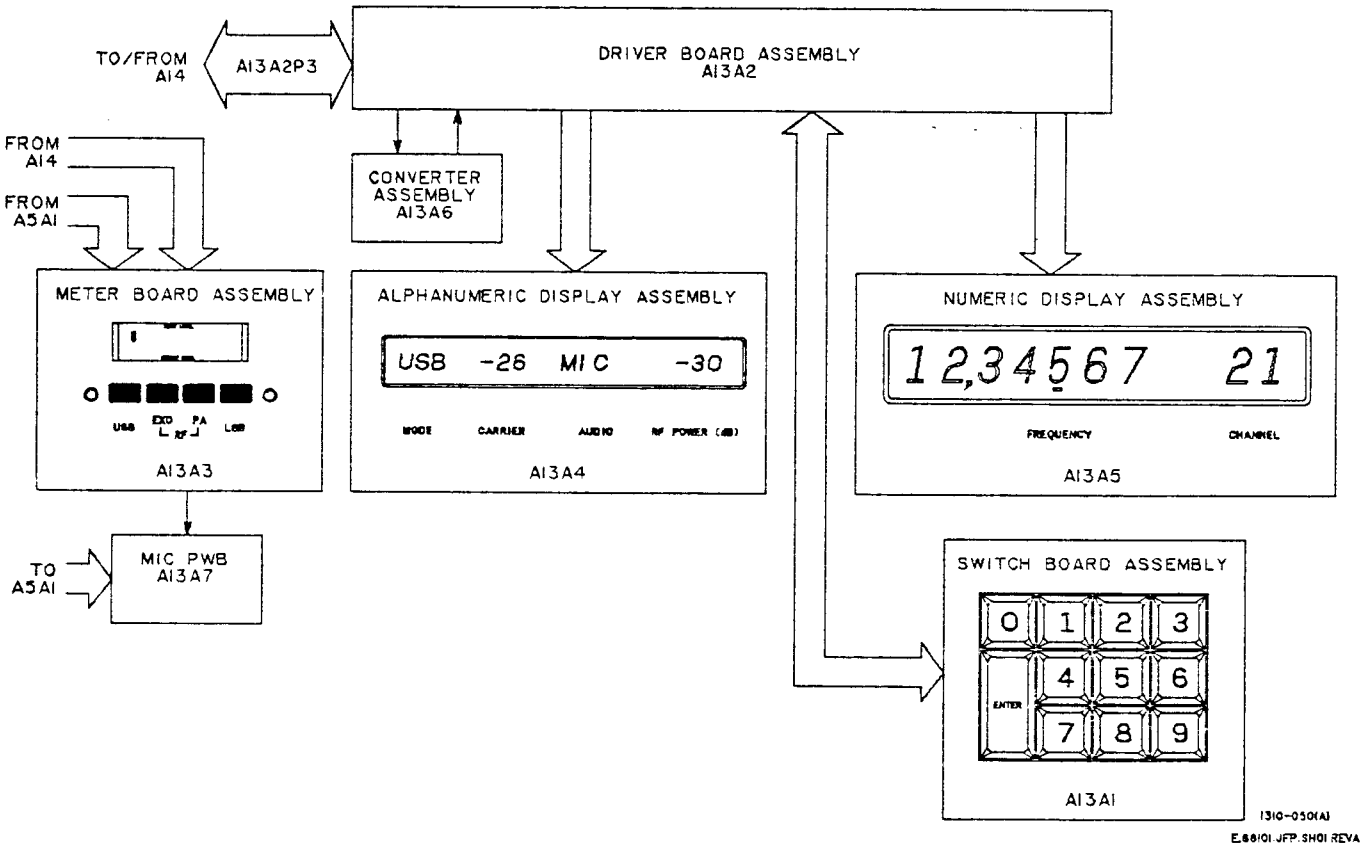
A13
FRONT PANEL ASSEMBLY



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FRONT PANEL ASSEMBLY A13

1. GENERAL INFORMATION

Front Panel Assembly A13 contains control circuits which permit all operator local interface functions such as tuning, channel selection, system status indications, etc.

All operator controls (mode select, carrier select, audio input select, etc) are accessed from the front of the assembly. Figure 3-1 of the Operation section details the location and functions of these controls. Figure 1 shows the six subassemblies of the front panel.

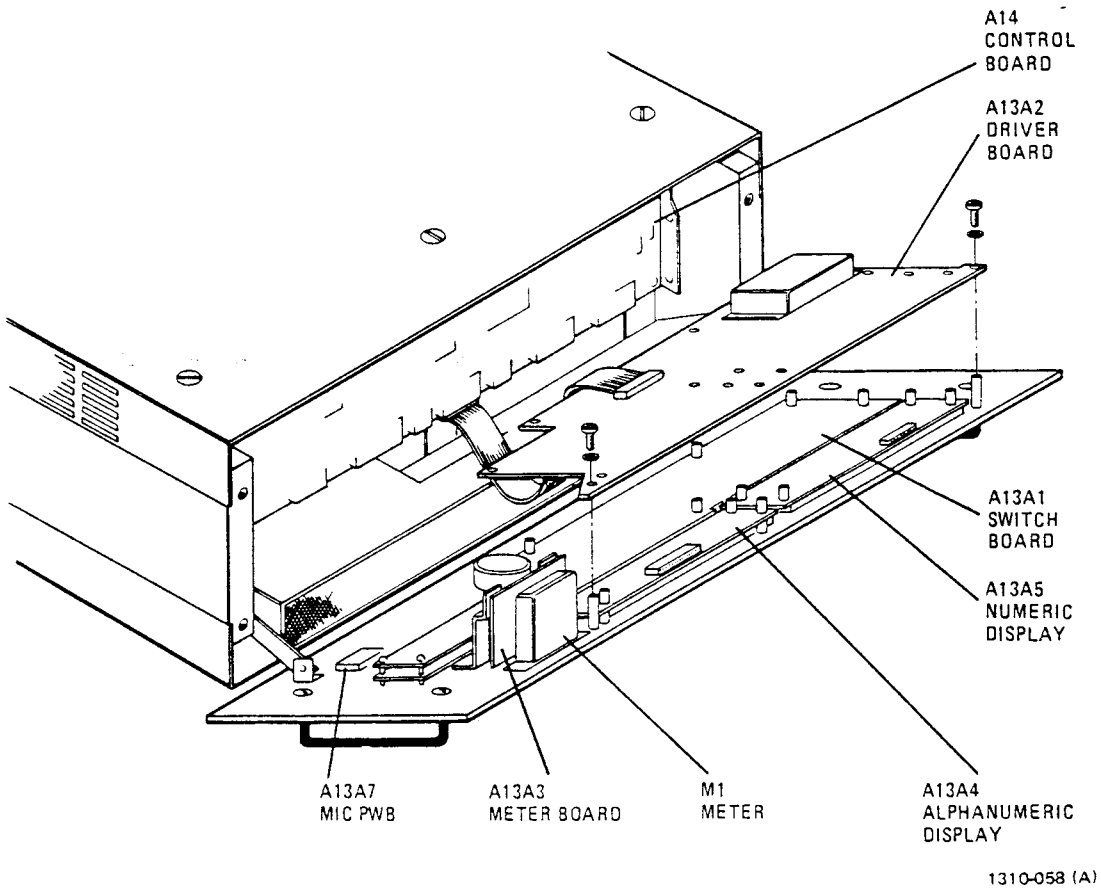


Figure 1. Front Panel Assembly A13 Exploded View

There are seven major subassemblies in Front Panel Assembly A13. They are shown in figure 2. These assemblies are:

- Switch Board Assembly A13A1
- Driver Board Assembly A13A2
- Meter Board Assembly A13A3
- Display Board (Alphanumeric) Assembly A13A4
- Display Board (Numeric) Assembly A13A5

- Converter Assembly A13A6
- Microphone PWB A13A7

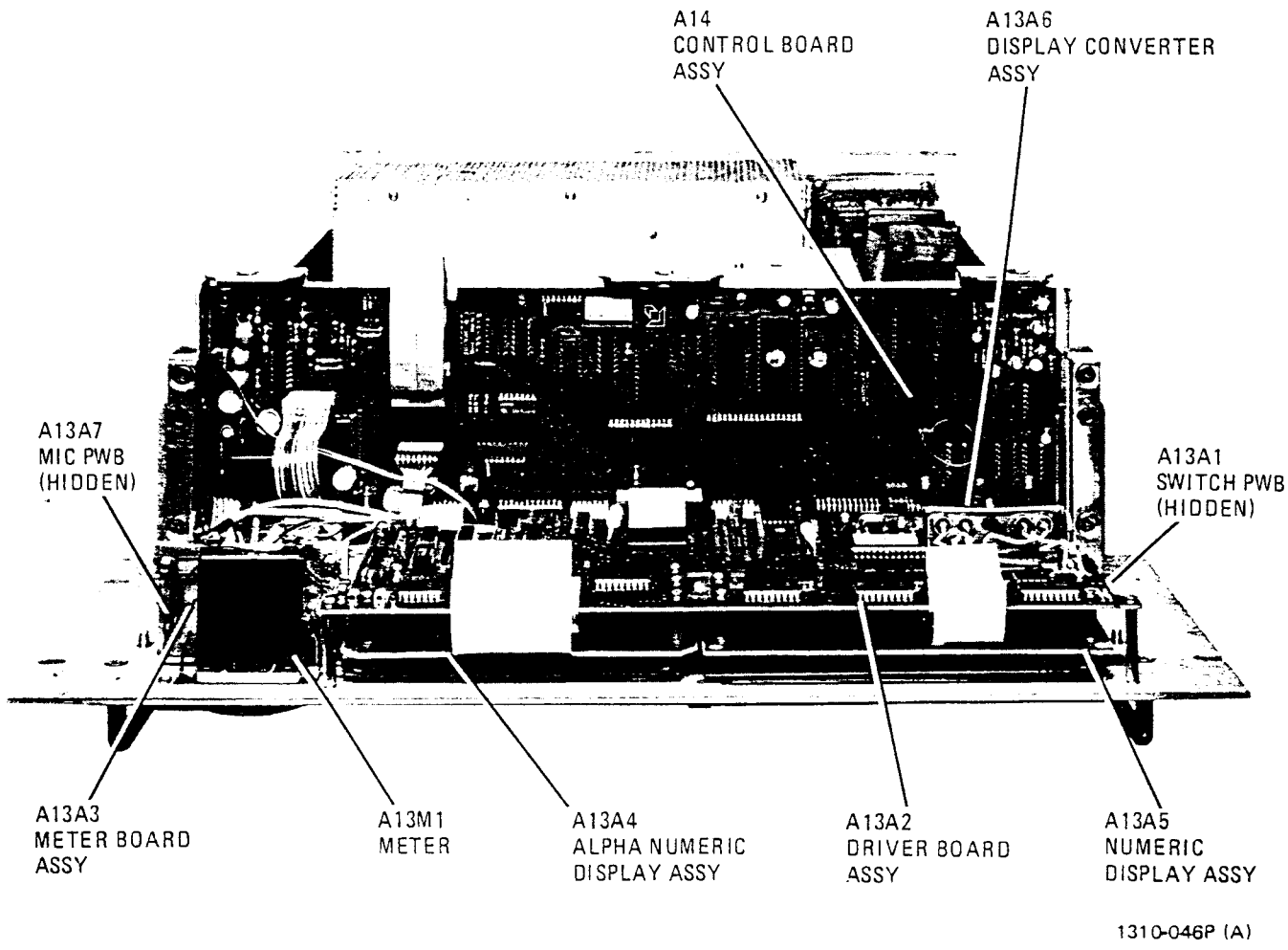


Figure 2. RF-1310 Front Panel Assembly A13 (Rear View)

The Front Panel Assembly is normally secured to the chassis by four front panel captive screws. Loosening these screws allows the entire assembly to pivot down on hinges (located at two lower corners). This permits access to any of the items listed above as well as to Control Board Assembly A14 which is mounted behind the front panel.

All major assemblies and components of Front Panel Assembly A13 are listed in table 1.

Table 1. Front Panel Assembly A13 Parts List

Ref. Desig.	Part Number	Description
A13	10121-2000	FRONT PANEL ASSEMBLY
A13A1	10121-2100	PWB ASSY, SWITCH AND LED
	10073-2200	PWB ASSY, FRONT PANEL
	10121-2300	PWB ASSY,METER
	10073-2400	PWB ASSY,DISPLAY
	10073-2500	PWB ASSY,DISPLAY
	10073-2250	CONVERTER MDL ASSY
	10121-2900	PWB ASSY, MIC
	10121-2005	PANEL, FRONT
	10073-2021	FILTER, POLARIZED DISPLAY
	10073-2020	FILTER, POLARIZED DISPLAY
	Z23-0011-402	GROMMET
	10073-7104	RETAINER,CAPTIVE
	10121-2006	BEZEL, UPPER
	10121-2004	BEZEL, LOWER FRT PNL
A13M1	10121-2311	METER
P1	J46-0016-006	CONN, 6 PIN
P2	J40-0002-002	HOUSING, CONN, 2 PIN
S1	10121-2011	SW 5POS 60DEG OP.FRAME

2. FRONT PANEL SWITCHBOARD A13A1

2.1 General Description

All front panel switches and LEDs are mounted on Front Panel Switchboard Assembly A13A1 except the meter select switches. Signals generated by switch closures are routed to Control Board Assembly A14 via Front Panel Driver Board Assembly A13A2. The discrete LED displays are also driven from Front Panel Driver Board Assembly A13A2. Figure 3 is a block diagram of the A13A1 assembly.

2.2 Interface Connections

Table 2 lists Front Panel Switchboard Assembly A13A1 interface connections.

2.3 Functional Description

2.3.1 Switch Matrix

The pushbutton switches on the front panel are arranged in a matrix of eight columns by four rows. The eight column signals (COL 0 through COL 7) are inputs from Front Panel Driver Board Assembly A13A2, while the four row signals (PB0 through PB3) are outputs to the Driver Board. The microprocessor on the Control Board detects switch activity by enabling all the column outputs while reading back the row inputs (PB0 through PB3) looking for a connection between any row and any column. If a closure is detected, it enables the column lines selectively while reading back the row lines again to determine the exact location of the switch closure. The microprocessor then performs the activity indicated by the closure, including display update.

2.3.2 LED Circuits

The discrete LEDs on the switchboard are driven directly from the Front Panel Driver board. (See the description for Driver Board A13A2). Table 3 lists and describes the LED indicators.

2.4 Maintenance

The advanced design of the A13A1 assembly eliminates the need for regular maintenance. However, when replacing components on this assembly, observe the following caution:

CAUTION

Cleaning fluids normally used to remove flux will damage switches used on this assembly. Cleaning of the A13A1 assembly is not recommended.

2.5 Parts List, Component Locations, and Schematic Diagrams

Table 4 is the Front Panel Switchboard Assembly A13A1 parts list. Figures 4 and 5 are the Front Panel Switchboard Assembly A13A1 component location diagram and schematic diagram, respectively.

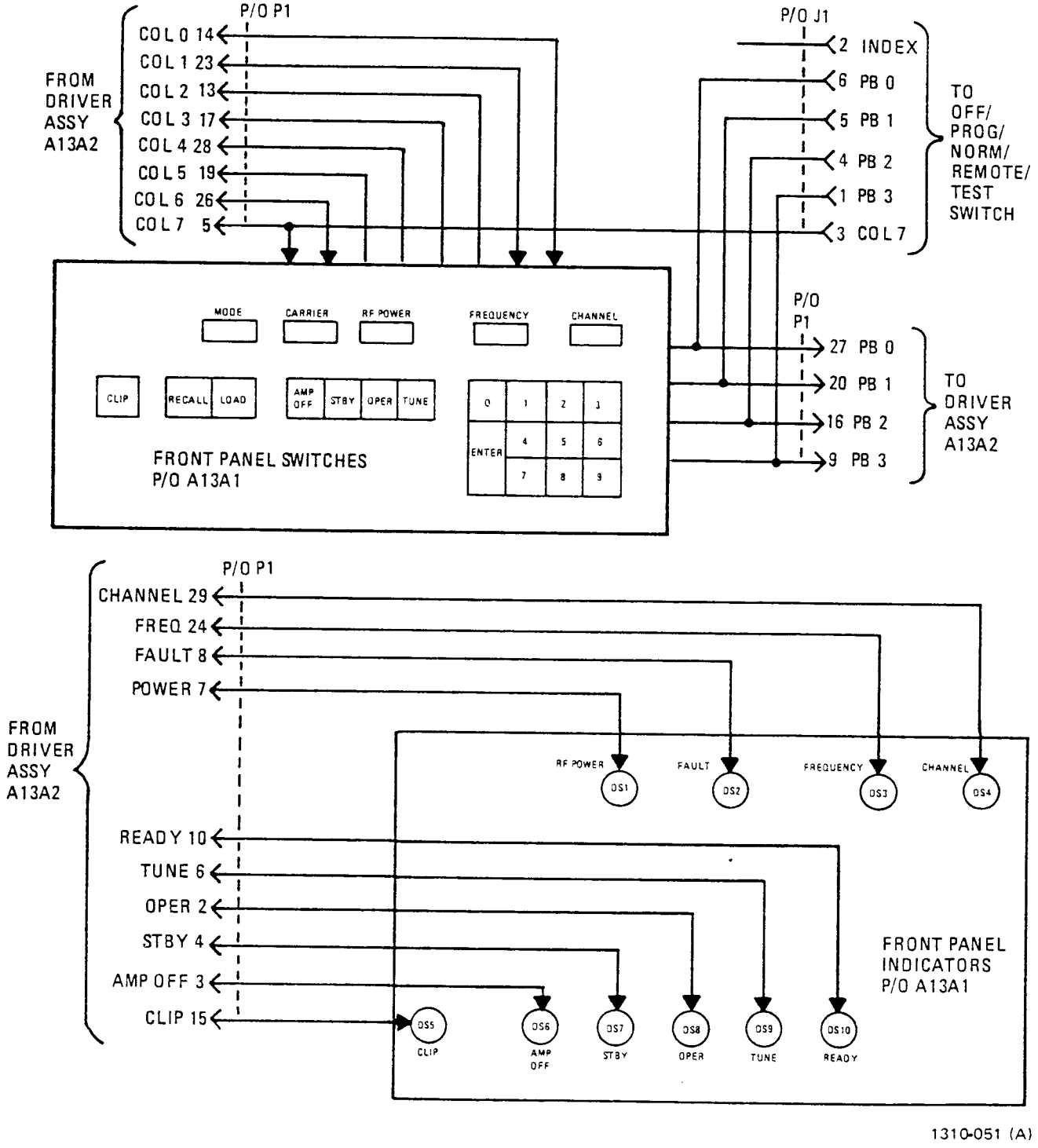


Figure 3. Front Panel Switchboard Assembly A13A1 Block Diagram

Table 2. Front Panel Switchboard Assembly A13A1 Interface Connections

Connector	Signal
P1 to/from A13A2	
P1-1	GND
P1-2	OPER
P1-3	AMP OFF
P1-4	STBY
P1-5	COL 7
P1-6	TUNE
P1-7	POWER
P1-8	Fault LED
P1-9	PB3
P1-10	READY
P1-11	TWA
P1-12	TWB
P1-13	COL 2
P1-14	COL 0
P1-15	CLIP
P1-16	PB2
P1-17	COL 3
P1-18	N/C
P1-19	COL 5
P1-20	PB1
P1-21	N/C
P1-22	N/C
P1-23	COL 1
P1-24	FREQ
P1-25	N/C
P1-26	COL 6
P1-27	PB0

Table 2. Front Panel Switchboard Assembly A13A1 Interface Connections (Cont.)

Connector	Signal
P1-28	COL 4
P1-29	CHANNEL
P1-30	+5 V
J1 to/from OFF/PROG/NORM/REMOTE/TEST SWITCH	
J1-1	PB3
J1-2	INDEX
J1-3	COL 7
J1-4	PB2
J1-5	PB1
J1-6	PB0

Table 3. Switchboard LED Indicator Assignments

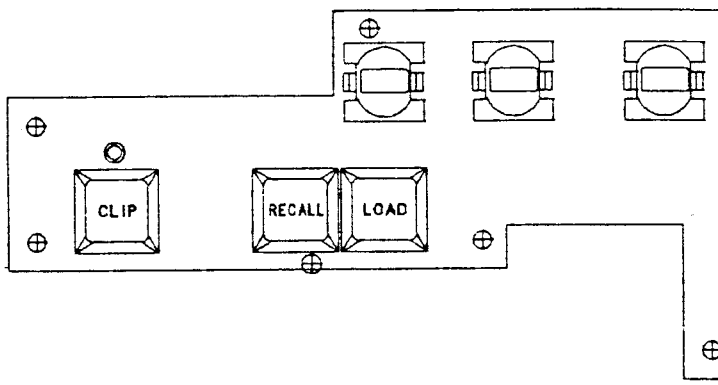
Indicator	Function	Description
DS1	RF Power	Lights when keypad is dedicated to changing the PA power reduction value.
DS2	FAULT	Lights when BITE, power supply, or synthesizer fault is detected. Will also light briefly during powerup.
DS3	Frequency	Lights when keypad is dedicated to changing the frequency display.
DS4	Channel	Lights when keypad is dedicated to changing channel selection.
DS5	Clip	Lights when clipper is selected.
DS6	AMP OFF	Lights to indicate that the systems power amplifier is off.
DS7	STBY	Lights when the systems power amplifier is in standby mode.
DS8	OPER	Lights when the systems power amplifier is operational.
DS9	TUNE	Lights when tuning sequence is in process.
DS10	READY	Lights when tuning sequence is completed and system is ready to broadcast.

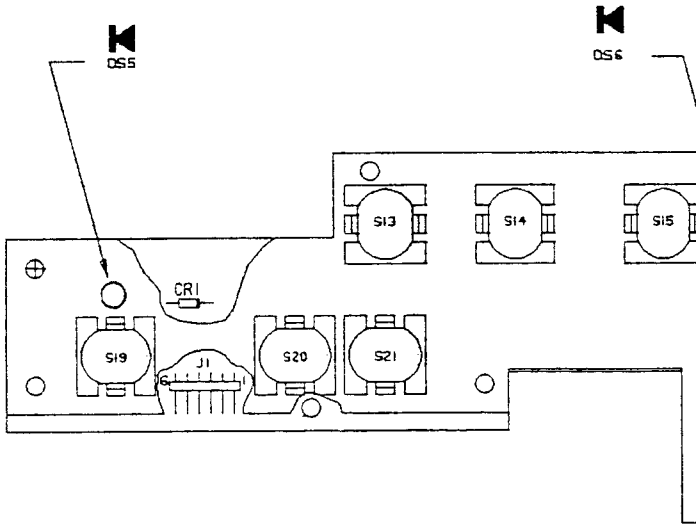
Table 4. Front Panel Switchboard Assembly A13A1 Parts List

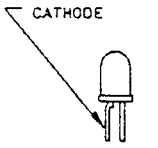
Ref. Desig.	Part Number	Description
A13A1	10121-2100	SWITCH AND LED ASSEMBLY
	10073-7052	RIBBON CABLE, 30 COND
	10073-2050	BUTTON,SW,0,CUSTOM MOLD
	10073-2051	BUTTON,SW,1,CUSTOM MOLD
	10073-2052	BUTTON,SW,2,CUSTOM MOLD
	10073-2053	BUTTON,SW,3,CUSTOM MOLD
	10073-2054	BUTTON,SW,4,CUSTOM MOLD
	10073-2055	BUTTON,SW,5,CUSTOM MOLD
	10073-2056	BUTTON,SW,6,CUSTOM MOLD
	10073-2057	BUTTON,SW,7,CUSTOM MOLD
	10073-2058	BUTTON,SW,8,CUSTOM MOLD
	10073-2059	BUTTON,SW,9,CUSTOM MOLD
	10073-2060	BUTTON,SW,TUNE,CUSTOM MLD
	10121-2044	BUTTON,SW,ENTER,MOLDED
	10121-2048	BUTTON,SW,CLIP, MOLDED
	10121-2047	BUTTON,SW,AMP OFF, MOLDED
	10073-2063	BUTTON,SW,RECALL,CSTM MLD
	10073-2064	BUTTON,SW,LOAD,CSTM MOLD
	10121-2046	BUTTON,SW,STBY,MOLDED
	10121-2045	BUTTON,SW,OPER,MOLDED
	10073-2069	BUTTON,SW,CUSTOM MOLD
CR1	1N4454	DIODE 200mA 75V SW
CR2	1N4454	DIODE 200mA 75V SW
CR3	1N4454	DIODE 200mA 75V SW
CR4	1N4454	DIODE 200mA 75V SW
CR5	1N4454	DIODE 200mA 75V SW
CR6	1N4454	DIODE 200mA 75V SW
CR7	1N4454	DIODE 200mA 75V SW
CR8	1N4454	DIODE 200mA 75V SW
DS1	N21-0002-000	LED GRN T-1 2.0MCD
DS2	N21-0001-000	LED RED T-1 2.5MCD
DS3	N21-0002-000	LED GRN T-1 2.0MCD
DS4	N21-0002-000	LED GRN T-1 2.0MCD
DS5	N21-0002-000	LED GRN T-1 2.0MCD
DS6	N21-0002-000	LED GRN T-1 2.0MCD
DS7	N21-0002-000	LED GRN T-1 2.0MCD
DS8	N21-0002-000	LED GRN T-1 2.0MCD
DS9	N21-0002-000	LED GRN T-1 2.0MCD
DS10	N21-0002-000	LED GRN T-1 2.0MCD
J1	J46-0033-006	CONN, 6 PIN
S1	S05-0004-001	SWITCH
S2	S05-0004-001	SWITCH
S3	S05-0004-001	SWITCH
S4	S05-0004-001	SWITCH
S5	S05-0004-001	SWITCH

Table 4. Front Panel Switchboard Assembly A13A1 Parts List (Cont.)

Ref. Desig.	Part Number	Description
S6	S05-0004-001	SWITCH
S7	S05-0004-001	SWITCH
S8	S05-0004-001	SWITCH
S9	S05-0004-001	SWITCH
S10	S05-0004-001	SWITCH
S11	S05-0004-001	SWITCH
S13	S05-0004-002	SWITCH
S14	S05-0004-002	SWITCH
S15	S05-0004-002	SWITCH
S16	S05-0004-002	SWITCH
S17	S05-0004-002	SWITCH
S18	S05-0004-002	SWITCH
S19	S05-0004-001	SWITCH
S20	S05-0004-001	SWITCH
S21	S05-0004-001	SWITCH
S22	S05-0004-001	SWITCH
S23	S05-0004-001	SWITCH
S24	S05-0004-001	SWITCH
S25	S05-0004-001	SWITCH







VIEW 1
NO SCALE

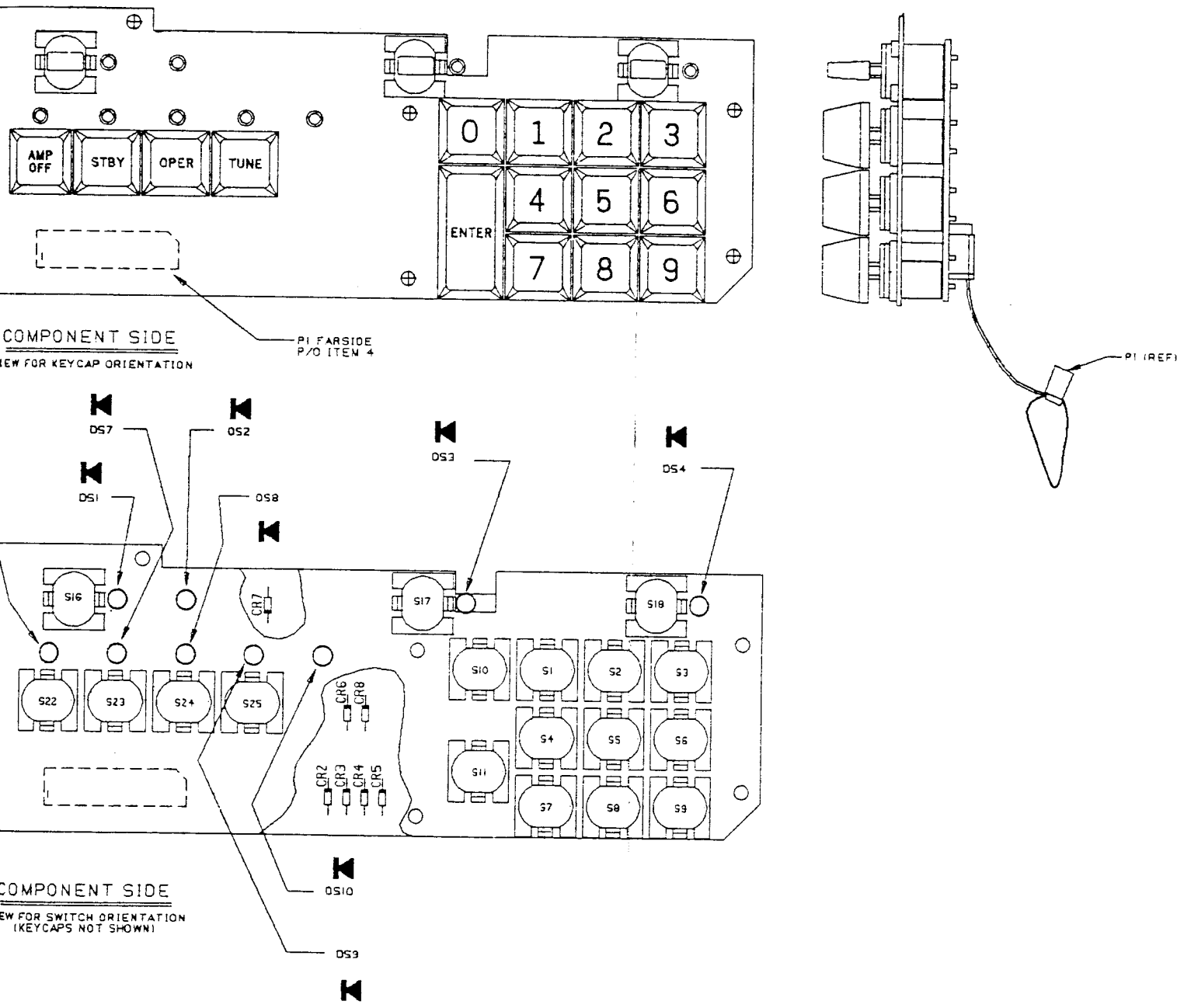
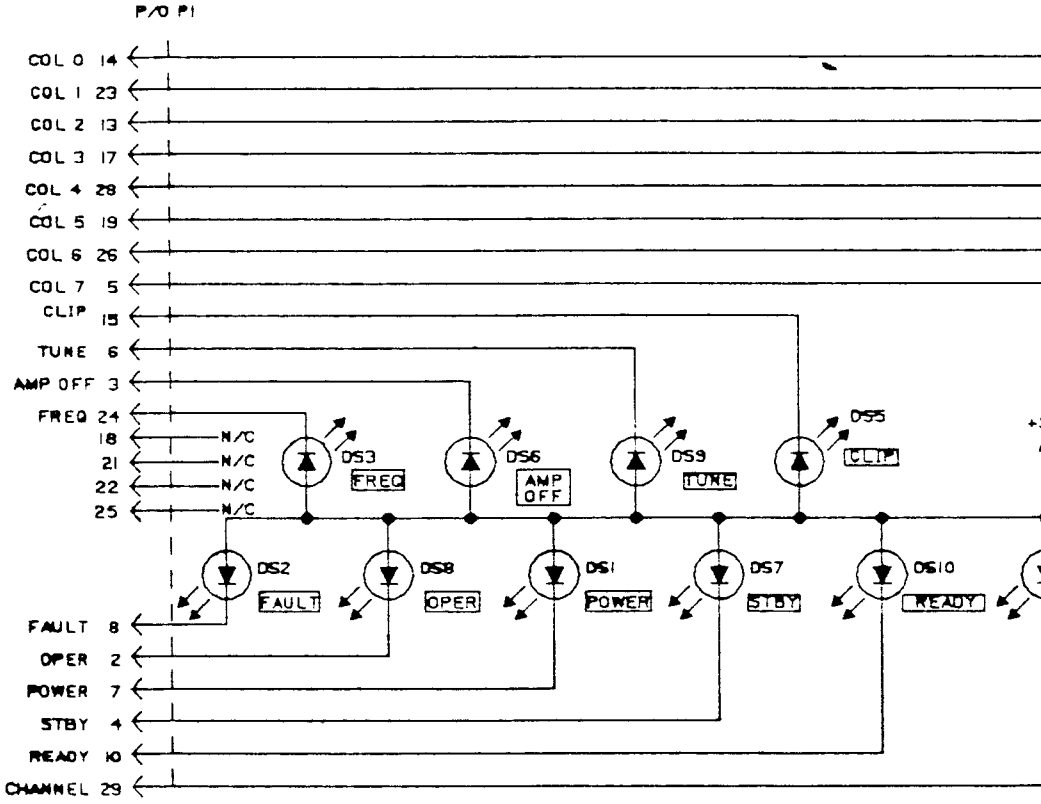


Figure 4. Front Panel Switchboard Assembly A13A1 Component Location Diagram (10121-2100)

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.
2. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
3. ☐ INDICATES FRONT PANEL MARKING.
4. CR1-CR8 ARE IN4454.



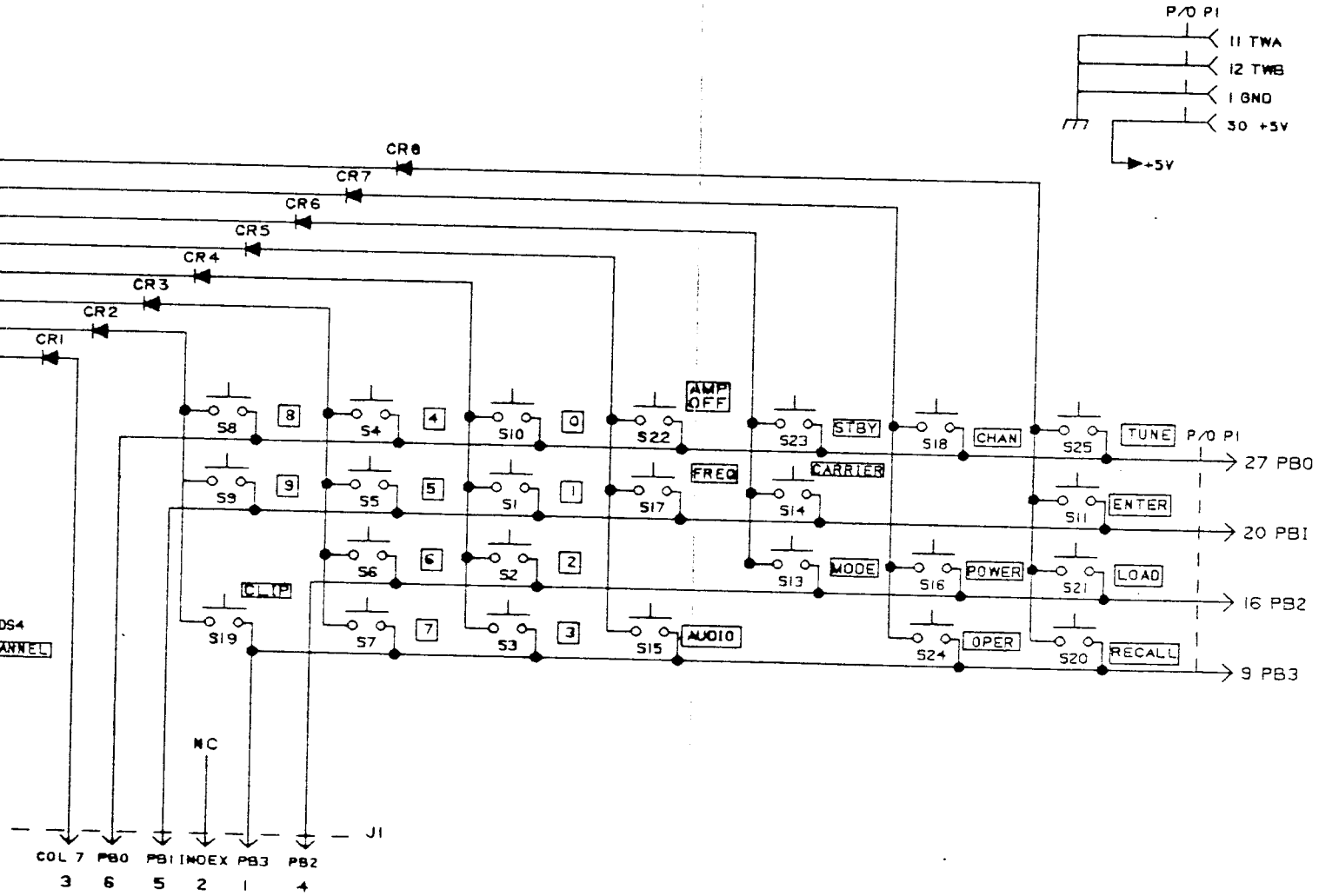


Figure 5. Front Panel Switchboard Assembly
A13A1 Schematic Diagram
(10121-2101 Rev. A)

3. FRONT PANEL DRIVER BOARD A13A2

3.1 General Description

Front Panel Driver Board A13A2 serves three basic front panel control functions. It generates the drive signals for the vacuum fluorescent displays, drives the discrete LED displays, and routes the signals to the front panel switchboard. Figure 6 is a block diagram of the A13A2 assembly.

The Driver Board controls the vacuum fluorescent displays by providing them with filament voltages, display segment information, and digit select information. The filament voltages are generated in Display Converter Assembly A13A6 and routed to the display connectors. The Driver Board multiplexes the VF displays by providing information for the segments to be lit within a character while enabling that character. This is done at a rapid rate to give the appearance of continuous illumination. The information to be displayed is provided to Driver Board A13A2 by Control Board Assembly A14 in serial fashion, using the Front Serial Data, Front Serial Clock, and Display Strobe signals on pins P3-2, P3-4, and P3-14, respectively.

The discrete LED displays of the front panel are lit by the Driver Board using information provided by the Control Board.

Driver Board Assembly A13A2 outputs eight column strobes to the switches in the front panel and inputs four row lines from the switches. The row lines are routed to the Control Board where a switch closure is detected as a connection from a column to a row.

3.2 Interface Connections

Table 5 summarizes the A13A2 interface connections.

3.3 Circuit Description

3.3.1 Microprocessor Operation

The heart of Front Panel Driver Board A13A2 operation is the U12 8035 microprocessor. The execution of the software program stored in the 2716-type EPROM (U16) causes the microprocessor to perform the display update functions described in paragraph 2. To execute the program, the microprocessor must continuously get instructions from U16 and process them. To accomplish this, the microprocessor (at the start of an instruction cycle) outputs the address of the instruction to be obtained into its address/data bus at pins U12-12 to U12-19. The address latch (U13) latches it to the EPROM. The U16 EPROM outputs the instruction to the data bus which is read by the microprocessor and executed. The microprocessor uses the Address Latch Enable (ALE) active high signal to indicate the presence of a valid address on the bus. The Program Store Enable (PSEN) signal is used to enable the EPROM to output the obtained instruction while the RD (read) and WR (write) signals are used to read from, and write to, other external devices. The RD signal is used to read display data sent by Control Board Assembly A14 from shift registers U14 and U15, while the WR signal is used to write the display information to VF display segment latches U8, U9, and U23. These functions are explained in greater detail below.

3.3.2 Display Data Input

Front Panel Driver Board A13A2 lights all LEDs and all segments of the vacuum fluorescent displays when the exciter is turned on. After completion of the power on self test, the display is updated to the last setting used before the exciter was turned off using display data provided by Control Board Assembly A14. The Control Board provides the information for all display updates to the Driver Board in serial fashion via P3-2. This information is clocked into serial shift registers U14 and U15 to be read in parallel by microprocessor U12. The clock signal is provided by the Control Board P4, and routed to the shift registers at pin 3. When the shift

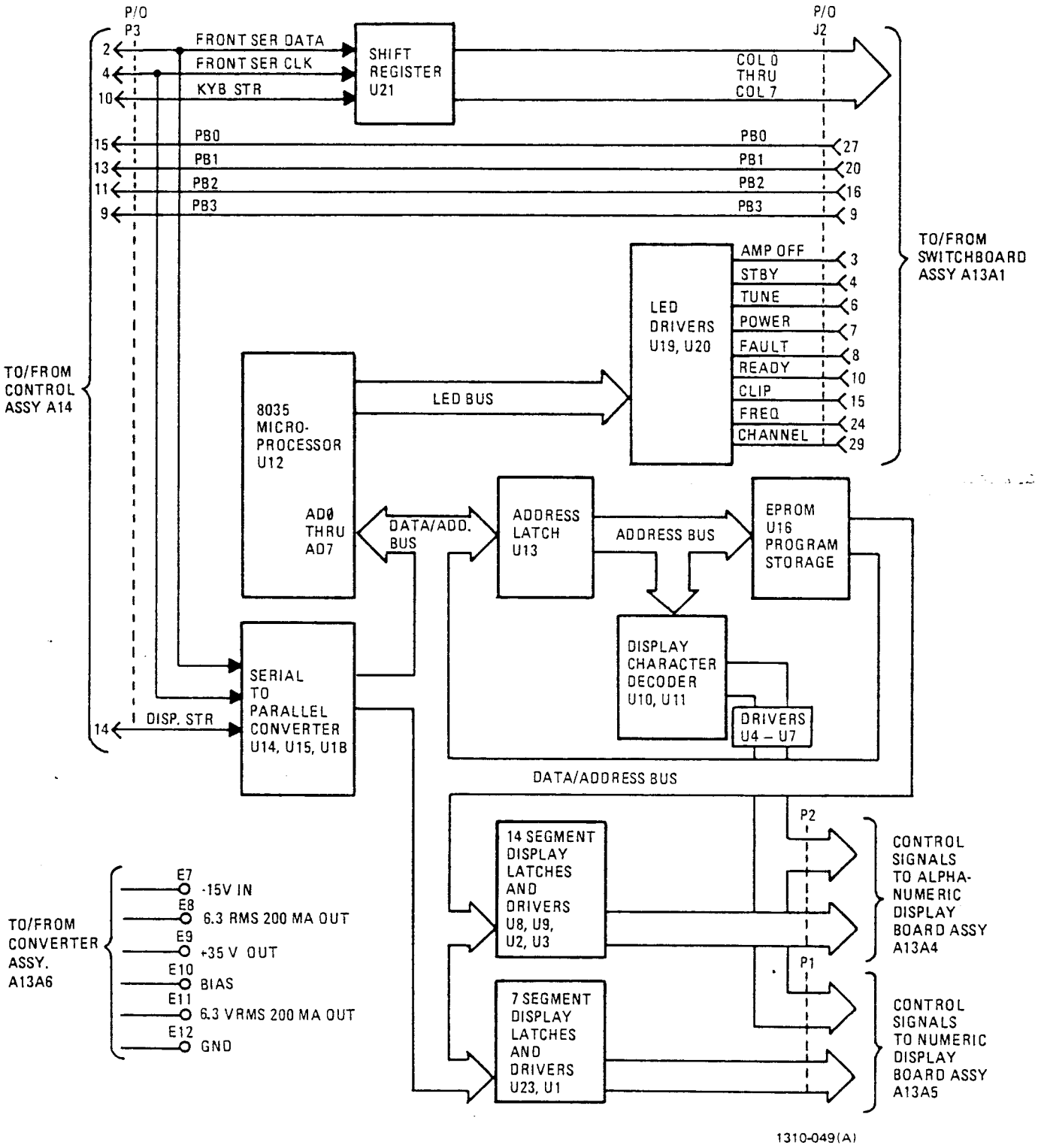


Figure 6. Front Panel Driver Board Assembly A13A2 Block Diagram

Table 5. Front Panel Driver Board Assembly A13A2 Interface Connections

Connector	Name	Description
P3 from A14 via W18		
P3-1	N/C	
P3-2	Front Serial Data	Serial display data from Control Board
P3-3	N/C	
P3-4	Front Serial CLK	Clock for display from Control Board
P3-5	N/C	
P3-6	-15 V	
P3-7	+ 5 V Display	
P3-8	Power Supply BITE	Power supply fault indicator
P3-9	PB3	Switch row readback to Control Board
P3-10	KYB STR	Keyboard strobe from Control Board
P3-11	PB2	Switch row readback to Control Board
P3-12	Fault Out	Output to rear panel (via Control Board)
P3-13	PB1	Switch row readback to Control Board
P3-14	DISP STR	Display strobe from Control Board
P3-15	PB0	Switch row readback to Control Board
P3-16	Reset	
P3-17	Spare	
P3-18	Ground	
P3-19	+ 5 V Unreg.	
P3-20	Ground	
J2 to/from A13A1		
J2-1	Ground	
J2-2	Oper	
J2-3	AMP OFF	
J2-4	STBY	
J2-5	COL 7	
J2-6	TUNE	

Table 5. Front Panel Driver Board Assembly A13A2 Interface Connections (Cont.)

Connector	Name	Description
J2-7	POWER	
J2-8	Fault	
J2-9	PB3	
J2-10	Ready	
J2-11	N/C	
J2-12	N/C	
J2-13	COL 2	
J2-14	COL 0	
J2-15	CLIP	
J2-16	PB2	
J2-17	COL 3	
J2-18	N/C	
J2-19	COL 5	
J2-20	PB1	
J2-21	N/C	
J2-22	N/C	
J2-23	COL 1	
J2-24	Freq	
J2-25	N/C	
J2-26	COL 6	
J2-27	PB0	
J2-28	COL 4	
J2-29	Channel	
J2-30	+ 5 V	
J3 to/from A13A4		
P2-1	a Segment	
P2-2	b Segment	
P2-3	c Segment	

Table 5. Front Panel Driver Board Assembly A13A2 Interface Connections (Cont.)

Connector	Name	Description
P2-4	d Segment	
P2-5	M Segment	
P2-6	N Segment	
P2-7	e Segment	
P2-8	f Segment	
P2-9	J Segment	
P2-10	k Segment	
P2-11	g Segment	
P2-12	h Segment	
P2-13	. Segment	
P2-14	, Segment	
P2-15	N/C	
P2-16	G1 Digit	
P2-17	P Segment	
P2-18	R Segment	
P2-19	G2 Digit	
P2-20	G3 Digit	
P2-21	G20 Digit	
P2-22	G4 Digit	
P2-23	G5 Digit	
P2-24	G6 Digit	
P2-25	G19 Digit	
P2-26	G7 Digit	
P2-27	G8 Digit	
P2-28	G9 Digit	
P2-29	G18 Digit	
P2-30	G10 Digit	
P2-31	G11 Digit	

Table 5. Front Panel Driver Board Assembly A13A2 Interface Connections (Cont.)

Connector	Name	Description
P2-32	G12 Digit	
P2-33	G17 Digit	
P2-34	G13 Digit	
P2-35	G14 Digit	
P2-36	N/C	
P2-37	G16 Digit	
P2-38	G15 Digit	
P2-39	Filament	
P2-40	Filament	
P1 to/from A13A5		
P1-1	G11 10 MHz Digit	
P1-2	G10 1 MHz Digit	
P1-3	G9 100 kHz Digit	
P1-4	G3 1/2 Digit	
P1-5	G7 1 kHz Digit	
P1-6	G8 10 kHz Digit	
P1-7	Filament	
P1-8	Decimal Point	
P1-9	G5 10 Hz Digit	
P1-10	G6 100 Hz Digit	
P1-11	N/C	
P1-12	Comma	
P1-13	G4 1 Hz Digit	
P1-14	c Segment	
P1-15	G2 CH10 Digit	
P1-16	G1 CH1 Digit	
P1-17	b Segment	
P1-18	a Segment	
P1-19	g Segment	

Table 5. Front Panel Driver Board Assembly A13A2 Interface Connections (Cont.)

Connector	Name	Description
P1-20	Filament	
P1-21	Underline Segment	
P1-22	d Segment	
P1-23	e Segment	
P1-24	f Segment	
E7	-15 V In	
E8	5.8 V_{rms} 200 mA Output	
E9	+ 35 V Out	
E10	Bias	
E11	5.8 V_{rms} 200 mA Output	
E12	Ground	

registers have been loaded with display data, the Control Board generates an interrupt to the U12 Driver Board microprocessor using the signal display strobe at P3-14. The display strobe pulse serves to trigger monostable multivibrator U24, which in turn generates the interrupt, causing the microprocessor to read the display data from shift registers U14 and U15. U18 buffers the display data onto the microprocessor data bus. The act of reading the shift registers causes resetting of the interrupt by the microprocessor read control line at U24-3 which is the reset in to the monostable.

3.3.3 Vacuum Fluorescent Display Drive

Display data read in from the Control Board is converted by microprocessor U12 into formats required for driving the VF displays. The displays are driven in multiplexed fashion so that only one character is driven at a given time. Each character in the VF displays has a unique address which is output by the microprocessor to the bus and latched into the U13 address latch during a display character update. The address is decoded by U10 or U11 into a character enable pulse. During the output instruction, the segment information for the character to be lit is latched into U23 for seven-segment characters or into U8 and U9 for 14-segment characters. Each character is enabled for approximately 640 microseconds after which, the microprocessor processes the next character in a similar manner.

3.3.4 LED Drive

The discrete LEDs on the front panel are driven from the parallel ports on microprocessor U12. These outputs are buffered by U19 and U20 and are routed to the switchboard via J2. An LED is lit by an active low output. The information to be written to the LEDs originates in Control Board Assembly A14 and is input to the Driver Board in the manner described in paragraph 3.3.2.

3.3.5 Pushbutton Circuitry

The Driver Board primarily routes the signals associated with detecting pushbutton activity to and from the Control Board and switchboards. The switches are arranged in a matrix of eight columns by four rows. Switch activity is detected by sensing a closure between a column line and a row line. The column outputs are written serially from the Control Board to the Driver board via P3-2, clocked via P3-4, and latched into shift register U21 by the signal KYB STR (keyboard strobe) at P3-10. The parallel outputs of the shift register are routed to the switchboard via J2 signals COL 0 through COL 7. The rows are routed back to the Control Board as signals PB0 to PB3 on pins P3-5, P3-13, P3-11, and P3-9 respectively.

3.4 Maintenance

3.4.1 Adjustments

The only adjustment on Front Panel Driver Board Assembly A13A2 is the VF display brightness, single-turn potentiometer R29, located at the top center of the PWB. Turn clockwise for brighter displays.

3.4.2 Troubleshooting

To make a quick assessment of Driver Board functions, the four test points should be checked with an oscilloscope.

- TP1 Microprocessor Write Line. Should be active low pulses repeated approximately every 600 to 700 microseconds.
- TP2 Character Strobe to U10. Active high pulse every 600 to 700 microseconds indicates display is being updated.
- TP3 Character Strobe to U11. Same as TP2. Also indicates display being updated. Both signals are required.
- TP5 Interrupt to microprocessor from Control board. Active low approximately 50 microseconds pulse every 1 second.

If the above signals are incorrect, more fundamental checks are indicated. Perform the checks in the following order.

a. Verify + 5 V at P3-7 and -15 V at P3-6.

b. Verify display converter voltages at E7-E12 of Driver Board and integrity of connections to converter module according to table 6.

c. Verify integrity of connections E1 through E6. The 10073-2400 alphanumeric display module requires connections E1 to E2 and E5 to E4.

d. Verify 6 MHz clock at U12-2 and U12-3.

e. Verify approximately + 5 V at U12-4. (Microprocessor reset in.)

f. Verify ALE signal, approximately 60-40 duty cycle square wave at U12-11.

g. Verify activity on bus AD0-AD7 (zero to five volt random square waves).

Table 6. Converter Voltages

Driver	Converter	Function
E7	C1	-15 Vdc
E8	C5	5.8 V_{rms}
E9	C3	+ 35 Vdc
E10	C4	Bias approximately 6 Vdc
E11	C2	5.8 V_{rms}
E12	E1	GND

h. Verify that all socketed ICs are installed correctly with no pins bent underneath the IC.

3.5 Parts List, Component Locations, and Schematic Diagram

Table 7 is the Front Panel Driver Board Assembly A13A2 parts list. Figures 7 and 8 are the Front Panel Driver Board Assembly A13A2 component location diagram and schematic diagram, respectively.

Table 7. Front Panel Driver Board Assembly A13A2 Parts List

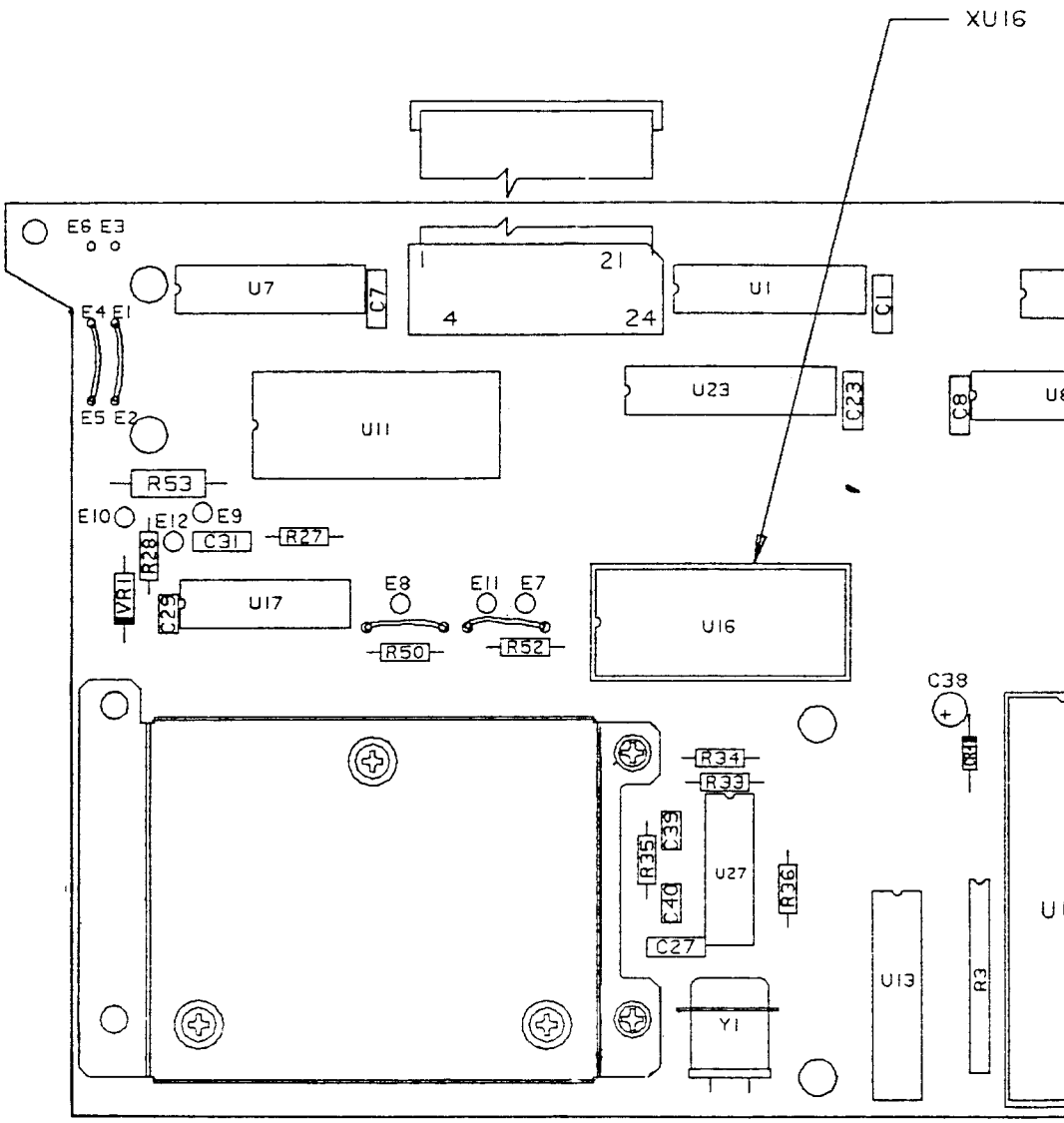
Ref. Desig.	Part Number	Description
A13A2	10073-2200	FRONT PANEL DRIVER BOARD ASSEMBLY
C1	M39014/02-1310	CAP .1UF 10% 100V CER-R
C2	M39014/02-1310	CAP .1UF 10% 100V CER-R
C3	M39014/02-1310	CAP .1UF 10% 100V CER-R
C4	M39014/02-1310	CAP .1UF 10% 100V CER-R
C5	M39014/02-1310	CAP .1UF 10% 100V CER-R
C6	M39014/02-1310	CAP .1UF 10% 100V CER-R
C7	M39014/02-1310	CAP .1UF 10% 100V CER-R
C8	M39014/02-1310	CAP .1UF 10% 100V CER-R
C10	M39014/02-1310	CAP .1UF 10% 100V CER-R
C12	M39014/02-1310	CAP .1UF 10% 100V CER-R
C14	M39014/02-1310	CAP .1UF 10% 100V CER-R
C15	M39014/02-1310	CAP .1UF 10% 100V CER-R
C19	M39014/02-1310	CAP .1UF 10% 100V CER-R
C22	M39014/02-1310	CAP .1UF 10% 100V CER-R
C23	M39014/02-1310	CAP .1UF 10% 100V CER-R
C24	M39014/02-1310	CAP .1UF 10% 100V CER-R
C25	M39014/02-1310	CAP .1UF 10% 100V CER-R
C26	M39014/02-1310	CAP .1UF 10% 100V CER-R
C27	M39014/02-1310	CAP .1UF 10% 100V CER-R
C29	CK05BX103M	CAP .01UF 20% 100V CER
C31	M39014/02-1310	CAP .1UF 10% 100V CER-R
C32	CK05BX102M	CAP 1000PF 20% 200V CER

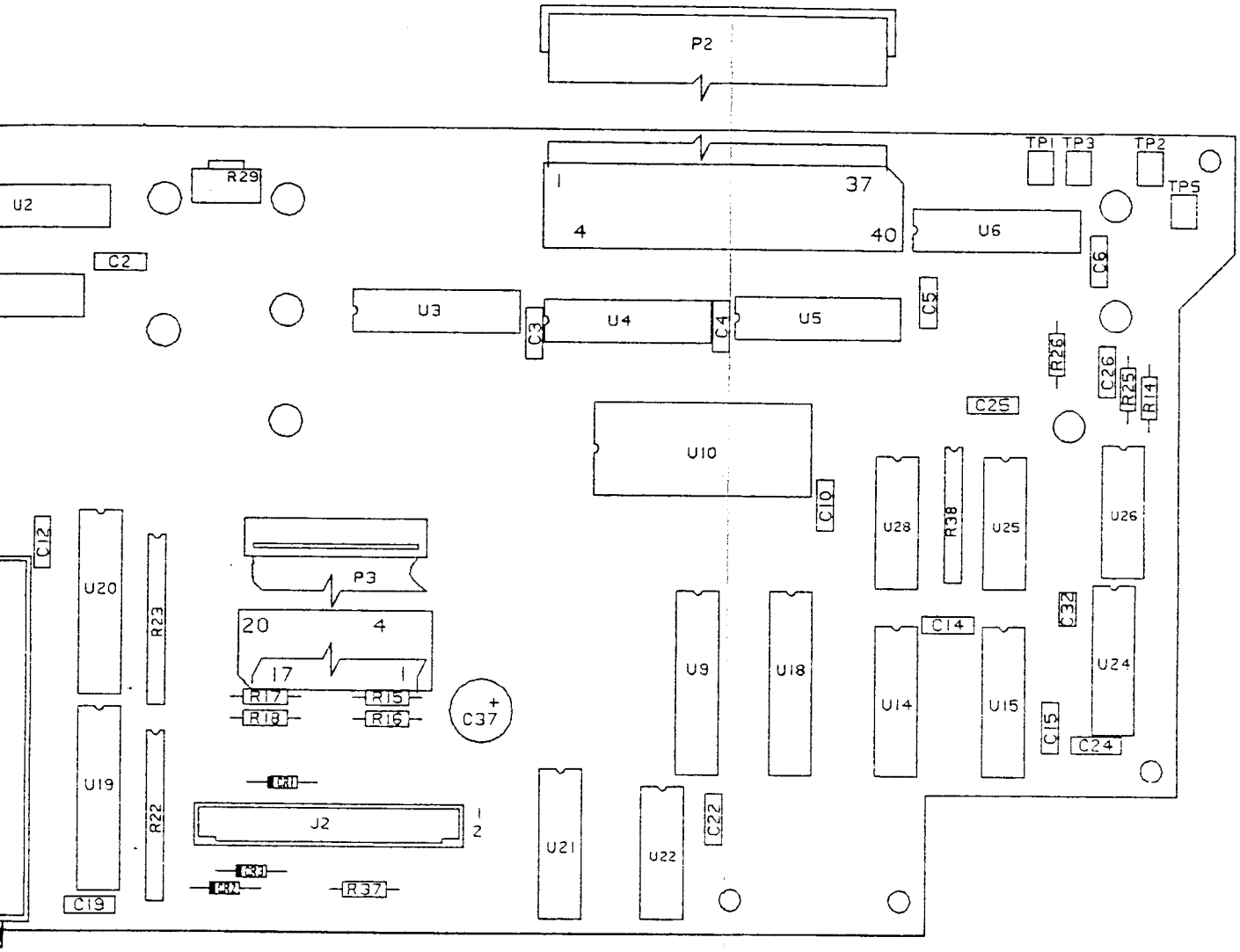
Table 7. Front Panel Driver Board Assembly A13A2 Parts List (Cont.)

Ref. Desig.	Part Number	Description
C37	C26-0025-470	CAP 47UF 20% 25V TANT
C38	C26-0050-479	CAP 4.7UF 20% 50V TANT
C39	CK05BX330M	CAP 33PF 20% 200V CER
C40	CK05BX330M	CAP 33PF 20% 200V CER
CR1	1N4454	DIODE 200mA 75V SW
CR2	1N4454	DIODE 200mA 75V SW
CR3	1N4454	DIODE 200mA 75V SW
CR4	1N4454	DIODE 200mA 75V SW
J2	J46-0013-030	HEADER, PROTECTED, 30 PIN
P1	10073-7050	RIBBON CABLE, 24 COND
P2	10073-7051	RIBBON CABLE, 40 COND
P3	10073-7053	RIBBON CABLE, 20 COND
R3	R50-0010-472	RES,10SIP,4.7K,2.0%, 9RES
R14	R65-0003-224	RES,220K 5% 1/4W CAR FILM
R15	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R16	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R17	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R18	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R22	R51-0010-121	RES, PACK
R23	R51-0010-121	RES, PACK
R25	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R26	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R27	R65-0003-204	RES,200K 5% 1/4W CAR FILM
R28	R65-0003-393	RES,39K 5% 1/4W CAR FILM
R29	R-2232	RES,VAR,PCB 100K .5 20%
R33	R65-0003-471	RES,470 5% 1/4W CAR FILM
R34	R65-0003-471	RES,470 5% 1/4W CAR FILM
R35	R65-0003-471	RES,470 5% 1/4W CAR FILM
R36	R65-0003-471	RES,470 5% 1/4W CAR FILM
R37	R65-0003-161	RES,160 5% 1/4W CAR FILM
R38	R50-0008-103	RES,8 SIP, 10K,2.0%, 7RES
R50	R65-0003-100	RES,10 5% 1/4W CAR FILM
R52	R65-0003-100	RES,10 5% 1/4W CAR FILM
R53	R65-0003-332	RES,3.3K 5% 1/4W CAR FILM
TP1	J-0392	TP PWB BRN RA SIDE ACCESS
TP2	J-0387	TP PWB RED RA SIDE ACCESS
TP3	J-0390	TP PWB ORN RA SIDE ACCESS
TP5	J-0389	TP PWB GRN RA SIDE ACCESS
U1	I75-0009-001	IC NE594 DISPLAY DRIVER
U2	I75-0009-001	IC NE594 DISPLAY DRIVER
U3	I75-0009-001	IC NE594 DISPLAY DRIVER
U4	I75-0009-001	IC NE594 DISPLAY DRIVER
U5	I75-0009-001	IC NE594 DISPLAY DRIVER
U6	I75-0009-001	IC NE594 DISPLAY DRIVER
U7	I75-0009-001	IC NE594 DISPLAY DRIVER

Table 7. Front Panel Driver Board Assembly A13A2 Parts List (Cont.)

Ref. Desig.	Part Number	Description
U8	107-0013-001	IC 74C373 PLASTIC CMOS
U9	107-0013-001	IC 74C373 PLASTIC CMOS
U10	101-0000-202	IC 4514B PLASTIC CMOS
U11	101-0000-202	IC 4514B PLASTIC CMOS
U12	IC-0374	IC 8035 MICRO 8-BIT
U13	107-0013-001	IC 74C373 PLASTIC CMOS
U14	101-0000-156	IC 4094B PLASTIC CMOS
U15	101-0000-156	IC 4094B PLASTIC CMOS
U16	10073-8302	SOFTWARE KIT
U17	105-0001-000	IC 4098B PLASTIC CMOS
U18	105-0000-244	IC 74LS244 PLASTIC TTL
U19	105-0000-244	IC 74LS244 PLASTIC TTL
U20	105-0000-244	IC 74LS244 PLASTIC TTL
U21	101-0000-156	IC 4094B PLASTIC CMOS
U22	105-0000-074	IC 74LS74 PLASTIC TTL
U23	107-0013-001	IC 74C373 PLASTIC CMOS
U24	105-0001-000	IC 4098B PLASTIC CMOS
U25	101-0056-001	IC 74C02 PLASTIC CMOS
U26	105-0000-027	IC 74LS27 PLASTIC TTL
U27	102-0015-000	IC 7404 PLASTIC TTL
U28	118-0006-001	IC 74C14 PLASTIC CMOS
VR1	1N5234B	DIODE 6.2V 5% .5W ZENER
XU12	J77-0008-007	SKT IC MACH 40 PIN
XU16	J77-0008-005	SKT IC MACH 24 PIN
Y1	Y15-0004-060	CRYSTAL, 6MHZ


XU16
E6 E3
E4 E1
E5 E2
U7
C7
1
21
4
24
U1
C1
U11
U23
C23
C8
R53
E10
E12
E9
C31
R27
R28
VR1
C29
U17
E8
E11
E7
R50
R52
U16
C38
R34
R33
R35
C39
U27
C40
R36
C27
U13
R3
Y1



XU12

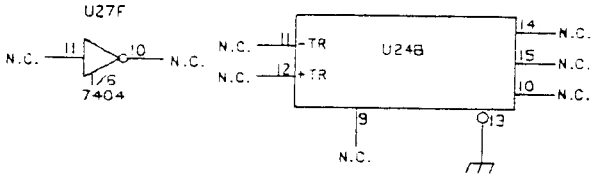
Figure 7. Front Panel Driver Board Assembly A13A2 Component Location Diagram (10073-2200)

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS.
4. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
5. CONNECT E4 TO E5 AND E1 TO E2 FOR FUTABA ALPHANUMERIC DISPLAY (P/N 10073-2400).
6. SIGNALS ARE PRODUCT SPECIFIC FOR THE FOLLOWING PINS:

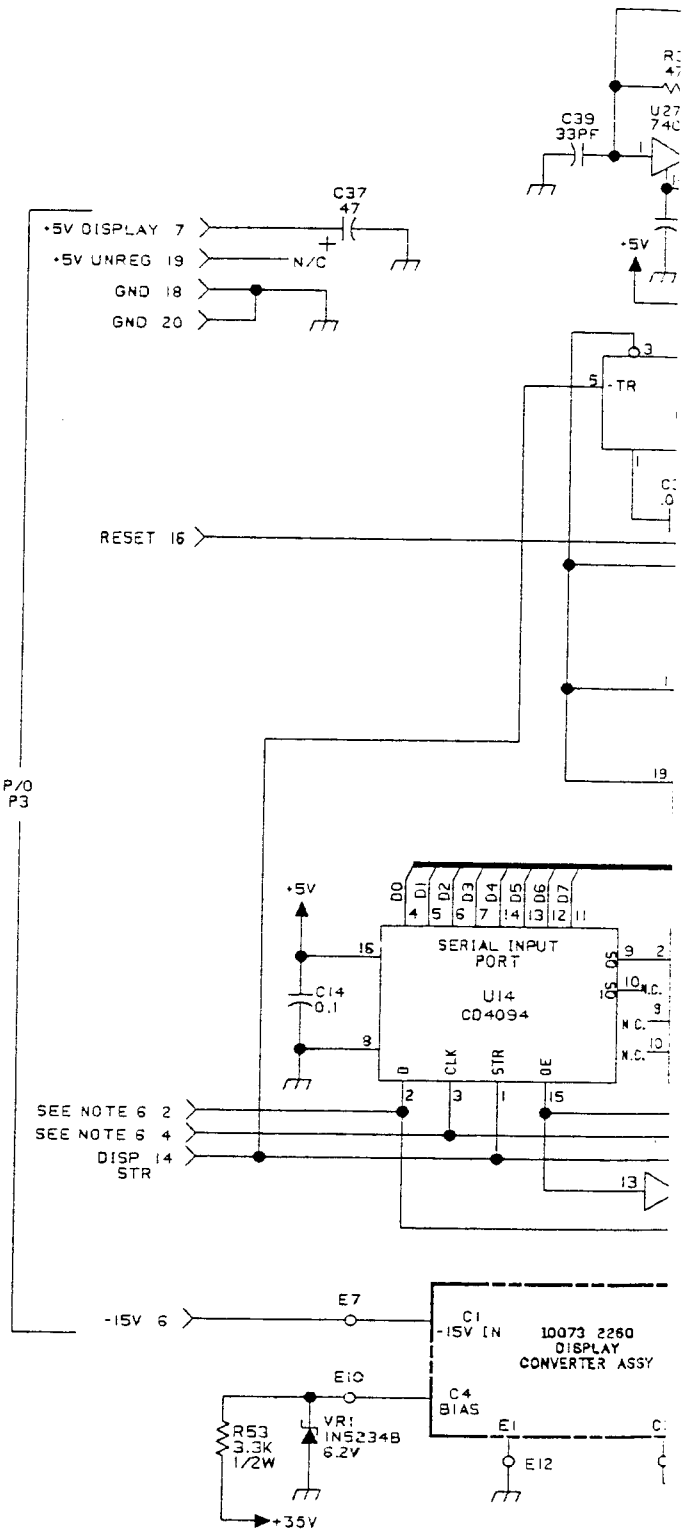
PIN	RF-590	RF-1310
P3-1	TUNE WHL INT	N/C
P3-2	DATA	FR SER DATA
P3-3	DIR	N/C
P3-4	CLK	FR SER CLK
J2-2	SCAN	OPER
J2-3	TEST	AMP OFF
J2-4	PROG	STBY
J2-6	RCV	TUNE
J2-7	BFO	POWER
J2-10	REMOTE	READY
J2-15	TUNE	CLIP
J2-25	NOISEBLANK	N/C

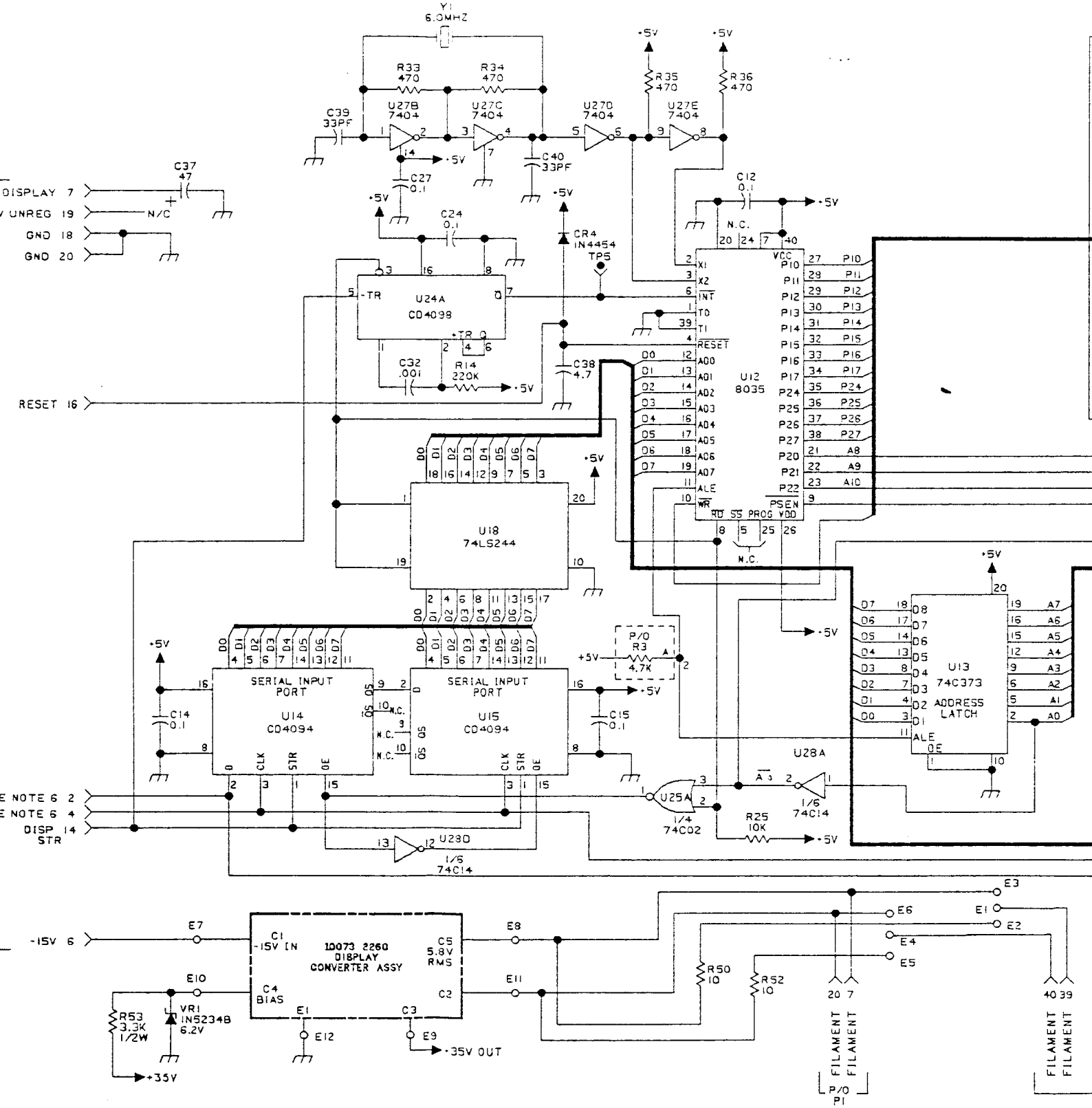
UNUSED GATES



TEST POINT	
TP1 PROCESSOR WRITE LINE	
TP2 DIGIT STROBE TO V10	
TP3 DIGIT STROBE TO V11	
TP5 INTERRUPT FOR DISPLAY UPDATE	

DISPLAY CONVERTER CONNECTIONS		
PCB	CONVERTER	FCN
E7	C1	-15V IN
E8	C5	6.3 OUT
E9	C3	+35V OUT
E10	C4	BIAS
E11	C2	6.3 OUT
E12	E1	GND




Y1
6.0MHZ
R33
470
R34
470
R35
470
R36
470
U27B
7404
U27C
7404
U27D
7404
U27E
7404
C39
33PF
C40
33PF
C27
0.1
C24
0.1
C12
0.1
C37
47
DISPLAY 7
UNREG 19
N/C
GND 18
GND 20
CR4
IN4454
TP5
U24A
CD4098
-TR
+TR
C32
.001
R14
220K
C38
4.7
RESET 16
U12
8035
N.C.
U18
74LS244
U14
CD4094
SERIAL INPUT
PORT
U15
CD4094
SERIAL INPUT
PORT
C14
0.1
C15
0.1
P/O
R3
4.7K
U13
74C373
ADDRESS
LATCH
ALE
OE
U28A
U25A
1/4
74C02
1/6
74C14
R25
10K
U28D
1/6
74C14
E NOTE 6 2
E NOTE 6 4
DISP 14
STR
-15V 6
E7
E8
E3
E1
E2
E6
E4
E5
E10
E11
C1
-15V IN
10073 2260
DISPLAY
CONVERTER ASSY
C5
5.8V
RMS
C4
BIAS
C2
C3
E1
E12
E9
+35V OUT
R53
3.3K
1/2W
VR1
IN52348
6.2V
+35V
R50
10
R52
10
20 7
40 39
FILAMENT
FILAMENT
P/O
P1

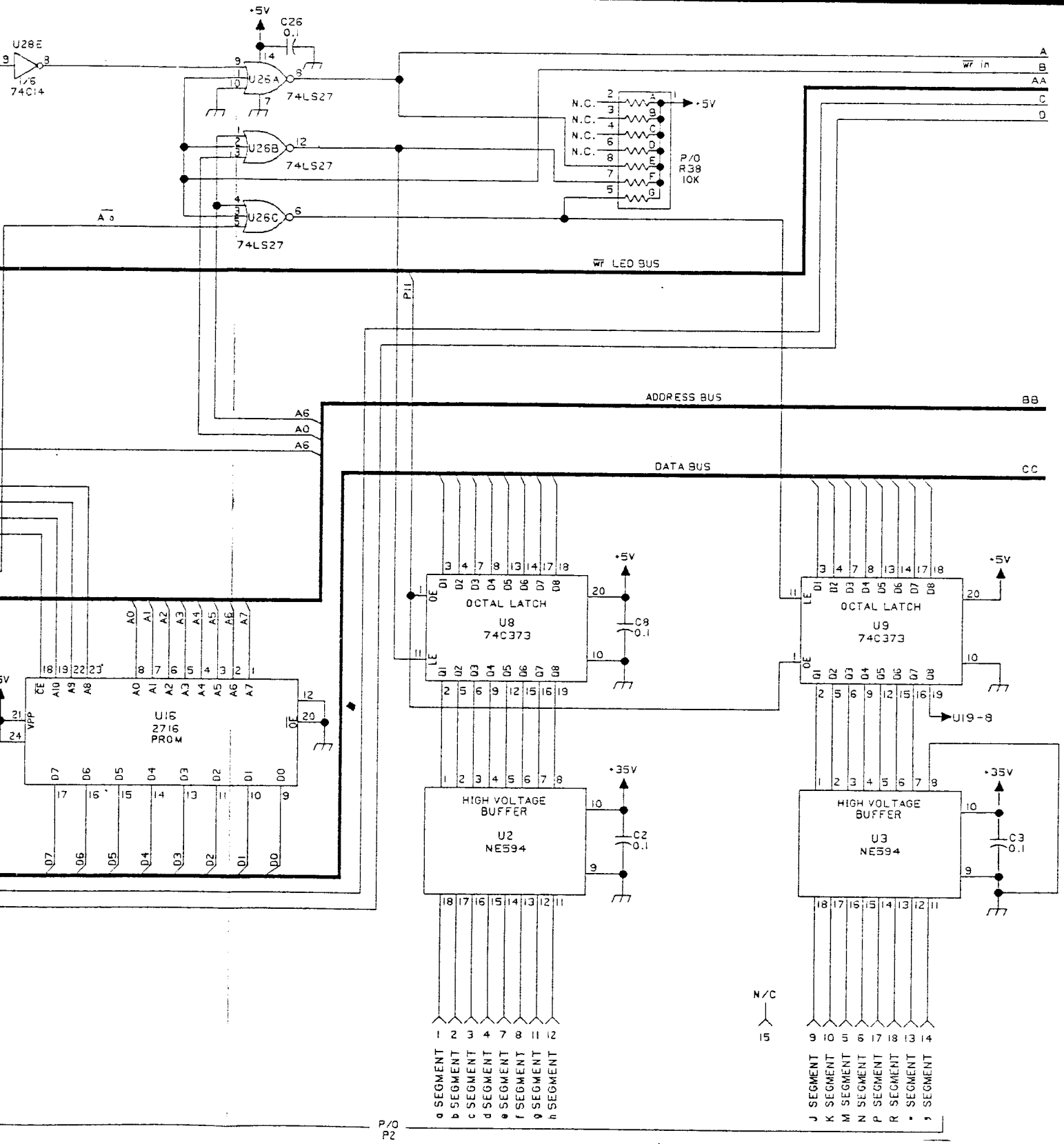
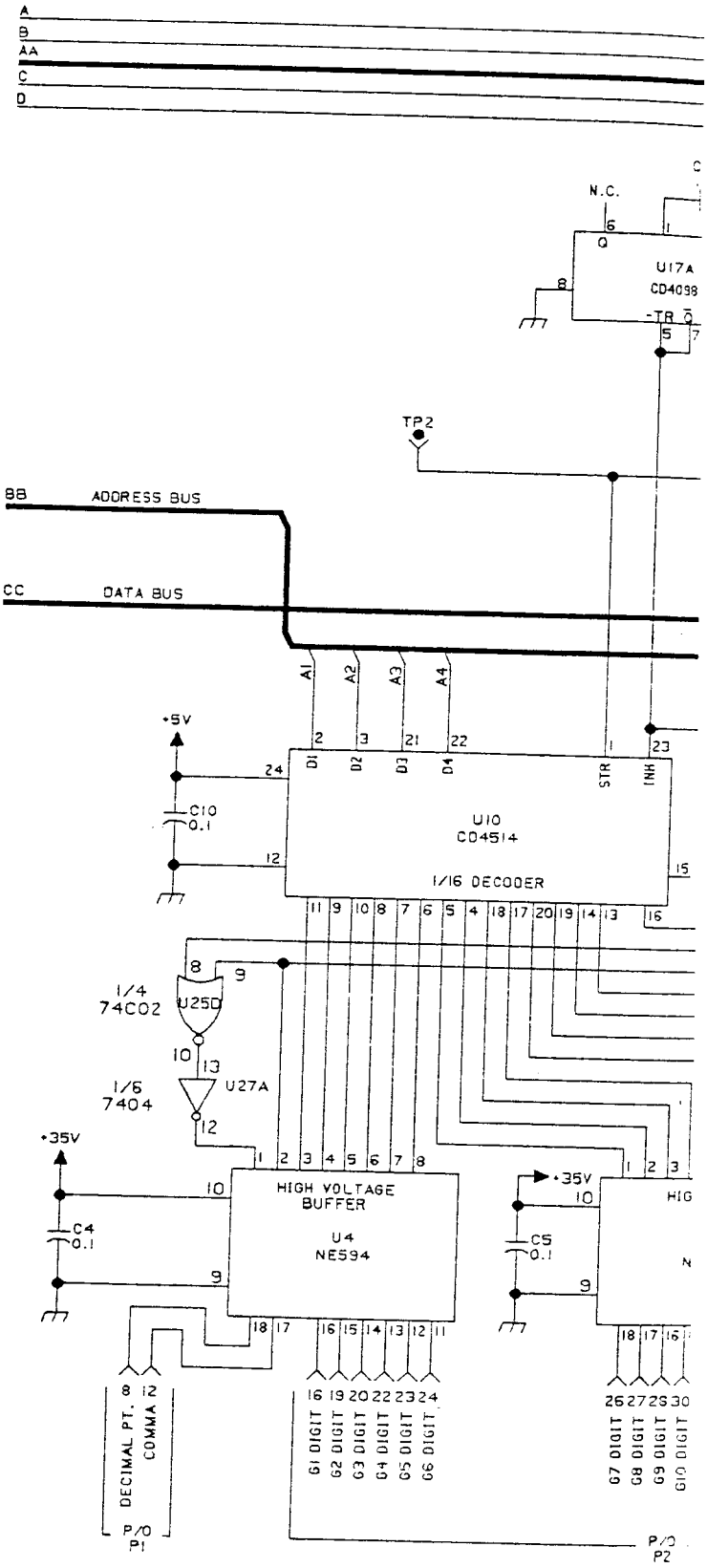
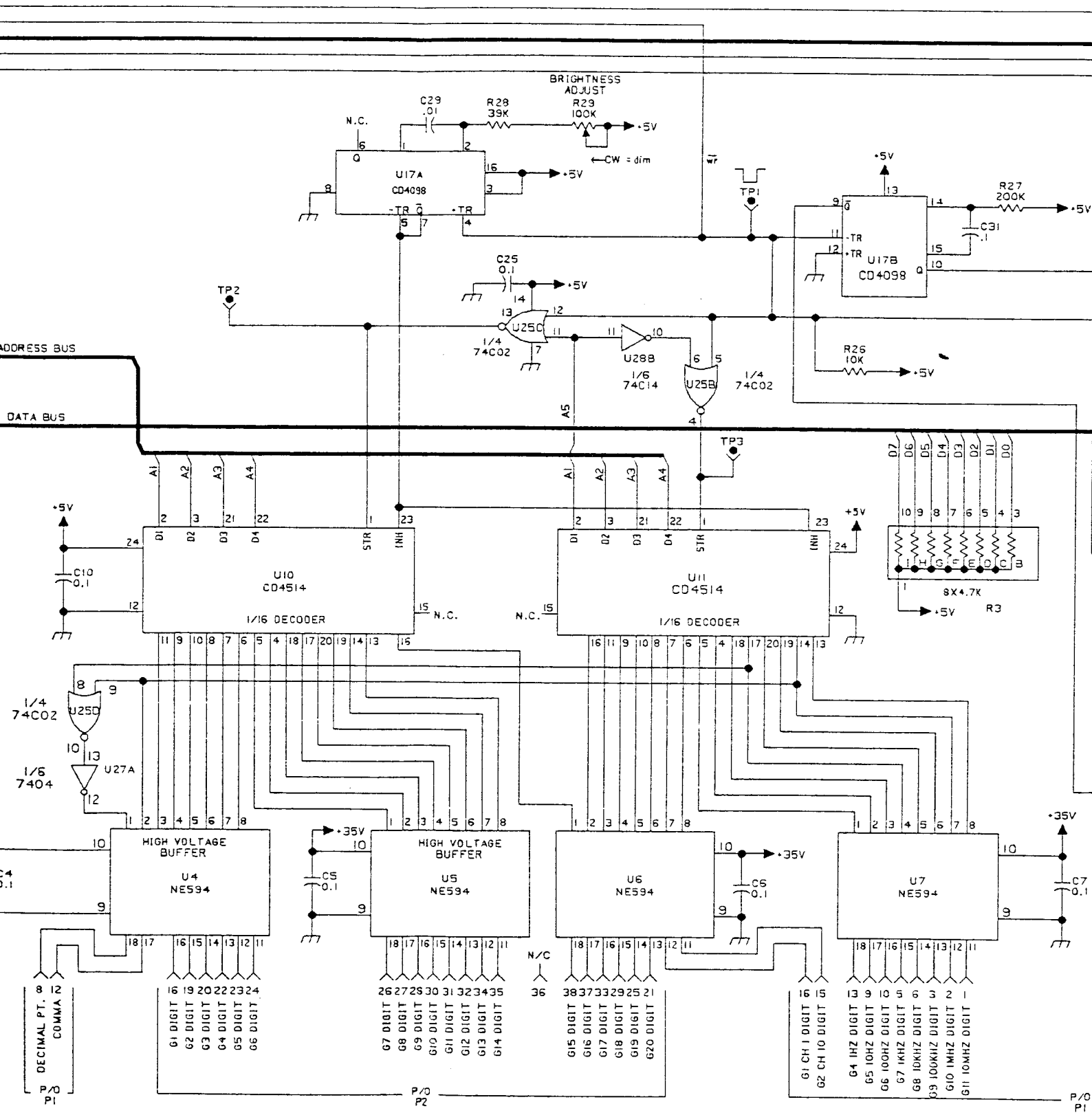


Figure 8. Front Panel Driver Board Assembly A13A2 Schematic Diagram (10073-2201 Rev. J) (Sheet 1 of 2)


A
B
AA
C
D
N.C.
U17A
CD4098
-TR
TP2
BB
ADDRESS BUS
CC
DATA BUS
A1
A2
A3
A4
+5V
D1
D2
D3
D4
STR
INH
C10
0.1
U10
CD4514
1/16 DECODER
1/4
74C02
U25D
1/6
7404
U27A
+35V
HIGH VOLTAGE
BUFFER
U4
NE594
C4
0.1
C5
0.1
DECIMAL PT.
COMMA
P/O
P1
G1 DIGIT
G2 DIGIT
G3 DIGIT
G4 DIGIT
G5 DIGIT
G6 DIGIT
G7 DIGIT
G8 DIGIT
G9 DIGIT
G10 DIGIT
P/O
P2


BRIGHTNESS ADJUST
C29 .01
R28 39K
R29 100K
N.C.
+5V
CW = dim
U17A CD4098
-TR Q +TR
wr
TP1
U17B CD4098
R27 200K
C31 .1
C25 0.1
TP2
U25C 1/4 74C02
U28B 1/6 74C14
U25B 1/4 74C02
R26 10K
ADDRESS BUS
DATA BUS
A5
TP3
D7 D6 D5 D4 D3 D2 D1 D0
8X4.7K R3
U10 CD4514 1/16 DECODER
U11 CD4514 1/16 DECODER
STR INH
C10 0.1
U25D 1/4 74C02
U27A 1/6 7404
HIGH VOLTAGE BUFFER
U4 NE594
U5 NE594
U6 NE594
U7 NE594
+35V
C5 0.1
C6 0.1
C7 0.1
N/C
DECIMAL PT.
COMMA
G1 DIGIT
G2 DIGIT
G3 DIGIT
G4 DIGIT
G5 DIGIT
G6 DIGIT
G7 DIGIT
G8 DIGIT
G9 DIGIT
G10 DIGIT
G11 DIGIT
G12 DIGIT
G13 DIGIT
G14 DIGIT
G15 DIGIT
G16 DIGIT
G17 DIGIT
G18 DIGIT
G19 DIGIT
G20 DIGIT
G1 CH 1 DIGIT
G2 CH 10 DIGIT
G4 1HZ DIGIT
G5 10HZ DIGIT
G6 100HZ DIGIT
G7 1KHZ DIGIT
G8 10KHZ DIGIT
G9 100KHZ DIGIT
G10 1MHZ DIGIT
G11 10MHZ DIGIT
P/O P1
P/O P2
P/O P1

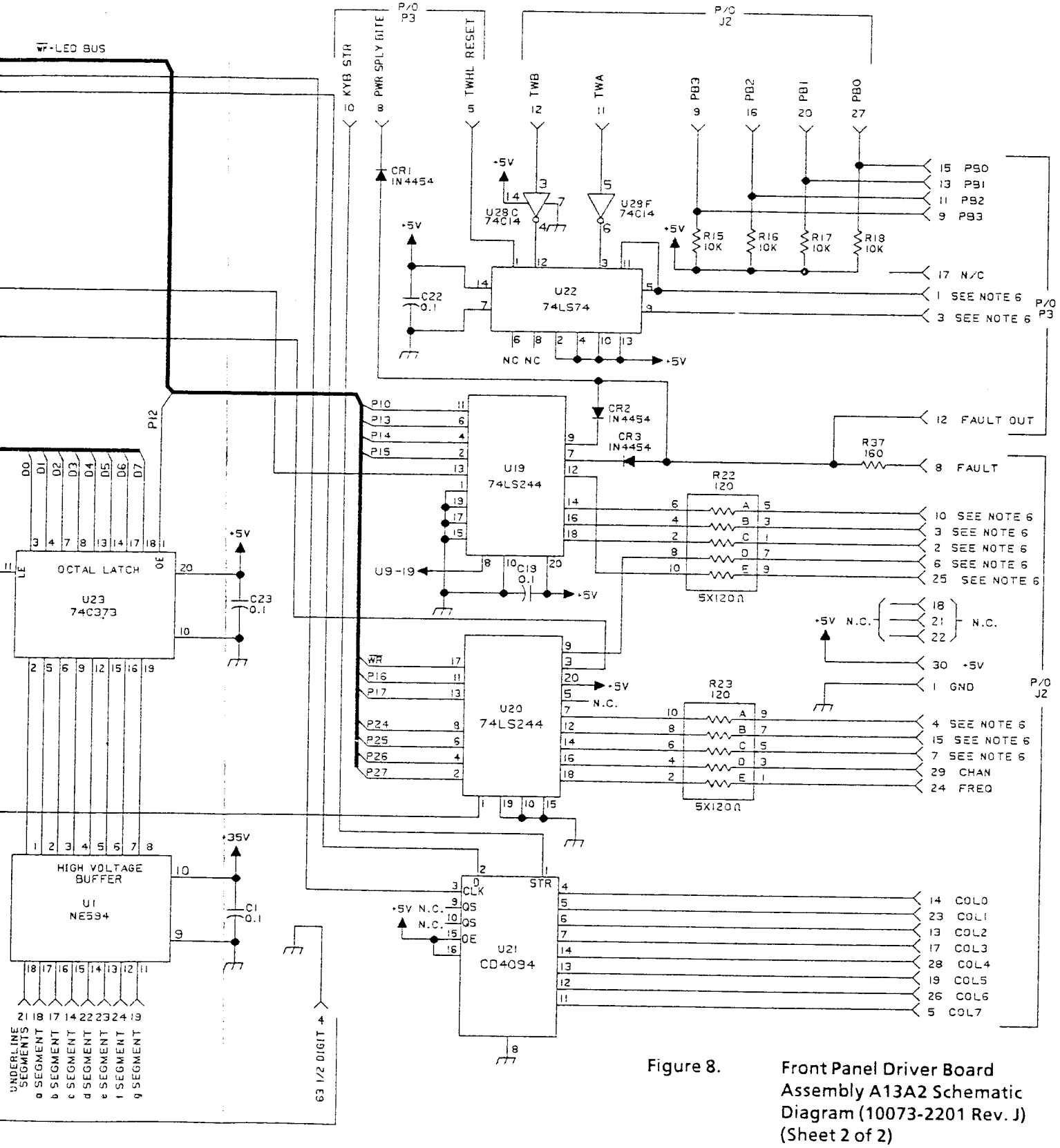


Figure 8. Front Panel Driver Board Assembly A13A2 Schematic Diagram (10073-2201 Rev. J) (Sheet 2 of 2)

4. FRONT PANEL METER BOARD ASSEMBLY A13A3

4.1 General Description

Front Panel Meter Board Assembly A13A3, shown in figure 9, contains the circuitry required to select and monitor RF and AF signals on the M1 front panel meter. The following signals may be selected for measurement via front panel pushbuttons.

- USB Audio In
- LSB Audio In
- Exciter RF Output
- PA RF Output

The USB and LSB audio signal levels are adjustable from the A13A3 assembly. Potentiometers for adjusting these levels are mounted on A13A3 and are accessible through holes in the front panel. The access holes are located next to the USB and LSB meter select switches. A13A3 is also used to route the CW KEY and PTT KEY signals from the front panel microphone jack to Control Board Assembly A14.

4.2 Interface Connections

Table 8 summarizes the A13A3 assembly interface connections.

4.3 Circuit Description

4.3.1 Meter Control

Dc signals representing the levels of RF output signals of the exciter (A1 OUTPUT DET) and power amplifier (BUFF APC) are routed to A13A3 via the Control Board Assembly A14. Likewise, USB and LSB audio signal levels are represented by dc signals that come from Audio 1 Assembly A5A1 and are labeled USB Meter Dc and LSB Meter Dc.

The signals are input to a switch network that applies one signal at a time to the front panel meter. The signals representing the exciter and PA output levels are routed directly to the meter when they are selected. When the USB or LSB switch is engaged, the USB meter dc or LSB meter dc signal is routed back to the A5A1 assembly as the Log Amp input signal. The signal is processed by a metering logarithmic amplifier on the A5A1 assembly. The A5A1 assembly returns the log amp output signal that is compatible with the front panel meter. This signal is routed through the switch network to the meter. The meter is zeroed for the audio signal level measurement by adjusting R99 on A5A1.

4.3.2 Audio Signal Level Adjustment

Potentiometers R4 and R5 on the Meter Board are used to adjust the USB and LSB audio signal levels, respectively. Both potentiometers can be accessed through holes in the front panel. The access holes are located adjacent to the USB and LSB meter select switches. Adjusting R4 or R5 will increase or decrease the gain of the first stage of the USB or LSB audio amplifier on A5A1.

4.3.3 CW KEY and PTT KEY

The CW KEY and PTT KEY signals are passively routed from the front panel microphone jack to Control Board Assembly A14 by the Meter Board.

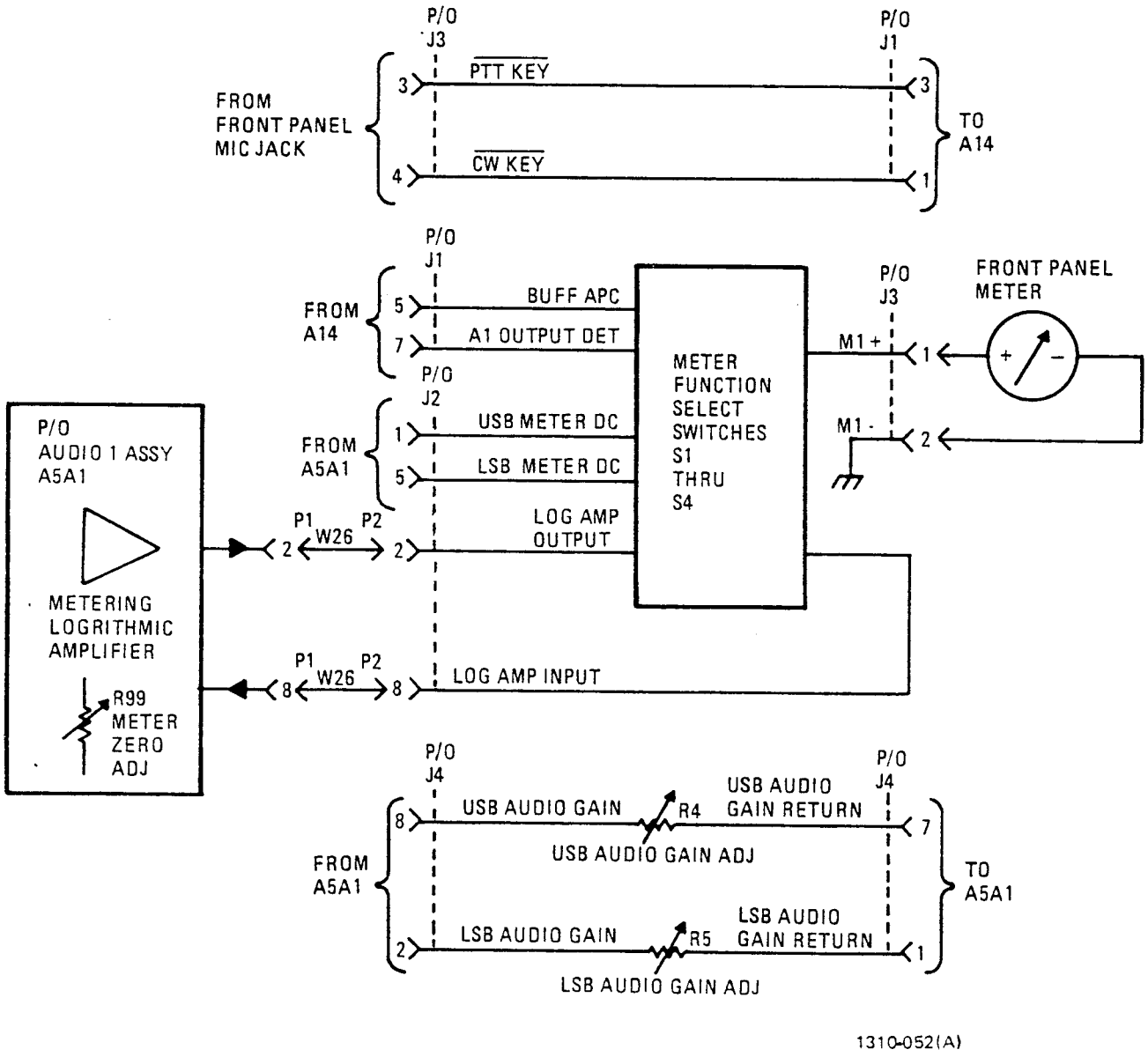


Figure 9. Front Panel Meter Board Assembly A13A3 Block Diagram

Table 8. Front Panel Meter Board Assembly A13A3 Interface Connections

Pin	Signal	Description
J1-1	CW KEY	CW KEY signal from front panel microphone jack to A14.
J1-2	INDEX	Not connected.
J1-3	PTT KEY	PTT key signal from front panel microphone jack to A14.
J1-4	Spare not connected	
J1-5	BUFF APC	PA RF output signal level to A13A3S3 (dc signal).
J1-6	GND	Ground
J1-7	A1 OUTPUT DET	RF output signal level from A1 to A13A3S1 (dc signal).
J1-8	Spare not connected	
J2-1	USB METER DC	USB audio signal level to A13A3S1.
J2-2	LOG AMP OUTPUT	
J2-3	INDEX	Not connected.
J2-4	Spare not connected	
J2-5	LSB METER DC	LSB audio signal level to A13A3S4.
J2-6	GND	Ground
J2-7	Spare not connected	
J3-1	M1 (+)	Dc signal to meter.
J3-2	M1 (-)	Meter return-ground.
J3-3	PTT KEY	PTT key signal from microphone jack.
J3-4	CW KEY	CW key signal from microphone jack.
J3-5	GND Ground	
J3-6	Spare not connected	
J4-1	LSB AUDIO GAIN RETURN	LSB audio gain control signal to A5 assembly (ground).
J4-2	LSB AUDIO GAIN	LSB audio gain control signal from A5 assembly.
J4-3	GND	Ground
J4-4	INDEX	Not connected.
J4-5	Spare not connected	
J4-6	GND	Ground
J4-7	USB AUDIO GAIN RETURN	USB audio gain control signal to A5 assembly (ground).
J4-8	USB AUDIO GAIN	USB audio gain control signal from A5 assembly.

4.4 Parts Lists, Component Locations, and Schematic Diagram

Table 9 is the Front Panel Meter Board Assembly A13A3 parts list. Figures 10 and 11 are the Front Panel Meter Board Assembly A13A3 component location diagram and schematic diagram.

Table 9. Front Panel Meter Board Assembly A13A3 Parts List (10121-2300)

Ref. Desig.	Part Number	Description
A13A3	10121-2300	METER PWB ASSEMBLY
	10073-2313	SW DPDT 4SEC INTLOCKING
J1	J46-0032-008	CONN,8 PIN
J2	J46-0032-008	CONN,8 PIN
J3	J46-0032-006	HEADER, 6 PIN DISCRETE
J4	J46-0032-008	CONN,8 PIN
R1	RN55D2432F	RES,24.3K 1% 1/8W MET FLM
R2	RN55D5492F	RES,54.9K 1% 1/8W MET FLM
R3	RN55D5622F	RES,56.2K 1% 1/8W MET FLM
R4	R30-0001-102	RES,VAR,1K 3/4W 20%
R5	R30-0001-102	RES,VAR,1K 3/4W 20%

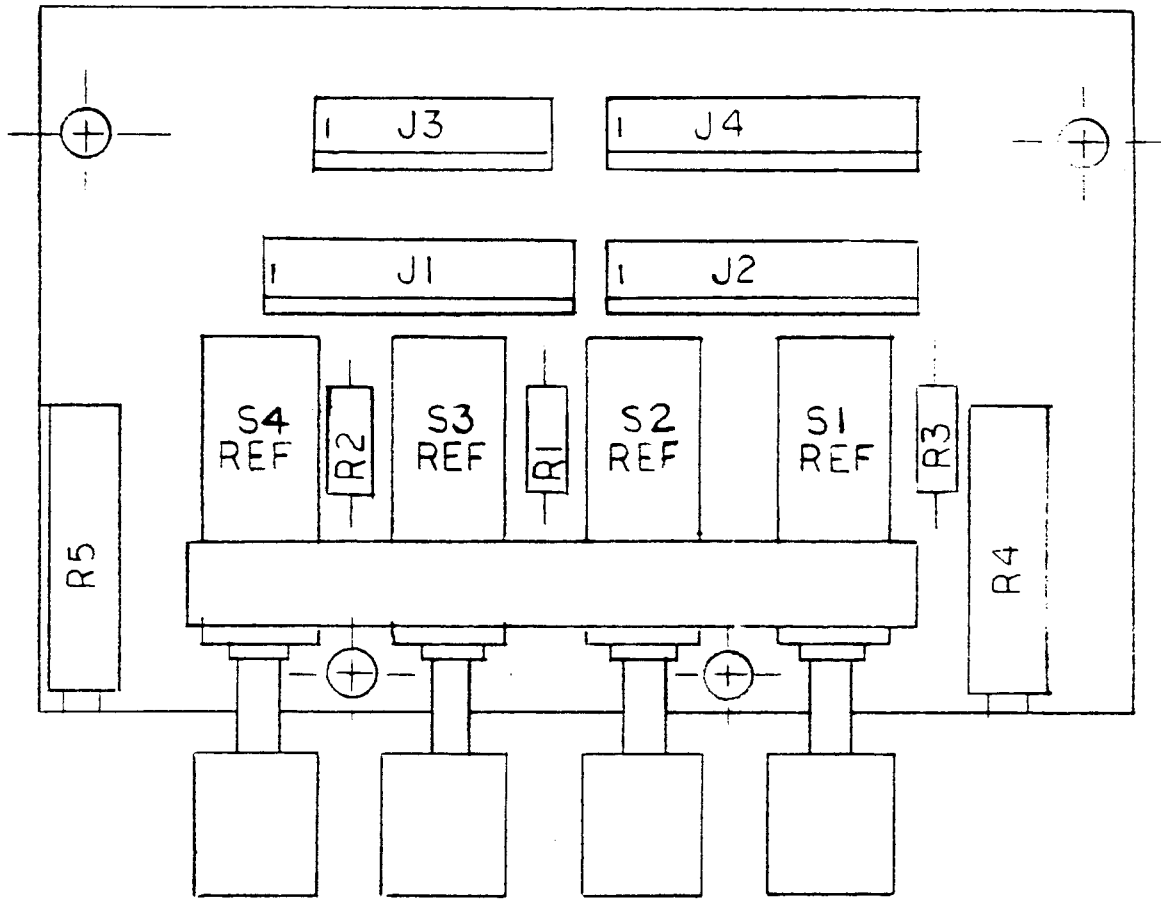


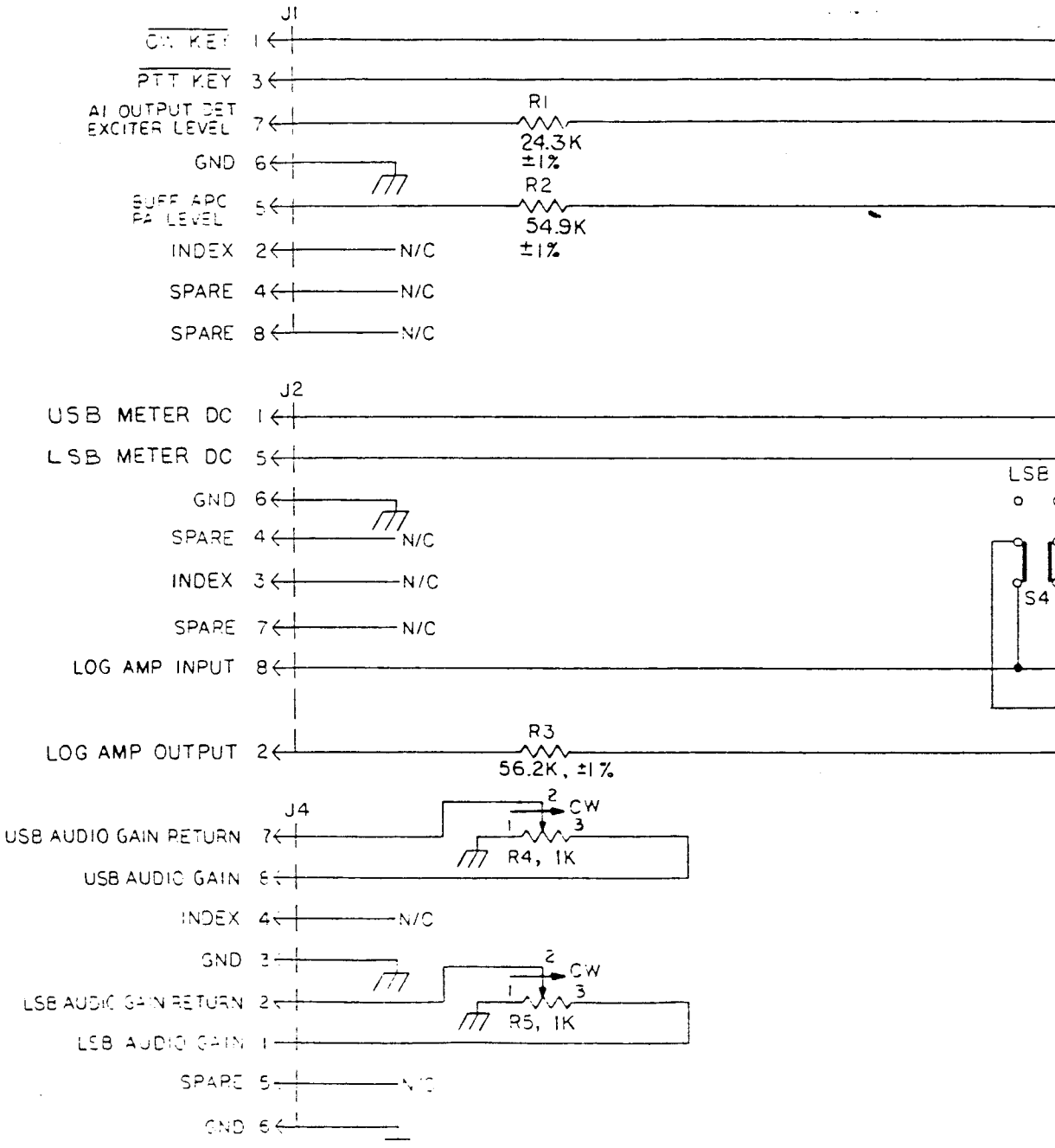
Figure 10. Front Panel Meter Board Assembly A13A3 Component Location Diagram (10121-2300)

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.

2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.

3. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.



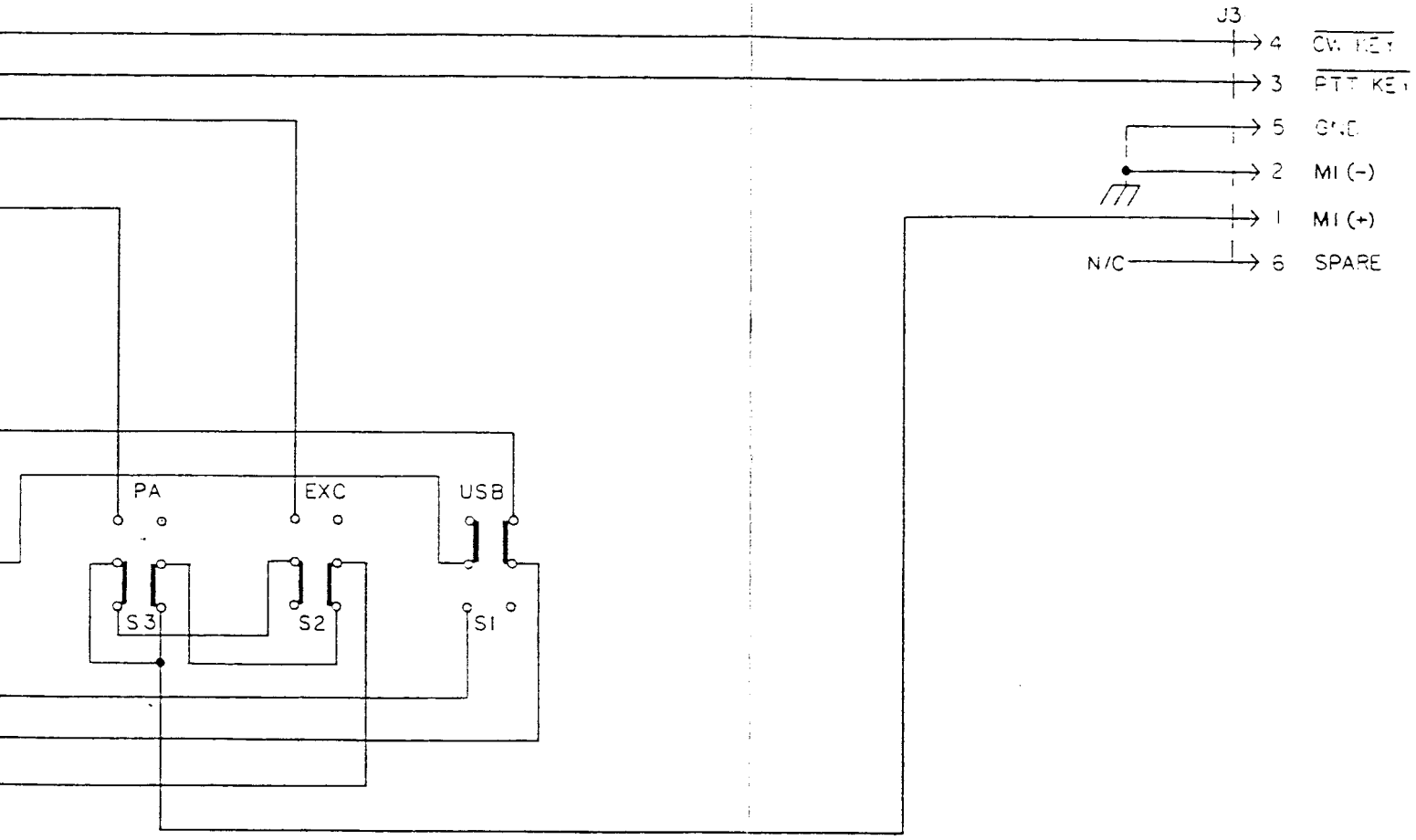


Figure 11. Front Panel Meter Board Assembly A13A3 Schematic Diagram (10121-2301 Rev. D)

5. FRONT PANEL ALPHANUMERIC DISPLAY ASSEMBLY A13A4

5.1 General Description

Front Panel Alphanumeric Display Assembly A13A4 consists of a single vacuum fluorescent display which contains twenty, fourteen-segment (British flag) characters. The alpha display provides indications of mode, carrier attenuation, audio source, and RF power attenuation. Additionally, the alphanumeric display is used to provide fault indications, if any, at the completion of the BITE test.

5.2 Interface Connections

Table 10 lists the A13A4 assembly interface connections.

Table 10. Front Panel Alphanumeric Display Assembly A13A4 Interface Connections

Connector	Description
J1 to/from A13A2	
J1-1	a Segment
J1-2	b Segment
J1-3	c Segment
J1-4	d Segment
J1-5	m Segment
J1-6	n Segment
J1-7	e Segment
J1-8	f Segment
J1-9	J Segment
J1-10	k Segment
J1-11	g Segment
J1-12	h Segment
J1-13	Decimal Point
J1-14	Comma
J1-15	N/C
J1-16	G1 Digit
J1-17	p Segment
J1-18	r Segment
J1-19	G2 Digit

Table 10. Front Panel Alphanumeric Display Assembly A13A4 Interface Connections (Cont.)

Connector	Description
J1-20	G3 Digit
J1-21	G20 Digit
J1-22	G4 Digit
J1-23	G5 Digit
J1-24	G6 Digit
J1-25	G19 Digit
J1-26	G7 Digit
J1-27	G8 Digit
J1-28	G9 Digit
J1-29	G18 Digit
J1-30	G10 Digit
J1-31	G11 Digit
J1-32	G12 Digit
J1-33	G17 Digit
J1-34	G13 Digit
J1-35	G14 Digit
J1-36	N/C
J1-37	G16 Digit
J1-38	G15 Digit
J1-39	Filament
J1-40	Filament

5.3 Functional Description

The alphanumeric vacuum fluorescent display is very similar in principle to the vacuum tube. Front Panel Driver Board A13A2 provides all required voltages and timing to properly drive the display. The 10073-2400 twenty-character VF display requires a 4.7 Vac filament voltage and 35 Vdc grid and anode voltages. The grids (20 of them) are essentially character enable signals which are driven in multiplexed fashion, enabled one at a time as the segment data for that character is provided to the anode pins. The anode pins are inputs for the 14 segments plus dot and comma signals. Figure 12 shows the display's segment location. See paragraphs 3.1 and 3.3.3 for additional details.

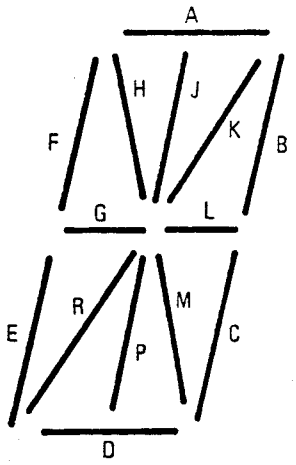


Figure 12. Alphanumeric Display Segment Location

5.3.1 Parts List and Schematic Diagram

Table 11 is the Front Panel Alphanumeric Display Assembly A13A4 parts list. Figures 13 and 14 are the Front Panel Alphanumeric Display Assembly A13A4 component location diagram and schematic diagram.

Table 11. Front Panel Alphanumeric Display Assembly A13A4 Parts List (PL 10073-2400)

Ref. Desig.	Part Number	Description
A13A4	10073-2400	ALPHANUMERIC DISPLAY ASSEMBLY
	P05-0004-001	TAPE,FM,CL CELL,1/8 X1
	H50-1006-409	SPCR 3/16HEX SS 4-40X.562
DS1	N50-0006-001	DSPL FLR VAC 14SEG 20-DIG
J1	J46-0031-040	CONN,40 PIN

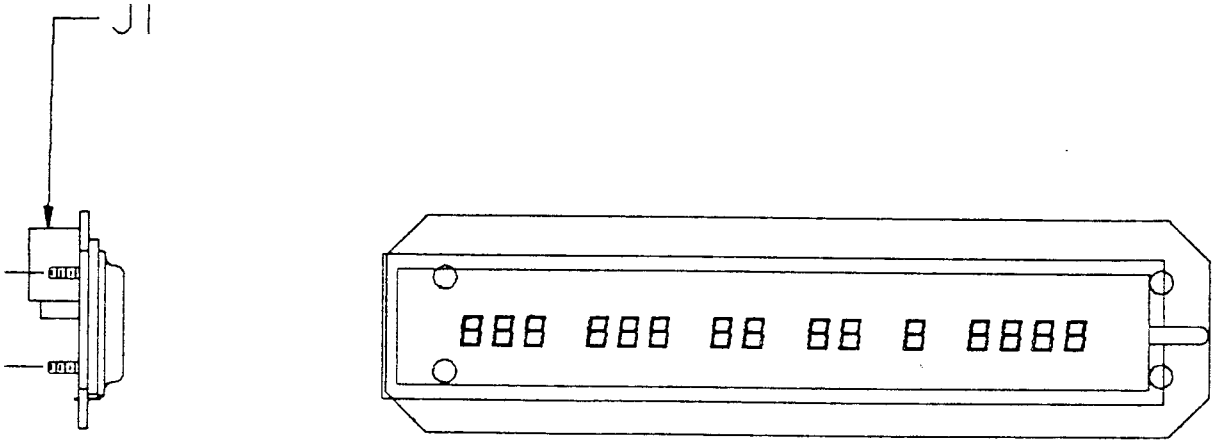


Figure 13. Front Panel Alphanumeric Display Assembly A13A4 Component Location Diagram (10073-2400)

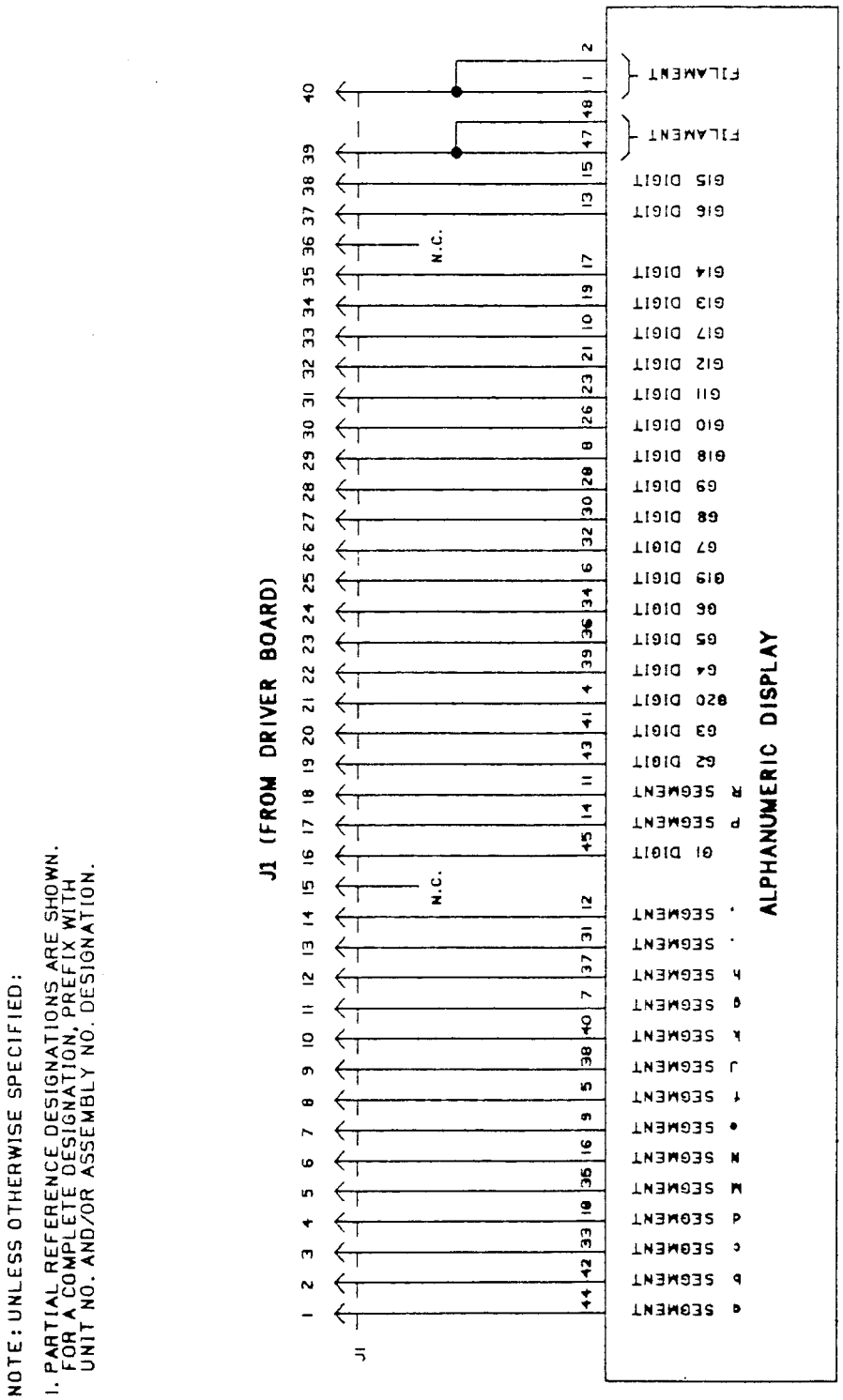


Figure 14. Front Panel Alphanumeric Display Board A13A4 Schematic Diagram (10073-2401 Rev. B)

6. FRONT PANEL NUMERIC DISPLAY ASSEMBLY A13A5

6.1 General Description

Front Panel Numeric Display Assembly A13A5 consists of a single vacuum fluorescent display which contains eight, seven-segment characters used for frequency display and two, seven-segment characters used for the channel display.

6.2 Interface Connections

Table 12 lists the A13A5 assembly interface connections.

Table 12. Front Panel Numeric Display Assembly A13A5 Interface Connections

Connector	Description
J1 to/from A13A2	
J1-1	G11 10 MHz Digit
J1-2	G10 1 MHz Digit
J1-3	G9 100 kHz Digit
J1-4	G3 1/2 Segments
J1-5	G7 1 kHz Digit
J1-6	G8 10 kHz Digit
J1-7	Filament
J1-8	Decimal Point
J1-9	G5 10 Hz Digit
J1-10	G6 100 Hz Digit
J1-11	N/C
J1-12	Comma
J1-13	G4 1 Hz Digit
J1-14	c Segment
J1-15	G2 CH10 Digit
J1-16	G1 CH1 Digit
J1-17	b Segment
J1-18	a Segment
J1-19	g Segment

Table 12. Front Panel Numeric Display Assembly A13A5 Interface Connections (Cont.)

Connector	Description
J1-20	Filament
J1-21	Underline Segments
J1-22	d Segment
J1-23	e Segment
J1-24	f Segment

6.3 Functional Description

The numeric vacuum fluorescent display is very similar in principle to the vacuum tube. Front Panel Driver Board A13A2 provides all required voltages and timing signals to properly drive the display. The 10073-2500 VF display operates by using a 5.8 Vac filament voltage and 35 Vdc grid and anode voltages. The grids (eleven of them; nine are used) are character enable signals which are driven in a multiplexed fashion. The grids are enabled one at a time as the seven segment data plus underline, if required, are provided to the anode pins. Each digit is enabled for approximately 600 to 700 microseconds. Figure 15 shows the display's segment's location.

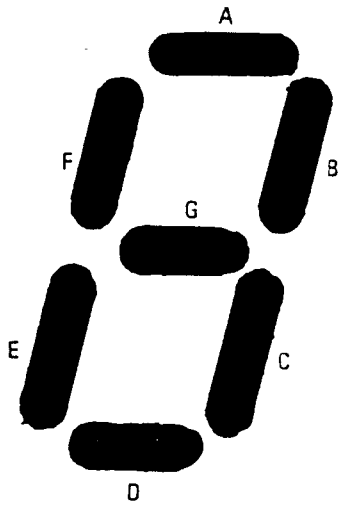


Figure 15. Numeric Display Segment Location

6.3.1 Parts List and Schematic Diagram

Table 13 is the Front Panel Numeric Display Assembly A13A5 parts list. Figures 16 and 17 are the Front Panel Numeric Display Assembly A13A5 component location diagram and schematic diagram.

Table 13. Front Panel Numeric Display Assembly A13A5 Parts List (PL 10073-2500)

Ref. Desig.	Part Number	Description
A13A5	10073-2500	NUMBERIC DISPLAY ASSEMBLY
	P05-0004-001	TAPE,FM,CL CELL,1/8 X1
	H50-1006-409	SPCR 3/16HEX SS 4-40X.562
DS1	N50-0005-001	DSPL FLR VAC 7SEG 11-DIG
J1	J46-0031-024	CONN,24 PIN

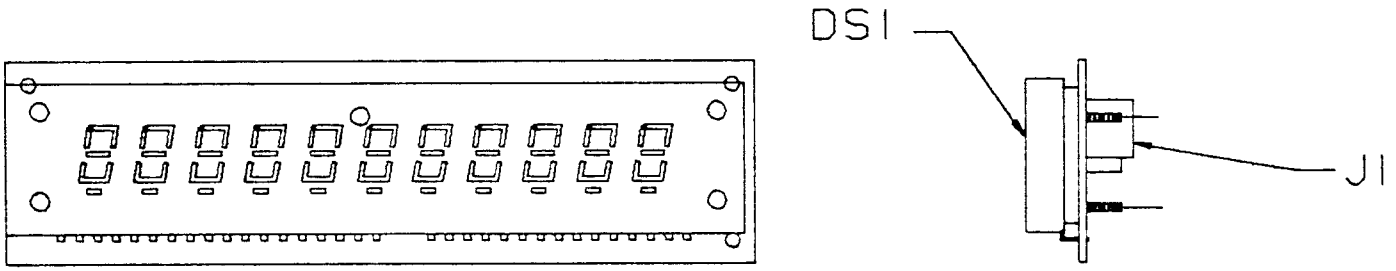
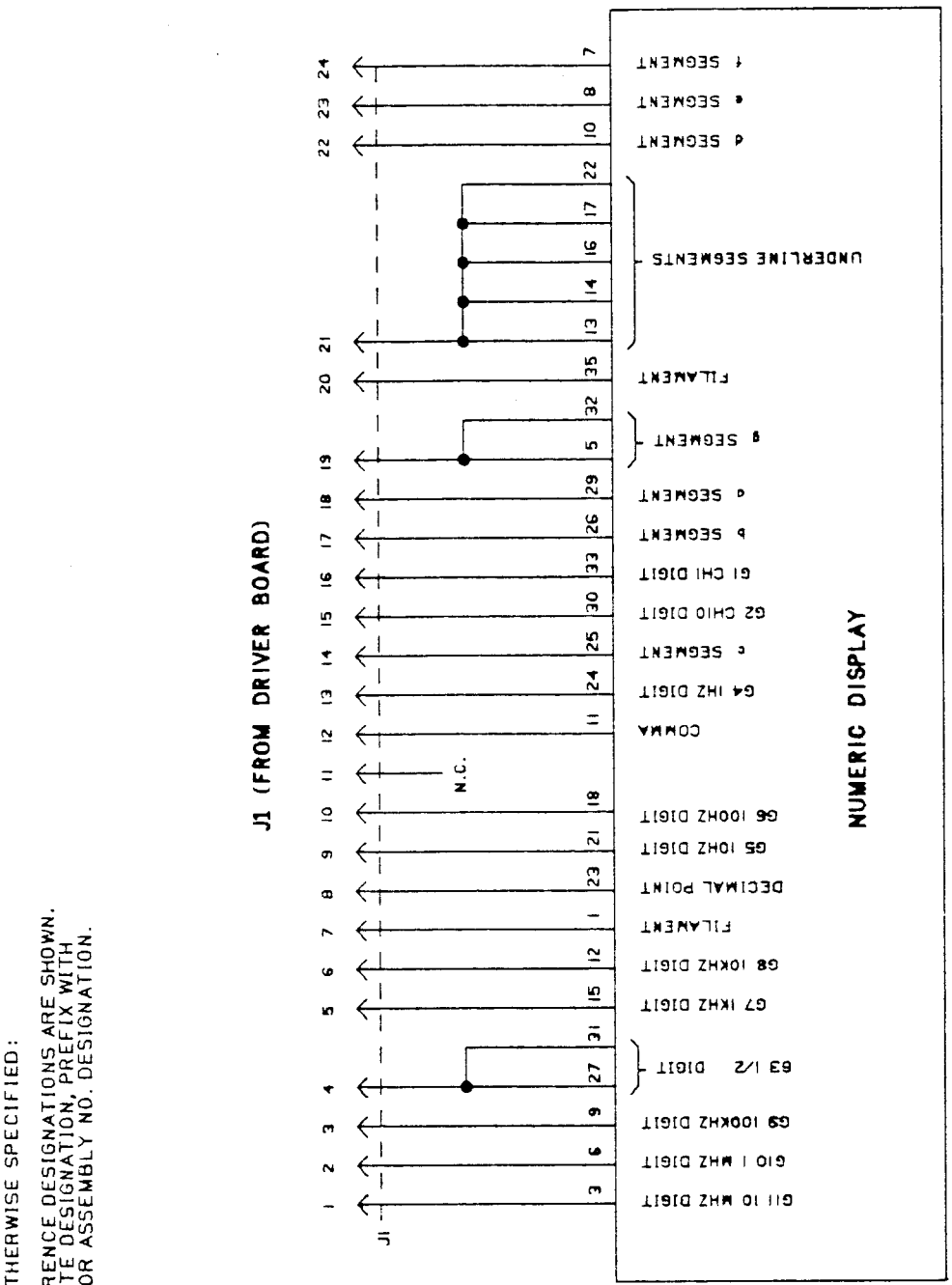


Figure 16. Front Panel Numeric Display Board A13A5 Component Location Diagram (10073-2500)



NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.

Figure 17. Front Panel Numeric Display Assembly A13A5 Schematic Diagram (10073-2501 Rev. B)

7. FRONT PANEL DISPLAY CONVERTER ASSEMBLY A13A6

7.1 General Description

Front Panel Display Converter Assembly A13A6 is a self contained dc-to-dc converter type power supply. It supplies anode and filament voltages to the A13A4 and A13A5 front panel vacuum fluorescent displays from the available -15 Vdc supply. Anode voltage output is 35 Vdc at 100 mA, and filament output voltage is 5.8 Vac at 200 mA.

The A13A6 assembly is a sealed unit (to provide EMI protection). Input/output connections to the internal A13A6A1 PWB is via feedthrough capacitors.

7.2 Circuit Description

The -15 Vdc is applied to push/pull square wave oscillator Q1 and Q2 operating at approximately 15 kHz. T1 is a saturating transformer used to provide feedback and two output voltages. One output is rectified by fullwave bridge CR2-CR5 and filtered by pi-network C2-L1-C3 to provide 35 Vdc at 100 mA for display anode power. The second output is filtered by L2, C5, T2, and C6 to provide 5.8 Vac at 200 mA for display filament power. A bias voltage of approximately 6 Vdc is also supplied to the filaments. This bias voltage originates on Front Panel Driver Board Assembly A13A2 and is applied via a center tap at T2.

7.2.1 Parts List and Schematic

Table 14 is the Front Panel Display Converter Assembly A13A6 parts list. Figure 18 is the Front Panel Display Converter Assembly A13A6 component location diagram. Table 15 is the Display Converter Board Assembly A13A6A1 parts list. Figure 19 is the Display Converter Board Assembly A13A6A1 component location diagram, and figure 20 is the A13A6 and A13A6A1 schematic diagram.

Table 14. Front Panel Display Converter Assembly A13A6 Parts List (PL 10073-2250)

Ref. Desig.	Part Number	Description
A13A6	10073-2250	CONVERTER MODULE ASSEMBLY
	10073-2256	COVER, CONVERTER
	10073-2255	CASE, CONVERTER
A1	10073-2260	PWB ASSY, CONVERTER
C1	10073-7035	CAP,FEED-THRU 100
C2	10073-7035	CAP,FEED-THRU 100
C3	10073-7035	CAP,FEED-THRU 100
C4	10073-7035	CAP,FEED-THRU 100
C5	10073-7035	CAP,FEED-THRU 100
E1	E58-0004-000	LUG SLDR RIGHT ANGLE

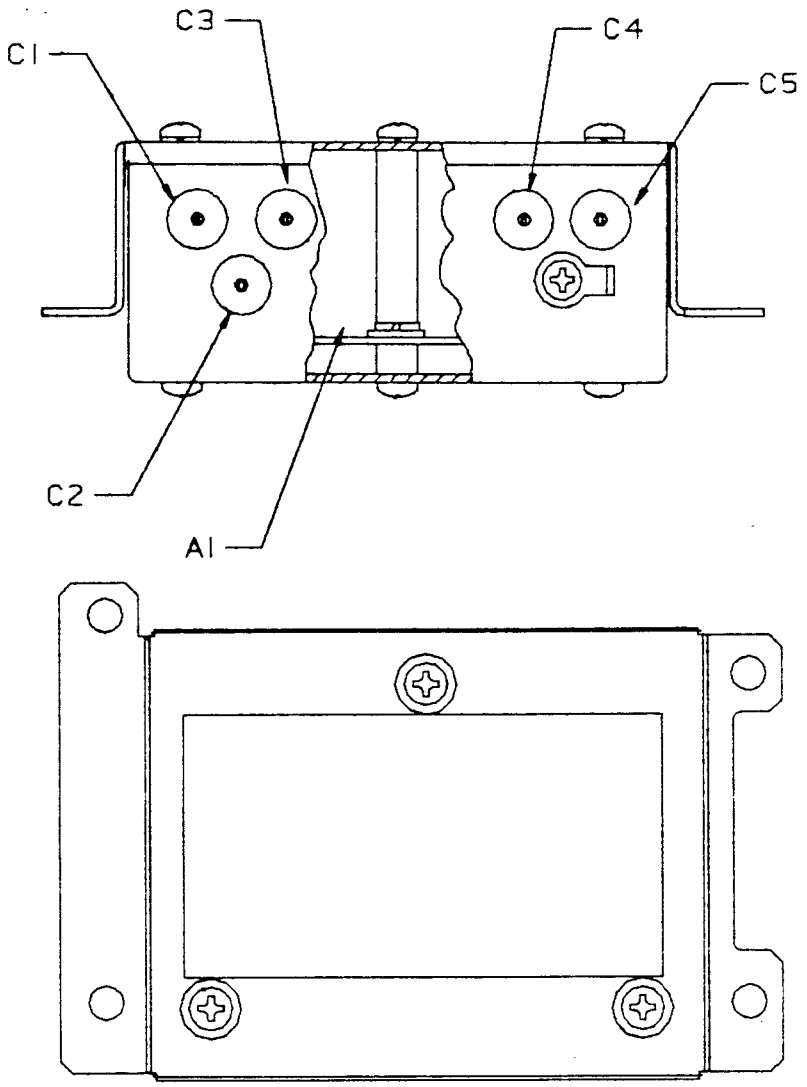


Figure 18. Front Panel Display Converter Assembly A13A6 Component Location Diagram (10073-2250)

Table 15. Display Converter Board Assembly A13A6A1 Parts List (PL 10073-2260)

Ref. Desig.	Part Number	Description
A13A6A1	10073-2260	CONVERTER ASSEMBLY
C1	CK06BX473K	CAP .047UF 10% 100V CER
C2	C26-0050-100	CAP 10UF 20% 50V TANT
C3	C26-0050-100	CAP 10UF 20% 50V TANT
C4	C18-0025-101	CAP 100UF 25V ELEC
C5	M39014/02-1318	CAP .33UF 10% 50V CER-R
C6	M39014/02-1318	CAP .33UF 10% 50V CER-R
C7	C26-0025-680	CAP 68UF 20% 25V TANT
CR1	1N4007	DIODE 1A 1000V RECT GP
CR2	D22-0007-002	DIODE 1A 100V RECT GP
CR3	D22-0007-002	DIODE 1A 100V RECT GP
CR4	D22-0007-002	DIODE 1A 100V RECT GP
CR5	D22-0007-002	DIODE 1A 100V RECT GP
CR6	D22-0007-002	DIODE 1A 100V RECT GP
CR7	D22-0007-002	DIODE 1A 100V RECT GP
L1	MS90538-12	COIL 100UH 5% FXD RF
L2	10073-7029	INDUCTOR, FILTER CHOKE
L3	10073-7029	INDUCTOR, FILTER CHOKE
Q1	2N5193	XSTR POWER PNP TO-205AA
Q2	2N5193	XSTR POWER PNP TO-205AA
R1	R65-0003-272	RES,2.7K 5% 1/4W CAR FILM
R2	R65-0003-270	RES,27 5% 1/4W CAR FILM
R3	R65-0003-101	RES,100 5% 1/4W CAR FILM
R4	R65-0003-223	RES,22K 5% 1/4W CAR FILM
T1	10073-7027	TRANSFORMER, POWER
T2	10073-7028	TRANSFORMER, RF, FIXED

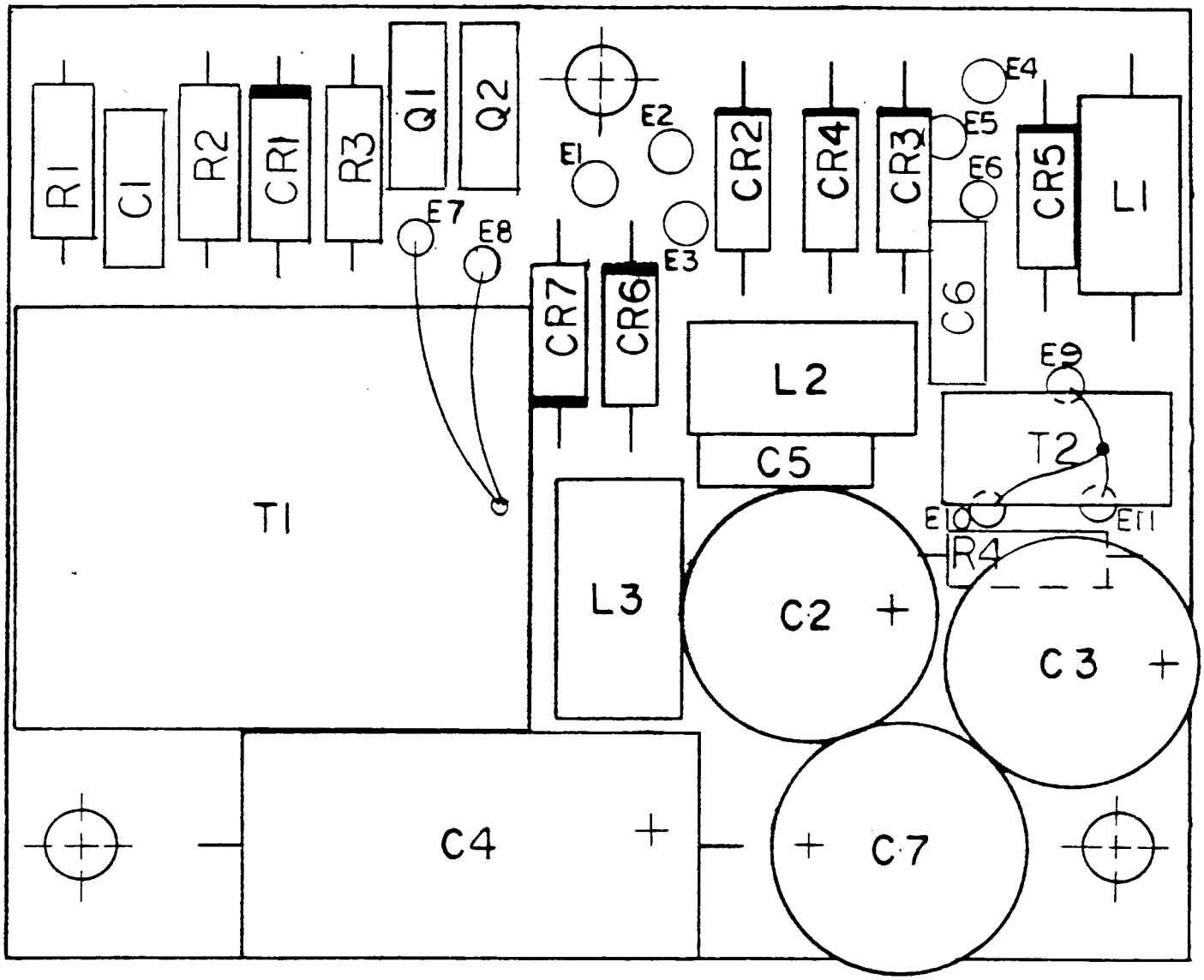
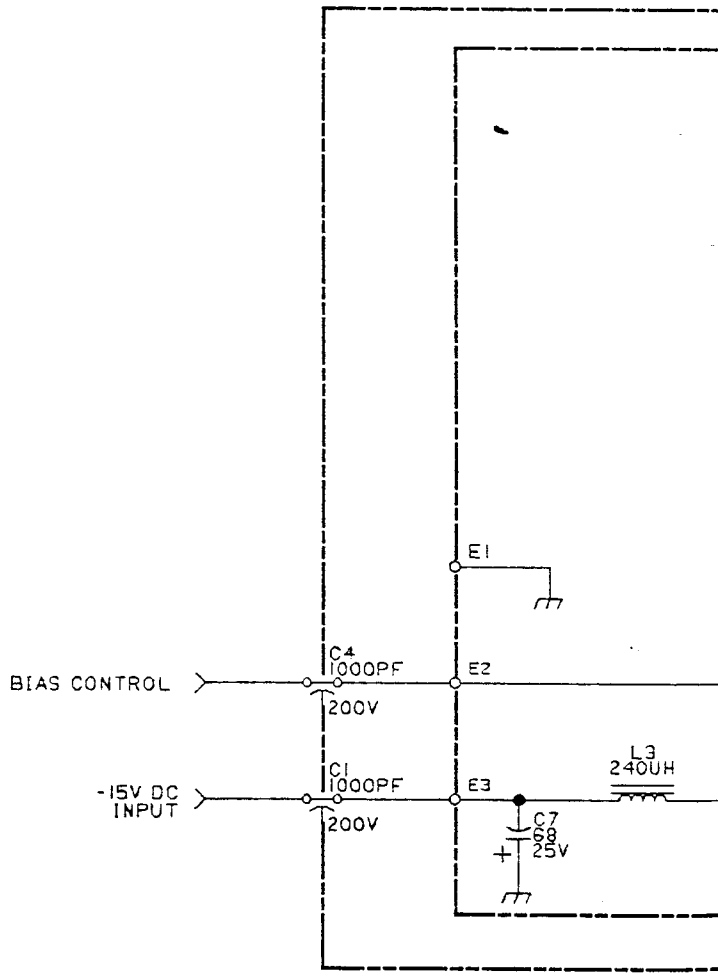


Figure 19. Display Converter Board Assembly A13A6A1 Component Location Diagram (10073-2260)

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS.
4. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.



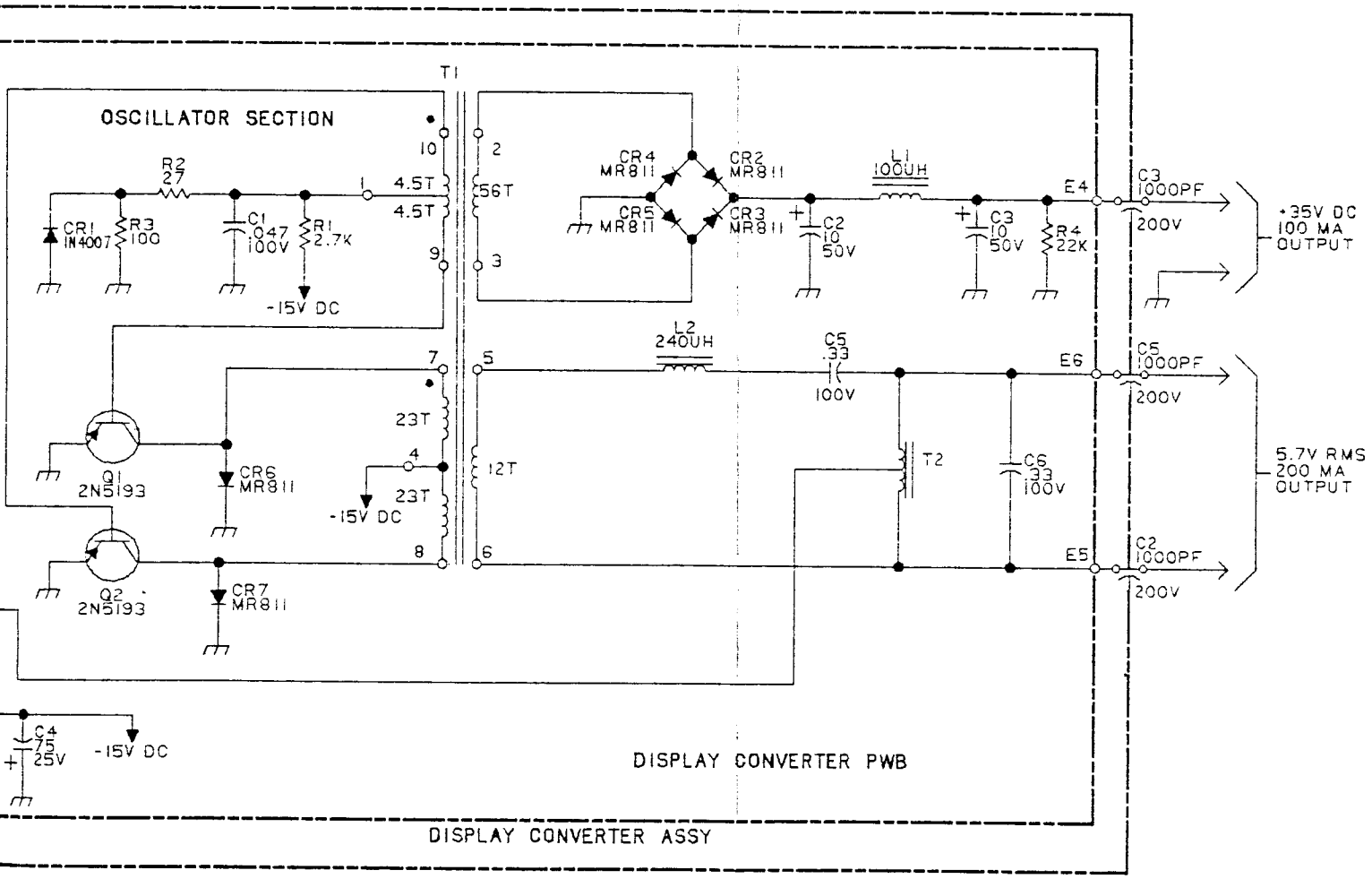


Figure 20. Front Panel Display Converter Assembly A13A6 and Display Converter Board Assembly A13A6A1 Schematic Diagram (10073-2251 Rev. F)

8. MICROPHONE ASSEMBLY A13A7

8.1 General Description

Microphone Assembly A13A7 includes the front panel microphone jack and three simple LC filter circuits. Filtering is provided for the AUDIO, CW KEY, and PTT signals. Two connectors on the PWB accept cables that carry the AUDIO signal to the A5A1 assembly and the CW KEY and PTT signals to the A13A3 assembly.

8.2 Interconnection

The interconnections of the A13A7 assembly with the other assemblies in the exciter are summarized in table 16.

Table 16. Microphone Assembly A13A7 Interconnections

Connector and Pin	Signal Name	Description
J1-A	GND	Ground
J1-B	N/C	Not connected
J1-C	PTT	PTT key signal
J1-D	AUDIO	Microphone audio in
J1-E	CW KEY	CW key signal
J1-F	N/C	Not connected
J2-1	GND	Ground
J2-2	INDEX KEY	Connector alignment key
J2-3	CW KEY	CW key signal to Meter Board
J2-4	PTT	PTT key signal to Meter Board
J3-1	AUDIO	Audio to A5A1 assembly (-56 dB nominal)
J3-2	AUDIO KEY	Audio ground
J3-3	INDEX KEY	Connector alignment key

8.3 Circuit Description

Microphone Assembly A13A7 circuit includes three separate LC filters; one each for the AUDIO, CW KEY, and PTT signals.

8.4 Parts List, Component Locations, and Schematic Diagram

All replaceable components of the microphone Assembly A13A7 are listed in table 17. Component locations are shown in figure 21. The Microphone Assembly schematic diagram is shown in figure 22.

Table 17. Microphone Assembly A13A7 Parts List

Ref. Desig.	Part Number	Description
A13A7	10121-2900	MICROPHONE ASSEMBLY
C1	M39014/02-1310	CAP .1UF 10% 100V CER-R
C2	M39014/02-1310	CAP .1UF 10% 100V CER-R
C3	M39014/02-1310	CAP .1UF 10% 100V CER-R
J1	J-0339	CONN AUDIO 6 PIN
J2	J46-0032-004	CONN,4 PIN
J3	J46-0032-004	CONN,4 PIN
L1	MS75085-8	COIL 120UH 10% FXD RF
L2	MS75085-2	COIL 39UH 10% FXD RF
L3	MS75085-2	COIL 39UH 10% FXD RF

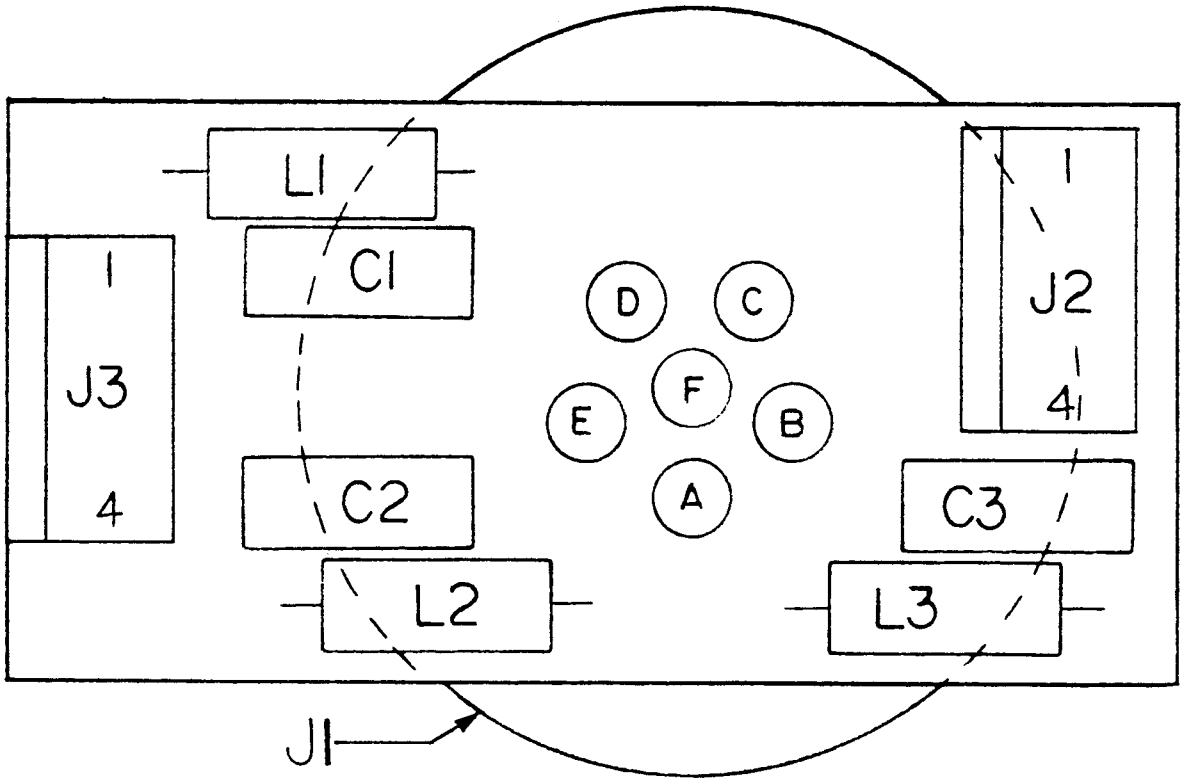


Figure 21. Microphone Assembly A13A7 Component Locations Diagram (10121-2900)

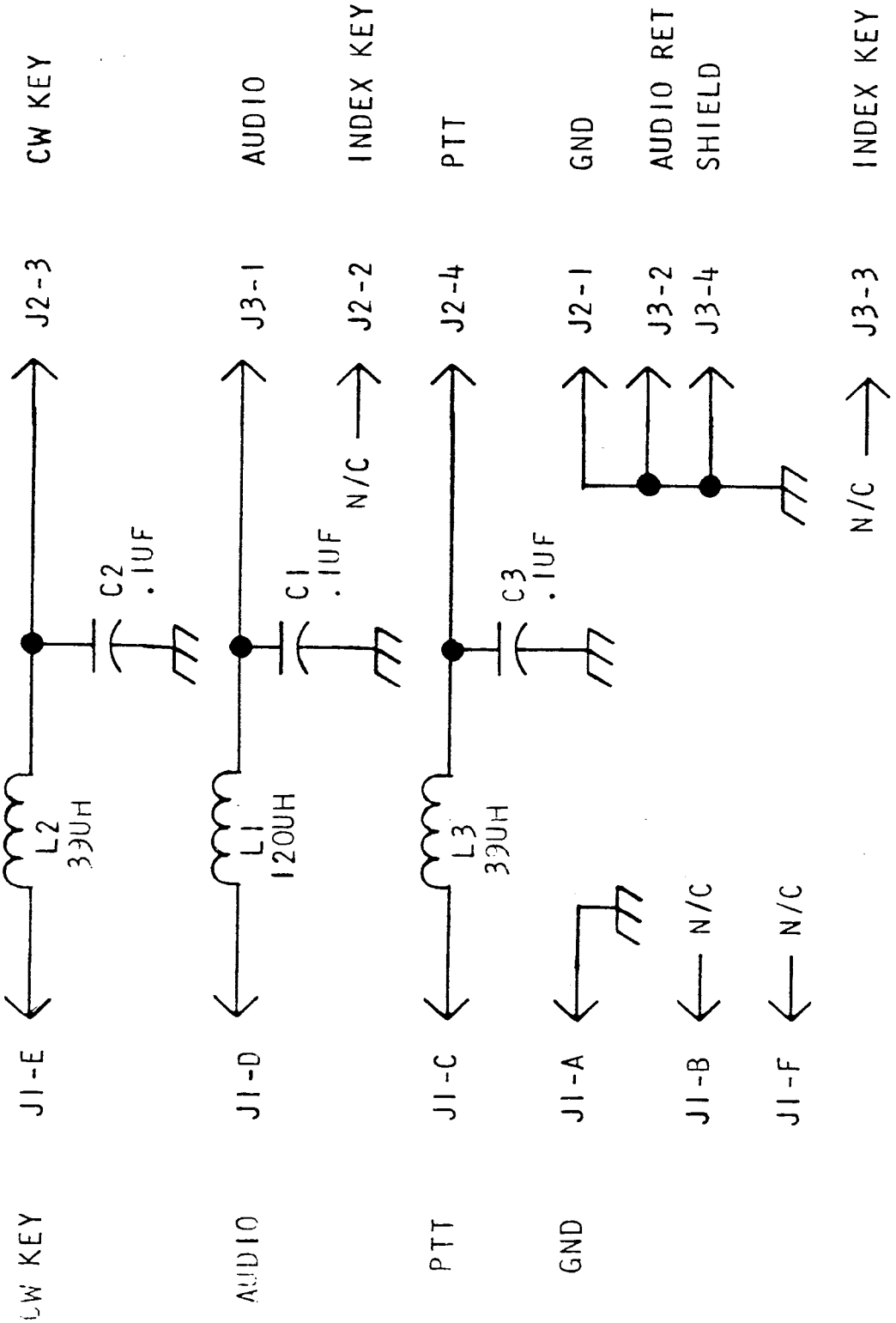


Figure 22. Microphone Assembly A13A7 Schematic Diagram (10121-2901 Rev. B)