

MODEL 2250

SECTION 5

REPAIR

5-1. INTRODUCTION.

This section provides procedures for the removal and replacement of assemblies and parts found to be defective. Use the following list of removals and replacements to help select the best procedure needed to effect a repair after troubleshooting.

<u>Procedure</u>	<u>Paragraph</u>
Circuit Card Assemblies (CCAs) A1 to A14 Removal	5-2a
CCAs A4, A5, A8, A9, A12 Shield Removal	5-2b
CCAs A10, A13 Shield Removal	5-2c
CCAs A11, A14 Shield Replacement	5-2d
Circuit Card Assemblies A1 to A14 Replacement	5-3
CCAs A4, A5, A8, A9, A12 Shield Replacement	5-3a
CCAs A10, A13 Shield Replacement	5-3b
CCAs A11, A14 Shield Replacement	5-3c
Circuit Card Assemblies A1 to A14 Replacement	5-3d
Front Bezel Assembly A15 Removal and Disassembly	5-4
Front Bezel Assembly A15 Removal	5-4a
Isolation Assemblies A15A4, A15A5 Removal	5-4b
Display Driver CCA A15A2, Keyboard A15A1, and Display CCA A15A3 Removal	5-4c
Front Bezel Assembly A15 Reassembly and Replacement	5-5
Display Driver CCA A15A2, Keyboard A15A1, and Display CCA A15A3 Replacement	5-5a
Isolation Assemblies A15A4, A15A5, and Shield Replacement	5-5b
Front Bezel Assembly A15 Replacement	5-5c
Rear Panel Assembly A17 Removal and Disassembly	5-6
Rear Panel Assembly A17 Removal	5-6a

MODEL 2250

<u>Procedure</u>	<u>Paragraph</u>
Isolated Power Supplies A17PS2 and A17PS3 Removal	5-6b
Main Power Supply Assembly A17PS1 Removal	5-6c
Main Power Transformer A17T1 Removal	5-6d
Fan Assembly A17B1 Removal	5-6e
Main Harness Assembly A17W1 Removal	5-6f
Address Switch A17S1 Removal	5-6g
I/O Cable Assembly A17W5 Removal	5-6h
Rear Panel Assembly A17 Reassembly and Replacement	5-7
I/O Cable Assembly A17W5 Replacement	5-7a
Address Switch A17S1 Replacement	5-7b
Main Harness Assembly A17W1 Replacement	5-7c
Fan Assembly A17B1 Replacement	5-7d
Main Transformer A17T1 Replacement	5-7e
Main Power Supply Assembly A17PS1 Replacement	5-7f
Isolated Power Supplies A17PS2 and A17PS3 Replacement	5-7g
Rear Panel Assembly A17 Replacement	5-7h
Motherboard A16A1 Removal	5-8
Motherboard A16A1 Replacement	5-9

Use standard shop practices and refer to the exploded view in figure 5-1 when doing removal and replacement.

WARNING

Disconnect DAV from ac power and disconnect signal and reference inputs at front and rear panel connectors before attempting any removal and replacement.

5-2. CIRCUIT CARD ASSEMBLIES (CCAs) A1 TO A14 REMOVAL.

- a. CCA REMOVAL. (See figure 5-1, sheet 1.)
 1. Remove four screws (1) and remove DAV top cover (2).
 2. Before removing CCAs A3 to A8, disconnect I/O cable connector A17W5J2 (3) from connector A15A3P2 (4).

MODEL 2250

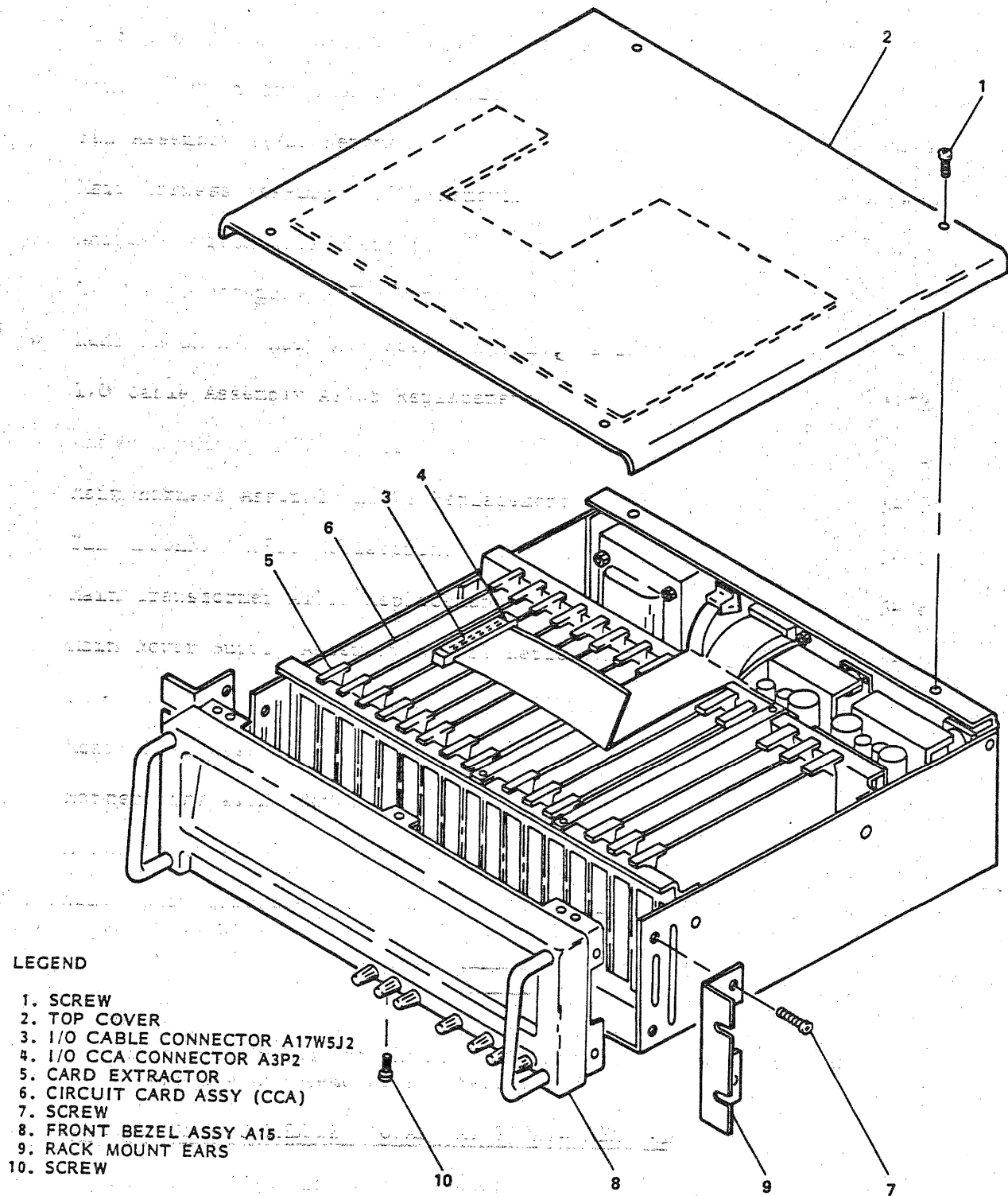
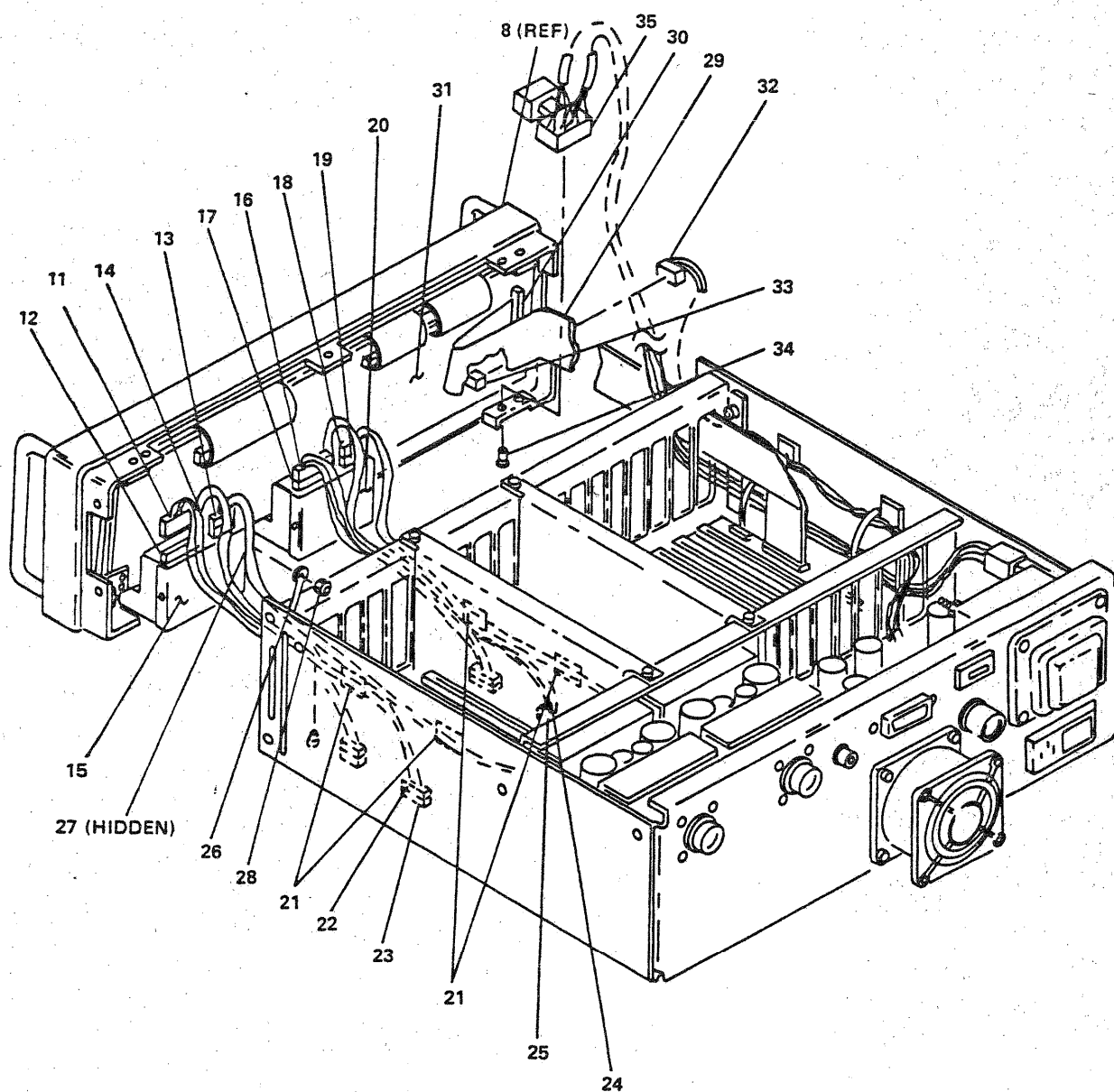


Figure 5-1. DAV, Exploded View (Sheet 1 of 7)

MODEL 2250

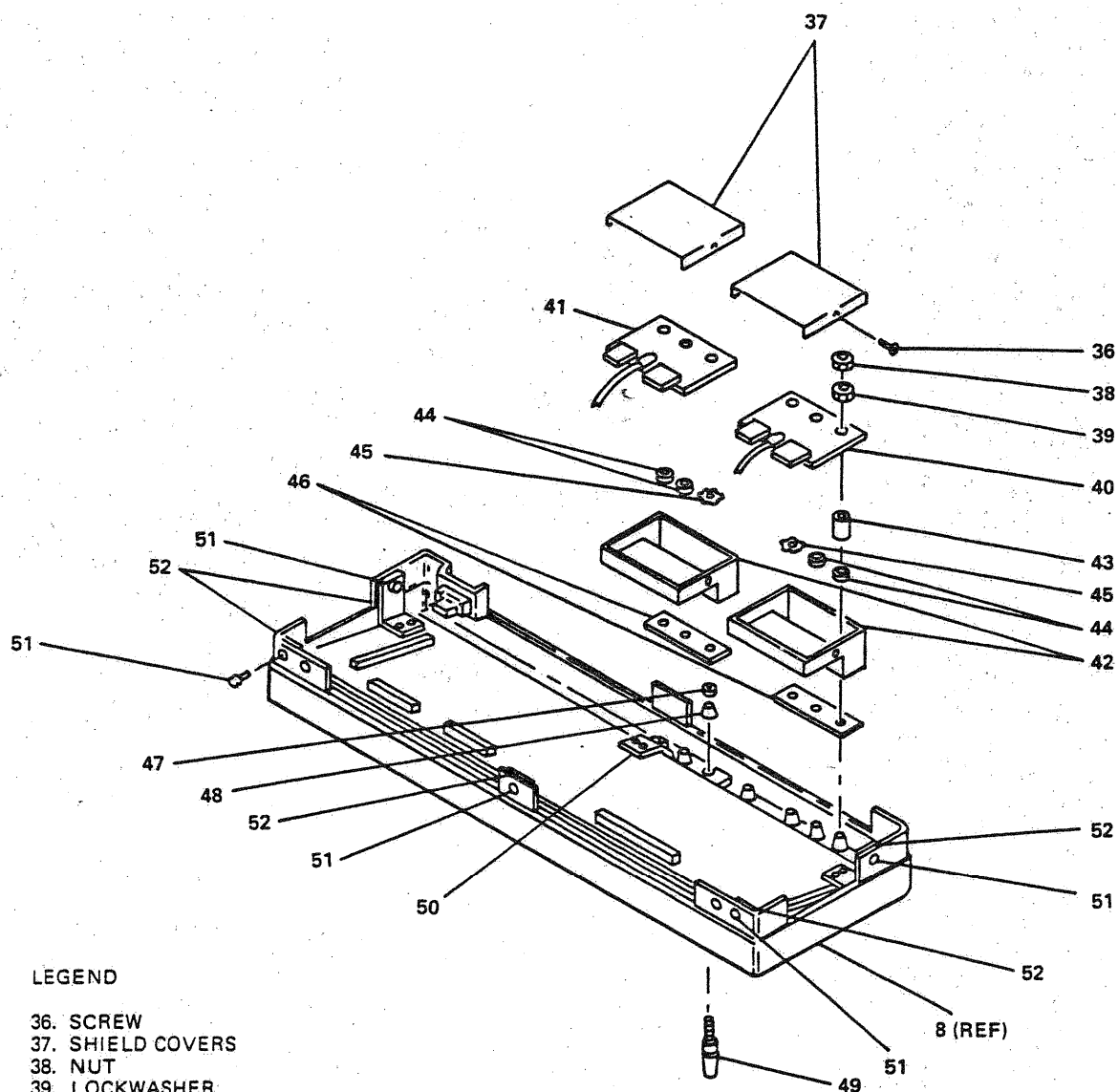


LEGEND

- | | |
|------------------------------------|-------------------------------------|
| 11. HARNESS JACK | 23. CONNECTOR A16A1J23 |
| 12. CONNECTOR A15A4J1 | 24. HARNESS JACK |
| 13. HARNESS JACK | 25. CONNECTOR A16A1J20 |
| 14. CONNECTOR A15A4J2 | 26. GROUND WIRE |
| 15. SIGNAL ISOLATION ASSY A15A4 | 27. CIRCUIT GROUND BINDING POST |
| 16. HARNESS JACK | 28. NUT |
| 17. CONNECTOR A15A5J1 | 29. 34-PIN RIBBON CABLE |
| 18. HARNESS JACK | 30. CONNECTOR A15A2J3 |
| 19. CONNECTOR A15A5J2 | 31. DISPLAY DRIVER CCA A15A2 |
| 20. REFERENCE ISOLATION ASSY A15A5 | 32. MAIN POWER HARNESS JACK A15A2J5 |
| 21. CABLE TIES | 33. CONNECTOR A16A18J5 |
| 22. HARNESS JACK | 34. SCREW |
| | 35. POWER SWITCH A15SW1 |

Figure 5-1. DAV, Exploded View (Sheet 2 of 7)

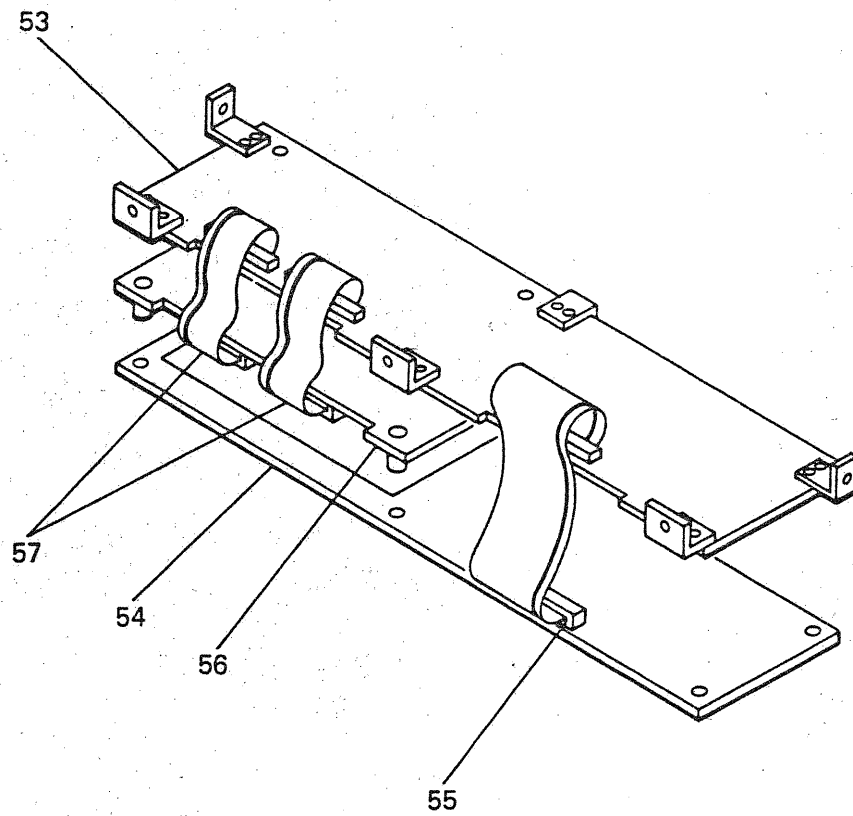
MODEL 2250



LEGEND

- 36. SCREW
- 37. SHIELD COVERS
- 38. NUT
- 39. LOCKWASHER
- 40. SIGNAL ISOLATION ASSY A15A4 P/N 787448-1
- 41. REFERENCE ISOLATION ASSY A15A5 P/N 787448-2
- 42. ASSEMBLY SHIELDS
- 43. MALE-FEMALE STANDOFFS
- 44. NYLON INSULATORS
- 45. EXTERNAL TOOTH LOCKWASHER
- 46. INSULATORS
- 47. NUT
- 48. INSULATOR
- 49. REFERENCE CHANNEL BINDING POST
- 50. BRACKET
- 51. SCREW
- 52. BRACKET

Figure 5-1. DAV, Exploded View (Sheet 3 of 7)



LEGEND

- 53. DISPLAY DRIVER CCA A15A2
- 54. KEYBOARD A15A1
- 55. 50-PIN CONNECTOR
- 56. DISPLAY CCA A15A3
- 57. 40-PIN CONNECTORS

Figure 5-1. DAV, Exploded View (Sheet 4 of 7)

MODEL 2250

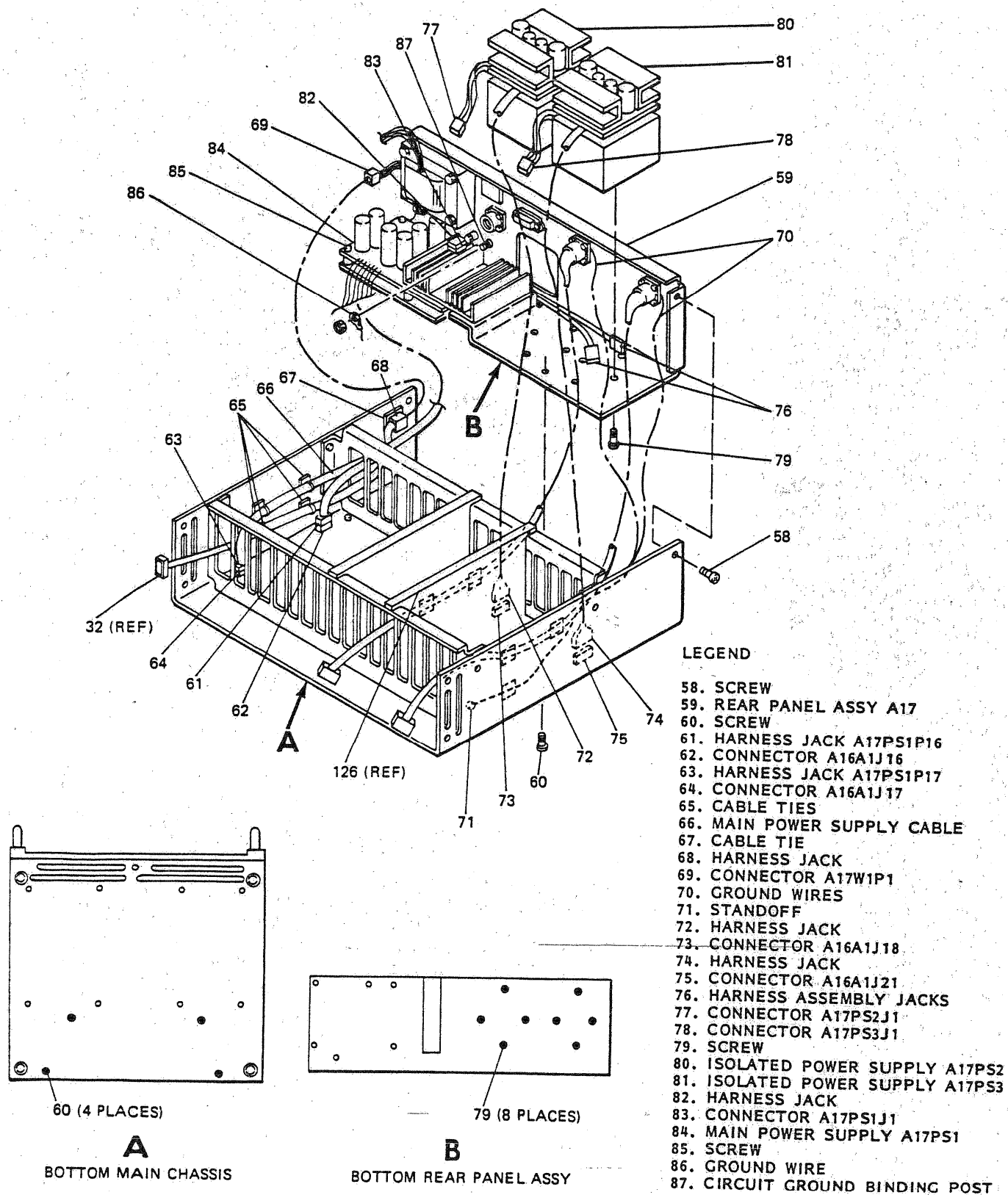


Figure 5-1. DAV, Exploded View (Sheet 5 of 7)

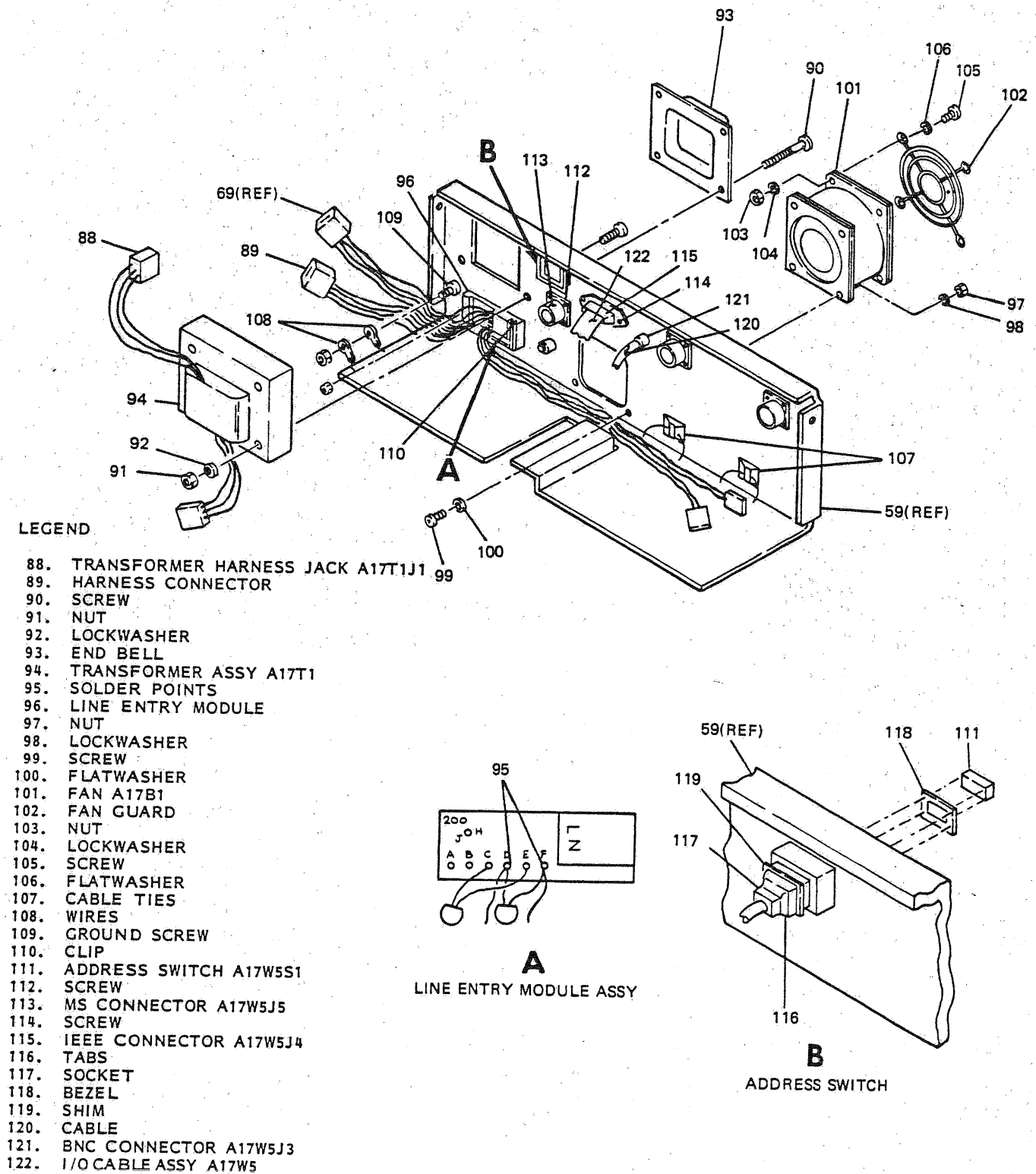
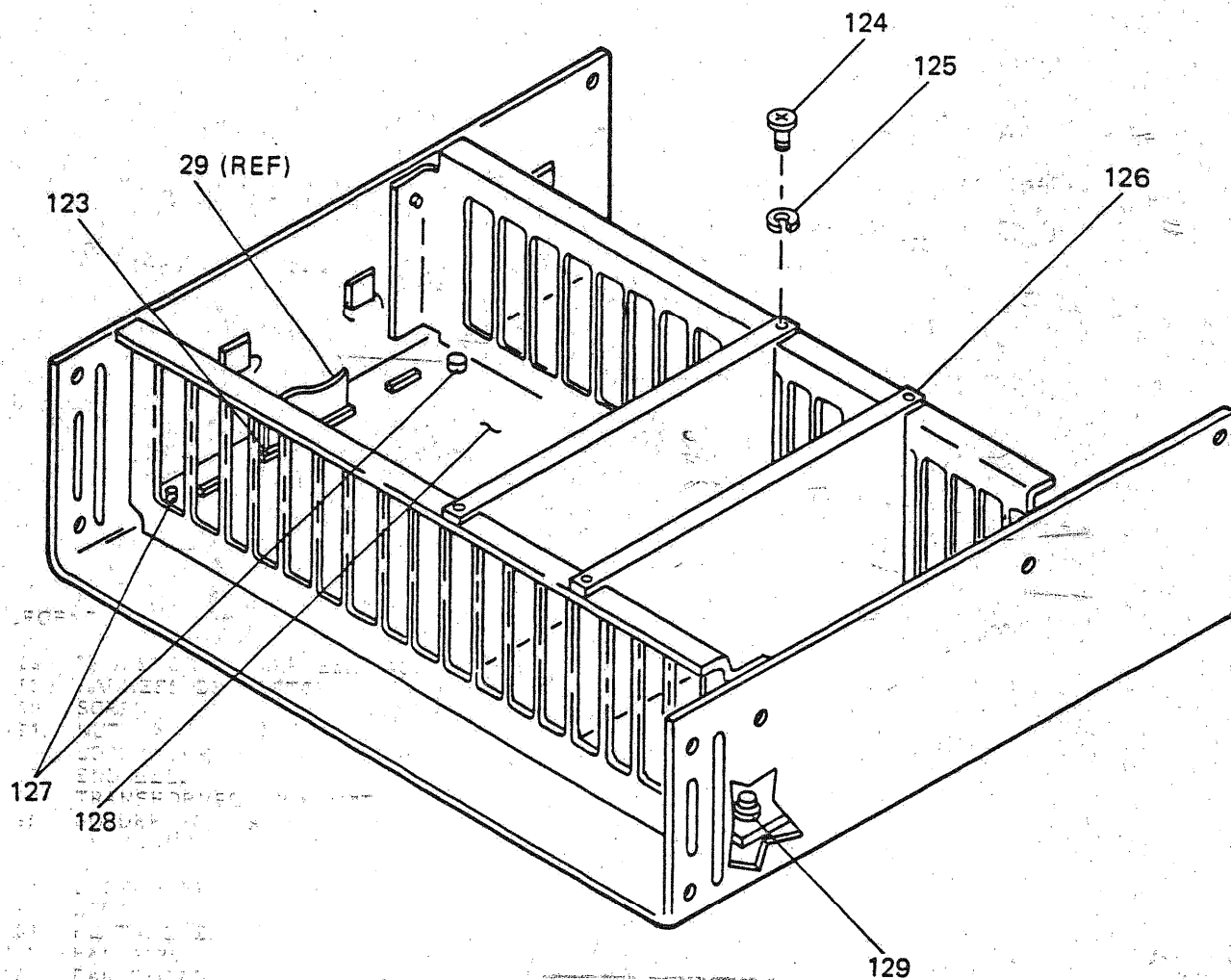


Figure 5-1. DAV, Exploded View (Sheet 6 of 7)



LEGEND

- 123. MOTHERBOARD CONNECTOR A16A1J1
- 124. SCREW
- 125. LOCKWASHER
- 126. BULKHEAD
- 127. SELF-LOCKING NUT
- 128. MOTHERBOARD A16A1
- 129. STANDOFF

Figure 5-1. DAV, Exploded View (Sheet 7 of 7)

MODEL 2250

3. Pull up on card extractors (5) and carefully pull CCA (6) out of motherboard connector.

b. CCAs A4, A5, A8, A9, A12, SHIELD REMOVAL.

1. Remove CCA as per paragraph a.
2. Remove four screws and lockwashers (1, figure 5-2) from panel (2) side of CCA (3) and remove shield (4). Remove CCA.

c. CCAs A10 AND A13 SHIELD REMOVAL.

1. Remove CCA as per paragraph a.
2. Remove four screws and lockwashers (1, figure 5-3) from shield side of CCA and remove shield (2). Remove CCA (3) from panel (4).

d. CCAs A11 AND A14 SHIELD REMOVAL.

1. Remove CCA as per paragraph a.
2. Remove four screws and lockwashers (1, figure 5-4) from panel (2) side of CCA (3) and remove shield (4). Remove CCA.

5-3. CIRCUIT CARD ASSEMBLIES A1 TO A14 REPLACEMENT.

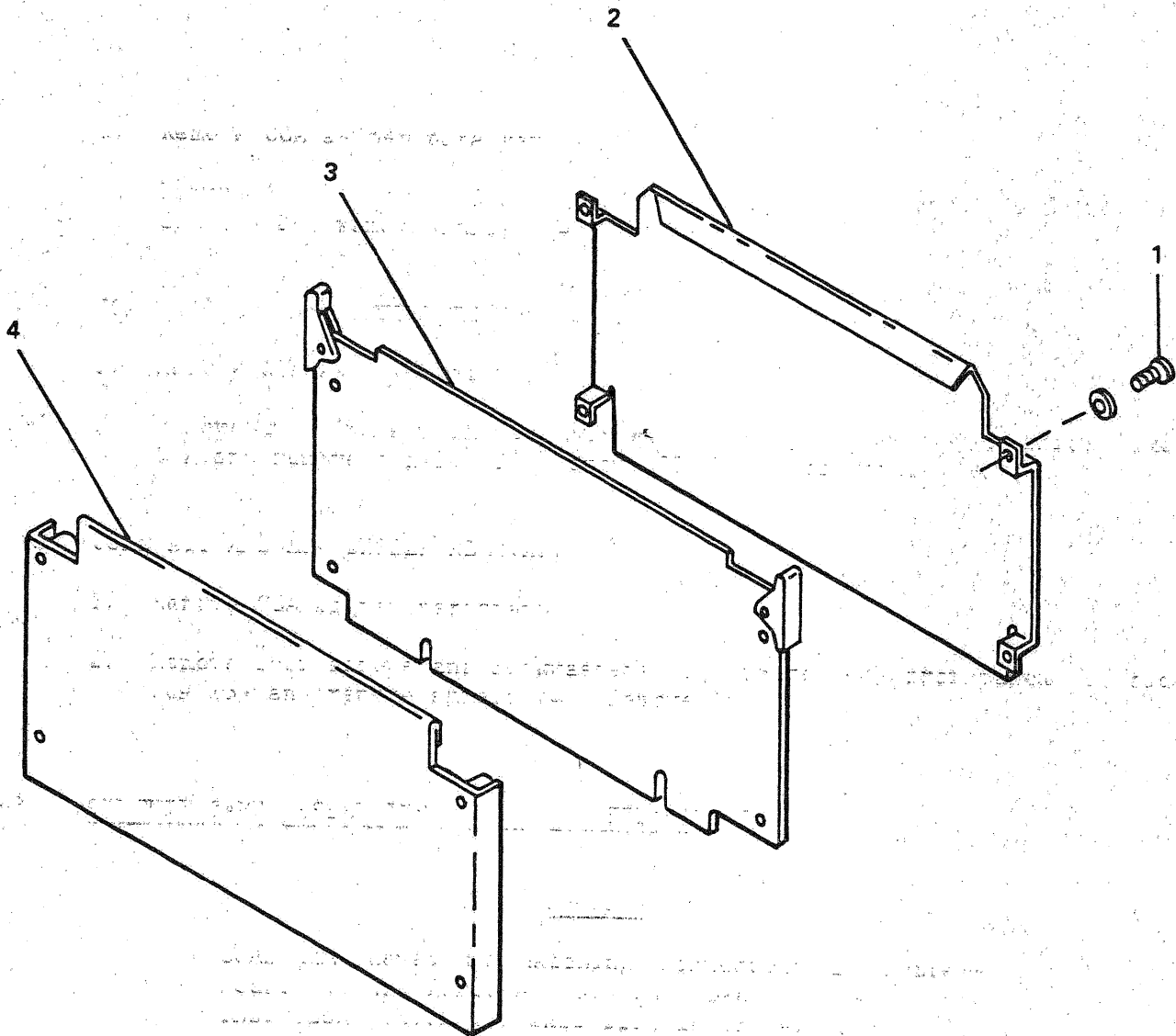
CAUTION

CCAs are keyed to matching connectors in motherboard. Do not force any CCA that meets resistance to insertion. Check for insertion in proper slot.

a. CCAs A4, A5, A8, A9, A12 SHIELD REPLACEMENT.

1. Place CCA (3, figure 5-2) component side against shield (4). Place panel (2) against back of CCA (3). Align screw holes and secure with four screws and lockwashers (1).
2. Replace CCA as per paragraph c.

MODEL 2250



LEGEND

- 1. SCREW AND LOCKWASHER
- 2. PANEL
- 3. CCA
- 4. SHIELD

Figure 5-2. CCAs A4, A5, A8, A9, A12 Shield Removal or Replacement

b. CCAs A10, A13, SHIELD REPLACEMENT.

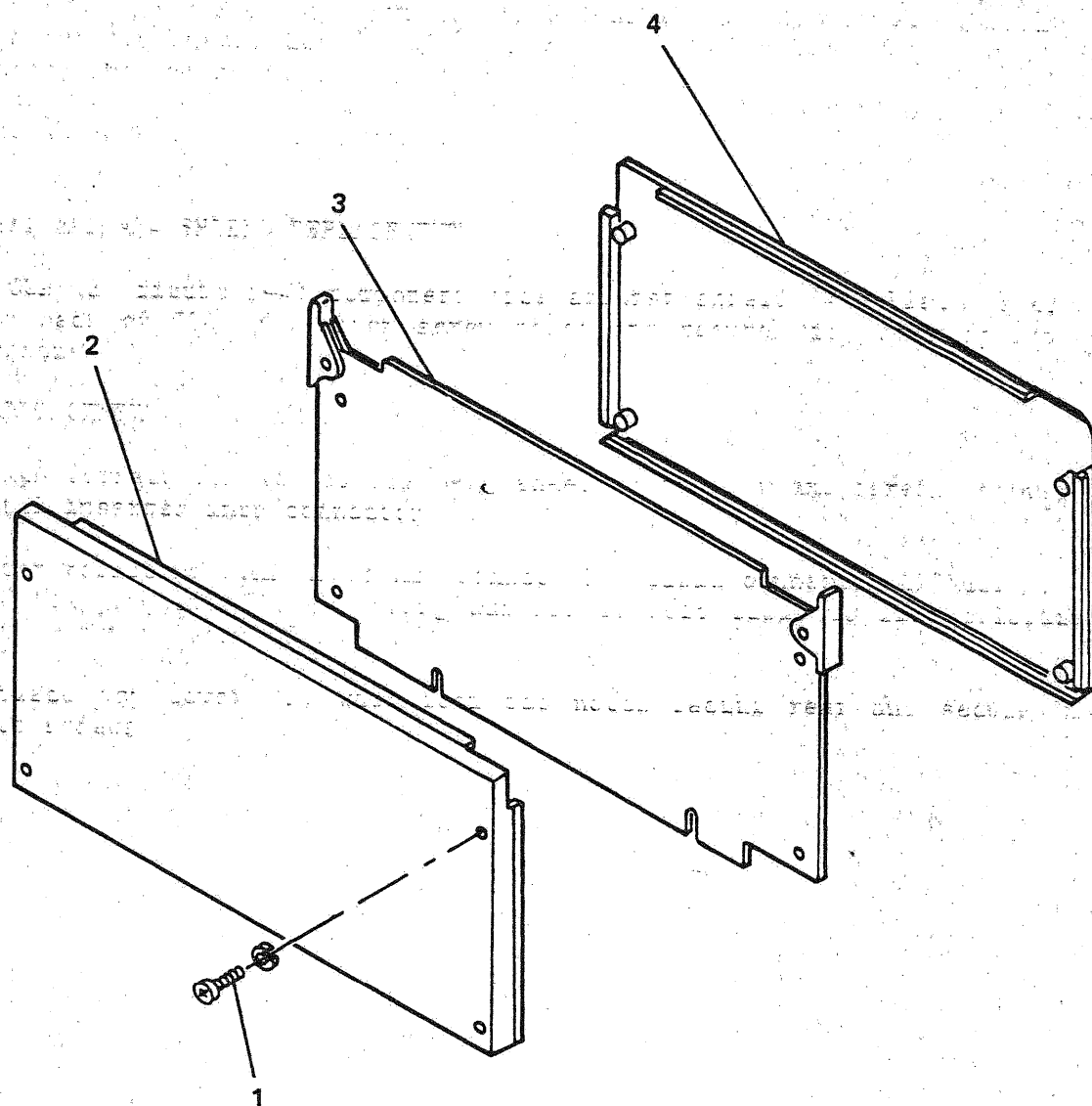
1. Place CCA (3, figure 5-3) wiring side against panel (4). Place shield (2) against component side of CCA. Align screw holes and secure with four screws and lockwashers (1).
2. Replace CCA as per paragraph d.

c. CCAs A11 AND A14 SHIELD REPLACEMENT.

Place CCA (3, figure 5-4) component side against shield (4). Place panel (2) against back of CCA (3). Align screw holes and secure with four screws and lockwashers (1).

d. CCAs REPLACEMENT.

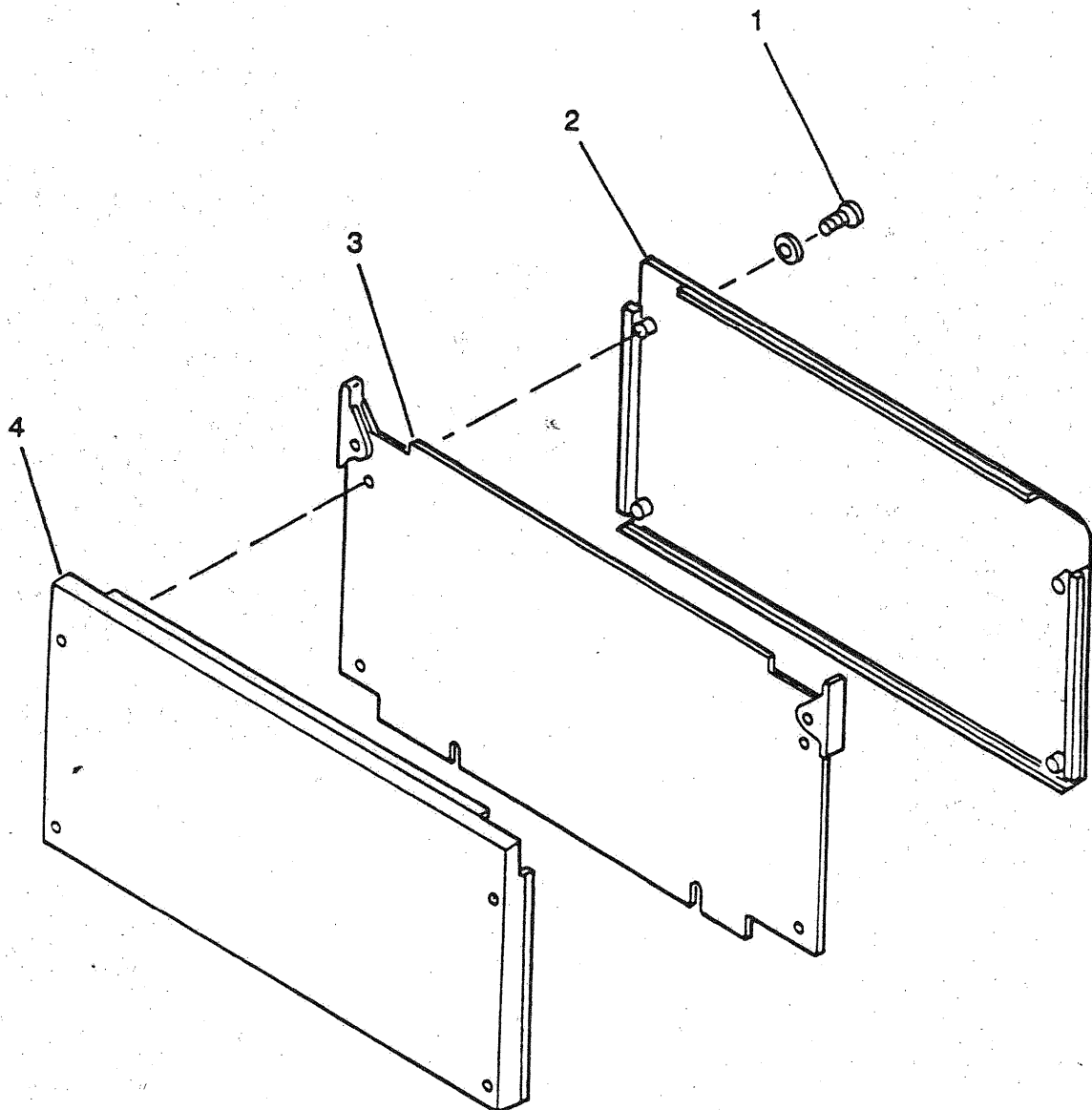
1. Align correct CCA (6, figure 5-1, sheet 1) in slot and carefully push in until inserted into connector.
2. After replacing CCAs A3 to A8, connect I/O cable connector A17W1J2 (3) to I/O CCA plug A15A3P2 (4) being careful to fold cable to face polarizing stripe toward rear of chassis.
3. Replace top cover (2) with foam pad notch facing rear and secure with four screws (1).



LEGEND

1. SCREW AND LOCKWASHER
2. SHIELD
3. CCA
4. PANEL

Figure 5-3. CCAs A10 and A13 Shield Removal or Replacement



LEGEND

- 1. SCREW AND LOCKWASHER
- 2. PANEL
- 3. CCA
- 4. SHIELD

Figure 5-4. CCAs A11 and A14 Shield Removal or Replacement

5-4. FRONT BEZEL ASSEMBLY A15 REMOVAL AND DISASSEMBLY.

a. FRONT BEZEL ASSEMBLY A15 REMOVAL.

1. Remove all CCAs as per paragraph 5-2.a.
2. Remove screws (7, figure 5-1, sheet 1) on each side securing front bezel assembly A15 (8) (and rack mount ears (9), if installed) to chassis.
3. Remove center screw (10) on bottom of chassis.
4. Carefully pull out front bezel assembly A15 (8) about an inch.
5. Remove harness jack (11, sheet 2) from connector A15A4J1 (12) and remove harness jack (13) from connector A15A4J2 (14) on signal isolation assembly A15A4 (15).
6. Remove harness jack (16) from connector A15A5J1 (17) and remove harness jack (18) from connector A15A5J2 (19) on reference isolation assembly A15A5 (20).
7. Cut four cable ties (21).
8. Unplug signal isolation assembly harness jack (22) from connector A16A1J23 (23).
9. Unplug reference isolation assembly harness jack (24) from connector A16A1J20 (25).
10. Remove ground wire (26) secured to circuit ground binding post (27) with 5/6-inch nut (28).
11. Remove 34-pin ribbon cable (29) from connector A15A2J3 (30) left side of display driver CCA A15A2 (31).
12. Unplug main power harness jack (32) (red/black wire) from connector A15A2J5 (33) on display driver CCA A15A2 (31).
13. Remove two screws (34) that secure power switch A15SW1 (35) to front bezel assembly A15 (8).
14. Remove front bezel assembly A15 (8).

b. ISOLATION ASSEMBLIES A15A4, A15A5 REMOVAL.

1. Remove front bezel assembly as per paragraph 5-4.a.
2. Remove two screws (36, figure 5-1, sheet 3) on either side of each isolation assembly. Remove shield covers (37).

CAUTION

Use caution not to damage relays.

3. Remove three hex nuts (38) and external tooth lockwasher (39) on each isolation assembly with 1/4-inch thin wall nut driver.
4. Remove signal isolation assembly A15A4 (40) right side and reference isolation assembly A15A5 (41) left side.
5. From inside assembly shields (42), remove three male-female standoffs (43).

NOTE

Before lifting out shields, note position of loose hardware as indicated on sheet 3: nylon insulators (44), external tooth lockwashers (45).

6. Lift out shields (42).
 7. Remove insulators (46).
- c. DISPLAY DRIVER CCA A15A2, KEYBOARD A15A1, AND DISPLAY CCA A15A3 REMOVAL.
1. Remove front bezel assembly and isolation assemblies as per paragraph 5-4.a and b.

NOTE

Bracket connecting display driver CCA A15A2 to front bezel assembly is secured underneath binding posts of reference channel.

2. Remove nut (47, figure 5-1, sheet 3), insulator (48), and remove reference channel binding post (49), for three posts securing bracket (50).
3. Remove five screws (51) from display driver CCA A15A2 brackets (52) mounted to front bezel assembly A15 (8). This frees the three assemblies.

NOTE

Keyboard A15A1, display driver CCA A15A2, and display CCA A15A3 can be separated for replacement of any one, but the three are kept electrically connected for troubleshooting. (See sheet 4.)

4. To separate display driver CCA A15A2 (53) from keyboard A15A1 (54), disconnect 50-pin connector (55).
5. To separate display CCA A15A3 (56) from display driver CCA A15A2 (53), remove two 40-pin connectors (57).

5-5. FRONT BEZEL ASSEMBLY A15 REASSEMBLY AND REPLACEMENT.

a. DISPLAY DRIVER CCA A15A2, KEYBOARD A15A1, AND DISPLAY CCA A15A3 REPLACEMENT.

1. Electrically connect display driver CCA A15A2 (53, figure 5-1, sheet 4) with keyboard A15A1 (54) using 50-pin connector (55) making sure polarizing stripe faces right edge of boards.
2. Electrically connect display driver CCA A15A2 (53) to display CCA A15A3 (56) using two 40-pin connectors (57) making sure polarizing stripes face left edge of boards.
3. Carefully adjust A15A1, A2, and A3 assemblies and align display driver CCA A15A2 brackets (52, sheet 3) over front bezel assembly A15 (8), screw hole and secure with five screws (51).
4. Replace reference channel binding posts (49), and secure display driver bracket (50) to front bezel assembly A15 (8), with insulator (48), and nut (47).
5. Replace isolation assemblies and front bezel assembly A15 as per paragraph 5-5.b and c.

b. ISOLATION ASSEMBLIES A15A4, A15A5, AND SHIELD REPLACEMENT.

1. Place insulators (46, figure 5-1, sheet 3) over binding posts (49).
2. Place assembly shields (42) over binding posts (49).
3. Place nylon insulators (44) and external tooth lockwashers (45) inside assembly shields (42) as indicated on sheet 3.
4. Replace three male-female standoffs (43) over binding posts (49) to secure each assembly shield (42).

NOTE

While securing the isolation assembly shields, maintain 1/8-inch clearance between shield and bezel assembly and 1/8-inch clearance between display driver CCA A15A2 and shield.

5. Place signal isolation assembly A15A4 (40) into right shield (42) and reference isolation assembly A15A5 (41) into left shield (42).
6. With 1/4-inch thin wall nut driver, secure each isolation assembly using three hex nuts (38) and three external tooth lockwashers (39).
7. Place a shield cover (37) over each isolation board assembly. Secure with two screws (36) on each shield.
8. Replace front bezel assembly A15 (8) as per paragraph 5-5.c.

c. FRONT BEZEL ASSEMBLY A15 REPLACEMENT.

1. Position power switch A15SW1 (35, figure 5-1, sheet 2) against bezel and secure with two screws (34).
2. Connect main power harness jack (32) to connector A15A2J5 (33) on display driver CCA A15A2 (31).
3. Connect 34-pin ribbon cable (29) to connector A15A2J3 (30) left side of display driver CCA A15A2 (31). Dress cable as shown in illustration.
4. Secure ground wire (26) to circuit ground binding post (27) with 5/6-inch nut (28).
5. Plug reference isolation harness jack (24) into motherboard connector A16A1J20 (25).
6. Plug signal isolation assembly harness jack (22) into motherboard connector A16A1J23 (23).
7. Plug harness jack (18) into connector A15A5J2 (19) and harness jack (16) into connector A15A5J1 (17) on reference isolation assembly A15A5 (20).
8. Plug harness jack (13) into connector A15A4J2 (14) and harness jack (11) into connector A15A4J1 (12) on signal isolation assembly A15A4 (15).
9. Secure cables to chassis with four cable ties (21).
10. Push front bezel assembly A15 (8) carefully against chassis.
11. Secure front bezel assembly A15 (8) [and rack mount ears (9, sheet 1), if required] with two screws (7) on each side.
12. Secure front bezel assembly A15 (8) with one screw (10) on bottom of chassis.
13. Replace all CCAs as per paragraph 5-3.c.

5-6. REAR PANEL ASSEMBLY A17 REMOVAL AND DISASSEMBLY.

a. REAR PANEL ASSEMBLY A17 REMOVAL.

1. Remove front bezel assembly A15 as per paragraph 5-4.a.
2. Remove one screw (58, figure 5-1, sheet 5) from each side securing rear panel assembly A17 (59) to chassis.
3. Remove four screws (60) from bottom of chassis.
4. Pull rear panel assembly A17 (59) away an inch.
5. Unplug main power supply harness jack A17PS1P16 (61) from motherboard connector A16A1J16 (62) and harness jack A17PS1P17 (63) from motherboard connector A16A1J17 (64).

MODEL 2250

6. Cut four cable ties (65).
 7. Pull disconnected main power supply cables (red/black wire) (66) through back of chassis.
 8. Cut cable ties (67) securing main ac power harness jack (68) on chassis and disconnect from main harness connector A17W1P1 (69).
 9. Disconnect two ground wires (70) secured to signal and reference input connectors from standoff (71).
 10. Unplug isolated power supply A17PS2 harness jack (72) from motherboard connector A16A1J18 (73) and isolated power supply A17PS3 harness jack (74) from motherboard connector A16A1J21 (75). Pull both harnesses through back of chassis.
- b. ISOLATED POWER SUPPLIES A17PS2 AND A17PS3 REMOVAL.
1. Remove rear panel assembly A17 as per paragraph 5-6.a.
 2. Unplug (and tag) two 4-pin jacks (76, figure 5-1, sheet 5) on harness assembly from isolated power supply connectors A17PS2J1 (77) and A17PS3J1 (78).
 3. Remove eight screws (79) from bottom of rear panel assembly (four per isolated power supply assembly).
 4. Remove isolated power supplies A17PS2 (80) and A17PS3 (81).
- c. MAIN POWER SUPPLY ASSEMBLY A17PS1 REMOVAL.
1. Remove rear panel assembly A17 as per paragraph 5-6.a.
 2. Unplug transformer harness jack (82, figure 5-1, sheet 5) from connector A17PS1J1 (83) on main power supply A17PS1 (84).
 3. Remove six pan-head screws (85) that secure main power supply A17PS1 (84) to rear panel assembly A17 (59). Lift away main power supply A17PS1 (84).
 4. Remove ground wire (86) from black circuit ground binding post (87).
- d. MAIN POWER TRANSFORMER A17T1 REMOVAL.
1. Remove rear panel assembly A17 and main power supply assembly A17PS1 as per paragraph 5-6.a and c.
 2. Unplug transformer harness jack A17T1J1 (88, figure 5-1, sheet 6) from harness connector (89).
 3. Remove four screws (90), four nuts (91) and four lockwashers (92) securing end bell (93) and transformer assembly A17T1 (94) to rear panel assembly A17 (59). Lift away transformer assembly and end bell.

e. FAN ASSEMBLY A17B1 REMOVAL.

1. Remove rear panel assembly A17 and main power supply A17PS1 as per paragraph 5-6.a and c.
2. Unsolder wires D and F (95, figure 5-1, sheet 6) from line entry module (96).
3. Remove four nuts (97) and lockwashers (98) from outside panel and four screws (99) and flatwashers (100) from inside rear panel assembly.
4. Pull fan A17B1 (101) away from outside rear panel assembly.

NOTE

Fan guards are riveted to fans on some units and are not removable.

f. MAIN HARNESS ASSEMBLY A17W1 REMOVAL.

1. Remove rear panel assembly A17, isolated power supplies A17PS2 and A17PS3, main power supply A17PS1, main power transformer A17T1, and fan assembly A17B1 as per paragraph 5-6.a, b, c, d, and e.
2. Cut cable ties (107, figure 5-1, sheet 6) on rear panel assembly.
3. Disconnect wires (108) from ground screw (109).
4. Press in tongs on 2 clips (110) on sides of line entry module (96) and push whole assembly with attached harness out of rear panel assembly.

g. ADDRESS SWITCH A17W5S1 REMOVAL.

1. Using long nose pliers with serrated jaws, grasp address switch A17S1 (111, figure 5-1, sheet 6), and pull straight out from outside of rear panel assembly A17 (59).

h. I/O CABLE ASSEMBLY A17W5 REMOVAL.

1. Remove rear panel assembly A17 and address switch A17W5S1 as per paragraph 5-6.a and g.
2. Remove four screws (112, figure 5-1, sheet 6) securing MS connector A17A1J5 (113) to rear panel assembly (59).
3. Remove two screws (114) securing IEEE connector A17W5J4 (115) to rear panel assembly.
4. Press two tabs (116) on each side of address switch socket (117) and remove bezel (118).
5. Remove shim (119).
6. Tag and cut or unsolder wire from cable (120) connected to BNC connector A17W5J3 (121).
7. Remove I/O cable assembly A17W5 (122).

5-7. REAR PANEL ASSEMBLY A17 REASSEMBLY AND REPLACEMENT.

a. I/O CABLE ASSEMBLY A17W5 REPLACEMENT.

1. Solder wire from cable (120, figure 5-1, sheet 6) to BNC connector A17J3 (121).
2. Place shim (119) over address switch socket (117).
3. Insert address switch socket (117) into hole in rear panel assembly A17 (59).
4. Snap bezel (118) into position on outside of rear panel assembly A17 (59).
5. Secure IEEE connector A17W5J4 (115) with two screws (114).
6. Secure MS connector A17W5J5 (113) with four screws (112).
7. Replace rear panel assembly A17 and address switch A17W5S1 as per paragraph 5-7.b, c, d, e, f, g, and h.

b. ADDRESS SWITCH A17W5S1 REPLACEMENT.

1. Push address switch A17W5S1 (111, figure 5-1, sheet 6) into address switch socket (117) from outside of rear panel assembly A17 (59).

c. MAIN HARNESS ASSEMBLY A17W1 REPLACEMENT.

1. Push harness assembly A17W1 through line entry module assembly rear panel opening and snap line entry module assembly (96, figure 5-1, sheet 6) into place so that tongs on clip (110) are not depressed.
2. Secure lugs on wires (108) to ground screw (109).
3. Secure cable to ties (107) on rear panel assembly A17 (59).
4. Replace fan assembly A17B1, main power supply assembly A17PS1, isolated power supplies, and rear panel assembly A17 as per paragraph 5-7.d, e, f, g, and h.

d. FAN ASSEMBLY A17B1 REPLACEMENT.

1. Place fan assembly A17B1 (101, figure 5-1, sheet 6) against rear panel assembly A17 (59) and align screw holes. Check to ensure that air flow direction arrow on fan A17B1 (101) is pointing away from rear panel.
2. Secure fan A17B1 (101) with four screws (99) and flatwashers (100) from inside rear panel assembly and four nuts (97) and lockwashers (98) from outside of rear panel.

MODEL 2250

3. Attach fan guard (102) to fan A17B1 (101) using four 6-32 hex nuts (103), #6 lockwashers (104), 6-32 panhead screws (105), and #6 split flatwashers (106).

NOTE

Fan guards are riveted to fans on some units and are not removable.

4. Replace main power supply assembly A17PS1 and rear panel assembly A17 as per paragraph 5-7.f and h.
- e. MAIN TRANSFORMER A17T1 REPLACEMENT.
1. Place transformer assembly A17T1 (94, figure 5-1, sheet 6) on inside of rear panel assembly and end bell (93) on outside of rear panel assembly and align screw holes.
 2. Secure transformer assembly A17T1 (94) to inside of rear panel assembly A17 (59) and end bell (93) to outside of rear panel assembly with four screws (90) through end bell with four lockwashers (92) and four nuts (91) on transformer.
 3. Connect transformer harness jack A17T1J1 (88) to harness connector (89).
 4. Replace main power supply assembly A17PS1 and rear panel assembly A17 as per paragraph 5-7.f and h.
- f. MAIN POWER SUPPLY ASSEMBLY A17PS1 REPLACEMENT.
1. Secure ground wire (86, figure 5-1, sheet 5) to circuit ground binding post (87).
 2. Place main power supply A17PS1 (84) inside of rear panel assembly and align screw holes. Secure main power supply A17PS1 (84) with six screws (85).
 3. Replace rear panel assembly as per paragraph 5-7.h.
- g. ISOLATED POWER SUPPLIES A17PS2 AND A17PS3 REPLACEMENT.
1. Connect two 4-pin harness jacks (76, figure 5-1, sheet 5) on harness to isolated power supply connectors A17PS2J1 (77) and A17PS3J1 (78).
 2. Place isolated power supplies A17PS2 (80) and A17PS3 (81) on inside of rear panel assembly (59) and align screw holes.
 3. Secure isolated power supplies A17PS2 (80) and A17PS3 (81) to bottom of rear panel assembly with four screws (79) on each isolated power supply.
 4. Replace rear panel assembly A17 as per paragraph 5-7.h.
- h. REAR PANEL ASSEMBLY A17 REPLACEMENT.
1. Place rear panel assembly A17 (59, figure 5-1, sheet 5) an inch away from chassis.

MODEL 2250

2. Pull two ground wires (70) from signal and reference input connectors through first rear right opening in chassis, through chassis and secure to circuit ground binding post (71).
3. Pull isolated power supply A17PS3 harness jack (74) through first rear right opening in chassis and connect to motherboard connector A16A1J21 (75).
4. Pull isolated power supply A17PS2 harness jack (72) through first rear right opening in chassis to the left of bulkhead (126) and connect to motherboard connector A16A1J18 (73).
5. Connect main ac power harness jack (68) on chassis to main harness connector A17W1P1 (69).
6. Secure cable with tie (67).
7. Pull main power supply cables (red/black wire) (66) through first rear left opening in chassis, through chassis, and pull main power harness jack (32) through first left front opening of chassis. Two harness jacks from main power supply cable hang free in chassis.
8. Plug main power supply harness jack A17PS1P17 (63) into motherboard connector A16A1J17 (64) and plug harness jack A17PS1P16 (61) into motherboard connector A16A1J16 (62).
9. Secure cables with four ties (65).
10. Push rear panel assembly A17 (59) against chassis.
11. Secure rear panel assembly A17 (59) to chassis on each side with one screw (58).
12. Secure rear panel assembly A17 (59) to bottom of chassis with four screws (60).
13. Replace front bezel assembly A15 as per paragraph 5-4.c.
14. Replace CCAs A1 to A14 as per paragraph 5-3.c.

5-8. MOTHERBOARD A16A1 REMOVAL.

- a. Remove circuit card assemblies A1 to A14 as per paragraph 5-2.a.
- b. Remove front bezel assembly A15 as per paragraph 5-4.a.
- c. Remove rear panel assembly A17 as per paragraph 5-6.a.
- d. Disconnect 34-pin ribbon cable (29, figure 5-1, sheet 7) from motherboard connector A16A1J1 (123).
- e. Remove two screws (124) and lockwashers (125) securing two bulkheads (126).

- f. Remove seven self-locking nuts (127) securing motherboard (128) to chassis.
- g. Remove standoff (129) from front right corner. Remove motherboard A16A1 (128).

5-9. MOTHERBOARD A16A1 REPLACEMENT.

- a. Position motherboard A16A1 (128, figure 5-1, sheet 7) in chassis and align screw holes.
- b. Secure motherboard A16A1 (128) to chassis with seven self-locking nuts (127).
- c. Replace standoff (129) on front right-hand corner.
- d. Align two bulkheads (126) over screw holes and secure with two lockwashers (125) and screws (124).
- e. Connect ribbon cable (29) to motherboard connector A16A1J1 (123).
- f. Replace rear panel assembly A17 as per paragraph 5-7.h.
- g. Replace front bezel assembly A15 as per paragraph 5-5.c.
- h. Replace circuit card assemblies A1 to A14 as per paragraph 5-3.c.

MODEL 2250

SECTION 6

PARTS LIST

6-1. INTRODUCTION.

This section contains replaceable parts lists, federal supply codes of manufacturers (FSCM), parts location diagrams, and a list of manufacturers of parts used for the Model 2250 Digital Analyzing Voltmeter.

6-2. PARTS LIST.

The parts list contains only replaceable parts for the DAV. It is prepared in tabular form and divided into five columns as follows:

- a. Column 1 - REF DES./Figure and Index No.
 1. Reference designations. Lists alphanumerical reference designations for circuit card assembly replaceable parts shown on schematic and parts location diagrams.
 2. Figure and Index Number. Lists index numbers for top assembly parts breakdown illustrations, if applicable.
- b. Column 2 - Description. Contains descriptions which identify replaceable parts.
- c. Column 3 - NAI P/N. Lists North Atlantic Industries part numbers assigned to replaceable parts.
- d. Column 4 - FSCM. Lists Federal Supply Code for Manufacturers. The FSCM identifies manufacturer or government agency whose number is listed in the manufacturer's part number column. If a FSCM is not assigned to a manufacturer, a five letter code is given and alphabetically referenced (AAAAA, BBBB, etc.) to the List of Manufacturer's table within this manual.
- e. Column 5 - MFR P/N. Lists manufacturer's part numbers of replaceable parts or data to aid in determining parts substitution.
- f. Column 6 - UOC (Usable On Code). This column contains codes to identify specific equipment configurations (model, assembly, etc.). When a part applies to all configurations, no coding system is used. The coding system is as follows: A, B, C,... and continues with double, AA through AZ, BA, BB, etc., when necessary.

6-3. LIST OF MANUFACTURERS.

This list contains the names, addresses, FSCMs, and other identifying codes of manufacturers referenced in the parts list. It is arranged numerically using the manufacturer's FSCMs provided in the Federal Supply Code for Manufacturers, Cataloging Handbooks H4-1, H4-2, and H4-3.

The list is prepared in tabular form as follows:

- a. Column 1 contains FSCMs of all manufacturers referenced in the parts list.
- b. Column 2 contains the names and addresses of manufacturers applicable to FSCMs listed in column 1.

6-4. PARTS LOCATION ILLUSTRATIONS.

Parts location illustrations are provided to give the user a quick and positive method for locating parts on specific assemblies being repaired. Each illustration provides corresponding location index numbers and each parts location diagram provides reference designations for circuit card components.

MODEL 2250

Table 6-1. Digital Analyzing Voltmeter Model 2250,
Part Number 402250-FX Common Parts

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
A1	Microprocessor Circuit Card Assembly (CCA)	787170	07342	787170
A2	Memory Circuit Card Assembly	787171-4	07342	787171-4
A2A	Memory CCA Reset Adapter	789092	07342	789092
A3	I/O Circuit Card Assembly	787172-2	07342	787172-2
A4	Timing and Control Circuit Card Assembly	787173-1	07342	787173-1
A5	Phase Locked Loop Circuit Card Assembly	787192-1	07342	787192-1
A6,A7	Accumulator Circuit Card Assembly	787193-1	07342	787193-1
A8	Autocal Circuit Card Assembly	787274-2	07342	787274-2
A9	A/D Converter Circuit Card Assembly	787664	07342	787664
A10	Filter Circuit Card Assembly	787176-1	07342	787176-1
A11	Front End Circuit Card Assembly	787505-1	07342	787505-1
A12	Same as A9			
A13	Same as A10			
A14	Same as A11			
A15	Front Bezel Assembly	787198	07342	787198
A16	Chassis Assembly	787197-2	07342	787197-2
A16A1	Mother Board Circuit Card Assembly	787177	07342	787177
A16W1	Relay Isolation Cable Assembly (#4)	548516	07342	548516
A16W2	Same as A16W1			
A17	Rear Panel Assembly	787277	07342	787277
F1	Fuse, 2A, 250 V	883922	75915	312002
F1	Fuse, 1A, 250 V, 3AG (for 230 V operation only)	800118	75915	312001
W1	Line Cord, 3 Conductor, Detachable, Unshielded	870165	70903	17251

MODEL 2250

Table 6-2. Model 2250 DAV - F1 Feature 1, Option 1 -
IEEE-488 Interface - Unique Parts

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U1	PROM, Programmed	888671-1A	07342	888671-1A
U2	PROM, Programmed	888671-2A	07342	888671-2A
U3,U4	Not used			

Table 6-3. Model 2250 DAV - F2 Feature 1, Option 2 -
MATE-CIIL Interface - Unique Parts

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U1	PROM, Programmed	888672-1C	07342	888672-1C
U2	PROM, Programmed	888672-2C	07342	888672-2C
U3,U4	Not used			

Table 6-4. Model 2250 DAV - F3 Feature 1, Option 3 -
Model 225 Emulation IEEE Interface - Unique Parts

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U1	PROM, Programmed	887989-1	07342	887989-1
U2	PROM, Programmed	887989-2	07342	887989-2
U3,U4	Not used			
U5	PROM, Programmed	887989-3	07342	887989-3
U6	PROM, Programmed	887989-4	07342	887989-4

MODEL 2250

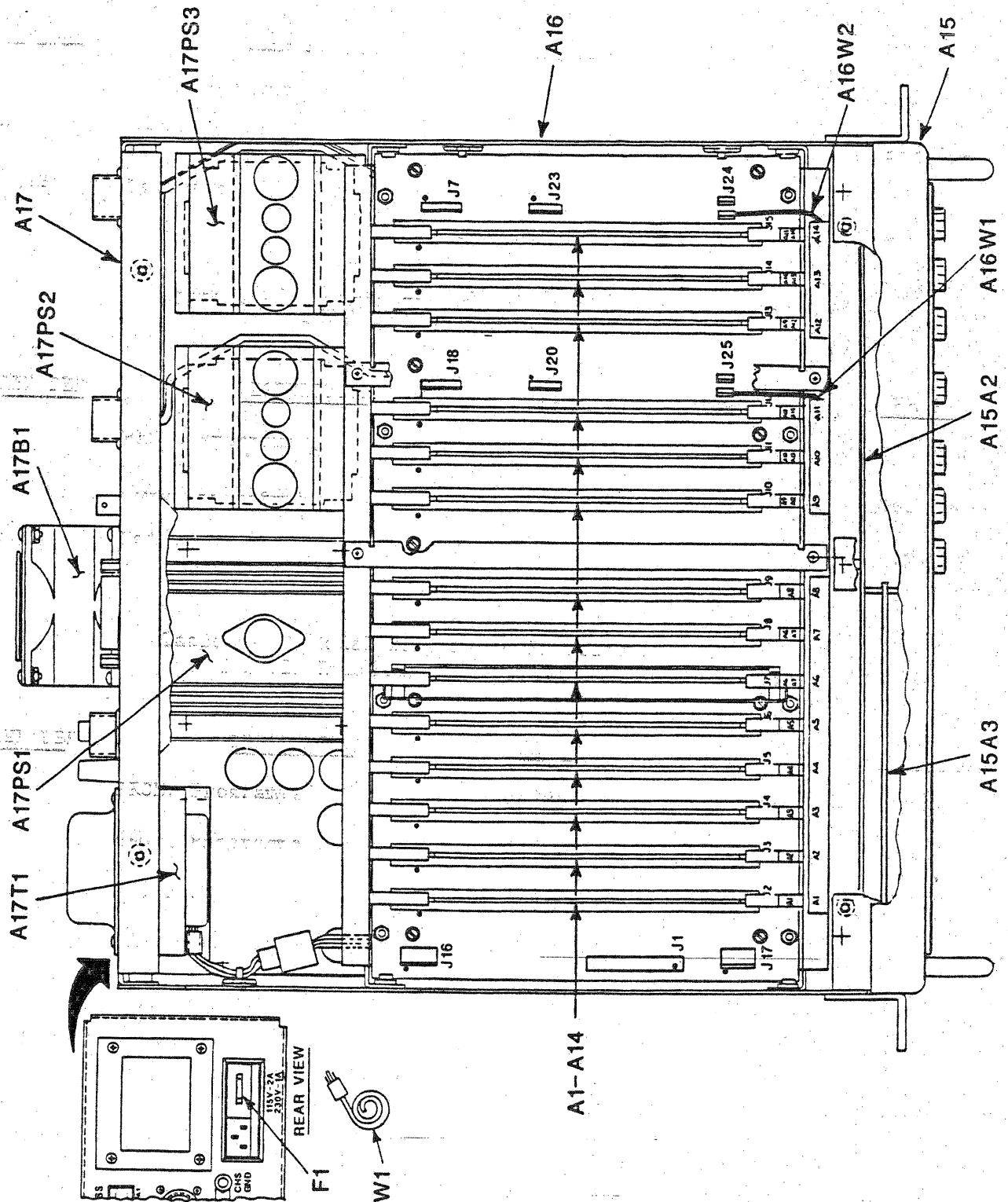


Figure 6-1. Model 2250 DAV Chassis Assembly, Parts Location

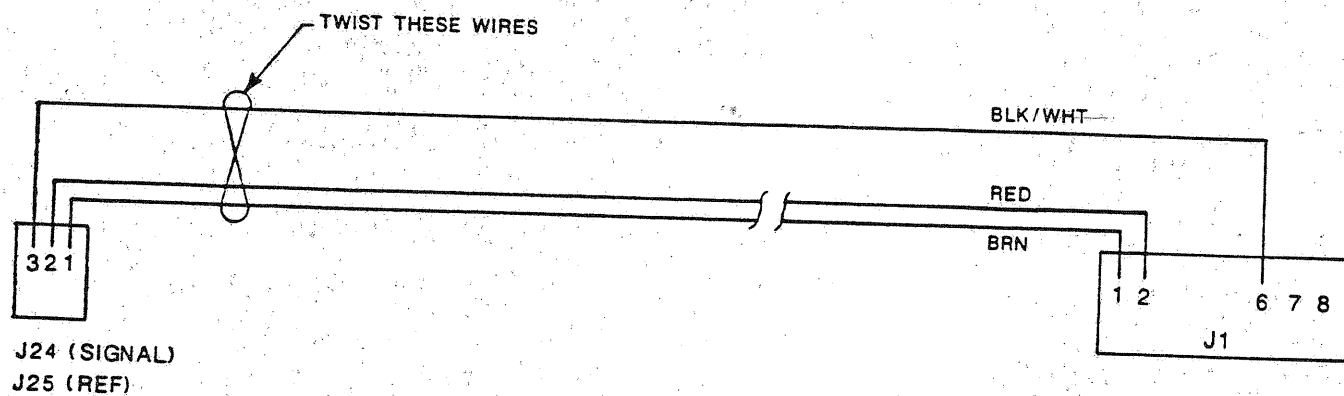


Figure 6-2. Relay Isolation Cable Assembly (#4) A16W1, A16W2 (P/N 548516),
Parts Location

MODEL 2250

Table 6-5. Replacement Parts List: Microprocessor
Circuit Card Assembly A1 - 787170 Revision F

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C1	Capacitor, Ceramic, 0.1 uf, 50 V, <u>+20%</u>	886063	16299	SR215E104MAA
C2	Capacitor, Tantalum, 10 uf, 25 V, <u>+20%</u>	886060	AAAAA	NDT-10M-25VM-ZD
C3	Same as C1			
C4	Capacitor, Ceramic, 0.47 uf, 50 V, <u>+10%</u>	882449	09182	CKR06BK474KP
C5,C6	Same as C1			
C7	Capacitor, Ceramic, 0.01 uf, 100 WVDC, <u>+10%</u>	808487	56289	CKR06BX103KL
C8	Capacitor, Ceramic, 0.1 uf, 50 V, <u>+20%</u>	885498	DDDDD	SA105E104MAA
C9-C27	Same as C8			
L1	Ferrite Wide Band Choke	886121	02114	VK20-09/3B
R1	Resistor, Composition, 1 M, 1/4 W, <u>+5%</u>	880100	01121	CB1055
R2	Same as R1			
R3	Resistor, Composition, 3.3 k, 1/4 W, <u>+5%</u>	803388	01121	CB3325
R4,R5	Same as R3			
TP1	Post, P and Cont., Mod II, Machine Applied	880007	00779	87022-9
TP2-TP11	Same as TP1			
U1	Timer	883803	18324	SE-555-FE
U2	IC, TTL, Hex Invertor Buffer/Driver	808971	01295	SN7406N
U3	IC, TTL, Quad 2-Input OR Gate	808898	01295	SN74LS32N

MODEL 2250

Table 6-5. Replacement Parts List: Microprocessor
Circuit Card Assembly A1 - 787170 Revision F (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U4	IC, TTL, Dual 4-Input Positive AND Gate	883509	01295	74LS21N
U5	IC, Microcomputer	870338	04713	MC680000L8
U6	IC, TTL, 8-Bit Encoder	883508	01295	74LS148N
U7	IC, TTL, Octal Line Buffer w/ TriState Outputs	808713	18324	74LS244
U8	IC, Octal Bus Driver	870340	34335	SN74S244F
U9-U11	Same as U7			
U12	IC, LV, TTL, 20-Pin, Bus Receiver, Plastic Case	886186	04713	SN74LS645
U13	Same as U12			
XU5	IC Socket, 64-pin, Low Profile	886122	71279	703-4364-01-06-00
Y1	Crystal, Clk, Oscillator, 8 MHz	886144	00815	HS-100 @8.000 MHz
Z1	Resistor, Network, 3.3 k, 15 Res	885964	32997	4116R-002-332

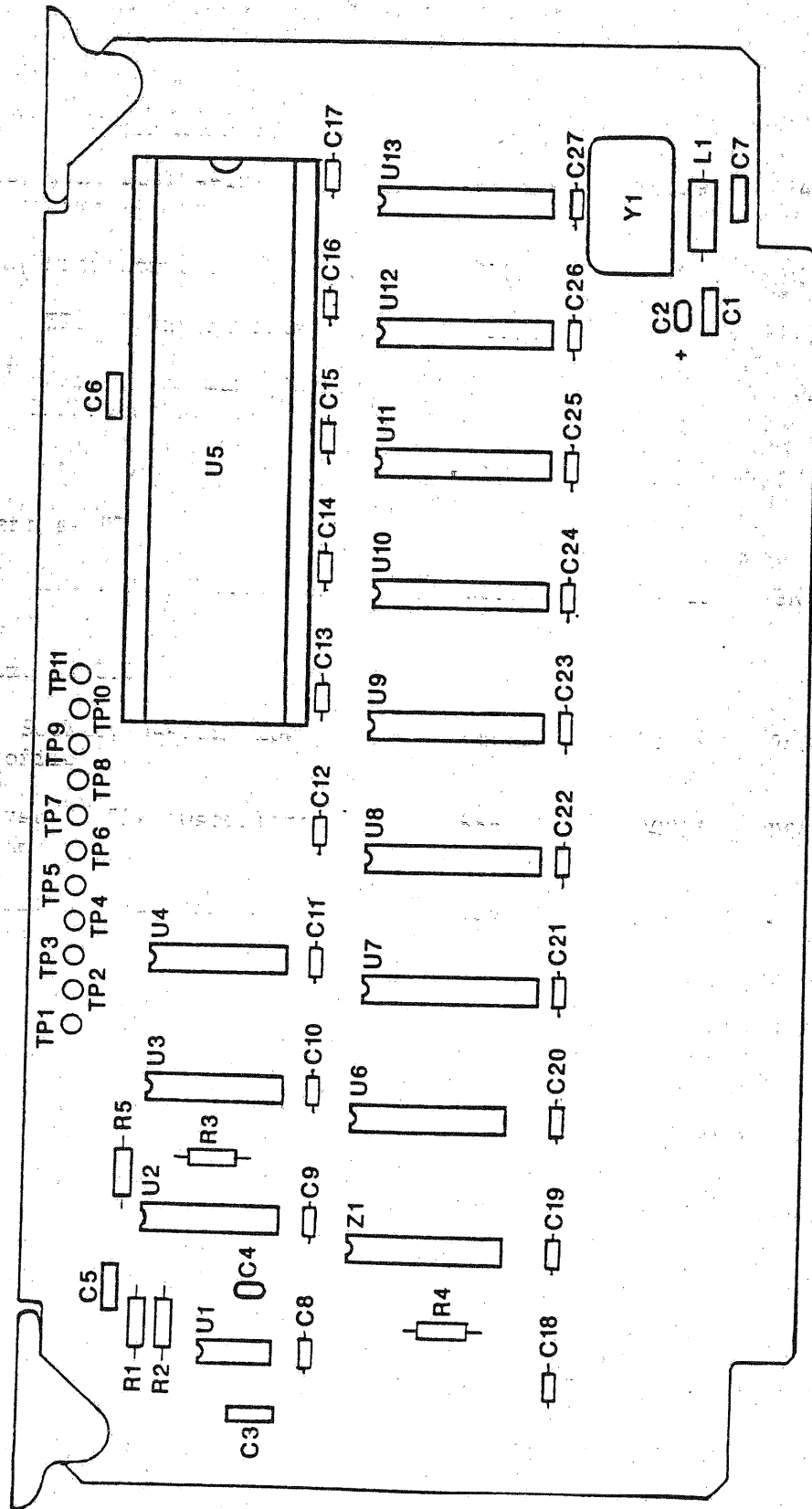


Figure 6-3. Microprocessor CCA AI (P/N 787170 Revision F), Parts Location

MODEL 2250

Table 6-6. Replacement Parts List: Memory Circuit
Card Assembly A2 - 787171-4 Revision A,B

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
A2	Memory Circuit CCA Revision B	787171-4	07342	787171-4	A
A2	Memory Circuit CCA Revision A	787171-4	07342	787171-4	B
B1	Battery, 2.4 V	886007	04713	MMB2.4B	
C1	Capacitor, Ceramic, 0.01 uf, 25 V, <u>+10%</u>	885363	96733	W211BX103-K	
C2-C5	Capacitor, Ceramic, 0.1 uf, 50 V, <u>+20%</u>	885498	DDDDD	SA105E104MAA	A
C2-C5	Same as C1				B
C6	Capacitor, Tantalum, 10 uf, 25 V, <u>+20%</u>	886060	AAAAA	NDT-10M-25VM-ZD	
C7	Capacitor, Tantalum, 1 uf, 35 V, <u>+1%</u>	883001	56289	150D105X9035A	
C8-C27	Same as C2				A
C8-C28	Same as C1				B
C28,C29	Same as C1				A
CR1	Diode, Schottky, 30 V	886005	81349	1N5818	
CR2,CR3	Same as CR1				
R1	Resistor, Composition, 6.34 k, 1/10 W, <u>+1%</u>	807575	81349	RN55D 6341F	A
R1	Resistor, Composition, 6.2 k, 1/4 W, <u>+5%</u>	880566	01121	CB6225	B
R2	Resistor, Composition, 10 k, 1/8 W, <u>+1%</u>	880044	16299	NA55-10K	A
R2	Resistor, Composition, 10 k, 1/4 W, <u>+5%</u>	880044	16299	NA55-10K	B
R3	Resistor, Composition, 470 k, 1/4 W, <u>+5%</u>	880746	01121	CB2725	A
R3	Resistor, Composition, 100 k, 1/4 W, <u>+5%</u>	880846	01121	CB1045	B
R4	Not used				
R5	Resistor, Fixed, Comp., 2.7 k, 1/4 W, <u>+5%</u>	880746	01121	CB2725	
R6	Resistor, Composition, 3.3 k, 1/4 W, <u>+5%</u>	803388	01121	CB3325	
R7	Resistor, Composition, 4.7 M, 1/4 W, <u>+5%</u>	807098	01121	CB4755	A

Table 6-6. Replacement Parts List: Memory Circuit
Card Assembly A2 - 787171-4 Revision A,B (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
TP1	Post, P and Cont., Mod II, Machine Applied	880007	00779	87022-9	
TP2-TP5	Same as TP1				
U1	Not supplied as part of this assembly. Refer to Digital Analyzing Voltmeter Unique Parts tables 6-2 and 6-3 for proper replacement parts.				
U2	Not supplied as part of this assembly. Refer to Digital Analyzing Voltmeter Unique Parts tables 6-2 and 6-3 for proper replacement parts.				
U3	IC, RAM, 32kx8, 150 ns	888673	BBBBB	HM62256P-15	
U4	Same as U3				
U5	Not supplied as part of this assembly. Refer to Digital Analyzing Voltmeter Unique Parts tables 6-2 and 6-3 for proper replacement parts.				
U6	Not supplied as part of this assembly. Refer to Digital Analyzing Voltmeter Unique Parts tables 6-2 and 6-3 for proper replacement parts.				
U7,U8	Not used				
U9	IC, TTL, Quad 2-Input NAND Gate	870321	26374	LS260P	
U10	IC, TTL, Hex Inverter	808341	01295	SN74LS04N	A
U10	IC, TTL, Hex Inverter	885980	01295	74LS05N	B

MODEL 2250

Table 6-6. Replacement Parts List: Memory Circuit
Card Assembly A2 - 787171-4 Revision A,B (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
U11	IC, TTL, Quad 2-Input OR Gate	808898	01295	SN74LS32N	
U12	IC, TTL, Dual 1 of 4 Decoder	880652	01295	SN74LS139	
U13	IC, TTL, Octal Line Buffer w/Tristate Outputs	808713	18324	74LS244	
U14	IC, LV, TTL, 20-Pin	886186	04713	SN74LS645	
U15	IC, HC, CMOS	886352	27014	74HC126	
U16	IC, TTL, Quad 2-Input NAND Buffer, w/Open Collector Output	883949	01295	SN74LS38N	
U17	IC, TTL, Serial In-Parallel Out Shift Register	884560	01295	SN74LS164N	
U18	IC, TTL, Dual Modulo-16 Counter	883463	07263	74LS393N	
U19,U20	Same as U13				
U21	Same as U14				
U22	IC, CMOS, OP Amp	887258	32293	ICL7611DCPA	
U23	IC, CMOS, Retriggerable, Resetable Monostable Multivibrator	808819	04713	MC14538BCP	A
U24	IC, Interface	883056	01295	SN75462P	A
U25	IC, CMOS, Hex Invertor	885985	01295	74HC14N	A
W10	Mini-Jumper	884691	22526	65474-001	
W10-1, W10-2	Same as TP1				
XU1	IC Socket, DIP, 28-Pin	883951	00779	2-640362-3	
XU2	Same as XU1				
XU3-XU6	Not used				
Z1	Resistor, Network, NML, 3.3 k, 6-Pin, SIP	884487	32997	4306R-101-332	
Z2,Z3	Same as Z1				

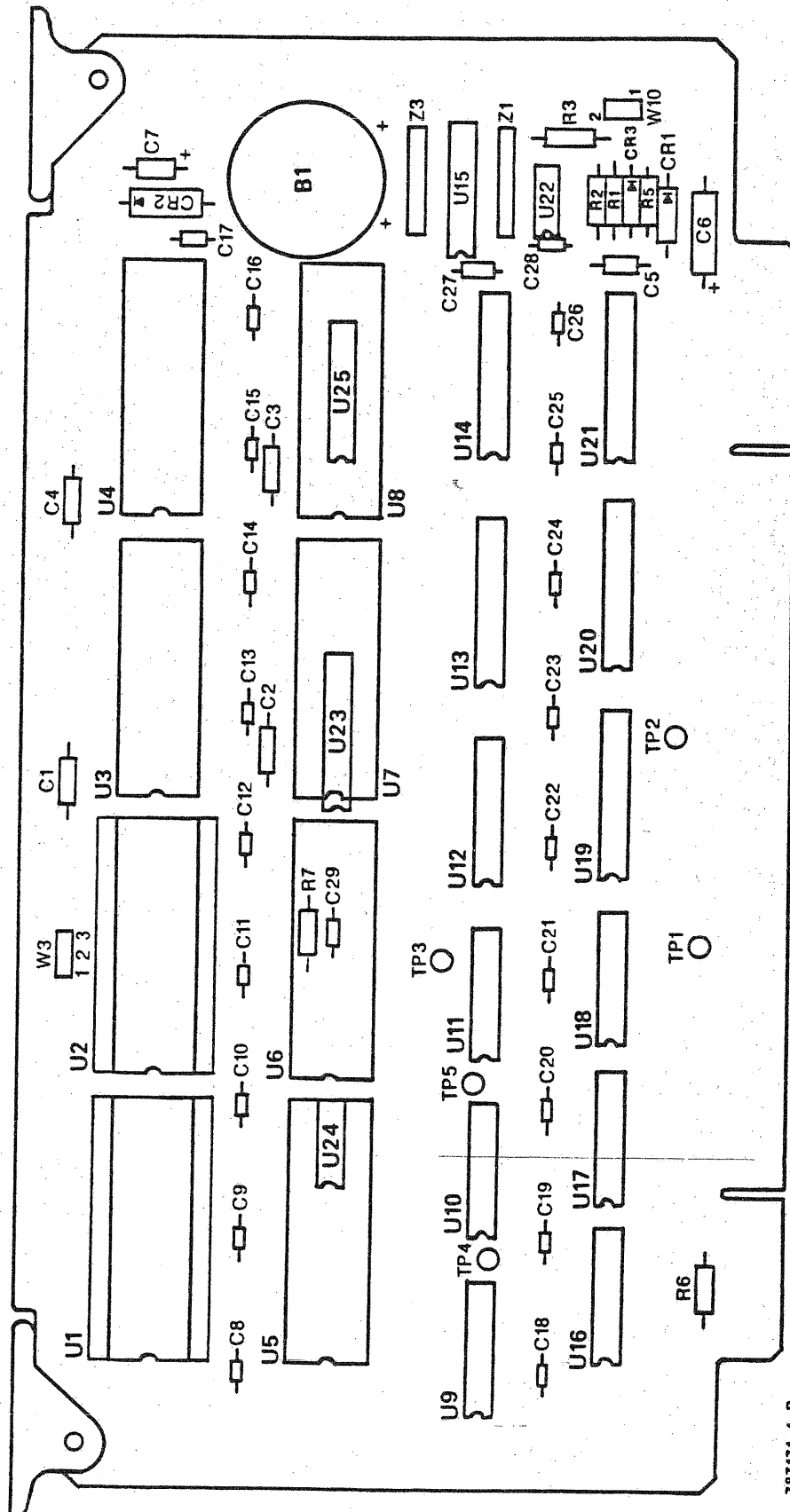
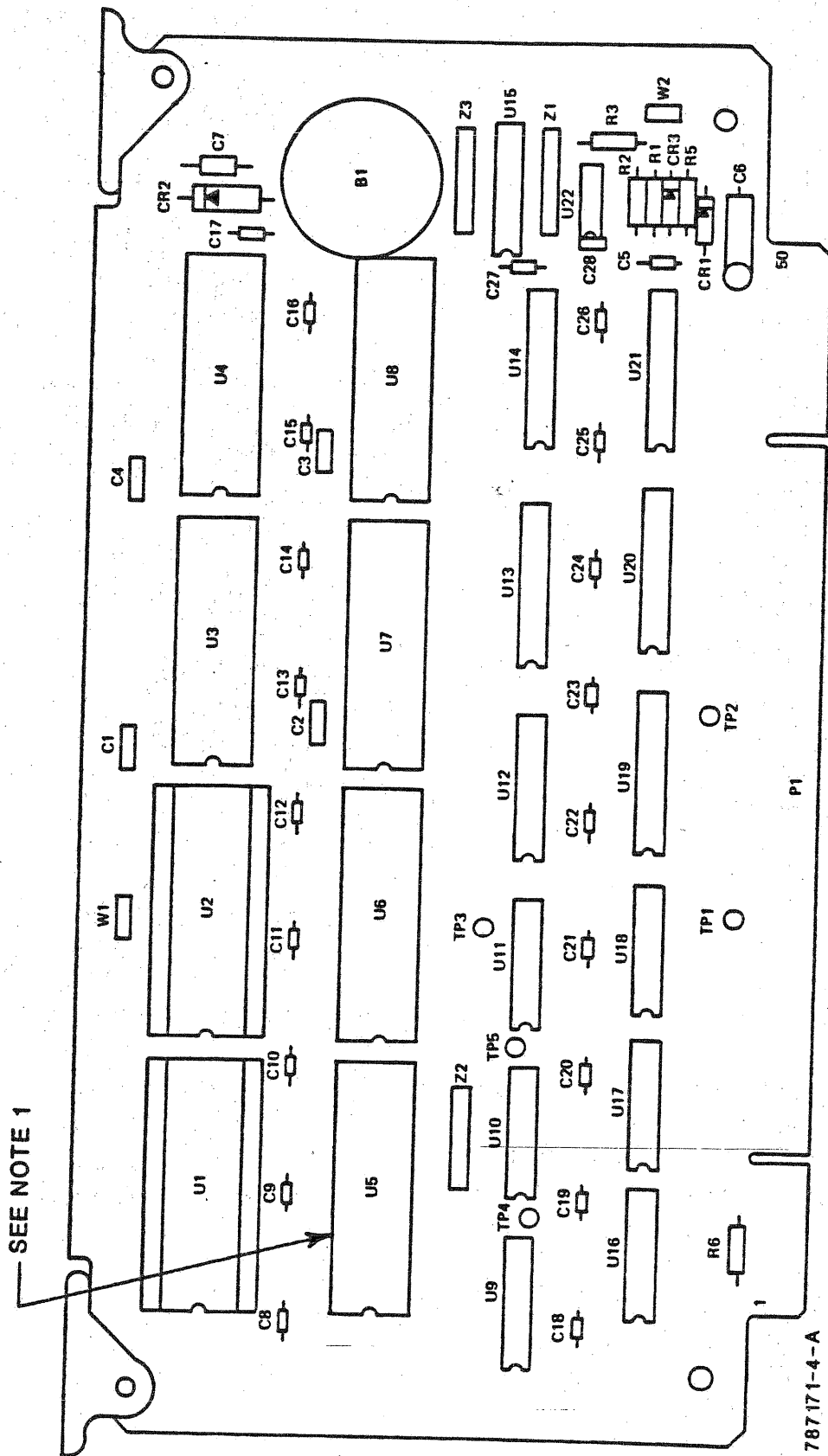


Figure 6-4. Memory CCA A2 (P/N 787171-4 Revision B), Parts Location



- NOTES: 1. U5 THROUGH U8 NOT USED.
2. U1 AND U2 ARE INSTALLED AT TOP ASSEMBLY.

Figure 6-4A. Memory CCA A2 (P/N 787171-4 Revision A), Parts Location

MODEL 2250

Table 6-6A. Replacement Parts List: Memory CCA
Reset Adapter A2A - 789092 Revision B

REF DES	DESCRIPTION	NAI P/N	FSCM	MFR P/N
C1	Capacitor, Ceramic, 0.01 uf, 25 V, <u>+10%</u>	885363	96733	W211BX103-K
C2	Same as C1			
E1	Post	880007	00779	87022-9
R1	Resistor, Composition, 4.7 M, 1/4 W, <u>+5%</u>	807098	01121	CB4755
R2	Resistor, Composition, 470 k, 1/4 W, <u>+5%</u>	806093	01121	CB4745
R3	Resistor, Metal Film, 10 k, 1/8 W, <u>+1%</u>	880044	16299	NA55-10K
R4	Resistor, Metal Film, 6.34 k, 1/10 W, <u>+1%</u>	807575	81349	RN55D6341F
U1	IC, CMOS, Hex Inverter, High Speed	885985	01295	74HC14N
U2	IC, CMOS, Retriggerable, Resettable Monostable Multi- vibrator	808819	04713	MC14538BCP
U3	IC, CMOS, Operational Amplifier	887250	32293	ICL7611DCPA
U4	IC, Interface, Dual-in-Line Peripheral Positive NAND Driver	883056	01295	SN75462P
XU22	Strip, 32 position	888815	51306	BBS-132-T-A

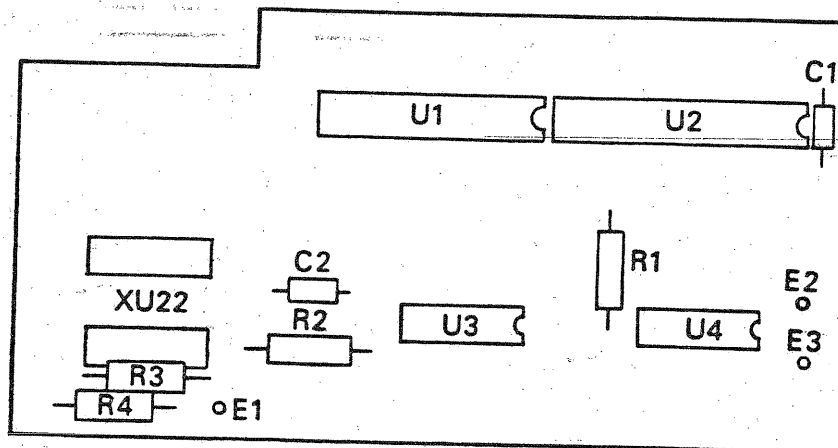


Figure 6-4B. Memory CCA Reset Adapter (P/N 789092 Revision B), Parts Location

MODEL 2250

Table 6-7. Replacement Parts List: I/O Circuit
Card Assembly A3 - 787172-2 Revision D

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C1	Capacitor, Ceramic, Axial Lead, 0.01 uf, 100 V, +80-20%	886812	96095	SA101E103ZAA
C2	Capacitor, Ceramic, 1 uf, 50 V, +10%	805155	95750	CK06BX105K
C3	Same as C1			
C4	Same as C2			
C5	Capacitor, Ceramic, Axial Lead, 0.1 uf, 50 V, +20%	885498	96095	SA105E104MAA
C6-C10	Same as C5			
C11	Same as C1			
C12	Same as C5			
C13,C14	Same as C1			
C15	Capacitor, Tantalum, 10 uf, 25 V, +20%	886060	AAAAA	NDT-10M-25VM-ZD
C16	Capacitor, Tantalum, 3.3 uf, 25 V, +20%	886064	AAAAA	NDT3.3M-25VMZD
C17	Same as C16			
C18	Same as C5			
C19	Same as C1			
C20-C24	Same as C5			
C25-C28	Same as C2			
C29-C31	Same as C5			
C32	Not used			
C33-C35	Same as C5			
C36	Same as C1			

MODEL 2250

Table 6-7. Replacement Parts List: I/O Circuit
Card Assembly A3 - 787172-2 Revision D (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
R1	Resistor, Variable, 50 k, 1/2 W, 2k-1, Cermet	807251	32997	3299X50KOHM
R2-R4	Same as R1			
R5	Resistor, Metal Film, 127 k, 1/10 W, <u>+1%</u>	808118	16299	NC4 127K
R6	Resistor, Metal Film, Special, 3.09 M, .1 W, <u>+1%</u>	808905	01637	CMF-1/103.09K T1
R7	Same as R5			
R8	Resistor, Composition, 1 k, 1/4 W, <u>+5%</u>	880084	01121	CB1025
R9	Resistor, Composition, 100 ohm, 1/4 W, <u>+5%</u>	880077	01121	CB1015
R10	Same as R6			
SW1	Switch, DIP, 16-Pin	808582	00779	435802-9
SW2	Same as SW1			
TP1	Post, P and Cont., Mod II, Machine Applied	880007	00779	87022-9
TP2-TP12	Same as TP1			
U1	Not used			
U2	IC, Interface	885997	01295	SN75160A
U3	IC, Interface	885998	01295	SN75161A
U4	IC, DAC, 16-Bit	887896	13919	BAC1600JF
U5	Same as U4			
U6	IC, Interface	885996	01295	TMS9914A
U7	IC, TTL, Octal Transparent Latch	884513	07263	74LS373PC

MODEL 2250

Table 6-7. Replacement Parts List: I/O Circuit
Card Assembly A3 - 787172-2 Revision D (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U8	Same as U7			
U9	IC, TTL, Dual JK Flip-Flop	883604	01295	SN74LS107N
U10	IC, TTL, Hex Inverter	808898	01295	SN74LS32N
U11	Same as U7			
U12	IC, TTL, 1-of-8 Decoder/ Demultiplexer	808135	01295	SN74LS138
U13	Same as U12			
U14	IC, TTL, Hex Inverter	885980	01295	74LS05N
U15	IC, LV, TTL, 20-Pin	886186	04713	SN74LS645
U16	IC, TTL, D-Type Flip-Flop w/Clear	883592	01295	ASN74LS273
U17-U19	Same as U16			
U20	IC, Amp, OP-27GZ	886028	06665	OP-27GZ
U21	Same as U20			
U22	IC, TTL, Octal Buffer/Line Driver	808713	18324	74LS244
W2,W4	Jumper, Mini, Shorting Strip	884691	22526	65474-001
W1-1,W1-2	Same as TP1			
W2-1,W2-2	Same as TP1			
W3-1,W3-2	Same as TP1			
W4-1,W4-2	Same as TP1			

MODEL 2250

Table 6-7. Replacement Parts List: I/O Circuit
Card Assembly A3 - 787172-2 Revision D (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
Z1	Resistor, Network, 3.3 k, 15 Res	885964	32997	4116R-002-332
Z2	Same as Z1			
Z3	Resistor, Network, 4 Pin, 80 k, 20 k, 175 k	887897	07342	887897
Z4	Same as Z3			

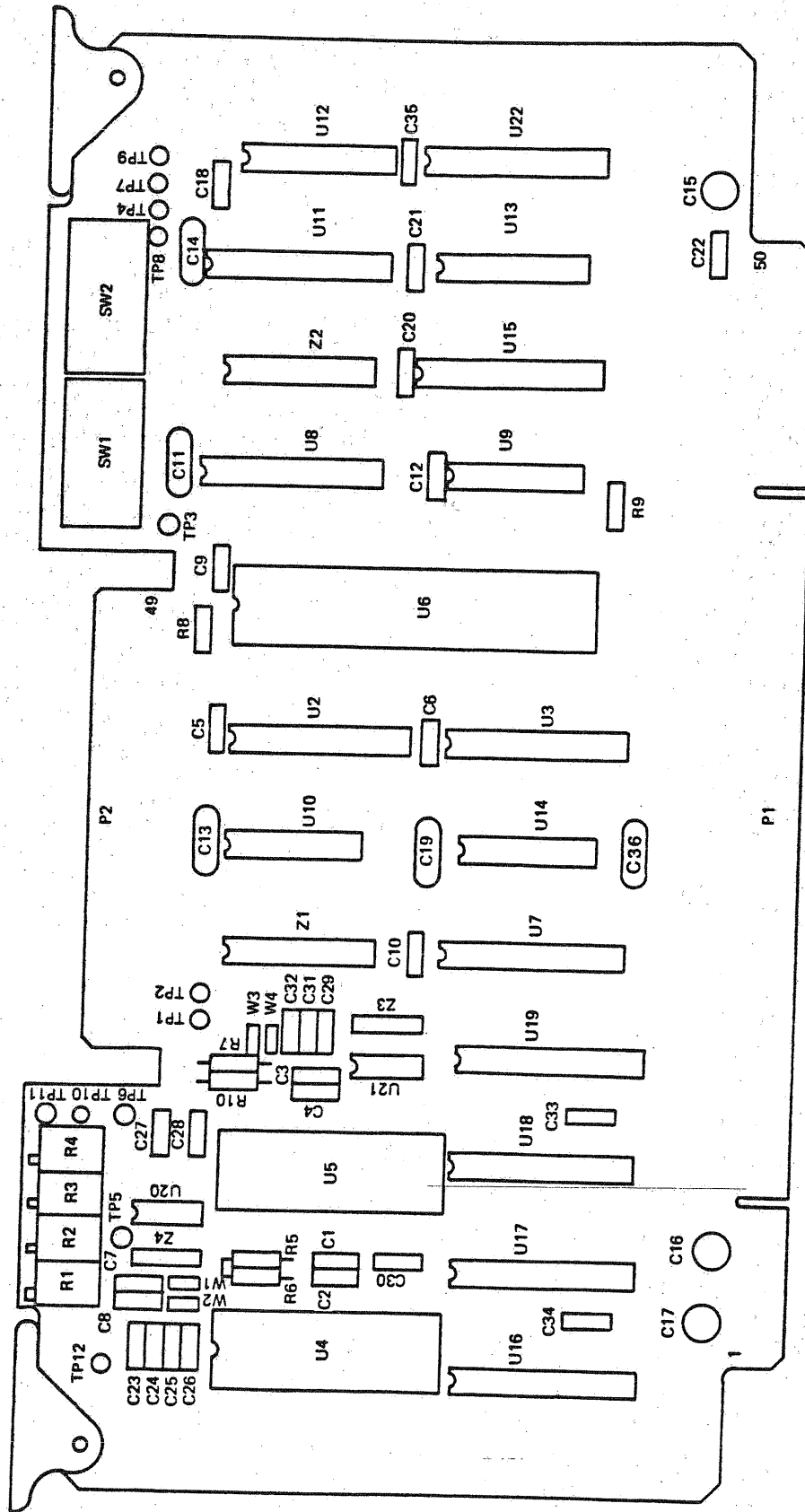


Figure 6-5. I/O CCA A3 (P/N 787172-2 Revision D), Parts Location

MODEL 2250

Table 6-8. Replacement Parts List: Timing and Control
Circuit Card Assembly A4 - 787173-1 Revision E

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C1	Capacitor, Ceramic, 0.1 uf, 50 V, <u>+20%</u>	886063	16299	SR215E104MAA
C2-C5	Same as C1			
C6	Capacitor, Ceramic, 0.1 uf, 50 V, <u>+80-20%</u>	886061	AAAAA	NCD-.01M50VZZ5V
C7-C14	Same as C6			
C15-C20	Same as C1			
C21	Capacitor, Tantalum, 1 uf, 35 V, <u>+10%</u>	883001	56289	150D105X9035A
C22	Same as C6			
C23-C25	Same as C1			
C26	Capacitor, Tantalum, 10 uf, 25 V, <u>+20%</u>	886060	AAAAA	NDT-10M-25V-M-ZD
C27	Same as C6			
R1	Resistor, Composition, 11 k, 1/4 W, <u>+5%</u>	802255	01121	CB6815
R2	Resistor, Composition, 18 k, 1/4 W, <u>+5%</u>	802183	01121	CB1835
R3	Same as R2			
U1	IC, TTL, 1-of-16 Decoder/ Demultiplexer	884668	01295	SN74LS154N
U2	IC, TTL (ALS), Synchronous Presettable Binary Counter	886356	01295	74ALS161
U3	IC/D, TTL, Quad 2-Input AND Gate	883236	01295	SN74LS08N
U4	IC, TTL, Dual D-Type Positive Edge-Triggered Flip-Flop	883240	01295	SN74LS74N

MODEL 2250

Table 6-8. Replacement Parts List: Timing and Control
Circuit Card Assembly A4 - 787173-1 Revision E (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U5	IC, TTL, Dual Modulo-16 Counter	883463	07263	74LS393N
U6	Same as U1			
U7	IC, TTL, 13-Input NAND Gate	880842	01295	SN74S133N
U8	Same as U4			
U9	Same as U5			
U10	IC/D, MOS HT, Programmable Timer	884475	04713	MC6840CP
U11	Same as U5			
U12	Same as U4			
U13	IC, TTL, Quad 2-Input NAND Gate	808128	01295	SB74S00N
U14	IC/D, TTL, Quad Set-Reset Latch	880068	01295	SN74279
U15	IC, TTL, Quad D Flip-Flop	808889	01295	SN74S174N
U16	Same as U5			
U17	IC, XMOS, Hex Inverter	885985	01295	74HC14N
U18	IC, TTL, Hex Schmitt Trigger Inverter	883703	01295	SN74LS14N
U19	IC, TTL, 1-of-8 Decoder/Demultiplexer	808135	01295	SN74LS138
U20	IC, TTL, Binary UP/DOWN Counter	808914	01295	SN74LS193N
U21	Same as U14			

MODEL 2250

Table 6-8. Replacement Parts List: Timing and Control
Circuit Card Assembly A4 - 787173-1 Revision E (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U22	IC, TTL, Quad 2-Input Multiplexer	880699	01295	SN745S157
U23,U24	Same as U22			
U25	IC, TTL, Quad 2-Input Schmitt Trigger NAND Gate	883982	01295	ASN74LS132N
U26	IC, TTL, Quad Bus Buffer Gate	808342	01295	SN74LS125N
U27	IC, TTL, Quad 2-Input NAND Gate	885981	01295	74LS03N
U28	IC/D, TTL, Quad Set-Reset Latch	883239	01295	SN74LS279N
U29	Same as U26			
U30-U32	IC, TTL, 8-Bit Register w/Clear	883634	01295	SN74LS273N
U33	IC, LV TTL, 20-Pin	886186	04713	SN74LS645
XU14	IC, Socket	808197	00779	2-640358-3

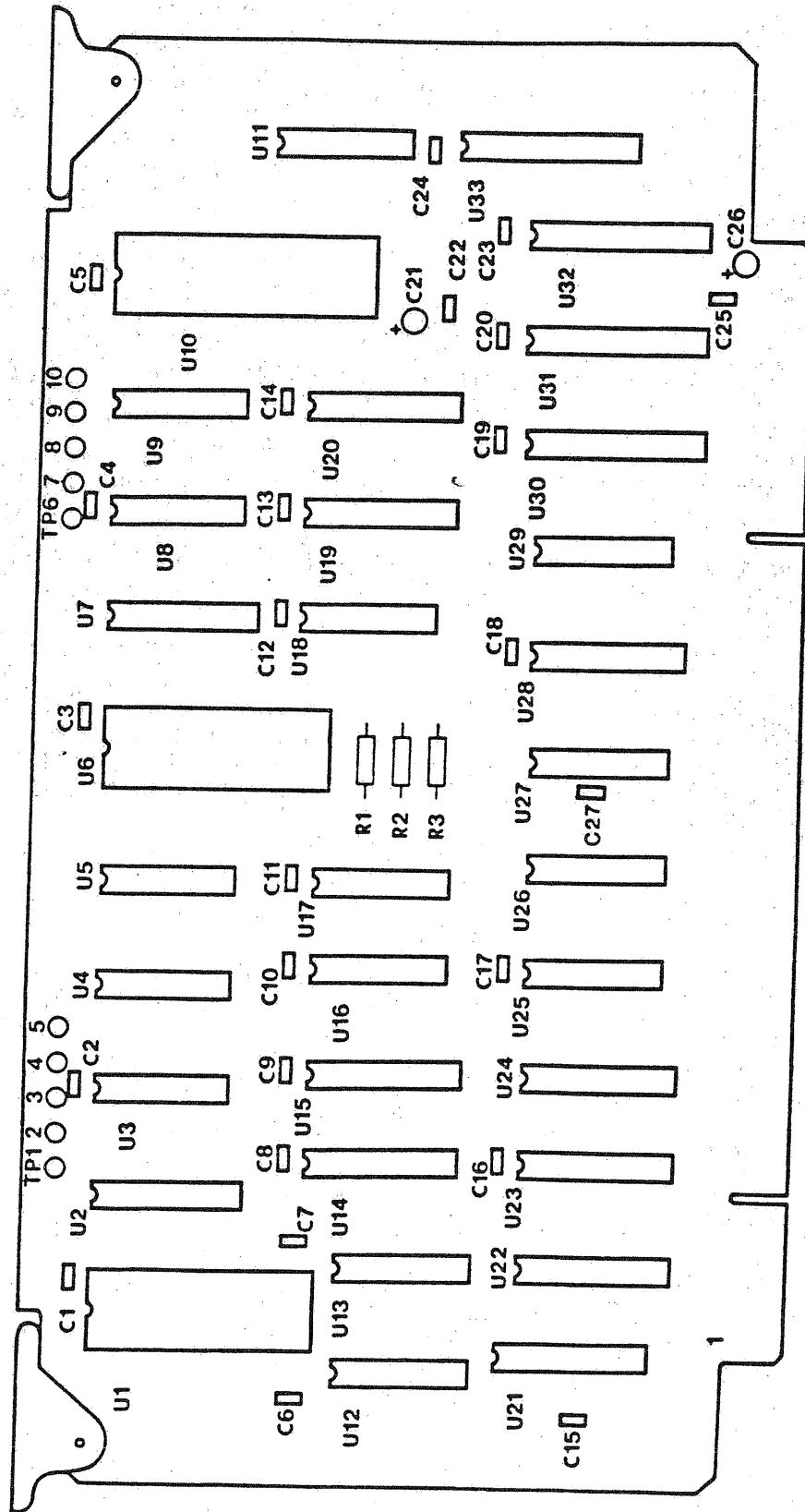


Figure 6-6. Timing and Control CCA A4 (P/N 787173-1 Revision E), Parts Location

MODEL 2250

Table 6-9. Replacement Parts List: Phase-Locked Loop
Circuit Card Assembly A5 - 787192-1 Revision F

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
BB1	Buss Bar, 10-Pos	886004	19648	SU10.75.3.1
BB2, BB3	Same as BB1			
C1	Capacitor, Ceramic, 39 pf, 200 V, $\pm 10\%$	808624	81349	CK05BX390K
C2	Capacitor, Ceramic, 24 pf, 200 V, $\pm 10\%$	886394	51406	CK05BX240K
C3	Capacitor, Metal Film, 180 pf, 200 V, $\pm 10\%$	808103	81349	CK05BX181K
C4	Capacitor, Ceramic, 820 pf, 200 V, $\pm 10\%$	886395	51406	CK05BX821K
C5	Capacitor, Ceramic, 560 pf, 200 V, $\pm 10\%$	805283	81349	CK05BX561K
C6	Capacitor, Ceramic, 1800 pf, 100 V, $\pm 10\%$	886397	51406	CK06BX182K
C7	Capacitor, Ceramic, 0.0056 uf, 200 V, $\pm 10\%$	805957	81349	CK06BX562K
C8	Capacitor, Ceramic, 0.018 uf, 100 V, $\pm 10\%$	805281	95750	CK06BX183K
C9	Same as C7			
C10	Same as C8			
C11	Capacitor, Ceramic, 0.056 uf, 100 V, $\pm 10\%$	805454	81349	CK06BX563K
C12	Capacitor, Ceramic, 0.18 uf, 100 V, $\pm 10\%$	886402	51406	CK06BX184K
C13	Capacitor, Ceramic, 0.22 uf, 50 V, $\pm 10\%$	882456	81349	CKR06BX224KP
C14	Capacitor, Ceramic, 1 uf, 50 V, $\pm 10\%$	882876	81349	CKR06BX105KP

MODEL 2250

Table 6-9. Replacement Parts List: Phase-Locked Loop
Circuit Card Assembly A5 - 787192-1 Revision F (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C15	Capacitor, El, Tantalum, 2.2 uf, 20 V, $\pm 20\%$	884160	25088	ST822A225M020N
C16	Capacitor, Tantalum, 4.7 uf, 25 V, $\pm 20\%$	886059	AAAAA	NDT4.7M25VMZD
C17	Capacitor, Ceramic, 0.015 uf, 100 V, $\pm 10\%$	806367	81349	CK06BX153K
C18	Same as C11			
C19	Capacitor, Ceramic, 3900 pf, 200 V, $\pm 10\%$	886400	51406	CK06BX392K
C20	Capacitor, Ceramic, 22 pf, 200 V, $\pm 10\%$	886399	51406	CK05BX220K
C21	Capacitor, Ceramic, 0.1 uf, 50 V, $\pm 10\%$	807730	81349	CK05BX104K
C22	Capacitor, Ceramic, 0.47 uf, 50 V, $\pm 10\%$	886398	54407	CP487
C23	Capacitor, Ceramic, 0.18 uf, 100 V, $\pm 10\%$	886402	51406	CK06BX184K
C24	Same as C21			
C25	Same as C20			
C26	Same as C14			
C27,C28	Capacitor, Tantalum, 10 uf, 25 V, $\pm 20\%$	886060	AAAAA	NDT-10M-25V-MZD
C29,C30	Capacitor, Tantalum, 3.3 uf, 25 V, $\pm 20\%$	886064	AAAAA	NDT3.3M-25V MZD
C31-C42	Capacitor, Ceramic, Axial Lead, 0.1 uf, 50 V, $\pm 20\%$	885498	96095	SA105E104MAA
C43	Same as C27			
C44	Same as C31			
CRI	Not used			

MODEL 2250

Table 6-9. Replacement Parts List: Phase-Locked Loop
Circuit Card Assembly A5 - 787192-1 Revision F (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
CR2	Diode, Sig. In	808974	01295	1N4148
CR3-CR8	Same as CR2			
CR9	Diode, Zener, 2.4 V	888287	04713	1N5221B
Q1	Transistor, MOSFET, TO-92 Case	886370	17896	VN10KM
Q2,Q3	Same as Q1			
R1	Resistor, Metal Film, 19.1 k, 1/10 W, <u>+1%</u>	808370	01121	CC1912F
R2	Resistor, Metal Film, 5.90 k, 1/20 W, <u>+1%</u>	886379	91637	EMF-50-100-5.90K
R3,R4	Not used			
R5	Resistor, Composition, 1 k, 1/8 W, <u>+5%</u>	880694	01121	BB1025
R6	Resistor, Metal Film, 4.12 k, 1/20 W, <u>+1%</u>	886373	91637	EFM-50-100-4.12K
R7	Resistor, Metal Film, 20 k, 1/10 W, <u>+0.5%</u>	808226	91637	CMF-55,T-2
R8	Resistor, Composition, 82 ohm, 1/8 W, <u>+5%</u>	887711	01121	RCR05G820JS
R9	Resistor, Metal Film, 10.0 k, 1/20 W, <u>+1%</u>	886380	91637	EMF-50-100-10K
R10	Same as R6			
R11	Resistor, Metal Film, 3.01 k, 1/20 W, <u>+1%</u>	886374	91637	EMF-50-100-3.01K
R12	Resistor, Metal Film, 6.98 k, 1/20 W, <u>+1%</u>	886393	91637	EMF-50-100-6.98K
R13	Resistor, Metal Film, 24.3 k, 1/20 W, <u>+1%</u>	886383	91637	EMF-50-100-24.3K
R14	Resistor, Composition, 510 ohm, 1/4 W, <u>+5%</u>	880082	01121	CB5115

MODEL 2250

Table 6-9. Replacement Parts List: Phase-Locked Loop
Circuit Card Assembly A5 - 787192-1 Revision F (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
R15	Same as R9			
R16	Resistor, Metal Film, 3.16 k, 1/20 W, <u>+1%</u>	886375	91637	EMF-50-100-3.16K
R17	Resistor, Metal Film, 1.00 k, 1/20 W, <u>+1%</u>	886372	91637	EMF-50-100-1K
R18	Resistor, Metal Film, 316 ohm, 1/20 W, <u>+1%</u>	886371	91637	EMF-50-100-316OHM
R19	Resistor, Metal Film, 316 k, 1/20 W, <u>+1%</u>	808640	92637	EMF-50-100-316K
R20	Resistor, Metal Film, 100 k, 1/20 W, <u>+1%</u>	808657	91637	EMF-50-100-100K
R21	Resistor, Metal Film, 31.6 k, 1/20 W, <u>+1%</u>	886384	91637	EMF-50-100-31.6K
R22	Same as R9			
R23	Not used			
R24	Same as R19			
R25	Same as R20			
R26	Same as R21			
R27	Same as R19			
R28	Resistor, Metal Film, 158 k, 1/20 W, <u>+1%</u>	808650	91637	EMF-50-100-158K
R29	Resistor, Metal Film, 49.9 k, 1/20 W, <u>+1%</u>	886387	91637	EMF-50-100-49.9K
R30	Resistor, Metal Film, 15.8 k, 1/20 W, <u>+1%</u>	886382	91637	EMF-50-100-15.8K
R31	Resistor, Metal Film, 4.99 k, 1/20 W, <u>+1%</u>	886377	91637	EMF-50-100-4.99K
R32	Resistor, Metal Film, 475 k, 1/20 W, <u>+1%</u>	886389	91637	EMF-50-100-475K

MODEL 2250

Table 6-9. Replacement Parts List: Phase-Locked Loop
Circuit Card Assembly A5 - 787192-1 Revision F (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
R33	Resistor, Metal Film, 150 k, 1/20 W, <u>+1%</u>	886388	91637	EMF-50-100-150K
R34	Resistor, Metal Film, 47.5 k, 1/20 W, <u>+1%</u>	886386	91637	EMF-50-100-47.5K
R35	Resistor, Metal Film, 15.0 k, 1/20 W, <u>+1%</u>	886381	91637	EMF-50-100-15.0K
R36	Same as R5			
R37	Resistor, Metal Film, 33.2 k, 1/20 W, <u>+1%</u>	886385	91637	EMF-50-100-33.2K
R38	Same as R19			
R39	Resistor, Metal Film, 3.32 k, 1/20 W, <u>+1%</u>	886376	91637	EMF-50-100-3.32K
R40	Same as R17			
R41	Resistor, Metal Film, 1.00 Meg, 1/20 W, <u>+1%</u>	886391	91637	EMF-50-100 1.0M
R42	Same as R19			
R43	Same as R20			
R44	Same as R21			
R45	Same as R41			
R46	Same as R19			
R47	Same as R20			
R48	Same as R21			
R49	Resistor, Metal Film, 499 k, 1/20 W, <u>+1%</u>	886390	91637	EMF-50-100-499K
R50	Same as R28			
R51	Same as R29			
R52	Same as R30			

MODEL 2250

Table 6-9. Replacement Parts List: Phase-Locked Loop
Circuit Card Assembly A5 - 787192-1 Revision F (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
R53	Resistor, Metal Film, 1.5 Meg, 1/10 W, <u>+1%</u>	886392	91637	EMF-55-100-1.5M
R54	Same as R32			
R55	Same as R33			
R56	Same as R34			
R57	Same as R5			
R58	Not used			
R59	Resistor, Composition, 10 k, 1/8 W, <u>+5%</u>	880830	01121	BB1035
R60-R62	Same as R59			
R63	Resistor, Composition, 1 M, 1/8 W, <u>+5%</u>	880833	01121	BB1055
R64	Resistor, Composition, 5.1 k, 1/8 W, <u>+5%</u>	880576	01121	BB5125
R65	Same as R59			
R66	Resistor, Variable, 20 k, 1/2 W, <u>+10%</u>	808241	32997	3299X203
R67	Resistor, Variable, 100 k, 1/2 W, 25-Turn	808428	32997	3299X-1-104
R68	Resistor, Composition, 3.3 k, 1/8 W, <u>+5%</u>	805103	81349	RC05GF332J
U1	IC, TTL, Hex Buffer/Driver	808140	01295	SN7407N
U2	IC, Data Converter	808886	02735	CD4051BE
U3,U4	Same as U2			
U5	IC, Data Converter	808227	02735	CB4052BE
U6-U9	Same as U5			
U10	IC, TTL, Hex Buffer/Driver	883497	01295	SN74LS153N

MODEL 2250

Table 6-9. Replacement Parts List: Phase-Locked Loop
Circuit Card Assembly A5 - 787192-1 Revision F (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U11	IC, TTL, Quad Bus Buffer	808342	01295	SN74LS125N
U12	IC, CMOS, Phase-Locked Loop	888289	27014	MM74HC4046N
U13	IC, CMOS, 2-Channel Analog Multiplexer	808304	02735	CD4053BE
U14	IC, CMOS, Hex Inverter	888290	02735	CD74HC4049E
U15	IC, TTL, Dual D-Type Edge Triggered Flip-Flop	883240	01295	SN74LS74N
U16	IC, CMOS, 3-Input NOR Gate (Triple)	888292	02735	CD74HC27
U17	IC, CMOS, High Speed Presettable Down Counter	888291	02735	CD4MC40103E
U18	Same as U17			
U19	IC, OP Amp, 8-Pin, DIP	886495	06665	OP16-EZ
U20	Same as U19			
U21	IC, TTL, Quad 2-Input Multiplexer	883460	07263	74LS157N
U22	IC, -5 V Voltage Regulator	884919	27014	70L05ACZ
U23	IC, Amplifier	885026	01295	TL082ACP
Z1	Resistor, Network, NML, 1 k, 8-P, 7 Res., $\pm 2\%$	808371	56289	420CH102X2PD

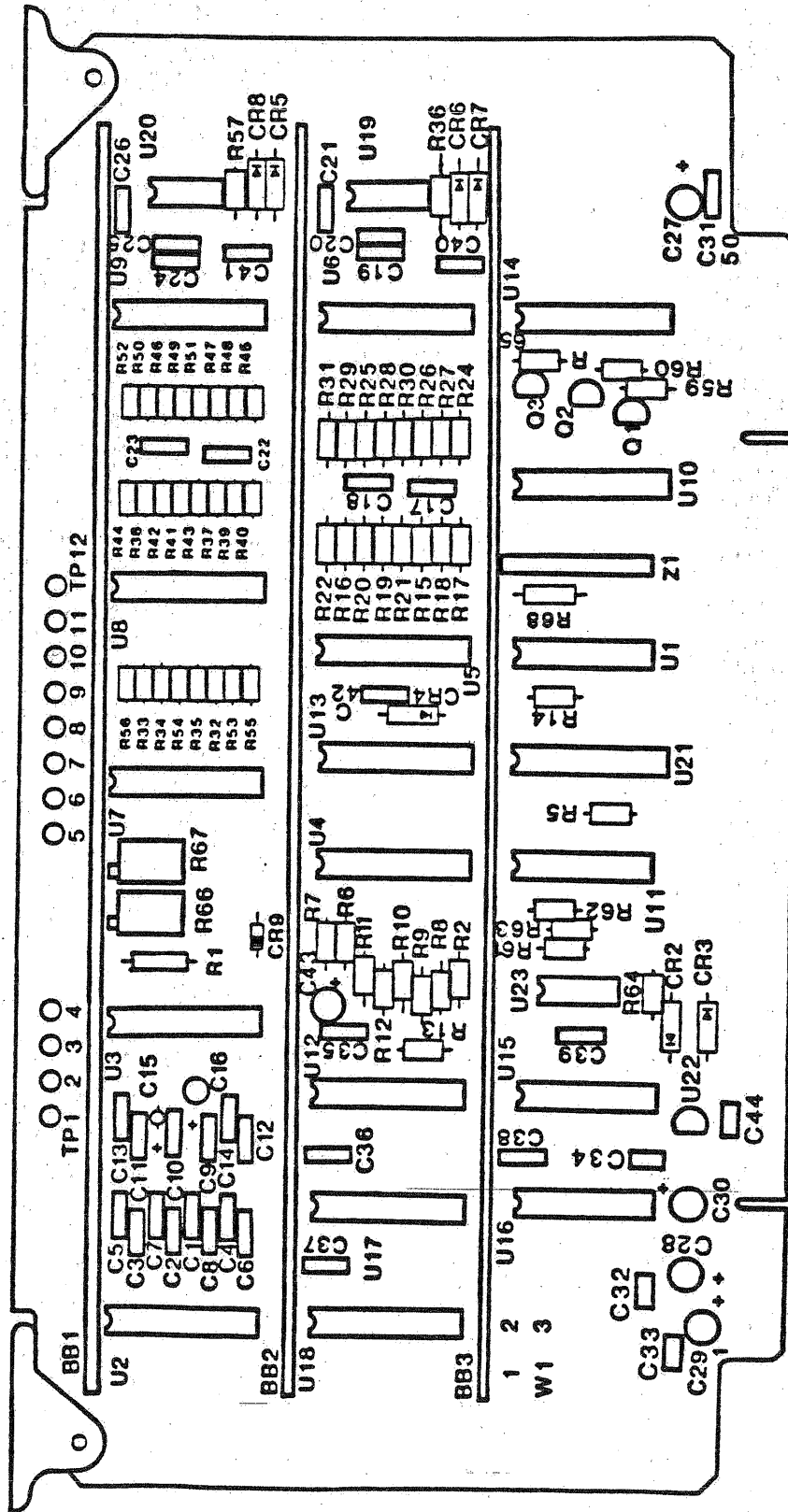


Figure 6-7. Phase-Locked Loop CCA A5 (P/N 787192-1 Revision F), Parts Location

MODEL 2250

Table 6-10. Replacement Parts List: Accumulator Circuit
Card Assembly A6,A7 - 787193-1 Revision A (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U17	Same as U16			
U18	Resistor, Network, SIP, 1 k, 6 Pos, 5 Res, $\pm 2\%$	885535	32997	430GR-101-102
U19	Same as U12			
U20	Same as U13			
U21	Same as U13			
U22	Same as U12			
U23	Same as U15			
U24	IC, XMOS, Hex Inverter	885985	01295	74HC14N
U25	IC, TTL, Octal Latch, Schottky	886738	01295	745273N
U26	IC, LV, TTL, 20-Pin	886186	04713	SN74LS645
U27	Same as U26			
XU14	Socket, Int Ckt, DIP, 20-Pin	808408	00779	2-640464-3

MODEL 2250

Table 6-10. Replacement Parts List: Accumulator Circuit
Card Assembly A6,A7 - 787193-1 Revision A

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C1	Capacitor, Tantalum, 10 uf, 25 V, <u>+20%</u>	886060	AAAAA	NDT-10M-25VM-ZD
C2	Capacitor, Ceramic, 0.1 uf, 50 V, <u>+20%</u>	886063	16299	SR215E104MAA
C3-C15	Same as C2			
TP1	Post	880007	00779	87022-9
TP2-TP14	Same as TP1			
U1	IC, TTL, Quad 2-Input Multiplexer	883590	01295	SN74LS158
U2	IC, TTL, 4-Bit Binary Full Adder (w/fast carry)	883593	01295	SN74LS283
U3	Same as U1			
U4	Same as U2			
U5	Same as U1			
U6	Same as U2			
U7	Same as U1			
U8	Same as U2			
U9	Same as U1			
U10,U11	Same as U2			
U12	IC, TTL, Octal D-Type Flip-Flop	808576	01295	SN74LS374N
U13	IC, RAM, 2 k x 8, 120 ms	886097	52464	MSM5128RS-62
U14	PAL, Overload Indicator	887742	07342	887742
U15	IC, CMOS, 8-Bit Latched Shift Register	885986	04713	74HC595N
U16	IC, TTL, Octal Buffer/Line Driver	885098	01295	SN74LS240

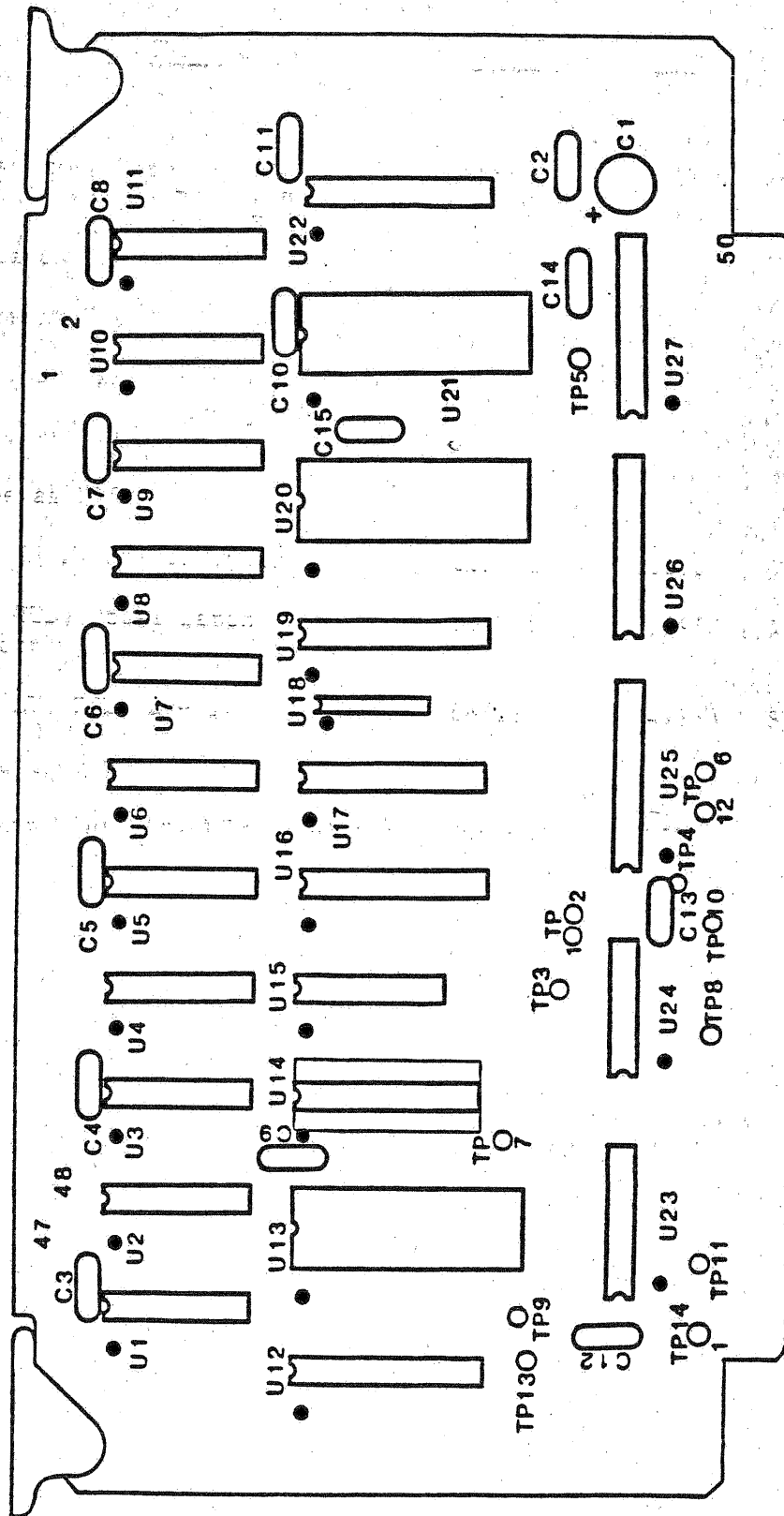


Figure 6-8. Accumulator CCA A6/A7 (P/N 787193-1 Revision A), Parts Location

MODEL 2250

Table 6-11. Replacement Parts List: Auto Calibration
Circuit Card Assembly A8 - 787274-2 Revision C

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C1	Capacitor, Ceramic, Axial Lead, 0.1 uf, 50 V, <u>+20%</u>	886063	16299	SR215E104MAA
C2-C20	Same as C1			
C21	Capacitor, Ceramic, 1500 pf, 100 V, <u>+10%</u>	805357	72982	8133-000-W5R0152K
C22	Same as C21			
C23	Capacitor, Tantalum, 3.3 uf, 25 V, <u>+20%</u>	886064	AAAAA	NDT3.3M-25VMZD
C24-C26	Same as C23			
C27	Capacitor, Ceramic 47 pf, 200 V, <u>+10%</u>	808622	81349	CK05BX470K
C28	Same as C27			
C29	Capacitor, Tantalum, Radial Lead, 10 uf, 25 V, <u>+20%</u>	886060	AAAAA	NDT-10M-25VM-ZD
C30	Same as C29			
C31	Capacitor, Ceramic, 0.47 uf, 50 V, <u>+10%</u>	882449	81349	CKR06BX474KP
C32	Capacitor, Ceramic, 0.047 uf, 100 V, <u>+1%</u>	883330	81349	CK06BX473K
C33	Capacitor, Ceramic, 0.0047 uf, 50 V, <u>+10%</u>	883359	81349	CK05BX472K
C34	Capacitor, Ceramic, 470 pf, 200 V, <u>+10%</u>	883364	81349	CK05BX471K
C35	Same as C23			
C36	Same as C23			
C37	Capacitor, Ceramic, 1200 pf, 100 V, <u>+10%</u>	884839	72982	CK05BX122K
C38	Capacitor, Ceramic, 560 pf, 200 V, <u>+10%</u>	805283	81349	CK05BX561K

MODEL 2250

Table 6-11. Replacement Parts List: Auto Calibration
Circuit Card Assembly A8 - 787274-2 Revision C (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C39	Capacitor, Ceramic, 390 pf, 200 V, <u>+10%</u>	805284	81349	CK05BX391K
C40-C43	Same as C1			
C44	Capacitor, Solid Tantalum, 22 uf, 10 V, <u>+10%</u>	886176	AAAAA	MDT47M10VM
C45	Same as C44			
CR1	Diode, Sig., 1N6263	883449	07980	5082-HSCH-1001
CR2-CR4	Same as CR1			
CR5	Rectifier, Schottky, 125 V, 1 A	886006	81349	1N5805
CR6	Same as CR5			
J1	Not used			
J2	Header, 2-Pin	886058	51306	TSW-136-09-T-S-RP
R1	Resistor, Metal Film, 15 k, 1/8 W, <u>+1%</u>	806538	16299	NC4
R2	Same as R1			
R3	Resistor, Metal Film, 1 k, 1/10 W, <u>+1%</u>	808213	16299	NC55
R4	Resistor, Metal Film, 5.62 k, 1/10 W, <u>+1%</u>	808231	16299	NC555621F
R6	Resistor, Variable, 500 ohm, 25 Turn, <u>+10%</u>	807655	32997	3299X-1-501
R7	Resistor, Fixed, Metal Film, 4.75 k, 100 PPM TC, <u>+1%</u>	886175	91637	CMF-55D4751F
R8	Resistor, Variable, Pot, 100 k	808428	32997	3299X-1-104
R9	Same as R8			

MODEL 2250

Table 6-11. Replacement Parts List: Auto Calibration
Circuit Card Assembly A8 - 787274-2 Revision C (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
R10	Resistor, Metal Film, 80.6 k, 1/10 W, <u>+1%</u>	808242	16299	NC558062F
R11	Resistor, Metal Film, 4.99 k, 1/8 W, <u>+1%</u>	880045	16299	NA55-4.99K
R12	Resistor, Fixed, Metal Film, 20 k, 1/8 W, <u>+1%</u>	806544	16299	NC55
R13	Resistor, Variable, 5 k, 1/2 W, 25 Turn, Cermet	807250	32997	3299X-5KOHM
R14-R16	Same as R3			
R17	Resistor, Metal Film, 5.23 k, 1/10 W, <u>+1%</u>	887988	16299	Type C4 - 5.23K
R18	Resistor, Composition, 10 ohm, 1/4 W, <u>+5%</u>	883106	01121	CB1005
R19	Same as R18			
R20	Resistor, Composition, 1 k, 1/4 W, <u>+5%</u>	880084	01121	CB1025
R21	Same as R20			
R22	Resistor, Composition, 10 k, 1/4 W, <u>+5%</u>	880092	01121	CB1035
R23	Resistor, Composition, 62 k, 1/4 W, <u>+5%</u>	802082	01121	CB6235
R24	Resistor, Metal Film, 2.67 k, 1/10 W, <u>+1%</u>	887987	16299	Type C4 - 2.67K
SW1	Switch, Misc., DIP, 16-Pin, 8 Piano	808582	81073	76PSB08S
SW2	Switch, DPDT, Rt. Angle, PC Mount	886739	70255	TSS2ING-RA
TP1	Post, P and Cont., Mod II, Machine Applied	880007	00779	87022-9
TP2-TP5	Same as TP1			

MODEL 2250

Table 6-11. Replacement Parts List: Auto Calibration
Circuit Card Assembly A8 - 787274-2 Revision C (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U1	IC, Reg., Adj, 14-Pin, DIP	886173	04713	MC14682
U2	IC, Function Generator	886172	52062	XR8038N
U3	IC, Analog Switch	886082	17856	DG212CJ
U4	IC/L Op Amp, St, NML	884427	01295	TL081CP
U5	IC, Amp, OP-37GZ	886029	06665	OP-37GZ
U6	IC/L, Op Amp, St, NML	808302	12040	LM311N
U7	IC, TTL, Quad D Flip-Flop	883603	01295	SN74LS175
U8	IC, DAC, 12-Bit, Buffered Multiplying	886033	24355	AD7545JN
U9	Same as U8			
U10	IC, TTL, Octal Buffer/Line Driver	885098	01295	SN74LS240
U11	IC, Amp, OP-27GZ	886028	06665	OP-27GZ
U12	Same as U11			
Z1	Resistor, Network, 3.3 k, 9 Res.	886057	01121	110A332

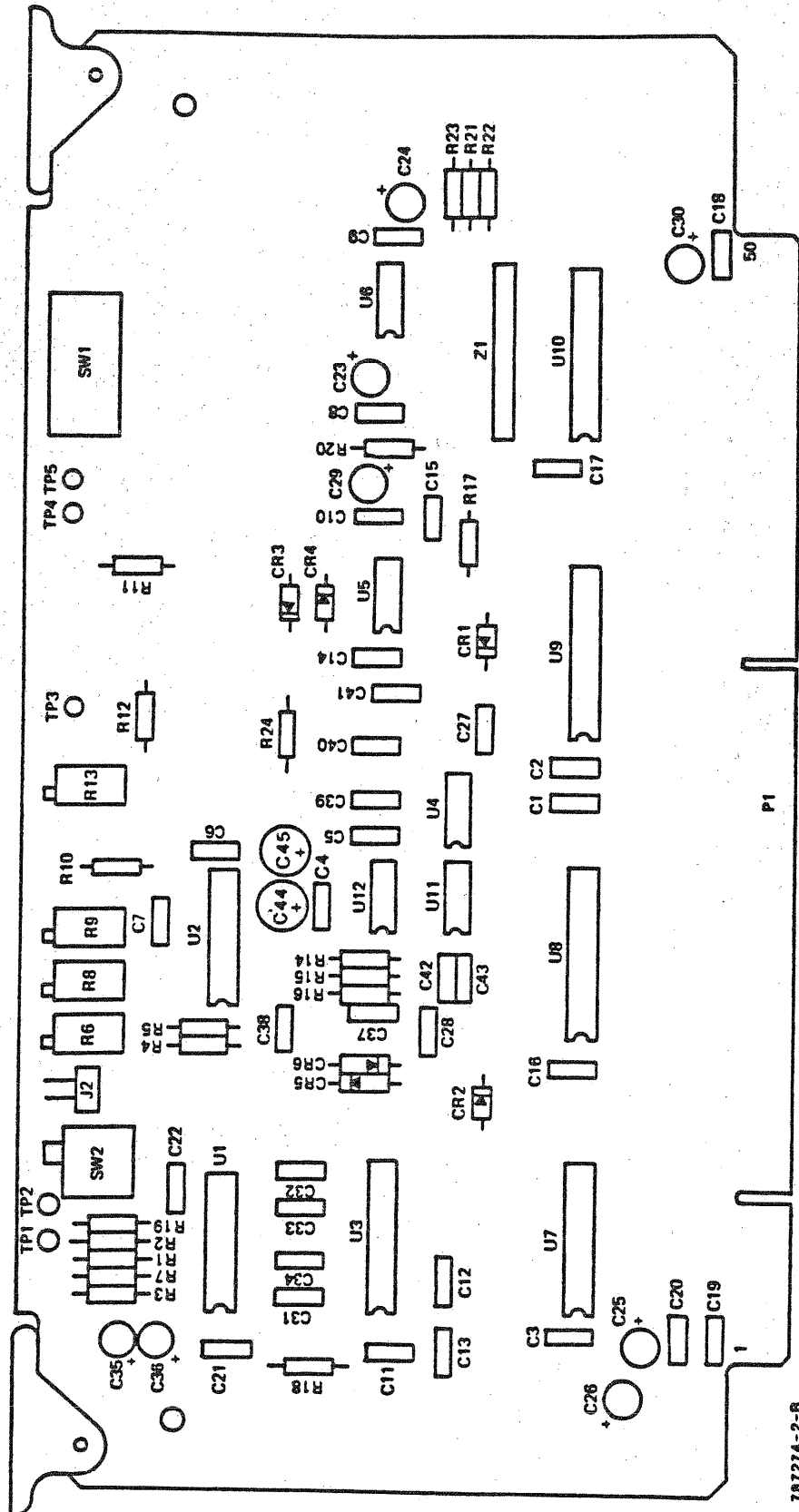


Figure 6-9. Auto Calibration CCA A8 (P/N 787274-2 Revision C), Parts Location

MODEL 2250

Table 6-12. Replacement Parts List: A/D Converter
Circuit Card Assembly A9,A12 - 787664 Revision G

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
A9,A12	A/D Converter CCA Revision G	787664	07342	787664	A
A9,A12	A/D Converter CCA Revision F	787664	07342	787664	B
A9,A12	A/D Converter CCA Revision E	787664	07342	787664	C
C1	Capacitor, Ceramic, 0.01 uf, 50 V, +80-20%	886061	AAAAA	NCD-.01M50VZZ5V	
C2	Same as C1				
C3	Not used				
C4	Not used				
C5-C8	Same as C1				
C9	Capacitor, Tantalum, 10 uf, 25 V, $\pm 20\%$	886060	AAAAA	NDT-10M-25VM-ZD	
C10,C11	Same as C9				
C12-C14	Same as C1				
C15	Capacitor, Mica, 47 pf, 500 V, $\pm 5\%$	886079	81349	M04EC470J	
C16,C17	Same as C1				
C18	Not used				
C19,C20	Same as C1				
C21	Capacitor, Ceramic, 680 pf, 200 V, $\pm 10\%$	807627	81349	CK05BX681K	
C22	Capacitor, Ceramic, 270 pf, 200 V, $\pm 10\%$	885595	81349	CKR05BX271KP	
C23	Capacitor, Ceramic, 0.0022 uf, 100 V, $\pm 10\%$	882037	81349	CK06BX222K	
C24-C28	Same as C1				
C29	Capacitor, Tantalum, 4.7 uf, 25 V, $\pm 20\%$	886059	AAAAA	NDT4.7M25VMZD	

MODEL 2250

Table 6-12. Replacement Parts List: A/D Converter
Circuit Card Assembly A9,A12 - 787664 Revision G (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
CR2	Same as CR1				
CR3	Diode, Sig.	882195	81349	AN1N914	
CR4	Same as CR3				
K1	Relay, Form C, 5 Coil, DIP	886719	95348	847C-1/-2	
R1	Resistor, Composition, 2 k, 1/4 W, $\pm 5\%$	880086	01121	CB2025	
R2	Resistor, Composition, 510 ohm, 1/4 W, $\pm 5\%$	880082	01121	CB5115	
R3	Resistor, Composition, 1.1 k, 1/4 W, $\pm 5\%$	802415	01121	CB1125	
R4	Not used				
R5	Not used				
R6	Resistor, Metal Film, 51 k, 1/8 W, $\pm 1\%$	806550	16299	RN55C5112F	
R7	Resistor, Variable, 50 k, 1/2 W, 25-Turn, Cermet	807251	32997	3299X50KOHM	
R8	Resistor, Metal Film, 10 ohm, 1/10 W, $\pm 1\%$	808240	16299	RN55D10R0B	
R9	Resistor, Variable, 500 ohm, 25 Turn, $\pm 10\%$	807655	32997	3299X-1-501	
R10	Resistor, Metal Film, 64.9 k, 1/10 W, $\pm 1\%$	807425	81349	N55D6492F	
R11	Resistor, Metal Film, 2.37 k, 1/10 W, $\pm 1\%$	886723	81349	N55D2371F	
R12	Resistor, Metal Film, 1.5 k, 1/10 W, $\pm 1\%$	807537	81349	N55D1501F	
R13	Resistor, Metal Film, 1 k, 1/10 W, $\pm 1\%$	808213	16299	NC55	
R14,R15	Same as R1				

Table 6-12. Replacement Parts List: A/D Converter
Circuit Card Assembly A9,A12 - 787664 Revision G (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
C30	Same as C29				
C31,C32	Same as C9				
C33	Capacitor, Ceramic, 0.1 uf, 50 V, $\pm 20\%$	886063	16299	SR215E104MAA	
C34-C36	Same as C33				
C37,C38	Same as C1				
C39	Not used				
C40	Capacitor, Ceramic, 1.0 uf, 50 V, $\pm 5\%$	886073	81349	CK06BX105J	
C41,C42	Same as C40				
C43,C44	Same as C33				
C45	Capacitor, Ceramic, 0.39 uf, 50 V, $\pm 5\%$	886076	81349	R055C394JAA	
C46	Same as C40				
C47	Capacitor, Ceramic, 0.056 uf, 100 V, $\pm 10\%$	805454	81349	CK06BX563K	
C48,C49	Same as C33				
C50,C51	Same as C9				
C52	Same as C40				
C53	Capacitor, Ceramic, 560 pf, 200 V, $\pm 10\%$	805283	81349	CK05BX561K	
C54-C56	Same as C1				
C100	Capacitor, Ceramic 27 pf, 200 WVdc, $\pm 10\%$	808401	72982	CK05BX270K	
C101	Same as C22				
CR1	Rectifier, Schottky, 125 V, 1A	886006	81349	N5805	

MODEL 2250

Table 6-12. Replacement Parts List: A/D Converter
Circuit Card Assembly A9,A12 - 787664 Revision G (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
R16	Resistor, Composition, 1 M, 1/4 W, $\pm 5\%$	880100	01121	CB1055	
R17	Resistor, Fixed, Comp-K ohm, 160 k, 1/4 W	803995	01121	CB1645	
R18	Resistor, Fixed, 69.8 k, 1/8 W, $\pm 1\%$	885979	81349	N55D69R8F	
R19	Resistor, Composition, 1 k, 1/4 W, $\pm 5\%$	880084	01121	CB1025	
R20	Resistor, Composition, 5.6 k, 1/4 W, $\pm 5\%$	801983	01121	CB5625	
R21	Same as R20				
R22	Resistor, Composition, 470 ohm, 1/4 W, $\pm 5\%$	880567	01121	CB4715	
R23	Same as R22				
R24,R25	Same as R20				
R26,R27	Same as R22				
R28	Same as R1				
R29	Resistor, Composition, 3.9 k, 1/4 W, $\pm 5\%$	801409	01121	CB3925	
R30	Same As R1				
R31	Same as R2				
R32	Same as R19				
R33	Same as R3				
R34	Same as R19				
R35	Not used				
R36	Resistor, Composition, 33 k, 1/4 W, $\pm 5\%$	880097	01121	CB3335	
R37	Resistor, Variable, 5 k, 1/2 W, 25 Turn, Cermet	807250	32997	3299X-5KOHM	

MODEL 2250

Table 6-12. Replacement Parts List: A/D Converter
Circuit Card Assembly A9,A12 - 787664 Revision G (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
R38	Same as R29				
R39	Same as R22				
R40	Same as R20				
R41	Resistor, Variable, 2 k, 1/2 W, 25 Turn, Cermet	807297	32997	3299X-1-202	F,G
R41	Resistor, Variable, 1 k, 1/2 W, 25 Turn, Cermet	807296	32997	3299X-1-102	E
R42	Resistor, Metal Film, 4.22 k, 1/10 W, $\pm 1\%$	808100	91637	MF-1/104.22K 1%	
R43	Resistor, Metal Film, 634 ohm, 1/10 W, $\pm 1\%$	887664	91637	MF-1/10 634OHM 1%	
R44	Resistor, Metal Film, 732 ohm, 1/10 W, $\pm 1\%$	808154	01121	CB1015	
R45	Same as R13				
R46	Not used				
R47	Resistor, Composition, 22 k, 1/4 W, $\pm 5\%$	880368	01121	CB2235	A
R47	Resistor, Composition, 2.2 k, 1/4 W, $\pm 5\%$	880670	01121	CB2225	B,C
R48	Same as R47				A
R48	Same as R47				B,C
R49,R50	Same as R22				
R51	Not used				
R52	Not used				
R53	Resistor, Composition, 390 k, 1/4 W, $\pm 5\%$	801987	01121	CB3945	A
R53	Resistor, Composition, 7.5 M, 1/4 W, $\pm 5\%$	807102	01121	CB7555	B,C
R54	Same as R53				A

MODEL 2250

Table 6-12. Replacement Parts List: A/D Converter
Circuit Card Assembly A9,A12 - 787664 Revision G (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
R54	Same as R53				B,C
R55	Resistor, Composition, 10 k, 1/4 W, $\pm 5\%$	806813	81349	RCR07GF103JS	
R56	Resistor, Composition, 270 k, 1/4 W, $\pm 5\%$	804400	01121	CB2745	
R57,R58	Same as R56				
R59	Resistor, Composition, 100 ohm, 1/4 W, $\pm 1\%$	880077	01121	CB1015	
R60	Same as R59				
R61	Not used				
R62	Not used				
R63	Not used				
R64	Not used				
R65	Same as R1				
R66	Same as R22				
R67	Same as R59				
R68	Resistor, Metal Film, 15 k, 1/8 W, $\pm 1\%$	806538	16299	NC4	
R69	Same as R19				A,B
R69	Not used				C
R70	Resistor, Carbon, 5.1 M, 1/4 W, $\pm 5\%$	806371	01121	RC07GF515J	
R71	Potentiometer, 10 k	807507	32997	3299X-1-103	
SW1	Switch, DPDT, Rt. Angle, PC Mount	886739	70255	TSS21NG-RA	
TP1	Post, P and Cont., Mod II, Machine Applied	880007	00779	87022-9	
TP2-TP19	Same as TP1				

MODEL 2250

Table 6-12. Replacement Parts List: A/D Converter
Circuit Card Assembly A9,A12 - 787664 Revision G (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
U1	IC, Amp, OP-37GZ	886029	06665	OP-37GZ	
U2	IC, Amplifier	886051	34371	HA1-5320-2	
U3	IC, A/D Converter, 12-Bit	888135	13919	ADC-806CM	
U4	IC, TTL, Quad 2-Input NAND Gate	808137	01295	SN74LS00N	
U5	IC, Analog Switch	886030	17856	DG509ACJ	
U6	IC, Dual Darlington Driver	886050	80183	ULN2061M	
U7	IC/L, Op Amp, St, NML	808302	12040	LM311N	
U8	IC, Interface Optocoupler	887665	28480	HCPL2400	
U9	IC, Interface	886048	28480	HCPL2630	
U10	Same as U9				
U11	IC, Interface	885991	58361	MCT6	
U12	Same as U11				
U13	IC, TTL	870313	07263	96S02PC	
U14	IC/L, Op Amp St, NML	808211	12040	LF356N	
U15	IC, TTL, Quad Bus Buffer Gate	808342	07263	74LS125APC	
U16	Same as U11				
U17	IC, Interface, Dual Optocoupler	889271	95131	HCPL2731	A
U17	Same as U9				B,C
U18	IC/L, Dif Comp St, NML	884448	81349	M393N	
U19	IC, Quad Op Amp	887660	13919	OPA404BG	
U20	IC, Linear Quad Analog Switch	808733	12040	LF13333N	
U21	Same as U8				

MODEL 2250

Table 6-12. Replacement Parts List: A/D Converter
Circuit Card Assembly A9,A12 - 787664 Revision G (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
Z1	Resistor, Network, 1 k, 2 k, 4 k	885349	07342	885349	
Z2	Resistor, Network, 1 k, 3 k	885352	07342	885352	
Z3	Resistor, Network, 470 ohm, 7 Res	886044	01121	108A471	
Z4	Same as Z3				
Z5	Resistor, Network, NML PRCN, 10 k Pair	808859	07342	808859	
Z6	Resistor, Network, 4 P, 10 k, 10 k, 5 k	887526	07342	887526	

MODEL 2250

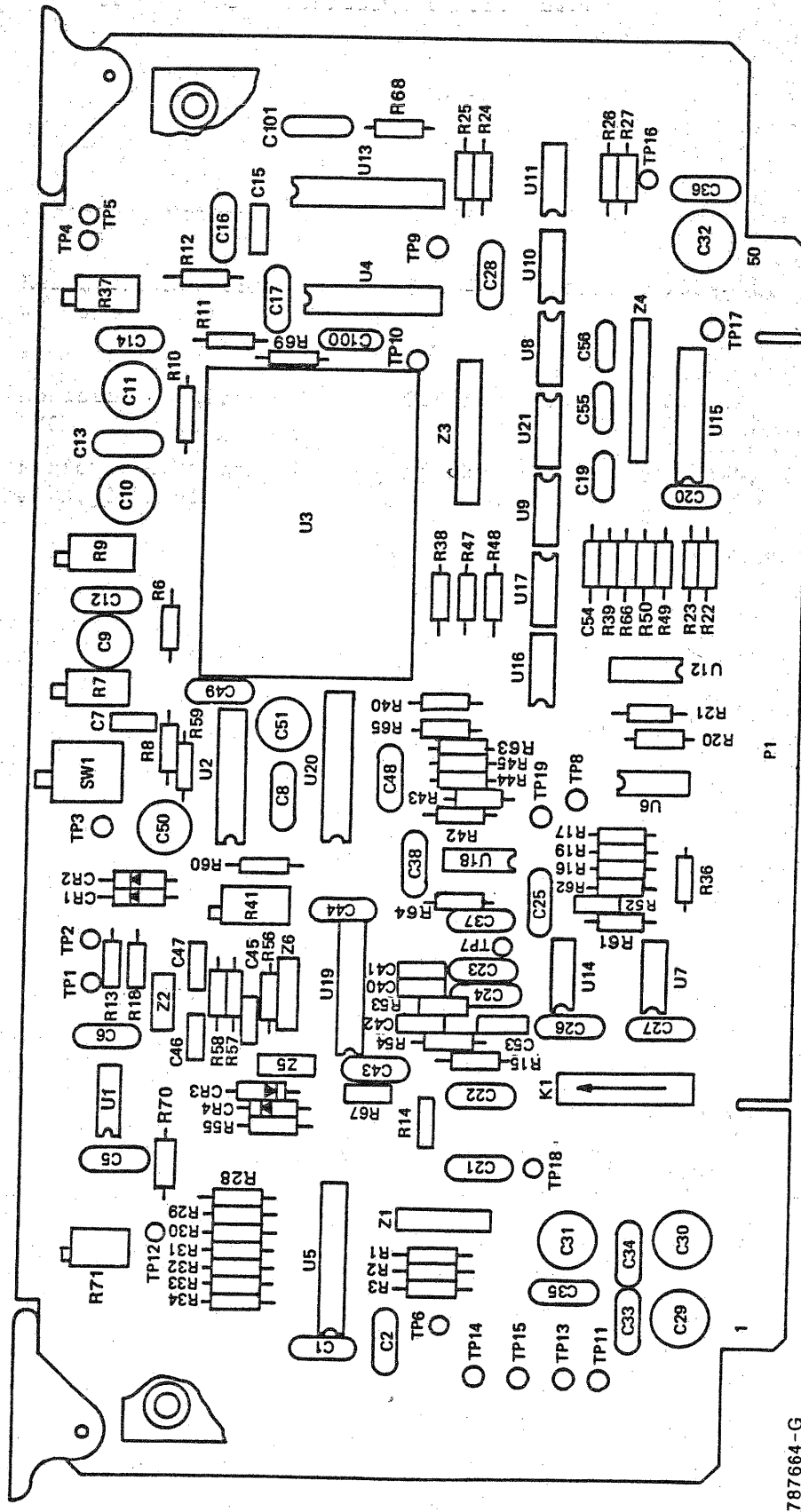


Figure 6-10. A/D Converter CCA A9/A12 (P/N 787664 Revision G), Parts Location

MODEL 2250

Table 6-13. Replacement Parts List: Filter Circuit Card Assembly
A10, A13 - 787176-1 Revision B

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
A10,A13	Filter, 10 Hz-100 kHz	787176	07342	787176
	Shield	299115	07342	299115
	Shield	299116	07342	299116

NOTE

This circuit card assembly is a proprietary item and therefore no parts breakdown or schematic diagram is supplied for it. Maintenance of this circuit card assembly is performed at the manufacturer's facility.

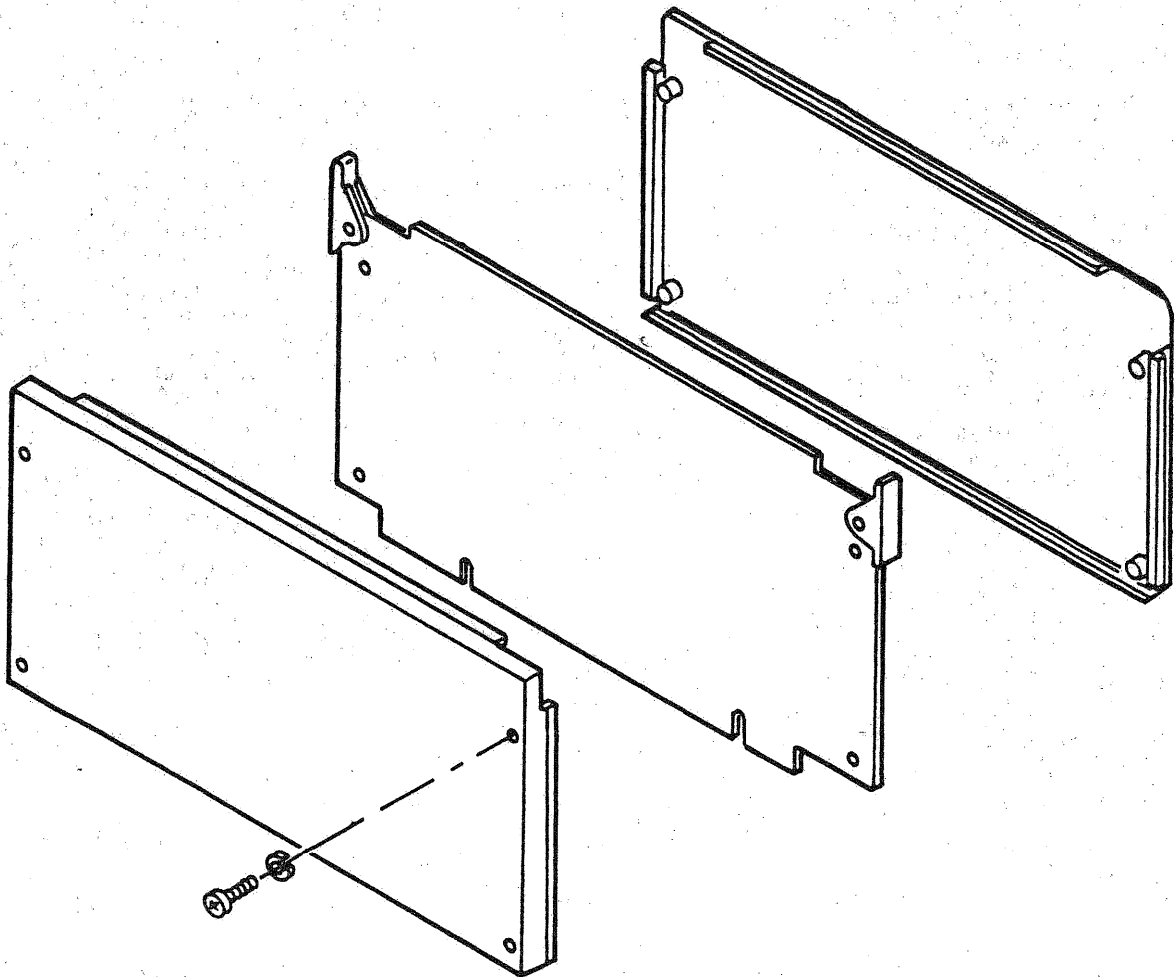


Figure 6-11. Filter CCA A10, A13 (P/N 787176-1 Revision B),
Parts Location

MODEL 2250

Table 6-14. Replacement Parts List: Front End
Circuit Card Assembly A11,A14 - 787505-1 Revision E

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C1	Capacitor, Mylar, 0.68 uf, 400 V, <u>+1%</u>	886857	12406	2D4A684F
C2	Capacitor, Polyst, 43 pf, 750 V, <u>+5%</u>	887678	84411	602.1 43pf 5%750V
C3	Capacitor, Glass, 11.0 pf, 750 V (0.8-11.0 pf)	887679	52769	GHL11000
C4	Capacitor, Glass, PS, 0.027, 100 V, <u>+1%</u>	808175	84171	1PGL273F
C5	Capacitor, Polystyrene, Molded, 22 pf, 750 V, <u>+5%</u> Radial Leads (Style 802)	808288	84411	808288
C6	Not used			
C7	Capacitor, Tantalum, 10 uf, 25 V, <u>+20%</u>	886060	AAAAA	NDT-10M-25VM-ZD
C8	Same as C2			
C9,C10	Same as C7			
C11	Capacitor, Ceramic, Axial Lead, 0.1 uf, 50 V, <u>+20%</u>	885498	96095	SA105E104MAA
C12-C28	Same as C11			
C29-C32	Same as C7			
C33,C34	Same as C11			
C35	Capacitor, Mica, 150 pf, 500 V, <u>+1%</u>	886010	11869	CM04FD151F03
C36	Capacitor, Mica, 82 pf, 500 V, <u>+1%</u>	807434	72136	DM15 820F
C37	Same as C3			
C38,C39	Same as C7			
C40-C44	Same as C11			

MODEL 2250

Table 6-14. Replacement Parts List: Front End
Circuit Card Assembly A11,A14 - 787505-1 Revision E (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C45	Capacitor, Ceramic, 560 pf, Temp Stable	884148	71590	CW15A561K
NOTE				
Capacitor C46 is a select-at-test component with a nominal value of 5 pf, but which may vary within a range of 1-5 pf. During alignment procedures select appropriate component as needed.				
C46	Capacitor, Mica, 5 pf, 300 V, +1 pf (Nominal Value)	806244	72136	DM5 05A
	Select at Test			
	Capacitor, Mica, 1 pf, 500 V, +0.5 pf	802619	72136	DM15-010D
	Capacitor, Mica, 2 pf, 500 V, +0.5 pf	808258	72136	DM15-020D
	Capacitor, Mica, 3 pf, 500 V, +0.5 pf	807459	72136	DN10-030-J
CR1	Diode, Zener	880714	81349	1N4735A
CR2	Same as CR1			
CR3	Diode, Sig, IN	802924	07263	1N3600
CR4	Same as CR3			
CR5	Diode, Zener	803552	81349	1N4734A
CR6	Same as CR5			
CR7	Rectifier, Schottky, 125 V, 1A	886006	81349	1N5805
CR8	Same as CR7			
CR9	Not used			
CR10	Not used			

MODEL 2250

Table 6-14. Replacement Parts List: Front End
Circuit Card Assembly A11,A14 - 787505-1 Revision E (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
CR11	Diode, Sig, IN	808974	81349	1N4148
CR12	Same as CR11			
K1	Relay, Form C, 5-Coil, Dip	886719	95348	847C-1/-2
K3-K4	Same as K1			
Q1	Transistor, Mosfet, N-Chan, NML	806213	81349	2N5246
Q2	Same as Q1			
Q3	Transistor, Mosfet	886496	17856	VN0300N
Q4,Q5	Same as Q3			
R1	Resistor, Mtch Set, 1.998 Meg	885353	07342	885353-0002
R2	Resistor, Mtch Set, 2.00 Meg	885353	07342	885353-0001
R3	Resistor, Metal Film, 2 Meg, 1/4 W, <u>+1%</u>	886863	81349	RN60D2004F
R4	Resistor, Fixed, WW, 27 k, 9 W, <u>+5%</u>	807231	91637	CW-7,9W, <u>+5%</u> .27KOHM
R5	Resistor, Metal Film, 14.3 k, 1/8 W, <u>+1%</u>	807475	16299	NC4 14.3K
R6	Resistor, Metal Film, 1.24 k, 1/10 W, <u>+1%</u>	887688	91637	CMF-55 1.24K
R7	Resistor, Composition, 10 k, 1/4 W, <u>+5%</u>	880092	01121	CB1035
R8	Resistor, Composition, 100 ohm, 1/4 W, <u>+5%</u>	880077	00779	87022-9
R9	Same as R8			
R10	Resistor, Variable, Pot, 100 k	808428	32997	3299X-1-104

MODEL 2250

Table 6-14. Replacement Parts List: Front End
Circuit Card Assembly A11,A14 - 787505-1 Revision E (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
R11	Resistor, Composition, 910 ohm, 1/4 W, <u>+5%</u>	807165	01121	CB9115
R12	Resistor, Composition, 820 ohm, 1/4 W, <u>+5%</u>	803693	01121	CB8215
R13	Resistor, Composition, 1 k, 1/4 W, <u>+5%</u>	880084	01121	CB1025
R14	Resistor, Variable, 10 k	807507	32997	3299X-1-103
R15	Not used			
R16	Resistor, Metal Film, 16.2 k, 1/8 W, <u>+1%</u>	806559	16299	NC4
R17	Resistor, Metal Film, 1 k, 1/10 W, <u>+1%</u>	808213	16299	NC55
R18	Resistor, Composition, 68 k, 1/4 W, <u>+5%</u>	880098	01121	CB6835
R19	Resistor, Fixed, WW, 100 ohm, 2 W, <u>+1%</u>	807648	81349	RW80U1000F
R20	Same as R5			
R21	Not used			
R22	Resistor, Composition, 3.3 k, 1/4 W, <u>+5%</u>	803388	01121	CB3325
R23	Same as R22			
R24	Resistor, Metal Film, 392 ohm, 1/8 W, <u>+1%</u>	887537	01121	RN55D3920F
R25	Resistor, Metal Film, 59 ohm, 1/8 W, <u>+1%</u>	887538	01121	RN55D0590F
R26	Same as R7			
R27	Resistor, Composition, 750 ohm, 1/4 W, <u>+5%</u>	880602	01121	CB7515
R28	Same as R27			

MODEL 2250

Table 6-14. Replacement Parts List: Front End
Circuit Card Assembly All, A14 - 787505-1 Revision E (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
R29	Not used			
R30	Resistor, Composition, 270 k, 1/4 W, <u>+5%</u>	804400	01121	CB2745
R31	Same as R30			
R32	Resistor, Composition, 5.6 k, 1/4 W, <u>+5%</u>	801983	01121	CB5625
R33	Same as R32			
R34	Resistor, Metal Film, 4.12 k, 1/20 W, <u>+1%</u>	886373	91637	EMF-50-100-4.12K
R35	Resistor, Metal Film, 4.32 k, 1/20 W, <u>+1%</u>	887763	81349	RN50STY1/20W
R36	Resistor, Composition, 18 k, 1/4 W, <u>+5%</u>	802183	01121	CB1835
R37	Not used			
R38	Not used			
R39	Resistor, Composition, 2 M, 1/4 W, <u>+5%</u>	807094	01121	CB2055
R40	Same as R39			
R41	Resistor, Trimpot, 20 ohm, Side Adj, 25 Turn	887936	32997	3299-X-1-200
TP1	Post, P and Cont., Mod II, Machine Applied	880007	00779	87022-9
TP2-TP6	Same as TP1			
TP7	Not used			
TP8-TP11	Same as TP1			
U1	IC, Op Amp, 8-Pin, DIP	886495	06665	OP16-EZ
U2	IC, Analog Switch	886030	17856	DG509ACJ

MODEL 2250

Table 6-14. Replacement Parts List: Front End
Circuit Card Assembly All, A14 - 787505-1 Revision E (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U3	IC, Op Amp, OP-37GZ	886029	06665	OP-37GZ
U4	IC, Linear Quad Analog Switch	808733	12040	LF13333N
U5	Same as U4			
U6,U7	Same as U3			
U8	IC, Interface	885991	58361	MCT6
U9-U11	Same as U8			
U12	IC, Quad Timer	887532	18324	NE559
U13	IC/L, Op Amp, St, NML	808302	12040	LM311N
U14	Same as U13			
Z1	Resistor, Network, 100 ohm, 900 ohm, 9 k	885350	07342	885350
Z2	Resistor, Network, 1 k, 16.3205 k	885351	07342	885351
Z3	Resistor, Network, 3 Pin, 100 ohm, 1.63205 k	887758	07342	887758
Z4	Resistor, Network, 470 ohm, 5 Res	885989	01121	106A471
Z5	Resistor, Network, 5.6 k, 5 Res	886046	01121	106A562
Z6	Resistor, Network, NML, 8 Pin, 4 Res, SIP	808626	32997	4308R-102-103

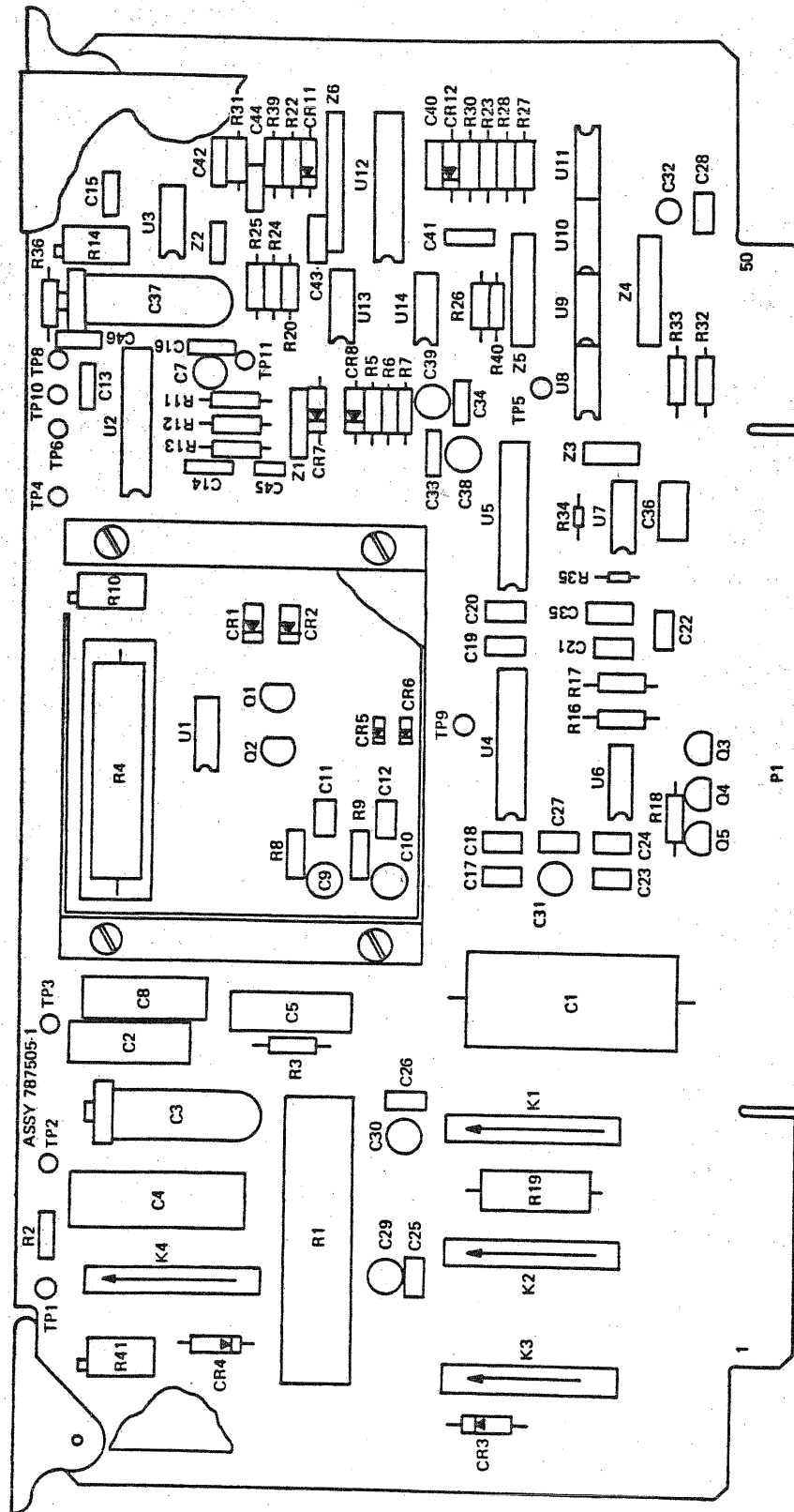


Figure 6-12. Front End CCA A11/A14 (P/N 787505-1 Revision E), Parts Location

MODEL 2250

Table 6-15. Replacement Parts List: Front Bezel Assembly
A15 - 787198 Revision F

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
	Bezel Assembly	298811	07342	298811
A15A1	Panel, Membrane, Non-Embossed (Keyboard)	298051-3	07342	298051-3
A15A2	Display Driver Circuit Card Assembly	787179	07342	787179
A15A3	Display Circuit Card Assembly	787178	07342	787178
A15A4	Signal Isolation Assembly	787448-0001	07342	787448-0001
A15A5	Reference Isolation Assembly	787448-0002	07342	787448-0002
A15S1	Switch Assembly	548493	07342	548493
A15W1	Cable Assembly, 40 Conductor	548477	07342	548477
A15W2	Cable Assembly, 50 Conductor	548476	07342	548476
A15W3	Same as A15W2			
A15W4	Wire Assembly, Ground	548494	07342	548494
A15W5	Shorting Link	800339	24655	938L
A15W6	Same as A15W5			
E1	Binding Post, Red	885360	18310	01-1102-1-0312
E2	Binding Post, Blk	886327	18310	01-1102-10310
E3-E6	Same as E2			
E7	Same as E1			

MODEL 2250

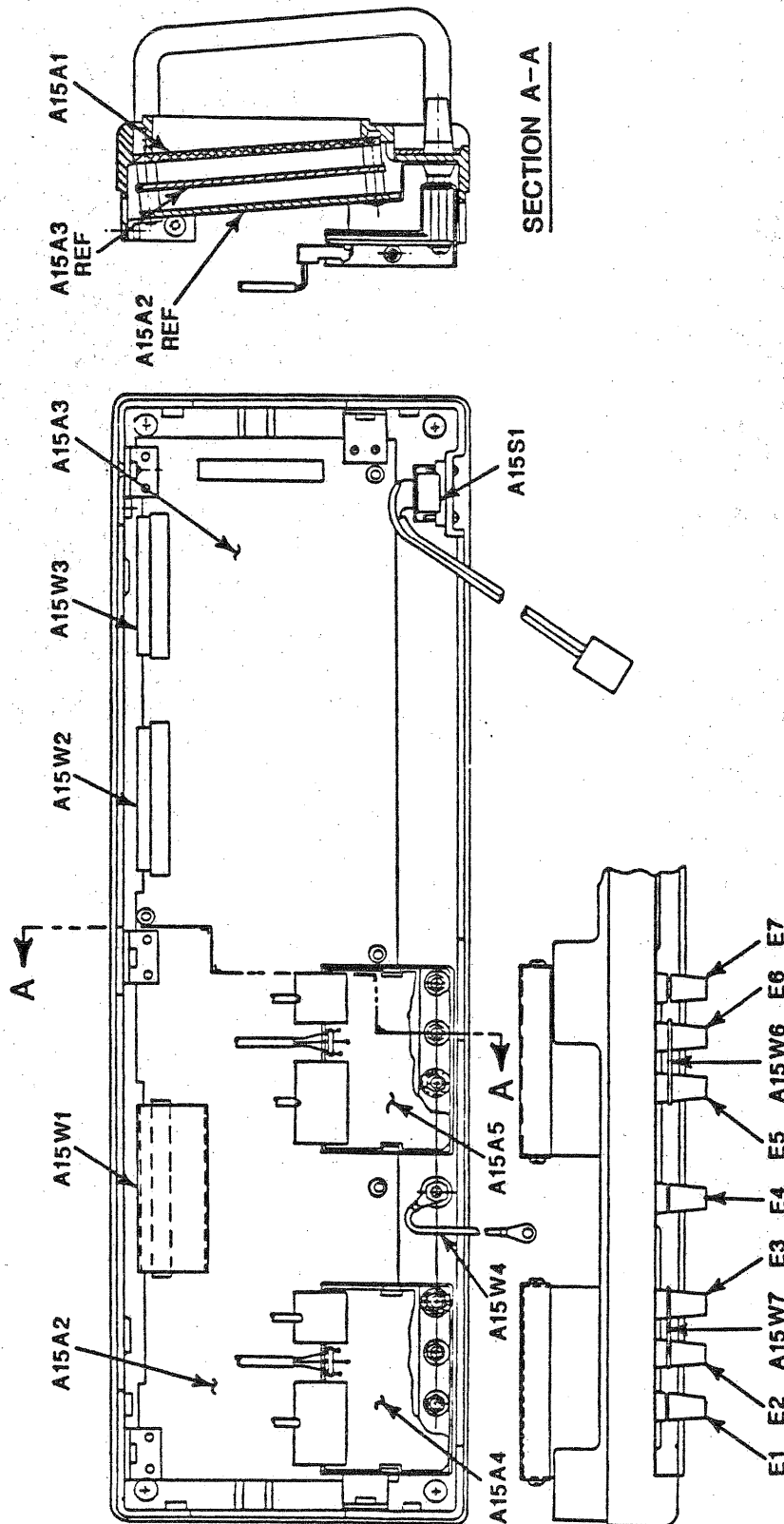


Figure 6-13. Front Bezel Assembly A15 (P/N 787198 Revision F), Parts Location

MODEL 2250

Table 6-16. Replacement Parts List: Display Driver
Circuit Card Assembly A15A2 - 787179 Revision D

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C1	Capacitor, Tantalum, 10 uf, 25 V, +20%	886060	AAAAA	NDT-10M-25V-M-ZD
C2	Capacitor, Solid, Tantalum, 47 uf, 20 V, +10%	883985	90201	CGS612UO50R4C
C3-C11	Same as C2			
C12	Capacitor, Ceramic, 0.01 uf, 50 V, +80-20%	886061	AAAAA	NCD-.01M50V-ZZ5V
C13-C19	Same as C12			
C20	Same as C2			
J1	Post, P and Cont, Mod II, Machine Applied	880007	00779	87022-9
J2-J4	Same as J1			
J5	Connector, Wafer, 2-Pin	886037	27264	26-48-1024
Q1	Transistor, Sig.	886018	81349	2N3444
Q2-Q21	Same as Q1			
U1	IC, Dual 4-Input NAND Gate	884629	01295	SN74LS20N
U2	Transistor Array	886602	02735	CA3082
U3	IC, TTL, Octal D Flip-Flop	808576	01295	SN74LS374N
U4	IC, TTL, Hex Inverter Buffer/Driver	808971	01295	SN7406N
U5	IC, TTL, Hex Inverter	885980	01295	74LS05N
U6	IC, Interface	885994	27014	MM74C911N
U7	IC, Interface	883412	04713	MC6821P
U8	Same as U3			
U9	Same as U4			

MODEL 2250

Table 6-16. Replacement Parts List: Display Driver
Circuit Card Assembly A15A2 - 787179 Revision D (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
U10	IC, TTL, 1-of-8 Decoder/Demultiplexer	808699	01295	SN74LS138
U11	IC, TTL, 5-Bit Shift Register	884214	01295	SN74LS96N
U12	Same as U6			
U13	IC, LV TTL, Bus Receiver, 20- Pin	886186	04713	SN74LS645
U14	Same as U6			
U15	IC, Expandable Segment Display Controller	885995	27014	MM74C912N
U16	Same as U10			
U17	IC, TTL, Quad 2-Input OR Gate	808898	01295	SN74LS32N
U18	Same as U6			
Z1	Resistor, Network, 33 ohm, 4 Res.	886023	01121	108B330
Z2-Z4	Same as Z1			
Z5	Resistor, Network, 10 k, 8 Res.	886020	01121	316B103
Z6	Same as Z5			
Z7	Resistor, Network, 75 ohm, 8 Res.	886022	01121	316B750
Z8	Same as Z7			
Z9	Resistor, Network, 47 ohm, 16-pin, 8 Res. DIP	886451	01121	316B470
Z10	Same as Z9			

MODEL 2250

Table 6-16. Replacement Parts List: Display Driver
Circuit Card Assembly A15A2 - 787179 Revision D (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
Z11	Resistor, Network, 3.3 k, SIP, 6-P, 3 Res, L PF	884755	01121	106B-3.3K
Z12-Z15	Same as Z1			
Z16	Resistor, Network, 470 ohm, 8 Res.	886021	01121	316B471

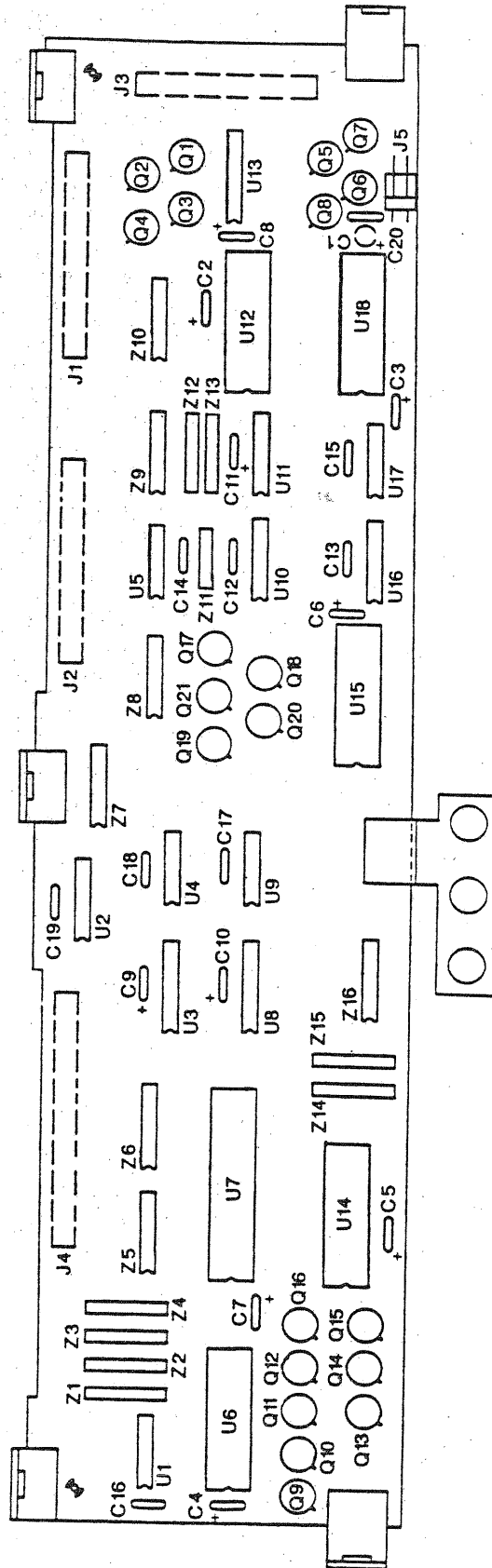


Figure 6-14. Display Driver Board A15A2 (P/N 787179 Revision D), Parts Location

MODEL 2250

Table 6-17. Replacement Parts List: Display
Circuit Card Assembly A15A3 - 787178 Revision D

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
NOTE				
NAI P/N 887339 represents a matched set of 3 LTD-6940 HR LEDs.				
NAI P/N 887340 represents a matched set of 5 LTS-3940 HR/315 AHR LEDs.				
DS1-DS3	Digital Display (Matched Set of 3)	887339	CCCCC	LTD-6940HR
DS4-DS8	Digital Display (Matched Set of 5)	887340	CCCCC	LTS-3940HR/315 AHR
DS9	Diode, LED	886043	CCCCC	LTL-57173
DS10- DS17	Same as DS9			
DS18	Digital Display	886042	CCCCC	LTA-1000E
DS19- DS23	Same as DS18			
DS24- DS30	Same as DS9			
J1	Header, PC, 40-Pin	880422	28218	3432-1002
J2	Same as J1			
XUDS4-	Socket, 14-Pin, Low Profile	887876	GGGGG	BU-14-02SF
XUDS5- XUDS8	Same as XUDS4			

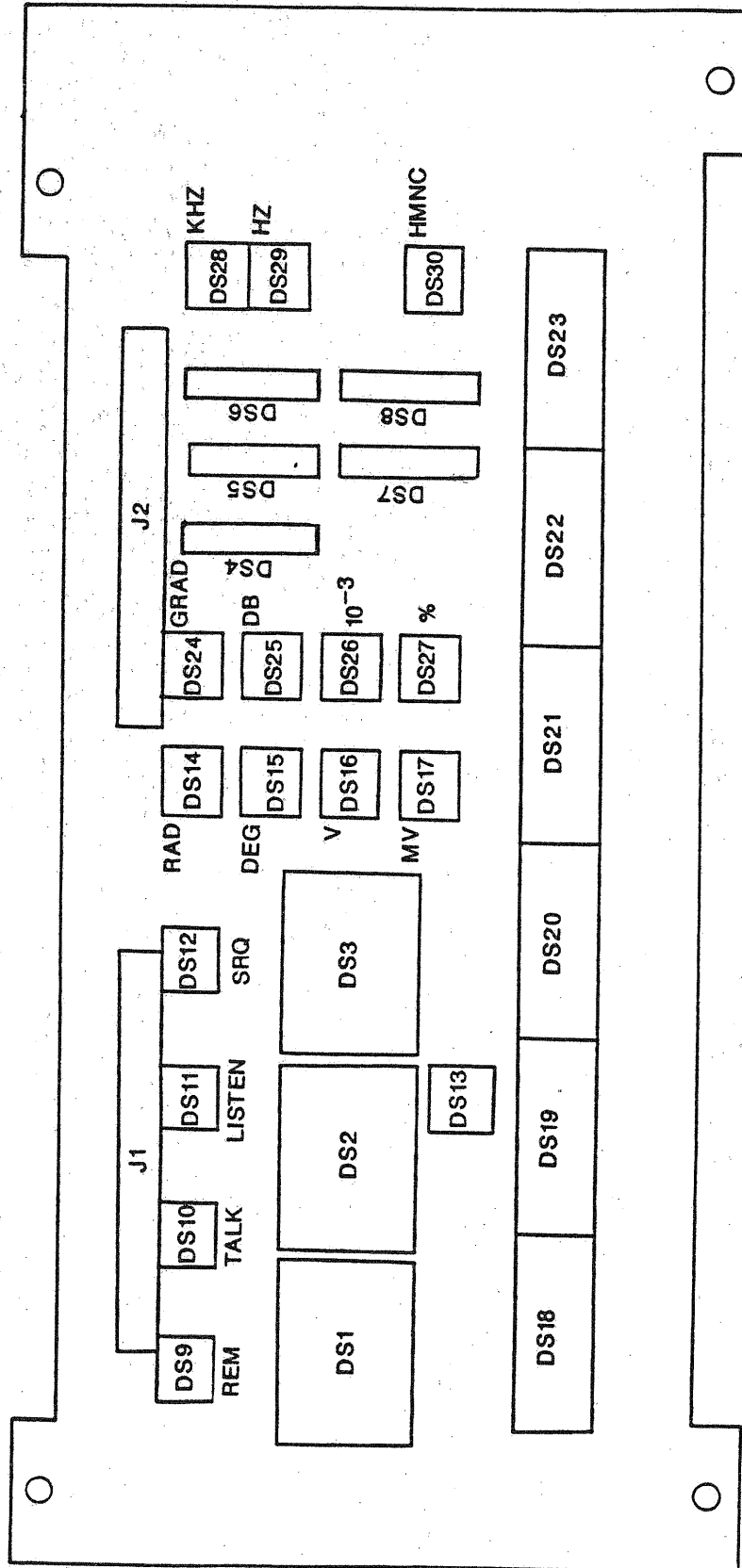


Figure 6-15. Display CCA A15A3 (P/N 787178 Revision D), Parts Location

MODEL 2250

Table 6-18. Replacement Parts List: Signal and Reference Isolation
Circuit Card Assemblies A15A4, A15A5 - 787448-1, -2 Revision D

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
CR1	Diode, Schottky, 30 V	886005	81349	1N5818
K1	Relay, Form C, 5-Coil, DIP	886719	95348	847C-1/-2
K2,K3	Same as K1			
P1	Connector, Right Angle, 8-Pos, 0.156 Ctrs	886720	06383	MLAS156-8
P2	Connector, Right Angle 5-Pos, 0.156 Ctrs	886721	06383	HLAS156-5
Q1	Transistor, Mosfet	886496	17896	VN0300N
Q2	Same as Q1			
R1	Resistor, Composition, 330 ohm, 1/4 W, +5%	880080	01121	CB3315
R2	Resistor, Composition, 5.6 k, 1/4 W, +5%	801983	01121	CB5625
U1	IC, Interface	885991	58361	MCT6
W1	Relay Isolation Cable Assembly (#1)	548513	07342	548513

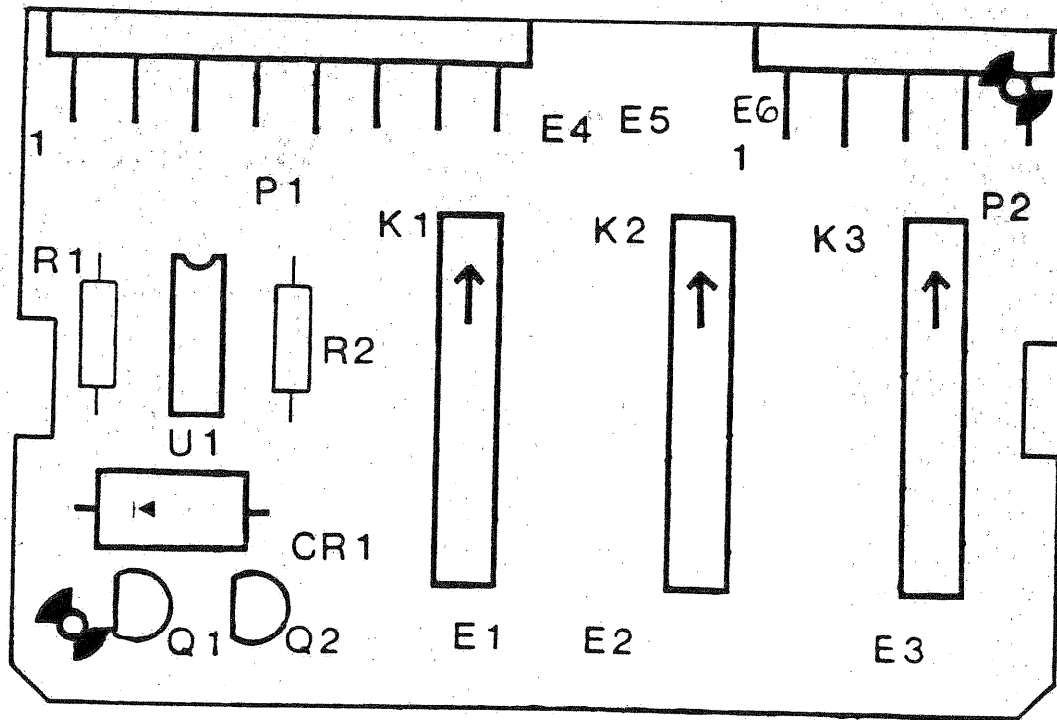


Figure 6-16. Signal and Reference Isolation CCA A15A4, A15A5
(P/N 787448-1, -2 Revision D), Parts Location

MODEL 2250

Table 6-19. Replacement Parts List: Front Bezel Switch Assembly
A15S1 - 548493 Revision E

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
J1	Connector, Rack and Panel, Plug, Nylon w/o Ear	880352	27264	03-09-2062
SW1	Switch, Pushbutton	886085	31918	01-003-00-FA-NE15- F2U103EE

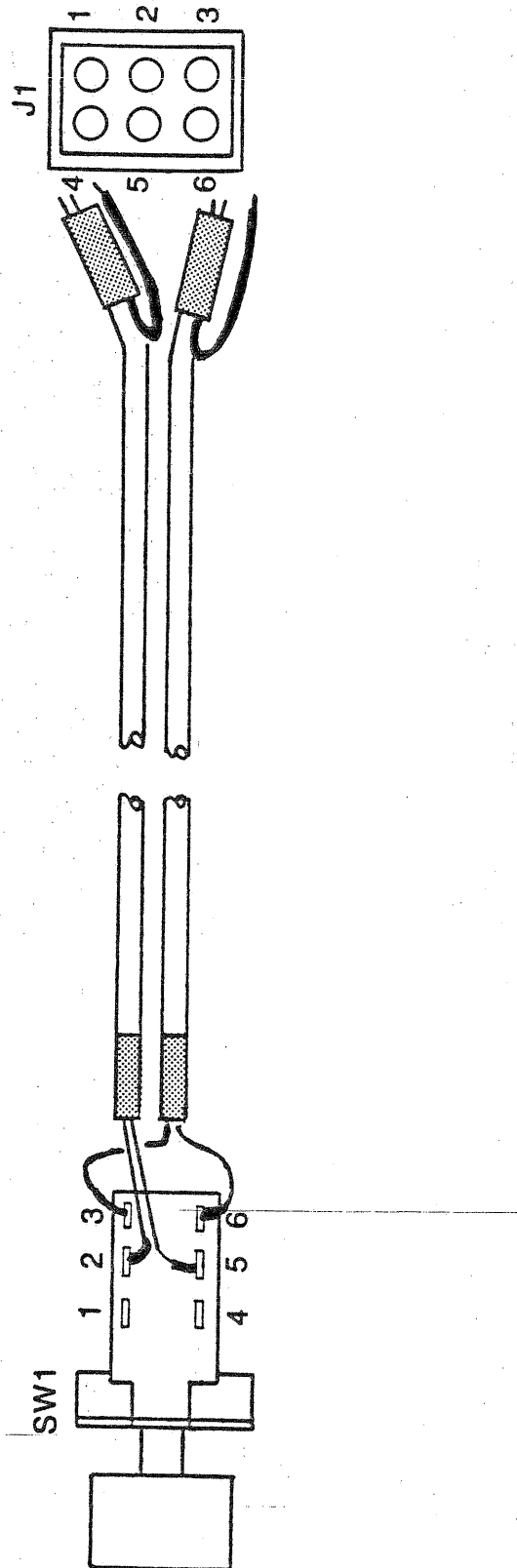


Figure 6-17. Assembly Switch A15S1 (P/N 548493 Revision E), Parts Location

MODEL 2250

Table 6-20. Replacement Parts List: Mother Circuit Card Assembly
A16A1 - 787177 Revision K

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C1	Capacitor, Tantalum, 3.3 uf, 25 V, <u>+20%</u>	886064	AAAAA	NDT3.3M-25 V MZD
C2	Capacitor, Ceramic, 0.01 uf, 50 V, <u>+80-20%</u>	886061	AAAAA	NCD-.01M50VZZ5V
C3	Same as C1			
C4	Same as C2			
C5	Same as C1			
C6	Same as C2			
C7	Capacitor, Tantalum, 10 uf, 25 V, <u>+20%</u>	886060	AAAAA	NDT-10M-25VM-ZD
C8	Capacitor, Ceramic, 0.1 uf, 50 V, <u>+20%</u>	886063	16299	SR215E104MAA
J1	Post, P and Cont., Mod II, Machine Applied	880007	00779	87022-9
J2	Connector, Card Edge, 100-Pin	886094	54453	EZA50DCSH
J3-J15	Same as J2			
J16	Connector, Male, 4-Pin	886095	06383	HLSS156-4
J17	Same as J16			
J18	Connector, Wafer, 6-Pin	886170	06383	HLSS156-6
J19	Not used			
J20	Connector, Wafer, 5-Pin, 0.156 Ctrs, 0.045	886581	06383	HLSS156-5
J21	Same as J18			
J22	Not used			
J23	Same as J20			
J24	Connector, Wafer, Lock, 0.156 CTRS, 3 P	886948	06383	HLSS156-3

MODEL 2250

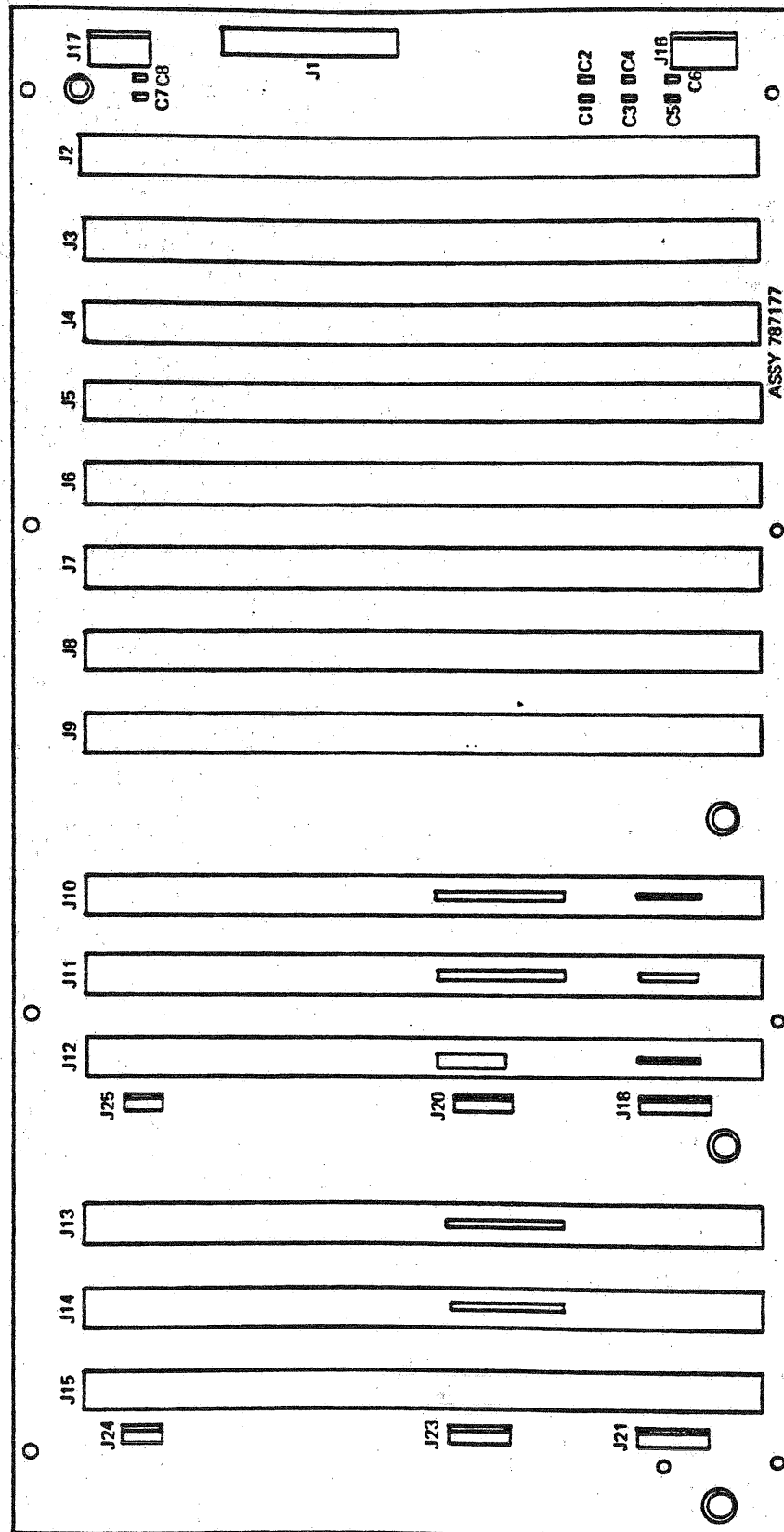


Figure 6-18. Mother Circuit Card Assembly A16A1 (P/N 787177 Revision K), Parts Location

MODEL 2250

Table 6-21. Replacement Parts List: Rear Panel Assembly
A17 - 787277 Revision F

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
A17	Rear Panel Assembly Revision F	787277	07342	787277	A
A17	Rear Panel Assembly Revisions D and E	787277	07342	787277	B
A17	Rear Panel Assembly Revisions B and C	787277	07342	787277	C
A17A1	Recorder Filter Assembly	787667	07342	787667	
A17B1	Fan Blo, 3 1/8-inch square, 115 V ac, 60 Hz	808689	92702	AS115AAES	
A17B1MP1	Guard, HDW, 3 1/8-inch sq.	808688	81040	6-182036	
A17B1MP2	Rubber Grommet	882970	81349	MS35489-4	
A17J1	Socket, Power Cord	886093	56289	200JMJ6-2	
A17E1	Binding Post, Green	886326	18310	01-1102-1-0315	
A17E2	Binding Post, Black	886327	18310	01-1102-1-0310	
A17PS1	Main Power Supply	787181	07342	787181	
A17PS2	Reference Isolated Power Supply Assembly	787313-1	07342	787313-1	
A17PS3	Signal Isolated Power Supply Assembly	787313-1	07342	787313-1	
A17T1	Main Transformer Assembly	787314	07342	787314	
A17T1J1	Connector, Housing, 6-Pin	880352	27264	03-09-2062	
A17T1J1MP1- A17T1J1MP5	Pin (5 required)	880224	27264	02-09-1103	

MODEL 2250

Table 6-21. Replacement Parts List: Rear Panel Assembly
A17 - 787277 Revision F

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
A17T1P1	Connector, 6-Pin	889150	27264	03-12-3062	D-F
A17T1P1	Connector	888365	27264	09-50-3061	B,C
A17T1J1MP1- A17T1J1MP6	Pin (6 required)	889152	27264	08-50-0105	D-F
A17T1J1MP1- A17T1J1MP6	Pin (6 required)	886039	27264	08-50-0105	B,C
A17W1	Main Harness Assembly	548504	07342	548504	
A17W2	Relay Isolation Cable Assembly #2	548514	07342	548514	
A17W3	Relay Isolation Cable Assembly #3	548515	07342	548515	
A17W5	I/O Cable Assembly	548502	07342	548502	
A17W5J3	Connector, BNC, Isolated	886750	05276	3778	
A17W5J3C1	Capacitor, Ceramic, 2200 pf, 200 V, $\pm 1\%$	808488	56289	CKR0606BX222KL	A
A17W5J3R1	Resistor, Composition, 100 ohm, 1/4 W, $\pm 5\%$	880077	01121	CB1015	A
A17W5J4	Connector, Screw Lock	808967	00779	552633-3	
A17W5S1	IEEE Address Switch	298891	07342	298891	
A17W6	Link, Shorting	800339	24655	938L	

NOTE: A17W5J3 RC FILTER IS NOT ON P/N 787277 REVISIONS D AND E.

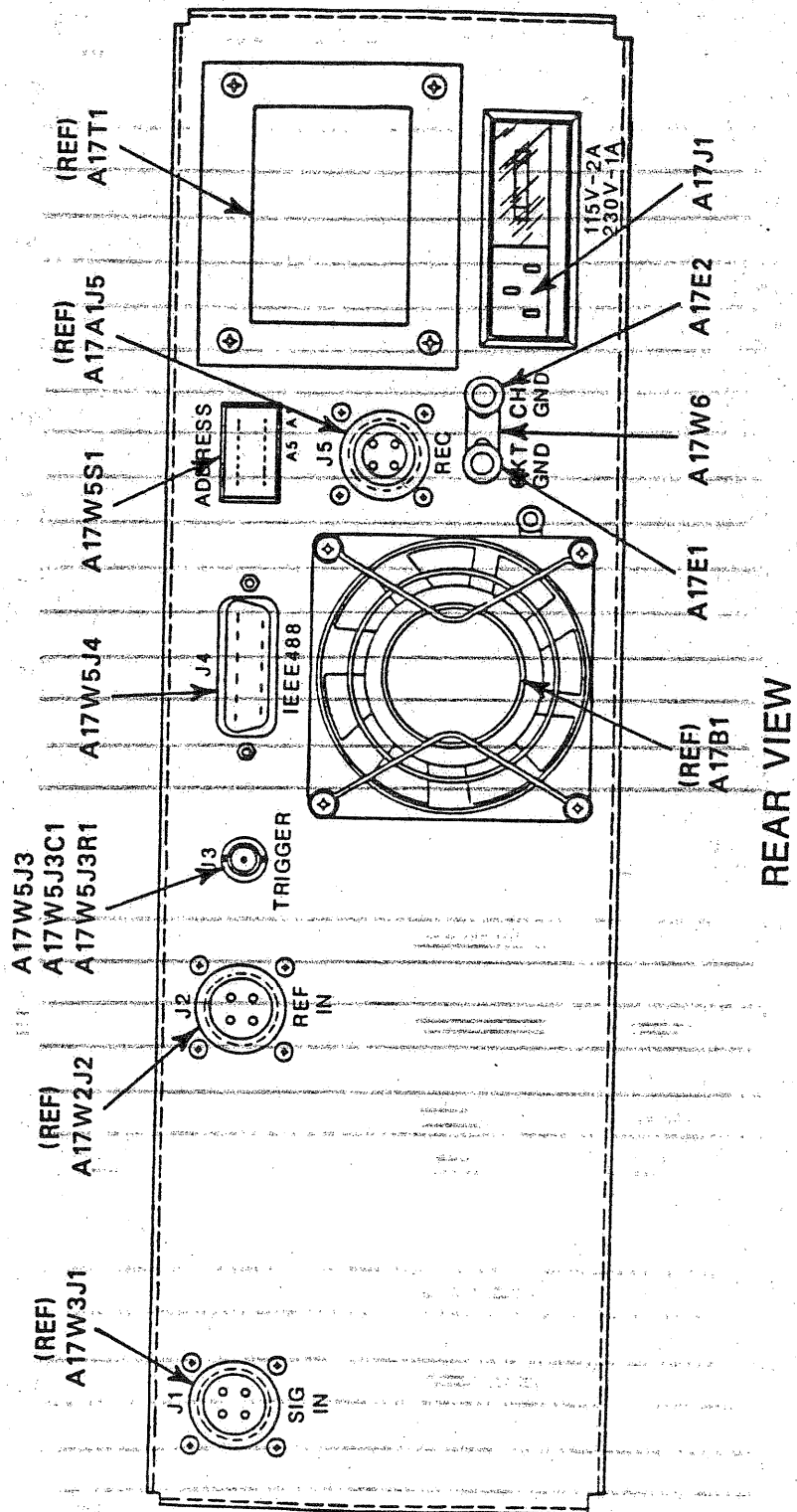


Figure 6-19. Rear Panel Assembly A17 (P/N 787277 Revision F), Parts Location (Sheet 1 of 2)

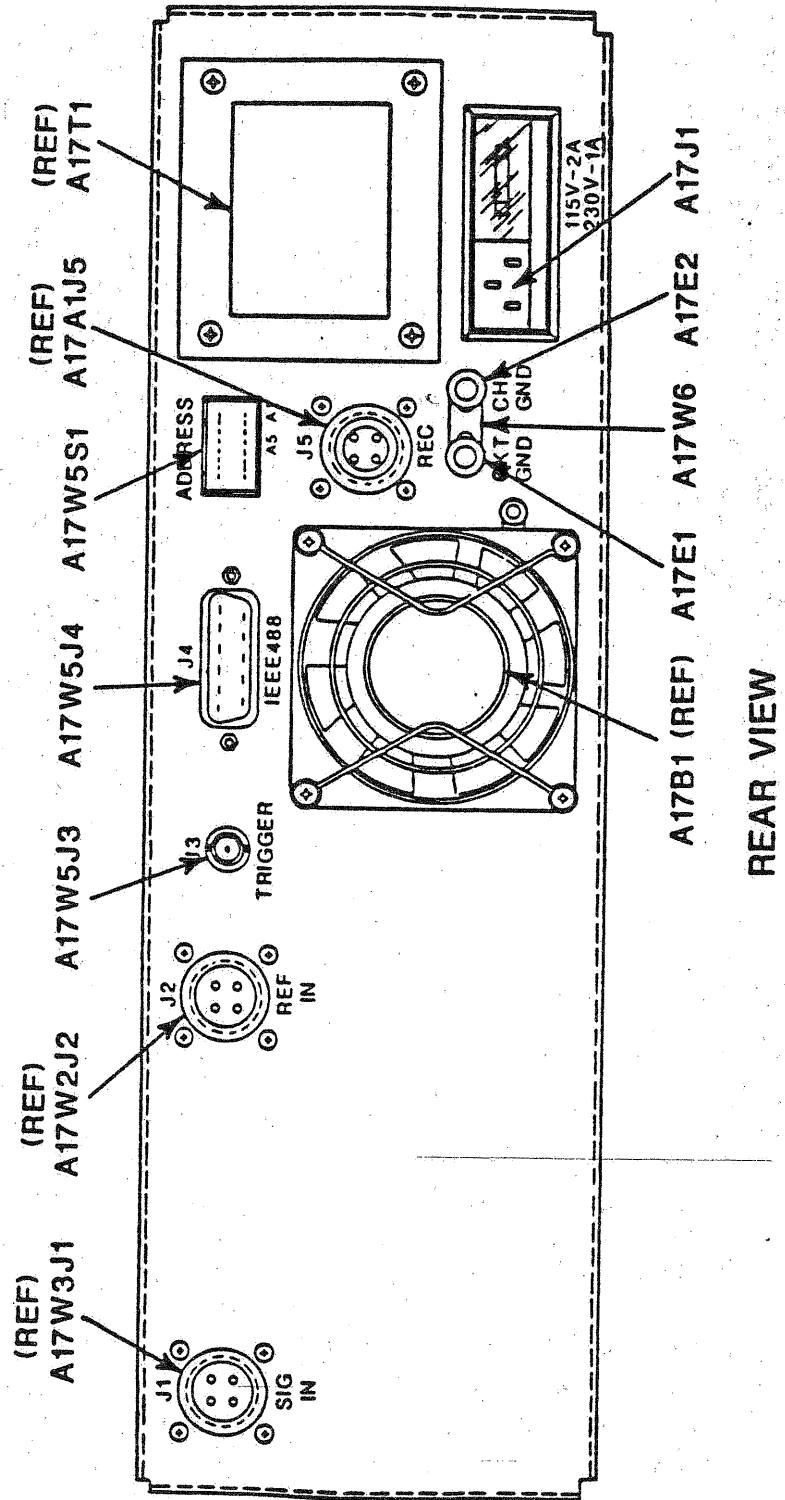


Figure 6-19. Rear Panel Assembly A17 (P/N 787277 Revision D), Parts Location
(Sheet 2 of 2)

MODEL 2250

Table 6-22. Replacement Parts List: Recorder Filter Assembly A17A1 -
787667 Revision B

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
C1	Capacitor, Tantalum, Radial Leads, 3.3 uf, 25 V, <u>+20%</u>	886064	AAAAA	NDT3.3M-25VMZD
C2-C4	Same as C1			
J1	Connector, Circular	801431	81349	MS-3102A-145-2S
J2	Connector, Wafer, 4 Pos	887595	06383	NLSS100-4
R1	Resistor, Composition, 2 k, 1/4 W, <u>+5%</u>	880086	01121	CB2025
R2	Same as R1			

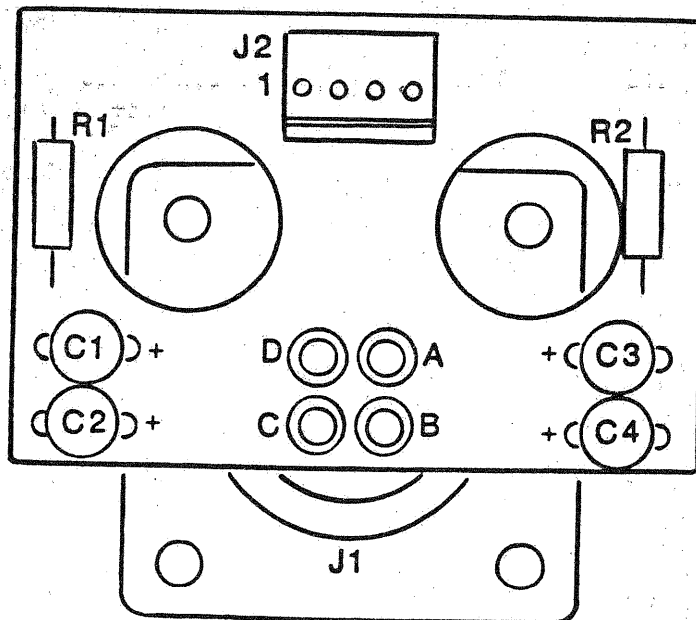


Figure 6-20. Recorder Filter Assembly A17A1 (P/N 787667 Revision B),
Parts Location

MODEL 2250

Table 6-23. Replacement Parts List: Main Power Supply
Circuit Card Assembly A17PS1 - 787181 Revision K

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
A17PS1	Main Power Supply CCA, Revision K	787181	07342	787181	A
A17PS1	Main Power Supply CCA, Revision J	787181	07342	787181	B
C1	Capacitor, El, Aluminum, 10000 uf, 25 V, Radial	886166	AAAAA	NRE-10000M25V	
C2-C4	Same as C1				
C5	Capacitor, El, Tantalum, 0.33 uf, 35 V, Radial, LDS	886167	AAAAA	NDT.33M35VNZ	
C6	Capacitor, Ceramic, 0.1 uf, 50 V, $\pm 20\%$	886063	16299	SR215E104MAA	
C7	Capacitor, Tantalum, 4.7 uf, 25 V, $\pm 20\%$	886059	AAAAA	NDT4.7M25VMZD	
C8	Capacitor, Tantalum, 10 uf, 25 V, $\pm 20\%$	886060	AAAAA	NDT-10M-25VM-ZD	
C9	Same as C7				
C10	Same as C6				
C11	Capacitor, Ceramic, 0.01 uf, 50 V, $+80-20\%$	886061	AAAAA	NCD-.01M50V-ZZ5V	
C12	Capacitor, El, Aluminum, 2200 uf, 35 V	887264	AAAAA	NRE-E-2200M35V- NREWA	
C13	Same as C12				
C14	Capacitor, El, Tantalum, 4.7 uf, 35 V, $\pm 20\%$	881427	56289	196D475X0035JE3	
C15	Same as C14				
C16	Capacitor, Tantalum, 3.3 uf, 25 V, $\pm 20\%$	886064	AAAAA	NDT3.3M-25V MZD	
C17	Same as C16				
C18,C19	Same as C11				
C20	Same as C6				
CR1	Diode, Dual Rectifier, Schottky	886164	81483	12CTQ040	
CR2	Same as CR1				

MODEL 2250

Table 6-23. Replacement Parts List: Main Power Supply
Circuit Card Assembly A17PS1 - 787181 Revision K (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	
CR3	Diode, PWR/Rectifier	808787	81349	JAN1N4001	
CR4	Same as CR3				
CR5	Diode, Bridge, Rectifier	884735	04713	MDA970A-1	
CR6-CR9	Same as CR3				
J1	Connector, Male	889151	27264	18-12-2221	A
J1	Connector, Wafer, 6-Pin	886170	06383	HLSS156-6	B
J1MP1- J1MP6	Pin, Male	888149		CA4068-4	A
R1	Resistor, Fixed, 1.1 k, 1/2 W, $\pm 5\%$	801595	01121	EB1125	
R2	Resistor, Fixed, Metal Film, 120 ohm, 1/4 W, $\pm 0.5\%$ @ 70°C	886168	91637	CMF-60T2-1200D	
R3	Resistor, Fixed, Metal Film, 383 ohm, 1/4 W, $\pm 0.5\%$ @ 70°C	886169	91637	CMF-60T2-3830D	
R4	Resistor, Composition, 5.1 k, 1/2 W, $\pm 5\%$	800613	01121	EB5125	
R5	Same as R4				
R6	Resistor, Composition, 47 k, 1/2 W, $\pm 5\%$	800870	01121	EB4735	
R7	Same as R6				
VR1	IC, Voltage Regulator, +5 V	808498	12040	LM340T-5.0	
VR2	IC, Regulator, 3 Terminal, Adjustable, 10 A	886161	27014	LM396K Steel	
VR3	IC, Regulator, 3 Terminal, +15 V, 1 A	886162	27014	LM340T-15	
VR4	IC, Regulator, 3 Terminal, -15 V, 1 A	886163	27014	LM320T-15	
W1	Cable Assembly, Main Power Supply	548496	07342	548496	

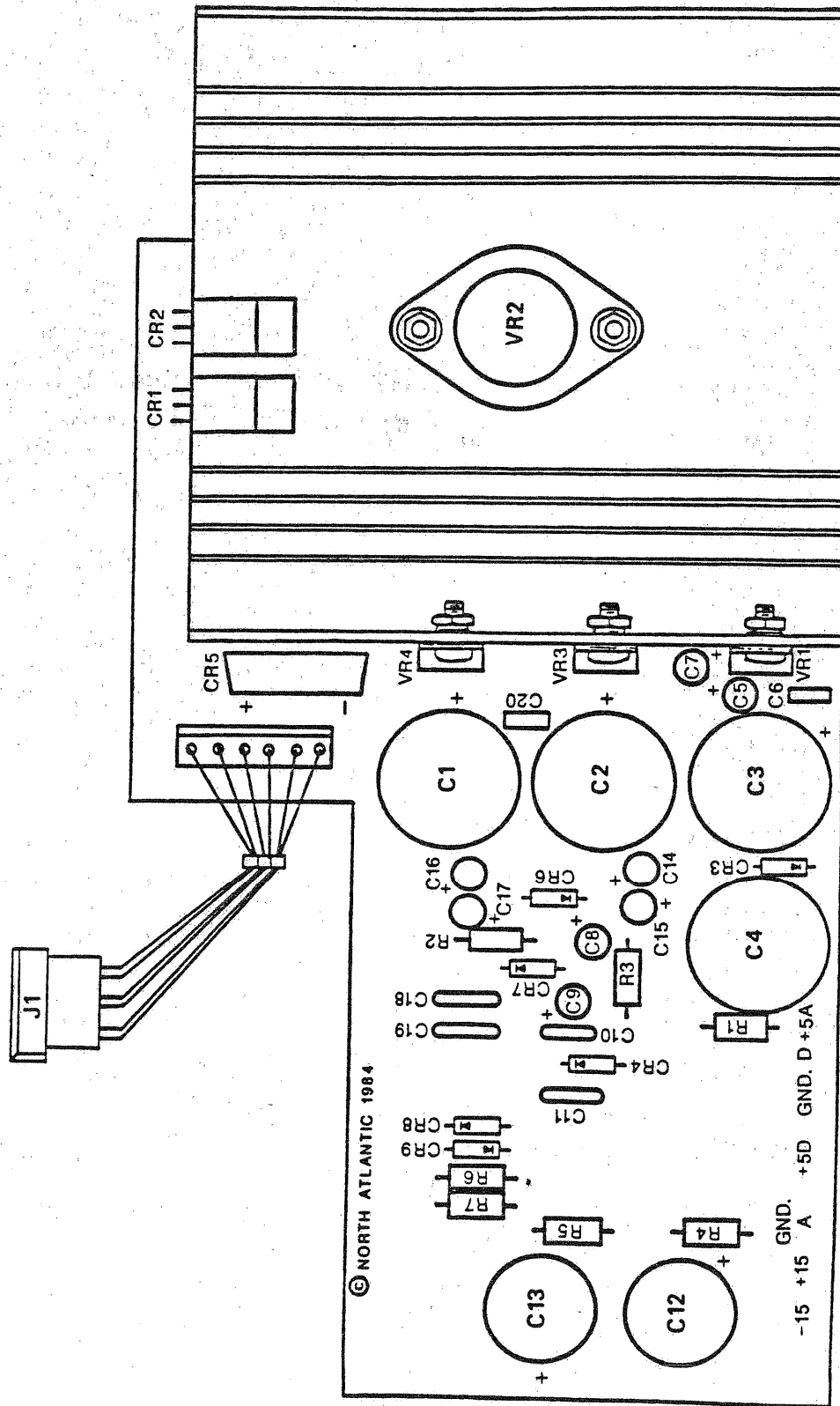


Figure 6-21. Main Power Supply CCA A17PS1 (P/N 787181 Revision J,K), Parts Location

MODEL 2250

Table 6-24. Replacement Parts List: Cable Assembly
Main Power Supply A17PS1W1 - 548496 Revision B

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
P1-P4	Not used			
P5	Connector, Wafer, 2-Pin	886038	27264	09-50-7921
P6-P15	Not used			
P16	Connector, Housing, 4 P, 0.156 Centers	886452	06383	CR156F20-4
P17	Same as P16			

MODEL 2250

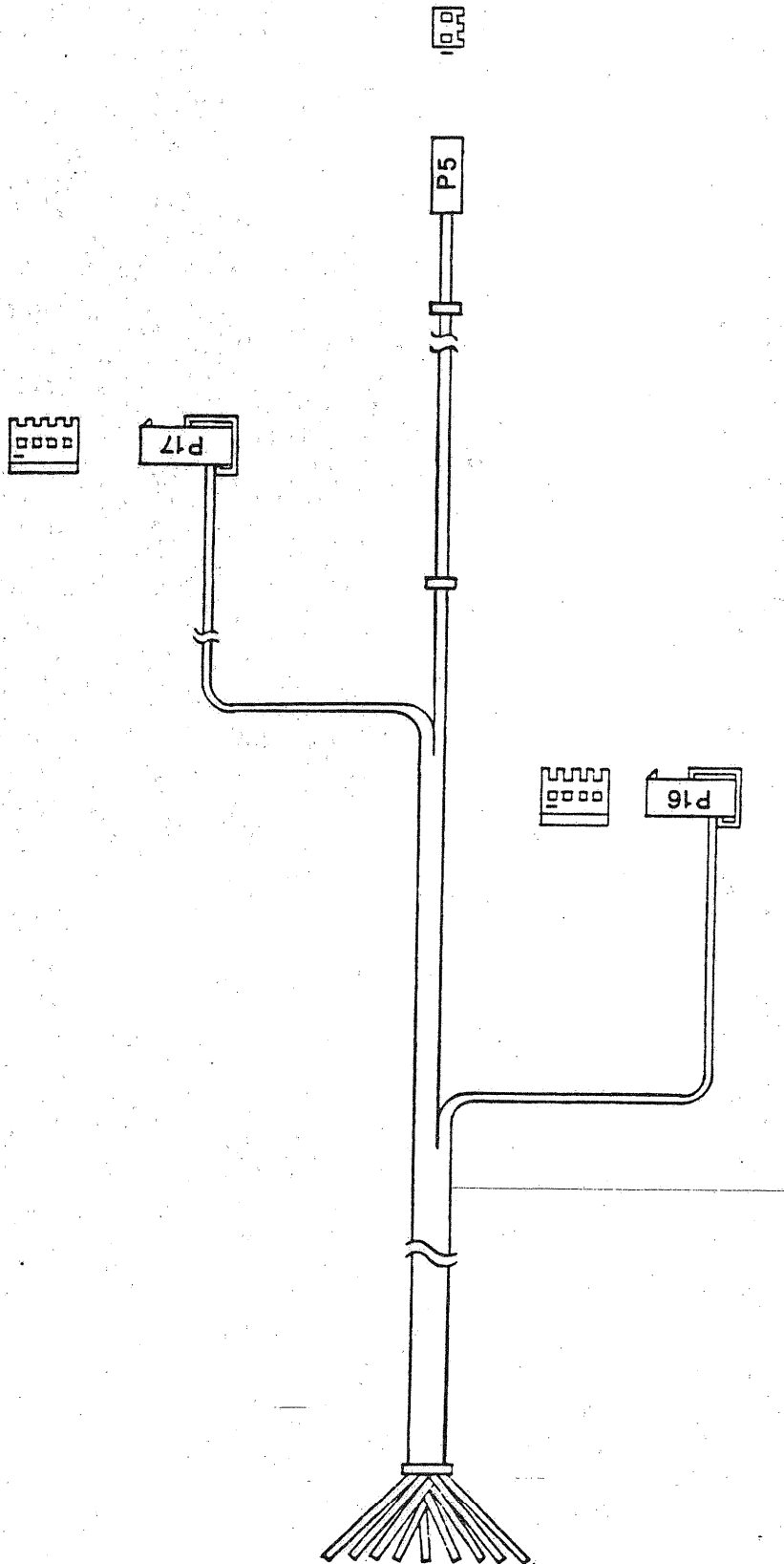


Figure 6-22. Main Power Supply Cable Assembly A17PS1W1 (P/N 548496 Revision B),
Parts Location

MODEL 2250

Table 6-25. Replacement Parts List: Isolated Power Supply
Assembly A17PS2, A17PS3 - 787313-1 Revision A

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
A17PS2A1, A17PS3A1	Isolated Power Supply Assembly	787180-1	07342	787180-1
A17PS2T1, A17PS3T1	Assembly, Transformer	787315	07342	787315
A17PS2T1J1, A17PS3T1J1	Connector	886409	00779	1-480426-0
A17PS2J1MP1- A17PS2J1MP4, A17PS3J1MP1- A17PS3J1MP4	Pin (4 required)	886407	00779	60618-1

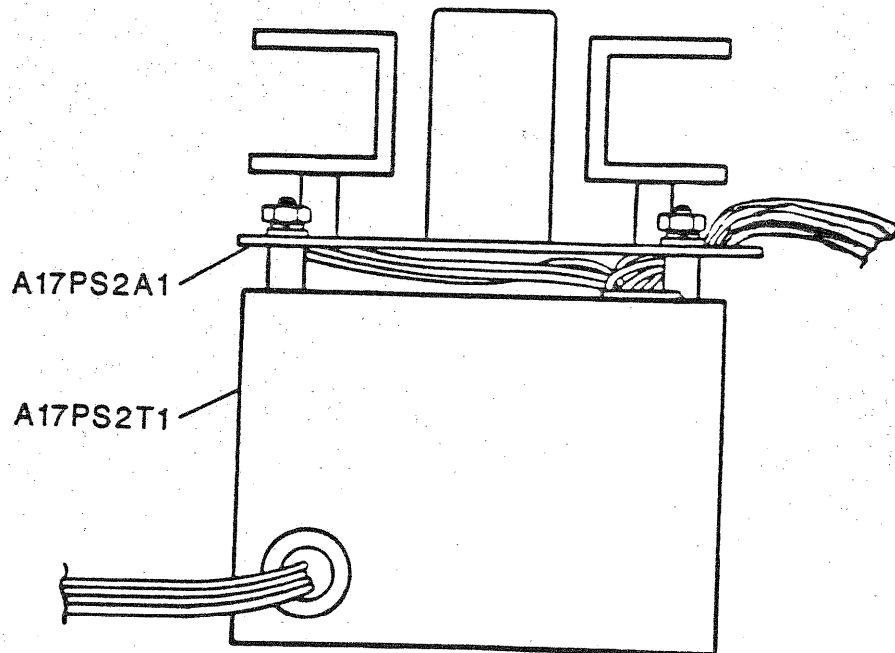


Figure 6-23. Isolated Power Supply Assembly A17PS2, A17PS3
(P/N 787313-1 Revision A), Parts Location

MODEL 2250

Table 6-26. Replacement Parts List: Isolated Power Supply
Circuit Card Assembly A17PS2A1, A17PS3A1 - 787180-1 Revision B

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>	<u>UOC</u>
C1*	Capacitor, El, Aluminum, 6800 uf, 16 V, $\pm 20\%$	886363	AAAAA	NRE-E682M25V22X41	
C2	Not used				
C3	Capacitor, El, Aluminum, 1500 uf, 35 V, $\pm 20\%$	887265	AAAAA	NRE-E-1500M35	
C4	Same as C3				
C5,C6	Capacitor, Tantalum, 4.7 uf, 25 V, $\pm 20\%$	886059	AAAAA	NDT4.7M25VMZD	
C7,C8	Not used				
C9	Capacitor, El, Tantalum, 2.2 uf, 20 V, $\pm 20\%$	808201	11100	PDT-2.2/35	
C10-C12	Same as C9				
C13	Capacitor, Ceramic, 0.01 uf, 50 V, $+80-20\%$	886061	AAAAA	NCD-.01M50V-ZZ5V	
C14	Not used				
C15,C16	Same as C13				
CR1	Diode, Bridge Rectifier	884735	04713	MDA970A-1	
CR2	Same as CR1				
CR3	Diode, Power/Rectifier	808787	81349	JAN1N4001	
CR4-CR8	Same as CR3				
R1	Resistor, Composition, 1.2 k, 1/2 W, $\pm 5\%$	800522	01121	EB1225	
R2	Not used				
R3	Resistor, Composition, 5.1 k, 1/2 W, $\pm 5\%$	800613	01121	EB-5125	

*C1 MFR P/N NRS-E-6800M25 is obsolete.

MODEL 2250

Table 6-26. Replacement Parts List: Isolated Power Supply
Circuit Card Assembly A17PS2A1, A17PS3A1 - 787180-1 Revision B (Continued)

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
R4	Same as R3			
VR1	IC/L, VR St, NML	808498	12040	LM340T-5.0
VR2	IC/L, VR St, NML, -5 V	808901	27014	LM7905CT
VR3	IC, Reg., 3 Terminal, +15 V, 1 A	886162	27014	LM340T-15
VR4	IC, Reg., 3 Terminal, -15 V, 1 A	886163	27014	LM340T-15
W1	Cable Assembly, Isolated Power Supply	548491	07342	548491
W1P1	Connector, 6-pin Female	886462	06383	CE156F22-6
W1P1MP1	Cover, Connector, Strain Relief	884832	06383	EC156F-6

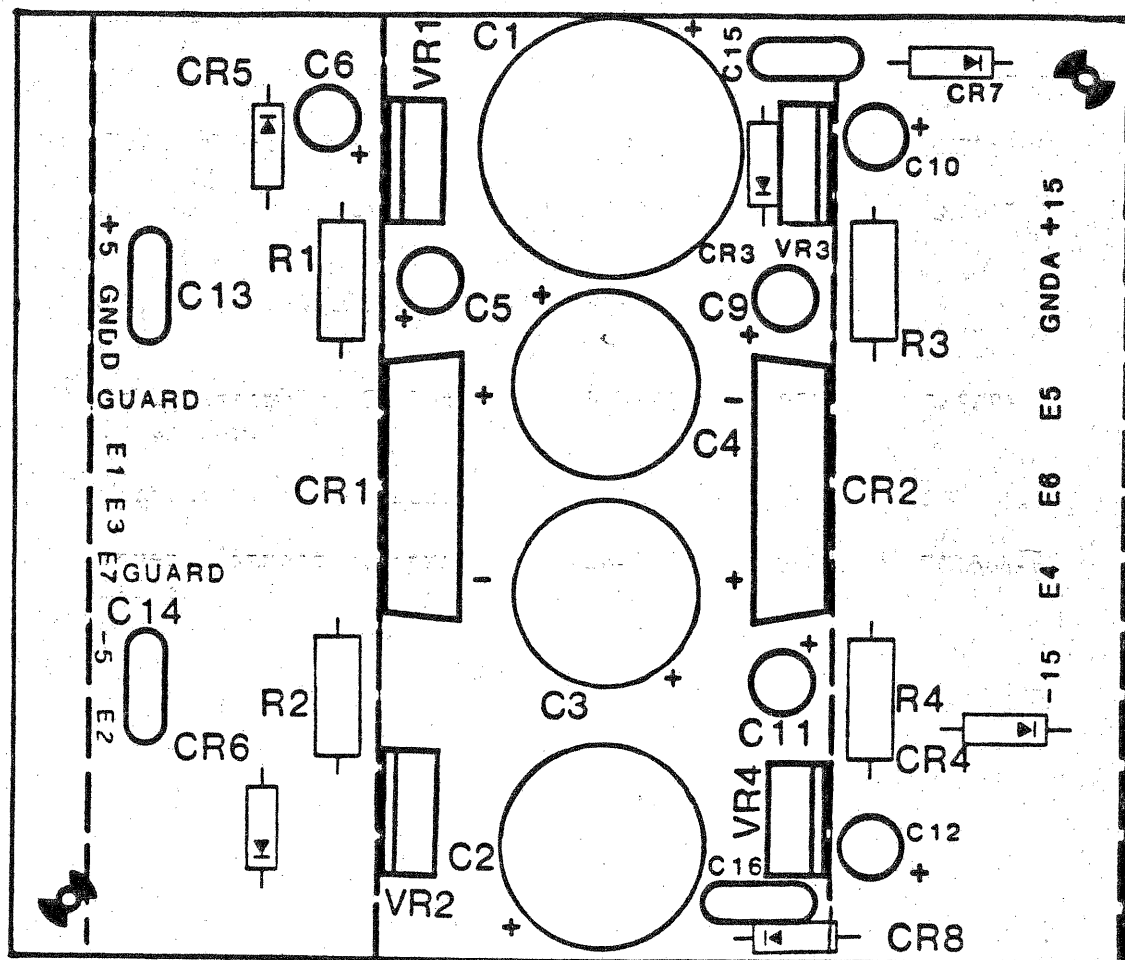


Figure 6-24. Isolated Power Supply A17PS2A1, A17PS3A1
(P/N 787180-1 Revision B), Parts Location

MODEL 2250

Table 6-27. Replacement Parts List: Main Harness Assembly
A17W1 - 548504 Revision E

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
E1	Terminal Lug	800249	83330	1466
E2-E6	Same as E1			
J1	Connector, 6 pin	886406	27264	126103-09-1063
J2	Same as J1			
J3	Socket Housing	886410	00779	1-480424-0
J4	Same as J3			
P1	Receptacle, AC Power Line Module	886093	56289	200JMJ6-2
VP1	Varistor, 130 V	807699	03508	V130LA10A
VP2	Same as VP1			

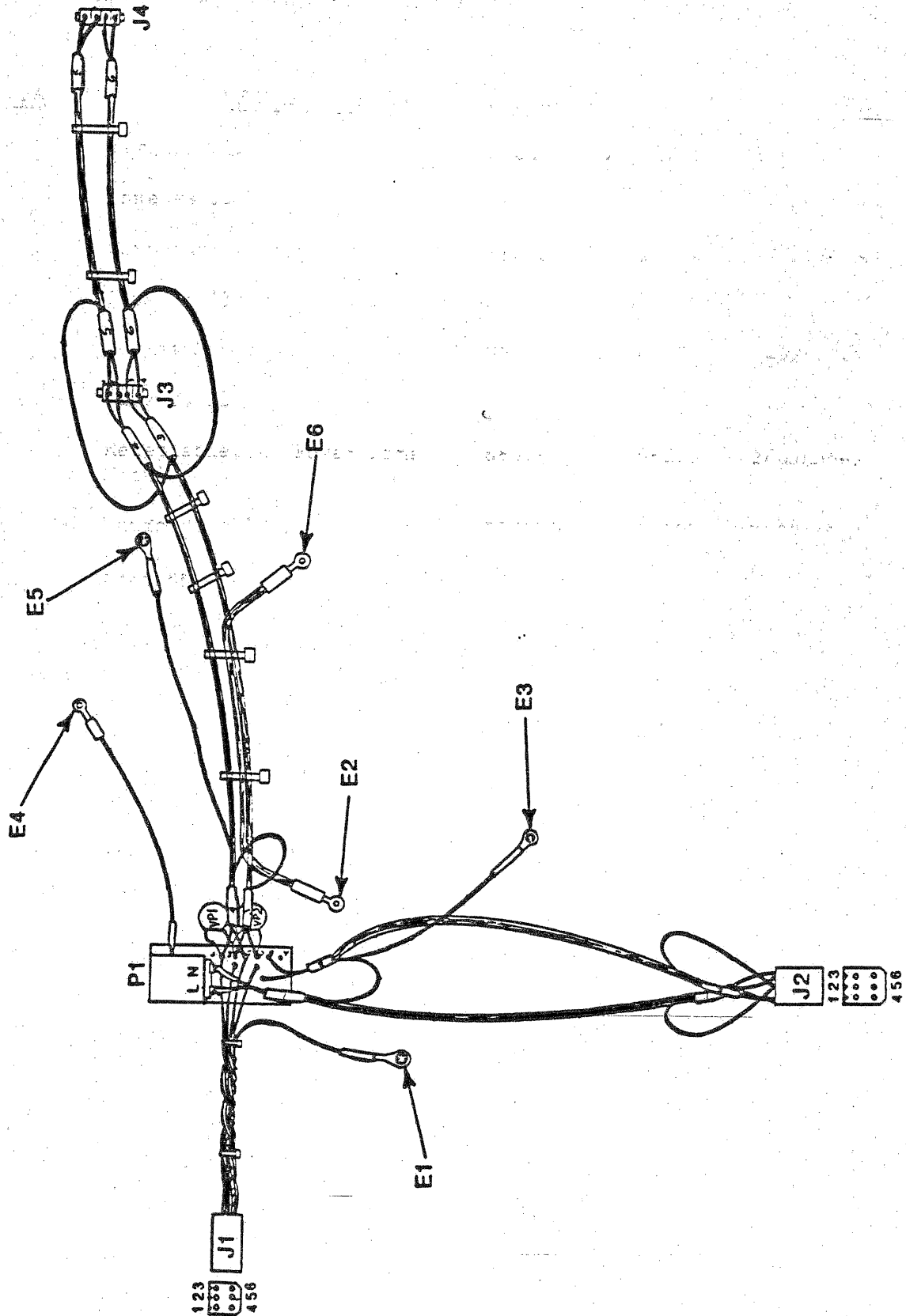


Figure 6-25. Main Harness Assembly A17W1 (P/N 548504 Revision E), Parts Location

MODEL 2250

Table 6-28. Replacement Parts List: Rear Panel Cable Assembly
A17W5 - 548502 Revision D

<u>REF DES</u>	<u>DESCRIPTION</u>	<u>NAI P/N</u>	<u>FSCM</u>	<u>MFR P/N</u>
A3J2	Connector, Card Edge, IDC, 50 Contacts	886582	EEEEEE	4401-50-00-P5
J4	Connector, Ribbon, Female	886235	26394	609-24F
J5A	Connector, Circular, Receptacle, 4 Pos	801431	81349	MS3102-A-14S-2S
S1	Switch, DIP, 16-Pin	883415	71450	206-8LPST-Std.
S1J2	Connector, DIP Switch	886236	26394	609-161DS

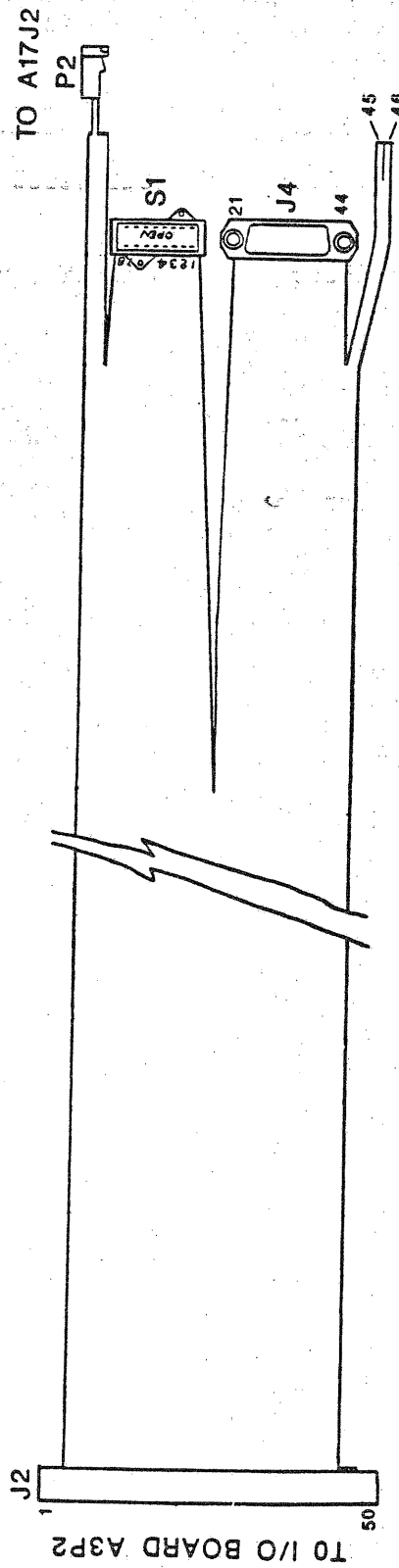
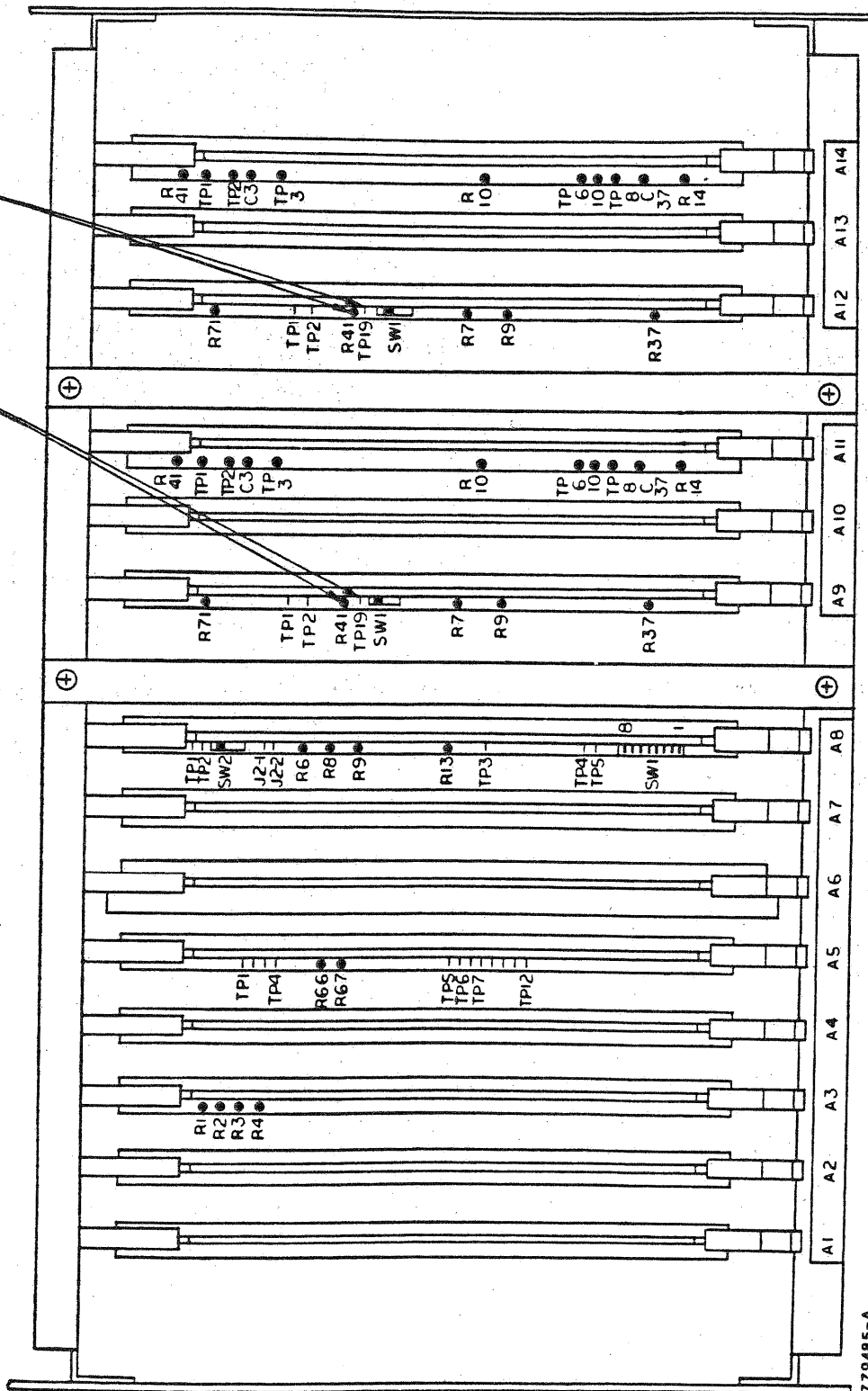


Figure 6-26. Rear Panel Cable Assembly A17W5 (P/N 548502 Revision D), Parts Location

SEE NOTE



NOTE:

TP19 AND R41 ARE LOCATED IN THE LOWER HALF OF THE BOARD.
SEE FIGURE 6-10. A/D CONVERTER CCA A9/A12 (P/N 787664),
PARTS LOCATION DIAGRAM FOR THE EXACT LOCATION.

Figure 6-27. Adjustable Component Test Points (P/N 779485 Revision A), Parts Location

Table 6-29. List of Manufacturers

<u>FSCM</u>	<u>NAME AND ADDRESS</u>	<u>FSCM</u>	<u>NAME AND ADDRESS</u>
00779	AMP Inc. 2800 Fulling Mill P.O. Box 3608 Harrisburg, PA 17105	05276	ITT Pomona Elect. Div. 1500 E. 9th Street P.O. Box 2767 Pomona, CA 91766
00815	Midland-Ross Corp. Northern Eng. Labs Div. 357 Beloit Street Burlington, WI 53105	06383	Panduit Corporation 17301 Ridgeland Tinley Park, IL 60477
01121	Allen-Bradley Co. 1201 S. 2nd Street Milwaukee, WI 53204	06540	Mite Corp. Amatom Elect. Hardware Div. 446 Blake Street New Haven CT 06515
01295	Texas Instruments Semiconductor Group 13500 No Central Expwy P.O. Box 225012 M/S 49 Dallas, TX 75265	06665	Precision Monolithics Inc. Sub. of Bourns Inc. 1500 Space Park Drive Santa Clara, CA 95050
01637	Ford Motor Craft 29500 Plymouth Rd. P.O. Box 3000 Livonia, MI 48151	07263	Fairchild Camera and Instrument Corp. Semiconductor Division 401 Ellis Street P.O. Drawer 7284 Mountain View, CA 94042
02114	Amperex Electronic Corp. Ferroxcube Div. 5083 Kings Highway Saugerties, NY 12477	07342	North Atlantic Inds, Inc. 60 Plant Avenue Hauppauge, NY 11788
02735	RCA - Solid State Route 202 Somerville, NJ 08876	07980	Hewlett-Packard Co. New Jersey Division 150 Green Pond Road Rockaway, NJ 07866
03508	General Electric Co. Semiconductor Prods Dept. West Genesee Street Auburn, NY 13021	11100	Nemco Corporation 3329 Prospect Indianapolis, IN 46203
04713	Motorola, Inc. Semiconductor Prods Inc. 5005 E. McDowell Road Phoenix, AZ 85008	11869	Microsonics Inc. 60 Winter Street Weymouth, MA 02188

MODEL 2250

Table 6-29. List of Manufacturers (Continued)

<u>FSCM</u>	<u>NAME AND ADDRESS</u>	<u>FSCM</u>	<u>NAME AND ADDRESS</u>
12040	Natl Semiconductor Corp Commerce Drive P.O. Box 443 Danbury, CT 06810	22526	DuPont E I DE Nemours and Co. Inc. Advanced Products Div. Military Products Group 515 Fishing Creek Rd. New Cumberland, PA 17070-3007
12406	Elpac Electronics Inc. 3131 S. Standard Avenue Santa Ana, CA 92705	24355	Analog Devices Route 1 Industrial Park P.O. Box 280 Norwood, MA 02062
13919	Burr-Brown Research Corp 6730 S. Tucson Boulevard P.O. Box 11400 Tucson, AZ 85734	24655	Genrad, Inc. Board Test Division 300 Baker Avenue Concord, MA 01742
14655	Cornell-Dubilier Elect. Div. Fed. Pac. Elect. Co. Government Contracts Dept. 150 Avenue L Newark, NJ 07101	25088	Siemens Corporation 186 Wood Avenue S. Iselin, NJ 08830
16299	AVX Corporation 3900 Electronics Drive Raleigh, NC 27604	26394	Ansley Electronics Corp. Sub. of Thomas & Betts Doylestown, PA
17856	Siliconix Inc. 2201 Laurelwood Road Santa Clara, CA 95054	26625	MIALUSA, Inc. Nutley, NJ
18310	Concord Electronics Corp. 30 Great Jones Street New York, NY 10012	27014	National Semiconductor 2900 Semiconductor Drive Santa Clara, CA 95051
18324	Great Western Chemical Co. 860 Wharf Richmond, CA 94804-3558	27264	Molex Inc. Corporate Headquarters 2222 Wellington Court Lisle, IL 60532
18565	Chomerics Inc. 77 Dragon Court Woburn, MA 01801	28218	Minn. Mining and Mfg Co. Business Prods Sales Div. 3M Center St. Paul, MN 55144
19420	Merrimack Magnetics Corp. 121 Hale Street Lowell, MA 01851	28480	Hewlett-Packard Co. Corporate Headquarters 3000 Hanover Street Palo Alto, CA 94304
19648	Eldre Components Inc. 1500 Jefferson Road Rochester, NY 14623		

MODEL 2250

Table 6-29. List of Manufacturers (Continued)

<u>FSCM</u>	<u>NAME AND ADDRESS</u>	<u>FSCM</u>	<u>NAME AND ADDRESS</u>
31019	Solid State Scientifics Commerce Drive Montgomeryville, PA 18936	52752	Electro-Films, Inc. 111 Gilbane Street Marwick, RI
31918	ITT Schadow, Inc. 8081 Wallace Road Eden Prairie, MN 55343	54453	Sullins Electronic Corp. 269 Pico Avenue P.O. Box 757 San Marcos, CA 92069
32293	Intersil Inc. Sub. of General Elec. Co. 10600 Ridgeview Court Cupertino, CA 95014-0104	56289	Sprague Electric 87 Marshall Street North Adams, MA 01247
32997	Bourns, Inc. Trimpot Division 1200 Columbia Avenue Riverside, CA 92507	58361	General Instrument Optoelectronics Division 3400 Hillview Avenue Palo Alto, CA 94304
34335	Advanced Micro Devices 901 Thompson Place Sunnyvale, CA 94086	70255	Alco Controls, Div. of Emerson Electric Co. P.O. Box 12700 St. Louis, MO 63141
34371	Harris Corp., Harris Semiconductor Prod. 200 Palm Bay Blvd. P.O. Box 883 Melbourne, FL 32901	70903	Belden Corporation 2000 S. Batavia Avenue Geneva, IL 60134
49956	Raytheon Co. 141 Spring Street Lexington, MA 02173	71400	Bussman, Div. McGraw Edison co. P.O. Box 14460 St. Louis, MO 63178
51306	Samtan Engineering Corp. 127 Wyllis Avenue Malden, MA 02148	71450	CTS Corporation 905 North West Blvd. Elkhart, IN 46514
51406	Murata Erie No. America 1148 Franklin Rd. S. E. Marietta, GA 30067	71590	Mepco/Centralab A North Am. Philips Co. Hwy. 20W P.O. Box 858 Fort Dodge, IA 50501
52062	Magnet Pulse Technology 1999 Robert Street Riverside, CA 92507	72136	Electro Motive Corp. Subs. of Intl. Electronics Corp. P.O. Box 7600 Florence, SC 29501
52464	OKI Electronics of Am. 4031 NE 12th Terrace Fort Lauderdale, FL 33334		

Table 6-29. List of Manufacturers (Continued)

<u>FSCM</u>	<u>NAME AND ADDRESS</u>	<u>FSCM</u>	<u>NAME AND ADDRESS</u>
72149	Electronic Transformer 460 Totowa Avenue Patterson, NJ 07511	91293	Johanson Manufacturing Co. P.O. Box 329 Boonton, NJ 07005
72982	Erie Technological Prod. 645 W. 11th Street Erie, PA 16512	91506	Augat, Inc. 33 Perry Avenue P.O. Box 779 Attleboro, MA 02703
76381	Minnesota Mining & Mfg. 3M Center St. Paul, MN 55101	91637	Dale Electronics Inc. P.O. Box 609 Columbus, NE 68601
80183	Sprague Products Co. 87 Marshall St. North Adams, MA 02147	92702	IMC Magnetics Corp. Eastern Division 570 Main Street Westbury, NY 11591
81040	Haddock Engineers Ltd. Montebello, CA	93652	Dietz Design Inc. 100 Electronics Parkway Belton, MO 64012
81073	Grayhill, Inc. P.O. Box 373 561 Hillgrove Avenue LaGrange, IL 60525	95348	Gordos Corp. 250 Greenwood Ave Bloomfield, NJ 07003-2416
81349	Military specifications promulgated by military departments/agencies under authority of Defense Stan- dardization Manual 4120 3-M.	95750	Republic Electric Ind.Inc. 575 Broad Hollow Road Melville, NY 11746
81483	International Rectifier P.O.B. 2321 Terminal Annex 9220 Sunset Boulevard Los Angeles, CA 90069	96906	Military standards promulgated by military departments under authority of Defense Standard- ization Manual 4120 3-M applies to book form documents that establish engineering and technical limita- tions and applications for items and which are identified by numbers such as MIL-STD-198 and MIL-STD-242, etc. Also sheet form documents that depict design cri- teria for items and which are identified by numbers such as MS 3057 and MS 75052 etc.
84171	Arco Electronics 400 Moreland Road Commack, NY 11725		
84411	American Shizuki Corp 301 W. O St. Ogallala, NE 69153-1844		
90201	Mallory Capacitor Co. Div.— P.R. Mallory and Co. 4760 Kentucky Avenue P.O. Box 372 Indianapolis, IN 46206		

Table 6-29. List of Manufacturers (Continued)

<u>FSCM</u>	<u>NAME AND ADDRESS</u>	<u>FSCM</u>	<u>NAME AND ADDRESS</u>
AAAAA	NIC Components Corporation 6000 New Horizons Blvd. North Amityville, NY 11701	DDDDD	AVX Ceramics Div. of AVX Corp. Seneca Avenue Olean, NY 14760
BBBBB	Hitachi America Ltd. 1800 Bering Drive San Jose, CA 95112	EEEEEE	H & T Components 87 Sand Pit Road Danbury, CT 06810
CCCCC	Lite-On Corp. (USA) Parkway Business Ctr.1 Suite 570 4950 Airport Parkway Dallas, TX 75248	FFFFF	Aptronics Div. of AP Products Inc. 9450 Pineneedle Drive P.O. Box 540 Mentor, OH 44060
		GGGGG	EURO-DIP 1565 W. University Dr. Tempe, AZ 85281

MODEL 2250

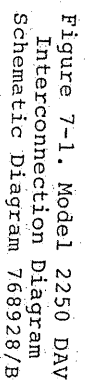
SECTION 7

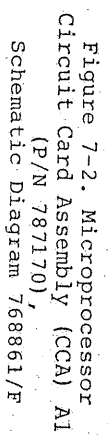
SCHEMATIC DIAGRAMS

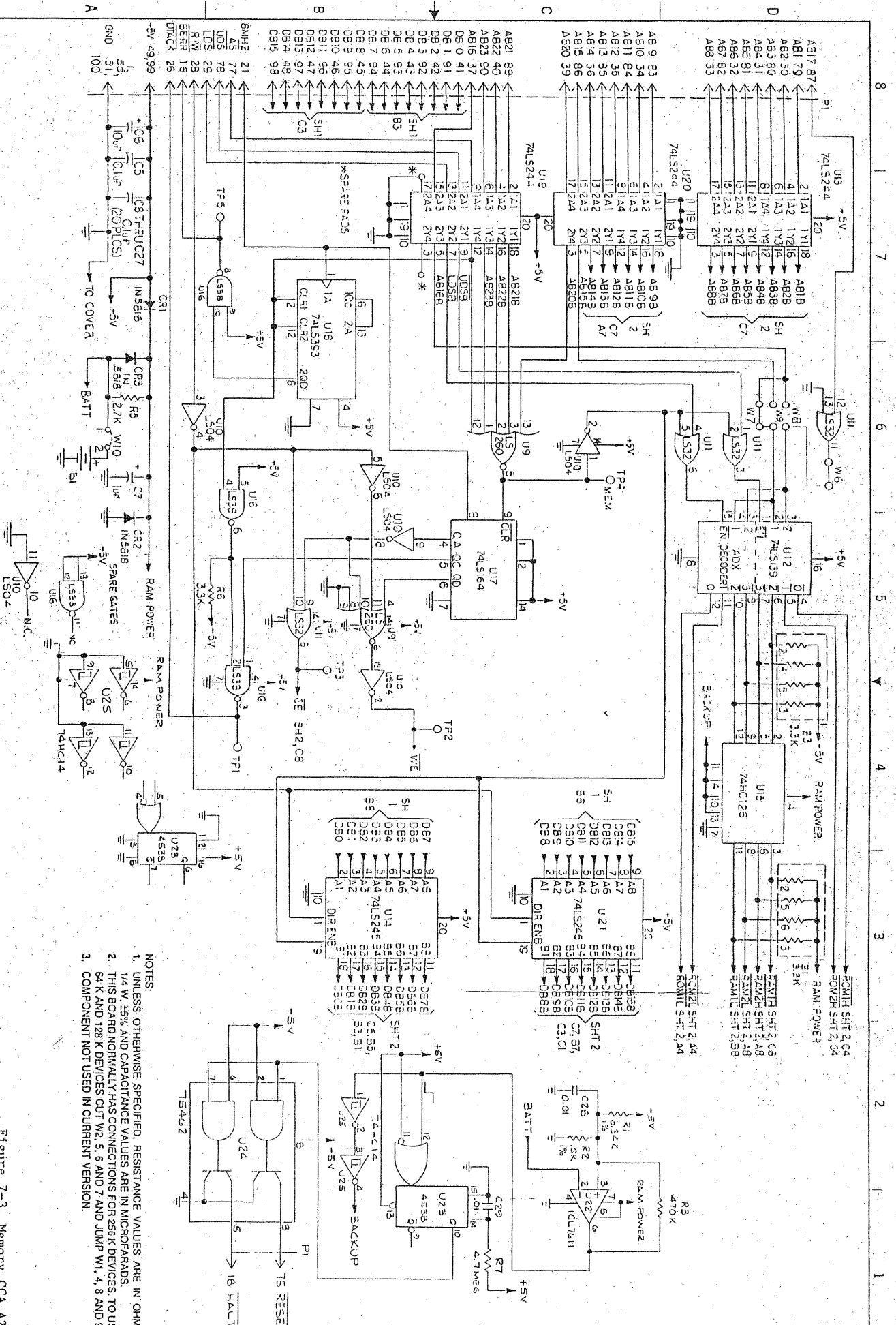
7-1. INTRODUCTION.

This section contains schematic diagrams for the Model 2250 Digital Analyzing Voltmeter.

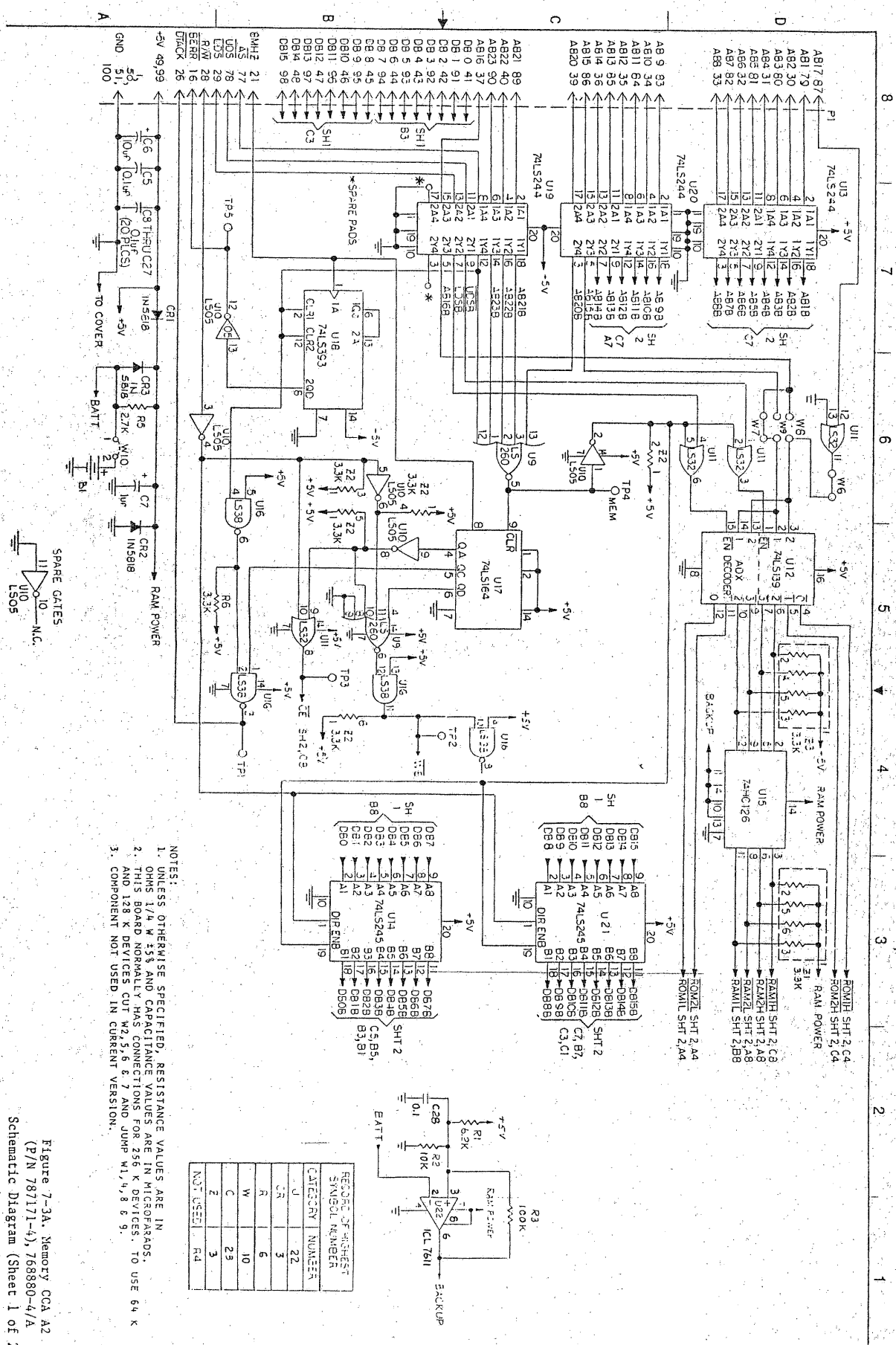
<u>FIGURE</u>	<u>DWG. NO./REV.</u>	<u>TITLE</u>	<u>PAGE</u>
7-1	768928/B	Model 2250 DAV Interconnection Diagram	7-3/(7-4 blank)
7-2	768861/F	Microprocessor Circuit Card Assembly (CCA) A1	7-5/(7-6 blank)
7-3	768880-4/B	Memory CCA A2	7-7/(7-8 blank)
7-3A	768880-4/A	Memory CCA A2	7-10A/(7-10B blank)
7-3B	769100/B	Memory CCA A2A Reset Adapter	7-10E/(7-10F blank)
7-4	768882-2/B	I/O CCA A3	7-11/(7-12 blank)
7-5	768879-1/D	Timing and Control CCA A4	7-15/(7-16 blank)
7-6	768878-1/D	Phase-Locked Loop CCA A5	7-21/(7-22 blank)
7-7	768865-1/A	Accumulator CCA A6, A7	7-25/(7-26 blank)
7-8	768877-2/A	Auto Calibration CCA A8	7-29/(7-30 blank)
7-9	768987/G	A/D Converter CCA A9, A12	7-31/(7-32 blank)
7-10	768930-1/E	Front End CCA A11, A14	7-35/(7-36 blank)
7-11	768862/D	Display Driver CCA A15A2	7-37/(7-38 blank)
7-12	768864/D	Display CCA A15A3	7-41/(7-42 blank)
7-13	768910/D	Isolation CCA A15A4, A15A5	7-43/(7-44 blank)
7-14	768866/J	Mother Board A16A1	7-45/(7-46 blank)
7-15	768983/B	Recorder Filter Assembly A17A1	7-47/(7-48 blank)
7-16	768863/H	Main Power Supply CCA A17PS1	7-49/(7-50 blank)
7-17	768876-1/B	Isolated Power Supply A17PS2A1, A17PS3A1	7-51/(7-52 blank)
7-18	298051-3	Membrane Panel (Keyboard) A15A1	7-53/(7-54 blank)

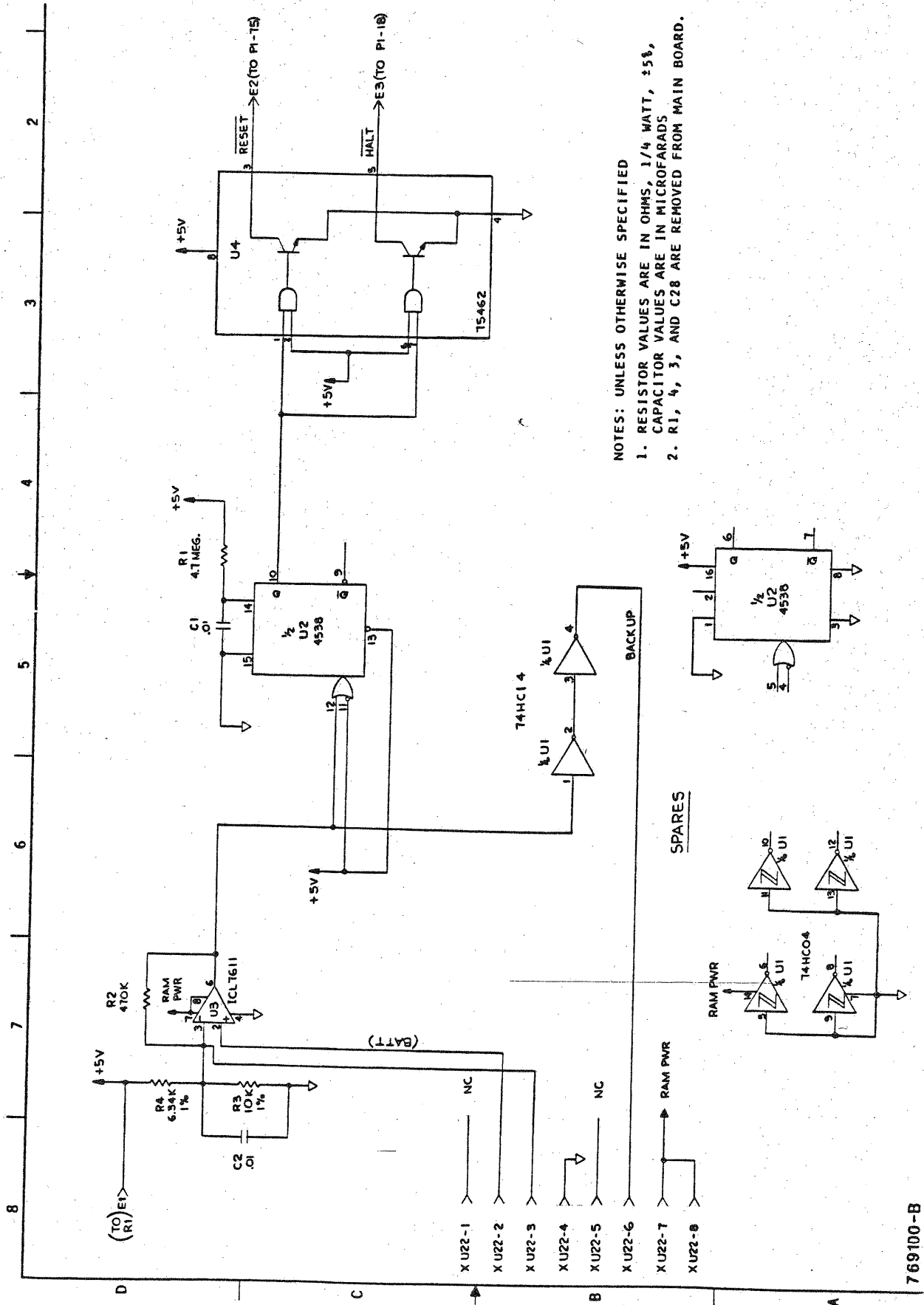






- NOTES:
1. UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, 1/4 W, 5% AND CAPACITANCE VALUES ARE IN MICROFARADS.
 2. THIS BOARD NORMALLY HAS CONNECTIONS FOR 56K DEVICES. TO USE 64 K AND 128 K DEVICES CUT WP. 5, 6 AND 7 AND JUMP W1, 4, 8 AND 9.
 3. COMPONENT NOT USED IN CURRENT VERSION.

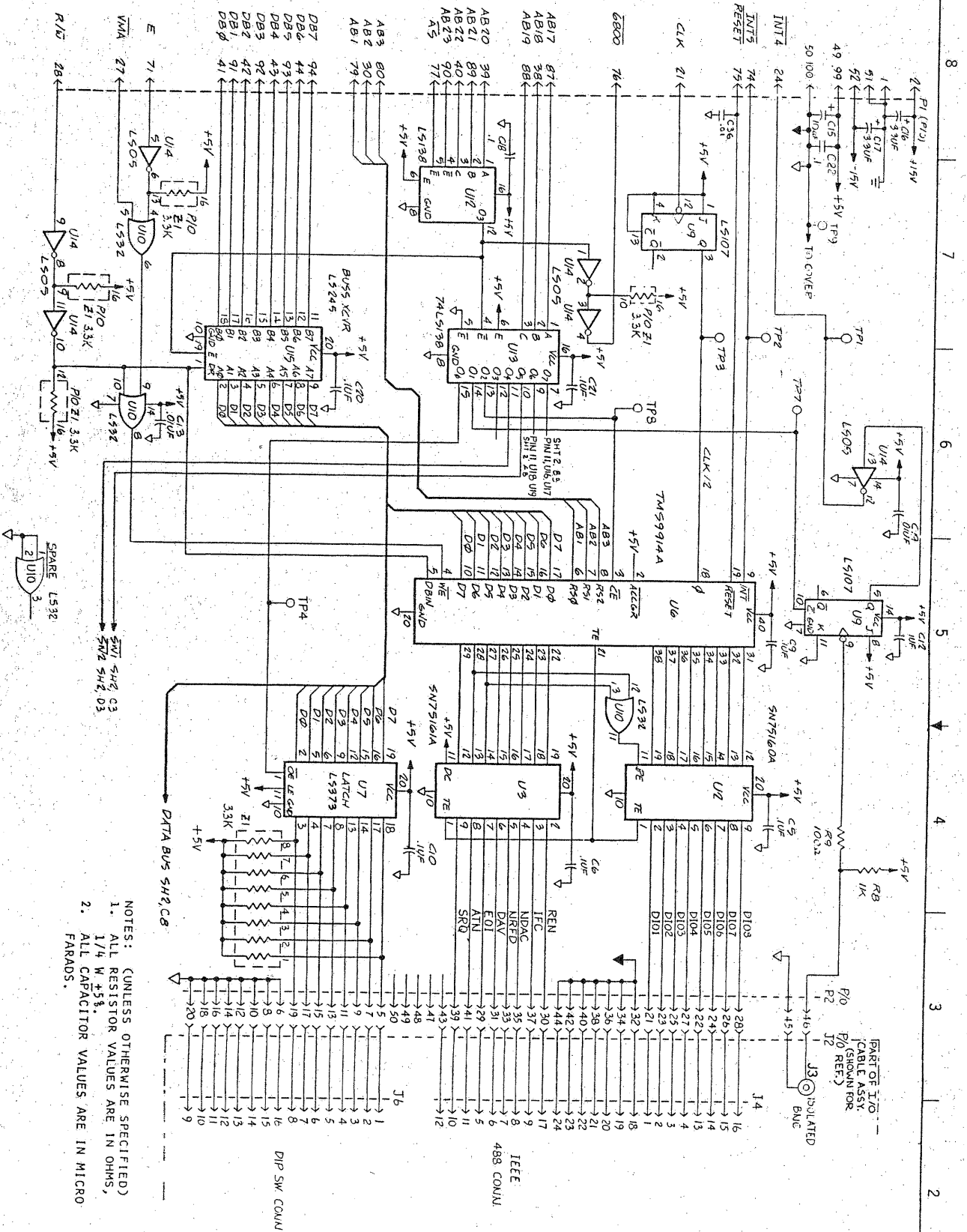




NOTES: UNLESS OTHERWISE SPECIFIED

1. RESISTOR VALUES ARE IN OHMS, 1/4 WATT, $\pm 5\%$, CAPACITOR VALUES ARE IN MICROFARADS
2. R1, 4, 3, AND C28 ARE REMOVED FROM MAIN BOARD.

Figure 7-3B. Memory CCA Reset Adapter, Schematic Diagram



NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. ALL RESISTOR VALUES ARE IN OHMS,
 1/4 W ±5%
 2. ALL CAPACITOR VALUES ARE IN MICRO
 FARADS.

Figure 7-4. I/O CCA A3 (P/N 787172-2)
 Schematic Diagram 768882-2/B
 (Sheet 1 of 2)

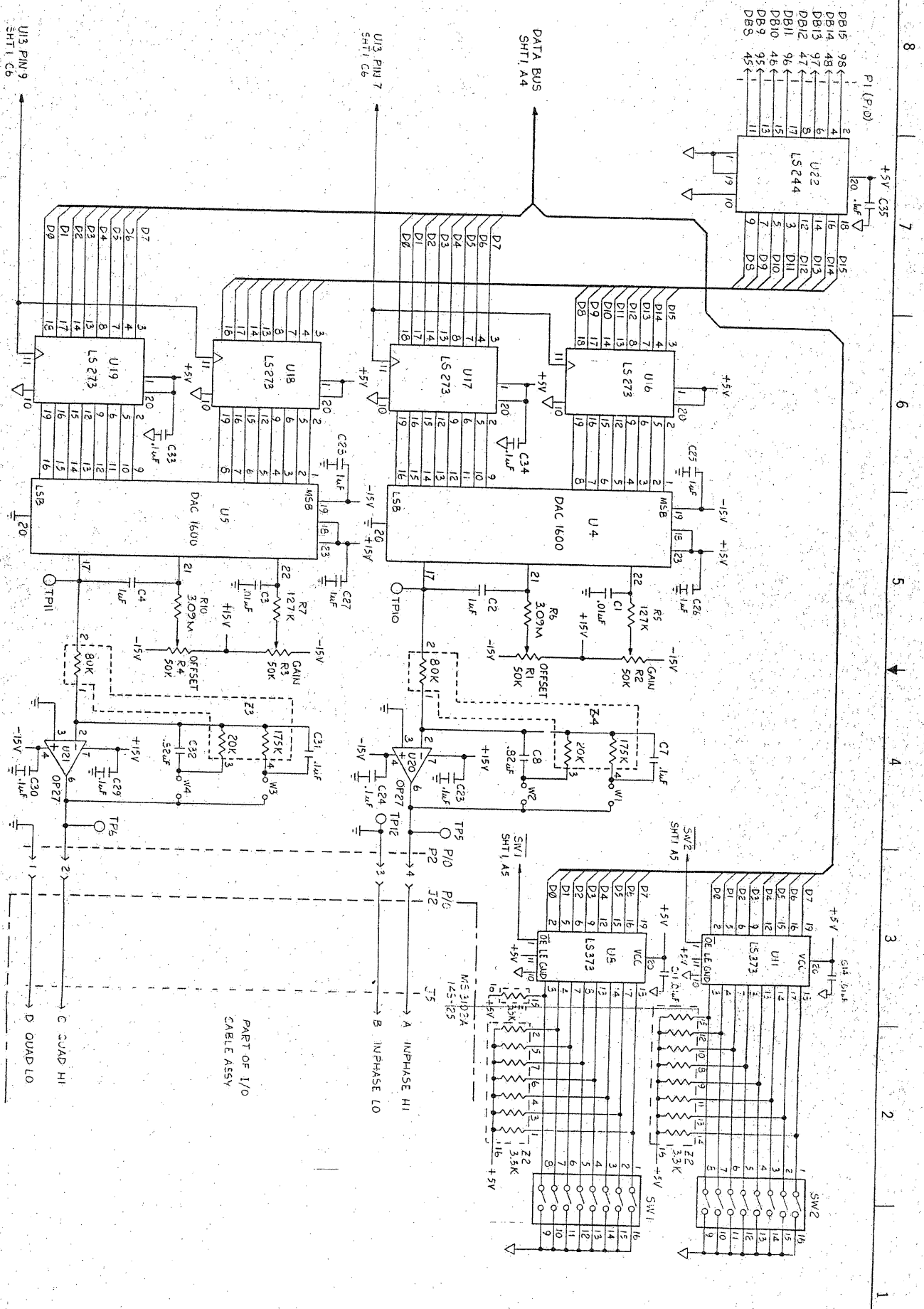
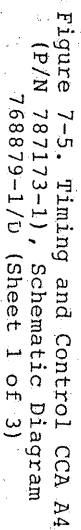


Figure 7-4. I/O CCA A3 (P/N 787172-2),
Schematic Diagram 768882-2/B
(Sheet 2 of 2)



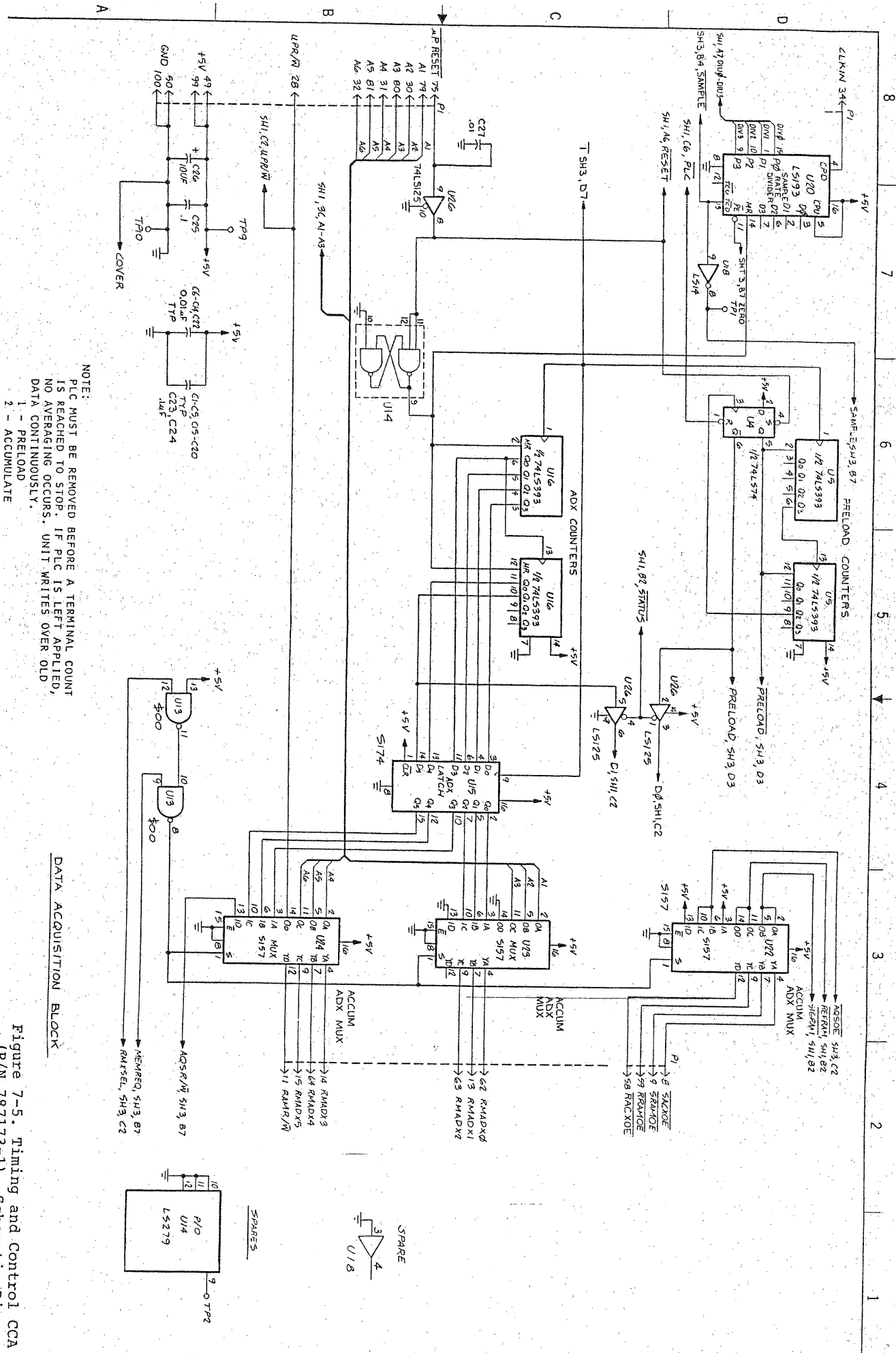


Figure 7-5. Timing and Control CCA A4
(P/N 787173-1), Schematic Diagram
768879-1/D (Sheet 2 of 3)

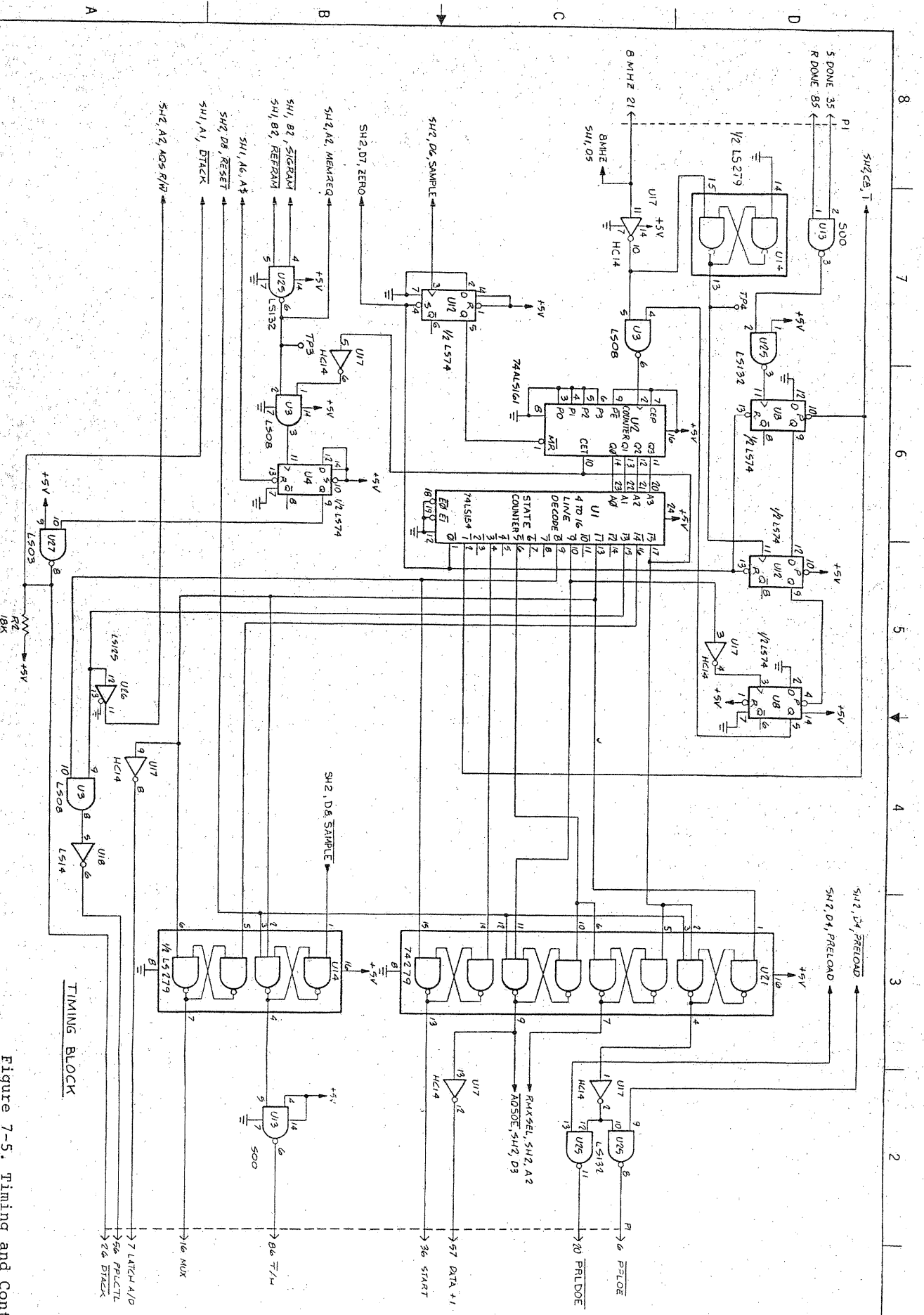
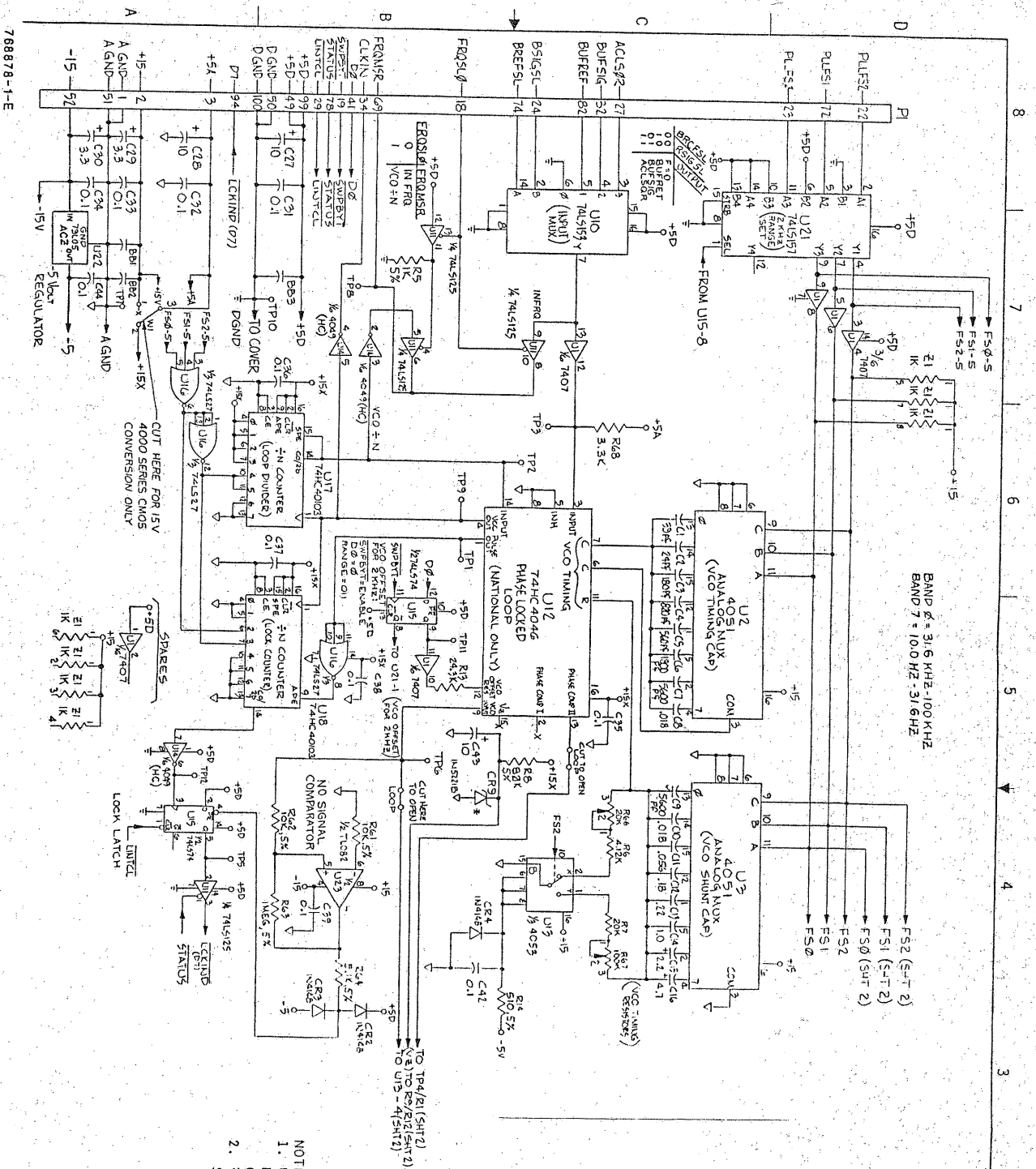


Figure 7-5. Timing and Control CCA A4
(P/N 787173-1), Schematic Diagram
768879-1/D (Sheet 3 of 3)



- NOTES:
1. UNLESS OTHER SPECIFIED RESISTANCE IS IN OHMS, 1/10 W, 1% CAPACITANCE IS IN MICROFARADS.
 2. DELETE COMPONENTS FOR 4000 SERIES CMOS OPERATION ONLY.

Figure 7-6. Phase-Locked Loop CCA A5
(P/N 787192-1), Schematic Diagram
7868/8-1/E (Sheet 1 of 2)

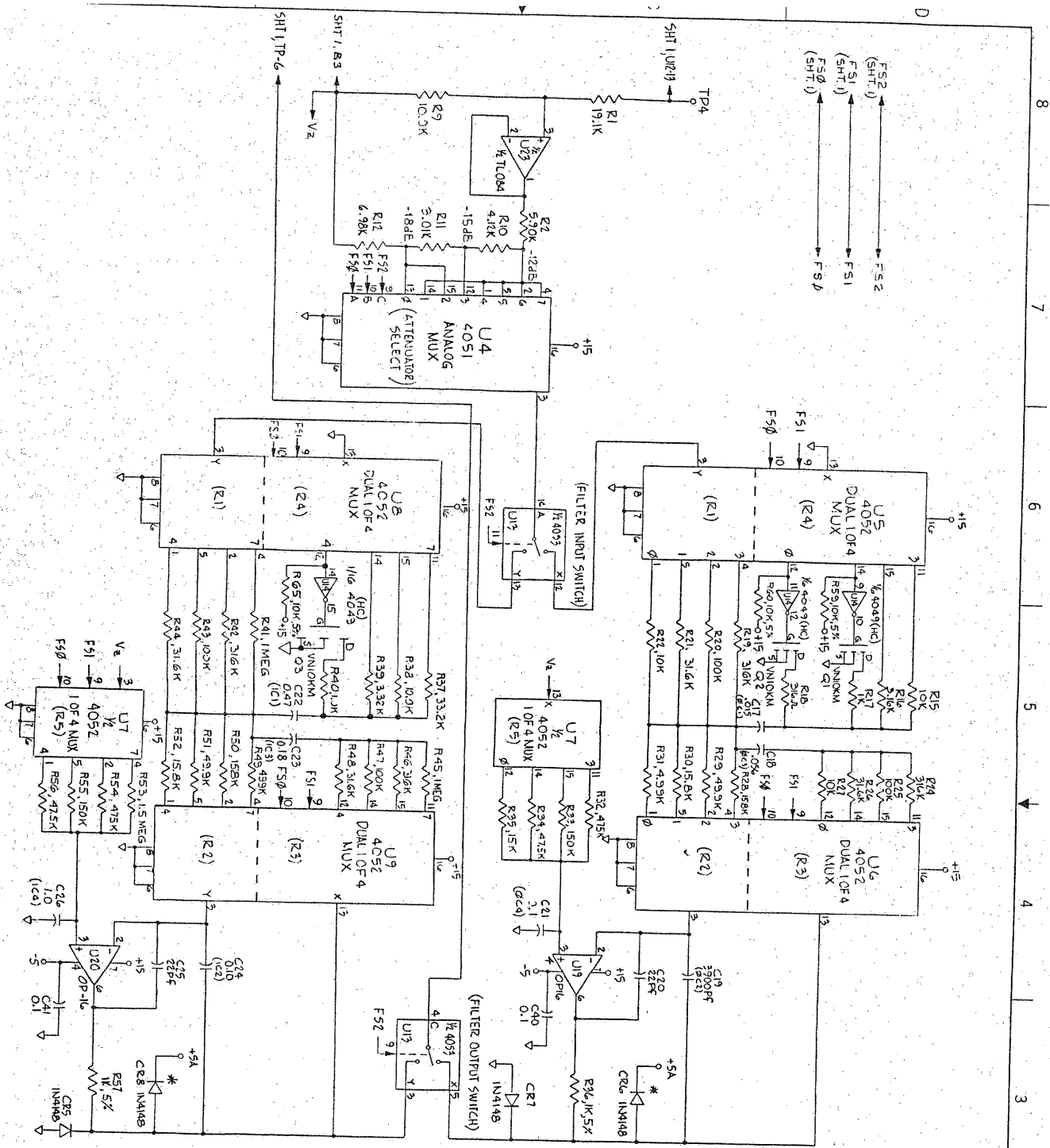


Figure 7-6. Phase-Locked Loop CCA AS
(P/N 787192-1), Schematic Diagram
768878-1/D (Sheet 2 of 2)

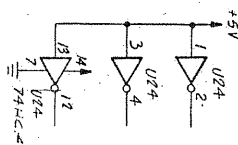
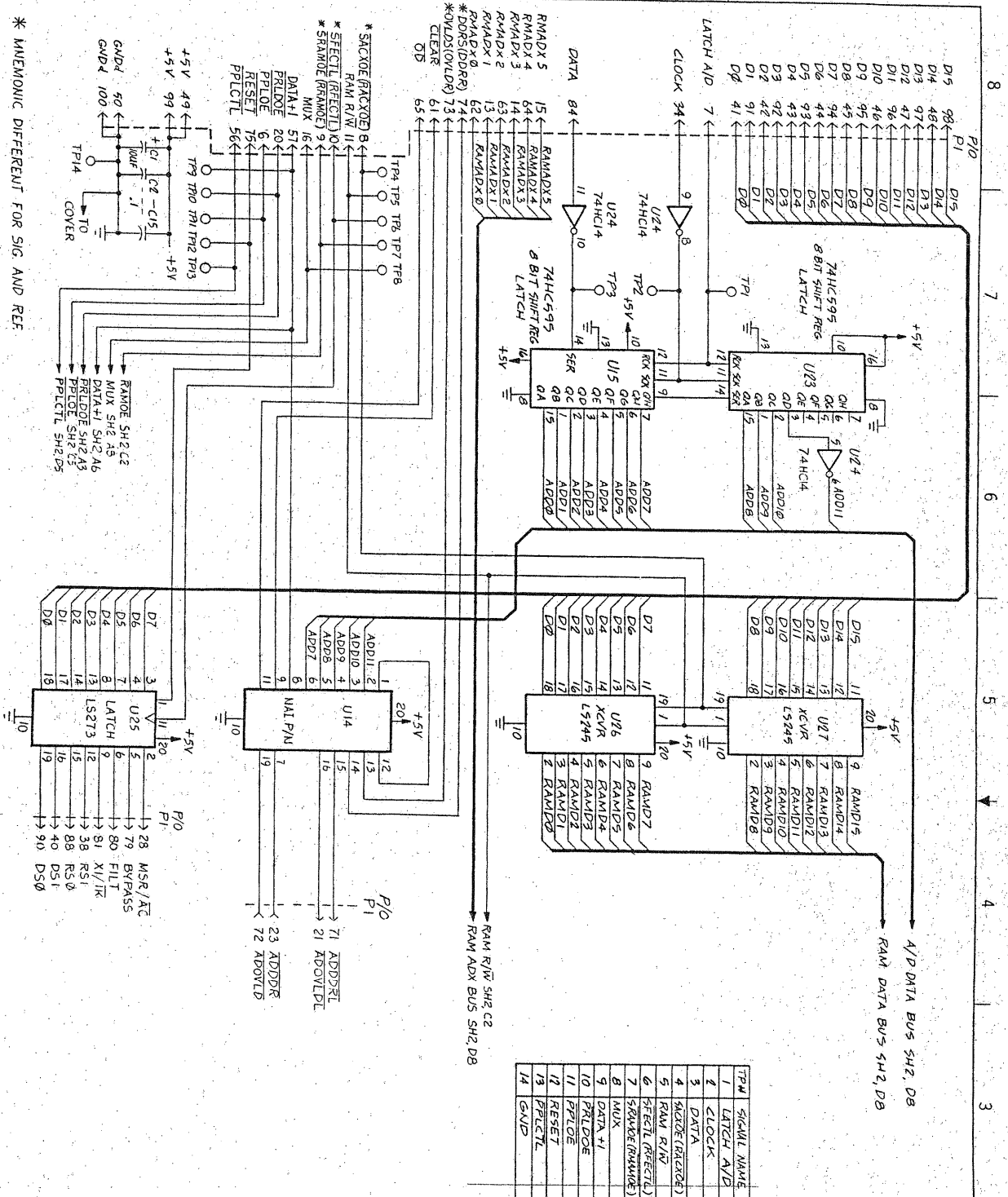


Figure 7-7. Accumulator CCA A6, A7 (P/N 787193-1), Schematic Diagram 768865-1/A (Sheet 1 of 2)

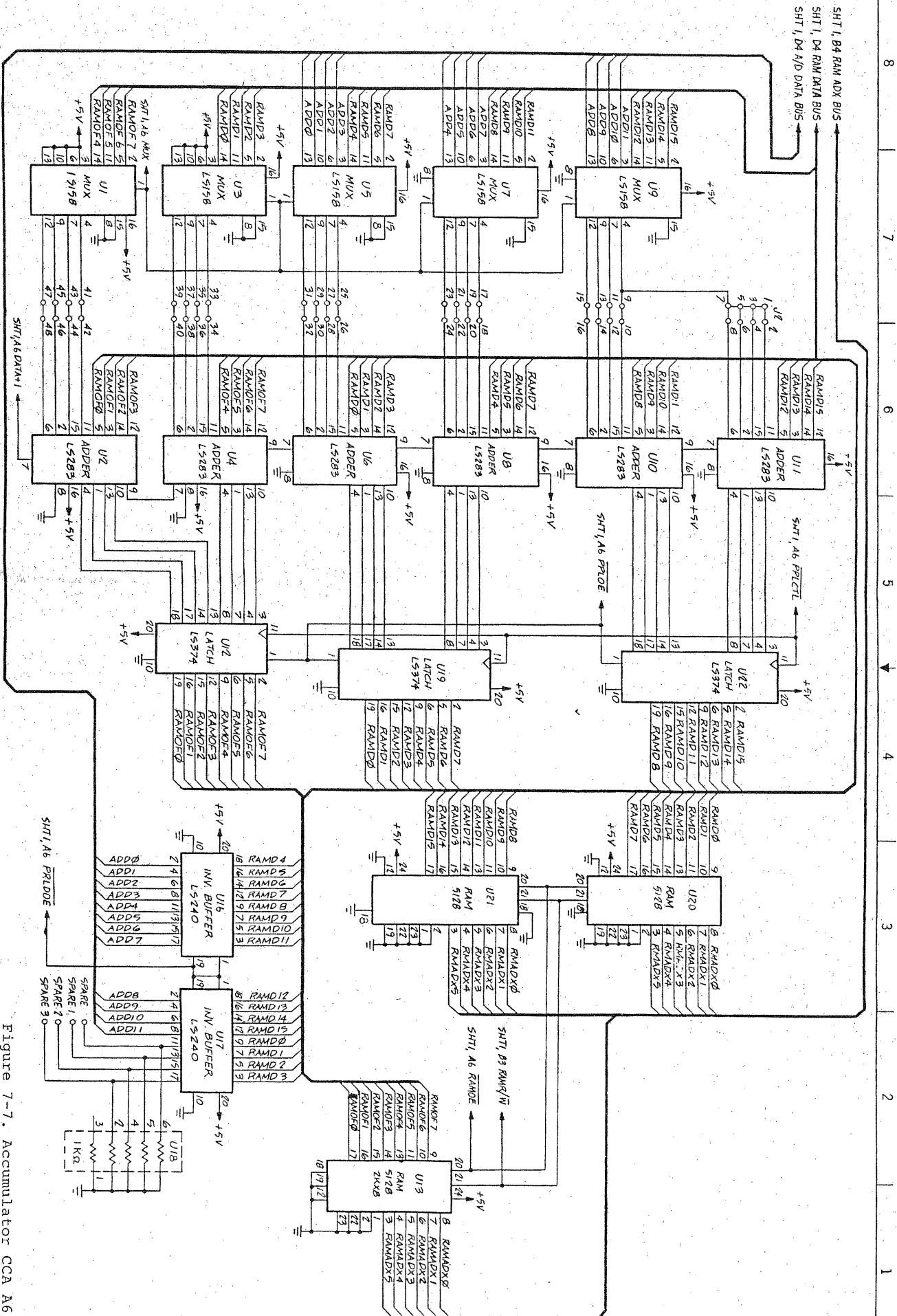
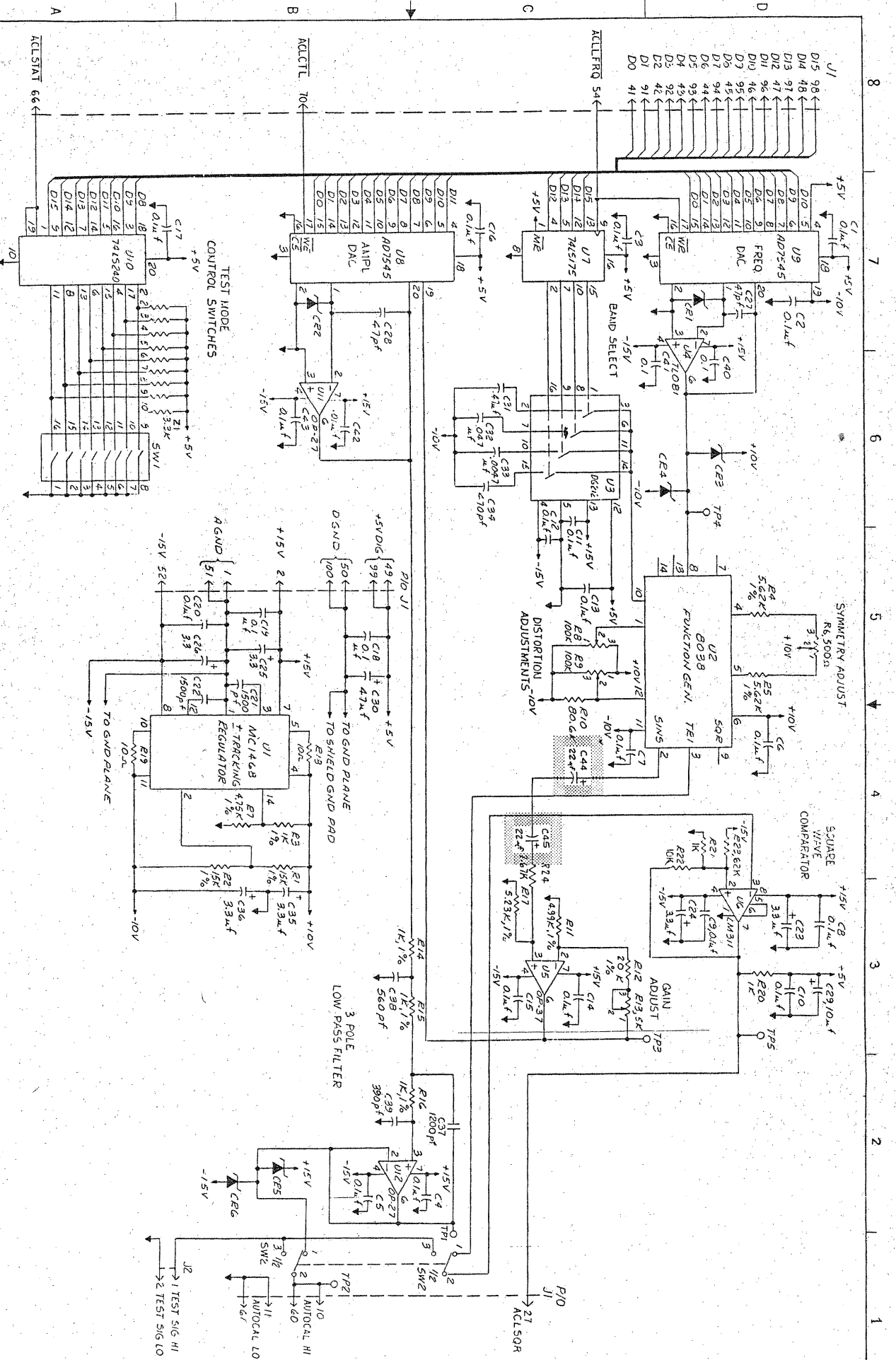


Figure 7-7. Accumulator CCA A6, A7
(P/N 787193-1), Schematic Diagram
768865-1/A (Sheet 2 of 2)



768877-2-C

Figure 7-8. Auto Calibration
CCA A8 (P/N 787274-2),
Schematic Diagram
768877-2/C

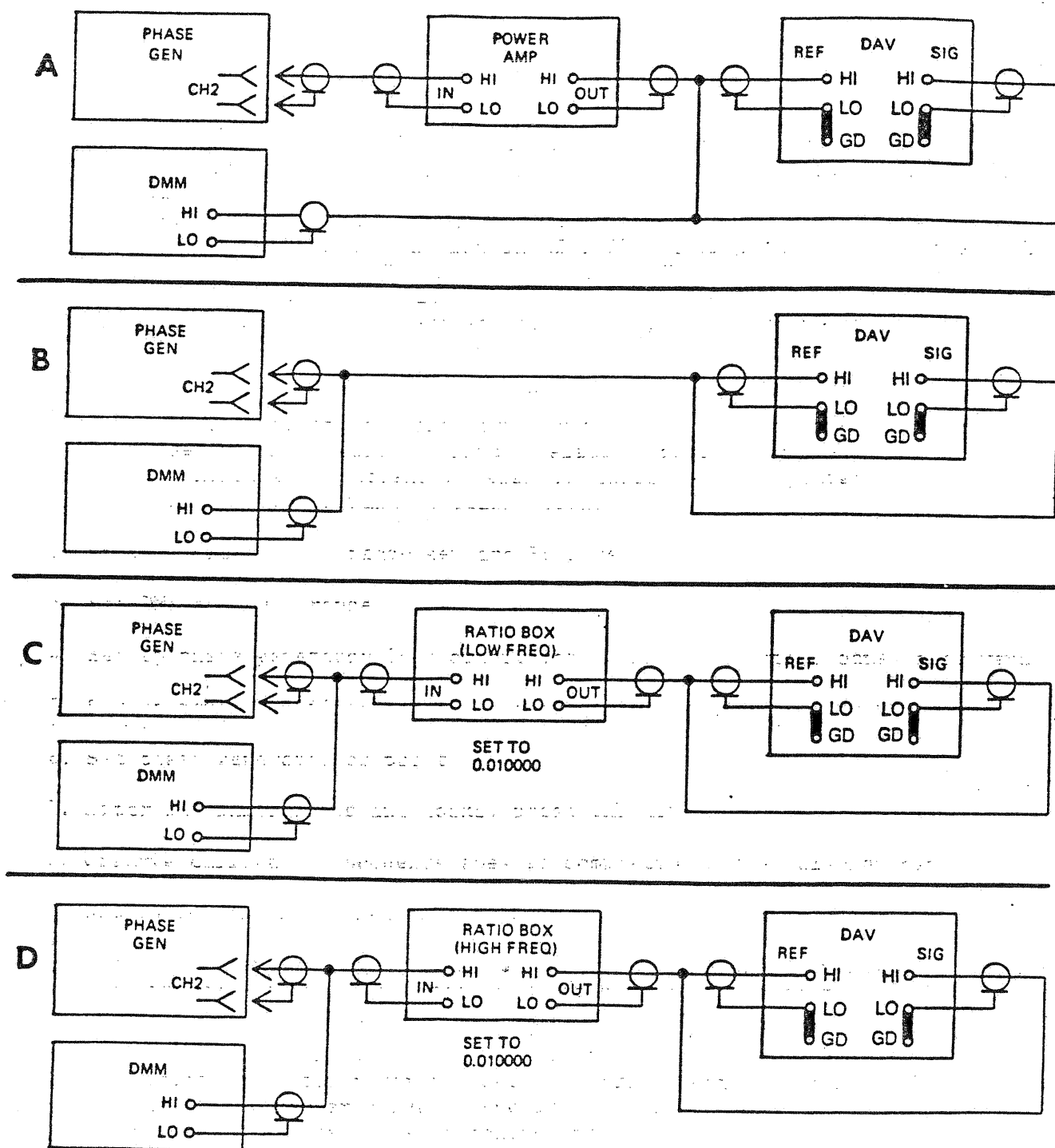


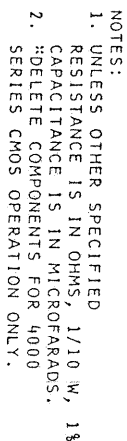
Figure 3-2. Wideband Accuracy Test Setup Diagram

Table 3-3. Wideband Accuracy Settings and Specifications (Continued)

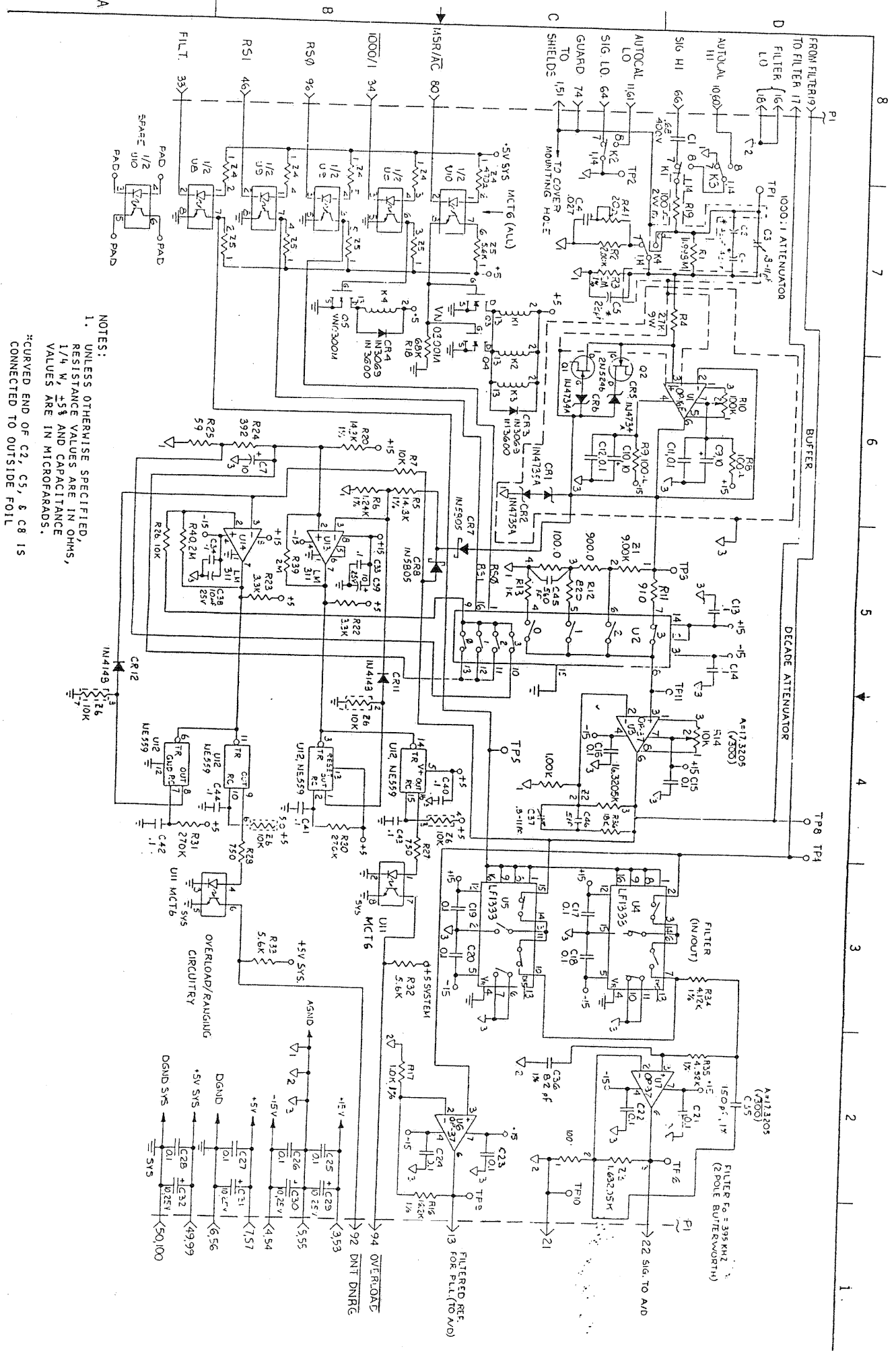
PHASE GENERATOR		TEST VOLTAGE	FIGURE 3-2 SETUP	DAV RANGE	DMM RANGE	DIVIDE DMM BY 100	DAV VOLTAGE TOLERANCE FUND AND TOTAL	DAV PHASE SPEC. DEGREES
FREQ	VOLT							
1.5 kHz	9.0 V	90 V	A	200 V	100 V	No	.195 V	0 +/- 0.05
1.5 kHz	4.5 V	45 V	A	200 V	100 V	No	.145 V	0 +/- 0.05
1.5 kHz	18.0 V	18.0 V	B	20 V	10 V	No	.0190 V	0 +/- 0.05
1.5 kHz	4.5 V	4.5 V	B	20 V	10 V	No	.01225 V	0 +/- 0.05
1.5 kHz	1.8 V	1.8 V	B	2 V	1 V	No	.00190 V	0 +/- 0.05
1.5 kHz	9.0 V	90 mV	C	200 mV	10 V	Yes	.145 mV	0 +/- 0.05
1.5 kHz	450 mV	4.5 mV	C	20 mV	1 V	Yes	.01225 mV	0 +/- 0.05
1.5 kHz	225 mV	2.25 mV	C	20 mV	300 mV	Yes	.011125 mV	0 +/- 0.05
5.0 kHz	9.0 V	90 V	A	200 V	100 V	No	.228 V	0 +/- 0.05
5.0 kHz	4.5 V	45 V	A	200 V	100 V	No	.174 V	0 +/- 0.05
5.0 kHz	18.0 V	18.0 V	B	20 V	10 V	No	.0229 V	0 +/- 0.05
5.0 kHz	4.5 V	4.5 V	B	20 V	10 V	No	.0147 V	0 +/- 0.05
5.0 kHz	1.8 V	1.8 V	B	2 V	1 V	No	.00229 V	0 +/- 0.05
5.0 kHz	9.0 V	90 mV	C	200 mV	10 V	Yes	.174 mV	0 +/- 0.05
5.0 kHz	450 mV	4.5 mV	C	20 mV	1 V	Yes	.0147 mV	0 +/- 0.05
5.0 kHz	225 mV	2.25 mV	C	20 mV	300 mV	Yes	.01335 mV	0 +/- 0.05
20 kHz	9.0 V	90 V	A	200 V	100 V	No	.309 V	0 +/- 0.20
20 kHz	4.5 V	45 V	A	200 V	100 V	No	.2145 V	0 +/- 0.20
20 kHz	18.0 V	18.0 V	B	20 V	10 V	No	.0336 V	0 +/- 0.20
20 kHz	4.5 V	4.5 V	B	20 V	10 V	No	.0174 V	0 +/- 0.20
20 kHz	1.8 V	1.8 V	B	2 V	1 V	No	.00336 V	0 +/- 0.20
20 kHz	9.0 V	90 mV	D	200 mV	10 V	Yes	.228 mV	0 +/- 0.20
20 kHz	450 mV	4.5 mV	D	20 mV	1 V	Yes	.0174 mV	0 +/- 0.20
20 kHz	225 mV	2.25 mV	D	20 mV	300 mV	Yes	.01470 mV	0 +/- 0.20

Table 3-3. Wideband Accuracy Settings and Specifications (Continued)

PHASE GENERATOR		TEST VOLTAGE	FIGURE 3-2 SETUP	DAV RANGE	DMM RANGE	DIVIDE DMM BY 100	DAV VOLTAGE TOLERANCE FUND AND TOTAL	DAV PHASE SPEC. DEGREES
FREQ	VOLT							
32 kHz	9.0 V	90 V	A	200 V	100 V	No	.546 V	0 +/- 0.32
32 kHz	4.5 V	45 V	A	200 V	100 V	No	.393 V	0 +/- 0.32
32 kHz	18.0 V	18.0 V	B	20 V	10 V	No	.0582 V	0 +/- 0.32
32 kHz	4.5 V	4.5 V	B	20 V	10 V	No	.03255 V	0 +/- 0.32
32 kHz	1.8 V	1.8 V	B	2 V	1 V	No	.00582 V	0 +/- 0.32
32 kHz	9.0 V	90 mV	D	200 mV	10 V	Yes	.411 mV	0 +/- 0.32
32 kHz	450 mV	4.5 mV	D	20 mV	1 V	Yes	.03255 mV	0 +/- 0.32
32 kHz	225 mV	2.25 mV	D	20 mV	300 mV	Yes	.028275 mV	0 +/- 0.32
54 kHz	9.0 V	90 V	A	200 V	100 V	No	.960 V	0 +/- 0.54
54 kHz	4.5 V	45 V	A	200 V	100 V	No	.600 V	0 +/- 0.54
54 kHz	18.0 V	18.0 V	B	20 V	10 V	No	.1140 V	0 +/- 0.54
54 kHz	4.5 V	4.5 V	B	20 V	10 V	No	.0465 V	0 +/- 0.54
54 kHz	1.8 V	1.8 V	B	2 V	1 V	No	.01140 V	0 +/- 0.54
54 kHz	9.0 V	90 mV	D	200 mV	10 V	Yes	.690 mV	0 +/- 0.54
54 kHz	450 mV	4.5 mV	D	20 mV	1 V	Yes	.0465 mV	0 +/- 0.54
54 kHz	225 mV	2.25 mV	D	20 mV	300 mV	Yes	.03525 mV	0 +/- 0.54
100 kHz	9.0 V	90 V	A	200 V	100 V	No	1.320 V	0 +/- 1.00
100 kHz	4.5 V	45 V	A	200 V	100 V	No	.780 V	0 +/- 1.00
100 kHz	18.0 V	18.0 V	B	20 V	10 V	No	.1590 V	0 +/- 1.00
100 kHz	4.5 V	4.5 V	B	20 V	10 V	No	.05775 V	0 +/- 1.00
100 kHz	1.8 V	1.8 V	B	2 V	1 V	No	.01590 V	0 +/- 1.00
100 kHz	9.0 V	90 mV	D	200 mV	10 V	Yes	.915 mV	0 +/- 1.00
100 kHz	450 mV	4.5 mV	D	20 mV	1 V	Yes	.05775 mV	0 +/- 1.00
100 kHz	225 mV	2.25 mV	D	20 mV	300 mV	Yes	.040875 mV	0 +/- 1.00



7-21/ ? blank)



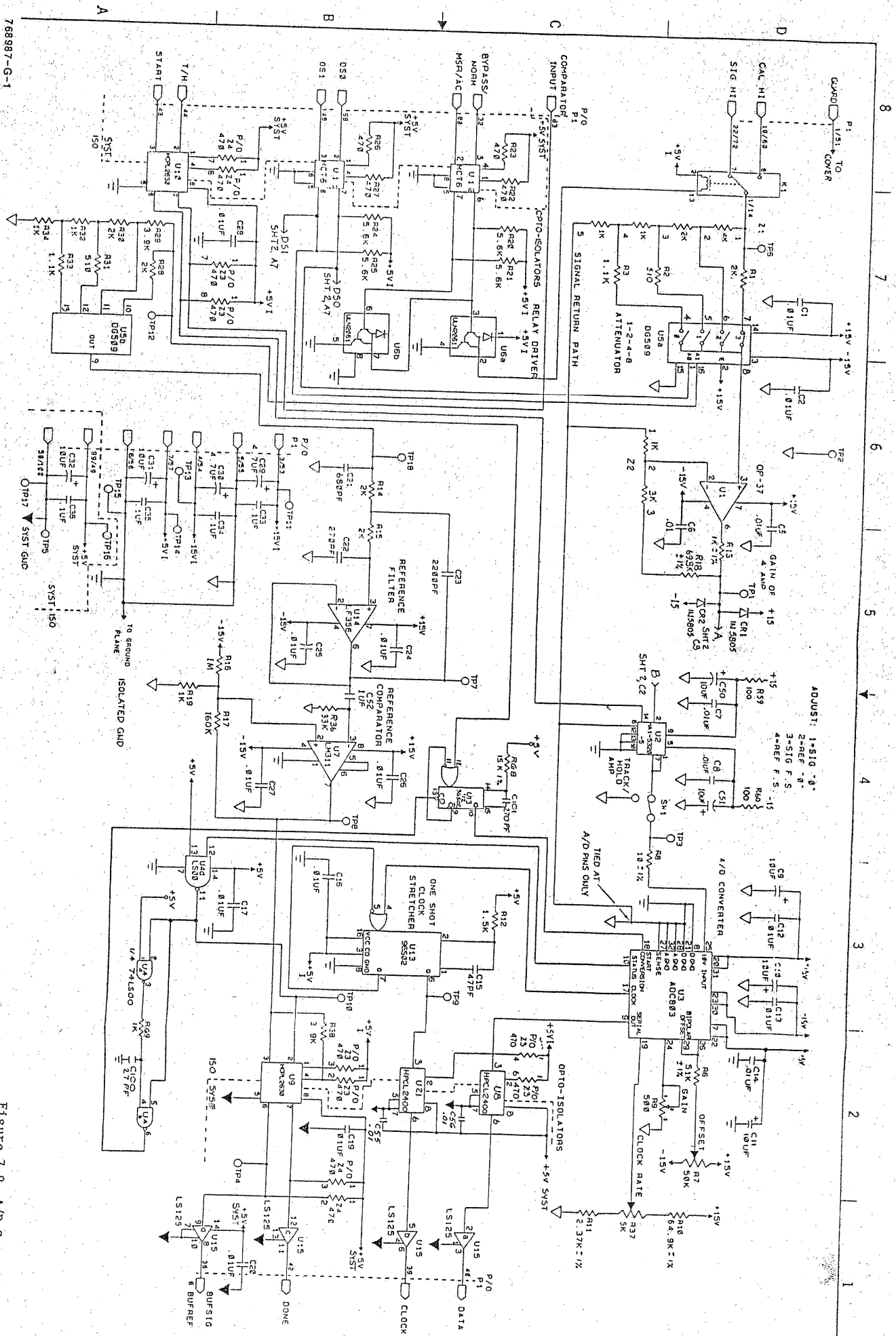
NOTES:
 1. UNLESS OTHERWISE SPECIFIED,
 RESISTANCE VALUES ARE IN OHMS,
 1/4 W, 1% AND CAPACITANCE
 VALUES ARE IN MICROFARADS.
 *CURVED END OF C2, C5, & C8 IS
 CONNECTED TO OUTSIDE FOIL

Figure 7-10. Front End CCA
 A11, A14 (P/N 787505-1),
 Schematic Diagram 768930-1/E

- (e) On DAV, press FUND key.
- (f) Verify that difference between readings on DAV and DMM is within tolerance as specified in table 3-3 (divide DMM reading by 100 if specified in table 3-3).
- (g) On DAV press TOTAL key.
- (h) Verify that difference between readings on DAV and DMM is within tolerance as specified in table 3-3 (divide DMM reading by 100 if specified in table 3-3).
- (i) On DAV, press PHASE ANGLE key.
- (j) Verify reading on DAV is within tolerance as specified in table 3-3.
- (k) On DAV, press READ REF key. Observe LED on READ REF key is lit (DAV set for REF channel measurement).
- (l) Repeat steps (e) through (h).
- (m) On DAV, press READ REF key and observe that LED on READ REF key goes out (DAV set for SIG channel measurement).
- (n) Repeat steps (b) through (m) for remaining test setup "A", 10 Hz (or frequency specified in table 3-3, for subsequent steps) settings listed in table 3-3.
- (o) Turn phase generator output off.
- (p) Reconfigure test setup for "B" configuration as shown in figure 3-2.
- (q) Set DMM range to setting specified for first setup "B" test.
- (r) Press DAV range key indicated for first setup "B" test.
- (s) Set DAV to TOTAL (AVG) mode by setting all switches on Autocal CCA A8SW1 DIP switch to the OFF position.
- (t) Turn phase generator output on.
- (u) Repeat steps (b) through (m) for all test setup "B", 10 Hz (or frequency specified in table 3-3, for subsequent steps) settings listed in table 3-4.
- (v) Turn phase generator output off.
- (w) Reconfigure test setup for "C" (or "D" for frequencies of 20 kHz or higher) configuration as shown in figure 3-2.
- (x) Set DMM range to setting specified for first setup "C" (or "D") test.
- (y) Press DAV range key indicated for first setup "C" (or "D") test.
- (z) Turn phase generator output on.
- (aa) Repeat steps (b) through (m) for all test setup "C" (or "D"), 10 Hz (or frequency specified in table 3-3, for subsequent steps) settings listed in table 3-3.
- (ab) Turn phase generator off.

Table 3-3. Wideband Accuracy Settings and Specifications

PHASE GENERATOR		TEST VOLTAGE	FIGURE 3-2 SETUP	DAV RANGE	DMM RANGE	DIVIDE DMM BY 100	DAV VOLTAGE TOLERANCE FUND AND TOTAL	DAV PHASE SPEC. DEGREES
FREQ	VOLT							
10 Hz	9.0 V	90 V	A	200 V	100 V	No	.290 V	0 +/- 0.10
10 Hz	4.5 V	45 V	A	200 V	100 V	No	.245 V	0 +/- 0.10
10 Hz	18.0 V	18.0 V	B	20 V	10 V	No	.0290 V	0 +/- 0.10
10 Hz	4.5 V	4.5 V	B	20 V	10 V	No	.02225 V	0 +/- 0.10
10 Hz	1.8 V	1.8 V	B	2 V	1 V	No	.00290 V	0 +/- 0.10
10 Hz	450 mV	4.5 mV	C	20 mV	1 V	Yes	.02225 mV	0 +/- 0.10
10 Hz	225 mV	2.25 mV	C	20 mV	300 mV	Yes	.021125 mV	0 +/- 0.10
50 Hz	9.0 V	90 V	A	200 V	100 V	No	.195 V	0 +/- 0.05
50 Hz	4.5 V	45 V	A	200 V	100 V	No	.145 V	0 +/- 0.05
50 Hz	18.0 V	18.0 V	B	20 V	10 V	No	.0190 V	0 +/- 0.05
50 Hz	4.5 V	4.5 V	B	20 V	10 V	No	.01225 V	0 +/- 0.05
50 Hz	1.8 V	1.8 V	B	2 V	1 V	No	.00190 V	0 +/- 0.05
50 Hz	450 mV	4.5 mV	C	20 mV	1 V	Yes	.01225 mV	0 +/- 0.05
50 Hz	225 mV	2.25 mV	C	20 mV	300 mV	Yes	.011125 mV	0 +/- 0.05
400 Hz	9.0 V	90 V	A	200 V	100 V	No	.195 V	0 +/- 0.05
400 Hz	4.5 V	45 V	A	200 V	100 V	No	.145 V	0 +/- 0.05
400 Hz	18.0 V	18.0 V	B	20 V	10 V	No	.0190 V	0 +/- 0.05
400 Hz	4.5 V	4.5 V	B	20 V	10 V	No	.01225 V	0 +/- 0.05
400 Hz	1.8 V	1.8 V	B	2 V	1 V	No	.00190 V	0 +/- 0.05
400 Hz	9.0 V	90 mV	C	200 mV	10 V	Yes	.145 mV	0 +/- 0.05
400 Hz	450 mV	4.5 mV	C	20 mV	1 V	Yes	.01225 mV	0 +/- 0.05
400 Hz	225 mV	2.25 mV	C	20 mV	300 mV	Yes	.011125 mV	0 +/- 0.05



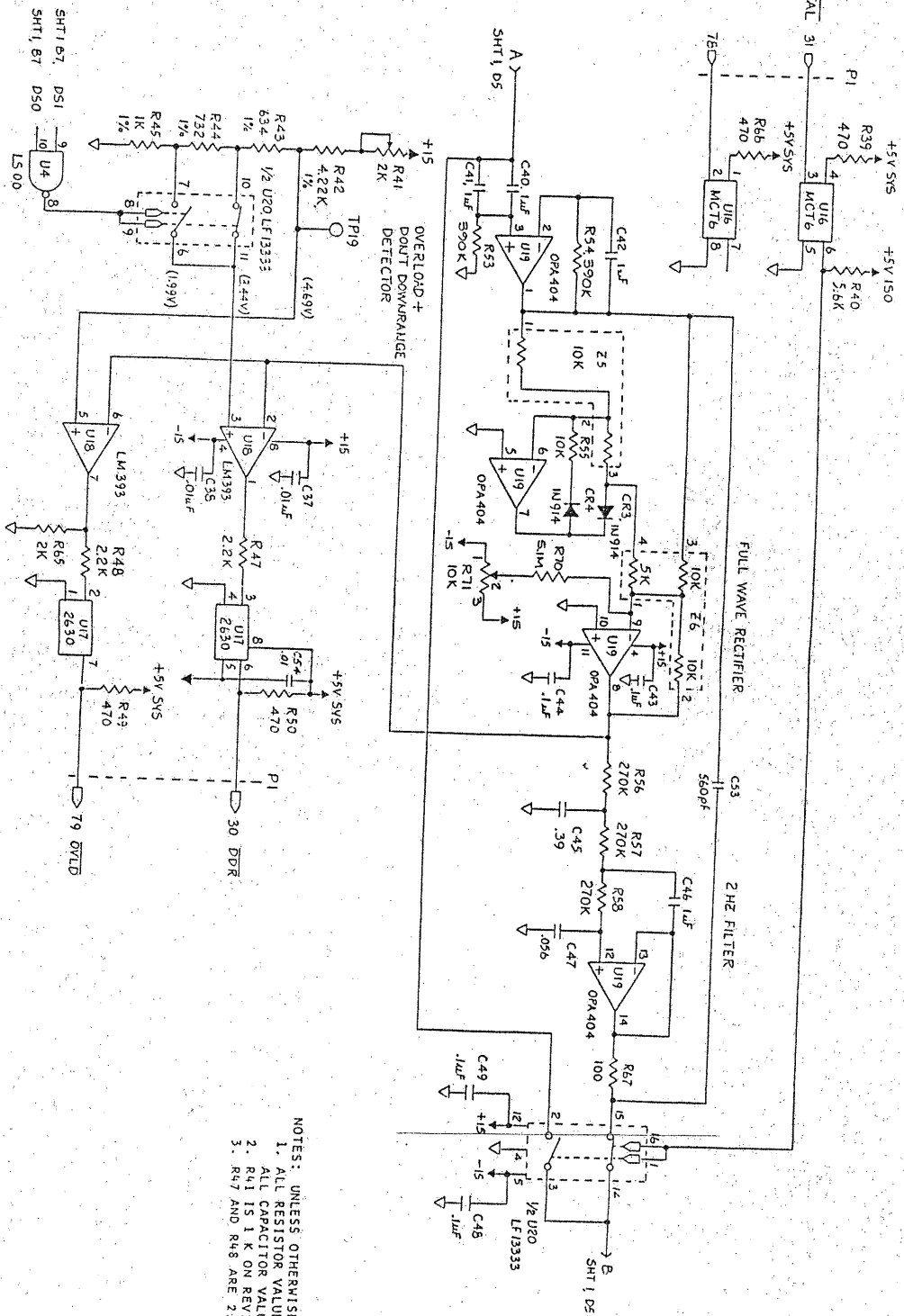


Figure 7-9. A/D Converter
 CCA A9, A12 (P/N 787664),
 Schematic Diagram 768987/G
 (Sheet 2 of 2)

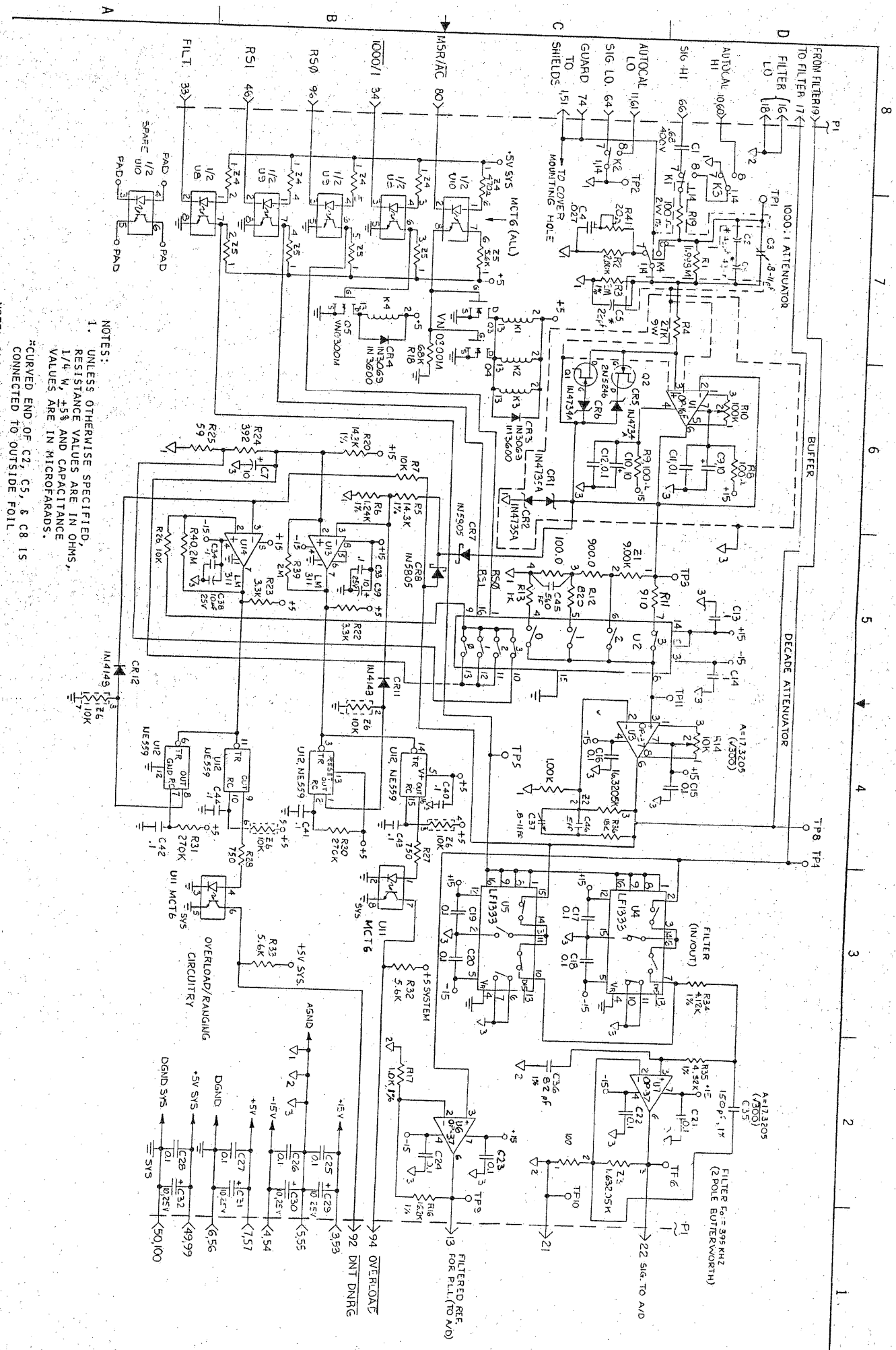


Figure 7-10. Front End CCA
 All, A14 (P/N 787505-1),
 Schematic Diagram 768930-1/E

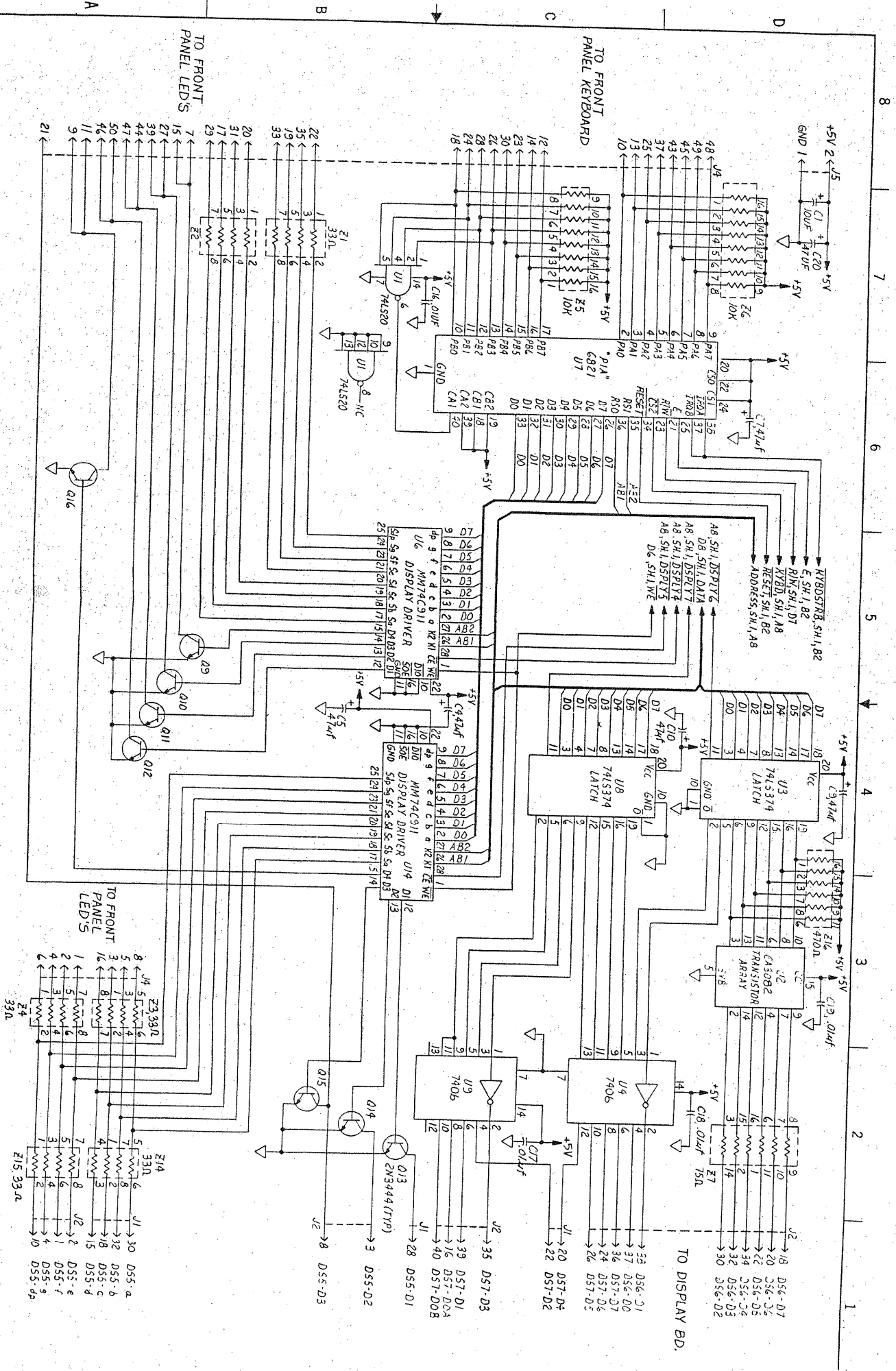


Figure 7-11. Display Driver CCA
A15A2 (P/N 787179), Schematic Diagram
768862/D (Sheet 2 of 2)

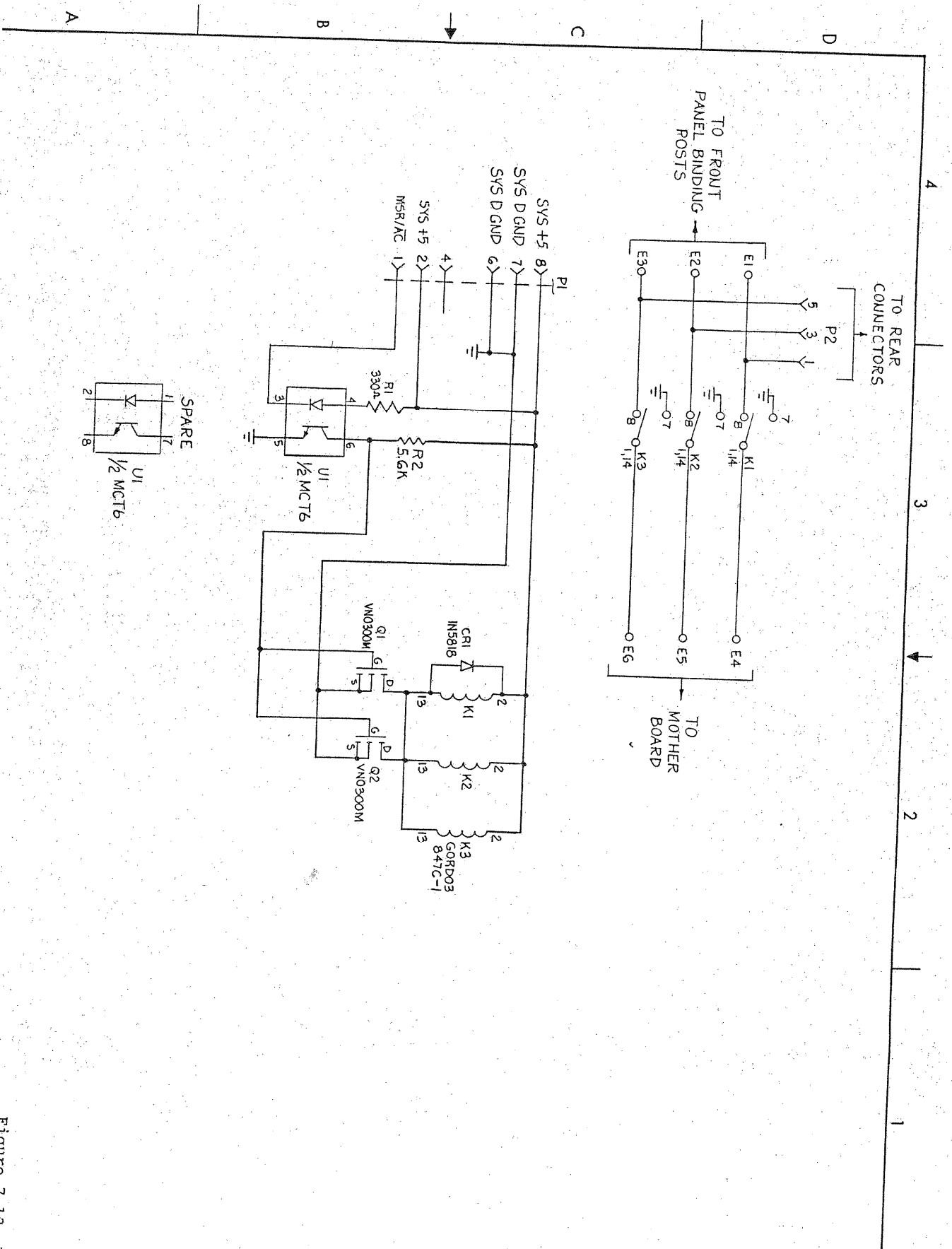


Figure 7-13. Isolation CCA
 Al5A4, Al5A5 (P/N 787448-1,-2)
 Schematic Diagram 768910/D

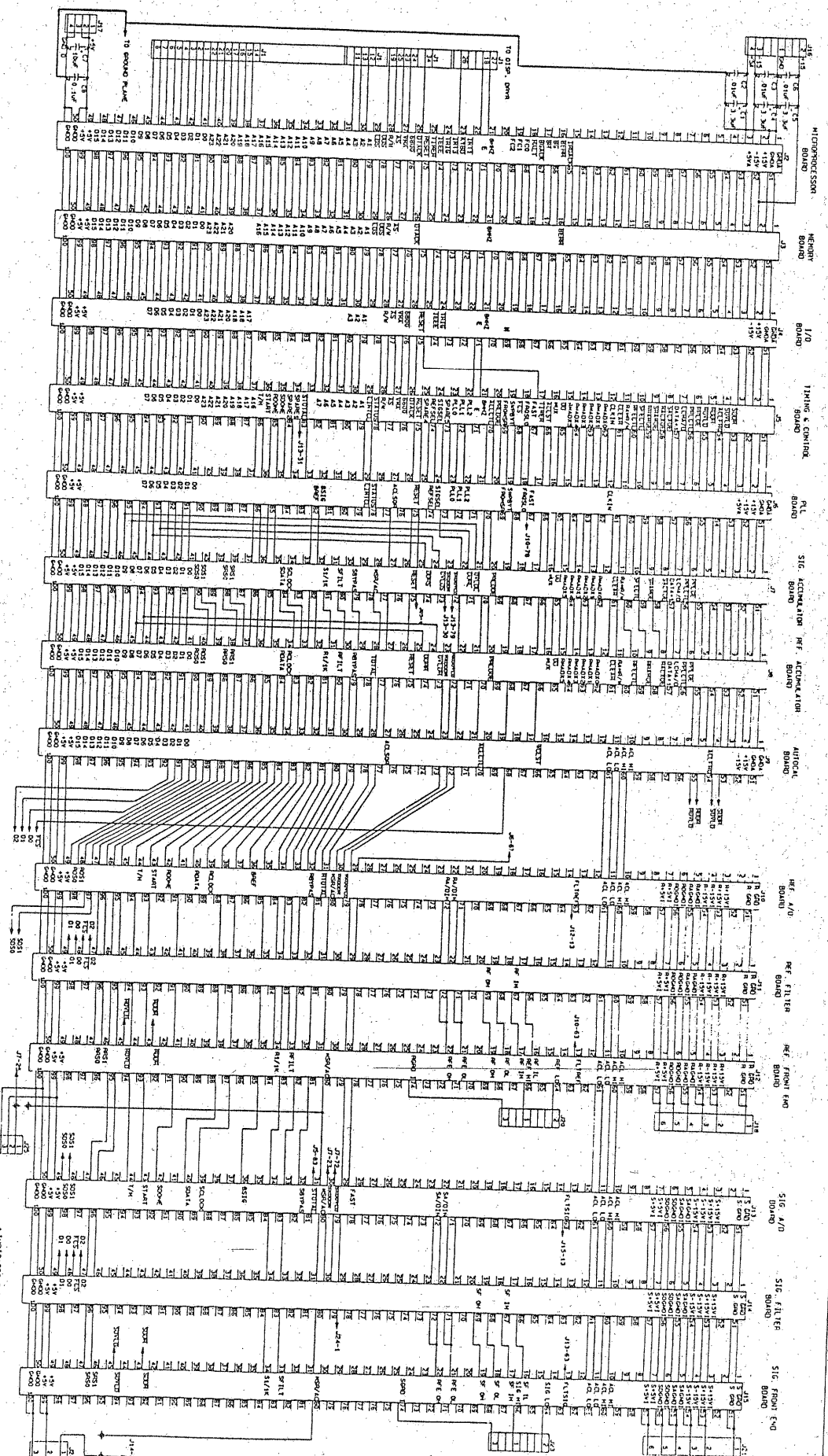
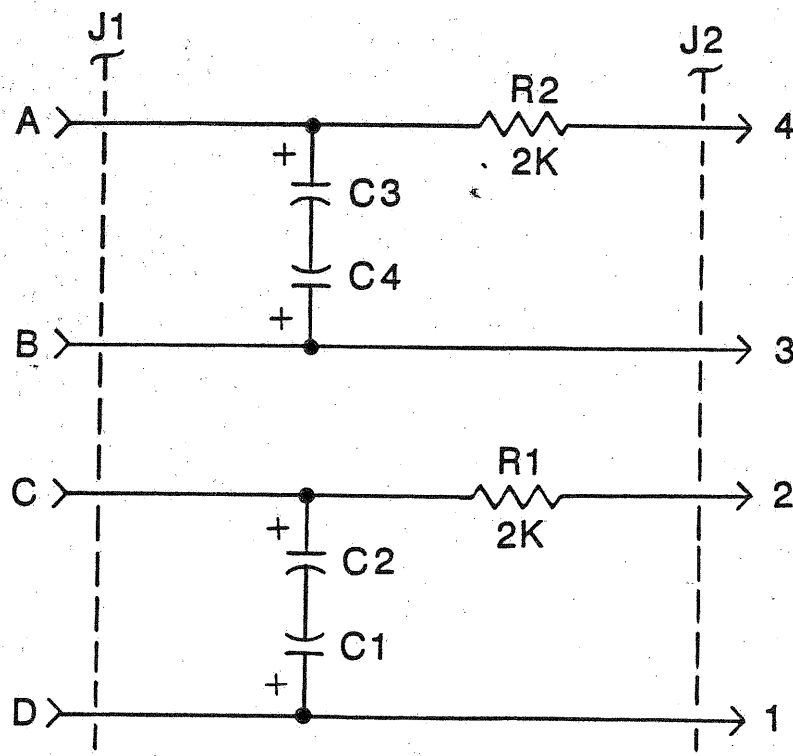


Figure 7-14. Mother Board
A16A1 (P/N 787177),
Schematic Diagram 76866/2



ALL CAPS 3.3 μ F, 25V

Figure 7-15. Recorder Filter Assembly
A17A1 (P/N 787667),
Schematic Diagram 768983/B

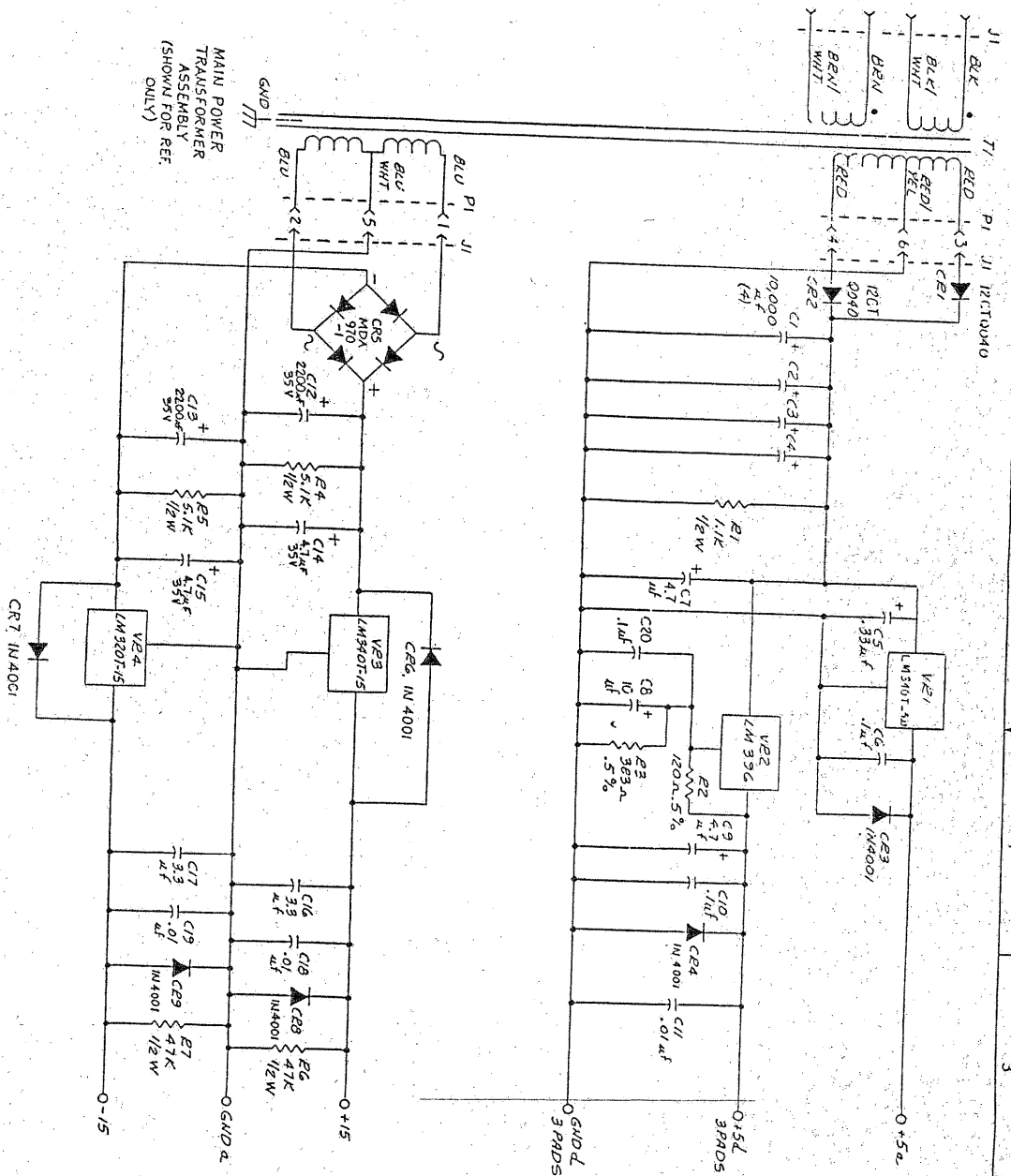
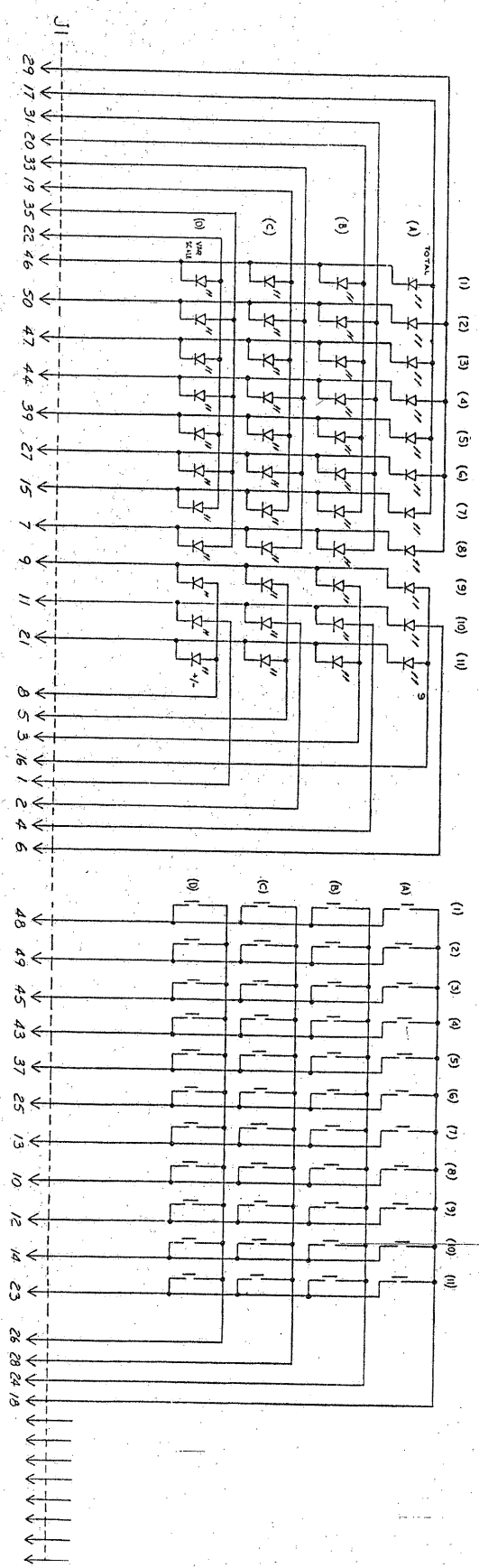


Figure 7-16. Main Power Supply
CCA A17PS1 (P/N 787181)
Schematic Diagram 768863/H

SCHEMATIC
NOTE: ALL LEDS ARE GENERAL INSTRUMENT
NO. MV55A OR APPROVED EQUIVALENT.



298051-3-A

Figure 7-18. Membrane Panel
(Keyboard) A15A1 (P/N 298051-3),
Schematic Diagram
Change 5 7-53/ 4 blank)

MODEL 2250

SECTION 8

UPDATE INFORMATION

8-1. INTRODUCTION.

As NAI continues to improve the performance of the DAV, corrections and modifications to the manual may be required. This section contains Product Revision Sheet (PRS) data which updates the unit to the most current configuration available.

1.0 ASSEMBLIES AND REVISION LEVELS AFFECTED:

Front End CCA A11,A14 NAI P/N 787505-1 Revision F2

2.0 CHANGES: Manual may be required. This section contains Product Revision Sheet

2.1 Change the following in Table 6-14:

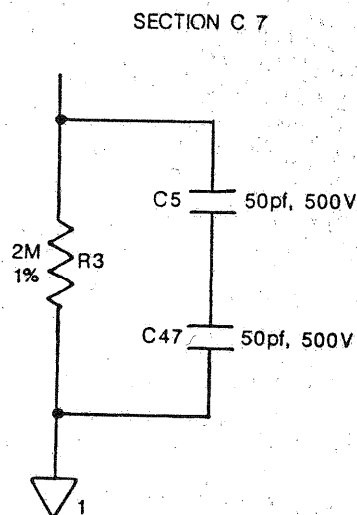
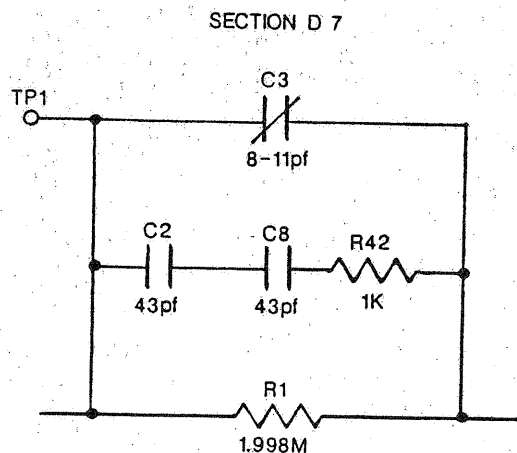
a. Delete Capacitor C5 NAI P/N 808288 (22 pf, 750 V).

b. Add the following components:

(1) C5,C47 Capacitor, Mica, NAI P/N 803638
50 pf, 500 V, $\pm 5\%$

(2) R42 Resistor, Composition, NAI P/N 880084
1 k, 1/4 W, $\pm 5\%$

2.2 Change figure 7-10 (schematic diagram 768930-1) as shown:



APPENDIX A

GLOSSARY OF TERMS

ABBREVIATION/ MNEMONIC	MEANING	ABBREVIATION/ MNEMONIC	MEANING
A	Address	DTACK	Data Transfer Acknowledge
AB	Address Bus	E	Enable
ACLCTL	Autocalibration Control	EN	Enable
ACLFRQ	Autocalibration Frequency	ENB	Enable B
ACLSQR	Autocalibration Squarewave	EOI	End or Identify
ACLSTAT	Autocalibration Status	FC	Function Code
A/D	Analog-to-Digital	FCS	Filter Control Strobe
ADC	A/D Converter	FET	Field Effect Transistor
AQSOE	Acquisition Output Enable	FILT	Filter
AQSR/W	Acquisition Read/Write	FMLCTL	Frequency Multiplier Control
AS	Address Strobe	FMLFRQ	Frequency Multiplier Frequency
ASCII	American Standard Code for Interface Interchange	FRQMSR	Frequency Measure
ATN	Attention	FRQSL	Frequency Select
ATTN	Attenuation	ES	Frequency Select (PLL)
AUTOCAL	Autocalibration	GPIB	General Purpose Interface Bus
BERR	Bus Error	HALT	Halt
BREFSL	Buffer Reference Signal Select	IEEE	Institute of Electrical and Electronics Engineers
BSIGSL	Buffer Signal Select	IFC	Interface Clear
BUF	Buffer	IH	Input High
CCA	Circuit Card Assembly	IL	Input Low
CE	Chip Enable	INFREQ	Input Frequency
CLK	Clock	INT	Interrupt
CLKIN	Clock Input	I/O	Input/Output
CLR	Clear	IPL	Interrupt Priority Level
CNTRL	Control	IRQACK	Interrupt Request Acknowledge
COMP	Comparator	KYBD	Keyboard
D	Data	KYBDSTRB	Keyboard Strobe
D/A	Digital-to-Analog	LCKIND	Lock Indication
DAC	D/A Converter	LDS	Lower Data Strobe
DAV	Digital Analyzing Voltmeter	LED	Light Emitting Diode
dB	Decibel	LINTCL	Lock Indicator Clear
DB(D)	Data Bus (Microprocessor)	MEMREQ	Memory Request
DFT	Discrete Fourier Transform	MSR/AC	Measure/Autocal Multiplexer
DIO	Data Input/Output (IEEE Bus)	MUX	Not Data Accepted
DIR	Direction	NDAC	Not Ready for Data
DIV	Divide	NRFD	Overload Detect (Enable)
DS	Data Strobe	OD	Output Enable
DSPLY	Display	OE	