

6155AS

6 DIGIT SERIAL INPUT
REMOTE DISPLAY TYPE

Rev	Eco. No	Date	By	CHK
E	U0092	8 Aug 90	RS	

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SECTION 1 GENERAL INFORMATION

The 6155AS is a six digit remote display module. It accepts serial ASCII coded data into a differential or single ended line receiver, at common Baud rates.

Numeric data and a selection of other characters can be displayed. The character set includes decimal point and negative sign. Simple messages

e.g. *H I ALL OF OF* can be formed with characters presentable on seven segment displays.

Multiple serial data may be transferred by sending code 03 followed by 02, an address from 0 to 15 (ASCII 30 to 3F) and the data. The address 0 (ASCII 30) is common to all remote displays for simultaneous display of the same message.

The 6155AS may be set-up to operate in a 'strobed' mode whereby the data string is transferred to the display on reception of a carriage return. Alternatively a 'shift' mode can be used in which the characters are displayed according to their current position in the input shift register. Two further modes enable connection to the Newport 269 and P6000 panel meters for 'remote display purposes.

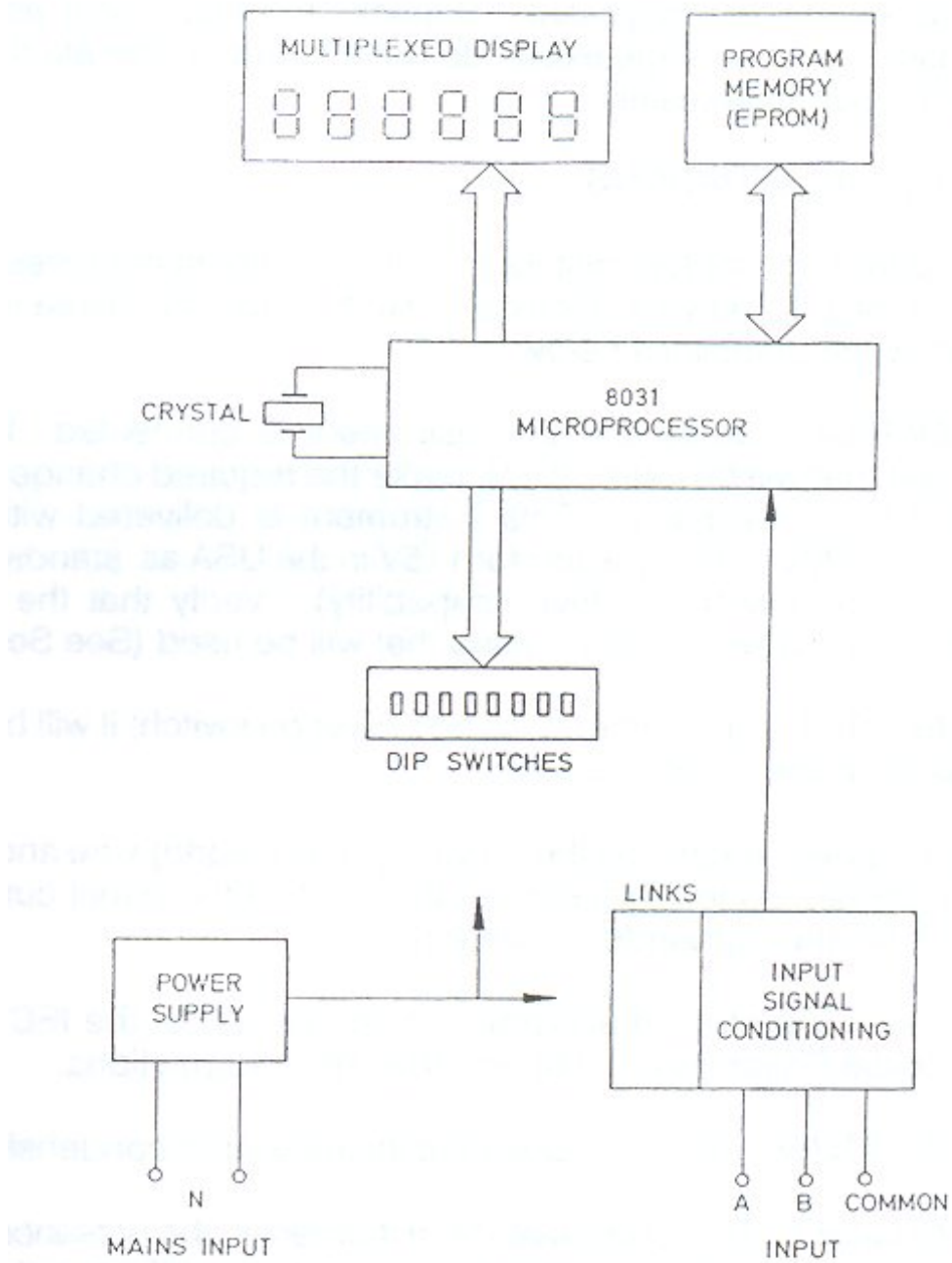


Figure 1-1 The 6155AS Block Diagram

SECTION 2 GETTING STARTED

2.1 UNPACKING AND INSPECTION

Your 6155AS remote display was systematically inspected and tested, then carefully packed before shipment. Unpack the instrument and inspect for shipping damage. If damage exists, do not attempt to operate the unit. Notify the freight carrier immediately.

2.2 SAFETY CONSIDERATIONS

As delivered from the factory/distributor, this instrument complies with required safety regulations. To prevent electrical or fire hazard and ensure safe operation, please follow the guidelines below:-

POWER VOLTAGE - Verify that the instrument is connected for the power voltage rating that will be used. If not, make the required changes as indicated in section 4.1 of this manual. This instrument is delivered with A.C. power connection for 230V in Europe and for 115V in the USA as standard (unless the instrument is fitted with DC drive capability). Verify that the instrument is configured for the power voltage rating that will be used (See Section 4.1).

POWER WIRING - This instrument has no power on switch; it will be in operation as soon as the power is connected.

Verify that the power cable has the proper ground (earth) wire and that this wire is properly connected to a ground (earth) point. If the panel cut-out is a metal enclosure, it must be grounded (earthed).

This instrument is protected according to the class I of the IEC (International Electrotechnical Commission) 348 and VDE 0411 regulations.

RAIN OR MOISTURE - Do not expose the instrument to condensing moisture.

FUMES AND GASES - Do not operate the instrument in the presence of flammable gases or fumes; such an environment constitutes a definite safety hazard.

EXERCISE CAUTION - As with any electronic instrument, high voltage may exist when attempting to install, calibrate, or remove parts of the instrument.

2.3 TURNING IT ON

Connect the proper line voltage to the power screw terminal (TB1).
See Figure 4.3.

WARNING:
INCORRECT POWER CAN DAMAGE YOUR 6155AS MODULE

2.4 MESSAGE DISPLAY AT POWER UP

At initial Power-up the 6155AS displays a message which indicates the following configuration details:-

- i) PROGRAM REVISION CODE
- i) SELECTED MODE (0, 1, 2 or 3)
- ii) PRESENT INPUT LEVEL ($\bar{\quad}$ = HIGH, — = LOW)
- iii) SELECTED ADDRESS (0 to 15)
- iv) SELECTED BAUD RATE (0=300, 1 =1200, 2=2400, 3=9600)

i.e. The following display "**A0_?!**" would indicate

PROGRAM REVISION CODE A;
MODE 0 INPUT LINE LOW;
ADDRESS 15; and 1200 BAUD RATE Selected.

SECTION 3 OPERATION

3.1 INTRODUCTION

This section provides information regarding transmission of messages to the module. See section 4 for configuration of jumpers, links and DIP switches.

3.2 MESSAGE FORMAT

All messages transmitted to the module should be in ASCII. The valid characters are shown in the diagram below

30	0	3C	c	48	H	54	t
31	1	3D	=	49	I	55	U
32	2	3E	3	4A	J	56	v
33	3	3F	7	4B	K	57	8
34	4	40	(Space)	4C	L	58	r
35	5	41	A	4D	n	59	y
36	6	42	b	4E	o	5A	2
37	7	43	[4F	o	5B	o
38	8	44	d	50	P	5C	4
39	9	45	E	51	q	5D	7
3A	-	46	F	52	r	5E	n
3B	-	47	G	53	S	5F	-

Figure 3-1 Display Character Table

Various control characters are also used :-

ASCII CODE	ACTION
03	ETX : Stops the module receiving further data except code 02
13	XOFF: As per ETX
02	STX : Starts the module receiving data. If the instrument has an address other than '0' the next character must be the address of the instrument or it will return to an inactive state
11	XON : As per STX
0D	END OF DATA: In shift mode next valid data will clear the display and insert character into least significant position. In strobed mode, the message is transferred to the display.
20	Inserts a space
2D	Inserts a negative sign (-)
2E	Adds a decimal point to the last character entered
0C	Blank Display
1B	Resets to Power-up condition

Figure 3-2 Control Characters

All other characters are invalid and will be ignored.

3.3 EXAMPLE MESSAGE

An example would be to write the message "**Lo -1.5**" to module set at address 04.

This message would be sent as follows :-
(This assumes the display to be in the inactive state i.e. having previously received a 03 or 13 code or else in the powered-up condition).

02	Activate module
34	Module address
4C	L
4F	O
20	Space
2D	Negative sign
31	1
2E	Adds decimal point
35	5
0D	Transfer data to display (only needed in strobed mode)
03	Disable module

3.4 ADDRESSING

There are 16 possible addresses, 0 to 15. These correspond to addresses set up on the DIP switches (see section 4.2) the 0 address (ASCII 30) is a common address and any characters following are displayed by all units.

3.5 PROTOCOL

The following serial ASCII protocols are switch selectable:

MODE 0: All data received is displayed (except illegal characters) in the order in which they are received.

MODE 1: The last six characters received are displayed once a carriage return character (OD) is received.

MODE 2: 269 Temperature Meter Display - display is updated when a carriage return character is received. When the transmitting meter is measuring temperatures this remote module repeats the four characters shown on the 269, followed by degrees C or degrees F. When the transmitting 269 is indicating millivolts, this remote module repeats the four characters in the middle four positions, and negative indication is in the left hand position. Overload indication is all E's (See section 4.7 for interfacing details).

MODE 3: P6000 Universal Counter (without units of measurement) Display is updated when the carriage return character is received. The display repeats the six characters shown on the P6000. If the first character received is a H the upper left hand indicator will light, if a L is received the lower left hand indicator will light and if the first character is a B, both indicators will light (See section 4.7 for interfacing details).

N.B. The P6000 must be configured to transmit a 9 character message, not a 12 character message.

3.6 LH/RH LED INDICATORS

Two rectangular LED's are provided on the 6155AS for use as general indicators / alarm condition displays. An extra (seventh - MSD) character transmitted (in modes 0 or 1) will control these two LED's as follows:-

RH LED = Upper horizontal segment = segment A

LH LED = Centre horizontal segment = segment G

Thus any valid character (see figure 3.1) can be sent which includes neither / either or both of the above segments to operate the indicators as required.

SECTION 4 CONFIGURATION/MECHANICAL INSTALLATION

4.1 AC POWER SELECTION JUMPERS

For 230V AC operation, link W1 should be installed (Remove links W2 and W3 if fitted). For 115V AC operation, links W2 and W3 should be installed (Remove link W1 if fitted).

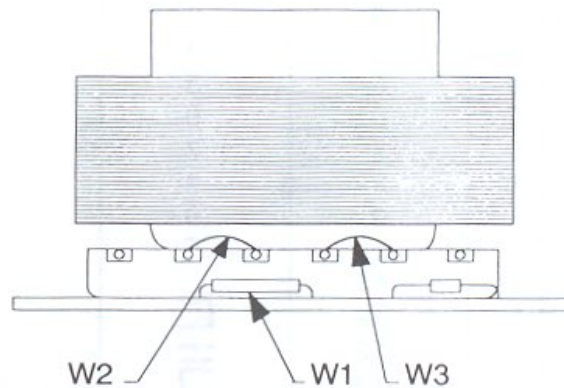
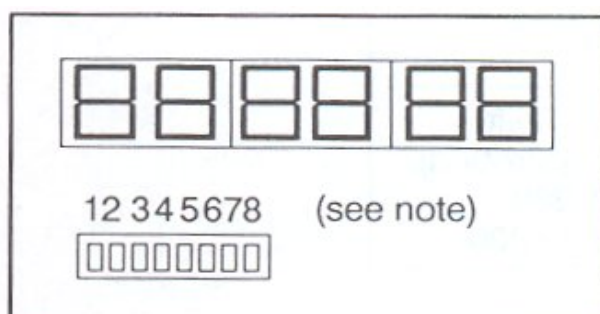


Figure 4-1 Jumper on Power Transformer

AC POWER CONNECTIONS		
AC POWER	WIRE COLOUR	
	EUROPE	USA
AC POWER HI	BROWN	BLACK
AC POWER LO	BLUE	WHITE
AC POWER GBD	GREE/YELLOW	GREEN

4.2 MODULE ADDRESS

To set module address, baud rate and mode the front lens of the module must be carefully removed with a thin bladed screwdriver, to gain access to the DIP switches (Figure 4-2)



Note

For DIP switches 1-8
UP = 0
DOWN = 1

Figure 4-2 DIP Switches

Switches 1 to 4 are used to set the module, address, the following table lists all possible combinations.

S1	S2	S3	S4	ADDRESS	DISPLAY	ASCII CHAR
0	0	0	0	0	0	0
1	0	0	0	1	1	1
0	1	0	0	2	2	2
1	1	0	0	3	3	3
0	0	1	0	4	4	4
1	0	1	0	5	5	5
0	1	1	0	6	6	6
1	1	1	0	7	7	7
0	0	0	1	8	8	8
1	0	0	1	9	9	9
0	1	0	1	10	-	:
1	1	0	1	11	-	;
0	0	1	1	12	⌈	<
1	0	1	1	13	=	=
0	1	1	1	14	⌋	>
1	1	1	1	15	⌋	?

4.3 BAUD RATE

Switches 5 and 6 set the baud rate.

S5	S6	BAUD
0	0	9600
1	0	2400
0	1	1200
1	1	300

4.4 MODE

Switches 7 and 8 set the mode.

S7	S8	MODE
0	0	0 (Shift)
1	0	1 (Strobed)
0	1	2 269
1	1	3 P6000

4.5 INPUT TYPE SELECTION

Jumper settings for signal conditioning.

Type	Jumpers	TB2 HI LO
TTL	B,C,G	AIN COM
2mA Loop	D,H,J,L	BIN COM Loop powered
2mA Loop	D,H,J,L	AIN BIN RCRV powered
20mA Loop	A,D,H,J,K,L	BIN COM Loop powered
20mA Loop	A,D,H,J,K,L	AIN BIN RCVR powered
±5V	D.F.H.I	BIN COM
P6000	As above	As above
±5V	D,F,I	BIN COM
Diff	C,H	BIN AIN Common at COM
Termination	E	
269	D,H,F,I	AIN/BIN COM

4.6 POWER AND SIGNAL CONNECTIONS

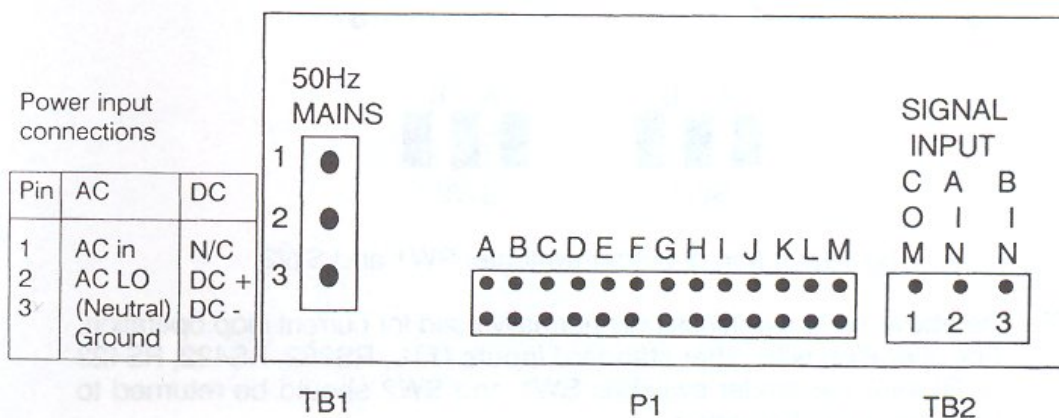


Figure 4-3 6155AS Rear panel with pin assignments

4.7 INPUT SIGNAL INVERSION

Solder switches SW1 and SW2 and the main PCB assembly (U0092) allow the input data logic polarity to be inverted. It is applicable both for external powered and 6155AS powered 2/20mA current loops

i.e. 2/20mA = LOGIC 1 = SPACE
0mA = LOGIC 0 = MARK

Follow the procedure below to select this feature if required.

PROCEDURE.

The procedure for all other aspects of configuration remain unchanged.

1. Remove any connector(s) from the rear of the 6155AS
2. Remove the front panel lens
3. Remove the two size #8 case retaining screws from the rear of the 6155AS
4. The 6155AS meter can now slide forward out of its casing
5. Open-circuit solder-switch positions SWI-A and SW2-A
6. Short-circuit solder-switch positions SWI-B and SW2-B
7. Re-assemble the 6155AS meter now by reversing steps 1 to 4. above

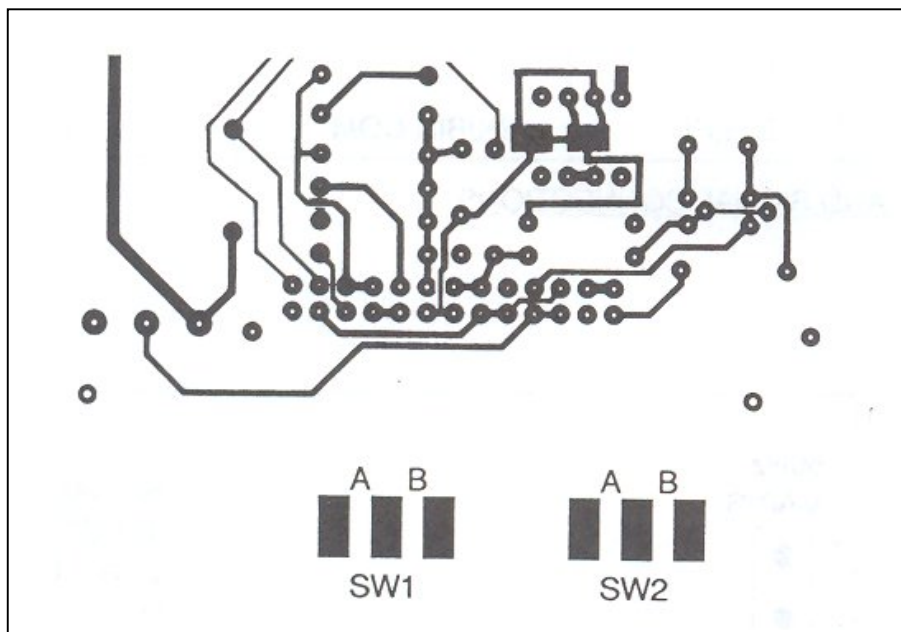


Figure 1 Location of solder switches SW1 and SW2

Note.

The above configuration is only normally used for current loop operation. For operation with other standard inputs (TTL, RS232, RS422, RS423 or RS485) the solder switches SW1 and SW2 should be returned to the normal configuration.

4.8 INTERFACING THE 6155AS WITH NEWPORT 269/P6000 UNITS

Shown below in figures 4-4 and 4-5 are interconnection and configuration details for using the 6155AS with Newport products 269 and P6000.

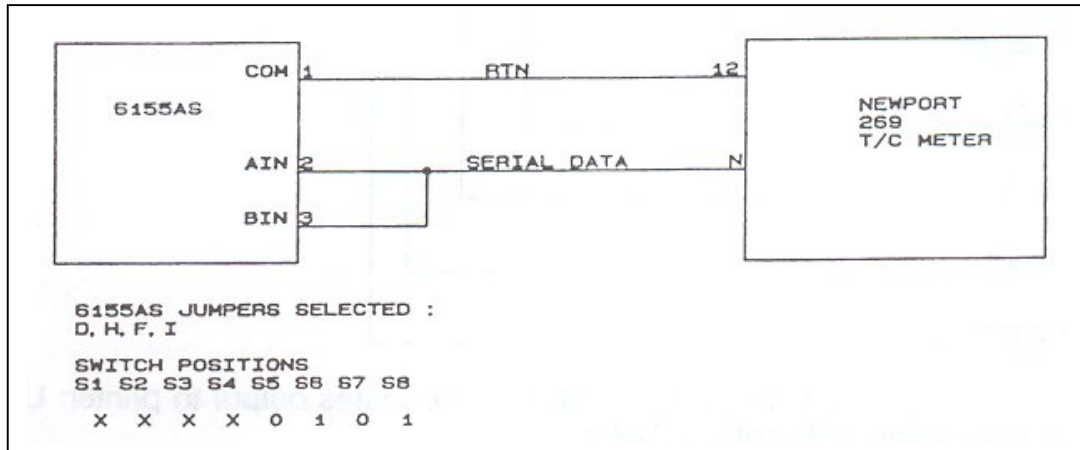


Figure 4-4 6155AS/269 Interfacing

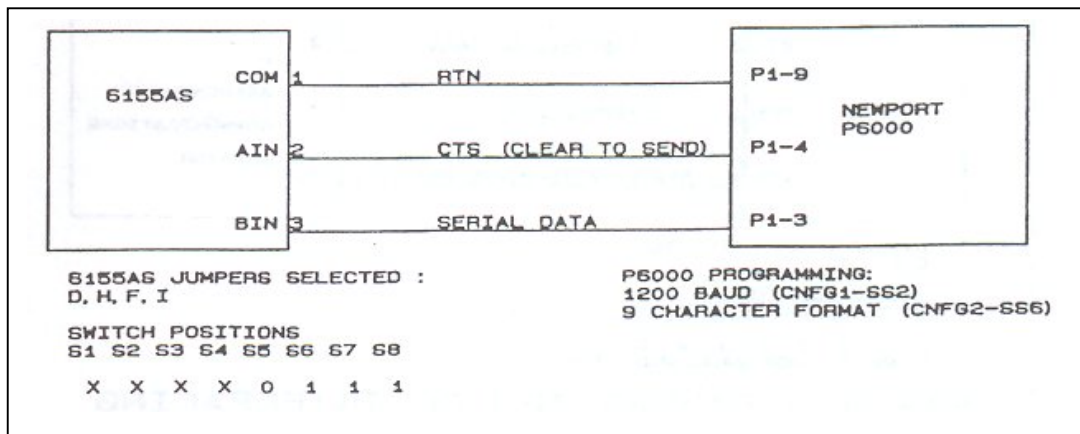
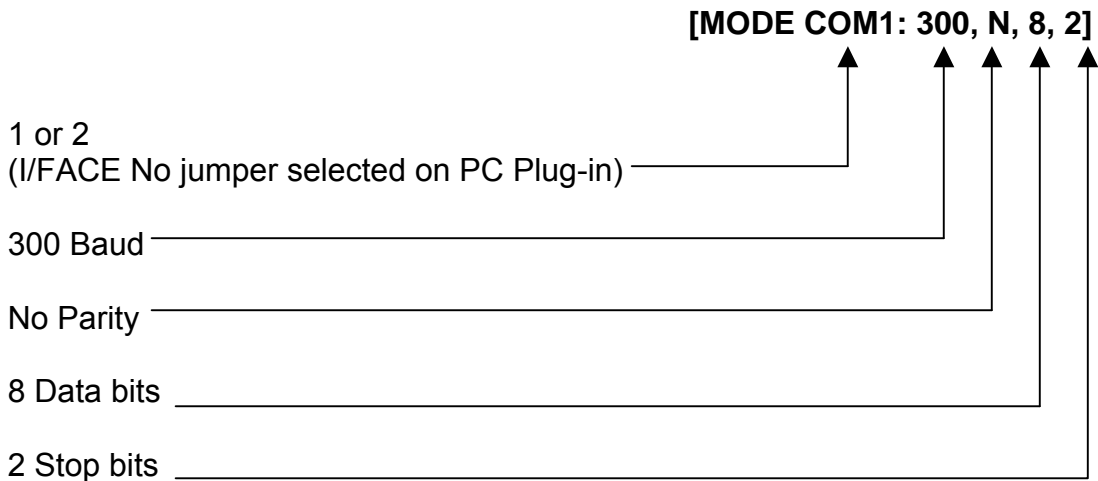


Figure 4-5 6155AS/P6000 Interfacing

4.9 INTERFACING THE 6155AS WITH IBM PC COMPATIBLES

Shown below in figure 4-6 are suggested inter-connection and configuration details for using the 6155AS with an IBM PC

The IBM serial interface is first set-up and enabled by the following DOS commands (See DOS manual for full details).



[MODE LPT1=COM1] Reroutes output to printer: LPT1 to Communications adapter: COM1)

Any Data now sent to the printer LPT1 will now be displayed on the 6155AS. i.e. If the following BASIC instruction is programmed:

[LPRINT "123456"] the 6155AS will display 123456.

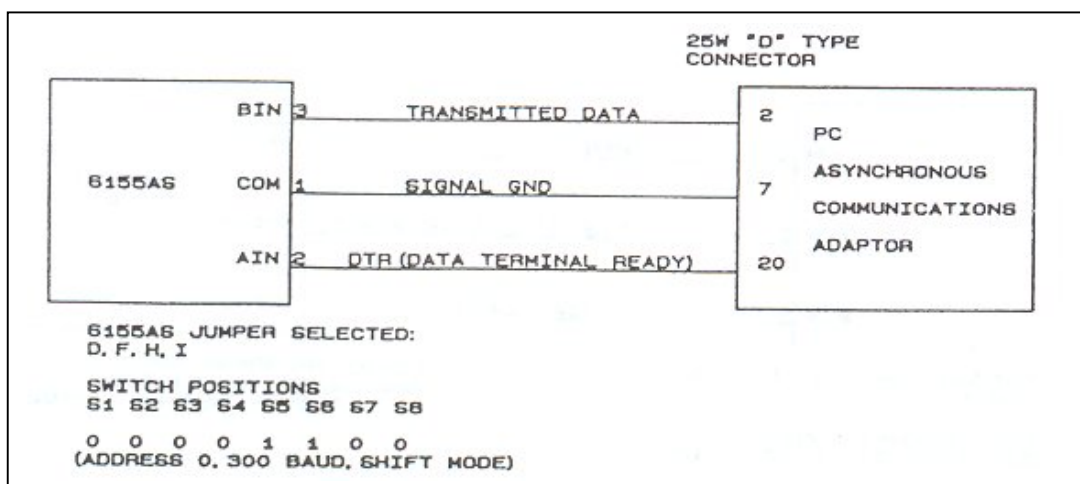


Figure 4-6 6155AS / IBM PC Interfacing

SECTION 5 SPECIFICATIONS

5.1 GENERAL

Function: A six-digit serial driven remote display module.

5.2 COMMUNICATION

BAUD RATE	300,1200,2400 OR 9600
MESSAGE FORMAT	1 Start Bit, 8 Data Bits or 1 Start Bit, 7 Data Bits and Parity (Parity is ignored) and 1, 1 1/2 or 2 Stop Bits.
HANDSHAKE	No Handshake required, 6155AS accepts data continuously.
DATA SENSE	Idle low normal. Idle high set during input type selection when required (see Sec. 4.5)
SIGNAL INPUT	8 types of serial ASCII input can be accommodated. (See Sec. 4.5 for jumper selection.) <ol style="list-style-type: none">(1) TTL LOGIC 1 =2V Min. =Space LOGIC 0=0.8V Max. =Mark LOGIC 0 Input current= -1 mA Max. Vin Max. =15V(2) 2mA LOOP (externally powered) LOGIC 1 =1.5mA Min.=Mark LOGIC 0=0.5mA Max.=Space Volt drop. = 1 V Max. Max input current.=0.5A(3) 2mA LOOP (6155AS powered) Open circuit voltage=5V ±5% Compliance = 3.5V Min. Other details as (2)

- (4) 20mA LOOP (externally powered)
LOGIC 1 =15mA Min.=Mark
LOGIC 0=5mA Max.=Space
Volt drop= 1 V Max.
- (5) 20mA LOOP (6155AS powered)
Open circuit voltage=5V \pm 5%
Compliance = 3.5V Min.
Other details as (4)
- (6) BIPOLAR \pm 5V (RS 423)
LOGIC 1 =3V Min. = Space
LOGIC 0=0V Max.=Mark
O/C = Mark
Input Resistance=4 to 10Kohm.
Max input = \pm 7V
- (7) BIPOLAR \pm 15V (RS 232)
LOGIC 1 =3V Min. =Space
LOGIC 0=-3V Max.=Mark
O/C = Mark
Input Resistance=4 to 7Kohm
Max input = \pm 30V
- (8) DIFFERENTIAL (RS422/485)
Threshold= \pm 0.2V Max.
Hysteresis=50mV typ.
Input Resistance=12Kohm min.
Max. diff. input= \pm 12V
Max.com.mode input= + 12/-7V
Termination = 120 ohm (selectable)

5.3 POWER

AC Voltage: 120/240V (Selected by internal links see Section 4-1)
+10% -15%, 50-60Hz

Power Consumption	5 Watts (max)
DC Power (Option)	Voltage: 9.5 to 32 V DC
	Current: 800 mA (Max)

5.4 DISPLAY

Type: 7 segment red LED
Digit height: 14.2mm

5.5 DIMENSION

Case-size: Bezel 96x48mm
Depth behind bezel: 140mm
Panel cut-out: 92x45mm
Panel thickness: 0.8mm – 6.0mm
Weight: 500g

5.6 OPERATING ENVIRONMENT

Temperature: 0-50 °C
Humidity: 0-95% RH non-condensing

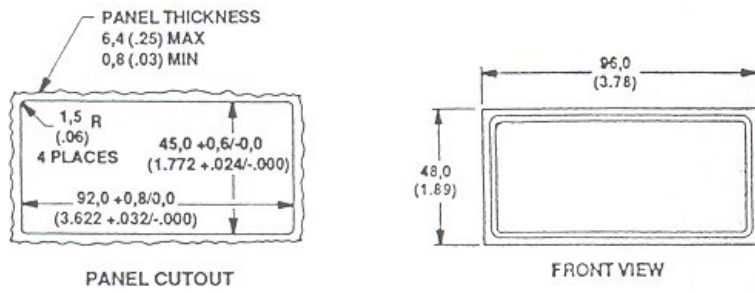
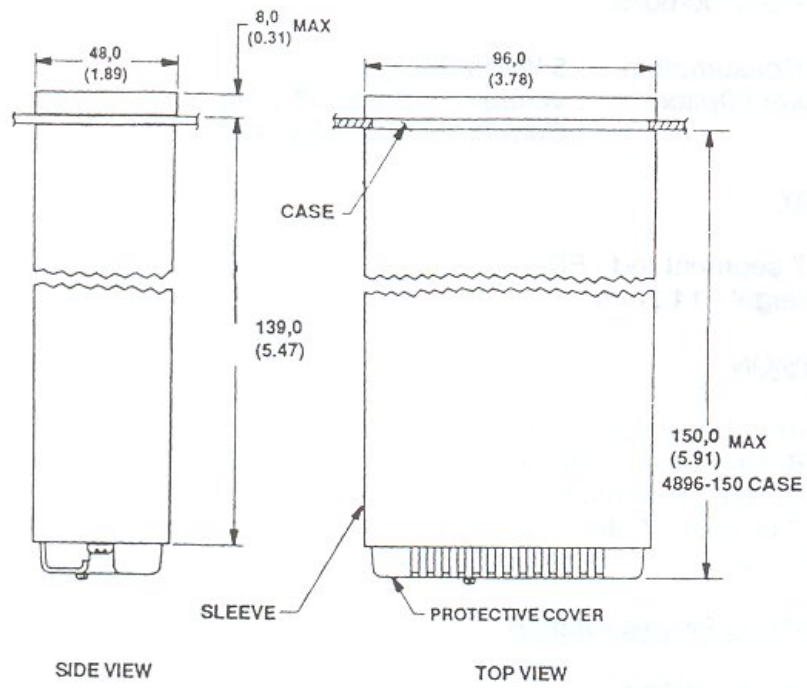


Figure 6-1 Case dimensions

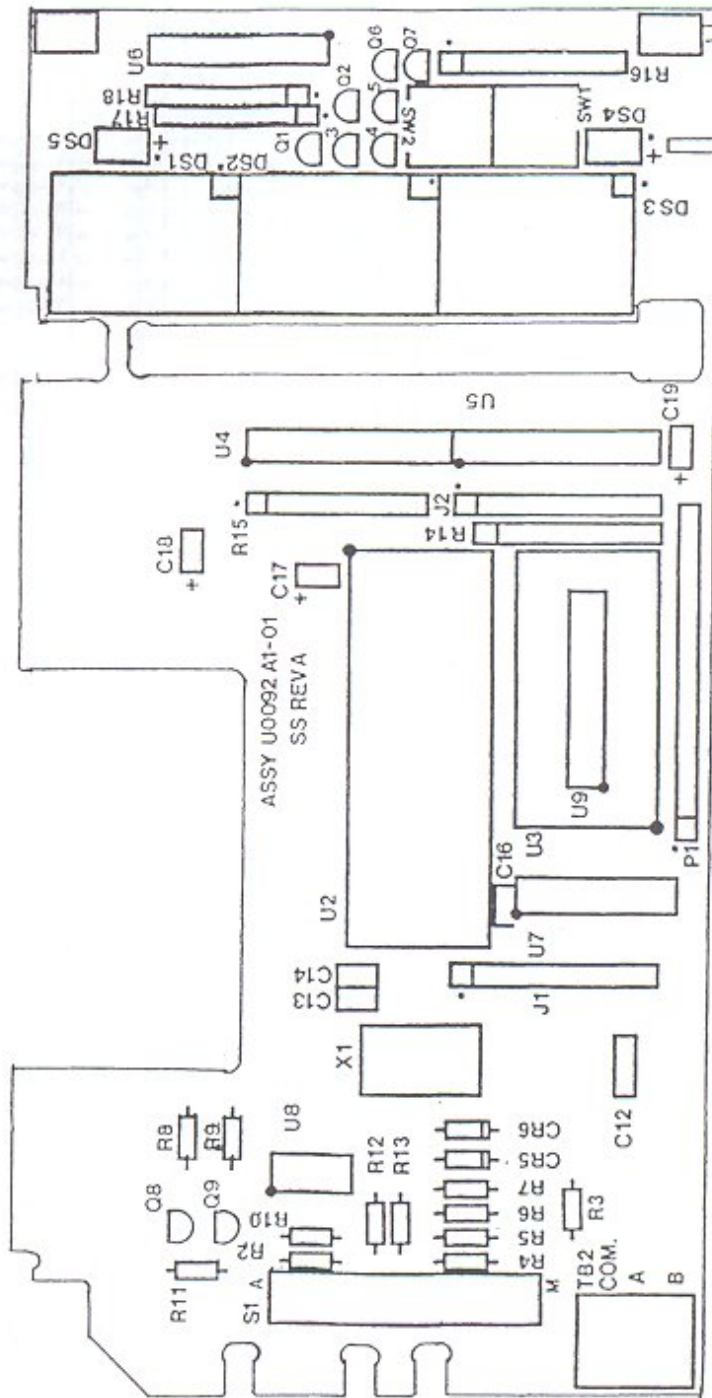


Figure 6-2 Main board & display board assembly diagrams

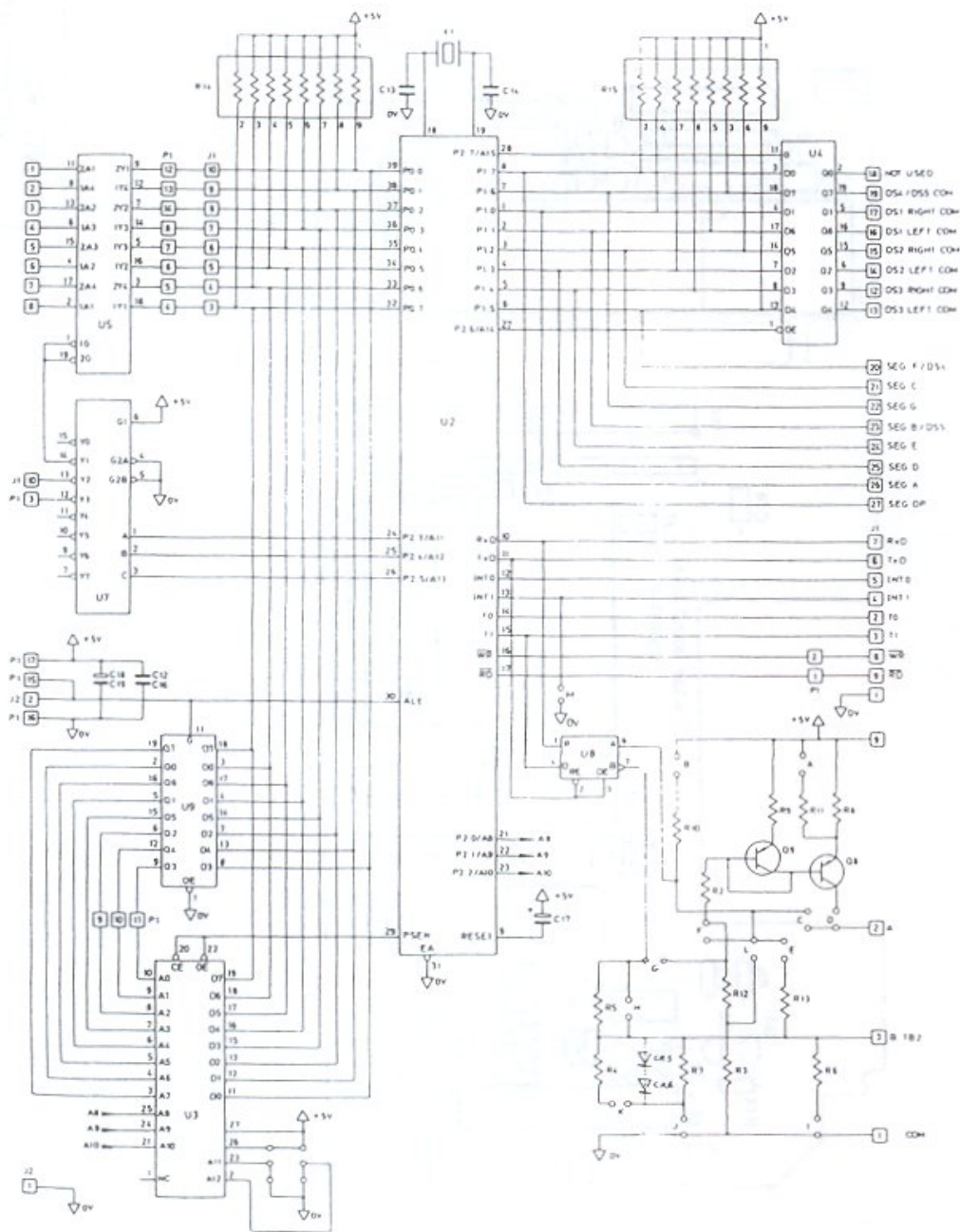


Figure 6-3 Main board schematic

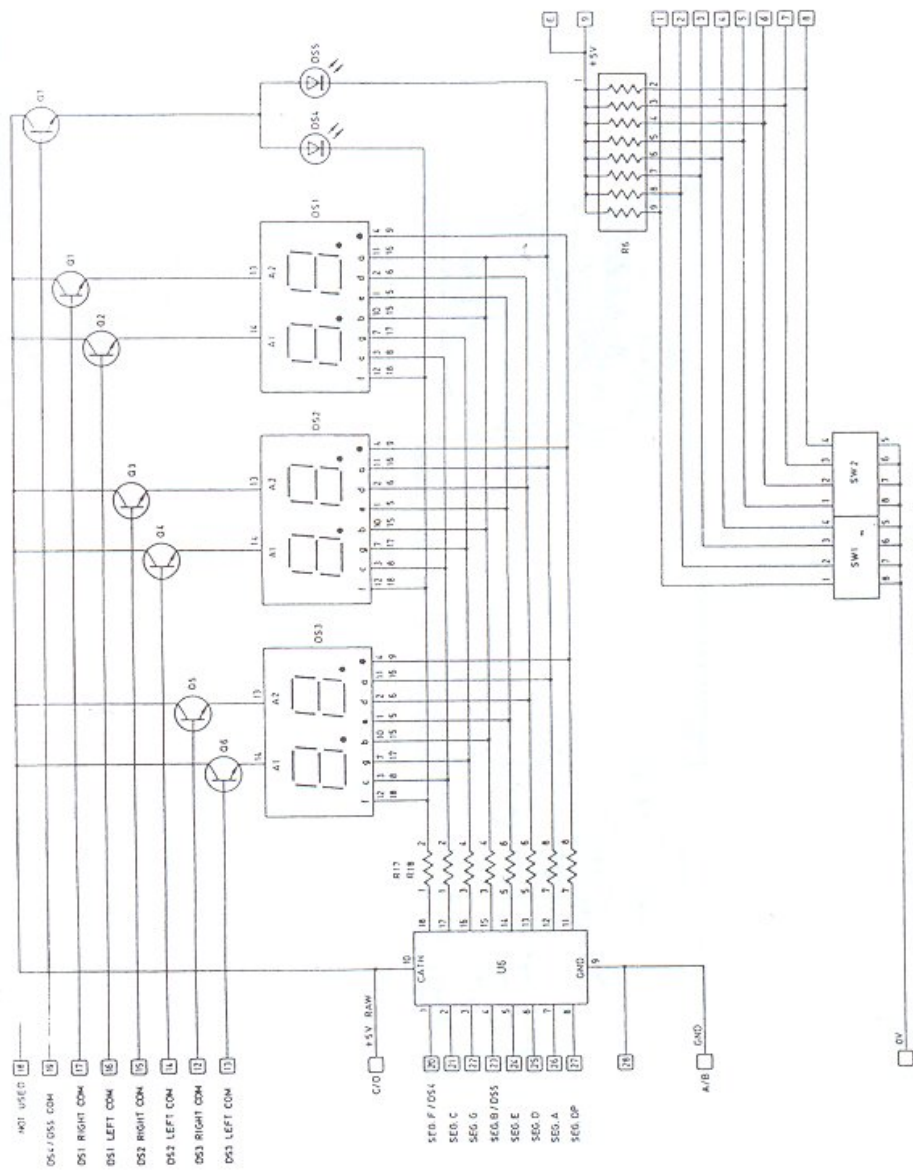


Figure 6-4 Display board schematic

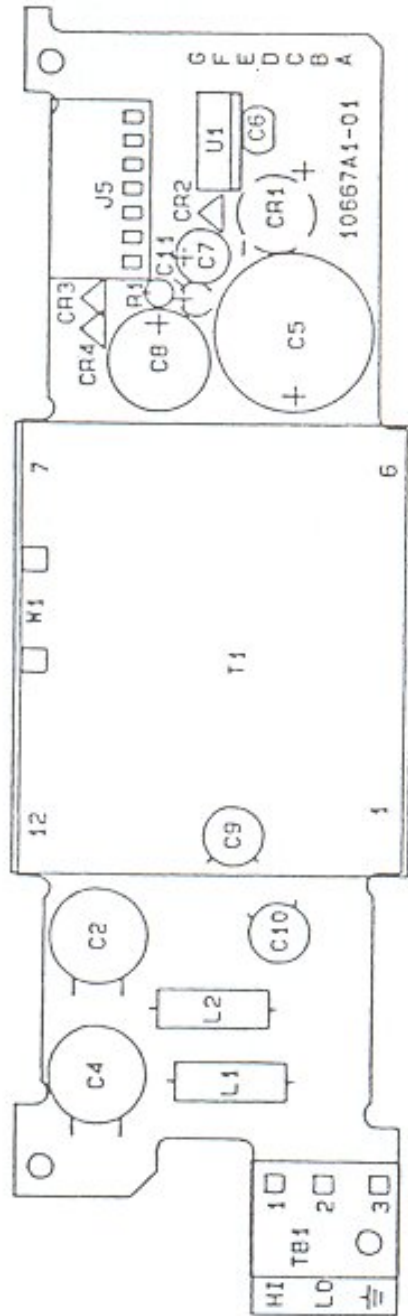


Figure 6-5 Power supply assembly diagram

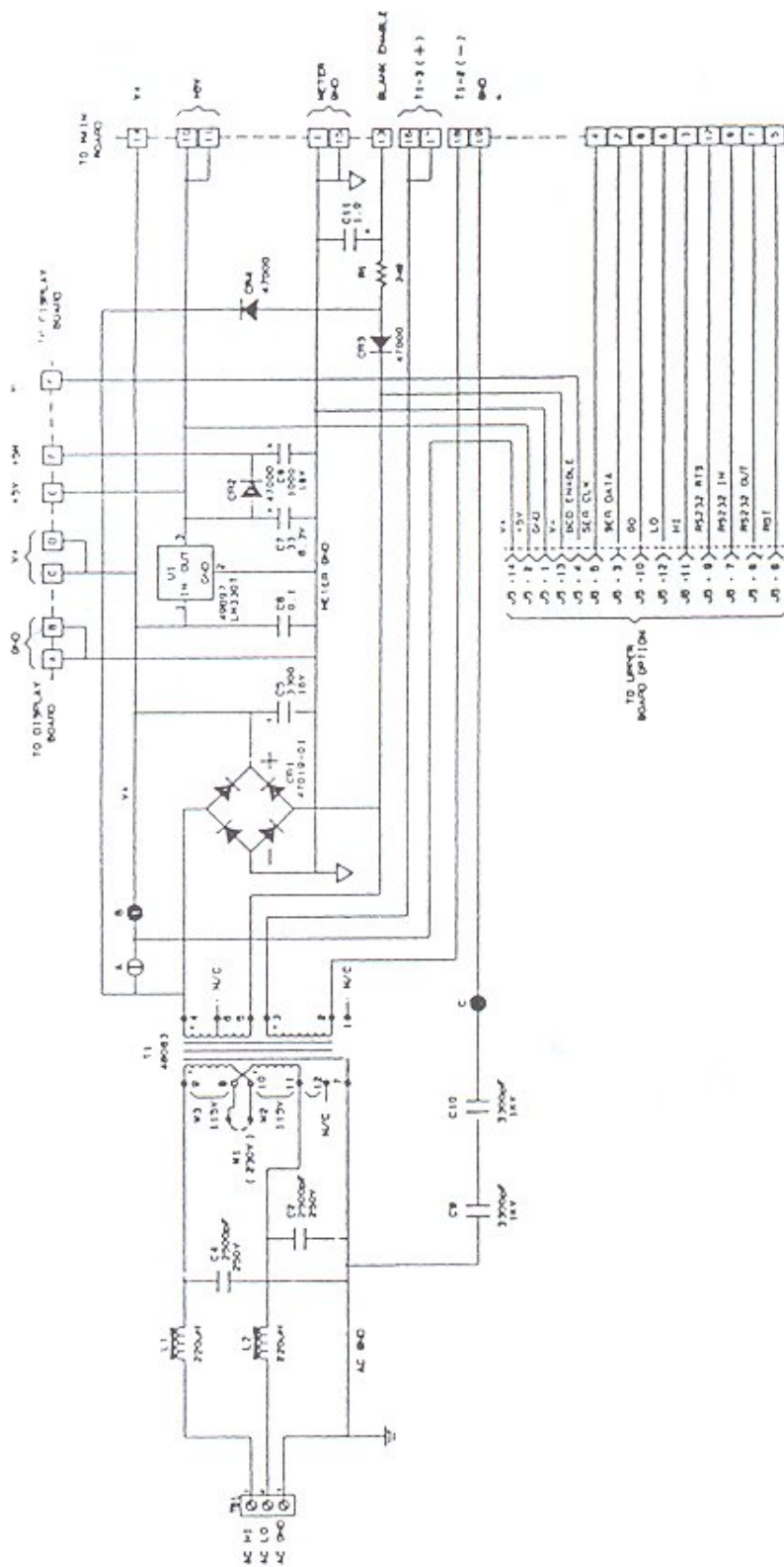


Figure 6-6 Power supply schematic

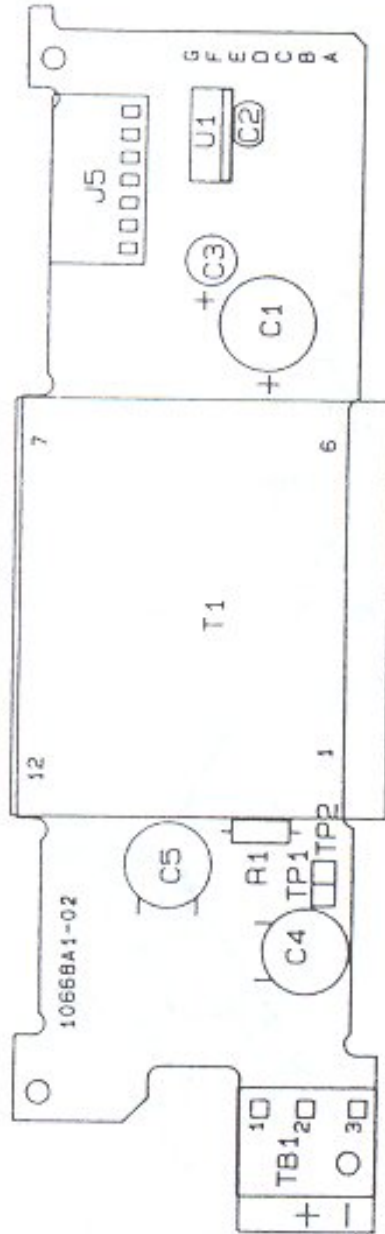


Figure 6-8 DC Power supply assembly (option)

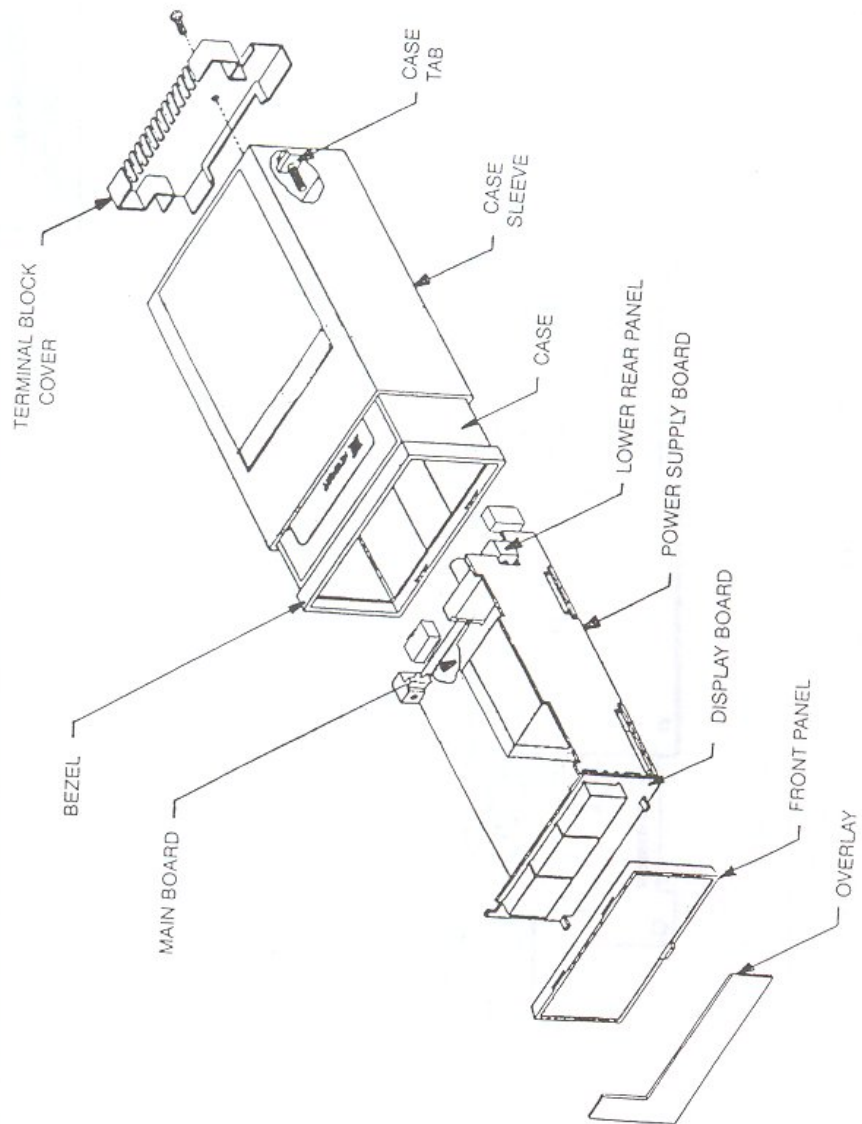


Figure 6-9 Exploded view of module

Rev	Eco. No	Date	By	CHK
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ADDENDUM TO 6155AS OWNERS MANUAL

From revision B of the program code, the 6155AS display incorporates additional features.

The 6th character of the display will now show "b" at power-up.

ASCII hex	Code	Keyboard character	Function
04	EOT	Ctrl D	Switches the display to behave to a sub-set of BS4504
12	DC2	Ctrl R	Sets the display to 25% brightness
14	DC4	Ctrl T	Sets the display to 100% brightness
18	CAN	Ctrl X	Sets the display to 50% brightness (normal)
02	STX	Ctrl B	Start message (BS4504)
03	ETX	Ctrl C	End message (BS4504)

Table. 1 Additional recognised codes.

BS4504 SUB-SET PROTOCOL.

The display powers-up normally responding to any valid received characters. If the character EOT is received at any time the 6155AS changes to a sub-set of the BS4504 protocol.

The four characters immediately following EOT are then interpreted as the group number (sent twice) and the ID number (sent twice).

If these characters correspond to the EQUIVALENT ADDRESS of the display set on the front panel DIP switches (see Table.2) the display becomes active. Otherwise it ignores all further characters until EOT is again transmitted.

Once active, the STX character starts the recognition and display of characters. ETX is used as a terminator and inhibits further operation and also causes the "strobe" function when operating in MODE 2.

Note that data strings terminated by carriage return should not be used, as carriage return followed by ETX will result in a blank display. See below for details.

The display is a receiver only and provides no response or talkback

The block check characters (error detection) are not used and all alpha characters following STX are treated as printable characters. These will appear on the display if operating in MODE 0. In MODE 1 they will display only if places within the final six positions of the character string.

Group and ID numbers 11 to 19 can be used as follows:

Address		DIP Switches				Displayed Character
(G)	(ID)	1	2	3	4	
1	1	1	0	0	0	1
1	2	0	1	0	0	2
1	3	1	1	0	0	3
1	4	0	0	1	0	4
1	5	1	1	1	0	5
1	6	0	1	1	0	6
1	7	1	0	0	0	7
1	8	0	1	0	1	8
1	9	1	1	0	1	9

Table. 2 BS4505-Equivalent addresses

To exit B55404 protocol and return to normal operation requires either a power-on reset or an ASCII 1B (ESC) character.

BRIGHTNESS CONTROL

The reception of DC2 (Ctrl R), DC4 (Ctrl T) or CAN (Ctrl X) now enable the display brightness to be controlled over the serial data line. See Table. 1 for details.

ETX (CONTROL C)

The character ETX (Ctrl C) is now equivalent to a carriage return followed by XOFF.

Thus a data string terminated with a carriage return will result in a blank display upon receipt of the ETX character.

NOTES

WARRANTY

All products from Newport Electronics are warranted against defective material and workmanship for a period of one (1) year from date of delivery.

We would like to know more about customer needs. Please help us by filling out the warranty card enclosed. In exchange, Newport Electronics will extend this warranty for one (1) additional year.

If the Newport product you have purchased appears to have a defect in material or workmanship or fails during normal use within the warranty period, please contact Newport Electronics INC on 1- 800 - 284 - 4914, if in the USA, or on 0800 488 488 for the UK, and European Headquarters, or call direct to any of our European offices shown on the back of this manual. We will assist you in resolving the problem. If it is necessary to return the product to Newport, please include a note stating: Name, Company, Address, Phone number, and a detailed description of the problem. Also, please indicate that this is a warranty repair. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

Newport's warranty does not apply to defects resulting from action of the buyer, such as mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorised modification.

No other warranties are expressed or implied. Newport Electronics specifically disclaims any implied warranties of merchantability or fitness for a specific purpose. The remedies outlined above are the buyer's only remedies. Newport Electronics will not be liable for direct, indirect, special, incidental or consequential damage whether based on contract, tort or other legal theory.