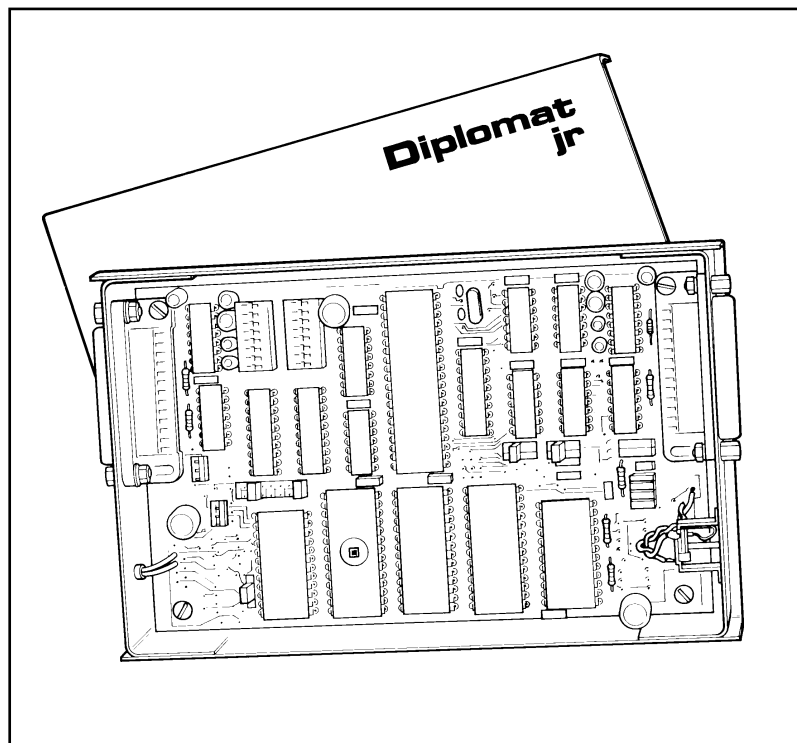


Lucidata Diplomat jr User Guide Model ASPI



Lucidata House
Selwyn Close
Great Shelford
CAMBRIDGE CB2 5HA

tel: +44 (0)1223 846100
fax: +44 (0)1223 846200
email: docs@lucidata.com

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Lucidata House
Selwyn Close
Great Shelford
CAMBRIDGE CB2 5HA
England

tel: +44(0)1223 846100
fax: +44(0)1223 846200

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Warranty

Lucidata Limited warrants that this product is free from defects in manufacture and that it meets the specifications outlined in this User Guide for a period of one year following purchase provided that the product has only been used in the manner and for the purpose described in this User Guide. This Warranty does not affect your statutory rights.

PRODUCT DETAILS

Product name *Diplomat™ jr*

Model ASPI-A1

Serial Number

Configuration Code

Firmware Reference 1.22

Issue Date 3/12/92

Special features/notes

About this Guide

About this Guide This User Guide is intended to assist in the safe and efficient operation of the Lucidata *Diplomat jr* ASPI protocol converter.

The Guide is split into a number of logical sections, so you can find the information you need quickly - in conjunction with the *Contents* page.

Introduction (this section) describes the scope and purpose of this Guide. A brief description of the unit is given, together with technical data, product support details and servicing information.

Installation describes how the unit is checked, connected into a computer system, and connected to the mains supply.

Getting Started describes how to use the Diplomat jr in normal operation, assuming that no re-configuration is required.

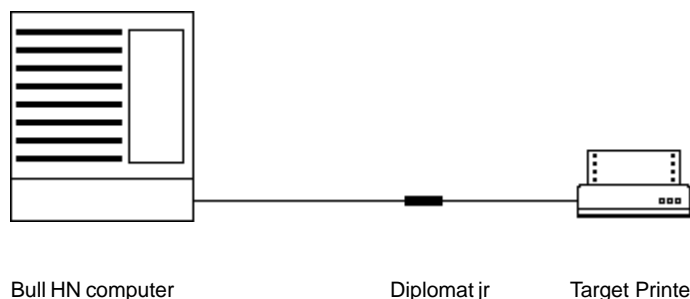
Configuration describes how the Diplomat jr can be re-configured for different operating environments.

Technical Description describes the functioning of the unit.

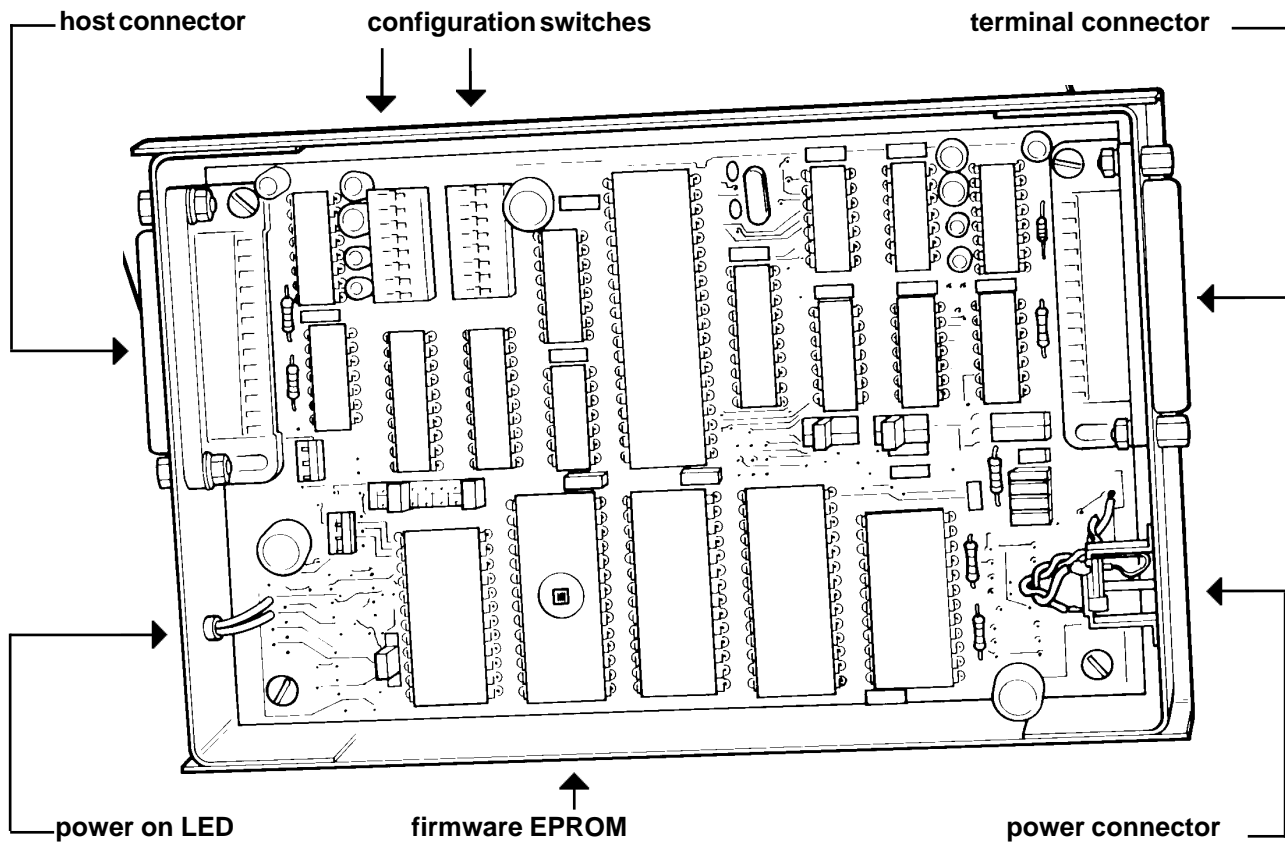
About the Diplomat jr

Lucidata Diplomat protocol converters enable interconnection of computer equipment from different manufacturers.

The ASPI model is designed to connect a single target asynchronous peripheral to a Bull mainframe computer supporting the Bull ASPI printer protocol. The target device is normally a printer but could also be a PC with a printer connected.



To the mainframe, the *Diplomat jr* ASPI appears as an ASPI 10/30 matrix or ASPI 80/85 laser printer. Switches within the Diplomat jr enable it to support a range of popular target printers. The settings are described in the *Configuration Section*.



Diplomat jr ASPI with top cover removed

The *Diplomat jr* is housed in a black aluminium case and is powered from a plug-in mains adaptor which is supplied with the unit. On either end of the unit are 25 pin female D-type connectors for the host (synchronous) and terminal (asynchronous) ports respectively. Both these connectors are fitted with a dust covers supplied with the unit. Next to the terminal connector is a DC power socket which accepts the jack-terminated lead from the plug in mains adaptor.

The unit contains advanced digital electronic circuitry which performs the required protocol emulation under the control of the software, known as **firmware**, contained in a single integrated circuit (EPROM). It is possible to change the configuration of the unit by altering the position of the switches and links within the unit.

Each *Diplomat jr* is supplied to meet the particular requirements stated by the purchaser at the time of ordering. The details of this specific unit are given on page 4, together with a description of any special features.

Technical Data

Weight & Dimensions

Height x width x depth	25mm x 175mm x 110mm
Weight	390g

Electrical Requirements

Power to Diplomat jr	+5V, 500 mA regulated
Power to adaptor	220-240V a.c. 50-60 Hz
Mains adaptor	BS 5850 approved

Operating environment

Temperature	0-50°C
Humidity	0-90% non-condensing

External connectors

Power	3.2mm jack socket
Host (synchronous)	25-way D-type female connector (DTE) RS232
Terminal (asynchronous)	25-way D-type female connector (DCE) RS232

External Indicators

Power on	LED indicating +5V present
----------	----------------------------

Configuration

At power up	Internal switches and links set by the user
-------------	---

Data rates

Host	1200-153600 bps in eight steps or external
Terminal	150 - 19200 bps in eight steps or external

NOTE: *Data rates greater than 19200 bps are NOT guaranteed for use with the standard RS232 interface.*

Service and Support

All *Diplomat* units are guaranteed as stated in the Warranty on page 4.

If a unit fails, and you have bought it from a Lucidata appointed dealer, you should return it to that dealer. If bought from the manufacturer, return the unit in its original packing to:

Service Department

Lucidata House
Selwyn Close
Great Shelford
CAMBRIDGE CB2 5HA
England

tel:(01223) 846100
int:+44 1223 846100
fax:(01223) 846200

You should telephone, fax or telex Lucidata prior to returning the unit to ascertain whether an apparent fault is due to mis-operation rather than to a technical fault within the unit.

Lucidata reserves the right to charge for any investigation of an apparent fault that is found to be due to incorrect operation, or for the repair of a fault that is due to the unit not being used in accordance with the instructions in this User Guide.

Maintenance

Faults that occur outside the warranty period will be repaired on a time-and-materials basis. Please send your unit to Lucidata. You will be given an estimate of the repair costs.

Support

Telephone support will be provided to all registered users of *Diplomat* units, during normal working hours. Support provided in person will be chargeable at a time-and-materials rate. Please contact Lucidata for details.

Registration also allows Lucidata to keep users informed of new products and enhancements to existing products, and details of the Lucidata post-Warranty maintenance contract scheme.

Product Upgrades

From time to time Lucidata may offer upgrades of firmware to existing registered users of *Diplomat* units.

Full instructions for implementing any such upgrade will accompany the upgrade pack.

Checking the product

Before attempting to install your *Diplomat jr*, you should check the contents of the package. You should have:

Diplomat jr IB80-A1 unit
plug-in power supply
User Guide
Registration Card
screwdriver
plastic bag containing two jumpers (inside *Diplomat jr*)

If any of these are missing, contact Lucidata or your Lucidata appointed dealer.

Checking the configuration

On receiving your unit, you may like to check and record the default settings.

Remove the four cross-head screws securing the cover to the base of the unit, using the supplied screwdriver. Carefully remove the cover to expose the circuitry.

CAUTION!

This unit contains devices which are static sensitive. Great care should be taken when adjusting switches and links to avoid touching any connections. Whenever possible, anti-static precautions should be taken, such as the use of an earthed wrist-strap and anti-static mat.

Connecting the host port

The host (synchronous) port can be found at one end of the unit, adjacent to the POWER ON LED. It is a 25-pin female D-type, and is supplied fitted with a protective cover.

It may be connected directly to the Bull mainframe or front-end processor via a suitable connecting cable. Alternatively, the connection may be made via a modem or line driver. DTE pin assignments allow the *Diplomat jr* ASPI to be directly substituted for an ASPI 10/30 matrix or ASPI 80/85 laser printer. Other connections may require the use of cross-over cables. Details of the pin assignments will be found in the *Technical Description* section on Page 23.

Installation

Connecting the terminal port

The terminal (asynchronous) port can be found at the other end of the unit, adjacent to the power-in jack socket. It is a female D-type, and is fitted with a protective cover.

It may be connected directly to a suitable peripheral - such as a terminal, printer, micro computer, modem or any other asynchronous device. DCE pin assignments make for plug compatibility with many terminal type devices. Connection to other devices may require the use of cross-over cables. Details on the pin assignments may be found in the *Technical Description* section on Page 24.

Connecting the power supply

Connect the jack plug on the flying lead into the jack socket at the end of the unit. Plug the power lead into a suitable 13A three-pin mains supply socket.

Product Registration

When you have successfully installed the *Diplomat jr*, you should complete the Registration form. Return this to Lucidata at the address given on the form without delay. No postage is necessary if posted in the UK.

- Switching on** Switch on the unit by switching on the mains socket powering the plug-in mains adaptor. The red Power On LED should light. If it does not, check the mains supply by substituting another working electrical appliance. If the *Diplomat jr* is thought to be faulty, see *Service and Support* in the *Introduction*.
- Printer Profile** When the *Diplomat jr* is turned on, it will automatically configure the terminal port for the printer profile set on the configuration switch S2. The information held in the firmware about the specified peripheral will be used to ensure that the required code translations are effected.
- Switching off** To switch off the *Diplomat jr*, switch off the mains supply to the plug-in mains adaptor. The red POWER ON LED will extinguish.

Introduction

Upon receipt, the *Diplomat jr* will already have been configured to your requirements. However, you may re-configure your unit, should your requirements change. Such a task is best undertaken by a person who is familiar with data communications products and terminology.

note *If you re-configure your unit, you are advised to note the original switch settings in the Switch summary at the end of this section.*

Disconnect the *Diplomat jr* from the mains power supply!

Remove the four cross-head screws securing the cover to the base of the unit, using the supplied screwdriver. Carefully remove the cover to expose the circuitry.

CAUTION!

This unit contains devices which are static sensitive. Great care should be taken when adjusting switches and links to avoid touching any connections. Whenever possible, anti-static precautions should be taken, such as the use of an earthed wrist-strap and anti-static mat.

You will observe that there are two white switch assemblies, with individual coloured sliders numbered 1 to 8. In addition there are a number of linking points which can be connected with jumpers. The position of all these is shown in the diagram on the summary pages at the end of this section.

All re-configuration takes place using these switches and links as described in this section. Both sets of switches are used, but a number of the links are only set during manufacture and are not used during re-configuration.

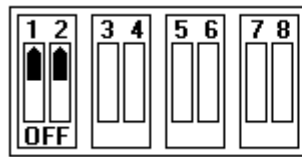
Clock Rates

Switch S1, slider 1,2,3 and 4 are used to determine the frequencies of the internal clocks T1 and T2. T1 and T2 can each take four values, dependent on the settings of the sliders.

Links L8, L9, L11 and L12 are used to determine which internal clocks (if any) are used. Links L1, L2, L3 and L10 determine which internal clocks (if any) are passed to the host port and on which pin(s).

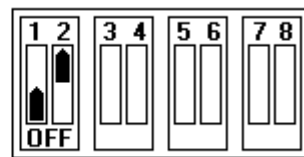
The diagrams below summarise the data rates for asynchronous communication obtainable with T1 and T2 for different settings of switch S1 sliders 1,2,3 and 4.

S1



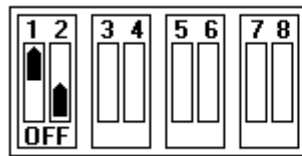
T1 75 bps

S1



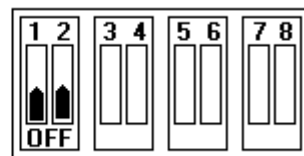
T1 19200 bps

S1



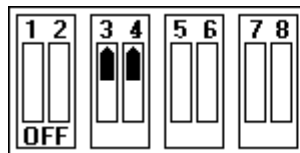
T1 300 bps

S1



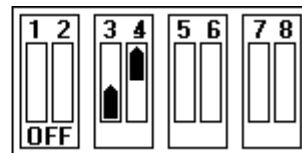
T1 600 bps

S1



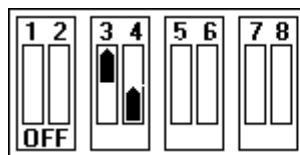
T2 1200 bps

S1



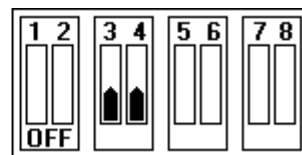
T2 2400 bps

S1



T2 4800 bps

S1



T2 9600 bps

Configuration

Clock Sources

Links A, B, C and D on the link blocks L8, L9, L11 and L12 are used to select the clock sources. Only one clock can be selected on a link at any one time.

Link L8

Link 8 is used to select the source of the Receive Clock for the host port. The following options are available.

-
- | | |
|---|---|
| A | connect to internal clock T1 (as set on switch S1, sliders 1 and 2) |
| B | connect to internal clock T2 (as set on switch S1, sliders 3 and 4) |
| C | connect to host port pin-17 (Receive Clock RXC) |
| D | not used on standard model |
-

Option C should not, in general, be used. If it is remember that the external clock must be 16 times the desired data rate.

Link L9

Link L9 is used to select the source of the Transmit Clock for the host port. The linking options are as follows:

-
- | | |
|---|---|
| A | connect to internal clock T1 (as set on switch S1, sliders 1 and 2) |
| B | connect to internal clock T2 (as set on switch S1, sliders 3 and 4) |
| C | connect to host port pin-15 (Transmit Clock TXC) |
| D | not used in the standard model. |
-

Option C should not, in general, be used. If it is remember that the external clock must be 16 times the desired data rate.

Link L11

Link L11 is used to select the source of the Receive Clock for the terminal port. The linking options available are as follows:

-
- | | |
|---|---|
| A | connect to internal clock T1 (as set on switch S1, sliders 1 and 2) |
| B | connect to internal clock T2 (as set on switch S1, sliders 3 and 4) |
| C | connect to terminal port pin-17 (external receive clock) |
| D | not used in the standard model. |
-

Link L11 is usually linked the same as Link 12 in option A or B. However, if a split receive/transmit speed is used, L11 could be linked in option A with Link L12 in option B. Switch S1 is used to define the clock rates.

Option C should not, in general, be used. If it is remember that the external clock must be 16 times the desired data rate.

Link L12

Link L12 is used to select the source of the Transmit Clock for the terminal port. The linking options are as follows:

- | | |
|---|---|
| A | connect to internal clock T1 (as set on switch S1, sliders 1 and 2) |
| B | connect to internal clock T2 (as set on switch S1, sliders 3 and 4) |
| C | connect to terminal port pin-15 (external transmit clock) |
| D | not used in the standard model |

Link L12 is usually linked the same as Link L11, in option A or B. However, if a split receive/transmit speed is used, L12 could be linked in option B with Link L11 in option A. Switch S1 is used to define the clock rates.

Option C should not, in general, be used. If it is remember that the external clock must be 16 times the desired data rate.

Terminal port transmitter control

Link L22 selects the source of the enabling signal for the asynchronous transmitter.

If L22 is left unstrapped, the transmitter is permanently enabled.

If L22 is connected from the centre pin to the pin nearest to the host port, then pin-20 of the terminal port exercises control over the transmitter.

Certain printers use pin-19 for a Ready/Busy signal. If L22 is connected from the centre pin to the pin nearest to the terminal port, this allows pin-19 of the terminal port to exercise control over the transmitter.

While these signals (pin-19 or pin-20) can be used, Lucidata recommends the use of XON/XOFF in-band signalling to control the data flow between the printer and the Diplomat.

If the target printer cannot be configured to hold DTR high whilst it is On-Line, then link L22 should be removed. This is because the Diplomat will send a BREAK to the host and show an OFF-LINE condition in its status bytes. This can cause the host to abort the current print.

Host Port RS232/RS422 option

Link L7 is used to select the RS232 or RS422 receiver. If the upper two pins of L7 are linked (see diagram on Page 20) the RS232 receiver is enabled. If the bottom two pins are linked, the RS422 receiver is enabled. This option is only applicable to the host side.

Host Port DTR control option

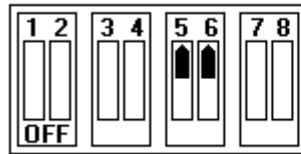
If the link on DTR (see diagram on Page 20) is connecting the left two pins, then pin 20 on the host connector is held high as long as power is applied to the Diplomat jr. If the link is in the other position, then pin 20 on the host connector follows the state of either pin 19 or 20 on the terminal connector, depending on how Link 22 is set.

Configuration

Host parity selection

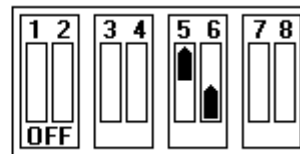
Host data is transmitted as 7 data bits plus an 8th bit and one stop bit. For speeds less than 300 bps, two stop bits are used. Switch S1 sliders 5 and 6 are used in combination to set whether or not parity checking is required, and the polarity of the eighth bit. The possible combinations are as follows:

S1



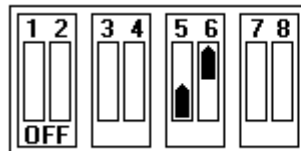
No parity check, bit 8=0

S1



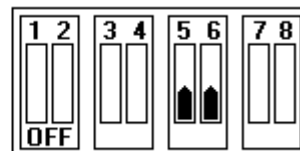
No parity check, bit 8=1

S1



Parity check, even parity

S1

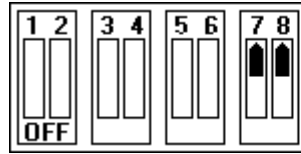


Parity check, odd parity

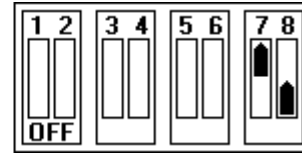
Terminal parity selection

Terminal data is transmitted as 7 data bits plus an 8th bit and one stop bit. For speeds less than 300 bps, two stop bits are used. Switch S1 sliders 7 and 8 are used in combination to set whether or not parity checking is required, and the polarity of the eighth bit. The possible combinations are as follows:

S1



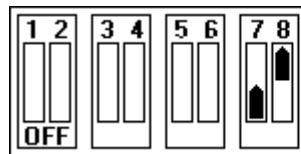
S1



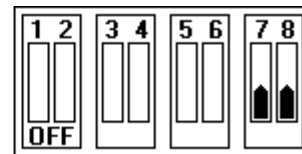
No parity check, bit 8=0

No parity check, bit 8=1

S1



S1



Parity check, even parity

Parity check, odd parity

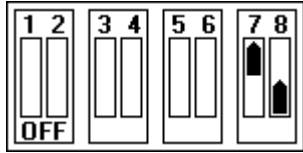
If it is intended to use Bit Mapped Graphics, the terminal Parity must be set to No Parity and bit 8=0. This allows 8 bit binary sequences to be sent to the printer. The printer itself should be set for 8 data bits, no parity.

Configuration

Normal/Diagnostic Operation

Sliders 7 and 8 of switch S2 are used to enable a diagnostic mode. For proper operation of the Diplomat jr ASPI Converter both sliders should be set as shown.

S2

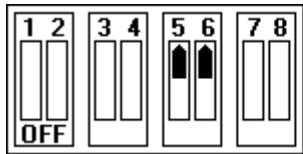


Normal Operation

ASPI Model Response

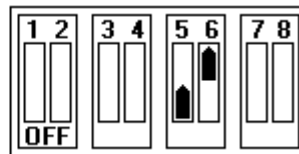
Sliders 5 and 6 of switch S2 are used to select whether the Diplomat jr emulates an ASPI 10/30/80 or 85 printer. The selection is illustrated below.

S2



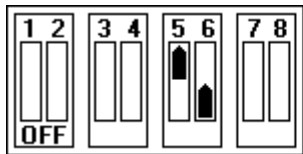
ASPI 10 printer

S2



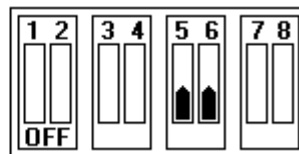
ASPI 30 printer

S2



ASPI 80 printer

S2



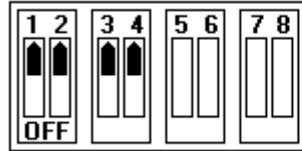
ASPI 85 printer

The above setting determines what Identifier Code the unit responds with to an ENquiry from the host. The translation function of the unit is unaffected.

Select Printer Profile

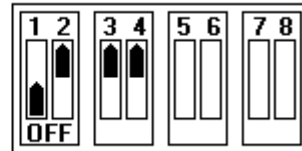
Sliders 1 to 4 of switch S2 are used to select one of up to 16 popular printer profiles. The following table lists the settings for the currently supported printers. All other settings select Transparent.

S2



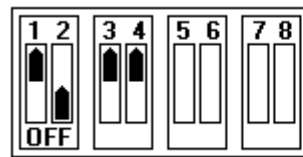
Generic Dot Matrix

S2



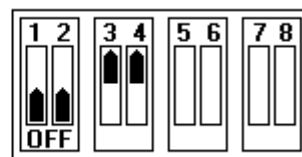
Bull 80

S2



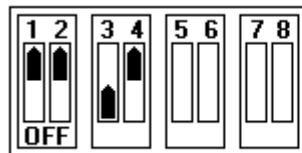
Xerox 4030

S2



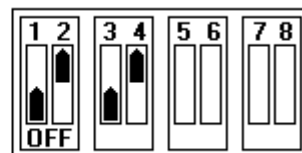
HP Laser

S2



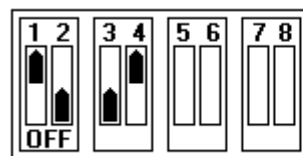
Epson FX-80

S2



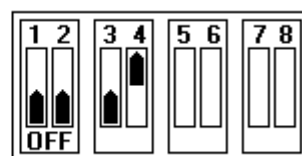
HP Laser without Line Graphics

S2



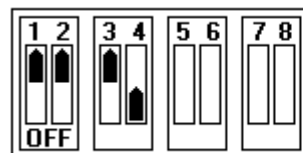
Bull VIP110

S2



Transparent

S2



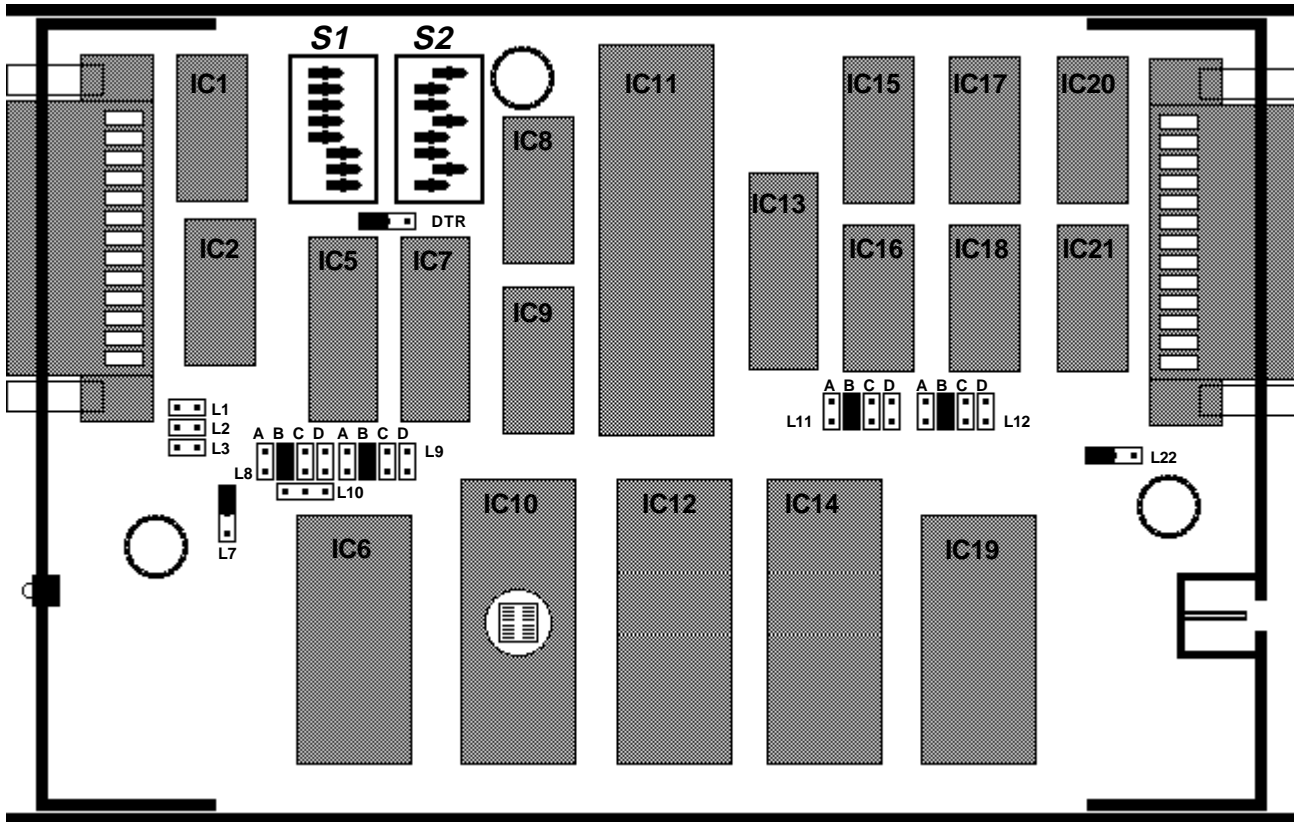
HP DeskJet

note: Not all features of the ASPI printer family are supported on all printer profiles. Refer to table in Appendix A for printer function compatibility.

Configuration Summary

HOST CONNECTOR

TERMINAL CONNECTOR



Links L1, L2 and L3 - internal clock to host port

- L1 pin-24 (internal clock output)
- L2 pin-17 (receive clock)
- L3 pin-15 (transmit clock)

Link L8 - select source of RX Clock for host port

- A connect to internal clock T1 (as set on switch S1)
- B connect to internal clock T2 (as set on switch S1)
- C connect to host port pin-17 (Receive Clock RX)
- D not used on standard model

Link L9 - select source of TX Clock for host port

- A connect to internal clock T1 (as set on switch S1)
- B connect to internal clock T2 (as set on switch S1)
- C connect to host port pin-15 (Transmit Clock TX)
- D not used in the standard model.

Link L10 - Internal clock to outside world

If L10 is set so that the centre pin in connected to the pin nearest to the host port, internal clock T1 will be available to pass to the host port.

Link L11 - select source of RX clock for terminal port

- A connect to internal clock T1 (as set on switch S1)
- B connect to internal clock T2 (as set on switch S1)
- C connect to terminal port pin-17 (external receive clock)
- D not used in the standard model

Link L12 - select source of TX clock for terminal port

- A connect to internal clock T1 (as set on switch S1)
- B connect to internal clock T2 (as set on switch S1)
- C connect to terminal port pin-15 (external transmit clock)
- D not used in the standard model

Link L22 - select source of the enabling signal for the terminal port

If L22 is left unstrapped, the transmitter is permanently enabled. If L22 is connected from the centre pin to the pin nearest to the host port, then pin20 of the terminal port exercises control on the transmitter. If L22 is connected from the centre pin to the pin nearest to the terminal port, then pin-19 of the terminal port exercises control on the transmitter.

DTR control option

If the link on DTR is connecting the left two pins, then pin 20 on the host connector is held high as long as power is applied to the Diplomat jr. If the link is in the other position, then pin 20 on the host connector follows the state of either pin 19 or 20 on the terminal connector, depending on how Link 22 is set.

<p style="text-align: center;">CLOCK SPEEDS</p> <p>S1 S1 <i>T1 75 bps</i> <i>T1 19200 bps</i></p> <p>S1 S1 <i>T1 300 bps</i> <i>T1 600 bps</i></p> <p>S1 S1 <i>T2 1200 bps</i> <i>T2 2400 bps</i></p> <p>S1 S1 <i>T2 4800 bps</i> <i>T2 9600 bps</i></p>	<p style="text-align: center;">HOST PARITY</p> <p>S1 S1 <i>No parity check, bit 8=0</i> <i>No parity check, bit 8=1</i></p> <p>S1 S1 <i>Parity check, even parity</i> <i>Parity check, odd parity</i></p>
<p style="text-align: center;">PRINTERS SUPPORTED</p> <p>S2 S2 <i>Generic Dot</i> <i>Bull 80</i></p> <p>S2 S2 <i>Xerox 4030</i> <i>HP Laser</i></p> <p>S2 S2 <i>Epson FX-80</i> <i>HP Laser (no LG)</i></p> <p>S2 S2 <i>Bull VP110</i> <i>Transparent</i></p> <p>S2 S2 <i>HP DeskJet</i></p>	<p style="text-align: center;">PRINTER PARITY</p> <p>S1 S1 <i>No parity check, bit 8=0</i> <i>No parity check, bit 8=1</i></p> <p>S1 S1 <i>Parity check, even parity</i> <i>Parity check, odd parity</i></p> <p style="text-align: center;">ASPI MODEL EMULATED</p> <p>S2 S2 <i>ASPI 10</i> <i>ASPI 30</i></p> <p>S2 S2 <i>ASPI 80</i> <i>ASPI 85</i></p>
<p style="text-align: center;">OPERATING MODE</p> <p>S2 <i>Normal operation</i></p>	

Technical Description

Communications

The Diplomat jr provides an interface between a single asynchronous communications line and a single asynchronous device - usually a printer.

Host Port

The host connection can be made directly to the mainframe or front-end processor or via a modem or line driver. The pin connections on the host port (DTE) allow the Diplomat jr to be directly substituted for an ASPI 10/30 matrix or ASPI 80/85 laser printer. Other connections may require the use of cross-over cables. The host connection may be operated in either RS232 or RS422 mode (selected with link L7).

Data rates can be selected within a range from 75 bps to 19200 bps. Control of character format and parity are by means of internal switches. Data flow control and error recovery are performed by the ASPI ETX/ACK protocol.

Terminal Port

The terminal connection can be made directly to a terminal, printer, micro computer, modem or other asynchronous device. The pin connections on the terminal port (DCE) enable terminal-type devices to be plugged in directly. Connection to other devices may require the use of cross-over cables.

Data rate is selectable within the range 75 to 19200 bps. Control of character format and parity are provided by means of internal switches. Data flow control is performed by XON/XOFF in-band signalling and operates in both directions. If the Diplomat jr receives a DC3 character, no more than two further characters should be received by the printer.

Electrical Interfaces

Three connections are made to the Diplomat jr unit.

Power at a regulated +5V is input to the unit via a jack socket at one end of the unit.

Connections at the host and terminal sides are made by means of connectors at either end of the unit. Normally these are 25 pin female D-type sockets unless notified otherwise under Product Details on Page 4. Both sockets are fitted with screwlock pillars so that the data cables can be securely fixed. On a new Diplomat jr the 'D' sockets are normally fitted with protective dust covers.

Host Port

The table below shows the pin connections to the host port connector. This port is normally connected to a host computer, and is a female 25-pin D-type configured as a serial asynchronous DTE.

PIN NO.

1	<i>Protective Ground connects to chassis and power supply ground</i>
2	<i>Transmitted Data from the Diplomat</i>
3	<i>Received Data going into the Diplomat</i>
4	<i>Request to Send is held high by the Diplomat when transmitting</i>
5	<i>Clear to Send must be high to enable the Diplomat's transmitter</i>
7	<i>Common signal return is connected to power supply ground</i>
8	<i>Data Carrier Detect must be high during sending to the Diplomat</i>
13	<i>RS422 T(A)</i>
14	<i>RS422 T(B)</i>
15	<i>*** Reserved *** Do NOT make any connection</i>
16	<i>RS422 R(A)</i>
17	<i>*** Reserved *** Do NOT make any connection</i>
19	<i>RS422 R(B)</i>
20	<i>Data Terminal Ready held high by the Diplomat when powered up</i>

All control signals required for the proper operation of the Diplomat are pulled high by means of an internally generated +10V supply, via internal 3K3 resistors, thus allowing a simple three wire connection.

note: If using RS422 mode, connections should only be made to pins 1, 7, 13, 14, 16 and 19 and to no other. In this mode the pinout of the port is identical to that of an ASPI 10/30 printer. In RS232 mode no connections should be made to pins 13, 14, 16 and 19.

The use of screened cable with the screen connected to pin 1 is recommended.

Technical Description

Terminal Port

The table below shows the pin connections to the terminal port connector. This port is normally connected to a terminal or other asynchronous peripheral and is a female 25-pin D-type configured as a serial asynchronous DCE.

PIN NO.

<i>1</i>	<i>Protective Ground connects to chassis and power supply ground</i>
<i>2</i>	<i>Asynchronous Received Data going into the Diplomat</i>
<i>3</i>	<i>Asynchronous Transmitted Data from the Diplomat</i>
<i>4</i>	<i>Request To Send held high if left open or controlled by terminal¹</i>
<i>5</i>	<i>Clear to Send will be held high if pin 4 is high</i>
<i>6</i>	<i>Data Set Ready held high whilst power on</i>
<i>7</i>	<i>Common signal return is connected to power supply ground</i>
<i>8</i>	<i>Data Carrier Detect held high if Diplomat ready to receive</i>
<i>15</i>	<i>*** Reserved *** Do NOT make any connection</i>
<i>17</i>	<i>*** Reserved *** Do NOT make any connection</i>
<i>19</i>	<i>If low² will disable Diplomat's transmitter</i>
<i>20</i>	<i>If low² will disable Diplomat's transmitter</i>

¹ If pulled down by the terminal will cause the Diplomat jr to reset to its initial state and to flush any data in its buffers. It will also send a BREAK to the host and show a RESET condition in its status bytes.

² Depends on link L22 but if pulled down will send a BREAK to the host and show an OFF-LINE condition in its status bytes.