ROBO 1500 PLOTTER SOFTWARE
OPERATIONS GUIDE

ROBOCOM LTD
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1.1 PLOTTING DRAWINGS

Drawings generated using the ROBO 1500 system can be converted into hard copy, ie ink on paper, using either a dot matrix printer or a precision drafting plotter.

A dot matrix copy is simply a 'dump' of whatever is on the screen when the IMAGE PRINT utility is selected on the drawing system. 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 are line-perfect, showing none of the irregularities caused by limited display resolution.

To drive a drafting plotter from your Apple computer, you need special software. Like the System Master drawing software, the Plotter Master software is supplied on a 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.

1.2. USING THIS MANUAL

Chapter 2 describes how to connect the plotter to the computer.

Chapter 3 shows you how to get the system going.

Chapter 4 explains the use of all the system's function.

The Appendix includes the connection charts for all supported plotters.

Plotters vary widely in their range of supported features. This manual is a general guide to the operation of all ROBO 1500 Plotter software. There may be features discussed in this manual which are not applicable to your plotter.

CHAPTER 2 INSTALLATION

To install and connect the plotter, follow the instructions presented in this chapter, referring to the appropriate chart in the Appendix.

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2.1. CONNECTING THE PLOTTER

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

However, you should first study the instuction manual supplied with the plotter as the information provided here is for guidance purposes only.

There are normally three elements which need to set up correctly

* The Serial Interface Card
* The Serial Interface Cable
* The Plotter

Each of these elements is covered in the sections below.

2.2. SERIAL INTERFACE CARD

The system supports the following proprietry Serial interface cards -

* Apple Super Serial
* Simon 'Arisocard' Serial
* CCS Asynchronous Serial (7710) - Certain plotters only, refer to charts in Appendix

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

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

When the switches have been set, insert the serial card in Slot 2 of the Apple computer. This is the recommended slot for the plotter serial interface card; another slot can be used if this recommended configuration conflicts with your own preferred layout.

2.3. 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 shown on the charts in the Appendix.

Connect the cable between the 25-pin connector from the serial card and the plotter socket marked 'RS-232' or 'Terminal'. If necessary, refer to the plotter manual to identify the socket.

2.4. PLOTTER PREPARATION

Set the 'DIP' switches on the plotter as shown on the chart in the Appendix. The switches are usually located at the rear of the plotter, but on some models they may be inside the casing. Refer to the plotter manual for detailed instructions.

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

Pen Number	Colour
1	Green
2	Magenta
3	Black
4	-
5	Red
6	Blue

If a single or two pen plotter is being used, refer to Section 4.1. for instructions for getting multiple colour plots.

Different pen weights can also be used instead of different pen colours - using the drawn colour to refer to a particular weight pen. Section 4.1. also gives instructions for this 're-assignment' of colour to pen.

2.5. PLOTTING AREA

The size of the plotted output depends on the plotter itself, as most plotters cannot draw over the entire surface of the paper.

For example, the maximum active area of a typical 'A4' plotter is 191.25 x 272.5 mm. A4 paper is 210 x 297 mm.

The aspect ratio (length to height) of the plotted drawing is always 4:3 regardless of plotter type; this equates to the ratio of the Work Page.

As a result, the maximum plotting area (ie size of plotted drawing is (Y max) by (X max x 0.75). On the 'A4' plotter, this represents 191.25 x 255 mm.

CHAPTER 3 OPERATION

This chapter shows how to load the software, configure it for your installation and how to use the controls to run the system.

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3.1. PLOTTER MASTER DISK

Two copies of the Plotter Master software disk are supplied. 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 environment free of strong magnetic fields and other hazards.

Attempts should not be made to copy the software disks. If the main copy is accidentally damaged, please return it to your dealer for replacement at a nominal charge.

3.2. LOADING THE SOFTWARE

If you are using the drawing software

1 Switch on the plotter and ensure that the pens are installed and servicable.

2 Select UTILS : RE-BOOT.

3 Ensure that a Library disk is present in Drive 2.

4 Remove the drawing System Master disk from Drive 1, insert the Plotter Master disk and press RETURN.

5 When the software has loaded, the System Menu is displayed.

Otherwise

1 Insert the Plotter Master disk in Drive 1 and a Library disk in Drive 2.

2 Switch on the plotter and ensure that the pens are installed and servicable.

3 Switch on the computer.

4 When the software has loaded, the System Menu is displayed.

3.3. THE SYSTEM MENU

The System Menu provides the system control options.

First time use

If you are installing the system, you must perform options 2, 3 and 4. Full instructions are provided in Sections 3.4. to 3.6.

* Option 2 - Configure System - tells the program what cards are in which slots in the computer.

* Option 3 - Select RGB Display - allows the program to operate with 'non-standard' RGB interfaces.

* Option 4 - Select Plotter - tells the program which plotter is installed.

NOTE : This option is not available on 'single-driver' software.

Normal use

For normal use, select Option 1 - Run Plotter program - to produce drawing plots. See Section 3.8.

3.4. CONFIGURING THE SYSTEM

This option enables you to specify which cards are installed in the computer.

1 Select Option 2 from the System Menu. The 'Configure System' screen is displayed.

2 The screen displays the default (recommended) layout.

If the default slot number for the card is correct, press RETURN and proceed to the next item.

Otherwise, enter the correct slot number for the card and press RETURN.

Note that you cannot assign more than one card to a particular slot.

3 When you have specified all cards, the Plotter Master disk is set up for the configuration entered and the System Menu is redisplayed.

If you use ESC to return to the System Menu before you have specified all the slots, you must re-select this option and complete the full sequence before the system can be used.

3.5. SELECTING THE DISPLAY

Many types of Monitor and RGB Video interface cards can be used with no special handling. However, certain types of display interface do need to be treated differently by the system. For these special cases, the interface type needs to be specified.

1 Select Option 3 from the System Menu. A screen is displayed listing the special display interfaces.

2 Press the option number for your display interface.

3 After selection, the System Menu is re-displayed.

NOTE If you subsequently revert to a 'standard' display interface, use 'SELECT RGB DISPLAY' to tell the system that a standard display is now connected.

3.6. SELECTING THE PLOTTER

* This section applies to 'Multi-Driver' Software only.

This option allows you to specify which model of plotter is connected.

1 Select Option 4 from the System Menu. A screen is displayed listing the supported plotters.

2 Press the option letter for your plotter.

3 After selection, the System Menu is re-displayed.

3.7. USING THE CONTROLS

This software is controlled both via the keyboard (mainly for numeric input) and via the Controller (mainly for positioning and sizing of plots). The general scheme of controls is as follows :

The Keyboard

* SELECTIONS are made by pressing a Number or Letter key.
* NUMERIC INPUT is entered by the Number (and '.') keys, followed by RETURN.
* QUIT by pressing the ESC key.

The Controller

* SELECTIONS are made by positioning the 'Selection bar' over the required option and pressing L (the LEFT button).
* ACTIVATE the function by pressing T (the TOP button).
* POSITION with the Controller X-Y movement.
* VARY size by rotating Z (the control knob).
* QUIT by pressing L & R together (LEFT and RIGHT buttons).

3.8. RUNNING THE PROGRAM

1 Ensure that the plotter is switched on.

2 Select Option 1 from the System Menu to load the plotter program.

3 When loaded, the Main Menu is displayed, listing the program FUNCTIONS. Selections can be made from the Menu by positioning the selection bar over the required option and pressing L.

The use of all system functions is described in the following chapter.

CHAPTER 4 FUNCTIONS

This chapter describes the use of all program functions for producing precision plots.

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4.1. LOAD

* This function is similar to the LOAD LIBRARY function in the drawing system - it enables you to select a drawing from the Library disk index and to load it into memory.

1 Select LOAD from the Main Menu. The current Library index is displayed with an active selection cursor.

2 Position the cursor over the box containing the required drawing.

3 Press T lo load the drawing.

4 When loaded, the Main Menu is re-displayed.

4.2. DISPLAY

* This function displays the loaded drawing at 'base scale' - its size as originally drawn. You can use ZOOM (see below) to select a portion of the drawing for plotting.

1 Select DISPLAY from the Main Menu.

2 The loaded drawing is displayed on the screen.

TERMINATE the display by pressing the keyboard SPACE BAR.

Press L & R together to return to the Main Menu.

4.3. ZOOM

* This function allows you to select a portion of the loaded drawing for plotting.

1 Select ZOOM from the Main Menu. The loaded drawing is displayed together with the Zoom cursor.

2 Adjust the cursor size by rotating Z and position the cursor to frame the area of the drawing to be plotted.

3 Press T to display the selected view.

TERMINATE the display by pressing the keyboard SPACE BAR.

Re-generate the drawing at base scale by selecting DISPLAY.

Press L & R together to return to the Main Menu.

4.4. ZOOM LOCKED

* This function is similar to ZOOM except that the cursor is limited to three preset magnifications - x8, x4 and x2.

All other instructions are as described for ZOOM.

4.5. SET UP PLOTTER

* This function provides several controls over the plotter's operation. ASSIGN COLOURS lets you 're-route' the drawing colours to different pen slots; LINE TYPES enables the drawing Line Types to be changed; PAPER SIZE enables the specification of Paper Size; PEN SPEEDS and PEN PRESSURE enable the setting of these factors. Please note that all of these options may not be supported on your plotter.

1 Select SET UP PLOTTER from the Main Menu. A menu listing the five Set Up options is displayed.

2 Select the required option using the Menu selection bar and confirming with L.

3 To return to the Main Menu, press L & R together.

The five Set Up options are described below.

4.5. SET UP PLOTTER (Cont.)

4.5.1. ASSIGN COLOURS

* This option enables the re-assignment of the colours used in a drawing to different pen slots on the plotter.

1 Depending on the number of pens on your plotter, the six screen colours are assigned as follows :

	Six Pen	Four Pen	Two Pen	One Pen
Pen 1	Green	Green	Green	White
Pen 2	Magenta	Magenta	White	
Pen 3	White	White		
Pen 4	-	-		
Pen 5	Red			
Pen 6	Blue			

Note that BLACK lines are ignored.

2 White lines obviously need to be plotted with a BLACK pen. However, it is up to you which pens you actually insert in the plotter's pen carrier - you do not have to put a Green pen in Slot 1.

For instance, you may want White lines to be plotted in 0.3 mm Black, and Blue lines to be plotted in 0.7 mm Black. You can also select an alternative style of pen (fibre tip, roller ball, etc).

3 To perform a Colour/Pen re-assignment, select ASSIGN COLOUR from the 'Set Up' Menu. On selection, the screen displays the default settings for your plotter as shown in the table above.

4 Select the Colour from the left column and confirm with L. The right column then becomes active, allowing you to select a Pen number in the same way.

5 Repeat (4) for other Colours if required.

Note that you can 'Null' a particular Colour - if selected, the plotter will ignore everything drawn in that colour.

6 Press L & R to exit back to the Main Menu.

<u>Multi-Colour Plots with Single and Two Pen Plotters</u>

A multi-colour (or multi-weight) plot can be built up from several passes of the same drawing, changing the pen(s) and Colour/Pen assignments at each pass.

4.5. SET UP PLOTTER (Cont.)

4.5.2. LINE TYPES

* The plotting software provides seven types of plotted line, any of which can be assigned to each of the four Line Types provided on the drafting system.

1 Select LINE TYPES from the 'Set Up' Menu. On selection, the screen displays the 'Screen' and 'Plotter' Line Types.

2 The left column initially represents the four Line Types as drawn on the screen, and the right column shows the Line Types available on the plotter.

3 To change a Line Type, select from the left column, confirming by pressing L.

The right column then becomes active. Again, select the required Line Type and confirm with L. This Line Type will appear on the plotted drawing in place of the drawn Line Type.

4 Repeat (3) for other Line Types if required.

5 Press L & R to exit back to the Main Menu.

4.5.3. PAPER SIZE

* This option enables the re-specification of the Paper Size. The default setting is always the largest Paper Size supported by the plotter.

1 Select PAPER SIZE from the 'Set Up' Menu. On selection, a screen is displayed listing the available Paper Sizes.

2 Enter the option number for the required Paper Size, and press RETURN.

4.5. SET UP PLOTTER (Cont.)

4.5.4. PEN SPEEDS

* This option allows you to set the plotter's pen speeds. This enables you to optimise on performance depending on the nature of the drawing being plotted, or when using different paper types.

1 Select PEN SPEEDS from the 'Set Up' Menu. On selection, a screen is displayed enabling specification of pen speeds.

On some plotters, you can set the pen speed individually for each pen; other plotters only support a 'global' speed setting.

2 Enter the pen speed value in the range of 1 to 10 (slowest to fastest), followed by RETURN.

3 For individually settable plotters, repeat (2) for each of the pens (a default value is presented for convenience).

4.5.5. PEN PRESSURE

* This option enables you to set the plotter's pen pressure. It is only supported on certain plotters.

1 Select PEN PRESSURE from the Main Menu. On selection, a screen is presented enabling specification of pen pressure.

2 Operation is as described above for PEN SPEED.

4.6. PLOT

* This function initiates the plotting process. It allows you to define, before plotting, the size and position of the plot within the active area of the plotter. The term 'plot' means either the 'base scale' version of the drawing as it came from the library, or the magnified portion selected with ZOOM.

1 Ensure that the plotter is 'on-line' and is loaded with paper.

2 Select PLOT from the Main Menu. The Plot Map - a grid representing the available Plotting area - is displayed.

3 A cursor frame is displayed, representing the entire area of the screen as it appeared in DISPLAY or following ZOOM.

4 Adjust the size of the cursor frame by rotating Z.

5 Position the cursor frame at the required location on the Plot Map.

6 When positioned, press T to initiate the plot.

HALT plotting temporarily by pressing R. Press R again to restart.

TERMINATE plotting during the plot by pressing the keyboard SPACE BAR.

7 When the plot is completed, the cursor frame used remains on the Plot Map as an aid to placement when compiling multi-plot drawings on the same sheet. To clear the Plot Map of these previous plot positions, select NEW PAGE from the Main Menu.

8 On completion, the Main Menu is re-displayed.

To QUIT the PLOT function before you initiate the plot, press L & R together.

4.7. PLOT LOCKED

* This function is similar to PLOT except that the cursor is limited to four fixed sizes in relation to the Plotting area. These sizes are 1/64, 1/16, 1/4, and Full size.

All other instructions are as described for PLOT.

4.8. PLOT TO SIZE

* This function enables you to produce a plot in which you set an overall size of the plot by specifying the actual size for the default 8-point grid spacing.

1 Ensure that the plotter is 'on-line' and loaded with paper.

2 Select PLOT TO SIZE from the Main Menu. A screen is displayed enabling the size specification.

3 As prompted on the screen, enter the value you wish to equate to an 8-pixel scale (ie default grid spacing) on the drawing, as displayed in either DISPLAY or ZOOM.

Having entered the value, enter the units (MM or IN). The dimension does not have to be in whole numbers - you can make it as precise as the application requires, eg 1.2345 mm.

Remember that there are 32 8-pixel divisions across the screen on the default grid.

4 When you have entered the size, the Plot Map is displayed with the cursor set to the specified size.

If you have chosen a value that would make the overall size of the plot greater than the Plotting area, the cursor is locked in the centre of the Plot Map. Some of the drawing will be 'clipped', ie rejected by the plotter if it extends beyond the active area.

5 When you have positioned the cursor (if not locked), press T to initiate the plot.

HALT plotting temporarily by pressing R. Press R again to restart.

TERMINATE plotting during the plot by pressing the keyboard SPACE BAR.

6 When the plot is completed, the Main Menu is re-displayed.

To QUIT the PLOT TO SIZE function before you initiate the plot, press L & R together.

4.9. PLOT TO SCALE

* This function enables drawings produced in SCALE mode to be plotted by setting a Scale Factor for the plot.

1 Ensure that the plotter is 'on-line' and loaded with paper.

2 Select PLOT TO SCALE from the Main Menu. A screen is displayed enabling scale specification.

3 As prompted on the screen, enter the required Scale factor for the drawing.

4 When you have entered the scale factor, the Plot Map is displayed with the cursor set to the relative size of the scaled drawing.

If you have chosen a scale that would make the overall size of the plot greater than the Plotting area, the cursor is locked in the centre of the Plot Map. Some of the drawing will be 'clipped' if it extends beyond the active area.

A very small scale will be ignored, enabling you to re-enter a larger value.

5 When you have positioned the cursor (if not locked), press T to initiate the plot.

HALT plotting temporarily by pressing R. Press R again to restart.

TERMINATE plotting during the plot by pressing the keyboard SPACE BAR.

6 When the plot is completed, the Main Menu is re-displayed.

To QUIT the PLOT TO SCALE function before you initiate the plot, press L & R together.

4.10. CLEAR PAGE

* Clears the Plot Map of the markers representing previous drawing plots.

1 Select CLEAR PAGE from the Main Menu.

2 The Plot Map is cleared and the Main Menu re-displayed to enable another selection.

4.11. RE-BOOT

* Enables you to exit the plotter program by 'booting' a program disk (for example, the drawing System Master disk.

1 Select RE-BOOT from the Main Menu.

2 Follow the prompt to remove the current program disk from Drive 1 and insert the required program disk.

3 When ready, press RETURN.

APPENDIX INSTALLATION CHARTS

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A.1. APPLE Color Plotter

A.2. HOUSTON INSTRUMENTS DMP series

A.3. GOULD BRYANS Colorwriter

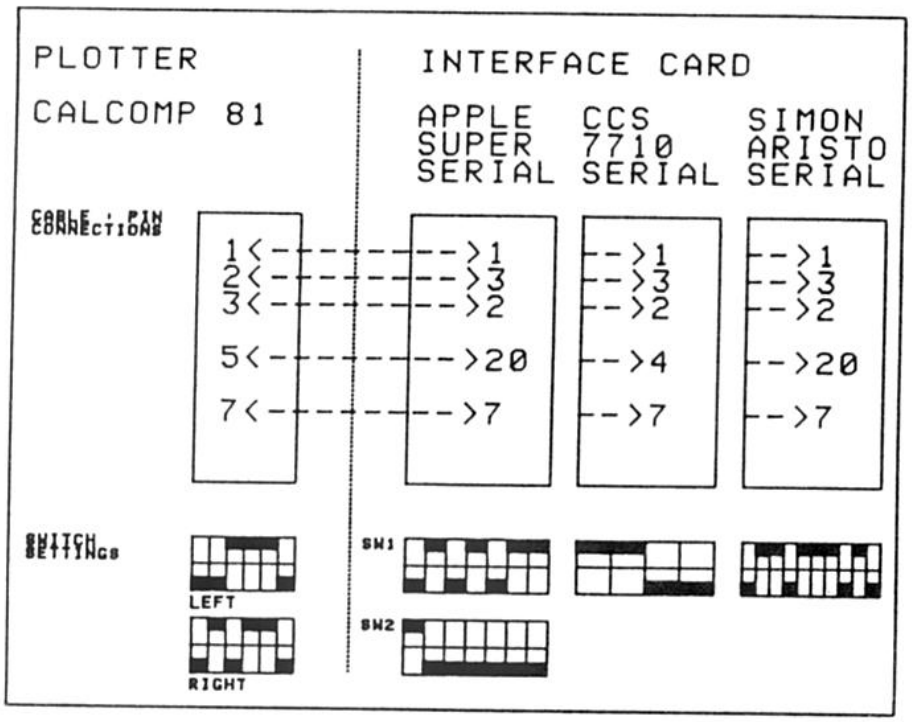
A.4. CALCOMP 81 / 84

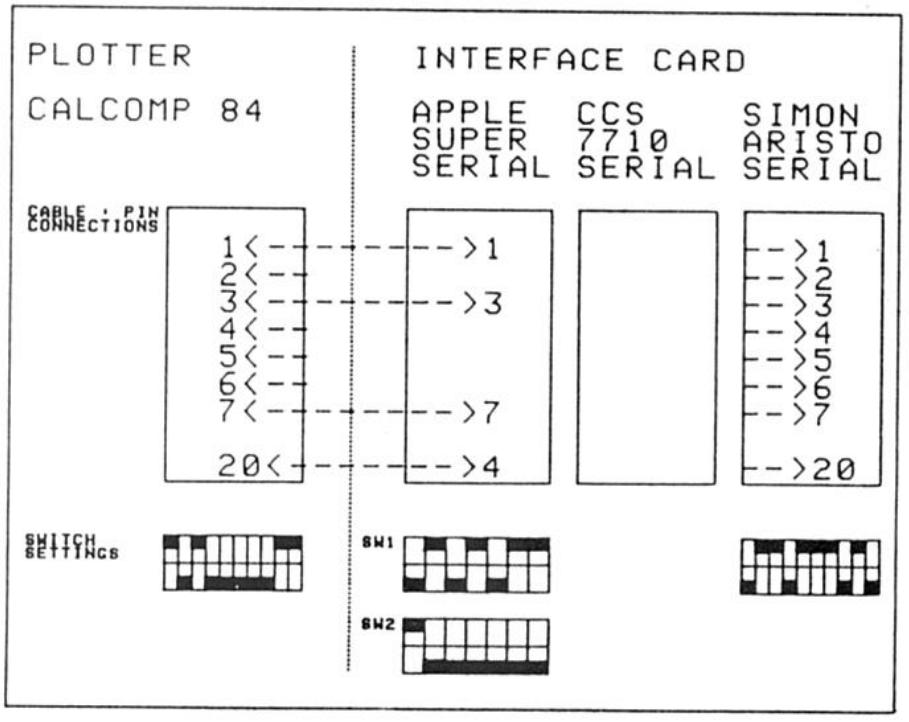
A.5. WATANABE MP-1000 / WX463x series

A.6. RIKADENKI RY1012

A.7. HEWLETT-PACKARD HP7470 / HP7475

A.8. HEWLETT-PACKARD HP7580 / HP7585


PLOTTER
CALCOMP 81
INTERFACE CARD
APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
1 2 3 5 7
1 3 2 20 7
1 3 2 4 7
1 3 2 20 7
SWITCH SETTINGS
LEFT
RIGHT
SW1
SW2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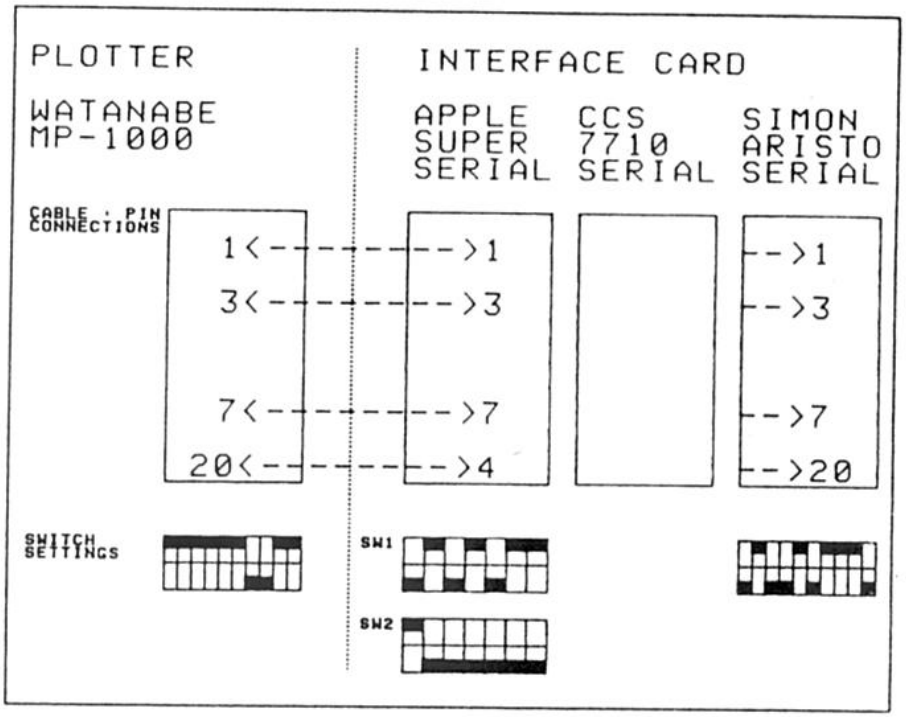
CALCOMP 84
INTERFACE CARD
APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
1 2 3 4 5 6 7 20
1 3 7 4
1 2 3 4 5 6 7 20
SWITCH SETTINGS
SW1
SW2


PLOTTER
WATANABE
MP-1000
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CCS 7710 SERIAL
SIMON ARISTO SERIAL
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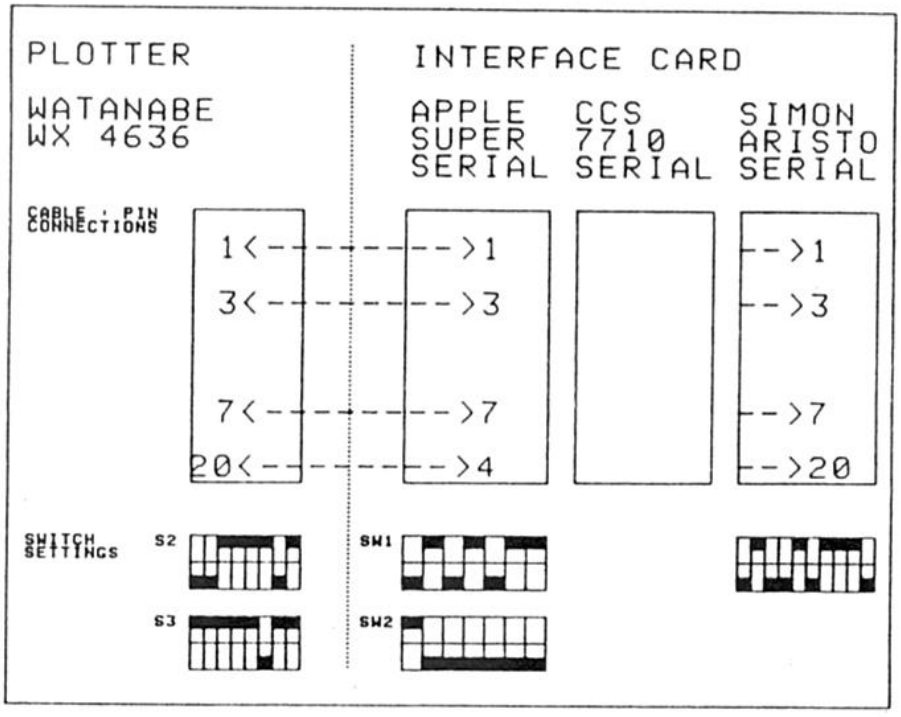
-->3
-->7
-->20
SWITCH SETTINGS
SW1
SW2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WATANABE
WX 4636
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APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
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-->3
-->7
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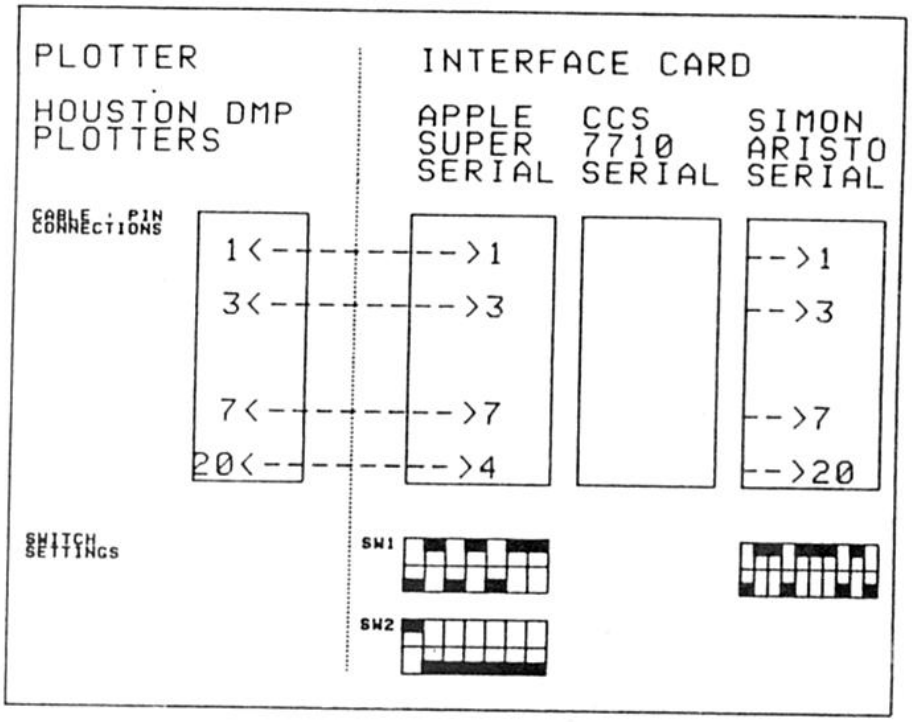
SWITCH SETTINGS
S2
S3
SW1
SW2


PLOTTER
HOUSTON DMP
PLOTTERS
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SUPER
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SERIAL
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ARISTO
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CONNECTIONS
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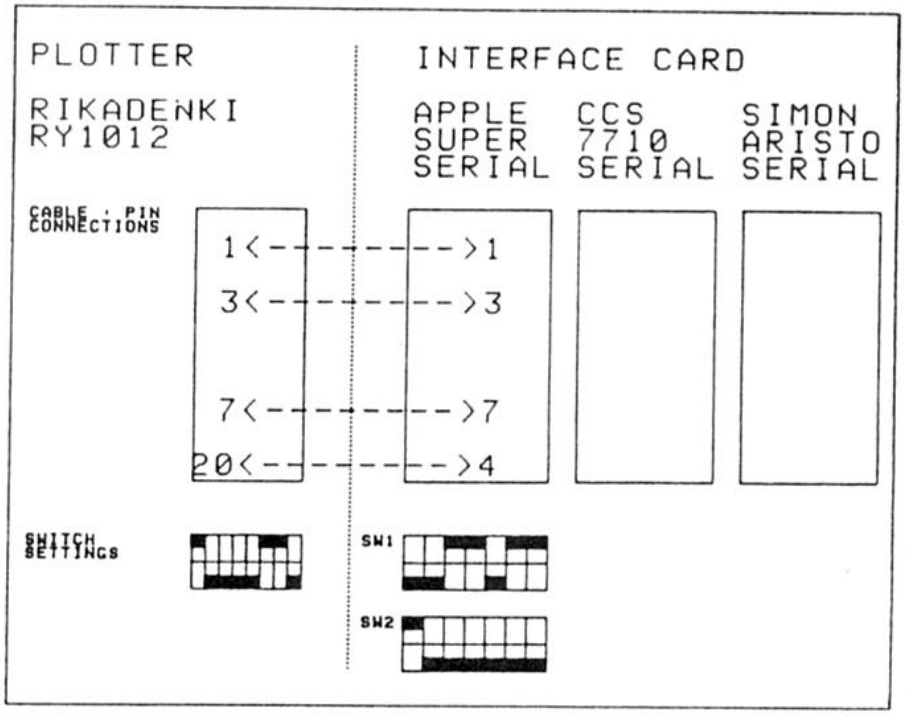
SETTINGS
SW1
SW2


PLOTTER
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RY1012
INTERFACE CARD
APPLE
SUPER
SERIAL
CCS
7710
SERIAL
SIMON
ARISTO
SERIAL
CABLE : PIN
CONNECTIONS
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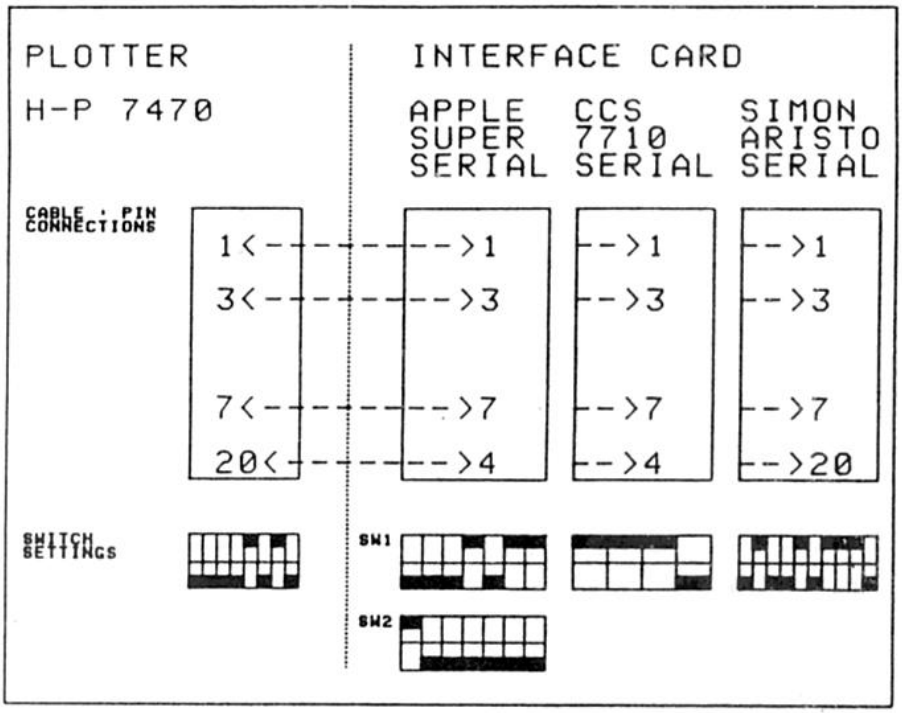
>7
>4
SWITCH
SETTINGS
SW1
SW2


PLOTTER
H-P 7470
INTERFACE CARD
APPLE SUPER SERIAL
CCS 7710 SERIAL
SIMON ARISTO SERIAL
CABLE : PIN CONNECTIONS
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3
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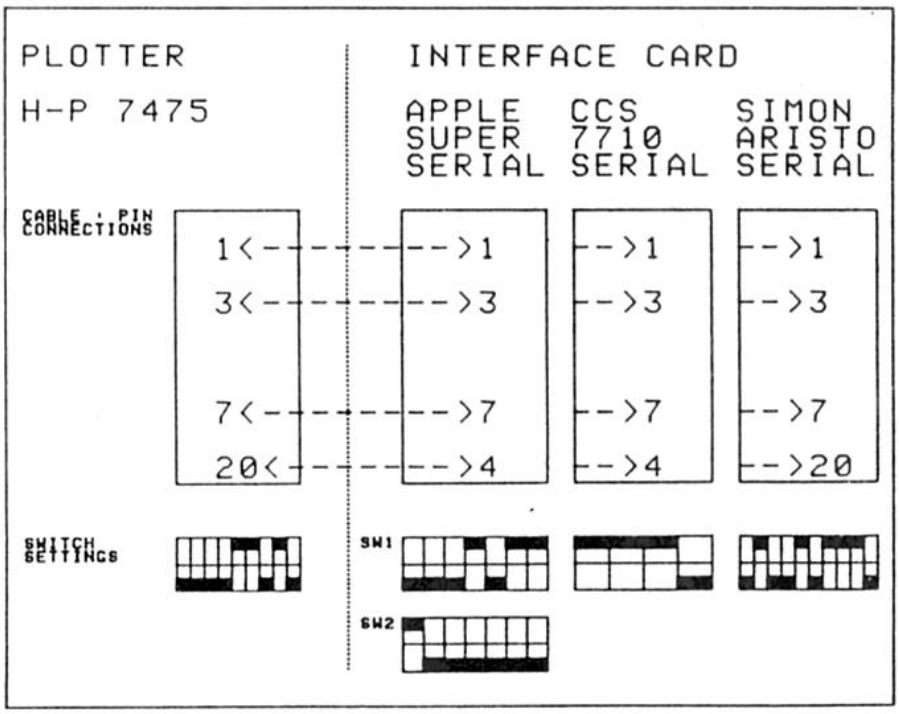
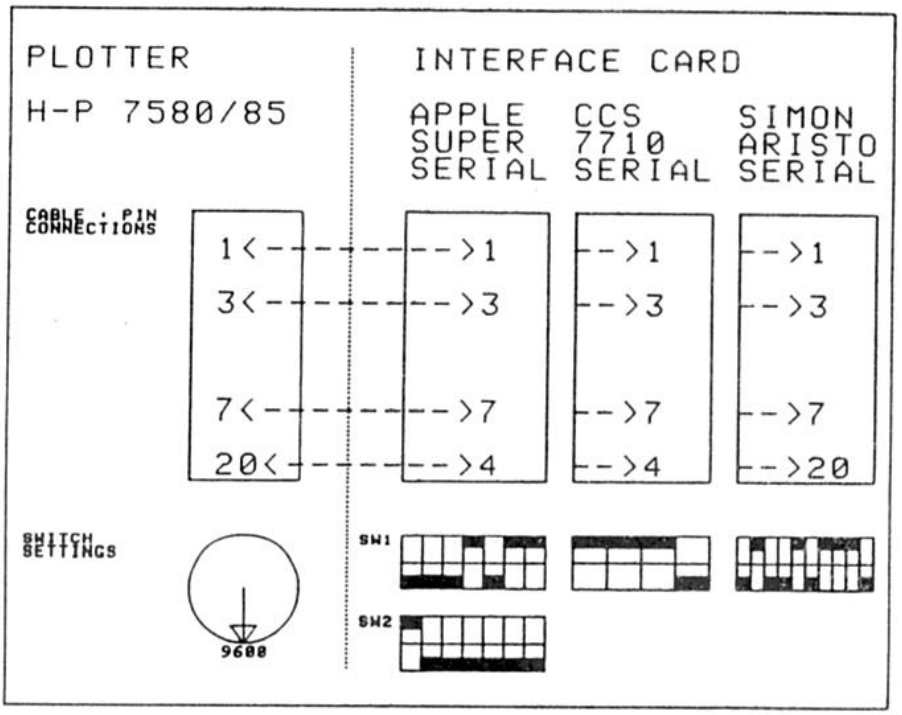
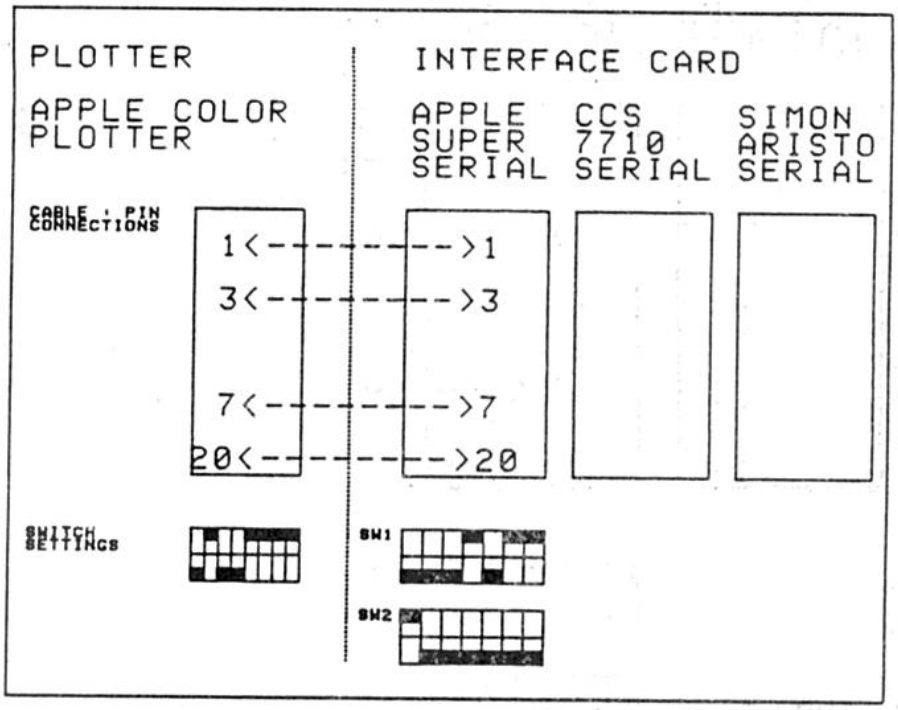
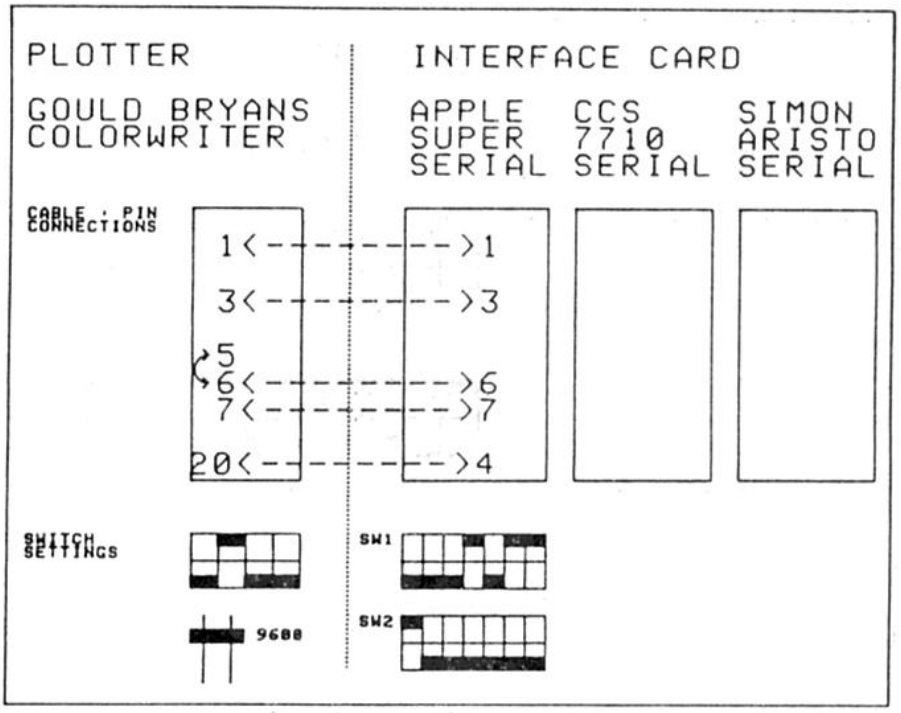
SWITCH SETTINGS
SW1
SW2


PLOTTER
H-P 7475
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
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


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


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

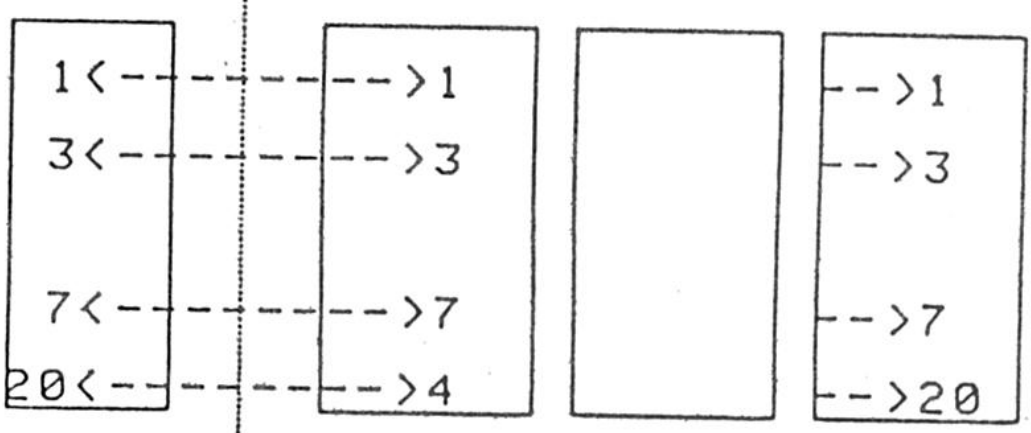
PLOTTER

HITACHI 672

INTERFACE CARD

APPLE SUPER SERIAL | CCS 7710 SERIAL | SIMON ARISTO SERIAL

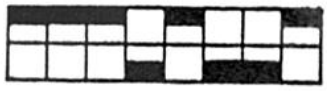
CABLE : PIN CONNECTIONS



SWITCH SETTINGS

ON

OFF



SW1

SW2

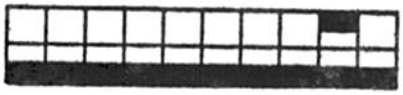
NO OTHER LINES MUST BE CONNECTED

ROLAND DXY 880

CENTRONICS ONLY SUPPPORTED

SWITCHES

SW1 ON OFF



SW2 ON OFF