

BOARD LOCATOR BY ASSEMBLY NUMBER	Assembly Number ○	Board Name	Board Location(Unit)	Schematic Location ◇
A1		Graticule Lights	Display	17
A2		Mode Switch	Acquisition	2
A3		Front Panel Keyboard Elect.	Display	18,36
A4		Front Panel Button	Display	18
A5		Intensity Control	Display	2,14,17
A6		Pot Adjust	Display	14,17
A7		Aux Regulator	Display	38
A8		Mother	Display	37
A9		Horizontal Channel Switch	Acquisition	10
A10		Horizontal Interconnect	Acquisition	10
A11		Main Interface	Acquisition	3,4,5,6,10
A12		Control Rectifier	Power Supply	15
A13		Trigger Amplifier	Acquisition	5,6
A14		Logic	Acquisition	4
A15		Signal Output	Acquisition	12
A16		Fan	Display	16
A17		Horizontal Amplifier	Display	11
A18		Vertical Amplifier	Display	9
A19		Vertical Channel Switch	Acquisition	7
A20		High Voltage	Display	14
A21		Z-Axis	Display	13,14
A22		Low Voltage Regulator	Power Supply	16
A23		Inverter	Power Supply	15
A24		Delay Line	Display	9
A25		Digitizer	Display	8,20,26
A26		Control Logic	Display	21,22,23,24,25
A27		MPU	Display	27,28,36
A28		RAM	Display	30
A29		Display	Display	31,32,33,34
A30		GPIB	Display	35
A31		ROM	Display	29
A32		Rear Panel Connector	Display	36
A33		X-Y Compensation	Acquisition	10
A34		Display Follower	Acquisition	3
A35		Display Follower	Acquisition	3
A36		Calculator Keyboard	Waveform Calculator	19,36
A37		Calculator Button	Waveform Calculator	19

BOARD LOCATOR BY BOARD NAME	Board Name	Assembly Number ○	Board Location(Unit)	Schematic Location ◇
	Aux Regulator	A7	Display	38
	Calculator Keyboard	A36	Waveform Calculator	19,36
	Calculator Button	A37	Waveform Calculator	19
	Control Logic	A26	Display	21,22,23,24,25
	Control Rectifier	A12	Power Supply	15
	Delay Line	A24	Display	9
	Digitizer	A25	Display	8,20,26
	Display Follower	A34	Acquisition	3
	Display Follower	A35	Acquisition	3
	Display	A29	Acquisition	31,32,33,34
	Fan	A16	Display	16
	Front Panel Keyboard Elect	A3	Display	18,36
	Front Panel Button	A4	Display	18
	GPIB	A30	Display	35
	Graticule Lights	A1	Display	17
	High Voltage	A20	Display	14
	Horizontal Channel Switch	A9	Acquisition	10
	Horizontal Amplifier	A17	Display	11
	Horizontal Interconnect	A10	Acquisition	10
	Intensity Control	A5	Display	2,14,17
	Inverter	A23	Power Supply	15
	Logic	A14	Acquisition	4
	Low Voltage Regulator	A22	Power Supply	16
	MPU	A27	Display	27,28,36
	Main Interface	A11	Acquisition	3,4,5,6,10
	Mode Switch	A2	Acquisition	2
	Mother	A8	Display	37
	Pot Adjust	A6	Display	14,17
	RAM	A28	Display	30
	ROM	A31	Display	29
	Rear Panel Connector	A32	Display	36
	Signal Output	A15	Acquisition	12
	Trigger Amplifier	A13	Acquisition	5,6
	Vertical Amplifier	A18	Display	9
	Vertical Channel Switch	A19	Acquisition	7
	X-Y Compensation	A33	Acquisition	10
	Z-Axis	A21	Display	13,14

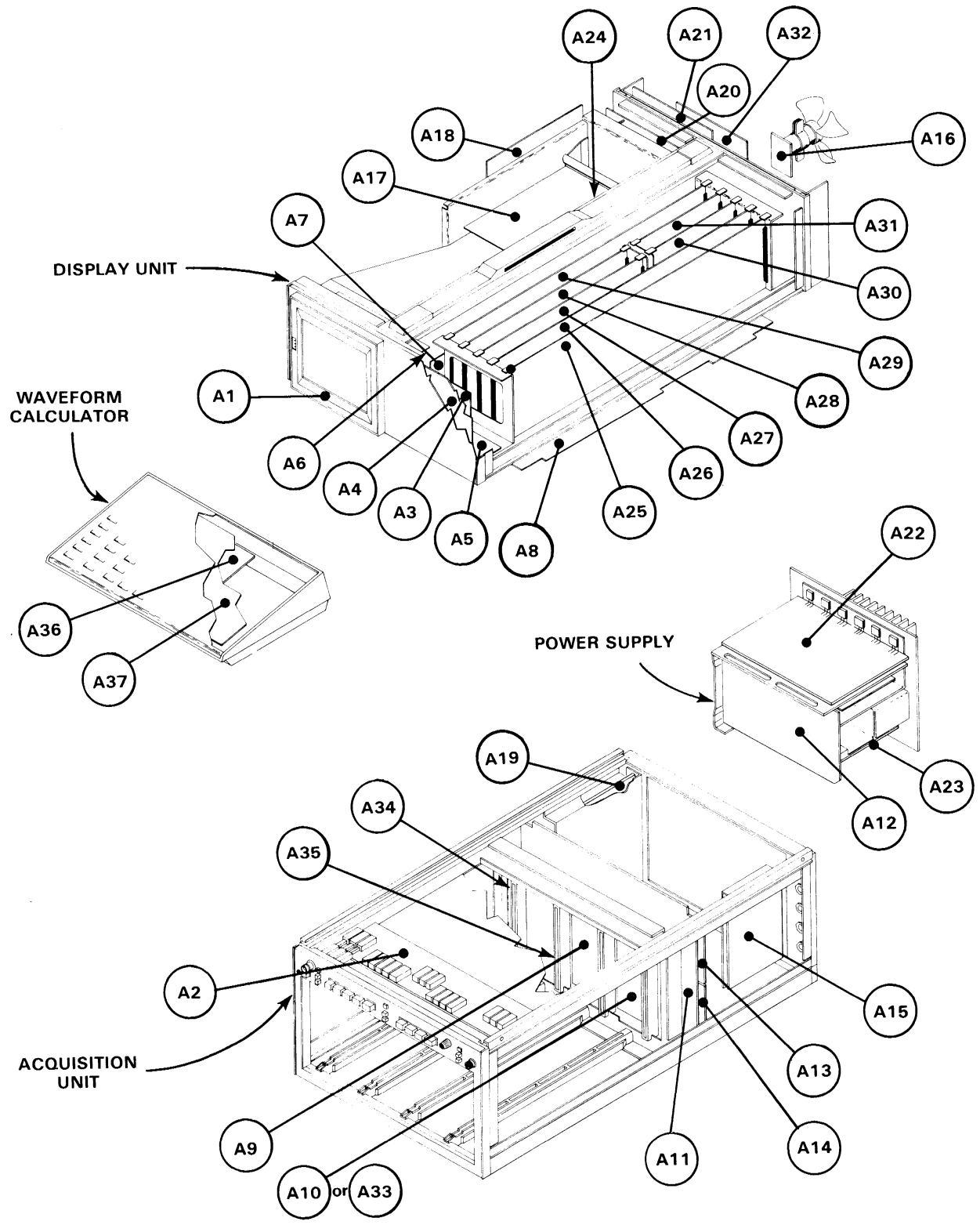


Figure 7-1. 7854 Circuit Board Locations.

A B C D E F G H

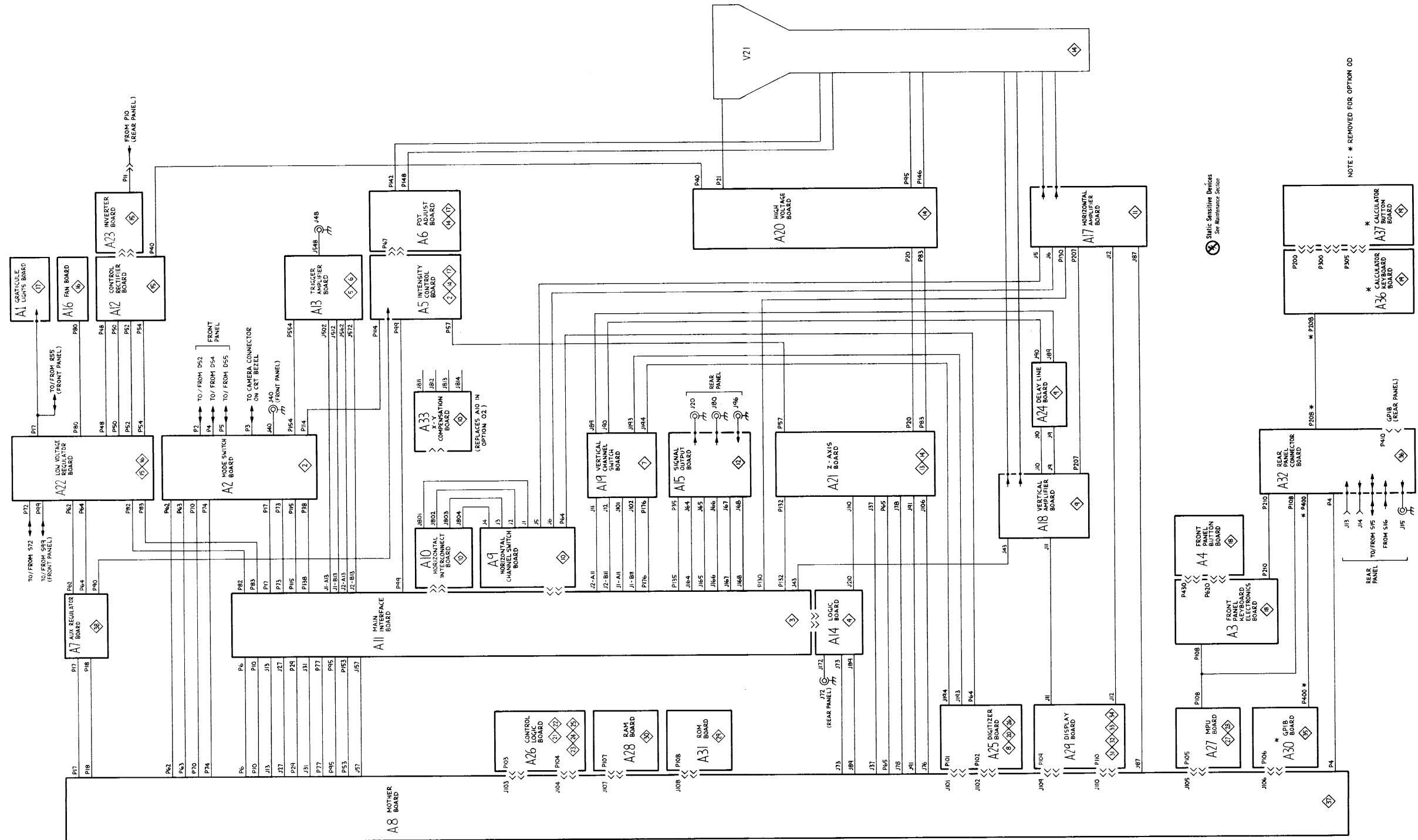
1

2

3

4

5



7854

2874-235
REV A MAR 1961

CABLE DISTRIBUTION

1 Cable Distribution
Reverse Side A2

NOTE: * REMOVED FOR OPTION 00

Assembly A2

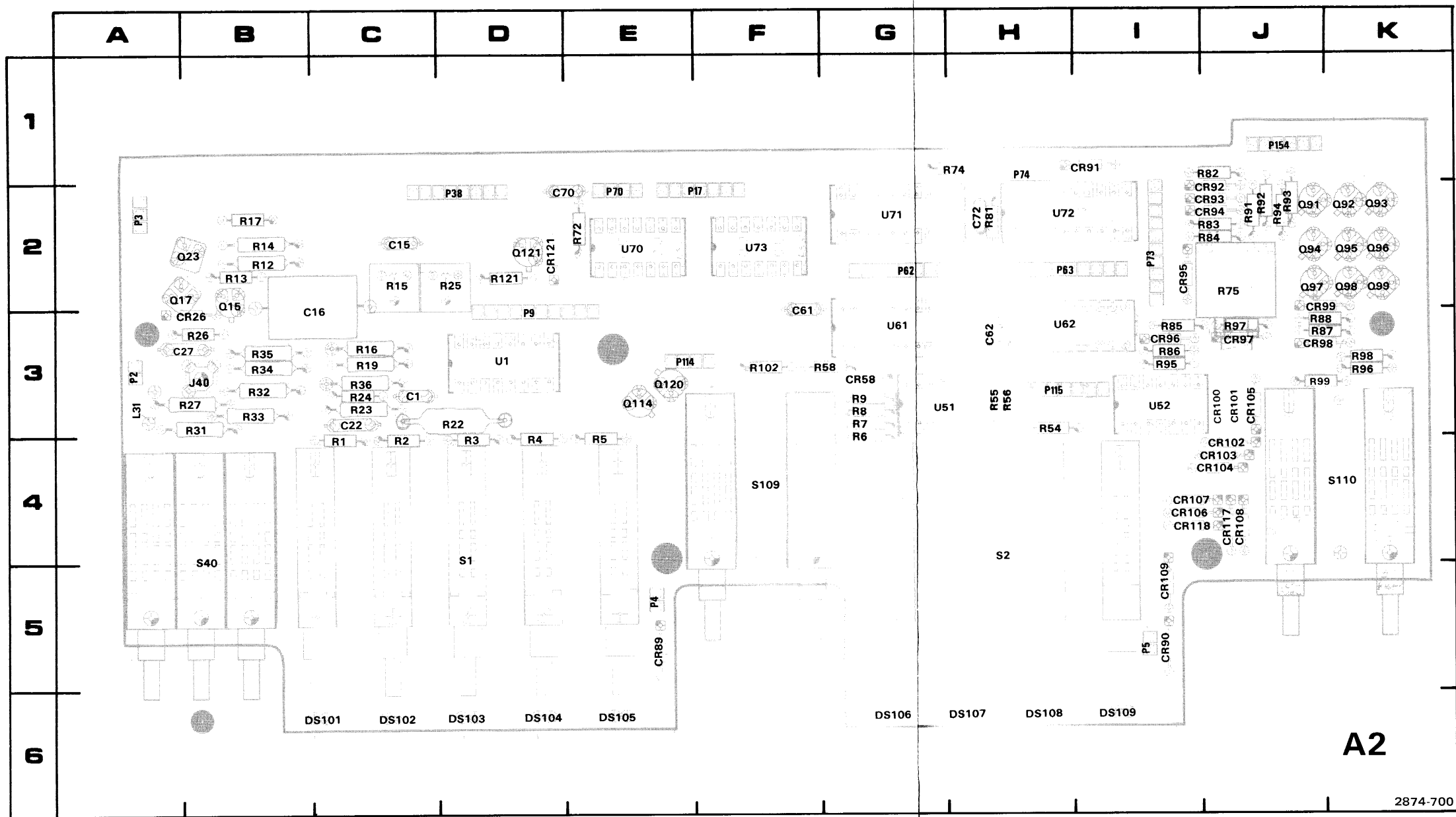
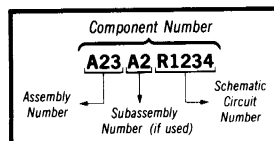


Figure 7-3. A2—Mode Switch circuit board assembly.

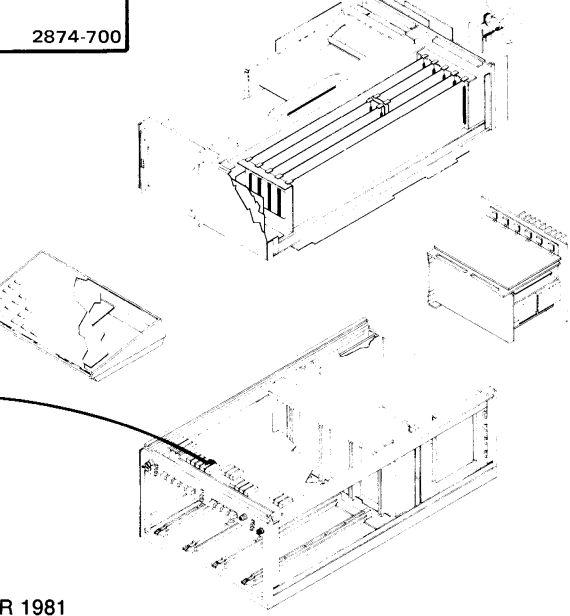
COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section

A2



REV A MAR 1981

A B C D E F G H

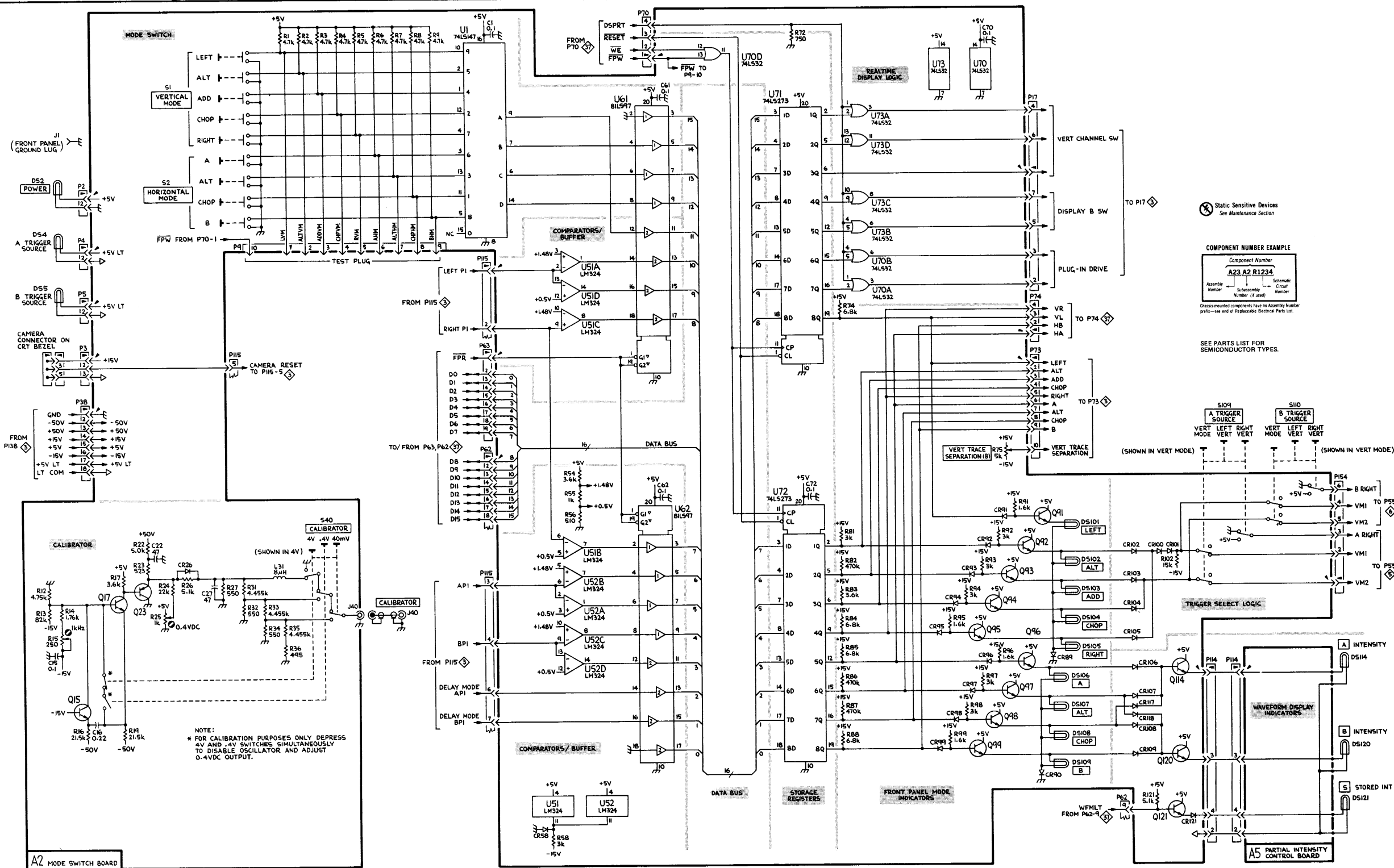
1

2

3

4

5



7854

2874-236

MODE SWITCH AND CALIBRATOR

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE
Component Number
A23 A2 R1234
Assembly Number Subassembly Number Schematic Number Circuit Number
Chassis mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List

SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

VERT TRIGGER SOURCE
A TRIGGER SOURCE B TRIGGER SOURCE
VERT LEFT VERT VERT RIGHT VERT
MODE LEFT VERT MODE RIGHT VERT
(SHOWN IN VERT MODE)

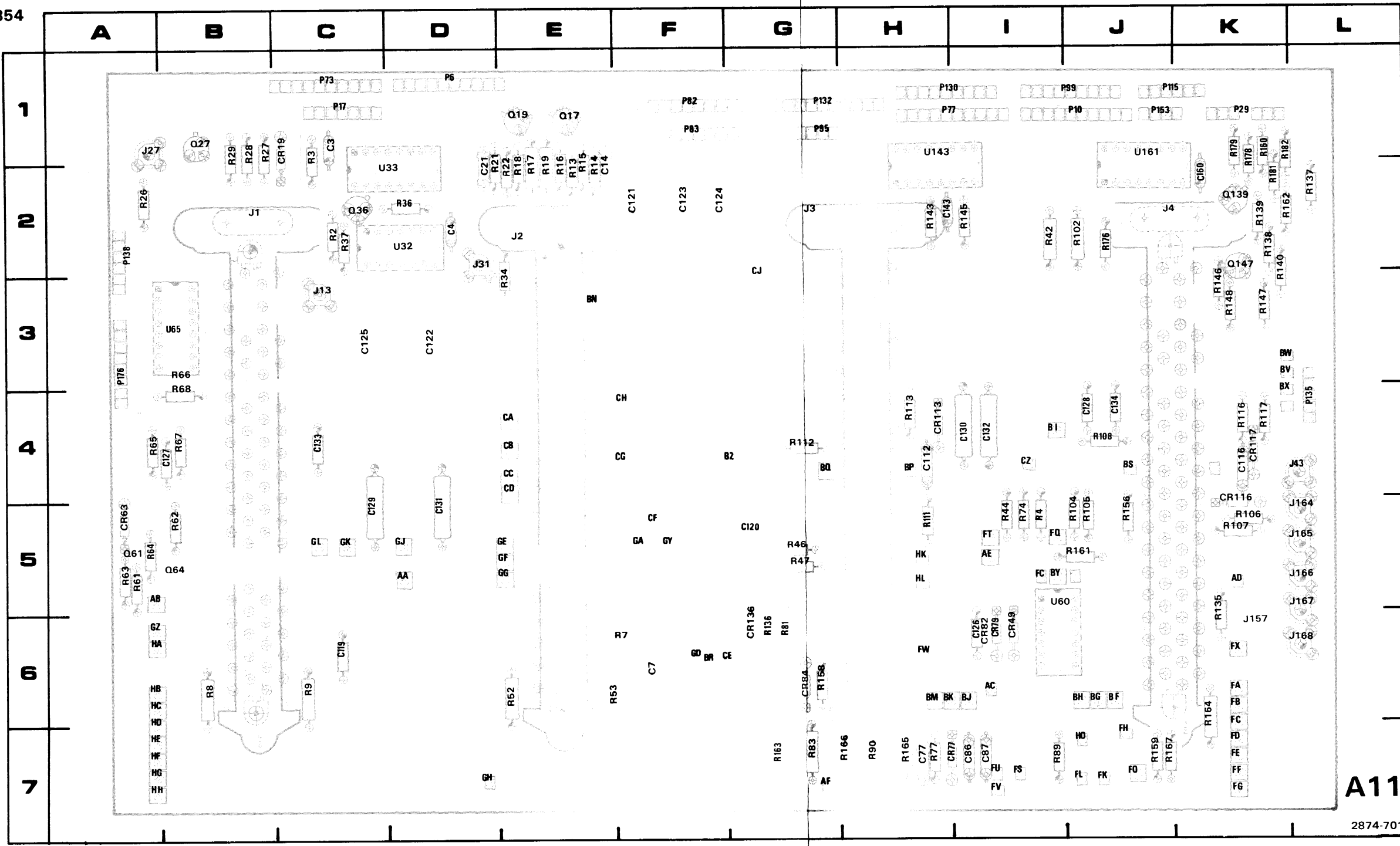
TRIGGER SELECT LOGIC

WAVEFORM DISPLAY INDICATORS

INTENSITY
A INTENSITY B INTENSITY
DSI04 DSI20

STORIED INT
DSI21

Mode Switch and Calibrator
Reverse Side A11

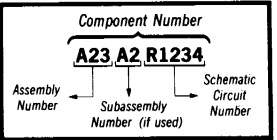


A11

2874-701

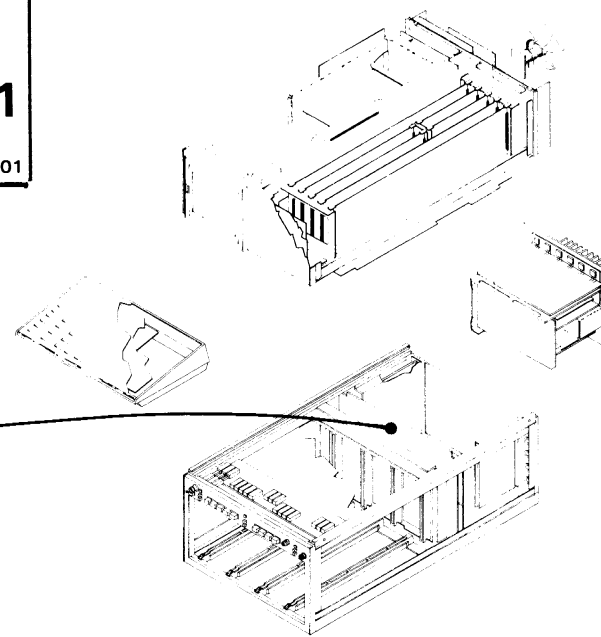
Figure 7-4. A11—Main Interface circuit board assembly.

COMPONENT NUMBER EXAMPLE



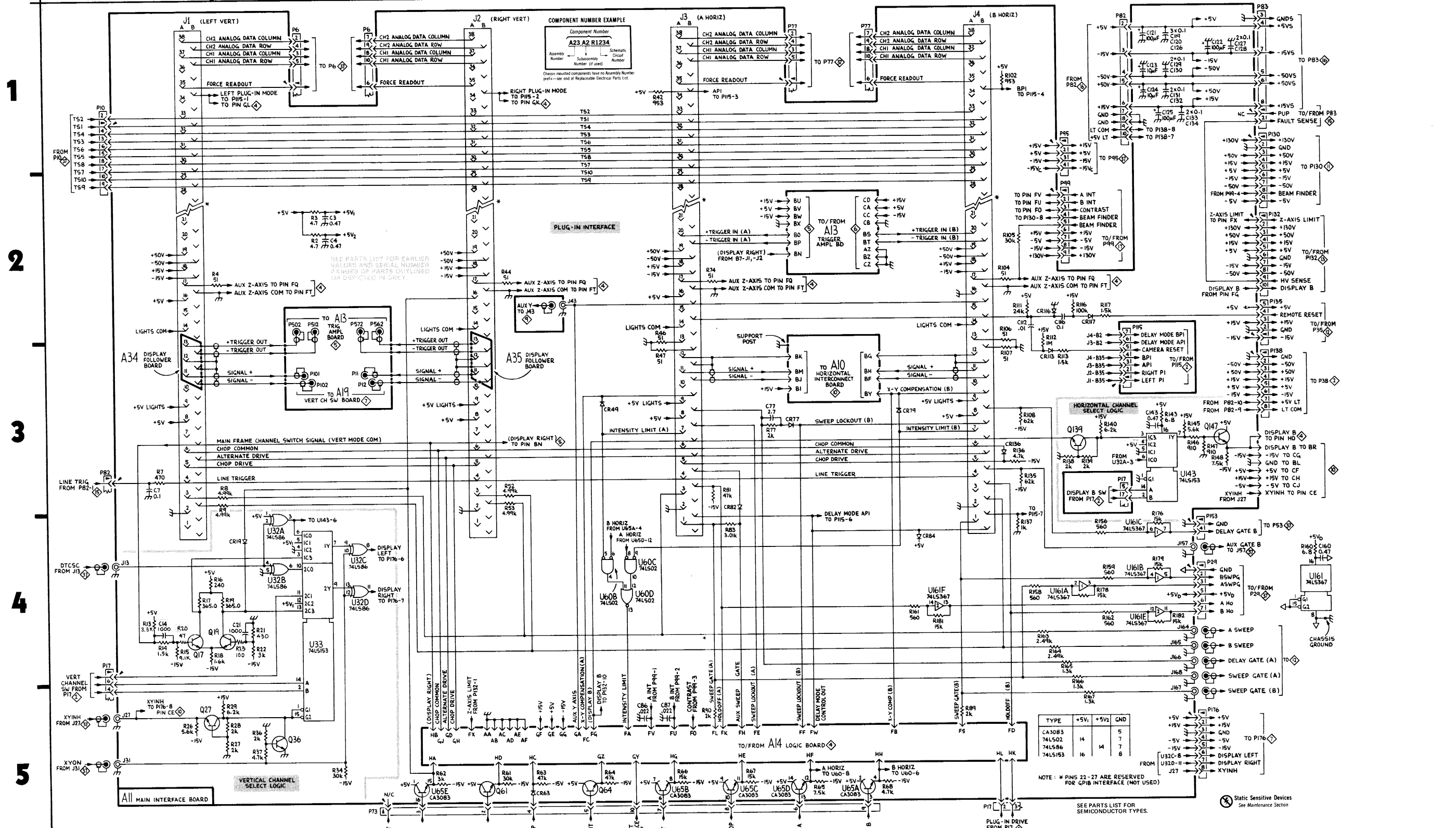
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices See Maintenance Section



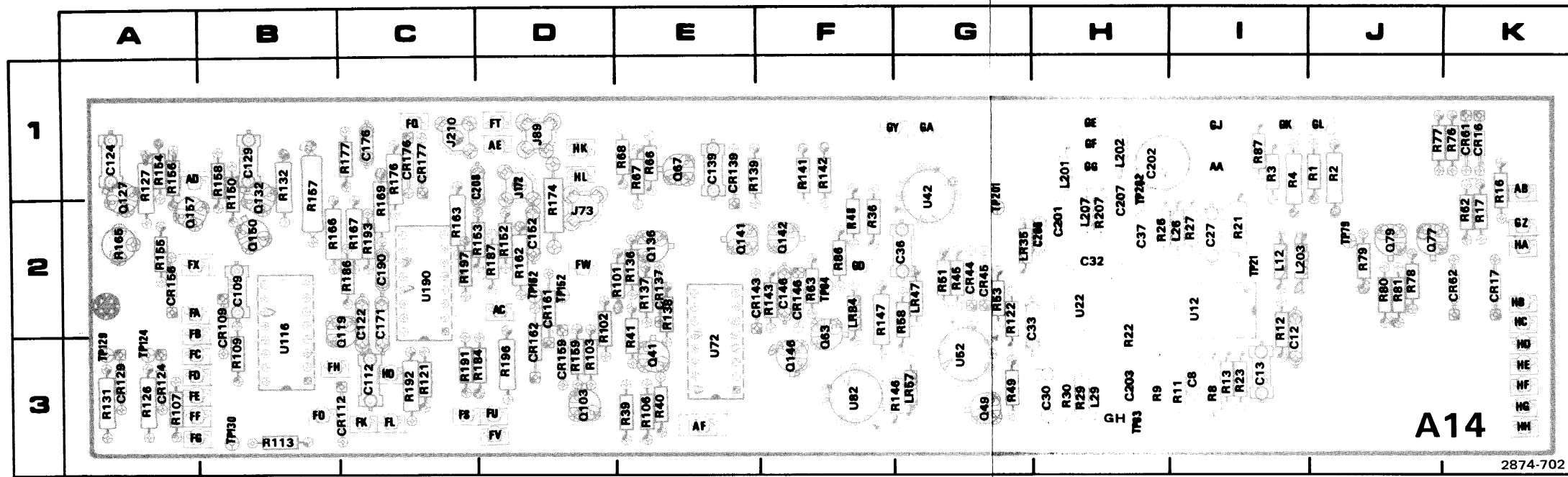
A11 MAIN INTERFACE BOARD Shown on diag. 3.4, 5.6 & 10

A B C D E F G H



Main interface

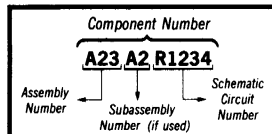
Reverse Side A14



2874-702

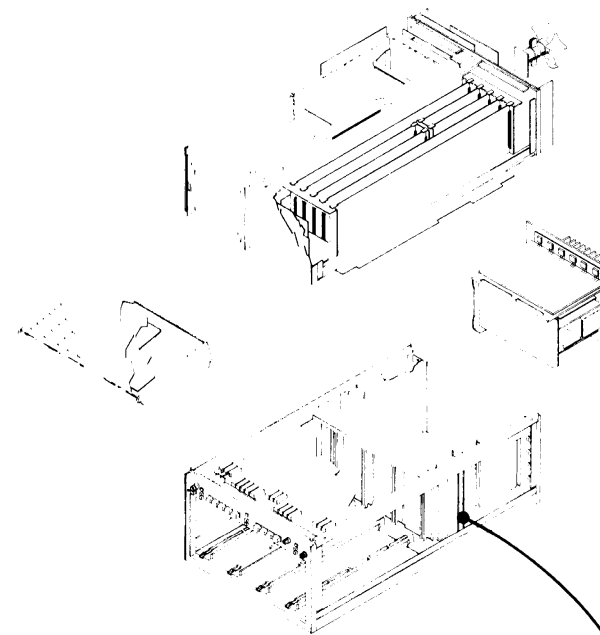
Figure 7-5. A14—Logic circuit board assembly.

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section

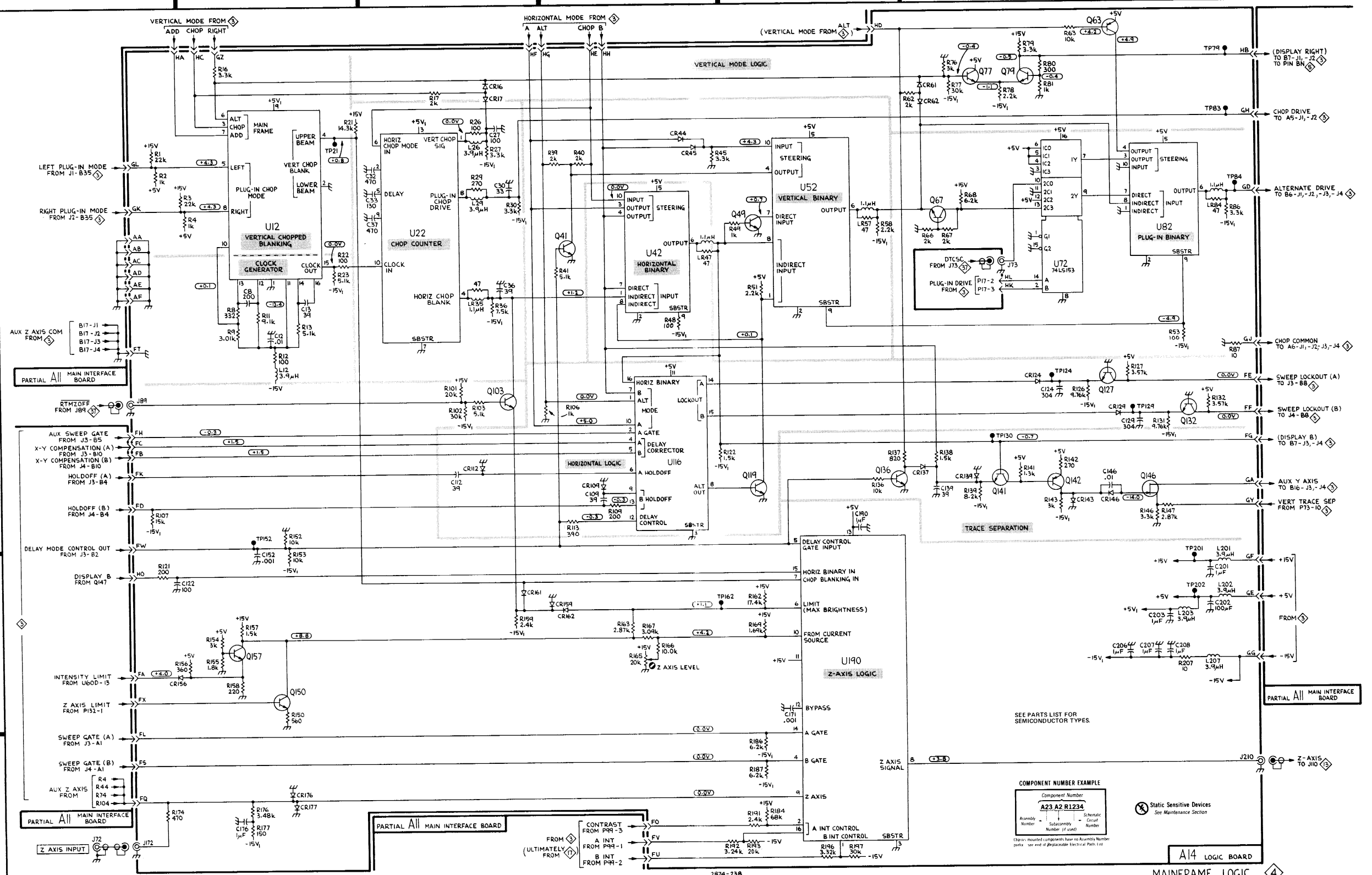


A14
LOGIC
BOARD
Shown on diag. 4

REV A MAR 1981

A B C D E F G H

1
2
3
4
5



COMPONENT NUMBER EXAMPLE
Component Number
A23 A2 R1234
Assembly Number Subassembly Number (if used)
Part Number (if used)
Example: mounted components have no Assembly Number parts use end of replaceable electrical paths list

Static Sensitive Devices
See Maintenance Section

7854

2874-238
REV A, MAR 1981

A14 LOGIC BOARD

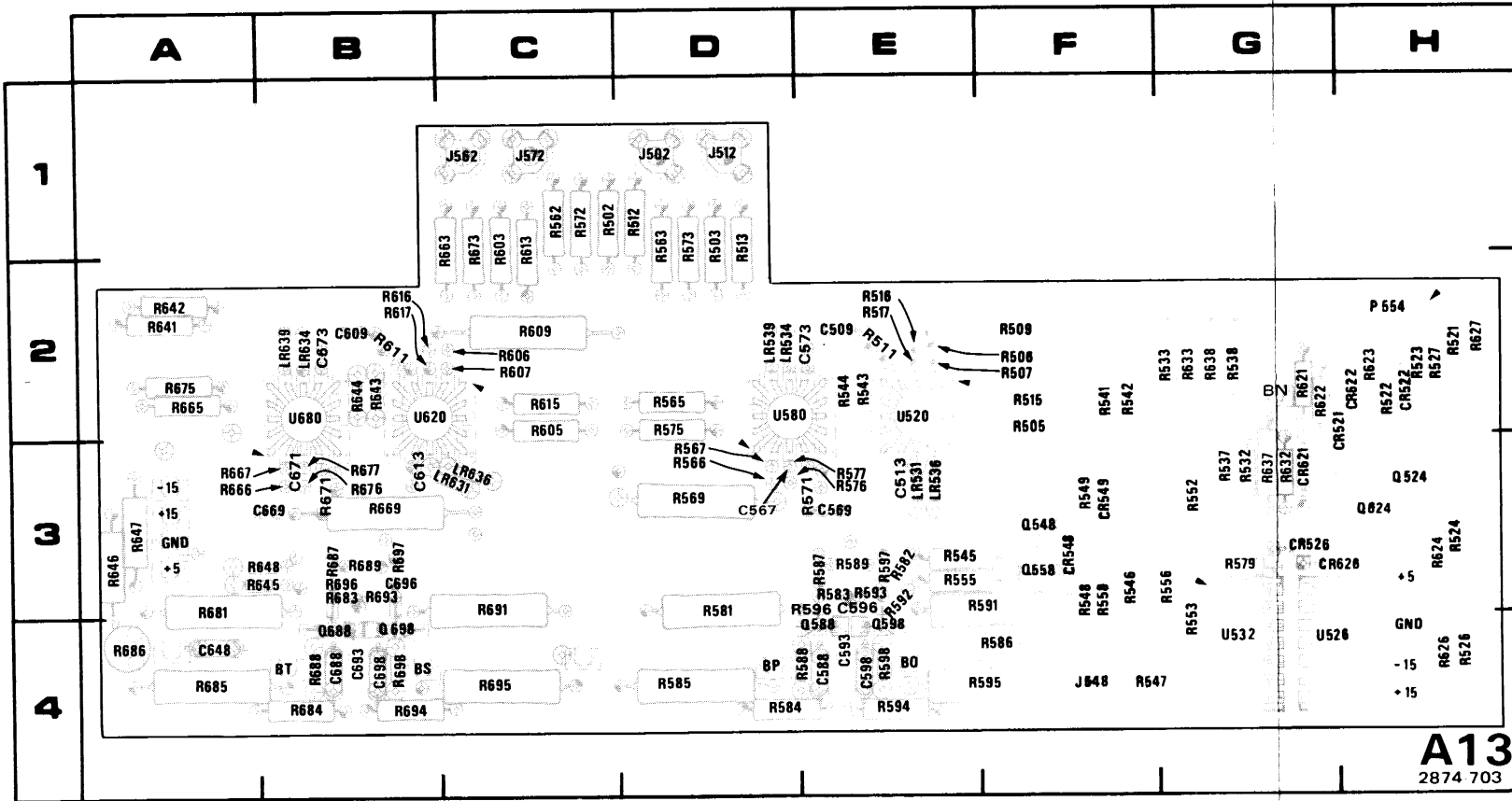


Figure 7-6. A13—Trigger Amplifier circuit board assembly.

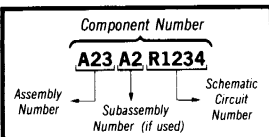
A TRIGGER SELECTOR DIAGRAM 5

PARTIAL A13 ASSY					
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C509	C1	E2	R533	D4	G2
C513	D3	E3	R537	C3	G3
C567	D4	E3	R538	D3	G2
C569	C4	E3	R541	E3	F2
C573	D5	E2	R542	E3	F2
C588	F2	E4	R543	E5	E2
C593	F3	E4	R544	E1	E2
C596	F3	E3	R545	F1	E3
C598	F4	E4	R546	F1	F3
			R547	F1	F4
			R548	F1	F3
CR521	C2	H2	R549	F1	F3
CR522	B3	H2	R552	F1	G3
CR526	C3	G3	R553	F1	G4
CR548	F1	F3	R555	F2	E3
CR549	G1	F3	R556	F1	G3
J502	A1	D1	R558	F2	F3
J512	A2	D1	R562	B4	C1
J548	G1	F4	R563	B4	D1
J562	A4	C1	R565	D4	D2
J572	A5	C1	R566	D4	C3
			R567	D4	C3
LR531	D2	E3	R569	C5	C3
LR534	D4	D2	R571	D5	E3
LR536	D3	E3	R572	B5	C1
LR539	D3	D2	R573	B5	D1
			R575	D5	D2
			R576	D5	E3
			R577	D5	E3
P554	A2	H2	R579	G4	G3
			R581	F3	C3
Q524	B3	H3	R582	F3	E3
Q548	F1	F3	R583	F3	E3
Q558	F2	F3	R588	F3	E3
Q588	F2	E4	R589	G3	E3
Q598	F4	E4	R591	F3	E3
			R592	F4	E3
			R593	F3	E3
			R594	G4	E4
			R595	G4	F4
			R596	F3	E3
			R597	G3	E3
			R598	F4	E4
			U520	D1	E2
			U526B	C4	G4
			U526C	C3	G4
			U532B	C3	G4
			U532C	C3	G4
			U580	D5	D2

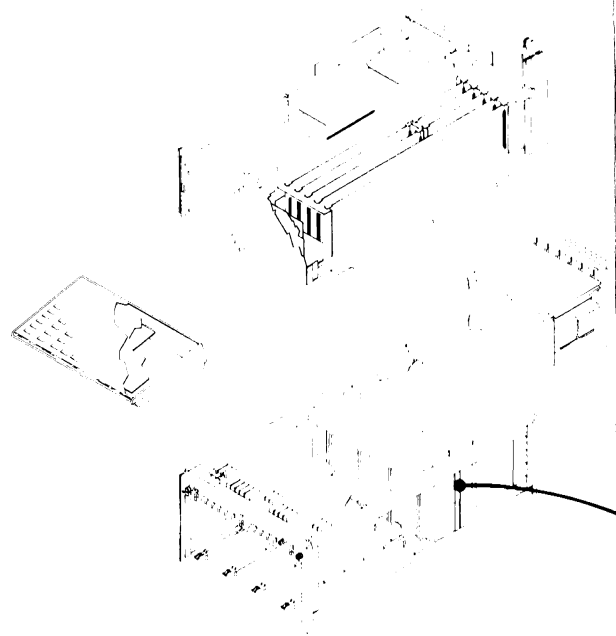
Partial A13 ASSY also shown on diagram 6.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



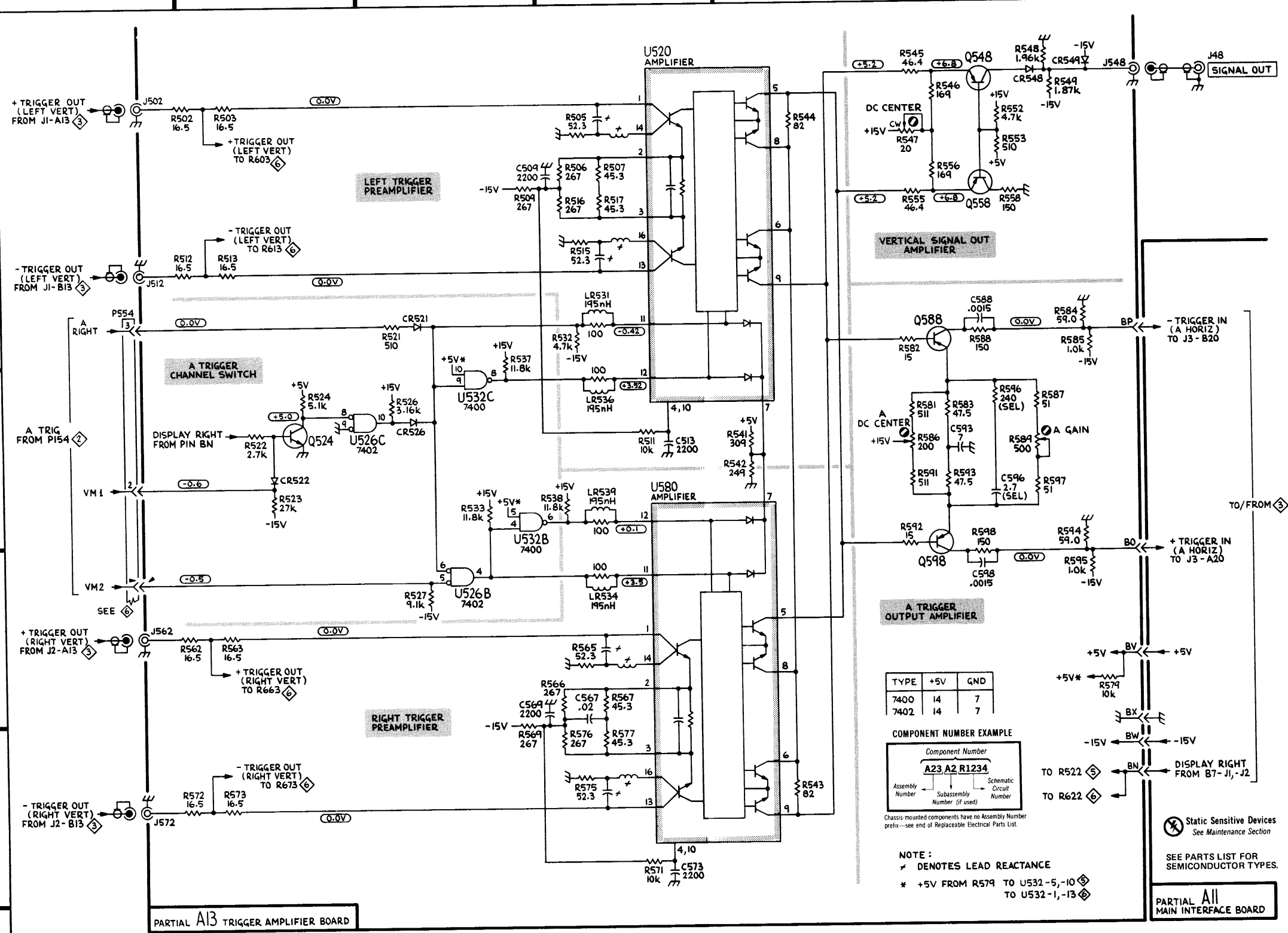
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



A13 TRIGGER AMPLIFIER BOARD
Shown on days 5 & 6

A B C D E F G H

1
2
3
4
5
6

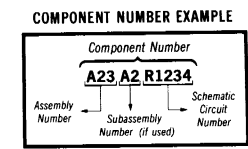


7854

2874-239
REV A MAR 1981

A TRIGGER SELECTOR 5

TYPE	+5V	GND
7400	14	7
7402	14	7



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

NOTE:
* DENOTES LEAD REACTANCE
* +5V FROM R579 TO U532-5,-10
TO U532-1,-13

Static Sensitive Devices
See Maintenance Section

SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

PARTIAL A11
MAIN INTERFACE BOARD

5 A Trigger Selector Reverse Side A13

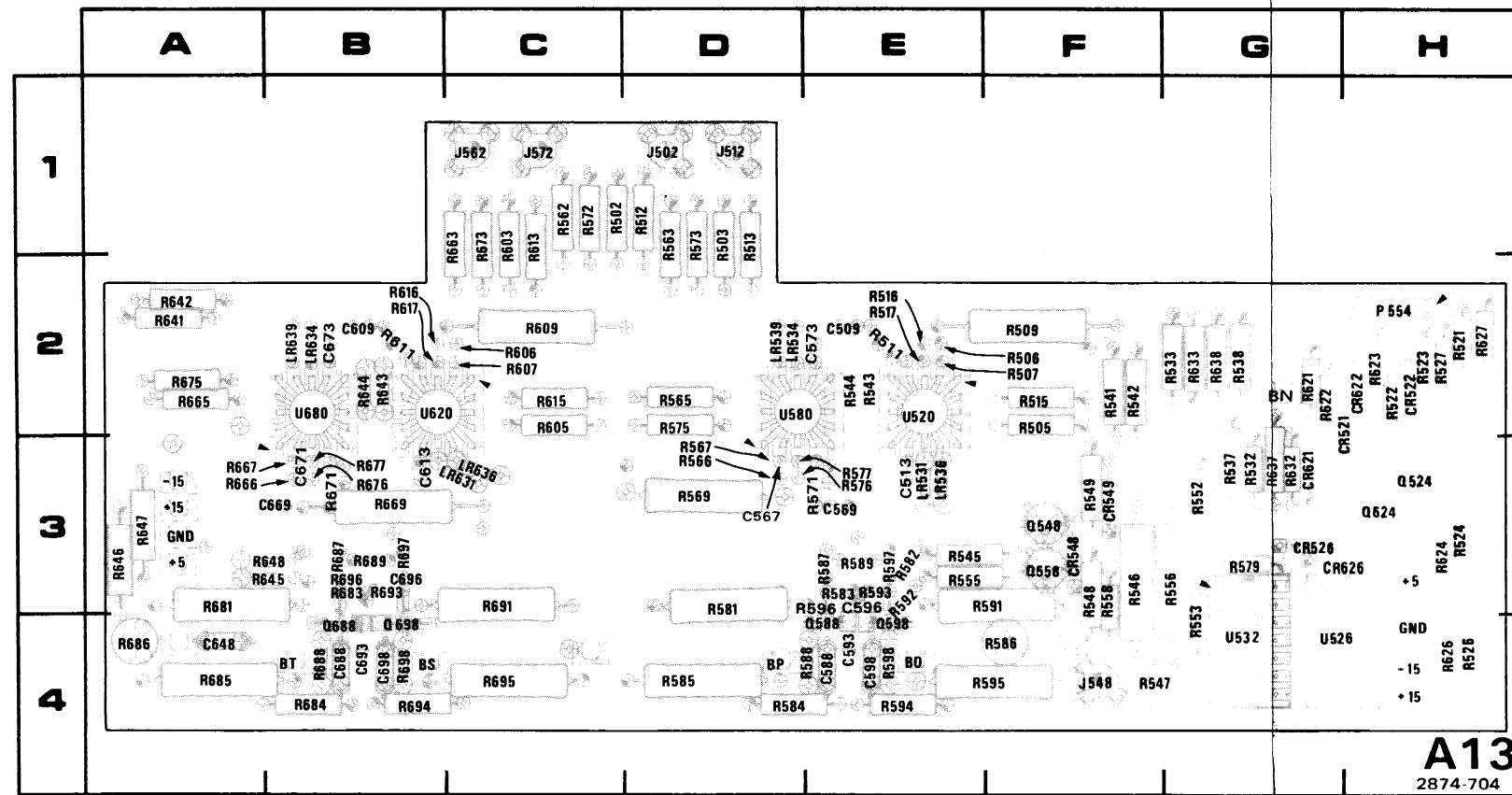
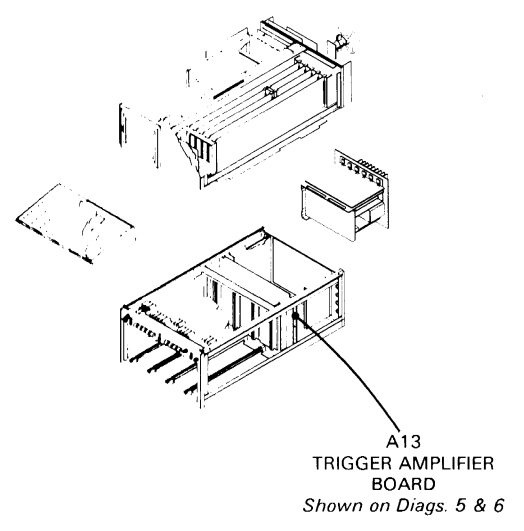


Figure 7-7. A13—Trigger Amplifier circuit board assembly.

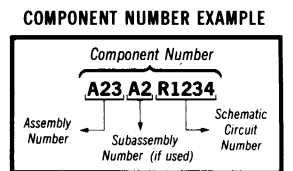
B TRIGGER SELECTOR DIAGRAM 6

PARTIAL A13 ASSY					
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C609	C1	B2	R633	D4	G2
C613	D3	B3	R637	C2	G3
C648	E3	A4	R638	D3	G2
C669	C4	B3	R641	E3	A2
C671	D5	B3	R642	E3	A2
C673	D5	B2	R643	E5	B2
C688	F2	B4	R644	E1	B2
C693	F3	B4	R645	F3	B3
C696	F3	B3	R646	E3	A3
C698	F4	B4	R647	E3	A3
			R648	F3	B3
CR621	C2	G3	R663	B4	C1
CR622	B3	H2	R665	D4	A2
CR626	C3	G3	R666	D4	A3
			R667	D4	A3
LR631	D2	C3	R669	C5	B3
LR634	D4	B2	R671	D5	B3
LR636	D3	C3	R673	B5	C1
LR639	D3	B2	R675	D5	A2
			R676	D5	B3
P554	A2	H2	R677	D5	B3
			R681	F3	A3
Q624	B3	H3	R683	F3	B3
Q688	F2	B4	R684	G2	B4
Q698	F4	B4	R685	G2	A4
			R686	F3	A4
R69	C2	B3	R687	G3	B3
R603	B1	C1	R688	F2	B4
R605	D1	C2	R689	G3	B3
R606	D1	C2	R691	F3	C3
R607	D1	C2	R693	F3	B3
R609	D2	C2	R694	G3	B4
R611	D3	B2	R695	G4	C4
R613	B2	C1	R696	F3	B3
R615	D2	C2	R697	G3	B3
R616	D2	B2	R698	F4	B4
R617	D2	B2			
R621	C2	G2	U526A	C4	G4
R622	B3	G2	U526D	C3	G4
R623	B3	H2	U532A	C3	G4
R624	B3	H3	U532D	C3	G4
R626	C3	H4	U620	D1	B2
R627	C4	H2	U680	D5	B2
R632	D2	G3			

Partial A13 ASSY also shown on diagram 5.



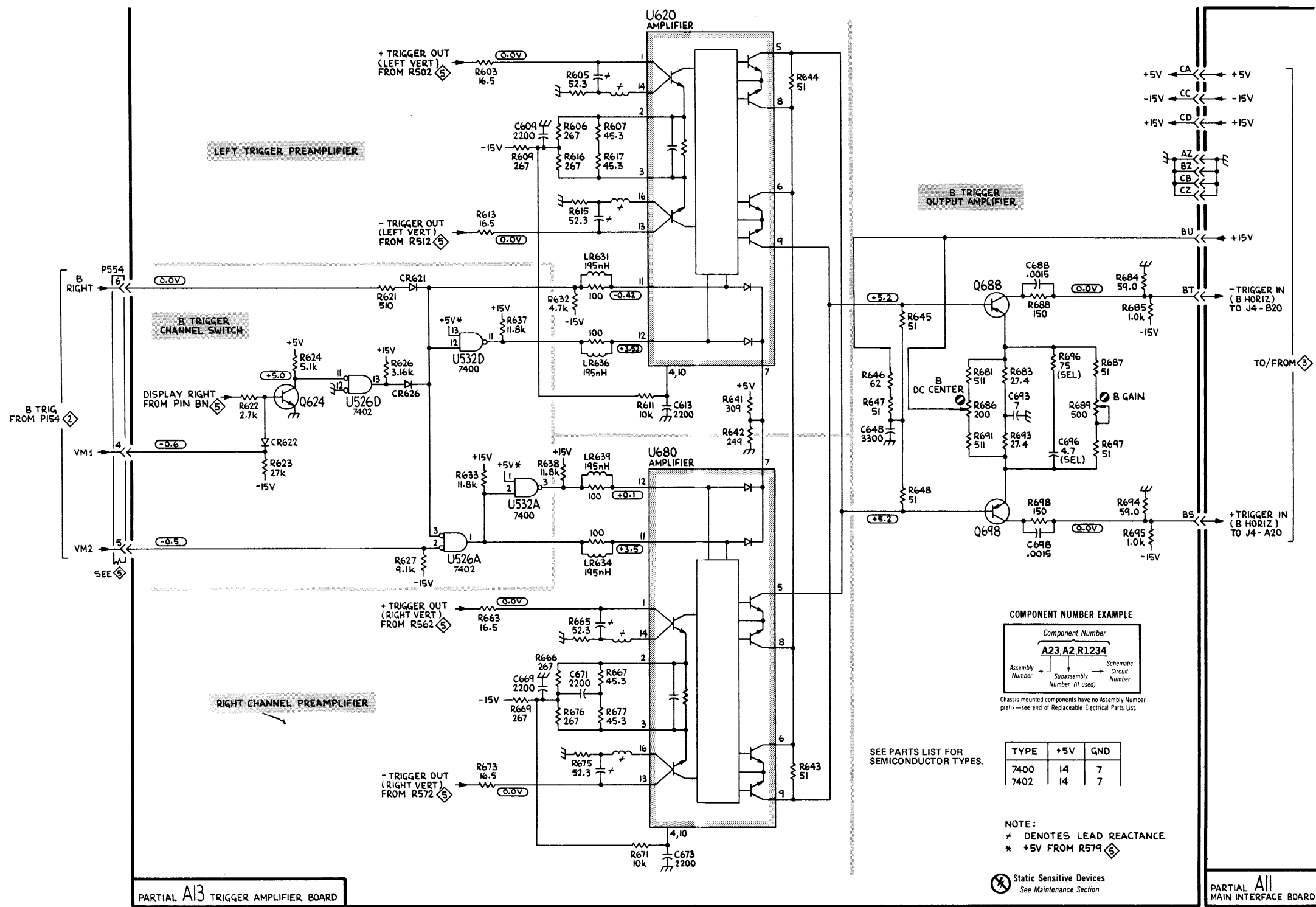
Static Sensitive Devices
See Maintenance Section



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

A B C D E F G H

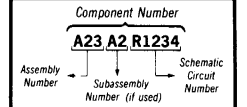
1
2
3
4
5
6



PARTIAL A13 TRIGGER AMPLIFIER BOARD

PARTIAL A11 MAIN INTERFACE BOARD

COMPONENT NUMBER EXAMPLE



Chassis mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

TYPE	+5V	GND
7400	14	7
7402	14	7

NOTE:
* DENOTES LEAD REACTANCE
* +5V FROM R579

Static Sensitive Devices
See Maintenance Section

2874-240
REV A MAR 1981

B TRIGGER SELECTOR 6

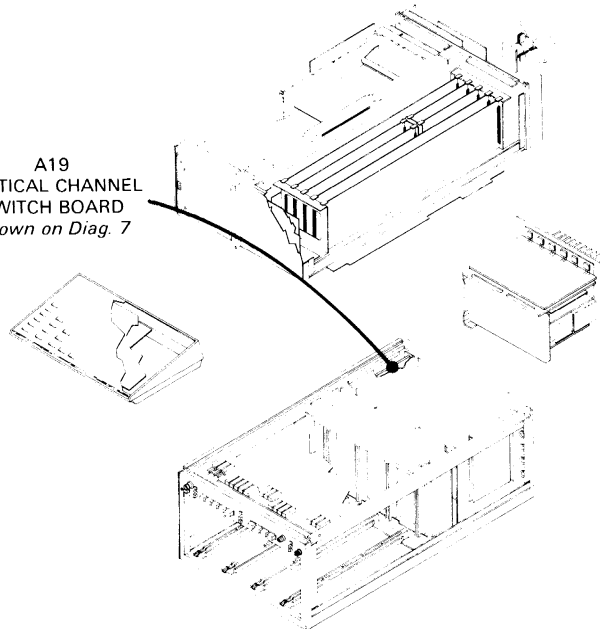
7854

B Trigger Selector
Reverse Side A19

VERTICAL CHANNEL SWITCH DIAGRAM 7

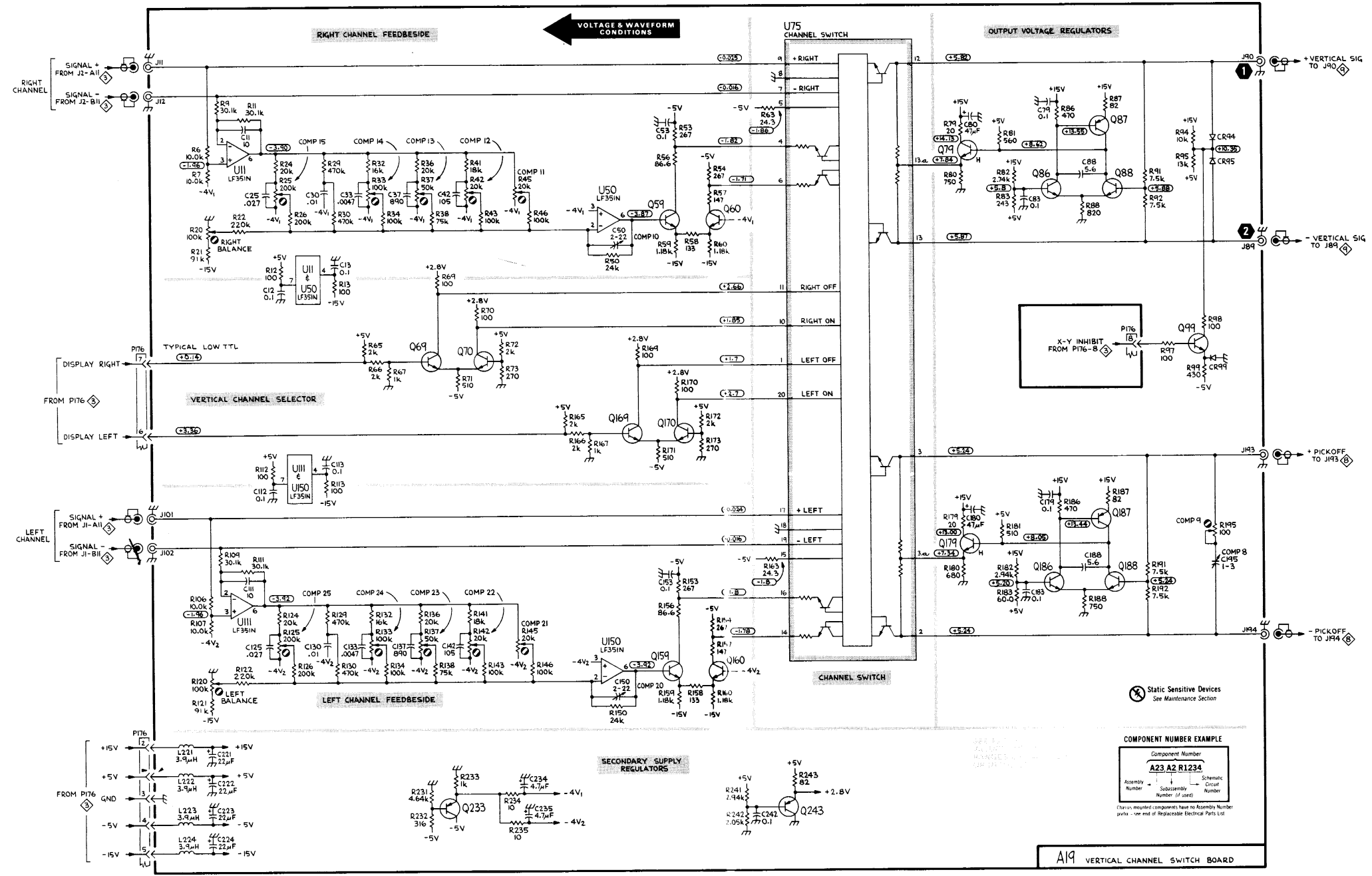
A19 ASSY PARTIAL								
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C11	B1	C5	Q159	D4	E2	R106	A4	D3
C12	B2	C5	Q160	D4	E2	R107	A4	C2
C13	B2	C5	Q169	C3	B3	R109	B3	C3
C25	B2	D6	Q170	D3	C3	R111	B3	B2
C30	B2	D5	Q179	E3	B4	R112	B3	D2
C33	B2	D6	Q186	E3	B5	R113	B3	B2
C37	B2	C6	Q187	F3	B4	R120	A4	C2
C42	C2	B6	Q188	F3	B4	R121	A4	C2
C50	C2	C5	Q233	C4	B3	R122	B4	C2
C53	D1	C4	Q243	D5	B3	R124	B4	B2
C79	E1	E4				R125	B4	B1
C80	E1	F4	R6	A1	D4	R126	B4	A1
C83	E2	E2	R7	A2	D5	R129	B4	B2
C88	F2	E3	R9	B1	C4	R130	B4	B2
C111	B3	C2	R11	B1	C5	R132	B4	C1
C112	B3	D2	R12	B2	C5	R133	B4	B1
C113	B3	C2	R13	B2	C5	R134	B4	B1
C125	B4	B1	R20	A2	B5	R136	C4	C1
C130	B4	B2	R21	A2	B5	R137	C4	C1
C133	B4	C1	R22	B2	B6	R138	C4	C2
C137	B4	C1	R24	B2	D6	R141	C4	C1
C142	C4	D1	R25	B2	D6	R142	C4	D1
C150	C4	D2	R26	B2	D6	R143	C4	D1
C153	D3	D3	R29	B2	D5	R145	C4	D1
C179	E3	A3	R30	B2	D5	R146	C4	D1
C180	E3	A3	R32	B2	D6	R150	C4	D2
C183	E4	A4	R33	B2	D6	R153	D3	D3
C188	F3	B4	R34	B2	C6	R154	D4	D3
C195	F3	C3	R36	C2	C6	R156	D4	D2
C221	B4	E6	R37	C2	C6	R157	D4	D2
C222	B4	E6	R38	C2	C6	R158	D4	E2
C223	B5	D5	R41	C2	C6	R159	D4	E2
C224	B5	E5	R42	C2	B6	R160	D4	E2
C234	C4	A6	R43	C2	B6	R163	D3	D3
C235	C5	D1	R45	C2	B6	R165	C3	E5
C242	D5	A3	R46	C2	B5	R166	C3	E4
			R50	C2	B5	R167	C3	B2
CR94	F1	D4	R53	D1	C4	R169	D2	C3
CR95	F2	D3	R54	D2	C4	R170	D3	C3
CR99	F3	E5	R56	D2	B5	R171	D3	B3
			R57	D2	B5	R172	D3	B2
J11	A1	D4	R58	D2	B5	R173	D3	B2
J12	A1	C4	R59	D2	B5	R179	E3	A4
J89	F2	E3	R60	D2	B5	R180	E3	B4
J90	F1	E4	R63	D1	C4	R181	E3	B4
J101	A3	D3	R65	B2	E4	R182	E3	A4
J102	A3	C3	R66	B2	E4	R183	E4	B3
J193	F3	C4	R67	B2	E4	R186	E3	A5
J194	F4	C3	R69	C2	E4	R187	F3	A4
			R70	C2	E4	R188	F3	A5
L221	A4	E5	R71	C3	D5	R191	F4	C4
L222	A4	E5	R72	C2	D5	R192	F4	C3
L223	A4	E5	R73	C2	D5	R195	F3	C4
L224	A5	E5	R79	E1	E4	R231	B4	B3
			R80	E2	E3	R232	B5	B3
P176	A2	F5	R81	E1	E4	R233	C4	A3
P176	A4	F5	R82	E2	E4	R234	C4	A5
P176	F2	F5	R83	E2	E4	R235	C5	A2
			R86	E1	E2	R241	D4	A2
Q59	D2	B5	R87	F1	E2	R242	D5	A2
Q60	D2	B5	R88	F2	E2	R243	D4	A2
Q69	C2	D4	R91	F2	D4			
Q70	C2	D4	R92	F2	D3	U11	B2	D5
Q79	E1	E3	R94	F1	E5	U50	C2	C5
Q86	E2	E2	R95	F2	E5	U75	D1	D3
Q87	F1	E3	R97	F2	E4	U111	B4	C2
Q88	F2	E3	R98	F2	E4	U150	C4	D2
Q99	F2	E4	R99	F3	D5			

A19
VERTICAL CHANNEL
SWITCH BOARD
Shown on Diag. 7



A B C D E F G

1
2
3
4
5



7854

2874-241
REV JUL 1981

A19 VERTICAL CHANNEL SWITCH BOARD
VERTICAL CHANNEL SWITCH

Vertical Channel
Reverse Side
A25

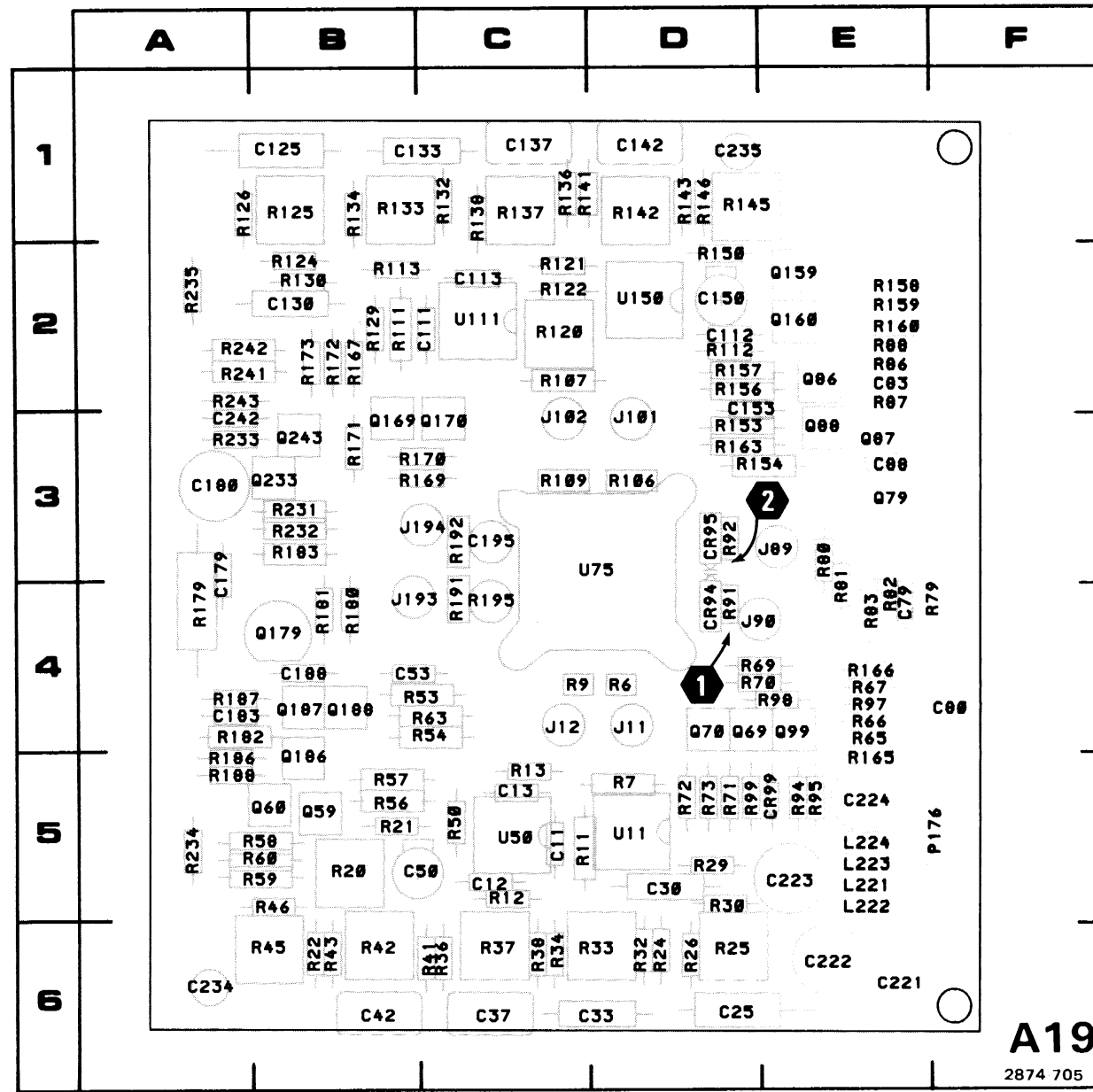
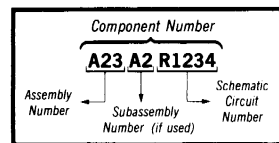


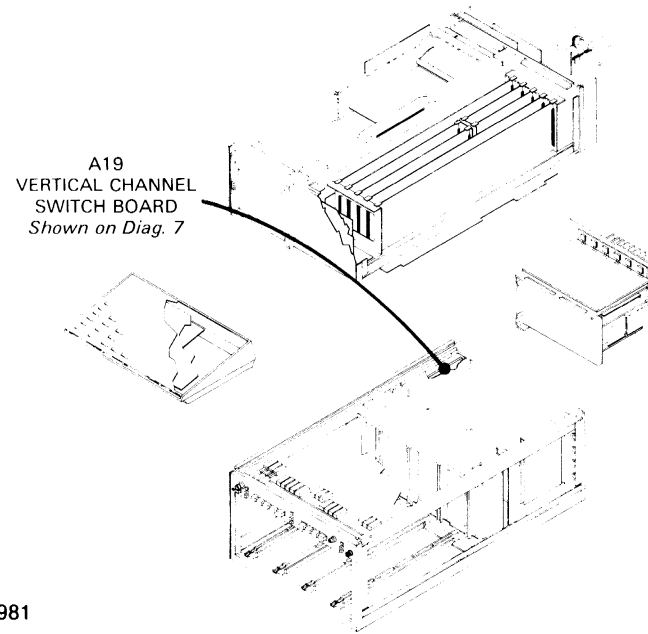
Figure 7-8. A19—Vertical Channel Switch circuit board assembly.

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section



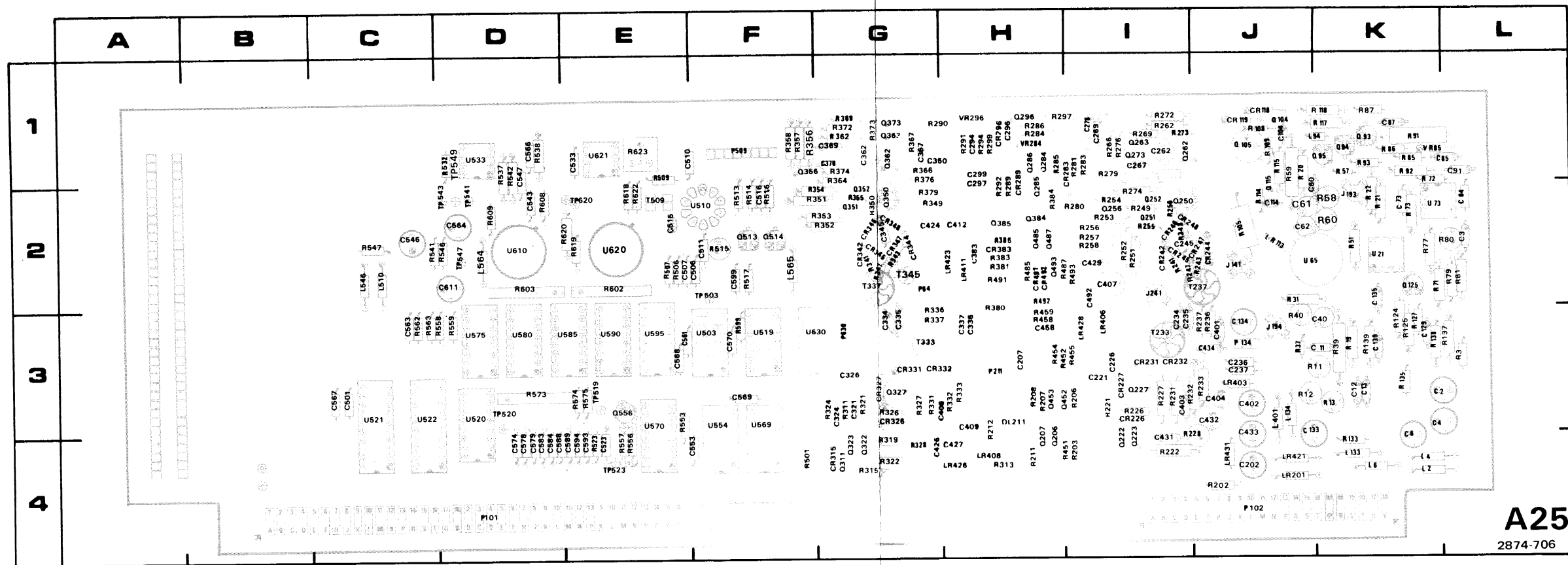
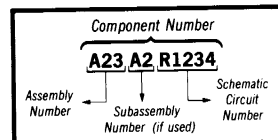


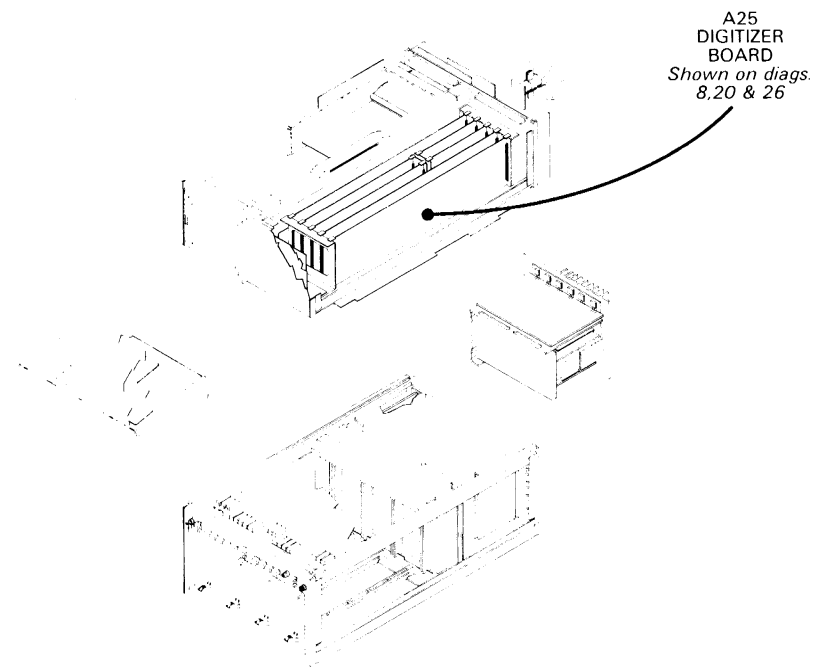
Figure 7-9. A25—Digitizer circuit board assembly.

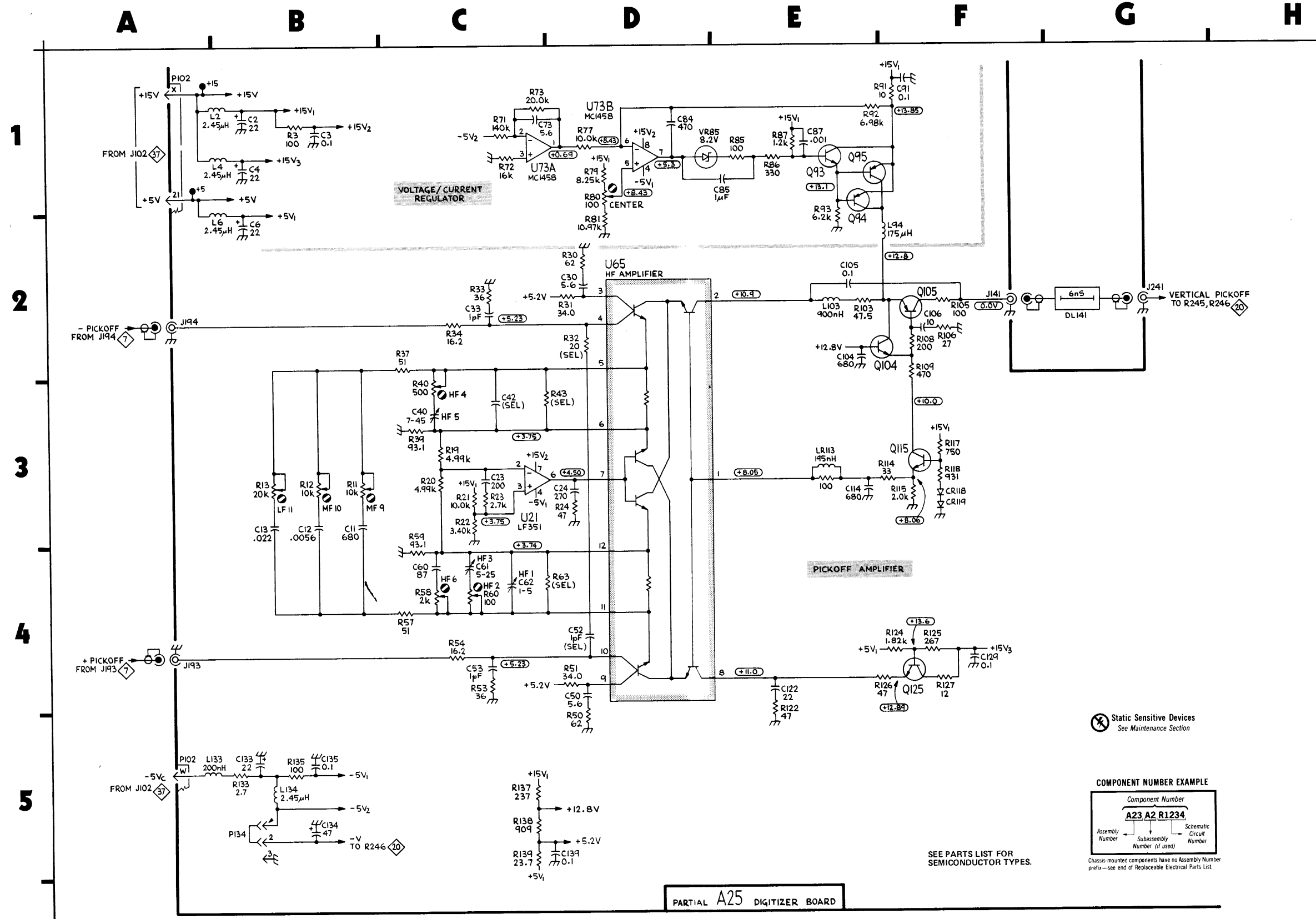
 Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



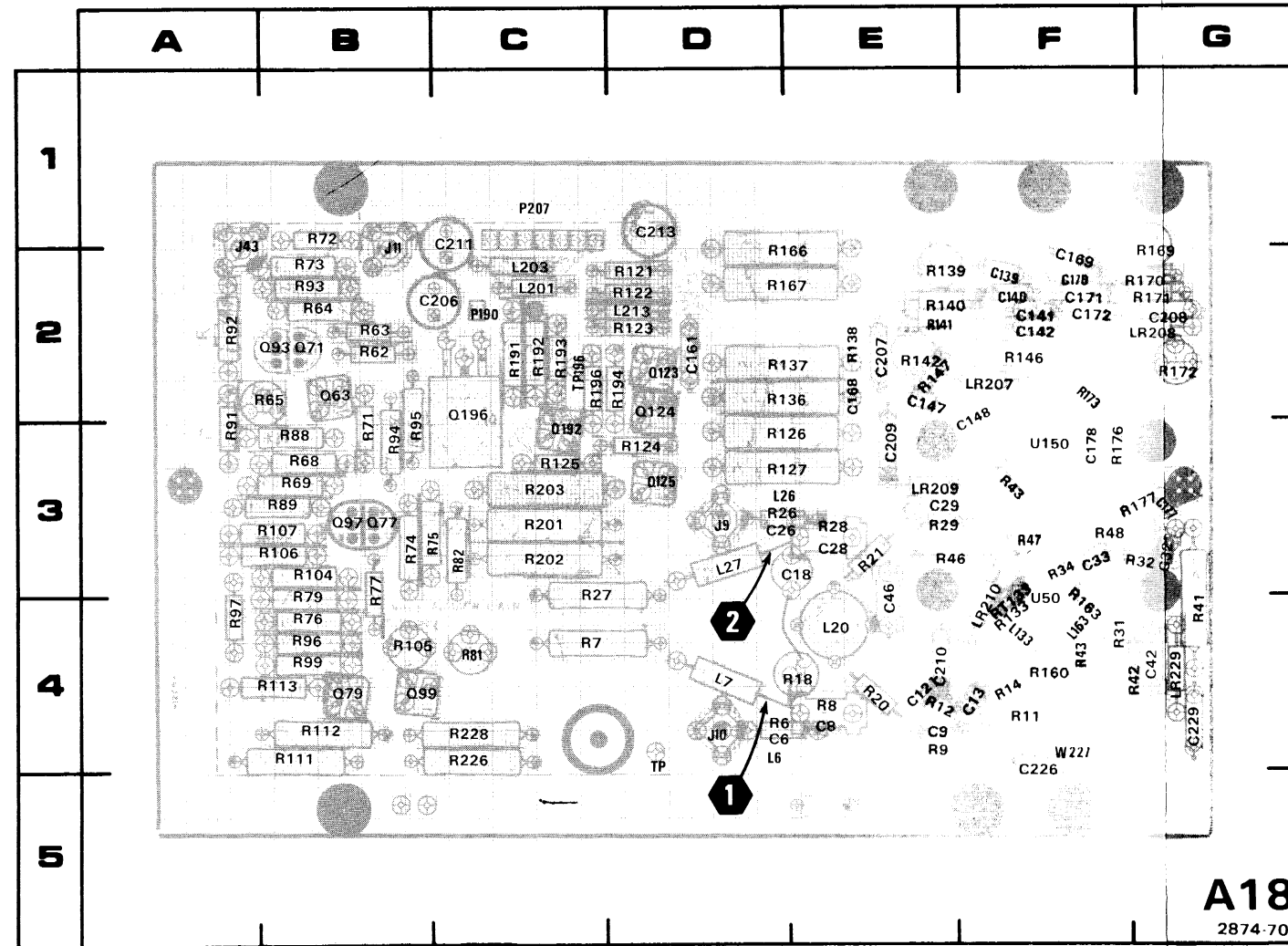


7854

2874-242
REV A MAR 1981

VERTICAL PICKOFF AMPLIFIER 8

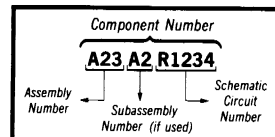
1
2
3
4
5
6



A18
2874-707

Figure 7-10. A18—Vertical Amplifier circuit board assembly.

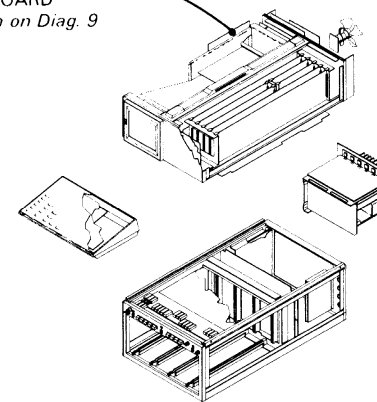
COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section

A18
VERTICAL AMPLIFIER
BOARD
Shown on Diag. 9



A

B

C

D

E

F

G

H

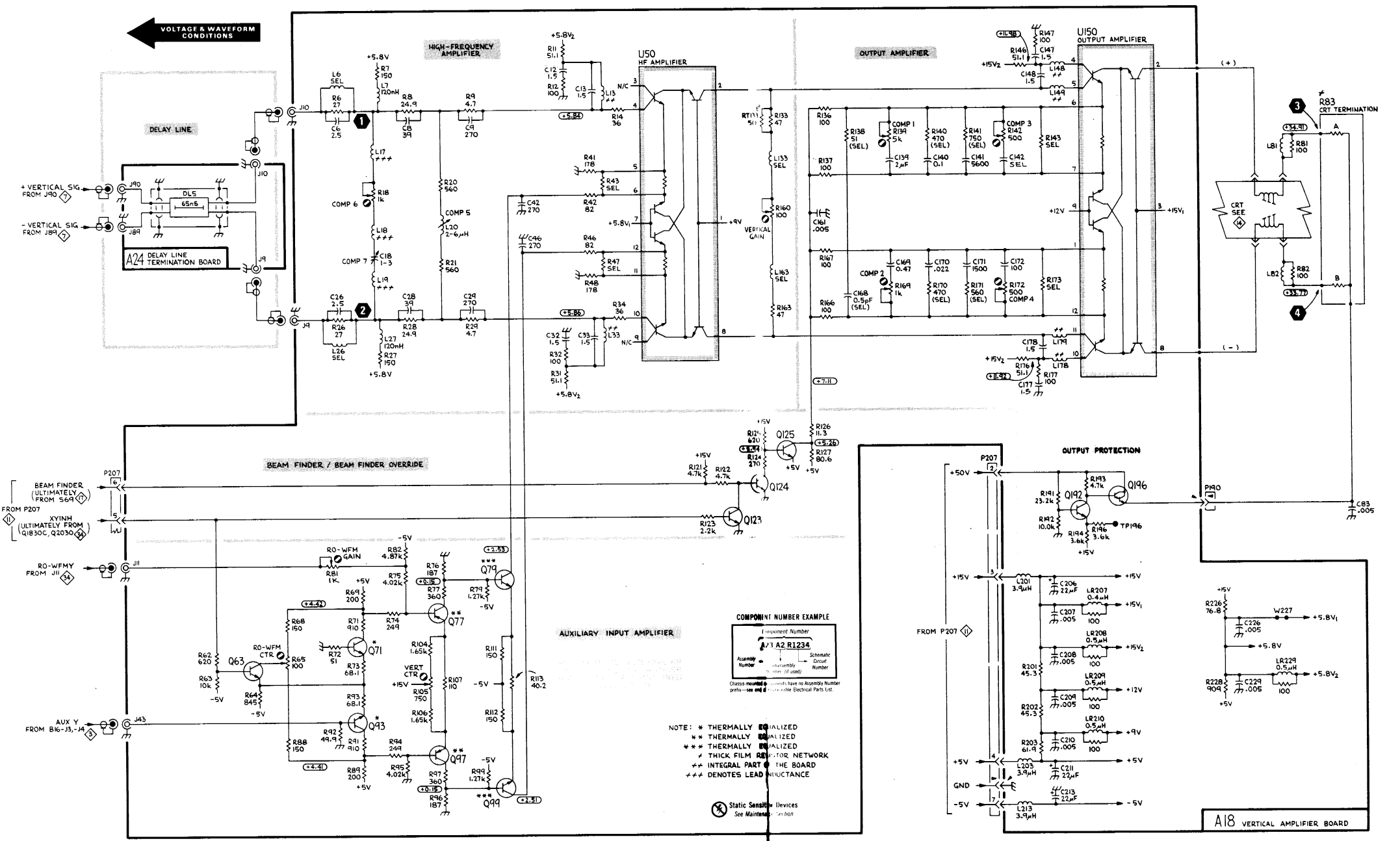
1

2

3

4

5



COMPONENT NUMBER EXAMPLE

Component Number	
A18	A2 R1234
Assembly Number	Schematic
Number	Serial Number
Date: month/year (if used)	
Change number: (if used) Have no Assembly Number unless used in the Electrical Parts List.	

- NOTE:**
- * THERMALLY STABILIZED
 - ** THERMALLY STABILIZED
 - *** THERMALLY STABILIZED
 - † THICK FILM RESISTOR NETWORK
 - †† INTEGRAL PART OF THE BOARD
 - ††† DENOTES LEAD INDUCTANCE

⊗ Static Sensitive Devices
See Maintenance Section

2874-243
REV JUL 1981

7854

VERTICAL AMPLIFIER

Amplifier A9, A10, & A33

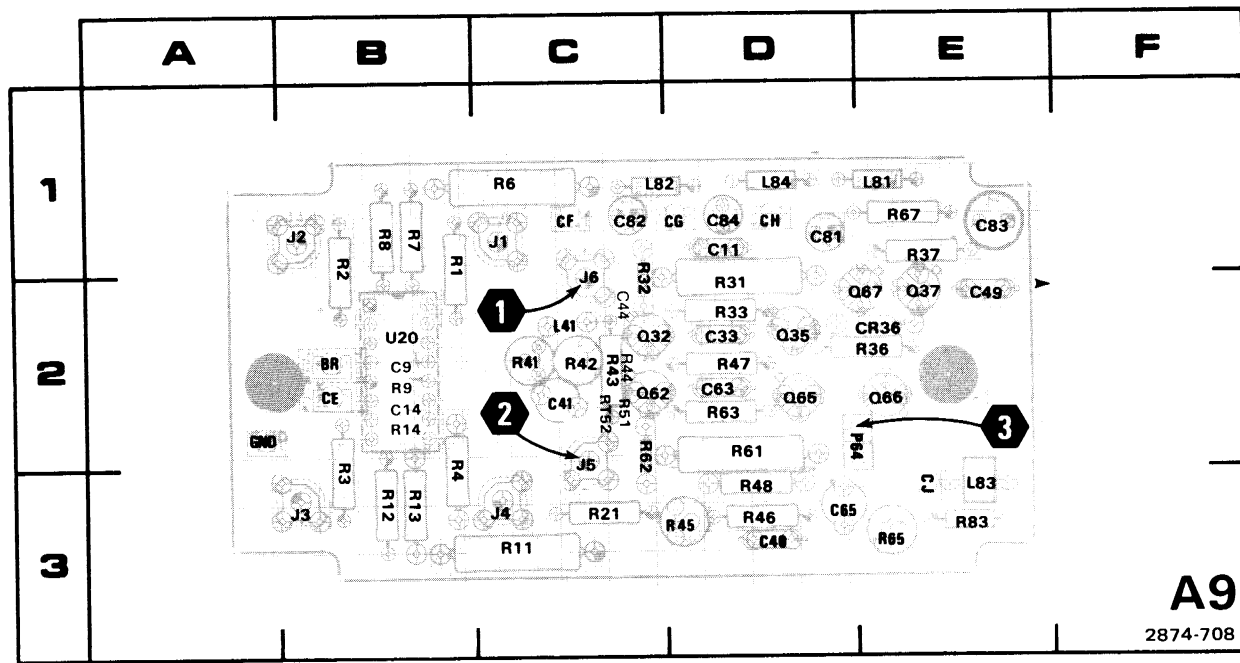


Figure 7-11. A9—Horizontal Channel circuit board assembly.

*C44, R44
Located on
back of board.

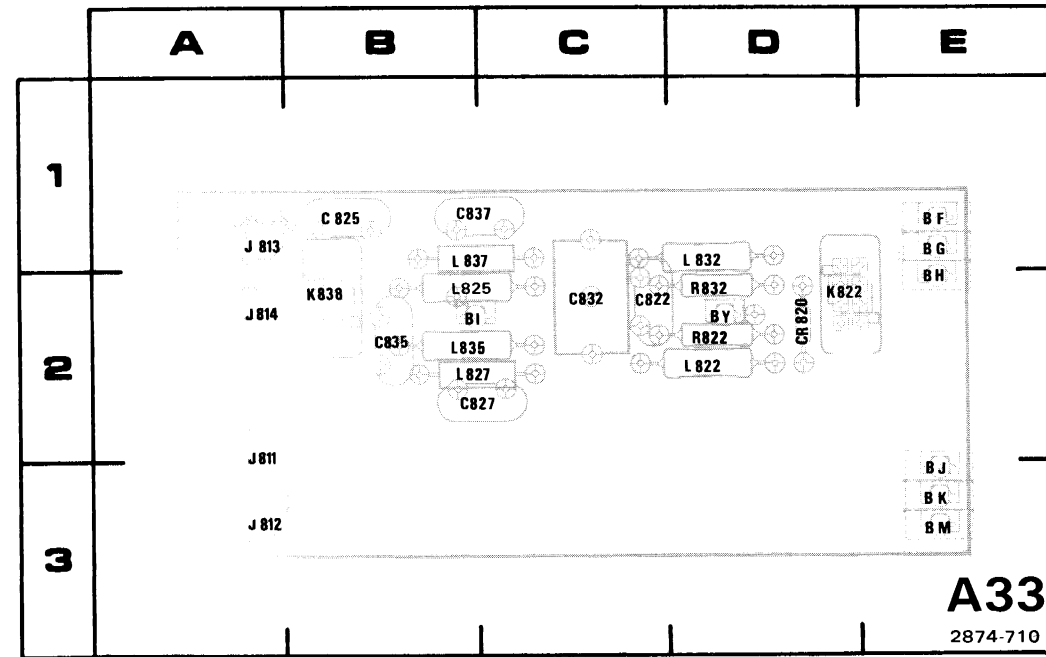


Figure 7-13. A33—X-Y Compensation circuit board assembly.

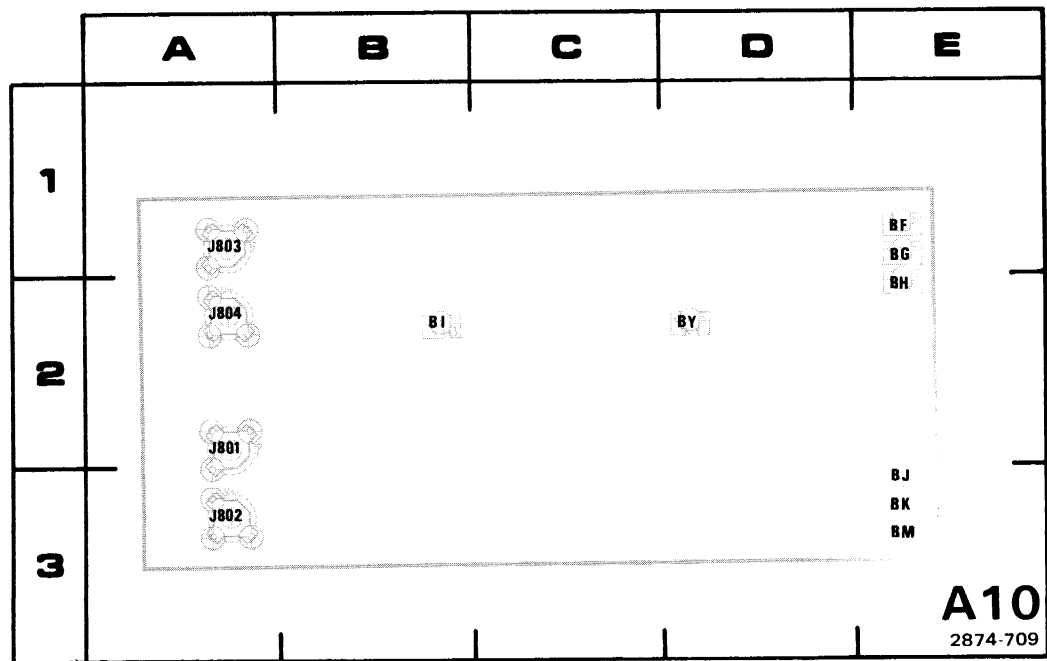
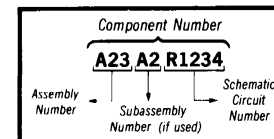


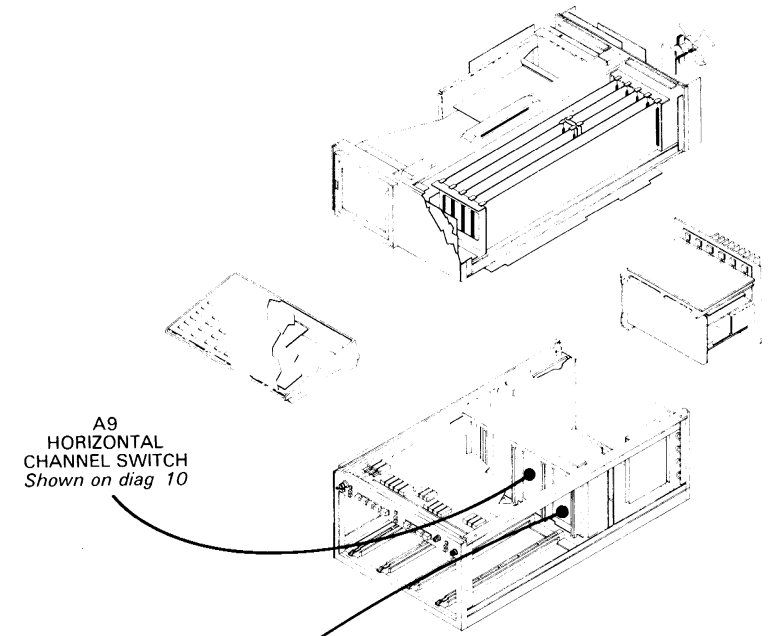
Figure 7-12. A10—Horizontal Interconnect circuit board assembly.

⊗ Static Sensitive Devices
See Maintenance Section

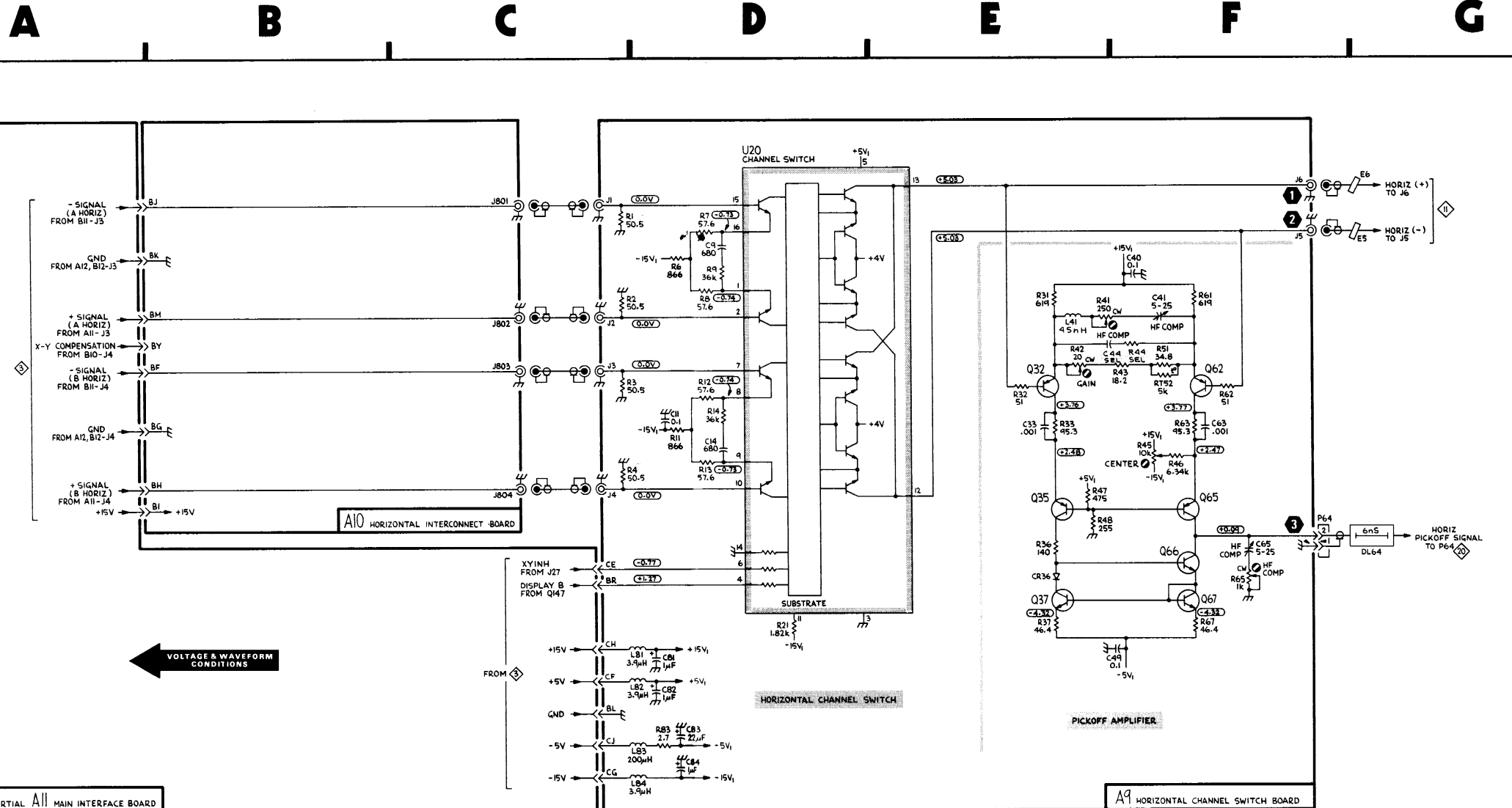
COMPONENT NUMBER EXAMPLE



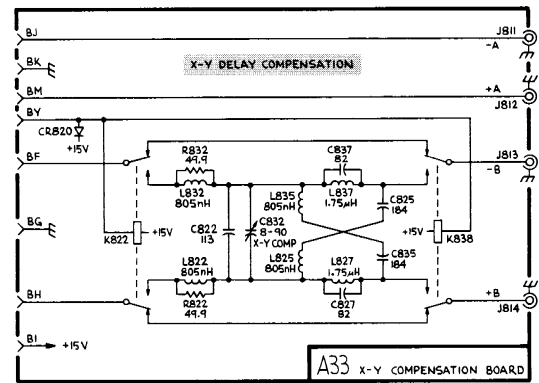
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



A10
HORIZONTAL
INTERCONNECT
BOARD
Shown on diag. 10
or
A33
X-Y COMPENSATION
BOARD
Shown on diag. 10



VOLTAGE & WAVEFORM CONDITIONS

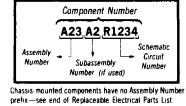


NOTE:
IN THE 7854 OPTION 02, THE A33 X-Y COMPENSATION BOARD
REPLACES THE A10 HORIZONTAL INTERCONNECT BOARD

SEE PARTS LIST FOR EARLIER
REVIEWS AND SERIAL NUMBER
RANGES OF PARTS OUTLINED
IN GREY

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis mounted components have no Assembly Number
prefix—see end of Replaceable Electrical Parts List

2874-244
REV JUL 1981

HORIZONTAL CHANNEL SWITCH AND PICKOFF AMPLIFIER

1
2
3
4
5

Horizontal Ch Sw
and Pickoff Amplifier
Reverse Side
A17

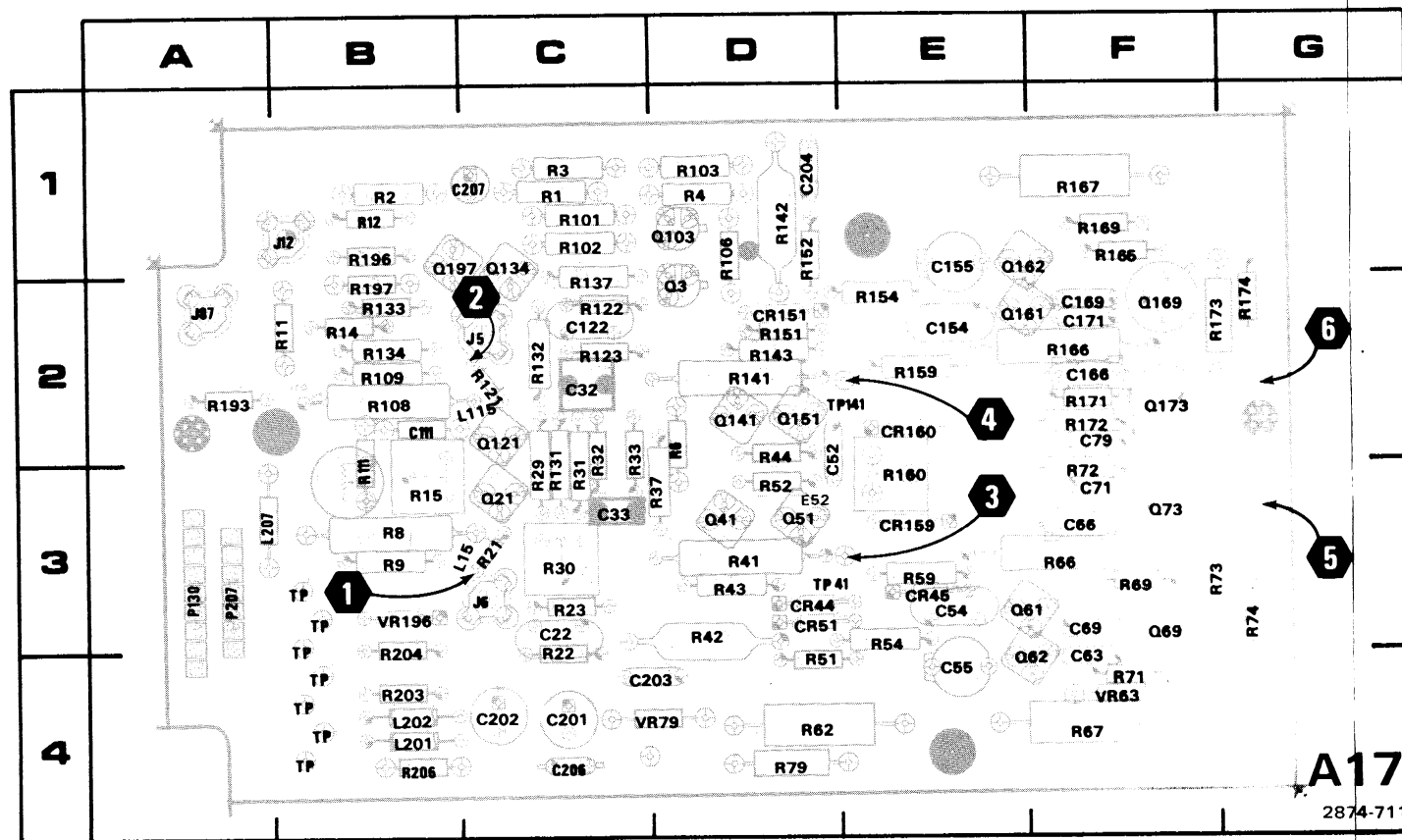
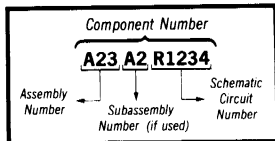


Figure 7-14. A17—Horizontal Amplifier circuit board assembly.

HORIZONTAL AMPLIFIER DIAGRAM 11

A17 ASSY								
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C22	B1	C3	Q21	B1	C3	R71	E1	F4
C32	B2	C2	Q41	D1	D3	R72	E1	F3
C33	B2	C3	Q51	D2	D3	R73	E1	F3
C52	D2	D2	Q61	E1	F3	R74	F1	G3
C54	D2	E3	Q62	E1	F4	R79	F2	D4
C55	D2	E4	Q69	E1	F3	R101	C2	C1
C63	E1	F4	Q73	F2	F3	R102	C2	C1
C66	E1	F3	Q103	C2	D1	R103	C2	D1
C69	E1	F3	Q121	B3	C2	R106	C3	D1
C71	E2	F3	Q134	C2	C1	R108	A2	B2
C79	E2	F2	Q141	D3	D2	R109	A2	B2
C111	B2	B2	Q151	D2	D2	R111	B2	B3
C122	B3	C2	Q161	E3	E2	R121	B3	C2
C154	D2	E2	Q162	E2	E1	R122	B3	C2
C155	D2	E1	Q169	E3	F2	R123	B3	C2
C166	E3	F2	Q173	F2	F2	R131	C2	C3
C169	E3	F2	Q197	C3	C1	R132	C2	C2
C171	E2	F2				R133	C2	B2
C201	B3	C4	R1	C2	C1	R134	C2	B2
C202	B3	C4	R2	C1	B1	R137	C3	C2
C203	E3	D4	R3	C2	C1	R141	D2	D2
C204	E4	D1	R4	C2	D1	R142	D2	D1
C206	B3	C4	R6	C1	D2	R143	D3	D2
C207	B4	C1	R8	A1	B3	R151	D2	D2
			R9	A2	B3	R152	D2	D1
CR44	D1	D3	R11	C1	B2	R154	D2	E2
CR45	D1	E3	R12	C1	B1	R159	E2	E2
CR51	D2	D3	R14	B2	B2	R160	E2	E3
CR151	D2	D2	R15	B2	B3	R165	E3	F1
CR159	E2	E3	R21	B1	C3	R166	E2	F1
CR160	E2	E2	R22	B1	C4	R167	E2	F2
			R23	B1	C3	R169	E2	F1
E52	D2	D3	R29	B2	C3	R171	E2	F2
J5	A3	C2	R30	B2	C3	R172	E2	F2
J6	A1	C3	R31	B2	C3	R173	E2	F2
J12	A1	B1	R32	B2	C3	R174	F2	G2
J87	A3	A2	R33	B2	C3	R193	A3	A2
			R37	C1	D3	R196	B3	B1
L15	B1	C3	R41	D1	D3	R197	C3	B2
L115	B2	C2	R42	D1	D3	R203	E3	B4
L201	A3	B4	R43	D1	D3	R204	E4	B4
L202	A3	B4	R44	D2	D2	R206	A3	B4
L207	A4	A3	R51	D2	D4			
			R52	D1	D3	TP41	D1	D3
P130	A3	A3	R54	D2	E3	TP141	D3	E2
P130	E3	A3	R59	E2	E3			
P207	C3	A3	R62	E1	D4	VR63	E1	F4
			R66	E1	F3	VR79	F2	D4
			R67	E1	F4	VR196	B3	B3
Q3	C2	D2	R69	E1	F3			

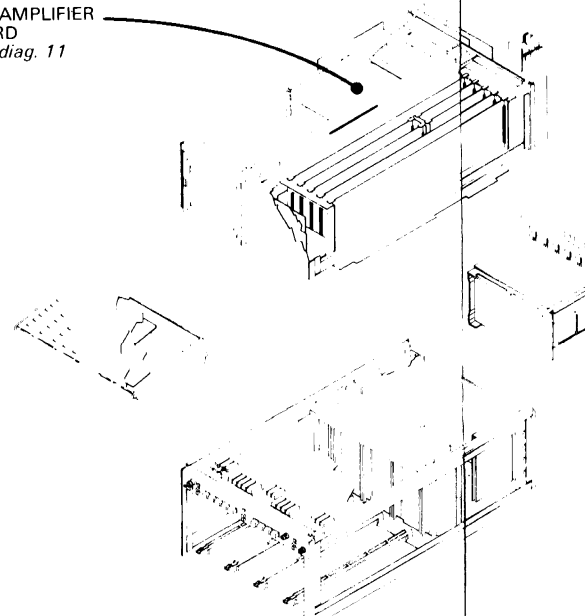
COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section

A17
HORIZONTAL AMPLIFIER
BOARD
Shown on diag. 11



A B C D E F G H

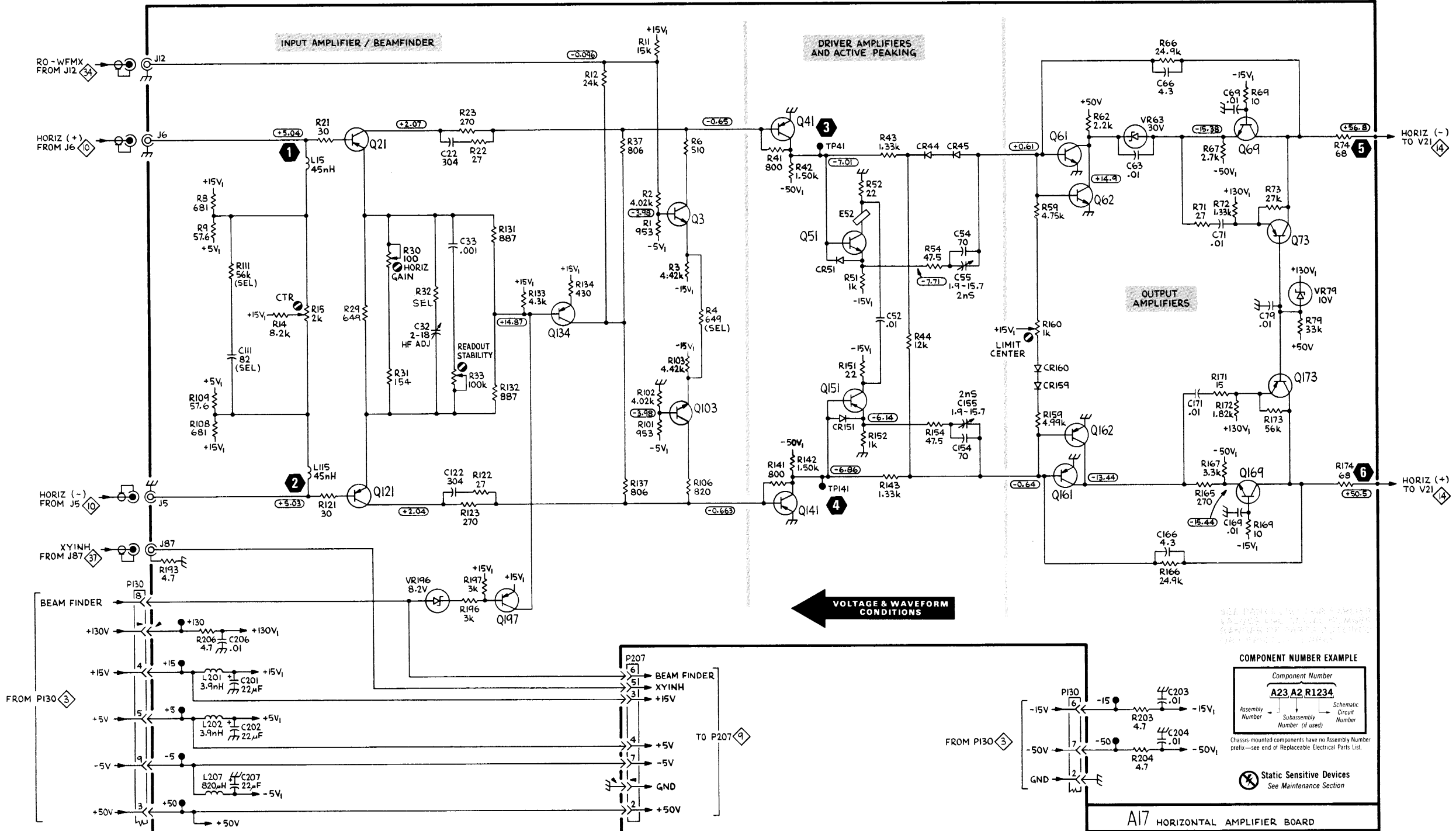
1

2

3

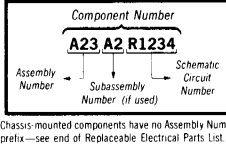
4

5



VOLTAGE & WAVEFORM CONDITIONS

COMPONENT NUMBER EXAMPLE



Static Sensitive Devices See Maintenance Section

A17 HORIZONTAL AMPLIFIER BOARD

7854

2874-245 REV JUL 1981

HORIZONTAL AMPLIFIER

A17 Horizontal Amplifier

Reverse Side A15

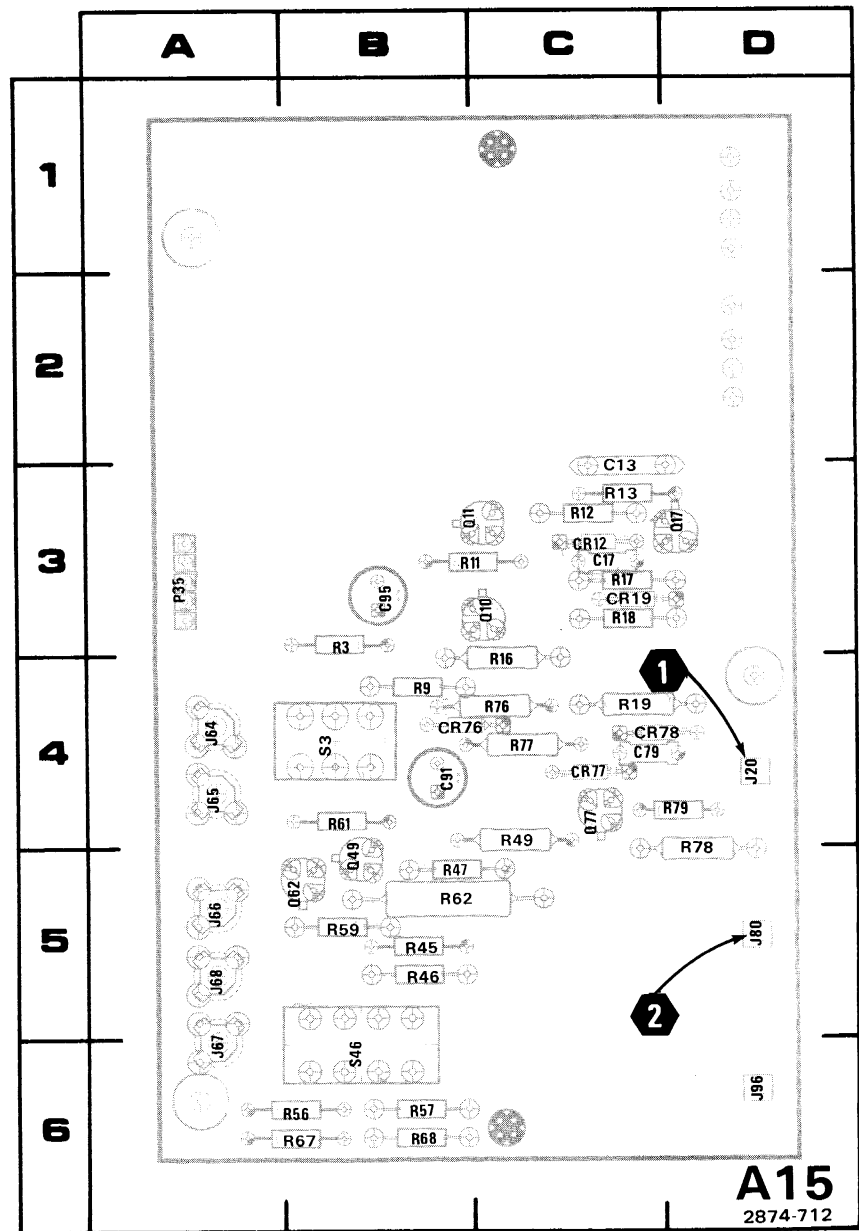
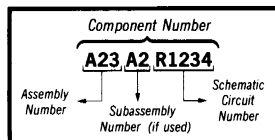


Figure 7-15. A15—Signal Output circuit board assembly.

COMPONENT NUMBER EXAMPLE

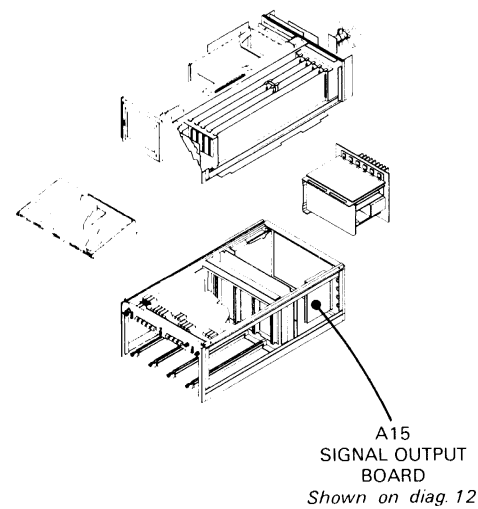


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section

OUTPUT SIGNALS DIAGRAM 12

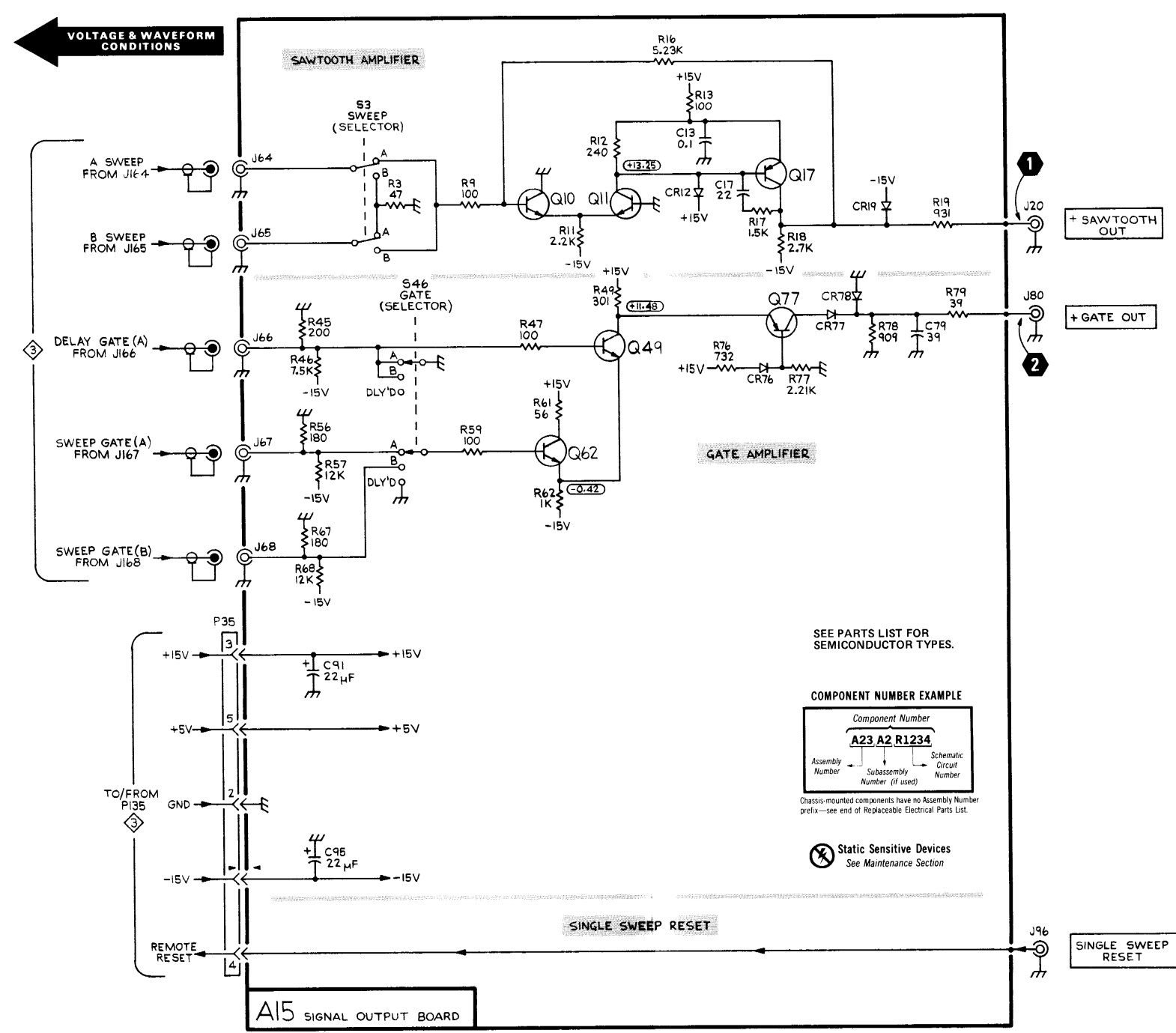
A15 ASSY		
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C13	E2	C3
C17	E2	C3
C79	F2	C4
C91	C4	B4
C95	C5	B3
CR12	E2	C3
CR19	E2	C3
CR76	E3	B4
CR77	E2	C4
CR78	E2	C4
J20	F2	D4
J64	C2	A4
J65	C2	A4
J66	C2	A5
J67	C3	A6
J68	C3	A5
J80	F2	D5
J96	F5	D6
P35	B4	A3
Q10	D2	C3
Q11	D2	B3
Q17	E2	D3
Q49	D3	B5
Q62	D3	B5
Q77	E2	C4
R3	C2	B3
R9	D2	C2
R11	D2	B3
R12	D2	C3
R13	E1	C3
R16	D1	C4
R17	E2	C3
R18	E2	C3
R19	F2	C4
R45	C2	B5
R46	C3	B5
R47	D2	B5
R49	D2	C4
R56	C3	B6
R57	C3	B6
R59	D3	B5
R61	D3	B4
R62	D3	B5
R67	C3	B6
R68	C3	B6
R76	E3	C4
R77	E3	C4
R78	E2	D4
R79	F2	D4
S3	C2	B4
S46	C3	B6



Assembly A15

A B C D E F G

1
2
3
4
5



7854

2874-246
REV A MAR 1981

OUTPUT SIGNALS 12

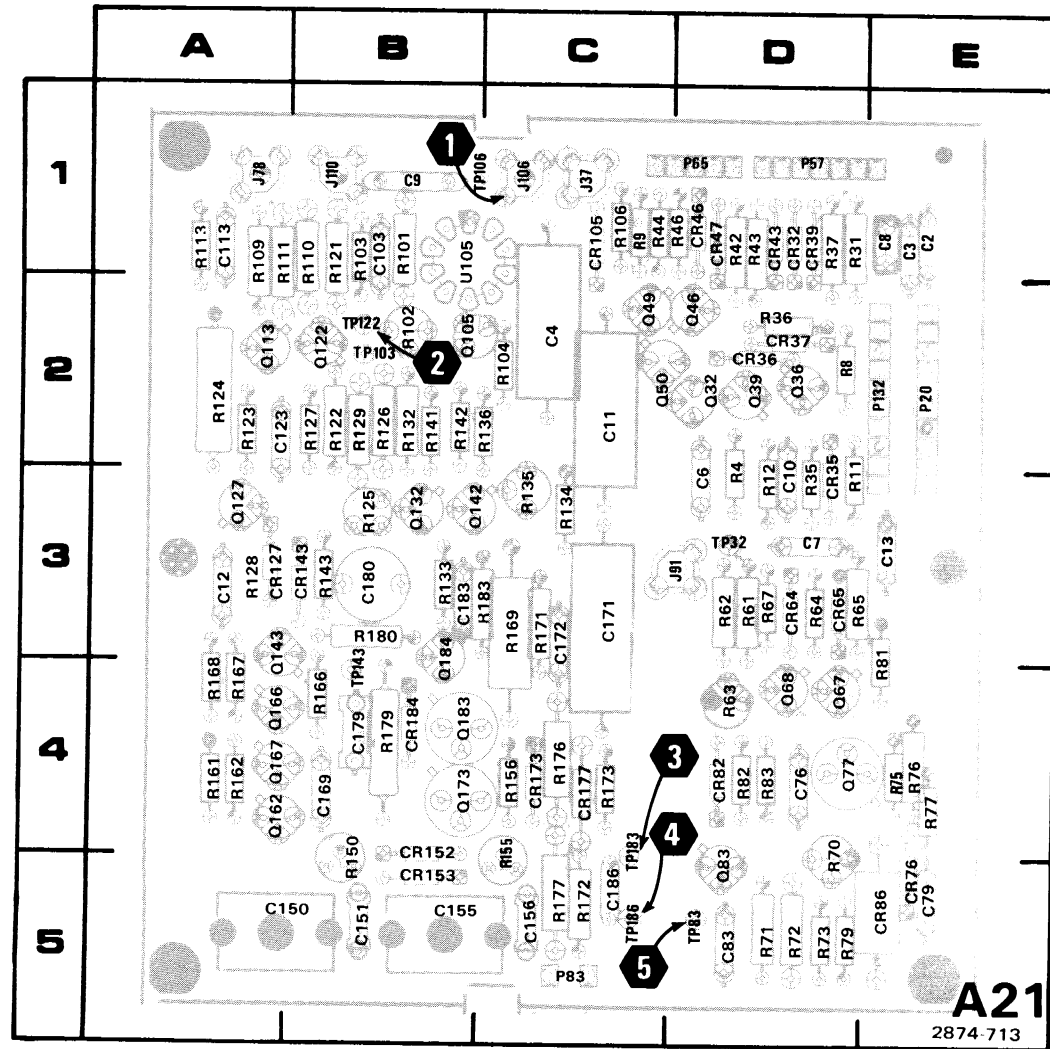
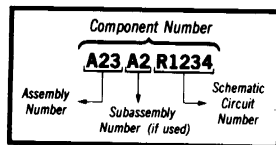


Figure 7-16. A21—Z-Axis circuit board assembly.

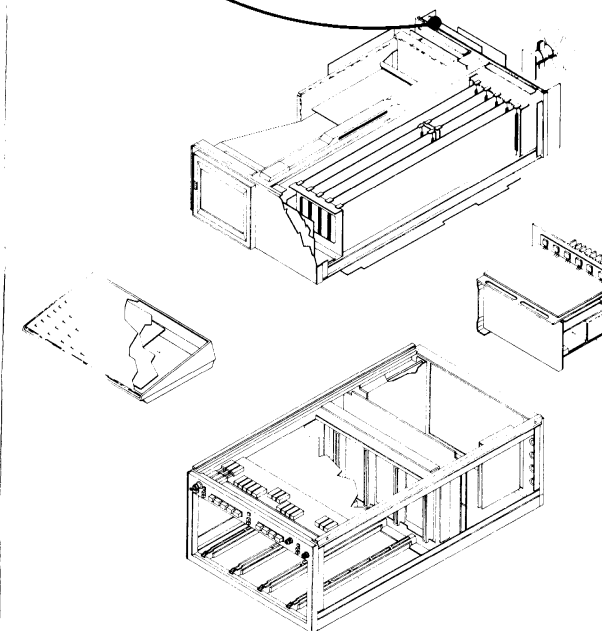
 **Static Sensitive Devices**
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

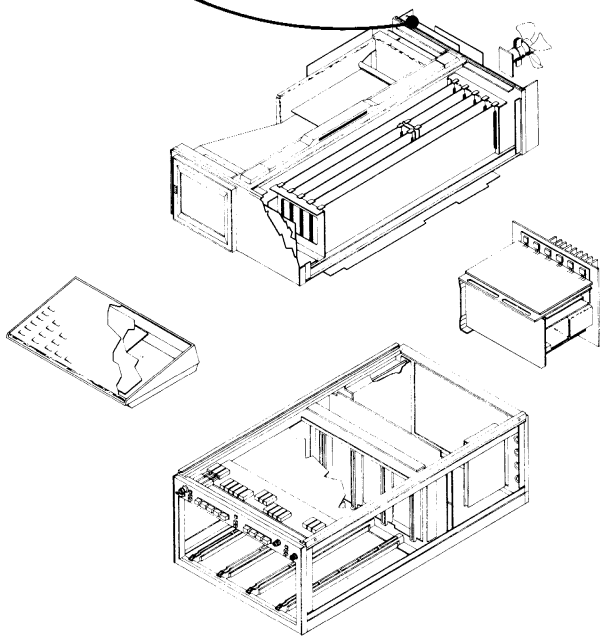
A21
Z-AXIS
BOARD
Shown on diags.
13 & 14



Z-AXIS AND FOCUS AMPLIFIER DIAGRAM 13

A21 ASSY								
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C2	B1	E1	P57	A2	D1	R79	F2	D5
C3	B1	E1	P57	C1	D1	R81	E2	E3
C4	B1	C2	P57	C2	D1	R82	E2	D4
C6	B1	D3	P65	C2	D1	R83	E2	D4
C7	B2	D3	P65	C3	D1	R101	B3	B1
C8	B2	E1	P83	F4	C5	R102	B3	B2
C9	B2	B1	P132	C2	E2	R103	B3	B1
C10	B2	D3				R104	B3	C2
C11	B2	C2	Q32	D1	D2	R106	B3	C1
C12	B2	A3	Q36	D2	D2	R109	B3	A1
C13	B2	E3	Q39	D2	D2	R110	B3	B1
C76	E2	D4	Q46	D2	D2	R111	B3	A1
C79	F2	E5	Q49	D2	C2	R113	B4	A1
C83	F2	D5	Q50	D2	C2	R121	B3	B1
C103	B3	B1	Q67	E1	D4	R122	B3	B2
C113	B4	A1	Q68	E1	D4	R123	B4	A2
C123	B4	A2	Q77	F2	D4	R124	B4	A2
C150	D3	B5	O83	F2	D5	R125	C3	B3
C151	D3	B5	Q105	B3	B2	R126	C3	B2
C155	D3	B5	Q113	B3	A2	R127	C4	B2
C156	D3	C5	Q122	B3	B2	R128	C4	A3
C169	E4	B4	Q127	C4	A3	R129	C3	B2
C171	E4	C3	Q132	C3	B3	R132	C3	B2
C172	E4	C3	Q142	C4	B3	R133	C3	B3
C179	E4	B4	Q143	D4	A4	R134	C3	C3
C180	E4	B3	Q162	E3	A4	R135	C3	C3
C183	E4	B3	Q166	E4	A4	R136	C3	B2
C186	F4	C5	Q167	E4	A4	R141	C4	B2
			Q173	F4	B4	R142	C4	B2
CR32	D1	D1	Q183	F4	B4	R143	D3	B3
CR35	D2	D3	Q184	F4	B4	R150	D3	B5
CR36	D2	D2				R155	D3	C3
CR37	D2	D2	R4	A1	D3	R156	D3	C3
CR39	D2	D1	R8	B2	D2	R161	E3	A4
CR43	D2	D1	R9	B2	D1	R162	E3	A4
CR46	D2	D1	R11	B2	D3	R166	D4	B4
CR47	D2	D1	R12	B2	D3	R167	E4	A4
CR64	E1	D3	R31	D1	D1	R168	E4	A4
CR65	E2	D3	R35	D2	D3	R169	F4	C3
CR76	E2	E5	R36	D2	D2	R171	E4	C3
CR82	E2	D4	R37	D2	D1	R172	E4	C5
CR86	F2	E5	R42	D2	D1	R173	E4	C3
CR105	B3	C1	R43	D2	D1	R176	F4	C3
CR127	C4	A3	R44	D2	C1	R177	F4	C5
CR143	D4	B3	R46	D2	C1	R179	E4	B4
CR152	D3	B4	R61	E1	D3	R180	E4	B3
CR153	D3	B5	R62	E1	D3	R183	E4	C3
CR173	E4	C4	R63	E2	D4			
CR177	E4	C4	R64	E2	D3	TP32	E1	D3
CR184	F4	B4	R65	E2	D3	TP83	F2	D5
			R67	E1	D3	TP103	B3	B2
J37	D1	C1	R70	E1	D5	TP106	B3	B1
J78	A3	A1	R71	F1	D5	TP122	B3	B2
J91	A4	D3	R72	F1	D5	TP143	D3	B4
J106	C3	C1	R73	F1	D5	TP183	F4	C3
J110	A3	B1	R75	E2	E4	TP186	F4	C5
			R76	E2	E4			
P20	C1	E2	R77	F2	E4	U105	B3	B1

A21
Z-AXIS
BOARD
Shown on diags.
13 & 14



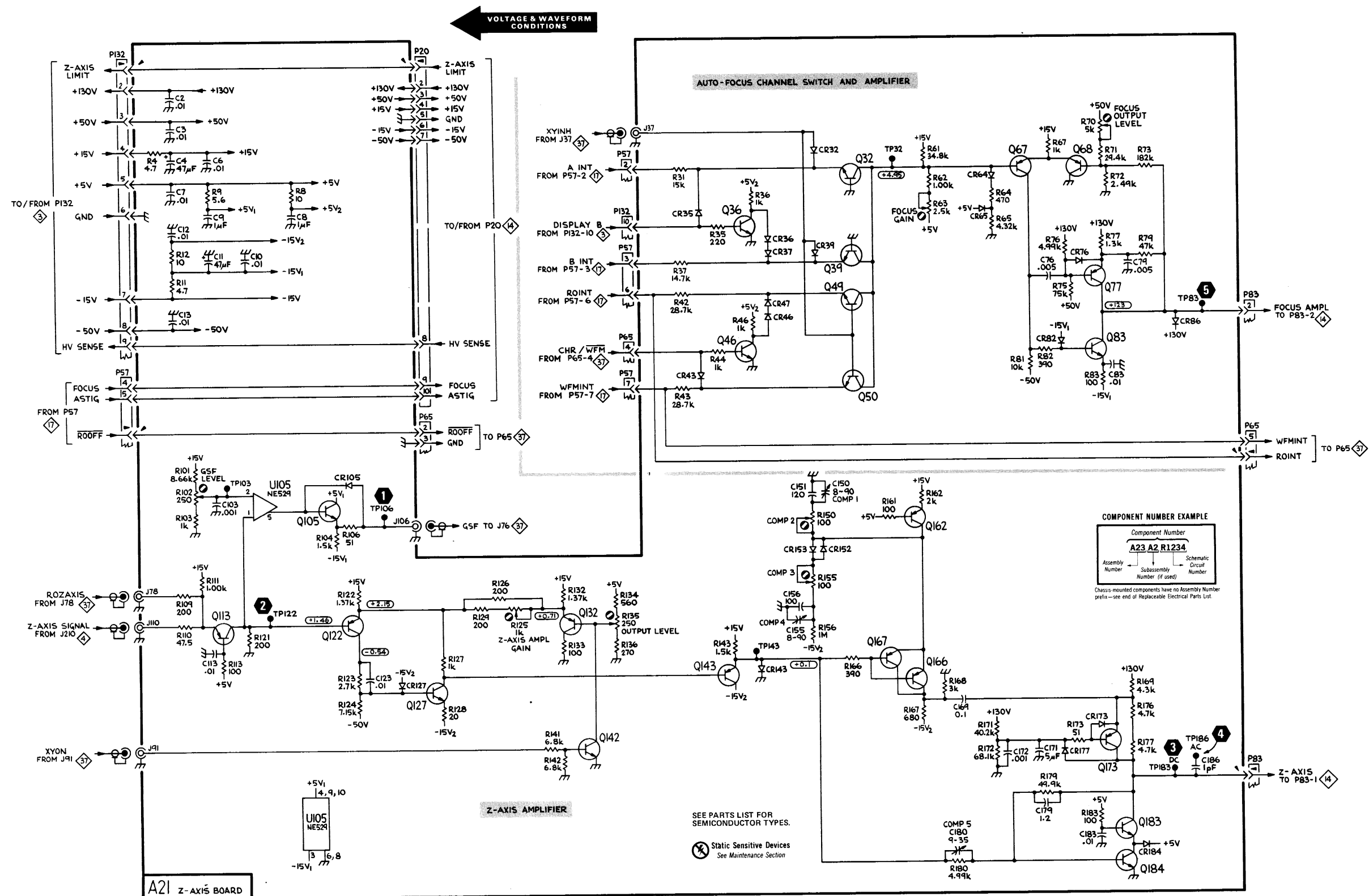
A B C D E F

1

2

3

4



13 Z Axis and Focus Amplifier Reverse Side A21 & A20

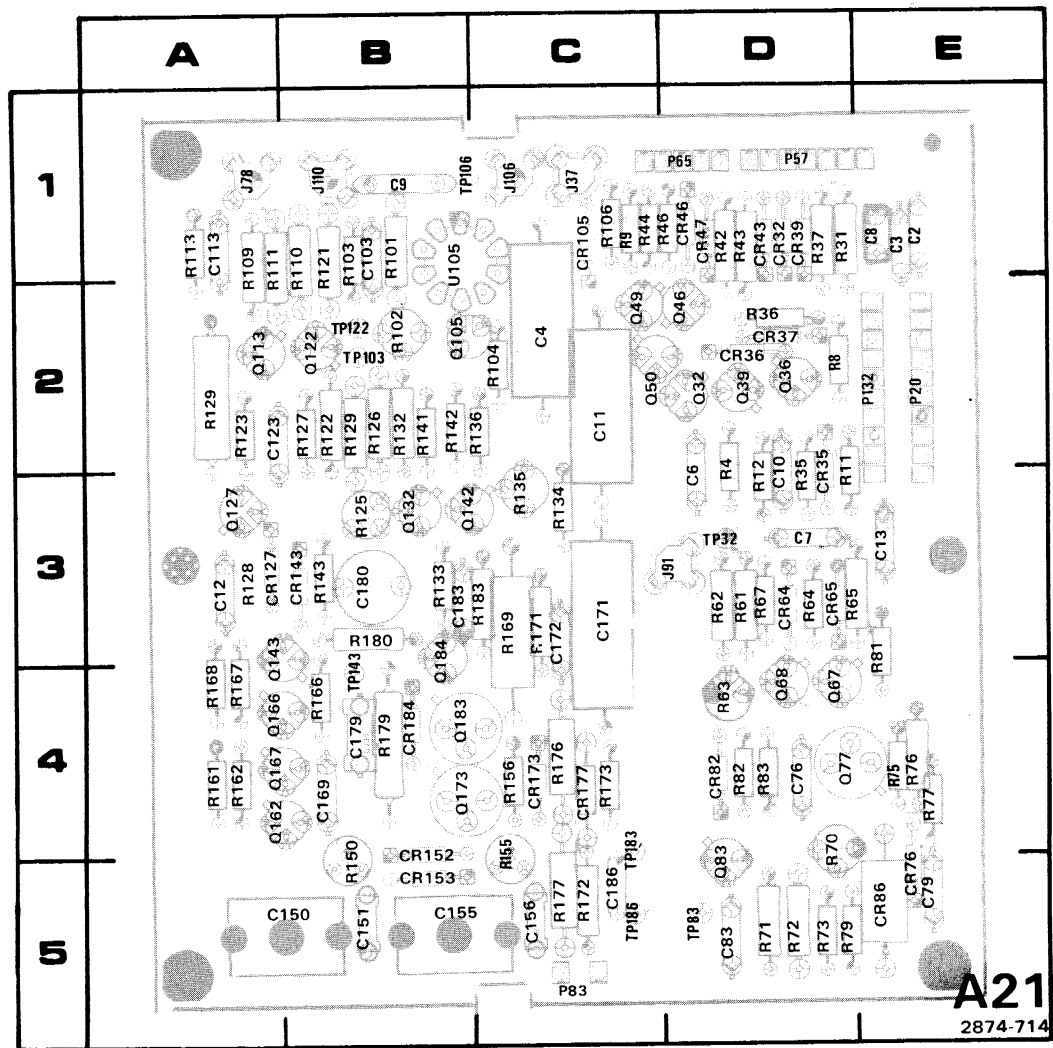


Figure 7-17. A21—Z-Axis circuit board assembly.

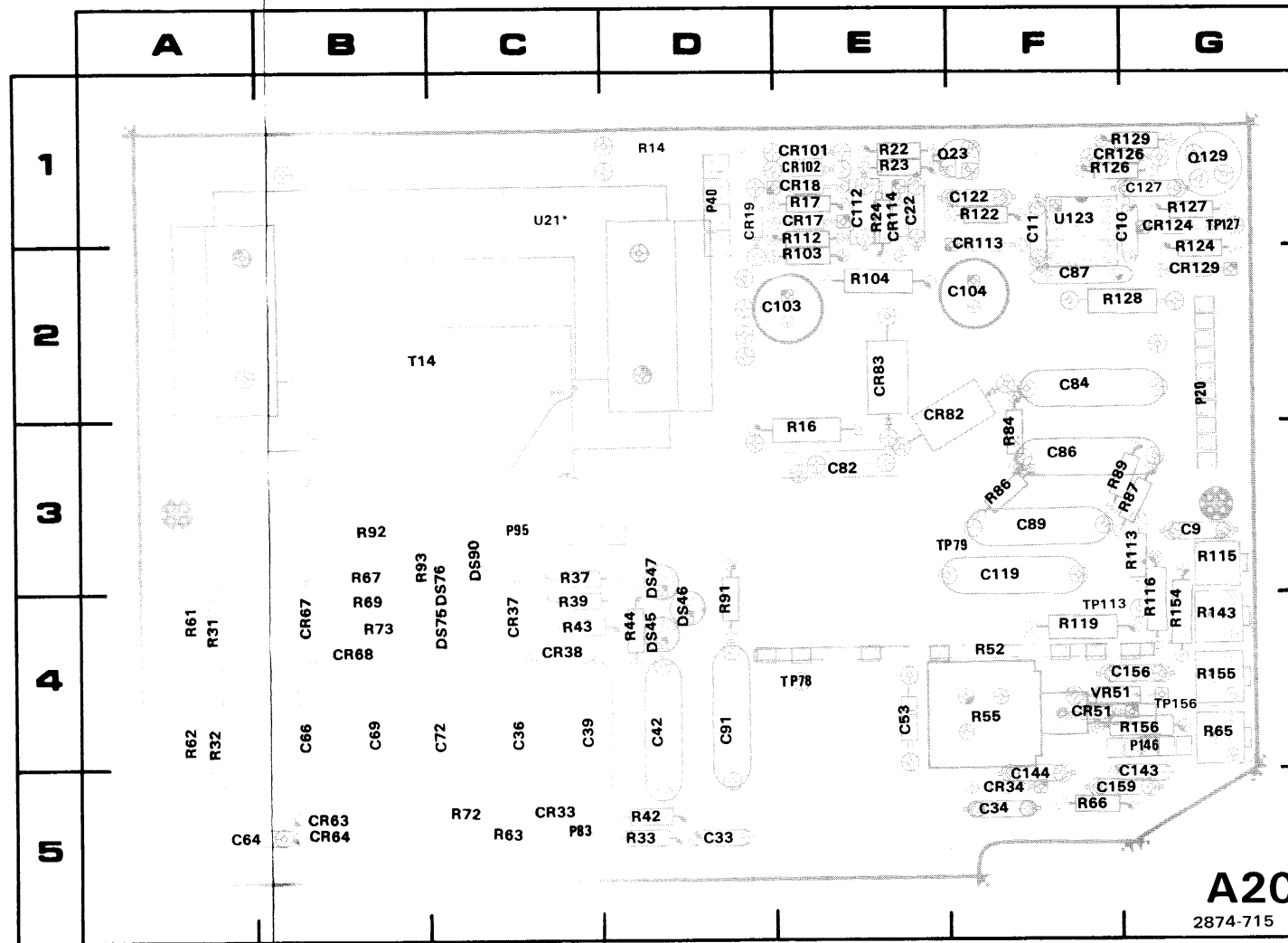
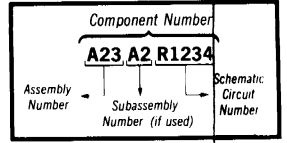


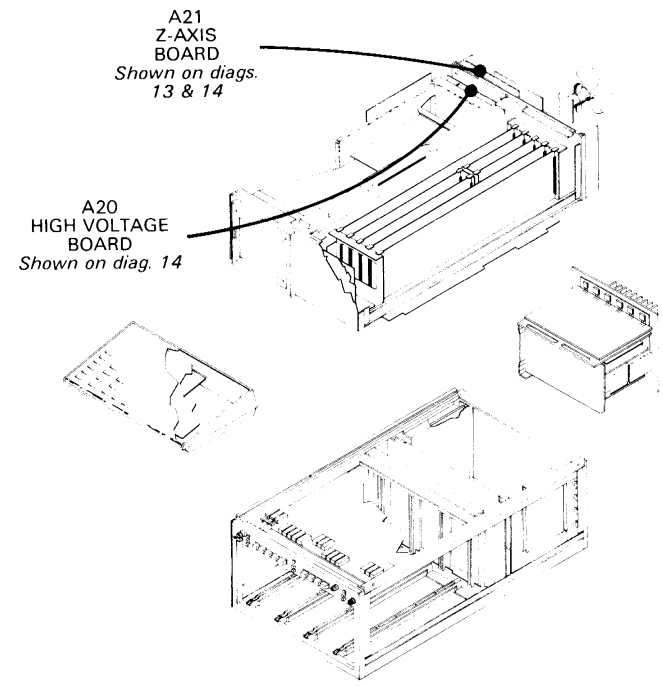
Figure 7-18. A20—High Voltage circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List



A B C D E F G

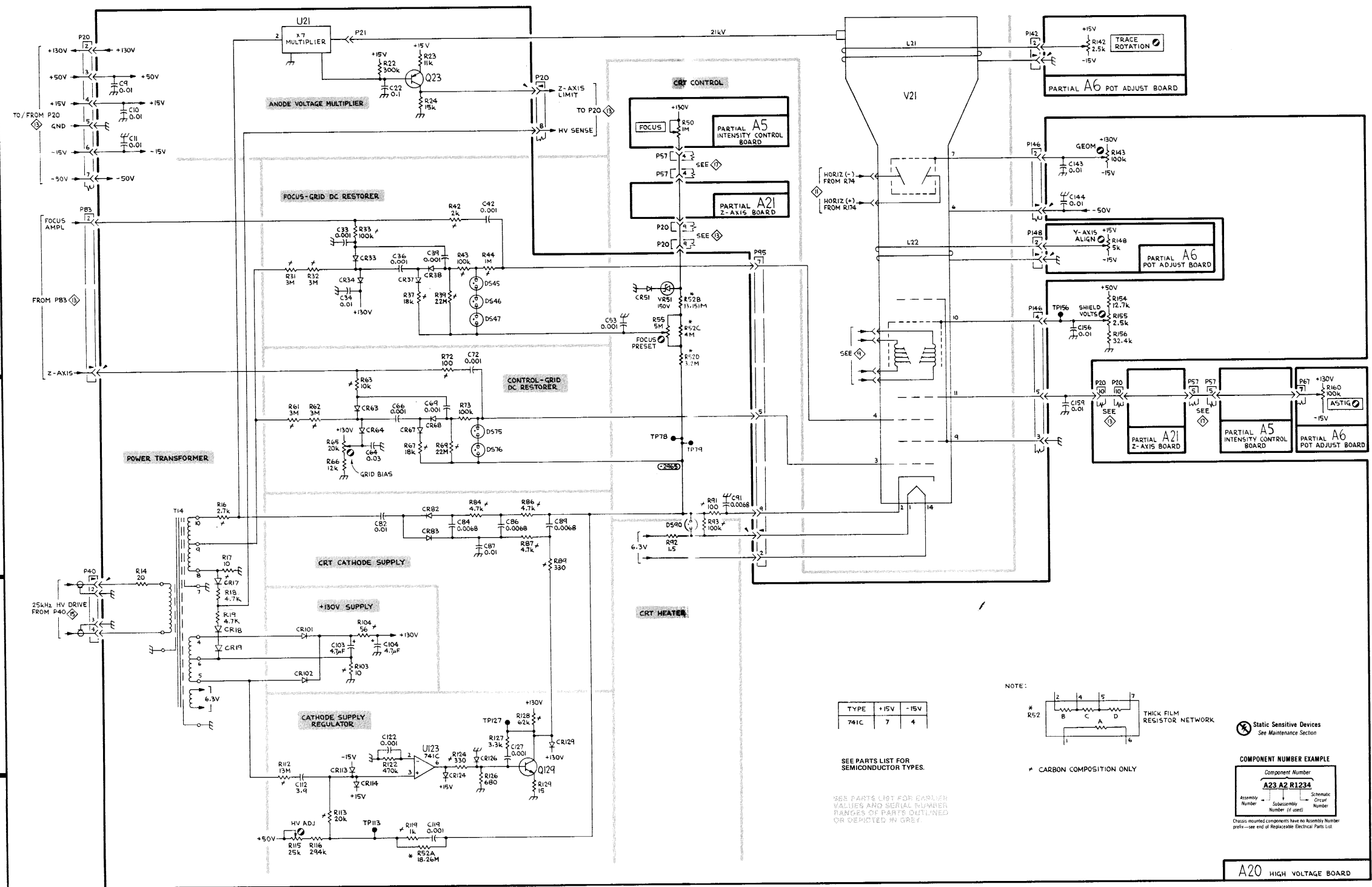
1

2

3

4

5



7854

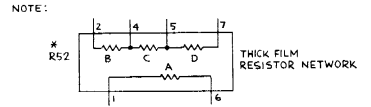
2874-348
REV. MAR 1981

HIGH-VOLTAGE POWER SUPPLY AND CRT

TYPE	+15V	-15V
741C	7	4

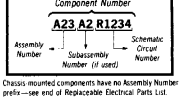
SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.



Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Check mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List

A20 HIGH VOLTAGE BOARD

High Voltage
Power Supply
A12 & A23
and CRT

Reverse Side

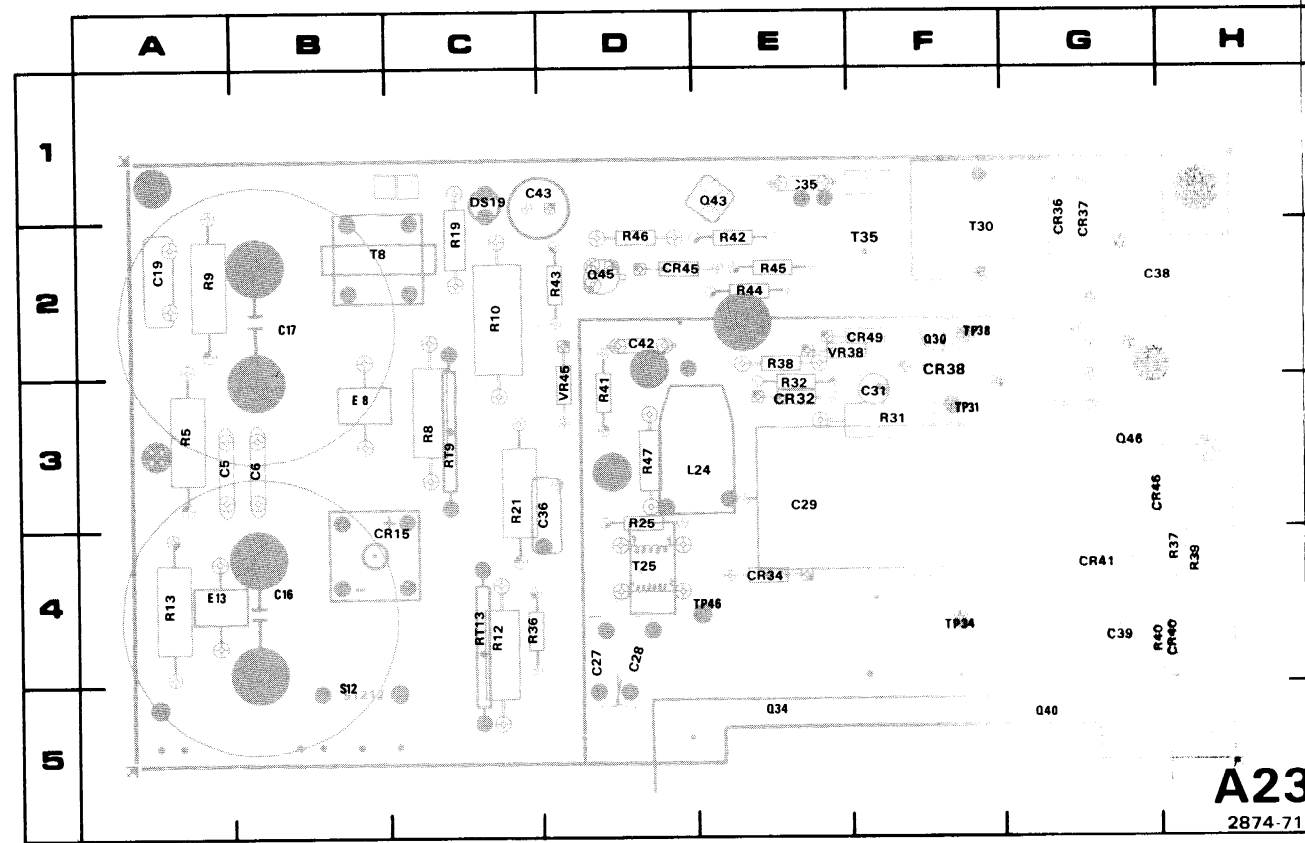


Figure 7-19. A23—Inverter circuit board assembly.

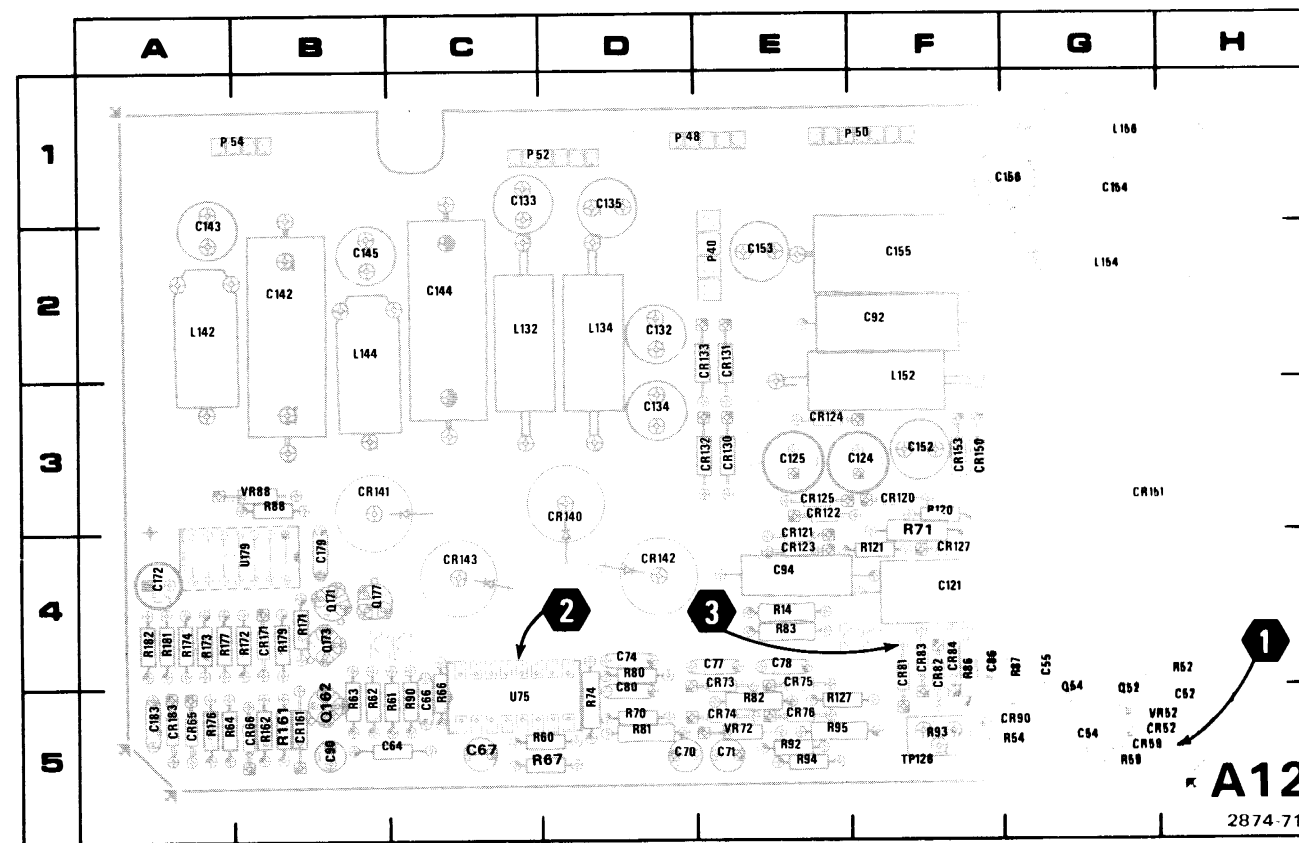
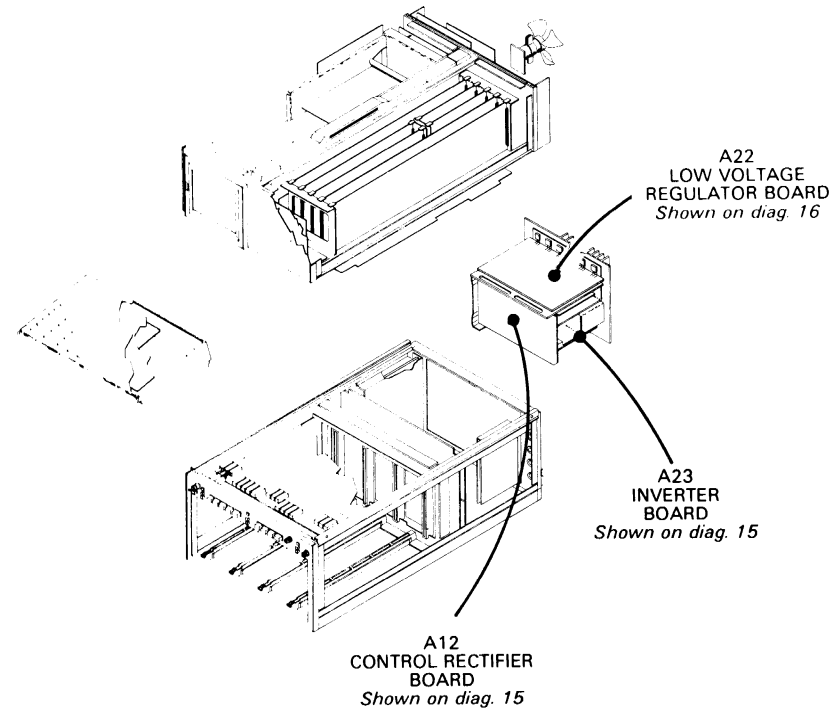
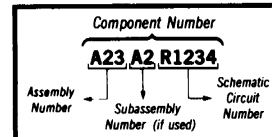


Figure 7-20. A12—Control Rectifier circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

CONVERTER / RECTIFIER DIAGRAM 15

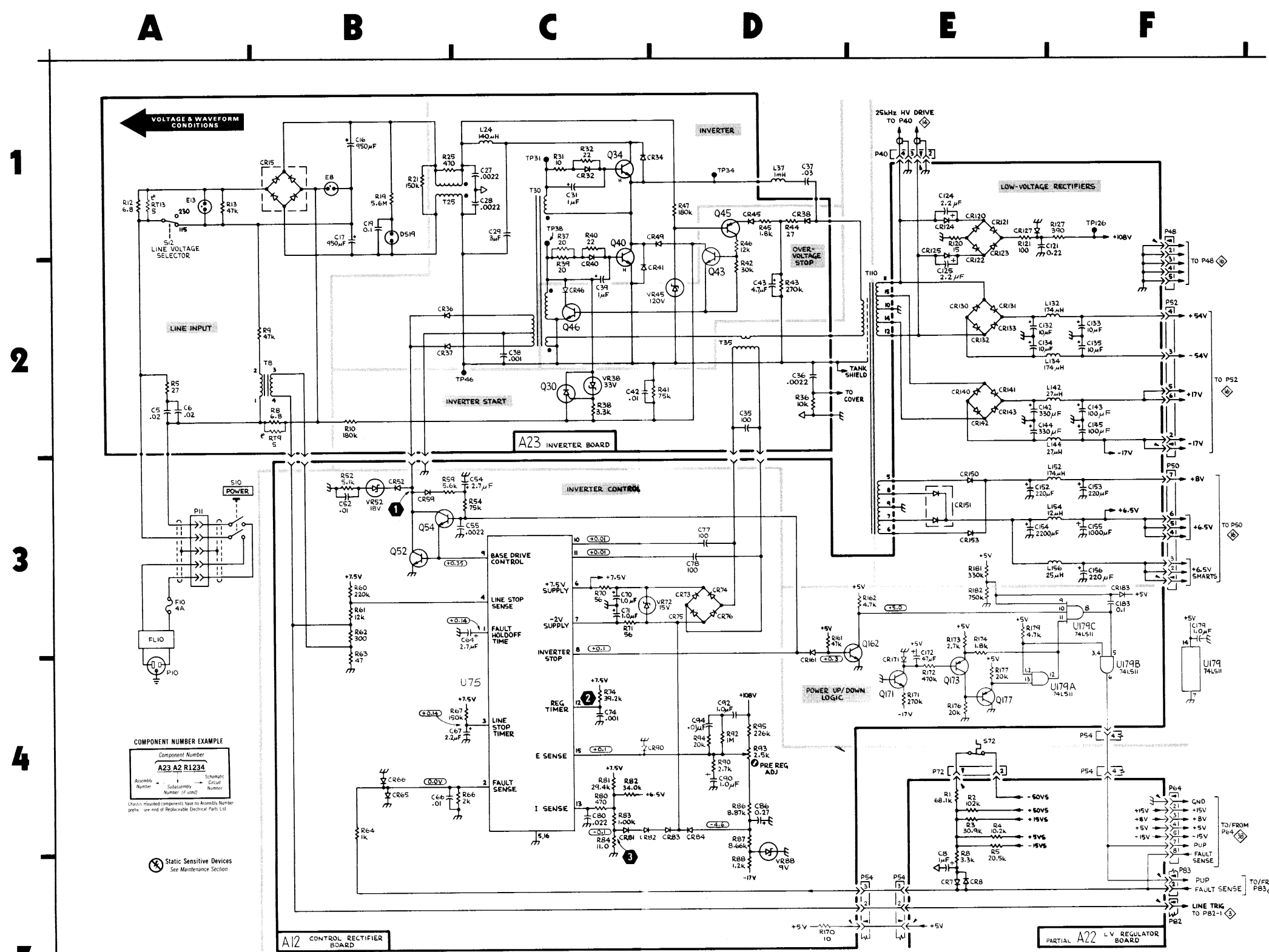
A12 ASSY														
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C52	B3	H5	C154	E3	G1	CR132	E2	E3	Q162	D4	B5	R94	D4	E5
C54	C3	G5	C155	F3	F2	CR133	E2	E2	Q171	E4	B4	R95	D4	E5
C55	C3	G4	C156	F3	G1	CR140	E2	D3	Q173	E4	B4	R120	E1	F3
C64	C3	B5	C172	E4	A4	CR141	E2	B3	Q177	E4	B4	R121	E1	E4
C66	B4	C5	C179	F3	B4	CR142	E2	D4				R127	F1	E5
C67	B4	C5	C183	F3	A5	CR143	E2	C4	R52	B3	H4	R161	D3	B4
C70	C3	D5				CR150	E3	F3	R54	C3	G5	R162	E3	B5
C71	C3	E5	CR52	B3	G5	CR151	E3	G3	R59	B3	G5	R171	E4	B4
C74	C4	D4	CR59	B3	G5	CR153	E3	F3	R60	B3	D5	R172	E4	B4
C77	D3	E4	CR65	B4	A5	CR161	D4	B5	R61	B3	B5	R173	E3	A4
C78	D3	E4	CR66	B4	B5	CR171	E4	B4	R62	B3	B5	R174	E3	A4
C80	C4	D4	CR73	D3	E4	CR183	F3	A5	R63	B3	B5	R176	E4	A5
C86	D4	F4	CR74	D3	E5				R64	B4	A5	R177	E4	A4
C90	D4	B5	CR75	D3	E4	L132	F2	C2	R66	C4	C5	R179	E3	B4
C92	D4	F2	CR76	D3	E5	L134	F2	D2	R67	B4	D5	R181	E3	A4
C94	D4	E4	CR81	C4	F4	L142	F2	A2	R70	C3	D5	R182	E3	A4
C121	F1	F4	CR82	C4	F4	L144	F2	B2	R71	C3	E4			
C124	E1	E3	CR83	D4	F4	L152	F3	F2	R74	C4	D5	TP126	F1	F5
C125	E2	E3	CR84	D4	F4	L154	F3	G2	R80	C4	D4			
C132	E2	D2	CR90	C3	G5	L156	F3	G1	R81	C4	D5	U75	C4	C5
C133	F2	C1	CR120	E1	F3				R82	C4	E5	U179A	F4	B4
C134	E2	D3	CR121	E1	E4	P40	E1	E2	R83	C4	E4	U179B	F4	B4
C135	F2	D1	CR122	E2	E3	P48	F1	D1	R84	C4	E4	U179C	F3	B4
C142	E2	B2	CR123	E1	E4	P50	F3	F1	R86	D4	E4			
C143	F2	A1	CR124	E1	E3	P52	F2	C1	R87	D4	G4	VR52	B3	G5
C144	E2	C2	CR125	E1	E3	P54	E5	A1	R88	D4	B3	VR72	D3	E5
C145	F2	B2	CR127	E1	F4				R90	D4	C5	VR88	D4	B3
C152	E3	F3	CR130	E2	E3	Q52	B3	G5	R92	D4	E5			
C153	F3	E2	CR131	E2	E2	Q54	B3	G5	R93	D4	F5			

PARTIAL A22 ASSY												
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	
C8	E4	F5	P54	E4	F5	R1	E4	F6	R5	E4	E6	
CR7	E4	F5	P64	F4	H4	R2	E4	E5	R8	E4	F5	
CR8	E4	F5	P72	E4	F5	R3	E4	E5				
			P82	F5	B5	R4	E4	E5				

Partial A22 ASSY also shown on diagram 16.

PARTIAL A23 ASSY														
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C5	A2	A3	CR32	C1	D3	Q30	C2	F2	R32	C1	E3	S12	A1	B5
C6	A2	B3	CR34	C1	E4	Q34	C1	E5	R36	D2	C4			
C16	B1	B4	CR36	B2	G1	Q40	C1	G5	R37	C1	H4	T8	B2	B2
C17	B1	B2	CR37	B2	G1	Q43	D2	E1	R38	C2	E2	T25	B1	D4
C19	B1	A2	CR38	D1	F3	Q45	D1	D2	R39	C2	H4	T30	C1	F1
C27	C1	D4	CR40	C2	H4	Q46	C2	G3	R40	C1	G4	T35	D2	E2
C28	C1	D4	CR41	D2	G4				R41	D2	D3			
C29	C1	E3	CR45	D1	D2	R5	A2	A3	R42	D2	E2	TP31	C1	F3
C31	C1	F3	CR46	C2	G3	R8	B2	C3	R43	D2	D2	TP34	D1	F4
C35	D2	E1	CR49	D1	F1	R9	B2	A2	R44	D1	E2	TP38	C1	F2
C36	D2	D3				R10	B2	C2	R45	D1	E2	TP46	C2	E4
C38	C2	H2	DS19	B1	C1	R12	A1	C4	R46	D1	D2			
C39	C2	G4				R13	A1	A4	R47	D1	D3	VR38	C2	F1
C42	C2	D2	E8	B1	B3	R19	B1	C2				VR45	D2	D3
C43	D2	D1	E13	A1	A4	R21	B1	C3	RT9	B2	C3			
						R25	B1	D3	RT13	A1	C4			
CR15	B1	C4	L24	C1	E3	R31	C1	F3						

CHASSIS MOUNTED PARTS												
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	
C37	D1	CHASSIS	FL10	A3	CHASSIS	P10	A4	CHASSIS	S10	A3	CHASSIS	
F10	A3	CHASSIS	L37	D1	CHASSIS	P11	A3	CHASSIS	S72	E4	CHASSIS	
						P83	F5	CHASSIS	T110	E2	CHASSIS	



1
2
3
4
5

VOLTAGE & WAVEFORM CONDITIONS

LINE INPUT

POWER

COMPONENT NUMBER EXAMPLE
 Component Number
 A23 A2 R1234
 Assembly Number - Subassembly Number (if used)
 Schematic Circuit Number
 Check mounted components have no Assembly Number prefix - see end of Replaceable Electrical Parts List

Static Sensitive Devices
 See Maintenance Section

7854

2874-249
 REV JUL 1951

CONVERTER / RECTIFIERS

15 Converter / Rectifiers
 Reverse Side
 A22 & A16

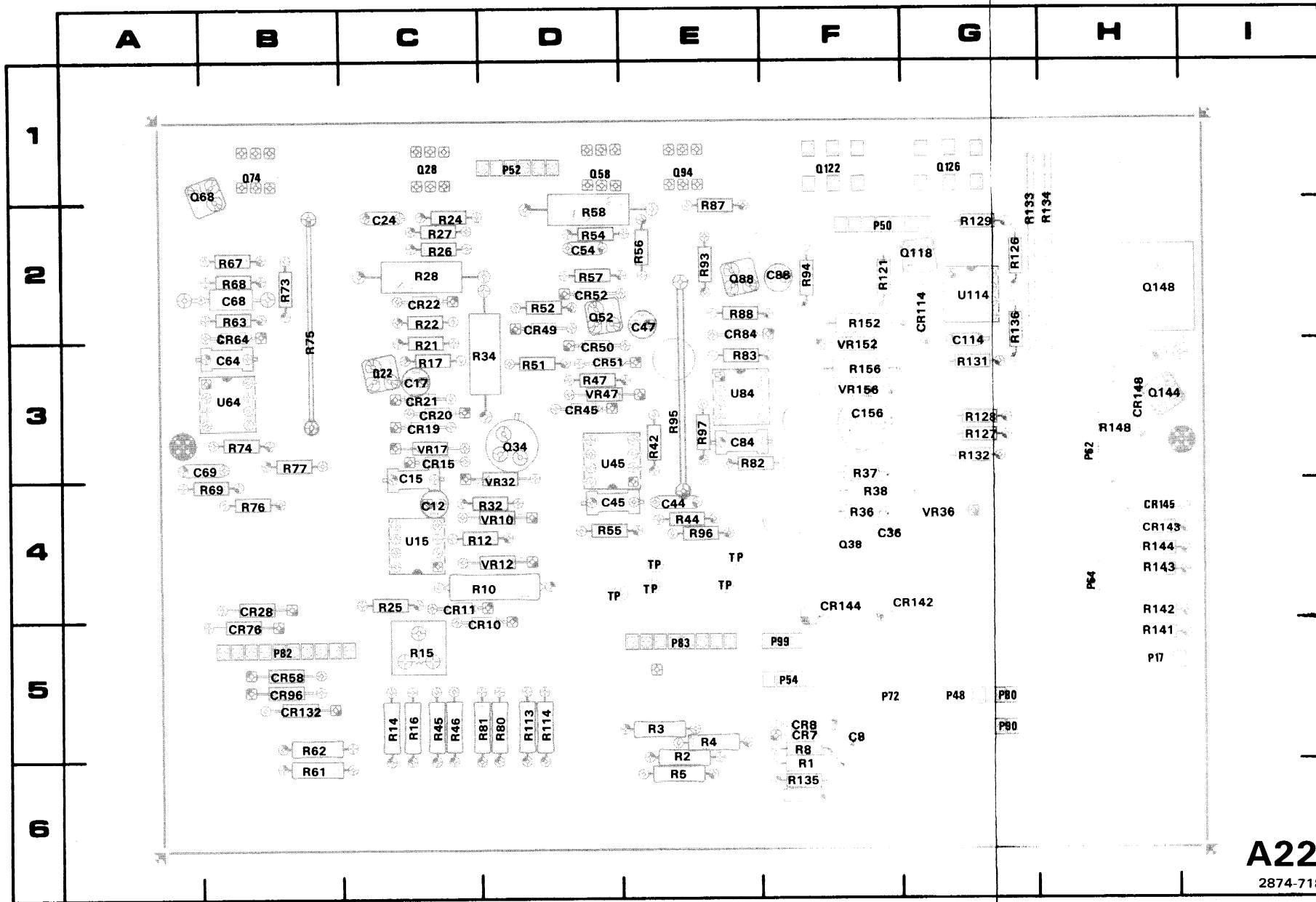


Figure 7-21. A22—Low Voltage circuit board assembly.

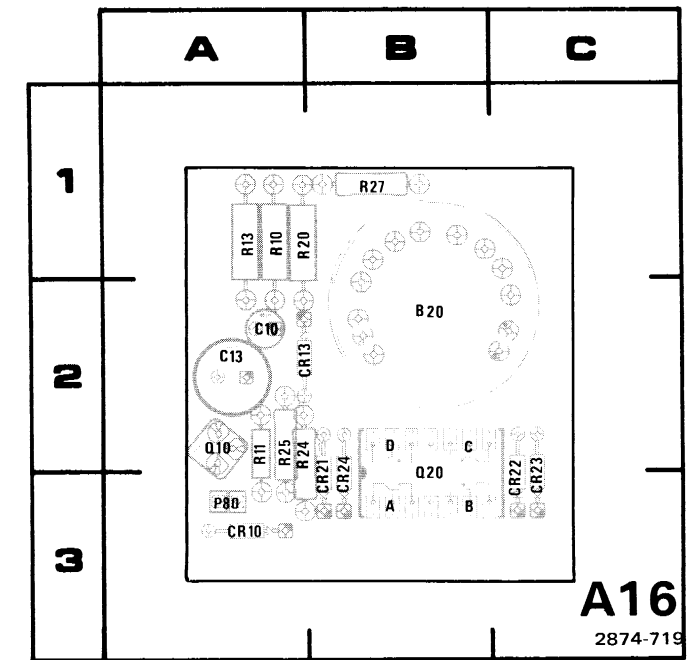
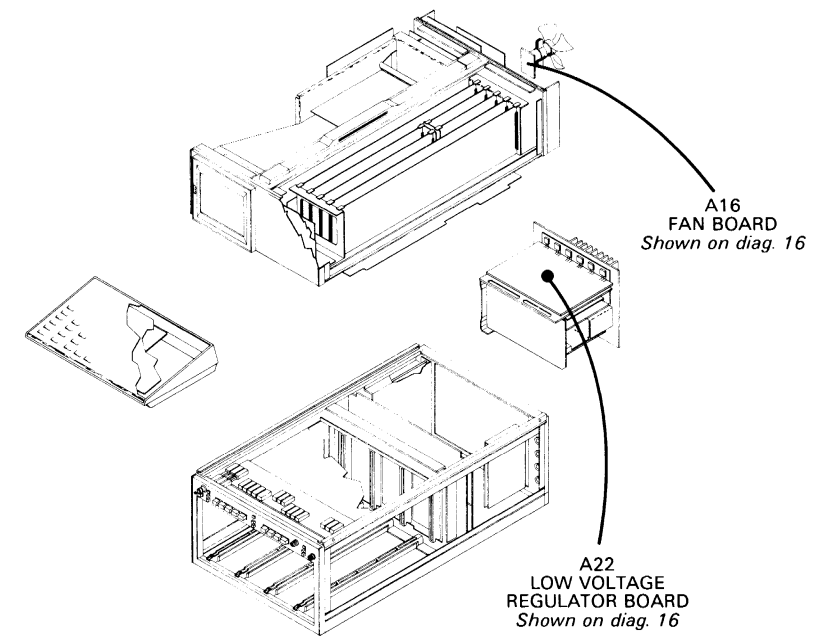
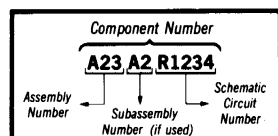


Figure 7-22. A16—Fan circuit board assembly.



REV A MAR 1981

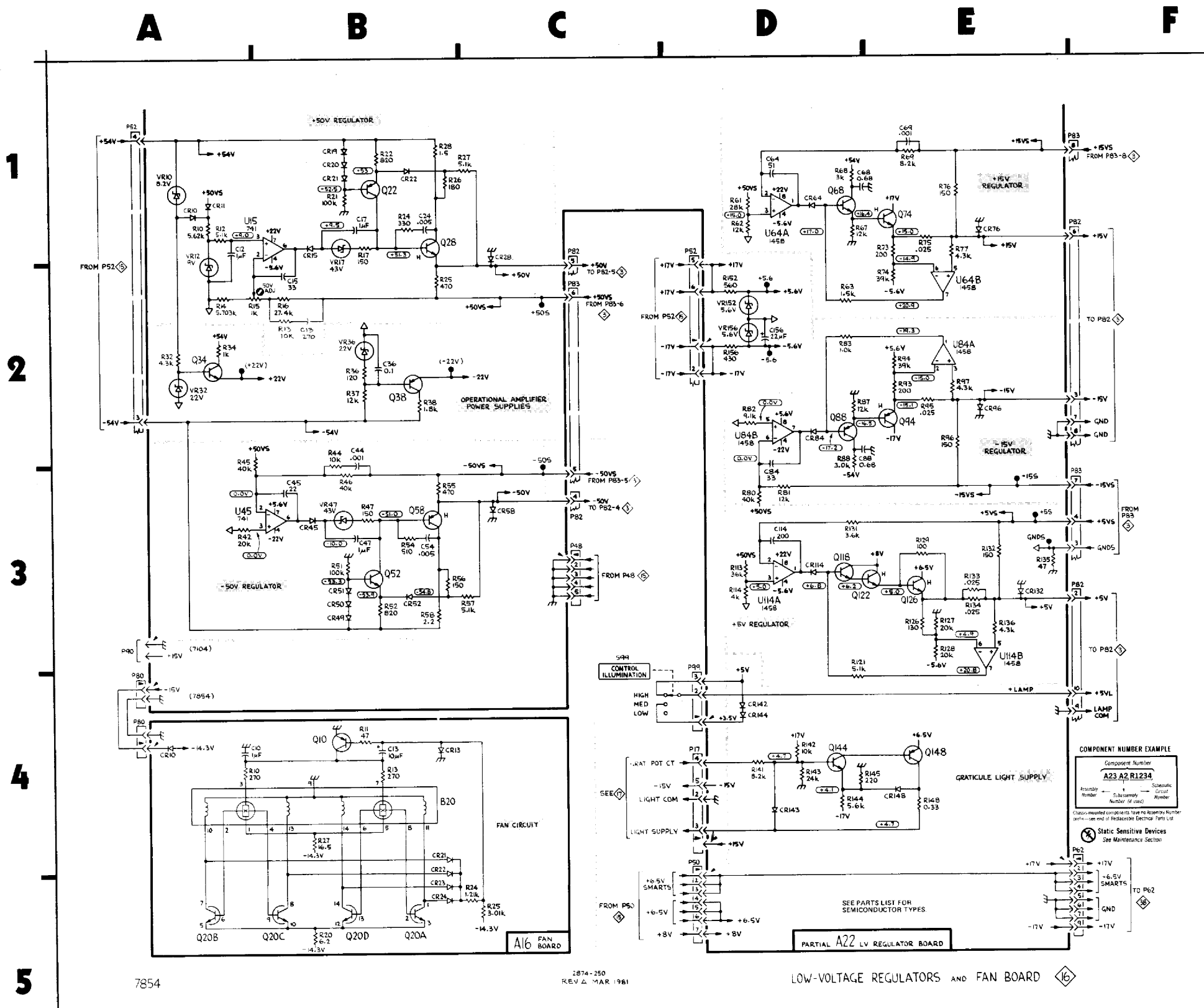
COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

⊗ Static Sensitive Devices
See Maintenance Section

-15V short to GND
P-80 AND P72 WERE SWAPPED
FAN + TEMP SWITCH.



7854

2874-250
REV. A MAR 1981

LOW-VOLTAGE REGULATORS AND FAN BOARD

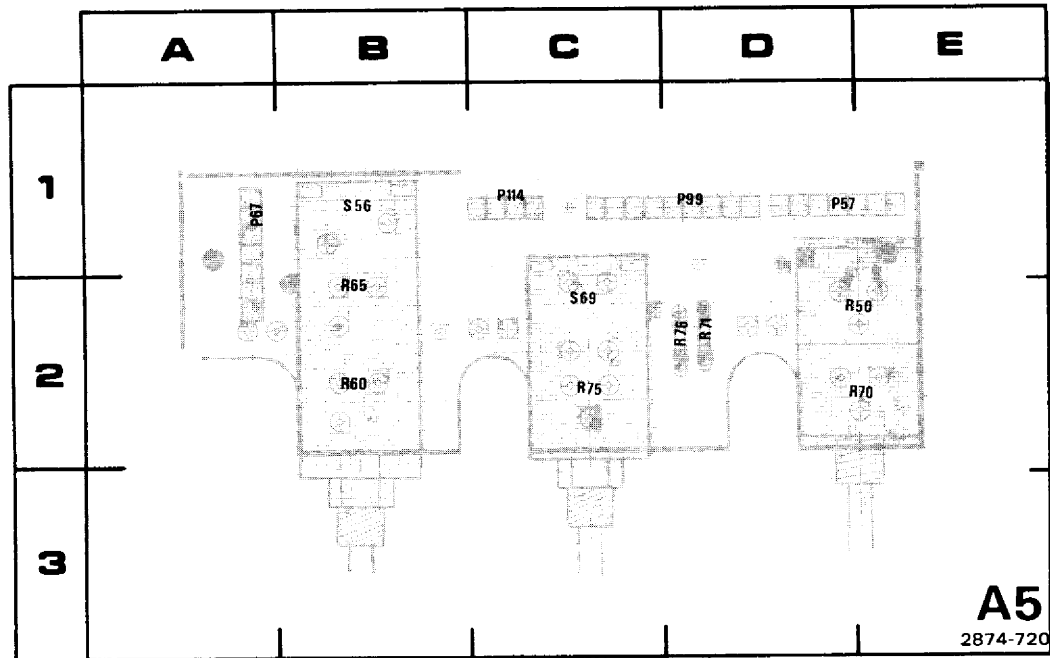


Figure 7-23. A5—Intensity Control circuit board assembly.

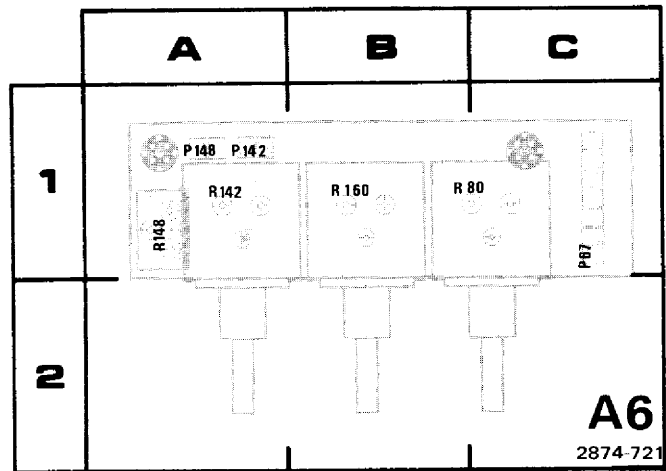
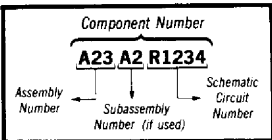


Figure 7-24. A6—Pot Adjust circuit board assembly.

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section

@

FRONT-PANEL CONTROLS DIAGRAM 17

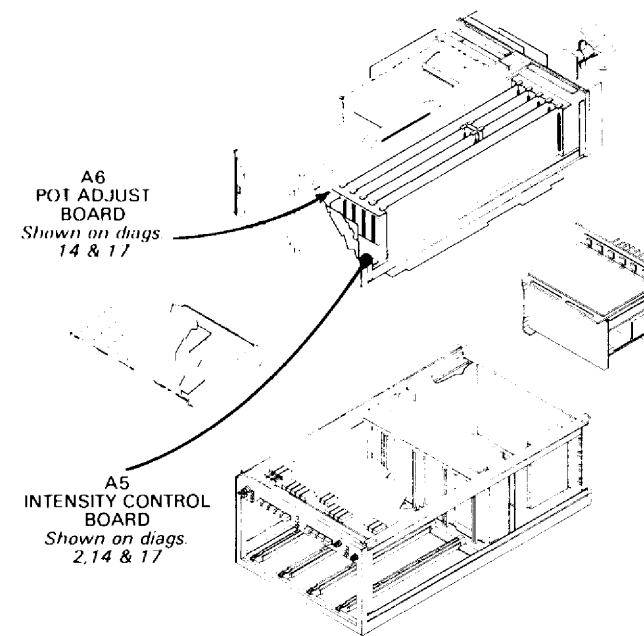
PARTIAL A5 ASSY		
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
P57	F2	D1
P67	D4	A1
P99	C5	D1
P99	E3	D1
R50	F5	D2
R60	C2	B2
R65	C3	B2
R70	C3	D2
R71	D3	D2
R75	C4	C2
R76	D4	D2
S60	D2	B1
S69	D3	C2

Partial A5 ASSY also shown on diagrams 2 and 14.

PARTIAL A6 ASSY		
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
P67	D4	C1
P67	E4	C1
P142	E5	A1
R80	E4	B1
R142	E5	A1
R160	E5	B1

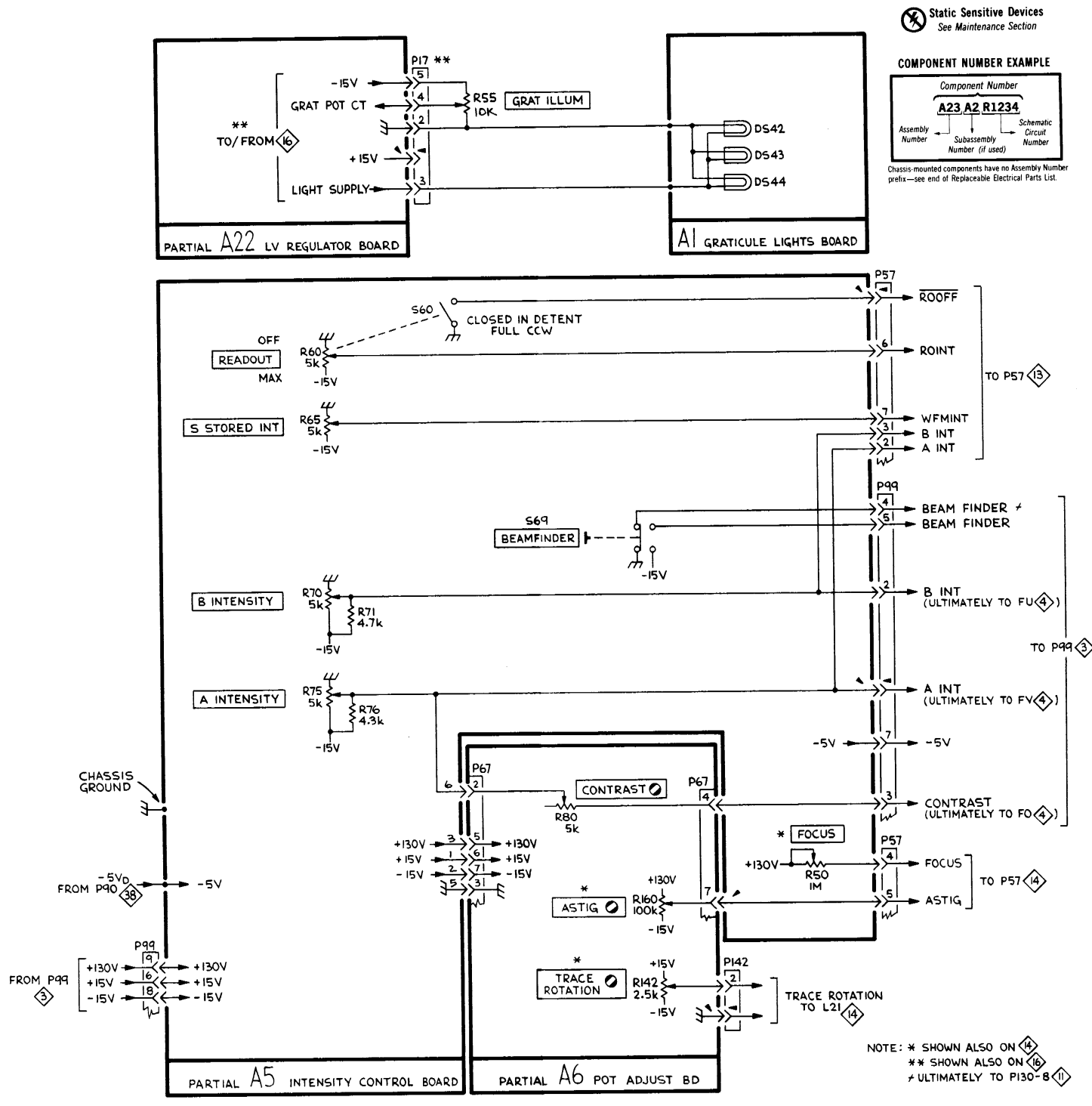
Partial A6 ASSY also shown on diagram 14.

CHASSIS MOUNTED PARTS		
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
DS42	E1	CHASSIS
DS43	E1	CHASSIS
DS44	E1	CHASSIS
P17	D1	CHASSIS
P57	F5	CHASSIS
R55	D1	CHASSIS



A B C D E F G H

1
2
3
4
5
6



7854

2874-251
REV A MAR 1981

FRONT-PANEL CONTROLS **17**

17 Front Panel Control
Reverse Side A3 & A4

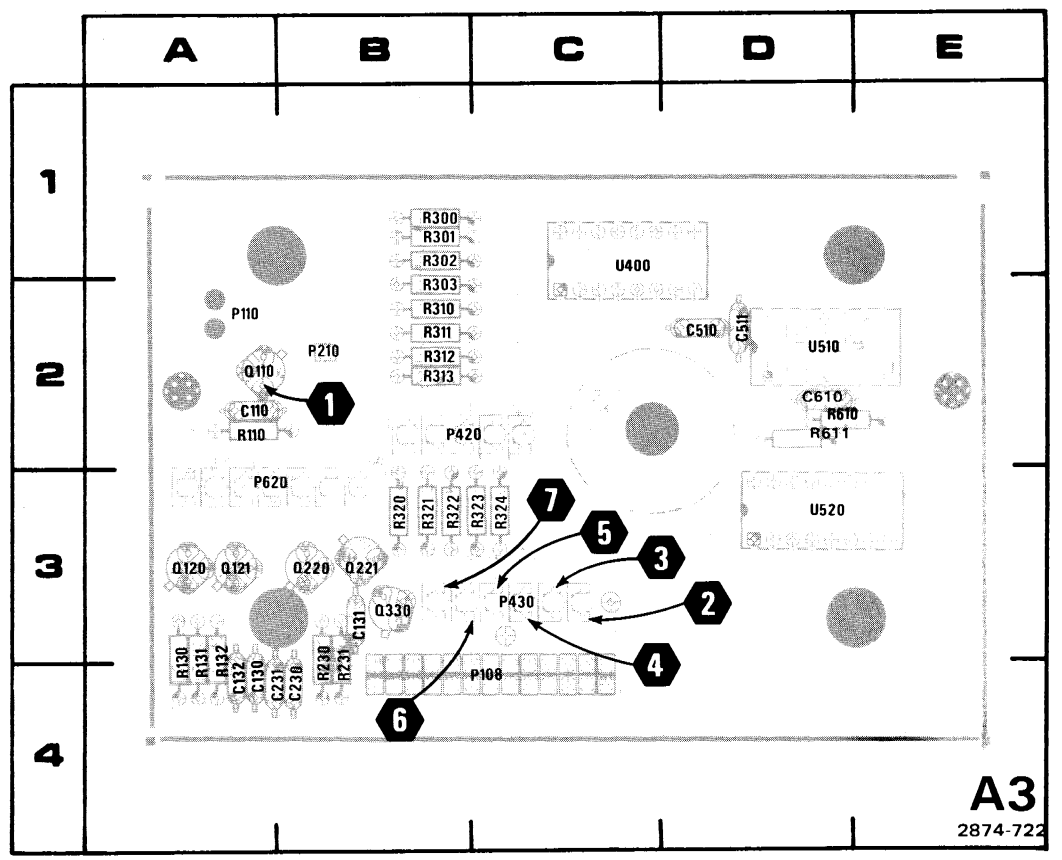


Figure 7-25. A3—Front Panel Keyboard Electronics circuit board assembly.

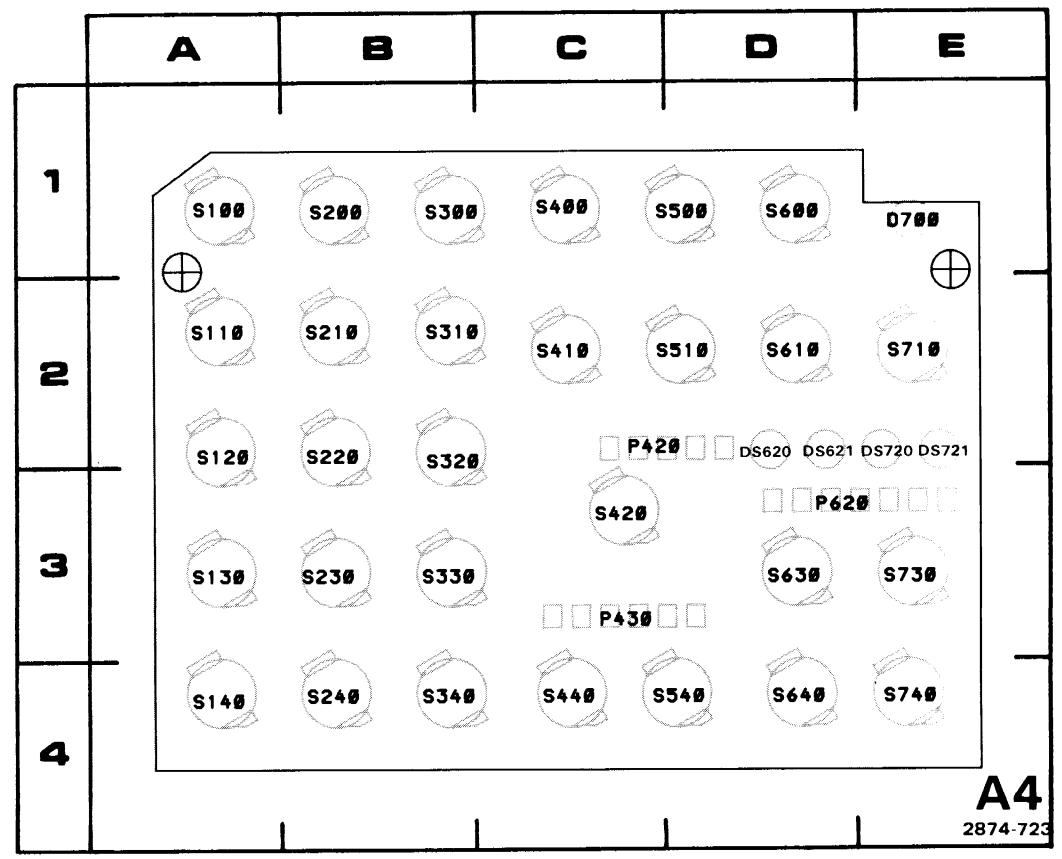


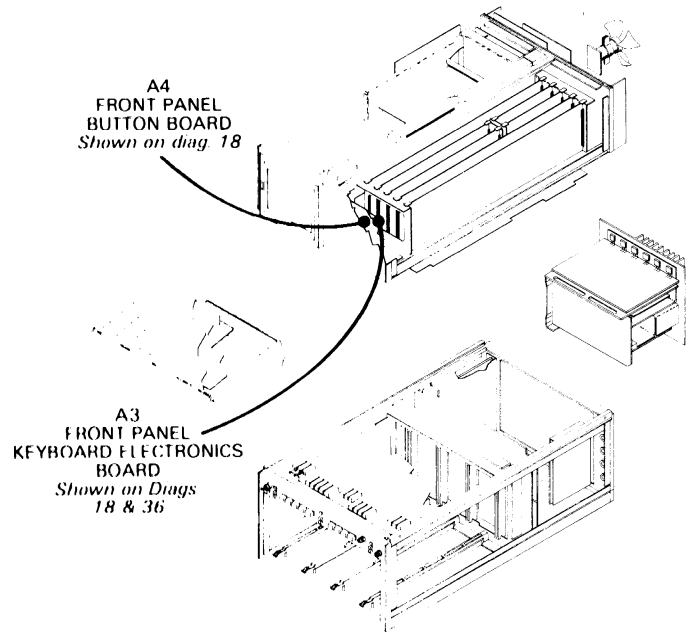
Figure 7-26. A4—Front Panel Button circuit board assembly.

FRONT-PANEL KEYBOARD DIAGRAM 18

PARTIAL A3 ASSY					
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C110	B3	A2	Q330	B2	B3
C130	A2	A4	R110	A3	A2
C131	A2	B3	R130	C2	A4
C132	A2	A4	R131	C2	A4
C230	A2	B4	R132	B2	A4
C231	A2	A4	R230	B2	B4
C510	A3	D2	R231	B2	B4
C511	G2	D2	R300	F1	B1
C610	B3	D2	R301	F1	B1
LS520	B3	D2	R302	F2	B1
			R303	F2	B2
P108	A2	C4	R310	F3	B2
P108	C3	C4	R311	F3	B2
P108	F4	C4	R312	F2	B2
P108	G2	C4	R313	F2	B2
P210	A3	B2	R320	B2	B3
P420	F2	B2	R321	B2	B3
P430	D3	C3	R322	B2	B3
P620	B1	A3	R323	C2	C3
P620	B2	A3	R324	C2	C3
P620	F1	A3	R610	G2	D2
			R611	G2	E2
Q110	B3	A2	U400	F1	C1
Q120	C2	A3	U510C	G2	D2
Q121	C2	A3	U510D	G2	D2
Q220	B2	B3	U520	C3	D3
Q221	B2	B3			

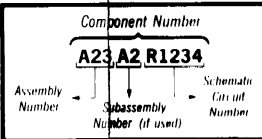
Partial A3 ASSY also shown on diagram 36.

A4 ASSY					
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
DS620	B1	D2	S320	D2	B2
DS621	B1	D2	S330	E2	B3
DS700	C1	D1	S340	E2	B4
DS720	B1	E2	S400	E2	C1
DS721	C1	E2	S410	E1	C2
			S420	C2	C3
S100	D3	A1	S440	E1	C4
S110	D2	A2	S500	E2	D1
S120	D2	A2	S510	E1	D2
S130	E2	A3	S540	E1	D4
S140	E2	A4	S600	E3	D1
S200	D3	B1	S610	C3	D2
S210	D2	B2	S630	C1	D3
S220	D2	B2	S640	C2	D4
S230	E2	B3	S710	E3	E2
S240	E2	B4	S730	C1	E3
S300	E3	B1	S740	C2	E4
S310	D2	B2			



Static Sensitive Devices
See Maintenance Section

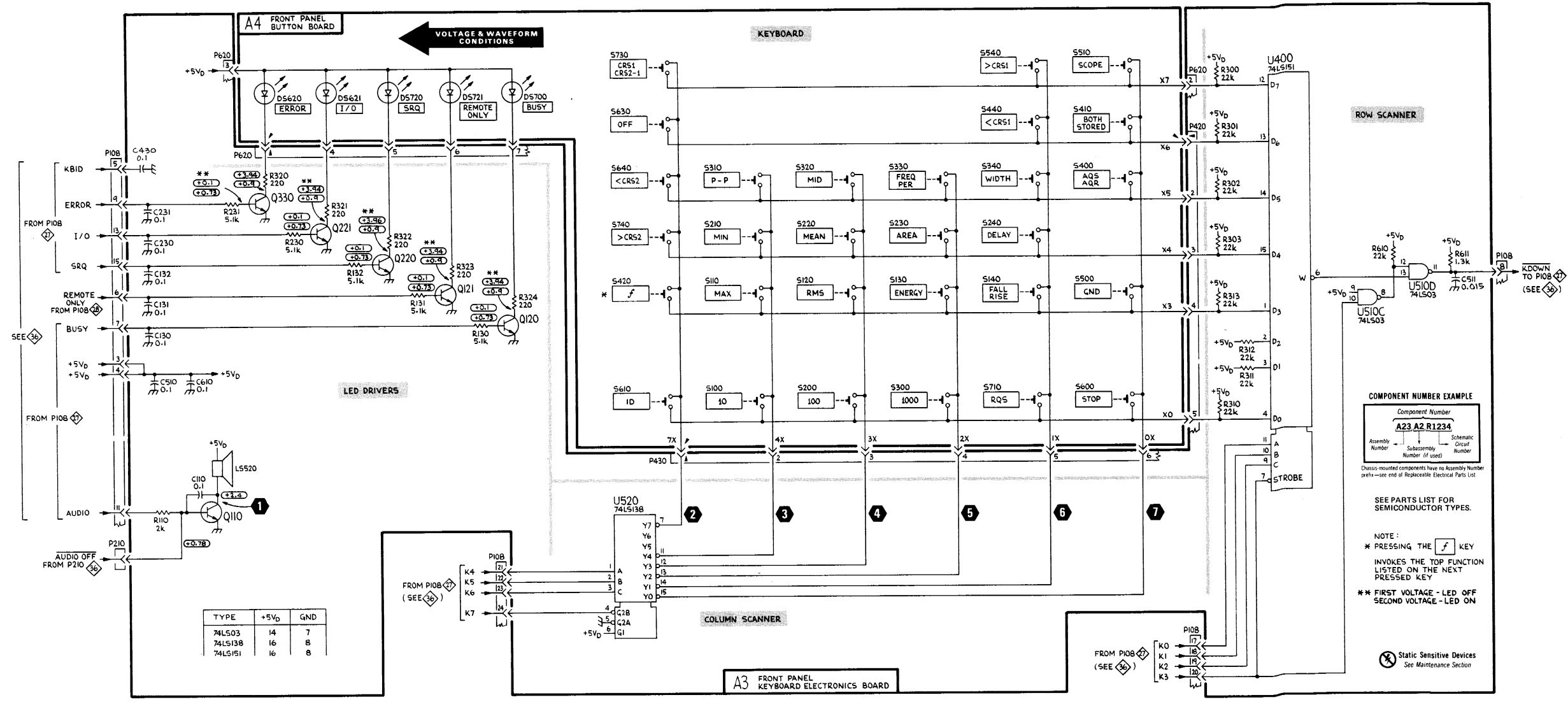
COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix - see end of Replaceable Electrical Parts List

A B C D E F G

1
2
3
4



7854

2874-252
 REV A MAR 1981

FRONT-PANEL KEYBOARD **18**

18 Front Panel
 Keyboard
 Reverse Side
 A36 & A37

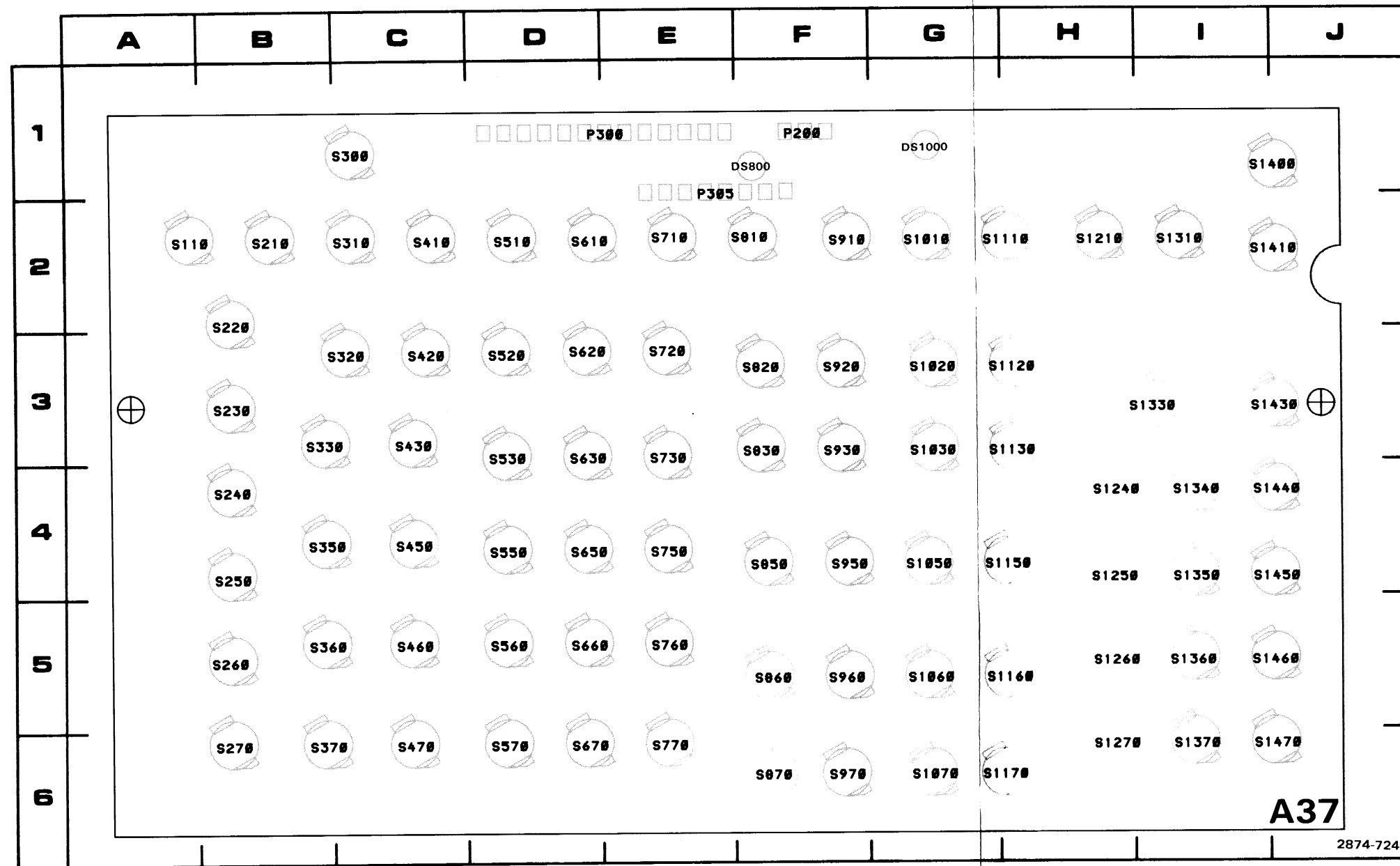
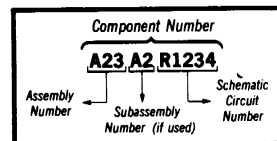


Figure 7-28. A37—Calculator Button circuit board assembly.

Assemblies A36 & A37

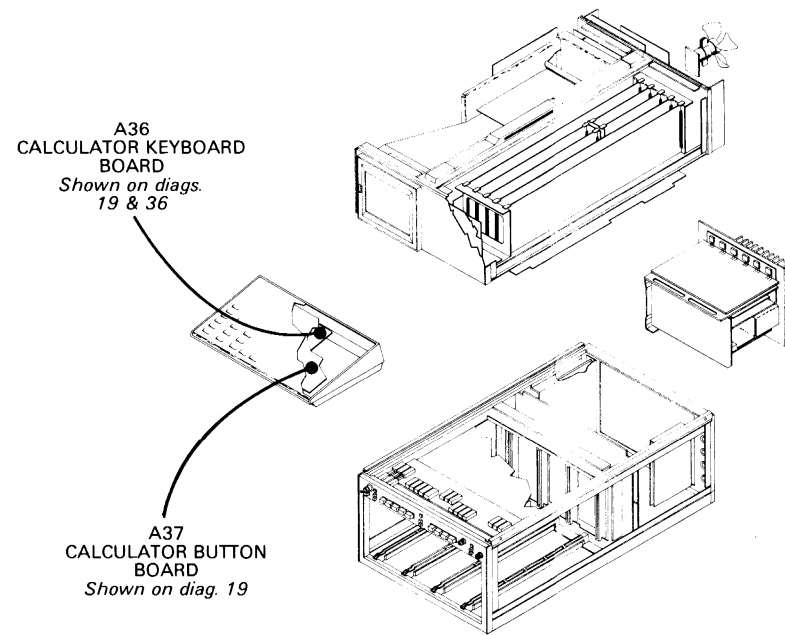
 Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

CALCULATOR KEYBOARD DIAGRAM 19



PARTIAL A36 ASSY								
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C210	B3	B2	R531	G2	E3	R644	G2	E4
C330	B3	C3	R532	G2	E3	R645	G2	E4
C410	B3	D2	R541	G2	E3			
			R542	G1	E4	U220A	G2	B2
P200	C2	C1	R543	G1	E4	U220B	H1	B2
P208	B2	B3	R544	G1	E4	U220D	B3	B2
P300	G1	D1	R545	G1	E4	U220E	B2	B2
P305	D4	C1	R630	G3	E3	U220F	B4	B2
			R631	G3	E3	U320	D4	C2
R110	C3	B2	R632	G3	E3	U520	G1	E2
R210	C2	B2	R641	G3	E3	U620	G4	E2
R430	G2	D3	R642	G3	E4			
R530	G1	E3	R643	G3	E4	W230	B4	B4

Partial A36 ASSY also shown on diagram 36.

A37 ASSY								
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
DS800	C2	F1	S530	E3	D3	S1030	E2	G3
DS1000	C3	G1	S550	E3	D4	S1050	E2	G4
			S560	E3	D5	S1060	D2	G5
P200	C2	F1	S570	F3	D6	S1070	D3	G6
P300	G1	E1	S610	D2	D2	S1110	F3	H2
P305	D4	E2	S620	E3	D3	S1120	E2	H3
			S630	E3	D3	S1130	E2	H3
S110	D3	A2	S650	E3	D4	S1150	E2	H4
S210	D3	B2	S660	E3	D5	S1160	D2	H5
S220	E3	B2	S670	F3	D6	S1170	D3	H6
S230	F3	B3	S710	D2	E2	S1210	F2	H2
S240	E3	B4	S720	E2	E3	S1240	E1	H4
S250	D1	B4	S730	E3	E3	S1250	E1	H4
S260	D1	B5	S750	E3	E4	S1260	F1	H5
S270	E1	B6	S760	E3	E5	S1270	F1	H6
S300	F1	C1	S770	F3	E6	S1310	F2	I2
S310	D3	C2	S810	F3	F2	S1330	D3	I3
S320	E3	C3	S820	E2	F3	S1340	E1	I4
S330	E1	B3	S830	E2	F3	S1350	E1	I4
S350	E1	B4	S850	E2	F4	S1360	F1	I5
S360	F1	B5	S860	E2	F5	S1370	F1	O6
S370	F1	B6	S870	F2	F6	S1400	D1	J1
S410	D3	C2	S910	F3	F2	S1410	D1	J2
S420	E3	C3	S920	E2	F3	S1430	D1	J3
S430	E3	C3	S930	E1	F3	S1440	E1	J4
S450	E3	C4	S950	E2	F4	S1450	E1	J4
S460	E3	C5	S960	E2	F5	S1460	F1	J5
S470	F3	C6	S970	F2	F6	S1470	F1	J6
S510	D3	D2	S1010	F3	G2			
S520	E3	D3	S1020	E2	G3			

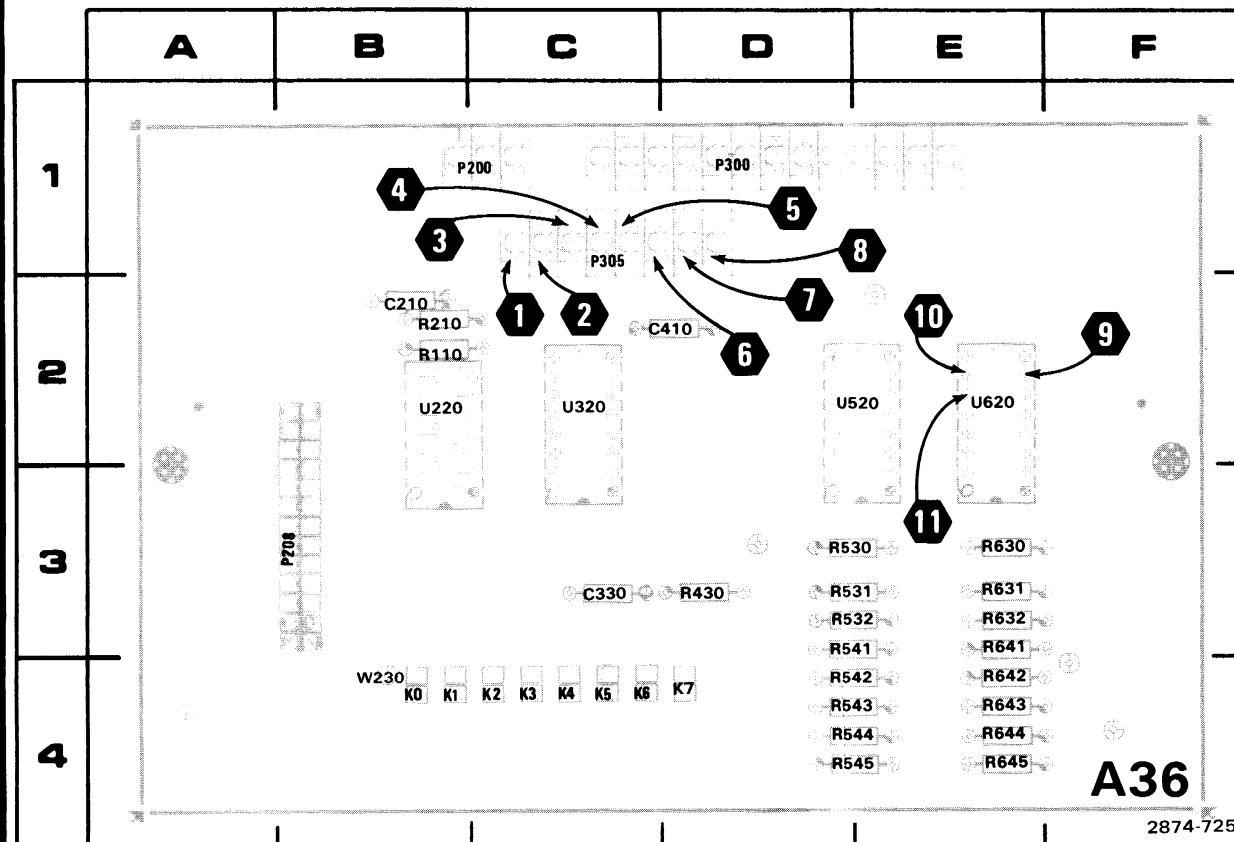


Figure 7-27. A36—Calculator Keyboard circuit board assembly.

A

B

C

D

E

F

G

H

1

2

3

4

5

VOLTAGE & WAVEFORM CONDITIONS

KEYBOARD

A37 CALCULATOR BUTTON BOARD

ROW SCANNER

COLUMN SCANNER

A36 CALCULATOR KEYBOARD BOARD

NOTE: ** REMOVED FOR OPTION 0D
A36 CALCULATOR KEYBOARD BOARD
A37 CALCULATOR BUTTON BOARD
CABLE, P208 ON A36 TO P208 ON A32

* PRESSING THE **f** KEY INVOKES
THE TOP FUNCTION LISTED ON THE
NEXT PRESSED KEY

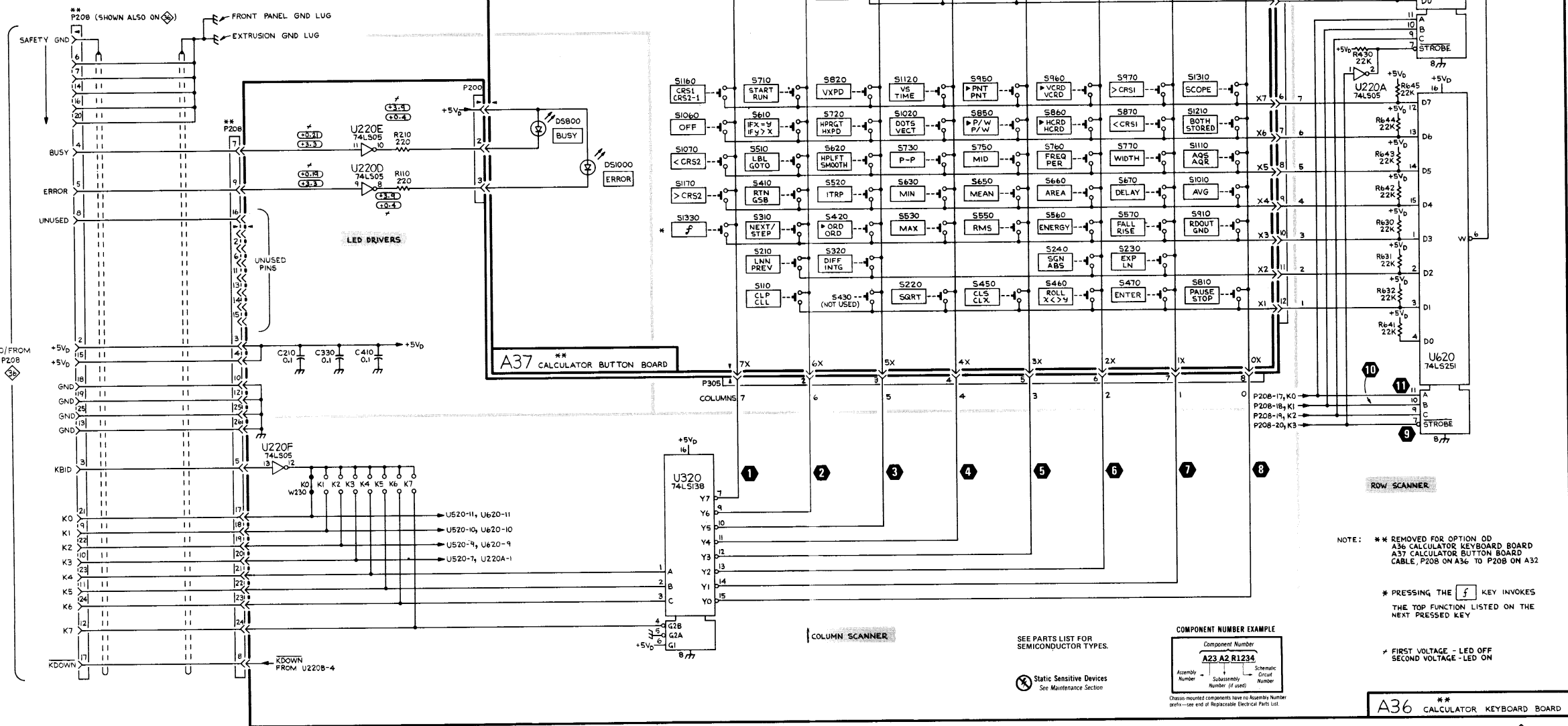
* FIRST VOLTAGE - LED OFF
SECOND VOLTAGE - LED ON

COMPONENT NUMBER EXAMPLE
Component Number
A23 A2 R1234
Assembly Number Subassembly Number (if used) Schematic Circuit Number

SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

Static Sensitive Devices
See Maintenance Section

Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List



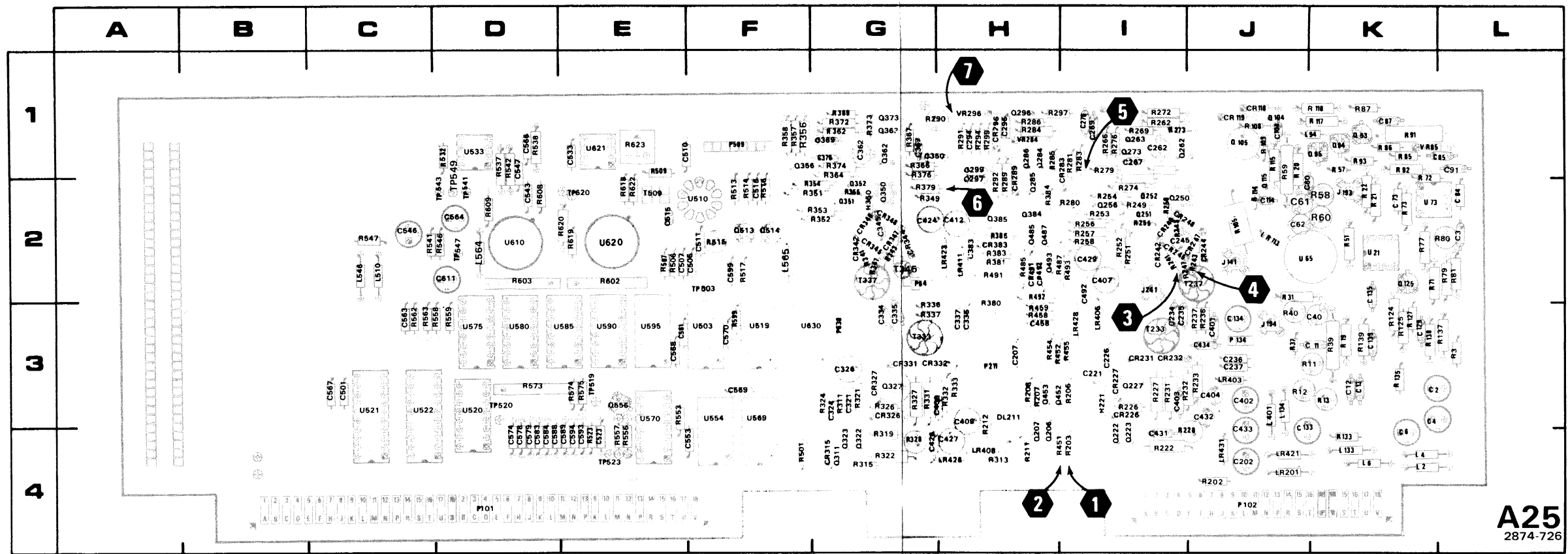
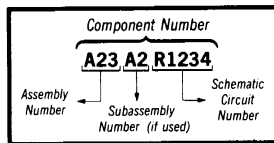


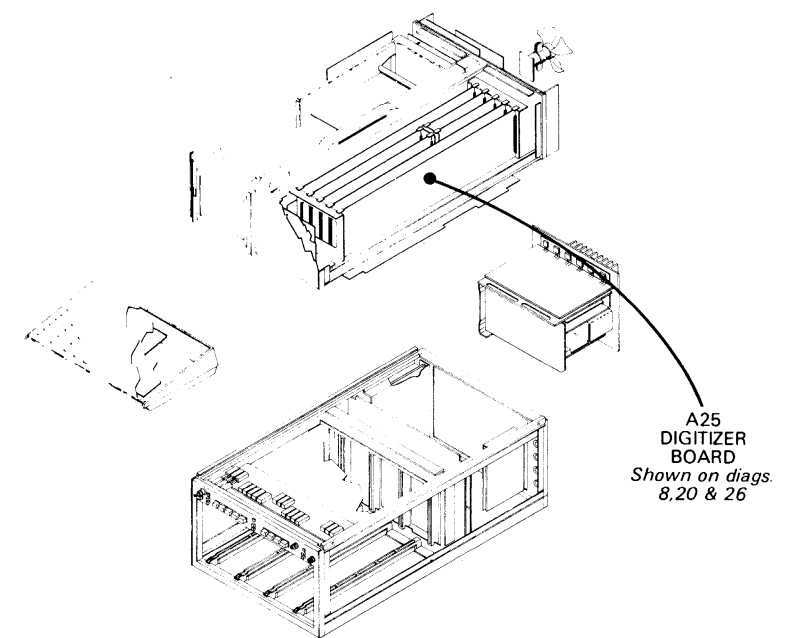
Figure 7-29. A25—Digitizer circuit board assembly.

 Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

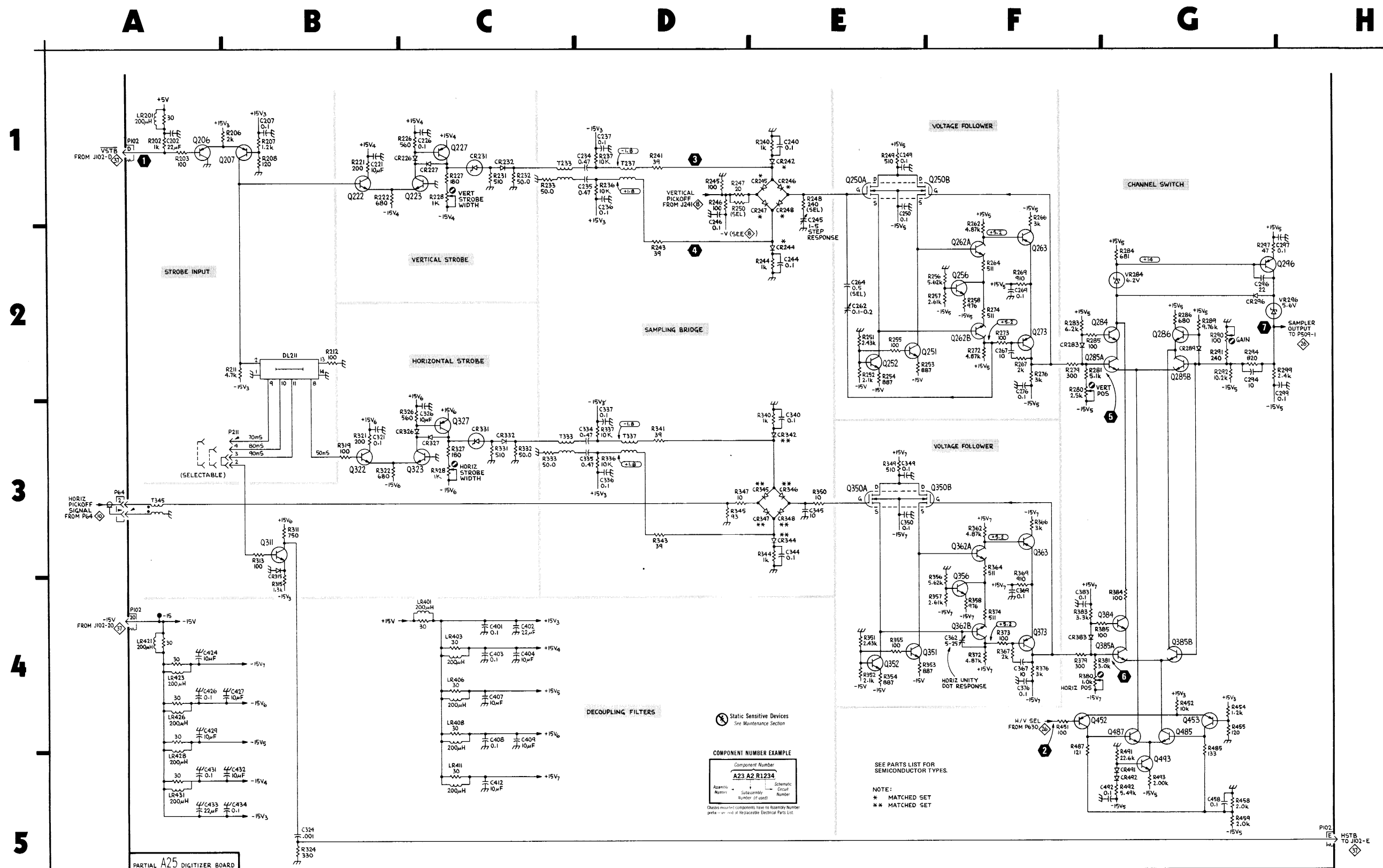


VERTICAL AND HORIZONTAL SAMPLER DIAGRAM 20

PARTIAL A25 ASSY														
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C202	A1	J4	C434	B5	J3	Q206	A1	H4	R233	C1	J3	R333	C3	H3
C207	B1	H3	C458	G5	H3	Q207	B1	H4	R236	D1	J3	R336	D3	G3
C221	B1	I3	C492	G5	I2	Q222	B1	I4	R237	D1	J3	R337	D3	G3
C226	C1	I3				Q223	C1	I4	R240	E1	*	R340	E3	*
C234	D1	I3	CR226	C1	I3	Q227	C1	I3	R241	D1	I2	R341	D3	G2
C235	D1	I3	CR227	C1	I3	Q250A	E1	I2	R243	D2	J2	R343	D3	G2
C236	D1	J3	CR231	C1	I3	Q250B	F1	I2	R244	E2	*	R344	E3	*
C237	D1	J3	CR232	C1	I3	Q251	E2	I2	R245	D1	*	R345	D3	*
C240	E1	*	CR242	E1	I2	Q252	E2	I2	R246	D1	*	R347	D3	G2
C244	E2	*	CR244	E2	J2	Q256	F2	I2	R247	D1	I2	R349	E3	G2
C245	E1	I2	CR245	E3	I2	Q262A	F2	I1	R248	E1	I2	R350	E3	G2
C246	D1	*	CR245	E1	I2	Q262B	F2	I1	R249	E1	I2	R351	E4	F2
C249	E1	*	CR245	E3	I2	Q263	F2	I1	R251	E2	I2	R352	E4	G2
C250	E1	*	CR246	E1	I2	Q273	F2	I1	R252	E2	I2	R353	E4	G2
C262	E2	I1	CR247	E1	J2	Q284	F2	H1	R253	E2	I2	R354	E4	F2
C264	E2	*	CR248	E1	I2	Q285A	F2	H2	R254	E2	I2	R355	E4	G2
C267	F2	I1	CR283	F2	I1	Q285B	G2	H2	R255	E2	I2	R356	F4	F1
C269	F2	I1	CR289	G2	H2	Q286	G2	H1	R256	F2	I2	R357	F4	F1
C276	F2	I1	CR296	G2	H1	Q296	H1	H1	R257	F2	I2	R358	F4	F1
C294	G2	H1	CR315	B3	G4	Q311	B3	G4	R258	F2	I2	R362	F3	G1
C296	G2	H1	CR326	C3	G3	Q322	B3	G3	R262	F1	I1	R364	F3	G1
C297	H1	H1	CR327	C3	G3	Q323	C3	G4	R264	F2	*	R366	F3	G1
C299	H1	H1	CR331	C3	G3	Q327	C3	G3	R266	F1	I1	R367	F4	G1
C321	B3	G3	CR332	C3	G3	Q350A	E3	G1	R267	F2	*	R369	F3	G1
C324	B5	G3	CR342	E3	G2	Q350B	F3	G1	R269	F2	I1	R372	F4	G1
C326	C3	G3	CR344	E3	G2	Q351	E4	G2	R272	F2	I1	R373	F4	G1
C334	D3	G3	CR345	E3	G2	Q352	E4	G2	R273	F2	I1	R374	F4	G1
C335	D3	G3	CR346	E3	G2	Q356	F4	F1	R274	F2	I2	R376	F4	G1
C336	D3	G3	CR347	E3	G2	Q362A	F3	G1	R276	F2	I1	R379	F4	G2
C337	D3	H3	CR348	E3	G2	Q362B	F4	G1	R279	F2	I1	R380	F4	H3
C340	E3	*	CR383	F4	H2	Q363	F3	G1	R280	F2	I2	R381	F4	H2
C344	E3	*	CR491	G5	H2	Q373	F4	G1	R281	F2	I1	R383	F4	H2
C345	E3	G2	CR492	G5	H2	Q384	F4	H2	R283	F2	I1	R384	G4	H2
C349	E3	*				Q385A	F4	H2	R284	G2	H1	R385	F4	H2
C350	E3	G1	DL211	B2	H3	Q385B	G4	H2	R285	F2	H1	R451	F4	H4
C362	F4	G1				Q452	F4	H3	R286	G2	H1	R452	G4	H3
C367	F4	G1	L401	C4	J3	Q453	G4	H3	R289	G2	H2	R454	G4	H3
C369	F4	G1				Q485	G4	H2	R290	G2	G1	R455	G4	I3
C376	F4	G1	LR201	A1	J4	Q487	G4	H2	R291	G2	H1	R458	G5	H3
C383	F4	H2	LR403	C4	J3	Q493	G5	H2	R292	G2	H2	R459	G5	H3
C401	C4	J3	LR406	C4	I3				R294	G2	F2	R485	G4	H2
C402	C4	J3	LR408	C4	H4	R202	A1	J4	R297	G2	H1	R487	F4	H2
C403	C4	I3	LR411	C5	H2	R203	A1	I4	R299	H1	H1	R491	G5	H2
C404	C4	J3	LR421	A4	J4	R206	B1	I3	R311	B3	G3	R492	G5	H3
C407	C4	I2	LR423	A4	H2	R207	B1	H3	R313	B3	H4	R493	G5	I2
C408	C4	G3	LR426	A4	H4	R208	B1	H3	R315	B4	G4			
C409	C4	H3	LR428	A5	I3	R211	B2	H4	R319	B3	G4	T233	C1	I3
C412	C5	H2	LR431	A5	J4	R212	B2	H3	R321	B3	G3	T237	D1	I2
C424	A4	G2				R221	B1	I3	R322	B3	G4	T333	C3	G3
C426	A4	G4	P64	A3	G2	R222	B1	I4	R324	B5	G3	T337	D3	G2
C427	B4	H4	P102	A1	J4	R226	C1	I3	R326	C3	G3	T345	A3	G2
C429	A4	I2	P102	A4	J4	R227	C1	I3	R327	C3	G3			
C431	A5	I4	P102	H5	J4	R228	C1	I4	R328	C3	G4	VR284	G2	H1
C432	B5	J3	P211	B3	H3	R231	C1	I3	R331	C3	G3	VR296	H1	H1
C433	A5	J4				R232	C1	I3	R332	C3	H3			

Partial A25 ASSY also shown on diagrams 8 and 26

* Mounted on back of board



7854

2874-254
REV A MAR 1961

VERTICAL AND HORIZONTAL SAMPLER

1
2
3
4
5

PI02
H5TB
TO J102-E

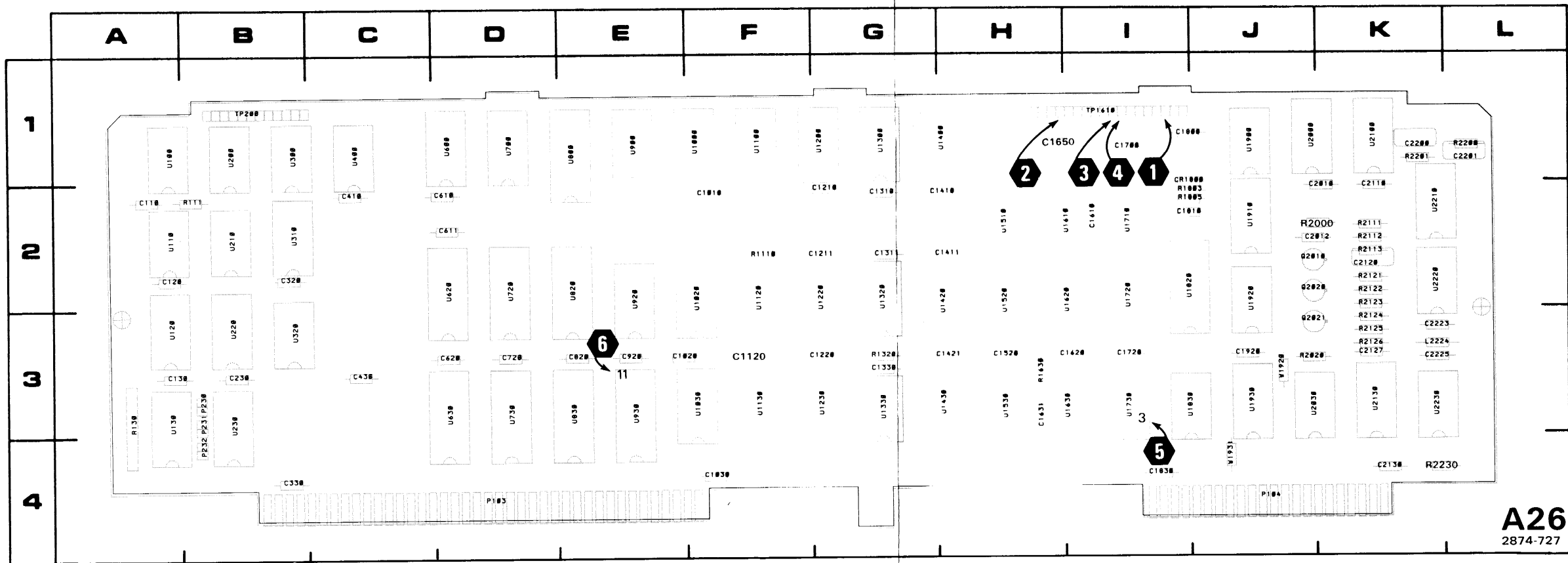
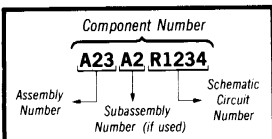


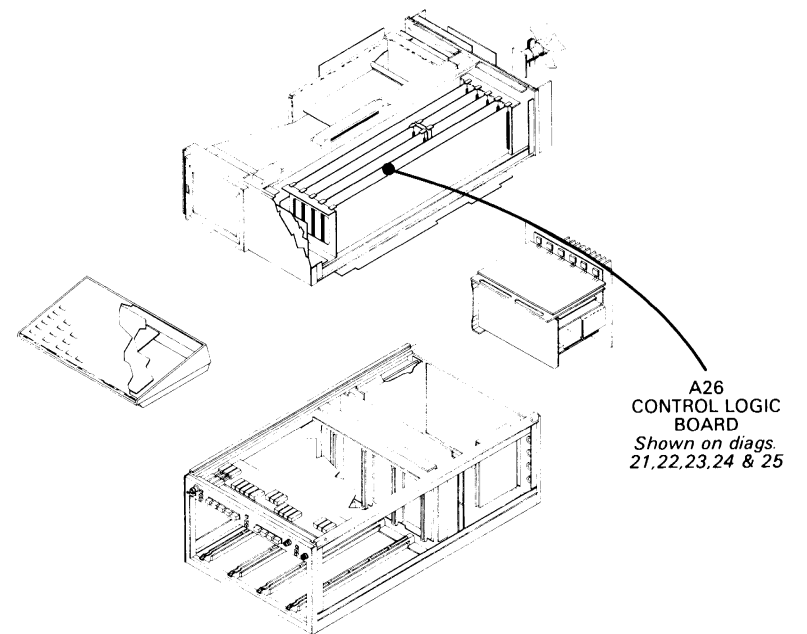
Figure 7-30. A26—Control Logic circuit board assembly.

 Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

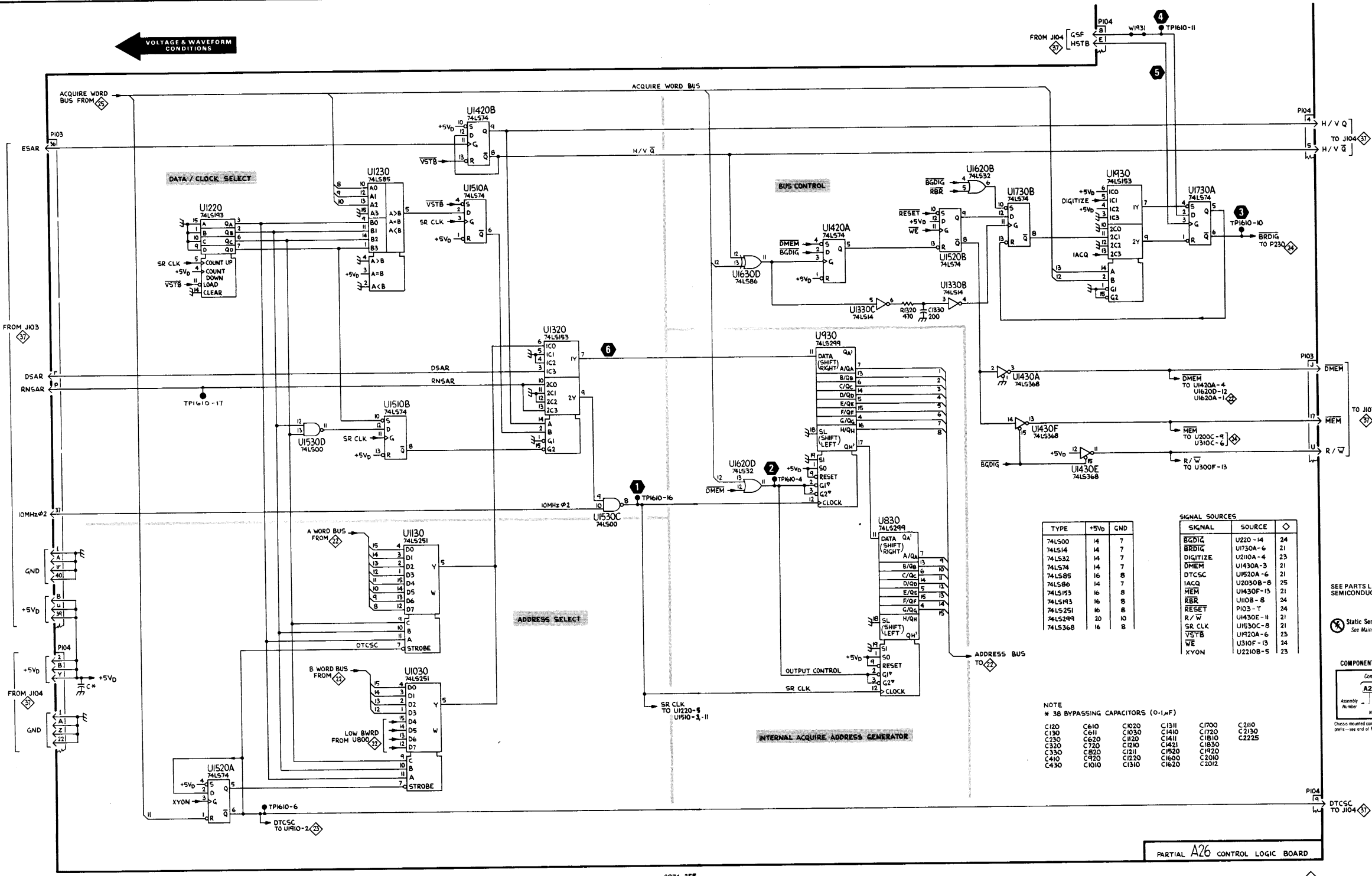


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



A B C D E F G H

1
2
3
4
5



TYPE	+5V	GND	SIGNAL	SOURCE	Q
74LS500	14	7	BRDIG	U220-14	24
74LS14	14	7	BRDIG	U1730A-6	21
74LS32	14	7	DIGITIZE	U210A-4	23
74LS74	14	7	DMEM	U1430A-3	21
74LS85	16	8	DTCS	U1520A-6	21
74LS86	14	7	IACQ	U2030B-15	25
74LS143	16	8	MEM	U1430F-8	21
74LS143	16	8	MEM	U1430F-13	21
74LS251	16	8	R/W	U1430E-11	21
74LS299	20	10	SR CLK	U1530C-8	21
74LS368	16	8	VSTB	U1420A-6	23
			WE	U1310F-13	34
			XYON	U2210B-5	23

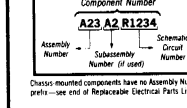
NOTE
38 BYPASSING CAPACITORS (0.1µF)

C120	C610	C1020	C1311	C1700	C2110
C130	C611	C1030	C1410	C1720	C2130
C230	C620	C1130	C1411	C1810	C2225
C320	C720	C1210	C1421	C1830	
C330	C820	C1211	C1520	C1920	
C410	C920	C1220	C1600	C2010	
C430	C1010	C1310	C1620	C2012	

SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



7854

2874-255
REV A MAR 1961

PARTIAL A26 CONTROL LOGIC BOARD
DIGITIZER CONTROL LOGIC

Digitizer Control Logic Reverse Side A26

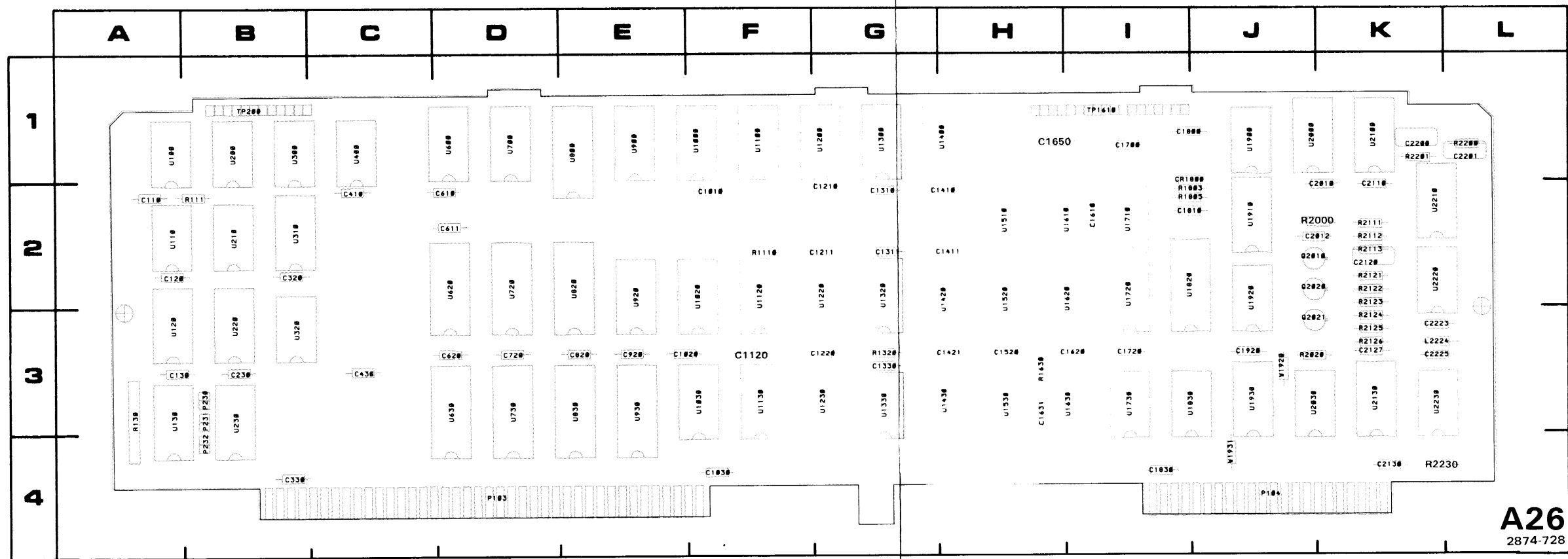
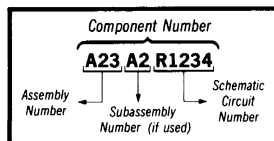


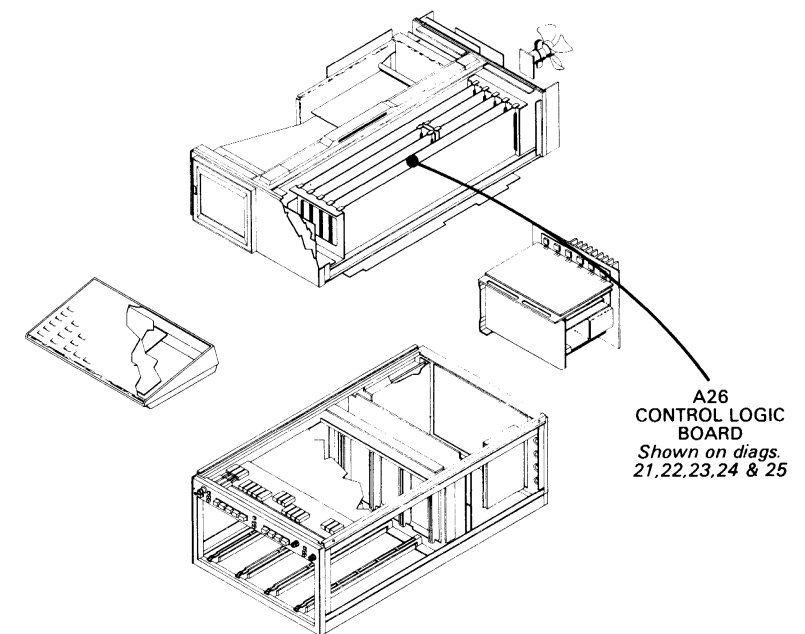
Figure 7-31. A26—Control Logic circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



REV A MAR 1981

A B C D E F G H

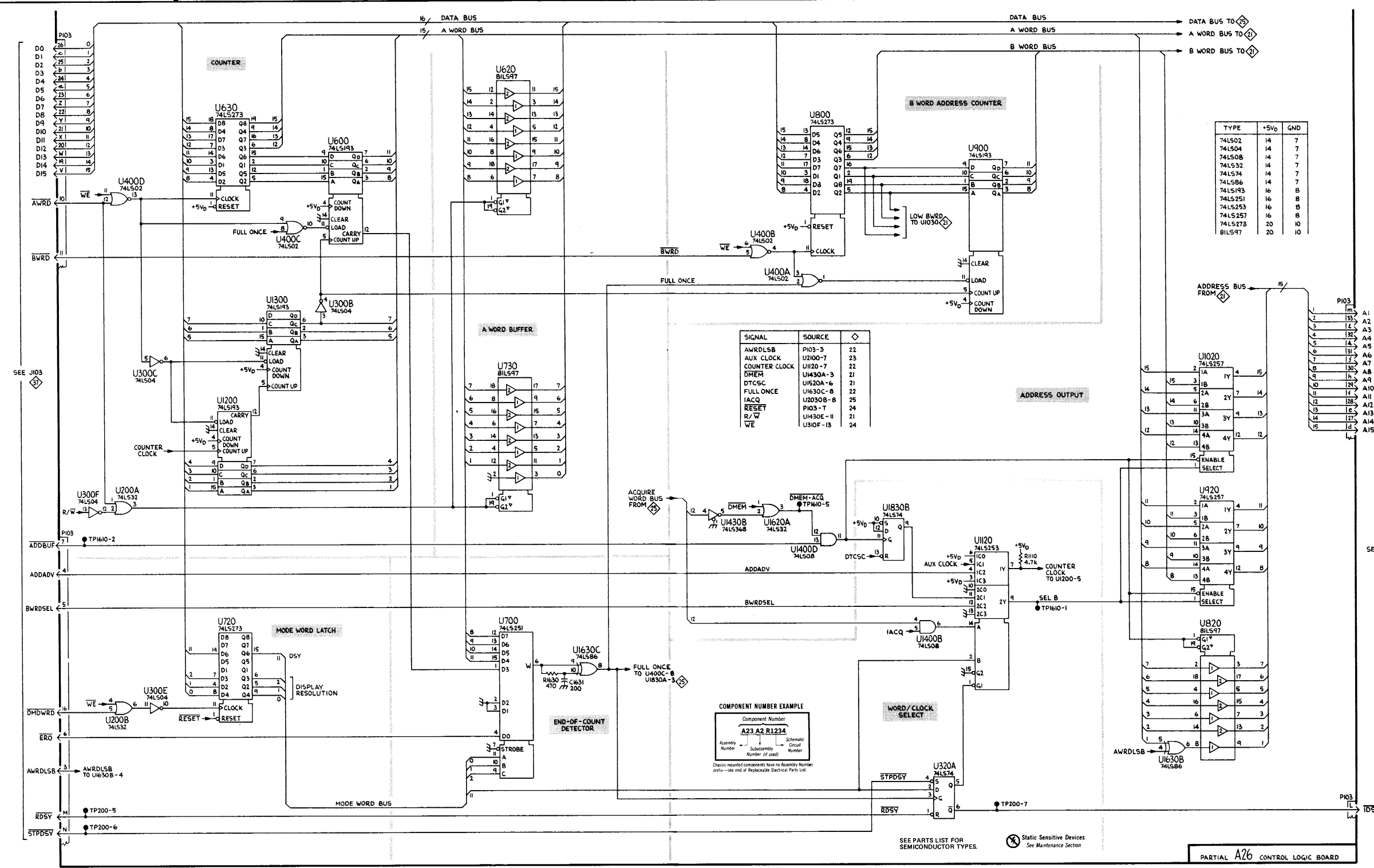
1

2

3

4

5



TYPE	+5V _D	GND
74LS02	14	7
74LS04	14	7
74LS08	14	7
74LS32	14	7
74LS74	14	7
74LS86	14	7
74LS193	16	8
74LS251	16	8
74LS253	16	8
74LS257	16	8
74LS273	20	10
81LS97	20	10

SIGNAL	SOURCE	◇
AWRDL5B	PI03-3	22
AUX CLOCK	U2100-7	23
COUNTER CLOCK	U1120-7	22
DMEM	U1430A-3	21
DTCSC	U1630A-6	21
FULL ONCE	U1630C-8	22
IACQ	U2030B-8	25
RESET	PI03-T	24
R/W	U1430E-II	21
WE	U101F-13	24

COMPONENT NUMBER EXAMPLE

Component Number
A23 A2 R1234

Assembly Number Schematic Diagram Number
 Subassembly Number (if used)

Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Address Generator
Reverse Side A26

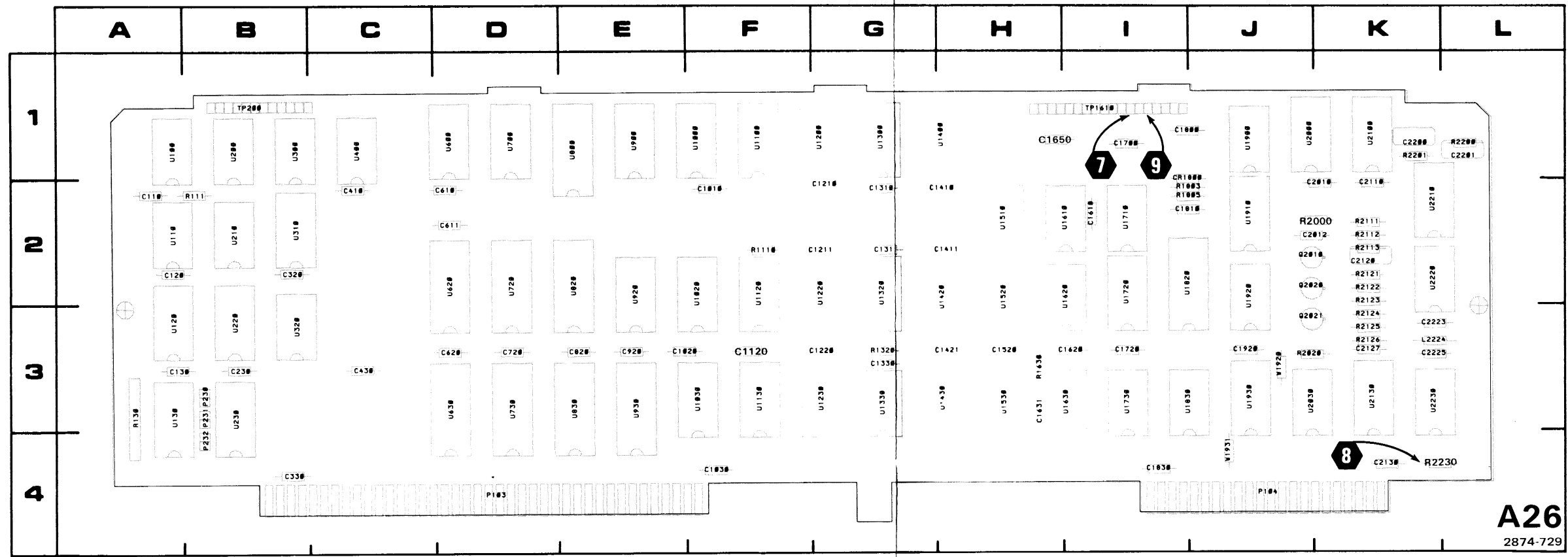
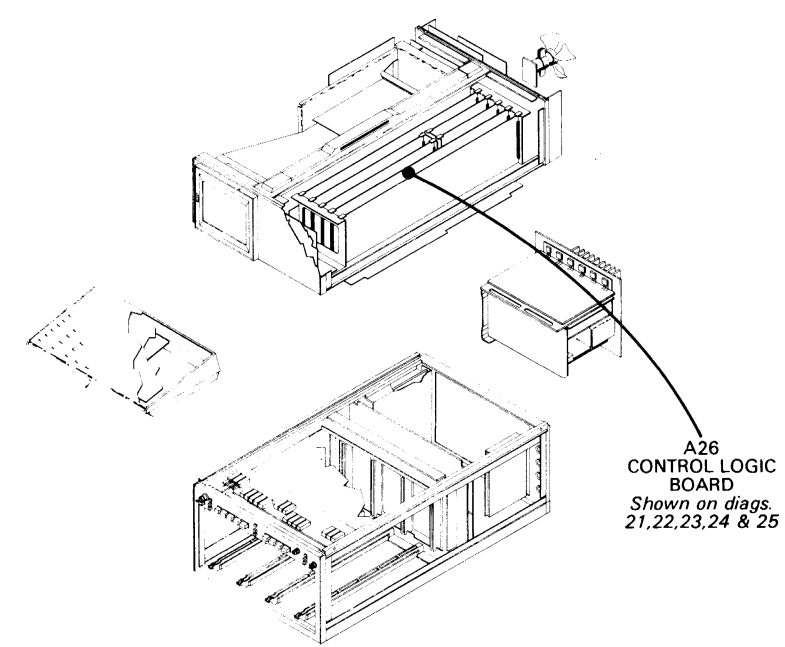
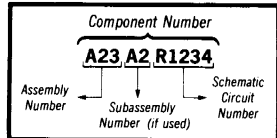


Figure 7-32. A26—Control Logic circuit board assembly.



 Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

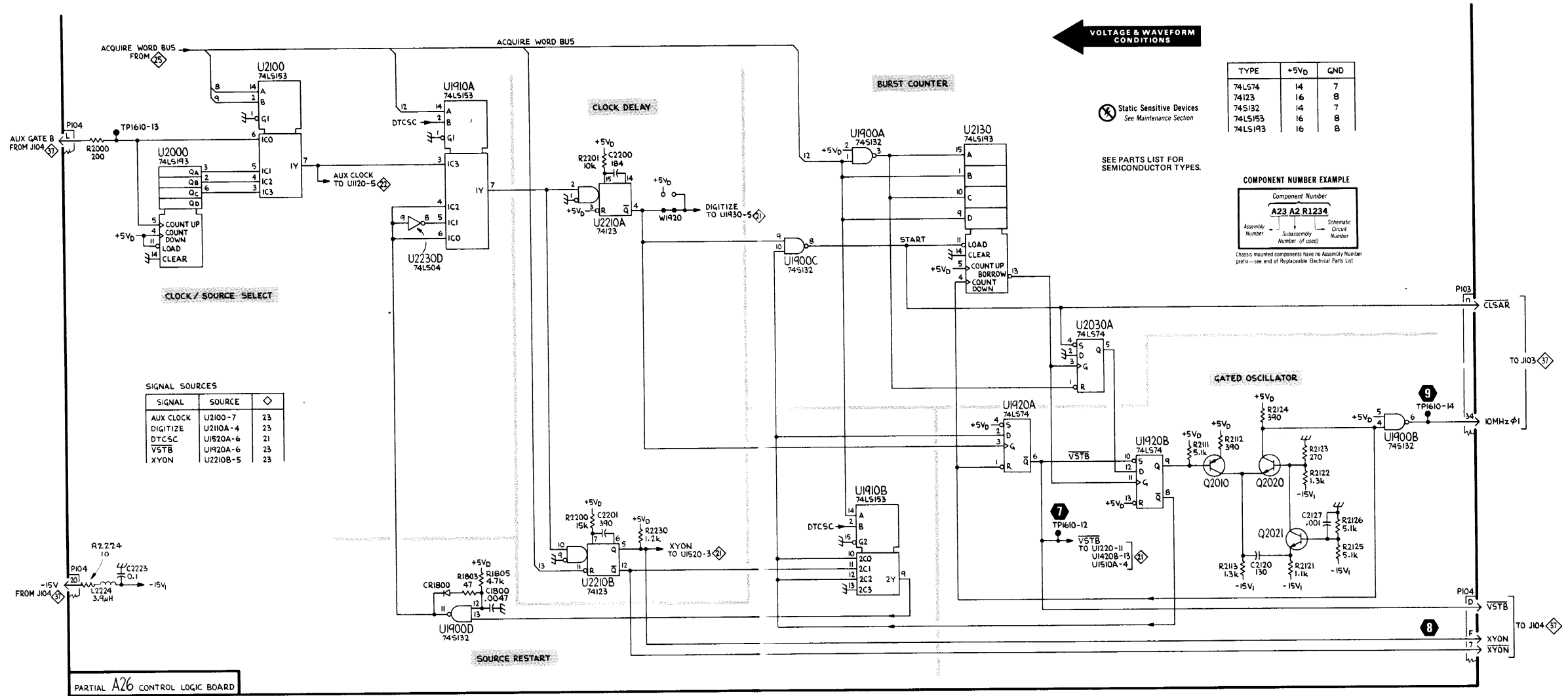
REV A MAR 1981

A B C D E F G

1

2

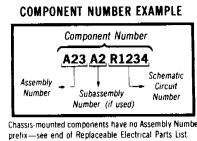
3



SIGNAL SOURCES

SIGNAL	SOURCE	◇
AUX CLOCK	U2100-7	23
DIGITIZE	U2100A-4	23
DTCSC	U1920A-6	21
VSTB	U1920A-6	23
XYON	U2210B-5	23

TYPE	+5V _D	GND
74LS74	14	7
74LS23	16	8
74LS132	14	7
74LS153	16	8
74LS193	16	8



VOLTAGE & WAVEFORM CONDITIONS

⊗ Static Sensitive Devices See Maintenance Section

SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

7854

2874-257
 REV A MAR 1981

DIGITIZER CLOCK ◇

23 Digitizer Clock

Reverse Side A26

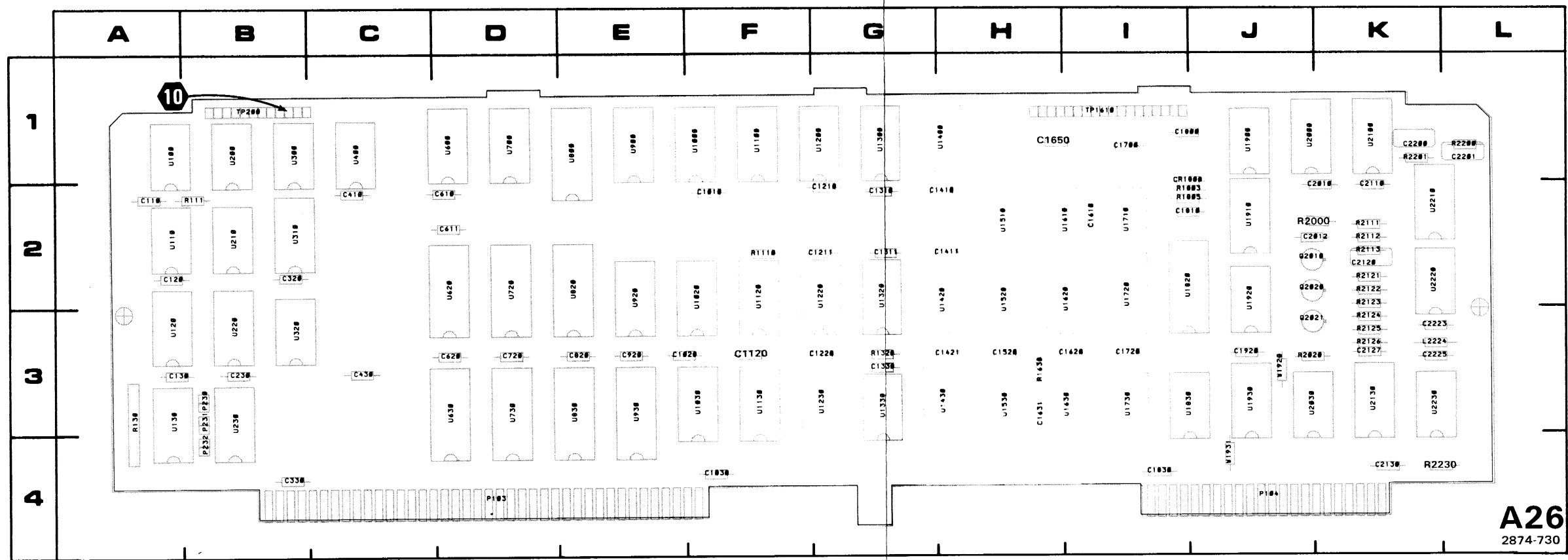
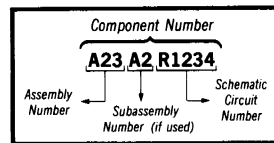


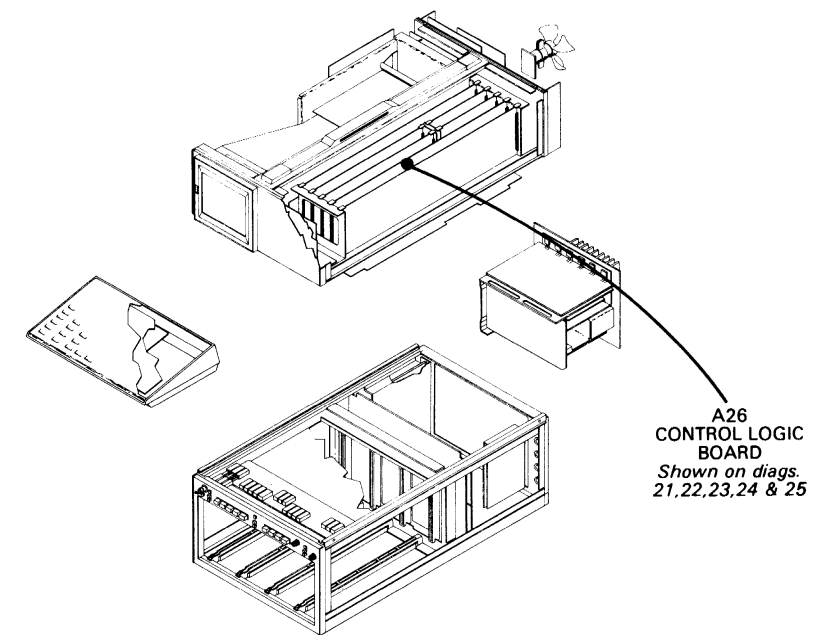
Figure 7-33. A26—Control Logic circuit board assembly.

 Static Sensitive Devices
See Maintenance Section

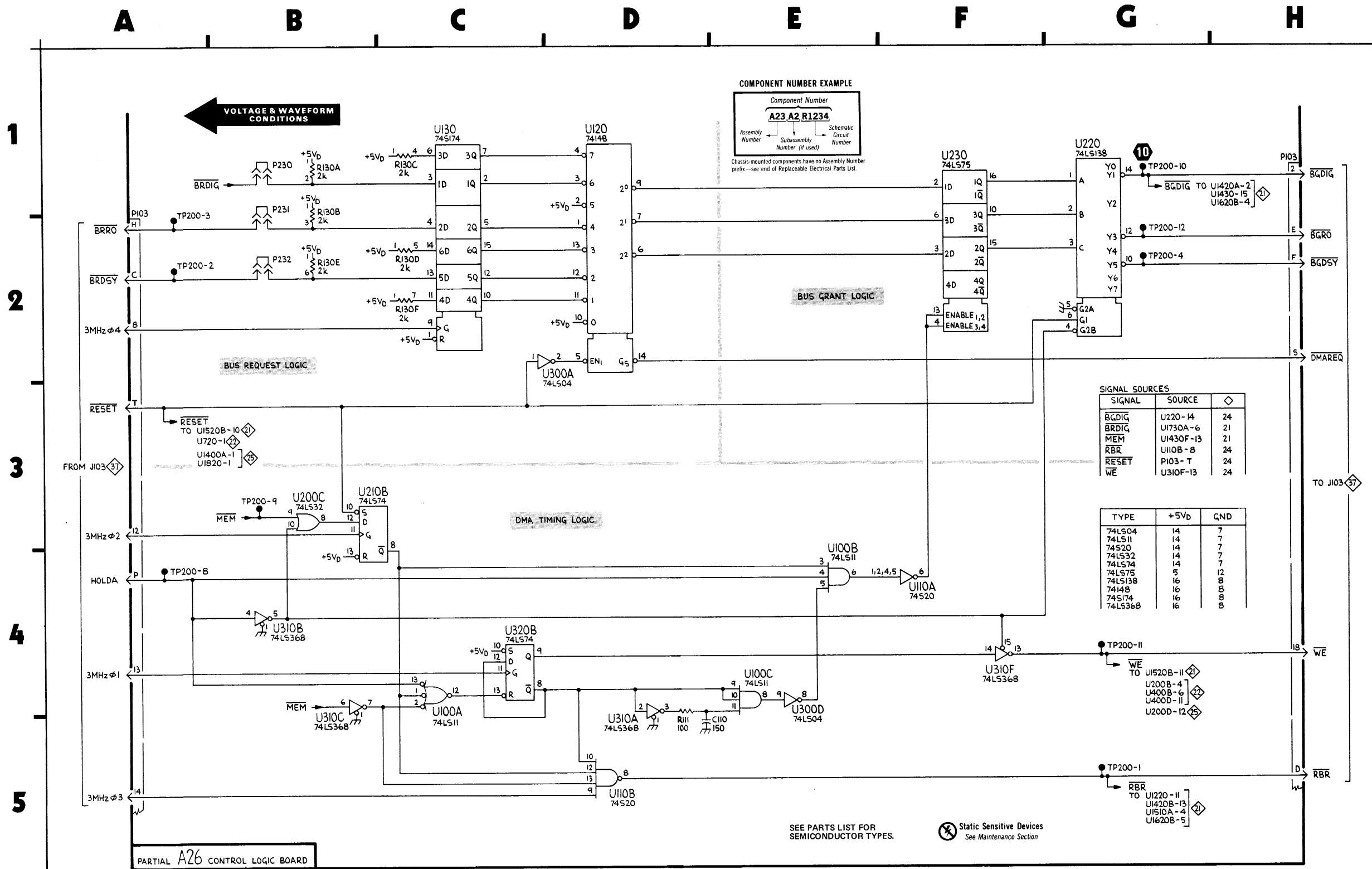
COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



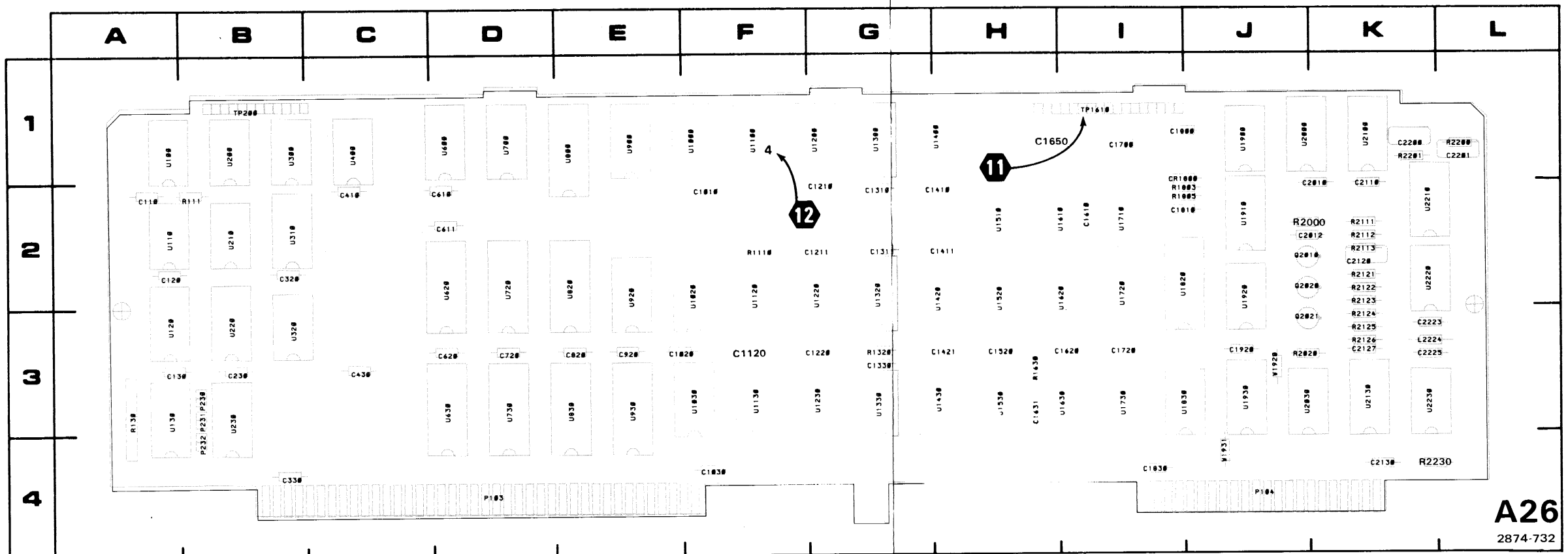
REV A MAR 1981



7854

2874-258
REV A MAR 1981

DMA CONTROL 24

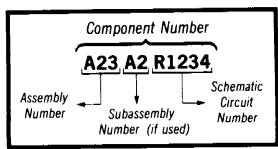


A26
2874-732

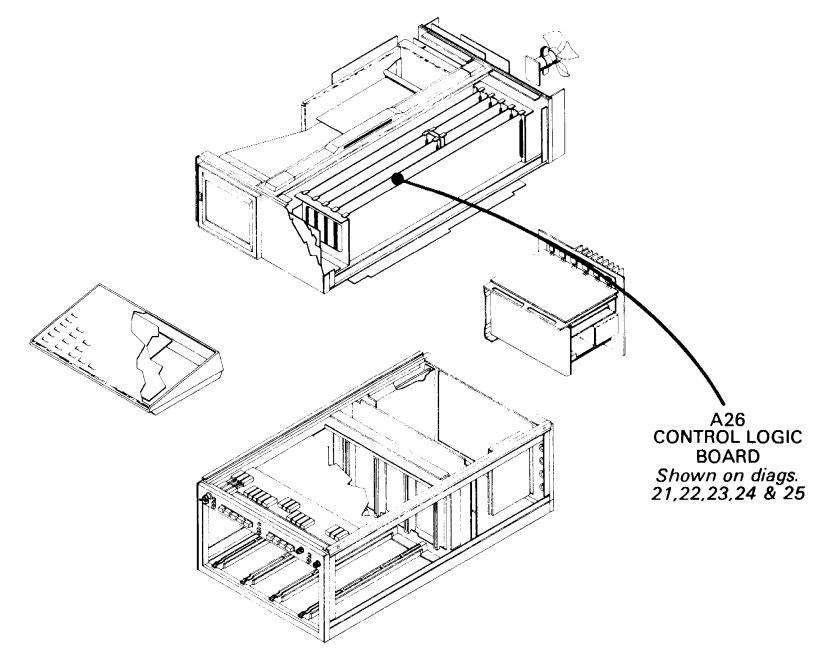
Figure 7-35. A26—Control Logic circuit board assembly.

 **Static Sensitive Devices**
See Maintenance Section

COMPONENT NUMBER EXAMPLE

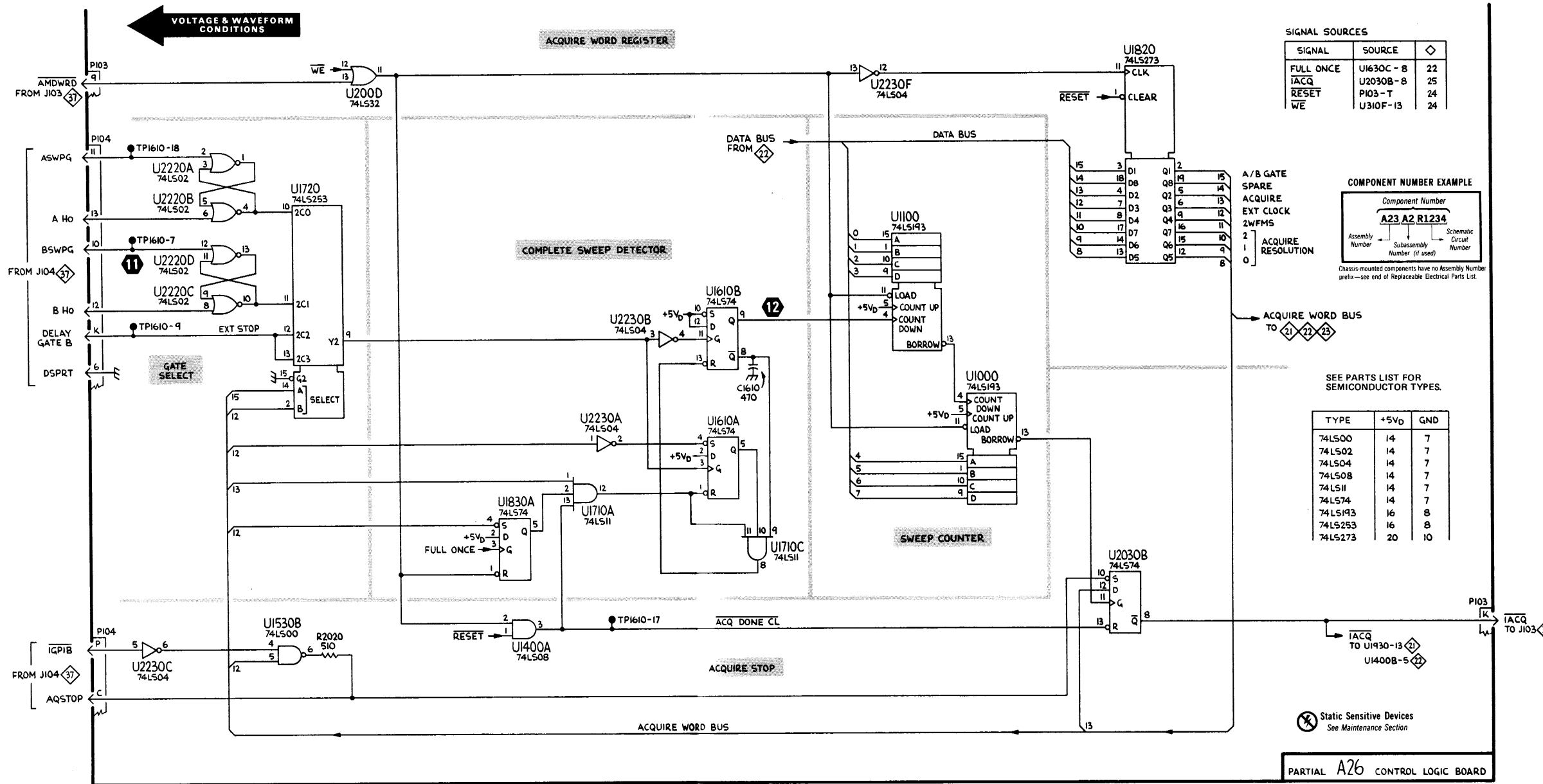


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



REV A MAR 1981

A B C D E F



1

2

3

7854

2874 - 259

DIGITIZER SWEEP COUNTER ◇25

◇25 Digitizer Sweep Counter Reverse Side A25

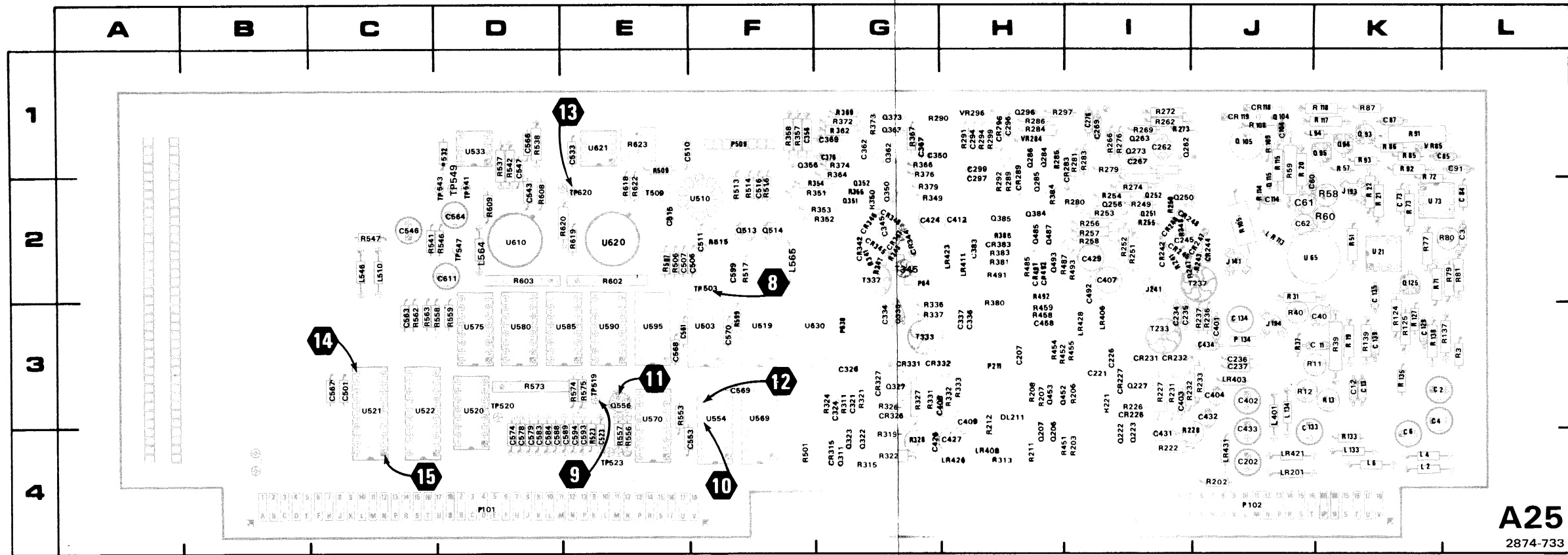
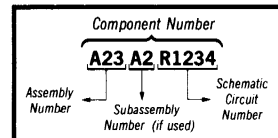


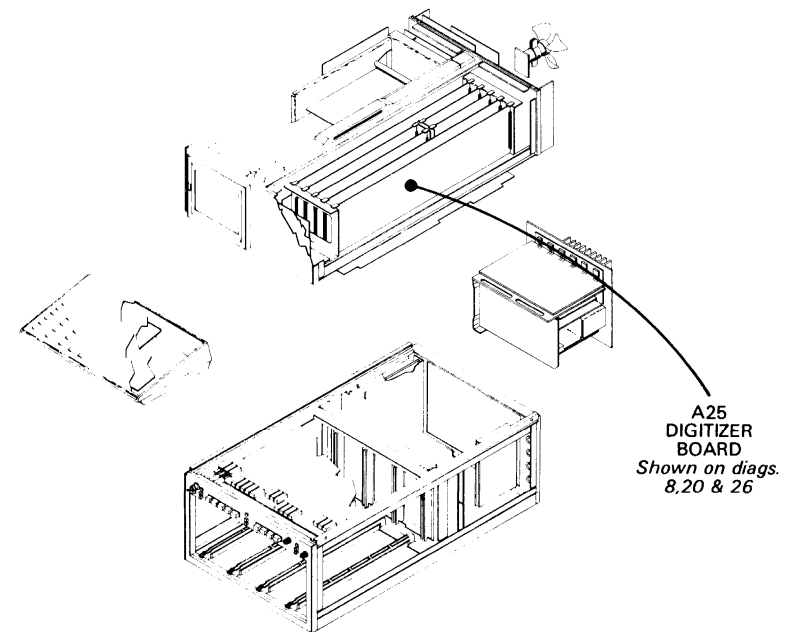
Figure 7-36. A25—Digitizer circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



A

B

C

D

E

F

G

H

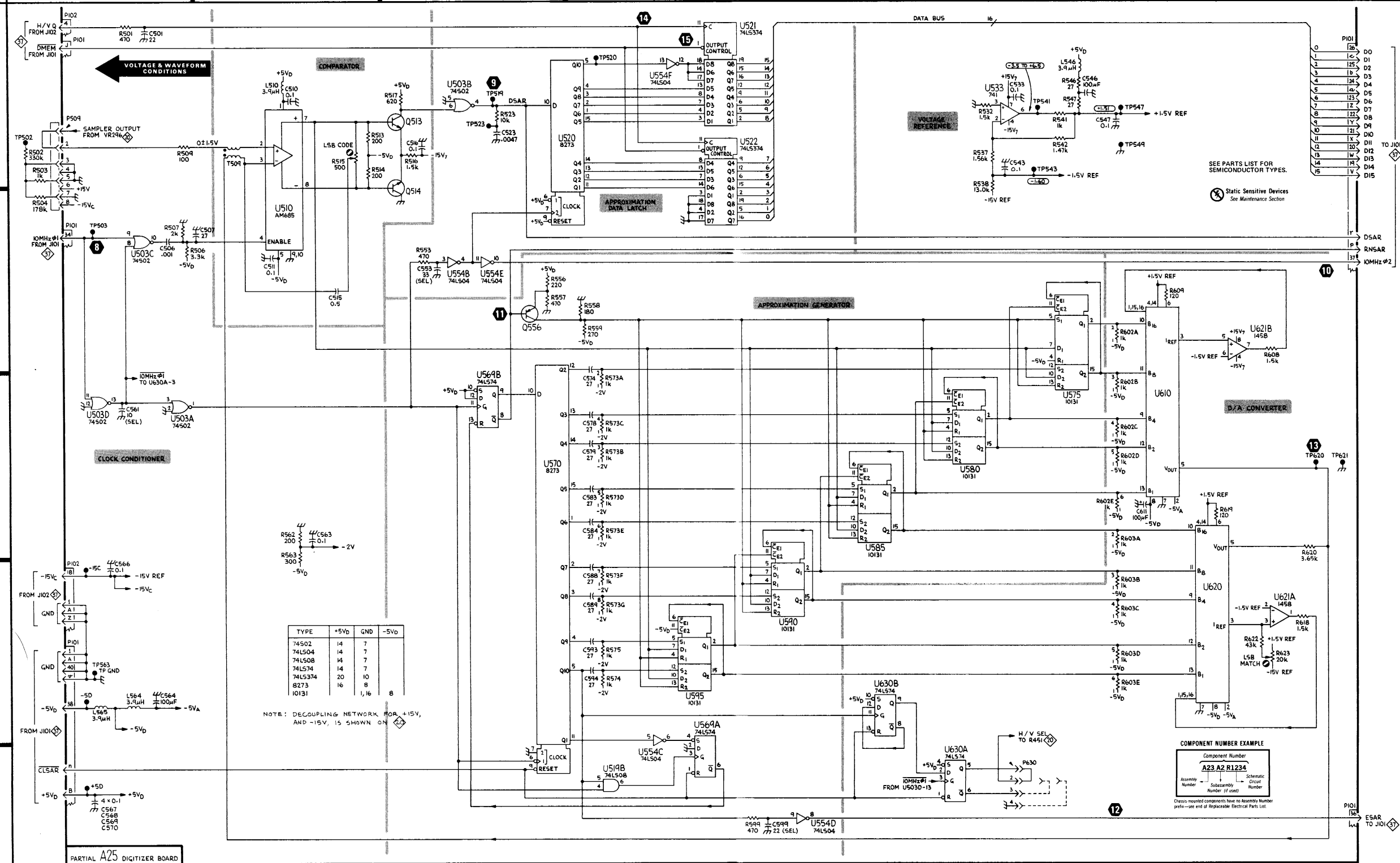
1

2

3

4

5



TYPE	+5Vd	GND	-5Vd
74502	14	7	
74LS04	14	7	
74LS08	14	7	
74LS74	14	7	
74LS374	20	10	
8273	16	8	8

NOTE: DECOUPLING NETWORK FOR +15V, AND -15V, IS SHOWN ON

COMPONENT NUMBER EXAMPLE

Component Number
A23 A2 R1234

Assembly Number Subassembly Number (if used) Schematic Circuit Number

Caution: mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

26 Digitizer Reverse Side A27

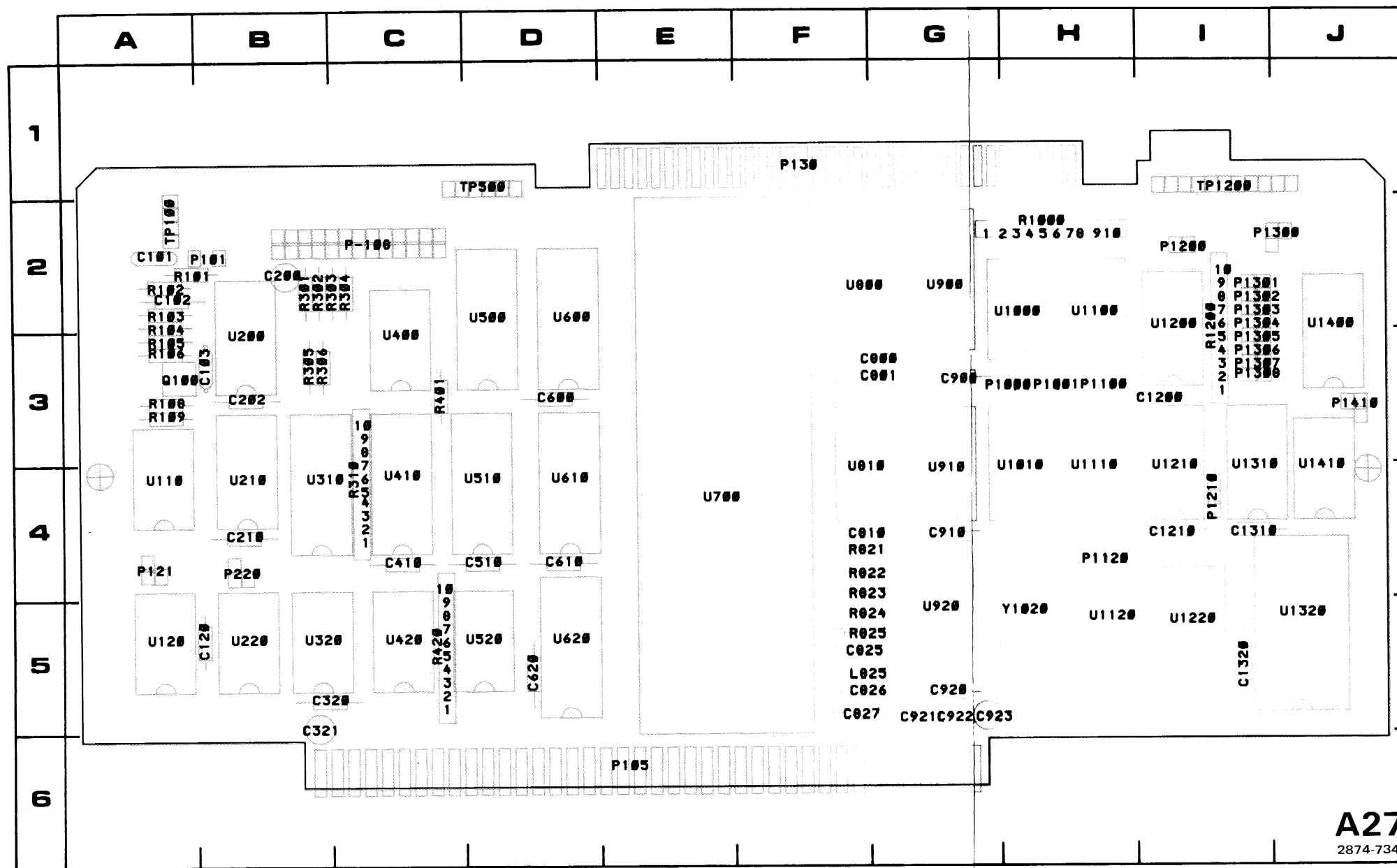
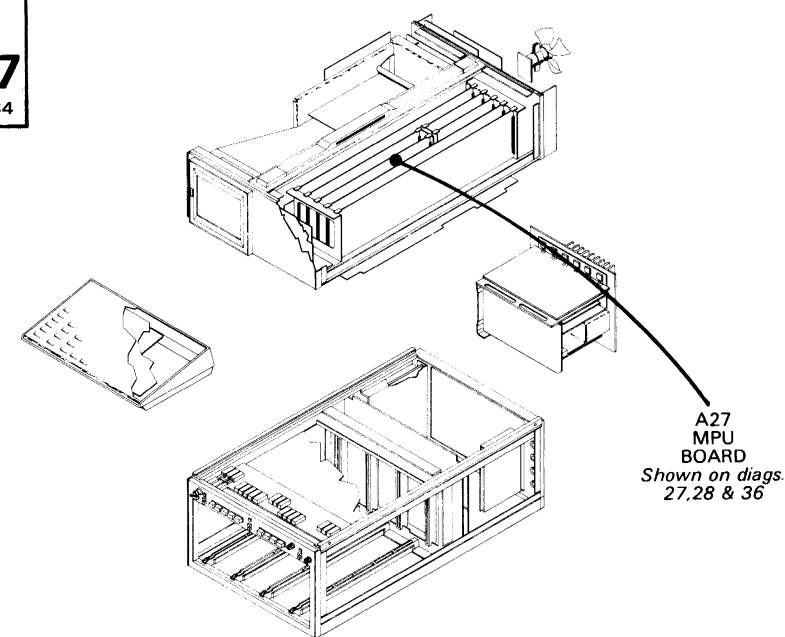
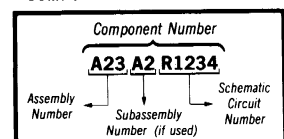


Figure 7-37. A27—MPU circuit board assembly.



Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

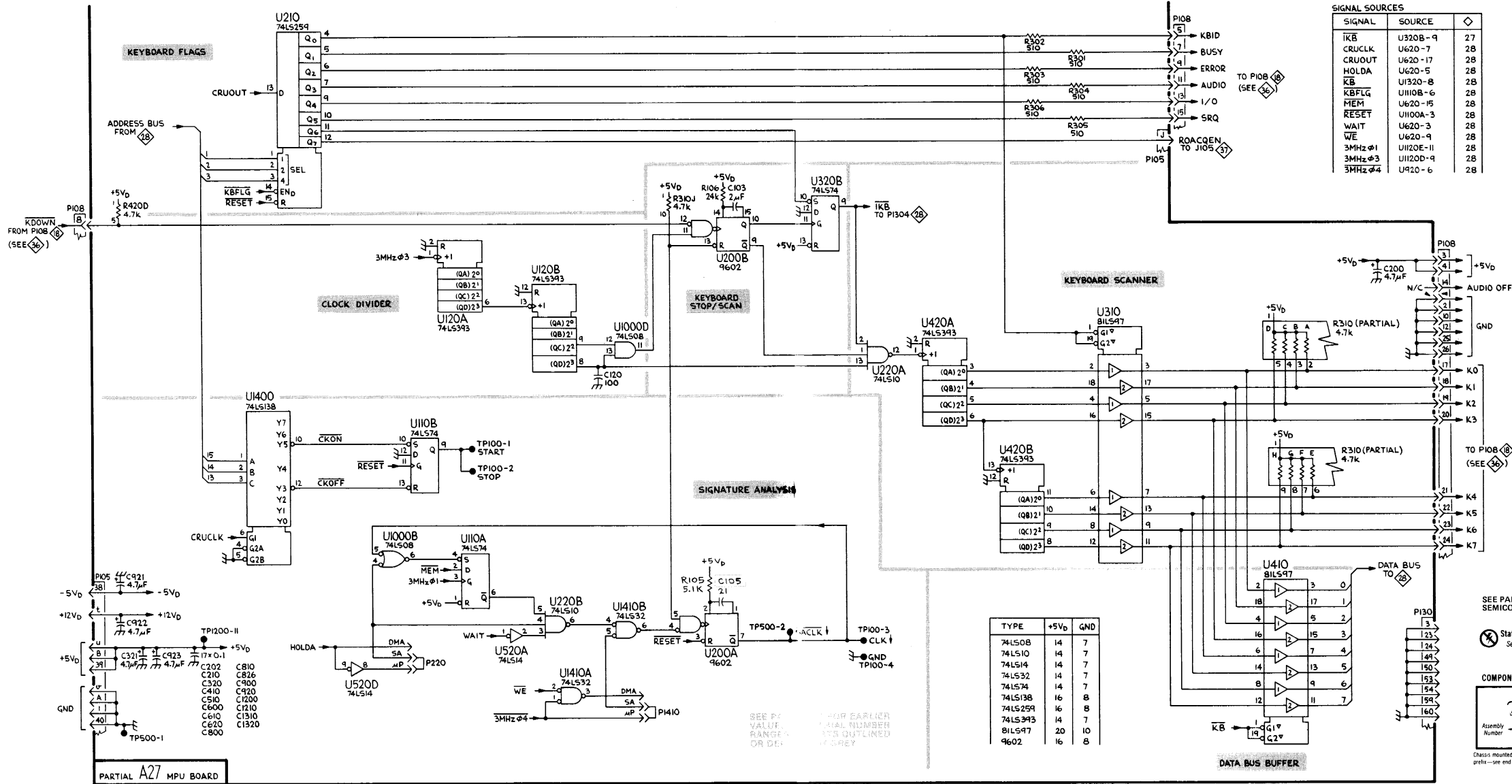
A B C D E F G

1

2

3

4



7854

2874-261
REV A MAR 1981

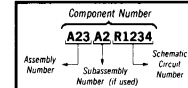
KEYBOARD INTERFACE AND SIGNATURE ANALYSIS

27

SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

27
Keyboard Interface
and
Signature Analysis

Reverse Side
A27

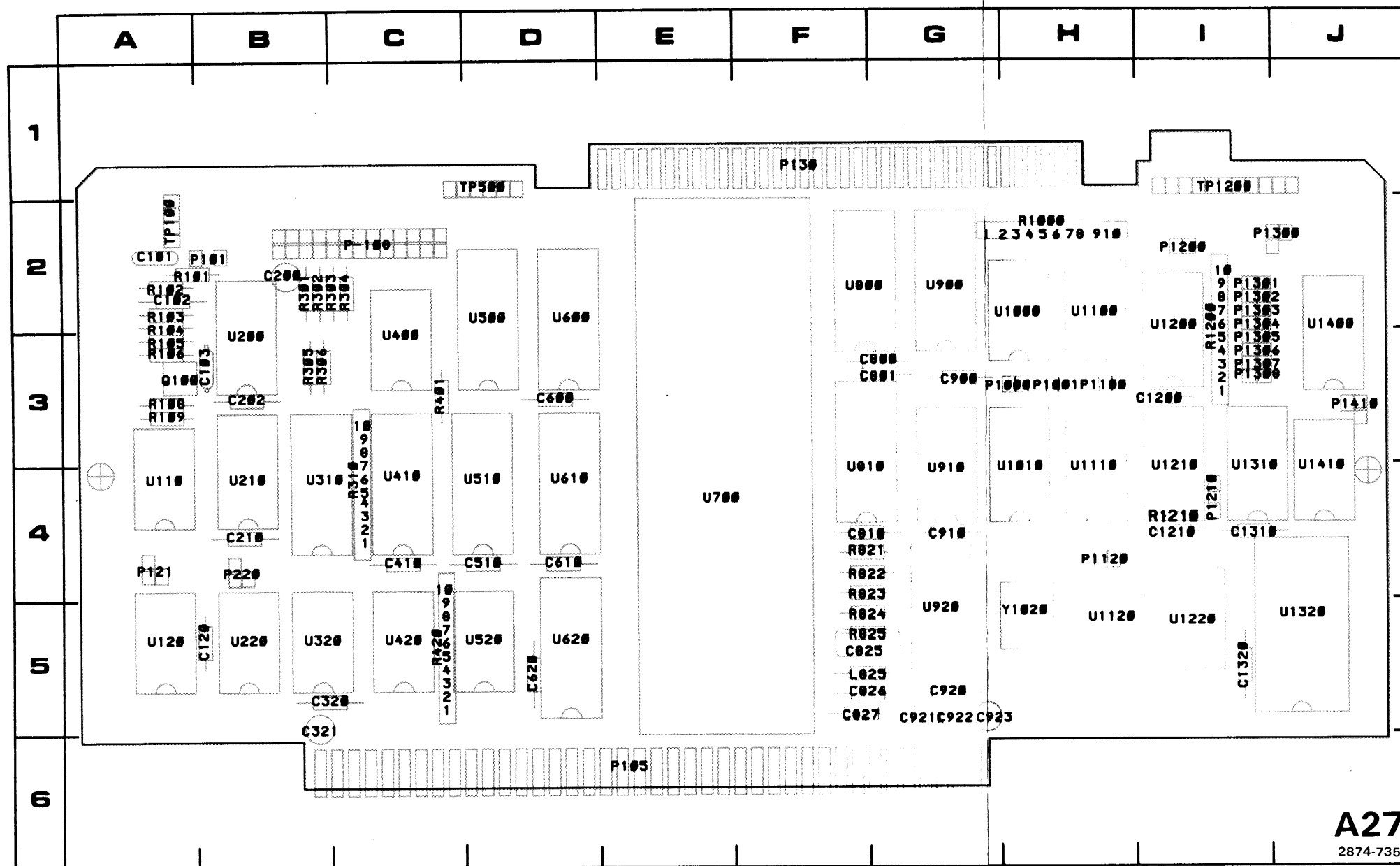
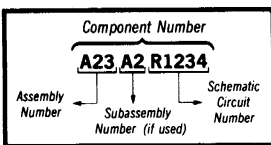


Figure 7-38. A27—MPU circuit board assembly.

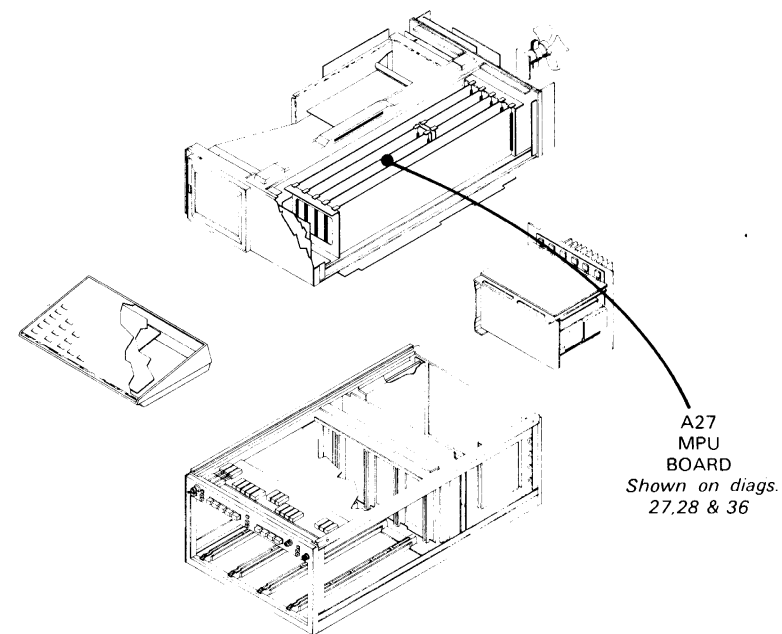
*R1210 Located on back of board.

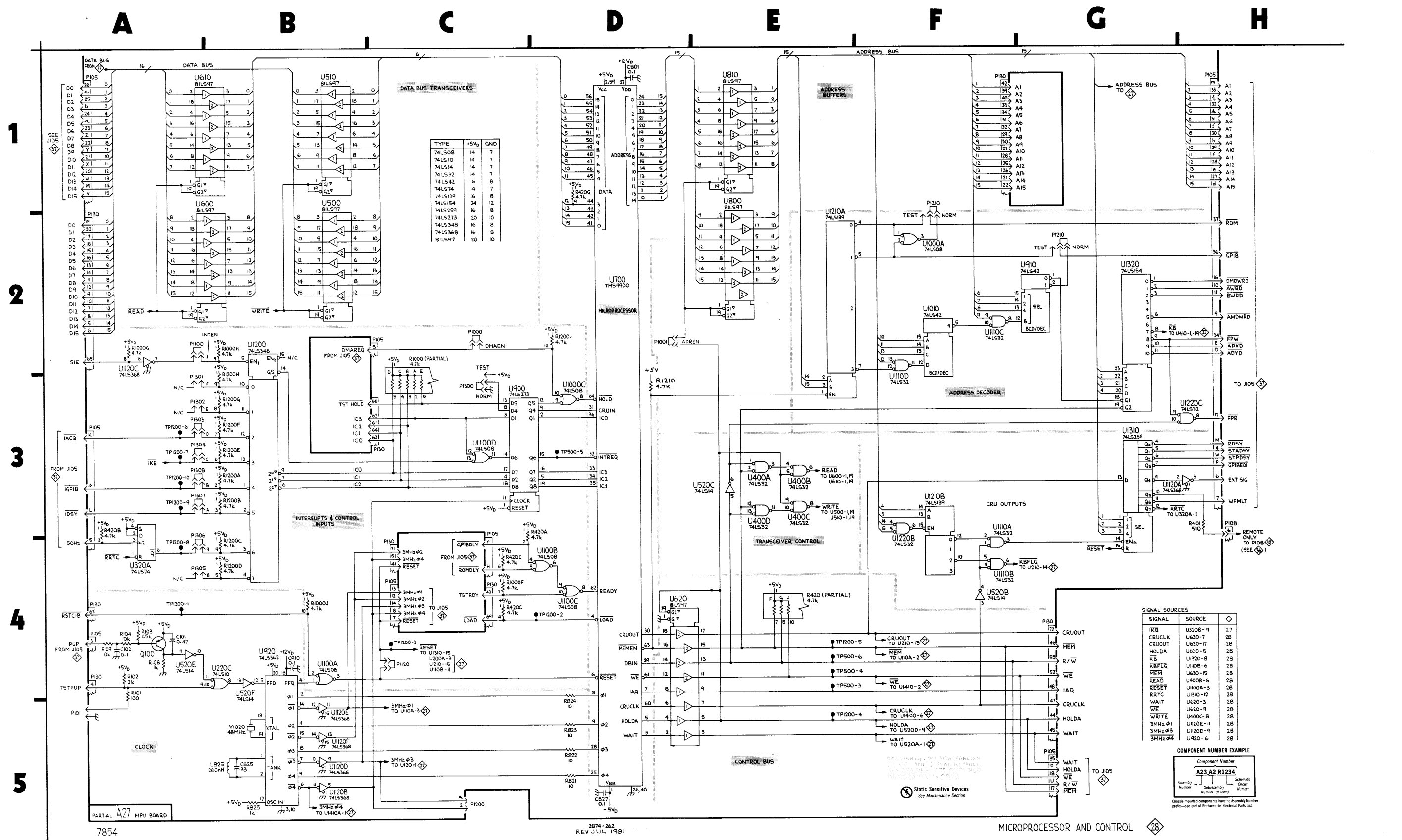
⊗ Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



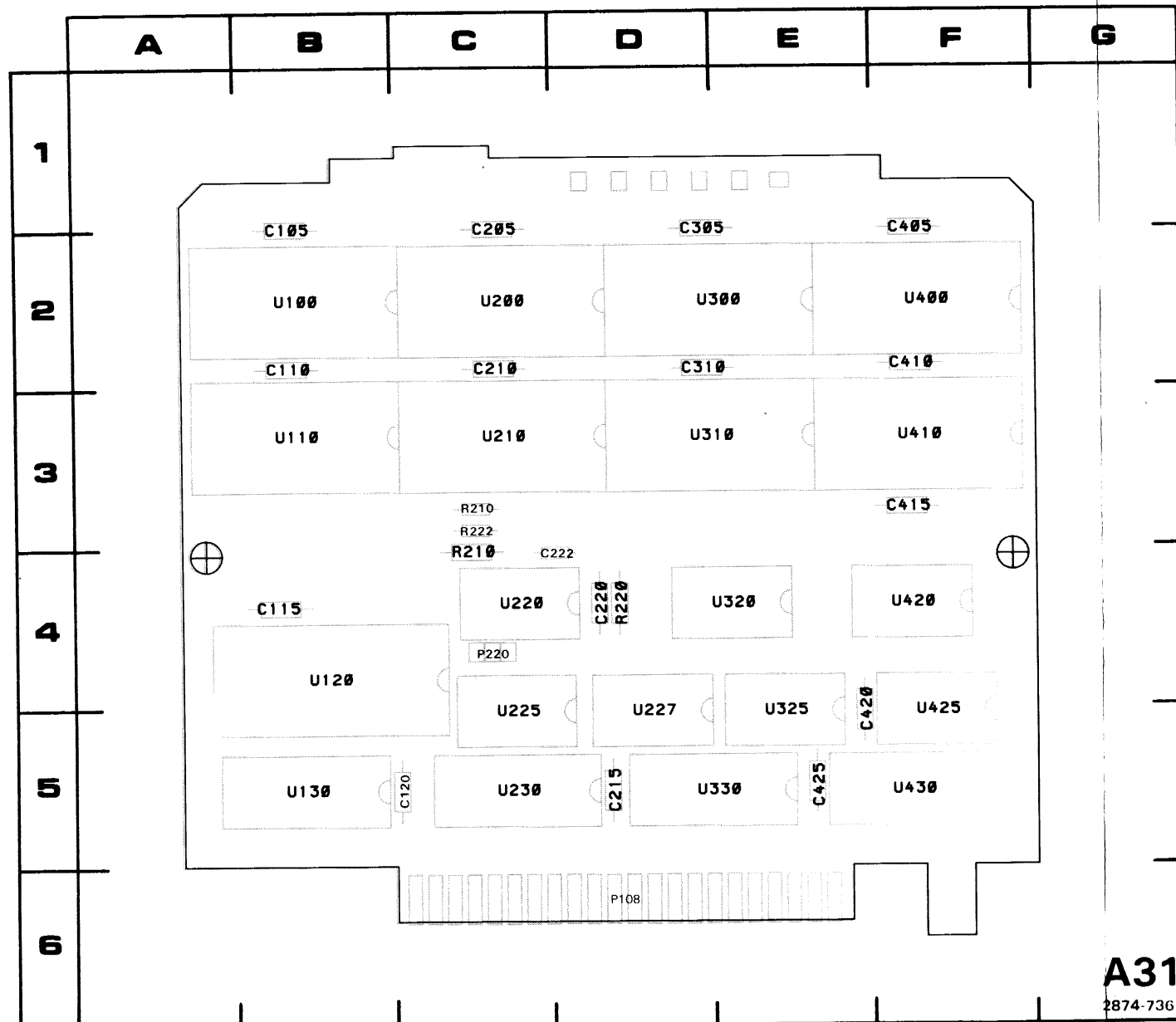


TYPE	+5V _D	GND
74LS08	14	7
74LS10	14	7
74LS14	14	7
74LS32	14	7
74LS42	16	8
74LS138	16	8
74LS154	24	12
74LS159	16	8
74LS273	20	10
74LS348	16	8
74LS368	16	8
74LS97	20	10

SIGNAL	SOURCE	Pin
IRCB	U3208-9	27
CRUCLK	U620-7	28
CRUOUT	U620-17	28
HOLDA	U620-5	28
KB	U1320-8	28
KBFLG	U1108-6	28
MEM	U620-15	28
READ	U4008-6	28
RESET	U1000A-3	28
RETC	U130-12	28
WAIT	U620-3	28
WE	U620-9	28
WRITE	U400C-8	28
3MHz #1	U1120E-II	28
3MHz #3	U1120D-9	28
3MHz #4	U1920-6	28

Component Number	Assembly Number	Subassembly Number	Schematic Number	Detail Number
A23	A2	R1234		

Chassis-mounted components have no Assembly Number prefix—see end of Reproducible Electrical Parts List.

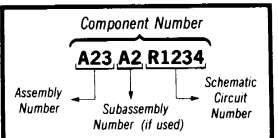


A31
2874-736

Figure 7-39. A31—ROM circuit board assembly.

Static Sensitive Devices
See Maintenance Section

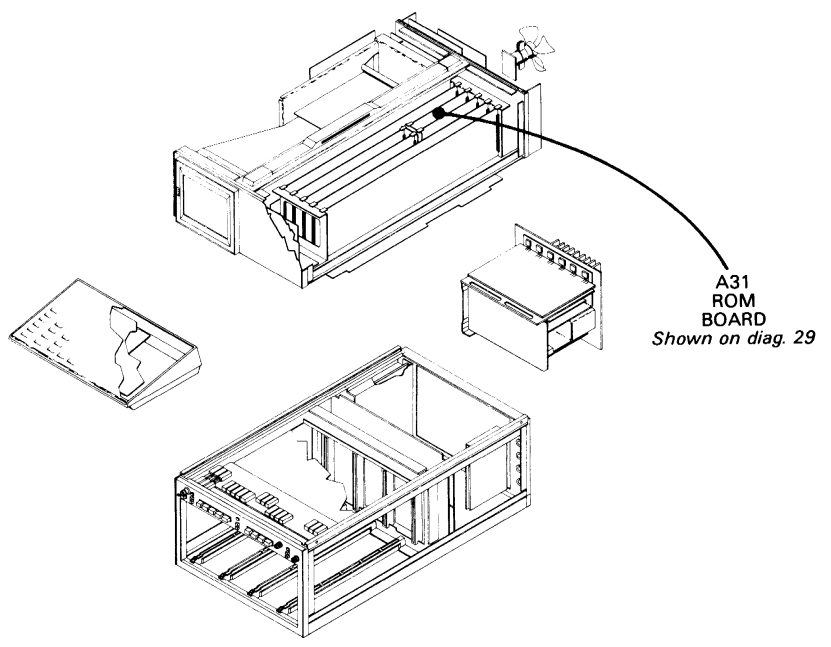
COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

READ ONLY MEMORY DIAGRAM 29

A31 ASSY					
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C105	A2	B1	U220B	A5	C4
C110	A2	B2	U220C	A5	C4
C115	A2	B4	U220D	B5	C4
C120	A2	B5	U225A	B4	C5
C205	A2	C1	U225B	C5	C5
C210	A2	C2	U225C	C5	C5
C215	A2	D5	U227A	B5	D4
C220	A2	D4	U227B	B5	D4
C222	A5	C3	U230	B2	C5
C305	A2	D2	U300	D2	E2
C310	A2	D2	U310	D1	E3
C405	A2	F1	U320A	C3	E4
C410	A2	F2	U320B	B3	E4
C415	A2	F3	U320C	C4	E4
C420	A2	E5	U320D	C4	E4
C425	A2	E5	U325A	B4	E5
			U325B	C4	E5
			U325C	B4	E5
P108	A1	D5	U330	G1	E5
P108	A3	D5	U400	C2	F2
P108	G1	D5	U410	C1	F3
P220	D5	C4	U420A	B4	F4
			U420B	B3	F4
R210	C3	C4	U420C	C4	F4
R220	C3	D4	U420D	C4	F4
R222	A5	C1	U425A	C4	F5
			U425B	B3	F5
			U425C	B4	F5
			U425D	C4	F5
			U425E	B4	F5
			U425F	B4	F5
			U430	G2	F5
U100	E2	B2			
U110	E1	B3			
U120	B2	B4			
U130	B1	B5			
U200	F2	C2			
U210	F1	C3			
U220A	B5	C4			



A

B

C

D

E

F

G

H

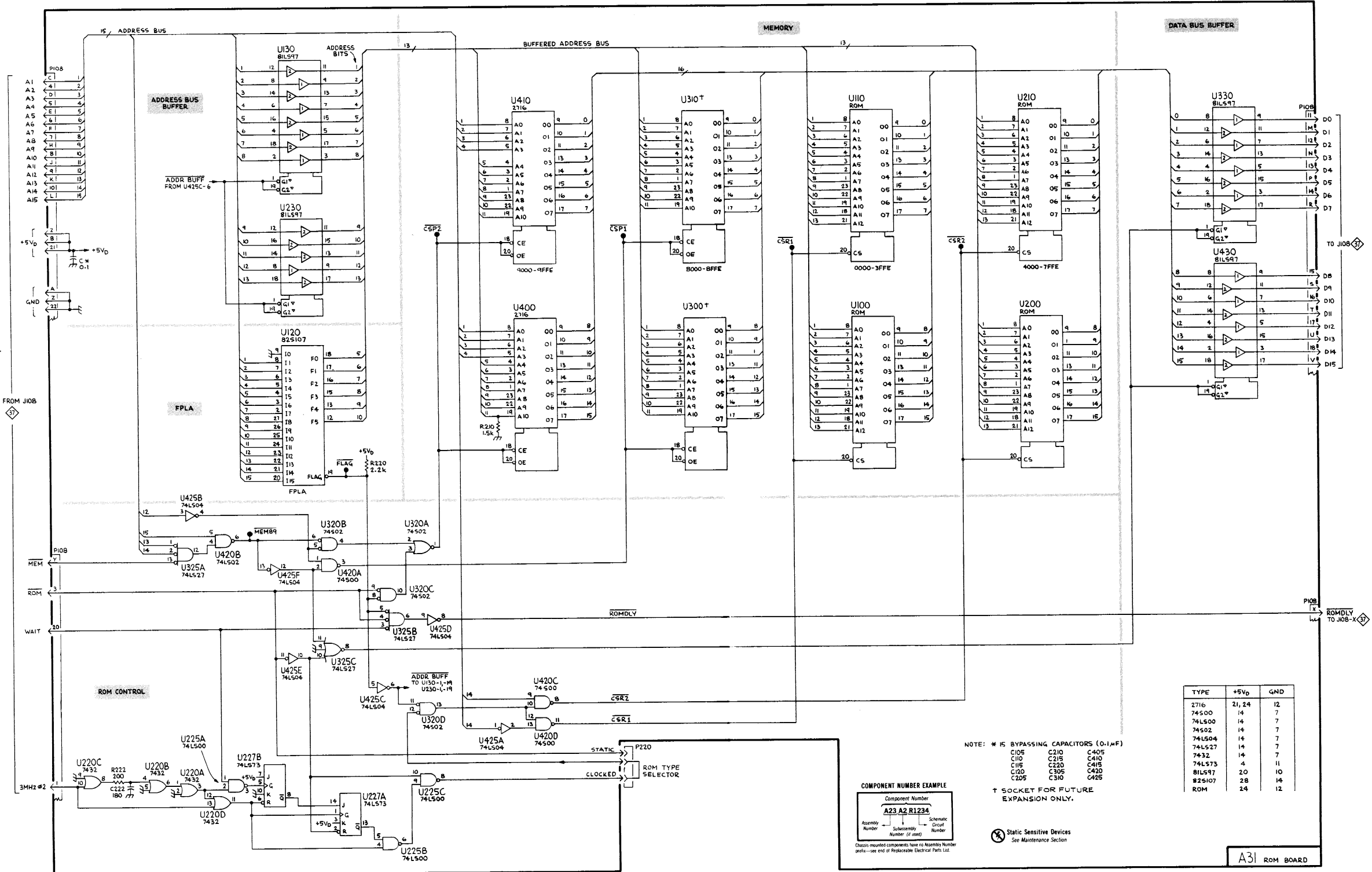
1

2

3

4

5



TYPE	+5V _D	GND
2716	21, 24	12
74500	14	7
74LS00	14	7
74502	14	7
74LS04	14	7
74LS27	14	7
74LS2	14	7
74LS73	4	11
81LS97	20	10
82S107	28	14
ROM	24	12

NOTE: * IS BYPASSING CAPACITORS (0.1µF)
 C105 C210 C405
 C110 C215 C410
 C115 C220 C415
 C120 C305 C420
 C205 C310 C425

† SOCKET FOR FUTURE EXPANSION ONLY.

COMPONENT NUMBER EXAMPLE
 Component Number
A23 A2 R1234
 Assembly Number Subassembly Number (if used) Schematic Circuit Number
 Chassis mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

⊗ Static Sensitive Devices
 See Maintenance Section

A31 ROM BOARD

7854

2874-263
 REV JUL 1981

READ ONLY MEMORY

29 Memory
 Read Only
 Reverse Side
 A28

Assembly A28

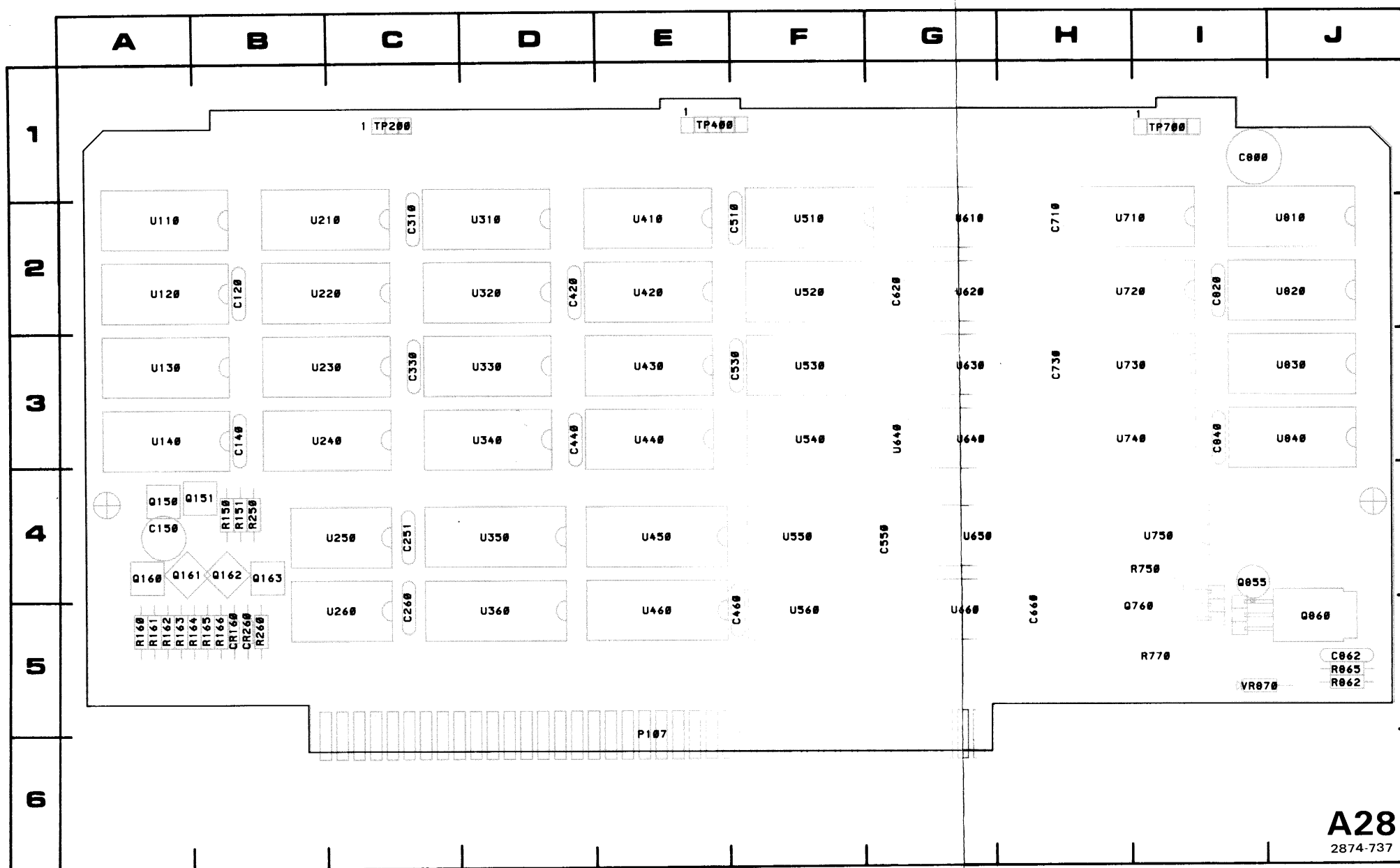
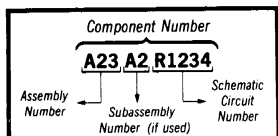


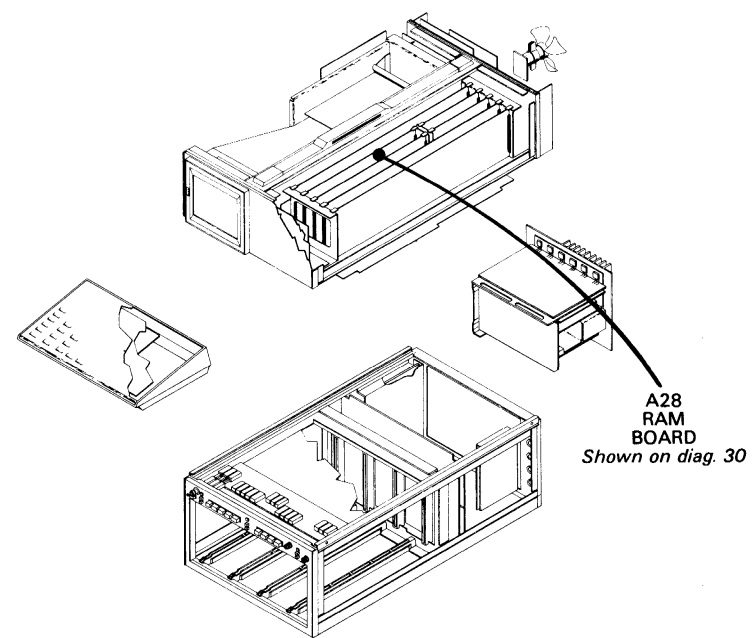
Figure 7-40. A28—RAM circuit board assembly.

COMPONENT NUMBER EXAMPLE



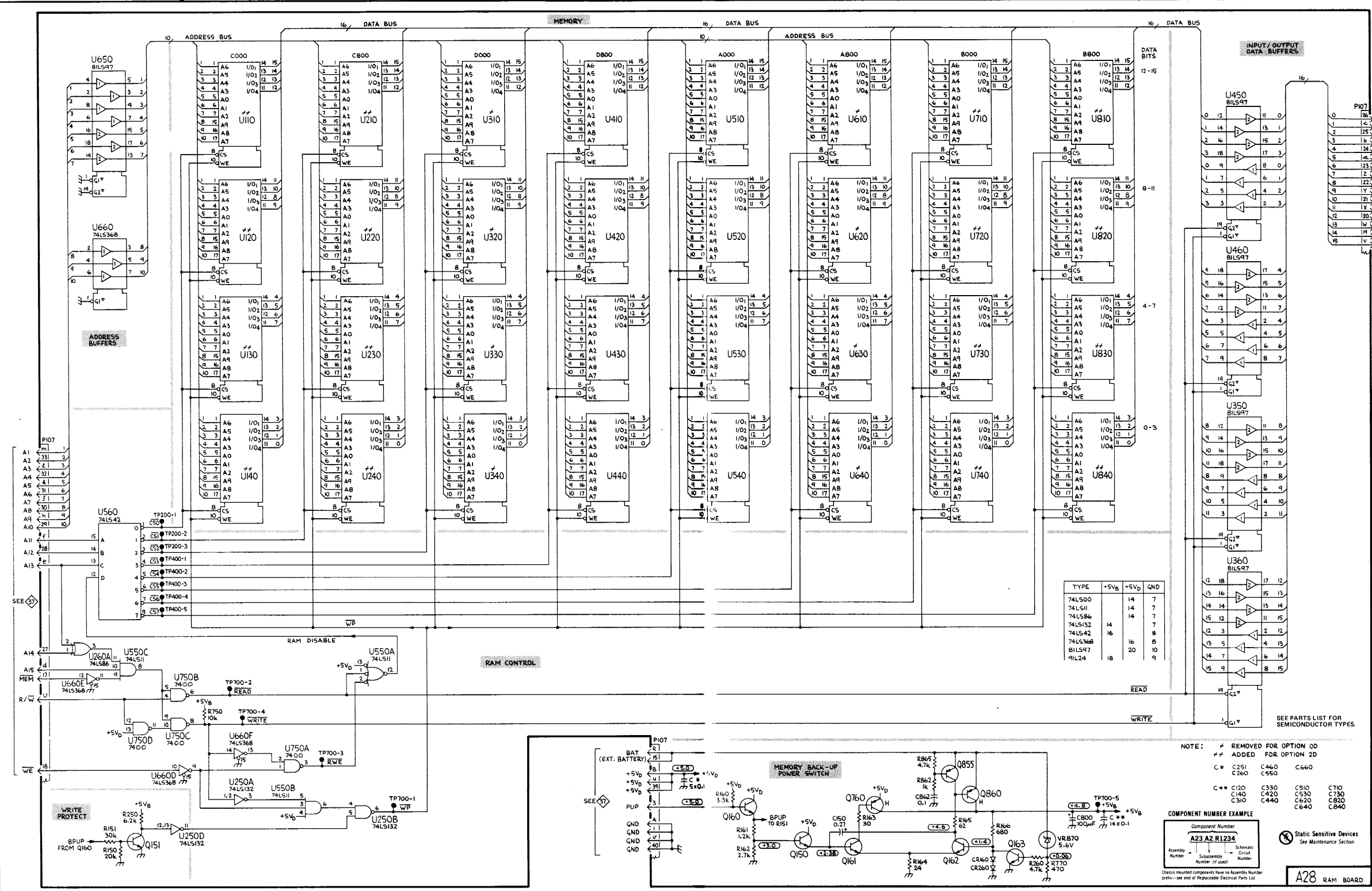
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section



A B C D E F G H

1
2
3
4
5



7854

2874-264
REV A MAR 1981

RANDOM ACCESS MEMORY

A28 RAM BOARD

NOTE: * REMOVED FOR OPTION 0D
 ** ADDED FOR OPTION 2D
 C* C251 C460 C660
 C260 C560
 C** C120 C330 C510 C710
 C140 C420 C630 C730
 C310 C440 C620 C820
 C640 C840

COMPONENT NUMBER EXAMPLE
 Component Number
 A23 A2 R1234
 Assembly Number Schematic Number
 Subassembly Number (if used) Circuit Number

Check mounted components for no assembly number prefix—see end of Replaceable Electrical Parts List

Static Sensitive Devices
 See Maintenance Section

Random Access Memory
 Reverse Side A29

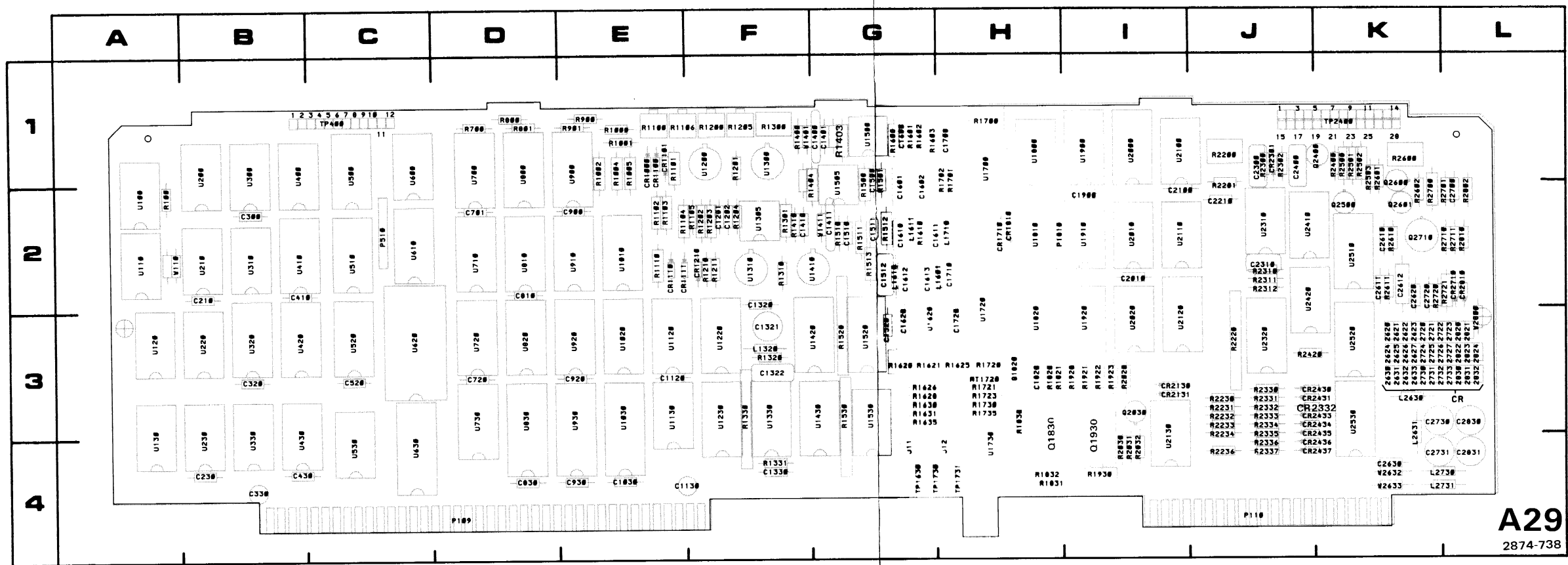
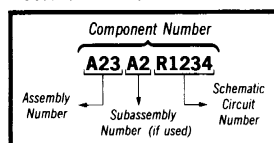


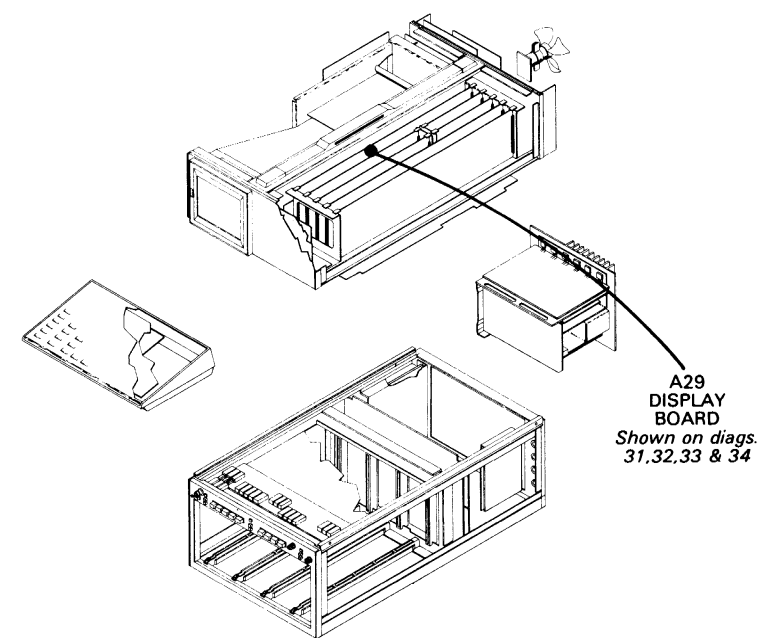
Figure 7-41. A29—Display circuit board assembly.

 Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

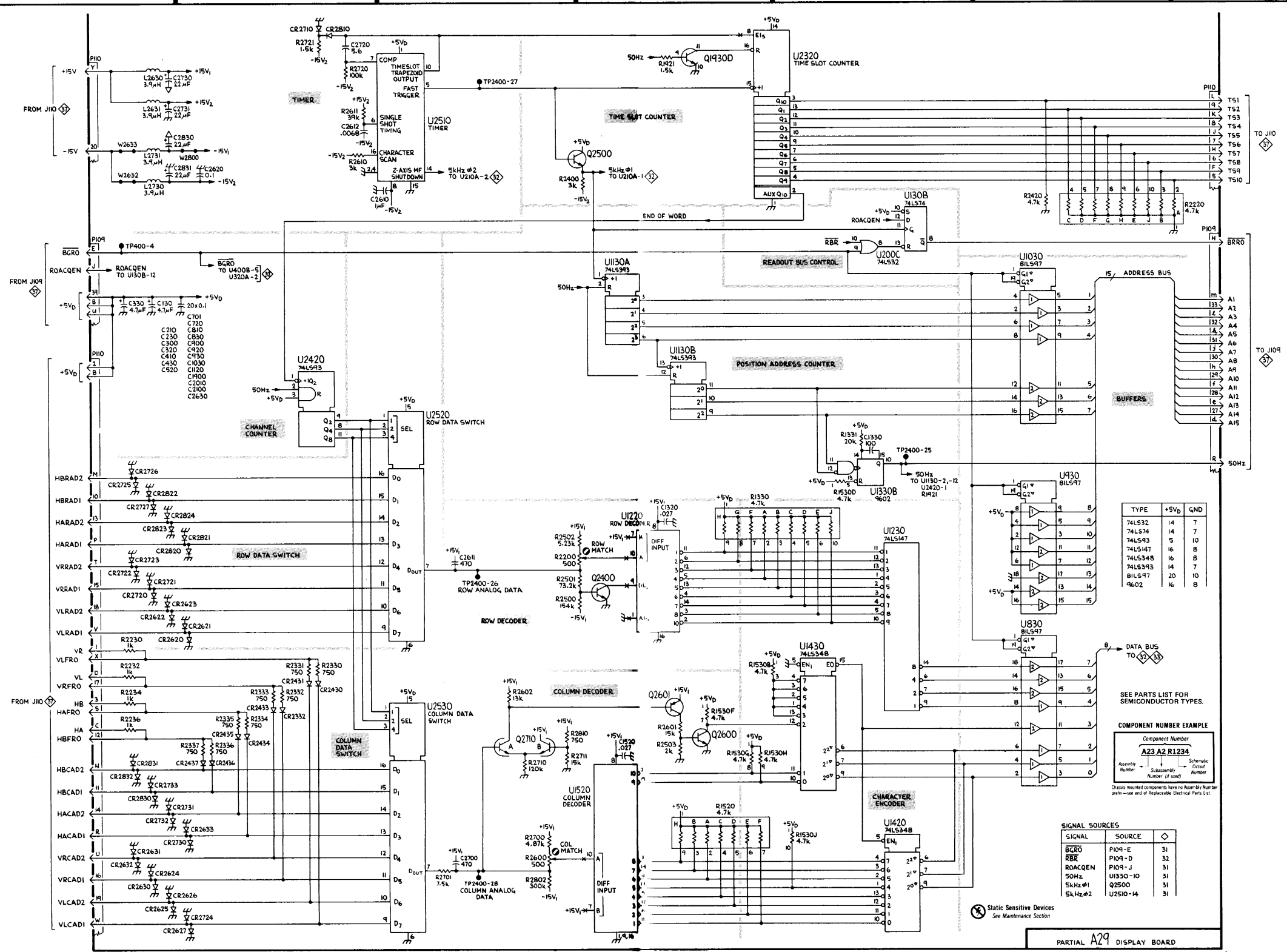


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



A B C D E F G

1
2
3
4
5



TYPE	+5V _D	GND
74LS32	14	7
74LS74	14	7
74LS93	5	10
74LS147	16	8
74LS348	16	8
74LS393	14	7
74LS97	20	10
9602	16	8

SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

COMPONENT NUMBER EXAMPLE

Component Number
A23 A2 R1234

Assembly Number Subassembly Number (if used) Schematic Circuit Number

Chassis mounted components have no Assembly Number prefix - see end of Replaceable Electrical Parts List.

SIGNAL SOURCES

SIGNAL	SOURCE	Symbol
BGR0	P109-E	31
RBR	P109-D	32
ROACQEN	P109-J	31
50Hz	U1330-10	31
5kHz#1	Q2500	31
5kHz#2	U2510-14	31

Static Sensitive Devices
See Maintenance Section

7854

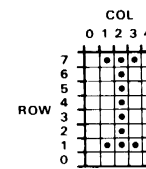
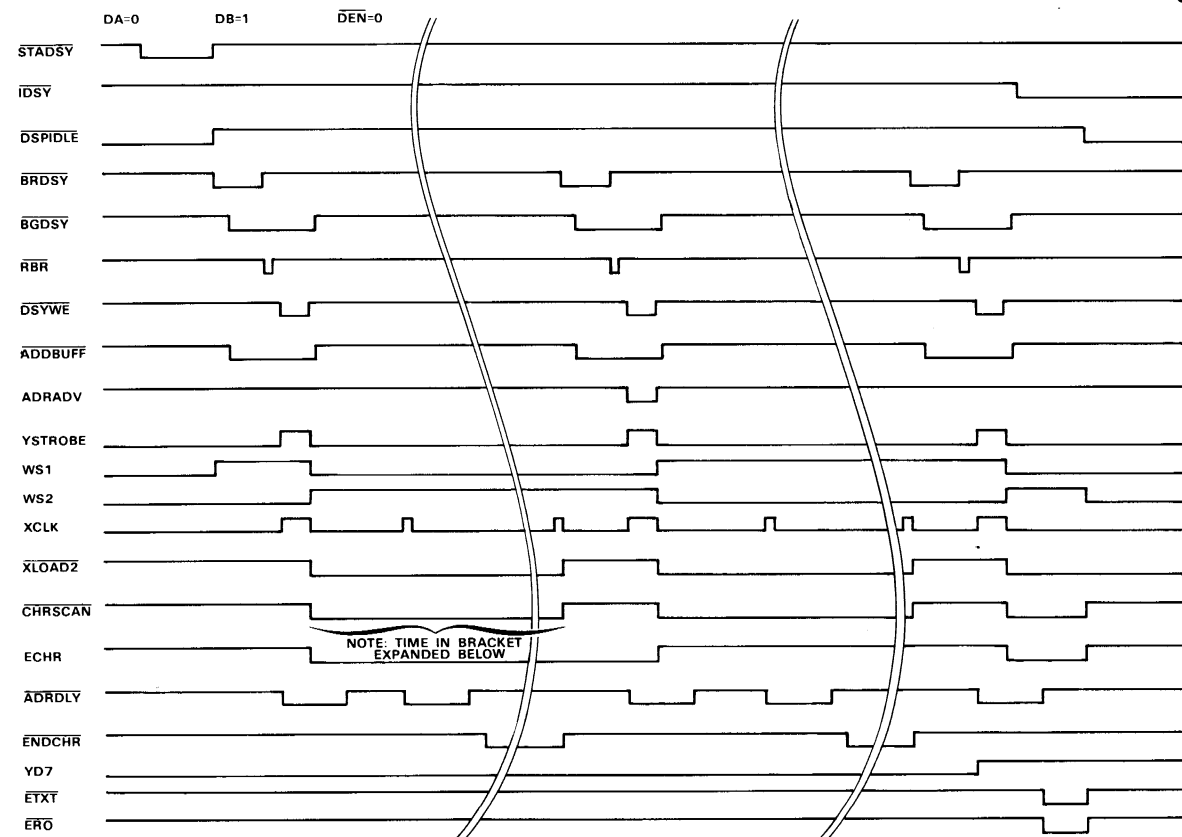
8814 265

PARTIAL A29 DISPLAY BOARD

READOUT ACQUIRE

Reverse Side
Character Mode
Timing Diagram

CHARACTER MODE



NOTE: ARROW DIRECTION INDICATES WHICH TRANSITION INDICATES FOLLOWING TRANSITION(S).

TIMING SEQUENCE FOR DISPLAY OF THE CHARACTER "1"

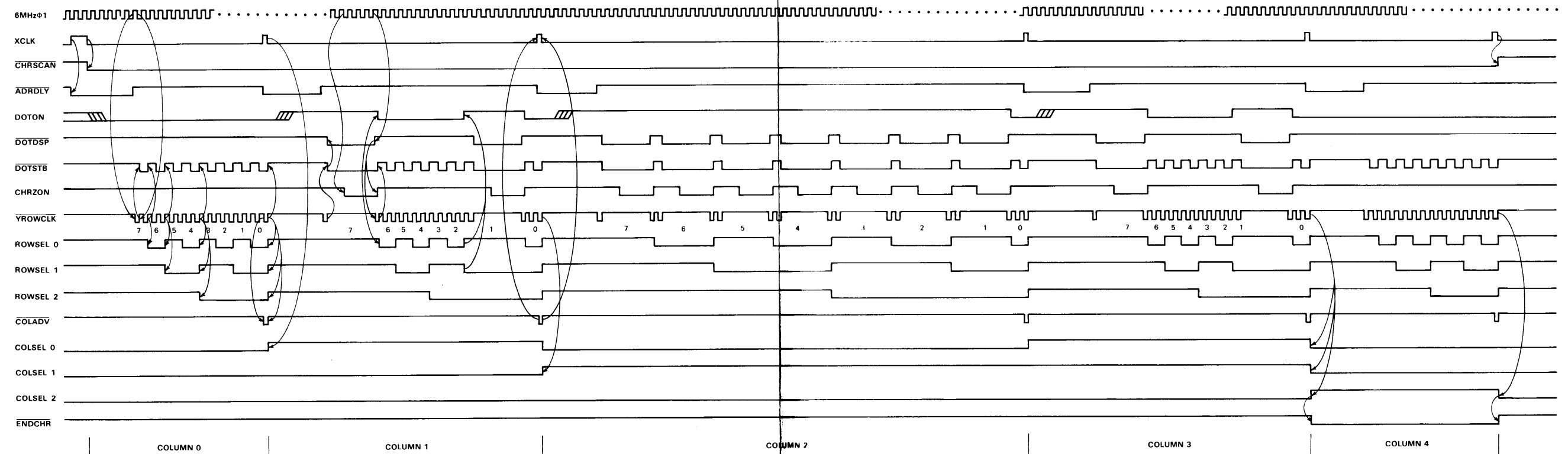


Figure 7-42. Character Mode Timing Diagram.

WAVEFORM CONDITIONS

The waveforms shown were obtained with the 7854 controls set as follows: CRT DISPLAY (STORED): VERTICAL MODE (LEFT); HORIZONTAL MODE (B); READOUT (OFF, for Y-T Mode and X-Y Mode ON, for Character Mode).

Refer to the waveform photos for additional setup information. No plug-in units were installed in the 7854.

Waveform Conditions. The waveforms shown were obtained with a 7854 Oscilloscope system. Any test oscilloscope system with 10M Ω impedance, at least 60 MHz bandwidth and 10X probe may be used. (Tektronix 7603 Oscilloscope, 7B80 Time Base, 7A26 Dual Trace Amplifier and P6063A Probe). The 7B80 Time Base was triggered on the input signal. A logic analyzer (Tektronix WR501) with P6451 Probe and test leads was used for waveforms 6 and 7 only.

Waveforms 6 and 7 Conditions.

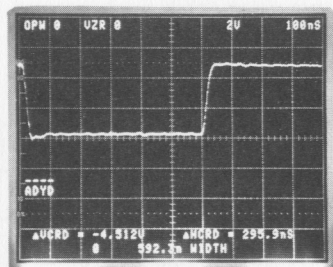
The 7B80 Time Base was triggered by the WR501 Logic Analyzer trigger output. The WR501 inputs were connected as follows (see Table 7-1 below):

TABLE 7-1 Setup For Waveforms 6, 7, 27 and 28		
WR501 Input No.	Connected To	Logic Level
0	U620-22	1
1	U620-23	0
2	U620-1	0
3	U620-2	1
4	U620-3	0
5	U620-4	0
6	U620-5	1
7	U630-19	1

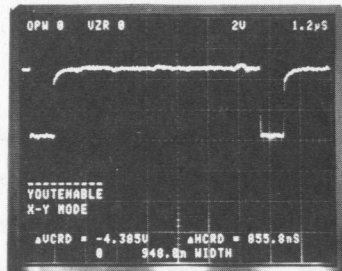
Display System
Waveforms

Reverse Side
X-Y Mode
Timing Diagram

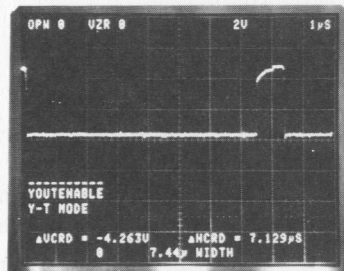
1



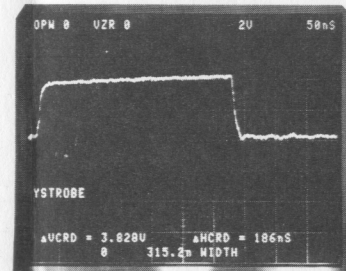
2



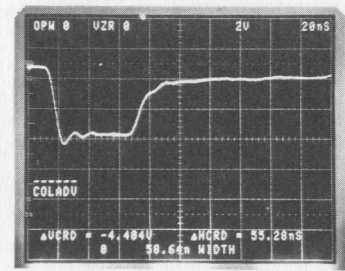
3



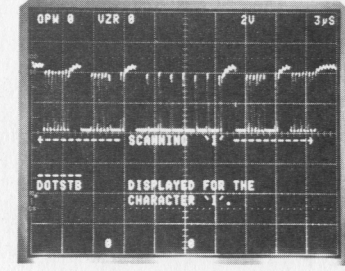
4



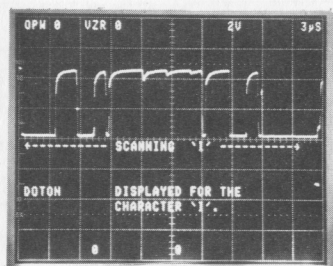
5



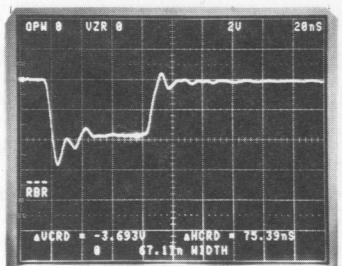
6



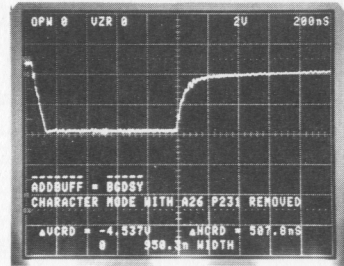
7



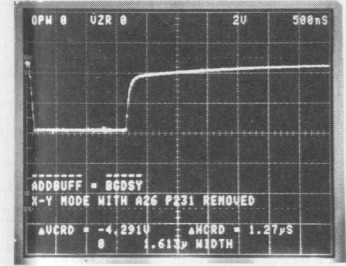
8



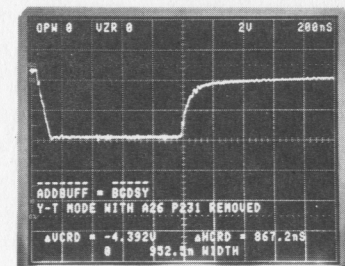
9



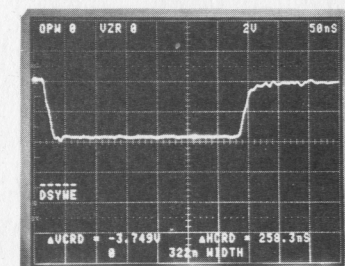
10



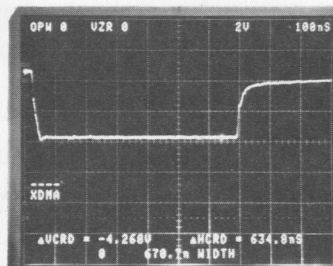
11



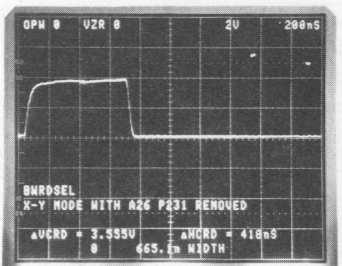
12



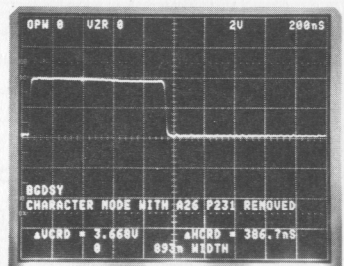
13



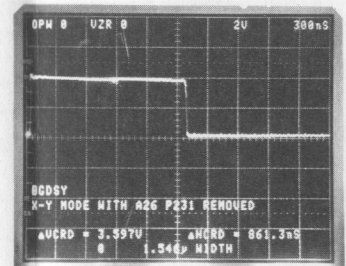
14



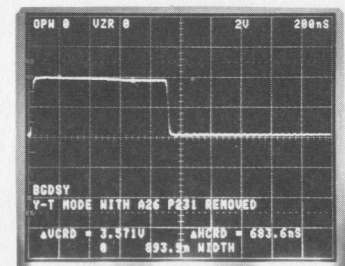
15



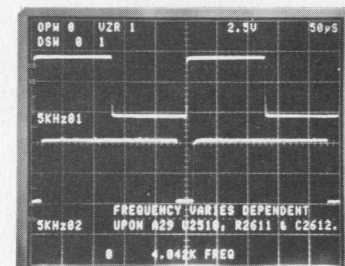
16



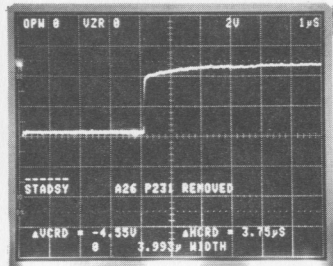
17



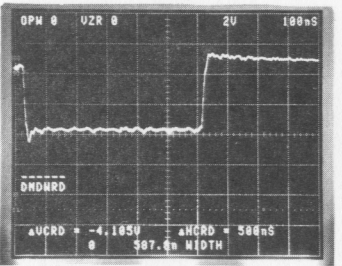
18



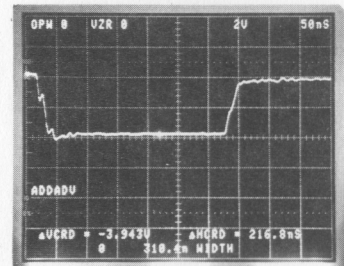
19



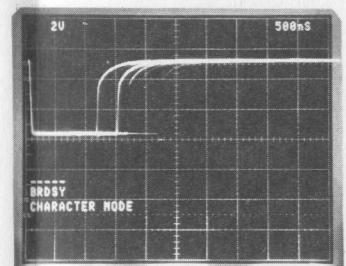
20



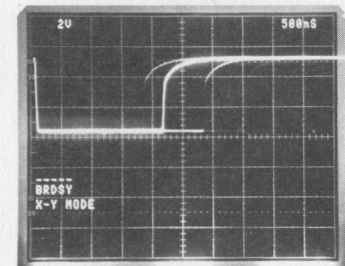
21



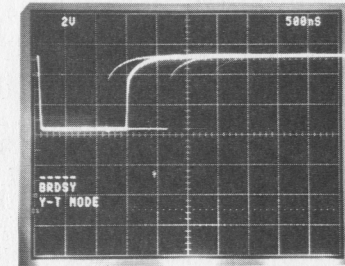
22



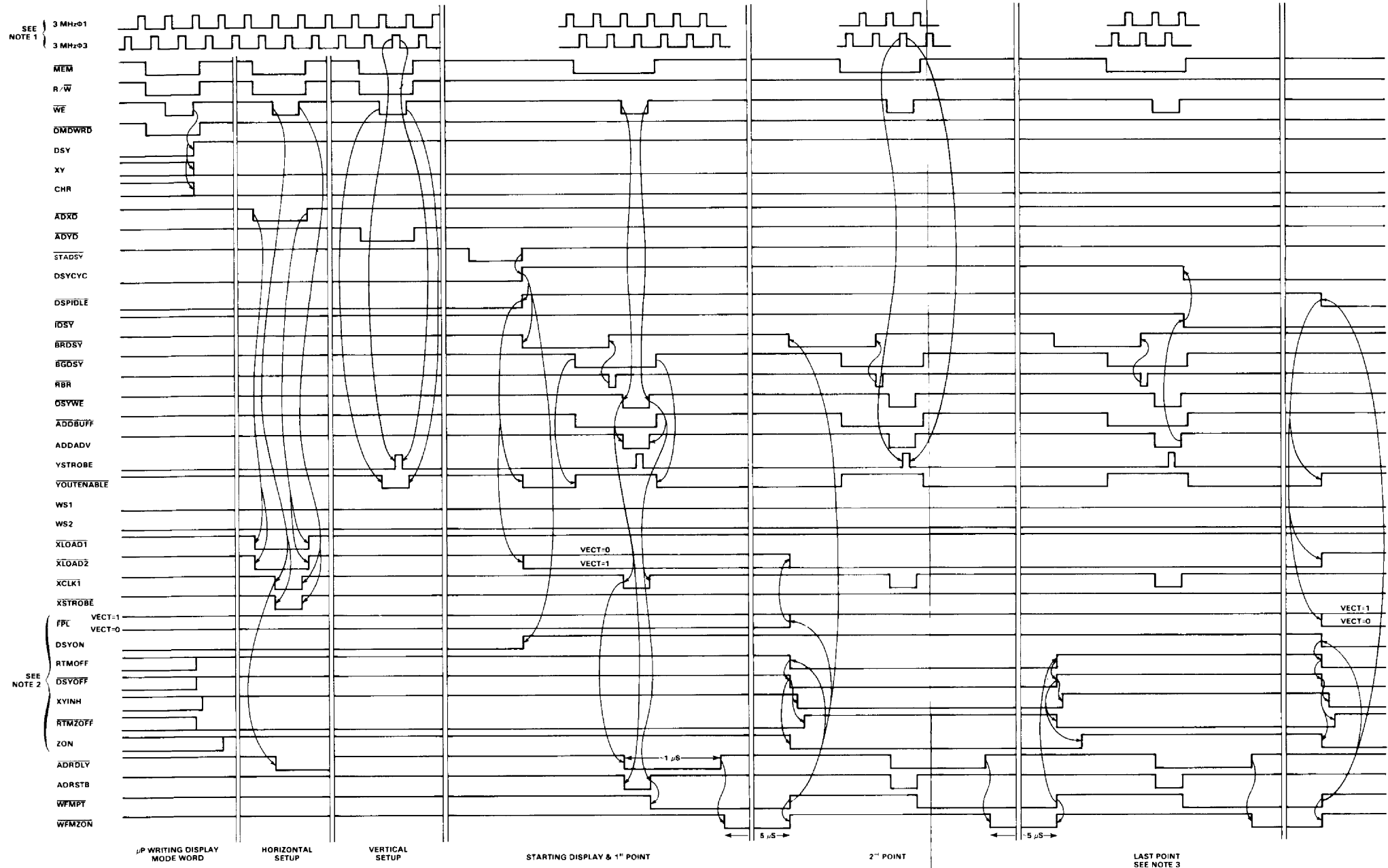
23



24



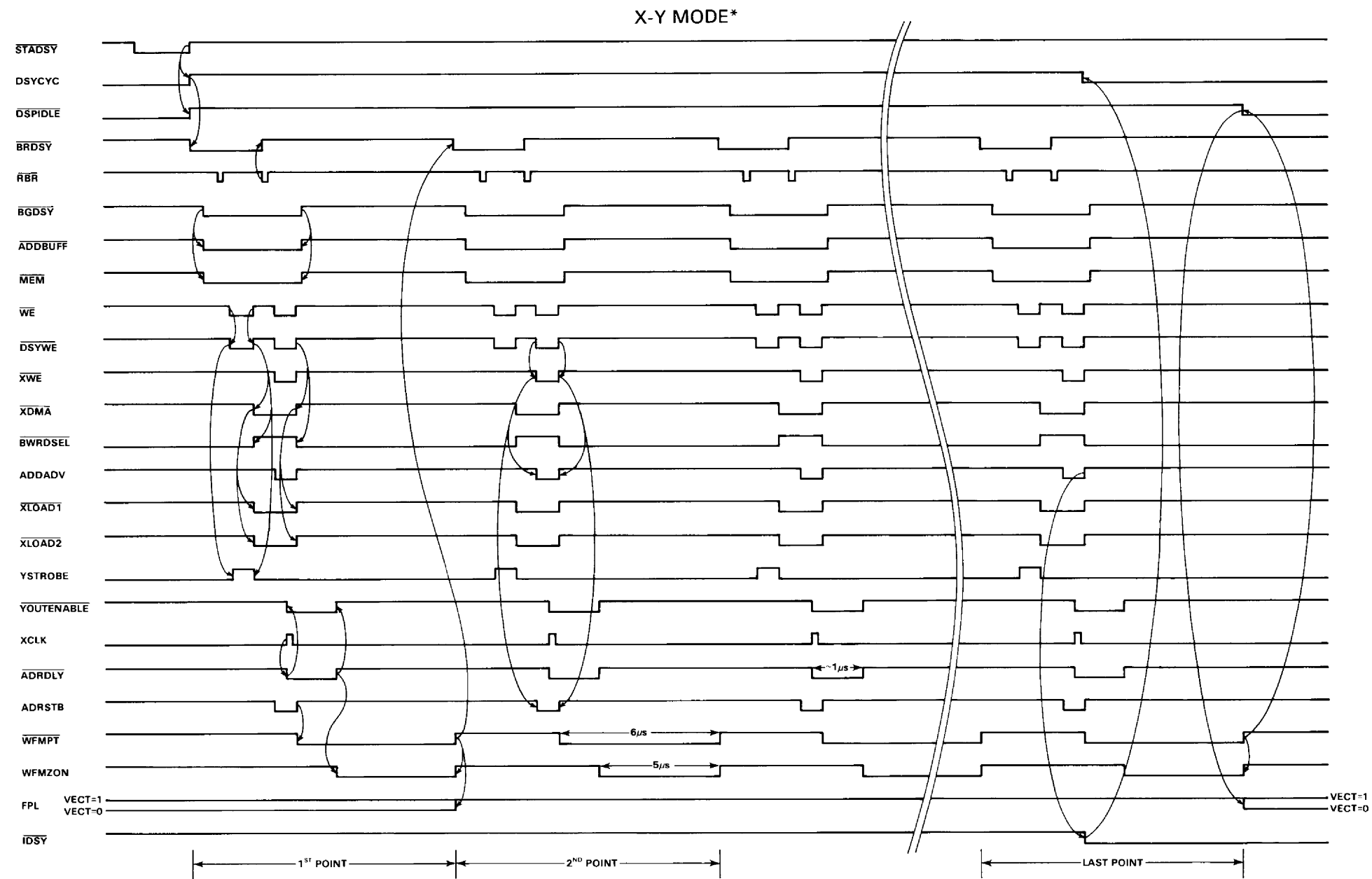
YT MODE



NOTE 1: 3 MHz ϕ 1 AND 3 MHz ϕ 3 ONLY SHOWN WHERE THEIR TIMING RELATIONSHIP APPLIES.
 NOTE 2: REAL TIME MODE BIT, RT, IS ASSUMED TO BE A LOGICAL '1' (IN 'BOTH' DISPLAY MODE).
 NOTE 3: THE LAST POINT IS THE (P/W)th POINT (I.E., IF POINTS/WAVEFORM = 128 THEN LAST POINT = 128th POINT).
 ARROW DIRECTION INDICATES WHICH TRANSITION INITIATES FOLLOWING TRANSITION(S).

Figure 7-43. YT Mode Timing Diagram.

2874-740



* All display related signals are not shown on this timing diagram. In X-Y mode, DSY is HI, XY is HI and CHR is LO. This timing diagram further assumes that the Real Time mode bit (RT) is LO (and thus DSYON is HI, RTMOFF is HI, DSYOFF is HI, XYINH is HI, RTMZOFF is LO and ZON is HI), XY is HI and CHR is LO (resulting in both WS1 and WS2 being LO). Refer to the first 3 sections of the Y-T MODE timing diagram for the Display Mode Word, Horizontal and Vertical setup sequences.

Figure 7-44. X-Y Mode Timing Diagram.

2874-741

WAVEFORM CONDITIONS

The waveforms shown were obtained with the 7854 controls set as follows: CRT DISPLAY (STORED); VERTICAL MODE (LEFT); HORIZONTAL MODE (B); READOUT (OFF; for Y-T Mode and X-Y Mode; ON for Character Mode). Refer to the waveform photos for additional setup information. No plug-in units were installed in the 7854.

Waveform Conditions. The waveforms shown were obtained with a 7854 Oscilloscope system. Any test oscilloscope system with 10M Ω impedance, at least 60 MHz bandwidth and 10X probe may be used. (Tektronix 7603 Oscilloscope, 7B80 Time Base, 7A26 Dual Trace Amplifier and P6063A Probe). The 7B80 Time Base was triggered on the input signal. A logic analyzer (Tektronix WR501) with P6451 Probe and test leads was used for waveforms 25, 27, 28, 30, 37, 41, and 42 only.

Setup A: Waveform 18 conditions. The 7B80 Time Base was triggered on 5 kHz Φ 1.

Setup B: Waveform 25 conditions. The 7B80 Time Base was triggered on 3 MHz Φ 1.

Setup C: Waveforms 27 and 28 conditions. The 7B80 Time Base was triggered by the WR501 Logic Analyzer trigger output. The WR501 inputs were connected and corresponding switches set as follows (see Table 7-2 below):

Setup D: Waveforms 30, 35, 37, 41 and 42 conditions. Same as setup C except as follows (see Table 7-1 below):

TABLE 7-1
Setup For Waveforms 6, 7, 27 and 28

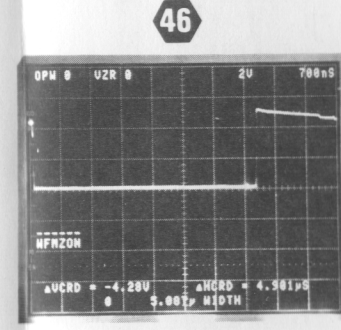
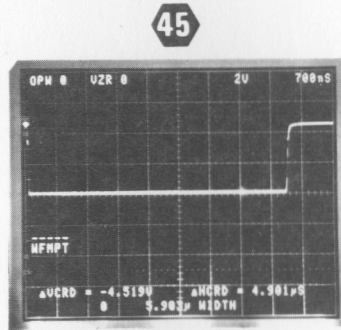
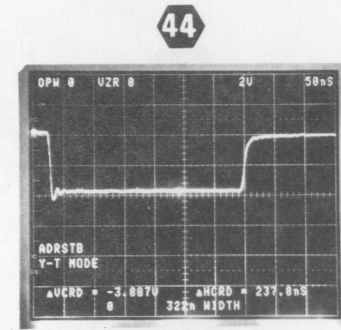
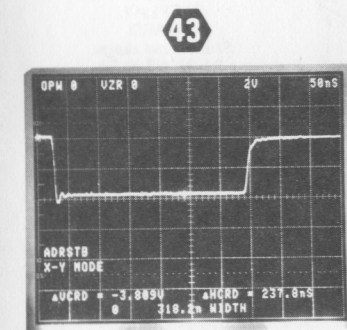
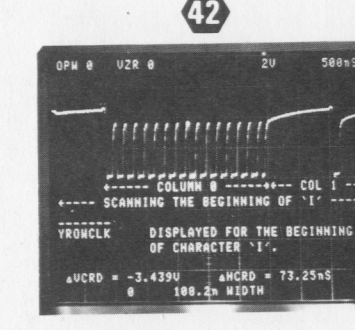
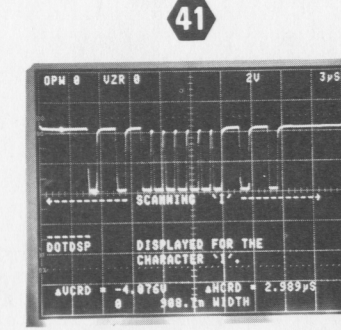
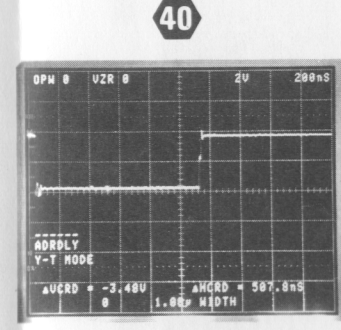
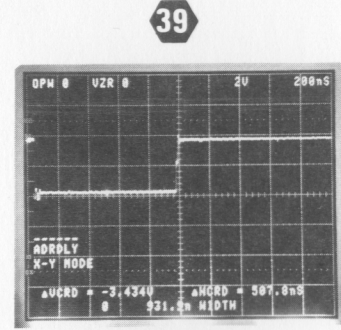
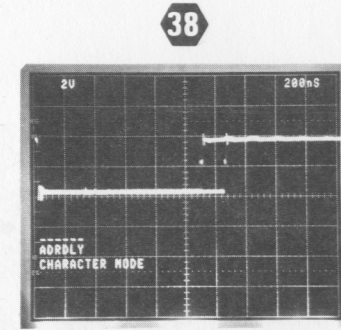
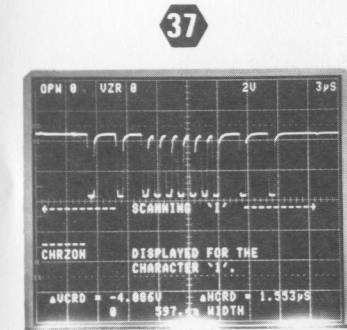
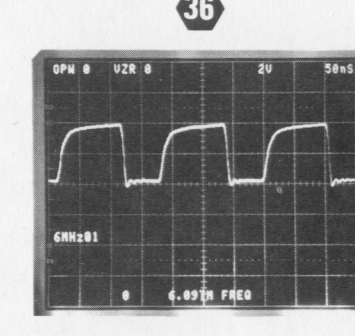
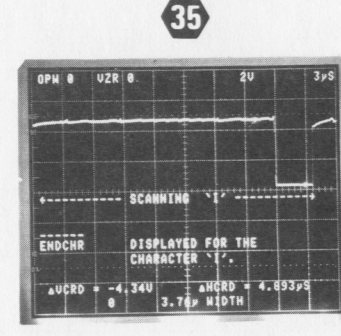
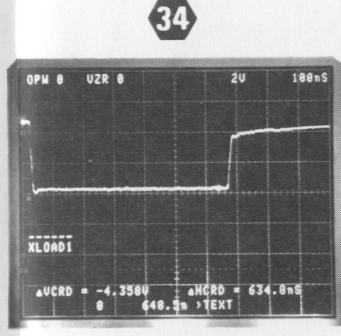
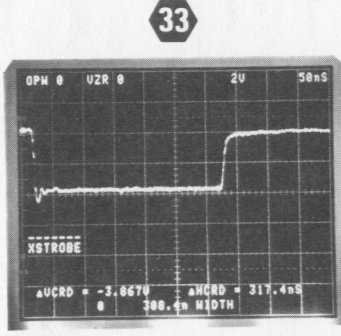
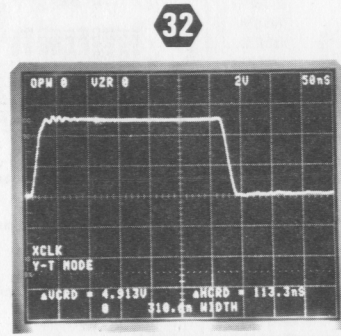
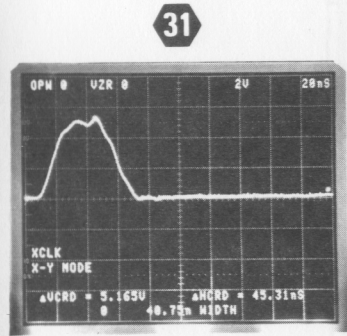
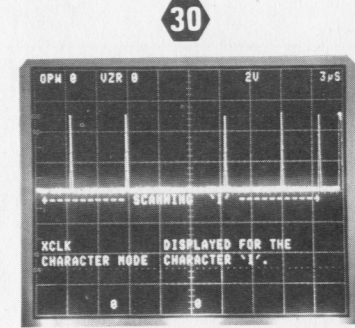
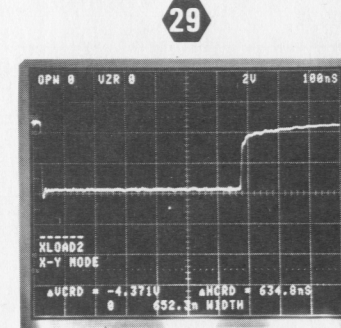
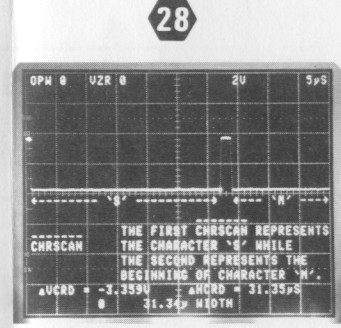
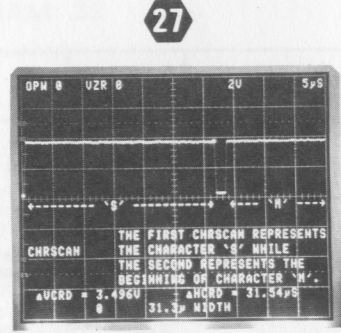
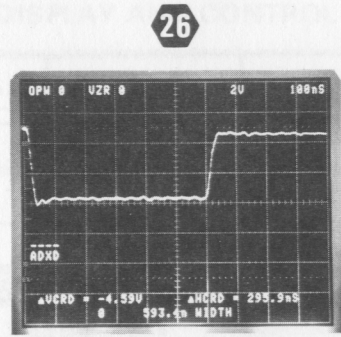
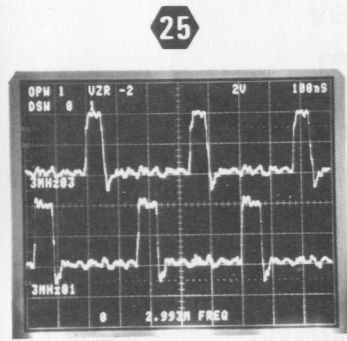
WR501 Input No.	Connected To	Logic Level
0	U620-22	1
1	U620-23	0
2	U620-1	0
3	U620-2	1
4	U620-3	0
5	U620-4	0
6	U620-5	1
7	U630-19	1

TABLE 7-2
Setup For Waveforms 30, 35, 37, 41 and 42

WR501 Input No.	Connected To	Logic Level
0	U620-22	1
1	U620-23	0
2	U620-1	1
3	U620-2	0
4	U620-3	0
5	U620-4	1
6	U620-5	1
7	U630-19	1

Display System
Waveforms

Reverse Side
A29



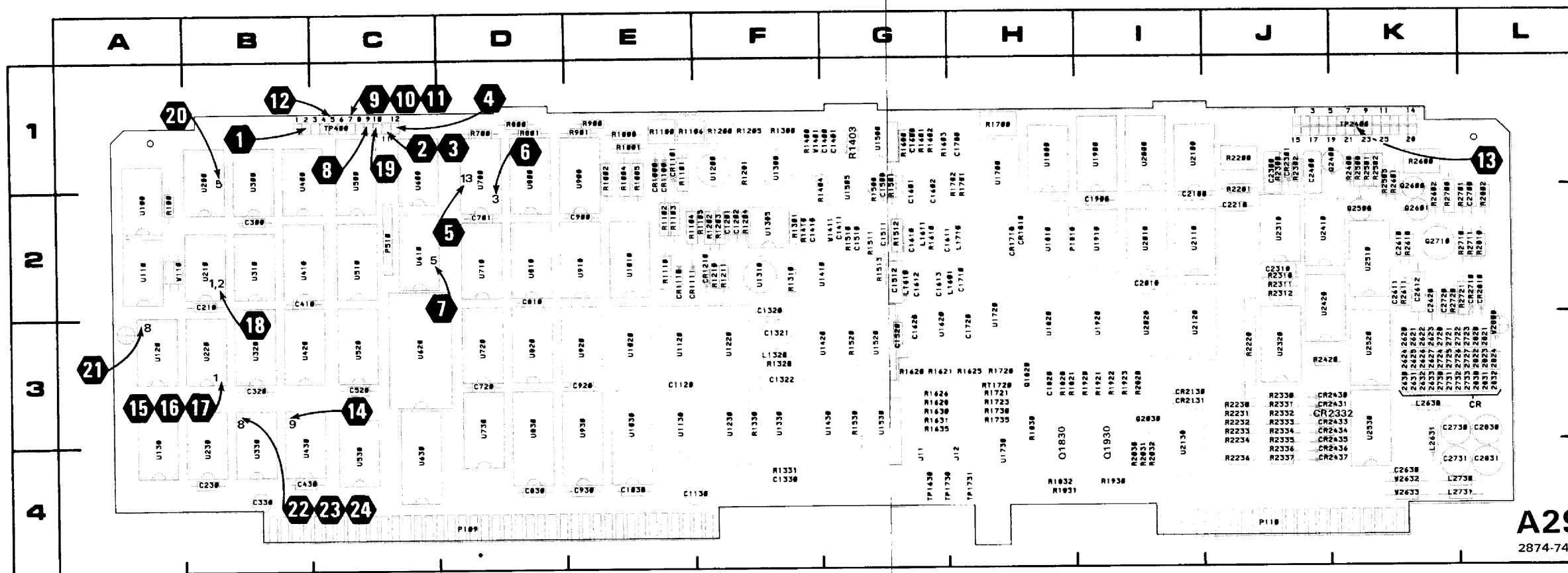
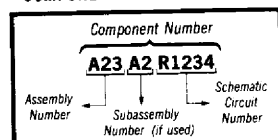


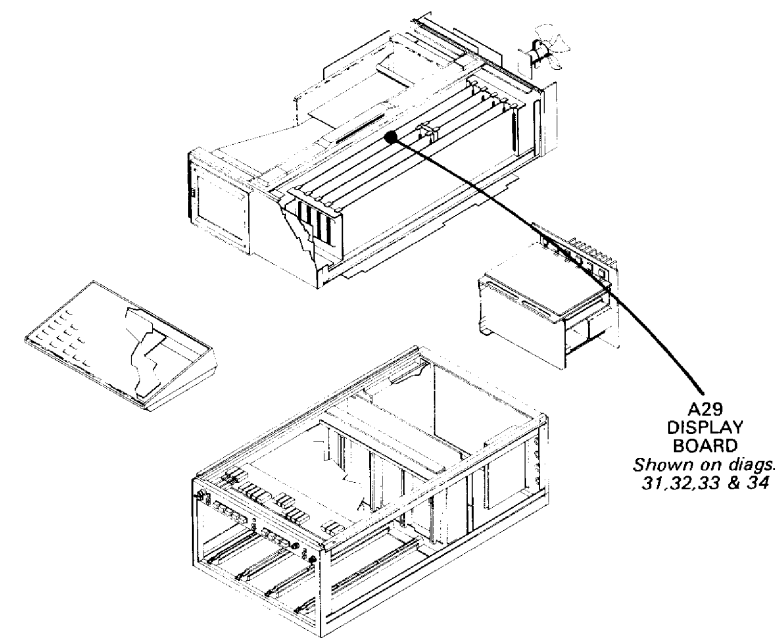
Figure 7-45. A29—Display circuit board assembly.

Static Sensitive Devices
See Maintenance Section

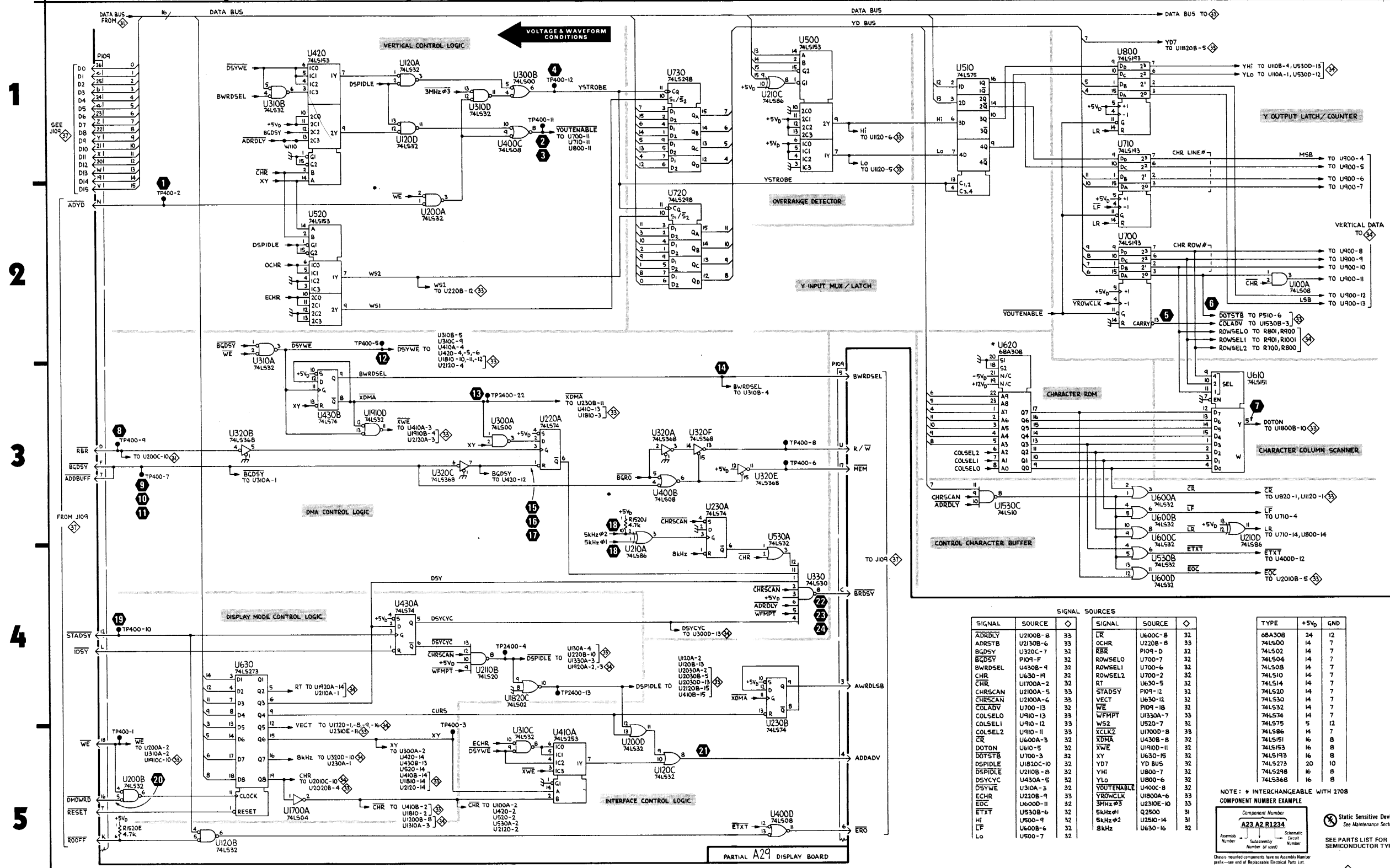
COMPONENT NUMBER EXAMPLE



Chassis mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



A B C D E F G H



SIGNAL SOURCES			
SIGNAL	SOURCE	Pin	TYPE
ADDRDY	U2100B-8	33	68A308
ADRSB	U2100B-6	33	74LS00
BGDSY	U320C-7	32	74LS02
BGDSY	PI04-F	32	74LS04
BWRDSEL	U430B-9	32	74LS08
CHR	U630-19	32	74LS10
CHR	U1700A-2	32	74LS14
CHRSCAN	U2100A-5	35	74LS14
CHRSCAN	U2100A-6	35	74LS20
COLADV	U700-13	32	74LS30
COLSELO	U410-13	33	74LS32
COLSEL1	U410-12	33	74LS32
COLSEL2	U410-11	33	74LS32
CR	U600A-3	32	U430B-8
DOTON	U610-5	32	74LS153
DOTSTB	U700-3	32	74LS153
DSPIDLE	U1820C-10	32	74LS153
DSPIDLE	U2100B-8	32	74LS248
DSYCYC	U430A-5	32	74LS248
DSYWE	U310A-3	32	74LS368
ECHR	U220B-9	32	74LS153
EOC	U600D-11	32	74LS153
ETXT	U530B-6	32	74LS153
HF	U500-9	32	74LS153
LF	U600B-6	32	74LS153
Lo	U500-7	32	74LS153
LR	U600C-8	32	74LS153
OCHR	U220B-8	33	74LS00
PI04-D	PI04-D	32	74LS04
ROWSELO	U700-7	32	74LS08
ROWSEL1	U700-6	32	74LS10
ROWSEL2	U700-2	32	74LS14
RT	U630-5	32	74LS14
STADSY	PI04-12	32	74LS20
VECT	U630-12	32	74LS30
WE	PI04-18	32	74LS32
WFMPPT	U1330A-7	33	74LS74
WS2	U520-7	32	74LS75
XCLK2	U1700D-8	33	74LS86
U430B-8	U430B-8	32	74LS151
U410D-11	U410D-11	32	74LS153
U630-15	U630-15	32	74LS153
YD BUS	YD BUS	32	74LS275
YH	U800-7	32	74LS248
YLO	U800-6	32	74LS368
YOUTENABLE	U400C-8	32	74LS153
YROWCLK	U1800A-6	33	74LS153
U2310E-10	U2310E-10	33	74LS153
Q2500	Q2500	31	74LS153
U2510-14	U2510-14	31	74LS153
U630-16	U630-16	32	74LS153

NOTE: * INTERCHANGEABLE WITH 2708
 COMPONENT NUMBER EXAMPLE
 A23 A2 R1234
 Assembly Number Subassembly Number (if used) Schematic Circuit Number

Static Sensitive Devices
 See Maintenance Section
 SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

Vertical Display and Control
 Reverse Side A29

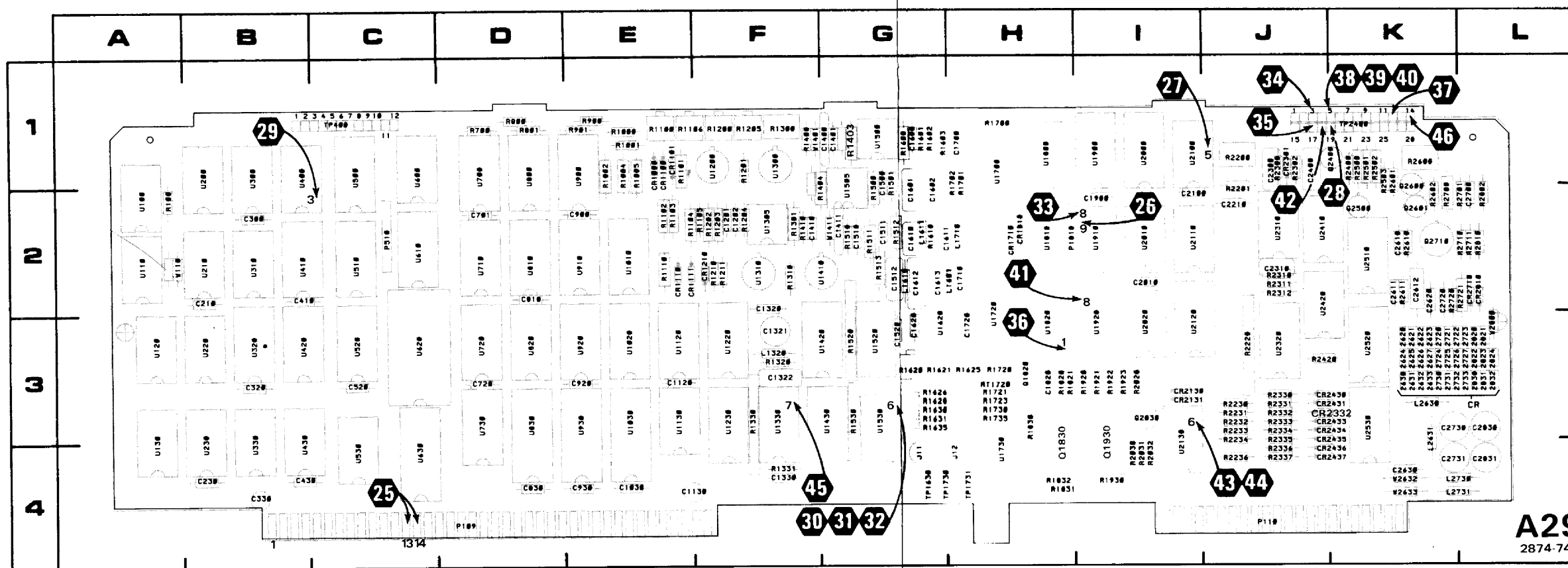
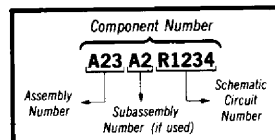


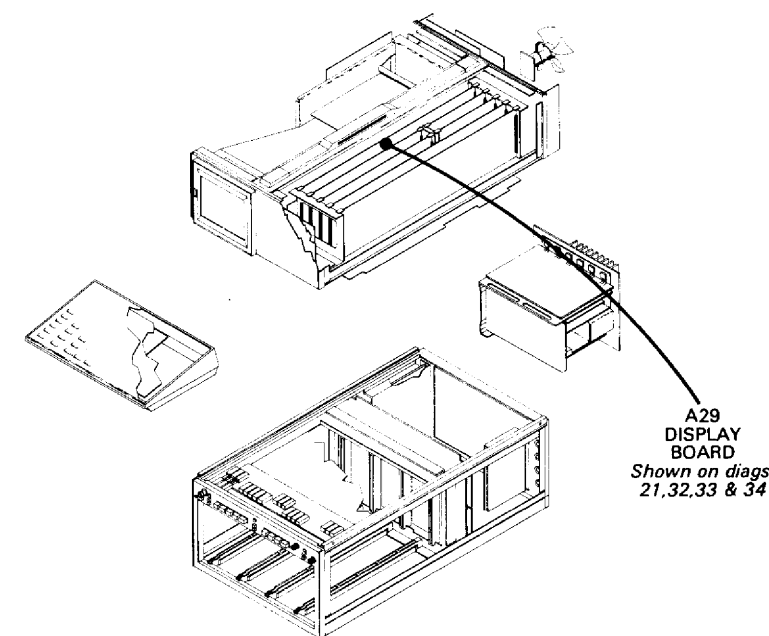
Figure 7-46. A29—Display circuit board assembly.

Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



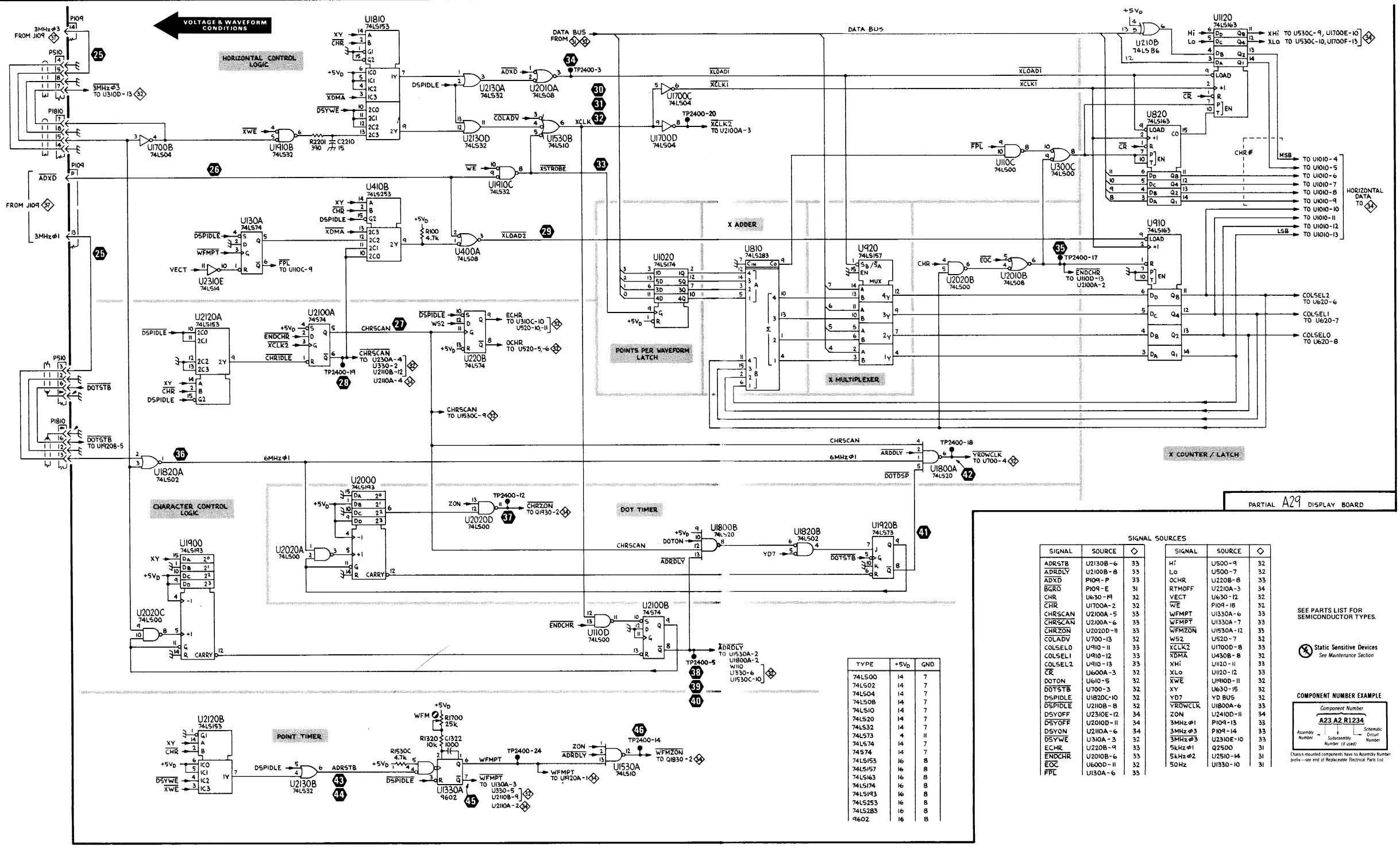
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



Assembly A29

A B C D E F G H

1
2
3
4
5



SIGNAL SOURCES

SIGNAL	SOURCE	Pin	SIGNAL	SOURCE	Pin
ADRSTB	U2130B-6	33	HI	U500-9	32
ADRDLV	U2100B-8	33	Lo	U500-7	32
ADXD	PI09-P	31	OCHR	U220B-8	33
BGR0	PI09-E	31	RTMOFF	U220A-3	34
CHR	U630-M	32	VECT	U630-I2	32
CHR	PI09-18	32	WE	PI09-18	32
CHRSCAN	U2100A-5	33	WFMP	U1330A-6	33
CHRSCAN	U2100A-6	33	WFMP	U1330A-7	33
CHRZON	U2200-11	33	WFMZON	U1930A-12	33
COLADV	U700-13	32	WS2	U520-7	32
COLSEL0	U410-11	33	XCLK2	U1700D-8	33
COLSEL1	U410-12	33	XDMA	U430B-8	32
COLSEL2	U410-13	33	XHI	U110-11	33
CR	U600A-3	32	XLO	U120-12	33
DOTON	U610-5	32	XWE	U140D-11	32
DOTSTB	U700-3	32	XY	U630-15	32
DSPIDLE	U1830C-10	32	YD7	YD BUS	32
DSYOFF	U2310E-12	34	YROWCLK	U1800A-6	33
DSYON	U2100D-11	34	ZON	U2410D-11	34
DSYWE	U310A-3	32	3MHz φ1	PI09-13	33
DSYWE	U310A-6	32	3MHz φ3	PI09-14	33
ECHR	U220B-9	33	3MHz φ3	U2310E-10	33
ENDCHR	U2010B-6	33	5kHz φ1	Q2500	31
EOC	U600D-11	32	5kHz φ2	U2510-14	31
FPL	U130A-6	33	50Hz	U1330-10	31

TYPE	+5V _D	GND
74LS00	14	7
74LS02	14	7
74LS04	14	7
74LS08	14	7
74LS10	14	7
74LS12	14	7
74LS13	14	7
74LS14	14	7
74LS15	16	8
74LS16	16	8
74LS17	16	8
74LS18	16	8
74LS19	16	8
74LS20	16	8
74LS21	16	8
74LS22	16	8
74LS23	16	8
74LS24	16	8
74LS25	16	8
74LS26	16	8
74LS27	16	8
74LS28	16	8
74LS29	16	8
74LS30	16	8

7854

2874-267
REV. A MAR 1981

HORIZONTAL DISPLAY AND CONTROL 33

SEE PARTS LIST FOR SEMICONDUCTOR TYPES.
Static Sensitive Devices See Maintenance Section

COMPONENT NUMBER EXAMPLE
A23 A2 R1234
Assembly Number Subassembly Number Schematic Number (if used)

Horizontal Display and Control
Reverse Side A29

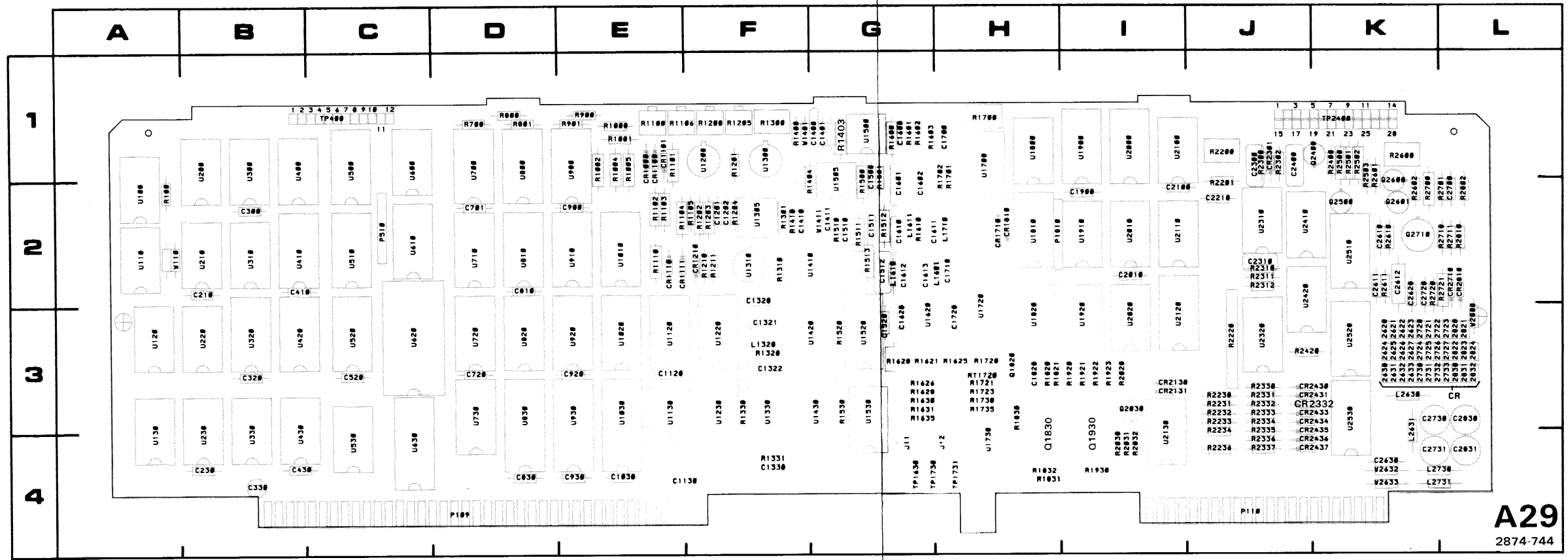
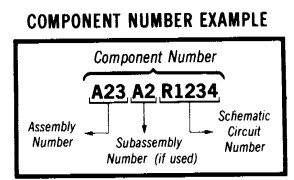
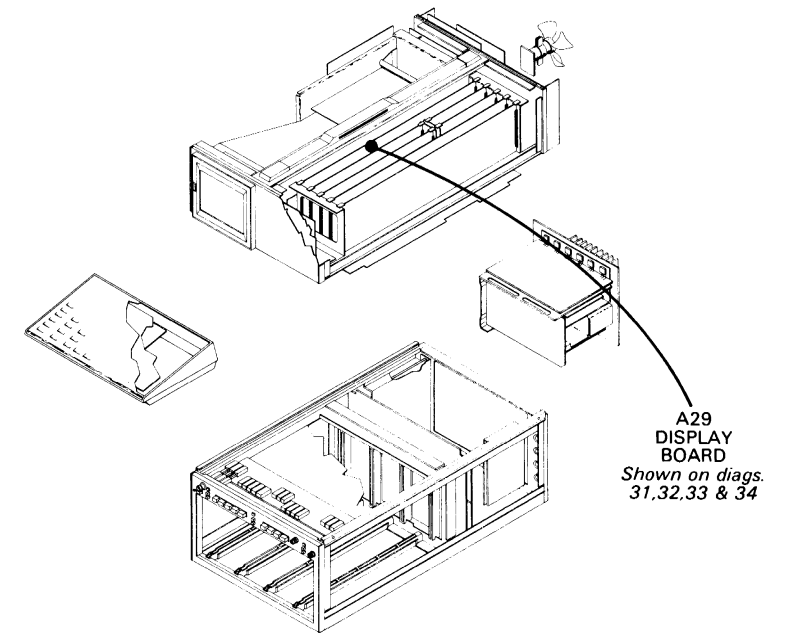


Figure 7-47. A29—Display circuit board assembly.

 Static Sensitive Devices
See Maintenance Section



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.



A B C D E F G H

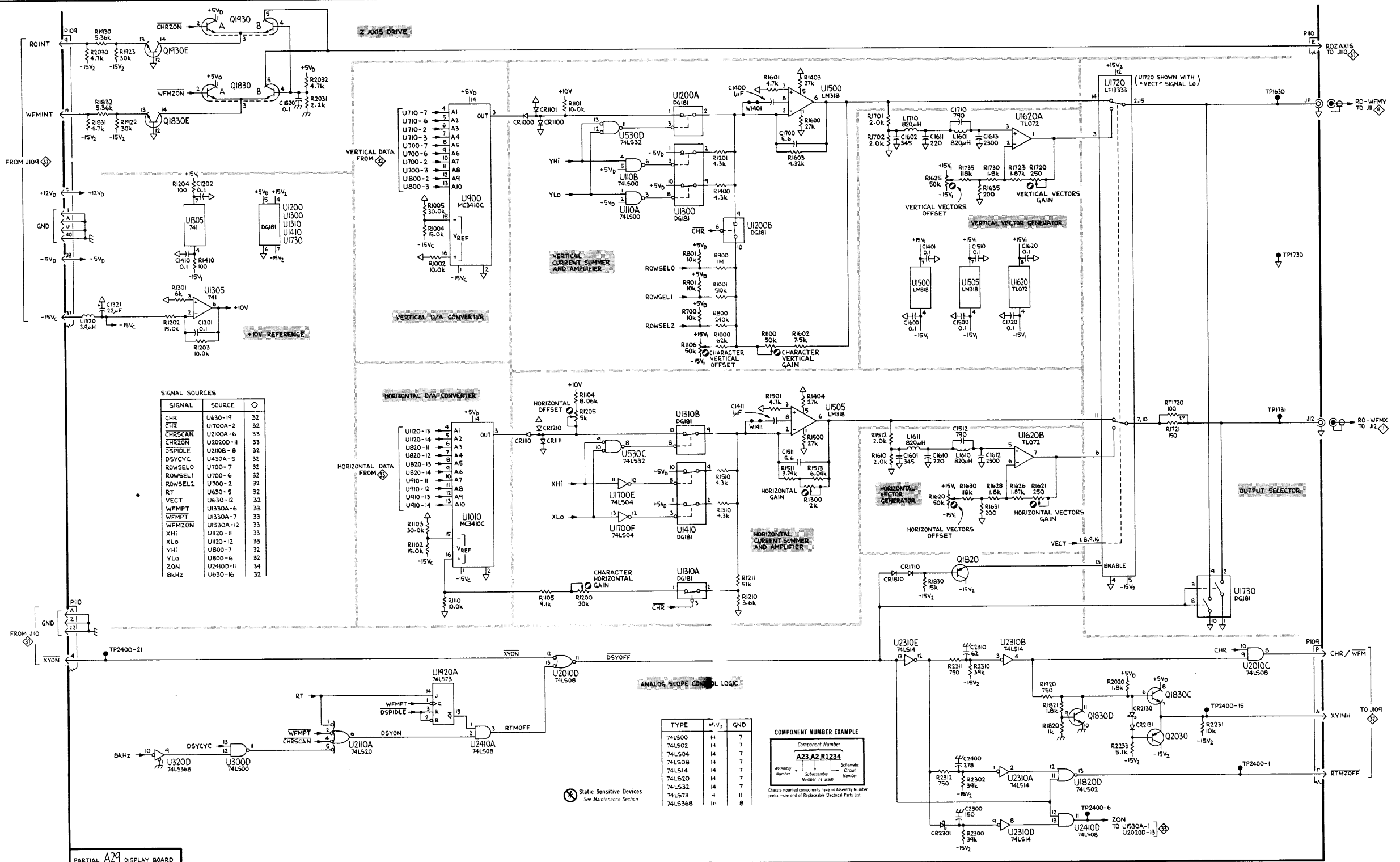
1

2

3

4

5



SIGNAL SOURCES

SIGNAL	SOURCE	Pin
CHR	U630-19	32
CHR	U700A-2	32
CHRSCAN	U2100A-6	33
CHRZON	U2020D-11	33
DSPIBLE	U210B-8	32
DSVCYC	U430A-5	32
ROWSELO	U700-7	32
ROWSEL1	U700-6	32
ROWSEL2	U700-2	32
RT	U630-5	32
VECT	U630-12	32
WFMPT	U1330A-6	33
WFMPT	U1330A-7	33
WFMZON	U1530A-12	33
XHI	U120-11	33
XLO	U120-12	33
YHI	U800-7	32
YLO	U800-6	32
ZON	U2410D-11	34
BkHz	U630-16	32

COMPONENT NUMBER EXAMPLE

Component Number	Assembly	Subassembly	Circuit Number
A23 A2 R1234			

Cross mounted components have no Assembly Number prefix - see end of Replaceable Electrical Parts List

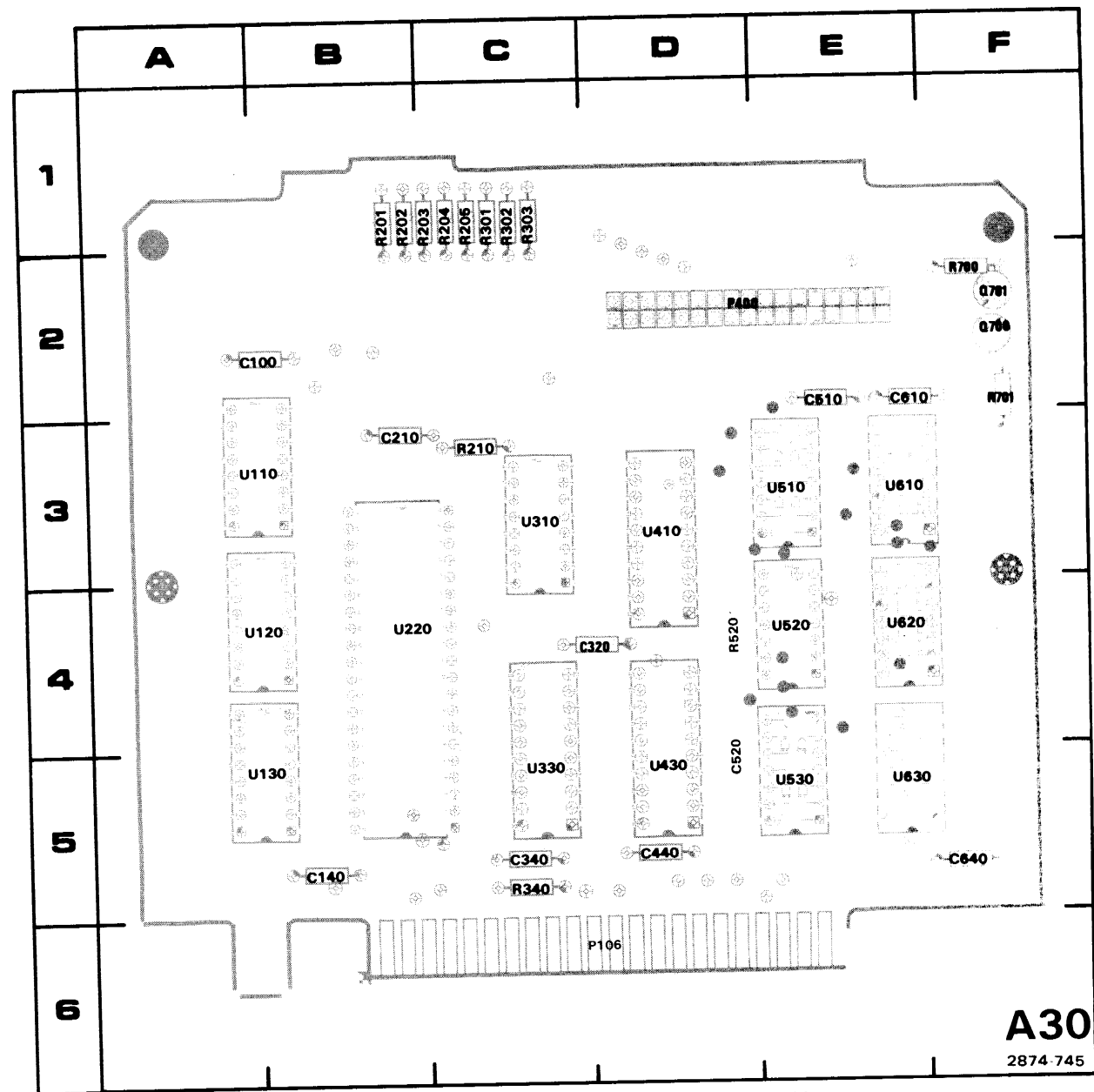
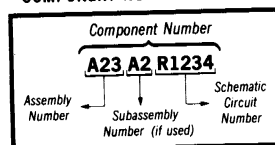


Figure 7-49. A30—GPIB circuit board assembly.

COMPONENT NUMBER EXAMPLE

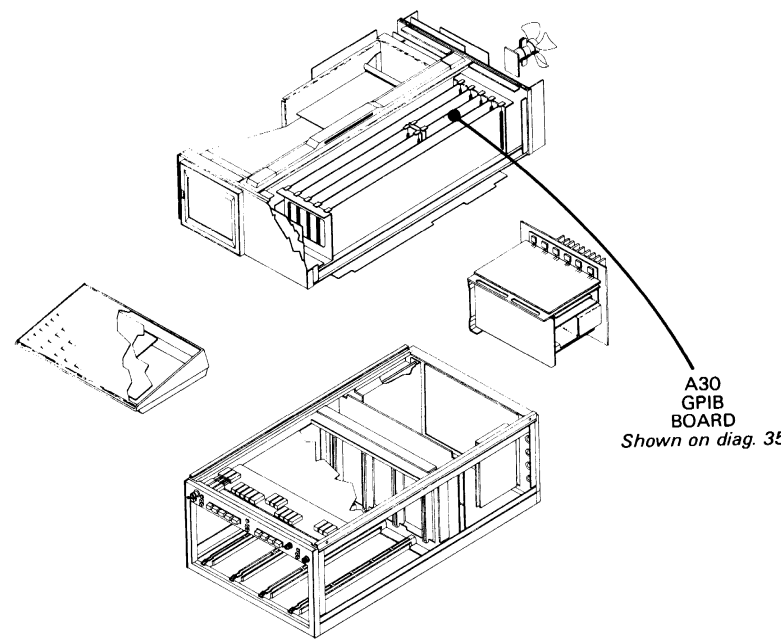


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section

GPIB DIAGRAM 35

A30 ASSY		
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C100	A1	B2
C140	A2	B5
C210	A2	B3
C320	A1	D4
C340	A2	C5
C440	A2	D5
C510	A1	E2
C610	A2	E2
C640	A2	F5
P106	A1	C5
P400	F1	D2
Q700	D5	F2
Q701	D5	F2
R201	E1	B1
R202	E1	B1
R203	E1	C1
R204	E1	C1
R205	E1	C1
R210	D4	C3
R301	E1	C1
R302	E1	C1
R303	E1	C1
R340	C3	C5
R700	D5	F2
R701	D5	F2
U110	E4	B3
U120	E2	B4
U130	E2	B5
U220	D2	B4
U310	E3	C3
U330A	B1	C5
U330B	B2	C5
U410	D1	D3
U430A	B2	D5
U430B	B1	D5
U510A	B3	E3
U510B	B3	E3
U510C	B4	E3
U510D	C4	E3
U520	B4	E4
U530A	B2	E5
U530B	C5	E5
U530C	A5	E5
U530D	B3	E5
U610A	C4	E3
U610B	C3	E3
U620A	A4	E4
U620B	B4	E4
U630A	A3	E5
U630B	B5	E5
U630C	D3	E5
U630D	D4	E5
U630E	B3	E5
U630F	C5	E5



REV A MAR 1981

A B C D E F

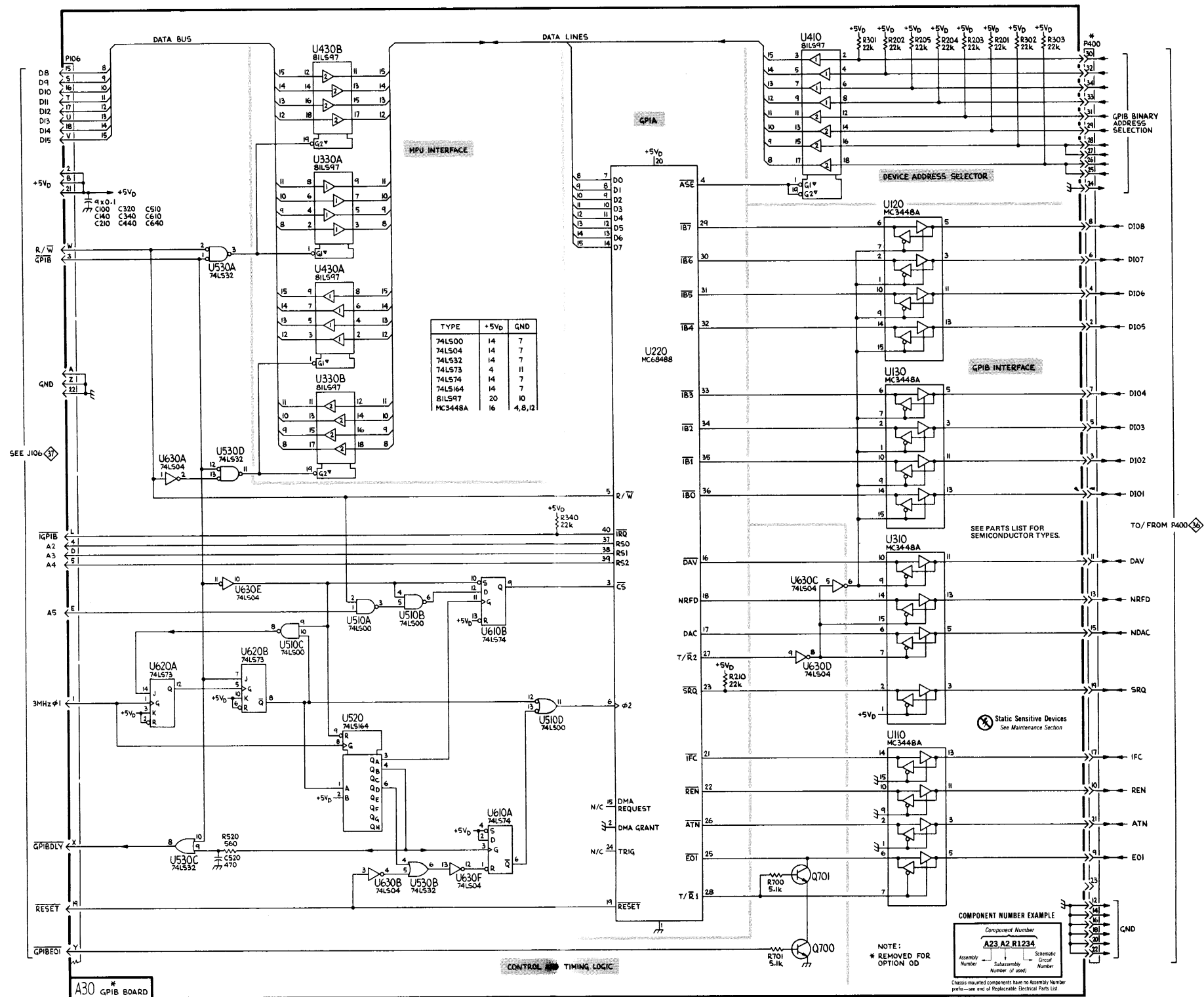
1

2

3

4

5



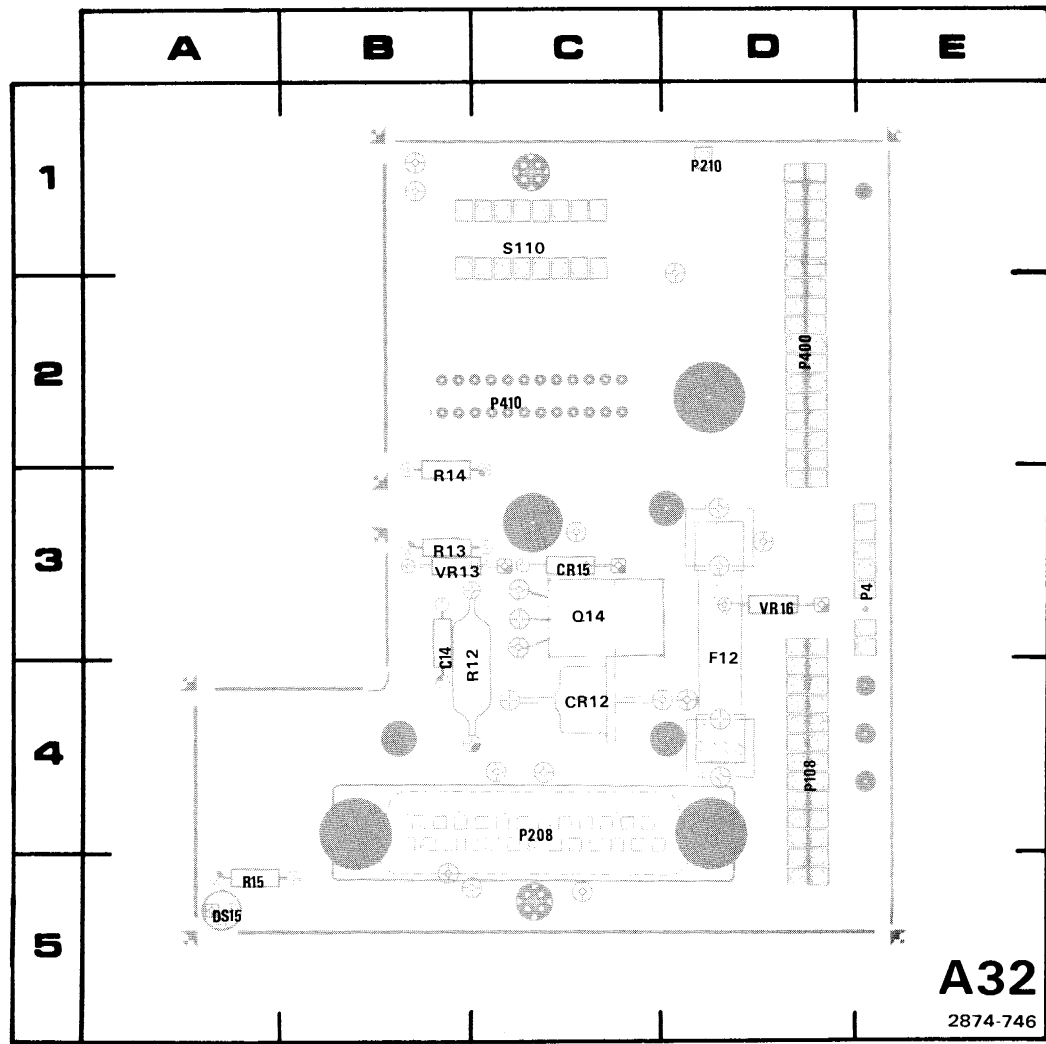


Figure 7-50. A32—Rear Panel Connector circuit board assembly.

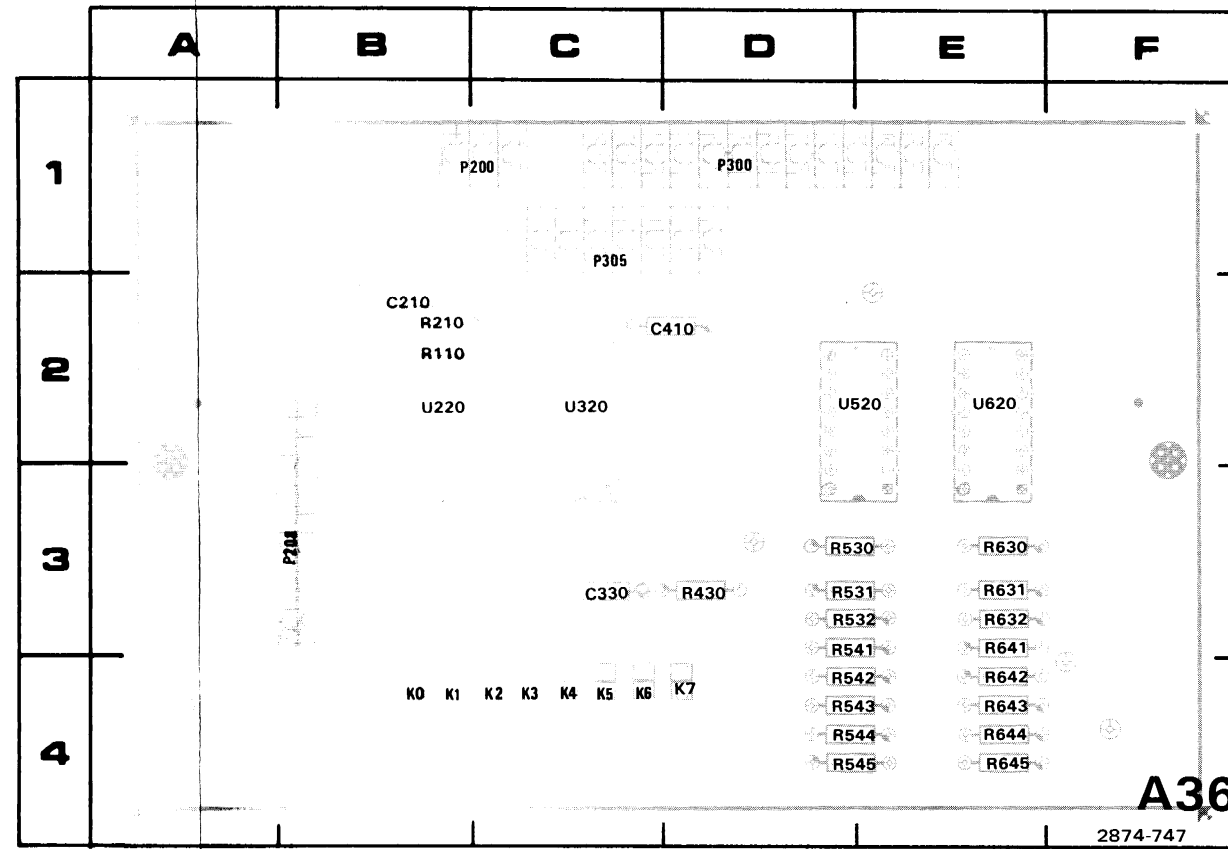


Figure 7-51. A36—Calculator Keyboard circuit board assembly.

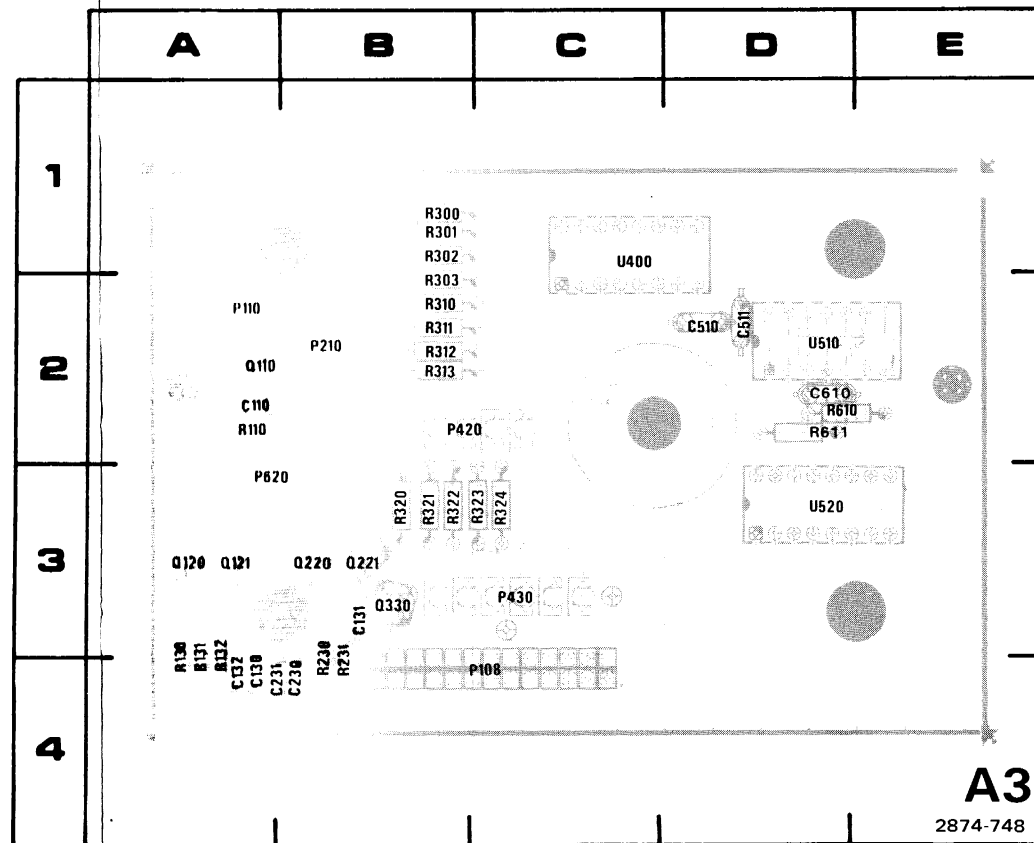
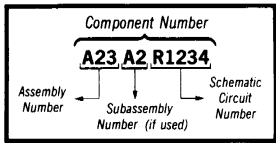


Figure 7-52. A3—Front Panel Keyboard Electronics circuit board assembly.

COMPONENT NUMBER EXAMPLE

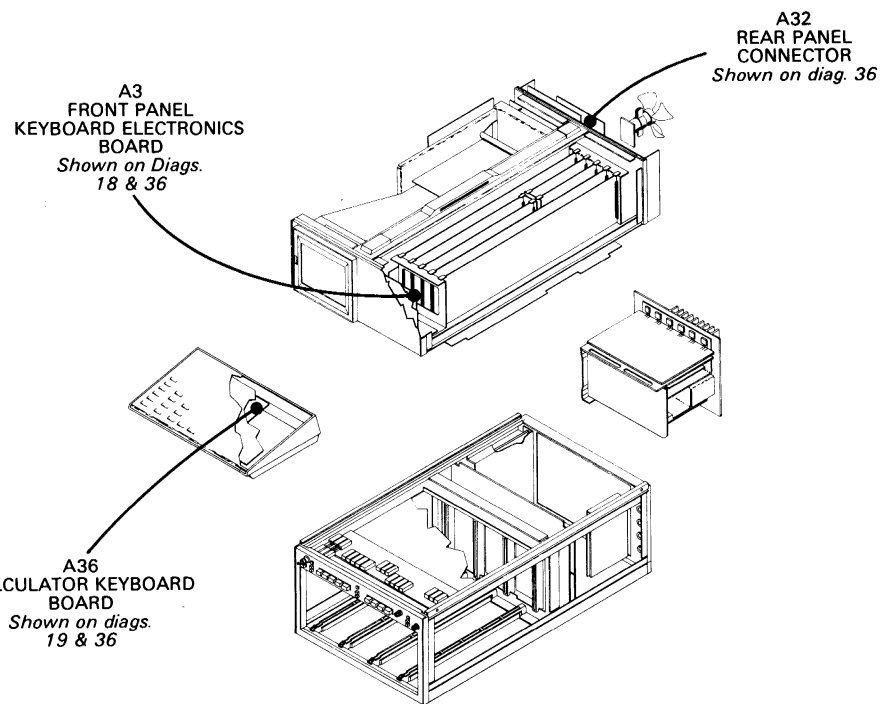


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section

REAR-PANEL CONNECTORS DIAGRAM 36

PARTIAL A3 ASSY		
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
P108	E1	C3
<i>Partial A3 ASSY also shown on diagram 18.</i>		
PARTIAL A27 ASSY		
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
P108	D1	C1
<i>Partial A27 ASSY also shown on diagrams 27 and 28.</i>		
A32 ASSY		
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C14	B3	D4
CR12	B3	C4
CR15	B3	C3
DS15	B3	A5
F12	B3	D4
P4	B3	E3
P108	E3	D4
P208	F3	C4
P210	B4	D1
P400	B1	D2
P410	B1	C2
Q14	B3	C3
R12	B3	D4
R13	B3	B3
R14	B3	B3
R15	B3	A5
S110	A2	C1
VR13	B3	B3
VR16	B3	D3
PARTIAL A36 ASSY		
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
P208	G3	B3
<i>Partial A36 ASSY also shown on diagram 19.</i>		
CHASSIS MOUNTED PARTS		
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
J13	A3	CHASSIS
J14	A3	CHASSIS
J15	A3	CHASSIS
S15	A3	CHASSIS
S16	A4	CHASSIS



35 GPIB
Reverse Side
A32, A27, & A3

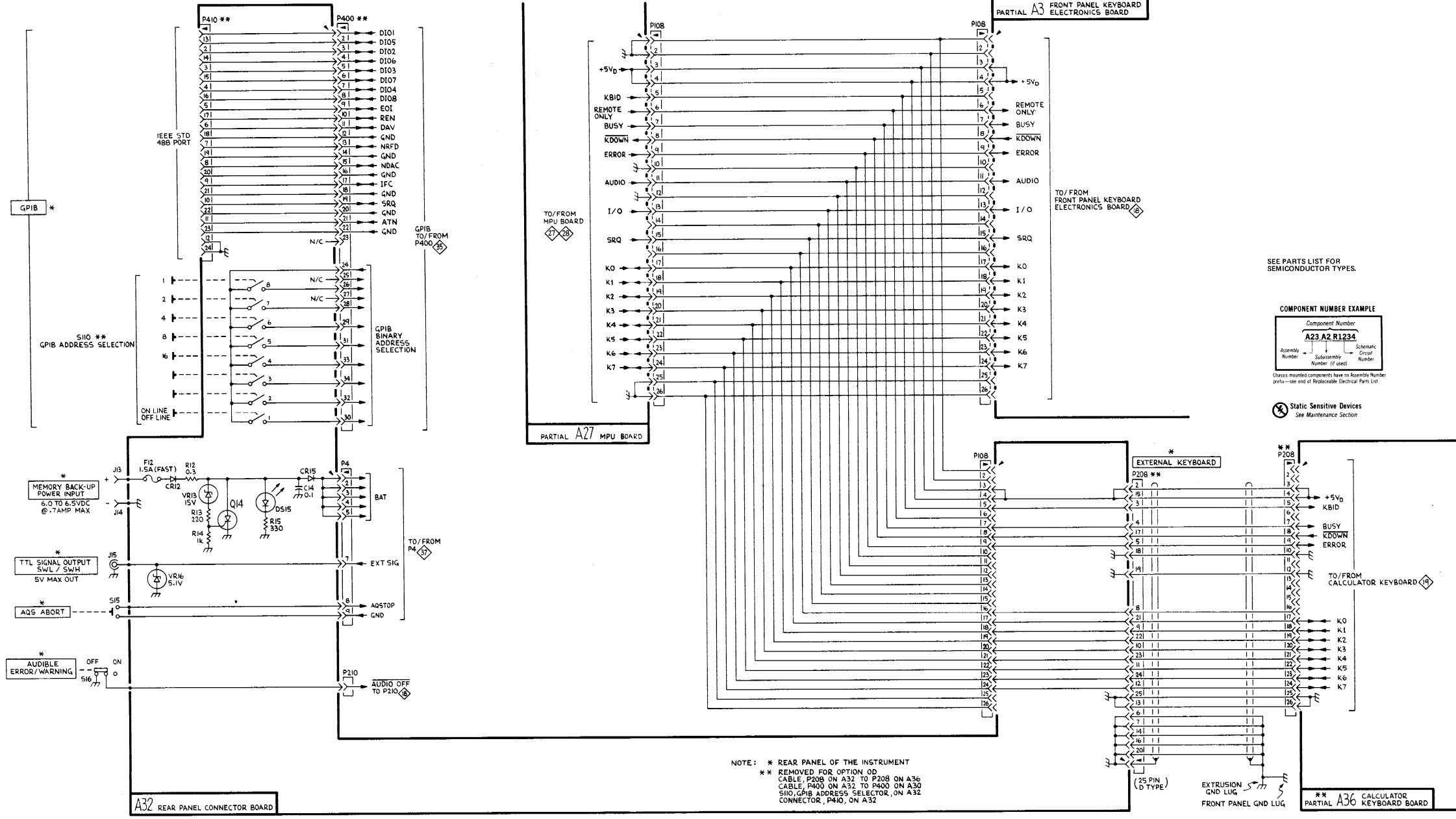
A B C D E F G

1

2

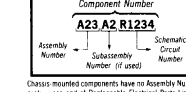
3

4



SEE PARTS LIST FOR SEMICONDUCTOR TYPES.

COMPONENT NUMBER EXAMPLE



Character mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List

⊗ Static Sensitive Devices See Maintenance Section

NOTE: * REAR PANEL OF THE INSTRUMENT
 ** REMOVED FOR OPTION 0D
 CABLE P208 ON A32 TO P208 ON A36
 CABLE P400 ON A32 TO P400 ON A30
 SIO, GPIB ADDRESS SELECTOR, ON A32
 CONNECTOR, P410, ON A32

2874-270
 REV A MAR 1981

7854

REAR PANEL CONNECTOR **36**

36 Rear Panel Connector Reverse Side A8

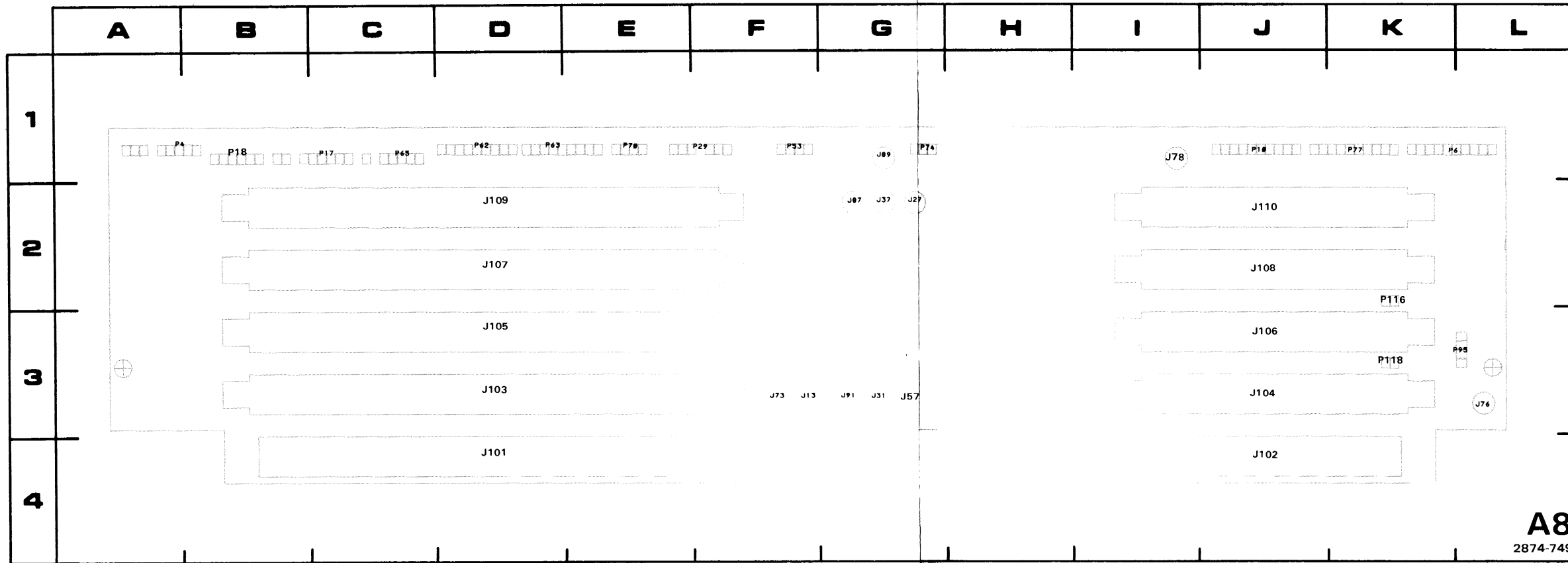
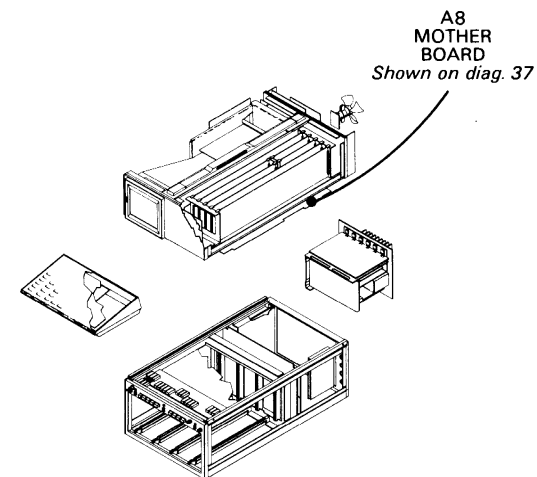
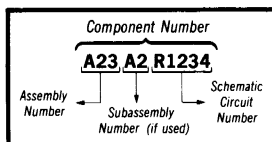


Figure 7-53. A8—Mother circuit board assembly.



 Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE

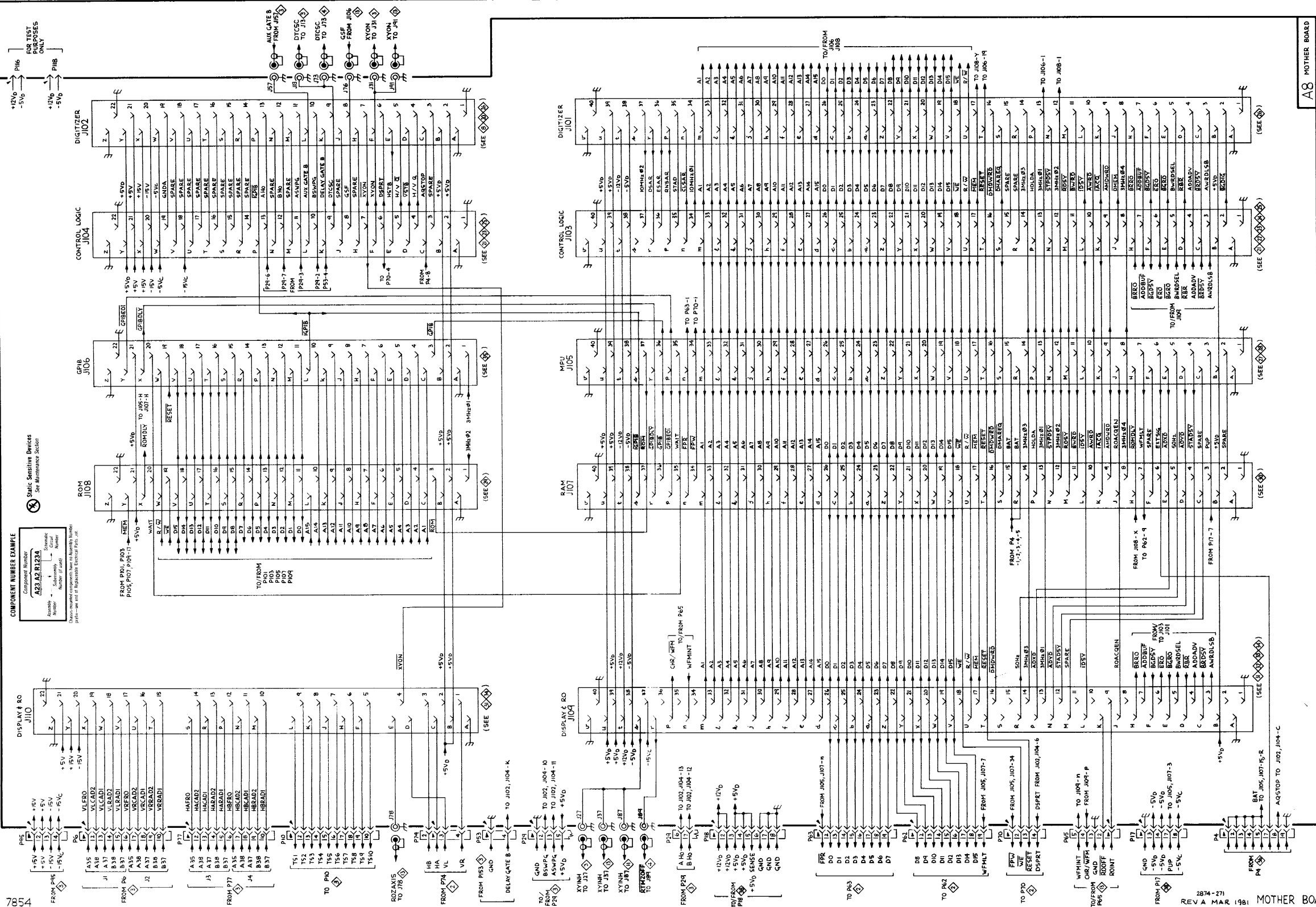


Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Assembly A8

A B C D E F G H

1
2
3
4
5



A8 MOTHER BOARD

7854

287A-271
REV A MAR 1981
MOTHER BOARD

37 Mother Board

Reverse Side A7

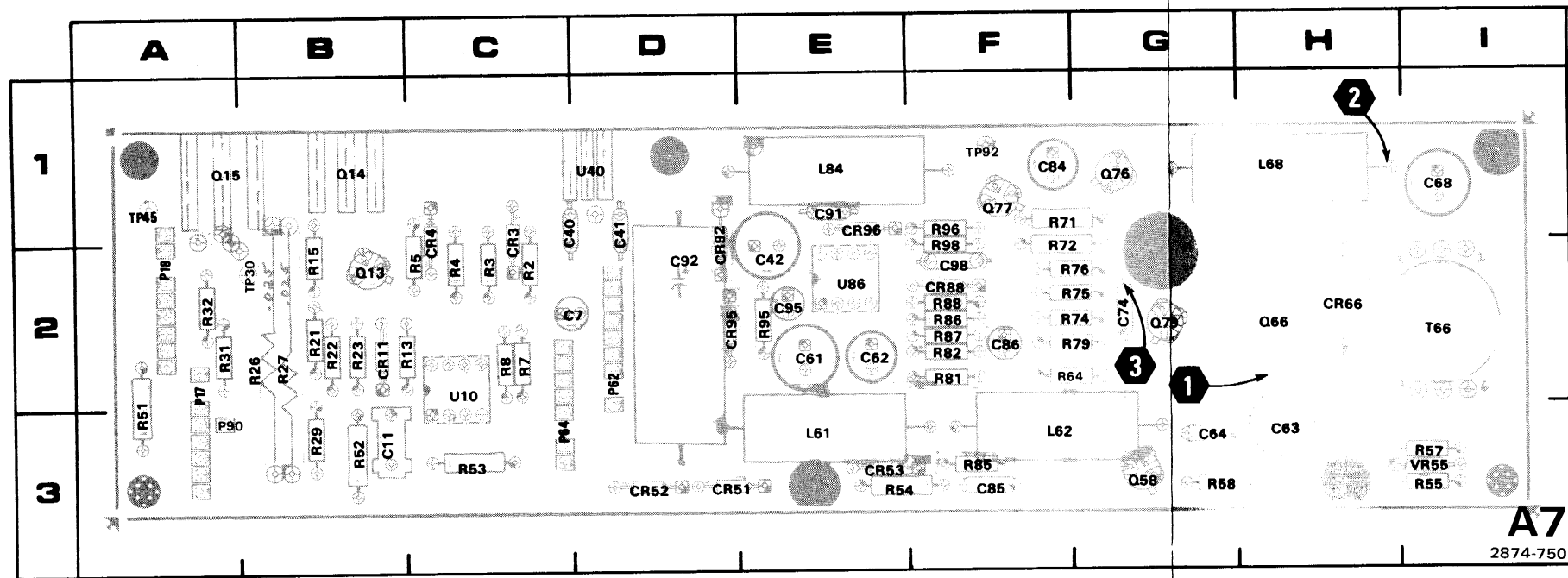
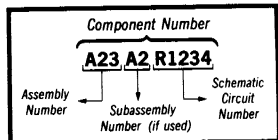


Figure 7-54. A7—Aux Regulator circuit board assembly.

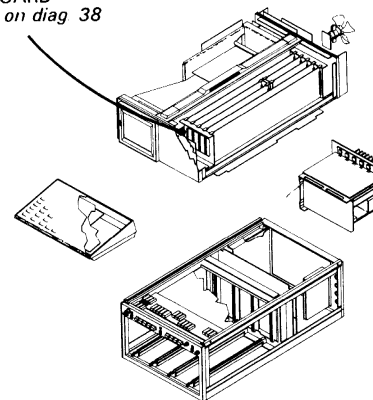
COMPONENT NUMBER EXAMPLE



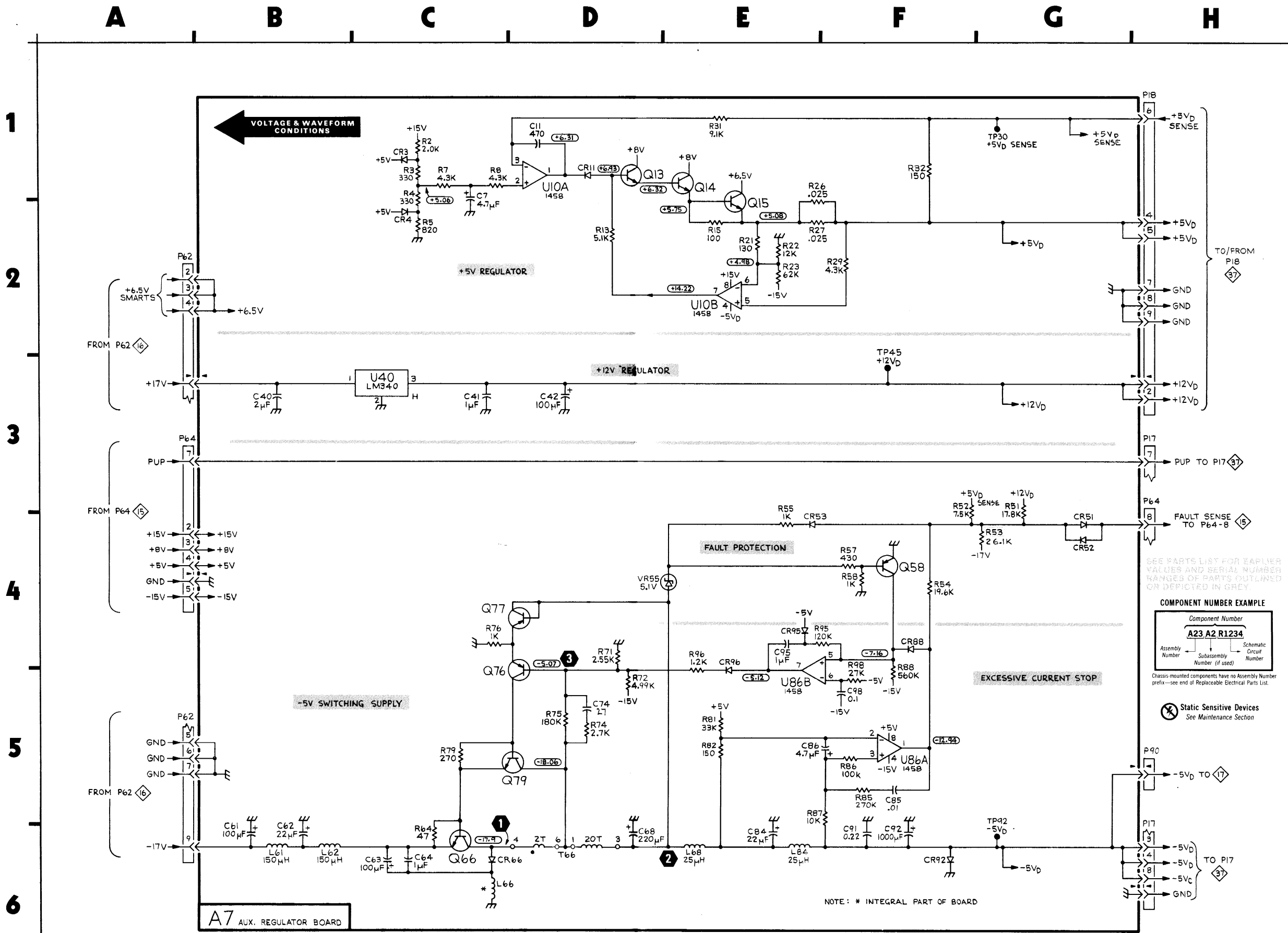
Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

Static Sensitive Devices
See Maintenance Section

A7
AUX REGULATOR
BOARD
Shown on diag 38

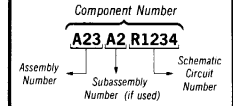


REV A MAR 1981



SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN GREY.

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

⚡ Static Sensitive Devices
See Maintenance Section

7854

2874-272
REV JUL 1981

AUXILIARY REGULATOR 38

TROUBLESHOOTING CHART INSTRUCTIONS

1. Follow the procedure for Analog Test Card (067-0912-00) installation in Section 3, Maintenance, then proceed with the following instructions.
2. Beginning at the top left block of the chart proceed downward until the 7854 does not perform as indicated.
3. Then follow the dashed lines as the symptom indicates. Each shaded block indicates a circuit which may be the cause of the malfunction. Refer to Section 3, Theory of Operation, for a detailed discussion of the circuit, and Section 7, Diagrams and Circuit Board illustrations, for the circuit schematic.

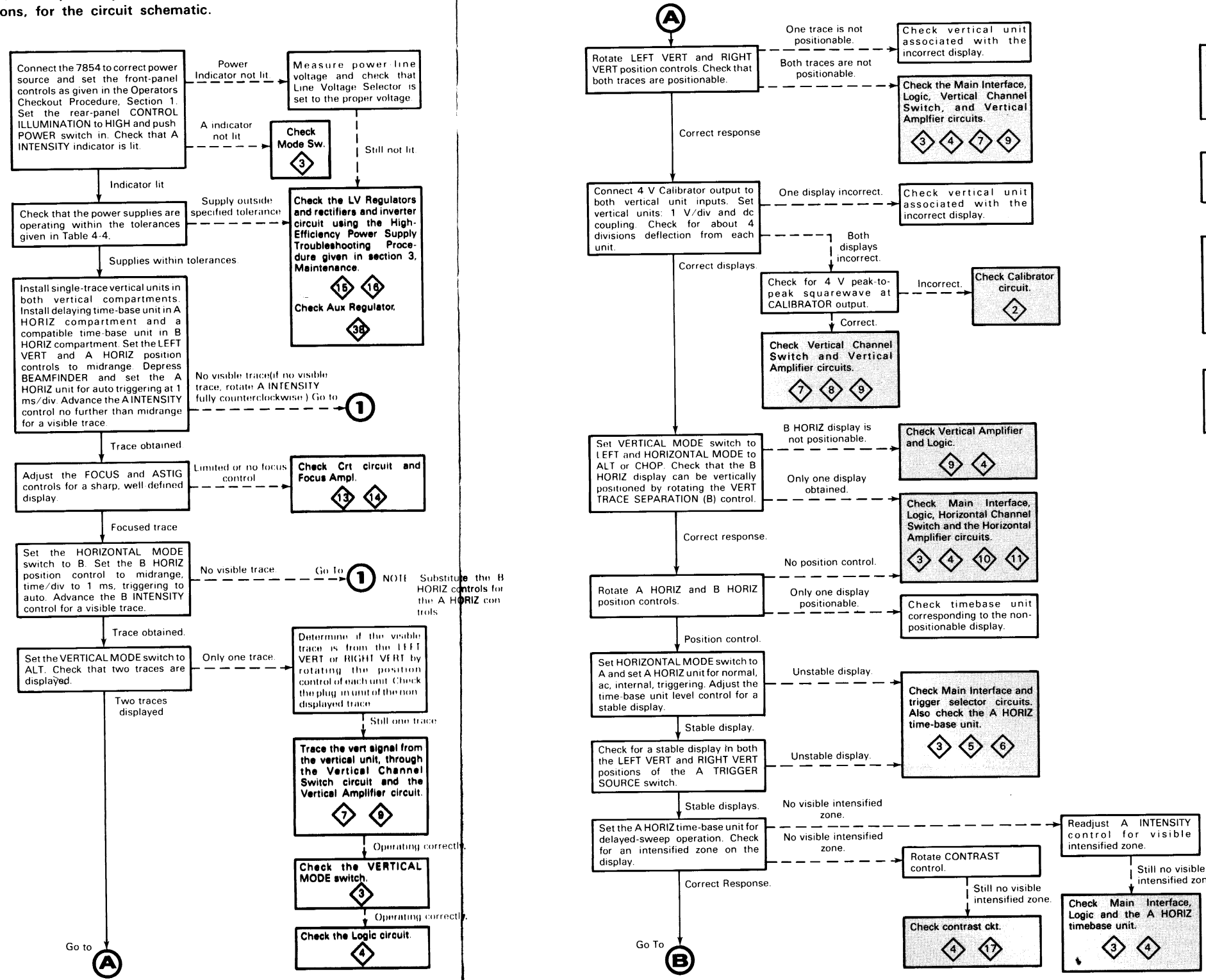


Figure 7-55. 7854 Troubleshooting Chart.

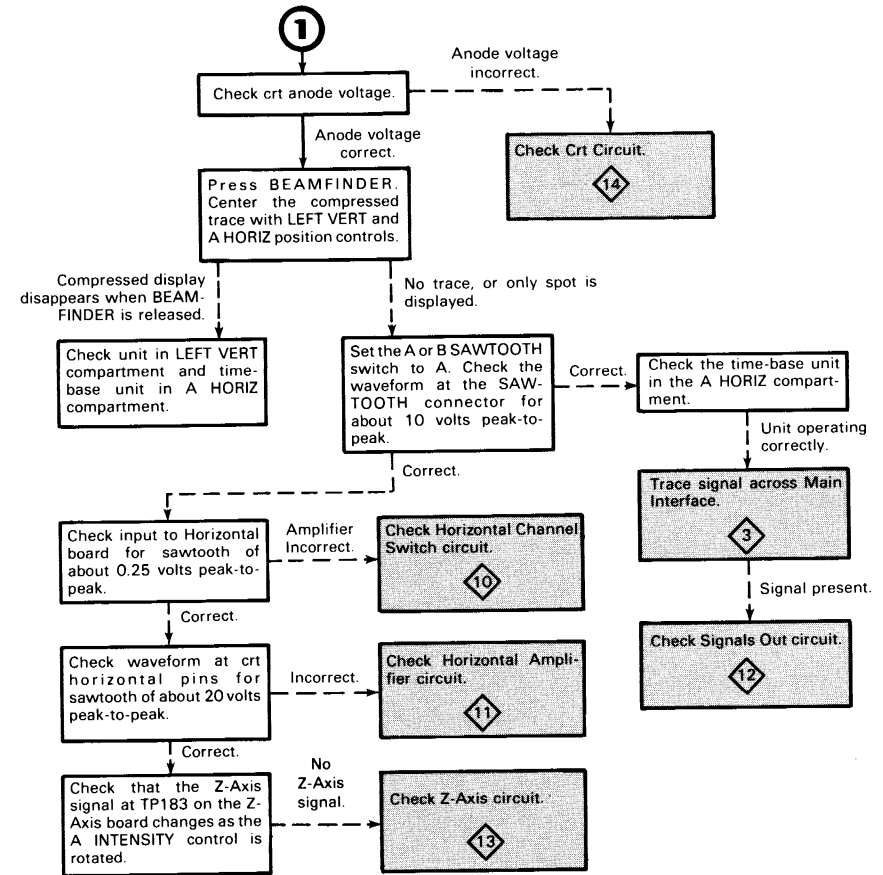
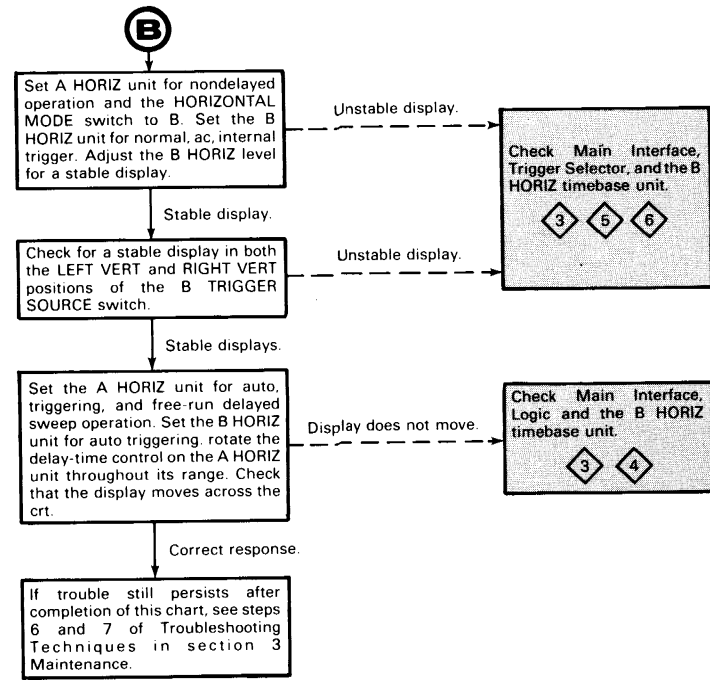
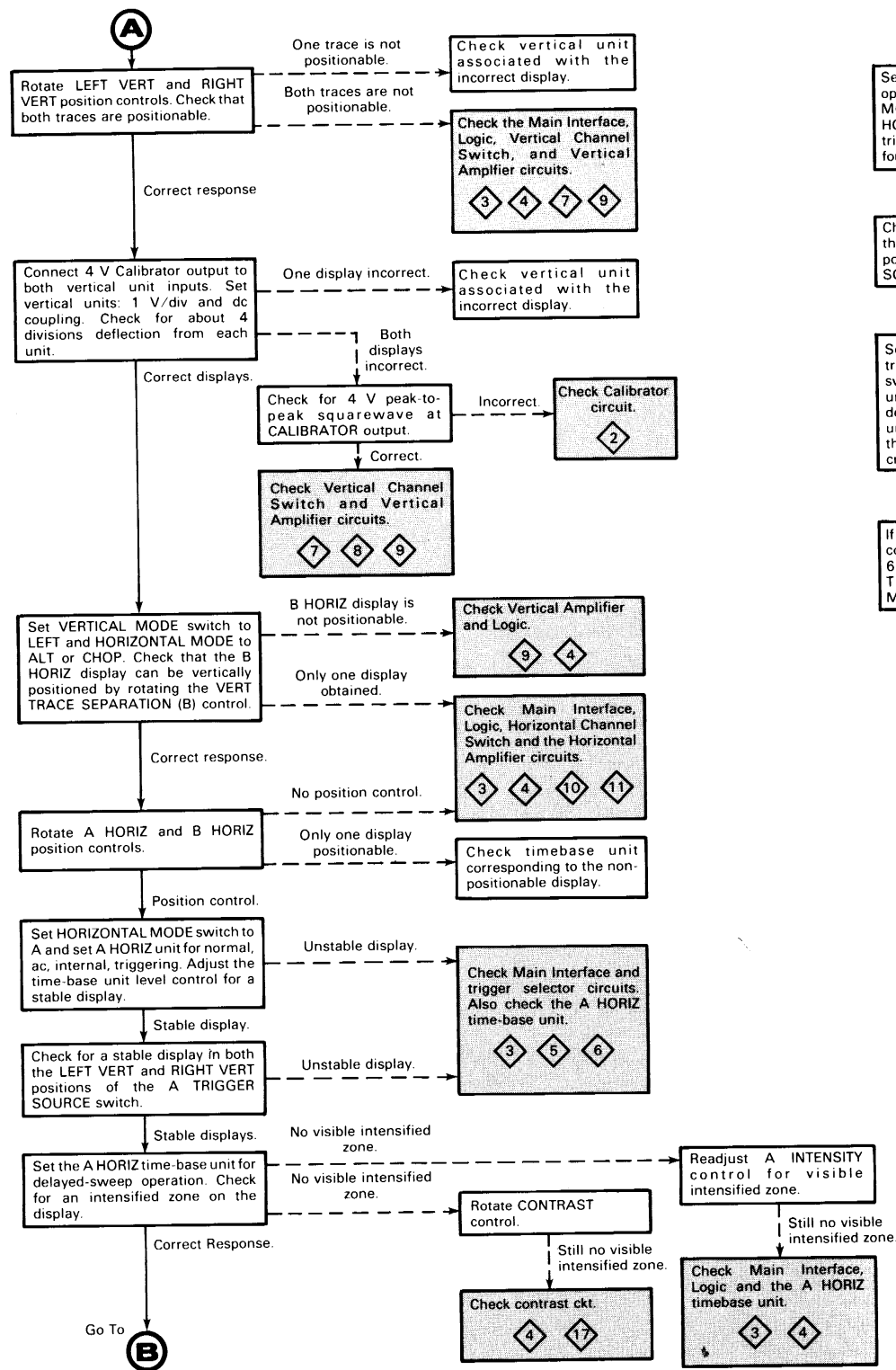


Figure 7-55. 7854 Troubleshooting Chart.

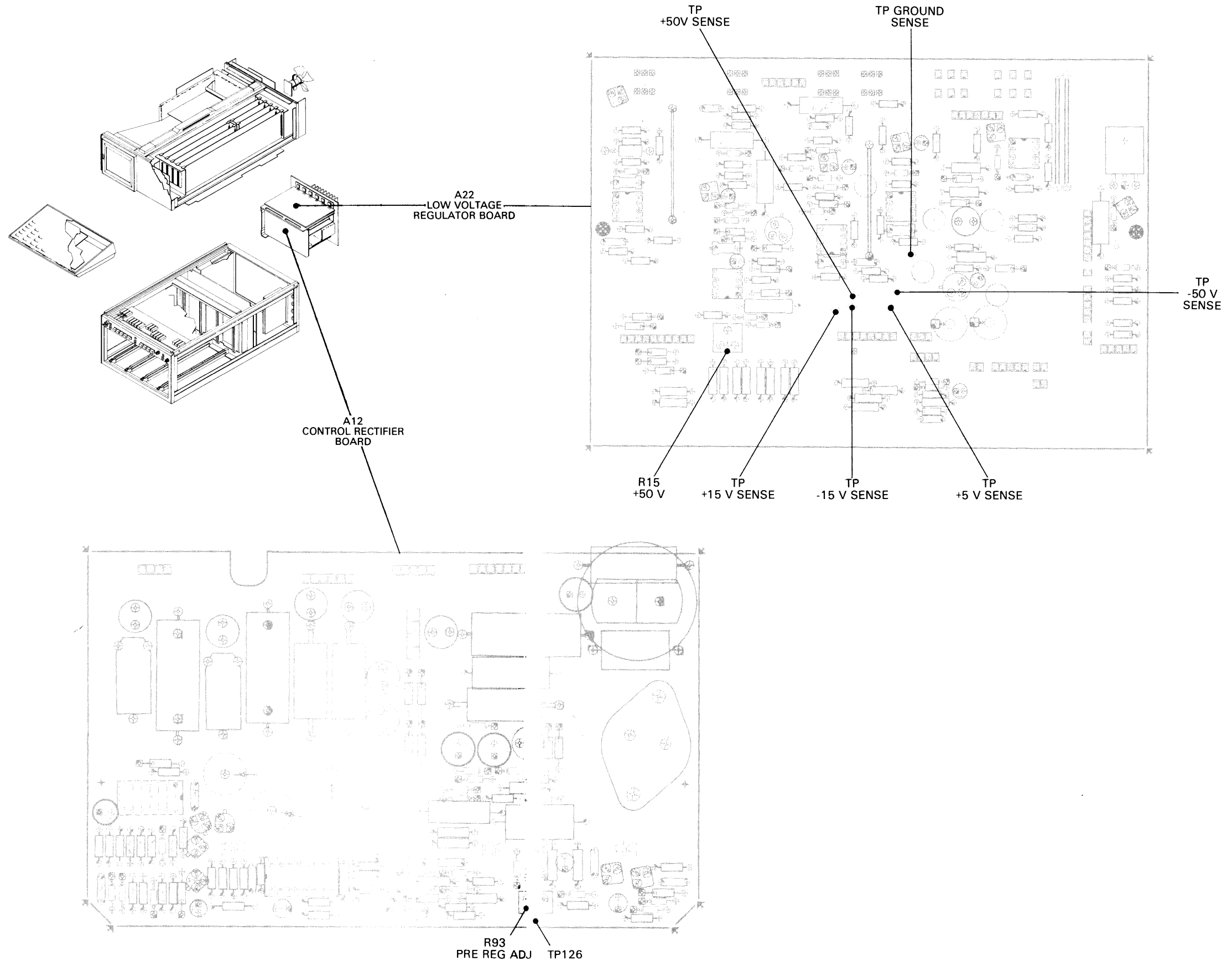


Figure 7-56. Test Point and Adjustment Locations A.

Test Point and Adjustment Locations A

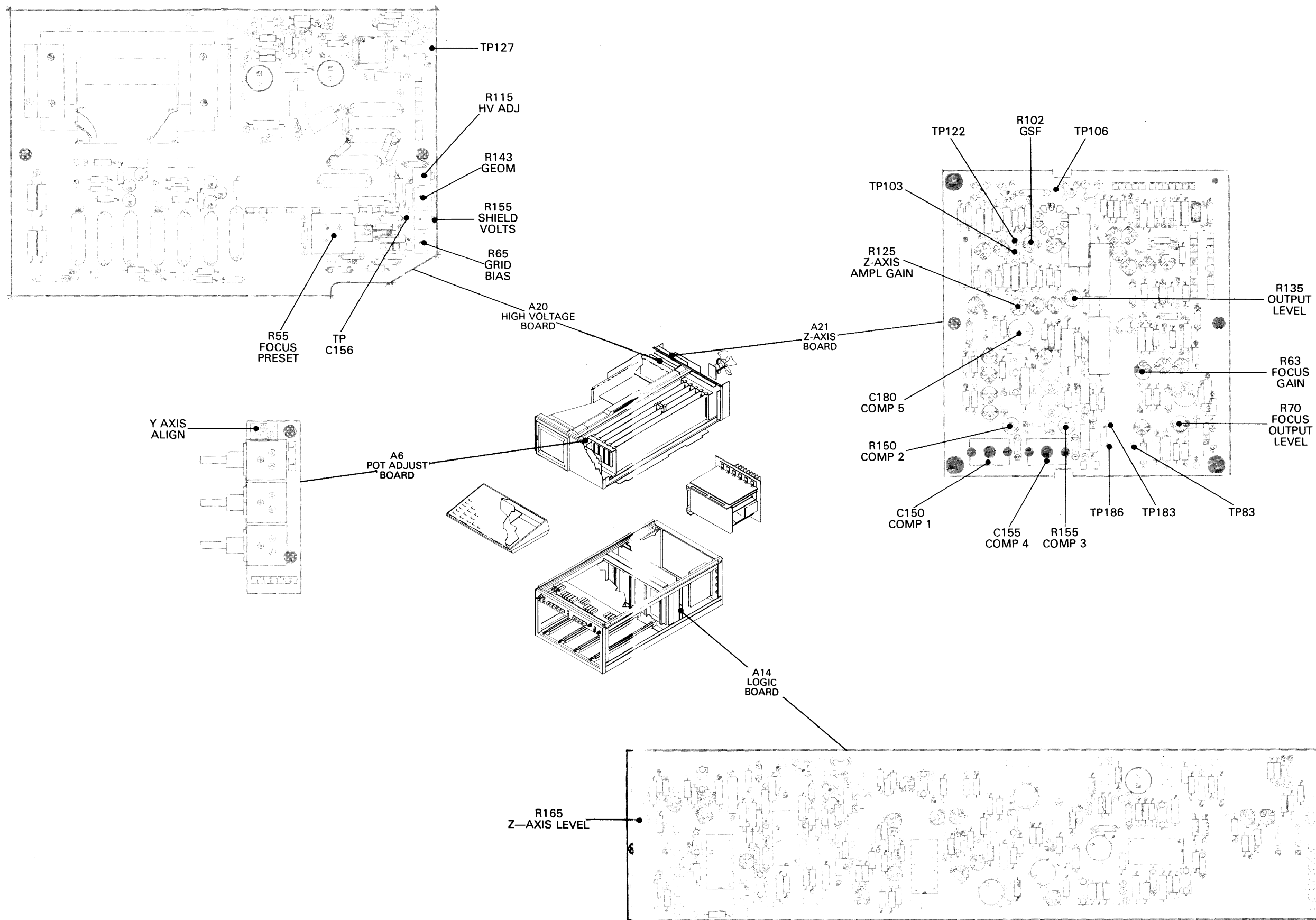


Figure 7-57. Test Point and Adjustment Locations B.

REV A MAR 1981

Test Point and Adjustment Locations B

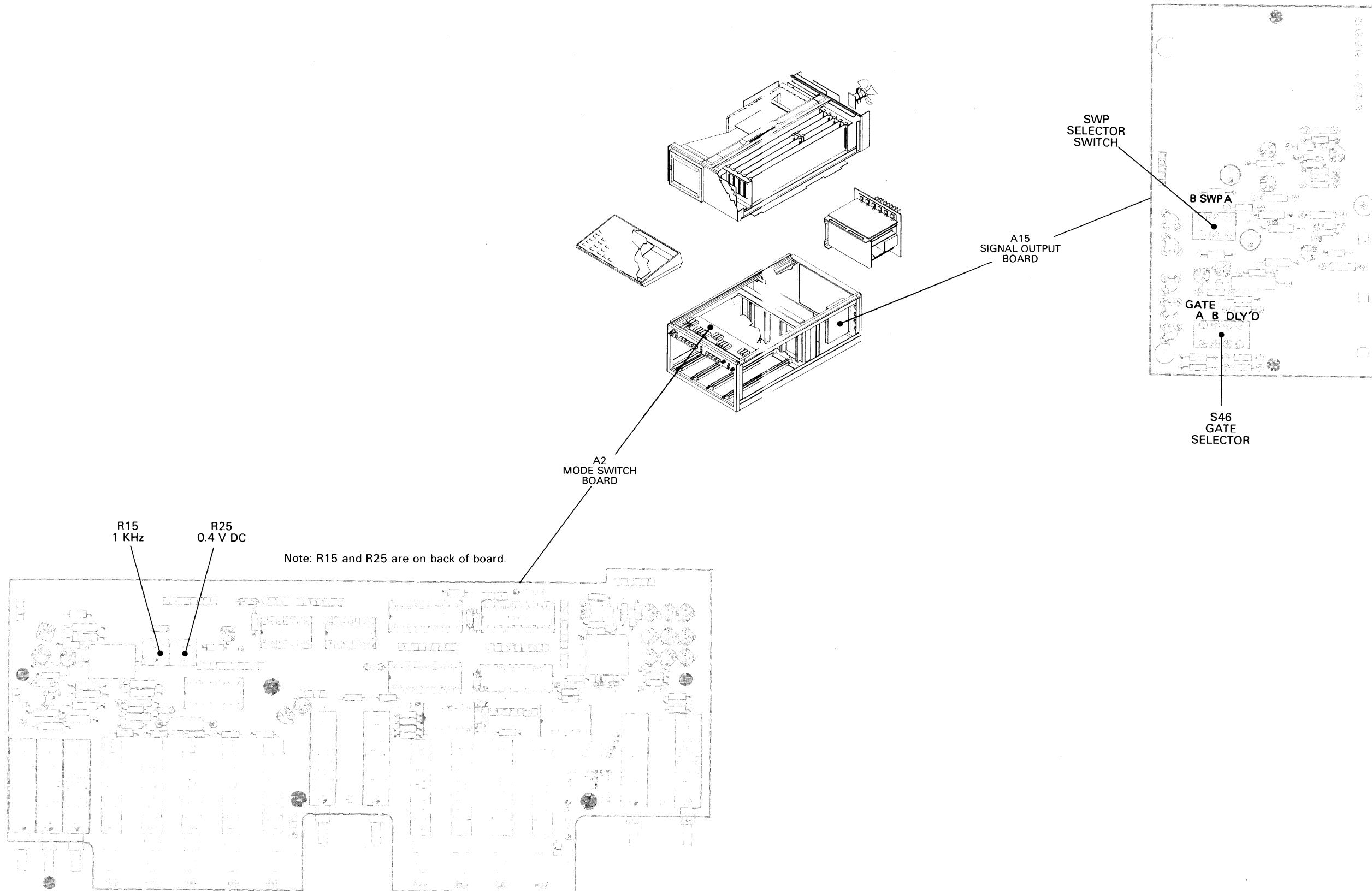
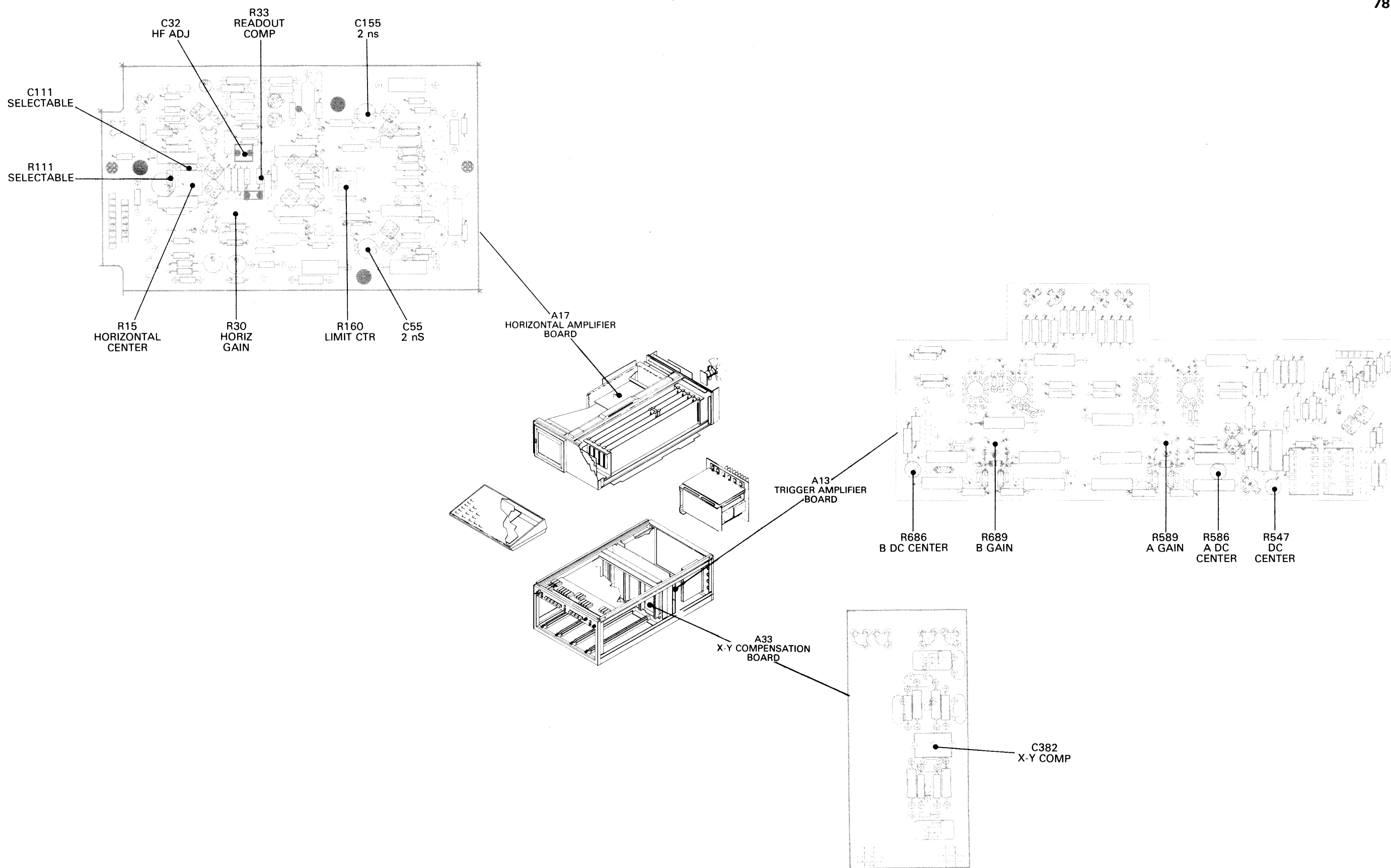


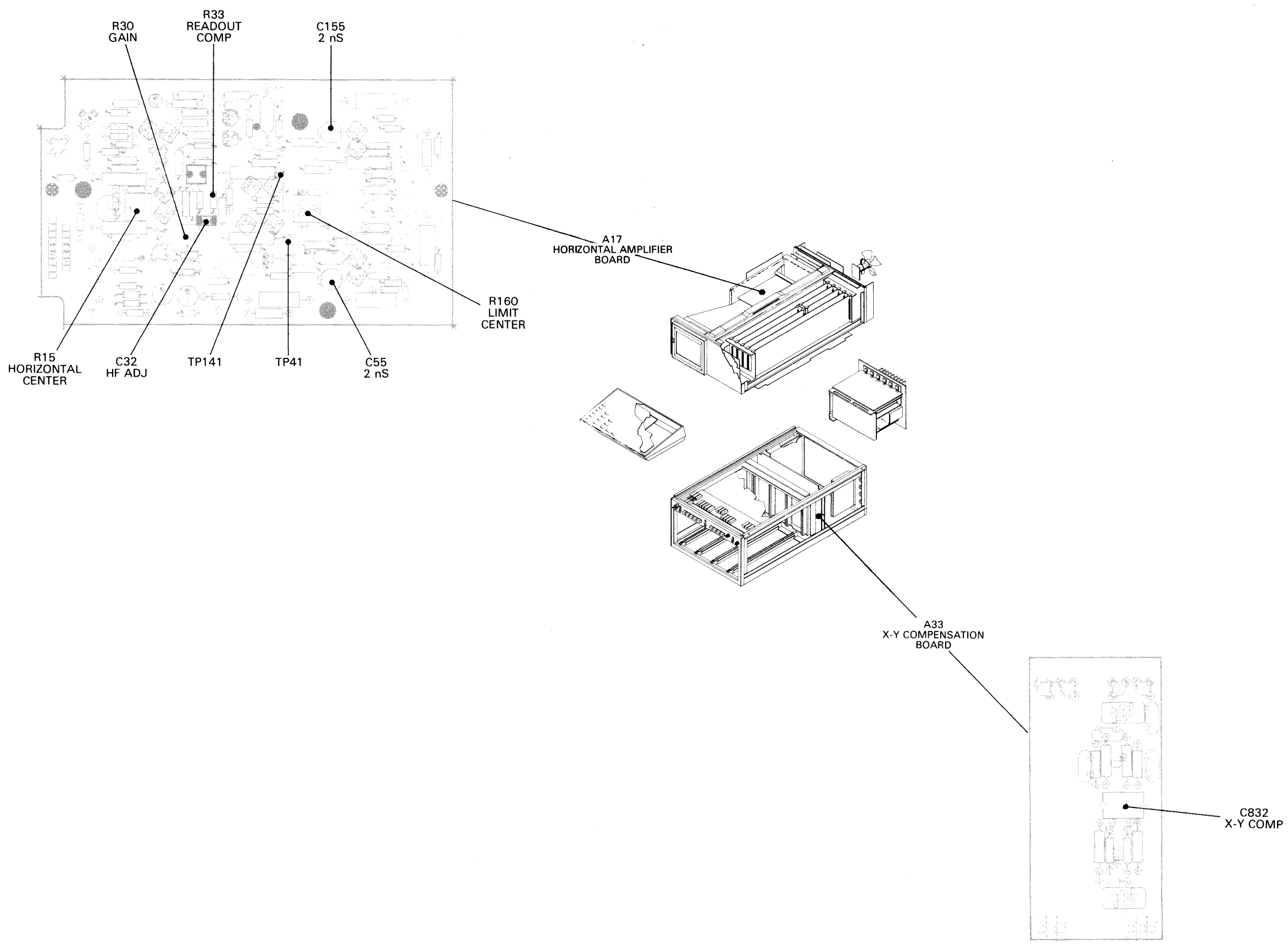
Figure 7-58. Test Point and Adjustment Locations C.



Test Point and Adjustment Locations D

Figure 7-59. Test Point and Adjustment Locations D.

REV A MAR 1981



Test Point and Adjustment Locations E

Figure 7-60. Test Point and Adjustment Locations E.

REV A MAR 1981

2874-756

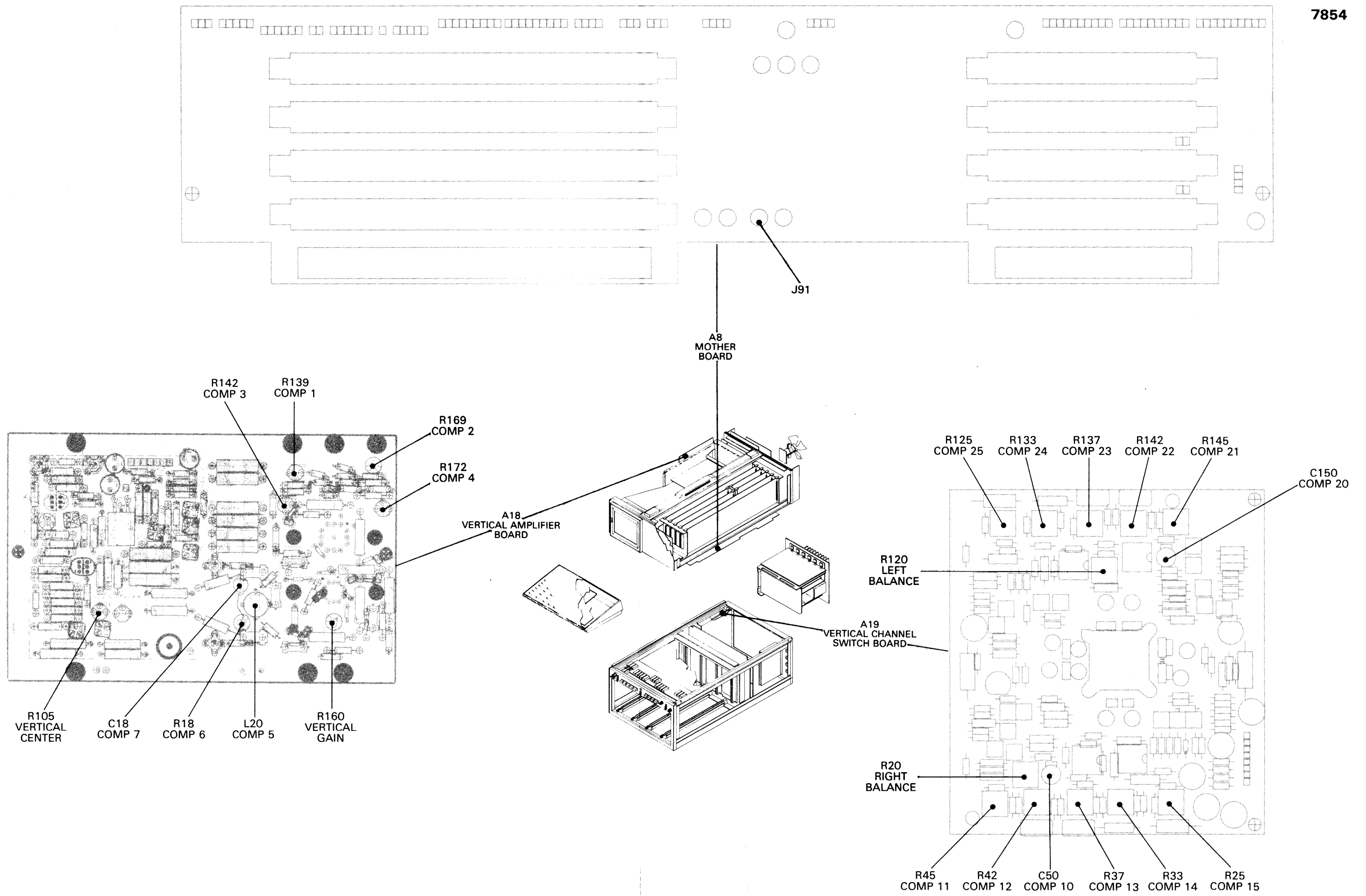


Figure 7-61. Test Point and Adjustment Locations F.

REV A MAR 1981

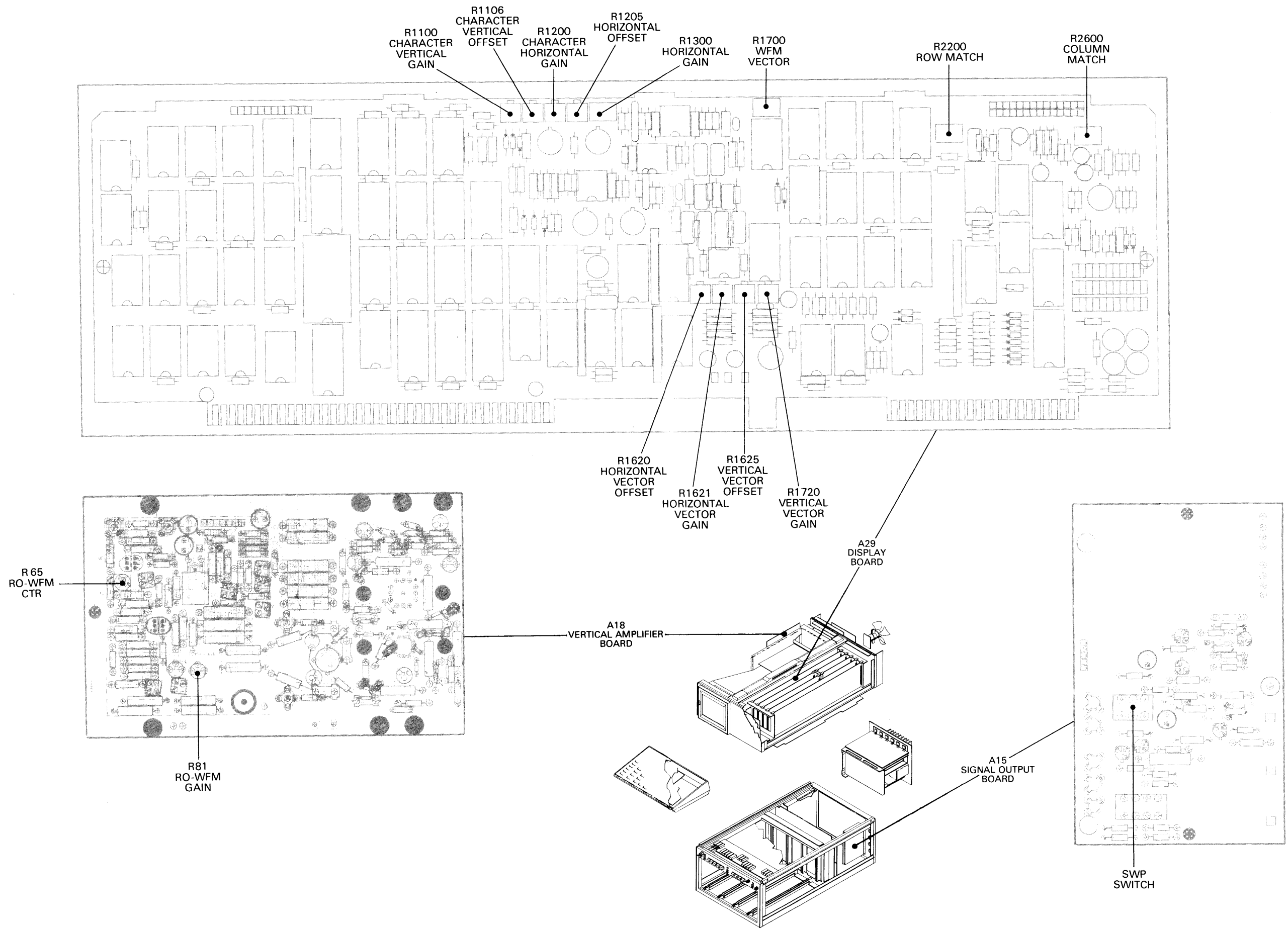
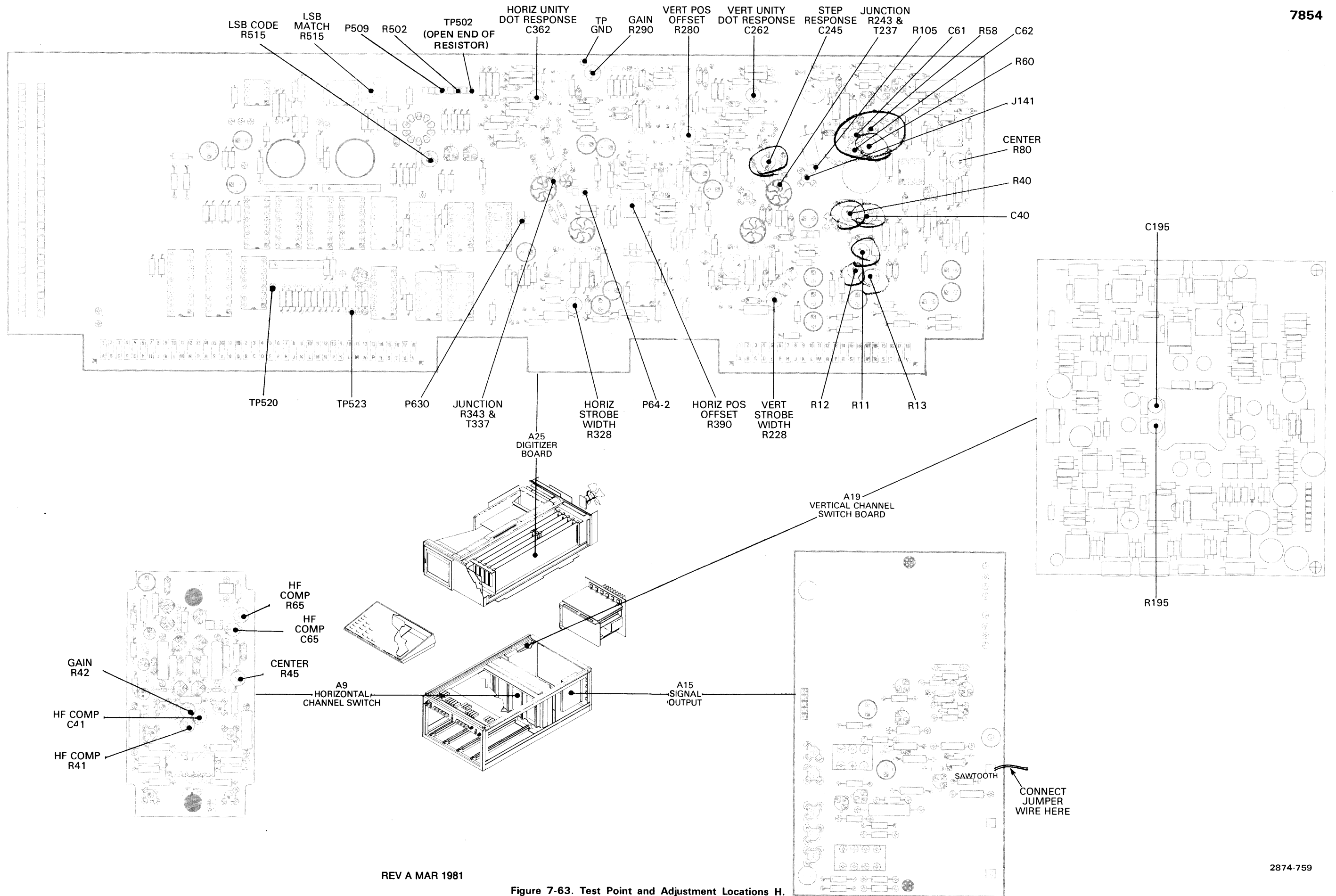


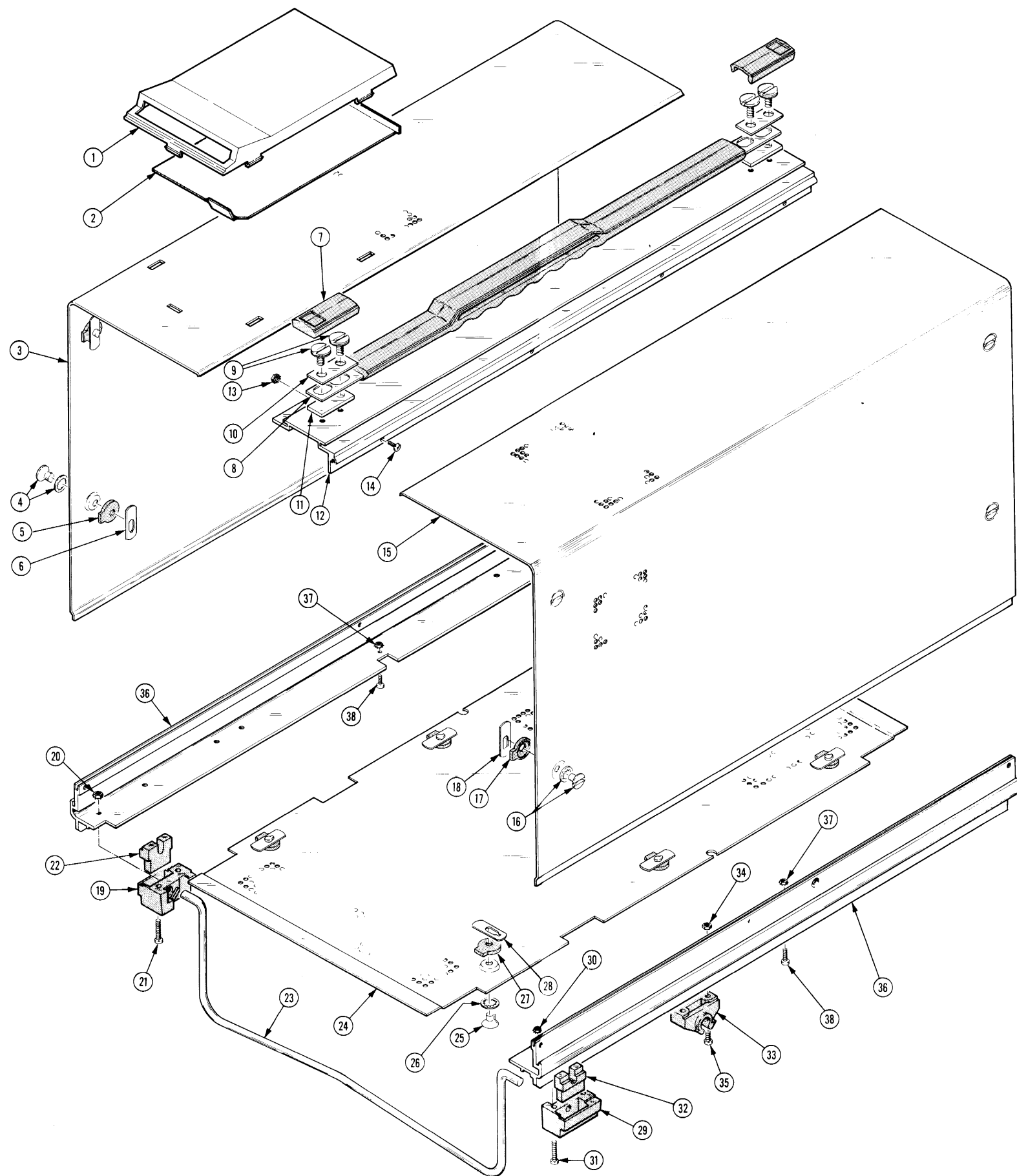
Figure 7-62. Test Point and Adjustment Locations G.



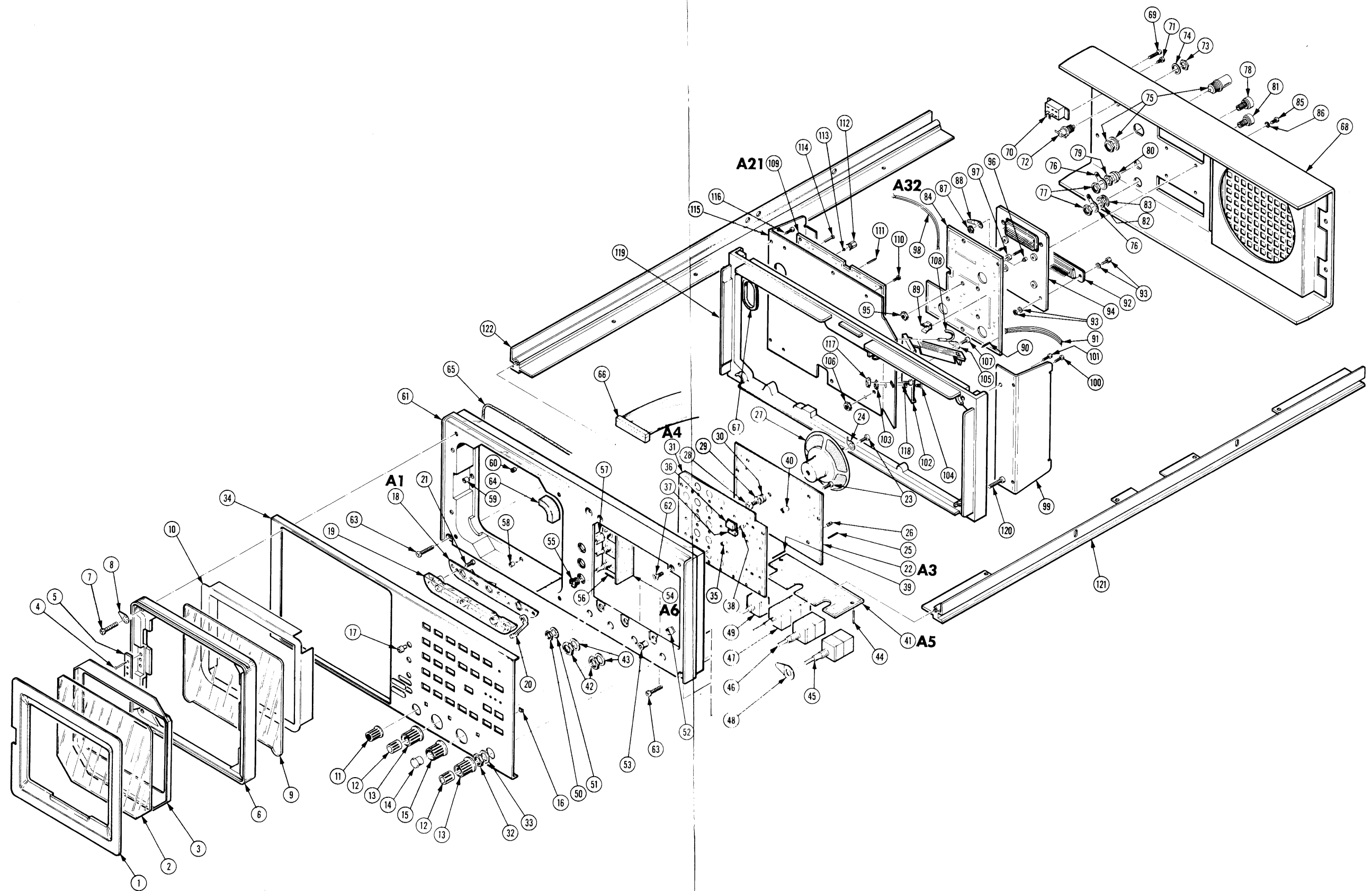
Test Point and Adjustment Locations H

REV A MAR 1981

Figure 7-63. Test Point and Adjustment Locations H.



@



7854 OSCILLOSCOPE

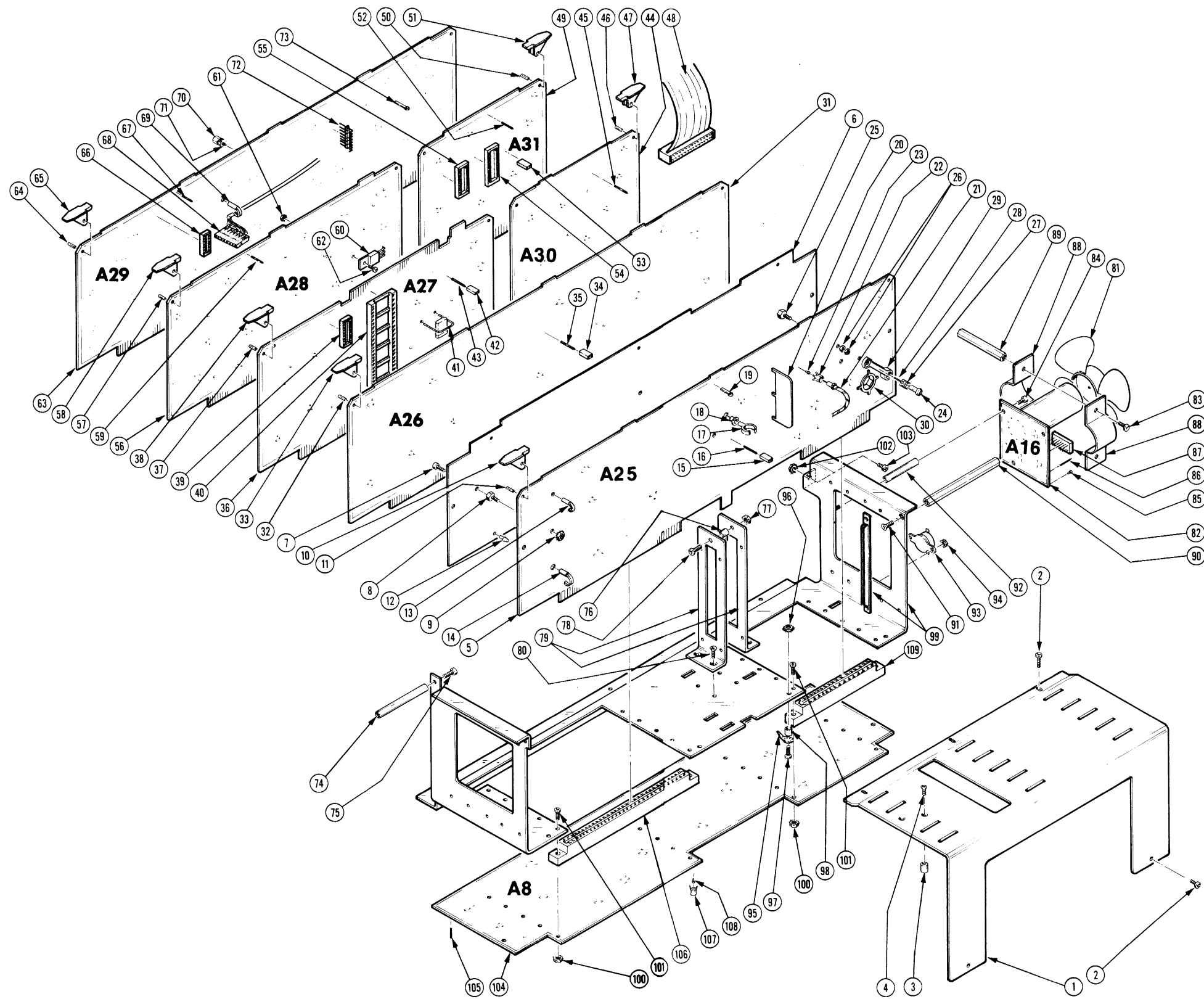
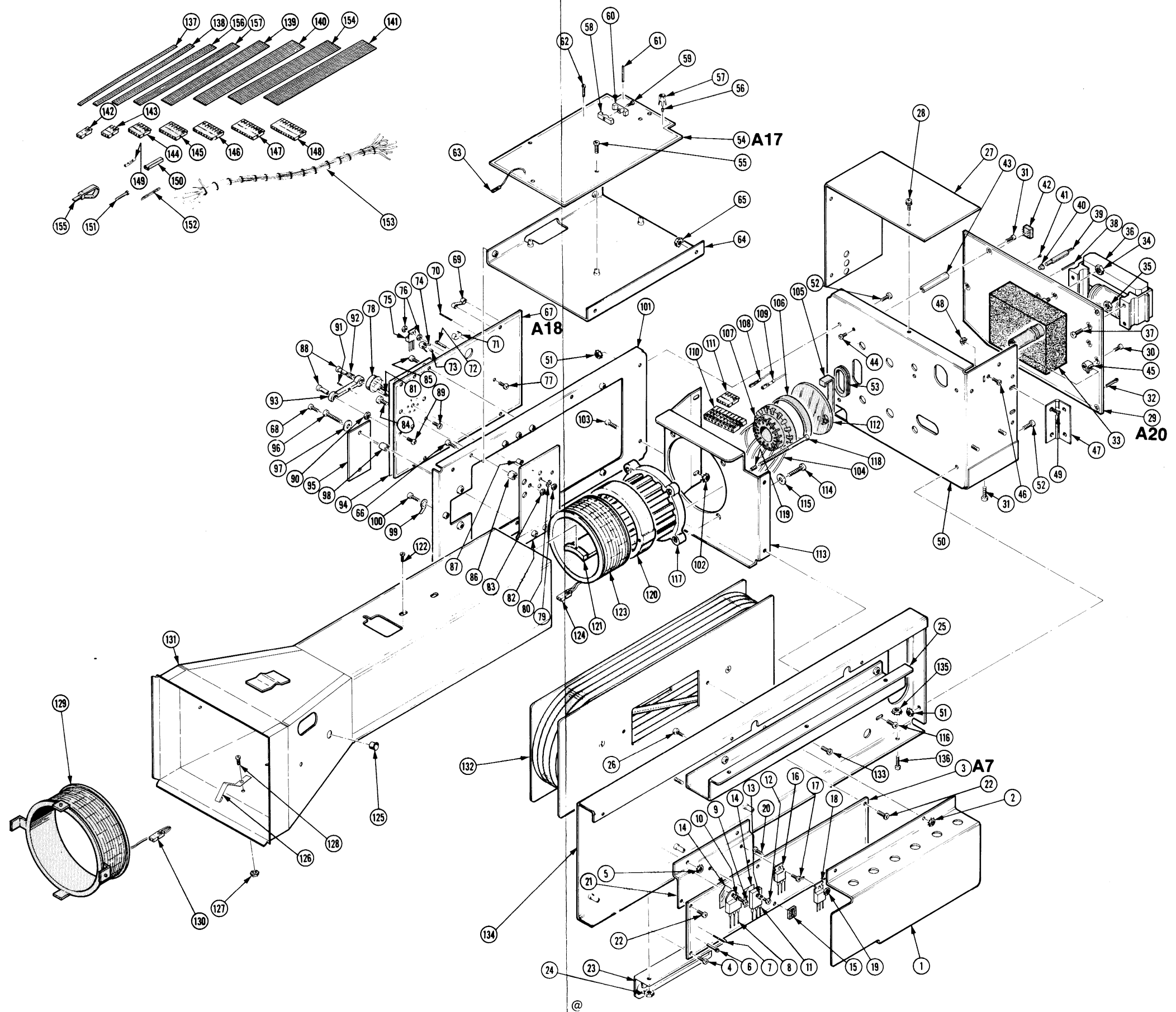


FIG. 3. CIRCUIT BOARDS

@

FIG. 4. CRT & CHASSIS



7854 OSCILLOSCOPE

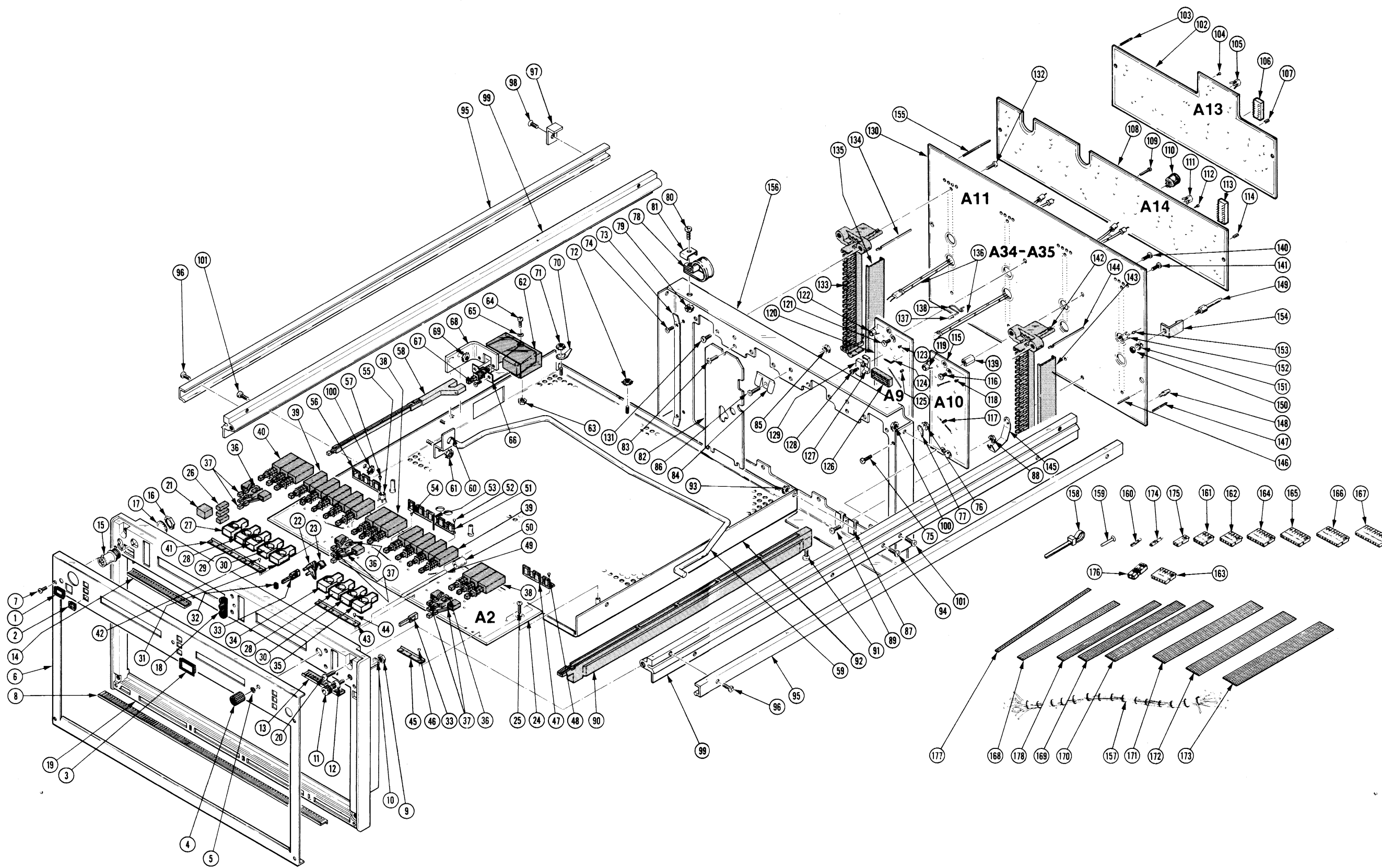


FIG. 5. LOWER UNIT & PLUG-IN HOUSING

FIG. 6. POWER SUPPLY

