

## **Welcome to ASTAAD**

ASTAAD is a design package for the BBC Master 128 and Master Compact. The system was published in BEEBUG magazine between October 1988 and February 1989. The version included in this package is an enhancement of the published program.

There are two parts to the ASTAAD system. The ASTAAD program itself is used to draw images, both via freehand drawing and geometric shapes. The associated STEAMS program is an image manipulator which allows images produced using ASTAAD to be manipulated and distorted in a number of ways.

## **Screen layout**

ASTAAD has only one screen presentation. There is one large drawing area, with a two line status display at the top of the screen. The drawing area is addresses as 1280 by 960 points, although the limits of a mode 0 display mean that the actual display resolution is 640 by 240.

The display for ASTAAD consists of a blue foreground on a yellow background. STEAMS has two colour schemes depending on which screen bank is in use (see later). The display is blue on white for the shadow display, and white on blue for the main display.

## **Controlling ASTAAD**

ASTAAD can be controlled via the keyboard, joystick (digital or analogue) or a mouse. Text is entered by means of the keyboard, and special features are selected using the function keys.

ASTAAD is controlled by the function keys, and our usual conventions are Copy, Tab, Escape. Input of text, data and cursor controls only is through the normal keyboard. Some options make use of multi toggles which are cycled through with key presses at less than half second intervals.

Typing any normal, printable, character causes that character to be reproduced on screen in a 16 X 32 pixel block. Delete deletes 16 X 32 pixel block to left of cursor. Return has no effect except when entering data into the header.

## **Alternative Input Device**

As already said, ASTAAD can also be controlled by means of joystick and mouse. The particular input device in use can be selected by pressing a particular letter in conjunction with the Ctrl key. The possible options are: Ctrl Z Keyboard & Digital Joystick Ctrl X Analogue joystick Ctrl C Mouse (Slow movement) Ctrl V Mouse (Medium movement) Ctrl B Mouse (Fast movement)

The chosen input device is used to move the cross hair cursor, and to perform some of the more common operations. In keyboard mode, the cursor is moved by using the four arrow keys. An option described later allows the speed of movement to be altered, as well as providing an accelerating movement which increases speed as the cursor is moved. With joystick connected, movement is exactly the same as through the keyboard controls. A digital joystick and the keyboard can be used simultaneously. If an analogue joystick is in use, then the absolute position of the cursor on the screen is determined by the joystick position. Text entry in this mode should be avoided, as the cursor cannot be moved one character space to the right after a character is entered. Instead, any character will be displayed at the instantaneous cursor position. In the case of mouse input, the cursor is moved by movement of the mouse. There are three possible speeds of movement, as listed above. It is easiest to use medium or fast to move to a particular area, and then change to slow for finer control while actually drawing.

## **Major Operations**

These are operations which can be performed directly from the current input device. The Basic operations are: Fixing a new reference point Drawing a vector to the current point Homing the cursor to the centre

The keyboard controls for these are: Tab Set the current cursor position as the new reference point. Copy Draw a line from the current reference point to the current cursor position. A second press of Copy will erase the line, provided the cursor has not been moved. Escape Return the cursor to the centre of the screen.

With a joystick, the fire button provides the function of Copy, and the second fire button (Of fitted) the Tab function. The Escape function must still be used via the keyboard.

When using a mouse, the buttons are mapped: Left Copy Centre Escape Right Tab

## Function keys

The majority of the features of ASTAAD are controlled by the red function keys on the main keyboard. The functions of these keys are unchanged regardless of the input device in use. Each function key can be pressed on its own, or in conjunction with Shift or Ctrl, giving thirty possible options. It is advisable to cut-out the keystrips supplied with ASTAAD, and place them above the keyboard during use.

The individual functions of each key are:

**Ctrl-f0 Print** Dumps screen to Epson compatible printer using built in printer dump. This is only intended as a draft dump. For printing 'final copies', the image should be saved, and printed using a dedicated printer dump (e.g BEEBUG's DumpMaster).

**Ctrl-f1 Vector/rect** This toggles between drawing a line from the reference point to the cursor position when COPY is pressed, or drawing a box. The default condition is to draw a line.

**Ctrl-f2 Solid or dotted** Controls how lines will be drawn. This is a multitoggle which cycles through solid lines, and several different dot-dash patterns. The current setting is shown in the status display.

**Ctrl-f3 Margins** Selecting this option releases the margins so that the cursor can be moved outside the visible drawing area. Subsequent selection of this option reverts to limiting the cursor to the drawing area. It is not possible to release margins when using an analogue joystick.

**Ctrl-f4 Mirror/Invert** Causes the screen to be either reversed (left to right), or inverted (top to bottom). The choice is made by entering either R or I in response to the prompt.

**Ctrl-f5 Set ECF** This chooses one of a number of extended fill patterns for flood filling areas (see later). It is best to try each pattern out to see all the possible options.

**Ctrl-f6 Set Scale** This allows the scale of the picture to be set. It has no effect on the operation of the system except to alter the numbers produced in the status display. When drawing a diagram to scale, this option can be used to select the desired co-ordinate base.

**Ctrl-f7 Link STEAMS** Selecting this option chains the STEAMS image manipulator, while retaining the current picture.

**Ctrl-f8 Save** Saves the current screen as a file using the given filename.

**Ctrl-f9 Load** Load a new screen. The screen must be a standard mode 0 screen saved from ASTAAD, or by using \*SAVE.

**Shift-f0 Soft ASTAAD** Toggles between using the standard system character set, or ASTAAD's own character set for the ASTAAD text function (see below).

If you opt to redefine the font, you are prompted for a number of additional parameters. These are: Character Width in screen units. Character Height in screen units. Character Spacing in screen units. This is the distance from the left edge of one character to the left edge of the next. Pen width in screen units. This determines the thickness of the characters. Dot interpolation. This controls the 'fineness' to which characters are rendered on screen. The higher the value, the better the appearance, but the longer the time taken to draw the characters.

**Shift-f1 Copy or Move** Selects whether the area move function will move the area (clearing the gap left), or copy the area.

**Shift-f2 Line or Arrow** Determines whether a line or an arrow is drawn by the line function (f2).

**Shift-f3 Circle/Arc** Switches between drawing a full circle, or an arc of a circle when the circle function (f3) is used.

**Shift-f4 Polygon/Ellipse** Toggles between drawing a polygon and an ellipse when the f4 function is used.

**Shift-f5 Infill/Outline** Toggles between drawing outline shapes (circles, ellipses etc.), or drawing filled shapes. The filling is performed using the selected fill pattern.

**Shift-f6 Colour Reverse** Swaps the background and foreground colours for all future drawing. A second selection of this option reverts to the normal colours.

**Shift-f7 Line fix or trans** Controls the movement of the cursor after a line or arrow is drawn. By default, the cursor is left at the start of the line. However, selecting this option will cause the cursor to be moved to the end of the line after a draw.

**Shift-f8 Cursor Speed** This is a multi toggle that determines the speed of cursor movement when the keyboard or a digital joystick are in use. There are three options: 2,4 which moves one pixel at a time. 16 which moves 8 pixels a time in the X direction, and 4 at a time in the Y direction. Accel which causes the movement to accelerate as the key is held down.

**Shift-f9 Origin Rel/Abs** Toggles between the origin for graphics co-ordinates being relative to the bottom left-hand corner of the screen, or the current cursor position.

**f0 ASTAAD** Invoke the ASTAAD (Any Size Text Any Attitude Display) text function. This allows text to be drawn in any size, at any angle. You are prompted first for the text to be printed. This can be up to forty characters long. You are then prompted as to whether you wish to redefine the font. This will be described below. Finally you are asked for the angle at which to draw the text. A value of zero results in normal horizontal text.

**f1 Area Move** This function copies or moves a rectangular area to the current cursor position. The area to be operated on is determined by the current reference position, and the previous reference position. Confirmation is sought before performing the operation. The choice of copy or move is controlled using Shift-f1.

**f2 Line** Draws a line or an arrow from the current cursor position. The length of the line is determined by the first value prompted for, while the second value entered controls the angle of the line. Arrows are drawn away from the cursor.

**f3 Circle** This function draws a circle or arc, depending on the setting of the previous option. The current cursor position is used as the centre of curvature, and you are prompted for the radius. In the case of an arc, you are also prompted for the starting angle, and the angle that the arc subtends. The arc is draw anticlockwise from the starting angle.

**f4 Polygon** Draws a polygon or an ellipse, using the current cursor position as the centre point. This function requires a number of additional parameters, the meaning of which depends on whether an ellipse or a polygon is being drawn.

For a polygon, the first parameter determines the size of the polygon. This is specified as the diameter of the circumcircle of the polygon.

(The circumcircle is the smallest circle that willfully contain the polygon.) The second parameter is the number of sides. You are then prompted as to whether you wish to specify further parameters. If you opt not to, then the polygon is drawn with a horizontal base line. Base Angle. The angle of the base line of the polygon from the horizontal. Rotation Axis. The axis (X, Y or Z) around which to rotate the polygon before drawing it. Tilt Angle. The angle through which to rotate the polygon about the chosen axis. Careful use of these three parameters allows polygons with any aspect ratio to be drawn.

For an ellipse, you are prompted for the length of the major axis, the length of the minor axis, and the angle of the major axis (taken anticlockwise from the horizontal).

**f5 Repeat** Repeats the last object drawn using the Line, Circle or Polygon function.

**f6 Move** Allows the cursor to be moved without drawing.

**f7 Draw** Draws freehand as the cursor is moved.

**f8 Rubout** Rubs out freehand as the cursor is moved.

**f9 Delete** Area Deletes the rectangle bounded by the current reference position and the current cursor position. Confirmation is sought before the operation is performed.

**Other Controls** There are a number of other controls available from the main keyboard. These are:

**Shift-Ctrl-Copy** Flood fill with ECF. This floods fill an area from the current cursor position outwards, using the ECF pattern selected with Ctrl-f5. If there is a 'leak' in the area being filled, then the pattern will flood out.

**Shift-Escape** This re-initialises ASTAAD to the state it is in when first started. Any drawing in progress will be lost.

**Ctrl-Escape** Quits ASTAAD.

## STEAMS

STEAMS is an image manipulator designed to be used in conjunction with ASTAAD. It allows areas of a picture to be distorted in a variety of ways.

STEAMS supports the same input devices as ASTAAD, with the one in use being determined in the same way. The area of the picture to be operated on by any particular function is marked by defining a box on the screen. The positioning and size of this box is determined by fixing one corner with the TAB key (or equivalent), and the opposite corner with the COPY key (or equivalent). If no box is set up, then any operation will effect all of the screen.

The various operations that STEAMS can perform are invoked via the function keys.

**Ctrl-F0 Print** Dump currently displayed screen to the printer.

**Ctrl-f1** No function.

**Ctrl-f2** No function.

**Ctrl-f3 Margins** Set or release margins (as for ASTAAD 3).

**Ctrl-f4** No function.

**Ctrl-f5** No function.

**Ctrl-f6** No function.

**Ctrl-f7 Link ASTAAD** Transfers the contents of the shadow screen back into ASTAAD.

**Ctrl-f8 Save** Saves the current displayed screen to file.

**Ctrl-f9 Load** Loads a name screen in the place of the currently displayed screen.

**Shift-f0** No function.

**Shift-f1 Copy or Move** Toggles between copying and moving for the area move function.

**Shift-f2 Overwrite/Overlay** Toggles between overwriting and overlaying the target screen when the mix screens function(f2) is used.

**Shift-f3** No function.

**Shift-f4** No function.

**Shift-f5** No function.

**Shift-f6 No function.**

**Shift-f7 No function.**

**Shift-f8 No function.**

**Shift-f9 Origin Rel/ Abs** Selects the basis for the graphics origin, as for ASTAAD.

**f0 Switch** Switches the display between the Main and the Shadow screen. STEAMS allows areas to be copied and mixed between the two screens.

**f1 Area Move** Copies or moves the area within the box to the position of the cursor. The box is moved such that its lower left-hand corner is placed at the cursor position.

**f2 Mix** See under Shift-f2 for full description.

**f3 Shrink** This takes the boxed area of one screen and shrinks it down onto the alternate screen. You are firstly prompted for the axis direction in which to perform the shrink. This can be entered as X or y. Any other entry results in the shrink taking place in both directions. You are then prompted for the shrink fraction. A value of 0.5 for example will halve the size of the image in the specified direction. A value greater than one can be entered to expand the area, but this will result in a loss of resolution. The shrink is performed such that the lower left-hand corner of the box is translated to the same position on the alternate screen.

**f4 No function.**

**f5 No function.**

**f6 No function.**

**f7 No function.**

**f8 Delete Borders** Deletes all the area outside the box.

**f9 Delete Box** Deletes the area within the box.

**Shift-Escape** Clears the currently displayed screen.

**Ctrl-Escape** Quits STEAMS

**Note:** The shrink and mix functions can take a fairly long time to function. The actual time taken is determined by the size of the area, the particular function, and the specified parameters, but it may be as long as eleven minutes.

#### **About the ASTAAD Disc**

To speed up the switching between ASTAAD and STEAMS, a special RAM based filing system is used. To load either program directly you should boot the disc, quit from ASTAAD, and type: LOAD "-DAVID-ASTAAD" or LOAD "-DAVID-STEAMS" as appropriate.

If you wish to alter the program in any way, it will be necessary to create a version that runs directly from disc. To do this, load both programs as described above, remove any occurrences of '-DAVID-' from both, and save to disc as ASTAAD and STEAMS.

#### **Example Drawing**

There are a number of sample drawing included on the ASTAAD disc. These are in the directory 'p' for the 5.25" DFS version, and the directory 'Pictures' on the ADFS version. On the 40 track DFS version several of the screens are on the second side of the disc, and will therefore be inaccessible with a single sided 40 track disc drive.