

**GENERAL SUPPORT
MAINTENANCE MANUAL**

FOR

**TEST SET,
DIGITAL CARD TESTER
AN/USM-465A
PRINTED CIRCUIT BOARDS**

PANEL BOARD 0100-2701	(NSN 6625-01-131-1255)
DISPLAY BOARD 0100-2702	(NSN 6625-01-124-8854)
DRIVER/SENSOR BOARD 0100-2703	(NSN 6625-01-124-1553)
PIN PROCESSOR BOARD 0100-2704	(NSN 6625-01-124-1554)
PROCESSOR BOARD 0100-2705	(NSN 6625-01-133-6602)
REFERENCE BOARD 0100-2708	(NSN 6625-01-124-8853)
PRINTER DRIVER BOARD 0100-2723	(NSN 6625-01-124-8852)
PERIPHERAL BOARD 0100-2724	(NSN 6625-01-124-1555)
TAPE DRIVE INTERFACE BOARD 0100-2736	(NSN 6625-01-132-2657)
MEMORY BOARD 0100-3754	(NSN 6625-01-124-1556)
REFERENCE IEEE BOARD 2225-2703	

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**This copy is a reprint which includes
current pages from Change 1.**

HEADQUARTERS, DEPARTMENT OF THE ARMY

3 JUNE 1985



5

SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1

DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

2

IF POSSIBLE, TURN OFF THE ELECTRICAL POWER

3

IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL

4

SEND FOR HELP AS SOON AS POSSIBLE

5

AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING

For operator safety, the DCT must be earth grounded. The power cord contains a protective earth grounding connector that provides protection from electrical shock.

WARNING

Voltage is applied to UUT during go-no go testing and fault diagnostics. For operator safety, do not touch UUT during go-no go testing until directed to do so. Touch UUT only with guided probe or other test equipment during fault diagnostics.

Refer to FM 21-11 for First Aid Data.

WARNING**HIGH VOLTAGE**

is used in the operation of this equipment.

DEATH ON CONTACT

may result if personnel fail to observe safety precautions.

CAUTION

This equipment contains parts and assemblies sensitive to damage by **ELECTROSTATIC DISCHARGE (ESD)**. Use ESD precautionary procedures when touching, removing or inserting printed circuit boards.

General Handling Procedures for ESD Sensitive Items

- Use wrist ground straps or manual grounding procedures
- Keep ESD sensitive items in protective covering when not in use
- Ground all electrical tools and test equipment
- Periodically check continuity and resistance of grounding system
- Use only metallized solder suckers
- Handle ESD sensitive items only in protected areas

Manual Grounding Procedures

- Make certain equipment is powered down
- Touch ground prior to removing ESD sensitive items
- Touch package of replacement ESD sensitive item to ground before opening
- Touch ground prior to inserting replacement ESD sensitive items

ESD Protective Packaging and Labeling

- Intimate covering of antistatic material with an outer wrap of either:

Type 1 aluminized material or conductive plastic film

or

Hybrid laminated bags having an interior of antistatic material with an outer metallized layer

- Label with sensitive electronic symbol and caution note

CHANGE

No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 15 February 1988

**GENERAL SUPPORT MAINTENANCE MANUAL
AN/USM-465A TEST SET DIGITAL CARD TESTER
(NSN 6625-01-126-2473)**

TM 11-6625-3038-40, 3 June 1985, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page. Added or revised illustrations are indicated by a vertical bar adjacent to the identification number.

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None.....	FP-105C/(FP-106C blank)
None.....	FP-105D/(FP-106D blank)
None.....	FP-105E/(FP-106E blank)
None.....	FP-105F/(FP-106F blank)
None.....	FP-105G/(FP-106G blank)
None.....	FP-105H/(FP-106H blank)
None.....	FP-105I/(FP-106I blank)
None.....	FP-105J/(FP-106J blank)
None.....	FP-105K/(FP-106J blank)
None.....	FP-105L/(FP-106L blank)
None.....	FP-105M/(FP-106M blank)
None.....	FP-129/(FP-130 blank)

2. File this change sheet in the front of the publication for reference purposes.

Distribution authorized to the Department of Defense and DOD contractors only for official use or for administrative or operational purposes. This determination was made on 4 November 1987. Other requests for this document will be referred to Commander, US Army Communication-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-P, Fort Monmouth, NJ 07703-5000.

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DISTRIBUTION:

To be distributed in accordance with DA Form 12-36 literature requirements for AN/USM-465A.

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For**

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REFERENCE IEEE BOARD 2225-2703	
512K MEMORY BOARD 2235-2706	

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Equipment Publications and Blank Forms), or DA Form 2028-2 located at the back of this manual direct to: Commander, U.S. Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, New Jersey 07703-5000. A reply will be furnished to you.

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
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HOW TO USE THIS MANUAL

- This manual covers testing procedures for printed circuit boards within the AN/USM-465A Digital Card Tester. Be sure this manual is the latest version. Refer to DA Pam 25-30.
- Paragraphs are numbered in order. Use the table of contents at the front of this manual to locate the paragraph that covers the printed circuit board (PCB) you are testing. Table 2-1 lists all test equipment and accessories needed to test each PCB.
- Use the list of abbreviations on page 1-2. It will help you understand the manual.
- Illustrations guide you through most procedures. Use the illustrations, but don't forget to read the text.
- In this manual, you will be given the instruction "Enter" followed by the outline of a key. This means that you should press and release that key. For example:



Enter  means: press and release the DELetion key.





Enter  means: press and release the EXECUTE key.




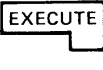




Enter  means press and release the C key.

- You will notice that some of the keys on your DCT have blue-printed commands on them. You will be instructed to use these commands as shown in the following example:

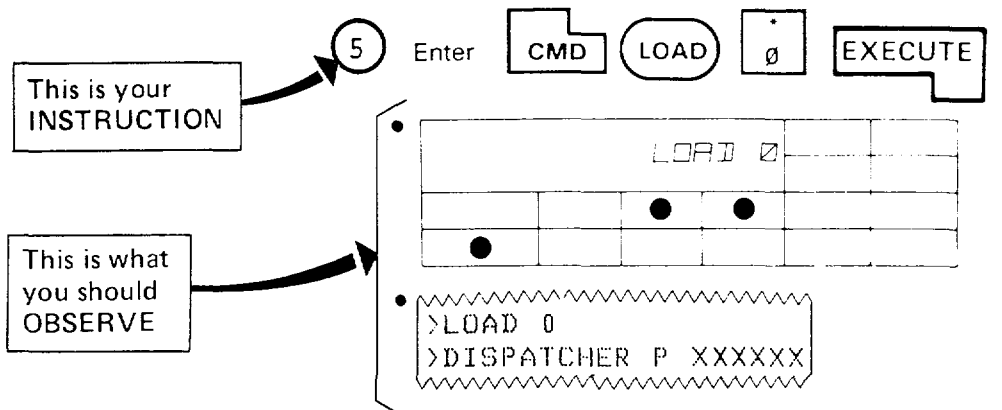
Enter   

When you see an instruction like the one above, use the  and  keys as follows:

Hold down the CMD key and press the  key (the key that shows "REWIND" printed in blue). Then release the  and  keys. Enter 

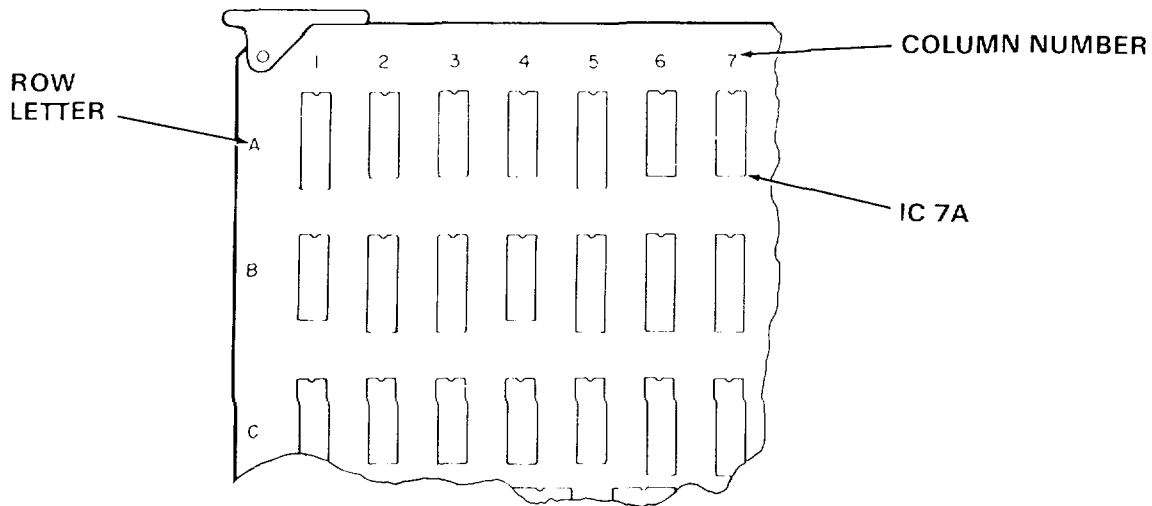
- When you see an instruction like "Enter     " enter  after releasing the  and  keys, before entering 

- In procedural steps in this manual, you are given instructions which are followed by heavy dots. The information following the heavy dots tells you what you should observe. For example:



- In the text, you will see instructions like: "see step (6) below" or "see paragraph 2-7, above". This does not always mean that the referenced item is directly above or below what you are reading. You may have to turn a page (or more) to locate the information you'll need.
- Printed circuit boards (PCBs) tested in this manual are identified by a part number of the form "XXXX-XXXX." Part numbers are printed on the component side of each board. A revision letter follows each part number to identify the board version. For example the panel board has the identification "0100-2701 -L" printed on its component side.
- The two ICD circuit card assemblies used in this manual are called ICD NO. 1 and ICD NO. 2 in the test procedures. This nomenclature is printed on the ICDs, just above the edge connector designations PA or PB. The procedures use an edge connector designation in conjunction with the ICD nomenclature to tell you which side of the specified board should be inserted in the DCT fold-down adapter (for example, "ICD NO. 1 SIDE PA").
- Adapter boards and cable sets are identified by the UUT for which they are used (for example, "ADAPTER FOR 0100-2702" or "CABLE SET FOR 0100-2705").
- All ICDs used in this manual carry a part number of the form "AXXXXXXX." These part numbers are printed on circuit card assemblies or on cable clamps. An extra digit may follow each part number to further identify the device. For example, the cable sets used with ICD NO. 2 are numbered A3038037-1 through A3038037-4.

- The test programs identify PCB components by reference designator or by assembly grid location. Grid locations consist of a column number and a row letter. For example, "7A" denotes the IC chip in column 7, row A.



- Number suffixes following IC chip locations denote pin numbers. For example, "7A.9" means pin 9 of chip 7A.
- Letter suffixes L, R, T, and B denote left, right, top, and bottom connections for components such as diodes, resistors, and capacitors. For example, "R28.L" means the connection at the left end of resistor R28.
- Suffixes L, M, and R denote left, middle, and right connections for transistors that are positioned horizontally. Suffixes T, M, and B denote top, middle, and bottom connections for transistors that are positioned vertically.

CHAPTER 1

INTRODUCTION

1-1. SCOPE.

This manual contains general support maintenance instructions to test and repair the printed circuit boards (PCBs) contained in the AN/USM-465A Digital Card Tester. An operational AN/USM-465A Digital Card Tester is used to test the PCBs from other AN/USM-465A Digital Card Testers.

1-2. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS.

Refer to the latest issue of DA Pam 25-30 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS.

a. **Reports of Maintenance and Unsatisfactory Equipment.** Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750 as contained in Maintenance Management Update.

b. **Report of Packaging and Handling Deficiencies.** Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73B/AFR 400-54/MCO 4430.3H.

c. **Discrepancy in Shipment Report (DISREP) (SF 361).** Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Destruction of Army electronics materiel to prevent enemy use is described in TM 750-244-2

1-5. PREPARATION FOR STORAGE OR SHIPMENT.

Preparation for storage or shipment is described in TB 43-0127

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs).

If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about the design. Put in on an SF 368 (Quality Deficiency Report). Mail it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-PA-MA-D, Fort Monmouth, New Jersey 07703-5000. We'll send you a reply.

1-7. NOMENCLATURE CROSS-REFERENCE LIST.

<u>Official Nomenclature</u>	<u>Common Name</u>
Adapter Fold-Down, P/N 2225-9520	Fold-Down Adapter
Cartridge Tape Drive, P/N 0100-3010	Adapter Tape Drive
Ckt Cd Assy, J-4223/USM-465A, P/N A3038070	ICD NO. 2
Ckt Cd Assy, J-4224/USM-465A, P/N A3038069	ICD NO. 1
Ckt Cd Assy, P/N 0100-2701	Panel Board
Ckt Cd Assy, P/N 0100-2702	Display Board
Ckt Cd Assy, P/N 0100-2703	Driver/Sensor Board
Ckt Cd Assy, P/N 0100-2704	High Speed Processor Board
	Pin Processor Board
Ckt Cd Assy, P/N 0100-2705	System Processor Board
	Processor Board
Ckt Cd Assy, P/N 0100-2708	Reference Board
Ckt Cd Assy, P/N 0100-2723	Printer Driver Board
	Printer Drive Board
Ckt Cd Assy, P/N 0100-2724	Peripheral Board
Ckt Cd Assy, P/N 0100-2736	Tape Drive Interface Board
Ckt Cd Assy, P/N 0100-3754	96K Memory Board
Ckt Cd Assy, P/N 2225-2703	Reference IEEE Board
Ckt Cd Assy, P/N 2235-2706	512K Memory Board
Digital Card Tester AN/USM-465A	DCT 2225/A
Digital Multimeter, AN/PSM-45	Digital Multimeter
PSP Monitor Tape, P/N 2225-0086	System Software Tape
Test Probe 10006D	Guided Probe
Thermal Printer Assembly, P/N 2225-0407	Printer
Tool, Pot Adjusting, GC8608, P/N A3043546	Potentiometer Adjustment Tool
Tool, UUT Ejector P/N A3043545	Pry Bar
Tool, 16 Pin IC Puller, P/N A3043547	16-Pin IC Chip Puller
Tool, 40 Pin IC Puller, P/N A3043548	40-Pin IC Chip Puller

1-8. LIST OF ABBREVIATIONS.

ASSY	Assembly
CCA	Circuit Card Assembly
CD	Card
CKT	Circuit
DCT	Digital Card Tester
DMM	Digital Multimeter
D/S	Driver/Sensor
ESD	Electrostatic Discharge
HSP	High Speed Processor
IC	Integrated Circuit
ICD	Interface Connecting Device
PCB	Printed Circuit Board
PMCS	Preventive Maintenance Checks and Services
TPS	Test Program Set
UUT	Unit Under Test

CHAPTER 2

MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

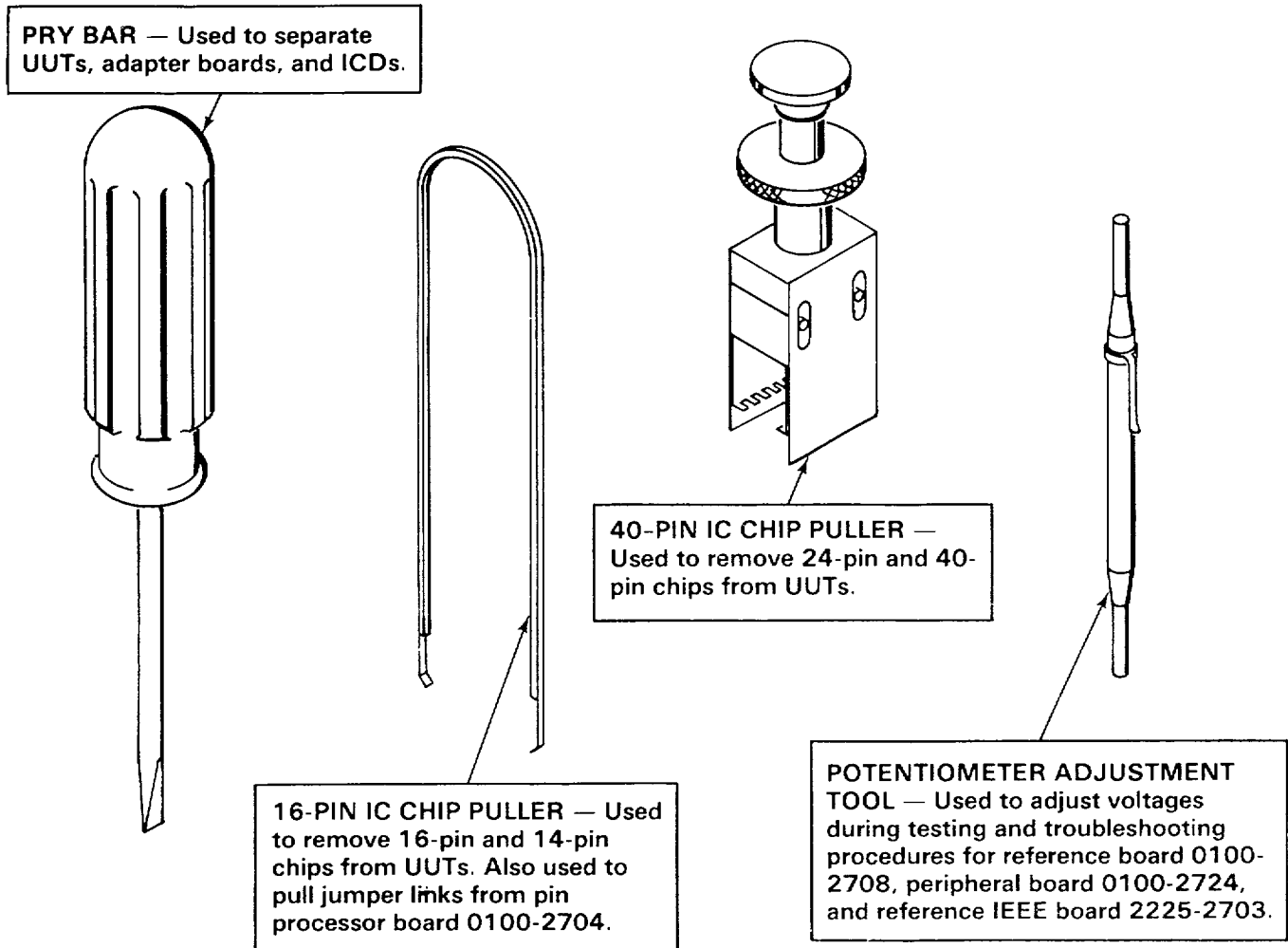
2-1. COMMON TOOLS AND EQUIPMENT.

For common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

2-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

Refer to the Repair Parts and Special Tools List (TM 11-6625-3038-24P) and the Maintenance Allocation Chart (MAC) (Appendix B, TM 11-6625-3038-20).

Tool Kit A3038085 contains several special tools used to perform the procedures in this manual. These tools are illustrated below. Use of each tool is described where applicable.



2-3. REPAIR PARTS.

Repair Parts are listed and illustrated in the Repair Parts and Special Tools List (TM 11-6625-3038-24P) covering organizational, direct, and general support maintenance for the DCT.

Section II. SERVICE UPON RECEIPT

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF 364 (Report of Discrepancy (ROD)).

Check the equipment against the packing slip to see if the equipment is complete. Check for proper test program set (ICDs, test program tapes, and TM 11-6625-3038-40). Report all discrepancies in accordance with the instructions of DA PAM 738-750.

Check to see if the equipment has been modified. Ensure that your maintenance manuals (refer to DA PAM 310-1) and test program sets (refer to TB 43-0128, CECOM Test Program Set (TPS) Index) are the latest issue.

Section III. CARD TESTING AND TROUBLESHOOTING

2-4. INTRODUCTION.

This section contains information required to test and troubleshoot printed circuit boards for the AN/USM-465A. During testing, each printed circuit board is referred to as the unit under test (UUT). Testing and troubleshooting paragraphs for the boards are arranged in part number order.

Each paragraph contains at least four sections as described below. Use of any additional sections is described where necessary in the procedures.

- a. MAIN TEST PROCEDURE guides maintenance personnel through basic testing and fault diagnosis.
- b. TEST PROGRAM OPTIONS describes utility programs that can be run as needed. Some of these procedures must be run with the main test procedure.
- c. FAULT DIAGNOSTICS helps verify, correct, or further isolate certain faults detected during the main test procedure. This section may also provide alternate procedures if board failures still occur after diagnosed faults have been repaired.
- d. SUPPLEMENTARY DATA provides pin cross-reference lists and other aids for use during probing and fault diagnosis. Use of the pin cross-reference list is described at the front of each SUPPLEMENTARY DATA section.

2-5. EQUIPMENT REQUIRED.

The following table lists the equipment and accessories needed to test each PCB. Refer to TB 43-0128, CECOM Test Program Set (TPS) Index, to be sure that all equipment and accessories are the latest issue.

2-5. EQUIPMENT REQUIRED (CONTINUED).

Table 2-1. Test Equipment and Accessories

UUT PART NO.	ICD NOMEN- CLATURE (PART NO.)	ICD EDGE CONNECTOR	ADAPTER BOARD NOMEN- CLATURE (PART NO.)	TAPE PART NO.	CABLE SET(S) NOMEN- CLATURE (PART NO.)	OTHER
0100-2701-L	ICD NO. 2 (A3038070)	PA	ADAPTER FOR 0100-2701 (A3038039)	A3038074	CABLE SET #1 FOR 0100-2701 CABLE SET #2 FOR 0100-2701 (A3038037-1)	NONE
0100-2702-K	ICD NO. 2 (A3038070)	PB	ADAPTER FOR 0100-2702 (A3038040)	A3038074	CABLE SET FOR 0100-2702 (A3038037-3)	NONE
0200-2703-G	ICD NO. 1 (A3038069)	PB	NONE	A3038073	NONE	NONE
0100-2704-K	ICD NO. 2 (A3038070)	PB	NONE	A3038074	CABLE SET FOR 0100-2704 (A3038037-4)	NONE
0100-2705-K	ICD NO. 1 (A3038069)	PA	NONE	A3038073	CABLE SET FOR 0100-2705 (A3038036-1)	NONE
0100-2708-H	ICD NO. 1 (A3038069)	PA	NONE	A3038073	NONE	AN/PSM-45
0100-2723-D	ICD NO. 1 (A3038069)	PA	ADAPTER FOR 0100-2723 (A3038041)	A3038073	CABLE SET FOR 0100-2723 (A3038036-2)	AN/PSM-45
0100-2724-K	ICD NO. 2 (A3038070)	PA	NONE	A3038074	CABLE SET FOR 0100-2724 (A3038037-2)	NONE
0100-2736-C	ICD NO. 1 (A3038069)	PB	ADAPTER FOR 0100-2736 (A3038042)	A3038073	CABLE SET FOR 0100-2736 (A3038036-5)	NONE

2-5. EQUIPMENT REQUIRED (CONTINUED).*Table 2-1. Test Equipment and Accessories (Continued)*

UUT PART NO.	ICD NOMEN- CLATURE (PART NO.)	ICD EDGE CONNECTOR	ADAPTER BOARD NOMEN- CLATURE (PART NO.)	TAPE PART NO.	CABLE SET(S) NOMEN- CLATURE (PART NO.)	OTHER
0100-3754-A	ICD NO. 1 (A3038069)	PA	NONE	A3038073	CABLE SET FOR 0100-3754 (A3038036-3)	NONE
2225-2703-B	ICD NO. 1 (A3038069)	PA	NONE	A3038073	CABLE SET FOR 2225-2703 (A3038036-4)	AN/PSM-45
2235-2706-C	ICD NO. 2 (A3038070)	PA	NONE	A3038074	CABLE SET FOR 2235-2706 (A3038037-5)	AN/PSM-45

NOTE

A revision letter follows the part number printed on each UUT. If your UUT shows revision letter(s) other than that shown in Table 2-1, the test program may not run properly. PRETEST NOTES at the beginning of each test procedure identify test programs that apply to more than one board revision.

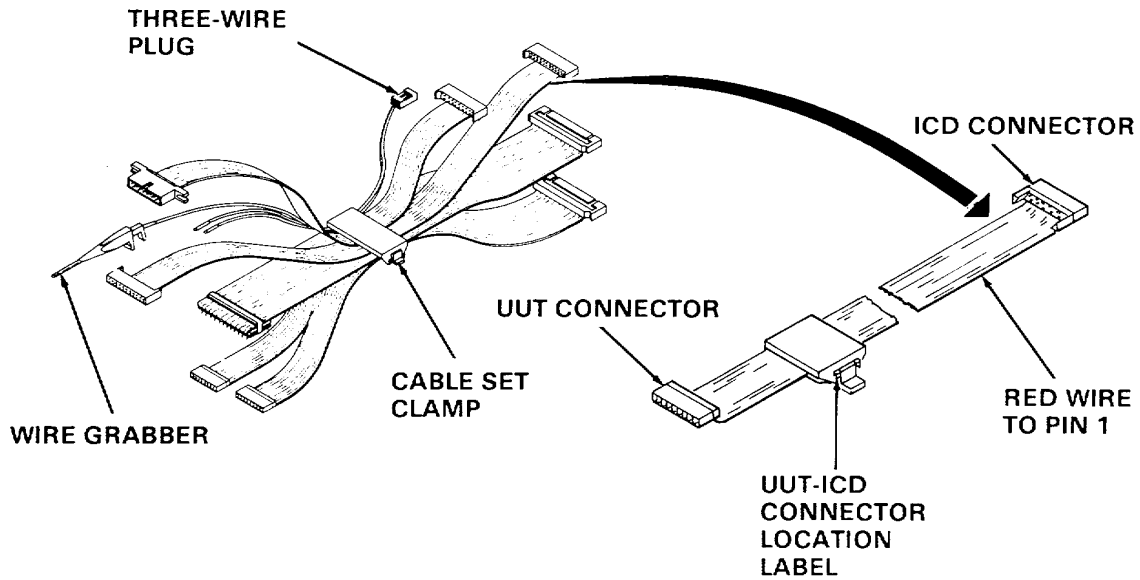
2-6. USE OF CABLE SETS.

The following guidelines apply whenever you are instructed to attach cable sets to UUTs, ICDs, or adapter boards.

- A label on the clamp of each cable set identifies the UUT for which the set is used. For example, the cable set used to test display board 0100-2702 carries the words "CABLE SET FOR 0100-2702" on the clamp label.
- The UUT end of each ribbon cable within the cable set is marked according to UUT and ICD locations. Pin 1 on each cable is identified by a red wire along one edge.
- When connecting cables to the UUT, ensure that the red wire on each cable leads to pin 1 of the appropriate IC chip, IC socket, or test point connector.
- When connecting cables to ICDs, ensure that the red wire on each cable leads to pin 1 of the appropriate connector on the ICD. A triangle near each connector indicates pin 1.
- When using J11 or J21 on ICD NO. 2 or J5 on ICD NO. 1, place the empty connector slot of the three-wire (red, orange, brown) plug at pin 4.

2-6. USE OF CABLE SETS (CONTINUED).

- Double check your cable set connections before running the TPS. Ensure that the cable clips, wire grabbers and mating connectors are correct positioned and securely installed.
- The cable sets are clamped to facilitate easy connection to boards and components Do not remove identifying clamps or disassemble the cable set.



2-7. SOFTWARE LOADING PROCEDURE.

Perform the following steps only when instructed to do so during the testing and troubleshooting procedures for your UUT.

NOTE

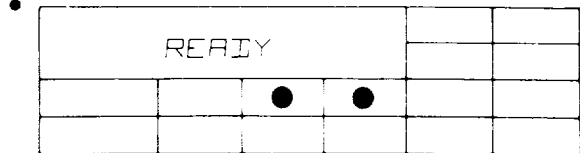
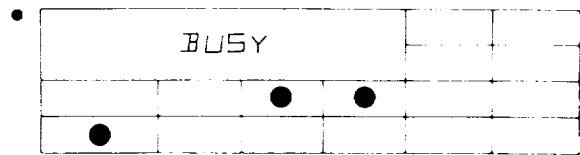
All TPS's contained in this TM are for use only with the 3.0 system software.

- (1) Place DCT in operation and load system software in accordance with TM 11-6625-3038-10.

CAUTION

Use the correct TPS tape cartridge for the UUT. Otherwise, the UUT may be damaged.

- (2) Install TPS tape cartridge A3038074 or A3038073 in tape drive. Refer to Table 2-1, above, to identify the correct tape cartridge for your particular UUT.



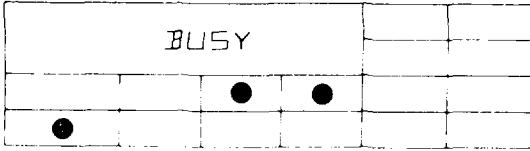
2-7. SOFTWARE LOADING PROCEDURE (CONTINUED).

(4) Enter



```

>10 0100-3754 REV A
>11 2225-2703 REV B
>12 2235-2706 REV B
>
>*****
>#####
    
```

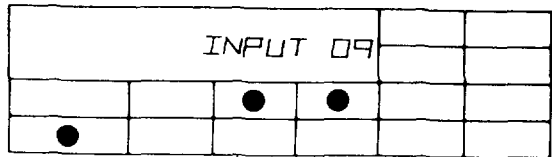


```

>RUN
>
>#####
>*****
>
>  ATTENTION!!!
>
>BEFORE PROCEEDING,
>MAKE SURE THAT YOU
>HAVE THE SHUNTS SET,
>THE ADAPTOR AND THE
>UNIT UNDER TEST
>INSTALLED ACCORDING:
>
>TM 11-6625-3038-40
>GR 2225-0141-PM4
>
>  *****
>
>TO LOAD AND RUN THE
>PROGRAM, ENTER THE
>OPTION NUMBER OF THE
>UNIT UNDER TEST AND
>PRESS EXECUTE. THE
>FOLLOWING IS THE
>LIST OF OPTIONS !
>
>  *****
>
>  OPTION LIST
>
>1  0100-2701 REV L
>2  0100-2702 REV K
>3  0100-2703 REV G
>4  0100-2704 REV K
>5  0100-2705 REV K
>6  0100-2708 REV H
>7  0100-2723-REV D
>8  0100-2724 REV K
>9  0100-2736 REV C
    
```

NOTE

This procedure is detailed in the testing and troubleshooting paragraph for your particular UUT.



NOTE

The testing and troubleshooting procedure for your UUT instructs you to enter a specific option number when this display appears. If you enter the wrong option number, enter **DEL** until the display clears. Then enter the correct option number.

2-8. PANEL BOARD 0100-2701.

a. MAIN TEST PROCEDURE

CAUTION

This equipment contains parts sensitive to damage by ELECTROSTATIC DISCHARGE (ESD). Use ESD precautionary procedures when touching removing or inserting parts or assemblies Review DOD-HDBK-263 for proper handling instructions.

PRETEST NOTES

- Before proceeding, ensure that you have the correct part numbers on the ICD, TPS tape cartridge, cable sets, and adapter board for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- Ensure that the ICD, cable sets, and adapter board have been tested in accordance with TM 11-6625-3097-24 if they are being used for the first time today.
- Proceed to step (3) if all applicable.

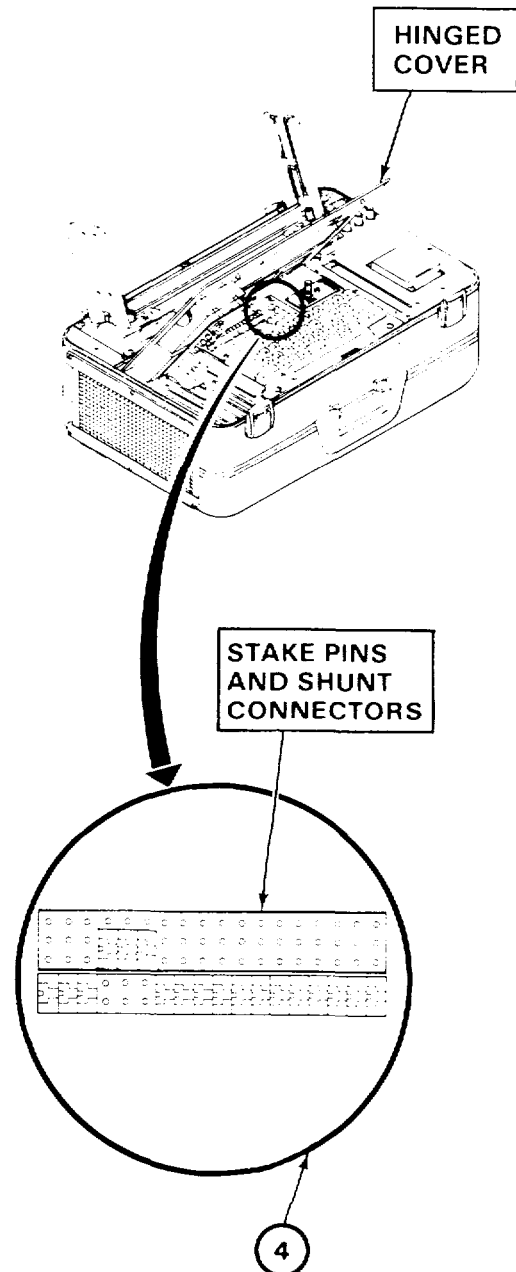
PMCS have already been performed on the DCT.

- (1) Prepare the DCT for use and Perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.

WARNING

Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.



2-8. PANEL BOARD 0100-2701 (CONTINUED).

- (5) Using 16-pin IC chip puller, remove IC chip 6B from panel board 0100-2701 (see Figure 2-1). Store chip in safe place on antistatic foam.
- (6) Ensure that DIP switches S5 through S8 at UUT location 7D are set to the OPEN (OFF) position. See Figure 2-1.

NOTE

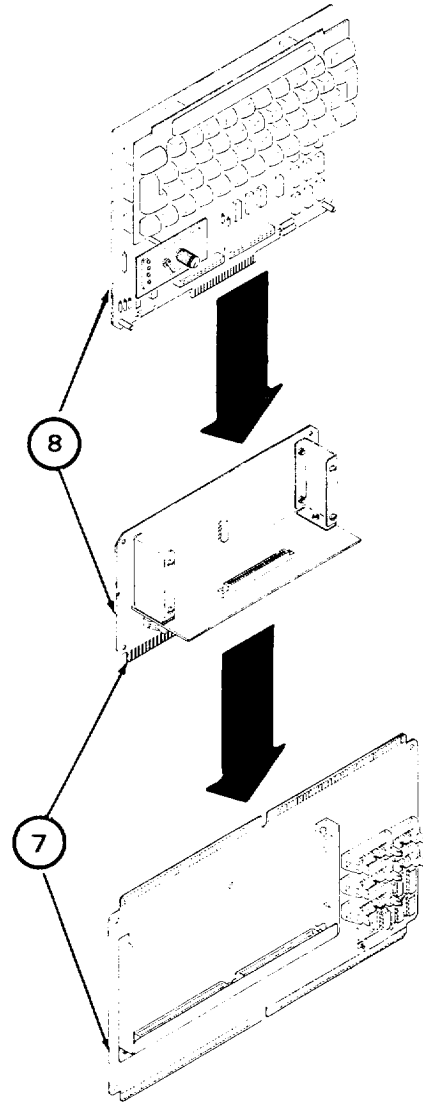
Ensure that adapter board seats firmly in the ICD during step (7). If board is firmly seated, the visible length of the board connector pins should be no more than 1/8 inch.

- (7) Install adapter board onto ICD NO. 2 SIDE PA (P/N A3038070).

NOTE

Ensure that UUT seats firmly in adapter board during step (8).

- (8) Install UUT onto ADAPTER FOR 0100-2701 (P/N A3038039).



2-8. PANEL BOARD 0100-2701 (CONTINUED).

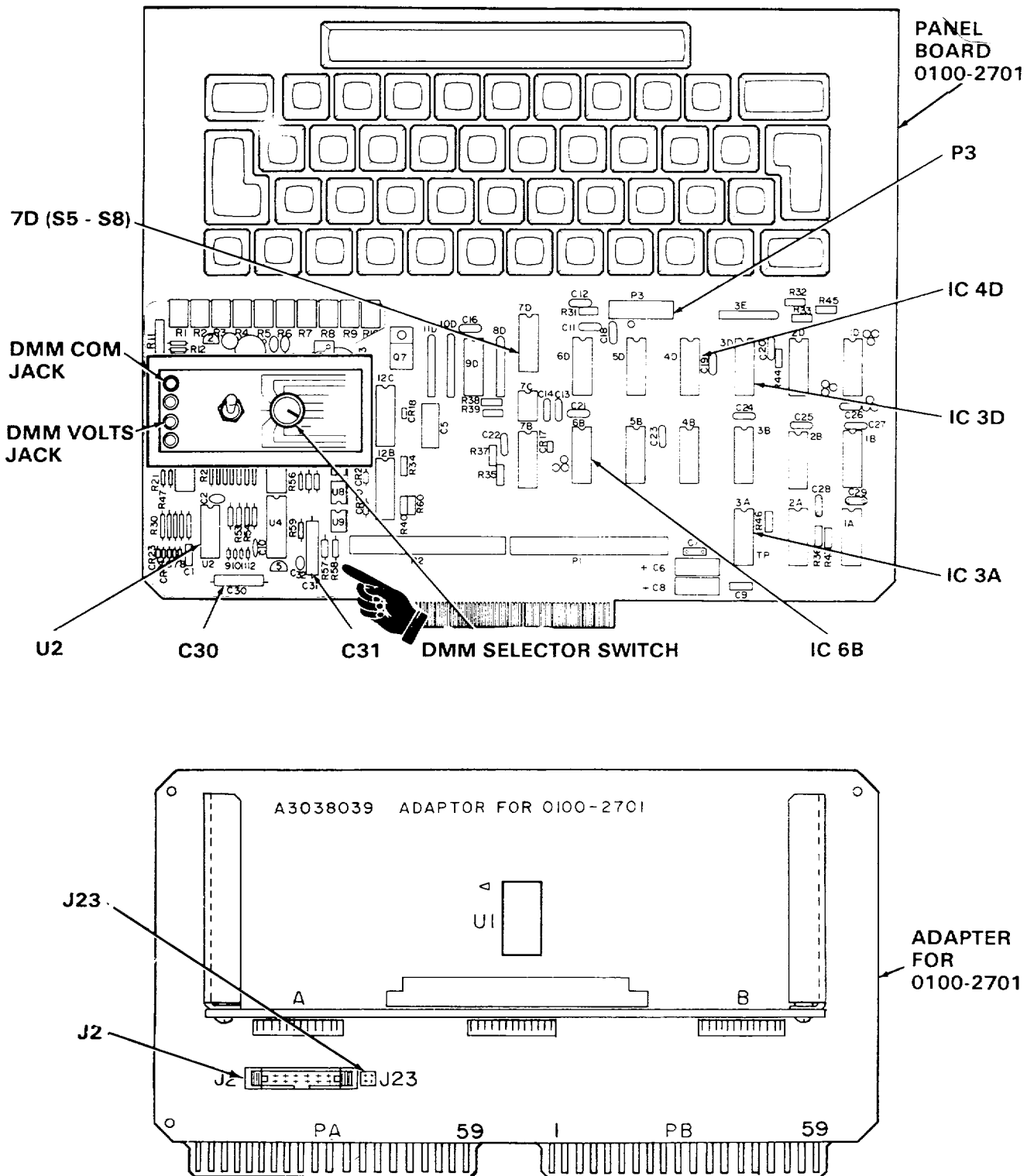


Figure 2-1. Cable Connection Points and Components Used During Panel Board Test (Sheet 1 of 2)

2-8. PANEL BOARD 0100-2701 (CONTINUED).

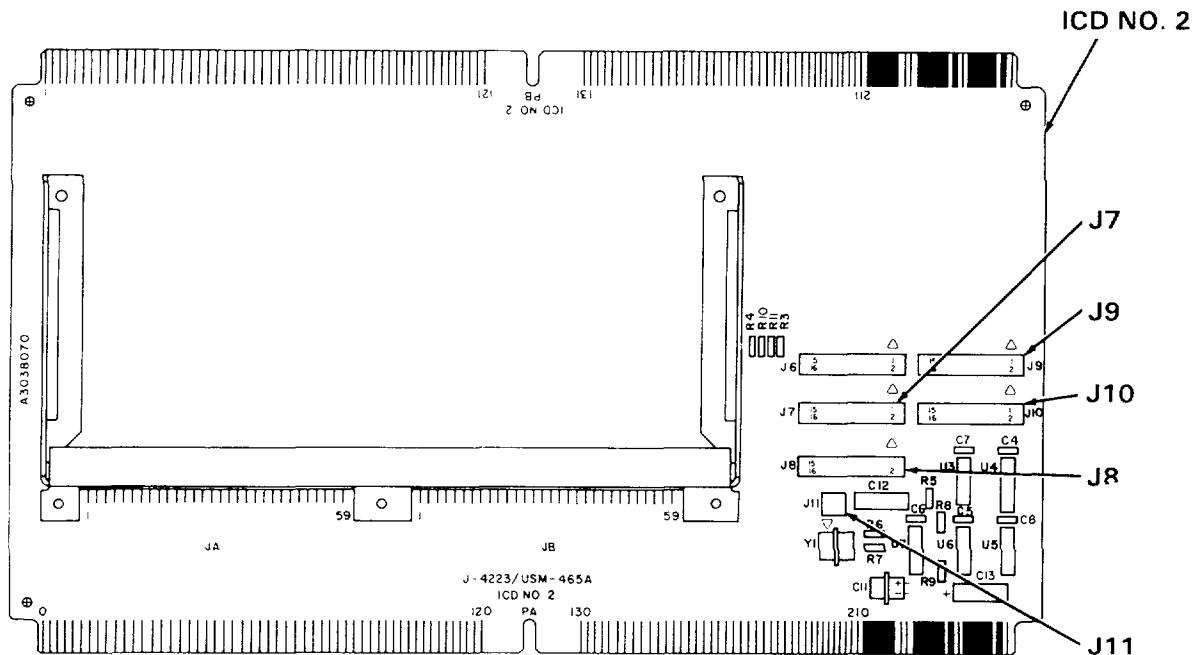


Figure 2-1. Cable Connection Points and Components Used During Panel Board Test (Sheet 2 of 2)

NOTE

Refer to paragraph 2-6, **USE OF CABLE SETS** (page 2-4) before performing test cable hookup.

(9) Connect CABLE SET #1 FOR 0100-2701 and CABLE SET #2 FOR 0100-2701 (P/N A3038037) to the UUT, ICD, and adapter board according to destination markings on clamp attached to each cable (see Figure 2-1). Perform the following steps using the designated cable or wire:

- a. Connect IC 4D (UUT) m J10 (ICD).
- b. Connect IC 3A (UUT) to J9 (ICD).
- c. Connect IC 6B (UUT) to J8 (ICD).
- d. Connect P3 (UUT) to J7 (ICD).
- e. Place three-wire plug on J11 (ICD).
- f. Place red wire grabber on C30, right lead (UUT).
- g. Place brown wire grabber on C31, top lead (UUT).
- h. Connect U2 (UUT) to J2 (adapter board).
- i. Place three-wire plug on J23 (adapter board).

- j. Place brown wire grabber at solder junction beneath DMM VOLTS jack (UUT). Ensure metal-to-metal contact.
- k. Place red wire grabber at solder junction beneath DMM COM jack (UUT). Ensure metal-to-metal contact.

(10) Install ICD, UUT, and adapter board into DCT fold-down adapter as a unit.

(11) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5).

Then return to step (12), below.

(12) Enter

!
1

 EXECUTE . Follow instructions

on paper tape until the following appear:

2-8. PANEL BOARD 0100-2701 (CONTINUED).

WARNING

(12) (Continued)

```

>1
>*****
>** 0100-2701 **
>** REV L **
>*****
>
>
>*****
>FOUR TASKS
>*****
>

```

```

>
>*****
>
>IF PART NUMBERS
>OR SHUNTS ARE
>NOT RIGHT.
>
>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
>
>*****
>
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
>

```

			INPUT MI		
●		●	●	●	

Voltage is applied to UUT during step (13), below. Do not touch UUT until "READY" appears on the display panel.

NOTE

If the test program does not behave as shown in steps (13) and (14), go to step (21).

(13) Enter **EXECUTE** . The test program runs automatically.

```

>T2701P1.PSR XXXXXX
>*** PERFORMANCE ***
>***** TESTS *****
>
>
>MOVE CHIP CLIP FROM
IC 4D TO IC 3D. AND
PRESS EXECUTE

```

NOTES ON TEST SETUP

- The test program will generate a message on the paper tape during step (13) if boards are not installed correctly. Perform steps (5) through (10) again, then test the UUT per step (20), below.
- If cables are not installed correctly, the test program will run and a NO GO message will appear on the paper tape (see step (21), below). Check cable connections per step (9) above, then test the UUT per step (20) below.

2-8. PANEL BOARD 0100-2701 (CONTINUED).

NOTES ON TEST PROGRAM STRUCTURE

- Although the test program runs automatically, certain segments of the test require operator action in accordance with the paper tape printout. Perform these actions when instructed to do so.
- You, the operator, will be instructed to move the cable connector clip from IC 4D to IC 3D on the UUT. See Figure 2-1 for IC chip locations
- The DMM (digital multimeter) rotary switch test program will instruct you to turn the DMM rotary switch on the UUT to each range setting, beginning at the 200 mV setting.
- You will be instructed to set DIP switches S5 through S8 at UUT location 7D to the open (OFF) and closed (ON) positions. Switches S1 through S4 at 7D are not used or tested.

(14) Follow instructions on paper tape. The UUT passes if the following display and printout appear:

READY				●	
			●		
		●		●	

```

>*** ALL TESTS GO ***
>
>*****
>
>REMOVE UUT AND
INSTALL NEXT UUT TO
BE TESTED AND
PERFORM UUT SETUP
PROCEDURE IN
TM11-6625-3038-40 OR
GR2225-141-PM4
>
>*****
>END LINE 32767
    
```

(15) Disconnect cable set only from the panel board if next UUT is identical. Otherwise, disconnect cable set from UUT, adapter board, and ICD.

CAUTION

Use extreme caution when removing boards from ICD. Otherwise boards or ICD may be damaged.

(16) Remove boards from DCT as follows:

- Remove ICD, adapter board, and panel board from DCT as a unit.
- Separate panel board from adapter board.
- Using pry bar, carefully remove adapter board from ICD if next UUT is different or if DCT is being shut down.

(17) Reinstall IC chip 6B onto UUT.

(18) Ensure that DIP switches S5 through S8 at UUT location 7D are in the OPEN (OFF) position.

NOTE

To shut down the DCT, refer to TM 11-6625-3038-10. To test another, identical UUT, proceed as follows.

(19) Perform steps (5) through (10) for next UUT (panel board) to be tested.

(20) Enter   

Perform test again, starting with step (14).

(21) Enter header information in accordance with TM 11-6625-3038-10 if the following display and printout (typical) appear.

					●
●	●	●	●		
●					

2-8. PANEL BOARD 0100-2701 (CONTINUED).

(21) (Continued).

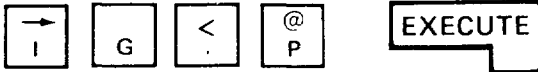
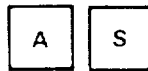
```

>***** NO GO *****
>T2701I2.IMG XXXXXX
>FAULT AT LINE 10250
I
> PIN PB.30
>173744 PB.30
>TYPE HEADER INFO
    
```

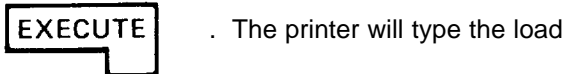
(22) If applicable, follow probing instructions on paper tape to isolate faulty component(s). Probe will continue until the probable fault is listed on the printer. A load list may also be printed.

NOTES ON FAULT DIAGNOSTICS

If a load list is not printed, enter



Then enter the probable fault location and



list for that node. Enter



to leave ASIG, P mode.

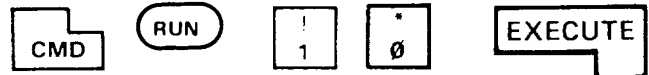
(refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTAL DATA, below) and probe the affected input/output node rather than the edge pin.


- Follow probing instructions on printout in accordance with TM 11-6625-3038-10.
- Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform steps (15) through (18), above. Forward UUT to repair station with paper tape.
- For more information, refer to FAULT DIAGNOSTICS, below.

If you are instructed to probe at edge connector pins, you may consult the board schematic diagram

b. TEST PROGRAM OPTIONS.

To rerun a specific part of the test program, enter



Enter  for list and select desired option.

- Options 3 through 13 are the individual test modules contained in the main test program.
- Options 14 through 24 are not applicable to the AN/USM-465A.

2-8. PANEL BOARD 0100-2701 (CONTINUED).

- Enter      to reset all variables and run a complete test.

c. FAULT DIAGNOSTICS.

- IC chip 6B is not tested during program execution. If the board fails in the system yet passes the test, IC chip 6B may be faulty. Replace 6B if the failure symptoms do not include DMM failure in the ohms range.
- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - Clean the ICD, UUT, and fold-down adapter pins with 99 percent isopropyl alcohol.
 - Test the ICD in accordance with TM 11-6625-3097-24
- If the UUT fails in the system after replacement of a bistable component (flip-flop or counter), the fault may be in the load of the component. Refer to the schematic diagrams in APPENDIX B and check the load on both outputs of the component.

d. SUPPLEMENTARY DATA.

Table 2-2 shows the relationship between the driver/sensor pins and component nodes or edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructs you to probe any pin or node that is inaccessible

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD (see Figure 2-1).

UUT edge pins listed in the BOARD CONNECTION column are represented as "A##" or "B##". "A##" pins can be probed at side "PA" of the adapter board. "B##" pins can be probed at side "PB" of the adapter board. See Figure 2-1. Locate pins according to the reference numbers printed on the adapter board.

Component nodes listed in the BOARD CONNECTION column are represented with the standard component identifiers and pin specifications (for example, "U2.3" or "6B.15"). Use Figure 2-1 as necessary to locate probing points on the UUT.

2-8. PANEL BOARD 0100-2701 (CONTINUED).

Table 2-2. Panel Board Pin Cross-Reference List

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0	A48	71	4D.2	141	P3.5	163	6B.15
2	A37	72	4D.15	143	P3.7	164	6B.3
4	A34	73	4D.1	145	P3.9	165	6B.14
6	A33	74	4D.16	147	P3.11	166	6B.4
8	A32	92	A16	148	P3.14	167	6B.13
10	A31	93	B16	151	P3.15	168	6B.5
12	A30	111	4D.8	152	4D.6	169	6B.12
14	A29	114	B4	153	3A.7	170	6B.6
16	A25	116	B12	154	4D.9	171	6B.11
27	U2.3	120	B25	155	4D.14	172	6B.7
31	U2.14	122	B27	156	4D.10	173	5B.10
32	U2.1	124	B29	157	4D.13	174	6B.8
33	VOLTS	126	B31	158	4D.11	175	6B.9
45	U2.7	128	B33	159	4D.12	177	C30.R
64	4D.7	130	B35	160	6B.1	179	C31.T
67	4D.5	132	B37	161	6B.16	181	3A.4
69	4D.4	137	P3.1	162	6B.2	191	3A.11
70	4D.3						

2-9. DISPLAY BOARD 0100-2702.

a. MAIN TEST PROCEDURE.

CAUTION

This equipment contains parts sensitive to damage by ELECTROSTATIC DISCHARGE (ESD). Use ESD precautionary procedures when touching, removing or inserting parts or assemblies. Review DOD-HDBK-263 for proper handling instructions.

PRETEST NOTES

- Before proceeding, ensure that you have the correct part numbers on the ICD, TPS tape cartridge cable set, and adapter board for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- A UUT containing a National Semiconductor DM74123N IC at location 10B will fail the read/write test with a fault indication at 10B.4. Before testing, verify chip manufacturer. If your UUT contains a National Semiconductor chip at 10B, replace it with a Texas Instruments SN74123N to allow complete UUT testing. Both IC types will, however, work in the system.
- Ensure that the ICD, cable set, and adapter board have been tested in accordance with TM 11-6625-3097-24 if they are being used for the first time today.
- Proceed to step (3) if all applicable PMCS have already been performed on the DCT.

2-9. DISPLAY BOARD 0100-2702 (CONTINUED).

- (1) Prepare the DCT for use and perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.

WARNING

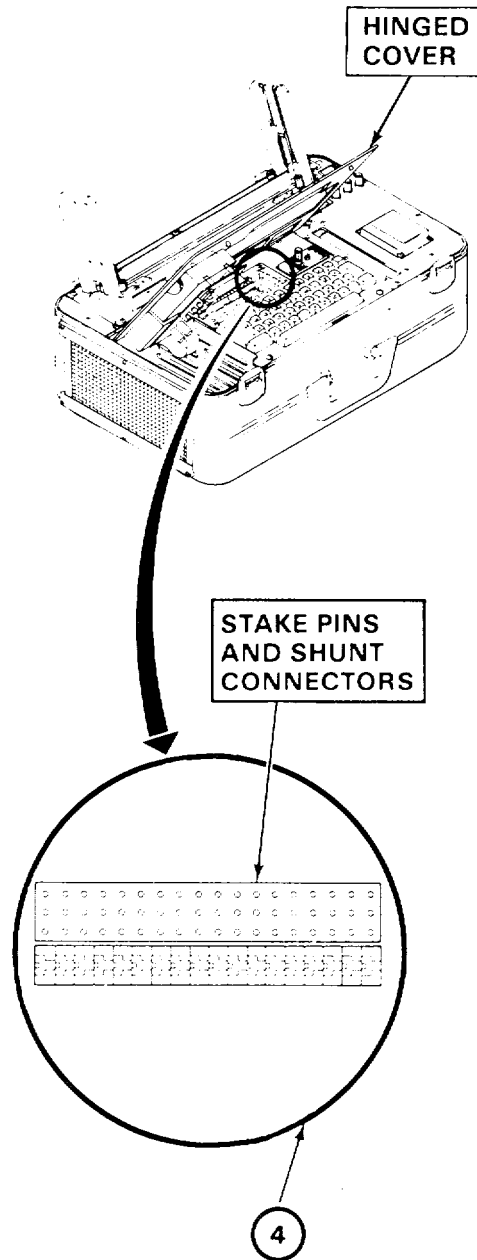
Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.

NOTE

Ensure that UUT seats firmly in adapter board during step (5).

- (5) Install display board 0100-2702 onto ADAPTER FOR 0100-2702 (P/N A3038040). Connector pins on solder side of the UUT mate with connectors P1, P2, and P3 on adapter board.



2-9. DISPLAY BOARD 0100-2702 (CONTINUED).

NOTE

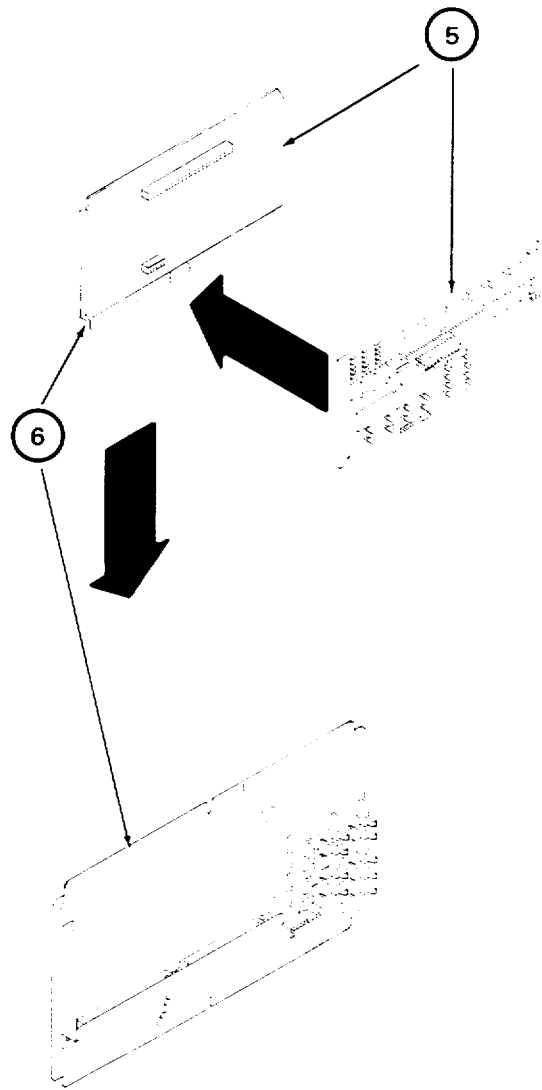
Ensure that adapter board seats firmly in the ICD during step (6). If board is firmly seated, visible length of the board connector pins should be no more than 1/8 inch.

- (6) Install adapter board into ICD NO. 2 SIDE PB (P/N A3038070).

NOTE

Refer to paragraph 2-6. **USE OF CABLE SETS** (page 2-4) before performing test cable hookup.

- (7) Connect CABLE SET FOR 0100-2702 (P/N A3038037-3) to the UUT and ICD according to destination markings on clamp attached to each cable (see Figure 2-2). Perform the following steps using the designated cable or wire:
- a. Connect TP connector (UUT) to J16 (ICD). Place red wire at TP1.
 - b. Connect IC 7A (UUT) to J17 (ICD).
 - c. Place three-wire plug on J21 (ICD).
 - d. Place red wire grabber on IC 10B, pin 4 (UUT).
 - e. Place orange wire grabber on R38, right lead (UUT).
 - f. Place brown wire grabber on R31 bottom lead (UUT).



2-9. DISPLAY BOARD 0100-2702 (CONTINUED).

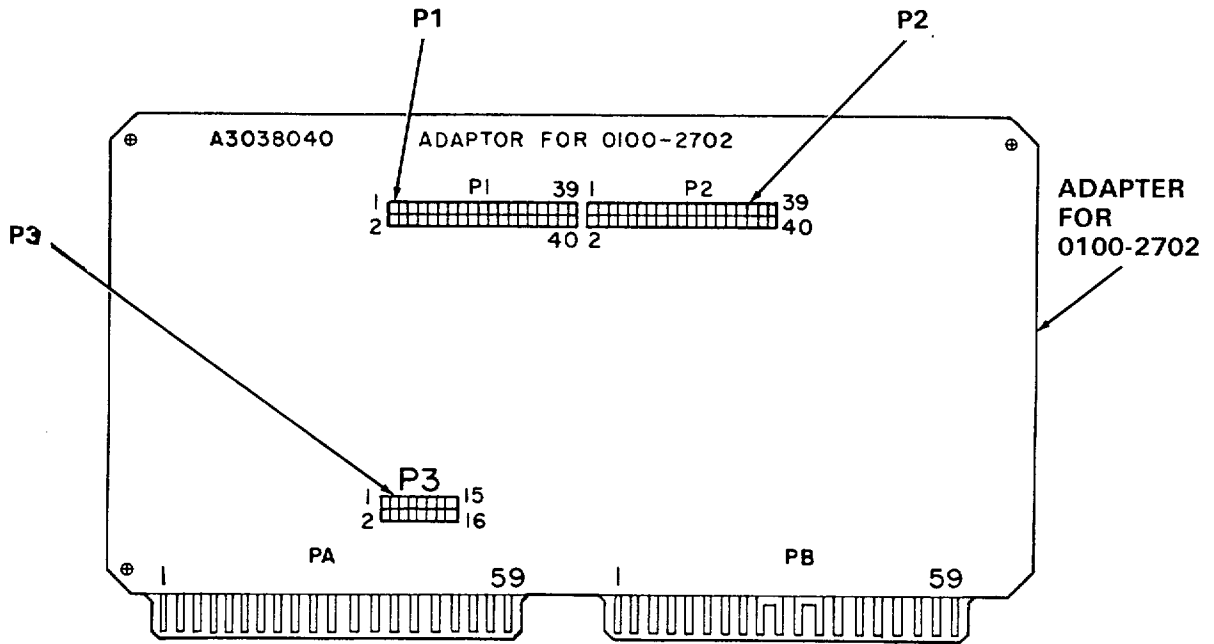
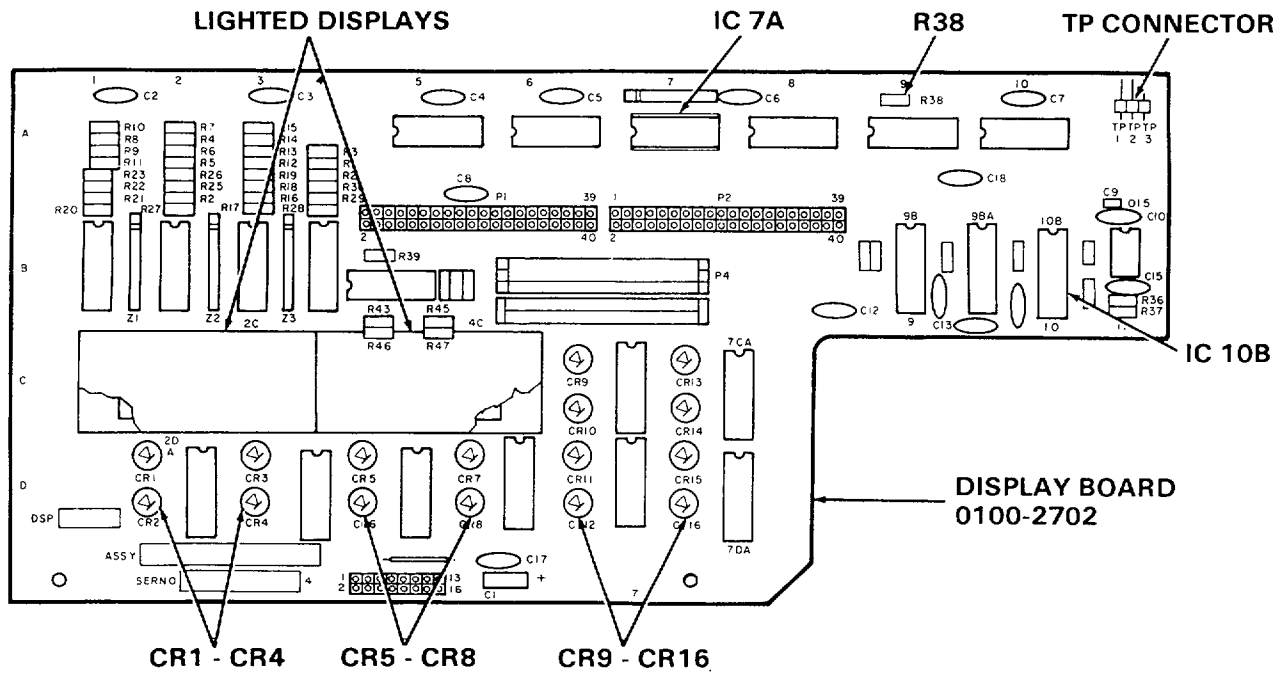


Figure 2-2. Cable Connection Points and Components Used During Display Board Test (Sheet 1 of 2)

2-9. DISPLAY BOARD 0100-2702 (CONTINUED).

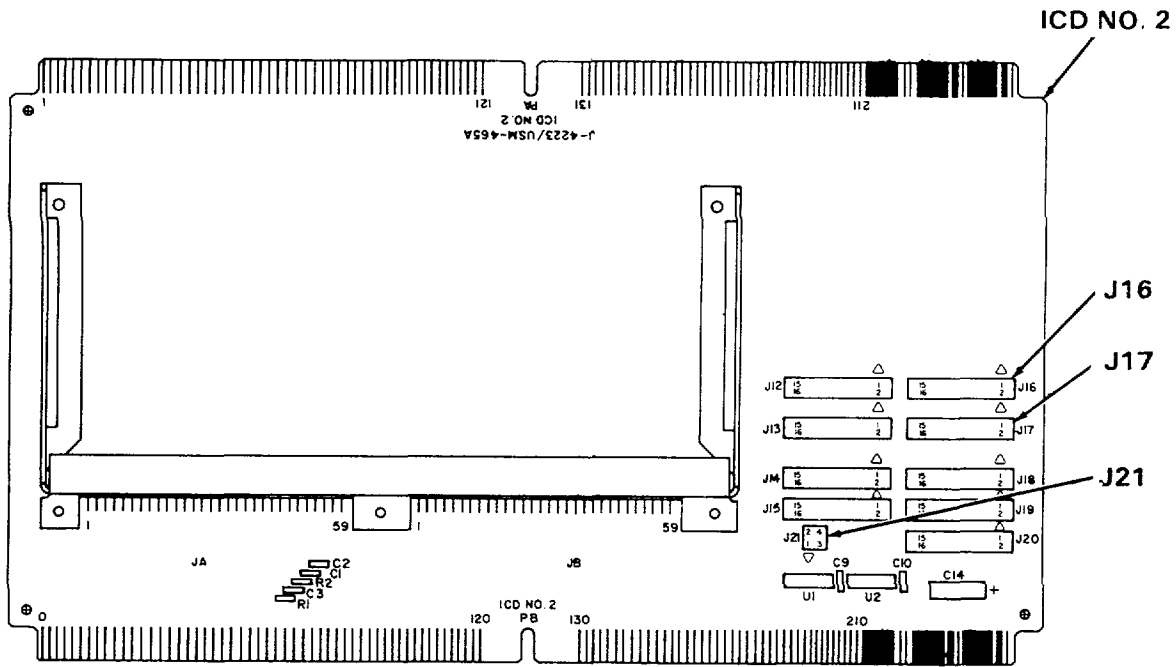


Figure 2-2. Cable Connection Points and Components Used During Display Board Test (Sheet 2 of 2)

NOTE

Ensure that the ICD is left-justified in fold-down adapter.

- (8) Install UUT, adapter board and ICD into DCT fold-down adapter as a unit.
- (9) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5). Then return to step (10), below.

- (10) Enter 2 EXECUTE . Follow instructions on paper tape until the following appear:

```

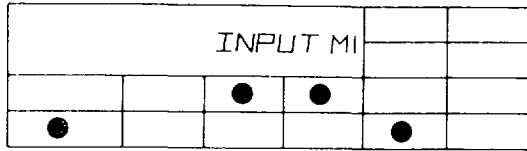
>2
>*****
>** 0100-2702 **
>** REV K **
>*****
>
>
>*****
>FOUR TASKS
>*****
    
```

```

>IF PART NUMBERS
>OR SHUNTS ARE
>NOT RIGHT.
>
>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
>
>*****
>
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
    
```


2-9. DISPLAY BOARD 0100-2702 (CONTINUED).

(10) (Continued)



WARNING

Voltage is applied to UUT during step (11), below. Do not touch UUT until "READY" appears on the display panel.

NOTE

If the test program does not behave as shown in steps (11) and (12) go to step (17).

(11) Enter **EXECUTE** . Follow instructions on printout.

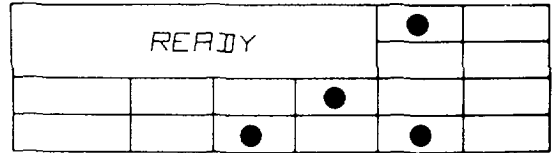
```

>T2702P1.PSR XXXXX
>*** PERFORMANCE ***
>***** TESTS *****
>T2702I3.IDMG 030687 I
>VERIFY THAT LEDS
  CR1-CR16 BLINK.
>DEPRESS AND RELEASE
  EXECUTE WHEN READY
>DID ALL LEDS
  FUNCTION PROPERLY?
  (Y/N)
>Y
    
```

```

FROM 0-9 WHEN A-Z.
  VERIFY THAT ONLY THE
  PROPER SEGMENTS ARE
  ON FOR THE CHARACTER
  BEING DISPLAYED.
>DEPRESS AND RELEASE
  EXECUTE WHEN READY
>DID ALL SEGMENTS
  FUNCTION PROPERLY?
  (Y/N)
    
```

(12) Follow instructions on paper tape. The UUT passes if the following display and printout appear:



```

>*** ALL TESTS GO ***
>
>*****
>
>REMOVE UUT AND
  INSTALL NEXT UUT TO
  BE TESTED AND
  PERFORM UUT SETUP
  PROCEDURE IN
  TM11-6625-3038-40 OR
  GR2225-141-PM4
>
>*****
>END LINE 32767
    
```

NOTE

If **1** is entered during step

(12) due to a display malfunction, program option 8 will run automatically. Follow instructions on paper tape if this occurs. Refer to **TEST PROGRAM OPTIONS**, below, for more information.

(13) Disconnect cable set only from the display board if next UUT is identical. Otherwise, disconnect cables from both UUT and ICD.

2-9. DISPLAY BOARD 0100-2702 (CONTINUED).

CAUTION

Use extreme caution when removing boards from ICD. Otherwise, boards or ICD may be damaged.

(14) Remove boards from DCT as follows:

- a. Remove ICD, adapter board, and UUT from DCT as a unit.
- b. Separate display board from adapter board.
- c. Using pry bar, carefully remove UUT from ICD if next UUT is different or if DCT is being shut down.

NOTES ON TEST SETUP

- The test program will generate a message on the paper tape during step (11) if boards are not installed correctly. Perform steps (5) through (8) again, then test the UUT per step (16) below.
- If cables are not installed correctly, the test program will run and a NO GO message will appear on the paper tape (see step (17) below). Check cable connections per step (7) above, then test the UUT per step (16) below.

NOTE

To shut down the DCT, refer to TM 11-6625-3038-10. To test another, identical UUT, proceed as follows.

(15) Perform steps (5) through (8) for net UUT to be tested.

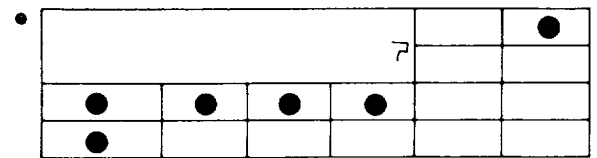
(16) Enter    . Perform

test again, starting with step (11). Refer to step (12) for board pass indications.

NOTE

Read NOTES ON FAULT DIAGNOSTICS before beginning probing sequence.

(17) If a board fails, the DCT will identify the fault immediately or supply probing instructions to isolate the fault. Enter header information in accordance with TM 11-6625-3038-10 if the following display and printout (typical) appear:



```

>***** NO GO *****
>T2702I2.IMG XXXXXX
>FAULT AT LINE 10250
> PIN PB.30
>173744 PB.30
>TYPE HEADER INFO
    
```

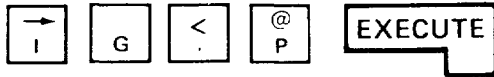
(18) If applicable, follow probing instructions on paper tape in accordance with TM 11-6625-3038-10 to isolate faulty component(s). Probing will continue until the probable fault is listed on the printout. A load list may also be printed.

2-9. DISPLAY BOARD 0100-2702 (CONTINUED).

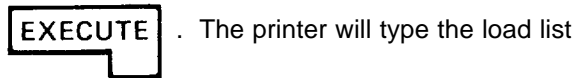
NOTES ON FAULT DIAGNOSTICS

- Dummy IC pins may appear in the fault diagnosis (probable fault or load list). These are denoted with an ".X" after the IC chip location and should be ignored.

- If a load list is not printed, enter **A** **S**



Then enter the probable fault location and



for that node. Enter **ATTN** to leave ASIG,

P mode.

- If you are instructed to probe at edge connector pins, you may consult the board schematic diagram (refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTARY DATA, below) and probe the affected input/output node rather than the edge pin.

- Follow probing instructions on printout in accordance with TM 11-6625-3038-10.

- Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform steps (13) and (14), above. Forward UUT to repair station with paper tape.

- For more information, refer to FAULT DIAGNOSTICS, below.

b. TEST PROGRAM OPTIONS.

- To rerun a specific part of the test program, enter **CMD** **RUN** **|** ***** **EXECUTE** . Enter **"** **2** for list and select desired option.

- Options 3 through 7 are the individual test modules contained in the main test program.

- Option 8 runs automatically during the main test if the display malfunctions and a **|** **1** is entered during step (12) (refer to MAIN TEST PROCEDURE, above) If no malfunction occurs, option 8 will not run less selected using not run unless selected using **CMD** **RUN** **|** ***** **EXECUTE** .

- Options 9 through 11 are not applicable to the AN/USM-465A.

- Enter **CMD** **RUN** **"** **2** ***** **EXECUTE** to reset all variables and run a complete test.

2-9. DISPLAY BOARD 0100-2702 (CONTINUED).

c. FAULT DIAGNOSTICS.

- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - a. Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - b. Clean the ICD, UUT, and fold-down adapter pins with 99 percent isopropyl alcohol.
 - c. Test the ICD in accordance with TM 11 -6625-3038-24.
- If the UUT fails in the system after replacement of a bistable component (flip-flop or counter), the fault may be in the load of the component. Refer to the schematic diagrams in APPENDIX B and check the load on both outputs of the component.

d. SUPPLEMENTARY DATA.

Table 2-3 shows the relationship between the driver/sensor pins and component nodes or edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructs you to probe any pin or node that is inaccessible.

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD (see Figure 2-2).

Component nodes listed in the BOARD CONNECTION column are represented with the standard component identifiers and pin specifications (for example, "U2.3" or "6B.15"). Use Figure 2-2 as necessary to locate probing points on the UUT.

Table 2-3. Display Board Pin Cross-Reference List

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0	P1.1	27	P3.2	84	P3.10	147	A7.12
2	P1.10	29	P3.4	86	P3.12	152	A7.1
4	P1.2	31	P3.3	88	P3.13	153	A7.2
6	P1.2	34	P1.10	89	0P3.14	154	A7.3
8	P1.35	36	P2.11	99	2P3.15	155	A7.4
10	P1.37	38	P2.14	94	P3.16	156	A7.5
12	P1.39	40	P3.5	110	TP1	157	A7.6
14	P2.1	44	P3.9	112	TP2	158	A7.7
16	P2.3	46	P3.11	114	TP3	159	A7.13
18	P2.5	58	P3.8	135	A7.8	160	A7.14
20	P2.6	66	A9.11	144	A7.9	161	A7.15
22	P2.7	70	B10.4	145	A7.10	190	C2.X
24	P3.1	75	A7.16	146	A7.11	191	C4.X

2-10. DRIVER/SENSOR BOARD 0100-2703.

WARNING

a. MAIN TEST PROCEDURE.

CAUTION

This equipment contains parts sensitive to damage by **ELECTROSTATIC DISCHARGE (ESD)**. Use ESD precautionary procedures when touching, removing, or inserting parts or assemblies. Review DOD-HDBK-263 for proper handling instructions.

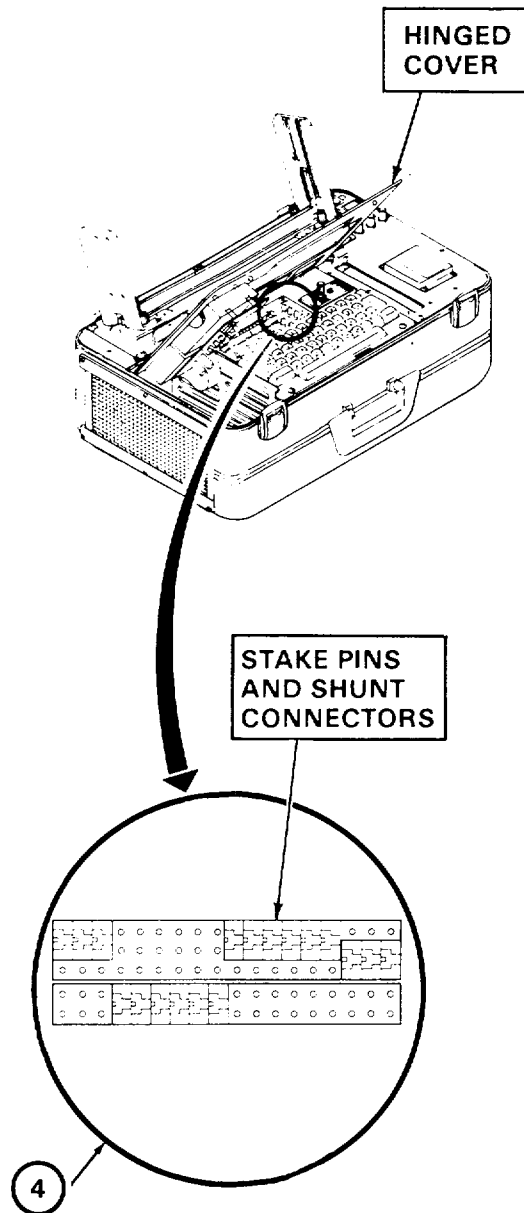
Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.

PRETEST NOTES

- Before proceeding, ensure that you have the correct part numbers on the ICD and TPS tape cartridge for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- Ensure that the ICD has been tested in accordance with TM 11-6625-3097-24 if it is being used for the first time today.
- Proceed to step (3) if all applicable PMCS have already been performed on the DCT.
- Both 0100-2703-F and 0100-2703-G are testable using this procedure.

- (1) Prepare the DCT for use and perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.



2-10. DRIVER/SENSOR BOARD 0100-2703 (CONTINUED).

NOTE

Ensure that UUT seats firmly in the ICD during step (5). If UUT is firmly seated, visible length of the board connector pins should be no more than 1/8 inch.

- (5) Install driver/sensor board 0100-2703 into ICD NO. 1 SIDE PB (P/N A3038069).

NOTE

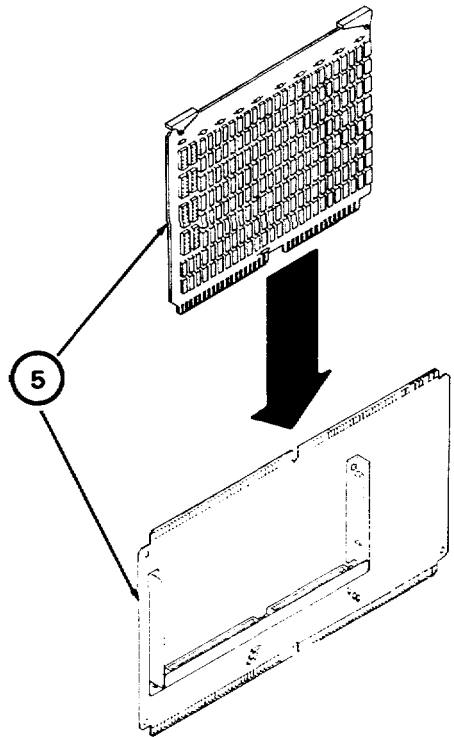
Ensure that the ICD is left-justified in DCT fold-down adapter.

- (6) Install UUT and ICD into DCT fold-down adapter as a unit.
- (7) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5). Then return to step (8), below.

- (8) Enter

#
3

 EXECUTE . Follow instructions on paper tape until the following appear:



```

>3
>*****
>** 0100-2703 **
>** REV G **
>*****
>
>
>*****
>TWO TASKS
>*****
    
```

```

>*****
>
>IF PART NUMBERS
>OR SHUNTS ARE
>NOT RIGHT.
>
>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
    
```

```

>
>*****
>
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
>
    
```

INPUT MI				
●		●	●	
				●

2-10. DRIVER/SENSOR BOARD 0100-2703 (CONTINUED).

WARNING

Voltage is applied to UUT during step (9). Do not touch UUT until "READY" appears on the display panel.

NOTE

If the test program does not behave as shown in step (9) go to step (14).

(9) Enter **EXECUTE** . The test program runs

automatically. The board passes if the following display and printout appear:

READY				●	
			●		
		●		●	

```

>
>T2703P1.PSR XXXXXX
>*** PERFORMANCE ***
>***** TESTS *****
>*** ALL TESTS GO ***
>
>*****
>
>REMOVE UUT AND
INSTALL NEXT UUT TO
BE TESTED AND
PERFORM UUT SETUP
PROCEDURE IN
TM11-6625-3038-40 OR
GR2225-141-PM4
>
>*****
>END LINE 32767
    
```

NOTE ON TEST SETUP

- The test program will generate a message on the paper tape during step (9) if boards are not installed correctly. Perform steps (5) and (6) again, then test the UUT per step (13), below.

(10) Enter **CMD** **RUN** **!** **0**
EXECUTE and run program options 14 and 15.

No operator action is required during these tests. Refer to section b, TEST PROGRAM OPTIONS, for information on the RUN 10 command. Refer to section c, TEST AID OPTIONS, for a detailed explanation of options 14 and 15.

CAUTION

Use extreme caution when removing boards from ICD. Otherwise, boards or ICD may be damaged.

- (11) Remove boards from DCT as follows:
- Remove ICD and UUT from DCT as a unit.
 - Using pry bar, carefully remove UUT from ICD.

NOTE

To shut down the DCT, refer to TM 11-6625-3038-10. To test another, identical UUT, proceed as follows.

- (12) Perform steps (5) and (6) for next UUT (driver/sensor board) to be tested.

2-10. DRIVER/SENSOR BOARD 0100-2703 (CONTINUED).

(13) Enter   

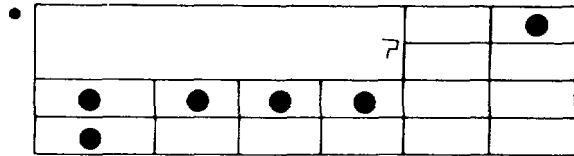
Perform test again, starting with step (9).

(14) If a board fails, the DCT will identify the fault immediately or supply probing instructions to isolate the fault. Enter header information in accordance with TM 11-6625-3038-10 if the following display and printout (typical) appear:

```

>***** NO GO *****
>T2703I2.IMG XXXXXX
>FAULT AT LINE 10250
> PIN PB.30
>173744 PB.30
>TYPE HEADER INFO
    
```


(15) If applicable, following probing instructions on paper tape in accordance with TM 11-6625-3038-10 to isolate faulty component(s). Probing will continue until the probable fault is listed on the printer. A load list may also be printed.




NOTES ON FAULT DIAGNOSTICS

• If a load list is not printed, enter  

Then enter the probable fault location and  . The printer will type the load list

for that node. Enter  to leave ASIG, P mode.

• If you are instructed to probe at edge connector pins you may consult the board schematic diagram (refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTARY DATA, below) and probe the affected input/output node rather than the edge pin.

• Follow probing instructions on printout in accordance with TM 11-6625-3038-10.

• Faults identified on the printout at the following locations may require use of TEST AID OPTIONS for further isolation or verification.

1. Faults at line 11210
2. Faults at line 14200
3. Probable fault listed as IC 10D or pin 9 of a driver/sensor CMOS chip.

Refer to section c, TEST AID OPTIONS.


• Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform step (11). Forward UUT to repair station with paper tape.

• For more information, refer to FAULT DIAGNOSTICS, below.

2-10. DRIVER/SENSOR BOARD 0100-2703 (CONTINUED).

b. TEST PROGRAM OPTIONS.

• To rerun a specific part of the test program, enter      . Enter

 for list and select desired option.

- Options 3 through 7 are the individual test modules contained in the main test program.
- Options 8 through 11 are not applicable to the AN/USM-465A.
- Options 12 through 16 are TEST AID OPTIONS used to help in isolating or verifying faults down to the chip or component level. Options 14 and 15 are run during the main test procedure. Refer to section c, TEST AID OPTIONS, below.

• Enter      to reset all variables and run a complete test.

c. TEST AID OPTIONS.

- If a CMOS chip is diagnosed as the probable fault at line 11210 or line 14200, further fault diagnosis is necessary. Prior to forwarding the board for repair, run option 12 for faults at line 11210 or option 13 for faults at line 14200. Follow instructions on paper tape until the program identifies the exact chip to be replaced.
- Options 14 and 15 are used to vary the driver/sensor board pin high, low, and threshold settings at six different values and test the threshold sensing capabilities. This detects any marginal faults that can cause system failure and that cannot be detected by the main test program. Option 14 tests pins at the B side of the board (see Figure 2-3, Sheets 3 and 4) and option 15 tests the A side (see Figure 2-3, Sheets 1 and 2). The sample printout represents a driver/sensor board that passes the B side test. A failure in this test will be indicated by a "FAULT AT LINE NO XXXXXX" statement plus the failing pin(s) number(s). To correlate the board edge pin numbers to the locations of suspect components, refer to section d, FAULT DIAGNOSTICS.

```

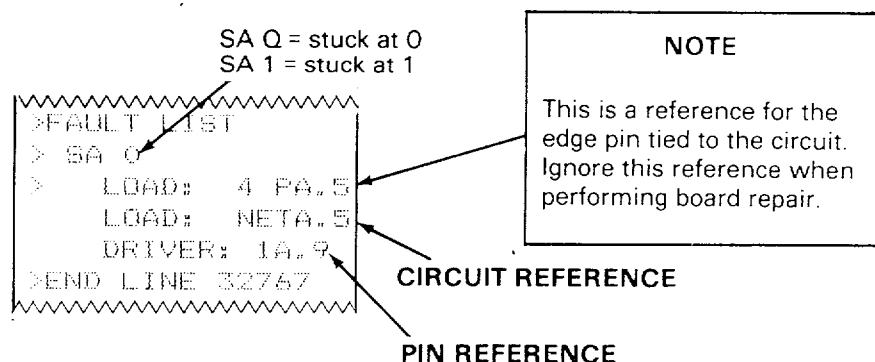
*****
>OPTION: 14
*****
>
\   TEST B SIDE
/-----
>PASSED
>-10   10   -5
>PASSED
>-12.8 12.7 -11
>PASSED
>-12.8 12.7  11
>PASSED
>-10   10    5
>PASSED
>-5    5    0
>PASSED
>END AT LINE 32767
  
```

2-10. DRIVER/SENSOR BOARD 0100-2703 (CONTINUED).

- If a fault printout lists IC 10D or pin 9 of a driver/sensor CMOS chip as the probable fault run option 16 (Q1 test) prior to replacing the IC. If the Q1 test passes, the IC listed in the fault printout is defective and should be replaced.

d. FAULT DIAGNOSTICS.

- If you are asked to probe at IC chips in rows A and D, count pins counterclockwise from the bottom of the chips. Chips in these rows are placed upside-down relative to the other chips on the board.
- After fault diagnostics, IC chip failure may be verified by interchanging similar chips on the board and rerunning the test program. If a different fault location is identified, the problem is a faulty chip. If the problem stays at the same location, components in the associated driver/sensor circuit may be defective.
- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - a. Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - b. Clean the ICD, UUT, and fold-down adapter pins with 99 percent isopropyl alcohol.
 - c. Test the ICD in accordance with TM 11-6625-3097-24.
- The load list on fault printouts such as the one shown below contains a NETA or NETB circuit reference. NETA represents the circuits located on side A of the driver/sensor board and NETB represents the circuits located on side B (see Figure 2-3). A pin reference follows the circuit reference to further identify the circuit location.



If replacement of the component listed as the probable fault does not correct the problem, use the references in the load list to perform further repair as follows.

- a. Refer to Figure 2-3 to locate the diode, transistor, and four resistors comprising the circuit (for the example above, locate circuit "NETA.5"). NETA circuits are shown on sheets 1 and 2 of Figure 2-3, and NETB circuits are shown on sheets 3 and 4.
- b. Remove and replace all six components in the circuit, then retest the board.

2-10. DRIVER/SENSOR BOARD 0100-2703 (CONTINUED).

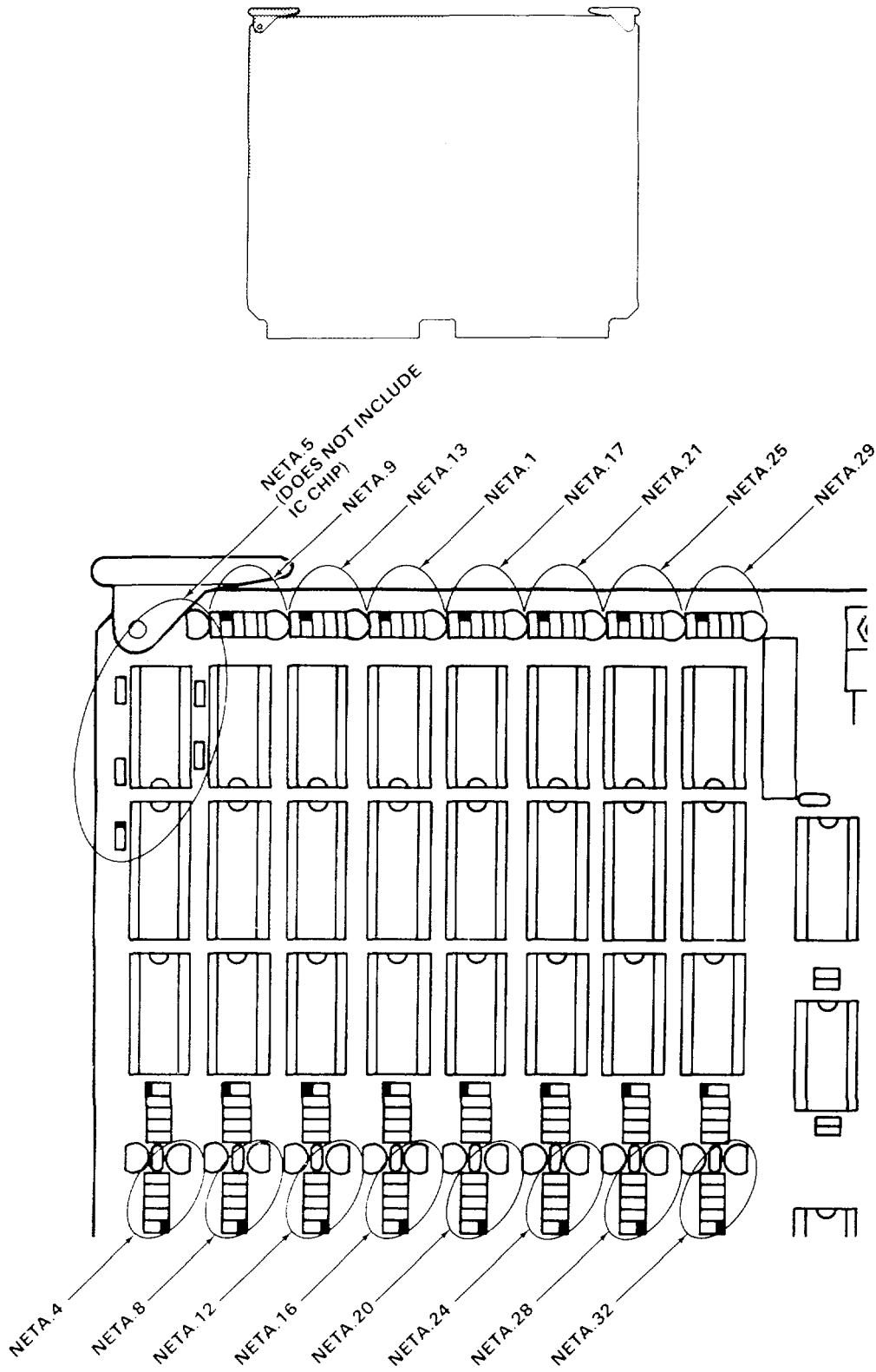


Figure 2-3. Driver/Sensor Component Layout (Sheet 1 of 4)

2-10. DRIVER/SENSOR BOARD 0100-2703 (CONTINUED).

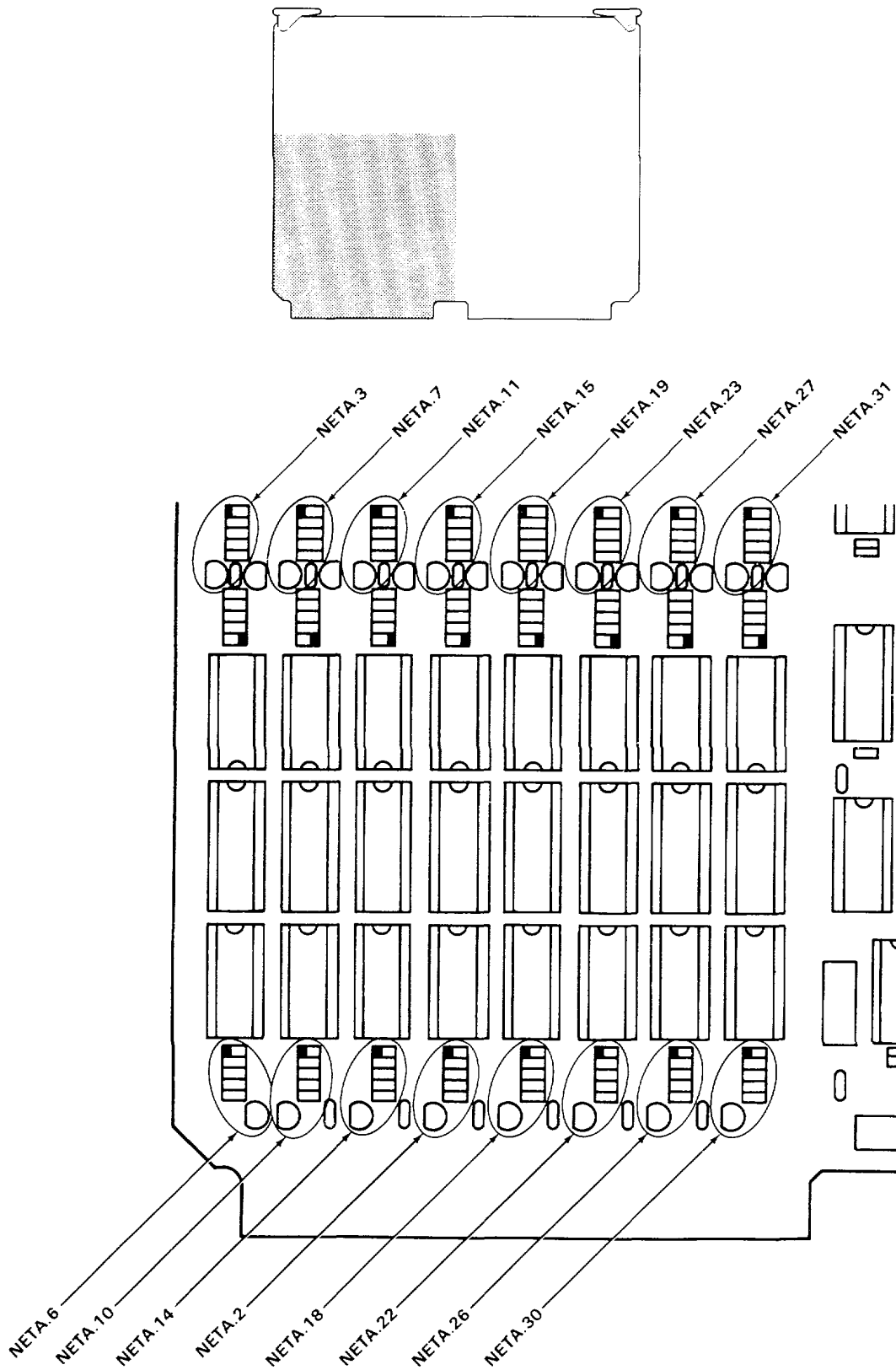


Figure 2-3. Driver/Sensor Component Layout (Sheet 2 of 4)

2-10. DRIVER/SENSOR BOARD 0100-2703 (CONTINUED).

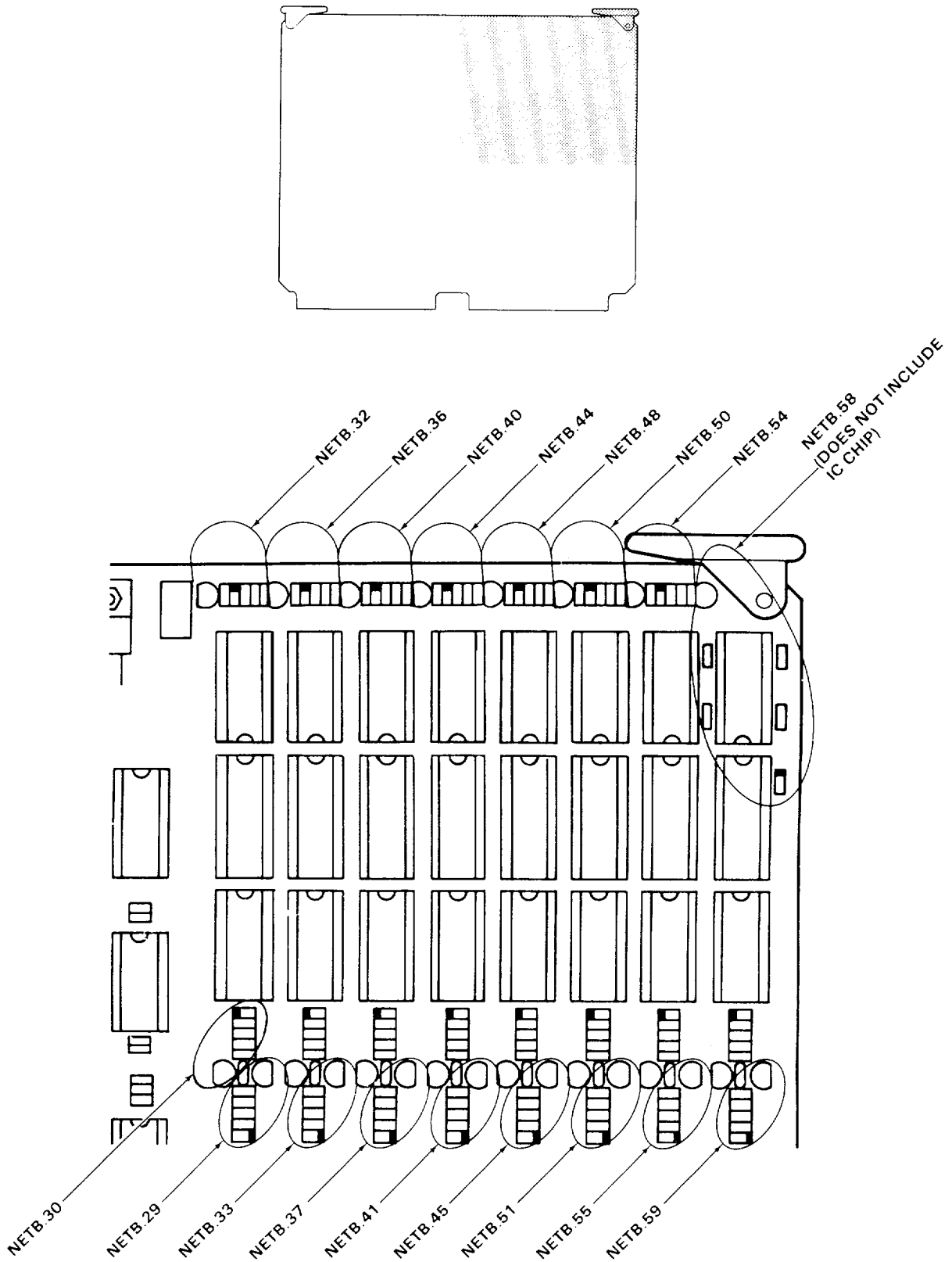


Figure 2-3. Driver/Sensor Component Layout (Sheet 3 of 4)

2-10. DRIVER/SENSOR BOARD 0100-2703 (CONTINUED).

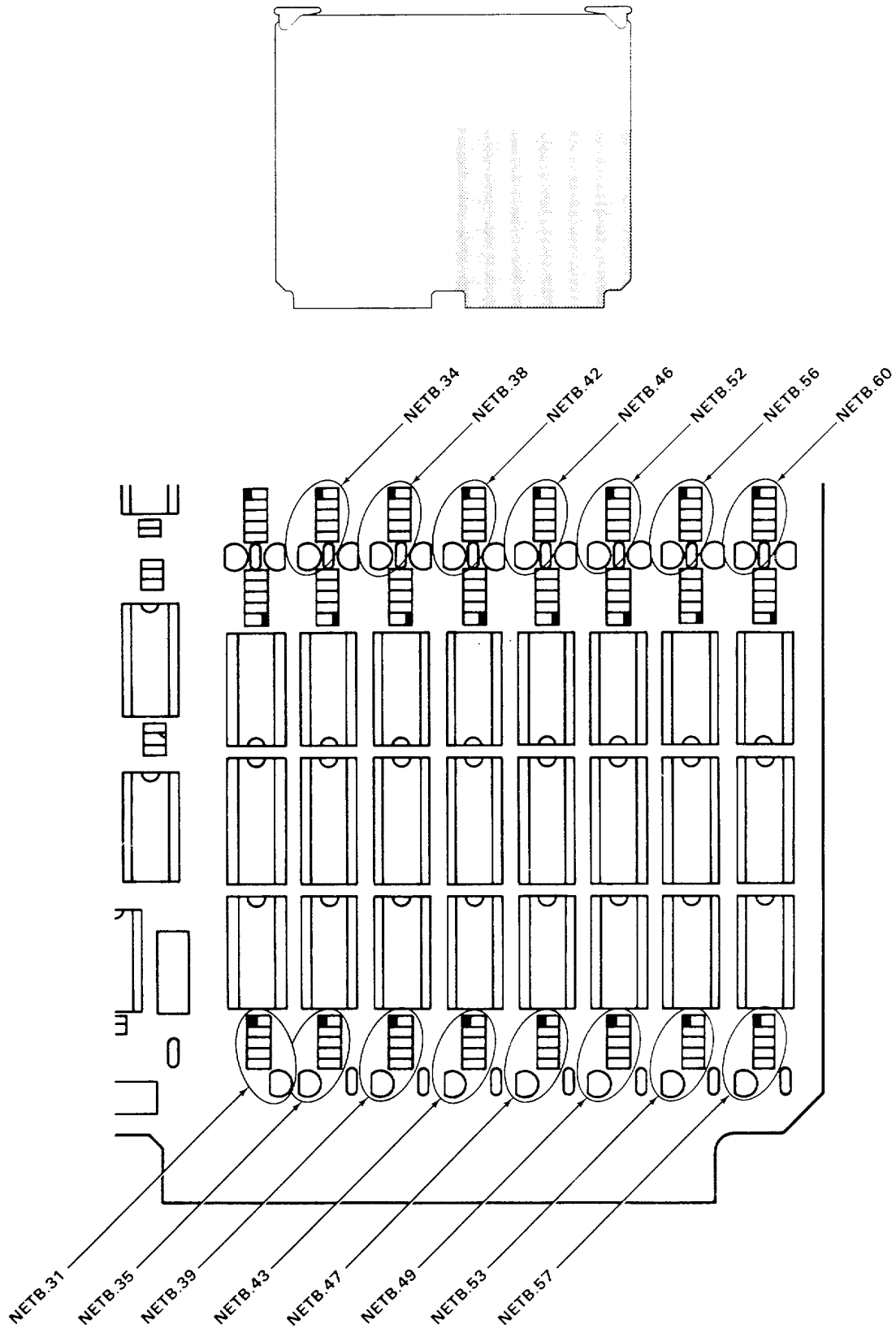


Figure 2-3. Driver/Sensor Component Layout (Sheet 4 of 4)

2-10. DRIVER/SENSOR BOARD 0100-2703 (CONTINUED).

e. SUPPLEMENTARY DATA.

Table 2-4 shows the relationship between the driver/sensor pins and edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructs you to probe any pin or node that is inaccessible.

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD.

UUT edge pins listed in the BOARD CONNECTION column are represented as "PA.##" or "PB.##". "PA.##" pins can be probed at side "A" of the UUT. "PB.##" pins can be probed at side "B" of the UUT. See Figure 2-3. Locate pins according to the reference numbers printed on the UUT.

Table 2-4. Driver/Sensor Pin Cross-Reference List

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0	PA.1	25	PA.26	83	PB.8	112	PB.37
1	PA.2	26	PA.27	84	PB.9	113	PB.38
2	PA.3	27	PA.28	85	PB.10	114	PB.39
3	PA.4	28	PA.29	86	PB.11	115	PB.40
4	PA.5	29	PA.30	87	PB.12	116	PB.41
5	PA.6	30	PA.31	88	PB.13	117	PB.42
6	PA.7	31	PA.32	89	PB.14	118	PB.43
7	PA.8	32	PA.33	90	PB.15	119	PB.44
8	PA.9	33	PA.34	91	PB.16	120	PB.45
9	PA.10	40	PA.41	92	PB.17	121	PB.46
10	PA.11	42	PA.43	93	PB.18	122	PB.47
11	PA.12	44	PA.45	94	PB.19	123	PB.48
12	PA.13	46	PA.47	95	PB.20	124	PB.49
13	PA.14	47	PA.48	96	PB.21	125	PB.50
14	PA.15	48	PA.49	97	PB.22	126	PB.51
15	PA.16	49	PA.50	102	PB.27	127	PB.52
16	PA.17	50	PA.51	103	PB.28	128	PB.53
16	PA.36	51	PA.52	104	PB.29	129	PB.54
17	PA.18	52	PA.53	105	PB.30	130	PB.55
18	PA.19	53	PA.54	106	PB.31	131	PB.56
19	PA.20	54	PA.55	107	PB.32	132	PB.57
20	PA.21	55	PA.56	108	PB.33	133	PB.58
21	PA.22	59	PA.60	109	PB.34	134	PB.59
22	PA.23	76	PB.1	110	PB.35	135	PB.60
23	PA.24	77	PB.2	111	PB.36	163	PB.26
24	PA.25	78	PB.3				

2-11. PIN PROCESSOR BOARD 0100-2704.

WARNING

a. MAIN TEST PROCEDURE.

CAUTION

This equipment contains parts sensitive to damage by ELECTROSTATIC DISCHARGE (ESD). Use ESD precautionary procedures when touching, removing, or inserting parts or assemblies. Review DOD-HDBK-263 for proper handling instructions.

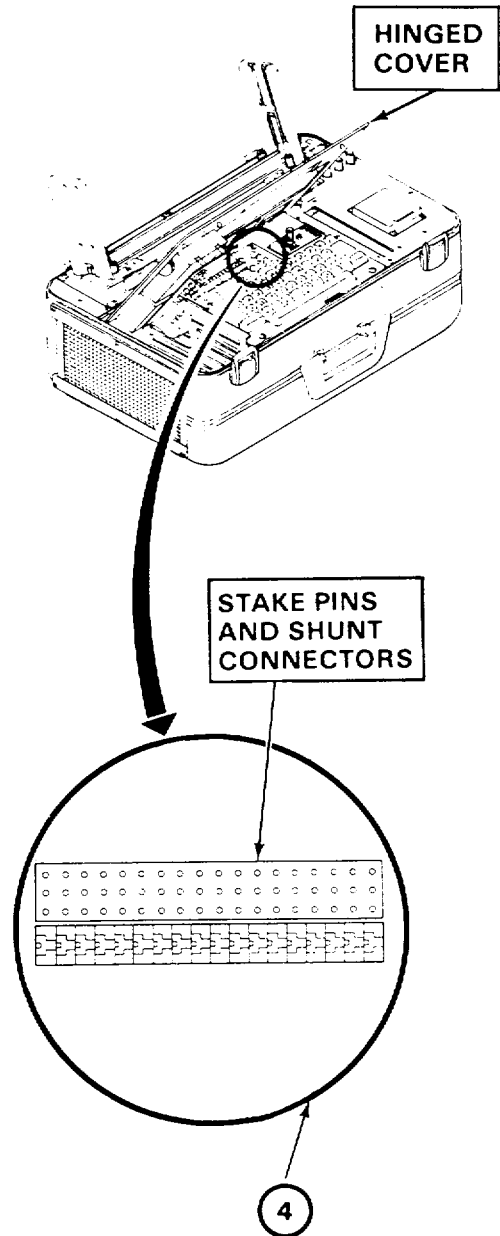
Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.

PRETEST NOTES

- Before proceeding, ensure that you have the correct part numbers on the ICD, TPS tape cartridge, and cable set for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- Ensure that the ICD and cable set have been tested in accordance with TM 11-6625-3097-24 if they are being used for the first time today.
- Proceed to step (3) if all applicable PMCS have already been performed on the DCT.

- (1) Prepare the DCT for use and perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.



**2-11. PIN PROCESSOR BOARD 0100-2704.
(CONTINUED).**

- (5) Remove jumper links E1-E2, E3-E4, and E5-E6 from pin processor board 0100-2704. See Figure 2-4.

NOTE

Ensure the UUT seats firmly in the ICD during step (6). If UUT is firmly seated, visible length of the board connector pins should be no more than 1/8 inch.

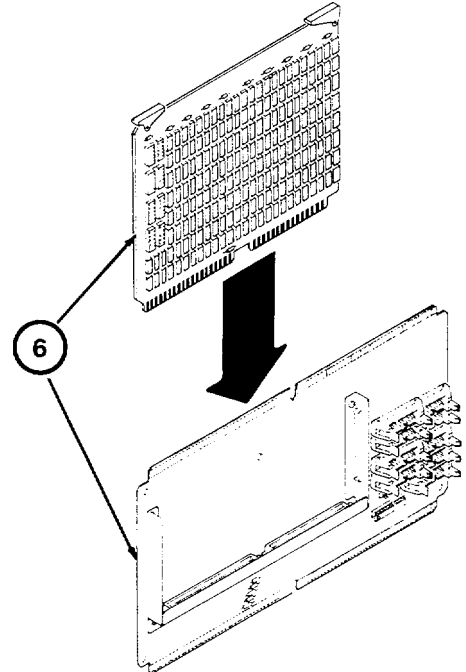
- (6) Install UUT into ICD NO. 2 SIDE PB (P/N A3038070).

NOTE

Refer to paragraph 2-6, USE OF CABLE SETS (page 2-4) before performing test cable hookup.

- (7) Connect CABLE SET FOR 0100-2704 (P/N A3038037-4) to the UUT and ICD according to destination markings on clamp attached to each cable (see Figure 2-4). Perform the following steps using the designated cable or wire:

- a. Place three-wire plug on J21 (ICD).
- b. Place brown wire grabber on IC 18D, pin 11 (UUT).
- c. Place red wire grabber on IC 15E, pin 8 (UUT).
- d. Place orange wire grabber on IC 7C, pin 12 (UUT).
- e. Connect IC 11B (UUT) to J12 (ICD).
- f. Connect IC 13C (UUT) to J13 (ICD).
- g. Connect IC 21C (UUT) to J14 (ICD).
- h. Connect IC 21D (UUT) to J15 (ICD).
- i. Connect IC 9D (UUT) to J20 (ICD).
- j. Connect IC 9C (UUT) to J19 (ICD).
- k. Connect IC 9B (UUT) to J18 (ICD).
- l. Connect IC 9A (UUT) to J17 (ICD).
- m. Connect IC 1A (UUT) to J16 (ICD).



NOTE

Ensure that ICD is left-justified in DCT fold-down adapter.

- (8) Install ICD and UUT into DCT fold-down adapter as a unit.

2-11. PIN PROCESSOR BOARD 0100-2704 (CONTINUED).

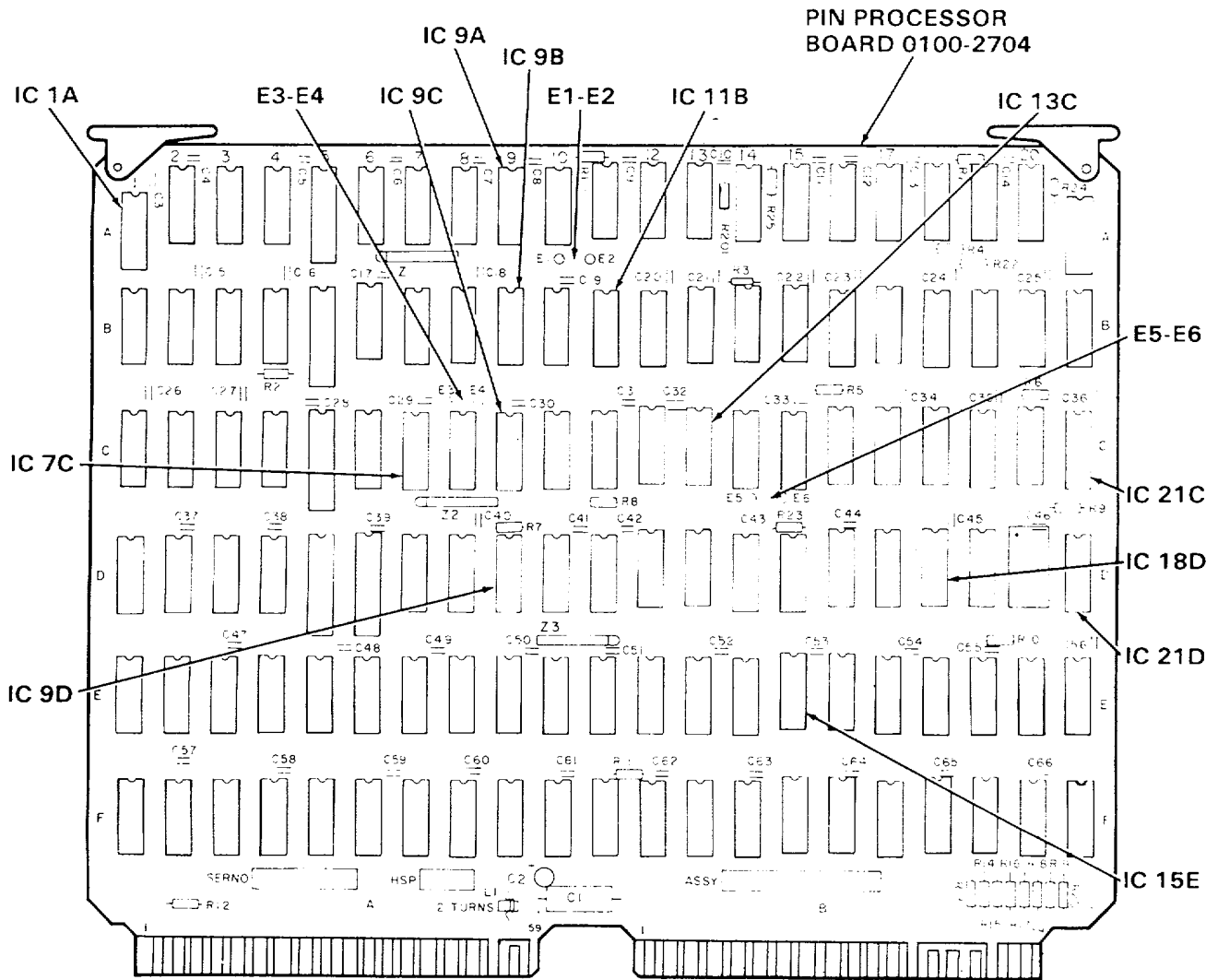


Figure 2-4. Cable Connection Points and Components Used During Pin Processor Board Test (Sheet 1 of 2)

2-11. PIN PROCESSOR BOARD 0100-2704 (CONTINUED).

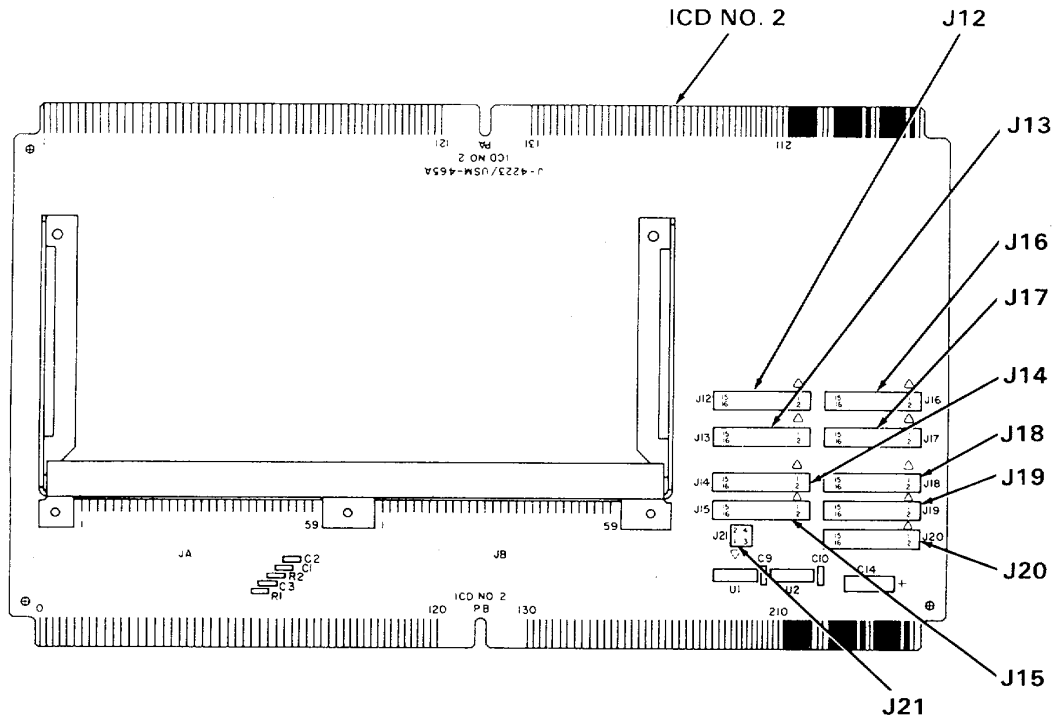


Figure 2-4. Cable Connection Points and Components Used During Pin Processor Board Test (Sheet 2 of 2)

(9) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5). Then return to step (10), below.

(10) Enter . Follow instructions on paper tape until the following appear:

```

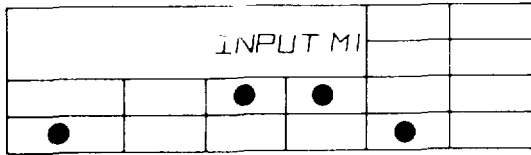
>4
>*****
>**  0100-2704  **
>**    REV K    **
>*****
>
>
>*****
>THREE TASKS
>*****
    
```

```

>IF PART NUMBERS
>OR SHUNTS ARE
>NOT RIGHT.
>
>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
>
>*****
>
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
    
```

2-11. PIN PROCESSOR BOARD 0100-2704 (CONTINUED).

(10) (Continued).



WARNING

Voltage is applied to UUT during step (11), below. Do not touch UUT until "READY" appears on the display panel.

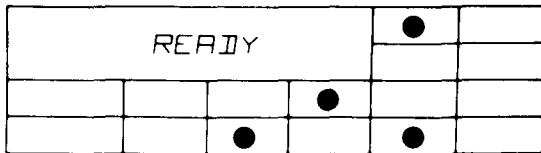
NOTE

If the test program does not behave as shown in step (11) go to step (18).

(11) Enter **EXECUTE**. The test program runs



automatically. The board passes if the following display and printout appear:



```






>
>T2704P1.H1P -*****
>*** PERFORMANCE ***
>***** TESTS *****
>T2704H1 H XXXXXX
>*** ALL TESTS GO ***
>
>*****
>
REMOVE UUT AND
INSTALL NEXT UUT TO
BE TESTED AND
PERFORM UUT SETUP
PROCEDURE IN
TM11-6625-3038-40 OR
GR2225-141-PM4
>
>*****
>END LINE 32767
    
```

NOTES ON TEST SETUP

- The test program will generate a message on the paper tape during step (11) above, if boards are not installed correctly. Perform steps (6) through (8) again, then test the UUT per step (17), below.
- If cables are not installed correctly, the test program will run and a NO GO message will appear on the paper tape (see step (18), below). Check cable connections per step (7), above, then test the UUT per step (17), below.

2-11. PIN PROCESSOR BOARD 0100-2704 (CONTINUED).

(12) Using needle nose pliers, reinstall jumper links E1-E2, E3-E4, and E5-E6 on UUT. Remove chip clips as necessary. Ensure that clips are repositioned properly before continuing.

(13) Enter     . Run option 13. Option 13 must be run with cables connected.

(14) Disconnect cable set only from the pin processor board if next UUT is identical. Otherwise, disconnect cable set from pin processor board and ICD.

CAUTION

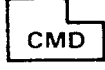


Use extreme caution when removing boards from ICD. Otherwise, boards or ICD may be damaged.

- (15) Remove boards from DCT as follows:
- a. Remove ICD and UUT from DCT.
 - b. Using pry bar, carefully remove UUT from ICD if next UUT is different or if DCT is being shut down.

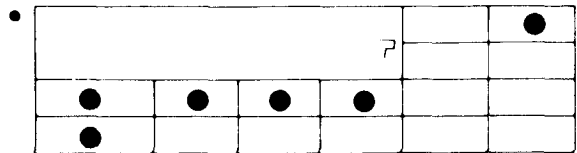
NOTE

To shut down the DCT, refer to TM 11-6625-3038-10. To test another, identical UUT, proceed as follows.

(16) Perform steps (5) through (8) for next UUT to be tested.

(17) Enter   . The test program will run automatically for the next UUT. Refer to step (11) for board pass indications.

(18) If a board fails the DCT will identify the fault immediately or supply probing instructions to isolate the fault. Enter header information in accordance with TM 11-6625-3038-10 if the following display and printout (typical) appear:



```

>***** NO GO *****
>T270412.IMG *****
>
>FAULT AT LINE 10250
> PIN PG.30
>173744 PB.30
>TYPE HEADER INFO
    
```

(19) If applicable, follow probing instructions on paper tape in accordance with TM 11-6625-3038-10 to isolate faulty component(s). Probing will continue until the probable fault is listed on the printout. A load list may also be printed.

2-11. PIN PROCESSOR BOARD 0100-2704 (CONTINUED).

NOTES ON FAULT DIAGNOSTICS

• If a load list is not printed, enter **A** **S**
I **G** **<** **@** **P** **EXECUTE** . Then

enter the probable fault location and **EXECUTE**

The printer will type the load list for that node. Enter **ATTN** to leave ASIG, P mode

• If you are instructed to probe at edge connector pins you may consult the board schematic diagram (refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTARY DATA, below) and probe the affected input/output node rather than the edge pin.

- Follow probing instructions on printout in accordance with TM 11-6625-3038-10.
- Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform steps (12) through (14). Forward UUT to repair station with paper tape.
- For more information, refer to section c, FAULT DIAGNOSTICS.

b. TEST PROGRAM OPTIONS.

• To rerun a specific part of the test program, enter **CMD** **RUN** **I** ***** **EXECUTE** . Enter **2** for list and select desired option.

- Options 3 through 6 are the individual test modules contained in the main test program.
- Option 13 must be used to check for proper insertion of jumper links after normal testing of the pin processor board.
- Options 7 through 12 and option 14 are not applicable to the AN/USM-465A.

• Enter **CMD** **RUN** **I** ***** **EXECUTE** to reset all variables and run a complete test.

2-11. PIN PROCESSOR BOARD 0100-2704 (CONTINUED).

c. FAULT DIAGNOSTICS.

- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - a. Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - b. Clean the ICD, UUT, and fold-down adapter pins with 99 percent isopropyl alcohol.
 - c. Test the ICD in accordance with TM 11-6625-3097-24.
- If the UUT fails in the system after replacement of a bistable component (flip-flop or counter), the fault may be in the load of the component. Refer to the schematic diagrams in APPENDIX B and check the load on both outputs of the component.

d. SUPPLEMENTARY DATA.

Table 2-5 shows the relationship between the driver/sensor pins and component nodes or edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructs you to probe any pin or node that is inaccessible.

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD (see Figure 2-4).

UUT edge pins in the BOARD CONNECTION column are represented as "A##" or "B##". "A##" pins can be probed at side "A" of the UUT. "B##" pins can be probed along side "B" of the UUT. See Figure 2-4. Locate pins according to the reference numbers printed on the UUT.

Component nodes listed in the BOARD CONNECTION column are represented with the standard component identifiers and pin specifications (for example, "U2.3" or "6B.15"). Use Figure 2-4 as necessary to locate probing points on the UUT.

Table 2-5. Pin Processor Board Pin Cross-Reference List

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0	A1	12	A13	24	A25	36	A37
1	A2	13	A14	25	A26	37	A38
2	A3	14	A15	26	A27	38	A39
3	A4	15	A16	27	A28	39	A40
4	A5	16	A17	28	A29	40	A41
5	A6	17	A18	29	A30	41	A42
6	A7	18	A19	30	A31	42	A43
7	A8	19	A20	31	A32	43	A44
8	A9	20	A21	32	A33	44	A45
9	A10	21	A22	33	A34	45	A46
10	A11	22	A23	34	A35	46	A47
11	A12	23	A24	35	A36	47	A48

2-11. PIN PROCESSOR BOARD 0100-2704 (CONTINUED).

Table 2-5. Pin Processor Board Pin Cross-Reference List (Continued)

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
48	A49	90	B15	125	B50	160	9A.14
49	A50	91	B16	126	B51	161	9A.15
50	A51	92	B17	127	B52	162	11B.6
51	A54	93	B18	128	B53	163	11B.3
52	A53	94	B19	129	B54	164	11B.2
53	A56	95	B20	130	B55	165	11B.1
54	A55	96	B21	131	B56	166	1A.2
55	A58	97	B22	132	B57	167	1A.1
56	A57	98	B23	133	B58	168	1A.4
57	A60	99	B24	134	B59	169	1A.5
64	9AB.13	100	B25	135	B60	170	1A.6
65	1188.4	101	B26	136	9B.9	171	1A.9
66	7C.12	102	B27	137	9B.10	172	1A10
67	11BA.4	103	B28	138	9B.11	173	1A.11
68	13CB.9	104	B29	139	9B.12	174	1A.12
69	18D.11	105	B30	140	9C.9	175	1A.13
70	A5E.8	106	B31	141	9C.10	176	21C.4
71	21D.5	107	B32	142	9C. 11	177	21C.15
72	21D.9	108	B33	143	9C.12	178	21C.7
73	21D.10	109	B34	144	9A.9	179	D
74	21D.11	110	B35	145	9A.10	180	21C.13
76	B1	111	B36	146	9A.11	181	E
77	B2	112	B37	147	9C.12	182	13CA.9
78	B3	113	B38	148	9D.9	183	HIGH
79	B4	114	B39	149	9A.10	184	13C.6
80	B5	115	B40	150	9D.11	185	13C.2
81	B6	116	B41	151	9A.12	186	13C.4
82	B7	117	B42	152	9A.1	187	13C.2
83	B8	118	B43	153	9A.2	188	13C.1
84	B9	119	B44	154	9A.3	189	C
85	B10	120	B45	155	9A.4	190	B
86	B11	121	B46	156	9A.5	191	A
87	B12	122	B47	157	9A.6		
88	B13	123	B48	158.	9A.7		
89	B14	124	B49	159	9A.13		

2-12. PROCESSOR BOARD 0100-2705.

WARNING

a. MAIN TEST PROCEDURE.

CAUTION

This equipment contains parts sensitive to damage by ELECTROSTATIC DISCHARGE (ESD). Use ESD precautionary procedures when touching, removing, or inserting parts or assemblies. Review DOD-HDBK-263 for proper handling instructions.

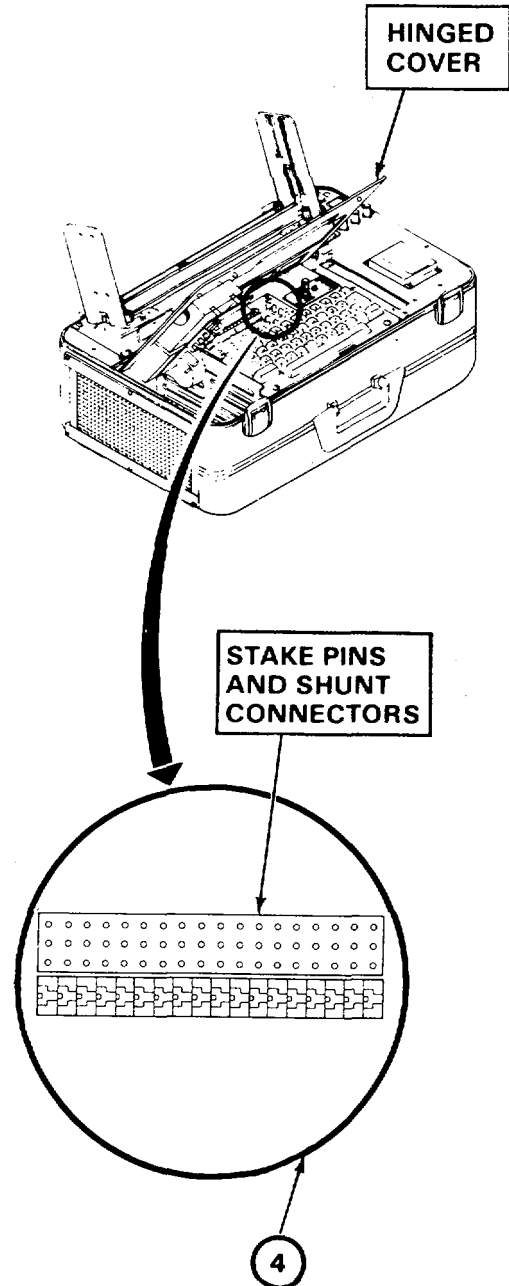
PRETEST NOTES

- Before proceeding, ensure that you have the correct part numbers on the ICD, TPS tape cartridge, and cable set for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- Ensure that the ICD and cable set have been tested in accordance with TM 11-6625-3097-24 if they are being used for the first time today.
- Proceed to step (3) if all applicable PMCS have already been performed on the DCT.

- (1) Prepare the DCT for use and perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.

Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.



2-12. PROCESSOR BOARD 0100-2705 (CONTINUED).

- (5) Tag and remove IC chips 7F, 9F, and 11F from processor board 0100-2705 using 40-pin IC chip puller. Tag each chip according to position prior to removing chips from IC sockets. Store chips in safe place on antistatic foam. See Figure 2-5 for IC chip location.

NOTE

Ensure the UUT seats firmly in the ICD during step (6). If UUT is firmly seated, visible length of the board connector pins should be no more than 1/8 inch.

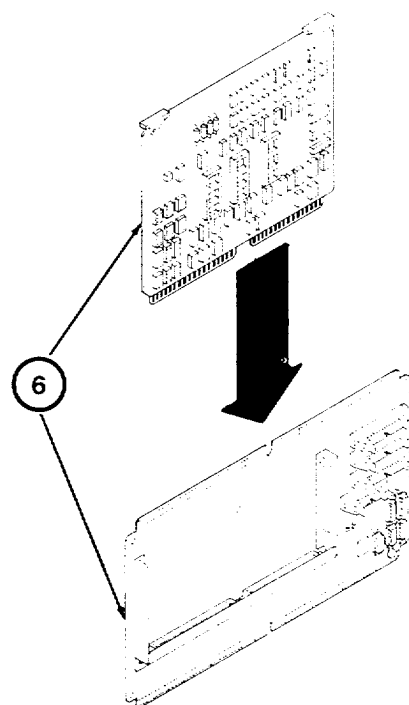
- (6) Install UUT into ICD NO. 1 SIDE PA (P/N A3038069).

NOTE

Refer to paragraph 2-6, USE OF CABLE SETS (page 2-4) before performing test cable hookup.

- (7) Connect CABLE SET FOR 0100-2705 (P/N A3038036-1) to the UUT and ICD according to destination markings on clamp attached to each cable (see Figure 2-5). Perform the following steps using the designated cable or wire:

- a. Connect IC socket 11F (UUT, use 40 pin header) to J1 (ICD).
- b. Connect IC socket 9F (UUT, use 40 pin header) to J2 (ICD).
- c. Connect IC socket 7F (UUT, use 40 pin header) to J3 (ICD).
- d. Connect TP connector J1 (UUT) to J4 (ICD). Place red wire at pin 1.
- e. Place three-wire plug on J5 (ICD).
- f. Place brown wire grabber on IC 18H, pin 8 (UUT).
- g. Place red wire grabber on IC 16H, pin 8 (UUT).



NOTE

Ensure that ICD is left-justified in DCT fold-down adapter.

- (8) Install ICD and UUT into DCT fold-down adapter as a unit.

2-12. PROCESSOR BOARD 0100-2705 (CONTINUED).

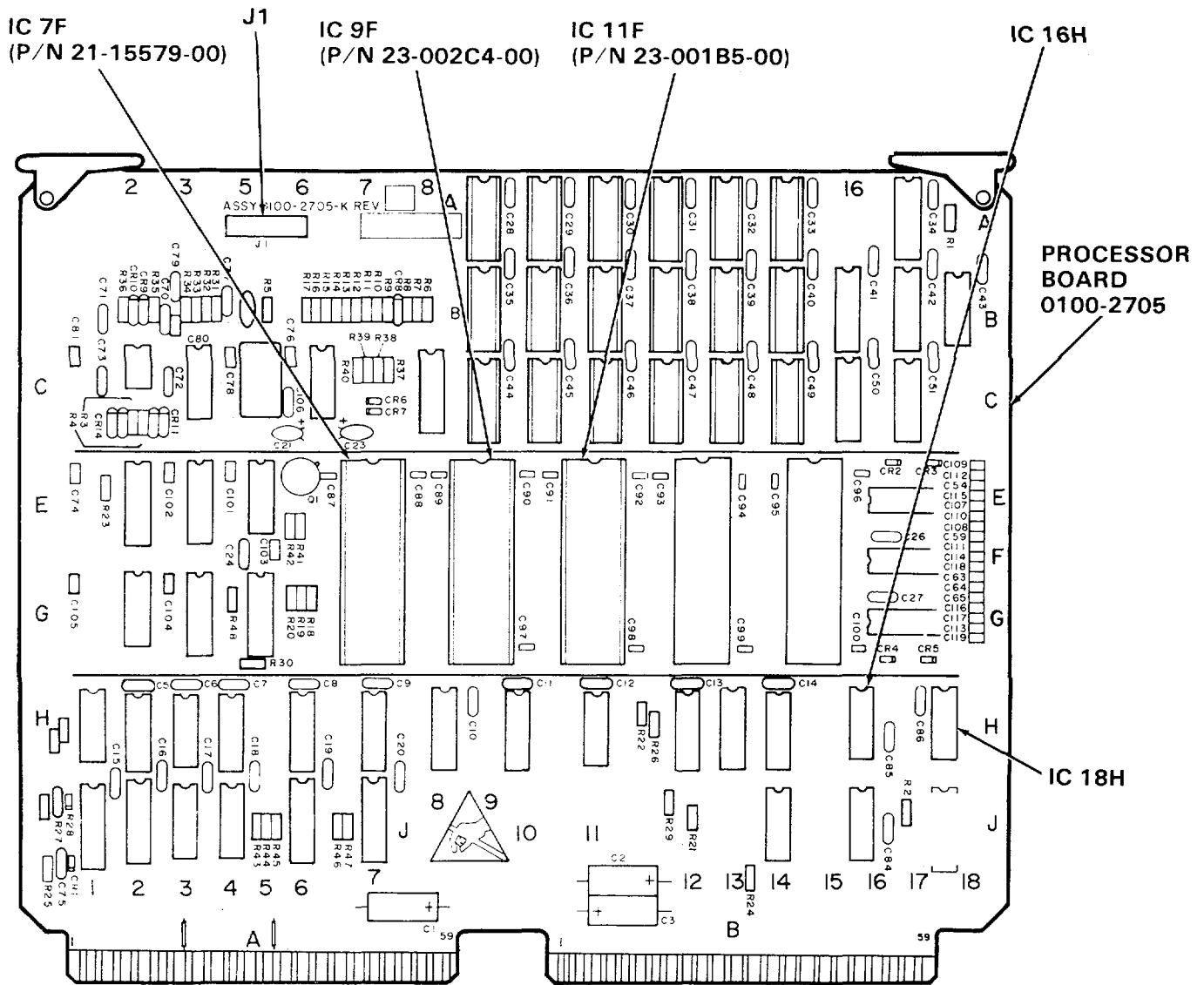


Figure 2-5. Cable Connection Points and Components Used During Processor Board Test (Sheet 1 of 2)

2-12. PROCESSOR BOARD 0100-2705 (CONTINUED).

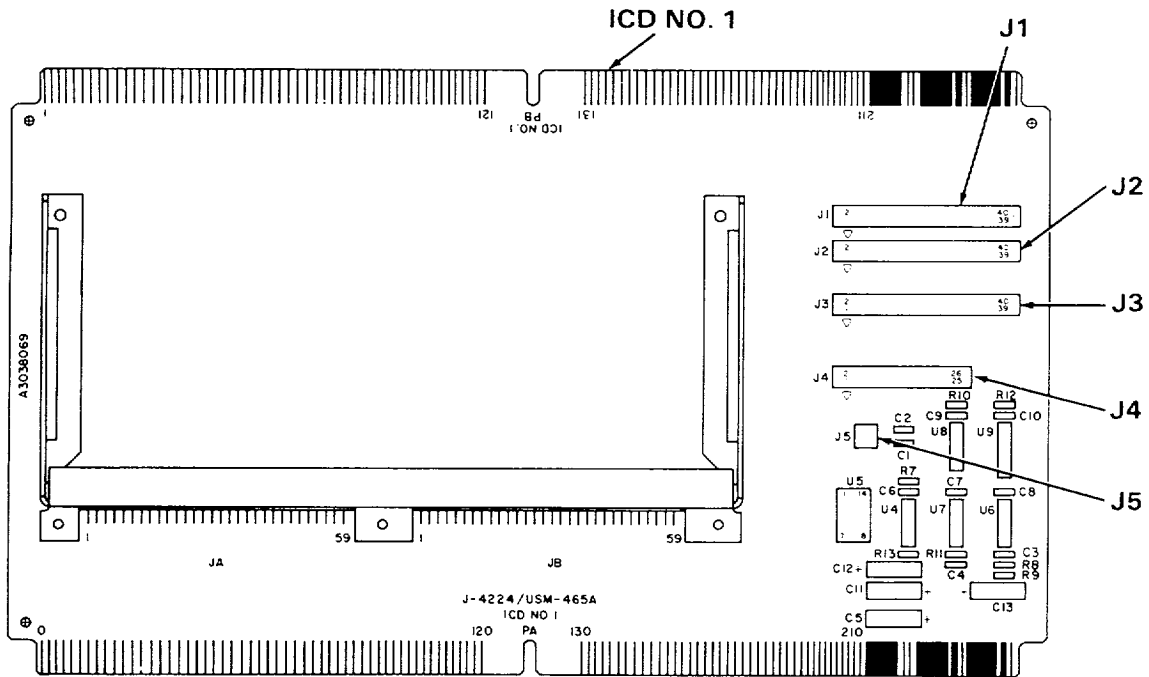


Figure 2-5. Cable Connection Points and Components Used During Processor Board Test (Sheet 2 of 2)

(9) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5). Then return to step (10), below.

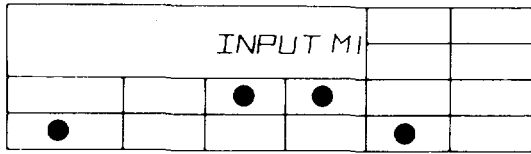
(10) Enter EXECUTE . Follow instructions on paper tape until the following appear:

```

>5
>*****
>** 0100-2705 **
>** REV K **
>*****
>
>
>*****
>THREE TASKS
>*****
>
>IF PART NUMBERS
>OR SHUNTS ARE
>NOT RIGHT.
>
>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
>
>*****
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
    
```

2-12. PROCESSOR BOARD 0100-2705
(CONTINUED).

(10) (Continued)



WARNING

Voltage is applied to UUT during step (11) below. Do not touch UUT until "READY" appears on the display panel.

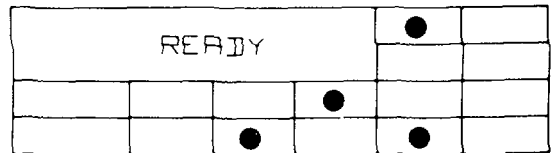
NOTE

If the test program does not behave as shown in step (11), go to step (17).

NOTES ON TEST SETUP

- The test program will generate a message on the paper tape during step (11) if boards are not installed correctly. Perform steps (6) through (8) again, then test the UUT per step (16) below.
- If cables are not installed correctly, the test program will run and a NO GO message will appear on the paper tape (see step (17), below). Check cable connections per step (7), above, then test the UUT per step (16) below.

(11) Enter **EXECUTE**. The test program runs automatically. The board passes if the following display and printout appear:



```

>*** ALL TESTS GO ***
>
>*****
>
>REMOVE UUT AND
INSTALL NEXT UUT TO
BE TESTED AND
PERFORM UUT SETUP
PROCEDURE IN
TM11-6625-3038-40 OR
GR2225-141-PM4
>
>*****
>END LINE 32767
    
```

(12) Disconnect cable set only from processor board if next UUT is identical. Otherwise, disconnect cables from both the UUT and ICD.

CAUTION

Use extreme caution when removing UUT from ICD. Otherwise, UUT or ICD may be damaged.

- (13) Remove boards from DCT as follows:
- Remove ICD and UUT from DCT as a unit.
 - Using pry bar, carefully remove UUT from ICD.
- (14) Reinstall IC chips 7F, 9F, and 11F onto processor board. Remove and discard tags.
- (15) Perform steps (6) through (8) for next UUT to be tested.

2-12. PROCESSOR BOARD 0100-2705 (CONTINUED).

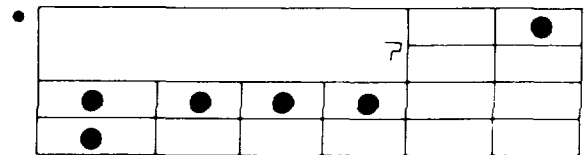
(16) Enter   . The

test program will run automatically for the next board. Refer to step (11) for board pass indications.

NOTE

Read NOTES ON FAULT DIAGNOSTICS before beginning probing sequence.

(17) If a board fails, the DCT will identify the fault immediately or supply probing instructions to isolate the fault. Enter header information in accordance with TM 11-6625-3038-10 if the following display and printout (typical) appear:





```

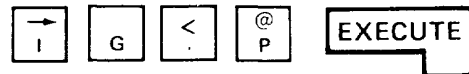
>***** NO GO *****
>T2705I2.IMG XXXXXX
I
>FAULT AT LINE 10250
> PIN PB.30
>173744 PB.30
>TYPE HEADER INFO
    
```


(18) If applicable, follow probing instructions on paper tape in accordance with TM 11-6625-3038-10 to isolate faulty component(s). Probing will continue until the probable fault is listed on the printer. A load list may also be printed.


NOTES ON FAULT DIAGNOSTICS

- During the ROM CELL TEST module the program will only list the column and pin number for failing IC chips. Check the printer tape to see which row was being tested at the time of failure. For example, a failure at "9.12" during the ROW B test identifies pin 12 of the IC chip at location 9B.
- During the ROM ADDRESS test, if the DCT prints out probing instructions at U17B, connect guided probe to the corresponding pins on IC 17B.
- If you are instructed to probe at edge connector pins you may consult the board schematic diagram (refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTARY DATA, below) and probe the affected input/output node rather than the edge pin.
- Follow probing instructions on printout in accordance with TM 11-6625-3038-10.

• If a load list is not printed, enter  








Then enter the probable fault location and 


The printer will type the load list for that node. Enter  to leave ASIG, P mode.

- Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform steps (12) through (14), above. Attach paper tape to UUT and forward to repair station
- For more information, refer to section c, FAULT DIAGNOSTICS, below.

2-12. PROCESSOR BOARD 0100-2705 (CONTINUED).

b. TEST PROGRAM OPTIONS.

• To rerun a specific part of the test program, enter     . Enter

 for list and select desired option.

- Options 3 through 16 are the individual test modules contained in the main test program.
- Options 17 through 25 are not applicable to the AN/USM-465A.
- Whenever a memory failure occurs, use option 7 to check clock circuit operation.

• Enter      to reset all variables and run a complete test.

c. FAULT DIAGNOSTICS.

- IC chips 7F, 9F, and 11 F are not tested during program execution. If the UUT fails in the system yet passes the test, replace the three chips with chips from a known-good board and check for proper operation in the system.
- If the UUT fails in the system after replacement of a bistable component (flip-flop or counter), the fault may be in the load of the component. Refer to the schematic diagrams in APPENDIX B and check the load on both outputs of the component.
- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - Clean the ICD, UUT, and fold-down adapter pins with 99 percent isopropyl alcohol.
 - Test the ICD in accordance with TM 11-6625-3097-24.
- The test program misdiagnoses certain faults in chips 3C, 3G, and 8C. The following table shows the misdiagnosed faults and their corresponding actual faults.

<u>DIAGNOSED FAULT</u>	<u>ACTUAL FAULT</u>
3C.7	3C.6
3G.2	3G.3
3G.7	3G.6 or 3G.10
3G.10	3G.11
3G.15	3G.14
PIN TP10	8C.10

2-12. PROCESSOR BOARD 0100-2705 (CONTINUED).

d. SUPPLEMENTARY DATA.

Table 2-6 shows the relationship between the driver/sensor pins and component nodes or edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructs you to probe any pin or node that is inaccessible.

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD (see Figure 2-5).

UUT edge pins in the BOARD CONNECTION column are represented as "A##" or "B##". "A##" pins can be probed at side "A" of the UUT. "B##" pins can be probed at side "B" of the UUT. See Figure 2-5. Locate pins according to the reference numbers printed on the UUT.

Component nodes listed in the BOARD CONNECTION column are represented with the standard component identifiers and pin specifications (for example "U2.3" or "6B.15"). Use Figure 2-5 as necessary to locate probing points on the UUT. Remember that IC chips listed without a row designation, such as "13.10", will be in the row currently being tested. Refer to the paper tape for an "A", "B", or "C" row designation.

Table 2-6. Processor Board Pin Cross-Reference List

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0	A1	40	A41	63	7F.2	86	B11
6	9F.7	41	A42	66	TP2	87	B12
10	9F.9	42	A43	68	TP4	89	B14
12	16H.8	43	A44	69	TP6Y	90	B15
13	18H.8	45	A46	70	TP6	91	B16
16	9F.8	46	A47	71	TP6X	92	B17
17	9F.16	47	A48	72	TP8	93	B18
18	9F.10	48	A49	73	TP14	94	B19
19	9F.19	49	A50	74	TP10	95	B20
20	9F.11	50	A51	75	TP16	96	B21
21	9F.19	51	A52	76	B1	97	B22
22	9F.4	52	A53	77	B2	99	B24
24	A25	53	A54	78	B3	100	B25
25	9F.5	54	A55	79	B4	101	B26
28	9F.6	55	A56	80	B5	102	B27
31	A32	56	A57	81	B6	103	B28
33	A34	57	A58	82	B7	105	B30
35	A36	58	A59	83	B8	106	B31
37	A38	59	A60	84	B9	107	11F.19
39	A40	62	7F.22	85	B10	110	13.10

2-12. PROCESSOR BOARD 0100-2705 (CONTINUED).

Table 2-6. Processor Board Pin Cross-Reference List (Continued)

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
112	13.12	135	7F.6	148	11.10	166	TP1
114	13.11	136	10.12	149	7F.13	167	TP3
120	14.12	137	7F.7	150	11.9	168	TP5
122	14.11	138	10.11	151	7F.14	169	9F.17
125	TP13	139	7F.8	151	12.12	170	9F.12
127	TP15	140	10.10	153	7F.15	171	9F.13
128	9.12	141	7F.9	154	12.11	172	9F.15
129	7F.3	142	10.9	155	7F.16	173	9F.14
130	9.11	143	7F.10	156	12.10	176	7F.40
131	7F4	144	11.12	157	7F.17	177	7F.1
132	9.10	145	7F.11	158	12.9	178	7F.21
133	7F.5	146	11.11	159	7F.18	179	7F.20
134	9.9	147	7F.12	165	13.9		

2-13. REFERENCE BOARD 0100-2708.

a. MAIN TEST PROCEDURE.

CAUTION

This equipment contains parts sensitive to damage by ELECTROSTATIC DISCHARGE (ESD). Use ESD precautionary procedures when touching, removing, or inserting parts or assemblies. Review DOD-HDBK-263 for proper handling instructions.

PRETEST NOTES

- Before proceeding, ensure that you have the correct part numbers on the ICD and TPS tape cartridge for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- Ensure that the ICD has been tested in accordance with TM 11-6625-3097-24 if it is being used for the first time today.
- Proceed to step **(3)** if all applicable PMCS have already been performed on the DCT.

2-13. REFERENCE BOARD 0100-2708 (CONTINUED).

- (1) Prepare the DCT for use and perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.

WARNING

Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.

NOTE

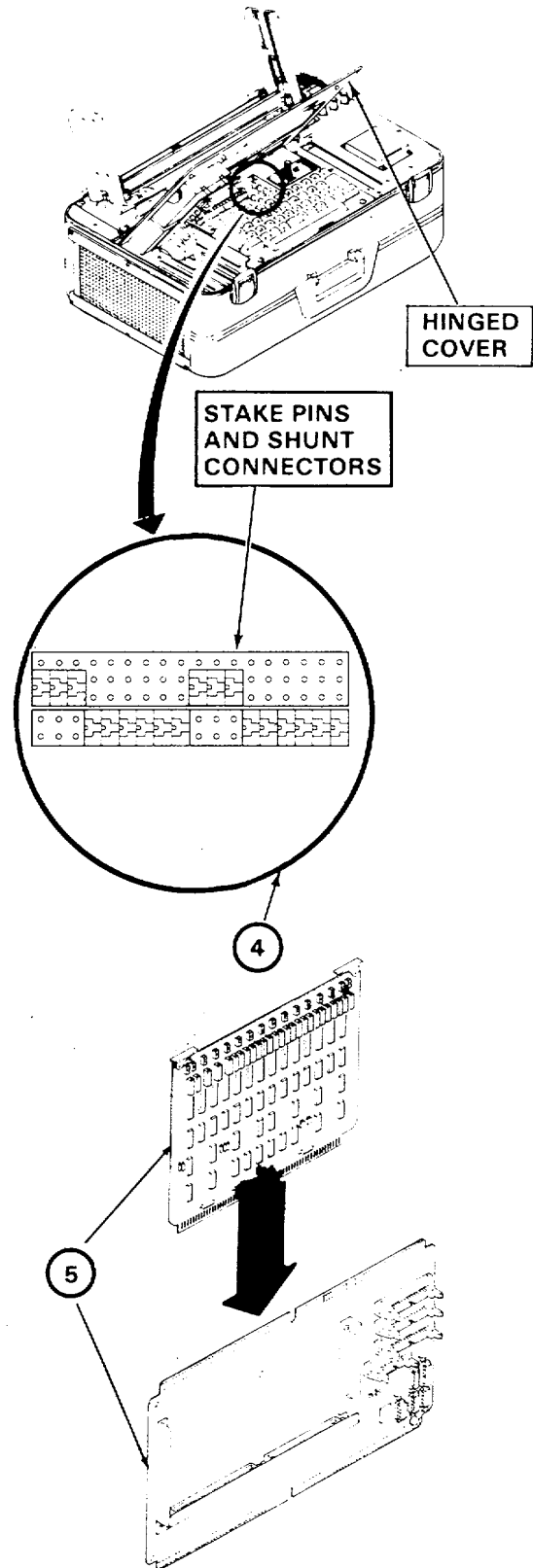
Ensure that UUT seats firmly in the ICD during step (5). If UUT is firmly seated, visible length of the board connector pins should be no more than 1/8 inch.

- (5) Install reference board 0100-2708 into ICD NO. 1 SIDE PA (P/N A3038069).

NOTE

Ensure that the ICD is left-justified in fold-down adapter.

- (6) Install ICD and UUT into DCT fold-down adapter as a unit.
- (7) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5). Then return to step (8) below.



2-13. REFERENCE BOARD 0100-2708
(CONTINUED).

WARNING

(8) Enter **& 6** **EXECUTE** . Follow instructions on paper tape until the following appear:

Voltage is applied to UUT during step (9), below. Do not touch UUT until "READY" appears on the display panel.

NOTE

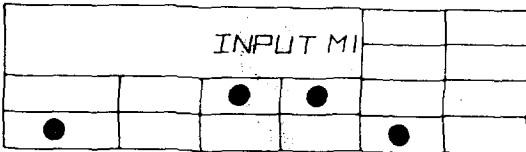
If the test program does not behave as shown in steps (9) and (10) go to step (14).

(9) Enter **EXECUTE** . The test program runs automatically.

```
>6
>*****
>** 0100-2708 **
>** REV H **
>*****
>
>
>*****
>TWO TASKS
>*****
```

```
>
>IF PART NUMBERS
>OR SHUNTS ARE
>NOT RIGHT.
>
>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
>
>*****
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
```

```
>T2708P1 *****
>*** PERFORMANCE ***
>***** TESTS *****
>T270813 *****
I
>*****
>USE A AN/PSM-45 OR
>EQUIVALENT DIGITAL
VOLTMETER.
>
>VOLTAGE MEASUREMENTS
ARE TO BE MADE AT
THE TEST POINTS
INDICATED IN THE
PROGRAM.
>
>CONNECT COMMON LEAD
FROM DVM TO TP16 ON
THE REFERENCE BOARD
UNDER TEST.
>
>PRESS EXECUTE TO
CONTINUE
```



2-13. REFERENCE BOARD 0100-2708
(CONTINUED).

(9) (Continued)

NOTES

- The test program will generate a message on the paper tape during step (9) if boards are not installed correctly. Perform steps (5) and (6) again, then test the UUT per step (13), below.
- Although the test program runs automatically, the test procedures will require you to adjust the board rimming potentiometers to provide certain test voltages (see Figure 2-6). These adjustments must be made so that a good board can pass the linearity and probe tests. These adjustments are for test purposes only and not for operational use. The board must be readjusted in the system according to TM 11-6625-3038-20.

(10) Follow instructions on paper tape (see Figure 2-6). The UUT passes if the following display and printout appear:

READY				●	
			●		
		●		●	

```

>SEE TM
  11-6625-3038-20 FOR
  SYSTEM ADJUSTMENT
>
>*****
>*** ALL TESTS GO ***
>
>*****
>
>REMOVE UUT AND
  INSTALL NEXT UUT TO
  BE TESTED AND
  PERFORM UUT SETUP
  PROCEDURE IN
  TM11-6625-3038-40 OR
  GR2225-141-PM4
>
>*****
>END LINE 32767
  
```

CAUTION

Use extreme caution when removing boards from ICD. Otherwise, boards or ICD may be damaged.

(11) Remove boards from DCT as follows:

- Remove ICD and UUT from DCT as a unit.
- Using pry bar, carefully remove UUT from ICD.

NOTE

To shut down the DCT, refer to TM 11-6625-3038-10. To test another, identical UUT, proceed as follows.

(12) Perform steps (5) and (6) for next UUT (reference board) to be tested.

(13) Enter



Perform test again, starting with step (9).

2-13. REFERENCE BOARD 0100-2708 (CONTINUED).

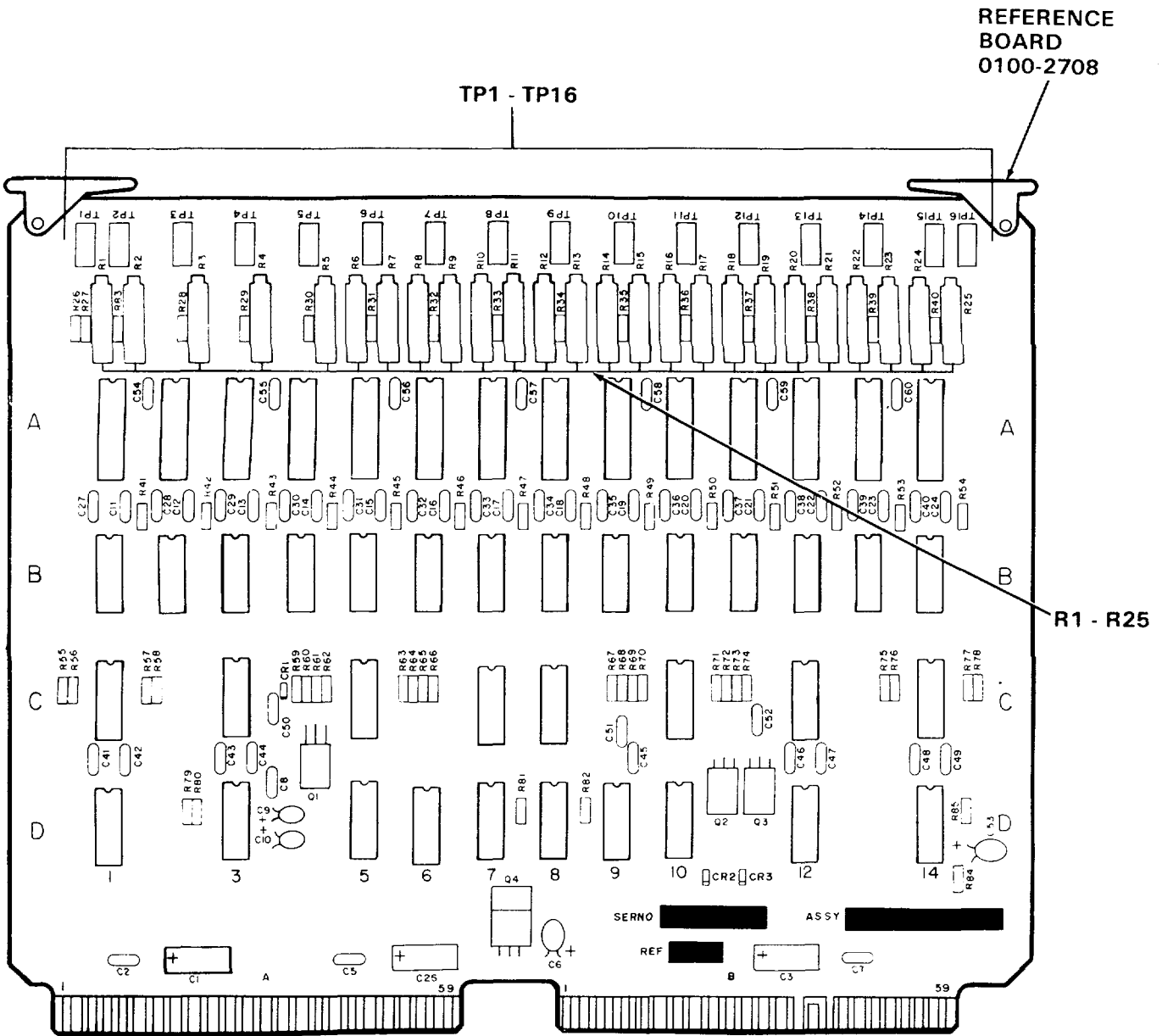
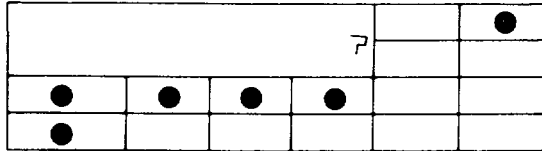


Figure 2-6. Components Used During Reference Board Test

2-13. REFERENCE BOARD 0100-2708
(CONTINUED).

(14) If a board fails, the DCT will identify the fault immediately or supply probing instructions to isolate the fault. Enter header information in accordance with TM 11-6625-3038-10 if the following display and printout (typical) appear:



```

>***** NO GO *****
>T278312.IMG XXXXXX
I
>FAULT AT LINE 10250
> PIN PB.30
>173744 PB.30
>TYPE HEADER INFO
    
```

(15) If applicable, follow probing instructions on paper tape in accordance with TM 11-6625-3038-10 to isolate faulty component(s). Probing will continue until the probable fault is listed on the printer. A load list may also be printed.

NOTES ON FAULT DIAGNOSTICS

- If a load list is not printed, enter A S

→ I G < @ P EXECUTE

Then enter the probable fault location and EXECUTE. The printer will type the load list for that node. Enter ATTN to leave ASIG, P mode.


- Follow probing instructions on printout in accordance with TM 11-6625-3038-10.
- Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform step (11). Forward UUT to repair station with paper tape.
- For more information, refer to FAULT DIAGNOSTICS below.

- If you are instructed to probe at edge connector pins, you may consult the board schematic diagram (refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTARY DATA, below) and probe the affected input/output node rather than the edge pin.

2-13. REFERENCE BOARD 0100-2708 (CONTINUED).

b. TEST PROGRAM OPTIONS.

- To rerun a specific part of the test program, enter      .Enter

 for list and select desired option.

- Options 3 through 8 are the individual test modules contained in the main test program.
- Options 9 and 10 are not applicable to the AN/USM-465A.

- Enter      to reset all variables and run a complete test.

c. FAULT DIAGNOSTICS.

- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - Clean the ICD, UUT, and fold-down adapter pins with 99 percent isopropyl alcohol.
 - Test the ICD in accordance with TM 11-6625-3097-24.
- If the UUT fails in the system after replacement of a bistable component (flip-flop or counter), the fault may be in the load of the component. Refer to the schematic diagrams in APPENDIX B and check the load on both outputs of the component.

d. SUPPLEMENTARY DATA.

Table 2-7 shows the relationship between the driver/sensor pins and component nodes or edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructs you to probe any pin or node that is inaccessible.

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD.

UUT edge pins in the BOARD CONNECTION column are represented as "A.###" or "B.###". "A.###" pins can be probed at side "A" of the UUT. "B.###" pins can be probed at side "B" of the UUT. See Figure 2-6. Locate pins according to the reference numbers printed on the UUT.

2-13. REFERENCE BOARD 0100-2708 (CONTINUED).

Table 2-7. Reference Board Pin Cross-Reference List

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0	A.1	27	A.28	43	A.44	92	B.13
1	A.2	29	A.30	45	A.46	93	B.18
2	A.3	31	A.32	47	A.48	96	B.21
3	A.4	32	A.5	48	A.49	109	B.34
5	A.6	33	A.34	49	A.50	111	B.36
7	A.8	34	B.23	50	A.51	113	B.38
9	A.40	35	A.36	62	B.30	115	B.40
11	A.12	37	A.38	86	B.11	117	B.42
23	A.24	41	A.42	88	B.13	160	B.24

2-14. PRINTER DRIVER BOARD 0100-2723.

a. MAIN TEST PROCEDURE.

CAUTION

This equipment contains parts sensitive to damage by **ELECTROSTATIC DISCHARGE (ESD)**. Use ESD precautionary procedures when touching, removing, or inserting parts or assemblies. Review DOD-HDBK-263 for proper handling instructions.

PRETEST NOTES

- Before proceeding, ensure that you have the correct part numbers on the ICD, TPS tape cartridge, cable set, and adapter board for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- Ensure that the ICD, cable set, and adapter board have been tested in accordance with TM 11-6625-3097-24 if they are being used for the first time today.
- Proceed to step **(3)** if all applicable PMCS have already been performed on the DCT.

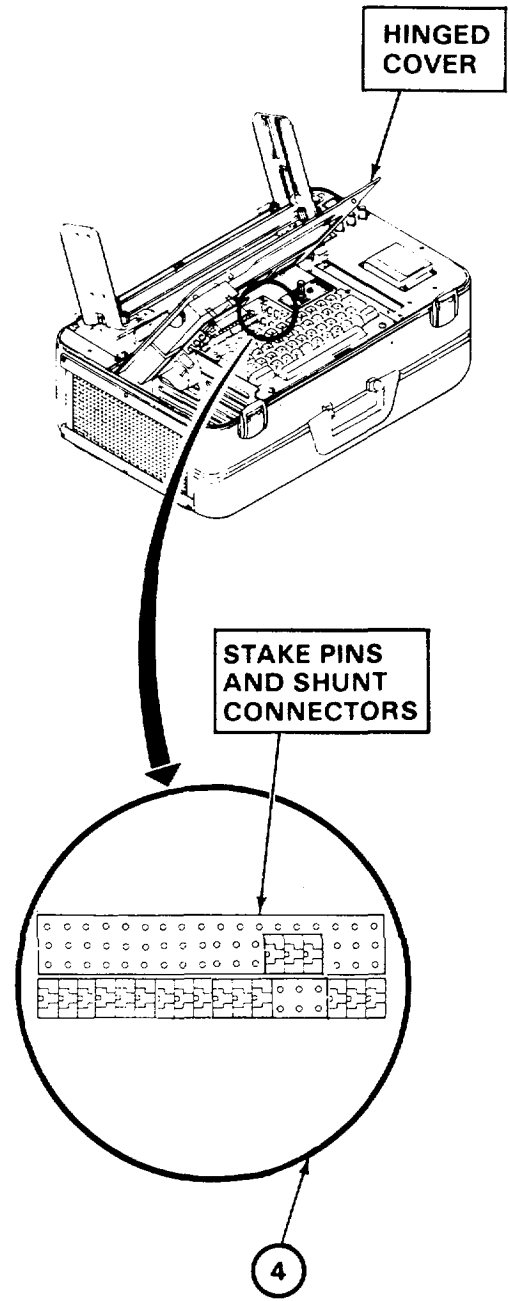
2-14. PRINTER DRIVER BOARD 0100-2723 (CONTINUED).

- (1) Prepare the DCT for use and perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.

WARNING

Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.
- (5) Mount printer driver board 0100-2723 on ADAPTER FOR 0100-2723 (P/N A3038041) with the UUT connector J1 to the left.



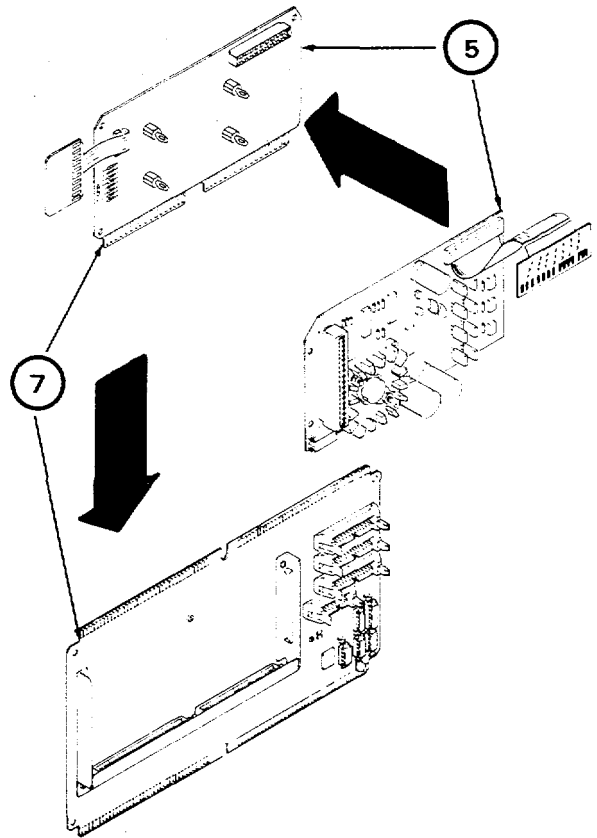
2-14. PRINTER DRIVER BOARD 0100-2723 (CONTINUED).

- (6) Insert adapter board J2 cable connector into J1 on the UUT with the red wire to the top. Connect UUT ribbon cable to J1 on the adapter board with red wire to the right. See Figure 2-7.

NOTE

Ensure that adapter board seats firmly in the ICD during step (7) if board is firmly seated, visible length of the board connector pins should be no more than 1/8 inch.

- (7) Install adapter board into ICD NO. 1 SIDE PA (P/N A3038069).
- (8) Connect brown wire grabber on CABLE SET FOR 0100-2723 (P/N A3038036-2) to IC chip 1A, pin 9, on the UUT. See Figure 2-7.
- (9) Connect other end of cable set to J5 on the ICD. Place empty connector slot on pin 4 of J5. See Figure 2-7.
- (10) Adjust R8 on the UUT to 2.7 K ohms \pm 100 ohms using AN/PSM-45 or equivalent DMM. Connect DMM common lead to GND pin of the ICD and DMM ohm lead to D/S pin 42 of the ICD. See Figure 2-7.



NOTE

Ensure that ICD is left-justified in DCT fold-down adapter.

- (11) Install ICD and UUT into DCT fold-down adapter as a unit.
- (12) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5). Then return to step (13), below.

2-14. PRINTER DRIVER BOARD 0100-2723 (CONTINUED).

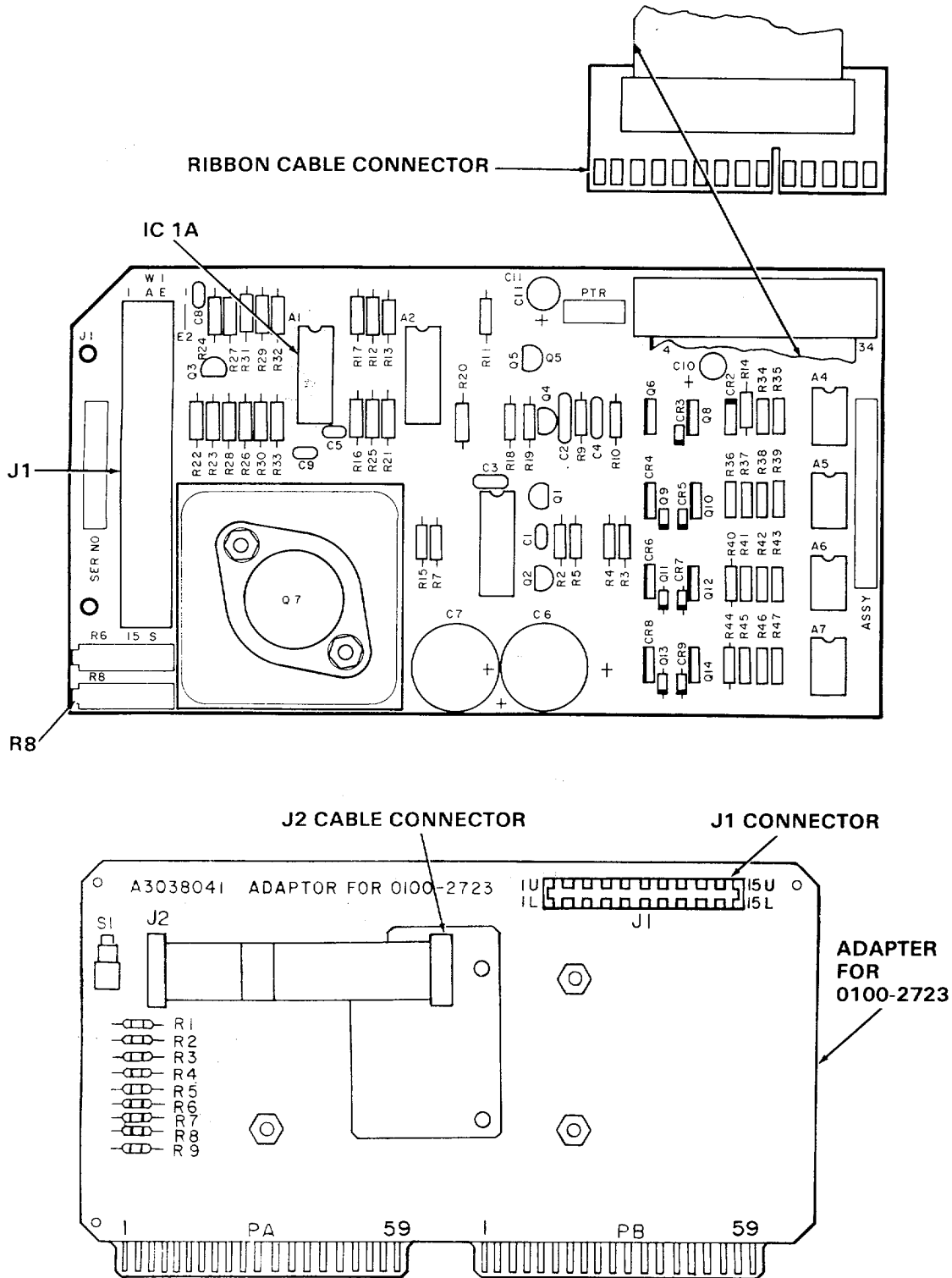


Figure 2-7. Cable Connection Points and Components Used During Printer Drive Board Test (Sheet 1 of 2)

2-14. PRINTER DRIVER BOARD 0100-2723 (CONTINUED).

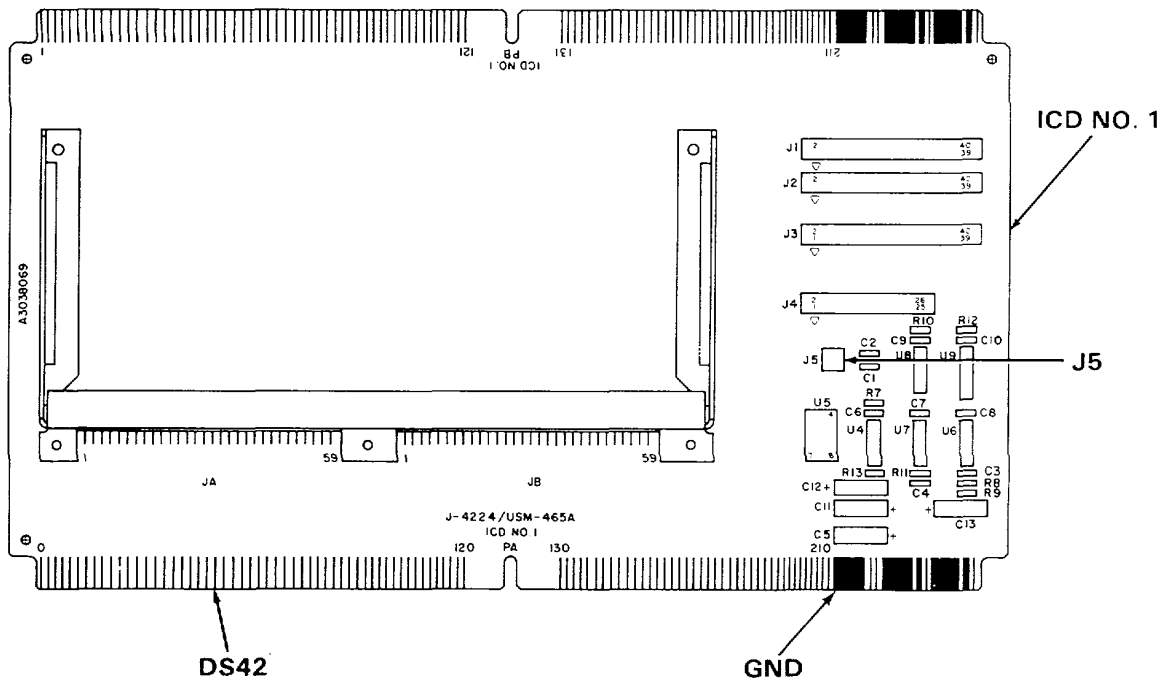


Figure 2-7. Cable Connection Points and Components Used During Printer Drive Board Test (Sheet 2 of 2)

(13) Enter 7 EXECUTE . Follow instructions

on paper tape until the following appear:

```

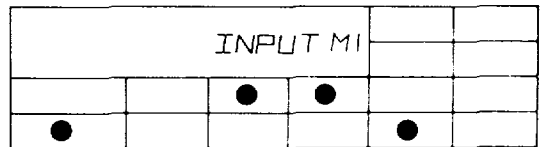
>7
>*****
>** 0100-2723 **
>** REV D **
>*****
>
>
>*****
>FOUR TASKS
>*****
    
```

```

>
>IF PART NUMBERS
>OR SHUNTS ARE
>NOT RIGHT.
    
```

```

>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
>
>*****
>
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
    
```



2-14. **PRINTER DRIVER BOARD 0100-2723 (CONTINUED).**

WARNING

Voltage is applied to UUT during step (14), below. Do not touch UUT until "READY" appears on the display panel.

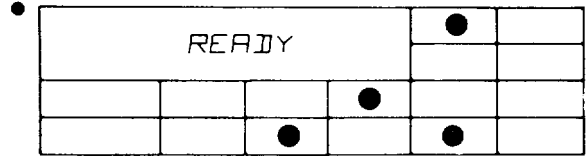
NOTE

If the test program does not behave as shown in step (14), go to step (19).

NOTES ON TEST SETUP

- The test program will generate a message on the paper tape during step (14) if boards are not installed correctly. Perform steps (5) through (11) again, then test the UUT per step (18), below.
- If cables are not installed correctly, the test program will run and a NO GO message will appear on the paper tape (see step (19), below). Check cable connections per steps (8) and (9), above, then test the UUT per step (18), below.

(14) Enter **EXECUTE** . The test program runs automatically. Perform instructions on paper tape. The UUT passes if the following display and printout appear:



```

>*** ALL TESTS GO ***
>
>*****
>
>REMOVE UUT AND
INSTALL NEXT UUT TO
BE TESTED AND
PERFORM UUT SETUP
PROCEDURE IN
TM11-6625-3038-40 OR
GR2225-141-PM4
>
>*****
>END LINE 32767
    
```

(15) Disconnect cable set only from printer driver board if next UUT is identical. Otherwise, disconnect cables from both the UUT and ICD.




CAUTION

Use extreme caution when removing UUT from ICD. Otherwise, UUT or ICD may be damaged.

- (16) Remove boards from DCT as follows:
- Remove ICD, adapter board, and UUT from DCT as a unit.
 - Disconnect and separate printer driver board from adapter board.
 - Using pry bar, carefully remove adapter board from ICD. Disregard this step if next UUT is identical.

2-14. PRINTER DRIVER BOARD 0100-2723 (CONTINUED).

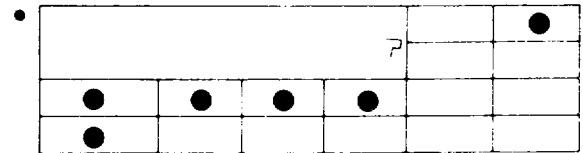
(17) Perform steps (5) through (11) for next UUT to be tested.

(18) Enter   . The test program will run automatically for the next UUT. Refer to step (14) for board pass indications.

NOTE

Read NOTES ON FAULT DIAGNOSTICS, below, before beginning probing sequence.

(19) If a board fails, the DCT will identify the fault immediately or supply probing instructions to isolate the fault. Enter header information in accordance with TM 11-6625-3038-10 if the following display and printout (typical) appear:












```

>***** NO GO *****
>T2723I2-ING *****
  |
>FAULT AT LINE 10250
> PIN PG.30
>I73744 PB.30
>TYPE HEADER INFO
  
```

(20) If applicable, follow probing instructions on paper tape in accordance with TM 11-6625-3038-10 to isolate faulty component(s). Probing will continue until the probable fault is listed on the printer. A load list may also be printed.

NOTES ON FAULT DIAGNOSTICS

- If transistor 03, pin C (03.C) is listed as the probable fault, the problem may actually be at IC 1A pins 1 or 2 (A1.1 or A1.2) or at pin B of 03. Remove and replace IC 1A and transistor 03.


- If a load list is not printed, enter       . Then enter the probable fault location and . The printer will type the load list for that node. Enter  to leave ASIG, P mode.

- If you are instructed to probe at edge connector pins you may consult the board schematic diagram (refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTARY DATA, below) and probe the affected input/output node rather than the edge pin.
- Follow probing instructions on printout in accordance with TM 11-6625-3038-10.
- Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform steps (15) and (16), above. Forward UUT to repair station with paper tape.
- For more information refer to FAULT DIAGNOSTICS, below.

2-14. PRINTER DRIVER BOARD 0100-2723 (CONTINUED).

b. TEST PROGRAM OPTIONS.

- To rerun a specific part of the test program, enter      . Enter

 for list and select desired option.

- Options 3 through 7 are the individual test modules contained in the main test program.
- Options 8 through 11 are not applicable to the AN/USM-465A.

- Enter      to reset all variables and run a complete test.

c. FAULT DIAGNOSTICS.

- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - Clean the ICD, UUT and fold-down adapter pins with 99 percent isopropyl alcohol.
 - Test the ICD in accordance with TM 11 -6625-3097-24.
- If the UUT fails in the system after replacement of a bistable component (flip-flop or counter), the fault may be in the load of the component. Refer to the schematic diagrams in APPENDIX B and check the load on both outputs of the component

d. SUPPLEMENTARY DATA.

Table 2-8 shows the relationship between the driver/sensor pins and component nodes or edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructs you to probe any pin or node that is inaccessible.

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD (see Figure 2-7).

UUT edge pins in the BOARD CONNECTION column are represented as "PB.##". "PB.##" pins can be probed at PB on the adapter board See Figure 2-7. Locate pins according to the reference numbers printed on the adapter board.

Component nodes listed in the BOARD CONNECTION column are represented with the standard component identifiers and pin specifications (for example, "U23" or "68.15"). Pins followed by "U" or "L", such as "3L", are located on the upper (U) or lower (L) row of the J1 connector on the adapter board. Use Figure 2-7 as necessary to locate probing points.

2-14. **PRINTER DRIVER BOARD 0100-2723 (CONTINUED).**

Table 2-8. *Printer Driver Board Pin Cross-Reference List*

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0	1L	24	11U	128	PB.14
2	2L	26	12U	129	PB.4
4	1U	28	13U	130	PB.8
6	4L	30	14U	131	PB.9
8	3L	33	PB.1	132	PB.10
10	6L	36	PB.2	133	PB.11
13	A1.9	38	PB.3	134	PB.12
18	8U	42	PB.7	135	PB.13
20	9U	46	PB.5		
22	10U	48	7U		

2-15. **PERIPHERAL BOARD 0100-2724.**

a. **MAIN TEST PROCEDURE.**

CAUTION

This equipment contains parts sensitive to damage by **ELECTROSTATIC DISCHARGE (ESD)**. Use ESD precautionary procedures when touching, removing, or inserting parts or assemblies. Review DOD-HDBK-263 for proper handling instructions.

PRETEST NOTES

- Before proceeding, ensure that you have the correct part numbers on the ICD, TPS tape cartridge, and cable set for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- Ensure that the ICD and cable set have been tested in accordance with TM 11-6625-3097-24 if they are being used for the first time today.
- Proceed to step **(3)** if all applicable PMCS have already been performed on the DCT.

2-15. PERIPHERAL BOARD 0100-2724 (CONTINUED).

- (1) Prepare the DCT for use and perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.

WARNING

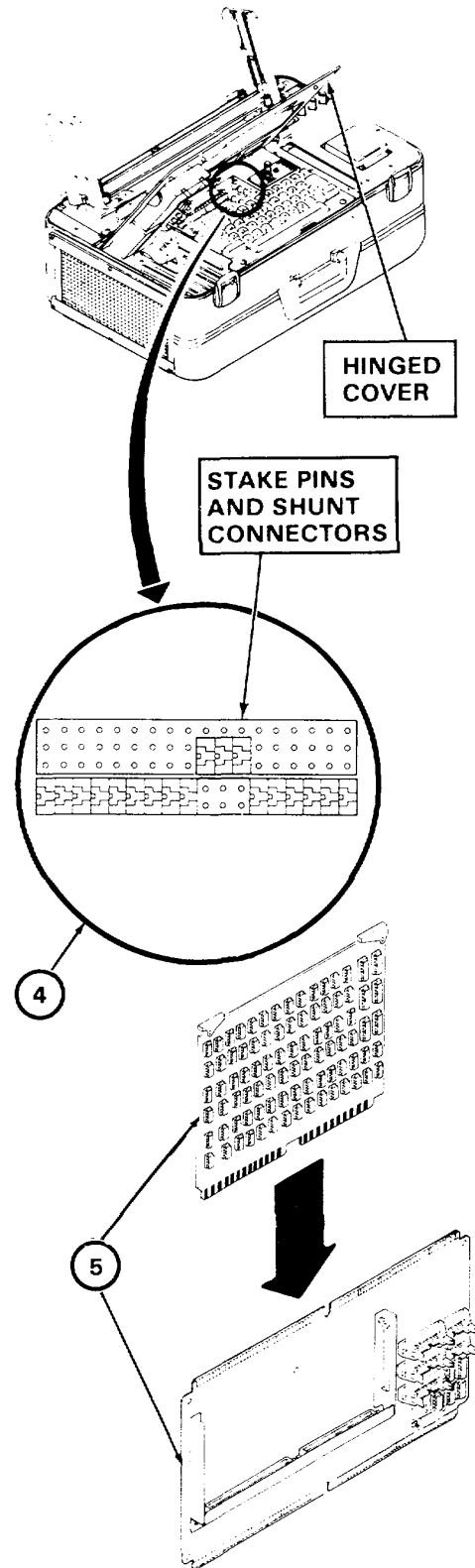
Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.

NOTE

Ensure that UUT seats firmly in adapter board during step (5). If UUT is firmly seated, visible length of the board connector pins should be no more than 1/8 inch.

- (5) Install peripheral board 0100-2724 into ICD NO. 2 SIDE PA (P/N A3038070).



2-15. PERIPHERAL BOARD 0100-2724 (CONTINUED).

NOTE

Refer to paragraph 2-6, USE OF CABLE SETS (page 2-4) before performing test cable hookup.

- (6) Connect CABLE SET FOR 0100-2724 (P/N A3038037-2) to the UUT and ICD according to destination markings on clamp attached to each cable (see Figure 2-8). Perform the following steps using the designated cable or wire:
 - a. Place three-wire plug on J11 (ICD).
 - b. Place brown wire grabber on IC 7B, pin 5 (UUT).
 - c. Place red wire grabber on IC 7B, pin 3 (UUT).
 - d. Connect IC 8B (UUT) to J8 (ICD).
 - e. Connect IC 10A (UUT) to J7 (ICD).
 - f. Connect TP connector (UUT) to J6 (ICD). Place red wire on cable to blank pin on connector.
 - g. Connect IC 11C (UUT) to J10 (ICD).
 - h. Connect IC 12C (UUT) to J9 (ICD).

NOTE

Ensure that the ICD is left-justified in fold-down adapter.

- (7) install UUT and ICD into DCT fold-down adapter as a unit.
- (8) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5). Then return to step (9), below.

- (9) Enter

8

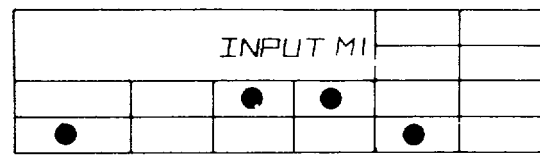
 EXECUTE . Follow instructions on paper tape until the following appear:

```

>@
>*****
>** 0100-2724 **
>** REV K **
>*****
>
>
>*****
>THREE TASKS
>*****
    
```

```

>IF PART NUMBERS
>OR SHUNTS ARE
>NOT RIGHT.
>
>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
>
>*****
>
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
>
    
```



2-15. PERIPHERAL BOARD 0100-2724 (CONTINUED).

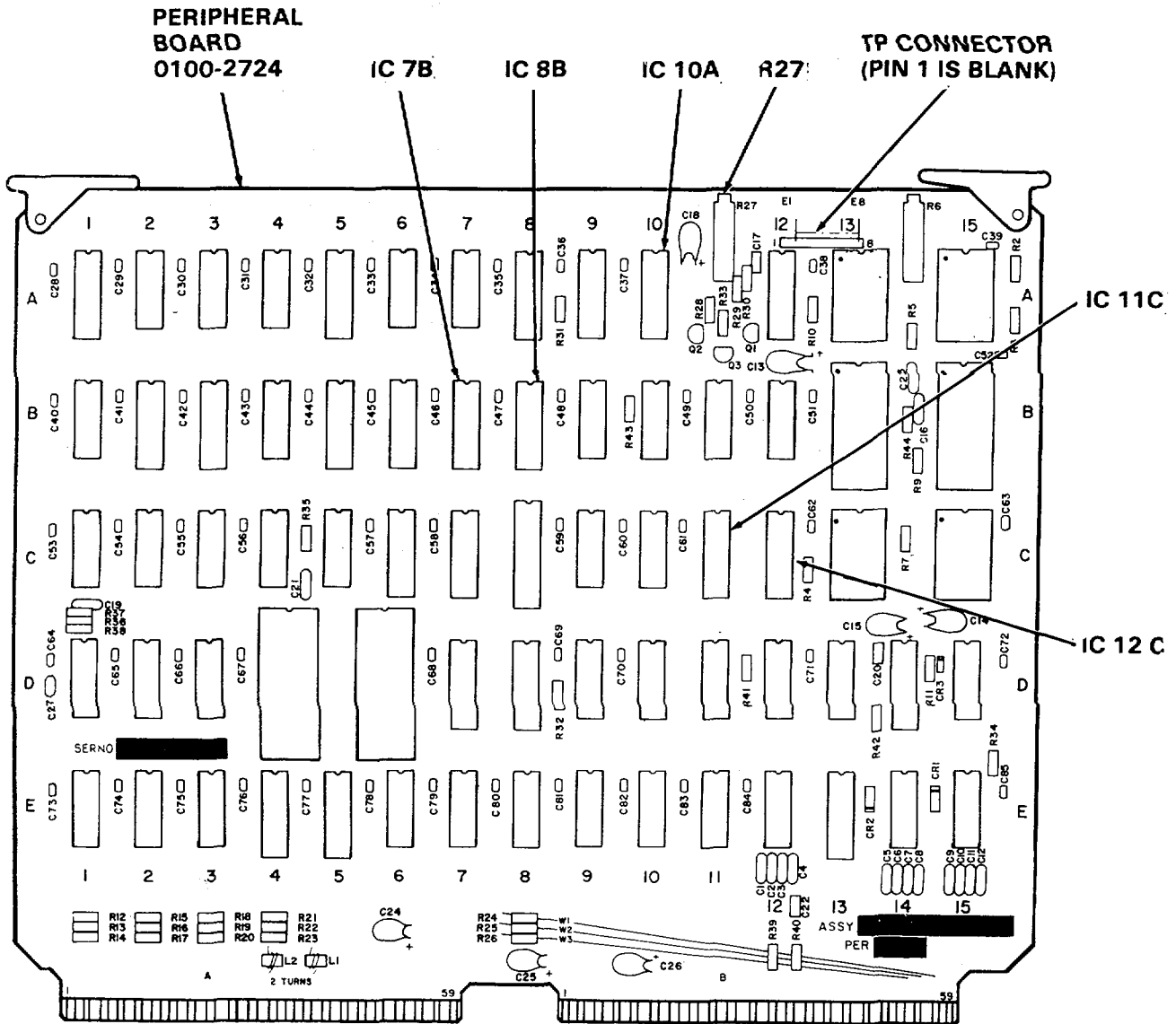


Figure 2-8. Cable Connection Points for Peripheral Board Test (Sheet 1 of 2)

2-15. PERIPHERAL BOARD 0100-2724 (CONTINUED).

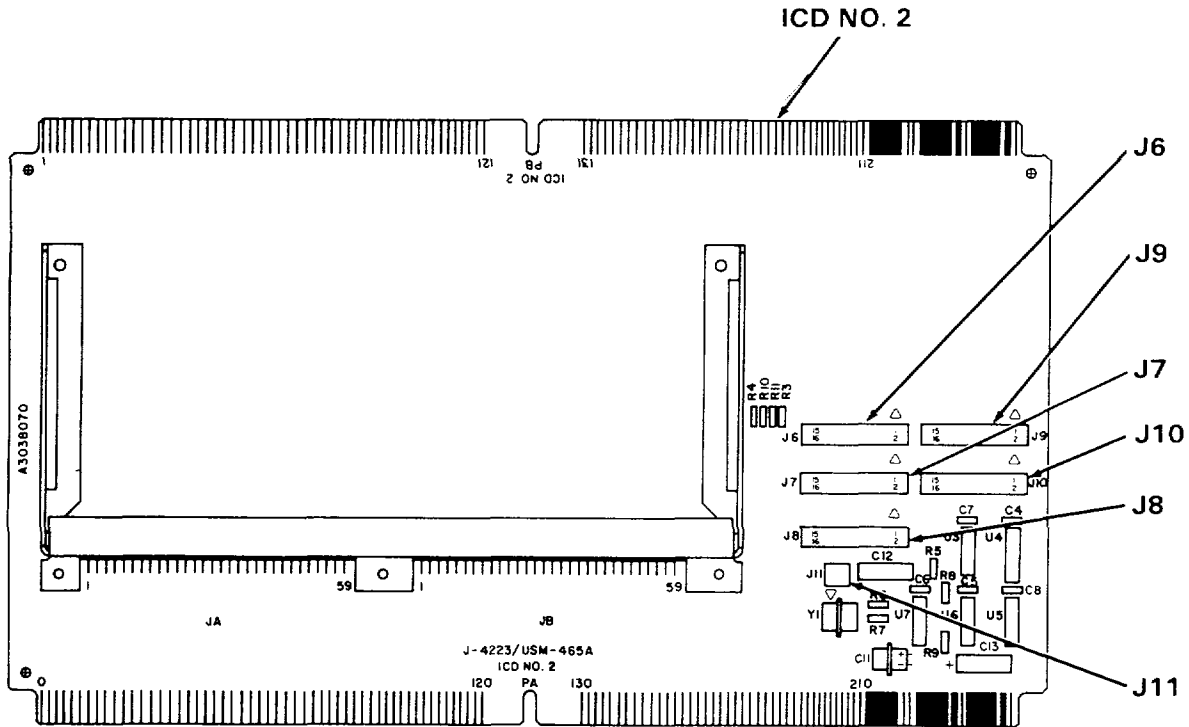


Figure 2-8. Cable Connection Points for Peripheral Board Test (Sheet 2 of 2)

WARNING

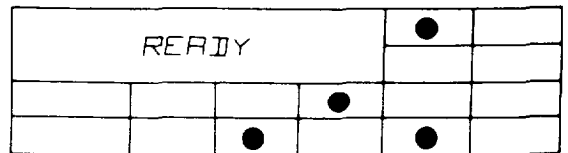
Voltage is applied to UUT during step (10) below. Do not touch UUT until "READY" appears on the display panel.

NOTE

If the test program does not behave as shown in step (10), go to step (16).

(10) Enter **EXECUTE**. The test program runs

automatically. The board passes if the following display and printout appear:



```

>*** ALL TESTS GO ***
>
>*****
>
>REMOVE UUT AND
INSTALL NEXT UUT TO
BE TESTED AND
PERFORM UUT SETUP
PROCEDURE IN
TM11-6625-3038-40 OR
GR2225-141-PM4
>
>*****
>END LINE 32767
    
```

2-15. PERIPHERAL BOARD 0100-2724 (CONTINUED).


NOTE

NOTES ON TEST SETUP


- The test program will generate a message on the paper tape during step (10) if boards are not installed correctly. Perform steps (5) through (7) again, then test the UUT per step (15), below.
- If cables are not installed correctly, the test program will run and a NO GO message will appear on the paper tape (see step (16), below). Check cable connections per step (6), above, then test the UUT per step (15), below.

To shut down the DCT, refer to TM 11-6625-3038-10. To test another, identical UUT, proceed as follows.

(11) Enter    

 and run program option 23.

Follow instructions on paper tape. Refer to section b, TEST PROGRAM OPTIONS, for information on use of the RUN 10 command.

Enter  when the adjustment is complete.




(12) Disconnect cable set only from the UUT if next UUT is identical. Otherwise, disconnect cable set from both UUT and ICD.

CAUTION

Use extreme caution when removing boards from the ICD. Otherwise, boards or ICD may be damaged.

- (13) Remove boards from DCT as follows:
- Remove ICD and UUT from DCT as a unit.
 - Using pry bar, carefully remove UUT from ICD.

(14) Perform steps (5) through (7) for next UUT (peripheral board) to be tested.

(15) Enter   . The test program will run automatically for the next UUT. Refer to step (10) for board indications.

(16) If a board fails, the DCT will identify the fault immediately or supply probing instructions to isolate the fault. Enter header information in accordance with TM 11-6625-3038-10 if the following display and printout (typical) appear:

				7		●
●	●	●	●			
●						

```







>***** NO GO *****
>T2724I2.LIMG XXXXXX
I
>FAULT AT LINE 10250
> PIN PB.30
>173744 PB.30
>TYPE HEADER INFO
    
```

2-15. PERIPHERAL BOARD 0100-2724
(CONTINUED).

NOTE










Read NOTES ON FAULT DIAGNOSTICS, below, before beginning probing sequence.

- (17) If applicable, follow probing instructions on paper tape in accordance with TM 11-6625-3038-10 to isolate faulty component(s). Probing will continue until the probable fault is listed on the printer. A load list may also be printed.

- (18) Enter      and run program option 23. Follow instructions on paper tape. Refer to section b, TEST PROGRAM OPTIONS, for information on use of the RUN 10 command. Enter  when the adjustment is complete.












NOTES ON FAULT DIAGNOSTICS

- Probing points identified by the letter prefix U and/or letter suffix F are located on ICD NO. 2. Example: When instructed to probe U3F.6, pin 6 of IC U3 on the ICD is the indicated node to probe.
- Black box 1 (BB1) is an oscillator circuit mounted on ICD NO. 2 consisting of R7, R6, IC U7, IC U6, and Y1. If printout instructs you to probe BB1.1, connect guided probe to IC U3, pin 1, or IC U2, pin 2, both on the ICD. If BB1 is listed as a probable fault or is contained in the load list when probing is complete, replace all five components contained in the BB1 circuit.
- Black box 2 (BB2) is the timing circuit for IC 12A on the peripheral board. If printout instructs you to probe at BB2.1, probe at IC 12A, pin 1, on the UUT. If instruction points to BB2.2, probe at IC 12A, pin 2, and if instruction points to BB2.3 probe at IC 12A, pin 6.
- If the test program finds a fault at pin 10A.11, resistor R27 may require adjustment. Refer to section c, below, and use RUN 10 option 23 to adjust R27.


- If a load list is not printed, enter        Then enter the probable fault location and  . The printer will type the load list for that node. Enter  to leave ASIG, P mode.
- If you are instructed to probe at edge connector pins you may consult the board schematic diagram (refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTARY DATA, below) and probe the affected input/output node rather than the edge pin.
- Follow probing instructions on printout in accordance with TM 11-6625-3038-10.
- Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform steps (12) and (13), above. Forward UUT to repair station with paper tape.
- For more information, refer to FAULT DIAGNOSTICS, below.

2-15. PERIPHERAL BOARD 0100-2724 (CONTINUED).

b. TEST PROGRAM OPTIONS.

- To rerun a specific part of the test program, enter      . Enter  for list and select desired option.
- Options 3 through 12 are the individual test modules contained in the main test program.
- Options 13 through 22 and option 24 are not applicable to the AN/USM-465A.
- Option 23 is run during the main test procedure and during fault diagnostics. Use of option 23 is described where applicable.
- Enter      to reset all variables and run a complete test.

c. FAULT DIAGNOSTICS.

- If the UUT fails in the system after replacement of a bistable component (flip-flop or counter), the fault may be in the load of the component. Refer to the schematic diagrams in APPENDIX B and check the load on both outputs of the component.
- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - Clean the ICD, UUT, and fold-down adapter pins with 99 percent isopropyl alcohol.
 - Test the ICD in accordance with TM 11-6625-3097-24.
- If a component in timing circuit BB2 is replaced or if a fault occurs at pin 10A.11, use RUN 10 option 23 to adjust potentiometer R27 (refer to section b, above, and follow instructions on paper tape). Enter  when the adjustment is complete.

d. SUPPLEMENTARY DATA.

Table 2-9 shows the relationship between the driver/sensor pins and component nodes or edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructs you to probe any pin or node that is inaccessible.

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD (see Figure 2-8).

UUT edge pins in the BOARD CONNECTION column are represented as "A##" or "B##". "A##" pins can be probed at side "A" of the UUT. "B##" pins can be probed at side "B" of the UUT. See Figure 2-8. Locate pins according to the reference numbers printed on the UUT.

Component nodes listed in the BOARD CONNECTION column are represented with the standard component identities and pin specifications (for example, "U2.3" or "6B.15") Use Figure 2-8 as necessary to locate probing points on the UUT.

2-15. PERIPHERAL BOARD 0100-2724 (CONTINUED).

Table 2-9. Peripheral Board Pin Cross-Reference List

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0	A1	35	A36	108	B33	154	11C.9
1	A2	37	A38	109	B34	155	11C.14
2	A3	39	A40	110	B35	156	11C.10
3	A4	40	E7	111	B36	157	11C.13
4	A5	41	A42	112	B37	158	11C.11
5	A6	43	A44	113	B38	159	11C.12
6	A7	45	A46	114	B39	160	8B.1
7	A8	46	E8	115	B40	162	8B.2
8	A9	47	A48	116	B41	163	8B.15
9	A10	48	A49	117	B42	164	8B.3
10	A11	50	A51	118	B43	165	8B.14
11	A12	54	A55	119	B44	166	8B.4
12	A13	55	A56	120	B45	167	8B.13
13	A14	56	A57	121	B46	168	8B.5
14	A15	58	A59	122	B47	169	8B.12
15	A16	78	B3	123	B48	170	8B.6
16	A17	79	B4	124	B49	171	8B.11
17	A18	83	B8	125	B50	172	8B.7
18	A19	85	B10	126	B51	173	8B.10
19	A20	86	B11	127	B52	174	8B.8
20	A21	90	B15	129	B54	175	8B.9
21	A22	91	B16	131	B56	177	7B.3
22	A23	92	B17	133	B58	179	7B.5
23	A24	93	B18	136	10A.1	181	12C.4
24	A25	94	11C.8	138	10A.2	183	12C.6
25	A26	95	B20	140	10A.3	185	12C.9
26	A27	96	12C.8	144	10A.5	187	12C.10
27	A28	97	B22	145	10A.12	189	12C.12
28	A29	98	B23	147	10A.11	190	12C.14
29	A30	99	B24	148	10A.7	191	12C.13
30	A31	101	B26	150	10A.8		
31	A32	103	B28	151	10A.9		
33	A34	105	B30	152	11C.6		

2-16. TAPE DRIVE INTERFACE BOARD 0100-2736.

WARNING

a. MAIN TEST PROCEDURE.

CAUTION

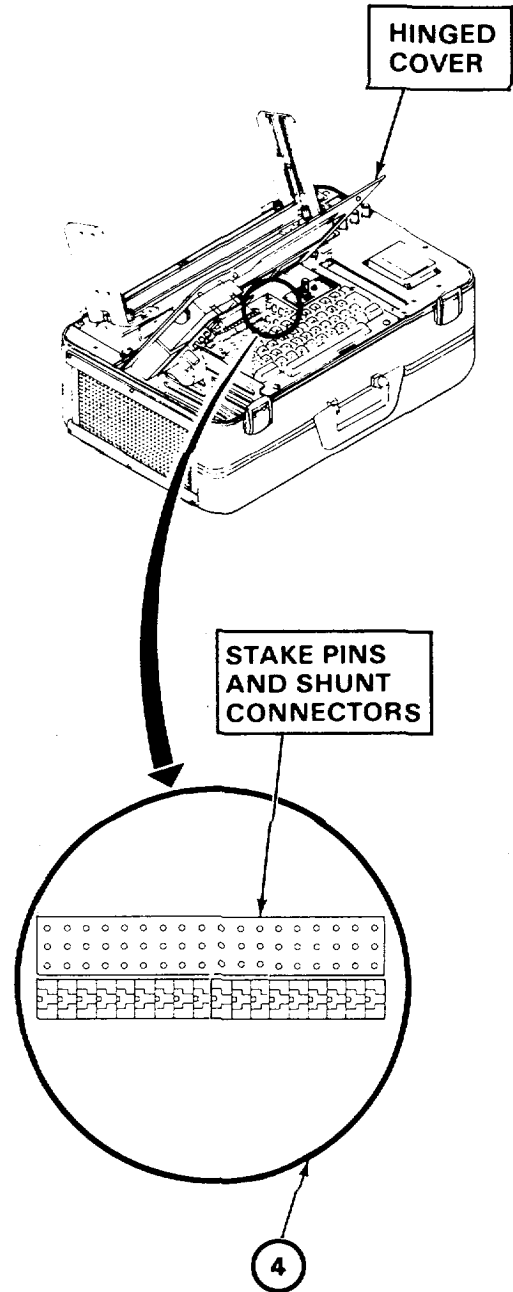
This equipment contains parts sensitive to damage by **ELECTROSTATIC DISCHARGE (ESD)**. Use ESD precautionary procedures when touching, removing, or inserting parts or assemblies. Review DOD-HDBK-263 for proper handling instructions.

PRETEST NOTES

- Before proceeding, ensure that you have the correct part numbers on the ICD, TPS tape cartridge, cable set, and adapter board for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- Ensure that the ICD, cable set, and adapter board have been tested in accordance with TM 11-6625-3097-24 if they are being used for the first time today.
- Proceed to step (3) if all applicable PMCS have already been performed on the DCT.

Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.



- (1) Prepare the DCT for use and perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.

2-16. TAPE DRIVE INTERFACE BOARD 0100-2736 (CONTINUED)

NOTE

Ensure that UUT seats firmly in adapter board during step (5).

- (5) Install tape drive interface board 0100-2736 onto P601 of ADAPTER FOR 0100-2736 (P/N A3038042). See Figure 2-9.

NOTE

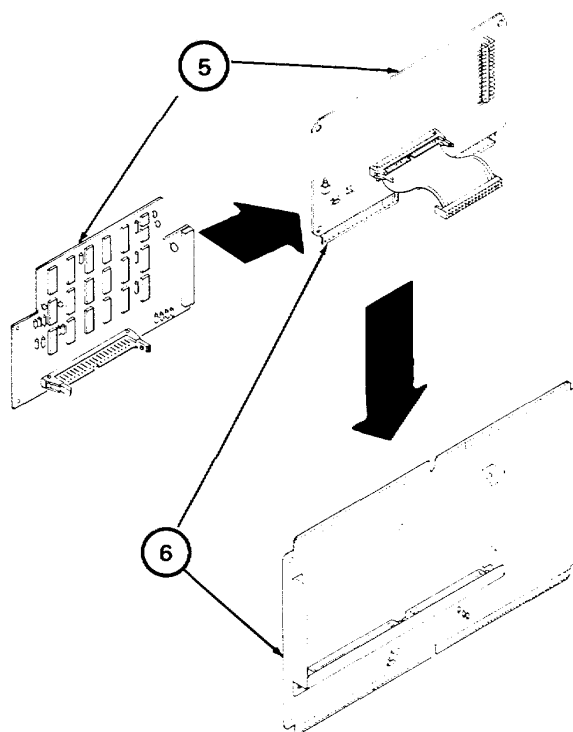
Ensure that adapter board seats firmly in the ICD during step (6). If board is firmly seated, visible length of the board connector pins should be no more than 1/8 inch.

- (6) Install adapter board into ICD NO. 1 SIDE PB (P/N A3038069).

NOTE

Refer to paragraph 2-6, USE OF CABLE SETS (page 2-4) before performing test cable hookup.

- (7) Connect CABLE SET FOR 0100-2736 (P/N A3038036-5) to the UUT and adapter board according to destination markings on clamp attached to each cable (see Figure 2-9). Perform the following steps using the designated wire:
- Place three-wire plug on J24 (adapter board) so that pin 4 is empty.
 - Place brown wire grabber on R2, top lead (UUT).
 - Place red wire grabber on R4, top lead (UUT).
 - Place orange wire grabber on R36, right lead (UUT).



- (8) Connect J600 ribbon cable (P/N A3038051) on adapter board to P600 on UUT. See Figure 2-9.

NOTE

Ensure that the ICD is left justified in the DCT fold-down adapter.

- (9) Install ICD, UUT, and adapter board into DCT fold-down adapter as a unit.
- (10) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5). Then return to step (11), below.

2-16. TAPE DRIVE INTERFACE BOARD 0100-2736 (CONTINUED).

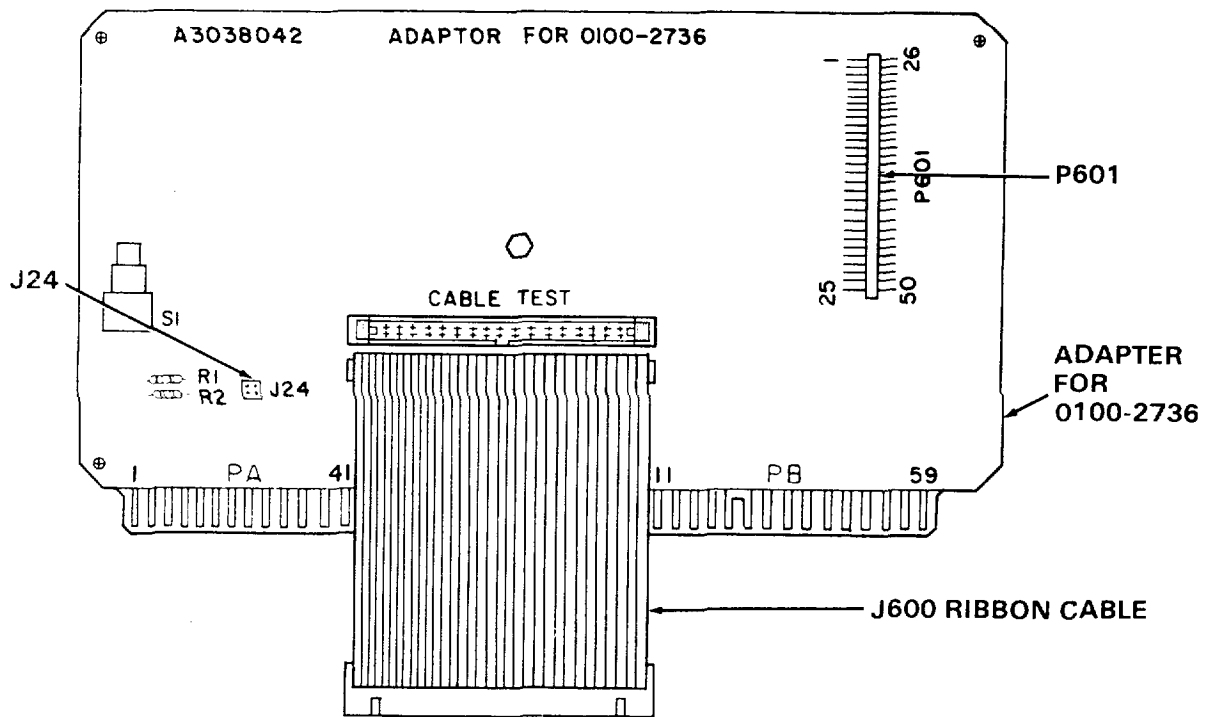
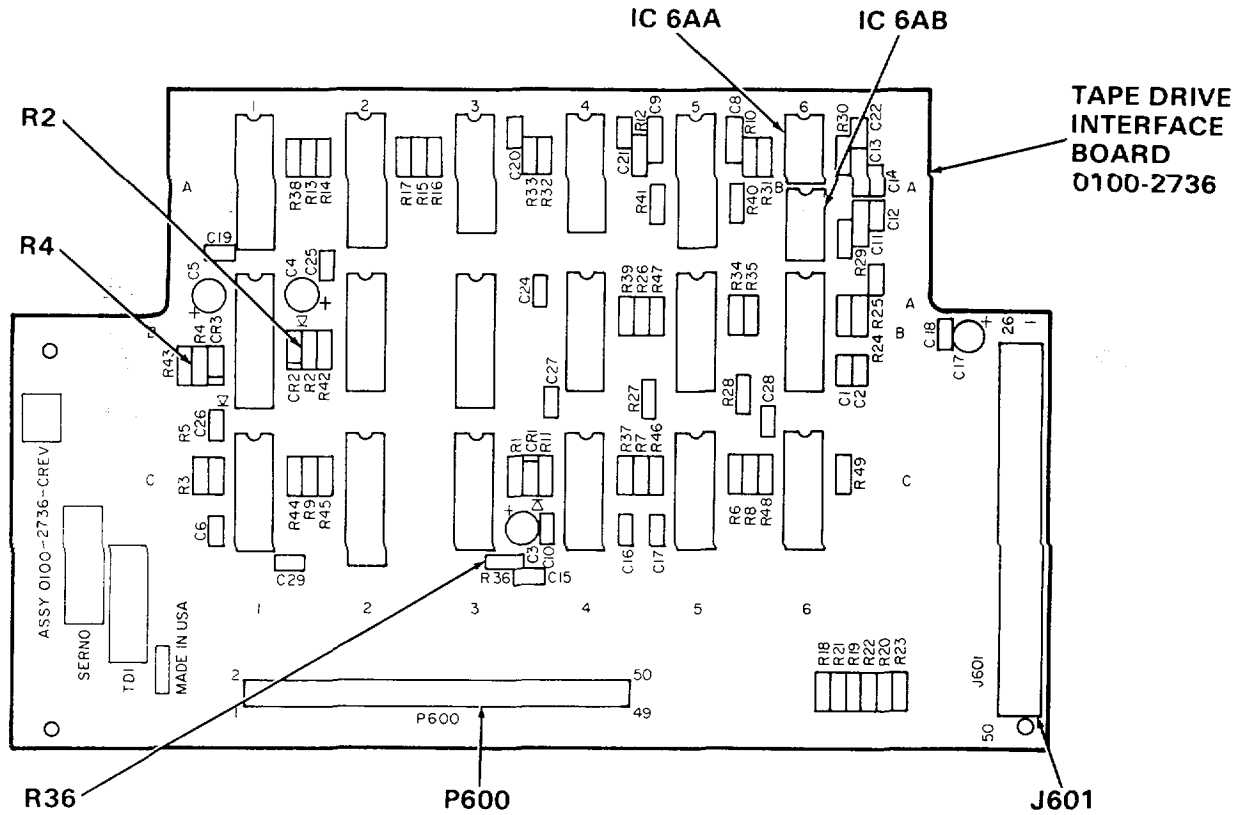


Figure 2-9. Cable Connection Points for Tape Drive Interface Board Test

2-16. TAPE DRIVE INTERFACE BOARD 0100-2736 (CONTINUED).

(11) Enter 9 EXECUTE . Follow instructions on paper tape until the following appear:

```

>9
>*****
>** 0100-2736 **
>** REV C **
>*****
>
>
>*****
>FOUR TASKS
>*****
    
```

```

>
>IF PART NUMBERS
>OR SHUNTS ARE
>NOT RIGHT.
>
>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
>
>*****
>
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
    
```

INPUT MI					
		●	●		
●				●	

NOTES ON TEST SETUP

- The test program will generate a message on the paper tape during step (12) if boards are not installed correctly. Perform steps (5) through (9) again, then test the UUT per step (16), below.
- If cables are not installed correctly, the test program will run and a NO GO message will appear on the paper tape (see step (17), below). Check cable connections per step (7), above, then test the UUT per step (16), below.

WARNING

Voltage is applied to UUT during step (12), below. Do not touch UUT until "READY" appears on the display panel.

NOTE

If the test program does not behave as shown in step (12), go to step (17).

(12) Enter EXECUTE . The test program runs











automatically. The board passes if the following display and printout appear,

READY				●	
		●	●		
















2-16. TAPE DRIVE INTERFACE BOARD 0100-2736 (CONTINUED).

NOTES ON FAULT DIAGNOSTICS

- If a failure occurs with the one-shot timers at board locations 6AA or 6AB, the DCT display will register "FAILED TIMR TEST" and the printout will list the possible causes. If a failure occurs with the one-shot at location 6AA, printout will list POSSIBLE CAUSES as 6AA, 6B1, and 4C3. If the one-shot at location 6AB fails, printout will list POSSIBLE CAUSES as 6AB, 6B1, and 4C3. Replace these components and run test again.
- If the test program lists 2C.16 as the probable fault, the fault is actually at 2C.1. If 2A.6 is listed as the probable fault, the fault is actually at 2A.7.
- If you are instructed to probe at edge connector pins, you may consult the board schematic diagram (refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTARY DATA, below) and probe the affected input/output node rather than the edge pin.
- Follow probing instructions on printout in accordance with TM 11-6625-3038-10.

- If a load list is not printed, enter        . Then enter the probable fault location and . The printer will type the load list for that node. Enter  to leave ASIG, P mode.
- Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform steps (13) and (14), above. Forward UUT to repair station with paper tape.
- For more information, refer to FAULT DIAGNOSTICS, below.

b. TEST PROGRAM OPTIONS.

- To rerun a specific part of the test program, enter       . Enter  for list and select desired option.
- Options 3 through 9 are the individual test modules contained in the main test program.
- Options 10 through 14 are not applicable to the AN/USM-465A.
- Enter        to reset all variables and run a complete test.

2-16. TAPE DRIVE INTERFACE BOARD 0100-2736 (CONTINUED).

c. FAULT DIAGNOSTICS.

- If the UUT fails in the system after replacement of a bistable component (flip-flop or counter), the fault may be in the load of the component. Refer to the schematic diagrams in APPENDIX B and check the load on both outputs of the component.
- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - a. Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - b. Clean the ICD, UUT, and fold-down adapter pins with 99 percent isopropyl alcohol.
 - c. Test the ICD in accordance with TM 11-6625-3097-24.

d. SUPPLEMENTARY DATA.

Table 2-10 shows the relationship between the driver/sensor pins and component nodes or edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructs you to probe any pin or node that is inaccessible.

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD (see Figure 2-9).

Component nodes listed in the BOARD CONNECTION column are represented with the standard component identifiers and pin specifications (for example, "U2.3" or "6B.15"). Use Figure 2-9 as necessary to locate probing points on the UUT.

Table 2-10. Tape Drive Interface Board Pin Cross-Reference List

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0	P600.2	22	P600.22	48	P601.8	114	P601.20
2	P600.4	23	P600.22	50	P601.9	115	99
4	P600.6	24	P600.24	56	PS11	116	P601.21
6	P600.8	25	P600.24	76	P601.12	118	P601.22
8	P600.10	26	P600.26	78	P600.3	120	P601.27
10	P600.12	27	P600.26	79	P600.5	122	P601.28
12	P600.14	28	P600.36	83	P601.23	124	P601.38
14	P600.7	34	P36.R	84	P601.37	125	P601.47
15	P600.15	36	P600.44	98	P601.49	126	P601.43
16	P600.16	38	P600.46	104	P601.15	128	P601.44
18	P600.18	40	P600.50	106	P601.16	130	P601.45
19	P600.18	42	P601.5	108	P601.17	132	P601.46
20	P600.20	44	P601.6	110	P601.18	134	P601.50
21	P600.20	46	P601.7	112	P601.19		

2-17. MEMORY BOARD 0100-3754.

WARNING

a. MAIN TEST PROCEDURE.

CAUTION

This equipment contains parts sensitive to damage by ELECTROSTATIC DISCHARGE (ESD). Use ESD precautionary procedures when touching, removing, or inserting parts or assemblies. Review DOD-HDBK-263 for proper handling instructions.

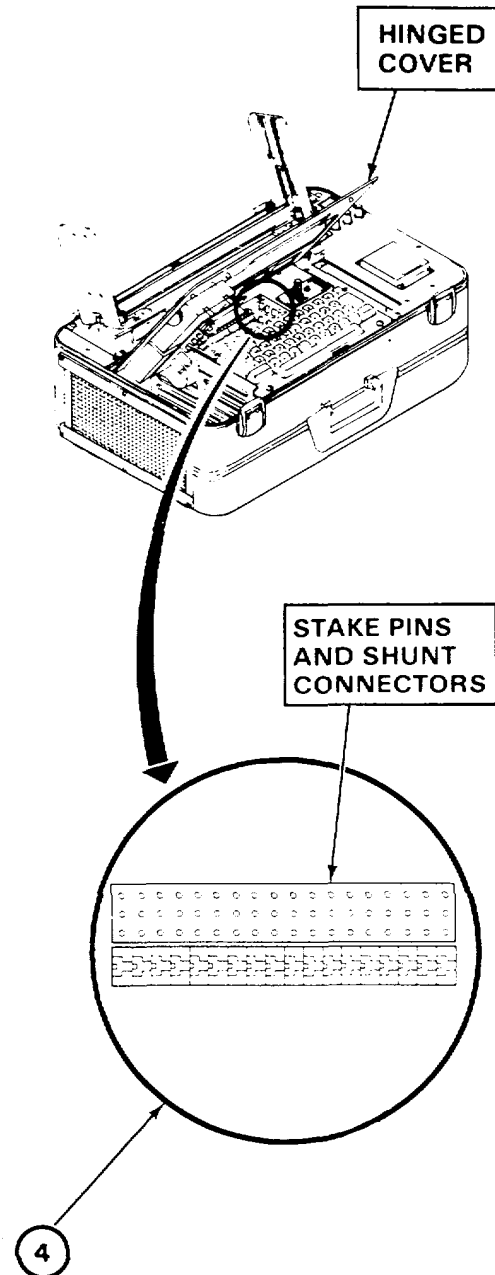
Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.

PRETEST NOTES

- Before proceeding, ensure that you have the correct part numbers on the ICD, TPS tape cartridge, and cable set for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- Ensure that the ICD and cable set have been tested in accordance with TM 11-6625-3097-24 if they are being used for the first time today.
- Proceed to step (3) if all applicable PMCS have already been performed on the DCT.
- In addition to part number 0100-3754, the memory board also carries part number 0100-2722. This number represents the basic board assembly and should not be confused with the number for the final assembly, 0100-3754.

- (1) Prepare the DCT for use and perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.



2-17. MEMORY BOARD 0100-3754 (CONTINUED).

NOTE

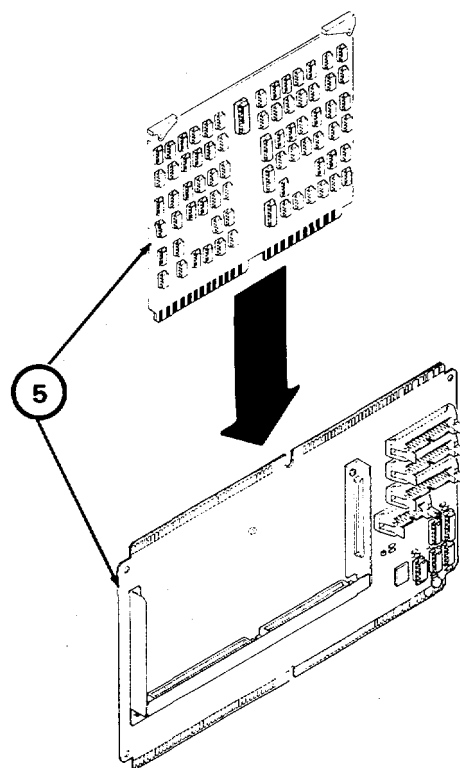
Ensure that UUT seats firmly in the ICD step (5). If board is firmly seated, visible length of the board connector pins should be no more than 1/8 inch.

- (5) Install memory board 0100-3754 into ICD NO. 1 SIDE PA (P/N A3038069).

NOTE

Refer to paragraph 2-6, USE OF CABLE SETS (page 2-4) before performing test cable hookup.

- (6) Connect CABLE SET FOR 0100-3754 (P/N A3038036-3) to the UUT and ICD according to destination markings on clamp attached to each cable (see Figure 2-10). Perform the following steps using the designated cable or wire:
- Place three-wire plug on J5 (ICD).
 - Place brown wire grabber on IC 11E, pin 6 (UUT).
 - Place red wire grabber on IC 11 E, pin 3 (UUT).
 - Place orange wire grabber on IC 13E, pin 8 (UUT).
 - Connect TEST POINTS connector (UUT) to J4 (ICD). The TEST POINTS connector is on the side opposite the edge connectors, in the middle of the UUT. Connect the red wire to pin 1.

**NOTE**

Ensure that the ICD is left-justified in fold-down adapter.

- (7) Install ICD and UUT into DCT fold-down adapter as a unit.
- (8) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5). Then return to step (9), below.

2-17. MEMORY BOARD 0100-3754 (CONTINUED).

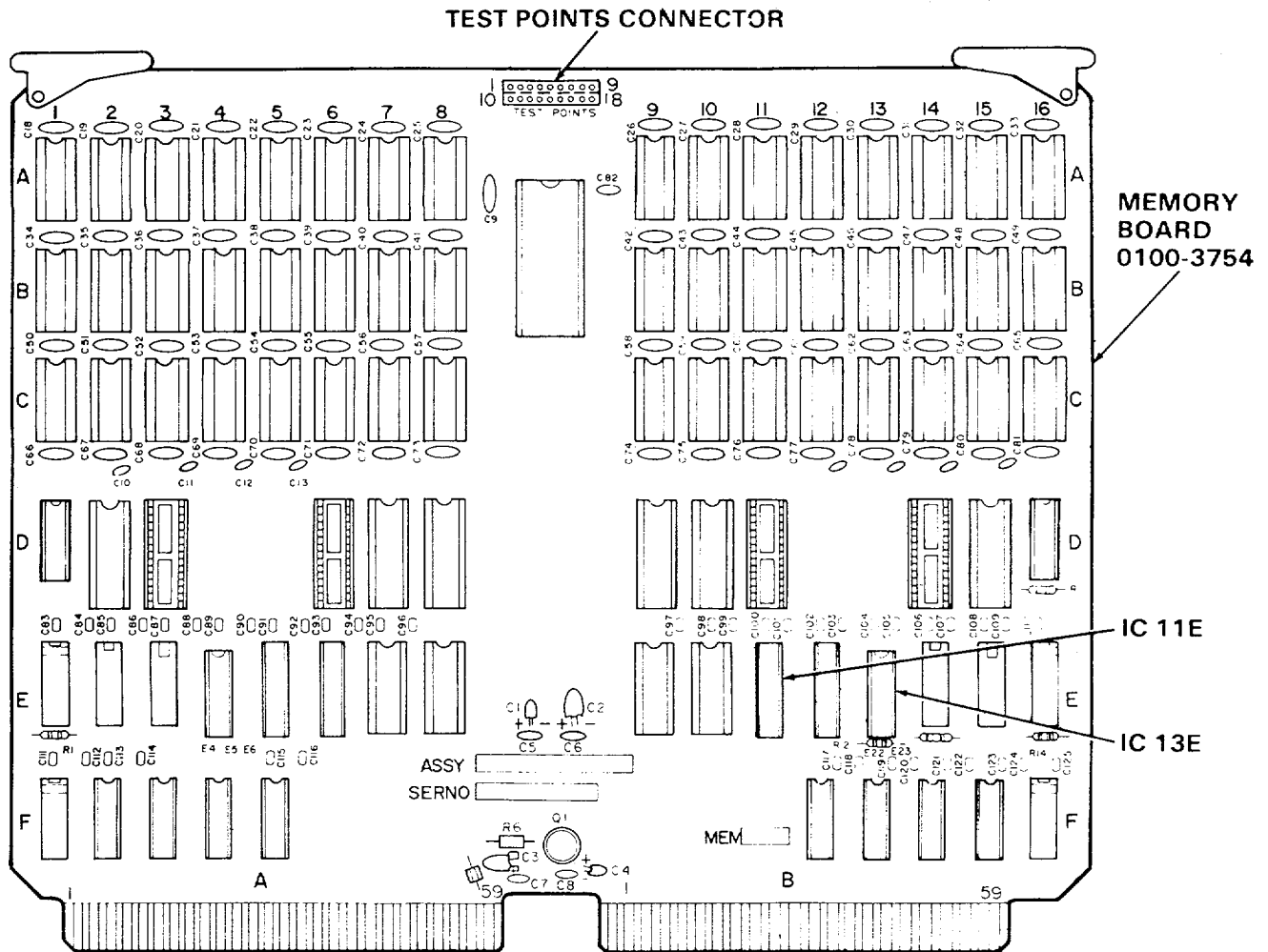


Figure 2-10. Cable Connection Points for Memory Board Test (Sheet 1 of 2)

2-17. MEMORY BOARD 0100-3754 (CONTINUED).

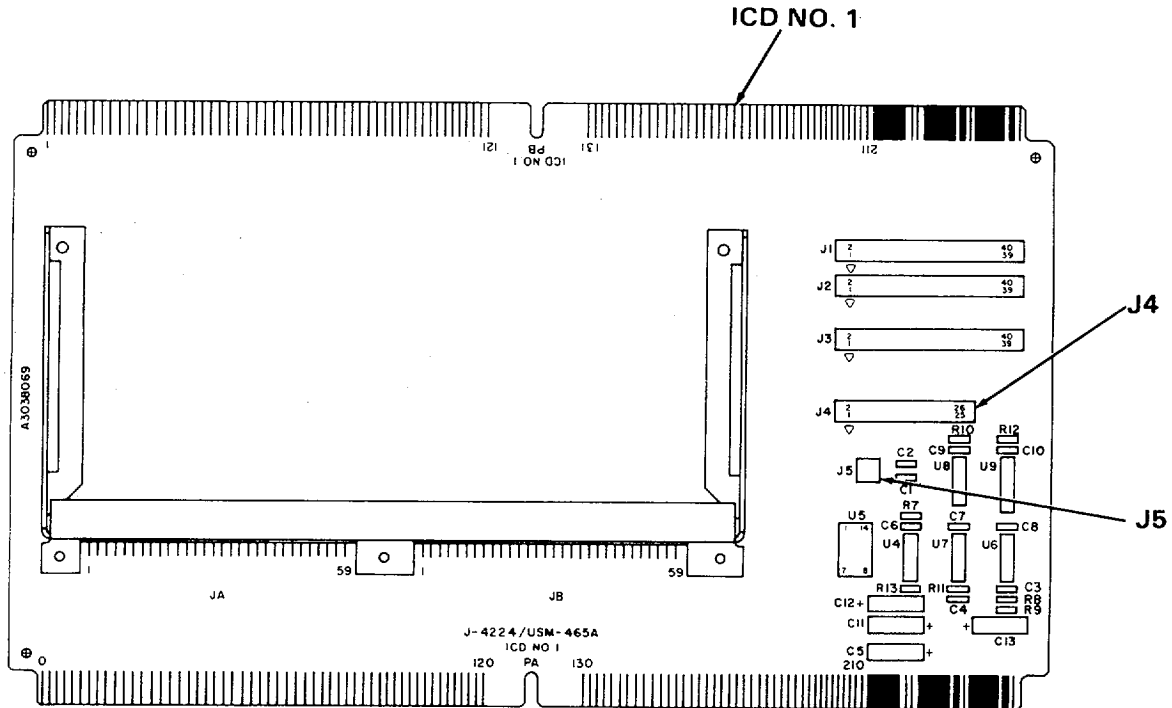


Figure 2-10. Cable Connection Points for Memory Board Test (Sheet 2 of 2)

(9) Enter EXECUTE . Follow instructions on paper tape until the following appear:

```

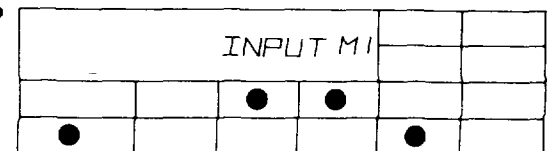
>10
>*****
>** 0100-3754 **
>** REV A **
>*****
>
>
>*****
>THREE TASKS
>*****
  
```

```

>
>IF PART NUMBER
>OR SHUNTS ARE
>NOT RIGHT.
>
  
```

```

>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
>
>*****
>
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
  
```



2-17. MEMORY BOARD 0100-3754 (CONTINUED).

WARNING

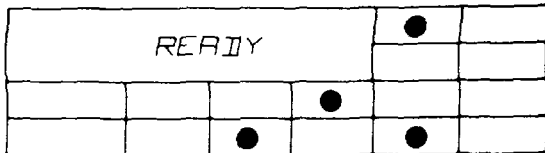
Voltage is applied to UUT during step (10) below. Do not touch UUT until "READY" appears on the display panel.

NOTE

If the test program does not behave as shown in step (10) go to step (15).

(10) Enter **EXECUTE** . The test program runs

automatically. The board passes if the following display and printout appear:



```

>*** ALL TESTS GO ***
>
>*****
>
>REMOVE UUT AND
INSTALL NEXT UUT TO
BE TESTED AND
PERFORM UUT SETUP
PROCEDURE IN
TM11-6625-3038-40 OR
GR2225-141-PM4
>
>*****
>END LINE 32767
    
```

NOTES ON TEST SETUP

- The test program will generate a message on the paper tape during step (10) if boards are not installed correctly. Perform steps (5) through (7) again, then test the UUT per step (14), below.
- If cables are not installed correctly, the test program will run and a NO GO message will appear on the paper tape (see step (15), below). Check cable connections per step (6), above, then test the UUT per step (14), below.

(11) Disconnect cable set only from UUT if next UUT is identical. Otherwise, disconnect cable set from both UUT and ICD.

CAUTION

Use extreme caution when removing boards from ICD. Otherwise, boards or ICD may be damaged.

(12) Remove boards from DCT as follows:

- Remove ICD and UUT from DCT as a unit.
- Using pry bar, carefully remove UUT from ICD.

(13) Perform steps (5) through (7) for next UUT to be tested.

(14) Enter **CMD** **RUN** **EXECUTE** . The

test program will run automatically for the next board. Refer to step (10) for board pass indications.

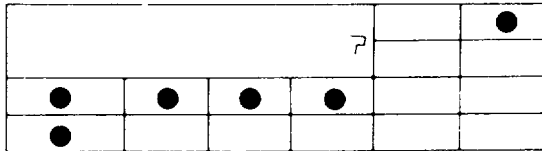
2-17. MEMORY BOARD 0100-3754 (CONTINUED),

(15) If a board fails the first three test modules, the DCT will identify the fault immediately or supply probing instructions to isolate the fault. Enter header information in accordance with TM 11-6625-3038-10 if the display and printout (typical) shown below appear. If fault display and printout are different, see NOTES ON FAULT DIAGNOSTICS, below.

```

>***** NO GO *****
>T3754I2, ICD *****
  |
>FAULT AT LINE 10250
> PIN PB,30
>173744 PB,30
>TYPE HEADER INFO
  
```

(16) If applicable, follow probing instructions on paper tape in accordance with TM 11-6625-3038-10 to isolate faulty component(s). Probing will continue until the probable fault is listed on the printer. A load list may also be printed.



NOTES ON BOARD FAILURES

- The memory board main test program set is divided into seven test modules, the first three of which are run in a normal manner. If a failure occurs during these three test modules, the correct image file will be automatically loaded and guided probe will be initiated, as necessary for fault isolation.
- Faults related to the ICD and those occurring during the remaining four test modules will be accompanied by error messages stating location of the failed test with the appropriate troubleshooting Instructions on the printout.
- Read NOTES ON FAULT DIAGNOSTICS, below, and section c, FAULT DIAGNOSTICS before you begin probing or troubleshooting.

2-17. MEMORY BOARD 0100-3754 (CONTINUED).

NOTES ON FAULT DIAGNOSTICS

- Components identified on the printout by the letter prefix U (for ICs) and/or the letter suffix F are located on ICD NO. 1. Example: If probing instruction reads U6F.13, then pin 13 of IC U6 on the ICD is the indicated node to probe.

- If a load list is not printed, enter



Then enter the probable fault location and

. The printer will type the load list for

that node. Enter to leave ASIG, P mode.

- If you are instructed to probe at edge connector pins you may consult the board schematic diagram (refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTARY DATA, below) and probe the affected input/output node rather than the edge pin.

- Follow probing instructions on printout in accordance with TM 11-6625-3038-10.

- Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform steps (11) and (12) above. Forward UUT to repair station with paper tape.

- For more information, refer to FAULT DIAGNOSTICS, below.

b. **TEST PROGRAM OPTIONS.**

- To rerun a specific part of the test program, enter



for list and select desired option.

- Options 3 through 9 are the individual test modules contained in the main test program.
- Options 10 through 14 are not applicable to the AN/USM-465A.
- Option 6 tests the oscillator circuit mounted on ICD NO. 1. If board failure occurs during the Refresh Test, run option 6 to verify proper operation of the test oscillator circuit on the ICD.

c. **FAULT DIAGNOSTICS.**

- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - Clean the ICD, UUT, and fold-down adapter pins with 99 percent isopropyl alcohol.
 - Test the ICD in accordance with TM 11-6625-3097-24.

2-17. MEMORY BOARD 0100-3754 (CONTINUED).

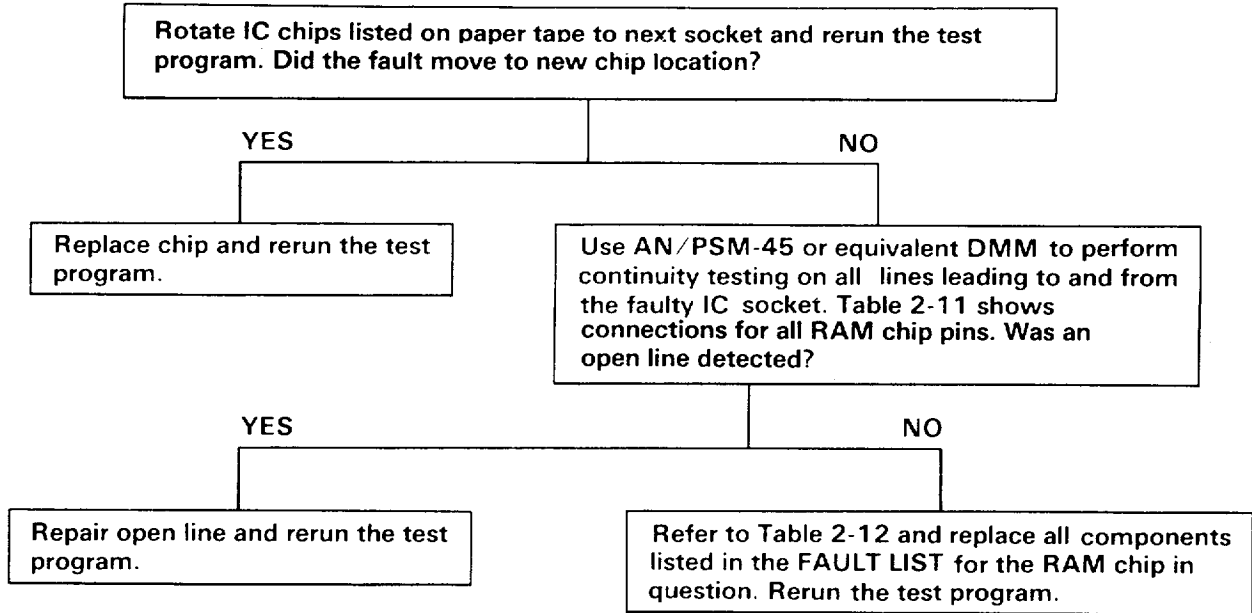
- If the UUT fails in the system after replacement of a bistable component (flip-flop or counter), the fault may be in the load of the component. Refer to the schematic diagrams in APPENDIX B and check the load on both outputs of the component.
- The RAM Test will not detect the condition of an open Vcc pin (pin 9) of the RAM chips due to internal charge build up during testing. If this fault is suspected, check the pins using AN/PSM-45 or equivalent digital multimeter with the RAM Test running. Reading should be ± 5 V. The ± 5 V line may also be checked for continuity.
- If a RAM memory fault occurs, the test program will identify the RAM chip that is most probably defective. A sample fault message is shown below. When such a message appears, follow all instructions on the paper tape and refer to troubleshooting tree, below.

```

>***** NO GO *****
>ROTATE THE FOLLOWING
MEMORY CHIP TO THE
NEXT POSITION AND
RERUN TEST TO
DETERMINE IF BAD.
>
>      A4
>
>IC 16F PIN 8 MAY
ALSO BE SHORTED TO
GROUND.
>END LINE 32767
    
```

NOTE

This last instruction only appears for faults in row A. Use AN/PSM-45 or equivalent to detect short at 16F.8.



2-17. MEMORY BOARD 0100-3754 (CONTINUED).

Table 2-11. RAM Chip Connections

RAM IC	=	CONNECTION	RAM IC	=	CONNECTION	RAM IC	=	CONNECTION
A1.2	=	E7.2	A5.2	=	E8.2	A9.2	=	E9.2
A1.3	=	E3.1	A5.3	=	E3.1	A9.3	=	D16.4
A1.4	=	D16.1	A5.4	=	D16.1	A9.4	=	D16.1
A1.5	=	U1.11	A5.5	=	U1.11	A9.5	=	U1.11
A1.6	=	U1.12	A5.6	=	U1.12	A9.6	=	U1.12
A1.7	=	U1.13	A5.7	=	U1.13	A9.7	=	U1.13
A1.10	=	U1.16	A5.10	=	U1.16	A9.10	=	U1.16
A1.11	=	U1.17	A5.11	=	U1.17	A9.11	=	U1.17
A1.12	=	U1.18	A5.12	=	U1.18	A9.12	=	U1.18
A1.13	=	U1.19	A5.13	=	U1.19	A9.13	=	U1.19
A1.14	=	E7.4	A5.14	=	E8.4	A9.14	=	E9.4
A1.15	=	E3.4	A5.15	=	E3.4	A9.15	=	E3.4
A2.2	=	E7.5	A6.2	=	E8.5	A10.2	=	E9.5
A2.3	=	E3.1	A6.3	=	E3.1	A10.3	=	D16.4
A2.4	=	D16.1	A6.4	=	D16.1	A10.4	=	D16.1
A2.5	=	U1.11	A6.5	=	U1.11	A10.5	=	U1.11
A2.6	=	U1.12	A6.6	=	U1.12	A10.6	=	U1.12
A2.7	=	U1.13	A6.7	=	U1.13	A10.7	=	U1.13
A2.10	=	U1.16	A6.10	=	U1.16	A10.10	=	U1.16
A2.11	=	U1.17	A6.11	=	U1.17	A10.11	=	U1.17
A2.12	=	U1.18	A6.12	=	U1.18	A10.12	=	U1.18
A2.13	=	U1.19	A6.13	=	U1.19	A10.13	=	U1.19
A2.14	=	E7.7	A6.14	=	E8.7	A10.14	=	E9.7
A2.15	=	E3.4	A6.15	=	E3.4	A10.15	=	E3.4
A3.2	=	E7.11	A7.2	=	E8.11	A11.2	=	E9.11
A3.3	=	E3.1	A7.3	=	E3.1	A11.3	=	D16.4
A3.4	=	D16.1	A7.4	=	D16.1	A11.4	=	D16.1
A3.5	=	U1.11	A7.5	=	U1.11	A11.5	=	U1.11
A3.6	=	U1.12	A7.6	=	U1.12	A11.6	=	U1.12
A3.7	=	U1.13	A7.7	=	U1.13	A11.7	=	U1.13
A3.10	=	U1.16	A7.10	=	U1.16	A11.10	=	U1.16
A3.11	=	U1.17	A7.11	=	Q1.17	A11.11	=	U1.17
A3.12	=	U1.18	A7.12	=	U1.18	A11.12	=	U1.18
A3.13	=	U1.19	A7.13	=	U1.19	A11.13	=	U1.19
A3.14	=	E7.9	A7.14	=	E8.9	A11.14	=	E9.9
A3.15	=	E3.4	A7.15	=	E3.4	A11.15	=	E3.4
A4.2	=	E7.14	A8.2	=	E8.14	A12.2	=	E9.14
A4.3	=	E3.1	A8.3	=	E3.1	A12.3	=	D16.4
A4.4	=	D16.1	A8.4	=	D16.1	A12.4	=	D16.1
A4.5	=	U1.11	A8.5	=	U1.11	A12.5	=	U1.11
A4.6	=	U1.12	A8.6	=	U1.12	A12.6	=	U1.12
A4.7	=	U1.13	A8.7	=	U1.13	A12.7	=	U1.13
A4.10	=	U1.16	A8.10	=	U1.16	A12.10	=	U1.16
A4.11	=	U1.17	A8.11	=	U1.17	A12.11	=	U1.17
A4.12	=	U1.18	A8.12	=	U1.18	A12.12	=	U1.18
A4.13	=	U1.19	A8.13	=	U1.19	A12.13	=	U1.19
A4.14	=	E7.12	A8.14	=	E8.12	A12.14	=	E9.12
A4.15	=	E3.4	A8.15	=	E3.4	A12.15	=	E3.4

2-17. MEMORY BOARD 0100-3754 (CONTINUED).

Table 2-11. RAM Chip Connections (Continued)

RAM IC	=	CONNECTION	RAM IC	=	CONNECTION	RAM IC	=	CONNECTION
A13.2	=	E10.2	B1.2	=	E7.2	B5.2	=	E8.2
A13.3	=	D16.4	B1.3	=	E3.1	B5.3	=	E3.1
A13.4	=	D16.1	B1.4	=	D16.10	B5.4	=	D16.10
A13.5	=	U1.11	B1.5	=	U1.11	B5.5	=	U1.11
A13.6	=	U1.12	B1.6	=	U1.12	B5.6	=	U1.12
A13.7	=	U1.13	B1.7	=	U1.13	B5.7	=	U1.13
A13.10	=	U1.16	B1.10	=	U1.16	B5.10	=	U1.16
A13.11	=	U1.17	B1.11	=	U1.17	B5.11	=	U1.17
A13.12	=	U1.18	B1.12	=	U1.18	B5.12	=	U1.18
A13.13	=	U1.19	B1.13	=	U1.19	B5.13	=	U1.19
A13.14	=	E10.4	B1.14	=	E7.4	B5.14	=	E8.4
A13.15	=	E3.4	B1.15	=	E3.13	B5.15	=	E3.13
A14.2	=	E10.5	B2.2	=	E7.5	B6.2	=	E8.5
A14.3	=	D16.4	B2.3	=	E3.1	B6.3	=	E3.1
A14.4	=	D16.1	B2.4	=	D16.10	B6.4	=	D16.10
A14.5	=	U1.11	B2.5	=	U1.11	B6.5	=	U1.11
A14.6	=	U1.12	B2.6	=	U1.12	B6.6	=	U1.12
A14.7	=	U1.13	B2.7	=	U1.13	B6.7	=	U1.13
A14.10	=	U1.16	B2.10	=	U1.16	B6.10	=	U1.16
A14.11	=	U1.17	B2.11	=	U1.17	B6.11	=	U1.17
A14.12	=	U1.18	B2.12	=	U1.18	B6.12	=	U1.18
A14.13	=	U1.19	B2.13	=	U1.19	B6.13	=	U1.19
A14.14	=	E10.7	B2.14	=	E7.7	B6.14	=	E8.7
A14.15	=	E3.4	B2.15	=	E3.13	B6.15	=	E3.13
A15.2	=	E10.11	B3.2	=	E7.11	B7.2	=	E8.11
A15.3	=	D16.4	B3.3	=	E3.1	B7.3	=	E3.1
A15.4	=	D16.1	B3.4	=	D16.10	B7.4	=	D16.10
A15.5	=	U1.11	B3.5	=	U1.11	B7.5	=	U1.11
A15.6	=	U1.12	B3.6	=	U1.12	B7.6	=	U1.12
A15.7	=	U1.13	B3.7	=	U1.13	B7.7	=	U1.13
A15.10	=	U1.16	B3.10	=	U1.16	B7.10	=	U1.16
A15.11	=	U1.17	B3.11	=	U1.17	B7.11	=	U1.17
A15.12	=	U1.18	B3.12	=	U1.18	B7.12	=	U1.18
A15.13	=	U1.19	B3.13	=	U1.19	B7.13	=	U1.19
A15.14	=	E10.9	B3.14	=	E7.9	B7.14	=	E8.9
A15.15	=	E3.4	B3.15	=	E3.13	B7.15	=	E3.13
A16.2	=	E10.14	B4.2	=	E7.14	B8.2	=	E8.14
A16.3	=	D16.4	B4.3	=	E3.1	B8.3	=	E3.1
A16.4	=	D16.1	B4.4	=	D16.10	B8.4	=	D16.10
A16.5	=	U1.11	B4.5	=	U1.11	B8.5	=	U1.11
A16.6	=	U1.12	B4.6	=	U1.12	B8.6	=	U1.12
A16.7	=	U1.13	B4.7	=	U1.13	B8.7	=	U1.13
A16.10	=	U1.16	B4.10	=	U1.16	B8.10	=	U1.16
A16.11	=	U1.17	B4.11	=	U1.17	B8.11	=	U1.17
A16.12	=	U1.18	B4.12	=	U1.18	B8.12	=	U1.18
A16.13	=	U1.19	B4.13	=	U1.19	B8.13	=	U1.19
A16.14	=	E10.12	B4.14	=	E7.12	B8.14	=	E8.12
A16.5	=	E3.4	B4.15	=	E3.13	B8.15	=	E3.13

2-17. MEMORY BOARD 0100-3754 (CONTINUED).

Table 2-11. RAM Chip Connections (Continued)

RAM IC	=	CONNECTION	RAM IC	=	CONNECTION	RAM IC	=	CONNECTION
B9.2	=	E9.2	B13.2	=	E10.2	C1.2	=	E7.2
B9.3	=	D16.4	B13.3	=	D16.4	C1.3	=	E3.1
B9.4	=	D16.10	B13.4	=	D16.10	C1.4	=	D16.13
B9.5	=	U1.11	B13.5	=	U1.11	C1.5	=	U1.11
B9.6	=	U1.12	B13.6	=	U1.12	C1.6	=	U1.12
B9.7	=	U1.13	B13.7	=	U1.13	C1.7	=	U1.13
B9.10	=	U1.16	B13.10	=	U1.16	C1.10	=	U1.16
B9.11	=	U1.17	B13.11	=	U1.17	C1.11	=	U1.17
B9.12	=	U1.18	B13.12	=	U1.18	C1.13	=	U1.18
B9.13	=	U1.19	B13.13	=	U1.19	C1.14	=	U1.19
B9.14	=	E9.4	B13.14	=	E10.4	C1.14	=	E7.4
B9.15	=	E3.13	B13.15	=	E3.13	C1.15	=	E3.10
B10.2	=	E9.5	B14.2	=	E10.5	C2.2	=	E7.5
B10.3	=	D6.4	B14.3	=	D16.4	C2.3	=	E3.1
B10.4	=	D16.10	B14.4	=	D16.10	C2.4	=	D16.13
B10.5	=	U1.11	B14.5	=	U1.11	C2.5	=	U1.11
B10.6	=	U1.12	B14.6	=	U1.12	C2.6	=	U1.12
B10.7	=	U1.13	B14.7	=	U1.13	C2.7	=	U1.13
B10.10	=	U1.16	B14.10	=	U1.16	C2.10	=	U1.16
B10.11	=	U1.17	B14.11	=	U1.17	C2.11	=	U1.17
B10.12	=	U1.18	B14.12	=	U1.18	C2.12	=	U1.18
B10.13	=	U1.19	B14.13	=	U1.19	C2.13	=	U1.19
B10.14	=	E9.7	B14.14	=	E10.7	C2.14	=	E7.7
B10.15	=	E3.13	B14.15	=	E3.13	C2.15	=	E3.10
B11.2	=	E9.11	B15.2	=	E10.11	C3.2	=	E7.11
B11.3	=	D16.4	B15.3	=	D16.4	C3.3	=	E3.1
B11.4	=	D16.10	B15.4	=	D16.10	C3.4	=	D16.13
B11.5	=	U1.11	B15.5	=	U1.11	C3.5	=	U1.11
B11.6	=	U1.12	B15.6	=	U1.12	C3.6	=	U1.12
B11.7	=	U1.13	B15.7	=	U1.13	C3.7	=	U1.13
B11.10	=	U1.16	B15.10	=	U1.16	C3.10	=	U1.16
B11.11	=	U1.17	B15.11	=	U1.17	C3.11	=	U1.17
B11.12	=	U1.18	B15.12	=	U1.18	C3.12	=	U1.18
B11.13	=	U1.19	B15.13	=	U1.19	C3.13	=	U1.19
B11.14	=	E9.9	B15.14	=	E10.9	C3.14	=	E7.9
B11.15	=	E3.13	B15.15	=	E3.13	C3.15	=	E3.10
B12.2	=	E9.14	B16.2	=	E10.14	C4.2	=	E7.14
B12.3	=	D16.4	B16.3	=	D16.4	C4.3	=	E3.1
B12.4	=	D16.10	B16.4	=	D16.10	C4.4	=	D16.13
B12.5	=	U1.11	B16.5	=	U1.11	C4.5	=	U1.11
B12.6	=	U1.12	B16.6	=	U1.12	C4.6	=	U1.12
B12.7	=	U1.13	B16.7	=	U1.13	C4.7	=	U1.13
B12.10	=	U1.16	B16.10	=	U1.16	C4.10	=	U1.16
B12.11	=	U1.17	B16.11	=	U1.17	C4.1	=	U1.17
B12.12	=	U1.18	B16.12	=	U1.18	C4.12	=	U1.18
B12.13	=	U1.19	B16.13	=	U1.19	C4.13	=	U1.19
B12.14	=	E9.12	B16.14	=	E10.12	C4.14	=	E7.12
B12.15	=	E3.13	B16.15	=	E3.13	C4.15	=	E3.10

2-17. MEMORY BOARD 0100-3754 (CONTINUED).

Table 2-11. RAM Chip Connections (Continued)

RAM IC	=	CONNECTION	RAM IC	=	CONNECTION	RAM IC	=	CONNECTION
C5.2	=	E8.2	C9.2	=	E9.2	C13.2	=	E10.2
C5.3	=	E3.1	C9.3	=	D16.4	C13.3	=	D16.4
C5.4	=	D16.13	C9.4	=	D16.13	C13.4	=	D16.13
C5.5	=	U1.11	C9.5	=	U1.11	C13.5	=	U1.11
C5.6	=	U1.12	C9.6	=	U1.12	C13.6	=	U1.12
C5.7	=	U1.13	C9.7	=	U1.13	C13.7	=	U1.13
C5.10	=	U1.16	C9.10	=	U1.16	C13.10	=	U1.16
C5.11	=	U1.17	C9.11	=	U1.17	C13.11	=	U1.17
C5.12	=	U1.18	C9.12	=	U1.18	C13.12	=	U1.18
C5.13	=	U1.19	C9.13	=	U1.19	C13.13	=	U1.19
C5.14	=	E8.4	C9.14	=	E9.4	C13.14	=	E10.4
C5.15	=	E3.10	C9.15	=	E3.10	C13.15	=	E3.10
C6.2	=	E8.5	C10.2	=	E9.5	C14.2	=	E10.5
C6.3	=	E3.1	C10.3	=	D16.4	C14.3	=	D16.4
C6.4	=	D16.13	C10.4	=	D16.13	C14.4	=	D16.13
C6.5	=	U1.11	C10.5	=	U1.11	C14.5	=	U1.11
C6.6	=	U1.12	C10.6	=	U2.12	C14.6	=	U1.12
C6.7	=	U1.13	C10.7	=	U1.13	C14.7	=	U1.13
C6.10	=	U1.16	C10.10	=	U1.16	C14.10	=	U1.16
C6.11	=	U1.17	C10.11	=	U1.17	C14.11	=	U1.17
C6.12	=	U1.18	C10.12	=	U1.18	C14.12	=	U1.18
C6.13	=	U1.19	C10.13	=	U1.19	C14.13	=	U1.19
C6.14	=	E8.7	C10.14	=	E9.7	C14.14	=	E10.7
C6.15	=	E8.11	C11.2	=	E9.11	C15.2	=	E10.11
C7.3	=	E3.1	C11.3	=	D16.4	C15.3	=	D16.4
C7.4	=	D16.13	C11.4	=	D16.3	C15.4	=	D16.13
C7.5	=	U1.11	C11.5	=	U1.11	C15.5	=	U1.11
C7.6	=	U1.12	C11.6	=	U1.12	C15.6	=	U1.12
C7.7	=	U1.13	C11.7	=	U1.13	C15.7	=	U1.13
C7.10	=	U1.16	C11.10	=	U1.16	C15.10	=	U1.16
C7.11	=	U1.17	C11.11	=	U1.17	C15.11	=	U1.17
C7.12	=	U1.18	C11.12	=	U1.18	C15.12	=	U1.18
C7.13	=	U1.19	C11.13	=	U1.19	C15.13	=	U1.19
C7.14	=	E8.7	C11.14	=	E9.9	C15.14	=	E10.9
C7.15	=	E3.10	C11.15	=	E3.10	C15.15	=	E3.10
C8.2	=	E8.14	C12.2	=	E9.14	C16.2	=	E10.14
C8.3	=	E3.1	C12.3	=	D16.4	C16.3	=	D16.4
C8.4	=	D16.13	C12.4	=	D16.13	C16.4	=	D16.13
C8.5	=	U1.11	C12.5	=	U1.11	C16.5	=	U1.11
C8.6	=	U1.12	C12.6	=	U1.12	C16.6	=	U1.12
C8.7	=	U1.13	C12.7	=	U1.13	C16.7	=	U1.13
C8.10	=	U1.16	C12.10	=	U1.16	C16.10	=	U1.16
C8.11	=	U1.17	C12.11	=	U1.17	C16.11	=	U1.17
C8.12	=	U1.18	C12.12	=	U1.18	C16.12	=	U1.18
C8.13	=	U1.19	C12.13	=	U1.19	C16.13	=	U1.19
C8.14	=	E8.12	C12.14	=	E9.12	C16.14	=	E10.12
C8.15	=	E3.10	C12.15	=	E3.10	C16.15	=	E3.10

2-17. MEMORY BOARD 0100-3754 (CONTINUED).

Table 2-12. RAM Fault Table

RAM IC CHIPS	FAULT LIST				
1A	16D,	3E,	1U,	7E,	15D
2A	16D,	3E,	1U,	7E,	15D
3A	16D,	3E,	1U,	7E,	15D
4A	16D,	3E,	1U,	7E,	15D
5A	16D,	3E,	1U,	8E,	15D
6A	16D,	3E,	1U,	8E,	15D
7A	16D,	3E,	1U,	8E,	15D
8A	16D,	3E,	1U,	8E,	15D
9A	16D,	3E,	1U,	9E,	15D
10A	16D,	3E,	1U,	9E,	15D
11A	16D,	3E,	1U,	9E,	15D
12A	16D,	3E,	1U,	9E,	15D
13A	16D,	3E,	1U,	10E,	15D
14A	16D,	3E,	1U,	10E,	15D
15A	16D,	3E,	1U,	10E,	15D
16A	16D,	3E,	1U,	10E,	15D
1B	16D,	3E,	1U,	7E,	15D
2B	16D,	3E,	1U,	7E,	15D
3B	16D,	3E,	1U,	7E,	15D
4B	16D,	3E,	1U,	7E,	15D
5B	16D,	3E,	1U,	8E,	15D
6B	16D,	3E,	1U,	8E,	15D
7B	16D,	3E,	1U,	8E,	15D
8B	16D,	3E,	1U,	8E,	15D
9B	16D,	3E,	1U,	9E,	15D
10B	16D,	3E,	1U,	9E,	15D
11B	16D,	3E,	1U,	9E,	15D
12B	16D,	3E,	1U,	9E,	15D
13B	16D,	3E,	1U,	10E,	15D
14B	16D,	3E,	1U,	10E,	15D
15B	16D,	3E,	1U,	10E,	15D
16B	16D,	3E,	1U,	10E,	15D
1C	16D,	1U,	3E,	7E,	15D
2C	16D,	1U,	3E,	7E,	15D
3C	16D,	1U,	3E,	7E,	15D
4C	16D,	1U,	3E,	7E,	15D
5C	16D,	1U,	3E,	8E,	15D
6C	16D,	1U,	3E,	8E,	15D
7C	16D,	1U,	3E,	8E,	15D
8C	16D,	1U,	3E,	8E,	15D
9C	16D,	1U,	3E,	9E,	15D
10C	16D,	1U,	3E,	9E,	15D
11C	16D,	1U,	3E,	9E,	15D
12C	16D,	1U,	3E,	9E,	15D
13C	16D,	1U,	3E,	10E,	15D
14C	16D,	1U,	3E,	10E,	15D
15C	16D,	1U,	3E,	10E,	15D
16C	16D,	1U,	3E,	10E,	15D

2-17. MEMORY BOARD 0100-3754 (CONTINUED).**d. SUPPLEMENTARY DATA.**

Table 2-13 shows the relationship between the driver/sensor pins and component nodes or edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructs you to probe any pin or node that is inaccessible.

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD (see Figure 2-10).

UUT edge pins in the BOARD CONNECTION column are represented as "A##" or "B##". "A##" pins can be probed at side "A" of the UUT. "B##" pins can be probed at side "B" of the UUT. See Figure 2-10. Locate pins according to the reference numbers printed on the UUT.

Component nodes listed in the BOARD CONNECTION column are located on the TEST POINTS connector. Use Figure 2-10 as necessary to locate probing points on the UUT.

Table 2-13. Memory Board Pin Cross-Reference List

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0	A1	48	A49	76	B1	96	B21
26	TP18	49	A50	77	B2	97	B22
30	A31	50	A51	78	B3	98	B23
31	A32	51	A52	79	B4	99	B24
32	A33	52	A53	80	B5	100	B25
33	A34	53	A54	81	B6	101	B26
34	A35	54	A55	82	B7	102	B27
35	A36	55	A56	83	B8	103	B28
36	TP15	56	A57	84	B9	104	B29
37	A38	57	A58	85	B10	105	B30
38	A39	58	A59	86	B11	108	TP5
39	A40	59	A60	87	B12	119	TP4
40	A41	64	TP9	88	B13	121	TP5
41	A42	66	TP10	89	B14	123	TP6
42	A43	68	TP11	90	B15	125	TP7
43	A44	70	TP12	91	B16	127	TP8
44	A45	72	TP13	92	B17	166	TP1
45	A46	73	TP16	93	B18	167	TP2
46	A47	74	TP14	94	B19	168	TP3
47	A48	75	TP17	95	B20		

2-18. REFERENCE IEEE BOARD 2225-2703.

a. MAIN TEST PROCEDURE.

CAUTION

This equipment contains parts sensitive to damage by ELECTROSTATIC DISCHARGE (ESD). Use ESD precautionary procedures when touching, removing, or inserting parts or assemblies. Review DOD-HDBK-263 for proper handling instructions.

PRETEST NOTES

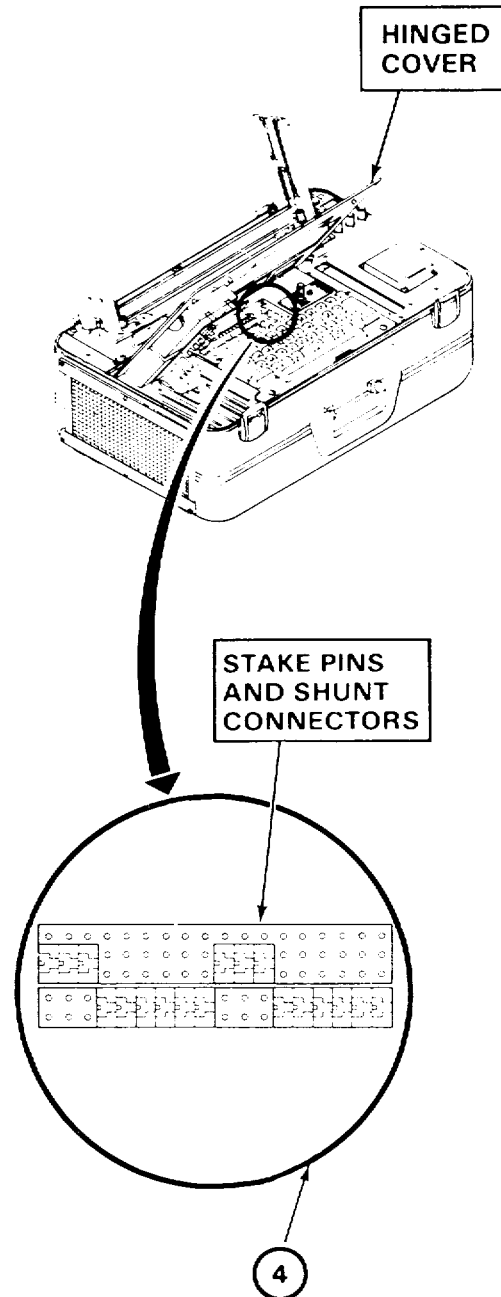
- Before proceeding, ensure that you have the correct part numbers on the ICD, TPS tape cartridge, and cable set for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- Ensure that the ICD and cable set have been tested in accordance with TM 11-6625-3097-24 if they are being used for the first time today.
- Proceed to step (3) if all applicable PMCS have already been performed on the DCT.

- (1) Prepare the DCT for use and perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.

WARNING

Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.



2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).

- (5) Using 40-pin IC chip puller, remove IC chip 10A from reference IEEE board 2225-2703 (see Figure 2-11). Store chip in safe place on antistatic foam.
- (6) Set dip switches S6 and S8 at UUT location B7 to the ON (CLOSED) position and all other dip switches at B7 to the OFF (OPEN) position (see Figure 2-11).

NOTE

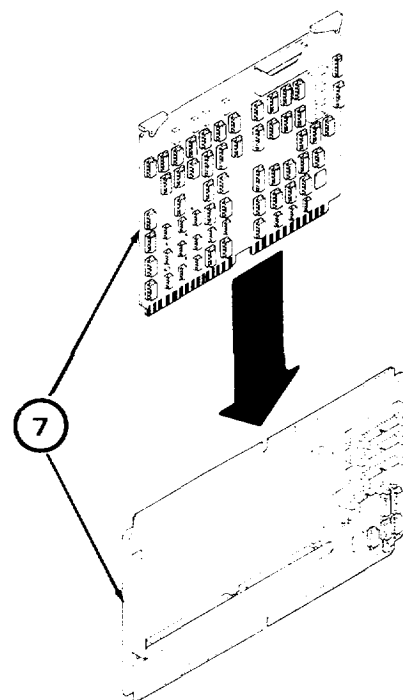
Ensure that UUT seats firmly in the ICD during step (7). If UUT is firmly seated, visible length of the board connector pins should be no more than 1/8 inch.

- (7) Install UUT into ICD NO. 1 SIDE PA (P/N A3038069).

NOTE

Refer to paragraph 2-6. **USE OF CABLE SETS** (page 2-4) before performing test cable hookup.

- (8) Connect CABLE SET FOR 2225-2703 (P/N A3038036-4) to the UUT and ICD according to destination markings on clamp attached to each cable (see Figure 2-11). Perform the following steps using the designated cable or wire:
 - a. Connect TP 5 through 13 (UUT, use left-hand connector) to J2 (ICD). Place red wire at TP 5.
 - b. Connect TP 18 through 26 (UUT, use right-hand connector) to J2 (ICD). Place red wire at TP 18.
 - c. Connect IC 10A (UUT) to J3 (ICD). Position the red wire to the top of the IC chip.
 - d. Connect J1 (UUT) to J4 (ICD). Position the red wire to the left of the connector.



NOTE

Ensure that the ICD is left-justified in fold-down adapter.

- (9) Install ICD and UUT into DCT fold-down adapter as a unit.
- (10) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5). Then return to step (11), below.

2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).

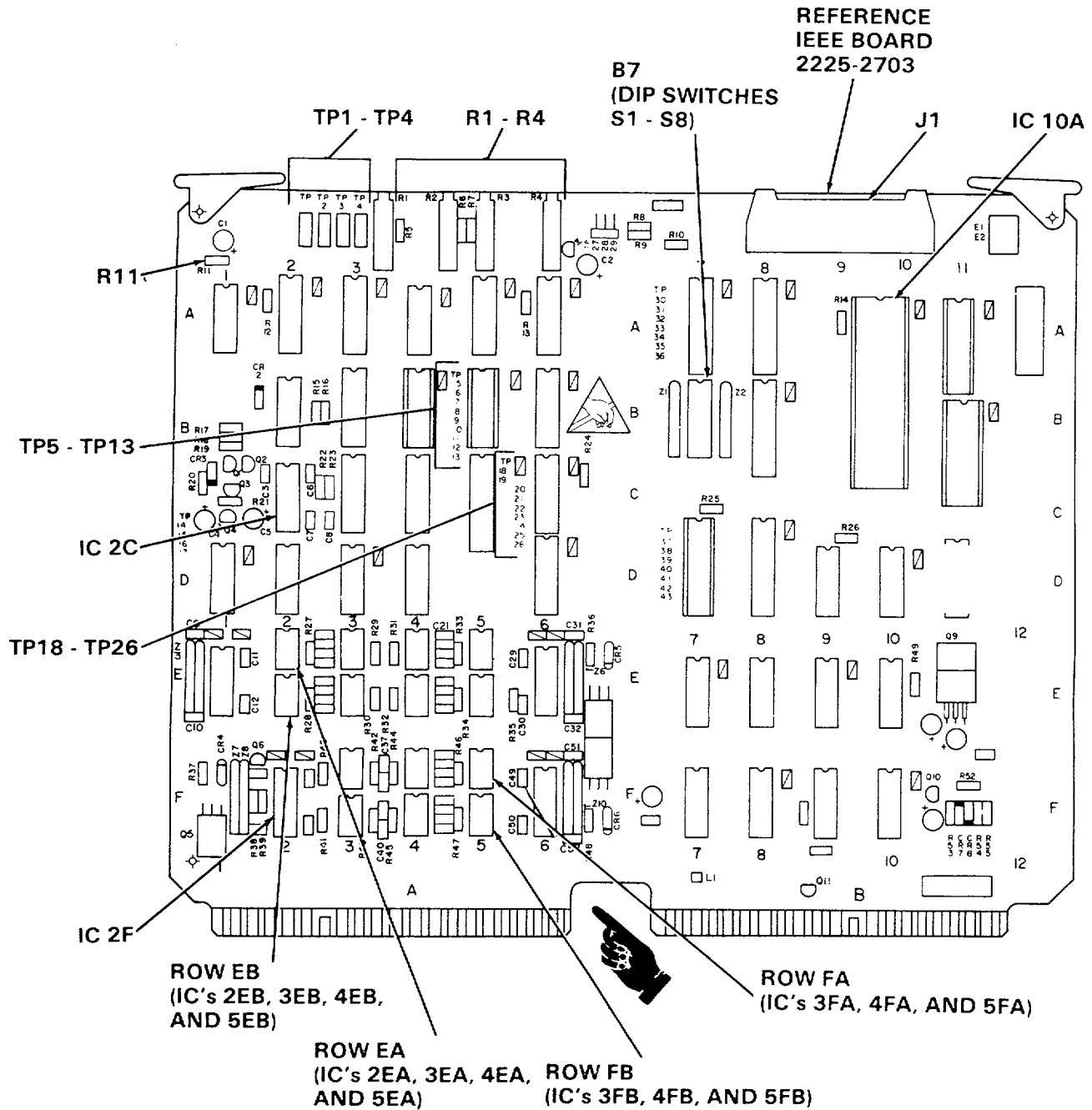


Figure 2-11. Cable Connection Points and Components Used During Reference IEEE Board Test (Sheet 1 of 2)

2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).

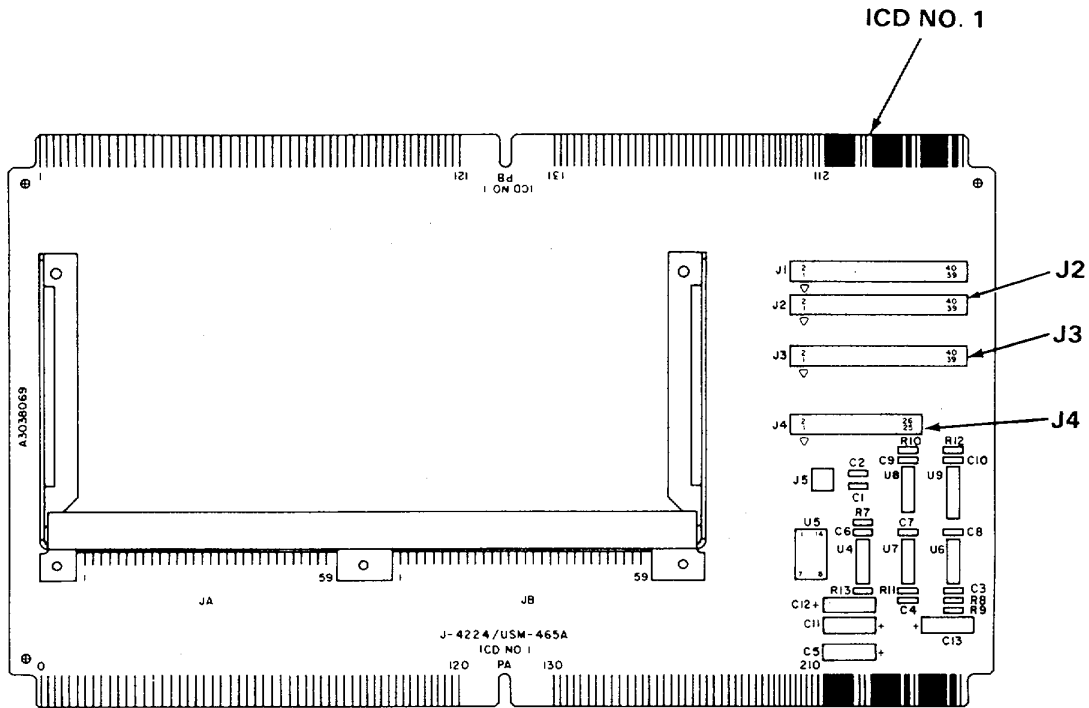


Figure 2-11. Cable Connection Points and Components Used During Reference IEEE Board Test (Sheet 2 of 2)

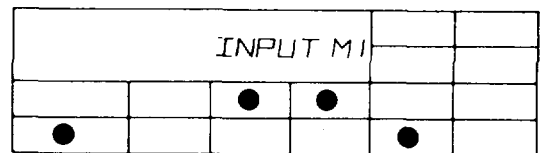
(11) Enter . Follow

instructions on paper tape until the following appear:

```
>11
>*****
>** 2225-2703 **
>** REV B **
>*****
>
>
>*****
>THREE TASKS
>*****
```

```
>
>IF PART NUMBERS
>OR SHUNTS ARE
>NOT RIGHT.
>
```

```
>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
>
>*****
>
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
>
```



2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).

NOTES

- The test program will generate a message on the paper tape during step (12) if boards are not installed correctly. Perform steps (7) through (9) again, then test the UUT per step (18), below.
- If cables are not installed correctly, the test program will run and a NO GO message will appear on the paper tape (see step (19), below). Check cable connections per step (8), above, then test the UUT per step (18), below.
- Although the test program runs automatically, the test procedures will require you to adjust the trimming potentiometers to provide certain test voltages. These adjustments should be made or else a good board may fail. These adjustments are for test purposes only and not for operational use. The board must be readjusted in the system according to TM 11-6625-3038-20.

WARNING

Voltage is applied to UUT during step (12), below. Do not touch UUT until "READY" appears on the display panel.

NOTE

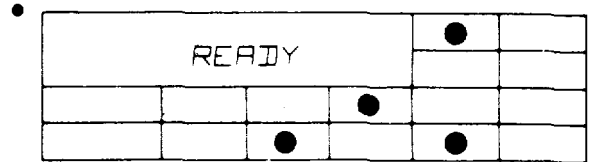
If the test program does not behave as shown in steps (12) and (13), go to step (19).

(12) Enter **EXECUTE** . The test program runs automatically.

```

>T52703P1.PSR XXXXXX
>*** PERFORMANCE ***
>***** TESTS *****
>*****
>USE A AN/PSM-45 OR
EQUIVALENT DIGITAL
VOLTMETER.
>
>VOLTAGE MEASUREMENTS
ARE TO BE MADE AT
THE TEST POINTS
INDICATED IN THE
PROGRAM.
>
>CONNECT COMMON LEAD
FROM DVM TO TP1 ON
THE REFERENCE BOARD.
>
>PRESS THE EXECUTE
KEY TO CONTINUE.
>*****
    
```

(13) Follow instructions on paper tape. The UUT passes if the following display and printout appear:



```

>*** ALL TESTS GO ***
>
>*****
>
>REMOVE UUT AND
INSTALL NEXT UUT TO
BE TESTED AND
PERFORM UUT SETUP
PROCEDURE IN
TM11-6625-3038-40 OR
GR2225-141-PM4
>
>*****
>END AT LINE 32767
    
```

2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).

(14) Disconnect cable set only from the UUT if next UUT is identical. Otherwise, disconnect cable set from both UUT and ICD.

CAUTION

Use extreme caution when removing UUT from ICD. Otherwise, UUT or ICD may be damaged.

- (15) Remove boards from DCT as follows:
 - a. Remove ICD and UUT from DCT as a unit.
 - b. Using pry bar, carefully remove UUT from ICD.

(16) Reinstall IC chip 10A onto UUT.

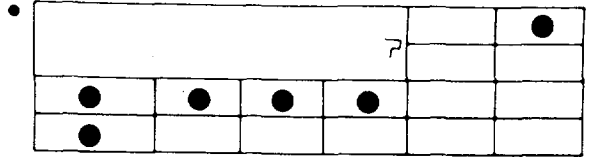
NOTE

To shut down the DCT, refer to TM 11-6625-3038-10. To test another, identical UUT, proceed as follows.

(17) Perform steps (5) through (9) for next UUT (reference IEEE board) to be tested.

(18) Enter    . Perform test again, starting with step (12).

(19) If a board fails, the DCT will identify the fault immediately or supply probing instructions to isolate the fault. Enter header information in accordance with TM 11-6625-3038-10 if the following display and printout (typical) appear



```

>***** NO GO *****
>T52703I2.LIMB XXXXXX
I
>FAULT AT LINE 10250
> PIN PB.30
>173744 PB.30
>TYPE HEADER INFO
    
```

NOTE

Read NOTES ON FAULT DIAGNOSTICS before beginning probing sequence.

(20) If applicable, follow probing instructions on paper tape in accordance with TM 11-6625-3038-10 to isolate faulty component(s). Probing will continue until the probable fault is listed on the printer. A load list may also be printed.

2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).

NOTES ON FAULT DIAGNOSTICS

- If a probable fault is listed as F9.5, the actual fault location is at D10.3 (IC 10D, pin 3).
- If a probable fault is listed as A1.6, the actual fault location is at A6.7 (IC 6A, pin 7).

- If a load list is not printed, enter A S



Then enter the probable fault location and

EXECUTE . The printer will type the load list for

that node. Enter ATTN to leave ASIG, P mode.

- If you are instructed to probe at edge connector pins, you may consult the board schematic diagram (refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTARY DATA, below) and probe the affected input/output node rather than the edge pin.
- Follow probing instructions on printout in accordance with TM 11-6625-3038-10.
- Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform steps (14) through (16), above. Forward UUT to repair station with paper tape.
- For more information, refer to FAULT DIAGNOSTICS, below.

b. TEST PROGRAM OPTIONS.

- To rerun a specific part of the test program, enter CMD RUN ! 1 * Ø EXECUTE . Enter " 2 for list and select desired option.

- Options 3 through 14 are the individual test modules contained in the main test program.
- Options 15 through 26 are not applicable to the AN/USM-465A.

- Enter CMD RUN " 2 * Ø EXECUTE to reset all variables and run a complete test.

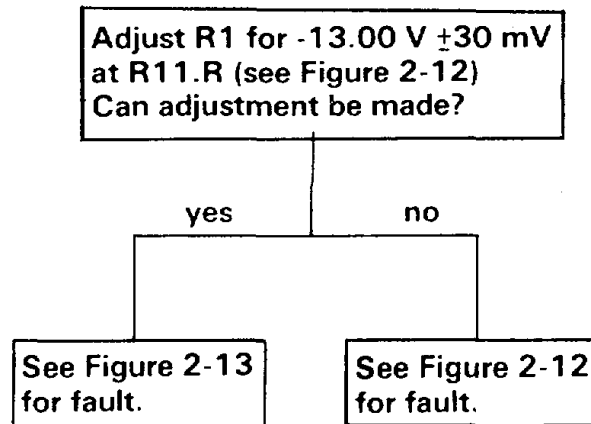
c. FAULT DIAGNOSTICS.

- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - Clean the ICD, UUT, and fold-down adapter pins with 99 percent isopropyl alcohol.
 - Test the ICD in accordance with TM 11-6625-3097-24.

2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).

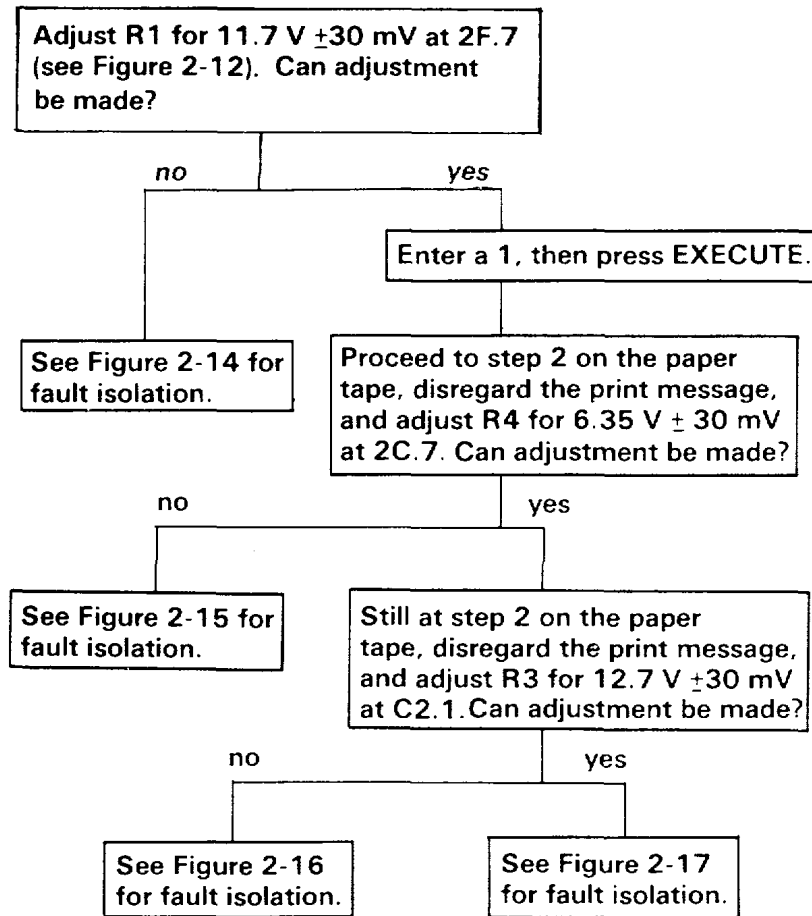
- If the UUT fails in the system after replacement of a bistable component (flip-flop or counter), the fault may be in the load of the component. Refer to the schematic diagrams in APPENDIX B and check the load on both outputs of the component.
- During the TP Test, the DCT printout will refer you to Item 1 or Item 2 below to locate faulty components if the specified test voltages cannot be achieved by adjusting the board trimming potentiometers.
 - a. Item 1 is used if the specified $11\text{ V} \pm 10\text{ mV}$ measurement at C2.14 (IC 2C, pin 14) cannot be achieved by adjusting R1.
 - b. Item 2 is used if the specified $-12.80\text{ V} \pm 30\text{ mV}$ measurement at TP 2 cannot be achieved by adjusting R2 or $12.70\text{ V} \pm 30\text{ mV}$ at TP 2 cannot be achieved by adjusting R3.
 - c. Items 1 and 2 will refer you to the various other test points and components to measure and check as contained in Figures 2-12 through 2-17. Follow the instructions contained in Item 1 or Item 2.

Item 1: Disregard the message at step 1 on the paper tape and follow the Troubleshooting Tree, below.

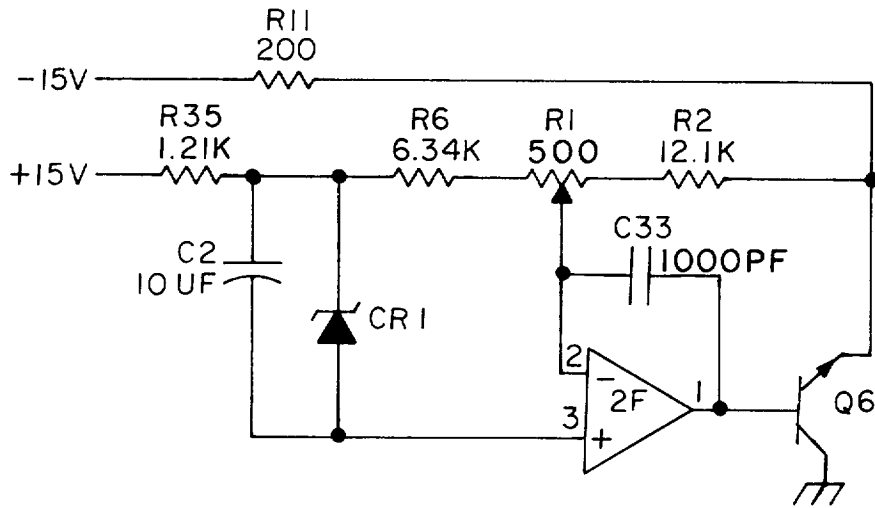


2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).

Item 2: Rerun the test program and disregard the message at step 1 on the paper tape. Follow the Troubleshooting Tree, below.



2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).



Probable Faults: 2F, Q6, CR1
 Load List: C2, R1, R6, R11, R35, R2, C33

Figure 2-12. Reference IEEE Board Circuit Schematic A

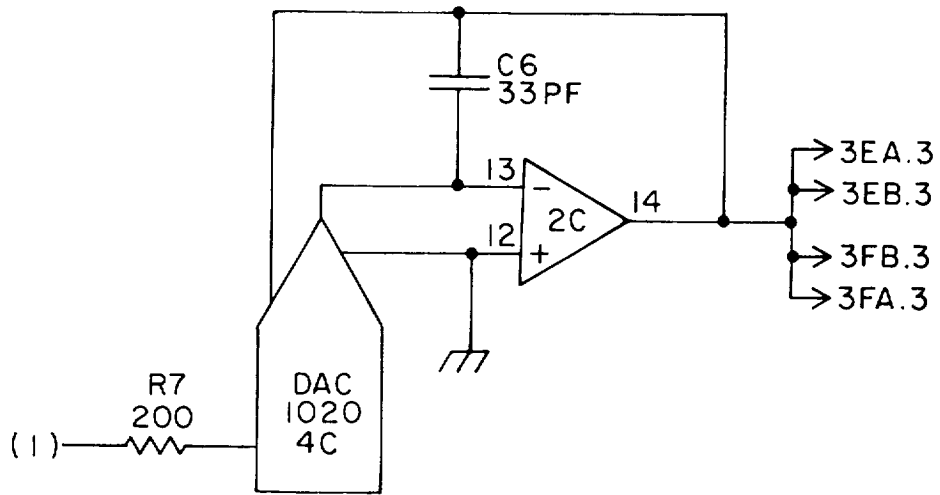


Figure 2-13. Reference IEEE Board Circuit Schematic B

2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).

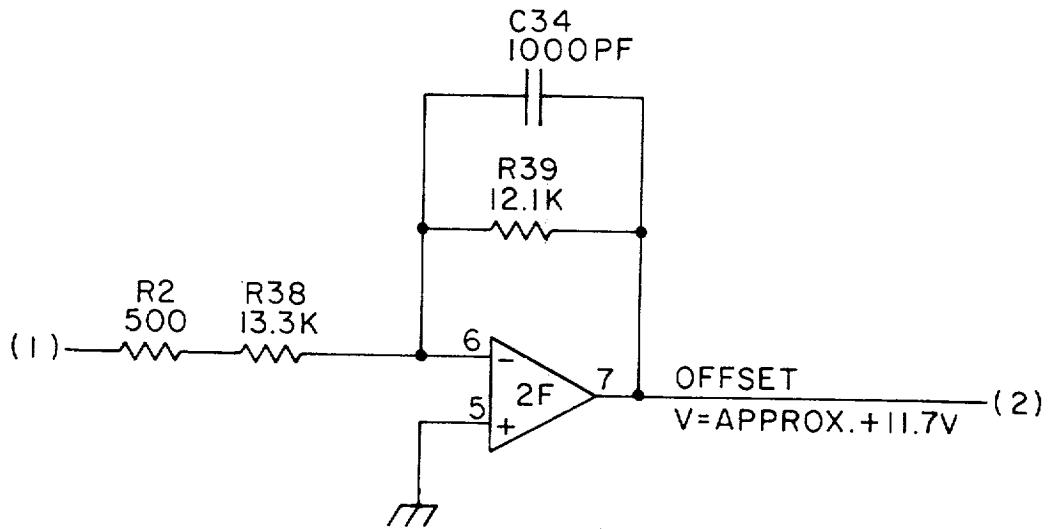


Figure 2-14. Reference IEEE Board Circuit Schematic C

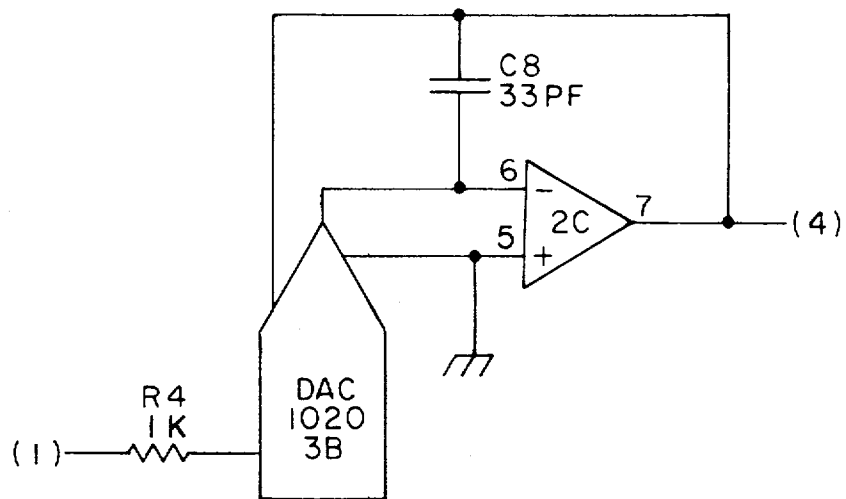


Figure 2-15. Reference IEEE Board Circuit Schematic D

2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).

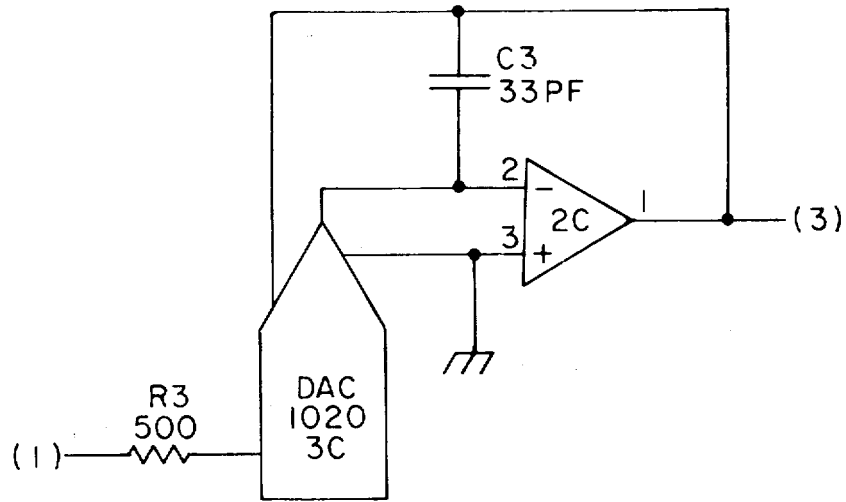


Figure 2-16. Reference IEEE Board Circuit Schematic E

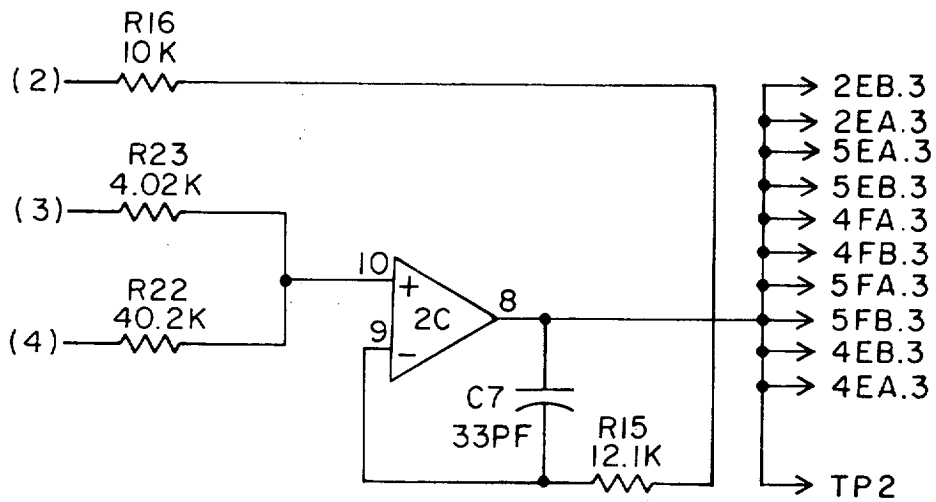


Figure 2-17. Reference IEEE Board Circuit Schematic F

2-18. REFERENCE IEEE BOARD 2225-2703 (CONTINUED).**d. SUPPLEMENTARY DATA.**

Table 2-14 shows the relationship between the driver/sensor pins and component nodes or edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructs you to probe any pin or node that is inaccessible.

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD (see Figure 2-11).

UUT edge pins in the BOARD CONNECTION column are represented as "A##" or "B##". "A##" pins can be probed at side "A" of the UUT. "B##" pins can be probed at side "B" of the UUT. See Figure 2-11. Locate pins according to the reference numbers printed on the UUT.

Component nodes listed in the BOARD CONNECTION column are represented with the standard component identifiers and pin specifications (for example, "U2.3" or "6B.15"). Use Figure 2-11 as necessary to locate probing points on the UUT.

Table 2-14. Reference IEEE Board Pin Cross-Reference List

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0	A1	46	A47	95	B20	141	A10.9
1	A2	47	A48	96	B21	142	A10.31
2	A3	48	A49	97	B22	143	A10.10
3	A4	49	A50	98	B23	144	A10.30
5	A6	50	A51	99	B24	145	A10.11
6	TP11	51	A52	100	B25	146	A10.29
7	A8	52	A53	101	B26	147	A10.12
8	A9	53	A54	102	B27	148	A10.28
9	A10	54	A55	103	B28	149	A10.13
10	TP13	54	A56	104	B29	150	A10.27
11	A12	55	A57	105	B30	151	A10.14
12	A13	57	A58	106	B31	152	A10.26
13	A14	58	A59	107	B32	153	A10.15
14	A15	59	A60	108	B33	154	A10.25
15	A16	62	A10.22	109	B34	155	A10.16
16	TP12	63	A10.2	110	B35	156	A10.24
17	TP23	66	J1.01	111	B36	157	A10.17
18	A19	68	J1.03	112	B37	158	A10.23
19	TP25	70	J1.05	113	B38	159	A1018
20	TP18	72	J1.07	114	B39	163	J1.22
21	TP26	73	J1.13	115	B40	164	J1.21
22	TP8	74	J1.09	116	B41	166	J1.02
23	A24	75	J1.15	117	B42	167	J1.04
24	A25	76	B1	118	B43	168	J1.06
25	TP9	77	B2	119	J1.08	169	TP24
26	J1.17	78	B3	121	J1.10	170	TP19
27	A28	79	B4	123	J1.12	171	TP20
29	A30	80	B5	125	J1.14	172	TP22
30	A31	81	B6	127	J1.16	173	TP21
31	A32	82	B7	128	A10.38	174	A10.39
33	A34	83	B8	129	A10.3	175	A10.19

Table 2-14. Reference IEEE Board Pin Cross-Reference List (Continued)

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
34	A35	84	B9	130	A10.37	176	A10.40
35	A36	85	B10	131	A10.4	177	A10.1
36	J1.11	86	B11	132	A10.36	178	A10.21
37	A38	87	B12	133	A10.5	179	A10.20
39	A40	88	B13	134	A10.35	181	TP5
40	A41	89	B14	135	A10.6	182	TP6
41	A42	90	B15	136	A10.34	183	TP7
42	A43	91	B16	137	A10.7	185	J1.25
43	A44	92	B17	138	A10.33	186	J1.26
44	A45	93	B18	139	A10.8	190	J1.25
45	A46	94	B19	140	A10.32	191	J1.26

Section IV. MAINTENANCE PROCEDURES

Refer to the paper tape that accompanies the faulty printed circuit board (PCB). Remove and replace any component listed as a probable fault and all components contained in the load list. Retest the board. PCB repair shall be in accordance with TB 43-0127.

If panel board 0100-2701 has failed during a Keyboard Opens test, remove and replace defective key(s). Solder as necessary. Retest the board.

2-19. 512K MEMORY BOARD 2235-2706.

WARNING

a. MAIN TEST PROCEDURE.

CAUTION

This equipment contains parts sensitive to damage by ELECTROSTATIC DISCHARGE (ESD). Use ESD precautionary procedures when touching, removing, or inserting parts or assemblies. Review DOD-HDBK-263 for proper handling instructions.

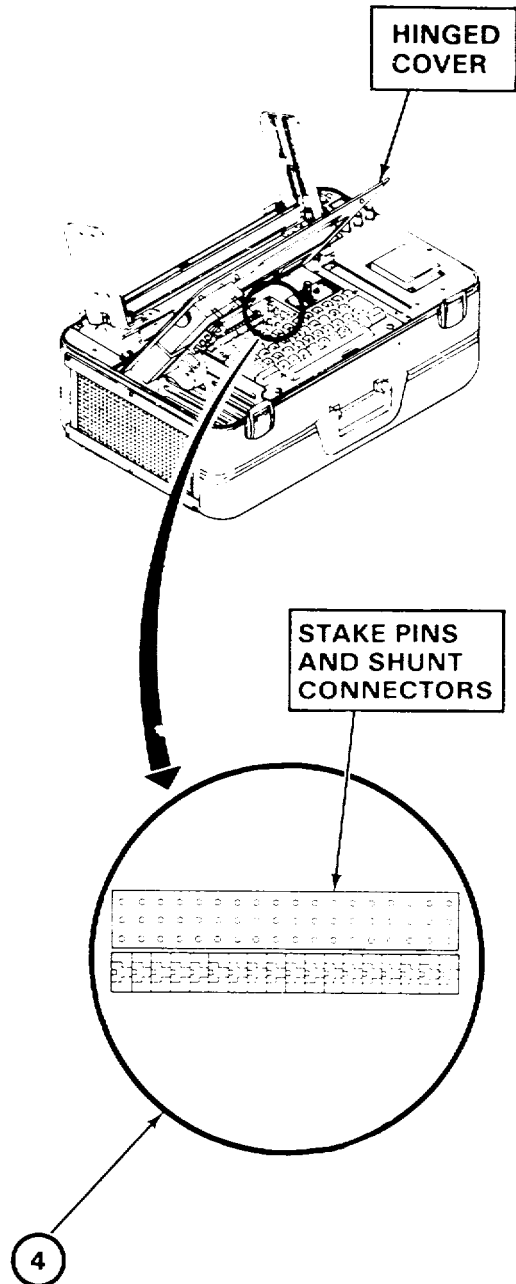
Ensure that the DCT is turned OFF before performing step (4) to avoid the danger of electric shock.

- (4) Open hinged cover on the DCT. Position shunt connectors on power supply pins as shown.

PRETEST NOTES

- Before proceeding, ensure that you have the correct part numbers on the ICD, TPS tape cartridge, and cable set for your UUT. Make sure your UUT shows the correct part number and revision level. Refer to Table 2-1 on page 2-3 and to TB 43-0128, CECOM Test Program Set Index.
- Ensure that the ICD and cable set have been tested in accordance with TM 11-6625-3097-24 if they are being used for the first time today.
- Proceed to step (3) if all applicable PMCS have already been performed on the DCT.

- (1) Prepare the DCT for use and perform PMCS as applicable in accordance with TM 11-6625-3038-10.
- (2) Perform all applicable PMCS in accordance with TM 11-6625-3038-20.
- (3) Shut down the DCT in accordance with TM 11-6625-3038-10.



2-19. 512K MEMORY BOARD 2235-2706 (CONTINUED).

NOTE

Ensure that UUT seats firmly in the ICD step (5). If board is firmly seated, visible length of the board connector pins should be no more than 1/8 inch.

- (5) Install memory board 2235-2706 into ICD NO. 2 SIDE PA (P/N A3038070).

NOTE

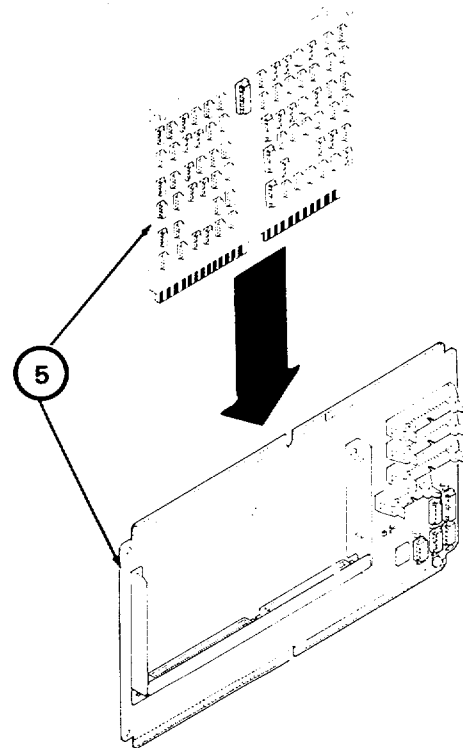
Refer to paragraph 2-6, USE OF CABLE SETS (page 2-4) before performing test cable hookup.

- (6) Connect CABLE SET FOR 2235-2706 (P/N A3038037-5) to the UUT and ICD according to destination markings on clamp attached to each cable (see Figure 2-8). Perform the following steps using the designated cable or wire:

- a. Connect TEST POINTS TP1-16 (UUT) to J8 (ICD).
- b. Connect TEST POINTS TP17-32 (UUT) to J7 (ICD).

NOTE

When connecting cables to UUT, ensure that the red wires are properly matched with pin 1 (TP1-16) and pin 17 (TP17-32) of the test point connectors.

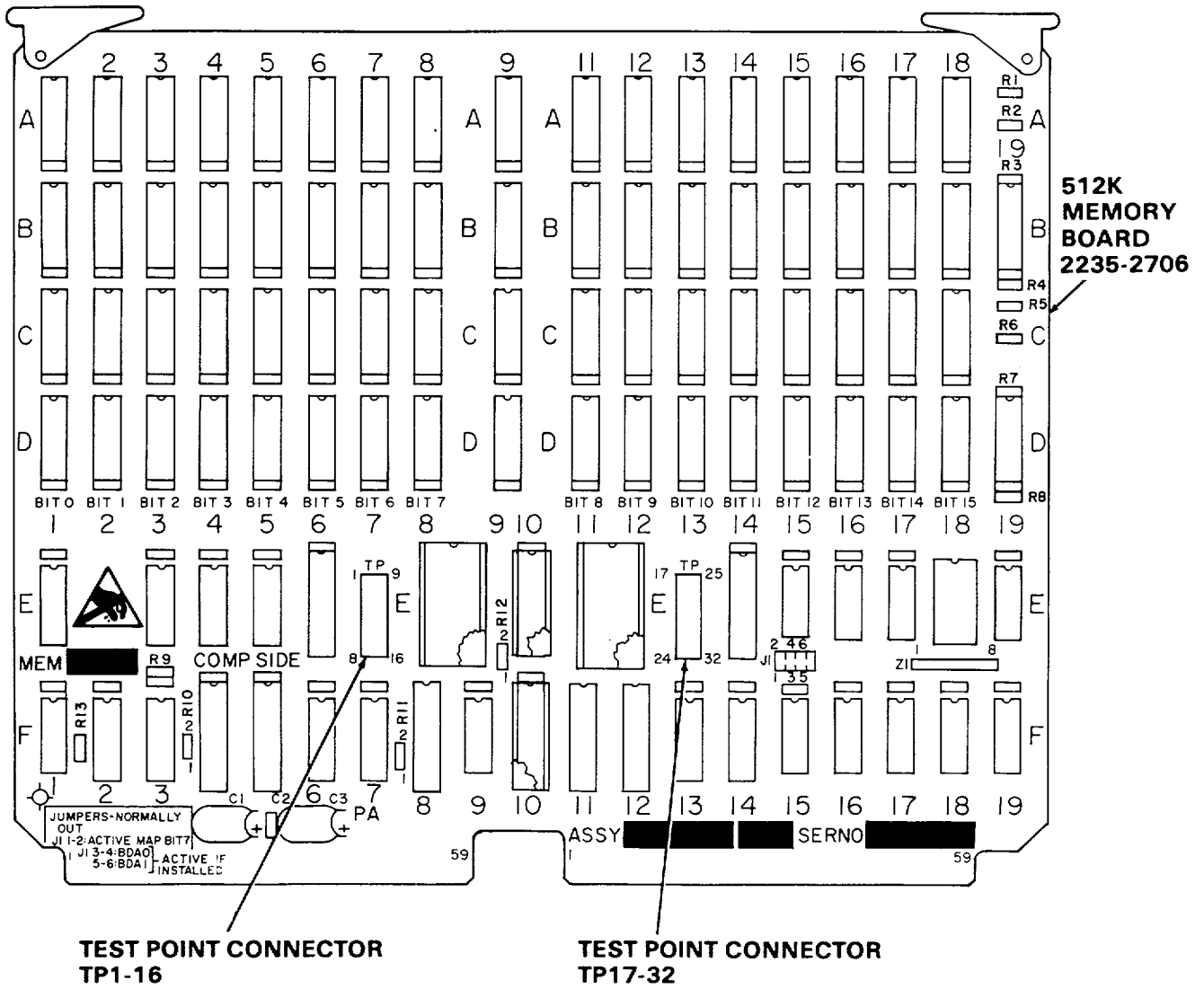


NOTE

Ensure that the ICD is left-justified in fold-down adapter.

- (7) Install ICD and UUT into DCT fold-down adapter as a unit.
- (8) Load system software and TPS tape dispatcher in accordance with paragraph 2-7, SOFTWARE LOADING PROCEDURE (refer to page 2-5). Then return to step (9), below.

2-19. 512K MEMORY BOARD 2235-2706 (CONTINUED).



TEST POINT CONNECTOR TP1-16

TEST POINT CONNECTOR TP17-32

Figure 2-18. Cable Connection Points for 512K Memory Board Test (Sheet 1 of 2)

2-19. 512K MEMORY BOARD 2235-2706 (CONTINUED).

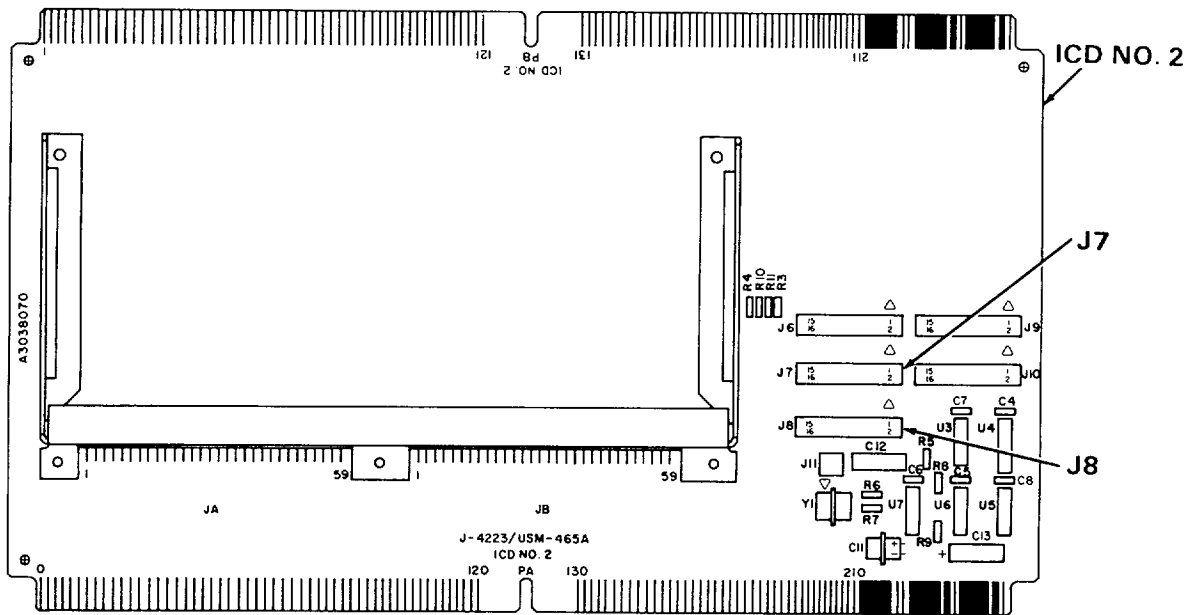


Figure 2-18. Cable Connection Points for 512K Memory Board Test (Sheet 2 of 2)

(9) Enter **EXECUTE** . Follow instructions on paper tape until the following appear:

```

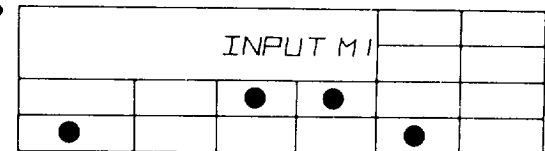
>12
>*****
>**  2235-2706  **
>**   REV B    **
>*****
>
>
>*****
>THREE TASKS
>*****
    
```

```

>
>IF PART NUMBER
>OR SHUNTS ARE
>NOT RIGHT.
>
    
```

```

>SEE
>TM11-6625-3038-40
>GR 2225-0141-PM4
>
>*****
>
>PRESS THE EXECUTE
>KEY WHEN READY TO
>CONTINUE.
>
>*****
    
```




2-19. 512K MEMORY BOARD 2235-2706 (CONTINUED).

WARNING

Voltage is applied to UUT during step (10), below. Do not touch UUT until "READY" appears on the display panel.

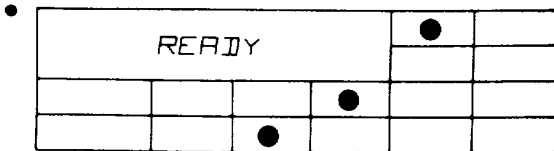
NOTE

If the test program does not behave as shown in step (10), go to step (16).

- (10) Enter  . The test program will run automatically.

```
>T2706P1.PSR 000000
```

- (11) The board passes if the following display and printout appear:



```
>*** PERFORMANCE ***
>***** TESTS *****
>T2706I1.IMG XXXXXX I
>T2706H1.HSP XXXXXX H
>T2706H2.HSP XXXXXX H
>T2706I2.IMG XXXXXX I
>*** ALL TESTS GO ***
>
>*****
>
>REMOVE UUT AND
>INSTALL NEXT UUT TO
>BE TESTED AND
>PERFORM UUT SETUP
>PROCEDURE IN
>TM11-6625-3038-40 OR
>GR2225-141-PM4
>
>*****
>END LINE 32767
```

NOTES ON TEST SETUP




- The test program will generate a message on the paper tape during step (10) if boards are not installed correctly. Perform steps (5) through (7) again, then test the UUT per step (15), below.
- If cables are not installed correctly, the test program will run and a NO GO message will appear on the paper tape (see step (15), below). Check cable connections per step (6), above, then test the UUT per step (14), below.

- (12) Disconnect cable set only from UUT if next UUT is identical. Otherwise, disconnect cable set from both UUT and ICD.

CAUTION

Use extreme caution when removing boards from ICD. Otherwise, boards or ICD may be damaged.

- (13) Remove boards from DCT as follows:
 - Remove ICD and UUT from DCT as a unit.
 - Using pry bar, carefully remove UUT from ICD.
- (14) Perform steps (5) through (7) for next UUT to be tested.

- (15) Enter    . The test program will run automatically for the next board. Refer to step (11) for board pass indications.

2-19. 512K MEMORY BOARD 2235-2706 (CONTINUED).

(16) If a board fails, the DCT will identify the fault immediately or supply probing instructions to isolate the fault. Enter header information in accordance with TM 11-6625-3038-10 if the display and printout (typical) shown below appear. If fault display and printout are different see NOTES ON FAULT DIAGNOSTICS, below.

```

>***** NO GO *****
>T270613.IMG XXXXXX
I
>FAULT AT LINE 10250
> PIN PB.30
>173744 PB.30
>TYPE HEADER INFO
    
```

(17) If applicable, follow probing instructions on paper tape in accordance with TM 11-6625-3038-10 to isolate faulty component(s). Probing will continue until the probable fault is listed on the printer. A load list may also be printed.

				7		●
●	●	●	●			
●						

NOTE ON BOARD FAILURES


- Read NOTES ON FAULT DIAGNOSTICS, below, and section c, FAULT DIAGNOSTICS before you begin probing or troubleshooting.


2-19. 512K MEMORY BOARD 2235-2706 (CONTINUED).

NOTES ON FAULT DIAGNOSTICS

- If a load list is not printed, enter  



Then enter the probable fault location and . The printer will type the load list for

that node. Enter  to leave ASIG, P mode.


- If you are instructed to probe at edge connector pins you may consult the board schematic diagram (refer to APPENDIX B) or pin cross-reference list (refer to SUPPLEMENTARY DATA, below) and probe the affected input/output node rather than the edge pin.
- Follow probing instructions on printout in accordance with TM 11-6625-3038-10.

- Upon completion of fault diagnostics, check all board and cable connections. Then rerun the test program to verify the board failure. If the board fails again, perform steps (11) and (12), above. Forward UUT to repair station with paper tape.
- For more information, refer to FAULT DIAGNOSTICS, below.
- The probing points listed in the first column below are accessible only from the rear (solder side) of the UUT. If the DCT printout instructs you to probe at any one of these points, use the alternate point on the UUT front side shown in the second column.

PROBE POINT (UUT REAR)	ALTERNATE PROBE POINT (UUT FRONT)
E18.6	E19.9
E18.8	E19.1
E18.10	E19.5
Z1.2	F17.9
Z1.3	F17.10
Z1.4	F15.12
Z1.5	F18.10
Z1.6	E15.11
Z1.7	E15.13
Z1.8	F5.11

b. TEST PROGRAM OPTIONS.

- To rerun a specific part of the test program, enter     . Enter

 for list and select desired option.

- Options 3 through 16 are the individual test modules contained in the main test program.
- Options 17 through 26 are not applicable to the AN/USM-465A.

- Enter      to reset all variables and run a complete test.

2-19. MEMORY BOARD 2235-2706 (CONTINUED).

c. FAULT DIAGNOSTICS.

- Perform the following steps if the test program diagnoses a fault at the UUT edge pin connector. Try the test again after each step.
 - a. Ensure that the ICD is left-justified in the fold-down adapter and that all connector pins are aligned.
 - b. Clean the ICD, UUT, and fold-down adapter pins with 99 percent isopropyl alcohol.
 - c. Test the ICD in accordance with TM 11-6625-3097-24.
- The program misdiagnoses certain faults during execution. The table below indicates the misdiagnosed faults and their corresponding actual faults.

<u>DIAGNOSED FAULT</u>	<u>ACTUAL FAULT</u>	<u>DIAGNOSED FAULT</u>	<u>ACTUAL FAULT</u>
A18.14	E18.10	E15.8	B19.5
B6.14	E18.6	E17.5	F7.11
B18.14	E18.10	E17.9	E18.8
C18.14	E18.10	F2.15	B19.5
D18.14	E18.10	F3.15	B19.5 or F11.7
E3.5	E17.5 or Z1.3	F6.13	D19.9
E4.5	F5.9	F8.5	D19.9
E5.5	F10.17	F16.12	B19.5
E5.9	F5.18 or F7.2	F17.6	F10.19
E11.17	E18.10	F18.8	B19.5
E14.18	E18.10	F18.9	B19.5
		TP17	F5.9
		TP19	F10.17

d. SUPPLEMENTARY DATA.

Table 2-15 shows the relationship between the driver/sensor pins and component nodes or edge pins on the UUT. Use the table to locate an alternate probing point when the paper tape instructions you to probe any pin or node that is inaccessible.

The driver/sensor (D/S) pins can be probed along the edge connector of the ICD, which is inserted into the fold-down adapter. Locate pins according to the reference numbers printed on the ICD (see Figure 2-18).

UUT edge pins in the BOARD CONNECTION column are represented as "A##" or "B##". "A##" pins can be probed at side "A" of the UUT. "B##" pins can be probed at side "B" of the UUT. See Figure 2-18. Locate pins according to the reference numbers printed on the UUT.

Component nodes listed in the BOARD CONNECTION column are located on the TEST POINTS connector. Use Figure 2-18 as necessary to locate probing points on the UUT.

2-19. 512K MEMORY BOARD 2235-2706 (CONTINUED).

Table 2-15. Memory Board Pin Cross-Reference List

D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION	D/S PIN	BOARD CONNECTION
0		45	A46	87	B12	147	TP30
1		46	A47	88	B13	148	TP23
2		47	A48	89	B14	149	TP31
3		48	E49	90	B15	150	TP24
4		49	A50	91	B16	151	TP32
5		51	A52	92	B17	160	TP1
6		52	A53	93	B18	161	TP9
7		53	A54	94	B19	162	TP2
8		54	A55TST	95	B20	163	TP10
9		55	A56	97	B22	164	TP3
10		56	A57	99	B24	165	TP11
11		57	A58	101	B26	166	TP4
12		58	A59	102	B27	167	TP12
13		59	A60	103	B28	168	TP5
14		60		105	B30	169	TP13
15		61		136	TP17	170	TP6
17		62		137	TP25	171	TP14
18		76	B1	138	TP18	172	TP7
19		78	B3	139	TP26	173	TP15
28	A55	80	B5	140	TP19	174	TP8
33	A34	81	B6	141	TP27	175	TP16
35	A36	82	B7	142	TP20	178	
37	A38	83	B8	143	TP28	188	
39	A40	84	B9	144	TP21		
41	A42	85	B10	145	TP29		
43	A44	86	B11	146	TP22		

Section IV. MAINTENANCE PROCEDURES

Refer to the paper tape that accompanies the faulty printed circuit board (PCB). Remove and replace any Component listed as a probable fault and all components contained in the load list. Retest the board. PCB repair shall be in accordance with TB 43-0127.

If panel board 0100-2701 has failed during a Keyboard Opens test, remove and replace defective key(s). Solder as necessary. Retest the board.

APPENDIX A

REFERENCES

A-1. SCOPE

This appendix lists all forms and technical manuals referenced in this manual.

A-2. FORMS

Discrepancy in Shipment Report (DISREP)..... SF 361
 Quality Deficiency Report SF 368
 Recommended Changes to Equipment Technical Publications DA Form 2028
 Recommended Changes to Publications and Blank Forms DA Form 2028-2
 Report of Discrepancy (ROD) SF 364

A-3. TECHNICAL BULLETINS

CECOM Test Program Set (TPS) Index..... TB 43-0128
 Maintenance and Repair of Printed Circuit Boards and Printed Wiring Assemblies TB 43-0127

A-4. TECHNICAL MANUALS

Operator's Manual, AN/USM-465A Test Set, Digital Card Tester
 (NSN 6625-01-126-2473)..... TM 11-6625-3038-10

Organizational Maintenance Manual Test Set, Digital Card Tester
 AN/USM-465A (NSN 6625-01-126-2473) TM 11-6625-3038-20

Organizational, Direct Support, General Support Maintenance and Depot
 Maintenance Repair Parts and Special Tools List, Test Set, Digital Card Tester
 AN/USM-465A (NSN 6625-01-126-2473) TM 11-6625-3038-24P

Organizational, Direct, and General Support Maintenance Manual,
 Test Program Set TPS11-AN/USM-465A Interface Connecting Devices TM 11 -6625-3097-24

Organizational, Direct Support, General Support Maintenance and Depot
 Maintenance Repair Parts and Special Tools List, Test Program
 Set TPS 11-AN/USM-465A TM 11-6625-3097-24P

Procedures for Destruction of Electronics Materiel to Prevent Enemy Use
 (Electronics Command) TM 750-244-2

APPENDIX A (CONTINUED)

REFERENCES

A-5. MISCELLANEOUS PUBLICATIONS

Maintenance Management Update..... DA PAM 738-750

Consolidated Index of Army Publications and Blank Forms..... DA PAM 310-1

Electrostatic Discharge Control Handbook for Protection of Electrical and
Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated
Explosive Devices)..... DOD-HDBK-263

First Aid for Soldiers FM 21-11

A-6. REGULATIONS

Reporting of Transportation Discrepancies in Shipments AR 55-38

Reporting of Item and Packaging Discrepancies AR 735-11-2

APPENDIX B

UUT SCHEMATIC DRAWINGS

UUT PART NUMBER	SCHEMATIC DRAWING FIGURE NUMBER	UUT NOMENCLATURE
0100-2701	B-1	Panel Board
0100-2702	B-2	Display Board
0100-2703	B-3	Driver/Sensor Board
0100-2704	B-4	Pin Processor Board
0100-2705	B-5	Processor Board
0100-2708	B-6	Reference Board
0100-2723	B-7	Printer Driver Board
0100-2724	B-8	Peripheral Board
0100-2736	B-9	Tape Drive Interface Board
0100-3754	B-10	Memory Board
2225-2703	B-11	Reference IEEE Board
2235-2706	B-12	512K Memory Board

APPENDIX C

UUT ASSEMBLY DRAWINGS

UUT PART NUMBER	SCHEMATIC DRAWING FIGURE NUMBER	UUT NOMENCLATURE
0100-2701	C-1	Panel Board
0100-2702	C-2	Display Board
0100-2703	C-3	Driver/Sensor Board
0100-2704	C-4	Pin Processor Board
0100-2705	C-5	Processor Board
0100-2708	C-6	Reference Board
0100-2723	C-7	Printer Driver Board
0100-2724	C-8	Peripheral Board
0100-2736	C-9	Tape Drive Interface Board
0100-3754	C-10	Memory Board
2225-2703	C-11	Reference IEEE Board
2235-2706	C-12	512K Memory Board

GLOSSARY

Batch	Two or more identical UUT's to be user tested.
Bistable Device	A component that remains either "on" or "off" until it is switched to another state. (A monostable device switches temporarily, but returns to its original state immediately.)
Black Box	A component that can be used to produce a consistent, known effect even though the user has no knowledge of the component's structure.
Chip	A small electronic device which contains an integrated circuit (IC).
Fault Diagnostics	To isolate a defective component or set of components (on a UUT) using the DCT.
Go-No Go Testing	Testing which informs you, the operator, whether the UUT is good (go) or bad (no go).
Image File	The image file is a "schematic" of the UUT. The DCT "looks at" this UUT "schematic" while deciding where you should probe.
Load List	The set of components or nodes at which failure may have occurred within a circuit if it did not occur at the probable fault location.
Node	A junction point in an electronic circuit. Signals are measured at such points to verify circuit operation.
Preload	Prepares the memory circuits in the DCT to accept the TPS information.
Probable Fault	The most likely failure location within a circuit, as detected and diagnosed by a test program.
System Software Tape	Used to self-test the DCT. Also preloads the DCT.
Test Program Set (TPS)	Includes a tape cartridge, board interface connecting device (ICD), and operator instructions. Used with specific board or set of boards.

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PUBLICATION NUMBER

TM 11-5840-340-12

DATE

23 Jan 74

TITLE

Radar Set AN/SPS-76

BE EXACT... PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.
----------	------------	------------	-----------

2-25	2-28		
3-10	3-3	3-1	
5-6	5-8		
		FO3	

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°.

REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 45 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.

Item 5, Function column. Change "2 db" to "3db."

REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.

Add step f.1 to read, "Replace cover plate removed in step e.1, above."

REASON: To replace the cover plate.

Zone C 3. On J1-2, change "+24 VDC to "+5 VDC."

REASON: This is the output line of the 5 VDC power supply. + 24 VDC is the input voltage.

TEAR ALONG DOTTED LINE

TYPE NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SSG I. M. DeSpirito 999-1776

SIGN HERE:

SSG I. M. DeSpirito

DA FORM 2028-2
1 AUG 74

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1134 1686-75

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PAGE NO.

PARA-GRAPH

FIGURE NO.

TABLE NO.

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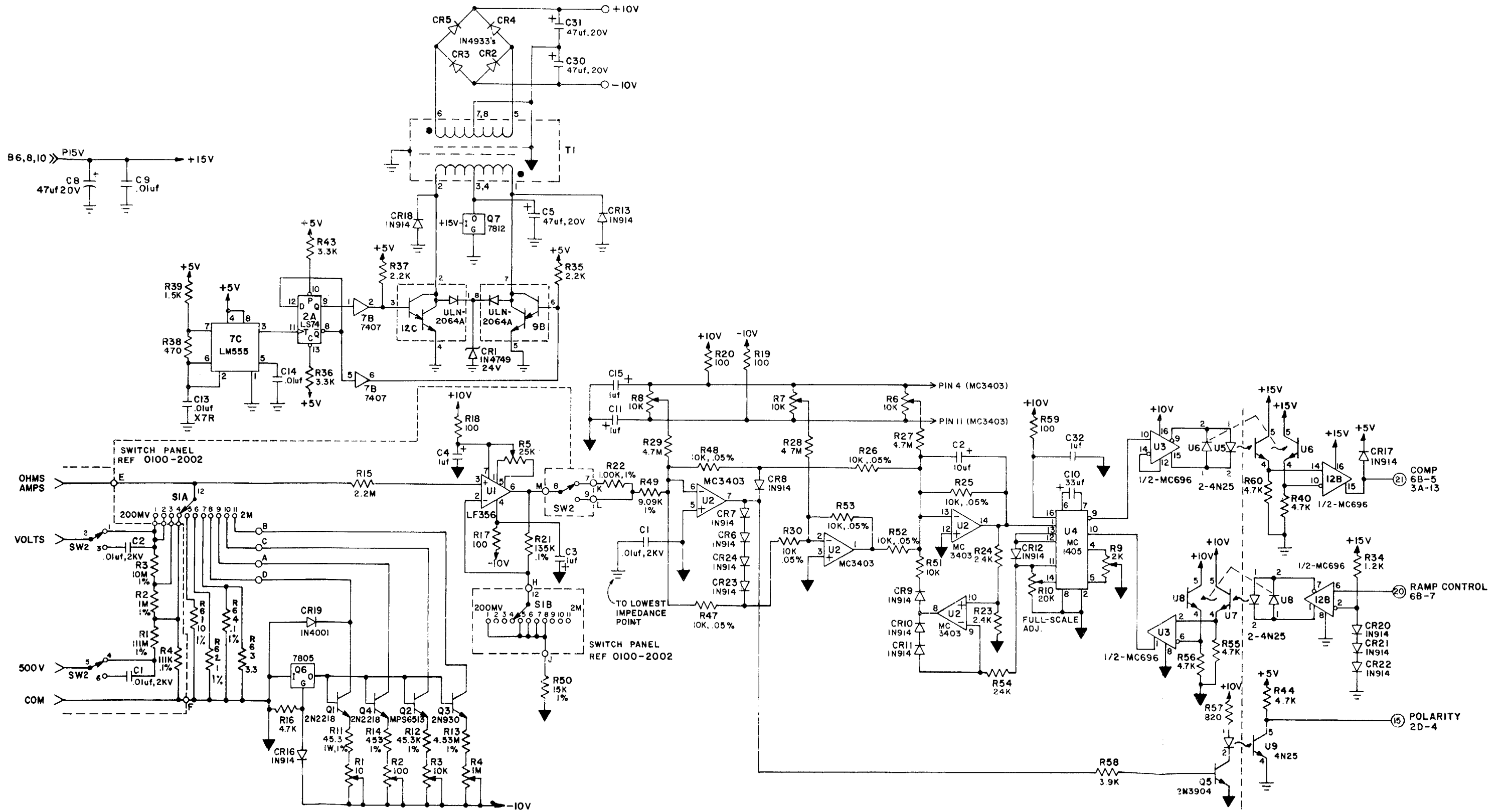


Figure B-1. Panel Board 0100-2701 Schematic Diagram (Sheet 1 of 4)

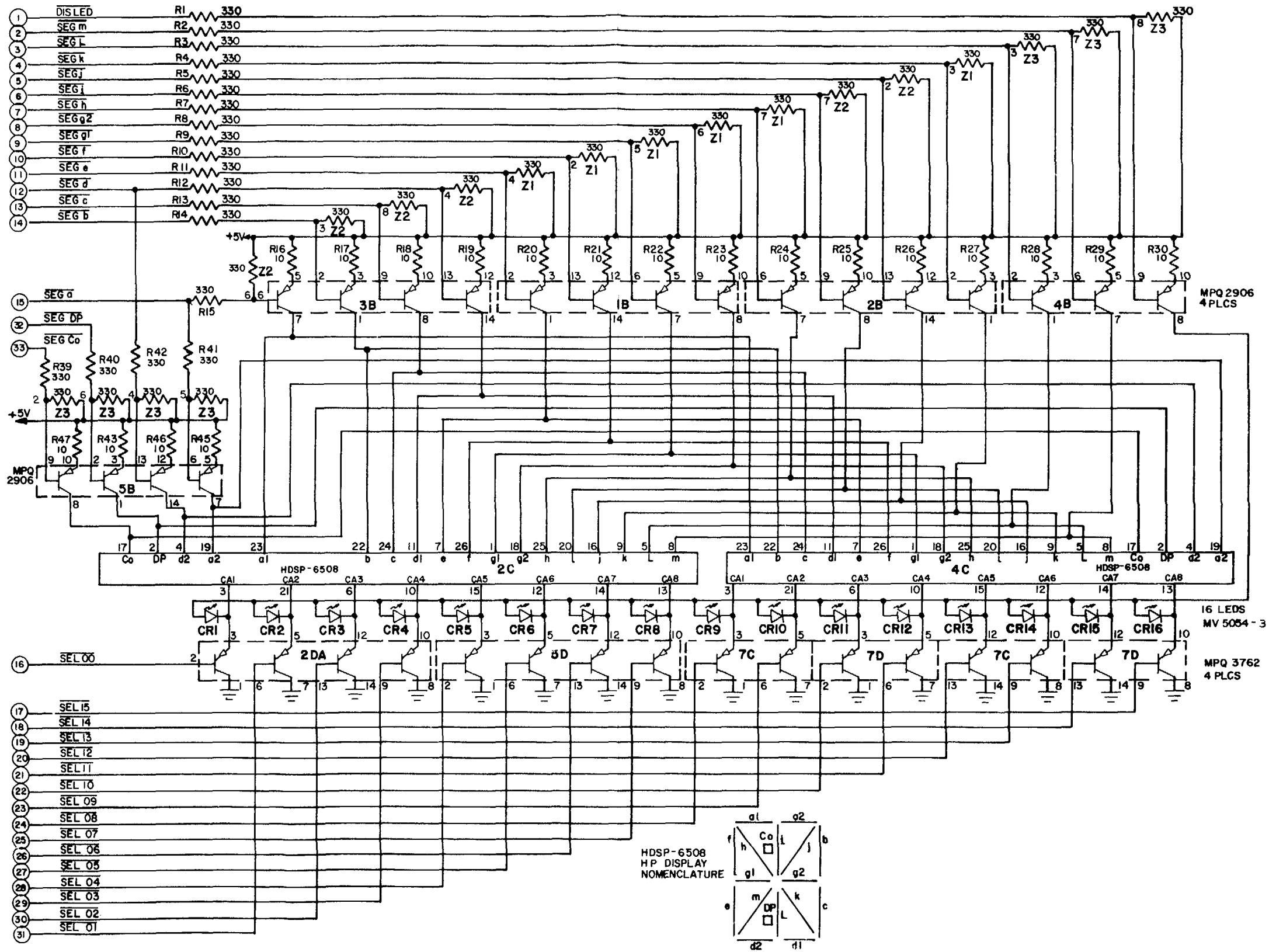


Figure B-2. Display Board 0100-2702 Schematic Drawing (Sheet 2 of 3)

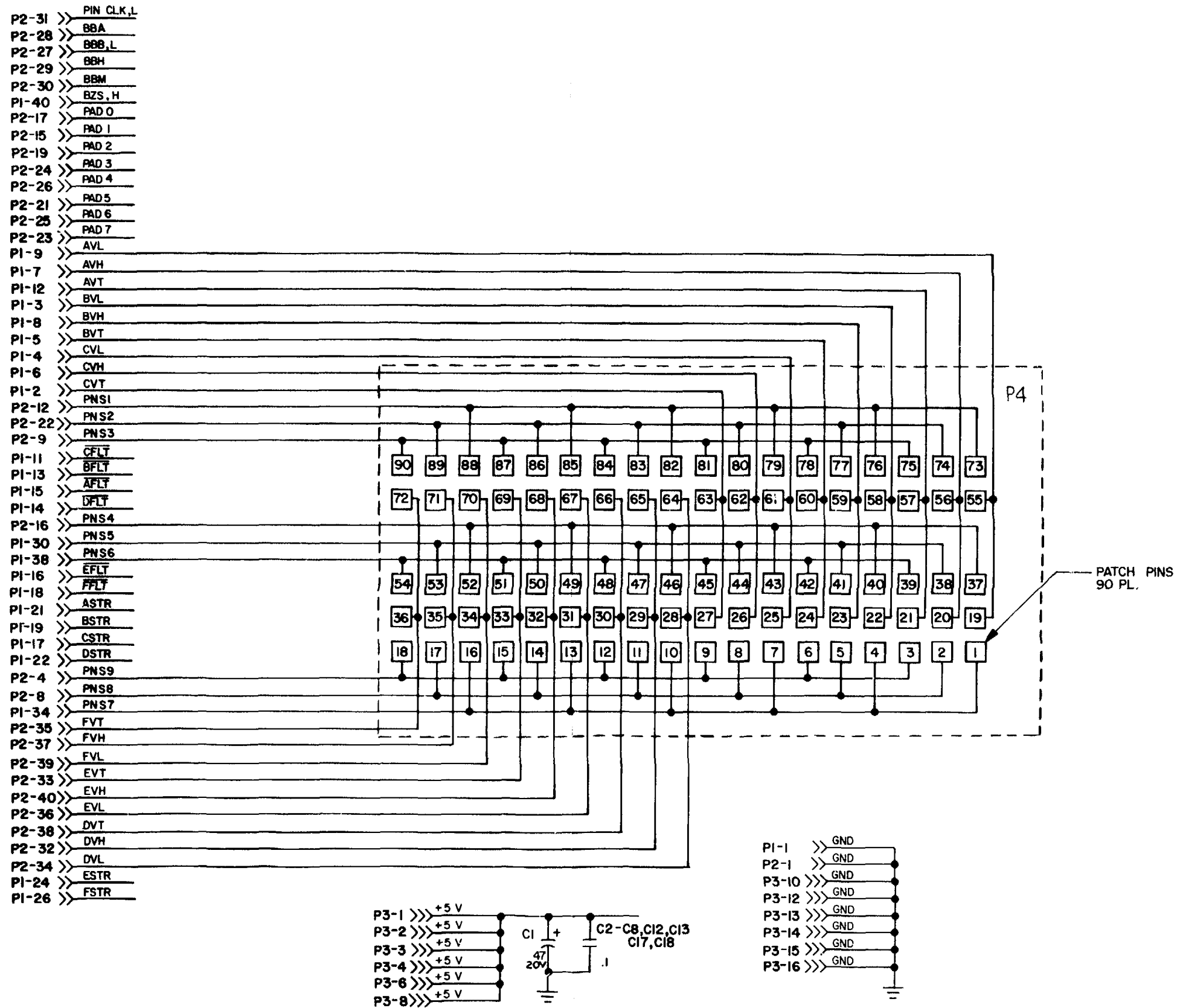


Figure B-2. Display Board 0100-2702 Schematic Drawing (Sheet 3 of 3)

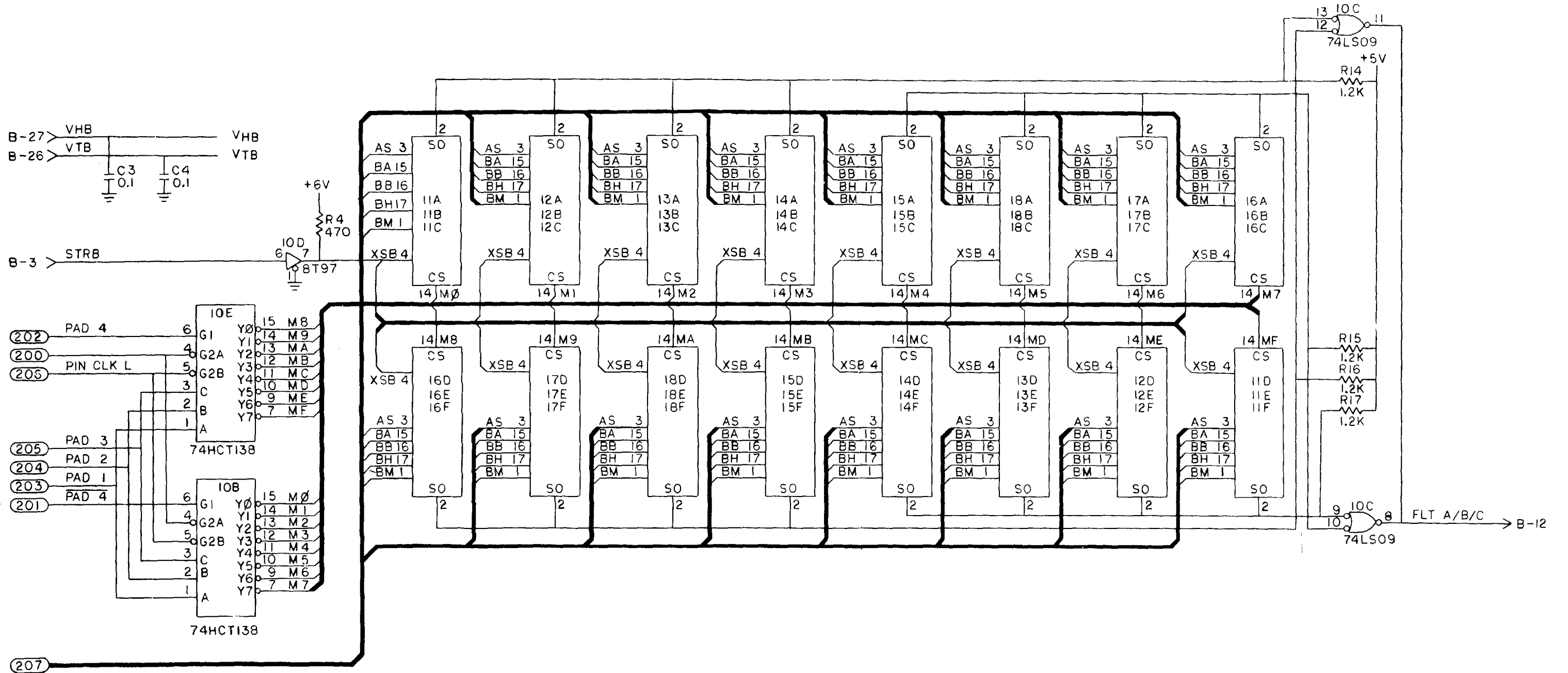


Figure B-3. Driver/Sensor Board 0100-2703 Schematic Drawing (Sheet 1 of 3)

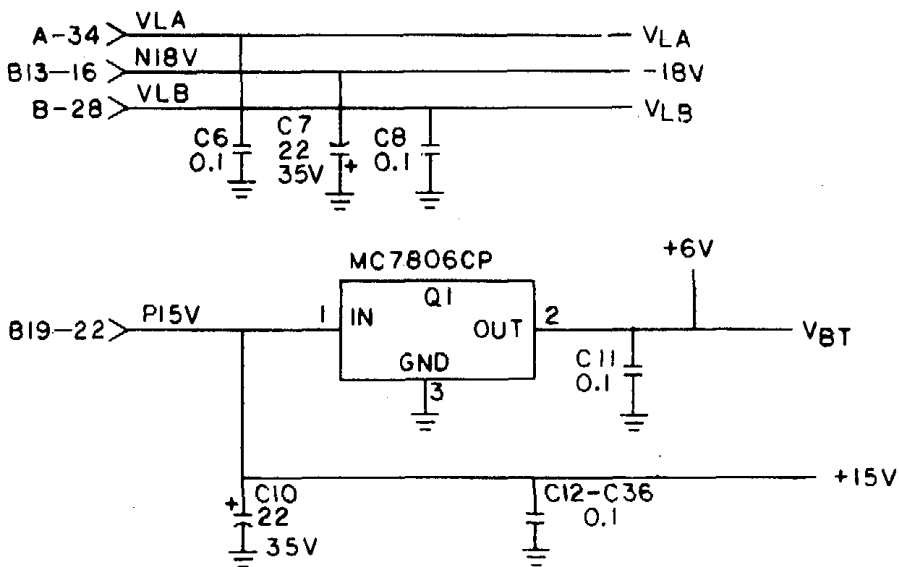
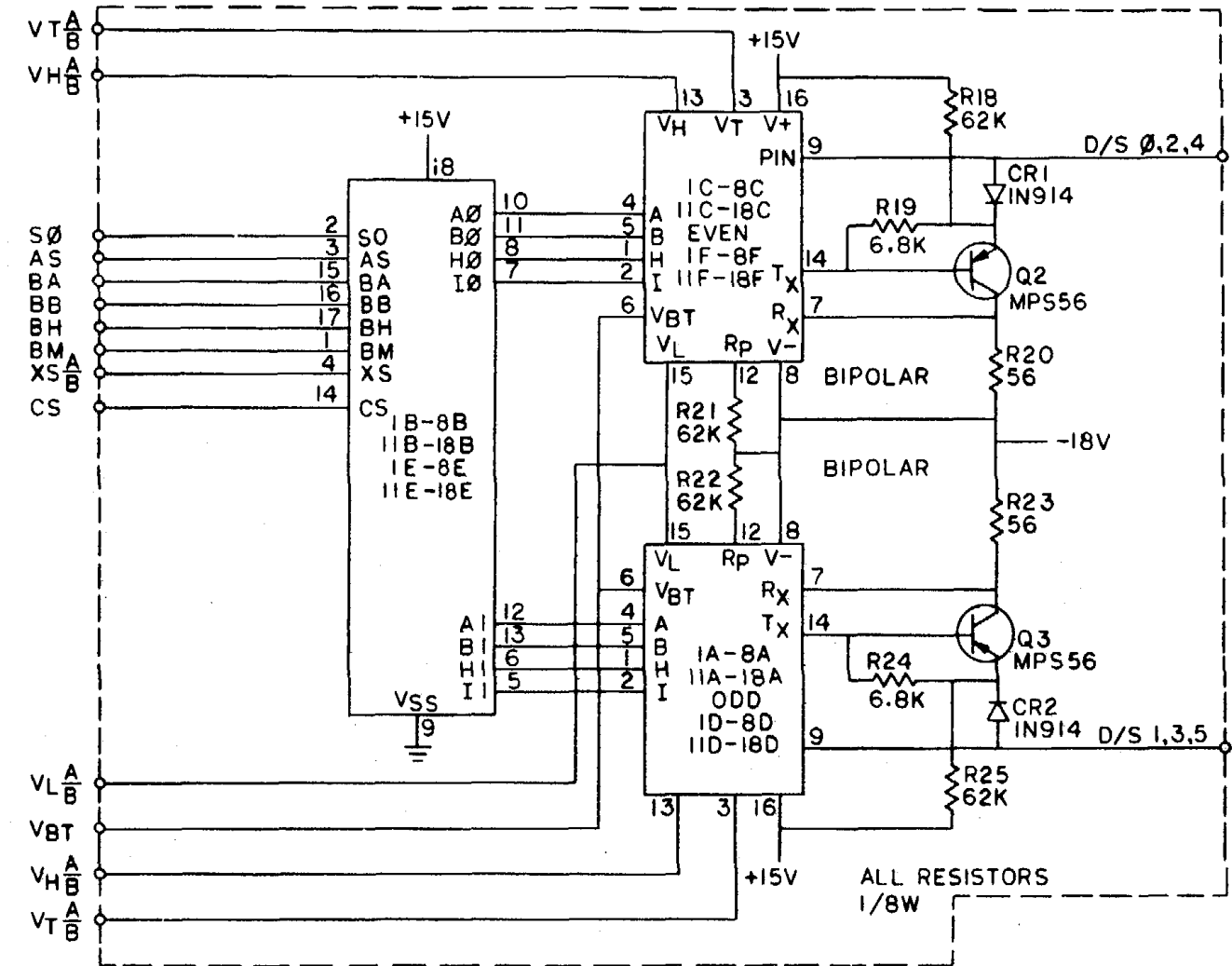


Figure B-3. Driver/Sensor Board 0100-2703 Schematic Drawing (Sheet 3 of 3)

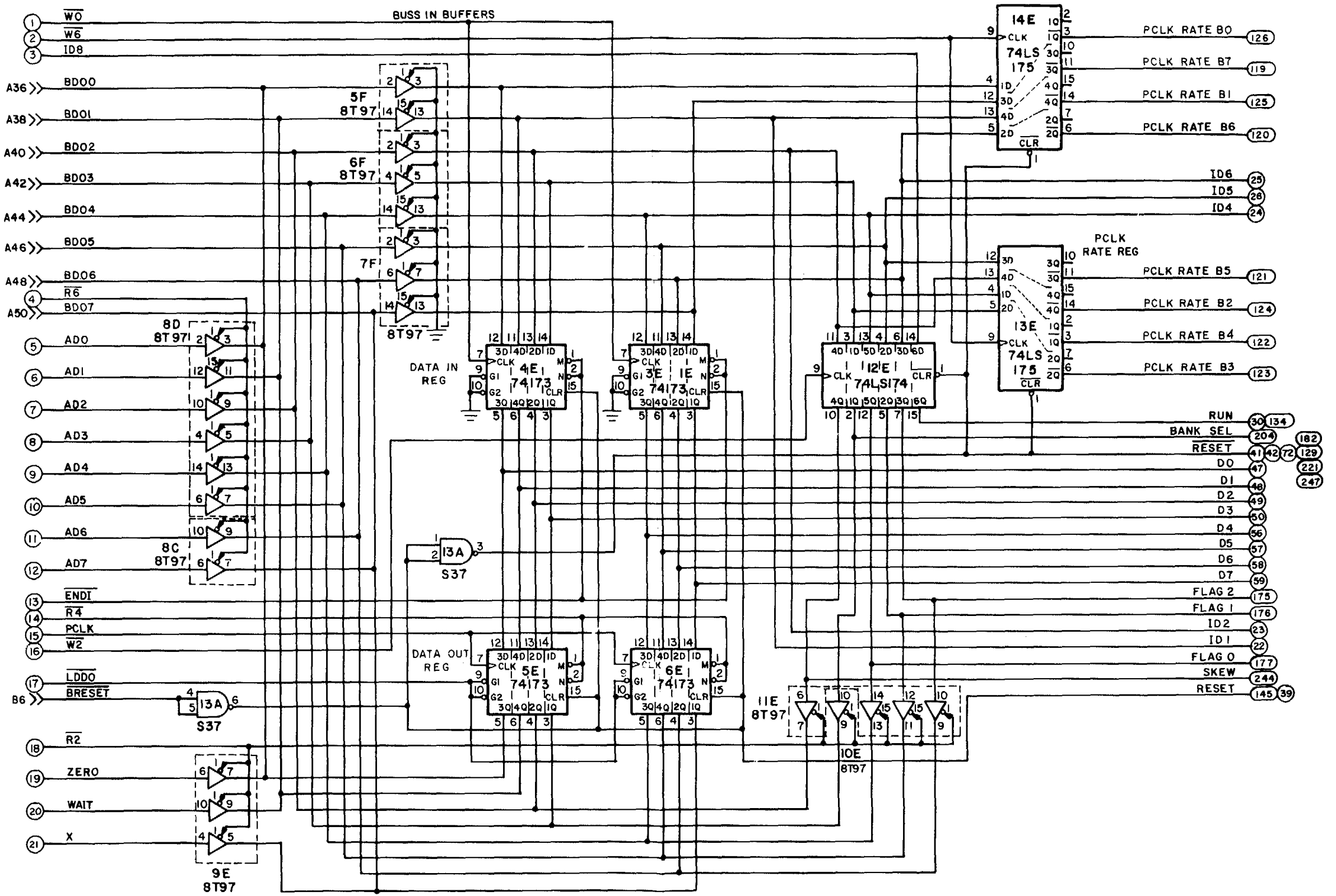


Figure B-4. Pin Processor Board 0100-2704 Schematic Drawing (Sheet 1 of 10)

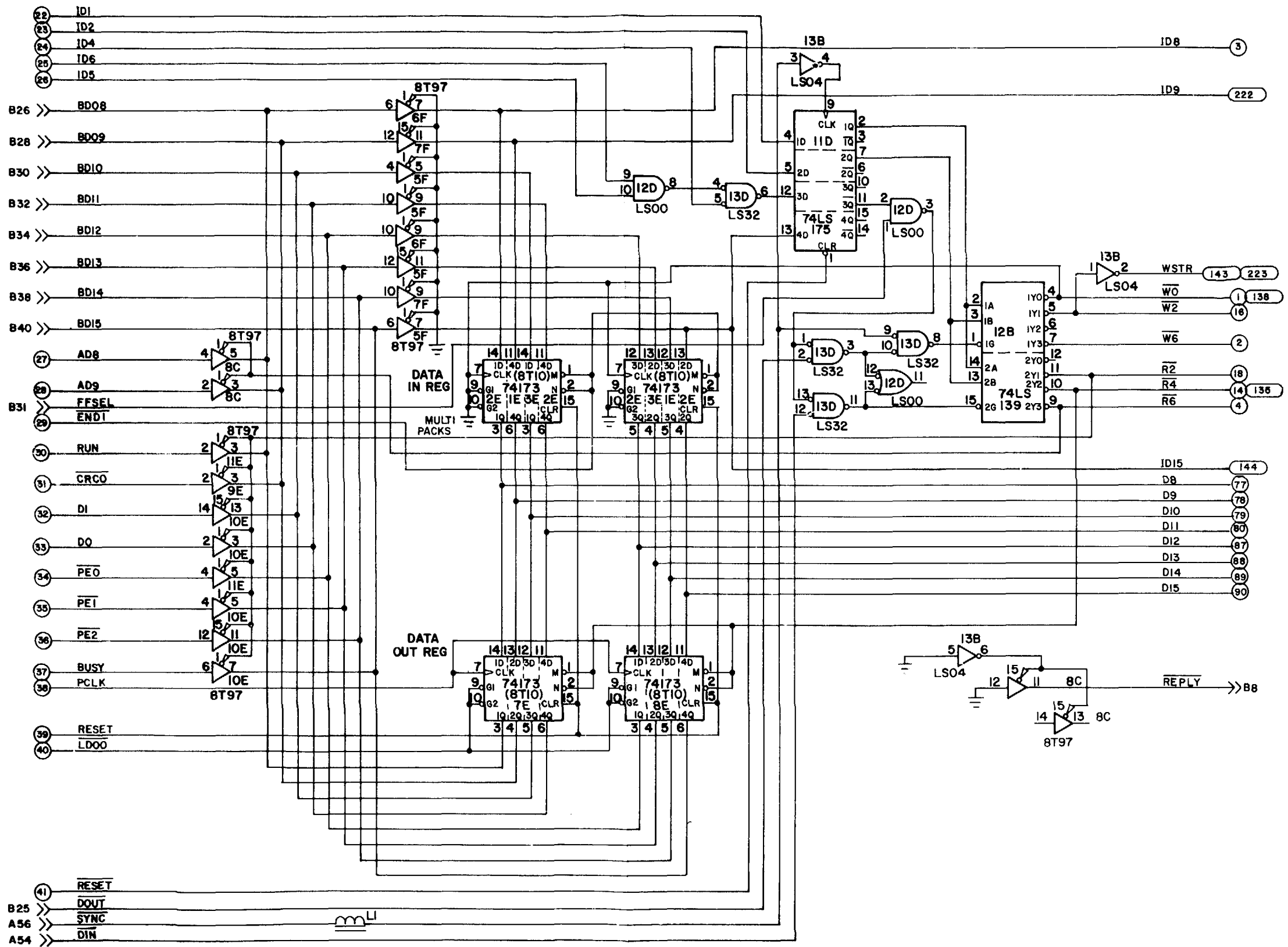


Figure B-4. Pin Processor Board 0100-2704 Schematic Drawing (Sheet 2 of 10)

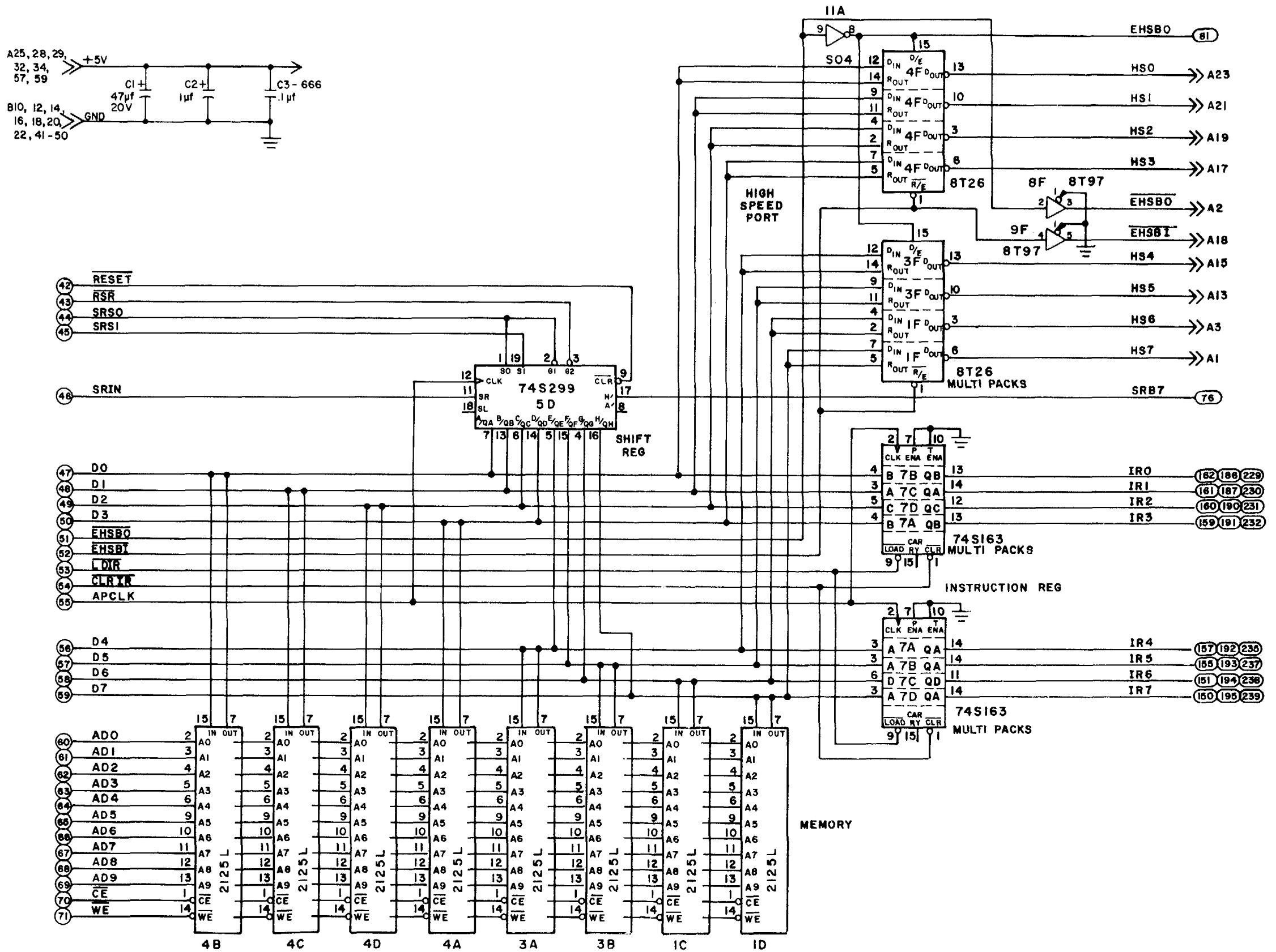


Figure B-4. Pin Processor Board 0100-2704 Schematic Drawing (Sheet 3 of 10)

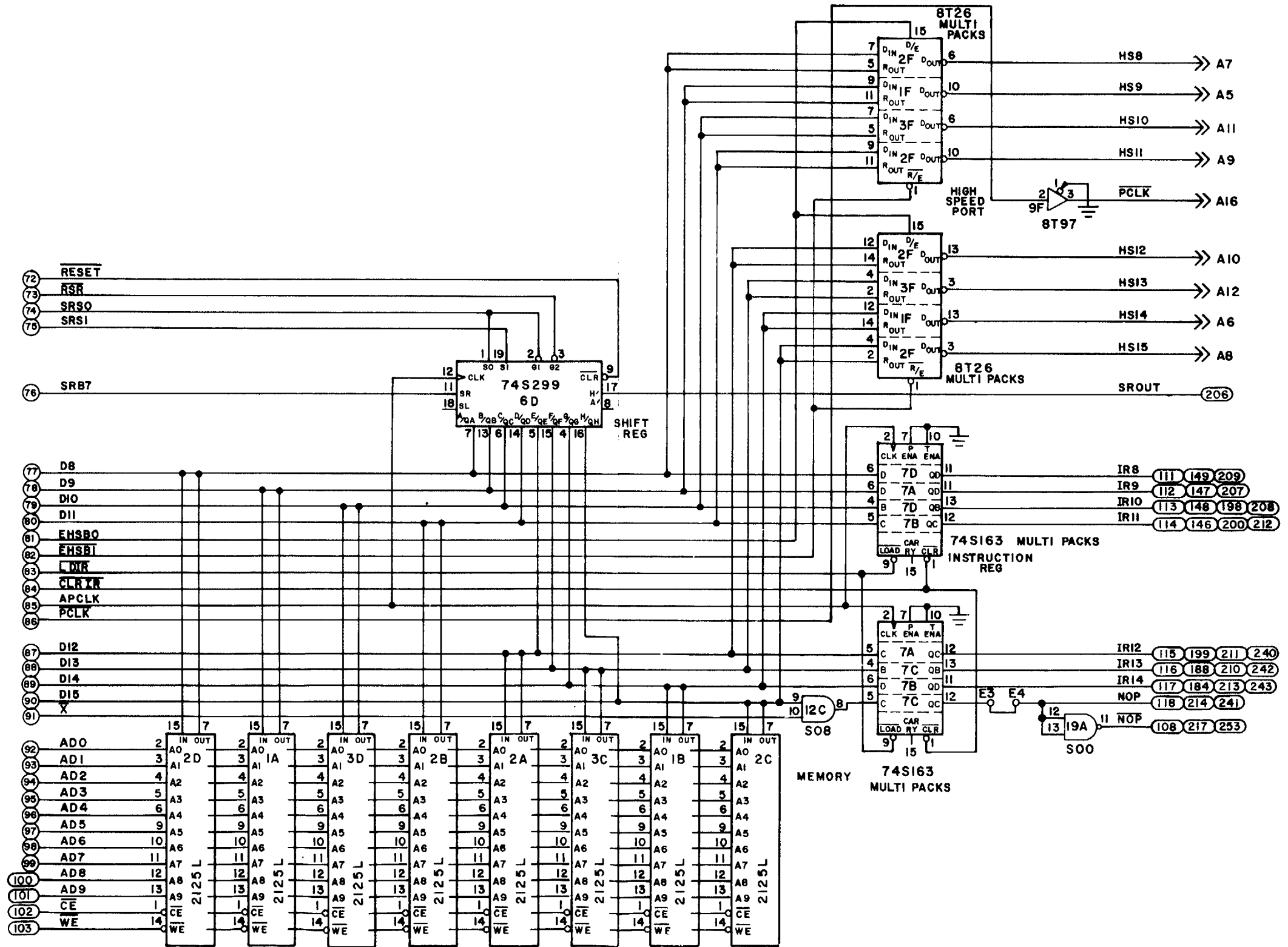


Figure B-4. Pin Processor Board 0100-2704 Schematic Drawing (Sheet 4 of 10)

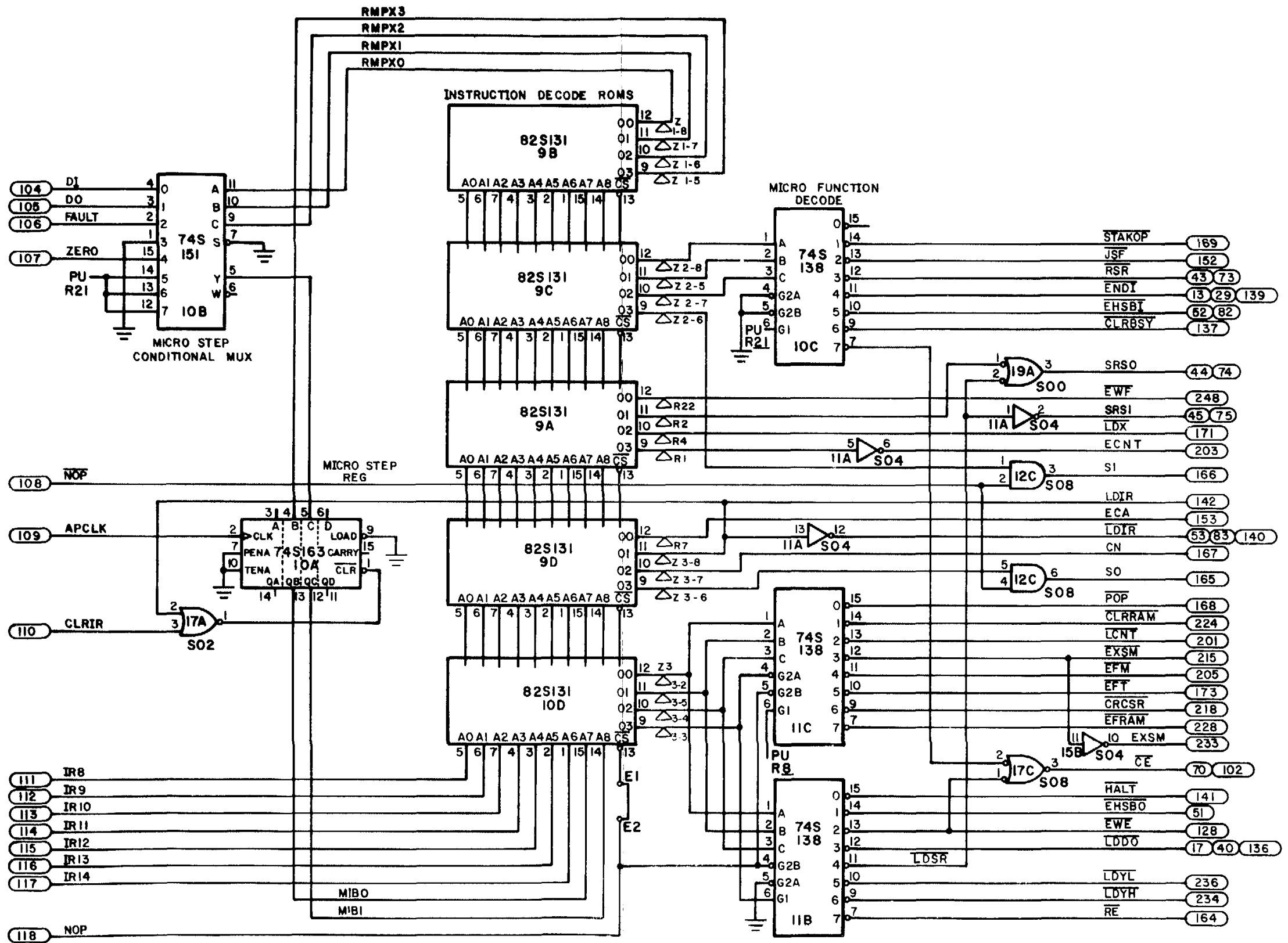


Figure B-4. Pin Processor Board 0100-2704 Schematic Drawing (Sheet 5 of 10)

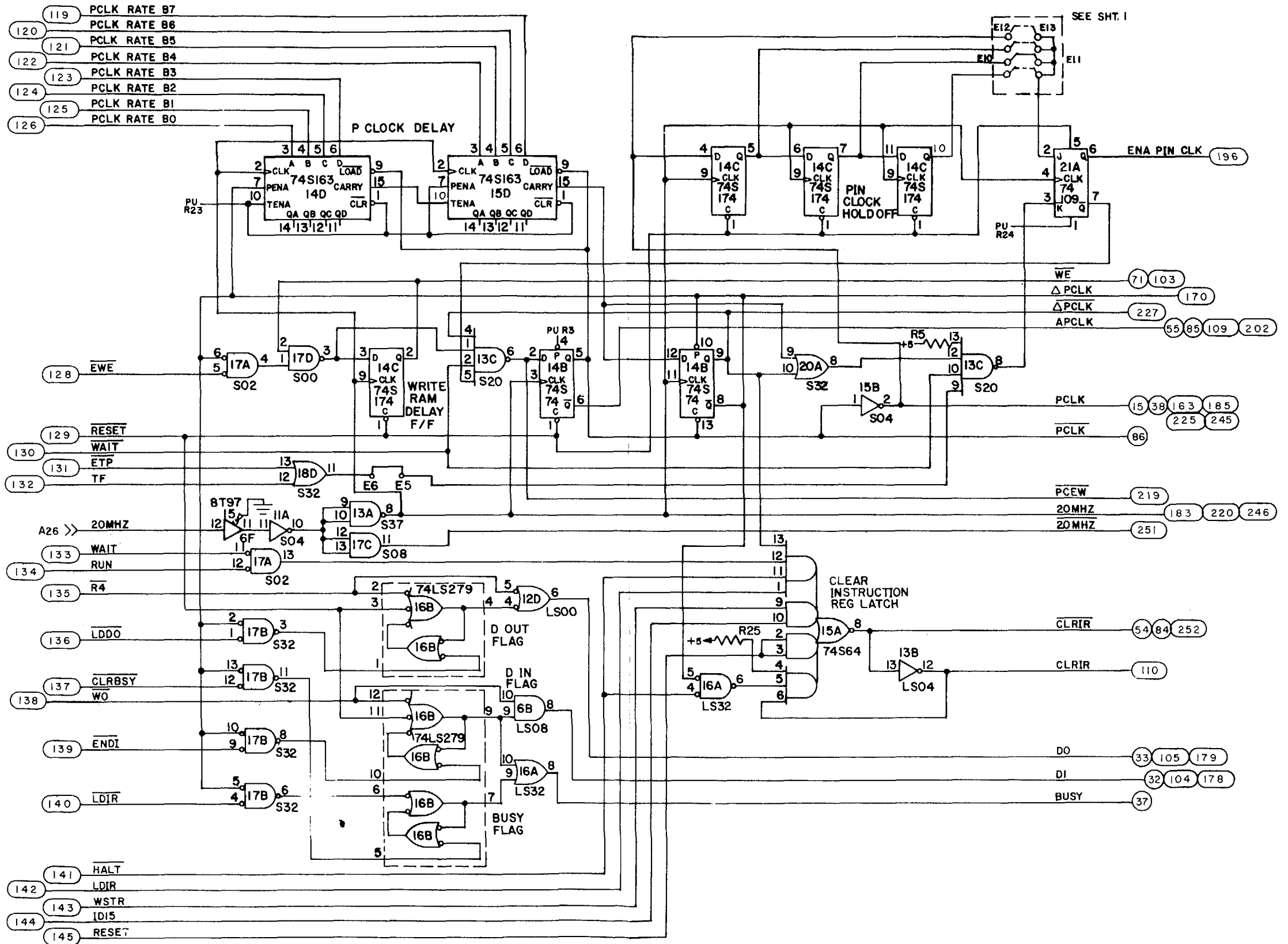


Figure B-4. Pin Processor Board 0100-2704 Schematic Drawing (Sheet 6 of 10)

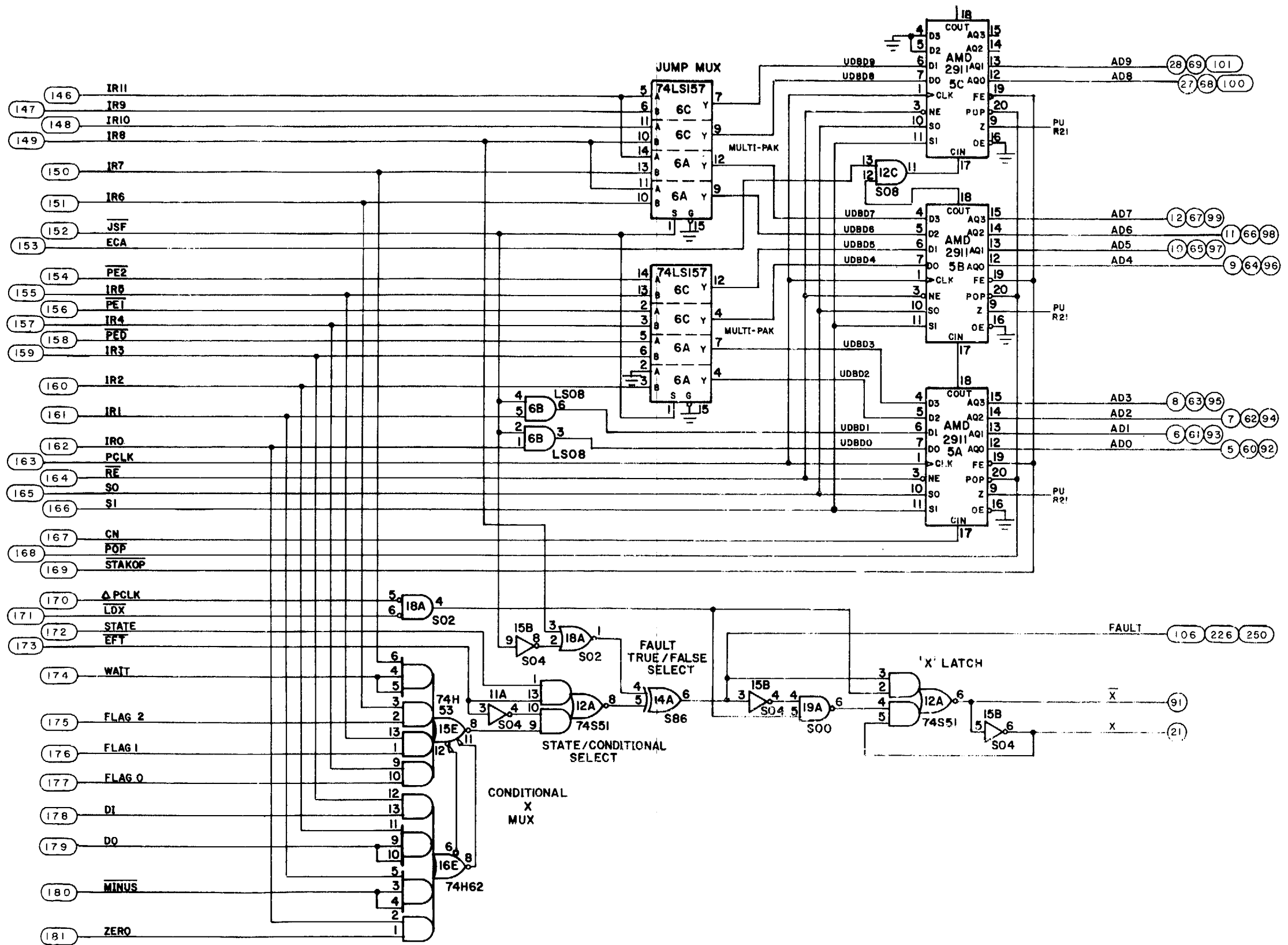


Figure B-4. Pin Processor Board 0100-2704 Schematic Drawing (Sheet 7 of 10)

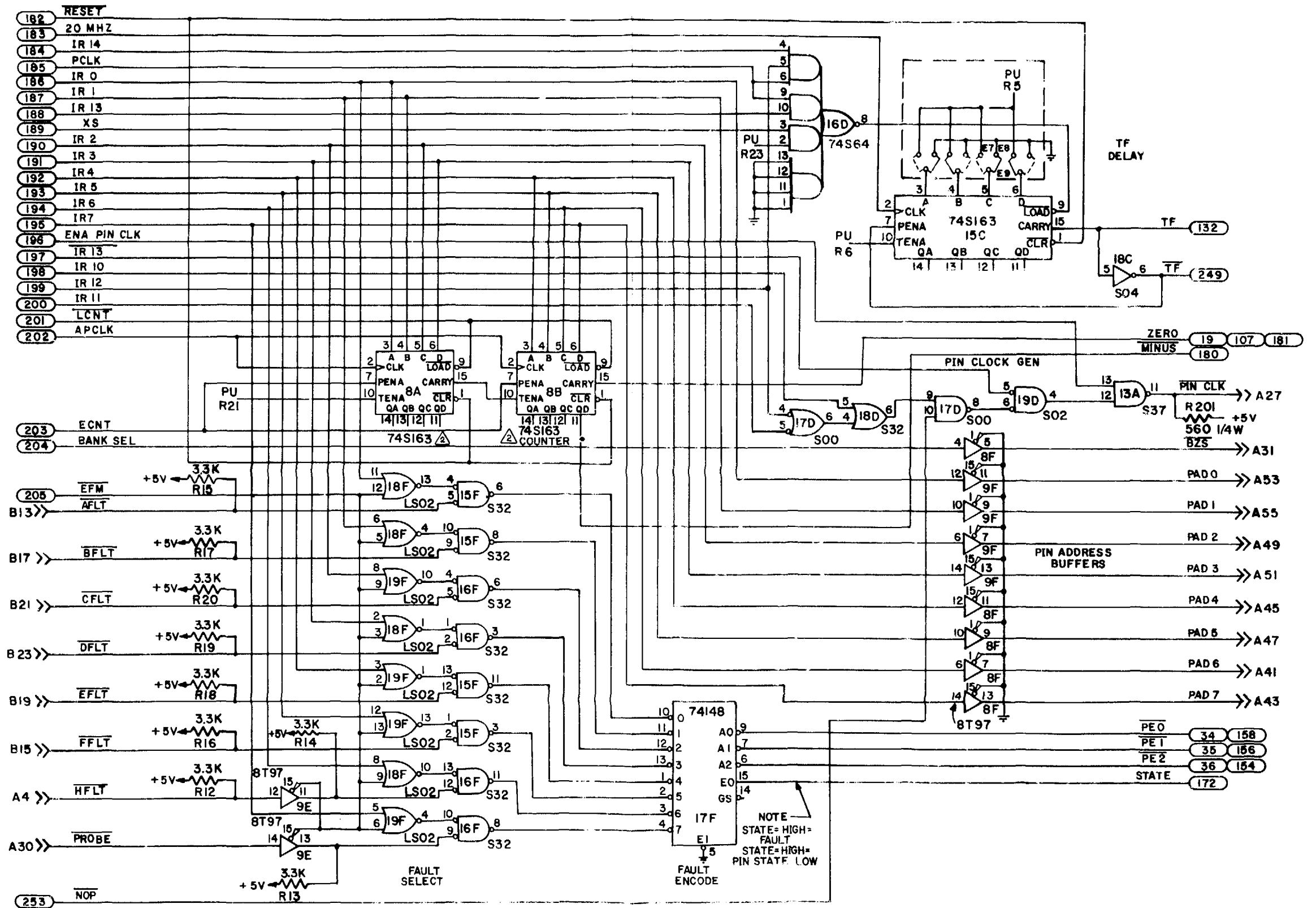


Figure B-4. Pin Processor Board 0100-2704 Schematic Drawing (Sheet 8 of 10)

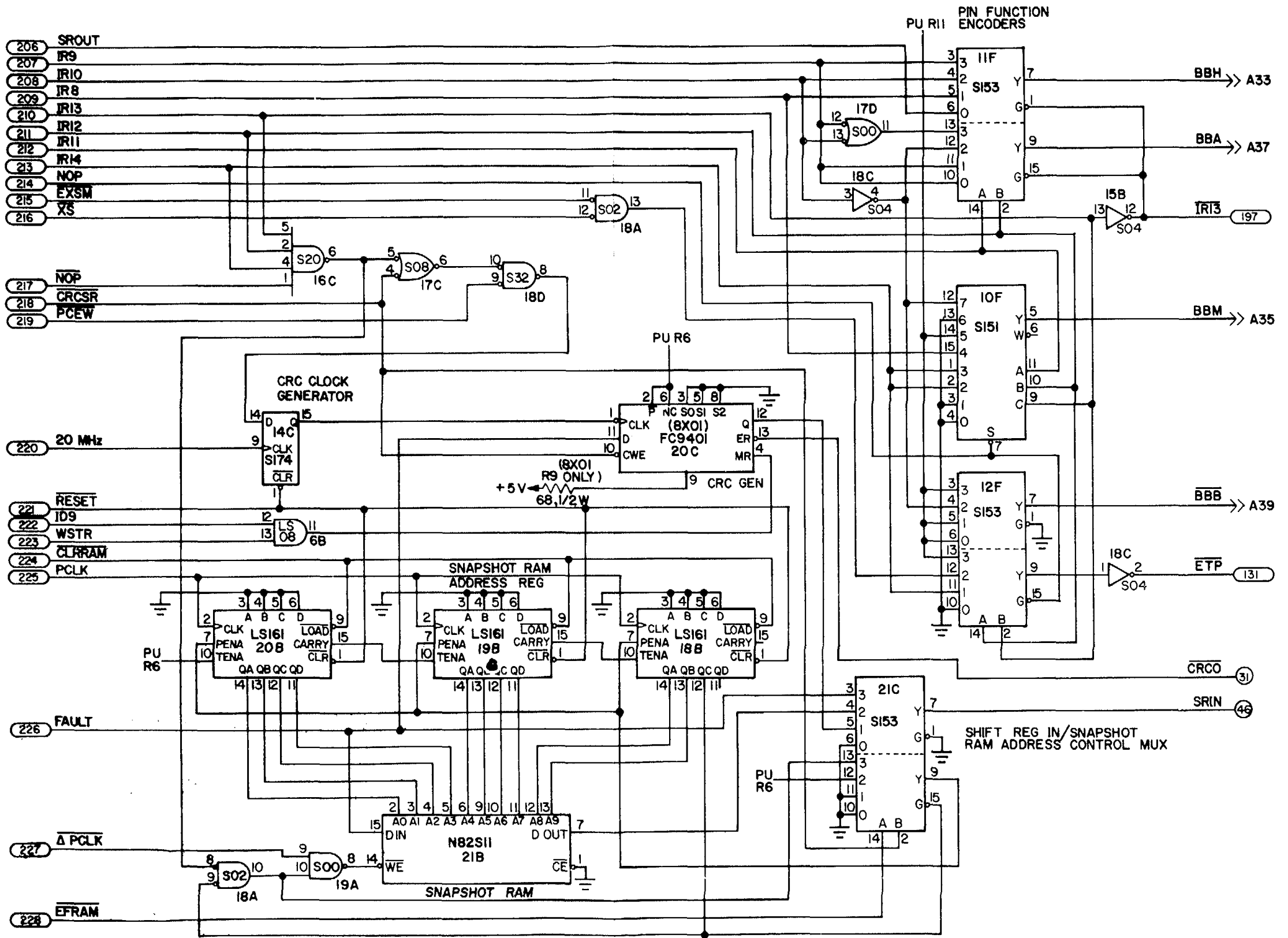


Figure B-4. Pin Processor Board 0100-2704 Schematic Drawing (Sheet 9 of 10)

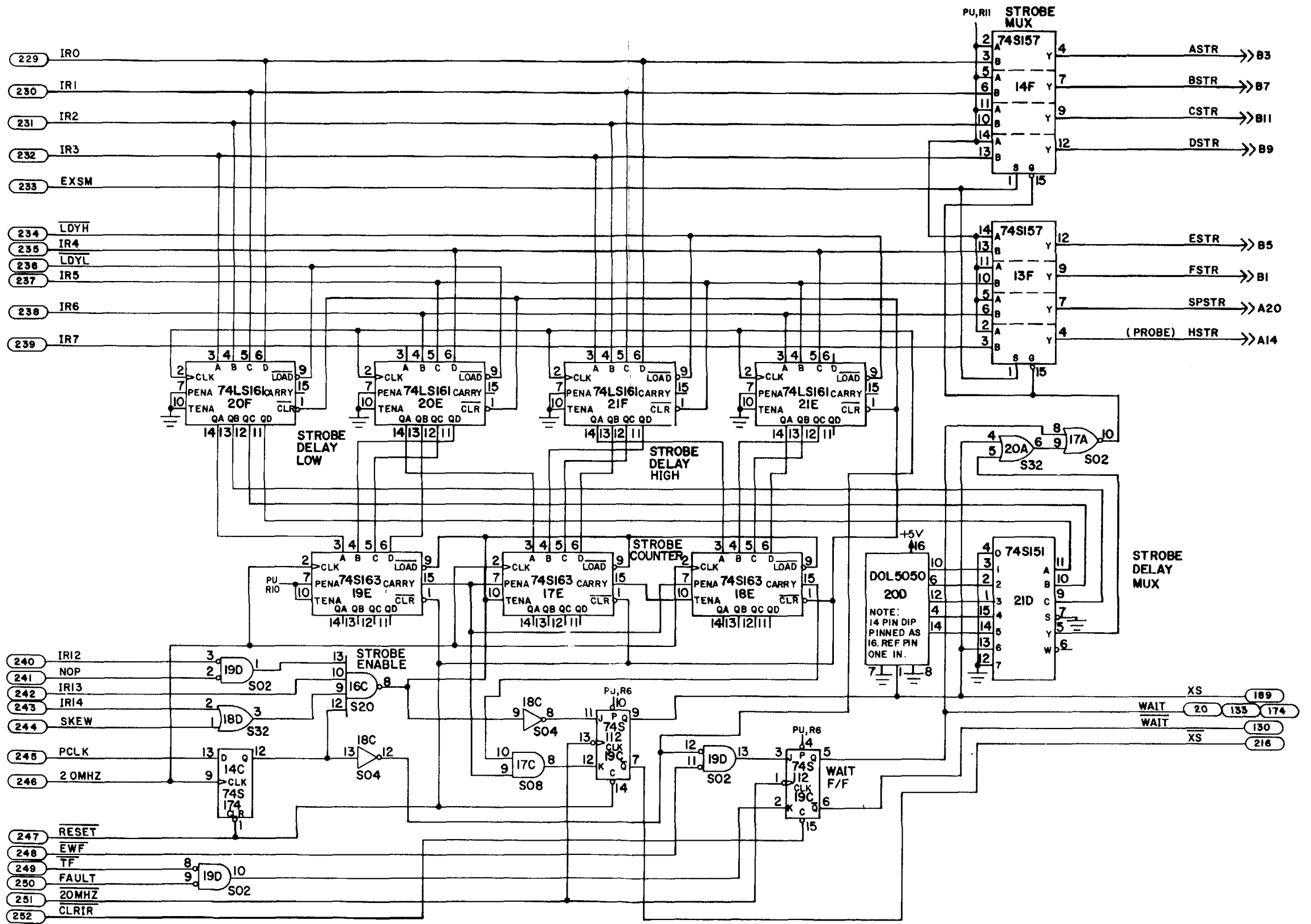


Figure B-4. Pin Processor Board 0100-2704 Schematic Drawing (Sheet 10 of 10)

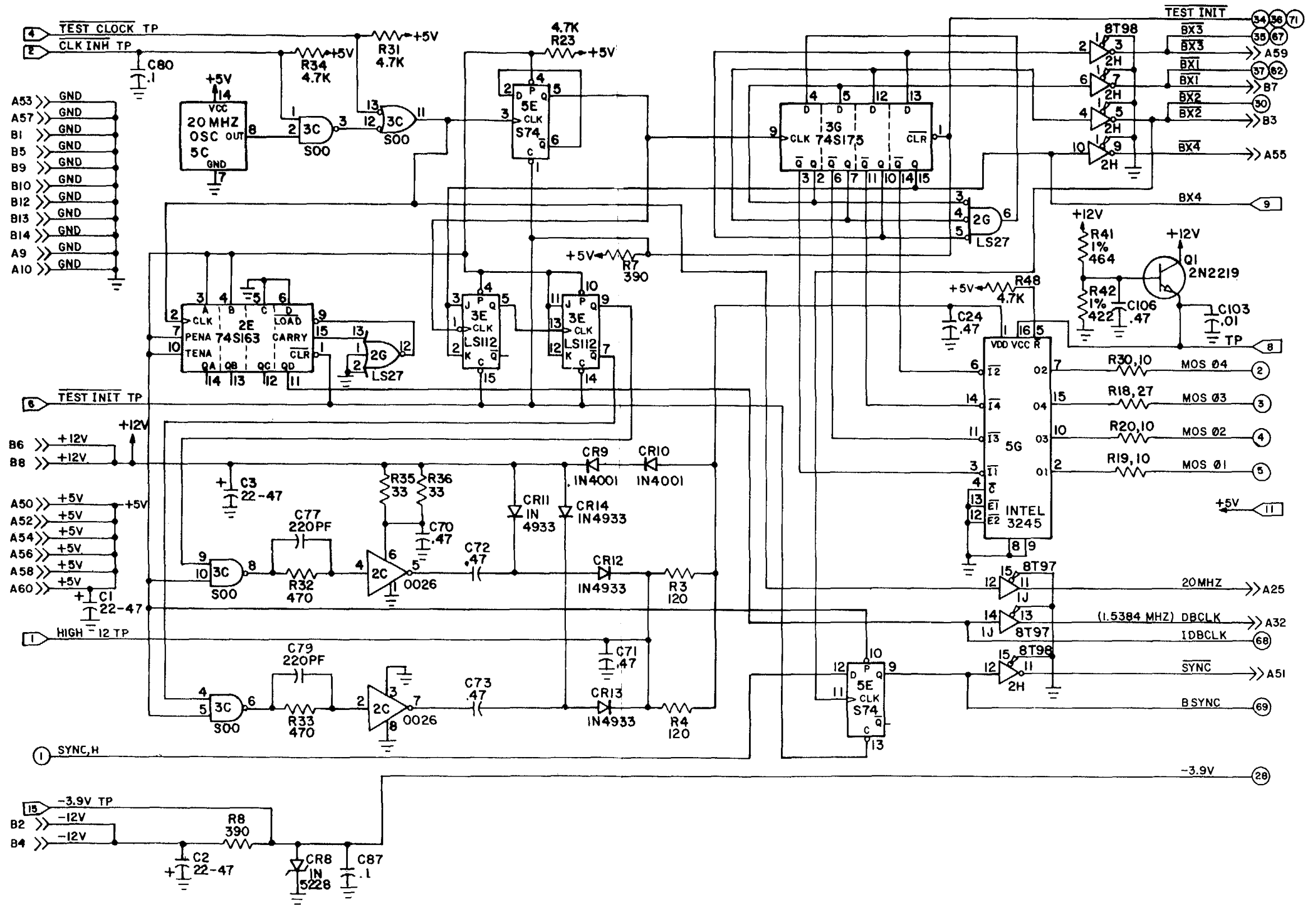


Figure B-5. Processor Board 0100-2705 Schematic Drawing (Sheet 2 of 5)

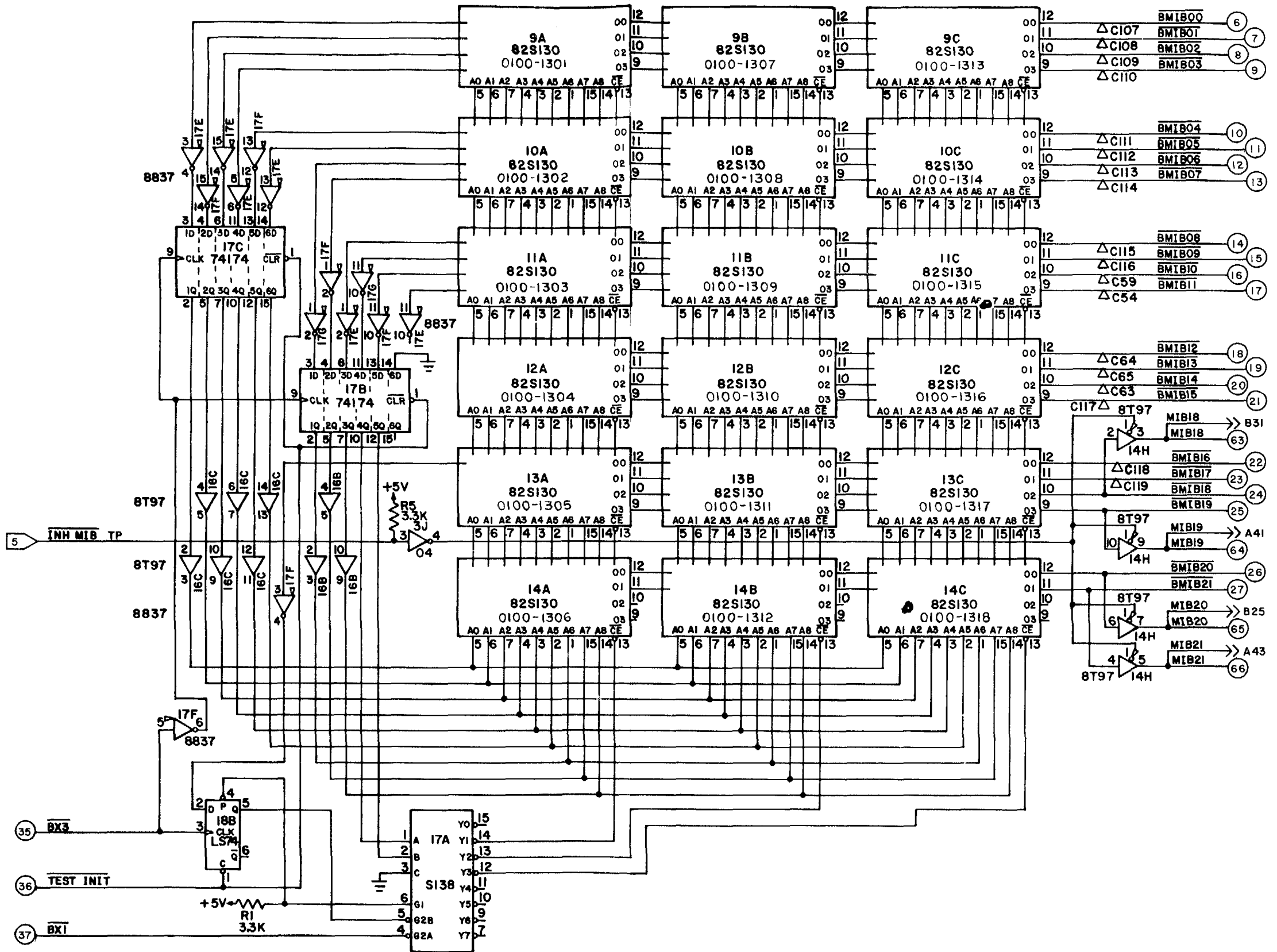


Figure B-5. Processor Board 0100-2705 Schematic Drawing (Sheet 3 of 5)

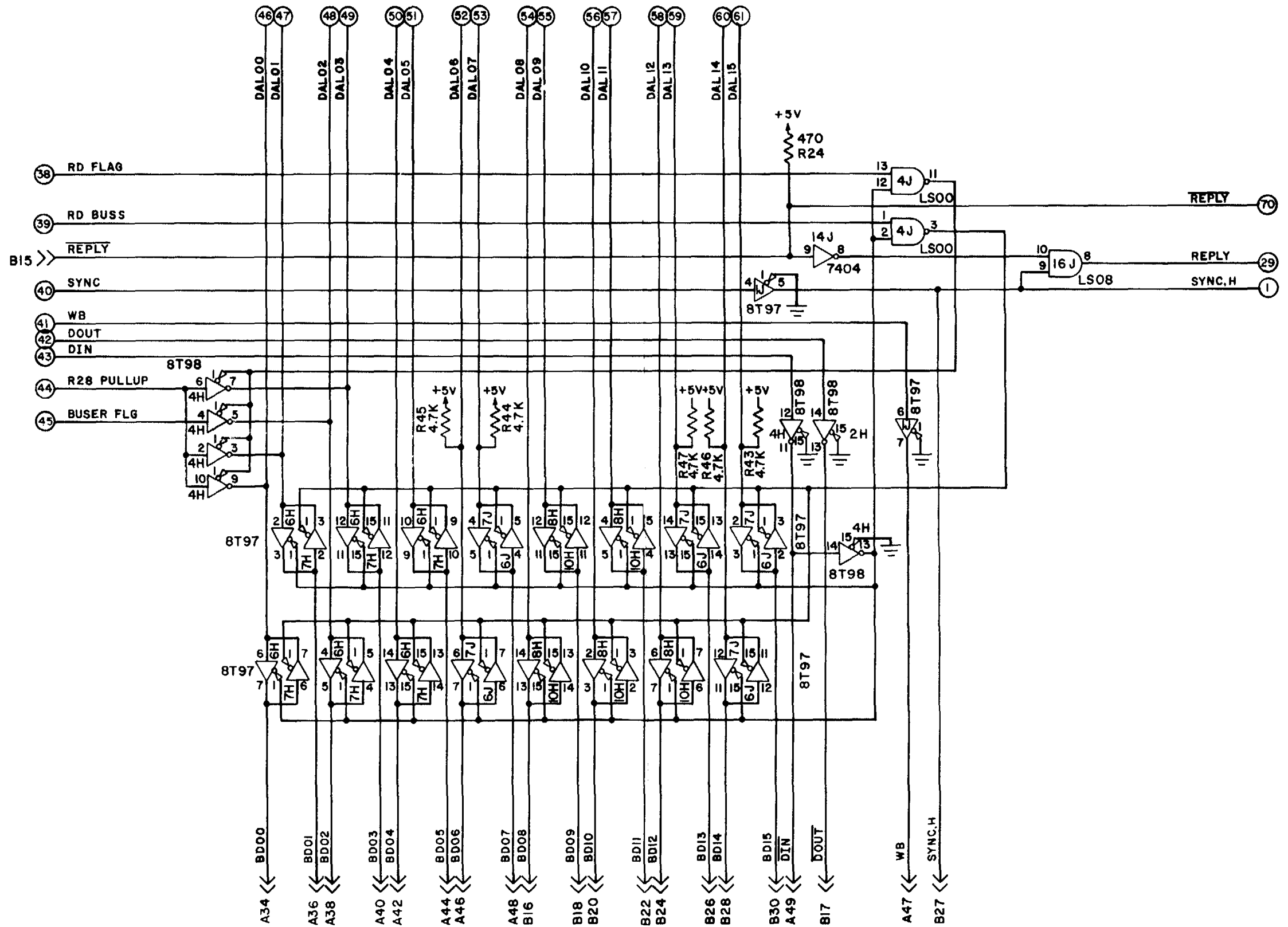


Figure B-5. Processor Board 0100-2705 Schematic Drawing (Sheet 4 of 5)

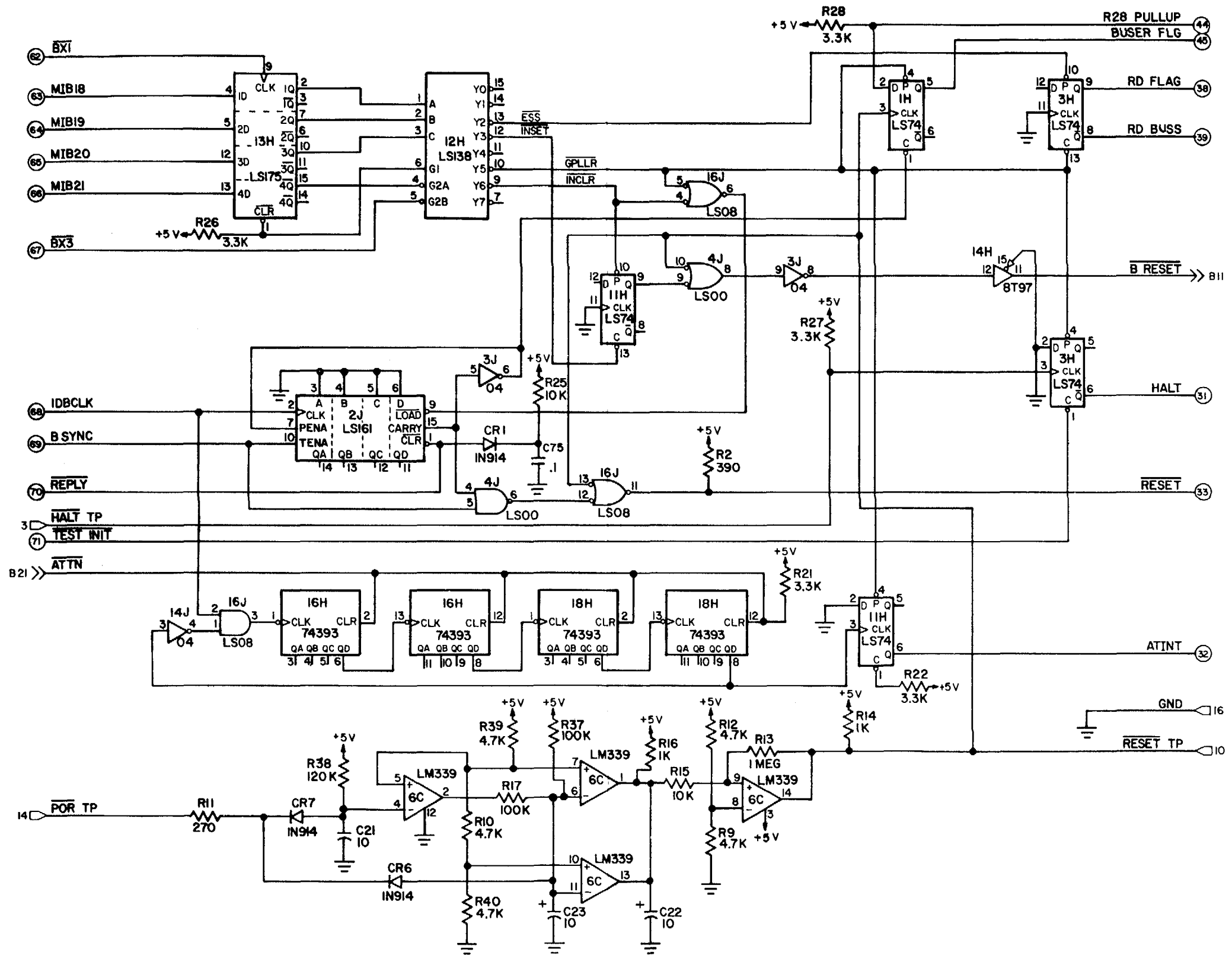


Figure B-5. Processor Board 0100-2705 Schematic Drawing (Sheet 5 of 5)

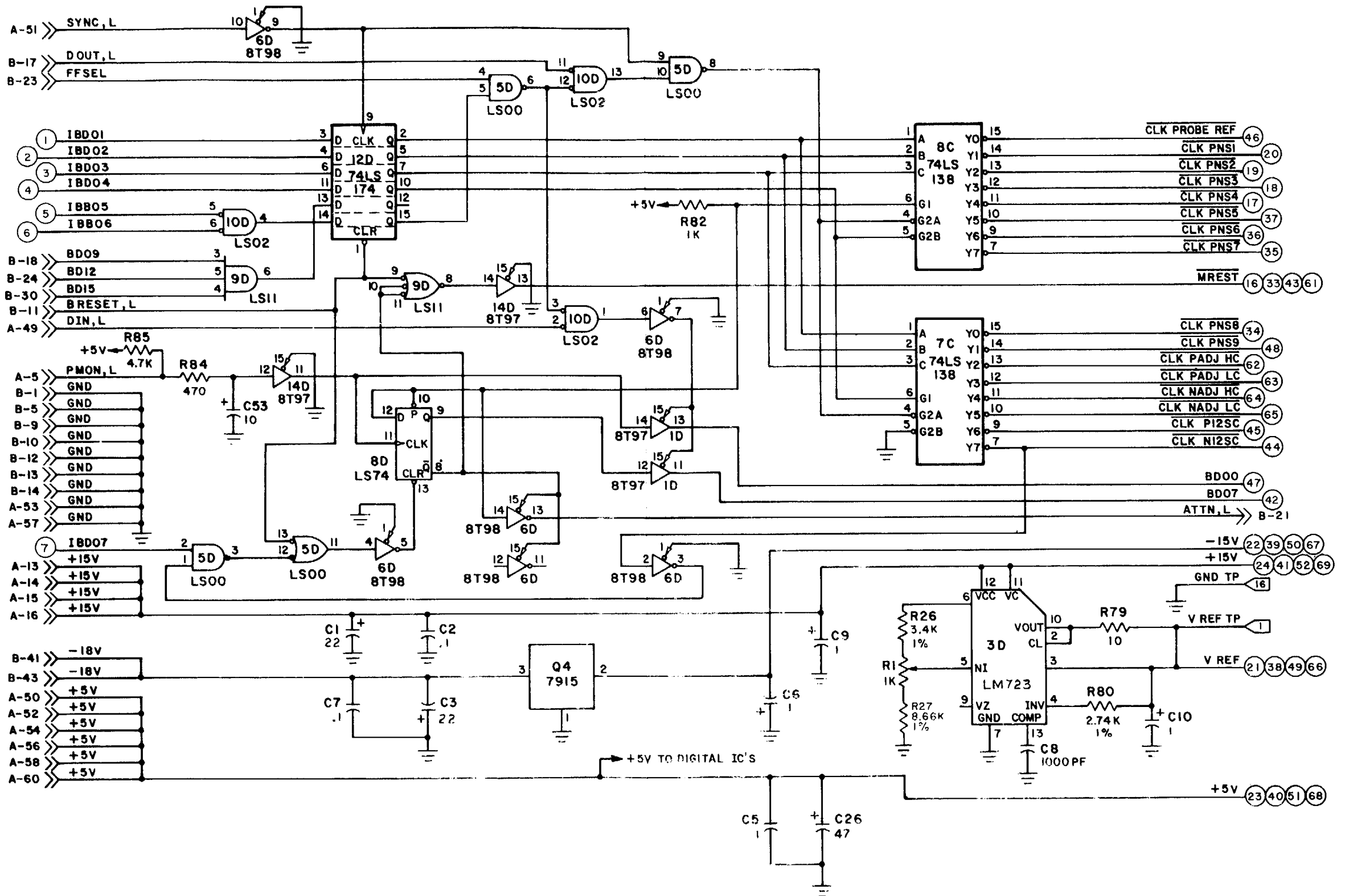


Figure B-6. Reference Board 0100-2708 Schematic Drawing (Sheet 1 of 5)

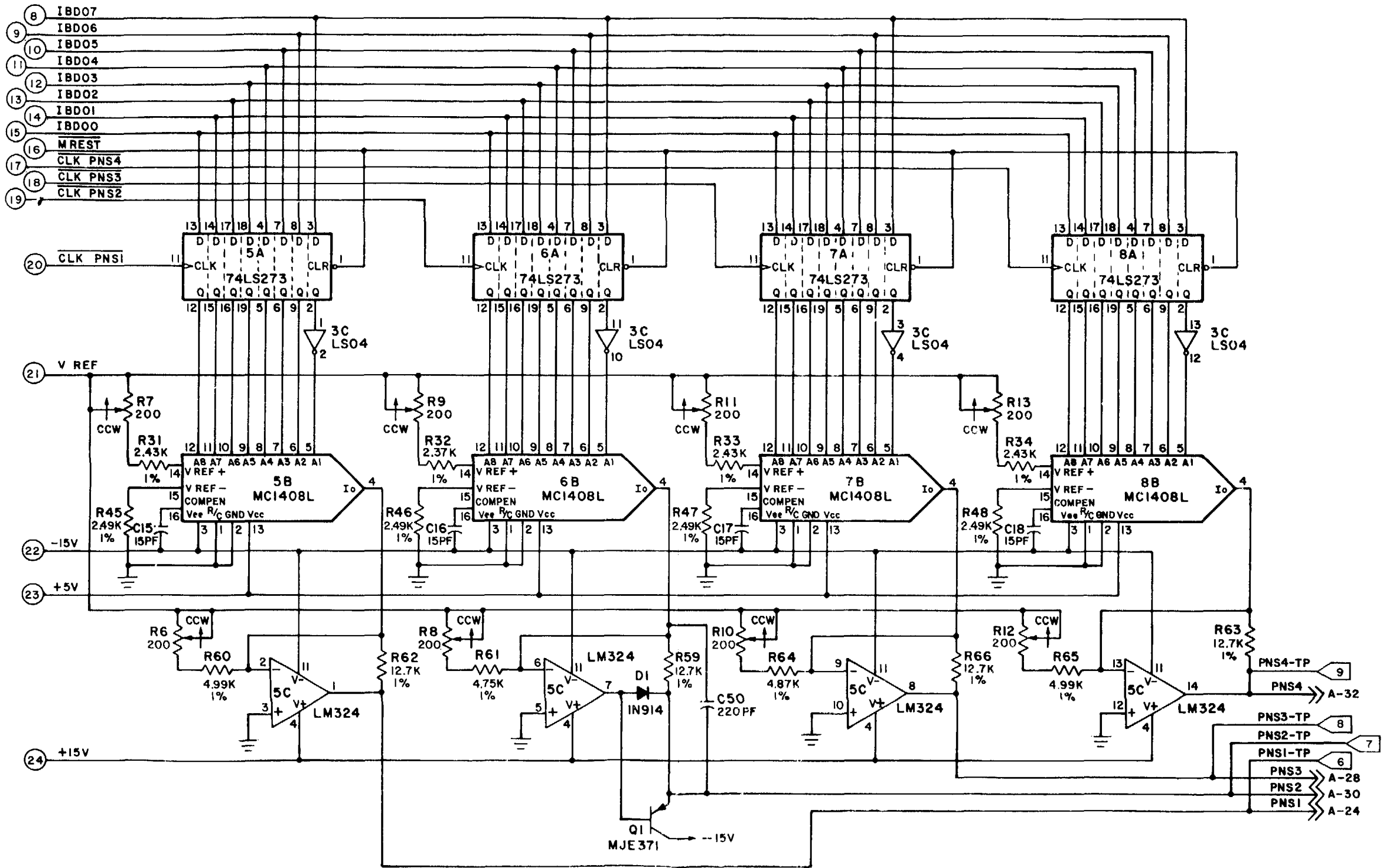


Figure B-6. Reference Board 0100-2708 Schematic Drawing (Sheet 2 of 5)

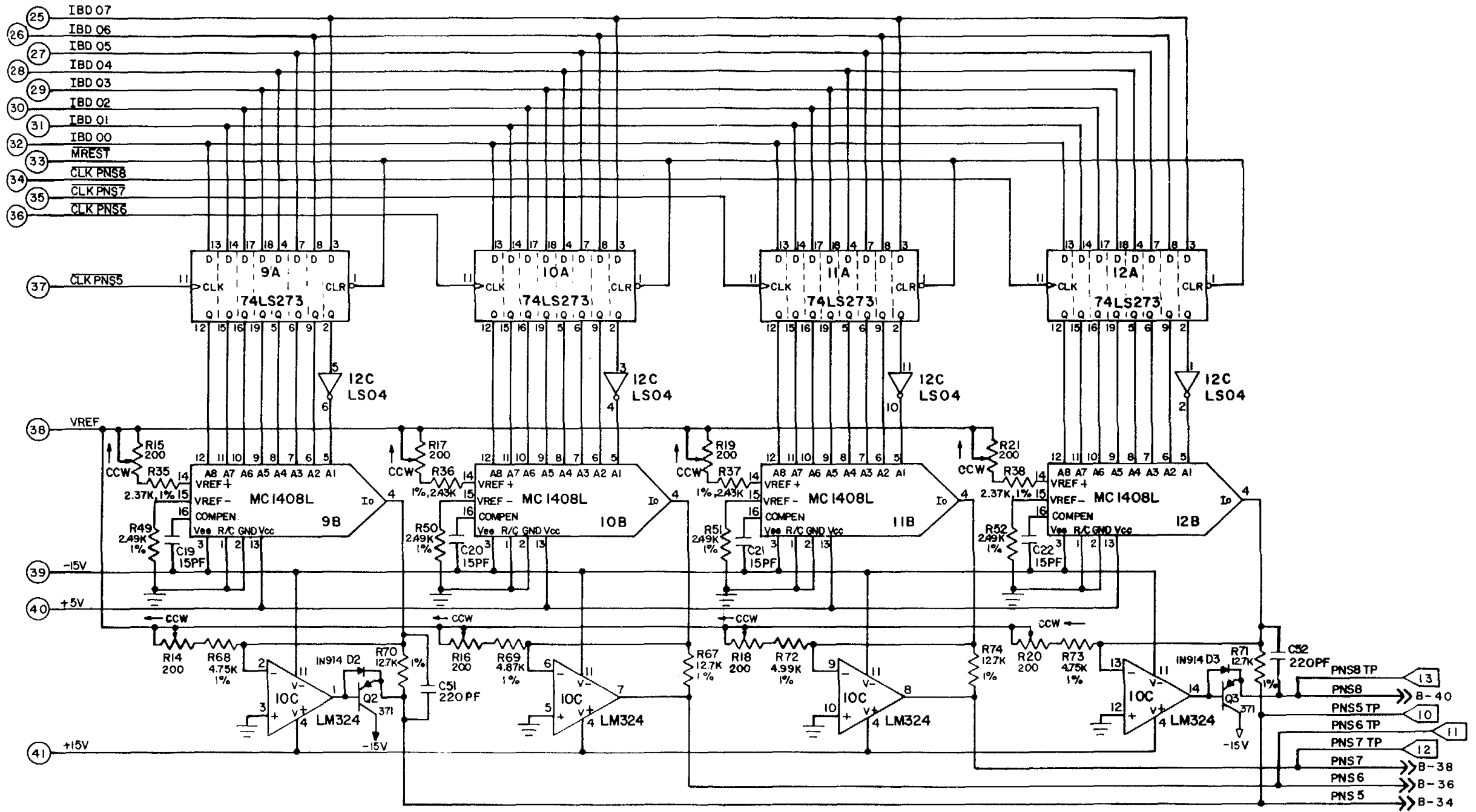


Figure B-6. Reference Board 0100-2708 Schematic Drawing (Sheet 3 of 5)

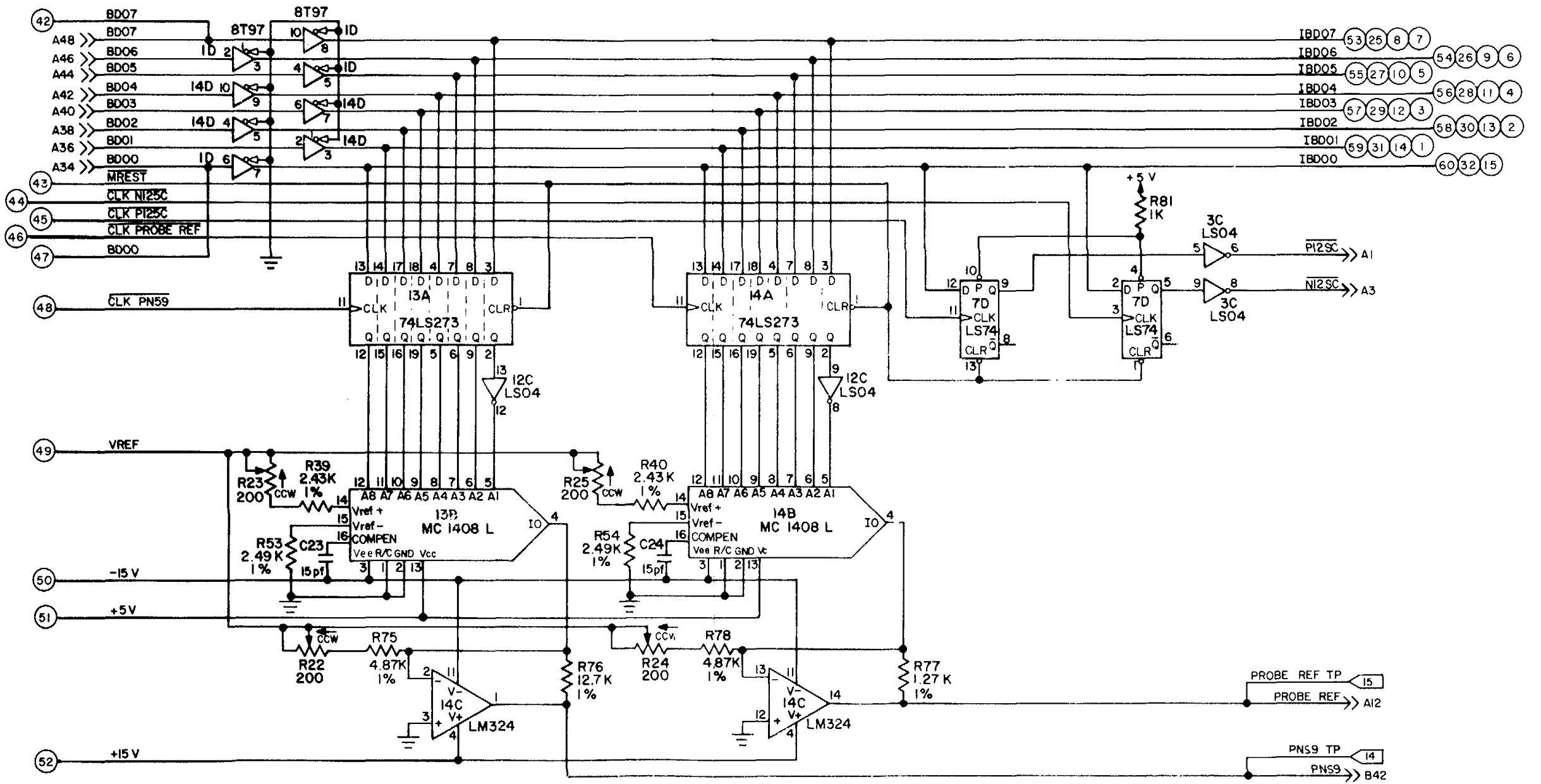


Figure B-6. Reference Board 0100-2708 Schematic Drawing (Sheet 4 of 5)

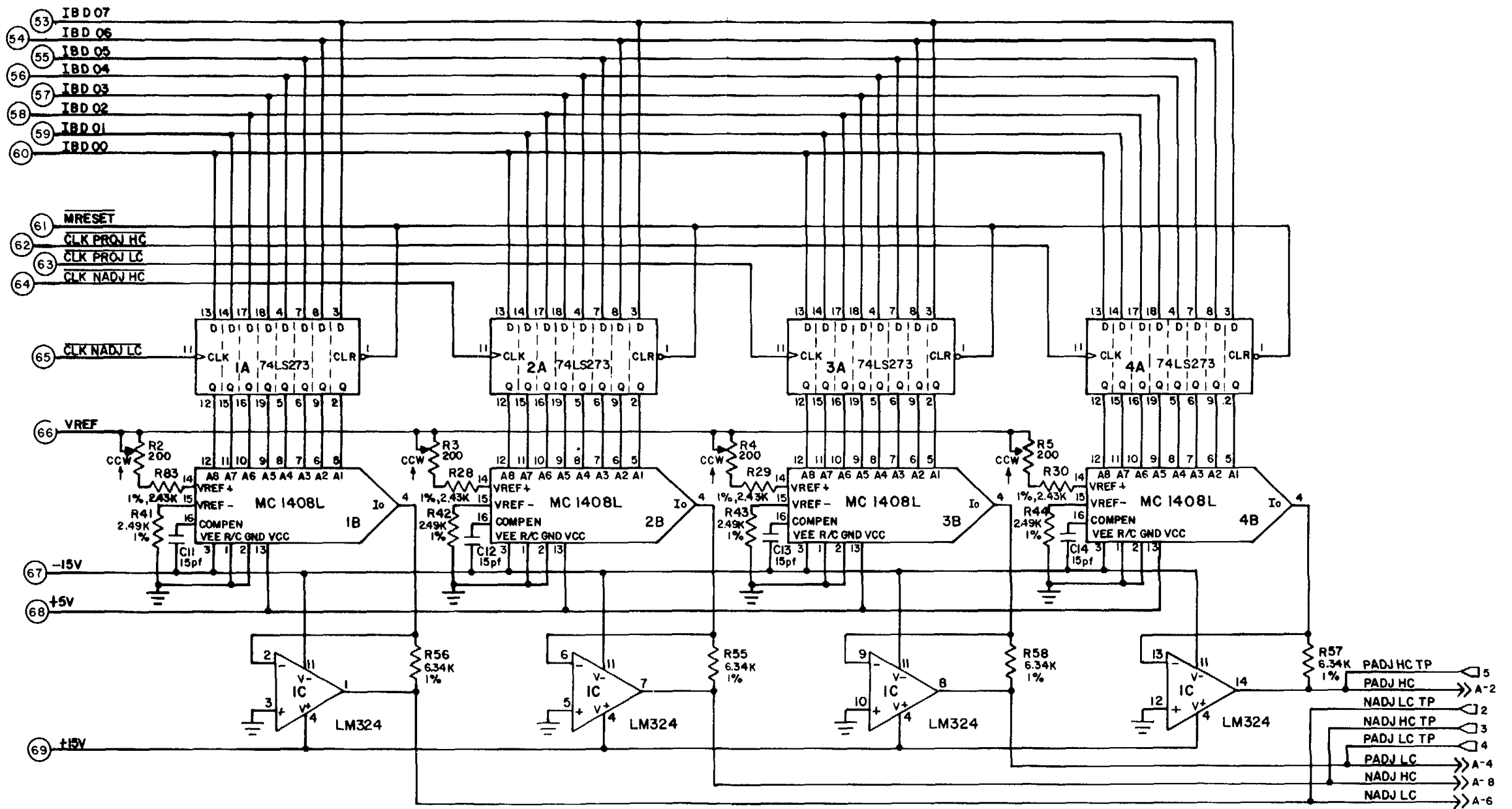


Figure B-6. Reference Board 0100-2708 Schematic Drawing (Sheet 5 of 5)

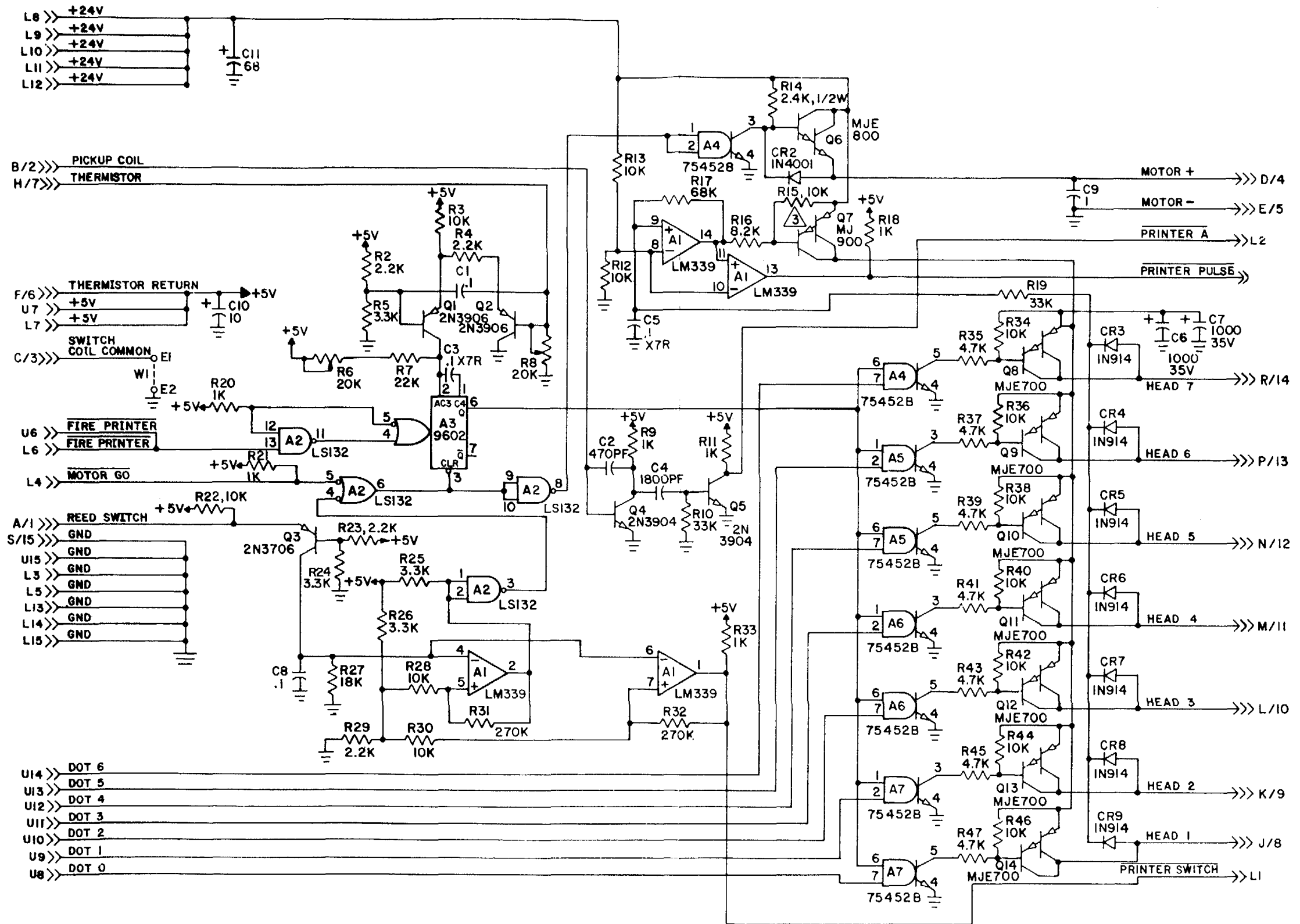


Figure B-7. Printer Driver Board 0100-2723 Schematic Drawing

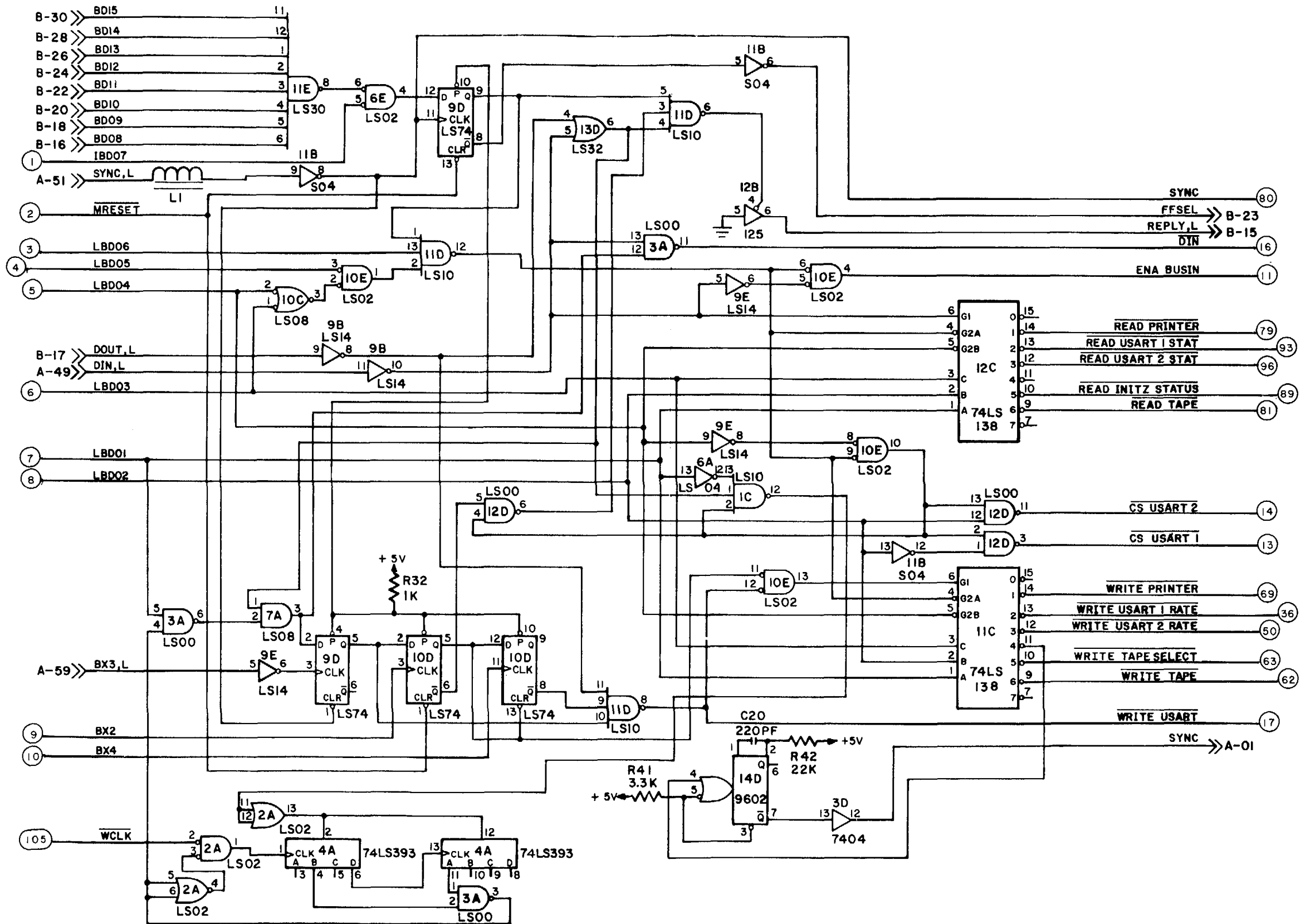


Figure B-8. Peripheral Board 0100-2724 Schematic Drawing (Sheet 1 of 7)

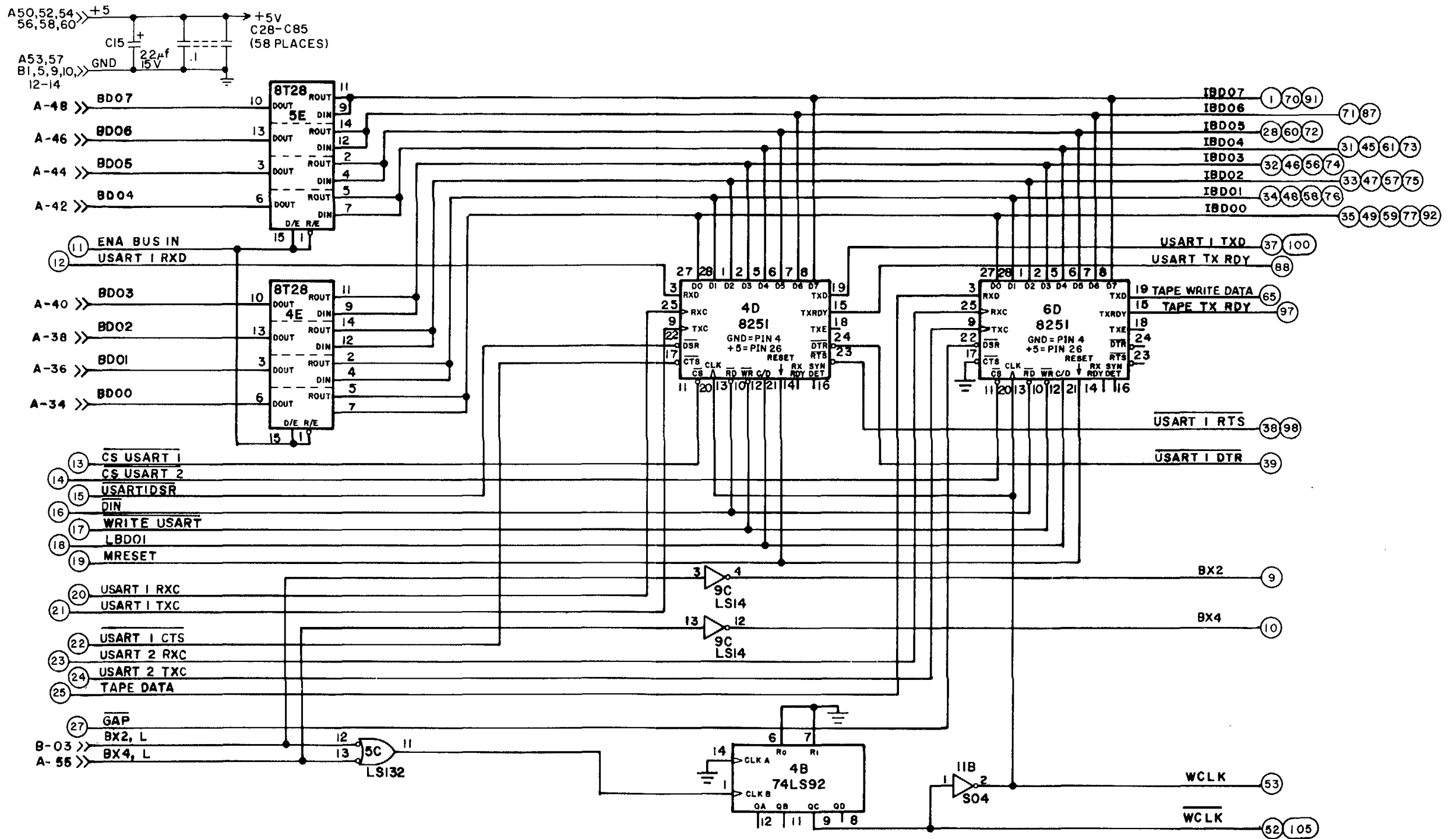


Figure B-8. Peripheral Board 0100-2724 Schematic Diagram (Sheet 2 of 7)

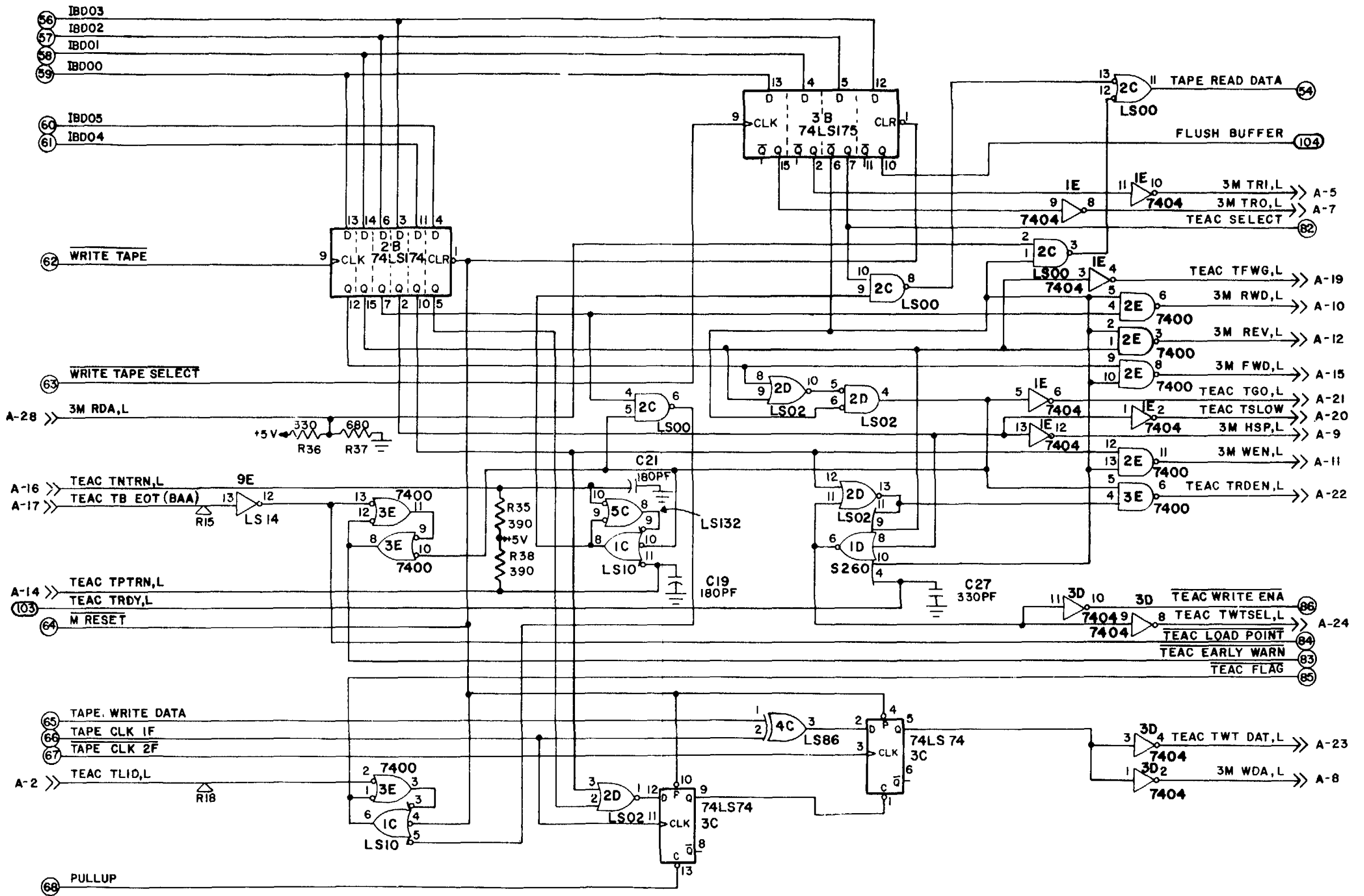


Figure B-8. Peripheral Board 0100-2724 Schematic Diagram (Sheet 5 of 7)

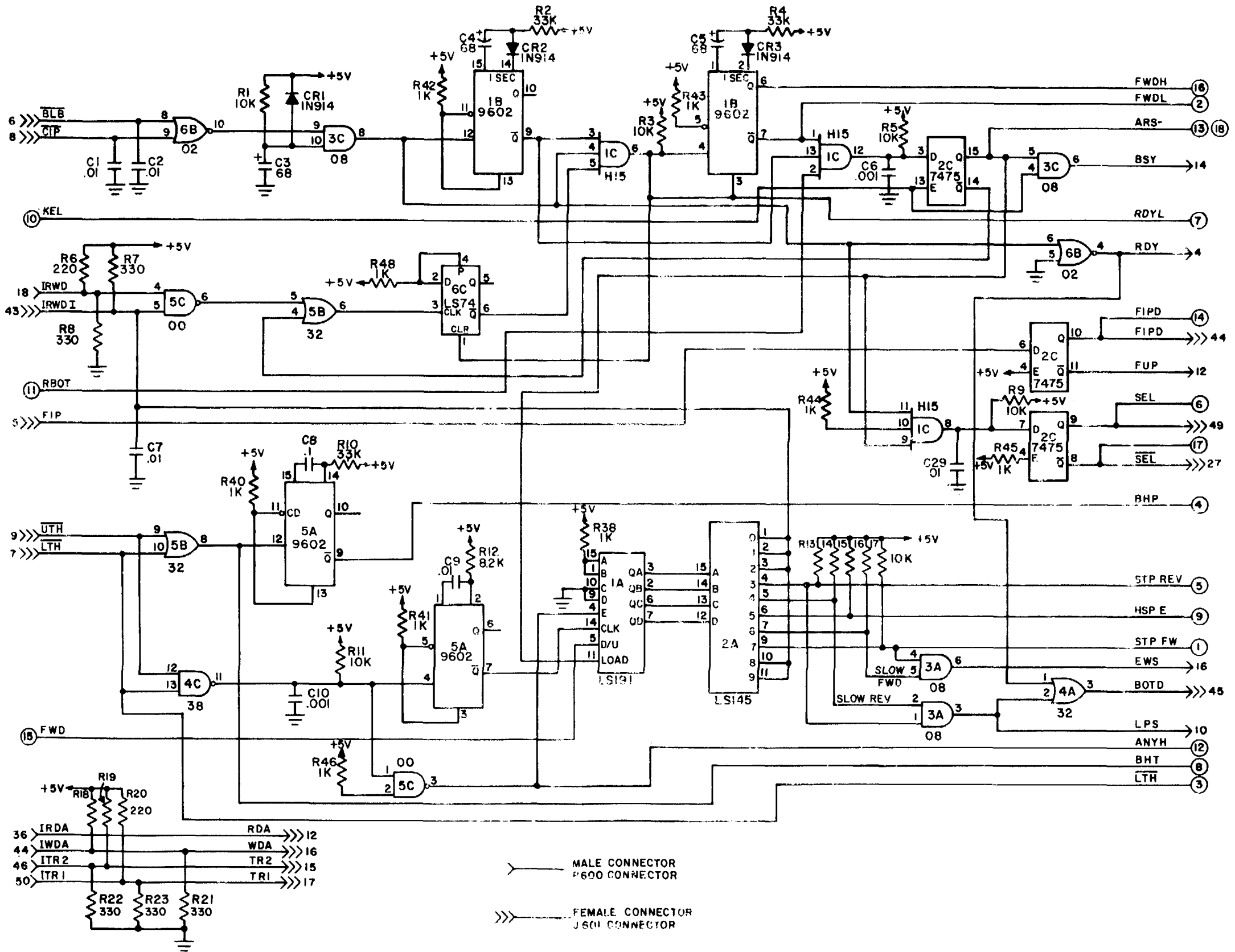


Figure B-9. Tape Drive Interface Board 0100-2736 Schematic Diagram (Sheet 1 of 2)

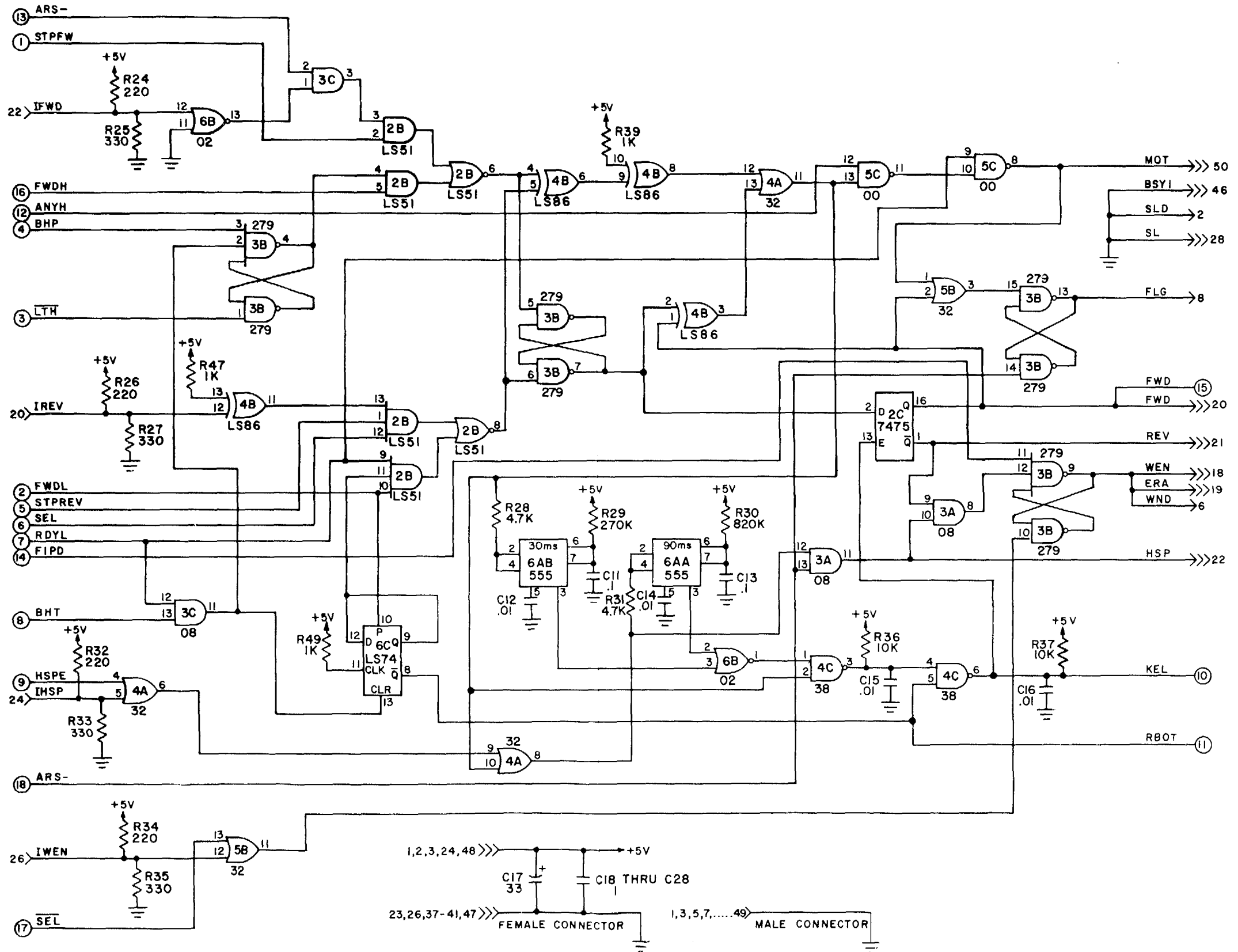


Figure B-9. Tape Driver Interface Board 0100-2736 Schematic Diagram (Sheet 2 of 2)

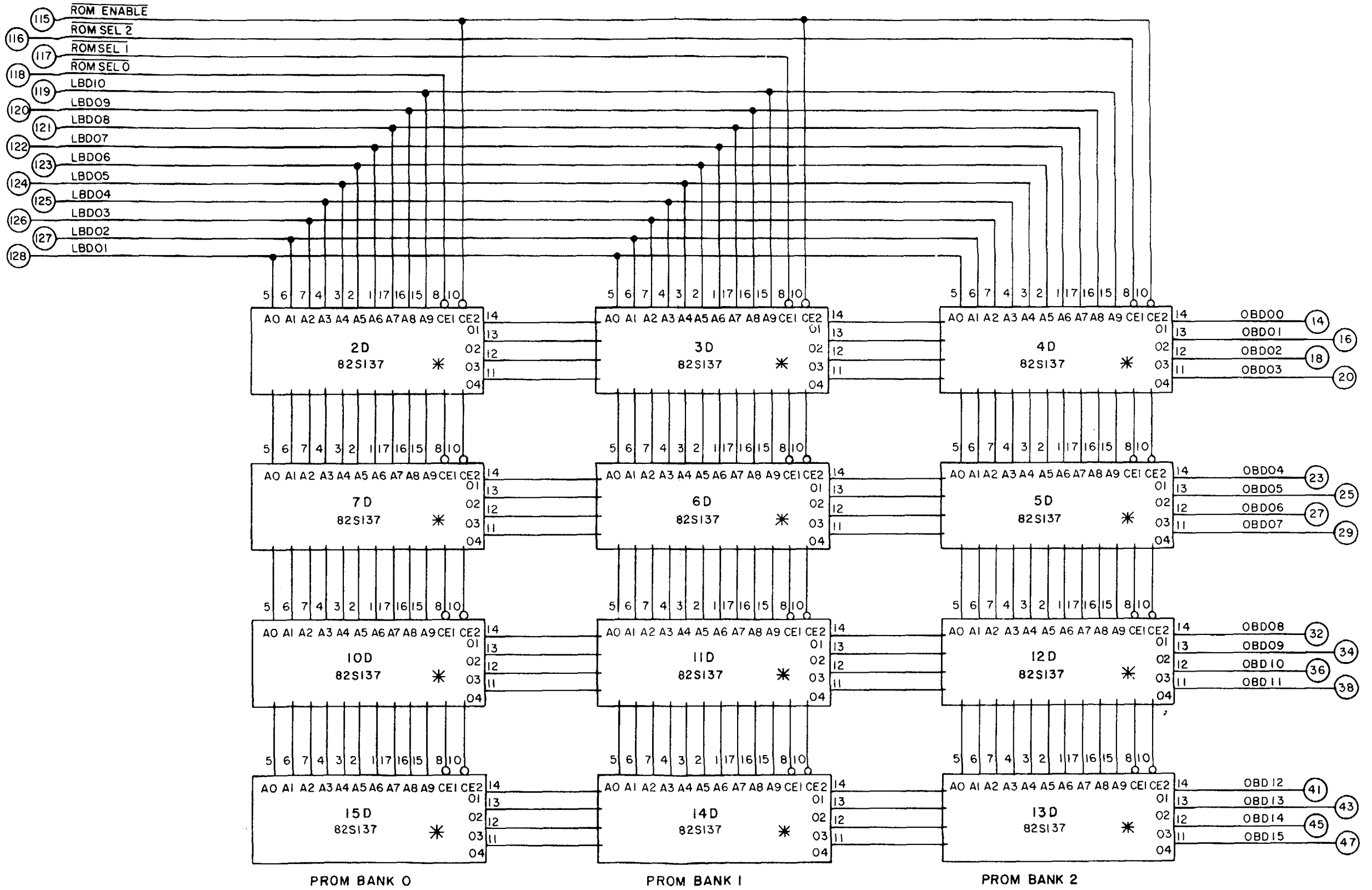


Figure B-10. Memory Board 0100-3754 Schematic Drawing (Sheet 1 of 6)

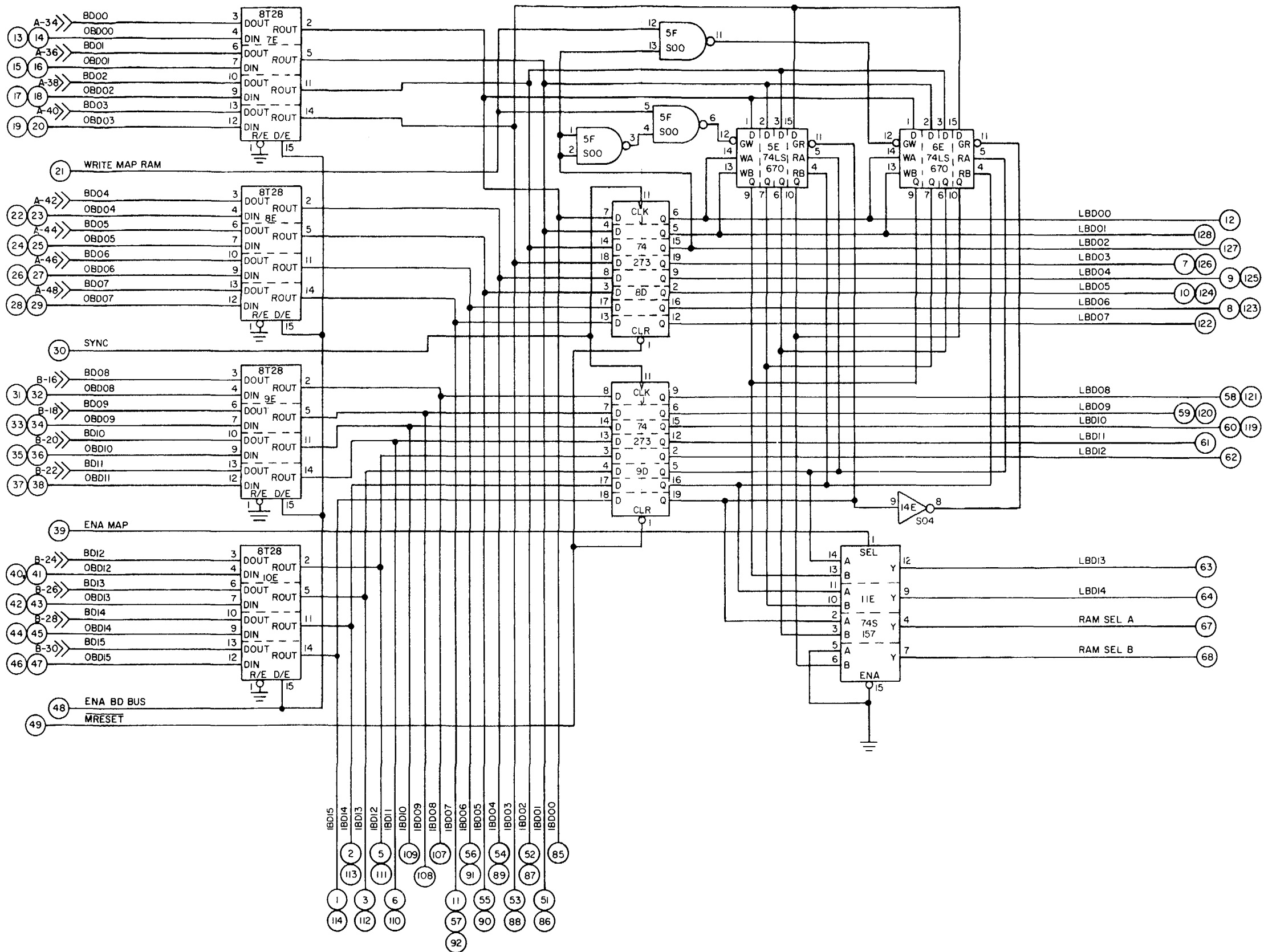


Figure B-10. Memory Board 0100-3754 Schematic Drawing (Sheet 2 of 6)

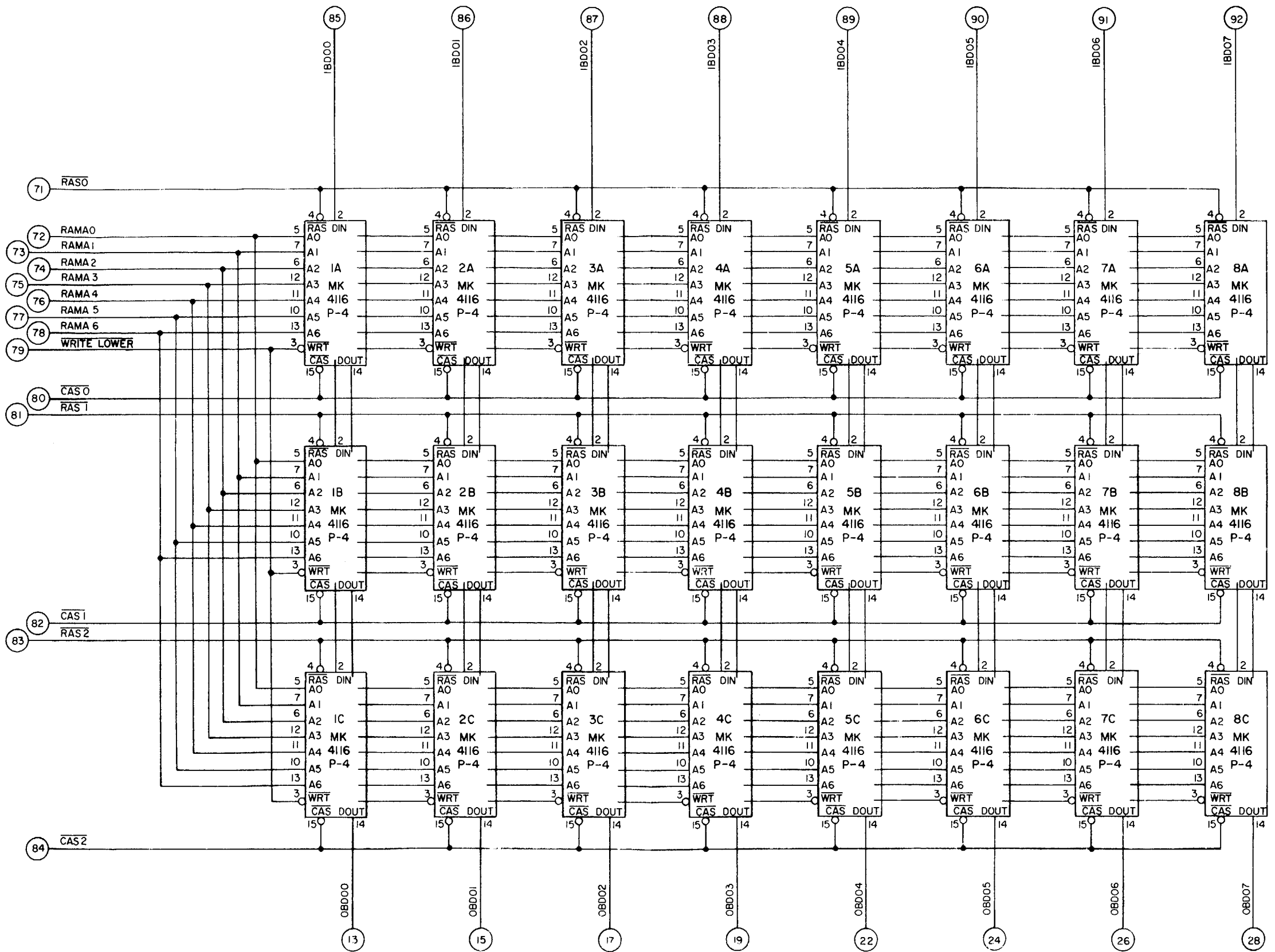


Figure B-10. Memory Board 0100-3754 Schematic Drawing (Sheet 3 of 6)

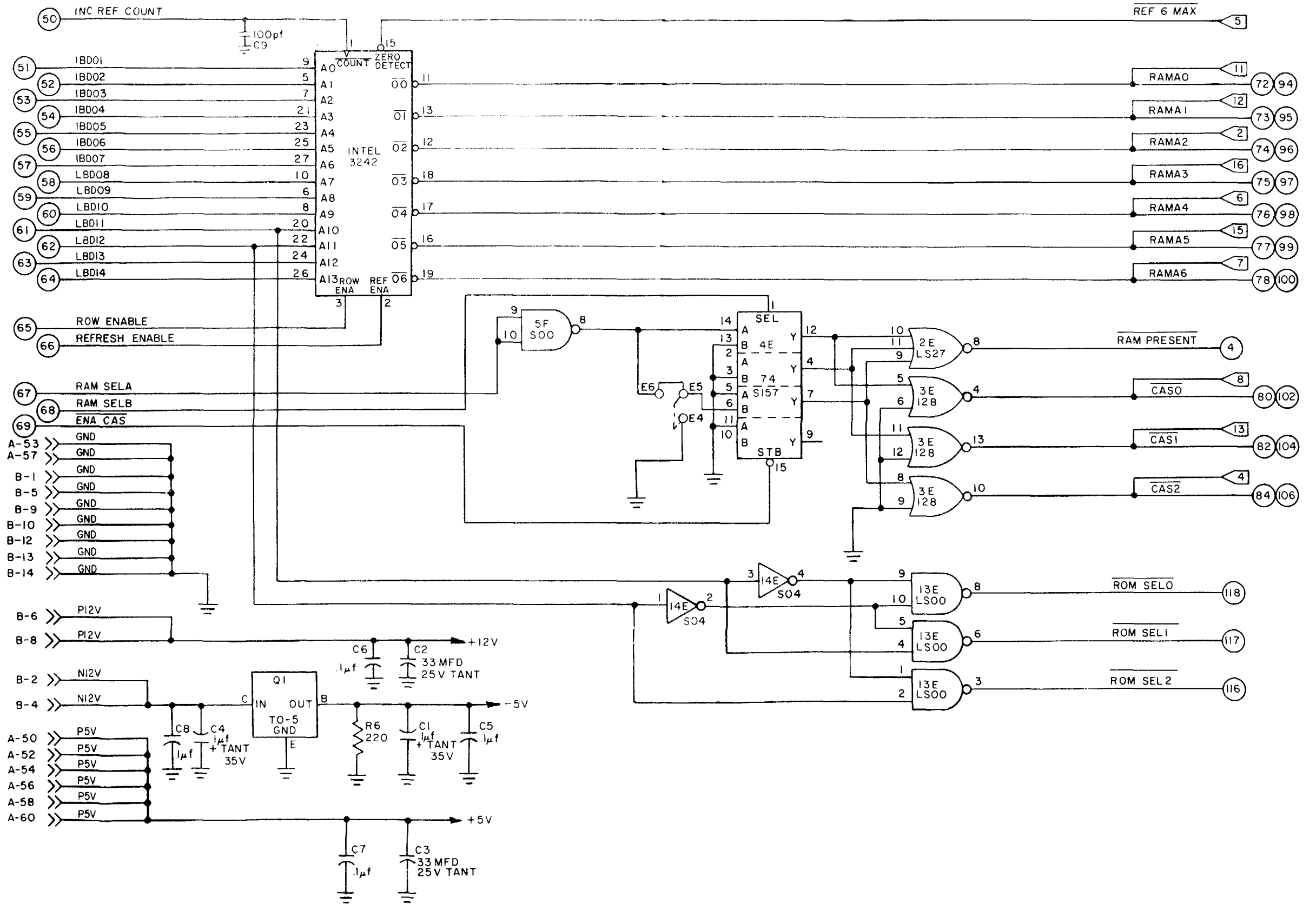


Figure B-10. Memory Board 0100-3754 Schematic Drawing (Sheet 4 of 6)

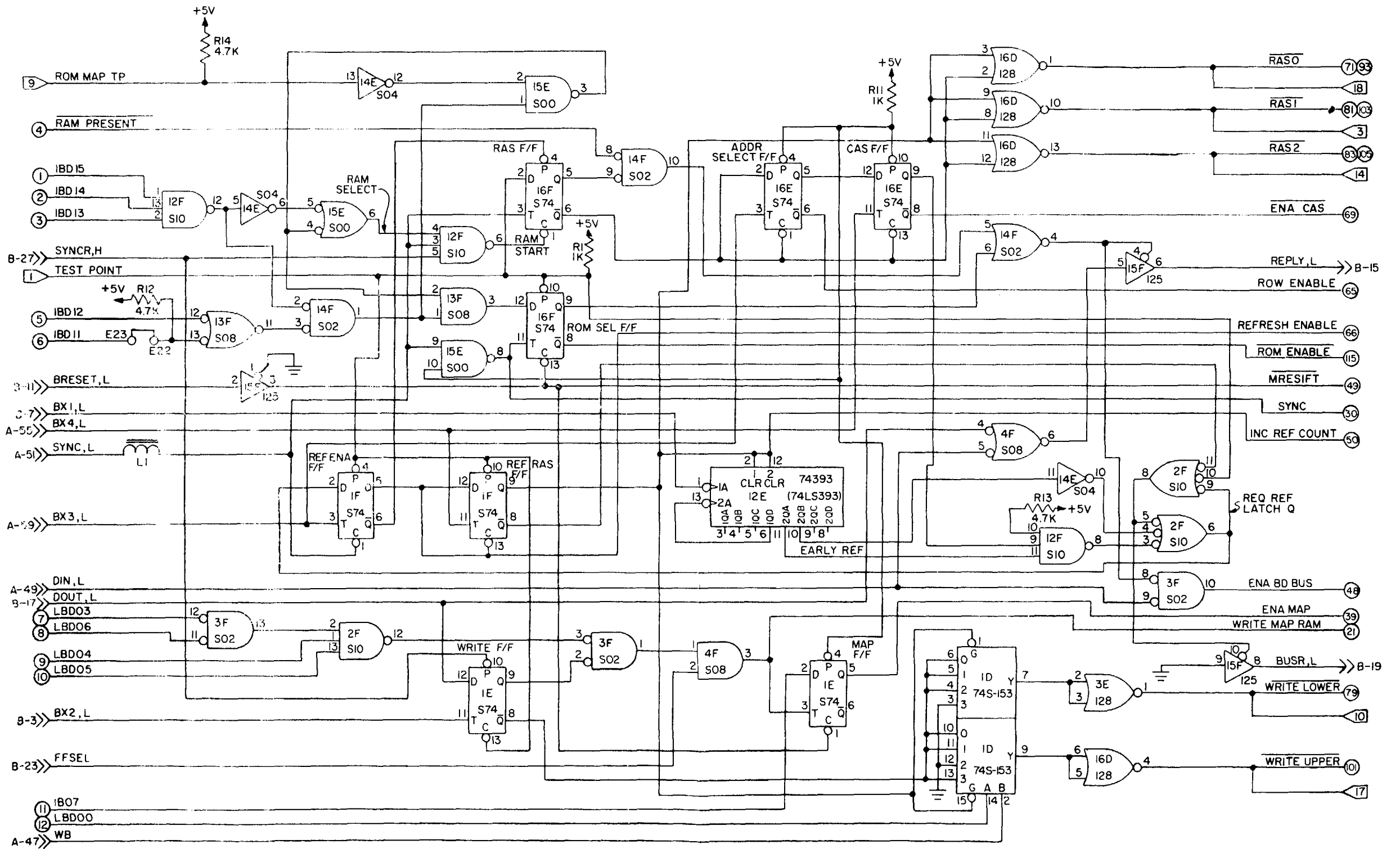


Figure B-10. Memory Board 0100-3754 Schematic Drawing (Sheet 5 of 6)

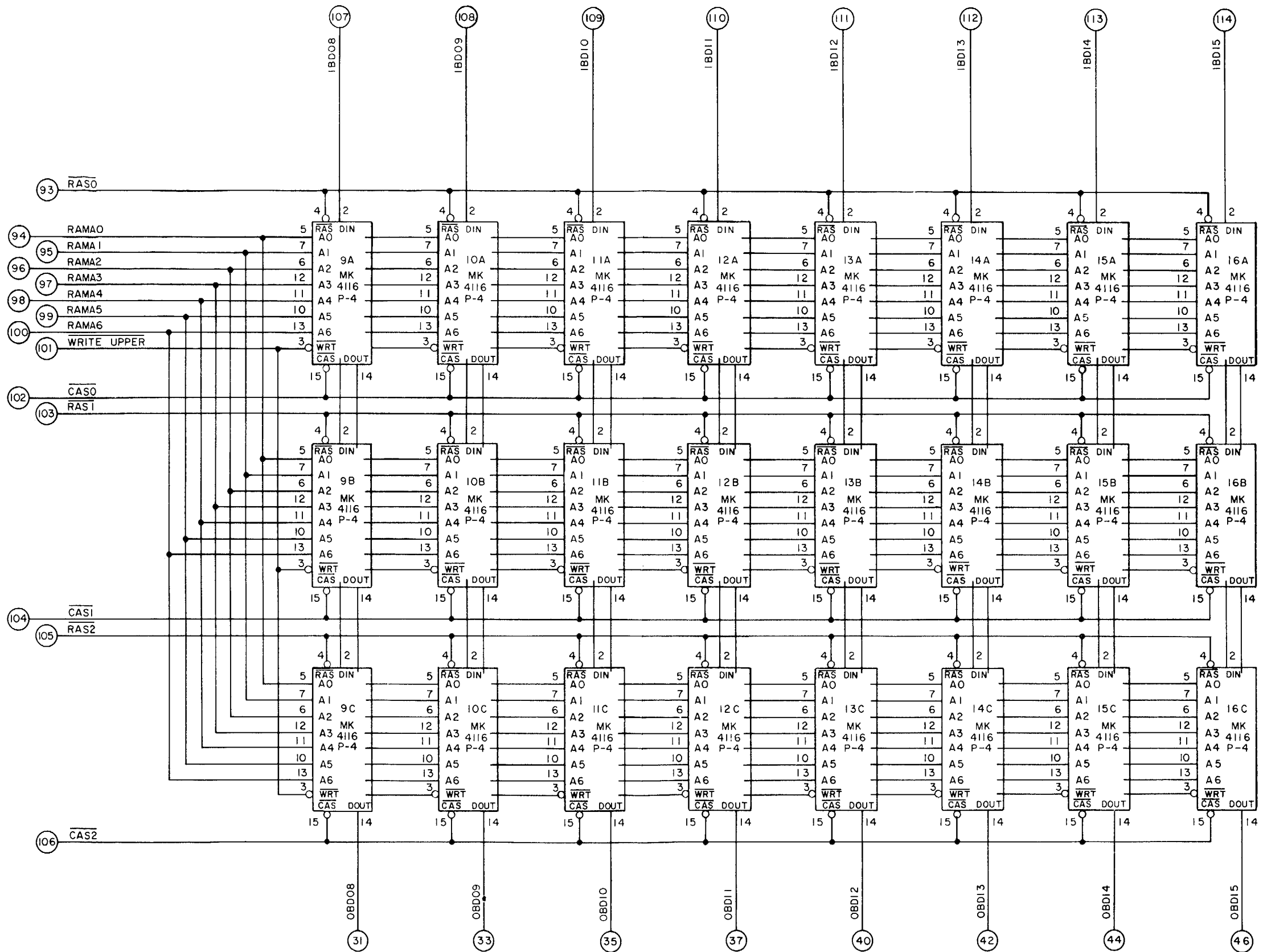


Figure B-10. Memory Board 0100-3754 Schematic Drawing (Sheet 6 of 6)

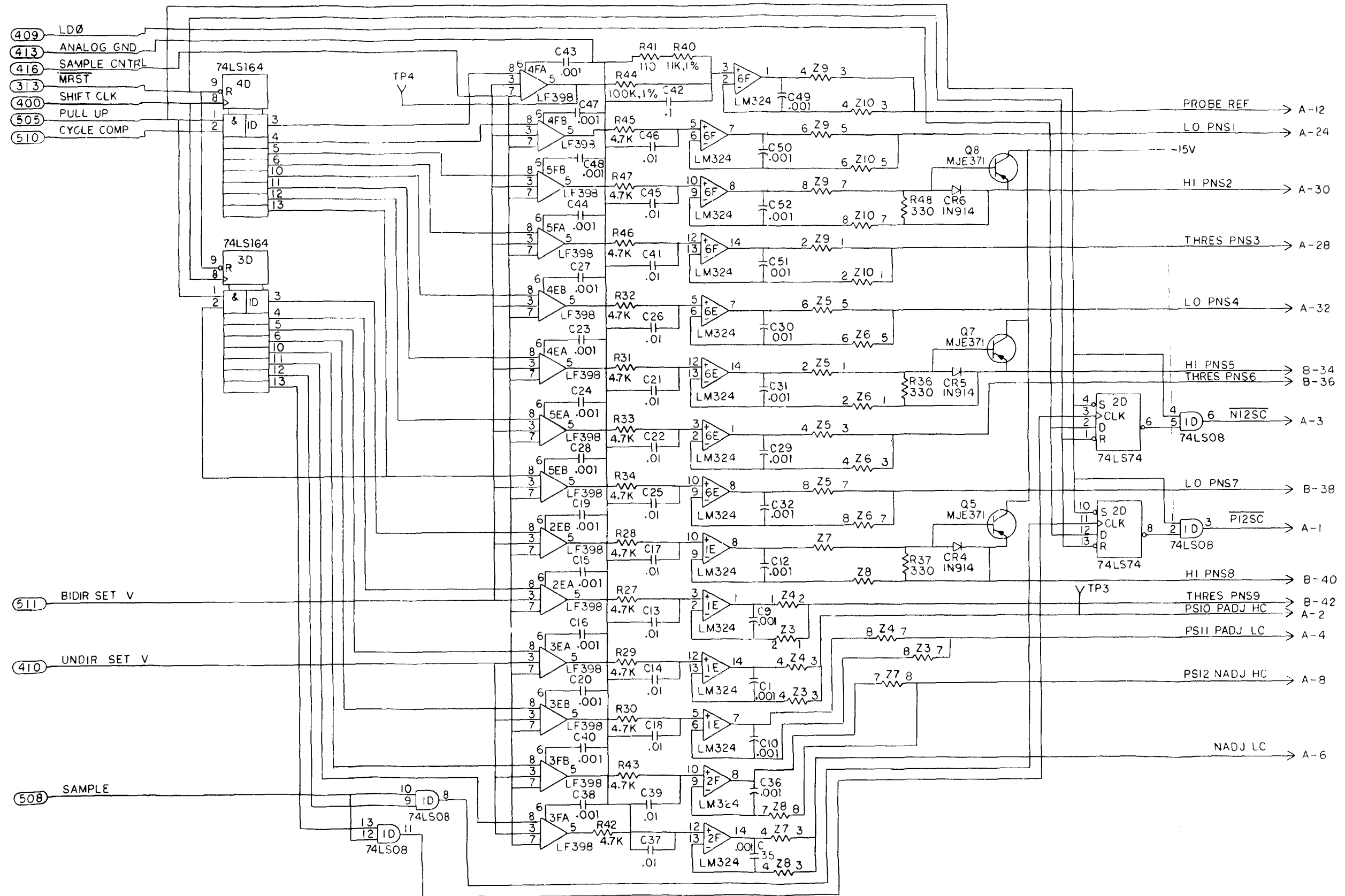


Figure B-11. Reference IEEE Board 2225-2703 Schematic Drawing (Sheet 1 of 7)

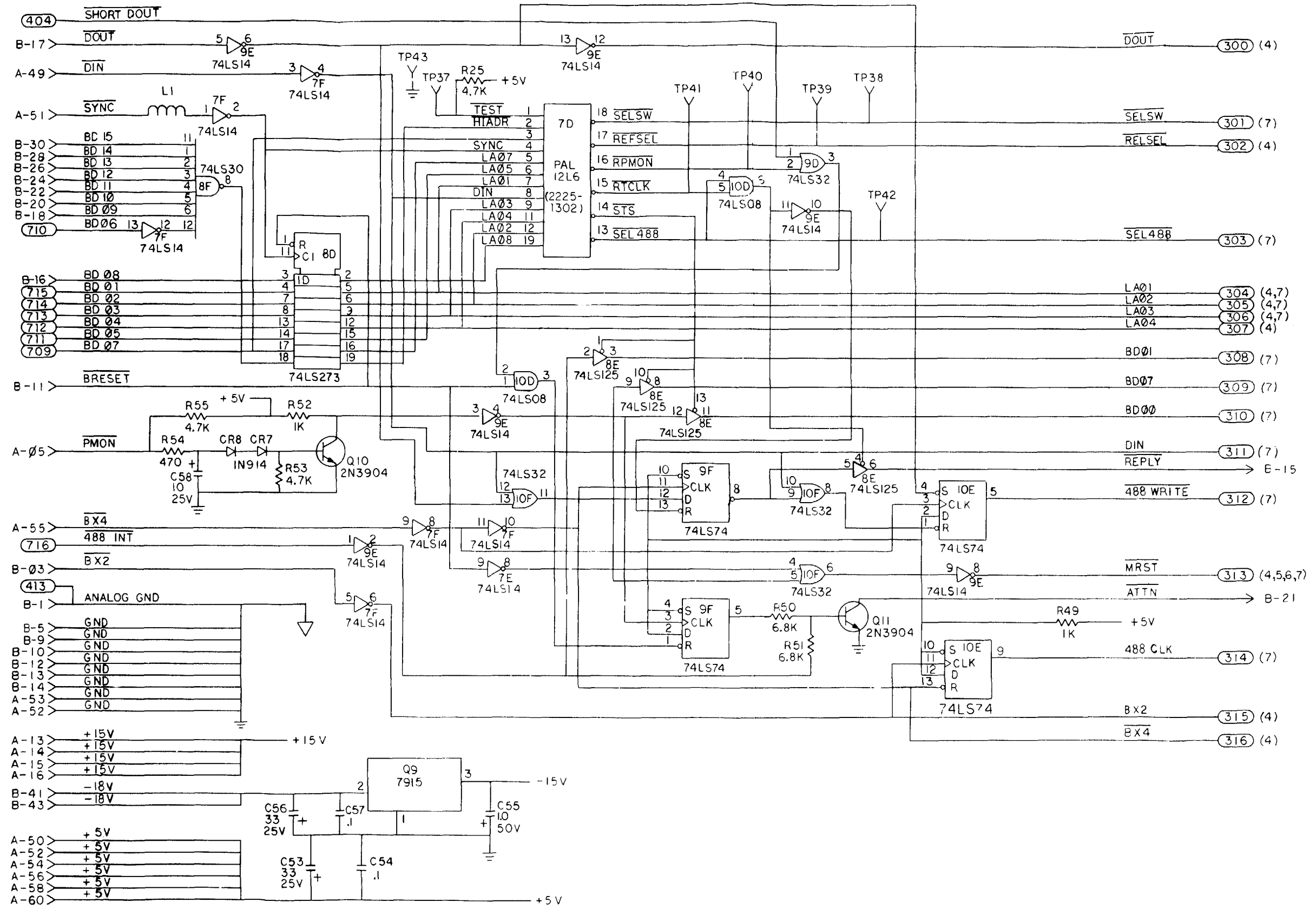


Figure B-11. Reference IEEE Board 2225-2703 Schematic Drawing (Sheet 4 of 7)

J1-CONNECTOR

PIN NO.	FUNCTION	PIN NO.	FUNCTION
1	DIO1	16	GND
2	DIO5	17	IFC
3	DIO2	18	GND
4	DIO6	19	SRQ
5	DIO3	20	GND
6	DIO7	21	ATN
7	DIO4	22	GND
8	DIO8	23	SHIELD
9	EQI	24	GND
10	REN	25	SYSTEM CNTRL
11	DAV	26	TRI STATE
12	GND	27	
13	NRFD	28	
14	GND	29	
15	NDAC	30	

A-CONNECTOR

PIN NO.	FUNCTION	PIN NO.	FUNCTION
A-1	PI25C	A-31	
A-2	PSIO PADJ HC	A-32	LO PNS4
A-3	NI25C	A-33	
A-4	PSII PADJ LC	A-34	BD00
A-5	PMON	A-35	
A-6	NADJ LC	A-36	BD01
A-7		A-37	
A-8	PSI2 NADJ HC	A-38	BD02
A-9		A-39	
A-10		A-40	BD03
A-11		A-41	
A-12	PROBE REF	A-42	BD04
A-13	+15V	A-43	
A-14	+15V	A-44	BD05
A-15	+15V	A-45	
A-16	+15V	A-46	BD06
A-17		A-47	
A-18		A-48	BD07
A-19		A-49	DIN
A-20		A-50	+5V
A-21		A-51	SYNC
A-22		A-52	+5V
A-23		A-53	GND
A-24	LO PNS1	A-54	+5V
A-25		A-55	BX4
A-26		A-56	+5V
A-27		A-57	GND
A-28	THRES PNS3	A-58	+5V
A-29		A-59	
A-30	HI PNS2	A-60	+5V

B-CONNECTOR

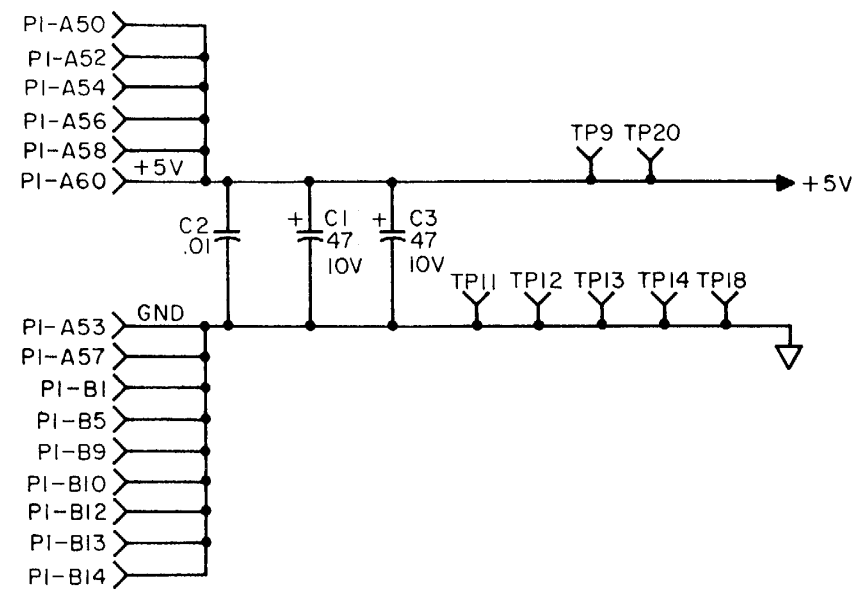
PIN NO.	FUNCTION	PIN NO.	FUNCTION
B-1	GND	B-31	
B-2		B-32	
B-3	BX2	B-33	
B-4		B-34	HI PNS5
B-5	GND	B-35	
B-6		B-36	THRES PNS6
B-7		B-37	
B-8		B-38	LO PNS7
B-9	GND	B-39	
B-10	GND	B-40	HI PNS8
B-11	BRESET	B-41	-18V
B-12	GND	B-42	THRES PNS9
B-13	GND	B-43	-18V
B-14	GND	B-44	
B-15	REPLY	B-45	
B-16	BD08	B-46	
B-17	D OUT	B-47	
B-18	BD09	B-48	
B-19		B-49	
B-20	BDI0	B-50	
B-21	ATTN	B-51	
B-22	BDI1	B-52	
B-23			
B-24	BDI2		
B-25			
B-26	BDI3		
B-27			
B-28	BDI4		
B-29			
B-30	BDI5		

TEST POINT	SIGNAL	TEST POINT	SIGNAL
TP1	ANALOG GND	TP23	5C16
TP2	BIDIR SETV	TP24	5C9
TP3	PSI0 PADJ HC	TP25	5C12
TP4	PROBE REF 1	TP26	GND
TP5	4B1	TP27	GND
TP6	4B2	TP28	+5V P/U
TP7	4B3	TP29	+5V P/U
TP8	4B4	TP30	7B15
TP9	4B5	TP31	7B16
TP10	4B6	TP32	7B13
TP11	4B7	TP33	7B14
TP12	4B9	TP34	7B11
TP13	GND	TP35	7B12
TP14	SAMPLE CONTROL	TP36	GND
TP15	-5V	TP37	TEST
TP16	GND	TP38	SEL5W
TP17	-15V	TP39	REFSEL
TP18	5C2	TP40	RPMON
TP19	5C19	TP41	RTCLK
TP20	5C5	TP42	SEL488
TP21	5C15	TP43	GND
TP22	5C6		

Figure B-11. Reference IEEE Board 2225-2703 Schematic Drawing (Sheet 6 of 7)

DEVICE TYPE	REF DES	UNUSED OUTPUT PIN	POWER PIN				GND PIN
			+5V	-5V	+2V	-2V	
2732(1300)	8E		24			12	
2732(1301)	11E		24			12	
16L8(1302)	10E		20			10	
16L8(1303)	10F		20			10	
9T28	6F		16			8	
	7F		16			8	
	13F		16			8	
	14F		16			8	
3648	9A		16			8	
	9B		16			8	
	9C		16			8	
	9D		16			8	
8265(4165)	1A		8			16	
	2A		8			16	
	3A		8			16	
	4A		8			16	
	5A		8			16	
	6A		8			16	
	7A		8			16	
	8A		8			16	
	11A		3			16	
	12A		8			16	
	13A		3			16	
	14A		8			16	
	15A		8			16	
	16A		8			16	
	17A		8			16	
	18A		8			16	
	1B		8			16	
	2B		8			16	
	3B		8			16	
	4B		8			16	
	5B		8			16	
	6B		8			16	
	7B		8			16	
	8B		8			16	
	11B		8			16	
	12B		8			16	
	13B		8			16	
	14B		8			16	
	15B		8			16	
	16B		8			16	
	17B		8			16	
	18B		8			16	
	1C		8			16	
	2C		8			16	
	3C		8			16	
	4C		8			16	
	5C		8			16	
	6C		8			16	
	7C		8			16	
	8C		8			16	
	11C		8			16	
	12C		8			16	
	13C		8			16	
	14C		8			16	
	15C		8			16	
	16C		8			16	
	17C		8			16	
	18C		8			16	
	1D		8			16	
	2D		8			16	
	3D		8			16	
	4D		3			16	
	5D		8			16	
	6D		8			16	
	7D		8			16	
	8D		8			16	
	11D		8			16	
	12D		8			16	
	13D		8			16	
	14D		8			16	
	15D		8			16	
	16D		8			16	
	17D		3			16	
	18D		3			16	
	250(6310)	18E		14			7

DEVICE TYPE	REF DES	UNUSED OUTPUT PIN	POWER PIN				GND PIN
			5V	5V	-2V	-2V	
74S00	9F		14			7	
74LS00	17F		14			7	
74LS02	19F		14			7	
74S03	15F		14			7	
74LS04	15E		14			7	
74S10	19E		14			7	
	1F		14			7	
74ALS27	16F		14			7	
74LS74	17E		14			7	
	18F		14			7	
74S86	16E		14			7	
74S139	19D		14			7	
74S158	1E		16			8	
74LS161	2F		16			8	
	3F		16			8	
74LS164	3E		14			7	
74S189	4E		16			8	
	5E		16			8	
74LS240	5F		20			10	
	11F		20			10	
74LS244	6E		20			10	
	14E		20			10	
74S374	8F		20			10	
	12F		20			10	
74S436	19B		16			8	



NOTES: UNLESS OTHERWISE SPECIFIED
 1. ALL RESISTOR VALUES ARE 1K OHM 5% 1/4W.
 2. ALL CAPACITOR VALUES ARE IN MICROFARADS.

Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 1 of 13)

PIN NO.	FUNCTION	PIN NO.	FUNCTION
A1		B1	GND
A2		B2	
A3		B3	BX2, L
A4		B4	
A5		B5	GND
A6		B6	
A7		B7	BX1, L
A8		B8	
A9		B9	GND
A10		B10	GND
A11		B11	BRESET, L
A12		B12	GND
A13		B13	GND
A14		B14	GND
A15		B15	REPLY, L
A16		B16	BD8
A17		B17	DOUT, L
A18		B18	BD9
A19		B19	BVSR, L
A20		B20	BD10
A21		B21	
A22		B22	BD11
A23		B23	
A24		B24	BD12
A25		B25	
A26		B26	BD13
A27		B27	SYNCR, H
A28		B28	BD14
A29		B29	
A30		B30	BD15

PIN NO.	FUNCTION	PIN NO.	FUNCTION
A30		B30	BD15
A31		B31	
A32		B32	
A33		B33	
A34		B34	
A35		B35	
A36	BD1	B36	
A37		B37	
A38	BD2	B38	
A39		B39	
A40	BD3	B40	
A41		B41	
A42	BD4	B42	
A43		B43	
A44	BD5	B44	
A45		B45	
A46	BD6	B46	
A47	WB, H	B47	
A48	BD7	B48	
A49	DIN, L	B49	
A50	+5 V	B50	
A51		B51	
A52	+5 V	B52	
A53	GND	B53	
A54	+5 V	B54	
A55	BX4, L	B55	
A56	+5 V	B56	
A57	GND	B57	
A58	+5 V	B58	
A59	BX3, L	B59	
A60	+5 V	B60	

Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 2 of 13)

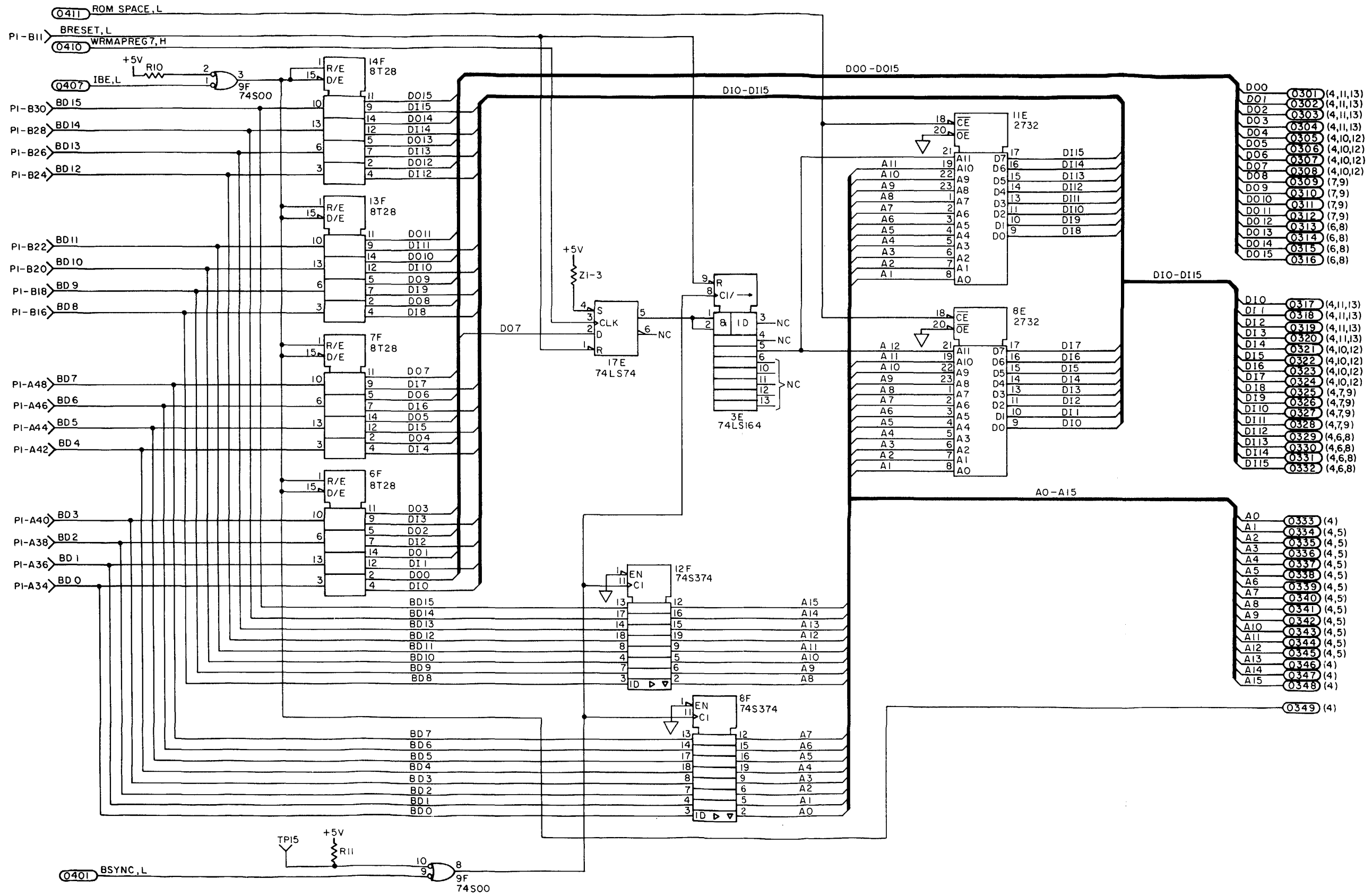


Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 3 of 13)

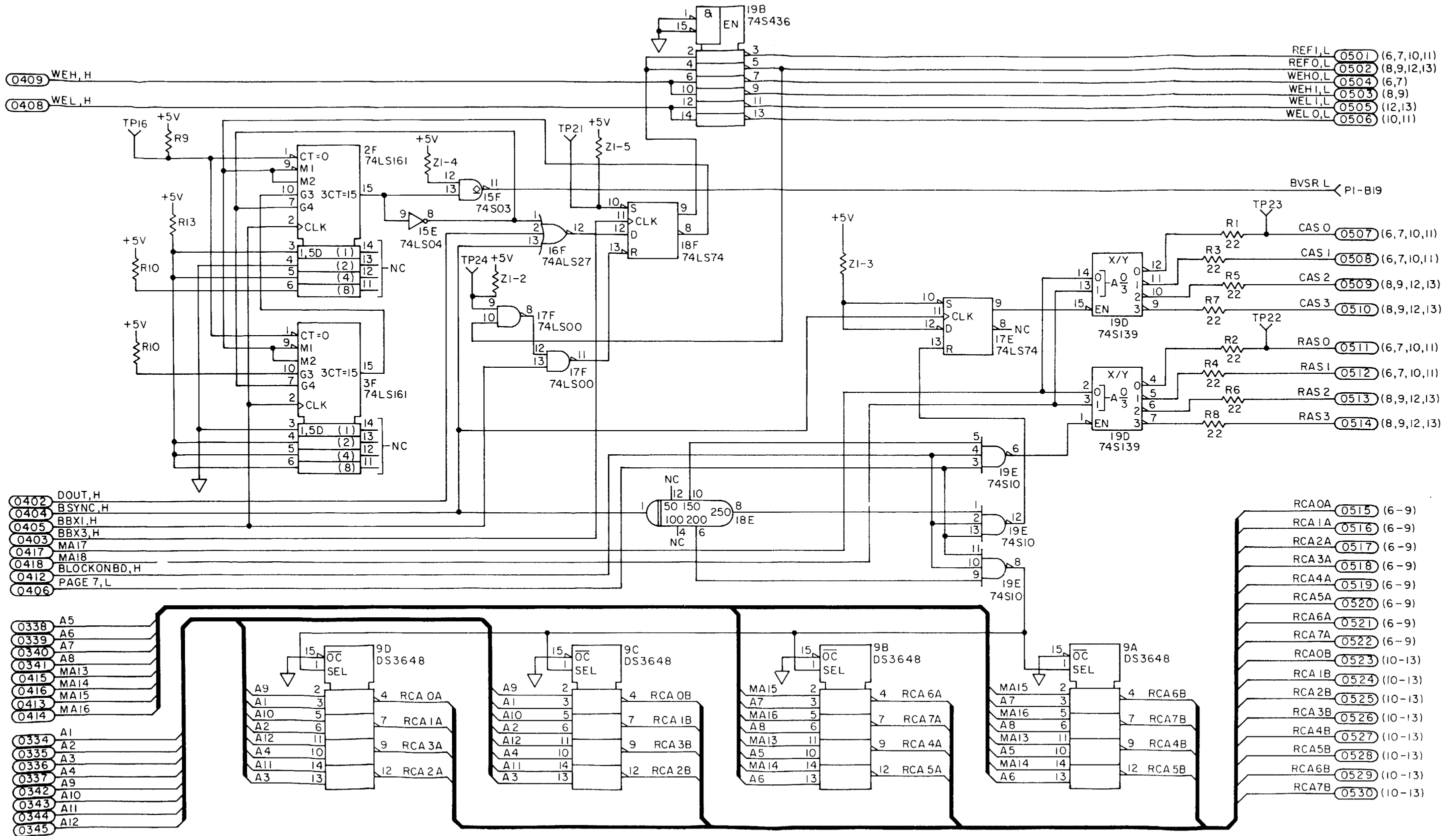


Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 5 of 13)

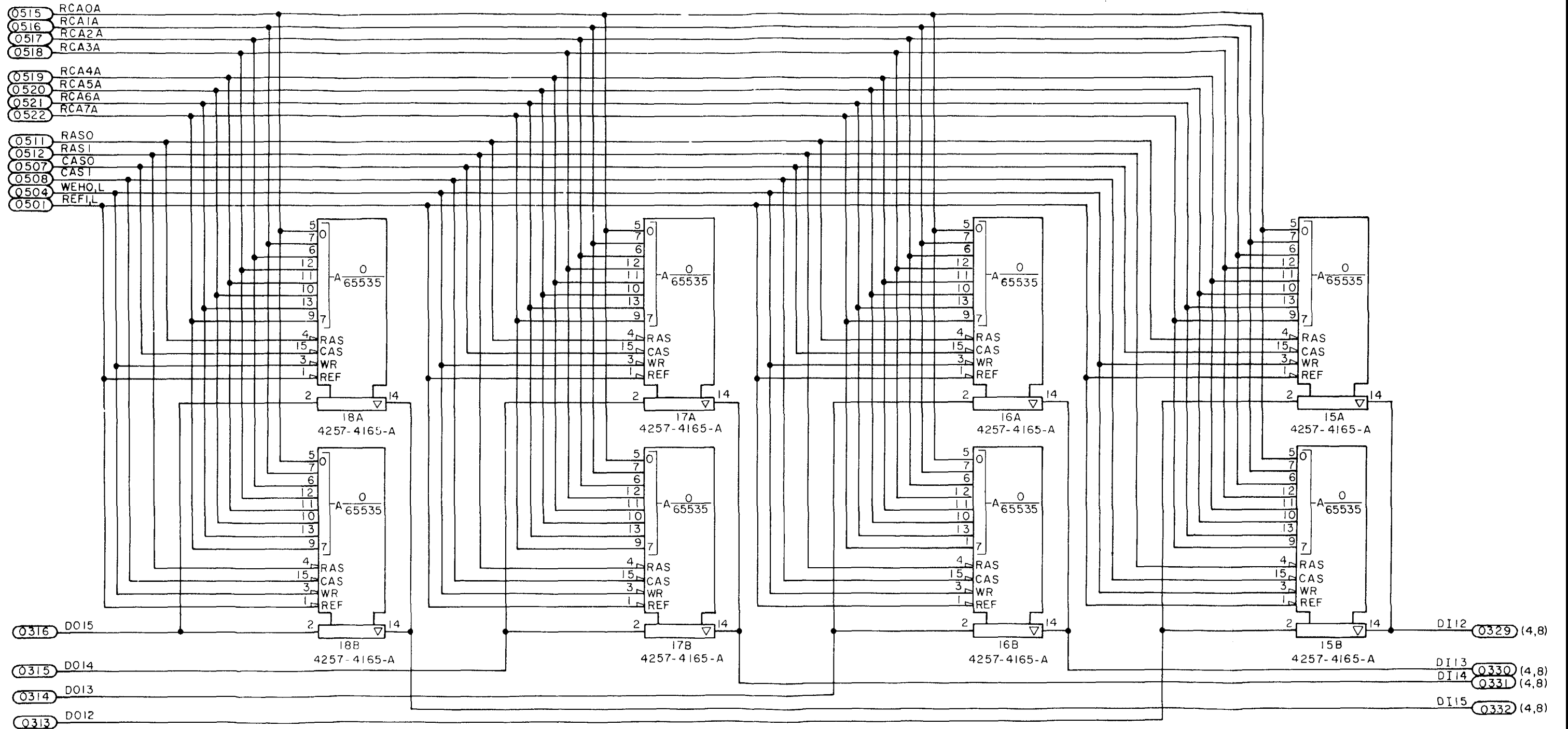


Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 6 of 13)

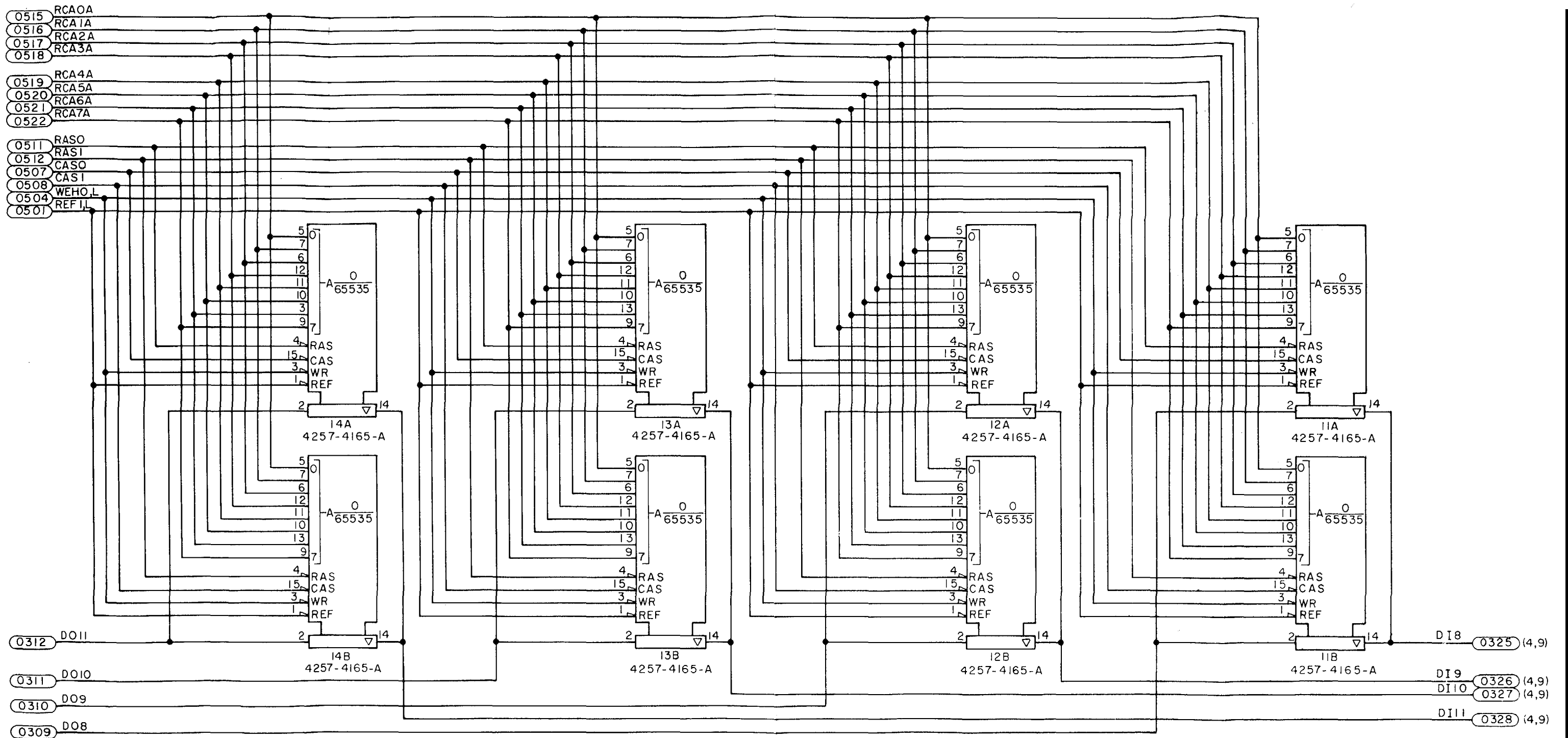


Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 7 of 13)

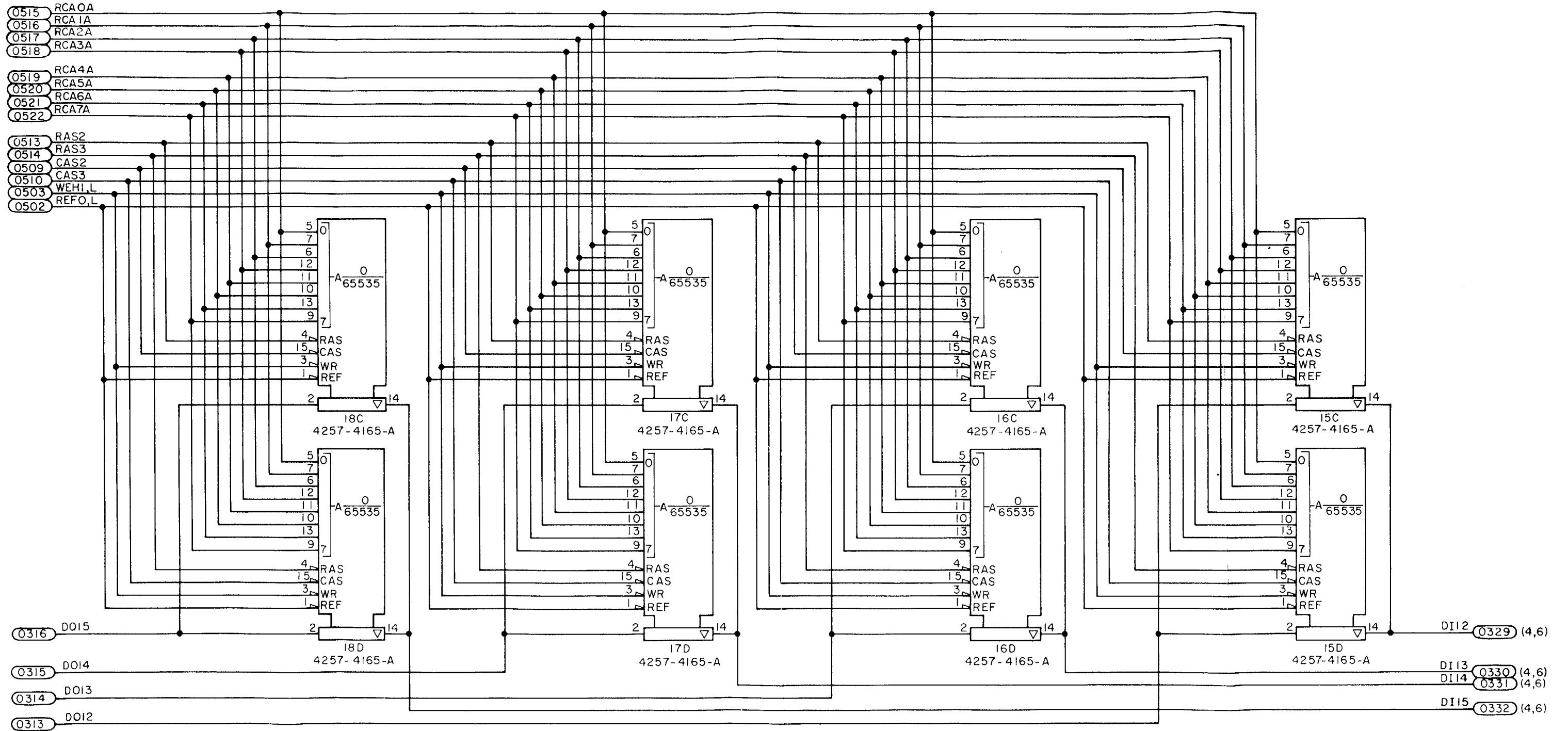


Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 8 of 13)

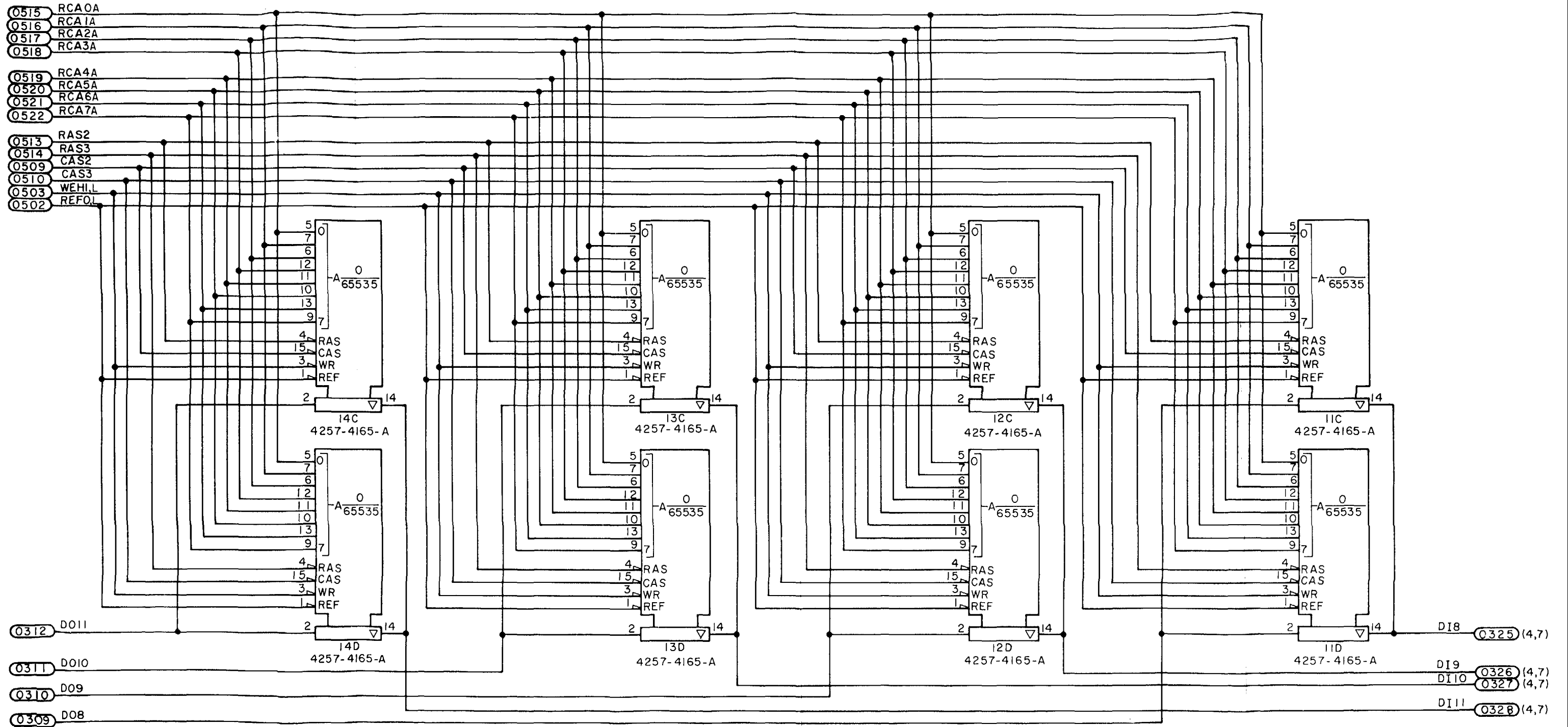


Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 9 of 13)

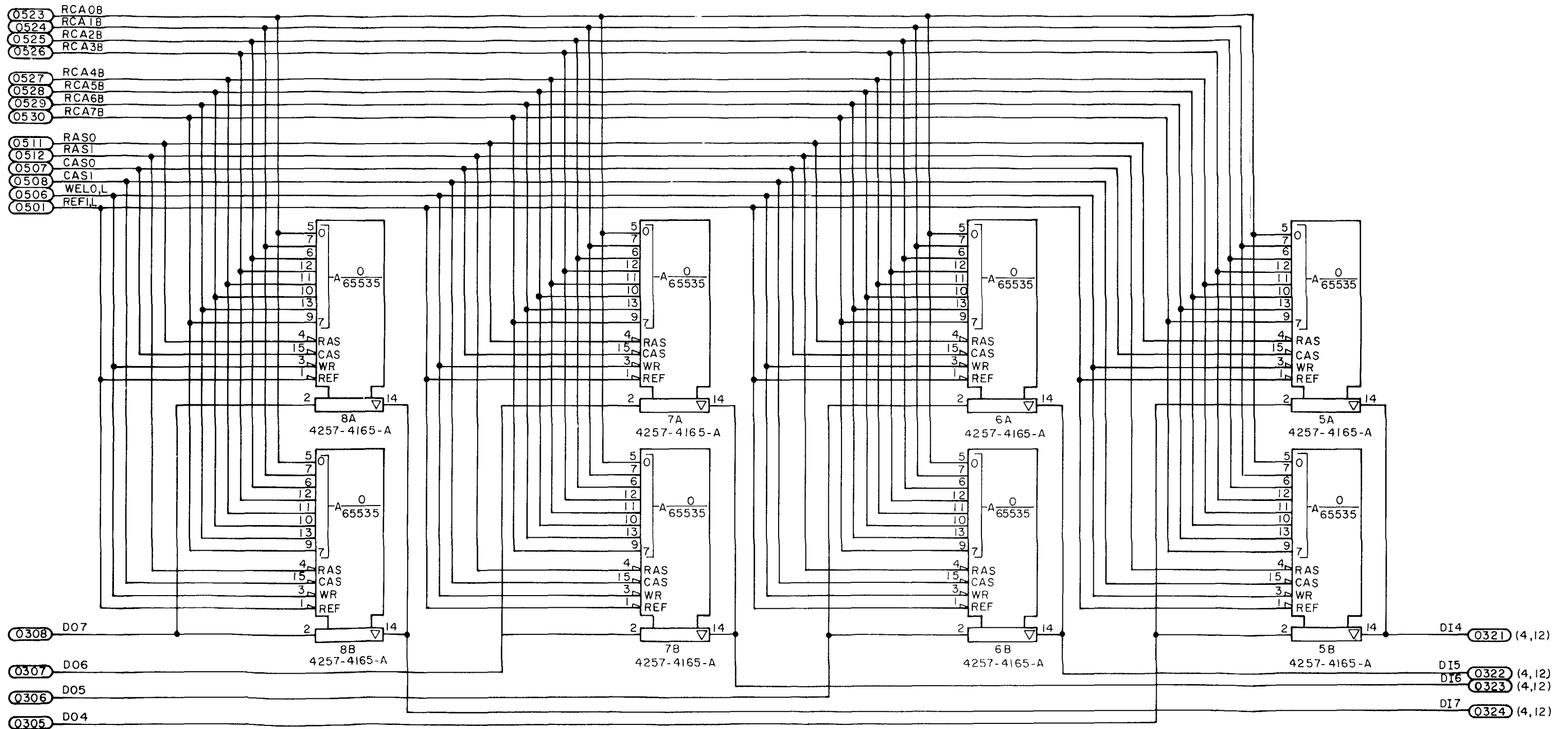


Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 10 of 13)

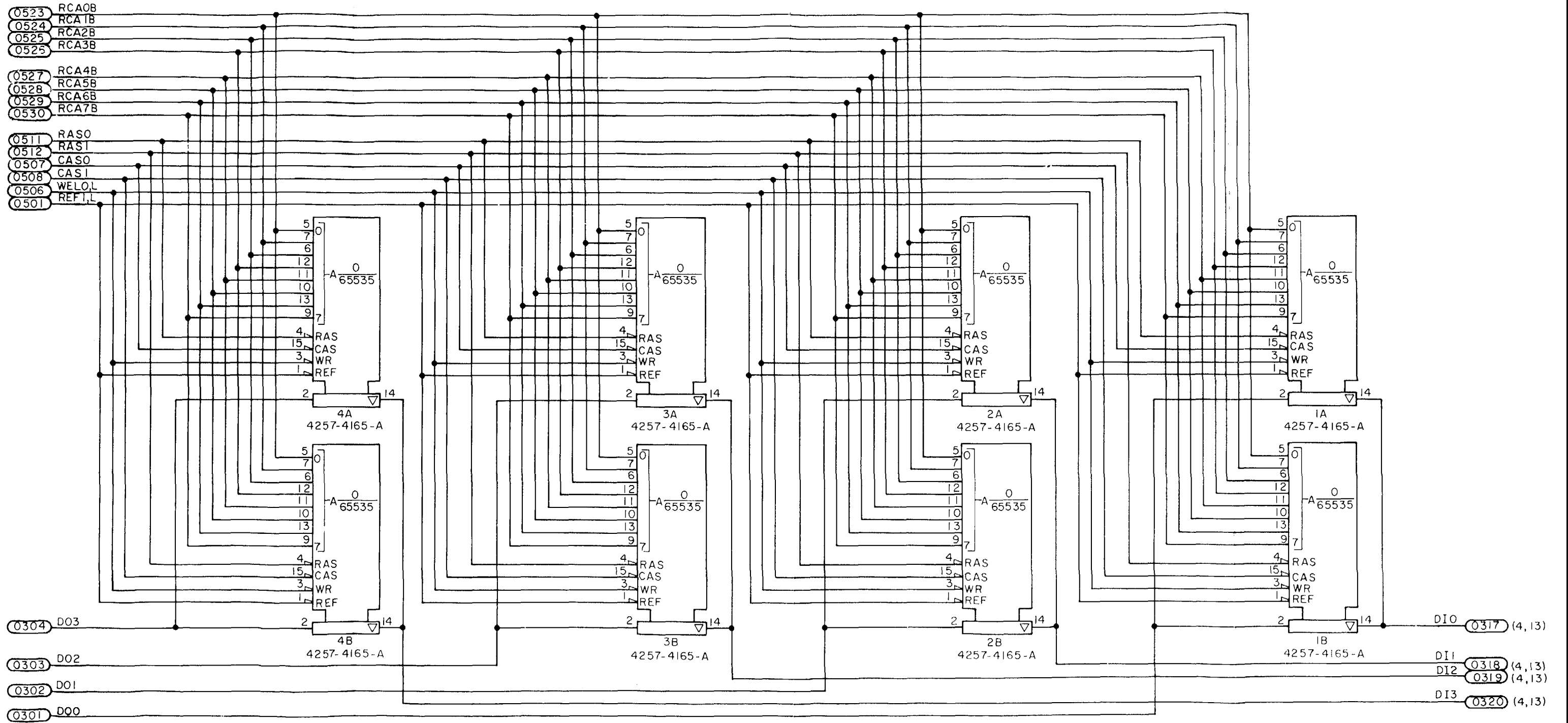


Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 11 of 13)

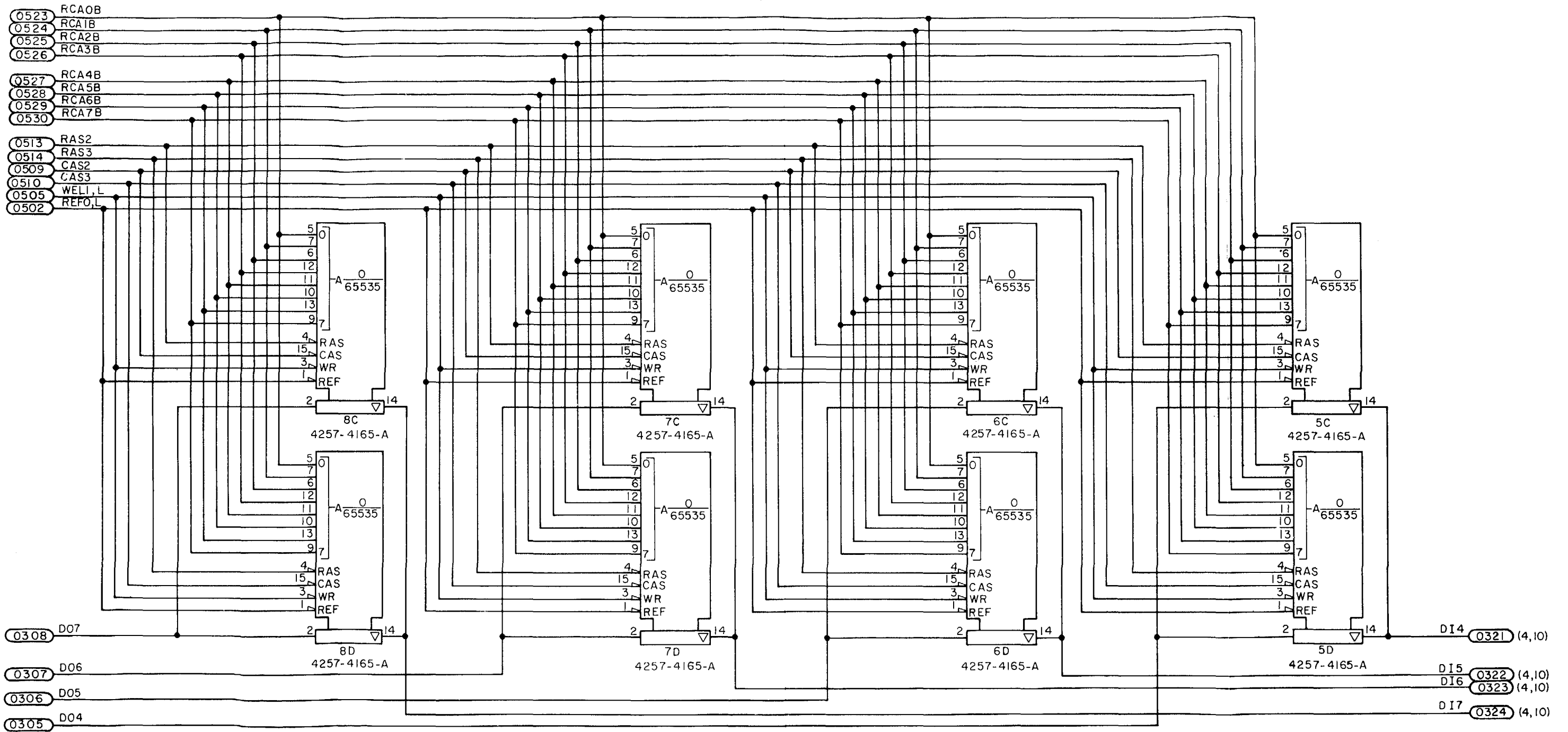


Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 12 of 13)

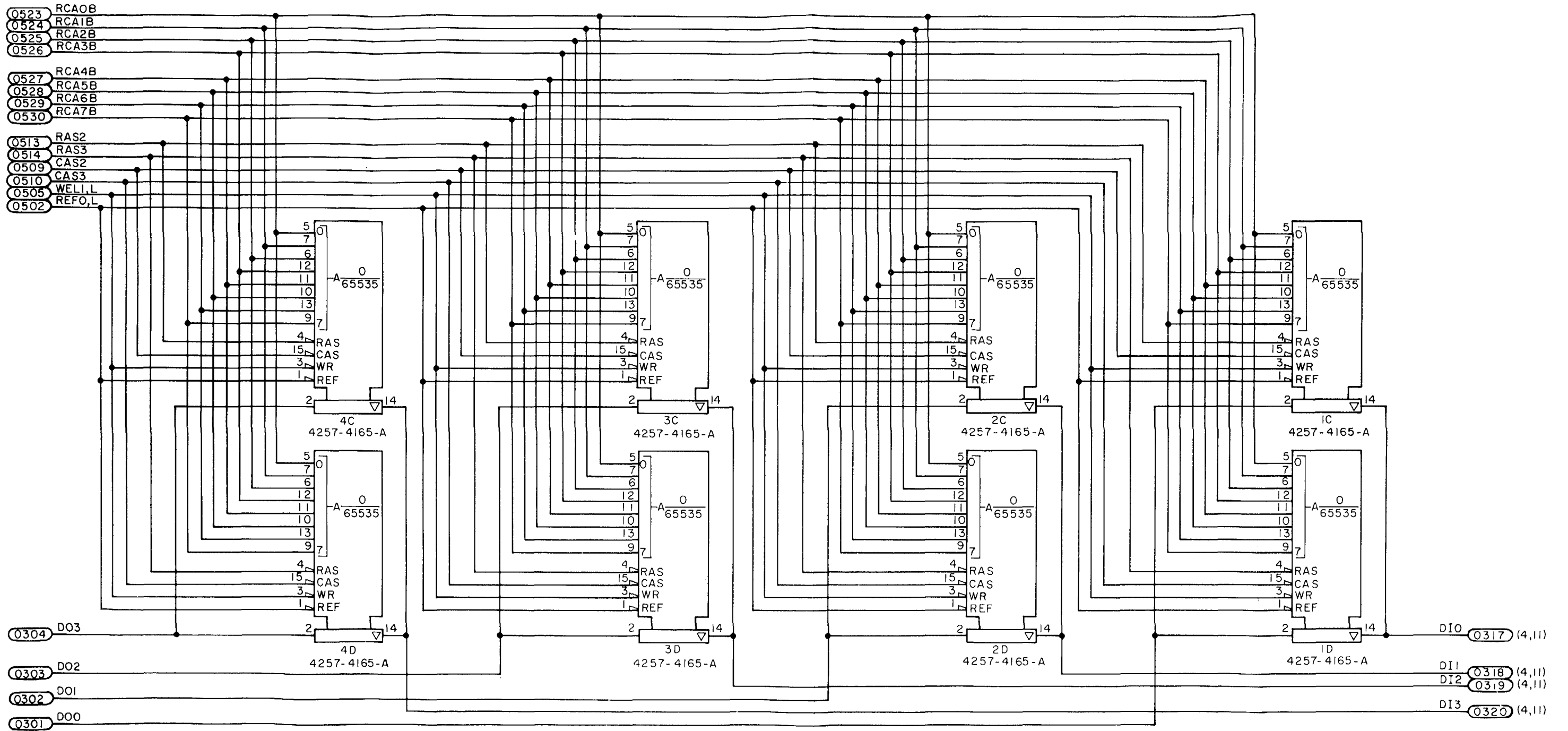


Figure B-12. 512K Memory Board 2235-2706 Schematic Drawing (Sheet 13 of 13)

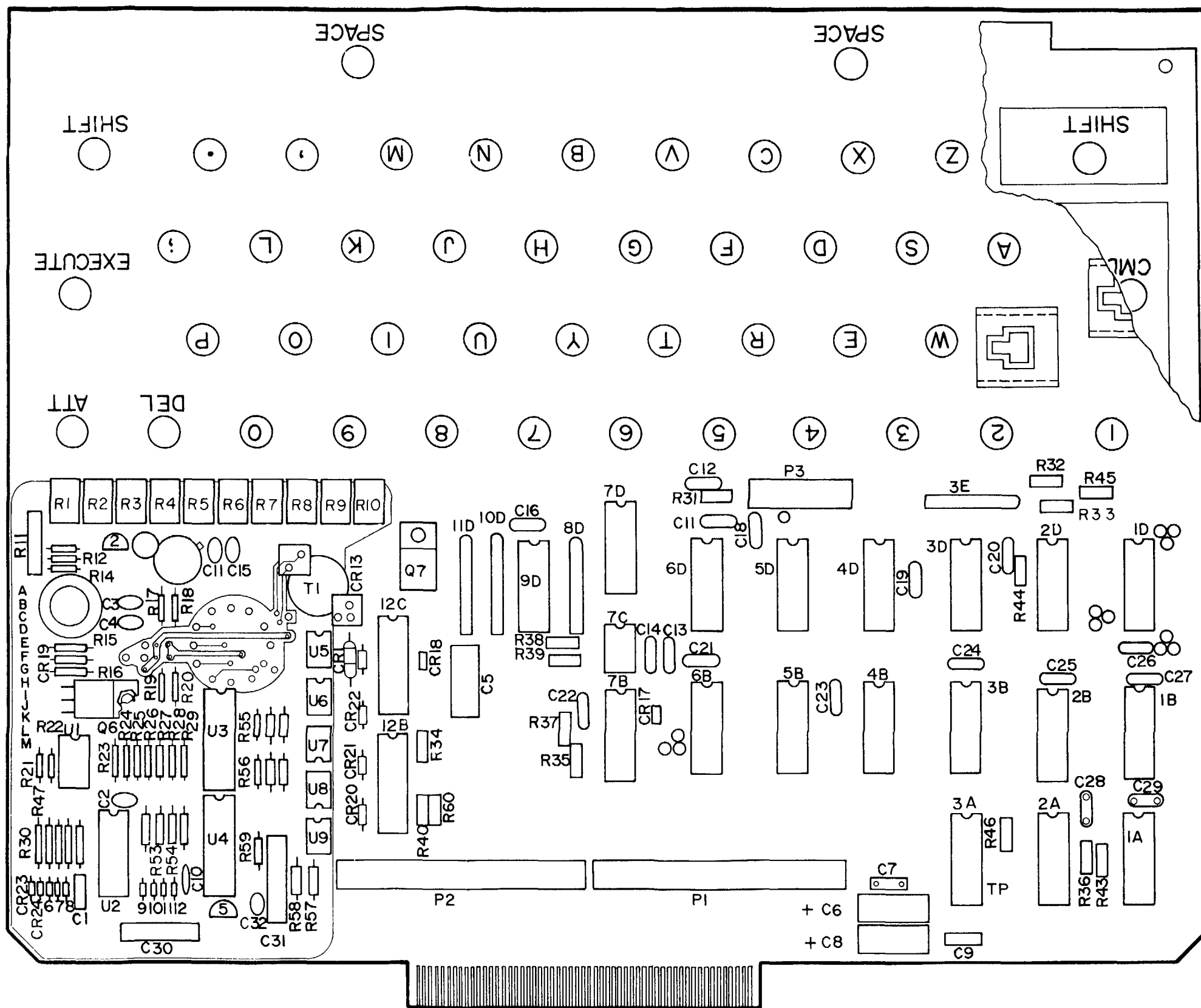


Figure C-1. Panel Board 0100-2701 Assembly Drawing

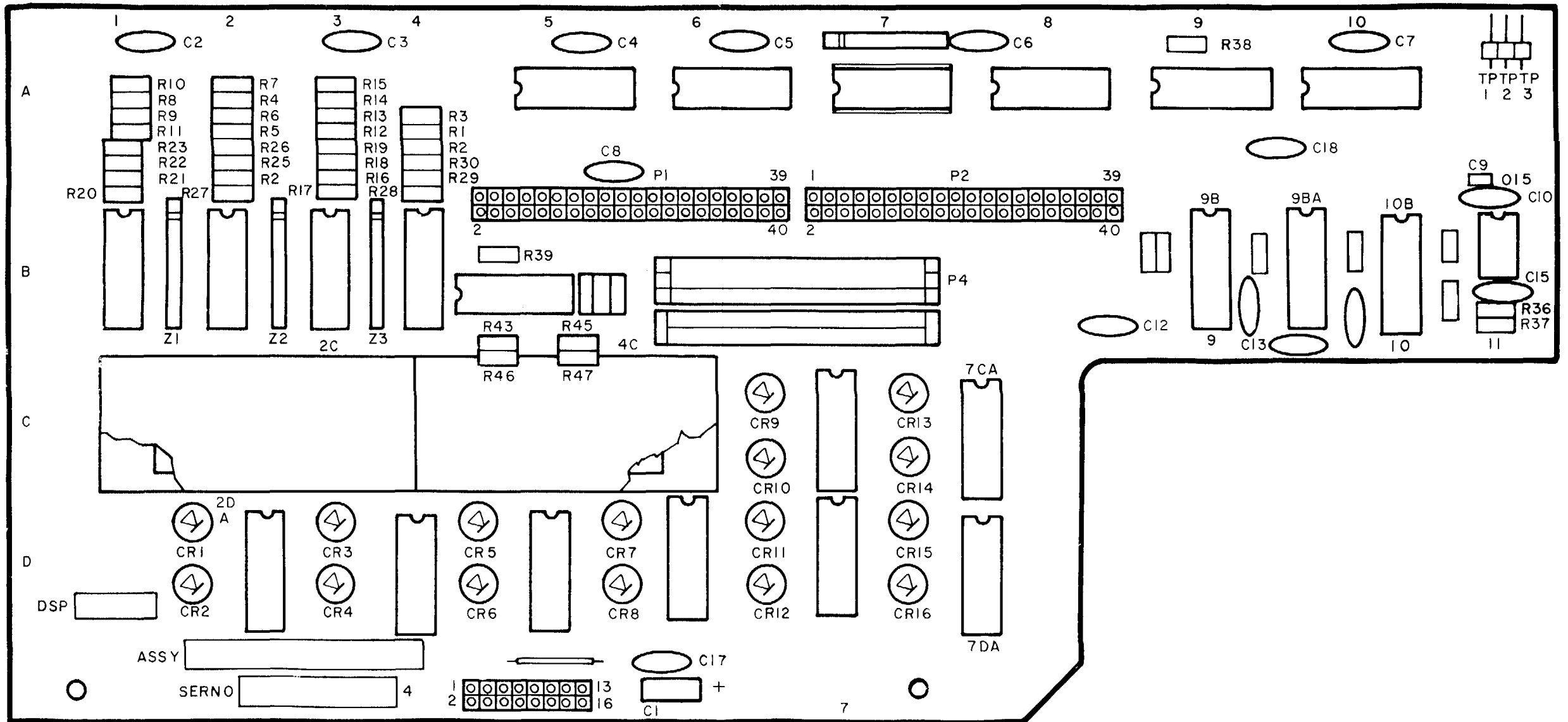


Figure C-2. Display board 0100-2702 Assembly Drawing

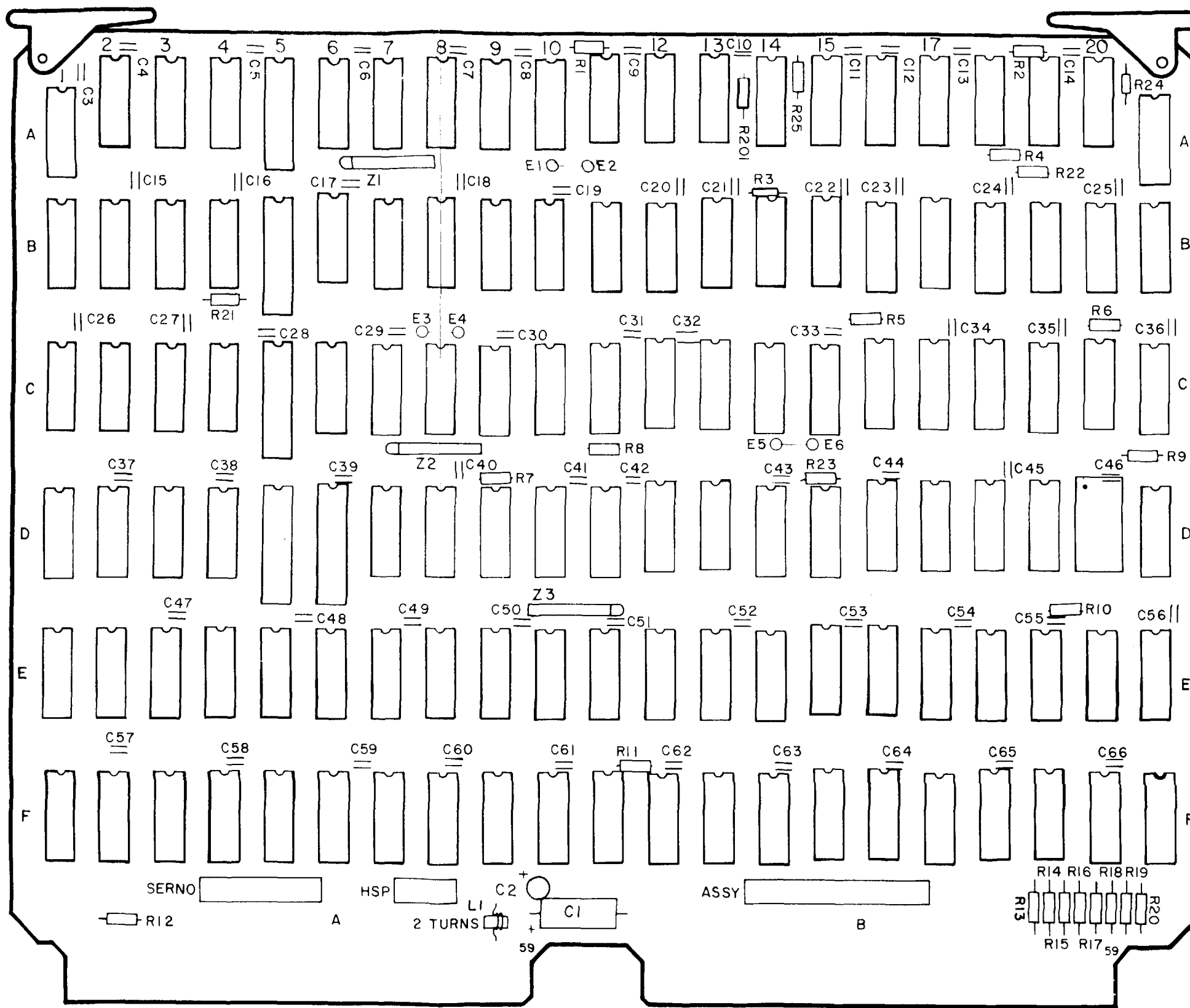


Figure C-4. Pin Processor Board 0100-2704 Assembly Drawing

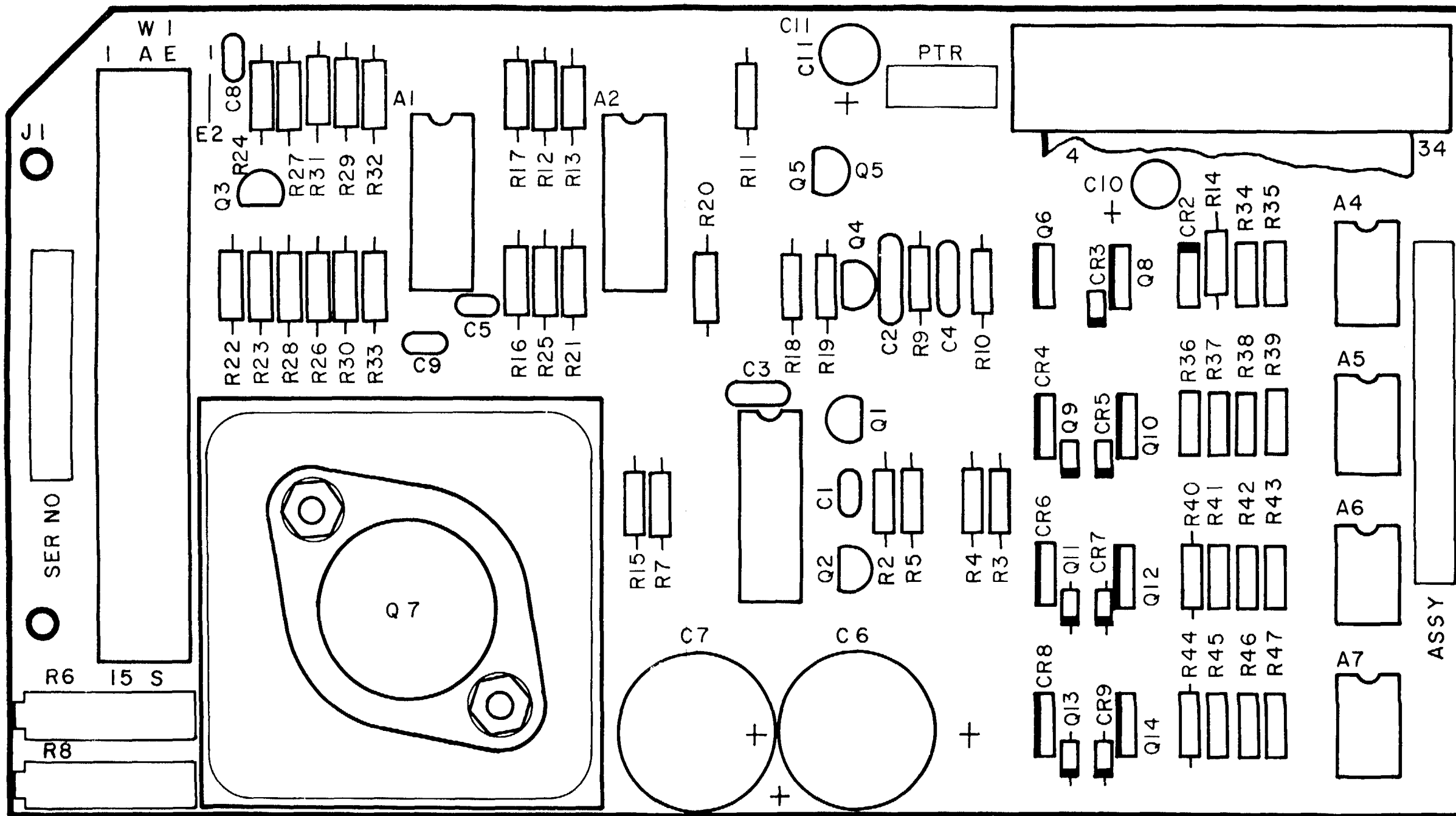


Figure C-7. Printer Driver Board 0100-2723 Assembly Drawing

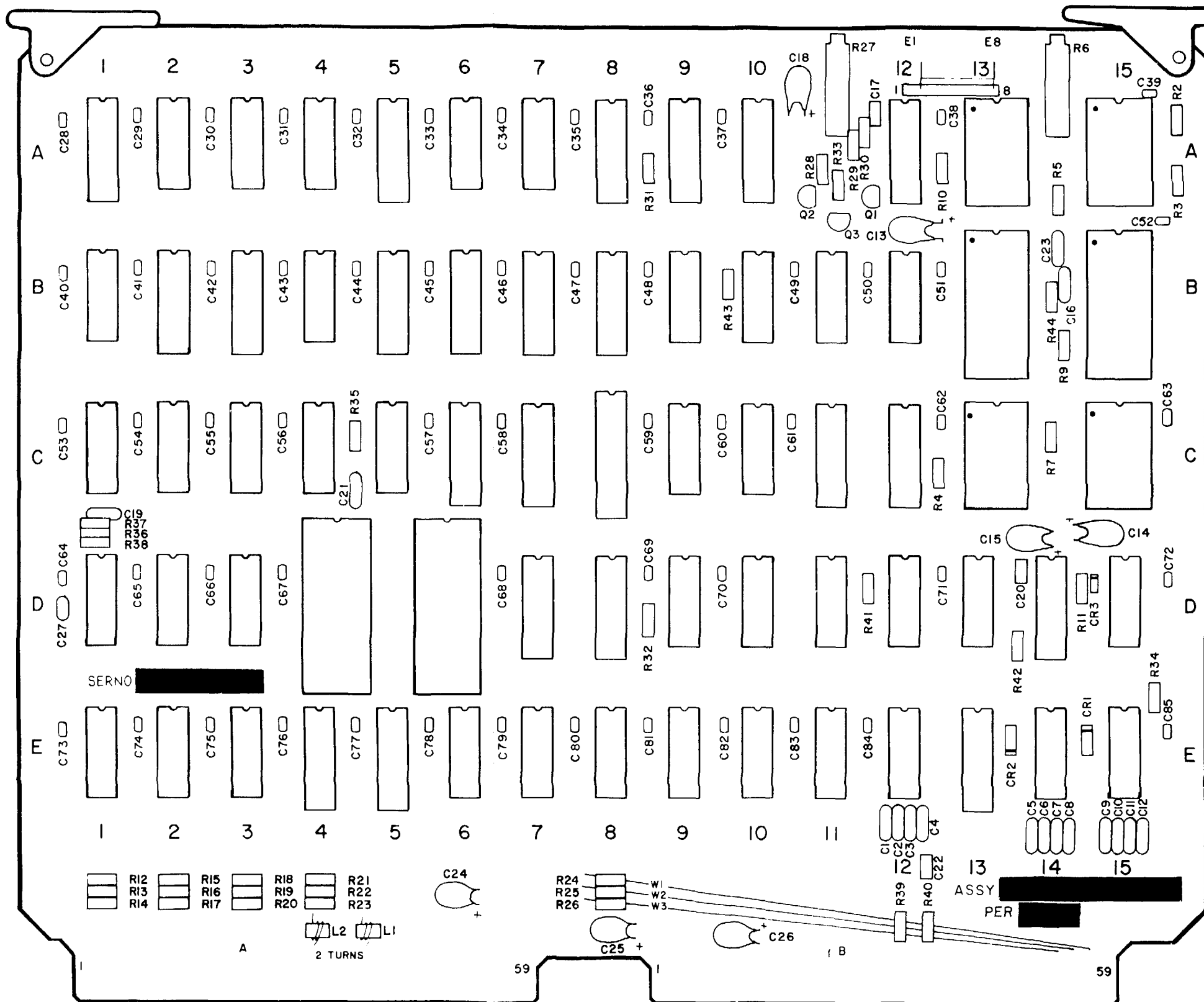


Figure C-8. Peripheral Board 0100-2724 Assembly Drawing

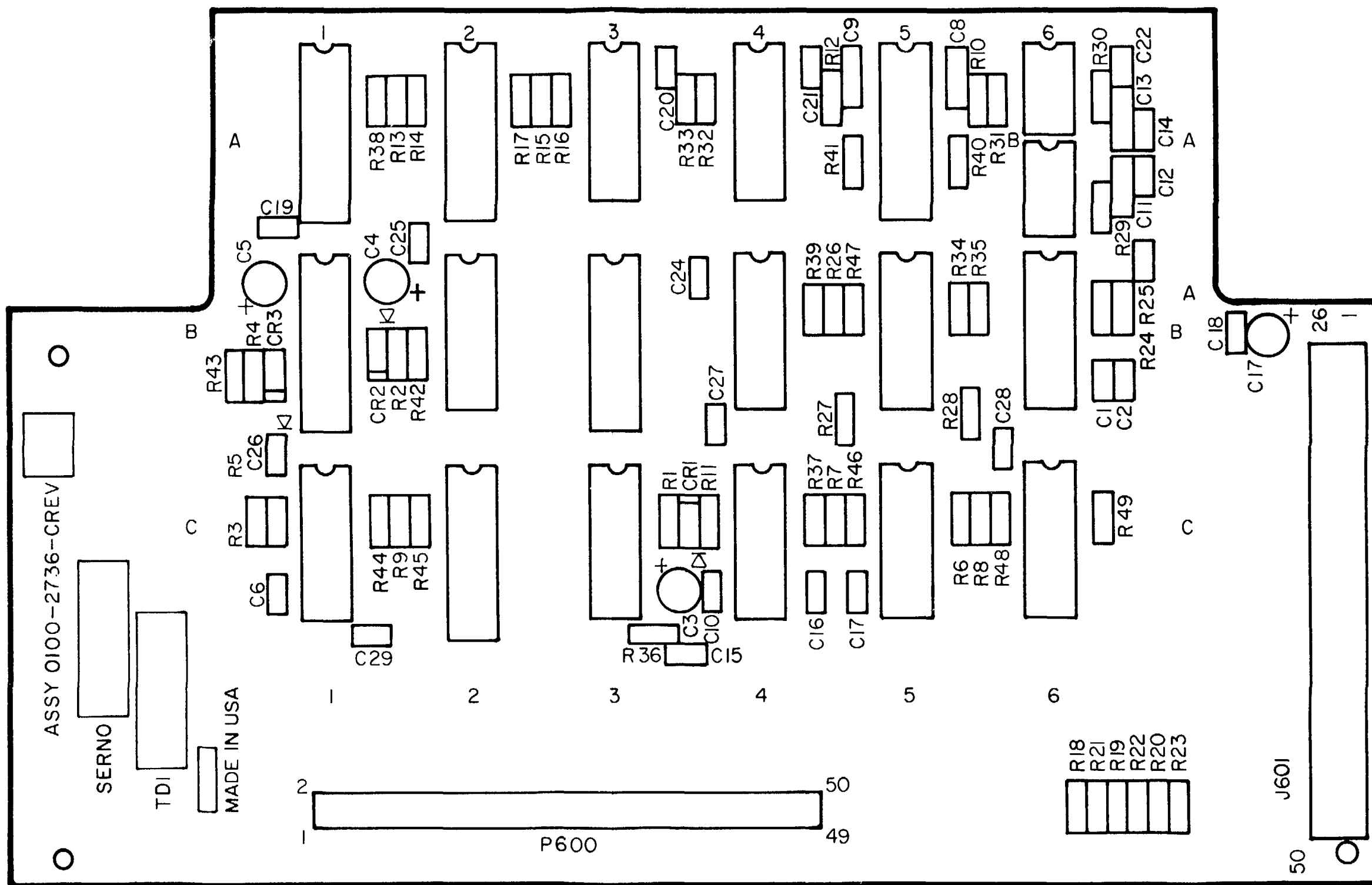


Figure C-9. Tape Drive Interface Board 0100-2736 Assembly Drawing

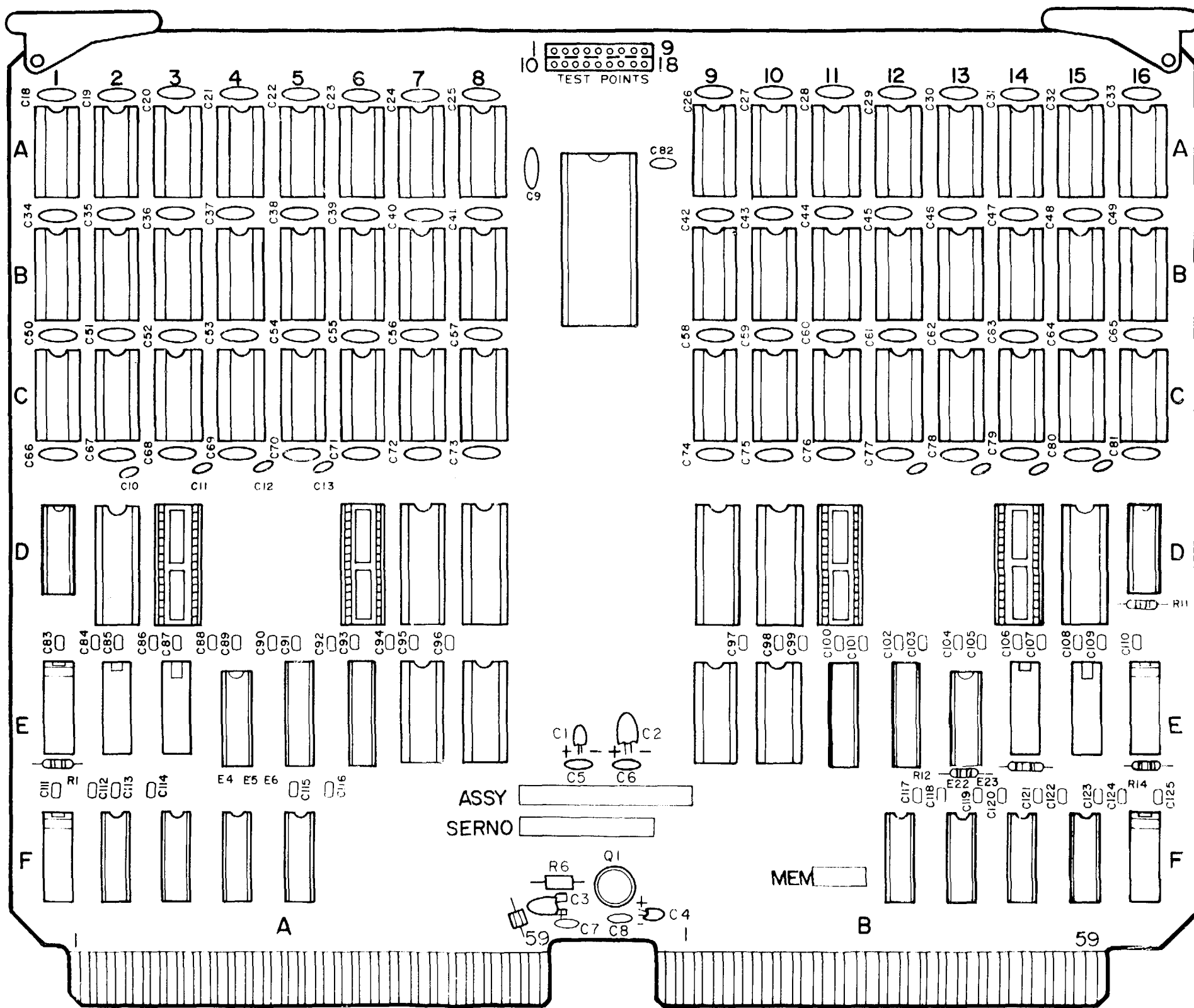


Figure C-10. Memory Board 0100-3754 Assembly Drawing

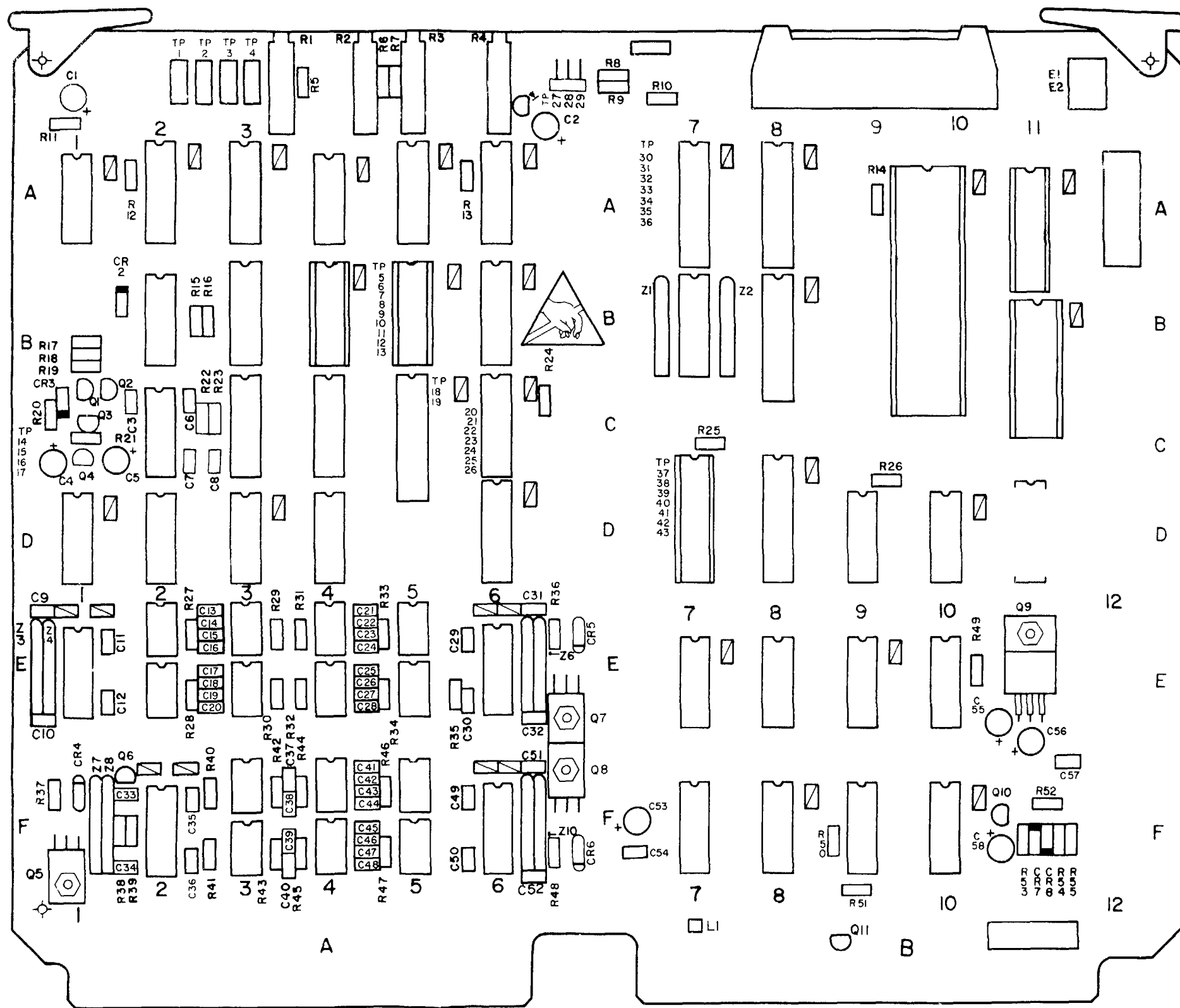


Figure C-11. Reference IEEE Board 2225-2703 Assembly Drawing

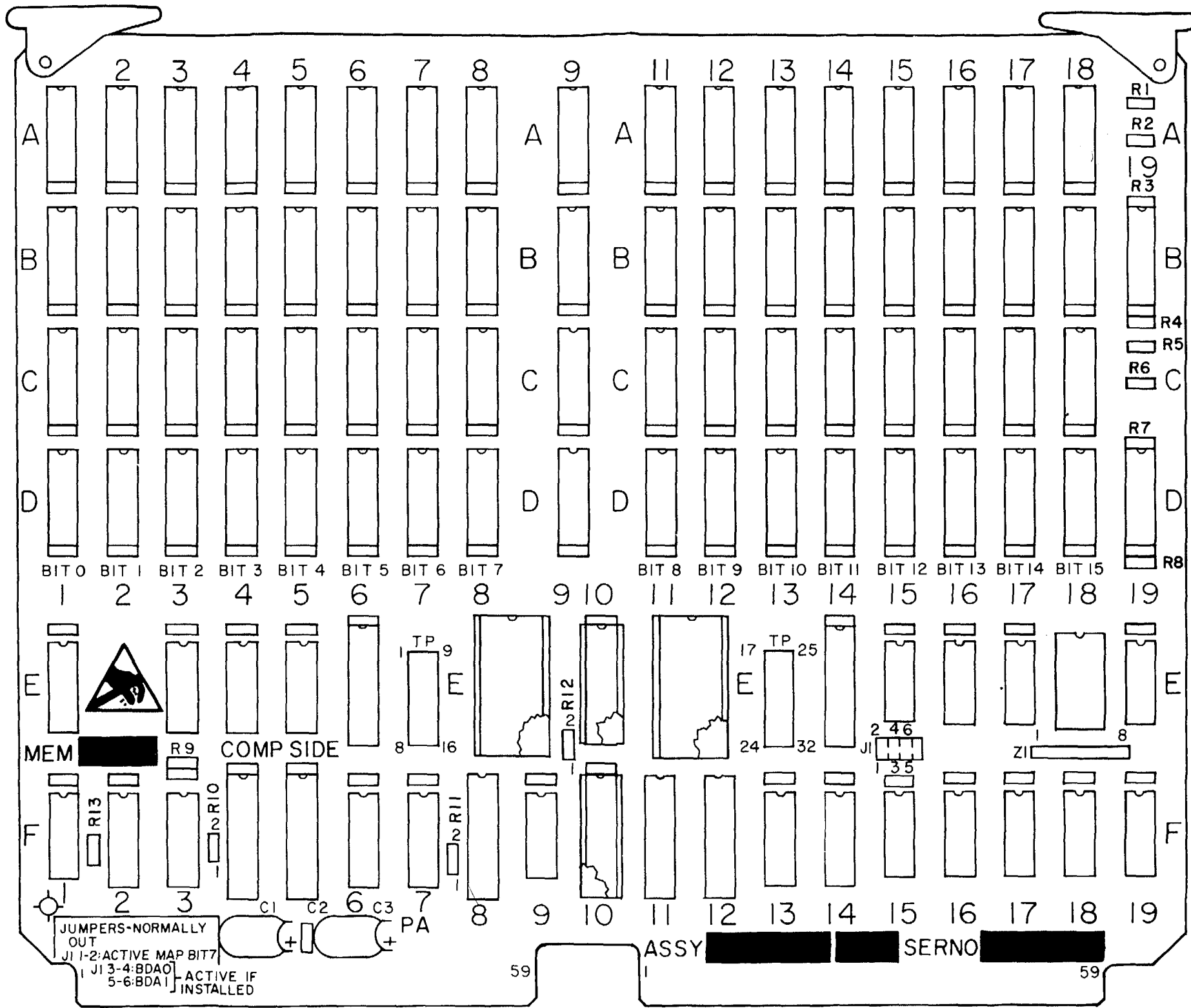


Figure C-12. 512K Memory Board 2235-2706 Assembly Drawing

