \tikzset{%
17450   natoapp6c/s/carrier/.pic={
17451     \pic{natoapp6c/s/warfare vessel};
17452     \path[draw,fill=pgfstrokecolor]
17453       (-0.15, 0.05) --
17454       (-0.15, 0.2) --
17455       (-0.3, 0.2) --
17456       (-0.3, 0.05) -- cycle;},
17457 }

```



natoapp6c/s/chemical biological radiological nuclear

```

17458 \tikzset{%
17459   natoapp6c/s/chemical biological radiological nuclear/.pic={
17460     \path[draw,fill=pgfstrokecolor] (-0.29,0.1) circle(0.096) (0.29,0.1) circle(0.096);
17461     \path[pic actions] (0.15,-0.2) arc(0:90:0.45 and 0.375)
17462     (-0.15,-0.2) arc(180:90:0.45 and 0.375);},
17463 }

```



natoapp6c/s/civilian military cooperation

```

17464 \tikzset{%
17465   natoapp6c/s/civilian military cooperation/.pic={%
17466     \path[draw] (.375,.2)--(-.375,.2)--(-.375,-.025)
17467     to[in=270, out=270, looseness=0.75] (.375,-.025)--cycle;},
17468 }

```



natoapp6c/s/civilian police

```

17469 \tikzset{%
17470   natoapp6c/s/civilian police/.pic={%
17471     \path[draw] (0.225, 0.2)
17472     to[in=270, out=270, looseness=3] (-0.225, 0.2)
17473     to [in=270, out=270, looseness=1.5] (0,0.2)
17474     to [in=270, out=270, looseness=1.5] (0.225, 0.2) -- cycle;},
17475 }

```



natoapp6c/s/civilian telecommunications

```

17476 \tikzset{%
17477   natoapp6c/s/civilian telecommunications/.pic={
17478     \path[draw] (0.075, -0.2){[line join=bevel] -- (0, 0.1) -- (-0.075, -0.2)}

```



```

17479      (0.065, -0.05) -- (-0.065, -0.05)
17480      (-0.325, 0.2) -- (-0.15, 0.125) -- (-0.15, 0.175) -- (0, 0.1) -- (0.15, 0.175) -- (0.15, 0.125) -- (0.3
17481    },
17482 }

```



natoapp6c/s/coast guard vessel

```

17483 \tikzset{%
17484   natoapp6c/s/coast guard vessel/.pic={%
17485     \pic[draw] {natoapp6c/s/ship};
17486     \path[pic actions] (0.15, 0.05) -- (0, -0.2) (0.2, 0.05)--(0.05, -0.2);}
17487 }

```



natoapp6c/s/combat support

```

17488 \tikzset{%
17489   natoapp6c/s/combat support/.pic={%
17490     \path[fill=pgfstrokecolor]
17491     (.15,.2)--(-.15,.2)--(-.15,-.05)--(0,-.2)--(.15,-.05) -- cycle;}
17492 }

```



natoapp6c/s/combatant

```

17493 \tikzset{%
17494   natoapp6c/s/combatant/.pic={%
17495     \begin{scope}[xshift=-4.5, yshift=-5]
17496       \path[pic actions]
17497       (0.3213,0.0534) .. controls (0.3186,0.0295) and (0.3072,0.0136) ..
17498       (0.2925,0.0063) .. controls (0.2777,-0.0010) and (0.2605,0.0001) ..
17499       (0.2461,0.0068) .. controls (0.2317,0.0136) and (0.2198,0.0265) ..
17500       (0.2163,0.0433) .. controls (0.2147,0.0513) and (0.2150,0.0601) ..
17501       (0.2179,0.0694) .. controls (0.1304,0.1129) and (0.0223,0.1961) ..
17502       (0.0013,0.3209) .. controls (0.0601,0.1809) and (0.1770,0.0912) ..
17503       (0.3213,0.0534) -- cycle
17504       (0.2304,0.0633) .. controls (0.2287,0.0570) and (0.2287,0.0513) ..
17505       (0.2298,0.0461) .. controls (0.2323,0.0340) and (0.2409,0.0245) ..
17506       (0.2520,0.0193) .. controls (0.2630,0.0141) and (0.2760,0.0135) ..
17507       (0.2864,0.0186) .. controls (0.2932,0.0220) and (0.2992,0.0277) ..
17508       (0.3033,0.0370) .. controls (0.2845,0.0413) and (0.2597,0.0498) ..
17509       (0.2304,0.0633) -- cycle
17510       (0.1785,0.1137) .. controls (0.2446,0.1612) and (0.3061,0.2300) ..
17511       (0.3214,0.3209) .. controls (0.2864,0.2377) and (0.2310,0.1723) ..
17512       (0.1614,0.1249)
17513       (0.1443,0.1138) .. controls (0.1011,0.0871) and (0.0530,0.0670) ..
17514       (0.0014,0.0535) .. controls (0.0041,0.0295) and (0.0154,0.0136) ..
17515       (0.0302,0.0063) .. controls (0.0449,-0.0010) and (0.0621,0.0001) ..
17516       (0.0765,0.0069) .. controls (0.0909,0.0137) and (0.1028,0.0265) ..
17517       (0.1063,0.0433) .. controls (0.1079,0.0513) and (0.1076,0.0602) ..

```

```

17518      (0.1047,0.0694) .. controls (0.1230,0.0785) and (0.1422,0.0893) ..
17519      (0.1613,0.1019)
17520      (0.0928,0.0461) .. controls (0.0903,0.0340) and (0.0816,0.0245) ..
17521      (0.0706,0.0193) .. controls (0.0596,0.0141) and (0.0466,0.0135) ..
17522      (0.0362,0.0186) .. controls (0.0294,0.0220) and (0.0234,0.0277) ..
17523      (0.0193,0.0370) .. controls (0.0381,0.0413) and (0.0629,0.0498) ..
17524      (0.0921,0.0633) --
17525      (0.0921,0.0633) .. controls (0.0938,0.0570) and (0.0938,0.0512) ..
17526      (0.0928,0.0461) -- cycle;
17527  \end{scope}
17528 },
17529 }

```



natoapp6c/s/combined arms

```

17530 \tikzset{%
17531   natoapp6c/s/combined arms/.pic={%
17532     \path[draw] pic {natoapp6c/s/armoured};
17533     \path[draw] (0.275, 0.2) -- (-0.275, -0.2) (0.275, -0.2) -- (-0.275, 0.2)};
17534 }

```



natoapp6c/s/computer system

```

17535 \tikzset{%
17536   natoapp6c/s/computer system/.pic={
17537     \path[draw,fill=pgfstrokecolor,pic actions]
17538     (-.3, .28) rectangle (.3, .3)
17539     (-.3, -.18) rectangle (.3, -.2)
17540     (-.3, -.18) rectangle (-.3, .28)
17541     (.3, -.18) rectangle (.3, .28)
17542     (-.3, -.3) rectangle (.3, -.28)
17543     (-.05,-.28) rectangle (.05,-.18)};
17544 }

```



natoapp6c/s/control

```

17545 \tikzset{%
17546   natoapp6c/s/control/.pic={
17547     \path[pic actions]
17548     [{Stealth[inset=0pt,scale=0.5]}--{Stealth[inset=0pt,scale=0.5]}]
17549     (0, .2) -- (0, -.2);
17550     \path[pic actions]
17551     [{Stealth[inset=0pt,scale=0.5]}--{Stealth[inset=0pt,scale=0.5]}]
17552     (-.2, 0) -- (.2, 0)};
17553 }

```



natoapp6c/s/convoy

```
17554 \tikzset{%
17555   natoapp6c/s/convoy/.pic={
17556     \path[draw,fill=pgfstrokecolor]
17557       (0.35, 0.175) --
17558       (-0.35, 0.175) --
17559       (-0.35, -0.175) --
17560       (-0.2, -0.175) --
17561       (-0.2, 0.025) --
17562       (0.2, 0.025) --
17563       (0.2, -0.175) --
17564       (0.35, -0.175) -- cycle;},
17565 }
```



natoapp6c/s/corps support

```
17566 \tikzset{%
17567   natoapp6c/s/corps support/.pic={%
17568     \edef\n@toapp@path{\n@toapp@corps@support{\natoapp@fac}}
17569     \expandafter\path[draw] \n@toapp@path;},
17570 }
```



natoapp6c/s/crime

```
17571 \tikzset{%
17572   natoapp6c/s/crime/.pic={\path[draw,dashed] (-.45,.25)--(.45,-.25);},
17573 }
```



natoapp6c/s/decoy

```
17574 \tikzset{%
17575   natoapp6c/s/decoy/.pic={%
17576     \path[fill=pgfstrokecolor,draw,yshift=1.5]
17577       (0.2, 0) -- (0.4, 0.15) -- (0.4, -0.15) -- cycle
17578       (-0.1, 0) -- (0.1, 0.15) -- (0.1, -0.15) -- cycle
17579       (-0.4, 0) -- (-0.2, 0.15) -- (-0.2, -0.15) -- cycle;},
17580 }
```



natoapp6c/s/direct communications

```
17581 \tikzset{%
17582   natoapp6c/s/direct communications/.pic={
17583     \path[draw] (-.35,0) circle(.1) (.35,0) circle(.1);
17584     \pic[fill=pgfstrokecolor]{natoapp6c/s/intermodal};
}
```

```

17585 },
17586 }

```



natoapp6c/s/direction finding

```

17587 \tikzset{%
17588   natoapp6c/s/direction finding/.pic={%
17589     \path[draw] (-.3,.2)--(0,.4)--(.3,.2) (0,.4)--(0,-.4);},
17590 }

```



natoapp6c/s/diving

```

17591 \tikzset{%
17592   pics/natoapp6c/s/diving/.is choice,
17593   pics/natoapp6c/s/diving/none/.style={
17594     code={
17595       \path[pic actions] (0,0) circle(.1) (0,0) circle(.25);
17596       \begin{scope}
17597         \clip (0,0) circle(.25) [reverseclip];
17598         \path[pic actions] (-.3,-.1) rectangle(.3,.1)
17599           (0,0) -- (-45:.4) -- (-135:.4) -- cycle;
17600       \end{scope}}},
17601   pics/natoapp6c/s/diving/military/.style={
17602     code={
17603       \begin{scope}[even odd rule]
17604         \clip (0,0) circle(0.1)[reverseclip];
17605         \pic[fill=pgfstrokecolor]{natoapp6c/s/diving=none};
17606       \end{scope}
17607       \path[fill=pgfstrokecolor] (0,0) circle(0.08);
17608     }},
17609   pics/natoapp6c/s/diving/.default=none,
17610 }

```



natoapp6c/s/drilling

```

17611 \tikzset{%
17612   natoapp6c/s/drilling/.pic={\path[fill=pgfstrokecolor]
17613     (-0.1,-0.2) -- (0.1,-0.2) -- (0.2, 0.2) -- (-0.2, 0.2) -- cycle;},
17614 }

```



natoapp6c/s/earthmover

```

17615 \tikzset{%
17616   natoapp6c/s/earthmover/.pic={
17617     \pic{natoapp6c/s/tank};
17618     \path[pic actions] (.3,

```

```

17619     .3)--(.175,.35)--(-.175,.35)--(-.3,.3)
17620     (0,.2)--(0,.35);
17621   },
17622 }

```



natoapp6c/s/electric power

```

17623 \tikzset{%
17624   natoapp6c/s/electric power/.pic={
17625     \path[pic actions]
17626       (-0.05, 0) .. controls(-0.06, 0.14) ..
17627       ( 0, 0.09) .. controls( 0.03, 0.06) ..
17628       ( 0, 0.06) .. controls(-0.03, 0.06) ..
17629       ( 0, 0.09) .. controls( 0.06, 0.14) ..
17630       (0.05, 0)
17631       ($(-55:0.125) + (0, 0.075)$) arc(-55:235:0.125) arc(415:360:0.05) --
17632       +(0, -0.08) arc(180:360:0.05035) --
17633       +(0, 0.08) arc(180:125:0.05) -- cycle;
17634   },
17635 }

```



natoapp6c/s/electronic ranging

```

17636 \tikzset{%
17637   natoapp6c/s/electronic ranging/.pic={%
17638     \path[draw] (135:.225) arc (135:315:.225)--cycle (0,0)--(225:-.225)};
17639 }

```



natoapp6c/s/electronic warfare wide

```

17640 \tikzset{%
17641   natoapp6c/s/electronic warfare wide/.pic={%
17642     % OBS
17643     \node[natoapp6c/text,natoapp6c/normal text] at(-.25,0){E};
17644     \node[natoapp6c/text,natoapp6c/normal text] at(.25,0){W};
17645   },
17646 }

```



natoapp6c/s/engineer

```

17647 \tikzset{%
17648   natoapp6c/s/engineer/.pic={\path[draw]
17649     (.4,-.2)--(.4,.2)--(-.4,.2)--(-.4,-.2) (0,.2)--(0,-.2)};
17650 }

```



natoapp6c/s/enhanced location reporting system

```
17651 \tikzset{%
17652   natoapp6c/s/enhanced location reporting system/.pic={\path[draw]
17653     (0, -0.3) -- (0, 0.3) (-0.2, -.3) -- (0, 0.-.1) -- (0.2, -.3);},
17654 }
```



natoapp6c/s/environmental protection

```
17655 \tikzset{%
17656   natoapp6c/s/environmental protection/.pic={%
17657     \path[draw] (0, 0.2)
17658     -- (0.1, 0.05)
17659     -- (0.05, 0.05)
17660     -- (0.15, -0.05)
17661     -- (0.1, -0.05)
17662     -- (0.2, -0.15)
17663     -- (0.15, -0.15)
17664     -- (0.05, -0.15)
17665     -- (0.05, -0.2)
17666     -- (-0.05, -0.2)
17667     -- (-0.05, -0.15)
17668     -- (-0.2, -0.15)
17669     -- (-0.1, -0.05)
17670     -- (-0.15, -0.05)
17671     -- (-0.05, 0.05)
17672     -- (-0.1, 0.05)
17673     -- cycle;},
17674 }
```



natoapp6c/s/explosion

```
17675 \tikzset{%
17676   natoapp6c/s/explosion/.pic={%
17677     \node [shape=rectangle,
17678     starburst,
17679     draw,
17680     minimum width=0.9cm,
17681     minimum height=0.9cm,
17682     starburst point height=0.25cm,
17683     starburst points=12] {};},
17684 }
```



natoapp6c/s/finance

```
17685 \tikzset{%
17686   natoapp6c/s/finance/.pic={%
```

```

17687 \path[draw] (-.3,-.25) rectangle(.3,0)
17688 (-.3,0) -- ++(60:.28) -- ([shift=(120:.28)].3,0) -- (.3,0);},
17689 }

```



natoapp6c/s/fishing vessel

```

17690 \tikzset{%
17691 natoapp6c/s/fishing vessel/.pic={
17692 \path[pic actions]
17693 (-0.15, -0.2) --
17694 ( 0.15, -0.2) --
17695 ( 0.25, 0.025) --
17696 (-0.05, 0.025) --
17697 (-0.05, 0.125) --
17698 (-0.2, 0.125) --
17699 (-0.2, 0.025) --
17700 (-0.25, 0.025) -- cycle
17701 (0.025, 0.025) -- (0.025, 0.2)
17702 (0.025, 0.025) -- +(45:0.2);},
17703 }

```



natoapp6c/s/fire protection

```

17704 \tikzset{%
17705 natoapp6c/s/fire protection/.pic={%
17706 \path[fill=pgfstrokecolor] (0,0) circle(.2)
17707 (0,0) -- (60:.3) -- (120:.3) -- cycle
17708 (0,0) -- (-30:.3) -- (30:.3) -- cycle
17709 (0,0) -- (150:.3) -- (210:.3) -- cycle
17710 (0,0) -- (240:.3) -- (300:.3) -- cycle;
17711 },
17712 }

```



natoapp6c/s/fixed and rotary wing

```

17713 \tikzset{%
17714 natoapp6c/s/fixed and rotary wing/.pic={%
17715 \path[xscale=.45,yscale=.75,pic actions] pic {natoapp6c/s/fixed wing};
17716 \path[yscale=.45,xscale=.7,rotate=90, pic actions] pic {
17717 natoapp6c/s/rotary wing};
17718 },
17719 }

```



natoapp6c/s/fixed wing

```

17720 \tikzset{%

```

```

17721 natoapp6c/s/fixed wing/.pic={
17722   \path[pic actions]
17723     (-0.36,0.125) arc (77:275:0.075 and 0.125) -- (0,0) -- cycle
17724     ( 0.36,0.125) arc (-275:-77:-0.075 and 0.125) -- (0,0)
17725     --cycle;},
17726 }

```



natoapp6c/s/flame thrower

```

17727 \tikzset{%
17728   natoapp6c/s/flame thrower/.pic={
17729     \path[pic actions]
17730       (-0.1, -0.4) -- (-0.1, 0.3) to[out=90,in=90,looseness=2]
17731       (0.1, 0.3) -- (0.1, 0.275);},
17732 }

```



natoapp6c/s/floating

```

17733 \tikzset{%
17734   natoapp6c/s/floating/.pic={
17735     \path[draw]
17736       (-0.5,0.100) --
17737       (-0.417,0.242) --
17738       (-0.333,0.100) --
17739       (-0.250,0.242) --
17740       (-0.167,0.100) --
17741       (-0.083,0.242) --
17742       (0.0,0.100) --
17743       (0.083,0.242) --
17744       (0.167,0.100) --
17745       (0.250,0.242) --
17746       (0.333,0.100) --
17747       (0.417,0.242) --
17748       (0.5,0.100);},
17749   pics/natoapp6c/s/surfaced/.style=natoapp6c/s/floating,
17750 }

```



natoapp6c/s/food

```

17751 \tikzset{%
17752   natoapp6c/s/food/.pic={
17753     \path[pic actions]
17754       (0.075, 0.2) to[out=210, in=150, looseness=1]
17755       (0.075, -0.2) to[out=180, in=180, looseness=1.5]
17756       (0.075, 0.2) -- cycle;},
17757 }

```




natoapp6c/s/fuel

```
17758 \tikzset{%
17759   natoapp6c/s/fuel/.pic={
17760     \path[draw] (0,0) -- (135:.3) -- (45:.3) -- cycle (0,0) -- (0,-.3)};
17761 }
```



natoapp6c/s/grenade launcher

```
17762 \tikzset{%
17763   pics/natoapp6c/s/grenade launcher/.is choice,%
17764   pics/natoapp6c/s/grenade launcher/none/.style={%
17765     code={%
17766       \pic[draw]{natoapp6c/s/rifle};
17767       \pic[draw]{natoapp6c/s/weapon=grenade launcher}};},%
17768   pics/natoapp6c/s/grenade launcher/non lethal/.style={
17769     code={%
17770       \pic[draw]{natoapp6c/s/non lethal weapon};
17771       \pic[draw]{natoapp6c/s/weapon=grenade launcher}};},
17772   pics/natoapp6c/s/grenade launcher/.default=none,
17773 }
```



natoapp6c/s/graffiti

```
17774 \tikzset{%
17775   natoapp6c/s/graffiti/.pic={
17776     \path[pic actions]
17777       (0.05, 0.2)
17778       arc (90:270:0.05)
17779       arc (450:270:0.05)
17780       arc (90:270:0.05)
17781       arc (450:270:0.05)
17782       (-0.05, 0.2)
17783       arc (90:270:0.05)
17784       arc (450:270:0.05)
17785       arc (90:270:0.05)
17786       arc (450:270:0.05)};},
17787 }
```



natoapp6c/s/group

```
17788 \tikzset{%
17789   natoapp6c/s/group/.pic={
17790     \path(-.23,.05) pic [draw,scale=.8] {natoapp6c/s/individual};
17791     \path(0,-.05) pic [draw,scale=.8] {natoapp6c/s/individual};
17792     \path(.23,.05) pic [draw,scale=.8] {natoapp6c/s/individual}};},
17793 }
```



natoapp6c/s/gun

```
17794 \tikzset{%
17795   pics/natoapp6c/s/gun/.is choice,
17796   pics/natoapp6c/s/gun/base/.style={
17797     code={
17798       \pic[draw]{natoapp6c/s/weapon=base};
17799       \pic[draw]{natoapp6c/s/weapon=top};
17800       \pic[draw]{natoapp6c/s/weapon=multi fire}}},
17801   pics/natoapp6c/s/gun/air defence/.style={
17802     code={
17803       \pic[draw]{natoapp6c/s/gun/base};
17804       \pic[draw]{natoapp6c/s/weapon=air defence}}},
17805   pics/natoapp6c/s/gun/anti tank/.style={
17806     code={
17807       \pic[draw]{natoapp6c/s/gun/base};
17808       \pic[draw]{natoapp6c/s/weapon/anti tank}}},
17809   pics/natoapp6c/s/gun/direct/.style={
17810     code={
17811       \pic[draw]{natoapp6c/s/gun/base};
17812       \pic[draw]{natoapp6c/s/weapon=bottom}}},
17813   pics/natoapp6c/s/gun/recoilless/.style={
17814     code={
17815       \pic[draw]{natoapp6c/s/rifle};
17816       \pic[yshift=-4,draw]{natoapp6c/s/weapon=multi fire}}},
17817   pics/natoapp6c/s/gun/.default=direct,
17818 }
```



natoapp6c/s/headquarters

```
17819 \tikzset{%
17820   natoapp6c/s/headquarters/.pic={
17821     \path[pic actions] (M.north west) -- ++(0,-.3) --
17822       ([shift=(-90:.3)]M.north east) -- (M.north east) -- cycle;},
17823 }
```



natoapp6c/s/house

```
17824 \tikzset{%
17825   natoapp6c/s/house/.pic={
17826     \path[pic actions]
17827       (-.125,-.175) rectangle (.125,.075)
17828       (-.167,.075) -- (0,.225) -- (.167,.075) -- cycle;},
17829 }
```



natoapp6c/s/howitzer

```
17830 \tikzset{%
17831   natoapp6c/s/howitzer/.pic={
17832     \pic[draw]{natoapp6c/s/weapon=base};
17833     \pic[draw]{natoapp6c/s/weapon=top};
17834     \pic[draw]{natoapp6c/s/weapon=multi fire};
17835     \pic[yshift=-8,draw]{natoapp6c/s/weapon=grenade launcher};
17836   },
17837 }
```



natoapp6c/s/in position

```
17838 \tikzset{%
17839   natoapp6c/s/in position/.pic={
17840     \path[draw,fill=pgfstrokecolor]
17841       (-.3,-.01) rectangle (-.2,.01) (.2,-.01) rectangle (.3,.01);},
17842 }
```



natoapp6c/s/individual

```
17843 \tikzset{%
17844   natoapp6c/s/individual/.pic={
17845     \path[pic actions]
17846       (0,.08) -- (0,-.3) (-.15,0) -- (.15,0) (0,.18) circle(.1);},
17847 }
```



natoapp6c/s/infantry

```
17848 \tikzset{%
17849   natoapp6c/s/infantry/.pic={
17850     \path[draw] (-.75,.5) -- (.75,-.5) (-.75,-.5) -- (.75,.5);},
17851 }
```



natoapp6c/s/intermodal

```
17852 \tikzset{%
17853   natoapp6c/s/intermodal/.pic={
17854     \path[pic actions]
17855       ( 0.15,  0.025) --
17856       (-0.15,  0.025) --
17857       (-0.15,  0.075) --
17858       (-0.25,  0) --
17859       (-0.15, -0.075) --
17860       (-0.15, -0.025) --
```

```

17861 ( 0.15, -0.025) --
17862 ( 0.15, -0.075) --
17863 ( 0.25, 0) --
17864 ( 0.15, 0.075) -- cycle;},
17865 }

```



natoapp6c/s/jagged wave

```

17866 \tikzset{%
17867   natoapp6c/s/jagged wave/.pic={
17868     \draw (0.3, -0.05) --
17869           (0.2, 0.05) --
17870           (0.1, -0.05) --
17871           (0, 0.05) --
17872           (-0.1, -0.05) --
17873           (-0.2, 0.05) --
17874           (-0.3, -0.05);},
17875 }

```



natoapp6c/s/jam

```

17876 \tikzset{%
17877   natoapp6c/s/jam/.pic={%
17878     \path[draw]
17879       (0.75, 0)
17880       to[out=90, in=90, looseness=2.25] ( 0.65, 0)
17881       to[out=-90, in=-90, looseness=2.25] ( 0.55, 0)
17882       to[out=90, in=90, looseness=2.25] ( 0.45, 0)
17883       to[out=-90, in=-90, looseness=2.25] ( 0.35, 0)
17884       to[out=90, in=90, looseness=2.25] ( 0.25, 0)
17885       to[out=-90, in=-90, looseness=2.25] ( 0.15, 0)
17886       to[out=90, in=90, looseness=2.25] ( 0.05, 0)
17887       to[out=-90, in=-90, looseness=2.25] (-0.05, 0)
17888       to[out=90, in=90, looseness=2.25] (-0.15, 0)
17889       to[out=-90, in=-90, looseness=2.25] (-0.25, 0)
17890       to[out=90, in=90, looseness=2.25] (-0.35, 0)
17891       to[out=-90, in=-90, looseness=2.25] (-0.45, 0)
17892       to[out=90, in=90, looseness=2.25] (-0.55, 0)
17893       to[out=-90, in=-90, looseness=2.25] (-0.65, 0)
17894       to[out=90, in=90, looseness=2.25] (-0.75, 0)
17895     ;},
17896 }

```



natoapp6c/s/jamming

```

17897 \tikzset{%
17898   natoapp6c/s/jamming/.pic={%
17899     \path(0,.4) pic {natoapp6c/s/jam} (0,.26) pic {natoapp6c/s/jam};},

```

17900 }



natoapp6c/s/jetski

```
17901 \tikzset{%
17902   natoapp6c/s/jetski/.pic={
17903     \path[pic actions]
17904       ( 0.3, -0.2) --
17905       (-0.3, -0.2) --
17906       (-0.35,-0.1) --
17907       (-0.1,  0.2) --
17908       ( 0,   0.2) --
17909       ( 0,   0.1) --
17910       (-0.05, 0.1) --
17911       (-0.1, -0.05) --
17912       ( 0.3, -0.05) --
17913       ( 0.3, -0.2) -- cycle;
17914 },
17915 }
```



natoapp6c/s/killing

```
17916 \tikzset{%
17917   natoapp6c/s/killing/.pic={\path[draw] (-.45,.25)--(.45,-.25);},
17918 }
```



natoapp6c/s/labour

```
17919 \tikzset{%
17920   natoapp6c/s/labour/.pic={%
17921     \path[draw] (-.15,.2) -- (.15,.2) (0,.2) -- (0,0)
17922     (-.15,0) -- ++(300:.3) -- ++(60:.3) -- cycle;},
17923 }
```



natoapp6c/s/land mine

```
17924 \tikzset{%
17925   pics/natoapp6c/s/land mine/.is choice,
17926   pics/natoapp6c/s/land mine/personnel/.style={
17927     code={\pic[fill=pgfstrokecolor]{natoapp6c/s/land mine=none};
17928     \path[pic actions] (135:0.35) -- (0, 0) -- (45:0.35);}},
17929   pics/natoapp6c/s/land mine/tank/.style={
17930     code={\pic[fill=pgfstrokecolor]{natoapp6c/s/land mine=none};}},
17931   pics/natoapp6c/s/land mine/none/.style={
17932     code={\path[pic actions] (0,0) circle(0.25);}},
17933   pics/natoapp6c/s/land mine/.default=none,
```

17934 }



natoapp6c/s/land missile

```
17935 \tikzset{%
17936   natoapp6c/s/land missile/.pic={\pic{natoapp6c/s/missile launcher};},
17937 }
```



natoapp6c/s/laser

```
17938 \tikzset{%
17939   natoapp6c/s/laser/.pic={
17940     \path[draw,line join=round,line cap=round,pic actions]
17941       ( 0.1, -0.25) --
17942       (-0.1, -0.225) --
17943       ( 0.1, -0.2) --
17944       (-0.1, -0.175) --
17945       ( 0.1, -0.15) --
17946       ( 0, -0.1375) --
17947       ( 0, -0.0125) --
17948       (-0.1, 0) --
17949       ( 0.1, 0.025) --
17950       (-0.1, 0.05) --
17951       ( 0.1, 0.075) --
17952       ( 0, 0.0875) --
17953       ( 0, 0.25)
17954       ( 0.1, 0.2) --
17955       ( 0, 0.25) --
17956       (-0.1, 0.2);},
17957 }
```



natoapp6c/s/launcher

```
17958 \tikzset{%
17959   natoapp6c/s/launcher/.pic={
17960     \path[draw] (-.3,-.2) -- (.3,.2) -- (.3,-.2);},
17961 }
```



natoapp6c/s/laundry

```
17962 \tikzset{%
17963   natoapp6c/s/laundry/.pic={%
17964     \path[draw] (0,-.3) -- (0,.1)
17965     (0,.1) -- ++(150:.25)
17966     (0,.1) -- ++(180:.2)
17967     (0,.1) -- ++(210:.25);},
```

17968 }



natoapp6c/s/machine gun

```
17969 \tikzset{%
17970   natoapp6c/s/machine gun/.pic={%
17971     \pic[draw]{natoapp6c/s/rifle};
17972     \pic[draw]{natoapp6c/s/weapon=machine gun};},
17973 }
```



natoapp6c/s/main gun

```
17974 \tikzset{%
17975   natoapp6c/s/main gun/.pic={
17976     \path[pic actions] (M.north west) -- ++(.25,0) --
17977       ([shift=(0:.25)]M.south west) -- (M.south west) -- cycle;},
17978 }
```



natoapp6c/s/maintenance

```
17979 \tikzset{%
17980   natoapp6c/s/maintenance/.pic={
17981     \path[fill=pgfstrokecolor]
17982       (-.38,.25)
17983       to[out=0,in=90,looseness=1.5] (-.2,.05) -- (.2,.05)
17984       to[out=90,in=180,looseness=1.5] (.38,.25) -- ++(0,-.08)
17985       to[out=180,in=90,looseness=1.5] (.28,0)
17986       to[out=-90,in=180,looseness=1.5] (.38,-.17) -- ++(0,-.08)
17987       to[out=180,in=-90,looseness=1.5] (.2,-.05) -- (-.2,-.05)
17988       to[out=-90,in=0,looseness=1.5] (-.38,-.25) -- ++(0,.08)
17989       to[out=0,in=-90,looseness=1.5] (-.28,0)
17990       to[out=90,in=0,looseness=1.5] (-.38,.17) -- cycle;
17991   },
17992 }
```



natoapp6c/s/medic

```
17993 \tikzset{%
17994   natoapp6c/s/medic/.pic={
17995     \path[pic actions]
17996       (-0.075,-0.2)
17997       --(0.075,-.2)
17998       --(.075,-.075)
17999       --(.2,-.075)
18000       --(.2,.075)
18001       --(.075,.075)
```

```

18002    --(.075,.2)
18003    --(-0.075,.2)
18004    --(-0.075,.075)
18005    --(-.2,.075)
18006    --(-.2,-.075)
18007    --(-.075,-.075)
18008    --cycle;},
18009 }

```



natoapp6c/s/medical

```

18010 \tikzset{%
18011  natoapp6c/s/medical/.pic={\path[draw] (-1,0) -- (1,0) (0,-1) -- (0,1)};},
18012 }

```



natoapp6c/s/medical treatment

```

18013 \tikzset{%
18014  natoapp6c/s/medical treatment/.pic={
18015    \path[draw] (0,0) pic {natoapp6c/s/medical}
18016    ([xscale=.5,shift={(0,-.2)}]M.west) -- ([xscale=.5,shift={(0,.2)}]M.west)
18017    ([xscale=.5,shift={(0,-.2)}]M.east) -- ([xscale=.5,shift={(0,.2)}]M.east)};},
18018 }

```



natoapp6c/s/mine

```

18019 \tikzset{%
18020  natoapp6c/s/mine/.pic={
18021    \path[fill=pgfstrokecolor,draw] (0,0) ellipse(.2 and .15)
18022    (0,0) -- ++(60:.3)
18023    (0,0) -- ++(90:.3)
18024    (0,0) -- ++(120:.3)
18025    (0,0) -- ++(240:.3)
18026    (0,0) -- ++(270:.3)
18027    (0,0) -- ++(300:.3)
18028    ;},
18029 }

```



natoapp6c/s/mine clearing equipment

```

18030 \tikzset{%
18031  natoapp6c/s/mine clearing equipment/.pic={
18032    \path[pic actions]
18033    (0, 0.2) -- (0, 0) -- (0.35, -0.2) -- (-0.35, -0.2) -- (0, 0)};},
18034 }

```




natoapp6c/s/mine warfare vessel

```

18035 \tikzset{%
18036   natoapp6c/s/mine warfare vessel/.pic={%
18037     \pic[scale=.8,fill=pgfstrokecolor,yshift=2.5]{natoapp6c/s/sea mine=top half};
18038     \pic          {natoapp6c/s/warfare vessel};
18039   },
18040 }

```



natoapp6c/s/missile

```

18041 \tikzset{%
18042   natoapp6c/s/missile/.pic={%
18043     \path[pic actions,draw]
18044       (0, 0.3)
18045       -- (-0.05, 0.2)
18046       -- (-0.05, -0.2)
18047       -- (-0.125,-0.3)
18048       -- (-0.125,-0.4)
18049       -- (0, -0.265)
18050       -- (0.125,-0.4)
18051       -- (0.125,-0.3)
18052       -- (0.05,-0.2)
18053       -- (0.05,0.2)
18054       -- cycle;},
18055 }

```



natoapp6c/s/missile launcher

```

18056 \tikzset{%
18057   pics/natoapp6c/s/missile launcher/.is choice,
18058   pics/natoapp6c/s/missile launcher/base/.style={
18059     code={
18060       \pic[draw]{natoapp6c/s/weapon=base};
18061       \pic[draw]{natoapp6c/s/weapon=top};
18062       \pic[draw]{natoapp6c/s/weapon=multi fire};
18063       \pic[draw]{natoapp6c/s/weapon=missile launcher};}},
18064   pics/natoapp6c/s/missile launcher/none/.style={
18065     code={
18066       \pic[draw]{natoapp6c/s/missile launcher=base};
18067       \path[pic actions] (-.2,-.2)--(-.2,-.35) (.2,-.2)--(.2,-.35);}},
18068   pics/natoapp6c/s/missile launcher/air defence/.style={
18069     code={
18070       \pic[draw]{natoapp6c/s/missile launcher=none};
18071       \pic[draw]{natoapp6c/s/weapon=air defence};}},
18072   pics/natoapp6c/s/missile launcher/anti tank/.style={
18073     code={
18074       \pic[draw]{natoapp6c/s/missile launcher=base};

```

```

18075     \pic[draw]{natoapp6c/s/weapon=anti tank};}},
18076 pics/natoapp6c/s/missile launcher/surface to surface/.style={
18077     code={%
18078     \pic[draw]{natoapp6c/s/missile launcher=none};
18079     \pic[draw]{natoapp6c/s/weapon=bottom};
18080     \pic[draw]{natoapp6c/s/weapon=machine gun};
18081     }},
18082 pics/natoapp6c/s/missile launcher/.default=none,
18083 }

```



natoapp6c/s/mobile advisor and support

```

18084 \tikzset{%
18085 natoapp6c/s/mobile advisor and support/.pic={
18086     \path[draw] (-.35,0) circle(.1) (.35,0) circle(.1);
18087     \path[draw,fill=pgfstrokecolor,pic actions]
18088     ( 0.15,  0.025) --
18089     (-0.25,  0.025) --
18090     (-0.25, -0.025) --
18091     ( 0.15, -0.025) --
18092     ( 0.15, -0.075) --
18093     ( 0.25,  0)     --
18094     ( 0.15,  0.075) -- cycle;},
18095 }

```



natoapp6c/s/moored

```

18096 \tikzset{%
18097 natoapp6c/s/moored/.pic={
18098     \path[draw] (0,.2) -- (0,-.05) (-.3,-.05) -- (.3,-.05);},
18099 }

```



natoapp6c/s/mortar

```

18100 \tikzset{%
18101 natoapp6c/s/mortar/.pic={
18102     \path[draw] (0,-.15) circle(.05) (0,-.1) -- (0,.2)
18103     ([shift=(225:.1)]0,.2) -- (0,.2) -- ([shift=(-45:.1)]0,.2);},
18104 }

```



natoapp6c/s/motorized

```

18105 \tikzset{%
18106 natoapp6c/s/motorized/.pic={\path[draw] (M.north) -- (M.south);},
18107 pics/natoapp6c/s/motorised/.style={natoapp6c/s/motorized},
18108 }

```



natoapp6c/s/mortuary affairs

```
18109 \tikzset{%
18110   natoapp6c/s/mortuary affairs/.pic={
18111     \path[draw] (-.1,-.2) rectangle (.1,.2)
18112       (0,-.17) -- (0,.17) (-.07,.1) -- (.07,.1)};},
18113 }
```



natoapp6c/s/mountain

```
18114 \tikzset{%
18115   natoapp6c/s/mountain/.pic={
18116     \path[draw,fill=pgfstrokecolor] (0,.2) -- ++(-60:.7) -- ++(180:.7) -- cycle;
18117   },
18118 }
```



natoapp6c/s/naval

```
18119 \tikzset{%
18120   natoapp6c/s/naval/.pic={
18121     \def\arrow{(0,0) -- (-.02,0) -- ++(60:.04) -- ++(-60:.04) -- cycle}
18122     \begin{scope}[pic actions]
18123       \path[draw]
18124         (0,.13) circle (.08) (-.2,.04) -- (.2,.04) (0,.04)
18125         -- (0,-.25) (210:.25) arc (210:340:.25);
18126       \path[draw,shift=(210:.25),rotate=30] \arrow;
18127       \path[draw,shift=(340:.25),rotate=-30] \arrow;
18128     \end{scope}},
18129 }
```



natoapp6c/s/navigation

```
18130 \tikzset{%
18131   natoapp6c/s/navigation/.pic={
18132     \path[draw]
18133       (.17,-.2) -- (0,.2) -- (-.17,-.2)
18134       ($(-180:.17)+(0,.05)$) arc[radius=.17,start angle=-180,end angle=0]};},
18135 }
```



natoapp6c/s/navy task

```
18136 \tikzset{%
18137   natoapp6c/s/navy task/.pic={
18138     \path[pic actions]
```

```

18139      (-0.25, -0.2) -- (-0.25, 0.1) -- (-0.15, 0.2)
18140      ( 0.25, -0.2) -- ( 0.25, 0.1) -- ( 0.15, 0.2);},
18141 }


```

	natoapp6c/s/non combatant
--	---------------------------

```

18142 \tikzset{%
18143   natoapp6c/s/non combatant/.pic={
18144     \path[draw,fill=pgfstrokecolor]
18145     (-0.25, -0.2) --
18146     (-0.25, 0.05) --
18147     (-0.15, 0.05) --
18148     (-0.15, 0.2) --
18149     (0.15, 0.2) --
18150     (0.15, 0.05) --
18151     (0.25, 0.05) --
18152     (0.25, -0.2) -- cycle;},
18153 }


```

	natoapp6c/s/non lethal weapon
--	-------------------------------

```

18154 \tikzset{%
18155   natoapp6c/s/non lethal weapon/.pic={%
18156     \pic[draw]{natoapp6c/s/weapon};%
18157     \pic[draw]{natoapp6c/s/weapon=non lethal};},
18158 }

```

	natoapp6c/s/nuclear
--	---------------------

```

18159 \tikzset{%
18160   natoapp6c/s/nuclear/.pic={
18161     \path[fill=pgfstrokecolor,pic actions] (0,0) circle(.05)
18162     (0: .3) arc(0 : 60:.3) -- ( 60:.1) arc( 60: 0: .1) -- cycle
18163     (180:.3) arc(180: 120:.3) -- ( 120:.1) arc( 120: 180:.1) -- cycle
18164     (-60:.3) arc(-60:-120:.3) -- (-120:.1) arc(-120:-60: .1) -- cycle;
18165   },
18166 }

```

	natoapp6c/s/observer
--	----------------------

```

18167 \tikzset{%
18168   natoapp6c/s/observer/.pic={
18169     \path[pic actions] (0.25,-.2)--(-.25,-.2)--(0,.2)--cycle;},
18170 }

```



natoapp6c/s/orbiter shuttle

```
18171 \tikzset{%
18172   natoapp6c/s/orbiter shuttle/.pic={
18173     \path[pic actions]
18174       ($(0, 0.3)!0.35!(0.125, -0.15)$) --
18175       (0.125, -0.15) -- (-0.125, -0.15) --
18176       ($(-0.125, -0.15)!0.65!(0, 0.3)$)
18177       to[in=105, out=75] cycle
18178       (0, -0.20) -- (0, -0.15); },
18179 }
```



natoapp6c/s/ordnance

```
18180 \tikzset{%
18181   natoapp6c/s/ordnance/.pic={
18182     \path[draw] (0,0) ellipse(.2 and .15);
18183     \begin{scope}
18184       \clip (0,0) ellipse(.2 and .15) [reverseclip];
18185       \path[draw] (0,0) -- ++(50:.3)
18186         (0,0) -- ++(70:.3)
18187         (0,0) -- ++(110:.3)
18188         (0,0) -- ++(130:.3)
18189       ;
18190     \end{scope}},
18191 }
```



natoapp6c/s/organisation

```
18192 \tikzset{%
18193   pics/natoapp6c/s/organisation/.style={natoapp6c/s/group},
18194 }
```



natoapp6c/s/over snow

```
18195 \tikzset{%
18196   natoapp6c/s/over snow/.pic={
18197     \ifn@to@pp@below%
18198       \draw ([shift={(-.15,.15)}]M.south west) to[in=180, out=270]
18199         ++(.15,-.15) -- (M.south east);
18200     \else%
18201       \draw ([shift={(.3,.1)}]M.west) to[in=180, out=-90]
18202         ([shift={(.5,-.1)}]M.west) --
18203         ([shift={(-.3,-.1)}]M.east);
18204     \fi},
18205 }
```



natoapp6c/s/pack animal

```
18206 \tikzset{%
18207   natoapp6c/s/pack animal/.pic={
18208     \def\n@to@pp@tmp{0}
18209     \ifn@to@pp@below\def\n@to@pp@tmp{-0.15}\fi
18210     \path[draw,shift={(0,\n@to@pp@tmp)}]
18211       (-0.3,-0.15) -- (-0.15,0.15) -- (0,-0.15) -- (0.15,0.15) -- (0.3,-0.15);},
18212 }
```



natoapp6c/s/patrol

```
18213 \tikzset{%
18214   natoapp6c/s/patrol/.pic={
18215     \pic{natoapp6c/s/warfare vessel};
18216     \path[draw,fill=pgfstrokecolor] (0.125, 0) -- (0, 0.2) -- (-0.125, 0) -- cycle;},
18217 }
```



natoapp6c/s/patrolling

```
18218 \tikzset{%
18219   natoapp6c/s/patrolling/.pic={
18220     % OBS
18221     \path[draw]
18222       (0.25, 0.05) -- (-0.05, 0.05) -- (0.05, -0.05) -- (-0.4, -0.05)
18223       (-0.3, 0) -- (-0.4, -0.05) -- (-0.3, -0.1)
18224       node [natoapp6c/text,natoapp6c/small text,
18225         scale=.5,anchor=west,inner sep=0] at (0.25, 0.05) {P};
18226   },
18227 }
```



natoapp6c/s/physician

```
18228 \tikzset{%
18229   natoapp6c/s/physician/.pic={
18230     \pic{natoapp6c/s/medical};
18231     \path[draw] (0.1, 0.05) -- (-0.1, 0.05);},
18232 }
```



natoapp6c/s/pipeline

```
18233 \tikzset{%
18234   natoapp6c/s/pipeline/.pic={
18235     \path[draw] (-0.15,-0.15) rectangle (0.15,0.15)
18236     (-0.3,0.1) -- (-0.15,0.1) (-0.3,-0.1) -- (-0.15,-0.1)
```

```

18237 (.3,.1) -- (.15,.1) (.3,-.1) -- (.15,-.1)
18238 (-.05,.15) rectangle (.05,.25) (-.1,.25) rectangle (.1,.30);},
18239 }

```



natoapp6c/s/poisoning

```

18240 \tikzset{%
18241 natoapp6c/s/poisoning/.pic={
18242 \path[pic actions] (0, 0.055) circle (0.145)
18243 (0.3, 0) -- (-0.3, -0.2)
18244 (-0.3, 0) -- (0.3, -0.2);},
18245 }

```



natoapp6c/s/postal

```

18246 \tikzset{%
18247 natoapp6c/s/postal/.pic={
18248 \path[draw] (-.25,.25) -- (.08,.25)
18249 to [out=-90,in=120,looseness=1] (.25,-.25)
18250 to [out=150,in=-90,looseness=1] (-.25,.25);
18251 },
18252 }

```



natoapp6c/s/printed media

```

18253 \tikzset{%
18254 natoapp6c/s/printed media/.pic={
18255 \path[pic actions] (0.2, 0) -- (-0.2, 0)
18256 (0, 0.1) circle (0.085)
18257 (0, -0.1) circle (0.085);},
18258 }

```



natoapp6c/s/psychological

```

18259 \tikzset{%
18260 natoapp6c/s/psychological/.pic={
18261 \path[pic actions] (-.25,.15) -- (-.1,.15) -- (.1,.25)
18262 -- ++(0,-.5) -- (-.1,-.15) -- (-.25,-.15) -- cycle
18263 (.1,.15) -- (.25,.15)
18264 (.1,.05) -- (.25,.05)
18265 (.1,-.05) -- (.25,-.05)
18266 (.1,-.15) -- (.25,-.15);},
18267 }

```



natoapp6c/s/quarry

```
18268 \tikzset{%
18269   natoapp6c/s/quarry/.pic={
18270     \path[draw] (-.2,-.2) -- (.18,.18) (.2,-.2) -- (-.18,.18)
18271       (25:.255) arc(25:65:.255)
18272       (115:.255) arc(115:155:.255);
18273     %([shift={(115:.08)}]-.1,.1) arc (115:155:.08)
18274     %([shift={(70:.08)}].1,.1) arc (70:110:.08);
18275   },
18276 }
```



natoapp6c/s/quartermaster

```
18277 \tikzset{%
18278   natoapp6c/s/quartermaster/.pic={
18279     \path[draw] (-.4,.1) -- (.1,.1) (.25,.1) circle(.15)
18280     (-.3,.1) -- (-.3,-.15) (-.15,.1) -- (-.15,-.15)
18281     (-.3,-.08) -- (-.15,-.08);},
18282 }
```



natoapp6c/s/radar

```
18283 \tikzset{%
18284   natoapp6c/s/radar/.pic={%
18285     \path[draw] (-.2,.2) arc (150:300:.25) (-.24,.01) -- (0,.2) --
18286     (0,0) -- (.2,.2);},
18287 }
```



natoapp6c/s/radio

```
18288 \tikzset{%
18289   natoapp6c/s/radio/.pic={%
18290     \path[draw] (-.2,.2) -- (-.13,.25) -- (-.07,.2) -- (0,.25) --
18291     (.07,.2) -- (.13,.25) -- (.2,.2) (0,.25) -- (0,-.05) (0,-.15) circle(.1);},
18292 }
```



natoapp6c/s/radio relay

```
18293 \tikzset{%
18294   natoapp6c/s/radio relay/.pic={%
18295     \path[draw] (-.2,.25) -- (.2,.25) (0,.25) -- (0,-.05) (0,-.15) circle(.1);},
18296 }
```




natoapp6c/s/radio relay line of sight

```

18297 \tikzset{%
18298   natoapp6c/s/radio relay line of sight/.pic={%
18299     \path[draw] (0,0) circle(.2);
18300     \path[fill=pgfstrokecolor] (0,0) -- (45:.2) arc(45:-45:.2) -- cycle;
18301     \path[fill=pgfstrokecolor] (0,0) -- (135:.2) arc(135:225:.2) -- cycle;},
18302 }

```



natoapp6c/s/radio teletype

```

18303 \tikzset{%
18304   natoapp6c/s/radio teletype/.pic={%
18305     \path[draw] (-.2,.25) -- (.2,.25) (-.15,.18) -- (.15,.18)
18306               (0,.25) -- (0,-.25)
18307               ([shift=(30:.1)]0,-.15) arc(30:330:.1);},
18308 }

```



natoapp6c/s/railroad

```

18309 \tikzset{%
18310   natoapp6c/s/railroad/.pic={%
18311     \ifn@to@pp@below%
18312       \path[pic actions] (M.south west) -- (M.south east)
18313         ([shift={(.08,-0.08)}]M.south west) circle(.08)
18314         ([shift={(.24,-0.08)}]M.south west) circle(.08)
18315         ([shift={(-.08,-0.08)}]M.south east) circle(.08)
18316         ([shift={(-.24,-0.08)}]M.south east) circle(.08);
18317     \else
18318       \path[pic actions] (-.45,.08) -- (.45,.08)
18319         (-.37,0) circle(0.08)
18320         (-.21,0) circle(0.08)
18321         (.21,0) circle(0.08)
18322         (.37,0) circle(0.08);
18323     \fi
18324   },
18325 }

```



natoapp6c/s/reconnaissance

```

18326 \tikzset{%
18327   natoapp6c/s/reconnaissance/.pic={%
18328     \path[draw] (M.north east)--(M.south west);},
18329 }

```



natoapp6c/s/recovery unmanned systems

```
18330 \tikzset{%
18331   natoapp6c/s/recovery unmanned systems/.pic={%
18332     \path[draw] (-.5,.15) to [out=-80,in=180] (0,-.15) to
18333     [out=0,in=260] (.5,.15);},
18334 }
```



natoapp6c/s/rifle

```
18335 \tikzset{%
18336   natoapp6c/s/rifle/.pic={%
18337     \pic[draw]{natoapp6c/s/weapon=full};
18338     \pic[draw]{natoapp6c/s/weapon=rifle};},
18339 }
```



natoapp6c/s/rising

```
18340 \tikzset{%
18341   natoapp6c/s/rising/.pic={
18342     \path[draw,fill=pgfstrokecolor] (0, 0.2) -- (0, -0.167)
18343     (0.1, -0.2) -- (-0.1, -0.2) -- (0, 0.0);},
18344 }
```



natoapp6c/s/riverine

```
18345 \tikzset{%
18346   natoapp6c/s/riverine/.pic={%
18347     \ifn@to@pp@below%
18348       \path[pic actions] (M.south west)
18349       to [out=-90,in=-90,looseness=.5] (M.south east) -- cycle;
18350     \else%
18351       \path[pic actions] (-.5,.15) to [out=-80,in=180] (0,-.15) to
18352       [out=0,in=260] (.5,.15) -- cycle;
18353     \fi},
18354 }
```



natoapp6c/s/rocket launcher

```
18355 \tikzset{%
18356   pics/natoapp6c/s/rocket launcher/.is choice,
18357   pics/natoapp6c/s/rocket launcher/base/.style={
18358     code={
18359       \pic[draw]{natoapp6c/s/weapon=base};
18360       \pic[draw]{natoapp6c/s/weapon=rifle};

```

```

18361     \pic[yshift=-4,draw]{natoapp6c/s/weapon=rifle};
18362   }},
18363   pics/natoapp6c/s/rocket launcher/anti tank/.style={
18364     code={
18365       \pic[draw]{natoapp6c/s/rocket launcher=base};
18366       \pic[draw]{natoapp6c/s/weapon=anti tank};
18367     }},
18368   pics/natoapp6c/s/rocket launcher/single/.style={
18369     code={
18370       \pic[draw]{natoapp6c/s/rocket launcher=base};
18371       \pic[draw]{natoapp6c/s/weapon=bottom}}},
18372   pics/natoapp6c/s/rocket launcher/multiple/.style={
18373     code={
18374       \pic[draw]{natoapp6c/s/rocket launcher=single};
18375       \pic[yshift=-6,draw]{natoapp6c/s/weapon=multi fire}}},
18376   pics/natoapp6c/s/rocket launcher/single head/.style={
18377     code={%
18378       \pic[yshift=4,draw]{natoapp6c/s/weapon=rifle}}},
18379   pics/natoapp6c/s/rocket launcher/multiple head/.style={
18380     code={
18381       \pic[yshift=-4,draw]{natoapp6c/s/weapon=rifle};
18382       \pic[yshift=-6,draw]{natoapp6c/s/weapon=rifle};
18383     }},
18384   pics/natoapp6c/s/rocket launcher/.default=single,
18385 }

```



natoapp6c/s/rotary wing

```

18386 \tikzset{%
18387   natoapp6c/s/rotary wing/.pic={
18388     \path[pic actions]
18389       (0.44, 0.15) -- (0.44, -0.15) -- (-0.44, 0.15) -- (-0.44, -0.15) --
18390       cycle;},
18391 }

```



natoapp6c/s/runway

```

18392 \tikzset{%
18393   natoapp6c/s/runway/.pic={%
18394     \path[draw] (-.3,-.15) -- (.3,-.15) (-.2,-.2) -- (.2,.2);},
18395 }

```



natoapp6c/s/sailing boat

```

18396 \tikzset{%
18397   natoapp6c/s/sailing boat/.pic={%
18398     \path[draw]
18399       (-0.15, -0.2) --

```

```

18400 ( 0.15, -0.2) --
18401 ( 0.25, -0.025) --
18402 (-0.25, -0.025) -- cycle
18403 ( 0, -0.025) -- (0, 0.2)
18404 (0.025, 0) -- (0.025, 0.19) -- (0.225, 0) -- cycle;},
18405 }

```



natoapp6c/s/satellite

```

18406 \tikzset{%
18407 pics/natoapp6c/s/satellite/.is choice,
18408 pics/natoapp6c/s/satellite/none/.style={
18409 code={
18410 \iftikz@mode@fill
18411 \def\n@to@pp@next{\path[draw,fill=pgfstrokecolor,pic actions]}
18412 \else
18413 \def\n@to@pp@next{\path[pic actions]}
18414 \fi
18415 \n@to@pp@next
18416 ( 0.45, 0.075) rectangle ( 0.15, -0.075)
18417 ( 0.075, 0.075) rectangle (-0.075, -0.075)
18418 (-0.45, 0.075) rectangle (-0.15, -0.075)
18419 ( 0.15, 0) -- (0.075, 0)
18420 (-0.15, 0) -- (-0.075, 0);
18421 }},
18422 pics/natoapp6c/s/satellite/astromical/.style={
18423 code={
18424 \begingroup\tikz@picmode
18425 \pic{natoapp6c/s/satellite=none};
18426 \endgroup
18427 \path[pic actions]
18428 (0.04, 0.075) rectangle (-0.04, 0.2)
18429 (0.02, -0.075) rectangle (-0.02, -0.2);}},
18430 pics/natoapp6c/s/satellite/bio/.style={
18431 code={
18432 \begingroup\tikz@picmode
18433 \pic[yshift=-1]{natoapp6c/s/satellite=none};
18434 \endgroup
18435 \path[pic actions]
18436 (-0.075, 0.13) circle (0.07)
18437 ($(-0.075, 0.13) + (60:0.07)$) --
18438 ++(-30:0.22) -- ++(0, -0.025) -- (-0.005, 0.13) -- cycle;
18439 }},
18440 pics/natoapp6c/s/satellite/communications/.style={
18441 code={
18442 \begingroup\tikz@picmode
18443 \pic[yshift=-1]{natoapp6c/s/satellite=none};
18444 \endgroup
18445 \path[pic actions]
18446 (0, 0.075) -- (0, 0.125)
18447 (0, 0.125) arc (270:340:0.25 and 0.1)
18448 (0, 0.125) arc (270:200:0.25 and 0.1);

```

```

18449     }},
18450 pics/natoapp6c/s/satellite/navigation/.style={
18451     code={
18452         \beginpgfgroup\tikz@picmode
18453         \pic[yshift=-3.75,scale=.9]{natoapp6c/s/satellite=none};
18454         \endpgfgroup
18455         \pic[scale=.5,yshift=3.5]{natoapp6c/s/navigation};
18456     }},
18457 pics/natoapp6c/s/satellite/earth observing/.style={
18458     code={
18459         \beginpgfgroup\tikz@picmode
18460         \pic[yshift=3.75, scale=0.9]{natoapp6c/s/satellite=none};
18461         \endpgfgroup
18462         \path[pic actions]
18463         (0, 0.065) -- +(315:0.125)
18464         (0, 0.065) -- +(225:0.125)
18465         (0, -0.12) circle (0.08);
18466     }},
18467 pics/natoapp6c/s/satellite/tether/.style={
18468     code={
18469         \beginpgfgroup\tikz@picmode
18470         \pic[yshift=-3.75, scale=0.9]{natoapp6c/s/satellite=none};
18471         \endpgfgroup
18472         \path[pic actions]
18473         (0, -0.066) -- +(30:0.3)
18474         (0, -0.066) +(30:0.375) circle(0.075);
18475     }},
18476 pics/natoapp6c/s/satellite/small/.style={
18477     code={
18478         \beginpgfgroup\tikz@picmode
18479         \pic[scale=0.6]{natoapp6c/s/satellite=none};
18480         \endpgfgroup
18481         \path[pic actions]
18482         (0.05, 0.2) -- ( 0, 0.1) -- (-0.05, 0.2)
18483         (0.05, -0.2) -- ( 0, -0.1) -- (-0.05, -0.2)
18484         (-0.4, 0.05) -- (-0.3, 0) -- (-0.4, -0.05)
18485         ( 0.4, 0.05) -- ( 0.3, 0) -- ( 0.4, -0.05);
18486     }},
18487 pics/natoapp6c/s/satellite/reconnaissance/.style={
18488     code={
18489         \pic[yshift=-1,fill=pgfstrokecolor]{natoapp6c/s/satellite=none};
18490         \path[pic actions]
18491         (-0.075, -0.05) -- +(250:0.1)
18492         (-0.025, -0.05) -- +(260:0.1)
18493         ( 0.025, -0.05) -- +(280:0.1)
18494         ( 0.075, -0.05) -- +(290:0.1);
18495     }},
18496 pics/natoapp6c/s/satellite/.default=none,
18497 }

```



natoapp6c/s/sea mine

```
18498 \tikzset{%
18499   pics/natoapp6c/s/sea mine/.is choice,
18500   pics/natoapp6c/s/sea mine/top half/.style={
18501     code={\path[draw,join=bevel,pic actions]
18502       (.2,0) arc(0:35:.2 and .175) --
18503       (42:.34 and .3) -- (48:.34 and .3) --
18504       % (($45:.1) + (40:.2)$) -- (($45:.1)+(50:.2)$) --
18505       (55:.2 and .175) arc(50:75:.2 and .175) --
18506       (80:.26 and .23) -- (100:.26 and .23) --
18507       (105:.2 and .175) arc(100:125:.2 and .175) --
18508       (132:.34 and .3) -- (138:.34 and .3) --
18509       %(($135:.1)+(130:.2)$) -- (($135:.1)+(140:.2)$) --
18510       (145:.2 and .175) arc(145:180:.2 and .175);
18511     }},
18512   pics/natoapp6c/s/sea mine/bottom half/.style={
18513     code={
18514       \path[pic actions] (.2,0) arc(0:-180:.2);}},
18515   pics/natoapp6c/s/sea mine/full/.style={
18516     code={
18517       \pic[fill=pgfstrokecolor]{natoapp6c/s/sea mine/top half};
18518       \pic[fill=pgfstrokecolor]{natoapp6c/s/sea mine/bottom half};}},
18519   pics/natoapp6c/s/sea mine/neutralised/.style={
18520     code={
18521       \begin{scope}[even odd rule]
18522         \clip [rotate=42] (-.4,-.015) rectangle (.4,.015) [reverseclip];
18523         \clip [rotate=-42] (-.4,-.015) rectangle (.4,.015) [reverseclip];
18524         \pic {natoapp6c/s/sea mine=full};
18525       \end{scope}
18526     }},
18527   pics/natoapp6c/s/sea mine/neutralized/.style=natoapp6c/s/sea mine/neutralised,
18528   pics/natoapp6c/s/sea mine/.default=full,
18529 }
```



natoapp6c/s/seabed installation

```
18530 \tikzset{%
18531   natoapp6c/s/seabed installation/.pic={%
18532     \path[pic actions]
18533     (-0.25, -0.2) --
18534     ( 0.25, -0.2) --
18535     ( 0.25, -0.075) --
18536     ( 0.05, -0.075) --
18537     ( 0.05,  0.025) --
18538     (-0.125, 0.025) --
18539     (-0.125, 0.2) --
18540     (-0.25, 0.2) -- cycle;},
18541 }
```



natoapp6c/s/search

```
18542 \tikzset{%
18543   natoapp6c/s/search/.pic={%
18544     \path[draw] (-.3,-.2)--(0,-.4)--(.3,-.2) (0,.4)--(0,-.4);},
18545 }
```



natoapp6c/s/searching

```
18546 \tikzset{%
18547   natoapp6c/s/searching/.pic={%
18548     \path[pic actions]
18549       (-0.4, 0)
18550       arc (180:0:0.1)
18551       arc (180:360:0.1)
18552       arc (180:0:0.1)
18553       arc (180:270:0.1) -- +(0.1, 0)
18554       (0.3, -0.05) -- (0.4, -0.1) -- (0.3, -0.15);},
18555 }
```



natoapp6c/s/semi trailer truck

```
18556 \tikzset{%
18557   natoapp6c/s/semi trailer truck/.pic={
18558     \pic[scale=.75,xshift=-2,draw]{natoapp6c/s/utility vehicle};
18559     \path[pic actions] (0.21, -0.025) -- (0.35, -0.025)
18560       (0.35, 0.05) -- (0.35, -0.1);},
18561 }
```



natoapp6c/s/sensor

```
18562 \tikzset{%
18563   natoapp6c/s/sensor/.pic={%
18564     \path[fill=pgfstrokecolor] (-.3,0) arc (270:360:.3) arc (180:270:.3) arc
18565       (90:180:.3) arc (0:90:.3);},
18566 }
```



natoapp6c/s/ship

```
18567 \tikzset{%
18568   natoapp6c/s/ship/.pic={%
18569     \path[pic actions]
18570       (-0.2, -0.2) --
18571       ( 0.2, -0.2) --
18572       ( 0.35, 0.05) --
```

```

18573 ( 0.15, 0.05) --
18574 ( 0.15, 0.2) --
18575 (-0.15, 0.2) --
18576 (-0.15, 0.05) --
18577 (-0.35, 0.05) --
18578 cycle;},
18579 }

```



natoapp6c/s/signal

```

18580 \tikzset{%
18581 natoapp6c/s/signal/.pic={%
18582 \path[draw] (M.north west) -- (0,-.1) -- (0,.1) -- (M.south east)};},
18583 }

```



natoapp6c/s/signals intelligence

```

18584 \tikzset{%
18585 natoapp6c/s/signals intelligence/.pic={%
18586 \path[draw] (-.2,.2) -- (-.13,.25) -- (-.07,.2) -- (0,.25) --
18587 (.07,.2) -- (.13,.25) -- (.2,.2) (0,.25) -- (0,-.2)};},
18588 }

```



natoapp6c/s/ski

```

18589 \tikzset{%
18590 natoapp6c/s/ski/.pic={
18591 \path[draw] (-.15,-.15) -- (.1,.2) (.15,-.15) -- (-.1,.2)
18592 (-.1,-.2) -- (-.2,-.1)
18593 (.1,-.2) -- (.2,-.1);
18594 },
18595 }

```



natoapp6c/s/sled

```

18596 \tikzset{%
18597 natoapp6c/s/sled/.pic={
18598 \ifn@to@pp@below%
18599 \draw ([shift={(-.15,.15)}]M.south west) to[in=180, out=-90]
18600 ++(.15,-.15) -- (M.south east) to[in=-90, out=0]
18601 ([shift={(.15,.15)}]M.south east);
18602 \else%
18603 \draw ([shift={(.3,.1)}]M.west) to[in=180, out=-90]
18604 ([shift={(.5,-.1)}]M.west) --
18605 ([shift={(-.5,-.1)}]M.east) to[in=-90, out=0]
18606 ([shift={(-.3,.1)}]M.east);


```



```

18607 \fi
18608 },
18609 }


```

 natoapp6c/s/small squashed text

```

18610 \tikzset{%
18611 pics/natoapp6c/s/small squashed text/.style={
18612 code={\n@to@pp@text@smallsquashed{#1};}},
18613 }

```

 natoapp6c/s/small text

```

18614 \tikzset{%
18615 pics/natoapp6c/s/small text/.style={code={\n@to@pp@text@small{#1};}},
18616 }

```

 natoapp6c/s/sniper

```

18617 \tikzset{%
18618 natoapp6c/s/sniper/.pic={%
18619 \path[draw] (-.2,.2)--(-.05,.2) (.05,.2)--(.2,.2) (0,.15)--(0,-.2);},
18620 }


```

 natoapp6c/s/space station

```

18621 \tikzset{%
18622 natoapp6c/s/space station/.pic={
18623 \path[join=bevel,pic actions]
18624 (-80:.15 and .06) -- (0.025, 0.175) arc(0:180:0.025) -- (-100:.15 and .06)
18625 ($ (80:.25 and 0.1)+(0,-.0125)$) arc(80:-260:.25 and .1) --
18626 (-260:.15 and .06) arc (-260:80:.15 and .06) -- cycle
18627 (-82:.25 and .1) -- (0.025, -0.175) arc(360:180:0.025) -- (-98:.25 and .1);
18628 },
18629 }

```

 natoapp6c/s/squashed text

```

18630 \tikzset{%
18631 pics/natoapp6c/s/squashed text/.style={code={\n@to@pp@text@squashed{#1};}},
18632 }

```



natoapp6c/s/submarine

```
18633 \tikzset{%
18634   natoapp6c/s/submarine/.pic={
18635     \path[fill=pgfstrokecolor,pic actions]
18636       (0.4, 0) --
18637       (0.25, 0.15) --
18638       (-0.25, 0.15) --
18639       (-0.4, 0) --
18640       (-0.25, -0.15) --
18641       (0.25, -0.15) -- cycle;},
18642 }
```



natoapp6c/s/submersible

```
18643 \tikzset{%
18644   natoapp6c/s/submersible/.pic={
18645     \path[pic actions]
18646       ($ (0, -0.05) + (106.6:0.35 and 0.15)$)
18647       arc (106.6:433.4:0.35 and 0.15) |- (0, 0.2) -| cycle;
18648   },
18649 }
```



natoapp6c/s/supply

```
18650 \tikzset{%
18651   natoapp6c/s/supply/.pic={
18652     \path[pic actions]
18653       ($ (M.east)-(0,.25)$) -- ($ (M.west)-(0,.25)$);},
18654 }
```



natoapp6c/s/surface combatant

```
18655 \tikzset{%
18656   natoapp6c/s/surface combatant/.pic={
18657     \pic {natoapp6c/s/warfare vessel};
18658     \path[draw,fill=pgfstrokecolor]
18659       (0.12,0.05) --
18660       (0.12,0.14) --
18661       (0.06,0.14) --
18662       (0.06,0.2) --
18663       (0.24,0.2) --
18664       (0.24,0.272) --
18665       (0.06,0.272) --
18666       (0.06,0.35) --
18667       (-0.06,0.35) --
18668       (-0.06,0.272) --
```

```

18669 (-0.24,0.272) --
18670 (-0.24,0.2) --
18671 (-0.06,0.2) --
18672 (-0.06,0.14) --
18673 (-0.12,0.14) --
18674 (-0.12,0.05) -- cycle;},
18675 }

```



natoapp6c/s/survey

```

18676 \tikzset{%
18677   natoapp6c/s/survey/.pic={
18678     \path[draw,fill=pgfstrokecolor,pic actions]
18679       (0, -0.1) -- (0, 0.195) -- (0.25, 0.0475) -- cycle;
18680     \path[pic actions] (0.1, -0.2) -- (0, -0.1) -- (-0.1, -0.2);},
18681 }

```



natoapp6c/s/tactical satellite

```

18682 \tikzset{%
18683   natoapp6c/s/tactical satellite/.pic={
18684     \path[fill=pgfstrokecolor,draw]
18685       (-.3,-.2) rectangle(-.15,.2)
18686       (.15,-.2) rectangle( .3,.2)
18687       (-.075,-.15) rectangle (.075,.15)
18688       (-.15,0) -- (.15,0)
18689       (0,-.15) -- (0,-.3);
18690     \path[draw] (-.2,-.35) to [out=40,in=140,looseness=1] (.2,-.35);},
18691 }

```



natoapp6c/s/tank

```

18692 \tikzset{%
18693   natoapp6c/s/tank/.pic={%
18694     \pic[draw]{natoapp6c/s/vehicle};
18695     \path[pic actions] ( 0.35, 0.2) -- (-0.35, 0.2);},
18696 }

```



natoapp6c/s/text

```

18697 \tikzset{%
18698   pics/natoapp6c/s/text/.style={code={%
18699     \n@to@pp@dbg{3}{Text: '#1'}%
18700     \n@to@pp@text@normal{#1};}},
18701 }

```



natoapp6c/s/topographic

```
18702 \tikzset{%
18703   natoapp6c/s/topographic/.pic={
18704     \path[draw] (0,.05) -- (0,.2)
18705       (0,.05) -- (-.1,-.2)
18706       (0,.05) -- (.1,-.2)
18707       (-30:.15) arc[radius=.15,start angle=-30,end angle=-150];},
18708 }
```



natoapp6c/s/torpedo

```
18709 \tikzset{%
18710   natoapp6c/s/torpedo/.pic={
18711     \path[draw,fill=pgfstrokecolor,pic actions]
18712       (-0.35, 0) --
18713       (-0.3, 0.075) --
18714       ( 0.25, 0.075) --
18715       ( 0.35, -0.075) --
18716       ( 0.35, 0.075) --
18717       ( 0.25, -0.075) --
18718       (-0.3, -0.075) -- cycle;},
18719 }
```



natoapp6c/s/towed

```
18720 \tikzset{%
18721   natoapp6c/s/towed/.pic={
18722     \ifn@to@pp@below%
18723       \path[pic actions] (M.south east) -- (M.south west)
18724       ([shift={(.08,0)}]M.south east) circle(.08)
18725       ([shift={(-.08,0)}]M.south west) circle(.08);
18726     \else%
18727       \path[draw] (-.32,0) -- (.32,0) (-.4,0) circle(.08) (.4,0) circle(.08);%
18728     \fi,
18729 }
```



natoapp6c/s/tracked

```
18730 \tikzset{%
18731   natoapp6c/s/tracked/.pic={
18732     \ifn@to@pp@below%
18733       \path[pic actions]
18734       ([shift={(.08,-.16)}]M.south west)
18735       arc [radius=.08,start angle=-90,end angle=-270]
18736       -- ([shift={(-.08,0)}]M.south east)
```

```

18737     arc [radius=.08,start angle=90,end angle=-90]
18738     -- cycle;
18739     \else%
18740     \path[pic actions]
18741     (-.3,-.1) arc [radius=.1,start angle=-90,end angle=-270]
18742     -- (.3,.1) arc [radius=.1,start angle=90,end angle=-90]
18743     -- cycle;
18744     \fi},
18745 }

```



natoapp6c/s/train locomotive

```

18746 \tikzset{%
18747   natoapp6c/s/train locomotive/.pic={
18748     \path[pic actions]
18749     (.35,-.3)--(-.35,-.3)--(-.35,.3)--(0,.3)--(0,0)--(0.35,0)--cycle;},
18750 }

```



natoapp6c/s/transportation

```

18751 \tikzset{%
18752   natoapp6c/s/transportation/.pic={
18753     \path[pic actions] (0,0) circle(.2)
18754     (180:.2) -- (0:.2)
18755     (225:.2) -- (45:.2)
18756     (270:.2) -- (90:.2)
18757     (315:.2) -- (135:.2) ;},
18758 }

```



natoapp6c/s/unexploded ordnance

```

18759 \tikzset{%
18760   natoapp6c/s/unexploded ordnance/.pic={
18761     \begin{scope}[transparency group=knockout]
18762       \path[draw,fill=pgfstrokecolor,pic actions] (0,0) circle(.2);
18763       \pic[opacity=0]{natoapp6c/s/small squashed text=UXO};
18764     \end{scope}},
18765 }

```



natoapp6c/s/unmanned

```

18766 \tikzset{%
18767   natoapp6c/s/unmanned/.pic={
18768     \path[pic actions]
18769     (0,-0.1)
18770     --(0.45,0.05)

```

```

18771    --(0.45,0.1)
18772    --(0,0.025)
18773    --(-0.45,0.1)
18774    --(-0.45,0.05)
18775    --cycle;},
18776 }

```



natoapp6c/s/utility vehicle

```

18777 \tikzset{%
18778   natoapp6c/s/utility vehicle/.pic={%
18779     \pic[draw]{natoapp6c/s/vehicle};
18780     \path[pic actions]
18781       (0.35, 0.3) to[in=-90, out=-90, looseness=1] (-0.35, 0.3); },
18782 }

```



natoapp6c/s/vehicle

```

18783 \tikzset{%
18784   natoapp6c/s/vehicle/.pic={
18785     \path[pic actions]
18786       (-0.35, 0.2) -- (-0.35, -0.2) -- ( 0.35, -0.2) -- ( 0.35, 0.2)
18787       (-0.35, -0.2) -- (-0.35, -0.3)
18788       (0.35, -0.2) -- ( 0.35, -0.3)
18789       (-0.35, 0.2) -- (-0.35, 0.3)
18790       (0.35, 0.2) -- ( 0.35, 0.3);}
18791 }

```



natoapp6c/s/video imagery

```

18792 \tikzset{%
18793   natoapp6c/s/video imagery/.pic={
18794     \path[pic actions]
18795       (-0.4, 0.2) -- (-0.4, -0.2) -- (0.05, -0.2) -- (0.2, 0.2) -- cycle
18796       (0.075, -0.15) -- (0.4, -0.15)
18797       (0.16, 0.1) -- (0.4, 0.1);
18798     \path[draw,fill=pgfstrokecolor,pic actions](0.38,-.2) rectangle (0.42,.15);}
18799 }

```



natoapp6c/s/warfare vessel

```

18800 \tikzset{%
18801   natoapp6c/s/warfare vessel/.pic={
18802     \path[draw,fill=pgfstrokecolor] (0, -0.2) -- (0.3, 0.05) -- (-0.3, 0.05) -- cycle;},
18803 }

```



natoapp6c/s/water

```

18804 \tikzset{%
18805   natoapp6c/s/water/.pic={
18806     \path[pic actions]
18807       (-0.3, 0.05) -- (0, 0.05) to[in=90, out=0] (0.3, -0.2)
18808       (0, 0.05) -- (0, 0.2)
18809       (0.075, 0.2) -- (-0.075, 0.2);},
18810 }

```



natoapp6c/s/wheeled

```

18811 \tikzset{%
18812   pics/natoapp6c/s/wheeled/.is choice,
18813   pics/natoapp6c/s/wheeled/and tracked/.style={
18814     code={
18815       \ifn@to@pp@below%
18816         \path[pic actions]
18817           ([shift={(.4,-.16)}]M.south west)
18818           arc [radius=.08,start angle=-90,end angle=-270]
18819           -- ([shift={(-.08,0)}]M.south east)
18820           arc [radius=.08,start angle=90,end angle=-90]
18821           -- cycle
18822           ([shift={(.08,-.08)}]M.south west) circle(.08);
18823       \else%
18824         \path[pic actions]
18825           (-.1,-.08) arc [radius=.08,start angle=-90,end angle=-270]
18826           -- (.32,.08) arc [radius=.08,start angle=90,end angle=-90]
18827           -- cycle
18828           (-.4,0) circle(0.08);
18829       \fi}},
18830   pics/natoapp6c/s/wheeled/limited/.style={
18831     code={
18832       \ifn@to@pp@below%
18833         \path[pic actions] (M.south west) -- (M.south east)
18834           ([shift={(.08,-.08)}]M.south west) circle(.08)
18835           ([shift={(-.08,-.08)}]M.south east) circle(.08);
18836       \else
18837         \path[pic actions] (-.4,.08) -- (.4,.08)
18838           (-.32,0) circle(0.08) (.32,0) circle(0.08);
18839       \fi}},
18840   pics/natoapp6c/s/wheeled/cross country/.style={
18841     code={\pic{natoapp6c/s/wheeled=limited};
18842       \ifn@to@pp@below%
18843         \path[pic actions] ([shift={ (0,-.08)}]M.south) circle(.08);
18844       \else
18845         \path[pic actions] (0,0) circle(0.08);
18846       \fi}},
18847   pics/natoapp6c/s/wheeled/semi/.style={
18848     code={\pic{natoapp6c/s/wheeled=limited};

```

```

18849 \ifn@to@pp@below%
18850 \path[pic actions] ([shift={(.24,-.08)}]M.south west) circle(.08);
18851 \else
18852 \path[pic actions] (-.16,0) circle(0.08);
18853 \fi}},
18854 pics/natoapp6c/s/wheeled/.default=limited,
18855 }

```

5.6.21 Some extra MIL-STD symbols

Extra NATO App6(c) symbol (from MIL-STD)



natoapp6c/s/prison

```

18856 \tikzset{%
18857   natoapp6c/s/prison/.pic={
18858     \path[pic actions] (-.3,-.3)rectangle(.3,.3)
18859     (-.23,-.30)--(-.23, .3)
18860     (.23,-.30)--(.23, .3)
18861     (-.08,-.30)--(-.08,-.2)
18862     (-.08,-.15) circle (.05)
18863     (-.08,-.1) --(-.08, .3)
18864     (.08,-.30)--(.08,-.2)
18865     (.08,-.15) circle (.05)
18866     (.08,-.1) --(.08, .3)
18867     (0,.15) circle(.07 and .1);
18868   },
18869 }

```

\n@to@pp@s@ll

A list of all defined symbols

```

18870 \def\n@to@pp@s@ll{
18871   weapon=base,
18872   weapon=top,
18873   weapon=bottom,
18874   weapon=rifle,
18875   weapon=machine gun,
18876   weapon=grenade launcher,
18877   weapon=missile launcher,
18878   weapon=non lethal,
18879   weapon=multi fire,
18880   weapon=air defence,
18881   weapon=anti tank,
18882   weapon=full,
18883   weapon,
18884   type=light,
18885   type=medium,
18886   type=heavy,
18887   type=vlight,

```


18888 type=vmedium,
18889 type=vheavy,
18890 type,
18891 above corps support,
18892 air assault with organic lift,
18893 air decoy,
18894 air assault,
18895 air defence,
18896 air strip,
18897 air traffic,
18898 airship,
18899 airborne,
18900 ammunition,
18901 amphibious,
18902 amphibious warfare ship,
18903 analysis,
18904 arrest,
18905 artillery,
18906 anti tank anti armour,
18907 antenna,
18908 armoured,
18909 armoured fighting vehicle,
18910 armoured personnel carrier,
18911 arctic,
18912 automobile,
18913 balloon,
18914 bar,
18915 base,
18916 bicycle equipped,
18917 boat,
18918 booby trap,
18919 bottomed,
18920 bridge=none,
18921 bridge=fixed,
18922 bridge=folding,
18923 bridge=hollow,
18924 bridge,
18925 capsule,
18926 carrier,
18927 chemical biological radiological nuclear,
18928 civilian military cooperation,
18929 civilian police,
18930 civilian telecommunications,
18931 coast guard vessel,
18932 combat support,
18933 combatant,
18934 combined arms,
18935 computer system,
18936 control,
18937 convoy,
18938 corps support,
18939 crime,
18940 decoy,

18941 direct communications,
18942 direction finding,
18943 diving=none,
18944 diving=military,
18945 diving,
18946 drilling,
18947 earthmover,
18948 electric power,
18949 electronic ranging,
18950 electronic warfare wide,
18951 engineer,
18952 enhanced location reporting system,
18953 environmental protection,
18954 explosion,
18955 finance,
18956 fishing vessel,
18957 fire protection,
18958 fixed and rotary wing,
18959 fixed wing,
18960 flame thrower,
18961 floating,
18962 surfaced,
18963 food,
18964 fuel,
18965 grenade launcher=none,
18966 grenade launcher=non lethal,
18967 grenade launcher,
18968 graffiti,
18969 group,
18970 gun=base,
18971 gun=air defence,
18972 gun=anti tank,
18973 gun=direct,
18974 gun=recoilless,
18975 gun,
18976 headquarters,
18977 house,
18978 howitzer,
18979 in position,
18980 individual,
18981 infantry,
18982 intermodal,
18983 jagged wave,
18984 jam,
18985 jamming,
18986 jetski,
18987 killing,
18988 labour,
18989 land mine=personnel,
18990 land mine=tank,
18991 land mine=none,
18992 land mine,
18993 land missile,

18994 laser,
18995 launcher,
18996 laundry,
18997 machine gun,
18998 main gun,
18999 maintenance,
19000 medic,
19001 medical,
19002 medical treatment,
19003 mine,
19004 mine clearing equipment,
19005 mine warfare vessel,
19006 missile,
19007 missile launcher=base,
19008 missile launcher=none,
19009 missile launcher=air defence,
19010 missile launcher=anti tank,
19011 missile launcher=surface to surface,
19012 missile launcher,
19013 mobile advisor and support,
19014 moored,
19015 mortar,
19016 motorized,
19017 mortuary affairs,
19018 mountain,
19019 naval,
19020 navigation,
19021 navy task,
19022 non combatant,
19023 non lethal weapon,
19024 nuclear,
19025 observer,
19026 orbiter shuttle,
19027 ordnance,
19028 organisation,
19029 over snow,
19030 pack animal,
19031 patrol,
19032 patrolling,
19033 physician,
19034 pipeline,
19035 poisoning,
19036 postal,
19037 printed media,
19038 psychological,
19039 quarry,
19040 quartermaster,
19041 radar,
19042 radio,
19043 radio relay,
19044 radio relay line of sight,
19045 radio teletype,
19046 railroad,

19047 reconnaissance,
19048 recovery unmanned systems,
19049 rifle,
19050 rising,
19051 riverine,
19052 rocket launcher=base,
19053 rocket launcher=anti tank,
19054 rocket launcher=single,
19055 rocket launcher=multiple,
19056 rocket launcher=single head,
19057 rocket launcher=multiple head,
19058 rocket launcher,
19059 rotary wing,
19060 runway,
19061 sailing boat,
19062 satellite=none,
19063 satellite=astronomical,
19064 satellite=bio,
19065 satellite=communications,
19066 satellite=navigation,
19067 satellite=earth observing,
19068 satellite=tether,
19069 satellite=small,
19070 satellite=reconnaissance,
19071 satellite,
19072 sea mine=top half,
19073 sea mine=bottom half,
19074 sea mine=full,
19075 sea mine=neutralised,
19076 sea mine=neutralized,
19077 sea mine,
19078 seabed installation,
19079 search,
19080 searching,
19081 semi trailer truck,
19082 sensor,
19083 ship,
19084 signal,
19085 signals intelligence,
19086 ski,
19087 sled,
19088 small squashed text=TXT,
19089 small text=TXT,
19090 sniper,
19091 space station,
19092 squashed text=TXT,
19093 submarine,
19094 submersible,
19095 supply,
19096 surface combatant,
19097 survey,
19098 tactical satellite,
19099 tank,

```

19100 text=TXT,
19101 topographic,
19102 torpedo,
19103 towed,
19104 tracked,
19105 train locomotive,
19106 transportation,
19107 unexploded ordnance,
19108 unmanned,
19109 utility vehicle,
19110 vehicle,
19111 video imagery,
19112 warfare vessel,
19113 water,
19114 wheeled=and tracked,
19115 wheeled=limited,
19116 wheeled=cross country,
19117 wheeled=semi,
19118 wheeled
19119 }

```

A Generate draft VASSAL module

We can use the code you wrote for your game pieces (counters, maps, tables), to generate a draft VASSAL module. To that end, use the document class `wgexport`, and some simple macros to export your graphics to a single PDF. A provided Python script then processes this to generate the draft VASSAL module.

The generated VASSAL module is not the final thing, but it is a good start.

A.1 Example

Suppose we have defined counters and markers like

```

allied 1 id      axis 1 ad      out of supply
allied 2 ad      axis 2 ad      game turn
allied 3 abid    axis 3 ic

```

via Tikz styles. Also assume that we have macros

```

\board  \oob  \charts  \front

```

which produces tikzpictures to the board, OOBs, charts, and cover, respectively. All this is defined in our package `mygame`. Of course that we have our rules in the file `game.pdf`.

We prepare a simple L^AT_EX source file

```

\documentclass{wgexport}
\usepackage{mygame}
\begin{document}

```

```

\begin{imagelist} %% Records image meta info
\chitimages{%
  {allied 1 id,allied 2 ad,allied 3 abid}/Allied,%
  {axis 1 ad,axis 2 ad,axis 3 ic}/Axis,%
  {out of supply, game turn}/Markers}}
\info{Board}{board}{} \board
\info{OOB}{oob}{} \oob
\info{Charts}{chart}{} \chart
\info{Cover}{front}{} \front
\end{imagelist}
\end{document}

```

When we run \LaTeX on this, we will get a PDF where each page is a separate image and the page is cropped to image. *In addition* we will get a CSV (comma-separated-values) file `export.csv` which contains some meta information about each page. In particular, it identifies the name of each page, the category, and sub category of the image.

For chits, the name of the image is the style name (e.g., `game turn`). For other images, it is the first argument to `\info` above.

The category is for chits is always `counter`. For other images, it is the second argument to the `\info` macro (e.g., `board`).

The category of an image is important later on when we generate the VASSAL module. Recognised categories are

- `counter` for counter images. Such an image will trigger the creation of a VASSAL game piece.
- `board` for board images. Images of this kind will result in VASSAL board (or Map) elements.
- `oob` for Order of Battle tables. This will also result in a VASSAL map being created, but one that is displayed as a pop-up and with a rectangular grid. This is useful for placing units in an Order of Battle chart.
- `chart` for charts. These images will be made VASSAL charts — i.e., pop-up windows which contains some graphics for the players reference.
- `front` for the cover image. This will become the module splash image. Only one such image (the first) will be used.

Other categories may be used, and the corresponding image will be added to the VASSAL module. However, they will no be processed in any specific way.

The *sub-category* is mainly used for counters. Above, we gave the sub-categories `Allied`, `Axis`, and `Markers`. The sub-categories will help to identify the factions of the game, and counter prototypes will be made for each category. The sub-categories of `board`, `charts`, `oob`, and `front` has no or little effect.

One we have processed the file above to generate our PDF (Say `export.pdf`), then we can process it (and the CSV file) with a Python script to make our draft VASSAL module

```

export.py export.pdf export.csv -o Game.vmod -t Game -v 0.1 \
  -d "My game" -r rules.pdf

```

This will generate the draft module `Game.vmod`. Note that we add the rules (`-r rules.pdf`) to the module so that the module is complete.

Once the module has been generated, one can open it in the VASSAL editor and further customise it. For example, the grids used in the boards needs to be adjusted, and one may want to make initial set-ups or add all counters to the OOB.

Of course, running the Python script will overwrite all changes, so perhaps it is a good idea to work on a copy of the output file.

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