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June 8, 2000

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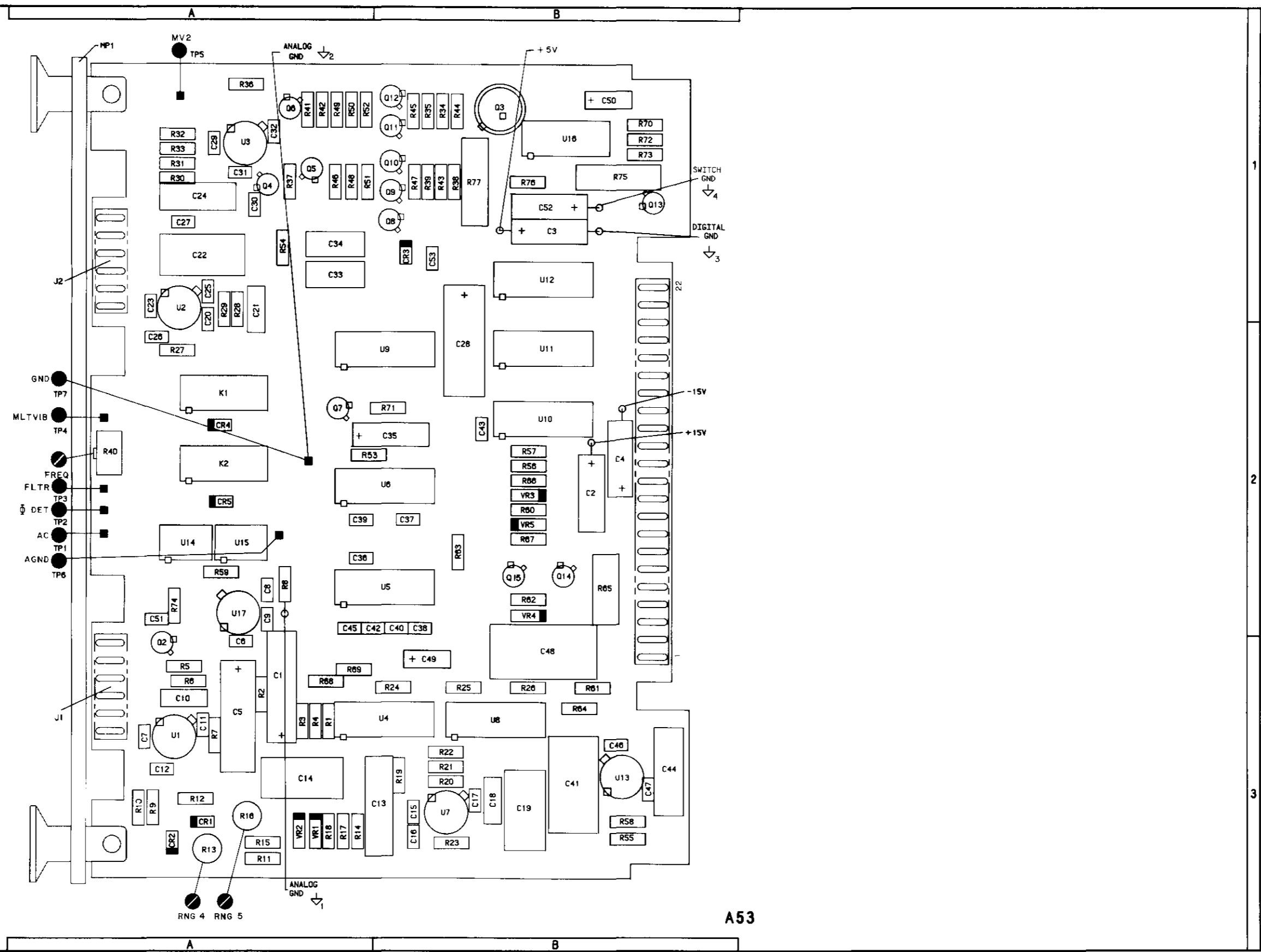
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Assembly		Schematic Service Sheet Number	Block Diagram	Theory/Trouble- Shooting Page Number	Parts List Page Number
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A53 Component Coordinates (1 of 2)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	A,3	Q4	A,1	R37	A,1				
C2	B,2	Q5	A,1	R38	B,1				
C3	B,1	Q6	A,1	R39	B,1				
C4	B,2	Q8	B,1	R40	A,2				
C5	A,3	Q9	B,1	R41	A,1				
C6	A,3	Q10	B,1	R42	A,1				
C7	A,3	Q11	B,1	R43	B,1				
C8	A,2	Q12	B,1	R44	B,1				
C9	A,2			R45	B,1				
C10	A,3	R1	A,3	R46	A,1				
C11	A,3	R2	A,3	R47	B,1				
C12	A,3	R3	A,3	R48	A,1				
C13	B,3	R4	A,3	R49	A,1				
C14	A,3	R5	A,3	R50	A,1				
C15	B,3	R6	A,3	R51	A,1				
C16	B,3	R7	A,3	R52	A,1				
C17	B,3	R8	A,2						
C18	B,3	R9	A,3	TP1	A,2				
C19	B,3	R10	A,3	TP2	A,2				
C20	A,2	R11	A,3	TP4	A,2				
C21	A,1	R12	A,3	TP5	A,1				
C22	A,1	R13	A,3	TP6	A,2				
C23	A,1	R14	A,3	TP7	A,2				
C24	A,1	R15	A,3						
C25	A,1	R16	A,3	U1	A,3				
C26	A,2	R17	A,3	U3	A,1				
C27	A,1	R18	A,3	U2	A,1				
C28	B,2	R19	B,3	U4	B,3				
C29	A,1	R20	B,3	U7	B,3				
C30	A,1	R21	B,3	U8	B,3				
C31	A,1	R22	B,3						
C32	A,1	R23	B,3	VR1	A,3				
C33	A,1	R24	B,3	VR2	A,3				
C34	A,1	R25	B,3						
C36	A,2	R26	B,3						
C37	B,2	R27	A,2						
C39	A,2	R28	A,1						
		R29	A,1						
CR1	A,3	R30	A,1						
CR2	A,3	R31	A,1						
		R32	A,1						
J1	A,1	R33	A,1						
J2	A,3	R34	B,1						
		R35	B,1						
MP1	A,1	R36	A,1						



Component Locator

**CHANGES**

**2340A,  
2345A and above**

On the schematic:

- W42 - W42 (Option 001 power sensor cable which replaces W41) is not shown on this schematic since its electrical path is identical to that of W41. Note that W42 is different from W41 in that an additional chassis-ground connection has been added to the black wire (0) of W42.

**2406A and above**

On the schematic:

- W41P3 - In the left portion of the schematic, add a connection between W41P3 pin F CHASSIS GROUND to J1 pin 10 SHIELD.

**2535A and above**

On the A25 schematic:

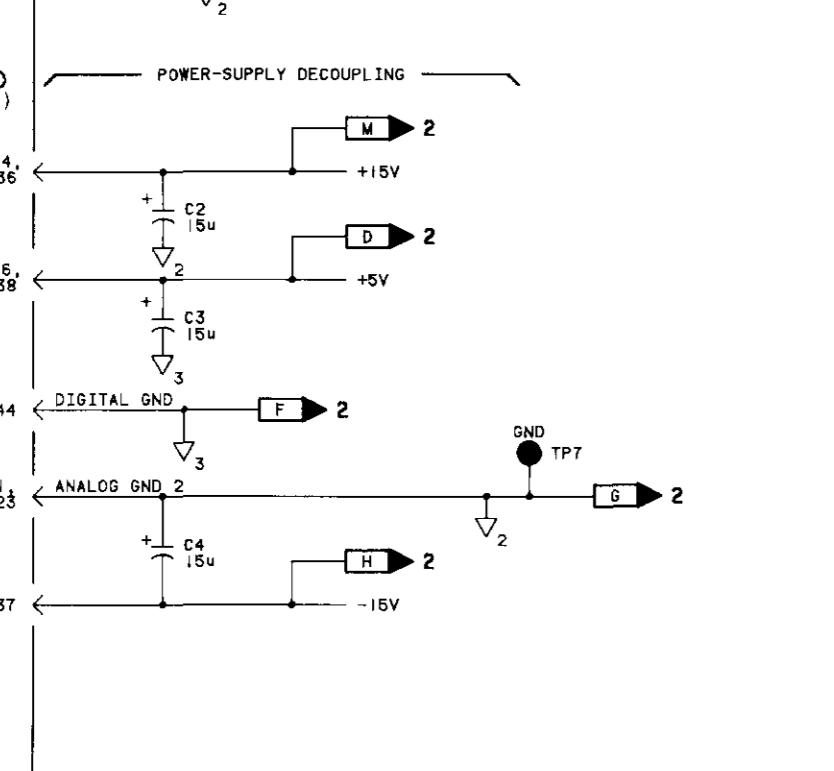
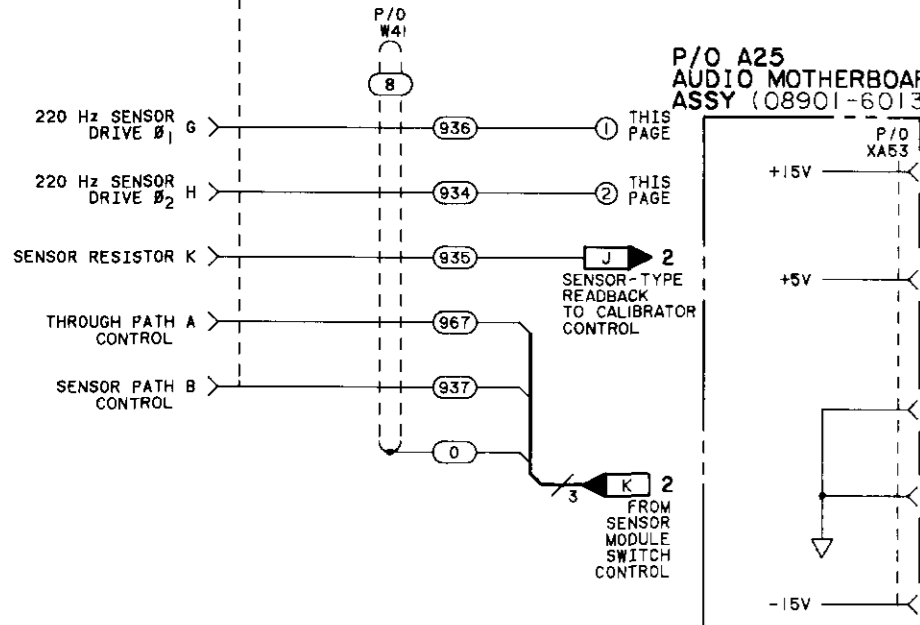
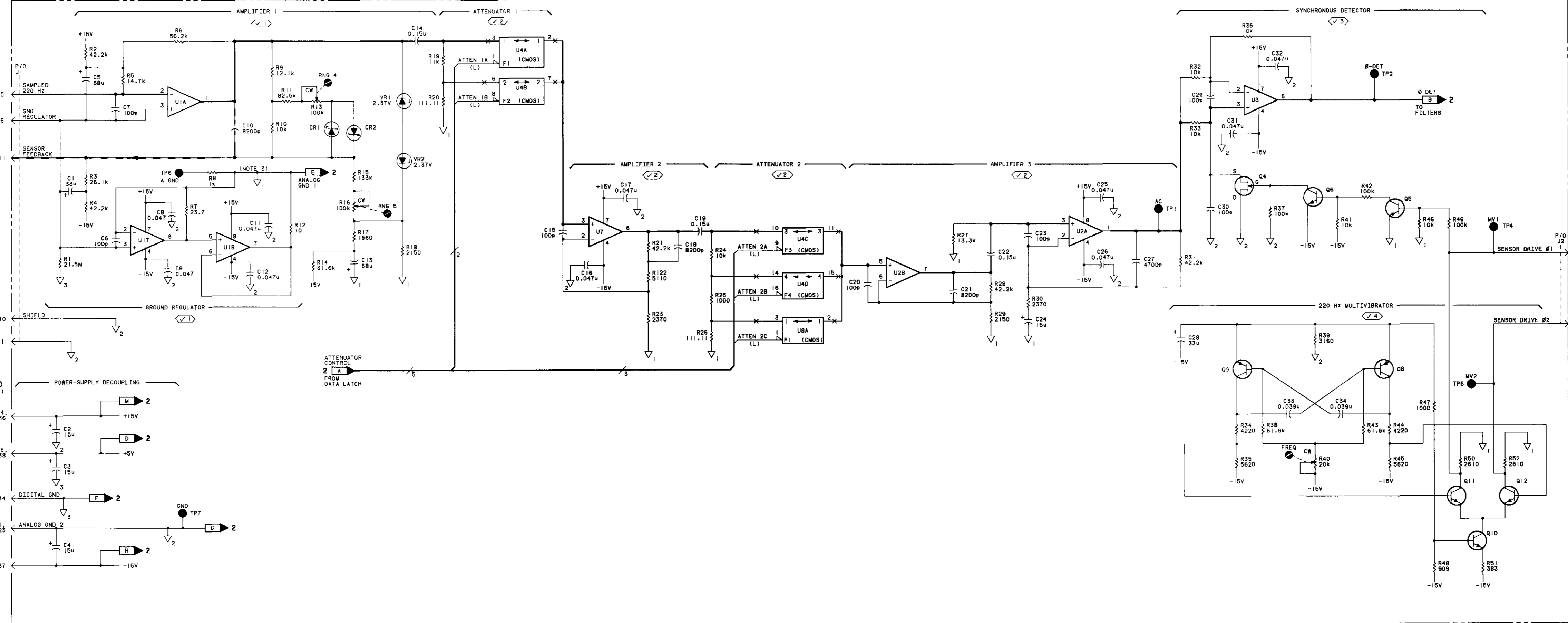
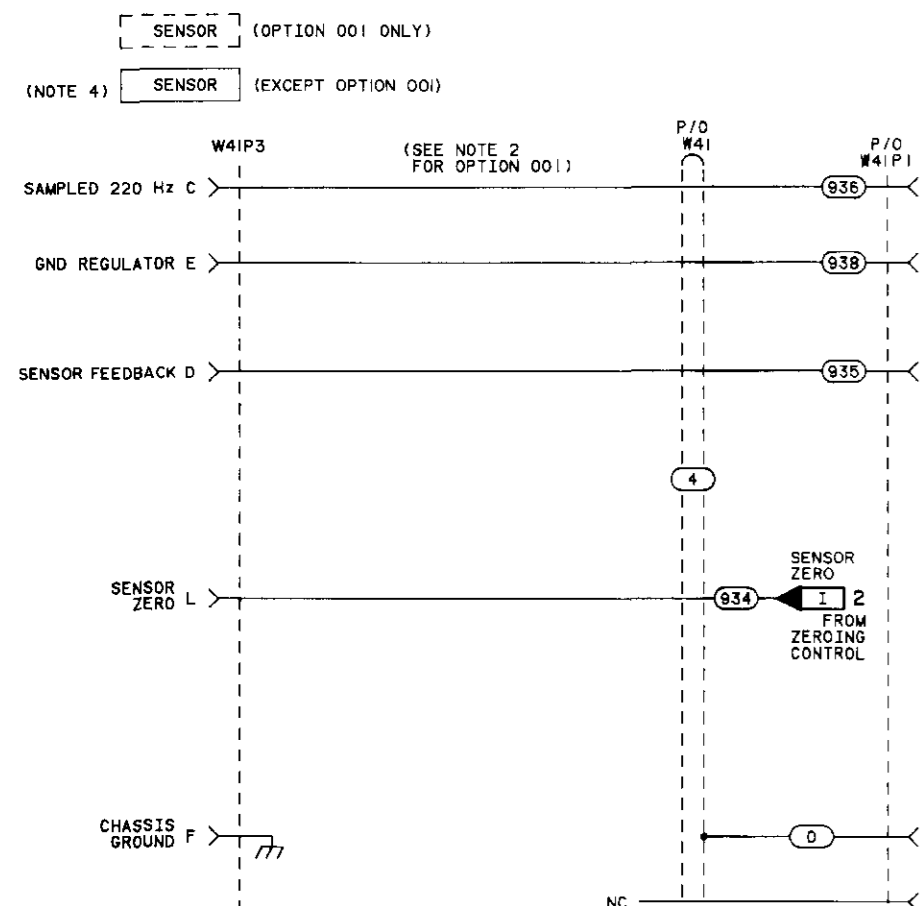
- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

**2631A and above**

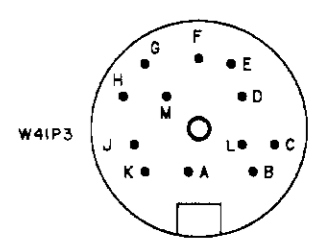
On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

P/O A53 RF POWER ASSEMBLY (1 OF 2) (08901-60130)



- NOTES
1. SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
  2. ALL REFERENCE TO W41 SHOULD BE CHANGED TO W42 WHEN OPTION 001 IS USED.
  3. ANALOG GND IS A COMMON GROUND FOR A53 CREATED BY THE A53 GROUND REGULATOR CIRCUIT.
  4. FRONT PANEL VIEW OF SENSOR CONNECTOR W41P3:

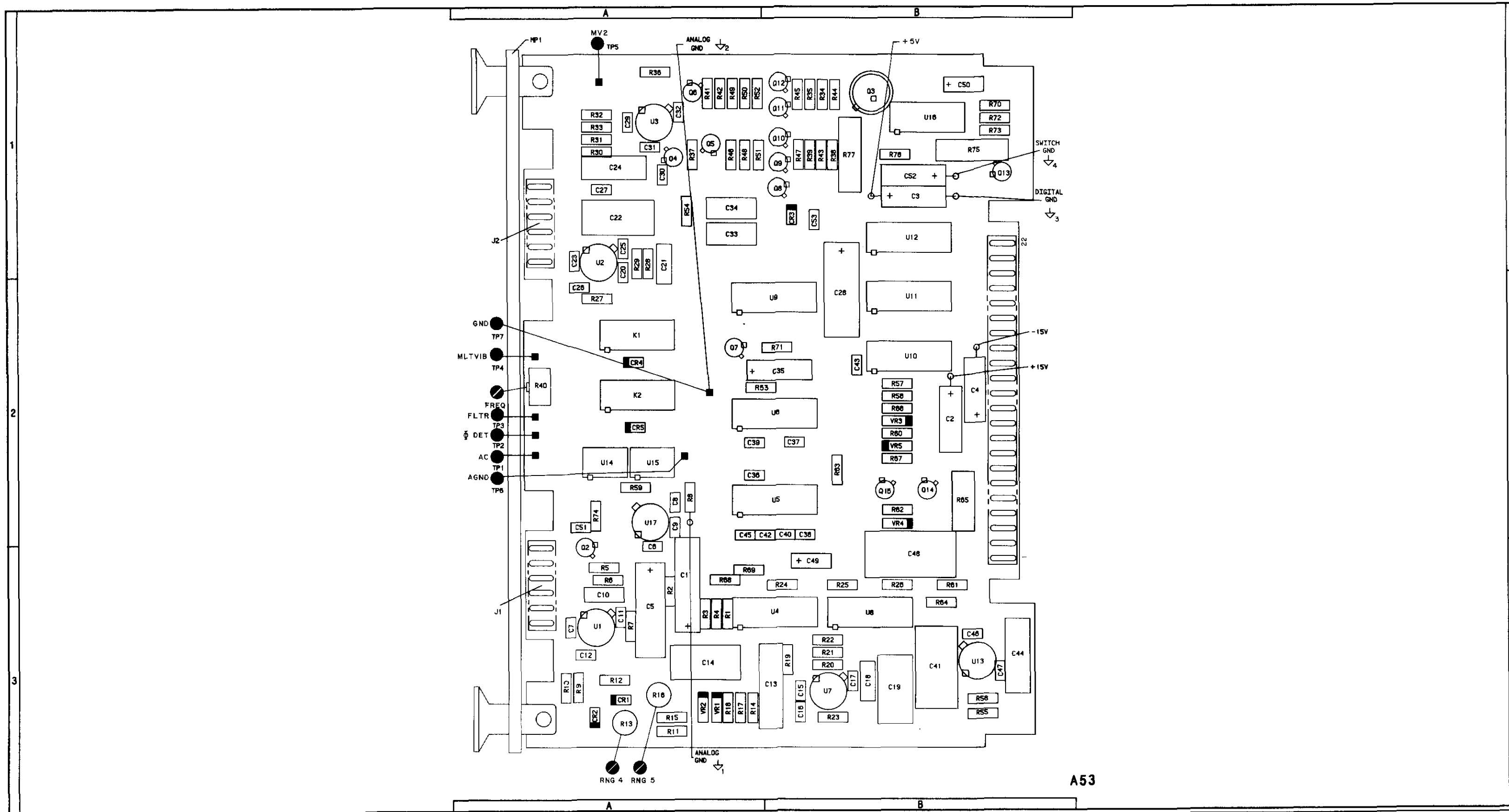


DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PART NUMBERS
U4,8	+15V - 13
	-15V - 4
	2 - 5

A53 Component Coordinates (2 of 2)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C35	B,2	R64	B,3						
C38	B,3	R65	B,2						
C40	B,3	R66	B,2						
C41	B,3	R67	B,2						
C42	A,3	R68	A,3						
C43	B,2	R69	A,3						
C44	B,3	R70	B,1						
C45	A,3	R71	B,2						
C46	B,3	R72	B,1						
C47	B,3	R73	B,1						
C48	B,3	R74	A,2						
C49	B,3	R75	B,1						
C50	B,1	R76	B,1						
C51	A,2	R77	B,1						
C52	B,1								
C53	B,1	TP3	A,2						
CR3	B,1	U5	B,2						
CR4	A,2	U6	B,2						
CR5	A,2	U8	B,3						
		U9	B,2						
J1	A,1	U10	B,2						
J2	A,3	U11	B,2						
		U12	B,1						
K1	A,2	U13	B,3						
K2	A,2	U14	A,2						
		U15	A,2						
MP1	A,1	U16	B,1						
		U17	A,2						
Q2	A,3								
Q3	B,1	VR3	B,2						
Q7	A,2	VR4	B,2						
Q12	B,2	VR5	B,2						
Q13	B,1								
Q14	B,2								
R53	A,2								
R54	A,1								
R55	B,3								
R56	B,2								
R57	B,2								
R58	B,3								
R59	A,2								
R60	B,2								
R61	B,3								
R62	B,2								
R63	B,2								



A53

Component Locator

A53 POWER METER (1 OF 2)  
 SENSOR INPUT CIRCUITS  
**SS 1**  
 SEE REVERSE SIDE

**CHANGES****2436A and above**

On the A53 schematic:

- A53R77 - Change the value of R77 to 14.7.

**2535A and above**

On the A25 schematic:

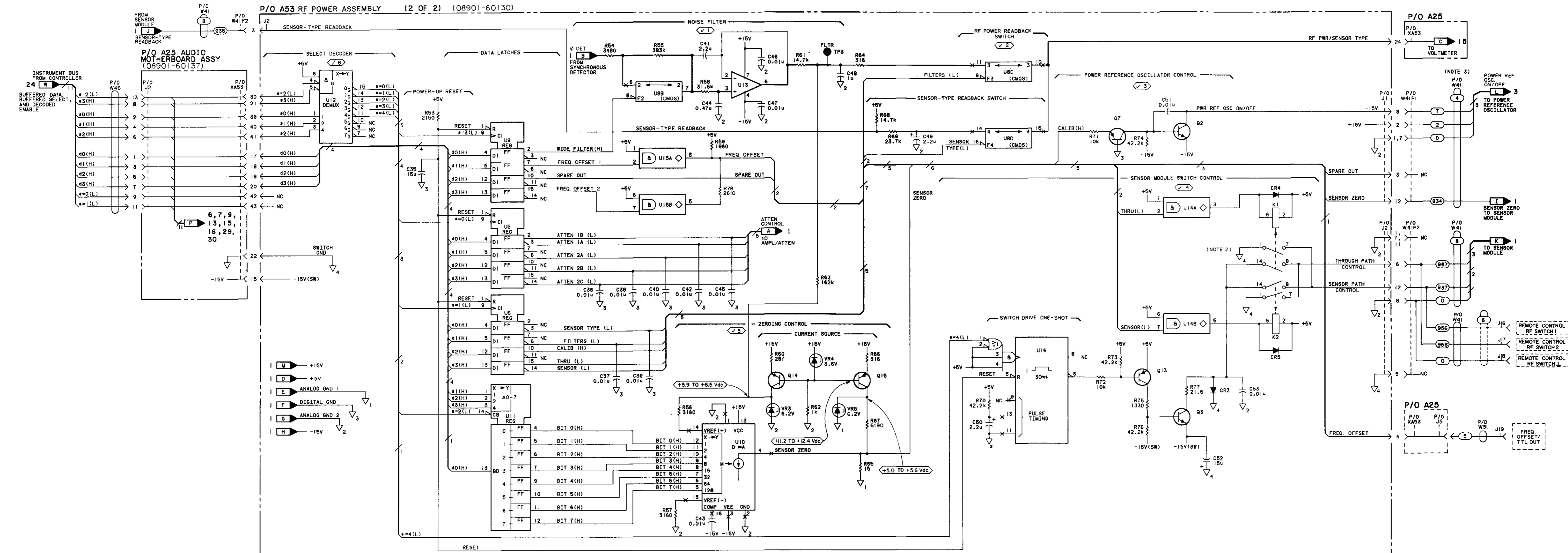
- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

**2631A and above**

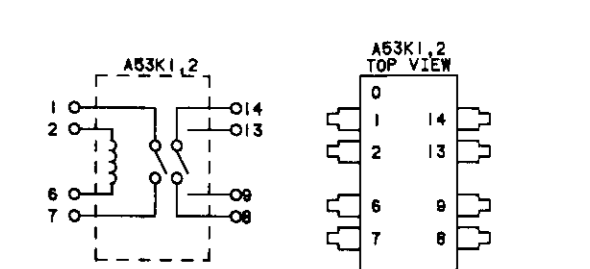
On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

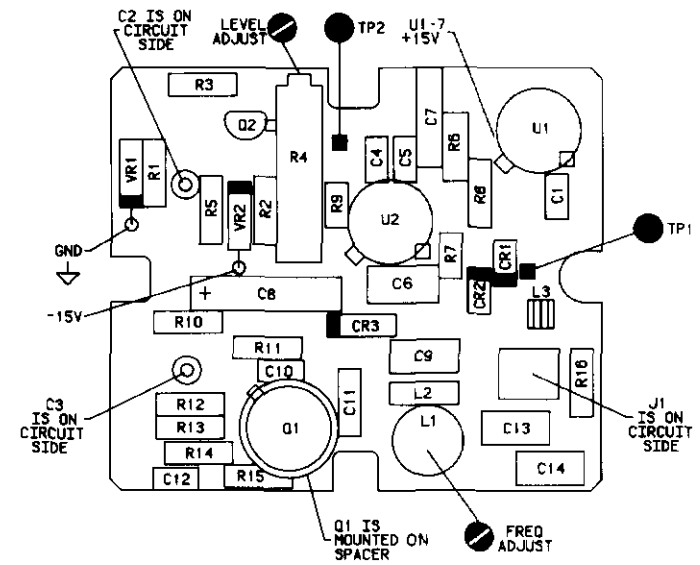
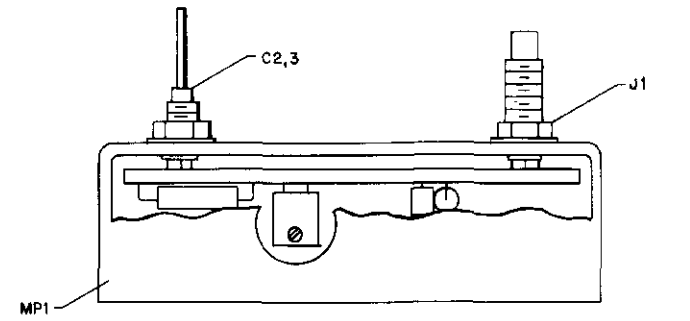




- NOTES
- SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
  - THE DIAGRAM BELOW SHOWS THE INTERNAL CIRCUITRY OF A53K1,2.
  - FOR OPTION 001, W42 REPLACES W41.



REFERENCE DESIGNATIONS	PIN NUMBERS
U5, 6, 9	+5V -15, 16 ∇2 - 8
U8	+15V -13 -15V -4 ∇2 - 5
U11, 12	+5V -16 ∇2 - 8
U14, 15	+5V -8 ∇2 - 4
U16	+5V -14 ∇2 - 7



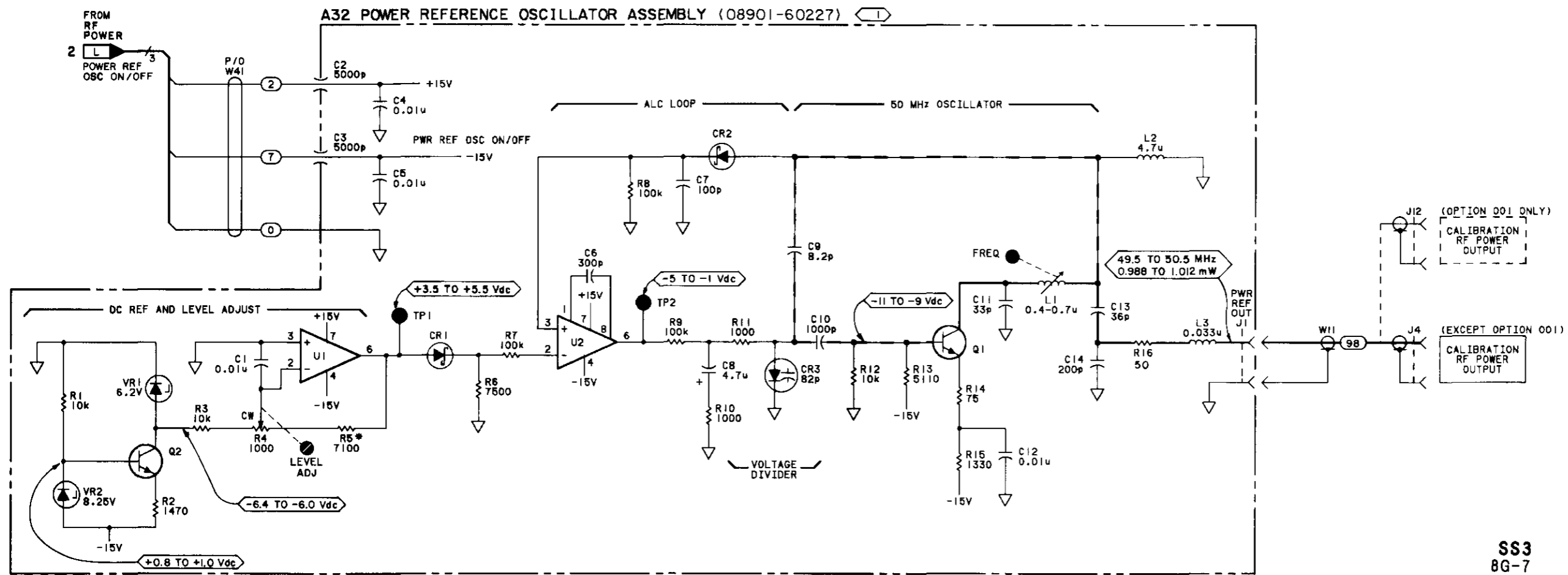
A32

Component Locator

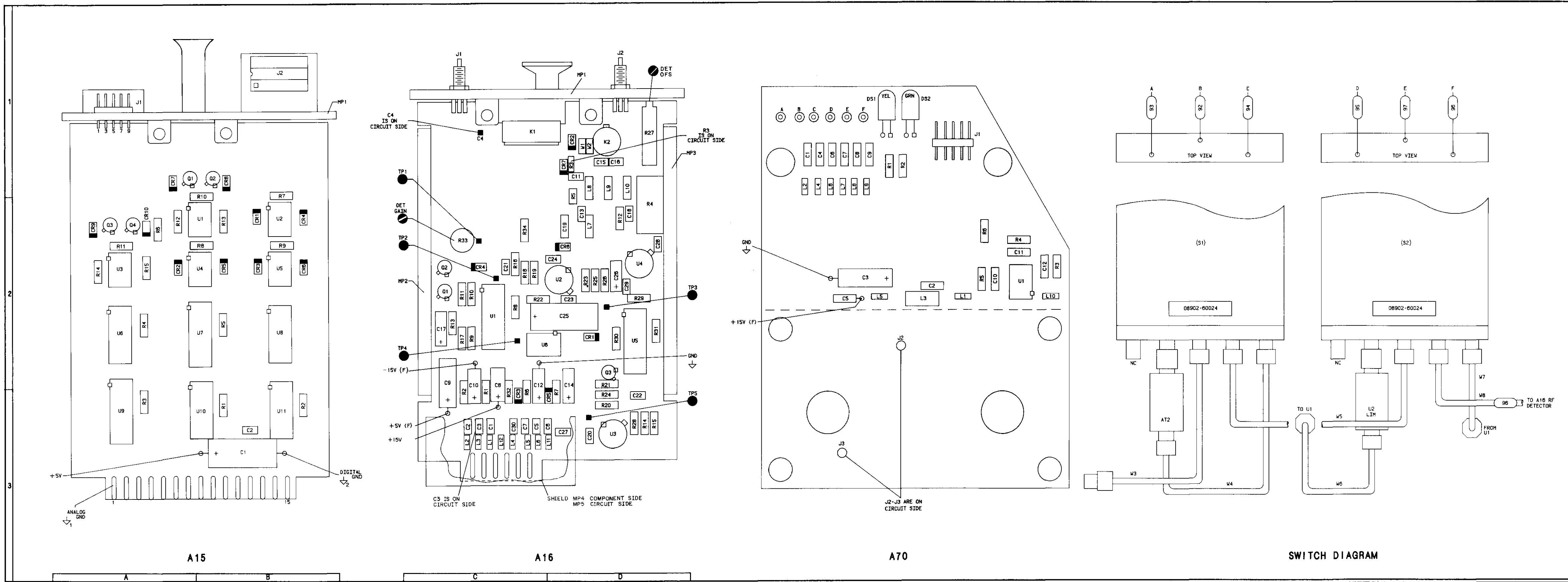
A53 POWER METER (2 OF 2)  
CONTROL CIRCUITS

SS2

SEE REVERSE SIDE



NOTES  
1. SEE TABLE 8-6 FOR SCHEMATIC DIAGRAM NOTES.



A15		COMP	X,Y	A16		COMP	X,Y	COMP	X,Y
C1	B,3	U5	B,2	C1	C,3	L3	C,3	R29	D,2
C2	B,3	U6	A,2	C2	C,3	L4	C,3	R30	D,2
CR1	B,2	U7	B,2	C3	C,3	L5	C,3	R31	D,2
CR2	A,2	U8	B,2	C4	C,1	L6	C,3	R32	C,3
CR3	B,2	U9	A,3	C5	C,3	L7	D,2	R33	C,2
CR4	B,2	U10	B,3	C6	D,3	L8	D,1	R34	C,2
CR5	B,2	U11	B,3	C7	C,3	L9	D,1	TP1	C,2
CR6	B,2			C8	C,3	L10	D,1	TP2	C,2
CR7	A,1			C9	C,3	L11	D,3	TP3	D,2
CR8	B,1			C10	C,3	L12	C,3	TP4	C,2
CR9	A,2			C11	D,1	MP1	D,1	U1	C,2
CR10	A,2			C12	C,3	MP2	C,2	U2	D,2
J1	A,1			C13	D,2	MP3	D,1	U3	D,3
J2	B,1			C14	D,3	Q1	C,2	U4	D,2
MP1	B,1			C15	D,1	Q2	C,2	U5	D,2
Q1	A,1			C16	D,1	Q3	D,2	U6	C,3
Q2	B,1			C17	C,2	R1	C,3	W1	D,1
Q3	A,2			C18	D,2	R2	D,1	W2	D,1
Q4	A,2			C19	D,2	R3	C,3		
R1	B,3			C20	D,3	R4	D,2		
R2	B,3			C21	C,2	R5	D,2		
R3	A,3			C22	D,3	R6	C,3		
R4	A,2			C23	D,2	R7	D,3		
R5	B,2			C24	D,2	R8	C,2		
R6	A,2			C25	D,2	R9	C,2		
R7	B,2			C26	D,2	R10	C,2		
R8	B,2			C27	D,3	R11	C,2		
R9	B,2			C28	D,2	R12	D,2		
R10	B,2			C29	D,2	R13	C,2		
R11	A,2			C30	C,3	R14	D,3		
R12	A,2			CR1	D,2	R15	D,3		
R13	B,2			CR2	D,1	R16	C,2		
R14	A,2			CR3	C,3	R17	C,2		
R15	A,2			CR4	C,2	R18	C,2		
U1	B,2			CR5	D,3	R19	C,2		
U2	B,2			CR6	D,2	R20	D,3		
U3	A,2			CR7	D,1	R21	D,3		
U4	B,2			J1	C,1	R22	C,2		
				J2	D,1	R23	D,2		
				K1	C,1	R24	D,3		
				K2	D,1	R25	D,2		
				L1	C,3	R26	D,2		
				L2	C,3	R27	D,1		
						R28	D,3		

Component Locators

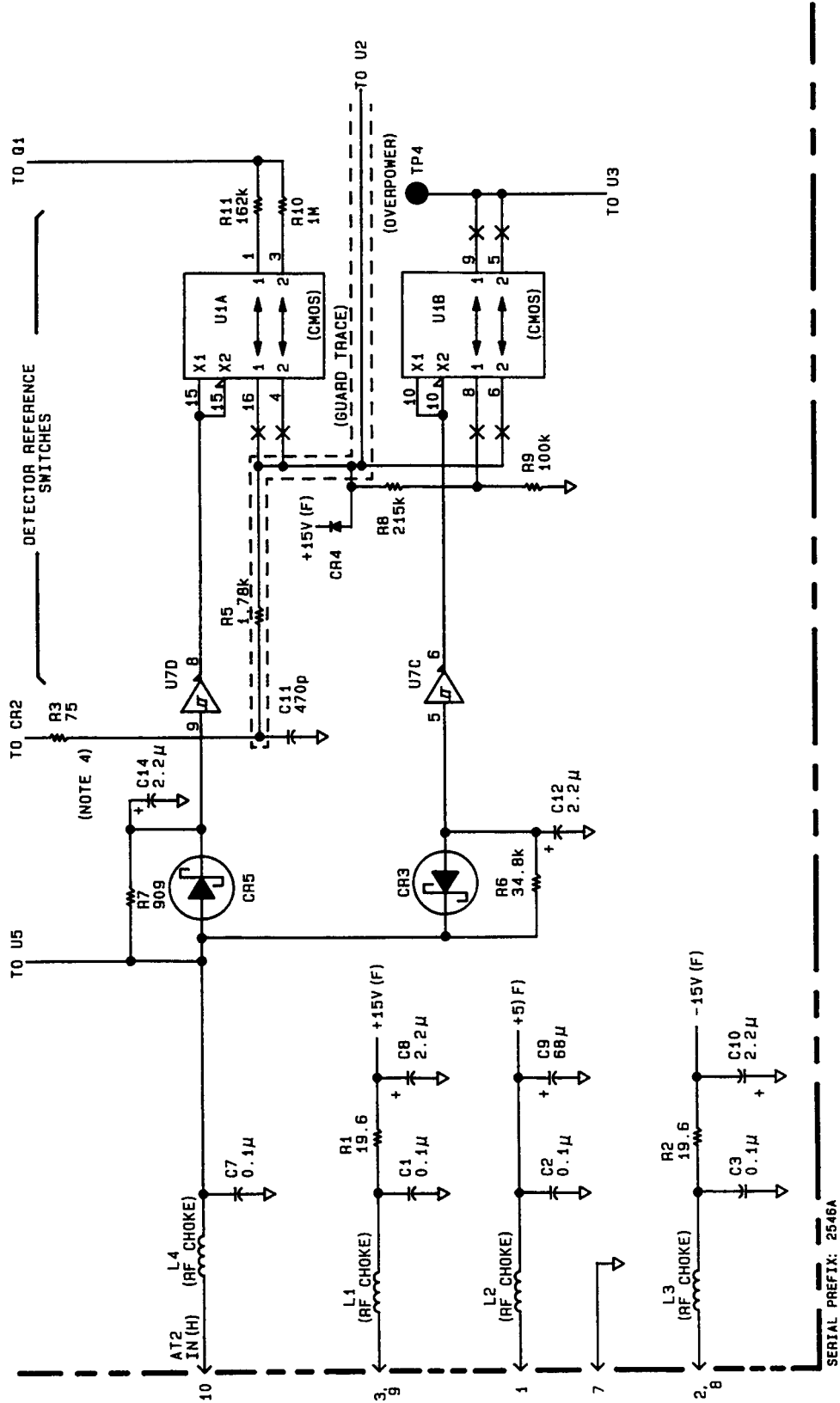
A32 POWER REFERENCE OSCILLATOR **SS3**  
SEE REVERSE SIDE

## CHANGES

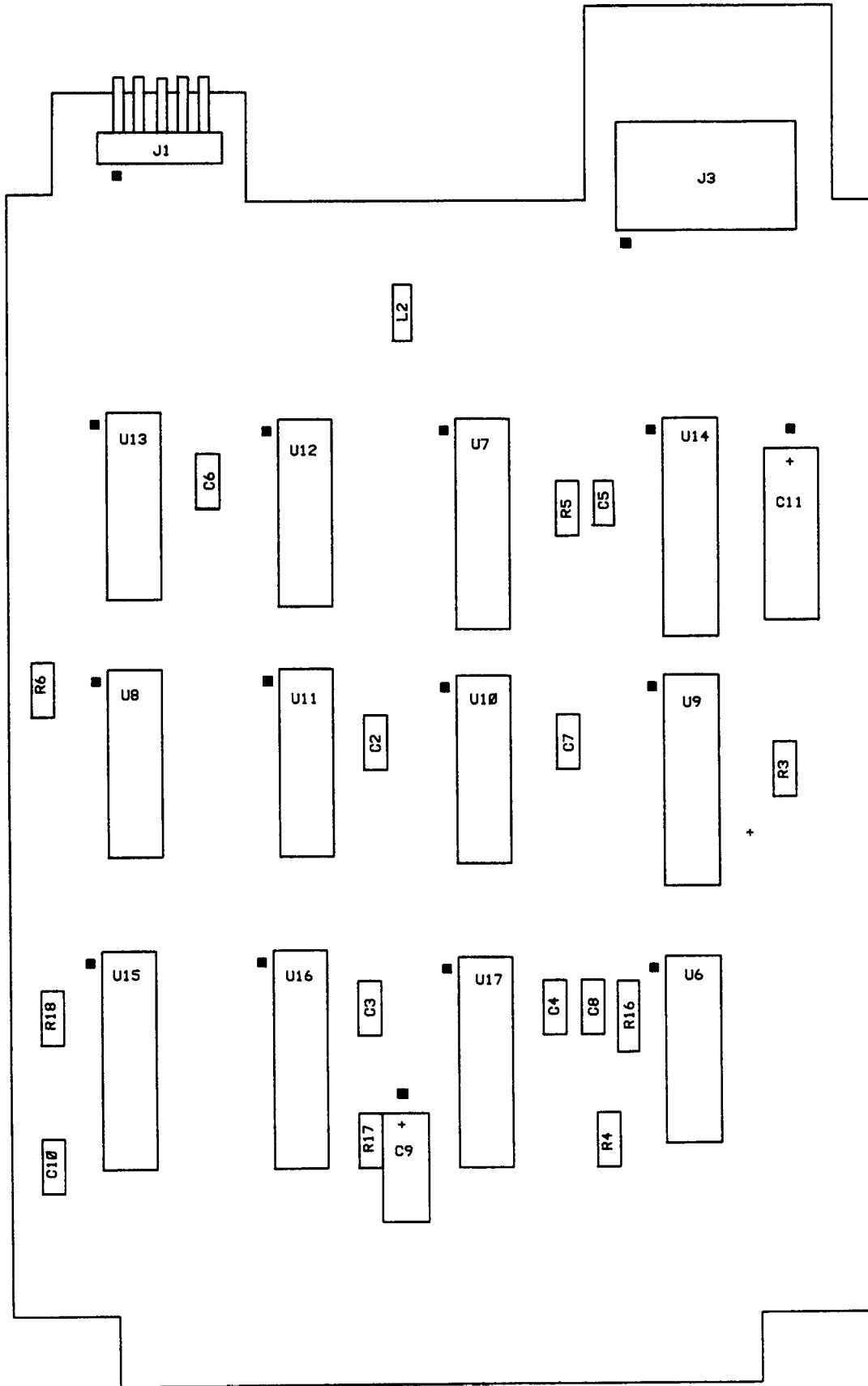
<p><b>All Serial Prefixes</b></p>	<p><b>On the A16 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b><u>R3</u></b> - Change the value of R3 to 61.59.</li> </ul> <p><b>On the Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b><u>SS4</u></b> - Add the new SS4 foldout (page number 8G-8.5 and revision date of <i>rev.17MAR87</i>).</li> </ul>
<p><b>2337A and above</b></p>	<p><b>On the A16 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b><u>R15</u></b> - Change the value of R15 to 2870 .</li> </ul>
<p><b>2338A to 2340A, 2428A and above</b></p>	<p><b>On the A16 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b><u>C20</u></b> - Change the the value of C20 to 470pF.</li> </ul>
<p><b>2449A and above</b></p>	<p><b>On the A16 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b><u>R11</u></b> - Change the the value of R11 to 162k.</li> </ul>
<p><b>2523A and above</b></p>	<p><b>On the A16 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b><u>R10</u></b> - Change the the value of R10 to 1M.</li> </ul>
<p><b>2528A and above</b></p>	<p><b>On the A16 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b><u>R15,R52</u></b> - Change the the value of R15 to 3480. Change the value of R52 to 14.7k.</li> </ul>
<p><b>2535A to 2630A</b></p>	<p><b>On the A25 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b><u>08902-60103</u></b> - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.</li> </ul>

### CHANGES

<p><b>2546A and above</b></p>	<p><b>On the A16 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>08902-60041</b> - Use the partial schematic on page 8G-8.3.</li> <li>• <b>NOTES</b> - Under NOTES, in the table of Digital and Integrated Circuit Voltage and Ground Connections, add U7 pin14 to +15V, and pin 7 to ground.</li> </ul> <p><b>On the A16 Component Locator:</b></p> <ul style="list-style-type: none"> <li>• <b>U7</b> - Add U7 in grid location A3, below and slightly to the left of K1. Orient U7 vertically (same as U1).</li> <li>• <b>R10,R11</b> - Change the reference designator of R11 to R10.</li> </ul>
<p><b>2631A and above</b></p>	<p><b>On the A25 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>08902-60116</b> - Change the pat number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.</li> </ul>
<p><b>2704A and above</b></p>	<p><b>On the Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>A15,A28,A70</b> - Use the new service sheet 4 with the revision date of <i>rev.17MAR87</i> for the A15, A28, and A70 schematics. Refer to the original SS4 on page 8G-9 for the AT1 Attenuator Assembly, A16, and the A25 schematics and to these texted change pages for any additional change information.</li> </ul> <p><b>On the Component Locator:</b></p> <ul style="list-style-type: none"> <li>• <b>A15</b> - Use the A15 component locator with the new A15 component locator on page 8G-8.4.</li> <li>• <b>A70</b> - Use the A70 component locator with the new A70 component locator on page 8G-8.5.</li> </ul>
<p><b>Errata</b></p>	<p><b>On the A16 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>R32,R33</b> - On SS4 (page 8G-9), at the output of the DETECTOR AMPLIFIER, change the value of R32 to 31.6, and change the value of R33 to 200.</li> </ul>
<p><b>Errata</b></p>	<p><b>On the A15 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>R17</b> - Change the value of R17 to 68.1k.</li> </ul>

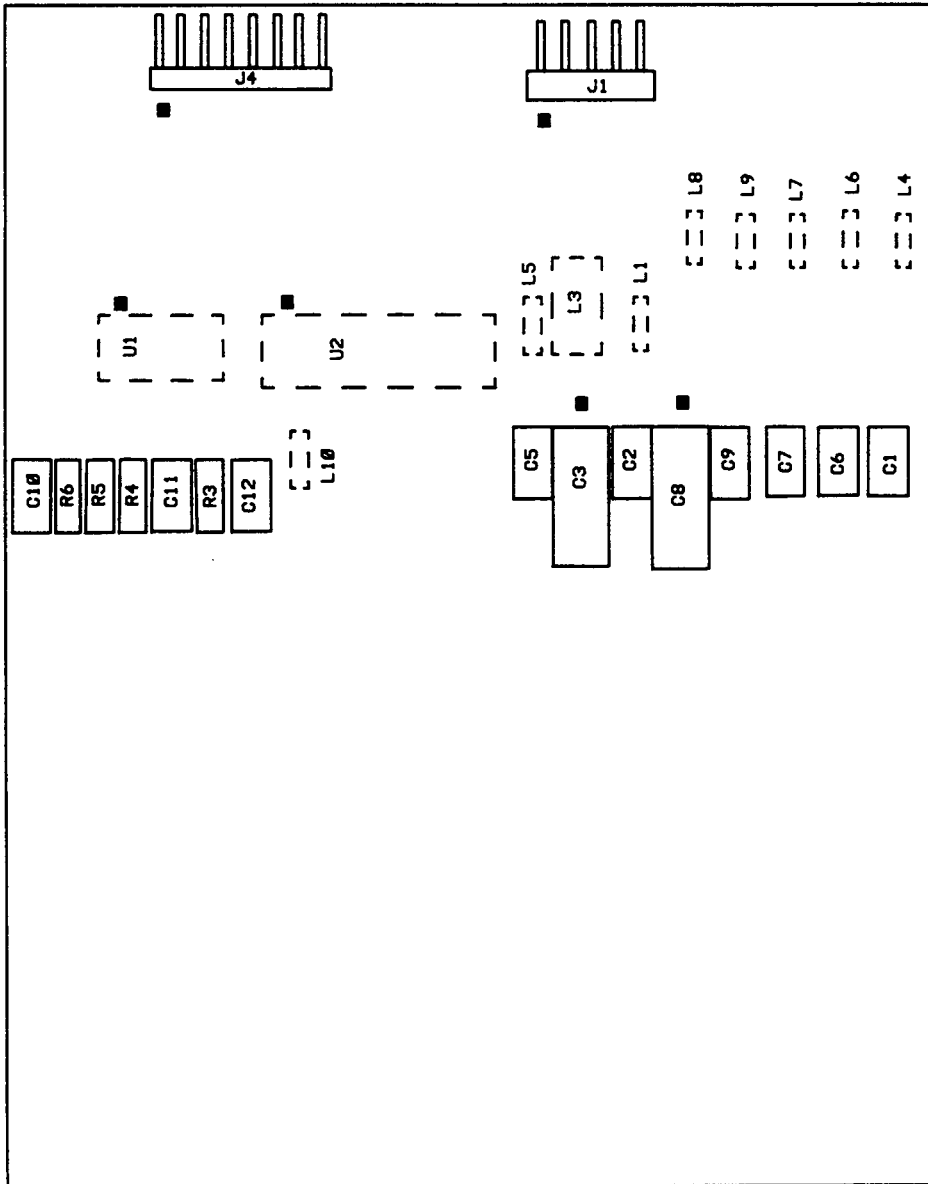


P/O SS4 A16 RF Detector Assembly, 08902-60041 board (2546A and above)



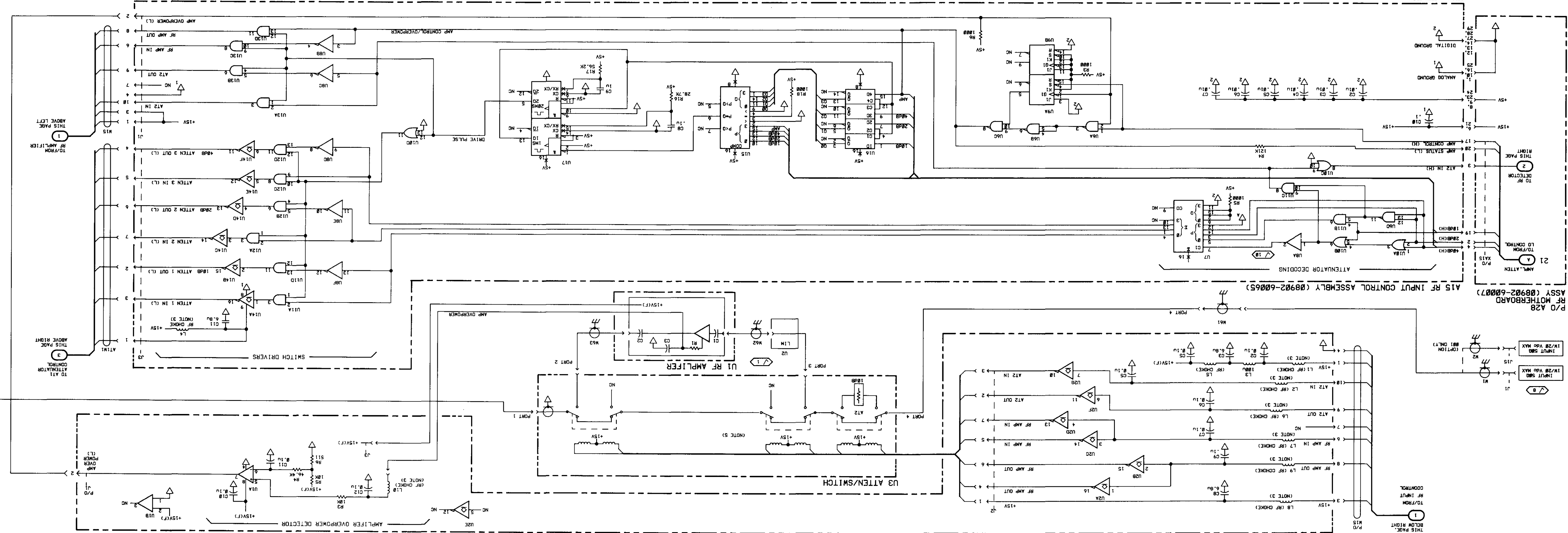
*A15 Component Locator, 08902-60064 board, (2704A and above)*





**A70 Component Locator, 08902-60065 board, (2704A and above)**

A70 AMPLIFIER/SWICH INTERCONNECT ASSEMBLY (08902-60064) 1



DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS	REFERENCES	PIN NUMBERS
	U7B	+1.5V - 9
	U2A	- 8
	U6A	+1.5V - 8
	U6A	+5V - 14
	U6A	+5V - 13A
		- 7

THIS PAGE ABOVE LEFT TO/FROM RF AMPLIFIER

THIS PAGE ABOVE RIGHT TO AT11 ATTENUATOR CONTROL

THIS PAGE BELOW RIGHT TO/FROM CONTROL

THIS PAGE ABOVE LEFT TO/FROM RF AMPLIFIER

P/O A28 RF MOTHERBOARD ASSY (08902-60007)

P/O XA15 TO/FROM

AMP/L ATTEN

21

2 TO CONTROL

19 18dB(H)

18 20dB(H)

17 AMP CONTROL (H)

16 AMP STATUS (L)

15 AT2 IN (H)

14 AT2 IN (L)

13

12

11

10

9

8

7

6

5

4

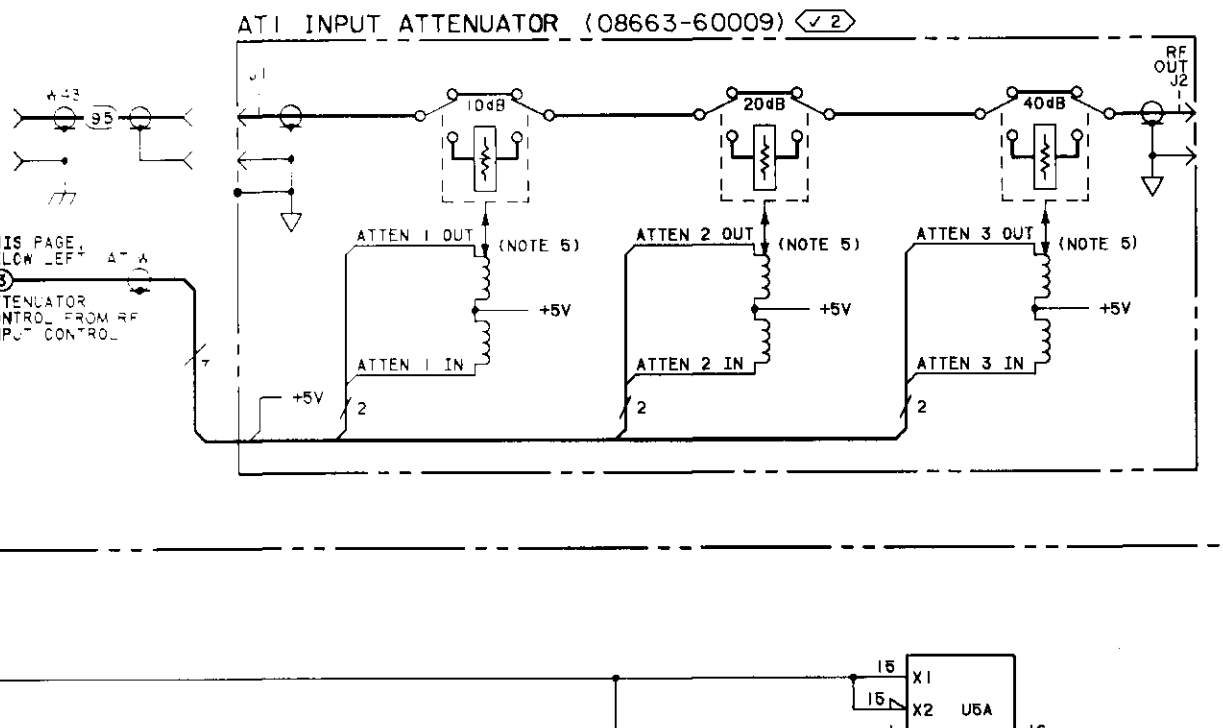
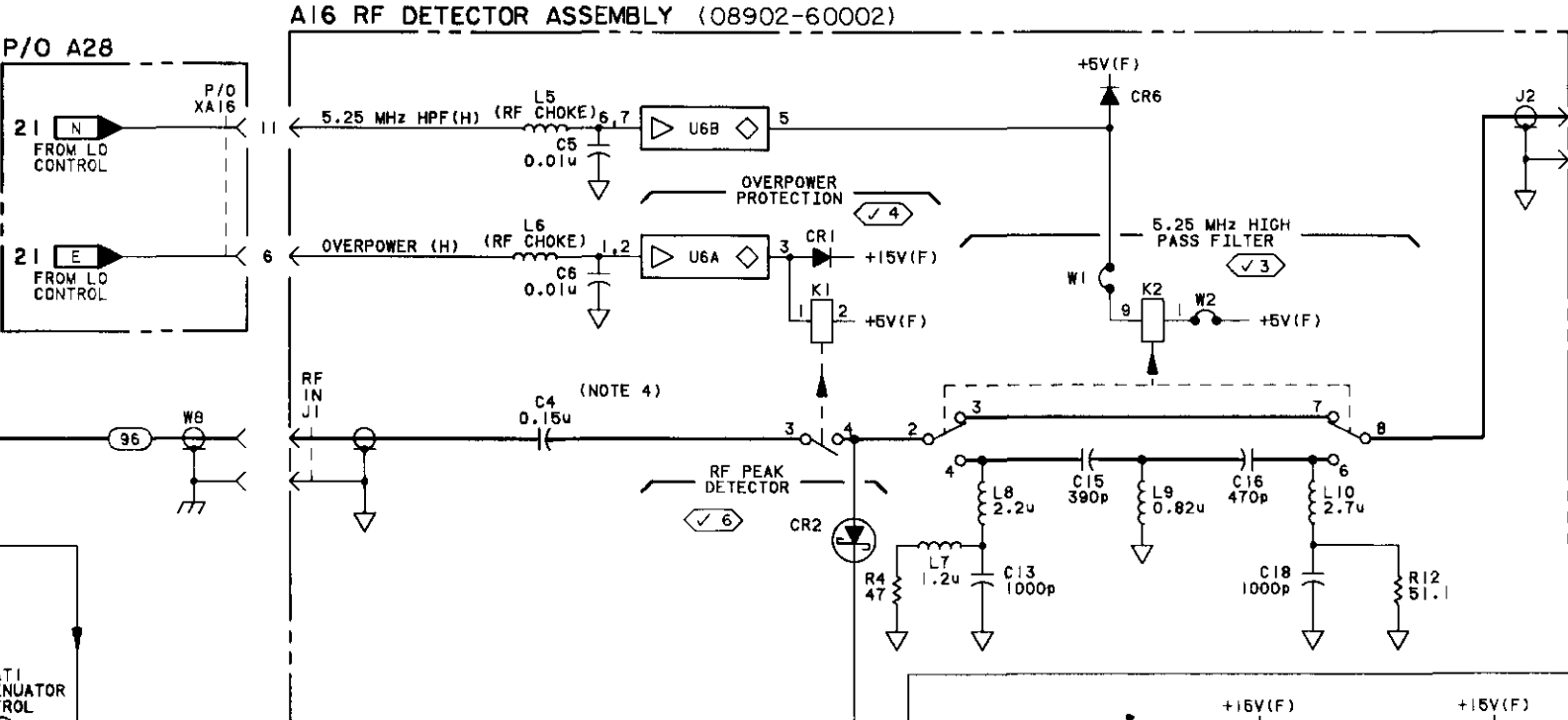
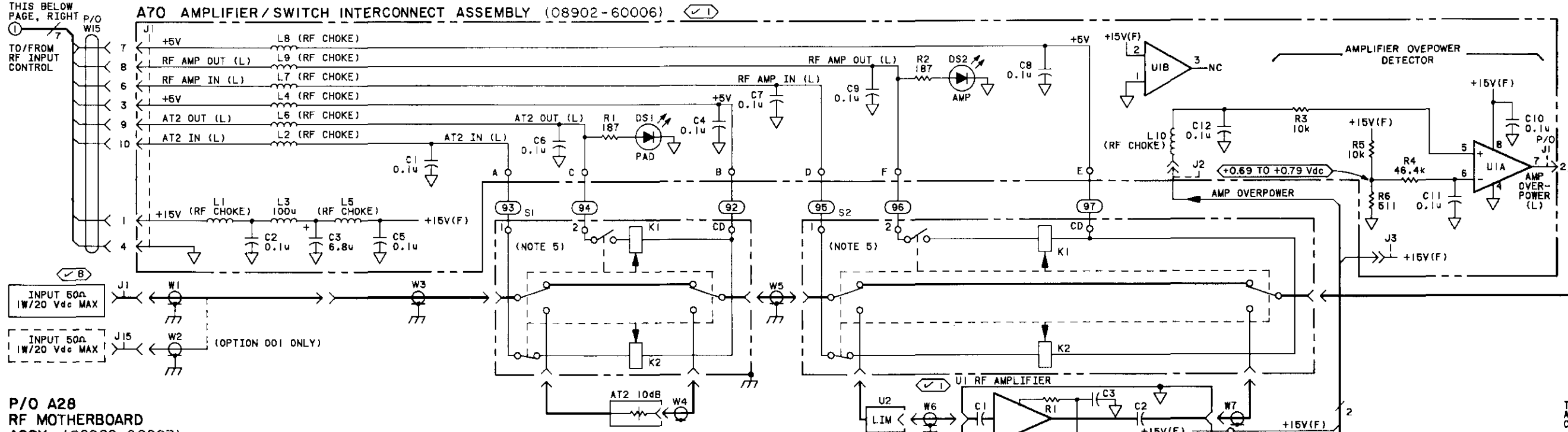
3

2

1

ANALOG GROUND

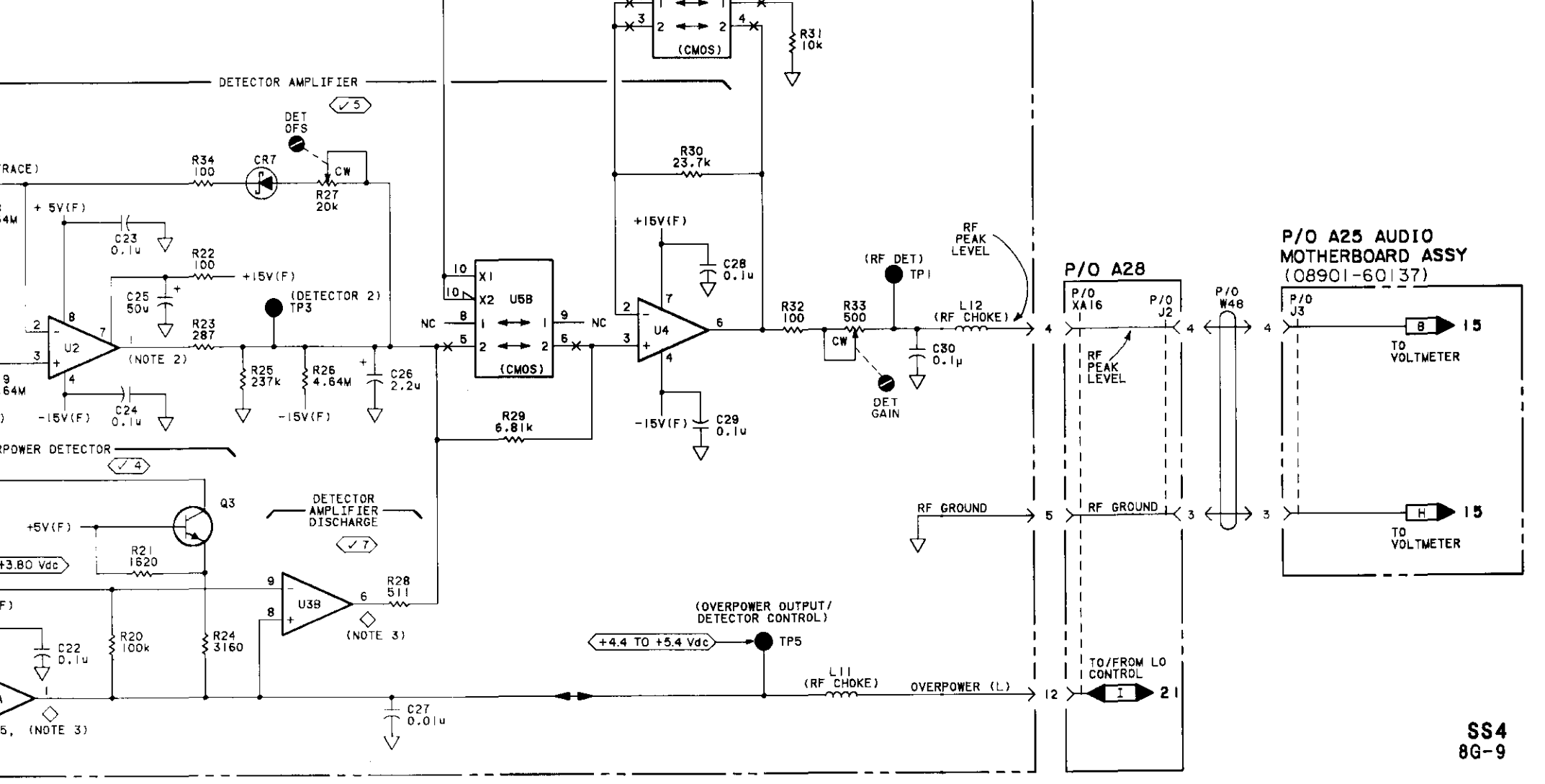
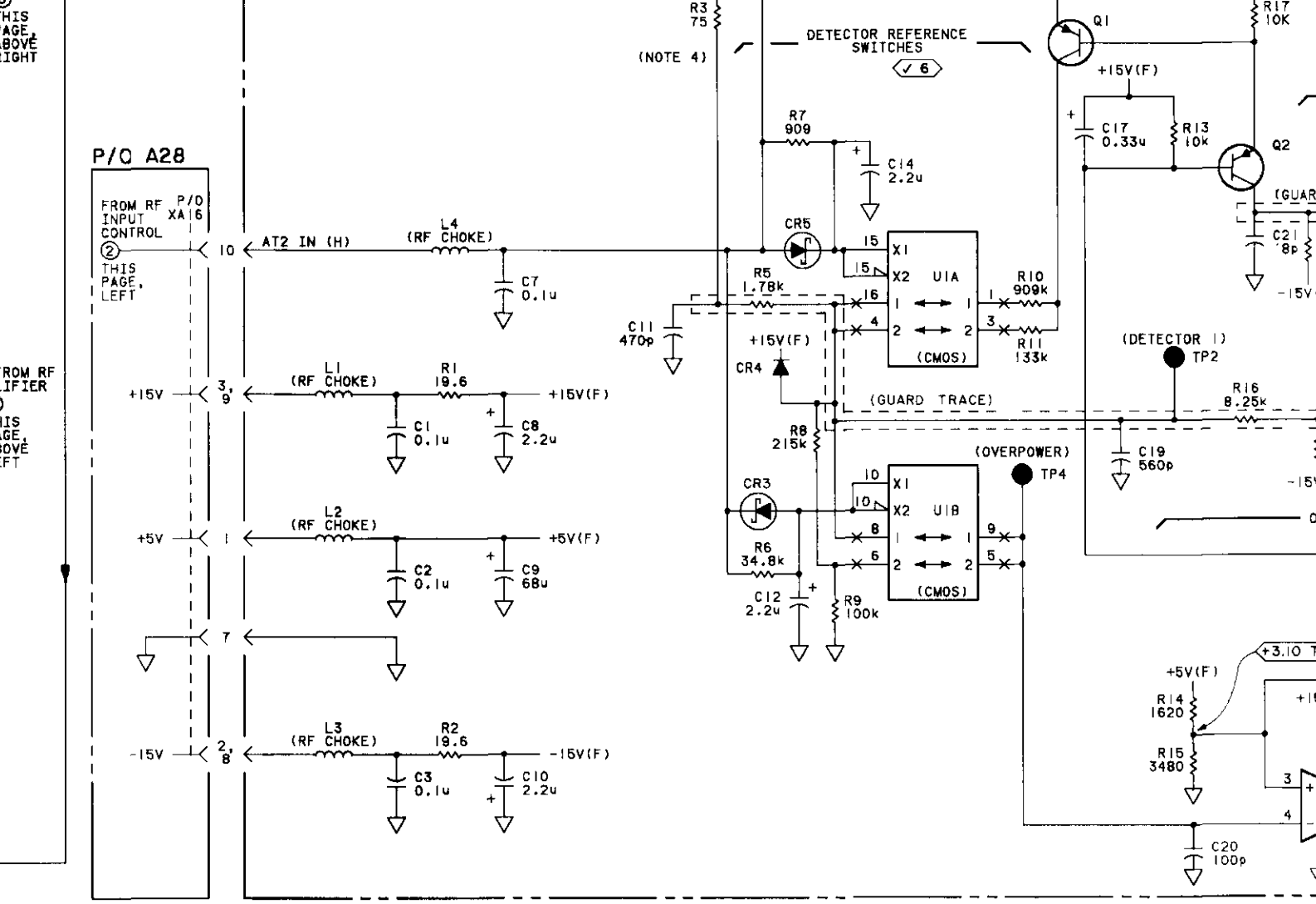
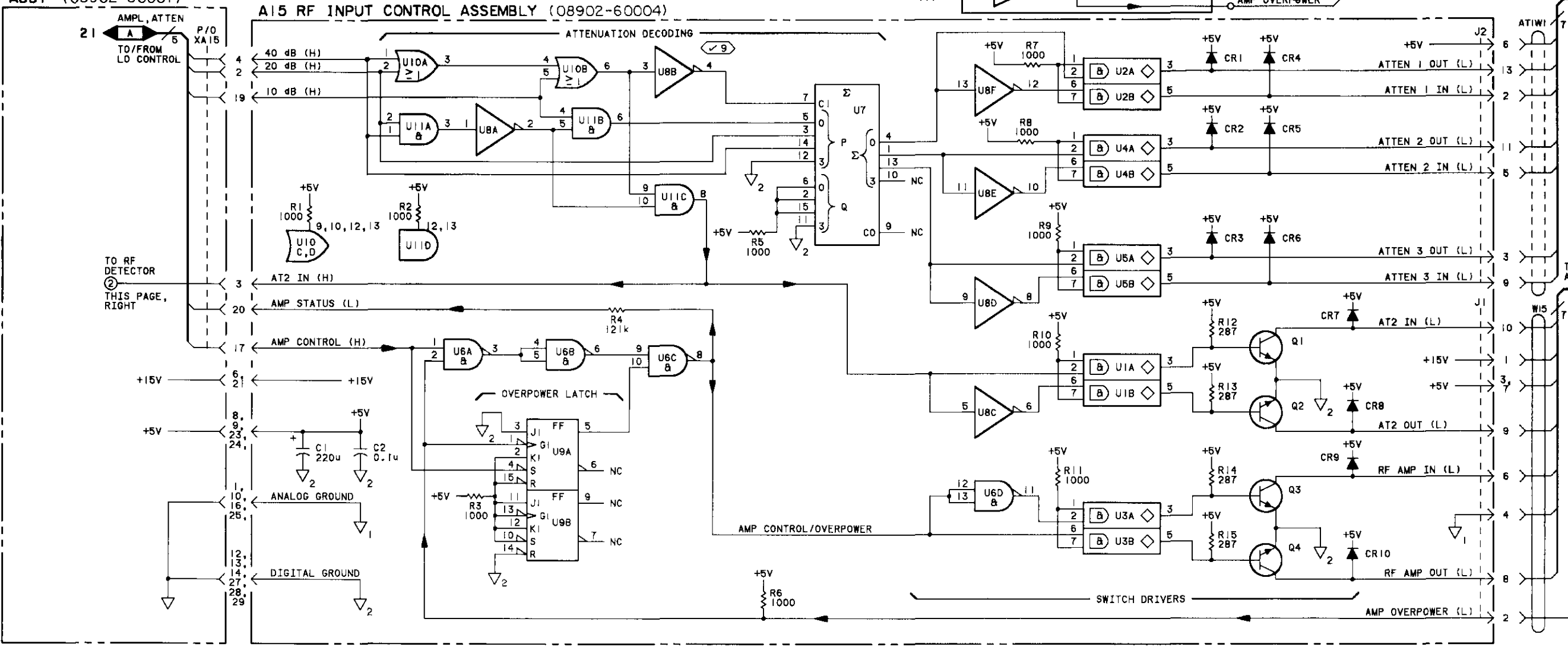
DIGITAL GROUND



NOTES

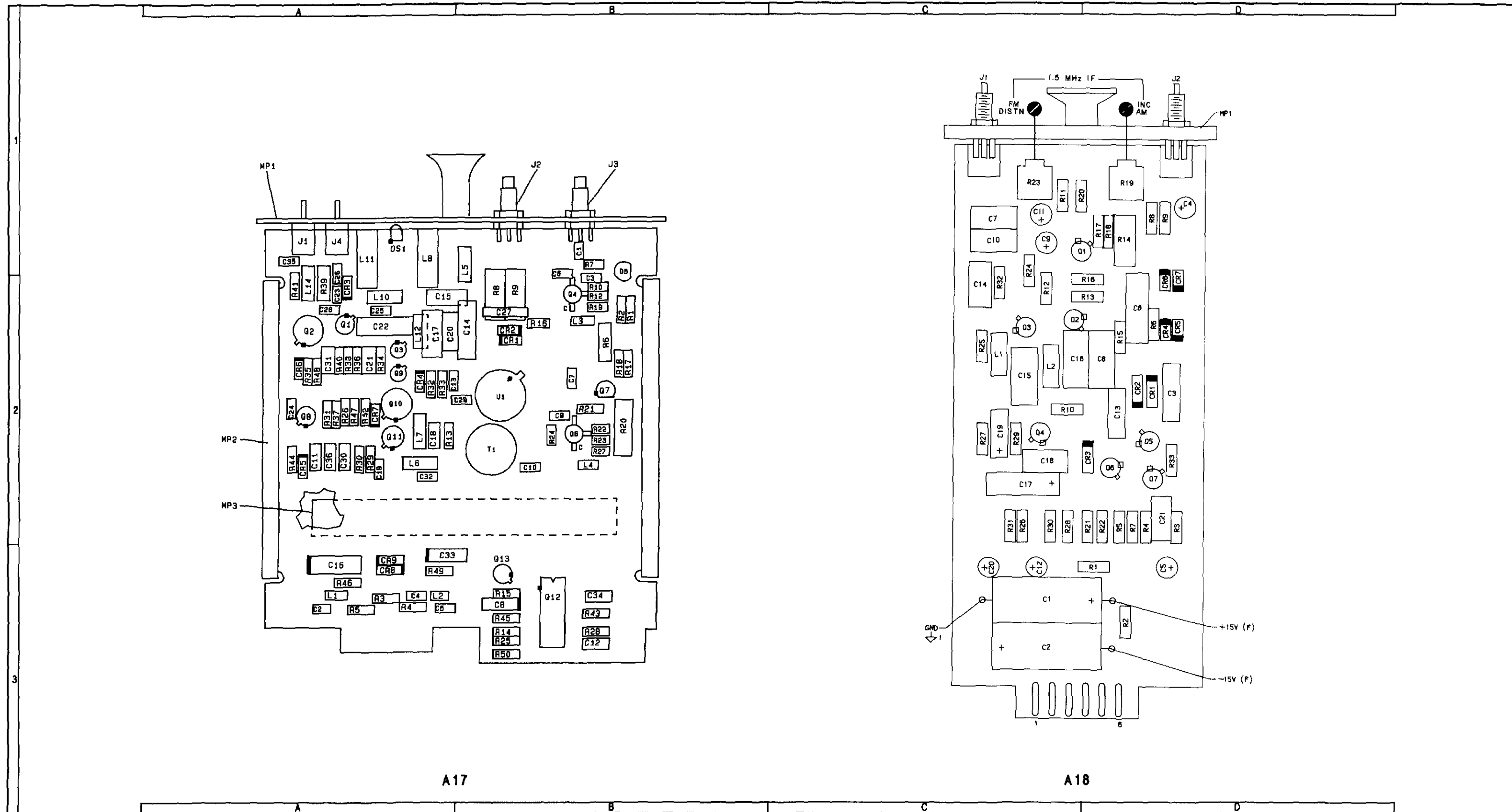
- SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
- A16U2 HAS AN OPEN-EMITTER OUTPUT.
- A16U3 HAS AN OPEN COLLECTOR OUTPUT.
- A16C4 AND A16R3 ARE CHIP PARTS. USE SILVER SOLDER AND LOW TEMPERATURE SOLDERING TECHNIQUES.
- RELAYS ARE LATCHING TYPE. A MOMENTARY RELAY LOW INPUT WILL ACTUATE THE INDICATED SEGMENT.

REFERENCE DESIGNATIONS	DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS	PIN NUMBERS
A15 U1-5	+5V	- 8
	△	- 4
U7, 9	+5V	- 16
	△	- 8
U6, 8, 10, 11	+5V	- 14
	△	- 7
A16 U1, 5	+15V	- 11
	△	- 14
	+5V	- 12
	△	8, 9, 13
U6	+5V	- 8
	△	- 4



A17 & A18 Component Coordinates (2535A AND ABOVE)

A17		COMP	X,Y	COMP	X,Y	A18		COMP	X,Y
C1	B,1	DS1	A,1	R12	B,2	C1	C,3	R1	D,3
C2	A,3	J1	A,1	R13	A,2	C2	C,3	R2	D,3
C3	B,2	J2	B,1	R14	B,3	C3	D,2	R3	D,2
C4	A,3	J3	B,1	R15	B,3	C4	D,1	R4	D,2
C5	A,3	J4	A,1	R16	B,2	C5	D,3	R5	D,2
C6	B,2	L1	A,3	R17	B,2	C6	D,2	R6	D,2
C7	B,2	L2	A,3	R18	B,2	C7	C,1	R7	D,2
C8	B,3	L3	B,2	R19	B,2	C8	D,2	R8	D,1
C9	B,2	L4	B,2	R20	B,2	C9	C,1	R9	D,1
C10	B,2	L5	B,1	R21	B,2	C10	C,1	R10	C,2
C11	A,2	L6	A,2	R22	B,2	C11	C,1	R11	C,1
C12	B,3	L7	A,2	R23	B,2	C12	C,3	R12	C,2
C13	A,2	L8	A,1	R24	B,2	C13	D,2	R13	D,2
C14	B,2	L9	A,1	R25	B,3	C14	C,2	R14	D,1
C15	A,2	L10	A,2	R26	A,2	C15	C,2	R15	D,2
C16	A,3	L11	A,1	R27	B,2	C16	C,2	R16	D,2
C17	A,2	L12	A,2	R28	B,3	C17	C,2	R17	D,1
C18	A,2	L14	A,2	R29	A,2	C18	C,2	R18	D,1
C19	A,2	MP1	A,1	R30	A,2	C19	C,2	R19	D,1
C20	A,2	MP2	A,2	R31	A,2	C20	C,3	R20	D,1
C21	A,2	MP3	A,2	R32	A,2	C21	D,2	R21	D,2
C22	A,2	Q1	A,2	R33	A,2	CR1	D,2	R22	D,2
C23	A,2	Q2	A,2	R34	A,2	CR2	B,2	R23	C,1
C24	A,2	Q3	A,2	R35	A,2	CR3	D,2	R24	C,2
C25	A,2	Q4	B,2	R36	A,2	CR4	D,2	R25	C,2
C26	A,2	Q5	B,2	R37	A,2	CR5	D,2	R26	C,2
C27	B,2	Q6	B,2	R38	A,2	CR6	D,2	R27	C,2
C28	A,2	Q7	B,2	R39	A,2	CR7	D,2	R28	C,2
C29	B,2	Q8	A,2	R40	A,2	J1	C,1	R29	C,2
C30	A,2	Q9	A,2	R41	A,2	J2	D,1	R30	C,2
C31	A,2	Q10	A,2	R42	A,2	L1	C,2	R31	C,2
C32	A,2	Q11	A,2	R43	B,3	L2	C,2	R32	C,2
C33	A,3	Q12	B,3	R44	A,2	MP1	D,1	R33	D,2
C34	B,3	Q13	B,3	R45	B,3	Q1	D,1		
C35	A,1			R46	A,3	Q2	C,2		
C36	A,2			R47	A,2	Q3	C,2		
CR1	B,2			R48	A,2	Q4	C,2		
CR2	B,2			R49	A,3	Q5	D,2		
CR3	B,2			R50	B,3	Q6	D,2		
CR3	A,2					Q7	D,2		
CR4	A,2								
CR5	A,2								
CR6	A,2								
CR7	A,2								
CR8	A,3								
CR9	A,3								



Component Locators

A15 RF INPUT  
 A16 RF DETECTOR  
 SEE REVERSE SIDE

A70 AMPLIFIER/SWITCH  
 INTERCONNECT  
 AT1 INPUT ATTENUATOR

**SS4**

**CHANGES****2328A to 2530A**

In the A17 component coordinates:

- A17L14 - Add L14 with coordinates A,1.
- A17C28 - Add C28 with coordinates A,2.

On the A17 component locator:

- A17L14 - In grid location A,1 add L14 between L12 and C20.
- A17C28 - In grid location A,2 add C28 directly to the right of R25.

On the A17 schematic:

- L6 - In A17 Input Mixer, delete L6 and replace it with C28, L14, and new L6 as shown in the figure on page 8G-10.3

**2414A to 2530A**

On the A17 component locator:

- A17MP5, MP6 - Delete all references to MP5 and MP6 in the A17 component locator.

On the A17 schematic:

- SHIELD - In the lower, left portion of the A17 schematic, delete the dashed line that represents the shield and the title "SHIELD".

**2451A to 2530A**

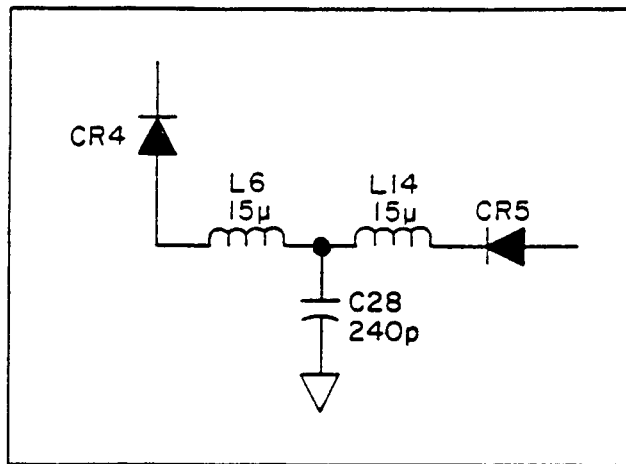
On the A18 schematic:

- A18E1 - Add a ferrite bead, E1, to the base of Q7.

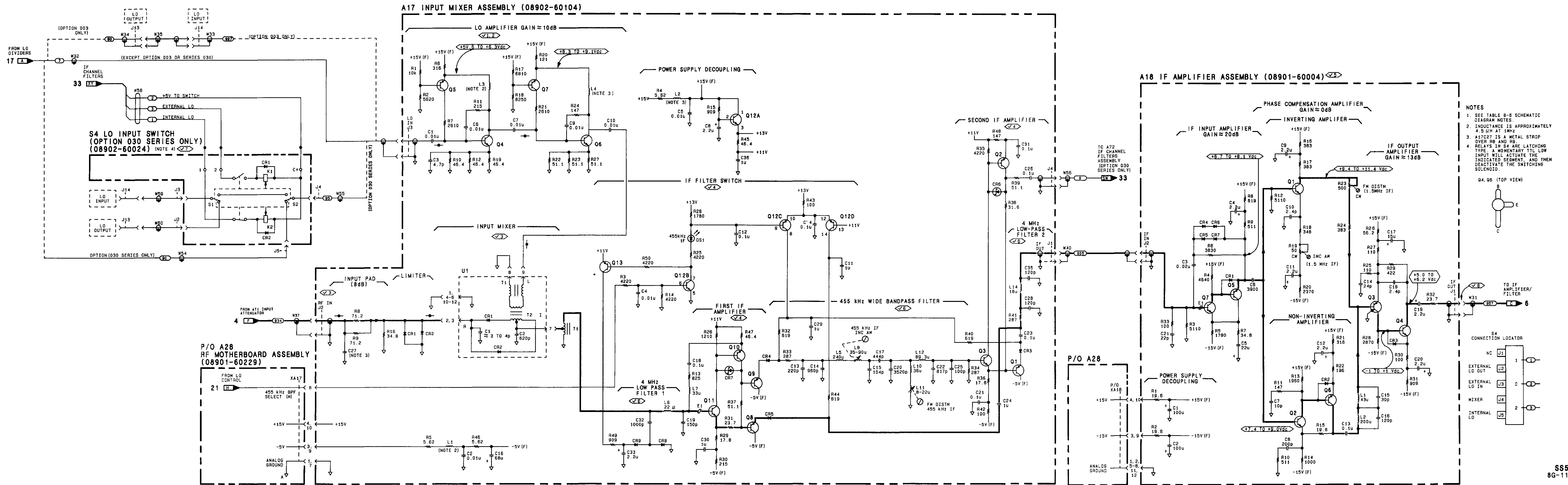
**2535A and above**

A17 Schematic:

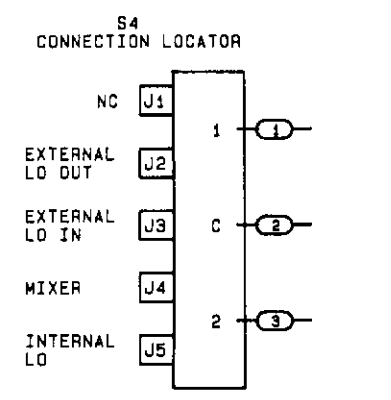
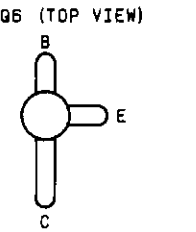
- Use SS5 (2535A) on page 8G-12 and 8G-13.



*P/O SS5 A17 Input Mixer Assembly (Refer to 2328A to 2530A)*

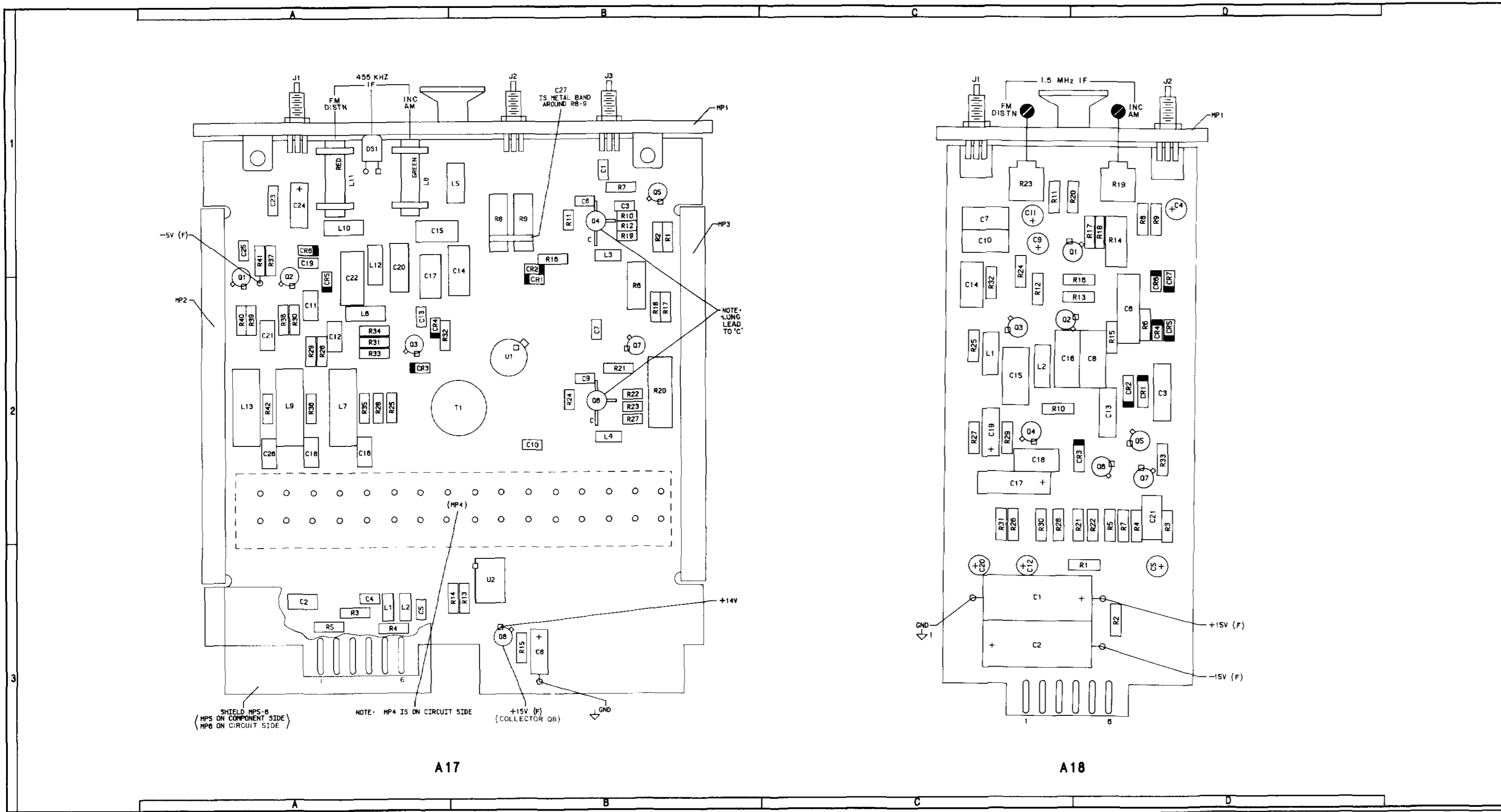


- NOTES**
1. SEE TABLE B-6 SCHEMATIC DIAGRAM NOTES.
  2. INDUCTANCE IS APPROXIMATELY 4.5 μH AT 1MHz
  3. A17C27 IS A METAL STRIP OVER R8 AND R9.
  4. RELAYS IN S4 ARE LATCHING TYPE. A MOMENTARY TTL LOW INPUT WILL ACTUATE THE INDICATED SEGMENT, AND THEN DEACTIVATE THE SWITCHING SOLENOID.



A17 & A18 Component Coordinates (2305A TO 2530A)

A17		COMP	X,Y	COMP	X,Y	A18		COMP	X,Y
C1	B,1	L7	A,2	R20	B,2	COMP	X,Y	R1	D,3
C2	A,3	L8	A,1	R21	B,2	C1	C,3	R2	D,3
C3	B,1	L9	A,2	R22	B,2	C2	C,3	R3	D,2
C4	A,3	L10	A,1	R23	B,2	C3	D,2	R4	D,2
C5	A,3	L11	A,1	R24	B,2	C4	D,1	R5	D,2
C6	B,1	L12	A,1	R25	A,2	C5	D,3	R6	D,2
C7	B,2	L13	A,2	R26	A,2	C6	D,2	R7	D,2
C8	B,3	MP1	B,1	R27	B,2	C7	C,1	R8	D,1
C9	B,2	MP1	B,1	R28	A,2	C8	D,2	R9	D,1
C10	B,2	MP2	A,2	R29	A,2	C9	C,1	R10	C,2
C11	A,2	MP2	A,2	R30	A,2	C10	C,1	R11	C,1
C12	A,2	MP3	B,1	R31	A,2	C11	C,1	R12	C,2
C13	A,2	MP3	B,1	R32	A,2	C12	C,3	R13	D,2
C14	B,1	MP4	B,2	R33	A,2	C13	D,2	R14	D,1
C15	A,1	MP4	B,2	R34	A,2	C14	C,2	R15	D,2
C16	A,2	MP5	A,3	R35	A,2	C15	C,2	R16	D,2
C17	A,2	MP5	A,3	R36	A,2	C16	C,2	R17	D,1
C18	A,2	MP6	A,3	R37	A,1	C17	C,2	R18	D,1
C19	A,1	MP6	A,3	R38	A,2	C18	C,2	R19	D,1
C20	A,1	Q1	A,2	R39	A,2	C19	C,2	R20	D,1
C21	A,2	Q2	A,2	R40	A,2	C20	C,3	R21	D,2
C22	A,2	Q3	A,2	R41	A,1	C21	D,2	R22	D,2
C23	A,1	Q4	B,1	R42	A,2			R23	C,1
C24	A,1	Q5	B,1	T1	B,2	CR1	D,2	R24	C,2
C25	A,1	Q6	B,2			CR2	B,2	R25	C,2
C26	A,2	Q7	B,2	U1	B,2	CR3	D,2	R26	C,2
C27	B,1	Q8	B,3	U2	B,3	CR4	D,2	R27	C,2
						CR5	D,2	R28	C,2
						CR6	D,2	R29	C,2
CR1	B,2	R1	B,1			CR7	D,2	R30	C,2
CR2	B,1	R2	B,1					R31	C,2
CR3	A,2	R3	A,3			J1	C,1	R32	C,2
CR4	A,2	R4	A,3			J2	D,1	R33	D,2
CR5	A,2	R5	A,3						
CR6	A,1	R6	B,2			L1	C,2		
		R7	B,1			L2	C,2		
DS1	A,1	R8	B,1					MP1	D,1
		R9	B,1						
		R10	B,1			Q1	D,1		
J1	A,1	R11	B,1			Q2	C,2		
J2	B,1	R12	B,1			Q3	C,2		
J3	B,1	R13	B,3			Q4	C,2		
		R14	A,3			Q5	D,2		
L1	A,3	R15	B,3			Q6	D,2		
L2	A,3	R16	B,1			Q7	D,2		
L3	B,1	R16	B,2						
L4	B,2	R17	B,2						
L5	B,1	R19	B,1						
L6	A,2								



Component Locators

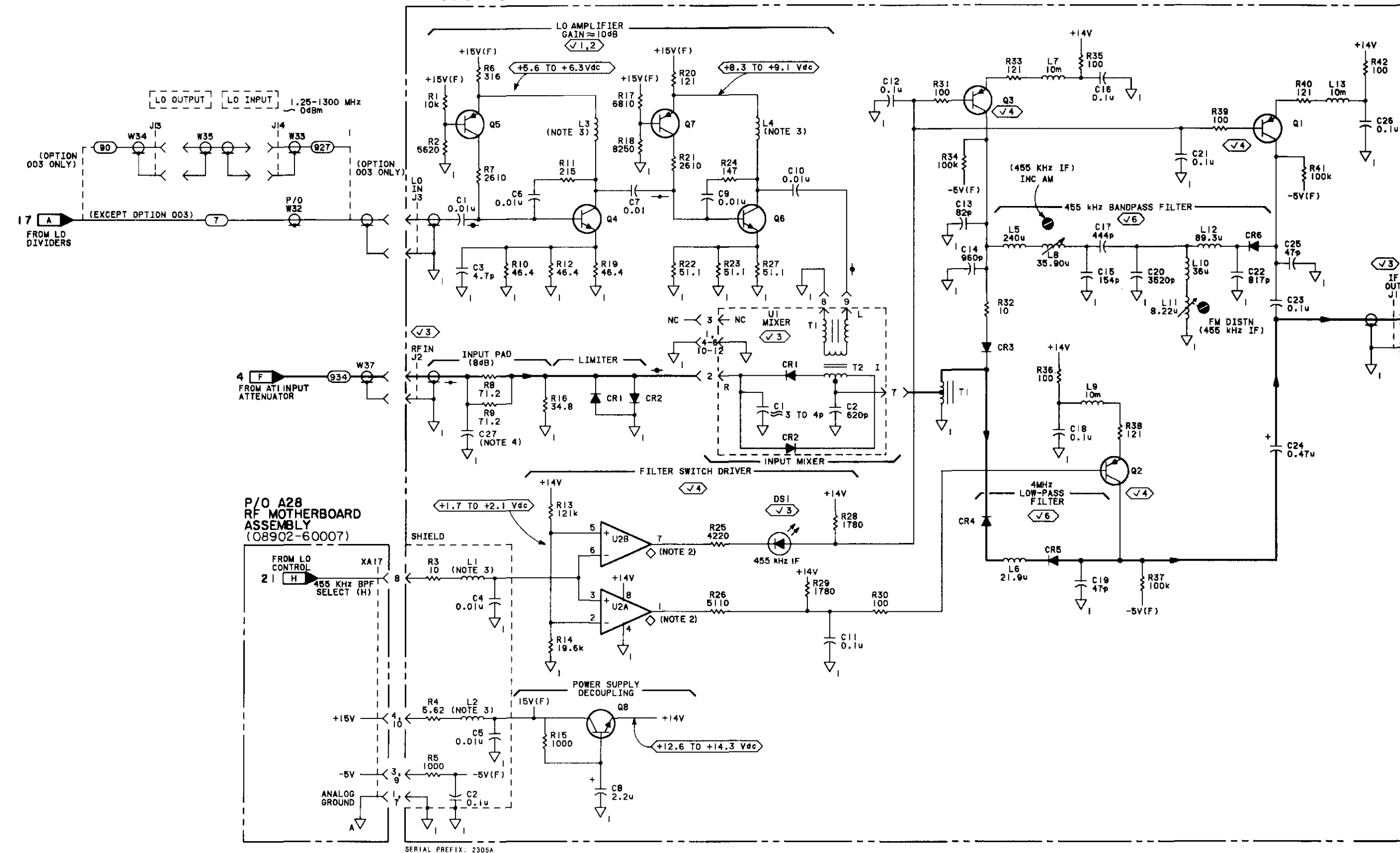
A17 INPUT MIXER  
 A18 IF AMPLIFIER  
 SERIAL PREFIX: 2535A AND ABOVE



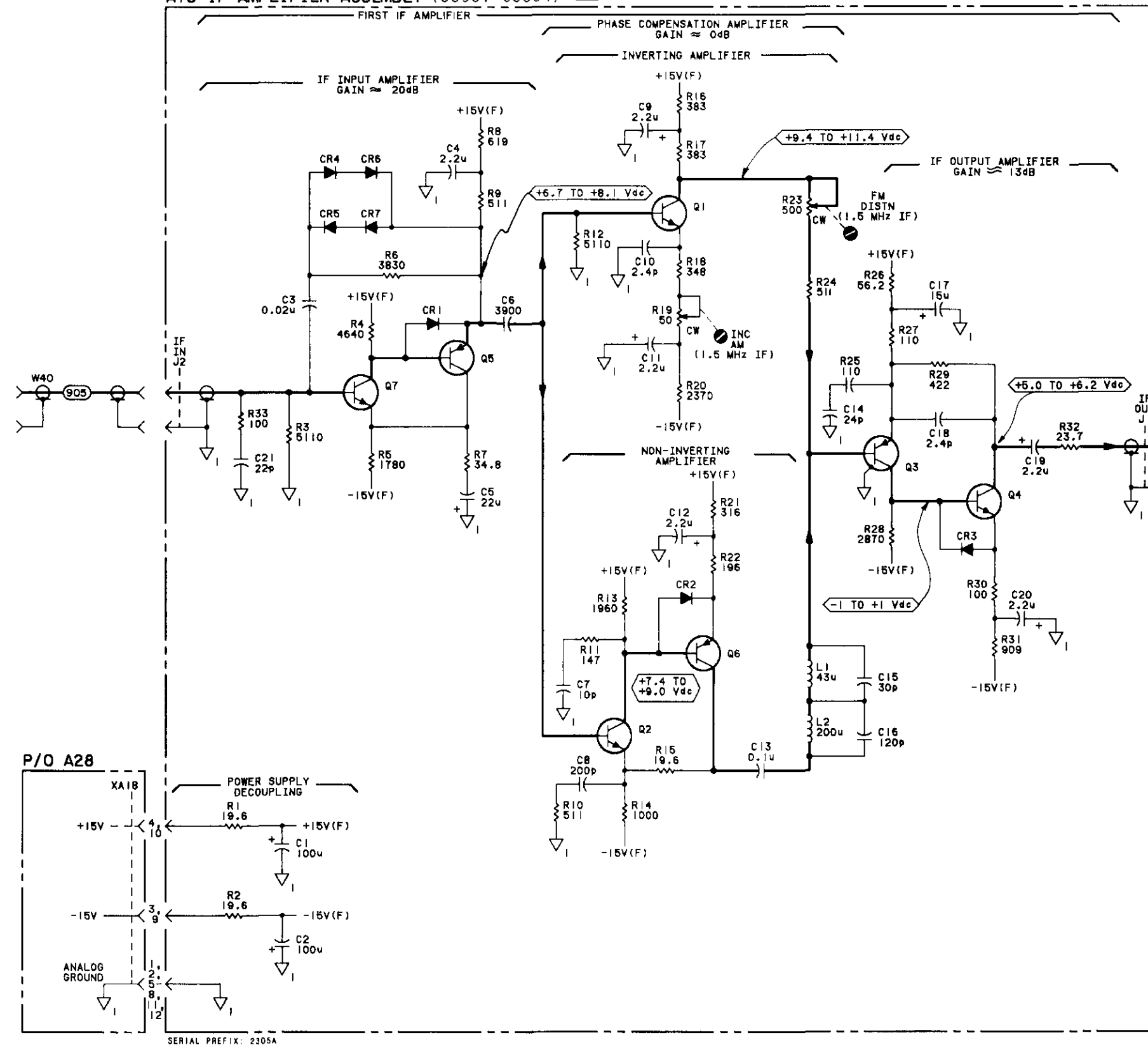
SEE REVERSE SIDE



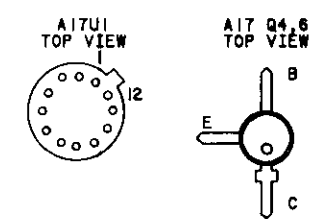
**A17 INPUT MIXER ASSEMBLY (08901-60145)**



**A18 IF AMPLIFIER ASSEMBLY (08901-60004)**

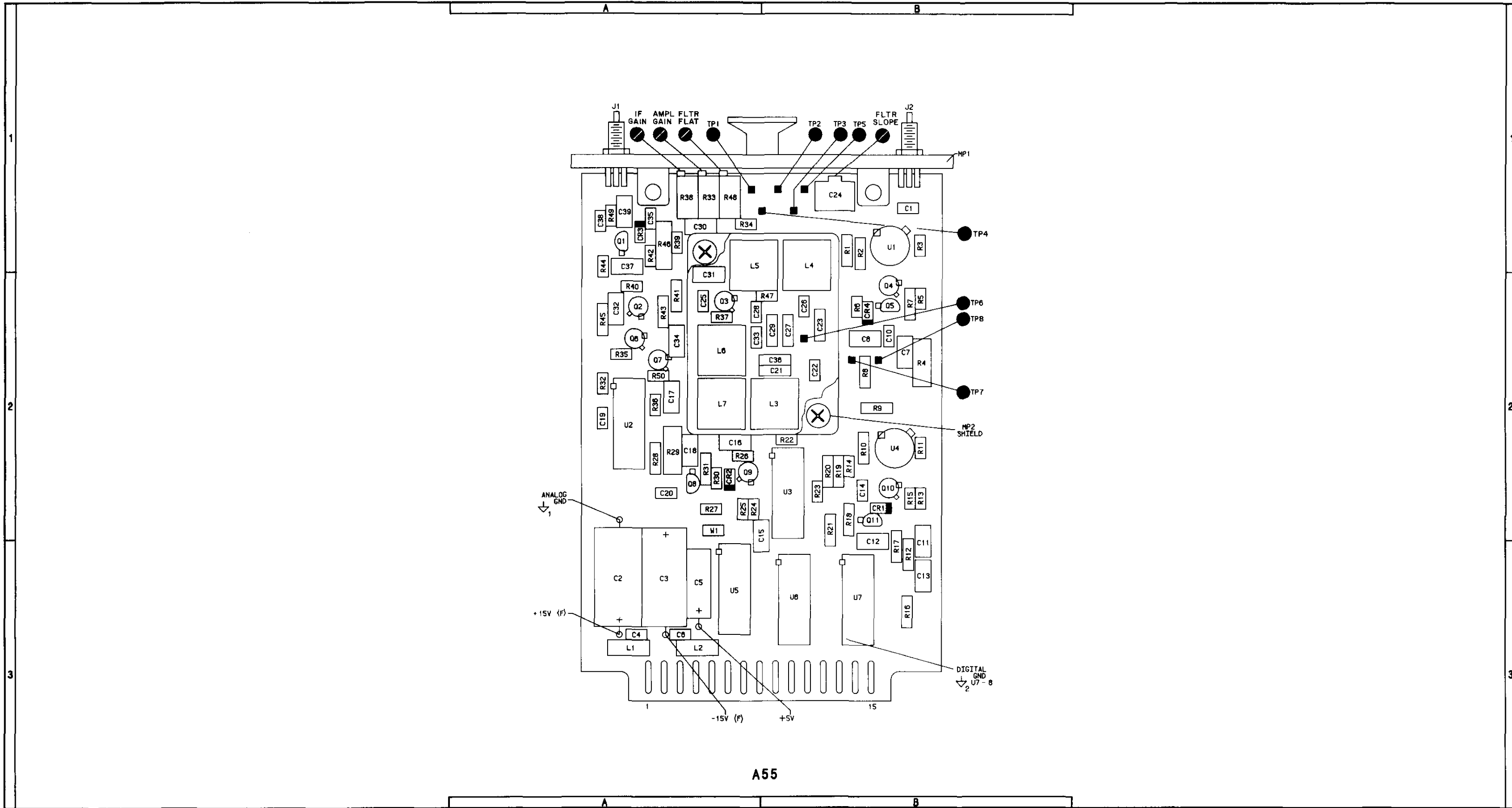


- NOTES:
1. SEE TABLE B-6 SCHEMATIC DIAGRAM NOTES.
  2. OPEN COLLECTOR OUTPUT.
  3. INDUCTANCE IS APPROXIMATELY 4.5uH AT 1 MHz.
  4. A17C27 IS A METAL STRAP OVER R8 AND R9.



A55 Component Coordinates (2305A TO 2530A)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,1	L1	A,3	R24	A,2				
C2	A,3	L2	A,3	R25	A,2				
C3	A,3	L3	B,2	R26	A,2				
C4	A,3	L4	B,2	R27	A,2				
C5	A,3	L5	A,2	R28	A,2				
C6	A,3	L6	A,2	R29	A,2				
C7	B,2	L7	A,2	R30	A,2				
C8	B,2			R31	A,2				
C10	B,2	MP1	B,1	R32	A,2				
C11	B,3	MP2	B,2	R33	A,1				
C12	B,3			R34	A,1				
C13	B,3	Q1	A,1	R35	A,2				
C14	B,2	Q2	A,2	R36	A,2				
C15	A,2	Q3	A,2	R37	A,2				
C16	A,2	Q4	B,2	R38	A,1				
C17	A,2	Q5	B,2	R39	A,1				
C18	A,2	Q6	A,2	R40	A,2				
C19	A,2	Q7	A,2	R41	A,2				
C20	A,2	Q8	A,2	R42	A,1				
C21	B,2	Q9	A,2	R43	A,2				
C22	B,2	Q10	B,2	R44	A,2				
C23	B,2	Q11	B,2	R45	A,2				
C24	B,1			R46	A,1				
C25	A,2	R1	B,1	R47	B,2				
C26	B,2	R2	B,1	R48	A,1				
C27	B,2	R3	B,1	R49	A,1				
C28	A,2	R4	B,2	R50	A,2				
C29	B,2	R5	B,2						
C30	A,1	R6	B,2	TP1	A,1				
C31	A,2	R7	B,2	TP2	B,1				
C32	A,2	R8	B,2	TP3	B,1				
C33	A,2	R9	B,2	TP4	B,1				
C34	A,2	R10	B,2	TP5	B,1				
C35	A,1	R11	B,2	TP6	B,2				
C36	B,2	R12	B,3	TP7	B,2				
C37	A,2	R13	B,2	TP8	B,2				
C38	A,1	R14	B,2						
C39	A,1	R15	B,2	U1	B,1				
		R16	B,3	U2	A,2				
CR1	B,2	R17	B,3	U3	B,2				
CR3	A,2	R18	B,2	U4	B,2				
CR3	A,1	R19	B,2	U5	A,3				
		R20	B,2	U6	B,3				
		R21	B,3	U7	B,3				
J1	A,1	R22	B,2						
J2	B,1	R23	B,2	W1	A,3				



Component Locator

A17 INPUT MIXER  
 A18 IF AMPLIFIER  
 SEE REVERSE SIDE  
**SS5**  
 SERIAL PREFIX: 2305A TO 2530A

**CHANGES****All Serial  
Prefixes****2339A to 2340A,  
2343A and above**

On the A55 schematic:

- A55C19 - Change the value of C19 to 22 PF.

On the A55 schematic:

- A55R19, R20 - Change the value of R19 to 683.7 and the value of R20 to 216.4.

A55 Component Coordinates:

- Use the A55 Component Coordinates on page 8G-14.3.

A55 Component Locator:

- Use the A55 Component Locator on page 8G-14.4.

On the A55 schematic:

- A55 - Change the part number of A55 IF AMPLIFIER/FILTER ASSEMBLY to (08902-60105).
- C9 - In the lower left corner of the schematic, just to the right of C4, insert C9 between the +15V lead and ground.
- A55C35 - Delete C35 and replace with an open circuit.
- A55R39 - Change the value of R39 to 348.
- A55R42 - Change the value of R42 to 750.
- A55R51 - Between C31 and the drain of Q3, add R51 with a value of 46.4. These components are in series.

**2535A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

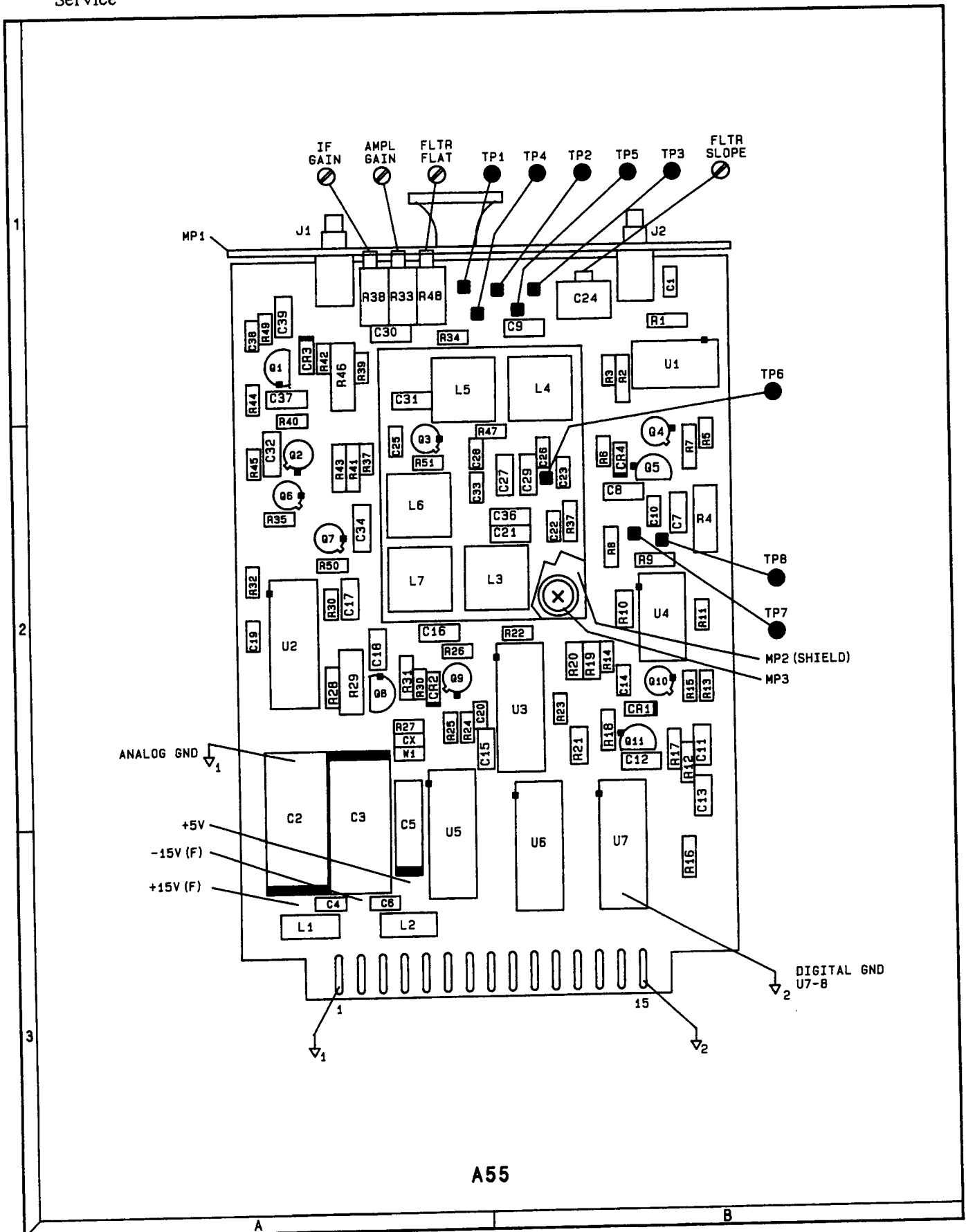
**2631A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

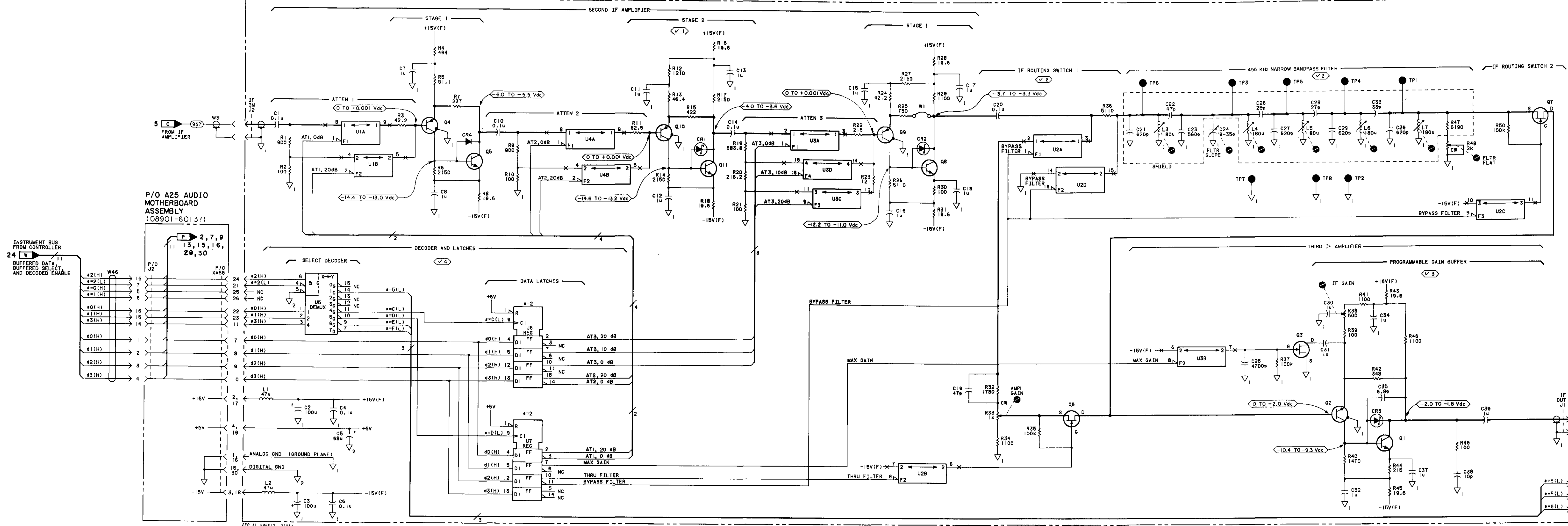
A55 Component Coordinates (2535A AND ABOVE)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,1	L1	A,3	R24	A,2				
C2	A,3	L2	A,3	R25	A,2				
C3	A,3	L3	B,2	R26	A,2				
C4	A,3	L4	B,2	R27	A,2				
C5	A,3	L5	A,2	R28	A,2				
C6	A,3	L6	A,2	R29	A,2				
C7	B,2	L7	A,2	R30	A,2				
C8	B,2			R31	A,2				
C9	B,1	MP1	B,1	R32	A,2				
C10	B,2	MP2	B,2	R33	A,1				
C11	B,3			R34	A,1				
C12	B,3	Q1	A,1	R35	A,2				
C13	B,3	Q2	A,2	R36	A,2				
C14	B,2	Q3	A,2	R37	B,2				
C15	A,2	Q4	B,2	R38	A,1				
C16	A,2	Q5	B,2	R39	A,1				
C17	A,2	Q6	A,2	R40	A,2				
C18	A,2	Q7	A,2	R41	A,2				
C19	A,2	Q8	A,2	R42	A,1				
C20	A,2	Q9	A,2	R43	A,2				
C21	B,2	Q10	B,2	R44	A,2				
C22	B,2	Q11	B,2	R45	A,2				
C23	B,2			R46	A,1				
C24	B,1	R1	B,1	R47	B,2				
C25	A,2	R2	B,1	R48	A,1				
C26	B,2	R3	B,1	R49	A,1				
C27	B,2	R4	B,2	R50	A,2				
C28	A,2	R5	B,2	R51	A,2				
C29	B,2	R6	B,2						
C30	A,1	R7	B,2	TP1	A,1				
C31	A,2	R8	B,2	TP2	B,1				
C32	A,2	R9	B,2	TP3	B,1				
C33	A,2	R10	B,2	TP4	B,1				
C34	A,2	R11	B,2	TP5	B,1				
C36	B,2	R12	B,3	TP6	B,2				
C37	A,2	R13	B,2	TP7	B,2				
C38	A,1	R14	B,2	TP8	B,2				
C39	A,1	R15	B,2						
		R16	B,3	U1	B,1				
CR1	B,2	R17	B,3	U2	A,2				
CR3	A,2	R18	B,2	U3	B,2				
CR3	A,1	R19	B,2	U4	B,2				
		R20	B,2	U5	A,3				
		R21	B,3	U6	B,3				
J1	A,1	R22	B,2	U7	B,3				
J2	B,1	R23	B,2						
				W1	A,3				



A55 Component Locator (Refer to 2535A)

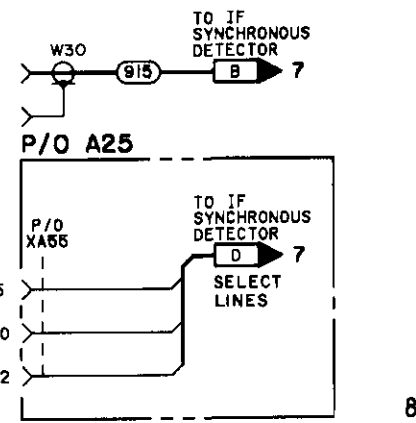
A55 IF AMPLIFIER/FILTER ASSEMBLY (08902-60003)



NOTES  
1. SEE TABLE 8-6 FOR SCHEMATIC DIAGRAM NOTES.

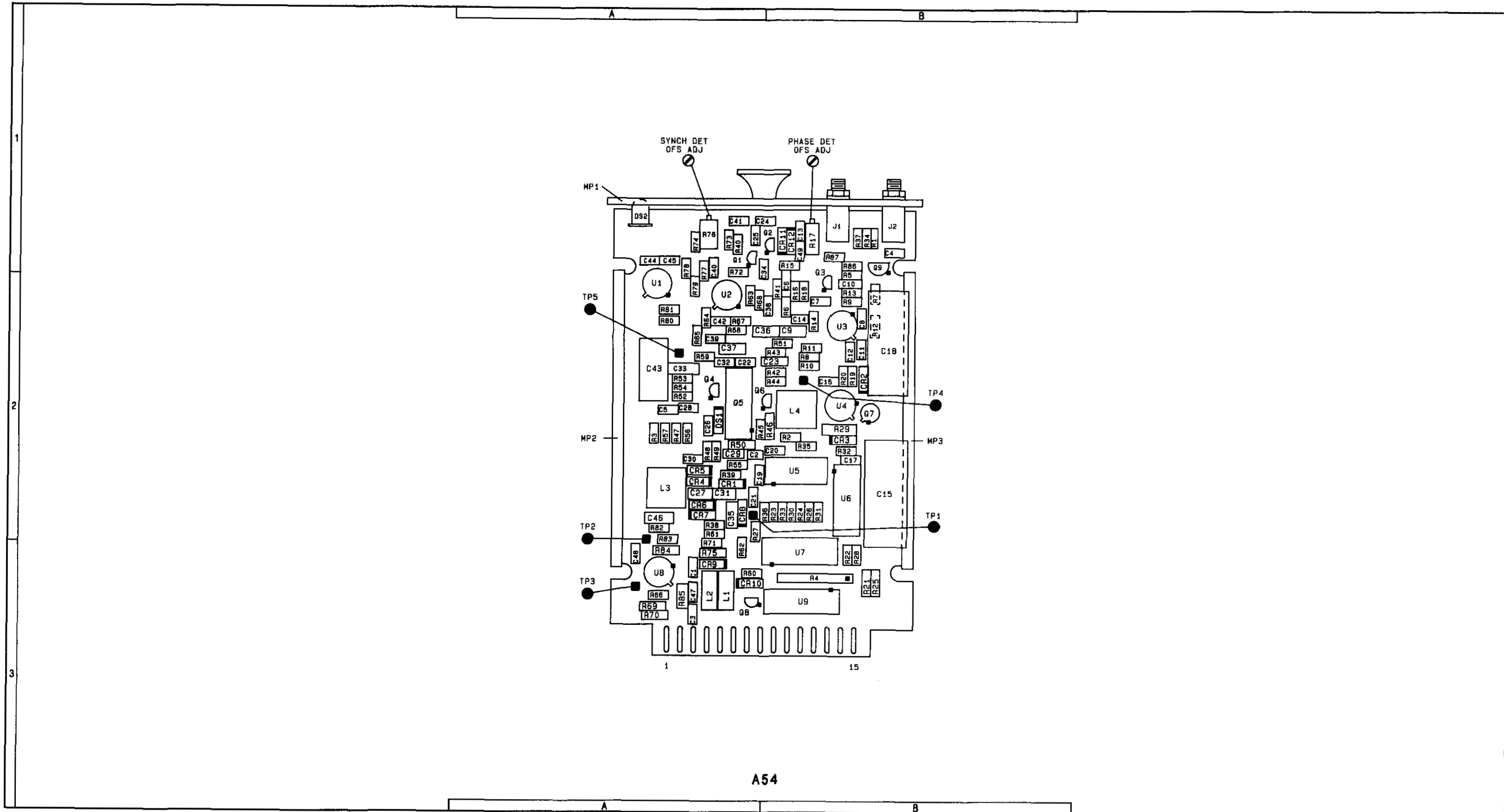
DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U2,3	+15V(F) - 13
	-15V(F) - 4
	⏏ - 5
U1,4	+15V(F) - 10
	-15V(F) - 6
	⏏ - 3
U6,6,7	+5V - 18
	⏏ - 8



A54 Component Coordinates

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	A,3	CR1	A,2	R12	B,2	R61	A,2		
C2	A,2	CR2	B,2	R13	B,2	R62	A,3		
C3	A,3	CR3	B,2	R14	B,2	R63	A,2		
C4	B,1	CR4	A,2	R15	B,1	R64	A,2		
C5	A,2	CR5	A,2	R16	B,2	R65	A,2		
C6	B,2	CR6	A,2	R17	B,1	R66	A,3		
C7	B,2	CR7	A,2	R18	B,2	R67	A,2		
C8	B,2	CR8	A,2	R19	B,2	R68	A,2		
C9	B,2	CR9	A,3	R20	B,2	R69	A,3		
C10	B,2	CR10	A,3	R21	B,3	R70	A,3		
C11	B,2	CR11	B,1	R22	B,3	R71	A,3		
C12	B,2	CR12	B,1	R23	B,2	R72	A,1		
C13	B,1			R24	B,2	R73	A,1		
C14	B,2	DS1	A,2	R25	B,3	R74	A,1		
C15	B,2	DS2	A,1	R26	B,2	R75	A,3		
C16	B,2			R27	A,2	R76	A,1		
C17	B,2	J1	B,1	R28	B,3	R77	A,1		
C18	B,2	J2	B,1	R29	B,2	R78	A,1		
C19	A,2			R30	B,2	R79	A,2		
C20	B,2	L1	A,3	R31	B,2	R80	A,2		
C21	A,2	L2	A,3	R32	B,2	R81	A,2		
C22	A,2	L3	A,2	R33	B,2	R82	A,2		
C23	B,2	L4	B,2	R34	B,1	R83	A,2		
C24	A,1			R35	B,2	R84	A,3		
C25	A,1	MP1	A,1	R36	B,2	R85	A,3		
C26	A,2	MP2	A,2	R37	B,1	R86	B,1		
C27	A,2	MP3	B,2	R38	A,2	R87	B,1		
C28	A,2			R39	A,2				
C29	A,2	Q1	A,1	R40	A,1	TP1	A,2		
C30	A,2	Q2	B,1	R41	B,2	TP2	A,2		
C31	A,2	Q3	B,2	R42	B,2	TP3	A,3		
C32	A,2	Q4	A,2	R43	B,2	TP4	B,2		
C33	A,2	Q5	A,2	R44	B,2	TP5	A,2		
C34	A,1	Q6	B,2	R45	A,2				
C35	A,2	Q7	B,2	R46	B,2	U1	A,2		
C36	A,2	Q8	A,3	R47	A,2	U2	A,2		
C37	A,2	Q9	B,1	R48	A,2	U3	B,2		
C38	A,2			R49	A,2	U4	B,2		
C39	A,2	R1	B,1	R50	A,2	U5	B,2		
C40	A,1	R2	B,2	R51	B,2	U6	B,2		
C41	A,1	R3	A,2	R52	A,2	U7	B,3		
C42	A,2	R4	B,3	R53	A,2				
C43	A,2	R5	B,2	R54	A,2				
C44	A,1	R6	B,2	R55	A,2				
C45	A,1	R7	B,2	R56	A,2				
C46	A,2	R8	B,2	R57	A,2				
C47	A,3	R9	B,2	R58	A,2				
C48	A,3	R10	B,2	R59	A,2				
C49	B,1	R11	B,2	R60	A,3				



A54

Component Locator

A55 IF AMPLIFIER/FILTER

SS6

SEE REVERSE SIDE

## CHANGES

**2535A and above**

On the A25 schematic:

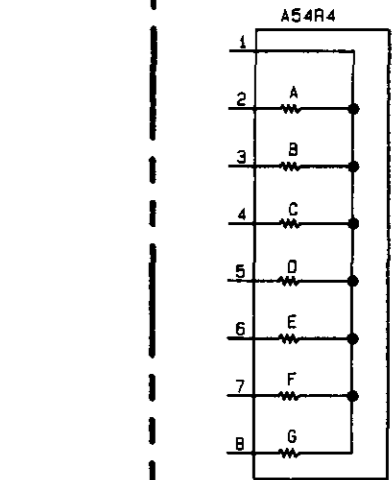
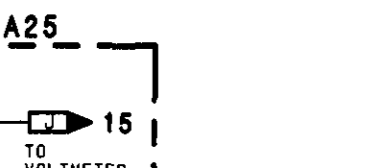
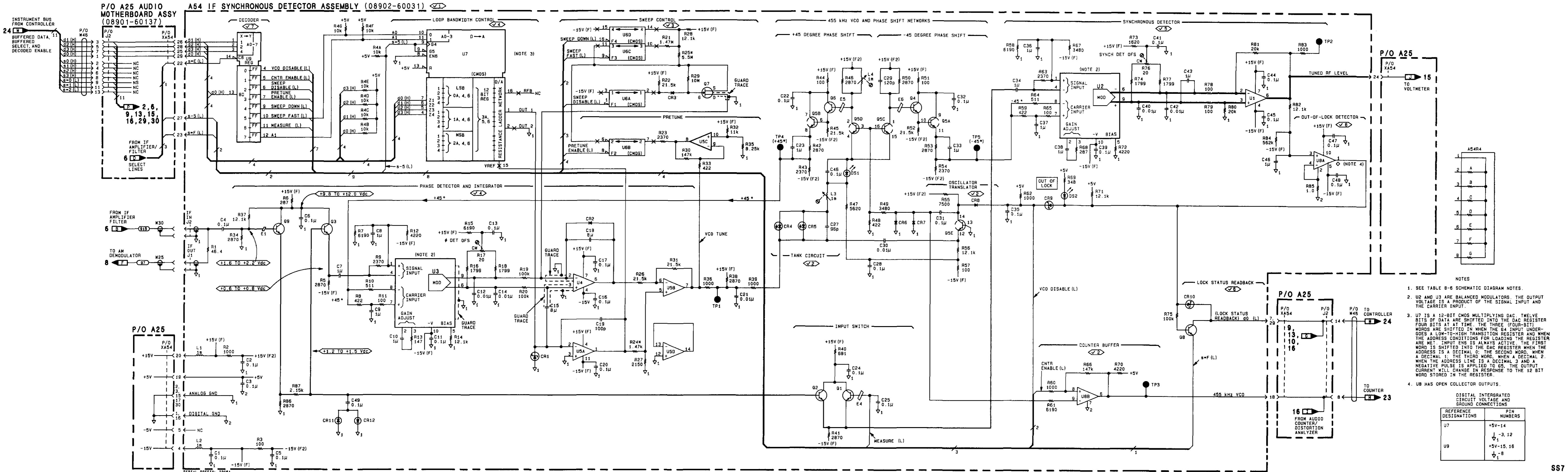
- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

**2631A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.





- NOTES
- SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
  - U2 AND U3 ARE BALANCED MODULATORS. THE OUTPUT VOLTAGE IS A PRODUCT OF THE SIGNAL INPUT AND THE CARRIER INPUT.
  - U7 IS A 12-BIT CMOS MULTIPLYING DAC. TWELVE BITS OF DATA ARE SHIFTED INTO THE DAC REGISTER FOUR BITS AT A TIME. THE THREE (FOUR-BIT) WORDS ARE SHIFTED IN WHEN THE 64 INPUT UNDERGOES A LOW-TO-HIGH TRANSITION REGISTER AND WHEN THE ADDRESS CONDITIONS FOR LOADING THE REGISTER ARE MET. INPUT ENB IS ALWAYS ACTIVE. THE FIRST WORD IS SHIFTED INTO THE DAC REGISTER WHEN THE ADDRESS IS A DECIMAL 0; THE SECOND WORD, WHEN A DECIMAL 1; THE THIRD WORD, WHEN A DECIMAL 2. WHEN THE ADDRESS LINE IS A DECIMAL 3 AND A NEGATIVE PULSE IS APPLIED TO 65, THE OUTPUT CURRENT WILL CHANGE IN RESPONSE TO THE 12 BIT WORD STORED IN THE REGISTER.
  - UB HAS OPEN COLLECTOR OUTPUTS.

DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U7	+5V-14
	↓ -3, 12
	↓ 1
U9	+5V-15, 16
	↓ 1
	↓ 8



Component Locator

A54 IF SYNCHRONOUS DETECTOR

**SS7**

SEE REVERSE SIDE

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,2	CR5	B,3	R10	A,2	R66	A,3		
C2	B,2	CR6	B,3	R13	A,2	R67	B,3		
C3	A,2	CR7	B,3	R14	A,2	R68	B,3		
C4	A,2	CR8	B,3	R15	A,2	R69	A,3		
C5	A,2	CR9	B,3	R16	A,2	R70	A,3		
C6	A,2	CR10	B,3	R17	B,2	R71	A,3		
C7	A,2	CR18	A,3	R18	B,2	R72	B,3		
C8	A,1	CR21	A,2	R19	B,1	R73	B,3		
C9	A,1			R20	B,2	R74	B,3		
C11	A,1	J1	A,3	R21	B,2	R75	B,3		
C14	A,2	J2	A,2	R22	A,2	R76	B,3		
C15	B,2			R23	B,2	R77	B,3		
C16	A,2	L1	B,2	R24	B,1	R78	A,3		
C17	B,2	L2	B,2	R25	A,2	R79	A,3		
C18	A,2	L3	A,2	R26	B,2	R80	B,3		
C19	B,2	L4	A,2	R27	A,2	R81	B,2		
C20	B,2	L5	A,2	A28	A,2	R82	B,3		
C21	B,2	L7	B,3	R29	B,2	R87	B,3		
C22	A,2	L8	B,3	R30	A,2	R88	B,3		
C23	A,2			R31	A,3	R124	A,2		
C24	A,2	Q1	A,3	R32	A,3	R126	A,2		
C25	A,2	Q2	B,2	R33	A,2	R128	B,3		
C26	A,2	Q4	A,2	R34	A,2	R129	B,2		
C29	A,3	Q5	A,2	R35	A,2				
C30	B,3	Q6	A,2	R36	A,2	TP1	A,3		
C31	A,3	Q7	A,2	R37	A,2	TP2	A,3		
C32	B,3	Q8	A,2	R38	A,2				
C34	B,3	Q13	B,3	R39	A,3	U1	A,3		
C36	A,3	Q14	B,3	R41	B,2	U2	A,3		
C37	B,3	Q15	B,3	R42	B,2	U3	B,3		
C38	B,3	Q16	B,3	R44	A,3	U4	B,2		
C39	A,3	Q17	B,3	R46	B,2	U5	A,3		
C40	B,3	Q18	B,3	R49	B,3				
C41	B,2	Q19	B,3	R50	B,3	VR2	A,3		
C42	B,3	Q20	B,2	R51	A,3	VR3	A,3		
C43	B,3	Q21	B,2	R52	B,3	VR4	A,3		
C44	B,2	Q31	B,2	R54	A,3				
C45	B,3			R55	B,3				
C46	A,3	R1	A,2	R56	B,3				
C47	A,3	R2	A,2	R57	B,3				
C50	B,2	R3	A,1	R58	B,2				
C51	A,3	R4	A,1	R60	B,3				
C52	A,3	R5	A,1	R61	A,3				
C53	A,1	R6	A,1	R62	B,3				
C55	B,1	R7	A,1	R63	B,3				
C68	B,2	R8	B,2	R64	B,3				
C69	B,3	R9	A,2	R65	A,3				

**CHANGES**

**2339A to 2340A,  
2343A and above**

On the A6 schematic:

- A6C51 - Change the value of C51 to 560p.

**2535A and above**

On the A6 schematic:

- A6R52, R75 - Change the value of R52 to 3.48k. Change the value of R75 to 12.5k.

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

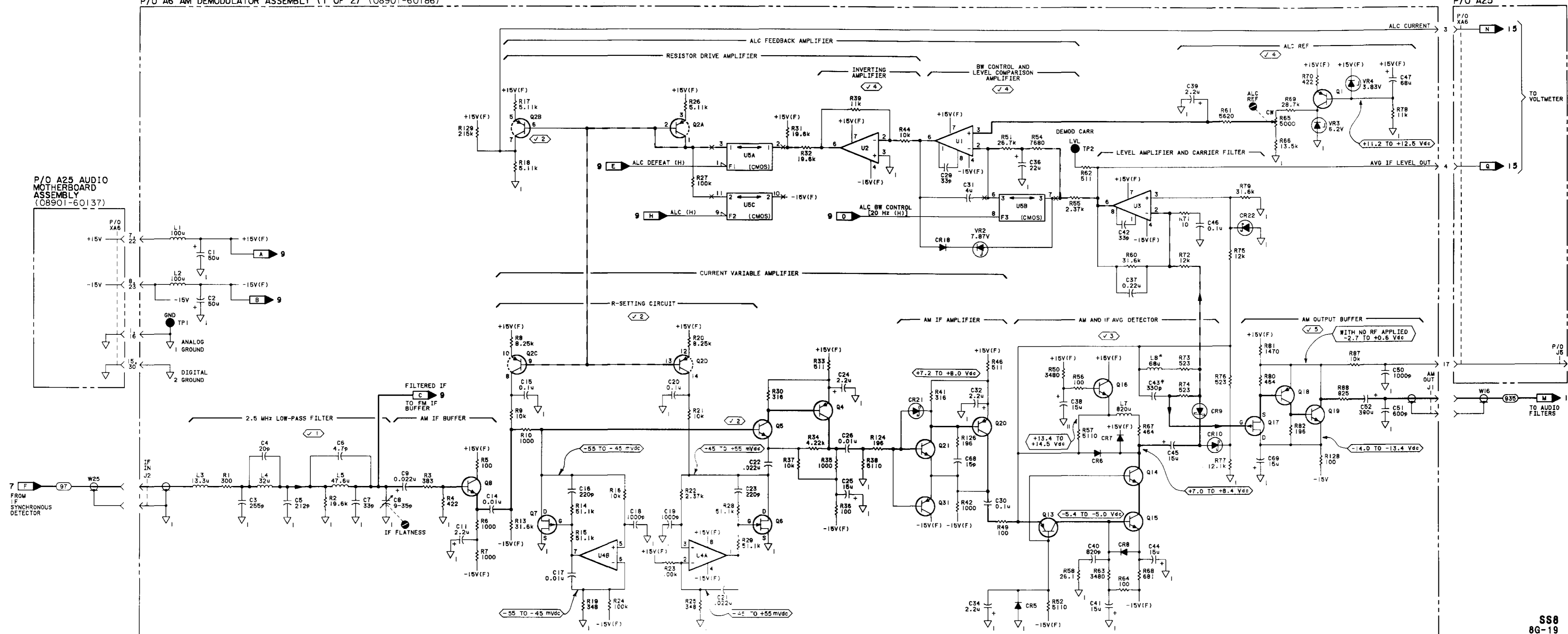
**2631A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

P/O A6 AM DEMODULATOR ASSEMBLY (1 OF 2) (08901-60186)

P/O A25 AUDIO MOTHERBOARD ASSEMBLY (08901-60137)



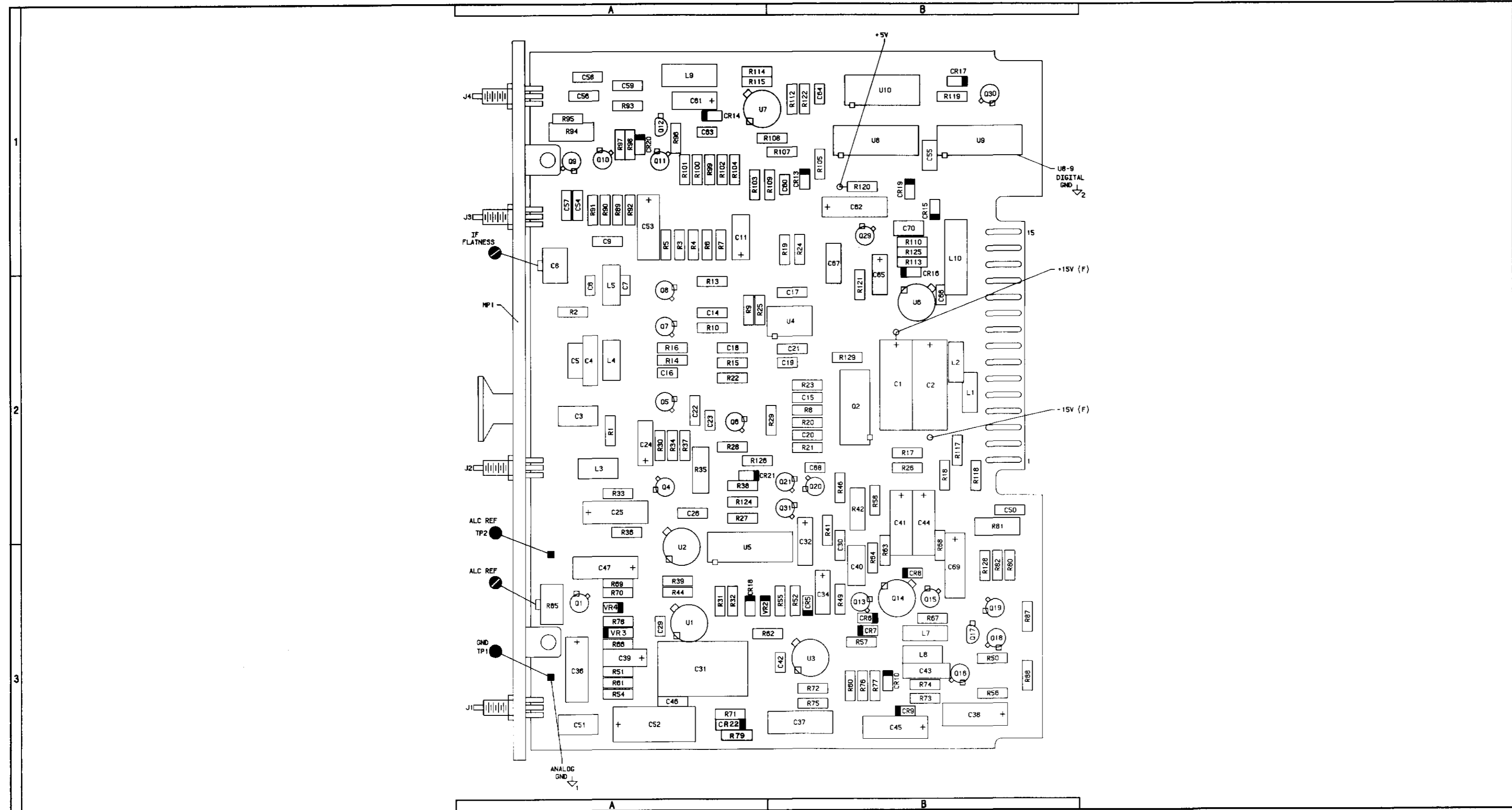
P/O A25

NOTES  
1. SEE TABLE 8-6 FOR SCHEMATIC DIAGRAM NOTES.

DIGITAL INTEGRATED VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U5	+6V -5
	↓ 2
	-18

A6 Component Coordinates (2 of 2)



COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C54	A,1	R98	A,1						
C56	A,1	R99	A,1						
C57	A,1	R100	A,1						
C58	A,1	R101	A,1						
C59	A,1	R102	A,1						
C60	B,1	R103	A,1						
C61	A,1	R104	A,1						
C62	B,1	R105	B,1						
C63	A,1	R107	B,1						
C64	B,1	R108	B,1						
C65	B,2	R109	B,1						
C66	B,2	R110	B,1						
C67	B,1	R112	B,1						
C70	B,1	R113	B,1						
		R114	A,1						
		R115	A,1						
CR13	B,1	R117	B,2						
CR14	A,1	R118	B,2						
CR15	B,1	R119	B,1						
CR16	B,2	R120	B,1						
CR17	B,1	R121	B,2						
CR19	B,1	R122	B,1						
CR20	A,1	R125	B,1						
J3	A,1	TP1	A,3						
J4	A,1								
L9	A,1	U6	B,2						
L10	B,1	U7	A,1						
		U8	B,1						
MP1	A,2	U9	B,1						
		U10	B,1						
Q9	A,1								
Q10	A,1								
Q11	A,1								
Q12	A,1								
Q29	B,1								
Q30	B,1								
R89	A,1								
R90	A,1								
R91	A,1								
R92	A,1								
R93	A,1								
R94	A,1								
R95	A,1								
R96	A,1								
R97	A,1								

Component Locator

A6 AM DEMODULATOR (1 OF 2)  
ALC LOOP

**SS8**

SEE REVERSE SIDE

## CHANGES

**2535A and above**

On the A25 schematic:

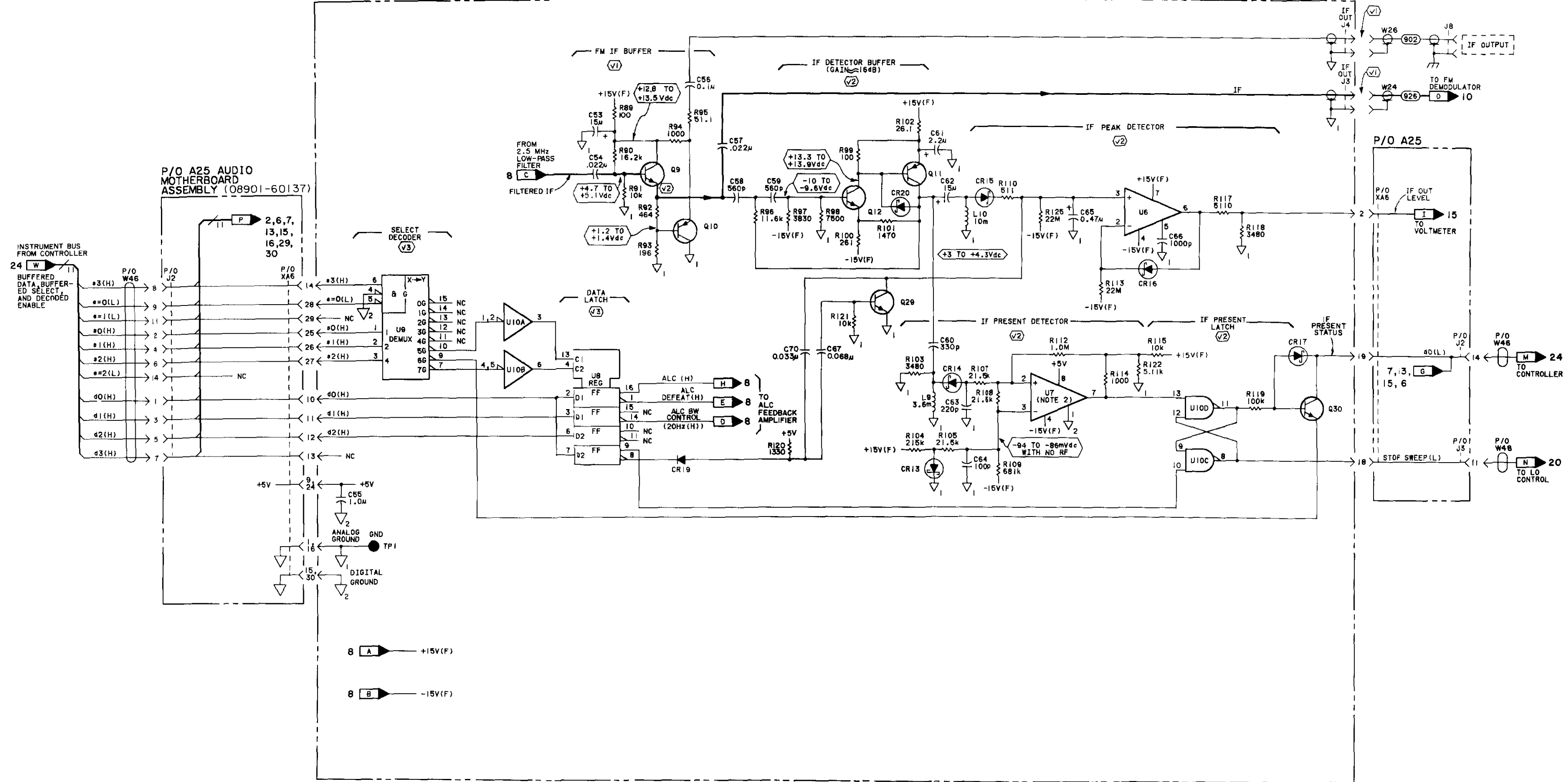
- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

**2631A and above**

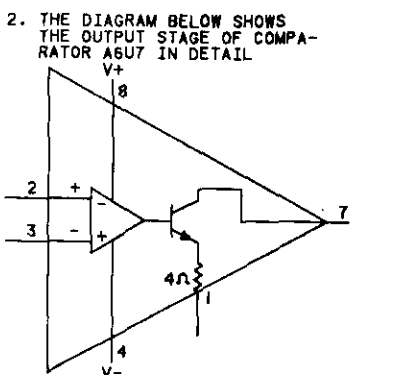
On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

P/O A6 AM DEMODULATOR ASSEMBLY (2 OF 2) (08901-60186)

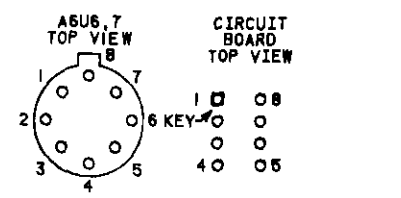


- NOTES
1. REFER TO TABLE 8-6 FOR SCHEMATIC DIAGRAM NOTES.
  2. THE DIAGRAM BELOW SHOWS THE OUTPUT STAGE OF COMPARATOR ASU7 IN DETAIL.



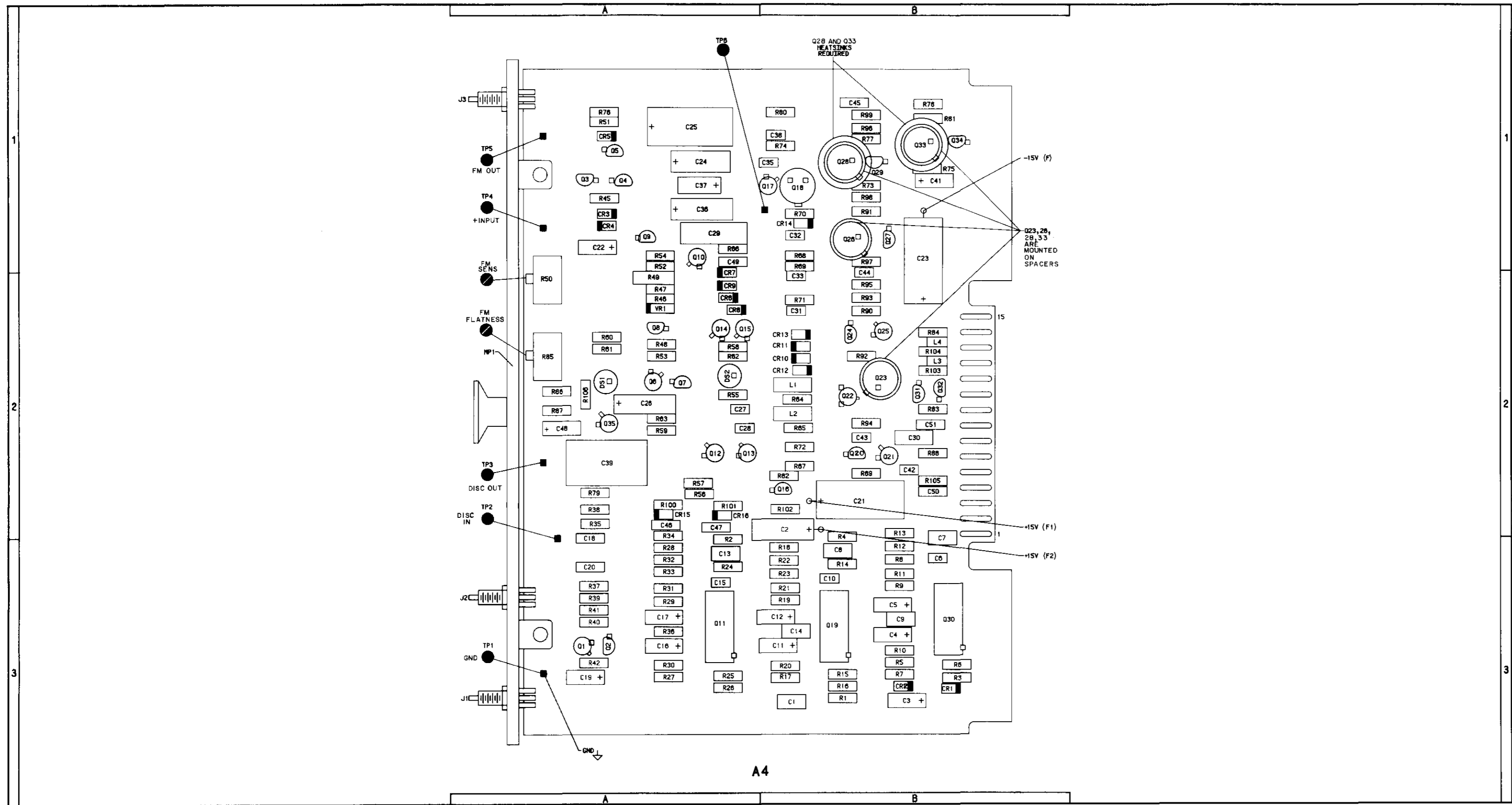
DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U8	+5V - 5
	V <sub>2</sub> - 12
U9	+5V - 16
	V <sub>2</sub> - 8
U10	+5V - 14
	V <sub>2</sub> - 7



A4 Component Coordinates (1 of 2)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,3	R14	B,3						
C2	B,2	R15	B,3						
C3	B,3	R16	B,3						
C4	B,3	R17	B,3						
C5	B,3	R18	B,3						
C6	B,3	R19	B,3						
C7	B,2	R20	B,3						
C8	B,3	R21	B,3						
C9	B,3	R22	B,3						
C10	B,3	R23	B,3						
C11	B,3	R24	A,3						
C12	B,3	R25	A,3						
C13	A,3	R26	A,3						
C14	B,3	R27	A,3						
C15	A,3	R28	A,3						
C16	A,3	R29	A,3						
C17	A,3	R30	A,3						
C18	A,2	R31	A,3						
C19	A,3	R32	A,3						
C20	A,3	R33	A,3						
		R34	A,2						
CR1	B,3	R35	A,2						
CR7	B,3	R36	A,3						
		R37	A,3						
J1	A,3	R38	A,2						
J2	A,3	R39	A,3						
J3	A,1	R40	A,3						
		R41	A,3						
Q1	A,3	R42	A,3						
Q2	A,3								
Q11	A,3	TP1	A,3						
Q19	B,3	TP2	A,2						
Q30	B,3								
R1	B,3								
R2	A,2								
R3	B,3								
R4	B,2								
R5	B,3								
R6	B,3								
R7	B,3								
R8	B,3								
R9	B,3								
R10	B,3								
R11	B,3								
R12	B,3								
R13	B,2								



Component Locator

SS9  
**A6 AM DEMODULATOR (2 OF 2)**  
**CONTROL CIRCUITS**  
SEE REVERSE SIDE



## CHANGES

2535A and above

On the A25 schematic:

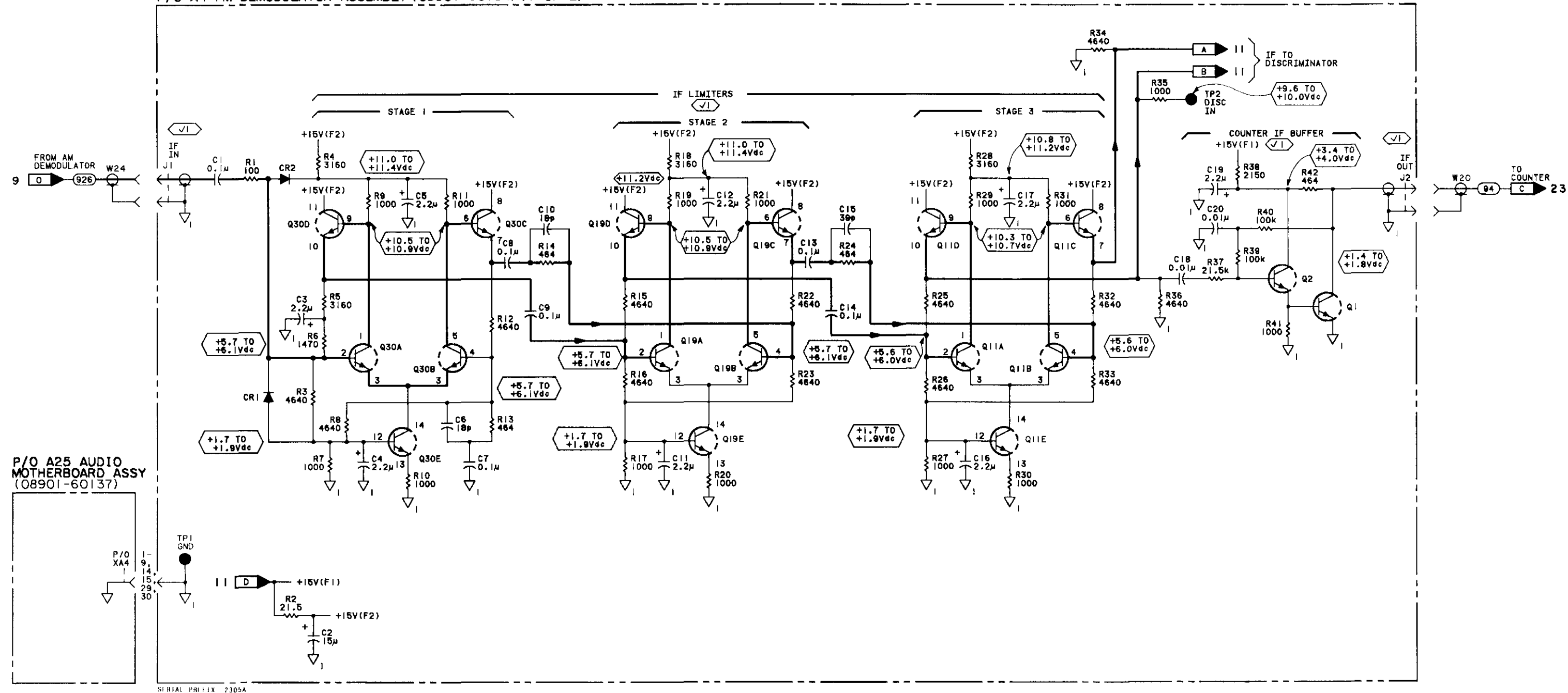
- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

2631A and above

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

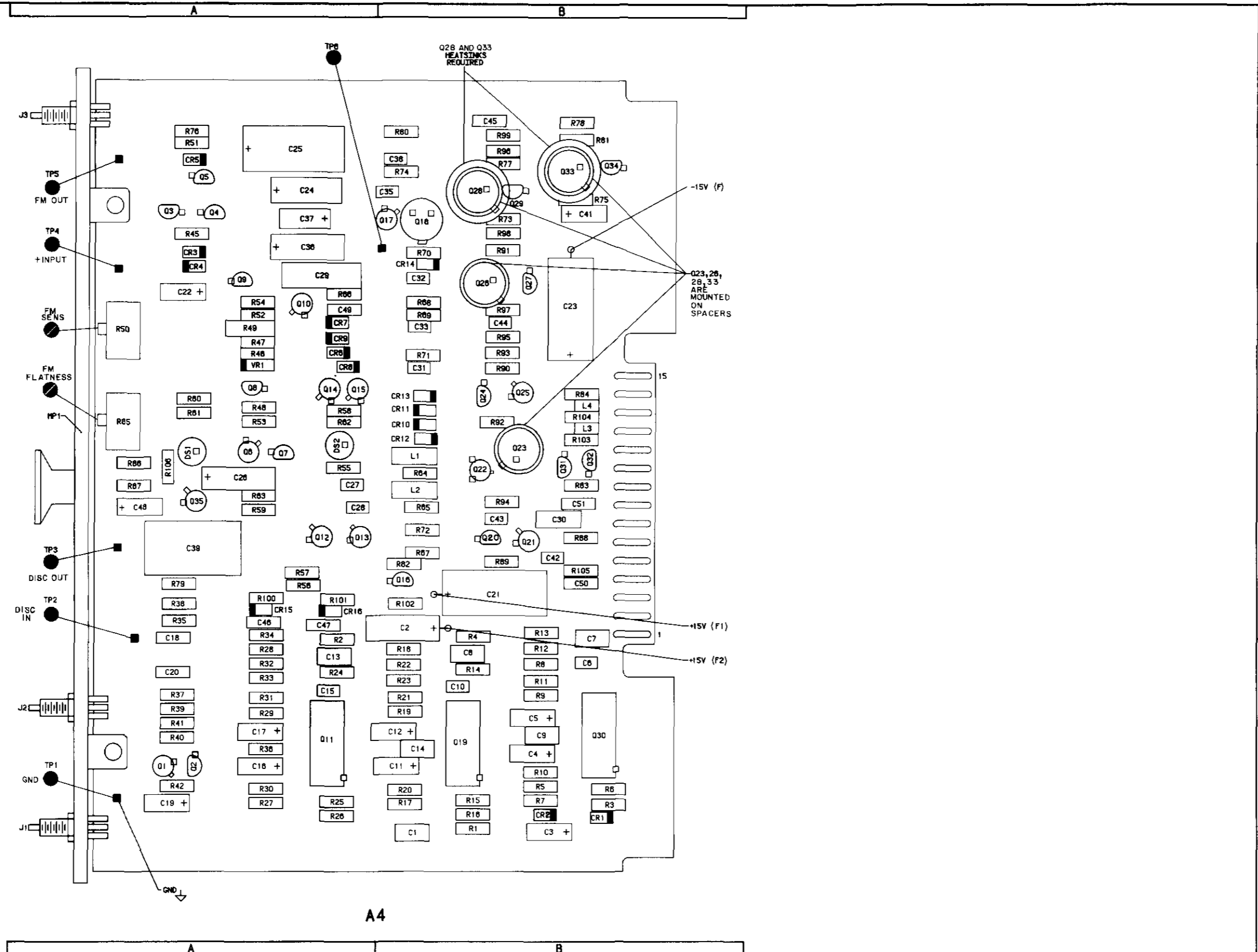
P/O A4 FM DEMODULATOR ASSEMBLY (08901-60184) (1 OF 2)



NOTES  
1. SEE TABLE 8-6 FOR SCHEMATIC DIAGRAM NOTES.

A4 Component Coordinates (2 of 2)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C21	B,2	J3	A,1	R52	A,2	R99	B,1		
C22	A,1			R53	A,2	R100	A,2		
C23	B,1	L1	B,2	R54	A,1	R101	A,2		
C24	A,1	L2	B,2	R55	A,2	R102	B,2		
C25	A,1	L3	B,2	R56	A,2	R103	B,2		
C26	A,2	L4	B,2	R57	A,2	R104	B,2		
C27	A,2			R58	A,2	R105	B,2		
C28	A,2	MP1	A,2	R59	A,2	R106	A,2		
C29	A,1			R60	A,2				
C30	B,2	Q2	B,2	R61	A,2	TP3	A,2		
C31	B,2	Q3	A,1	R62	A,2	TP4	A,1		
C33	B,2	Q4	A,1	R63	A,2	TP5	A,1		
C32	B,1	Q5	A,1	R64	B,2	TP6	B,1		
C35	B,1	Q6	A,2	R65	B,2				
C36	A,1	Q7	A,2	R66	A,1	VR1	A,2		
C37	A,1	Q8	A,2	R67	B,2				
C38	B,1	Q9	A,1	R68	B,1				
C39	A,2	Q10	A,1	R69	B,2				
C41	B,1	Q12	A,2	R70	B,1				
C42	B,2	Q13	A,2	R71	B,2				
C43	B,2	Q14	A,2	R72	B,2				
C44	B,2	Q15	A,2	R73	B,1				
C45	B,1	Q16	B,2	R74	B,1				
C47	A,2	Q18	B,1	R76	A,1				
C48	A,2	Q21	B,2	R77	B,1				
C49	A,1	Q22	B,2	R78	B,1				
C50	B,2	Q23	B,2	R79	A,2				
C51	B,2	Q24	B,2	R80	B,1				
		Q25	B,2	R81	B,1				
CR3	A,1	Q26	B,1	R82	B,2				
CR4	A,1	Q27	B,1	R83	B,2				
CR5	A,1	Q28	B,1	R84	B,2				
CR6	A,2	Q29	B,1	R85	A,2				
CR7	A,2	Q31	B,2	R86	A,2				
CR8	A,2	Q32	B,2	R87	A,2				
CR9	A,2	Q33	B,1	R88	B,2				
CR10	B,2	Q34	B,1	R89	B,2				
CR11	B,2	Q35	A,2	R90	B,2				
CR12	B,2			R91	B,1				
CR13	B,2	R45	A,1	R92	B,2				
CR14	B,1	R46	A,2	R93	B,2				
CR15	A,2	R47	A,2	R94	B,2				
CR16	A,2	R48	A,2	R95	B,2				
		R49	A,2	R96	B,1				
DS2	A,2	R50	A,2	R97	B,1				
DS3	A,2	R51	A,1	R98	B,1				



Component Locator

A4 FM DEMODULATOR (1 OF 2)  
 FM LIMITER CIRCUITS  
**SS10**  
 SEE REVERSE SIDE

## CHANGES

**2535A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

**2631A and above**

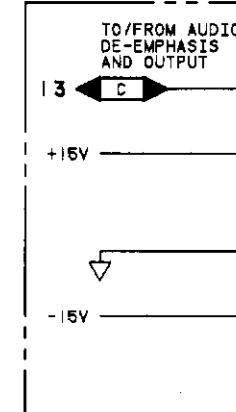
On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

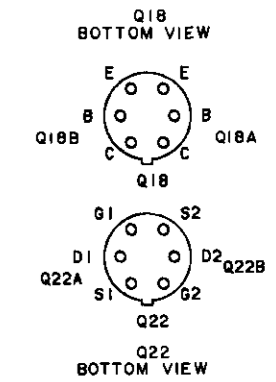
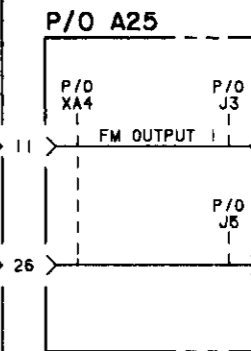
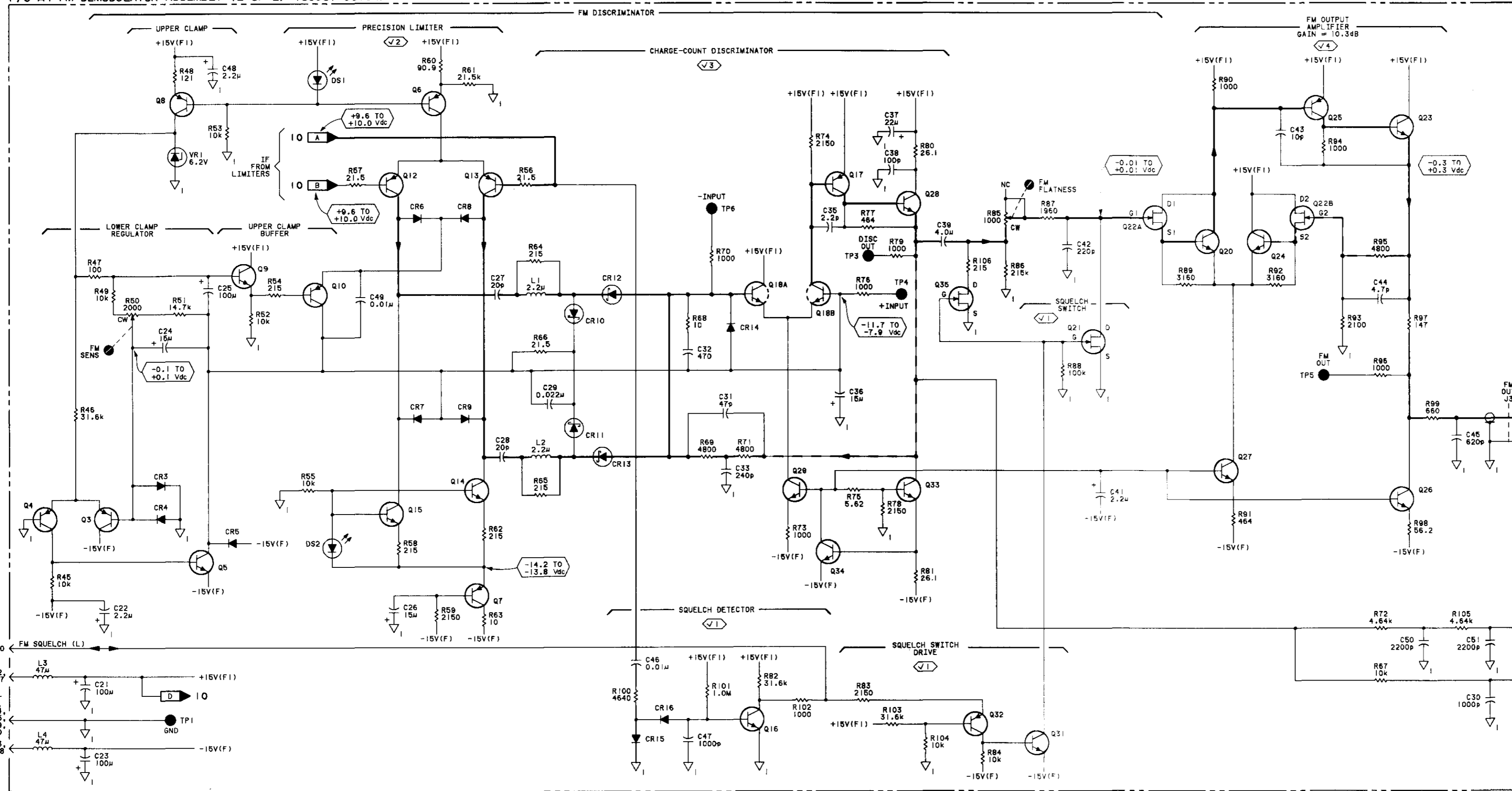
P/O A4 FM DEMODULATOR ASSEMBLY (2 OF 2) (08901-60184)

NOTES  
1. SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.

P/O A25 AUDIO MOTHERBOARD ASSEMBLY (08901-60137)



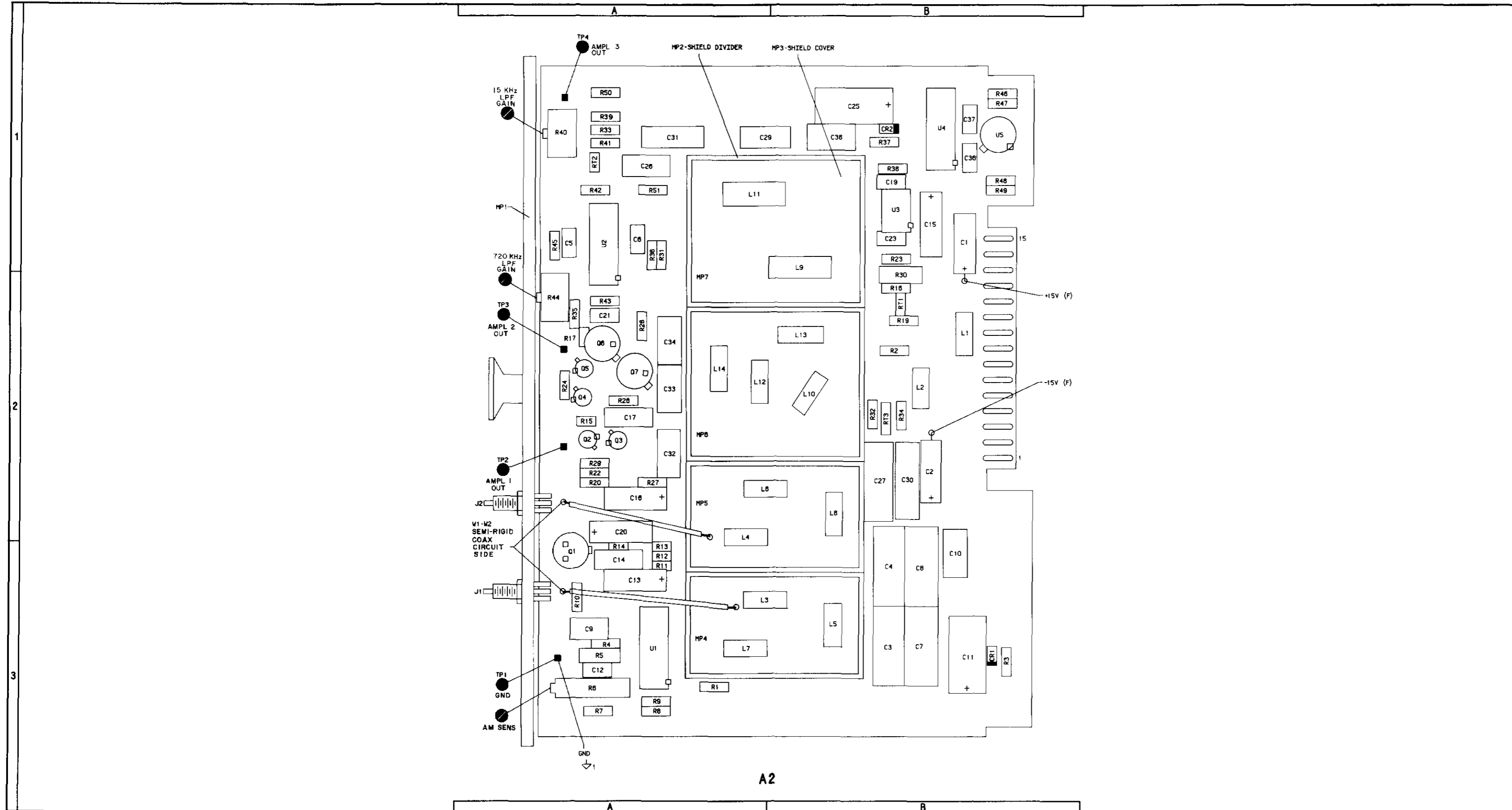
SERIAL PREFIX: 2305A



SS11  
8G-25

A2 Component Coordinates

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,1	L8	B,2	R27	A,2				
C2	B,2	L9	B,1	R28	A,2				
C3	B,3	L10	B,2	R29	A,2				
C4	B,3	L11	A,1	R30	B,2				
C5	A,1	L12	A,2	R31	A,1				
C6	A,1	L13	B,2	R32	B,2				
C7	B,3	L14	A,2	R33	A,1				
C8	B,3			R34	B,2				
C9	A,3	MP1	A,1	R34	A,1				
C10	B,3	MP2	A,1	R35	A,2				
C11	B,3	MP3	B,1	R36	A,1				
C12	A,3	MP4	A,3	R37	B,1				
C13	A,3	MP5	A,2	R38	B,1				
C14	A,3	MP6	A,2	R39					
C15	B,1	MP7	A,2	R40	A,1				
C16	A,2			R41	A,1				
C17	A,2	Q1	A,3	R42	A,1				
C19	B,1	Q2	A,2	R43	A,2				
C20	A,2	Q3	A,2	R44	A,2				
C21	A,2	Q4	A,2	R45	A,1				
C23	B,1	Q5	A,2	R46	B,1				
C25	B,1	Q6	A,2	R47	B,1				
C26	A,1	Q7	A,2	R48	B,1				
C27	B,2			R49	B,1				
C29	A,1	R1	A,3	R50	A,1				
C30	B,2	R2	B,2	R51	A,1				
C31	A,1	R3	B,3						
C32	A,2	R4	A,3	RT1	B,2				
C33	A,2	R5	A,3	RT2	A,1				
C34	A,2	R6	A,3	RT3	B,2				
C36	B,1	R7	A,3						
C37	B,1	R8	A,3	TP1	A,3				
C38	B,1	R9	A,3	TP2	A,2				
		R10	A,3	TP3	A,2				
CR1	B,3	R11	A,3	TP4	A,1				
CR2	B,1	R12	A,3						
		R13	A,3	U1	A,3				
J1	A,3	R14	A,3	U2	A,1				
J2	A,2	R15	A,2	U3	B,1				
		R16	B,2	U4	B,1				
L1	B,2	R17	A,2	U5	B,1				
L2	B,2	R19	B,2						
L3	A,3	R20	A,2	W1	A,2				
L4	A,2	R22	A,2	W2	A,3				
L5	B,3	R23	B,1						
L6	A,2	R24	A,2						
L7	A,3	R26	A,2						



Component Locator

A4 FM DEMODULATOR (2 OF 2)  
 FM DISCRIMINATOR CIRCUITS **SS11**  
 SEE REVERSE SIDE

**CHANGES****2451A and above**

On the A2 schematic:

- A2R1, R2 - Change the values of R1 and R2 to 6.19k.

**2535A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

**2631A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

**2703A and above**

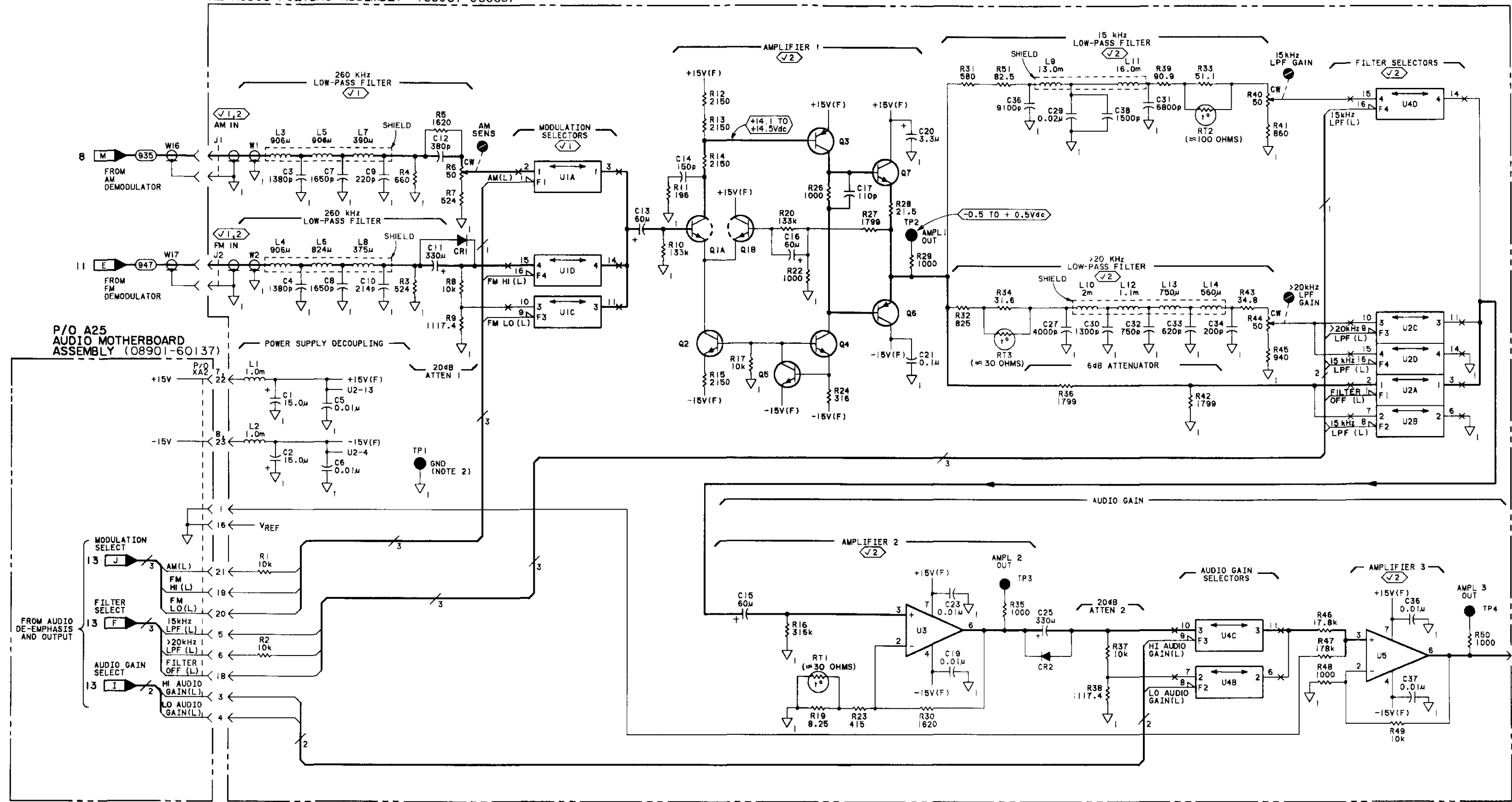
On the A2 schematic:

- A2 - Locate R51 under *15kHz LOW-PASS FILTER*, and change the value of R51 to 100 ohm.

A2 AUDIO FILTERS ASSEMBLY (08901-60008)

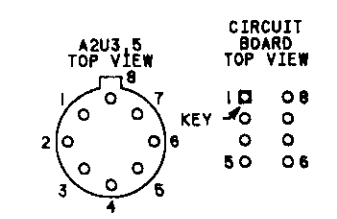
NOTES

1. REFER TO TABLE 8-6 FOR SCHEMATIC DIAGRAM NOTES.
2. ANALOG GROUND CONNECTION IS MADE THROUGH THE SHIELD OF W16 AND W17.



DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

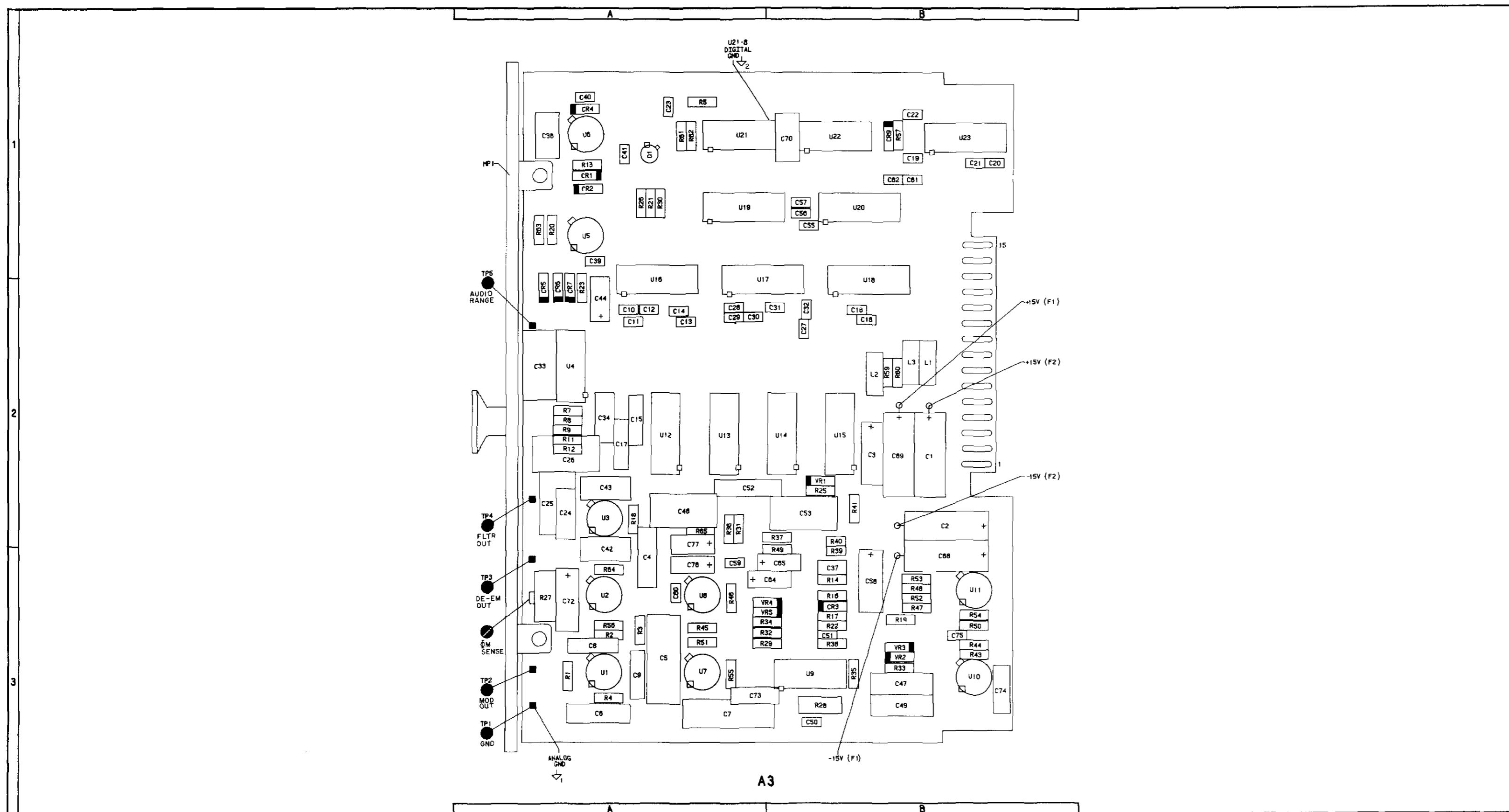
REFERENCE DESIGNATIONS	PIN NUMBERS
U1, 2, 4	+15V(F) - 13
	-15V(F) - 4
	VREF - 5





A3 Component Coordinates

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,2	C52	A,2	R11	A,2	R62	A,1		
C2	B,2	C53	B,2	R12	A,2	R63	A,1		
C3	B,2	C55	B,1	R13	A,1	R64	A,3		
C4	A,3	C56	B,1	R14	B,3	R65	A,2		
C5	A,3	C57	B,1	R16	B,3				
C6	A,3	C58	B,3	R17	B,3	TP1	A,3		
C7	A,3	C59	A,3	R18	A,2	TP2	A,3		
C8	A,3	C60	A,3	R19	B,3	TP3	A,3		
C9	A,3	C61	B,1	R20	A,1	TP4	A,2		
C10	A,2	C62	B,1	R21	A,1	TP5	A,2		
C11	A,2	C64	B,3	R22	B,3				
C12	A,2	C65	B,3	R23	A,2	U1	A,3		
C13	A,2	C68	B,3	R25	B,2	U2	A,3		
C14	A,2	C69	B,2	R26	A,1	U3	A,2		
C15	A,2	C70	B,1	R27	A,3	U4	A,2		
C16	B,2	C72	A,3	R28	B,3	U5	A,1		
C17	A,2	C73	A,3	R29	B,3	U6	A,1		
C18	B,2	C74	B,3	R30	A,1	U7	A,3		
C19	B,1	C75	B,3	R31	A,2	U8	A,3		
C20	B,1	C76	A,3	R32	B,3	U9	B,3		
C21	B,1	C77	A,3	R33	B,3	U10	B,3		
C22	B,1			R34	B,3	U11	B,3		
C23	A,1	CR1	A,1	R35	B,3	U12	A,2		
C24	A,2	CR2	A,1	R36	A,2	U13	A,2		
C25	A,2	CR3	B,3	R37	B,2	U14	B,2		
C26	A,2	CR4	A,1	R38	B,3	U15	B,2		
C27	B,2	CR5	A,2	R39	B,3	U16	A,2		
C28	A,2	CR6	A,2	R40	B,3	U17	A,2		
C29	A,2	CR7	A,2	R41	B,2	U18	B,2		
C30	A,2	CR9	B,1	R43	B,3	U19	A,1		
C31	B,2			R44	B,3	U20	B,1		
C32	B,2	L1	B,2	R45	A,3	U21	A,1		
C33	A,2	L2	B,2	R46	A,3	U22	B,1		
C34	A,2	L3	B,2	R47	B,3	U23	B,1		
C36	A,1			R48	B,3				
C37	B,3	MP1	A,1	R49	B,3	VR1	B,2		
C39	A,1			R50	B,3	VR2	B,3		
C40	A,1	Q1	A,1	R51	A,3	VR3	B,3		
C42	A,3	R1	A,3	R52	B,3	VR4	B,3		
C43	A,2	R2	A,3	R53	B,3	VR5	B,3		
C44	A,2	R3	A,3	R54	B,3				
C47	B,3	R4	A,3	R55	A,3				
C48	A,2	R5	A,1	R57	B,1				
C49	B,3	R7	A,2	R59	B,2				
C50	B,3	R8	A,2	R60	B,2				
C51	B,3	R9	A,2	R61	A,1				



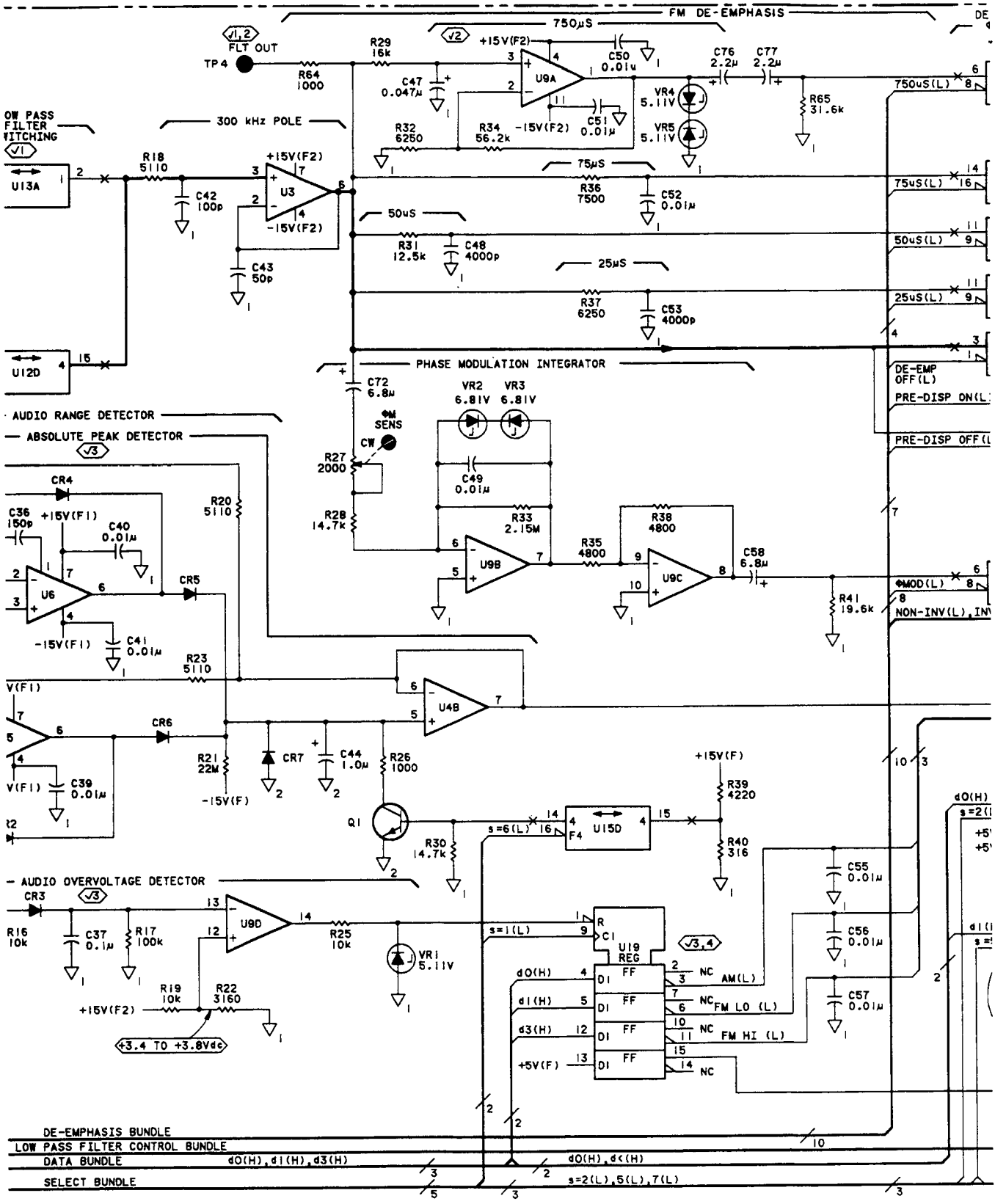
Component Locator

A2 AUDIO FILTERS **SS12**

SEE REVERSE SIDE

## CHANGES

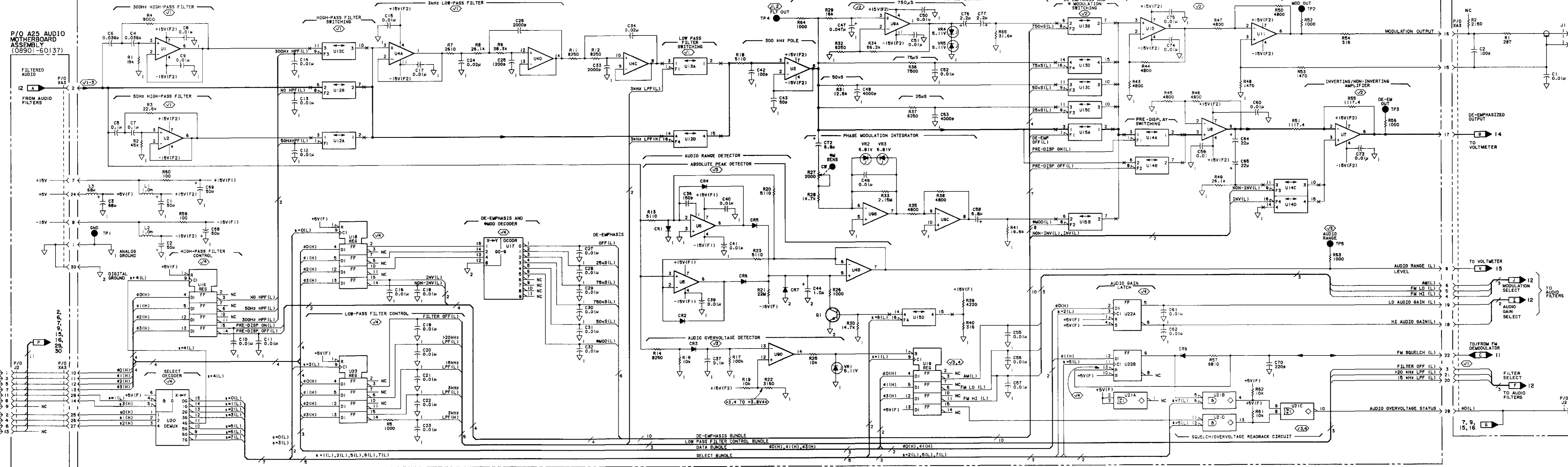
<p><b>All Serial Prefixes</b></p>	<p><b>On the A3 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>08901-60009</b> - Use the partial schematic on page 8G-28.3.</li> <li>• <b>L2, L3</b> - On the left side of the schematic, change L2 to L3, and change L3 to L2.</li> </ul> <p><b>On the Component Locator:</b></p> <ul style="list-style-type: none"> <li>• <b>L2, L3</b> - Change L2 to L3, and change L3 to L2.</li> </ul>
<p><b>2519A and above</b></p>	<p><b>On the A3 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>C4, C6, C47</b> - Change the value of C4, C6 and C47 to 0.03<math>\mu</math>F.</li> <li>• <b>C48, C53</b> - Change the value of C48 and C53 to 3900pF.</li> <li>• <b>R1, R29</b> - Change the value of R1 and R29 to 25 k.</li> <li>• <b>R4</b> - Change the value of R4 to 12.5 k.</li> <li>• <b>R36</b> - Change the value of R36 to 7400.</li> </ul>
<p><b>2535A and above</b></p>	<p><b>On the A25 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>08902-60103</b> - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY TO 08902-60103.</li> </ul>
<p><b>2631A and above</b></p>	<p><b>On the A25 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>08901-60116</b> - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.</li> </ul>
<p><b>Errata</b></p>	<p><b>On the A3 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>R51, R55</b> - Under INVERTING/NON-INVERTING AMPLIFIER, change the value of R51 and R55 to 1 k.</li> </ul>



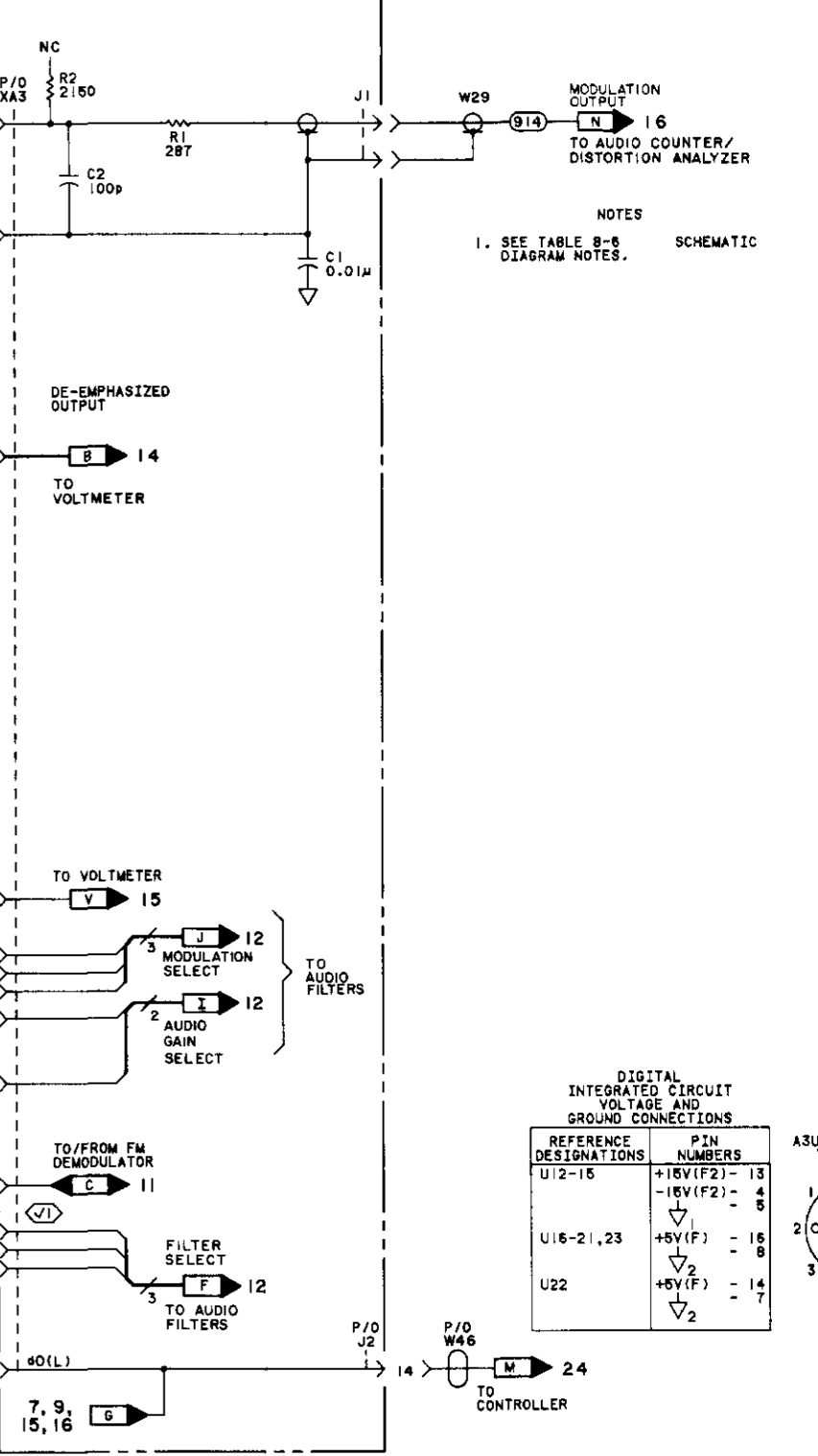
A3 AUDIO DE-EMPHASIS AND OUTPUT ASSEMBLY (P/O ERRATA)

A3 AUDIO DE-EMPHASIS AND OUTPUT ASSEMBLY (08901-60009)

P/O A25 AUDIO MOTHERBOARD ASSEMBLY (08901-60137)



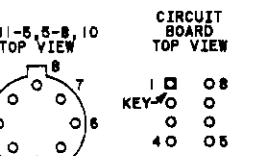
P/O A25



NOTES  
1. SEE TABLE 8-6 DIAGRAM NOTES.

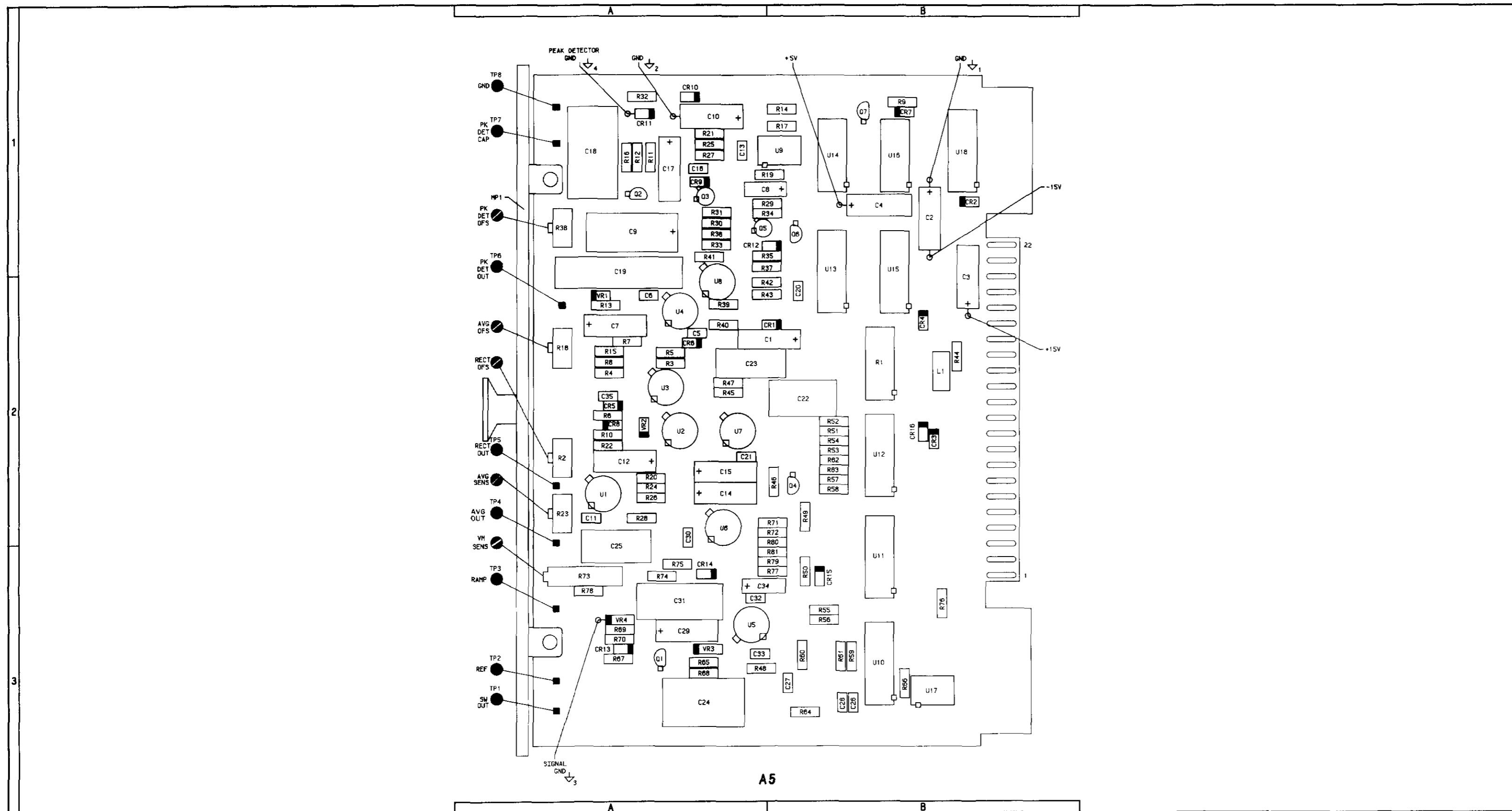
DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U12-15	+15V(F2) - 13 -15V(F2) - 4, 5
U16-21, 23	+5V(F) - 16, 8 +5V(F) - 2, 14
U22	+5V(F) - 14 -15V(F) - 7



A5 Component Coordinates (1 of 2)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,2	R2	A,2	TP8	A,1				
C2	B,1	R3	A,2						
C3	B,2	R4	A,2	U1	A,2				
C4	B,1	R5	A,2	U3	A,2				
C5	A,2	R6	A,2	U4	A,2				
C6	A,2	R7	A,2	U8	A,2				
C7	A,2	R8	A,2	U9	B,1				
C8	B,1	R9	B,1	U15	B,1				
C9	A,1	R10	A,2	U16	B,1				
C10	A,1	R11	A,1						
C11	A,2	R12	A,1	VR1	A,2				
C12	A,2	R13	A,2	VR2	A,2				
C13	A,1	R14	B,1						
C14	A,2	R15	A,2						
C15	A,2	R16	A,1						
C16	A,1	R17	B,1						
C17	A,1	R18	A,2						
C18	A,1	R19	B,1						
C19	A,2	R20	A,2						
C20	B,2	R21	A,1						
C35	A,2	R22	A,2						
		R23	A,2						
		R24	A,2						
CR1	B,2	R25	A,1						
CR2	B,1	R26	A,2						
CR3	B,2	R27	A,1						
CR4	B,2	R28	A,2						
CR5	A,2	R29	B,1						
CR6	A,2	R30	A,1						
CR7	B,1	R31	A,1						
CR8	A,2	R32	A,1						
CR9	A,1	R33	A,1						
CR10	A,1	R34	B,1						
CR11	A,1	R35	B,1						
CR12	B,1	R36	A,1						
		R37	B,1						
		R38	A,1						
MP1	A,1	R39	A,2						
		R40	A,2						
Q1	A,3	R41	A,1						
Q2	A,1	R42	B,2						
Q3	A,1	R43	B,2						
Q5	A,1								
Q6	B,1	TP4	A,3						
Q7	B,1	TP5	A,2						
		TP6	A,2						
R1	B,2	TP7	A,1						



Component Locator

A3 AUDIO DE-EMPHASIS AND OUTPUT **SS 13**  
SEE REVERSE SIDE

**CHANGES****2451A and above**

On the A5 schematic:

- A5R4, R15, R39 - Change the value of R4 and R15 to 10M. Change the value of R39 to 215k.

**2530A and above**

On the A5 schematic:

- A5 - Change the part number of A5 VOLTMETER ASSEMBLY to 08902-60101.

**2535A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

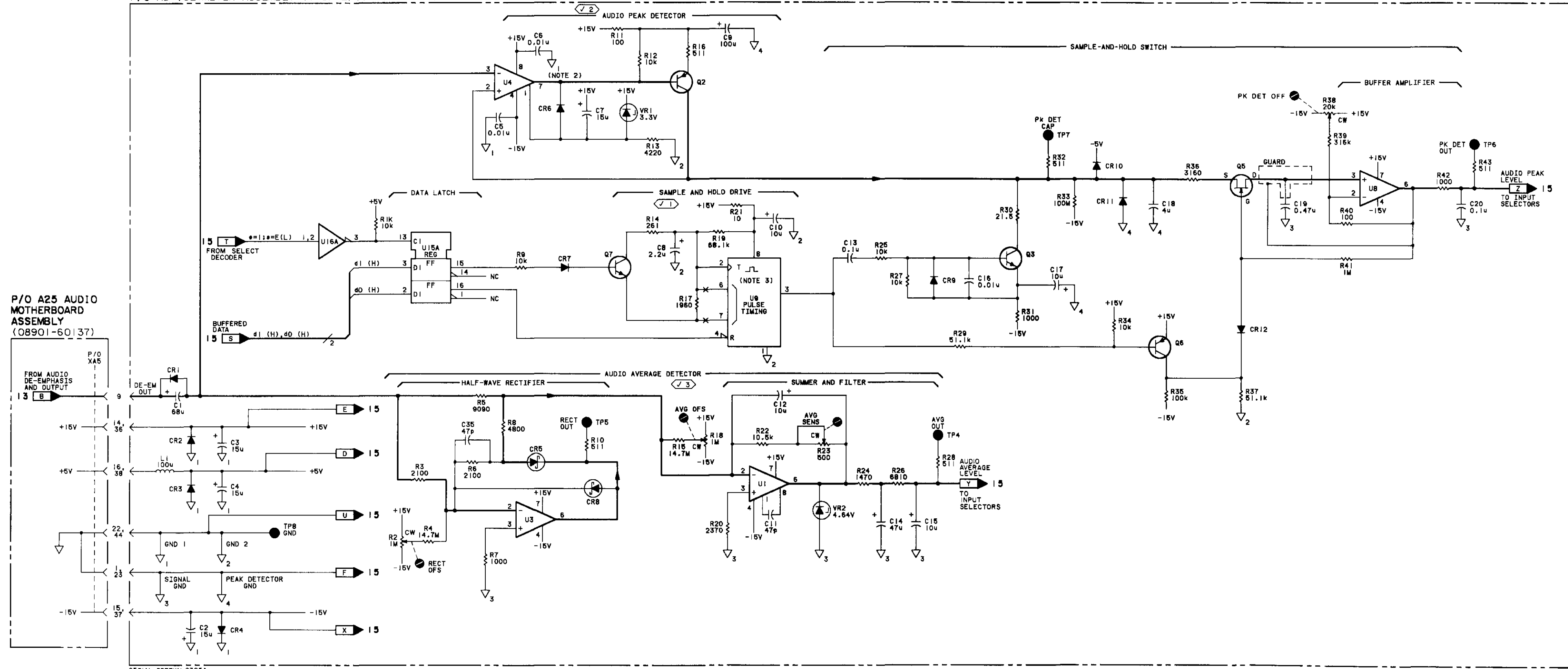
**2631A and above**

On the A25 schematic:

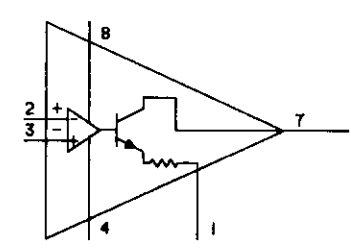
- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

P/O A5 VOLTMETER ASSEMBLY (1 OF 2) (08902-60005)

P/O A25 AUDIO MOTHERBOARD ASSEMBLY (08901-60137)

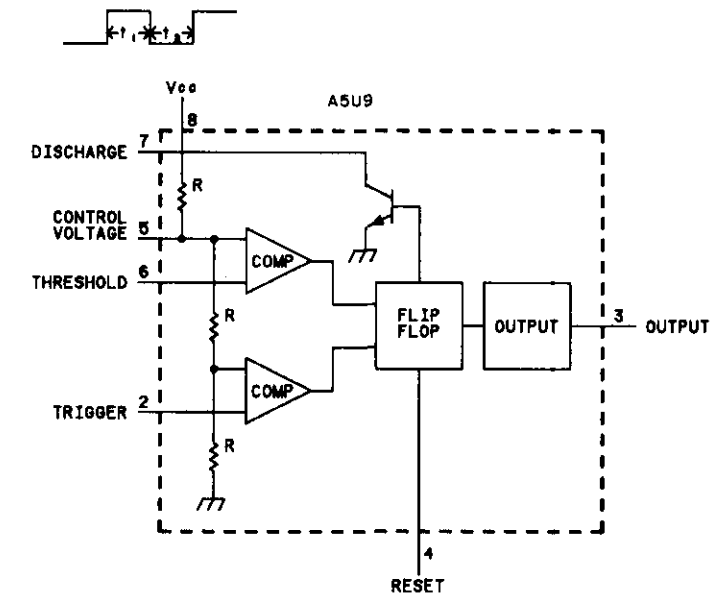


- SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
- THE DIAGRAM BELOW SHOWS THE OUTPUT STAGE OF COMPARATOR A5U4 IN DETAIL.



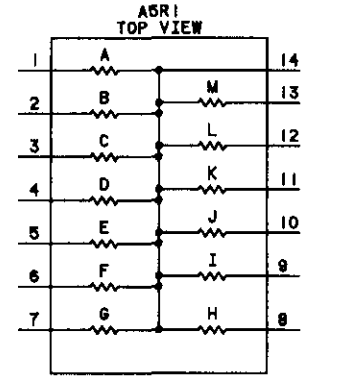
NOTES

- PULSE TIMING FOR MONOSTABLE MULTIVIBRATOR A5U9 (SHOWN BELOW) IS AS FOLLOWS:  
 Q7 OFF:  $t_1 = 131ms$ ,  $t_2 = 9.4ms$   
 Q7 ON:  $t_1 = 108ms$ ,  $t_2 = 2.4ms$



DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

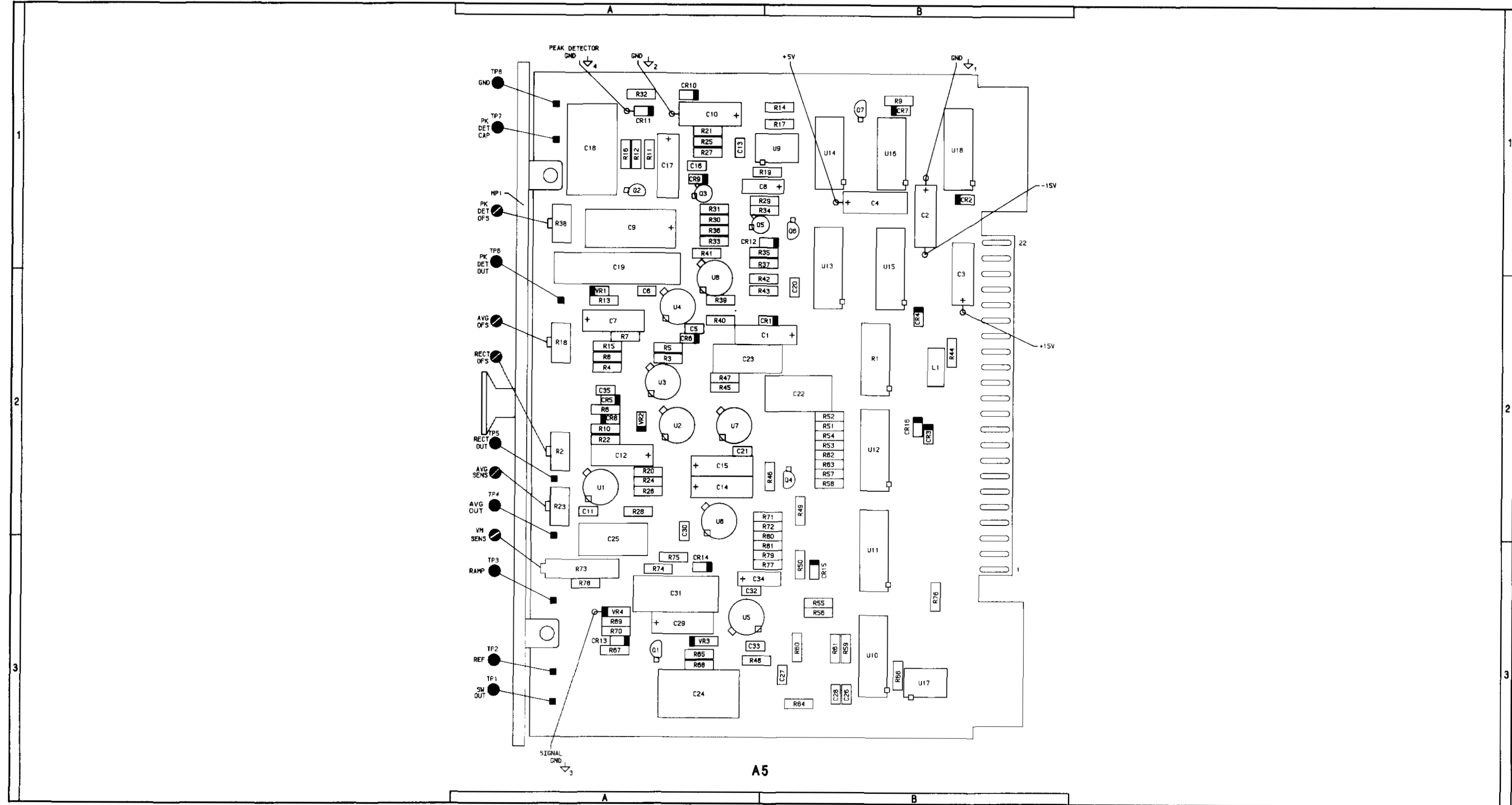
REFERENCE DESIGNATIONS	PIN NUMBERS
U15	+5V - 5
	$\nabla_2$ - 12
U16	+5V - 14
	$\nabla_2$ - 7



SERIAL PREFIX: 2305A

A5 Component Coordinates (2 of 2)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C21	A,2	R66	B,3						
C22	B,2	R67	A,3						
C23	A,2	R68	A,3						
C24	A,3	R69	A,3						
C25	A,3	R70	A,3						
C26	B,3	R71	B,2						
C27	B,3	R72	B,2						
C28	B,3	R73	A,3						
C29	A,3	R74	A,3						
C30	A,2	R75	A,3						
C31	A,3	R76	B,3						
C32	A,3	R77	B,3						
C33	A,3	R78	A,3						
C34	A,3	R79	B,3						
		R80	B,3						
		R81	B,3						
CR13	A,3								
CR14	A,3								
CR15	B,3	TP1	A,3						
CR16	B,2	TP2	A,3						
		TP3	A,3						
MP1	A,1								
		U2	A,2						
Q4	B,2	U5	A,3						
		U6	A,2						
		U7	A,2						
R1	B,2	U10	B,3						
R44	B,2	U11	B,3						
R45	A,2	U12	B,2						
R46	B,2	U13	B,1						
R47	A,2	U14	B,1						
R48	A,3	U15	B,1						
R49	B,2	U16	B,1						
R50	B,3	U17	B,3						
R51	B,2	U18	B,1						
R52	B,2								
R53	B,2								
R54	B,2	VR3	A,3						
R55	B,3	VR4	A,3						
R56	B,3								
R57	B,2								
R58	B,2								
R59	B,3								
R60	B,3								
R61	B,3								
R62	B,2								
R63	B,2								
R64	B,3								
R65	A,3								



Component Locator

**A5 VOLTMEETER (1 OF 2)**  
**AUDIO DETECTORS**  
SS14  
SEE REVERSE SIDE



**CHANGES****2530A and above**

On the A5 schematic:

- A5 - Change the part number of A5 VOLTMETER ASSEMBLY to 08902-60101.

**2535A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.
- A25 - In P/O A25 Audio Motherboard Assembly under bullet "R" that comes from Service Sheet 16, add a bullet "TC" from Service Sheet 36. This line comes from IF AMPLIFIER/DETECTOR and goes to A5 via A5 pin 13. In P/O A5 Voltmeter Assembly, this line is called IF RMS LEVEL OUT and goes to U11 pin 12.

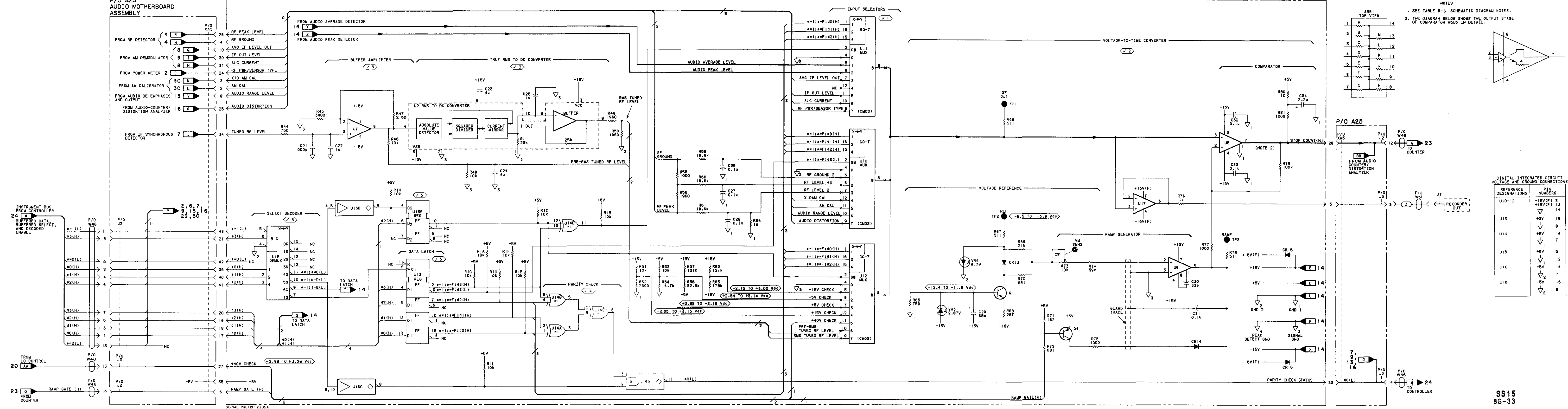
**2631A and above**

On the A25 schematic:

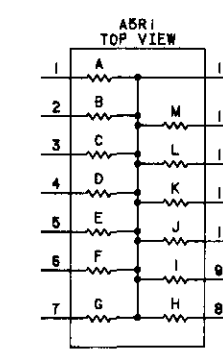
- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

P/O A25  
AUDIO MOTHERBOARD  
ASSEMBLY

P/O A5 VOLTMETER ASSEMBLY (2 OF 2) (08902-60005)



- NOTES
- SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
  - THE DIAGRAM BELOW SHOWS THE OUTPUT STAGE OF COMPARATOR ASR1 IN DETAIL.

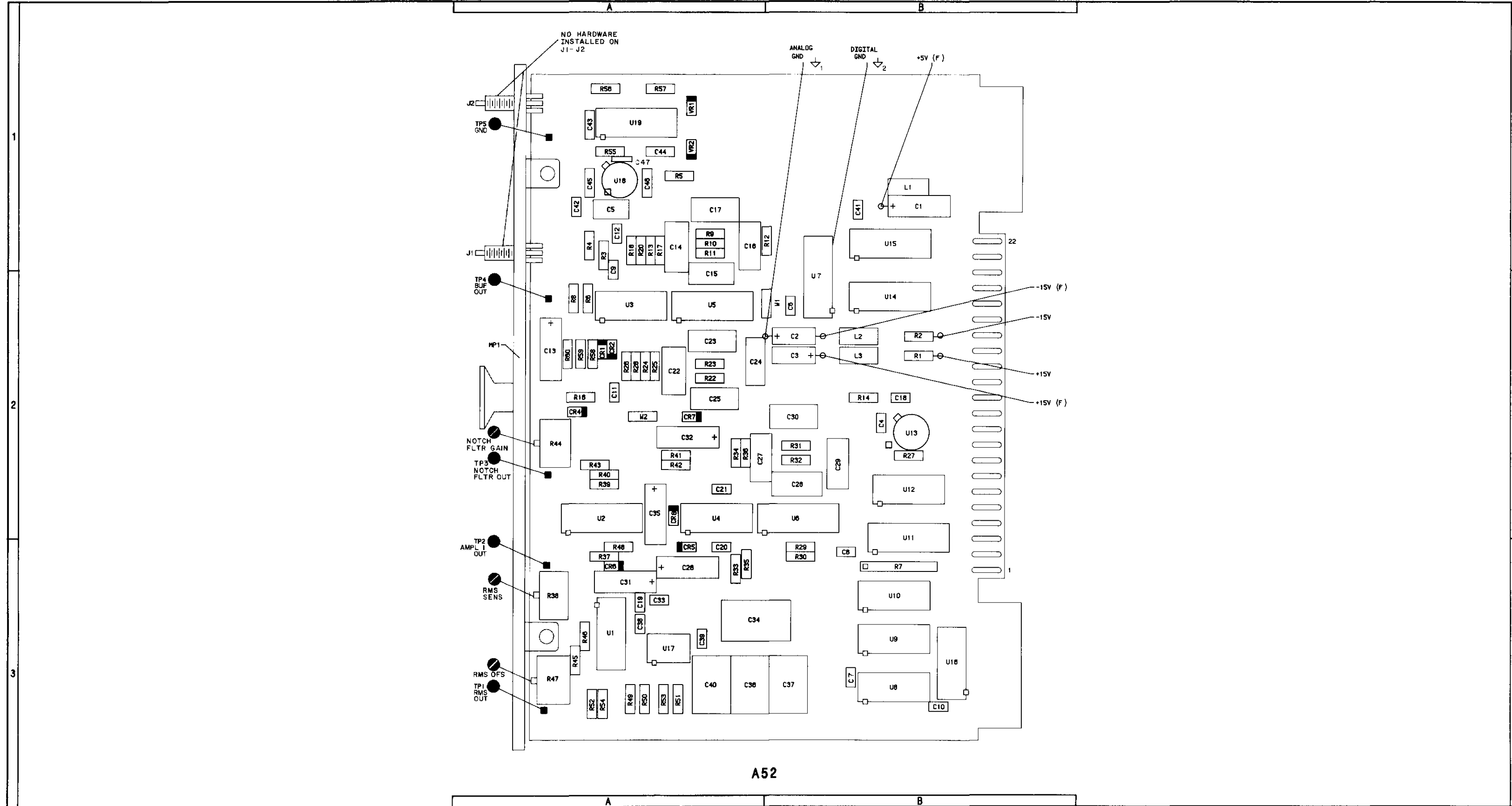


DIGITAL INTEGRATED CIRCUIT  
VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	VOLTAGE	PIN NUMBERS
U10-12	-15V(F)	3
	+15V(F)	13
	-15V	14
	+5V	16
U13	+5V	8
U14	+5V	14
	-15V	7
U15	+5V	5
	+5V	14
	-15V	7
U16	+5V	14
	-15V	7
U18	+5V	16
	-15V	7

A52 Component Coordinates

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,1	CR1	A,2	R36	A,2	U16	B,3		
C2	B,2	CR2	A,2	R37	A,3	U17	A,3		
C3	B,2	CR4	A,2	R38	A,3	U18	A,1		
C4	B,2	CR5	A,3	R39	A,2	U19	A,1		
C5	A,1	CR6	A,3	R40	A,2				
C6	B,2	CR7	A,2	R41	A,2	VR1	A,1		
C7	B,3	CR8	A,2	R42	A,2	VR2	A,1		
C8	B,3			R43	A,2				
C9	A,2	J1	A,1	R44	A,2	W1	B,2		
C10	B,3	J2	A,1	R45	A,3	W2	A,2		
C11	A,2			R46	A,3				
C12	A,1	L1	B,1	R47	A,3				
C13	A,2	L2	B,2	R48	A,3				
C14	A,1	L3	B,2	R49	A,3				
C15	A,2			R50	A,3				
C16	A,1	R1	B,2	R51	A,3				
C17	A,1	R2	B,2	R52	A,3				
C18	B,2	R3	A,1	R53	A,3				
C19	A,3	R4	A,1	R54	A,3				
C20	A,3	R5	A,1	R55	A,1				
C21	A,2	R6	A,2	R56	A,1				
C22	A,2	R7	B,3	R57	A,1				
C23	A,2	R8	A,2	R58	A,2				
C24	A,2	R9	A,1	R59	A,2				
C25	A,2	R10	A,1	R60	A,2				
C26	A,3	R11	A,1						
C27	A,2	R12	B,1	TP1	A,3				
C28	B,2	R13	A,1	TP2	A,3				
C29	B,2	R14	B,2	TP3	A,2				
C30	B,2	R16	A,2	TP4	A,2				
C31	A,3	R17	A,1	TP5	A,1				
C32	A,2	R18	A,1						
C33	A,3	R20	A,1	U1	A,3				
C34	A,3	R22	A,2	U2	A,2				
C35	A,2	R23	A,2	U3	A,2				
C36	A,3	R24	A,2	U4	A,2				
C37	B,3	R25	A,2	U5	A,2				
C38	A,3	R26	A,2	U6	B,2				
C39	A,3	R27	B,2	U7	B,2				
C40	A,3	R28	A,2	U8	B,3				
C41	B,1	R29	B,3	U9	B,3				
C42	A,1	R30	B,3	U10	B,3				
C43	A,1	R31	B,2	U11	B,3				
C44	A,1	R32	B,2	U12	B,2				
C45	A,1	R33	A,3	U13	B,2				
C46	A,1	R34	A,2	U14	B,2				
C47	A,1	R35	A,3	U15	B,1				



A52 Component Locator

A5 VOLTMETER (2 OF 2)  
VOLTMETER CIRCUITS

**SS 15**

SEE REVERSE SIDE

**CHANGES****2326A and above**

On the A52 schematic:

- A52R50 - In upper, right portion of the schematic, delete resistor R50 and replace with jumper W3.

**2413A and above**

On the schematic:

- W53 - Add W53 as shown in the figure on page 8G-34.3

**2535A and above**

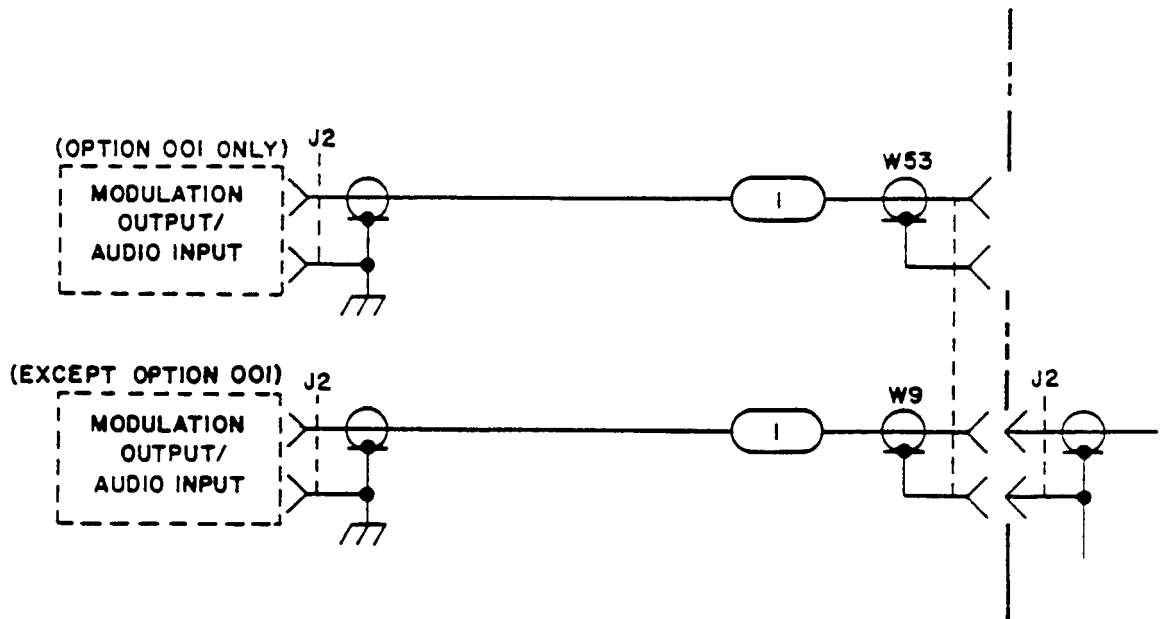
On the A25 schematic:

- Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

**2631A and above**

On the A25 schematic:

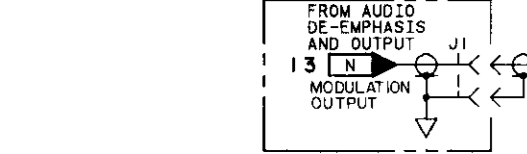
- Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.



*P/O SS16 A52 Audio Counter/Distortion Analyzer Assembly (Refer to 2413A)*

**A52 AUDIO COUNTER/DISTORTION ANALYZER ASSEMBLY (08901-60131)**

**P/O A25 AUDIO MOTHERBOARD ASSEMBLY (08901-60137)**



(OPTION 001 ONLY)  
MODULATION OUTPUT/AUDIO INPUT

(EXCEPT OPTION 001)  
MODULATION OUTPUT/AUDIO INPUT

BUFFERED DATA  
BUFFERED SELECT  
DECODED ENABLE

INSTRUMENT BUS FROM CONTROLLER

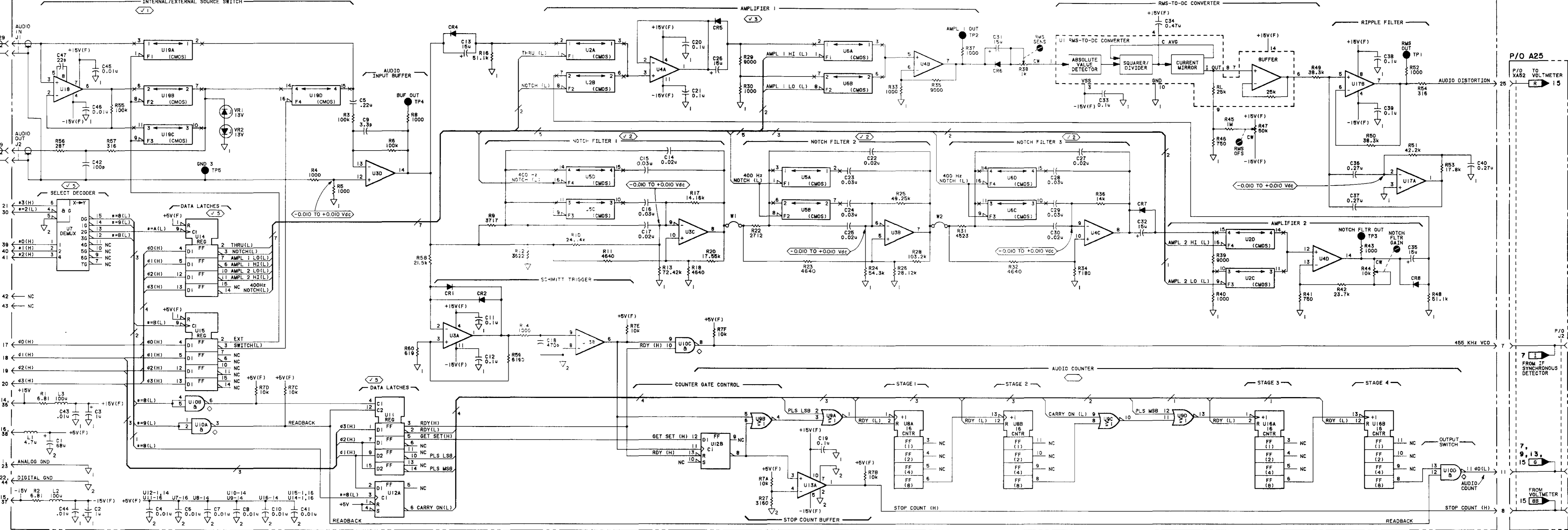
P/O A25

P/O W46

P/O XA52

P/O W46

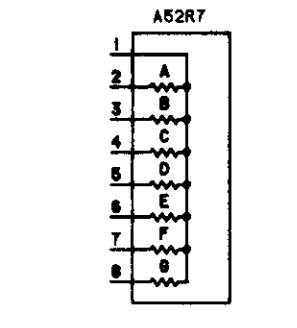
P/O W46



NOTES  
1. SEE TABLE B-6 SCHEMATIC DIAGRAM NOTES.

DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	VOLTAGE	PIN NUMBERS
U2, 6, 8, 10	+15V(F) - 13	
	-15V(F) - 4	
	-15V(F) - 5	
U7, 11, 14, 15	+5V(F) - 16	
	+5V(F) - 18	
U8, 9, 10, 12, 18	+5V(F) - 14	
	+5V(F) - 7	

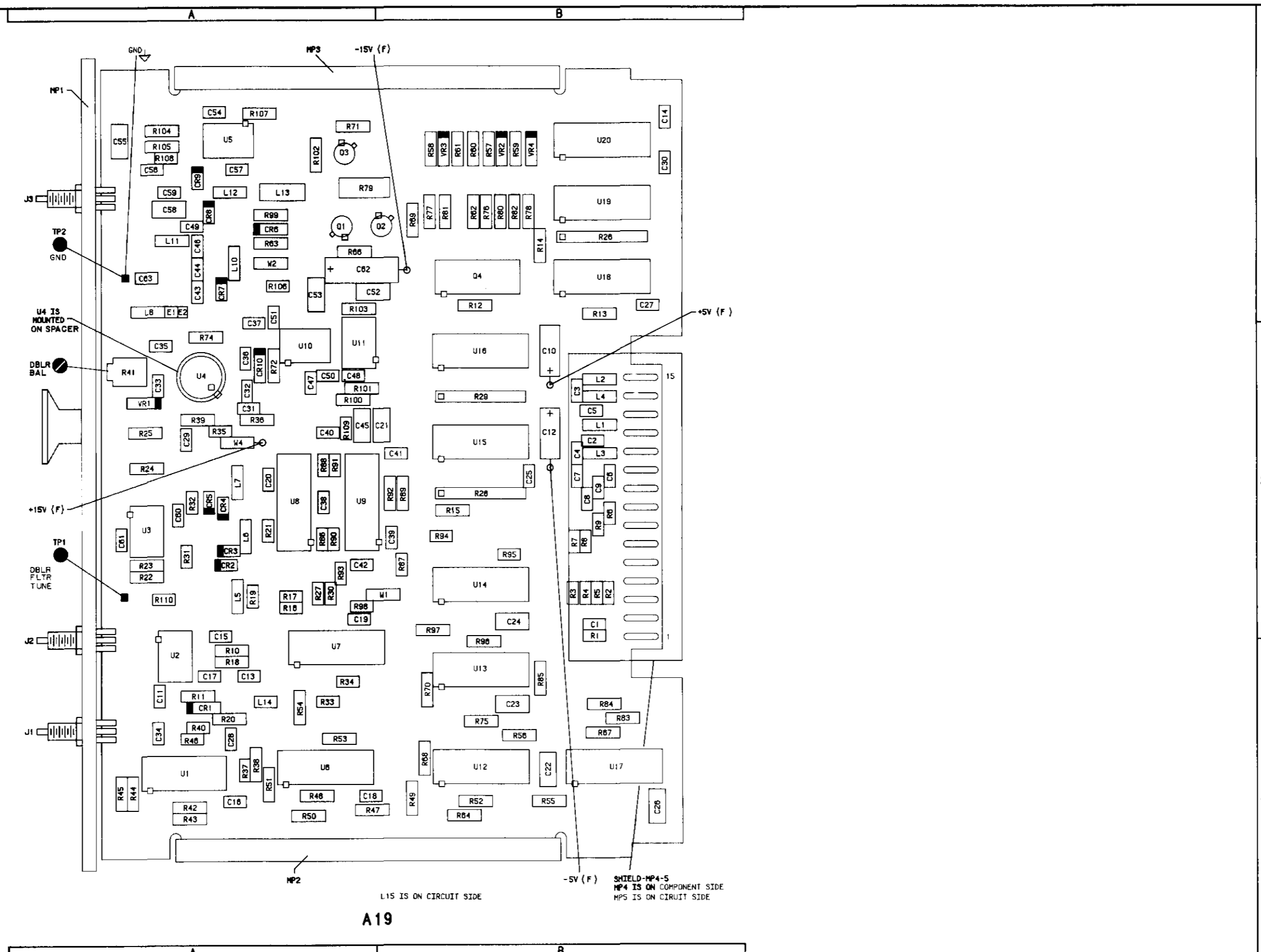


SS16  
8G-35

SERIAL PREFIX: 2305A

A19 Component Coordinates

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,2	C48	A,2	L14	A,3	R35	A,2	R84	B,3	U17	B,3
C2	B,2	C49	A,1	R36	A,2	R85	B,3	R85	B,3	U18	B,1
C3	B,2	C50	A,2	MP1	A,1	R37	A,3	R86	A,2	U19	B,1
C4	B,2	C51	A,1	MP2	A,3	R38	A,3	R87	B,2	U20	B,1
C5	B,2	C52	A,1	MP3	A,1	R39	A,2	R88	A,2	VR1	A,2
C6	B,2	C53	A,1	MP4	B,2	R40	A,3	R89	B,2	VR2	B,1
C7	B,2	C54	A,1	MP5	B,2	R41	A,2	R90	A,2	VR3	B,1
C8	B,2	C55	A,1			R42	A,3	R91	A,2	VR4	B,1
C9	B,2	C56	A,1	Q1	A,1	R43	A,3	R92	B,2		
C10	B,2	C57	A,1	Q2	B,1	R44	A,3	R93	A,2	W1	B,2
C11	A,3	C58	A,1	Q3	A,1	R45	A,3	R94	B,2	W2	A,1
C12	B,2	C59	A,1	Q4	B,1	R46	A,3	R95	B,2	W4	A,2
C13	A,3	C60	A,2			R47	A,3	R96	B,3		
C14	B,1	C61	A,2	R1	B,3	R48	A,3	R97	B,2		
C15	A,3	C62	A,1	R2	B,2	R49	B,3	R98	A,2		
C16	A,3	C63	A,1	R3	B,2	R50	A,3	R99	A,1		
C17	A,3			R4	B,2	R51	A,3	R100	A,2		
C18	A,3	CR1	A,3	R5	B,2	R52	B,3	R101	A,2		
C19	A,2	CR2	A,2	R6	B,2	R53	A,3	R102	A,1		
C20	A,2	CR3	A,2	R7	B,2	R54	A,3	R103	A,1		
C21	B,2	CR4	A,2	R8	B,2	R55	B,3	R104	A,1		
C22	B,3	CR5	A,2	R9	B,2	R56	B,3	R105	A,1		
C23	B,3	CR6	A,1	R10	A,3	R57	B,1	R106	A,1		
C24	B,2	CR7	A,1	R11	A,3	R58	B,1	R107	A,1		
C25	B,2	CR8	A,1	R12	B,1	R59	B,1	R108	A,1		
C26	B,3	CR9	A,1	R13	B,1	R60	B,1	R109	A,2		
C27	B,1	CR10	A,2	R14	B,1	R61	B,1	R110	A,2		
C28	A,3			R15	B,2	R62	B,1				
C29	A,2	E1	A,1	R16	A,2	R63	A,1	TP1	A,2		
C30	B,1	E2	A,1	R17	A,2	R64	B,3	TP2	A,1		
C31	A,2			R18	A,3	R66	A,1				
C32	A,2	J1	A,3	R19	A,2	R67	B,3	U1	A,3		
C33	A,2	J2	A,3	R20	A,3	R68	B,3	U2	A,3		
C34	A,3	J3	A,1	R21	A,2	R69	B,1	U3	A,2		
C35	A,2			R22	A,2	R70	B,3	U4	A,2		
C36	A,2	L1	B,2	R23	A,2	R71	A,1	U5	A,1		
C37	A,2	L2	B,2	R24	A,2	R72	A,2	U6	A,3		
C38	A,2	L3	B,2	R25	A,2	R74	A,2	U7	A,3		
C39	B,2	L4	B,2	R26	B,1	R75	B,3	U8	A,2		
C40	A,2	L5	A,2	R27	A,2	R76	B,1	U9	A,2		
C41	B,2	L6	A,2	R28	B,2	R77	B,1	U10	A,2		
C42	A,2	L7	A,2	R29	B,2	R78	B,1	U11	A,2		
C43	A,1	L8	A,1	R30	A,2	R79	A,1	U12	B,3		
C44	A,1	L10	A,1	R31	A,2	R80	B,1	U13	B,3		
C45	A,2	L11	A,1	R32	A,2	R81	B,1	U14	B,2		
C46	A,1	L12	A,1	R33	A,3	R82	B,1	U15	B,2		
C47	A,2	L13	A,1	R34	A,3	R83	B,3	U16	B,2		

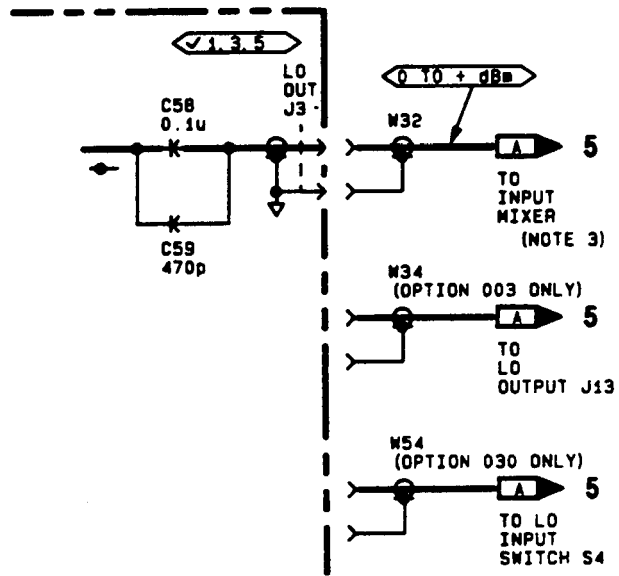


**CHANGES**

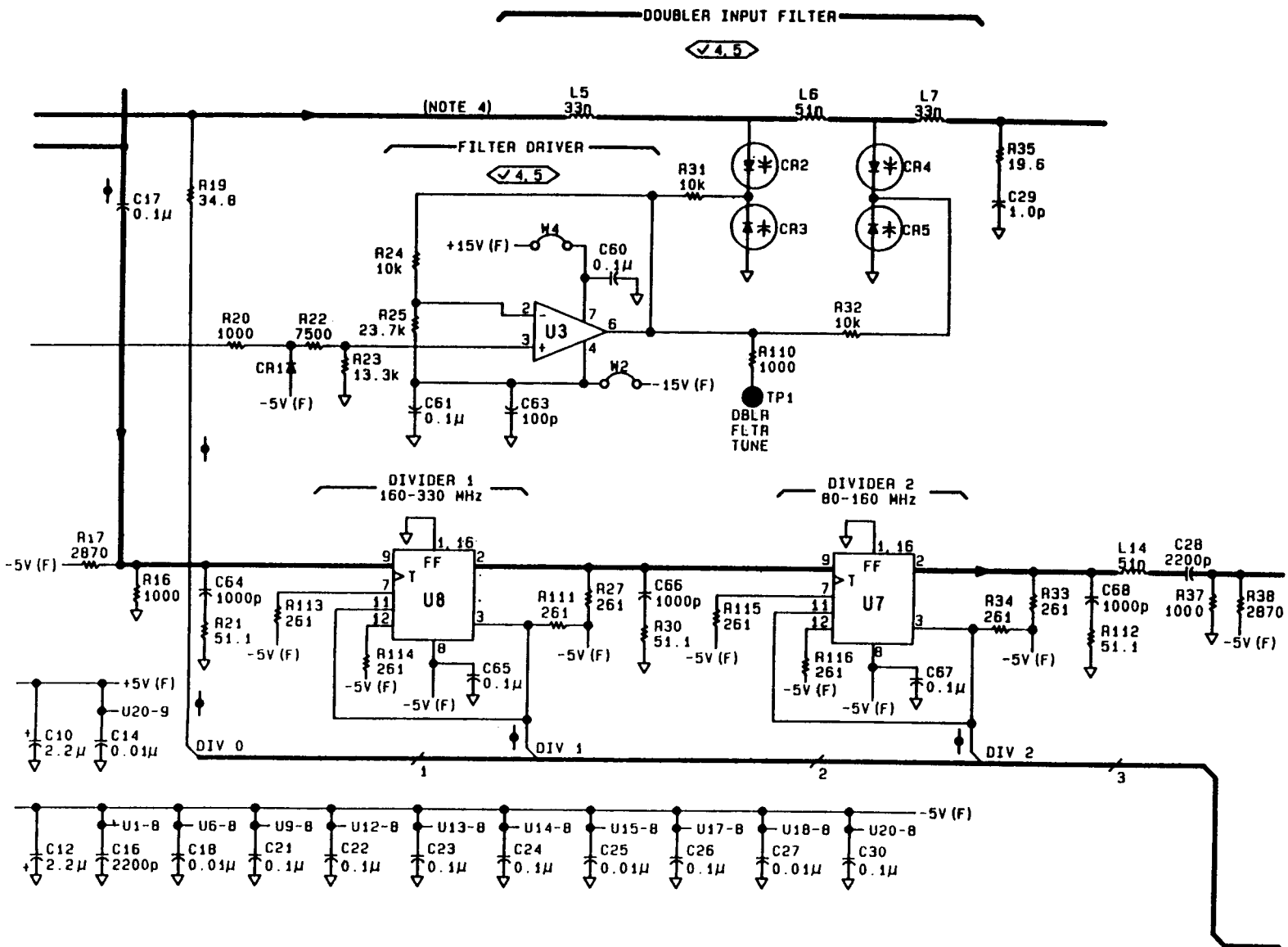
<p><b>All serial prefixes</b></p>	<p><b>On the A19 schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>W34</b> - Add W34 as shown in the figure on page 8G-36.3.</li> </ul>
<p><b>2345A to 2717A</b></p>	<p><b>On the A19 schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>C38, R86</b> - Under DIVIDER 1-8 GATES change the values of C38 to 100p and R86 to 51.1 ohm.</li> <li>• <b>R21, R27</b> - To the left of DIVIDER 1 change the values of R21 to 121 ohm and R27 to 51.1 ohm.</li> </ul>
<p><b>2535A to 2717A</b></p>	<p><b>On the A19 schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>W54</b> - Add W54 as shown in the partial schematic on page 8G-36.3.</li> </ul>
<p><b>2621A to 2717A</b></p>	<p><b>On the A19 schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>08901-60274</b> - In the upper left hand corner of the A19 LO DIVIDER ASSEMBLY (page 8G-37, SS17) change the board number to 08901-60274.</li> <li>• <b>08901-60274</b> - Use the partial schematic on page 8G-36.4 and 8G-36.5 in conjunction with service sheet 17.</li> </ul> <p><b>On the A19 Component Locator:</b></p> <ul style="list-style-type: none"> <li>• <b>08901-60274</b> - Use the new A19 component locator on page 8G-36.6.</li> </ul>



*Reserved for future changes.*



P/O SS17 A19 LO Divider Assembly, 08901-60274 board, (2535A to 2717A)

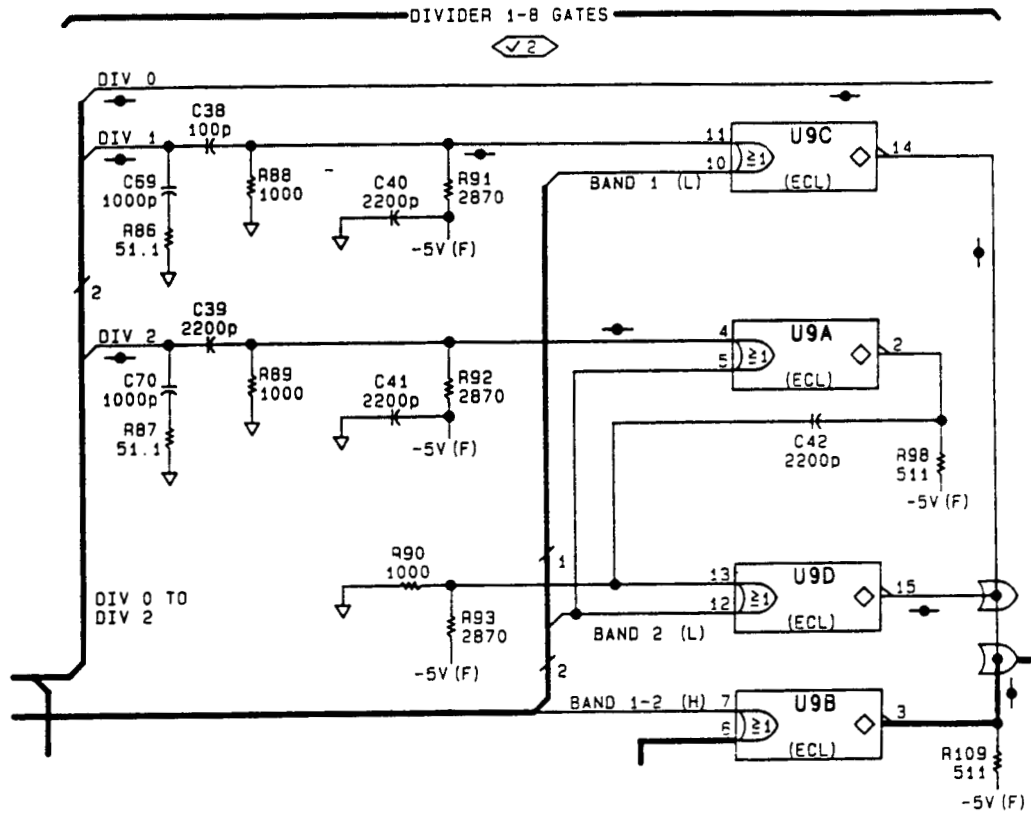


P/O A19 IO Divider Assembly, 08902-60274 board, (3621A to 2717A)

SS17

8G-36.4

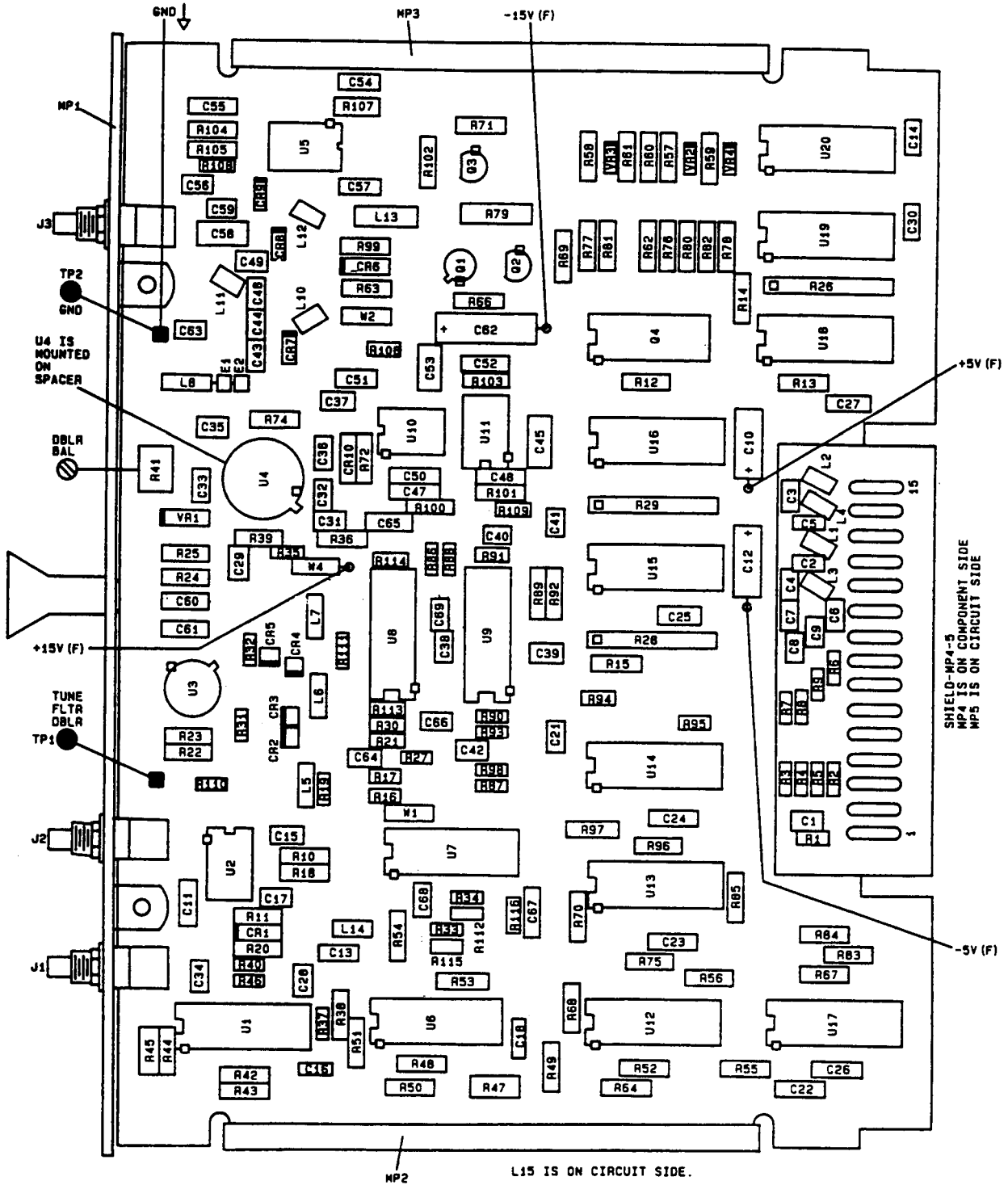
rev. 02JAN89



P/O A19 LO Divider Assembly, 08901-60274 board, (2621A to 2717A)

SS17

8G-36.5



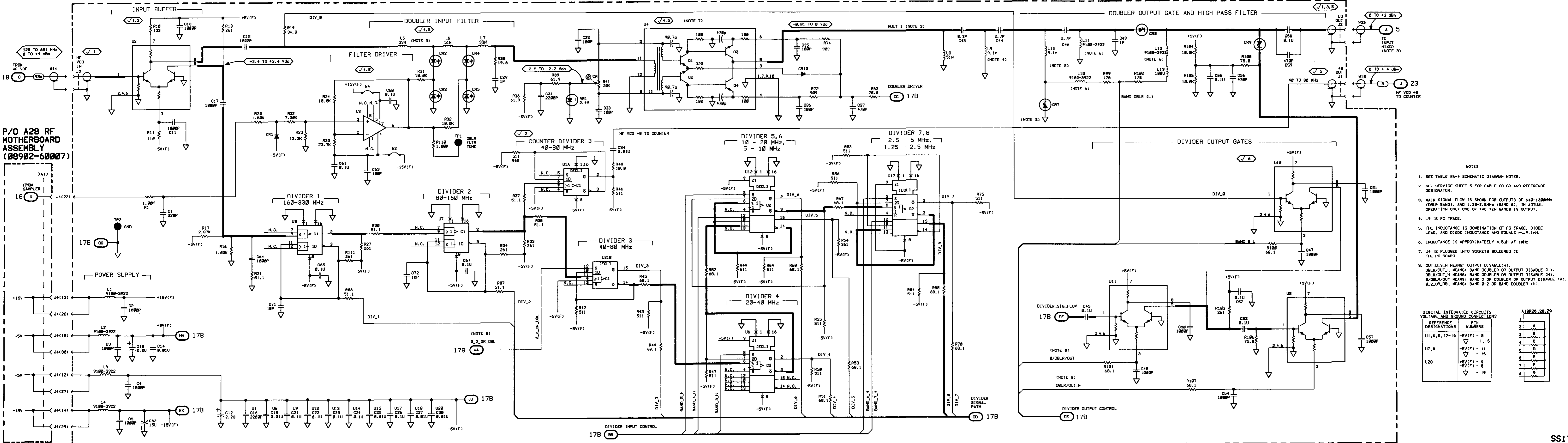
A19 Component Locator for the 08902-60274 board, (2621A to 2717A)

## CHANGES

<p><b>All serial prefixes</b></p>	<p><b>On the A19 schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>R33, R34</b> - Between DIVIDER 2 and DIVIDER 3 locate R33 and R34, change the values to 750 ohm.</li> <li>• Delete the page number (8G-36.9) and replace it with a revision date of <i>rev.01NOV88</i>.</li> </ul>
<p><b>2742A and above</b></p>	<p><b>On the A19 schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>A19</b> - Use SS17A with the revision date of <i>rev.01NOV88</i>.</li> <li>• <b>E1, E2</b> - Along the top portion of SS17A, locate L8. Add E1 and E2 between the node of the main signal path and L8.</li> </ul> <p><b>On the A19 Component Locator:</b></p> <ul style="list-style-type: none"> <li>• <b>A19</b> - Use the new A19 component locator on page 8G-36.9.</li> </ul> <p><b>On the A19 Component Coordinates:</b></p> <ul style="list-style-type: none"> <li>• <b>A19</b> - Use the new A19 (SS17A) component coordinates on page 8G-36.10.</li> </ul>
<p><b>2834A and above</b></p>	<p><b>On the A19 schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>R33</b> - Between DIVIDER 2 and DIVIDER 3 locate R33 and change its value to 261 ohm.</li> </ul>

*Reserved for future changes.*

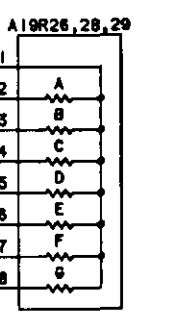
A19 LO DIVIDER ASSEMBLY (08902-60126)



- NOTES
- SEE TABLE 8A-4 SCHEMATIC DIAGRAM NOTES.
  - SEE SERVICE SHEET 5 FOR CABLE COLOR AND REFERENCE DESIGNATOR.
  - MAIN SIGNAL FLOW IS SHOWN FOR OUTPUTS OF 640-1300MHz (DBLR BAND), AND 1.25-2.5MHz (BAND B). IN ACTUAL OPERATION ONLY ONE OF THE TEN BANDS IS OUTPUT.
  - L9 IS PC TRACE.
  - THE INDUCTANCE IS COMBINATION OF PC TRACE, DIODE LEAD, AND DIODE INDUCTANCE AND EQUALS ~9.1nH.
  - INDUCTANCE IS APPROXIMATELY 4.5uH AT 1MHz.
  - U4 IS PLUGGED INTO SOCKETS SOLDERED TO THE PC BOARD.
  - OUT\_DIS\_H MEANS: OUTPUT DISABLE(H).  
 DBLR/OUT\_L MEANS: BAND DOUBLER OR OUTPUT DISABLE (L).  
 DBLR/OUT\_H MEANS: BAND DOUBLER OR OUTPUT DISABLE (H).  
 B/OVR/OUT MEANS: BAND 0 OR DOUBLER OR OUTPUT DISABLE (H).  
 B\_2\_OR\_DBL MEANS: BAND B-2 OR BAND DOUBLER (H).

DIGITAL INTEGRATED CIRCUITS VOLTAGE AND GROUND CONNECTIONS

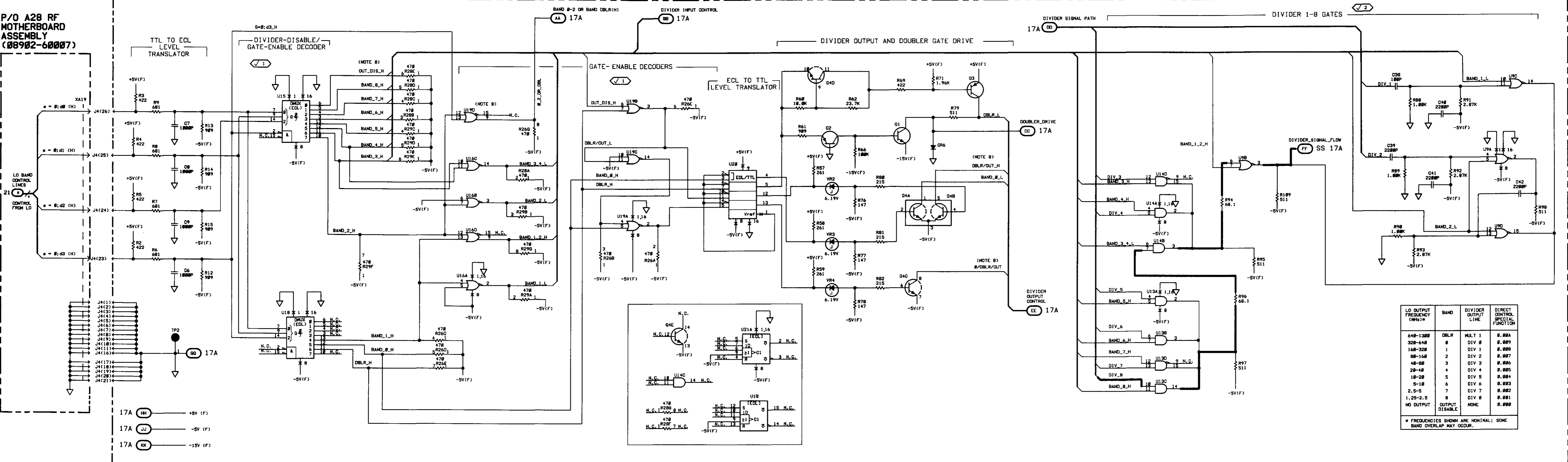
REFERENCE DESIGNATIONS	PIN NUMBERS
U1,6,9,12-19	-5V(F) - 8
	-1,16
U7,8	-5V(F) - 11
	-16
U20	+5V(F) - 8
	-5V(F) - 8
	-16





P/O A28 RF  
MOTHERBOARD  
ASSEMBLY  
(08902-60007)

A19 LO DIVIDER ASSEMBLY (08902-600126)



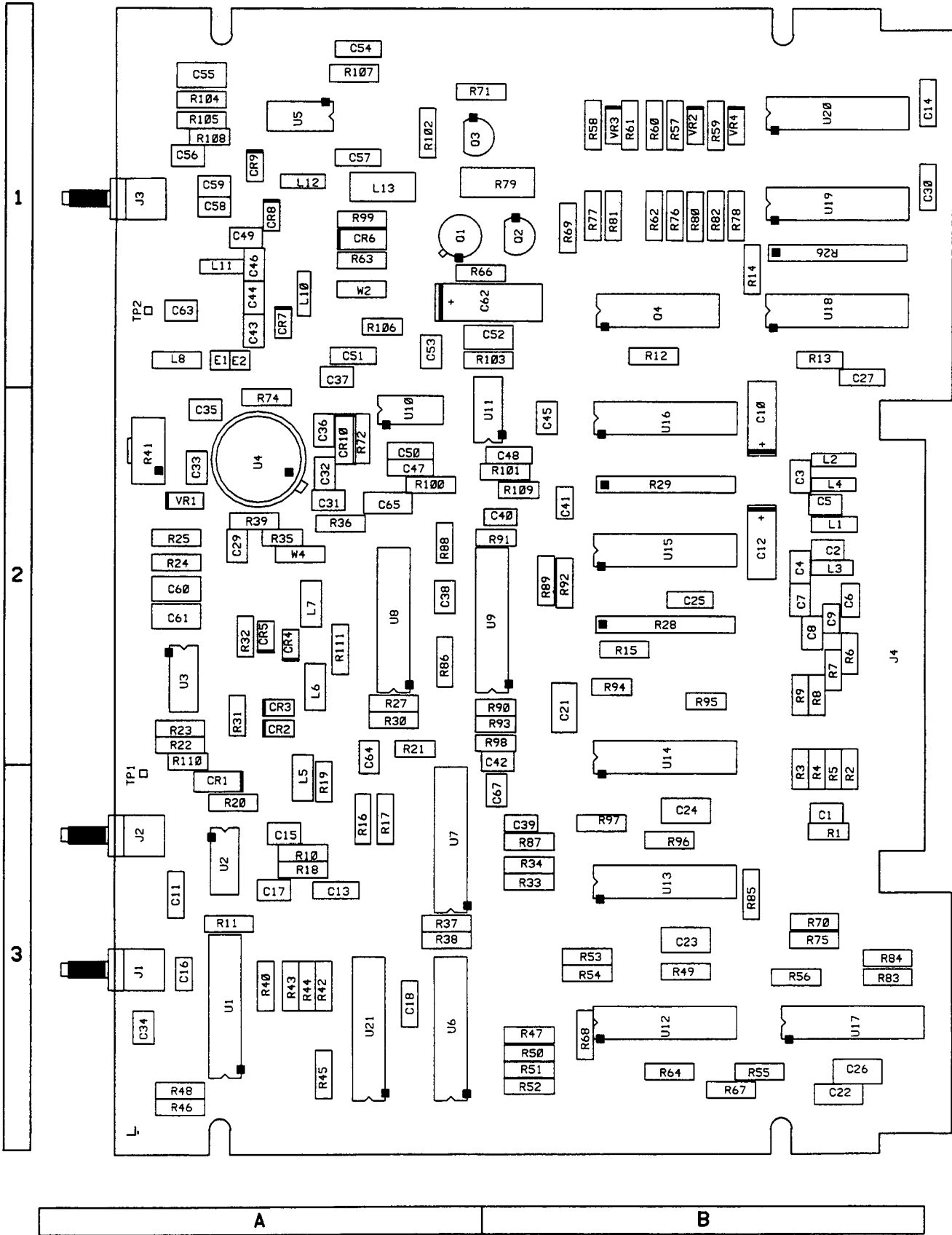
- NOTES
- SEE TABLE BA-4 SCHEMATIC DIAGRAM NOTES.
  - SEE SERVICE SHEET 5 FOR CABLE COLOR AND REFERENCE DESIGNATOR.
  - MAJN SIGNAL FLOW IS SHOWN FOR OUTPUTS OF 640-1300MHz (DBLR BAND), AND 1.25-2.5MHz (BAND 0). IN ACTUAL OPERATION ONLY ONE OF THE TEN BANDS IS OUTPUT.
  - L9 IS PC TRACE.
  - THE INDUCTANCE IS COMBINATION OF PC TRACE, DIODE LEAD, AND DIODE INDUCTANCE AND EQUALS ~9.1nH.
  - INDUCTANCE IS APPROXIMATELY 4.5nH AT 100Hz.
  - U4 IS PLUGGED INTO SOCKETS SOLDERED TO THE PC BOARD.
  - OUT\_DIS\_H MEANS: OUTPUT DISABLE (H).  
DBLR/OUT\_L MEANS: BAND DOUBLER OR OUTPUT DISABLE (L).  
DBLR/OUT\_H MEANS: BAND DOUBLER OR OUTPUT DISABLE (H).  
B/DBLR/OUT MEANS: BAND 0 OR DOUBLER OR OUTPUT DISABLE (H).  
B\_2\_OR\_DBL MEANS: BAND 0-2 OR BAND DOUBLER (H).

DIGITAL INTEGRATED CIRCUITS  
VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U1, 6, 9, 12-19	-5V(F) - 8 -1, 16
U7, 8	-5V(F) - 11 -16
U20	+5V(F) - 9 -5V(F) - 8 -16

LO OUTPUT FREQUENCY (MHz)*	BAND	DIVIDER OUTPUT LINE	DIRECT CONTROL SPECIAL FUNCTION
640-1300	DBLR	MULT 1	0.004
320-640	0	DIV 0	0.009
160-320	1	DIV 1	0.008
80-160	2	DIV 2	0.007
40-80	3	DIV 3	0.006
20-40	4	DIV 4	0.005
10-20	5	DIV 5	0.004
5-10	6	DIV 6	0.003
2.5-5	7	DIV 7	0.002
1.25-2.5	8	DIV 8	0.001
NO OUTPUT	OUTPUT DISABLE	NONE	0.000

\* FREQUENCIES SHOWN ARE NOMINAL; SOME BAND OVERLAP MAY OCCUR.



A19 Component Locator for the 08902-60126 board, (2742A and above)

*A19 Component Coordinates for the 08902-60126 board, (2742A and above)*

**A19 Component Coordinates (2742A and Above)**

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,3	C58	A,1	R18	A,3	R83	B,3		
C2	B,2	C59	A,1	R19	A,3	R84	B,3		
C3	B,2	C60	A,2	R20	A,3	R85	B,3		
C4	B,2	C61	A,2	R21	A,2	R86	A,2		
C5	B,2	C62	A,1	R22	A,2	R87	B,3		
C10	B,2	C63	A,1	R23	A,2	R99	A,1		
C11	A,3	C64	A,2	R24	A,2	R100	A,2		
C12	B,2	C65	A,2	R25	A,2	R101	A,2		
C13	A,3	C67	A,3	R27	A,2	R102	A,1		
C14	B,1			R30	A,2	R103	A,1		
C15	A,3	CR1	A,3	R31	A,2	R104	A,1		
C16	A,3	CR2	A,2	R32	A,2	R105	A,1		
C17	A,3	CR3	A,2	R33	B,3	R106	A,1		
C18	A,3	CR4	A,2	R34	B,3	R107	A,1		
C21	B,2	CR5	A,2	R35	A,2	R108	A,1		
C22	B,3	CR7	A,1	R36	A,2	R110	A,2		
C23	B,3	CR8	A,1	R37	A,3	R111	A,2		
C24	B,3	CR9	A,1	R38	A,3				
C25	B,2	CR10	A,2	R39	A,2	TP1	A,3		
C26	B,3			R40	A,3				
C27	B,1	E1	A,1	R41	A,2	U1	A,3		
C29	A,2	E2	A,1	R42	A,3	U2	A,3		
C30	B,1			R43	A,3	U3	A,2		
C31	A,2	J1	A,3	R44	A,3	U4	A,2		
C32	A,2	J2	A,3	R45	A,3	U5	A,1		
C33	A,2	J3	A,1	R46	A,3	U6	A,3		
C34	A,3			R47	B,3	U7	A,3		
C35	A,2	L1	B,2	R48	A,3	U8	A,2		
C36	A,2	L2	B,2	R49	B,3	U10	A,2		
C37	A,1	L3	B,2	R49	B,3	U11	A,2		
C43	A,1	L4	B,2	R50	B,3	U12	B,3		
C44	A,1	L5	A,3	R51	B,3	U17	B,3		
C45	B,2	L6	A,2	R52	B,3	U21	A,3		
C46	A,1	L7	A,2	R53	B,3				
C47	A,2	L8	A,1	R54	B,3	VR1	A,2		
C48	A,2	L10	A,1	R55	B,3				
C49	A,1	L11	A,1	R56	B,3	W 2	A,1		
C50	A,2	L12	A,1	R63	A,1	W 4	A,2		
C51	A,1	L13	A,1	R64	B,3				
C52	A,1			R67	B,3				
C53	A,1	R1	B,3	R68	B,3				
C54	A,1	R10	A,3	R70	B,3				
C55	A,1	R11	A,3	R72	A,2				
C56	A,1	R16	A,3	R74	A,2				
C57	A,1	R17	A,3	R75	B,3				

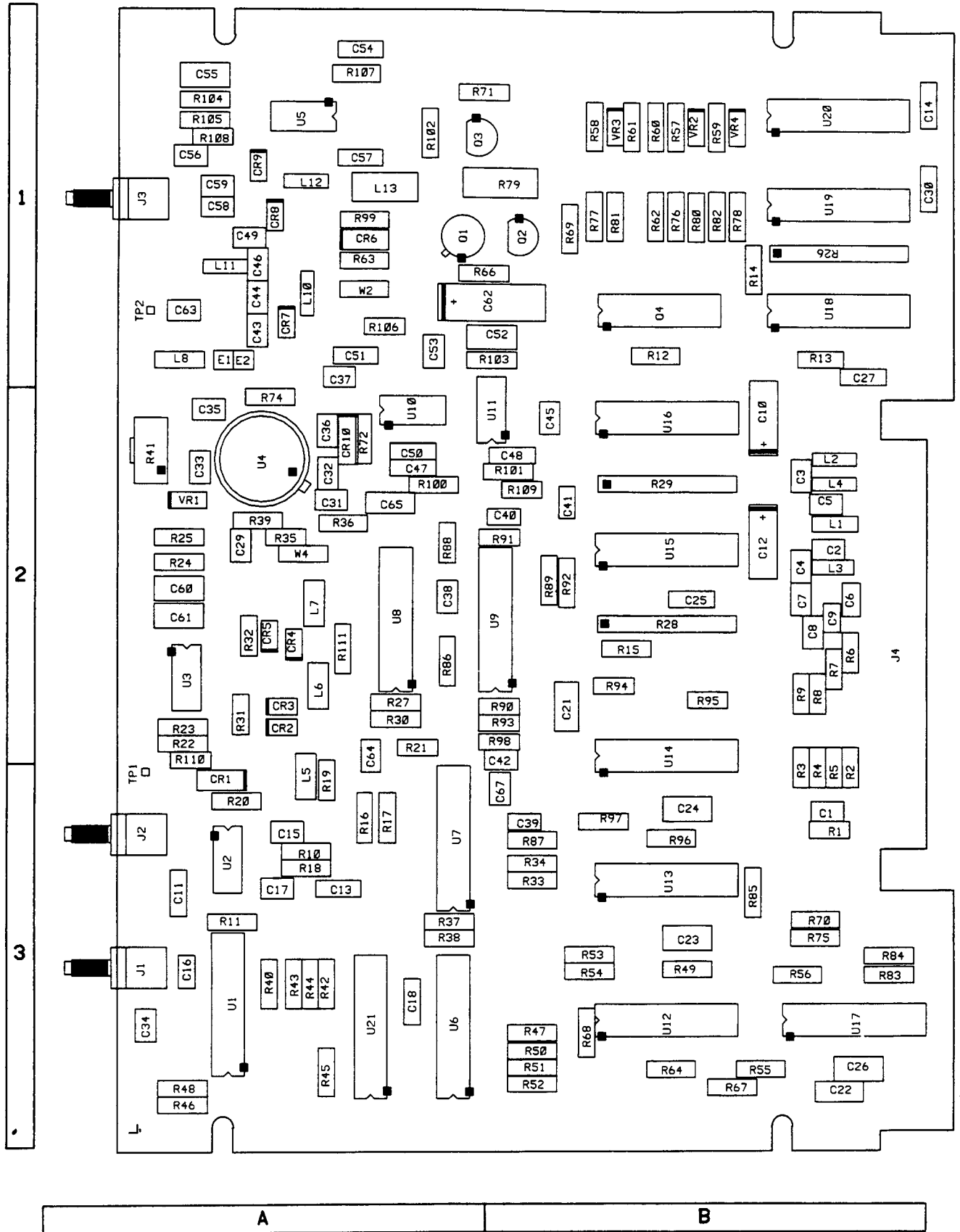
*Reserved for future changes.*

*Reserved for future changes.*

### CHANGES

<p><b>All serial prefixes</b></p>          <p><b>2742A and above</b></p>	<p>On the A19 schematic:</p> <ul style="list-style-type: none"><li>• Delete the page number (8G-36.11) and replace it with a revision date of <i>rev.01DEC88</i>.</li></ul> <p>On the A19 schematic:</p> <ul style="list-style-type: none"><li>• <b>A19</b> - Use SS17B with the revision date of <i>rev.01DEC88</i>.</li></ul> <p>On the A19 Component Locator:</p> <ul style="list-style-type: none"><li>• <b>A19</b> - Use the new A19 component locator for SS17B on page 8G-36.15.</li></ul> <p>On the A19 Component Coordinates:</p> <ul style="list-style-type: none"><li>• <b>A19</b> - Use the new A19 component coordinates for SS17B on page 8G-36.16.</li></ul>

*Reserved for future changes.*



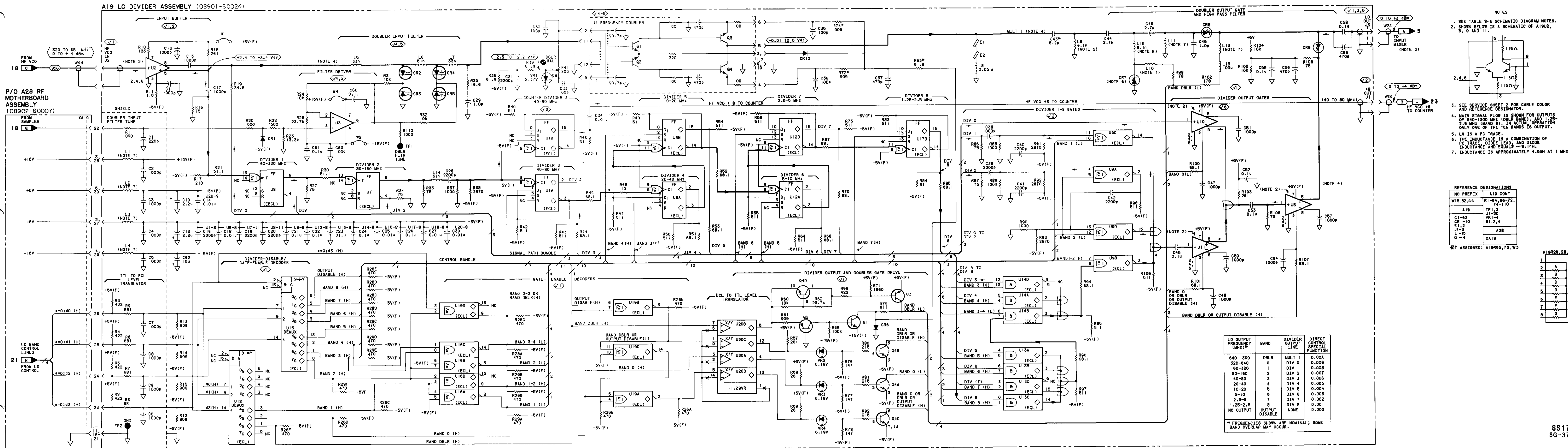
A19 Component Locator for the 08902-60126 board, (2742A and above)



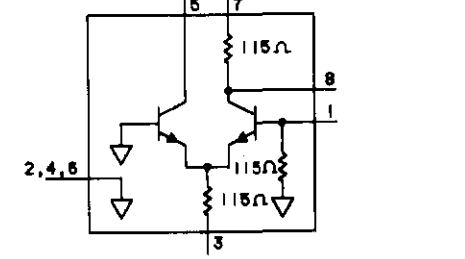
A19 Component Coordinates (2742A and Above)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C6	B,2	R78	B,1						
C7	B,2	R79	A,1						
C8	B,2	R80	B,1						
C9	B,2	R81	B,1						
C38	A,2	R82	B,1						
C39	B,3	R88	A,2						
C40	A,2	R89	B,2						
C41	B,2	R90	A,2						
C42	A,2	R91	A,2						
		R92	B,2						
CR6	A,1	R93	A,2						
		R94	B,2						
J4	B,2	R95	B,2						
		R96	B,3						
Q1	A,1	R97	B,3						
Q2	B,1	R98	A,2						
Q3	A,1	R109	B,2						
Q4	A,1								
Q12	B,1	TP2	A,1						
R2	B,3	U9	A,2						
R3	B,3	U13	B,3						
R4	B,3	U14	B,2						
R5	B,3	U15	B,2						
R6	B,2	U16	B,2						
R7	B,2	U18	B,1						
R8	B,2	U19	B,1						
R9	B,2	U20	B,1						
R13	B,1								
R14	B,1	VR2	B,1						
R15	B,2								
R26	B,1								
R28	B,2								
R29	B,2								
R57	B,1								
R58	B,1								
R59	B,1								
R60	B,1								
R61	B,1								
R62	B,1								
R66	A,1								
R69	B,1								
R71	A,1								
R76	B,1								
R77	B,1								

A19 Component Coordinates for the 08902-60126 board, (2742A and above)



- NOTES
- SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
  - SHOWN BELOW IS A SCHEMATIC OF A1902, 5, 10 AND 11.



- SEE SERVICE SHEET 2 FOR CABLE COLOR AND REFERENCE DESIGNATOR.
- MAIN SIGNAL FLOW IS SHOWN FOR OUTPUTS OF 640-1300 MHz (DBLR BAND), AND 1.25-2.5 MHz (BAND 8). IN ACTUAL OPERATION ONLY ONE OF THE TEN BANDS IS OUTPUT.
- SEE A PC TRACE.
- THE INDUCTANCE IS A COMBINATION OF PC TRACE, DIODE LEAD, AND DIODE INDUCTANCE AND EQUALS  $\approx 9.1$  nH.
- INDUCTANCE IS APPROXIMATELY 4.5 nH AT 1 MHz.

REFERENCE DESIGNATIONS

NO PREFIX	A19 CONT
W18, 32, 44	R1-84, 66-72, 74-110
A19	TP1, 2
C1-63	U1-20
CR1-10	VR1-4
E1, 2	W1, 2, 4
J1-5	A28
L1-15	XA19
Q1-4	

NOT ASSIGNED: A19065, 73, W3



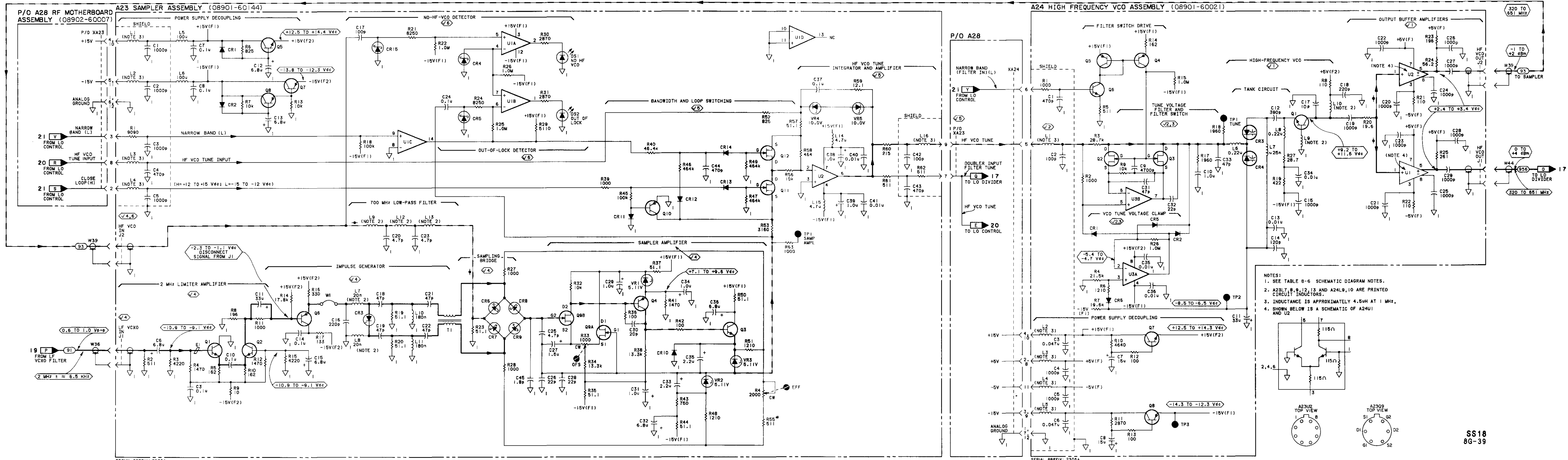
LO OUTPUT FREQUENCY (MHz)*	BAND	DIVIDER OUTPUT LINE	DIRECT CONTROL SPECIAL FUNCTION
640-1300	DBLR	MULT 1	0.00A
320-640	0	DIV 0	0.00B
160-320	1	DIV 1	0.00C
80-160	2	DIV 2	0.00D
40-80	3	DIV 3	0.00E
20-40	4	DIV 4	0.00F
10-20	5	DIV 5	0.00G
5-10	6	DIV 6	0.00H
2.5-5	7	DIV 7	0.00I
1.25-2.5	8	DIV 8	0.00J
NO OUTPUT	OUTPUT DISABLE	NONE	0.00K

\* FREQUENCIES SHOWN ARE NOMINAL; SOME BAND OVERLAP MAY OCCUR.



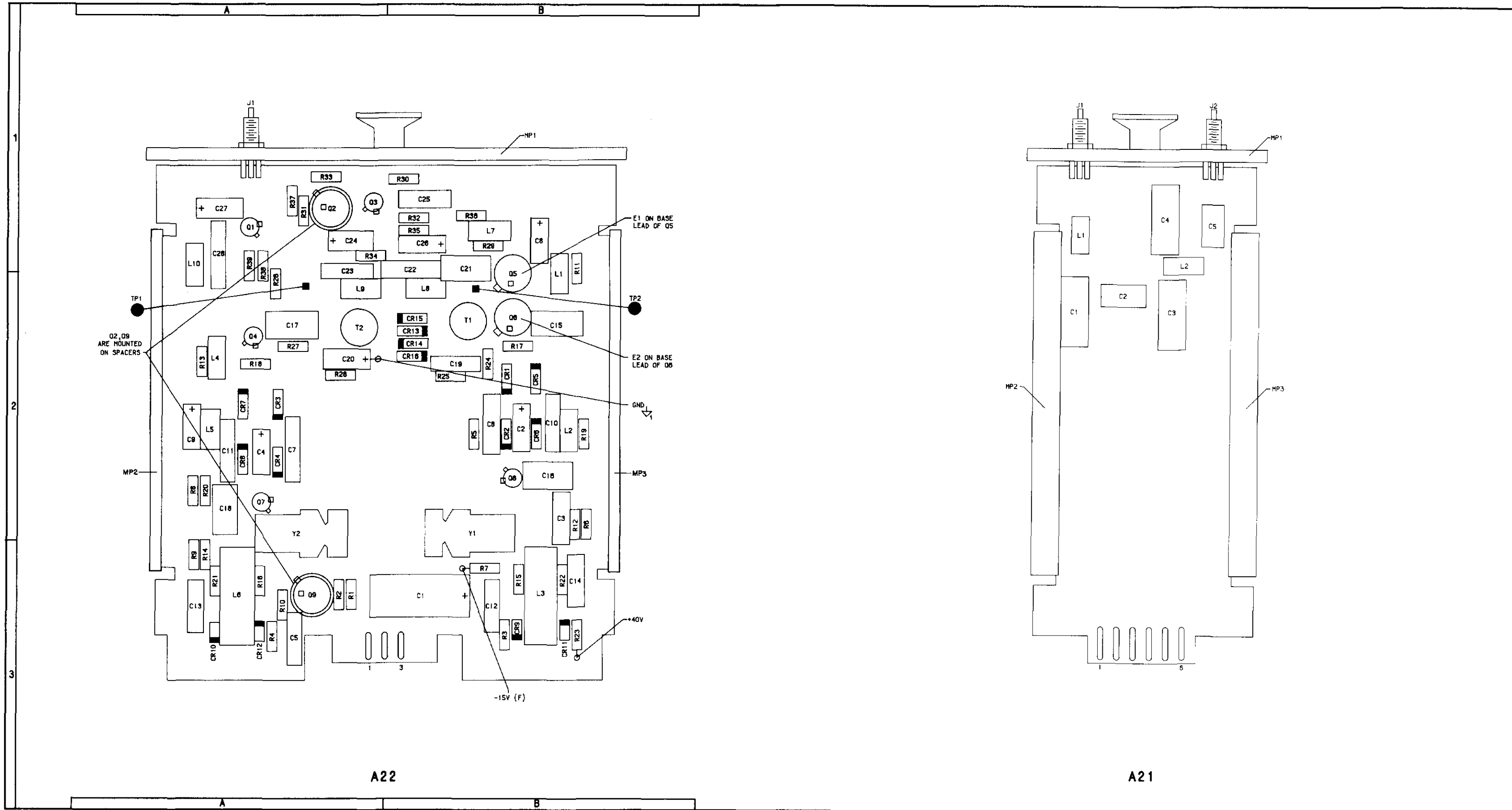
### CHANGES

<p><b>2412A and above</b></p>	<p><b>On the A24 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <u>A24E1-4</u> - Add E1 and E2 to CR3, one on each lead. Add E3 and E4 to CR4, one on each lead..</li> </ul>
<p><b>2414A and above</b></p>	<p><b>On the A23 Component Locator:</b></p> <ul style="list-style-type: none"> <li>• <u>A23MP4,MP5</u> - Delete all references to MP4 and MP5.</li> </ul> <p><b>On the A23 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <u>SHIELD</u> - In the upper, left portion of the A23 schematic, delete the dashed line that represents the shield and the title "SHIELD".</li> </ul>
<p><b>All Serial Prefixes</b></p>	<p><b>On the A23 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <u>R4</u> - Change the reference designator R4 to R54.</li> </ul>



A22 Component Coordinates

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,3	E2	B,2	R20	A,2				
C2	B,2	J1	A,1	R21	A,3				
C3	B,2	L1	B,2	R22	B,3				
C4	A,2	L2	B,2	R23	B,3				
C5	A,3	L3	B,3	R24	B,2				
C6	B,2	L4	A,2	R25	B,2				
C7	A,2	L5	A,2	R26	A,2				
C8	B,1	L6	A,3	R27	A,2				
C9	A,2	L7	B,1	R28	A,2				
C10	B,2	L8	B,2	R29	B,1				
C11	A,2	L9	A,2	R30	B,1				
C12	B,3	L10	A,1	R31	A,1				
C13	A,3			R32	B,1				
C14	B,3			R33	A,1				
C15	B,2	MP1	B,1	R34	A,1				
C16	B,2	MP2	A,2	R35	B,1				
C17	A,2	MP3	B,2	R36	B,1				
C18	A,2			R37	A,1				
C19	B,2	Q1	A,1	R38	A,2				
C20	A,2	Q2	A,1	R39	A,1				
C21	B,2	Q3	A,1						
C22	B,2	Q4	A,2	T1	B,2				
C23	A,2	Q5	B,2	T2	A,2				
C24	A,1	Q6	B,2						
C25	B,1	Q7	A,2	TP1	A,2				
C26	B,1	Q8	B,2	TP2	B,2				
C27	A,1	Q9	A,3						
C28	A,1			Y1	B,2				
				Y2	A,2				
CR1	B,2	R1	A,3						
CR2	B,2	R2	A,3						
CR3	A,2	R3	B,3						
CR4	A,2	R4	A,3						
CR5	B,2	R5	B,2						
CR6	B,2	R6	B,2						
CR7	B,2	R7	B,3						
CR8	A,2	R8	A,2						
CR9	A,2	R9	A,3						
CR10	B,3	R10	A,3						
CR11	A,3	R11	B,2						
CR12	B,3	R12	B,2						
CR13	A,3	R13	A,2						
CR14	B,2	R14	A,3						
CR15	B,2	R15	B,3						
CR16	B,2	R16	A,3						
		R17	B,2						
		R18	A,2						
		R19	B,2						
E1	B,2								

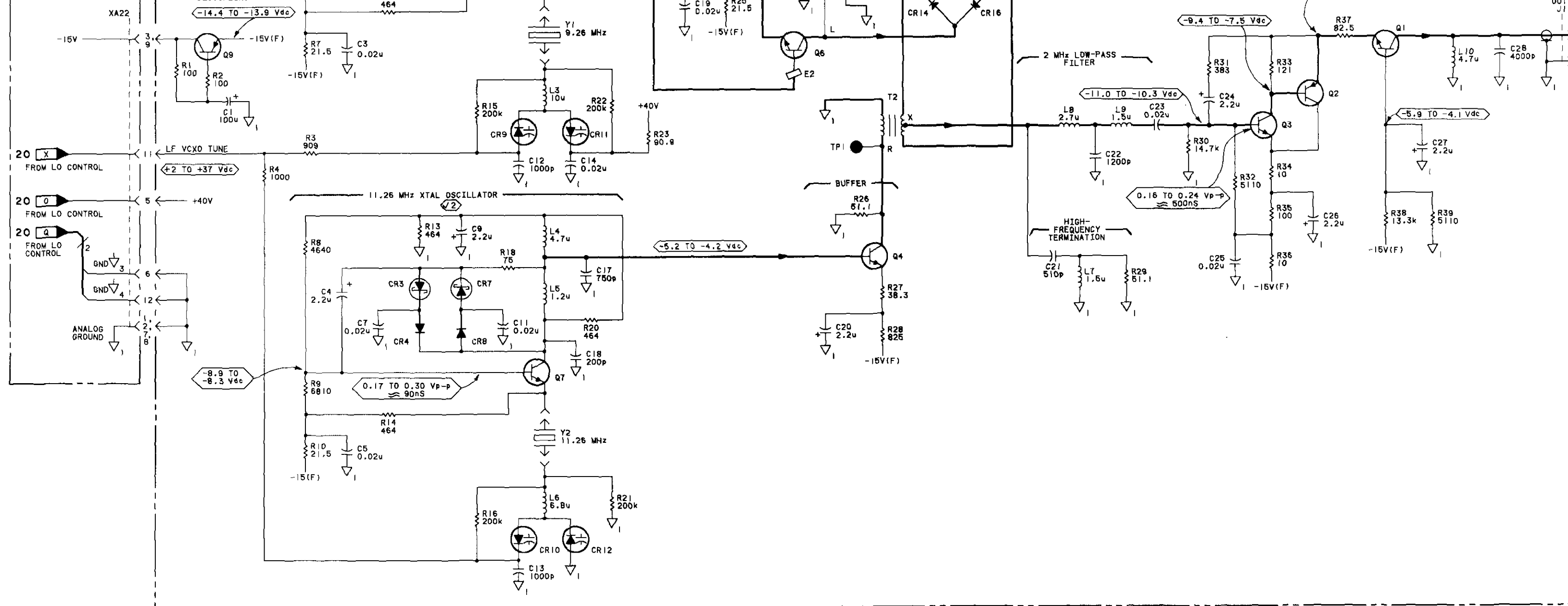


Component Locators

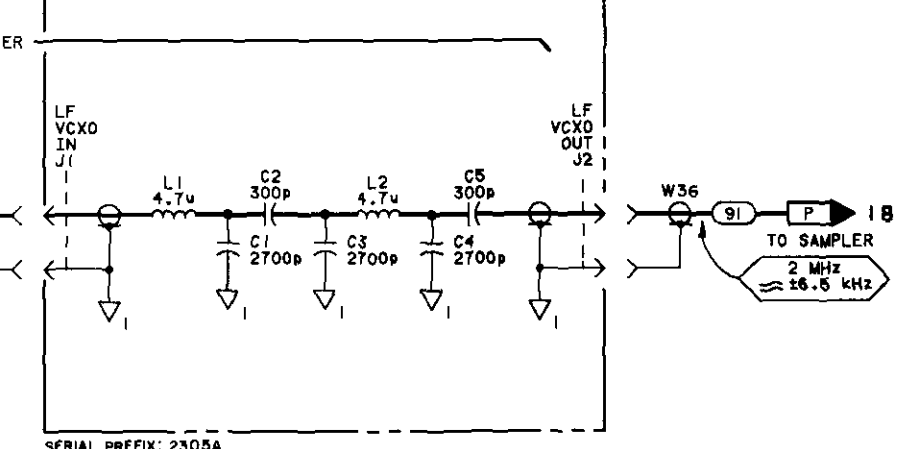
A23 SAMPLER  
 A24 HIGH FREQUENCY VCO **SS 18**  
SEE REVERSE SIDE

A22 LOW FREQUENCY VCXO ASSEMBLY (08901-60007) (1)

P/O A28  
RF MOTHERBOARD  
ASSEMBLY  
(08902-60007)



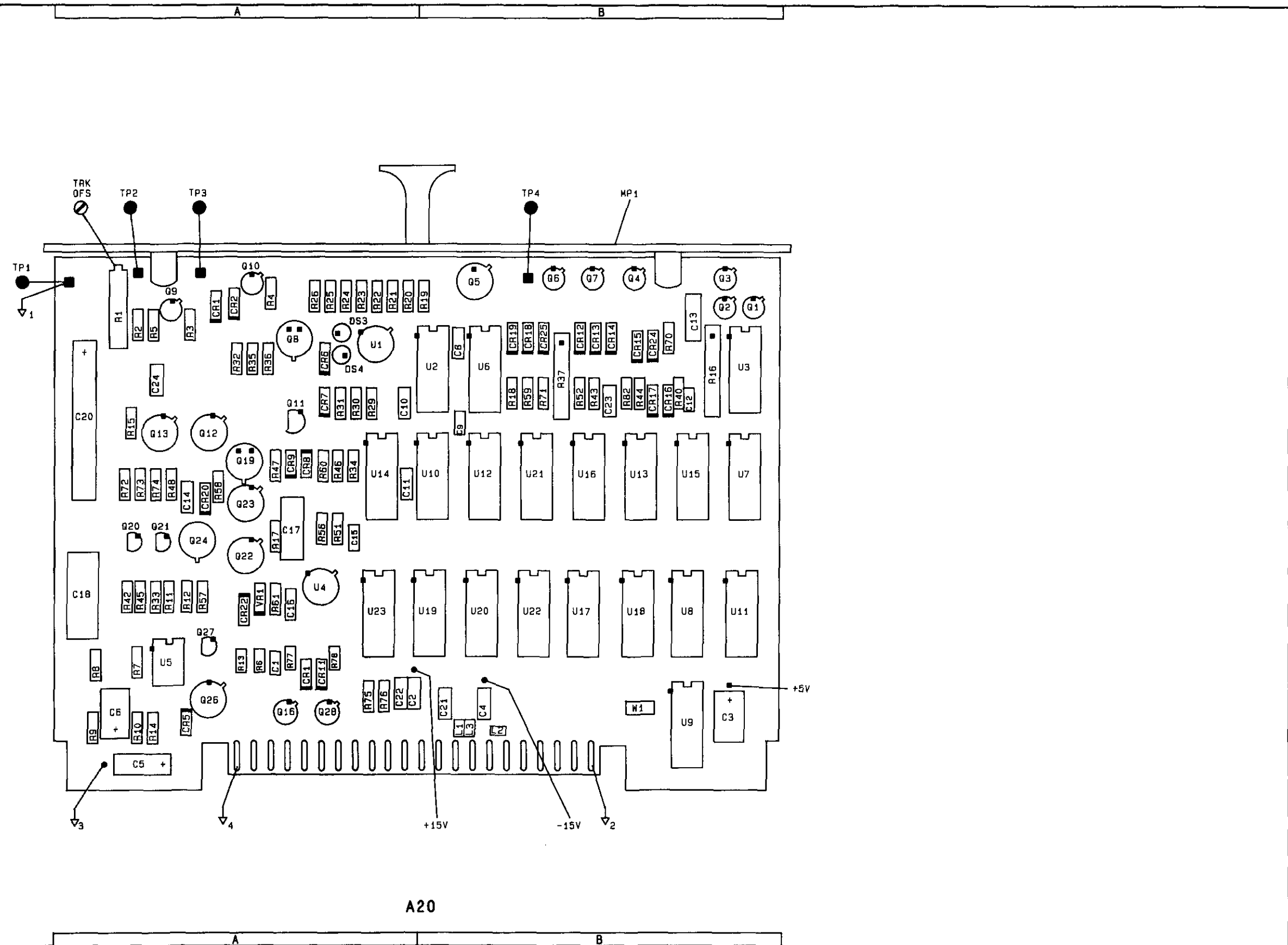
A21 LOW FREQUENCY VCXO  
FILTER ASSEMBLY (08901-60025) (3)



NOTES  
1. SEE TABLE B-6 SCHEMATIC DIAGRAM NOTES.

SERIAL PREFIX: 2305A

A20 Component Coordinates (1 of 2) (2535A AND ABOVE)



A20 Component Locator

A21 LOW FREQUENCY VCXO FILTER  
A22 LOW FREQUENCY VCXO  
SEE REVERSE SIDE

**SS19**

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	A,3	MP1	B,1	R24	A,1	U13	B,2		
C2	A,3			R25	A,1	U14	A,2		
C3	B,3	Q1	B,1	R26	A,1	U23	B,2		
C4	B,3	Q2	B,1	R29	A,2				
C5	A,3	Q3	B,1	R30	A,2	VR1	A,2		
C6	A,3	Q4	B,1	R31	A,2				
C7	B,2	Q5	B,1	R32	A,2	W1	B,3		
C8	B,2	Q6	B,1	R33	A,2				
C9	B,2	Q7	B,1	R34	A,2				
C10	A,2	Q8	A,2	R35	A,2				
C11	A,2	Q9	A,1	R36	A,2				
C12	B,2	Q10	A,1	R37	B,2				
C13	B,1	Q11	A,2	R40	B,2				
C14	A,2	Q12	A,2	R42	A,2				
C15	A,3	Q13	A,2	R43	B,2				
C16	A,2	Q19	A,2	R44	B,2				
C17	A,2	Q20	A,2	R45	A,2				
C18	A,2	Q21	A,2	R46	A,2				
C20	A,2	Q22	A,2	R47	A,2				
C24	A,2	Q23	A,2	R48	A,2				
		Q24	A,2	R51	A,2				
CR1	A,1	Q26	A,3	R52	B,2				
CR2	A,1	Q27	A,3	R56	A,2				
CR5	A,3			R57	A,2				
CR6	A,2	R1	A,1	R58	A,2				
CR7	A,2	R2	A,2	R59	B,2				
CR8	A,2	R3	A,2	R60	A,2				
CR9	A,2	R4	A,1	R61	A,2				
CR12	B,2	R5	A,2	R70	B,2				
CR13	B,2	R6	A,3	R71	B,2				
CR14	B,2	R7	A,3	R72	A,2				
CR15	B,2	R8	A,3	R73	A,2				
CR16	B,2	R9	A,3	R74	A,2				
CR17	B,2	R10	A,3						
CR18	B,2	R11	A,2	TP1	A,1				
CR19	B,2	R12	A,2	TP2	A,1				
CR20	A,2	R13	A,3	TP3	A,1				
CR22	A,2	R14	A,3	TP4	B,1				
CR24	B,2	R15	A,2						
CR25	B,2	R16	B,2	U1	A,2				
		R17	A,2	U2	B,2				
DS3	A,2	R18	B,2	U3	B,2				
DS4	A,2	R19	B,1	U4	A,2				
		R20	A,1	U5	A,3				
L1	B,3	R21	A,1	U6	B,2				
L2	B,3	R22	A,1	U10	B,2				
L3	B,3	R23	A,1	U12	B,2				



## CHANGES

### All Serial Prefixes

On the A20 schematic:

- R47 - In the **P/O A20 CONTROL ASSEMBLY**, under **LF VCXO TUNE AMPLIFIER**, change the value of R47 to 26.1K.

### 2403A to 2530A

On the A20 schematic:

- A20R19-R26 - Make the following value changes:

R19	61.9k
R20	28.7k
R21	13.3k
R22	6190
R23	2610
R24	464k
R25	237k
R26	121k

### 2535A and above

SS20 Schematic:

- Use SS20 (2535A) on page 8G-44 and 8G-45.

### 2546A and above

On the A20 schematic:

- A20R57 - Change the value of R57 to 46.4k.

### 2748A and above

On the Component Coordinates:

- CR21 - Add CR21 A,1 to the coordinates.

On the Component Locator:

- CR21, C7, C19 - Add CR21 between R35 and R36 with the polarity nearest Q10. Add C7 between U12 and U21. Add C19 between C12 and R16.

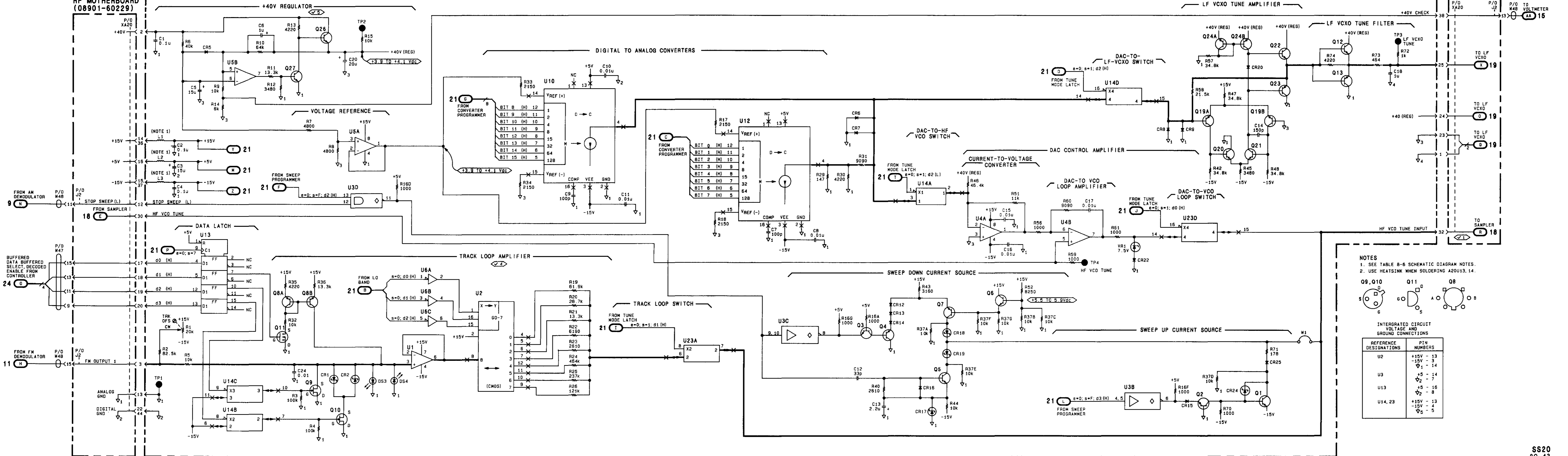
On the schematic:

- R35, C21, R32 - On the lower left portion of the schematic, next to **DATA LATCH**, locate R35 and change the value to 3.48k. Add CR21 between R35 and Q8A with the anode connecting to R35 and the cathode connecting to Q8A. Below Q8A change the value of R32 to 9.09k.
- On the lower left hand corner of the schematic, change the serial prefix to 2748A and above.

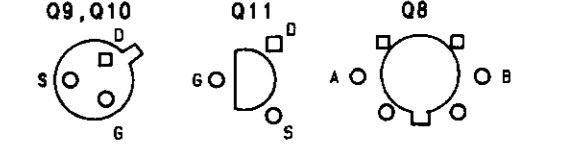
P/O A28  
RF MOTHERBOARD  
(08901-60229)

P/O A20 LO CONTROL ASSEMBLY (1 OF 2) (08901-60262)

P/O A28  
P/O XA20  
P/O J2  
P/O J48  
P/O TO VOLTMETER  
AA 15



NOTES  
1. SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.  
2. USE HEATSINK WHEN SOLDERING A20U13, 14.

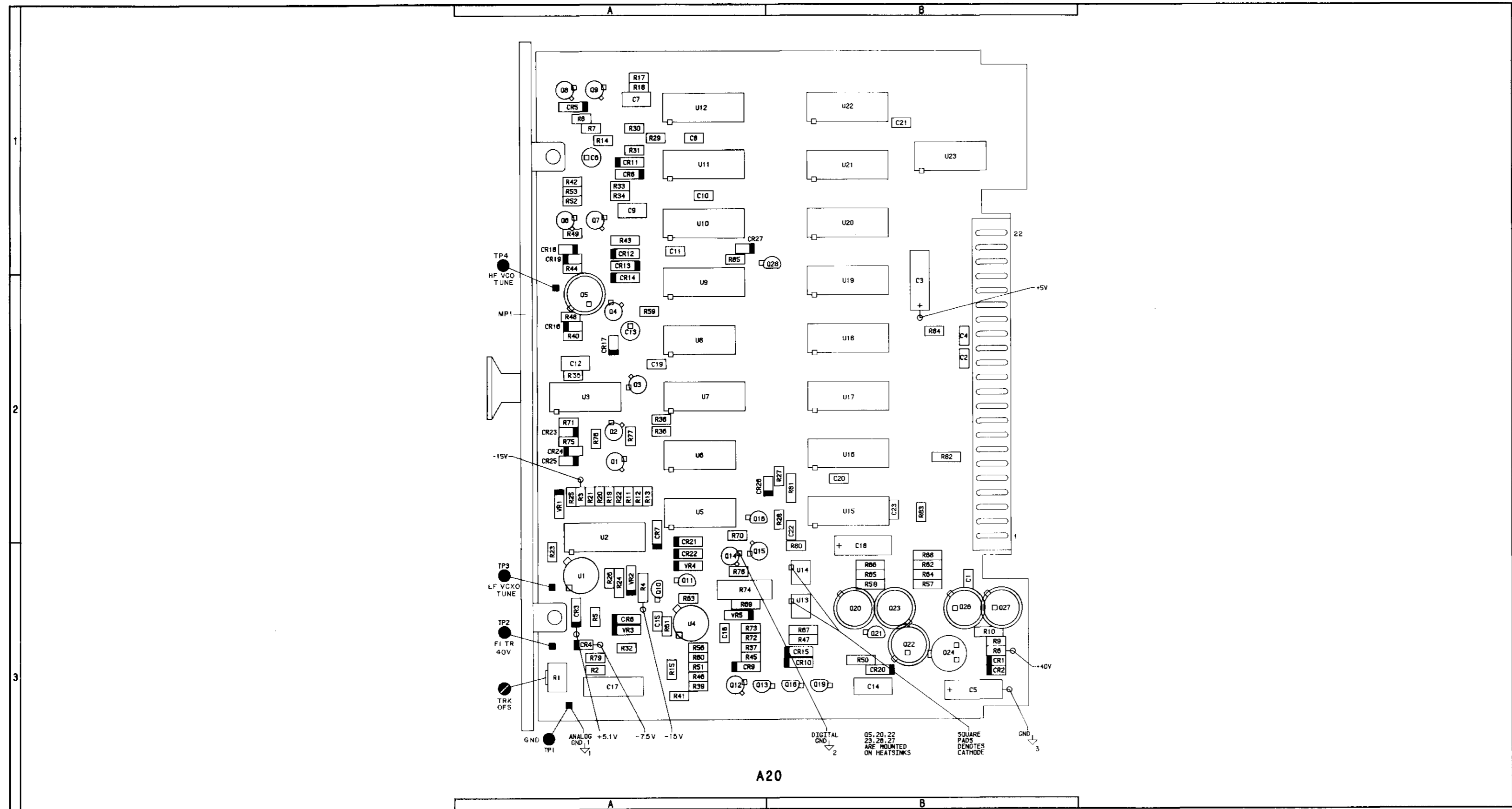


INTEGRATED CIRCUIT  
VOLTAGE AND  
GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U2	+15V - 13 -15V - 3 V1 - 14
U3	+5 - 14 V2 - 7 V3 - 8
U13	+5 - 14 -15V - 4 V5 - 5
U14, 23	+15V - 13 -15V - 4 V5 - 5

A20 Component Coordinates (1 of 2)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,3	Q1	A,2	R23	A,3	R71	A,2		
C2	B,2	Q2	A,2	R24	A,3	R72	A,3		
C3	B,2	Q3	A,2	R25	A,2	R73	A,3		
C4	B,2	Q4	A,2	R26	A,3	R74	A,3		
C5	B,3	Q5	A,2	R27	B,2	R75	A,2		
C6	A,1	Q6	A,1	R28	B,2	R76	A,2		
C7	A,1	Q7	A,1	R29	A,1	R77	A,2		
C8	A,1	Q8	A,1	R30	A,1	R78	A,3		
C9	A,1	Q9	A,1	R31	A,1	R79	A,3		
C10	A,1	Q10	A,3	R32	A,3	R83	B,2		
C11	A,1	Q11	A,3	R33	A,1	R84	B,2		
C12	A,2	Q12	A,3	R34	A,1				
C13	A,2	Q13	A,3	R35	A,2	TP1	A,3		
C14	B,3	Q14	A,3	R36	A,2	TP2	A,3		
C15	A,3	Q15	A,3	R37	A,3	TP3	A,3		
C16	A,3	Q18	B,3	R38	A,2	TP4	A,2		
C17	A,3	Q19	B,3	R39	A,3				
C18	B,3	Q20	B,3	R40	A,2	U1	A,3		
		Q21	B,3	R41	A,3	U2	A,3		
CR1	B,3	Q22	B,3	R42	A,1	U3	A,2		
CR2	B,3	Q23	B,3	R43	A,1	U4	A,3		
CR3	A,3	Q24	B,3	R44	A,2	U5	A,2		
CR4	A,3	Q26	B,3	R45	A,3	U6	A,2		
CR5	A,1	Q27	B,3	R46	A,3	U10	A,1		
CR6	A,3			R47	B,3	U12	A,1		
CR7	A,3	R1	A,3	R48	A,2	U13	B,3		
CR8	A,1	R2	A,3	R49	A,1	U14	B,3		
CR9	A,3	R3	A,2	R50	B,3				
CR10	B,3	R4	A,3	R51	A,3	VR1	A,2		
CR11	A,1	R5	A,3	R52	A,1	VR2	A,3		
CR12	A,1	R6	B,3	R53	A,1	VR3	A,3		
CR13	A,1	R7	A,1	R56	A,3	VR4	A,3		
CR14	A,2	R8	A,1	R57	B,3	VR5	A,3		
CR15	B,3	R9	B,3	R58	B,3				
CR16	A,2	R10	B,3	R59	A,2				
CR17	A,2	R11	A,2	R60	A,3				
CR18	A,1	R12	A,2	R61	A,3				
CR19	A,1	R13	A,2	R62	B,3				
CR20	B,3	R14	A,1	R63	A,3				
CR21	A,3	R15	A,3	R64	B,3				
CR22	A,3	R17	A,1	R65	B,3				
CR23	A,2	R18	A,1	R66	B,3				
CR24	A,2	R19	A,2	R67	B,3				
CR25	A,2	R20	A,2	R68	B,3				
		R21	A,2	R69	A,3				
MP1	A,2	R22	A,2	R70	A,3				



A20

Component Locator

A20 LO CONTROL (1 OF 2)  
ANALOG CIRCUITS

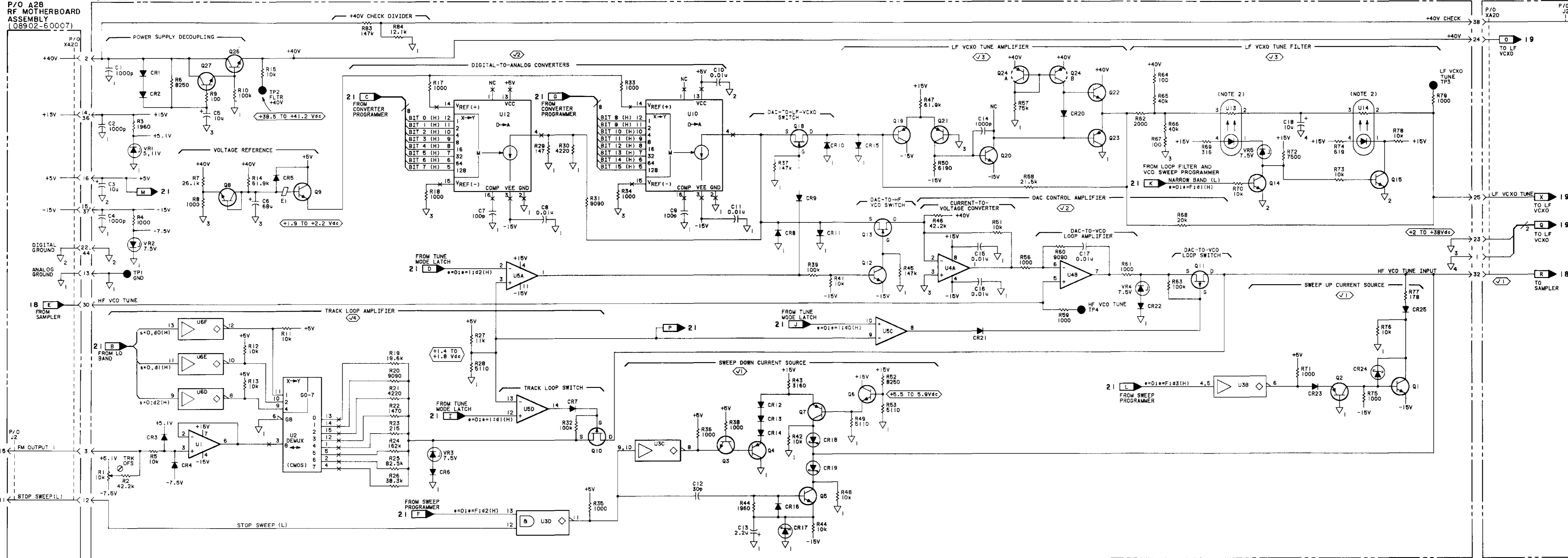
**SS20**

SEE REVERSE SIDE SERIAL PREFIX: 2535A AND ABOVE

P/O A28  
RF MOTHERBOARD  
ASSEMBLY  
(08902-60007)

P/O A20 LO CONTROL ASSEMBLY (1 OF 2) (08901-60185)

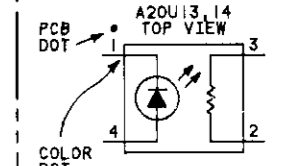
P/O A28



- NOTES
1. SEE TABLE B-6 SCHEMATIC DIAGRAM NOTES.
  2. USE HEATSINK WHEN SOLDERING A20U13, 14.

INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

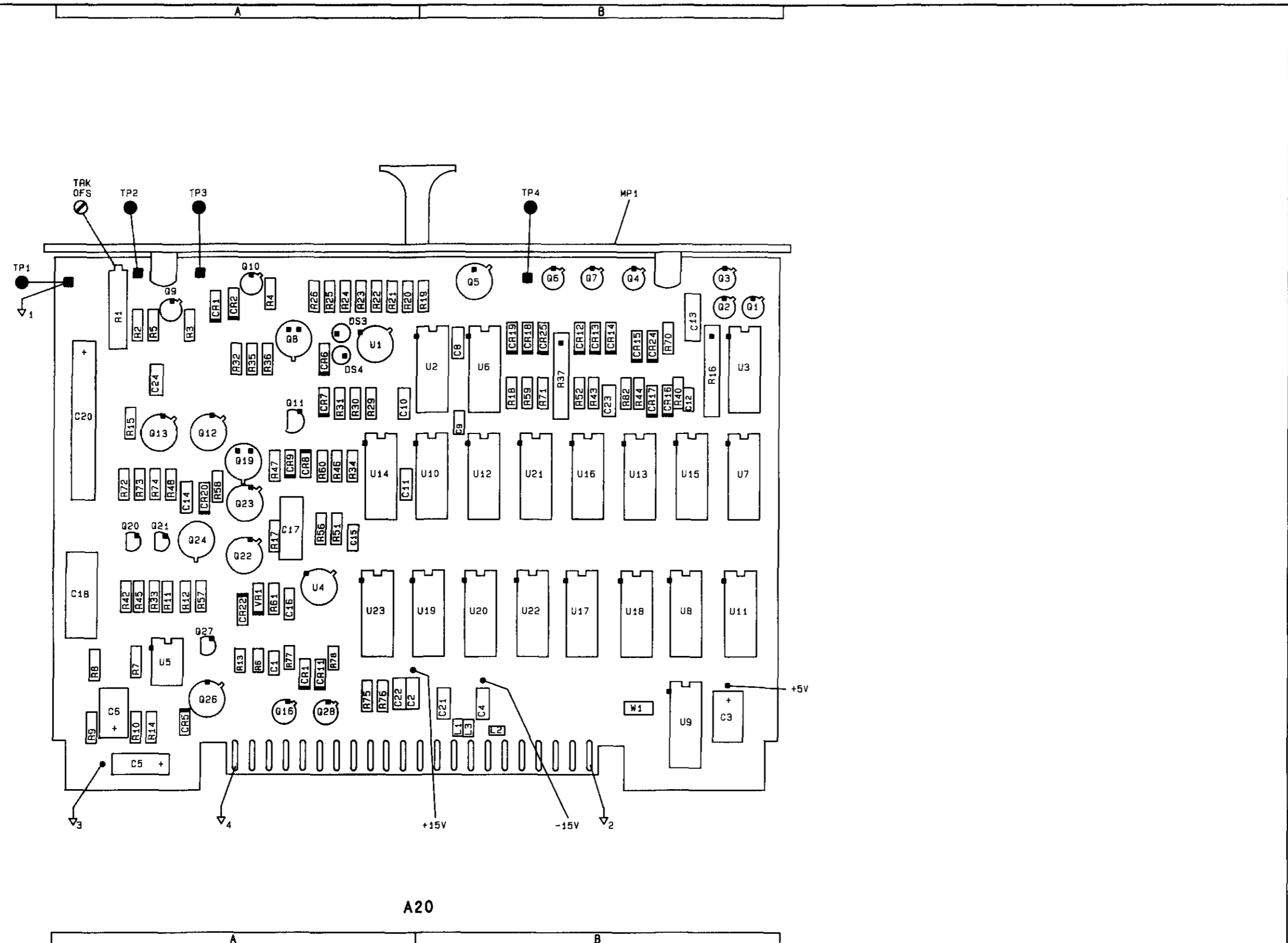
REFERENCE DESIGNATIONS	PIN NUMBERS
U2	+5.1V - 16
	-5.1V - 7
	1 - 8
U3, 6	+5V - 14
	2 - 7



SERIAL PREFIX: 2305A

A20 Component Coordinates (2 of 2) (2535A AND ABOVE)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C19	B,2								
C21	B,3								
C22	A,3								
C23	B,2								
CR10	A,3								
CR11	A,3								
MP1	B,1								
Q16	A,3								
Q28	A,3								
R16	B,2								
R75	A,3								
R76	A,3								
R77	A,3								
R78	A,3								
R82	B,2								
U3	B,2								
U6	B,2								
U7	B,2								
U8	B,2								
U9	B,3								
U11	B,2								
U15	B,2								
U16	B,2								
U17	B,2								
U18	B,2								
U19	B,2								
U20	B,2								
U21	B,2								



Component Locator

A20 LO CONTROL (1 OF 2)  
ANALOG CIRCUITS

**SS20**

SEE REVERSE SIDE SERIAL PREFIX: 2305A TO 2530A

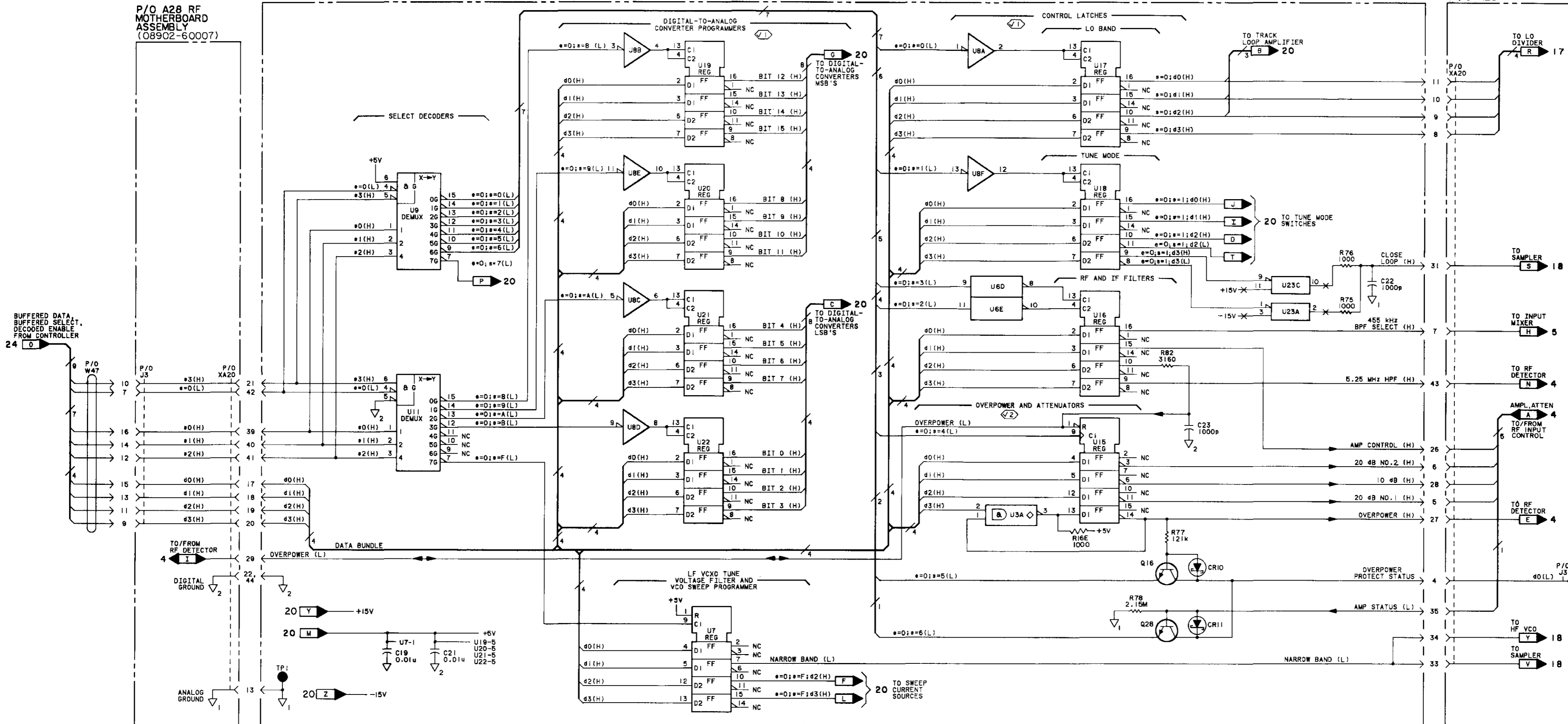
## CHANGES

**2535A and above**

SS20 Schematic:

- Use SS21 (2535A) on page 8G-48 and 8G-49.

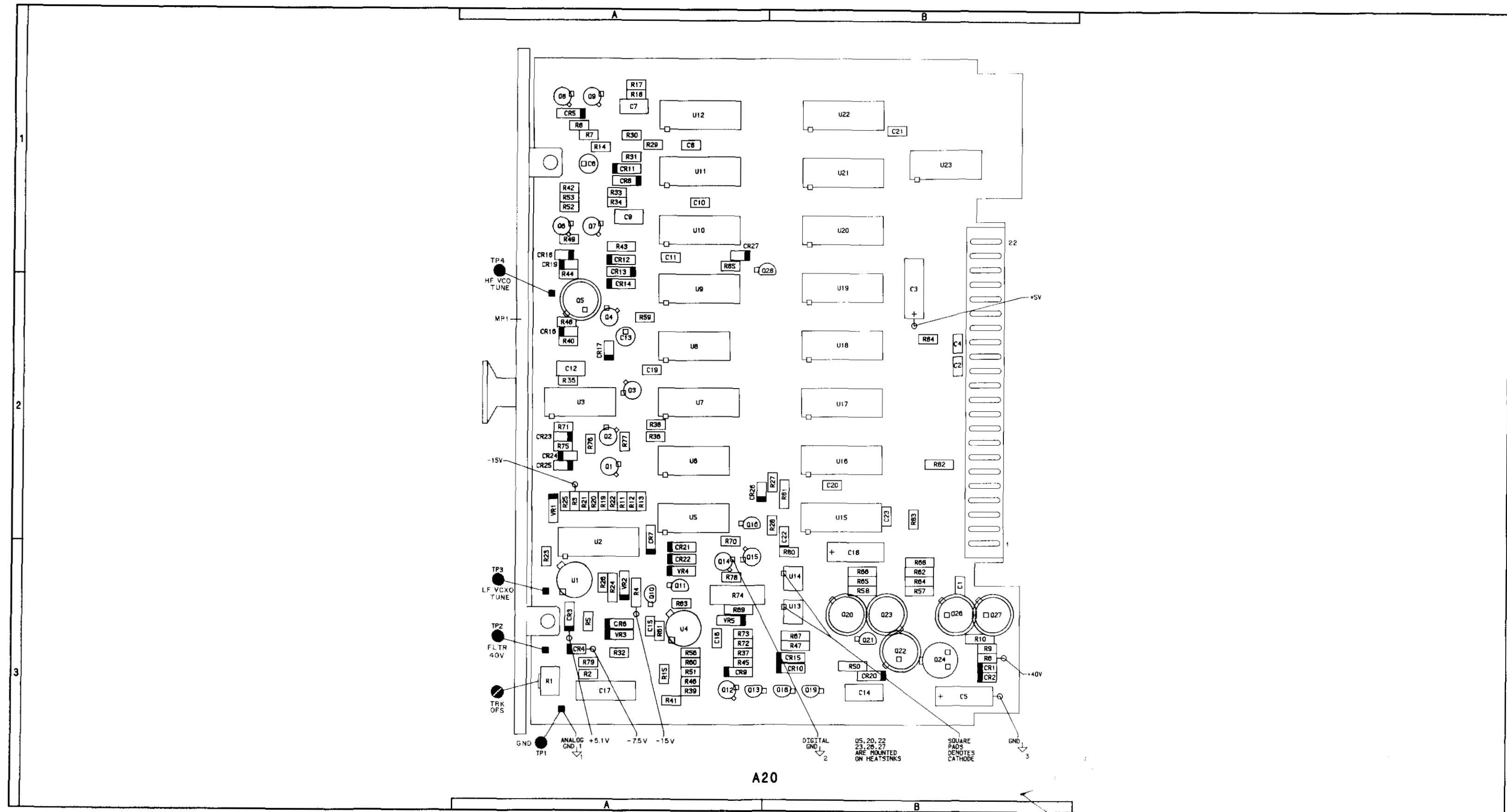
P/O A20 LO CONTROL ASSEMBLY (2 OF 2) (08901-60262)



NOTES  
1. SEE TABLE B-6  
DIAGRAM NOTES. SCHEMATIC

DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	VOLTAGE	PIN NUMBERS
U16-22	+5V	- 5
	▽ <sub>2</sub>	- 12
U3,6,8,23	+5V	- 14
	▽ <sub>2</sub>	- 7
U7,9,11,15	+5V	- 16
	▽ <sub>2</sub>	- 8
U23	+15	- 13
	-15	- 4
	▽ <sub>1</sub>	- 5



Component Locator

A20 LO CONTROL (2 OF 2)  
DIGITAL CIRCUITS

**SS21**

SEE REVERSE SIDE

SERIAL PREFIX: 2535A AND ABOVE

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C19	A,2								
C20	B,2								
C21	B,1								
C22	B,3								
C23	B,2								
CR26	A,2								
CR27	A,1								
Q16	A,2								
Q28	B,1								
R80	B,3								
R81	B,2								
R82	B,2								
R85	A,1								
TP1	A,3								
U5	A,2								
U7	A,2								
U8	A,2								
U9	A,2								
U11	A,1								
U15	B,2								
U16	B,2								
U17	B,2								
U18	B,2								
U19	B,2								
U20	B,1								
U21	B,1								
U22	B,1								
U23	B,1								

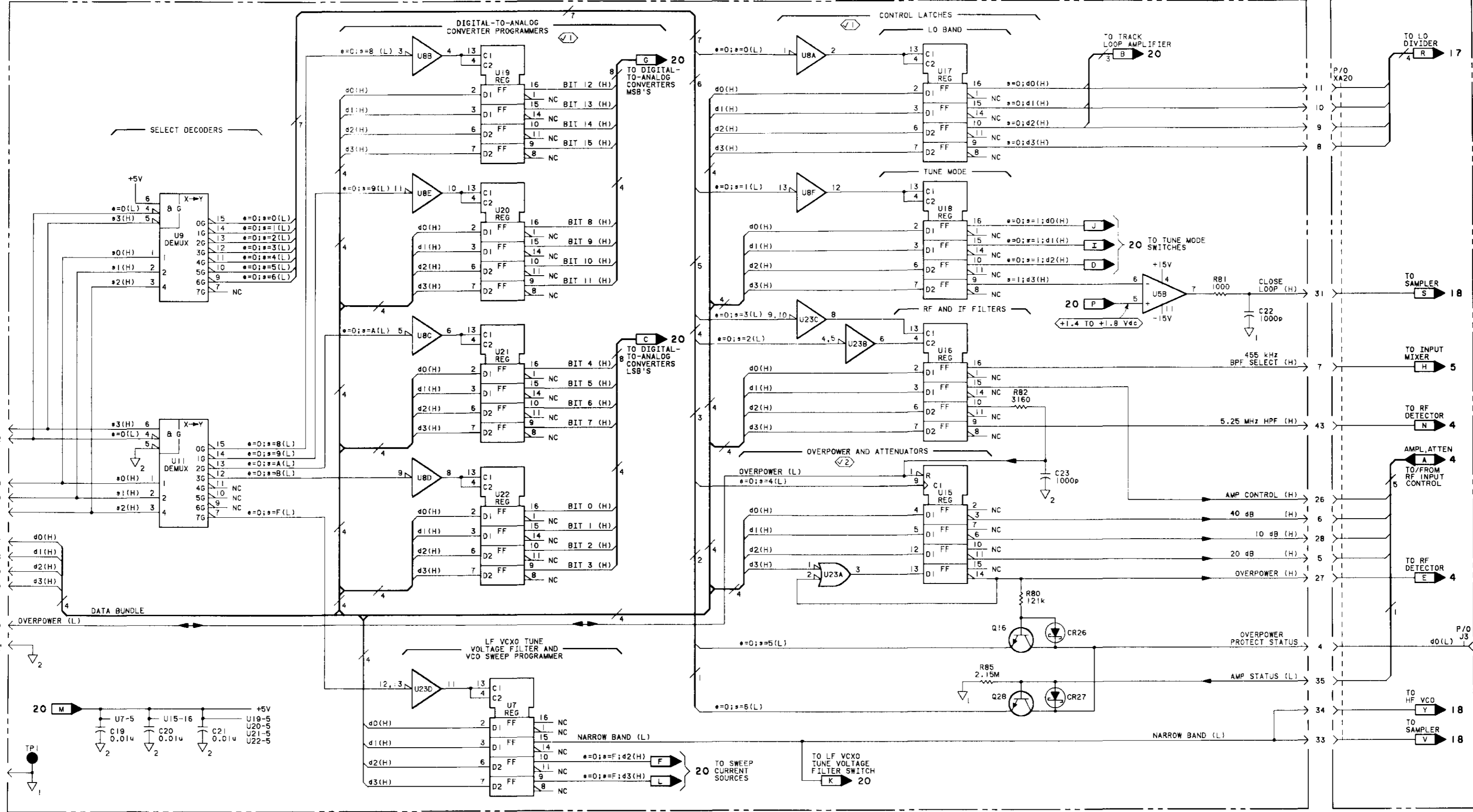
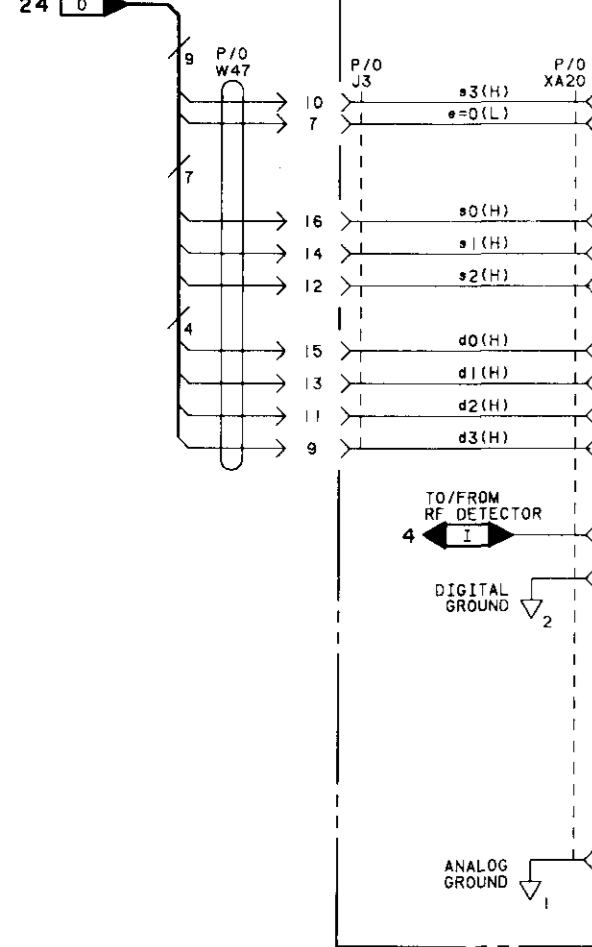


P/O A28 RF MOTHERBOARD ASSEMBLY (08902-60007)

P/O A20 LO CONTROL ASSEMBLY (2 OF 2) (08901-60185)

P/O A28

BUFFERED DATA, BUFFERED SELECT, DECODED ENABLE FROM CONTROLLER



NOTES  
1. SEE TABLE 8-6 DIAGRAM NOTES. SCHEMATIC

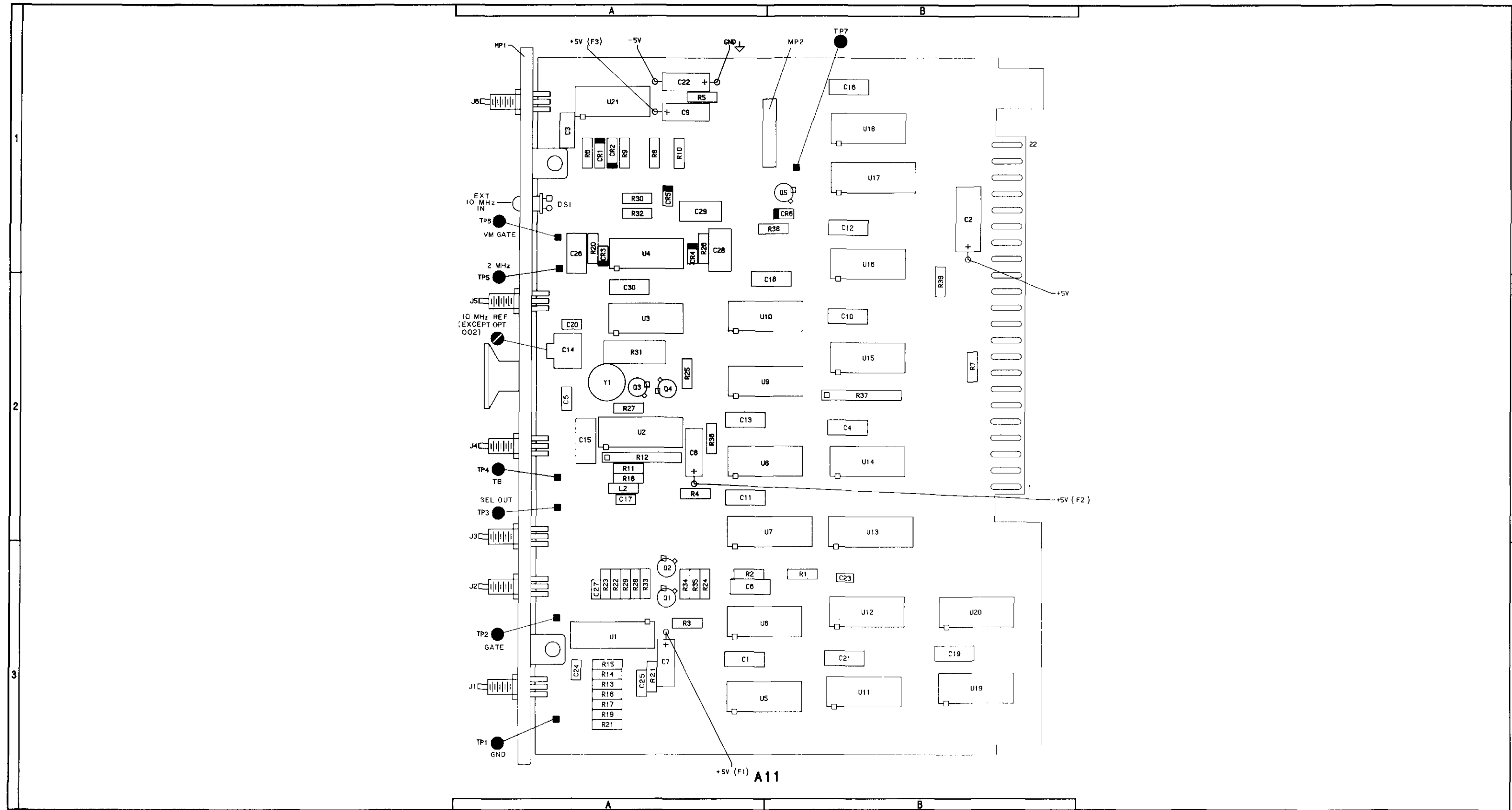
DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U7, 16-22	+5V - 5
	∇ <sub>2</sub> - 12
U8, 23	+5V - 14
	∇ <sub>2</sub> - 7
U9, 11, 15	+5V - 16
	∇ <sub>2</sub> - 8

SERIAL PREFIX: 2305A TO 2530A

A11 Component Coordinates (1 of 2)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C2	B,1	R27	A,2						
C3	A,1	R30	A,1						
C5	A,2	R31	A,2						
C8	A,2	R32	A,1						
C9	A,1	R36	A,2						
C14	A,2								
C15	A,2	TP1	A,3						
C17	A,2	TP4	A,2						
C18	B,2	TP5	A,2						
C20	A,2								
C22	A,1	U2	A,2						
C26	A,1	U3	A,2						
C28	A,1	U4	A,1						
C29	A,1	U8	B,2						
C30	A,2	U9	B,2						
		U10	B,2						
CR1	A,1	U20	A,3						
CR2	A,1	U21	A,1						
CR3	A,1								
CR4	A,1								
CR5	A,1								
DS1	A,1								
J4	A,2								
J5	A,2								
J6	A,1								
L2	A,2								
MP1	A,1								
Q3	A,2								
Q4	A,2								
R4	A,2								
R5	A,1								
R6	A,1								
R8	A,1								
R9	A,1								
R10	A,1								
R11	A,2								
R12	A,2								
R18	A,2								
R20	A,1								
R25	A,2								
R26	A,1								



Component Locator

A20 LO CONTROL (2 OF 2)  
DIGITAL CIRCUITS  
SEE REVERSE SIDE  
SERIAL PREFIX: 2306A TO 2530A  
**SS21**

**CHANGES****2535A and above**

On the A11 schematic:

- A11C26, A11C28 - Change the value of C26 and C28 to 220p.
- A11C29 - Change the value of C29 to 470p.
- A11L1 - Add L1 between pins 16, 38 and the junction of C30 and the +5V line. Add under L1 "(NOTE 3)".
- Then, under NOTES, add 3. INDUCTANCE IS APPROXIMATELY 4.5 uH at 1 MHz.

On the A11 component coordinates:

- A11L1 - Add L1 in grid location B,2

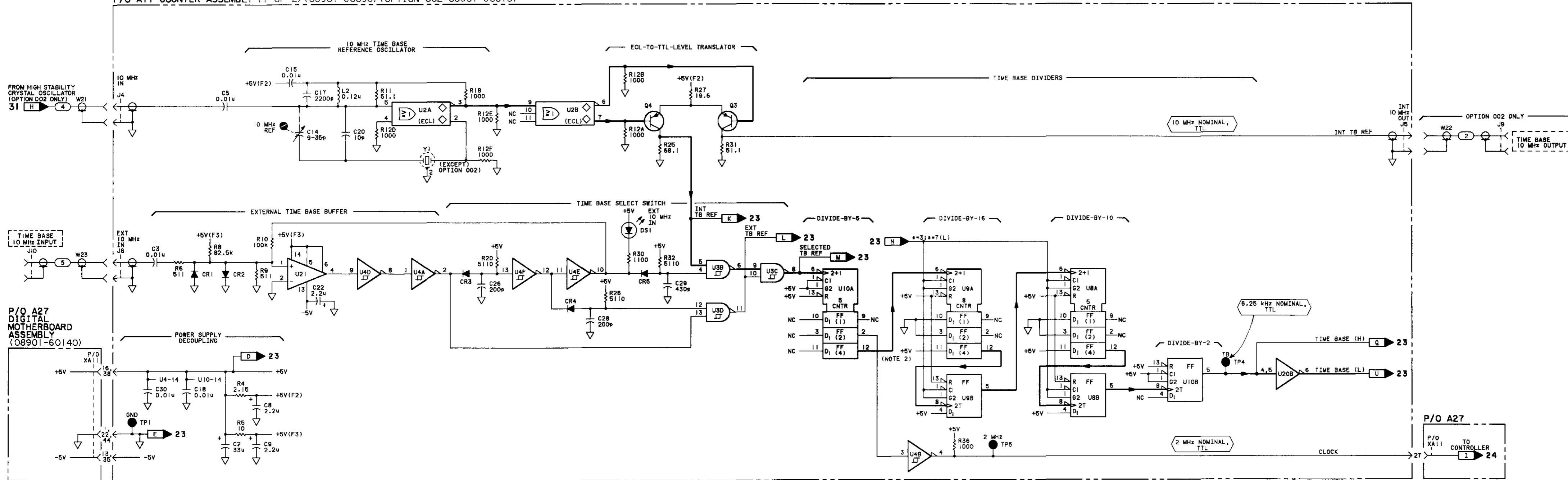
On the A11 component locator:

- A11L1 - In grid coordinates B,2 add L1 with one end next to the positive (+5V) end of C2.
- A11C20 - In grid coordinates A,2 move C20 to between C5 and Y1.
- A11C24 - In grid coordinates A,3 move C24 to between U1 and R15.

On the A27 schematic:

- A27 - Change the part number of A27 Digital Motherboard to 08902-60102.

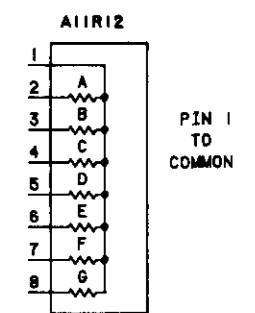
P/O A11 COUNTER ASSEMBLY (1 OF 2) (08901-60093) (OPTION 002:08901-60018)



- NOTES
- SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
  - THE OUTPUTS FROM PIN 2 AND PIN 12 OF U10A ARE BOTH 2 MHz (10 MHz ÷ 5). THE DIFFERENCE IN THE OUTPUTS IS THE RESPECTIVE DUTY CYCLES.

DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U2	+5V(F1)-1, 16
	▽ - 8
U3, 4, 8-10, 20	+5V - 14
	▽ - 7



SS22  
8G-51

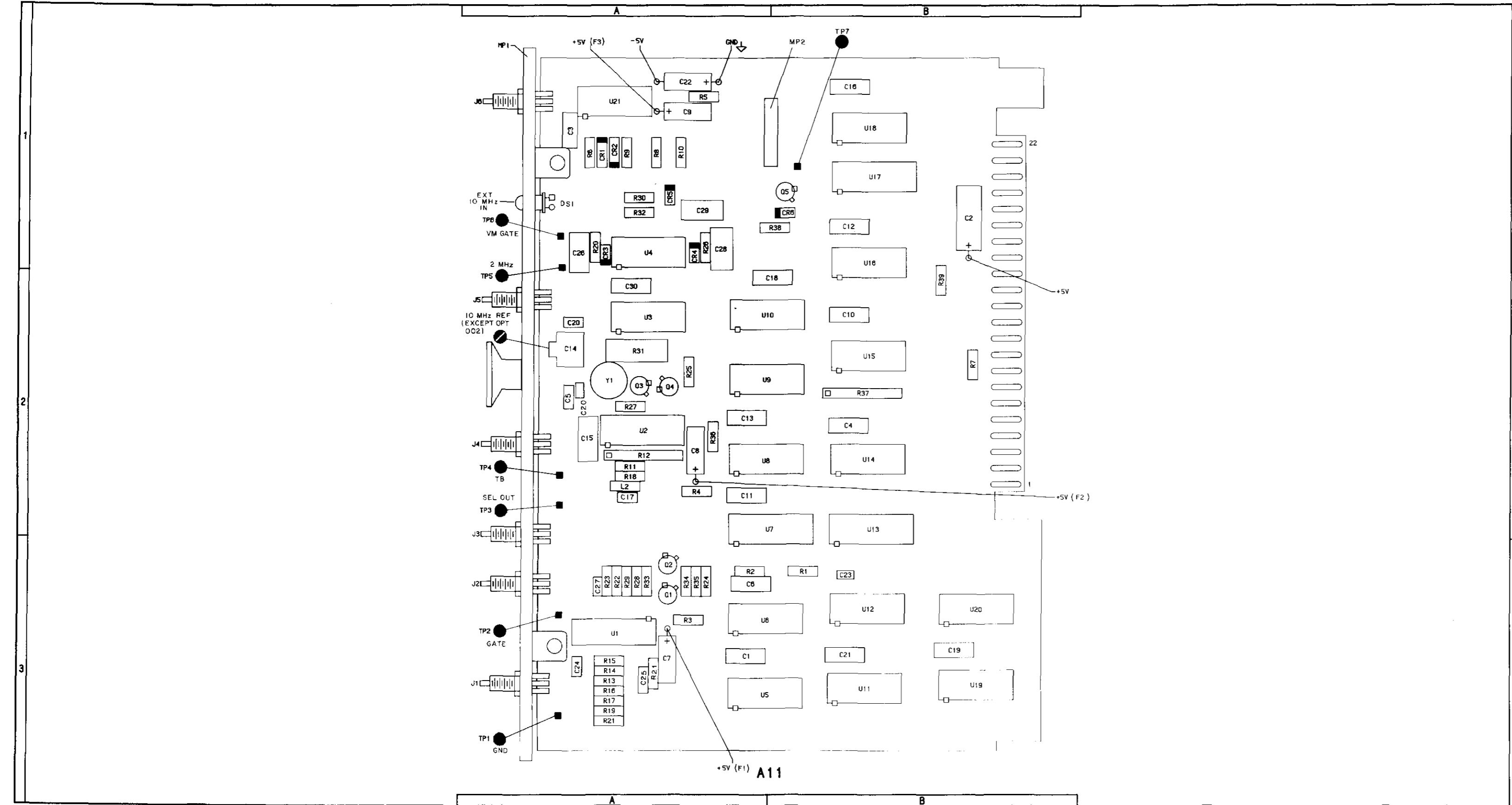
P/O A27  
DIGITAL MOTHERBOARD ASSEMBLY (08901-60140)

P/O A27  
TO CONTROLLER

SERIAL PREFIX: 2305A

A11 Component Coordinates (2 of 2)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	A,3	R37	B,2						
C4	B,2	R38	B,1						
C6	A,3	R39	B,2						
C7	A,3								
C10	B,2	TP2	A,3						
C11	A,2	TP3	A,2						
C12	B,1	TP6	A,1						
C13	A,2	TP7	B,1						
C16	B,1								
C19	B,3	U1	A,3						
C21	B,3	U4	A,1						
C23	B,3	U5	A,3						
C24	A,3	U6	A,3						
C25	A,3	U7	B,3						
C27	A,3	U11	B,3						
		U12	B,3						
CR6	B,1	U13	B,3						
		U14	B,2						
J1	A,3	U15	B,2						
J2	A,3	U16	B,2						
J3	A,3	U17	B,1						
		U18	B,1						
MP1	A,1	U19	B,3						
		U20	B,3						
Q1	A,3								
Q2	A,3	Y1	A,2						
Q5	B,1								
R1	B,3								
R2	A,3								
R3	A,3								
R7	B,2								
R13	A,3								
R14	A,3								
R15	A,3								
R16	A,3								
R17	A,3								
R19	A,3								
R21	A,3								
R22	A,3								
R23	A,3								
R24	A,3								
R28	A,3								
R29	A,3								
R33	A,3								
R34	A,3								
R35	A,3								



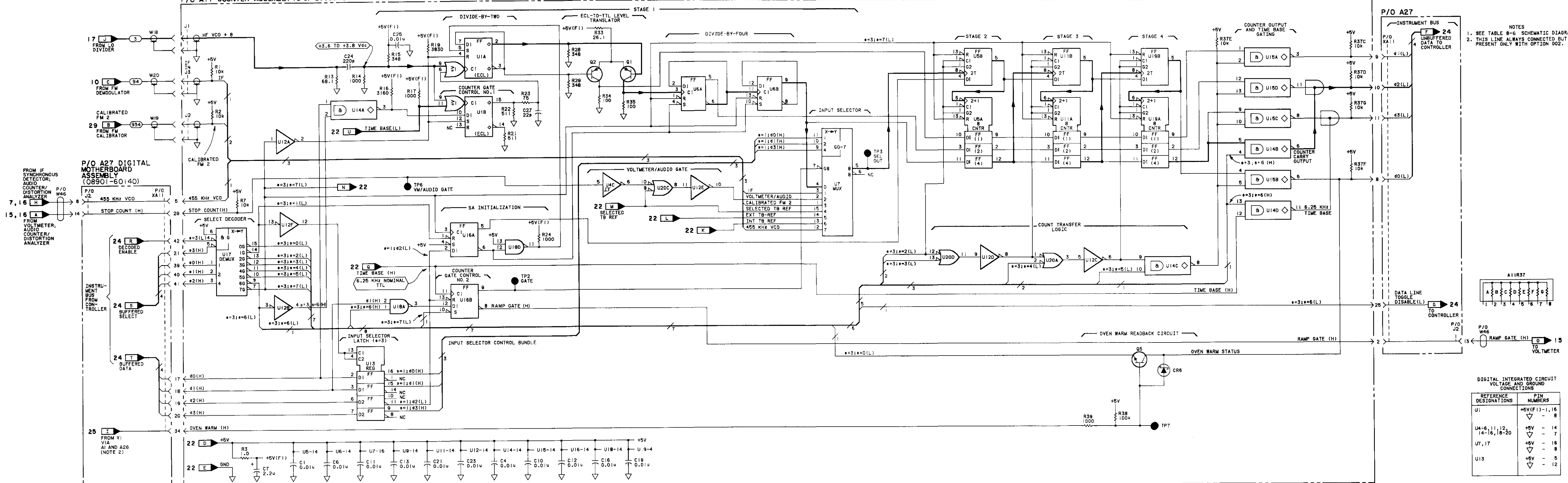
Component Locator

A11 COUNTER (1 OF 2)  
TIME BASE CIRCUITS **SS22**  
SEE REVERSE SIDE

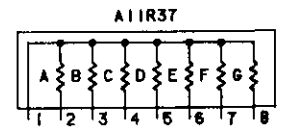
**CHANGES**

<b>All serial prefixes</b>	<p>On the A11 schematic:</p> <ul style="list-style-type: none"><li>• <b>R16</b> - In the upper left portion of the schematic, up and to the right of U14A, locate and change the value of R16 to 1000 ohms.</li></ul>
<b>2535A and above</b>	<p>On the A27 schematic:</p> <ul style="list-style-type: none"><li>• <b>08902-60102</b> -Change the part number of the A27 Digital Motherboard to 08902-60102.</li></ul>

P/O A11 COUNTER ASSEMBLY (2 OF 2) (08901-60093) (OPTION 002:08901-60018)



- NOTES
- SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
  - THIS LINE ALWAYS CONNECTED BUT SIGNAL PRESENT ONLY WITH OPTION 002.

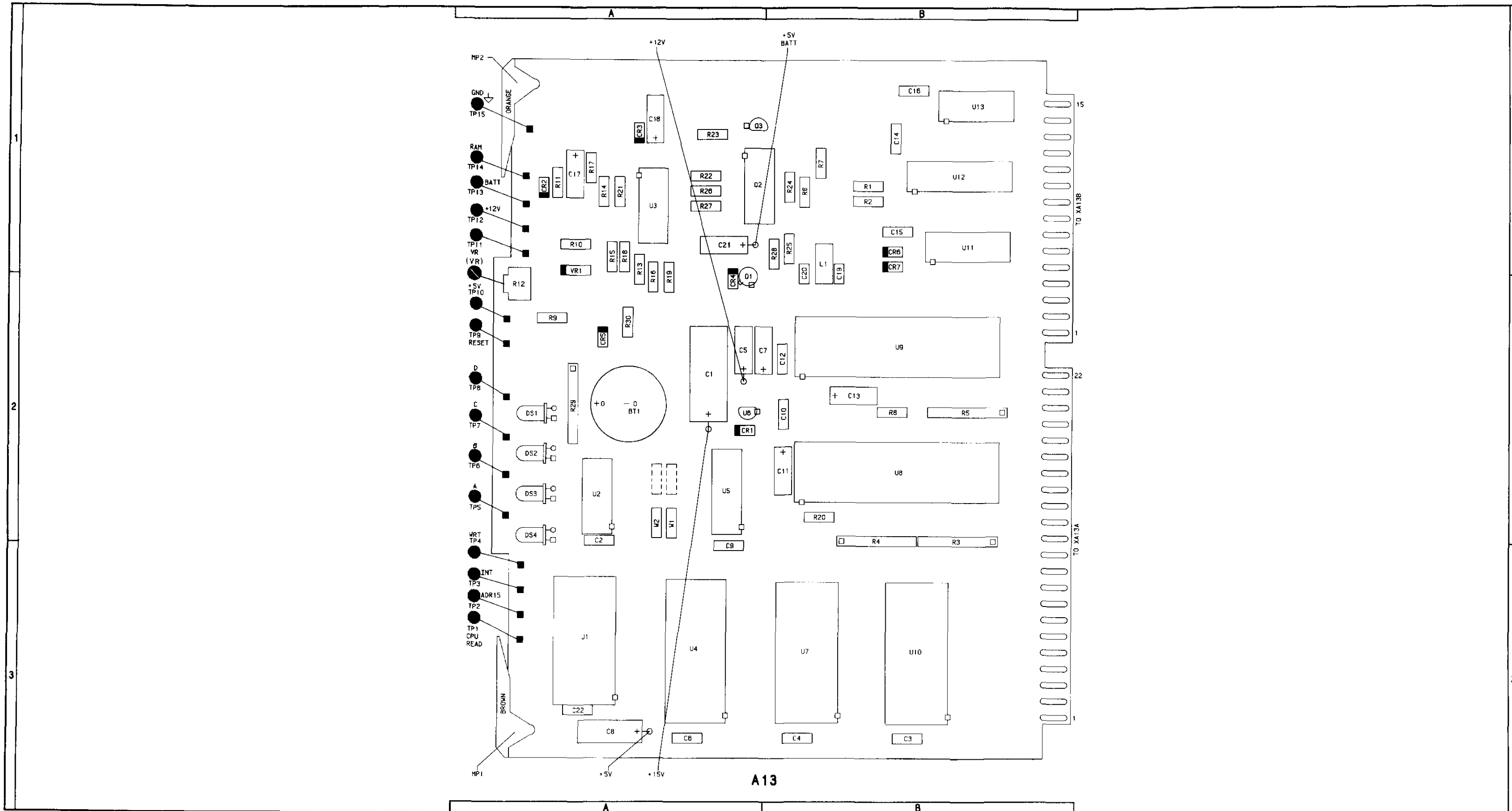


DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U1	+5V(F1)-1, 16
	- 8
U4-6, 11, 12, 14-16, 18-20	+5V - 14
	- 7
U7, 17	+5V - 16
	- 8
U13	+5V - 5
	- 12

A13 Component Coordinates

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
BT1	A,2	R2	B,1	U2	A,2				
		R3	B,2	U3	A,1				
C1	A,2	R4	B,2	U4	A,3				
C2	A,2	R5	B,2	U5	A,2				
C3	B,3	R6	B,1	U6	A,2				
C4	B,3	R7	B,1	U7	B,3				
C5	A,2	R8	B,2	U8	B,2				
C6	A,3	R9	A,2	U9	B,2				
C7	A,2	R10	A,1	U10	B,3				
C8	A,3	R11	A,1	U11	B,1				
C9	A,3	R12	A,2	U12	B,1				
C10	B,2	R13	A,2	U13	B,1				
C11	B,2	R14	A,1			VR1	A,2		
C12	B,2	R15	A,1						
C13	B,2	R16	A,2						
C14	B,1	R17	A,1	W1	A,2				
C15	B,1	R18	A,1	W2	A,2				
C16	B,1	R19	A,2						
C17	A,1	R20	B,2						
C18	A,1	R21	A,1						
C19	B,2	R22	A,1						
C20	B,2	R23	A,1						
C22	A,3	R24	B,1						
C29	A,1	R25	B,1						
		R26	A,1						
CR1	A,2	R27	A,1						
CR2	A,1	R28	A,1						
CR3	A,1	R29	A,2						
CR4	A,2	R30	A,2						
CR5	A,2			TP1	A,3				
CR6	B,1			TP2	A,3				
				TP3	A,3				
DS1	A,2			TP4	A,3				
DS2	A,2			TP5	A,2				
DS3	A,2			TP6	A,2				
DS4	A,2			TP7	A,2				
				TP8	A,2				
L1	B,2			TP9	A,2				
MP1	A,3			TP10	A,2				
MP2	A,1			TP11	A,1				
				TP12	A,1				
Q1	A,2			TP13	A,1				
Q2	A,1			TP14	A,1				
Q3	A,1			TP15	A,1				
R1	B,1	U1	A,3						



Component Locator

A11 COUNTER (2 OF 2)  
COUNTER CIRCUITS **SS23**  
SEE REVERSE SIDE

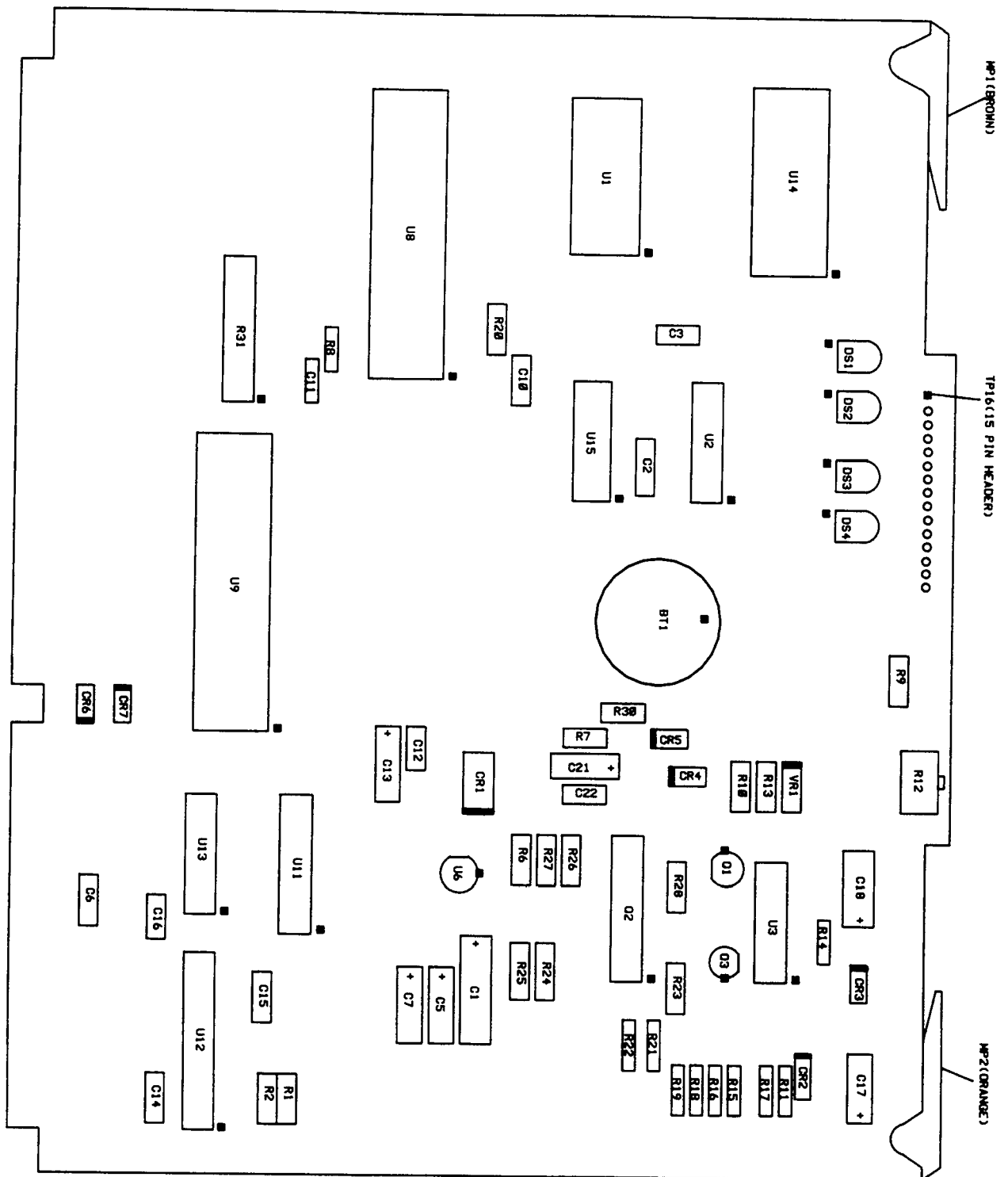


## CHANGES

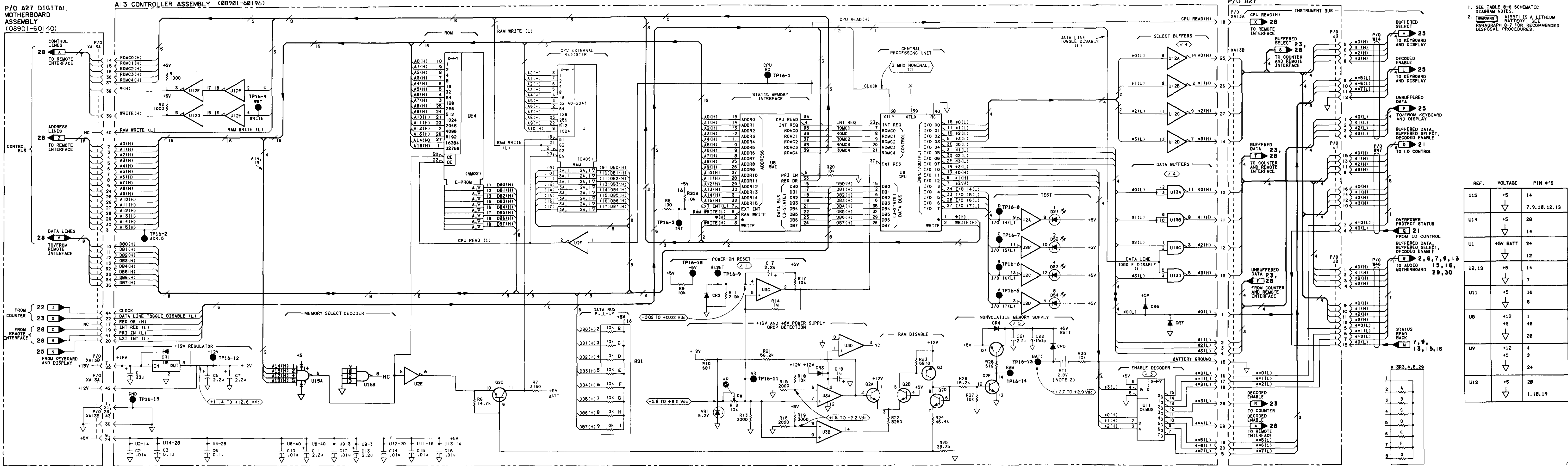
<p><b>All serial prefixes</b></p>	<p><b>On the A13 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>SS24</b> - Replace the page number (8G-54.5) on SS24 (2745A and above) with a revision date of <i>rev. 20MAY88</i>.</li> <li>• <b>U6</b> - In the lower left hand corner of the schematic locate U6 under the +12V REGULATOR and change pin 1 to pin 3 and pin 3 to pin 1.</li> </ul>
<p><b>2530A and above</b></p>	<p><b>On the A13 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>C19, C20</b> - Under CENTRAL PROCESSING UNIT, change the values of C19 and C20 to 47p.</li> </ul>
<p><b>2535A and above</b></p>	<p><b>On the A27 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>08902-60102</b> - Change the part number of the A27 Digital Motherboard to 08902-60102.</li> <li>• <b>Buffered Select Bullet "S"</b> - On the right side of the page bullet "S" currently directs you to service sheets 23 and 28. Add service sheet 33 and 34 to this list.</li> <li>• <b>Buffered Data Bullet "T"</b> - On the right side of the page, bullet "T" currently directs you to service sheet 23. Add service sheet 33 to the list.</li> <li>• <b>Decoded Enable Bullet "R"</b> - On the right side of the page, bullet "R" currently directs you to service sheet 23. Add service sheet 33 to this list.</li> </ul>
<p><b>2540A and above</b></p>	<p><b>On the A13 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>R11</b> - In the center of the schematic locate R11 under POWER-ON RESET and change the value to 51.1k.</li> </ul>
<p><b>2627A and above</b></p>	<p><b>On the A13 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>C19, C20, L1</b> - Under CENTRAL PROCESSING UNIT, delete C19, C20, and L1.</li> </ul> <p><b>On the A13 Component Locator:</b></p> <ul style="list-style-type: none"> <li>• <b>C19, C20, L1</b> - Delete C19, C20, and, L1 from the component locator.</li> </ul> <p><b>On the A13 Component Coordinates:</b></p> <ul style="list-style-type: none"> <li>• <b>C19, C20, L1</b> - Delete C19, C20, and, L1 from the component coordinates table.</li> </ul>

## CHANGES

<p><b>2745A and above</b></p>	<p><b>On the A13 Component Locator:</b></p> <ul style="list-style-type: none"> <li>• <u>A13</u> - The new part number for the A13 Controller Assembly is 08901-60196. Use the new component locator on page 8G-54.3.</li> </ul> <p><b>On the A13 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <u>A13</u> - The new part number for the A13 Controller Assembly is 08901-60196. Use the new schematic foldout with the revision date of <i>rev.20MAY88</i>.</li> <li>• <u>A13</u> - In the lower left hand corner of the schematic, change the serial prefix to read "2745A and above".</li> </ul>
<p><b>Errata</b></p>	<p><b>On the A13 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <u>C21</u> - Under NONVOLATILE MEMORY SUPPLY, change the value of C21 to 0.22 <math>\mu</math>F.</li> <li>• <u>C17</u> - Under POWER-ON RESET, change the value of C17 to 4.7 <math>\mu</math>F.</li> </ul> <p><b>On the Component Locator:</b></p> <ul style="list-style-type: none"> <li>• <u>U6</u> - On page 8G-54, find U6 and move the polarity symbol to the opposite side of the component. Make the same change to U6 on the component locator on page 8G-54.3.</li> </ul>



- NOTES
- SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
  - WARNING** AI3BT1 IS A LITHIUM BATTERY. SEE PARAGRAPH 8-7 FOR RECOMMENDED DISPOSAL PROCEDURES.

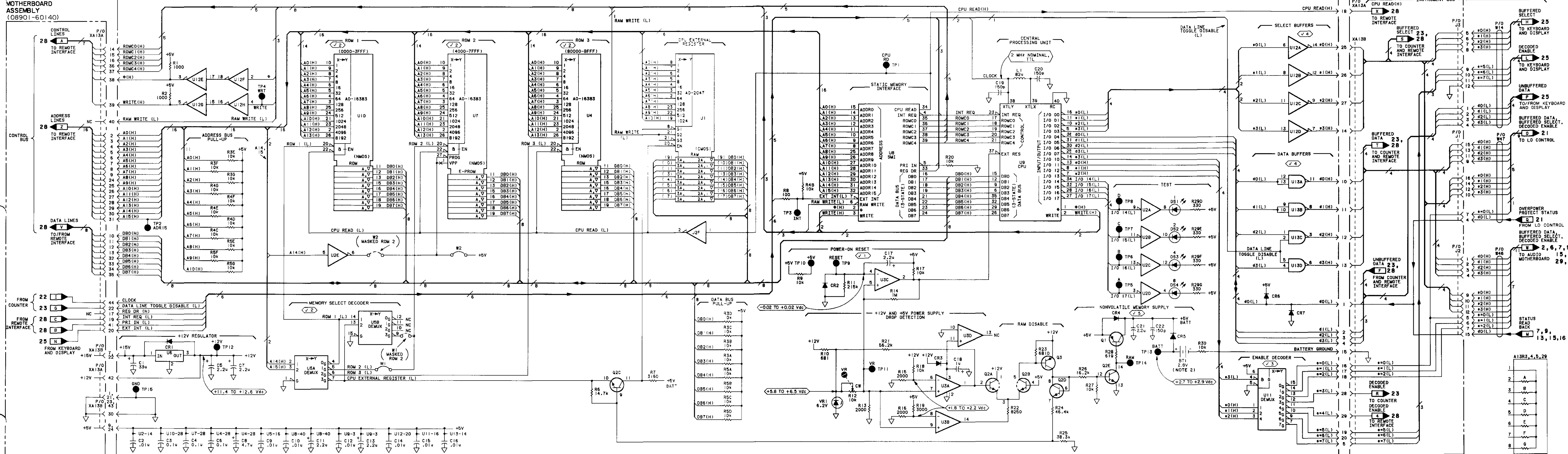


REF.	VOLTAGE	PIN #'S
U15	+5	14
U14	+5	7, 9, 10, 12, 13
U1	+5V BATT	24
		12
U2, 13	+5	14
		7
U11	+5	16
		8
U8	+12	1
	+5	4B
		2B
U9	+12	4
	+5	3
		24
U12	+5	2B
		1, 10, 19

P/O A27 DIGITAL MOTHERBOARD ASSEMBLY (08901-60140)

A13 CONTROLLER ASSEMBLY (08901-60244)

P/O A27

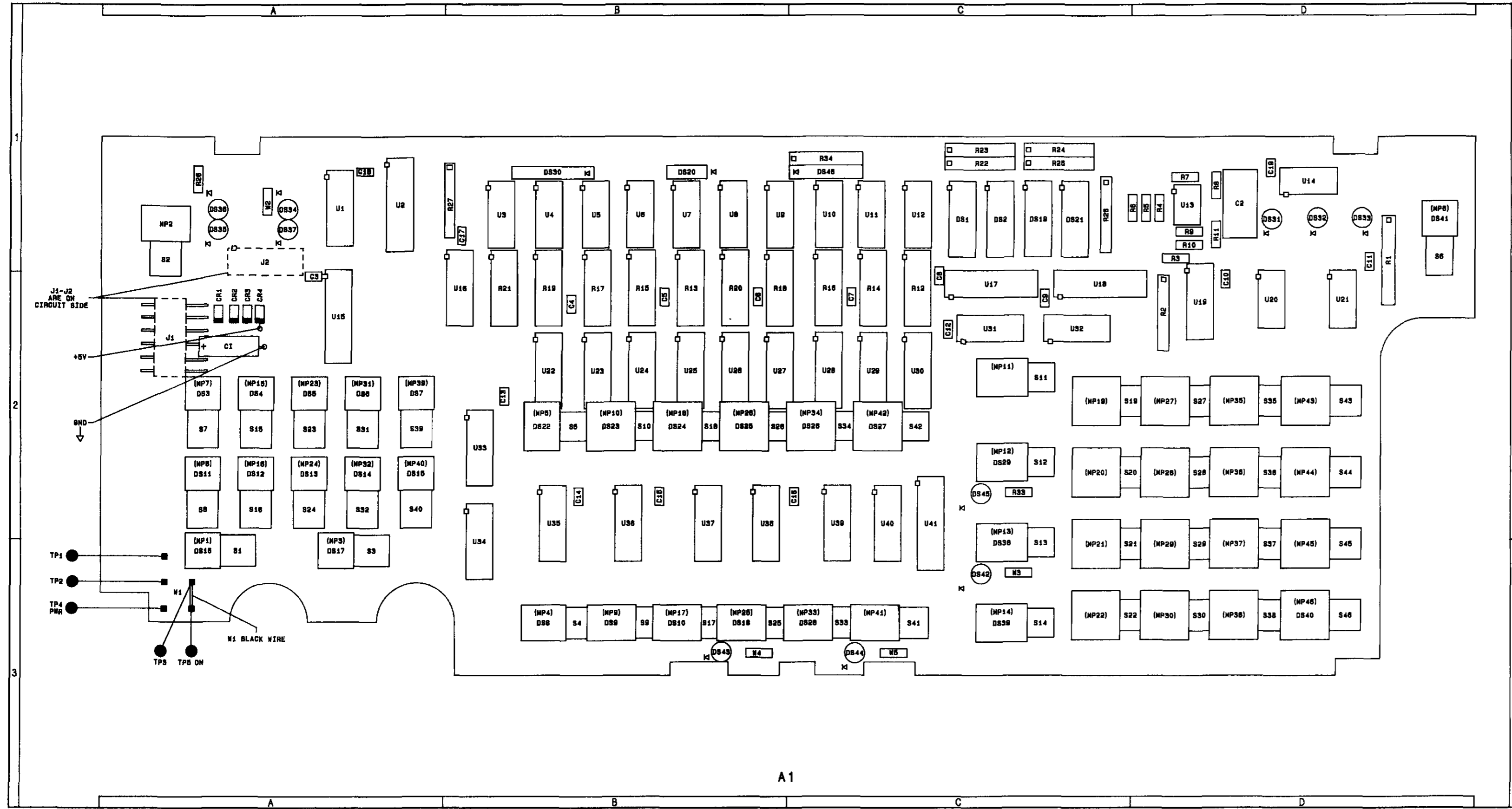


- NOTES
- SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
  - WARNING** A13B1 IS A LITHIUM BATTERY. SEE PARAGRAPH 6-7 FOR RECOMMENDED DISPOSAL PROCEDURES.

DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	VIN NUMBERS
U1	+6V BATT -24
U2, 13	+6V - 14
U4, 10	+6V - 7
	+6V - 1, 27, 28
U6, 11	+6V - 16
U7	+6V - 8
U8	+6V - 14
	+12V - 1
U9	+12V - 4
	+12V - 3
	+6V - 20
U12	+6V - 10, 19

A1 Component Coordinates (1 of 3)



Component Locator

A13 CONTROLLER **SS24**  
SEE REVERSE SIDE

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	A,2	MP25	B,3	S13	C,3				
C2	D,1	MP26	B,2	S14	C,3				
C3	A,2	MP27	D,2	S15	A,2				
C4	B,2	MP28	D,2	S16	A,2				
C5	B,2	MP29	D,3	S17	B,3				
C6	B,2	MP30	D,3	S18	B,2				
C7	C,2	MP31	A,2	S19	C,2				
C8	C,2	MP32	A,2	S20	C,2				
C9	C,2	MP33	C,3	S21	C,3				
C10	D,2	MP34	C,2	S22	C,3				
C11	D,1	MP35	D,2	S23	A,2				
C12	C,2	MP36	D,2	S24	A,2				
C13	B,2	MP37	D,3	S25	B,3				
C14	B,2	MP38	D,3	S26	B,2				
C15	B,2	MP39	A,2	S27	D,2				
C16	C,2	MP40	A,2	S28	D,2				
C17	B,1	MP41	C,3	S29	D,3				
C18	A,1	MP42	C,2	S30	D,3				
C19	D,1	MP43	D,2	S31	A,2				
		MP44	D,2	S32	A,2				
J1	A,2	MP45	D,3	S33	C,3				
J2	A,1	MP46	D,3	S34	C,2				
				S35	D,2				
MP1	A,3	R1	D,1	S36	D,2				
MP2	A,1	R2	D,2	S37	D,3				
MP3	A,3	R3	D,1	S38	D,3				
MP4	B,3	R4	D,1	S39	A,2				
MP5	B,2	R5	D,1	S40	A,2				
MP6	D,1	R6	D,1	S41	C,3				
MP7	A,2	R7	D,1	S42	C,2				
MP8	A,2	R8	D,1	S43	D,2				
MP9	B,3	R9	D,1	S44	D,2				
MP10	B,2	R10	D,1	S45	D,3				
MP11	C,2	R11	D,1	S46	D,3				
MP12	C,2								
MP13	C,3	S1	A,3	TP1	A,3				
MP14	C,3	S2	A,1	TP2	A,3				
MP15	A,2	S3	A,3	TP3	A,3				
MP16	A,2	S4	B,3	TP4	A,3				
MP17	B,3	S5	B,2	TP5	A,3				
MP18	B,2	S6	D,1	U13	D,1				
MP19	C,2	S7	A,2	U14	D,1				
MP20	C,2	S8	A,2	U19	D,2				
MP21	C,3	S9	B,3	U20	D,2				
MP22	C,3	S10	B,2	U21	D,2				
MP23	A,2	S11	C,2						
MP24	A,2	S12	C,2	W1	A,3				

## CHANGES

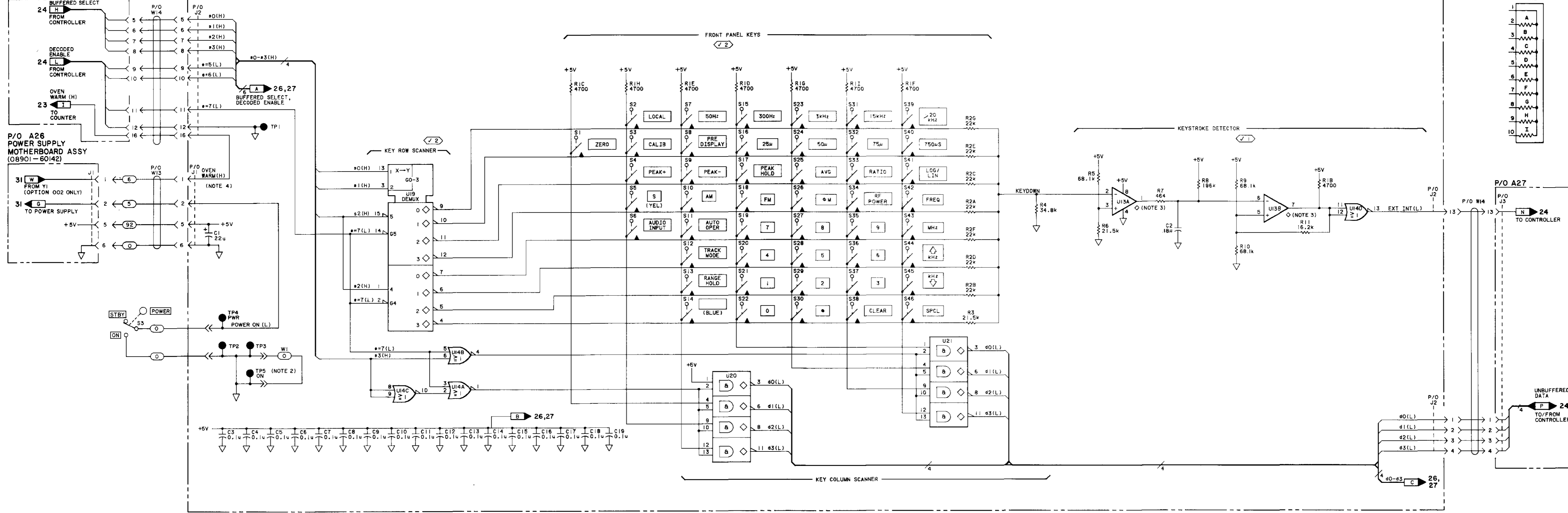
### 2535A and above

On the A27 schematic:

- A27 - Change the part number of A27 Digital Motherboard to 08902-60102.

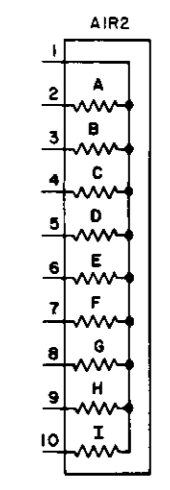
P/O A27 DIGITAL MOTHERBOARD ASSY (08901-60140)

P/O A1 KEYBOARD AND DISPLAY ASSEMBLY (1 OF 3) (08901-60143)



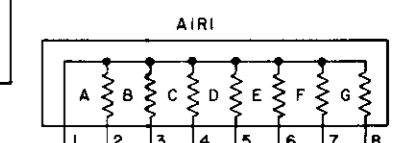
NOTES

- SEE TABLE 8-5 SCHEMATIC DIAGRAM NOTES.
- JUMPER A1TP4 TO A1TP3 WITH A1W1 TO TURN ON INSTRUMENT WHEN S3 IS DISCONNECTED.
- AMPLIFIERS U13 A, B HAVE OPEN-COLLECTOR OUTPUTS.
- OPTION 002 OVEN WARM LINE FROM HIGH STABILITY CRYSTAL OSCILLATOR, Y1, CONNECTS THROUGH A26 AND A1 TO A11 COUNTER ASSEMBLY.



DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U19	+5V - 16
	↓ - 8
U14,20,21	+5V - 14
	↓ - 7



SERIAL PREFIX: 2305A



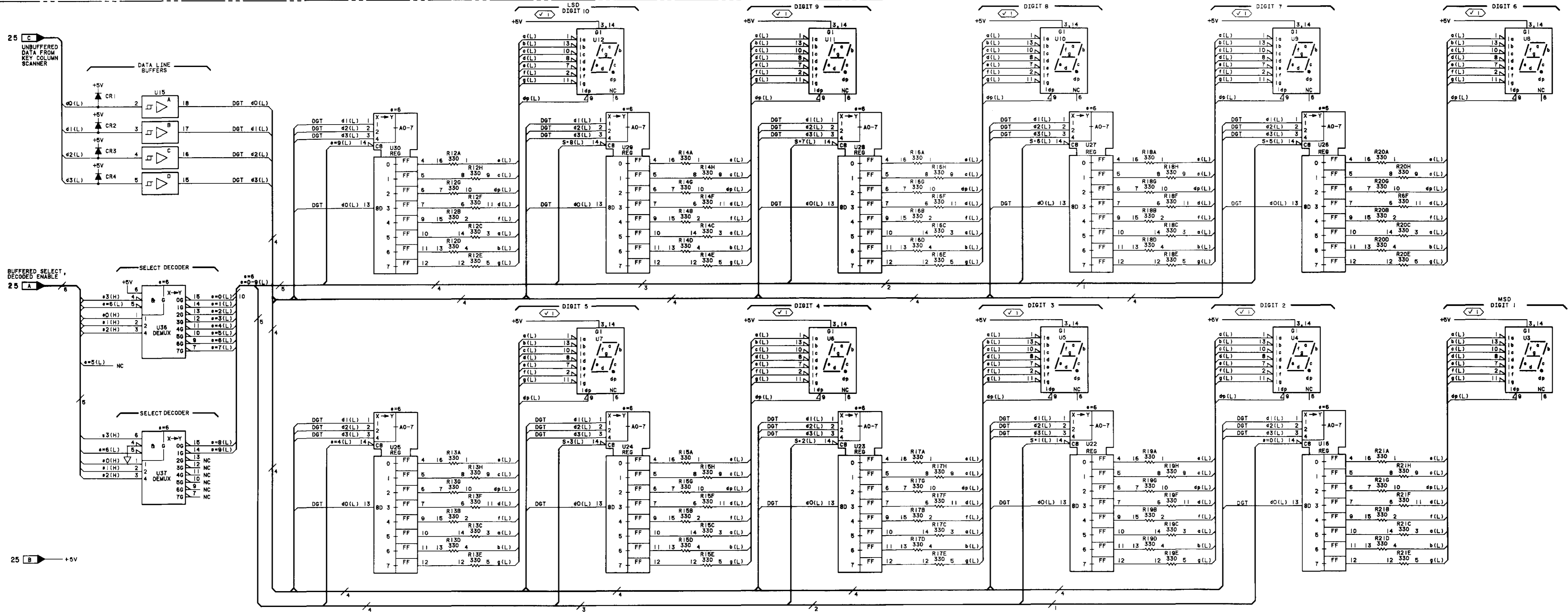
A1 Component Coordinates (2 of 3)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
CR1	A,2								
CR2	A,2								
CR3	A,2								
CR4	A,2								
J1	A,2								
J2	A,1								
R12	C,2								
R13	B,2								
R14	C,2								
R15	B,2								
R16	C,2								
R17	B,2								
R18	B,2								
R19	B,2								
R20	B,2								
R21	B,2								
U3	B,1								
U4	B,1								
U5	B,1								
U6	B,1								
U7	B,1								
U8	B,1								
U9	B,1								
U10	C,1								
U11	C,1								
U12	C,1								
U15	A,2								
U16	B,2								
U22	B,2								
U23	B,2								
U24	B,2								
U25	B,2								
U26	B,2								
U27	B,2								
U28	C,2								
U29	C,2								
U30	C,2								
U36	B,2								
U36	B,2								
W1	A,3								



Component Locator

A1 KEYBOARD AND DISPLAY (1 OF 3)  
KEYBOARD CIRCUITS  
SS25  
SEE REVERSE SIDE



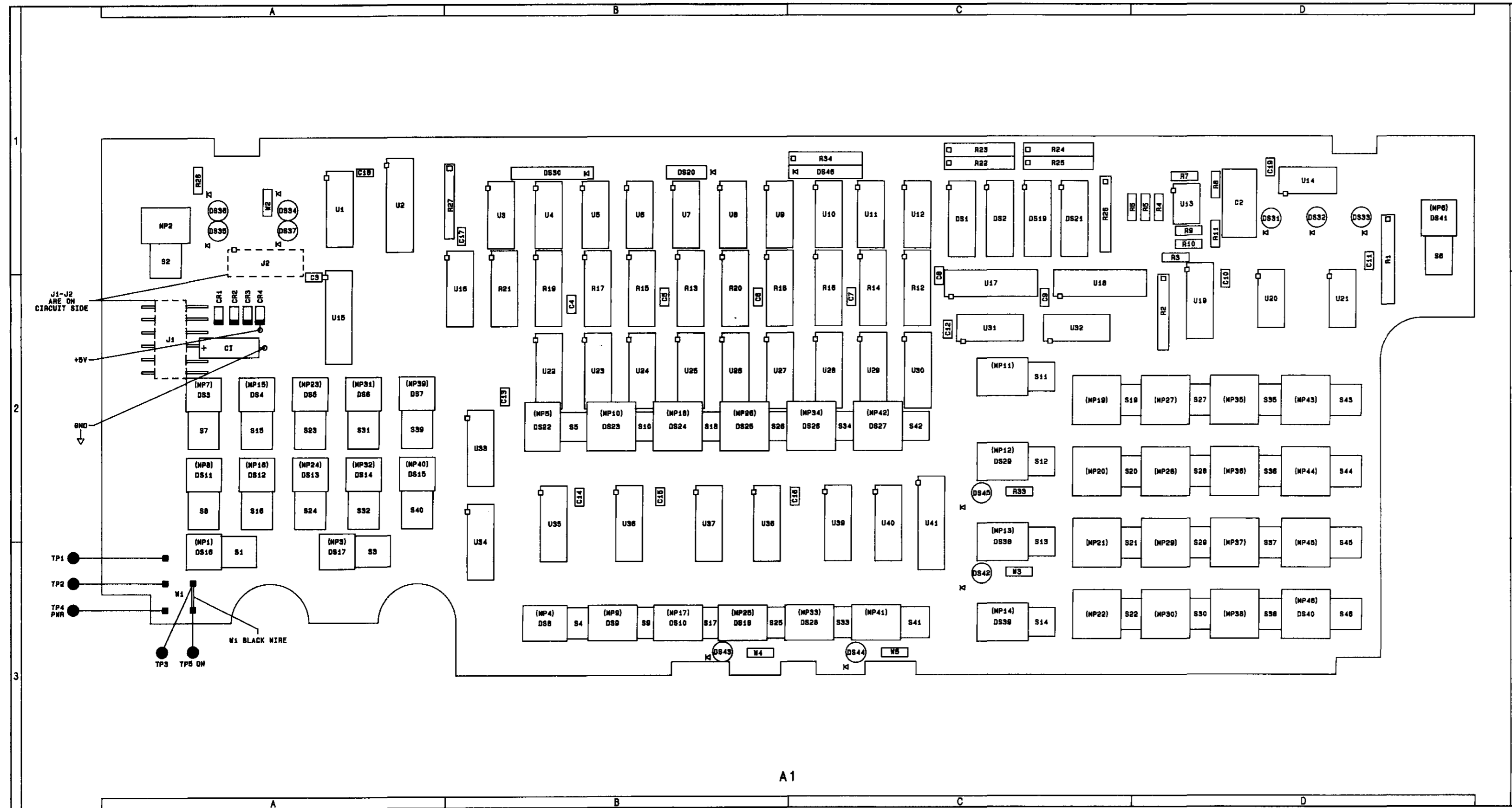
NOTES  
 1. REFER TO TABLE 8-6 FOR SCHEMATIC DIAGRAM NOTES.

DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U16, 22-30, 36, 37	+5V - 15, 16 - 8
U15	+5V - 20 - 10

A1 Component Coordinates (3 of 3)

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
DS1	C,1	J1	A,2						
DS2	C,1	J2	A,1						
DS3	A,2								
DS4	A,2	R22	C,1						
DS5	A,2	R23	C,1						
DS6	A,2	R24	C,1						
DS7	A,2	R25	C,1						
DS8	B,3	R26	A,1						
DS9	B,3	R26	C,1						
DS10	B,3	R27	B,1						
DS11	A,2	R33	C,2						
DS12	A,2	R34	C,1						
DS14	A,2	U1	A,1						
DS15	A,2	U2	A,1						
DS16	A,3	U15	A,2						
DS17	A,3	U17	C,2						
DS18	B,3	U18	C,2						
DS19	C,1	U31	C,2						
DS20	B,1	U32	C,2						
DS21	C,1	U33	B,2						
DS22	B,2	U34	B,3						
DS23	B,2	U35	B,2						
DS24	B,2	U37	B,2						
DS25	B,2	U39	C,2						
DS26	C,2	U40	C,2						
DS27	C,2	U41	C,2						
DS28	C,3								
DS29	C,2	W2	A,1						
DS30	B,1	W3	C,3						
DS31	D,1	W4	B,3						
DS32	D,1	W5	C,3						
DS33	D,1								
DS34	A,1								
DS35	A,1								
DS36	A,1								
DS37	A,1								
DS38	C,3								
DS39	C,3								
DS40	D,3								
DS41	D,1								
DS42	C,3								
DS43	B,3								
DS44	C,3								
DS45	C,2								
DS46	C,1								

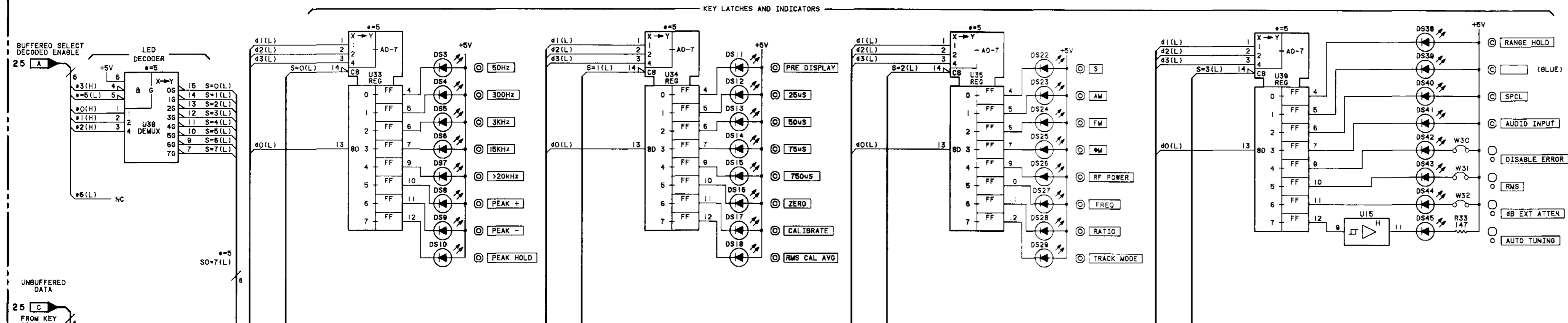


Component Locator

A1 KEYBOARD AND DISPLAY(2 OF 3) DISPLAY CIRCUITS

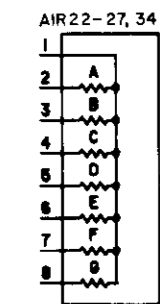
**SS26**

SEE REVERSE SIDE



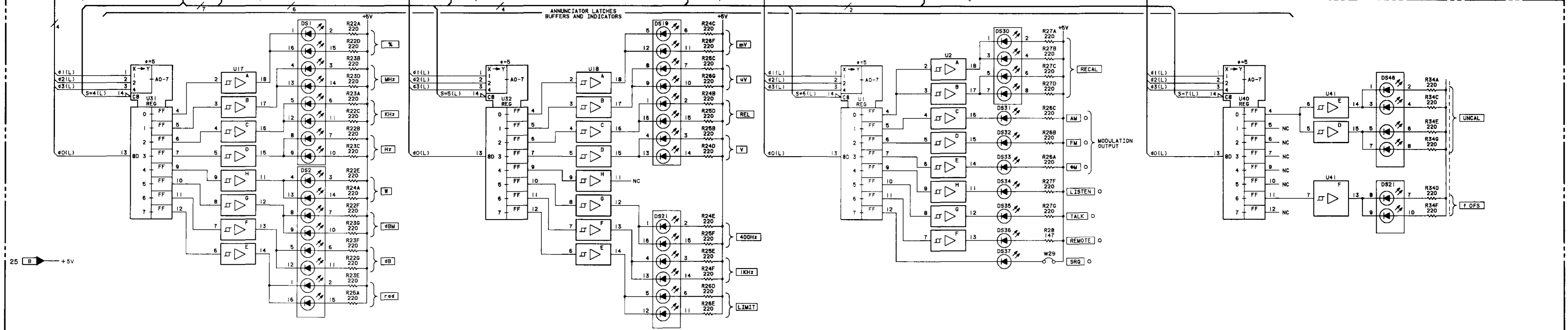
NOTES

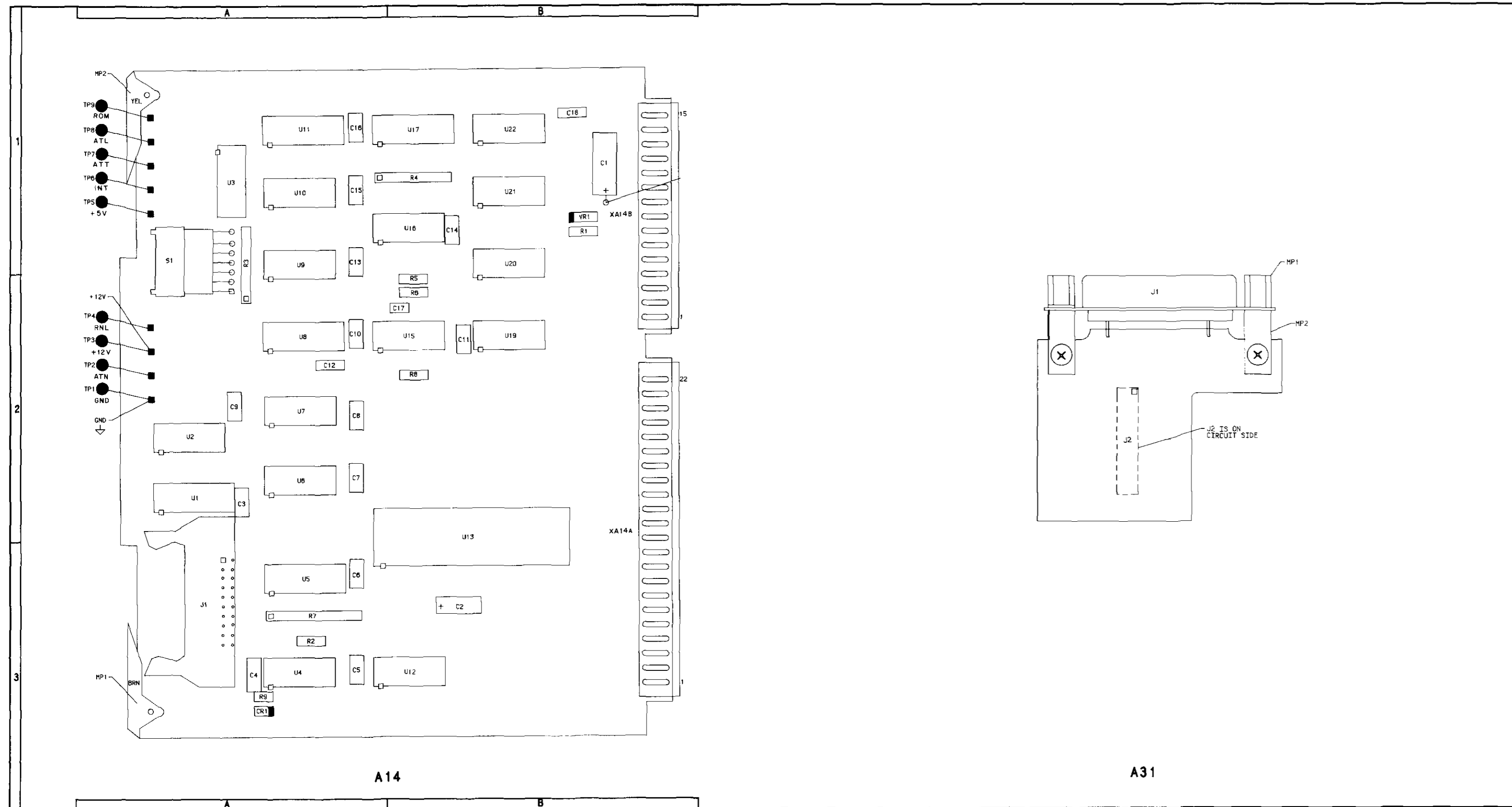
1. SEE TABLE B-6 SCHEMATIC DIAGRAM NOTES



DIGITAL INTEGRATED CIRCUIT VOLTAGE AND PIN CONNECTIONS

REFERENCE DESIGNATIONS	PART NUMBERS
U1, 31-35, 38-40	+5V - 15, 16 ↓ - 8
U2, 15, 18, 41	+5V - 20 ↓ - 10





A14 Component Coordinates

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,1	U1	A,2						
C2	B,3	U2	A,2						
C3	A,2	U3	A,1						
C4	A,3	U4	A,3						
C5	A,3	U5	A,3						
C6	A,3	U6	A,2						
C7	A,2	U7	A,2						
C8	A,2	U8	A,2						
C9	A,2	U9	A,1						
C10	A,2	U10	A,1						
C11	B,2	U11	A,1						
C12	A,2	U12	B,3						
C13	A,1	U13	B,3						
C14	B,1	U15	B,2						
C15	A,1	U16	B,1						
C16	A,1	U17	B,1						
C17	B,2	U19	B,2						
C18	B,1	U20	B,1						
		U21	B,1						
		U22	B,1						
CR1	A,3	VR1	B,1						
J1	A,3								
MP1	A,3								
MP2	A,1								
R1	B,1								
R2	A,3								
R3	A,1								
R4	B,1								
R5	B,2								
R6	B,2								
R7	A,3								
R8	B,2								
R9	A,3								
S1	A,1								
TP1	A,2								
TP2	A,2								
TP3	A,2								
TP4	A,2								
TP5	A,1								
TP6	A,1								
TP7	A,1								
TP8	A,1								
TP9	A,1								

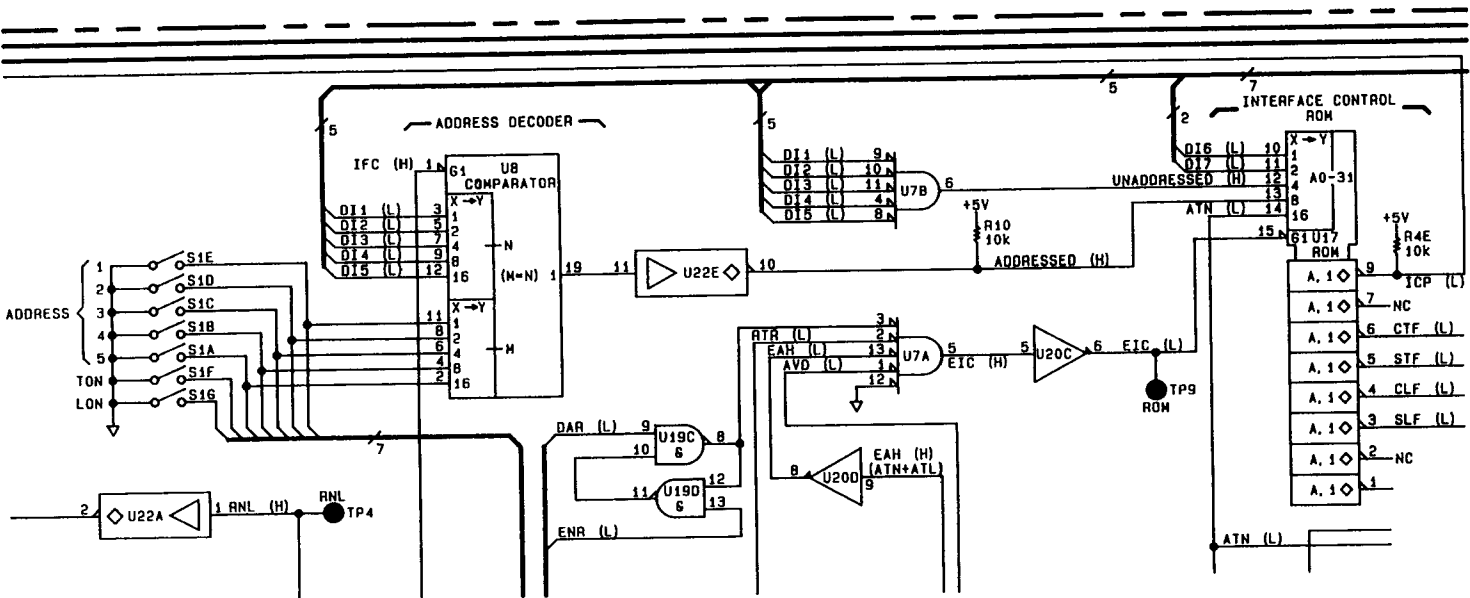
Component Locators

A31

A1 KEYBOARD AND DISPLAY (3 OF 3)  
 ANNUNCIATOR CIRCUITS  
 SEE REVERSE SIDE **SS27**

**CHANGES**

<b>2522A and above</b>	<p><b>On the Component Locator:</b></p> <ul style="list-style-type: none"><li>• <u>R10</u> - In grid location B,1, add R10 directly above U17.</li></ul> <p><b>On the Component Coordinates:</b></p> <ul style="list-style-type: none"><li>• <u>R10</u> - Add R10 in location B,1.</li></ul> <p><b>On the A14 Schematic:</b></p> <ul style="list-style-type: none"><li>• <u>A14</u> - Change the part number of A14 to 08901-60268.</li><li>• <u>R10, U8</u> - Use the partial schematic on page 8G-62.3.</li></ul>
<b>2535A and above</b>	<p><b>On the A27 Schematic:</b></p> <ul style="list-style-type: none"><li>• <u>A27</u> - Change the part number of A27 to 08902-60102.</li></ul>
<b>3018A and above</b>	<p><b>On the A14 Schematic:</b></p> <ul style="list-style-type: none"><li>• <u>R5</u> - Under INTERFACE CONTROL, change the value of R5 to 2150 <math>\Omega</math>.</li></ul>

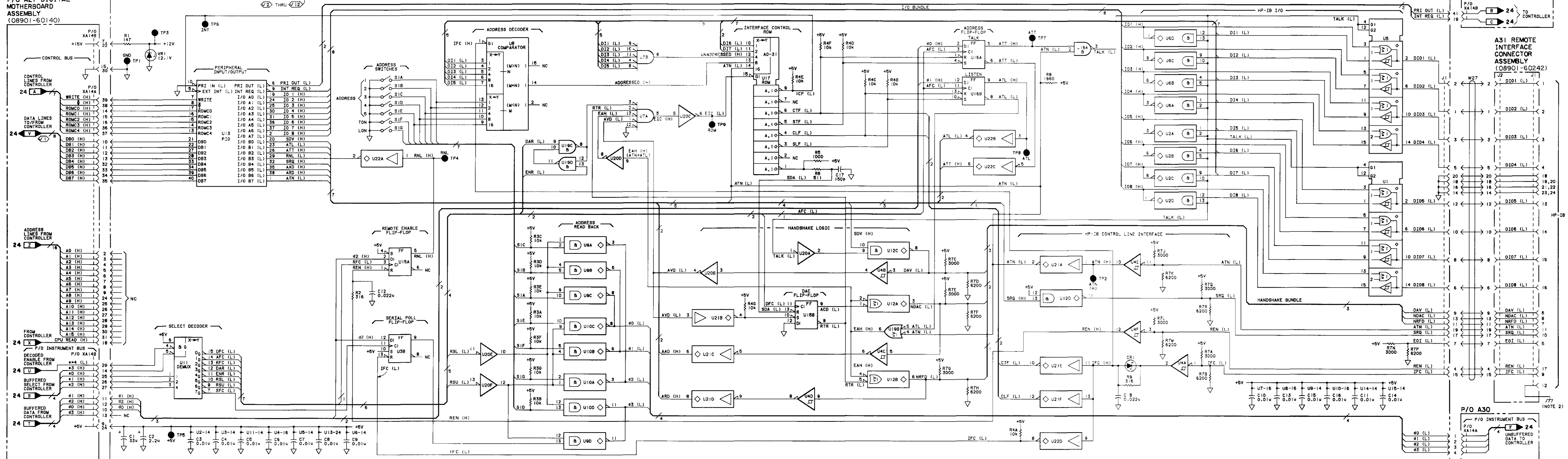


P/O SS28 Remote Interface Assembly (Refer to 2522A)

P/O A27 DIGITAL MOTHERBOARD ASSEMBLY (08901-60140)

A14 REMOTE INTERFACE ASSEMBLY (08901-60223)

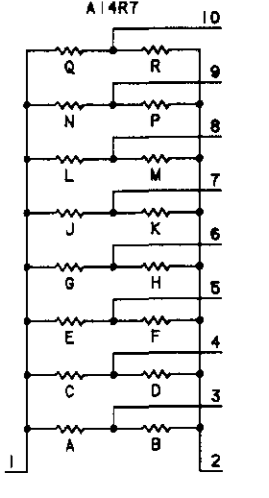
P/O A30 A31 REMOTE INTERFACE CONNECTOR ASSEMBLY (08901-60242)



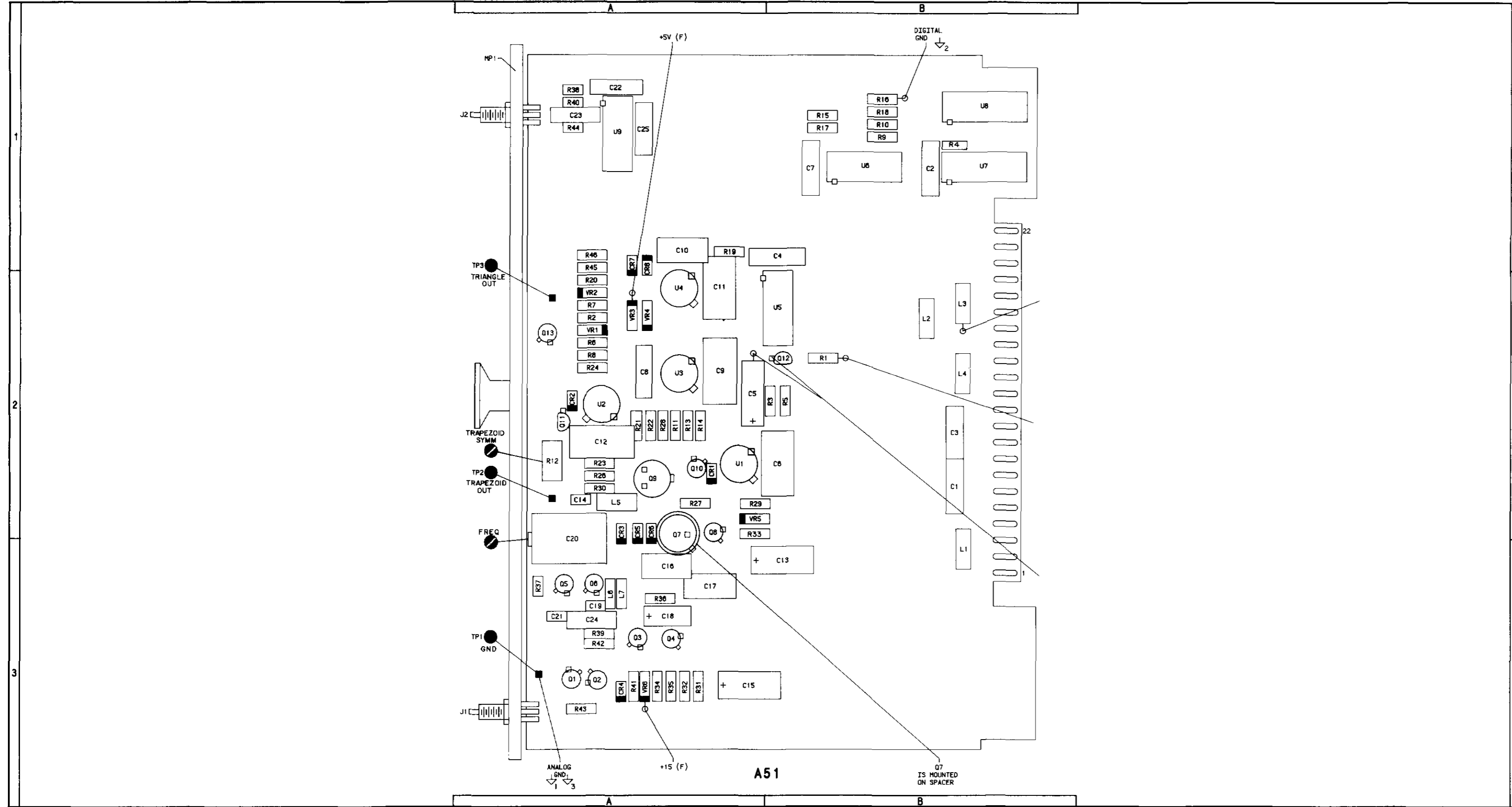
- NOTES
- SEE TABLE 8-6 FOR SCHEMATIC DIAGRAM NOTES.
  - CHASSIS GROUND IS ACHIEVED BY MECHANICAL CONTACT THRU SCREWS HOLDING P.C. BOARD TO FRAME.

DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	VOLTAGE	PIN NUMBERS
U1, 5, 8, 11, 17, 18	+5V	16
	△	8
U2-4, 6, 7, 9, 10, 12, 15, 16, 19-22	+5V	14
	△	7
U3	+12V	3
	△	4
	△	18
U14	+5V	24
	△	12







Component Locator

A14 REMOTE INTERFACE  
 A31 REMOTE INTERFACE CONNECTOR (HP-1B)  
 SEE REVERSE SIDE

**SS28**

A51 Component Coordinates

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,2	Q1	A,3	R35	A,3				
C2	B,1	Q2	A,3	R36	A,3				
C3	B,2	Q3	A,3	R37	A,3				
C5	A,2	Q4	A,3	R38	A,1				
C6	B,2	Q5	A,3	R39	A,3				
C7	B,1	Q6	A,3	R40	A,1				
C8	A,2	Q7	A,3	R41	A,3				
C9	A,2	Q8	A,3	R42	A,3				
C10	A,1	Q9	A,2	R43	A,3				
C11	A,2	Q10	A,2	R44	A,1				
C12	A,2	Q11	A,2	R45	A,2				
C13	B,3	Q12	B,2	R46	A,1				
C14	A,2	Q13	A,2						
C15	A,3			TP1	A,3				
C16	A,3	R1	B,2	TP2	A,2				
C17	A,3	R2	A,2	TP3	A,2				
C18	A,3	R3	B,2						
C19	A,3	R4	B,1	U1	A,2				
C20	A,3	R5	B,2	U2	A,2				
C21	A,3	R6	A,2	U3	A,2				
C22	A,1	R7	A,2	U4	A,2				
C23	A,1	R8	A,2	U5	B,2				
C24	A,3	R9	B,1	U6	B,1				
C25	A,1	R10	B,1	U7	B,1				
		R11	A,2	U8	B,1				
CR1	A,2	R12	A,2	U9	A,1				
CR2	A,2	R13	A,2						
CR3	A,3	R14	A,2	VR1	A,2				
CR4	A,3	R15	B,1	VR2	A,2				
CR5	A,3	R16	B,1	VR3	A,2				
CR6	A,3	R17	B,1	VR4	A,2				
CR7	A,2	R18	B,1	VR5	A,2				
CR8	A,2	R19	A,1	VR6	A,3				
		R20	A,2						
J1	A,3	R21	A,2						
J2	A,1	R22	A,2						
		R23	A,2						
L1	B,3	R24	A,2						
L2	B,2	R26	A,2						
L3	B,2	R27	A,2						
L4	B,2	R28	A,2						
L5	A,2	R29	A,2						
L6	A,3	R30	A,2						
L7	A,3	R31	A,3						
		R32	A,3						
MP1	A,1	R33	A,3						
		R34	A,3						

## CHANGES

**2535A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

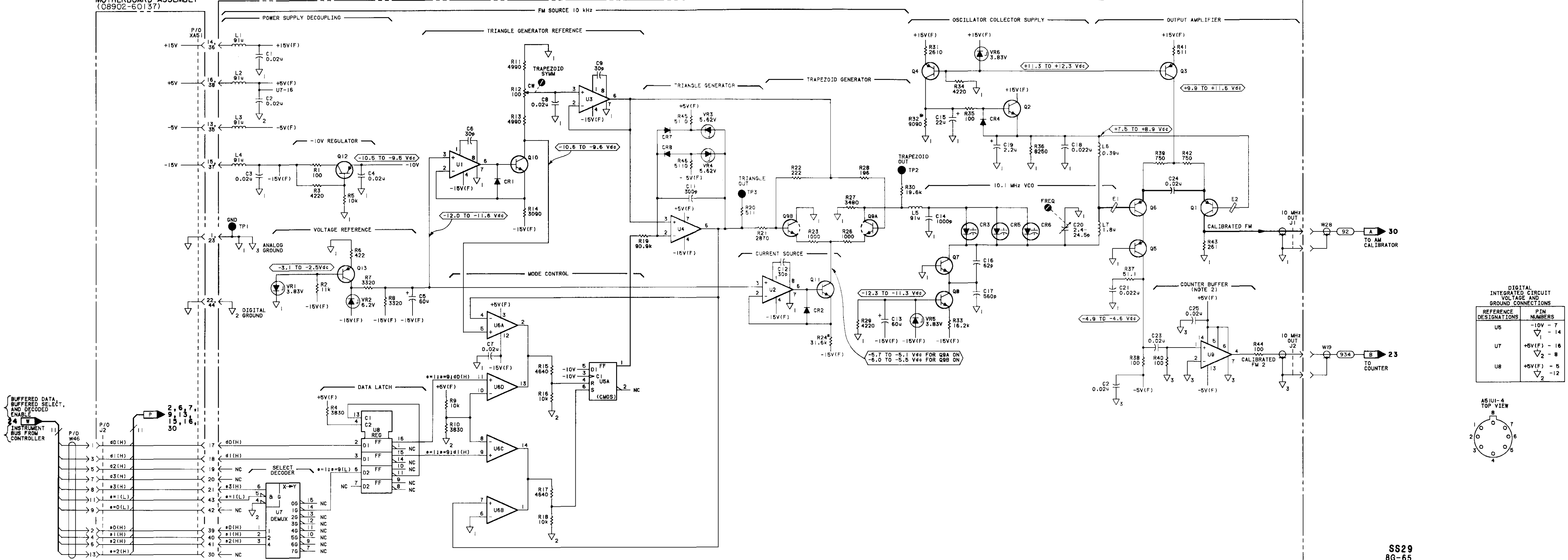
**2631A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

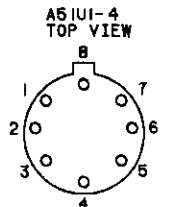
P/O A25 AUDIO MOTHERBOARD ASSEMBLY (08902-60137)

A51 FM CALIBRATOR ASSEMBLY (08901-60013)



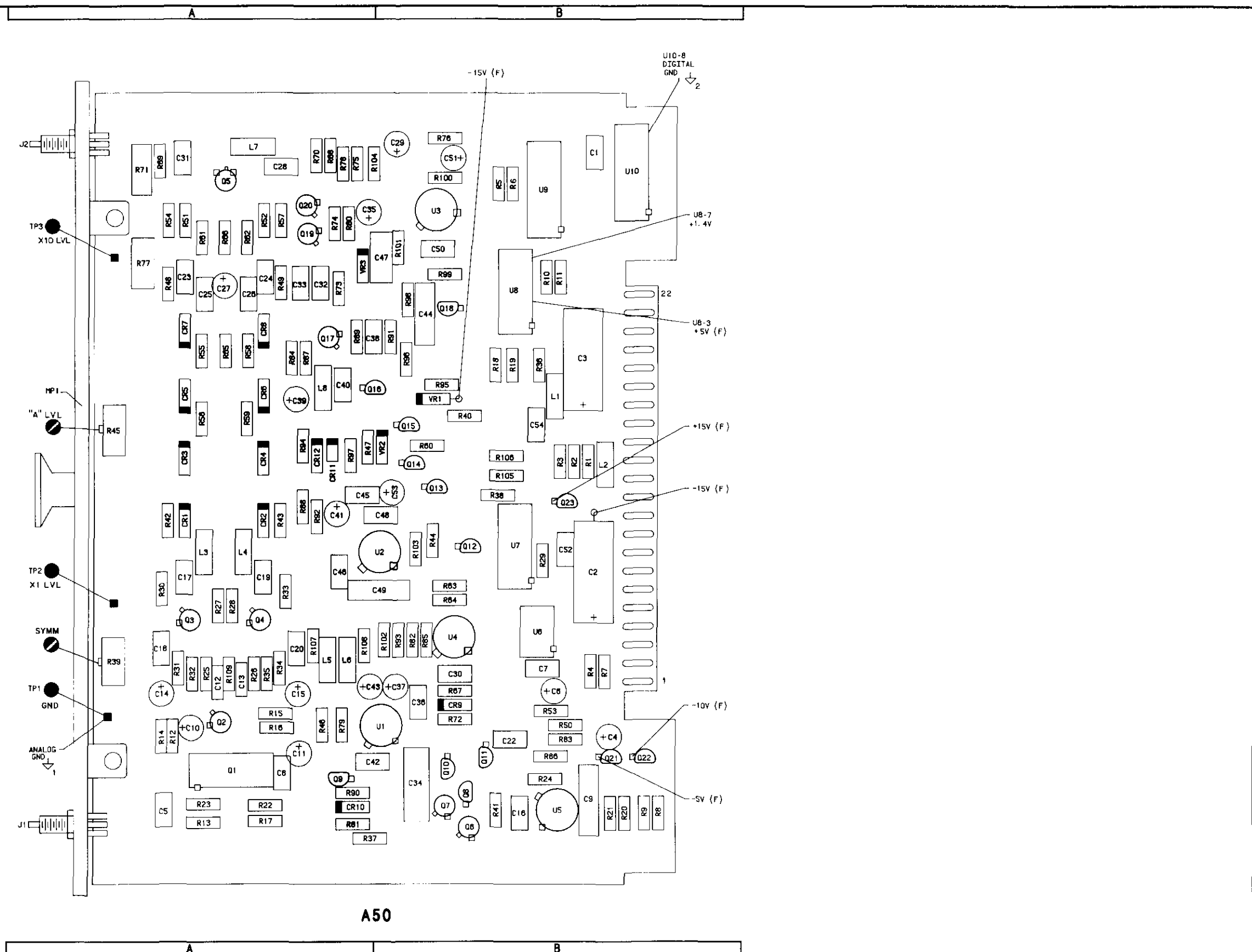
DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

REFERENCE DESIGNATIONS	PIN NUMBERS
U5	-10V - 7 - 14
U7	+5V(F) - 16 - 8
U8	+5V(F) - 5 - 12



A50 Component Coordinates

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	B,1	C49	B,2	Q14	B,2	R37	A,3	R84	A,2
C2	B,2	C50	B,1	Q15	B,2	R38	B,2	R85	B,3
C3	B,2	C51	B,1	Q16	B,2	R39	A,3	R86	B,3
C4	B,3	C52	B,2	Q17	A,2	R40	B,2	R87	A,2
C5	A,3	C53	B,2	Q18	B,1	R41	B,3	R88	A,2
C6	B,3	C54	B,2	Q19	A,1	R42	A,2	R89	A,2
C7	B,3			Q20	A,1	R43	A,2	R90	A,3
C8	A,3	CR1	A,2	Q21	B,3	R44	B,2	R91	B,2
C9	B,3	CR2	A,2	Q22	B,3	R45	A,2	R92	A,2
C10	A,3	CR3	A,2	Q23	B,2	R46	A,3	R93	B,3
C11	A,3	CR4	A,2			R47	A,2	R94	A,2
C12	A,3	CR5	A,2	R1	B,2	R48	A,1	R95	B,2
C13	A,3	CR6	A,2	R2	B,2	R49	A,1	R96	B,2
C14	A,3	CR7	A,2	R3	B,2	R50	B,3	R97	A,2
C15	A,3	CR8	A,2	R4	B,3	R51	A,1	R98	B,1
C16	B,3	CR9	B,3	R5	B,1	R52	A,1	R99	B,1
C17	A,2	CR10	A,3	R6	B,1	R53	B,3	R100	B,1
C18	A,3	CR11	A,2	R7	B,3	R54	A,1	R101	B,1
C19	A,2	CR12	A,2	R8	B,3	R55	A,2	R102	B,3
C20	A,3			R9	B,3	R56	A,2	R103	B,2
C22	B,3	J1	A,3	R10	B,1	R57	A,1	R104	A,1
C23	A,1	J2	A,1	R11	B,1	R58	A,2	R105	B,2
C24	A,1			R12	A,3	R59	A,2	R106	B,2
C25	A,1	L1	B,2	R13	A,3	R60	B,2	R107	A,3
C26	A,1	L2	B,2	R14	A,3	R61	A,1	R109	A,3
C27	A,1	L3	A,2	R15	A,3	R62	A,1		
C28	A,1	L4	A,2	R16	A,3	R63	B,2	TP1	A,3
C29	B,1	L5	A,3	R17	A,3	R64	B,2	TP2	A,2
C30	B,3	L6	A,3	R18	B,2	R65	A,2	TP3	A,1
C31	A,1	L7	A,1	R19	B,2	R66	A,1		
C32	A,1	L8	A,2	R20	B,3	R67	B,3	U1	B,3
C33	A,1			R21	B,3	R68	A,1	U2	B,2
C34	B,3	MP1	A,2	R22	A,3	R69	A,1	U3	B,1
C35	A,1			R23	A,3	R70	A,1	U4	B,3
C36	B,3	Q1	A,3	R24	B,3	R71	A,1	U5	B,3
C37	B,3	Q2	A,3	R25	A,3	R72	B,3	U6	B,2
C38	A,2	Q3	A,2	R26	A,3	R73	A,1	U7	B,2
C39	A,2	Q4	A,2	R27	A,2	R74	A,1	U8	B,1
C40	A,2	Q5	A,1	R28	A,2	R75	A,1	U9	B,1
C41	A,2	Q6	B,3	R29	B,2	R76	B,1	U10	B,1
C42	B,3	Q7	B,3	R30	A,2	R77	A,1		
C43	A,3	Q8	B,3	R31	A,3	R78	A,1	VR1	B,2
C44	B,1	Q9	A,3	R32	A,3	R79	A,3	VR2	B,2
C45	A,2	Q10	B,3	R33	A,2	R80	A,1	VR3	A,1
C46	A,2	Q11	B,3	R34	A,3	R81	A,3		
C47	B,1	Q12	B,2	R35	A,3	R82	B,3		
C48	B,2	Q13	B,2	R36	B,2	R83	B,3		



Component Locator

A51 FM CALIBRATOR **SS29**

SEE REVERSE SIDE

## CHANGES

**2535A and above**

On the A25 schematic:

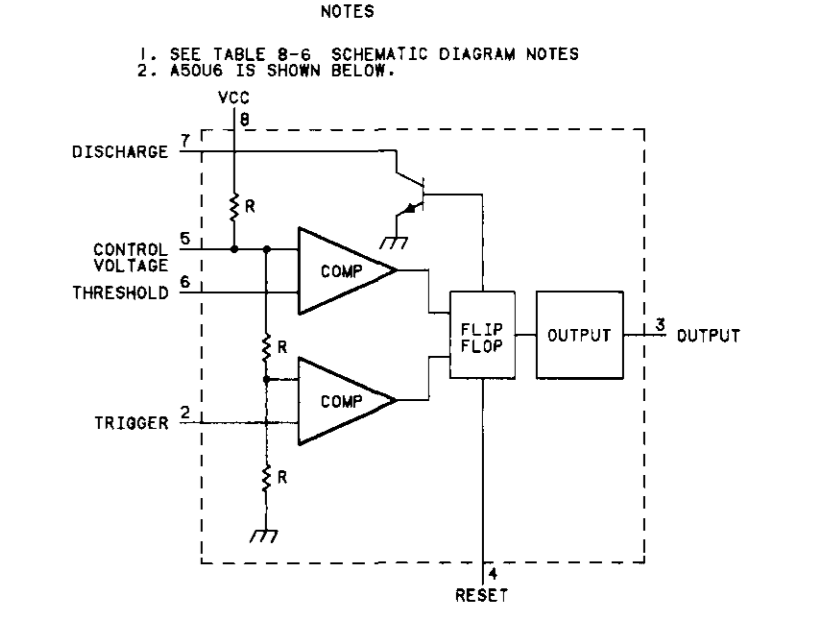
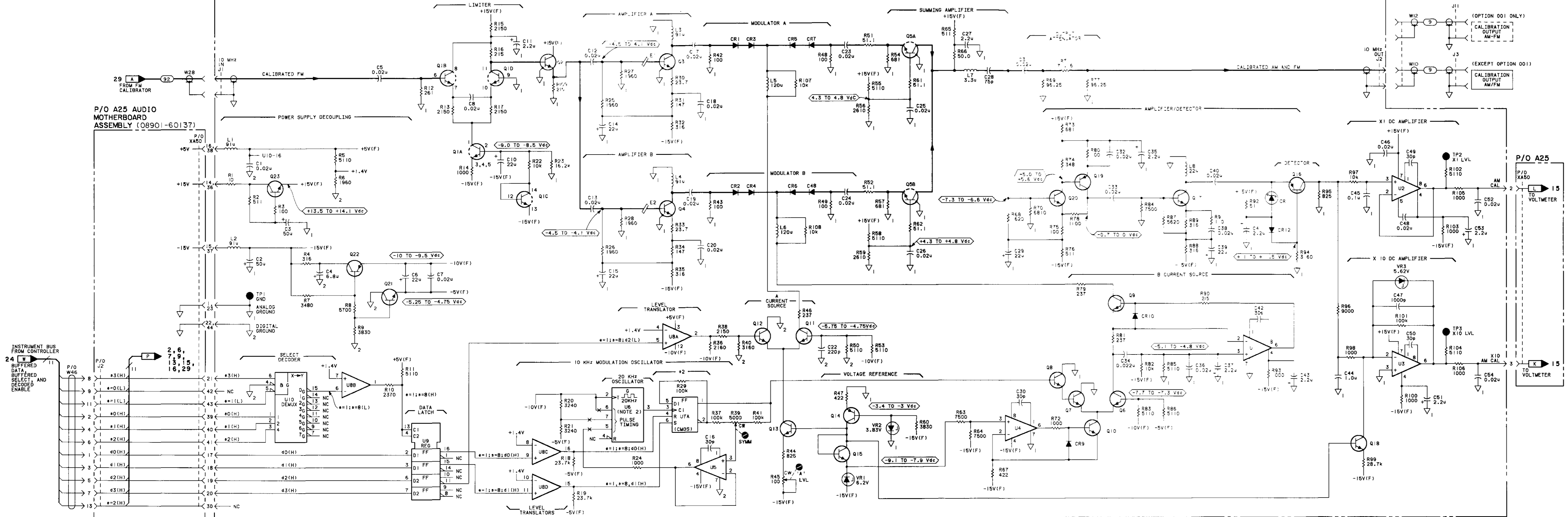
- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60103.

**2631A and above**

On the A25 schematic:

- A25 - Change the part number of the A25 AUDIO MOTHERBOARD ASSEMBLY to 08902-60116.

A50 AM CALIBRATOR ASSEMBLY (08901-60220)



DIGITAL INTEGRATED CIRCUIT VOLTAGE AND GROUND CONNECTIONS

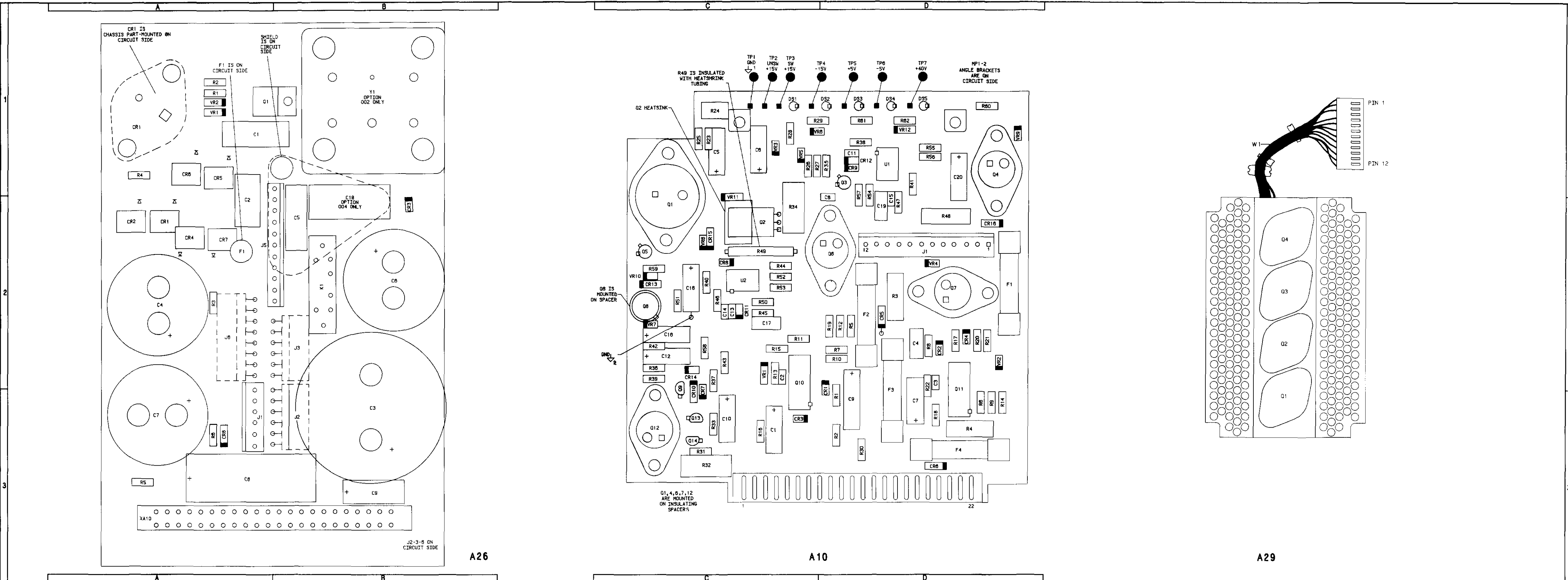
REFERENCE DESIGNATIONS	PIN NUMBERS
U6	-5V(F) - 8
	-15V(F) - 1
U7	-5V(F) - 14
	-10V(F) - 7
U8	+5V(F) - 5
	$\sqrt{2}$ - 12
U10	+5V(F) - 16
	$\sqrt{2}$ - 8

P/O A25 AUDIO MOTHERBOARD ASSEMBLY (08901-60137)

INSTRUMENT BUS FROM CONTROLLER

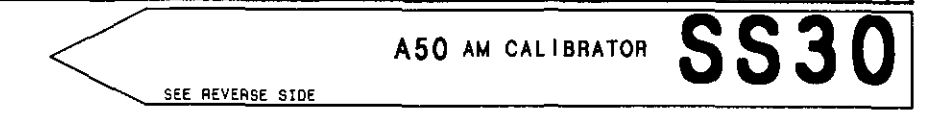
24 BUFFERED DATA BUFFERED SELECT AND DECODE ENABLE

SERIAL PREFIX: 2305A



A10		COMP		A26		COMP		COMP	
COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	C,3	R18	D,3	C1	A,1				
C2	C,2	R19	D,2	C2	A,2				
C3	D,2	R20	D,2	C3	B,3				
C4	D,2	R21	D,2	C4	A,2				
C5	C,1	R22	D,3	C5	B,2				
C6	C,1	R23	C,1	C6	B,2				
C7	D,3	R24	C,1	C7	A,3				
C8	D,2	R25	C,1	C10	B,2				
C9	D,3	R26	C,1	R27	C,1				
CR1	D,3	R28	C,1	CR1	A,1				
CR2	D,2	R29	D,1	CR1	A,2				
CR3	C,3	R30	D,3	CR2	A,2				
CR4	D,2	TP1	C,1	CR3	B,2				
CR5	D,2	TP2	C,1	CR4	A,2				
CR6	D,3	TP3	C,1	CR5	A,1				
DS1	C,1	TP4	C,1	CR6	A,1				
DS2	D,1			CR7	A,2				
F3	D,3	VR1	C,2	J1	A,3				
F4	D,3	VR2	D,2	J2	B,3				
J1	D,2	VR3	C,1	J3	B,2				
Q6	D,2	VR4	D,2	J5	A,2				
Q7	D,2	VR5	C,1	J6	A,2				
Q10	C,2	VR6	D,1	K	1B,2				
Q11	D,3			Q1	A,1				
R1	D,3			R1	A,1				
R2	D,3			R2	A,1				
R3	D,2			R3	A,2				
R4	D,3			R4	A,1				
R5	D,2			R5	A,3				
R6	D,3			VR1	A,1				
R7	D,2			VR2	A,1				
R8	D,2			XA10	A,3				
R9	D,3			Y1	B,1				
R10	D,2								
R11	C,2								
R12	D,2								
R13	C,2								
R14	D,3								
R15	C,2								
R16	C,3								
R17	D,2								

Component Locators



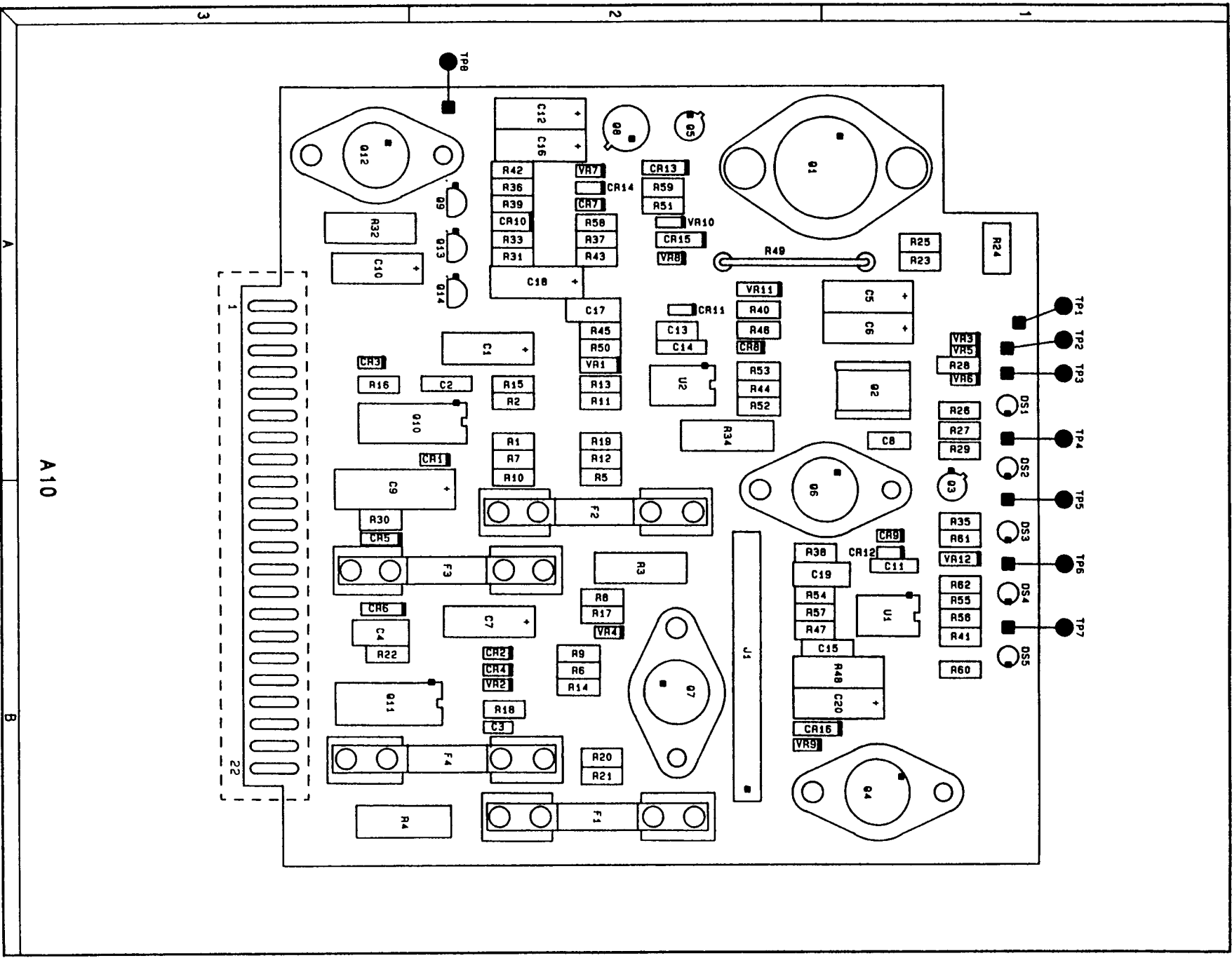
## CHANGES

<p><b>All Serial Prefixes</b></p>	<p><b>On the Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>C6 and C7</b> - Under OVER-VOLTAGE PROTECTION (two places), change C6 and C7 to 22<math>\mu</math>F.</li> <li>• <b>A26</b> - Locate P/O A26 POWER SUPPLY MOTHERBOARD ASSEMBLY, connect the line from J5A pin 8 to E on on A30, and connect J5A pin 7 to C on A30. Locate P/O A26 POWER SUPPLY MOTHERBOARD ASSEMBLY, on the left side of the assembly border, find J5A pin 8 and change the wire color code from 0 to 04. Find J5A pin 7 and change the wire color code from 04 to 0.</li> </ul>
<p><b>2522A and Above</b></p>	<p><b>A10 Component Coordinates:</b></p> <ul style="list-style-type: none"> <li>• Use the A10 Component Coordinates on page 8G-68.3.</li> </ul> <p><b>A10 Component Locator:</b></p> <ul style="list-style-type: none"> <li>• Use the A10 Component Locator on page 8G-68.4.</li> </ul> <p><b>On the Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>A10</b> - Change the part number of A10 power supply Regulators Assembly to 08901-60269.</li> </ul>
<p><b>2751A and Above</b></p>	<p><b>On the A26 Schematic:</b></p> <ul style="list-style-type: none"> <li>• In the upper left portion of SS31, change the P/O A26 POWER SUPPLY MOTHERBOARD ASSEMBLY board part number to 08901-60295.</li> <li>• <b>ON/STAND-BY RELAY</b> - In the upper left portion of SS31 under P/O A26 POWER SUPPLY MOTHERBOARD ASSEMBLY locate ON/STAND-BY RELAY and change pin 1 to pin 13. Below the relay, locate P/O K1 and change pin 5 to 4, and pin 4 to 5.</li> <li>• <b>(NOTE 4) P/O K1</b> - On the right hand side of SS31 under P/O A26, locate (NOTE 4) P/O K1 and change pin 8 to 12 and pin 6 to 11.</li> </ul>



**A10 Component Coordinates (2522A and Above)**

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	A,2	R17	B,2						
C2	A,2	R18	B,2						
C3	B,2	R19	A,2						
C4	B,3	R20	B,2						
C5	A,1	R21	B,2						
C6	A,1	R22	B,3						
C7	B,2	R23	A,1						
C8	A,1	R24	A,1						
C9	B,3	R25	A,1						
		R26	A,1						
CR1	A,2	R27	A,1						
CR2	B,2	R28	A,1						
CR3	A,3	R29	A,1						
CR4	B,2	R30	B,3						
CR5	B,3								
CR6	B,3	TP1	A,1						
		TP2	A,1						
DS1	A,1	TP3	A,1						
DS2	A,1	TP4	A,1						
F3	B,2	VR1	A,2						
F4	B,2	VR2	B,2						
		VR3	A,1						
J1	B,2	VR4	B,2						
		VR5	A,1						
Q6	A,2	VR6	A,1						
Q7	B,2								
Q8	A,2								
Q10	A,2								
Q11	B,3								
R1	A,2								
R2	A,2								
R3	B,2								
R4	B,3								
R5	A,2								
R6	B,2								
R7	A,2								
R8	B,2								
R9	B,2								
R10	A,2								
R11	A,2								
R12	A,2								
R13	A,2								
R14	B,2								
R15	A,2								
R16	A,3								



SS31

8G-68.4

A10 Component Locator  
(2522A and Above)

A10

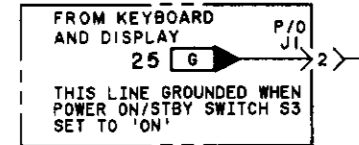
DANGER HAZARDOUS VOLTAGE

WARNINGS

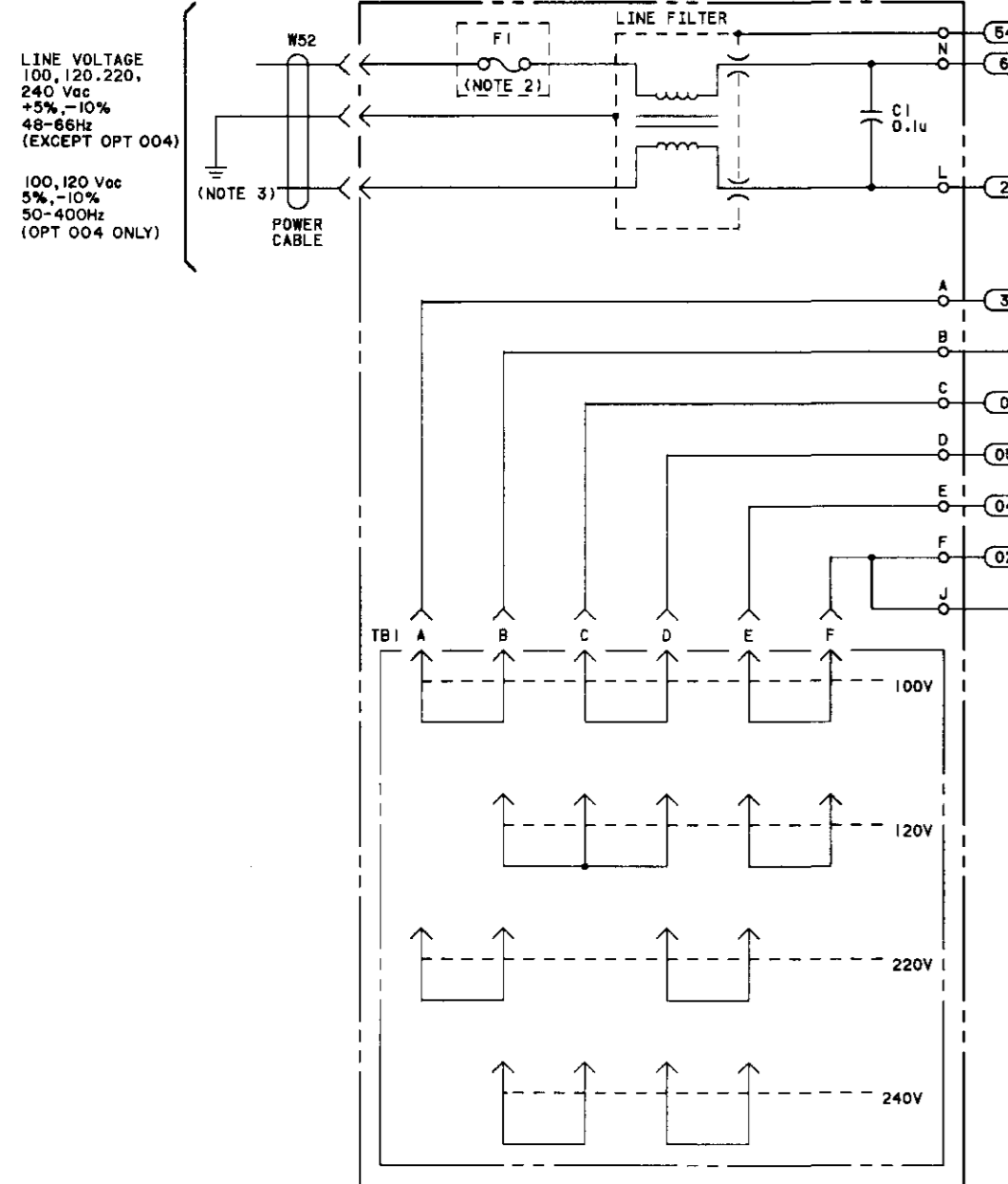
MAINS VOLTAGE IS PRESENT AT THE LINE POWER MODULE WHENEVER THE POWER CABLE IS CONNECTED. IN ADDITION, APPROXIMATELY 117 Vrms IS PRESENT AT THE CONTACTS OF THE PLUG MATING WITH A26USA AND B AND AT A26USA AND B ITSELF WHENEVER THE POWER CABLE IS CONNECTED. BE EXTREMELY CAREFUL WHEN WORKING IN PROXIMITY TO THESE AREAS. THESE HAZARDOUS VOLTAGES COULD CAUSE SERIOUS PERSONAL INJURY IF CONTACTED.

WHENEVER THE POWER CABLE IS CONNECTED, APPROXIMATELY 50 Vrms IS ACCESSIBLE AT THE SECONDARY OF T1 AND WHEN T1 IS CONNECTED, AT A26X10 PIN 42. BE EXTREMELY CAREFUL WHEN WORKING IN PROXIMITY TO THESE AREAS.

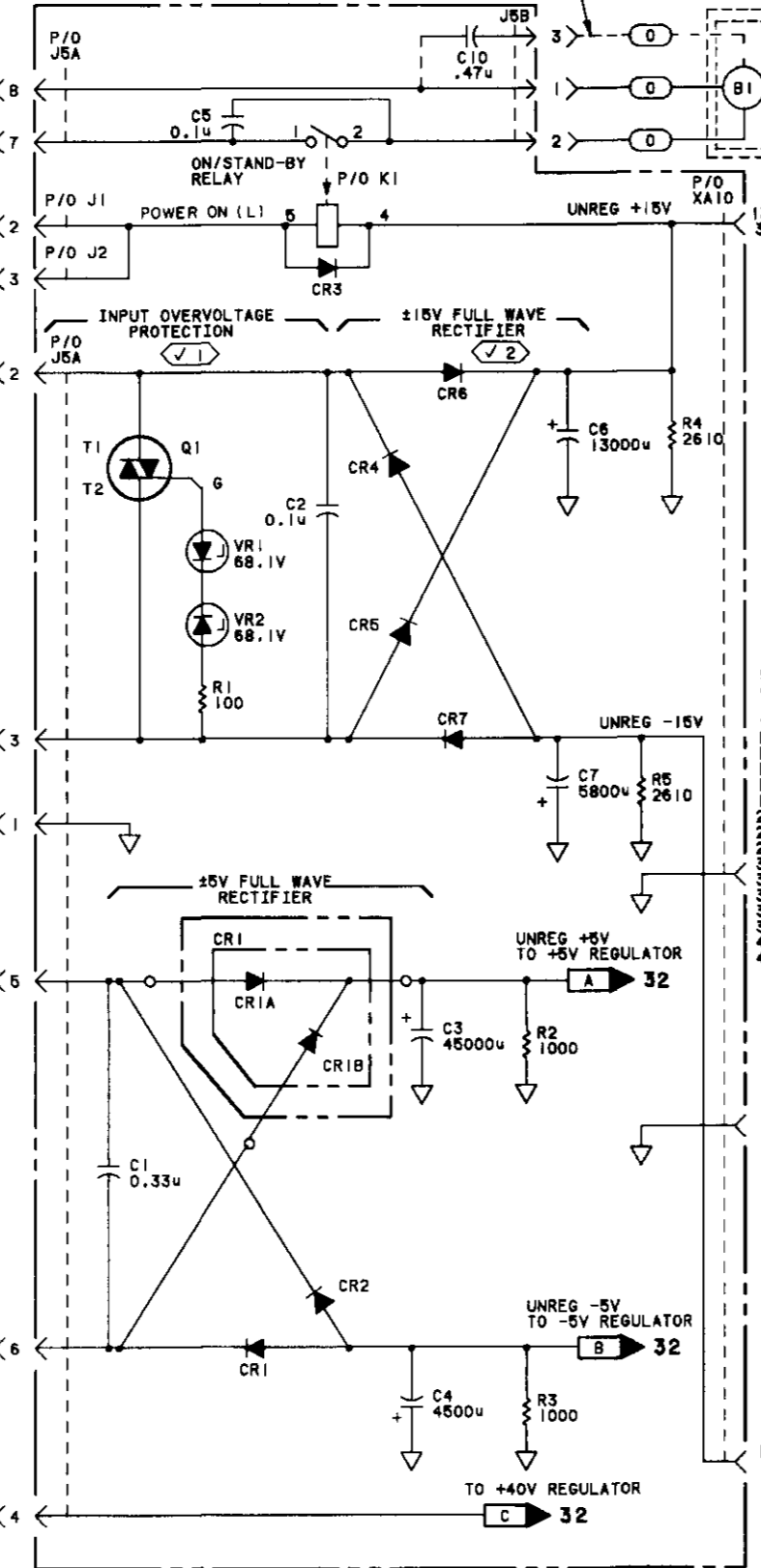
P/O A1 KEYBOARD AND DISPLAY ASSEMBLY (08901-60143)



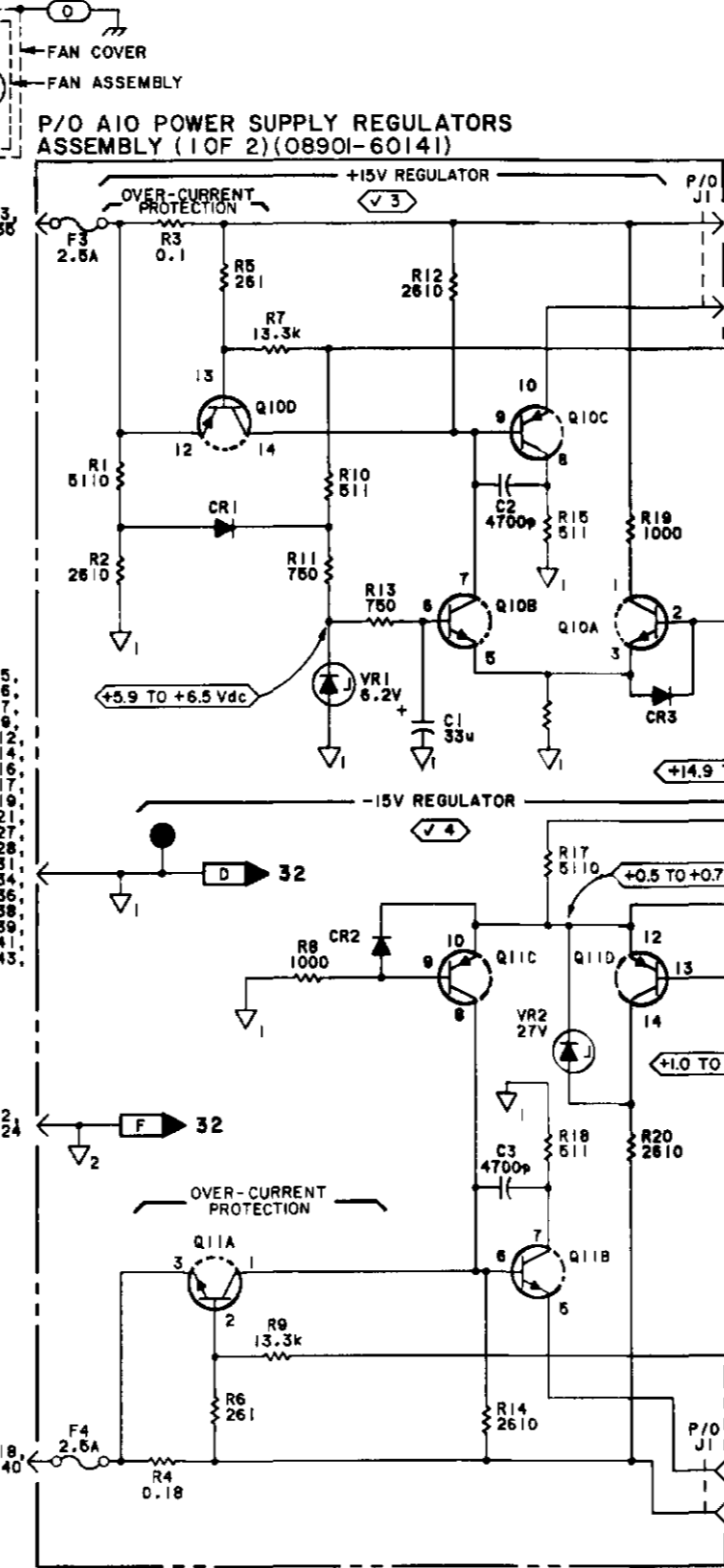
A30 LINE POWER ASSEMBLY (0960-0443)



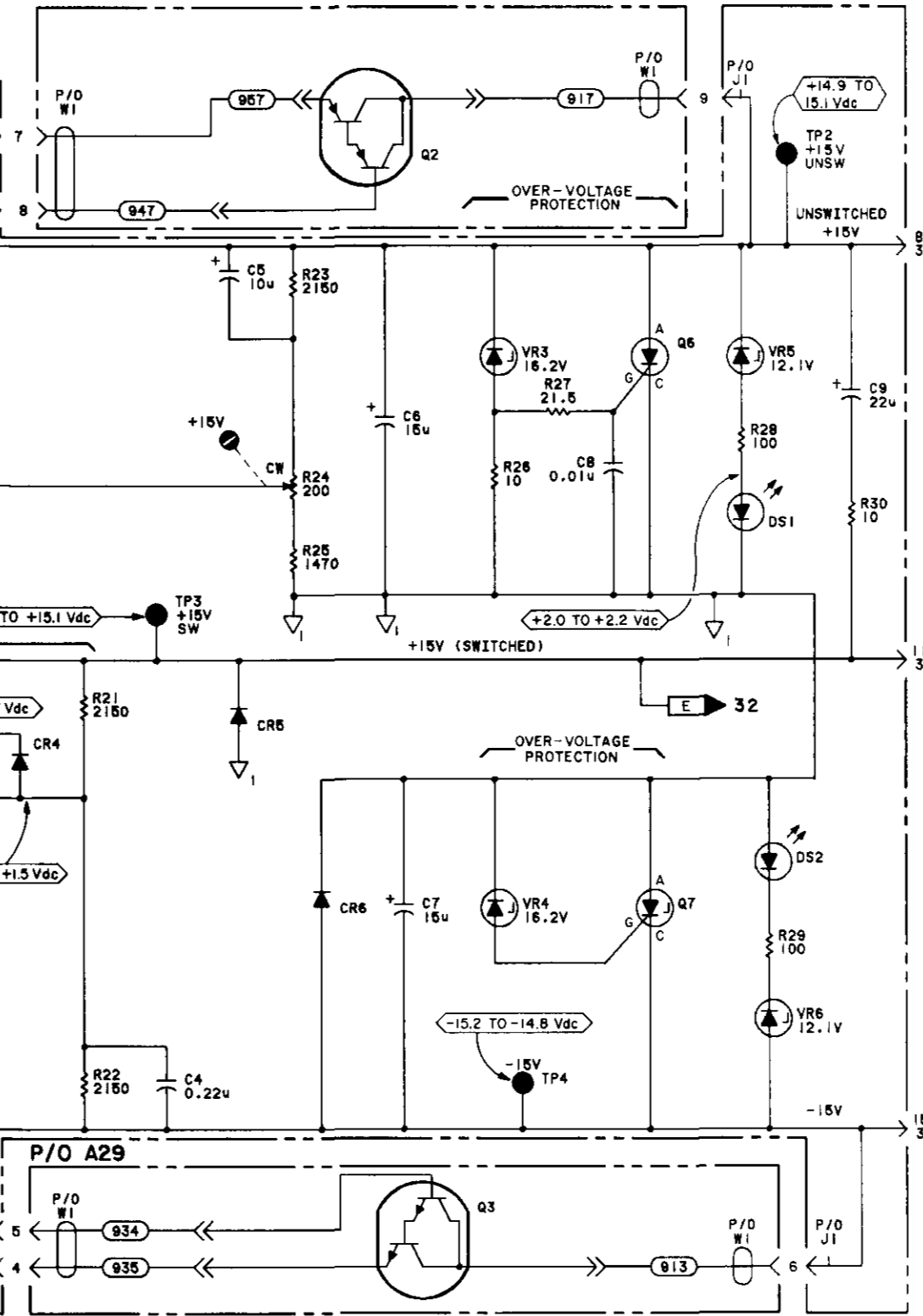
P/O A26 POWER SUPPLY MOTHERBOARD ASSEMBLY (08901-60142)



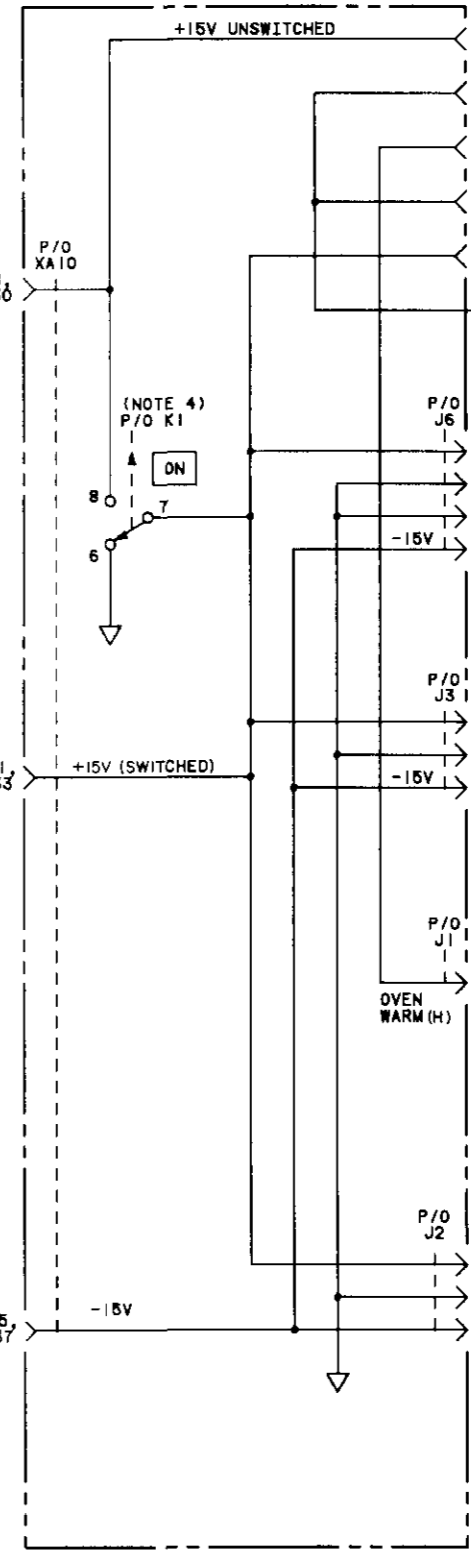
P/O A10 POWER SUPPLY REGULATORS ASSEMBLY (1 OF 2) (08901-60141)



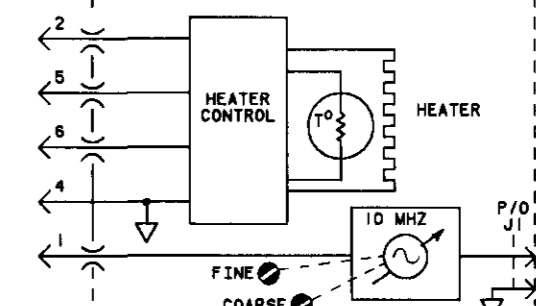
P/O A29 SERIES REGULATOR HEAT SINK ASSEMBLY (08901-60181)



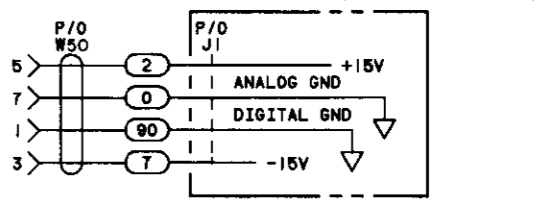
P/O A26



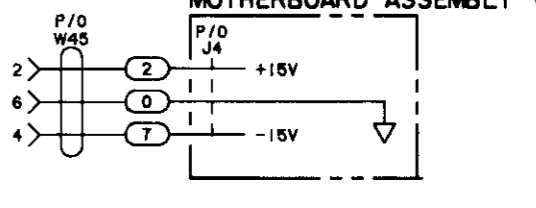
Y1 HIGH STABILITY CRYSTAL OSCILLATOR (OPTION 002 ONLY)



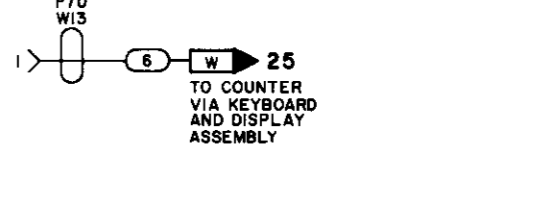
P/O A28 RF MOTHERBOARD ASSEMBLY (08902-60007)



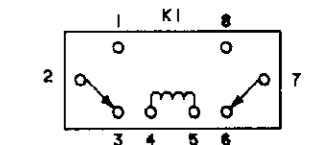
P/O A27 DIGITAL MOTHERBOARD ASSEMBLY (08901-60140)

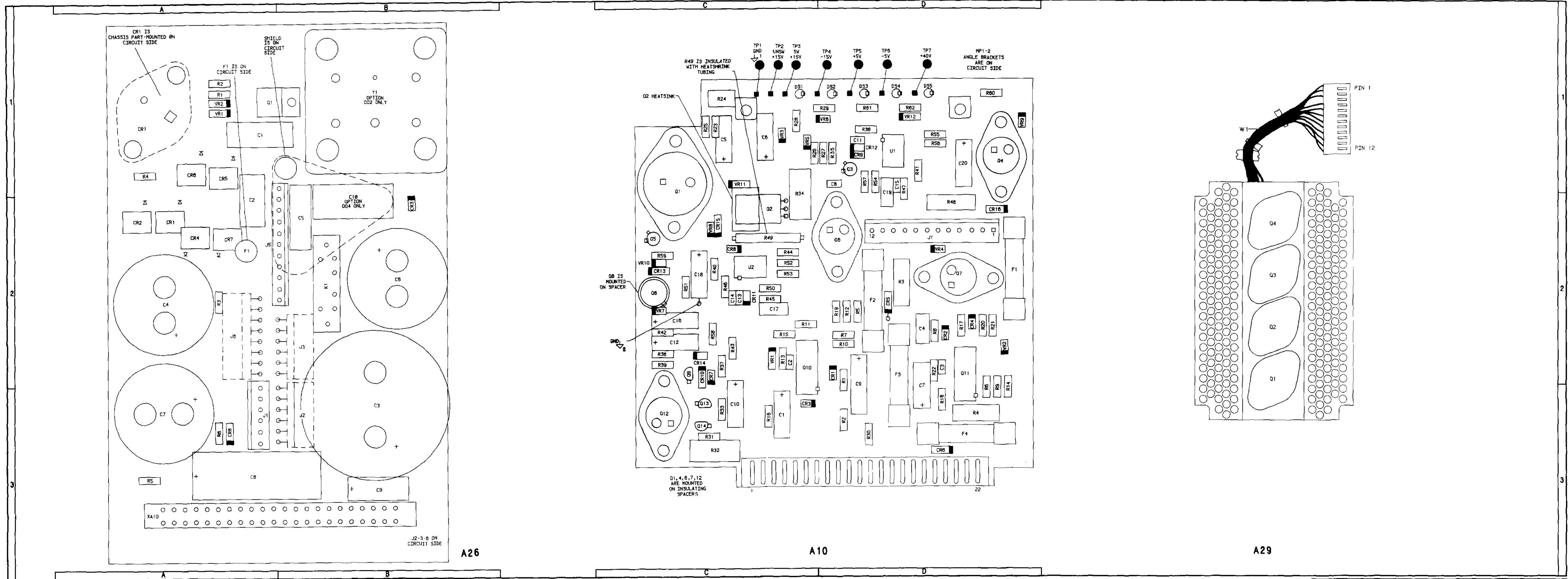


P/O A25 AUDIO MOTHERBOARD ASSEMBLY (08901-60137)



- NOTES
1. SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES
2. THE VALUE OF F1 IS 2.5 AMP FOR 110/120V AND 1.5 AMP FOR 220/240V.
3. CHASSIS GROUND IS ACHIEVED BY MECHANICAL CONTACT THROUGH SCREWS HOLDING P.C. BOARD TO FRAME
4. ENERGIZED BY ON/STAND-BY SWITCH SET TO ON





A10 (2305A TO 2530A) & A26 Component Coordinates (2 of 2)

A10		COMP	X,Y	A26		COMP	X,Y	COMP	X,Y
COMP	X,Y			COMP	X,Y				
C10	C,2	R35	D,1	C8	A,3				
C11	D,1	R36	C,2	C9	B,3				
C12	C,2	R37	D,1						
C13	C,2	R38	D,1	CR8	A,3				
C14	C,2	R39	C,2						
C15	D,1	R40	C,2	F1	A,2				
C16	C,2	R41	D,1	J1	A,3				
C17	C,2	R42	C,2	J2	B,3				
C18	C,2	R43	C,2	J3	B,2				
C19	D,2	R44	C,2	J6	A,2				
C20	D,1	R45	C,2						
		R46	C,2						
		R47	D,1						
CR7	C,2	R48	D,2						
CR8	C,2	R49	C,2						
CR9	D,1	R50	C,2						
CR10	C,2	R51	C,2						
CR11	C,2	R52	C,2						
CR12	D,1	R53	C,2						
CR13	C,2	R54	D,1						
CR14	C,2	R55	D,1						
CR15	C,2	R56	D,1						
CR16	D,2	R57	D,1						
		R58	C,2						
DS3	D,1	R59	C,2						
DS4	D,1	R60	D,1						
DS5	D,1	R61	D,1						
		R62	D,1						
F1	D,2	TP1	C,1						
F2	D,2	TP5	D,1						
Q1	C,1	TP6	D,1						
Q2	C,2	TP7	D,1						
Q3	D,1								
Q4	D,1	U1	D,1						
Q5	C,2	U2	C,2						
Q8	C,2	VR7	C,2						
Q9	C,2	VR8	C,2						
Q12	C,2	VR9	D,1						
Q13	C,2	VR10	C,2						
Q14	C,2	VR11	C,1						
R31	C,2	VR12	D,1						
R32	C,2								
R33	C,2								
R34	C,2								

Component Locators

A10 PS REGULATORS    A29 SERIES REG HEATSINK  
 A26 PS MOTHERBOARD    A30 LINE POWER

# SS31

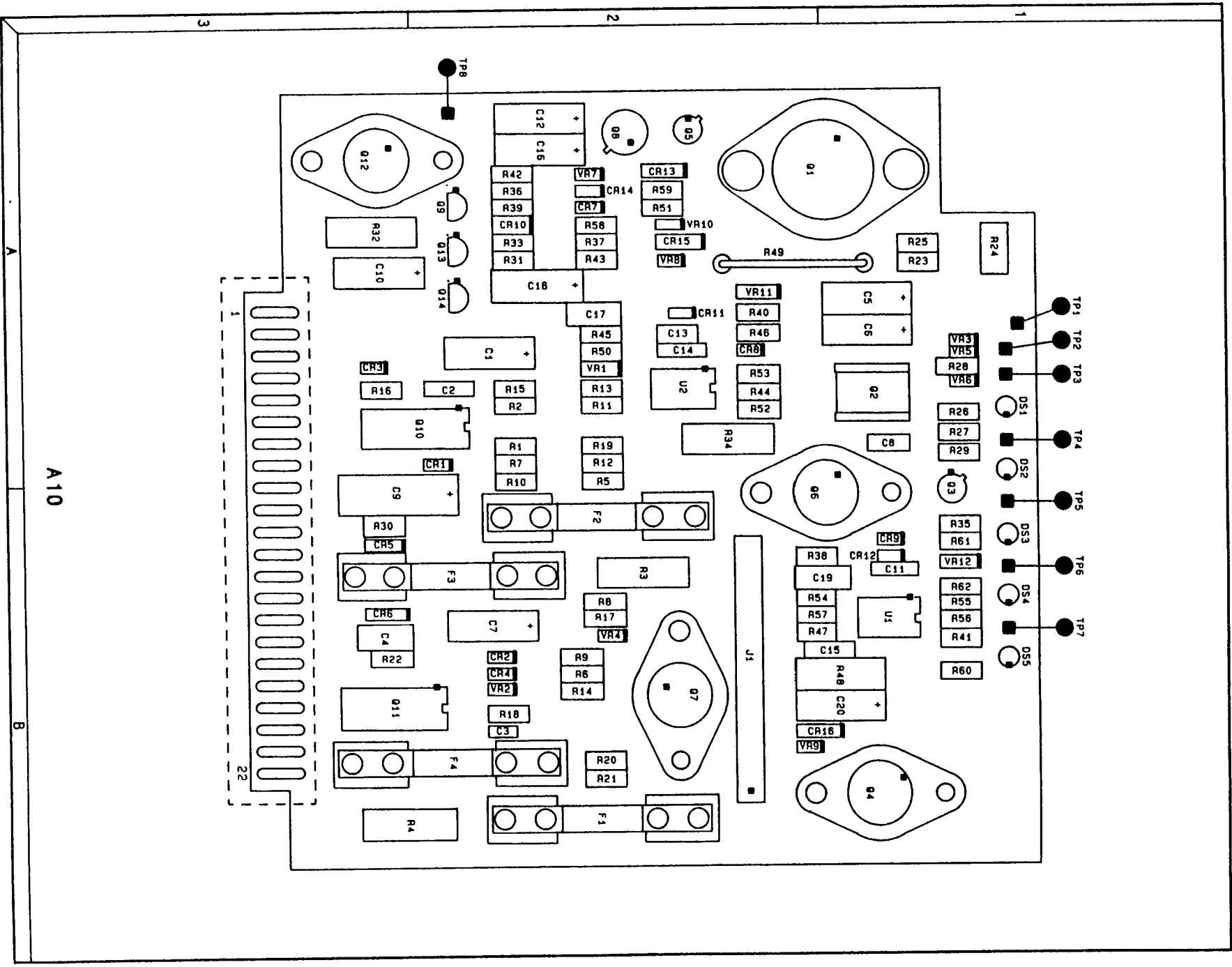
SEE REVERSE SIDE

## CHANGES

<p><b>2522A and Above</b></p>	<p><b>A10 Component Coordinates:</b></p> <ul style="list-style-type: none"> <li>• Use the A10 Component Coordinates on page 8G-70.3.</li> </ul> <p><b>A10 Component Locator:</b></p> <ul style="list-style-type: none"> <li>• Use the A10 Component Locator on page 8G-70.4.</li> </ul> <p><b>On the Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>A10</b> - Change the part number of A10 power supply Regulators Assembly to 08901-60269.</li> </ul>
<p><b>2618A and Above</b></p>	<p><b>On the A10 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>R50, R54</b> - Change R50 to 4k<math>\Omega</math>. Change R54 to 4k<math>\Omega</math>.</li> </ul>
<p><b>2742A and Above</b></p>	<p><b>On the A10 Schematic:</b></p> <ul style="list-style-type: none"> <li>• <b>C10</b> - Change the value of C10 to 47<math>\mu</math>F.</li> </ul>
<p><b>2751A and Above</b></p>	<p><b>On the A26 Schematic:</b></p> <ul style="list-style-type: none"> <li>• In the upper left portion of SS32, change the P/O <b>A26 POWER SUPPLY MOTHERBOARD ASSEMBLY</b> board part number to 08901-60295.</li> </ul>

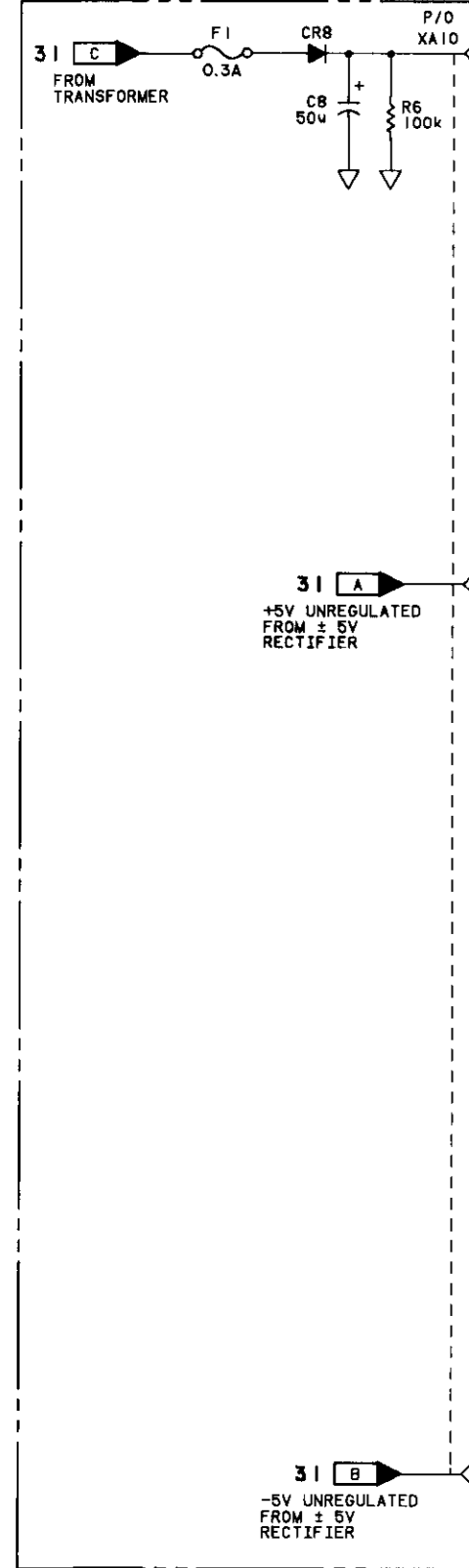
**A10 Component Coordinates (2522A and Above)**

COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y	COMP	X,Y
C1	A,2	R17	B,2						
C2	A,2	R18	B,2						
C3	B,2	R19	A,2						
C4	B,3	R20	B,2						
C5	A,1	R21	B,2						
C6	A,1	R22	B,3						
C7	B,2	R23	A,1						
C8	A,1	R24	A,1						
C9	B,3	R25	A,1						
		R26	A,1						
CR1	A,2	R27	A,1						
CR2	B,2	R28	A,1						
CR3	A,3	R29	A,1						
CR4	B,2	R30	B,3						
CR5	B,3								
CR6	B,3	TP1	A,1						
		TP2	A,1						
DS1	A,1	TP3	A,1						
DS2	A,1	TP4	A,1						
F3	B,2	VR1	A,2						
F4	B,2	VR2	B,2						
		VR3	A,1						
J1	B,2	VR4	B,2						
		VR5	A,1						
Q6	A,2	VR6	A,1						
Q7	B,2								
Q8	A,2								
Q10	A,2								
Q11	B,3								
R1	A,2								
R2	A,2								
R3	B,2								
R4	B,3								
R5	A,2								
R6	B,2								
R7	A,2								
R8	B,2								
R9	B,2								
R10	A,2								
R11	A,2								
R12	A,2								
R13	A,2								
R14	B,2								
R15	A,2								
R16	A,3								

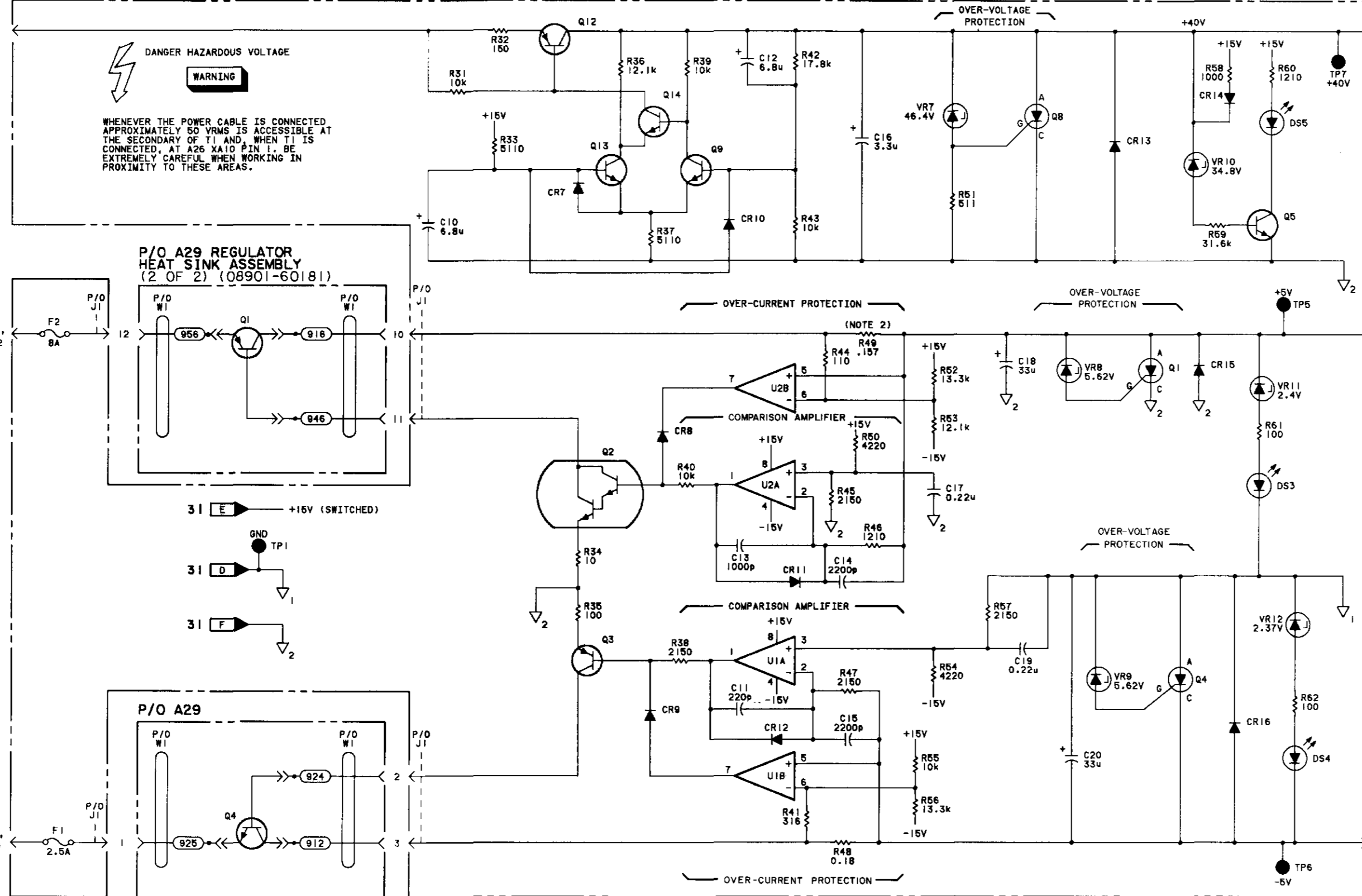


A10 Component Locator  
(2522A and Above)

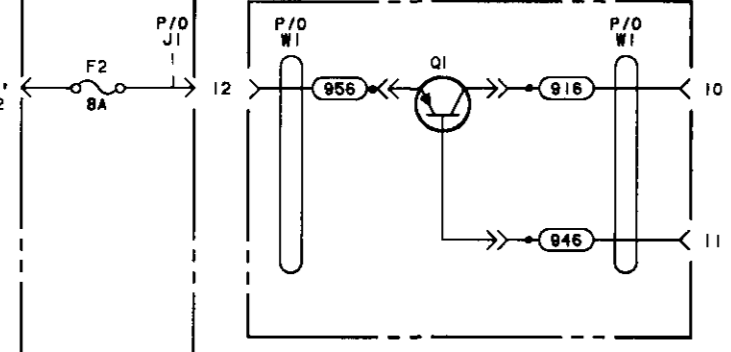
**P/O A26 POWER SUPPLY MOTHERBOARD ASSEMBLY (08901-60142)**



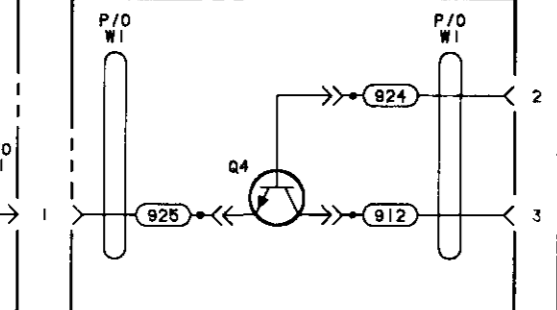
**P/O A10 POWER SUPPLY REGULATORS ASSEMBLY (2 OF 2) (08901-60141)**



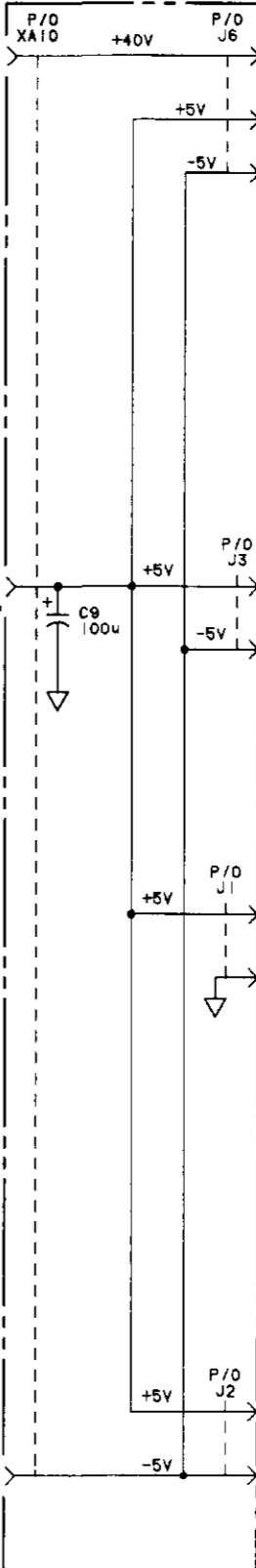
**P/O A29 REGULATOR HEAT SINK ASSEMBLY (2 OF 2) (08901-60181)**



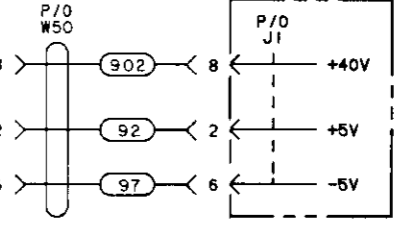
**P/O A29**



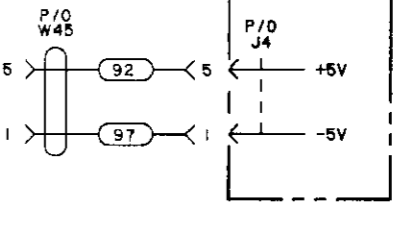
**P/O A26**



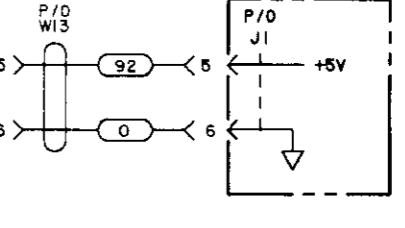
**P/O A28 RF MOTHERBOARD ASSEMBLY (08902-60007)**



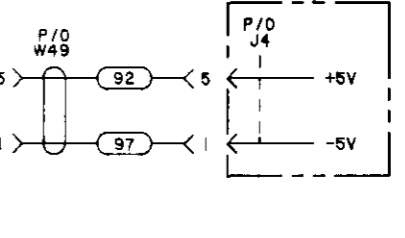
**P/O A27 DIGITAL MOTHERBOARD ASSEMBLY (08901-60140)**



**P/O A1 KEYBOARD AND DISPLAY ASSEMBLY (08901-60143)**

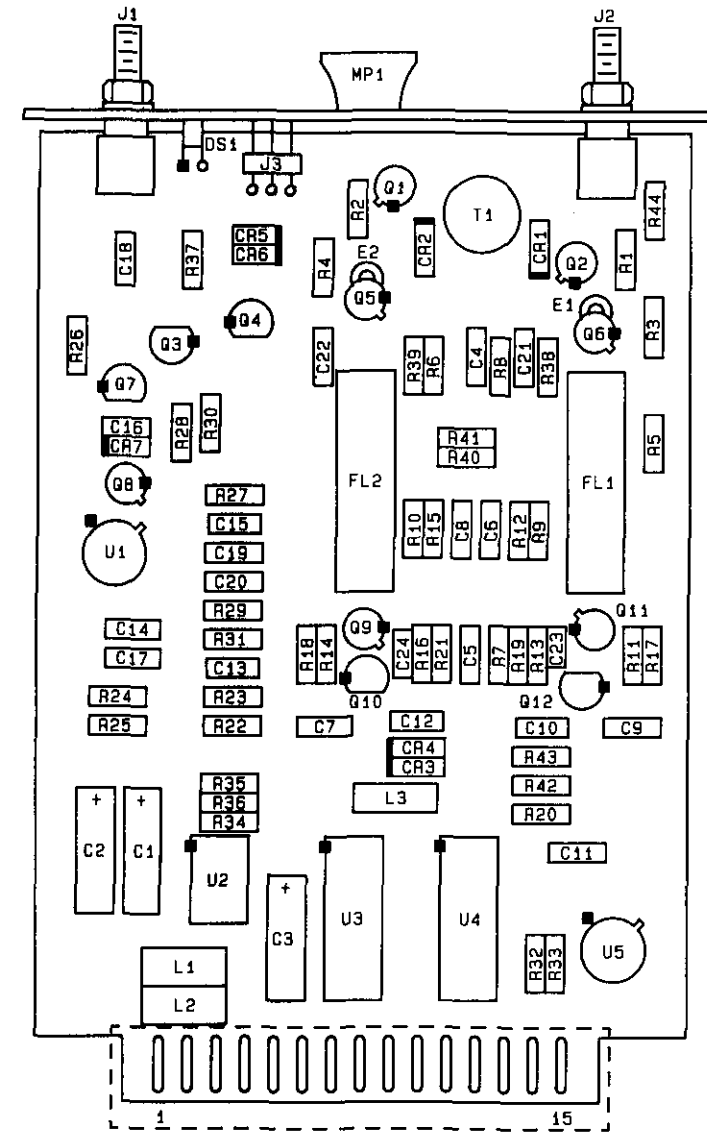


**P/O A25 AUDIO MOTHERBOARD ASSEMBLY (8901-60137)**



- NOTES:
- SEE TABLE 8-6 SCHEMATIC DIAGRAM NOTES.
  - A10 R48 IS A 2.54 CM (1 INCH) STRIP OF NICKEL COPPER.





A72

Component Locator

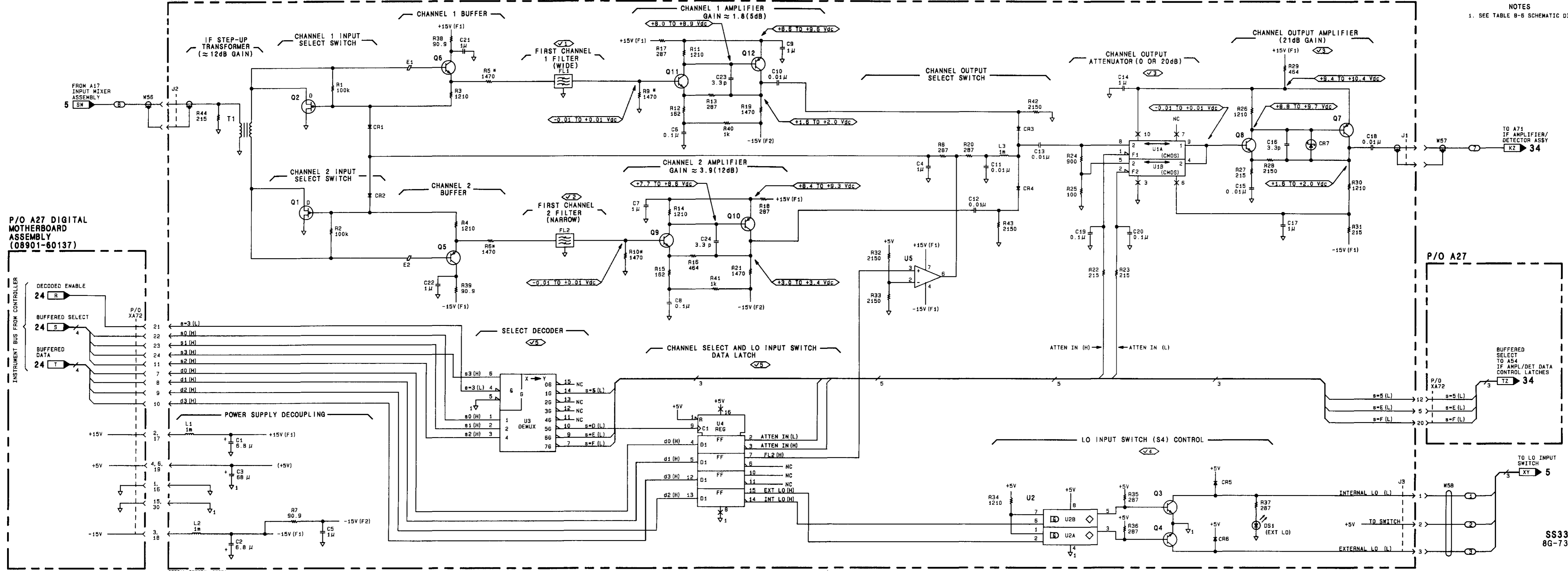
A10 PS REGULATORS SEE REVERSE SIDE	A26 PS MOTHERBOARD	A29 SERIES REGULATOR HEATSINK	<b>SS32</b>
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**CHANGES****Errata****On the Schematic:**

- At the top of the schematic, change the reference designator of IF CHANNEL FILTER ASSEMBLY from A72 to A71, and change the part number from 08902-60108 to 08902-60109.

**A72 IF CHANNEL FILTER ASSEMBLY (OPTION 030 SERIES) (08902-60108)**

NOTES  
1. SEE TABLE B-6 SCHEMATIC DIAGRAM NOTES.

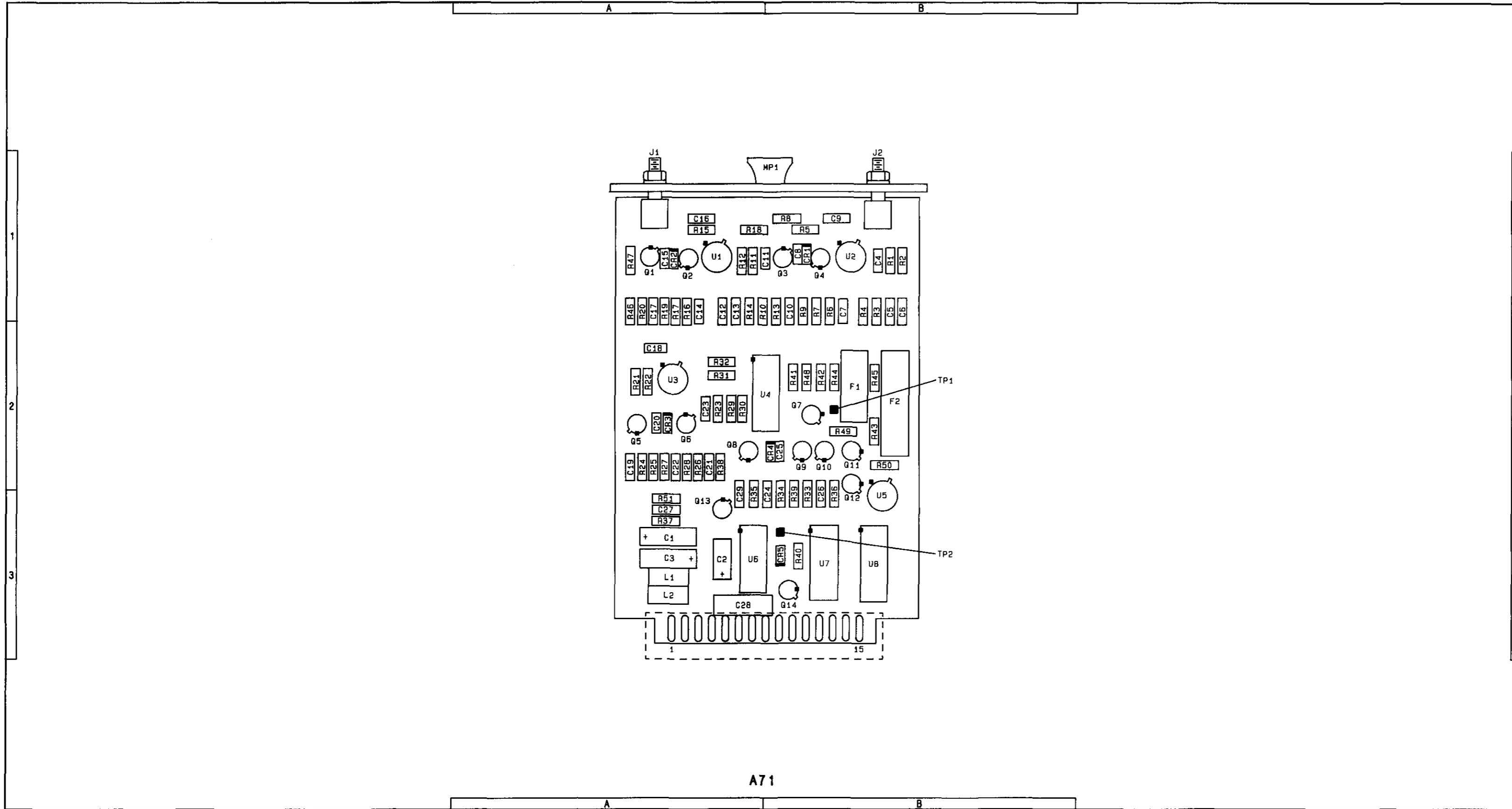


P/O A27 DIGITAL MOTHERBOARD ASSEMBLY (08901-60137)

P/O A27

SS33  
8G-73

SERIAL PREFIX: 2539A



A71  
Component Locator

A72 IF CHANNEL FILTER **SS33**  
SEE REVERSE SIDE

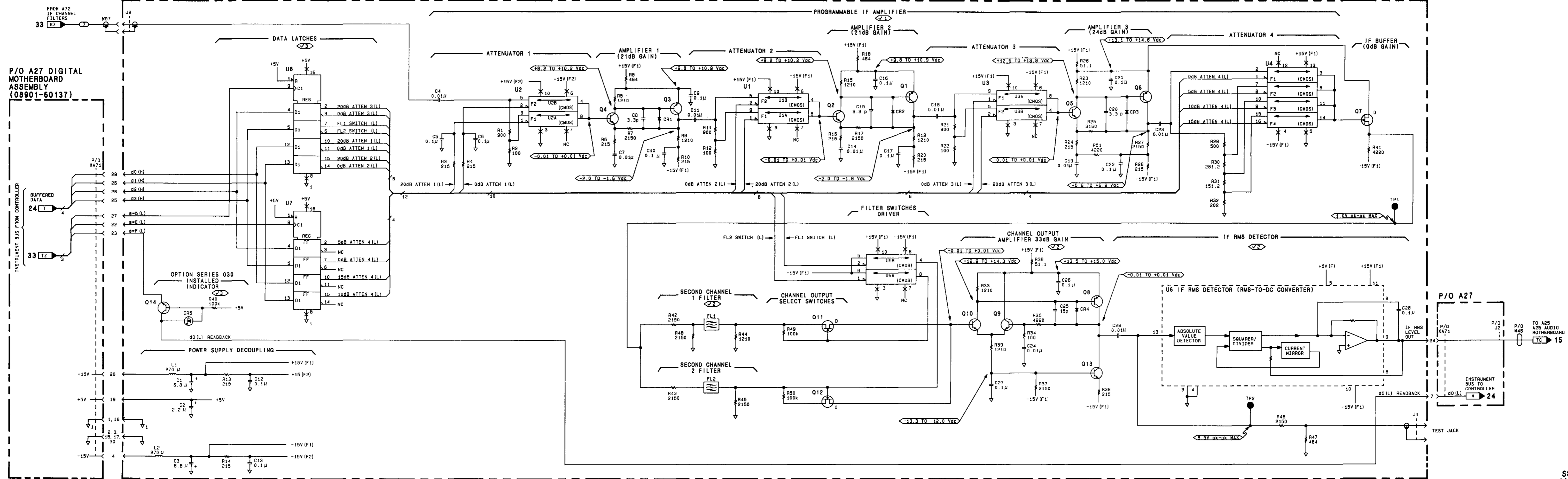
**CHANGES**

<b>2627A and above</b>	<b>On the A27 Schematic:</b> <ul style="list-style-type: none"><li>• <b>A27C9</b> - On the back of the schematic, in the connector pin-out fourth from the left, on the clock line between pin 27 and pin 44, delete A27C9.</li></ul>
<b>Errata</b>	<b>On the Schematic:</b> <ul style="list-style-type: none"><li>• At the top of the schematic, change the reference designator of <b>IF AMPLIFIER/DETECTOR ASSEMBLY</b> from A71 to A72, and the part number from 08902-60109 to 08902-60108.</li></ul>

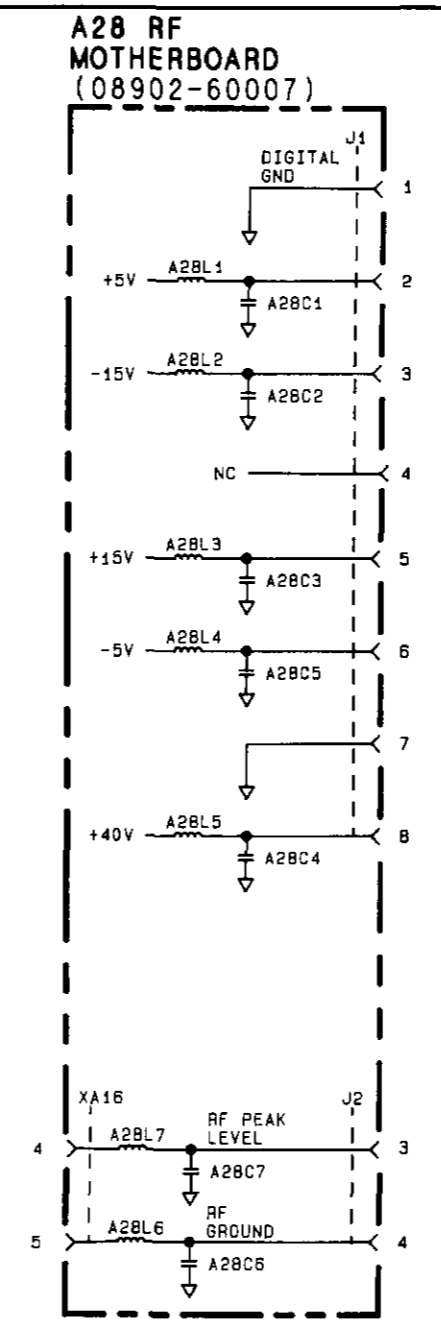
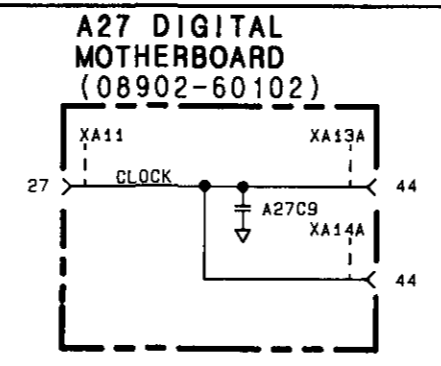
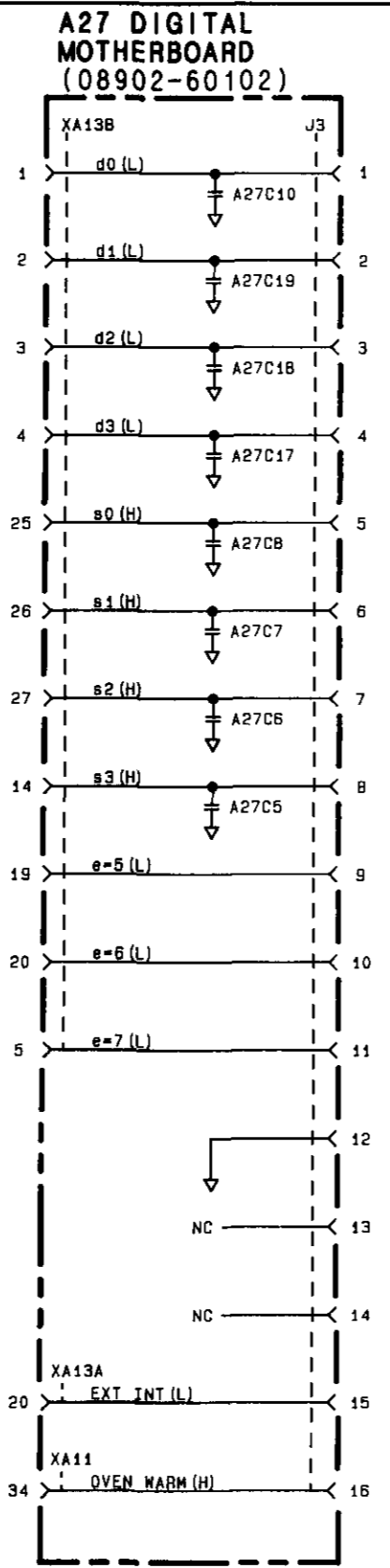
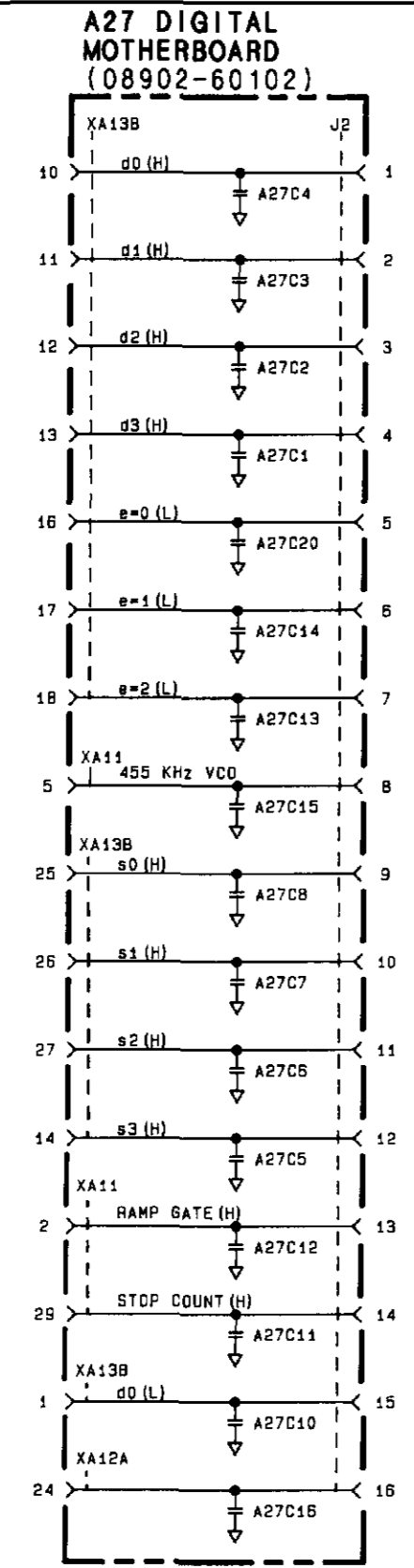
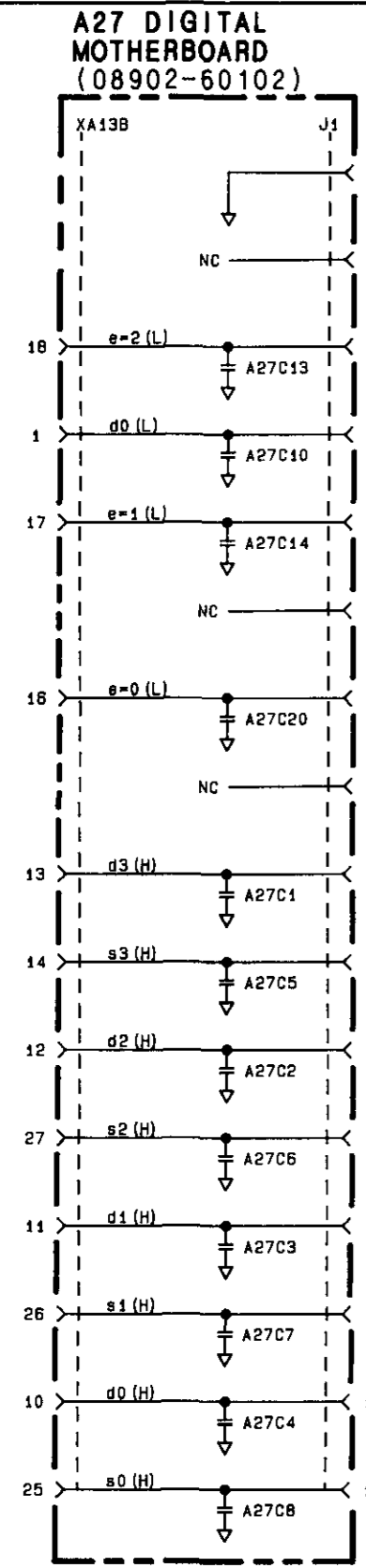
A71 IF AMPLIFIER/DETECTOR ASSEMBLY (OPTION 030 SERIES) (08902-60109)

P/O A27 DIGITAL MOTHERBOARD ASSEMBLY (08901-60137)

INSTRUMENT BUS FROM CONTROLLER



SERIAL PREFIX: 2935A



A71 IF AMPLIFIER/DETECTOR **SS34**  
SEE REVERSE SIDE

**CHANGES**

Model 8902A

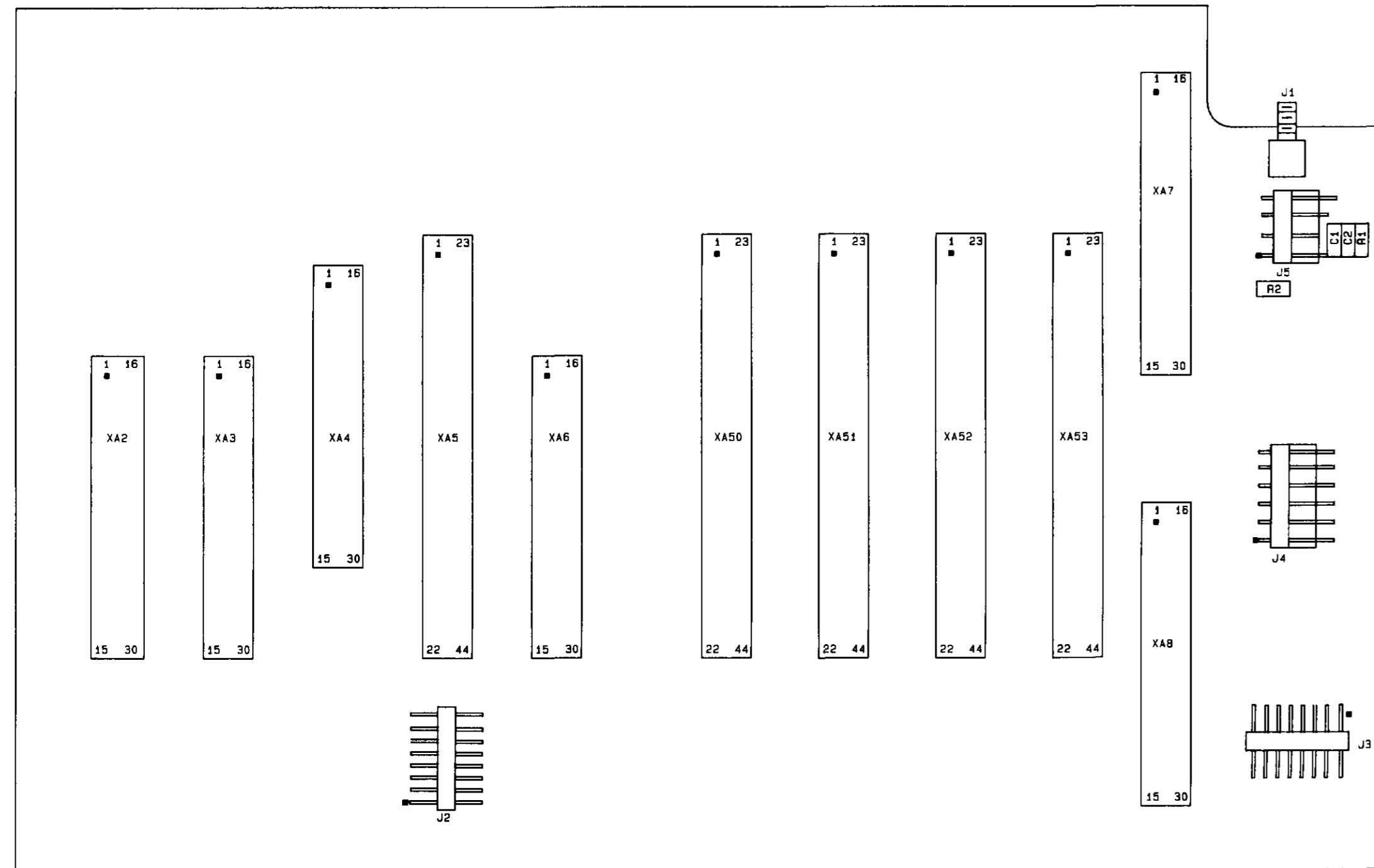
Service

2627A and above

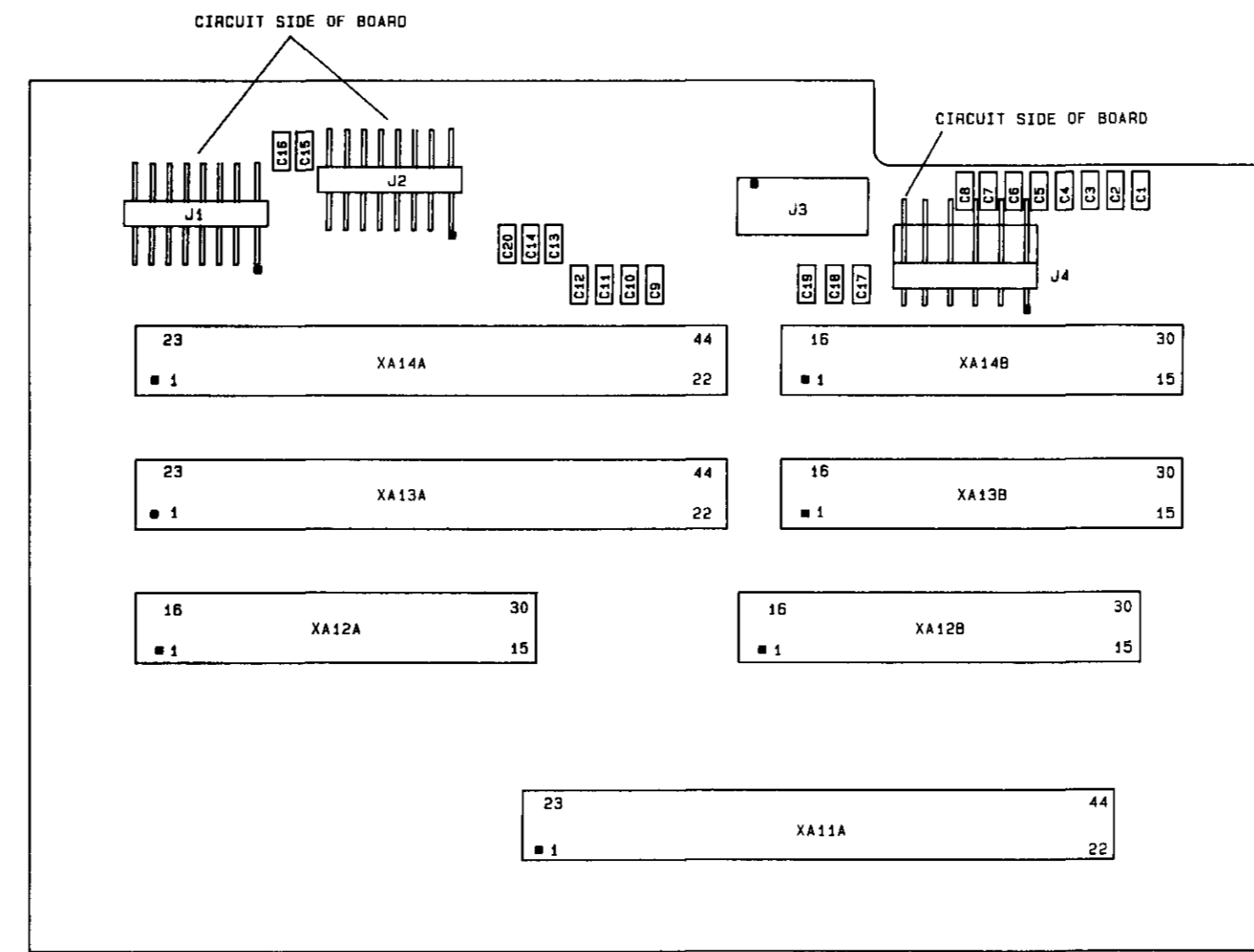
On the A27 schematic:

- A27C9 - In the fourth column from the left, delete A27C9 from the CLOCK line between Pins 27 and 44.

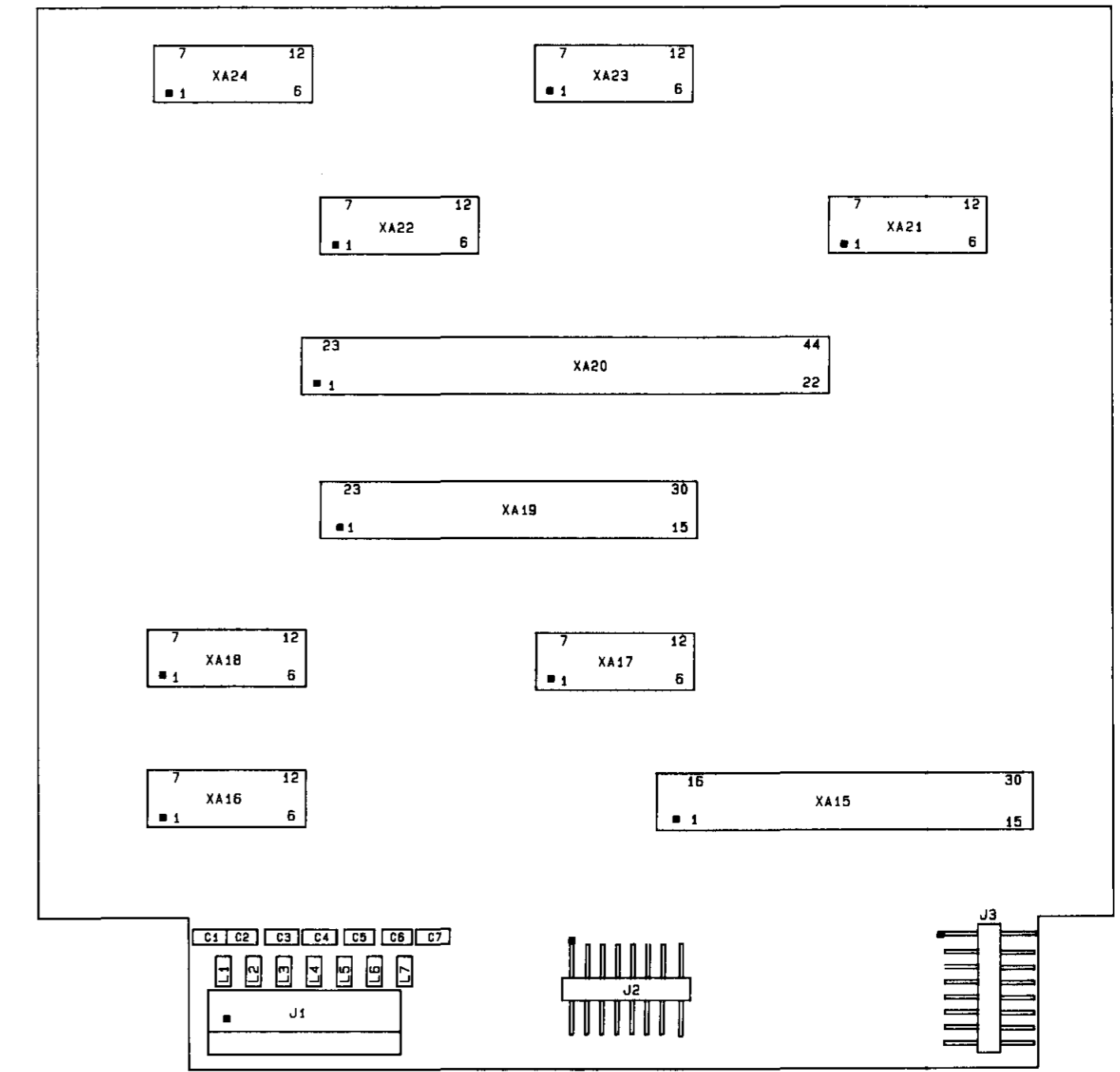




A25

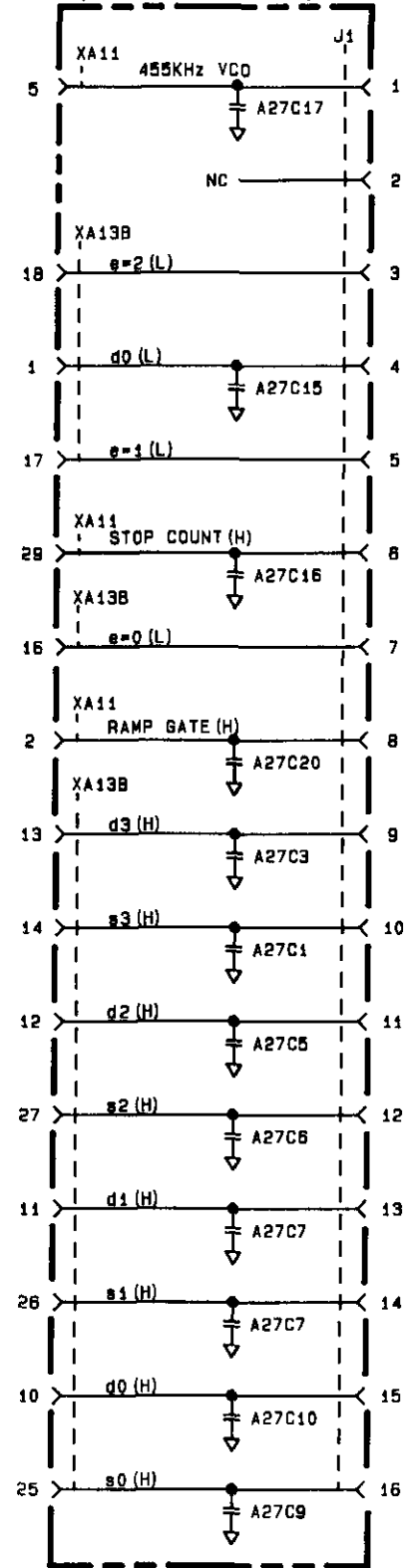


A27

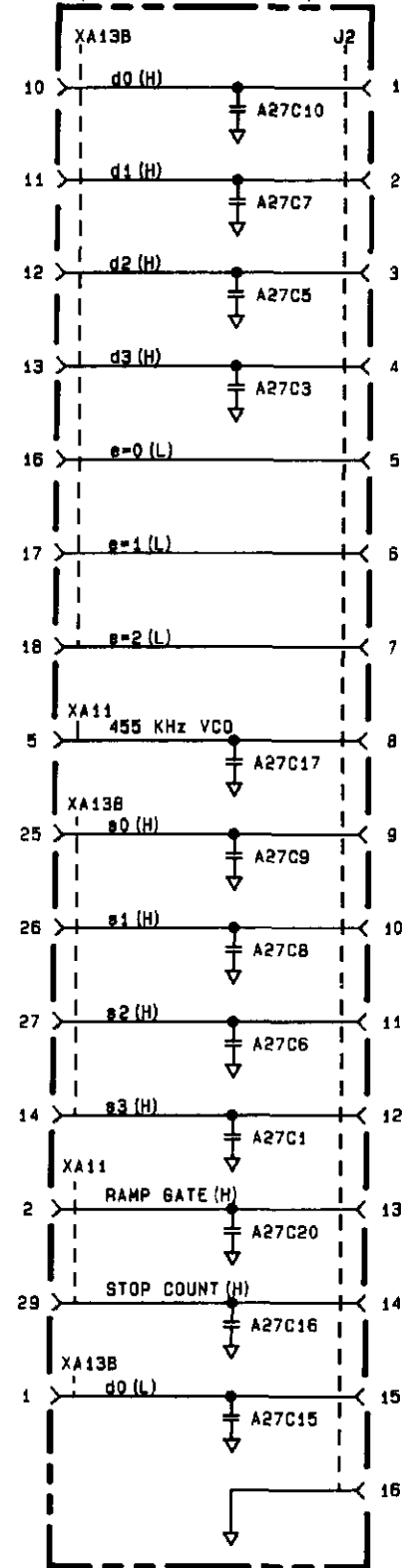


A28

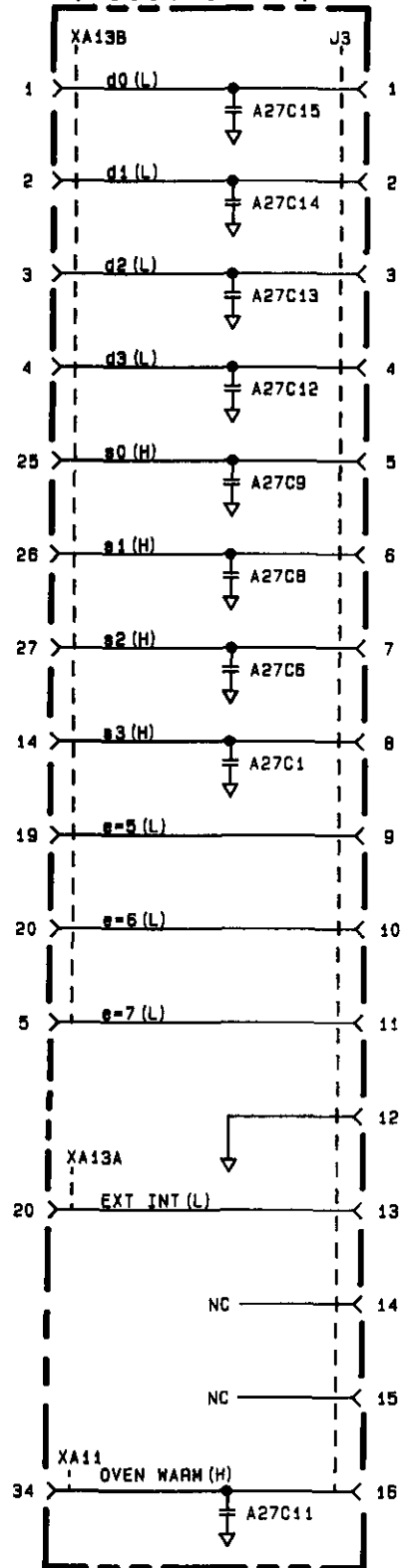
**A27 DIGITAL MOTHERBOARD (08901-60140)**



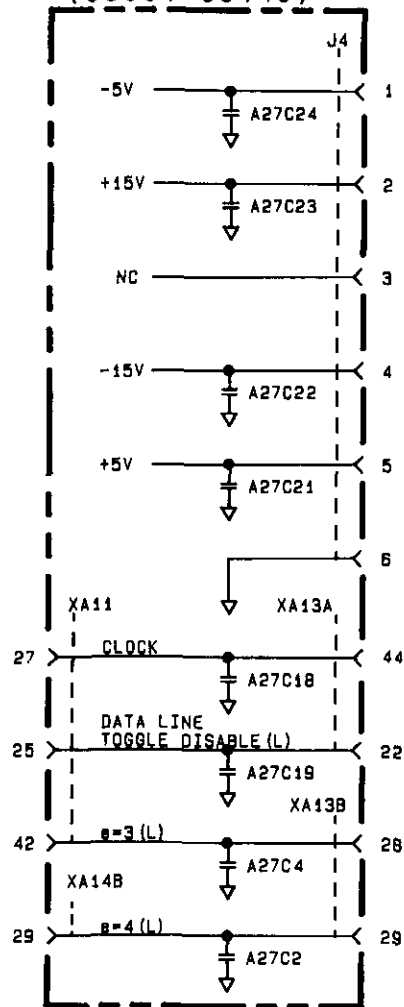
**A27 DIGITAL MOTHERBOARD (08901-60140)**



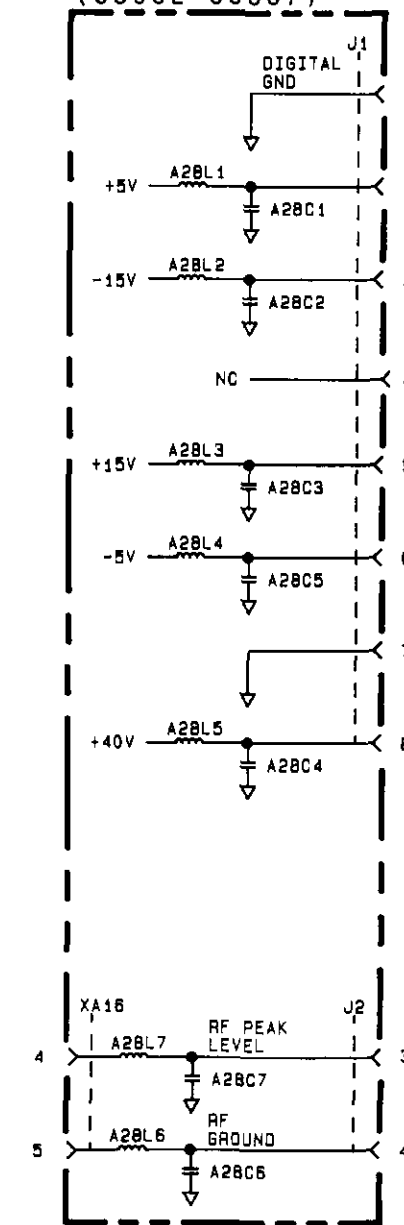
**A27 DIGITAL MOTHERBOARD (08901-60140)**



**A27 DIGITAL MOTHERBOARD (08901-60140)**



**A28 RF MOTHERBOARD (08902-60007)**



A25 AUDIO MOTHERBD  
A27 DIGITAL MOTHERBD  
SEE REVERSE SIDE

A28 RF MOTHERBD  
SERIAL PREFIX: 2535A AND ABOVE

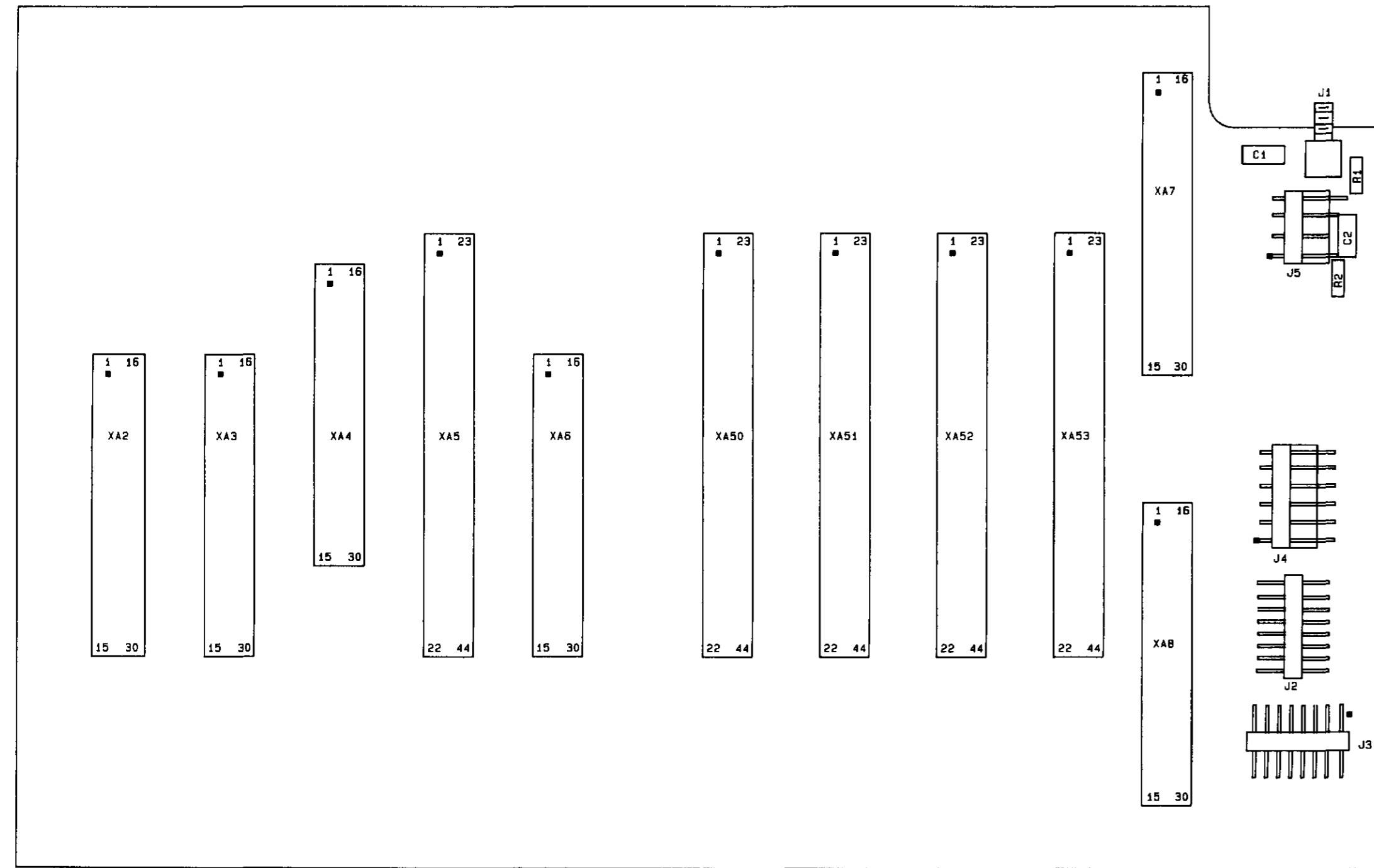
**SS35**

## CHANGES

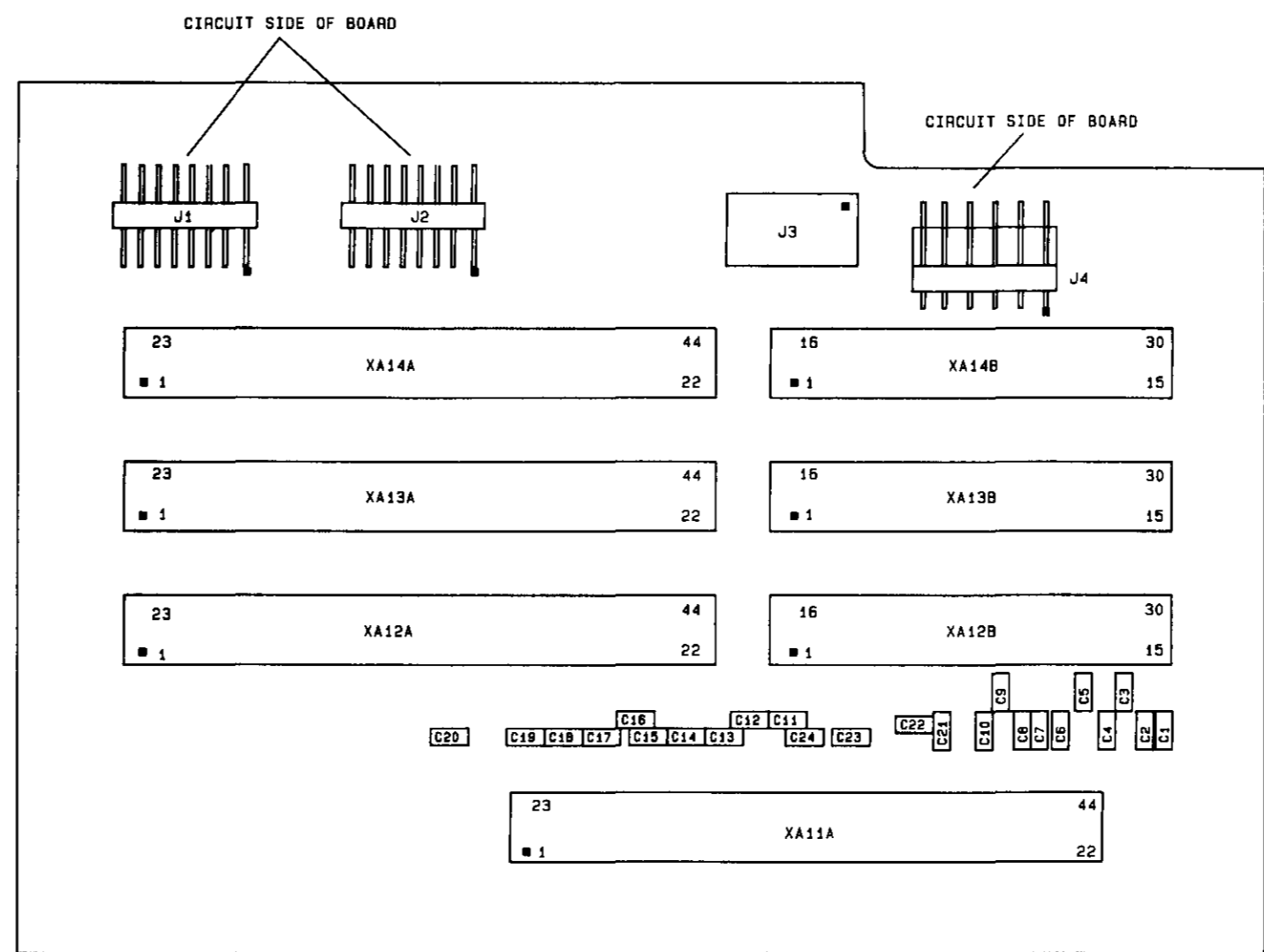
2627A and above

On the A27 schematic:

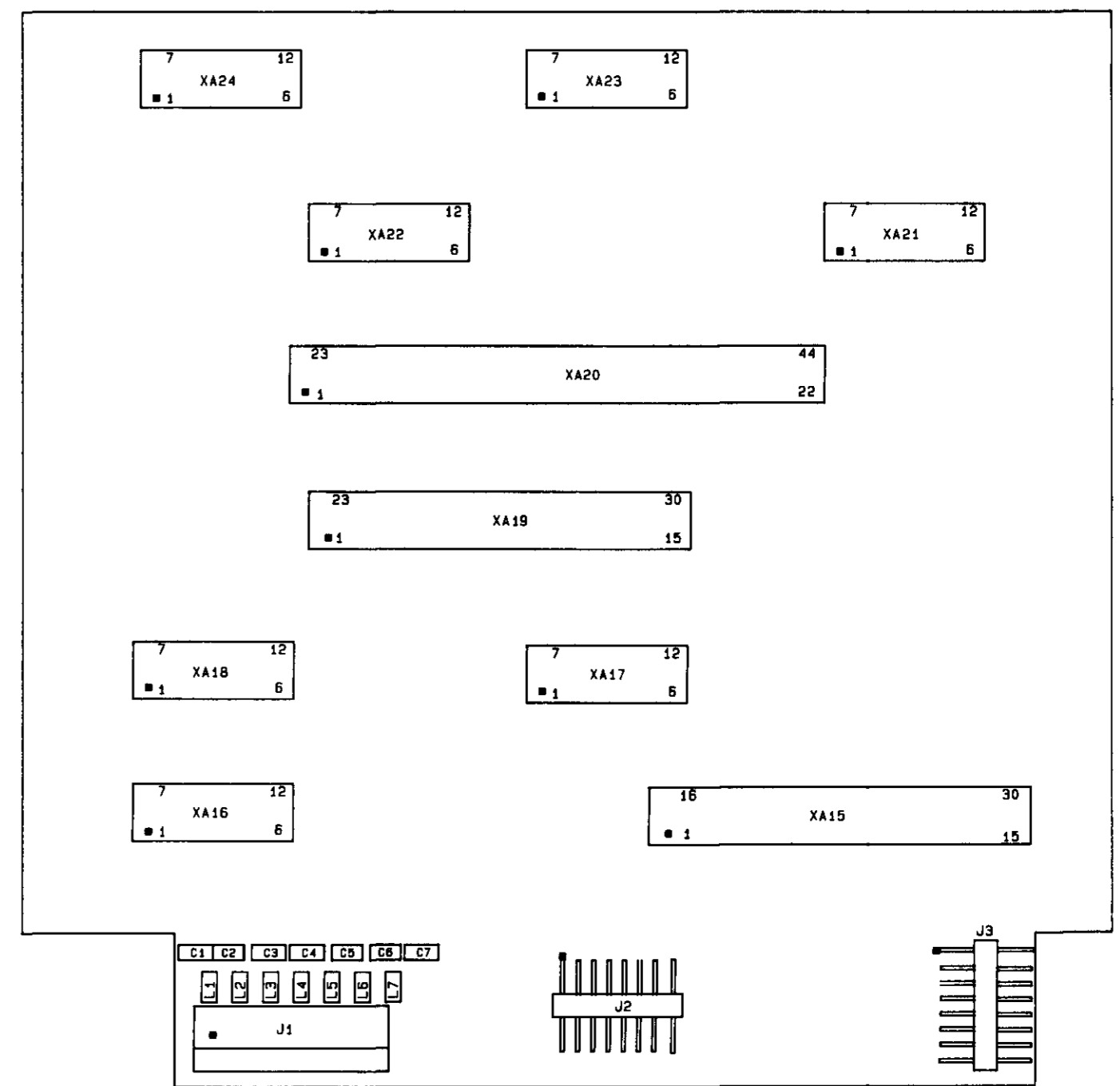
- A27C18 - In the third column from the left, delete A27C18 from the CLOCK line between Pins 27 and 44.



A25



A27



A28

# SERVICE SHEET A

## Topics

- Service Special Function Summary
- Error Message Summary

## SERVICE SPECIAL FUNCTION SUMMARY

### 40.0 Controller Reset.

### 41.0 Controller Clear. (Same as pressing blue key, INSTR PRESET.)

### 42.0 Display Software Date.

### 43.N Measurement Progress and Service Error Message Display Control.

N=0 Disables display of Service Error Messages.

N=1 Enables display of Service Error Messages. Cleared by AUTOMATIC OPERATION.

N=2 Enables display of Service Error Messages. Not cleared by AUTOMATIC OPERATION.

N=40 to N=89 Enables measurement to pause on Measurement Progress and Service Error Message determined by N.

N=140 to N=189 Enables measurement to halt on Measurement Progress and Service Error Message determined by N.

### 44.N Tuned-Flag Control.

N=0 Clears the internal tuned-flag.

N=1 Sets the internal tuned-flag.

**45.N AM and FM Calibrator and RF Power Reference Control.**

N	AM Calibrator		FM Calibrator Frequency	RF Power Reference
	Channel A	Channel B		
0	Off	Off	Low	Off
1	On	Off	Low	Off
2	Off	On	Low	Off
3	On	On	Low	Off
4	Switching 33% AM		Low	Off
5	Switching 100% AM		Low	Off
6	On	Off	High	Off
7	Off	On	High	Off
8	On	On	High	Off
9	Switching 33% AM		High	Off
10	Switching 100% AM		High	Off
11	On	Off	Switching	Off
12	Off	On	Switching	Off
13	On	On	Switching	Off
14	Switching 33% AM		Switching	Off
15	Switching 100% AM		Switching	Off
16	Off	Off	Low	On
17	On	Off	Low	On
18	Off	On	Low	On
19	On	On	Low	On
20	Switching 33% AM		Low	On
21	Switching 100% AM		Low	On
22	On	Off	High	On
23	Off	On	High	On
24	On	On	High	On
25	Switching 33% AM		High	On
26	Switching 100% AM		High	On
27	On	Off	Switching	On
28	Off	On	Switching	On
29	On	On	Switching	On
30	Switching 33% AM		Switching	On
31	Switching 100% AM		Switching	On

**46.N Count Internal Signals.**

- N=1 Intermediate Frequency
- N=2 Voltage-to-Time Converter
- N=3 FM Calibrator
- N=4 High Frequency VCO Divided by 8
- N=8 Selected Time Base Reference
- N=9 External Time Base Reference
- N=A Internal Time Base Reference
- N=B Audio Counter Input or IF Synchronous Detector VCO (depends on which mode was last used)

**48.N IF Synchronous Detector Control.**

- N=0 Displays the dc output voltage.
- N=1 Disconnects the input to the Synchronous Detector and displays the output offset voltage.
- N=2 Disables VCO sweep and displays the VCO frequency.
- N=3 Enables VCO fast sweep up and displays the VCO frequency.
- N=4 Enables VCO fast sweep down and displays the VCO frequency.
- N=5 Enables VCO slow sweep up and displays the VCO frequency.
- N=6 Enables VCO slow sweep down and displays the VCO frequency.
- N=7 Pretunes the VCO and displays the VCO frequency.
- N=8 Disables the VCO and displays the VCO frequency.
- N=9 Displays lock status.

**49.N Display Internal Voltages.**

- N=0 Ground
- N=1 RF Peak Detector Ground
- N=2 RF Peak Detector  $\div 3$
- N=3 RF Peak Detector
- N=4  $\times 10$  AM Calibrator
- N=5  $\times 1$  AM Calibrator
- N=6 Audio Range Detector
- N=7 RMS-to-DC Converter
- N=8 Ground
- N=9 Audio Average Detector
- N=A Audio Peak Detector
- N=B IF Average Detector
- N=C IF RMS Detector (Option Series 030)
- N=D IF Peak Detector
- N=E ALC Current
- N=F RF Average Power or Sensor Identifier. To read average power, precede with Special Function 0.212. To read sensor identifier, precede with Special Function 0.211.

**50.N Display Internal Voltages.**

- N=0 Ground
- N=1 -15V Supply
- N=2 -5V Supply
- N=3 +5V Supply
- N=4 +15V Supply
- N=5 +40V Supply
- N=6 IF Synchronous Detector without DC-to-RMS Converter
- N=7 IF Synchronous Detector with DC-to-RMS Converter

**52.N Read-Only Memory Verification. (N=ROM number: 1, 2, or 3)**

**53.N IF Synchronous Detector Test.**

N=0 Performs all tests in the groups listed for N=1 through N=4.

N=1 Tests the presence and pretune frequency of the VCO.

Fault 1. VCO signal not present.

Fault 2. VCO pretune frequency too low.

Fault 3. VCO pretune frequency too high.

Fault 4. Undefined.

N=2 Tests the direction and speed of the VCO sweep.

Fault 5. VCO will not fast sweep up.

Fault 6. VCO will not slow sweep down.

Fault 7. VCO fast sweep too fast or too slow.

Fault 8. VCO slow sweep too fast or too slow.

N=3 Tests the sweep limits of the VCO.

Fault 9. VCO lower sweep limit too high or too low.

Fault 10. VCO upper sweep limit too high or too low.

Fault 11. Undefined.

Fault 12. Undefined.

N=4 Tests the ability of the VCO to lock and tests the output and linearity of the Synchronous Detector.

Fault 13. Phase Detector does not lock.

Fault 14. Synchronous Detector output too high or too low.

Fault 15. Synchronous Detector offset too high.

Fault 16. Synchronous Detector linearity too low.

**54.N Local Oscillator Test.**

N=0 Performs all tests below—displays number of first test failed.

N	Test Number	Display Digits	Test
1	01	1 and 2	(Undefined)
1	02	3 and 4	Time Base
1	03	5 and 6	Counter
1	04	7 and 8	HF VCO and Divider Output
2	05	1 and 2	HF VCO Tuned to Top of Range
2	06	3 and 4	HF VCO Tuned to Bottom of Range
2	07	5 and 6	HF VCO Tuned to Mid-Range
2	08	7 and 8	(Undefined)
3	09	1 and 2	Gain of Most Significant DAC
3	10	3 and 4	Gain of Least Significant DAC
3	11	5 and 6	(Undefined)
3	12	7 and 8	(Undefined)
4	13	1 and 2	Phase Lock Loop Acquisition
4	14	3 and 4	Phase Lock Loop Stability
4	15	5 and 6	(Undefined)
4	16	7 and 8	(Undefined)
5	17	1 and 2	Tune LF VCXO with DAC
5	18	3 and 4	Gain of LF VCXO Drive
5	19	5 and 6	(Undefined)
5	20	7 and 8	(Undefined)



**55.0 Sweep Doubler Band.**

**56.0 Sweep Bands 4 through 8.**

**57.0 Sweep Bands DBLR through 3.**

**60.0 Key Scan.** (Jumper A13TP1 to A13TP3.)

**61.N Display HP-IB Status.**

N=0 <Addressed to Talk>.<Addressed to Listen> (True=1)

N=1 <DAV>.<RFD><DAC> (True=1)

N=2 <ATN>.<REN> (True=1)

N=3 <SPM>.<SRQ> (True=1)

N=4 PIO Port A (True=1)

<b>Display Digit</b>	1	2	3	4	5	6	7	8
<b>Mnemonic</b>	IO8	IO7	IO6	IO5	IO4	IO3	IO2	IO1

N=5 PIO Port B (True=1)

<b>Display Digit</b>	1	2	3	4	5	6	7	8
<b>Mnemonic</b>	ATN	ARD	AAD	SRQ	RNL	ATT	ATL	SDV

## ERROR MESSAGE SUMMARY

The error messages are grouped by error code as follows:

1. Error 01 through Error 19 and Error 90 through Error 99 are Operating Errors. Refer to the *Operation and Calibration Manual* for additional information.
2. Error 20 through Error 29 are Entry Errors. Refer to the *Operation and Calibration Manual* for additional information.
3. Error 30 through Error 39 are Tuned RF Level Calibration Errors. Refer to the *Operation and Calibration Manual* for additional information.
4. Error 40 through Error 89 are Service Errors. Refer to paragraph 8-8 for additional information.

### NOTE

*Not all of the available error message numbers are used.*

### Operating Errors (Error 01 through Error 19 and Error 90 through Error 99).

- Error 01—IF frequency error.
- Error 02—Input level too high.
- Error 03—Input level too low.
- Error 04—Audio circuits overdriven.
- Error 05—FM squelched.
- Error 06—RF input overload.
- Error 07—Voltmeter and display overload.
- Error 08—Calibrator error.
- Error 09—Option not installed.
- Error 10—Input frequency out of range.
- Error 11—Calculated value out of range.
- Error 12—Time base oven cold (Option 002).
- Error 13—Power sensor not connected.
- Error 14—Power sensor cannot zero.
- Error 15—Calibration factor error.
- Error 16—Audio circuits underdriven.
- Error 17—Selective power measurement error (Option Series 030).
- Error 18—RF power will not calibrate.
- Error 19—Tuned RF level circuits underdriven.
- Error 96—No input signal sensed by instrument (HP-IB only).

### Entry Errors (Error 20 through Error 29)

- Error 20—Entered value out of range.
- Error 21—Invalid key sequence.
- Error 22—Invalid Special Function prefix.
- Error 23—Invalid Special Function suffix.
- Error 24—Invalid HP-IB code.
- Error 25—Special Functions selected not compatible with selected measurement.
- Error 26—End of RF power calibration factor table reached.

**Tuned RF Level Calibration Errors (Error 30 through Error 39)**

- Error 30—Manual input attenuation or gain selection.
- Error 31—Requires new power reference.
- Error 32—Manual IF gain selection.
- Error 33—Power sensor reference error.
- Error 34—Signal lost during calibration.
- Error 35—Level error during calibration.

**Service Errors (Error 40 through Error 89)**

- Error 67—Tuned RF level ranging.
- Error 68—RF amplifier overpower.
- Error 69—IF synchronous detector fails to lock.
- Error 70—Phase lock loop stepdown.
- Error 71—Phase lock loop step up.
- Error 72—Audio overload.
- Error 74—FM Calibrator over deviation.
- Error 75—FM Calibrator under deviation.
- Error 76—AM Calibrator modulators unequal.
- Error 77—AM Calibrator channel B out of range.
- Error 78—Key not found.
- Error 79—Audio autorange rangeback.
- Error 80—Audio settling timeout.
- Error 81—LO tuning adjusted to center signal in IF passband.
- Error 82—Unable to make audio count.
- Error 89—Software error.

## SERVICE SHEET B

**Topic**

- Direct Control Special Function Summary

**General Instrument Readback Control**

Function Readback	Direct Control Special Function	Service Sheet	Meaning of Readback
Overpower Protect	0.050	21	d0=1 if relay tripped
RF Amplifier	0.060	21	d0=1 if overpowered or not switched in
IF Present	0.0E0	9	d0=1 if IF present
FM Squelch	0.170	13	d0=1 if squelched
Audio Overvoltage	0.150	13	d0=1 if overvoltage
Parity	0.1Fd then 0.100	15	d0=0 if d0+d1+d2+d3 is even; d0=1 if odd
Audio Counter	0.296	16	d0=carry output of stage 4
IF Synchronous Detector Lock	0.2F0	7	d0=1 if locked
Time Base Oven	0.300	23	d0=0 if cold
Time Base	0.360	23	d3=state of time base
Counter Carry	0.360	23	d2=1 if carry
Counter Stage 4	0.350	23	d=output
Counter Stage 3	0.340	23	d=output
Counter Stage 2	0.330	23	d=output
Counter Stage 1	0.320	23	d=output
Option Series 030	0.3F0	34	d0=1 if option present
HP-IB Address	0.450	28	d=complement of most significant bits
HP-IB Address	0.460	28	d0=complement of least significant bits; d1=0 if talk only; d2=0 if listen only; d3=1 if Serial Poll Flip-Flop set
Keyboard	0.7s0	25	See following table.

**Keyboard Readback (0.7d0 SPCL).** After entering the Special Function, ground A13TP3. See Service Sheet 25.

Direct Control Special Function	Display vs. Key Pressed			
	000111.0000	001011.0000	001101.0000	001110.0000
0.700	>20 kHz	15 kHz	3 kHz	300 Hz
0.710	750 μs	75 μs	50 μs	25 μs
0.720	LOG/LIN	RATIO	AVG	PEAK HOLD
0.730	FREQ	RF POWER	ΦM	FM
0.740	MHz	9	8	7
0.750	kHz ↑	6	5	4
0.760	kHz ↓	3	2	1
0.770	SPCL	CLEAR	• (Dec. Point)	0
0.780	50 Hz	LCL	(None)	(None)
0.790	PRE DISPLAY	CALIB	ZERO	(None)
0.7A0	PEAK-	PEAK+	(None)	(None)
0.7B0	AM	S (Yellow)	(None)	(None)
0.7C0	AUTO OPER	AUDIO INPUT	(None)	(None)
0.7D0	TRACK MODE	(None)	(None)	(None)
0.7E0	RANGE HOLD	(None)	(None)	(None)
0.7F0	(Blue)	(None)	(None)	(None)

**Hexadecimal Information for Direct Control Special Function Entry**

Hexadecimal Character	Decimal Equivalent	Binary Equivalent	Keystroke Entry	HP-IB Code Entry	Display On Entry
0	0	0000	0	0	0
1	1	0001	1	1	1
2	2	0010	2	2	2
3	3	0011	3	3	3
4	4	0100	4	4	4
5	5	0101	5	5	5
6	6	0110	6	6	6
7	7	0111	7	7	7
8	8	1000	8	8	8
9	9	1001	9	9	9
A	10	1010	S (Shift) 0	X0	A
B	11	1011	S (Shift) 1	X1	b
C	12	1100	S (Shift) 2	X2	C
D	13	1101	S (Shift) 3	X3	d
E	14	1110	S (Shift) 4	X4	E
F	15	1111	S (Shift) 5	X5	F

**1 Power Meter Attenuation Control (0.20d SPCL).** See Service Sheets 1 and 2.

Attenuator 1	Attenuator 2	Direct Control Special Function
0 dB	0 dB	0.203
0 dB	20 dB	0.205
0 dB	40 dB	0.209
40 dB	20 dB	0.204
40 dB	0 dB	0.202

**2 Power Meter Noise Filter Bandwidth and Frequency Offset Mode Control (0.23d SPCL).** See Service Sheet 2.

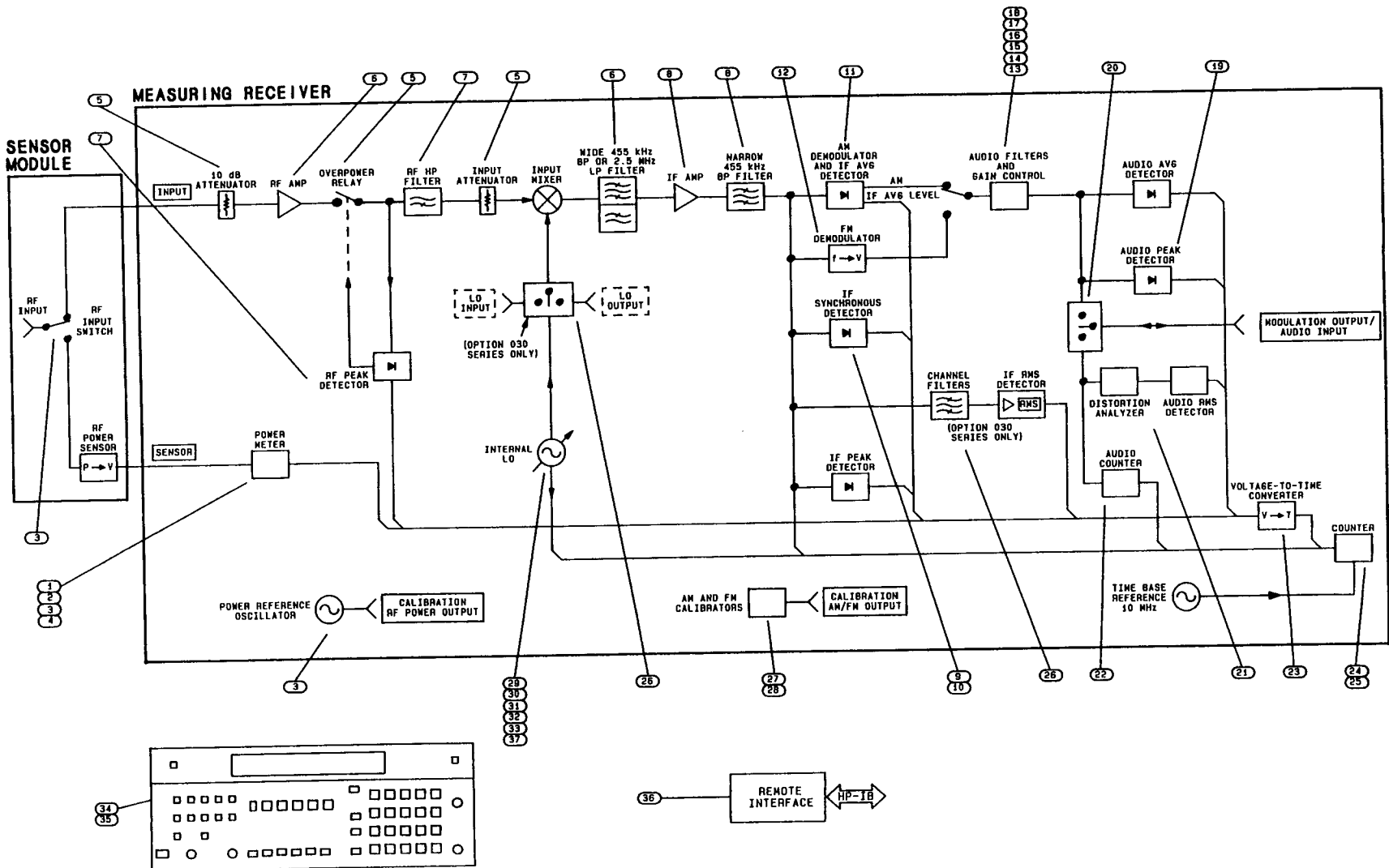
Noise Filter Bandwidth	Frequency Offset Mode	Voltage at FREQ OFFSET TTL OUT	Direct Control Special Function
Wide	Not offset	0 Vdc	0.231
Wide	0-18 GHz	+5 Vdc	0.233
Wide	18-40 GHz	+3 Vdc	0.23F
Narrow	Not offset	0 Vdc	0.230
Narrow	0-18 GHz	+5 Vdc	0.232
Narrow	18-40 GHz	+3 Vdc	0.23E

**3 Sensor Module and Power Calibrator Control (0.21d and 0.24 SPCL).** To actually switch the RF path within a Sensor Module, the module must be triggered. After keying in the Direct Control Special Function, key in 0.24 SPCL. See Service Sheets 2 and 3.

Readback Mode	Power Calibrator	Sensor Module Mode	Direct Control Special Function
Power meter	Off	Power sensor	0.21A
Power meter	On	Power sensor	0.21E
Power meter	On	Thru path	0.216
Sensor type	On	Thru path	0.215

**4 Power Sensor Zeroing DAC Setting.** Key in 0.22d SPCL. The value of the data (d) determines the output of the DAC. See Service Sheet 2.

Modified Block Diagram



**5** **Input RF Attenuators Control and Overpower Reset** (0.04d SPCL). See Service Sheets 4 and 21.

AT2	AT1	Direct Control Special Function	
		Without Overpower Reset	With Overpower Reset
0 dB	0 dB	0.04F	0.047
10 dB	0 dB	0.04D	0.045
10 dB	10 dB	0.04B	0.043
10 dB	20 dB	0.049	0.041
10 dB	30 dB	0.04E	0.046
10 dB	40 dB	0.04C	0.044
0 dB	50 dB	0.04A	0.042

**6** **RF Input Amplifier Control and IF Filter Select** (0.03d SPCL). See Service Sheets 4, 5, and 21.

RF Input Amplifier	IF (Filter)	Direct Control Special Function
Out	1.5 MHz (4 MHz LP)	0.030
Out	455 kHz (455 kHz BP)	0.031
In	1.5 MHz (4 MHz LP)	0.032
In	455 kHz (455 kHz BP)	0.033

**7** **RF Peak Detector Control and 5.25 MHz High-Pass Filter Select** (0.02d SPCL). See Service Sheets 4 and 21.

RF Peak Detector	Direct Control Special Function	
	High-Pass Filter In	High-Pass Filter Out
On	0.02C	0.024
Off	0.028	0.020

**8** **Second IF Amplifier Control and Narrow IF Filter Select** (0.2Cd and 0.2Dd SPCL). See Service Sheet 6.

Attenuator 2	Attenuator 3	Direct Control Special Function
0 dB	0 dB	0.2CB
20 dB	0 dB	0.2C3
0 dB	10 dB	0.2CD
0 dB	20 dB	0.2CE

Attenuator 1	Prog. Gain Amplifier	Narrow IF Bandpass Filter	Direct Control Special Function
0 dB	Normal	Thru path	0.2D5
20 dB	Normal	Thru path	0.2D4
0 dB	Maximum	Thru path	0.2D7
0 dB	Normal	Filter in	0.2D1

**9 IF Synchronous Detector Control (0.2Ed SPCL).** When a Direct Control Special Function is entered, all other functions in the group remain in their previous states. See Service Sheet 7.

Function	Direct Control Special Function
VCO disable	0.2E0
VCO enable	0.2E1
Counter enable	0.2E2
Counter disable	0.2E3
Sweep disable	0.2E4
Sweep enable	0.2E5
Pretune enable	0.2E6
Pretune disable	0.2E7
Sweep down	0.2E8
Sweep up	0.2E9
Sweep fast; clear A0	0.2EA
Sweep slow; set A0	0.2EB
Measure enable	0.2EC
Measure disable	0.2ED
Clear A1	0.2EE
Set A1	0.2EF

**10 IF Synchronous Detector Loop Bandwidth DAC Control (0.2Fd SPCL).** Key in the entire table of Direct Control Special Functions in sequence. The value of the data (d) determines the output of the DAC. See Service Sheet 7.

Weighting of DAC	Direct Control Special Functions
Most significant	0.2EA, 0.2EF, 0.25d
Second most significant	0.2EB, 0.2EE, 0.25d
Least significant	0.2EA, 0.2EE, 0.25d
Execute the sequence	0.2EB, 0.2EF, 0.250

**11 AM ALC Control (0.0Dd SPCL).** See Service Sheets 8 and 9. Also see *Readback Control* table.

ALC Mode	Direct Control Special Function
Off	0.0D0
Fast	0.0D3
Slow	0.0D1

**12 FM Squelch (0.15d SPCL).** See Service Sheet 11. Also see *Readback Control* table.

Squelch	Direct Control Special Function
On	0.150
Off	0.152



**13 Audio Input Select and Audio Overvoltage Detector Reset** (0.11d SPCL). See Service Sheet 13. Also see *Readback Control* table.

Function	Direct Control Special Function
High gain FM; detector reset	0.118
Low gain FM; detector reset	0.112
AM; detector reset	0.111
No input; no detector reset	0.110

**14 Audio Gain Control** (0.12d SPCL). See Service Sheets 12 and 13.

Audio Gain	Direct Control Special Function
High	0.121
Low	0.120

**15 Audio Low-Pass Filter Select** (0.13d SPCL). See Service Sheets 12 and 13.

Low-Pass Filter	Direct Control Special Function
3 kHz	0.130
15 kHz	0.13C
>20 kHz	0.13A
All off	0.139

**16 Audio High-Pass Filter and FM Pre-Display De-emphasis Control** (0.14d SPCL). See Service Sheet 13.

High-Pass Filter	Direct Control Special Function	
	Pre-Display On	Pre-Display Off
300 Hz	0.144	0.14C
50 Hz	0.142	0.14A
All Off	0.141	0.149

**17 FM De-emphasis, Phase Modulation, and + or - Peak Detector Control** (0.10d SPCL). See Service Sheet 13.

Function	Direct Control Special Function	
	Peak+ Detector	Peak- Detector
De-emphasis off	0.100	0.108
De-emphasis 25 $\mu$ s	0.101	0.109
De-emphasis 50 $\mu$ s	0.104	0.10C
De-emphasis 75 $\mu$ s	0.102	0.10A
De-emphasis 750 $\mu$ s	0.103	0.10B
Phase modulation	0.105	0.10D

**18 Discharge Absolute Peak Detector.** Key in 0.160 SPCL several times. See Service Sheet 13.

**19 Voltmeter Peak Detector Control (0.1Ed SPCL).** See Service Sheet 14.

Mode	Direct Control Special Function
Slow charge	0.1E3
Fast charge	0.1E1
Very fast charge; hold	0.1E0
Discharge	0.1E0 then 0.1E1

**20 Modulation Output/Audio Input Select (0.2Bd SPCL).** See Service Sheet 16.

Mode	Direct Control Special Function
Output	0.2B0
Input	0.2B1

**21 Distortion Analyzer Control (0.2Ad SPCL).** See Service Sheet 16.

Mode	Amplifier 1 Gain	Amplifier 2 Gain	Notch Frequency	Direct Control Special Function
Thru path	0 dB	0 dB	1 kHz	0.2A0
Thru path	20 dB	0 dB	1 kHz	0.2A2
Notch filter	0 dB	0 dB	1 kHz	0.2A1
Notch filter	0 dB	20 dB	1 kHz	0.2A5
Notch filter	0 dB	0 dB	400 Hz	0.2A9

**22 Audio Counter Control (0.28d and 0.29d SPCL).** The table follows the normal count sequence. See Service Sheet 16. Also see *Readback Control* table.

Operation	Direct Control Special Function
<b>Count Sequence</b>	
Enable inputs of stages 1 and 3	0.296
Reset counter	0.282
Release counter reset	0.28A
Initiate count on next input pulse	0.28E
Initiate count stop on next input pulse	0.28A
<b>Readback Sequence</b>	
Enable readback pulsing of stages 3 and 4	0.288
Disable readback of stages 3 and 4	0.292
Enable readback pulsing of stages 1 and 2	0.28C
Disable readback of stages 1 and 2	0.294

**23 Voltmeter Input Select (0.1Cd and 0.1Fd SPCL).** See Service Sheet 15.

Selector	Input	Direct Control Special Function
A5U10	Ground	0.1C0 then 0.1F0
A5U10	RF Peak Detector Ground	0.1C0 then 0.1F1
A5U10	RF Peak Detector ÷3	0.1C0 then 0.1F2
A5U10	RF Peak Detector	0.1C0 then 0.1F3
A5U10	×10 AM Calibrator	0.1C0 then 0.1F4
A5U10	×1 AM Calibrator	0.1C0 then 0.1F5
A5U10	Audio Range Detector	0.1C0 then 0.1F6
A5U10	RMS-to-DC Converter	0.1C0 then 0.1F7
A5U11	Ground	0.1C0 then 0.1F8
A5U11	Audio Average Detector	0.1C0 then 0.1F9
A5U11	Audio Peak Detector	0.1C0 then 0.1FA
A5U11	IF Average Detector	0.1C0 then 0.1FB
A5U11	IF RMS Detector (Opt. Series 030)	0.1C0 then 0.1FC
A5U11	IF Peak Detector	0.1C0 then 0.1FD
A5U11	ALC Current	0.1C0 then 0.1FE
A5U11	Sensor Identifier	0.211, 0.1C0, then 0.1FF
A5U11	RF Average Power	0.212, 0.1C0, then 0.1FF
A5U12	Ground	0.1C4 then 0.1F8
A5U12	-15V Supply	0.1C4 then 0.1F9
A5U12	-5V Supply	0.1C4 then 0.1FA
A5U12	+5V Supply	0.1C4 then 0.1FB
A5U12	+15V Supply	0.1C4 then 0.1FC
A5U12	+40V Supply	0.1C4 then 0.1FD
A5U12	IF Synch. Det. without DC-RMS Converter	0.1C4 then 0.1FE
A5U12	IF Synch. Det. with DC-RMS Converter	0.1C4 then 0.1FF

**24 Counter Input Select (0.31d SPCL).** See Service Sheet 23.

Input	Direct Control Special Function
High Frequency VCO ÷8	0.314
Intermediate Frequency	0.315
Voltage-to-Time Converter or Audio	0.316
FM Calibrator	0.317
Selected Time Base Reference	0.31C
External Time Base Reference	0.31D
Internal Time Base Reference	0.31E

**25 Counter Control (0.36d and 0.370 SPCL).** See Service Sheet 23. Also see *Readback Control* table.

Function	Direct Control Special Function
Enable low-frequency count; Enable high-frequency count	0.363
Enable low-frequency count; Disable high-frequency count	0.362
Disable low-frequency count; Enable high-frequency count	0.361
Disable counting	0.360
Initialize counter hardware	0.370

**26 Selective Power IF Filter, IF Gain, and LO Input Control (Option Series 030)** (0.39d, 0.3Dd, and 0.3Ed SPCL). See Service Sheets 33 and 34. Also see *Readback Control* table.

First Channel Filter	Channel Output Attenuator	Local Oscillator	Direct Control Special Function
Filter 1	20 dB	Internal	0.3D0
Filter 1	0 dB	Internal	0.3D1
Filter 2	20 dB	Internal	0.3D2
Filter 1	20 dB	External	0.3D4

Attenuator			Second Channel Filter	Direct Control Special Function
1	2	3		
20 dB	20 dB	20 dB	Filter 1	0.390
0 dB	20 dB	20 dB	Filter 1	0.391
20 dB	0 dB	20 dB	Filter 1	0.392
20 dB	20 dB	0 dB	Filter 1	0.394
20 dB	20 dB	20 dB	Filter 2	0.398

Attenuator 4	Direct Control Special Function
0 dB	0.3E7
5 dB	0.3EB
10 dB	0.3ED
15 dB	0.3EE

**27 FM Calibrator Control** (0.19d SPCL). See Service Sheet 29.

Frequency	Direct Control Special Function
Switching	0.193
High	0.192
Low	0.191

**28 AM Calibrator Control** (0.18d SPCL). See Service Sheet 30.

Mode		Direct Control Special Function
Channel A	Channel B	
On	Switching	0.184
On	Off	0.186
Off	On	0.181
On	On	0.185
Off	Off	0.183

**29 LO Band Control** (0.00d SPCL). See Service Sheet 17.

Band Name	LO Output Frequency (MHz)	Direct Control Special Function
DBLR	640-1300	0.00A
0	320-640	0.009
1	160-320	0.008
2	80-160	0.007
3	40-80	0.006
4	20-40	0.005
5	10-20	0.004
6	5-10	0.003
7	2.5-5	0.002
8	1.25-2.5	0.001
Output Disable	No output	0.000

**30** **LO Tune Mode Control** (0.01d SPCL). Also key in 0.0FF SPCL to inhibit the sweep current sources. See Service Sheet 20.

Tune Mode	Direct Control Special Function
Close sampler loop; DAC to LF VCXO	0.013
Close sampler loop; DAC off	0.017
Close track loop; DAC to LF VCXO	0.019
Close track loop; DAC off	0.01D
Loops open; DAC to LF VCXO	0.01B
Loops open; DAC to HF VCO	0.01E
Loops open; DAC off	0.01F

**31** **LO Sweep and IF Detector Latch Control** (0.0Fd SPCL). See Service Sheets 9 and 20.

Sweep Mode and IF Present Latch Status	Direct Control Special Function
Enable latch to stop sweep down	0.0FF
Sweep down; reset latch	0.0FE
Sweep up; reset latch	0.0F2

**32** **LF VCXO and HF VCO Tune Line Filter Control and IF Level Detector Reset** (0.0Fd SPCL). See Service Sheets 9, 20, and 23.

Filter Bandwidth and IF Level Detector Reset	Direct Control Special Function
Narrow filters; detector not reset	0.0F8
Wide filters; detector not reset	0.0FA
Narrow filters; detector reset	0.0F9 then 0.0F8
Wide filters; detector reset	0.0FB then 0.0FA

**33** **DAC Setting (LO Frequency Control)** (0.08d to 0.0Bd SPCL). The value of the data (d) determines the output of the DAC. See Service Sheet 20.

Weighting of DAC	Direct Control Special Function
Most significant	0.08d
Second most significant	0.09d
Second least significant	0.0Ad
Least significant	0.0Bd

**34** **Annunciator and Key Light Control** (0.50d to 0.57d SPCL). See Service Sheet 27.

Title	Light Type	Direct Control Special Function
50 Hz	Key Light	0.50F
300 Hz	Key Light	0.50D
3 kHz	Key Light	0.50B
15 kHz	Key Light	0.509
>20 kHz	Key Light	0.507
PEAK+	Key Light	0.505
PEAK-	Key Light	0.503
PEAK HOLD	Key Light	0.501
PRE DISPLAY	Key Light	0.51F
25 $\mu$ s	Key Light	0.51D
50 $\mu$ s	Key Light	0.51B
75 $\mu$ s	Key Light	0.519
750 $\mu$ s	Key Light	0.517
ZERO	Key Light	0.515
CALIBRATE	Key Light	0.513
RMS CAL AVG	Key Light	0.511
S (Shift)	Key Light	0.52F
AM	Key Light	0.52D
FM	Key Light	0.52B
$\Phi$ M	Key Light	0.529
RF POWER	Key Light	0.527
FREQ	Key Light	0.525
RATIO	Key Light	0.523
TRACK MODE	Key Light	0.521
RANGE HOLD	Key Light	0.53F
(Blue)	Key Light	0.53D
SPCL	Key Light	0.53B
AUDIO INPUT	Key Light	0.539
DISABLE ERROR	Annunciator	0.537
RMS	Annunciator	0.535
dB EXT ATTEN	Annunciator	0.533
AUTO TUNING	Annunciator	0.531
%	Annunciator	0.54F
MHz	Annunciator	0.54D
kHz	Annunciator	0.54B
Hz	Annunciator	0.549
W	Annunciator	0.547
dBm	Annunciator	0.545
dB	Annunciator	0.543
rad	Annunciator	0.541
mV	Annunciator	0.55F
$\mu$ V	Annunciator	0.55D
REL	Annunciator	0.55B
V	Annunciator	0.559
400 Hz	Annunciator	0.555
1 kHz	Annunciator	0.553
LIMIT	Annunciator	0.551
RECAL	Annunciator	0.56F
AM	Annunciator	0.56D
FM	Annunciator	0.56B
$\Phi$ M	Annunciator	0.569
LISTEN	Annunciator	0.567
TALK	Annunciator	0.565
REMOTE	Annunciator	0.563
SRQ	Annunciator	0.561
UNCAL	Annunciator	0.57F
f OFS	Annunciator	0.573

**35** **Display and Decimal Point Control** (0.60d to 0.69d SPCL). See Service Sheet 26.

Digit Number	Direct Control Special Function	Segment Displayed	d
1	0.60d	a	5
2	0.61d	b	3
3	0.62d	c	D
4	0.63d	d	9
5	0.64d	e	F
6	0.65d	f	7
7	0.66d	g	1
8	0.67d	dp	B
9	0.68d		
10	0.69d		

**36** **Remote Interface Assembly** (0.400 to 0.474 SPCL). See Service Sheet 28.

Function	Direct Control Special Function
Clear DAC Flip-Flop.	0.400
Clear Talk and Listen Address Flip-Flops.	0.410
Set Talk, clear Listen Address Flip-Flops.	0.411
Clear Talk, set Listen Address Flip-Flops.	0.412
Set Talk and Listen Address Flip-Flops*.	0.413
Clear Remote Enable (REN) Flip-Flop.	0.420
Set Remote Enable (REN) Flip-Flop.	0.424
Allow Interface Control ROM to be disabled.	0.430
Allow Interface Control ROM to be enabled.	0.440
Clear Serial Poll Flip-Flop.	0.470
Set Serial Poll Flip-Flop (unless IFC true).	0.474

\* Disables instrument. Re-establish control by turning the instrument to STBY, then to ON, or by issuing the Local message via the HP-IB.

**37** **Track Loop Mode Control (2535A and Above)** (0.07d SPCL). See Service Sheet 20 (2535A and Above).

Mode	Direct Control Special Function
1.5 MHz IF	0.070
455 kHz Wide IF	0.072
455 kHz Narrow IF	0.076