ROBOGRAPHICS SYSTEM

PLOTTER SOFTWARE

USER GUIDE

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1.0 INTRODUCTION

Drawings generated using the Robographics system can be converted into hard copy, i.e. ink on paper, using either a dot matrix printer or a precision drafting plotter. The two methods are different.

A dot matrix copy is simply a one-shot 'dump' of whatever is on the screen when the PRINT utility is selected from the graphics system menu. Unfortunately, display effects such as jagged lines also appear in the printed image. A plotted drawing is quite different: it is generated, line by line, from the list of instructions compiled by the computer when you created and filed the drawing. Plotted drawings appear line-perfect, showing none of the irregularities caused by limited display resolution.

To drive a drafting plotter from your Apple you need special software to link the system to your plotter. Like the System Master graphics software, the Plotter Software is supplied on a single floppy disk. When you have completed a drawing session you load this software so that the computer acts as a plotter driver instead of a drawing generator.

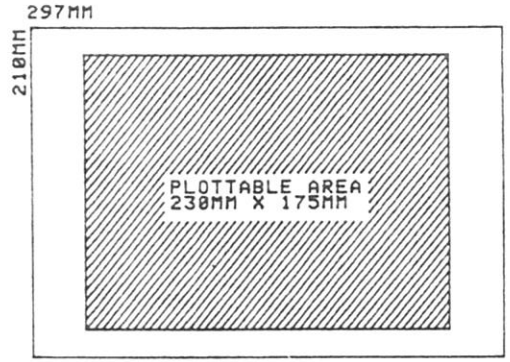
The information in this section applies to all plotters which can be used with the system. For information specific to your plotter and interface card (e.g. baud rate switch settings), refer to Section 4.0 of this User Guide, or consult your local dealer.

2.0 GETTING STARTED

Ensure your plotter and interface are correctly installed, and you are familiar with the plotter controls before continuing.

2.1 SIZE OF PLOTTED OUTPUT

The size of the plotted output is dependant on the plotter itself, as most plotters cannot draw over the entire surface of the paper. For example, the active plottable area of most A4 plotters is approximately 9 x 7 inches (230 x 175 mm). Check the operating instructions for the active area available with your plotter



The software normally limits the active plotting area to slightly less than the physical area defined by the plotter mechanism. This ensures that everything on the Work Page can be reproduced by the plotter.

The aspect ratio, length to height, of the plottable area is always 4:3, regardless of plotter type. This equates to the ratio of the Work Page.

2.2 PLOTTER SOFTWARE DISKS

Two copies of the plotter software are provided. One is intended for immediate use and the other is a back-up. The back-up copy should be stored carefully in a clean, dry enviroment clear of strong magnetic fields and other hazards.

It is not possible to copy the plotter software. If the main copy is accidentally damaged, return it to your dealer for replacement at a nominal charge.

2.3 LOADING THE PLOTTER SOFTWARE

If you are in a drawing session and wish to move on to plotting, you should first FILE the current drawing, then follow the instructions below :-

1 Switch off the computer, then remove the library disk from Drive 1.

2 Insert the Plotter Software disk in Drive 1, then switch on the computer again. Always pause for a few seconds between switching off and on.

3 A System Menu is displayed, listing the available options.

4 If you are installing the system, you will need first to configure the program for your plotter. Enter 2 and press the RETURN key for this option, then follow the instructions below.

For normal usage, to load the plotter program enter 1 and press the RETURN key.

2.4 CONFIGURING THE PLOTTER SYSTEM

Select option 2 from the System Menu to perform the plotter set-up procedure, which allows you to configure the plotter software for your particular model of plotter, or paper size.

1 When selected, a menu is displayed showing the available options. Move XY to control the menu selection bar, which can be moved up and down the menu.

2 Position the bar over the option required and press L. Hold the button down long enough to make the selection.

3 The disk drive will run briefly and the System Menu will be redisplayed.

Note: Once you have configured your Plotter Disk apply a write protect tag to the disk to avoid accidental overwriting. In future, if you want to re-configure the program for another plotter, remember to remove the tag first and to replace it after you have performed the set up.

If you enter this option and decide not to re-configure the program you can exit back to the System Menu by pressing L and R together.

2.5 RUNNING THE PLOTTER PROGRAM

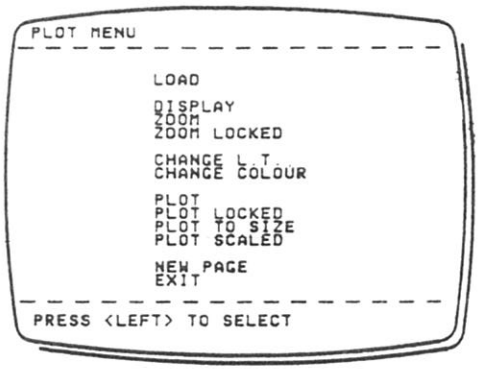
On selecting option 1 from the System Menu the program will be loaded.

1 You are prompted to insert a Library or Archive Disk in Drive 2. Insert the disk which contains the drawings you wish to plot and press the RETURN key.

2 A menu is displayed, the Plot Menu, showing the available options (Fig 1). Move XY to control the menu selection bar, which can be moved up and down the menu.

3 Position the bar over the option required and press L. Hold the button down long enough to make the selection.

4 Refer to the individual function instructions given below.



3.0 FUNCTIONS

3.1 LOAD

This is similar to the LOAD function in the graphics system: it allows you to select a drawing from a Library or Archive disk, and load it into memory.

One of the three library index pages is displayed. If the library unit you wish to plot is on another page, press and release L or R as required.

Move XY to select the unit with the cursor. When the selection is confirmed by pressing and releasing T, the library unit is loaded into the computer memory and the Plot Menu is re-displayed.

3.2 DISPLAY

This function displays the chosen library unit at base scale, i.e. its size as originally drawn. You can terminate the display process anytime by pressing the space bar on the keyboard.

EXIT from DISPLAY to the Plot Menu by pressing and releasing L and R together.

3.3 ZOOM

When ZOOM is selected, the chosen library unit is displayed at base scale, together with a zoom cursor frame. The cursor can be positioned by XY movement and adjusted in size by rotating Z, allowing you to select any detail of the library unit to be plotted at full page size. Press and release T to confirm the desired zoom view. The zoomed view becomes the area that will be plotted.

You can terminate the display process anytime by pressing the space bar on the keyboard.

To replay the library unit at base scale, select DISPLAY.

EXIT from ZOOM to the Plot Menu by pressing and releasing L and R together.

3.4 ZOOM LOCKED

This is similar to the regular ZOOM function, except that it provides a choice of three preset magnifications, x8, x4 and x2. This is useful for assembling on one plot several details at the same magnification.

3.5 CHANGE L.T. (LINE TYPE)

The system provides a choice of four line types for drawing. If you do not do anything to change it, the plotter will reproduce those line types exactly as you drew them. However, the plotter software provides seven types of plotted line, any of which can be assigned to the four kinds of line on the screen. To do this, select CHANGE L.T. from the Plot Menu, and the display changes to the Line Type Menu (Fig 1).

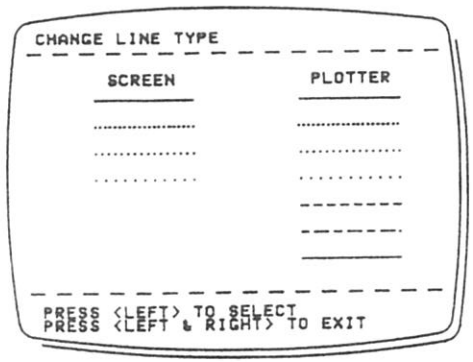


Fig 1 Line Type Menu

The left column initially represents the four types of line as drawn on the screen. The line types available on the plotter are shown on the right.

To change a line-type assignment, move XY and press and release L to select one of the four drawing line types from the left column.

The right column then becomes active, and you can choose any of the plotter line types with the cursor. Press and release L to confirm the chosen type of plotter line as the substitute for the screen line at left.

Repeat the procedure to change other line assignments if you wish.

EXIT from CHANGE L.T. to the Plot Menu by pressing and releasing L and R together.

3.6 CHANGE COLOUR

This function allows the assignment of line colours to plotter pen number. The use of this function depends on the number of pens on the plotter, so the different options are described below.

MULTI PEN PLOTTERS

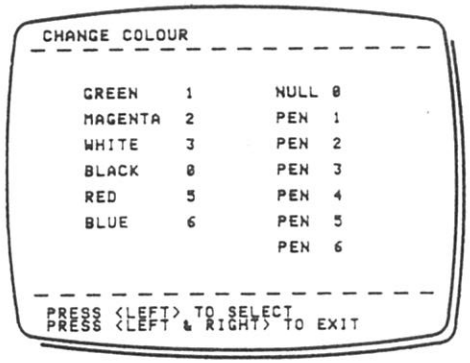
If your plotter has six pens or more the six screen colours used for line drawing will usually be assigned automatically as follows :-

Colour	Pen no.
GREEN	1
MAGENTA	2
WHITE	3
BLACK	0
RED	5
BLUE	6

This assignment of colours to pens is the default state, and that is how your drawing will be plotted unless you do something to change it. Note that BLACK lines are ignored unless you change the colour/pen assignment.

CHANGING COLOUR/PEN ASSIGNMENTS

To change the assignment of line colour to pen number, select CHANGE COLOUR from the Plot Menu. This displays the Colour Select menu which lists the default state for your plotter.



Select a colour from the left column by moving XY, then press and release L to confirm. The right column then becomes active, allowing you to select a pen number with XY. When you press and release L to confirm, the default state is modified by your new pen assignment.

Repeat the procedure to change other screen colours to pen assignments as you wish.

NULL is the 'no plot' option. If you assign '0' to a colour, that colour will be skipped in the plotting sequence, i.e. the plotter simply ignores everything drawn in that colour.

LOADING THE PEN MAGAZINE

It is up to you what pens you actually load into the numbered magazine slots; you do not have to put a green pen in Slot 1.

For instance, you might want white lines on the screen to be plotted in 0.3 mm black, and blue lines to be plotted in black also, but in a heavier weight (e.g. 0.7 mm) for contrast. You can also select an alternative style of pen (fibre tip, roller ball, etc).

The ability to choose which pen goes where, coupled with the facility to reassign line colour to pen number, gives you great flexibility in configuring the plotter. So much so that an organized approach is essential!

A convention often adopted is to put a standard-weight black pen in Slot 3, corresponding to the screen colour WHITE in the default state.

TWO PEN PLOTTERS

In the default state for a two pen plotter, WHITE lines on the screen are plotted by pen 1, and all colours other than BLACK by pen 2 (BLACK is assigned '0', and is ignored).

SINGLE PEN PLOTTERS

In the default state for a single pen plotter, only WHITE lines are plotted. All others are assigned '0', and are ignored, until re-assigned.

MULTI-COLOUR PLOTS WITH SINGLE AND TWO PEN PLOTTERS

A multi-colour (or multi-weight) plot is built up from several passes of the same drawing, changing the pen at each pass. With a single pen unit, the procedure is to plot the default colour, WHITE, then choose a second line colour by changing its assignment from '0' to '1', changing WHITE from '1' to '0' at the same time.

Change the pen and then, without altering the registration of the paper in the plotter, make the second pass. Repeat the procedure as needed for completion.

With a two pen plotter be careful to assign pen 2 to only one screen colour (in the default state pen 2 plots all colours other then BLACK and WHITE).

3.7 PLOT

Remember to load paper and switch on the plotter!

The PLOT function initiates the plotting process. It also allows you to define, before plotting, the size and position of the drawing within the active area of the plotter. The term 'drawing' means either the base scale version of your selected library unit as it came from the library, or the magnified portion you selected with ZOOM. When the option is selected the display changes to the Plot Map, a grid representing the active plotter area available to draw on.

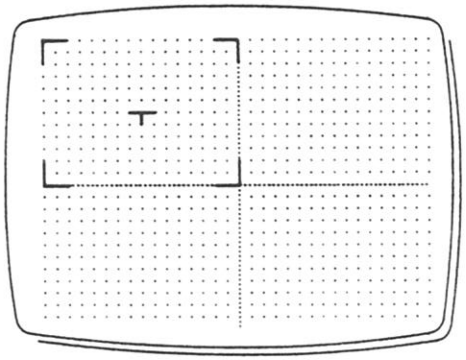


Fig 1 Plot map with plot cursor

A cursor frame representing the entire area of the screen as it appeared in the DISPLAY mode or ZOOM mode is also displayed.

Adjust the cursor position and size by moving XY and applying Z rotation. With the cursor frame at the desired location and size, press and release T to initiate the plot.

When the plot is completed, the cursor frame used, now inactive, is displayed as part of the Plot Map. This helps placement when compiling multi-part plots on the same sheet.

To clear the Plot Map of these previous plot positions select NEW PAGE from the Plot Menu.

TERMINATE the plot anytime by pressing the space bar.

HALT the plot temporarily by pressing R. Press R again to restart.

EXIT the PLOT function, before you initiate the plot, by pressing and releasing L and R together.

3.8 PLOT LOCKED

Remember to load paper and switch on the plotter!

PLOT LOCKED is similar to PLOT except that the plot cursor is limited to four fixed sizes in relation to the plotter active area. These sizes are 1/64, 1/16, 1/4 and 1/1.

3.9 PLOT TO SIZE

Remember to load paper and switch on the plotter!

This function allows you to set a specific numerical relationship between dimensions of the plots, measured in millimetres, and the screen display, as measured in pixels.

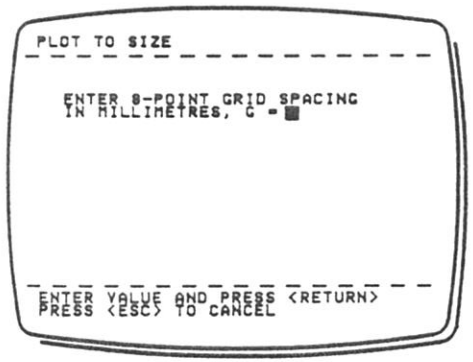


Fig 1 Plot to Size Menu

As prompted by the screen, type in the dimension you wish to equate to an 8 pixel scale on your drawing, as displayed in either the DISPLAY mode or ZOOM mode.

The dimension does not have to be whole number of millimetres, you can make it as precise as your application requires, e.g. 3.245 mm. This gives you complete control over your finished artwork dimensions, allowing you to size book illustrations, for example, without the time and expense of photostatting.

Why 8 pixels? Because that's the X axis spacing of both the system preset grids and the 'locked zoom' grid. The full screen width is 32 times the 8 pixels dimension.

When you have typed in the grid dimension, position the plot cursor as required on the Plot Map, then initiate the plot by pressing and releasing T.

If you have chosen a number that would make the 256 pixel dimension wider than the plottable area, the plot cursor will be locked in the center of the Plot Map, and some of your drawing may be 'clipped', i.e. rejected by the plotter, if it extends beyond the full page boundary. A very small value will also be ignored.

TERMINATE the plot anytime by pressing the space ber.

HALT the plot temporarily by pressing R. Press R again to restart.

EXIT the PLOT TO SIZE function, before you enter the dimension, by pressing the ESCAPE key. You can also exit before you press and release T to initiate the plot, by pressing L and R together.

3.10 PLOT TO SCALE

This function allows the setting of a scale factor for plotting a drawing produced in SCALE mode.

Enter the required scale factor and press the RETURN key, expressed in the form '1:X', where X represents the appropriate scale ratio to plot. If a factor larger or smaller than allowed is entered, it will be ignored.

The Plot Map is displayed, with the cursor set to the calculated plot size defined by the scale factor. Move XY to position the cursor at the required position, and press T to to initiate the plot.

TERMINATE the plot anytime by pressing the space ber.

HALT the plot temporarily by pressing R. Press R to restart.

EXIT the PLOT TO SCALE function, before you enter the factor, by pressing the ESCAPE key. You can also exit before you press and release T to initiate the plot, by pressing L and R together.

3.11 NEW PAGE

This function clears the Plot Map of the markers representing previous plots.

3.12 EXIT

This is the exit plot function, which prompts you to remove the disk from Drive 1, and insert the new disk to be loaded.

4.0 CONNECTING THE PLOTTER

This section provides the essential information for setting up and connecting the plotter to the Apple computer.

However, you should first study the User Manual supplied with the plotter, the information provided here is for guidance purposes only.

There are normally three elements which need to be set up correctly:-

The Serial Interface Card

The Interface Cable

The Plotter

Each of these elements is dealt with below.

4.1 SERIAL INTERFACE CARD

The system supports the following proprietory serial interface cards:-

Apple Super Serial

Simon 'Aristocard' Serial

Certain types of plotter will also operate with the **CCS Asynchronous Serial Card (Model 7710).**

Other serial interface cards which are functionally equivalent to these interface cards can also be used; but other types of interface card are not supported.

To prepare the serial card, set the 'DIP' switches on the card as shown in the appropriate chart at the end of this Guide. If the Apple Super Serial card is being used, also ensure that the 'Jumper Block' is installed with the arrow pointing toward 'Terminal' (refer to the guide supplied with the card for detailed instructions).

When the switches have been set as required, insert the serial card in Slot 2 of the Apple computer.

4.2 INTERFACE CABLE

The interface cable connects the serial interface card to the plotter.

It is essential that the cable has the correct 'pin to pin' connections between the plotter and interface card. These connections are described in the appropriate chart at the end of this Guide.

The appropriate cable end should be connected to the serial card, and the other end to the plotter socket marked 'RS-232' or 'Terminal'. If necessary, refer to the plotter guide to identify the socket.

4.3 PLOTTER

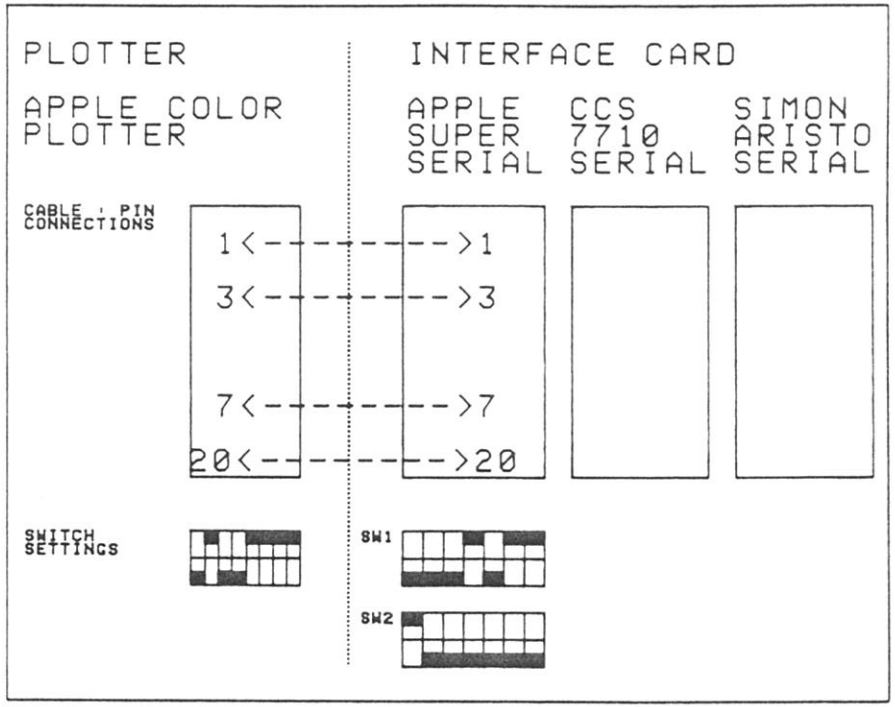
To prepare the plotter, set the 'DIP' switches on the plotter as shown in the appropriate chart at the end of this Guide.

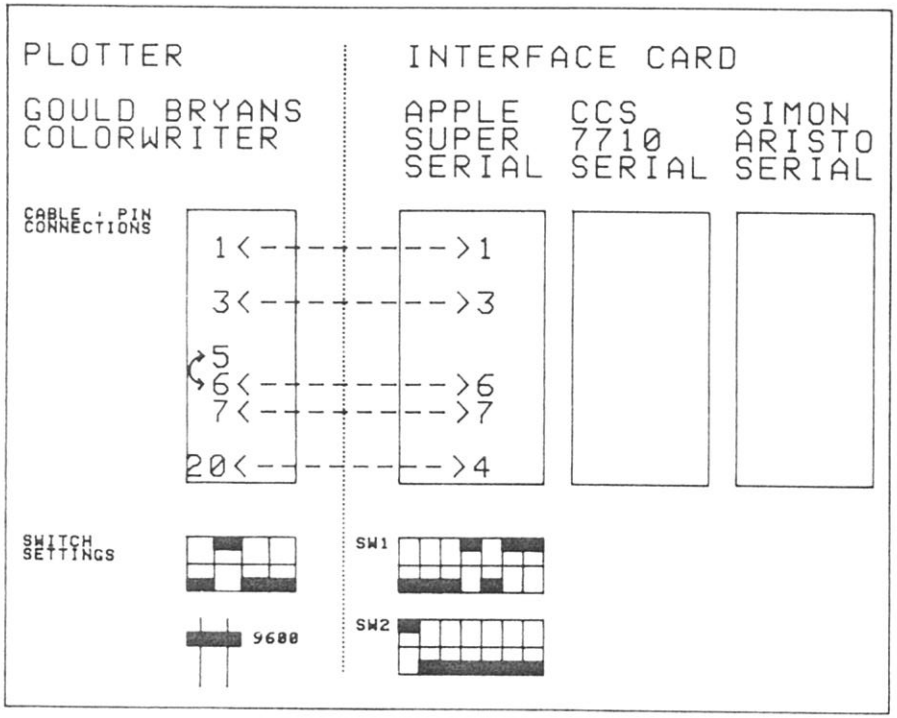
The switches are usually located at the rear of the plotter, but on some models may be inside the casing. Refer to the plotter guide for detailed instructions.

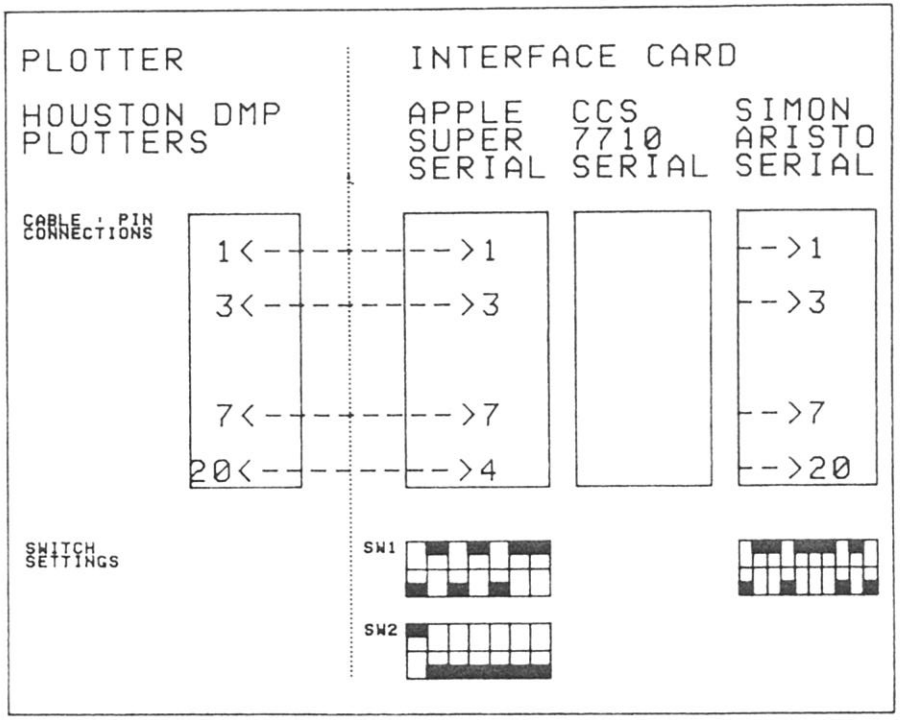
Once the plotter switches have been set, if a multipen plotter is being used, insert the pens into the pen holders in the following order:-

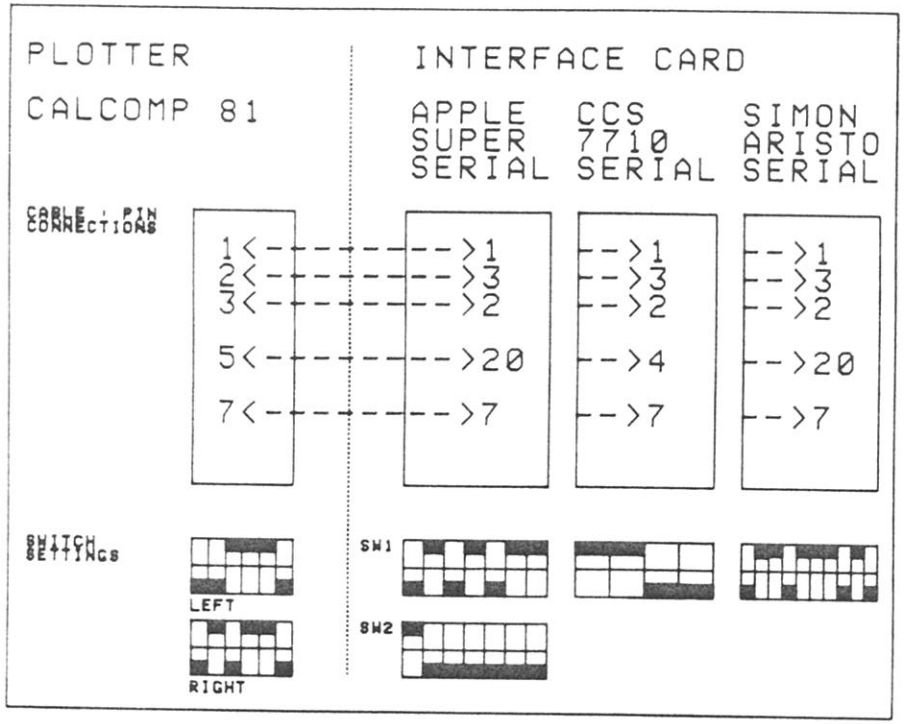
Pen Number	Colour
1	GREEN
2	MAGENTA
3	BLACK
5	RED
6	BLUE

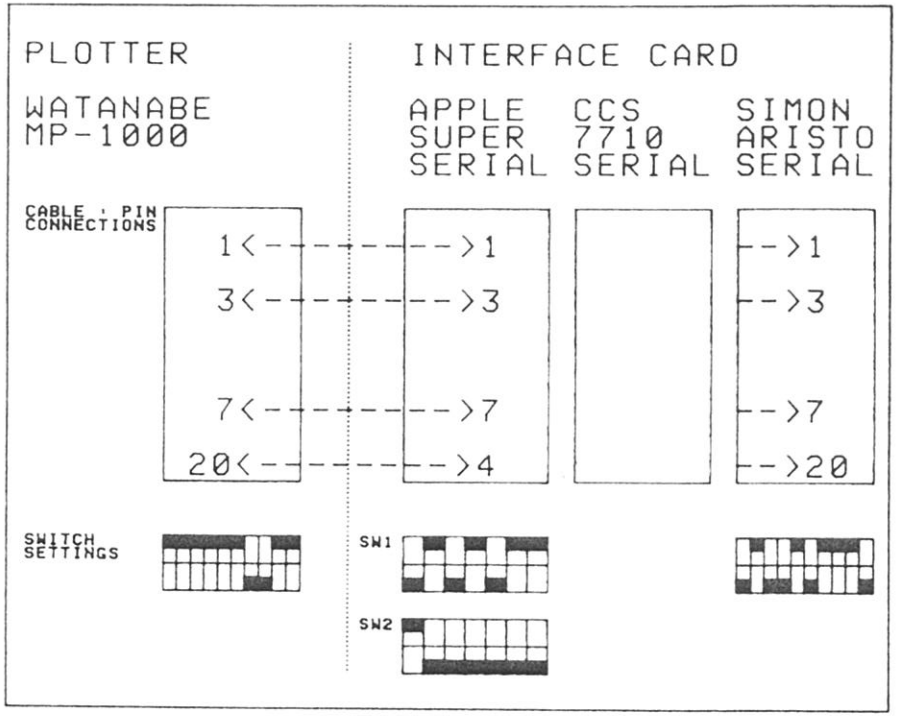
If a single or two pen plotter is being used refer to Section 3.6 for information on using multiple colours.

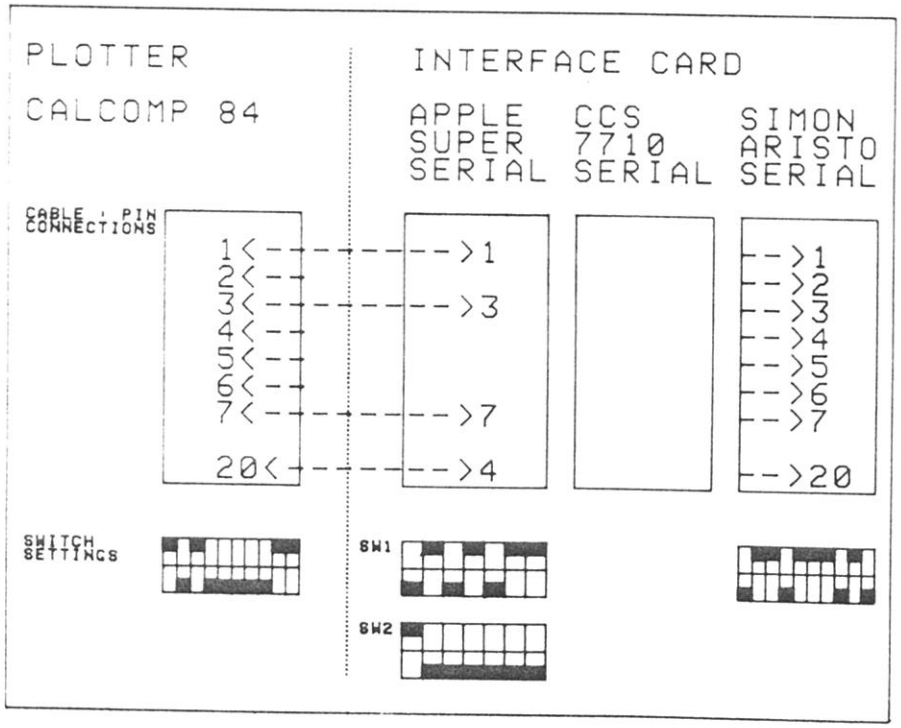


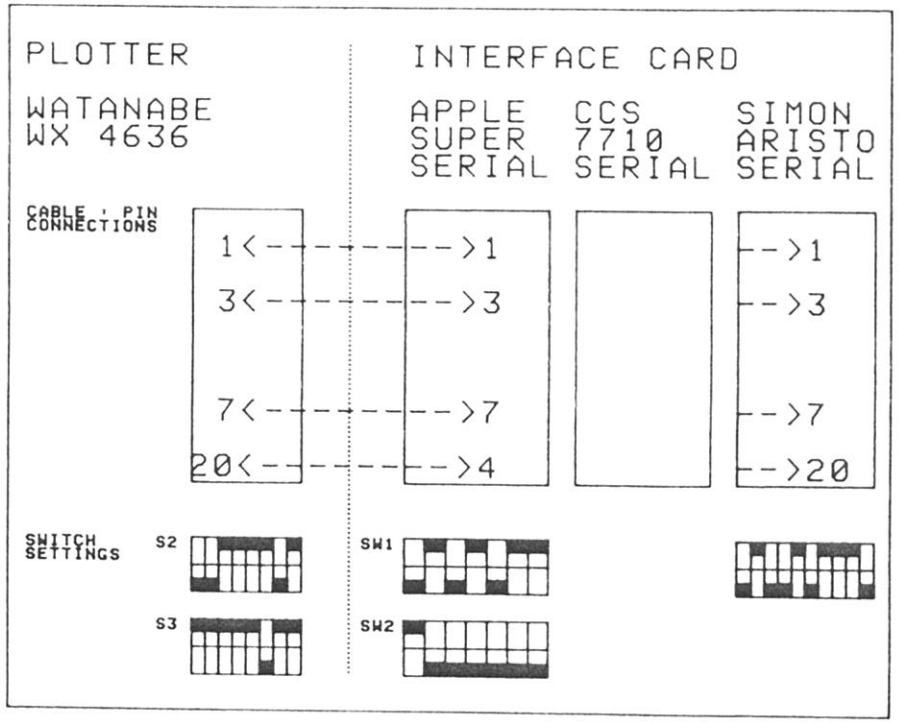

PLOTTER
GOULD BRYANS
COLORWRITER
INTERFACE CARD
APPLE
SUPER
SERIAL
CCS
7710
SERIAL
SIMON
ARISTO
SERIAL
CABLE : PIN
CONNECTIONS
1
3
5
6
7
20
1
3
6
7
4
SWITCH
SETTINGS
9600
SW1
SW2

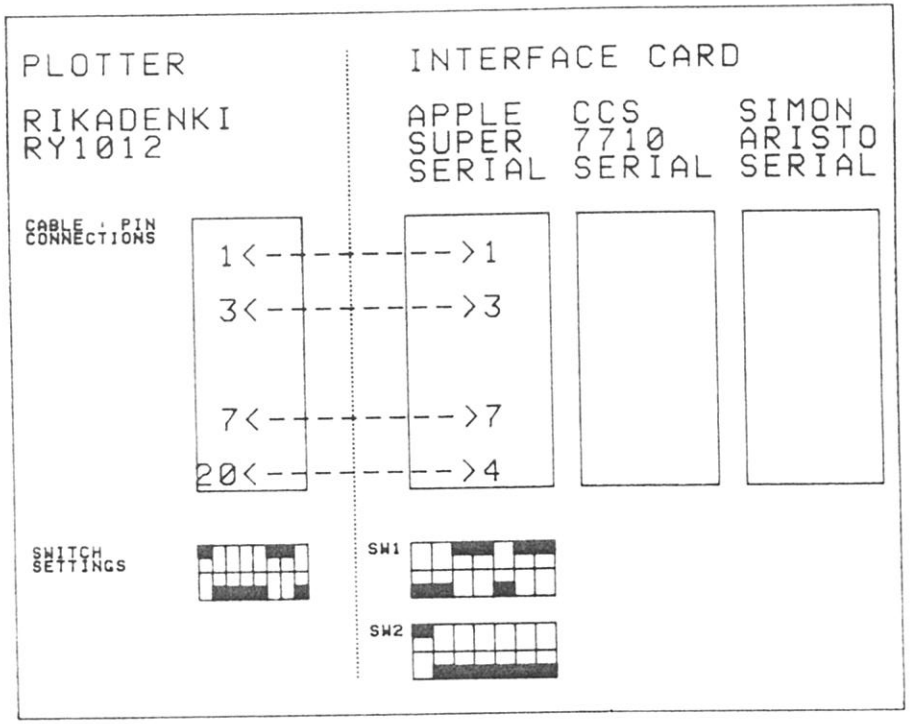

PLOTTER
HOUSTON DMP
PLOTTERS
INTERFACE CARD
APPLE
SUPER
SERIAL
CCS
7710
SERIAL
SIMON
ARISTO
SERIAL
CABLE : PIN
CONNECTIONS
1
3
7
20
1
3
7
4
1
3
7
20
SWITCH
SETTINGS
SW1
SW2

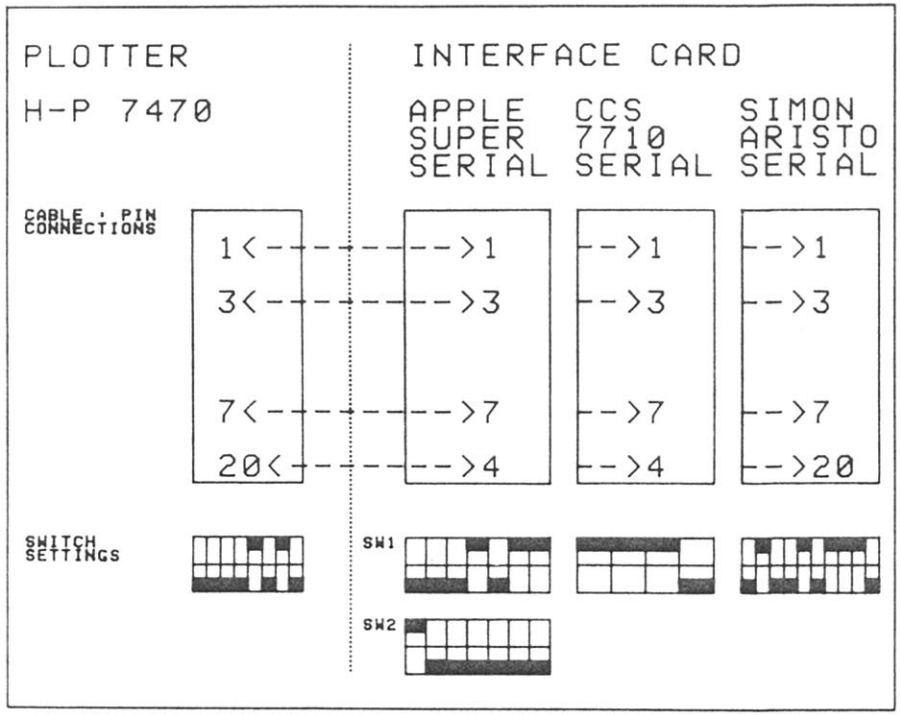

PLOTTER
CALCOMP 81
INTERFACE CARD
APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
1 3 2 5 7
1 3 2 20 7
1 3 2 4 7
1 3 2 20 7
SWITCH SETTINGS
LEFT
RIGHT
SW1
SW2

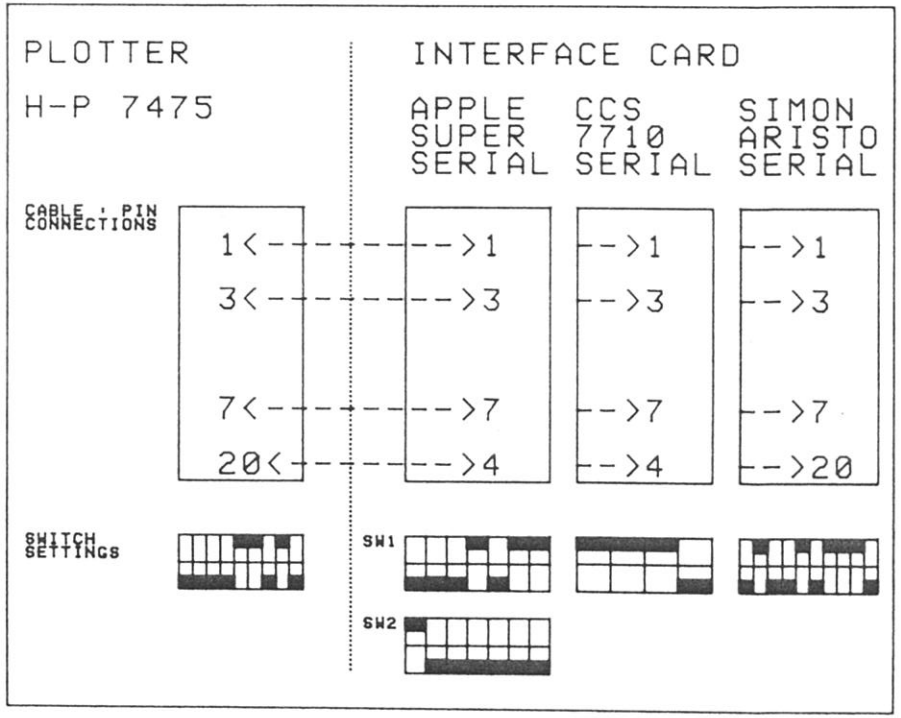

PLOTTER
WATANABE MP-1000
INTERFACE CARD
APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
1 3 7 20
1 3 7 4
1 3 7 20
SWITCH SETTINGS
SW1
SW2

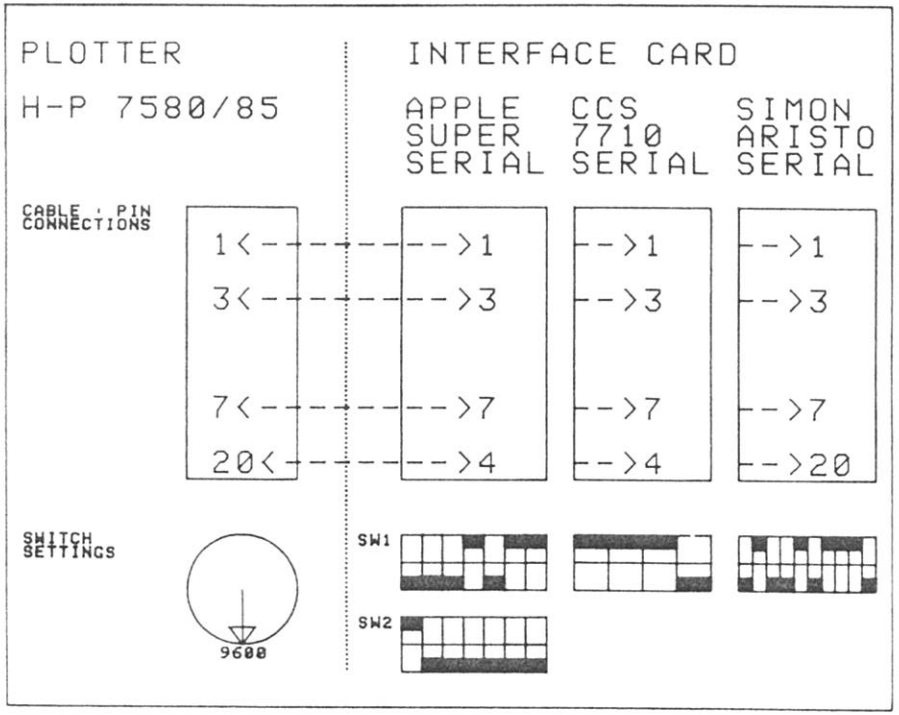

PLOTTER
CALCOMP 84
INTERFACE CARD
APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
1 2 3 4 5 6 7 20
1 3 7 4
1 2 3 4 5 6 7 20
SWITCH SETTINGS
SW1
SW2


PLOTTER
WATANABE WX 4636
INTERFACE CARD
APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
1 3 7 20
1 3 7 4
1 3 7 20
SWITCH SETTINGS
S2
S3
SW1
SW2


PLOTTER
RIKADENKI
RY1012
INTERFACE CARD
APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
1<----->1
3<----->3
7<----->7
20<----->4
SWITCH SETTINGS
SW1
SW2


PLOTTER
H-P 7470
INTERFACE CARD
APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
1<----->1
3<----->3
7<----->7
20<----->4
20<----->20
SWITCH SETTINGS
SW1
SW2


PLOTTER
H-P 7475
INTERFACE CARD
APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
1<----->1
3<----->3
7<----->7
20<----->4
20<----->20
SWITCH SETTINGS
SW1
SW2


PLOTTER
H-P 7580/85
INTERFACE CARD
APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
1<
3<
7<
20<
-->1
-->3
-->7
-->4
-->1
-->3
-->7
-->4
-->1
-->3
-->7
-->20
SWITCH SETTINGS
9600
SW1
SW2