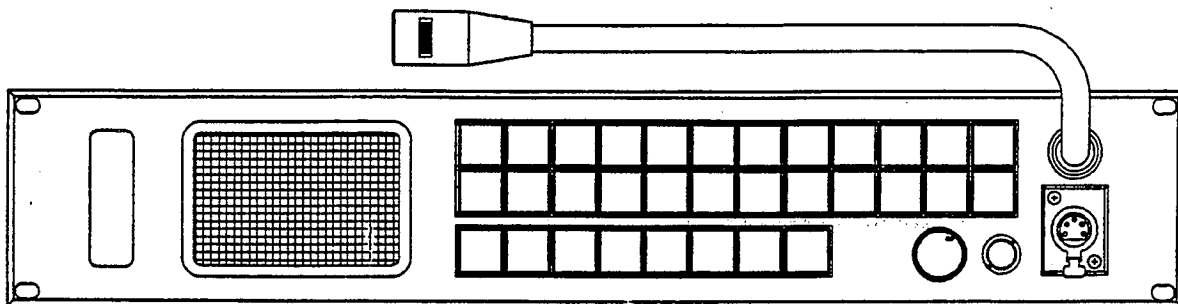


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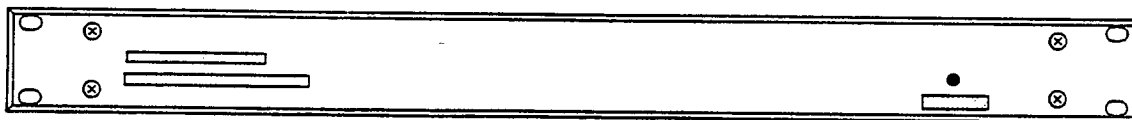
MODEL 848A

Matrix Intercom Station



MODEL DC848

Data Connector



RTS™

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This equipment contains and uses a design embodied in United States Patent No. 4,358,644: "A Bilateral Current Source for a Multi-terminal Intercom". This design employs a two-wire to four-wire converter.

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Customer Service Department
RTS/Telex,
2550 Hollywood Way, Suite 207
Burbank, CA 91505 U.S.A.
Telephone: (818) 566-6700
Fax: (818) 843-7953

RETURN SHIPPING INSTRUCTIONS

PROCEDURE FOR RETURNS

If a repair is necessary, contact the dealer where this unit was purchased.

If repair through the dealer is not possible, obtain a RETURN AUTHORIZATION from:

Customer Service Department
Telex Communications, Inc.
Telephone: (800) 828-6107
Fax: (800) 323-0498

DO NOT RETURN ANY EQUIPMENT DIRECTLY TO THE FACTORY WITHOUT FIRST OBTAINING A RETURN AUTHORIZATION.

Be prepared to provide the company name, address, phone number, a person to contact regarding the repair, the type and quantity of equipment, a description of the problem and the serial number(s).

SHIPPING TO MANUFACTURER FOR REPAIR OR ADJUSTMENT

All shipments of RTS products should be made via United Parcel Service or the best available shipper, prepaid. The equipment should be shipped in the original packing carton; if that is not available, use any suitable container that is rigid and of adequate size. If a substitute container is used, the equipment should be wrapped in paper and surrounded with at least four inches of excelsior or similar shock-absorbing material. All shipments must be sent to the following address and must include the Return Authorization.

Factory Service Department
Telex Communications, Incorporated
West 1st Street
Blue Earth, MN 56013 U.S.A.

Upon completion of any repair the equipment will be returned via United Parcel Service or specified shipper collect.

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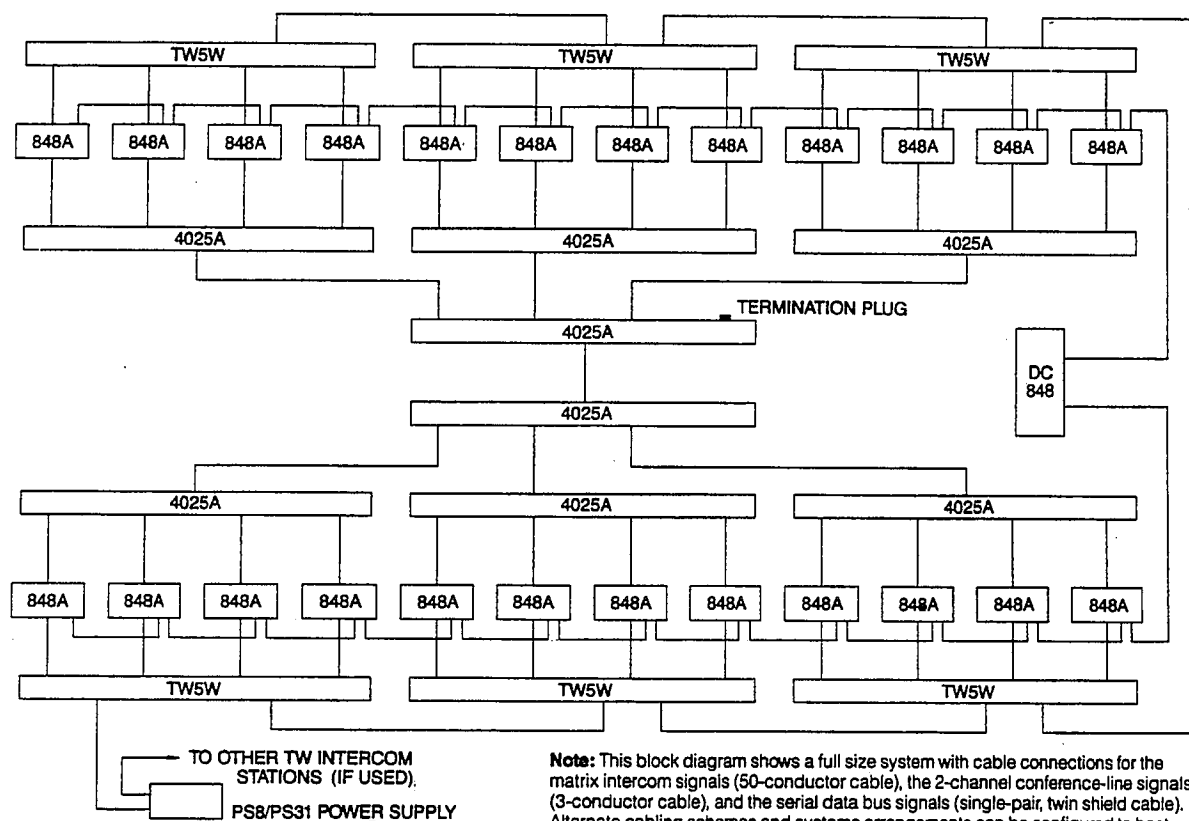


Figure 1-1
Model 848A System Block Diagram

SECTION 1: DESCRIPTION & SPECIFICATIONS

1.1 DESCRIPTION

1.1.1 System and Model 848A Description (See Figure 1-1, Model 848A System Block Diagram)

Point-to-Point Matrix Intercom

A Model 848A system consists of Model 848A stations, connecting cables, and, optionally, a Model DC848 Data Concentrator and data terminal (a personal computer can be used as a terminal).

Each 848A is a station in a point-to-point intercom system which can have as few as 2 stations or as many as 24 stations. Each station can talk to a single station or combination of other stations.

Any configuration of multiple stations in this system is called a matrix. In the matrix, up to 12 separate conversations may be in progress at any time. Each conversation requires two talk paths to two listen buses. Each talk path is the listen bus for one of the twenty four stations.

In a typical operating example, a user (caller) chooses the station he wishes to talk to by pressing the pushbutton corresponding to the called station. The called station can then hear the calling station. No other station can hear this message unless it shares the same listen bus as the called station or more than one station has been called by the caller.

The called station answers the calling station by pressing the pushbutton corresponding to the calling station. If the 848A system includes a DC848 Data Concentrator, a call may also be answered by pressing the call answer pushbutton, which is marked with the station's own number with a colored insert. When the communication is completed, each station releases and the connection is broken.

A station can talk to all other stations at once, by pressing the ALL TALK button.

Conference Intercom

Each Model 848A station has two TW Intercom conference-line channels, which either connect to an RTS Systems TW Intercom System, or interconnect 848A stations for two channels of isolated conference intercom. These conference lines, Channels 1 & 2, have front panel TALK and LISTEN switches for each

channel. The conference line channels and point-to-point channels may be used at the same time.

Model 848A Station Microprocessor

Each Model 848A is equipped with an internal microprocessor which provides electronic switch-action (momentary /latching), and a link to the Model DC848 Data Concentrator. If the power fails, the station remembers its settings. The settings are restored when the power returns.

1.1.2 System and Model DC848 Description

Connecting a Model DC848 to the 848A system adds these functions to the system:

1. Call Tally
2. Received Call Stacking
3. Remote-Control / Programming Capabilities

1. The Call Tally function means that the pushbutton corresponding to the calling station will flash on the called station's panel, telling the operator visually which station is calling.

2. The Received Call Stacking function means that if a station is called by several stations, the called station will make a queue of the calling stations. This queue can be answered in succession by pressing the Call Answer pushbutton.

3. The Remote Control / Programming Capabilities allow the Model 848A to be controlled and programmed remotely by connecting either a computer or a "dumb" terminal to the Model DC848 data bus. The software for the 848A and DC848 lets each station be programmed individually in real-time.

Features programmable with this setup include:

- a. Forced Crosspoint. Sets up a one way voice communication path between two stations.
- b. Inhibit Crosspoint. Inhibits voice path and tally, one way, between two stations.

(Continued)

- c. Panel Switch Action (Latch Disable). Sets the switch action for an individual panel switch, either momentary only or both momentary and latching.
- d. Hands-Free Answer (Auto Reciprocal). When a station is called, its microphone turns on automatically to allow hands-free answering
- e. "Instant Mic On". When set, the microphone will turn on automatically whenever a call is originated.
- f. "Instant Speaker On". When set, the speaker will turn on automatically whenever the station is called.
- g. Auto Tally Flash Time. Adjusts the time the pushbutton will flash when called. Can be set from a 10-second minimum to a 60-second maximum in 10 second increments
- h. Panel Group Assignments. Assigns panels into preset groups.
- i. System Status Displays.
 - a. Dynamic Comlink Display shows stations that are connected and responding to the DC848 data concentrator.
 - b. Dynamic Matrix Status Display shows all possible talk paths in current system and their status.
- j. System Configuration. Allows preset configuration to be stored into memory, and retrieved. There is also a reset choice.
- k. Password Security. Sets a password, preventing unauthorized use, either by terminal or modem.

1.1.3 Model 848A Operational Controls

The operational controls are:

Three rows of pushbutton switches, and
The master VOLUME control.

The first two rows of 24 pushbutton switches select the called point to point matrix stations, except for the one pushbutton with a colored insert. This pushbutton is the "Call Answer" pushbutton, and is active only

in a system with a DC848 connected. This button is also the station address.

All pushbuttons have two levels of brightness. An activated button has a higher brightness. The third row of eight pushbutton switches are as follows:

CONF 1 TALK	INTERCOM CH.1
CONF 1 LISTEN	INTERCOM CH.1
CONF 2 TALK	INTERCOM CH.2
CONF 2 LISTEN	INTERCOM CH.2
ALL TALK	
PANEL MIC (selects panel microphone when ON or headset microphone when OFF)	
SPKR ON (speaker on)	
MIC ON (enables mic circuit in either panel mic or headset, whichever is selected by PANEL MIC switch)	

1.1.4 Model 848A Connections, Inputs and Outputs

Front Panel

Dynamic Microphone Headset Connector.
Carbon Microphone Headset Connector.

Rear Panel

POWER INPUT connector, J702 (12 volt ac/dc).
AUXILIARY CONNECTION connector, J104.
TW INTERCOM SYSTEM LINE INPUT connector, J602 (Conference Line, Two Channels).
EXTERNAL LOUDSPEAKER connector, J204.
SERIAL IN connector, J1001.
SERIAL LOOP-THRU connector, J1002.
LINE CONNECTION connector, J401

Auxiliary Connections

The auxiliary connections on the back panel of the Model 848A provide the user with a program input, an unswitched microphone preamplifier output and additional connections to the front panel.

The program input accepts a -10 dBu signal which is distributed to both the loudspeaker and the headsets. The level can be adjusted on the adjustment card.

The unswitched microphone output provides a -10 dBu line level signal from the Model 848A microphone preamplifier.

Additional connections for an external panel microphone and headset. A remote microphone switch is also available. Any switch, such as a footswitch, can be used to short the two terminals together to turn on the microphone circuit.

1.1.5 Model 848A Preset (Trimpot) Adjustments

The preset adjustment pots are located behind the small rectangular panel to the left of the loudspeaker. To access the adjustments, press the rectangular panel lightly, then release, this will unlock the panel. Pull the panel out as far as it will go.

Behind this small panel, on a circuit board, in two rows, are the following ten adjustment pots:

Top Row

LISTEN/TW 1	Conference Line 1 level
LISTEN/TW 2	Conference Line 2 level
LISTEN/ALL (Talk)	Page level
LISTEN/MATRIX	24 point-to-point stations
LISTEN/PGM	Auxiliary program

Bottom row

BAL/1	Conference Line 1 balance
BAL/2	Conference Line 2 balance
SIDETONE	Headset Sidetone Level
	Adjustment
DIM	Speaker Attenuation during
	Mic on
MIC	Microphone gain
	adjustment

1.1.6 Power

Model 848A Power

Each Model 848A requires 12 volts ac at 1.4 amperes to operate. This power is supplied by an RTS Systems Remote Power Supply--included with each unit. The power supply comes in two types, one whose mains input is 117 volts/50-60 hertz ac, or a second type whose mains input is 220 volts/50-60 hertz ac.

Model DC848 Power

The Model DC848 requires 12 volts ac at 0.5 amperes, and comes with its own RTS Systems Power Supply Unit normally identical to the 848A supply.

1.1.7 Package

Model 848A Package

The Model 848A is enclosed within a metal case designed to fit a standard 19" rack and occupies two rack units of space. The Model 848A measures 3.47" high x 19" wide x 7" deep and weighs 6 pounds.

Model DC848 Package

The Model DC848 is enclosed within a metal case designed to fit in a standard 19" rack and occupies one rack unit of space. It is 1.75" high x 19" wide x 10" deep, and weighs 2.2 pounds.

1.2 SPECIFICATIONS

1.2.1 MODEL 848A MATRIX INTERCOM SYSTEM SPECIFICATIONS

Bus Complement

- 24 balanced distributed talk/listen buses
- 1 balanced distributed all talk bus
- 2 TW Intercom 2-wire buses

Audio Level/Bus Impedance

Distributed Summing Buses:

-10 dBu, test level	500 ohms
-20 dBu, nominal level	500 ohms

TW Intercom Lines

0 dBu, test level	200 ohms
-10 dBu, nominal speech	200 ohms

Station Bridging Impedance

Distributed Summing Buses	12 kilohms, nominal
	6 kilohms, LISTEN selected
TW Intercom Lines	10 kilohms, nominal

Distributed Summing Bus Termination

(One termination per system bus is usually required.
Termination plugs may be ordered from RTS Systems.)

Up to 8 stations	680 ohms (RTS Systems Part Number 9020-5189-01)
Up to 16 stations	1500 ohms (RTS Systems Part Number 9020-5189-02)
Over 16 stations	No termination

Recommended Maximum System Size

Number of stations (bus level lowered by 3 dB)	32
Stations per bus (same listen channel)	4
Operating Distance with balanced-pair cable, #22 gauge wire	5,000 feet

1.2.2 MODEL 848A INTERCOM STATION SPECIFICATIONS

Microphone Preamplifier

Input	Switchable, panel or headset Mic
Input Impedance	500 ohms/dynamic Mic 800 ohms/10 milliamperes max carbon Mic
Source Impedance	200 ohms, nominal
Maximum Input Level	150 millivolts
Voltage Gain	50 dB, nominal, adjustable
Limiter Range	30 dB
Frequency Response	100 hertz to 10 kilohertz, ± 3 dB
Output (rear panel access) (load impedance 10K ohm)	-10 dBu, test level -20 dBu, nominal speech level
Headset Microphone sensitivity required	-50 dBu minimum
Headset Microphone Source Impedance Range	100 to 1000 ohms

Headphone Amplifier

Output Power	1 watt into 8 ohms 300 milliwatts into 32 ohms
Frequency Response	150 hertz to 8 kilohertz, ± 3 dB
Headphone Impedance Range	25 to 600 ohms

Loudspeaker Amplifier

Output Power into 8 ohm speaker	2 watts into 8 ohms
Dim Range (dim when Mic on)	3 dB to 20 dB, adjustable
Frequency Response	150 hertz to 8 kilohertz, 3 dB

User Adjustable Level Trimpots

Listen Bus (1 of 24 system buses)
All talk listen
TW Intercom Channel 1 listen
TW Intercom Channel 2 listen
Sidetone (only in headphone)
Program input

(Continued)

1.2.2 MODEL 848A INTERCOM STATION SPECIFICATIONS (Continued)

Auxiliary Connections

External Headset
External Panel Microphone
External Electret Panel Mic
External Microphone On--Off
Unswitched Mic Output @-10 dBu
Program Input @-10 dBu, 10K ohms

Power And Mechanical

848A Power Requirements 12 volts ac / 1.4 amperes / 45-440 hertz

Power Supply Module
Power Requirements from Mains: 25 volt-amperes, typical
30 volt-amperes, maximum
250 volt-amperes surge, 25 milliseconds

Dimensions 3.47" H x 19" W x 7" D
88.13 H x 482.6 W x 177.8 D mm

Weight 6 pounds; 2.75 kilograms
Finish
Front Panel Enamel Paint, light gray
Rear Housing Gold Iridite

Connector Requirements

Matrix Intercom:

Audio Line Connector 50-Pin Microribbon male
Line Cable Type 25-Twisted Pair, unshielded, or
50-Conductor Flat Ribbon Cable

TW Intercom:

Audio Line Connector XLR type, 3-pin female
Line Cable Type Belden 8723 twin pair or
equivalent

Serial Data Connector 9 pin "D" male
Serial Data Loop-Through 9 pin "D" female

Headset Connector
Dynamic Mic XLR-type, 5-pin female
Carbon Mic ¼" phone jack, 3 circuit

Power Supply 4-pin circular

1.2.3 MODEL DC848 DATA CONCENTRATOR SPECIFICATIONS

Connections

Connection to Terminal or Modem: J101: RS232

Terminal Mode

DEC VT100 or equivalent.

Settings: 9600 baud, 8 bits, 1 start bit, 1 stop bit, no parity.

Modem Mode

Remote terminal to emulate DEC VT100 or equivalent.

Settings: 9600/4800/2400/1200/600/300 baud, software selected, 8 bits, 1 start bit, 1 stop bit, no parity.

Connection to string of Model 848A stations: J102/J103: RS422,

Parameters

RS485 half duplex serial communication network

78.6 kilobaud, 8 bits, 1 start, 1 stop bit.

Power And Mechanical

Power Requirements 12 volts ac / 0.15 amperes / 45-440 hertz.

Power Supply Module

Power Requirements from Mains: 10 volt-amperes, typical
 15 volt-amperes, maximum
 50 volt-amperes surge, 25 milliseconds

Dimensions 1 3/4"H x 19"W x 10"D
 44.45H x 482.6W x 254D(mm)

Weight 2.2 pounds, 1 kilogram

Finish

Front panel Enamel Paint, light grey
Rear Housing gold iridite

SPECIFICATION NOTES:

0 dBu = 0.775 volts r.m.s.

0 dBm = 1 milliwatt

= 0.775 volts r.m.s. into 600 ohm load (0 dBu, open circuit)

= 0.387 volts r.m.s. into 150 ohm load (-6 dBu, open circuit)

NOTE: All product information and specifications are subject to change without notice.

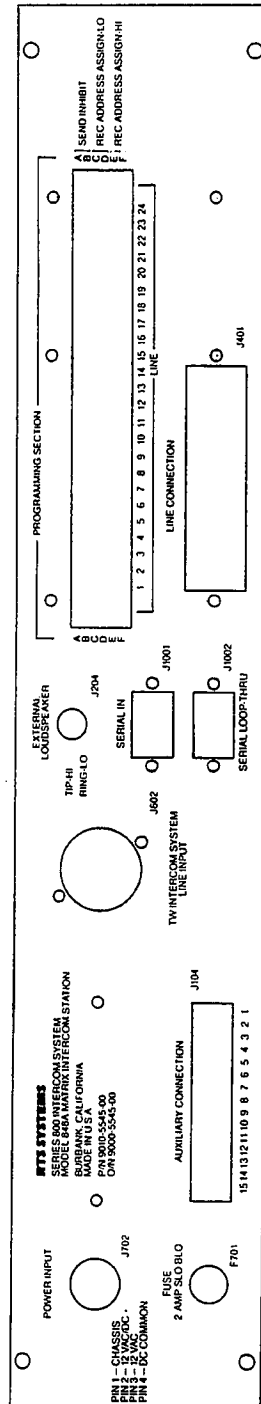


Figure 2-1
Model 848A Rear Panel

SECTION 2: INSTALLATION

2.1 INSTALLATION PROCEDURE

TO INSTALL MODEL 848A	TO INSTALL MODEL DC848
1. Determine the cables, splitters and termination plugs necessary for the number of units in the 848A matrix system. See Section 2.3.2.1 and Tables 2-1, 2-2, 2-3)	1. Determine the best location for the Model DC848 considering the cabling requirements, and the location of the (optional) data terminal, personal computer or modem. If using a modem, jumper per Section 2.5.1.
2. List Model 848A locations versus station addresses (01 through 24) (See Table 2-4). A master form to copy is at the rear of this manual.	2. Mount the Model DC848 in a rack.
3. Set the individual station's matrix listen bus by using the jumpers on the rear programming panel. (Section 2.3.2.2) Put colored lens on corresponding front panel button to create the station address.	3. The Model DC848 and all of the Model 848A stations are to be interconnected at their data connectors. Determine the data cabling requirements, and sketch out a plan. As an aid, use Table 2-1, and step 4, below.
4. Set the station's logical address internally by using the dip switch setting that corresponds to the number selected above. (Section 2.3.2.2) To access the dip switches, remove the 4 top-cover screws on the 848A and slide the top panel back. After setting the dip switches, replace the top panel securely.	4. Interconnect the data connectors of the Model 848A's using RS422 9-pin data cables. Connect one of the Model 848A stations on the end to the Model DC848. The data connectors on the back of the Model 848A are labeled J1001 and J1002, and wired in parallel. The data connectors on the back of the Model DC848 are labeled J102 and J103, and also wired in parallel. (See the System Block Diagram on page ix).
5. Mount the 848A unit See Section 2.2	5. If there are any unused 848A positions on the RS422 cable run, plug the RS422 ends together for a completed path.
6. Connect the 25-pair audio cables to Line Connection J401, making sure the connection is flush, securing the end with the ties provided. For system splitter and termination requirements, see Table 2-1.	6. Connect the Model DC848 to the computer terminal by connecting an RS232 cable to J101 at the rear of the DC848.(See Section 2.4).
7. If interconnecting a Model DC848, connect the RS422 logic cables at J1001 and/or J1002, creating a serial loop-through from unit to unit. See "To Install Model DC848".	7. Connect the modular power supply that came with the Model DC848 to the DC848.
8. Connect the TW System (if applicable), interconnect 848As using TW5W splitters, or allow the supplied terminal plug to remain in place. See Section 2.3.2.1	8. Power up the data terminal or computer, and set it up with the correct communications parameters (See Section 1).
9. Power the unit. See Section 2.3.1	9. Plug the Model DC848 modular supply into the mains. The Main Menu or Security Menu should come up on the data terminal or computer.

Table 2-1
Matrix Audio Cables, Splitters, and Termination Plugs Required

Number of 848A Stations	-----Number Required-----				Notes
	25 Pair Cables	Model 4025 Split.	Term.01	Term.02	
1	0	0	1	0	Test Configuration
2	2	1	1	0	
3	3	1	1	0	
4	4	1	1	0	
5	6	2	1	0	
6	7	2	1	0	
7	8	2	1	0	
8	10	3	1	0	
9	11	3	0	1	
10	12	3	0	1	
11	14	4	0	1	
12	15	4	0	1	
13	16	4	0	1	
14	18	5	0	1	
15	19	5	0	1	
16	20	5	0	1	
17	22	6	0	0	
18	23	6	0	0	
19	24	6	0	0	
20	26	7	0	0	
21	27	7	0	0	
22	28	7	0	0	
23	30	8	0	0	
24	31	8	0	0	

Table 2-2
Data Cables and Splitters

<u>Number of 848A Stations</u>	<u>Number Required</u>				<u>Notes</u>
	<u>Single String Data Cables</u>	<u>Split.</u>	<u>Double String Cables</u>	<u>Split.</u>	
1	1	0			Test Configuration
2	2	0	3	1	
3	3	0	4	1	
4	4	0	5	1	
5	5	0	6	1	
6	6	0	7	1	
7	7	0	8	1	
8	8	0	9	1	
9	9	0	10	1	
10	10	0	11	1	
11	11	0	12	1	
12	12	0	13	1	
13	13	0	14	1	
14	14	0	15	1	
15	15	0	16	1	
16	16	0	17	1	
17	17	0	18	1	
18	18	0	19	1	
19	19	0	20	1	
20	20	0	21	1	
21	21	0	22	1	
22	22	0	23	1	
23	23	0	24	1	
24	24	0	25	1	

Table 2-3
Conference Audio Cables, Splitters, and Termination Plugs Required

Number of 848A Stations	-----Number Required-----			Notes
	Microphone Cables	TW5W Splitter	Termination Plugs	
1	1	1	1	Test Configuration
2	2	1	1	
3	3	1	1	
4	4	1	1	
5	5	1	1	
6	7	2	1	
7	8	2	1	
8	9	2	1	
9	10	2	1	
10	12	3	1	
11	13	3	1	
12	14	3	1	
13	15	3	1	
14	17	4	1	
15	18	4	1	
16	19	4	1	
17	20	4	1	
18	22	5	1	
19	23	5	1	
20	24	5	1	
21	25	5	1	
22	27	6	1	
23	28	6	1	
24	29	6	1	

Table 2-4
Location versus Address Assignment and Cabling Log

<u>848A Station Number</u>	<u>Station Address (Dip Switch)</u>	<u>Listen Bus (Rear Panel)</u>	<u>Location</u>	<u>Notes</u>
1	1	1		
2	2	2		
3	3	3		
4	4	4		
5	5	5		
6	6	6		
7	7	7		
8	8	8		
9	90	9		
10	10	10		
11	11	11		
12	12	12		
13	13	13		
14	14	14		
15	15	15		
16	16	16		
17	17	17		
18	18	18		
19	19	19		
20	20	20		
21	21	21		
22	22	22		
23	23	23		
24	24	24		

Table 2-5
Station Select Logical Address:
Dip Switch Setting Chart

<u>Station Address</u>	<u>Dipswitch S101 Setting</u>				
	<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>S4</u>	<u>S5</u>
Panel #1	0	0	0	0	0
Panel #2	1	0	0	0	0
Panel #3	0	1	0	0	0
Panel #4	1	1	0	0	0
Panel #5	0	0	1	0	0
Panel #6	1	0	1	0	0
Panel #7	0	1	1	0	0
Panel #8	1	1	1	0	0
Panel #9	0	0	0	1	0
Panel #10	1	0	0	1	0
Panel #11	0	1	0	1	0
Panel #12	1	1	0	1	0
Panel #13	0	0	1	1	0
Panel #14	1	0	1	1	0
Panel #15	0	1	1	1	0
Panel #16	1	1	1	1	0
Panel #17	0	0	0	0	1
Panel #18	1	0	0	0	1
Panel #19	0	1	0	0	1
Panel #20	1	1	0	0	1
Panel #21	0	0	1	0	1
Panel #22	1	0	1	0	1
Panel #23	0	1	1	0	1
Panel #24	1	1	1	0	1

All other settings are not valid

2.2 MECHANICAL INSTALLATION

The Model 848A mounts in an EIA standard 19-inch equipment rack/enclosure, and is two rack units high. Allow room for the panel microphone and controls in front and the cabling in the rear. There are no ventilation requirements.

The Model DC848 Data Concentrator mounts in an EIA standard 19 inch equipment rack, and, is one rack unit high. Allow room for cabling in the rear. There are no ventilation requirements.

2.3 ELECTRICAL

2.3.1 Power

Power is supplied to the Model 848A via a step down transformer. The 14 volt ac output of the transformer connects to a four pin circular connector (plug). This connector plugs in to a mating four pin circular power input connector (receptacle), J702, on the Model 848A rear panel. Tighten the retaining ring on the four pin circular plug.

Fuse

A single 2 ampere slow-blow fuse, F701, is located on the 848A rear panel. Replace only with a 2 ampere slow-blow fuse. Metric fuses can be used when the fuse carrier is changed to an RTS Systems part number: 2802-0006-00 (Schurter FEK 031.1663).

2.3.2 Signal

2.3.2.1 System Audio and Digital Connections

System Audio Connection

The 25 pair audio cables from the 848A are interconnected in parallel to form 25 balanced audio buses. Connect the cables in parallel by using Model 4025A 1 X 5 Splitter Assemblies. A cable is run from J401 on each 848A to a splitter assembly. Splitter assemblies are interconnected with 25 pair cables from the male on one splitter to a female on another splitter. (See Figure 1-1, System Block Diagram on page ix). A termination plug is sometimes required in the system (explained below).

System Digital Connections, 848A to 848A to DC848

System digital connections are required when a Model DC848 is used in the system. The system digital connections are paralleled RS422 cables. These cables may be connected by looping through on the two connectors on the rear of the 848A, J1001,

and J1002, and the two connectors on the rear of the DC848, J102 and J103. Interconnect the data connectors of the Model 848A's using RS422 9-pin data cables. Connect one of the Model 848A stations on the end to the Model DC848. The data connectors on the back of the Model 848A are labeled J1001 and J1002, and wired in parallel. The data connectors on the back of the Model DC848 are labeled J102 and J103, and also wired in parallel. (See System Block Diagram on page ix).

In some installations it will be necessary to use a splitter to complete the string of digital cables.

System Digital Connections, DC848 to Terminal or Personal Computer

Use a standard RS232 cable to connect the DC848 to a terminal. Use a null modem RS232 cable to connect the DC848 to a personal computer. The end of the cable plugging into the DC848A is a 25 pin female DB25 connector. The mating connector on the DC848 is J101, a male DB25 connector. The type of connector on the end of the cable plugging into the terminal or personal computer is determined by the terminal or personal computer. On the DC848 end the connections are as follows:

Pin 2	Rx
Pin 3	Tx
Pin 7	Gnd
Shell	Shield

See Section 2.4 for further details

Conference Line (TW) Connection

The TW connector on the back panel of the Model 848A provides two conference-line channels. To connect, simply insert a 3-pin XLR type male connector from the TW Intercom line into the J602 input on the back panel of the Model 848A. However, this input will not power a TW Intercom system. Consult the TW Intercom System Manual for details on how to install and use a TW Intercom System.

2.3.2.2 Listen Bus & Logical Address Selection

2.3.2.2.1 Listen Bus Selection (Audio)

Back Panel Jumpers

The Model 848A has a Listen Bus Selection area on the back panel, which sets the listen bus.

On the Model 848A, it is not necessary to use the back panel programming section to inhibit a station from

calling other stations as was necessary on the Model 848.

The Model 848A must be assigned its own station listen bus by using jumpers. One of these jumpers connects a pin in row C to the corresponding pin in row D; the other jumper connects a pin in row E to the corresponding pin in row F. Pins CD and EF connect one of the 24 balanced listen buses to the listen electronics of that unit.

The pushbutton on the front panel corresponding to the listen address must now be designated "call answer" and accented with a colored filter. This key represents its own station call and can be used for auto call answering. The position of this key must correspond to the listen address selected by the jumpers on the rear panel.

2.3.2.2.2 Logical Address Selection (Digital)

Dip Switch Setting

Step 1: After setting the Station Listen bus on the rear panel, open the cover to access the internal dip switch.

Step 2: Using the dip switch settings given in Table 25, set DIP SWITCH S101 to correspond to the address set on the rear panel and designated as a "call answer" pushbutton on the front panel (see above).

2.3.2.3 System Termination Plugs

Matrix Lines and All Talk Bus

The matrix lines and the balanced all-talk bus should have an impedance between 500 and 600 ohms for proper operation. A termination plug with 25 resistive terminations should be plugged into the system line at one location only. This termination plug is not provided with the Model 848A, but may be ordered from RTS Systems.

For two to eight stations, the terminator has twenty-five 680 ohm resistors (RTS P/N 9020-5189-01). For nine to sixteen stations, the required terminator has twenty-five 1500 ohm resistors (RTS P/N 9020-5189-02). For seventeen or more stations no resistive termination is required.

TW Connector Termination

Each TW System line must be terminated with 200 ohms. If the TW line is used with an RTS TW System, the termination is provided by the RTS Systems' power supply. If the TW input connections are not used,

terminate J602 on the back panel, with termination plug RTS P/N 9020-5188-00.

2.3.2.4 Installing Additional Features

Auxiliary Connections

The auxiliary connections on the back panel of the Model 848A provide the user with a program input, an unswitched microphone preamplifier output and access to front panel connections. The program input accepts a -10 dBu signal which is distributed to both the loudspeaker and the headsets. The level can be adjusted on the adjustment card.

The unswitched microphone preamplifier output provides a -10 dBu line level signal from the Model 848A microphone.

Using a standard Molex KK, 0.156 center connector (supplied in your package), auxiliary connections provide additional connections for the panel microphone and the various headsets. A remote microphone switch, such as a footswitch, can be also be set up in this way.

Auxiliary Connector Pin Numbers

<u>Pin No.</u>	<u>Description</u>
1	Not connected
2	PGM program input high
3	PGM program input low
4	Unswitched Mic preamp output high
5	Unswitched Mic preamp output low
6	Mic switch ground
7	Mic switch (low=on)
8	EPM LOW Electret Panel Mic input low
9	EPM HI Electret Panel Mic input high
10	DPM LO Dynamic Panel Mic input low
11	DPM HI Dynamic Panel Mic input high
12	HDM LO Dynamic Headset Mic input low
13	HDM HI Dynamic Headset Mic input high
14	HP LO HeadPhone output low
15	HP HI HeadPhone output high

Remote Microphone Switching

There are two ways to switch a remote microphone: Through the rear panel Mic switch, or via a phantom connection through the dynamic headset connector.

Rear Panel Microphone Switch:

A remote footswitch or other dry contact may be connected to the auxiliary connector through pins 6 and 7. When the switch is closed the microphone signal is turned on and the front panel tally (in the Mic ON pushbutton) will illuminate to its bright (active) state. Note that the front panel pushbutton may override the remote switch and lock on the microphone switches.

Remote Microphone Switch Through the Dynamic Headset Connector:

The microphone-on function may be remote-controlled by connecting a 4.7 kilohm resistor from each side of the dynamic microphone transformer balanced input on the front panel, through a switch to ground. (See Figure 2-2) This feature keeps noise from the microphone pre-amplifier off the buses when the microphone is off. This feature also improves the performance of large systems. A switch can short the microphone termination input and add significant noise to the system, causing possible instability.

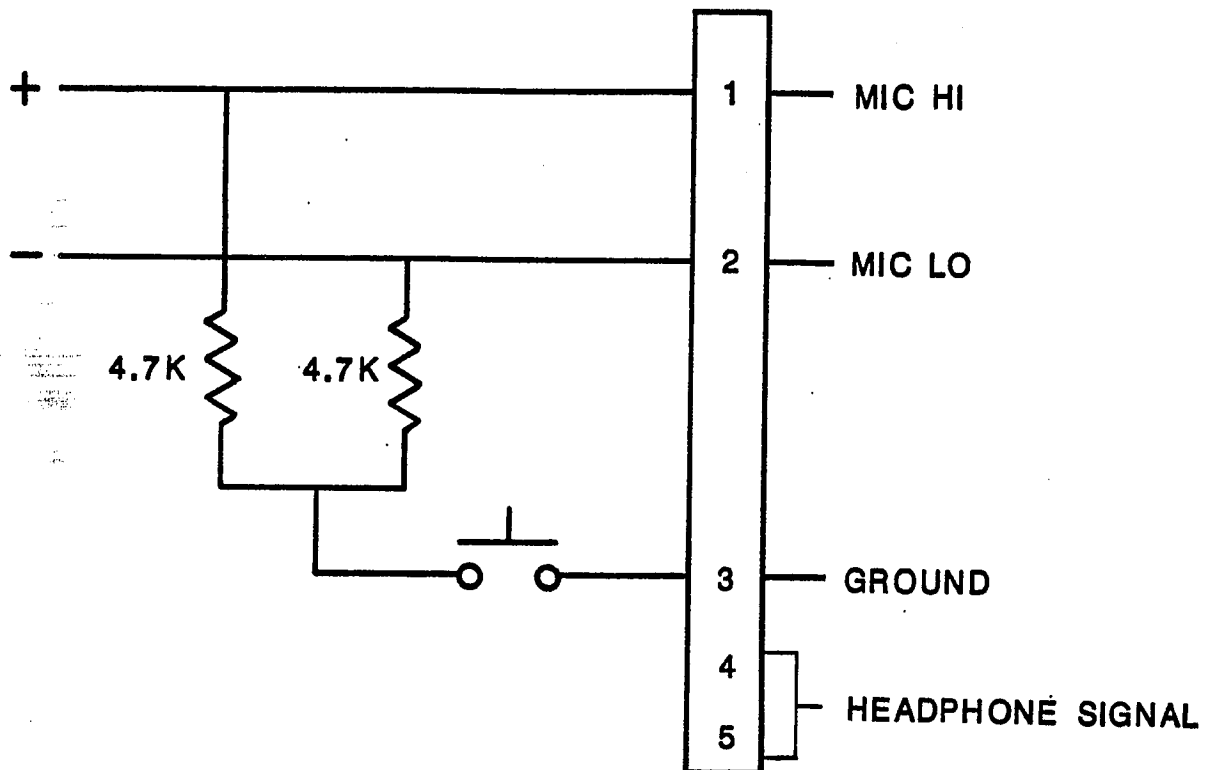


Figure 2-2
Remote Microphone Switch Through The Dynamic Headset Connector

2.4 MODEL DC848 SERIAL FORMAT

The RS232C serial format for the Model DC848 Data Concentrator is: 9600 baud, 8 bits, 1 start bit, 1 stop bit, no parity.

A terminal must emulate DEC's (Digital Equipment Corporation) VT100-type terminal for the proper escape sequences and control characters used by the DC848. Some terminals may require a null modem adapter or gender change or both.

The Model DC848 is RS232 configured as DCE to plug directly into a terminal. Use a null modem adapter or null modem type cable to plug into a computer.

Pin 2	Rx
Pin 3	Tx
Pin 7	Gnd
Shield	Shield

2.5 FACTORY CONFIGURATION

Each DC848/848A System leaves the factory in this configuration: All undesigned 848A station addresses are programmed for inhibit, which will disable the 848A front panel buttons from responding if there is no designation in the switch. "Hands Free Answer" and "Instant Mic" are disabled. The tally flash time is set for 40 seconds.

There are not forced talk paths, no inhibited talk paths, no latch disabled switches and no group assignments. The Security Password is factory set at 0000000. (See Section 2.6 for details on Computer Programming Functions.)

2.5.1 Installing CPU Board Jumpers

To enable certain functions of the DC848, the following jumpers (or switches) must be activated on the DC848 CPU Board prior to installation:

J1, Pins 7 & 8 or S1, switches 6 & 7:	Enables DC848 modem operation
J1, Pins 9 & 10 or S1, switch 8:	Enables the password function

See page 7-36 for location of J1, or page 7-36A for location of S1.

Note: S1-1 through S1-5 are not used and should be left in the OFF position.

2.6 COMPUTER PROGRAMMING FUNCTIONS

Enhanced operating functions (explained below) are available to a Model 848A system which includes a Model DC848 Data Concentrator, associated connecting cables, and a customer furnished DEC VT100 terminal or equivalent. A personal computer with VT100 emulating software may be used instead of a VT100 terminal. The terminal or computer is plugged into the DC848.

The enhanced operating functions are implemented by keying in commands to the system via the terminal or computer ("programming"). When keying in commands via the menus, it is not necessary to hit "return" to execute a command unless stated on the screen. Pressing "escape" will return the display back to the previous menu or to the Main Menu.

The numbers associated with a panel are keyed in as two digit numbers (for example, 01, 02, 23, 24), or a letter-number combination in the case of the Intercom Lines (for example, T1 or L2). The "return" or "enter" key is not required to enter the number. The numbers associated with commands are keyed in as single digit numbers, for example, 1, 2, 5, 6. The "return" or "enter" key is not required to enter the number.

2.6.1 Explanation of Functions

Forced/Inhibited Crosspoints (Force/Inhibit A Talk Path)

The forced/inhibited crosspoints function forces or inhibits a fixed talk path between 848A stations. Any one or combination of buttons can be locked in or locked out. Once programmed, the fixed parameters of the talk path cannot be cleared at the panel and will remain forced or inhibited until reprogrammed at the local terminal or personal computer.

Panel Switch Action (Latch Disable)

The Panel Switch Action function can change the action of selected buttons from momentary/alternate to momentary only, disabling any latching action.

Hands-Free Answer (Automatic Reciprocal)

The Hands-Free Answer function can set an 848A station to respond automatically to other selected 848A stations, leaving a user's hands free. When the programmed station calls, the talk path is instantly established.

At the called station, Hands Free Answer indicates an established talk path with a beep. This beep prevents inadvertent "eavesdropping" in case the visual connection signal (brightly lit button) is unnoticed.

"Instant Mic On"

When set, the microphone will turn on automatically whenever a call is originated.

"Instant Speaker On"

When set, the loudspeaker will automatically turn on whenever a call is received.

Tally Flash Time

When a call is received at an 848A station, the pushbutton corresponding to the calling station will flash (if the talk path is not already on), providing a tally that tells the responding operator where the incoming call originated. If the talk path is already on, then the communication is already established and tally is not required. The length of time the pushbutton will flash is variable from a 10-second minimum to a 60-second maximum and can be set from the Tally Flash Time Menu. Press L or S to lengthen or shorten the tally time.

Panel Group Assignment

Using the Panel Group Assignment List, 848A units within the matrix can be programmed into preset groups. Each group would then act as a single unit in receiving communications from the panel being programmed. Up to four groups can be created, and as many units as needed can be assigned to each group.

SYSTEM STATUS

Dynamic Comlink Displays

This display indicates all 848A panels that are currently communicating with the Model DC848 on the RS485 serial line. This status display is dynamic, meaning that it will reflect a change in status as it happens, without reset. There are two ways to get to this display: 1) By choosing #1 on the Dynamic System Status root menu, or 2) By hitting [return] whenever any menu displays the message, "THIS panel not communicating with the system".

Dynamic Matrix Status Display

This display indicates all possible talk paths in the system and their current status (i.e. communicating, not communicating). This display can be reached through the Dynamic System Status root menu. A Panel number appears in the appropriate crosspoint to indicate that the crosspoint button has been illuminated. "--" indicates that the crosspoint button is off.

SYSTEM CONFIGURATION

This series of displays allows a user to save into memory all programmed parameters (i.e. latch disable, groups, forced crosspoints and all other settings throughout the entire system) so that the data is not lost. Parameters may be saved and recalled for two full configurations. There is also a reset choice.

Password Security Menu

The Password Security Menu is designed to prevent casual or inadvertent tampering with system settings, and to prevent unauthorized use of the modem connection. After entering the password into the system by following the sequence, it is recommended that whenever you exit the program you do so into the Security Mode. As an additional security measure, unplug and remove the terminal from the DC848 when programming is completed. When accessing the system by modem, an exit into the Security Mode automatically disconnects the modem.

There is a safeguard built into the system in the event that the password programmed into the system is misplaced, unknown or forgotten. First remove the DC848 cover, then remove the jumper from J1 Pins 9 & 10 or turn off switches 6 & 7 of S1 (see page 7-36 or 7-36a for the location). This will enable you to access the system without a password. Next, choose the Password Security menu and create a new password. Finally, replace the jumper on J1 pins 9 & 10 or turn on switches 6 & 7 of S1. This will activate the new password.

2.6.2 Programming the 848A/DC848 Enhanced Functions

The Main Menu

The 848A enhanced functions are programmed via computer screen menus from the DC848. The first menu, The 848A Main Menu (See Figure 3-3), lists a submenu for each enhanced function. Enter a single digit to display an enhanced function submenu.

IMPORTANT NOTE:

If there is a beep and the following message appears: **"THIS PANEL NOT COMMUNICATING WITH THE SYSTEM"**, select another panel by entering the 2-digit panel number or go to the System Status Display to recheck panel status.

The Force/Inhibit A Talk Path List (Forced Crosspoint):

On the FORCE/INHIBIT A TALK PATH LIST (See Figure 3-4A) the panel number being displayed or programmed is at the top of the screen. The chart lists the talk path switches in this panel that access the other panels in the system, and shows the status of each ("ON" indicates a forced talk path, "--" indicates a non-forced talk path). To force a talk path (crosspoint) to an always ON state independent of the corresponding button, choose "1." To inhibit a talk path to an always OFF state, choose "2". Once you have chosen the function, you must choose the other panel number in the path to be forced/inhibited.

From that point, there is a toggle ON/OFF action for that function. If the function is on and ENTER is pressed, it will toggle off; if the function is off, pressing ENTER will toggle it on. A forced talk path will show on the display as "FO" and an inhibited talk path will show as "IH".

Note: THE FORCE/INHIBIT A TALK PATH LIST is interactive; the last function programmed takes precedence.

The Panel Switch Action Menu (Latch Disable):

On the PANEL SWITCH ACTION MENU (See Figure 3-6A), the panel number of the 848A being displayed or programmed is at the top of the screen. Each of the 24 pushbuttons or station-select-switches on the front panel is normally both alternate-action and momentary-action. If held, the pushbutton's action will be momentary, releasing the talk-path when the pushbutton is released. If pressed with a light tap (i.e., less than 1 second), the talk-path will be latched on until the pushbutton is depressed again to turn off the talk path. It is possible to make any of these buttons momentary action only. The chart shows the status of each button or station switch for a particular panel. A latch disabled button is shown as "LD". (See Figure 3-6A) To make the button momentary action only, type "1". To restore a button to both actions, type "2". Then enter the two-digit pushbutton number to be changed (See Figure 3-6B).

The Hands-Free Answer List (Auto Reciprocal):

The HANDS-FREE ANSWER LIST shows which stations the 848A operator can automatically respond to when that station calls. The panel number being displayed or programmed is at the top of the screen. A selected panel number will show as "HF". (See Figure 3-7A) To program this feature, choose "1"; to de-program this feature, choose "2". Then enter the two-digit panel number to be changed. (See Figure 3-7B)

The Panel Instant Mic Assignment List

The PANEL INSTANT MIC ASSIGNMENT LIST enables a user to turn on the Instant Mic function for a particular panel. (See Figure 3-8) To use this feature, first display the number of the panel you want to program. To program this feature choose "1"; to de-program this feature, choose "2". Then enter the two-digit panel number to be changed. A panel which has Instant Mic will appear on the display as "IM".

The Panel Instant Speaker Assignment List

The PANEL INSTANT SPEAKER ASSIGNMENT LIST enables a user to turn on the Instant Speaker function for a particular panel. To use this feature, first display the number of the panel you want to program. Next, to program this feature choose "1"; to de-program this feature choose "2". Then enter the two-digit panel number to be changed. A panel which has Instant Speaker will appear on the display as "IS".

Panel Group Assignment List

The PANEL GROUP ASSIGNMENT LIST assigns switches into groups, and the assignments apply only to communications from the panel being set. First, display the panel number of the panel you want to program. Then, to assign a switch to a group, choose "1"; to remove a switch from a group, choose "2". At the prompts, enter the one-digit group number (i.e., 1-4), then the two-digit switch number (i.e., 01 or L2) involved in the programming.

Panel Tally Setup

The PANEL TALLY SETUP shortens or lengthens the tally flash time. To shorten the time, choose "1"; to lengthen the time, choose "2". The display will then reflect a longer or shorter time until your adjustment is completed.

Dynamic Comlink Status Display and Dynamic Matrix Status Display

Neither of these status display panels can be programmed in any way other than altering the status of a unit. Both these displays are dynamic; that is, they update without reset to reflect any change in status.

System Configuration Menus

From the System Configuration Root Menu, configurations can be stored or retrieved, or the entire system can be reset to allow a completely new configuration. Using the Store Configuration sub-menu, two configurations (A and B) can be stored, and the screen supplies a warning message when data will be overwritten. From the Retrieve Configuration sub-menu, the two stored configurations can be accessed, and a warning message appears on the screen whenever the current system setup is overwritten.

Reset System Root Menu

To reset to System Setup only, press "1". To reset the system setup and the setups of all individual panels, press "2". This interrupts all current communications. To alter the security code password, press "3".

2.7 DOWNLOADING SYSTEM SETTINGS

An entire 848A system may be set up from a computer which is equipped with a floppy disc capability. See Appendix B for a complete explanation.

2.8 MODEM OPERATION

2.8.1 Modem Installation

Make certain that the CPU board is correctly jumpered for modem operation. (See Section 2.5.1 and Figure 2-1).

To connect, use a null modem cable between the DC848 and the modem. The cable connects at pins 2, 3 and 7.

Make sure that power to the modem is on before the Model DC848 is powered up. If this is not the case, interrupt power to the DC848 and restart.

A Basic Time Model BT2400E modem has been tested with the DC848 system. The DC848 works best with modems with a command set similar to the Model BT2400E.

2.8.2 Modem Operation

To sign on, set 2400, 1200, 600 or 300 baud, 8 bits, one stop bit, one start bit, no parity. Set the terminal for VT100 emulate. When using a communications package, insert the phone number.

This program is intended to run at 2400 baud because the time required to refresh the screen through the modem is 1/8 the rate of direct (no modem) communication at 9600 baud. The other baud rates should be used only if 2400 baud won't work, or if the phone line is noisy. Whenever possible, use 2400 baud.

The Model DC848 modem mode is set to answer within one ring. There is normally a two-second delay before the screen appears, calling up either the password menu or the main menu, depending upon security.

The DC848 initializes the modem every two minutes to overcome power transients that may reset the modem and not the DC848.

When exiting the program, use X, the Security Mode, to automatically disconnect the modem.

After three-and-a-half minutes of no activity, the modem will also automatically disconnect. In case of a power failure, there will be a 5 second delay in restoration of the program.

2.9 RESETTING AN INDIVIDUAL 848A PANEL

An individual panel may have its micro-processor reset by holding in button #1 (upper-left hand button) while power is shut off and then reapplied to that panel.

RTS SYSTEMS INC. 848A SYSTEM TERMINAL CONTROL PROGRAM VERSION 6.0

848A MAIN MENU

1. FORCE/INHIBIT A TALK PATH
2. PANEL SWITCH ACTION (LATCH DISABLE)
3. HANDS FREE ANSWER (AUTO RECIPROCAL)
4. INSTANT MIC ASSIGNMENTS
5. INSTANT SPEAKER ASSIGNMENTS
6. GROUP LIST ASSIGNMENTS
7. TALLY FLASH TIME
8. SYSTEM STATUS DISPLAYS
9. SYSTEM CONFIGURATION
- X. EXIT TO SECURITY MENU (DISCONNECTS MODEM)

ENTER SELECTION:

Figure 2-3
Main Menu Display

ADDENDUM 1

Model 848A/DC848 software update to Version 6.5 has added the following features:

- **TW Dynamic Matrix Display screen:** In the System Status Menu, after viewing the Dynamic Matrix Display, by hitting [return] a user may call up an additional display showing the status of the bottom-row buttons for each of the 24 panels. Hitting [return] again will then return the user to the Main Menu. To view back-and-forth between the two Matrix Displays, the [esc] and [return] keys are alternately used. Status of the bottom-row buttons is indicated using the following abbreviations:

T1 = Talk 1
L1 = Listen 1
T2 = Talk 2
L2 = Listen 2
SP = Speaker
MS = Mic Switch
AT = ALL TALK
PM = Panel Mic

- **Store Configuration:** In the System Configuration Menu, when you use the Store Configuration option, the system may store either the pre-programmed configuration or both the preprogrammed and the actual panel configuration as it appears at the user station. When you retrieve the configuration, you have the option of retrieving all the crosspoints or only the pre-programmed (from the DC848) crosspoints. When you retrieve a stored configuration, none of the crosspoints currently selected at each panel will be interrupted; it will add the retrieved configuration to them. To retrieve only the exact pre-programmed crosspoints, you must use the Reset System option prior to retrieving the configuration.

- **Mic Kill:** In the System Configuration Menu, listed as Number 4 is now a "Mic Kill" option, which assures that all microphones in the system are off.

RTS SYSTEMS INC. 848A FORCE/INHIBIT A TALK PATH

PANEL NUMBER 01

01 **	02 --	03 --	04 FO	05 --	06 --	07 --	08 --	09 --	10 --	11 --	12 --
13 --	14 --	15 --	16 --	17 --	18 --	19 --	20 --	21 --	22 --	23 --	24 --
T1 --	L1 --	T2 --	L2 --								

1. TOGGLE FORCED TALK PATH
2. TOGGLE INHIBIT TALK PATH
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

ENTER SELECTION:

Figure 2-4A
Force/Inhibit A Talk Path:
Selecting a Function

RTS SYSTEMS INC. 848A FORCE/INHIBIT A TALK PATH

PANEL NUMBER 01

01 **	02 --	03 --	04 --	05 IH	06 --	07 --	08 --	09 --	10 --	11 --	12 --
13 --	14 --	15 --	16 --	17 --	18 --	19 --	20 --	21 --	22 --	23 --	24 --
T1 --	L1 --	T2 --	L2 --								

1. TOGGLE FORCED TALK PATH
2. TOGGLE INHIBIT TALK PATH
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

ENTER TALK PATH TO CHANGE FORCE STATE (01-L2):

Figure 2-4B
Force/Inhibit A Talk Path:
Selecting A Talk Path

RTS SYSTEMS INC. 848A PANEL SWITCH ACTION MENU (LATCH DISABLE)

PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	--	--	--	--	LD	--	--	--	--	--	--
13	14	15	16	17	18	19	20	21	22	23	24
--	--	--	--	--	--	--	--	--	--	--	--
T1	L1	T2	L2								
--	--	--	--								

1. SET LATCH DISABLE (MOMENTARY ONLY)

2. CANCEL LATCH DISABLE (MOMENTARY ONLY)

3. DISPLAY ANOTHER PANEL

4. DISPLAY NEXT PANEL

5. RETURN TO MAIN MENU

ENTER SELECTION:

Figure 2-5A
Panel Switch Action Menu (Latch Disable):
Selecting a Function

RTS SYSTEMS INC. 848A PANEL SWITCH ACTION MENU (LATCH DISABLE)

PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	--	--	--	--	LD	--	--	--	--	--	--
13	14	15	16	17	18	19	20	21	22	23	24
--	--	--	--	--	--	--	--	--	--	--	--
T1	L1	T2	L2								
--	--	--	--								

1. SET LATCH DISABLE (MOMENTARY ACTION)

2. CANCEL LATCH DISABLE (MOMENTARY ACTION)

3. DISPLAY ANOTHER PANEL

4. DISPLAY NEXT PANEL

5. RETURN TO MAIN MENU

SET LATCH DISABLE (MOMENTARY ONLY) FOR SWITCH NUMBER (01-L2):

Figure 2-5B
Panel Switch Action Menu:
Selecting a Switch Button

RTS SYSTEMS INC. 848A HANDS-FREE ANSWER LIST (AUTO RECIPROCAL)

PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	--	--	--	--	--	HF	--	--	--	--	--
13	14	15	16	17	18	19	20	21	22	23	24
--	--	--	--	--	--	--	--	--	--	--	--

1. SET HANDS-FREE ANSWER
2. CANCEL HANDS-FREE ANSWER
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

ENTER SELECTION:

Figure 2-6A
Hands-Free Answer (Auto-Reciprocal) Function Menu:
Selecting a Function

RTS SYSTEMS INC. 848A HANDS-FREE ANSWER LIST (AUTO RECIPROCAL)

PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	--	--	--	--	--	HF	--	--	--	--	--
13	14	15	16	17	18	19	20	21	22	23	24
--	--	--	--	--	--	--	--	--	--	--	--

1. SET HANDS-FREE ANSWER
2. CANCEL HANDS-FREE ANSWER
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

SET HANDS-FREE ANSWER FOR SWITCH NUMBER (01-24):

Figure 2-6B
Set Hands-Free Answer (Auto-Reciprocal) Menu:
Selecting a Panel Number

RTS SYSTEMS INC. 848A INSTANT MIC ASSIGNMENT LIST

PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	--	--	--	--	--	--	--	IM	--	--	--
13	14	15	16	17	18	19	20	21	22	23	24
--	--	--	--	--	--	--	--	--	--	--	--
T1	L1	T2	L2								
--	--	--	--								

1. SET INSTANT MIC ON FOR A SWITCH
2. CANCEL INSTANT MIC ON FOR A SWITCH
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

ENTER SELECTION:

Figure 2-7A

Instant Mic On: Choosing a Function

RTS SYSTEMS INC. 848A INSTANT MIC ASSIGNMENT LIST

PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	--	--	--	--	--	--	--	IM	--	--	--
13	14	15	16	17	18	19	20	21	22	23	24
--	--	--	--	--	--	--	--	--	--	--	--
T1	L1	T2	L2								
--	--	--	--								

1. SET INSTANT MIC ON FOR A SWITCH
2. CANCEL INSTANT MIC ON FOR A SWITCH
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

SET INSTANT MIC FOR SWITCH NUMBER (01-L2):

Figure 2-7B

Instant Mic On: Selecting a Switch

RTS SYSTEMS INC. 848A PANEL INSTANT SPEAKER ASSIGNMENT LIST
PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	--	--	--	--	IS	--	--	--	--	--	--
13	14	15	16	17	18	19	20	21	22	23	24
--	--	--	--	--	--	--	--	--	--	--	--
T1	L1	T2	L2								
--	--	--	--								

1. SET INSTANT SPEAKER ON FOR A SWITCH
2. CANCEL INSTANT SPEAKER ON FOR A SWITCH
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

ENTER SELECTION:

Figure 2-8A
Instant Speaker On: Choosing a Function

RTS SYSTEMS INC. 848A PANEL INSTANT SPEAKER ASSIGNMENT LIST
PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	--	--	--	--	IS	--	--	--	--	--	--
13	14	15	16	17	18	19	20	21	22	23	24
--	--	--	--	--	--	--	--	--	--	--	--
T1	L1	T2	L2								
--	--	--	--								

1. SET INSTANT SPEAKER ON FOR A SWITCH
2. CANCEL INSTANT SPEAKER ON FOR A SWITCH
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

SET INSTANT SPEAKER ON FOR SWITCH NUMBER (01-L2):

Figure 2-8B
Instant Speaker On: Selecting a Switch

RTS SYSTEMS INC. 848A PANEL GROUP ASSIGNMENT LIST

PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	--	--	--	--	--	G2	G2	--	--	--	--
13	14	15	16	17	18	19	20	21	22	23	24
--	--	G2	--	--	--	--	--	--	--	--	--
T1	L1	T2	L2								
--	--	--	--								

1. ASSIGN SWITCH TO A GROUP
2. REMOVE SWITCH FROM GROUP ASSIGNMENT
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

ENTER SELECTION:

Figure 2-9A

Panel Group Assignment: Selecting a Function

RTS SYSTEMS INC. 848A PANEL GROUP ASSIGNMENT LIST

PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	--	--	--	--	--	G2	G2	--	--	--	--
13	14	15	16	17	18	19	20	21	22	23	24
--	--	G2	--	--	--	--	--	--	G1	G1	--
T1	L1	T2	L2								
--	--	--	--								

1. ASSIGN SWITCH TO A GROUP
2. REMOVE SWITCH FROM GROUP ASSIGNMENT
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

ASSIGN SWITCH TO GROUP, ENTER GROUP NUMBER (1-4): 1

ENTER SWITCH NUMBER (01-L2):

Figure 2-9B

Panel Group Assignment: Assigning A Group

RTS SYSTEMS INC. 848A PANEL TALLY SETUP

PANEL NUMBER 01

- AUTO TALLY FLASH TIME.....10 SECONDS
1. LENGTHEN TALLY FLASH TIME (MAX 60 SECONDS)
 2. SHORTEN TALLY FLASH TIME (MIN 10 SECONDS)
 3. DISPLAY ANOTHER PANEL
 4. DISPLAY NEXT PANEL
 5. RETURN TO MAIN MENU

[L] Tally Flash Time Longer (Max. 60 Sec.)

[S] Tally Flash Time Shorter (Min. 10 Sec.)

Figure 2-10
Panel Tally Setup

RTS SYSTEMS INC. 848A SYSTEM TERMINAL CONTROL PROGRAM

848A DYNAMIC DISPLAY ROOT MENU

1. DISPLAY DYNAMIC COMLINK STATUS
2. DISPLAY DYNAMIC MATRIX STATUS
- 3.
- 4.
5. RETURN TO MAIN MENU

ENTER SELECTION:

Figure 2-11
Dynamic Display Root Menu

RTS SYSTEMS INC. 848A SYSTEM TERMINAL CONTROL PROGRAM

848A SYSTEM CONFIGURATION ROOT MENU

1. STORE CURRENT CONFIGURATION
2. RETRIEVE A CONFIGURATION
3. RESET AND INITIALIZATION
- 4.
5. RETURN TO MAIN MENU

ENTER SELECTION:

Figure 2-13
System Configuration Root Menu

RTS SYSTEMS INC. 848A SYSTEM TERMINAL CONTROL PROGRAM

STORE CONFIGURATION SUB MENU

1. STORE CURRENT SETUP TO CONFIGURATION [A]
2. STORE CURRENT SETUP TO CONFIGURATION [B]
- 3.
- 4.
5. RETURN TO MAIN MENU

ENTER SELECTION: 1

STORE CURRENT SETUP TO CONFIGURATION [A]

*****WARNING*****

SETUP PREVIOUSLY STORED TO CONFIGURATION [A] WILL BE OVERWRITTEN

DO YOU WISH TO CONTINUE?: [Y FOR YES]
ANY OTHER RETURNS TO ROOT MENU

Figure 2-14A
Store Configuration Sub Menu and selection

RTS SYSTEMS INC. 848A SYSTEM TERMINAL CONTROL PROGRAM

RETRIEVE CONFIGURATION SUB MENU

1. RETRIEVE SETUP FROM CONFIGURATION [A]
2. RETRIEVE SETUP FROM CONFIGURATION [B]
- 3.
- 4.
5. RETURN TO MAIN MENU

ENTER SELECTION: 1

RETRIEVE SETUP FROM CONFIGURATION [A]

*****WARNING*****

CURRENT SYSTEM SETUP WILL BE OVERWRITTEN

DO YOU WISH TO CONTINUE?: [Y FOR YES]
ANY OTHER RETURNS TO ROOT MENU

Figure 2-14B
Retrieve Configuration Sub Menu and selection

RTS SYSTEMS INC. 848A SYSTEM TERMINAL CONTROL PROGRAM

RESET SYSTEM ROOT MENU

1. RESET SYSTEM SETUP ONLY
2. RESET SYSTEM SETUP AND ALL PANELS
3. CHANGE CURRENT SECURITY PASSWORD
- 4.
5. RETURN TO MAIN MENU

ENTER SELECTION:1

RESET SYSTEM ONLY

THIS COMMAND WILL CLEAR ALL PROGRAMMED PARAMETERS FOR ALL PANELS
DO YOU WISH TO CONTINUE?: [Y FOR YES]

ANY OTHER RETURNS TO ROOT MENU

Figure 2-15A
Reset System Root Menu and Selection

RTS SYSTEMS INC. 848A SYSTEM TERMINAL CONTROL PROGRAM

CHANGE OR DISABLE PASSWORD SECURITY

[RETURN] TO ACCEPT 5 TO 8 CHARACTERS

0 [RETURN] DISABLES PASSWORD SECURITY SYSTEM

[ESC] TO START NEW ENTRY

ENTER PASSWORD:

Figure 2-15B
The Password Security Menu

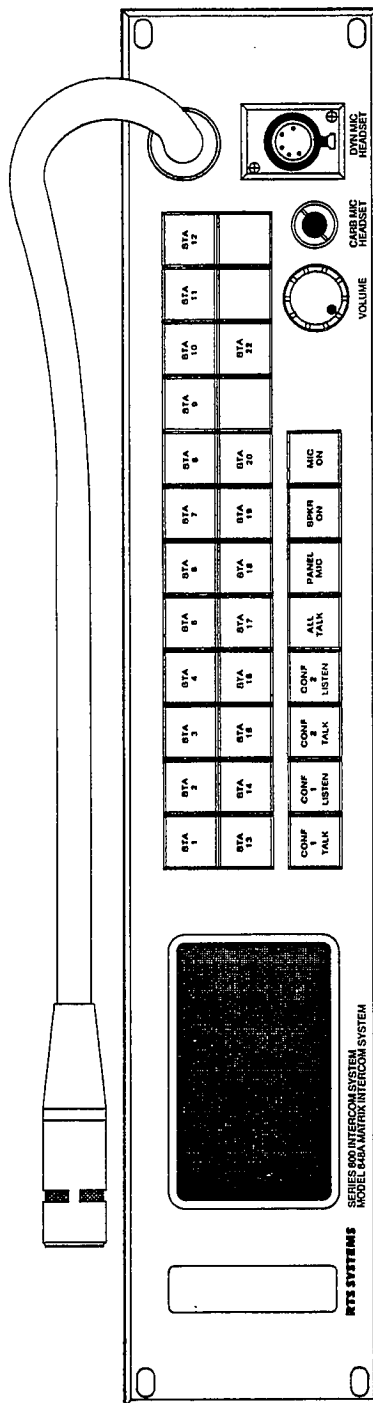


Figure 3-1
Model 848A Front Panel

SECTION 3: OPERATION

3.1 Operating Controls (See Figure 3-1)

Table 3-1 below lists the Model 848A operating controls. The reference numbers in Table 3-1 correspond to the circled numbers in Figure 3-1.

Table 3-1

<u>Ref. No.</u>	<u>Name</u>	<u>Description</u>
1	Adjustment Panel	Opening this panel allows the user access to: Operator adjustments for level controls for the listen functions; technician adjustments for conference channels 1 and 2 balance, Sidetone, Microphone Gain and Speaker Dim.
2	Panel Microphone	The panel microphone is a cardioid electret microphone mounted on a 20-inch flexible gooseneck.
3	Loudspeaker	This internal loudspeaker is disabled when an external loudspeaker is plugged into the rear panel speaker jack.
4	Station Select Pushbutton (Matrix Intercom)	To talk directly to other stations, any one or any combination of 24 push-buttons may be selected. All pushbuttons are momentary/latching-action with dual level illumination: dim for stand-by and bright for operate.
5	TW Intercom Channel Select	The two TW Intercom conference-line channels allow conferences with groups on the same channel. To listen to a channel, press the listen button for that channel; to talk, press the talk button. It is possible to use the matrix intercom and the conference intercom at the same time.
6	ALL TALK	This momentary pushbutton addresses all of the stations at the same time. Its operation is independent of any existing talk circuit set-ups since it works on an independent all talk bus. This button also does not access the conference-line circuits.
7	PANEL MIC	This latching action pushbutton selects between the panel microphone and the headset microphone. (panel mic=bright, headset mic=dim)
8	SPKR ON	Sets the loudspeaker at on or off.
9	MIC ON	Allows the microphone to be turned on or off without disturbing any station selection. The MIC ON switch, when enabled, automatically dims the speaker to prevent feedback. It may also be remote controlled.
10	VOLUME CONTROL	The VOLUME CONTROL adjusts the listen sound level of the speaker and the headset. The VOLUME CONTROL range is limited so that a call may always be heard through headset or speaker (when the speaker is on or the headset is worn).
11	CARBON MICROPHONE HEADSET	This jack is used with carbon microphone or equivalent headsets.
12	DYNAMIC MICROPHONE HEADSET	This connector is for dynamic microphone headsets.

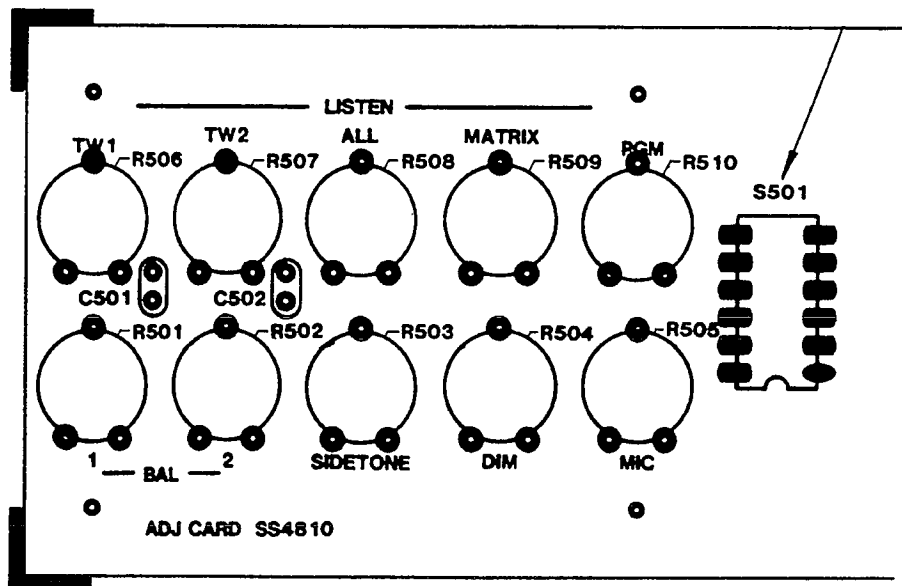


Figure 3-2
Adjustment Panel

3.2 Operation

3.2.1 (Point-to-Point) Operation

Originating a Call

To communicate directly with another station or stations:

1) Select panel microphone operation by pressing the PANEL MIC button (brightly lit). For headset microphone operation, the PANEL MIC button is dimly lit.

2) Select loudspeaker operation by pushing the SPKR ON button (brightly lit). For headset or headphone (only) operation the SPKR ON button is dimly lit.

3) Push the button corresponding to the station to be called. <Note: the station select buttons are both alternate-action and momentary-action buttons; If the pushbutton is pushed and held, the action will be momentary and the talk-path will be released when the pushbutton is released. If the pushbutton is tapped lightly (depressed for less than 1 second), the talk-path will be latched on until the pushbutton is depressed again to turn off the crosspoint. Any number of stations can be selected at the same time.>

Push the MIC ON button, then speak into the microphone.

An alternate operating mode is to use a single headphone to listen and the panel microphone to talk.

Answering a Call

System with Model DC848:

When another station is calling, the button corresponding to that station will flash. To answer, push the green CALL ANSWER button or the flashing button, turn the microphone ON, and talk. When the conversation is completed, release the CALL ANSWER button. If another station is calling it can be answered at this time, by pressing the CALL ANSWER button again.

System without Model DC848:

When another station is calling, the voice will be heard, but no light indication will be seen. To answer, push the button corresponding to the caller's station, turn the microphone ON, and talk. Callers should identify themselves. If they don't, the ALL call will have to be used to determine the caller's

station. When the conversation is completed, release the button corresponding to the caller's station and turn off the microphone.

3.2.2 Conference Line Operation

In conference line operation, both the TALK and LISTEN buttons must be used for two-way communication. To monitor the conference line, only the LISTEN button is selected. Conference lines can be used at the same time as the station lines.

3.3 Adjustments (See Figure 3-2)

Operator and technician adjustment pots are on the Adjustment Panel, which is a small rectangular panel just to the left of the front panel loudspeaker. The panel is released by pressing on the panel to unlock it, then pulling it forward.

Operator Adjustments

On the inside of the panel, there are two rows of trimmer potentiometers. The top row contains listen adjustments for the following:

TW 1	Conference Line 1
TW 2	Conference Line 2
ALL	TALK page
MATRIX	24 point-to-point stations
PGM	Auxiliary program

To adjust the levels turn the pot with your fingers or a small screwdriver. Turning to the right increases the level.

The bottom row contains five additional adjustments--three are screwdriver-adjustable and two are finger-adjustable.

The sidetone pot is finger-adjustable and is used to adjust the level of the speaker's voice in his own headphone. Turning this pot to the right will increase the volume.

The loudspeaker dim level is also finger-adjustable and will set the amount of speaker attenuation when the MIC ON pushbutton is pressed.

Technician Adjustments

The following are screwdriver-adjustable trimmer potentiometers (explained in Section 5):

TW 1 BAL	Conference Line 1 balance
TW 2 BAL	Conference Line 2 balance
MIC	Microphone gain adjustment

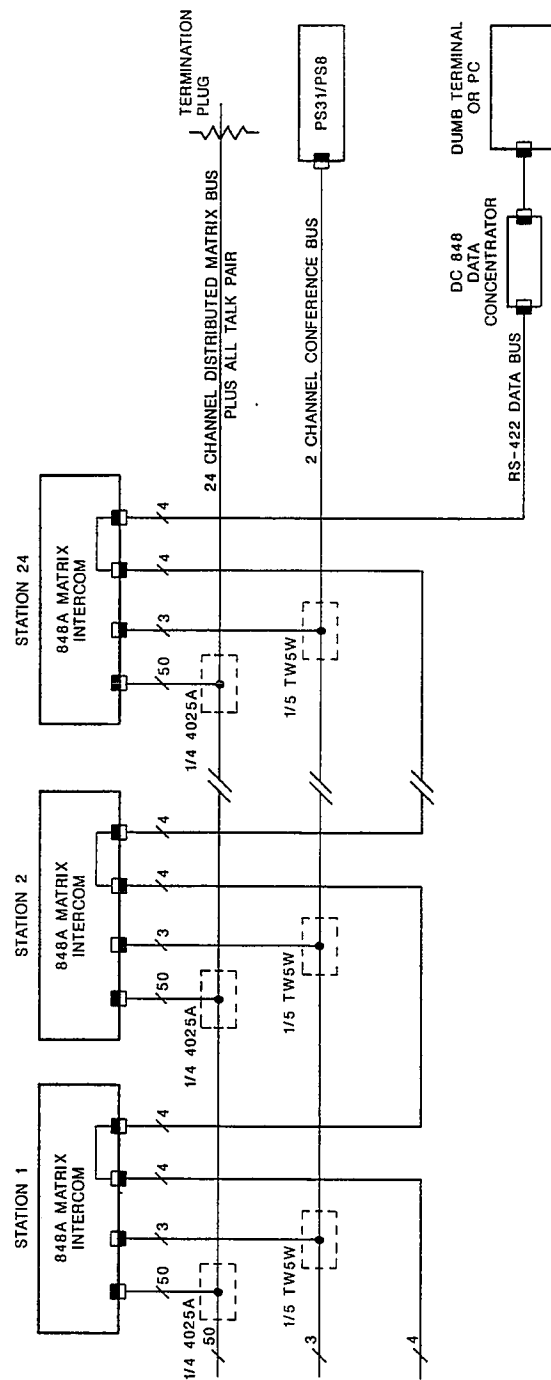


Figure 4-1
Model 848A Block Diagram

SECTION 4: THEORY OF OPERATION

4.1 INTRODUCTION

The Model 848A is an intercommunications master station. Each 848A is a station in a point-to-point intercom system which can have as few as 2 stations or as many as 24 stations -- forming a full 24 by 24 station system. Any configuration of multiple stations in this system is called a matrix. In the matrix, up to 12 conversations may be in progress at any time, either separately or in groups. Each 848A station has two built-in conference-line intercom channels that can be used separately or as part of an RTS Systems TW Intercom System. Each station also contains an ALL TALK button for paging throughout the entire system.

4.1.1 System Concept

(See Figure 1-1, System Block Diagram)

The Model 848A is an audio communication station with 24 station channels and 2 conference-line intercom channels. Operating in a 4-wire, full-duplex mode, all communication paths are distributed to each station. This concept eliminates the need for central matrix switching electronics -- all station-select switching is done directly at each station.

Each talk path is dedicated to a send/receive bus. In a typical operating example, a user chooses the station he wishes to talk to by pushing that station's pushbutton. The selected station will automatically hear the calling station. No other station will hear this message unless they are assigned the same receive address or more than one station has been selected by the sender.

The receiving station answers the calling station by simply pressing the call answer pushbutton, which is marked with the station's own number and has a colored insert. When the communication is completed, each station releases and the connection is broken.

The ALL TALK button allows any station to talk to all other stations simultaneously.

When the Model DC848 Data Concentrator is used in conjunction with the Model 848A, a call light tally feature is added. With this feature, the calling station's button will flash and an operator can tell visually which station is calling.

Each Model 848A station within the system has two TW Intercom conference-line channels, which allow a connection to our standard RTS Systems TW Intercom lines. These conference-line channels may also be used within an 848A system without external connections. Conference-Line Channels 1 & 2 have individual front panel TALK and LISTEN switches for each channel. In this way, a user can join conversations or just monitor them. The conference-line channels can be used at the same time as the point-to-point channels.

Each Model 848A station is connected to other 848A stations with 25 pair cables. These cables are connected from the individual 848A units to splitter assemblies.

4.2 FUNCTIONAL DESCRIPTION

The functional elements in the Model 848A Matrix Intercom are:

- 1) The MICROPHONE Electronics
- 2) The TALK Electronics
- 3) The LISTEN Electronics
- 4) The TW Electronics
- 5) The CPU Electronics
- 6) The Power Supply

4.2.1 Microphone Electronics

The Model 848A microphone electronics consist of: a microphone select switch (U102), a microphone preamplifier and limiter (U101), and an electronic microphone switch (102).

The microphone select switch (U102) selects input from either the panel microphone or the headset microphone and sends the signal to the microphone preamplifier and limiter (U101). This preamplifier/limiter combination amplifies and conditions the microphone signal to the 2 volts peak (4 volts peak-to-peak) signal required.

The signal then feeds to microphone switch 1 or microphone switch 2 (U102). Microphone switch 1 is the on/off switch to the talk electronics. Microphone switch 2 is the on/off switch to the TW electronics. (For operation see Section 3.2.2.)

The microphone signal also goes to a rear panel auxiliary connector at J104 (pins 4 and 5) through transformer T101 for an unswitched microphone preamplifier output at a level of -10 dBu nominal.

4.2.2 Talk Electronics

The Model 848A TALK electronics consist of: a buffer amplifier (U101), a line driver amplifier (U103), and electronic talk switches (U301 to U316).

Electronic microphone switch 1 passes the signal to buffer amplifier U101 which provides a gain of 2.4 to the line driver. The line driver (U103) balances the signal and provides a low output impedance to the talk select bus. This passes to electronic switches U301 to U316 which are controlled by the front panel bus-select switches. The balanced signal then feeds through 1% resistors to the listen-select matrix board which puts the signal through another pair of 1% resistors before passing the signal to the 50-pin talk bus connector. Each of the 24 outputs present approximately 12k ohms bridging impedance to the balanced talk bus.

4.2.3 Listen Electronics

The Model 848A LISTEN electronics consist of: the summing amplifier (U202), the headphone and

speaker amplifiers (U205), and level adjustments (R508--R510).

Through the placement of jumpers, one of the 24 buses on the matrix board is chosen as an address for each unit. (See Section 2.3.2) This listen signal then passes through transformer T201 (a 10 kilohm to 10 kilohm center tap transformer) to provide optimum common mode interference rejection and isolation.

The signal then passes through the matrix listen level control (R509) located on the adjustment board. Resistor 509 is a 20 kilohm audio potentiometer. From here the signal is fed to the listen summing amplifier (U202).

Other signals are also fed to the listen summing amplifier: A program signal from rear panel connector J104 (pins 2 and 3) is fed into the summing amplifier through transformer T202 (a 10 kilohm to 10 kilohm center tap transformer); The listen audio of TW channels 1 and 2 is fed into the amplifier; The all talk listen audio is fed into the amplifier through transformer T203 (a 600:600 ohm transformer); The sidetone signal is fed into the summing amplifier only when the loudspeaker is turned off and the headset is used.

The output from the summing amplifier is passed through the master volume control (R401) located on the front panel. R401 is a 10 kilohm audio potentiometer. The signal is then distributed to the headphone and loudspeaker amplifiers, U204 and U205.

The output from headphone amplifier (U204) is designed to drive headphones of 8 ohms or greater impedance.

The signal to the loudspeaker amplifier runs through electronic speaker switch U203 and speaker dim switch U203. The speaker dim is activated when the Mic switch is on. The loudspeaker is automatically dimmed to the level preset by the operator at adjustment R504. Resistor R504 is a 20 kilohm potentiometer. This adjustment is found on the adjustment card.

The signal for the loudspeaker then passes to buffer amplifier U202 and then on to the speaker amplifier U205. This amplifier provides a maximum of 2 watts to 8 ohm and higher impedance speakers.

4.2.4 TW Intercom Conference Line Electronics

The Model 848A TW electronics consist of bilateral current sources (U604 and U605), channel 1 microphone switch (U601), channel 2 microphone switch (U602), balance adjustments (R501 and R502), and listen level adjustments (R506 and R507).

The microphone signal feeds the microphone on/off switch U601 and then feeds channel 1 talk switch U601 and channel 2 talk switch U602. The signals are buffered by amplifiers U604 and U605, and then sent to the bilateral current sources which apply the signal to the line through the conference line connectors on the rear panel.

Incoming signals from the conference line are received by the bilateral current sources and sent through electronic switches to the balance controls on the adjustment card-R501 and R502 (10 kilohm linear potentiometers). The signal is then routed to the summing amplifier of the listen circuit through the listen level adjustments R506 and R507 (20 kilohm audio potentiometers) located on the adjustment board.

4.2.5 CPU Electronics

The Model 848A Central Processing Unit (CPU) accepts inputs from switches and from the DC848A Data Concentrator and outputs information to lamps, audio switches and the Model DC848A.

The CPU electronics include a 63A03R Microprocessor (U2), a 74HC573 latch (U4), a 27C256 EPROM with 32K Bytes (U6), and a 6264 Static RAM with 8K Bytes (U8)

Inputs:

a. 848A Keyboard Switches

The CPU reads the switches of the 848A keyboard using parallel to serial converters (input shift registers U9 through U13)

b. Dip Switches

The CPU reads the dip switches to establish the logical address of that 848A.

c. Model DC848

The CPU communicates with the DC848 using a built in (part of the microcontroller) serial interface and an external RS422 interface.

Outputs:

a. Lamps

The CPU controls the lamps using serial to parallel converters (output shift registers U14 through U21).

b. Audio Switches (Gates)

The CPU controls the gates using serial to parallel converters (output shift registers U14 through U21).

c. Model DC848

The CPU communicates with the DC848 using a built in (part of the microcontroller) serial interface and an external RS422 interface.

4.2.5.1 Detailed Theory Of Operation 848A CPU Electronics:

The processor sends an enable pulse (*EN) to the input shift registers via Port 1, Bit 1. This pulse causes the parallel data input of the shift registers to be latched (switch data) and ready to shift serially. The microprocessor also sets up serial crosspoint data (audio gate control) on Port 1, Bit 4 and lamp data (LmpD) on Port 1, Bit 3. It then sends a pulse on the

clock line (CLK) at Port 1, Bit 0, to clock all shift registers. Serial switch information is sent to the processor at each clock interval on Port 1, Bit 7 (SwD). This is done 40 times (40 clock pulses) to read all of the switches, and to output all of the lamp and gate controls. The processor then sends a pulse on the strobe line (STR) at Port 1, Bit 2 to allow all of the output shift registers to send their parallel data into the open collector outputs of the CPU. This occurs internally within the UCN5820 shift register.

The strobe pulse also controls the watchdog circuit U3. If the processor stops running, then the strobe pulse will not be present. A time duration is set up by R12 and C6. If there is no pulse for that duration, then its absence causes U3 (astable multi-vibrator) to toggle, which turns on Q1, triggering a hardware reset to the microprocessor.

The microprocessor has an internal serial communications interface (SCI) at Port 2 for asynchronous serial communications to the Data Concentrator (DC848). Transmit and Receive Data (TxD and RxD) is buffered by U23. U22 is not normally installed. W1 jumper allows U23 to be used in half duplex mode (RS485). The driver (75176) is controlled by the processor (Tx CTL). The signal is +5 volts to transmit, 0 volts to receive.

The 848A system uses the RS485 half duplex serial communication network, 78.6K baud, 8 bits, 1 start bit and 1 stop bit. The CPU has its own voltage regulator which gets its power from the +18 volts unregulated DC supply from the mother board. Voltage regulator U7 LM317 is set by R15 and R16 to +5 volts. Diode D2 supplies protection for capacitive loads on the output of the regulator.

4.2.6 Power Supply Electronics

The power supply electronics contain a full-wave bridge rectifier to convert the 12 volts AC into 15 volts unregulated raw DC. Voltage regulator U701 (LM317T) supplies 12 volts regulated DC power and voltage regulator U702 (LM317LZ) supplies 6 volts regulated DC power.

4.3 DC 848 Data Concentrator

4.3.0 General Information

The DC848 has two major functions:

Function number one is to transmit "tally" or calling party identification signals (blinking or lamps) from station to station. This is accomplished using an RS485 data party line.

Function number two is to allow user control of the system via a data terminal or computer. User control of the system is: observing the state of the system, adding and removing special features to 848A stations, saving and restoring features to the system, resetting the entire system, and some housekeeping functions. This is accomplished using an RS232 terminal connection.

Both functions are implemented by a combination of hardware and software. The software has been reduced to machine code and stored in Erasable Programmable Read Only Memory (EPROM). User selected features are stored as data tables in Random Access Memory (RAM). The Random Access Memory is made nonvolatile (the data remains even when the power is turned on and off) by using a Dallas Semiconductor "Smart Socket" which has a ten year, built-in lithium battery.

The hardware consists of a microcontroller, EPROM, RAM, two sets of Input/Output (I/O) circuitry, and housekeeping circuitry. The microcontroller is an eight bit (byte) device which runs at a clock frequency of 4.9152 megahertz. The EPROM stores 32 Kbytes of information (32 Kbytes=32,768 bytes); the RAM stores 8 Kbytes of information (8196 bytes).

One Input/Output is a RS485 port (serial, half duplex). This port has three wires: a common, a transmit, and a receive. The software is designed so that only one 848A connects itself to the transmit and receive wires (buses) at a time (half duplex). The Model DC848 transmits a coded signal (protocol) to arbitrate which station connects to the transmit and receive buses and what is to be transmitted. The

RS485 generation capability is part of microcontroller, U5, and the transmission/receiving interfacing capability is accomplished by U2, an RS422 driver (RS485 is RS422 protocol but half duplex).

A second Input/Output is an RS232 port (serial, full duplex). This port uses three of the RS232 wires: transmit, receive, and common. This port allows a data terminal (VT100 protocol), or a computer (with a VT100 protocol communication program and serial RS232 port) to communicate with the DC848. The data terminal or computer may be connected to the DC848 with an appropriate cable, or, in the case of the computer, via a user-supplied modem and a telephone line.

4.3.1 DC848 Hardware

The Model DC848 Data Concentrator is comprised of a UMC-100 PCB assembly which includes a Hitachi 63A03R micro-controller. U9 serves as a memory block decoder. ROM is located at 8000H to FFFFH.

RAM is located at 6000H to 7FFFH. The RAM socket is a Dallas Semiconductor Smart Socket with internal battery backup. During a power failure, the socket retains RAM data. Upon power reset, as part of the software initialization a serial number of 05A5H is tested for in RAM.

If the test succeeds, then the data in the RAM has been retained. If the test fails, the processor reinitializes all RAM locations and sets 05A5H to the serial number RAM location.

The UMC100 has an on-board watchdog comprised of U7, an astable multivibrator, and Q1.

The output of decoder U12 (3400H) pin 10 is used to re-trigger the watchdog. A time duration is set by R33 and C11, creating a re-triggerable astable multivibrator with U7. If there is no pulse for this set time duration, U7 toggles, which turns on Q1, causing a hardware reset to the microprocessor.

Serial communication for the DC848 is accomplished with the embedded SCI (Serial Communications Interface) in U5. U2 RS422 driver is used in half-

duplex mode with W1 installed. The transmitter/receiver control is accomplished with Port 2, bit 0 (1=transmit, 0=receive). U1 is not normally installed.

Serial Data to the terminal is sent via ACIA (Asynchronous Communications Interface Adapter) U14, a 63A50 from Hitachi. The transmit and receive clock is derived from E clock through divider U17 for baud rate control. The divider is programmed through the U15 output port.

The ACIA is coupled to an RS232 driver U19 through opto-isolators U21, U22, U23 and U24. DC to DC converter is used to generate isolated +5 volts for U19. This allows total ground isolation from the 848A system ground and any earth ground that could come from a terminal. The most recent models of the DC848 do not have this ground isolation.

The ACIA is serviced in software on an interrupt basis - for both receive and transmit functions.

4.3.2 DC848 Software

The DC848 software is in fact firmware: software that has been compiled to machine code and stored in EPROM (Erasable Programmable Read Only Memory). The terminal drivers are interrupt driven.

The DC848 arbitrates the party-line 485 bus that interconnects all panels and the DC848.

Each panel is polled using its panel address. The DC848 sends (through 485 driver U2) and F7H (break character) and a panel address (1 to 23). This is followed by programming or tally information that must go to that panel as calculated by the DC848.

An EOM character here defined as 0F4H is sent prompting the selected panel to respond with switch data. If no switch activity is sensed from the panel, it responds with EOM of F4H. If switch activity is sensed, the panel sends switch information to the DC848 (for tally and display updates), and an EOM of F4 to indicate End Of Message. The DC848 then

continues panel polling with the next consecutive panel.

The embedded SCI (panel Serial Communications Interface) is interrupt driven for receive data only. The transmit to panel occurs on the non-interrupt side. This baud rate is 78.6K, 8 bits, no parity.

The ACIA is also serviced on the interrupt side, thus making a maximum of two levels of interrupt.

Modem mode is sensed from Port 1, bit 5. U5 sets bit 6 to a logical 0 and reads bit 5 to determine if the jumper is installed between pins 7 and 8 on J1 or, on recent models, to determine if switches 6 and 7 of S1 are on.. Modem mode uses three basic timers: one timer to send modem initialization every two minutes, one timer to sense maximum time between 2-digit modem responses (if modem sends one character only, the DC848 will send modem initialization after 300 milliseconds.), and one timer for delaying output of menu to modem after establishing modem connection. All three timers are software 2-byte timers, and each is serviced in its respective command level.

There are 49 command levels that the DC848 software created; one level for each menu and sub-menu. As the menus are selected and stepped through, it changes the operating system command level.

Software Version 6.0 occupies approximately 9.5 kilobytes for its task-driven operation system. The software is comprised of 34 separate modules, each assembled and then linked to ROMable code.

SECTION 5: MAINTENANCE, TEST PROCEDURE and TROUBLESHOOTING

5.1 INTRODUCTION

This section provides service information for normal maintenance, factory performance tests and troubleshooting information. The normal maintenance begins at Section 5.3. The factory performance tests begin at Section 5.4. The troubleshooting information begins at Section 5.6.

5.2 SERVICE INFORMATION

The Model 848A is warranted for a period of one year from the purchase date. A copy of the warranty is located at the front of this manual.

5.3 GENERAL MAINTENANCE

These servicing instructions are for qualified personnel only. To avoid electric shock, do not perform any servicing other than that contained in the operating instructions unless qualified to do so.

WARNING:

Disconnect power before servicing.

5.3.1 Safety Considerations

Although this equipment has been designed in accordance with international safety standards, this manual contains information, cautions, and warnings which must be followed to ensure safe operation and to maintain the equipment in safe operating condition. Service and adjustments should be performed only by qualified service personnel.

Any adjustment, maintenance, and repair of the opened equipment while any power or voltage is applied should be avoided as much as possible, and, when inevitable, should be carried out only by a skilled person who is aware of the hazard involved.

WARNING

Any interruption of the protective grounding conductor (inside or outside the equipment) or disconnection of the protective earth is likely to make the equipment dangerous. Intentional interruption of the protective grounding conductor is strictly prohibited.

It is possible for capacitors inside the equipment to still be charged even if the equipment has been disconnected from its power source.

WARNING

The service information presented in this manual is normally used with the protective covers removed and power applied to the equipment. Energy available at many points may, if contacted, result in personal injury.

5.3.2 Cleaning

Clean the outside of the MODEL 848A with denatured alcohol or a mild solution of detergent and water. Clean the interior with dry, low pressure air. The circuit boards can be cleaned with 1,1,1 trichloroethane or Freon TF. Do not allow these or any solvents to get into the pots.

5.4 Access

To get inside the Model 848A, remove the screws on the top cover. Slide the cover off.

For component replacement: After the top cover has been removed, disconnect the connectors from the back panel at the programming section, J402 and J403. Now disconnect the connectors from the mother board at J203, J601 and J701. The back panel is attached to the chassis with eight screws: one at each of the four corners of the panel, two on the top edge securing the top cover, and two on the bottom edge securing the bottom cover. Remove the screws and carefully pull the back panel away from the chassis.

To completely remove the mother board from the unit: After the back panel has been removed, carefully disconnect all of the remaining connectors from the mother board. The mother board is attached to the chassis with six screws: one in each of the four corners and two along the edges, center section top and bottom. Remove these screws and carefully slide the mother board toward the rear of the chassis. For further illustration, see the drawings located in the back of this manual.

5.5 TEST PROCEDURE, MODEL 848A

EQUIPMENT NEEDED:

1. Voltage and current metered variable voltage transformer: "VARIAC", "POWERSTAT", etc.
2. Two Channel Oscilloscope, 15 megahertz minimum bandwidth.
3. Audio Signal Generator, 20 hertz-20 kilohertz.
4. AC voltmeter with decibel scale, bridging input.

And for parts replacement:

5. Temperature controlled soldering iron, and
6. Rosin core, 60/40 composition solder.

DO NOT USE SOLDER PASTE!

Documents required:

Schematic Diagram, Figure 7-1
Assembly Diagram, Figure 7-2

5.5.1 Set-up

Carefully remove the screws on the top cover. Visually inspect the mother board for proper I.C.'s and fuse (2 ampere slow-blow).

Check that all cables are plugged in with the proper orientation.

Set all of the adjustment pots on the adjustment board to minimum.

Set all switches to off.

Connect the test terminating plug to Line Connection J401 and a terminating plug to TW Intercom System Line Input J103.

The 50-pin test terminating plug is a 50-pin connector with twenty-five 620 ohm resistors connected between the pins as follows: 1 and 26, 2 and 27, . . . 25 and 50.

The A3M terminating plug is a connector with a 200 ohm resistor connected between pins 1-2, and another 200 ohm resistor connected between pins 1-3.

5.5.2 Voltage Test

With an ohmmeter, check for 22,000 ohms between circuit ground test point and chassis ground point. The circuit ground test point is located on the circuit board, center, towards the rear of the unit, next to resistors R389 and R390.

Also check for less than 0.4 ohms between pin 1 of the four-pin power connector J702 and the ground prong on the power supply cord; and between pin 1 of the power connector and the metal chassis of the 848A.

Attach the power transformer to J702.

Using a variable voltage transformer, increase the voltage slowly to 120 volts, stopping to troubleshoot if the line current is in excess of 200 milliamperes.

Measure the voltage from the ground test point to chassis. It should be 0.0 ± 0.5 volts DC.

Measure the voltage from the ground test point to the input terminal of U701. It should be approximately 15.0 ± 0.5 volts DC.

Measure voltage from the output terminal of U701, it should be approximately 12.7 ± 0.5 volts DC.

Measure voltage from the output terminal (center leg) of U702. It should be approximately 6.5 ± 0.5 volts.

5.5.3 Microphone Preamplifier and Limiter Test

Apply a -45 dBu (12 millivolt peak-to-peak), 400 hertz signal to the front panel headset connector pins 1 and 2. Connect the test probe to U101 pin 1. Slowly turn the GAIN control R505 up until a signal of 3 volts peak-to-peak is seen on the scope.

Increase the signal level by 20 dB to -25 dBu (120 millivolts peak-to-peak), 4 volts peak-to-peak should show on the scope.

Decrease the signal level by 10 dB to -35 dBu (40 millivolts, peak-to-peak). The level should remain at approximately 4 volts peak-to-peak.

Disconnect the panel microphone by unplugging J102. Connect the signal between pins 10 and 11 of auxiliary connector J104. Check for proper signal level with the panel microphone selected (PANEL Mic pushbutton depressed).

5.5.4 Unswitched Microphone Output and Frequency Response

Select the headset microphone by releasing the PANEL Mic pushbutton and apply the 400 hertz signal at -3 dBu to the headset connector on the front panel.

Check the unswitched microphone output at J104, pins 4 and 5. The output level should be 4 volts peak-to-peak (+5 dBu). Decrease the input signal to -45 dBu. The output level should be 3 volts peak-to-peak (+2.7 dBu). Change the frequency to 10 hertz. The output level should be 3 volts peak-to-peak. Increase the frequency to 10 kilohertz. The output level should be 2 volts peak-to-peak (0 dBu to -1 dBu). Return the input signal to 400 hertz at -35 dBu.

Connect to U101, pin 7. There should be no signal. Move the front panel microphone switch to "on"; The signal should be 7 volts peak-to-peak.

Check pin locations 1 and 7 of U103. Both locations should have 7 volts peak-to-peak when the microphone is turned on.

Select the panel Mic switch to off; The 400 Hertz tone should disappear.

5.5.5 External Mic-On Switches

5.5.5.1 REAR PANEL Mic SWITCH Connect a switch between pins 6 and 7 of the auxiliary connector J104 on the rear panel. With the front panel Mic switch set to off, close the remote switch. The Mic circuit should turn on and the Mic pushbutton should illuminate brightly.

5.5.5.2 PHANTOM HEADSET Mic SWITCH Connect a headset with switch wired per Figure 2-10. This switch should also operate the microphone circuit when the front panel Mic switch is set to off.

5.5.6 Talk Electronics

Apply a -35 dBu, 400 hertz signal to the front panel headset connector. Connect analyzer or oscilloscope

to the terminating resistor between pins 1 and 26 on the 50 pin terminating plug. Select station 1. The output signal should be approximately 600 millivolts peak-to-peak (-10 dBu).

Turn off the signal at station 1. The signal should be completely gone. Turn on station 1 and check the frequency response. Lower the input level to -45 dBu. The output signal should be approximately -13 dBu. Change the input frequency to 100 hertz. The output level should be the same. Change the frequency to 10 kilohertz. The output level should be -16 dBu or 3 dB \pm 1 dB below the value at 400 hertz. Return to -35 dBu at 400 hertz.

Move analyzer leads to the next resistor on the terminating plug. That is station 2. Verify an output when the station is selected, and then verify that there is no output when the station is turned off. Continue from station to station until all of the 24 outputs have been checked.

On the last resistor, number 25 (the ALL TALK BUS), no signal should be present. Depress the momentary button for the ALL TALK. The signal should be present when the button is pressed and gone when the button is released. Turn off all the front panel talk buttons.

5.5.7 TW Talk Electronics

Connect analyzer to channel 1 TW terminating resistor on pin 2 of the terminating plug. Depress conference line 1 TALK. The signal level should be about 2.5 volts peak-to-peak. Check the frequency response. Change the input frequency to 100 hertz. The level should be 2.5 volts peak-to-peak. Change the frequency to 10 kilohertz. The level should remain the same.

Turn on conference line 2 TALK and turn off conference line 1 TALK. No signal should appear on line 1. Now move the analyzer over to channel 2 (pin 3) and repeat the above steps. Remember, a signal should be present when the channel is selected, and the signal should be gone when the channel is off.

5.5.8 TW Listen

Apply a 0 dBu (approximately 2 volts peak-to-peak) signal to conference line 1.

Center the TW BALANCE control R501 for conference line 1 (located on the adjustment card, see Figure 3-3). Turn the LISTEN level control for

line 1 R506 fully clockwise. Connect scope probe to pin 7 of U202 and depress the conference line 1 LISTEN button. The level should be approximately 2.5 ± 0.25 volts peak-to-peak. Rotate the level control for this channel clockwise and counter-clockwise checking for smooth action and any dead spots. Check the frequency response. Change the input frequency to 100 hertz. The level should be 1.50 volts peak-to-peak at pin 7 of U202. Change the frequency to 10 kilohertz. The level should remain the same. Repeat procedure for conference line 2.

5.5.9 PGM Input

On the rear panel auxiliary connector apply a -10 dBu signal to pins 2 and 3. Rotate the PROGRAM level control on the adjustment card fully clockwise. Check for 2.75 ± 0.25 volts peak-to-peak, at pin 7 of U202. Fully rotate the adjustment clockwise and counter-clockwise checking for smooth action and dead spots. Check for frequency response. Change the input frequency to 100 hertz. The level should be 2.5 volts peak-to-peak at pin 7 of U202. Change the frequency to 10 kilohertz. The level should be 1.75 volts.

5.5.10 ALL TALK Bus

Apply a -10 dBu signal to the last resistor (pins 25, 50) of the 25-pin terminating plug. Rotate the ALL LISTEN level R508 fully clockwise. The level should be 2 volts peak-to-peak, ± 0.25 volts, at pin 7. Rotate the adjustment clockwise and counter-clockwise checking for smooth action and dead spots. Check frequency response. Change the input frequency to 100 hertz. The level should be 1.50 volts peak-to-peak, ± 0.25 volts, at pin 7 of U202. Change the frequency to 10 kilohertz. The level should be 1.25 volts peak-to-peak, ± 0.25 volts, at pin 7 of U202.

5.5.11 Matrix Listen

Connect jumpers into the programming section so that the unit has a station assign address of station 1. (i.e. install jumpers AB, CD and EF on channel 1. See Section 2.3.) Connect a -10 dBu signal across resistor 1 of the 25-pin terminating plug. Rotate the MATRIX LISTEN level control R509 fully clockwise. The level should be approximately 2.75 volts peak-to-peak, ± 0.25 volts, at pin 7 of U202. Rotate the level control clockwise and counter-clockwise, checking for smooth action and dead spots. Check for frequency response. Change the input frequency to 100 hertz.

The level should be 2.5 volts peak-to-peak, ± 0.25 volts, at pin 7 of U202. Change the frequency to 10 kilohertz.

The level should be 1.75 volts peak-to-peak, ± 0.25 volts. Leave the signal on the matrix input, returning to 400 hertz, and leave the LISTEN LEVEL control fully clockwise.

5.5.12 Headphone Amplifier

Connect a 16 ohm load to the dynamic microphone headset connector between pins 3 and 4 on the front panel. Connect the probe across the load and rotate the front panel level control checking for smooth operation and dead spots. The level should be approximately 8 volts peak-to-peak at clipping. Clipping should occur between one and two o'clock on the front panel volume control with the -10 dBu input signal on the matrix input.

5.5.13 Loudspeaker Amplifier

Check the loudspeaker amplifier. Attach a probe to the white lead of the loudspeaker. Turn the loudspeaker on and increase the level to clipping. Clipping should occur between twelve and one o'clock on the front panel volume control with the -10 dBu input signal. Signal should be approximately 10 volts peak-to-peak at clip level.

5.5.14 Loudspeaker Dim

Adjust the volume control for 1 volt peak-to-peak output to the front panel speaker. Turn the Mic switch "on". The DIM is now activated. By rotating the DIM adjustment R504 the level should vary between 0.6 volts peak-to-peak and 50 millivolts peak-to-peak. Set the dim level to 0.3 volts peak-to-peak.

5.5.15 Listening Test and Balance Adjust

Connect a headset to the front panel dynamic headset connector. Select TW 1 TALK and LISTEN simultaneously. Speak into the microphone. Adjust balance 1 R501 for a null. Repeat for TW 2. Make sure the loudspeaker is off. Turn up the sidetone pot R503. Sound quality should be clear and clean. Adjust to desired level. Select PANEL Mic. Speak into the panel microphone. Sound quality should be clear and clean. Disconnect the dynamic microphone headset. Connect a carbon microphone into the carbon microphone jack. Speak into the microphone. Sound quality should be clear and clean.

End of test. Replace top cover and carefully replace screws. Return the unit to service.

5.6 DC848 TEST PROCEDURE

EQUIPMENT NEEDED

1. 100 megahertz oscilloscope with an X10 scope probe
2. Multimeter
3. Variable voltage transformer, i.e. Variac or equivalent
4. A 25-pin (RS232) cable
5. Two or more tested Model 848A units
6. As required, 9-pin (RS422) cable
7. Computer terminal, DEC VT100-type, with keyboard

Documents Required:

Schematic Diagram, SD5555
Wiring Diagram, WD5556
Technical Manual TM5545

5.6.1 Set-up

Verify that the Model DC848 under test has the latest version software installed and is properly labeled.

Attach the modular power supply to a variable power transformer.

Slowly increase the AC while monitoring the line current. If there is excessive current draw, stop and troubleshoot.

5.6.2 Power Supply

When the DC848 is fully powered to 120 volts AC, the front panel LED should be brightly lit. Verify each of the following DC power supply points:

U4 output = +5 volts DC
U19, Pin 2 = +10 volts DC
U19, Pin 6 = -10 volts DC

Turn off the power to the Model DC848.

5.6.3 Performance Check

Hook up the computer terminal to the DC848 at J103 or J104 ("computer terminal") using the RS232 cable. Use a null modem or null modem type cable to plug directly into the computer.

Connect the Model 848A units to the DC848 at J102 ("Serial Data") using the RS422 cable.

Turn on the power to the DC848. No fault LED's on the DC848 PC board should be on. These LED's are used to indicate communication path errors. If any LED's are on, double check the cabling between the Model 848A units and the DC848. Look for shorts, open paths or two input cables going to the same 848A unit. The 848A units should be strung together in series. Any unused addresses should have their data cables connected together to complete the path.

Hit the "return" key on the computer terminal keyboard to get the DC848 Main Menu to appear on the screen. Verify the "control program version" at the top of the screen is the same as the software version installed in the DC848 PCA.

5.6.4 Digital Checks

With a scope probe, check U5 (microprocessor) at Pin 40 for a square wave at 1.5 megahertz that has a duty cycle of 50% (high and low the same).

This signal is the DC848 control line of the RS422 driver, which is the DC848 polling sequence of inline 848A panels.

Reconnect the RS422 ("Serial Data") to the DC848. With a scope probe, check U2, Pin 2 for a pulse that responds to the 848A panel commands (touching an 848A panel button).

5.6.5 Programming the DC848

Read over Chapter 2 of this Technical Manual for programming procedures. Verify that each menu works according to the software version installed in your DC848.

5.6.6 Unit Configuration for Shipment

DC848 units are shipped from the factory in the following configurations:

Single DC848, with no system

Forced crosspoints.....none
Inhibited crosspoints.....none
Latch disable.....none
Hands Free Answer.....none
Auto speaker.....disabled
Auto mic.....disabled
Tally flash time.....40 seconds

DC848 System (standard setup)

Forced crosspoints.....none
Inhibited crosspoint..any undesignated station
Latch disable.....none
Hands Free Answer.....none
Auto speaker.....disabled
Auto mic.....disabled
Tally flash time.....40 seconds

DC848 System (special setup)

Programmed as indicated on system specification sheet

RTS SYSTEMS INC. 848A SYSTEM TERMINAL CONTROL PROGRAM VERSION 2.1

848A MAIN MENU

1. DISPLAY FORCED CROSSPOINT LIST
2. DISPLAY INHIBIT LIST
3. DISPLAY PANEL SWITCH ACTION MENU
4. DISPLAY AUTO RECIPROCAL LIST
5. DISPLAY AUTO FUNCTION MENU

ENTER SELECTION:

RTS SYSTEMS INC. 848A SYSTEM TERMINAL CONTROL PROGRAM VERSION 5.0

848A MAIN MENU

1. FORCE/INHIBIT A TALK PATH
2. PANEL SWITCH ACTION (LATCH DISABLE)
3. HANDS FREE ANSWER (AUTO RECIPROCAL)
4. INSTANT MIC ASSIGNMENTS
5. INSTANT SPEAKER ASSIGNMENTS
6. GROUP LIST ASSIGNMENTS
7. TALLY FLASH TIME
8. SYSTEM STATUS
9. SYSTEM CONFIGURATION

ENTER SELECTION:

**Figure 5-1
Software Versions**

RTS SYSTEMS INC. 848A FORCE/INHIBIT A TALK PATH

PANEL NUMBER 01

01 **	02 _	03 _	04 FO	05 _	06 _	07 _	08 _	09 _	10 _	11 _	12 _
13 _	14 _	15 _	16 _	17 _	18 _	19 _	20 _	21 _	22 _	23 _	24 _
T1 _	L1 _	T2 _	L2 _								

1. TOGGLE FORCED TALK PATH
2. TOGGLE INHIBIT TALK PATH
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

ENTER SELECTION:

Figure 5-2
Switch #4 -- Forced Crosspoint is ON

RTS SYSTEMS INC. 848A FORCE/INHIBIT A TALK PATH

PANEL NUMBER 01

01 **	02 _	03 _	04 FO	05 IH	06 _	07 _	08 _	09 _	10 _	11 _	12 _
13 _	14 _	15 _	16 _	17 _	18 _	19 _	20 _	21 _	22 _	23 _	24 _
T1 _	L1 _	T2 _	L2 _								

1. TOGGLE FORCED TALK PATH
2. TOGGLE INHIBIT TALK PATH
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

ENTER SELECTION:

Figure 5-3
Switch #5 -- Crosspoint Inhibit is ON

RTS SYSTEMS INC. 848A PANEL SWITCH ACTION MENU (LATCH DISABLE)

PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	-	-	-	-	LD	-	-	-	-	-	-
13	14	15	16	17	18	19	20	21	22	23	24
-	-	-	-	-	-	-	-	-	-	-	-
T1	L1	T2	L2								
-	-	-	-								

1. TURN ON MOMENTARY ACTION (LATCH DISABLE)
2. TURN OFF MOMENTARY ACTION
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

TURN ON MOMENTARY ONLY FOR SWITCH NUMBER:

Figure 5-4
Switch #6 -- Latch Disable is ON

RTS SYSTEMS INC. 848A HANDS-FREE ANSWER LIST (AUTO RECIPROCAL)

PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	-	-	-	-	-	HF	-	-	-	-	-
13	14	15	16	17	18	19	20	21	22	23	24
-	-	-	-	-	-	-	-	-	-	-	-

1. SET HANDS-FREE ANSWER FUNCTION
2. CANCEL HANDS-FREE ANSWER FUNCTION
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

ENTER SELECTION:

Figure 5-5
Switch 7 -- Hands-Free Answer is ON

RTS SYSTEMS INC. 848A PANEL GROUP ASSIGNMENT LIST

PANEL NUMBER 01

01	02	03	04	05	06	07	08	09	10	11	12
**	-	-	-	-	-	G2	G2	-	-	-	-
13	14	15	16	17	18	19	20	21	22	23	24
-	-	G2	-	-	-	-	-	-	G1	G1	-
T1	L1	T2	L2								
-	-	-	-								

1. ASSIGN SWITCH TO A GROUP
2. REMOVE SWITCH FROM GROUP ASSIGNMENT
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

ASSIGN SWITCH TO GROUP, ENTER GROUP NUMBER (1-4): 1
ENTER SWITCH NUMBER (01-24):

Figure 5-6
Panel #1 -- Switches 22 and 23 are in Group 1
Switches 7, 8 & 15 are Group 2

RTS SYSTEMS INC. 848A PANEL TALLY SETUP

PANEL NUMBER 04

AUTO TALLY FLASH TIME.....10 SECONDS

1. LENGTHEN TALLY FLASH TIME (MAX 60 SECONDS)
2. SHORTEN TALLY FLASH TIME (MIN 10 SECONDS)
3. DISPLAY ANOTHER PANEL
4. DISPLAY NEXT PANEL
5. RETURN TO MAIN MENU

[L] Tally Flash Time Longer (Max. 60 Sec.)
[S] Tally Flash Time Shorter (Min. 10 Sec.)

Figure 5-7
Panel #4 -- Tally Flash Time set at 10 seconds

RTS SYSTEMS INC. 848A DYNAMIC COMLINK STATUS DISPLAY											
OK = Panel is communicating with system											
-- = Panel is not communicating with system											
XX = Communication collision (2 or more panels at same address)											
01 OK	02 --	03 OK	04 OK	05 OK	06 OK	07 OK	08 OK	09 OK	10 XX	11 XX	12 OK
13 OK	14 OK	15 OK	16 OK	17 OK	18 --	19 OK	20 OK	21 OK	22 --	23 --	24 --
[Return] TO MAIN MENU											

Figure 5-8
Panels 2, 18, 22, 23 & 24 are off-line,
and there is a problem with Panels 11 and 12
being addressed to the same location

RTS SYSTEMS INC. 848A DYNAMIC MATRIX STATUS DISPLAY																						
P# 01:	**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P# 02:	--	**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P# 03:	--	--	**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P# 04:	--	--	--	**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P# 05:	--	--	--	--	**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P# 06:	--	--	--	--	--	**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P# 07:	--	--	--	--	--	--	**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P# 08:	--	--	--	--	--	--	--	**	--	--	--	--	--	--	--	--	--	--	--	--	--	--
P# 09:	01	02	03	04	05	06	--	--	**	--	--	--	--	--	--	--	18	--	--	--	--	--
P# 10:	--	--	--	--	--	--	--	--	--	**	--	--	--	--	--	--	--	--	--	--	--	--
P# 11:	--	--	--	--	--	--	08	--	10	**	--	--	14	--	--	--	--	--	--	--	--	--
P# 12:	--	--	--	--	--	--	--	--	--	--	**	--	--	--	--	--	--	--	--	--	--	--
P# 13:	--	--	--	--	--	--	--	--	--	--	--	**	--	--	--	--	--	--	--	--	--	--
P# 14:	--	--	--	--	--	--	--	--	--	--	--	--	**	--	--	--	--	--	--	--	--	--
P# 15:	--	--	--	--	--	--	--	--	--	--	--	--	--	**	--	--	--	--	--	--	--	--
P# 16:	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**	--	--	--	--	--	--	--
P# 17:	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**	--	--	--	--	--	--
P# 18:	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**	--	--	--	--	--
P# 19:	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**	--	--	--	--
P# 20:	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**	--	--	--
P# 21:	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**	--	--
P# 22:	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**	--
P# 23:	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**
P# 24:	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**

Figure 5-9
Panel 9 is in communication with Panels 1 through 6, and 18
Panel 11 with Panels 8, 10 and 14

5.7 UNIT TROUBLESHOOTING

PROBLEM: The unit's talk and/or listen circuits "buzz" when the 848A chassis or gooseneck is touched.

SOLUTION: The connection between chassis ground and the gooseneck has been broken. Check the unit with an ohmmeter as in step 5.5.2. Also check for a DC voltage between chassis and circuit ground.

PROBLEM: No lights.

SOLUTION: (1) No power being applied to the unit. (2) Switch board has been disconnected from the mother board. Check cables inside of the unit.

PROBLEM: No output to the line.

SOLUTION: (1) The 50-pin cable is not secured to the "line input" or the splitter assembly. (2) The cables on the mother board to the 848A back panel have come loose from their connectors on the mother board.

PROBLEM: Too much feedback.

SOLUTION: (1) Incorrect balancing of sidetone. After your 848A has been connected to the system, readjust the sidetone. (2) Check for double or no termination. Verify that termination plugs are in place.

PROBLEM: Channel output on the line is at different levels and/or no listen from the line.

SOLUTION: (1) Cable problem inside of the 848A. (2) Cable problem from the 848A to the line-50-pin cable. (3) Channels have not been properly balanced. (4) A bilateral circuit has malfunctioned. (5) The listen level pots have not been adjusted. (6) The master volume pot has not been adjusted.

5.8 SYSTEM TROUBLESHOOTING

The Model 848A is designed to function in a system of up to 24 different point-to-point stations, and two RTS Systems TW conference lines. System problems can be entire stations off-line, humming or squealing, or level changes. These problems are traceable to one of two areas: the cable connections or the individual units. When you have isolated a problem to an individual unit, stop and refer to the test procedure listed in Section 5.5.5.

If products other than RTS Systems products are connected to the Model 848A system, there may be interface problems.

5.8.1 Station Off-Line

The problem is either in the unit or in the connecting line. Make sure the power connector to the unit is firmly in place and the power supply is plugged into a live outlet. Check the 50-pin ribbon connector line. Disconnect and then reconnect the connector from both the back of the 848A and the splitter. If the connectors appear to be sound, exchange the 50-pin ribbon connector line with another line from a different station. If this doesn't solve the problem, go inside of the individual unit and test.

5.8.2 Level Changes And Squealing

Level changes are a result of improper termination and/or too many units on the bus. Check to see that you have not exceeded the recommended number of stations per bus. And check to see that you have not double terminated the system.

Squealing is caused when the system is not terminated. If there are less than 17 stations in the point-to-point system, one termination is required. The termination plug must be of the proper size. From 1 to 8 stations require a 680 ohm termination plug. From 9 to 16 stations require a 1500 ohm termination plug.

Each TW system line also needs to be terminated. If a TW line is not used, insert the terminating plug into the back of the 848A. If a TW line is used the TW system provides its own termination.

The following are the screwdriver-adjustable trimmer potentiometers:

TW 1 BAL	Conference Line 1 balance
TW 2 BAL	Conference Line 2 balance
Mic	Microphone gain adjustment

These adjustments are explained in Section 5.

5.8.3 Mic 1/Mic 2 Adjustment

Electronic Mic SWITCH 1 controls the microphone output to the point-to-point electronics. Electronic Mic SWITCH 2 controls the microphone output to the TW electronics. These switches have been factory set to require a signal from the front panel Mic ON switch to operate. If a user wants to have the microphone continuously on to either of these destinations, then the factory-installed jumpers will have to be moved. Move W2 to W3 to turn Mic SWITCH 1 permanently on. Move W1 to W4 to turn Mic SWITCH 2 permanently on.

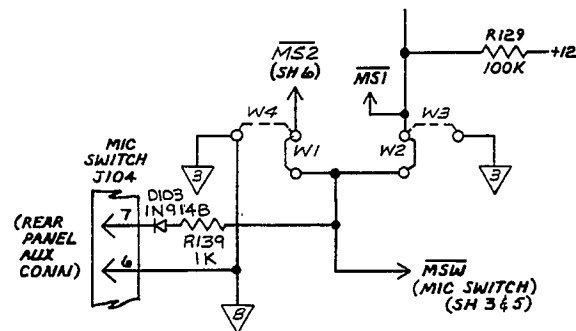
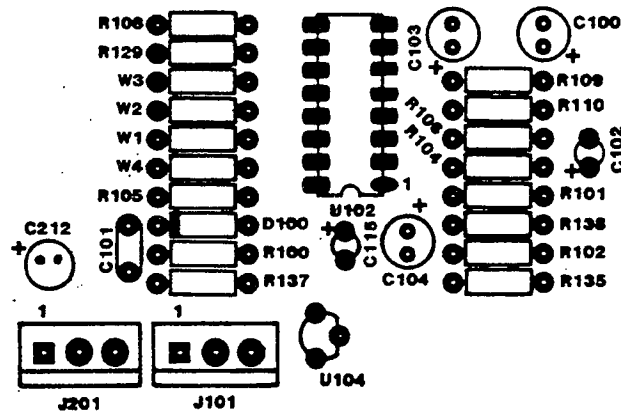


Figure 5-10
Mic 1/Mic 2
Adjustment

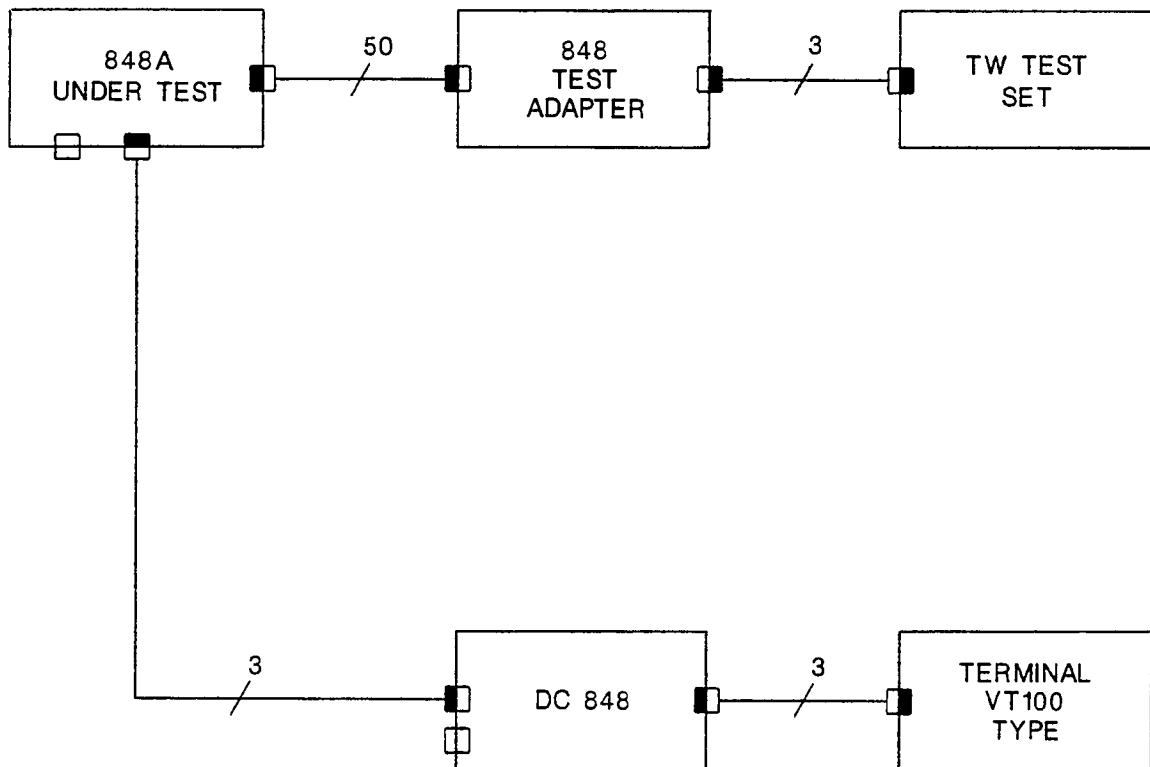


Figure 5-11
Test Setup

SECTION 6: LISTS OF REPLACEABLE PARTS

6.1 INTRODUCTION This section contains parts lists, and instructions for ordering replacement parts. The Parts List is divided into sub part lists, listed below in 6.1.1 Division of Parts Lists. Immediately following the description of a part is the manufacturer and the manufacturer's part number.

6.1.1 DIVISION OF PARTS LIST INTO SUB-PARTS LISTS

Model 848A:

6.4	Final Assembly	9010-5545-00
6.5	Front Panel Assembly	9020-5543-00
6.6	Back Panel Assembly	9020-5542-00
6.7	Sub-Chassis Assembly	9020-5600-00
6.8	Adjustment Board Side Rail Assembly	9020-5365-00
6.9	Printed Circuit Assembly, Mother Board	9030-4706-00
6.10	Printed Circuit Assembly, Switch Board	9030-3000-09
6.11	Printed Circuit Assembly, CPU Board	9030-5381-00
6.12	Printed Circuit Assembly, Adjustment Board	9030-4810-00
6.13	Printed Circuit Assembly, Listen Select Matrix Board	9030-4320-00
6.14	Cable Assemblies	9020-5368-00
6.15	Power Supply Assembly	9020-4979-00

Model DC848:

6.16	Final Assembly	9010-5556-00
6.17	Back Panel Assembly	9020-5553-00
6.18	Printed Circuit Board Assembly, UMC-100	9030-5555-00
6.19	Power Supply Assembly	9020-4979-00

6.2 HOW TO OBTAIN PARTS

Parts may be obtained directly from Customer Service, RTS Systems, Inc.:

RTS SYSTEMS, Inc.
1100 W. Chestnut Street
Burbank, CA 91506
(818) 566-6700

6.3. SHIPPING LIST

6.3.1. Model 848A Shipping List

Model 848A ordering number: 9010-5545-00

<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
1	Model 848A	9010-5545-00
1	Instruction Manual	9300-5545-00
1	Power Supply Assembly	9020-4979-00
17	Terminal connectors, pin crimp	2006-0014-00
1	15-pin connector with locking ramp	2006-0075-00
1	Plastic bag	
1	Model 848A Shipping Carton	

6.3.2 Model DC848 Shipping List

Model DC848 ordering number: 9010-5556-00

<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
1	Model DC848	9010-5556-00
1	Instruction Manual	9300-5545-00
1	Power Supply Assembly	9020-4979-00
1	Plastic bag	
1	Model DC848 Shipping Carton	

6.4 FINAL ASSEMBLY (9010-5545-00)

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
1	1	Front Panel Assembly,	9020-5543-00
3	1	Adjustment Board Side Rail Assembly,	9020-5365-00
4	1	Back Panel Assembly,	9020-5542-00
5	1	Printed Circuit Board Assembly, Mother Board,	9030-4706-00
6	1	Side rail, 848 right	9100-4740-02
8	17	Screw, 6-32 x $\frac{1}{4}$ " phillips, pan head, yellow cadmium	1008-6038-00
9	3	Lockwasher, #6 internal tooth, zinc	1006-0006-00
10	8	Screw, 8-32 x $\frac{3}{8}$ ", pan head phillips	1008-8022-00
11	4	Washer, lock #8	1006-0027-00
12	2	Nut, hex, kep 6-32	1007-0002-00
10	1	Printed Circuit Card Assembly, L.S.M.,	9030-4320-00
18	1	Cover, top 848	9100-4739-02
19	1	Cover, bottom 848	9100-4739-01
	1	Sub-Chassis Assembly,	9020-5560-00
	1	Printed Circuit Board Assembly, Adjustment Board	9030-4810-00
	1	Printed Circuit Assembly, Switch Board,	9030-3000-09
	1	Printed Circuit Assembly, CPU Board,	9030-5381-00
	1	Power Supply Assembly	9020-4979-00

6.5 FRONT PANEL ASSEMBLY, 9020-5543-00

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
1	1	Front panel	9070-5543-00
2	1	Microphone, gooseneck, 20", Shiba P/N LR-420	2608-0025-00
3	1	Connector, carbon Mic, Switchcraft P/N MN114B	2013-0003-00
4	1	Connector, 5-pin female, Cannon P/N AXR-5-31	2018-0005-01
5	2	Connector, 4-pin female, Molex P/N 09-50-3041	2006-0013-00
6	1	Connector, 3-pin female Molex P/N 09-50-3031	2006-0018-00
8	3	Spacer, hex 6-32 x $\frac{9}{16}$ ", Amatom P/N 8216-A-0632	1001-0023-00
-	2	Screw, 4-40 x $\frac{3}{8}$ " phillips, flat head, brt. wht. zinc	1008-4012-00
9	9	Connector, pin crimp terminal Molex P/N 08-50-0108	2006-0014-00
10	2	Nut, kep, 4-40	1007-0001-00
11	1	Wire, 24 awg, bus, Belden P/N 8022, .5 ft.	2512-0024-00
12	1	Wire, 24 awg, 6" long, green	2511-0054-00
13	2	Wire, 24 awg, 6" long, red	2511-0032-00
14	1	Wire, 24 awg, 6" long, black	2511-0033-00
15	1	Wire, 24 awg, 6" long, orange	2511-0050-00
16	1	Wire, 24 awg, 6" long, yellow, vinyl type B	2511-0357-00
17	1	Wire, 24 awg, 6" long, brown, vinyl 19 strands	2511-0049-11
18	1	Connector, pin crimp, female, Molex P/N 08-50-0106	2006-0016-00
19	1	Sleeving, shrink, $\frac{1}{4}$ " black	1301-0001-00
20	1	Sleeving, Teflon #20 awg, Alpha tft, .10 ft.	1304-0001-00

6.6 BACK PANEL ASSEMBLY, 9020-5542-00 (Drawing AS5542)

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
1	1	Back panel	9080-5542-00
2	1	Connector, carbon Mic, Switchcraft P/N MN114B	2013-0003-00
3	1	Cable mounting cradle, Panduit P/N TM1S4	1005-0046-00
4	1	Jack, 4-conductor, Calrad P/N 30-454	2013-0005-00
5	1	Connector, 3-pin female, Hirose P/N HA16PR-3S	2018-0036-00
6	2	Connector, 3-pin female Molex P/N 09-50-3031	2006-0018-00
7	1	Connector, 4-pin female Molex P/N 09-50-3041	2006-0013-00
8	6	Connector, pin crimp terminal Molex P/N 08-50-0108	2006-0014-00
9	4	Connector, pin female crimp Molex P/N 08-50-0106	2006-0016-00
11	2	Lug, solder #6, Smith P/N 1416-6	1003-0003-00
12	7	Screw, 4-40 x 3/8" phillips, pan head	1008-4035-00
13	2.5	Jack socket assembly (2 per pkg), 3M P/N 3341-1L	1005-0045-00
15	2	Screw, 4-40 x 3/8" phillips, flat head, brt. wht zinc	1008-4001-00
16	8	Nut, kep, 4-40	1007-0001-00
17	1	Wire, 24 awg, 5" long, red	2511-0008-00
18	2	Wire, 24 awg, 5" long, violet	2511-0124-00
19	2	Wire, 24 awg, 5" long, 19 strand vinyl, black	2511-0007-00
20	1	Wire, 24 awg, 5" long, blue	2511-0005-00
21	1	Wire, 18 awg, green, Teflon stranded, 1.25 ft.	2511-0304-00
22	1	Wire, 20 awg, red 19 strand Teflon .5 ft.	2511-0329-00
24	1	Wire, 20 awg, violet, vinyl, 19 strand, .5 ft	2511-0358-00
	1	Label	9170-5561-00
	1	Shrink Tubing, 5/16", OD Clear, 4 in.	1301-0012-00
25	1	Cable Assembly (see 6.15)	9020-5587-00

6.7 SUB-CHASSIS ASSEMBLY, 9020-5600-00

-	4	Spacer, hex 6-32 x 7/16", Smith P/N 9293	1001-0030-00
-	2	Spacer, 6-32 x 1 1/4" M/F hex, Amatom P/N 9475A0632	1001-0101-00
-	2	Spacer, 4-40 x 1" hex, thread, Smith P/N 2334	1001-0110-00
-	4	Washer, #6 flat, cadmium plated	1006-0005-00
-	4	Lockwasher, #6 internal tooth, zinc-plated	1006-0006-00
-	12	Screw, 4-40 x 3/8" socket cap head	1008-4029-00
-	2	Screw, 4-40 x 1/4", pan head, yellow cadmium	1008-4023-00
-	10	Screw, 6-32 x 1/4", phillips, pan head, yellow cadmium	1008-6038-00
-	1	Pot, 10K ohm audio, Bourns P/N 81A1A-B24-S15	1407-0009-01
-	3	Connector, pin crimp terminal, Molex P/N 08-50-0108	2006-0014-00
-	2	Connector, pin crimp, female, Molex P/N 08-50-0106	2006-0016-00
-	1	Connector, 3 pin female, Molex P/N 09-50-3031	2006-0018-001
-	1	Connector, housing, 2 pin, Molex P/N 09-50-3021	2006-0019-00
-	1	Wire, 24 awg, 6" long, red	2511-0032-00
-	1	Wire, 24 awg, 6" long, black	2511-0033-00
-	1	Wire, 24 awg, 6" long, orange	2511-0050-00
-	1	Wire, 20 awg, vinyl, 19 strands, black	2511-0315-00
-	1	Wire, 20 awg, PVC 19 strands, white	2511-0355-00
-	1	Speaker, Oaktron P/N FE-3X5FA	2609-0005-00
-	1	Knob, gray 1/4" shaft, Selco P/N S210-250	2703-0005-00
-	1	Cap, gray with dot, Selco P/N C212	2705-0003-00
-	1	Speaker grill	9120-3088-00

6.8 ADJUSTMENT BOARD SIDE RAIL ASSEMBLY, 9020-5365-00

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
1	1	Side rail, left	9100-4740-01
2	1	PCA Adjustment Board	9030-4810-00
3	1	Front panel	9070-3011-00
4	2	Nut, hex, kep 6-32	1007-0002-00
5	6	Screw, 6-32 x $\frac{1}{4}$ " phillips, pan head, yellow cadmium	1008-6038-00
6	6	Lockwasher, #6 internal tooth, zinc-plated	1006-0006-00
7	1	Support, adjustment card	9110-4809-00
8	1	Latch and keeper, Southco P/N A4-10-501-20	1005-0039-00
9	2	Screw, 4-40 x $\frac{3}{8}$ " cadmium, phillips, pan head	1008-4035-00
10	2	Nut, kep, 4-40	1007-0001-00

6.9 PRINTED CIRCUIT ASSEMBLY, MOTHER BOARD, 9030-4706-00

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
PC1	1	Printed circuit board	9040-4706-00
	6	Spacer, 6-32 x 5/16", Amatom P/N 9534B-B-0632	1001-0115-00
	2	Pem fastener, 4-40, PEM P/N KF2-440	1005-0114-00
	2	Lockwasher, #6 internal tooth, zinc plated	1006-0006-00
	2	Washer, compression 4-40, Motorola P/N B52200F006	1006-0041-00
	2	Screw, 4-40 x 5/16", pan head, phillips yellow cadmium	1008-4024-00
	2	Screw, 6-32 x $\frac{1}{4}$ ", pan head, phillips clear cadmium	1008-6061-00
C100	-	Capacitor, electro radial 100uF/10 volts	1513-R107-4C
C101	-	Capacitor, ceramic mono radial .033/50 volts	1511-R333-2I
C102	-	Capacitor, tantalum radial 1uF/35 volts	1515-R105-3G
C103-C104	-	Capacitor, electro radial 10uF/16 volts	1513-R106-4E
C105	-	Capacitor, electro radial 47uF/16 volts	1513-R476-4E
C106	-	Capacitor, electro radial 10uF/16 volts	1513-R106-4E
C107	-	Capacitor, ceramic mono radial .1uF/50 volts	1511-R104-2I
C108	-	Capacitor, ceramic mono radial .01uF/50 volts	1511-R103-2I
C109	-	Capacitor, ceramic mono radial .1uF/50 volts	1511-R104-2I
C110	-	Capacitor, ceramic disc radial 33 pF/50 volts	1510-R330-2I
C111	-	Capacitor, ceramic mono radial .1uF/50 volts	1511-R104-2I
C112	-	Capacitor, ceramic mono radial .22 uF/50 volts	1511-R224-2I
C113	-	Capacitor, electro radial 10uF/16 volts	1513-R106-4E
C114	-	Capacitor, ceramic mono radial .22 uF/50 volts	1511-R224-2I
C115	-	Capacitor, tantalum radial 1uF/35 volts	1515-R105-3G
C116	-	Capacitor, ceramic mono radial .22 uF/50 volts	1511-R224-2I
C117	-	Capacitor, ceramic disc radial 33 pF/50 volts	1510-R330-2I
C118	-	Capacitor, ceramic mono radial 1uF/50 volts	1513-R105-4I
C200-C206	-	Capacitor, ceramic mono radial .22 uF/50 volts	1511-R224-2I
C119	-	Capacitor, ceramic disc radial 10pF/50 volts	1510-R100-2I

MOTHER BOARD ASSEMBLY, (Continued):

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
C207	-	Capacitor, ceramic disc radial 220pF/50 volts	1510-R221-2I
C208-C209	-	Capacitor, ceramic mono radial .22 uF/50 volts	1511-R224-2I
C210	-	Capacitor, ceramic mono radial .1uF/50 volts	1511-R104-2I
C211	-	Capacitor, ceramic mono radial .22 uF/50 volts	1511-R224-2I
C212	-	Capacitor, electro radial 1uF/50 volts	1513-R105-4I
C213	-	Capacitor, ceramic disc radial 470pF/50 volts	1510-R471-2I
C214	-	Capacitor, electro radial 1uF/50 volts	1513-R105-4I
C215	-	Capacitor, ceramic mono radial .01uF/50 volts	1511-R103-2I
C216	-	Capacitor, electro radial 100uF/10 volts	1513-R107-4C
C217	-	Capacitor, electro radial 10uF/16 volts	1513-R106-4E
C218-C219	-	Capacitor, ceramic mono radial .22 uF/50 volts	1511-R224-2I
C220	-	Capacitor, ceramic mono radial .1uF/50 volts	1511-R104-2I
C221	-	Capacitor, electro radial 47uF/16 volts	1513-R476-4E
C222	-	not used	
C223-C224	-	Capacitor, ceramic mono radial .22uF/50 volts	1511-R224-2I
C225	-	Capacitor, electro radial 1000uF/16 volts	1513-R108-4E
C226	-	Capacitor, electro radial 1uF/50 volts	1513-R105-4I
C227	-	Capacitor, ceramic mono radial .01uF/50 volts	1511-R103-2I
C228	-	Capacitor, electro radial 1uF/50 volts	1513-R105-4I
C229	not used		
C230	-	Capacitor, ceramic disc radial 33 pF/50 volts	1510-R330-2I
C301-C348	-	Capacitor, electro radial 10uF/16 volts	1513-R106-4E
C601	-	Capacitor, ceramic mono radial .22uF/50 volts	1511-R224-2I
C602	-	Capacitor, ceramic disc radial 33pF/50 volts	1510-R330-2I
C603	-	Capacitor, ceramic mono radial .1uF/50 volts	1511-R104-2I
C604	-	Capacitor, electro radial 10uF/16 volts	1513-R106-4E
C605	-	Capacitor, ceramic disc radial 10pF/50 volts	1510-R100-2I
C606	-	Capacitor, electro radial 47uF/16 volts	1513-R476-4E
C607	-	Capacitor, electro radial 10uF/50 volts	1513-R106-4I
C608	-	Capacitor, ceramic mono radial .22uF/50 volts	1511-R224-2I
C609	-	Capacitor, ceramic disc radial 33pF/50 volts	1510-R330-2I
C610	-	Capacitor, ceramic mono radial .1uF/50 volts	1511-R104-2I
C611	-	Capacitor, electro radial 10uF/16 volts	1513-R106-4E
C612	-	Capacitor, ceramic disc radial 10pF/50 volts	1510-R100-2I
C613	-	Capacitor, electro radial 47uF/16 volts	1513-R476-4E
C614	-	Capacitor, electro radial 10uF/50 volts	1513-R106-4I
C701-C704	-	Capacitor, ceramic disc radial .01uF/1 kilovolt	1510-R103-4F
C705	-	Capacitor, electro radial 2200uF/25 volts	1513-R228-4F
C706	-	Capacitor, electro radial 15,000uF/25 volts	1513-R159-4F
C707	-	Capacitor, electro radial 2200uF/25 volts	1513-R228-4F
C708-C709	-	Capacitor, ceramic mono radial .22uF/50 volts	1511-R224-2I
C710	-	Capacitor, electro radial 100uF/10 volts	1513-R107-4C
C711	-	Capacitor, electro radial 470uF/10 volts	1513-R477-4C
C712	-	Capacitor, ceramic disc radial .1uF/1 kilovolt	1510-R104-2R

MOTHER BOARD ASSEMBLY, (Continued):

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
D100	-	Diode IN6263, signal	1601-6263-00
D101	-	Diode IN914B, signal	1601-0914-0B
D102	-	Diode IN6263, signal	1601-6263-00
D301-D380		Diode, IN4004, 1 ampere 400 volts	1601-4004-00
D332-D333		Diode, MR502, Motorola	1601-0502-00
D701-D704		Diode, MR502	1601-0502-00
D705	-	Diode, IN4004	1601-4004-00
R100	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 120 ohm	1402-1200-5D
R101-R102		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 1K ohm	1402-1001-5D
R103-R104		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 470 ohm	1402-4700-5D
R105	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 68K ohm	1402-6802-5D
R106-R107		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 220 ohm	1402-2202-5D
R108	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 22K ohm	1402-2202-5D
R109-R111		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R112-R113	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 10M ohm	1402-1005-5D
R114	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R115	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 62K	1402-6202-5D
R116	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 22K ohm	1402-2202-5D
R117	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 470K ohm	1402-4703-5D
R118	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 22 ohm	1402-22R0-5D
R119	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R120	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 10K ohm	1402-1002-5D
R121	-	Resistor, metal film $\frac{1}{4}$ watt $\pm 1\%$ 20.0K ohm	1403-2002-2D
R122	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 22K ohm	1402-2202-5D
R123	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 220 ohm	1402-2202-5D
R124	-	Resistor, metal film $\frac{1}{4}$ watt $\pm 1\%$ 20.0K ohm	1403-2002-2D
R125	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 220 ohm	1402-2202-5D
R126-R128		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 10 ohm	1402-10R0-5D
R129	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R130	-	not used	
R131	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 130K ohm	1402-1303-5D
R132-R134		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R135	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100 ohm	1402-1303-5D
R136	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 10K ohm	1402-1002-5D
R137	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 680 ohm	1402-6800-5D
R138	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 1.5K ohm	1402-1501-5D
R139	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 1K ohm	1402-1001-5D

MOTHER BOARD ASSEMBLY, (Continued):

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
R200	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 22K ohm	1402-2202-5D
R201	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R202-R203	not used		
R204	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R205-R206		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 3K ohm	1402-3001-5D
R207-R209		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 22K ohm	1402-2202-5D
R210-R211		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 33K	1402-3302-5D
R212-R213		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R214-R215		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 3K ohm	1402-3001-5D
R216	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R217			
R218	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 22 ohm	1402-22R0-5D
R219-R220		Resistor, carbon film $\frac{1}{4}$ watt 5% 100 ohm	1402-1303-5D
R221	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 100K ohm	1402-1003-5D
R222-R223		Resistor, carbon film $\frac{1}{4}$ watt 5% 22K ohm	1402-2202-5D
R224 -	not used		
R225-R226		Resistor, carbon film $\frac{1}{4}$ watt 5% 22K ohm	1402-2202-5D
R227	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 2.2K ohm	1402-2201-5D
R228	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 2.7 ohm	1402-2R70-5D
R229	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 39 ohm	1402-39R0-5D
R230	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 390 ohm	1402-3900-5D
R231	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 100 ohm	1402-1303-5D
R232	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 2.7 ohm	1402-2R70-5D
R233	-	Resistor, carbon film $\frac{1}{2}$ watt 5% 0.5 ohm	1402-0R50-5E
R234-R235		Resistor, carbon film $\frac{1}{4}$ watt 5% 22K ohm	1402-2202-5D
R236	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 7.5K ohm	1402-7501-5D
R237	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 22K ohm	1402-2202-5D
R238-R239		Resistor, carbon film $\frac{1}{4}$ watt 5% 100K ohm	1402-1003-5D
R240	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 470K ohm	1402-4703-5D
R241	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 220 ohm	1402-2202-5D
R242	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 22K ohm	1402-2202-5D
R243		Resistor, carbon film $\frac{1}{4}$ watt 5% 100K ohm	1402-1003-5D
R301-R331		Resistor, carbon film $\frac{1}{4}$ watt 5% 22K ohm	1402-2202-5D
R332	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 100K ohm	1402-1003-5D
R333	-	Resistor, carbon film $\frac{1}{4}$ watt 5% 10K ohm	1402-1002-5D
R341-R394		Resistor, metal film $\frac{1}{4}$ watt $\pm 1\%$ 3.01K ohm	1403-3011-2D
R601-R606		Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R607	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 22 ohm	1402-22R0-5D
R608	-	Resistor, metal film $\frac{1}{4}$ watt $\pm 1\%$ 60.4K ohm	1403-6042-2D

MOTHER BOARD ASSEMBLY, (Continued):

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
R609	-	Resistor, metal film $\frac{1}{4}$ watt $\pm 1\%$ 20.0K ohm	1403-2002-2D
R610	-	Resistor, metal film $\frac{1}{4}$ watt $\pm 1\%$ 60.4K ohm	1403-6042-2D
R611	-	Resistor, metal film $\frac{1}{4}$ watt $\pm 1\%$ 20.0K ohm	1403-2002-2D
R612	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100 ohm	1402-1303-5D
R613	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R614-R616	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 22K ohm	1402-2202-5D
R617	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 22 ohm	1402-22R0-5D
R618	-	Resistor, metal film $\frac{1}{4}$ watt $\pm 1\%$ 60.4K ohm	1403-6042-2D
R619	-	Resistor, metal film $\frac{1}{4}$ watt $\pm 1\%$ 20.0K ohm	1403-2002-2D
R620	-	Resistor, metal film $\frac{1}{4}$ watt $\pm 1\%$ 60.4K ohm	1403-6042-2D
R621	-	Resistor, metal film $\frac{1}{4}$ watt $\pm 1\%$ 20.0K ohm	1403-2002-2D
R622	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100 ohm	1402-1303-5D
R623	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 100K ohm	1402-1003-5D
R624-R625	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 22K ohm	1402-2202-5D
R701	-	Resistor, carbon film $\frac{1}{2}$ watt $\pm 5\%$ 0.1 ohm	1402-0R10-5E
R702	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 2.2K ohm	1402-2201-5D
R703	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 240 ohm	1402-2400-5D
R704	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 39 ohm	1402-39R0-5D
R705	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 470 ohm	1402-4700-5D
R706	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 22K ohm	1402-2202-5D
R707	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 1K ohm	1402-1001-5D
R708	-	Resistor, carbon film $\frac{1}{4}$ watt $\pm 5\%$ 240 ohm	1402-2400-5D
Q101		Transistor, J305/E305, Siliconix	1602-0305-00
Q102		Transistor, 2N5210, NPN	1602-5210-00
Q301		Transistor, 2N5210	1602-5210-00
U101		I.C. NE5532-N, Signetics	1603-5532-0N
U102		I.C. CD4053 BE, RCA, analog switch	1603-4053-BE
U103		I.C. NE5532	1603-5532-0N
U104		I.C. LM317LZ, voltage regulator	1603-0317-00
U201		I.C. NE5532	1603-5532-0N
U202		I.C. CD4053 BE	1603-4053-BE
U203		I.C. NE5532	1603-5532-0N
U204		I.C. LM380N-8, National	1603-0380-00
U205		I.C. LM383T, National	1603-0383-0T

MOTHER BOARD ASSEMBLY, (Continued):

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
Q201	-	Transistor, 2N5210	1602-5210-00
Q202		Transistor, J305	1602-0305-00
Q203		Transistor, 2N5210	1602-5210-00
Q204		I.C. LM380	1603-0380-00
U301-U316		I.C. CD4053 BE	1603-4053-BE
U601-U603		I.C. CD4053 BE	1603-4053-BE
U604-U605		I.C. NE5532	1603-5532-0N
U701	-	I.C. Voltage regulator LM317T	1603-0317-0T
U702		I.C. LM317 LZ	1603-0317-00
W1		Zero ohm jumper	1402-000-5D
W2		Zero ohm jumper	1402-000-5D
W3-W4		not used	
W5 not used			
		I.C. Socket 8 pin Burndy	2001-0001-00
	22	I.C. Socket 16 pin Burndy	2001-0003-00
T101		Transformer, Bourns P/N LM9003	2306-0001-00
T102		Transformer, Bourns P/N LM9003	2306-0001-00
T201		Transformer, Bourns P/N LM9003	2306-0001-00
T202		Transformer, Mouser P/N 42TM018	2306-0019-00
T203		Transformer, Bourns P/N LM9003	2306-0001-00
F701	1	Fuse, 2 ampere slow-blow, 120 volt, Bussman P/N MDL-2	2801-0009-00
	1	Fuse carrier, Schurter P/N FEK 031.1666	2802-0002-00
	1	Fuse holder, PCA mount, Schurter P/N FAU 031.3573	2802-0011-00
	a/r	Thermal compound, Thermalloy P/N 249	4002-0249-00
W701	-	Jumper .4" bare, Cambion P/N 3600017040300	2515-0005-00
J101	-	Connector, 3 pin Molex P/N 09-74-1031	2006-0069-00
J102	-	Connector, 4 pin Molex P/N 09-74-1041	2006-0068-00
J103	-	Connector, 4 pin Molex P/N 09-74-1041	2006-0068-00
J104	-	Connector, 15 pin right angle Molex P/N 09-75-1158	2006-0067-00
J105	-	20-pin header Berg P/N 65610-420	2007-0034-00
J106 not used			
J107	-	10-pin header Berg P/N 65610-410	2007-0033-00
J108	-	10-pin header Berg P/N 65610-410	2007-0033-00

MOTHER BOARD ASSEMBLY, (Continued):

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
J201	-	Connector, 3-pin Molex P/N 09-74-1031	2006-0069-00
J202	-	Connector, 2-pin Molex P/N 09-74-1021	2006-0071-00
J203	-	Connector, 3-pin Molex P/N 09-74-1031	2006-0069-00
J301-J308		10-pin header Berg P/N 65610-410	2007-0033-00
J309	-	14-pin header Berg P/N 65610-414	2007-0036-00
J310	-	Connector, 3-pin Molex P/N 09-74-1031	2006-0069-00
J311	-	14-pin header Berg P/N 65610-414	2007-0036-00
J312	-	14-pin header Berg P/N 65610-414	2007-0036-00
J313	-	14-pin header Berg P/N 65610-414	2007-0036-00
J601	-	Connector, 3-pin printed circuit mount metal	2018-0010-00
J701	-	Connector, 3-pin Molex P/N 09-74-1031	2006-0069-00
XU101-XU205		I.C. socket 8-pin	

6.10 PRINTED CIRCUIT ASSEMBLY, SWITCH BOARD 9030-3000-09

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
1	1	Printed Circuit Board	9040-3000-09
	41	Coupling piece, EAO P/N 99-910	1005-0033-00
D901		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D902		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D903		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D904		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D905		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D906		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D907		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D908		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D909		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D910		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D911		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D912		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D913		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D914		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D915		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D916		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D917		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D918		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D919		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D920		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D921		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D922		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D923		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D924		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D925		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D926		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D927		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D928		Diode, IN4004 1 ampere, 400 volts	1601-4004-00

PRINTED CIRCUIT ASSEMBLY, SWITCH BOARD, cont'd

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
D929		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D930		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D931		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D932		Diode, IN4004 1 ampere, 400 volts	1601-4004-00
D933-D938	6	Diode, Motorola MR502	1601-0502-00
DS901-DS932		Lamp, 18 volt, JKL P/N 8099SBP	1802-8099-00
J901-J908		Header, 10-pin, Berg P/N 65611-410	2007-0048-00
J910	-	Connector, 3-pin wafer, Molex P/N 09-65-1031	2006-0002-00
S901-S932		Switch, momentary lighted pushbutton EAO P/N 99-456	1911-0013-00
	32	Switch lens holder gray EAO P/N 99-920.8	2711-0001-00
-	41	Coupling piece, EAO P/N 99-910	1005-0033-00

6.11 PRINTED CIRCUIT ASSEMBLY, CPU BOARD, 9030-5381-00

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
PC1	1	Printed Circuit Board	9040-5381-00
C1-C2		Capacitor, ceramic disc radial, 10pF\50 volts	1510-R100-2I
C3	1	Capacitor, ceramic mono radial, .1uF/50 volts	1511-R104-2I
C4	1	Capacitor, tantalum radial, 1.0uF/16 volts	1515-R105-3E
C5-C7		Capacitor, ceramic mono radial, .1uF/50 volts	1511-R104-2I
C8	1	Capacitor, tantalum radial, 1.0uF/16 volts	1515-R105-3E
C9-C11		Capacitor, ceramic mono radial, .1uF/50 volts	1511-R104-2I
C12	1	Capacitor, tantalum radial, 1.0uF/35 volts	1515-R105-3G
C13-C30		Capacitor, ceramic mono radial, .1uF/50 volts	1511-R104-2I
D1	1	Diode, signal, 1N4148	1601-4148-00
D2	1	Diode, 1 ampere, 400 volts, 1N4004	1601-4004-00
J607-J609		Header, 10 pin, Berg P/N 65610-410	2004-0033-00
J801-J808		Socket strip, 10 position, Samtec P/N SEP-10758-02	2019-0018-00
J905-J908		Header, 10 pin, Berg P/N 65610-410	2004-0033-00
Q1	1	Transistor, 2N5210 NPN	1602-5210-00
R1	1	Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 10K ohm	1402-1002-5D
R2-R7	1	Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 10 ohm	1402-10R0-5D
R8-R9	1	Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 10K ohm	1402-1002-5D
R10	1	Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 2.2M ohm	1402-2204-5D
R11	1	Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 4.7K ohm	1402-4701-5D
R12	1	Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 2M ohm	1402-2004-5D
R13	1	Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 2.2K ohm	1402-2201-5D
R14	1	Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 100K ohm	1402-1003-5D
R15	1	Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 240 ohm	1402-2400-5D
R16	1	Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 750K ohm	1402-7500-5D

PRINTED CIRCUIT ASSEMBLY, CPU BOARD, cont'd

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
R17-R25		Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 10K ohm	1402-1002-5D
R26-R33		Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 100K ohm	1402-1003-5D
R34-R41		Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 10K ohm	1402-1002-5D
R42-R49		Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 100K ohm	1402-1003-5D
R50-R57		Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 10K ohm	1402-1002-5D
R58-R65		Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 100K ohm	1402-1003-5D
R66-R81		Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 10K ohm	1402-1002-5D
R82-R97		Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 100K ohm	1402-1003-5D
R98-R100		Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 10K ohm	1402-1002-5D
R101-R104		Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 10 ohm	1402-10R0-5D
R105-R108		Resistor, carbon film $\frac{1}{4}$ watt, $\pm 5\%$, 22K	1402-2202-5D
S1-S4	1	Switch, dip, 5 position, Amer Research P/N K405-S	1909-0006-00
U1	1	Integrated circuit, 74HC04, National	1603-0056-00
U2	1	Integrated circuit, 63A03RP, Hitachi	1603-0109-00
U3	1	Integrated circuit, 4047	1603-4047-00
U4	1	Integrated circuit, 74HC573	1603-0110-00
U5	1	Integrated circuit, 74HC139	1603-0111-00
U6	1	Integrated circuit, 27C256	1603-0112-00
U7	1	Integrated circuit, voltage regulator, National LM317	1603-0317-MP
U8	1	Integrated circuit, HM6264LP-15	1603-6264-LP
U9-U13	1	Integrated circuit, MC14021	1603-0108-00
U14-U21	1	Integrated circuit, UCN5821A	16035821-0A
U22-U23	1	Integrated circuit, 75176	1603-0107-00
W1	1	Jumper, .2 in., AP products P/N 922345-02	2515-0004-02
Y1	1	Crystal, 4.9152 megahertz, Fox P/N 049	3301-0005-00
XU1	1	Integrated circuit socket, 14 pin, Burndy DIL P/N DIL14P-108	2001-0002-00
XU2	2	Integrated circuit socket, 40 pin, Burndy DIL P/N DIL40P-108	2001-0017-00
XU3	1	Integrated circuit socket, 14 pin, Burndy DIL P/N DIL14P-108	2001-0002-00
XU4	1	Integrated circuit socket, 20 pin, Burndy DIL P/N DIL20P-108	2001-0036-00
XU5	1	Integrated circuit socket, 16 pin, Burndy DIL P/N DIL16P-108	2001-0003-00
XU6	1	Integrated circuit socket, 28 pin, Rob/Robinson nugen P/N 1CT-286-S-X	2001-0037-00
XU7	not used		
XU8	1	Integrated circuit socket, "smart", Dallas Semi P/N DS1213	2001-0035-00
XU9-XU21		Integrated circuit socket, 16 pin, Burndy DIL P/N DIL16P-108	2001-0003-00
XU22-XU23		Integrated circuit socket, 8 pin, Burndy DIL P/N DIL8P-108	2001-0001-00
		Heat Sink, AHAM, 362 P/N 7-362-BA	4502-0003-00

6.12 PRINTED CIRCUIT ASSEMBLY, ADJUSTMENT BOARD, 9030-4810-00

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
PC1	1	Printed circuit board	9040-4810-00
J501	1	Header 20-pin right angle 3M P/N 3428-1202	2007-0095-00
C501-C502	2	Capacitor, ceramic mono radial .1uF/50volts	1511-R104-2I

PRINTED CIRCUIT ASSEMBLY, ADJUSTMENT BOARD, cont'd

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
R501-R502	2	Pot 10K ohms linear Piher P/N PTC10Lvp10K	1409-0009-00
R503-R504	2	Pot 20K ohms audio Piher P/N PT10yv20Klog	1409-0047-00
R505	1	Pot 10K ohms linear Piher P/N PTC10Lvp10K	1409-0009-00
R506-R510	5	Pot 20K ohms audio Piher P/N PT10yv20Klog	1409-0047-00
J501	1	Header 20-position, right-angle 3M P/N 3428-1202	2007-0095-00

**6.13 PRINTED CIRCUIT ASSEMBLY, LISTEN SELECT MATRIX BOARD, 9030-4320-00
(see Drawing AS4320)**

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
PC1	1	Printed circuit board	9040-4320-00
	4	Standoff, 4-40 x 1/4" Amatom P/N 9533B-B-0440	1001-0112-00
	2	Standoff, 4-40 x 3/16" Amatom P/N 9532B-B-0440	1001-0113-00
J401	1	50 pin connector, Male Amphenol TRW Cinch P/N 57-10500-27	2008-0010-00
J402-J403	2	Header, 26-pin, Berg P/N 65610-426	2007-0035-00
R401-R449	48	Resistor, metal film 1/4 watt, ±1% 3.01K ohm	1403-3011-2D
J501-J524	24	Header, 6-pin single row, AP Products P/N 929647-01-06	2007-0097-00

6.15 CABLE ASSEMBLIES

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
6.15A	1	Cable assembly, 3 conductor, as per drawing AS5368	9020-5368-00
	6	Connector, pin crimp female, Molex P/N 08-50-0106	2006-0016-00
	2	Connector, 3-pin female, Molex P/N 09-50-3031	2006-0018-00
	1	Wire, 18 awg, black Teflon	2511-0157-00
	1	Wire, 18 awg, red Teflon stranded	2511-0305-00
6.15B	1	Cable assembly, 20 conductor as per drawing AS5370	9020-5370-00
	2	Connector, 20 position with S.R., Berg P/N 66900-020	2008-0015-00
	1	Ribbon cable, 20 conductor, Spectra P/N 8431352801020	2501-0006-00
6.15C	1	Cable assembly, 26 conductor as per drawing AS5371-1	9020-5371-01
	2	Conductor, 14-pin female w/Strain Relief, Berg P/N 66900-014	2007-0037-00
	1	Connector, 26-pin female, 3M P/N 3399-6026	2008-0033-00
	1	Cable, 26-pin flat, Spectra P/N 8431352801026	2501-0011-00
6.15D	1	Cable Assembly, 26 conductor, as per drawing AS5371-2	9020-5371-02
	2	Connector, 14-pin female with S.R., Berg P/N 66900-014	2007-0037-00
	1	Connector, 26-pin female, 3M 3399-6026	2008-0033-00
	1	Cable, 26-pin flat, Spectra P/N 8431352801026	2501-0011-00

CABLE ASSEMBLIES, (Continued):

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
6.15E	1	Cable assembly, serial connector as per drawing AS5587	9020-5587-00
	1	Connector, 10-pin, 3M P/N 3473-6010	2007-0038-00
	1	Connector, 9-pin D female, Amphenol P/N 84117DEFRA9S	2008-0073-00
	1	Connector, 9-pin "D" Male Amphenol P/N 84117DEFRA9P	
	1	Cable, 10 conductor, Spectra P/N 8431352801010	2501-0012-00
6.15F	1	Cable Assembly, J305 to J905	9020-5591-00
	2	Connector, 10-pin, 3M P/N 3473-6010	2007-0038-00
	1	Cable, 10 conductor, Spectra P/N 8431352801010	2501-0012-00
6.15G	1	Cable Assembly, J306 to J906	9020-5592-00
	2	Connector, 10-pin, 3M P/N 3473-6010	2007-0038-00
	1	Cable, 10 conductor, Spectra P/N 8431352801010	2501-0012-00
6.15H	1	Cable Assembly, J307 to J907	9020-5593-00
	2	Connector, 10-pin, 3M P/N 3473-6010	2007-0038-00
	1	Cable, 10 conductor, Spectra P/N 8431352801010	2501-0012-00
6.15I	1	Cable Assembly, J308 to J908	9020-5594-00
	2	Connector, 10-pin, 3M P/N 3473-6010	2007-0038-00
	1	Cable, 10 conductor, Spectra P/N 8431352801010	2501-0012-00
6.15J	1	Cable Assembly, J107 to J607	9020-5598-00
	2	Connector, 10-pin, 3M P/N 3473-6010	2007-0038-00
	1	Cable, 10 conductor, Spectra P/N 8431352801010	2501-0012-00
6.15K	1	Cable Assembly, J108 to J608	9020-5599-00
	2	Connector, 10-pin, 3M P/N 3473-6010	2007-0038-00
	1	Cable, 10 conductor, Spectra P/N 8431352801010	2501-0012-00

6.15 POWER SUPPLY ASSEMBLY, 9020-4979-00

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
1	1	Jack, 4-conductor female, Calrad P/N 30-453	2013-0016-00
2	1	Power Supply, 12 volts AC, 3.3 amps, Condor P/N WP664012CG	2202-0019-00

MODEL DC848**6.16 MODEL DC848 FINAL ASSEMBLY, 9010-5556-00**

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
	1	Power supply assembly	9020-4979-00
	1	Front panel	9070-5554-00
	2	Side panel	9100-5551-00
	1	Bottom cover	9100-5552-01
	2	Top cover	9100-5552-02
	4	Screw, 8-32 x 3/8", 1000 flat head, phillips, black	1008-8024-00
	4	Screw, 8-32 x 3/8", pan head phillips, gold	1008-8022-00
	4	Screw, 6-32 x 1/4", pan head phillips, gold	1006-0027-00
	6	Screw, 4-40 x 1/4"	1008-4023-00
	1	Printed circuit assembly, UMC-100	9030-5555-00
	1	Back panel assembly	9020-5553-00

6.17 BACK PANEL ASSEMBLY, MODEL DC848, 9020-5553-00

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
	3	Nut, kep, 4-40	1007-0001-00
	3	Jack socket assembly	1005-0045-00
	1	Strain relief, Dennison	2509-0001-00
	1	Tie wrap	2516-0008-00
	1	Solder lug, #4	1003-0004-00
	1	Fuse holder	2802-0003-00
	1	Fuse carrier	2802-0002-00
	1	Fuse, 1/4 ampere, slow-blow	2801-0001-00
	1	Connector, 4-pin, male, Calrad	2013-0005-00
J101	1	Connector, 25-pin D, solder cup, Calrad P/N 30-552A	2004-0034-00
J102	1	Connector, 9-pin male D, solder cup, Calrad P/N 30-550A	2004-3035-00
J103	1	Connector, 9-pin female D, solder cup, Calrad P/N 30-560A	2004-0036-00
P3	1	Connector, 3-pin, Molex	2006-0018-00
	2	Crimp pin, Molex	2006-0016-00
P8	1	Connector, 3-pin, Panduit P/N CE100F24-3	2020-0040-00
P2	1	Connector, 5-pin, Panduit P/N CE100F24-5	2020-0041-00
	3	Bead, ferrite, Mouser P/N 542-FB43-287	2404-0002-00
	3	Bead, ferrite, Mouser P/N 542-FB73-287	2404-0003-00
	1	Shrink tubing, 1/8"	1301-0003-00
	1	Wire, 24 AWG, black	2511-0307-00
	1	Wire, 24 AWG, brown	2511-0318-00
	1	Wire, 24 AWG, red	2511-0320-00
	1	Wire, 24 AWG, orange	2511-0324-00
	1	Wire, 24 AWG, yellow	2511-0323-00
	1	Wire, 20 AWG, black, Teflon	2511-0322-00
	1	Wire, 20 AWG, red, Teflon	2511-0329-00
	1	Wire, 20 AWG, green, Teflon	2511-0354-00
	1	Cover, 3 pin, Panduit P/N EC100F-3	1005-0173-00
	1	Cover, 5 pin, Panduit P/N EC100F-5	1005-0174-00
	1	Shrink tubing, 5/16" diameter, clear	1301-0012-00

6.18 PRINTED CIRCUIT BOARD ASSEMBLY, UMC-100 9030-5555-00

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
PC1	1	Printed circuit board	9040-5555-00
R1-R4	1	Resistor, carbon film, $\frac{1}{4}$ watt $\pm 5\%$, 10Kohm	1402-1002-5D
R5-R8	1	Resistor, carbon film, $\frac{1}{4}$ watt $\pm 5\%$, 10ohm	1402-10R0-5D
R9-R18	1	Resistor, carbon film, $\frac{1}{4}$ watt $\pm 5\%$, 10Kohm	1402-1002-5D
R19-R26	1	Resistor, carbon film, $\frac{1}{4}$ watt $\pm 5\%$, 100Kohm	1402-1003-5D
R28	1	Resistor, carbon film, $\frac{1}{4}$ watt $\pm 5\%$, 2.2Mohm	1402-2204-5D
R29	1	Resistor, carbon film, $\frac{1}{4}$ watt $\pm 5\%$, 7.5ohm	1402-75R0-5D
R33	1	Resistor, carbon film, $\frac{1}{4}$ watt $\pm 5\%$, 100Kohm	1402-1003-5D
R34	1	Resistor, carbon film, $\frac{1}{4}$ watt $\pm 5\%$, 10Kohm	1402-1002-5D
R35-R39	1	Resistor, carbon film, $\frac{1}{4}$ watt $\pm 5\%$, 4.7Kohm	1402-4701-5D
R40	1	Resistor, carbon film, $\frac{1}{4}$ watt $\pm 5\%$, 10Kohm	1402-1002-5D
C1-C2	1	Capacitor, mono, radial, .1uF/50 volts	1511-R104-2I
C3	1	Capacitor, electrolytic radial, 1000uF/16 volts	1513-R108-4E
C4-C5	1	Capacitor, ceramic disc, radial, 10pF/50 volts	1510-R100-2I
C6-C7	1	Capacitor, tantalum, 1.0uF/16 volts	1515-R105-3E
C8-C23	1	Capacitor, mono, radial, .1uF/50 volts	1511-R104-2I
C24-C27	1	Capacitor, tantalum, 22uF/16 volts	1515-R226-2E
C28-C29	1	Capacitor, mono, radial, .1uF/50 volts	1511-R104-2I
D1-D2	1	Diode, 1N4004, rectifier, 1 ampere, 400 volts	1601-4004-00
D3	1	Diode, 1N414B	1601-4148-00
D4	1	Diode, 1N4004, rectifier, 1 ampere, 400 volts	1601-4004-00
D5-D8	1	Light Emitting Diode (LED), red, super brite Stanley P/N ESR3431	1801-0019-00
J1	1	Header, 10 pin, Panduit P/N HLSS100-10	2007-0122-00
J2	1	Header, 5 pin, Panduit P/N HLSS100-5	2007-0121-00
J3	2	Header, 3 pin, Panduit P/N HLSS100-3	2007-0120-00
J4-J7	1	Header, 10 pin, Panduit P/N HLSS100-10	2007-0122-00
J8	2	Header, 3 pin, Panduit P/N HLSS100-3	2007-0120-00
Q1	1	Transistor, 2N5210, NPN	1602-5210-00

PRINTED CIRCUIT BOARD ASSEMBLY, UMC-100, (Continued):

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
U1-U2	1	Integrated circuit, 75176	1603-0107-00
U3	1	Integrated circuit, 74HC04, hex inverter	1603-0056-00
U4	1	Integrated circuit, LM317CT, voltage regulator	1603-0125-0T
U5	1	Integrated circuit, 63A03R	1603-0126-00
U6	1	Integrated circuit, 74HC00, quad 2-input NAND gate	1603-0055-00
U7	1	Integrated circuit, 4047	1603-4047-00
U8	1	Integrated circuit, 74HC573	1603-0110-00
U9	1	Integrated circuit, 74HC139	1603-0111-00
U10	1	Integrated circuit, 27C256	1603-0112-00
U11	1	Integrated circuit, HM6264	1603-0123-00
U12	1	Integrated circuit, 74HC139	1603-0111-00
U13	1	Integrated circuit, 74HC574	1603-0121-00
U14	1	Integrated circuit, 63A50	1603-0122-00
U15-U16	1	Integrated circuit, 74HC574	1603-0121-00
U17	1	Integrated circuit, MC14526	1603-0124-00
U18	1	Integrated circuit, 74HC574	1603-0121-00
U19	1	Integrated circuit, MAX232	1603-0119-00
U20	1	Integrated circuit, 74HC574	1603-0121-00
Y1	1	Crystal, 4.9152 megahertz	3301-0005-00
XU1	1	Integrated circuit socket, 8 pin, DIL8P-108	2001-0001-00
XU2	1	Integrated circuit socket, 8 pin, DIL8P-108	2001-0001-00
XU3	1	Integrated circuit socket, 14 pin, DIL14P-108	2001-0002-00
XU5	1	Integrated circuit socket, 40 pin, ICT-406-S-X	2001-0017-00
XU6	1	Integrated circuit socket, 14 pin, DIL14P-108	2001-0002-00
XU7	1	Integrated circuit socket, 14 pin, DIL14P-108	2001-0002-00
XU9	1	Integrated circuit socket, 16 pin, DIL16P-108	2001-0003-00
XU10	1	Integrated circuit socket, 28 pin, ICT-286-S-X	2001-0037-00
XU11	1	Integrated circuit socket, Smart P/N DS1213	2001-0035-00
XU12	1	Integrated circuit socket, 16 pin, DIL16P-108	2001-0003-00
XU13	1	Integrated circuit socket, 20 pin, DIL20P	2001-0036-00
XU14	1	Integrated circuit socket, 24 pin, ICT-246-S-X	2001-0016-00
XU15	1	Integrated circuit socket, 20 pin, DIL20P	2001-0036-00
XU16	1	Integrated circuit socket, 20 pin, DIL20P	2001-0036-00
XU17	1	Integrated circuit socket, 16 pin, DIL16P-108	2001-0003-00
XU18	1	Integrated circuit socket, 20 pin, DIL20P	2001-0036-00
XU19	1	Integrated circuit socket, 16 pin, DIL16P-108	2001-0003-00
XU20	1	Integrated circuit socket, 20 pin, DIL20P	2001-0036-00

6.19 DC848 POWER SUPPLY ASSEMBLY, 9020-4979-00

<u>REF#</u>	<u>QTY</u>	<u>DESCRIPTION</u>	<u>RTS PART NUMBER</u>
-	1	Jack, 4 conductor female, Calrad P/N 30-453	2013-0016-00
-	1	Power Supply, 12 volts ac, 3.3 amperes, Condor P/N WP664012CG	2202-0019-00

SECTION 7: DRAWINGS

Model 848A

RTS Systems

Document

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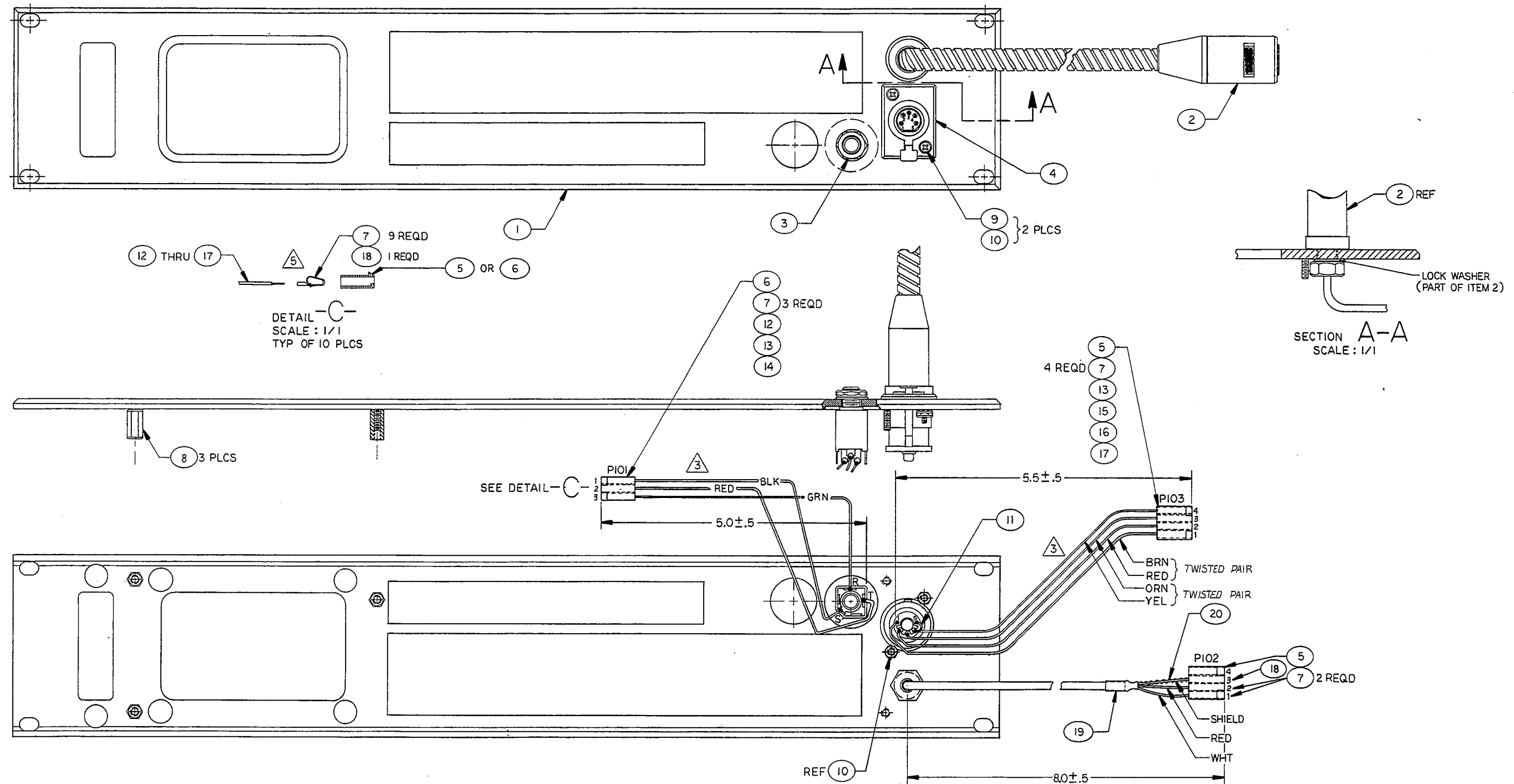
Model DC848

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8. INSTALL TOP(ITEM18) USING ITEM 8(4 PLCS).
7. ADJUST AND TIGHTEN FRONT PANEL OF ADJUSTMENT BD, ITEM 3.
6. INSTALL ALL CABLE ASSEMBLIES AND PLUG IN ALL CONNECTORS. USING WIRING DIAGRAM WD5545, FOR REF.
5. INSTALL ITEM 4 USING ITEMS 10 & 11(4 PLCS), & ITEM 8(2 PLCS).
4. INSTALL BOTTOM(ITEM19) TO ITEM 5 USING ITEM 8(8 PLCS).
- ③ 3. PLACE ITEM 5 INTO SLOT OF ITEM 3. SEE ABOVE VIEW.
2. ASSEMBLE ITEM 1 TO ITEM 2 USING ITEMS 8,9 & 12.
1. ASSEMBLE ITEMS 3 & 6 TO ITEM 2 USING ITEM 10(4 PLCS).

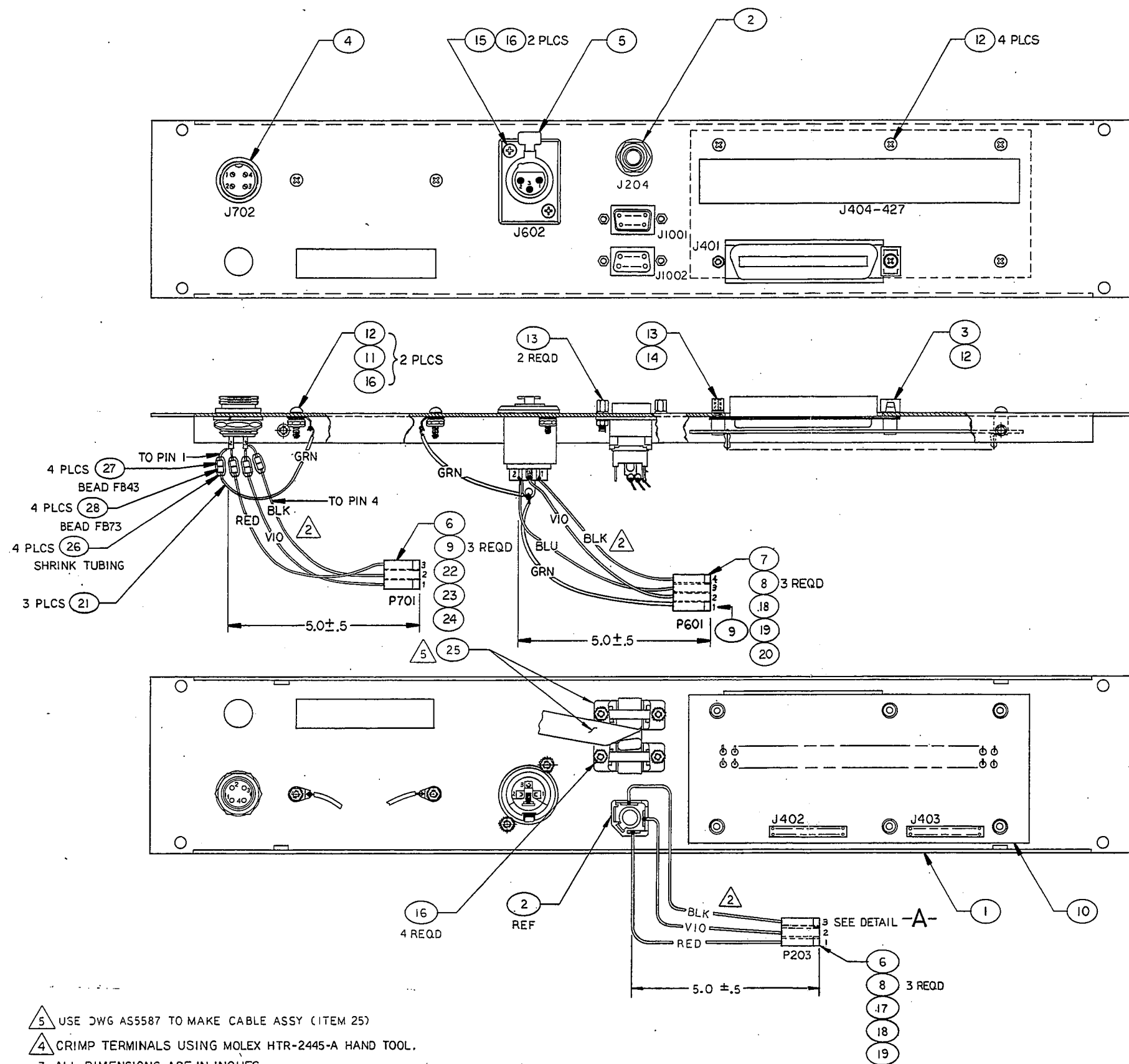
ASSEMBLY INSTRUCTIONS:

AS5545
Final Assembly, Model 848A

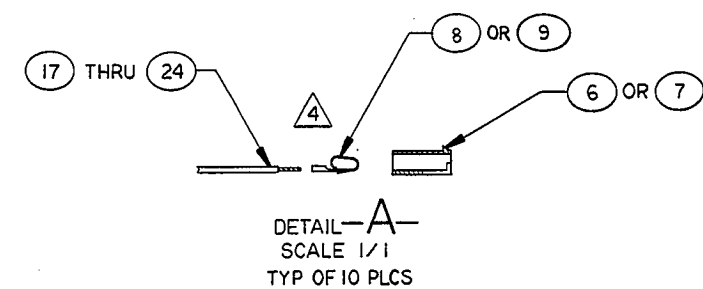


- 5 CRIMP TERMINALS USING MOLEX HTR-2445-A HAND TOOL.
 4. SEE WIRING DIAGRAM WD5545, FOR REF.
 3 TWIST WIRES AFTER ASSEMBLY.
 2 NOT USED
 1. ALL DIMENSIONS ARE IN INCHES.
 NOTES:

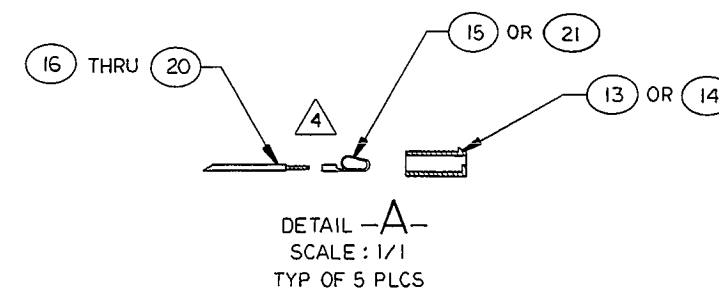
AS5543
 Final Assembly, Model 848A Front Panel



- 5 USE DWG AS5587 TO MAKE CABLE ASSY (ITEM 25)
- 4 CRIMP TERMINALS USING MOLEX HTR-2445-A HAND TOOL.
3. ALL DIMENSIONS ARE IN INCHES.
- 2 TWIST WIRES AFTER ASSY.
1. SEE WIRING DIAGRAM WD5545 FOR REF.
- NOTES:

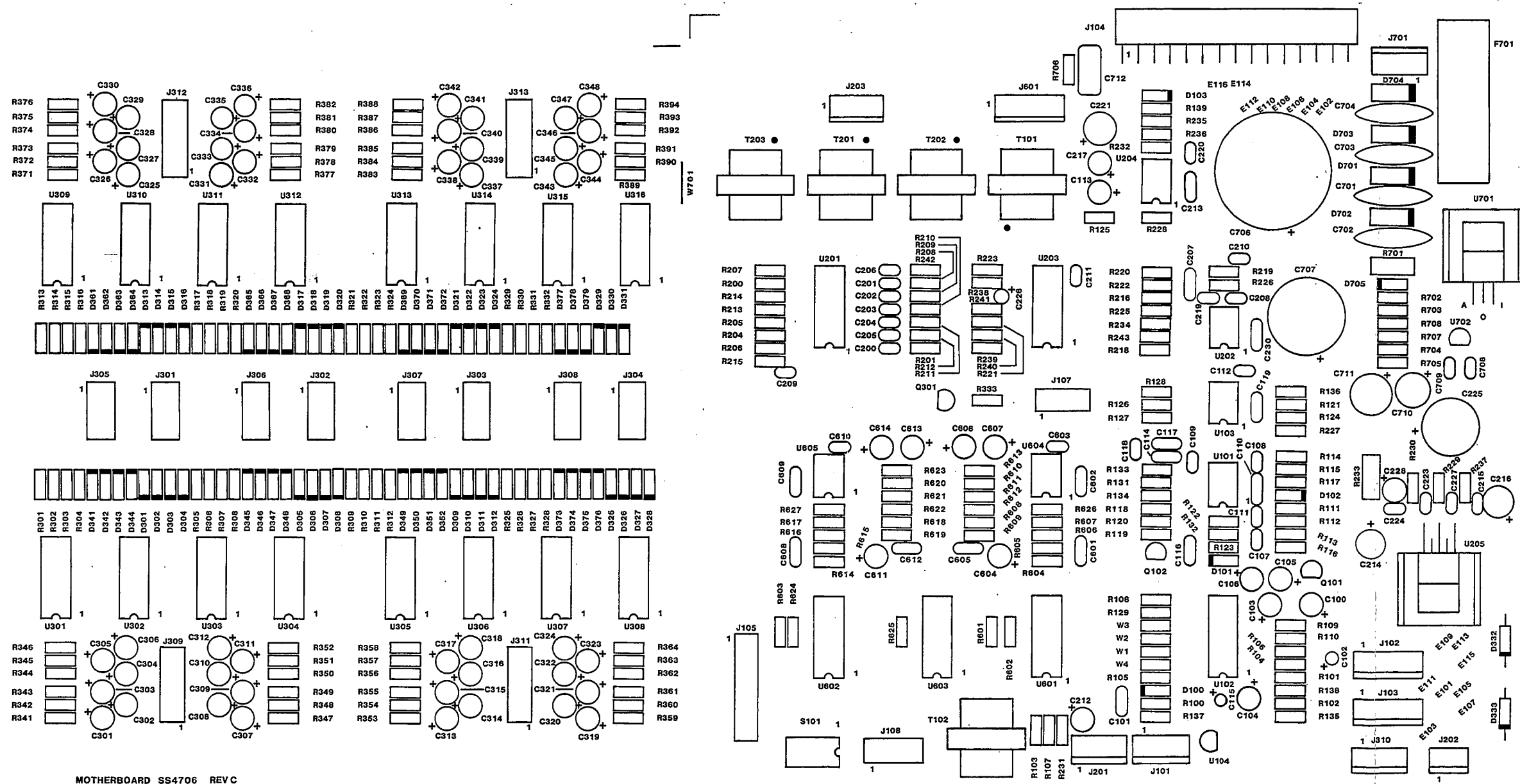


AS5542
Final Assembly, Model 848A Rear Panel

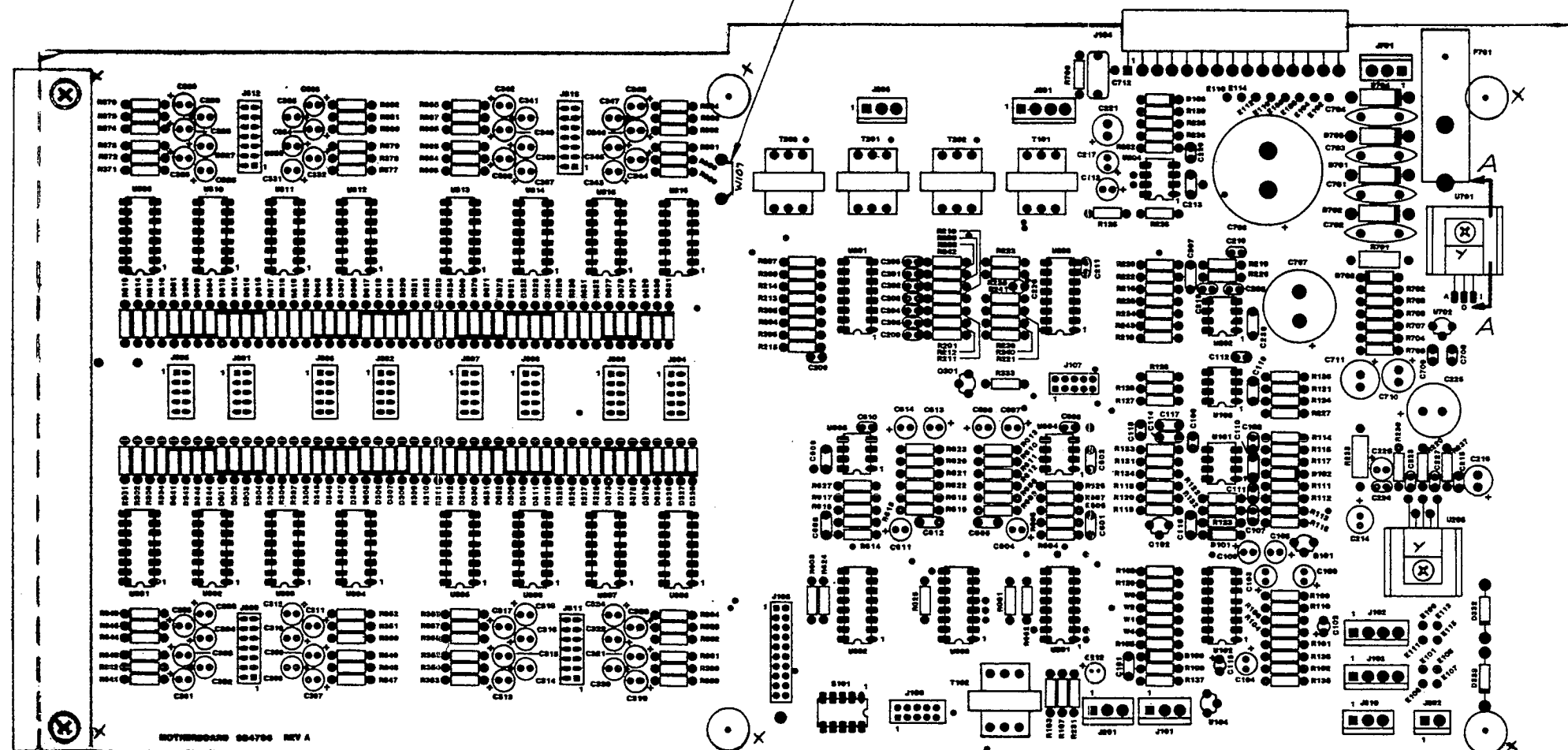
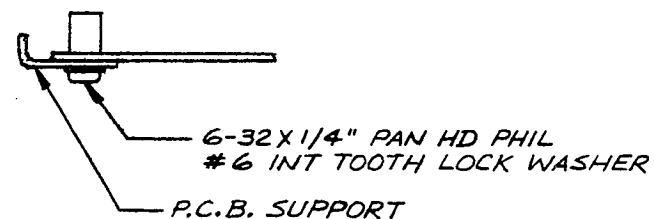


- NOTES

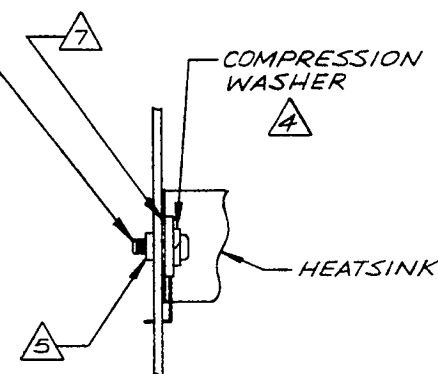
Page 7-5



AS4706
 Assembly Diagram, Model 848A Mother Board
 Page 1 of 2



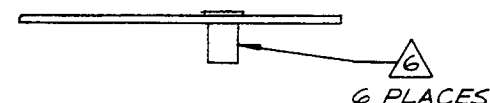
4-40 X 5/16"
PAN HD SCREW

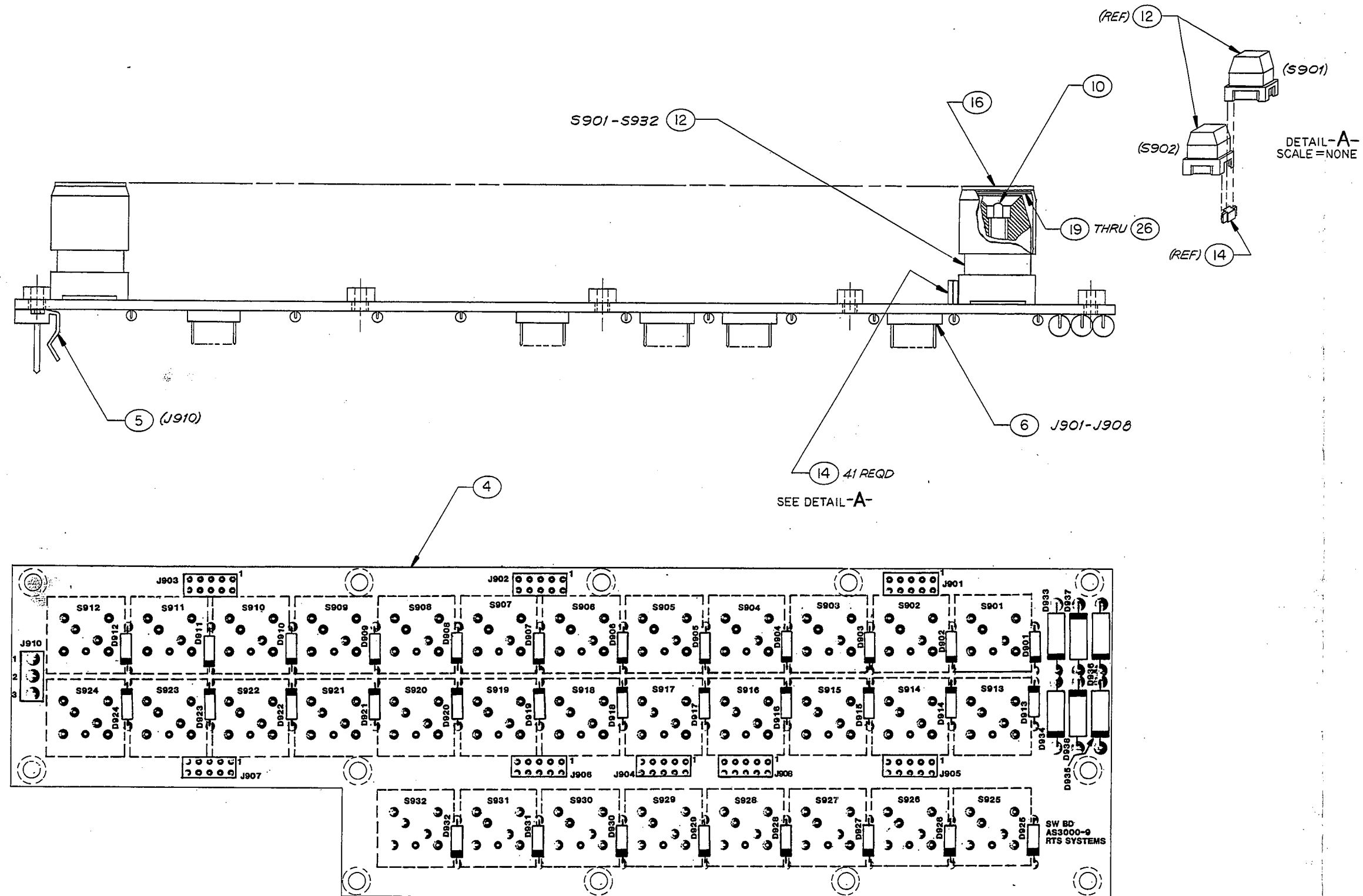


SECTION A-A
2 PLACES (U701 & U205)

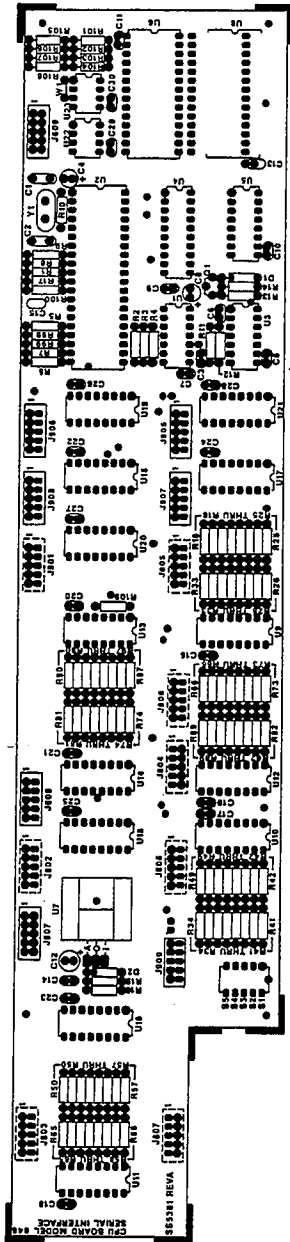
WIRE CHART ²		
TO	FROM	COLOR
E101	E102	WHT
E103	E104	BLK
E105	E108	RED
E107	E106	BRN
E109	E110	PRP
E111	E112	GRY
E113	E114	BLU
E115	E116	GRN

1. APPLY THERMAL GREASE BETWEEN HEATSINKS AND U701 & U205
 2. INSTALL 5/16" SWAGE STANDOFF (6 PLACES MARKED 'X')
 3. INSTALL PEM NUT KF2-440, RTS P/N 1005-0114-00, (2 PLACES MARKED 'Y'). INSTALL FROM CIRCUIT SIDE.
 4. APPLY TORQUE UNTIL COMPRESSION WASHER IS DEPRESSED TO HALF ITS ORIGINAL HEIGHT
 5. INSTALL JUMPER W107 1/8" OFF BOARD SURFACE
 6. THE FOLLOWING WIRES ARE ARRANGED INTO TWISTED PAIRS: WHT & BLK, BRN & RED, PRP & GRY, BLU & GRN. USE 24 AWG, 3" LG WIRES
 1. FOR PART NO. & DESCRIPTION SEE SEPARATE PARTS LIST 9030-4706-00
- NOTES:





AS3000-09
Assembly Diagram, Model 848A Switch Board

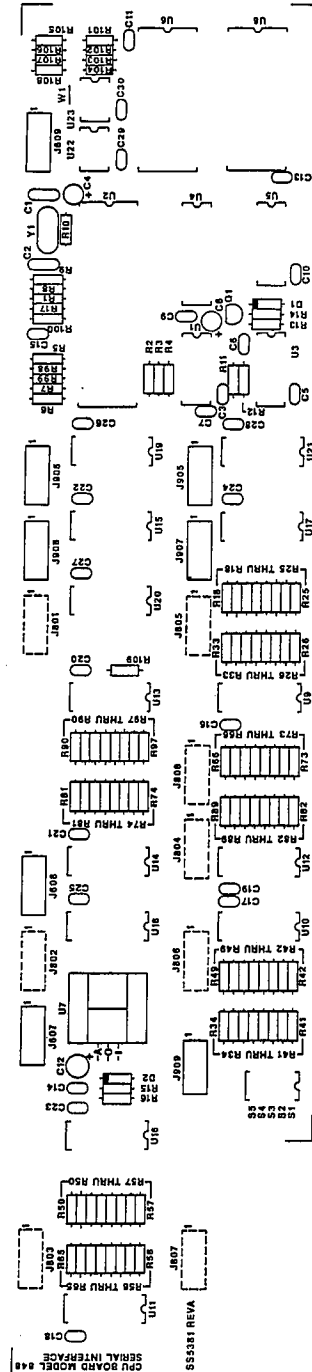


COMPONENT SIDE SHOWN

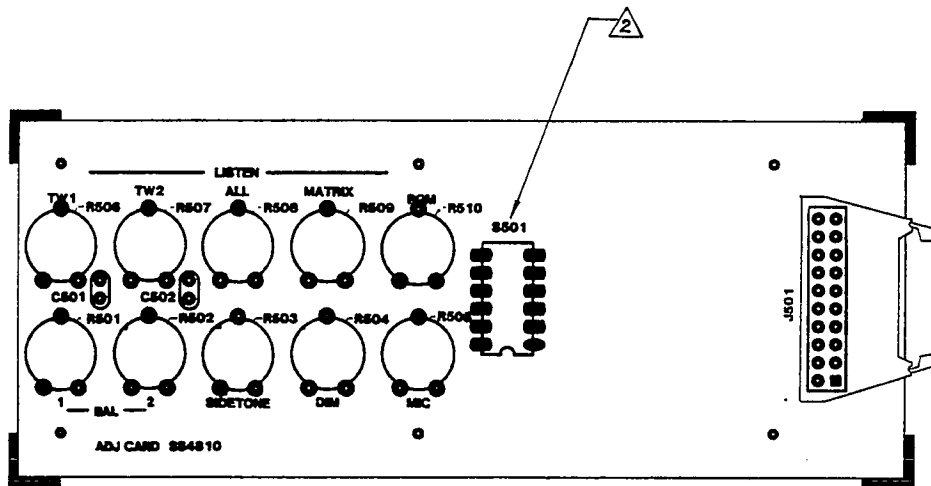
1. ITEM SHOWN WITH DOTTED LINE TO BE INSTALLED FROM CIRCUIT SIDE (B PLACES)

NOTES :

SEE SEPARATE PARTS LIST 9030538100



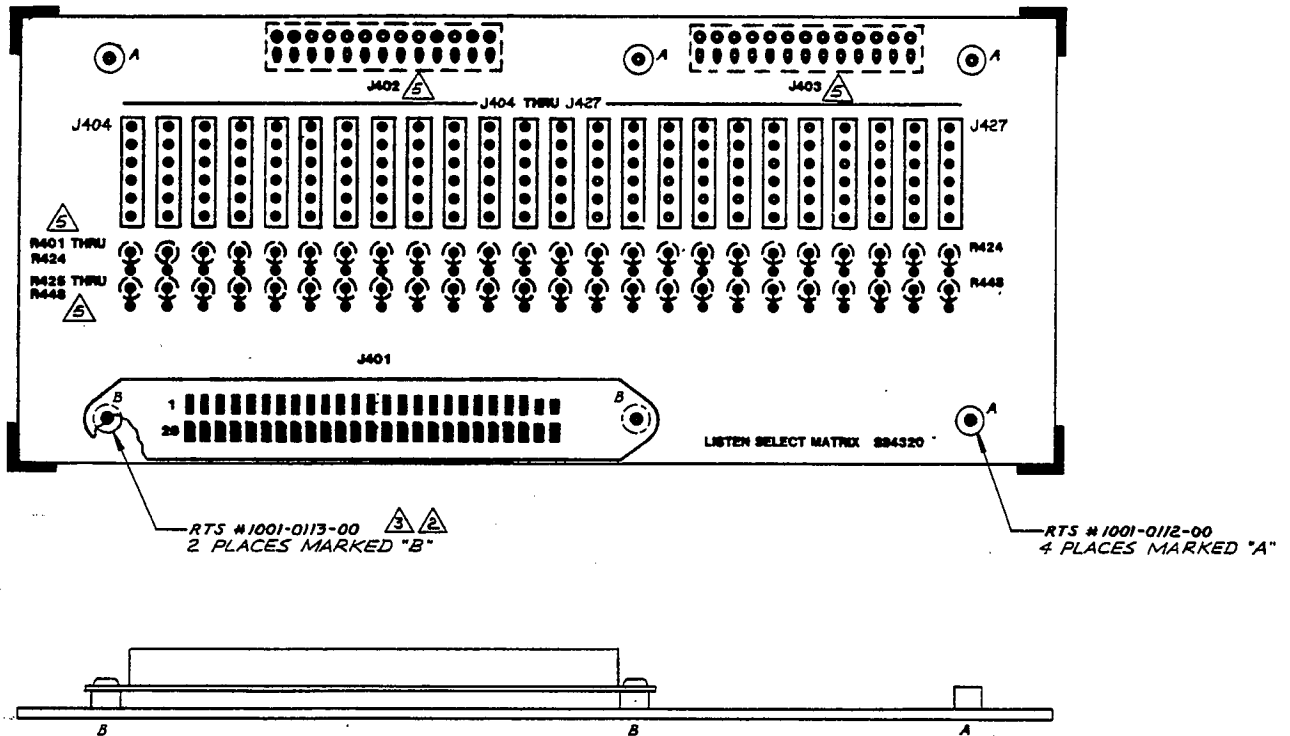
AS5381
Assembly Diagram, Model 848A CPU Board



△ 2 HOLES FOR S501 ARE TO BE MASKED
OFF. (12 HOLES)

FOR PART NO. & DESCRIPTION SEE SEPARATE
PARTS LIST 9030-4810-00.

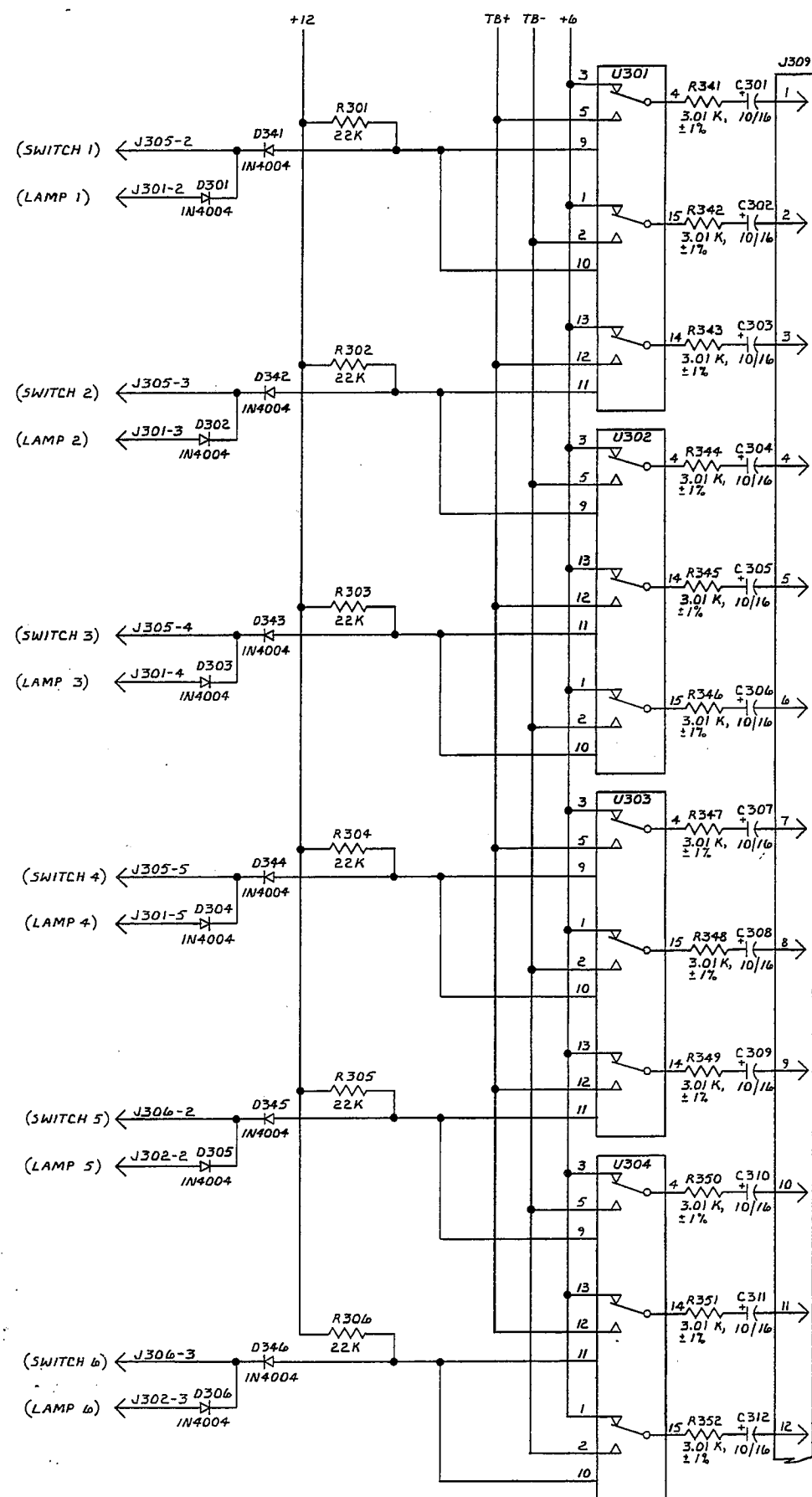
AS4810
Assembly Diagram, Model 848A Adjustment Board



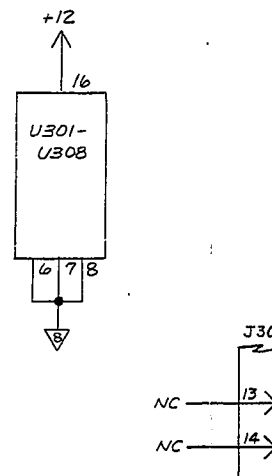
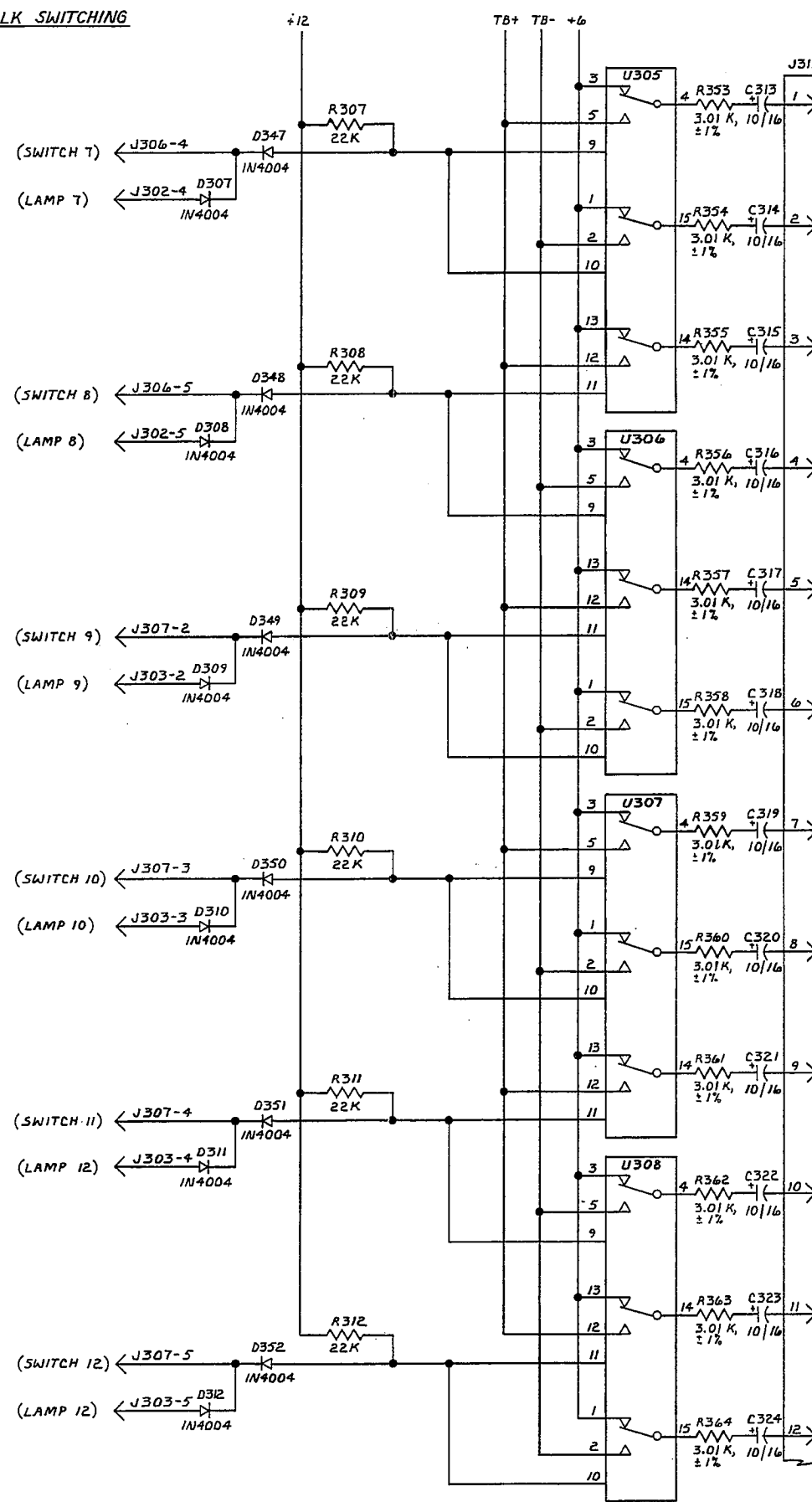
- △ J402, J403, & R401 THRU R448 ARE INSTALLED ON FAR SIDE OF BOARD
- △ SECURE J401 TO STANDOFFS WITH 2 #4-40 X 1/4 SCREWS BEFORE SOLDER OPERATION.
- △ B STANDOFFS MUST BE INSTALLED BEFORE J401.
2. SWAGE IN THREADED STANDOFFS MARKED "A & B".
1. FOR PART NO. & DESCRIPTION SEE SEPARATE PARTS LIST 9030-4320-00.

NOTES:

AS4320
Assembly Diagram, Model 848A Listen Select Matrix Board



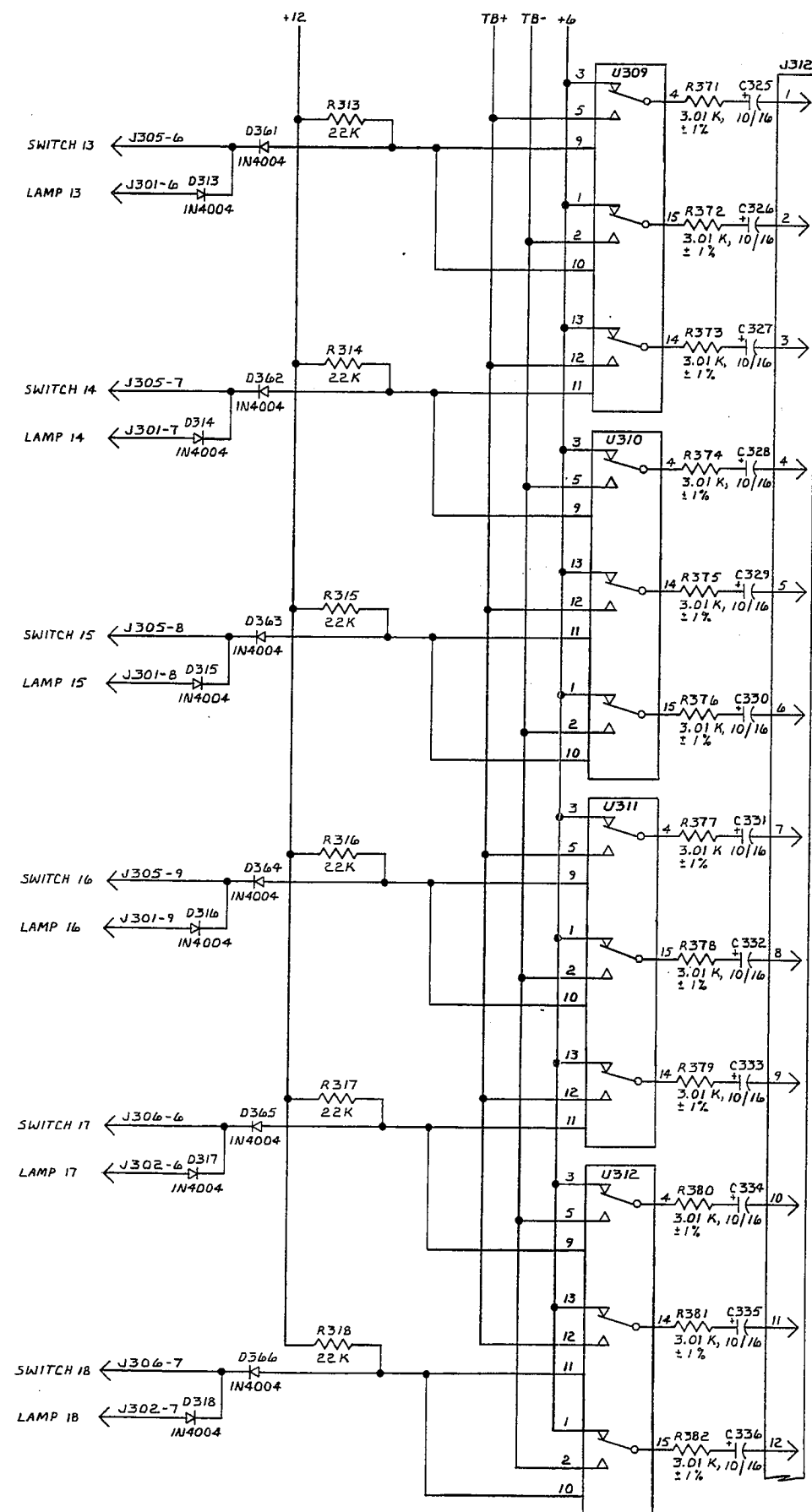
TALK SWITCHING



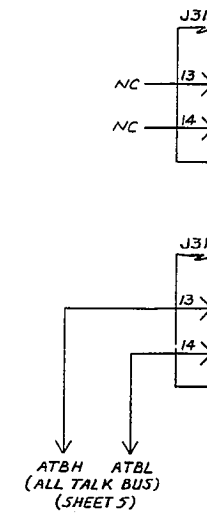
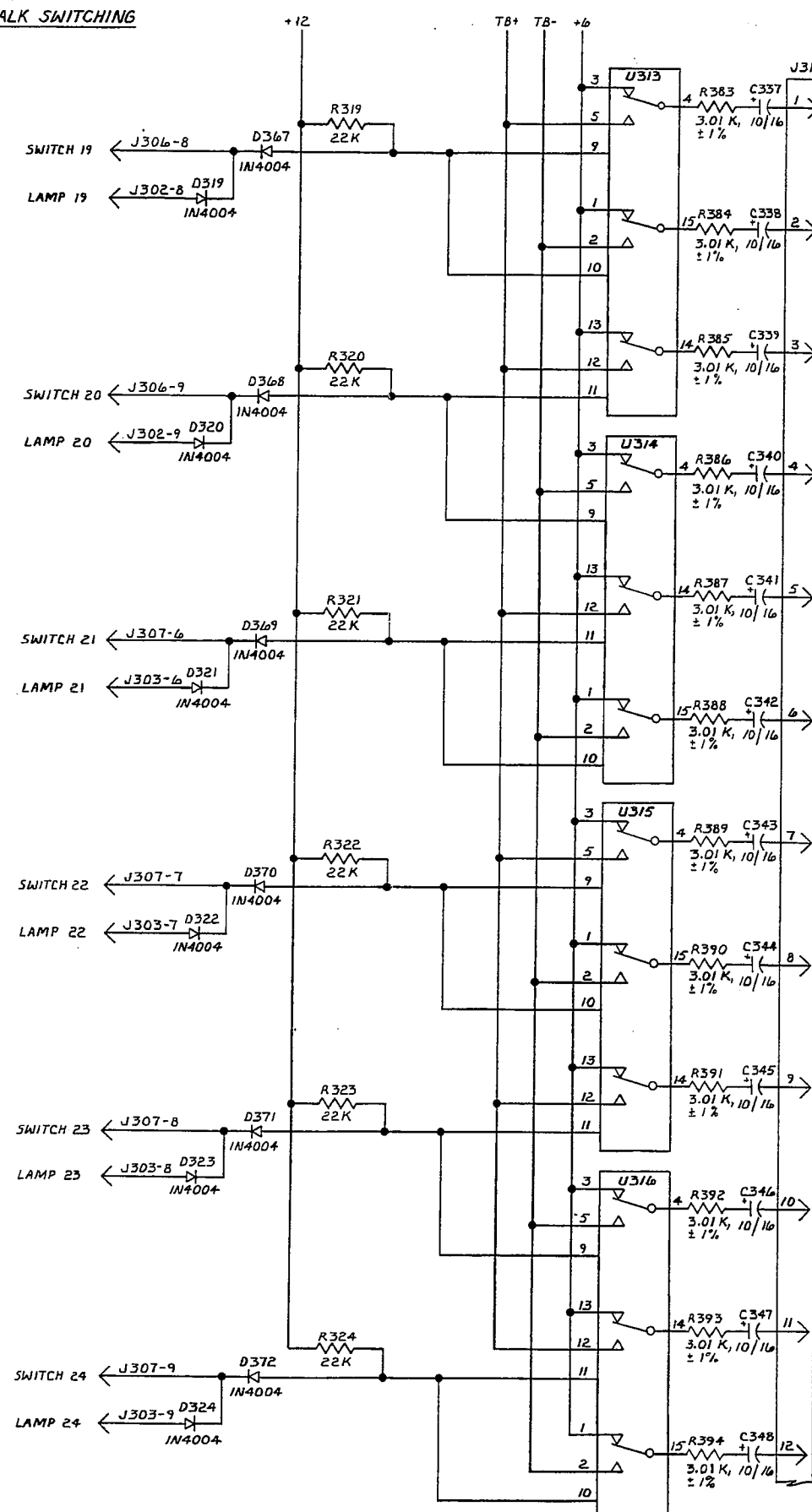
LB HI
(LISTEN BUS)
(SHEET 5)

2. CAPACITANCE VALUE SHOWN MICROFARADS/VOLTS.
1. ALL RESISTORS ARE 1/4W, $\pm 5\%$ CARBON FILM.
NOTES: (UNLESS OTHERWISE SPECIFIED)

SD4706
Schematic Diagram, Model-848 Motherboard
Page 1 of 7

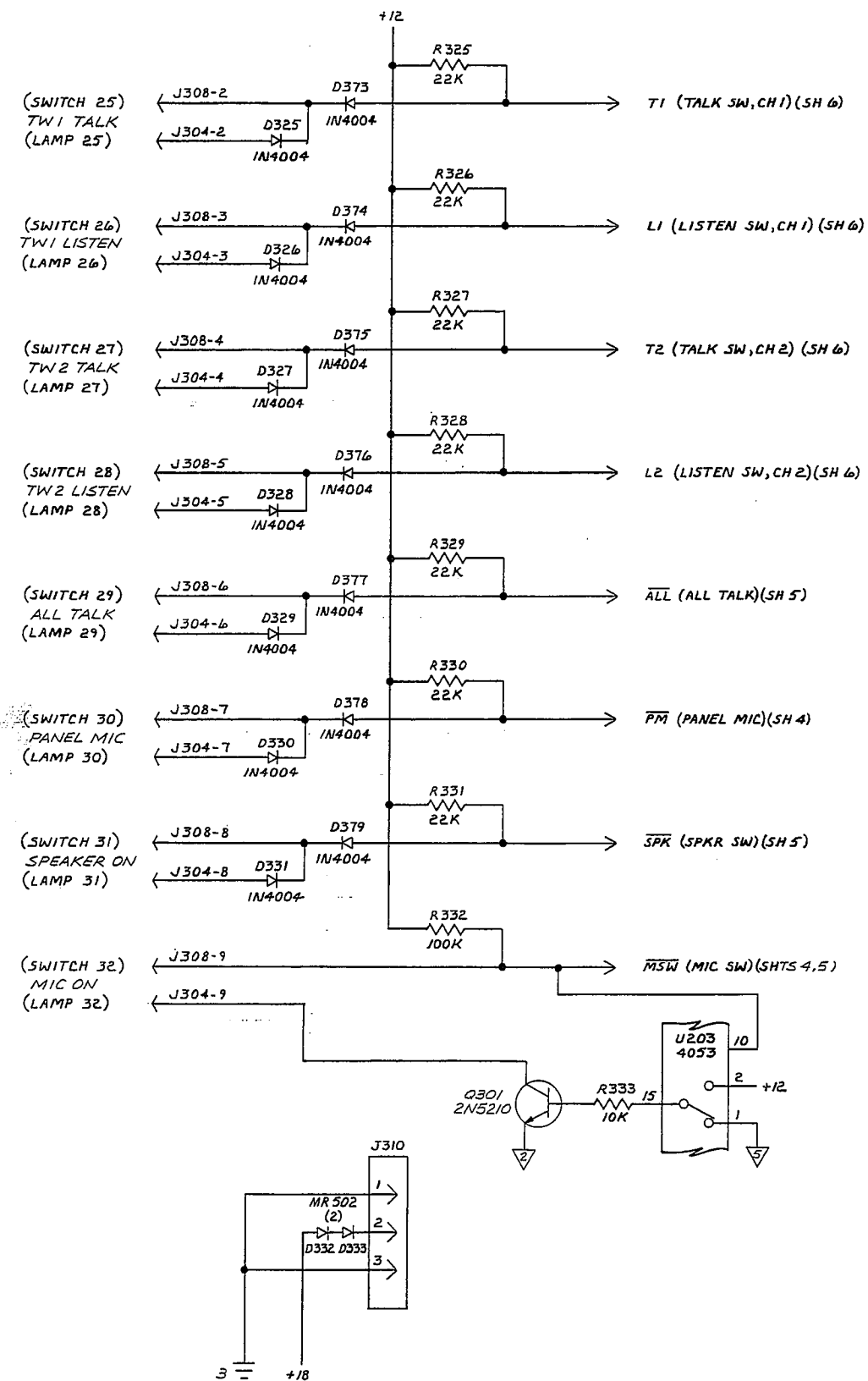


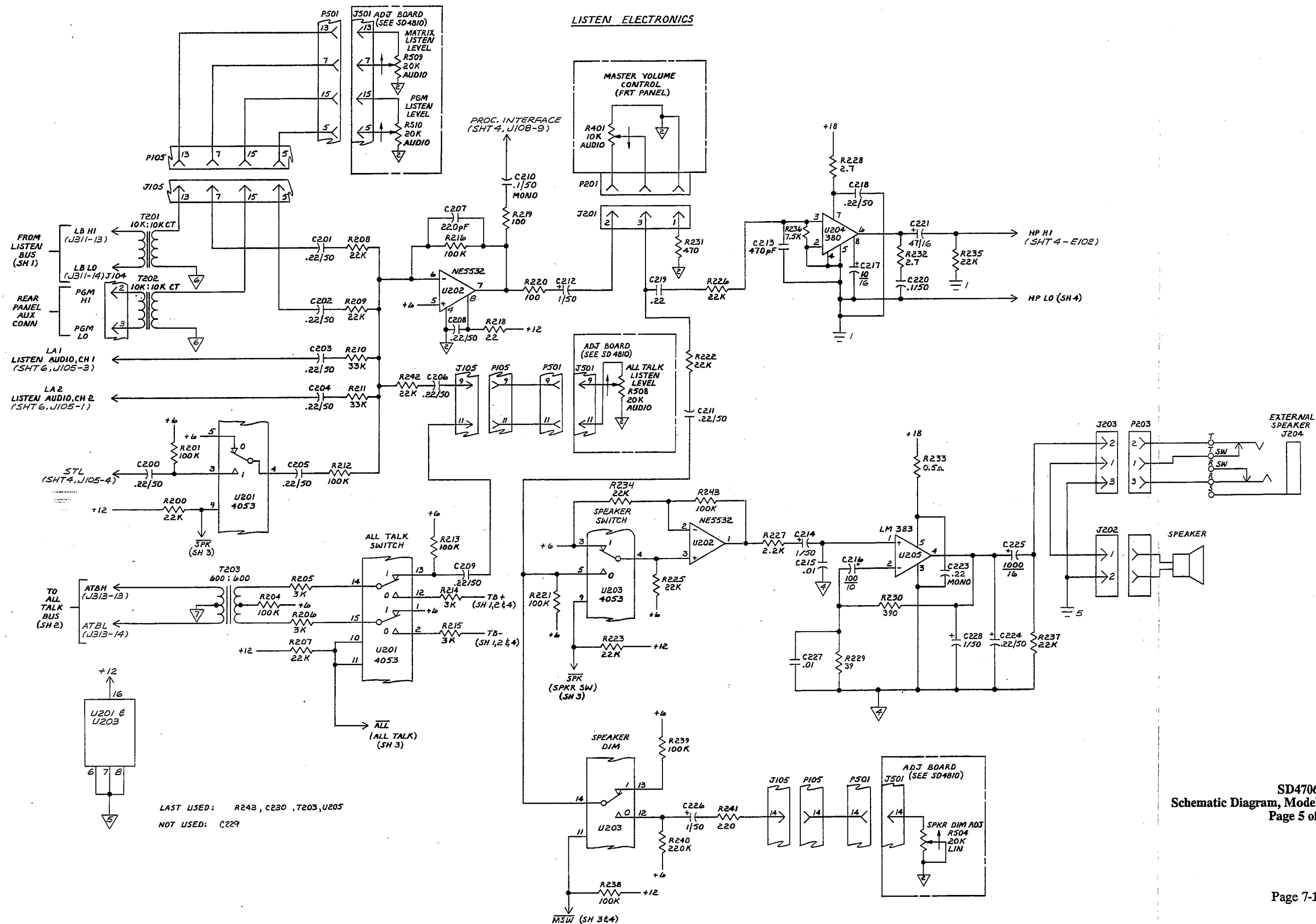
TALK SWITCHING

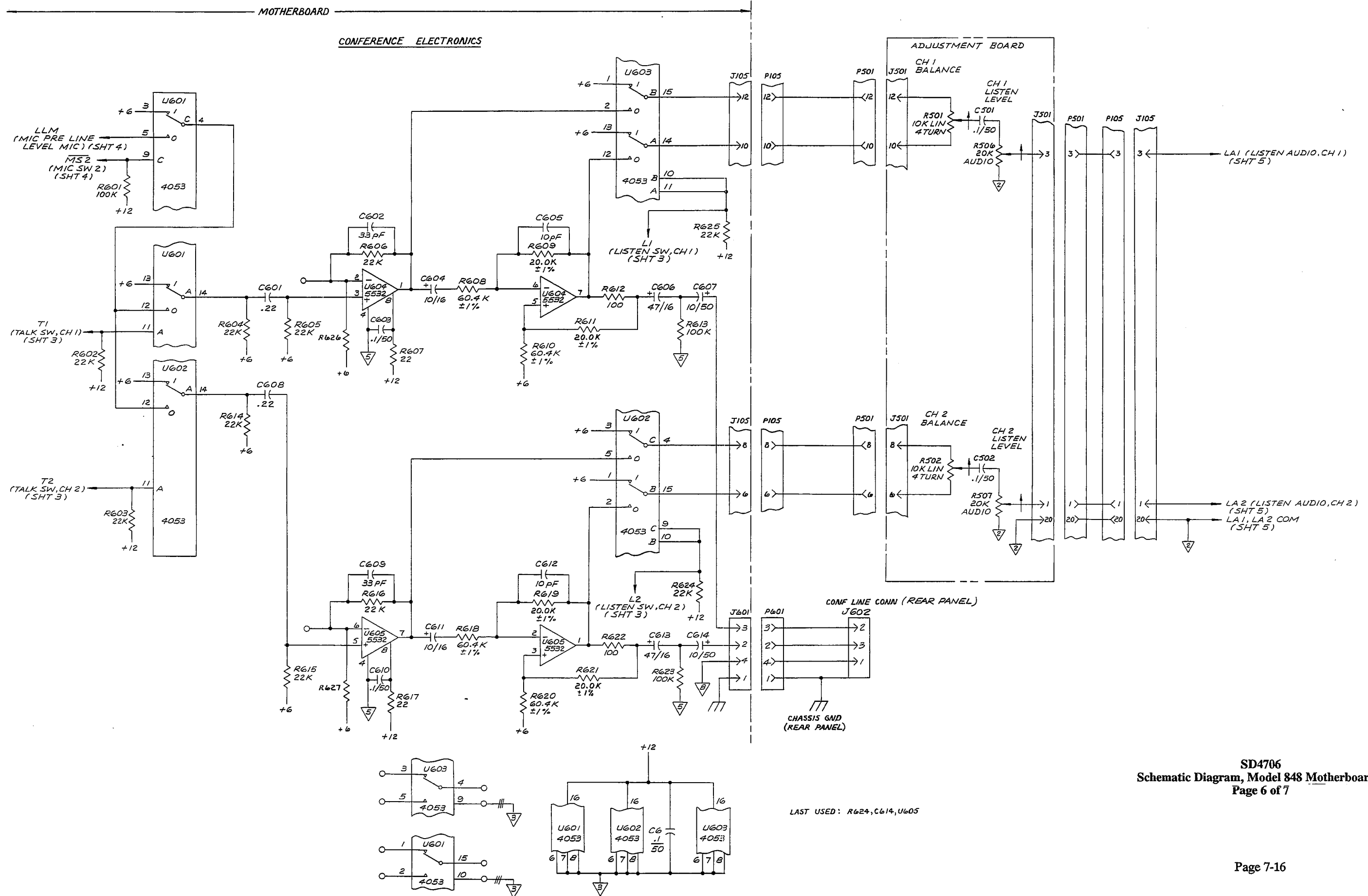


SD4706
Schematic Diagram, Model 848 Motherboard
Page 2 of 7

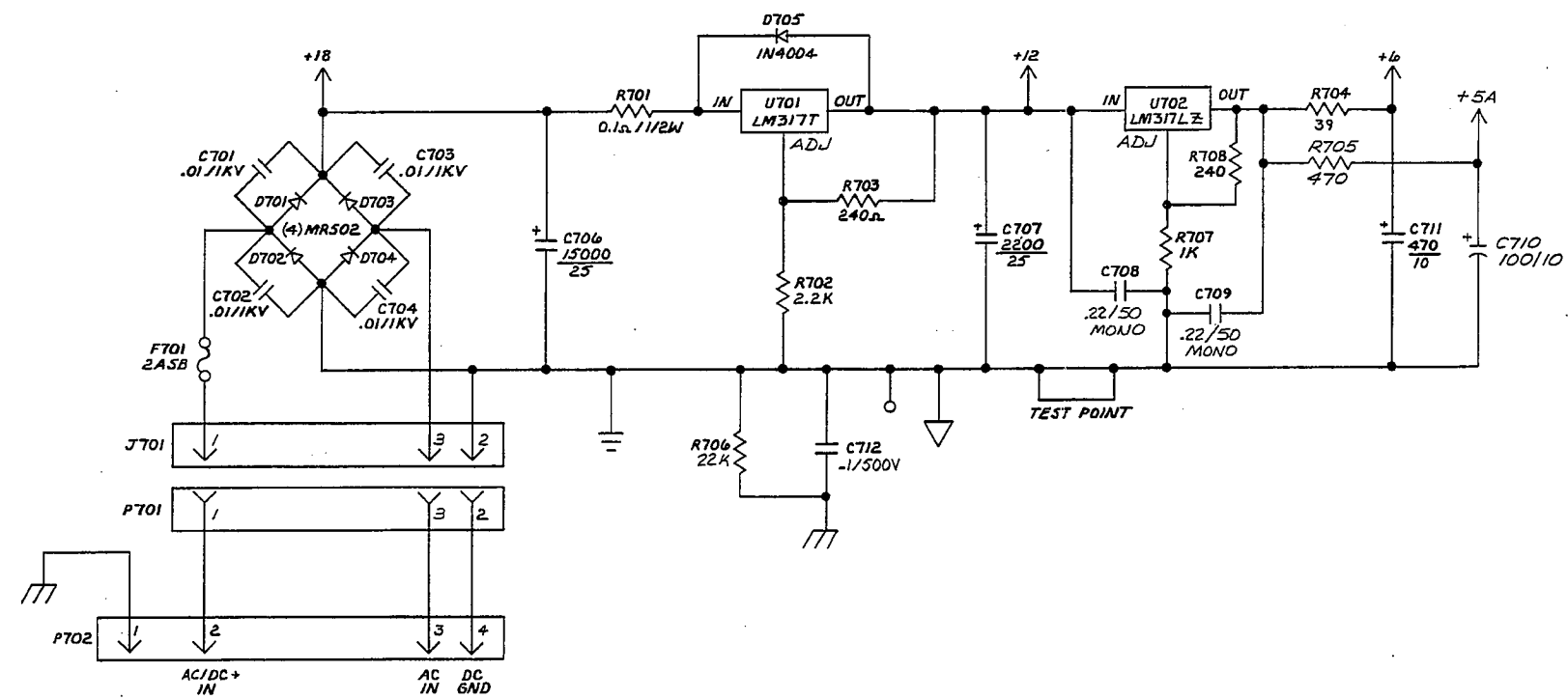
TALK SWITCHING

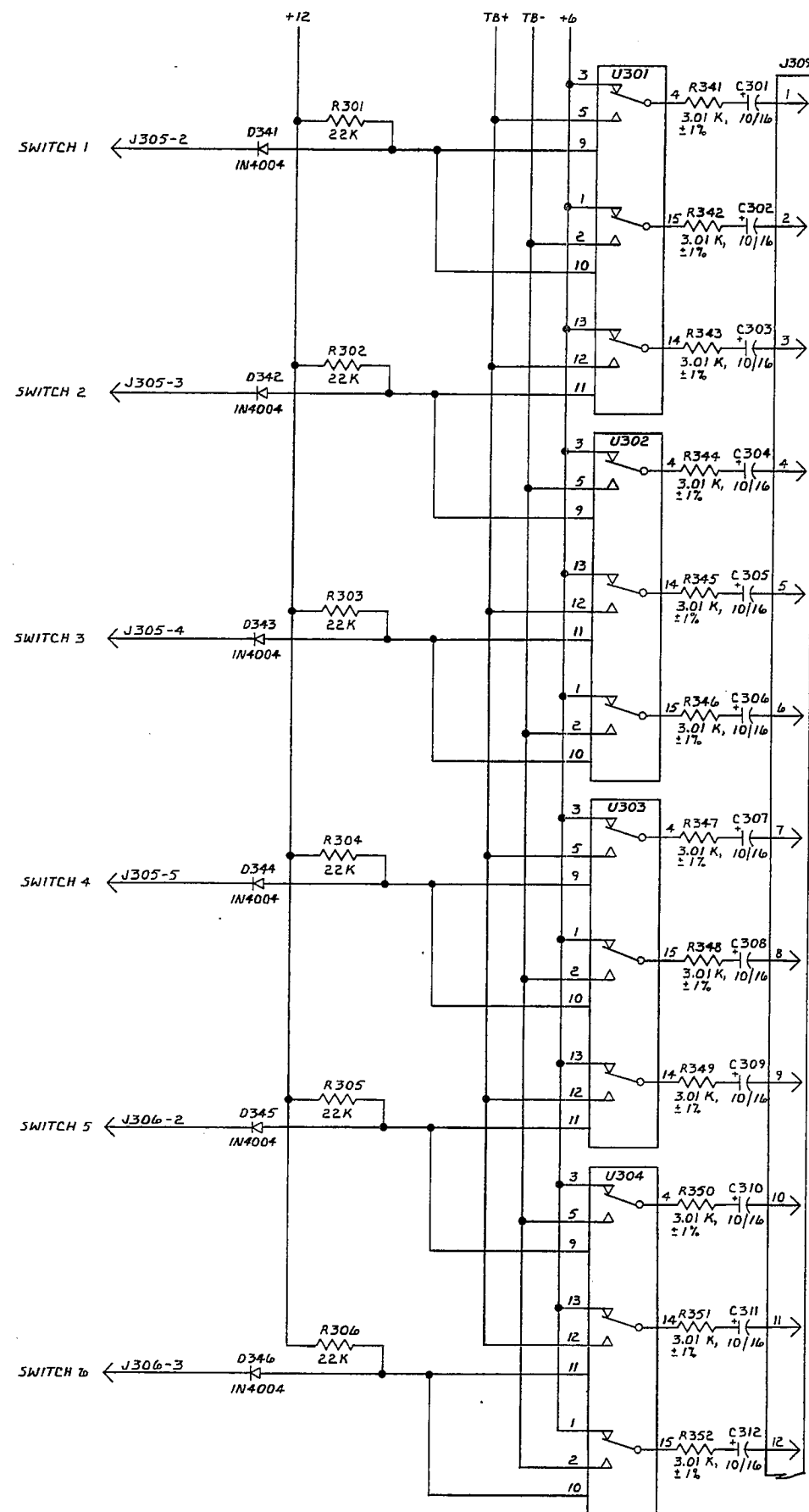




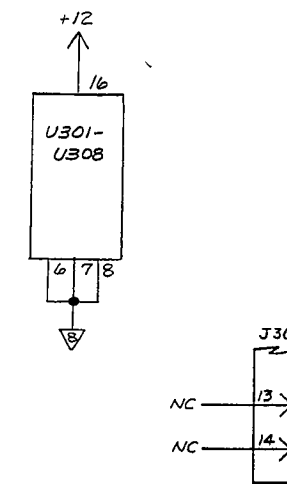
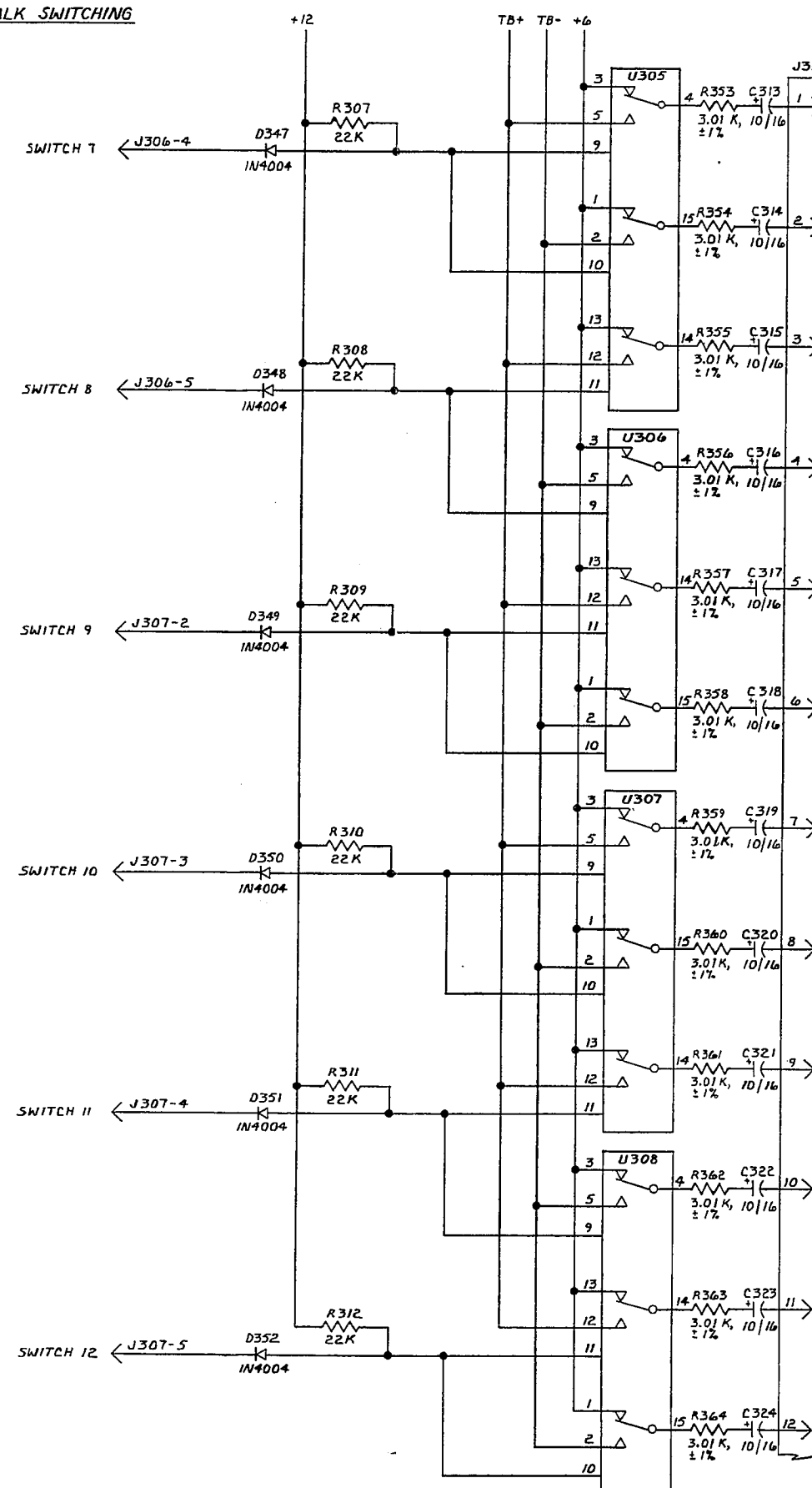


RECTIFIER / FILTER / REGULATORS

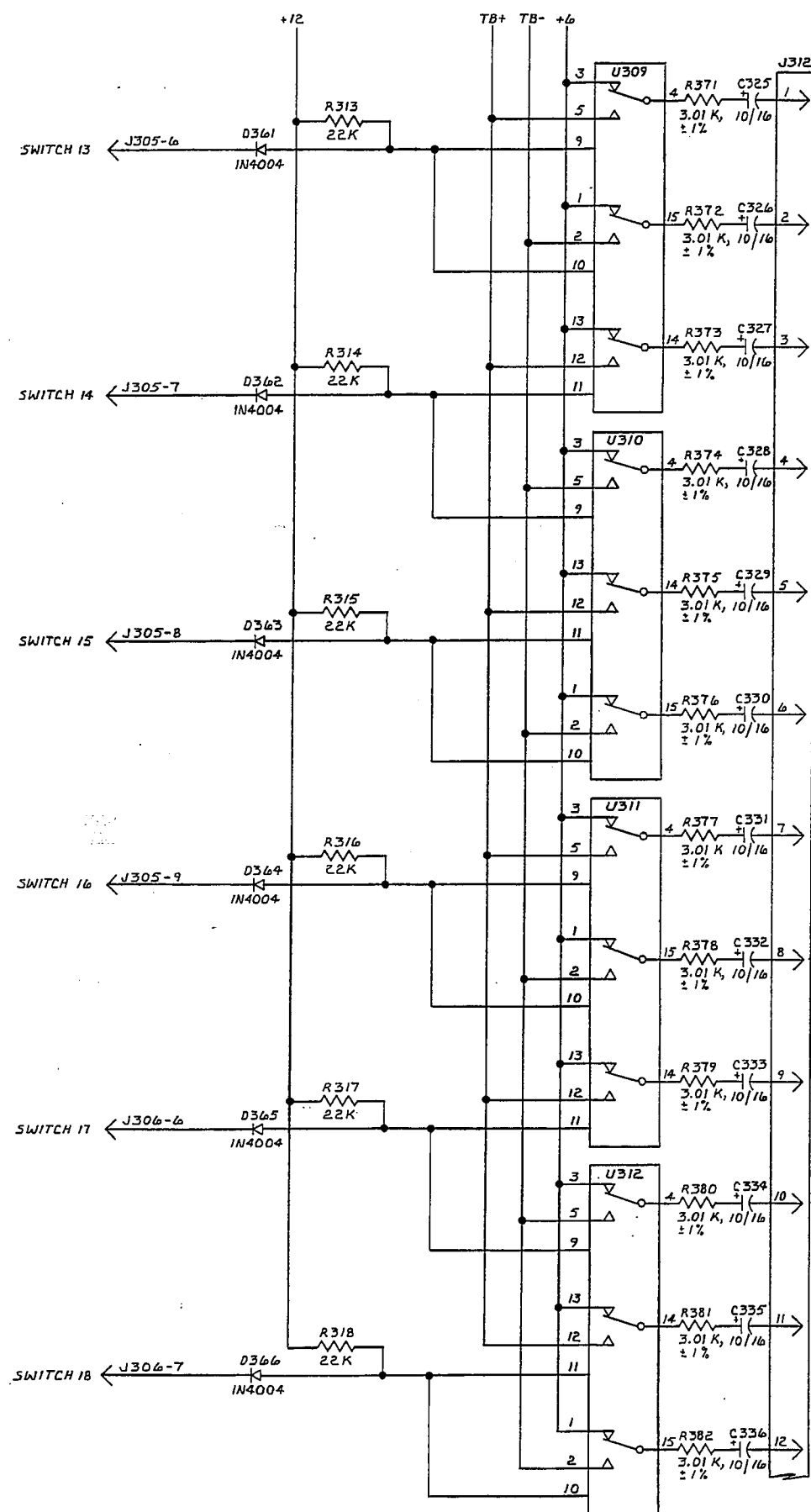




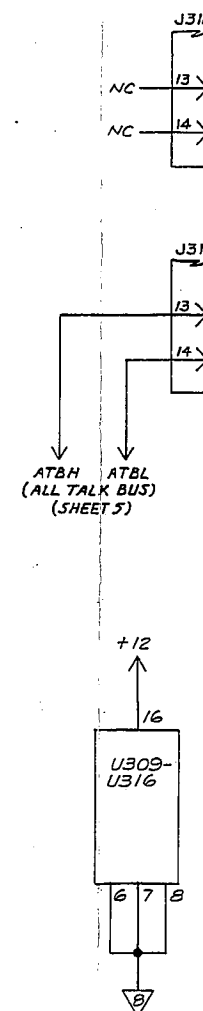
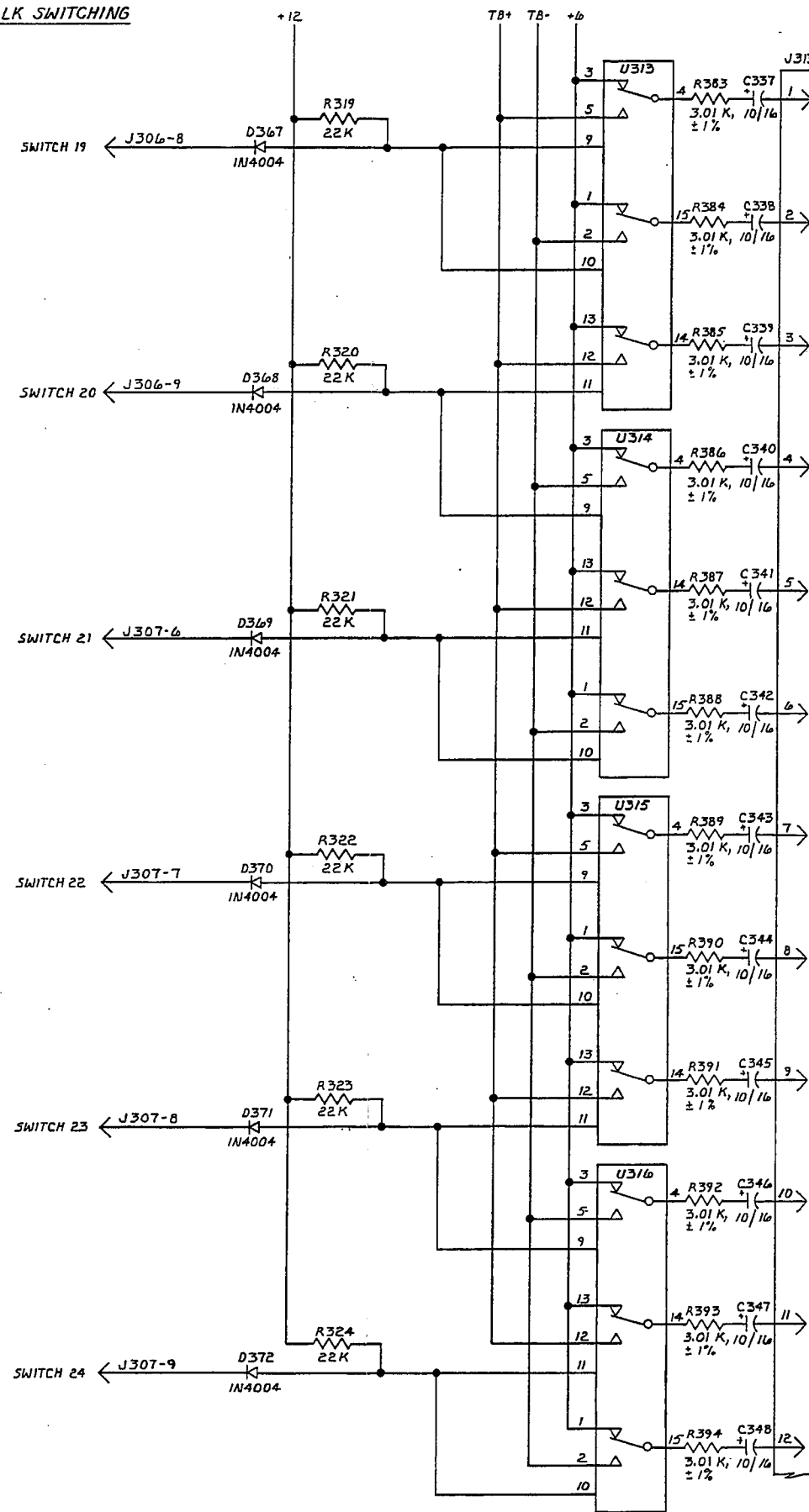
TALK SWITCHING

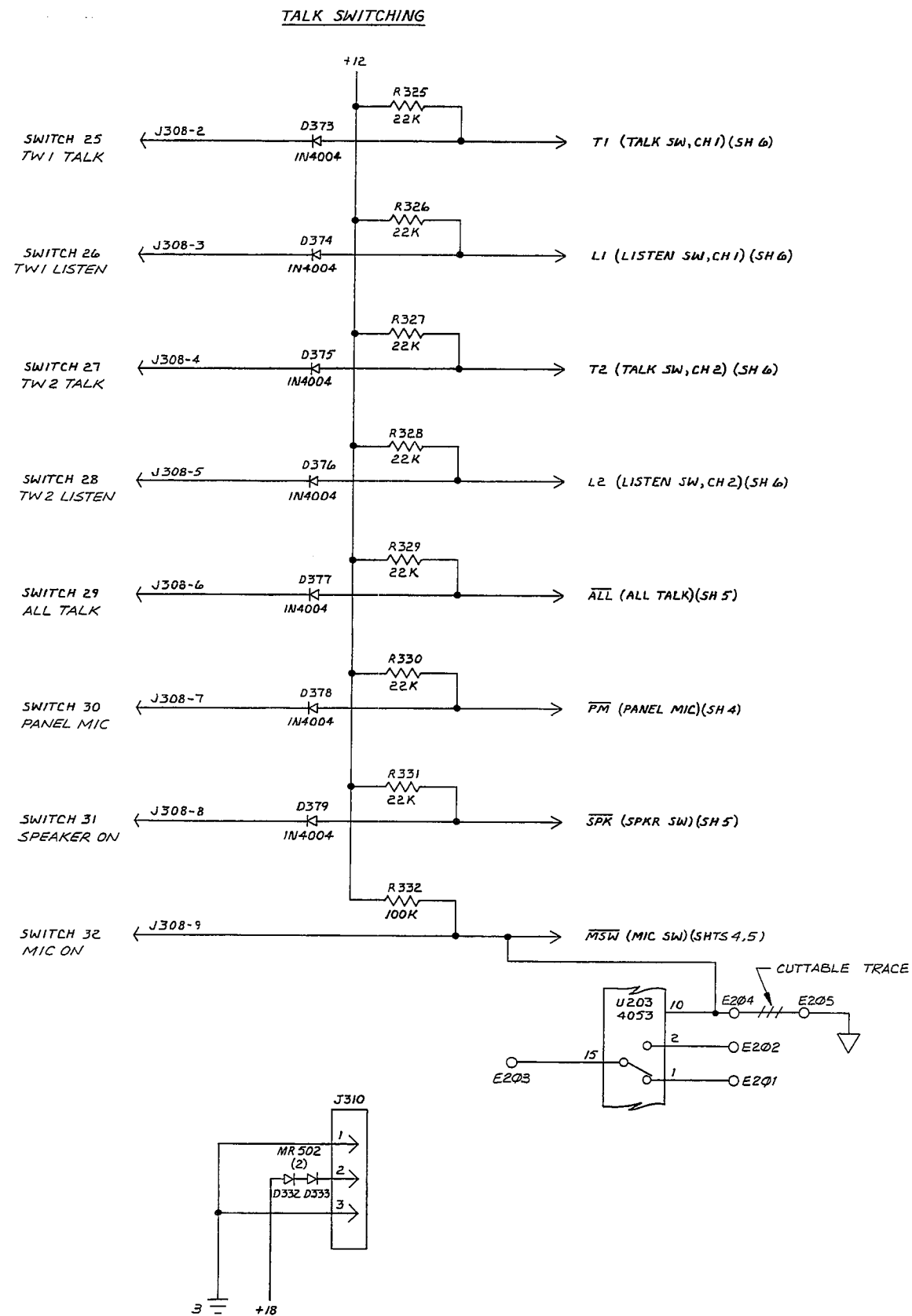


2. CAPACITANCE VALUE SHOWN MICROFARADS/VOLTS.
1. ALL RESISTORS ARE 1/4W, $\pm 5\%$ CARBON FILM.
NOTES: (UNLESS OTHERWISE SPECIFIED)

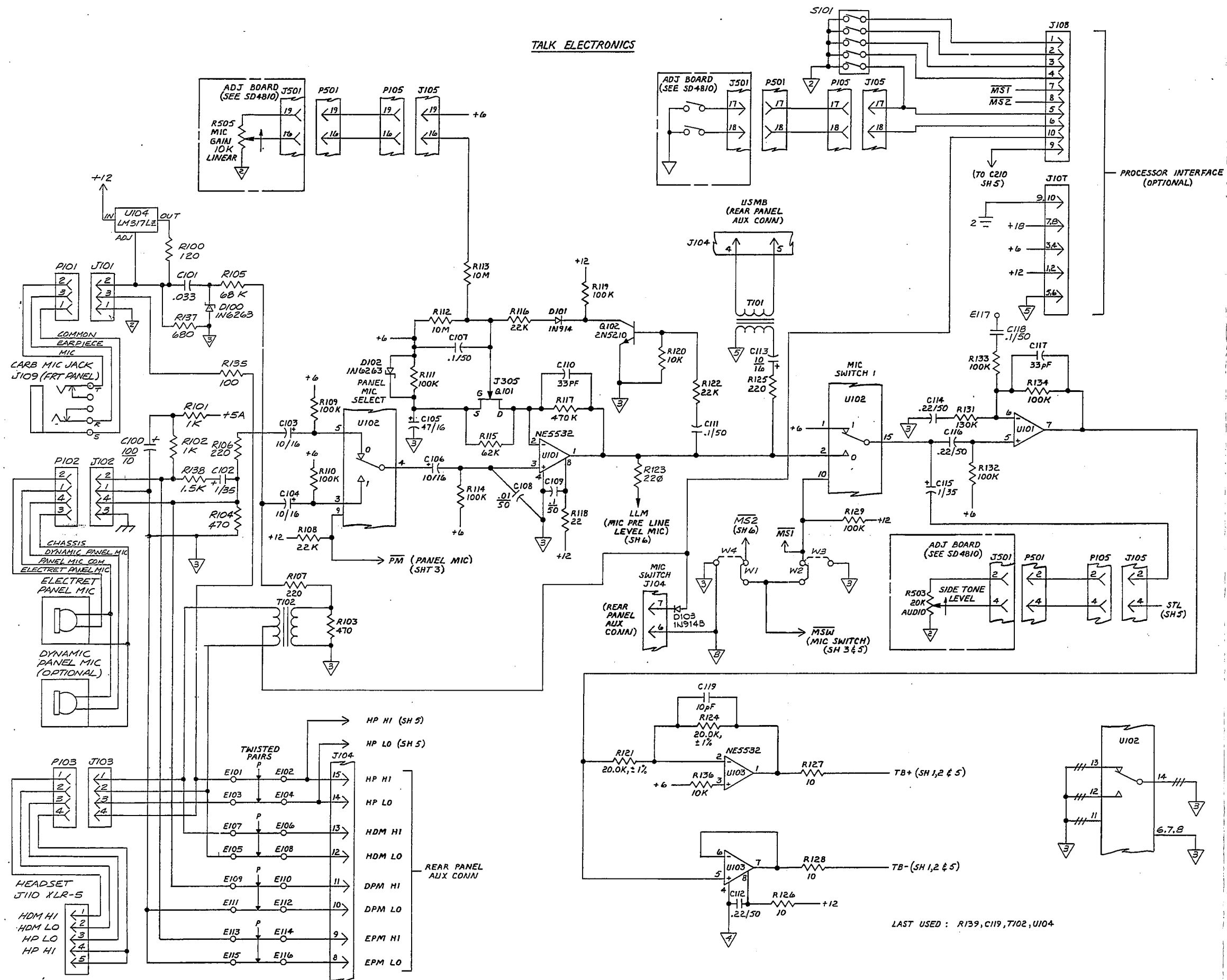


TALK SWITCHING

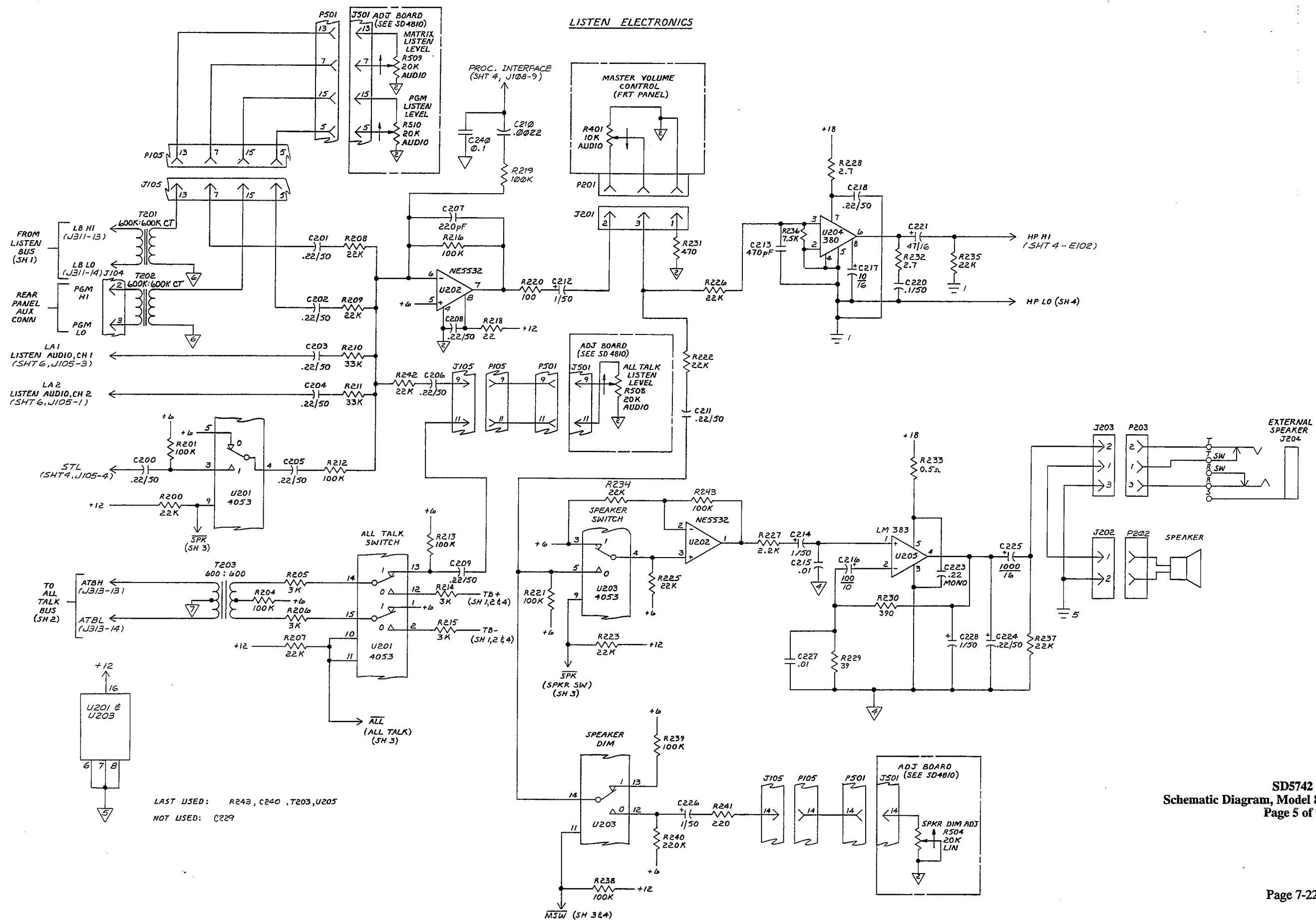


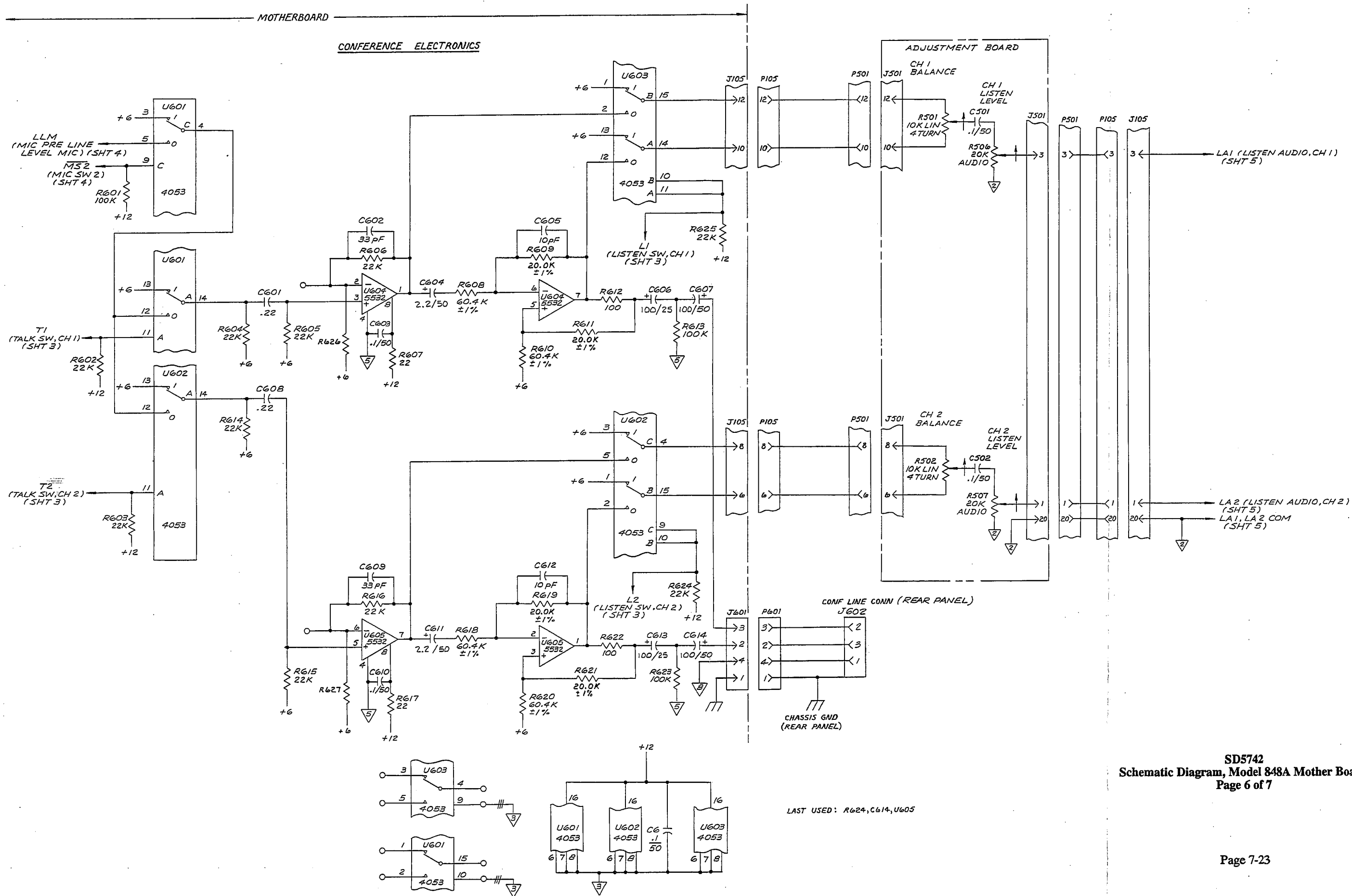


TALK ELECTRONICS



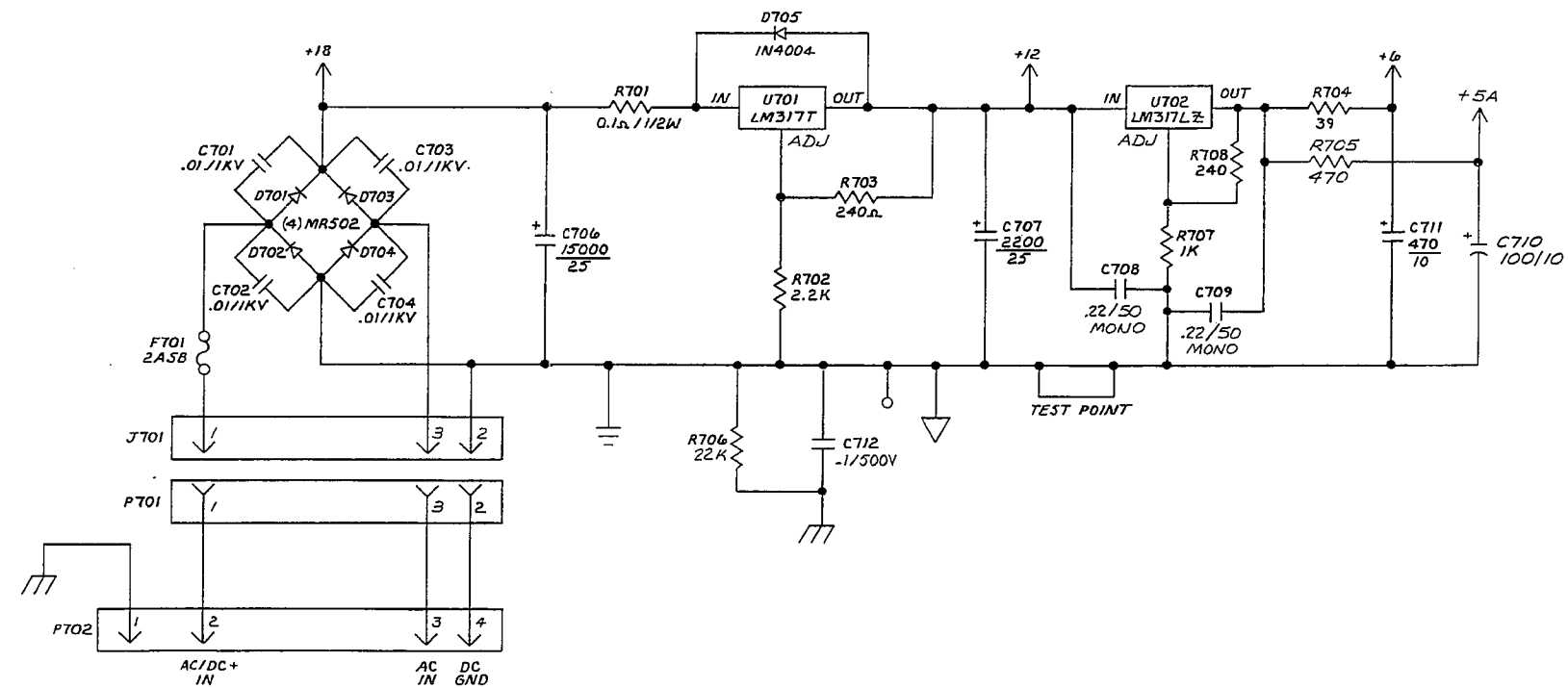
SD5742
Schematic Diagram, Model 848A Mother Board
Page 4 of 7

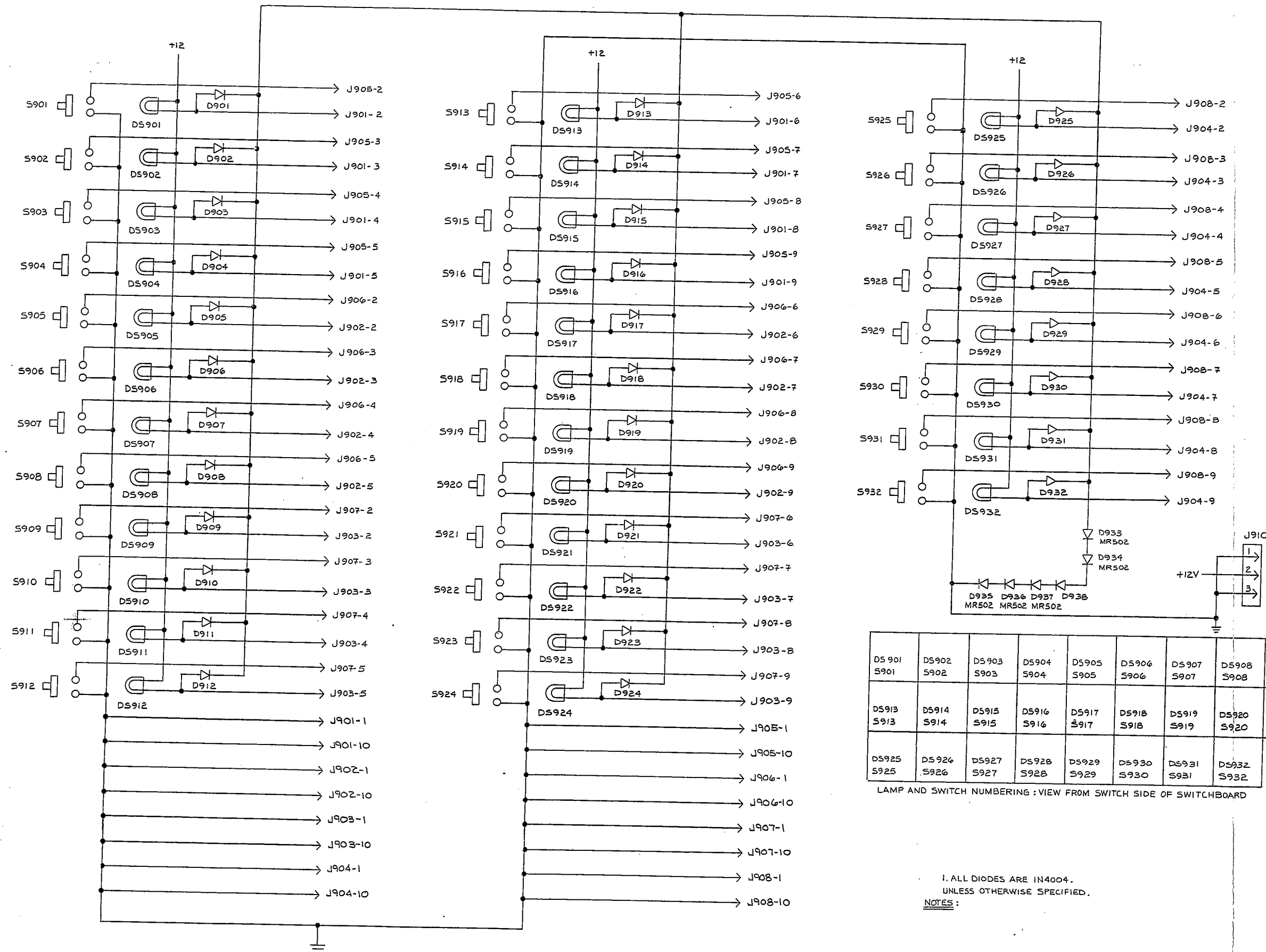




SD5742
Schematic Diagram, Model 848A Mother Board
Page 6 of 7

RECTIFIER / FILTER / REGULATORS





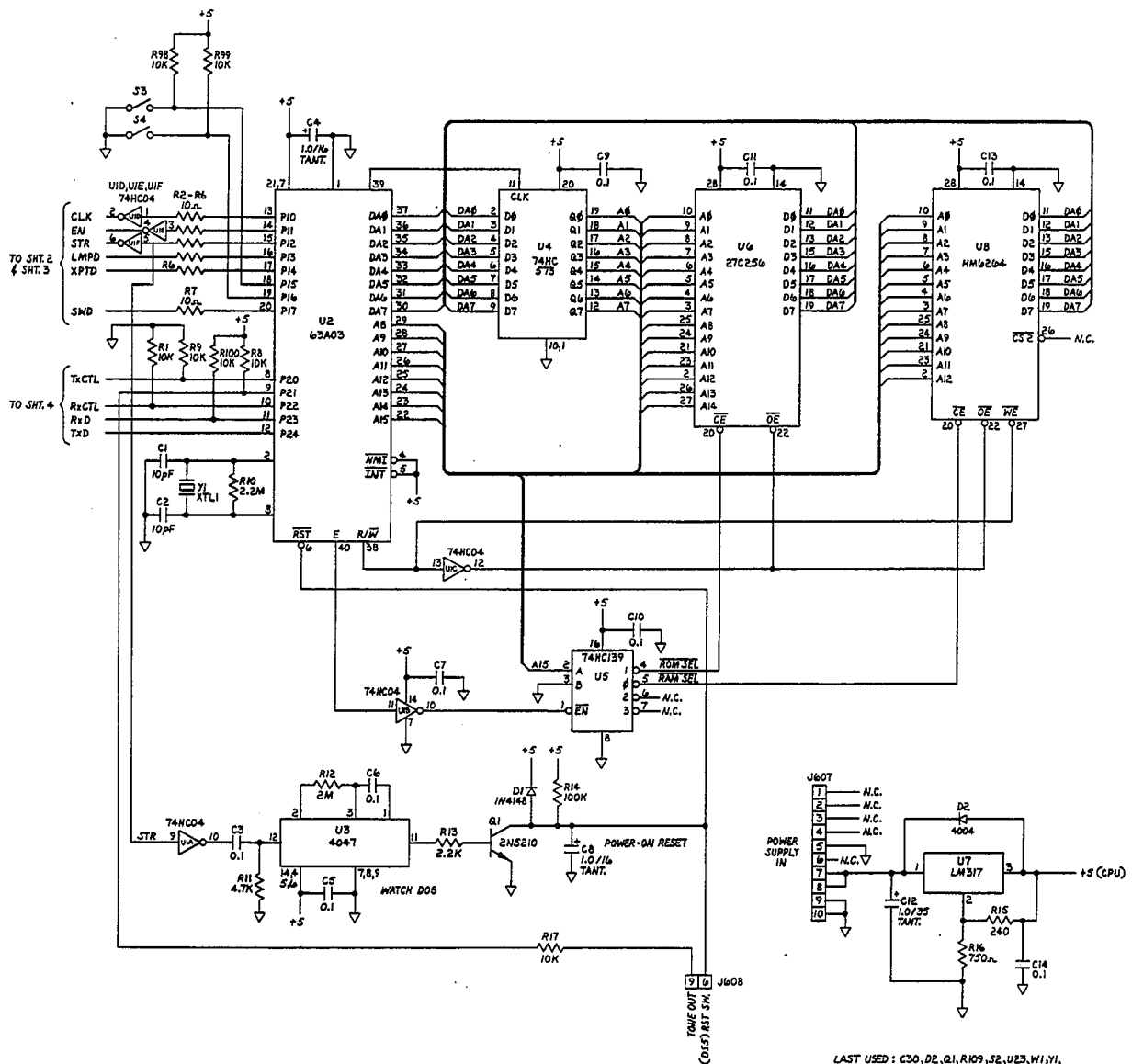
DS901 S901	DS902 S902	DS903 S903	DS904 S904	DS905 S905	DS906 S906	DS907 S907	DS908 S908	DS909 S909	DS910 S910	DS911 S911	DS912 S912
DS913 S913	DS914 S914	DS915 S915	DS916 S916	DS917 S917	DS918 S918	DS919 S919	DS920 S920	DS921 S921	DS922 S922	DS923 S923	DS924 S924
DS925 S925	DS926 S926	DS927 S927	DS928 S928	DS929 S929	DS930 S930	DS931 S931	DS932 S932				

LAMP AND SWITCH NUMBERING : VIEW FROM SWITCH SIDE OF SWITCHBOARD

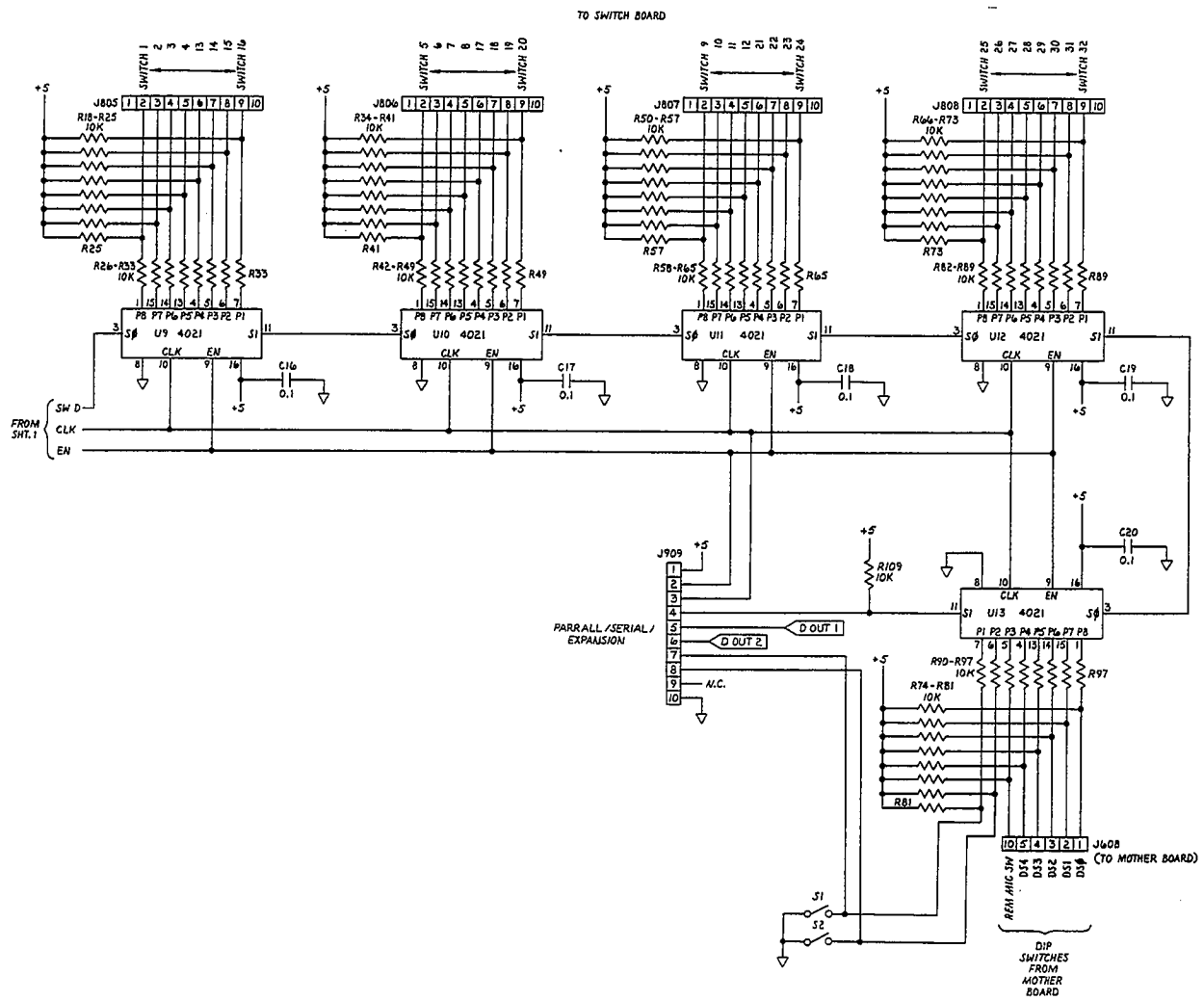
1. ALL DIODES ARE IN4004.
UNLESS OTHERWISE SPECIFIED.
NOTES :

USED ON THIS PAGE: D901-D938, DS901-DS932, J910
S901-S932, J901-J908

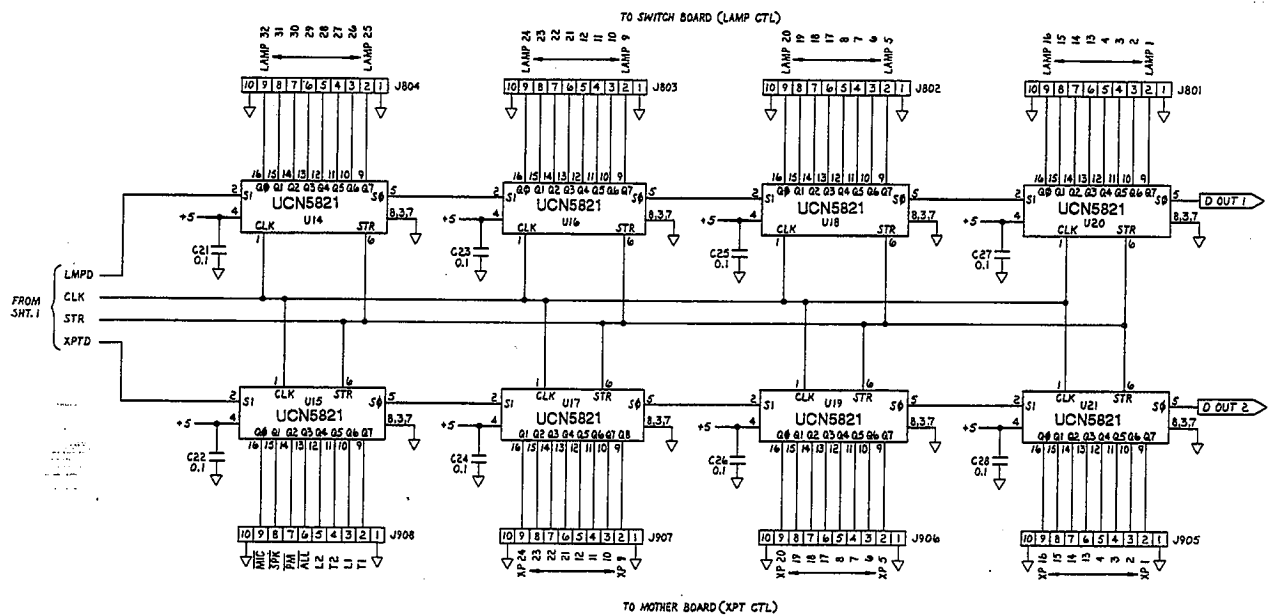
SD3000 / Sht-11
Schematic Diagram, Model 848A Switch Board



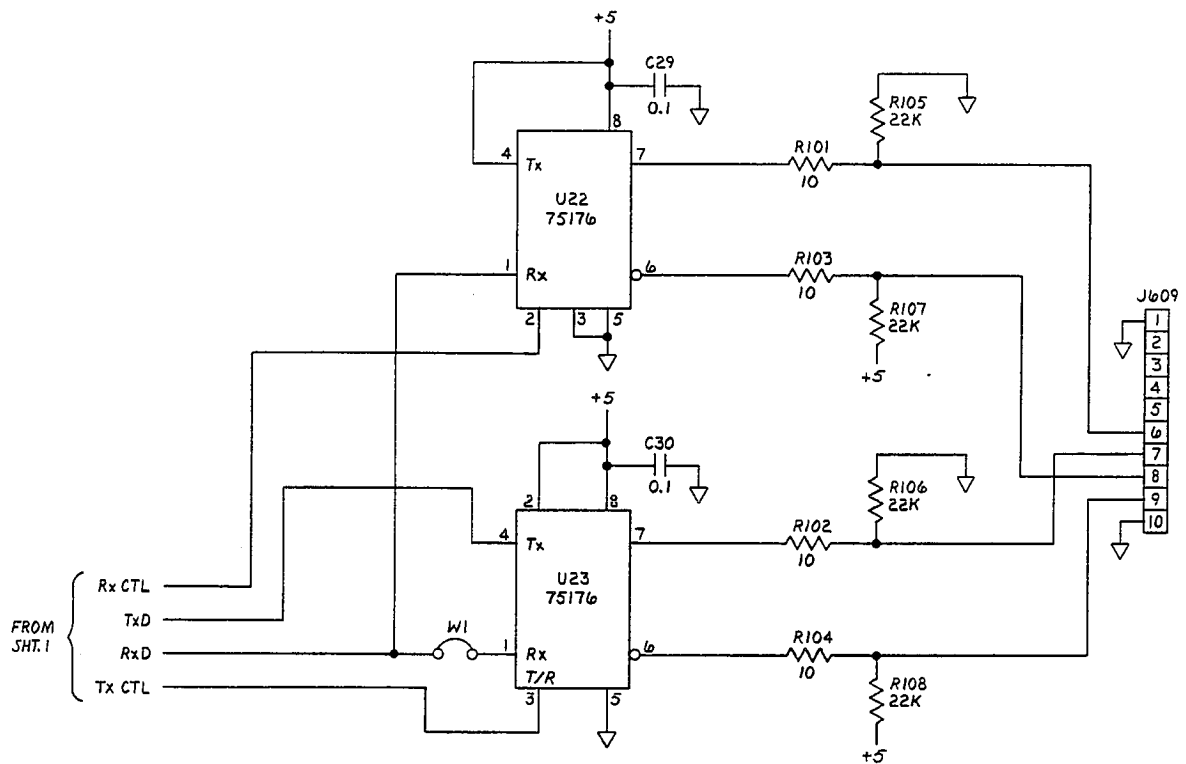
SD5381
Schematic Diagram, Model 848A CPU Board (pg. 1 of 4)



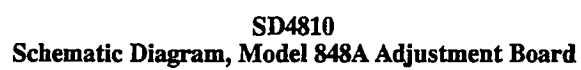
SD5381
Schematic Diagram, Model 848A CPU Board (pg. 2 of 4)

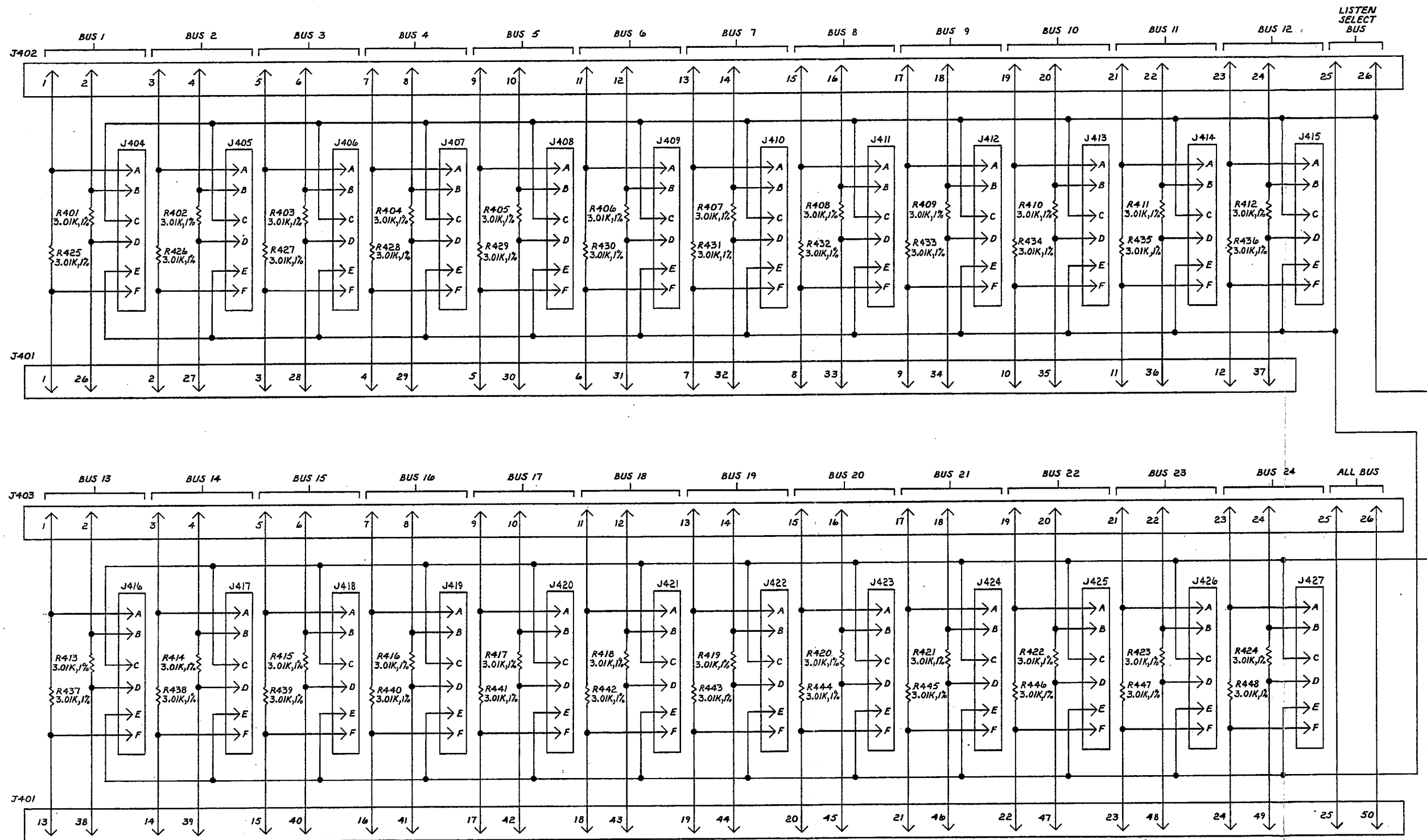


SD5381
Schematic Diagram, Model 848A CPU Board (pg. 3 of 4)



SD5381
Schematic Diagram, Model 848A CPU Board (pg. 4 of 4)



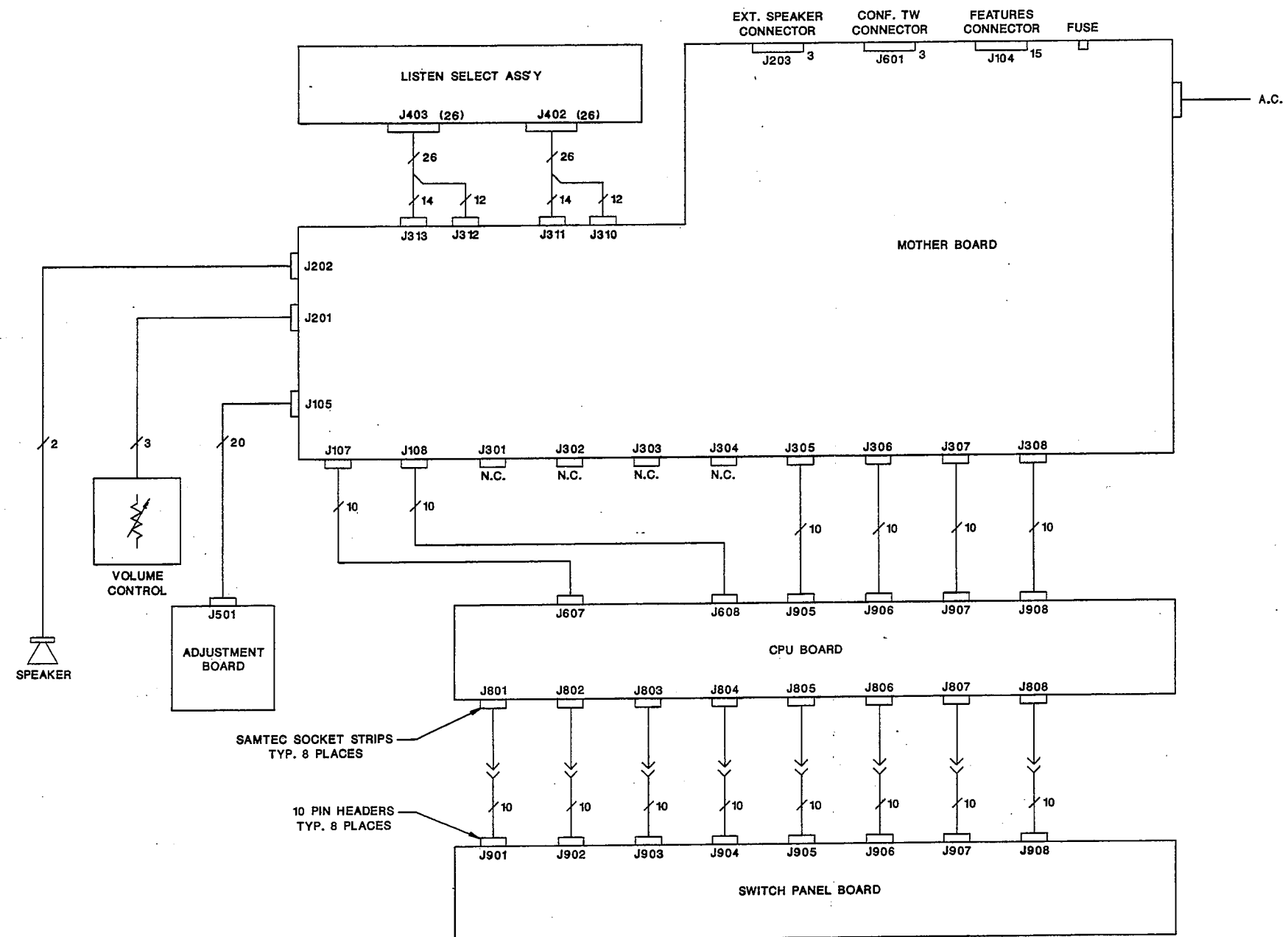


3. TO INHIBIT TALKING TO ANY ONE BUS INSTALL A JUMPER FROM A TO B ON THAT CHANNELS PROGRAMMING PINS.
2. TO PROGRAM A LISTEN BUS, THREE JUMPERS ARE REQUIRED. FIRST CHOOSE A RECEIVE ADDRESS. THEN INSTALL THE THREE JUMPERS FOR EXAMPLE, USING BUS NO. 11:
JUMPER PINS A & B, PINS C & D AND PINS E & F IN THE SAME COLUMN. PINS E & F AND C & D CONNECT A BALANCED PAIR TO THE LISTEN ELECTRONICS.
JUMPER PINS A & B PREVENT THIS STATION FROM TALKING ON IT'S OWN LISTEN BUS.

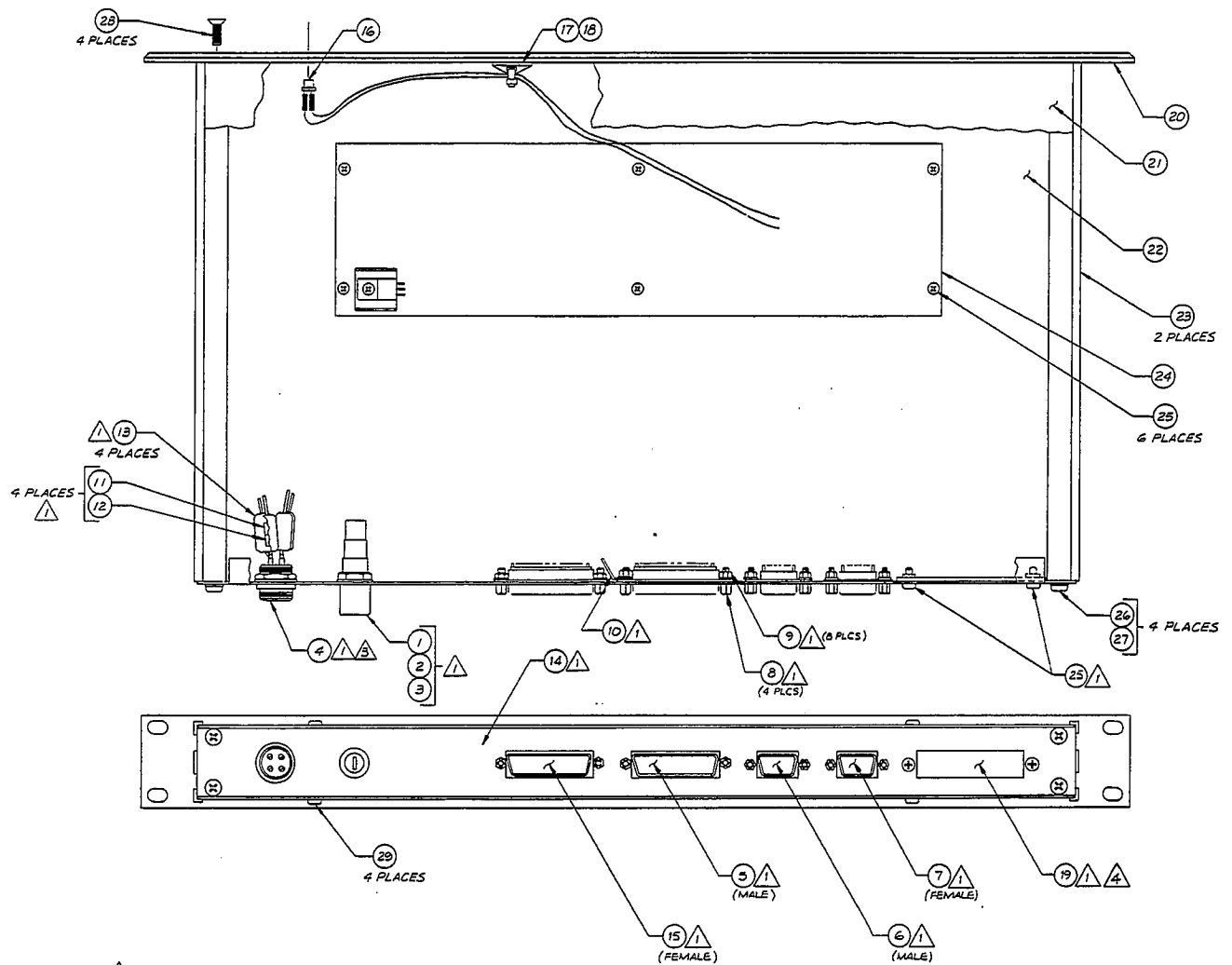
1. ALL RESISTORS ARE METAL FILM, 1/4WATT, 1%.

NOTES: UNLESS OTHERWISE SPECIFIED

SD4320
Schematic Diagram, Model 848A Listen Select
Matrix Board



WD5381
Wiring Diagram, Model 848A for CPU

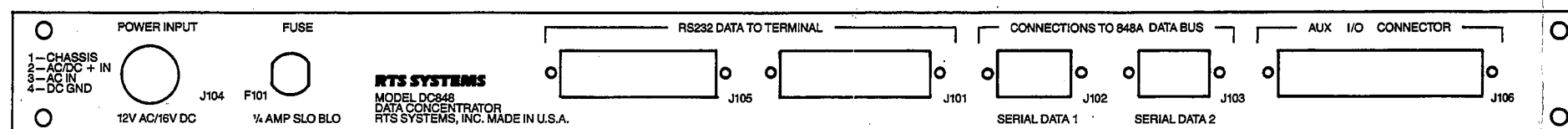


- △ A 50 PIN "D" CONNECTOR ASSY FOR I/O CONNECTIONS WILL BE INSTALLED UPON REQUEST. A MALE PLUG CONNECTOR (BOURNS # ME/52-5050 OR EQUIV) IS TO BE USED.
- △ GROUND WIRE MUST BE #18 AWG PER UL.
2. REFER TO DWG NO WD5556 FOR WIRING OF THIS UNIT
- △ THESE ITEMS ARE PART OF THE REAR PANEL ASSY

NOTES:

SEE SEPARATE PARTS LIST 9010555600

Assembly Diagram AS5556 Model DC848 Final Assembly

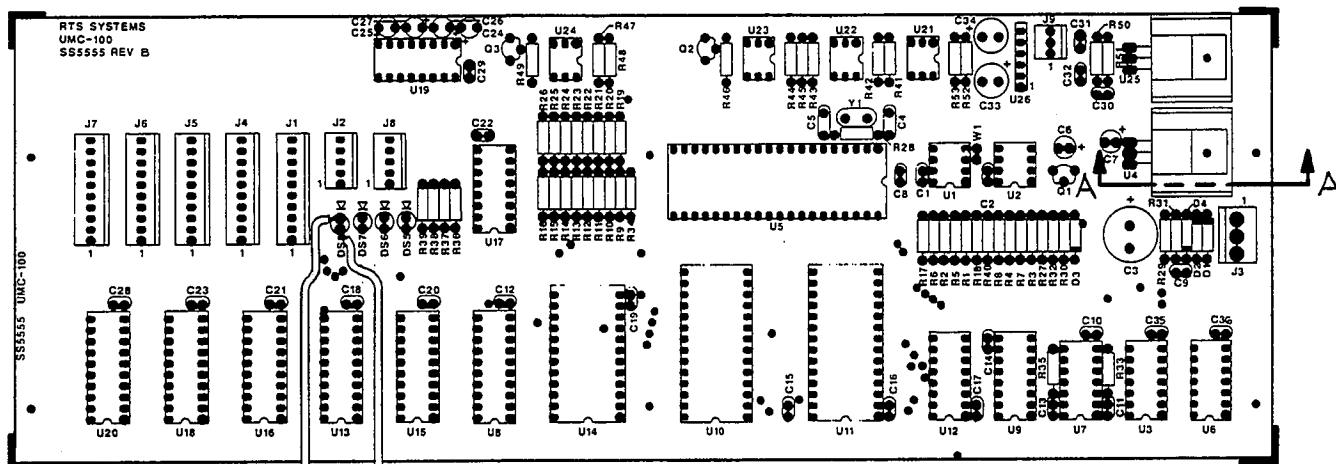


REAR PANEL (FAB 5553)

NOTES :

1. SILKSCREEN NOMENCLATURE BLACK, PER FED-STD-595A, COLOR NO. 27038.
2. CHARACTER DEFINITION TO MATCH ORIGINAL ARTWORK SS5553, REV A

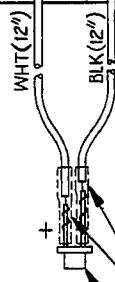
FD5553
Finishing Detail, Rear Panel, Model DC848



NOTES :

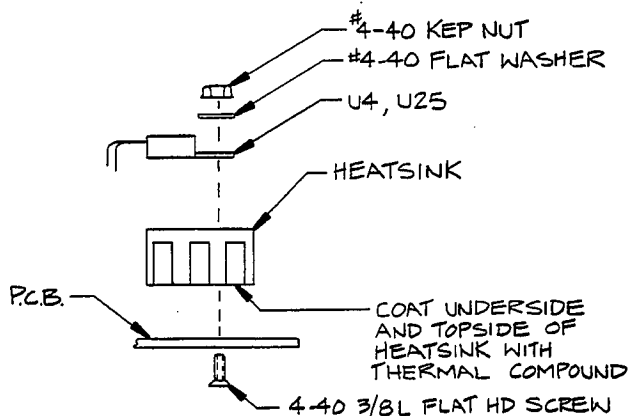
1. FRONT PANEL LED IS INSTALLED BY RTS SYSTEMS AFTER P.C. BOARD RETURNS FROM BEING ASSEMBLED.
2. REMOVE DIODE (DS8) FROM P.C. BOARD. INSTALL FRONT PANEL LED WIRES IN PLACE OF DS8 AS SHOWN.

SEE SEPARATE PARTS LIST 9030555500



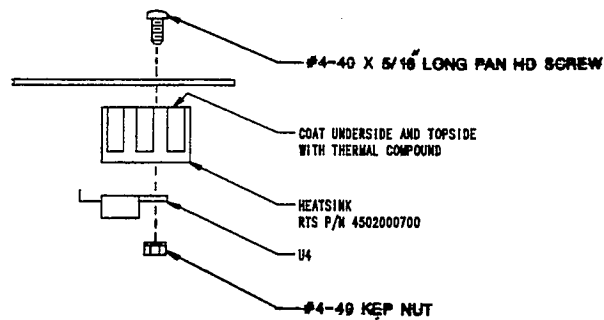
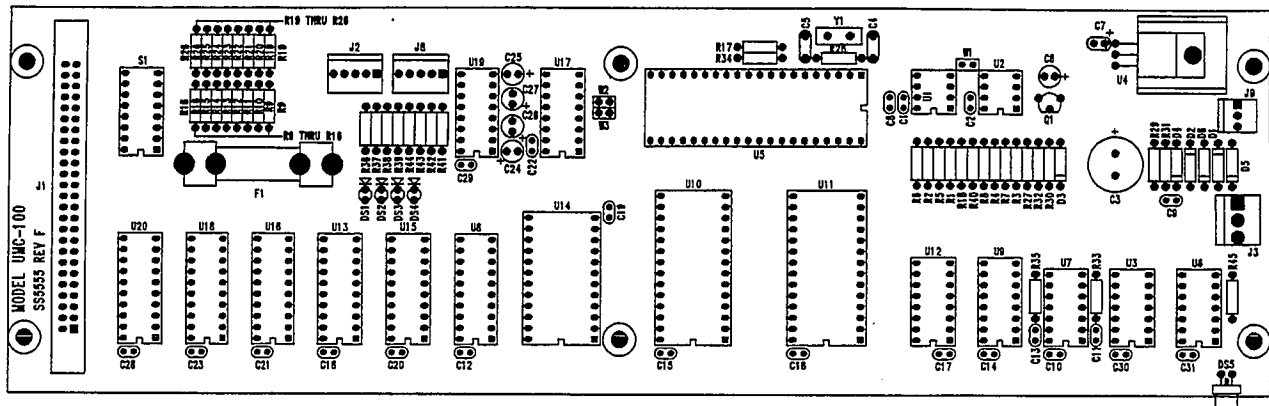
HEATSHRINK TUBING

LED : 180101470G , OSHINO , GRN
(FRONT PANEL)

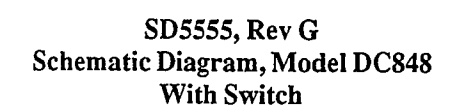


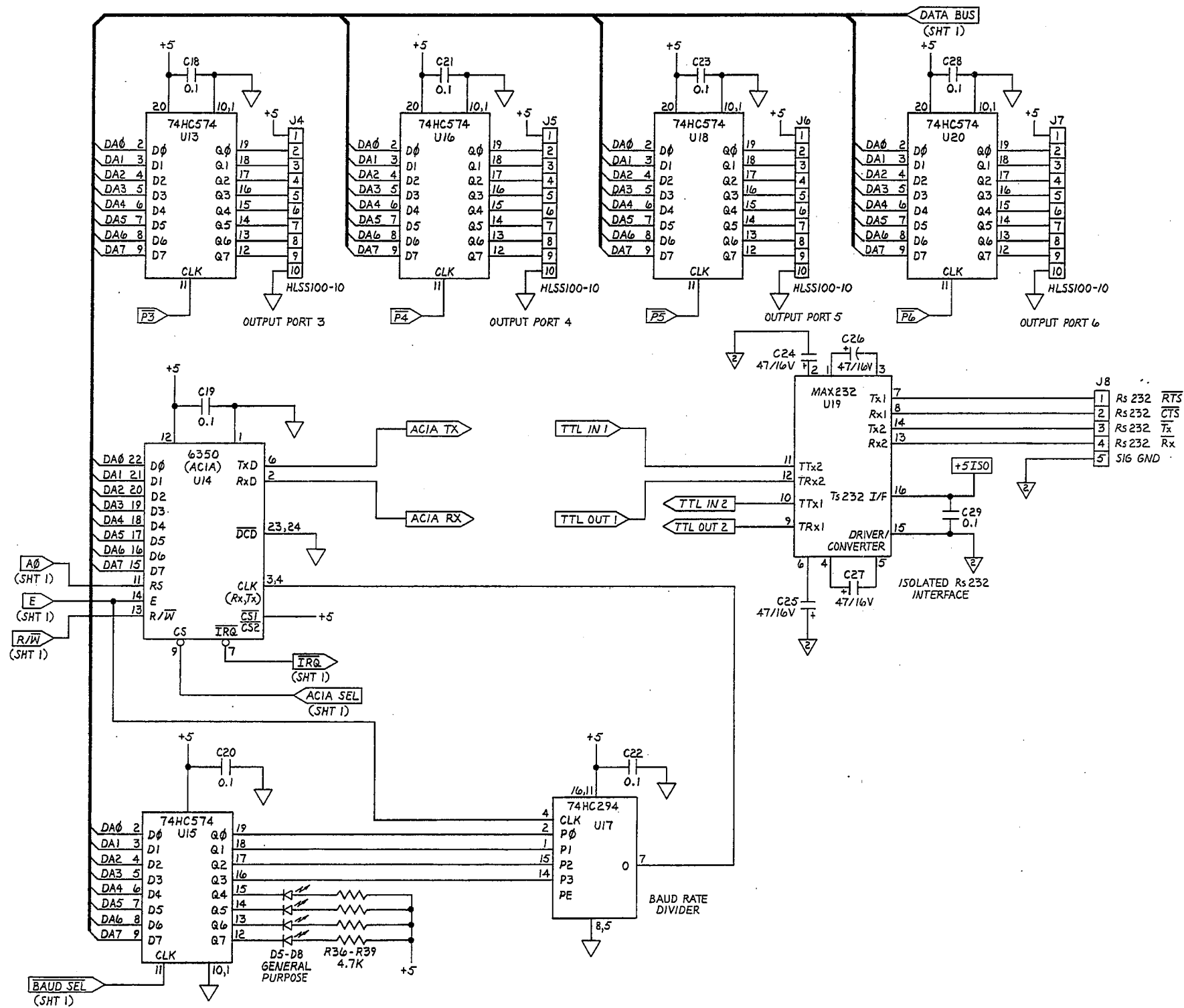
SECTION A-A
(TYP HEATSINK ASSY)
(2 PLACES)

Assembly Diagram AS5555
Model DC848 PCA

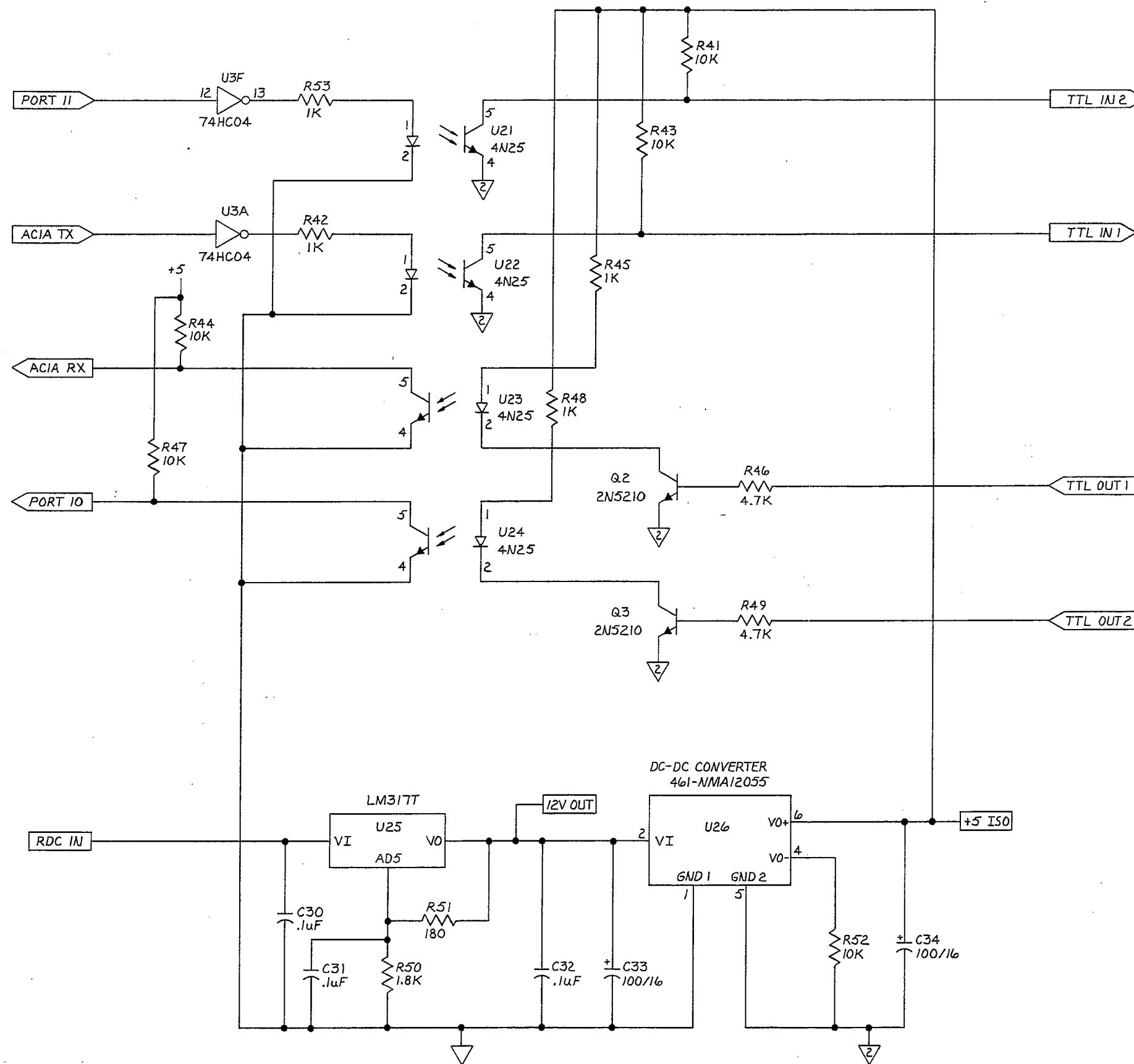


Assembly Diagram AS5555
Model DC848 PCA
With Switch

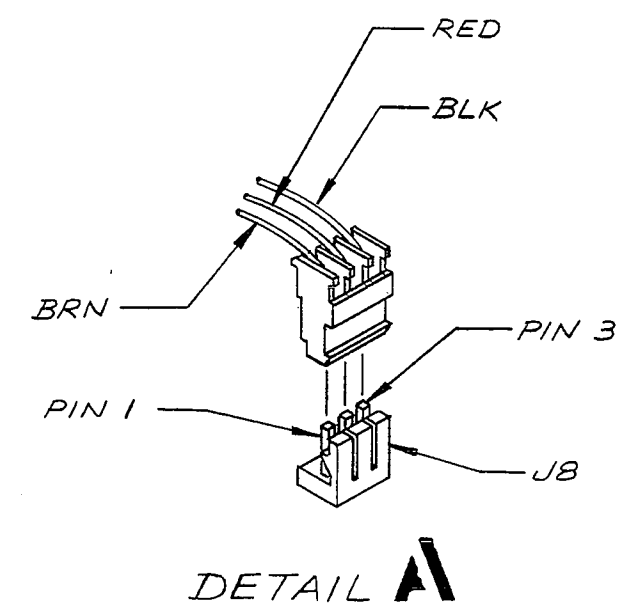
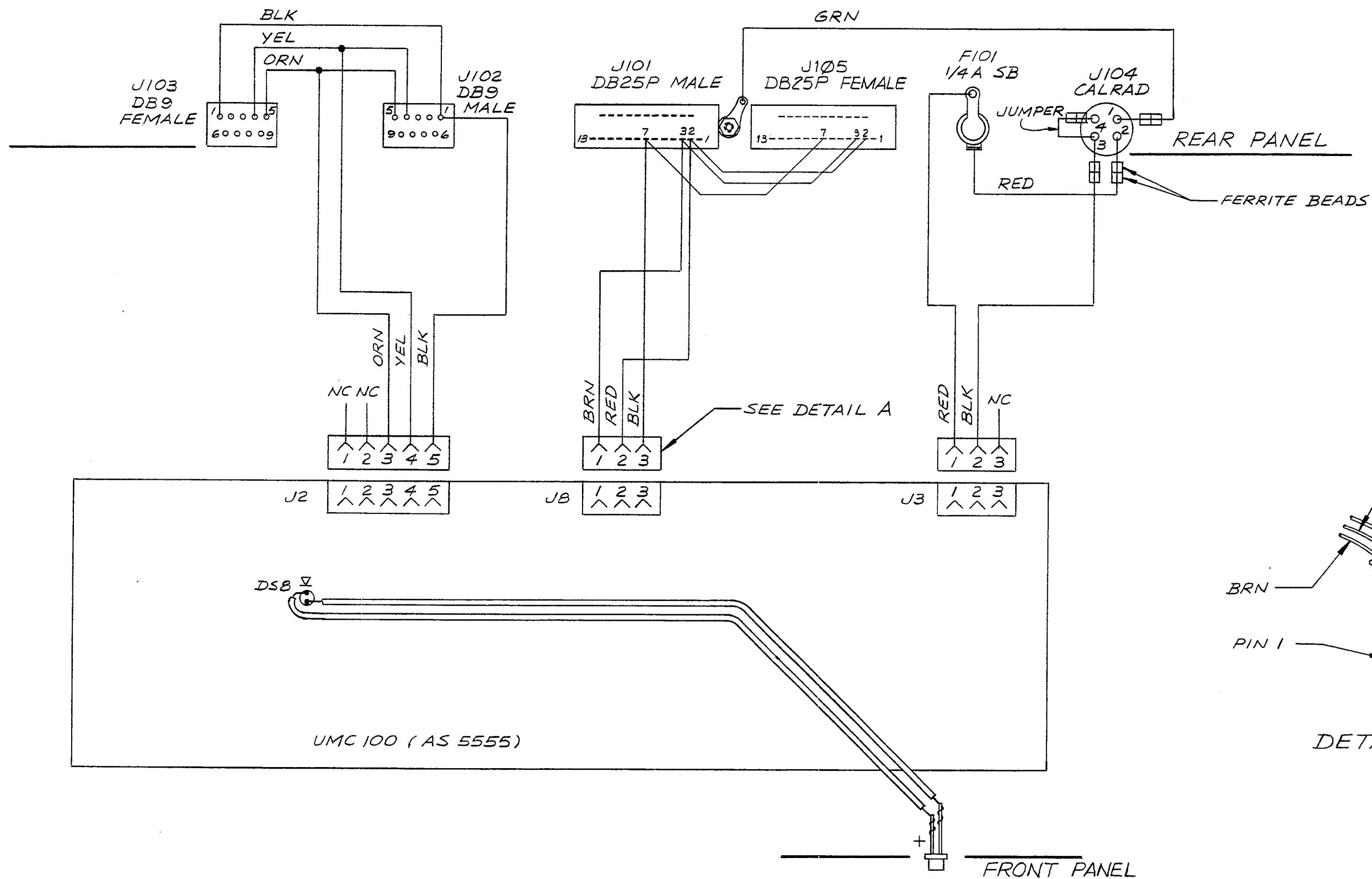




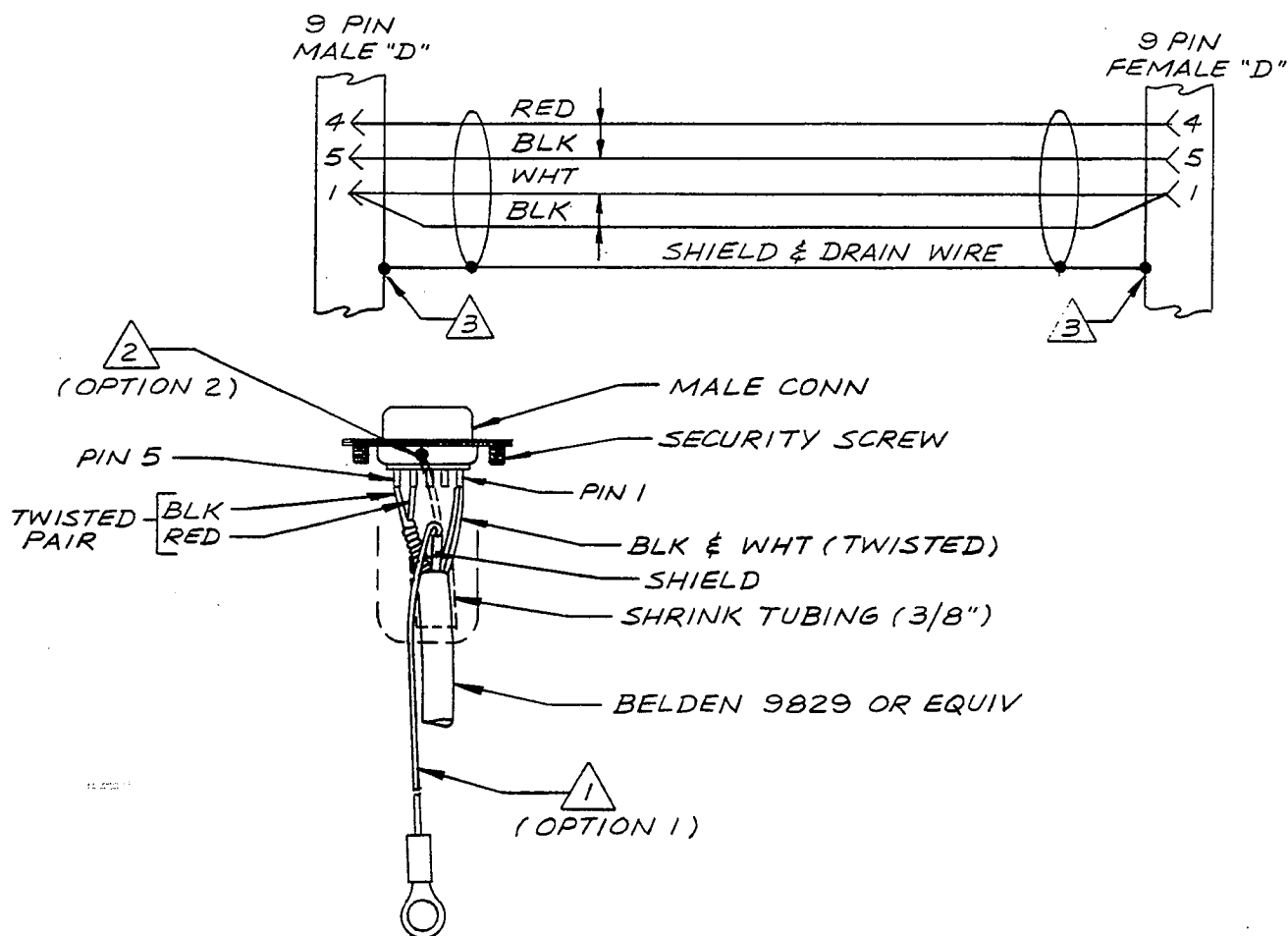
SD5555
Schematic Diagram, Model DC848
Page 2 of 3



SD5555
Schematic Diagram, Model DC848
Page 3 of 3



WD5556
Wiring Diagram,



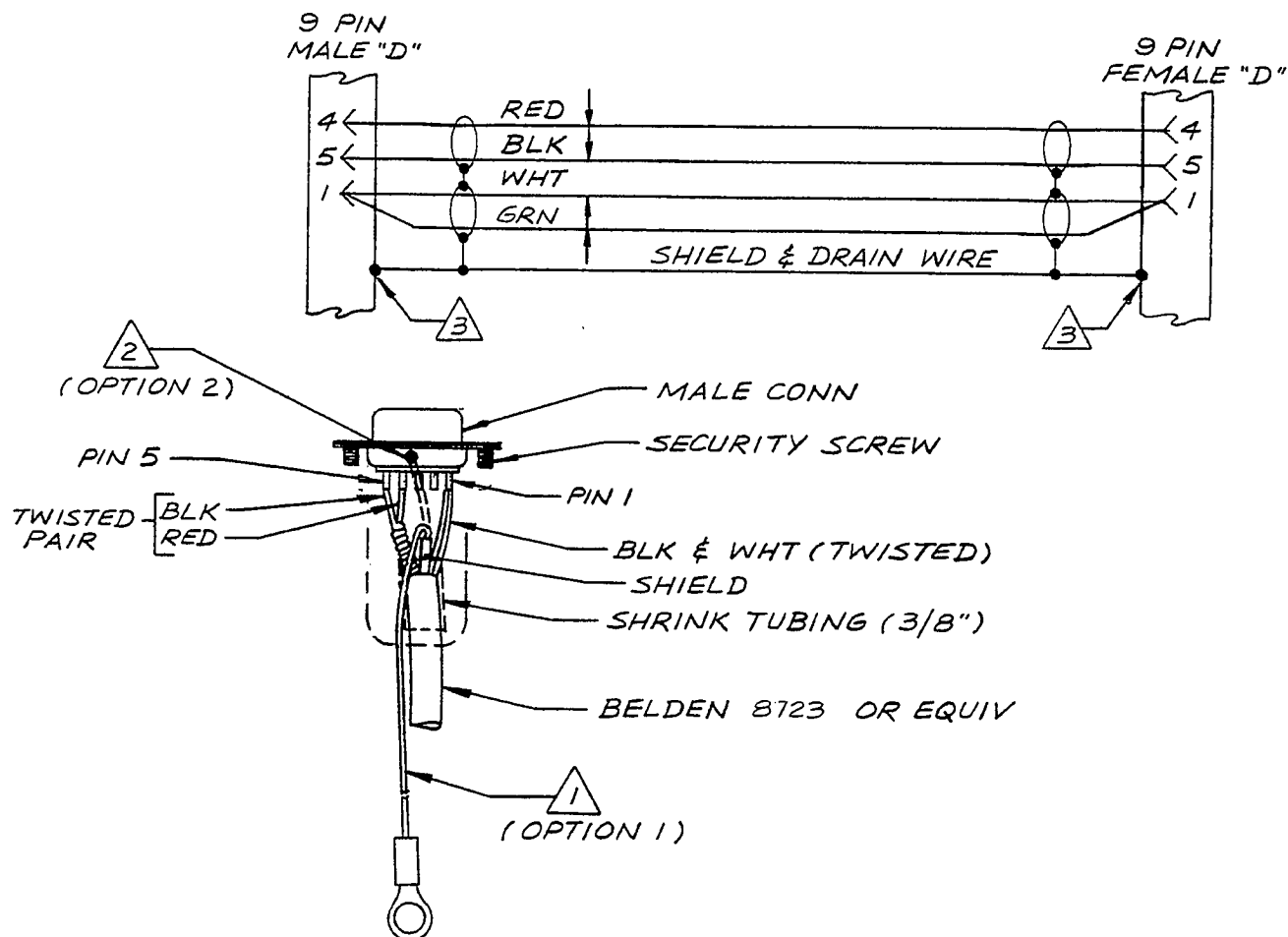
NOTES:

1 Option 1: Solder 24 gauge insulated wire (approx 6" long) to shield. Terminate wire end with ring lug. Wire can pigtail from back of connector shell, to attach to chassis at connector securing screw.

2 Option 2: Insulate shield wire. File top surface of connector to remove plating. Solder shield to connector (approx where shown). Install shell normally.

3 Shown: shield connected to metal shell of connector

Wiring Diagram WD5655
Model DC848 RS422 Cable, Page 1 of 2



NOTES:

① **Option 1:** Solder 24 gauge insulated wire (approx 6" long) to shield. Terminate wire end with ring lug. Wire can pigtail from back of connector shell, to attach to chassis at connector securing screw.

② **Option 2:** Insulate shield wire. File top surface of connector to remove plating. Solder shield to connector (approx where shown). Install shell normally.

③ **Shown:** shield connected to metal shell of connector

Appendix A

Table A-1

Location versus Address Assignment and Cabling Log

<u>848A Station Number</u>	<u>Station Address (Dip Switch)</u>	<u>Listen Bus (Rear Panel)</u>	<u>Location</u>	<u>Notes</u>
1	1	1		
2	2	2		
3	3	3		
4	4	4		
5	5	5		
6	6	6		
7	7	7		
8	8	8		
9	90	9		
10	10	10		
11	11	11		
12	12	12		
13	13	13		
14	14	14		
15	15	15		
16	16	16		
17	17	17		
18	18	18		
19	19	19		
20	20	20		
21	21	21		
22	22	22		
23	23	23		
24	24	24		

Table A-2
Parts List Reference:
Vendor Directory

<u>Name</u>	<u>Cage Code</u>	<u>Address</u>	<u>Phone</u>	<u>Other</u>
3M	04963	BLDG. 502, POB 2963 AUSTIN TX 78769-2963	800-CAL-LEPD	ELECTRONIC PRODUCTS DIVISION
AHAM	1EL88	27901 FRONT STREET, RANCHO CALIF, CA 92390	714-676-4151	DBA ATI HEATSINKS
ALLEN-BRADLEY	01121	1414 ALLEN-BRADLEY DR, EL PASO TX 79936	915-592-4888	DIV. ROCKWELL
AMATOM	9W423	446 BLAKE ST, NEW HAVEN CT 06515	203-397-3311	DIV. MITE CO
AMER RESEARCH	65832	1500 EXECUTIVE DRIVE, ELGIN, IL 60120	312-888-7245	
AMPHENOL-BENDIX	74868	2122 YORK RD, OAKBROOK IL 60521	312-986-2700	
AP PRODUCTS	80266	9325 PROGRESS PKWY, MENTOR OH 44060	216-354-2101	DIV. OF 3M
APTRONICS	75037	9450 PINENEEDLE DR, MENTOR, OH 44060	1-800-792-0137	3M PRODUCT DIVISION
BELDEN	16428	PDB 1980, RICHMOND IN 47374	317-983-5200	ELECTRONIC DIVISION
BERG, W.M. INC.	29440	499 OCEAN AVENUE, EAST ROCKAWAY NY 11518	516-599-5010	
BOURNS	08116	1200 COLUMBIA AV, RIVERSIDE CA 92507	317-983-5200	
BURNDY CORP	09922	RICHARDS AVENUE, NORWALK CT 06856	203-838-4444	
BUSSMANN	71400	POB 14460, ST. LOUIS MO 63178	314-394-2877	
C&K	09353	15 RIVERDALE AV, NEWTON MA 02158-1082	617-964-6400	
CALRAD IMPORTERS	53514	819 N. HIGHLAND, HOLLYWOOD CA 90038	213-465-2131	
CAMBION	71279			DIV MIDLAND ROSS
CANNON USA	71468	10550 TALBERT AV, FOUNTAIN VALLEY CA 92708	714-964-8352	
CONDOR	59940	580 WEDDELL DR #3, SUNNYVALE CA 94089	408-745-7141	
DALLAS SEMI	----		(214) 450-0400	APPLYING FOR CAGE CODE
DENNISON		300 HOWARD ST, FRAMINGHAM MA 01701	800-225-5913	
EAO SWITCH CORP	61706	MILFORD CT		
FAIR-RITE	34899	PO BOX J, WALLKILL NY 12589	914-895-2055	
FEK				
FOX ELECTRONICS	61429	6225 PRESIDENTIAL CT, FT MEYER FL 33907	813-482-7212	
HIROSE USA	0AG18	9254 DEERING AV, CHATSWORTH CA 91311	818-709-9247	
HITACHI AMERICA		2210 O'TOOLE AV SAN JOSE CA 95131	408 435-8300	SEMICONDUCTOR & IC DIV
JKL	55335	13343 PAXTON ST, PACOIMA CA 91331	818-896-0019	
LICON	04426	6615 IRVING PK RD, CHICAGO IL 60624	312-282-4040	DIV. ILL TOOL WORKS
MOLEX	27264	2222 WELLINGTON CT, LISLE IL 60532	312-969-4550	
MOTOROLA	04713	3102 N 56TH ST PHOENIX AZ 85018	602-952-3000	SEMICONDUCTOR DIV
MOUSER	50811	11433 WOODSIDE AV, SANTEE CA 92071	619-449-2300	
NATIONAL	27014	11731 MARKON DR, GARDEN GROVE CA 92641		
NEUTRIK	83330	1913 ATLANTIC AVENUE, MANASQUAN nj	201-223-9400	DIV. HH SMITH
NPN	04713	SEE MOTOROLA		
OAKTRON	07109	PO BOX 53143, MILWAUKEE WI 53288	608-328-5560	

**Parts List Reference:
Vendor Directory, cont'd**

PANDUIT	06383	17301 RIDGELAND AV, TINLEY PK IL 60477-0981	312-532-1800	
PEM	46384	PO BOX 1000, DANBORO, PENN 18916	215-766-0371	
PENN ENG & MANU	99256	DANBORO, PA 19816-1000	215-766-0371	
PIHER	54869	903 FEEHANVILLE DR, MT PROSPECT IL 60056	312-543-6400	
RCA	02735			SOLID STATE DIV
ROBINSON NUGENT INC	06776	800 E 8TH ST, NEW ALBANY IN 47150	812-945-0211	
SAMTEC	55322	810 PROGRESS BLVD, NEW ALBANY NY 47150	812-944-6733	
SCHURTER	61935	1016 CLEGG CT, PETALUMA CA 94952	707-778-6311	
SELCO	59270	7580 STAGE RD, BUENA PK CA 90621	714-521-8673	ALSO: SEL SALES, INC
SIFAM	59270	SEE SELCO		
SIGNETICS	18324	811 E ARGO AV, SUNNYVALE CA 94086	408-739-7700	
SILICONIX	17856	2201 LAURELWOOD, SANTA CLARA CA 95054	408-246-8000	
SMART	----	SEE DALLAS SEMICONDUCTOR		
SMITH, HH (DIALIGHT)	83330	1913 ATLANTIC AV, MANASQUAN NJ 08736	201-223-9400	DIV OF N AMER PHILIPS
SOUTHCO	94222	212 N BRINTON LAKE RD, CONCORDVILLE PA 19331	215-459-4000	
SPECTRA	74868	SEE AMPHENOL		
STANLEY	61544	10 OCEAN AV, COPIAGNE NY 11726	516-842-8866	
SWITCHCRAFT	82389	5555 N ELSTON AV, CHICAGO IL 60630-1314		DIV OF RAYTHEON
THERMALLOY	13103	2021 W VALLEY VIEW LN, DALLAS, TX 75381	214-243-4321	
TRW CONN	71735	1501 MORSE AV, ELK GROVE VILLAGE IL 60007	312-987-6000	

Table A-3
Parts List Reference:
Cage Code Cross-Reference

<u>OEM Part No</u>	<u>OEM CAGE CODE</u>	<u>Vendor Part No</u>	<u>VENDOR CAGE CODE</u>	<u>Item of Supply Part No</u>	<u>CAGE CODE</u>
10005-0174-00	60572	EC100F-5	06383		
1001-0023-00	60572	8216-A-0632	06540		
1001-0030-00	60572	9293	83330		
1001-0101-00	60572	9475A0632	06540		
1001-0110-00	60572	2334	83330		
1001-0112-00	60572	9532B-B-0440	06540		
1001-0113-00	60572	9532B-B-0440	06540		
1001-0115-00	60572	9534B-B-0632	06540		
1003-0003-00	60572	1416-6	83330		
1003-0003-00	60572	1416-6	83330		
1005-0033-00	60572	99-910	61706		
1005-0039-00	60572	A4-10-501-20	94222		
1005-0045-00	60572	3341-1L	04963		
1005-0046-00	60572	TM1S4	06383		
1005-0114-00	60572	KF2-440	46384		
1005-0173-00	60572	EC100F-3	06383		
1006-0041-00	60572	B52200F006	04713		
1407-0009-01	60572	81A1A-824-S15	08116		
1409-0009-00	60572	PTC10LVP10K	54869		
1409-0047-00	60572	PT10yv20Klog	54869		
1601-0502-00	60572	MR502	04713		
1602-0305-00	60572	J305/E305	17856		
1602-5210-00	60572	2N5210	04713		
1603-0056-00	60572	74HC04	27014		
1603-0109-00	60572	63A03RP	HITACHI		
1603-0110-00	60572	74HC573	27014		
1603-0111-00	60572	74HC139	27014		
1603-0317-MP	60572	LM317	27014		
1603-0383-00	60572	LM3800N-8	27014		
1603-0383-0T	60572	LM383T	27014		
1603-4053-BE	60572	CD4053 BE	02735		
1603-5532-0N	60572	NE5532-N	18324		
1801-0019-00	60572	ESBR3441	61544		
1802-8099-00	60572	8099SBP	55335		
1909-0006-00	60572	K405-S	65832		
1911-0013-00	60572	99-456	61706		
2001-0001-00	60572	DIL8P-108	09922		
2001-0002-00	60572	DIL14P-108	09922		
2001-0002-00	60572	DIL14P-108	09922		

<u>OEM Part No</u>	<u>OEM CAGE CODE</u>	<u>Vendor Part No</u>	<u>VENDOR CAGE CODE</u>	<u>Item of Supply Part No</u>	<u>CAGE CODE</u>
2001-0003-00	60572	DIL16P-108	09922		
2001-0017-00	60572	DIL40P-108	09922		
2001-0035-00	60572	DS1213	DALLAS SEMI		
2001-0035-00	60572	DS1213	SMART/DALLAS SEMI		
2001-0036-00	60572	DIL20P-108	09922		
2001-0037-00	60572	1CT-286-S-X	06776		
2004-0033-00	60572	65610-410	29440		
2004-0034-00	60572	30-552A	53514		
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REVISIONS FOR THE SECOND PRINTING:

<u>Date</u>	<u>Edition</u>	<u>Page No.</u>	<u>Description of Revision</u>
6/89	3rd	Cover	Added: Second Printing, June 1989.
6/89	3rd	Cover	Changed: 9010-5545-00 to 9000-5545-00.
6/89	3rd	ii	Added: Second Printing, June 1989.
6/89	3rd	ii	Changed: Edited by to Sheryl D. Thompson.
6/89	3rd	6-14	Added: Page 6-14 (missing in previous edition).
6/89	3rd	7-11 - 7-17	Deleted: "A" from the 848.
6/89	3rd	7-25	Repalced: Drawing SD300-09 with SD3000 sheet #11.

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