

6155AS

6 DIGIT SERIAL INPUT
REMOTE DISPLAY TYPE

U0124ML-01

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ADDENDUM TO 6155AS HANDBOOK.

APPLICATION:

From issue B and above of the 6155AS PCB (U0092); there is an additional facility incorporated which permits the inversion of current loop input data (2/20mA). It is applicable both for Loop powered and 6155AS powered operation:

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

Follow the procedure below to select this feature if required.

PROCEDURE:

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 be slide forward out of its casing.
5. Open-circuit solder-switch positions SW1-A and SW2-A.
6. Short-circuit solder-switch positions SW1-B and SW2-B.
7. Re-assemble the 6155AS meter now by reversing steps 1.to 4. above.
8. The procedure for all other aspects of configuration remain unchanged.
Refer to the 6155AS Owners Manual for full details.

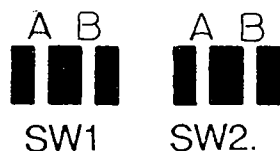


fig.1 Location of solder-switches SW1 and SW2.

WARNING:

THE ABOVE PROCEDURE INVERTS ALL TYPES OF DATA INPUT. IF AN INPUT SIGNAL OTHER THAN CURRENT LOOP IS BEING USED (TTL, RS232, RS422, RS423 OR RS485) THE SOLDER SWITCHES SW1 AND SW2 SHOULD BE RETURNED TO THE STANDARD CONFIGURATION.

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. **Hi, ALL OFF** 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.

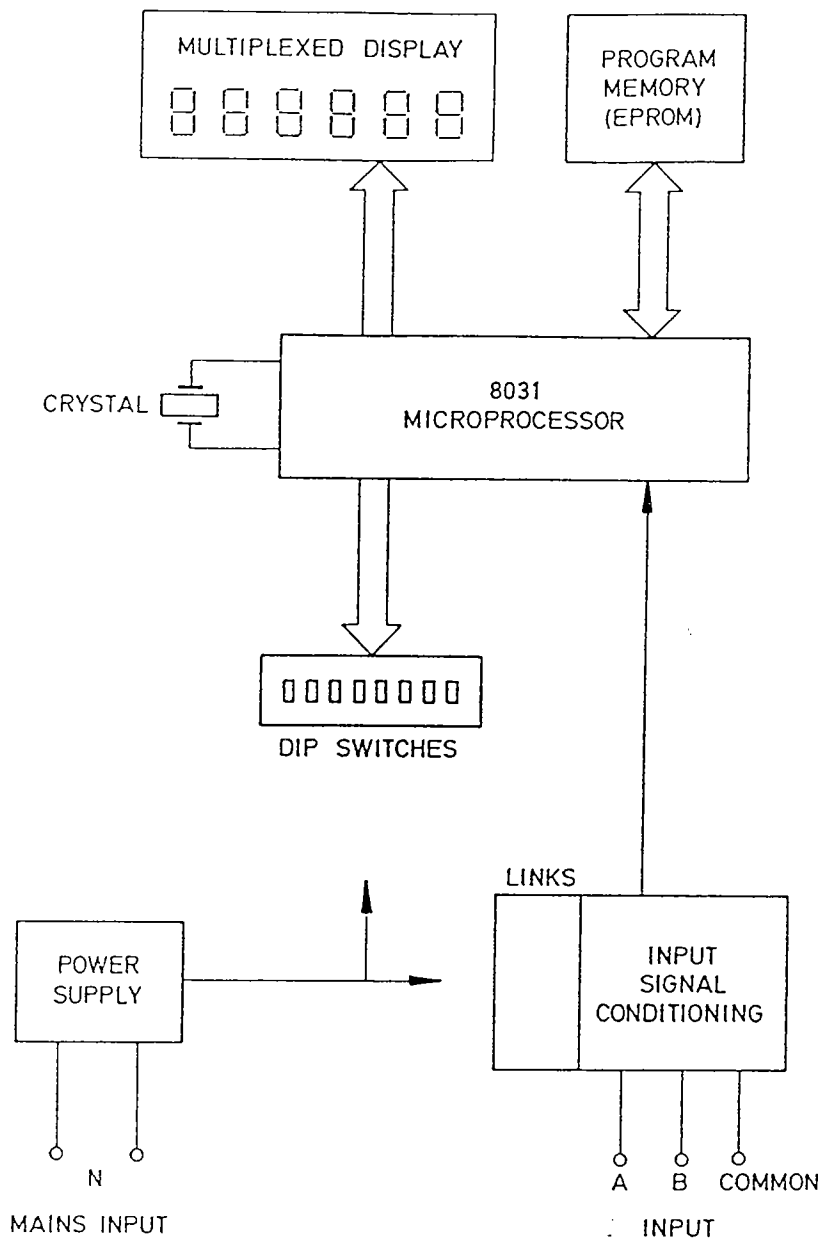


Figure 1.1 The 6155AS Block Diagram

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 cutout 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 (¯=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_7I " 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.

ASCII CODE	DISPLAYED CHARACTER	ASCII CODE	DISPLAYED CHARACTER	ASCII CODE	DISPLAYED CHARACTER	ASCII CODE	DISPLAYED CHARACTER
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	4	4B	K	57	w
34	4	40	(SPACE)	4C	L	58	x
35	5	41	A	4D	M	59	y
36	6	42	b	4E	N	5A	z
37	7	43	C	4F	O	5B	[
38	8	44	d	50	P	5C	\
39	9	45	E	51	Q	5D]
3A	:	46	F	52	R	5E	^
3B	_	47	G	53	S	5F	_

Figure 3.1 Display Character Table

Various control characters are also used :-

ASC11 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 A.C 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).

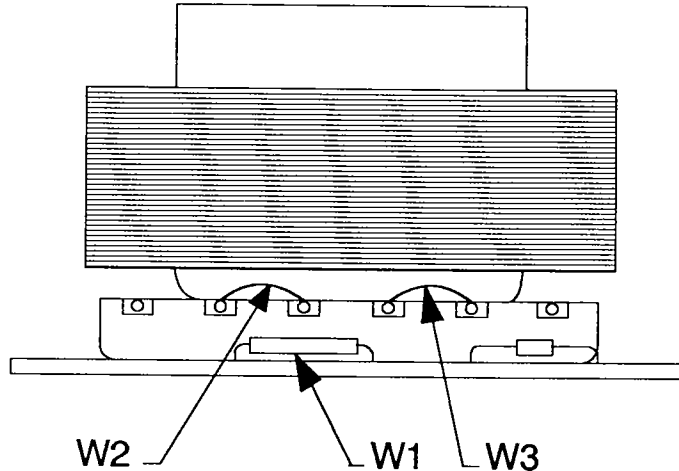
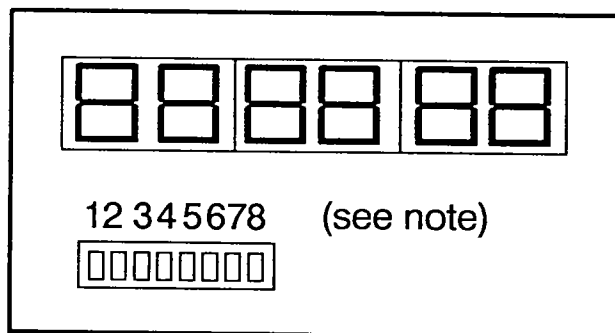


Figure 4.1 Jumper Locations on Power Transformer.

AC POWER CONNECTIONS		
AC POWER	WIRE COLOUR	
	EUROPE	USA
AC POWER HI	BROWN	BLACK
AC POWER LO	BLUE	WHITE
AC POWER GND	GREEN/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 CHR.
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
“	D,H,J,L	AIN	BIN
20mA Loop	A,D,H,J,K,L	BIN	COM
“	A,D,H,J,K,L	AIN	BIN
±5V	D,F,H,I	BIN	COM.
P6000	As Above	As Above.	
±15V	D,F,I	BIN	COM.
DIFF	C,H	BIN	AIN
Termination	E	Common at COM.	
269	D,H,F,I	AIN/BIN COM.	

4.6 POWER AND SIGNAL CONNECTIONS

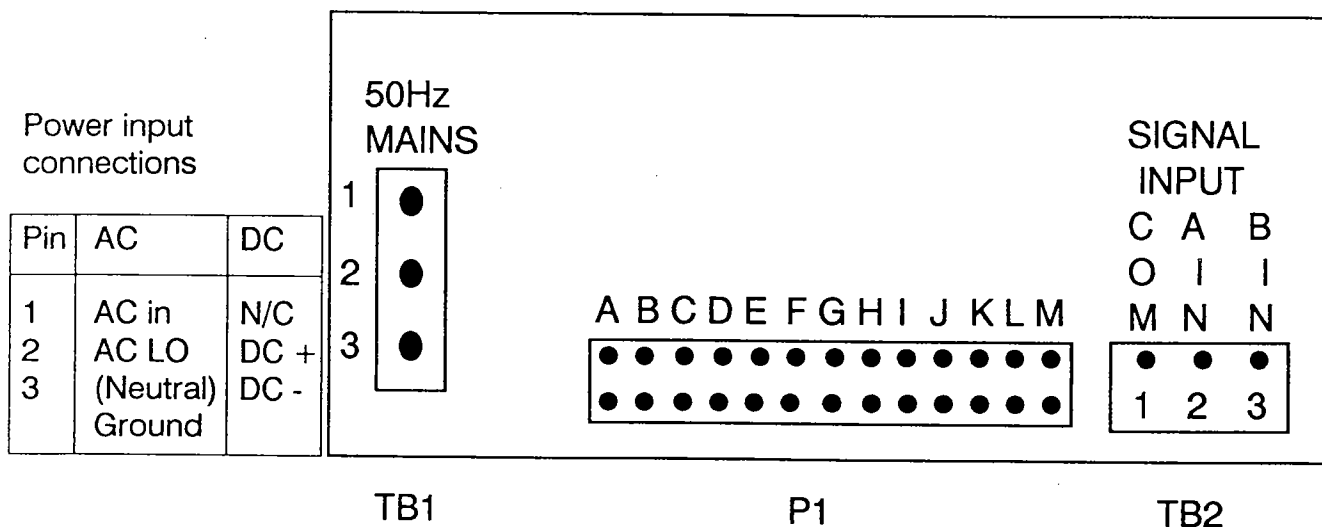


Figure 4.3 6155AS Rear Panel with pin Assignments

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:-

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 be slide forward out of its casing.
5. Open-circuit solder-switch positions SW1-A and SW2-A.
6. Short-circuit solder-switch positions SW1-B and SW2-B.
7. Re-assemble the 6155AS meter now by reversing steps 1.to 4. above.
8. The procedure for all other aspects of configuration remain unchanged.

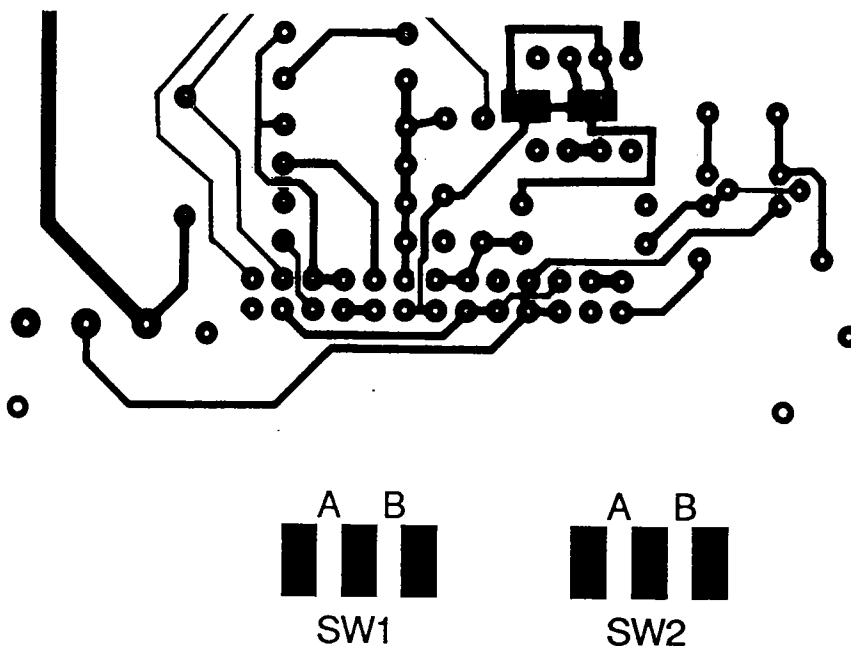
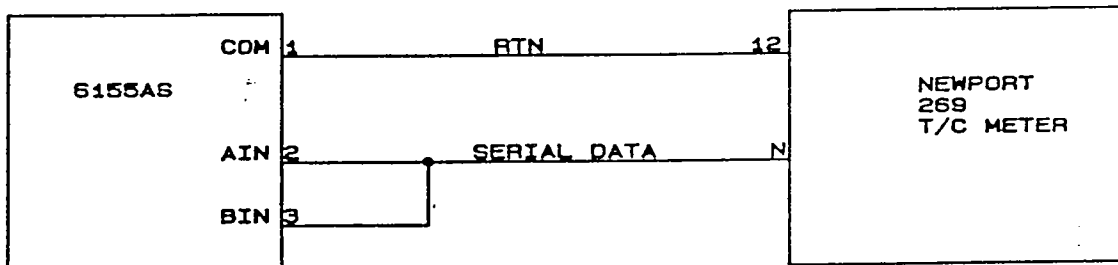


fig.1 Location of solder-switches SW1 and SW2.

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

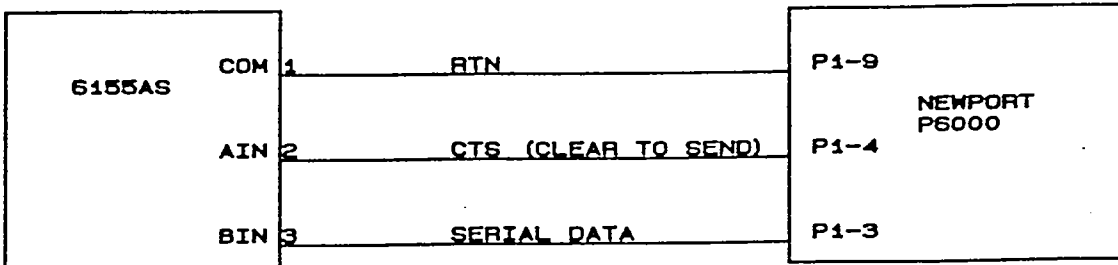
Shown below in figures 4.4 and 4.5 are interconnection and configuration details for using the 6155AS with Newport products 269 and P6000.



6155AS JUMPERS SELECTED :
D, H, F, I

SWITCH POSITIONS
S1 S2 S3 S4 S5 S6 S7 S8
X X X X 0 1 0 1

FIG 4.4 6155AS/269 INTERFACING



6155AS JUMPERS SELECTED :
D, H, F, I

SWITCH POSITIONS
S1 S2 S3 S4 S5 S6 S7 S8
X X X X 0 1 1 1

P6000 PROGRAMMING:
1200 BAUD (CNFG1-SS2)
9 CHARACTER FORMAT (CNFG2-SS6)

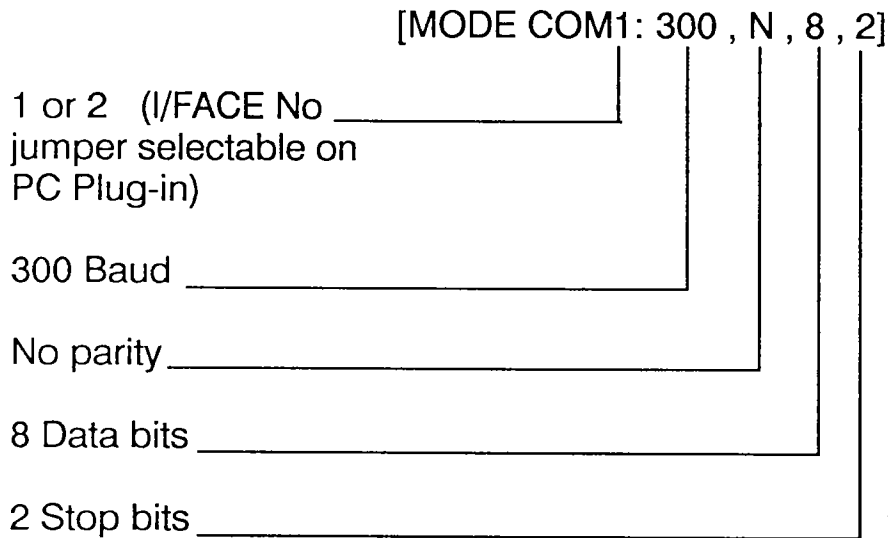
FIG 4.5 6155AS/P6000 INTERFACING

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] (Re-routes output to printer: LPT1 to Communications Adaptor: 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.

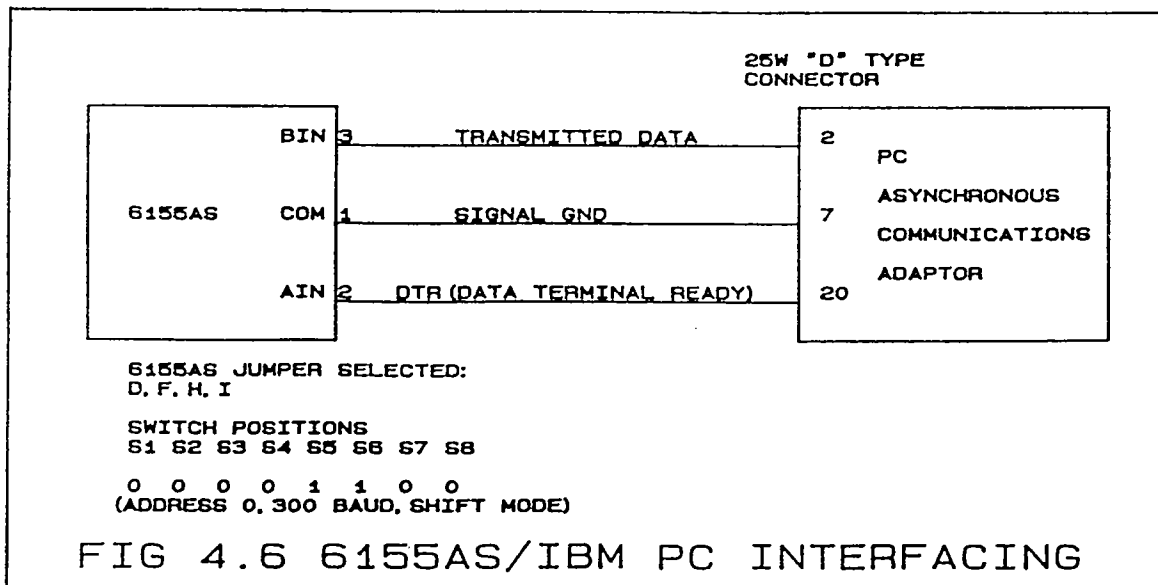


Figure 4.6 6155AS / IBM PC Interfacing

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.)

(1) TTL

LOGIC 1=2V Min. =Space
LOGIC 0=0.8V Max. =Mark
LOGIC 0 Input current= -1mA Max.
Vin Max. =15V

(2) 2mA LOOP (externally powered)

LOGIC 1=1.5mA Min.=Mark
LOGIC 0=0.5mA Max.=Space
Volt drop.=1V Max.
Max input current.=0.5A

(3) 2mA LOOP (6155AS powered)

Open circuit voltage=5V \pm 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=1V 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

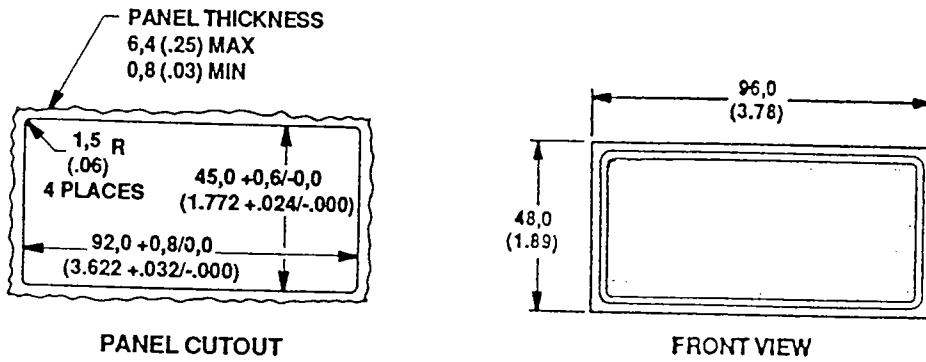
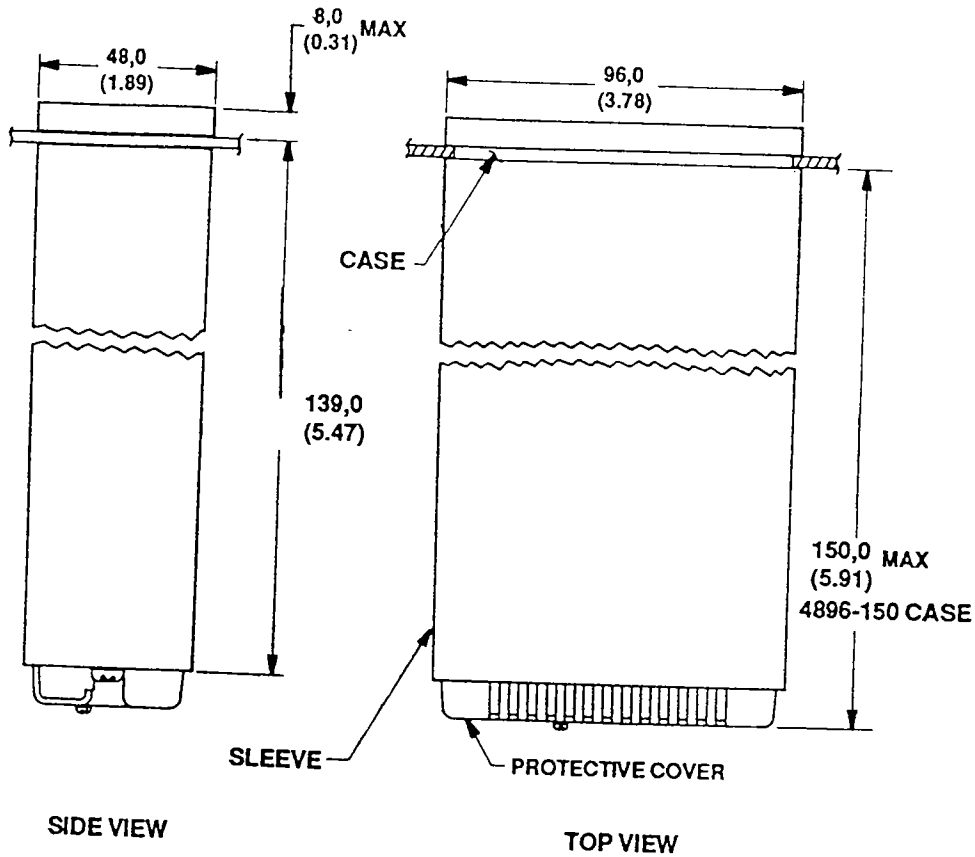


Figure 6-1 Case Dimensions

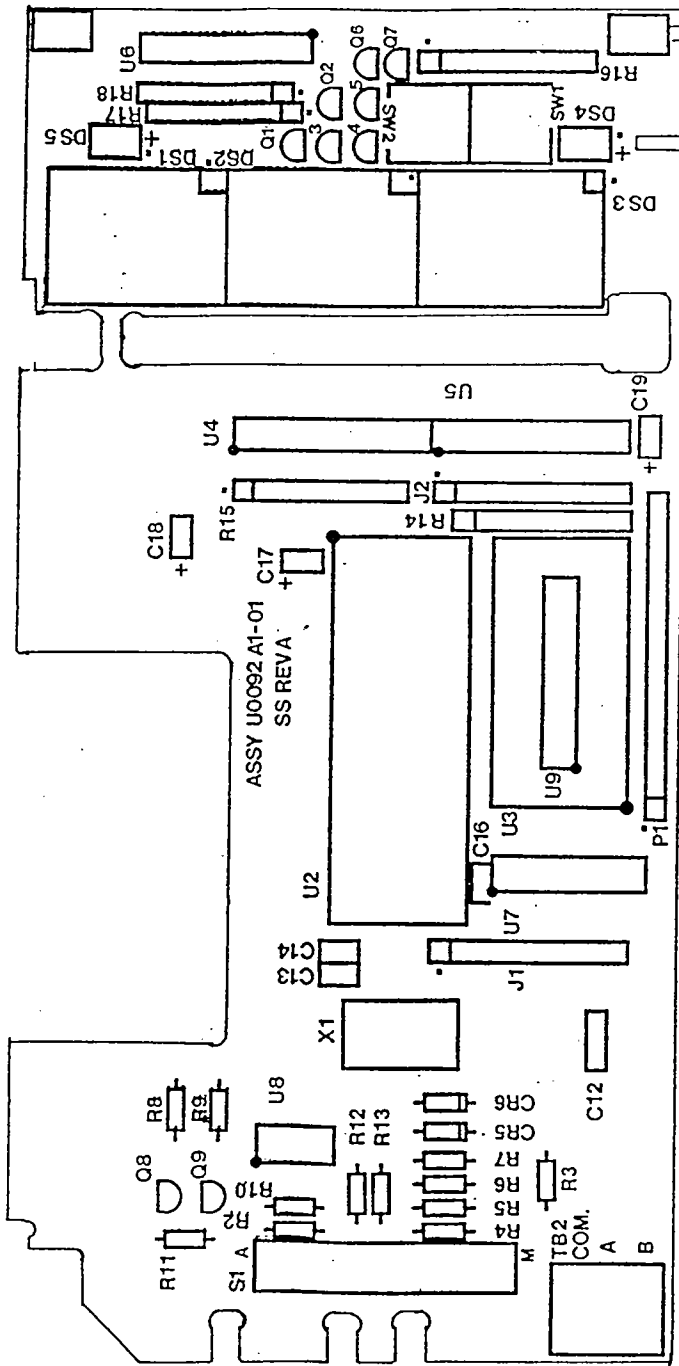


Figure 6-2 Main Board & Display Board Assembly Diagrams.

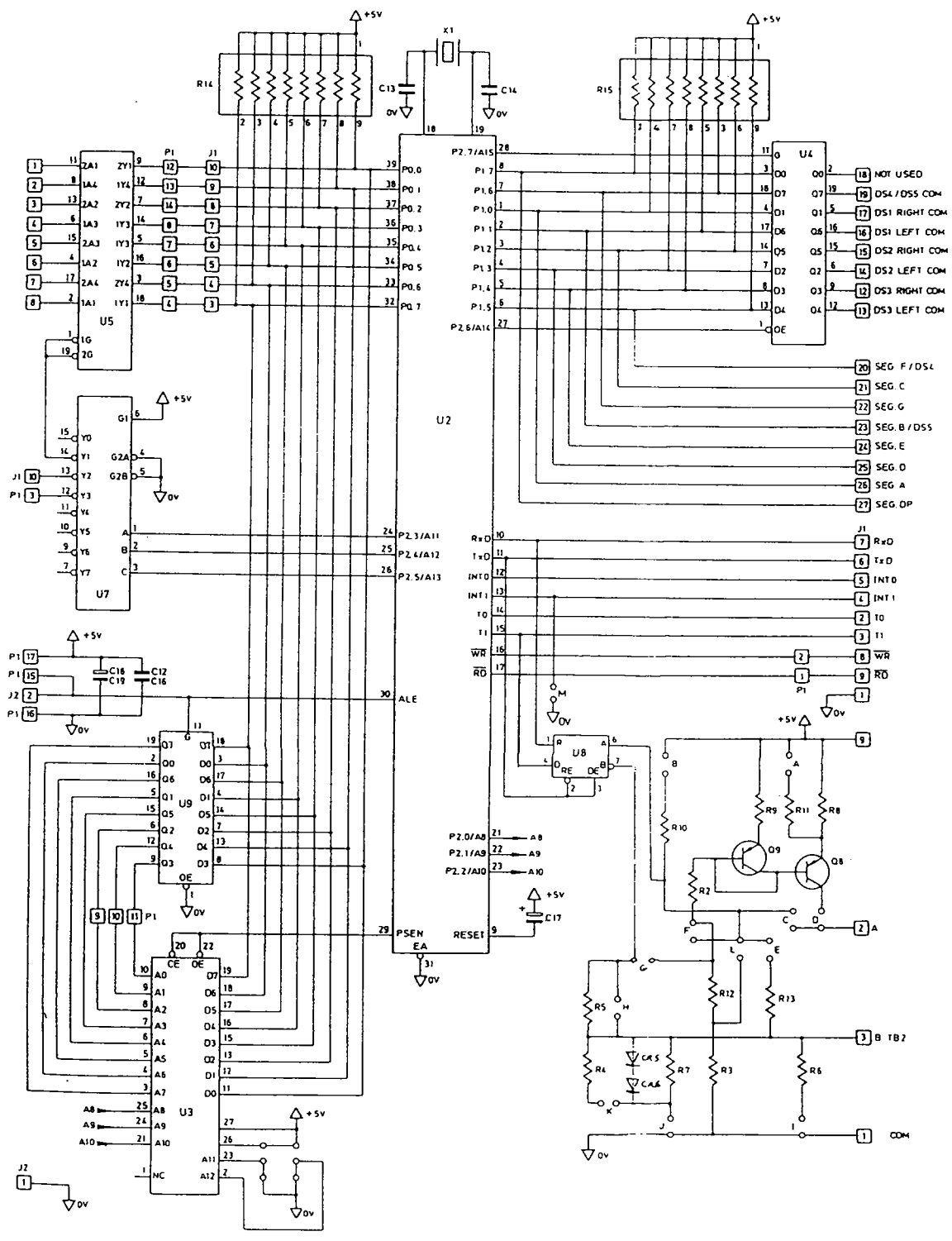
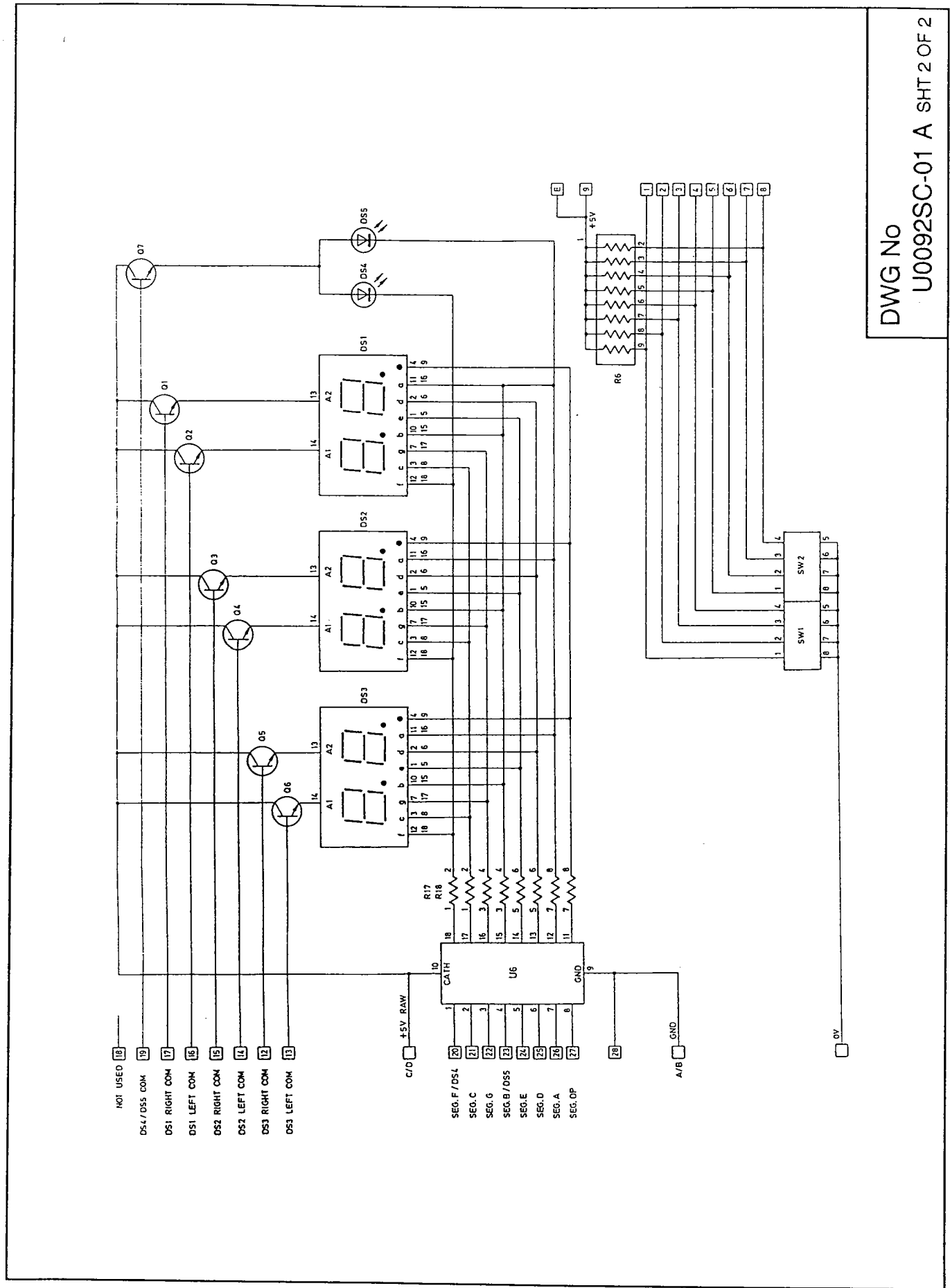


Figure 6-3 Main Board Schematic.



DWG No
U0092SC-01 A SHT 2 OF 2

Figure 6-4 Display Board Schematic.

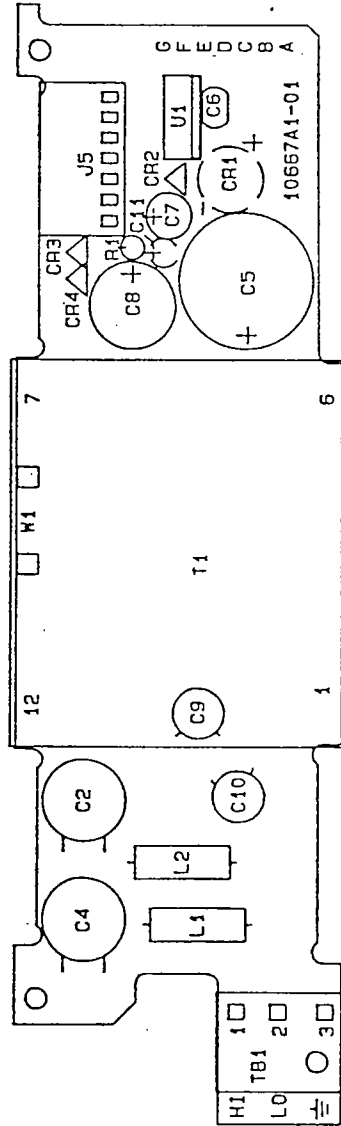
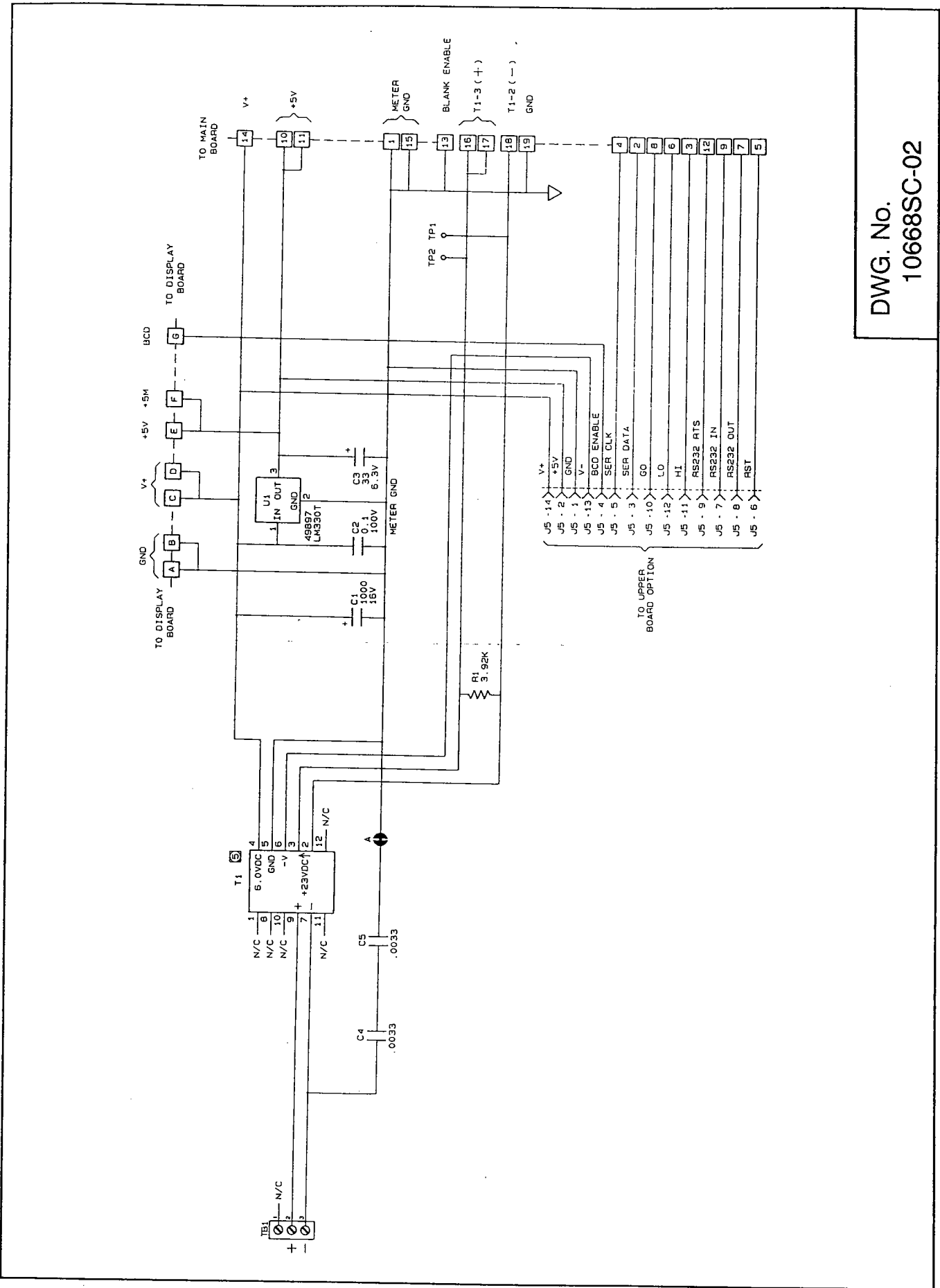


Figure 6-5 Power Supply Assembly diagram.



DWG. NO.
10668SC-02

Figure 6-7 DC Power Supply Schematic (Option)

DWG. NO.
10668AY-02

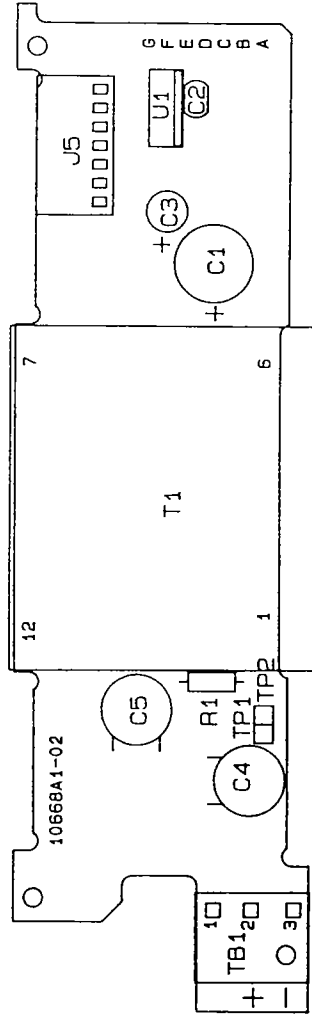


Figure 6-8 DC Power Supply Assembly (Option)

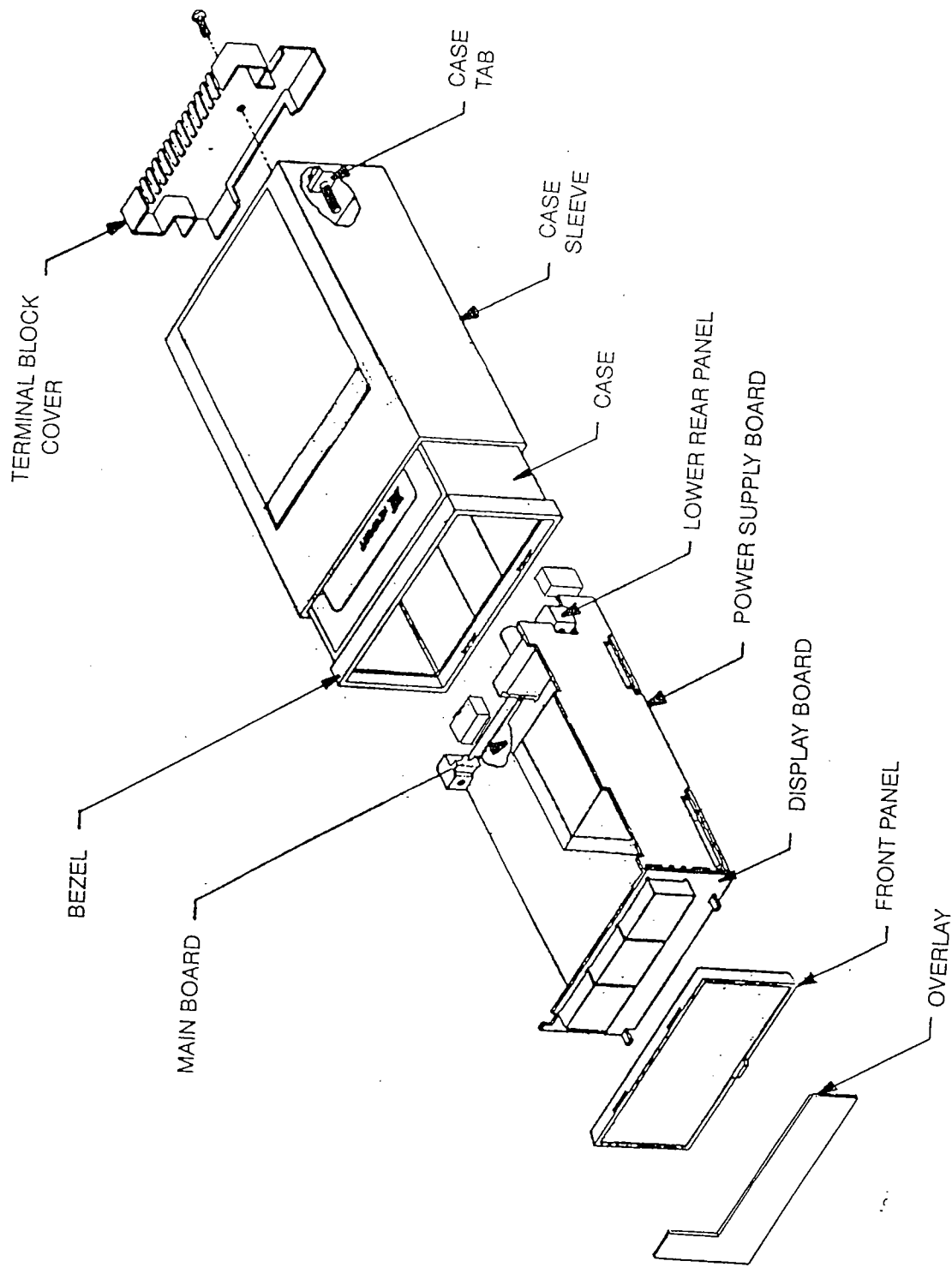


Figure 6-9 Exploded View of Module.