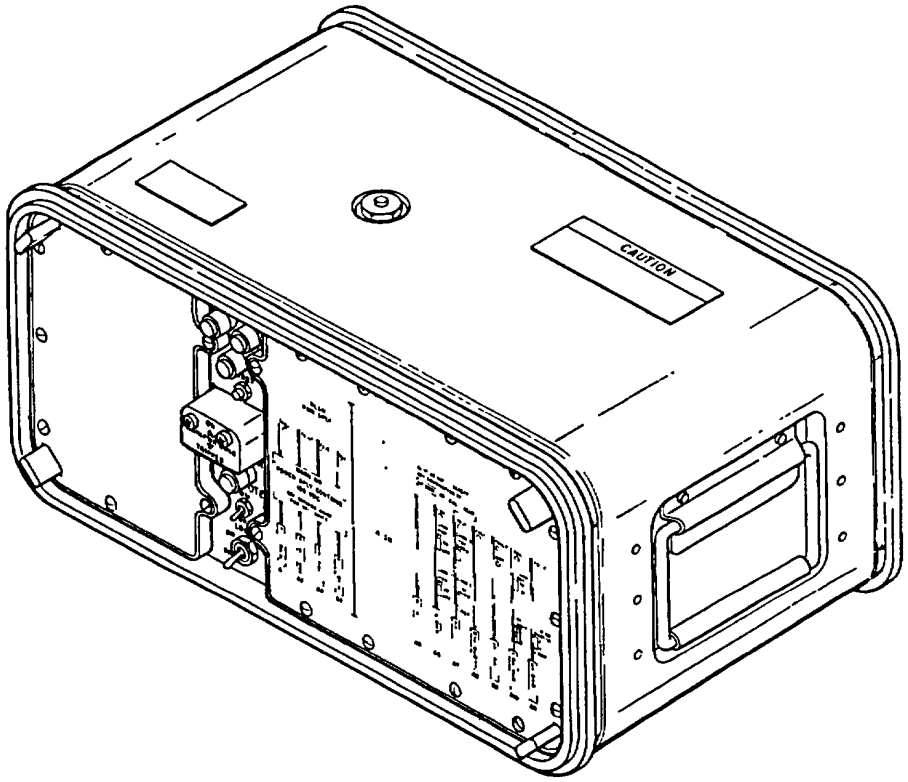
ARMY TM 11-5805-706-34
NAVY EE163-ED-MMI-010/E154 TD1233
AIR FORCE TO 31W2-2TTC-12

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL



MULTIPLEXER

TD-1233(P)/TTC
(NSN 5820-01-145-2462)

DEPARTMENTS OF THE ARMY, THE NAVY, AND THE AIR FORCE

16 SEPTEMBER 1985

TM 11-5805-706-34
EE163-ED-MMI-01A/E154-TD1233
TO 31W2-2TTC-12
C 1

Change

No. 1

DEPARTMENTS OF THE ARMY,
THE NAVY, AND THE AIR FORCE
Washington, DC, 15 June 1990

DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL

MULTIPLEXER
TD-1233(P)/TTC
(NSN 5820-01-145-2462)

TM 11-5805-706-34/EE163-ED-MMI-010/E154-MD1233/TO 31W2-2TTC-12, 16 September 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 illustration identification number.

Remove pages	Insert pages
C/(D blank)	C and D
i and ii	i and ii
1-1 and 1-2	1-1 and 1-2
1-15 and 1-16	1-15 and 1-16
2-1 and 2-2	2-1 and 2-2
None	2-2.1/(2-2.2 blank)
2-5 through 2-12	2-5 through 2-12
2-15 and 2-16	2-15 and 2-16
2-21 through 2-35	2-21 through 2-36
2-79 through 2-113/(2-114 blank)	None
A-1 and A-2	A-1 and A-2
C-1 through C-14	C-1 through C-14
Glossary-1 through Glossary-3/ (Glossary-4 blank)	Glossary-1 through Glossary-3/ (Glossary-4 blank)
Figure FO-7	Figure FO-7
Figure FO-12A	None
Figure FO-12B (Sheet 1 of 2) and Figure FO-12B (Sheet 2 of 2)	Figure FO-12B (Sheet 1 of 2) and Figure FO-12B (Sheet 2 of 2)
Figure FO-14 (Sheet 1 of 3) through Figure FO-14 (Sheet 3 of 3)	Figure FO-14 (Sheet 1 of 3) through Figure FO-14 (Sheet 3 of 3)

Remove pages	Insert pages
Figure FO-17 (Sheet 1 of 4)	Figure FO-17 (Sheet 1 of 4)
Figure FO-18 (Sheet 1 of 3) and Figure FO-18 (Sheet 2 of 3)	Figure FO-18 (Sheet 1 of 3) and Figure FO-18 (Sheet 2 of 3)
Figure FO-19 (Sheet 1 of 3) through Figure FO-19 (Sheet 3 of 3)	Figure FO-19 (Sheet 1 of 3) through Figure FO-19 (Sheet 3 of 3)
Figure FO-20 (Sheet 1 of 8)	Figure FO-20 (Sheet 1 of 8)
Figure FO-20 (Sheet 5 of 8)	Figure FO-20 (Sheet 5 of 8)
Figure FO-20 (Sheet 8 of 8)	Figure FO-20 (Sheet 8 of 8)
Figure FO-21 (Sheet 1 of 4) through Figure FO-21 (Sheet 3 of 4)	Figure FO-21 (Sheet 1 of 4) through Figure FO-21 (Sheet 3 of 4)
Figure FO-22 (Sheet 2 of 7) through Figure FO-22 (Sheet 7 of 7)	Figure FO-22 (Sheet 2 of 7) through Figure FO-22 (Sheet 7 of 7)
Figure FO-24 (Sheet 1 of 7) and Figure FO-24 (Sheet 2 of 7)	Figure FO-24 (Sheet 1 of 7) and Figure FO-24 (Sheet 2 of 7)
Figure FO-25 (Sheet 1 of 6) through Figure FO-25 (Sheet 3 of 6)	Figure FO-25 (Sheet 1 of 6) through Figure FO-25 (Sheet 3 of 6)
Figure FO-25 (Sheet 5 of 6) and Figure FO-25 (Sheet 6 of 6)	Figure FO-25 (Sheet 5 of 6) and Figure FO-25 (Sheet 6 of 6)
Figure FO-26 (Sheet 2 of 4) through Figure FO-26 (Sheet 4 of 4)	Figure FO-26 (Sheet 2 of 4) through Figure FO-26 (Sheet 4 of 4)

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

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

By Order of the Secretary of the Navy:

JOHN C. WEAVER
Rear Admiral, United States Navy
Commander, Space and Naval Warfare
Systems Command

By Order of the Secretary of the Air Force:

LARRY D. WELSH
General, United States Air Force
Chief of Staff

Official:

CHARLES C. McDONALD
General, United States Air Force
Commander, Air Force
Logistics Command

DISTRIBUTION:
To be distributed in accordance with DA Form 12-51 DS/GS requirements for TD-1233/TTC.

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

HIGH VOLTAGE

The high voltage used in this equipment can kill on contact. Observe the following safety precautions:

- **Ground the Equipment** — Before connecting primary power or the signal cables, connect a heavy gage copper wire from the ground lug on the rear panel to earth ground. Do not remove this wire until the signal cables and primary power have been disconnected.
- **Avoid the Power Input** — Be careful not to contact the 115-volt ac input connections when installing or servicing the equipment.
- **Do Not Service Alone** — Never work on the equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who can administer first aid.
- **Use One Hand** — Where possible, use only one hand to service the equipment. Keep the other hand away to reduce the hazard of current flowing through the vital organs of the body.

CLEANING SOLVENT

The fumes of trichlorotrifluoroethane used for cleaning this equipment can cause severe irritation or injury. Observe the following safety precautions:

- **Ventilate** — Use only outside or in well ventilated areas and avoid breathing the fumes.
- **No Smoking** — Do not smoke while using and do not use near an open flame or hot surface. Trichlorotrifluoroethane does not burn but heat converts the fumes to a toxic, irritating gas.
- **Use Gloves** — Use gloves that trichlorotrifluoroethane can't penetrate. Because the solvent dissolves the natural oils, avoid long or repeated contact with your skin.
- **Wash** — Wash hands immediately after using.
- **Do Not Take Internally** — Do not drink. If taken internally, see a doctor immediately.

HEAVY EQUIPMENT

This equipment weighs over 35 pounds and can cause serious injury if lifted or carried alone. Observe the following safety precaution:

- **Do Not Lift or Carry Alone** — Do not attempt to lift, carry, or move the equipment by yourself - get help.

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES, DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the changes is indicated by vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

DATES OF ISSUE for original and changed pages are:

Original .....0.....16 September 1985
Change .....1.....15 June 1990

TOTAL NUMBER OF PAGES in this publication is 278, consisting of the following:

Page No.	Change No.*	Page No.	Change No.*
Cover	0	A-1 - A-2	0
A - B	0	B-1 - B-2	0
C -D	1	C-1 - C-14	1
i - ii	1	GLOSSARY-1 -	
iii - iv Blank	0	GLOSSARY-3	1
1-1	0	GLOSSARY-4 Blank	0
1-2	1	INDEX-1 - INDEX-5	0
1-3 - 1-14	0	INDEX-6	1
1-15	1	Forms (8)	0
1-16 - 1-18	0	FO-1 - FO-6	0
2-1 - 2-2.1	1	FO-7	1
2-2.2 Blank	0	FO-8 - FO-12	0
2-3 - 2-4	0	FO-12A (DELETED)	1
2-5 - 2-6	1	FO-12B (Sheet 1) -	
2-7	0	FO-12B (Sheet 2)	1
2-8	1	FO-13	0
2-9	0	FO-14 (Sheet 1) -	
2-10	1	FO-14 (Sheet 3)	1
2-11 .	0	FO-15 - FO-16	0
2-12	1	FO-17 (Sheet 1)	1
2-13- - 2-15	0	FO-17 (Sheet 2) -	
2-16	1	FO-17 (Sheet 4)	0
2-17 - 2-20	0	FO-18 (Sheet 1) -	
2-21 - 2-25	1	FO-18 (Sheet 2)	1
2-26	0	FO-18 (Sheet 3)	0
2-27 - 2-28	1	FO-19 (Sheet 1) -	
2-29	0	FO-19 (Sheet 3)	1
2-30	1	FO-20 (Sheet 1)	1
2-31	0	FO-20 (Sheet 2) -	
2-32 - 2-33	1	FO-20 (Sheet 4)	0
2-34	0	FO-20 (Sheet 5)	1
2-35	1	FO-20 (Sheet 6) -	
2-36 - 2-78	0	FO-20 (Sheet 7)	0
2-79 - 2-114 (DELETED)	1	FO-20 (Sheet 8)	1
3-1	0	FO-21 (Sheet 1) -	
3-2 Blank	0	FO-21 (Sheet 3)	1

***Zero In this column indicates an original page.**

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES, DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the changes is indicated by vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Page No.	Change No.*
FO-21 (Sheet 4)	0
FO-22 (Sheet 1)	0
FO-22 (Sheet 2) -	
FO-22 (Sheet 7)	1
FO-23 (Sheet 1)	1
FO-23 (Sheet 2) -	
FO-23 (Sheet 8)	0
FO-24 (Sheet 1) -	
FO-24 (Sheet 2)	1
FO-24 (Sheet 3) -	
FO-24 (Sheet 7)	0
FO-25 (Sheet 1) -	
FO-25 (Sheet 3)	1
FO-25 (Sheet 4)	0
FO-25 (Sheet 5) -	
FO-25 (Sheet 6)	1
FO-26 (Sheet 1)	0
FO-26 (Sheet 2) -	
FO-26 (Sheet 4)	1

***Zero in this column indicates an original page.**

Technical Manual
No. TM 11-5805-706-34
Technical Manual
No. EE163-ED-MMI-010/E154 TD1233
Technical Order
No. 31W2-2TTC-12

DEPARTMENTS OF THE ARMY,
THE NAVY, AND
THE AIR FORCE

Washington, DC, 16 September 1985

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL MULTIPLEXER TD-1233(P)/TTC (NSN 5820-01-145-2420)

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 Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-ME-PS, Fort Monmouth, New Jersey 07703-5000.

For Air Force, submit AFTO Form 22 (Technical Order System Publication Improvement Report and Reply) in accordance with paragraph 6-5, Section VI, TO 00-5-1. Forward direct to prime ALC/MST.

For Navy, mail comments to the Commander, Space and Naval Warfare Systems Command, ATTN: SPAWAR 8122, Washington, DC 20363-5100.

In either case, a reply will be furnished direct to you.

Page

LIST OF ILLUSTRATIONS

Fig. No.

HOW TO USE THIS MANUAL

This manual tells you how to operate and maintain Multiplexer TD-1233(P)/TTC.

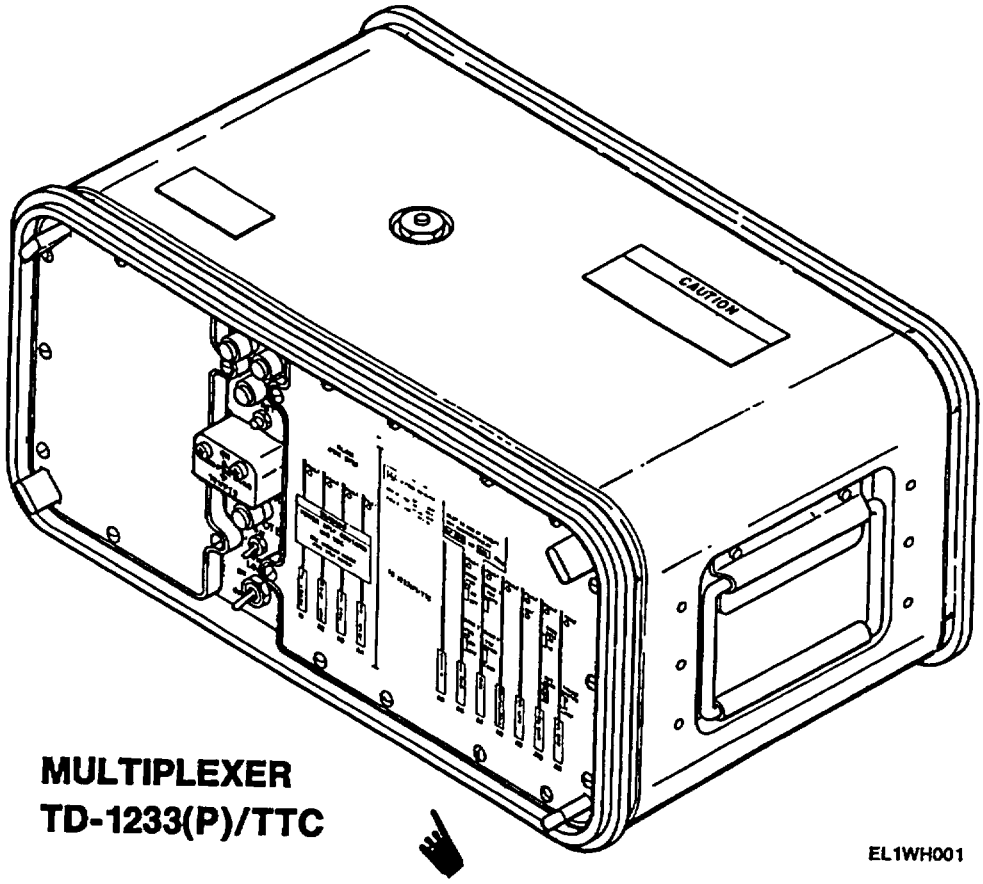
Step-by-step procedures with illustrations give you all the necessary information to maintain this equipment at the direct support level. However, do not attempt any procedures before you first familiarize yourself with the entire procedure.

If you are looking for general information, use the table of contents in the front of this book to locate chapters and sections containing this information.

If you are looking for specific information, use the subject index in front of each chapter to locate the paragraph and page where the topic is discussed.

CHAPTER 1
INTRODUCTION

SECTION I. GENERAL INFORMATION



1-1. SCOPE

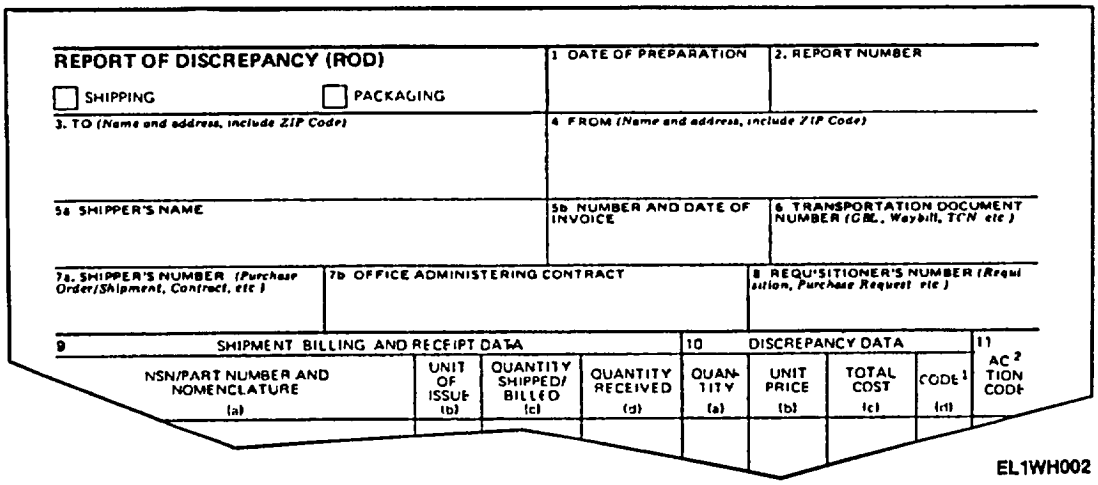
This manual provides direct support and general support maintenance instructions for Multiplexer TD-1233(P)/TTC. Multiplexer TD-1233(P)/TTC is referred to in this manual as the RLGM (Remote Loop Group Multiplexer). For Air Force use, direct support maintenance is performed at the intermediate level.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS

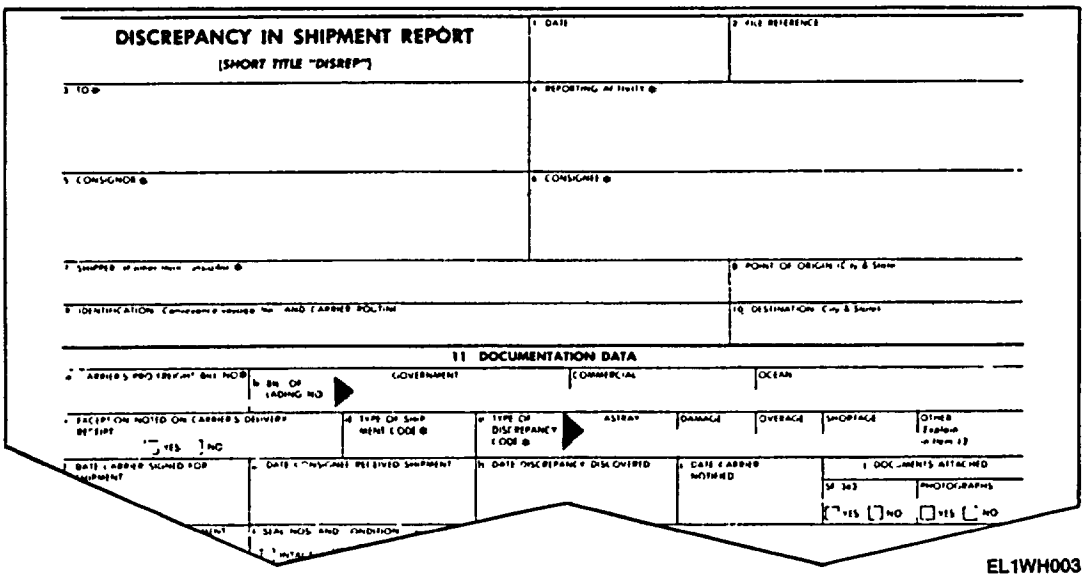
a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update. Air Force personnel will use AFR 66-1 for maintenance reporting and TO-00-35D54 for unsatisfactory equipment reporting. Navy personnel will report maintenance performed utilizing the

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS-Continued

Maintenance Data Collection Subsystem (MDCS) in accordance with OPNAVINST 4790.2, Volume 3, and unsatisfactory material conditions (UR submissions) in accordance with OPNAVINST 4790, Volume 2, Chapter 17.



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 4355.73A/AFR 400-54/MC0 4430.3F.



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.

1-3. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2, Procedures for Destruction of Electronic Materiel to Prevent Enemy Use.

1-4. ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage, the PMCS should be performed to assure operational readiness.

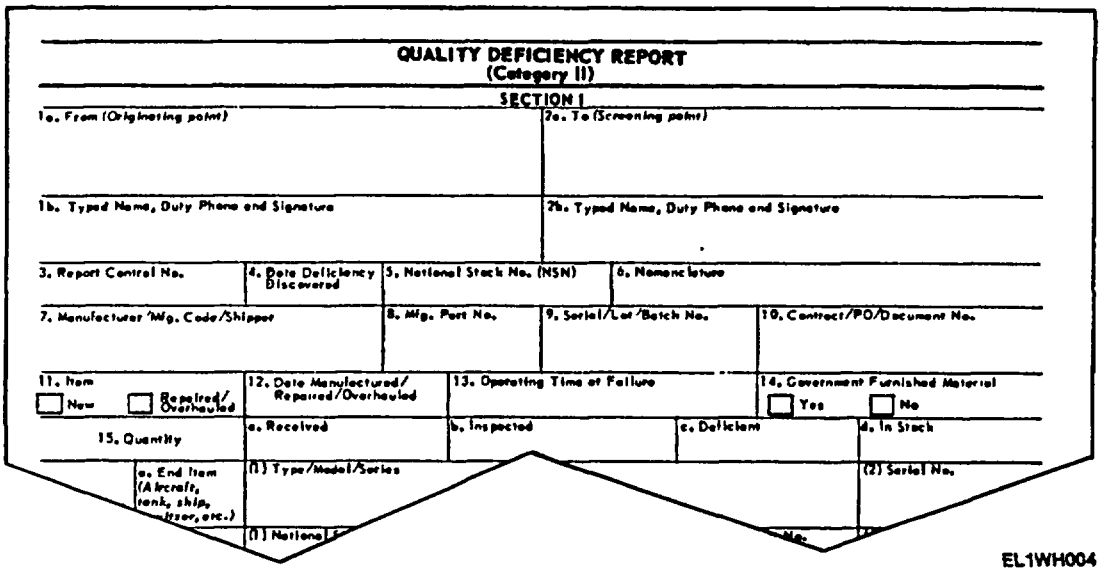
1-5. NOMENCLATURE CROSS-REFERENCE LIST

The following list will help you locate the official nomenclature of the major equipment associated with the RLGM. Official nomenclature must be used when completing report forms or when using technical manuals.

Common Name	Official Nomenclature	Reference Designation
AC INPUT	Ac Input Circuit Card Assembly	A1
AAU	Analog Applique Unit Circuit Card Assembly	A6 or A7*
BITE 2	BITE 2 Circuit Card Assembly	A5
DC INPUT	Dc Input Circuit Card Assembly	A4
GP FRG	Group Framing Circuit Card Assembly	A9
GP MDM	Group Modem Circuit Card Assembly	A11
LP MDM	Loop Modem Circuit Card Assembly	A6 or A7*
MUX/DEMUX	Multiplexer/Demultiplexer Circuit Card Assembly	A8
MULTI VDC	Multi Vdc Circuit Card Assembly	A2
TMG GEN	Timing Generator Circuit Card Assembly	A10
52 VDC	52 Vdc Circuit Card Assembly	A3

* The RLGM can be configured with any combination of loop modem or analog applique CCAs in slots A6 and A7.

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRS)


QUALITY DEFICIENCY REPORT
(Category II)
SECTION I
1a. From (Originating point)
2a. To (Screening point)
1b. Typed Name, Duty Phone and Signature
2b. Typed Name, Duty Phone and Signature
3. Report Control No.
4. Date Deficiency Discovered
5. National Stock No. (NSN)
6. Nomenclature
7. Manufacturer 'Mfg. Code/Shipper
8. Mfg. Part No.
9. Serial/Lot 'Batch No.
10. Contract/PO/Document No.
11. Item
New
Repaired/ Overhauled
12. Date Manufactured/ Repaired/Overhauled
13. Operating Time at Failure
14. Government Furnished Material
Yes
No
15. Quantity
a. Received
b. Inspected
c. Deficient
d. In Stock
e. End Item (Aircraft, tank, ship, ...izer, etc.)
(1) Type/Model/Series
(2) Serial No.
(1) National
No.
EL1WH004

a. Army. If your Multiplexer TD-1233(P)/TTC needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, New Jersey 07703-5007. We'll send you a reply.

b. Air Force. Air Force personnel are encouraged to submit EIRs in accordance with AFR 900-4.

c. Navy. Navy personnel are encouraged to submit EIRs through their local Beneficial Suggestion Program.

SECTION II. EQUIPMENT DESCRIPTION AND DATA

See TM 11-5805-706-12 for RLGM equipment description and data.

SECTION III. PRINCIPLES OF OPERATION

1-7. GENERAL

Refer to TM 11-5805-706-12 for a simplified functional description of the RLGM. This section contains a detailed functional description of the RLGM and detailed descriptions of the functions of each of the circuit card assemblies (CCAs) within the RLGM.

1-8. RLGM FUNCTIONAL DESCRIPTION (fig. FO-1)

The remote loop group multiplexer (RLGM) is a full duplex multichannel communications unit. It can receive a group of up to four channels of data arranged in a particular time division order and retransmit this data on four individual channels. The RLGM demultiplexing process restores the channel identification, so that the first channel in the group is passed on as outgoing channel 1, etc. Conversely, it can receive up to four channels and retransmit these as a single group. Each channel is arranged to occupy a particular time slot through a process of time division multiplexing. Each channel time slot identifies the channel number. Diphase modulated digital data enters as a group of channels (up to four) from any number of sources. This data is applied to the group modem where it is demodulated to baseband nonreturn to zero (NRZ) and passed to the multiplexer/demultiplexer. Here the individual channels that comprise the group are sorted out and passed to the loop modems, which modulate this data back to a conditioned diphase format, and transmitted to digital secure voice terminals (DSVTs). For use with analog terminal equipment, data will be demuxed from the group and passed to an analog applique channel which converts the NRZ data to an analog signal. The incoming data from the group modem is also passed to the group framing unit which functions to detect the framing bit in the data bit stream in order to recognize the beginning and ending of a group. A timing generator provides timing signals to synchronize the group framing and formatting process. The timing generator can synchronize its oscillator to a signal from this group data input or it can run as a master. Incoming channel data (up to four), either conditioned diphase digital data or analog telephone inputs, are fed to the loop modems or analog applique unit. The modems demodulate diphase data to baseband NRZ. The analog applique converts the voice data to

1-8. RLGM FUNCTIONAL DESCRIPTION-Continued

digital baseband NRZ. These are passed to the multiplexer/demultiplexer which, through time division multiplexing, formats the individual channels into a group. Inputs to the multiplexer/demultiplexer from the framing unit provide properly timed framing bits. These bits mix with the data and form the group which is passed to the group modem for transmission. The loop modem can also supply dc power to the digital field telephone through the same cable as the diphase data. A power supply converts input ac power to dc voltages for operating the electronic circuits. The RLGM may also be remotely powered by a 180 V dc source transmitted over the same cable as the group data.

1-9. TIMING GENERATOR

(fig. FO-2)

The timing generator generates timing signals to synchronize the processing functions of the RLGM. A phase locked loop can lock the voltage controlled crystal oscillator (VCO) to the incoming timing. The primary frequency of the VCO is 18.430 MHz. Switch S2 (CHAN RATE) selects a divide by 2 or 4 to produce the basic timing frequencies 9.216 or 4.608 MHz from which all other timing frequencies are derived by synchronous division and selects 16/32 group traffic bit rate.

The output retime function consists of preprogrammed counters that count down the output group rate to 1 and 2 times the chosen rate which is passed to the mux/demux CCA for data formatting. A frequency is also derived to be used for feedback to the phase lock loop. The 32, 64, and 512 kHz outputs are passed through buffers to the functions shown. Similarly, the 2 kHz output from the frequency divider is counted down to be compatible with the incoming telemetry subchannel. In the event of an alarm, the telemetry subchannel is preset to zero. The 150 Hz output from the frequency divider is also counted down by a timer. This timer generates controls for the long timeouts used in group framing by the loop modem and analog applique CCAs. The rate decoding logic is controlled by S2 to program the operation of the mux/demux. BITE monitoring outputs are generated by an input from the BITE CCA. This input enables 16 tristate line drivers that are integrated with the circuit functions that they monitor, and pass the BITE status signals to the BITE CCA. Thus, a timing generator fault will illuminate the fault indicator on the timing generator by the BITE error input from the BITE CCA.

1-10. LOOP MODEM
(fig. FO-3)

The loop modem CCA provides for full duplex processing to and from two digital secure voice terminals (DSVT). Its principal function is to accept diphase data from the DSVTs and demodulate this format to baseband NRZ. Conversely, it accepts the incoming NRZ data and converts it to diphase format. Input data is loaded into the modulator. After conversion to diphase, the data is clocked out at twice the input data rate. A line driver feeds that data to the line through an isolation transformer which is center tapped and connected to a +52 V dc supply. Thus the data rides on a +52 V dc power source to power the DSVTs. The demodulator receives diphase data from the DSVTs through an isolation transformer. The data is processed by an equalizer to a CMOS-compatible level and is gated by a threshold detector to minimize noise interference. The data synchronizer detects data bit transitions and identifies a high speed timing pulse that occurs 3/4 of a bit interval later. The demodulator samples the data with this timing and adds module 2. This converts the diphase data to baseband NRZ, which is buffered in the FIFO and shifted out. The BITE bus gates out signals from internal BITE sensors to external BITE circuitry. External BITE circuitry lights the fault lamp when a loop modem CCA fault is detected.

1-11. ANALOG APPLIQUE
(fig. FO-4)

The analog applique CCA incorporates two fully independent channels for duplex processing. Each channel can simultaneously accept digital baseband NRZ data, transmit and accept analog voice, and transmit digitally encoded baseband NRZ. Analog voice data is gain-set and filtered and passed to an analog-to-digital converter. There the voice input is encoded into a binary-coded bit stream which is formatted into NRZ baseband. Digital input data enters the CCA through S1 in the NORMAL position and enters the digital-to-analog converter (D/A). It passes out as analog data and is filtered, gain-set and outputted. Switches S1 and S2 have two positions, NORMAL and LOOP. In the LOOP position, the coder and decoder are looped back on the digital side. The built-in test equipment (BITE) function consists of tristate buffers which send out the BITE sensor status data by the BITE enable input. When a fault is detected, the fault lamp is lit.

1-12. MULTIPLEXER/DEMULTIPLEXER (fig. FO-5)

The multiplexer/demultiplexer extracts up to four individual data channels from a single bit stream, or formats the same number of individual data channels into a single bit stream. Each mux/demux CCA must be individually programmed to establish the framing pattern sequence. One toggle switch on the timing generator CCA is used in the RLGM to generate programming inputs. This switch controls the timing of the enable outputs from the sequence generator to three muxes. One mux selects from the even-numbered channels, another selects from the odd-numbered channels, and the third selects from the overhead channel. A dedicated counter generates the select function to control which channel the mux selects. The select lines are constantly changing state as the counter is incremented by the group timing. The muxes include tristate readout and devices controlled by timed enable signals from the sequence generator, which read out data bits to structure the programmed group format. The three bit stream outputs from the three muxes are combined into one at the output control. The demux process is the same as that described above, except in reverse order. The functions are the same. The input data is a single bit stream presented to three muxes which sort out the bits in proper sequence to generate four channel outputs and an overhead channel output.

The BITE monitors on the mux/demux CCA consist of line drivers which are integrated within the circuits being monitored. These drivers are enabled by the BITE enable input from the BITE CCA. Once enabled, the 16-bit information outputs are made available to the BITE CCA. If the BITE CCA declares a mux/demux fault, the FAULT indicator lamp is lit.

1-13. GROUP FRAMING (fig. FO-6)

The group framing CCA consists of two circuit functions which are used for framing and synchronization. The framing portion consists mainly of counters which monitor the incoming data and detect any errors in the framing patterns. This action determines the frame status. The primary outputs from the framing circuits are receive side in/out of frame, and transmit side in/out of frame. The synchronizer portion interprets the frame status information and provides controls for the receive/transmit data and frame output pattern.

1-13. GROUP FRAMING--Continued

The input data to the framing portion consists of a stream of NRZ data which is received from the group equipment and fed to the group modem. The sequence of data is partitioned into frames consisting of a predetermined number of consecutive bits. This is determined by the number of channels within the group data stream. The frame regenerator aligns itself with the framing pattern contained within the overhead channel of the data stream. Frame acquisition is a three level process which is controlled by the frame monitor. During each level, the outputs of the error counters are examined at the completion of a predetermined interval. If the number of errors is below threshold values, the acquisition level is advanced.

The synchronizer provides controls which enable synchronization with another multiplexer. The in frame condition will control the data transfer to the multiplexer. When data is not in frame, data to the multiplexer is inhibited, and a frame search is initiated. This search determines the location of the frame bit. Once the frame channel has been selected, it is continuously monitored during the frame maintenance mode to detect any loss of bit integrity.

1-14. GROUP MODEM
(fig. FO-7)

The group modem CCA accepts baseband NRZ data and modulates it to conditioned diphase, or it accepts conditioned diphase and demodulates it to baseband NRZ. It also provides for a local analog voice orderwire channel using a TS-3647/G telephone test set (COU) for up to two miles separation.

NRZ group data enters the group modem CCA at dual flip-flop (FF) U12. The first FF samples the input baseband data with the group timing. When the data is ONEs the FF toggles. This transition represents a data 1 level. The exclusive OR logic function U7 gates this transition with the group timing. The resultant output is the diphase data. This diphase input is clocked by clock times 2 signal in flip-flop U12. The output of this flip-flop thus becomes conditioned diphase. This signal is passed to the line driver U17 which provides the output signal in the coaxial line. This signal is compared to the minimum acceptable signal level. A BITE alarm is generated if this signal level falls below the minimum.

1-14. GROUP MODEM--Continued

Analog Voice Orderwire (AVOW) inputs and outputs for the orderwire are provided on this CCA. Coupling transformers provide inputs and outputs from the COU to the coax cable which also serves to transmit data.

Conditioned diphase modulated group data is applied to the high pass filter. The high pass filter discriminates against the AVOW but passes the higher frequency data signals. An equalizer circuit provides phase and amplitude equalization to compensate for any such distortions acquired by the data signals during transmission over the CX-11230 cable. The equalizer compensation is fixed for the longest cable at 576 kb/s.

The signals are then passed to a limiter stage, where operational amplifier further amplifies and limits the amplitude swings. The hard limited data signals then pass to an edge detector circuit U4. Here two FFs in combination with logic gates generate timing signals for every data transition, whether positive or negative. In order to accomplish timing recovery it is necessary that the timing signal occur at 3/4 baud of the data. This is accomplished by FF U6 and counter U11: FF U6 accepts the diphase transitions which are clocked out by the group timing times 8. The output of U6 then presets counter U11 to produce an output after counting six inputs from the group timing times 8 (a period equal to 3/4 bit interval). This same timing signal, now the recovered timing, is fed back to U4 to synchronize the recovered timing to the local timing. U8 is a dual FF both of which are clocked by the recovered timing. The data input to the first FF is the hard limited diphase data. The output of this becomes the input to the second FF. The logic demodulates the conditioned diphase to baseband NRZ. A first in first out (FIFO) buffer arrangement is used to store, buffer, and read out the NRZ data to the demultiplexer. The FIFO also generates BITE signals to indicate its status.

1-15. BITE 2
(fig. FO-8)

The BITE CCA controls the sequence timing to evaluate the BITE sensor outputs from each CCA. It stores which card is at fault to maintain the fault light on that card until it can be replaced or repaired. The functional elements of the BITE CCA are shown in the functional block diagram.

1-15. BITE 2-Continued

The BITE buffers are enabled by the bus enable decoder, one CCA at a time. The BITE buses are arranged into two groups. Two programmable multiplexers, each dedicated to a bus group, monitor the buses (two at a time, one from each group). Group 1 mux is programmed by the bus decoder to monitor each bus line for either a level or an activity. It determines where the signal being monitored is (internal or external). (External is defined as a signal originating outside the unit.) Programming for the Group 2 mux is hardwired in the back plane. It defines the buses it monitors to be internal activity lines.

Multiplexed fault data enters the fault detector. It compares data from the two bus groups. It determines if a fault exists and whether the fault originated within the unit or externally. When faults occur, they are stored in gating logic located in the fault control logic which stores the fault. Here the fault is inhibited if a higher priority fault exists. If the fault persists after a delay the information is given to the fault control drivers.

The fault control drivers decode the fault information, light the appropriate light emitting diode (LED) and give the appropriate alarm outputs (summary (S), summary alarm (SA) or loss of input (LOI)). The card advance counter is advanced to examine the next CCA.

The BITE card is independent. All BITE timing is derived from an on-board clock; therefore the BITE timing is immune to RLGM failures. Removal of the BITE card will not interfere with normal unit operation.

The BITE card is equipped with a self-test capability that is activated by pressing the TEST switch on the RLGM front panel. Upon activation, all BITE circuits are exercised, the RLGM front panel SUMMARY FAULT and LOI lamps are lit and the individual CCA LEDs are lit in a certain sequence. The sequence is as follows:

- Mux/Demux A8
- Group Framing A9
- Loop Modem or AAU A6
- Loop Modem or AAU A7
- Timing Generator A10
- Group Modem A11

At the end of the self-test all LEDs and lamps should be extinguished.

1-15. BITE 2--Continued

The BITE card generates three alarm types, S alarm, SA alarm, and LOI alarm.

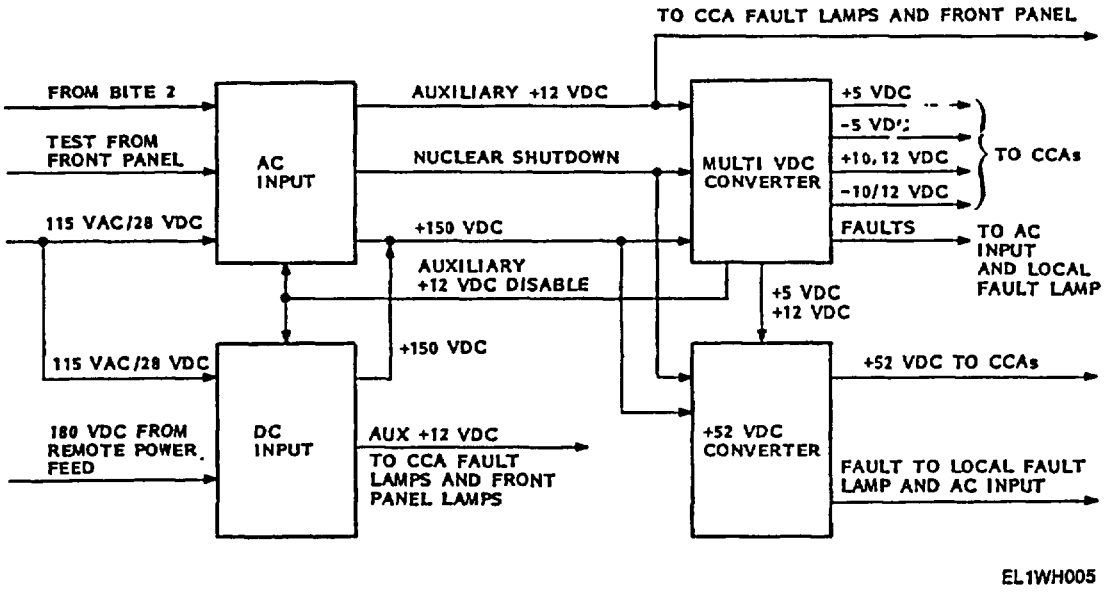
- S - any fault, lights summary (SMY) fault lamp, and sends contact closure to external equipment.
- SA - any fault except LOI or frame alarm, sends contact closure to external equipment.
- LOI - indicates any loss of signal external to unit, and lights Loss Of Input (LOI) lamp.

1-16. POWER SUPPLY

The RLGM power supply consists of four functional sections:

a. Ac input CCA
b. Dc input CCA
c. Multi Vdc converter
d. +52 Vdc converter

The RLGM power supply produces +5 ±0.25 V dc, -5 ±0.25 V dc, +10 ±0.5 V dc, -10 ±0.5 V dc, +52 ±2.5 V dc, and +150 ±10 V dc.



1-16. POWER SUPPLY-Continued

Using 115 V ac as a primary power input, the ac input CCA converts the 115 V ac to +150 V dc and also generates a +12 V dc auxiliary voltage. Both the +150 V dc and +12 V dc auxiliary are sent to the multi Vdc converter. The +12 V dc auxiliary also goes to the CCA and front panel lamps to energize them prior to operation of the multi Vdc converter's +12 V dc supply. Other inputs to the ac input CCA are from BITE 2 and the front panel TEST switch.

Pressing the TEST switch lights up all CCA fault lamps and front panel lamps. The input from BITE 2 interrogates the power supply to determine its fault status. Nuclear shutdown commands from the ac input CCA go to both the multi Vdc converter and the +52 Vdc converter. The multi Vdc converter receives +150 V dc from either the ac input CCA or the dc input CCA and converts it to +5 V dc, -5 V dc, +10/ 12 V dc, and -10/12 V dc for use by the RLGM CCAs. When the +10/12 V dc supply is operating, an auxiliary +12 V dc disable command is sent to the ac input CCA. Faults occurring in the multi Vdc converter are sent to the ac input CCA for monitoring by BITE 2 and light the card fault lamp. Reference voltages of +5 V dc and +12 V dc go to the +52 Vdc converter CCA from the multi Vdc converter CCA. The +52 Vdc converter CCA receives +150 V dc from the ac input CCA or the dc input CCA and converts it to +52 V dc. Regulation of the +52 V dc is accomplished by using +5 V dc and +12 V dc from the multi Vdc converter CCA. Faults within the +52 Vdc converter light the card fault lamp and are transmitted to the ac input CCA for monitoring by BITE 2. The dc input CCA operates with a primary input of +28 V dc or a remote power feed of 180 V dc. It senses the primary power voltage to determine if the feed is 115 V ac, 28 V dc, or 180 V dc and internal circuits switch operation of the power supply to conform with the type of primary supply. The dc input CCA outputs +150 V dc for use by the multi Vdc converter and +52 Vdc converter. Auxiliary +12 V dc is also generated by the dc input CCA for the same purposes as provided by the ac input CCA.

a. Ac Input CCA (fig. FO-9). The ac input CCA produces +150 V dc and +12 V dc. The +150 V dc is for use by the multi Vdc CCA and the +12 V dc is for initial startup of certain power supply functions. The ac input CCA also contains circuits used to activate the fault lamps on the CCAs and on the front panel.

1-16. POWER SUPPLY--Continued

Ac power is applied to the +150 V rectifying circuits. The output of the rectifying circuits is held to a low current until application of the soft start signal from the multi Vdc CCA. Once the soft start signal is received, the full current level of the +150 V dc is fed to the multi Vdc CCA and the +52 Vdc CCA. Ac power is also applied to the +12 V step-down and rectifying circuits, where the 115 V ac is used to produce +12 V dc. The +12 V dc from the +12 V step-down and rectifying circuits is fed to the +12 V select circuits along with +12 V from the multi Vdc CCA.

The nuclear shutdown circuit monitors for nuclear radiation. If any nuclear radiation is detected, a signal is sent to the +12 V crowbar fault circuits and the -12 V crowbar shutdown circuits which in turn shut down the +12 V and -12 V supplies in the multi Vdc CCA. When the nuclear shutdown signal is applied to the multi Vdc CCA, a crowbar fault signal is fed back from the multi Vdc CCA to the +12 V crowbar fault circuits. The +12 V crowbar fault circuits send a signal to the +12 V reference logic to activate the fault lamps. The +12V reference sense logic also monitors the +150 V dc line for a low level status. If a low level occurs, the fault lamp on the front panel is lit. If nuclear radiation is sensed or the +150 V low sense occurs, the fault lamp on the CCA is lit.

b. Multi Vdc CCA (fig. FO-10). The multi Vdc CCA supplies all of the low voltage power required by the RLGM. These voltages include +5, -5, +10, and -10 V dc. The supply startup circuits utilize +150 V dc from the ac input CCA. The +150 V dc is used for sampling and then fed to the multi Vdc switcher circuit. If front panel circuit breaker and power switch are ON, signal B OFF is applied to the supply startup circuit, causing a sample of the +150 V dc to be routed to the 150 V hi/low sensing circuits and autostart and run sense logic. The +150 V dc sample is used as a reference voltage in the +150 V hi/low sensing circuit and the autostart and run sense logic. As long as the +150 V dc is at the proper level, the output of the +150 V hi/low sense circuit is high. This high is fed to the clock and sum sense logic. A second input to the clock and sum sense logic is obtained from the autostart and run sense logic. This input is high when either the run reference input is a high or the clock and sum sense logic output is a high. If either input to the clock and sum sense logic is low, the clock is inhibited and no outputs are provided. When both inputs are high, the clock operates and an output is applied to the multi Vdc switcher circuits. The

1-16. POWER SUPPLY--Continued

switcher produces the required stepped down voltages for use by each of the low voltage power supplies. The outputs of the power supplies provide the required operating voltages for the CCAs. The low voltages are BITE-sensored for an out-of-tolerance condition. If that condition exists, an output is sent to the ac input CCA.

The crowbar switcher and current sense circuits monitor the current drain of the multi Vdc switcher. When the drain is excessive, the crowbar switcher and current sense circuits send a signal to the crowbar driver. The crowbar driver processes , the signal which is fed back to the crowbar and current sense, where a crowbar fault is produced and sent to the ac input CCA. A second input to the crowbar switcher and current sense (nuclear shutdown) from the ac input CCA also produces a crowbar fault output of the multi Vdc CCA.

c. +52 Vdc (CCA) (fig. FO-11). The +52 Vdc CCA is derived from the +150 V dc -rectifier in the ac input CCA. A pulse generator operates at a frequency determined by circuit constants and is energized by +12 V dc from the multi V dc supply. The pulses interrupt a rectifier transformer circuit which is supplied by the +150 V dc input. The transformer steps down the pulsed +150 V dc which is also rectified and filtered to produce +52 V dc. A voltage comparator compares a fraction of the +52 V dc with a reference +5 V dc from the multi Vdc CCA. The voltage comparator generates an error signal to control the duty cycle of the pulse generator and thus control the output of the +52 V dc transformer rectifier. A second voltage comparator using the same +5 V voltage reference generates a fault signal if the +52 V dc output is so far out of tolerance that it cannot be controlled. The +52 V dc output can be shut down by a control signal that signifies detection of nuclear radiation.

d. Dc Input CCA (fig. FO-12). The dc input CCA generates 150 V dc and 12 V dc outputs from a 28 V dc input excitation. The input excitation arrangement will tolerate 115 V ac but the circuitry will shunt an ac input so that the unit will not respond to ac excitation. The operation is as follows. 115 V ac or 28 V dc is sent to to the CCA via one set of normally closed contacts on relay K4. From here the input is either shunted to ground by ac shunt (if ac input) or applied

1-16. POWER SUPPLY-Continued

to control Q8. When Q8 conducts, charge current flows into a bank of capacitors which impress a voltage across VR6. The voltage drop across VR6 turns on the SCR Q1 which fires and closes relay K1. When K1 closes, the SCR continues to conduct through another set of relay contacts holding K1 closed as long as 28 V dc is present. The action of K1 also applies 28 V dc to voltage regulator VR19 which establishes a controlled voltage that is applied to 20 kHz clock circuit U1. This circuit is a free running multivibrator that generates a 20 kHz squarewave. The two outputs are of opposite polarities and reverse during each half cycle. The signals, when positive, cause a current to flow in the base of control Q6 and on the alternate half cycle in Q7. These currents are amplified by Q2 and Q4 causing a very large current to flow through the primaries of transformers T1 and T2 from the 28 V dc main. Thus, for each half cycle of the clock, the primaries of T1 and T2 are alternately switched and caused to conduct a large current which is extinguished when the multivibrator changes state. This pulsing action causes a large induced voltage in the secondary which excites the primary of T3 and induces the required large voltage in the secondary of T3. The secondary of T3 has two separate windings. One is passed to a bridge rectifier to produce 150 V dc. The other is passed to another bridge rectifier to produce 12 V dc.

A fault sensing circuit monitors the performance of the two dc outputs 150 V and 12 V. U2 is a device that comprises a light emitting diode and a transistor. It is energized from the 150 V dc supply. If the 150 V dc is present, the light emitting diode illuminates the transistor causing it to conduct. The light emitting diode properties are such that it will emit over a very broad range of supply voltage. Thus the 150 V dc can vary over a wide range and still operate the sensor. When the transistor in U2 conducts and the 12 V supply is present, Q9 conducts heavily, turning off Q10, which produces a no-fault signal. When either the 150 V supply or the 12 V supply, or both, are not operative, the output is low to indicate a fault. Relay K2 is operated by the 12 V regulated dc generated on the multivolt dc CCA. When the voltage comes up and K2 operates, it disconnects the 150 V dc from its temporary load while the multivolt CCA bus is coming up to voltage. It also disconnects 180 V dc external power feed from the indicator that warns of the presence of this input. This indicator will be illuminated when the external

1-16. POWER SUPPLY-Continued

180 V dc power feed is present and all other supply voltages are absent. Under these conditions K2 is relaxed and the 180 V dc is impressed on VR1 through a dropping resistor. This produces a reference 12 V dc which is outputted to indicate the presence of external 180 V dc.

CHAPTER 2
MAINTENANCE INSTRUCTIONS FOR DIRECT SUPPORT

CHAPTER 2
MAINTENANCE INSTRUCTIONS FOR
DIRECT SUPPORT - - Continued

Section IV Deleted

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

2-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to Section III, Maintenance Allocation Chart (MAC). For Air Force, see applicable table of allowances (TA).

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

For Repair Parts and Special Tools List (RPSTL), refer to TM 11-5805-706-24P (Army) or TO 31W2-2TTC-14 (USAF).

Maintenance tools and equipment as authorized by the Maintenance Allocation Chart for Direct Support maintenance are as follows:

Tool Kit, Electronic Equipment TK-105/G, 1 each

AN/PSM-45 Digital Multimeter (or Air Force equivalent), 1 each

2-3. REPAIR PARTS

Repair parts are listed and illustrated in the Repair Parts and Special Tools List (TM 11-5805-706-24P) covering Direct Support maintenance for the RLGM. For Air Force, see TO 31W2-2TTC-14.

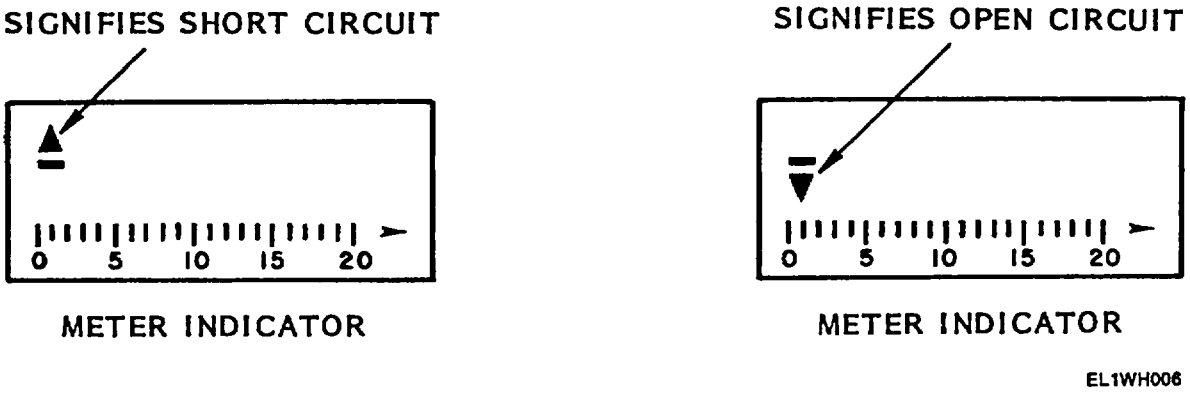
Section II. TROUBLESHOOTING

2-4. SYMPTOM INDEX

The symptom index relates fault symptoms to precise troubleshooting procedures for isolating each fault. If possible, debrief the operator/organizational maintenance technician for a general description of the problem. Try to verify the fault. If you observe the same fault symptom, try to observe all other indications and develop them into as accurate a symptom as possible. Next, look the symptom up in the symptom index. In the index, you will find a troubleshooting procedure referenced beside the symptom. Use this troubleshooting procedure to isolate and repair the fault. If you fail to isolate the fault, you have probably failed to define the symptom accurately or the problem must be addressed to a higher level of maintenance. Make another attempt to redefine the symptom, being careful to observe all fault indications.

24. SYMPTOM INDEX-Continued

In the following troubleshooting procedures, normal indications on the digital multimeter are specified as short circuit and open circuit. A short circuit is indicated on the digital multimeter as an up arrow. An open circuit is indicated on the digital multimeter as a down arrow.



SYMPTOM INDEX

2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Applicable Configurations
All

Test Equipment
Digital Multimeter AN/PSM-45 with needle point probes (or Air Force equivalent)

Tools and Special Tools
Tool Kit, Electronic Equipment TK-105/G (or Air Force equivalent)

Materials/Parts
None

Personnel Required
1

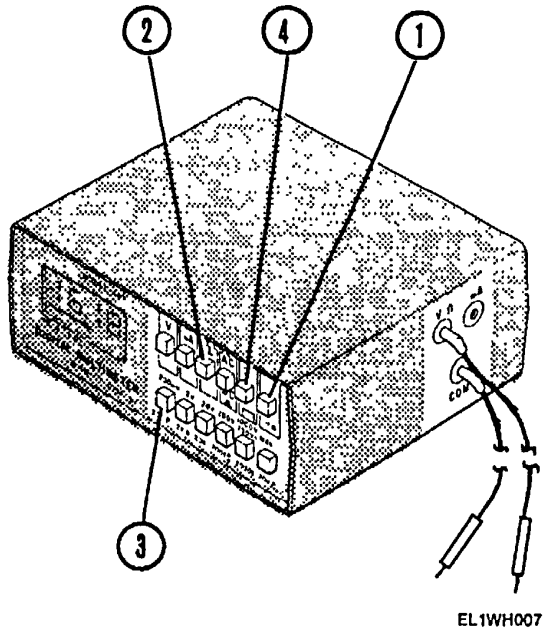
References
Paragraph 2-13, Rear Cover Assembly Removal and Replacement

Equipment Conditions
All external wires and cables to RLGM disconnected
Rear cover assembly removed for all procedures except DSVT binding posts

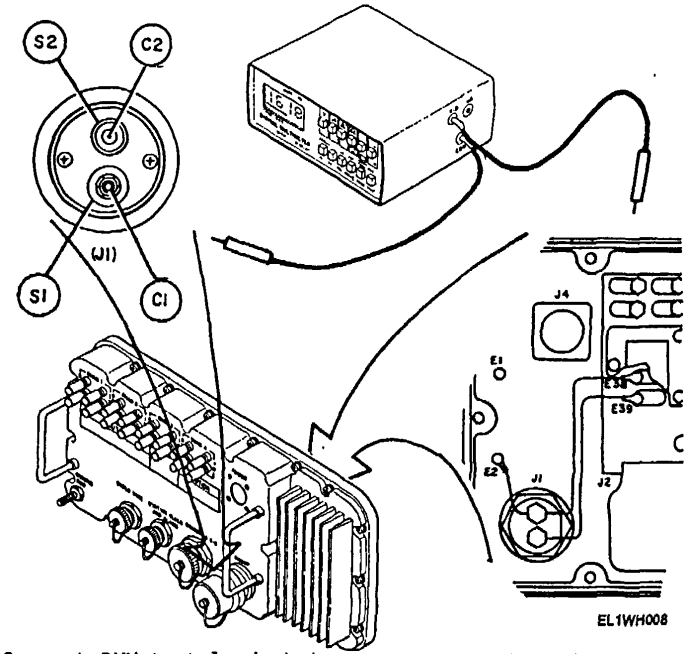
Special Environmental Conditions
None

General Safety Instructions
None

2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

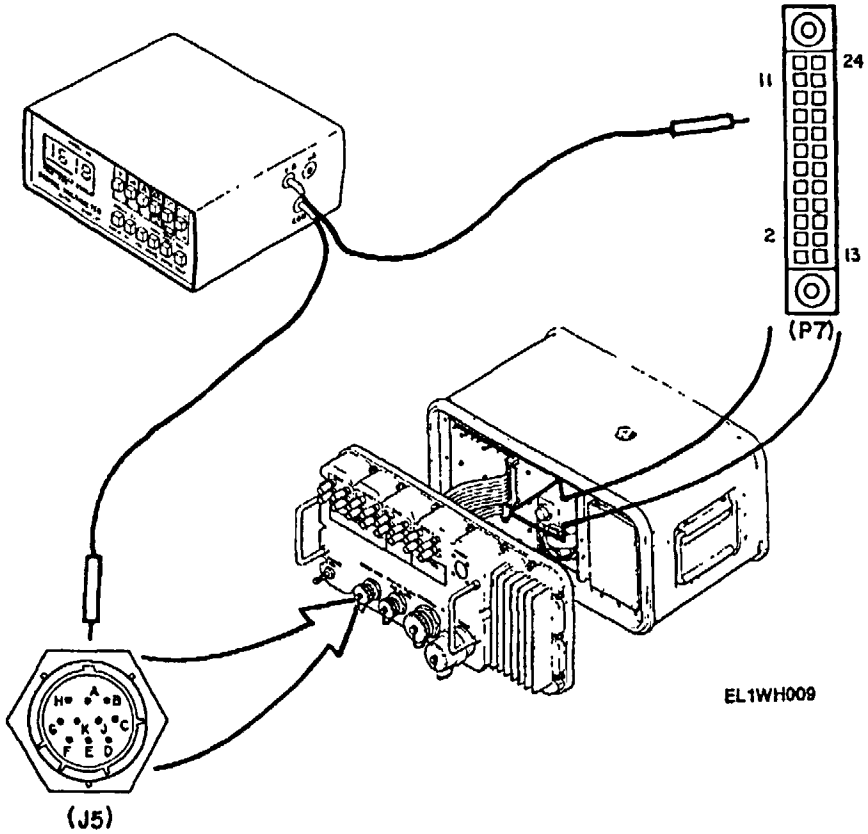
Item	Action	Normal Indication	Corrective Action
	AN/PSM-45 TEST EQUIPMENT  EL1WH007 a. Set digital multimeter (DMM) POWER pushbutton **(1)** to ON (IN). b. Set DV4 n pushbutton **(2)** and 200 pushbutton **(3)** to IN position c. Set PEAK HOLD pushbutton **(4)** to OUT position.		

2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
	REAR COVER ASSEMBLY TEST		
1.	Gain access to rear cover assembly by performing removal procedure for rear cover assembly. (See paragraph 2-13.)		**NOTE** **See paragraph 2-13 for replacement**
2.	Continuity check connector J1 (GROUP) and connection points E2, E38, and E39.		procedures.
			
	Connect DMM test leads between connector J1 and connection points E2, E38, and E39 in the following order and observe indication on DMM.		

2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

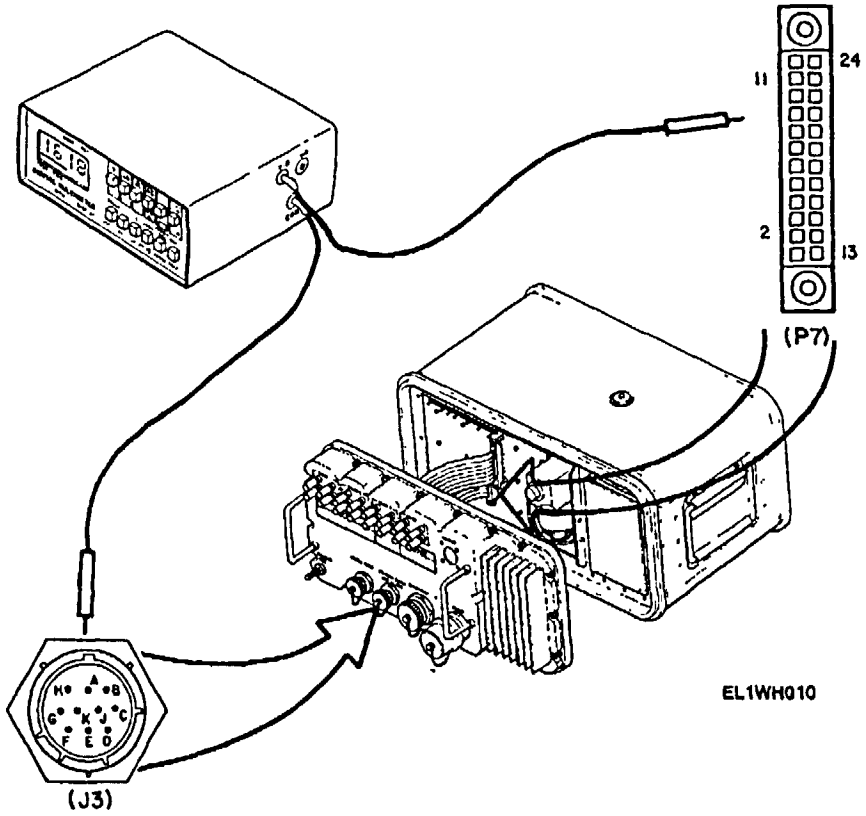
Item	Action		Normal Indication	Corrective Action
2. (Cont)	Red Lead	Black Lead		
	J1-C1	E-39	All checks should show a short circuit	If indication not normal, replace rear cover assembly
	J1-S1	E2		
	J1-C2	E38		
	J1-S2	E2		

Item	Action	Normal Indication	Corrective Action
3.	Continuity check connectors J5 (ORDERWIRE) and P7.  Connect DMM test leads between connectors P7 and J5 in the following order and observe indication on DMM.		**NOTE** **See paragraph 2-13 for replacement procedures.**

2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
3. (Cont)	Red Lead / Black Lead P7-1 / J5-C P7-2 / J5-E P7-3 / J5-D P7-4 / J5-B P7-5 / J5-A P7-6 / J5-F P7-7 / J5-G	All checks should show a short circuit cover assembly	If indications not normal replace

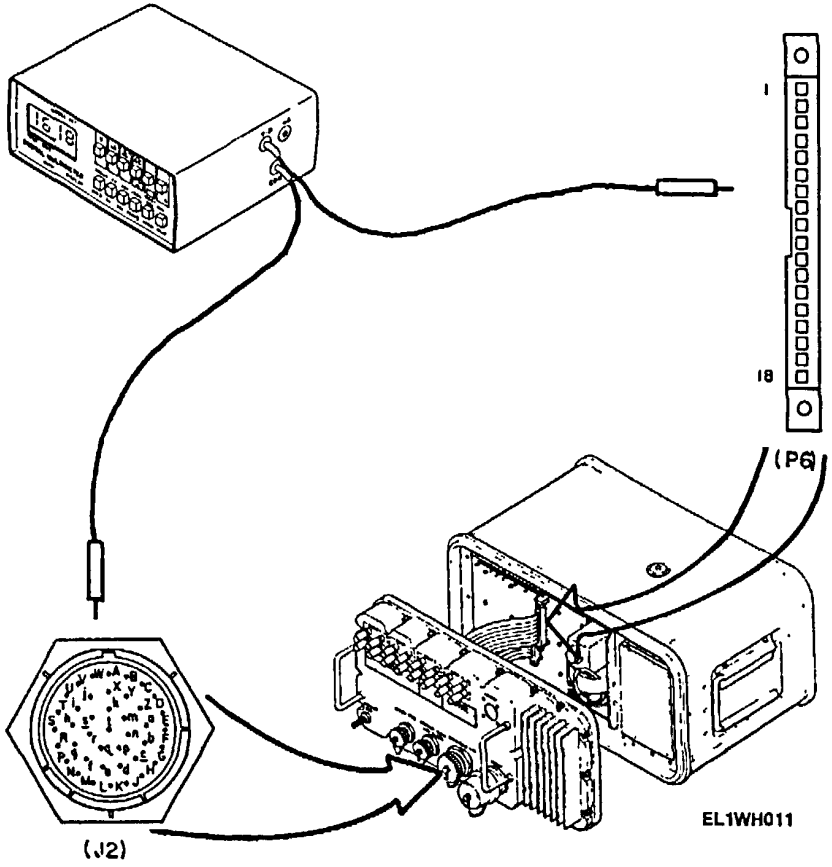
2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
4.	Continuity check connectors J3 (STATUS CLOCK AND ALARM) and P7.		**NOTE** **See paragraph 2-13 for replacement procedures**
			
	Connect DMM test leads between connectors P7 and J3 in the following order and observe indication on DMM		

2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action		Normal Indication	Corrective Action
4. (Cont)	Red Lead	Black Lead		
	P7-9	J3-G	All checks should	If indications not
	P7-10	J3-A	show a short	normal replace
	P7-11	J3-B	circuit	cover assembly
	P7-12	J3-C		
	P7-21	J3-D		
	P7-22	J3-E		
	P7-23	J3-F		
	P7-24	J3-H		

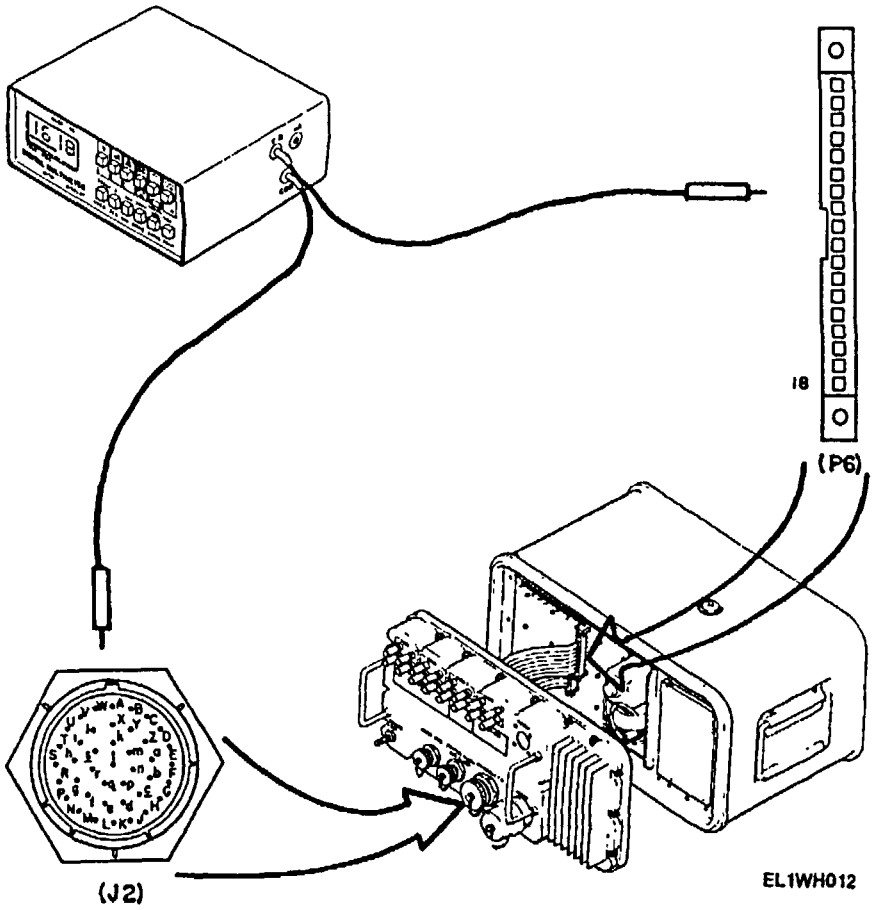
2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
5.	Continuity check connectors J2 (CHANNELS 1-4) and P6.  Connect DMM test leads between connectors P6 and J2 in the following order and observe indication on DMM.		**NOTE** **See paragraph 2-13 for replacement procedures.**

2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action		Normal Indication	Corrective Action
5. (cont)	Red Lead	Black Lead		
	P6-1	J2-q	All checks should show a short circuit	If indications not normal replace cover assembly
	P6-2	J2-k		
	P6-3	J2-d		
	P6-4	J2-J		
	P6-5	J2-H		
	P6-6	J2-c		
	P6-7	J2-G		
	P6-8	J2-b		
	P6-9	J2-F		
	P6-10	J2-a		

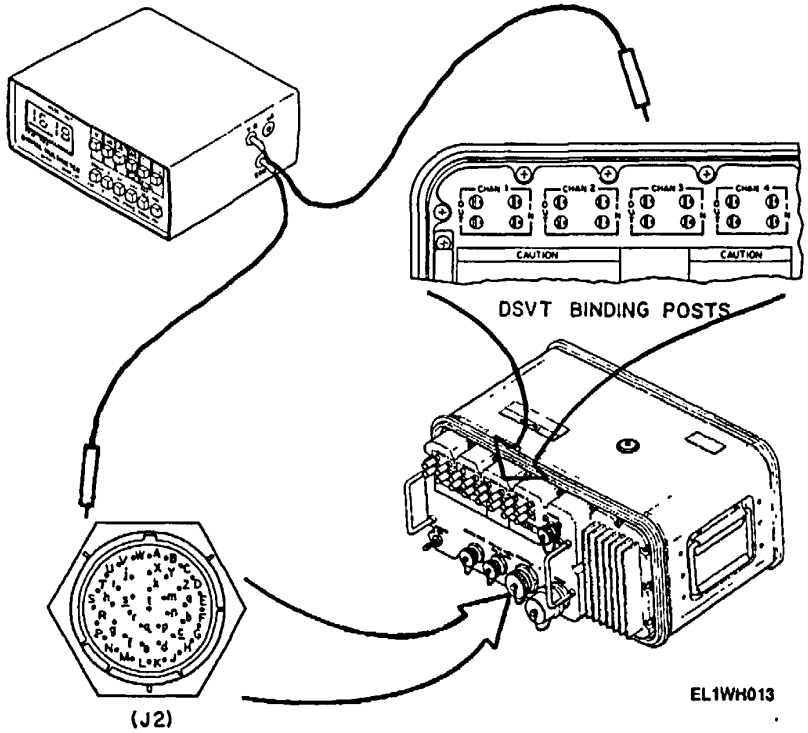
2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
5. (Cont)			

2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action		Normal Indication	Corrective Action
5. (Cont)	Red Lead	Black Lead		
	P6-11	J2-E	All checks should	If indications not
	P6-12	J2-D	show a short	normal replace
	P6-13	J2-Z	circuit	cover assembly
	P6-14	J2-c		
	P6-15	J2-Y		
	P6-16	J2-B		
	P6-17	J2-X		
	P6-18	Chassis		

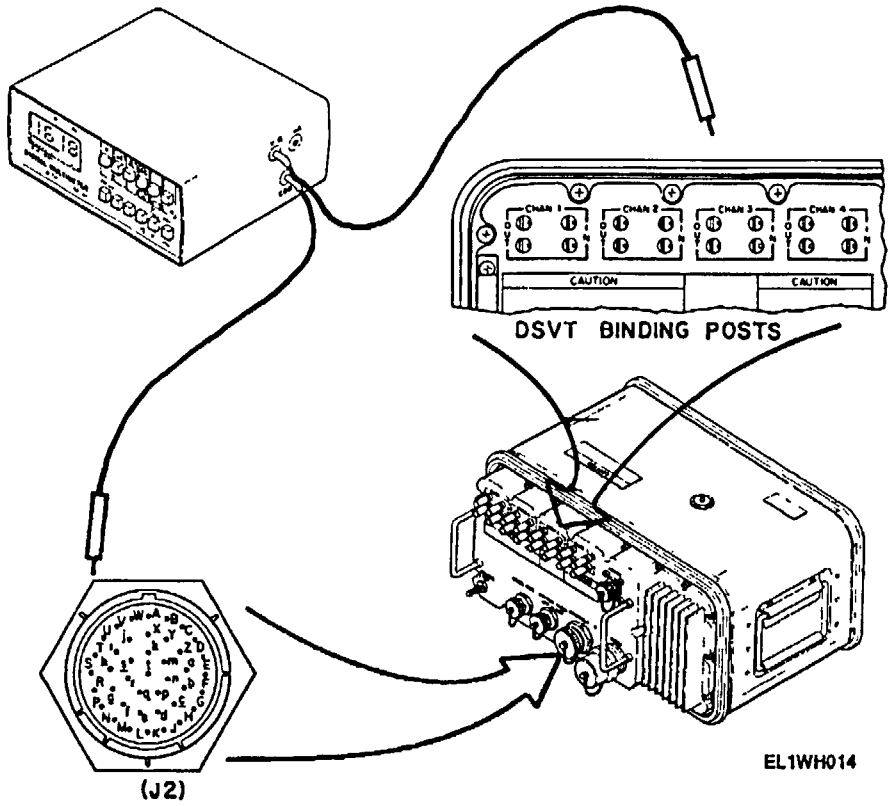
2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
6.	Continuity Check DSVT binding posts and 32.		**NOTE** **See paragraph 2-13 for replacement procedures.**
			
	Connect DMM test leads between DSVT terminals and J2 in the following order and observe indication on DMM.		
	NOTE **(U) means upper binding post** **(L) means lower binding post**		

2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action		Normal Indication	Corrective Action
6. (Cont)	Black Lead	Black Lead		
	Channel 1 Out (U)	J2-F	All checks should	If indications not
	Channel 1 Out (L)	J2-Q	show a short	normal replace
	Channel 1 In (U)	J2-b	circuit	cover assembly
	Channel 1 In (L)	J2-B		
	Channel 2 Out (U)	J2-G		
	Channel 2 Out (L)	J2-Y		
	Channel 2 In (U)	J2-c		
	Channel 2 In (L)	J2-C		
	Channel 3 Out (U)	J2-H		
	Channel 3 Out (L)	J2-Z		

2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
6. (Cont)			

2-5. REAR COVER ASSEMBLY TROUBLESHOOTING PROCEDURES-Continued

Item	Action		Normal Indication	Corrective Action
6. (Cont)	Red Lead	Black Lead		
	Channel 3 In (U)	J2-J	All checks should	If indications not
	Channel 3 In (L)	J2-D	show a short	normal replace
	Channel 4 Out (U)	J2-d	circuit	cover assembly
	Channel 4 Out (L)	J2-E		
	Channel 4 In (U)	J2-K		
	Channel 4 In (L)	J2-a		
7.	Replace rear cover assembly. (See paragraph 2-13.)			

2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES

INITIAL SETUP

Applicable Configurations
All

Test Equipment
Digital Multimeter AN/PSM-45 with needlepoint probes (or Air Force equivalent)

Tools and Special Tools
Tool Kit, Electronic Equipment TK-10S5/G (or Air Force equivalent)

Materials/Parts
None

Personnel Required
1

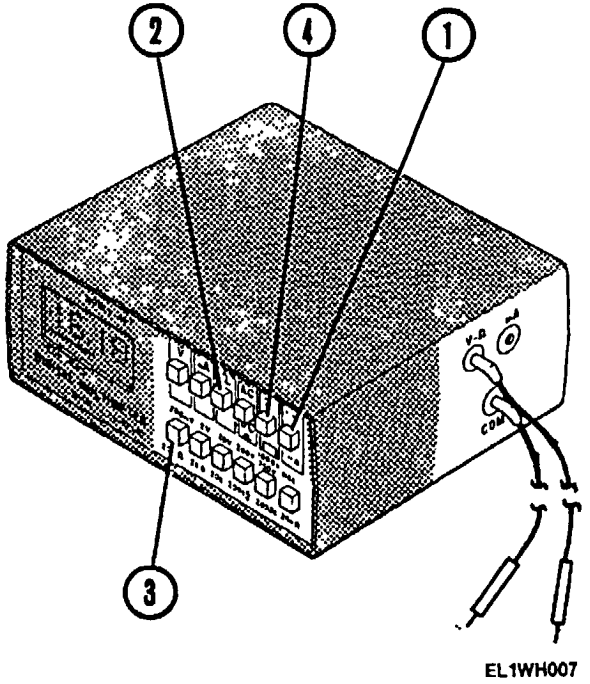
References
Paragraph 2-8, Front Panel ALARM and POWER Lamp Sockets Removal and Replacement Procedure
Paragraph 2-9, MAIN PWR BRKR Circuit Breaker Removal and Replacement Procedure
Paragraph 2-10, LOCAL POWER ON/OFF Switch Removal and Replacement Procedure
Paragraph 2-11, ALARM TEST Switch Removal and Replacement Procedure
Paragraph 2-12, REMOTE POWER ON/OFF Switch Removal and Replacement Procedure

Equipment Conditions
Power off
Power connector disconnected

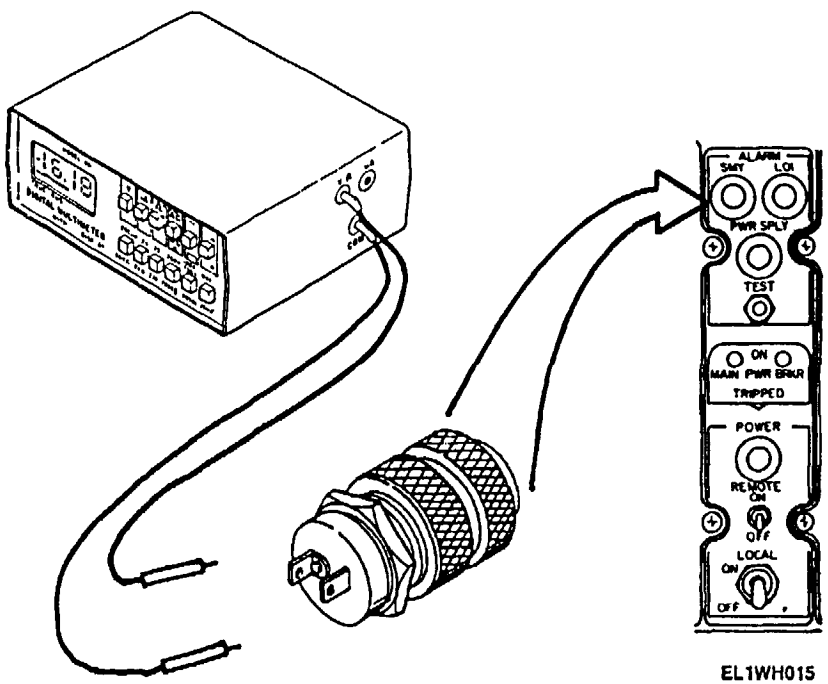
Special Environmental Conditions
None

General Safety Instructions
None

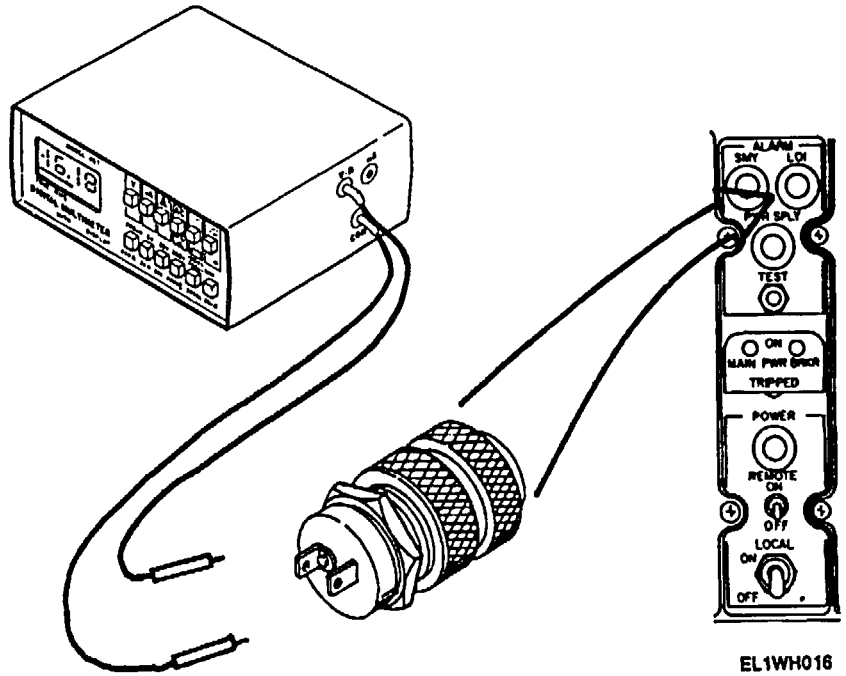
2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
	AN/PSM-45 TEST SETUP  EL1WH007 a. Set DMM POWER pushbutton (1) to ON (in). b. Set DVM n pushbutton (2) and 200 pushbutton (3) to IN position c. Set PEAK HOLD pushbutton (4) to OUT position.		

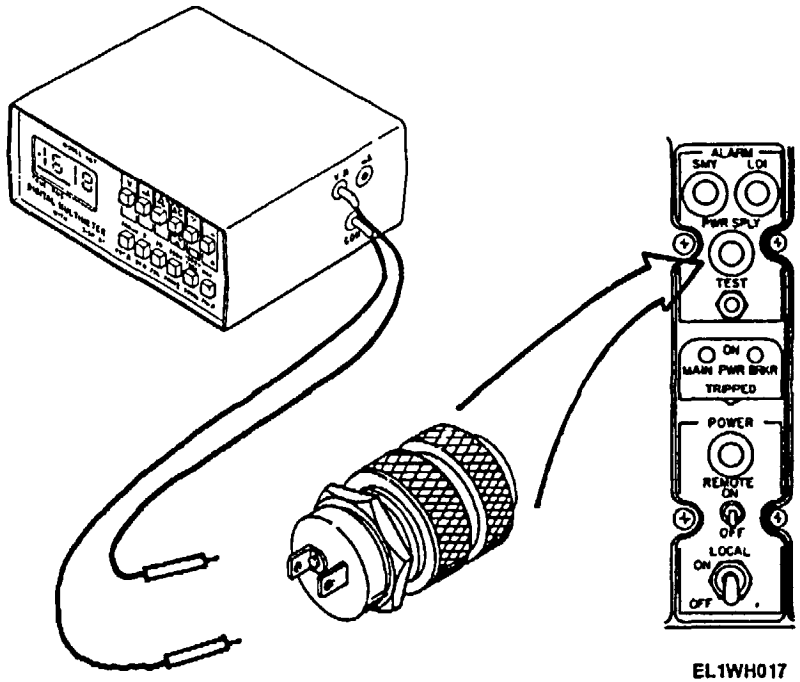
2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
1.	OPERATOR CONTROLS AND INDICATORS TEST ALARM SMY lamp socket.		
	 EL1WH015		
	a. Gain access to rear of lamp socket by performing removal procedure for the lamp socket.(See paragraph 2-8.)		
	b. Replace lens with lamp installed onto lamp socket.		
	c. Connect DMM between terminals 1 and 2 and observe indication on DMM.	Short circuit	Replace lamp socket
	d. Replace lamp socket. (See paragraph 2-8.)		

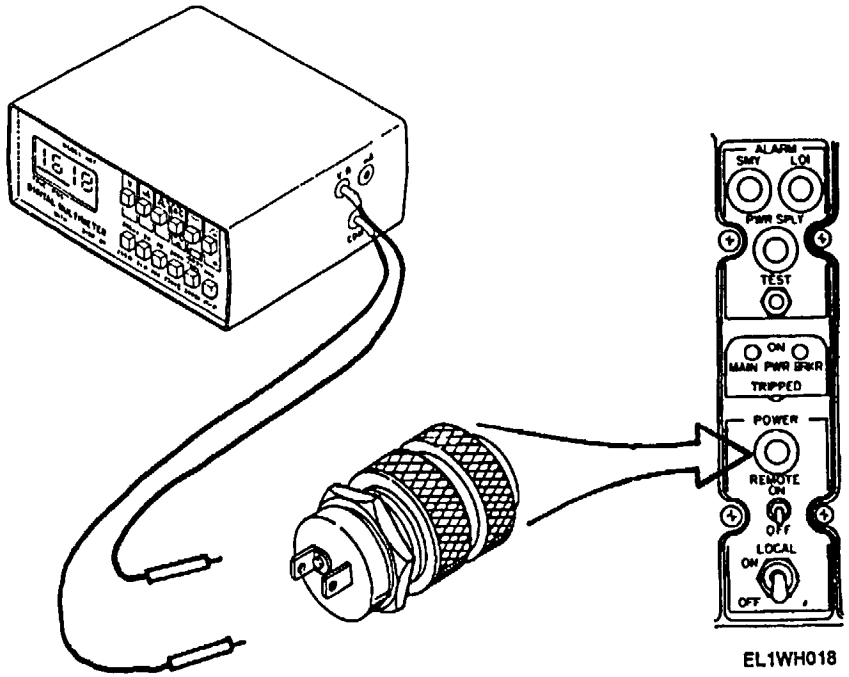
2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
2.	ALARM LOI lamp socket  EL1WH016		
	a. Gain access to rear of lamp socket by performing removal procedure for the lamp socket. (See paragraph 2-8.)		
	b. Replace lens with lamp installed onto lamp socket.		
	c. Connect DMM between terminals 1 and 2 and observe indication on DMM.	Short circuit	Replace lamp socket
	d. Replace LOI lamp socket. (See paragraph 2-8.)		

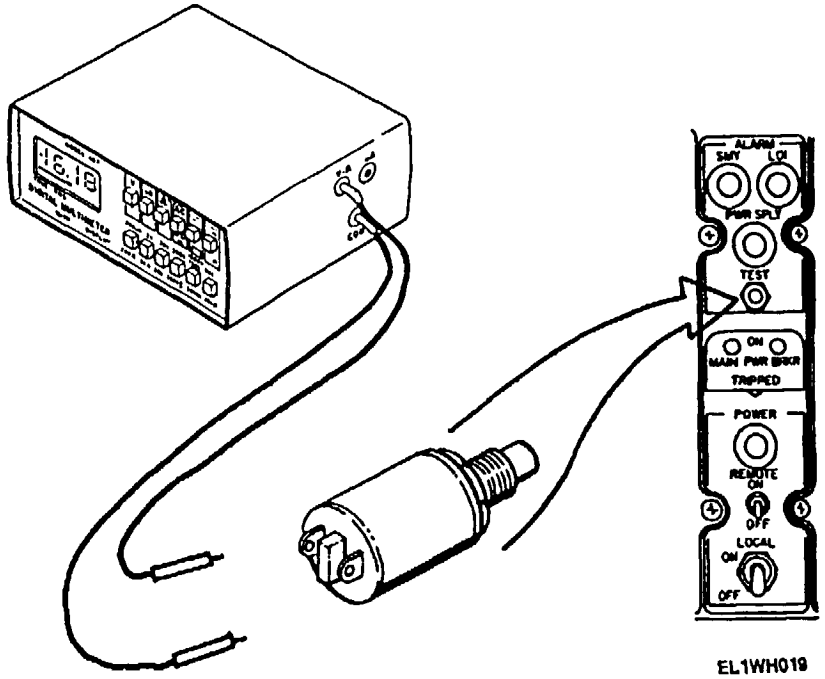
2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
3.	ALARM PWR SPLY lamp socket  EL1WH017 a. Gain access to rear of lamp socket by performing removal procedure for the lamp socket. (See paragraph 2-8.) b. Replace lens with lamp installed onto lamp socket.		
	c. Connect DMM between terminals 1 and 2 and observe indication on DMM.	Short circuit	Replace lamp socket
	d. Replace PWR SPLY lamp socket. (See paragraph 2-8.)		

2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
4.	POWER lamp socket  EL1WH018 a. Gain access to rear of lamp socket by performing removal procedure for the lamp socket. (See paragraph 2-8.) b. Replace lens with lamp installed onto lamp socket.		
	c. Connect DMM between terminals 1 and 2 and observe indication on DMM.	Short circuit	Replace lamp socket
	d. Replace POWER ON lamp socket. (See paragraph 2-8.)		

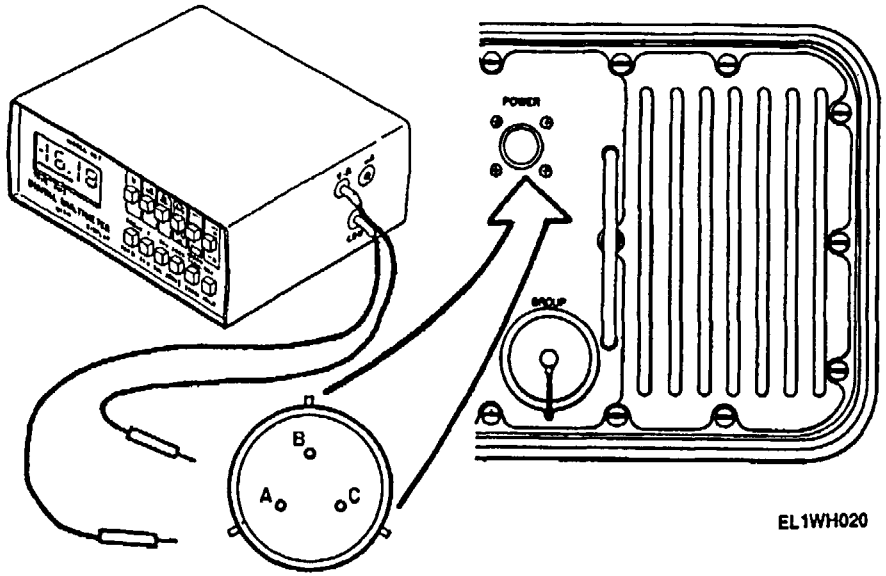
2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
5.	ALARM TEST switch  a. Gain access to rear of lamp socket by performing removal procedure for ALARM TEST switch. (See paragraph 2-11.)		

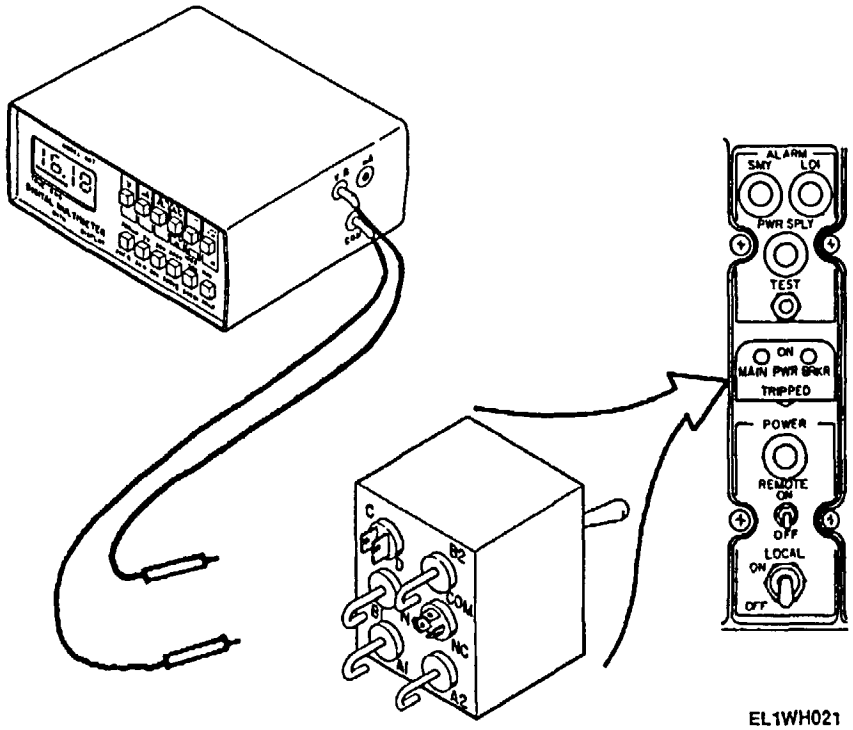
2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
5. (Cont)			
	b. Connect DMM between terminals.		
	c. Press and hold pushbutton and observe indication on DMM.	Short circuit	Replace pushbutton switch
	d. Release pushbutton and observe indication on DMM.	Open circuit	Replace pushbutton switch
	e. Replace ALARM TEST pushbutton switch.		

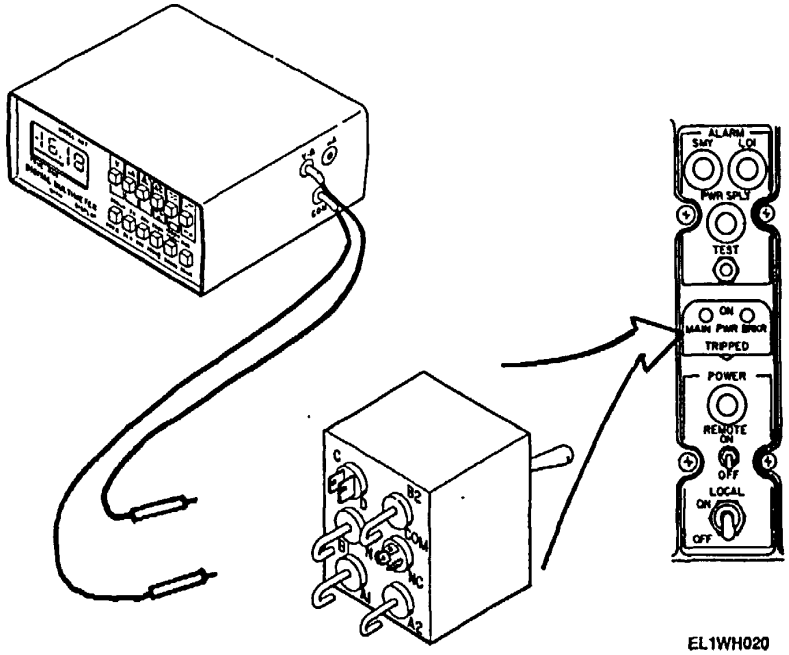
2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
6.	MAIN PWR BRKR circuit breaker		
	a. Set MAIN PWR BRKR to ON.		
	b. Set LOCAL ON/OFF switch to ON.		
	c. Insure that all power supply CCAs are installed in their proper locations.		
			
	d. Connect DMM between terminals A and B and observe indication on DMM	Open circuit	Perform steps f through h
	e. Connect DMM between terminals A and C and observe indication on DMM.	Open circuit	Replace circuit breaker

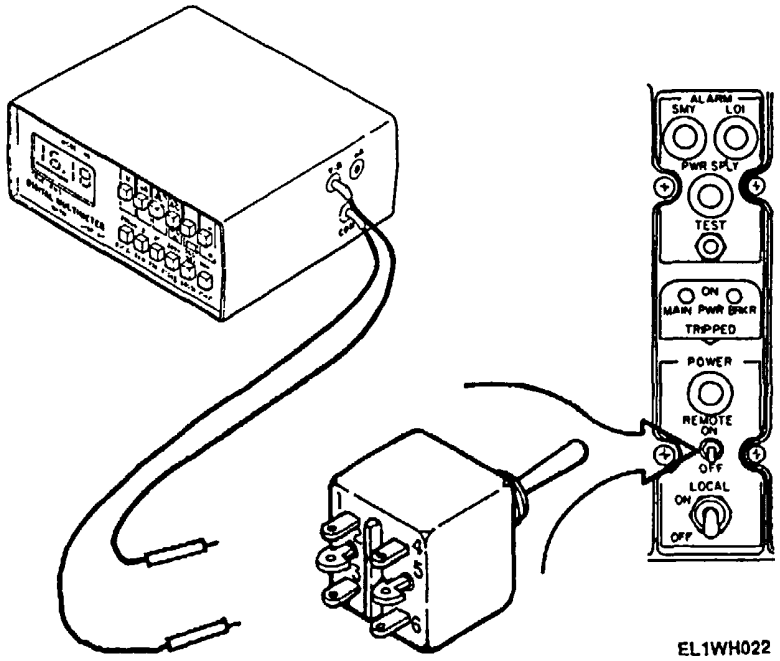
2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
6. (Cont)	 EL1WH021 f. Gain access to rear of circuit breaker by performing removal procedure for MAIN PWR BRKR. (See paragraph 2-9) j. Set circuit breaker to ON (up).		

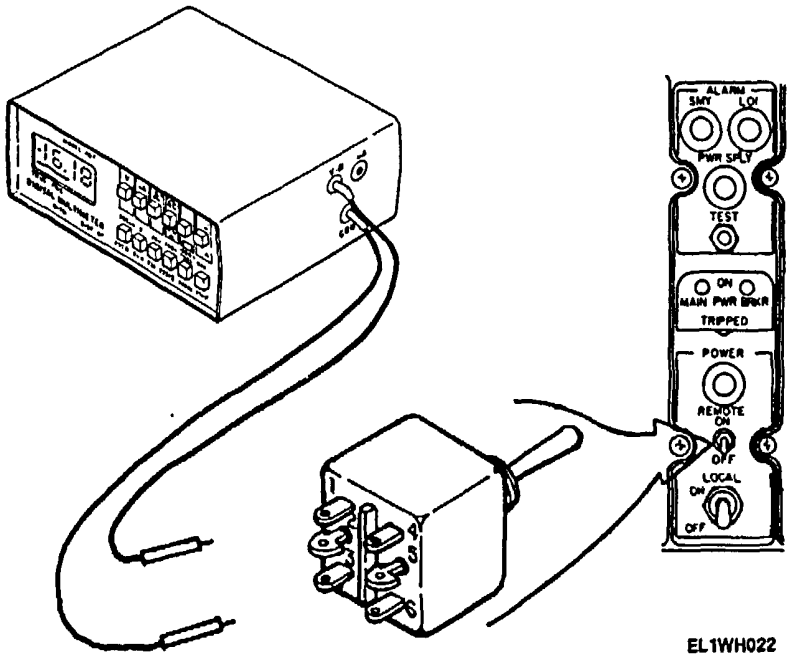
2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
6. (Cont)			
	h. Connect DMM between the following terminals and observe indication on DMM		
	Red Lead / Black Lead		
	A1 / B1	Short circuit	Replace Circuit breaker
	A2 / B2		
	C / D	Short Circuit	Replace Circuit breaker
		Short circuit	Replace circuit breaker
	i. Replace circuit breaker. (See paragraph 2-9)		

2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
7.	REMOTE ON/OFF switch  a. Gain access to rear of switch by performing removal procedure for REMOTE ON/OFF switch. (See paragraph 2-12.) b. Set switch to OFF (down).		

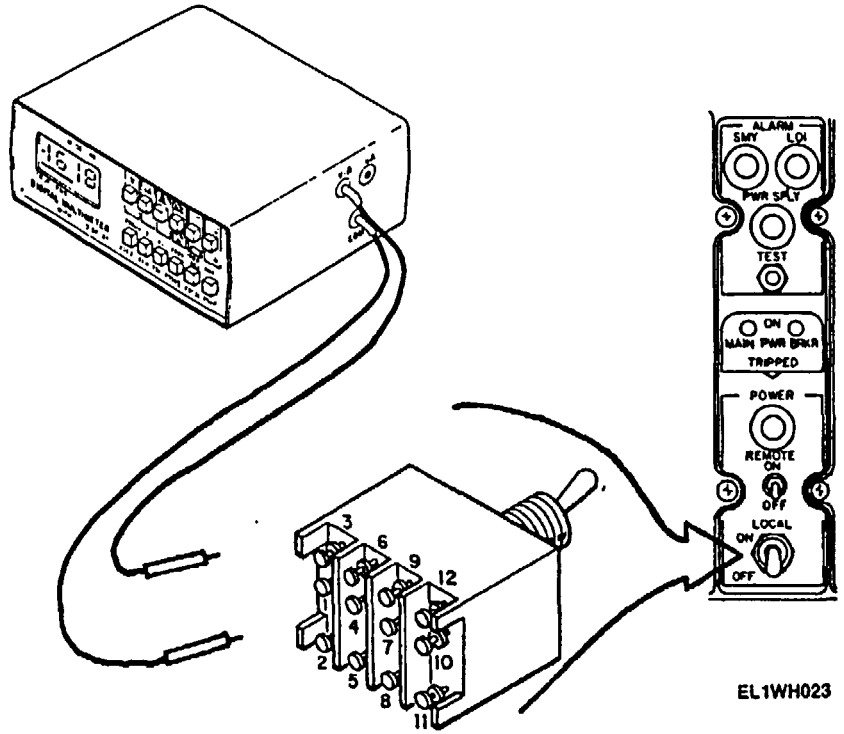
2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
			
	c. Connect DMM between the following terminals and observe indication of DMM.		
	Red Lead 1 / Black Lead 2	Short circuit	Replace switch
	4 / 5	Short circuit	Replace switch

2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
7. (Cont)			
	d. Set switch to ON (up).		
	e. Connect DMM between the following terminals and observe indication on DMM		
	Red Lead 2 / Black Lead 3	Short circuit	Replace switch
	Red Lead 5 / Black Lead 6	Short circuit	Replace switch
	f. Replace REMOTE ON/OFF switch. (See paragraph 2-12.)		

2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
8.	LOCAL POWER ON/OFF switch  a. Gain access to rear of switch by performing removal procedure for LOCAL ON/OFF switch. (See paragraph 2-10.) b. Set switch to OFF (down).		

2-6. OPERATOR CONTROLS AND INDICATORS TROUBLESHOOTING PROCEDURES-Continued

Item	Action	Normal Indication	Corrective Action
8. (Cont)			
	c. Connect DMM between the following terminals and observe indication on DMM. Red Lead / Black Lead 2 / 3 5 / 6 8 / 9 11 / 12	All checks should show a short circuit	If indications not normal replace cover assembly
	d. Set switch to ON (up). e. Connect DMM between the following terminals and observe indication on DMM. Red Lead / Black Lead 2 / 1 5 / 4 8 / 7		

Section III. MAINTENANCE

2-7. RLGM REPAIR PROCEDURE

INITIAL SETUP

Applicable Configurations

All

Tools and Special Tools

Tool Kit, Electronic Equipment TK-105/G (or Air Force equivalent)

Materials and Parts

See table of materials and parts

Personnel Required

1

References

TM 11-5805-706-12, paragraph 4-16, Removal and Replacement of Power Supply CCA Compartment Cover
TM 11-5805-706-12, paragraph 4-17, Removal and Replacement of Power Supply CAs
Paragraph 2-5, Rear Cover Assembly Troubleshooting Procedures
Paragraph 2-6, Operator Controls and Indicators Troubleshooting Procedures
Paragraph 2-13, Rear Cover Assembly Removal and Replacement Procedure

2-7. RLGM REPAIR PROCEDURE-Continued

LIST OF TASKS

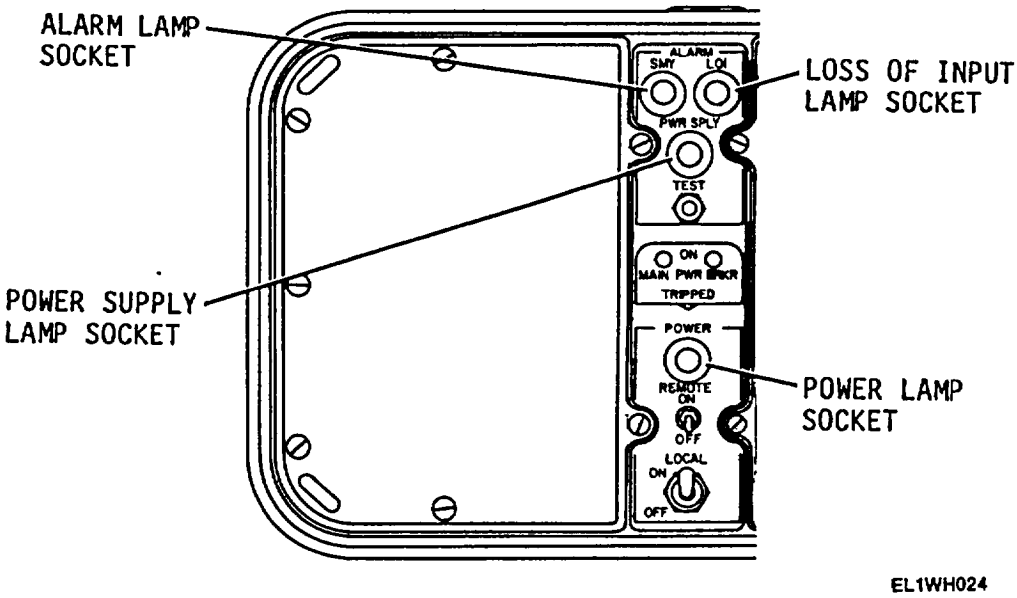
Task Number	Task	Task Reference Number (Para)	Troubleshooting Reference Number (Para)
1.	Removal and Replacement of ALARM SMY, LOI, PWR SPLY, and POWER ON lamp sockets.	2-8	2-6
2.	Removal and Replacement of ALARM TEST SWITCH	2-11	2-6
3.	Removal and Replacement of MAIN PWR BRKR	2-9	2-6
4.	Removal and Replacement of REMOTE ON/OFF Switch	2-12	2-6
5.	Removal and Replacement of LOCAL ON/OFF Switch	2-10	2-6
6.	Removal and Replacement of Rear Cover Assembly	2-13	2-5
7.	Removal and Replacement of DSVT Binding Posts	2-14	2-5
8.	Removal and Replacement of Rear Cover Assembly Support	2-15	-
9.	Removal and Replacement of Rear Cover Assembly Ground Rod	2-16	-
10.	Removal and Replacement of Rear Cover Assembly Panel Gasket	2-17	-
11.	Removal and Replacement of Rear Cover Assembly Input Power Filter Gasket	2-18	-
12.	Removal and Replacement of Rear Cover Assembly Captive Screws	2-19	-
13.	Removal and Replacement of Transport Cover Gasket	2-20	-
14.	Removal and Replacement of Transport Cover Latches	2-21	-

2-7. RLGM REPAIR PROCEDURE-Continued

MATERIALS AND PARTS USED TO REPAIR RLGM

Item	Reference Designation	Paragraph Number
MAIN PWR BRKR	CB1	2-9
ALARM TEST Switch	S1	2-11
REMOTE ON/OFF Switch	S2	2-12
LOCAL ON/OFF Switch	S3	2-10
ALARM SMY Lamp Socket	DS1	2-8
LOI Lamp Socket	DS2	2-8
PWR SPLY Lamp Socket	DS3	2-8
POWER ON Lamp Socket	DS4	2-8
Rear Cover Assembly	-	2-13
DSVT Binding Posts	-	2-14
Rear Cover Assembly Support	-	2-15
Rear Cover Assembly Ground Rod	-	2-16
Rear Cover Assembly Panel Gasket	-	2-17
Rear Cover Assembly Input Power	-	2-18
Filter Gasket	-	
Rear Cover Assembly Captive Screws	-	2-19
Transport Cover Gasket	-	2-20
Transport Cover Latches	-	2-21
Gasket Adhesive	-	2-18
Primer	-	2-16
Sealing Compound	-	2-16

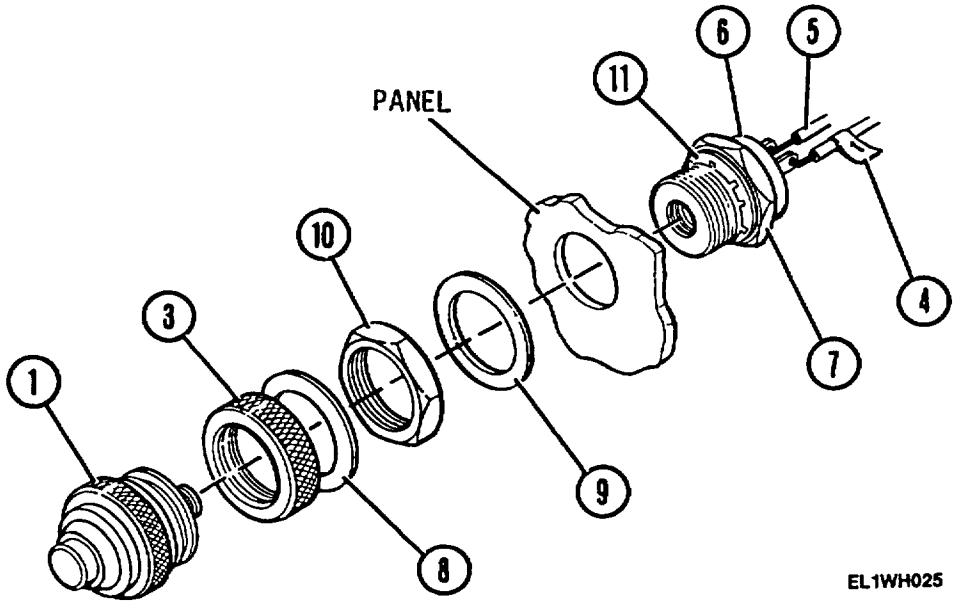
2-8. REMOVAL AND REPLACEMENT OF FRONT PANEL ALARM AND POWER LAMP SOCKETS PROCEDURE



PRELIMINARY PROCEDURES

- Remove power supply CCA compartment cover. (See TM 11-5805-706-12, paragraph 4-16.)
- Remove power supply CCAs. (See TM 11-5805-706-12, paragraph 4-17.)

2-8. REMOVAL AND REPLACEMENT OF FRONT PANEL ALARM AND POWER LAMP SOCKETS PROCEDURE- Continued



NOTE

This procedure applies to ALARM SUMMARY, ALARM PWR SPLY, ALARM LOSS OF INPUT, POWER, AND RMT PWR OUT lamp sockets.

REMOVAL

1 Unscrew lens cap **(1)** from lamp socket.
2 Remove round nut **(3)** and rubber gasket **(8)** from lamp socket.
3 Using 9/16-inch socket wrench, remove mounting nut **(10)** and flat washer **(9).**

NOTE
When pushing socket through panel, insure that no hardware drops into case.

4 Push lamp socket back through panel and dress wires to allow access through CCA compartment opening for unsoldering.
5 Tag wires with masking tape **(4)** and number.
6 Unsolder all wires **(5)** from lamp socket **(6)** and remove faulty socket.

2-8. REMOVAL AND REPLACEMENT OF FRONT PANEL LAMP SOCKETS PROCEDURE -Continued

REPLACEMENT

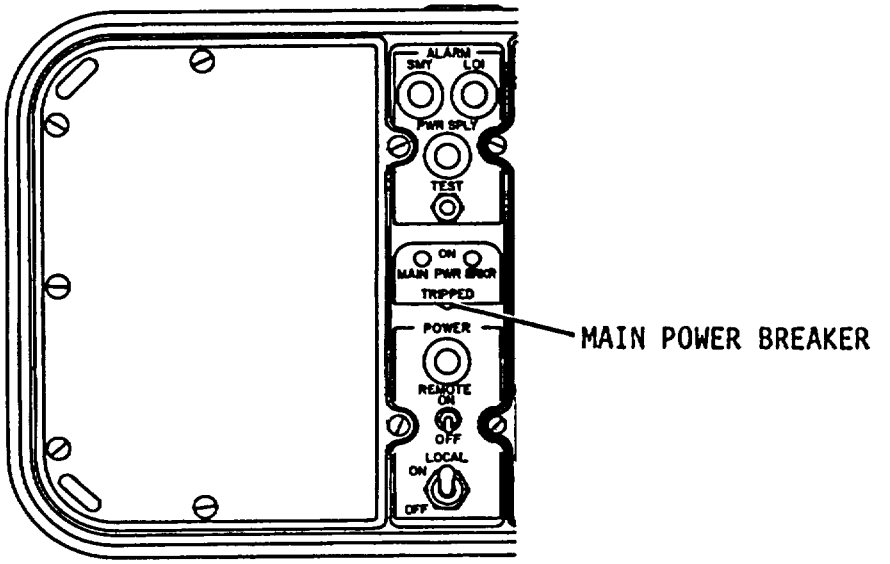
1 Remove lens cap **(1).**
2 Remove round nut **(3)** , rubber gasket **(8)**, mounting nut **(10)**, and flat washer **(9).**
3 Position nut **(7)** on lamp socket housing for appropriate panel thickness.

NOTE

Before installation of new lamp socket, verify its performance by performing the Operator Controls and Indicators Trouble-shooting Procedures. (See paragraph 2-6.)

4 Solder all wires **(5)** to replacement lamp socket **(6)**, making sure to attach wires to correct socket terminals and remove tags **(4).**
5 Insert the replacement lamp socket **(6),** with nut **(7)** and star washer **(11),** through rear of front panel.
6 Using 9/16-inch socket wrench, secure lamp socket **(6)** to front panel with flat washer **(9)** mounting nut **(10).**
7 Install rubber gasket **(8)** and round nut **(6)** onto lamp socket **(6).**
8 Insert previously removed lens cap **(1)** into socket, and screw lens cap **(1)** into lamp socket.
9 Replace power supply CCAs. (See TM 11-5805-706-12, paragraph 4-17.)
10. Replace power supply CCA compartment cover. (See TM 11-5805-706-12, paragraph 4-16.)

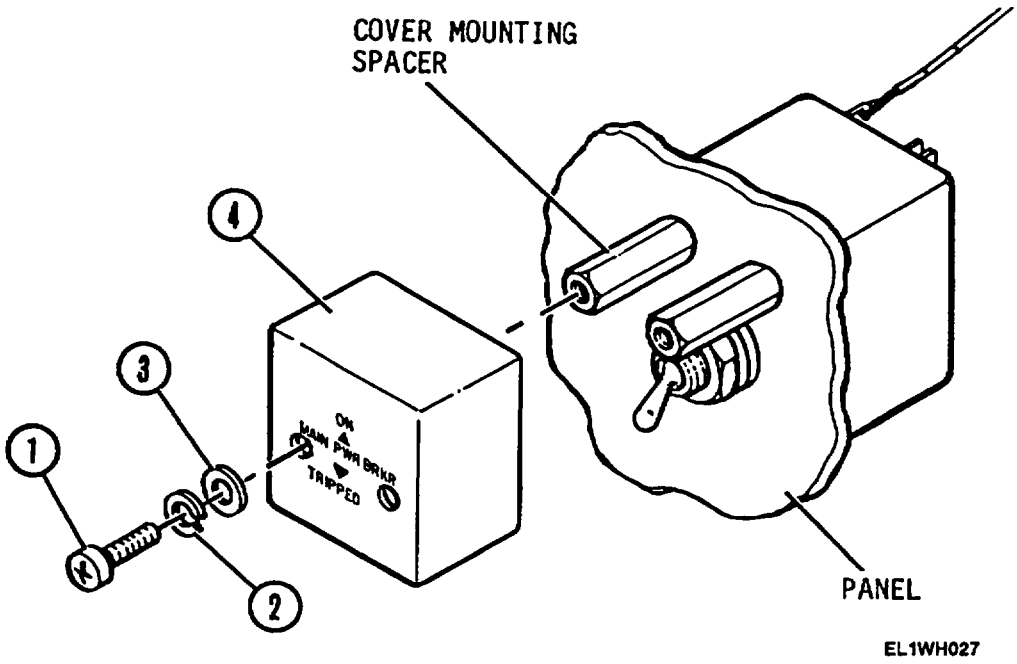
2-9. REMOVAL AND REPLACEMENT OF MAIN PWR BRKR CIRCUIT BREAKER PROCEDURE



PRELIMINARY PROCEDURES

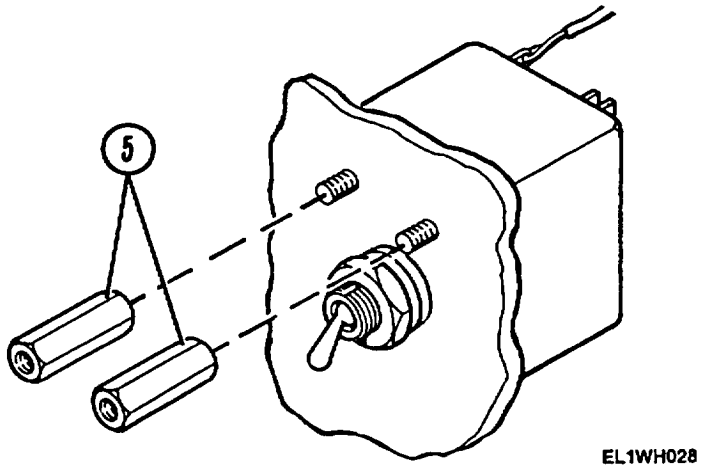
- Remove power supply CCA compartment cover. (See TM 11-5805-706-12, paragraph 4-16.)
- Remove power supply CCAs. (See TM 11-5805-706-12, paragraph 4-17.)

2-9. REMOVAL AND REPLACEMENT OF MAIN PWR BRKR CIRCUIT BREAKER PROCEDURE-Continued



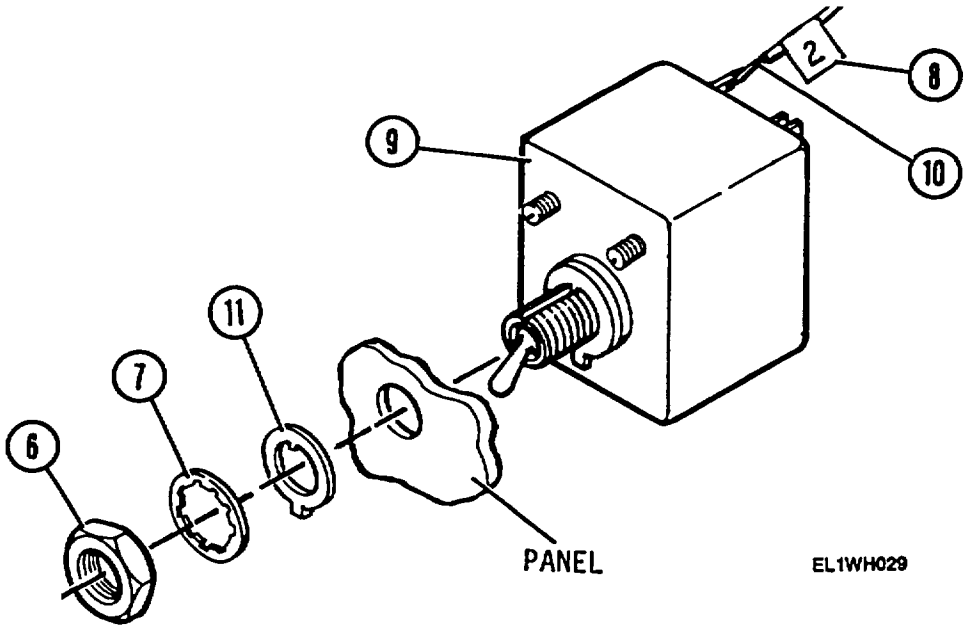
REMOVAL

1 Using No. 2 Phillips screwdriver, remove two screws **(1)** , two lockwashers **(2),** and two flat washers **(3)** which fasten circuit breaker protective cover **(4)** to front panel, and remove cover.



2 Using 1/4-inch socket wrench, remove the two standoffs **(5)** from the front panel and circuit breaker.

2-9. REMOVAL AND REPLACEMENT OF MAIN PWR BRKR CIRCUIT BREAKER PROCEDURE-Continued



3 Using 1/2-inch socket wrench, remove nut **(6)** star washer **(7),** and lock ring **(11)**

NOTE

When pushing circuit breaker through panel, insure that no hardware drops into case.

4 Push circuit breaker **(9)** back through panel and dress wires to allow access through CCA compartment opening for unsoldering.

5 Tag all wires **(10)** with masking tape **(8)** and number.

6 Unsolder all wires **(10)** from circuit breaker **(9)** and remove circuit breaker.

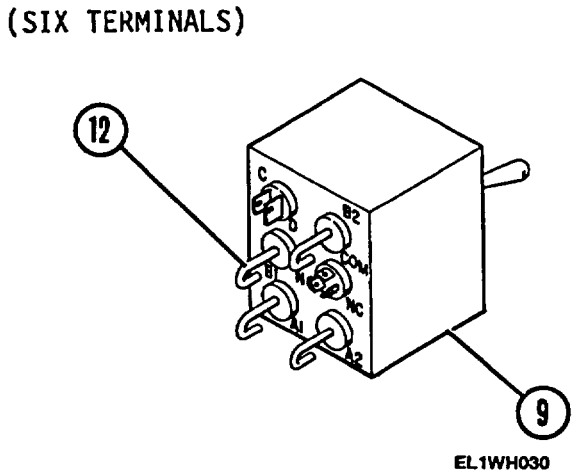
REPLACEMENT

NOTE

Before installation of new circuit breaker, verify its performance by performing the Operator Controls and Indicators Troubleshooting Procedures. (See paragraph 2-6.)

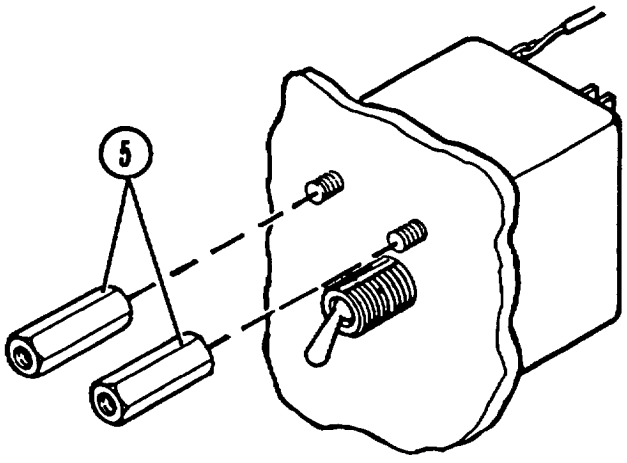
1 Prepare replacement circuit breaker for installation by removing hex nut **(6),** star washer **(7),** and lock ring **(11).**

2-9. REMOVAL AND REPLACEMENT OF MAIN PWR BRKR CIRCUIT BREAKER PROCEDURE-Continued



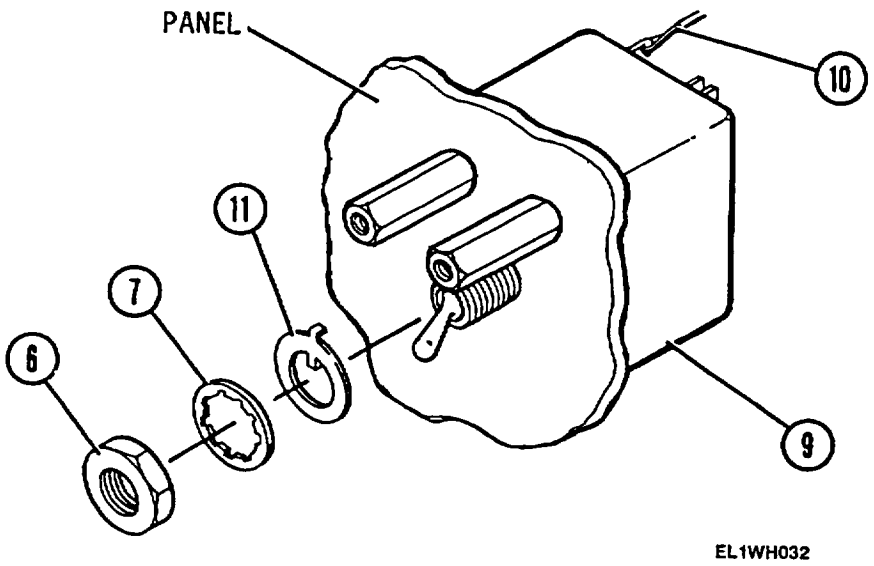
2 Solder all wires **(10)** to replacement circuit breaker **(9),** making sure to attach wires to correct circuit breaker terminals **(12),** and remove tags **(8).**

3 Insert the replacement circuit breaker **(9)** through rear of front panel.



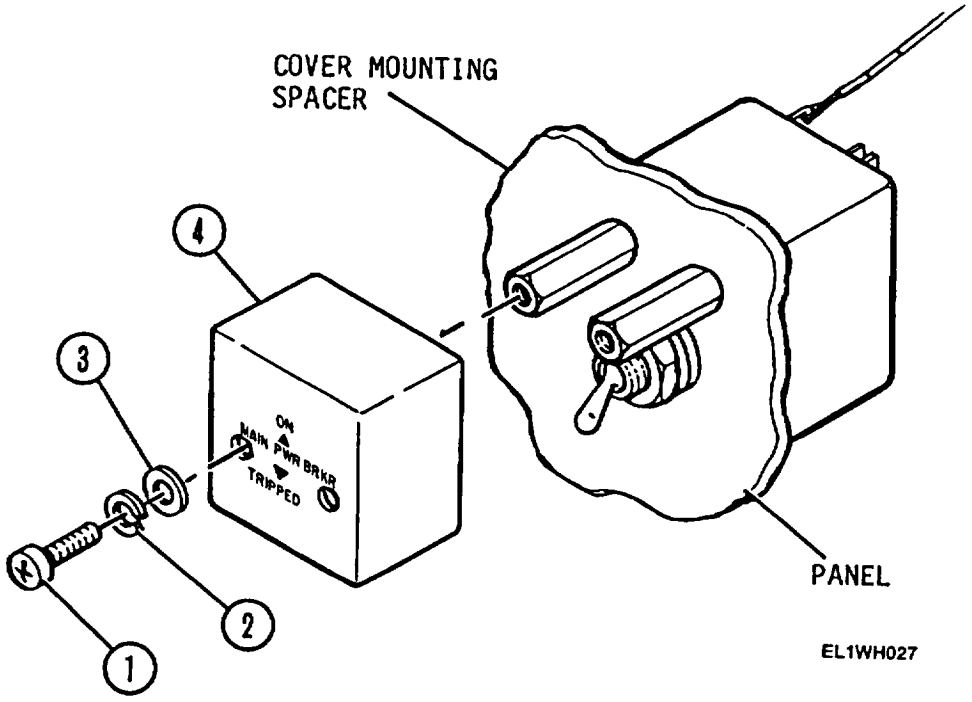
4 Using 1/4-inch socket wrench secure the two standoffs **(5)** to the front panel and circuit breaker.

2-9. REMOVAL AND REPLACEMENT OF MAIN PWR BRKR CIRCUIT BREAKER PROCEDURE-Continued



5 Using 1/2-inch socket wrench secure circuit breaker **(9)** to front panel with lock ring **(11),** star washer **(7),** and hex nut **(6).**

2-9. REMOVAL AND REPLACEMENT OF MAIN PWR BRKR CIRCUIT BREAKER PROCEDURE-Continued

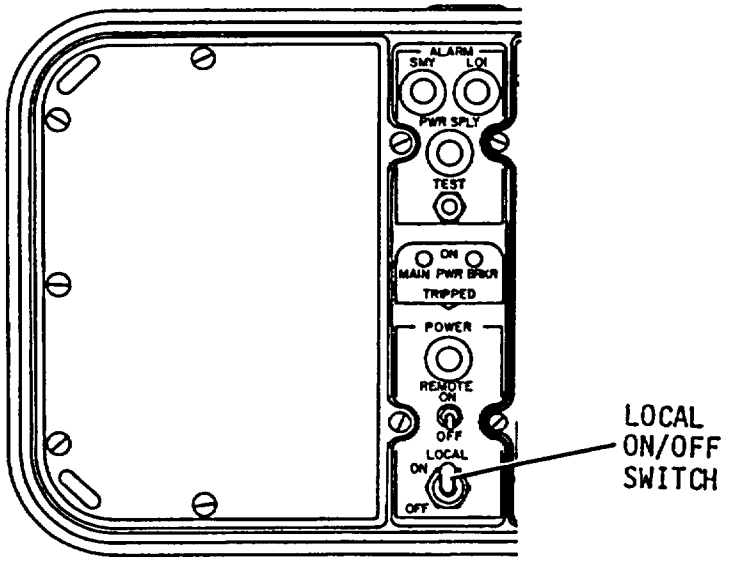


6 Replace circuit breaker protective cover plate **(4)** using previously removed flat washers **(3),** lockwashers **(2),** and screws **(1).**

7 Replace power supply CCAs. (See TM 11-5805-706-12, paragraph 4-17.)

8 Replace power supply CCA compartment cover. (See TM 11-5805-706-12, paragraph 4-16.)

2-10. REMOVAL AND REPLACEMENT OF LOCAL POWER ON/OFF SWITCH PROCEDURE



EL1WH033

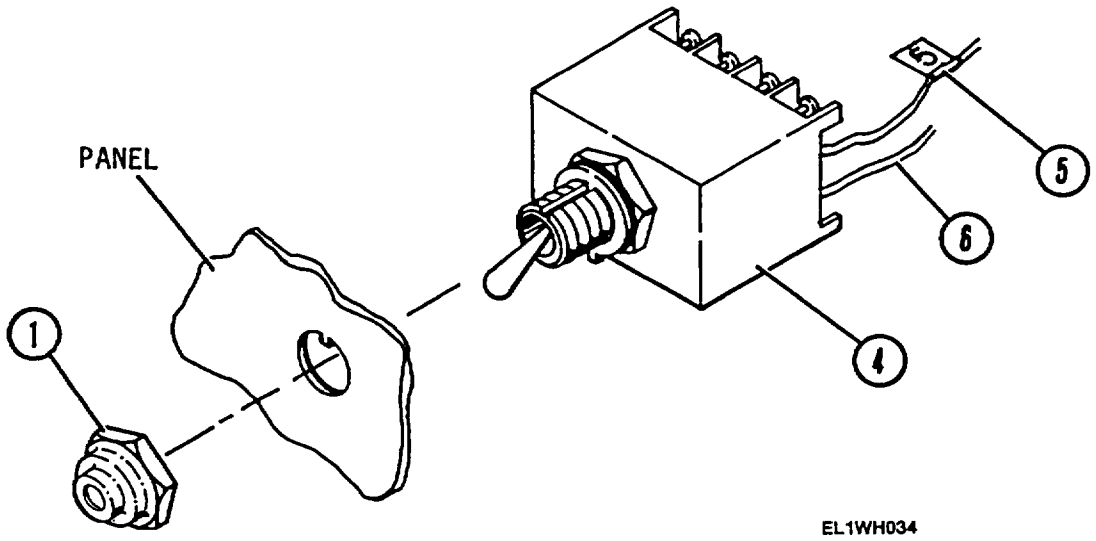
PRELIMINARY PROCEDURES

- Remove power supply CCA compartment cover. (See TM 11-5805-706-12, paragraph 4-16.)
- Remove power supply CCAs. (See TM 11-5805-706-12, paragraph 4-17.)

2-10. REMOVAL AND REPLACEMENT OF LOCAL POWER ON/OFF SWITCH PROCEDURE -Continued

CAUTION

Caution should be taken not to damage the boot over the nut.



REMOVAL

1 Using 5/8-inch socket wrench, remove nut **(1).**

NOTE

When pushing switch through panel, insure that no hardware drops into case.

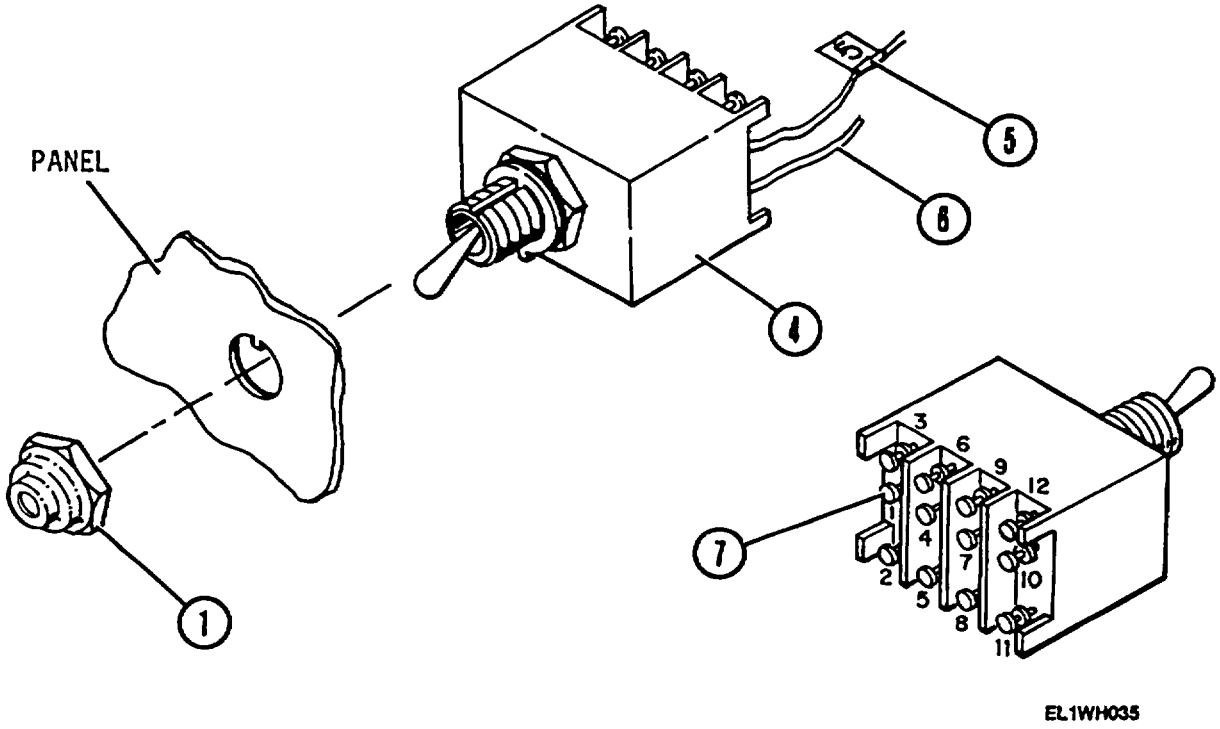
2 Push switch **(4)** back through panel and dress wires to allow access through CCA compartment opening for unsoldering.
3 Tag wires **(6)** with masking tape **(5)** and number.
4 Unsolder all wires **(6)** from switch **(4)** and remove switch.

REPLACEMENT

NOTE

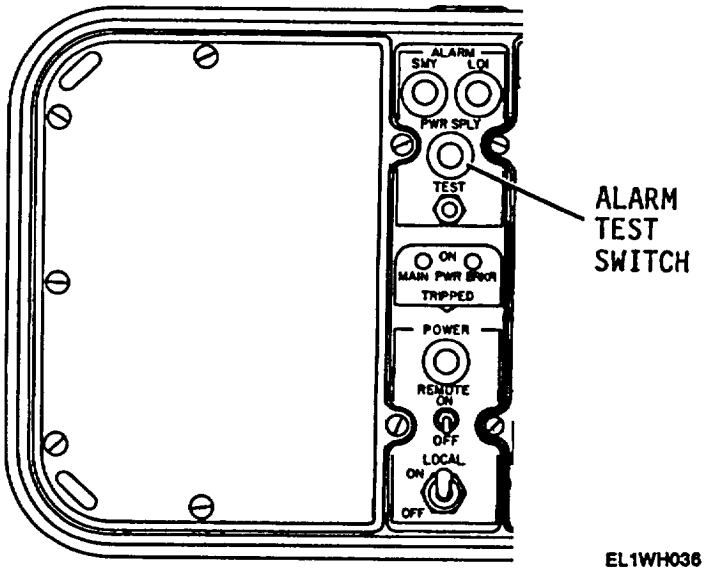
Before installation of new power switch, verify its performance by performing the Operator Controls and Indicators Troubleshooting Procedures. (See paragraph 2-6.)

2-10. REMOVAL AND REPLACEMENT OF LOCAL POWER ON/OFF SWITCH PROCEDURE -Continued



1 Prepare replacement switch for installation by removing hex nut **(1).**
2 Solder all wires **(6)** to replacement switch **(4),** making sure to attach wires to correct switch terminals **(7),** and remove tags **(5).**
3 Insert the replacement switch **(4)** through rear of front panel.
4 Using 5/8-inch socket wrench, secure switch to front panel with hex nut **(1).**
5 Replace power supply CCAs. (See TM 11-5805-706-12, paragraph 4-17.)
6 Replace power supply CCA compartment cover. (See TM 11-5805-706-12, paragraph 4-16.)

2-11. REMOVAL AND REPLACEMENT OF ALARM TEST SWITCH PROCEDURE



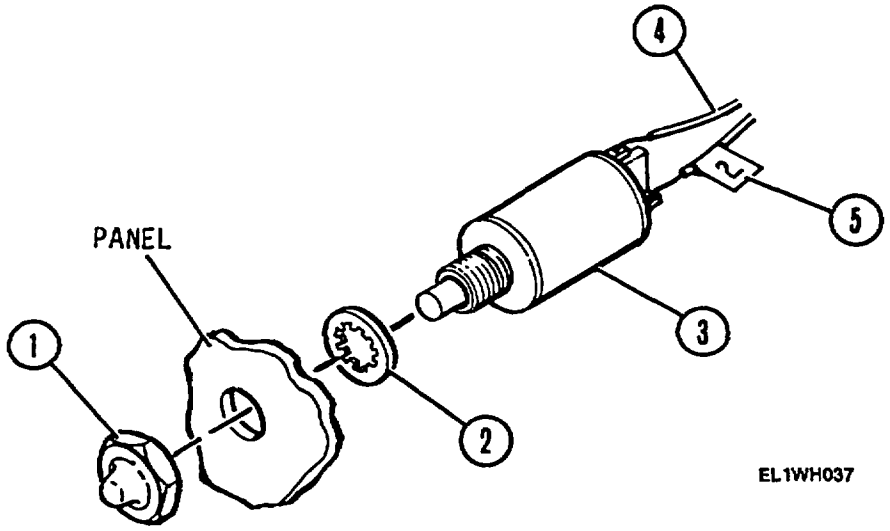
PRELIMINARY PROCEDURES

- Remove power supply CCA compartment cover. (See TM 11-5805-706-12, paragraph 4-16.)
- Remove power supply CCAs. (See TM 11-5805-706-12, paragraph 4-17.)

2-11. REMOVAL AND REPLACEMENT OF ALARM TEST SWITCH PROCEDURE -Continued

CAUTION

Caution should be taken not to damage the boot over the nut.



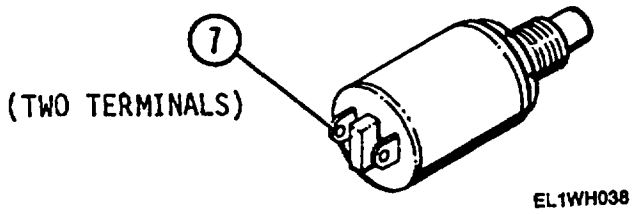
REMOVAL

1 Using 3/8-inch socket wrench, remove nut **(1).**

NOTE
When pushing switch through panel, insure that no hardware drops into case.

2 Push switch **(3)** and star washer **(2)** back through front panel and dress wires to allow access through CCA compartment opening for unsoldering.
3 Tag all wires **(4)** with masking tape **(5)** with switch name.
4 Unsolder all wires **(4)** and remove switch **(3).**

2-11. REMOVAL AND REPLACEMENT OF ALARM TEST SWITCH PROCEDURE -Continued



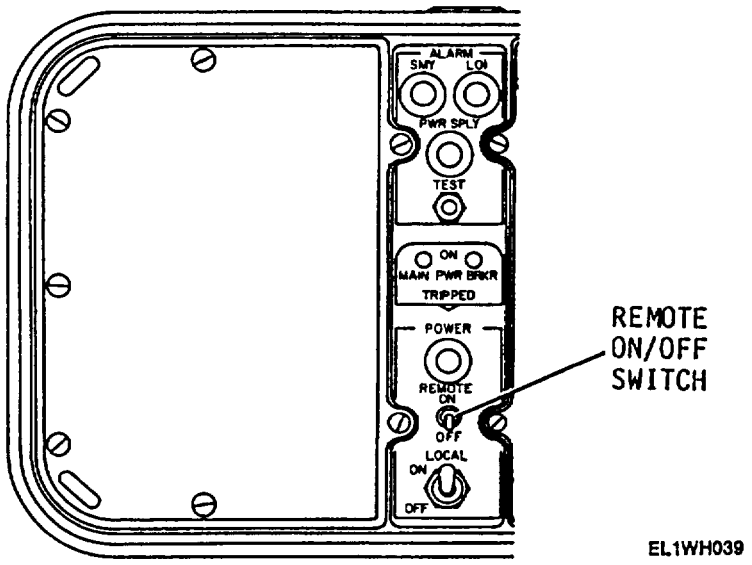
REPLACEMENT

NOTE

Before installation of new switch, verify its performance by performing the Operator Controls and Indicators Troubleshooting Procedures. (See paragraph 2-6.)

1 Prepare replacement switch **(3)** for installation by removing nut **(1)** and star washer **(2).**
2 Solder all wires **(4)** to replacement switch **(3),** and remove tags **(5).**
3 Insert replacement switch **(3)** through rear of front panel.
4 Using 3/8-inch socket wrench, secure switch **(3)** to front panel with hex nut **(1).**
5 Replace power supply CCAs. (See TM 11-5805-706-12, paragraph 4-17.)
6 Replace power supply CCA compartment cover. (See TM 11-5805-706-12, paragraph 4-16.)

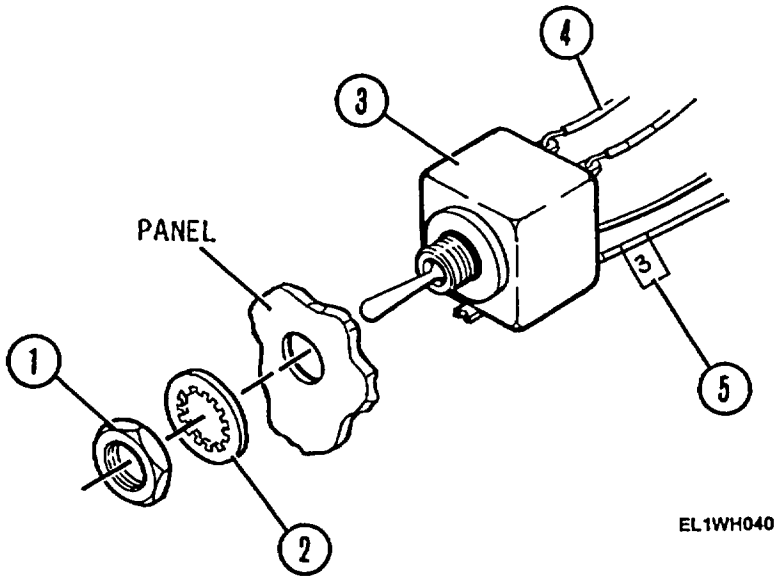
2-12. REMOVAL AND REPLACEMENT OF REMOTE POWER ON/OFF SWITCH PROCEDURE



PRELIMINARY PROCEDURES

- Remove power supply CCA compartment cover. (See TM 11-5805-706-12, paragraph 4-16.)
- Remove power supply CCAs. (See TM 11-5805-706-12, paragraph 4-17.)

2-12. REMOVAL AND REPLACEMENT OF REMOTE POWER ON/OFF SWITCH PROCEDURE-Continued



REMOVAL

1 Using 5/16-inch socket wrench, remove nut **(1)** and star washer **(2).**

NOTE
When pushing switch through panel, insure that no hardware drops into case.

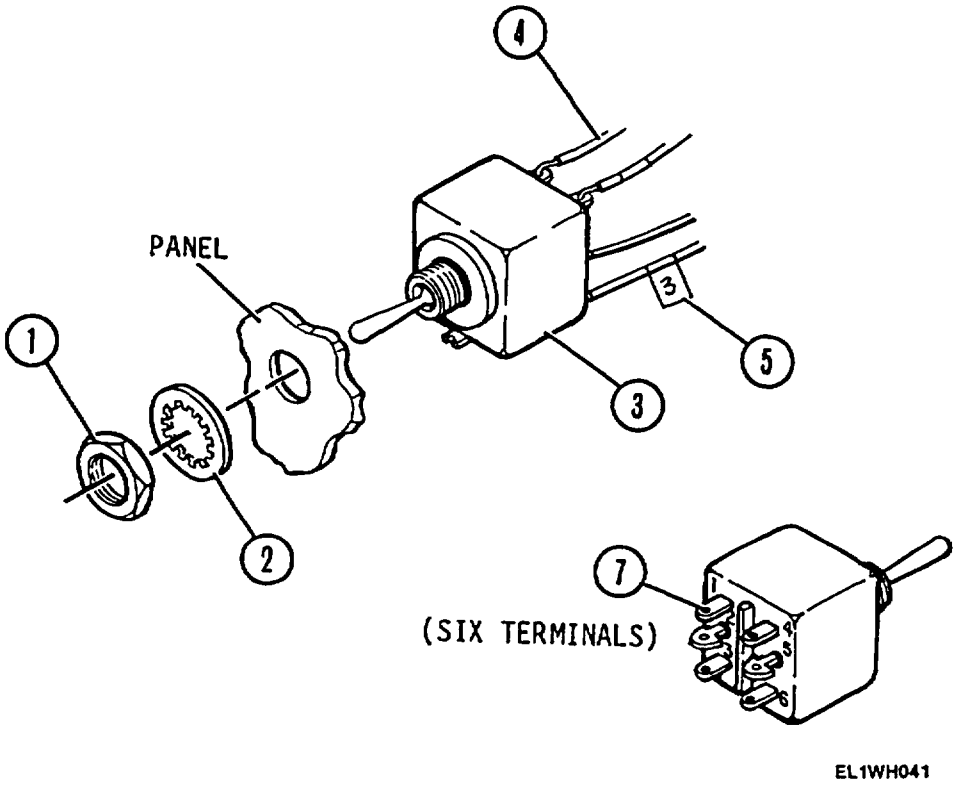
2 Push switch **(3)** back through front panel and dress wires to allow access through CCA compartment opening for unsoldering.
3 Tag all wires **(4)** with masking tape **(5)** and number.
4 Unsolder all wires **(4)** and remove switch **(3).**

REPLACEMENT

NOTE
Before installation of new switch, verify its performance by performing the Operator Controls and Indicators Troubleshooting Procedures. (See paragraph 2-6.)

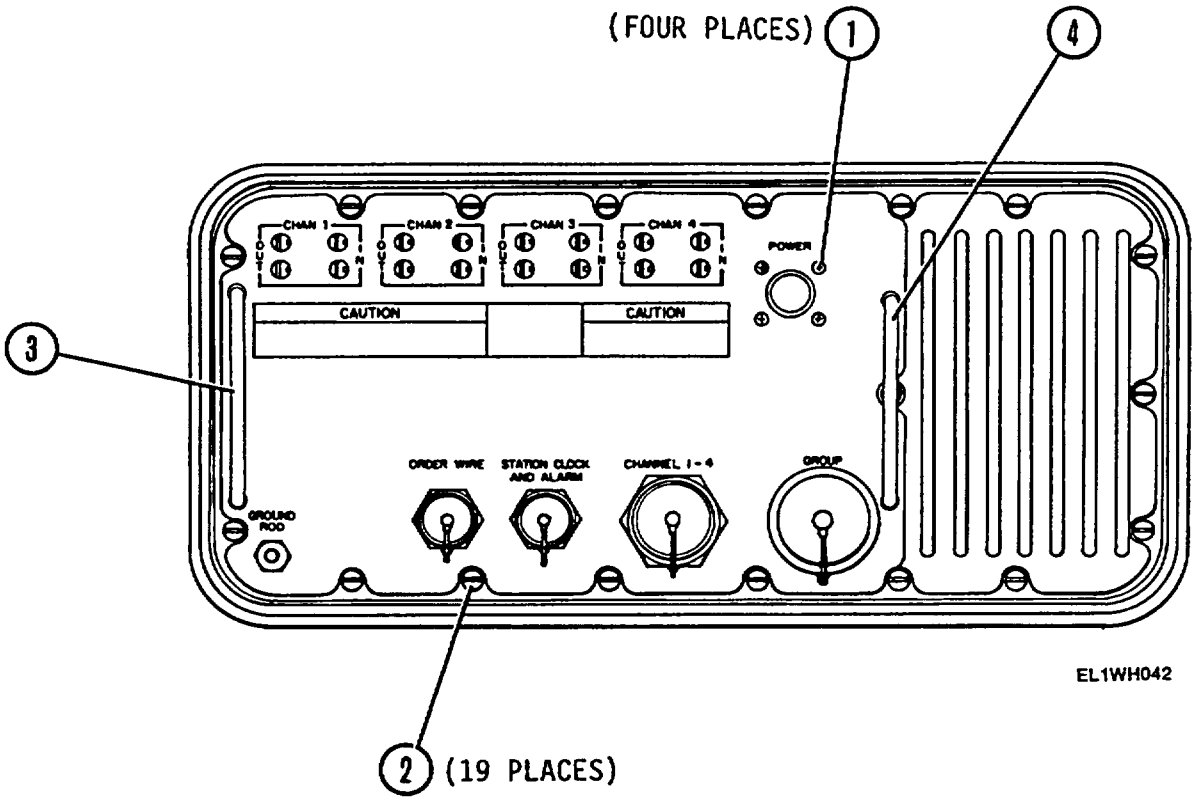
1 Prepare replacement switch (3) for installation by removing nut (1) and star washer (2).

2-12. REMOVAL AND REPLACEMENT OF REMOTE POWER ON/OFF SWITCH PROCEDURE-Continued



2 Solder all wires (4) to replacement switch (3), making sure to attach wires to correct switch terminals (7) and remove tags (5).
3 Insert replacement switch (3), with notch on bottom, through rear of front panel.
4 Using 5/16-inch socket wrench, secure switch (3) to front panel with star washer (2) and hex nut (1).
5 Replace power supply CCAs. (See TM 11-5805-706-12, paragraph 4-17.)
6 Replace power supply CCA compartment cover. (See TM 11-5805-706-12, paragraph 4-16.)

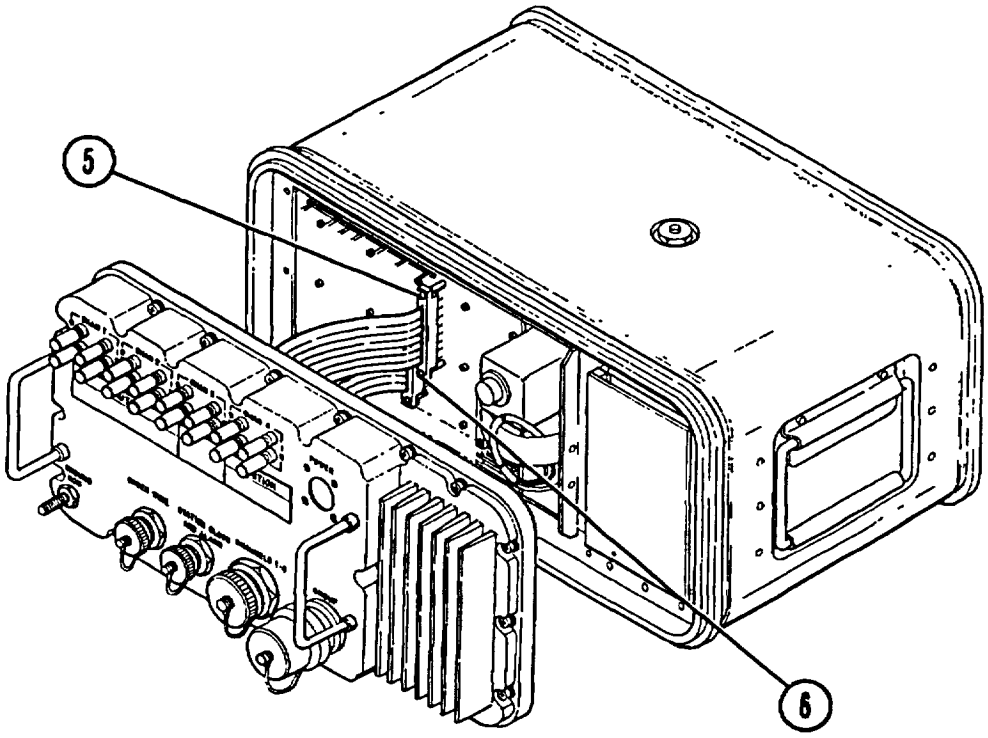
2-13. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY PROCEDURE



REMOVAL

1 Using No. 1 Phillips screwdriver, remove four screws **(1)** fastening rear cover assembly to EMI filter.
2 Using 3/8 x 8-inch flat blade screwdriver, loosen 19 captive screws **(2)** on rear cover assembly.
3 Grasp left handle **(3)** and right handle **(4)** and, while carefully pulling straight out, unseat and remove the rear cover assembly.

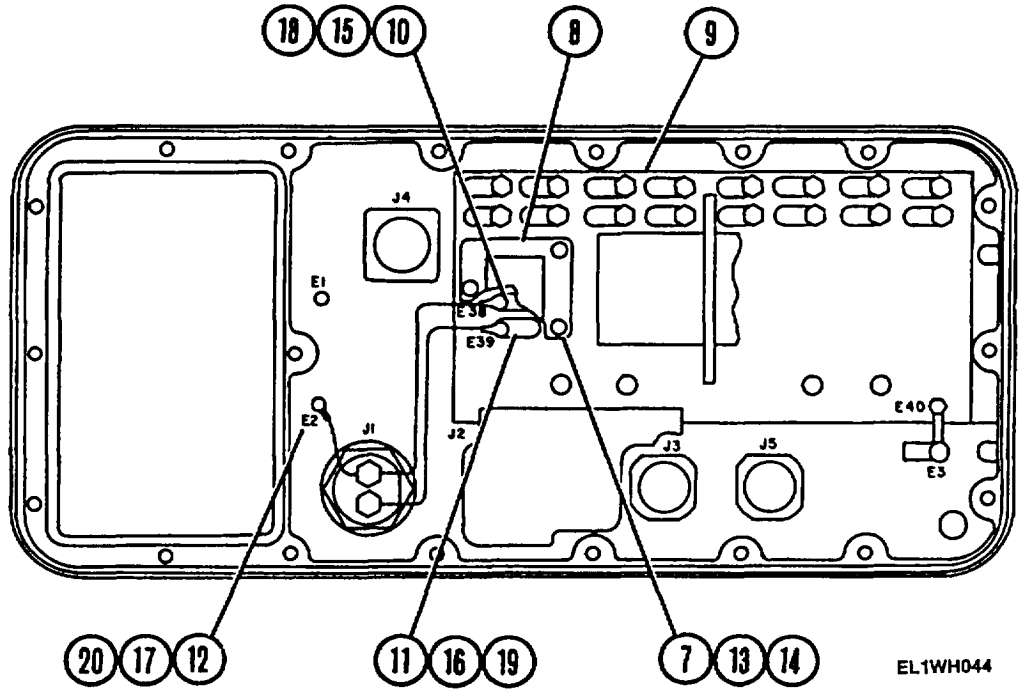
2-13. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY PROCEDURE -Continued



EL1WH043

4 Using No. 1 Phillips screwdriver, remove two machine screws, lockwashers, and flat washers at each of plugs P6 **(5)** and P7 **(6).** Disconnect plugs P6 **(5)** and P7 **(6).**

2-13. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY PROCEDURE-Continued



5 Using No. 1 Phillips screwdriver, remove the three screws **(7),** flat washers **(13),** and lockwashers **(14)**, which fasten protective cover **(8)** to surge arrestor pc board **(9)**.

6 Using 1/4-inch socket wrench, remove nut **(15)** and flat washer **(18)** from connection point E38 **(10).** Lift wire connecting rear cover assembly to RLGM backplane and tag "E38." Reinstall flat washer **(18)** and nut **(15)** finger tight to prevent loss.

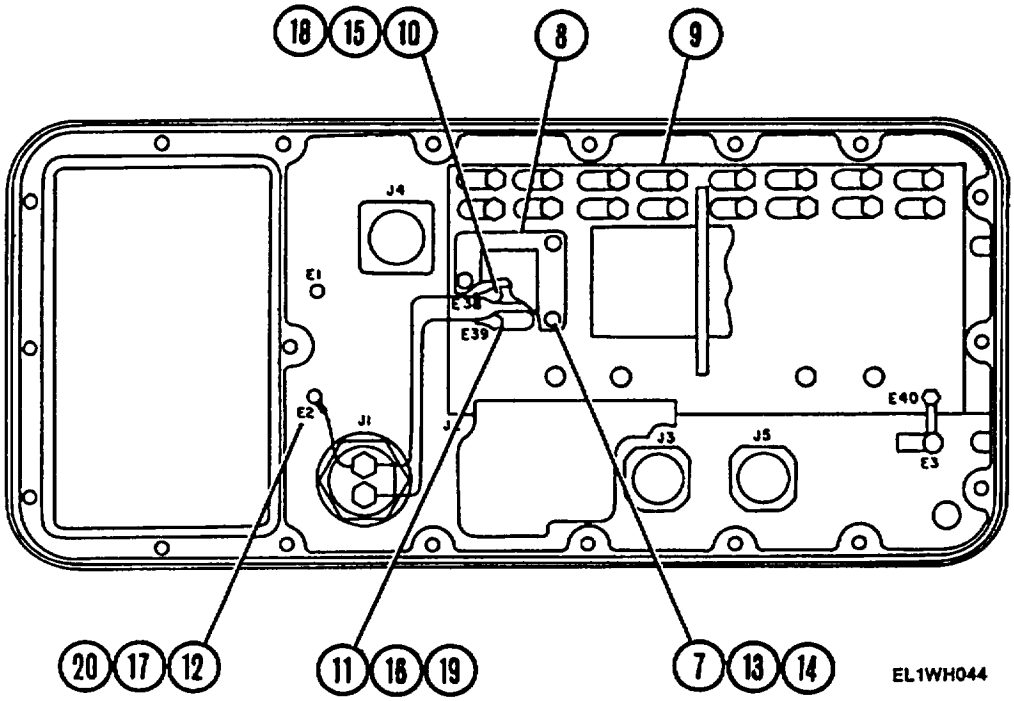
7 Using 1/4-inch socket wrench, remove nut **(16)** and flat washer **(19)** from connection point E39 **(11).** Lift wire connecting rear cover assembly to RLGM backplane and tag "E39." Reinstall nut **(16)** and flat washer **(19)** finger tight to prevent loss.

8 Using No. 1 Phillips screwdriver, remove machine screw **(17)** and washer **(20)** at connection point E2 **(12).** Lift two wires connecting rear cover assembly to RLGM backplane and tag "E2." Reinstall flat washer **(20)** and screw **(17)** to prevent loss.

9 Using No. 1 Phillips screwdriver, reinstall protective cover **(8),** using three machine screws **(7),** flat washers **(13)**, and lockwashers **(14).**

2-13. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY PROCEDURE-Continued

REPLACEMENT



1 Using No. 1 Phillips screwdriver, remove three screws **(7),** three flat washer **(13),** and three lockwashers **(14)** which fasten protective cover **(8)** to surge arrestor pc board **(9)**.

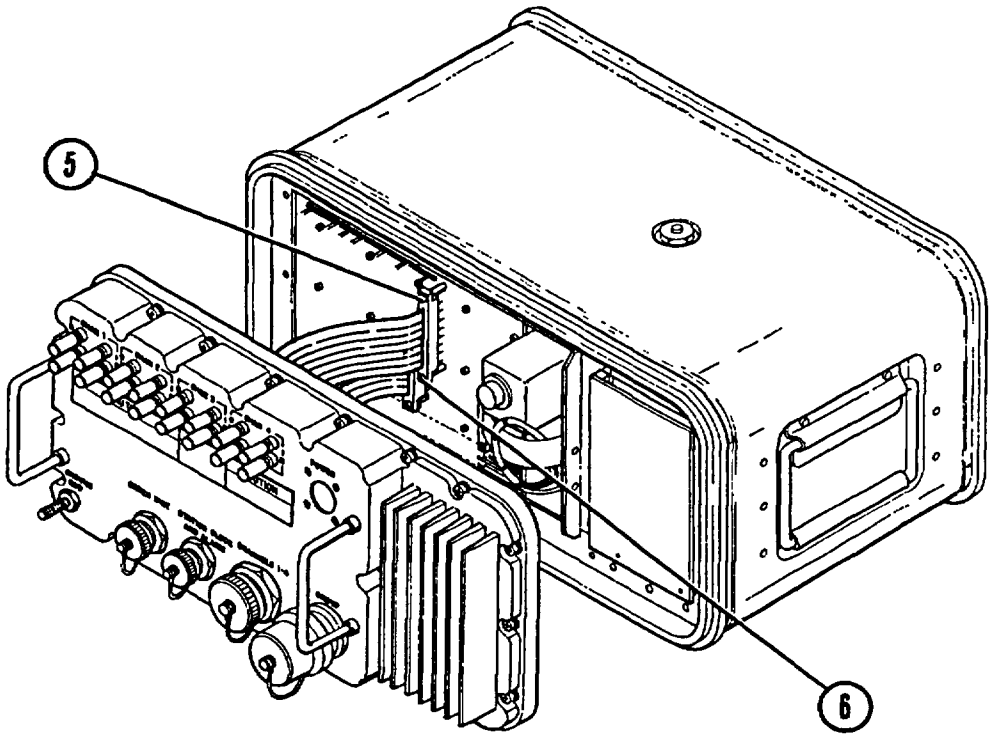
2 Using 1/4-inch socket wrench, remove nut **(15)** and flat washer **(18)** from connection point E38 **(10).** Install wire tagged "E38" from RLGM backplane. Reinstall flat washer **(18)** and nut **(15),** but do not overtighten.

3 Using 1/4-inch socket wrench, remove nut **(16)** and flat washer **(19)** from connection point E39 **(11).** Install wire tagged "E39" from RLGM backplane. Reinstall flat washer **(19)** and nut **(16)** but do not overtighten.

4 Using No. 1 Phillips screwdriver, remove machine screw **(17)** and flat washer at connection point E2 **(12).** Install two wires tagged "E2" from RLGM backplane. Reinstall flat washer **(20)** and machine screw **(17),** but do not overtighten.

2-13. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY PROCEDURE-Continued

5 Using No. 1 Phillips screwdriver, reinstall protective cover **(8**), using three machine screws **(7)**, flat washers **(13)**, and lockwashers **(14)**. Do not overtighten.

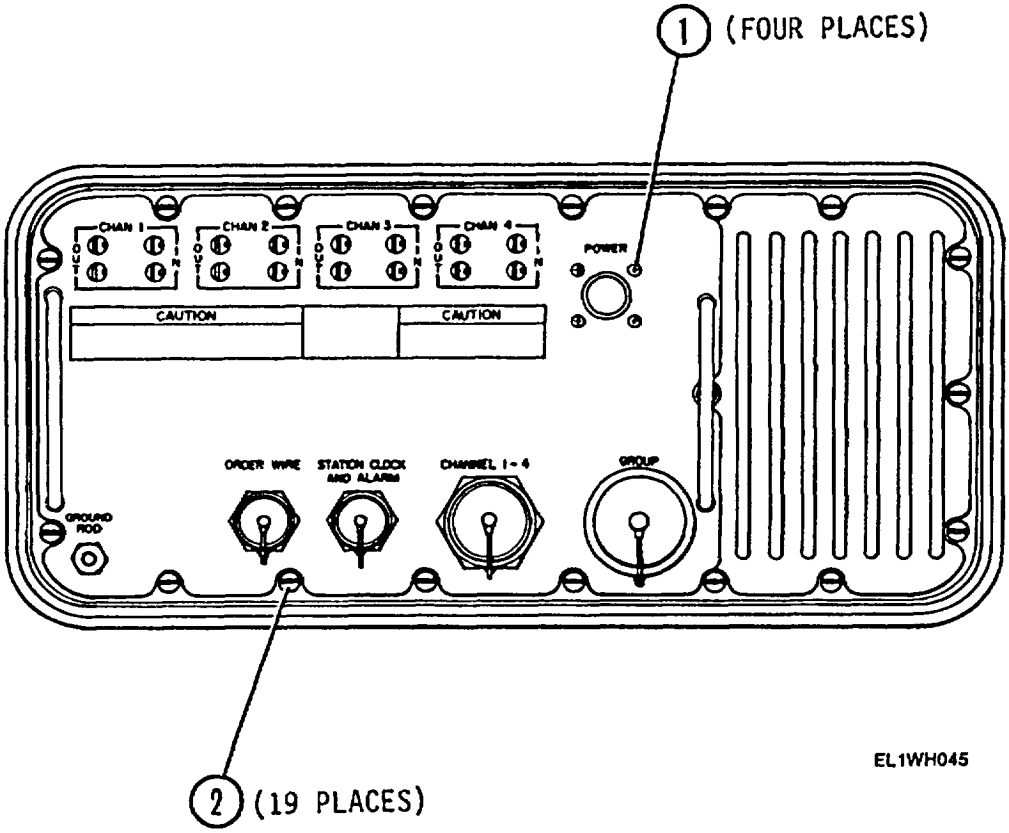


EL1WH043

6 Using 2-inch No. 1 Phillips screwdriver, connect plug P6 **(5)** and plug P7 **(6)** to RLGM backplane. Install two machine screws, lockwashers, and flat washers at each plug; tighten, but do not overtighten.

7 Position replacement rear cover assembly carefully into opening and press into place.

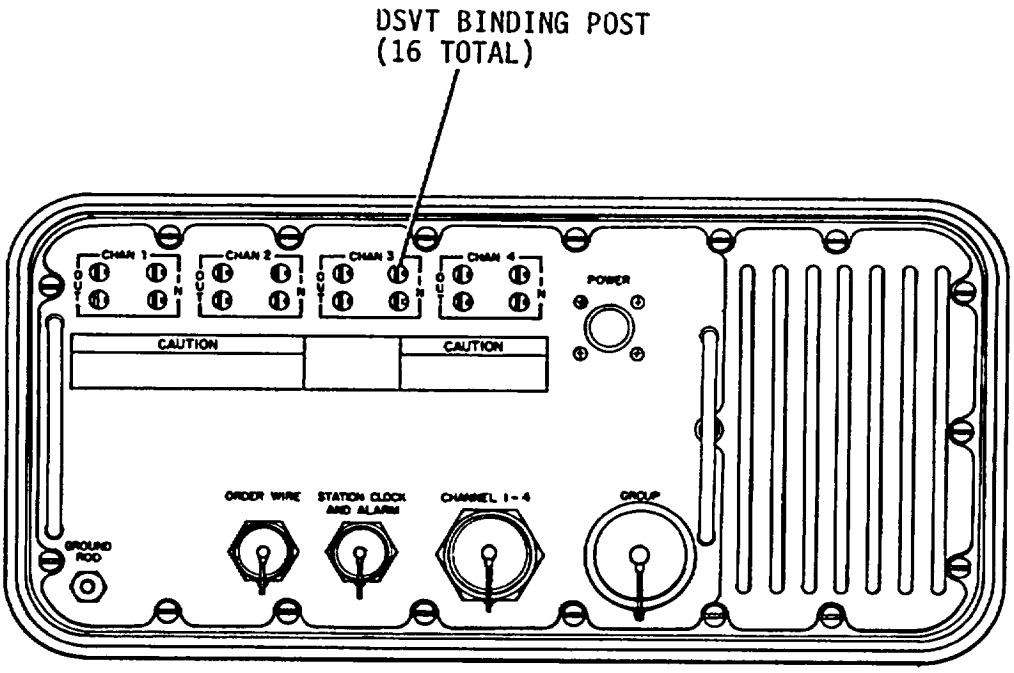
2-13. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY PROCEDURE-Continued



8 Using 3/8 x 8-inch flat blade screwdriver, tighten 19 captive screws **(2)** on rear cover assembly. Do not overtighten.

9 Using No. 1 Phillips screwdriver, install four screws **(1)** fastening rear, rear cover assembly to EMI filter. Do not overtighten.

2-14. REMOVAL AND REPLACEMENT OF DSVT BINDING POSTS PROCEDURE

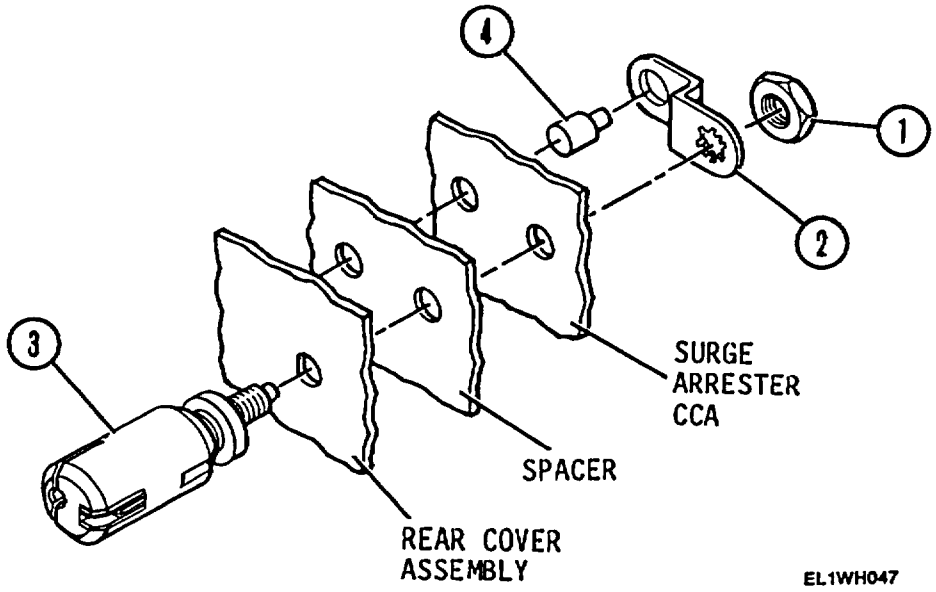


EL1WH046

PRELIMINARY PROCEDURE

- Remove rear cover assembly. (See paragraph 2-13.)

2-14. REMOVAL AND REPLACEMENT OF DSVT BINDING POSTS PROCEDURE -Continued



REMOVAL

1 Using 11/32-inch socket wrench, remove locknut **(1)** surge arrester retaining clip **(2)** and surge arrester **(4)** at inside rear cover assembly.

2 Remove binding post **(3)** at outside of rear cover assembly.

3 Prepare replacement binding post by removing locknut **(1)**.

REPLACEMENT

1 Insert binding post **(3)** into outside of rear cover assembly.

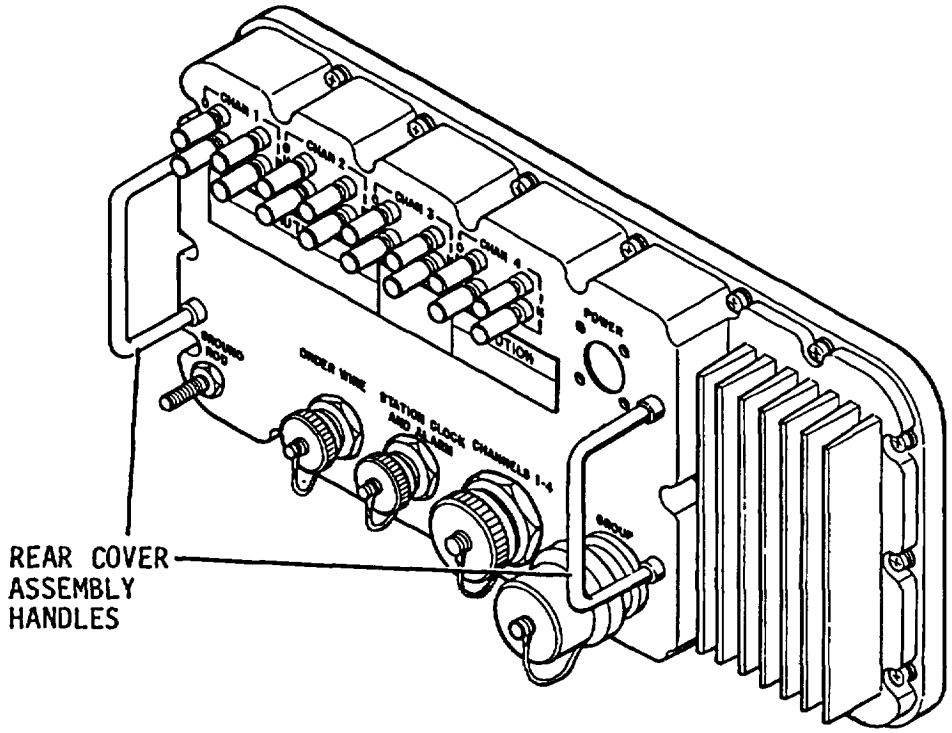
2 Install surge arrester **(4)** surge arrester retaining clip **(2)**, and locknut **(1)**. Tighten locknut, but do not overtighten.

NOTE

Before installing rear cover assembly, verify DSVT repair by performing Rear Cover Assembly Troubleshooting Procedures. (See paragraph 2-5.)

3 Replace rear cover assembly. (See paragraph 2-13.)

2-15. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY HANDLES PROCEDURE

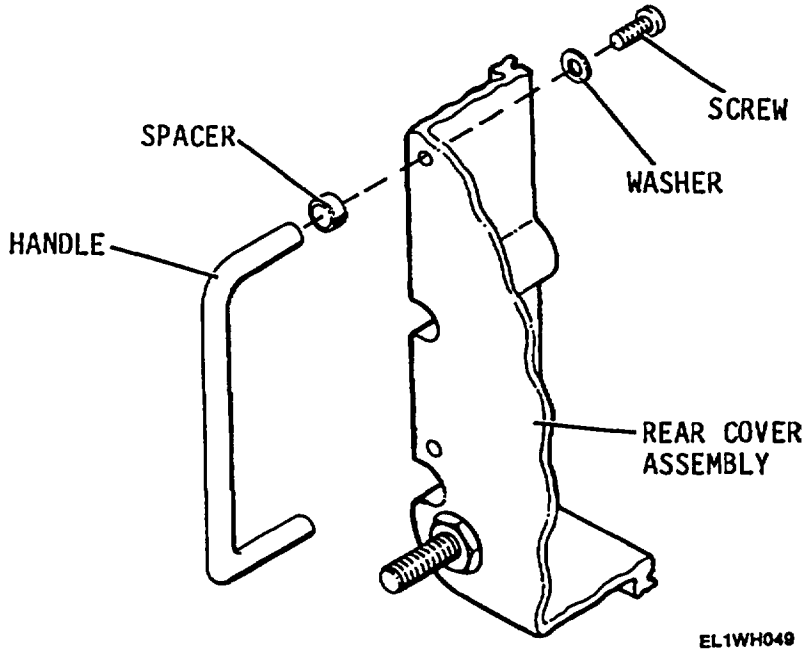


EL1WH048

PRELIMINARY PROCEDURE

1 Remove rear connector panel assembly. (See paragraph 2-13.)

2-15. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY HANDLES PROCEDURE-Continued



REMOVAL

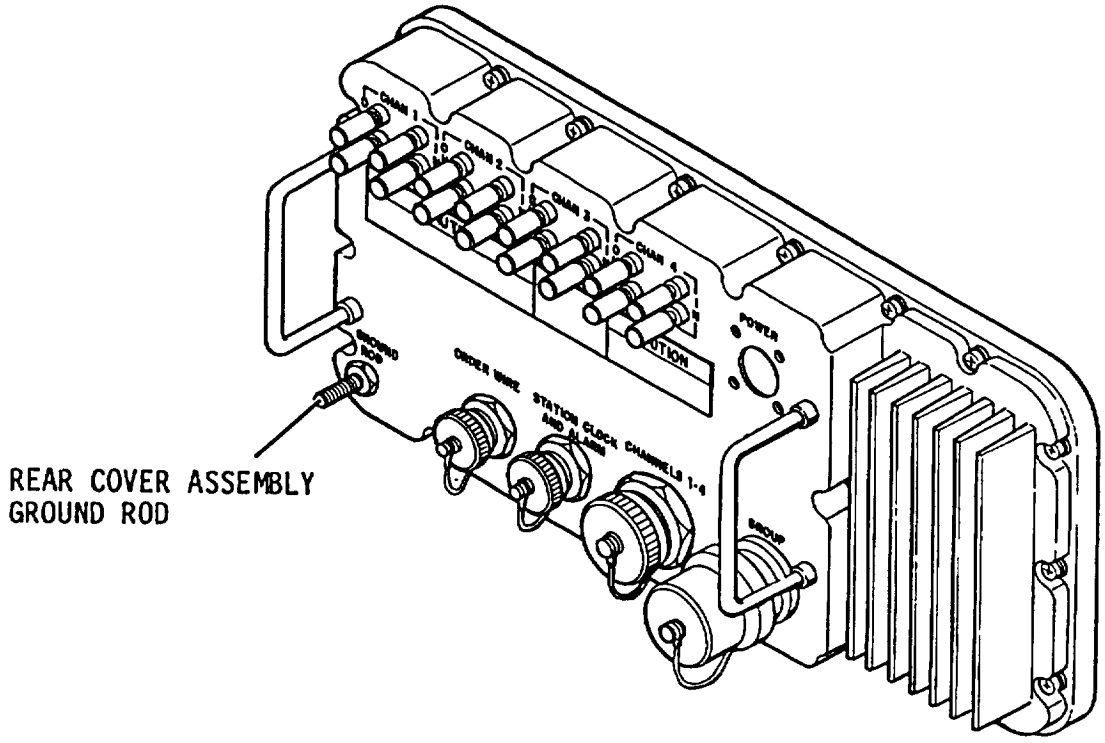
- Using No. 2 Phillips screwdriver, remove Phillips head screws and washers securing handles to rear cover assembly.

REPLACEMENT

1 Position replacement handles on rear cover assembly and secure using Phillips head screws and washers.

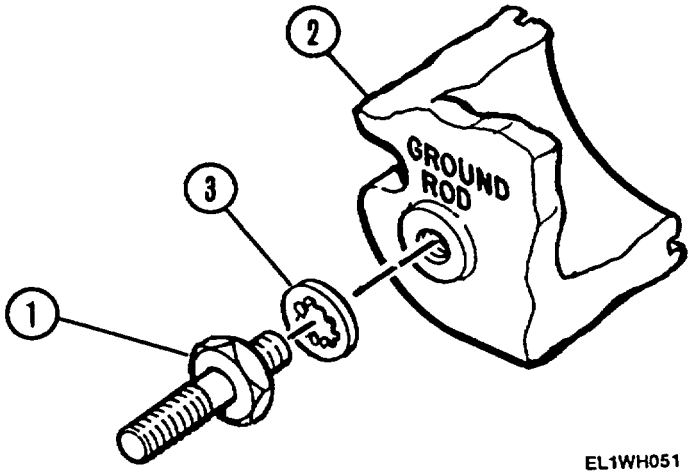
2 Carefully replace rear cover assembly. (See paragraph 2-13.)

2-16. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY GROUND ROD PROCEDURE

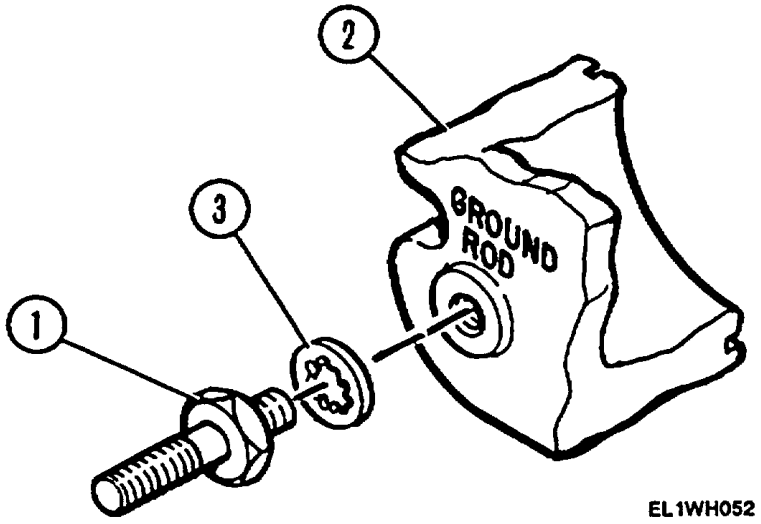


REMOVAL

1 Using 9/16-inch open-end wrench, unscrew ground terminal **(1)** from rear cover assembly **(2)**. Retain star washer **(3)**.



2-16. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY GROUND ROD PROCEDURE-Continued



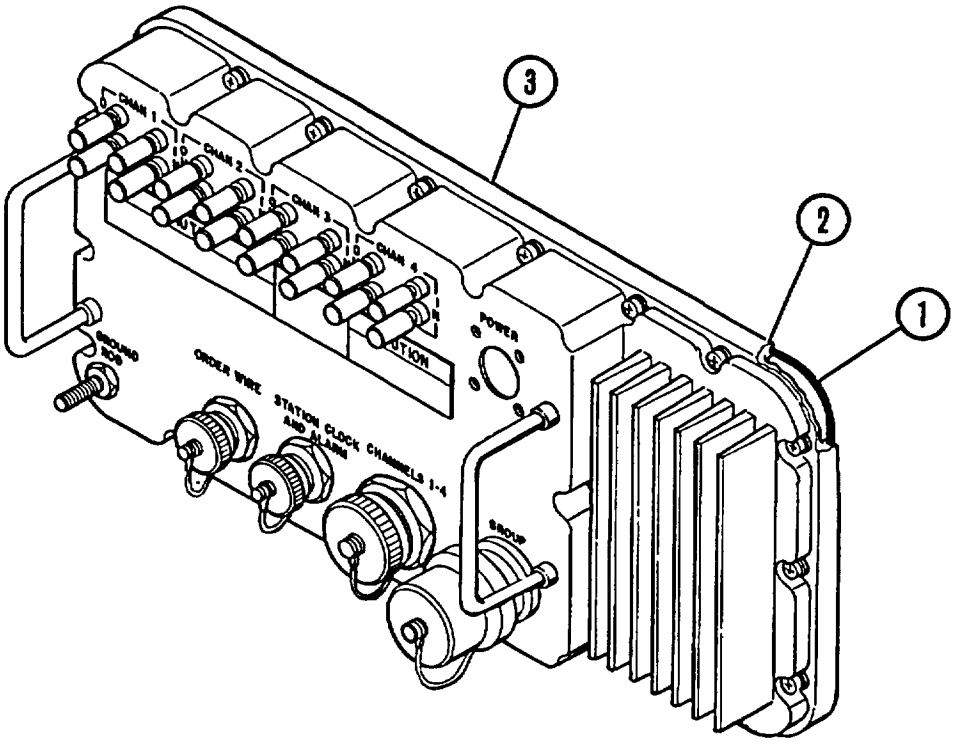
2 Apply primer and sealing compound to shorter threaded end of terminal **(1)**.

REPLACEMENT

1 To replace ground rod assembly, install star washer **(3)** over shorter end of terminal.

2 Screw shorter of end of terminal **(1)** with star washer **(3)** attached into threaded hole on rear cover assembly **(2)**. Tighten with 9/16-inch open-end wrench, but do not overtighten.

2-17. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY PANEL GASKET PROCEDURE



EL1WH053

PRELIMINARY PROCEDURE

- Remove rear cover assembly. (See paragraph 2-13.)

REMOVAL

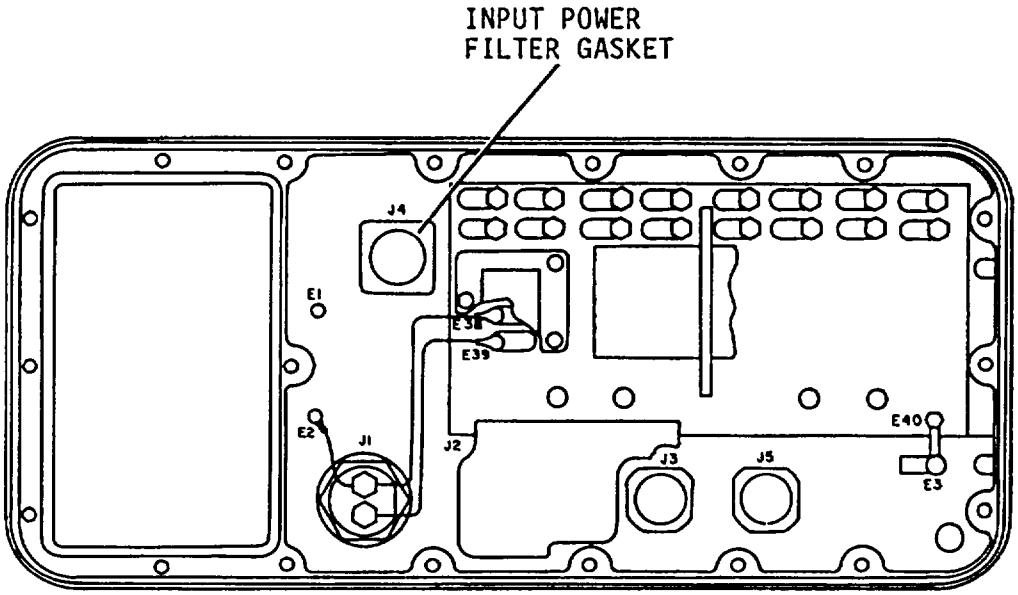
- Remove O-ring panel gasket **(1)** from slot **(2)** extending around edge of inside surface of rear cover assembly **(3)**.

REPLACEMENT

1 Press new O-ring **(1)** into slot **(2)**.

2 Replace rear cover assembly **(3)**. (See paragraph 2-13.)

2-18. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY INPUT POWER FILTER GASKET PROCEDURE

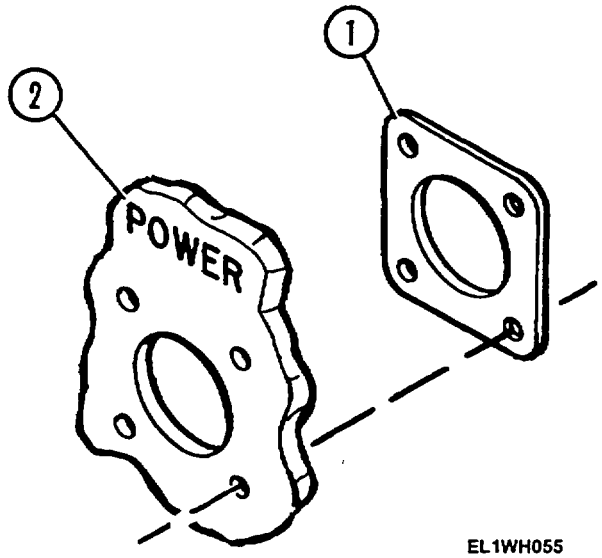


EL1WH054

PRELIMINARY PROCEDURE

- Remove rear cover assembly. (See paragraph 2-13.) Note that plugs P6 and P7 need not be disconnected to replace input power filter gasket.

2-18. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY INPUT POWER FILTER GASKET PROCEDURE-Continued



REMOVAL

- Using flat bladed screwdriver, carefully scrape old gasket **(1)** away from rear cover assembly J4 gasket surface **(2)**. Remove all existing material and adhesive, taking care not to damage the rear cover assembly metal surface.

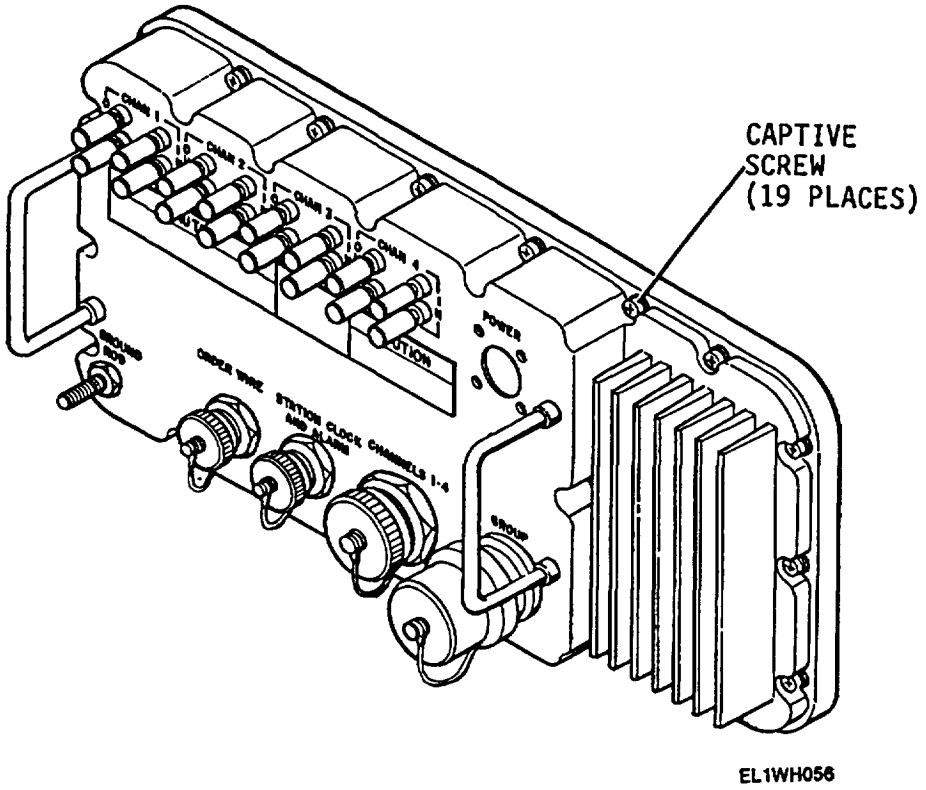
REPLACEMENT

1 Apply a thin coat of gasket adhesive to one surface of replacement gasket **(1)**.

2 Press replacement gasket **(1)** into place on rear cover assembly gasket surface **(2)**. Allow 15 minutes adhesive cure time.

3 Replace rear cover assembly. (See paragraph 2-13.)

2-19. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY CAPTIVE SCREWS PROCEDURE



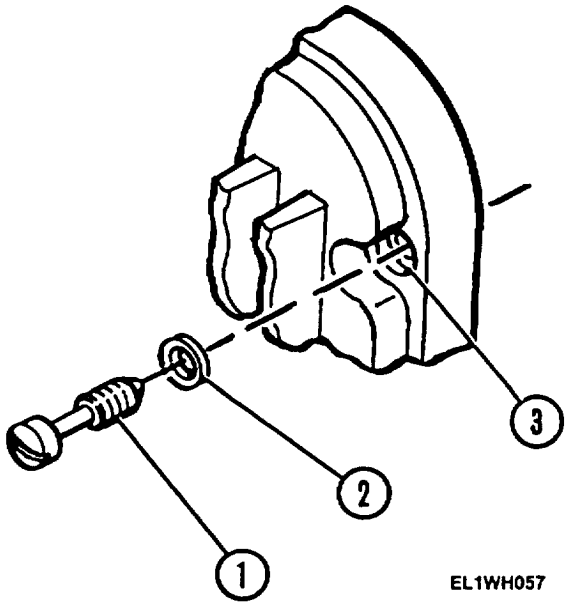
PRELIMINARY PROCEDURE

- Remove rear cover assembly. (See paragraph 2-13.) Note that plugs P6 and P7 do not need to be disconnected to replace captive screws.

NOTE

If screw head is damaged such that screw cannot be unscrewed from assembled RLGM, forward RLGM to next higher maintenance level.

2-19. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY CAPTIVE SCREWS PROCEDURE-Continued



REMOVAL

1 Damaged screw head. Grasp head of screw **(1)**, pull out until engaged in rear cover assembly threaded hole **(2)**, and turn counterclockwise until screw comes loose from rear cover assembly. Retain old flat washer **(3)**.

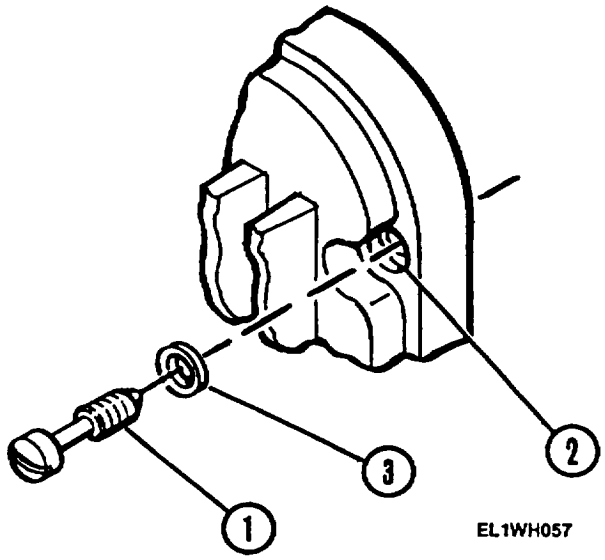
2 Lightly damaged screw threads. Using 1/4 x 4-inch flat blade screwdriver, unscrew captive screw **(1)** from rear cover assembly threaded hole **(2)** using short, back-and-forth unscrewing movements.

CAUTION

If captive screw resists removal with moderate pressure applied, complete rear cover assembly removal (paragraph 2-13), and forward rear cover assembly to next higher maintenance level.

2-19. REMOVAL AND REPLACEMENT OF REAR COVER ASSEMBLY CAPTIVE SCREWS PROCEDURE-Continued

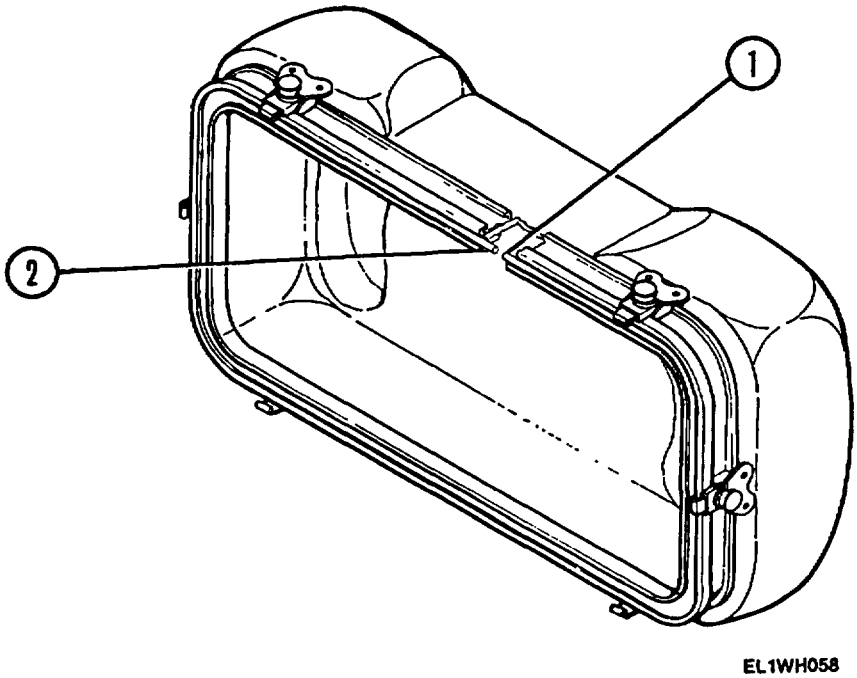
REPLACEMENT



1 Using 1/4 x 4-inch flat blade screwdriver, insert new captive screw **(1)** and flatwasher **(3)** into rear cover assembly threaded hole **(2)**.

2 Replace rear cover assembly. (See paragraph 2-13.)

2-20. REMOVAL AND REPLACEMENT OF TRANSPORT COVER GASKET PROCEDURE



PRELIMINARY PROCEDURE

NOTE

O-ring gaskets and removal and replacement procedures are identical for front and rear covers.

- Unlatch and remove transport cover(s) from RLGM, if fastened.

REMOVAL

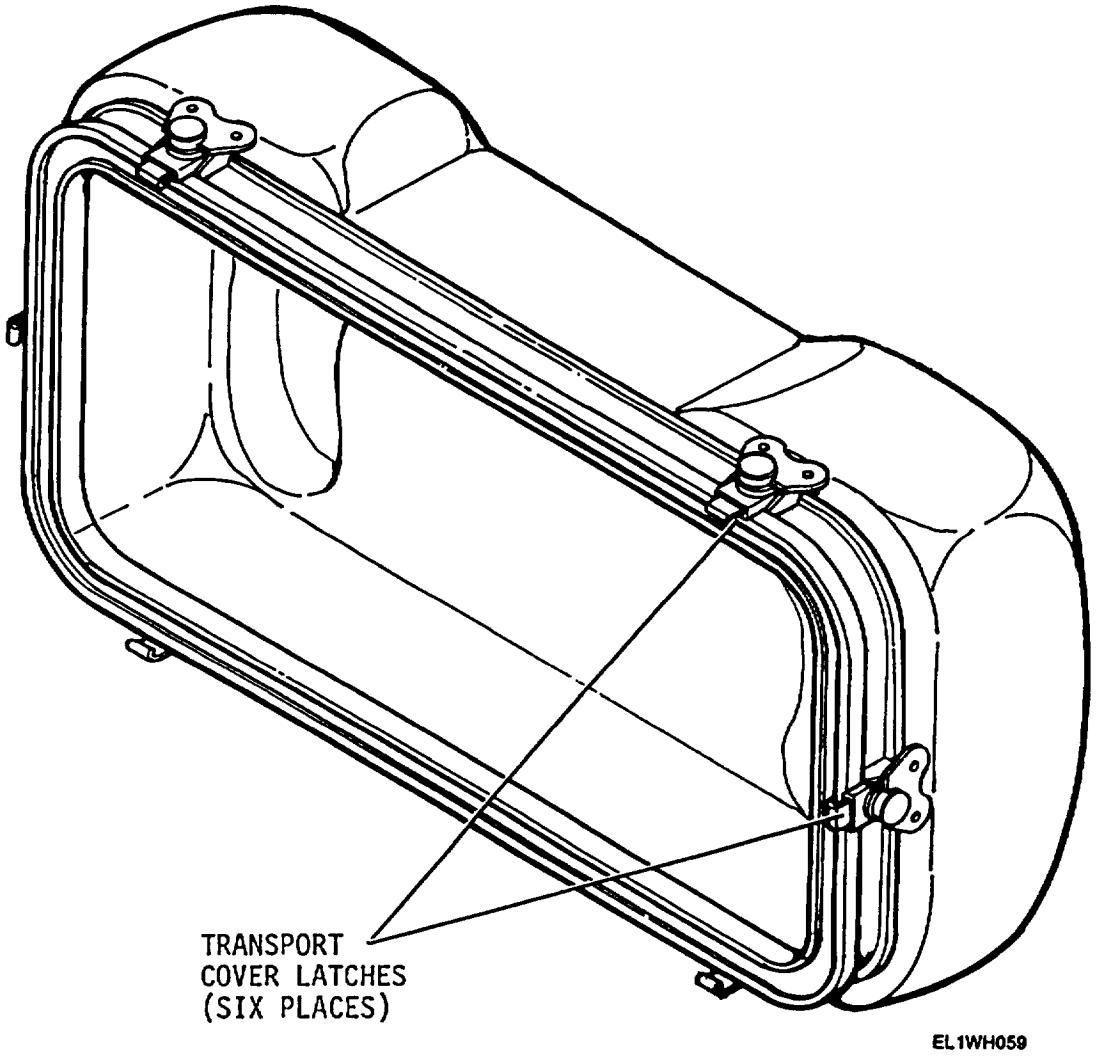
- Pull existing O-ring **(1)** from transport cover slot **(2)** extending around edge of transport cover.

REPLACEMENT

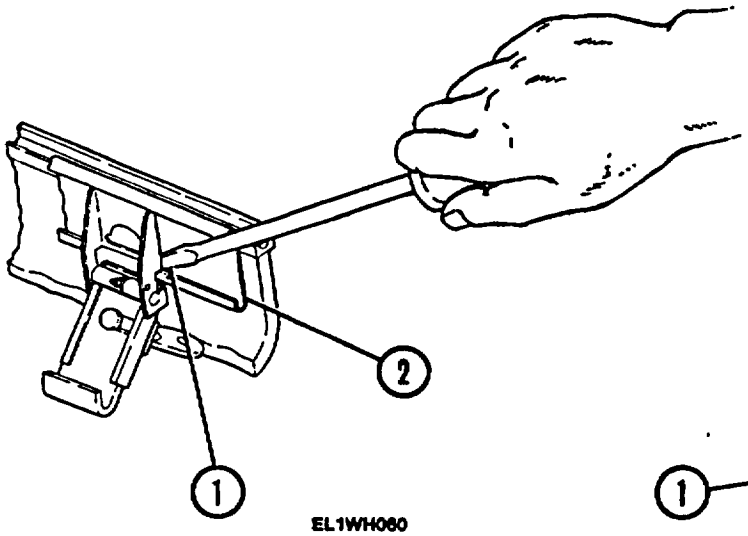
1 Press new O-ring **(1)** into slot **(2)**.

2 Transport cover may now be fastened to RLGM.

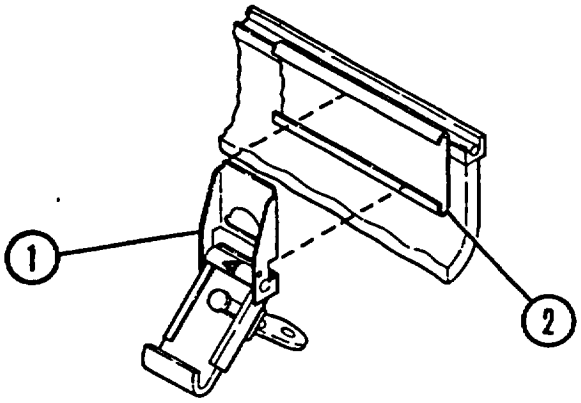
2-21. REMOVAL AND REPLACEMENT OF TRANSPORT COVER LATCHES PROCEDURE



2-21. REMOVAL AND REPLACEMENT OF TRANSPORT COVER LATCHES PROCEDURE - Continued



EL1WH060



EL1WH061

REMOVAL

1 Using 3/8 x 8-inch flat blade screwdriver, work screwdriver between inner surface of latch **(1)** and transport cover closure band **(2)** at hinge side of latch.

2 With a quick prying motion, snap latch **(1)** free from transport cover closure band **(2)**.

NOTE

Snapping the latch free may cause a slight nick in the transport cover closure band.

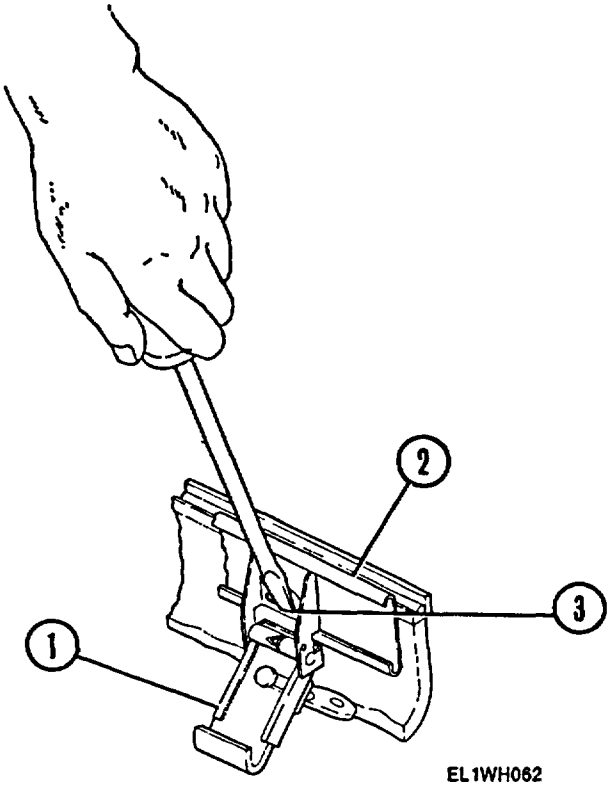
2-21. REMOVAL AND REPLACEMENT OF TRANSPORT COVER LATCHES PROCEDURE - Continued

REPLACEMENT

1 Insert latch **(1)** into desired position at transport cover closure band **(2)**.

NOTE

If nicking of the transport cover closure band occurred during latch removal, position replacement latch slightly to the side of the nick.



2 Position 3/8 x 8-inch flat blade screwdriver at latch expansion plate **(3)** and with a quick, hammering motion, fasten latch **(1)** onto transport cover closure band **(2)**.

CHAPTER 3
MAINTENANCE INSTRUCTIONS FOR GENERAL SUPPORT

General support maintenance is performed at a special repair facility using Electronic Equipment Test Station AN/USM-410 and Digital Card Tester AN/USM 465A. Appropriate CCA repair instructions will provided in a separate publication.

APPENDIX A
REFERENCES

A-1. SCOPE

This appendix lists all forms, technical publications, and miscellaneous publications referenced in the manual.

A-2. FORMS

Technical Order System Publication Improvement Report and Reply	AFTO Form 22
Recommended Changes to Publications and Blank Forms	DA Form 2028
Recommended Changes to Equipment Technical Publications	DA Form 2028-2
Equipment Inspection and Maintenance Worksheet	DA Form 2404
Transportation Discrepancy Report (TDR)	SF 361
Report of Discrepancy (ROD)	SF 364
Manual Deficiency Report (Category 1)	DA Form 173
Product Quality Deficiency Report (Category 2)	SF 368

A-3. TECHNICAL MANUALS

Procedures for Destruction of Electronic Materiel to Prevent Enemy Use (Electronics Command)	TM 750-244-2
Operator and Organizational Maintenance Manual, Multiplexer TD-1233(P)/TTC	TM 11-5805-706-12
Organization, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Multiplexer TD-1233(P)/TTC (NSN 5820-01-145-2462)	TM 11-5805-706-24P

A-4. REGULATIONS

Report of Transportation Discrepancies in Shipments	AR 55-38
Reporting of Item and Packaging Discrepancies	AR 735-11-2

A-5. MISCELLANEOUS PUBLICATIONS

Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)	CTA 50-970
Consolidated Index of Army Publications and Blank Forms	DA Pam 25-30
The Amy Maintenance Management System (TAMMS)	DA Pam 738-750
Federal Supply Code for Manufacturers (FSCM)	SB 708-41/42

APPENDIX B
EXPENDABLE SUPPLIES AND MATERIALS LIST

SECTION I. INTRODUCTION

B-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the TD-1233(P)/TTC. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

B-2. EXPLANATION OF COLUMNS

a. Column 1, Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "use cleaning rag, item 2, Appendix B").

b. Column 2, Level. This column identifies the lowest level of maintenance that requires the listed item.

C	Operator or Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance

c. Column 3, National Stock Number. This is the National Stock Number assigned to the item; use it to request or requisition the item.

d. Column 4, Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column 5, Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	0	6850-00-105-3084	Cleaning compound, tri-chlorotrifluoroethane (80244) MIL-C-81302	pt
2	0	8305-00-267-3015	Cheesecloth (81348) CCCC440	yd

APPENDIX C
WIRE RUN LISTS

C-1. ORGANIZATION OF WIRING DATA

This appendix contains wiring information for the electrical connector assembly contained in the RLGM. Signal names in the wire run list are specific to the RLGM; therefore, the correlation of signal names between the schematic and wire run list is not always exact.

The wiring data is listed in groups and provides the to-from terminations and the level of each wire. The groups are identified by signal name. Within each signal name group, wires are identified by a wire number. The listing is arranged in alphanumeric sequence by signal name, and in numeric sequence of wire numbers within the signal name group.

Coaxial twisted-pair wires are arranged in pairs within each signal name. Both wires bear the same wire number and level. In a twisted pair, the wire going to ground is always the secondary wire. In a coaxial wire, the center conductor is always the primary wire.

Some input/output pins shown on schematic diagrams are not used in all applications. Only those pins used are listed in the wire run list. Use the wire run list as a guide for pin usage in each application. Refer to interconnection diagram of the equipment for a cross reference of XA-designation to A-designation. The interconnection diagram also shows any additional CCA input/output pins that are used.

The wire list is broken down as follows:

- Interconnection from CCA to CCA or connector. All wires are on level 1 (pages C-2 to C-9).
- Interconnection from CCA to CCA or connector. All wires are on level 2 (pages C-10 to C-13).
- Interconnection of any twisted pairs. All wires are on level 1 (page C-14).

C-2. NON-STANDARD ABBREVIATIONS AND ENTRIES

ZLVL - Level at which the wire is placed on the wire pin. Level 1 is nearest to the panel and subsequent levels are in ascending order away from the panel.

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
AA1JMPR01	WH	3.5	XA	0006-0018	XA	0006-0013
AA1JMPR02	WH	3.5	XA	0006-0016	XA	0006-0069
AA1JMPR03	WH	4.0	XA	0006-0095	XA	0006-0031
AA1JMPR04	WH	4.0	XA	0006-0102	XA	0006-0040
AA2JMPR01	WH	3.5	XA	0007-0018	XA	0007-0013
AA2JMPR02	WH	3.5	XA	0007-0016	XA	0007-0069
AA2JMPR03	WH	4.0	XA	0007-0096	XA	0007-0031
AA2JMPR04	WH	4.0	XA	0007-0102	XA	0007-0040
BTB00N	WH	7.0	XA	0005-0007	XA	0006-0094
BTB00N	WH	7.0	XA	0007-0094	XA	0008-0066
BTB00N	WH	5.0	XA	0009-0070	XA	0010-0081
BTB01N	WH	6.5	XA	0005-0102	XA	0006-0077
BTB01N	WH	5.0	XA	0007-0077	XA	0008-0010
BTB01N	WH	5.0	XA	0009-0073	XA	0010-0027
BTB02N	WH	4.5	XA	0005-0090	XA	0006-0097
BTB02N	WH	7.0	XA	0007-0097	XA	0008-0013
BTB02N	WH	5.0	XA	0009-0072	XA	0010-0028
BTB03N	WH	5.0	XA	0005-0046	XA	0006-0037
BTB03N	WH	6.5	XA	0007-0037	XA	0008-0067
BTB03N	WH	4.0	XA	0009-0075	XA	0010-0076
BTB04N	WH	5.0	XA	0005-0045	XA	0006-0092
BTB05N	WH	5.0	XA	0005-0047	XA	0006-0093
BTB06N	WH	6.5	XA	0005-0100	XA	0006-0073
BTB07N	WH	6.5	XA	0005-0101	XA	0006-0078

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
BTB08N	WH	4.0	XA	0005-0043	XA	0006-0099
BTB08N	WH	4.5	XA	0007-0099	XA	0008-0049
BTB08N	WH	5.5	XA	0009-0068	XA	0010-0088
BTB09N	WH	7.0	XA	0005-0044	XA	0006-0015
BTB09N	WH	7.5	XA	0007-0015	XA	0008-0048
BTB09N	WH	5.5	XA	0009-0010	XA	0010-0084
BTB10N	WH	4.0	XA	0005-0096	XA	0006-0098
BTB10N	WH	4.5	XA	0007-0098	XA	0008-0103
BTB10N	WH	5.0	XA	0009-0071	XA	0010-0086
BTB11N	WH	6.0	XA	0005-0037	XA	0006-0071
BTB11N	WH	7.5	XA	0007-0071	XA	0008-0047
BTB11N	WH	4.0	XA	0009-0077	XA	0010-0079
BTB12N	WH	4.5	XA	0005-0097	XA	0006-0100
BTB12N	WH	4.5	XA	0007-0100	XA	0008-0104
BTB12N	WH	5.0	XA	0009-0069	XA	0010-0080
BTB13N	WH	4.5	XA	0005-0098	XA	0006-0036
BTB13N	WH	5.5	XA	0007-0036	XA	0008-0050
BTB13N	WH	5.0	XA	0009-0064	XA	0010-0075
BTB14N	WH	7.0	XA	0005-0099	XA	0006-0014
BTB14N	WH	4.0	XA	0007-0014	XA	0008-0071
BTB14N	WH	4.0	XA	0009-0074	XA	0010-0078
BTB15N	WH	4.5	XA	0005-0042	XA	0006-0038
BTB15N	WH	6.0	XA	0007-0038	XA	0008-0072
BTB15N	WH	4.0	XA	0009-0076	XA	0010-0020

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
BTC10CKA	WH	7.5	XA	0005-0105	XA	0005-0063
BTEN0N	WH	3.5	XA	0005-0014	XA	0005-0066
BTEB0N	WH	7.0	XA	0005-0017	XA	0010-0077
BTEN1N	WH	8.5	XA	0005-0019	XA	0011-0066
BTEN2N	WH	4.0	XA	0005-0076	XA	0005-0013
BTEN3N	WH	7.5	XA	0005-0020	XA	0009-0009
BTEN4N	WH	4.0	XA	0005-0028	XA	0005-0022
BTEN5N	WH	5.5	XA	0005-0023	XA	0007-0088
BTEB6N	WH	4.0	XA	0005-0082	XA	0005-0018
BTERR0N	WH	10.0	XA	0005-0039	XA	0010-0008
BTERR1N	WH	11.0	XA	0005-0093	XA	0011-0007
BTERR2N	WH	8.5	XA	0005-0035	XA	0008-0007
BTERR3N	WH	9.5	XA	0005-0092	XA	0009-0007
BTERR4N	WH	6.5	XA	0005-0034	XA	0006-0009
BTERR5N	WH	7.0	XA	0005-0086	XA	0007-0009
BTEST2N	WH	4.5	XA	0005-0036	XA	0005-0078
BTF1T0UTN	WH	7.0	J	0008-0004	XA	0005-0077
BTF1TSUMA	WH	6.0	J	0008-0003	XA	0005-0040
BTGND	WH	3.5	XA	0005-0004	XA	0005-0002
BTGND	WH	4.0	XA	0005-0074	XA	0005-0010
BT1MTMEFN	WH0	4.0	XA	0005-0015	XA	0005-0009
BT10TM	WH	7.5	J	0008-0008	XA	0005-0075
BTPSVA	WH	3.5	XA	0005-0012	XA	0005-0011
BTPSVA	WH	3.5	XA	0005-0027	XA	0005-0026

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
BTPSVA	WH	3.5	XA	0005-0089	XA	0005-0088
BTPSVA	WH	4.0	XA	0005-0103	XA	0005-0094
BTSATLMYA	WH	9.5	XA	0005-0064	XA	0010-0093
BTSLFTSTN	WH	6.0	J	0008-0007	XA	0005-0038
GFHDMDTA	WH	5.0	XA	0008-0044	XA	0009-0032
GFHEETA	WH	6.5	XA	0009-0041	XA	0009-0008
GFHFALN	WH	8.5	XA	0005-0079	XA	0009-0102
GFHGND	WH	4.0	XA	0009-0066	XA	0009-0002
GFHGND	WH	3.5	XA	0009-0100	XA	0009-0098
GFHGTFN	WH	4.0	XA	0006-0101	XA	0007-0101
GFHGTFN	WH	3.5	XA	0009-0044	XA	0009-0042
GFHIETA	WH	6.5	XA	0009-0043	XA	0009-0011
GFHIRDN	WH	5.0	XA	0008-0034	XA	0009-0048
GFHPMLDN	WH	3.5	XA	0009-0022	XA	0009-0021
GFHSERA	WH	5.5	XA	00008-0023	XA	0009-0039
GFHSTRA	WH	4.0	XA	0009-0045	XA	0009-0035
GFHXMDZN	WH	5.5	XA	0008-0085	XA	0009-0047
GMGND	WH	3.5	XA	0011-0106	XA	0011-0111
GMHAVOWGND	WH	11.0	J	0007-0007	XA	0011-0002
GMHAVOWINR	WH	10.0	J	0007-0005	XA	0011-0010
GMHAVOWINS	WH	10.0	J	0007-0004	XA	0011-0009
GMHAVOWOFF	WH	8.5	J	0007-0006	XA	0011-0105
GMHAVOWOTR	WH	9.0	J	0007-0003	XA	0011-0048
GMHAVOWOTS	WH	9.0	J	0007-0002	XA	0011-0047

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
GMHBDATA	WH	5.5	XA	0008-0008	XA	0009-0026
GMHCLKSFLA	WH	4.5	XA	0010-0066	XA	0011-0063
GMHDATA	WH	6.5	XA	0011-0040	XA	0011-0008
GMHDPOUTP	WH	15.0	J	0009-0011	XA	0011-0012
GMHDPOUTS	WH	15.5	J	0009-0012	XA	0011-0011
GMHHLDATA	WH	3.5	XA	0011-0043	XA	0011-0038
GMHRCCLK	WH	7.5	XA	0010-0063	XA	0011-0042
GMHSMPA	WH	4.0	XA	0011-0039	XA	0011-0033
LM1ADATA	WH	6.0	XA	0006-0033	XA	0008-0102
LM1ADPINR	WH	7.5	J	0006-0014	XA	0006-0048
LM1ADPINS	WH	8.0	J	0006-0005	XA	0006-0105
LM1ADPOUTR	WH	7.0	J	0006-0015	XA	0006-0104
LM1ADPOUTS	WH	8.0	J	0006-0007	XA	0006-0103
LM1AHLDATA	WH	4.0	XA	0006-0047	XA	0006-0039
LM1BDATA	WH	5.5	XA	0006-0032	XA	0008-0036
LM1BDPINR	WH	6.0	J	0006-0016	XA	0006-0066
LM1BDPINS	WH	5.0	J	0006-0008	XA	0006-0065
LM1BDPOUTR	WH	6.0	J	0006-0017	XA	0006-0063
LM1BDPOUTS	WH	5.5	J	0006-0009	XA	0006-0064
LM1BHLDATA	WH	3.5	XA	0006-0067	XA	0006-0062
LM1GND	WH	5.5	XA	0006-0024	XA	0006-0002
LM2ADATA	WH	4.5	XA	0007-0033	XA	0008-0094
LM2ADPINR	WH	8.5	J	0006-0010	XA	0007-0048
LM2ADPINS	WH	9.5	J	0006-0002	XA	0007-0105

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
LM2ADPOUTR	WH	8.5	J	0006-0011	XA	0007-0104
LM2ADPOUTS	WH	9.0	J	0006-0003	XA	0007-0103
LM2AHLDATA	WH	4.0	XA	0007-0047	XA	0007-0039
LM2BDATA	WH	4.5	XA	0007-0032	XA	0008-0037
LM2BDPINR	WH	6.5	J	0006-0012	XA	0007-0066
LM2BPINS	WH	5.5	J	0006-0004	XA	0007-0065
LM2BDPOUTR	WH	6.5	J	0006-0013	XA	0007-0063
LM2BDPOUTS	WH	6.0	J	0006-0005	XA	0007-0064
LM2BHLDATA	WH	3.5	XA	0007-0067	XA	0007-0062
LM2GND	WH	5.5	XA	0007-0024	XA	0007-0002
MDDSC7	WH	6.0	XA	0008-0065	XA	0009-0030
MDDSC8	WH	6.5	XA	0008-0068	XA	0009-0094
MDHDATA	WH	6.5	XA	0008-0029	XA	0011-0016
MDHDFZA	WH	4.5	XA	0008-0025	XA	0009-0034
MDHEFA	WH	4.5	XA	0008-0024	XA	0008-0069
MDHFREFA	WH	5.0	XA	0008-0070	XA	0009-0025
MDHGND	WH	3.5	XA	0008-0006	XA	0008-0002
MDHGND	WH	4.5	XA	0008-0026	XA	0008-0014
MDHGND	WH	3.5	XA	0008-0087	XA	0008-0086
MDHGND	WH	3.5	XA	0008-0091	XA	0008-0089
MDHGND	WH	3.5	XA	0008-0038	XA	0008-0093
MDHGND	WH	3.5	XA	0008-0095	XA	0008-0039
MDHGND	WH	3.5	XA	0008-0097	XA	0008-0096
MDHGND	WH	3.5	XA	0008-0099	XA	0008-0098

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
MDHGND	WH	3.5	XA	0008-0042	XA	0008-0043
MDHGND	WH	3.5	XA	0008-0040	XA	0008-0041
MDHGND	WH	3.5	XA	0008-0046	XA	0008-0045
MDHGND	WH	3.5	XA	0008-0106	XA	0008-0105
MDHOGSA	WH	4.0	XA	0008-0035	XA	0008-0084
MDHOT01A	WH	5.5	XA	0006-0082	XA	0008-0077
MDHOT02A	WH	6.0	XA	0006-0089	XA	0008-0078
MDHOT03A	WH	4.5	XA	0007-0082	XA	0008-0079
MDHOT04A	WH	5.0	XA	0007-0089	XA	0008-0080
MDHSC6	WH	7.5	XA	0008-0064	XA	0010-0097
SALARMA	WH	6.0	J	0007-0022	J	0008-0006
SALARMN	WH	6.0	J	0007-0021	J	0008-0005
SALMA	WH	6.5	J	0007-0009	J	0008-0002
TGFBLGA	WH	4.0	XA	0010-0013	XA	0010-0012
TGGND	WH	7.0	XA	0010-0040	XA	0010-0002
TGGND	WH	4.0	XA	0010-0092	XA	0010-0041
TGHTLDTOA	WH	5.0	XA	0008-0031	XA	0010-0039
TGLGA	WH	4.5	XA	0010-0023	XA	0011-0073
TGLGA	WH	5.5	XA	0008-0032	XA	0009-0106
TGL2GA	WH	4.5	XA	0010-0024	XA	0011-0072
TGL8GA	WH	4.5	XA	0010-0029	XA	0011-00369
TGPUP1A	WH	5.0	XA	0009-0038	XA	0010-0050
TGPUP2A	WH	5.0	XA	0008-0030	XA	0009-0099
TGPUP3A	WH	8.5	XA	0005-0065	XA	0008-0092

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
TGPUP3A	WH	4.0	XA	0008-0083	XA	0008-0090
TGPUP3A	WH	3.5	XA	0008-0012	XA	0008-0015
TGPUP3A	WH	3.5	XA	0008-0009	XA	0008-0011
TGRATEA	WH	5.0	XA	0010-0031	XA	0010-0071
TGRLGMS2A	WH	3.5	XA	0010-0037	XA	0010-0032
TGSALMA	WH	10.5	J	0008-0001	XA	0010-0045
TGSALMN	WH	7.0	J	0007-0023	XA	0010-0046
TGSTACLK	WH	5.5	XA	0010-0091	XA	0010-0014
TGSTACLKA	WH	7.0	J	0007-0010	XA	0010-0089
TGSTACLMN	WH	7.0	J	0007-0011	XA	0010-0090
TG1PPSA	WH	4.0	XA	0006-0086	XA	0007-0086
TG15OHN	WH	4.0	XA	0010-0094	XA	0010-0087
TG16A	WH	6.0	XA	0009-0103	XA	0010-0025
TG18432A	WH	3.5	XA	0010-0067	XA	0010-0065
TG32A	WH	4.5	XA	0009-0017	XA	0010-0082
TG32XA	WH	7.0	XA	0006-0012	XA	0008-0088
TG32XA	WH	6.5	XA	0007-0012	XA	0010-0026
TG4096/2	WH	6.5	XA	0010-0102	XA	0010-0070
TG512XA	WH	6.5	XA	0007-0045	XA	0010-0085
TG64XA	WH	4.0	XA	0006-0072	XA	0007-0072

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
BTB00N	WH	4.0	XA	0006-0094	XA	0007-0094
BTB00N	WH	4.0	XA	0008-0066	XA	0009-0070
BTB00N	WH	4.5	XA	0010-0081	XA	0011-0030
BTB01N	WH	4.0	XA	0006-0077	XA	0007-0077
BTB01N	WH	4.5	XA	0008-0010	XA	0009-0073
BTB01N	WH	4.0	XA	0010-0027	XA	0011-0026
BTB02N	WH	4.0	XA	0006-0097	XA	0007-0097
BTB02N	WH	4.0	XA	0008-0013	XA	0009-0072
BTB02N	WH	4.0	XA	0010-0028	XA	0011-0028
BTB03N	WH	4.0	XA	0006-0037	XA	0007-0037
BTB03N	WH	4.5	XA	0008-0067	XA	0009-0075
BTB03N	WH	5.0	XA	0010-0076	XA	0011-0013
BTB04N	WH	4.0	XA	0006-0092	XA	0007-0092
BTB05N	WH	4.0	XA	0006-0093	XA	0007-0093
BTB06N	WH	4.0	XA	0006-0073	XA	0007-0073
BTB07N	WH	4.0	XA	0006-0078	XA	0007-0078
BTB08N	WH	4.0	XA	0006-0099	XA	0007-0099
BTB08N	WH	7.5	XA	0008-0049	XA	0009-0068
BTB08N	WH	4.5	XA	0010-0088	XA	0011-0027
BTB09N	WH	4.0	XA	0006-0015	XA	0007-0015
BTB09N	WH	7.5	XA	0008-0048	XA	0009-0010
BTB09N	WH	5.5	XA	0010-0084	XA	0011-0069
BTB10N	WH	4.0	XA	0006-0098	XA	0007-0098
BTB10N	WH	7.0	XA	0008-0103	XA	0009-0071

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
BTB10N	WH	6.0	XA	0010-0086	XA	0011-0064
BTB11N	WH	4.0	XA	0006-0071	XA	0007-0071
BTB11N	WH	6.0	XA	0008-0047	XA	0009-0077
BTB11N	WH	4.5	XA	0010-0079	XA	0011-0084
BTB12N	WH	4.0	XA	0006-0100	XA	0007-0100
BTB12N	WH	7.0	XA	0008-0104	XA	0009-0069
BTB12N	WH	5.0	XA	0010-0080	XA	0011-0092
BTB13N	WH	4.0	XA	0006-0036	XA	0007-0036
BTB13N	WH	8.0	XA	0008-0050	XA	0009-0064
BTB13N	WH	5.0	XA	0010-0075	XA	0011-0067
BTB14N	WH	4.0	XA	0006-0014	XA	0007-0014
BTB14N	WH	4.0	XA	0008-0071	XA	0009-0074
BTB14N	WH	5.5	XA	0010-0073	XA	0011-065
BTB15N	WH	4.0	XA	0006-0038	XA	0007-0038
BTB15N	WH	4.0	XA	0008-0072	XA	0009-0076
BTB15N	WH	5.0	XA	0010-0020	XA	0011-0031
BTEN0N	WH	3.5	XA	0005-0017	XA	0005-0014
BTEN2N	WH	7.0	XA	0005-0076	XA	0008-0033
BTEN3N	WH	4.0	XA	0005-0084	XA	0005-0020
BTEN4N	WH	4.5	XA	0005-0028	XA	0006-0088
BTEN6N	WH	5.5	XA	0005-0104	XA	0005-0082
BTGND	WH	4.0	XA	0005-0010	XA	0005-0004
BTGND	WH	5.5	XA	0005-0095	XA	0005-0074
BTLMTMFFN	WH	3.5	XA	0005-0016	XA	0005-0015

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
BTPSVA	WH	4.5	XA	0005-0026	XA	0005-0012
BTPSVA	WH	4.0	XA	0005-0088	XA	0005-0027
BTPSVA	WH	3.5	XA	0005-0094	XA	0005-0089
BTPSVA	WH	3.5	XA	0005-0048	XA	0005-0103
GFHGND	WH	6.5	XA	0009-0098	XA	0009-0066
GFHGND	WH	3.5	XA	0009-0101	XA	0009-0100
GFHGTFN	WH	5.0	XA	0007-0101	XA	0009-0042
GFHGTFN	WH	7.0	XA	0009-0044	XA	0011-0017
GMHAVOWGND	WH	5.0	XA	0001-0075	XA	0011-0002
GMHBBDATA	WH	5.5	XA	0009-0026	XA	0011-0071
GMHCLKSELA	WH	3.5	XA	0010-0013	XA	0010-0066
GMHDPIN	WH	3.5	XA	0011-0055	XA	0011-0050
LM1GND	WH	5.5	XA	0006-0046	XA	0006-0024
LM2GND	WH	5.5	XA	0007-0046	XA	0007-0024
MDHEFA	WH	4.0	XA	0008-0024	XA	0009-0023
MDHGND	WH	4.0	XA	0008-0014	XA	0008-0006
MDHGND	WH	3.5	XA	0008-0086	XA	0008-0026
MDHGND	WH	3.5	XA	0008-0089	XA	0008-0087
MDHGND	WH	3.5	XA	0008-0093	XA	0008-0091
MDHGND	WH	3.5	XA	0008-0039	XA	0008-0038
MDHGND	WH	3.5	XA	0008-0096	XA	0008-0095
MDHGND	WH	3.5	XA	0008-0098	XA	0008-0097
MDHGND	WH	3.5	XA	0008-0043	XA	0008-0099
MDHGND	WH	3.5	XA	0008-0041	XA	0008-0042

WIRE DATA LIST

SIGNAL	CLR	LGTH	FROM RLGM		TO RLGM	
MDHGND	WH	3.5	XA	0008-0045	XA	0008-0040
MDHGND	WH	3.5	XA	0008-0105	XA	0008-0046
TGGND	WH	3.5	XA	0010-0041	XA	0010-0040
TGLGA	WH	5.0	XA	0008-0032	XA	0010-0023
TGL2GA	WH	4.5	XA	0008-0082	XA	0010-0024
TGPUP2A	WH	6.0	XA	0008-0030	XA	0010-0049
TGPUP3A	WH	3.5	XA	0008-0090	XA	0008-0092
TGPUP3A	WH	4.5	XA	0008-0015	XA	0008-0083
TGPUP3A	WH	3.5	XA	0008-0011	XA	0008-0012
TGPUP3A	WH	8.0	XA	0008-0009	XA	0010-0048
TG1PPSA	WH	6.5	XA	0007-0086	XA	0010-0099
TG150HN	WH	5.0	XA	0009-0050	XA	0010-0094
TG32XA	WH	4.0	XA	0006-0012	XA	0007-0012
TG512XA	WH	4.0	XA	0006-0045	XA	0007-0045
TG64XA	WH	6.0	XA	0007-0072	XA	0010-0083

WIRE DATA LIST

SIGNAL		CLR	LGTH	FROM RLGM		TO RLGM	
GMHDPIN	R	BK	11.5	XA	0011-0050	J	0009-0002
GMHDPIN	S	WH	12.0	XA	0011-0046	J	0009-0003

GLOSSARY

Word	Meaning
Analog Applique	Data sources and control functions that are randomly time-related to each other.
Bridge	To connect more than one voice channel together.
Channel	A path that carries a signal.
Clock	A source of timing signals.
Comparator	A device used to compare two signals and output the difference.
Conditioned Diphase	A waveform for data transmission designed for simple timing extraction.
Converter	A device used to change a signal from one form to another.
Crowbar	A circuit which shuts down the power supply voltage in response to a fault input.
Data	The signal that contains the digital information to be processed or transmitted.
Data Stream	All data transmitted through a path in a single input or output operation.
Demodulation	The process of removing the modulated carrier from the data.
Demultiplex	The process by which one signal is separated into two or more independent signals.
Duplex	Two way data flow.
Energize	To activate or turn on.
Faults	Error or indication that something is wrong with the equipment.
Format	The way in which the data is arranged on the bit stream.
Frame	The array of bits between two frame bits.
Gate	To permit a signal to pass through a circuit which has the capability of blocking or passing the signal in response to a control.

GLOSSARY-Continued

Word	Meaning
Synchronous	Data sources timed from a common timing source.
Timing	A signal used to mark the time position of bits in a digital stream.
Transition	A point in time where a signal begins to change polarity.

ALPHABETICAL INDEX

ALPHABETICAL INDEX-Continued

ALPHABETICAL INDEX-Continued

ALPHABETICAL INDEX-Continued

ALPHABETICAL INDEX-Continued

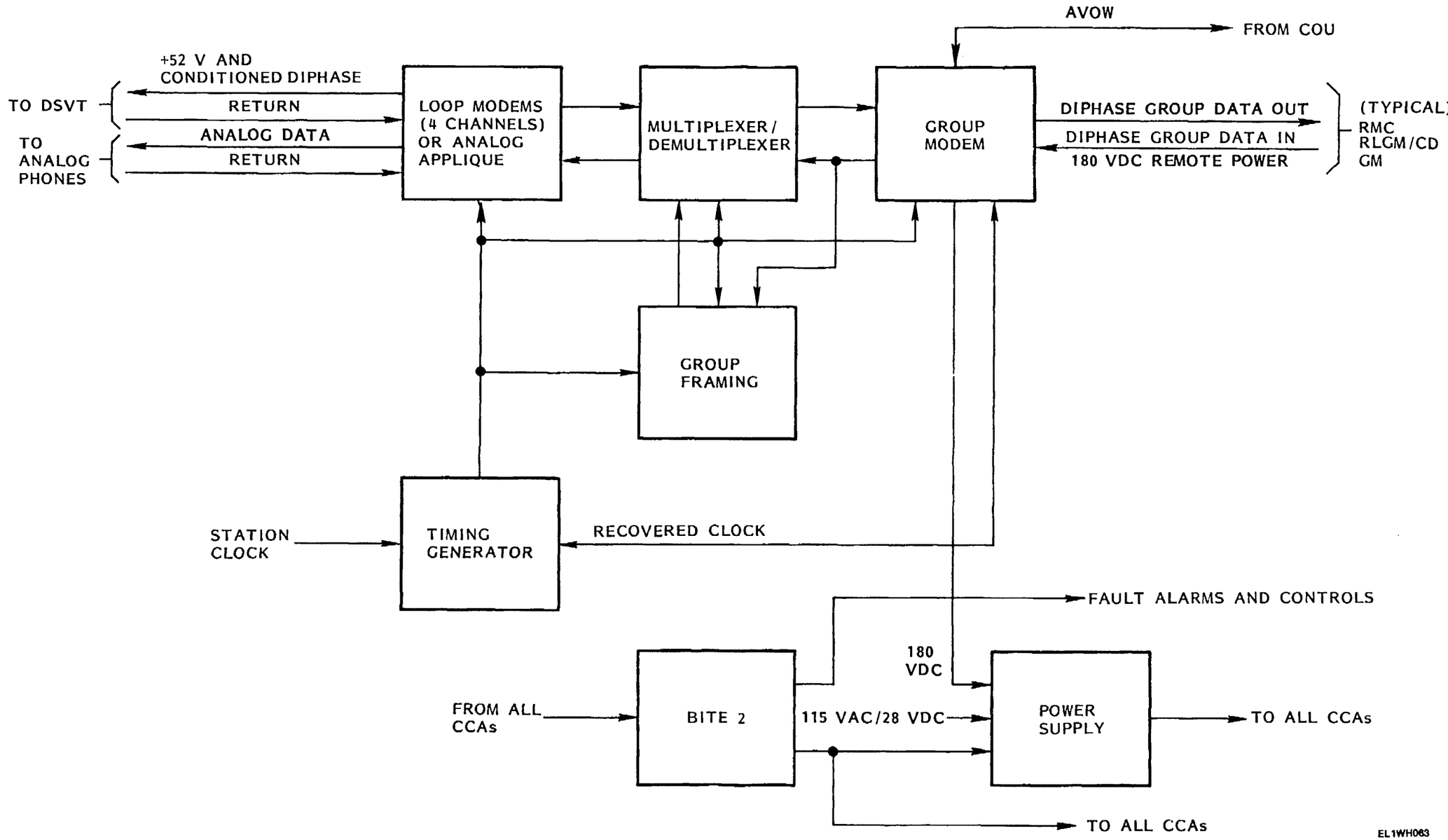


Figure FO-1. RLGM Functional Block Diagram

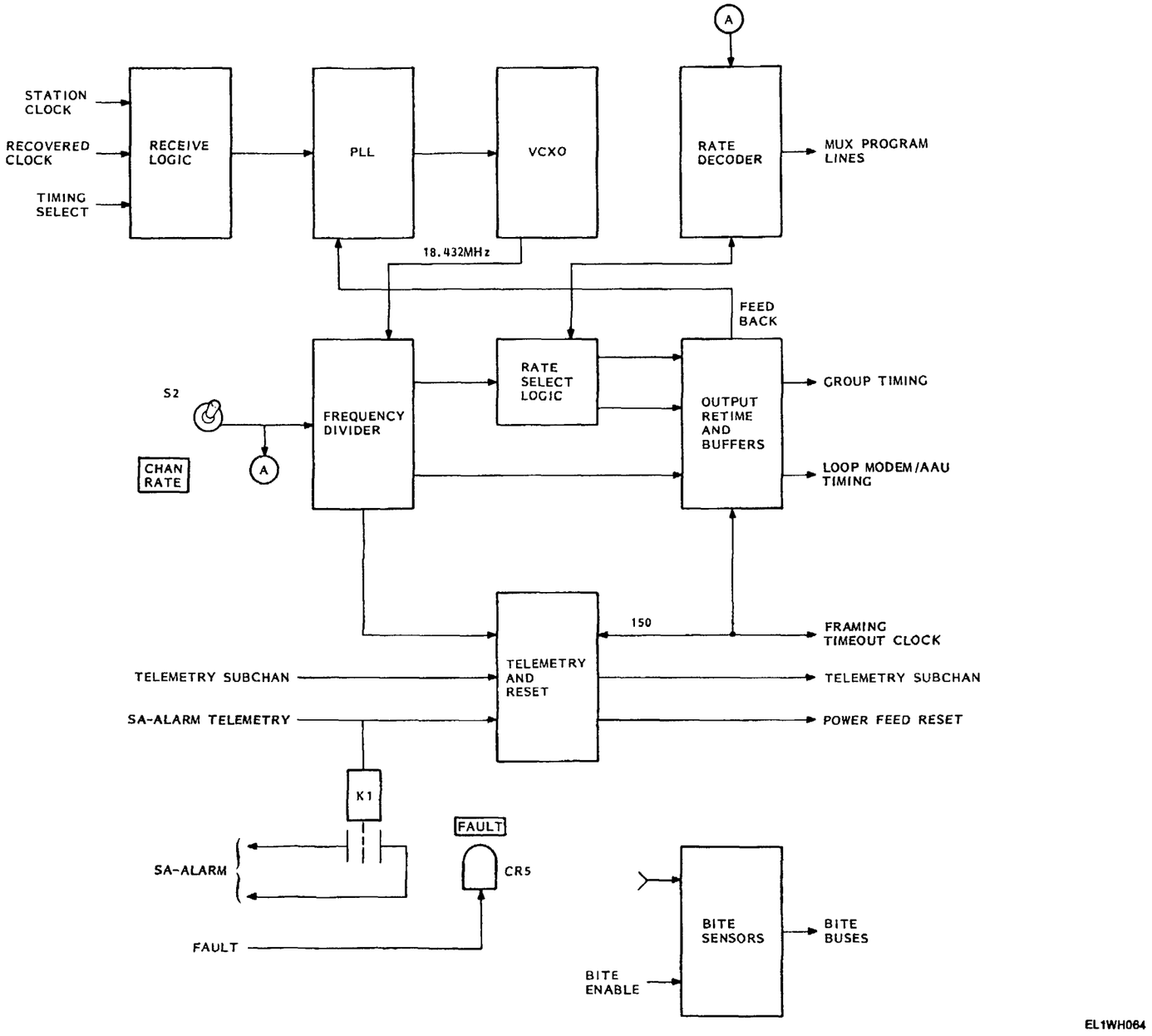


Figure FO-2. Timing Generator Block Diagram

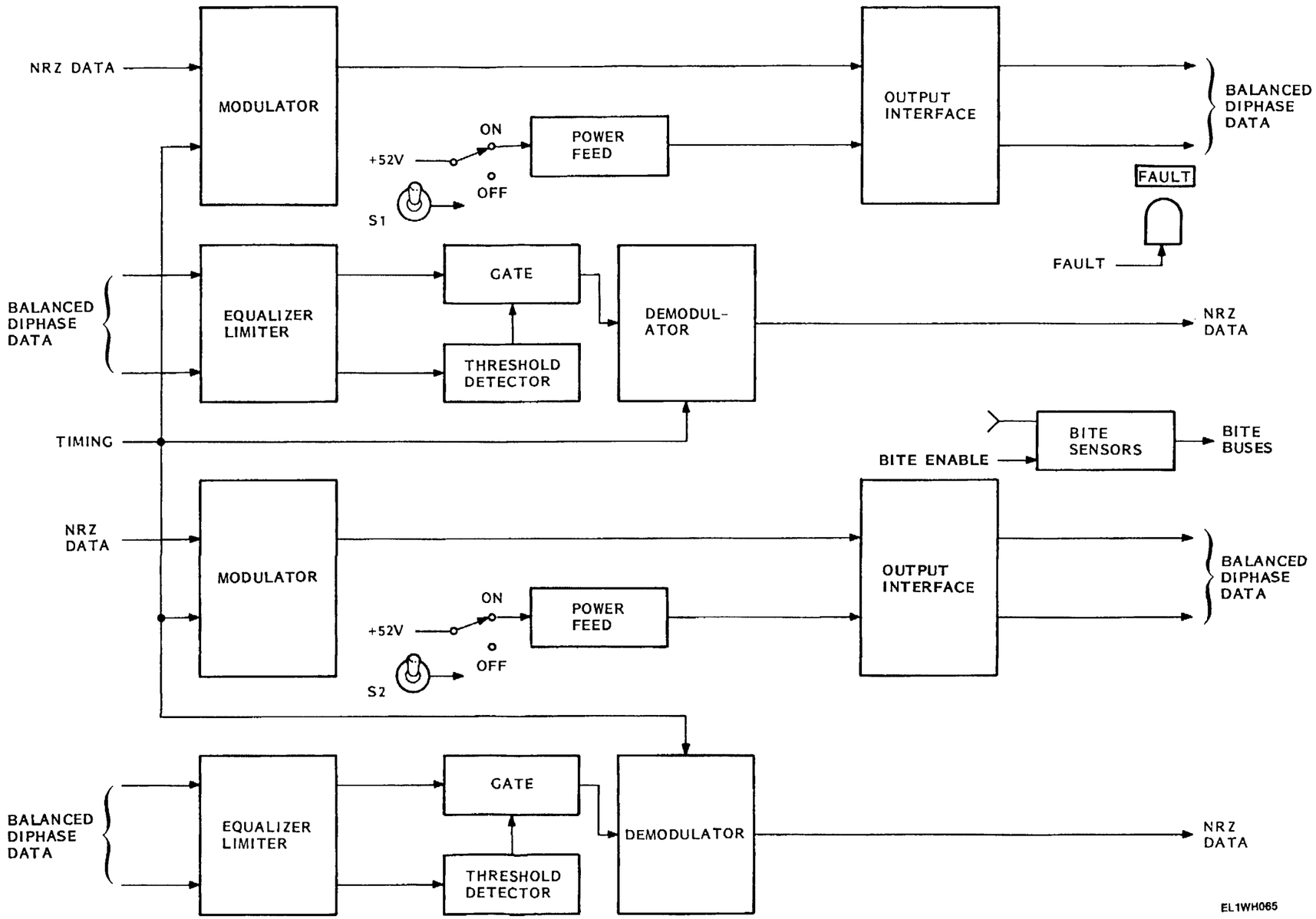


Figure FO-3. Loop Modem Block Diagram

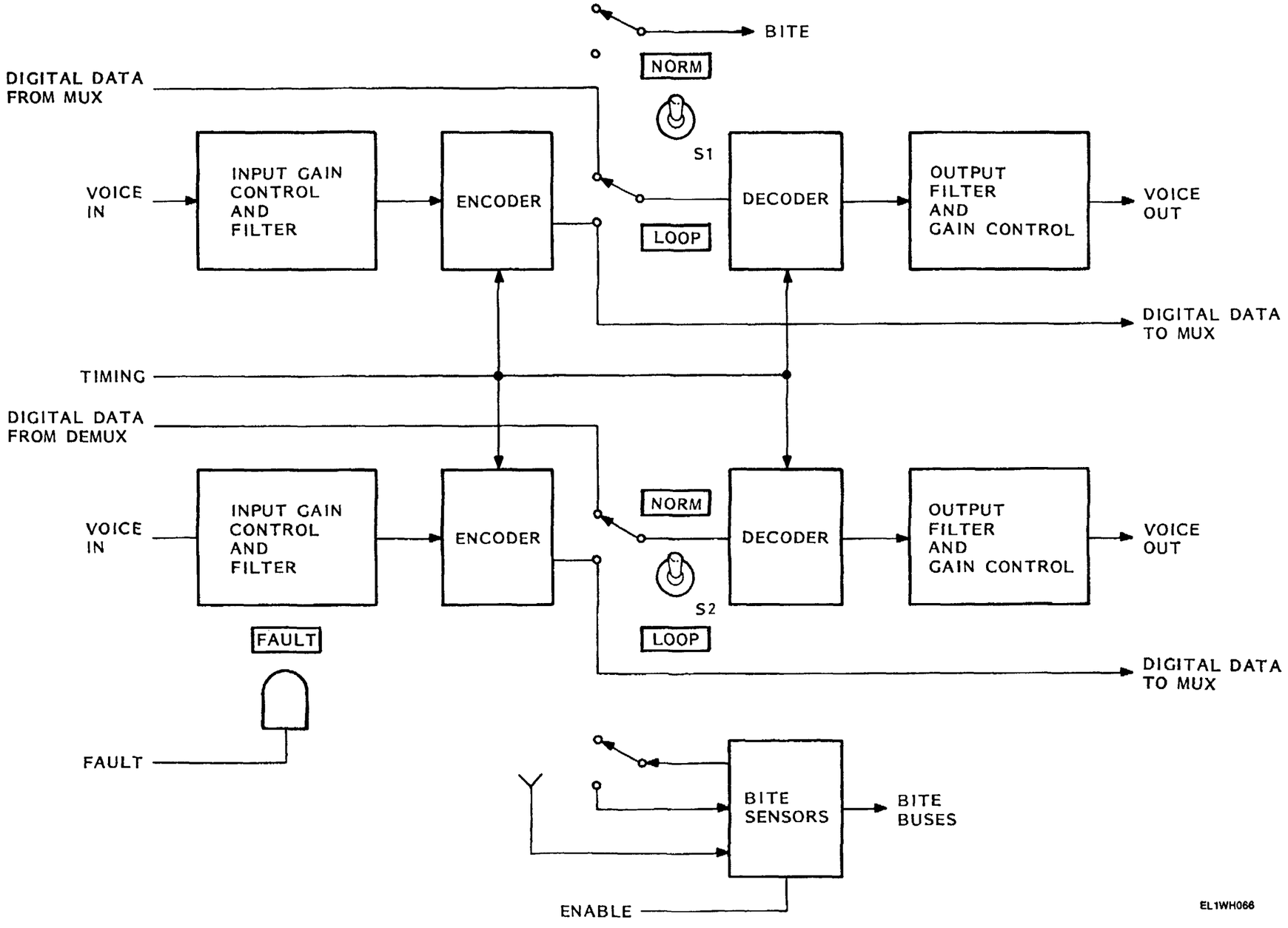


Figure FO-4. Analog Applique Block Diagram

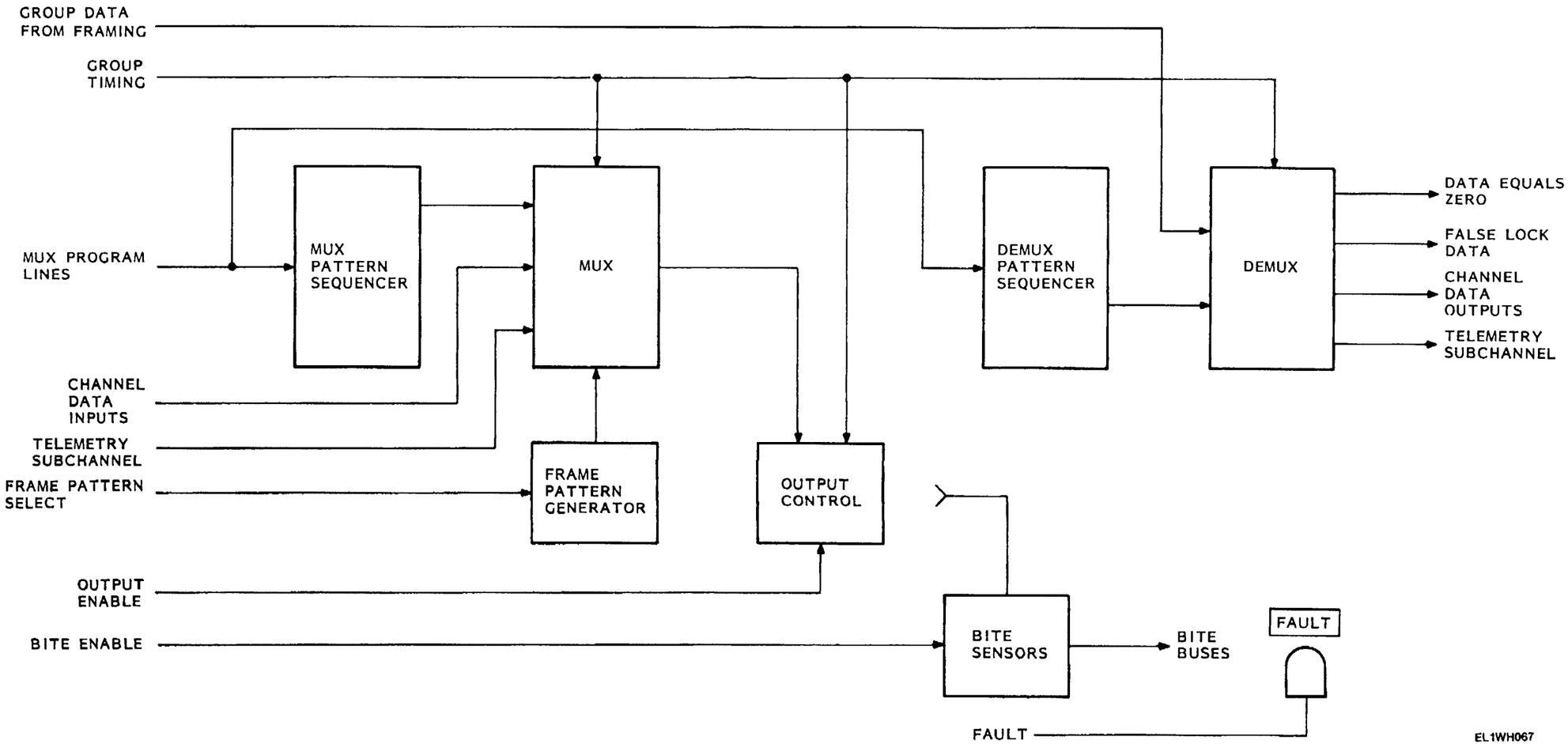


Figure FO-5. Multiplexer/Demultiplexer Block Diagram

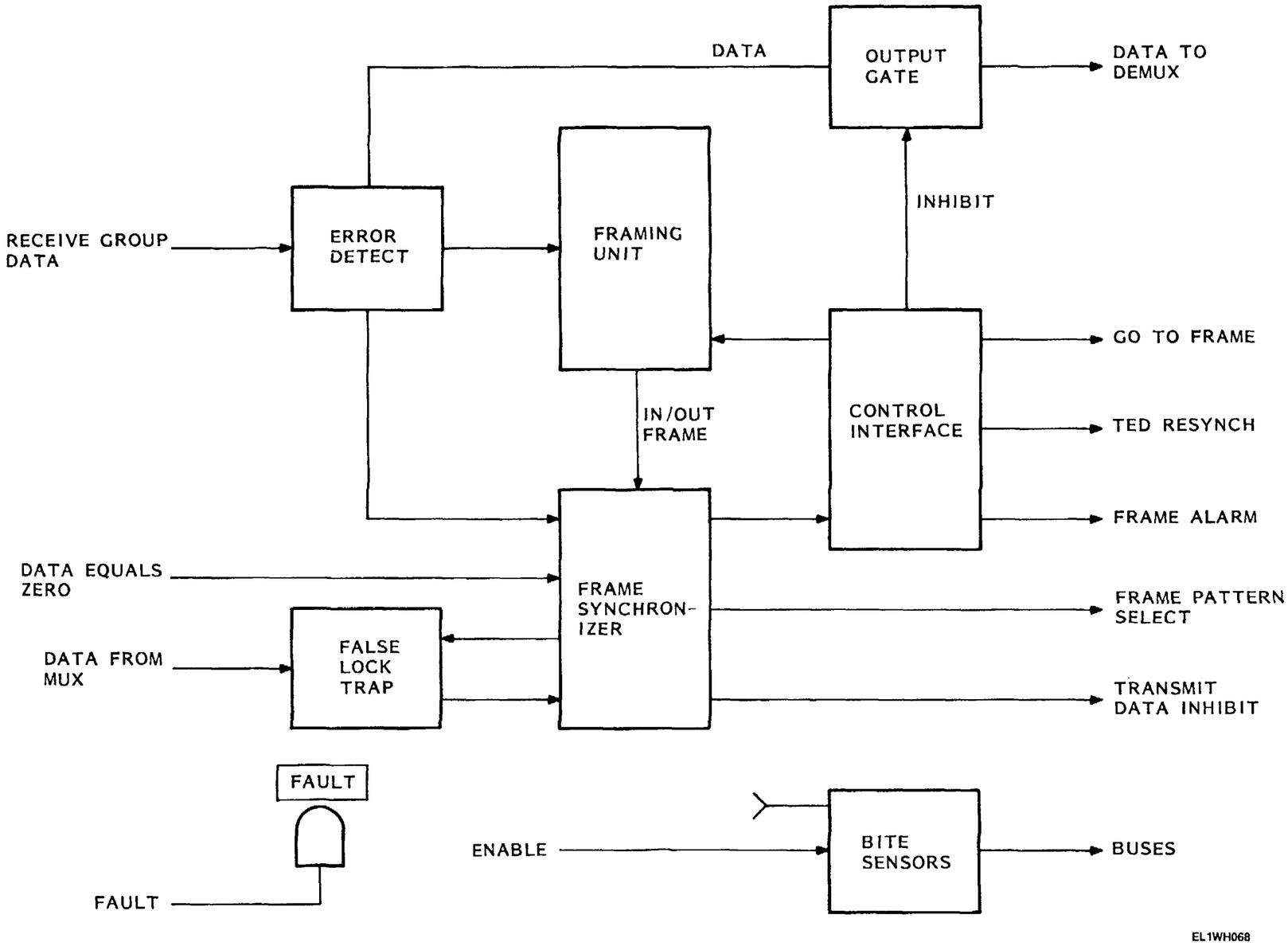


Figure FO-6. Group Framing Block Diagram

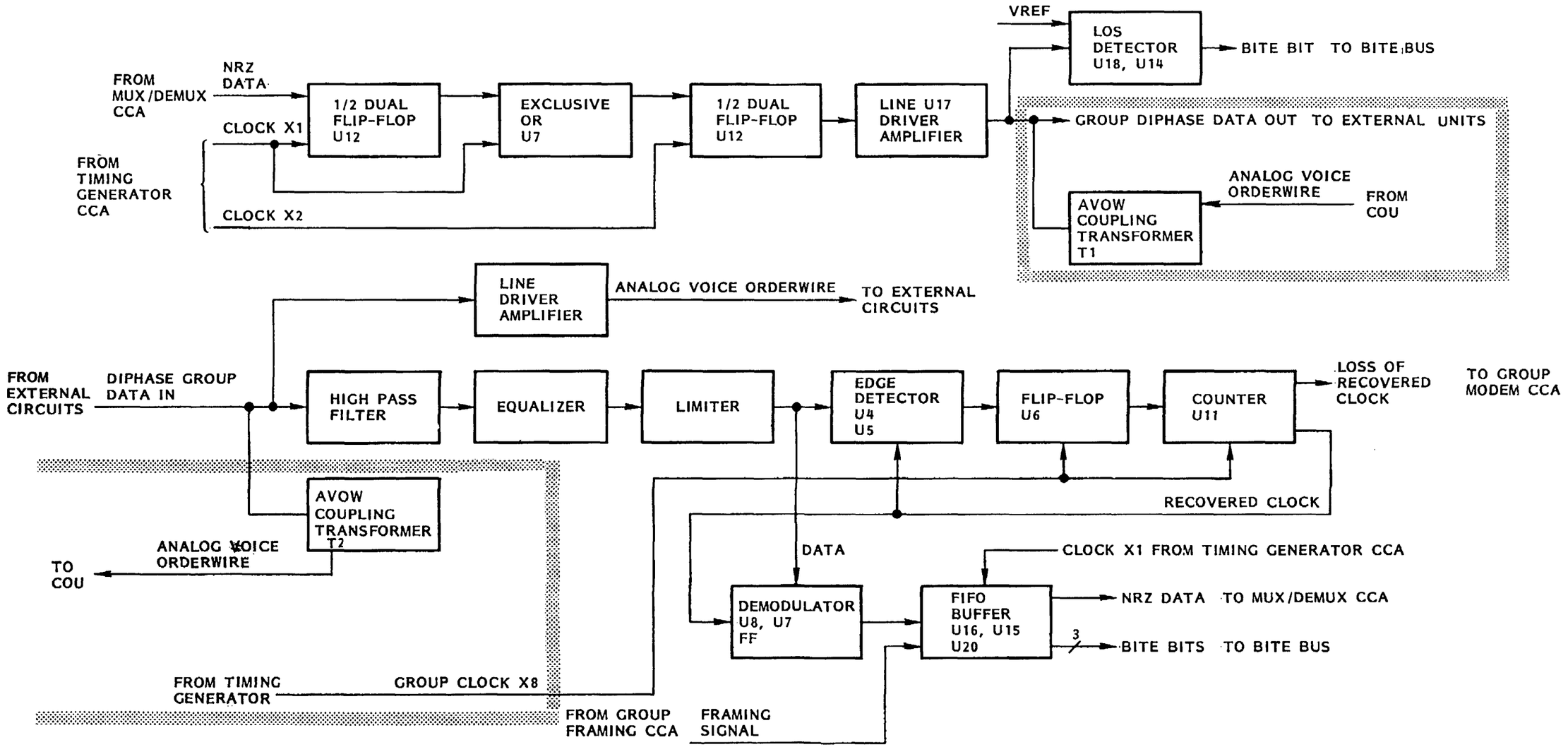


Figure FO-7. Group Modem Block Diagram

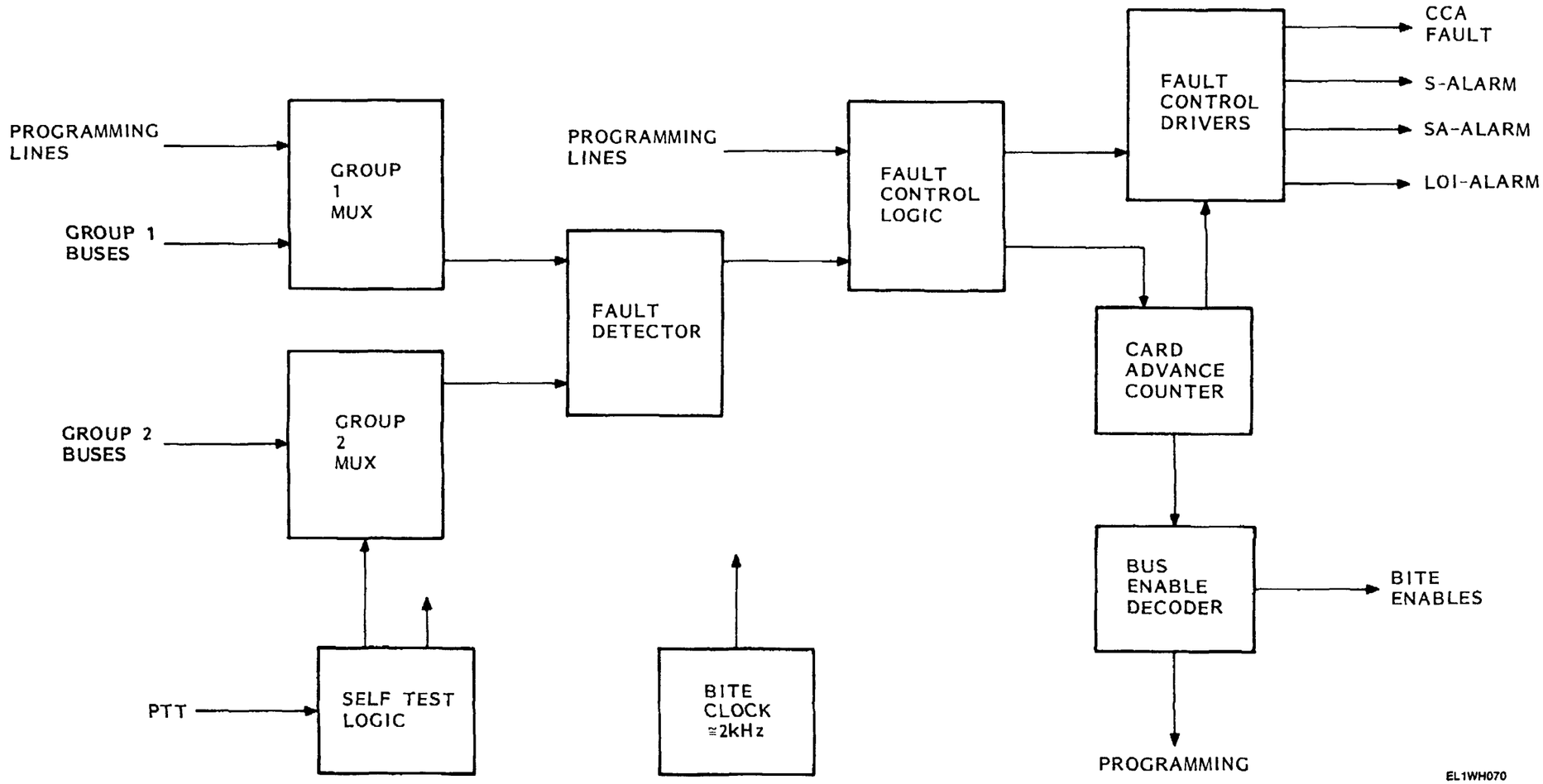


Figure FO-8. BITE 2 Block Diagram

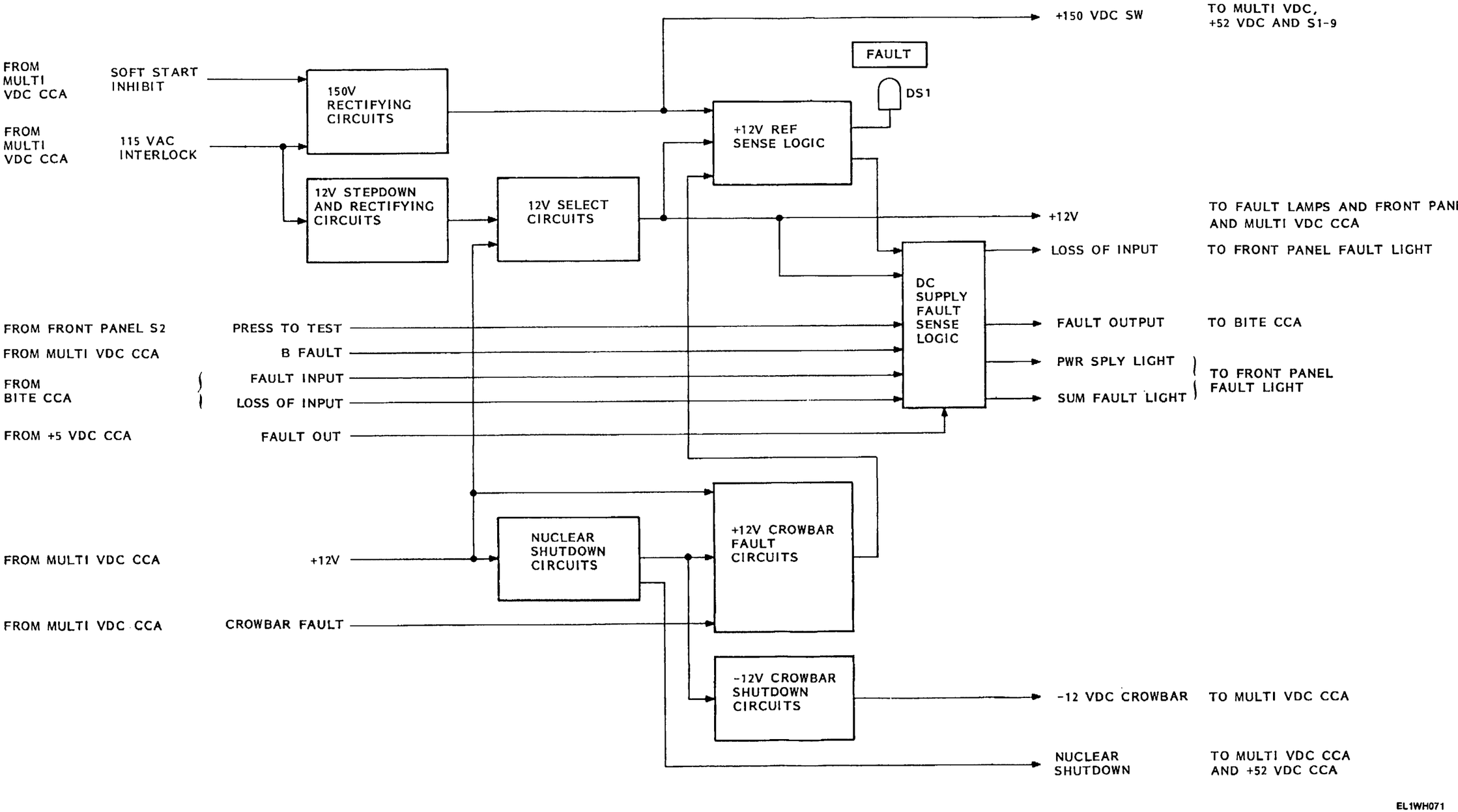


Figure FO-9. Power Supply Ac Input CCA Block Diagram

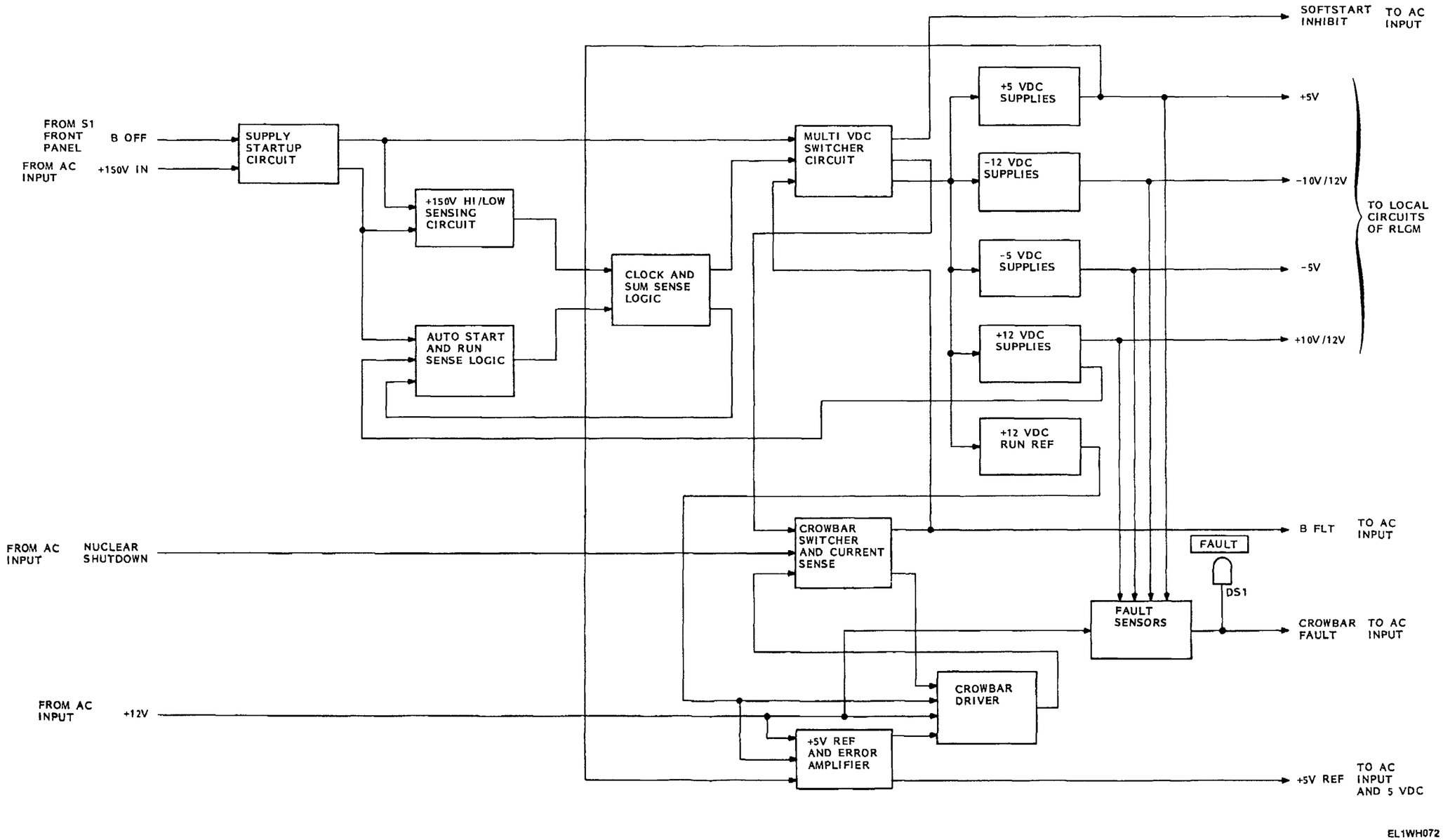


Figure FO-10. Power Supply Multi Vdc CCA Block Diagram

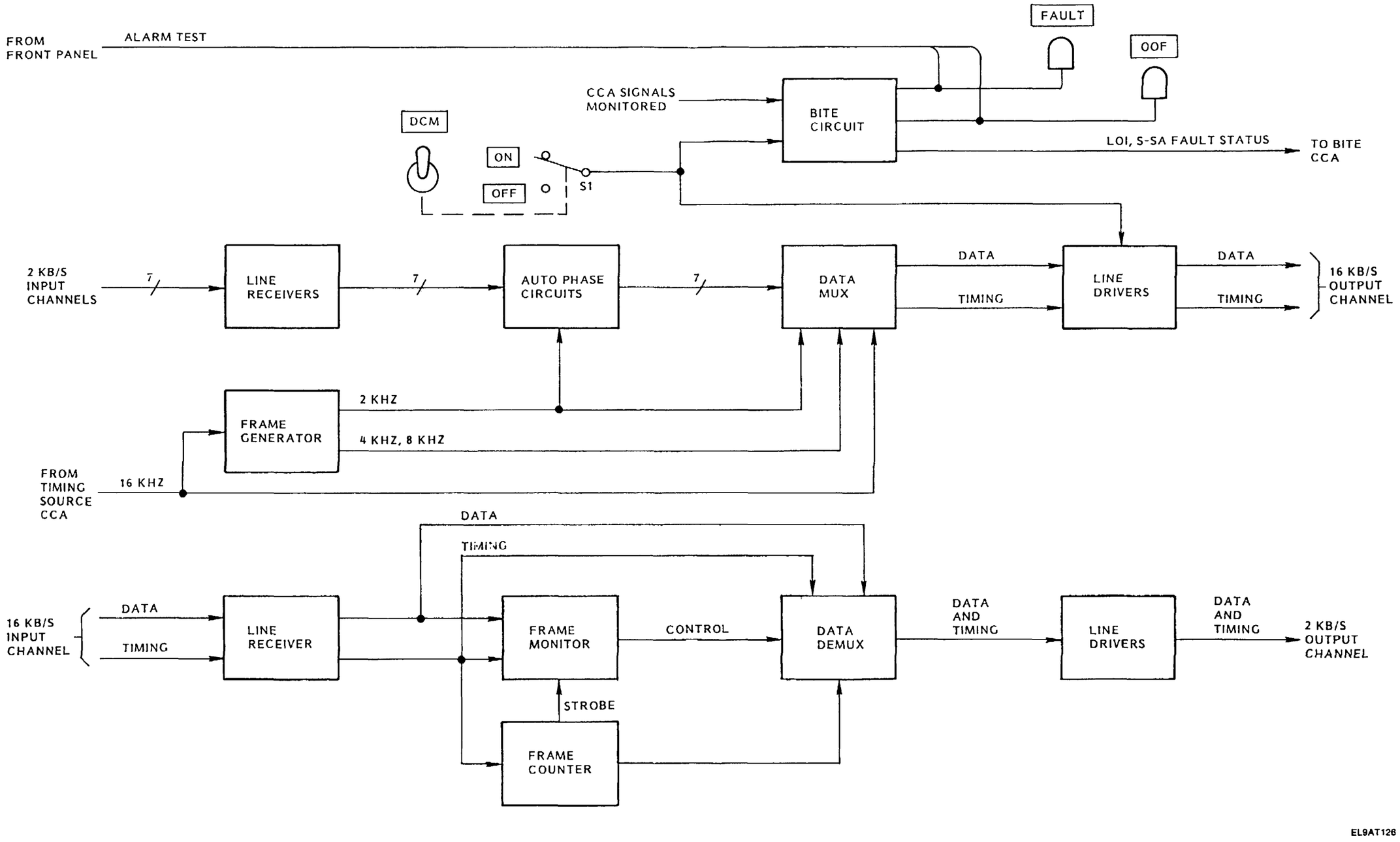


Figure FO-11. Data Channel Multiplexer Block Diagram

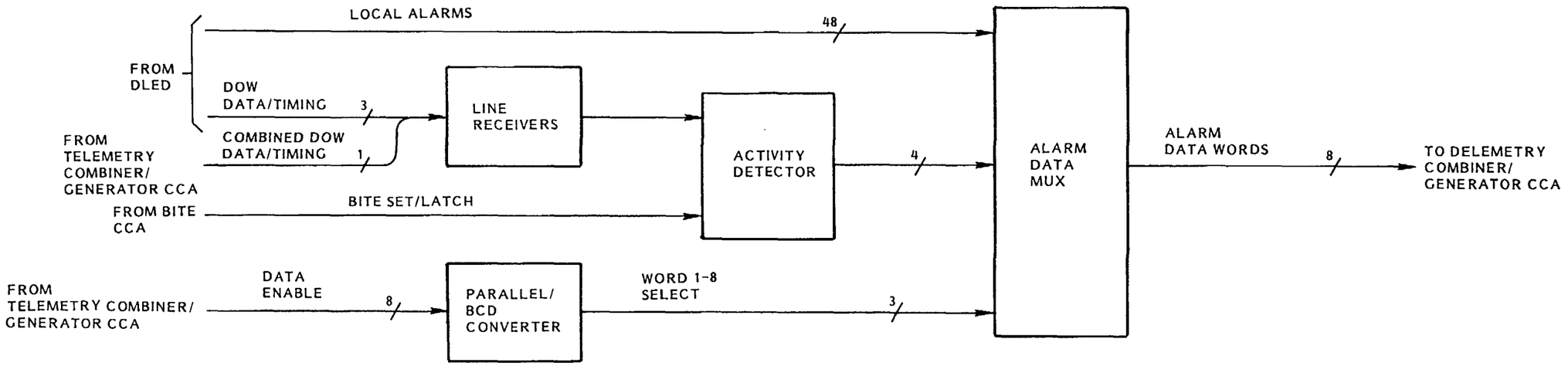


Figure FO-12. Alarm Interface Block Diagram

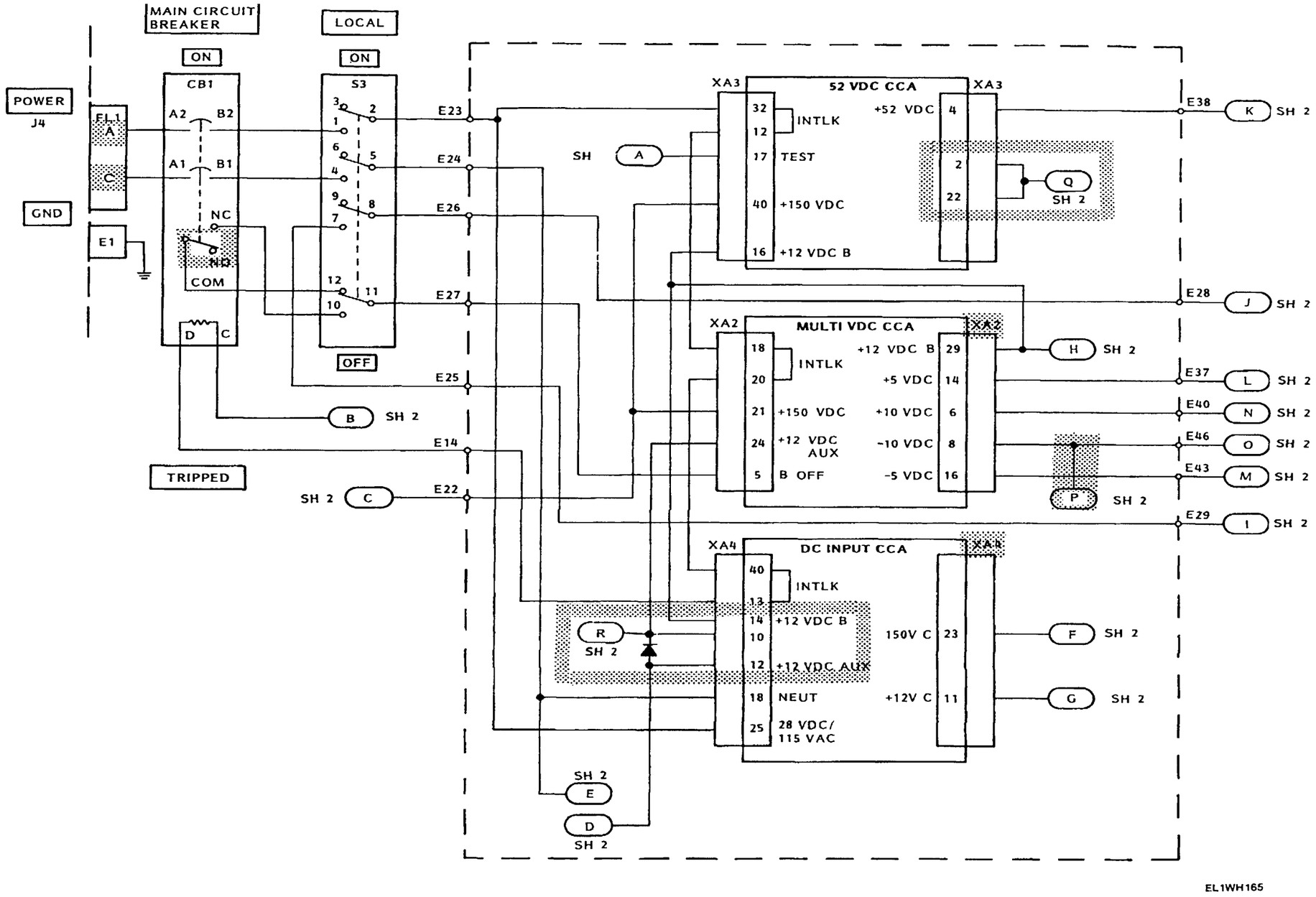


Figure FO-12B. Controls and Indicators Functional Block Diagram (Sheet 1 of 2)

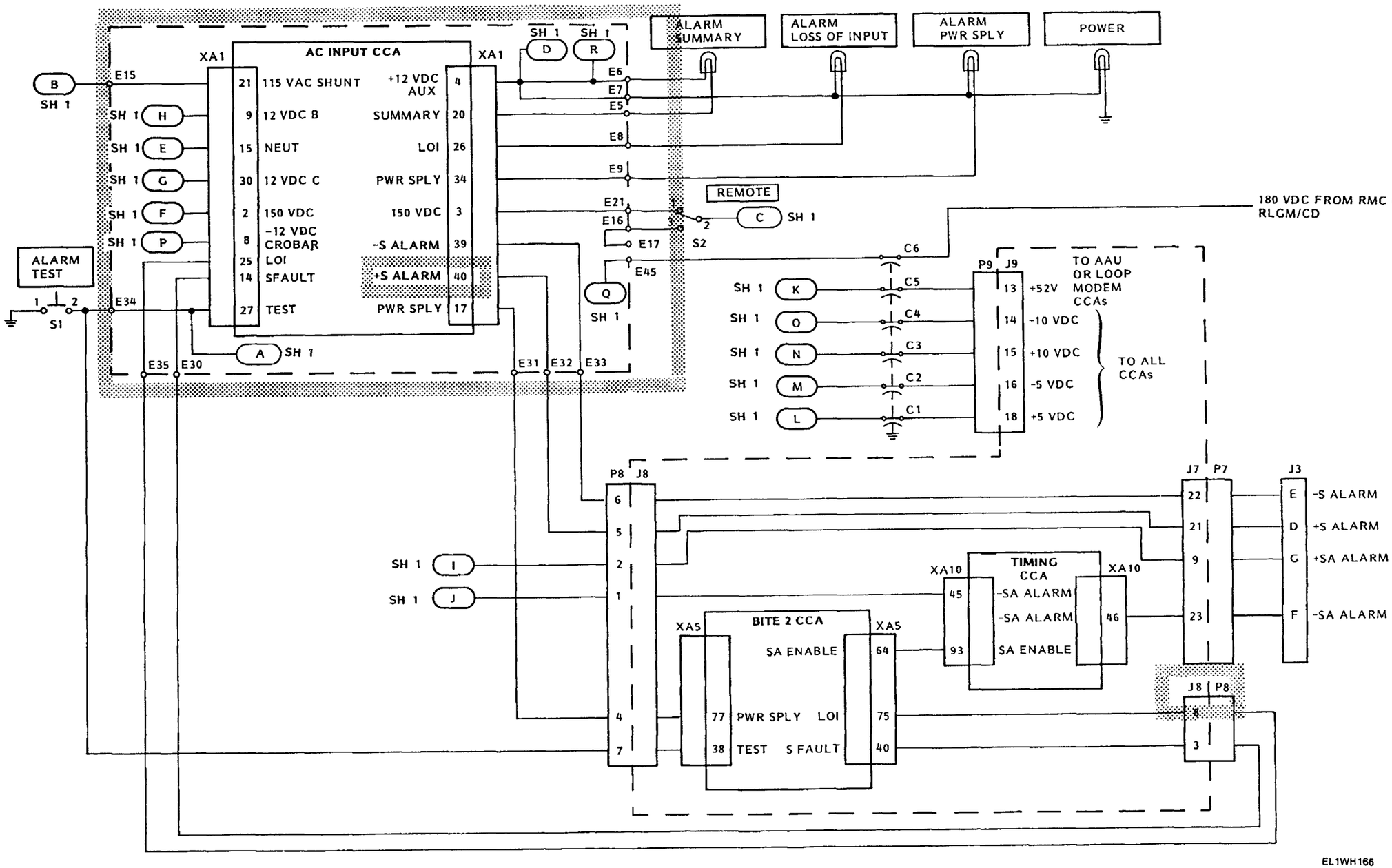


Figure FO-12B. Controls and Indicators Functional Block Diagram (Sheet 2 of 2)

SCHEMATIC DIAGRAMS

Schematic diagrams contain zone identifiers (three letters and five numbers) and signal continuation symbols which enable the user to follow signals on a single sheet or between sheets of a multi-sheet schematic.

ZONE IDENTIFIERS

Each sheet of a schematic is divided into five vertical zones (numbered) and three horizontal zones (lettered). This allows the schematic to be divided into 15 zones with each zone referenced by a number/letter combination. This permits easy circuit component location for reference purposes. The three horizontal zones on each sheet are lettered A, B, and C while the five vertical zones are numbered as follows:

Sheet 1 - zones 1 through 5

Sheet 2 - zones 11 through 15

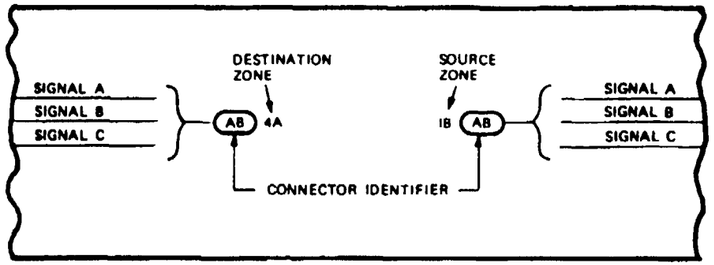
Sheet 3 - zones 21 through 25

Sheet 4 - zones 31 through 35

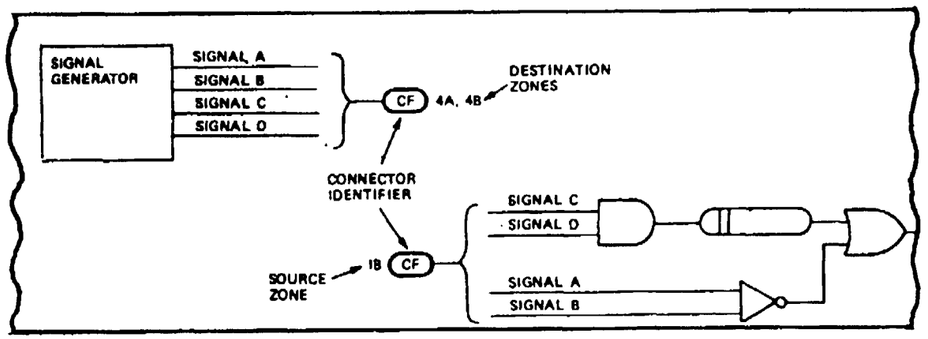
etc.

OVAL CONNECTORS

Oval connectors are used to continue signals from one area of a sheet to another area of a sheet.

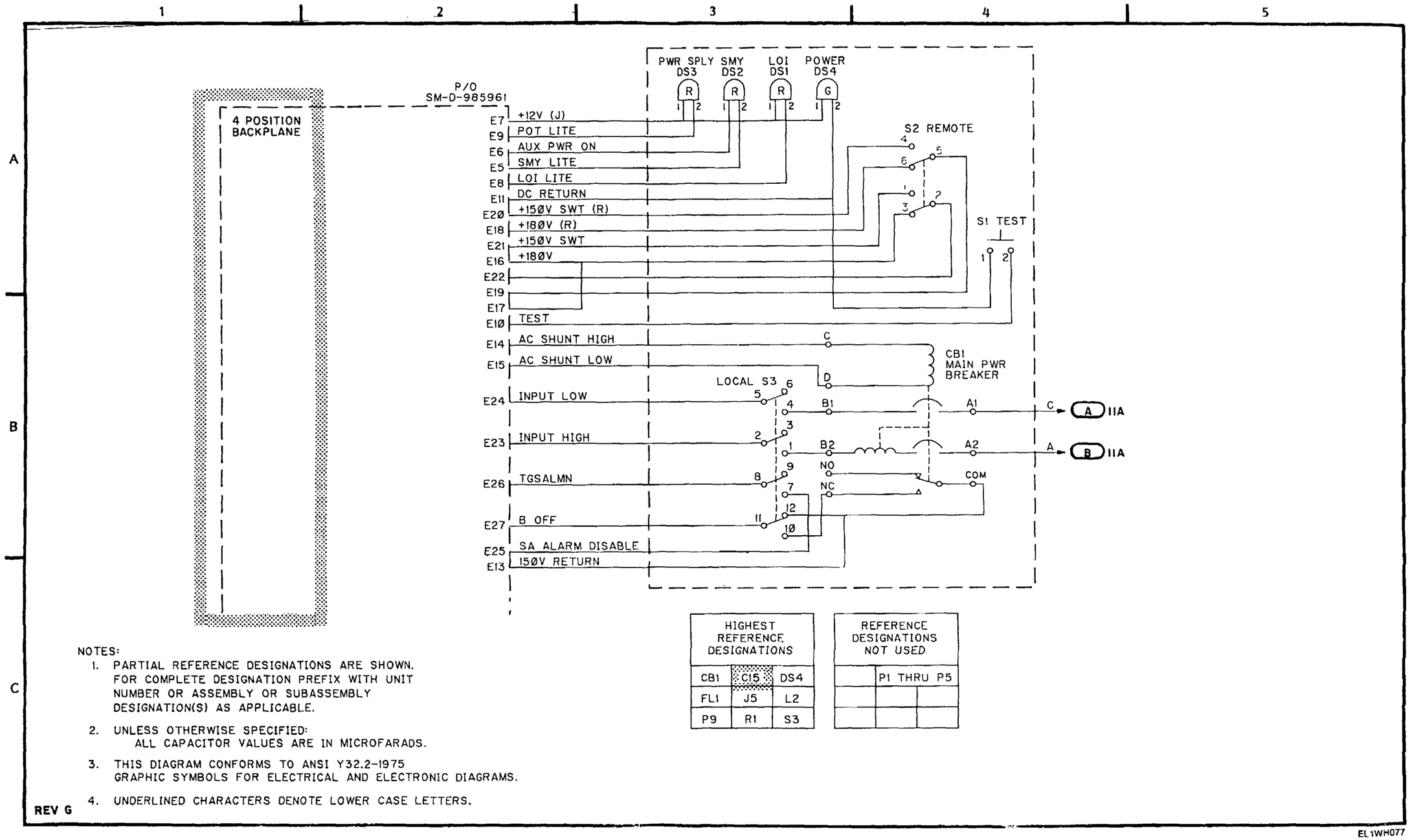


Oval Connectors Used to Continue Signals EL1WH075



Oval Connectors Used to Continue Signals to More Than One Destination. EL1WH076

Figure FO-13. Schematic Diagram Zone Identifiers and Connectors



HIGHEST REFERENCE DESIGNATIONS		
CB1	C15	DS4
FL1	J5	L2
P9	R1	S3

REFERENCE DESIGNATIONS NOT USED		
	P1 THRU P5	

NOTES:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR COMPLETE DESIGNATION PREFIX WITH UNIT NUMBER OR ASSEMBLY OR SUBASSEMBLY DESIGNATION(S) AS APPLICABLE.
2. UNLESS OTHERWISE SPECIFIED: ALL CAPACITOR VALUES ARE IN MICROFARADS.
3. THIS DIAGRAM CONFORMS TO ANSI Y32.2-1975 GRAPHIC SYMBOLS FOR ELECTRICAL AND ELECTRONIC DIAGRAMS.
4. UNDERLINED CHARACTERS DENOTE LOWER CASE LETTERS.

REV G

EL1WH077

Figure FO-14. Multiplexer TD-1233 (P) TTC Interconnection Diagram (Sheet 1 of 3)

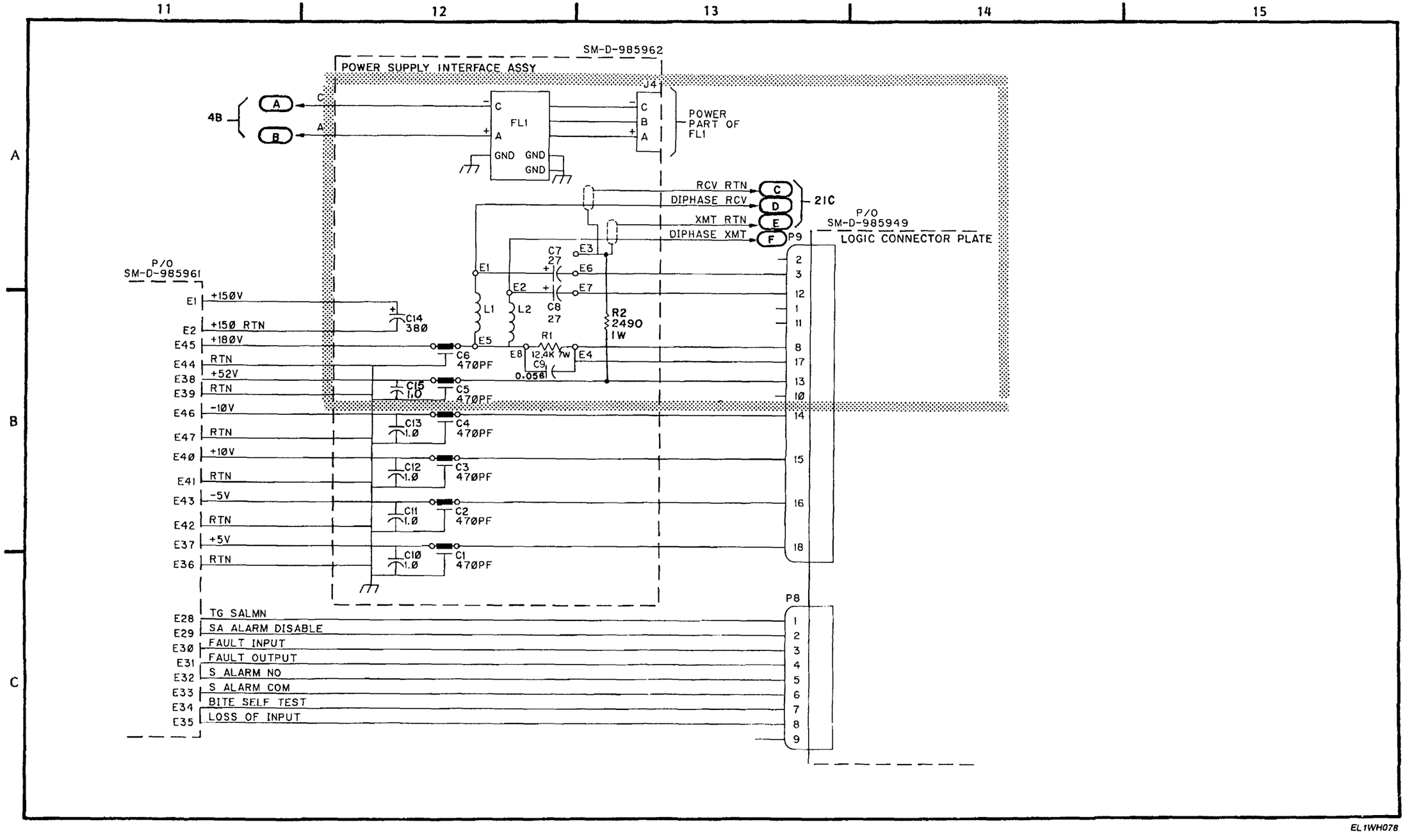


Figure FO-14. Multiplexer TD-1233 (P) TTC Interconnection Diagram (Sheet 2 of 3)

Change 1

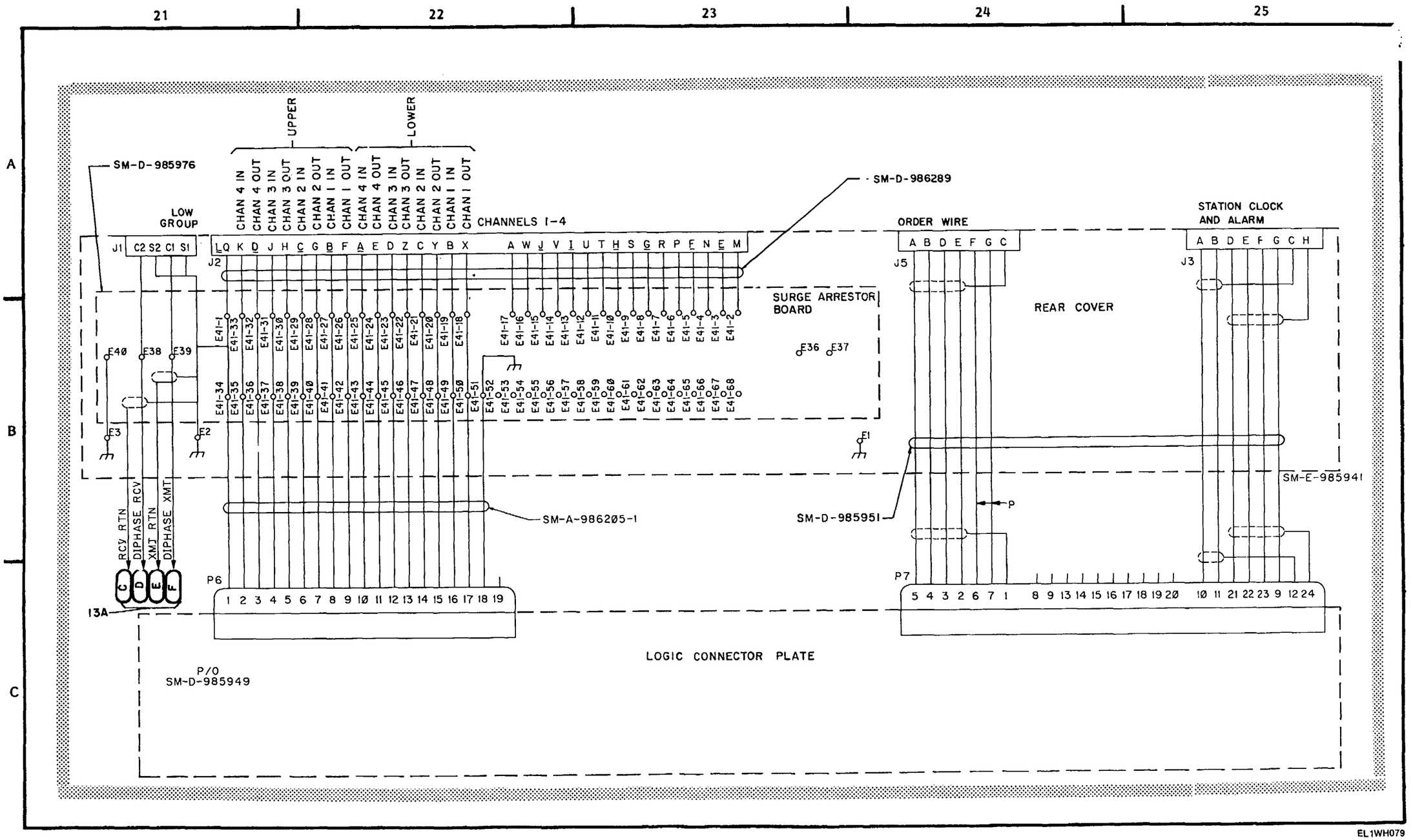


Figure FO-14. Multiplexer TD-1233 (P) TTC Interconnection Diagram (Sheet 3 of 3)

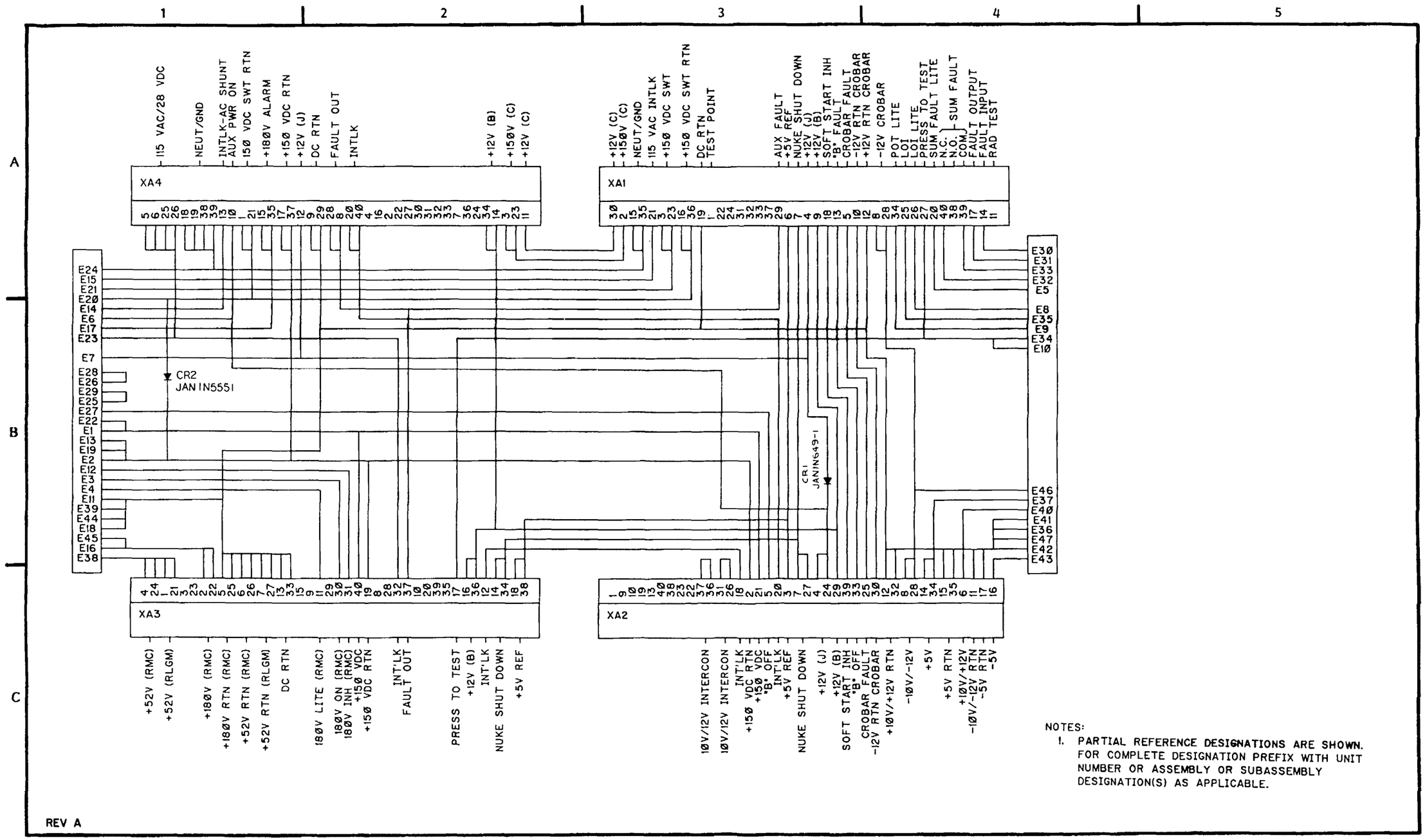
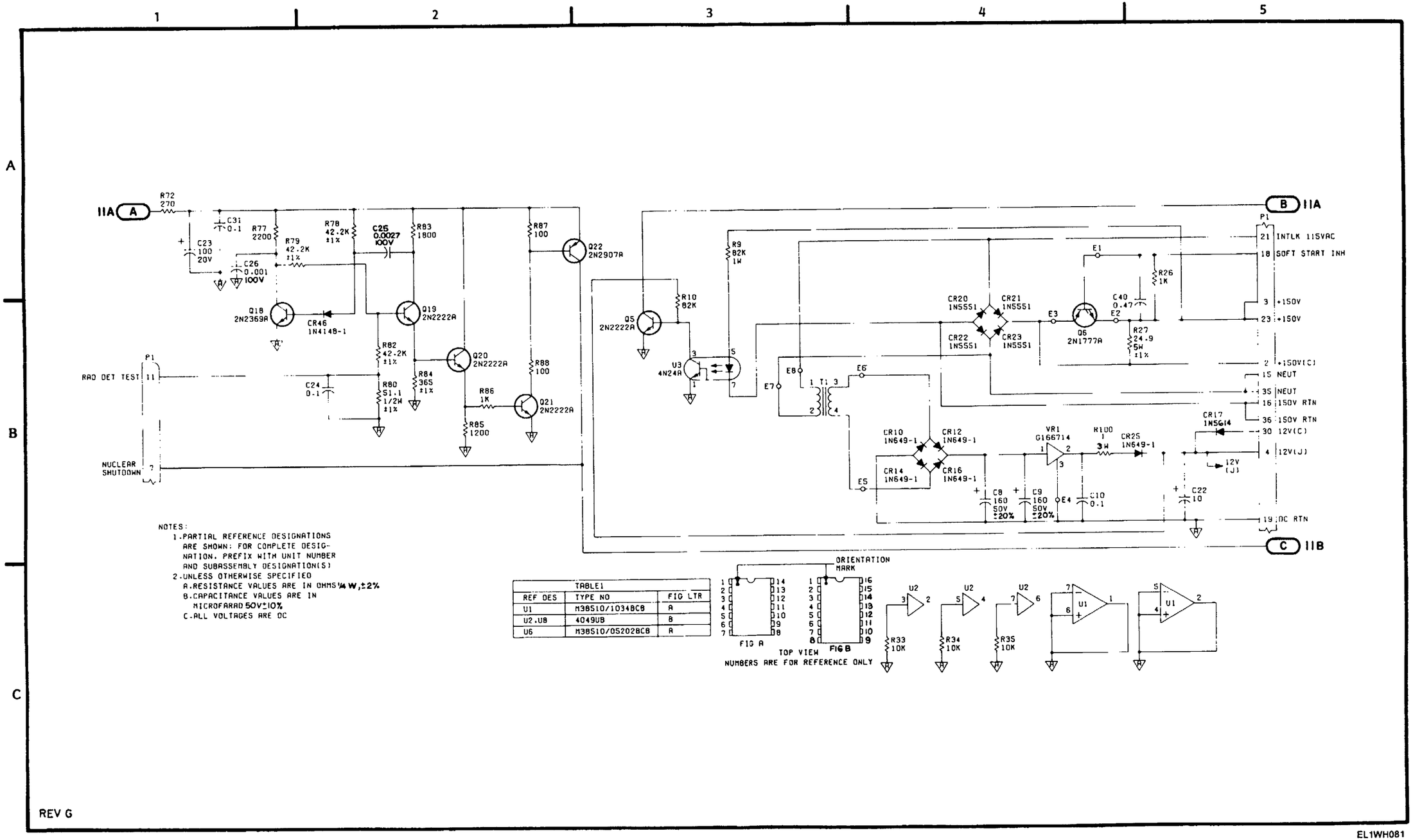


Figure FO-15. 4-Position Backplane Schematic Diagram



EL1WH081

Figure FO-16. Ac Input CCA A1 Schematic Diagram (Sheet 1 of 2)

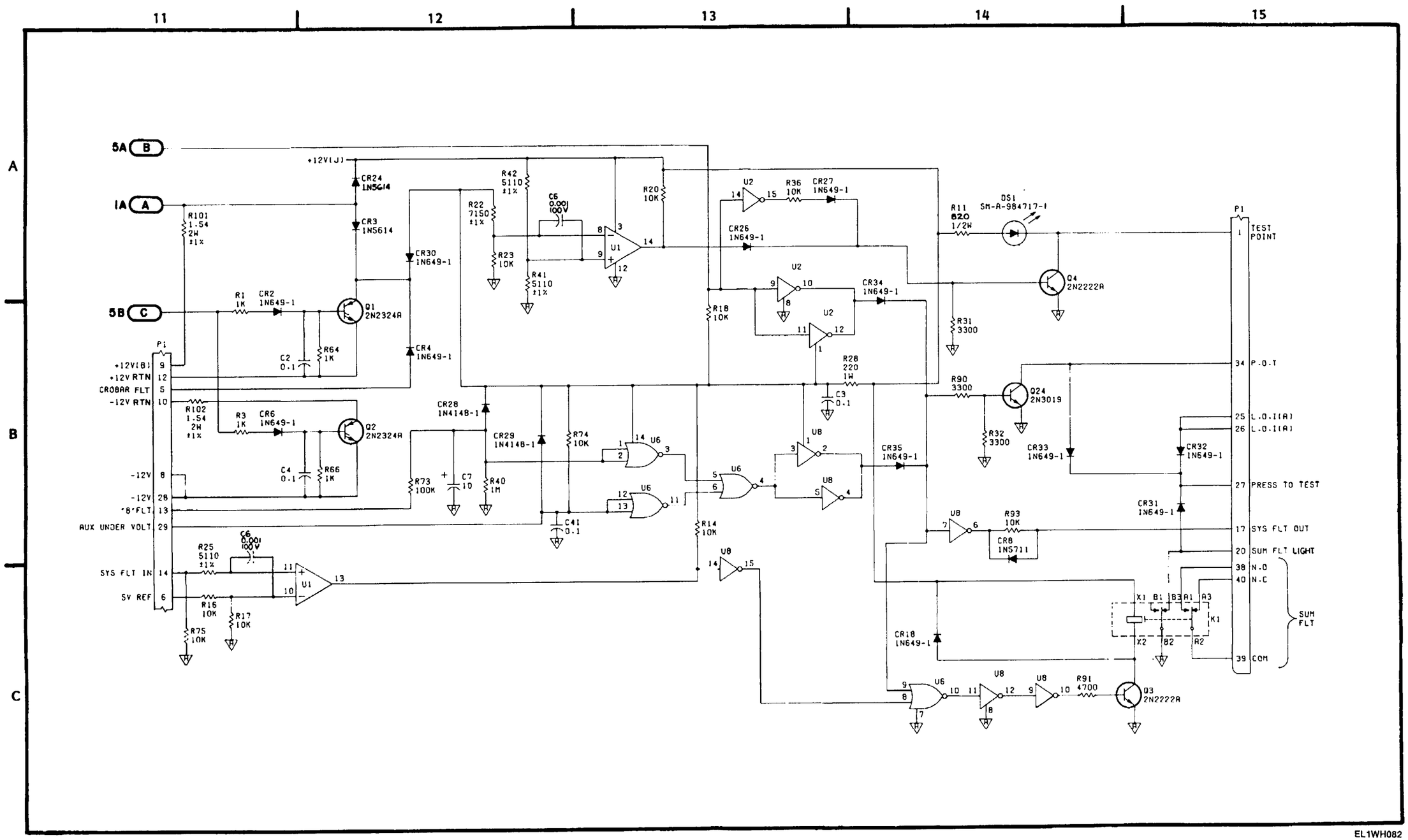
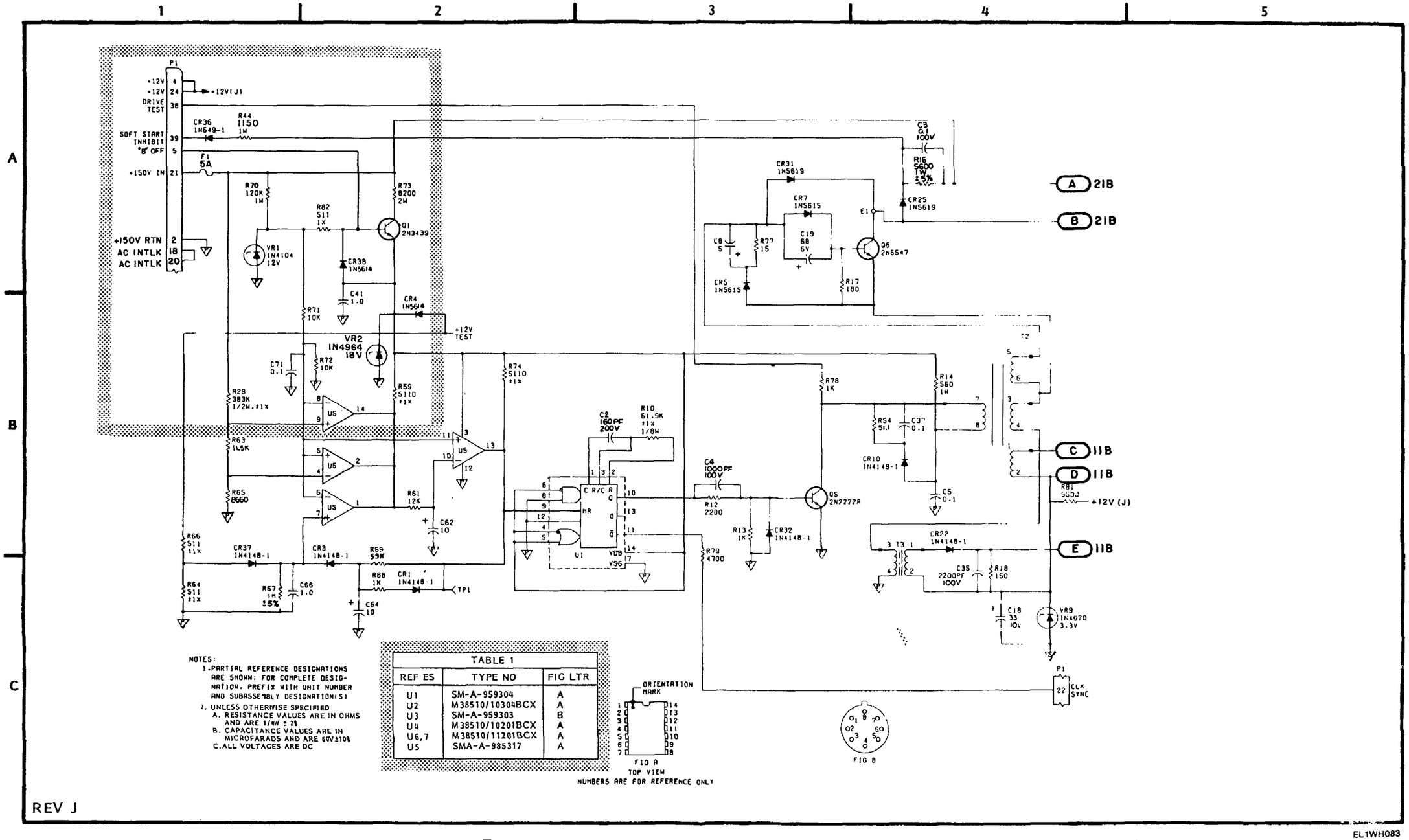


Figure FO-16. Ac Input CCA A1 Schematic Diagram (Sheet 2 of 2)



NOTES:
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION, PREFIX WITH UNIT NUMBER AND SUBASSEMBLY DESIGNATION(S)
2. UNLESS OTHERWISE SPECIFIED
   A. RESISTANCE VALUES ARE IN OHMS AND ARE 1/4W ± 2%
   B. CAPACITANCE VALUES ARE IN MICROFARADS AND ARE 60V ±10%
   C. ALL VOLTAGES ARE DC

TABLE 1

REF ES	TYPE NO	FIG LTR
U1	SM-A-959304	A
U2	M38510/10304BCX	A
U3	SM-A-959303	B
U4	M38510/10201BCX	A
U6,7	M38510/11201BCX	A
U5	SMA-A-985317	A

EL1WH083

Figure FO-17. Multi Vdc CCA A2 Schematic Diagram (Sheet 1 of 4)

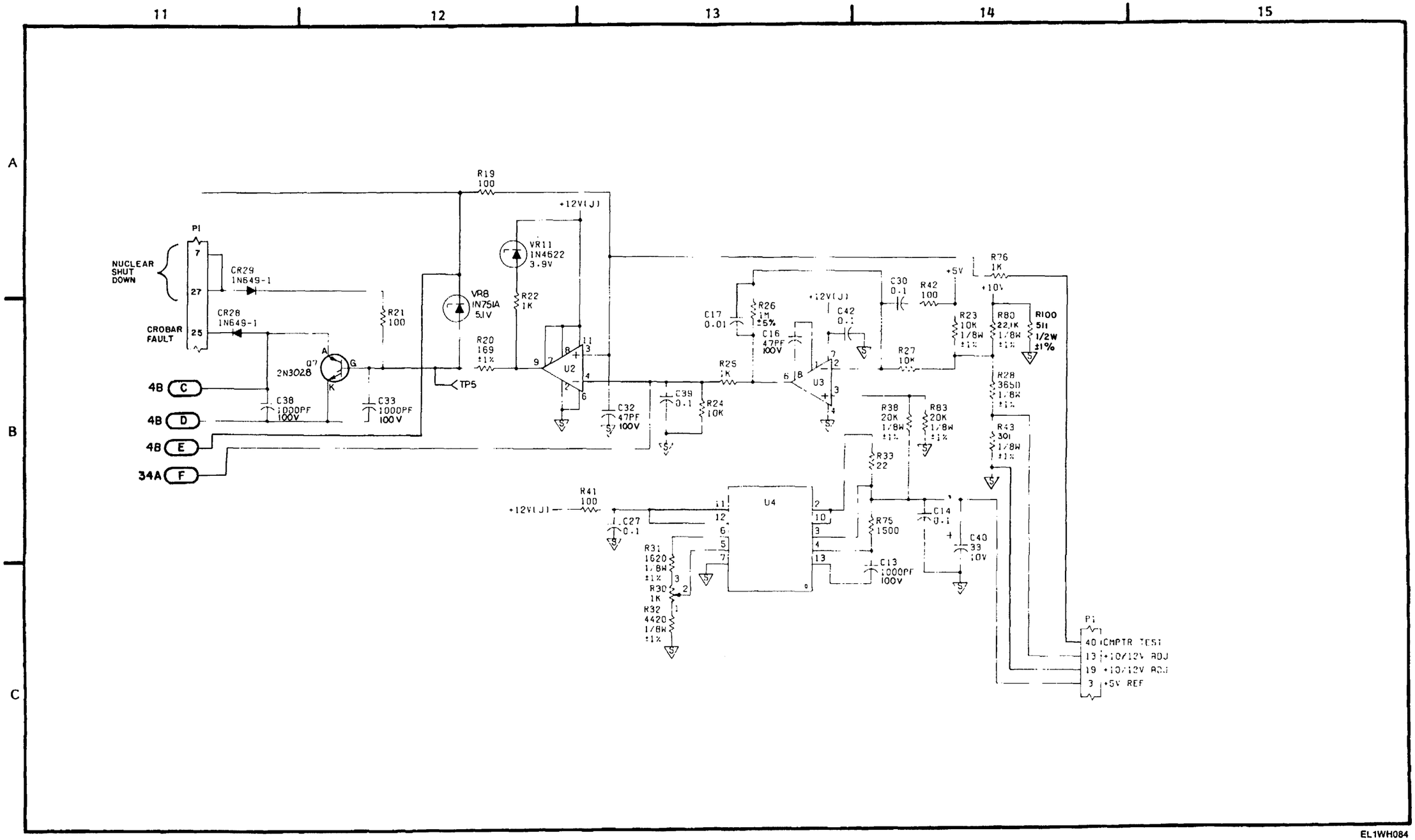
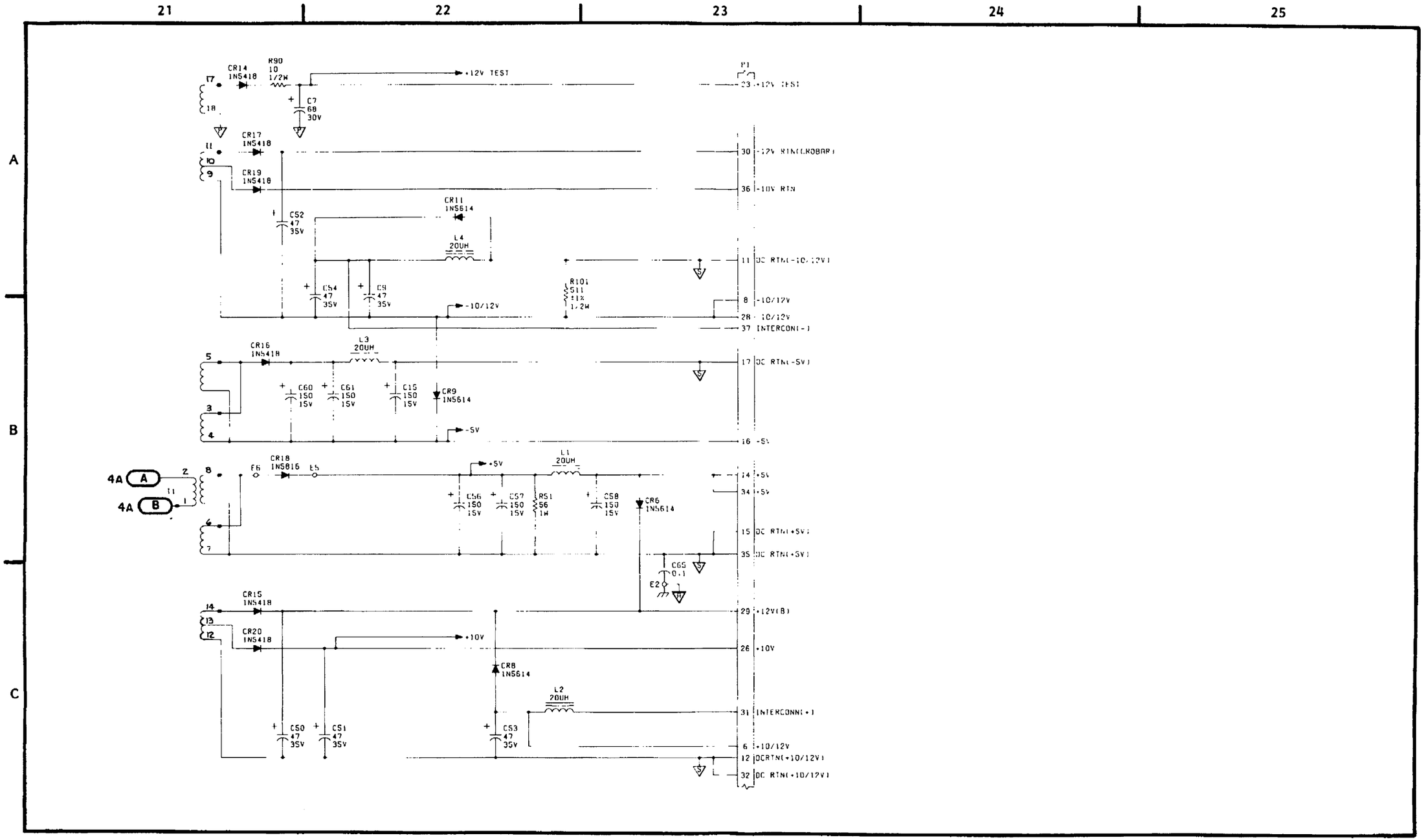
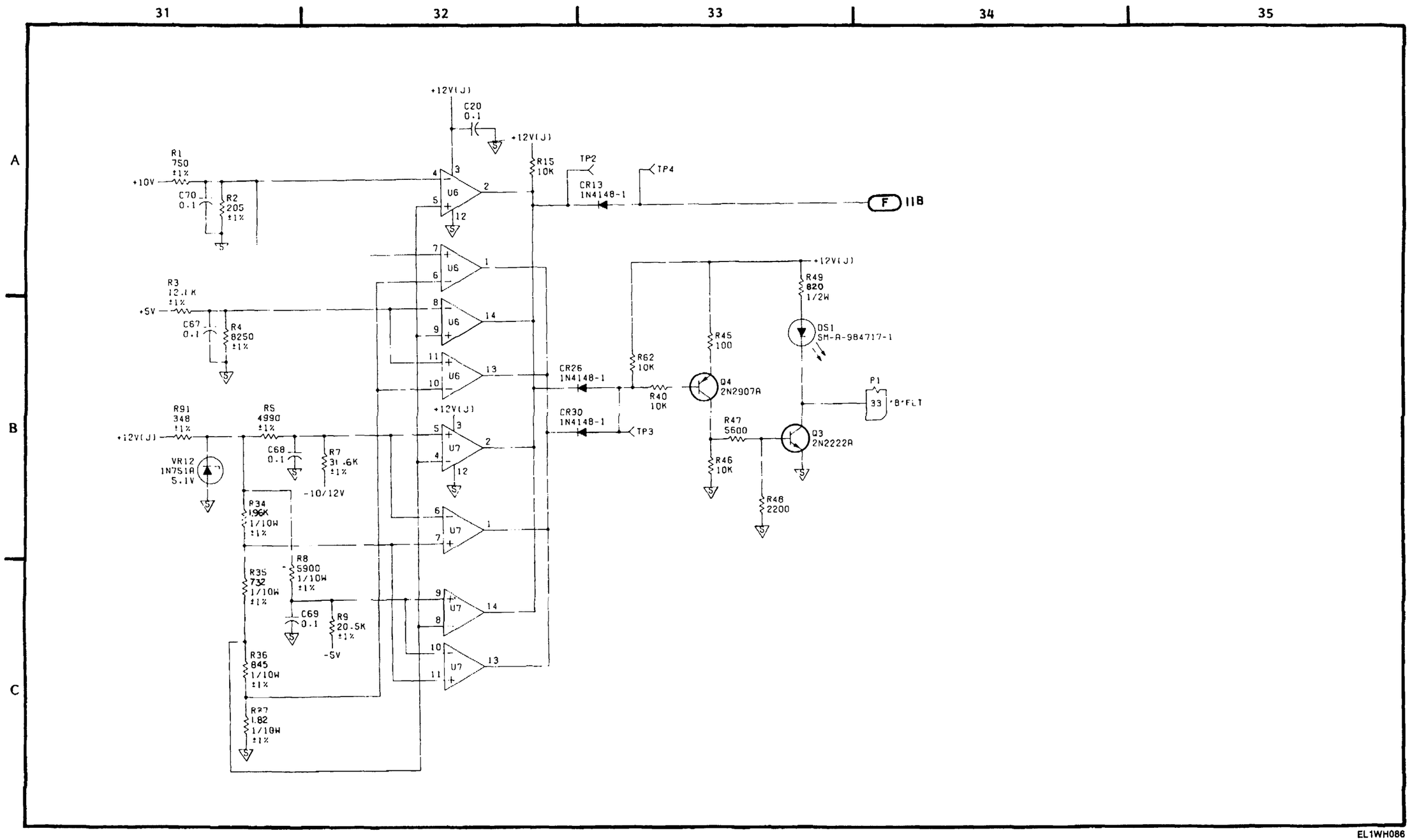


Figure FO-17. Multi Vdc CCA A2 Schematic Diagram (Sheet 2 of 4)



EL1WH085

Figure FO-17. Multi Vdc CCA A2 Schematic Diagram (Sheet 3 of 4)



EL1WH086

Figure FO-17. Multi Vdc CCA A2 Schematic Diagram (Sheet 4 of 4)

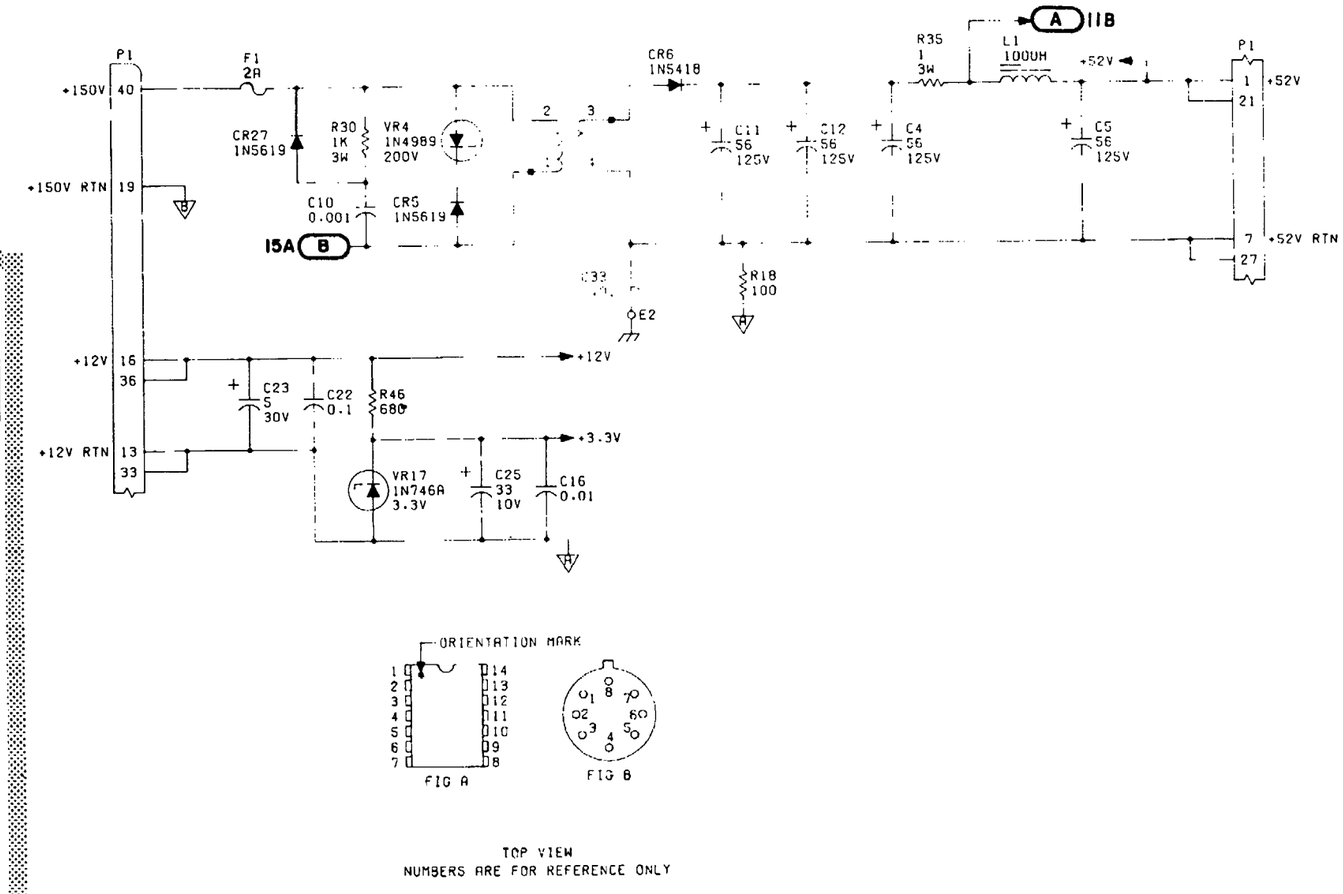
NOTES:
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION, PREFIX WITH UNIT NUMBER AND SUBASSEMBLY DESIGNATION(S)
2. UNLESS OTHERWISE SPECIFIED
   A. RESISTOR VALUES ARE IN OHMS AND ARE 1/4W, ±2%
   B. CAPACITOR VALUES ARE IN MICROFARADS AND ARE 50V, ±10%
   C. ALL VOLTAGES ARE DC

TABLE 1

REF DES	TYPE	POWER PINS +12V	POWER PINS GND	FIG LTR	ESD
U1,3	M38510/103048CX	11	6	A	-
U2	7703301GX	7	4	B	-
U4	SM-A-959304	14	7	A	-
U5	M38510/112018CX	3	12	A	-

TABLE 2

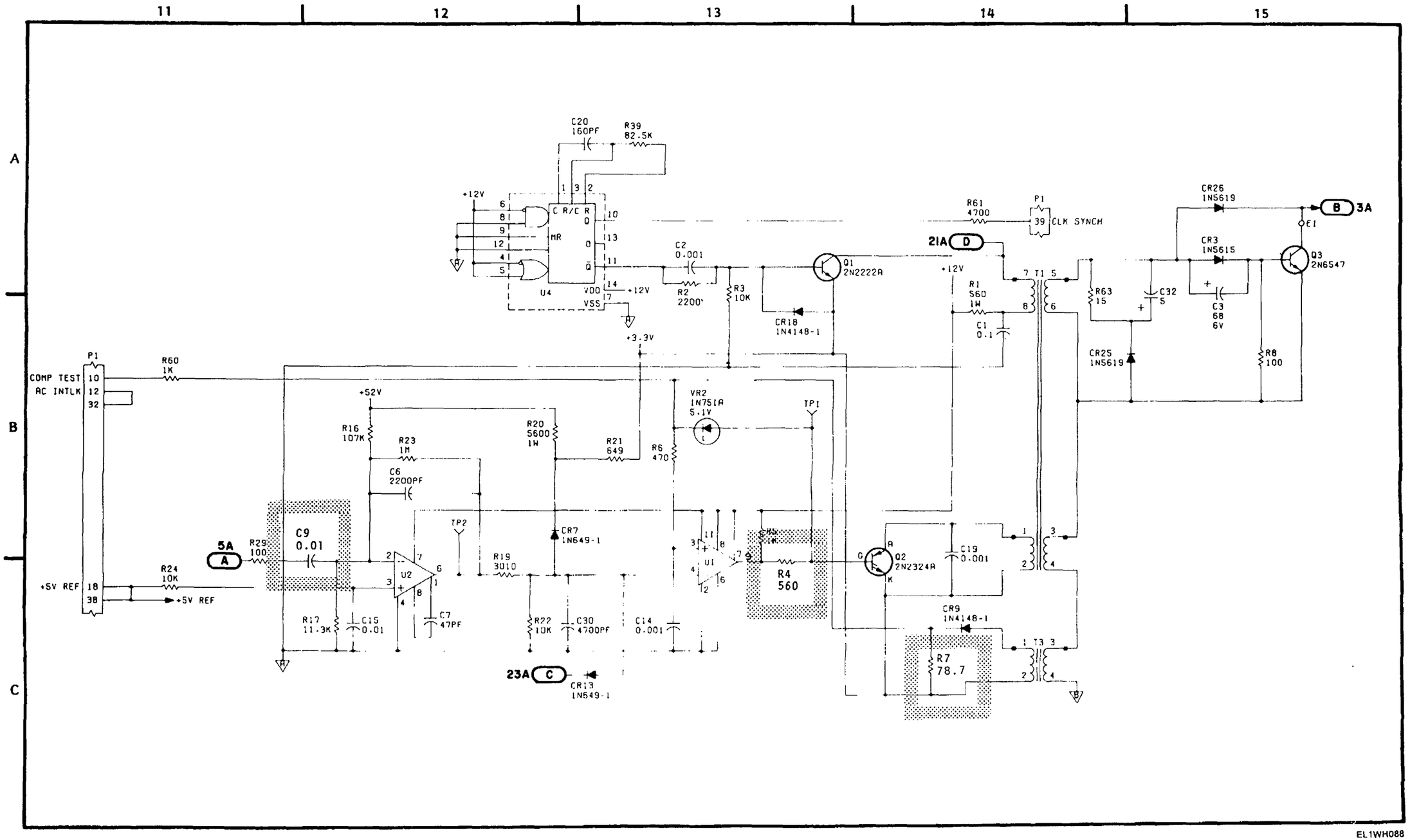
REF DES: HIGHEST USED	REF DES: NOT USED
C36	C13,28, 29,31,34
CR27	CR1,2,4,10,15,17, 19 THRU 24
DS1	
E2	
L1	
P1	
Q7	Q6
R65	R13,32,33,34,36,37, 38,44,45, 47 THRU 51, 53 THRU 59, 64
TP2	
T3	
U5	
VR17	VR1,3,5 THRU 14, 16



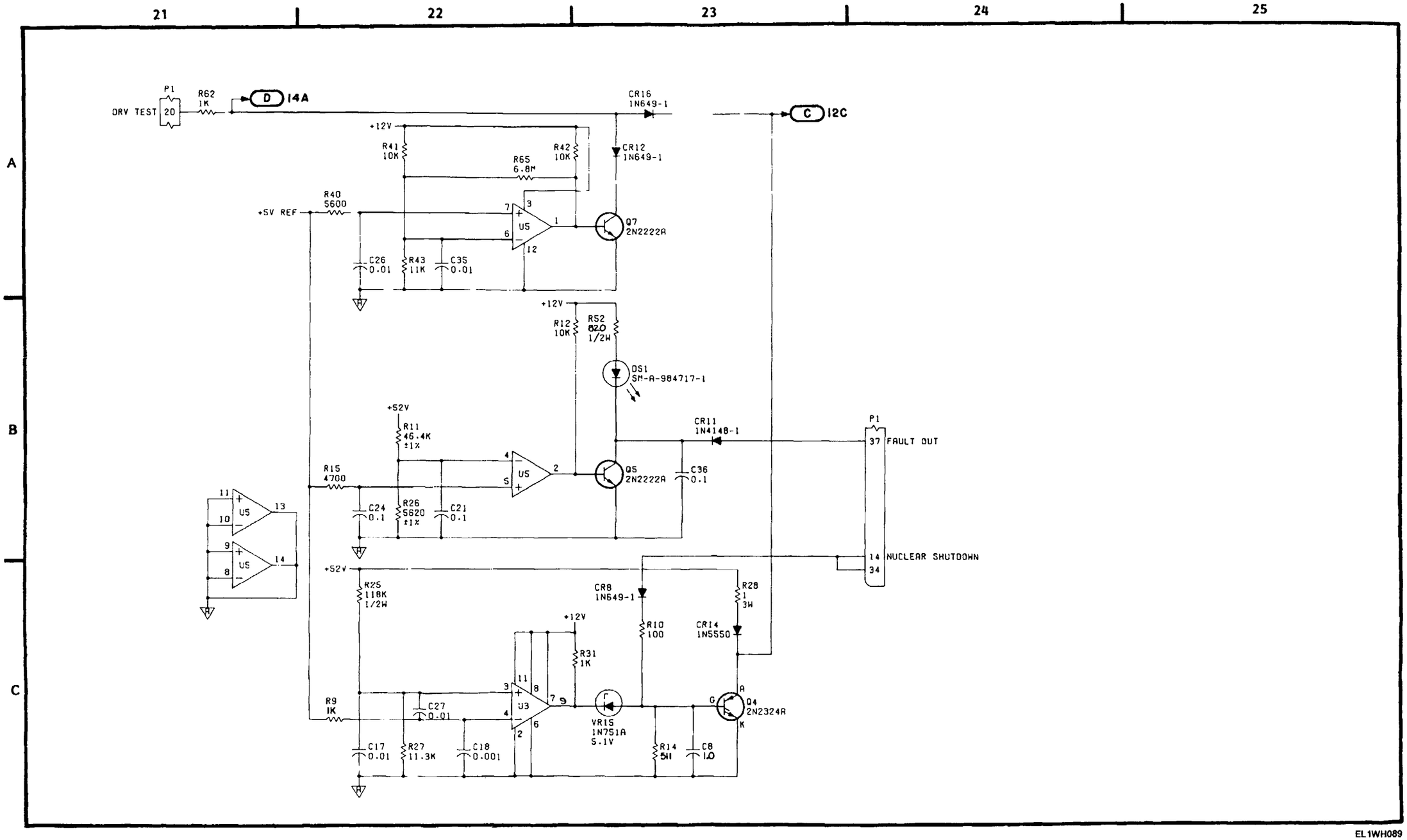
REV H

EL1WH087

Figure FO-18. 52 Vdc CCA A3 Schematic Diagram (Sheet 1 of 3)



■ *Figure FO-18. 52 Vdc CCA A3 Schematic Diagram (Sheet 2 of 3)*



EL1WH089

Figure FO-18. 52 Vdc CCA A3 Schematic Diagram (Sheet 3 of 3)

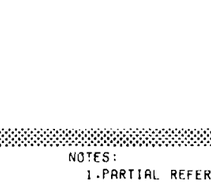
NOTES:
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT NUMBER AND SUBASSEMBLY DESIGNATION(S)
2. UNLESS OTHERWISE SPECIFIED
   A. RESISTER VALUES ARE IN OHMS AND ARE 1/4W, ±2%
   B. CAPACITOR VALUES ARE IN MICROFARADS AND ARE 50V, ±10%
   C. ALL VOLTAGES ARE DC

TABLE 1

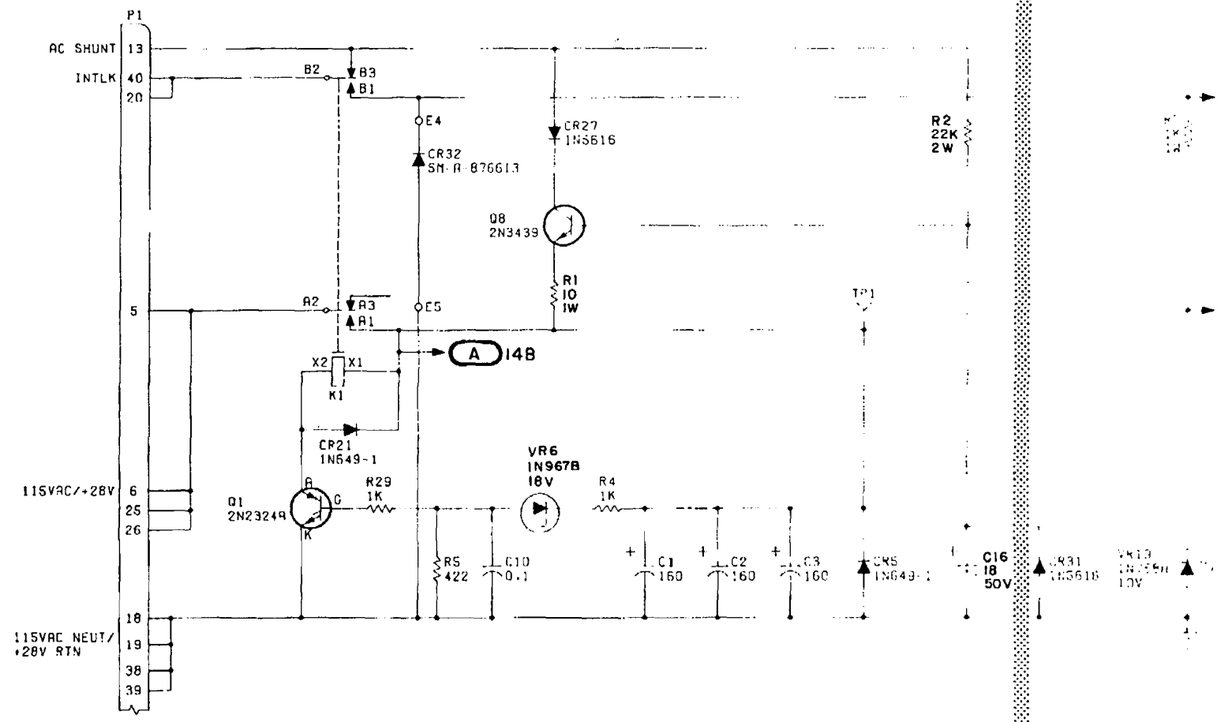
REF DES	TYPE	POWER PINS +10V	POWER PINS GND	FIG LTR	ESD
U1	SM-A-959304	14	7	A	-
U2	JAN4N24A	-	-	A	-

TABLE 2

REF DES HIGHEST USED	REF DES NOT USED
C6	C12,13
CR44	CR12,18,20, 25,28 34-42
DS1	
E7	
K2	
P1	
Q10	
R29	R3,19-21
T3	
TP7	
U2	
VR19	VR2-5,7-18



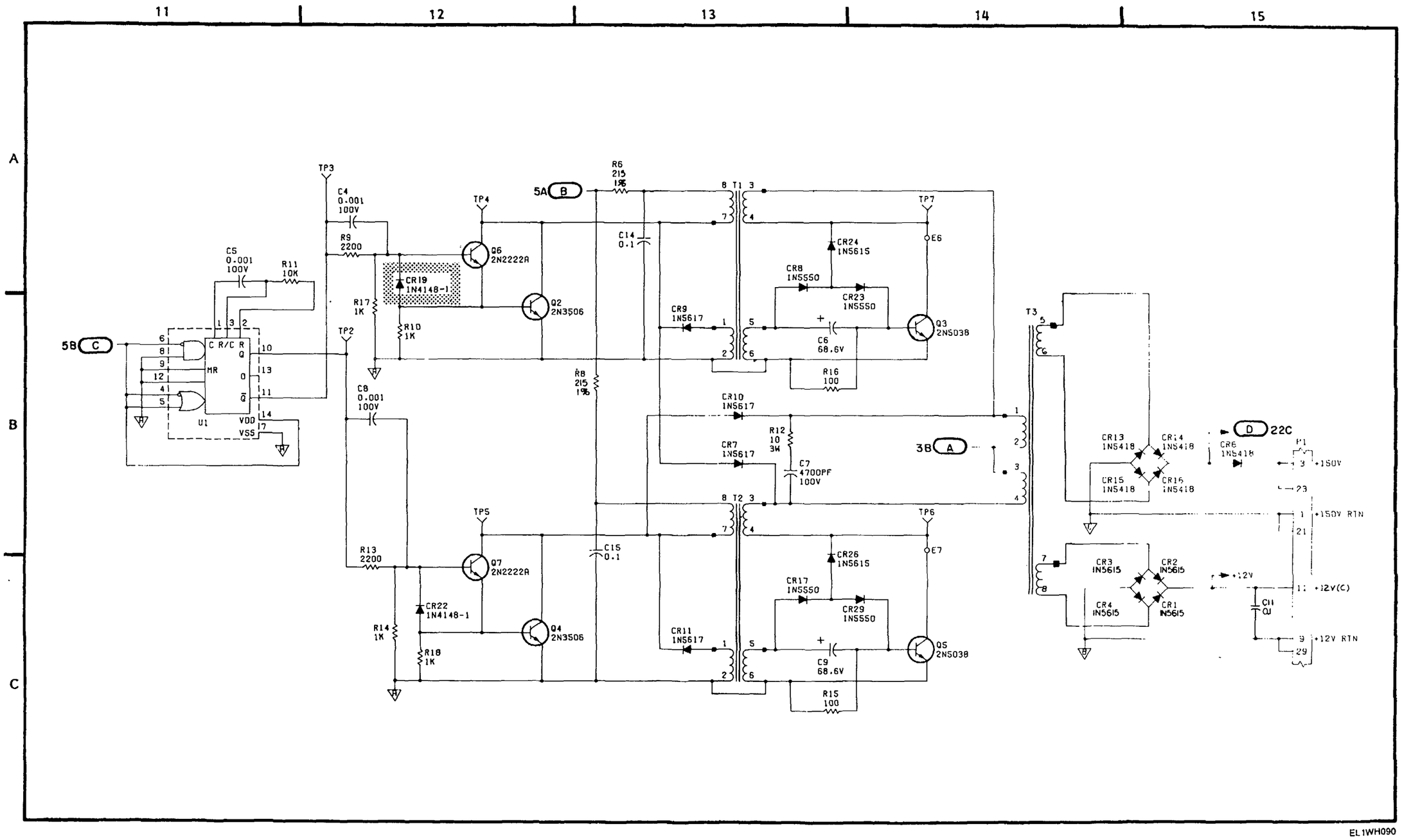
NUMBERS ARE FOR REFERENCE ONLY



REV K

EL1WH095

Figure FO-19. Dc Input CCA A4 Schematic Diagram (Sheet 1 of 3)



■ *Figure FO-19. Dc Input CCA A4 Schematic Diagram (Sheet 2 of 3)*

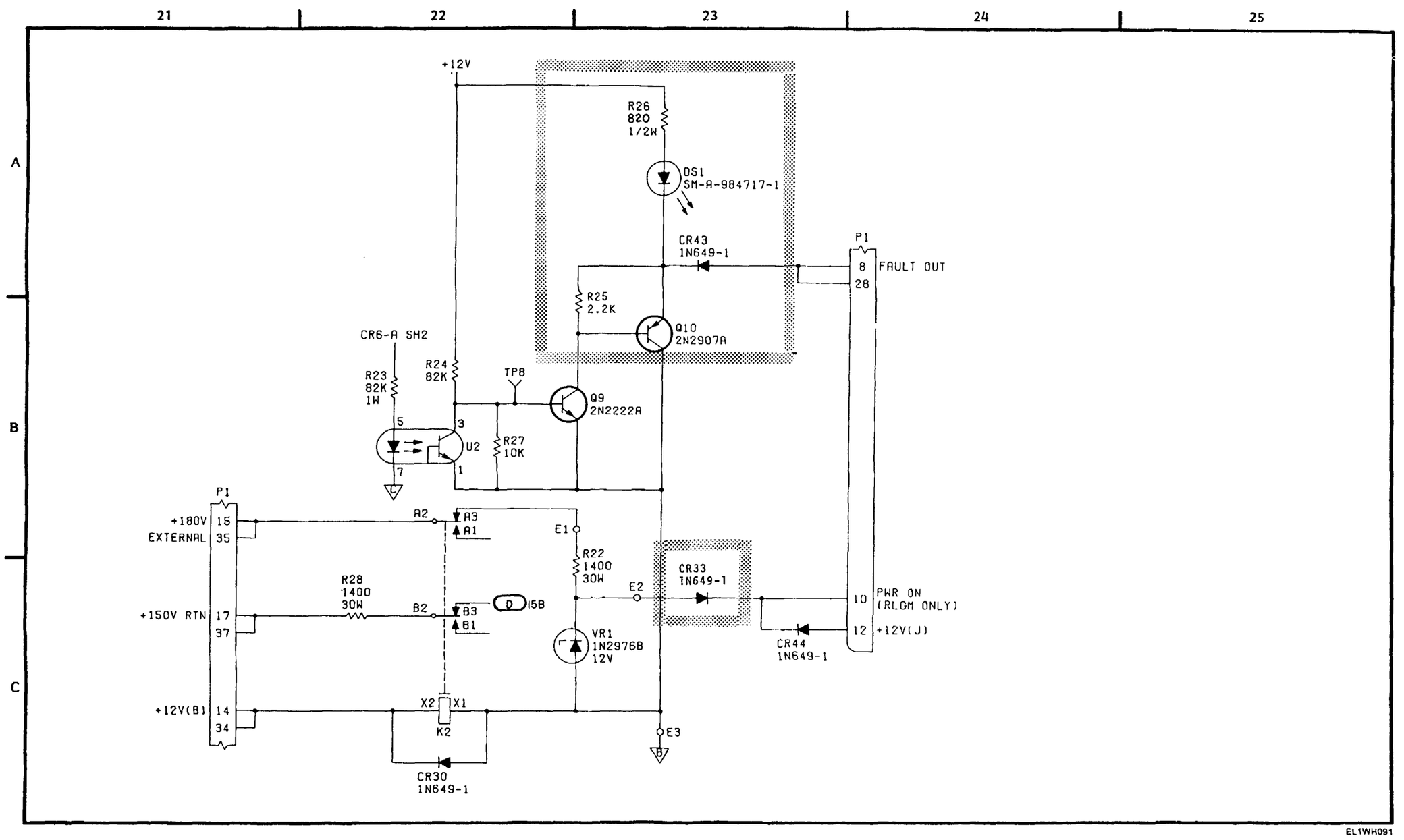


Figure FO-19. Dc Input CCA A4 Schematic Diagram (Sheet 3 of 3)

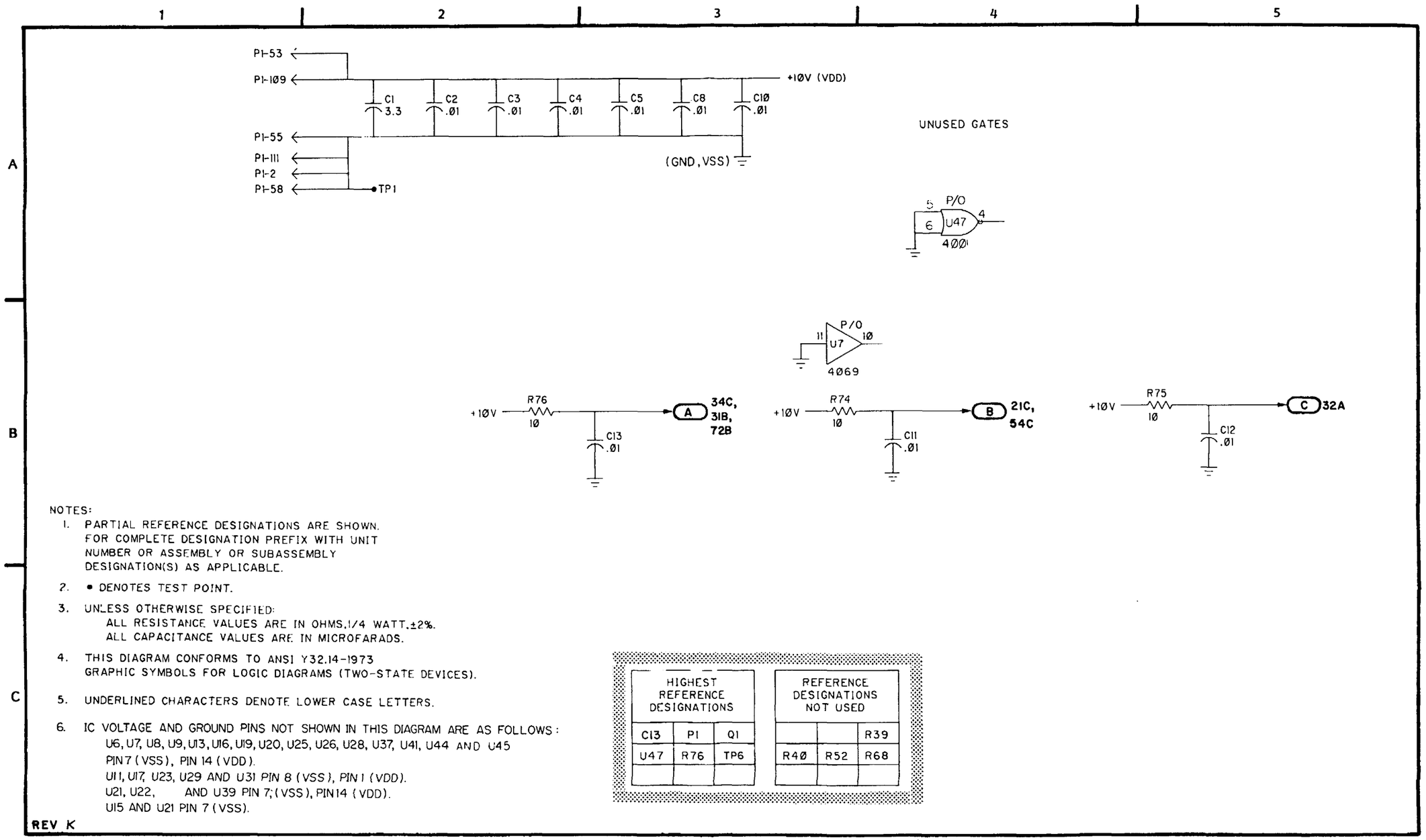
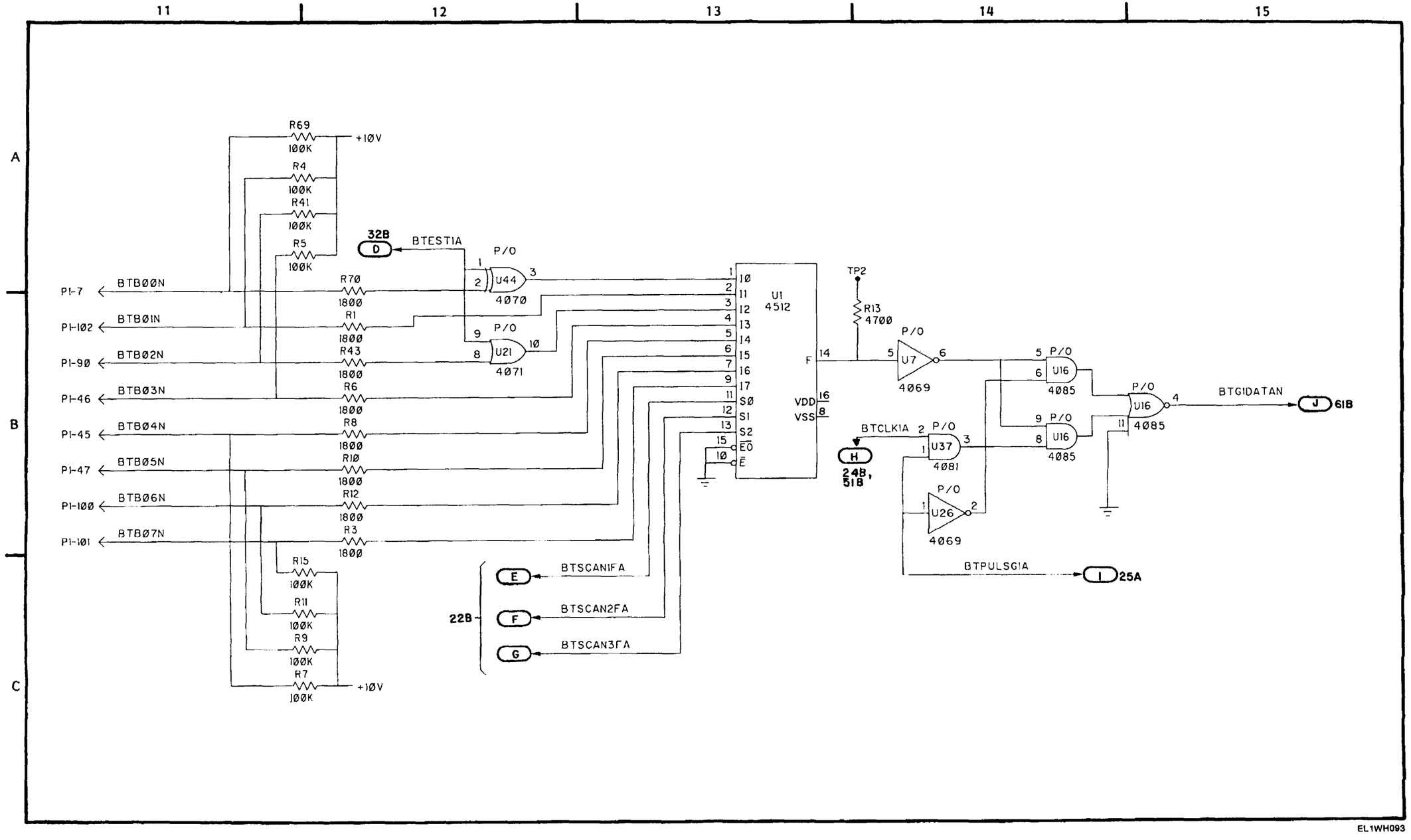


Figure FO-20. BITE 2 CCA A5 Schematic Diagram (Sheet 1 of 8)



EL1WH093

Figure FO-20. BITE 2 CCA A5 Schematic Diagram (Sheet 2 of 8)

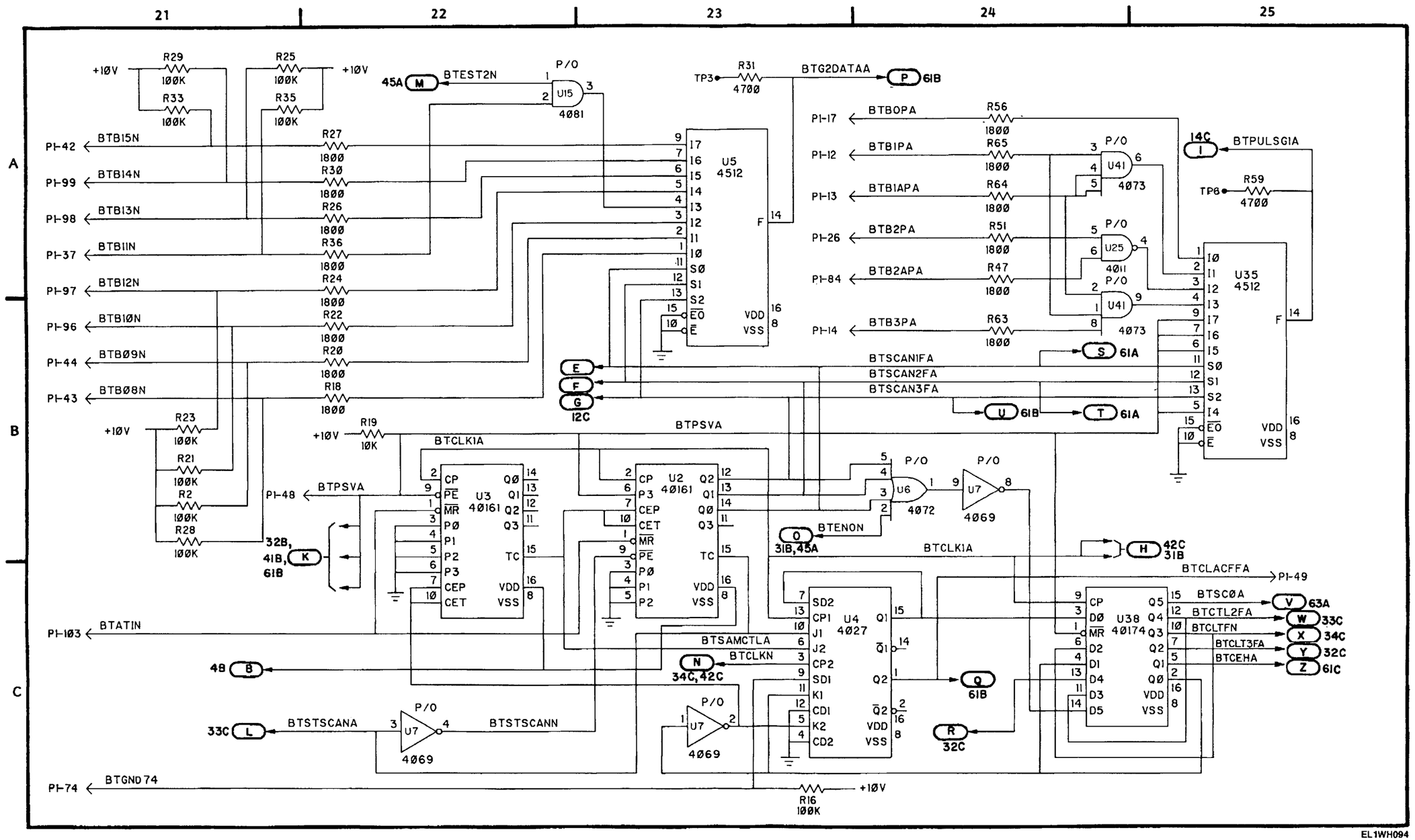
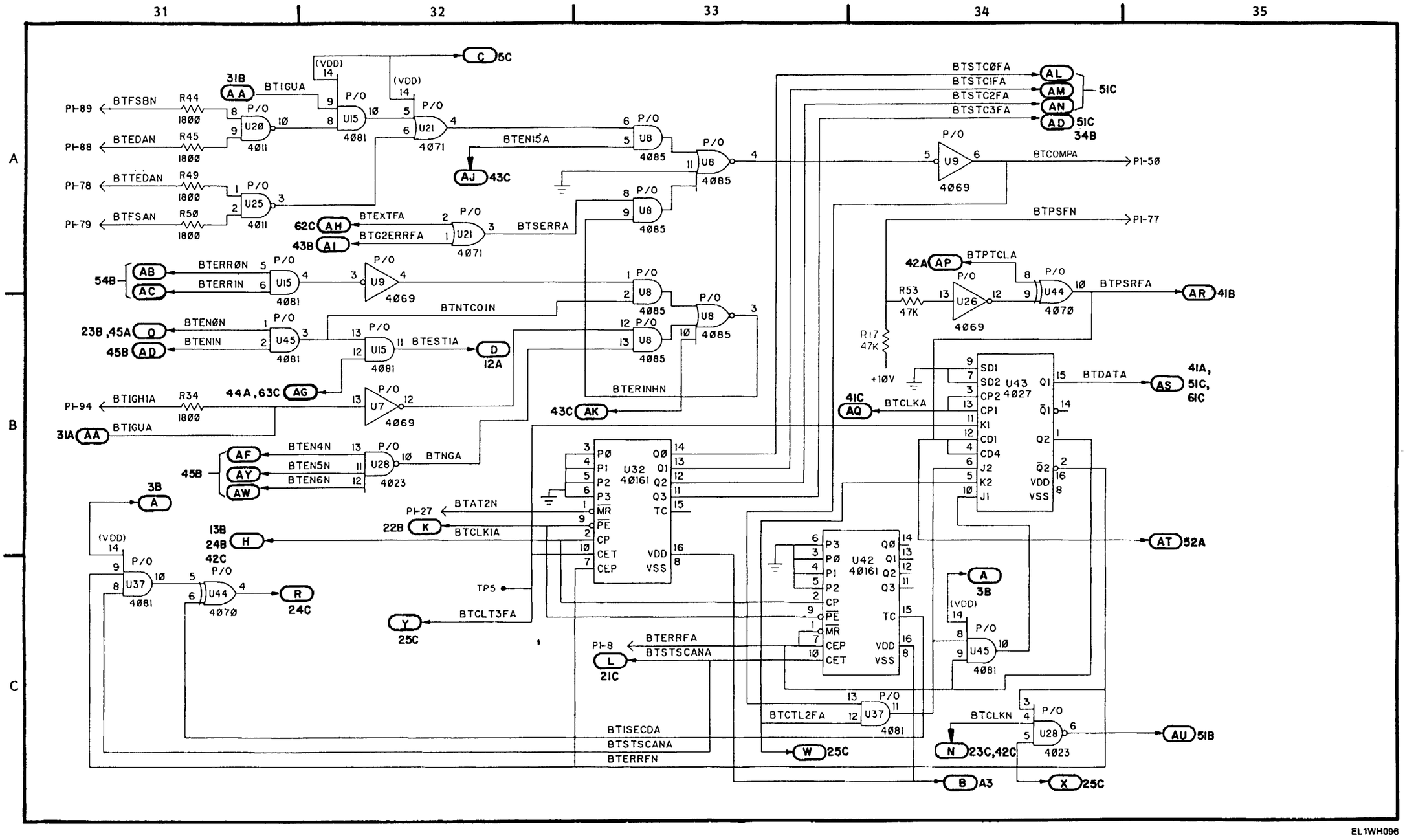
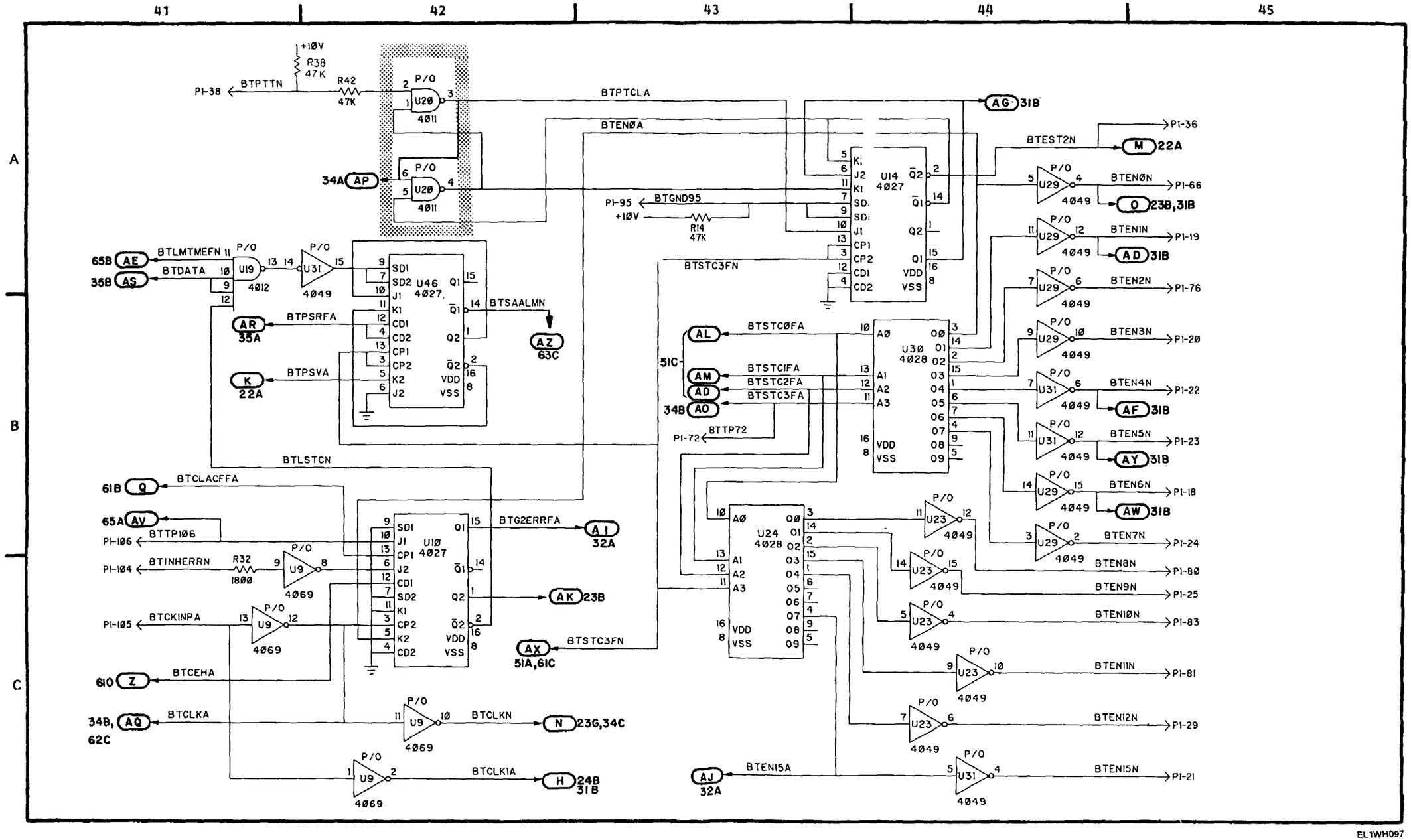


Figure FO-20. BITE 2 CCA A5 Schematic Diagram (Sheet 3 of 8)



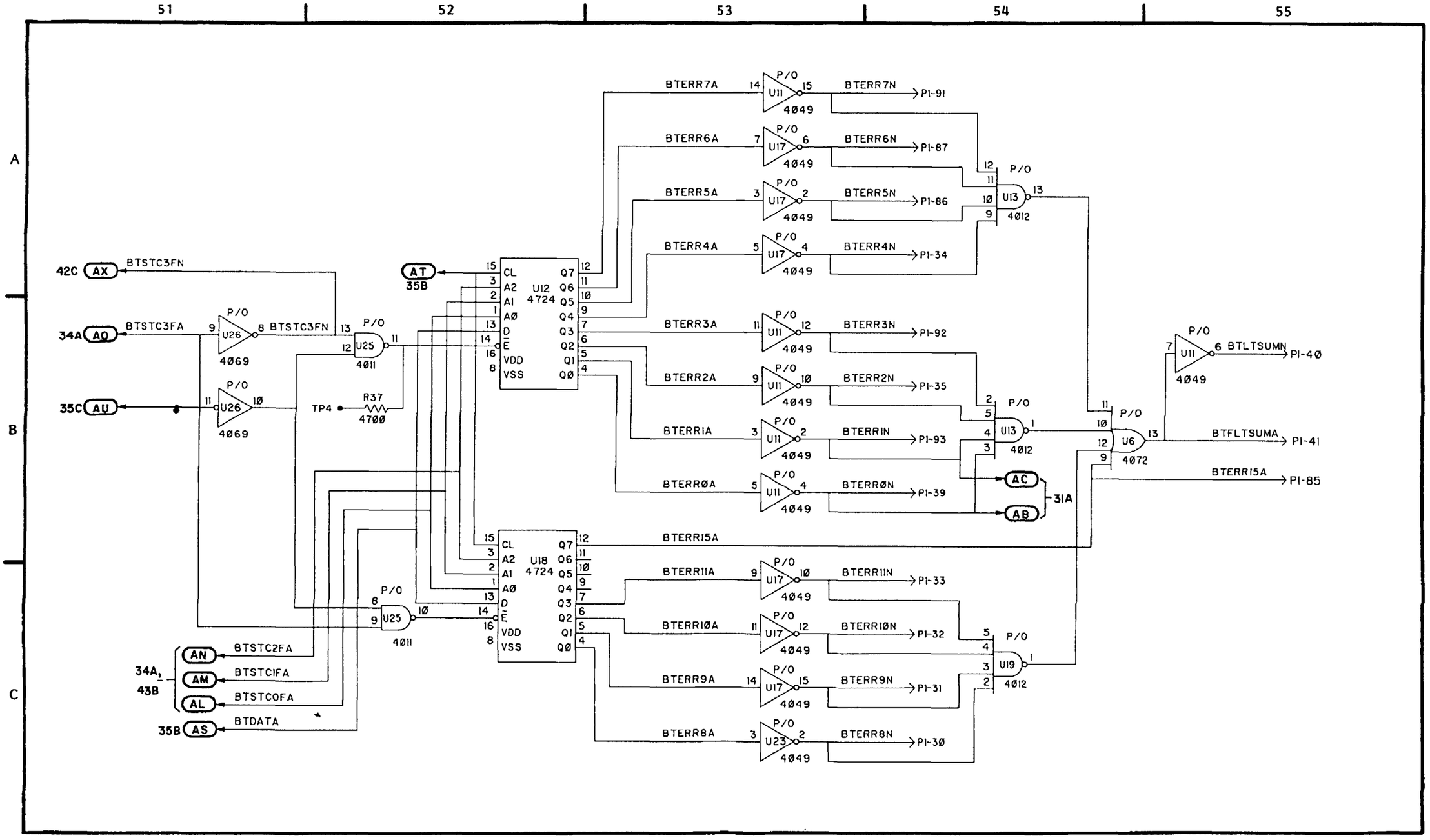
EL1WH096

Figure FO-20. BITE 2 CCA A5 Schematic Diagram (Sheet 4 of 8)



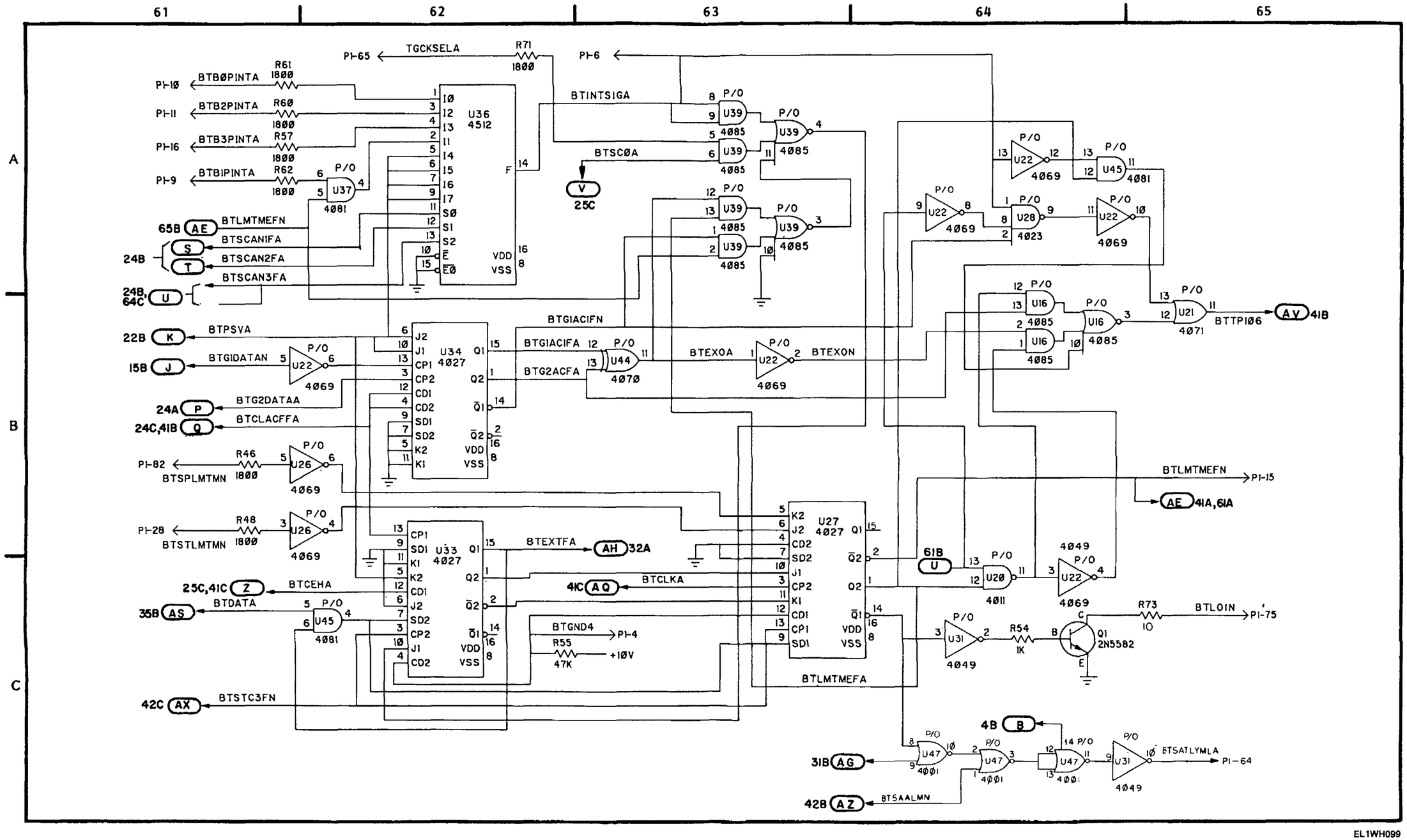
EL1WH097

Figure FO-20. BITE 2 CCA A5 Schematic Diagram (Sheet 5 of 8)



EL1WH098

Figure FO-20. BITE 2 CCA A5 Schematic Diagram (Sheet 6 of 8)



EL1WH099

Figure FO-20. BITE 2 CCA A5 Schematic Diagram (Sheet 7 of 8)

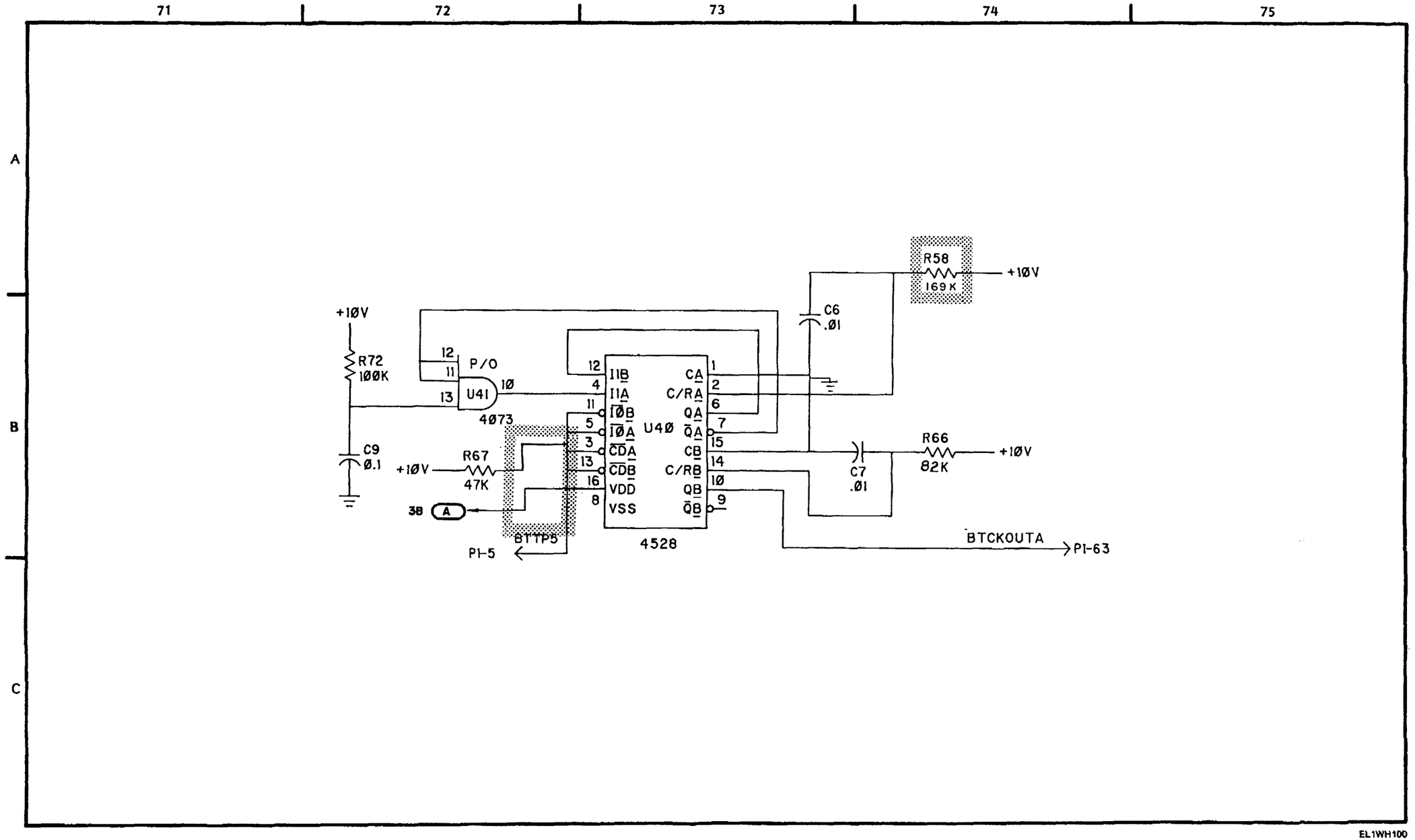
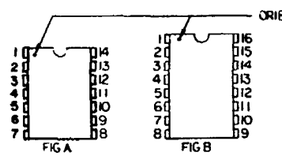


Figure FO-20. BITE 2 CCA A5 Schematic Diagram (Sheet 8 of 8)

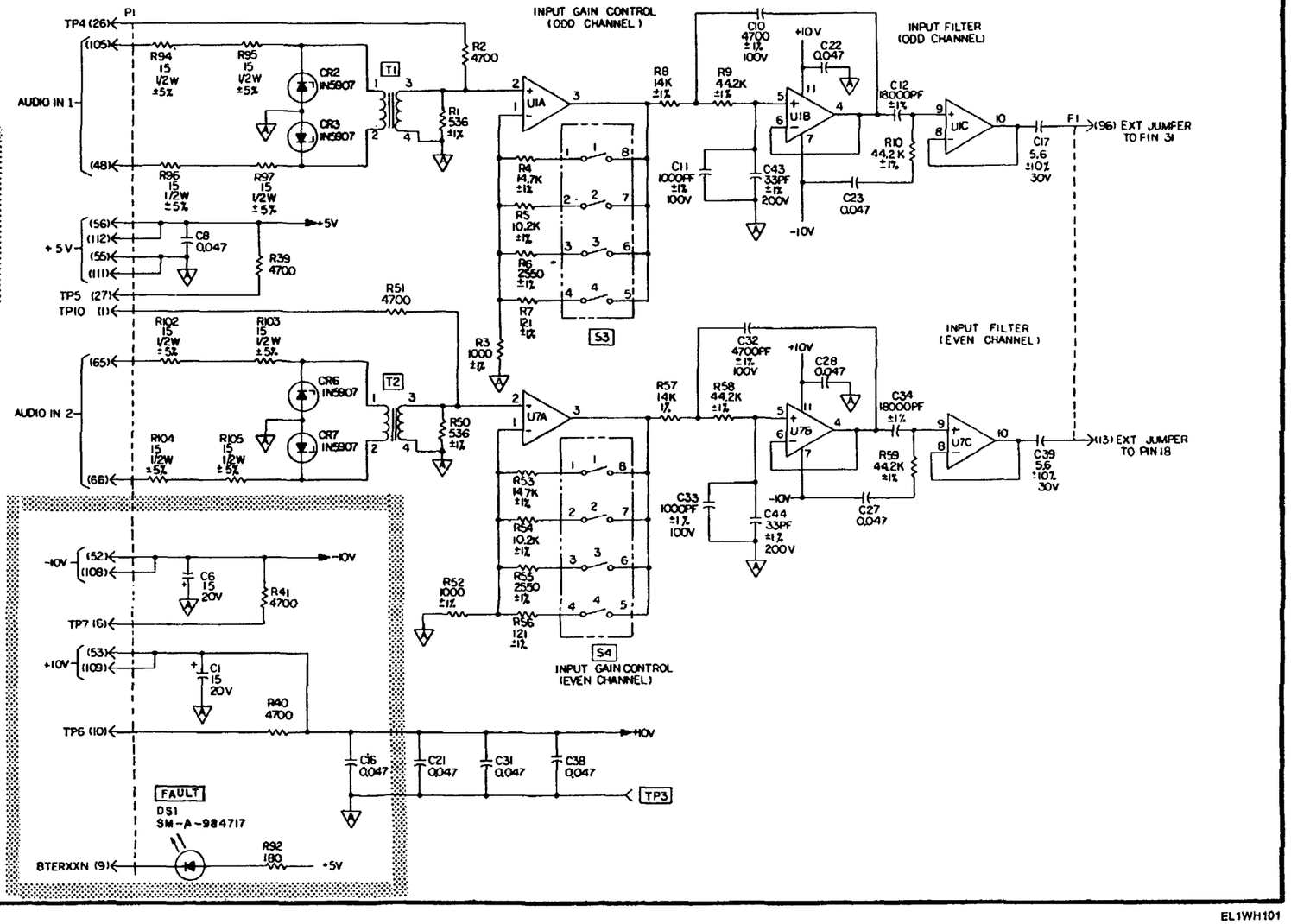
NOTES:
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION PREFIX WITH UNIT NUMBER AND SUBASSEMBLY DESIGNATION(S)
2. UNLESS OTHERWISE SPECIFIED:
   A. RESISTANCE VALUES ARE IN OHMS ±2%,1/4W
   B. CAPACITANCE VALUES ARE IN MICROFARADS,±10%,50V
3. [ ] INDICATES MARKING ON CIRCUIT BOARD

TABLE 1					
REF DES	PART NO.	POWER +10V	POWER GND	PINS +10V	FIG LTR
U1,7	M38510/11004BCX	11	—	7	A
U2	M38510/17504BEX	16	8,5	—	B
U3	SM-A-876923	16	8	—	B
U4,5,8,9	SM-A-984980	16	8	—	B
U6,10	M38510/10102BCX	9,13	—	4	A



PIN NUMBERS ARE FOR REFERENCE ONLY

TABLE 2	
REF DES	
HIGHEST USED	NOT USED
CR9	CR1
DS1	
FL2	
C44	C2-5,28, 29,30
S6	
T4	
U10	
R113	R38,42, 68,88



REV F

EL1WH101

Figure FO-21. Analog Applique Unit CCA A6, A7 Schematic Diagram (Sheet 1 of 4)

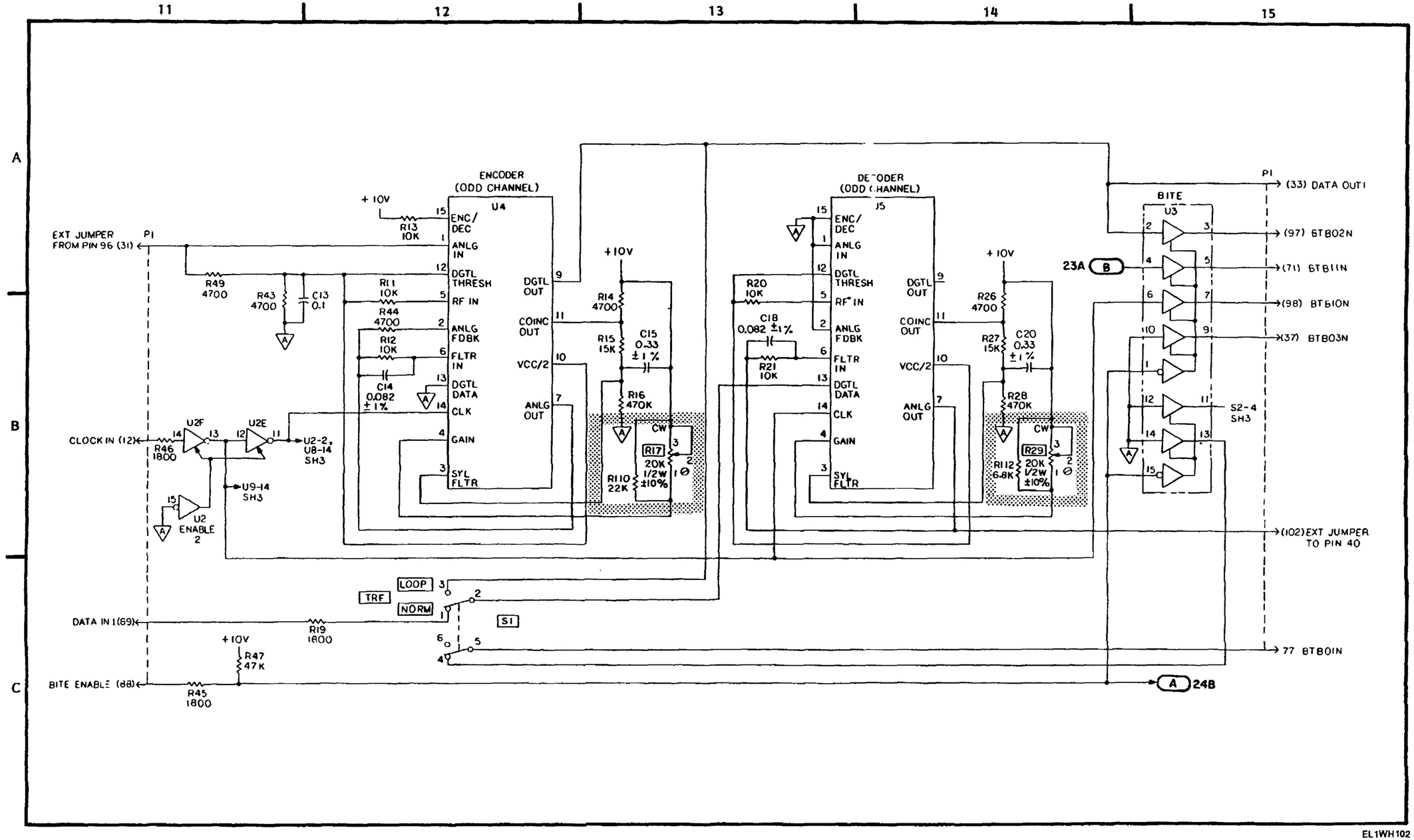


Figure FO-21. Analog Applique Unit CCA A6, A7 Schematic Diagram (Sheet 2 of 4)

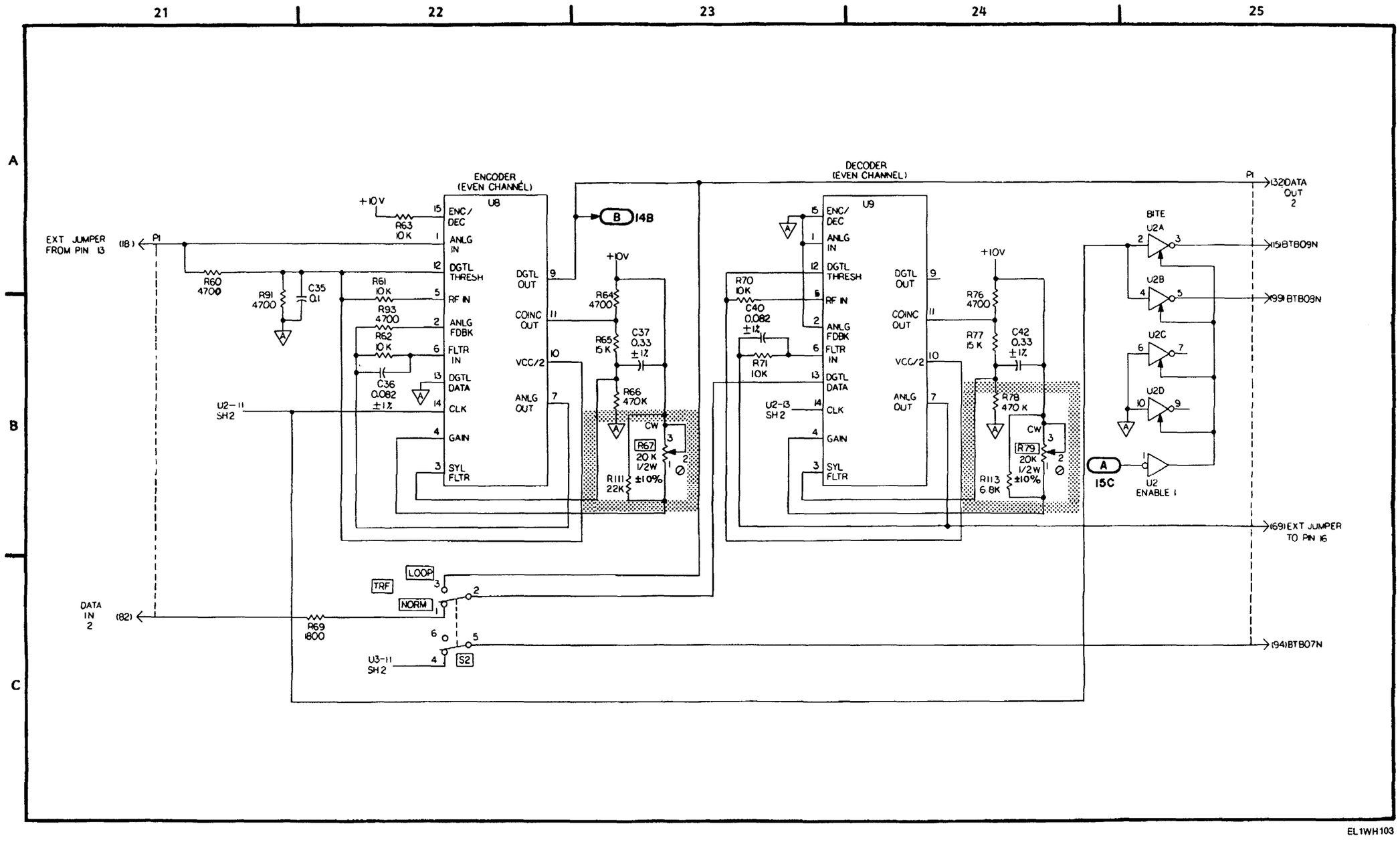


Figure FO-21. Analog Applique Unit CCA A6, A7 Schematic Diagram (Sheet 3 of 4)

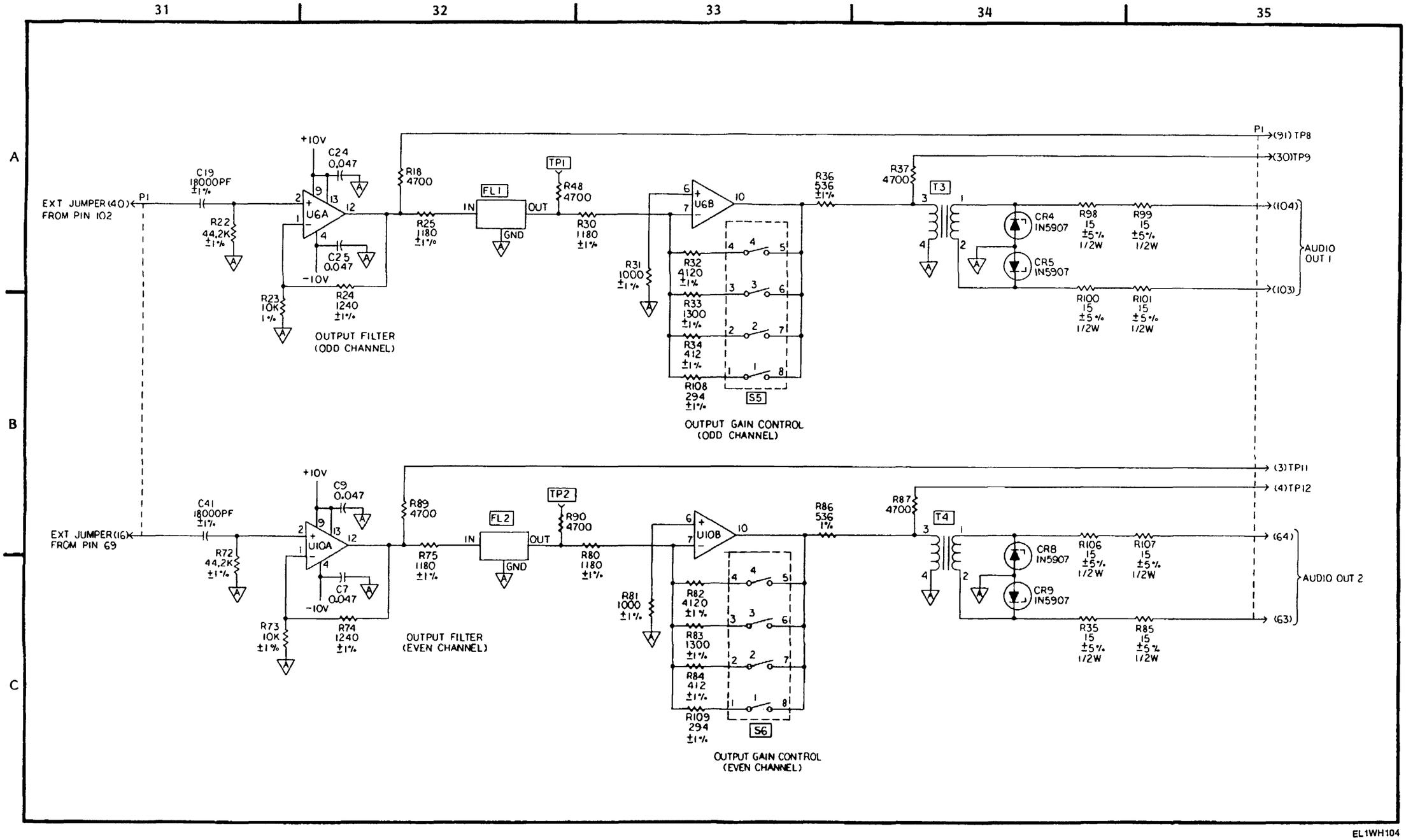
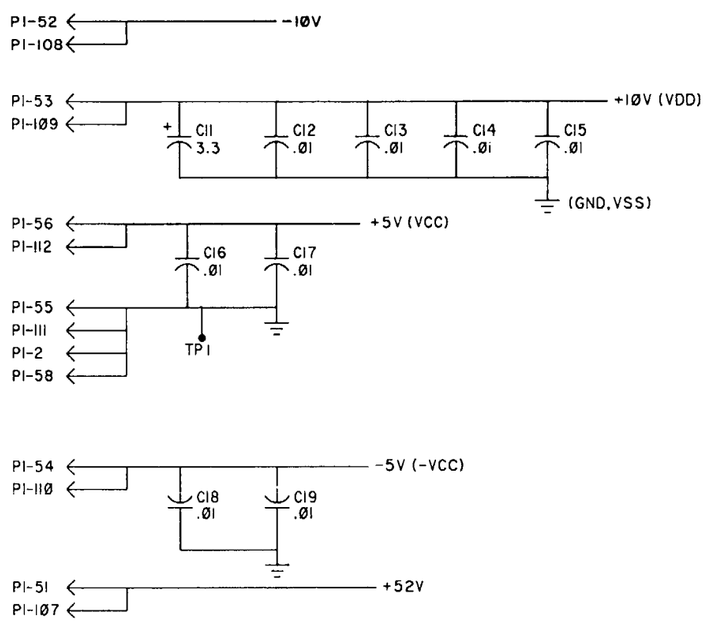
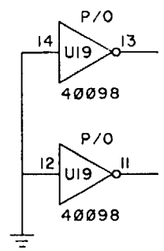


Figure FO-21. Analog Applique Unit CCA A6, A7, Schematic Diagram (Sheet 4 of 4)



UNUSED GATES



NOTES:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR COMPLETE DESIGNATION PREFIX WITH UNIT NUMBER OR ASSEMBLY OR SUBASSEMBLY DESIGNATION(S) AS APPLICABLE.
2. • DENOTES TEST POINT.
3. UNLESS OTHERWISE SPECIFIED:
   ALL RESISTANCE VALUES ARE IN OHMS,1/4 WATT ±2%.
   ALL CAPACITANCE VALUES ARE IN MICROFARADS.
4. THIS DIAGRAM CONFORMS TO ANSI Y32.14-1973, GRAPHIC SYMBOLS FOR LOGIC DIAGRAMS (TWO-STATE DEVICES).
5. UNDERLINED CHARACTERS DENOTE LOWER CASE LETTERS.
6. SECTION B IS TOP HALF OF CARD AND GOES TO ODD NUMBERED LOOPS (1,3,5,7).
   SECTION A IS BOTTOM HALF OF CARD AND GOES TO EVEN NUMBERED LOOPS (2,4,6,8).
7. IC VOLTAGE AND GROUND PINS NOT SHOWN IN THIS DIAGRAM ARE AS FOLLOWS:
   U5,U6,U10,U11,U20,U21,U27 AND U28 PIN 7(VSS), PIN 14(VDD).
   U16 AND U17 PIN 8(VSS, PIN 16(VDD).
   U4,U19 AND U26 PIN 8(VSS).

HIGHEST REFERENCE DESIGNATIONS		
CR31	C29	P1
Q6	R87	S2
T4	U34	TP3

REFERENCE DESIGNATIONS NOT USED		
CR13		CR28

REV H

EL1WH105

Figure FO-22. Loop Modem CCA A6, A7 Schematic Diagram (Sheet 1 of 7)

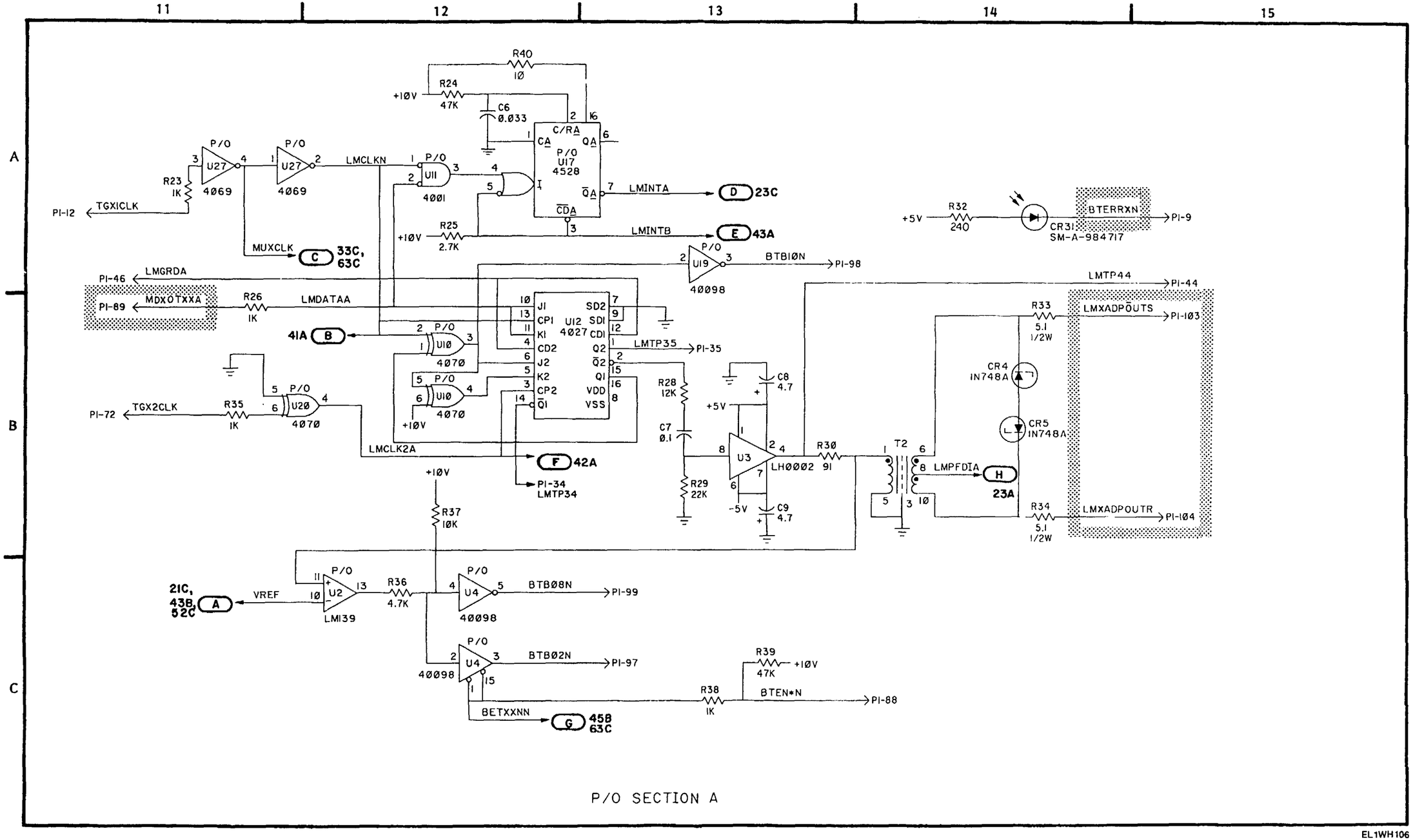


Figure FO-22. Loop Modem CCA A6, A7 Schematic Diagram (Sheet 2 of 7)

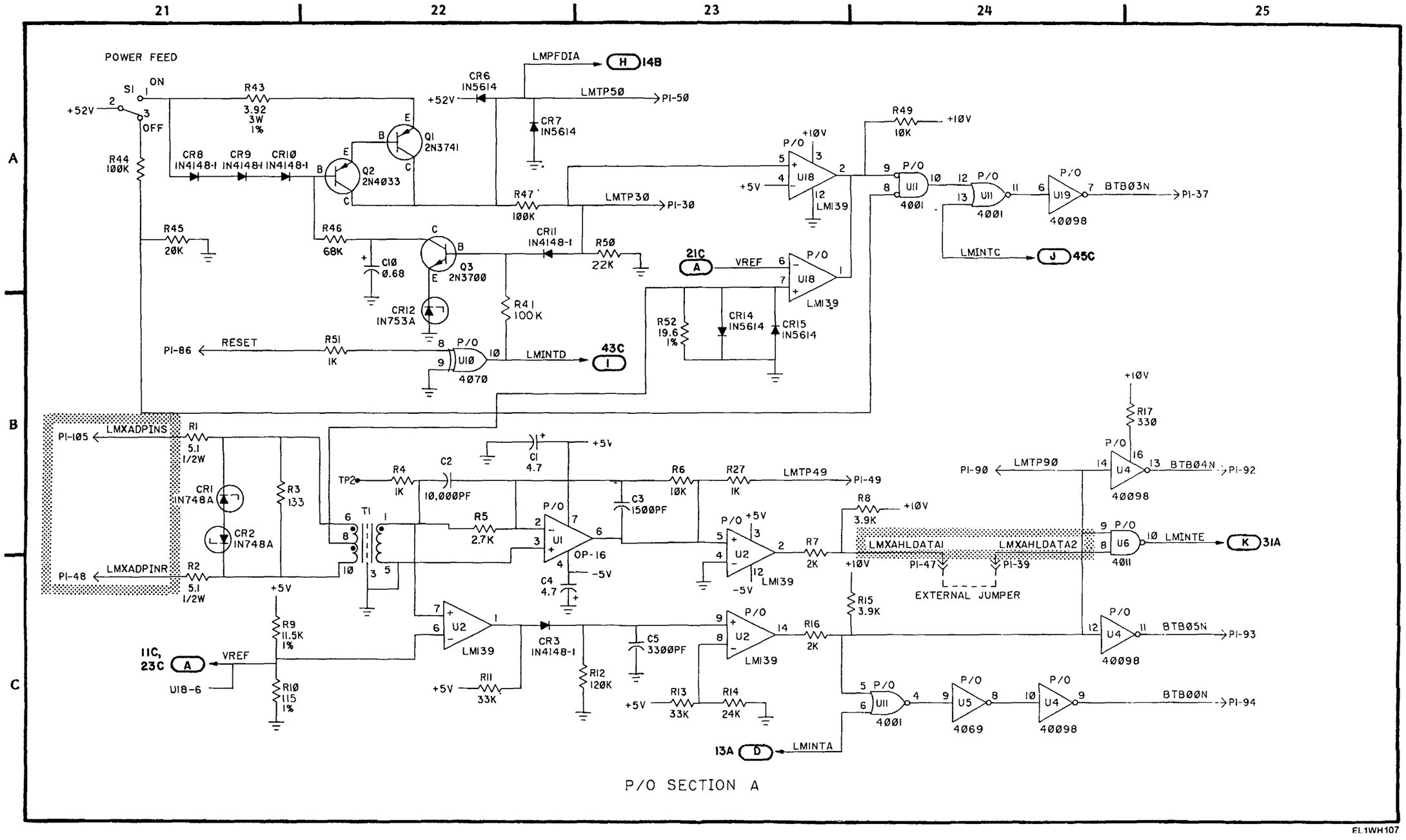


Figure FO-22. Loop Modem CCA A6, A7 Schematic Diagram (Sheet 3 of 7)

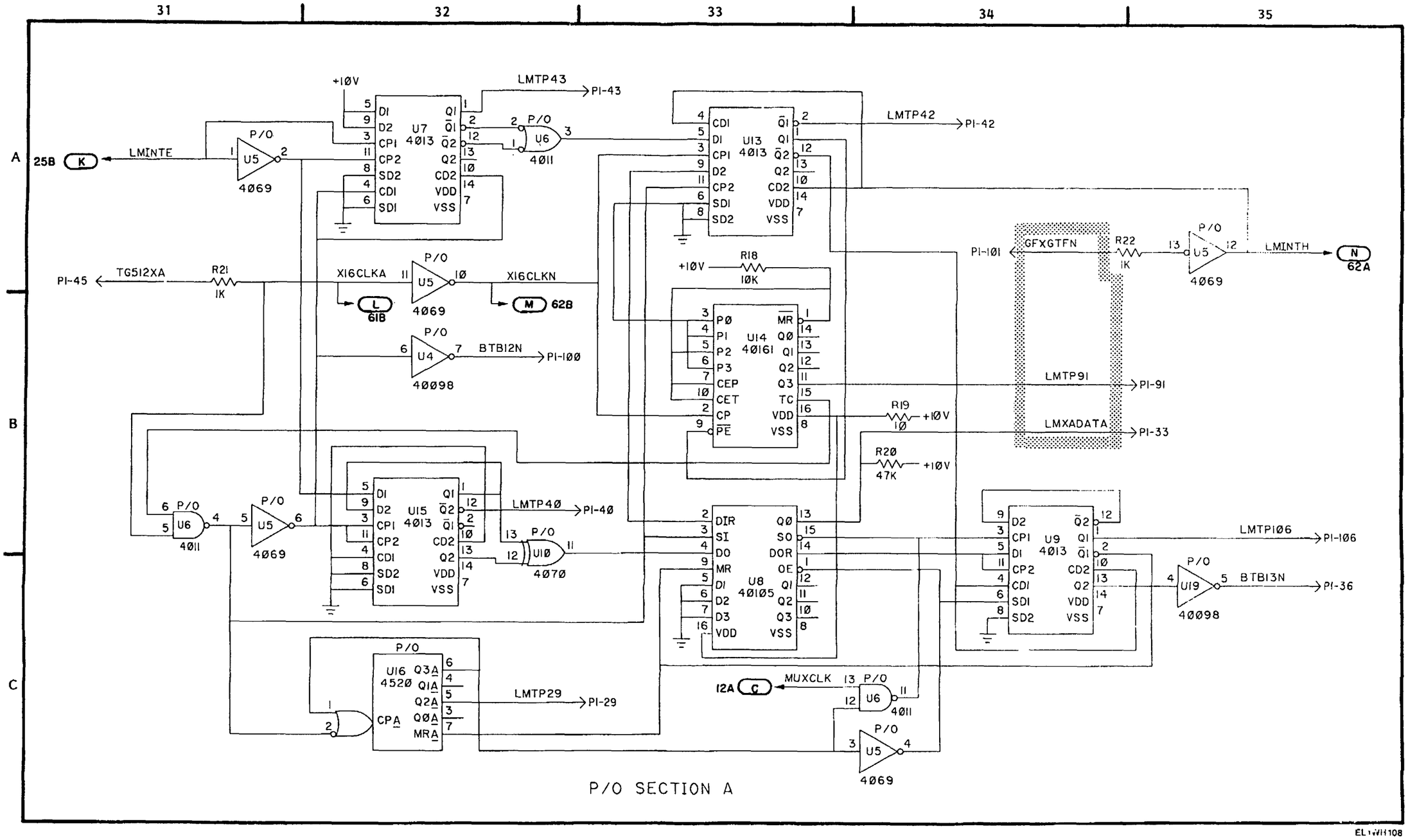


Figure FO-22. Loop Modem CCA A6, A7 Schematic Diagram (Sheet 4 of 7)

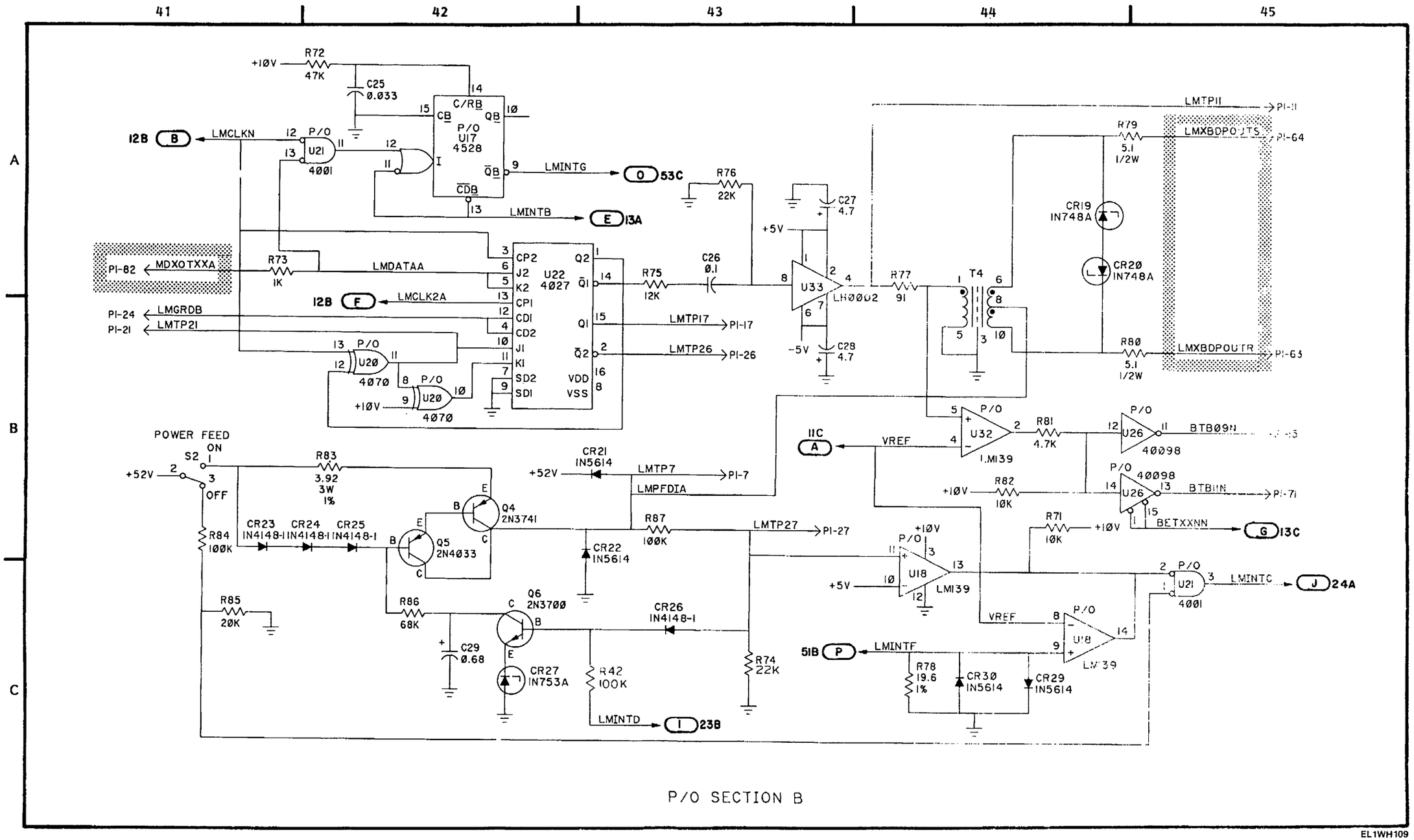
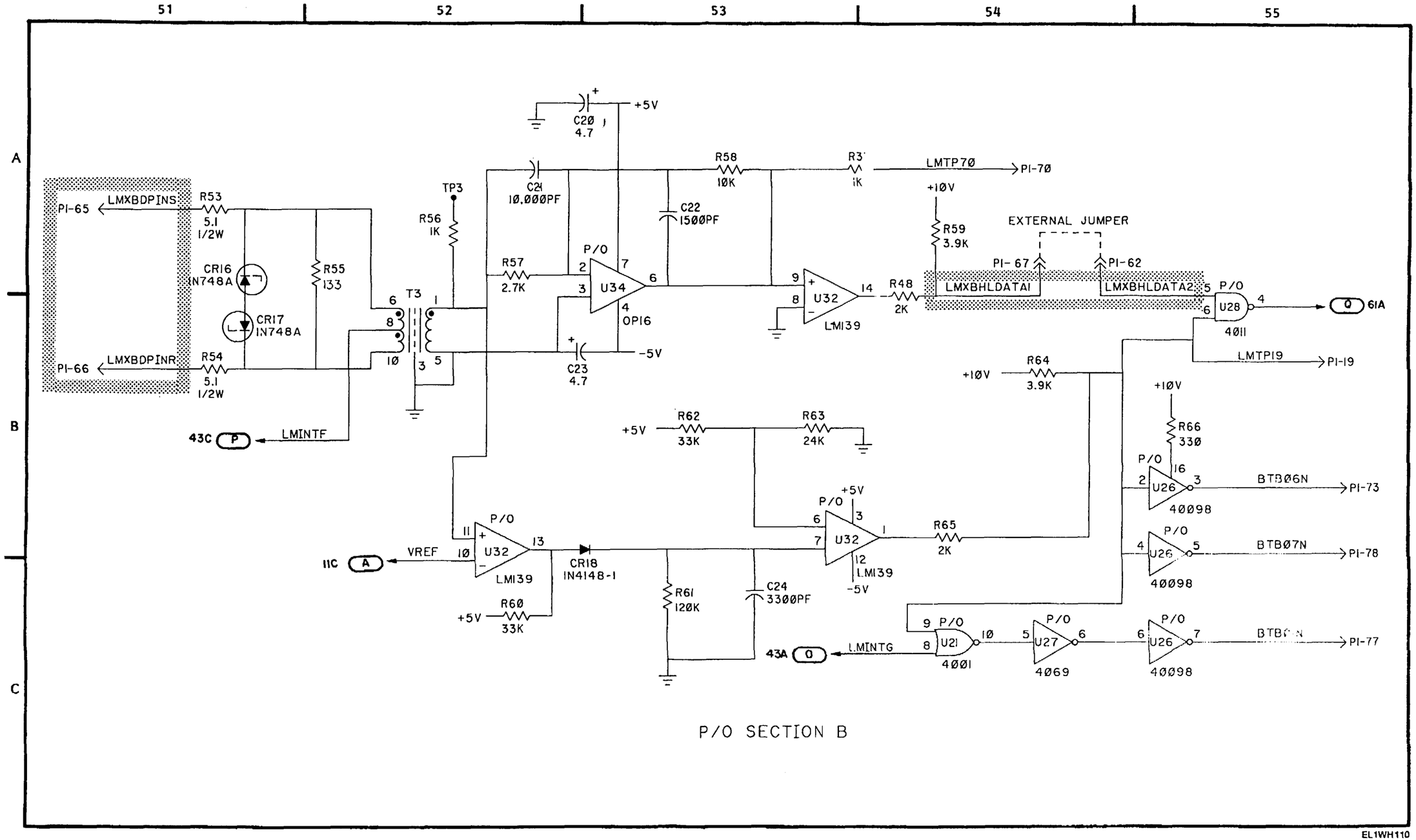


Figure FO-22. Loop Modem CCA A6, A7 Schematic Diagram (Sheet 5 of 7)



P/O SECTION B

Figure FO-22. Loop Modem CCA A6, A7 Schematic Diagram (Sheet 6 of 7)

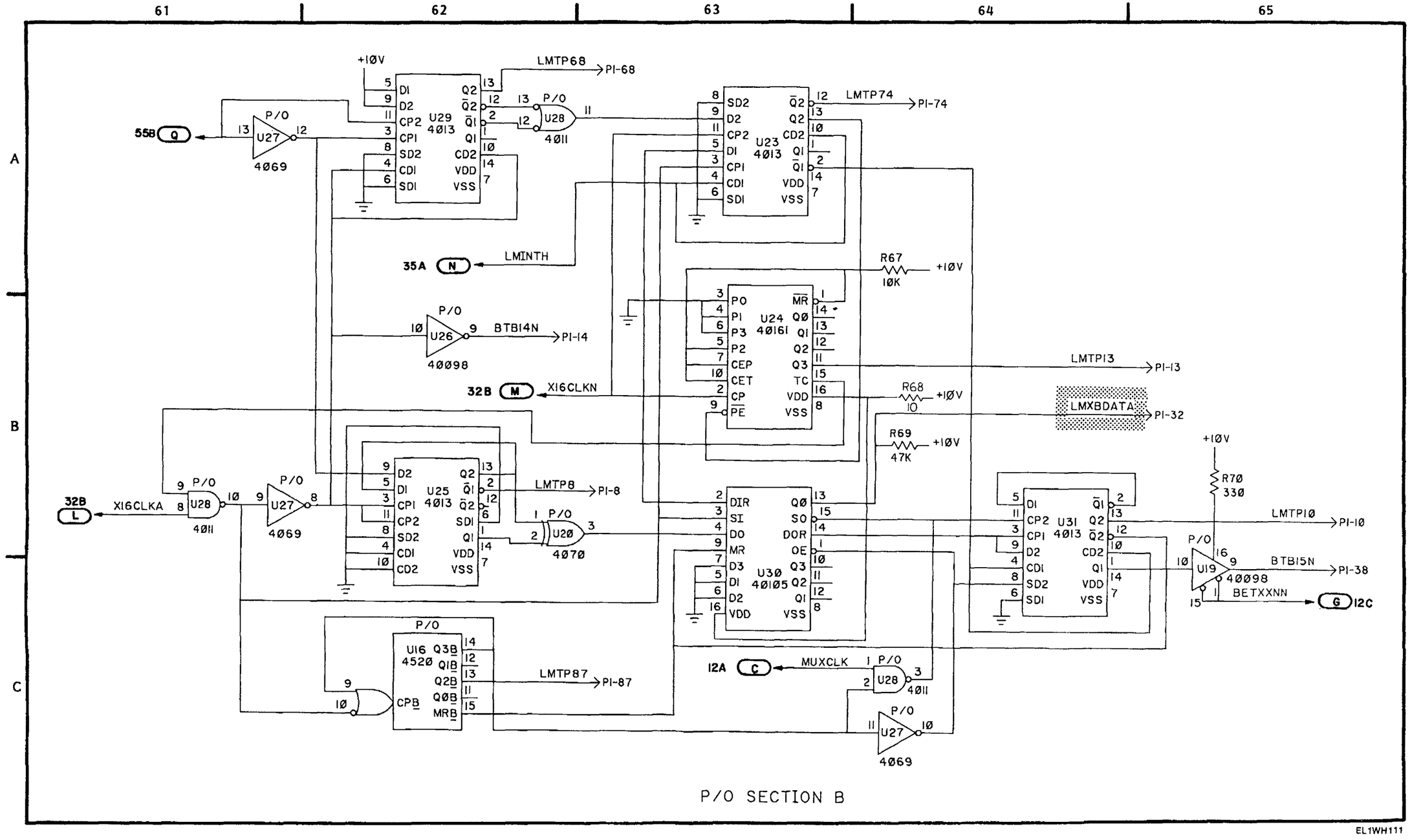


Figure FO-22. Loop Modem CCA A6, A7 Schematic Diagram (Sheet 7 of 7)

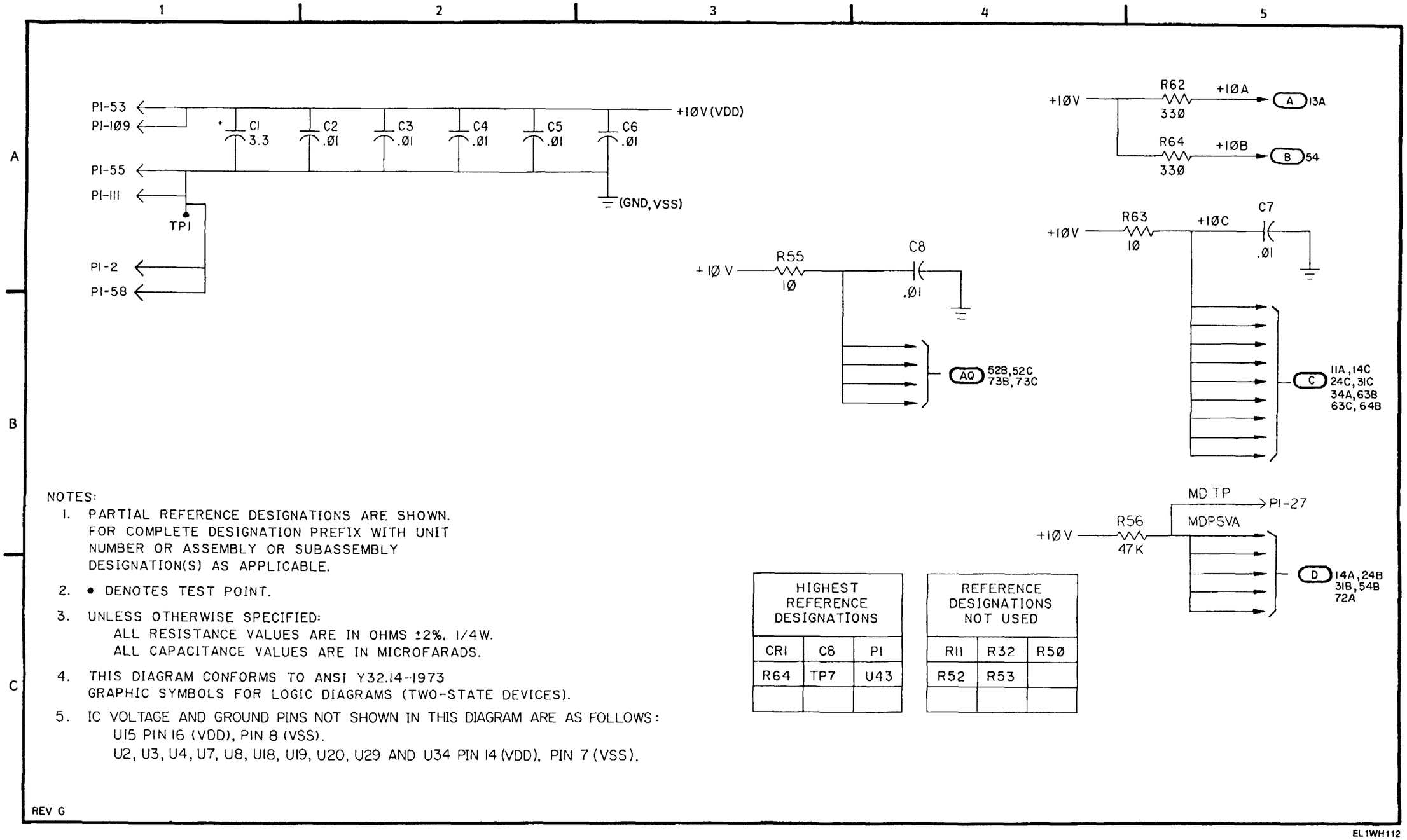


Figure FO-23. Multiplexer/Demultiplexer CCA A8, Schematic Diagram (Sheet 1 of 8)

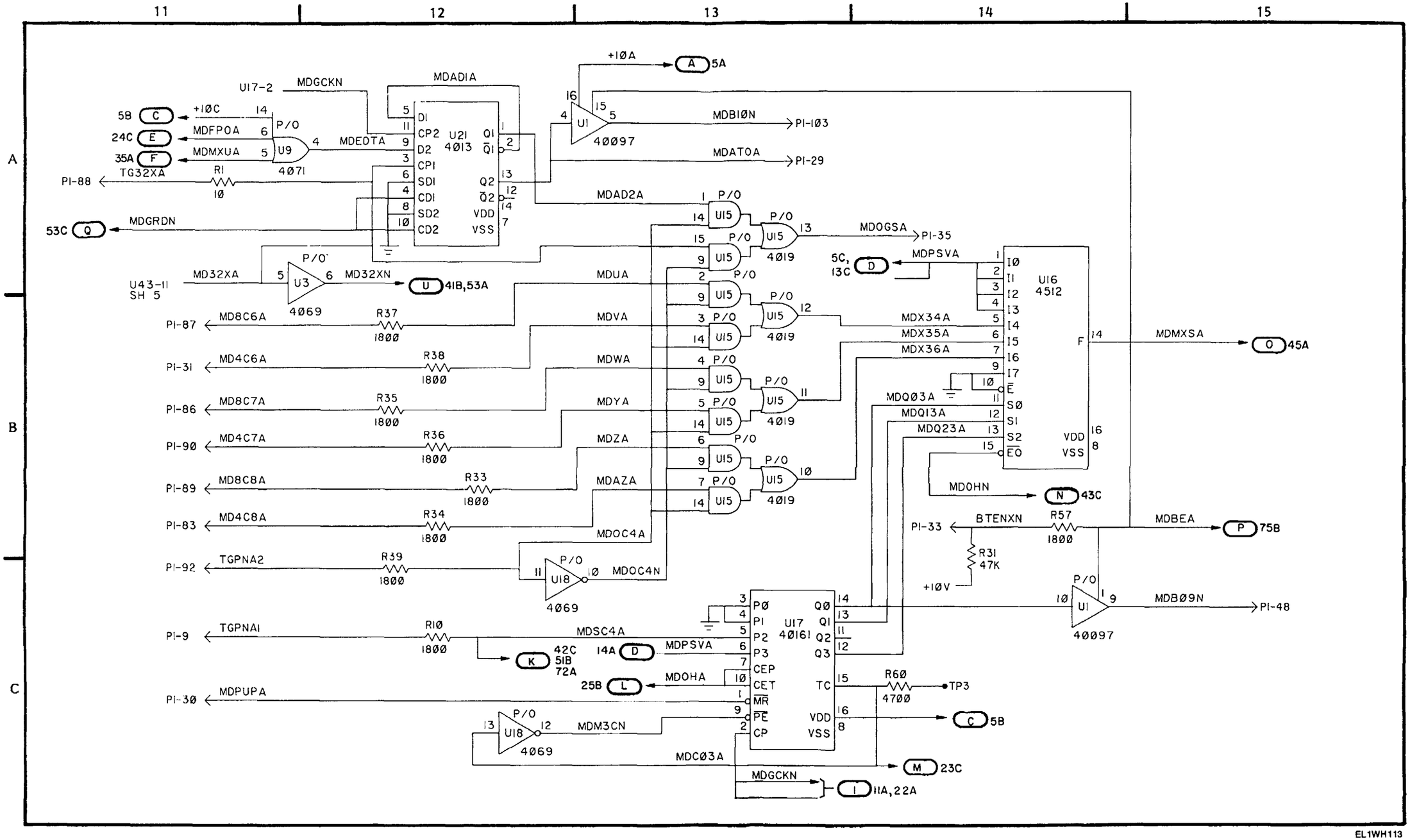


Figure FO-23. Multiplexer/Demultiplexer CCA A8, Schematic Diagram (Sheet 2 of 8)

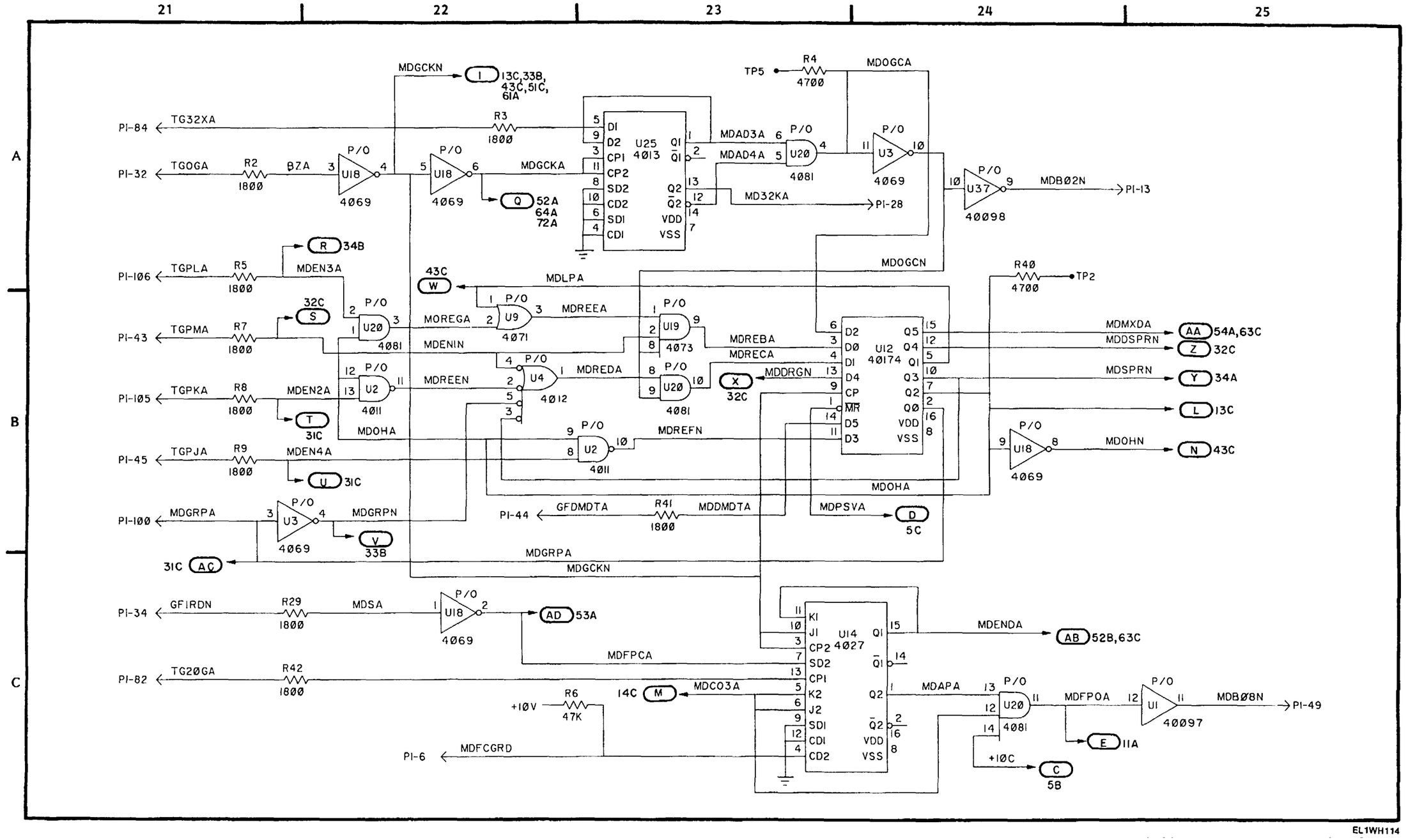


Figure FO-23. Multiplexer/Demultiplexer CCA A8, Schematic Diagram (Sheet 3 of 8)

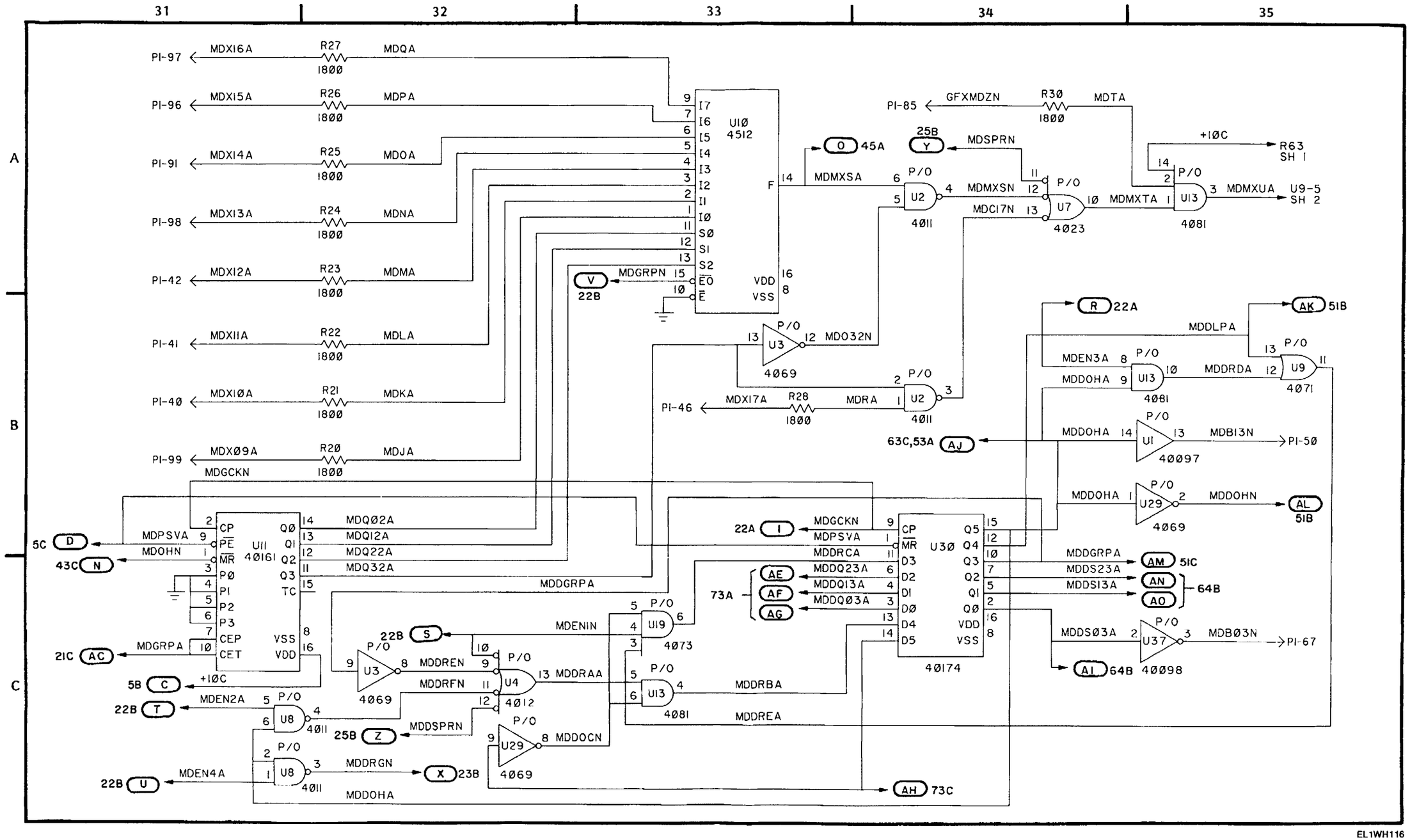


Figure FO-23. Multiplexer/Demultiplexer CCA A8, Schematic Diagram (Sheet 4 of 8)

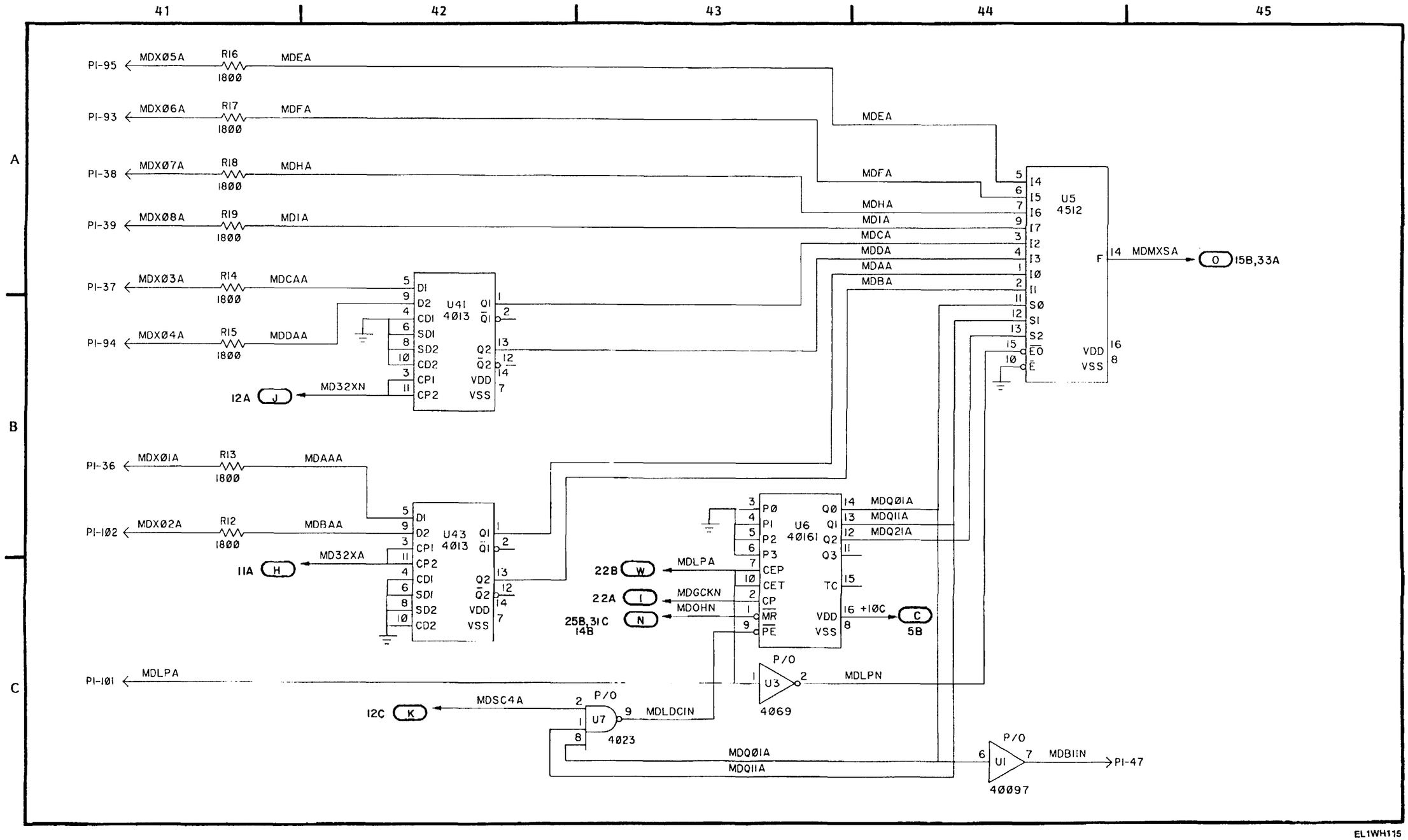


Figure FO-23. Multiplexer/Demultiplexer CCA A8, Schematic Diagram (Sheet 5 of 8)

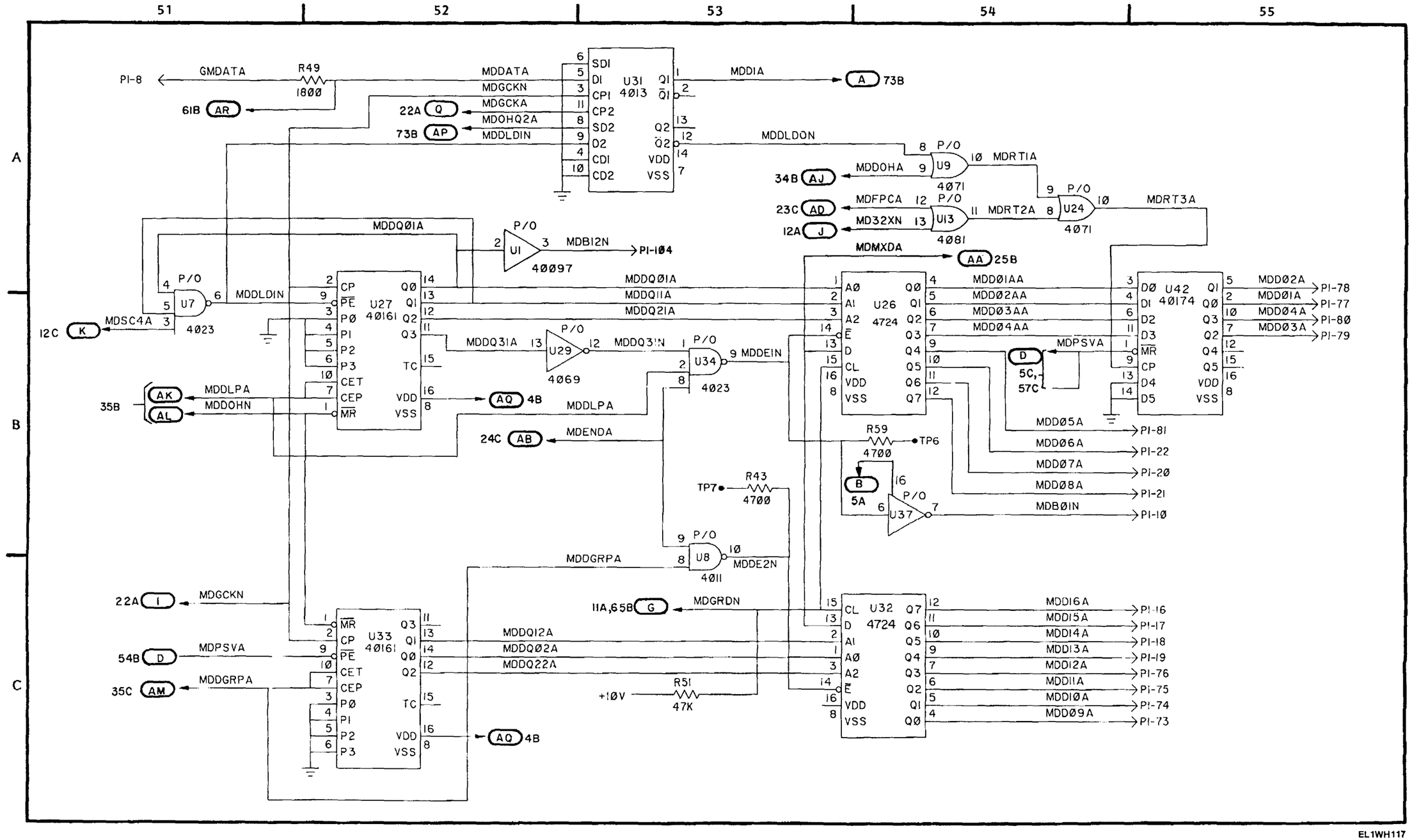


Figure FO-23. Multiplexer/Demultiplexer CCA A8, Schematic Diagram (Sheet 6 of 8)

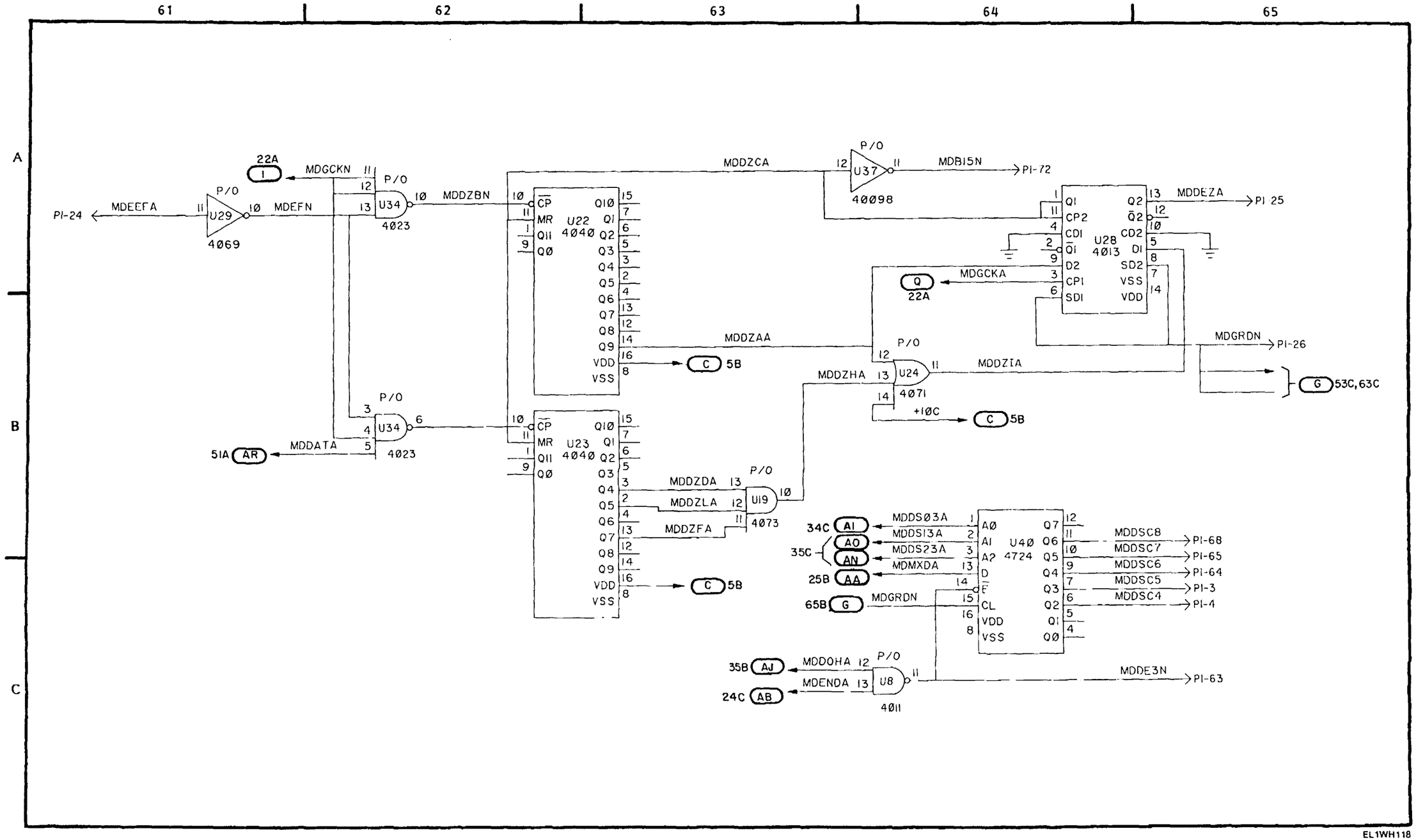
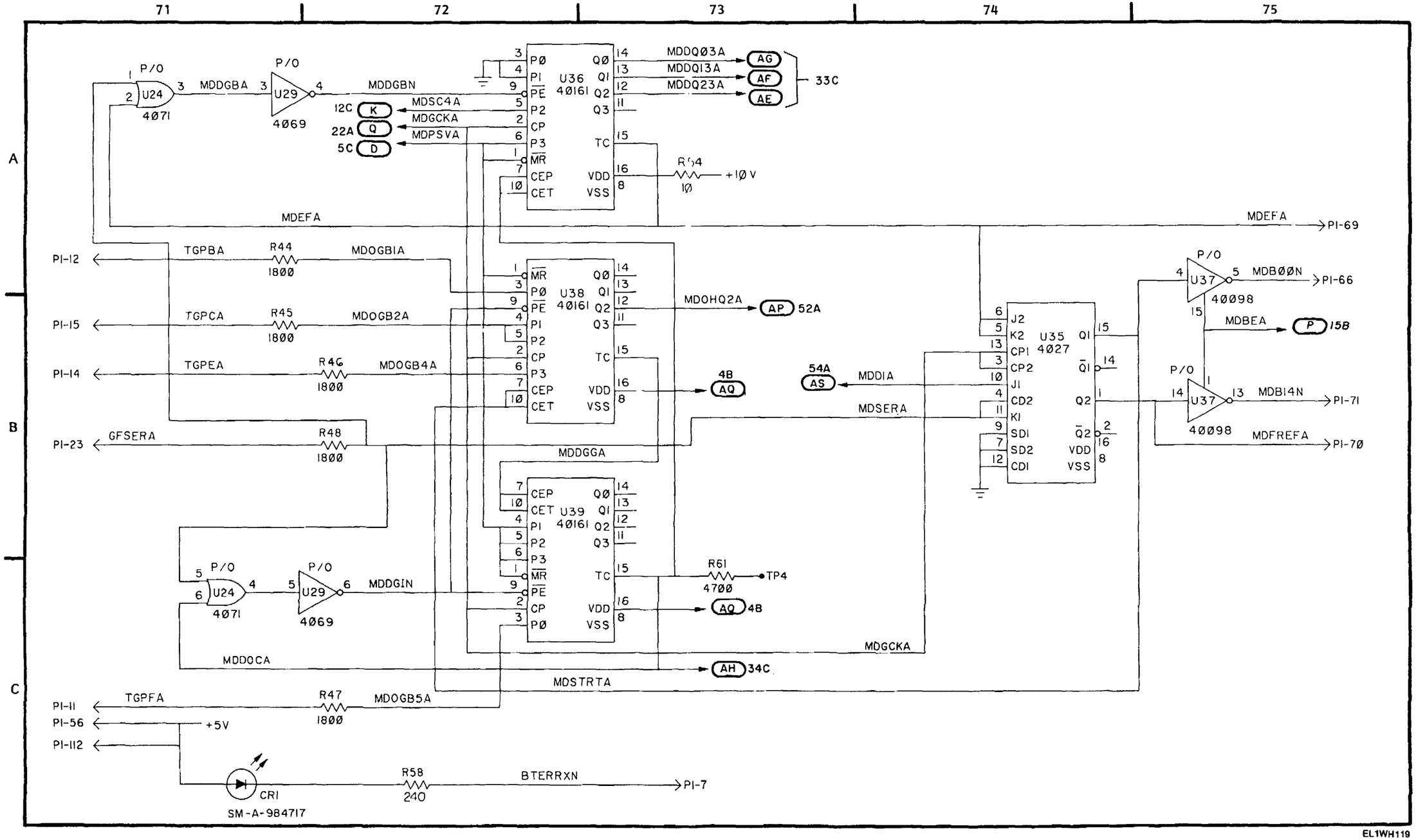
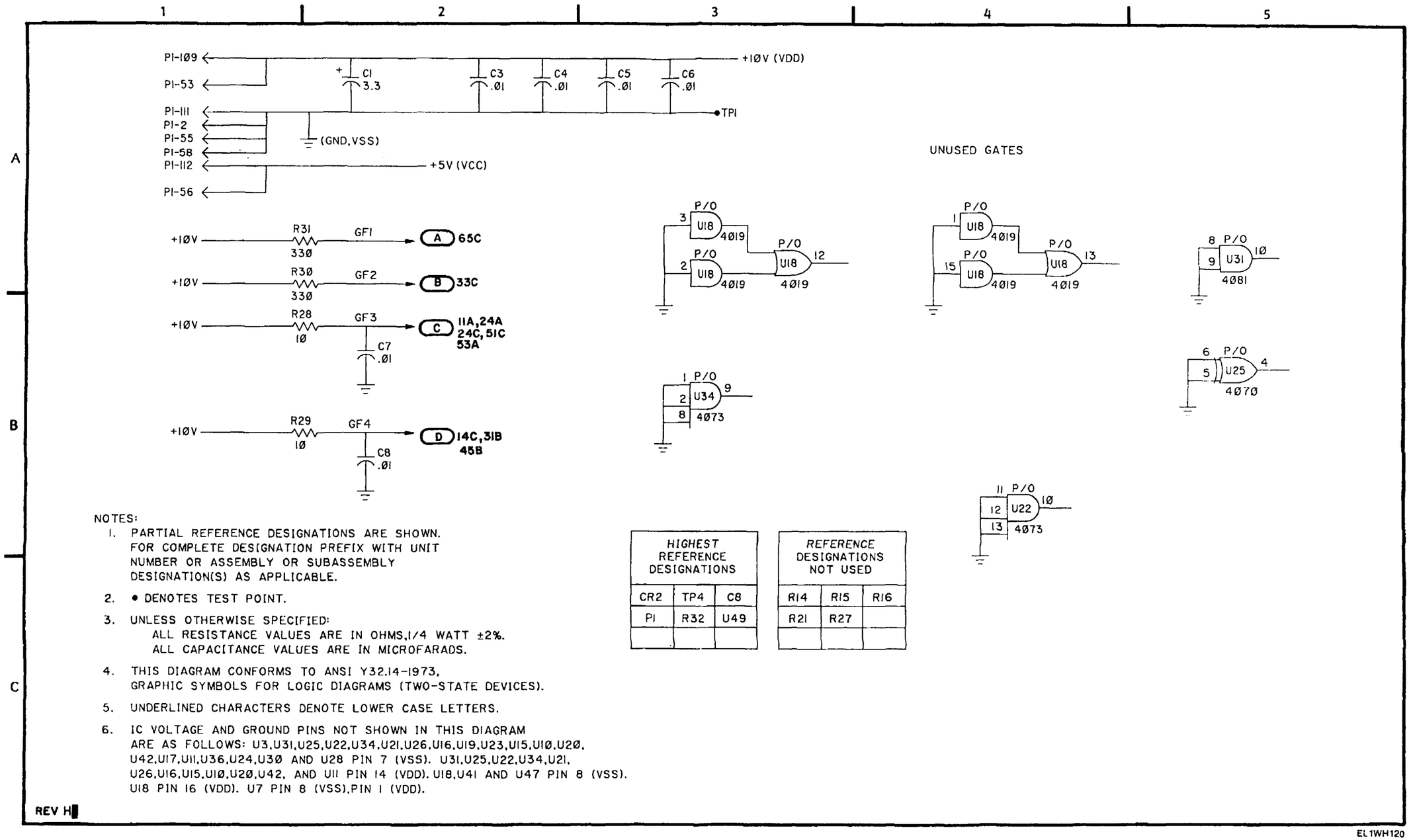


Figure FO-23. Multiplexer/Demultiplexer CCA A8, Schematic Diagram (Sheet 7 of 8)



EL1WH119

Figure FO-23. Multiplexer/Demultiplexer CCA A8, Schematic Diagram (Sheet 8 of 8)



NOTES:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR COMPLETE DESIGNATION PREFIX WITH UNIT NUMBER OR ASSEMBLY OR SUBASSEMBLY DESIGNATION(S) AS APPLICABLE.
2. • DENOTES TEST POINT.
3. UNLESS OTHERWISE SPECIFIED:
   ALL RESISTANCE VALUES ARE IN OHMS,1/4 WATT ±2%.
   ALL CAPACITANCE VALUES ARE IN MICROFARADS.
4. THIS DIAGRAM CONFORMS TO ANSI Y32.14-1973, GRAPHIC SYMBOLS FOR LOGIC DIAGRAMS (TWO-STATE DEVICES).
5. UNDERLINED CHARACTERS DENOTE LOWER CASE LETTERS.
6. IC VOLTAGE AND GROUND PINS NOT SHOWN IN THIS DIAGRAM ARE AS FOLLOWS: U3,U31,U25,U22,U34,U21,U26,U16,U19,U23,U15,U10,U20, U42,U17,U11,U36,U24,U30 AND U28 PIN 7 (VSS). U31,U25,U22,U34,U21, U26,U16,U15,U10,U20,U42, AND U11 PIN 14 (VDD). U18,U41 AND U47 PIN 8 (VSS). U18 PIN 16 (VDD). U7 PIN 8 (VSS),PIN 1 (VDD).

HIGHEST REFERENCE DESIGNATIONS		
CR2	TP4	C8
P1	R32	U49

REFERENCE DESIGNATIONS NOT USED		
R14	R15	R16
R21	R27	

REV H

EL 1WH120

Figure FO-24. Group Framing CCA A9, Schematic Diagram (Sheet 1 of 7)

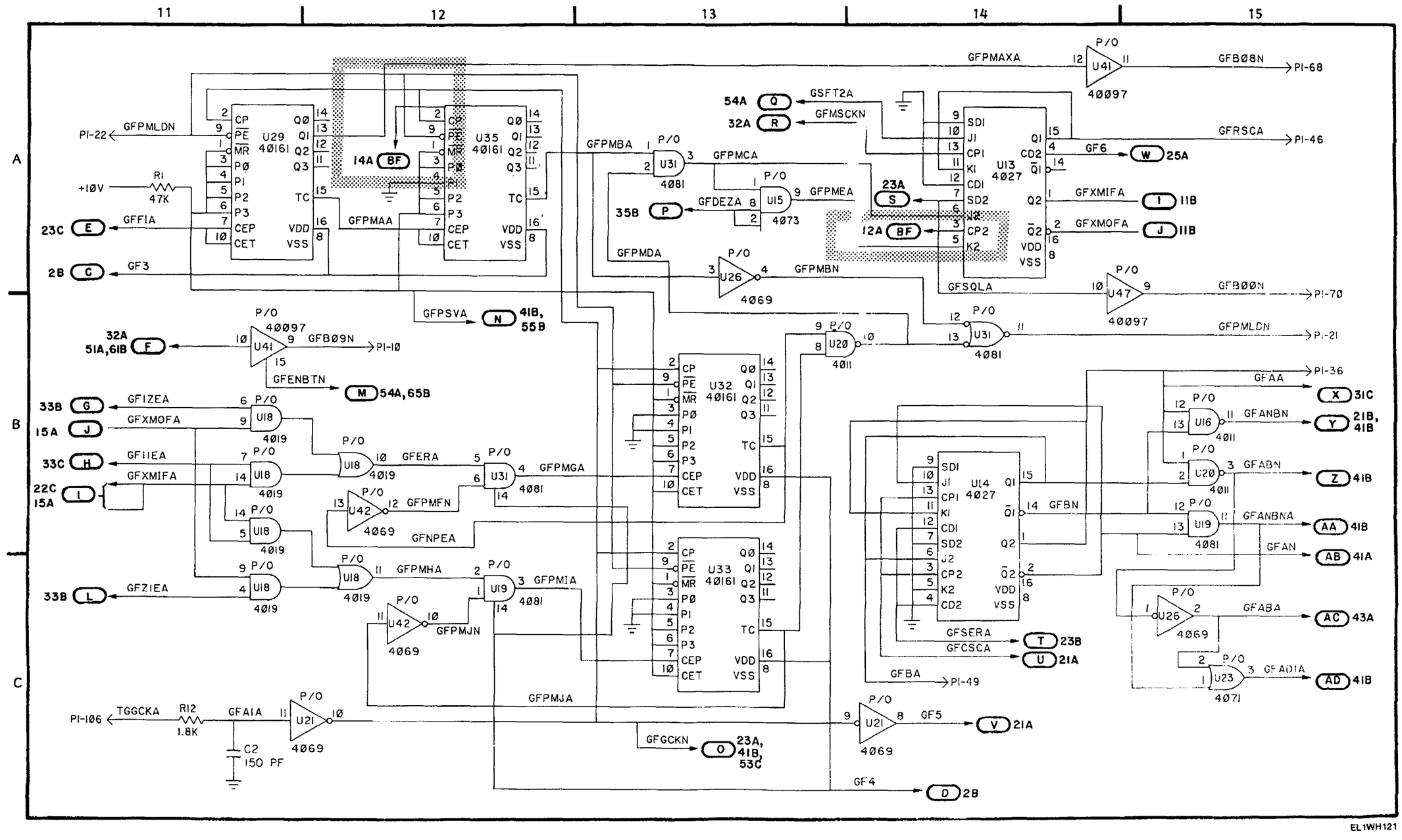


Figure FO-24. Group Framing CCA A9, Schematic Diagram (Sheet 2 of 7)

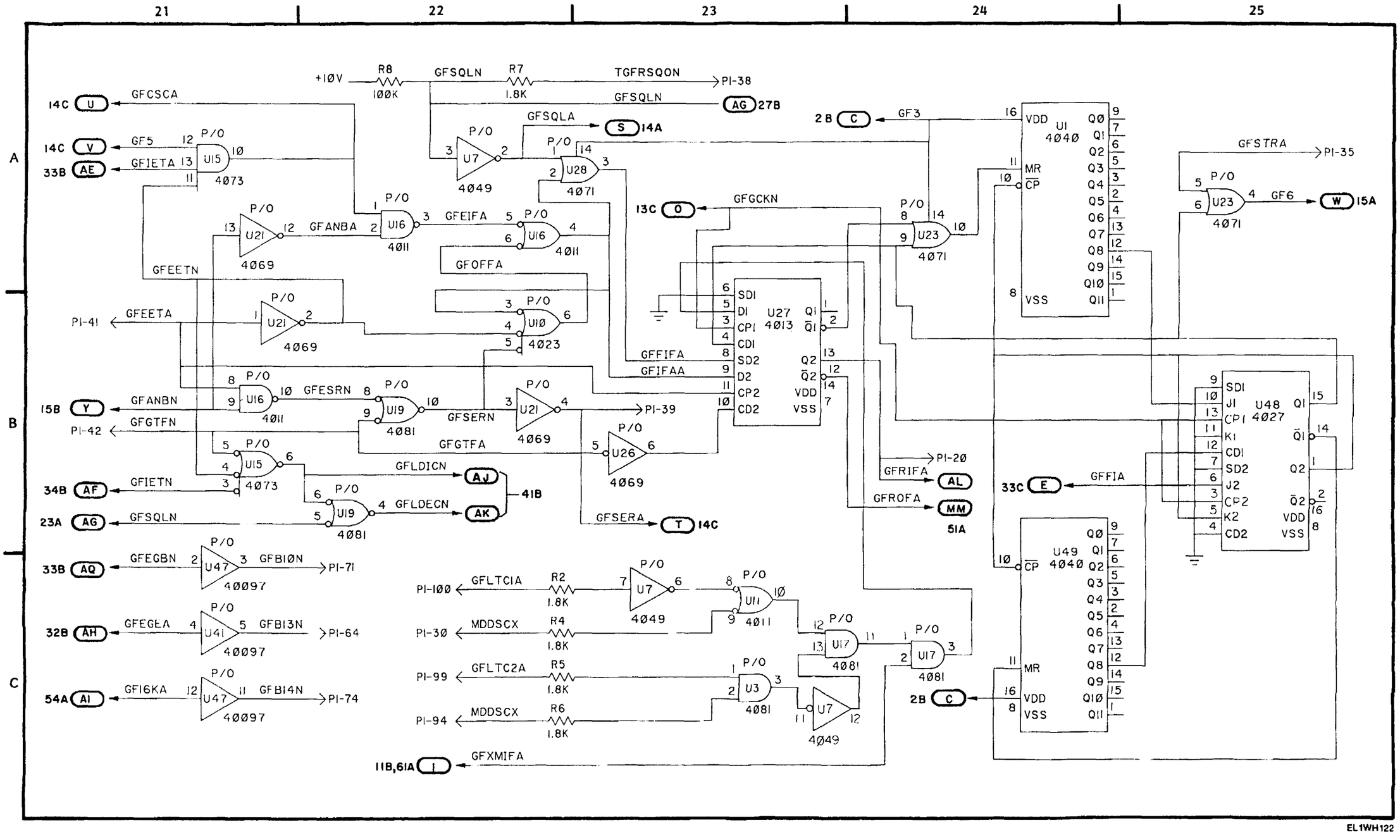


Figure FO-24. Group Framing CCA A9 Schematic Diagram (Sheet 3 of 7)

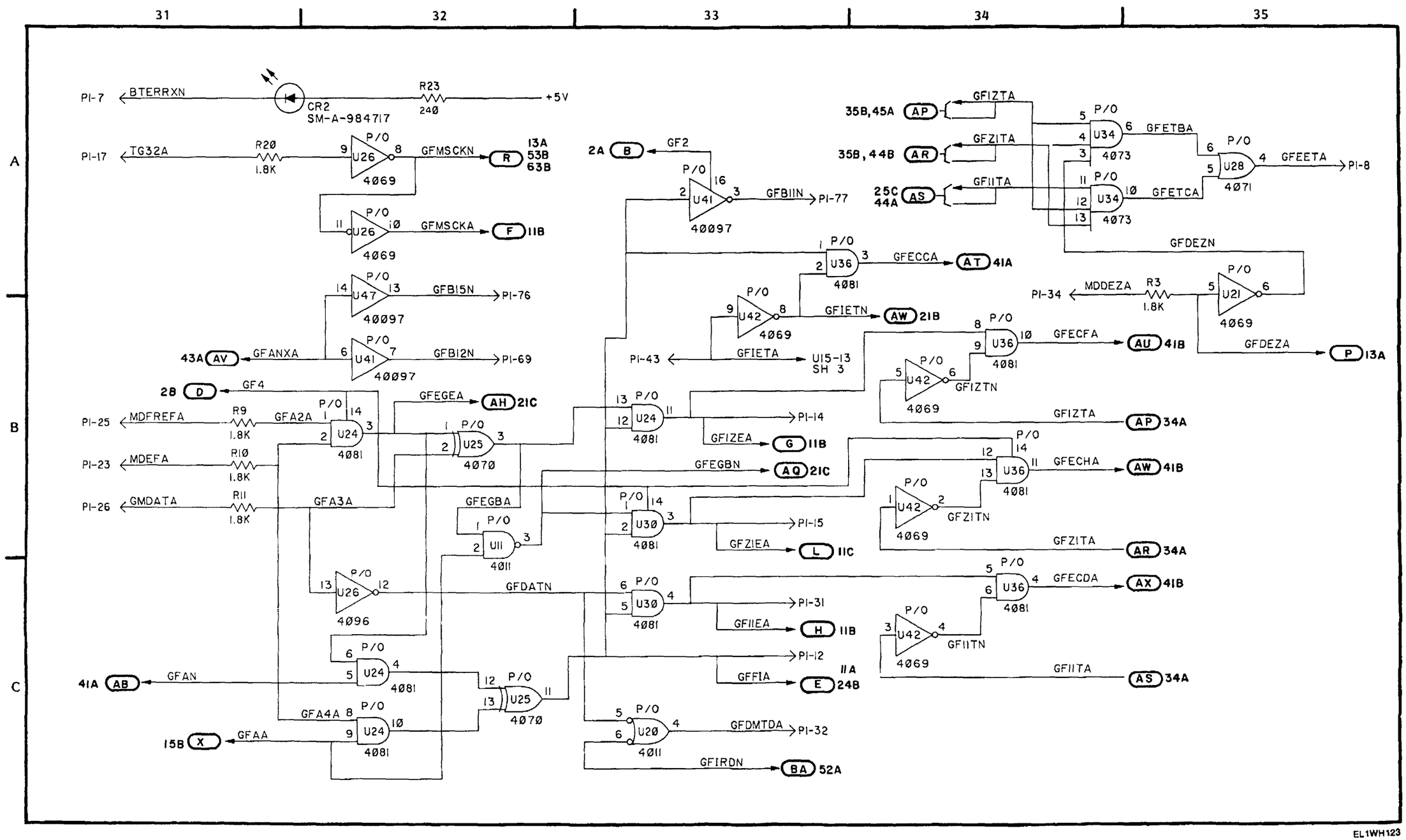


Figure FO-24. Group Framing CCA A9 Schematic Diagram (Sheet 4 of 7)

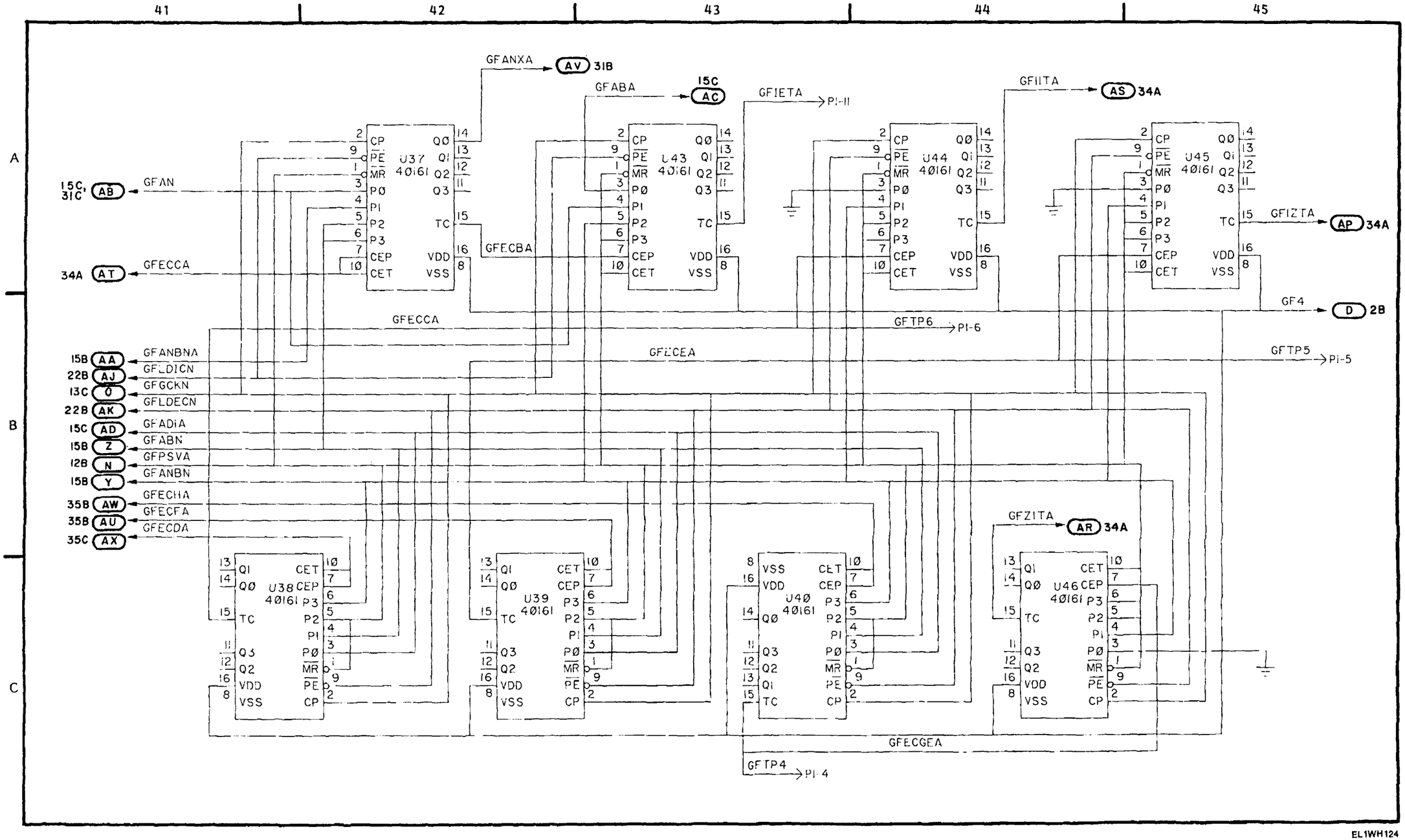


Figure FO-24. Group Framing CCA A9 Schematic Diagram (Sheet 5 of 7)

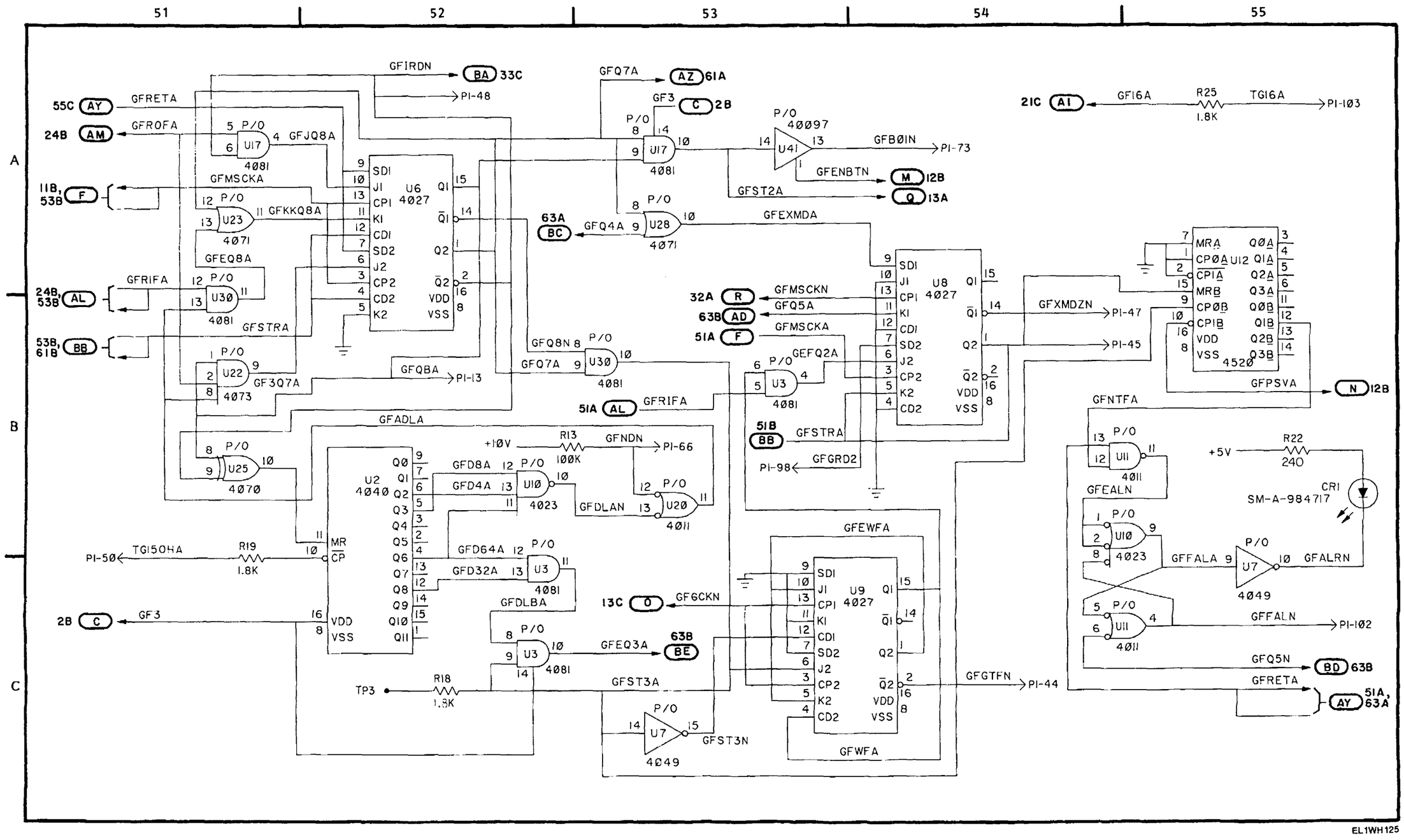


Figure FO-24. Group Framing CCA A9 Schematic Diagram (Sheet 6 of 7)

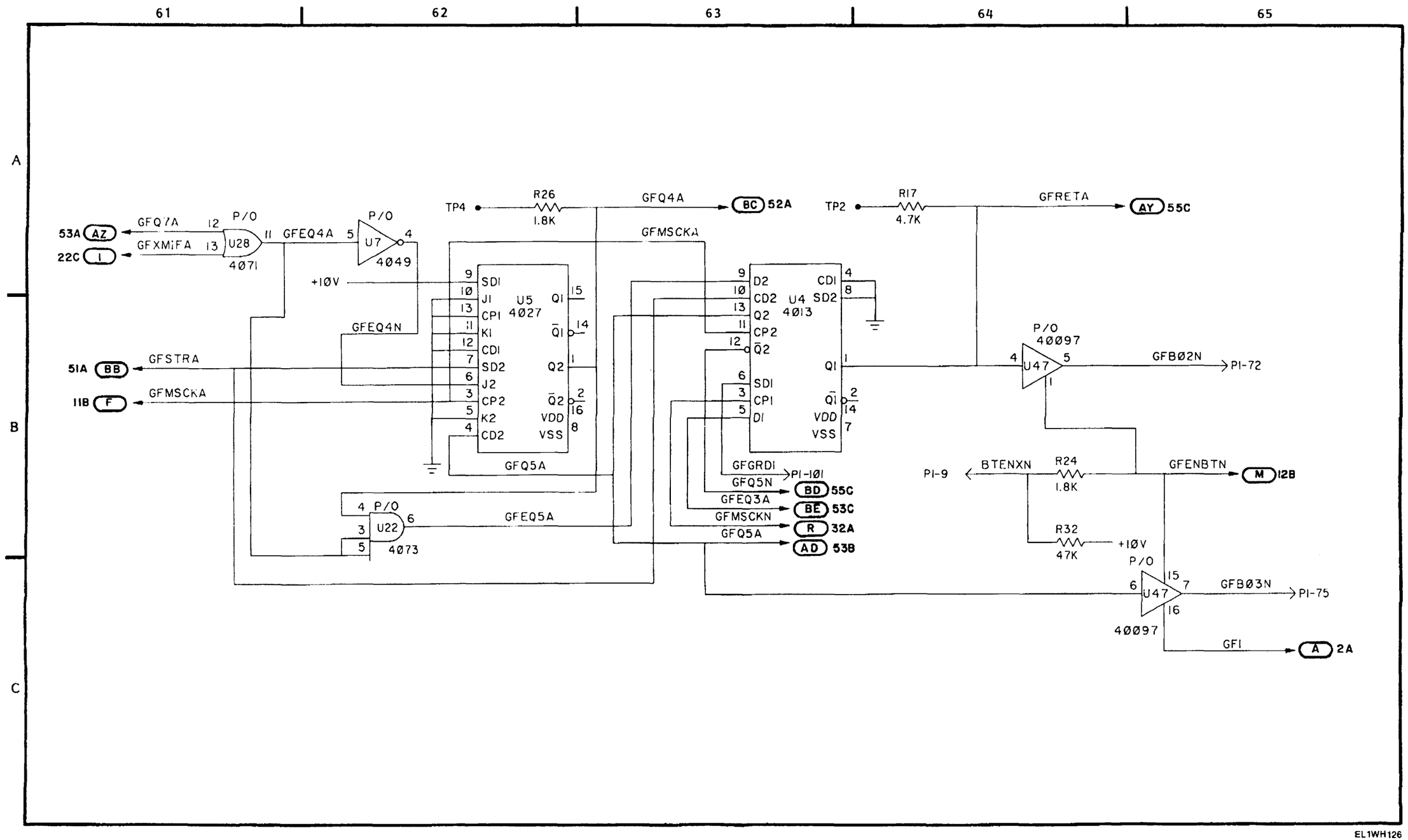


Figure FO-24. Group Framing CCA A9 Schematic Diagram (Sheet 7 of 7)

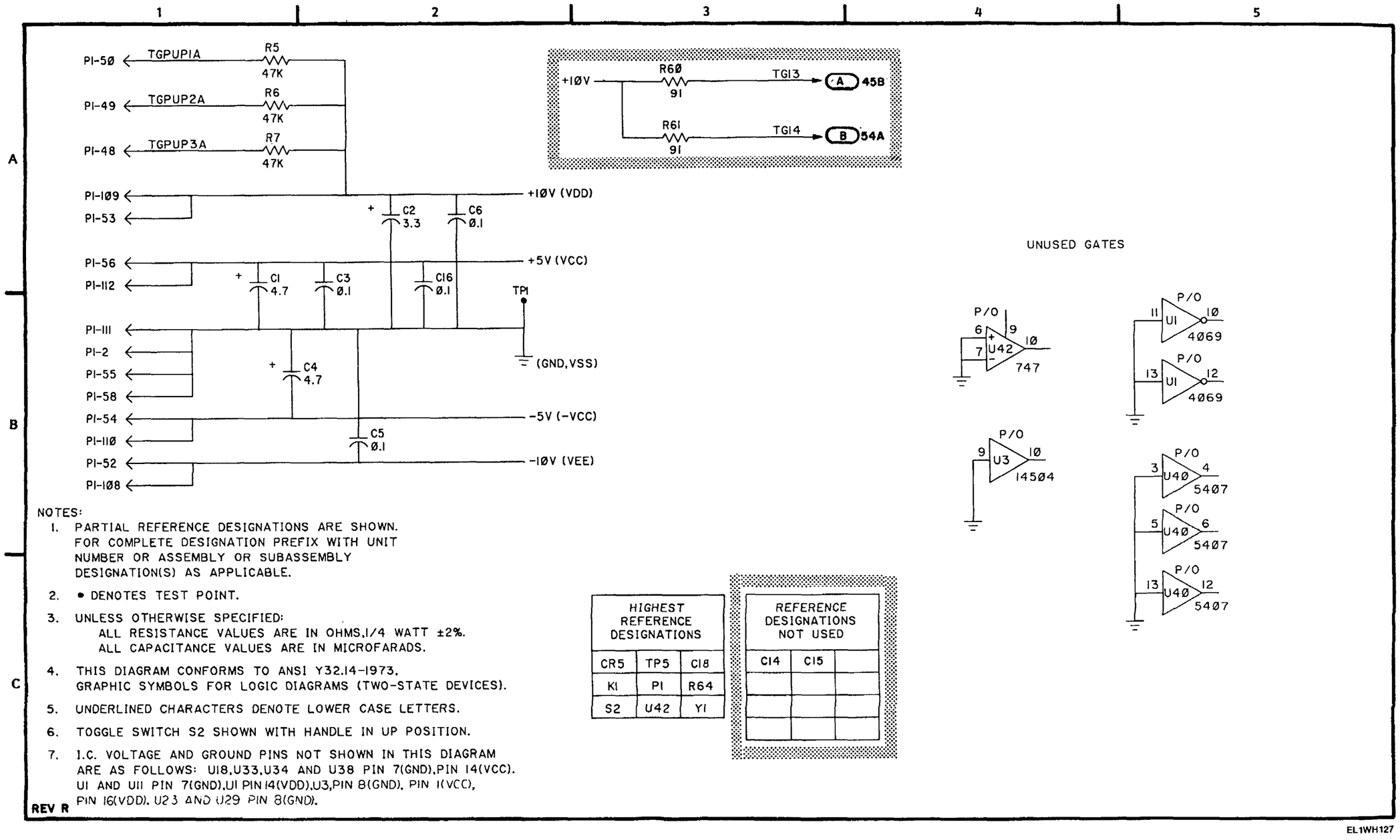
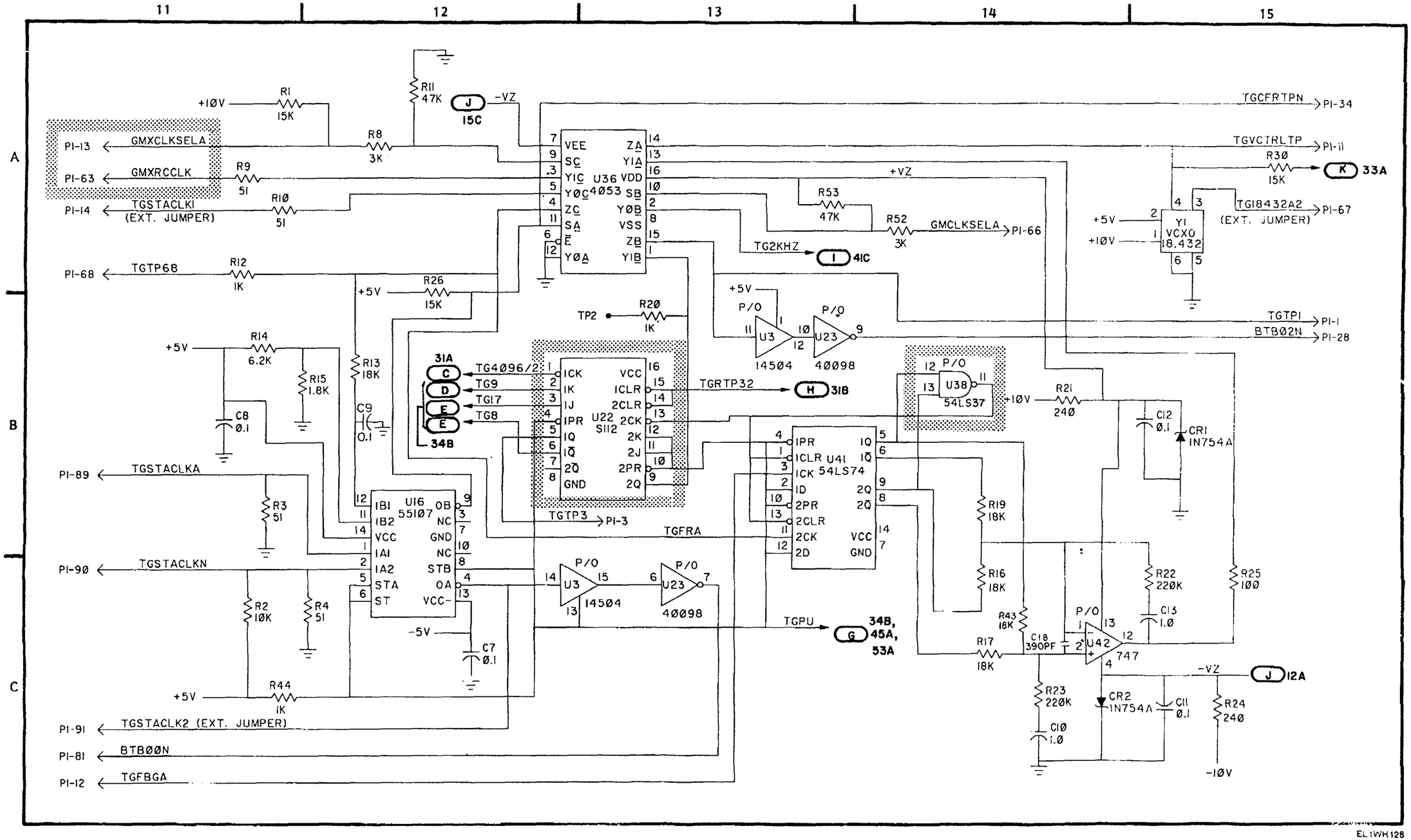
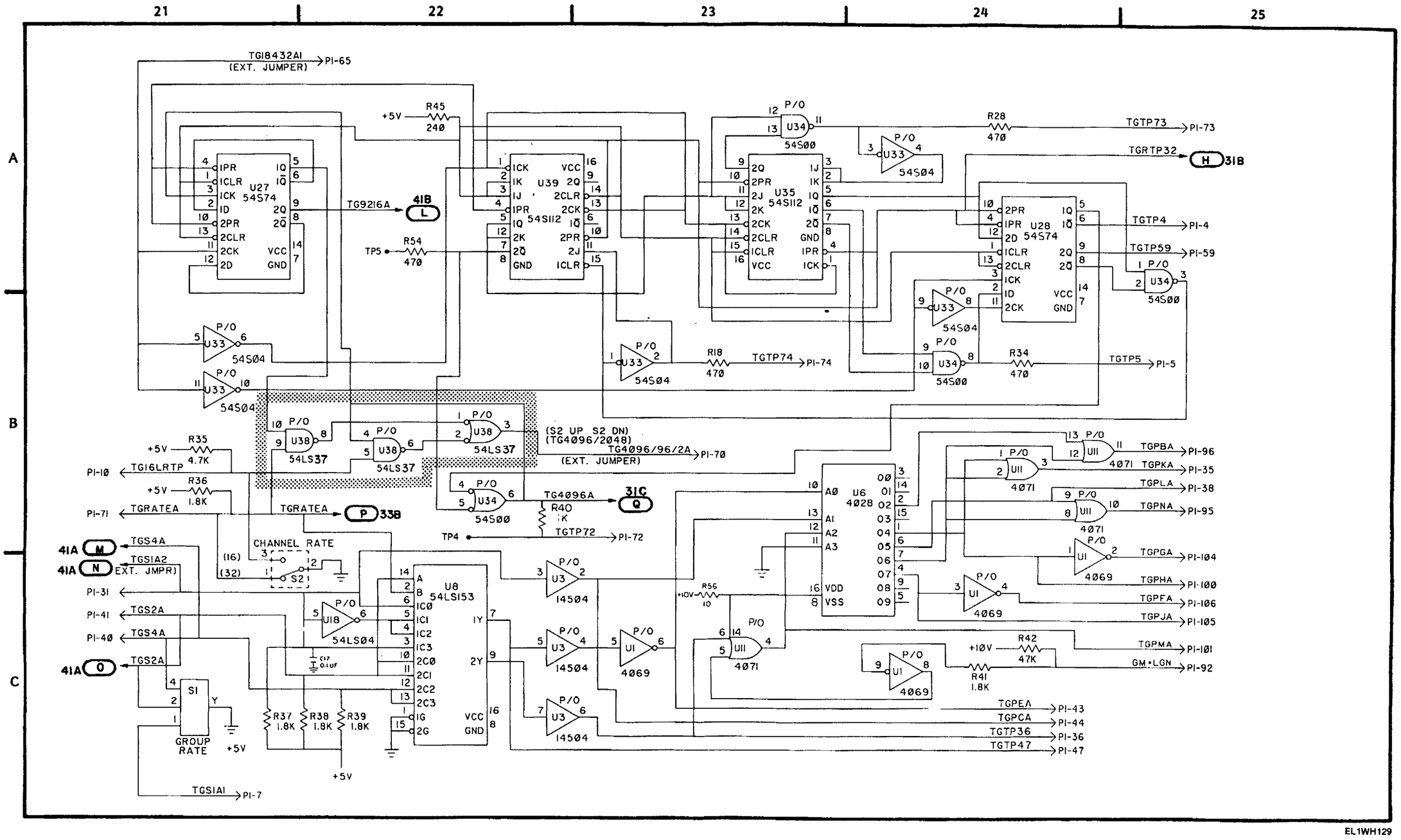


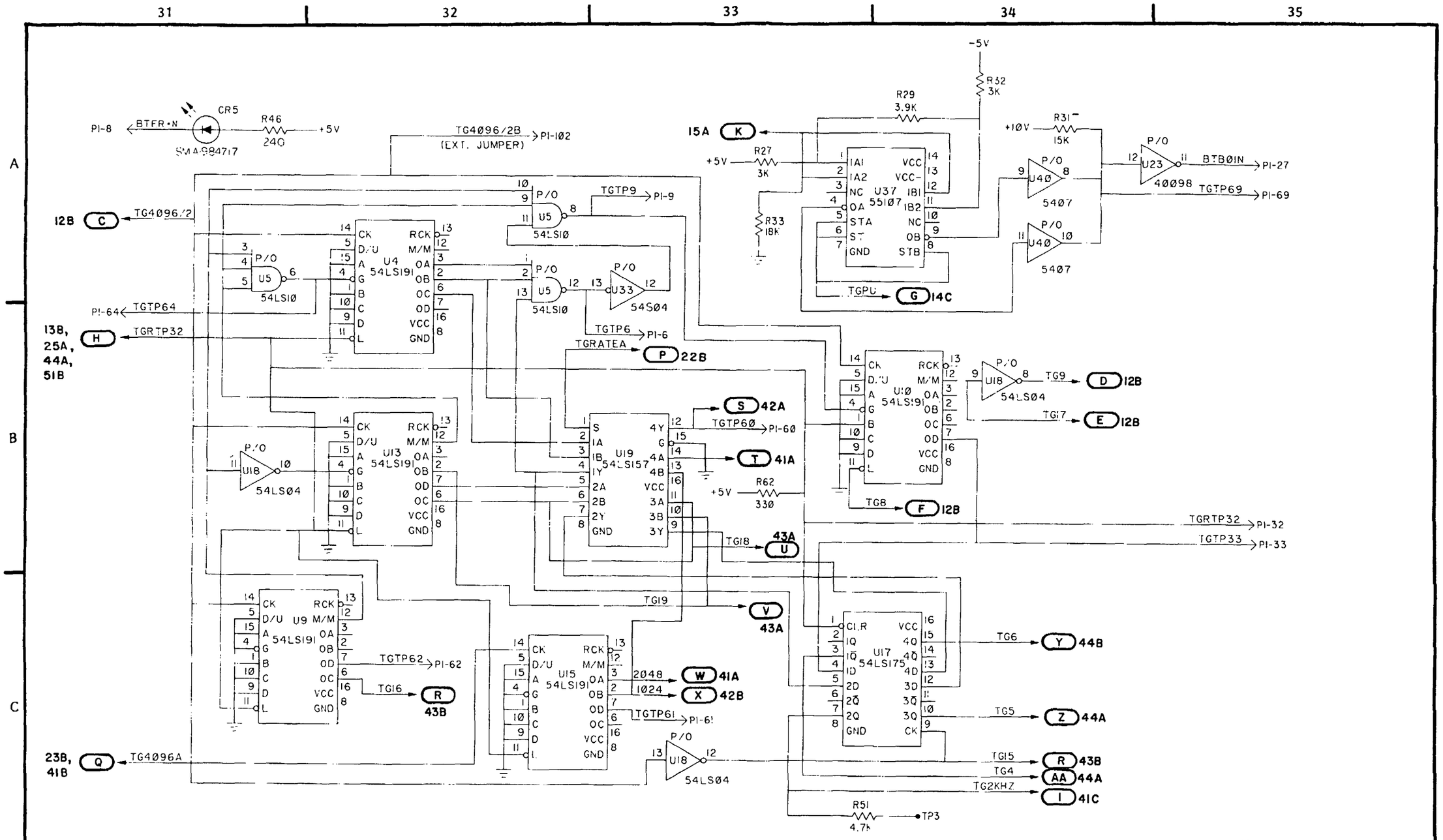
Figure FO-25. Timing Generator CCA A10 Schematic Diagram (Sheet 1 of 6)



■ *Figure FO-25. Timing Generator CCA A10 Schematic Diagram (Sheet 2 of 6)*

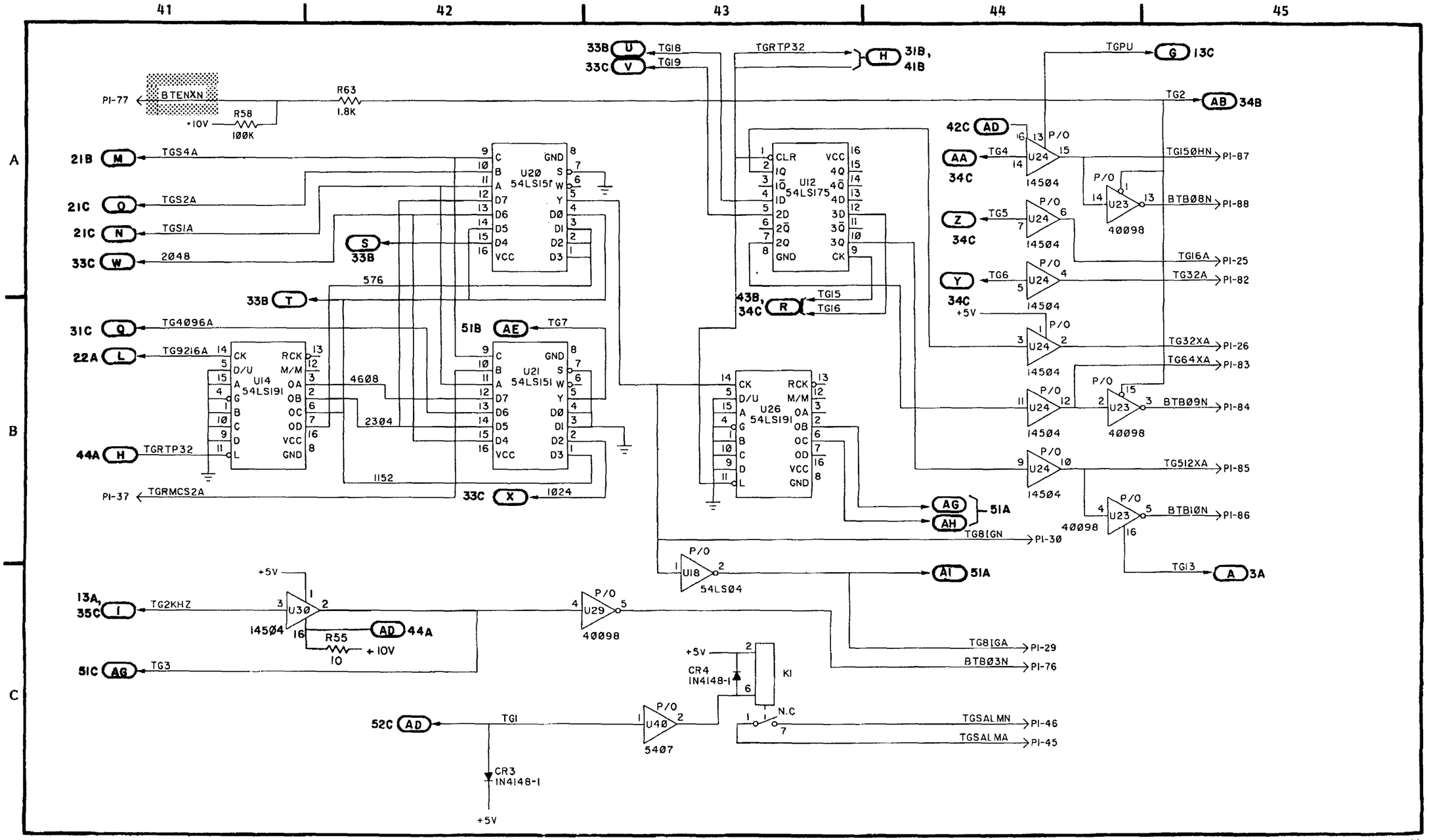


■ *Figure FO-25. Timing Generator CCA A10 Schematic Diagram (Sheet 3 of 6)*



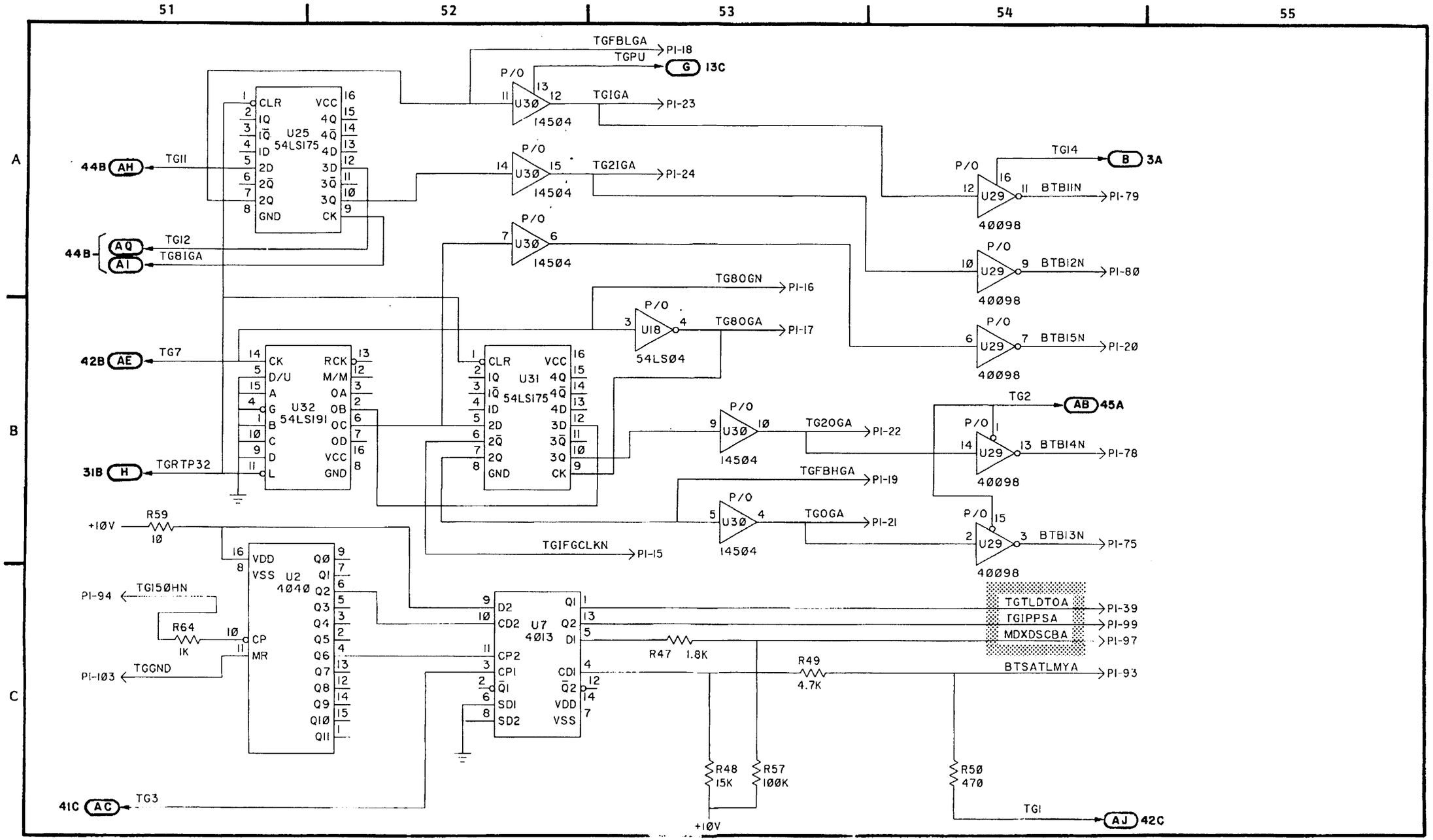
EL1WH130

Figure FO-25. Timing Generator CCA A10 Schematic Diagram (Sheet 4 of 6)



EL1WH131

■ *Figure FO-25. Timing Generator CCA A10 Schematic Diagram (Sheet 5 of 6)*



EL1WH132

■ *Figure FO-25. Timing Generator CCA A10 Schematic Diagram (Sheet 6 of 6)*

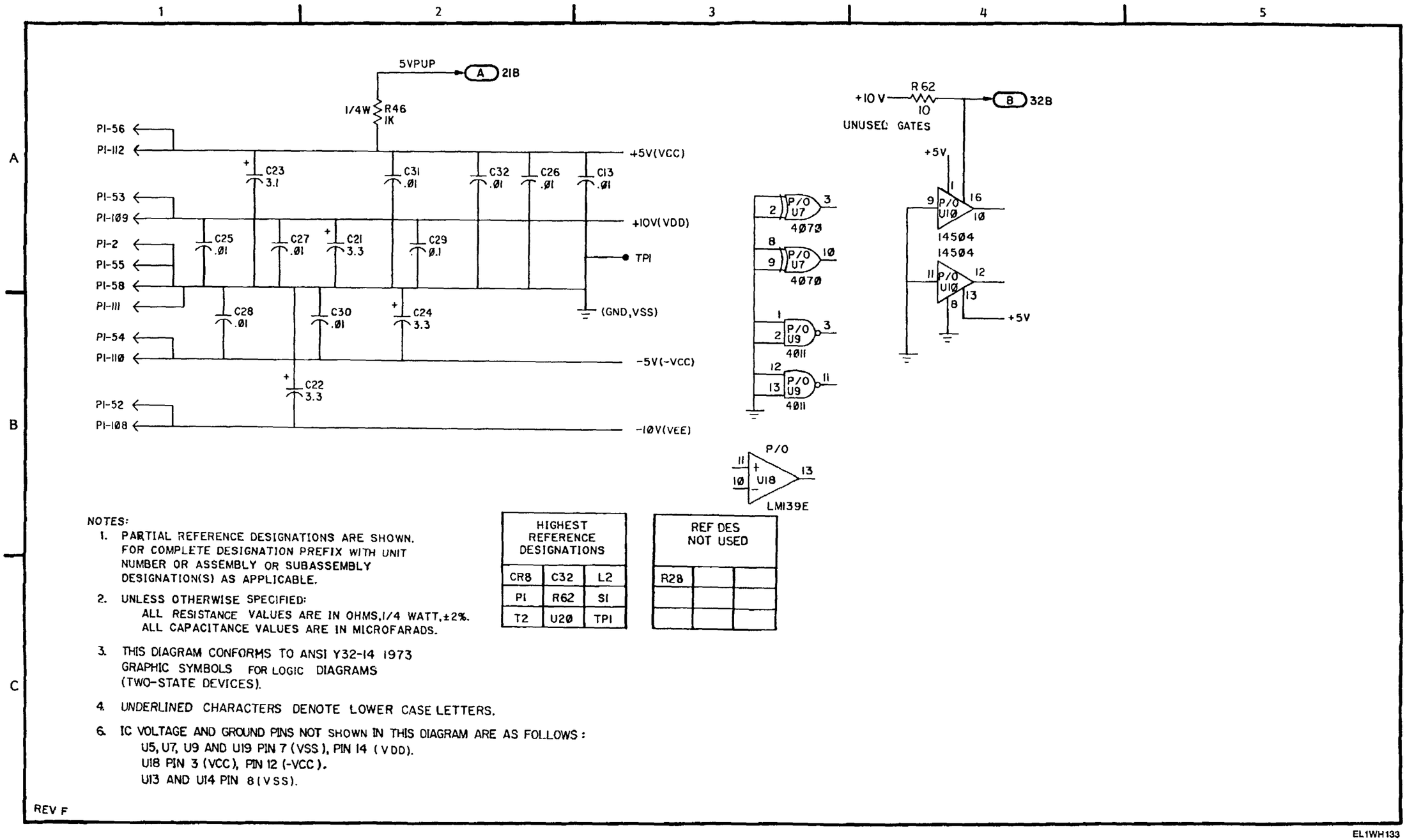
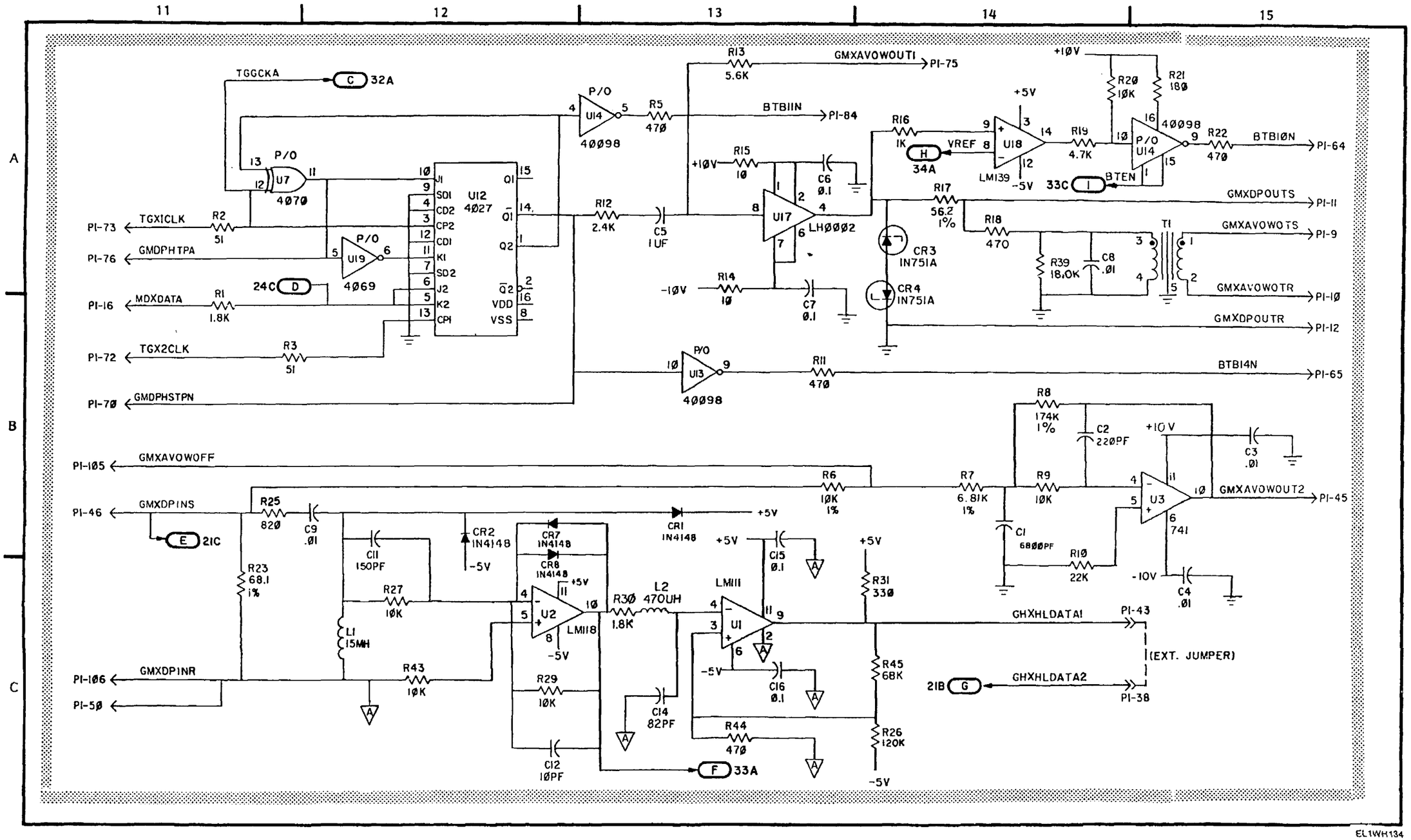
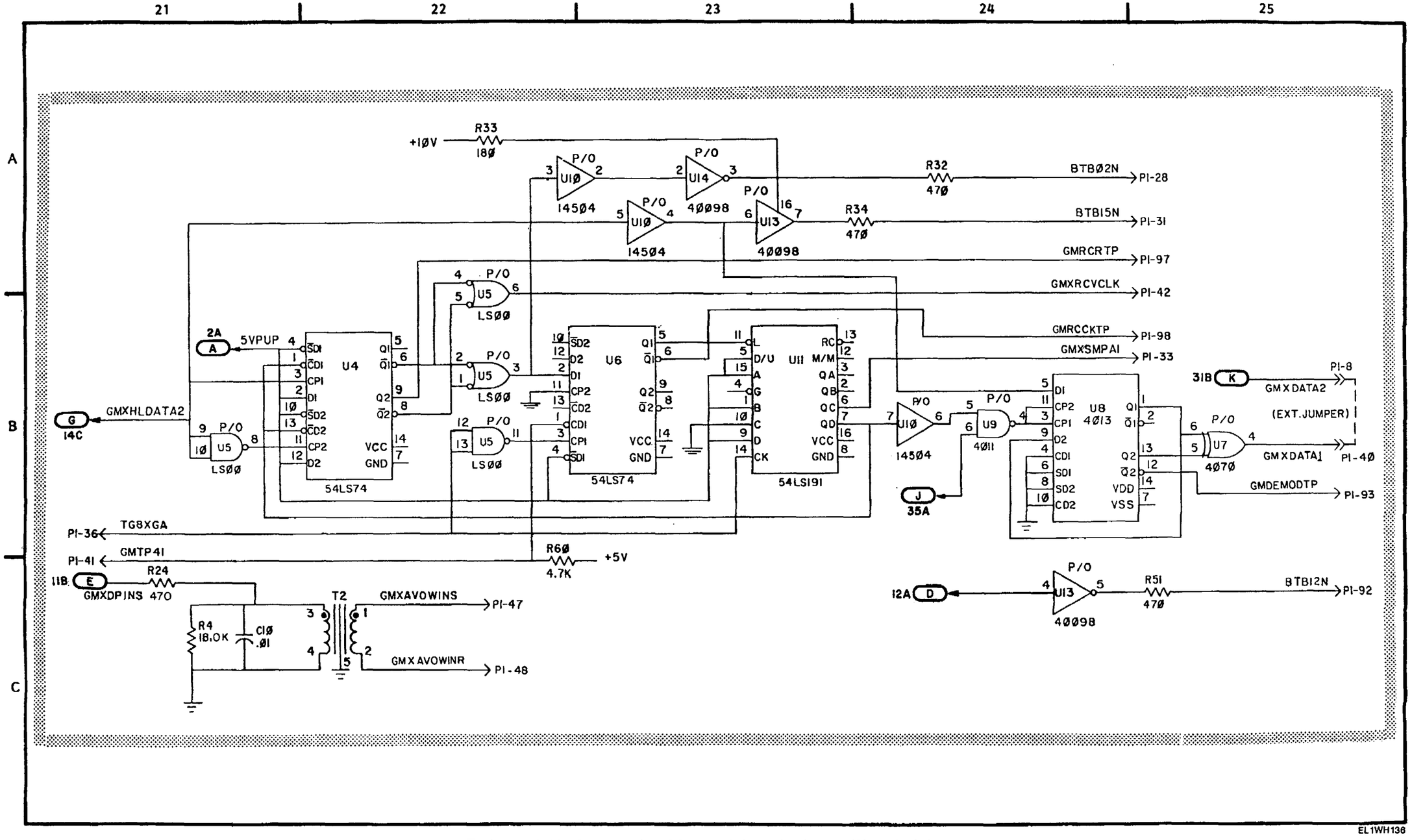


Figure FO-26. Group Modem CCA A11 Schematic Diagram (Sheet 1 of 4)



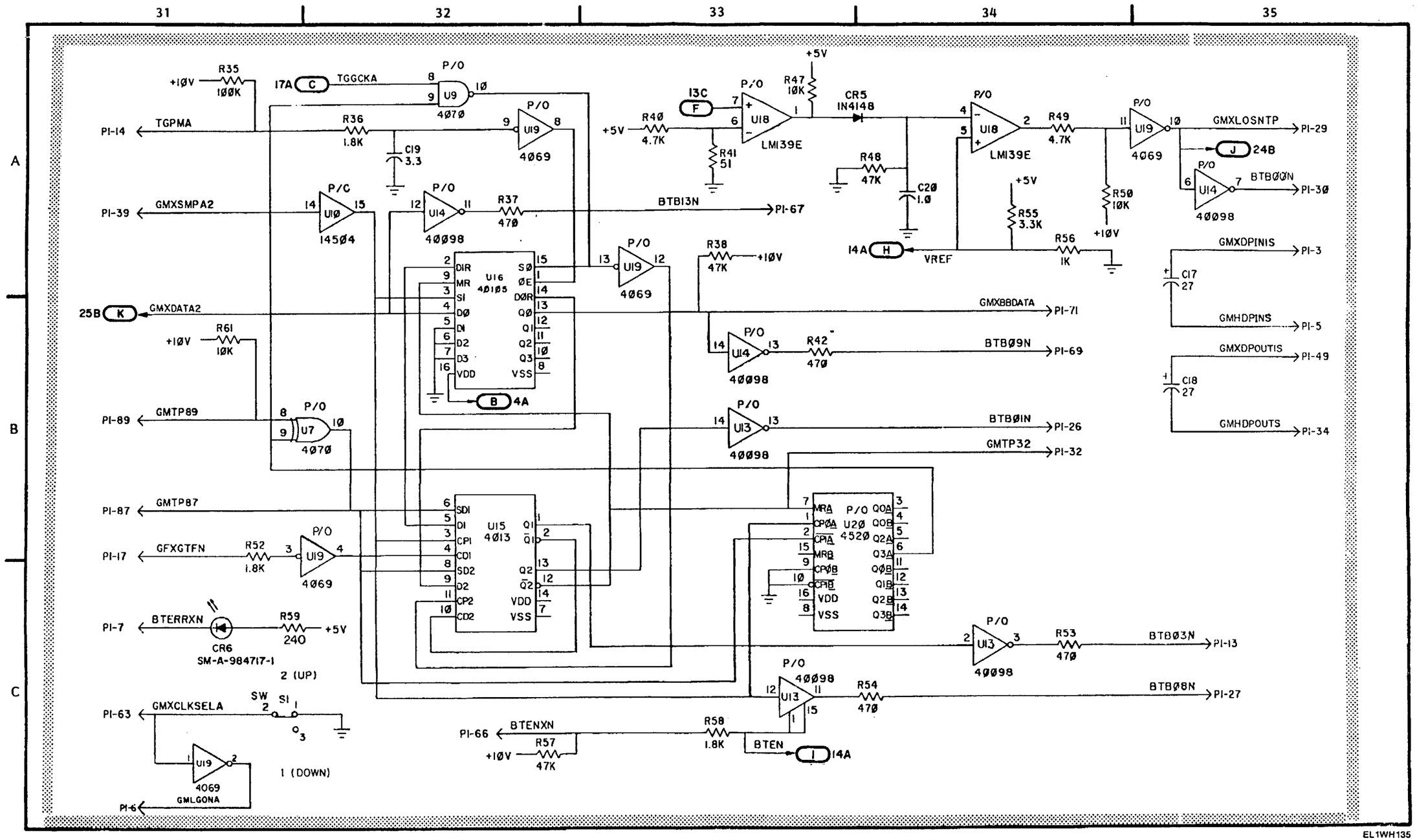
EL1WH134

■ *Figure FO-26. Group Modem CCA A11 Schematic Diagram (Sheet 2 of 4)*



EL1WH136

■ *Figure FO-26. Group Modem CCA A11 Schematic Diagram (Sheet 3 of 4)*



EL1WH135

■ *Figure FO-26. Group Modem CCA A11 Schematic Diagram (Sheet 4 of 4)*

By Order of the Secretaries of the Army, the Navy and the Air Force:

JOHN A WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

MILDRED E. HEDBERG
Brigadier General, United States Army
The Adjutant General

G. B. SCHICK, JR.
Rear Admiral, United States Navy
Commander, Naval Electronic
Systems Command

Official:

EARL T. O'LOUGHLIN
General, USAF, Commander, Air Force
Logistics Command

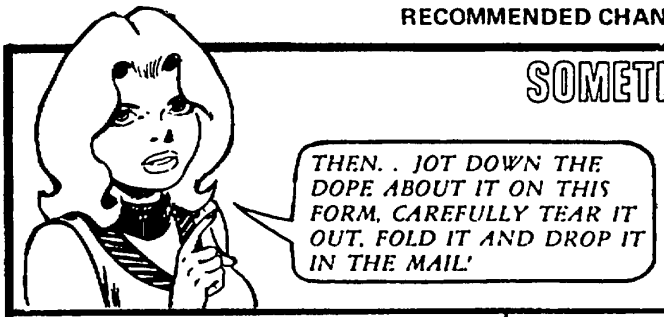
CHARLES A. GABRIEL
General, USAF
Chief of Staff

DISTRIBUTION:

To be distributed in accordance with DA Form 12-51C literature requirements for TD-1233/TTC.

☆U.S. GOVERNMENT PRINTING OFFICE: 1985-515-085: 20187

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)
Commander
Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703-5007

DATE SENT
10 July 1975

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/PRC-76

BE EXACT. PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			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 25 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.
3-10	3-3		3-1	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.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		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.

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
SSG I. M. DeSpiritof 999-1776

SIGN HERE
I. M. DeSpiritof

DA, FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P S --IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5805-706-34	16 Sept 1985	Multiplexer TD-1233(P)/TTC

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA GRAPH	FIGURE NO	TABLE NO.

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

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE

P.S. IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPE OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

TEAR ALONG PERFORATED LINE

REVERSE OF DA FORM 2028-2

TEAR ALONG PERFORATED LINE

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

Commander
US Army Communications-Electronics Command
and Fort Monmouth
ATTN: AMSEL-ME-MP
Fort Monmouth, New Jersey 07703-5007

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

SQUARE MEAS URE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

WEIGHTS

1 Gram = 0 001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0 06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35 31 Cu. Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces
320 Fahrenheit is equivalent to 0° Celsius

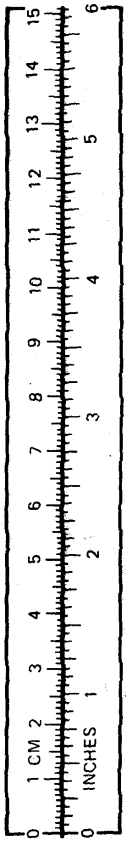
TEMPERATURE

5/9 (°F - 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32 2° Celsius
9/5 (°C + 32) = °F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid	Ounces Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Quarts.	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.45
Short Tons	Metric Tons	0.0907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet .	10.764
Square Meters	Square Yards	1.195
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters Fluid	Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



PIN: 058542-001