

TM-8102000503

DIGITAL
HF/ISB
RECEIVER

R-9200

OPERATION and MAINTENANCE
MANUAL



SUNAIR

3101 SW Third Avenue, Ft. Lauderdale, FL 33315-3389

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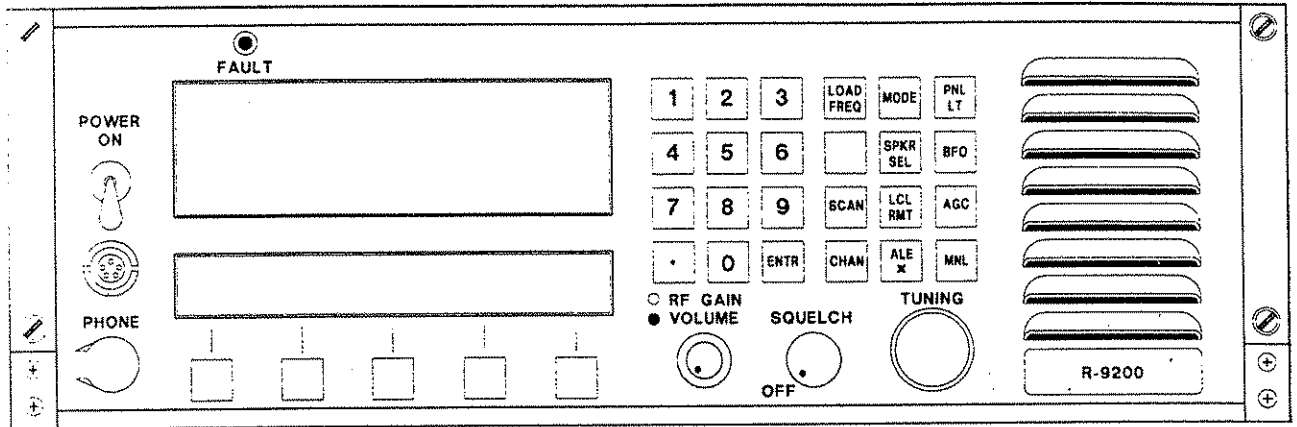
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SUNAIR ELECTRONICS, INC.



**R-9200
DIGITAL HF/ISB
RECEIVER**

**OPERATION
AND
MAINTENANCE MANUAL**

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In case of difficulty please contact the Sunair Product Service Department, between the hours of 8:00 AM and 5:00 PM Eastern Time or write to:

Product Service Dept.
Sunair Electronics, Inc.
3101 SW Third Avenue
Ft. Lauderdale, FL 33315-3389
U.S.A.

Telephone: (954) 525-1505

Fax: (954) 765-1322

Email: techsupport@sunairhf.com

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TABLE of ABBREVIATIONS

ADDR	Address	LVL	Level
AGC	Automatic Gain Control	MAN	Manual
ALC	Automatic Level Control	M CH	Manual Channel
AM	Amplitude Modulation	MED	Medium
AME	Amplitude Modulation Equivalent	MHz	Megahertz
AMP/AMPL	Amplifier	MIC	Microphone
ARQ	Automatic Request	MIL-STD	Military Standard
AUD	Audio	MNL	Manual
AUTO	Automatic	ms	Millisecond
AUX	Auxiliary	MTTR	Mean Time To Repair
BAUD	A variable unit of data transmission speed (bits per second)	MTR	Meter
BELL U.S.	Telephone standards	NAR	Narrow
BFO	Beat Frequency Oscillator	O.D.	Olive Drab
BITE	Built In Test Equipment	PA	Power Amplifier
BRD	Board	PC	Printed Circuit
CH /CHAN /CHL/CHN	Channel	PEP	Peak Envelope Power
CLR	Clear	PLL	Phase-Locked Loop
CMOS	Complementary Metal Oxide Semiconductor	P/N	Part Number
CPLR	Coupler	PNL	Panel
CPU	Computer	POSTSL	Post-Selector
CW	Carrier Wave	PRESEL	Pre-Selector
dB	Decibel	PTT	Push-To-Talk
dBm	Decibels referred to 1 milliwatt across 600 ohms	PWR	Power
DSBSC	Double Sideband Suppressed Carrier	RCV/RX	Receive
DSP	Display	REFL	Reflected
DUART	Dual Asynchronous Receive/Transmit	REV	Revision
EEPROM	Electrically Erasable and Programmable Read Only Memory	RF	Radio Frequency
EPROM	Electrically Programmable Read Only Memory	RFI	Radio Frequency Interference
EMI	Electromagnetic Radiation Interference	RFL	Reflected
ENTR	Enter	RMT	Remote
FAX	Facsimile	RS232	Computer control, hardwired up to 50 feet maximum
FEC	Forward Error Correction	RS422	Computer control, hardwired up to 4000 feet maximum
FREQ	Frequency	RS485	Computer control, hardwired for multiple users
FSK	Frequency Shift Keying	RTTY	Radio Teletype
FWD	Forward	SEL	Select
GRP	Group	SLO	Slow
HF	High Frequency	S MTR	Signal Strength Meter
Hz	Hertz	SPKR	Speaker
IC	Integrated Circuit	SPLX	Simplex
IF	Intermediate Frequency	SRAM	Static Random Access Memory
I/O	Input/Output	SSB	Single Sideband
IONCAP	Ionospheric Communications Analysis and Prediction	TCXO	Temperature Controlled Crystal Oscillator
kHz	Kilohertz	TGC	Transmit Gain Control
kW	Kilowatt	THD	Total Harmonic Distortion
ISB	Independent Sideband	TTL	Transistor Transistor Logic
LCD	Liquid Crystal Display	TX/XMT	Transmit
LCL	Local	USB	Upper Sideband
LED	Light Emitting Diode	UTC	Universal Time
LK	Link	VCO	Voltage Controlled Oscillator
LO	Local Oscillator	VHF	Very High Frequency
LP/LPX	Lincompex	VRMS	Volts Root Mean Square
LRU	Lowest Repairable Unit	VSWR	Voltage Standing Wave Ratio
LSB	Lower Sideband	W	Watt
LT	Light	WPM	Words Per Minute

* Asterisk indicates function selected

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SECTION I

GENERAL INFORMATION

1.1 SCOPE OF MANUAL

This manual contains information necessary to install, operate, and maintain the R-9200 HF/ISB Digital Receiver. Installation information is in Section II. Operating Instructions are in Section III. Theory of Operation is in Section IV. Maintenance and Repair Procedures are in Section V. Information in this manual applies to all equipment configurations, unless otherwise stated in the text or illustrations.

1.2 PURPOSE OF EQUIPMENT

The R-9200 HF/ISB Digital Receiver is capable of providing communications from 100 kHz to 29.99999 MHz. Modes of operation include USB, LSB, ISB, AME, and CW (FSK, FAX, High Speed DATA, ARQ and FEC are available with optional external modems). The R-9200 is designed to be used in fixed station or mobile environments and can be computer or remotely controlled via RS232/422/485/FSK tones. The standard features along with the available options make the R-9200 part of the most versatile and expandable HF system on the market today.

Features of the R-9200 include: manual or memory frequency selection in 10 Hz steps, 128 programmable channels, AC/DC operation with auto changeover, keyboard entry, nonvolatile memory using EEPROM (no batteries required), BITE to LRU (Lowest Repairable Unit), receive scanning, computer control, and high speed data capability.

1.3 GENERAL DESCRIPTION

The R-9200 can be used in base station 19 inch rack installations, on table tops, in mobile installations and transportable cases. Its rugged package makes the R-9200 ideal for all environments. Internally, the R-9200 is designed with the service technician in mind. Descriptive readouts on the front panel (BITE) and modularized plug-in assemblies make the MTTR (Mean Time To Repair) less than fifteen (15) minutes. LEDs located on the assemblies allow the technician to pinpoint the faulty module immediately. The R-9200 is lightweight for its capability, only thirty-nine pounds (39 lbs.) with AC supply installed. Available in Olive Drab (OD) or Gray, the R-9200 is compatible with most radio station color schemes. If a particular color other than OD or Gray is required, contact the Sunair Marketing Department for information concerning changes to the standard colors.

The R-9200 has a simple, easily understood front panel. First time users can operate the radio without extensive training. The wide screen LCD is continuously updated by the microprocessor with operational status such as Frequency, Channel, Mode, BFO, AGC, Local or Remote Control. The LCD also contains a bar graph meter which selectively indicates signal strength, and Remote receive audio levels. Softkeys and a softkey menu LCD display selected options such as Time, CW Filter, etc. The softkeys also provide access to remote control configuration, meter selection, speaker control and other operating features not found on the front panel keyboard.

1.4 TECHNICAL SPECIFICATIONS

1.4.1 GENERAL

FREQUENCY RANGE: 100 kHz to 29.99999 MHz in 10 Hz steps.

PROGRAMMABLE CHANNELS: 128

FREQUENCY STABILITY: 1×10^6 (Optional ± 1 part in 10^9).

MODES OF OPERATION: USB, LSB, ISB, CW, AME, (DATA, RTTY, ARQ, FEC, FAX with optional external modems).

MEMORY RETENTION: Non-Volatile.

SCAN/SWEEP: Manual or automatic Rate/Dwell programmable.

BFO: + 1.99 kHz, 10 Hz Resolution.

SYNTHESIZER LOCK: 10 ms.

REMOTE INTERFACE: RS232/422/485 (FSK Tone Optional).

RF INPUT IMPEDANCE: 50 Ohm nominal, unbalanced.

BITE: Fault isolated to module level (LRU), descriptive readout on front panel and individual module indication.

INPUT POWER: DC - 26 VDC $\pm 15\%$; AC - 115/230 VAC $\pm 15\%$ 50-60 Hz; AC/DC Auto Changeover.

SIZE - INCHES (CM): 5.96H (15.2) X 17.83W (45.4) X 17.66L (44.9).

WEIGHT - POUNDS (KG): 39 (17.7)

CONSTRUCTION: Modular plug-in assemblies.

1.4.2 RECEIVER SPECIFICATIONS

SELECTIVITY: SSB - 300 to 3000 Hz @ 6 dB; CW - 500 Hz @ 3 dB, centered at 1 kHz (Optional); AM ± 300 Hz @ 6 dB; (Optional Phase Delay Compensated Filters Available).

SENSITIVITY: SSB - 0.5 μ V for 10 dB (S+N)/N; AM - 3.0 μ V for 10 dB (S+N)/N; CW - 0.3 μ V for 10 dB (S+N)/N; (Degradation below 2.0 MHz).

AUDIO OUTPUT: 5 Watts into internal speaker < 5% THD; Two selectable lines, at -20 dBm to +10 dBm into 600 Ohms; Headset, low impedance.

IMAGE & IF REJECTION: 80 dB minimum.

SPURIOUS REJECTION: 80 dB minimum.

AGC CHARACTERISTICS: Attack Time - 10 ms nominal; Release Time - 23 ms fast, 200 \pm 100 ms medium, 1 sec \pm 200 ms slow.

SQUELCH: Syllabic.

ANTENNA INPUT PROTECTION: 100 VRMS, self resetting.

INTERNALLY GENERATED SPURIOUS: 99.6% of the available frequencies from 100 kHz to 30 MHz at or below 0.2 μ v equivalent input at the antenna terminal.

1.4.3 ENVIRONMENTAL

TEMPERATURE: -30°C to +50°C.

HUMIDITY: 100% at 50°C.

RAIN: MIL-STD-810D, Method 506.2.

SHOCK: MIL-STD-810D, Method 516.3.

VIBRATION: MIL-STD-810D, Method 514.6.

1.5 HIGH FREQUENCY PROPAGATION

When HF radio is used, a limited amount of communication is accomplished in a direct line. Some radio waves will travel outward from the transmit antenna along the ground (ground wave propagation) but these waves soon lose their strength and are eventually lost. The greater use of HF radio is via Skywave Propagation which, simply stated, is a process of using the ionosphere to bend the radio waves back to earth to arrive at the distant station. To be successful in using the ionosphere in this manner you must:

- a) Have a general knowledge of the ionosphere and its affect on radio waves.
- b) Select the proper frequency to work in conjunction with the condition of the ionosphere.
- c) Insure the angle of radiation of the radio waves is correct for the condition of the ionosphere and the distance to the receiving station.

Proper frequency selection is critical for effective communication. To select the proper frequency, consulting any of the available sources of such information as IONCAP would be of great benefit. In the absence of such information, viable paths may be selected by receiver monitoring for calls originating near the destination of interest or by trial and error. For example, a high frequency at night, when the ionosphere is at its weakest, would be too strong and the signal would go completely through the ionosphere and out into space. Too low a frequency during the day, when the ionosphere is the most dense, would create a situation where the signal is so weak the ionosphere would totally absorb the radio waves and nothing would return to earth. The general rule of thumb, then is; higher frequencies in the day, lower frequencies at night.

The angle of radiation or take-off angle of a given antenna is also crucial to effective communication. The distance from where the signal exits the transmit antenna to the point at which it returns to earth depends on the angle it enters the ionosphere. If the angle is HIGH, the distance of the signal will be SHORT. If the angle is LOW, the distance will be FAR. The angle of radiation also presents another problem. Too steep an angle means the area of interaction between radio wave and ionosphere is smaller and the danger of the radio wave going straight through and into space increases. Check the literature of the antenna system in use to be sure the angle of radiation or take off angle is consistent with the distance over which you wish to communicate.

1.6 EQUIPMENT SUPPLIED

The following is a list of equipment, with appropriate Sunair part numbers, supplied with the R-9200 Receiver.

<u>Supplied Equipment:</u>	<u>Sunair Part Numbers:</u>
Receiver, R-9200	8102001291 O.D. 8102001259 GRAY
Manual	8102000503
Mating Connector Kit	8102000490
Power Cord Assembly, 115 VAC or Power Cord Assembly, 230 VAC	8076002095 8076002192

1.7 OPTIONS AVAILABLE

The following is a list of optional equipment or accessories available for use with the R-9200 Receiver.

<u>Optional Equipment/Accessories:</u>	<u>Sunair Model/Part Numbers:</u>
High Stability Reference Oscillator	5024013701
Remote Control Unit, RCU-9310/R	8078701292 O.D. 8078701250 GRAY
Remote Control Unit (Computer Control), RPC-9286D	8078201001
Headset	0840200005
Headset, Lightweight	1010690027
Headset, with Dynamic Microphone	1012220001
Shockmount Assembly (Mobile Application)	8076002591
Rackmount Kit with Slides	8076004896 O.D. 8076004853 GRAY
Power Cord Assembly, DC	8076002290
Running Spares Kit	8102904097
Field Module Kit	8102905093
Depot Spares Kit, Gray	8102901055
Depot Spares Kit, O. D.	8102901098

Depot Spares Kit, R-9200	8102900091
Cable Assembly Audio and Control (Made to length)	8078004591
Cable Assembly Audio to external data modems (6 foot length)	8076004594
Power Cord Assembly, DC	8076002290
Service Kit 9000 Series	8076003393
Clock	1011190010
Preselector/Postselector Unit, F-9800	8110001254

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SECTION II

INSTALLATION

2.1 GENERAL

Section II contains all necessary instructions for the unpacking, inspection, and if necessary, reshipping of damaged equipment or parts. In addition, further information regarding location and mounting considerations, power requirements, antenna and ground system hook-ups and final checkouts after installation is also provided.

2.2 UNPACKING AND INSPECTION

As soon as you have received your unit(s), unpack and inspect all components and accessories. Check the packing list to be sure you have received all items ordered, and that all items necessary for operation have been ordered.

NOTE:

Be sure to retain the carton and its associated packing materials should it be necessary to reship damaged equipment.

Do not accept a shipment when there are visible signs of damage to the cartons until a complete inspection is made. If there is a shortage of items or any evidence of damage, insist on a notation to that effect on the shipping papers before signing the receipt from the carrier. If concealed damage is discovered after the shipment has been accepted, notify the carrier immediately in writing and await his inspection before making any disposition of the shipment. A full report of the damage should also be forwarded to Sunair's Product Services Department. Please be sure to include the following information for prompt service:

- a) ORDER NUMBER.
- b) MODEL AND SERIAL NUMBER.
- c) NAME OF TRANSPORTATION AGENCY.
- d) APPLICABLE DATES.

Upon receipt of this information arrangements will be made, by Sunair, for repair or replacement.

2.3 RETURN OF EQUIPMENT TO FACTORY

The shipping carton for the R-9200 has been designed to protect the equipment during shipment. The container and its associated packing materials should be used to reship the unit. When necessary to return equipment to Sunair for warranty or non-warranty repair, an authorization number is required. This number can be obtained from our Product Services Department:

TELEPHONE: (954) 525-1505,

FACSIMILE: (954) 765-1322.

If the original shipping carton is not available, be sure to carefully pack each unit separately, using suitable cushioning material where necessary. Very special attention should be given to providing enough packing material around connectors and other protrusions from the unit. Rigid cardboard should be placed at the corners of the equipment

to protect against denting. **DO NOT USE DUNNAGE (STYROFOAM PEANUTS) FOR PACKING PROTECTION**, they may allow the unit to shift while being shipped, and, therefore, become damaged.

When returning subassemblies or components for repair or replacement, be sure to pack each separately, using suitable cushioning material.

Shipment to be made **PREPAID** consigned to:

Sunair Electronics, Inc.
Product Services Department
3101 SW Third Avenue
Fort Lauderdale, Florida 33315-3389
U.S.A.

Plainly mark with indelible ink all mailing documents as follows:

US Goods Returned For Repair
Value For Customs - \$(Amount)

Mark ALL SIDES of the package:

FRAGILE - ELECTRONIC EQUIPMENT!

NOTE:

Before shipping, carefully inspect the package to be sure it is marked properly and is securely wrapped.

2.4 GENERAL INSTALLATION AND MOUNTING INFORMATION

Satisfactory operation of this equipment will depend upon the care and thoroughness taken during installation.

2.4.1 GENERAL INSTALLATION

For installation and use with transmitters, modems, and other peripherals. Use this manual in conjunction with their respective operating manuals for complete installation information.

- a) Carefully plan transmitters/peripherals/coupler/antenna locations, observing the following requirements before starting installation.
- b) Provide best possible RF ground for receiver and coupler. Use flat copper strap 1" wide or No. 6 or larger wire and connect to ground terminal at rear of receiver. Leads to ground system should be as short as possible.
- c) Provide separation between transmitter output and receiver with its associated wiring.
- d) If the receiver is installed on a wood or fiberglass boat, approximately ten (10) to twelve (12) square feet of metal surface area in contact with the water should be provided for use as an RF ground.
- e) If operated on DC power, check for correct polarity before applying power.

Connection of the R-9200 power sources, antennas and other equipment may be accomplished as follows:

TO ADD	CONNECT	NOTE
AC Power	AC source to J1 on rear panel.	See Figure 2.4.1.1.
DC Power	DC source to J3 on rear panel.	See Figure 2.4.1.1.
Antenna	Antenna to J4 on rear panel.	See Figure 2.4.1.1.
Headphones	Headphones to J2 on front panel.	See Figure 2.4.1.1.
Microphone or optional Headset	Microphone or optional Headset to J3 on front panel.	See Figure 2.4.1.1.
External Data Modems (Direct Connection R-9200)	Modem audio and keyline to R-9200 through audio connector J5 on the rear panel.	See Figure 2.4.1.1 and 2.4.1.2.
Remote Control (RCU-9310R)	Control lines from J6 (RCU-9310/R) to remote connector J8 on the rear panel of the R-9200.	See Figure 2.4.1.1 and consult RCU-9310R Manual.
	Audio lines from J4 (RCU-9310/R) to audio connector J5 on the rear panel of the R-9200.	
Remote Control (RPC-9286)	Control lines from J2 (RPC-9286) to remote connector J8 on the rear panel of the R-9200.	See Figure 2.4.1.1 and consult RPC-9286 Manual.
	Signal line from J3 (RPC-9286) to audio connector J5 on the rear panel of the R-9200.	
Preselector (F-9800)	Control lines from J5 (F-9800) to remote connector J8 on the rear panel of the R-9200.	See Figures 2.4.1.1, 2.4.1.3 and consult F-9800 Manual.
	Antenna from J2 (F-9800) to J4 on rear panel of R-9200.	See Figures 2.4.1.1, 2.4.1.3 and consult F-9800 Manual. Also check R-9200 CPU Assembly 1A2A1 S1 Section 6 for Preselector selection see page 5-36.

2.4.2 BASE STATION INSTALLATION

The R-9200 is equipped with rubber feet so that it can be placed directly on a table, desk or similar flat surface. The front feet are taller than the rear feet to tilt the transceiver at a convenient operating angle. Minimum clearances of one (1) inch at the sides and two (2) inches at the rear and top should be allowed to provide for adequate cooling of the rear panel heat sinks. Figure 2.4.1.1 shows the applicable outline dimensions of the equipment and the location of inputs and outputs for antennas, remote controls, signal lines, and modems.

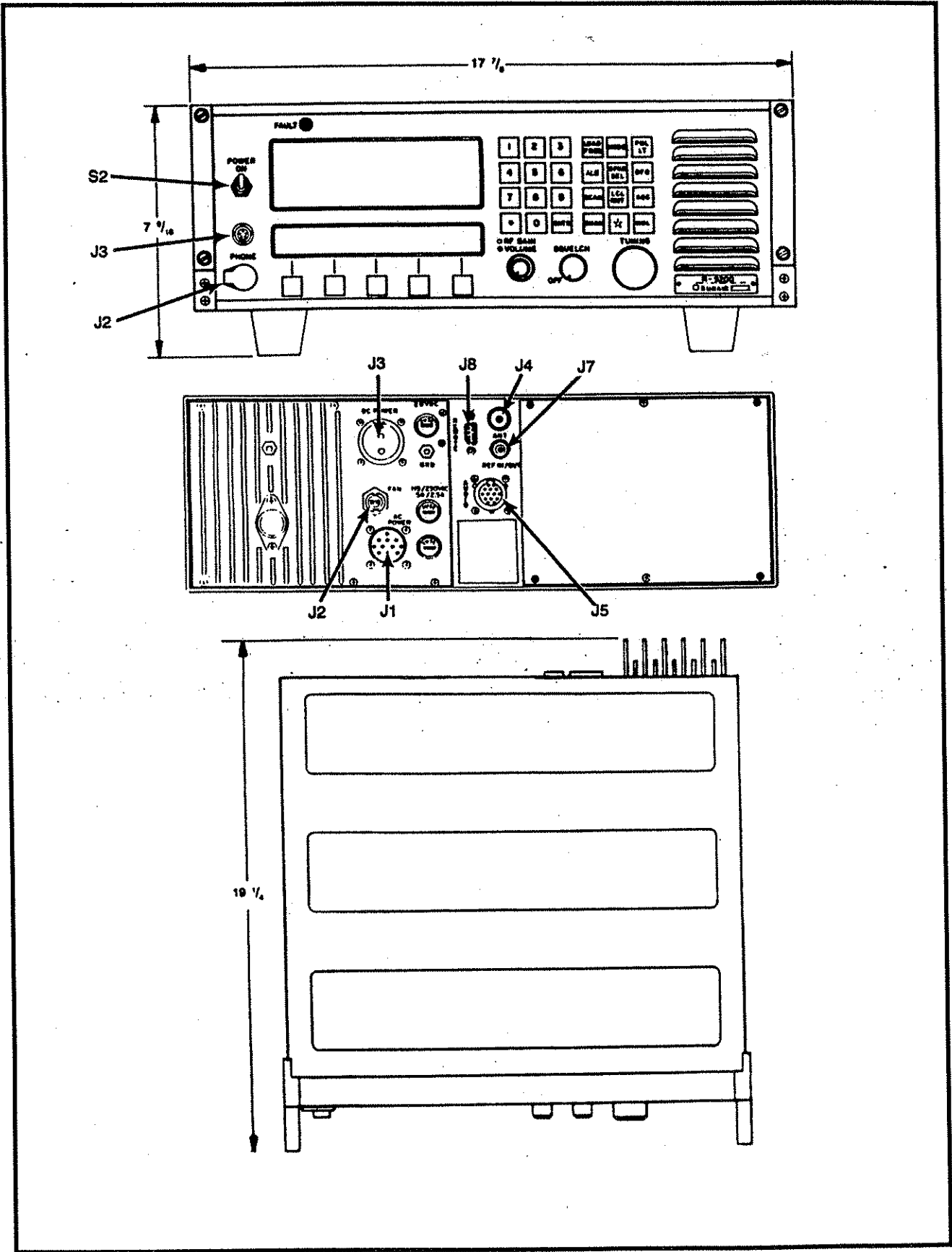


Figure 2.4.1.1 R-9200 Outline Dimensions.

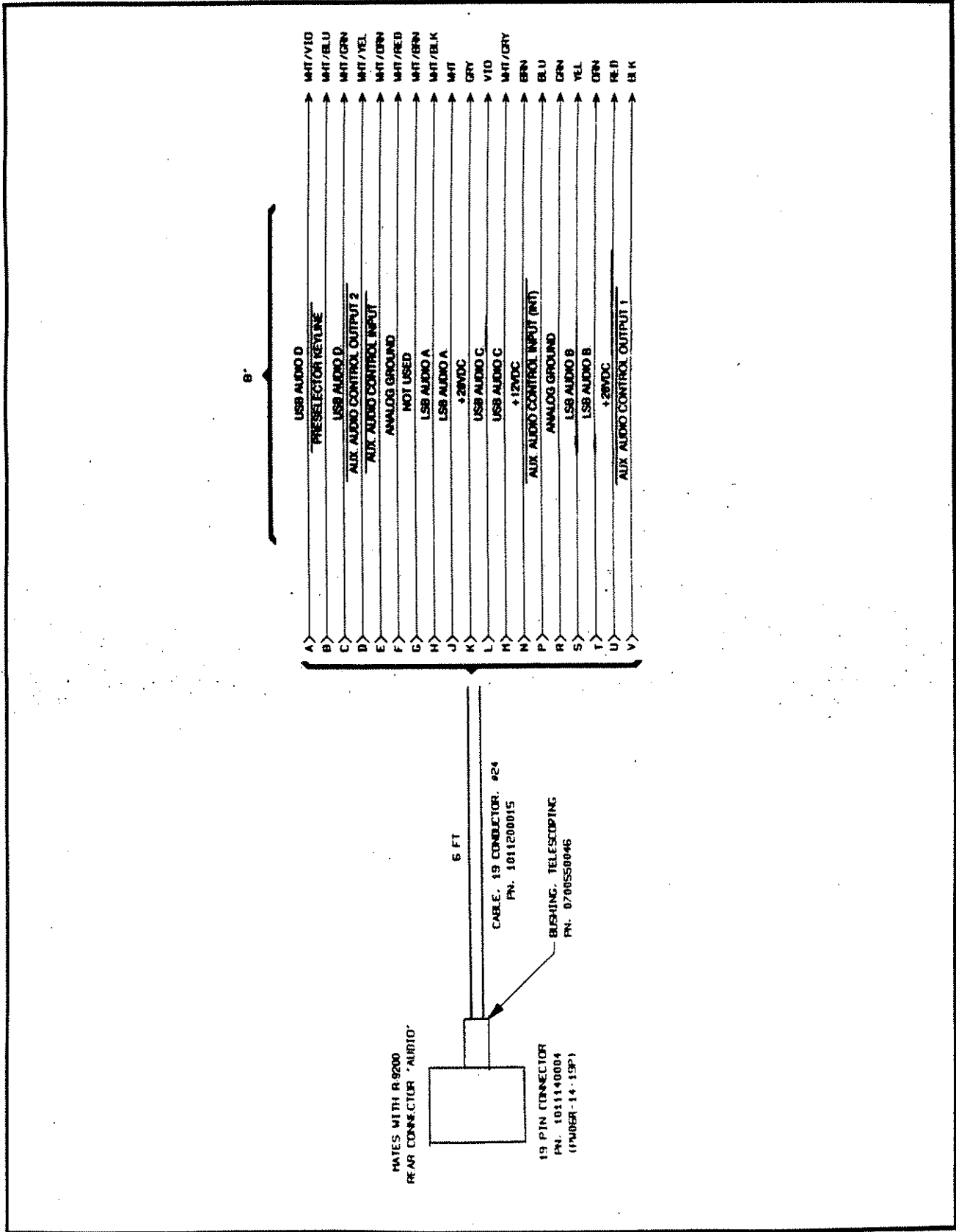


Figure 2.4.1.2 Cable Assembly, R-9200 Audio Interface.

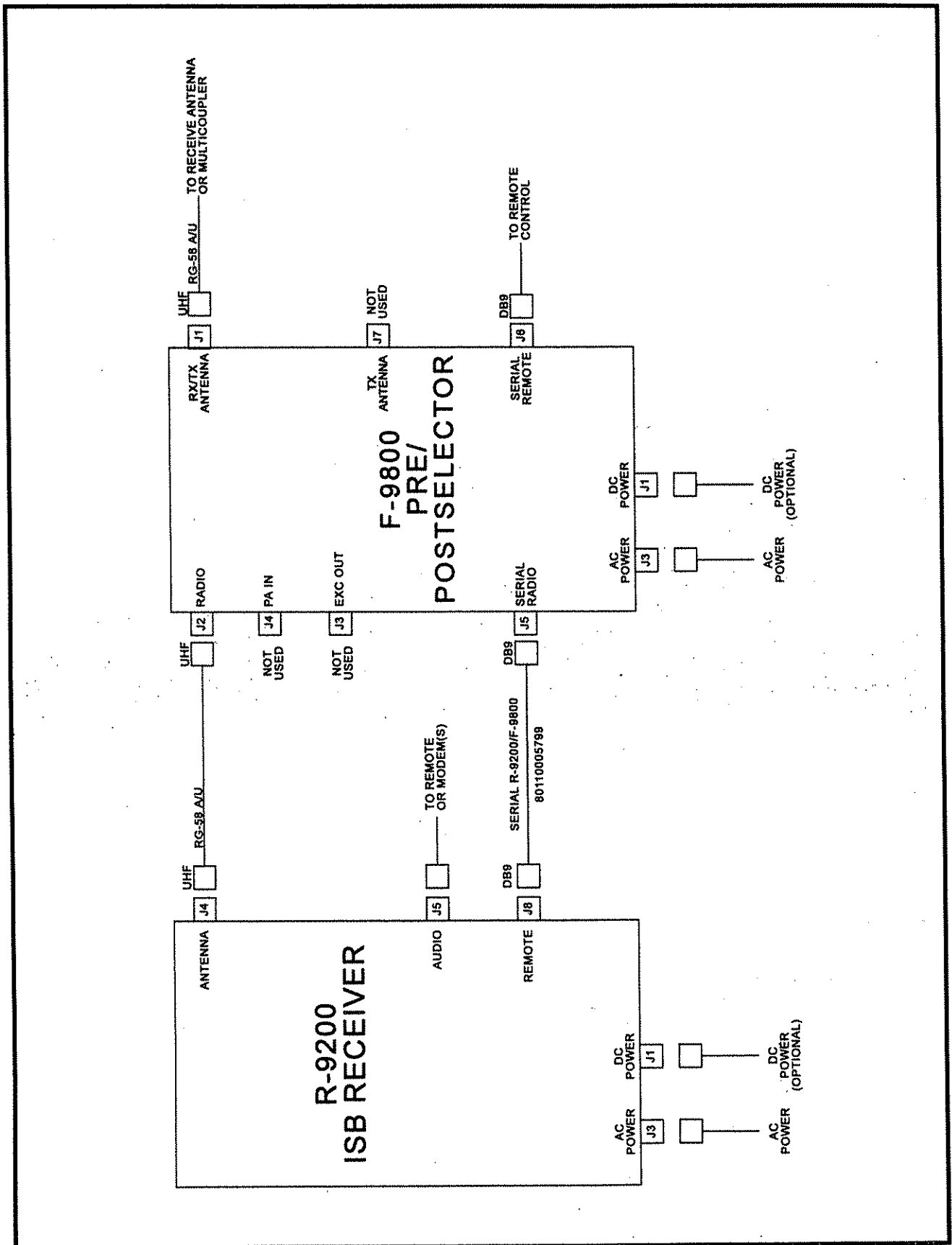


Figure 2.4.1.3 Connecting R-9200 to F-9800.

2.4.3 VEHICULAR INSTALLATIONS

The R-9200 Shockmount Assembly (Sunair p/n 8076002591) is designed to mount the receiver in vehicular/mobile installations. Figure 2.4.3.1 gives the applicable outline dimensions for the R-9200 coupled with the shockmount.

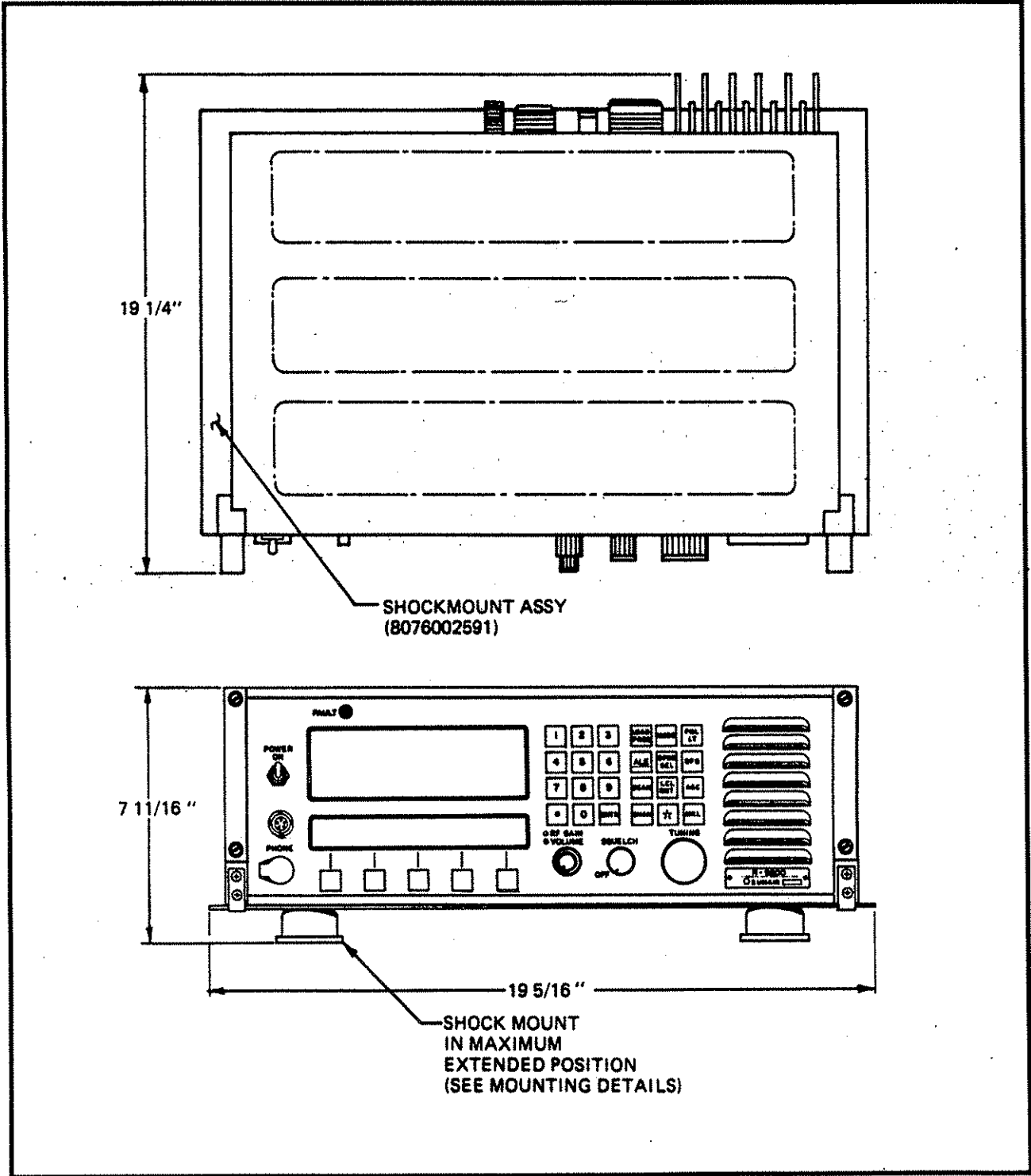


Figure 2.4.3.1 Outline Dimensions of R-9200 with Shockmount.

In order to minimize RF pickup, it is important that the ground strap supplied with the shockmount be securely fastened between the ground post on the transceiver and the bottom of the right rear shock isolator (see detail in Figure 2.4.3.2).

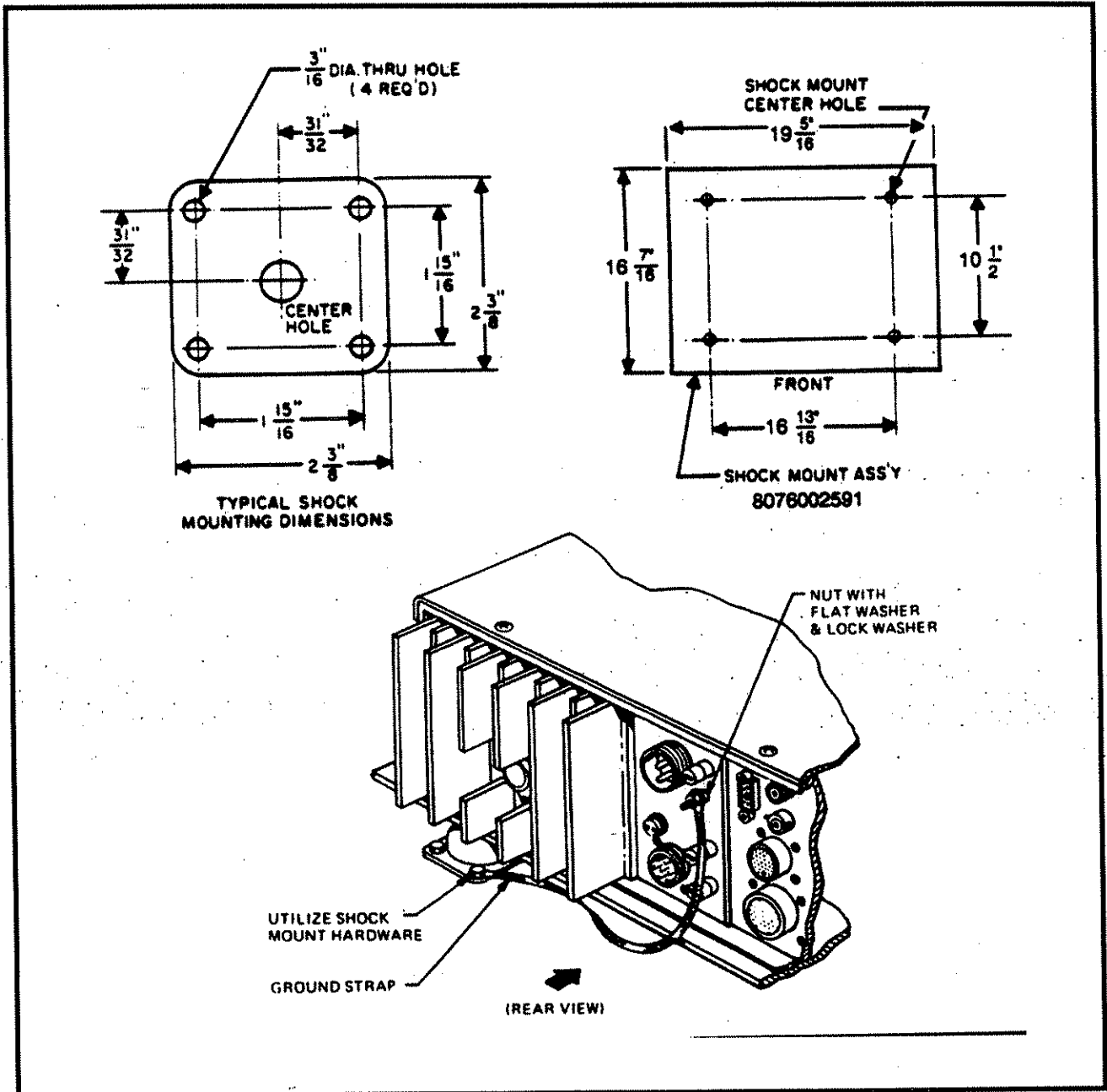


Figure 2.4.3.2 Grounding of R-9200 to Shockmount.

2.4.4 MARINE INSTALLATIONS

In marine installations, follow the same recommendations as outlined in paragraph 2.4.3. If the receiver is installed on a wood or fiberglass boat, a ground plate of twelve (12) square feet minimum area in contact with the water should be installed. A heavy ground lead such as a one inch (1") wide strap or braid should be connected between the ground post on the receiver and the ground plate. The length of this ground lead should be held to an absolute minimum commensurate with a neat installation.

2.4.5 RACK INSTALLATION

The receiver may be conveniently mounted in a standard nineteen inch (19") rack using the Rackmount Kit (Sunair p/n 8076004853 [GRAY] or 8076004896 [OD]). The kit includes rack slides, associated hardware and filler panels. The transceiver, in the rack mounted configuration, requires a standard panel space of seven inches (7") high. Refer to Figure 2.4.5.1 for assembly details.

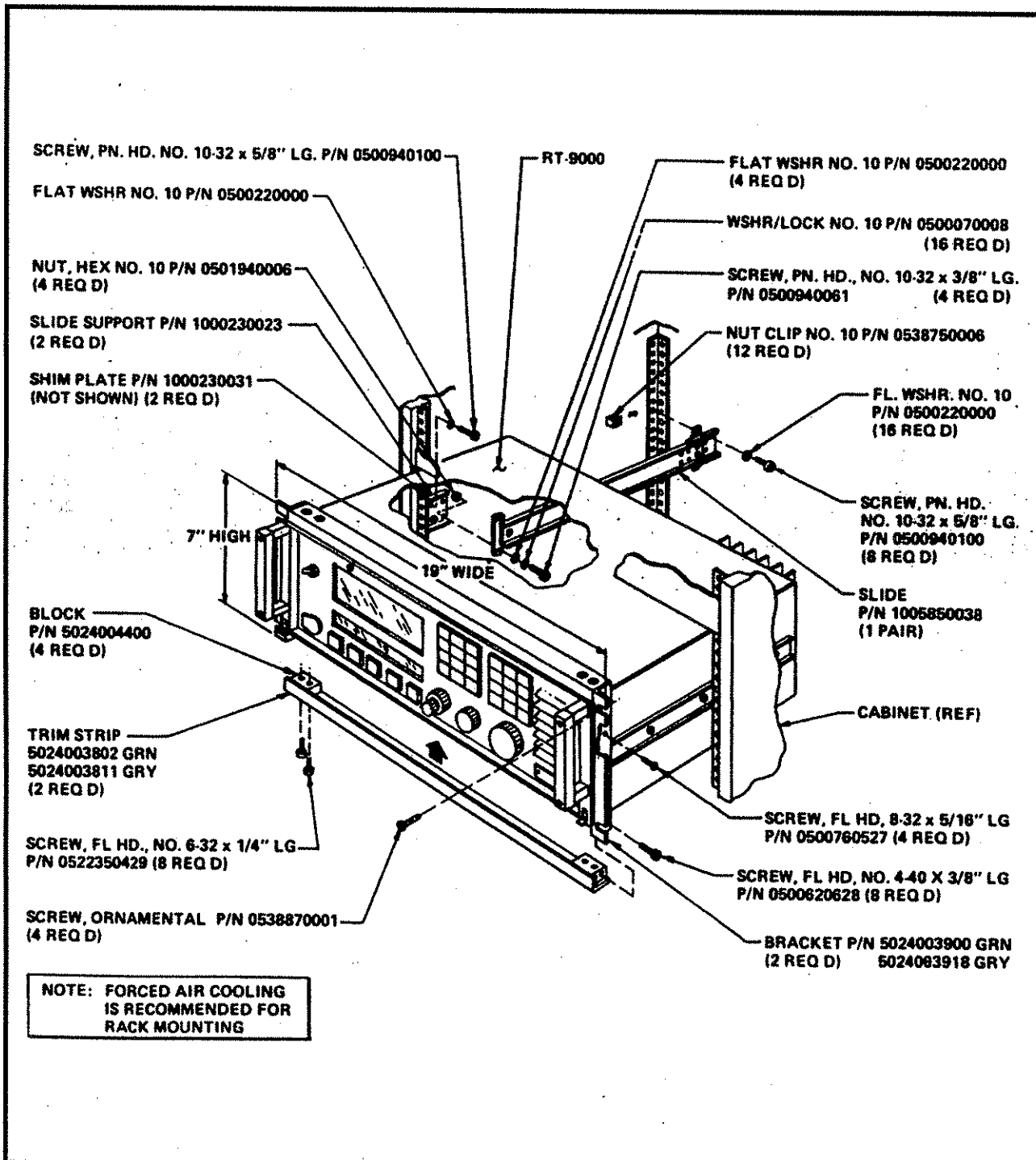


Figure 2.4.5.1 Installation of R-9200 in Equipment Rack.

2.5 ANTENNAS AND GROUND SYSTEMS

2.5.1 GENERAL

The R-9200 is designed to operate from a 50 Ohm resistive antenna system. It, of course, will function with higher impedance antennas, the overall path performance being dictated by the specific antenna characteristics.

NOTE: Some general 'DOs' and 'DON'Ts' of antenna installation are:

- a) The antenna should be clear of all large objects such as trees, buildings and power lines.
- b) Although the R-9200 will operate with electrically short antennas (i.e. those under 1/8 wavelength), such antennas are not efficient. If the installation permits, antennas over 1/8 wavelength long at the lowest operating frequency should be used. Antenna length generally limits system performance in vehicular applications at frequencies below four (4) MHz as proper size would be inappropriate for the vehicle.
- c) When using whip antennas, the ground system actually forms part of the receiving system. Where space permits (such as in a base station installation) a good ground plan or radial system should be installed at the base of the antenna.

NOTE: An inadequate ground system is most often responsible for disappointing performance when using a whip antenna.

- d) In vehicular installations and marine installations in a metal hull ship, one inch (1") wide strap or braid should be connected between the antenna ground and the frame of the vehicle. The length should be as short as possible. In an installation aboard a wood or fiberglass boat, a ground plate with at least 12 square feet in contact with the water should be attached to the hull and a short, 1 inch wide strap should be connected between the radio ground post and the plate. As previously mentioned this ground lead should be as short as possible.

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SECTION III

OPERATION

3.1 GENERAL

This section provides the operator with the location and use of the R-9200 front panel controls for proper utilization of the equipment. For convenience of discussion, functions are addressed in normal sequence. However, it is not necessary to observe this order once the user becomes familiar with the equipment. Any setting may be changed independently by referring to the appropriate section in this chapter pertaining to the function in question. Reference to Figure 3.1.1 below, shows the location of the control groupings, displays, and their general purpose.

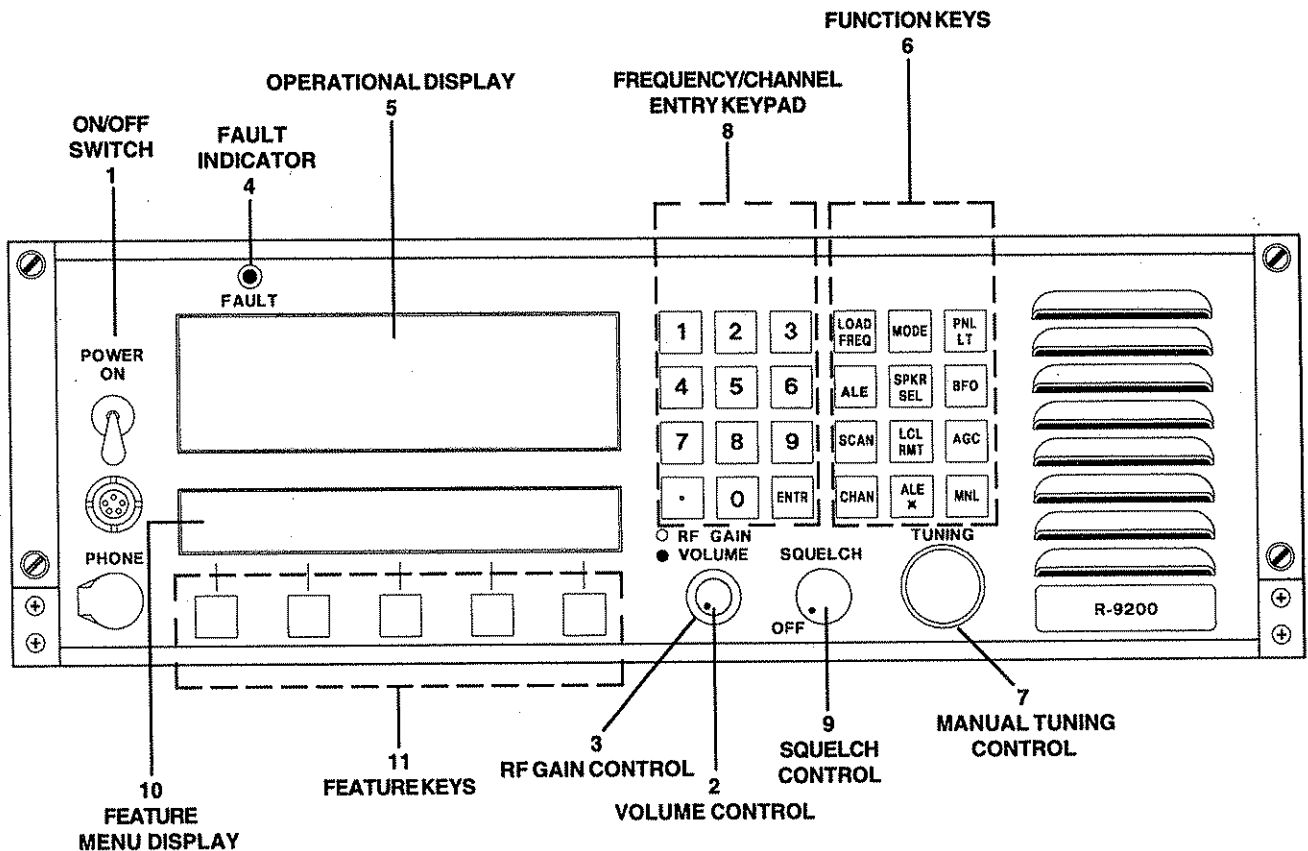


Figure 3.1.1 Front Panel Controls for the R-9200.

1 ON/OFF SWITCH

When the switch is in the upward position, power is applied to the receiver.

2 VOLUME CONTROL (INSIDE)

When in the full counter clockwise position the audio output is minimum. Output may be increased by advancing this control in a clockwise direction.

NOTE: The setting of this control does not affect the level of the remote audio output located at the rear surface of the equipment.

3 RF GAIN CONTROL (OUTSIDE)

When in the full clockwise position the RF Gain is at a maximum. The receiver is normally operated at this setting. In the event of operation in an extremely high signal level environment, better reception may be achieved by reducing RF Gain by turning this control in a counterclockwise direction.

4 FAULT INDICATOR

If at any time this red indicator is lit, there is a fault in the receiver. Please check the installation and proceed to the section on 'BITE' located in section 3.3.1 of this manual.

5 OPERATIONAL DISPLAY

This Liquid Crystal Display (LCD), provides a variety of information required to operate the equipment. Information will appear in four primary areas of the operational display as indicated in Figure 3.1.2.

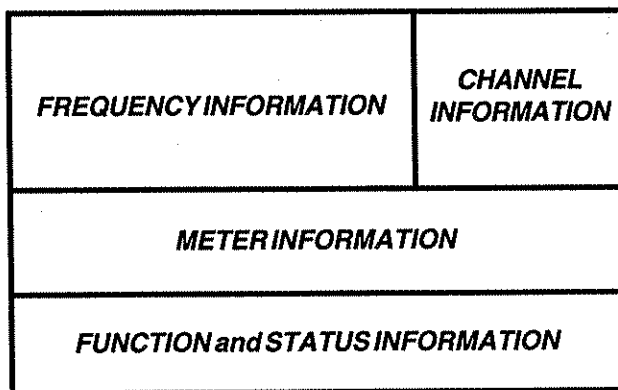


Figure 3.1.2 Operational Display Information Location.

6 FUNCTION KEYS

This grouping of twelve (12) keys are used to control or establish the primary operating functions of the equipment such as mode selection, channel selection, channel loading, AGC characteristic, local/remote operation, panel illumination, and manual receiver tuning.

7 MANUAL TUNING CONTROL

This permits manual tuning of the receiver frequency or channels. Actual movement of frequency will be indicated on the operational display.

8 FREQUENCY/CHANNEL ENTRY KEYS

This group of twelve (12) numeric keys is used for entry of frequency or channel information, either to establish a particular operating frequency or load frequency information into channel storage for later recall.

9 SQUELCH CONTROL

When this control is in the fully counterclockwise position the equipment is unsquelched. To enable the squelch, turn the control clockwise to the desired threshold (signal strength required to unsquelch the receiver). The greater the clockwise setting of the control, the greater the signal strength required to open the squelch.

10 FEATURE MENU DISPLAY

This display provides names or functions for the five (5) keys located directly below the display. In most cases, this display will automatically indicate the appropriate selections based upon the condition of other equipment settings. The menu may be changed at will, however, by depression of the fifth key located under 'MORE'.

11 FEATURE KEYS

This grouping of five (5) 'SOFT' keys will enable the various functions indicated in the feature menu display located directly above the key.

NOTE:

An asterisk (*) appearing in the feature menu display indicates that the feature preceding it is enabled or 'ON'.

Utilization of the controls of the R-9200 Receiver can be divided into three categories:

- A. Primary Operations (Section 3.2),
- B. Equipment Set-up (Section 3.3), and
- C. Advanced Operations (Section 3.4).

3.2 PRIMARY OPERATION

3.2.1 RECEIVER SET UP FOR MODE AND AGC

Turn the equipment 'ON' with toggle switch 1, and refer to Figure 3.2.1. The operational display should appear as indicated in the figure except that specific frequencies and modes will reflect the condition of the equipment when last used. Depress 'MODE' key 2, to select the desired mode of reception as indicated in the operational display at 3. Choices are 'USB', 'LSB', 'ISB', 'CW', and 'AM'. If the Data filter options have been installed 'DATA' is displayed.

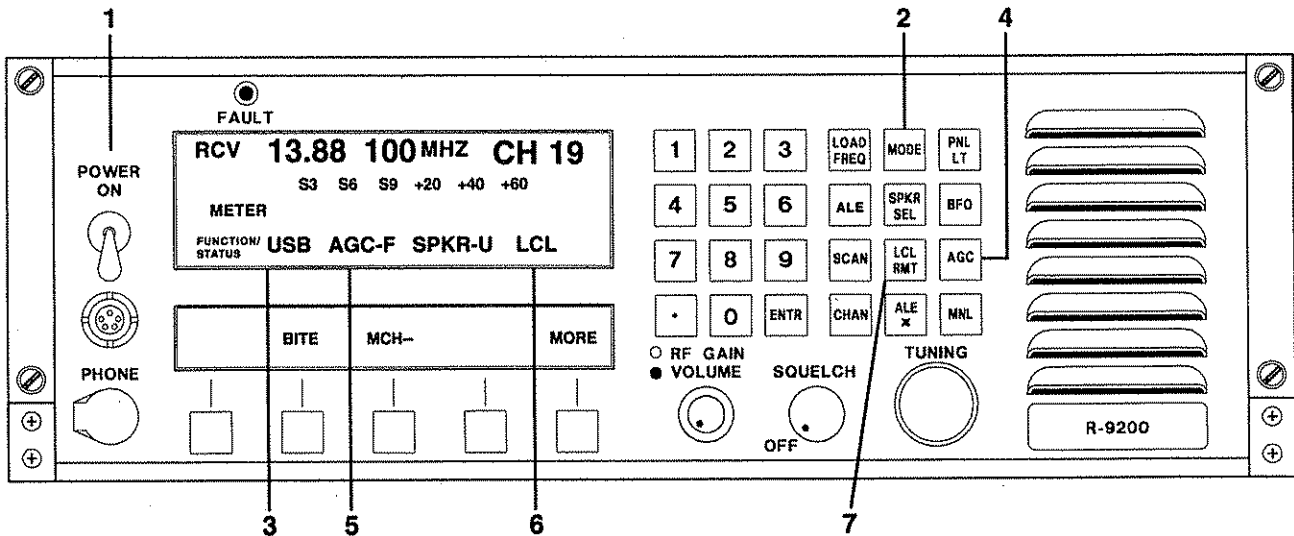


Figure 3.2.1.1 R-9200 Receiver Displays.

Depress 'AGC' key 4, to select 'AGC' Characteristic, which will be indicated in the display segment at 5. Choices are 'AGC-S' (Slow), 'AGC-M' (Medium), and 'AGC-F' (Fast). A slow 'AGC' characteristic is generally desirable with speech transmission. A fast 'AGC' characteristic is desirable for data reception. To select 'AGC-0' (No AGC), see Section 3.2.7.

This section of the operational display 6 indicates the point of control of the receiver and should read 'LCL' (Local) unless a remote unit is connected to the receiver and presently has control - in which case the display will read 'RMT' (Remote). To change control back to the receiver simply depress the 'LCL/RMT' (Local/Remote) key 7.

NOTE: If the receiver is not connected to remote control equipment the operational display should always read 'LCL' and depression of the 'LCL/RMT' key will produce the message:

'NO REMOTE SYSTEM'

to appear momentarily on the operational display.

THE BASIC FUNCTIONAL PARAMETERS OF THE RECEIVER HAVE NOW BEEN ESTABLISHED.

3.2.2 ESTABLISHING AN OPERATING FREQUENCY

If operational display 1 does not read 'M' (Manual Operation), refer to Figure 3.2.2, then depress 'MNL' key 2. The display will now read 'M'. (The equipment's feature menu display will also read as indicated in 7). Depression of the 'LOAD FREQ' key, 3, will blank the operational display located at 4, and change feature menu display to provide 'ERASE' and 'END' functions.

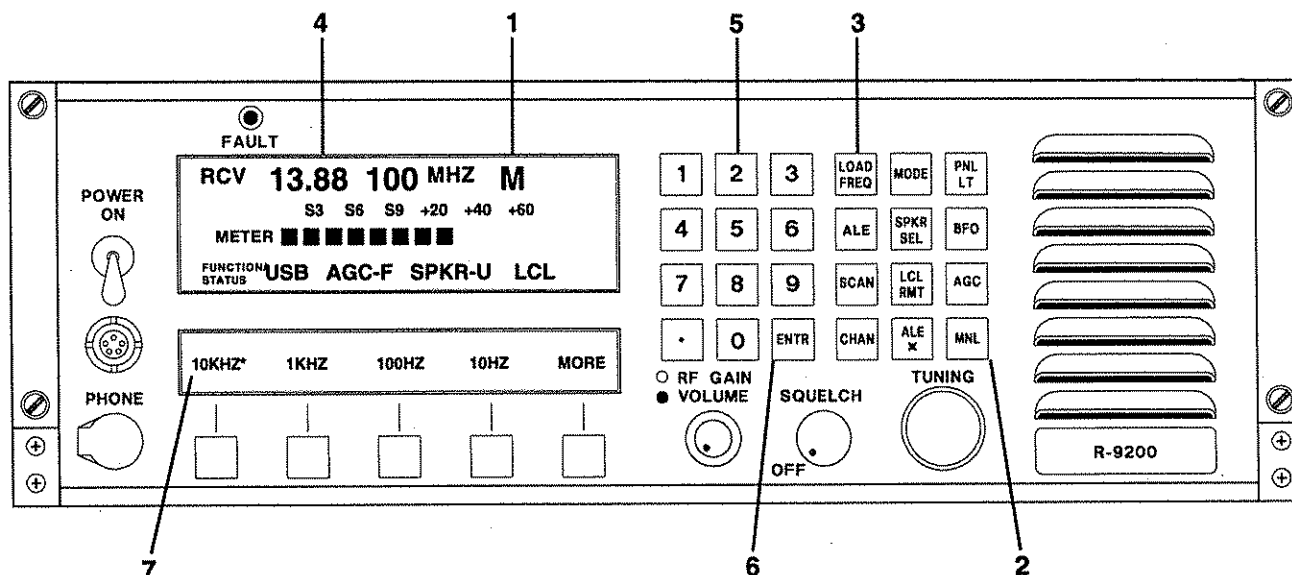


Figure 3.2.2.1 R-9200 Operational Controls.

The numeric keypad, 5, may now be used to enter any operational frequency by entering seven (7) digits. (For frequencies less than 10 MHz, the first digit entered must be '0'. The numbers being entered will appear on the operational display at 4, in the order of entry from left to right. When seven (7) digits have been entered depress the 'ENTER' key, 6, to activate the receiver.

THE RECEIVER IS NOW OPERATIONAL ON THE FREQUENCY SELECTED

NOTE: If an error is made in entering a frequency, simply depress the 'LOAD FREQ' key to clear the frequency and repeat the procedure.

NOTE: If a frequency below 100 kHz is entered, the frequency will flash on and off and the message:

'ILLEGAL RCV FREQ'

will appear on the operational display.

3.2.3 MANUAL TUNING

Once an initial operating frequency has been established and the R-9200 is in the 'M' (Manual) mode as indicated by 1, in Figure 3.2.3, frequency can be increased or decreased by: Turning the 'Tuning' control 2 clockwise to increase frequency or counter clockwise to decrease frequency.

The rate at which the frequency is moved the (the increments or frequency 'steps') is indicated in the 'Feature Menu Display' at 3 .

The location of the asterisk (*) 4 , indicates the incremental change in frequency which rotation of the tuning control will produce, in this case 10 kHz: To change this rate to 1 kHz, 100 Hz or 10 Hz, simply depress the feature key 5 located below the desired setting. The asterisk (*) will move to indicate the increment selected.

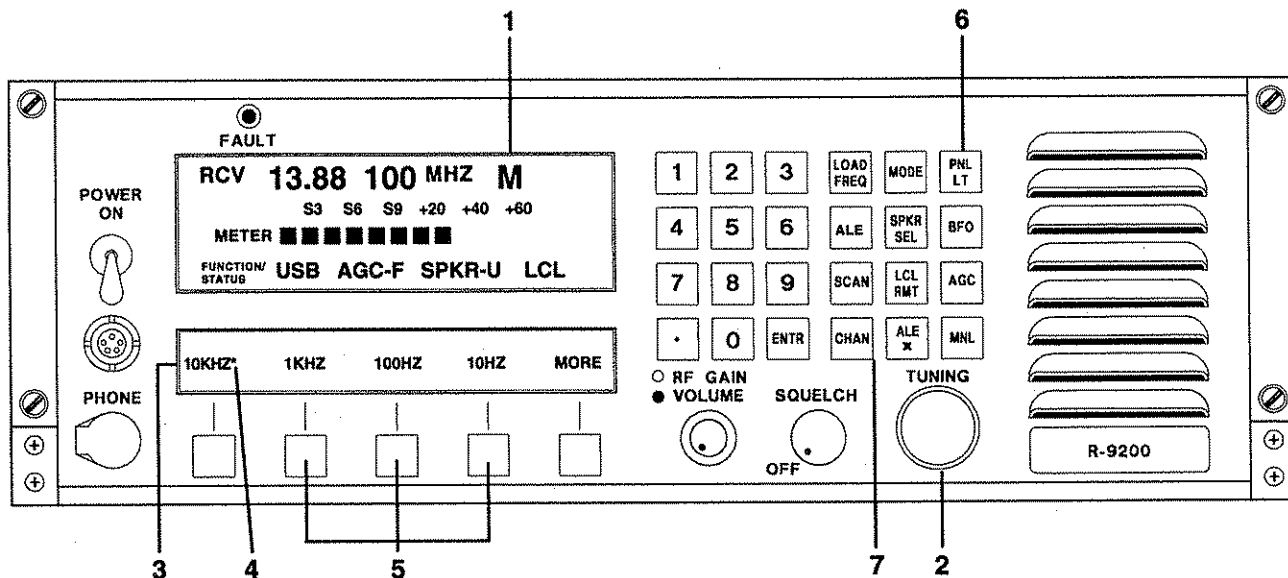


Figure 3.2.3.1 R-9200 Operational Controls.

To exit 'MANUAL TUNING' depress the 'CHAN' key.

3.2.4 PANEL LIGHTING

At initial turn ON the Panel Lighting will be illuminated. If no keyboard activity has been detected for approximately 30 minutes the unit will automatically turn OFF the Panel Lighting. Both the 'Operational' and 'Feature' displays may be illuminated by depressing the 'PNL LT' key located at 6 in Figure 3.2.3. A second depression will turn the lighting off.

NOTE: The backlighting devices for the two (2) Front Panel LCDs will gradually lose their luminescence with time. For this reason the Panel Light should be turned OFF whenever possible. See Section V for replacement of backlight devices.

3.2.5 OPERATING WITH PRE-SET CHANNELS

Operation using pre-set channel frequencies can only be accomplished if the desired frequencies have been entered into the memory of the receiver. If this has not been accomplished refer to Section 3.2.7 prior to proceeding.

Turn the equipment 'ON' 1 and advance the volume control 2 to a comfortable listening level.

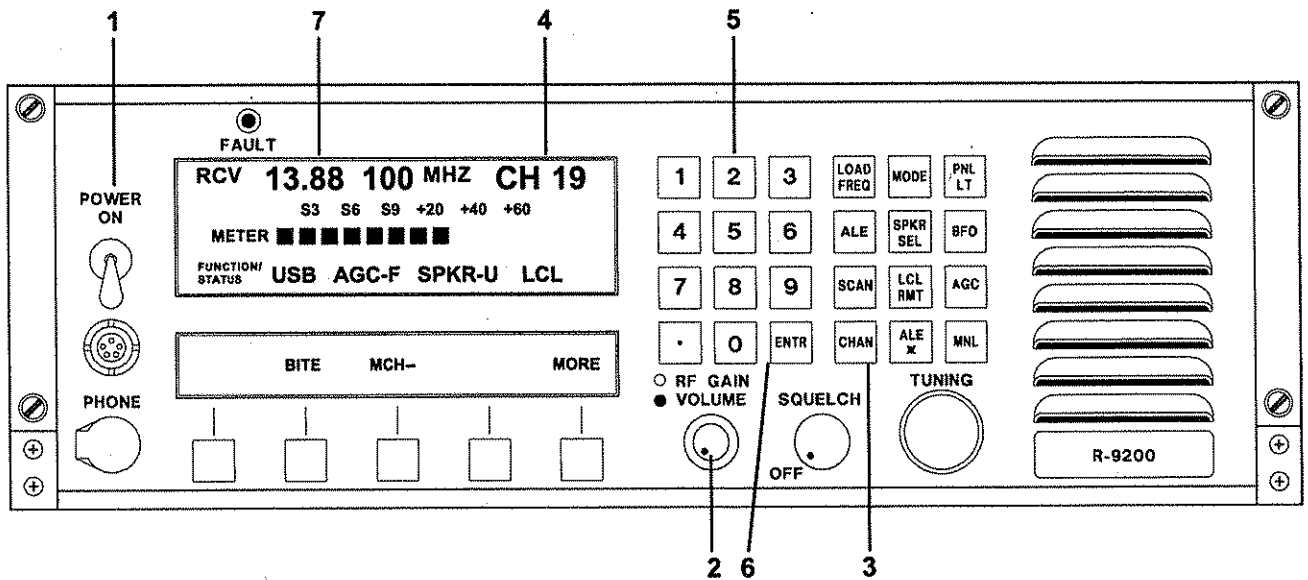


Figure 3.2.5.1 R-9200 Operational Controls.

Depress the 'CHAN' (Channel) key 3 to blank the channel number appearing at 4 .

Enter any channel number from 00-127 using the numeric keypad 5 . The number entered will be shown on the operational display at 4 .

Depress the 'ENTER' key 6 . The receive operating frequency stored for the channel entered will now appear on the operational display at 7 .

NOTE: If during loading of channel number you wish to return to the last channel selected depress 'END' key on feature menu display.

THE RECEIVER IS NOW FULLY OPERATIONAL ON THE CHANNEL SELECTED.

3.2.6 MANUAL CHANNEL SCANNING

Once the equipment is in the pre-set channel mode of operation as outlined in Section 3.2.5, all of the channels programmed may be viewed and/or used by depressing equipment 'Feature' menu 'MORE' key, 1 , until the display 2 reads as shown in Figure 3.2.6.1.

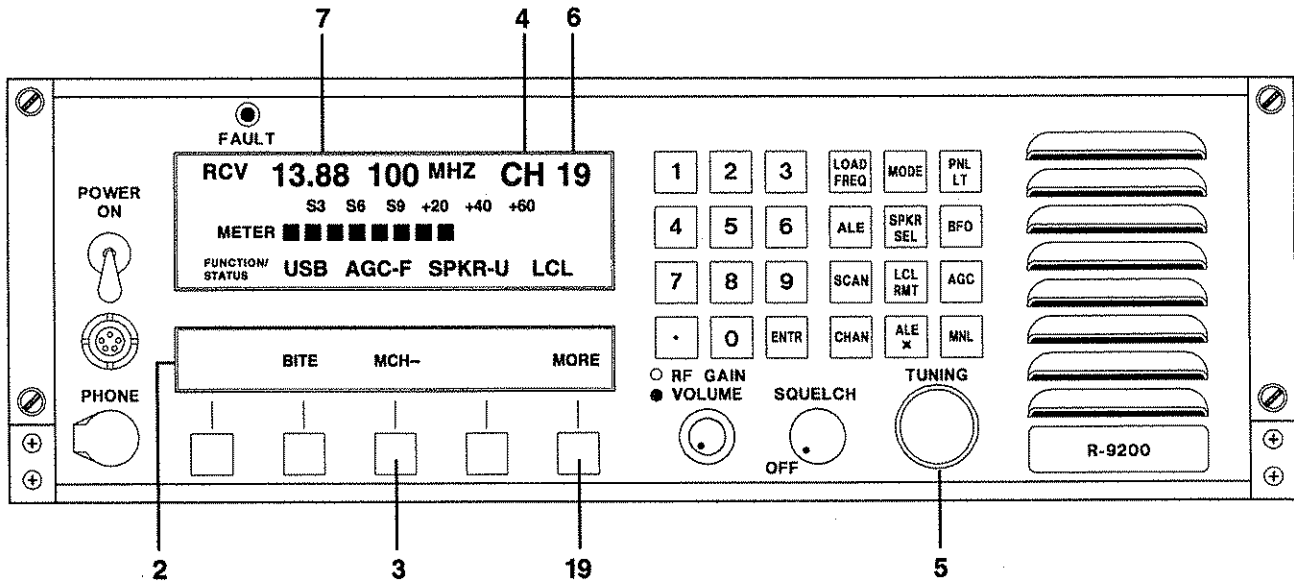


Figure 3.2.6.1 R-9200 Operational Controls.

Depress 'MCH-' (Manual Channel) key **3** . The 'CH' designator preceding the channel number on the operational display at **4** will change to 'MC' (Manual Channel) and an asterisk (*) will appear next to 'MCH-' in the feature menu display, denoting that the selected function has been enabled.

Rotation of the tuning control **5** will increase or decrease channel numbers **6** (in order) and the associated stored operating frequency will appear in the operational display at **7** .

NOTE: 'MODE' and 'AGC Characteristic' are also pre-programmable for each channel and may change in the operational display as the tuning control is rotated.

The R-9200 may be set on any channel and the receiver is fully operational.

NOTE: This mode provides a rapid means of logging pre-stored channel information, if unknown.

Escaping from this method of operation may be achieved by simply depressing the 'MCH-' key **3** again. The asterisk (*) will disappear. The 'MC' designator at **4** will revert to 'CH', and the channel number **6** and frequency **7** will remain where last left in the manual channel scan operation.

Changing from the displayed channel to any other may be accomplished as described in Section 3.2.5.

3.2.7 LOADING PRE-SET CHANNEL FREQUENCIES

The R-9200 is capable of storing operating information on 128 pre-set channels (numbers 00-127) for later recall and use. For each channel the operating information to be stored consists of:

- A. Receive Frequency
- B. Mode of Reception
- C. AGC Speed

The following procedure, referring to Figure 3.2.7.1, should be followed to enable proper loading of channels.

If receiver is not 'ON', turn 'ON' with toggle switch **1** and advance the volume control **2** clockwise to a comfortable listening level. Depress the 'CHAN' (Channel) key **3**. The operational display will now read 'CH' at **4** and blank at **5**.

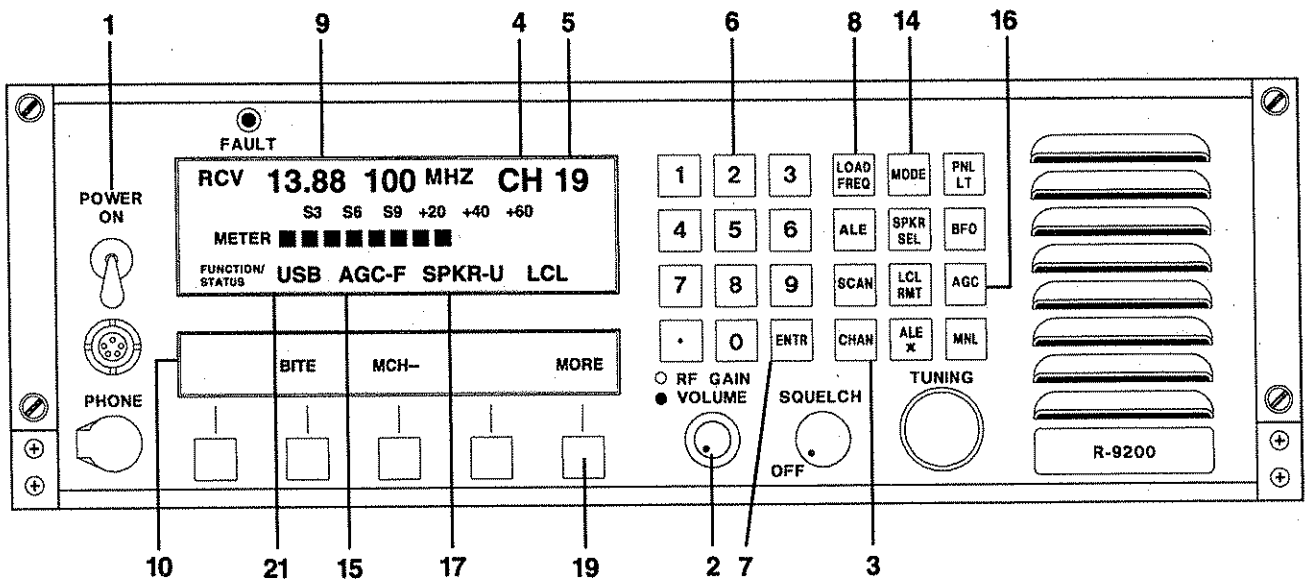


Figure 3.2.7.1 R-9200 Channel Loading Controls.

Use the numeric keypad **6** to enter the channel number (enter a '0' first for a number less than 10). Depress the 'ENTER' key **7**. The channel number to be programmed will now appear at **5**.

Once the desired channel number has been selected, operational information may be entered as follows:

- A. To load the Receive Frequency depress the 'LOAD FREQ' key **8**. The operational display at **9** will now be blank.

Enter the desired receive, or operating, frequency (Seven (7) digits are required. Enter '0' first if frequency is less than 10 MHz.) using the numeric keypad **6** . The entered frequency will appear in order of digit entry (left to right) on the operational display at **9** .

NOTE: When the 'LOAD FREQ' key is depressed, the equipment feature menu display **10** will change to provide an 'ERASE' function at **11** . As shown in Figure 3.2.7.2. Depression of this key will erase the numeric frequency entry, one digit at a time, beginning with the last digit entered (right to left). When the desired digits are blanked, simply resume keypad entry of frequency. Do not depress 'END' key **18** unless you desire to abort frequency loading and have the channel revert to its original stored information.

Once the desired receive frequency has been entered, depress the 'ENTER' key **7** to store the information.

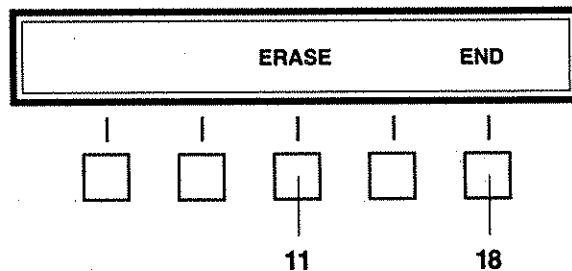


Figure 3.2.7.2 R-9200 Feature Menu Display.

B. To load Mode of Reception, depress the 'MODE' key **14** successively until the desired mode appears on the operational display at **21** . Choices are: 'USB', 'LSB', 'CW', 'ISB', and AM. Depress 'ENTER' key **7** .

NOTE: If 'CW' is selected as a mode of reception filter selection is automatically established by default.

C. To load AGC speed, depress the 'AGC' key **16** successively until the desired speed appears on the operational display at **15** . Choices are 'AGC-S' (Slow), 'AGC-M' (Medium), and 'AGC-F' (Fast). Depress the 'ENTER' key **7** .

NOTE: If the mode of reception selected for this channel is 'AM' a fast AGC speed is automatically selected. If another AGC speed is desired, depress the 'AGC' key **16** successively until the desired speed appears on the operational display at **15** .

D. To select 'NO AGC' depress the equipment's Feature Menu 'MORE' key, **19**, until the feature menu display **10** reads as shown in Figure 3.2.7.3.

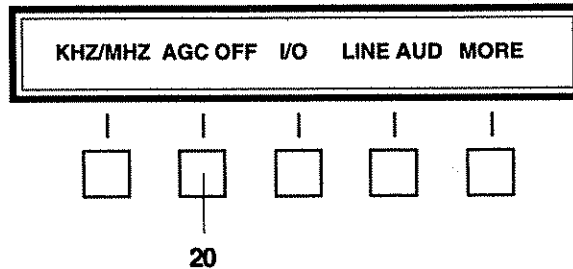


Figure 3.2.7.3 R-9200 Feature Menu Display.

E. Depressing 'AGC OFF' feature key, **20** will cause an asterisk (*) to appear on the operational display ('AGC OFF *'), and a '0' will be displayed at **15**.

NOTE:

With the 'AGC OFF' selected the receiver will have this function for all channels. To remove this function, depress the 'MORE' key **19** until display reads as shown in Figure 3.2.7.3. Turn OFF the 'AGC OFF' by depressing key **20** again, removing the asterisk and returning the operational display to previously selected AGC speed.

All of the storage data for this channel has now been entered and the receiver is fully operational on this channel. Additional channels may be loaded by simply repeating this process.

3.2.8 BFO Operation

To use the BFO the receiver must be in the channelized mode of operation, see Section 3.2.5.

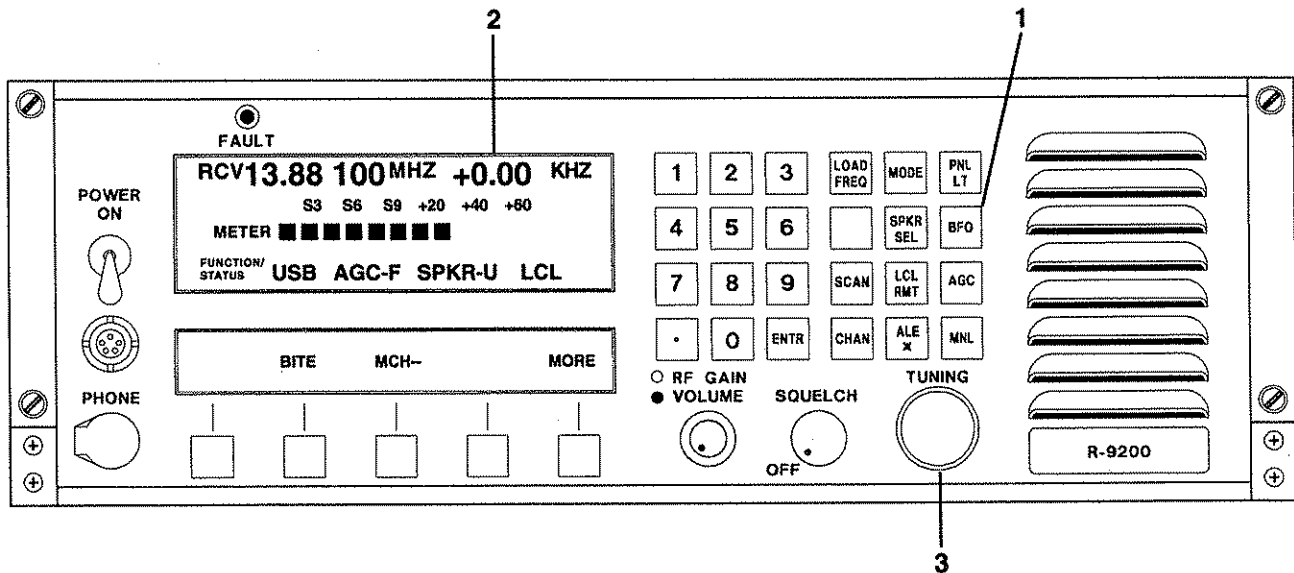


Figure 3.2.8.1 R-9200 Displays, with BFO Enabled.

Depress the 'BFO' feature key **1**. The Channel No., **2** in the operational display will blank and the BFO offset (initially: +0,00 kHz) will appear.

The BFO offset may now be established anywhere within a +1.99 kHz range by rotation of the tuning control **3**. The offset frequency is increased in 10 Hz steps by clockwise rotation of this control and decreased (negative) by counterclockwise rotation.

The BFO is disabled by simply depressing the 'BFO' key **1** again.

NOTE: BFO offset frequency is established only for the 'USB', 'LSB', 'CW', and 'ISB' mode of the receiver.

3.3 EQUIPMENT SET-UP

This section addresses those features and functions that are either of secondary operational importance or need be accomplished only infrequently, usually at the time of commissioning.

3.3.1 BITE (Built In Test Equipment)

The R-9200 is equipped with sufficient self-diagnostics to permit the operator to assure himself that all internal subassemblies (LRUs) are functioning correctly or, in the case of malfunction, which specific LRU(s) are faulty. This program may be accessed independent of any prior established modes of operation.

Depress the feature menu select key **1** successively until the feature menu shown in Figure 3.3.1.1 is indicated on the feature menu display **2**.

Depress the 'BITE' key **3**. The equipment will initiate a self test routine of all modules and will display the results in **4** of the operational display. The initial message will be

'BITE IN PROGRESS'.

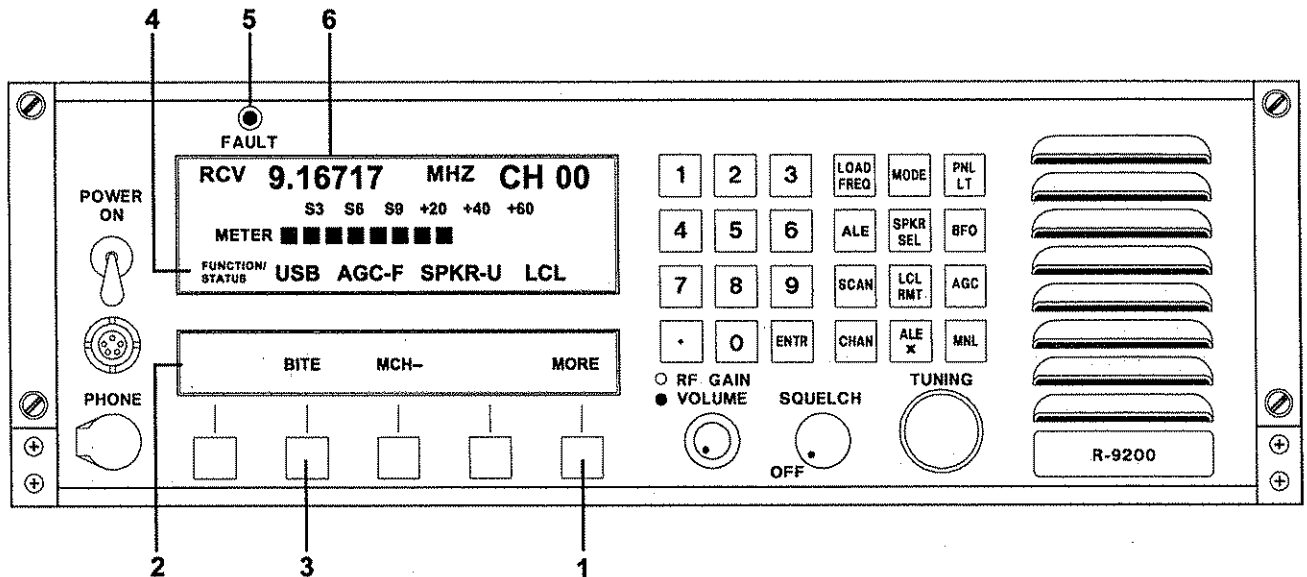


Figure 3.3.1.1 R-9200's Operational and Feature Menu Displays.

As each module is tested a corresponding message will appear briefly on the operational display in the following order:

'FRONT PANEL O.K.'	or	'FRONT PANEL FAULT'
'CPU O.K.'	or	'CPU FAULT'
'SYNTHESIZER O.K.'	or	'SYNTHESIZER FAULT'
'POWER SUPPLY O.K.'	or	'POWER SUPPLY FAULT'
'I/O O.K.'	or	'I/O FAULT' (Displayed <u>ONLY</u> when I/O selected.)

A 1000 Hz audio tone will then be heard from the front panel speaker. As each module is tested, messages will appear on the operational display in the following order:

'AUDIO O.K.'	or	'AUDIO FAULT'
--------------	----	---------------

As the audio test is completed, the RCV frequency display **6** will automatically shift to first 24.99900 MHz then 25.00100 MHz as each sideband is tested.

'IF O.K.'

'FRONT END O.K.'

At the successful conclusion of the BITE test, the message:

'TEST COMPLETED'

will appear on the operational display and the equipment will revert automatically to operational status.

If any of the modules (LRUs) are faulty and 'FAULT' 5 is lit. Proceed to Section V of this manual, concerned with fault isolation and repair.

3.3.2 METER FUNCTIONS

A variety of metering functions are available on the front panel operational display at **1** in Figure 3.3.2.1.

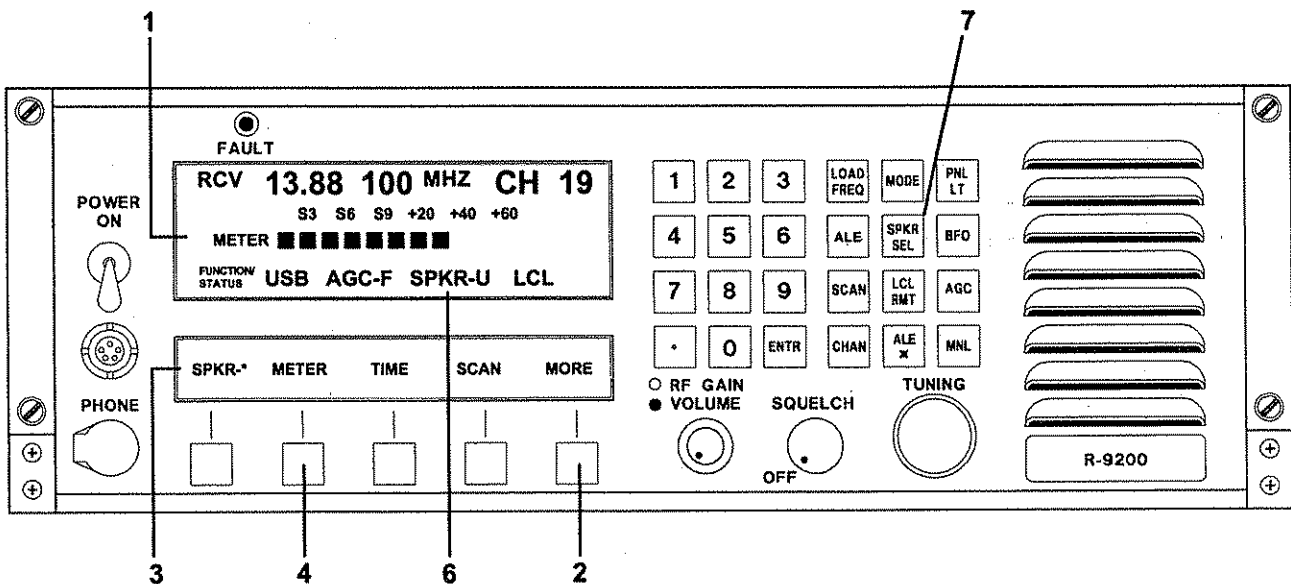


Figure 3.3.2.1 R-9200 Operational Displays.

The available Meter functions are:

IN RECEIVE:

- 'S MTR' - Signal Strength Meter (shown in Figure 3.3.2.1)
- 'LINE' - 600 OHM Line Audio Outputs (either USB or LSB)

To make the desired selections depress the feature menu select key 'MORE' 2 until the feature menu display appears as indicated by 3 .

Depress the METER function key 4 and the feature menu display will appear as shown in Figure 3.3.2.2.

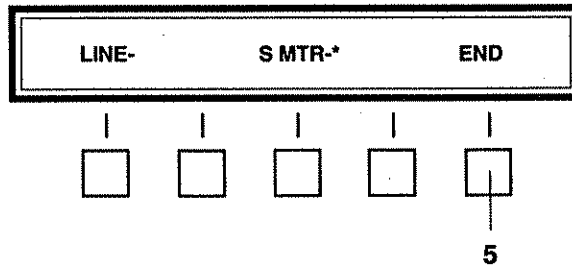


Figure 3.3.2.2 R-9200 Feature Menu Display.

To select the desired Receive Meter display simply depress the feature key below the desired display.

NOTE: The asterisk (*) will move to the function selected indicating that it has been enabled.

Once the selection has been made, depress the menu selector key 'END' 5 and the feature menu display will revert to that shown in Figure 3.3.2.1, and the receive metering will now read at 1 .

3.3.3 SPEAKER SELECT FUNCTIONS

The speaker is normally enabled in the R-9200 by default. In ISB mode ONLY the speaker may be connected to either 'USB' or 'LSB' audio and its location is indicated in the operational display at 6 in Figure 3.3.2.1. To shift the speaker from one sideband audio to the other, simply depress the 'SPKR SEL' key 7 , and 6 will change from 'U' to 'L'.

To disable the speaker depress the feature menu select 'MORE' key 1 successively until the feature menu display indicated in Figure 3.3.3 is shown.

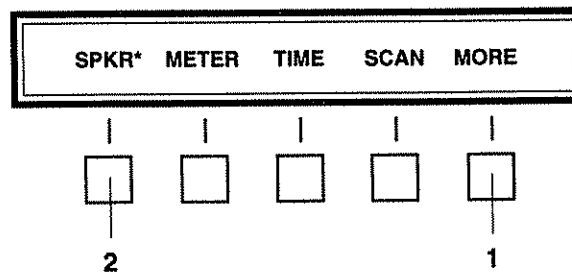


Figure 3.3.3.1 R-9200 Feature Menu Display.

Depress the 'SPKR' key, **2**, the speaker will be disabled and the asterisk (*), enable function, will disappear.

NOTE: When the R-9200 is turned off, or primary power is interrupted, the speaker will automatically revert to the 'ON' condition when power is restored.

3.3.4 MHz or KHz FREQUENCY DISPLAY

The primary frequency display can be indicated in Megahertz (MHz) or Kilohertz (kHz).

Depress the feature menu select 'MORE' key, **1**, successively until the feature menu display is as shown in Figure 3.3.4.

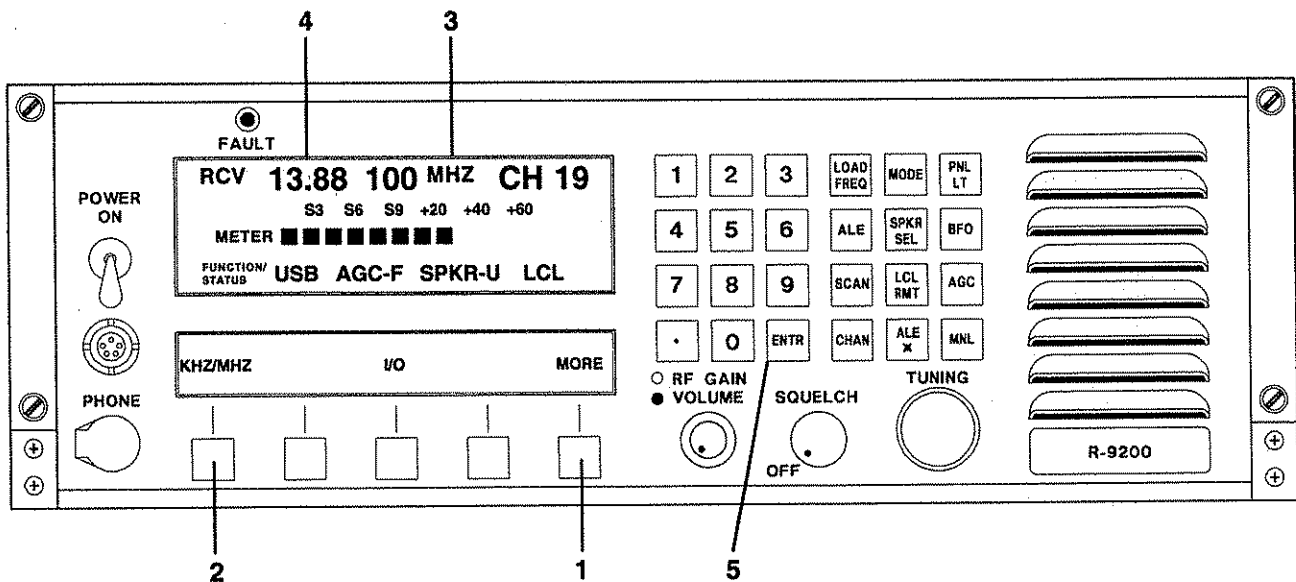


Figure 3.3.4.1 R-9200 Operating Controls.

Depressing the 'kHz/MHz' feature key **2** will toggle the display at **3** to read either 'MHz' or 'kHz'. Note that the decimal point **4** will move three digits to the right of the place shown in Figure 3.4.1.1 when the display reads in 'kHz'.

Depress the 'ENTER' key **5** to store this selection in memory.

3.3.5 LOCAL/REMOTE OPERATION

When connected as a remote system, the control of the R-9200 may be set for 'LOCAL' (at the radio) or 'REMOTE' (from a remote control unit). The 'LCL-RMT' (Local Remote) key 1 shown in Figure 3.3.5 will toggle back and forth between these choices as indicated by the operational display at 2.

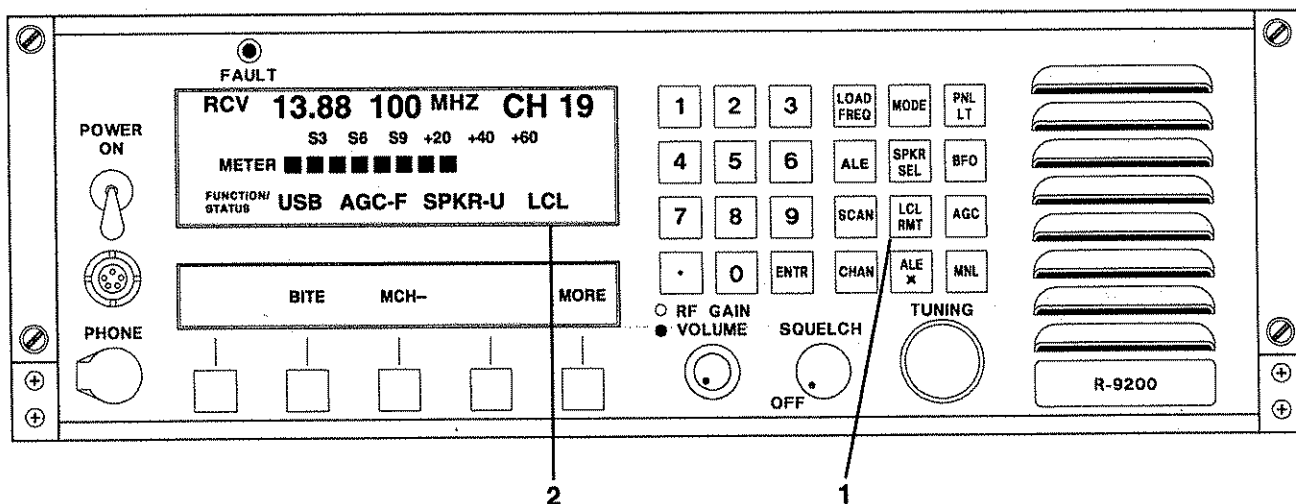


Figure 3.3.5.1 Local/Remote Selection.

NOTE: When the equipment is in the 'RMT' (Remote) condition, any attempt to change frequencies, modes or other functions, except 'Local/Remote', will cause the message:

'FUNCTION DISALLOWED'

to appear briefly on the operational display.

NOTE: When the R-9200 is NOT connected to a remote system, and I/O is NOT selected, depressing the 'LCL RMT' key 1 will cause the message:

'NO REMOTE SYSTEM'

to appear briefly on the operational display.

NOTE: When the R-9200 is NOT connected to a remote system, and I/O selected, depressing the 'LCL RMT' key **1** will cause the message:

'NO REPLY FROM REMOTE'

to appear briefly on the operational display.

3.3.6 TIME DISPLAY

If a clock has not been installed, depression of the 'TIME' feature key will produce the message, 'NO CLOCK INSTALLED' on the operational display. For equipment supplied with the clock option, the function may be accessed by successively depressing the feature menu select key 'MORE' **1** until the feature menu shown in Figure 3.3.6.1 appears.

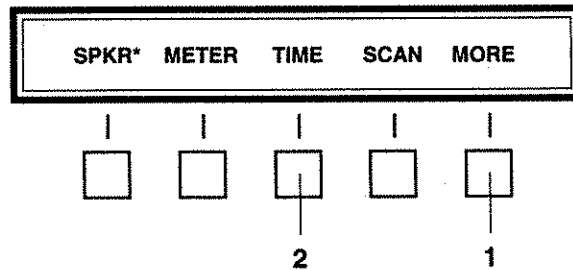


Figure 3.3.6.1 Feature Menu Display for Selection of Time.

Depress 'TIME' select key **2**. Display will now appear as shown in Figure 3.3.6.2.

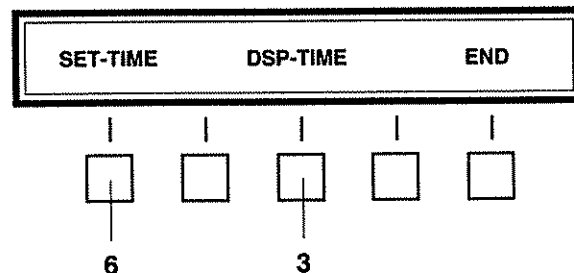


Figure 3.3.6.2 Time Display and Time Set Display.

Time can now be displayed by depressing the feature select key 'DSP-TIME' (Display Time) **3**. The presentation will appear as shown in Figure 3.3.6.3.

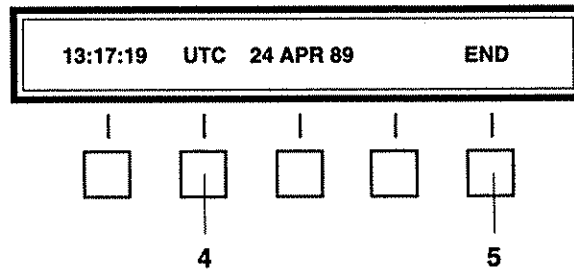


Figure 3.3.6.3 Time Display.

Other times such as 'EST' (Eastern Standard Time) and 'PST' (Pacific Standard Time) may be viewed by successive depressions of the selector key 4 .

Depression of the 'END' key 5 will cause the feature menu display to revert to that shown in Figure 3.3.6.2.

TO SET TIME:

Depress the 'SET-TIME' key 6 . The feature menu display will appear as shown in Figure 3.3.6.4.

NOTE: Use UTC Time ONLY.

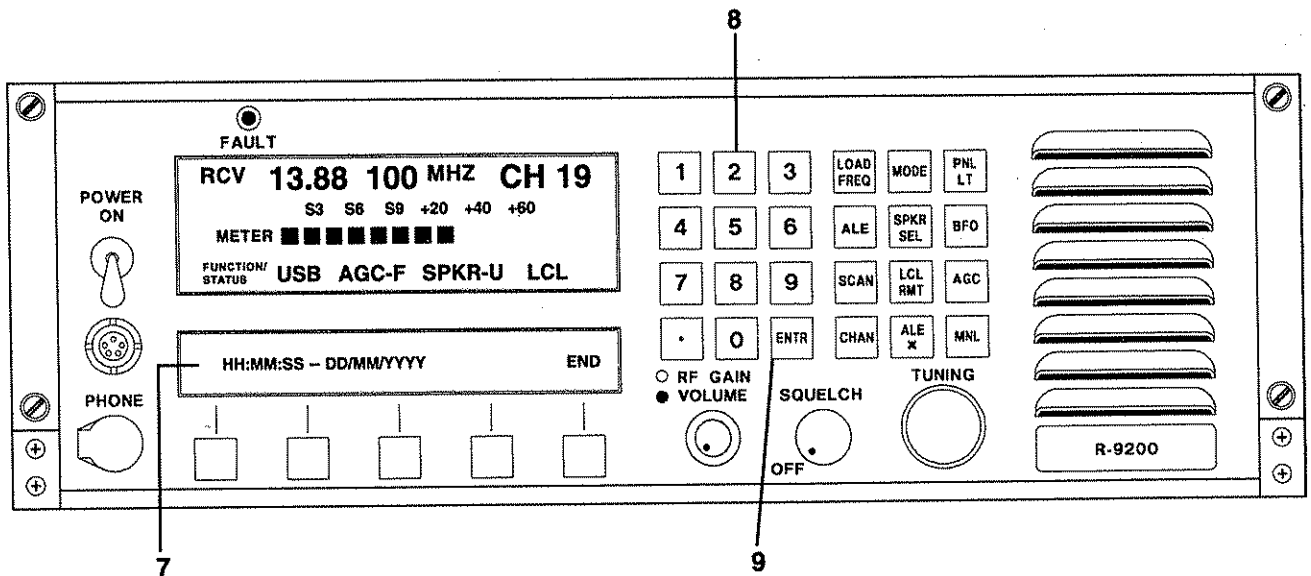


Figure 3.3.6.4 'Set-Time' Feature Menu Display.

The first 'H' (Hour) 7 will flash, indicating the space in the feature menu display for numeric keyboard entry. As the first number is entered on the numeric keypad, 8, the second space will flash, and so on, until numbers have been entered for hours, minutes, seconds—day, month, and year.

When the last digit has been entered, depress the 'ENTER' key 9 to set the clock. The feature menu display will revert to that shown in Figure 3.3.6.2. Depress the 'DSP-TIME' key 3 to display the time.

3.3.7 CHANNEL CLEARING AND SOFTWARE REVISION LEVEL

To clear ALL pre-programmed channel information, otherwise referenced as a memory dump, depress feature menu select key 'MORE' 1 until feature menu display appears as in Figure 3.3.7.1.

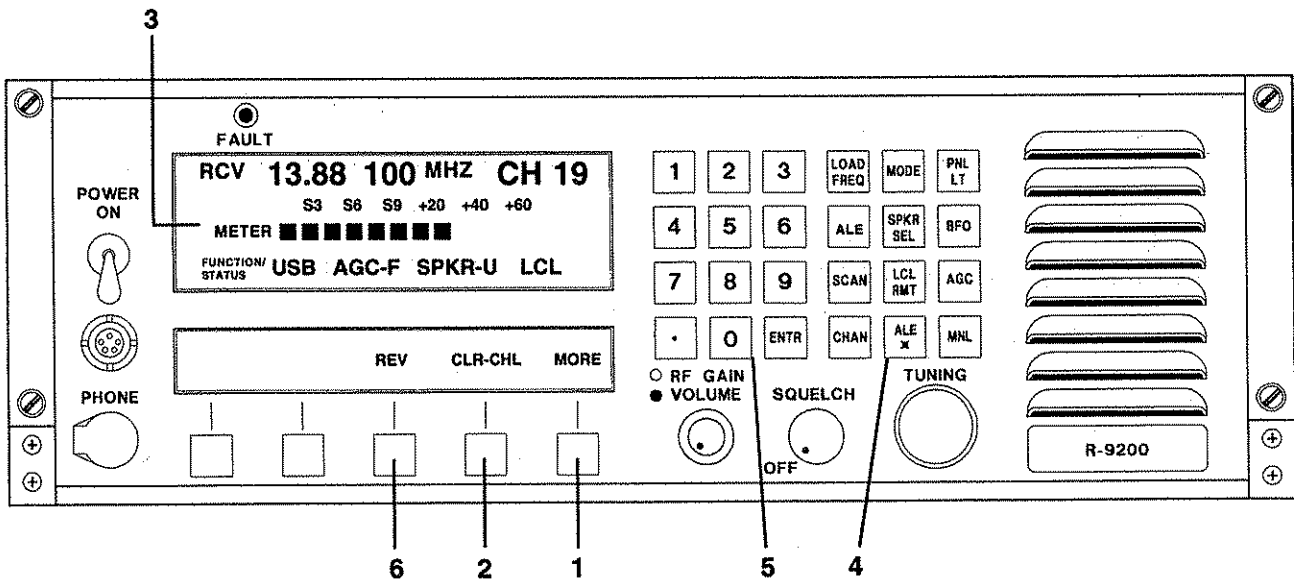


Figure 3.3.7.1 Operational Controls for Selecting Memory Dump.

Depress the 'CLR-CHL' (Clear Channel) feature key 2. The operational display 3 will go blank and the message:

'PRESS *0* TO CLEAR ALL CHANNELS'

will appear on the operational display. If you do not wish to clear all channels in memory, depress the feature key 'END' and the operational display will revert to its normal operational presentation.

If you do wish to clear all channel information in memory, depress the asterisk (*) key 4, then the zero '0' key 5, and finally the asterisk (*) key 4 again. The memory will now be cleared.

**9000 SERIES EQUIPMENT REMOTE CONTROL
I/O REMOTE CONTROL SELECTION**

INTERIM OPERATING INSTRUCTIONS FOR I/O ACCESS USING CODE KEY

The following instructions apply to software revisions: RT-9000: C24, R-9200: B10, T-9400: A16, RCU-9310: A12, RCU-9310R: A2, RCU-9310T: A2 and all subsequent revisions.

Important Operating Notes:

- (a) An * (asterisk) associated with a function indicates that the function is enabled.
- (b) If no * (asterisk) appears on the Port A Conditioning Feature Menu Display the I/O is disabled.
- (c) Pressing **END** will exit the I/O selection menu.

I/O PORT SET-UP

Refer to section 3.3.8 I/O Port Set-Up page revision 7/29/97 for Feature Menu Display details.

To access and configure the 9000 series equipment I/O PORT SET-UP accomplish the following steps:

- 1.0 Depress the **I/O** key. Located in position 2 on the Feature Menu Display.
- 2.0 **ENTER CODE NUMBER** will be displayed at position number 3 on the Feature Menu Display.
- 3.0 Enter code: **2580**, using the Frequency/Channel Entry Keypad. Note: The Operational LCD display will display a square block on the right-hand side of the Operational Display for each keypress entry.
- 4.0 The Operational display **FUNCTION /STATUS** field will now display the selected Mode, AGC , RF power and remote control status.
- 5.0 The Feature Display will change to: **RS232 RS422 RS485 MODEM END**.
- 6.0 Select the desired remote control mode, Example **RS232**. Note: The companion remote control device and remote control interconnecting cable must be configured for the selected operating mode and bit-per-second rate before proper operation can be achieved.
- 7.0 Upon selecting the operating mode the Feature Menu will change to: **BAUD ADDRESS END**.
- 8.0 Select the desired **BAUD** rate in bit-per-second.
- 9.0 Select the desired equipment **ADDRESS**.
- 10.0 Depress **END**.

11.0 **ENTER CODE NUMBER** will be displayed in the Feature Menu.

12.0 Enter code: **2580**, using the Frequency/Channel Entry Keypad. Note: The Operational LCD display will display a square block on the right-hand side of the Operational Display for each keypress entry.

13.0 The Feature Display will change to: **RS232 RS422 RS485 MODEM END**

14.0 Depress **END**.

14.0 The radio will return to normal operation.

To view the current software Revision Level installed on CPU and I/O PC assemblies:

Depress the 'REV' feature key 6 . An asterisk will appear at 'REV *' on feature menu display and operational display 3 will display the message:

'REV CPU-XX IO-XX'.

Depress the 'REV' feature key 6 again. The asterisk at 'REV *' on the feature menu display will go out and the operational display will return to normal.

3.3.8 'I/O' PORT SET-UP

This section deals with conditioning the R-9200 to automatically handle information, in the correct format, for external modems and/or remote lines. The receiver provides dual informational outputs located on the rear surface of the equipment as shown in Figure 3.3.8.1. Although both ports use the same connector, the plug wiring may be split to accommodate different routings for each port.

NOTE: If I/O ports are NOT being utilized NO I/O function should be selected. Any selection could cause:

'I/O FAULT'
or
'NO REPLY FROM REMOTE'

to be displayed after BITE test or intermittently during normal operations.

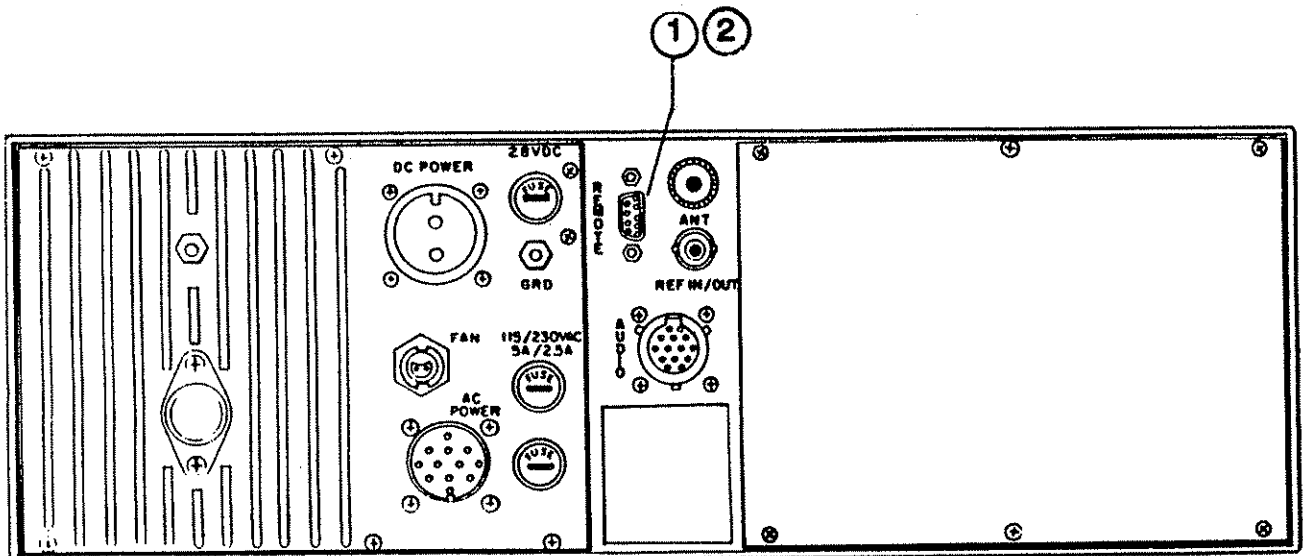


Figure 3.3.8.1 R-9200 Rear Surface Connectors.

The location of 'PORT A' is shown by 1 and the location of 'PORT B' by 2 (same connector). Port B is a dedicated RS232 port, used for specific predetermined operations, such as 'Pre-selectors', etc. The correct output format for Port A is determined by the requirements of the modem(s) and/or lines connected to this port. Once the desired format is determined, remote Port 'A' may be conditioned by depressing the feature menu select key 'MORE' 3 successively until the display shown in Figure 3.3.8.2 appears.

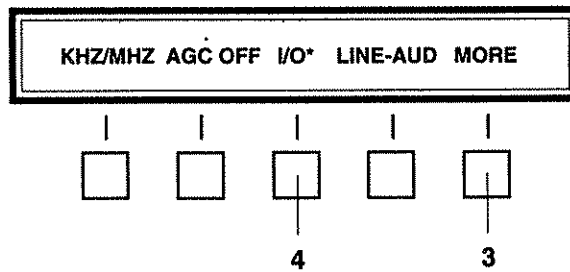


Figure 3.3.8.2 Feature Menu Display of Port A Selection Menu.

Depress the 'I/O' (Input/Output) select key 4 . The feature menu display will now read as shown in Figure 3.3.8.3.

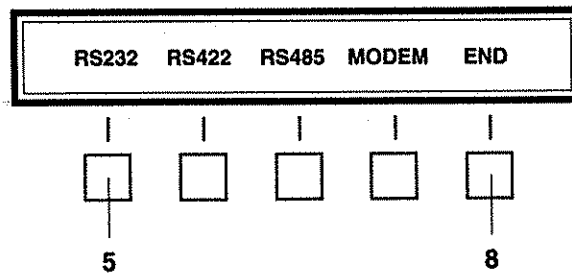


Figure 3.3.8.3 Port A Conditioning Feature Menu Display.

To select 'RS232', 'RS422', or 'RS 485', depress the feature select key immediately below the format desired. In this case , key 5 to select 'RS232'. The feature menu display will now appear as shown in Figure 3.3.8.4 and display the established baud rate.

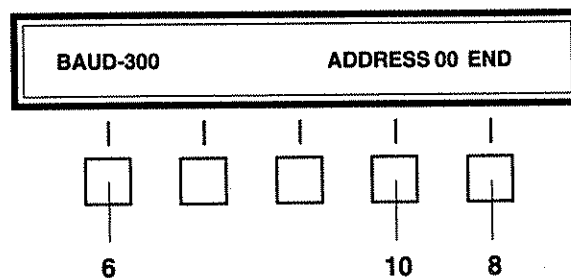


Figure 3.3.8.4 Baud Rate Display.

If a different baud rate is desired than that shown in the display in Figure 3.3.8.4, depress the feature select key **6** and other choices will appear on the feature menu display as shown in Figure 3.3.8.5.

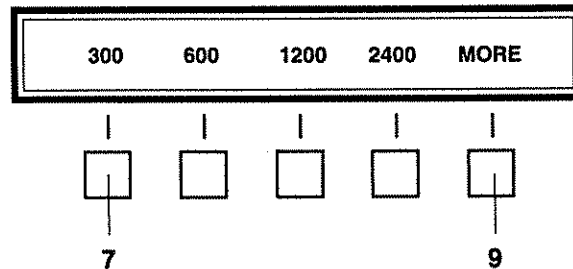


Figure 3.3.8.5 Baud Rate Selection Menu 1.

Depress the feature select Key **9**. The feature menu display will advance to that shown in Figure 3.3.8.6.

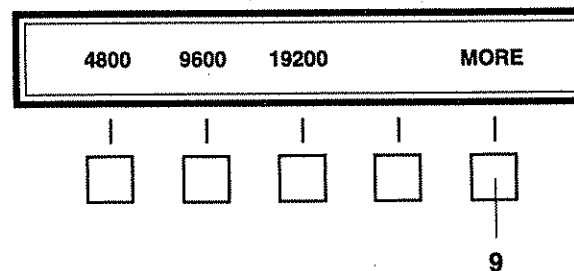


Figure 3.3.8.6 Baud Rate Selection Menu 2.

Depress the selector key immediately below the desired baud rate in Figure 3.3.8.5 or 3.3.8.6. By depressing 'MORE' Key **9** the menu will toggle between 1 and 2. If '300' Key **7** is depressed the feature menu display will immediately revert to that shown in Figure 3.3.8.4 and the newly selected baud rate will be displayed.

Depression of 'END' Key **8** in Figure 3.3.8.4 will cause the feature menu display to revert to that shown in Figure 3.3.8.3. Depression of 'END' Key **8** in Figure 3.3.8.3 will condition the I/O and feature menu display will revert to that shown in Figure 3.3.8.2.

NOTE:

RS-232 operation maximum baud rate 4800
 RS-422 operation maximum baud rate 19200
 RS-485 operation maximum baud rate 19200
 'MODEM (FSK TONES) operation baud rate is defaulted to 300.

3.3.9 ADDRESS

To permit the R-9200 to be controlled by a remote unit (such as the RPC-9286D) equipment address must be established.

With feature menu display as shown in Figure 3.3.8.4, depress key **10** to select 'ADDRESS'. The feature menu display will now appear as shown in Figure 3.3.9.1.

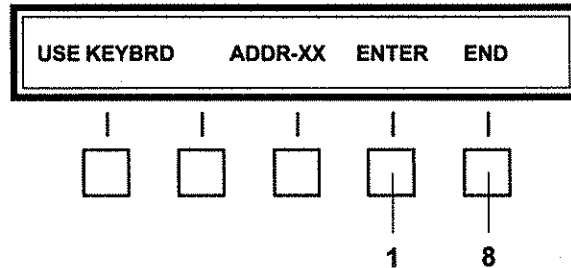


Figure 3.3.9.1 Feature Menu Display for Selection of Address.

Depress the appropriate two (2) digit address on the numeric key pad. Address XX will appear in feature display. Depress the 'ENTER' key **1** to enter this address. Depressing 'END' Key **8** will cause feature menu display to revert to Figure 3.3.8.4. Depressing 'END' Key **8** once more will return display to normal menu.

NOTE: See remote control unit manual for further instructions.

3.3.10 CW FILTER

In order to invoke access to the proper feature menu for CW Filter selection, the R-9200 must first be put in the 'CW' mode of operation. This may be done by successively depressing the 'MODE' key until the 'CW' mode is displayed on the operational display. Once the 'CW' mode has been selected, the feature menu display will appear as shown in Figure 3.3.10.1.

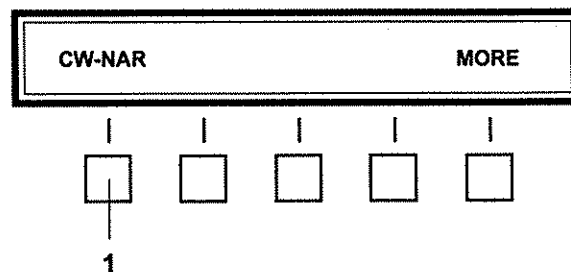


Figure 3.3.10.1 Feature Menu Display for Selection of CW Filter.

The receiver has been equipped with an audio narrow band CW filter. If this function is desired, it may be employed by depressing the 'CW-NAR' (CW-Narrow) select key **1**. An asterisk (*) will appear next to the 'CW-NAR' function to indicate that the filter is introduced into the equipment for the CW mode of operation.

NOTE: If this filter is chosen, it will automatically be utilized for all CW operations, independent of other menu selections.

3.3.11 LINE AUDIO SELECTION

The audio output connector at the rear of the R-9200 provides for two sets of 600 OHM output lines for each sideband audio (LSB-A&B, USB-C&D) to permit the utilization of more than one external audio applique unit. Selection of either external applique may be made from the front panel by depressing the feature menu 'MORE' key **1** until the Feature Menu Display indicated in Figure 3.3.11.1 appears.

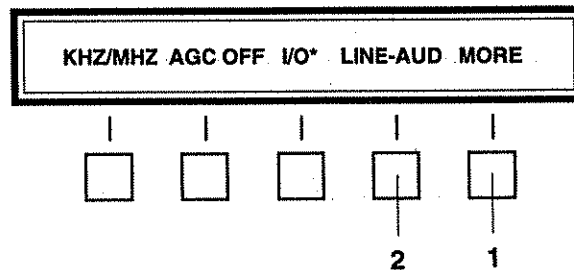


Figure 3.3.11.1 Feature Menu Display of Port Selection Menu.

Depress the 'LINE-AUD' feature key **2** to bring up the line audio selection menu shown in Figure 3.3.11.2.

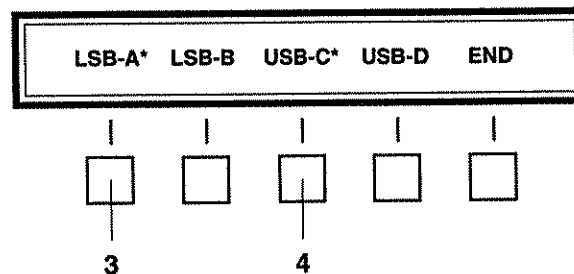


Figure 3.3.11.2 Line Audio Selection Feature Menu Display.

Depress the feature menu select key 'MORE' 1 successively until the feature menu display appears as shown in Figure 3.4.1.2, or receiver scan can be selected by depressing 'SCAN', function key 12 .

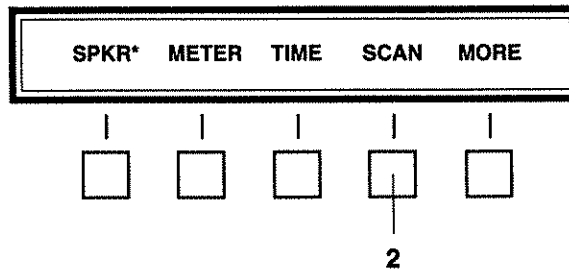


Figure 3.4.1.2 Feature Menu Display for 'SCAN' Select Key.

Depress the 'SCAN' select key 2 and the feature menu display will appear as shown in Figure 3.4.1.3.

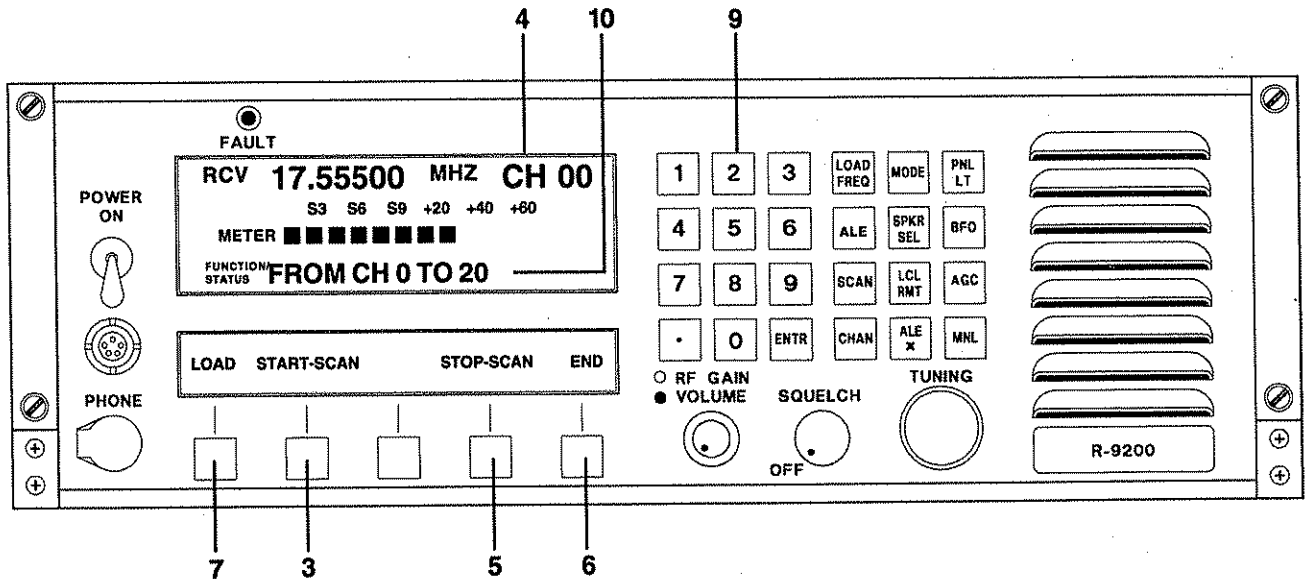


Figure 3.4.1.3 Feature Menu Display for 'SCAN' Function.

To initiate a 'SCAN' function, depress the 'START SCAN' key 3 and the channels being scanned will be shown in the operational display at 10 (if the operational display shows 'THIS GROUP NOT SETUP' go to Section 3.2.7 and load PRE-SET CHANNEL FREQUENCIES for the group/block you wish to scan). To stop the scanning process, simply depress the 'STOP SCAN' key 5. To return to normal channelized operation depress the 'END' key 6 .

NOTE:

The dwell time on any given frequency has been kept to a minimum, about 2 sec, consistent with recognizing the presence or absence of a signal in order that a relatively continuous monitoring occurs. If for some reason, longer or shorter dwell times are required, please contact Sunair for instructions on how to proceed.

To load a desired block of channels depress the 'LOAD' key 7 . The feature menu display will appear as shown in Figure 3.4.1.4.

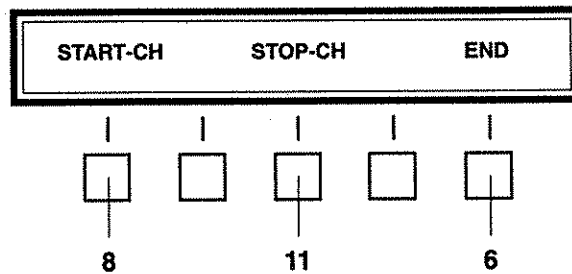


Figure 3.4.1.4 Feature Menu Display for 'SCAN LOAD' Select Key.

The operational display will briefly display the message:

'USE KEYB FOR NUMBERS'

To select a new start channel, depress the 'START-CH' key 8 and enter the appropriate digits (00-127) on the numeric keypad, 9 . The newly selected start channel will be displayed on the operational display in the 'FROM CH XX TO YY' message 10 . To select a new stop channel depress the 'STOP-CH' key 11 and enter the appropriate digits (00-127) on the numeric keypad 9 . The newly selected stop channel will be displayed on the operational display in the 'FROM CH XX TO YY' message 10 . To terminate the loading of a new start channel and/or stop channel, depress the 'END' key 6 and the feature menu display will revert to that shown on Figure 3.4.1.3.

NOTE:

When selecting a start channel or stop channel ascertain that the start channel is lower than the stop channel. Otherwise, the following message will be displayed:

'START MUST BE LESS'

momentarily and a new channel must be entered either for 'START CH' or 'STOP CH'.

3.4.2 OPTIONS

If the R-9200 has any of the available options installed see applicable section(s) for the operation procedures.

3.4.2.1 OVEN

When the optional High Stability Reference Oscillator (P/N 5024013701) is installed the operational display may read:

'OVEN WARM UP'

for up to several minutes, when the R-9200 is turned 'ON', until the reference oscillator is stabilized.

3.4.2.2 LSB DATA FILTER

Depress 'MORE', key 1 until feature menu display is as shown in Figure 3.4.2.2.1.

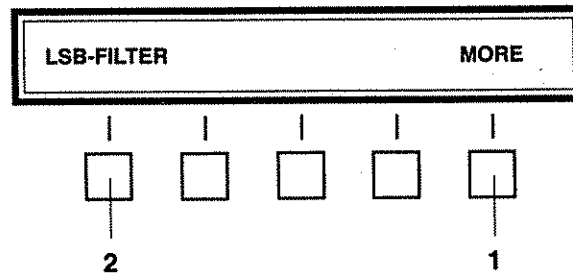


Figure 3.4.2.2.1 Feature Menu Display for LSB Filter Selection.

Depress 'LSB FILTER', key 2. Feature menu display will appear as shown in Figure 3.4.2.2.2.

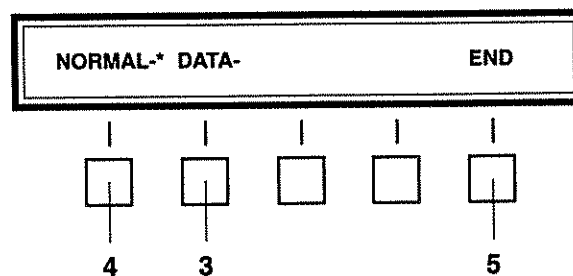


Figure 3.4.2.2.2 Feature Menu Display for LSB Filter Mode Selection.

Depressing the 'DATA' key 3 will cause an asterisk (*) to move to 'DATA' for data reception; depressing 'NORMAL', key 4, will cause an asterisk (*) to move to 'NORMAL' for voice reception. Upon mode selection, depress 'END' key 5 to return to Figure 3.4.2.2.1, depress 'MORE' key 1 to return to other menus.

3.4.2.3 USB DATA FILTER

Depress 'MORE' key 1 until the feature menu display is as shown in Figure 3.4.2.3.1. Depress 'USB FILTER' Key 2.

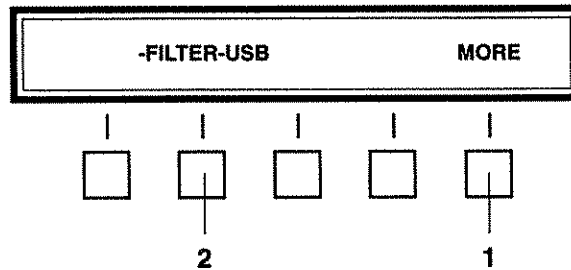


Figure 3.4.2.3.1 Feature Menu Display for USB Filter Selection.

Feature menu display will appear as shown in Figure 3.4.2.3.2.

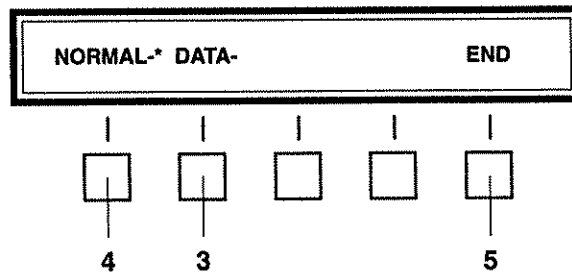


Figure 3.4.2.3.2 Feature Menu Display for USB Filter Mode Selection.

Depressing 'DATA', key 3 will cause an asterisk (*) to move to 'DATA' for data reception; depressing 'NORMAL', key 4, will cause an asterisk (*) to move to 'NORMAL' for voice reception. Upon mode selection, depress 'END', key 5 to return to Figure 3.4.2.3.1, depress 'MORE' key 1 to return to other menus.

3.4.2.4 PRE-SELECTOR

Depress 'MORE', key 1 until feature menu display is as shown in Figure 3.4.2.4.1.

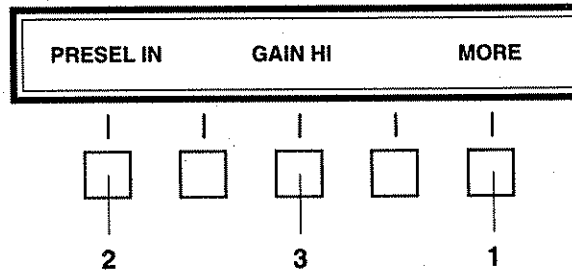


Figure 3.4.2.4.1 Feature Menu Display for Pre-selector Selection.

Depressing 'PRESEL', key 2 will toggle the feature menu display 'IN' or 'OUT' (Placing the 'Pre-selector in or out of operation). Depressing 'GAIN' key 3 will toggle the feature menu display 'HI' or 'LO' (0dB for 'HI' or -10dB for 'LO').

3.4.2.5 RADIO SECURITY

The R-9200 can be equipped with a security feature which, when invoked, will prevent unauthorized personnel from either viewing receiver settings (by blanking the operational display), or changing any receiver setting (by disabling the front panel controls).

For further information contact Sunair.

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SECTION IV

THEORY OF OPERATION

4.1 GENERAL

The theory of operation of the R-9200 Receiver is presented in seven (7) parts:

- (1) Front Panel Module.
- (2) Microprocessor Assembly.
- (3) Synthesizer Assembly.
- (4) Receiver Module.
- (5) Filter Module.
- (6) Select/Distribution Reference.
- (7) DC and AC Power Assemblies.

Figure 4.1.1 is the overall block diagram of the R-9200 Receiver referred to in the discussion.

4.2 NON-SIGNAL CIRCUIT SECTION

4.2.1 FRONT PANEL ASSEMBLY 1A1

The Front Panel Assembly contains the circuitry necessary to provide analog and control interfacing with appropriate sub-assemblies. It also provides and accepts digital information through the receiver control/data bus, via the microprocessor assembly, with the various other assemblies. A wide screen Liquid Crystal Display (LCD) indicates operating status such as frequency, channel, mode, BFO, AGC release time, and local/remote control, as selected by front panel keypad. The LCD contains a bar graph display which can selectively indicate received signal strength, and 600 Ohm receive audio levels. The receiver's Built-In-Test Equipment (BITE) circuitry monitors status of all receiver plug-in assemblies. Plain language messages are displayed on the LCD, providing assurance of continuing functionality of the R-9200 Receiver or HF system. Selecting the receiver BITE function exercises a comprehensive test routine (contained in the microprocessor software) which checks all plug-in sub-assemblies to the Lowest Repairable Unit (LRU). Should a fault be detected the 'FAULT' Light Emitting Diode (LED) in the upper left hand corner will illuminate and the LCD will display what LRU(s) is (are) inoperative. A Soft Key Menu LCD located directly below the primary LCD permits the selection of enhanced functions not found on the keyboard entry keypad, such as Sweep, Scan, BITE, Time-of-Day, etc... The soft keys also provide access to remote control configuration, meter selections, remote audio, and speaker control.

4.2.2 MICROPROCESSOR ASSEMBLY 1A2A1**4.2.2.1 GENERAL**

The Microprocessor Assembly provides overall control of the R-9200 functions. It enables most front panel controls, status indications, and storage or operation on any frequency. The information exhibited on the Front Panel LCD is furnished by the Microprocessor Assembly. It has complete control of all frequency information routed to the Synthesizer Assembly 1A2A2 via Control/Data Bus. The Microprocessor Assembly acquires BITE information from the Receiver Assembly via Control/Data Bus. The Microprocessor Assembly, via the Control/Data Bus, selects the proper Band Pass Filter within the Front End Assembly 1A2A5 and the appropriate Low Pass Filter in the Filter Module 1A3. The Microprocessor Assembly is referenced to a 5 MHz standard frequency, by means of the Select/Distribution Amplifier Assembly 1A2A6 for its clock signal.

4.2.2.2 MICROPROCESSOR U2

The Microprocessor Assembly contains the 80C85 (8-bit) microprocessor U2. U2 is the prime control for all of the R-9200's functions. It executes instructions (software) contained in EPROMs U13 and U14. U2 controls circuits on the Microprocessor Assembly by three busses:

- a) AD0 thru AD7, a Multiplexed Address/Data Bus containing either data or address information.
- b) A8 thru A15, which always contains address information.
- c) The Control/Status Bus which contains signals:

\overline{RD} = READ Control

\overline{WR} = WRITE Control

$\overline{IO/\overline{M}}$ = I/O Write, I/O Read, Memory Write or Memory Read

ALE = Address Latch Enable

4.2.2.3 ERASABLE PROGRAMMABLE READ ONLY MEMORY (EPROMs) U13 AND U14

The EPROMs U13 and U14 contain the necessary data bits which make up the program or software which microprocessor U2 uses to control the R-9200 functions.

4.2.2.4 STATIC RANDOM ACCESS MEMORY (SRAM) U3

The SRAM provides an area of temporary storage which U2 uses as a 'scratch pad' during the execution of its program with U13 and U14.

4.2.2.5 ELECTRICALLY ERASABLE PROGRAMMABLE READ ONLY MEMORY (EEPROM) U8

Long term storage of the R-9200 functions is handled by the non-volatile memory in U8. The frequency information for each of the 128 channels, mode, AGC, power level, etc., is placed in U8 to be used by U2 during the execution of its program with U13. U8 is an 8k X 8 bit CMOS EEPROM in which each byte may be reliably written 10,000 times without degrading device operation. The data in the byte will remain valid after its last write operation for ten (10) years with or without power applied.

4.2.2.6 OPTIONAL SMART WATCH U14(A)

Smart Watch is an optional IC that is piggy-backed into U14's socket. It keeps track of hundredths of seconds, seconds, minutes, hours, days, date of the month, months and years. An embedded lithium energy cell maintains watch information whenever the Receiver is turned off. The above information is available to the U2 Microprocessor, on the Multiplexed Address/Data Bus, to be displayed on the Front Panel LCD as a Time-of-Day Clock.

4.2.3 OPTOCOUPLER ASSEMBLY 1A2A1A1

The Optocoupler is a sub-assembly containing (PS2401A-4) optically coupled isolators that plug into the Microprocessor Assembly 1A2A1. The Optocoupler Assembly electronically isolates the microprocessor busses from the Receiver Control/Data Bus to prevent transfer of Receiver noise to the Microprocessor Assembly or the transfer of Microprocessor Bus noise to Receiver circuits.

4.2.4 SYNTHESIZER ASSEMBLY 1A2A2

The Synthesizer Assembly consists of one (1) printed circuit motherboard (1A2A2A5) and four (4) plug in assemblies: 1A2A2A1 - First Local Oscillator, 1A2A2A2 - Second Local Oscillator, 1A2A2A3 - Third Local Oscillator/Beat Frequency Oscillator, and the 1A2A2A4 - Reference Loop and Doubler.

4.2.4.1 GENERAL

The Synthesizer Assembly generates the (3) three Local Oscillator (LO) injection frequencies necessary to determine the operating frequency of the R-9200 Receiver. The synthesizer input is a 5 MHz reference signal from the internal Temperature Controlled Crystal Oscillator (TCXO) or an external reference signal via the 1A2A6 Reference Select/Distribution Amplifier Assembly. The three LO injection frequencies are produced from the 5 MHz reference by digital phase lock techniques. The frequency accuracy of the Receiver is, therefore, solely determined by the accuracy of the frequency standard employed.

4.2.4.2 THIRD LO/BFO ASSEMBLY 1A2A2A3

The 455 kHz Third LO/BFO reference is produced by a bus controlled Phase-Locked Loop (PLL) operating on a Voltage-Controlled Oscillator (VCO). The output of the (455 kHz) Third LO is used for product detection injection frequency.

4.2.4.3 SECOND LO ASSEMBLY 1A2A2A2

The 47.850 MHz Second LO varied +5 kHz in 10 Hz steps by means of two (2) bus controlled PLL VCOs. The Second LO output is used in the 1A2A4 IF/Filter Assembly to down convert the 48.305 MHz received First IF frequency to the 455 kHz Second IF frequency.

4.2.4.4 FIRST LO ASSEMBLY 1A2A2A1

The First LO Assembly consists of four (4) individual bus controlled PLL VCOs, covering the frequency range of 48.31 to 78.31 MHz in 1 kHz steps. Only one (1) of the PLL VCOs is activated at any given time, and is determined by HF Receive Frequency selected through the microprocessor assembly and via the receiver's controlled Data Bus. The frequency output of the First LO assembly is given by:

$$F1 = 48.305 \text{ MHz} + F0 \text{ MHz}$$

where F1 = First LO output frequency
F0 = Selected R-9200 operating frequency (i.e. 1.60000 MHz).

Example: 48.305 MHz + 1.60000 MHz = 49.905 MHz.

The First LO frequency is used in the 1A2A5 Front End Assembly during receive to up convert the selected incoming RF signal to the receive First IF of 48.305 MHz.

4.2.4.5 REFERENCE LOOP AND DOUBLER ASSEMBLY 1A2A2A4

The Reference Loop and Doubler Assembly consists of a Reference Frequency Divider, a PLL controlled 40 MHz Crystal Oscillator, and a Frequency Doubler Circuit that produce the 1 MHz and 40 MHz outputs used by the Third LO Assembly and the 40 MHz and 80 MHz used by the Second LO Assembly in synthesizing their outputs.

4.2.5 I/O ASSEMBLY 1A2A8

The I/O Assembly contains two independent I/O ports, designated 'A' and 'B'. Port B is a dedicated RS-232 port used for specific external modems such as Preselector/Postselector. Port A provides the control interface between the receiver and its companion remote control I.E. RCU-9310R or RPC-9286D. This port is configurable from the control panel for RS-232, RS-422, or RS-485 formats at speeds of 300, 600, 1200, 2400, 4800, 9600 and 19200 baud. With optional Tone Modem 1A2A8A1, FSK tones at 300 baud only may be used to transmit control information to and from the RCU-9310R.

I/O Port functions are implemented by a Dual Universal Asynchronous Receiver/Transmitter (DUART) (U9) under control of the I/O Assembly's microprocessor (U10). The microprocessor executes special instructions contained in EPROM's (U20) software in response to messages from the Front Panel or 1A2A1 microprocessor. When under remote control by either the RCU-9310R or RPC-9286D their messages cause the EPROM's (U20) software to respond.

The organization of the I/O Assembly hardware and software is such that 'A' and 'B' ports may be active simultaneously.

4.3 SIGNAL SECTION

This section utilizes two (2) modules:

- (1) The Filter Module 1A3 containing:
 - 1A3A1 - RF Detector Assembly.
 - 1A3A2 - Filter Assembly Bands 1 thru 4.
 - 1A3A3 - Filter Assembly Bands 5 thru 8.
- (2) The Receiver module containing:
 - 1A2A3 - Audio Assembly.
 - 1A2A4 - IF Assembly.
 - 1A2A5 - Front End Assembly.

These two assemblies are interconnected by means of the 1A2A7 Receiver Motherboard.

4.3.1 GENERAL SIGNAL FLOW

Received RF signals from the antenna are routed through a VHF Filter and a Low Pass Filter network on the 1A3 Filter Module. The desired Low Pass Filter is selected via the Band Information Decimal Lines controlled by the frequency information stored in the 1A2A1 CPU Assembly. These eight (8) filters are switched in one at a time by high speed relays (K1 thru K16). The filters operate in the following frequency ranges:

Band Selected:			
0	or 1	100 kHz	to 1.99999 MHz
	2	2.0 MHz	to 2.99999 MHz
	3	3.0 MHz	to 3.99999 MHz
	4	4.0 MHz	to 5.99999 MHz
	5	6.0 MHz	to 8.99999 MHz
	6	9.0 MHz	to 12.99999 MHz
	7	13.0 MHz	to 19.99999 MHz
	8	20.0 MHz	to 29.99999 MHz

The filtered RF signal is sent through the receiver protection circuit (1A3A1 CR4 and 5), an instant shunt peak power limiter circuit, which prevents damage to the sensitive receiver 'Front End' when extremely high levels of RF are picked up by the antenna. The filtered RF signal exits the 1A3 filter module at 1A3A1 J3 and is routed via coaxial cable to motherboard 1A2A7 J13 Receive In. Front End Assembly 1A2A5 receives the RF signal at P7 and routes the signal to nine (9) Band Pass Filters. The desired Band Pass Filter is selected by the Band Information Decimal Lines from the CPU Assembly 1A2A1 by forward biasing the proper input and output diode gates (CR3 through CR20). The frequency range of Band Pass Filters are the same as Low Pass filters except as follows:

Band Selected:			
0		100 kHz	to 1.59999 MHz
1		1.6 MHz	to 1.99999 MHz

The filtered RF signal is routed through diode gate CR21 forward biased by +12R. The filtered RF signal is amplified by Low-Noise-Amplifier Q5 and Q6, which drives the High Level Balanced Mixer X2. The mixing of the received RF signal and selected First Local Oscillator (L.O.) frequency of 48.31 thru 78.31 MHz produces the receiver's First Intermediate Frequency (IF) of 48.305 MHz. The First IF signal is amplified, by Low Noise Post Mixer amplifier Q7 and Q8, and sent out thru 1A2A5 P4 to 1A2A7 J16. Then via coaxial cable to 1A2A7 J19 into the IF Assembly 1A2A4 at P4.

On the IF PC assembly 1A2A4 the First IF signal is filtered by a Narrow Band Crystal filter FL1 passing 48.305 MHz plus the sideband intelligence contained in the First IF. The resulting 48.305 MHz plus intelligence is coupled across splitter transformer T1 sending the same signal to the First IF USB and First IF LSB circuits. These circuits operate basically the same, therefore only the signal path thru the First IF USB will be followed.

The 48.305 MHz plus intelligence signal is amplified by monolithic amplifiers U1 and U2. IF gain thru this circuit is 30 dB typical and Automatic Gain Control (AGC) is +60 dB typical. The gain of U1 and U2 is controlled by USB AGC 1. The output of U2 is sent to mixer X1 where it is mixed with the Second LO frequency of 47.845 thru 47.855 MHz, producing the USB 455 kHz IF signal. The 455 kHz IF signal is sent to the USB IF Filters (FL4-USB; Optional FL5-DATA or FL6-AM). The inputs from CPU assembly 1A2A1 USB MODE A and USB MODE B select the proper filter for the receive mode selected thru diode input and output gates (CR23 thru CR28). The filtered output signal USB 455 kHz IF is now sent to Buffer U12. The output of U12 is adjusted by IF Gain Control R89. This 455 kHz signal plus intelligence is further amplified in monolithic amps U13, U14 and U15. U13 and U14 outputs are AGC controlled by USB AGC 2, typical IF gain is 55dB and USB AGC 2 has a range of +70 dB typical. The 455 kHz output of U15 is sent to U29 which with associated circuitry make up the AGC Detector and Amplitude Modulation

(AM) Detector. The AM Detector U29-C and D is a fixed amplifier and AM envelope detector used to produce AM audio that is sent to the Audio Assembly 1A2A3 for AM audio when AM mode of receive is selected.

The AGC Detector U29-A and B and CR49 output gain is controlled by R186 AGC Gain pot. The detected AGC signal is low pass filtered (U41-A, Q19 and Q20) DC amplified (U41-B, C and D) to produce USB AGC 1, USB AGC 2 and USB S-METER outputs. The AGC outputs go to previously mentioned circuits U1, U2, U13 and U14. The S-METER output is sent to the CPU Assembly 1A2A1 to be displayed as signal strength bar meter on the Front Panel Operational Display when selected. When AGC speed is selected from Front Panel push button or stored memory, the CPU assembly 1A2A7 outputs USB AGC A and USB AGC B causing U28-B to output to Release timer circuit (U40-A and B, Q12, 13 and 14) the high level needed to select the AGC speed. When manual AGC is selected a variable DC voltage from Front Panel RF Gain Control is applied to CR50 allowing manual AGC control. The IF output signal from U15 is also sent from the IF Assembly 1A2A4 at P1-J via Motherboard Assembly 1A2A7 to P1-A on the Audio Assembly 1A2A3.

On the Audio Assembly 1A2A3 the USB IF (455 kHz plus intelligence) and LO #3 (455 kHz) are applied to U28 the USB Product Detector. As on the IF Assembly 1A2A4 the USB and LSB are separate circuits but operate basically the same, therefore only the USB signal path will be followed. The output of U28 is the USB receive audio sent thru U27-B, U32-C, U10-A and U12-A R85 Receive Line Level in the output of U12-A is used to set the Receive Audio 600 Ohm output to -20 dBm to +10 dBm for external devices connected to USB C or USB D outputs. The USB receive audio is amplified in U13-A and B and impedance matched to 600 Ohm with T1. The USB receive audio is also sent to U11-A and passed thru if USB speaker is selected, to Speaker Buffer U1-A where it is electronically switch selected (U4-A, B and C) to go thru a CW Narrow Band Audio Filter (U-3) or normal audio thru Electronic Volume Control (U31) that is amplified (U1-Band C) electronically switched (U6-A, B and C) to Speaker Driver (U7) capable of producing 5 watts of audio power. The audio output is reduced by R205 and routed to 1A1 Front Panel headphone audio (J2). Full power audio is routed thru energized K1 to the Front Panel Speaker.

The Syllabic Squelch circuit (U2 and U30) is a true Syllabic type which operates on voice characteristics and rejects other types of received audio, such as noise, steady tones, etc. The received audio is sampled in the Squelch Circuit and when threshold set by R32 and clockwise position of Front Panel Squelch Control turns on U6-A thru CR25. The Syllabic Squelch circuit is designed to remain unswitched during voice pauses or short fades, minimizing the effects of nuisance interruptions.

In the 1A5A1 DC to DC Power Supply Module the DC input power is routed to three (3) high-efficiency switching regulators (U1, U2 and U5) to produce the +5 VDC Digital, +5 VDC Analog, and +12 VDC needed for the operation of the receiver circuits. Each of the IC regulators are electronically over voltage protected. Whenever a regulator's output voltage exceeds a predetermined level, an electronic circuit senses a fault and grounds the output of that regulator, preventing damage to the receiver circuits. The +28 VDC applied to the receiver circuits is protected with a fuse and transient protection device. The 1A5A2 AC power supply produces a regulated +28 VDC that is applied to the DC to DC Power Supply. In AC line operation, this power supply is of linear design reducing the undesirable effects of Radio Frequency Interference (RFI) and Electromagnetic Radiation Interference (EMI) from the receiver. With both power supplies are installed the R-9200 receiver accommodates both AC line and DC battery power thru separate connectors. With both AC and DC power connected, the supply will automatically sense AC line reductions or failure and switch to the DC battery back up voltage source. When the AC returns the unit will automatically switch to AC line power.

The 1A2A6 Select/Distribution Reference Amplifier assembly amplifies and TTL conditions the receiver TCXO 5 MHz and routes it to the 1A2A2 Synthesizer and 1A2A2 Microprocessor assemblies. By internal switches, the TCXO amplified signal may be connected to the receiver's rear panel to external peripheral equipment. Also, an external frequency standard can be applied to the rear panel and switched into the assembly in place of the receiver TCXO.

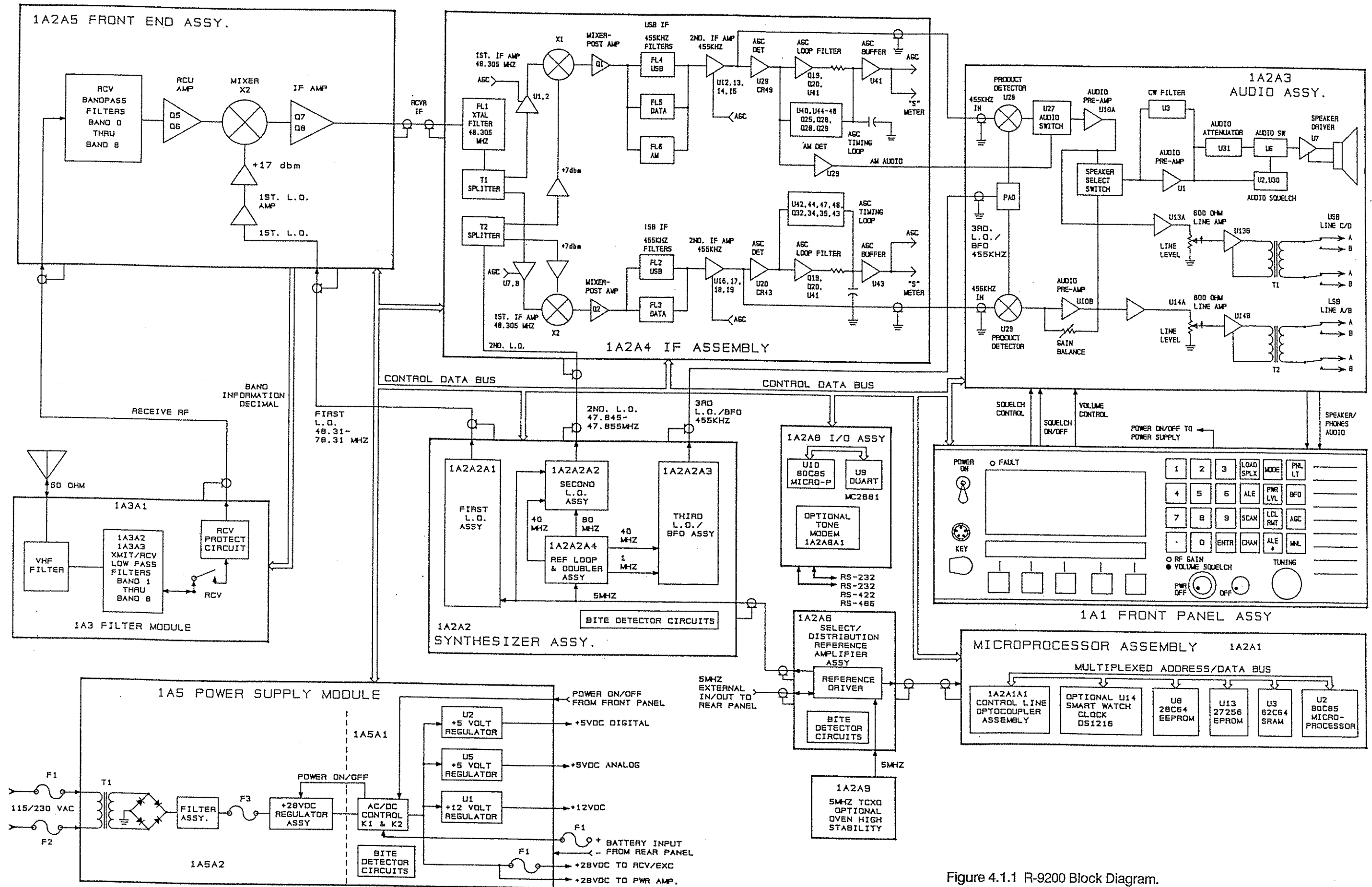


Figure 4.1.1 R-9200 Block Diagram.

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SECTION V

FAULT ISOLATION/MAINTENANCE AND REPAIR

5.1 GENERAL

This Section provides the procedures for Fault Isolation, Maintenance and Repair to the Lowest Repairable Unit (LRU) level.

5.2 DISASSEMBLY

Disassembly should be only to the extent necessary to accomplish the repair or replacement of the defective LRU. Procedures for the disassembly of major modules and assemblies are given in the following paragraphs.

5.2.1 TOP OR BOTTOM RECEIVER COVER REMOVAL

Refer to Figure 5.2.1.1.

- a) Remove the three screws at the rear of the cover.
- b) Release cover latches.
- c) Pull cover up and back from the front panel (1A1).

5.3 TEST SET UP

5.3.1 PRELIMINARY

To run 'BITE' on R-9200 no external test equipment is required.

WARNING: For personal safety and to prevent damage to voltage sensitive components in the receiver, always turn 'OFF' the R-9200 whenever reseating printed circuit cards (PC), LRUs, and when replacing fuses.

5.4 BITE

5.4.1 PRELIMINARY

The 'BITE' of the R-9200 Receiver provides immediate LRU faults. The Surveillance BITE is controlled by the microprocessor on CPU Assembly 1A2A1. It checks the operational status of the LRUs with the exception of the DC to DC Power Supply 1A5A1, AC Power Supply 1A5A2, and the Select/Distribution Reference Amplifier 1A2A6. These LRUs have self-surveillance BITE non-dependent upon CPU Assembly 1A2A1.

The front panel LCD will display a plain language 'FAULT MESSAGE', the 'FAULT' Red LED will illuminate on the Front Panel Figure 5.4.1.5 and on the faulty LRU. (See Figures 5.4.1.1 and 5.4.1.2.)

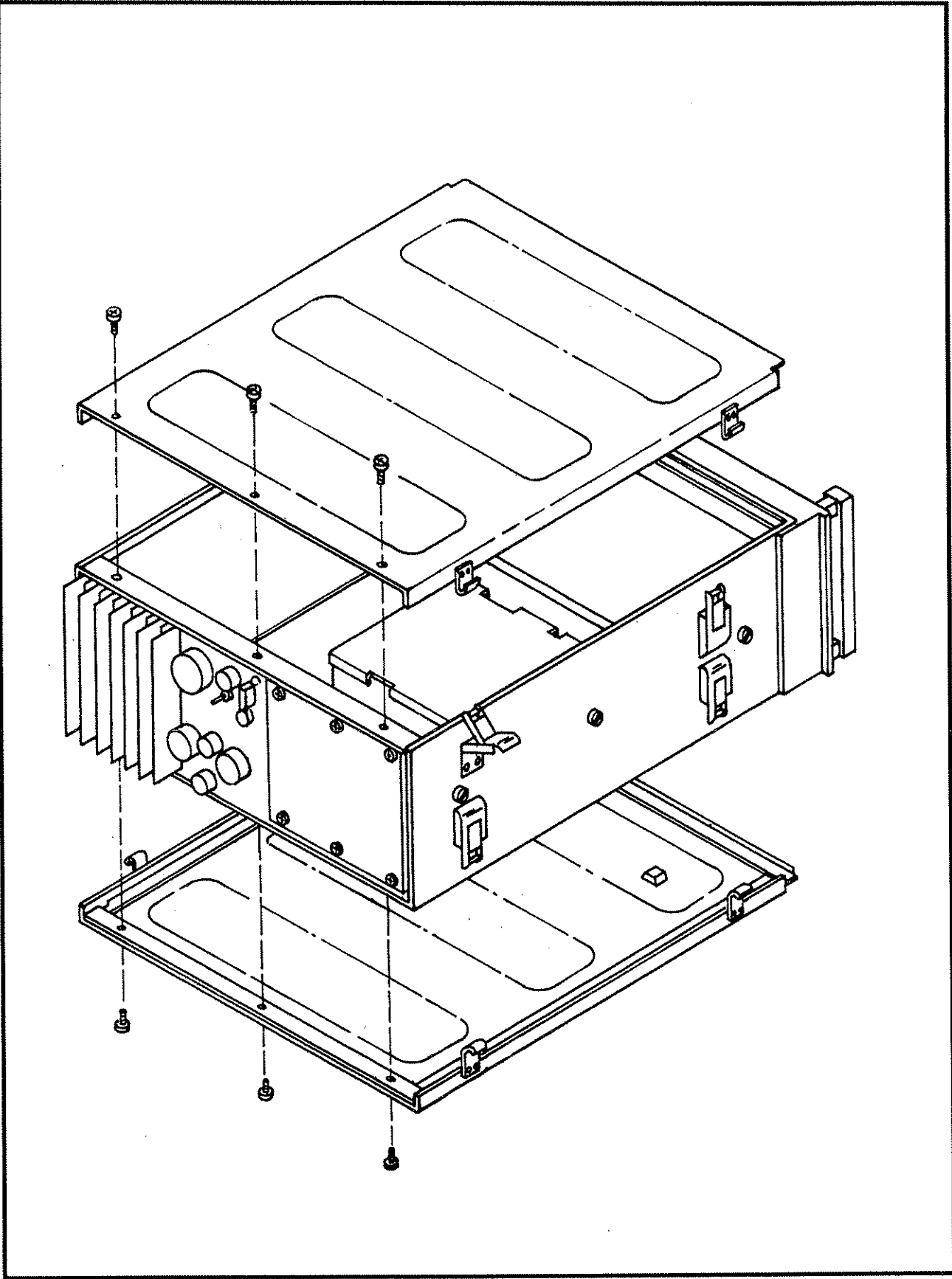


Figure 5.2.1.1 Top or Bottom Receiver Cover Removal.

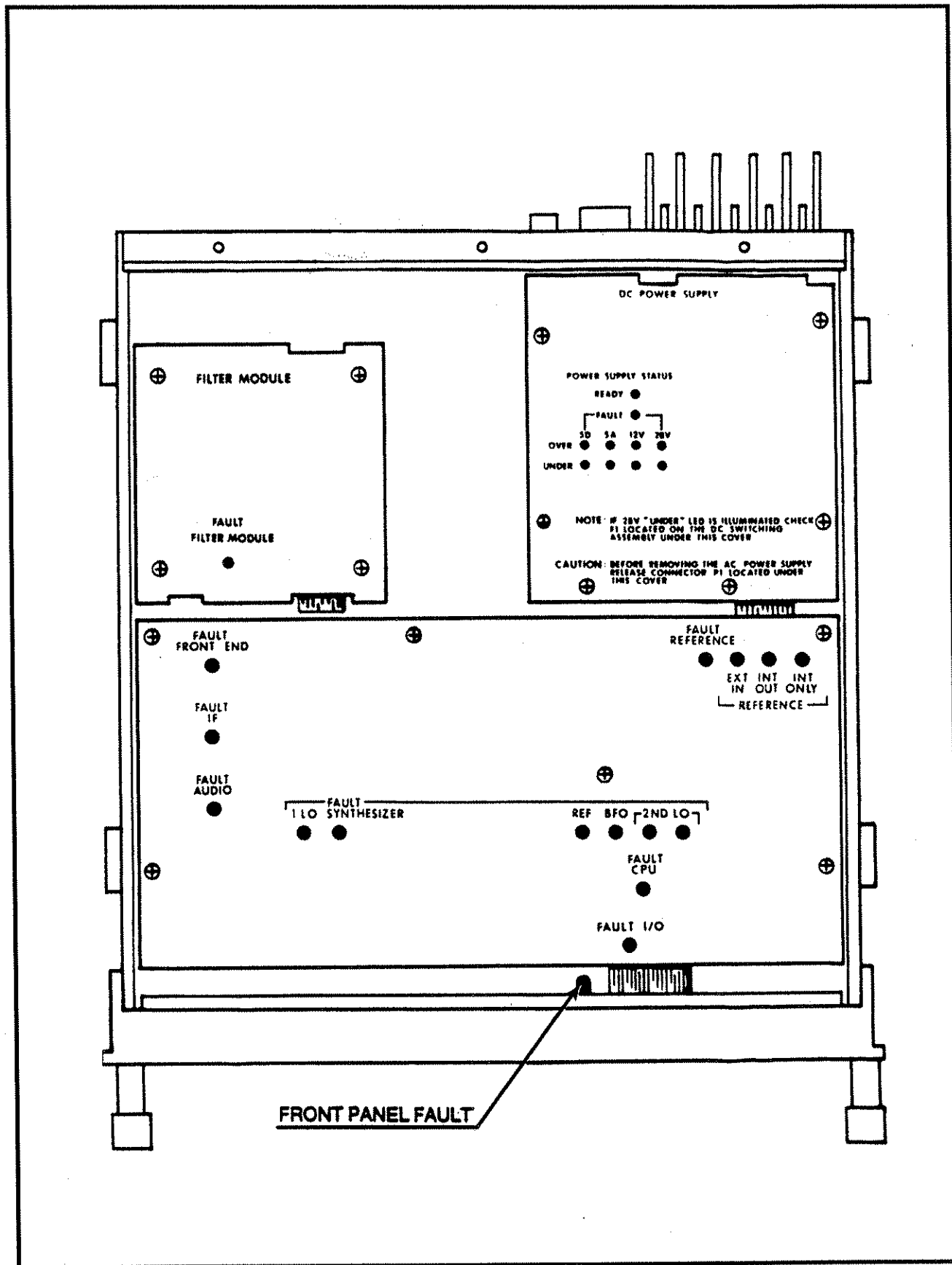


Figure 5.4.1.1 Top View of R-9200 LRU 'Fault Indicators'.

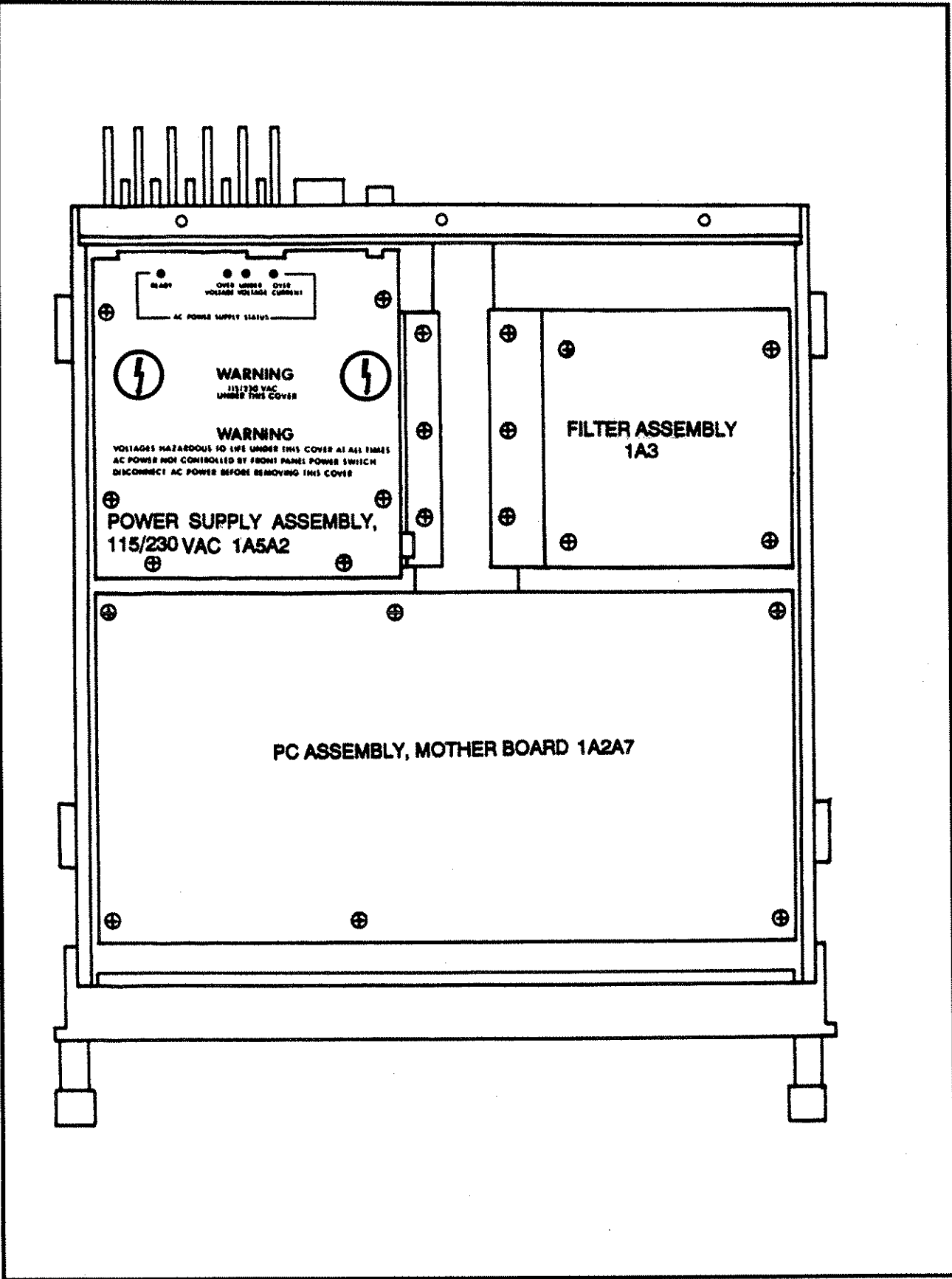


Figure 5.4.1.2 Bottom View of R-9200 AC Power LRU 'Fault Indicators' Location.

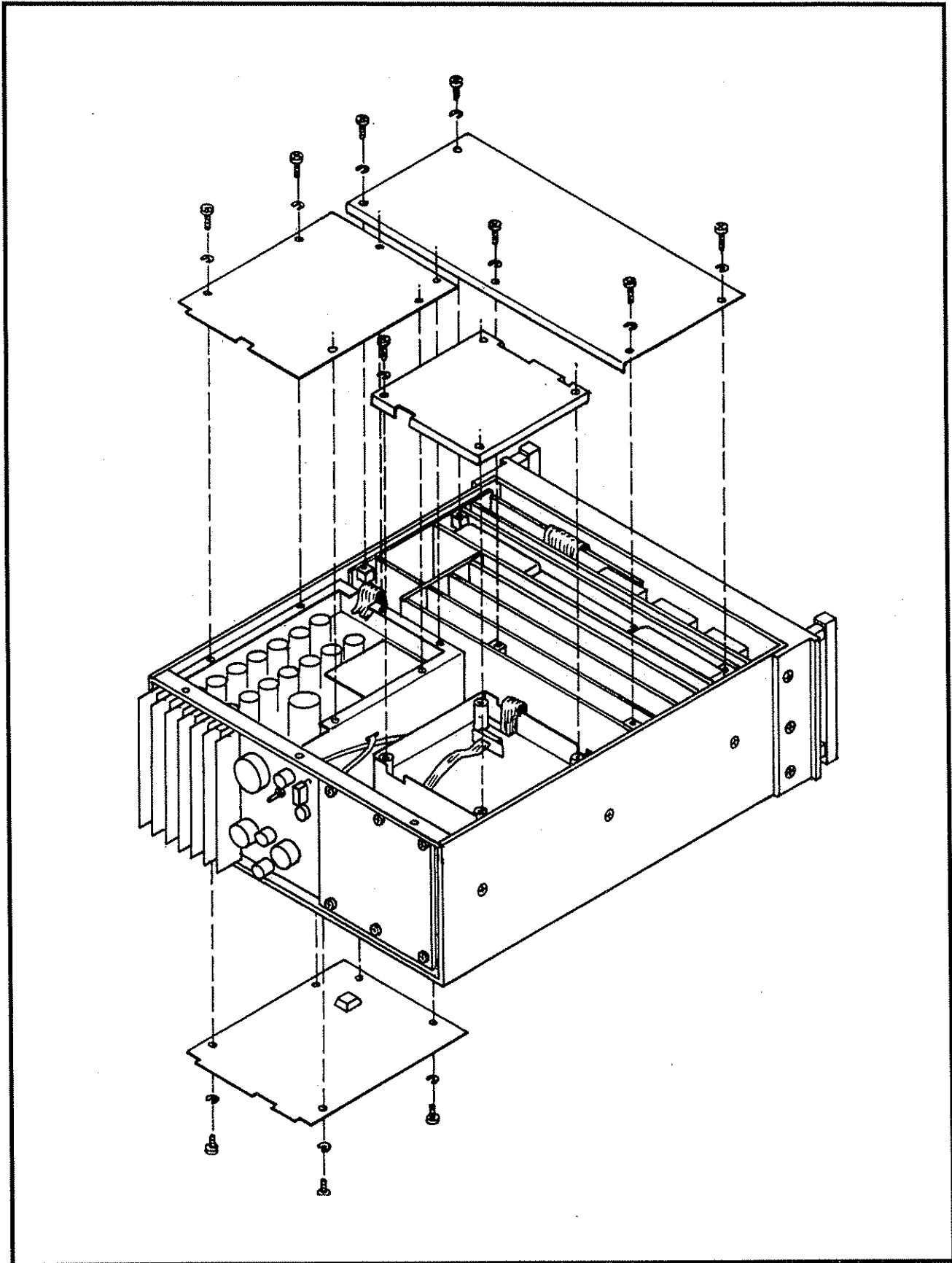


Figure 5.4.1.3 Module Cover Removal.

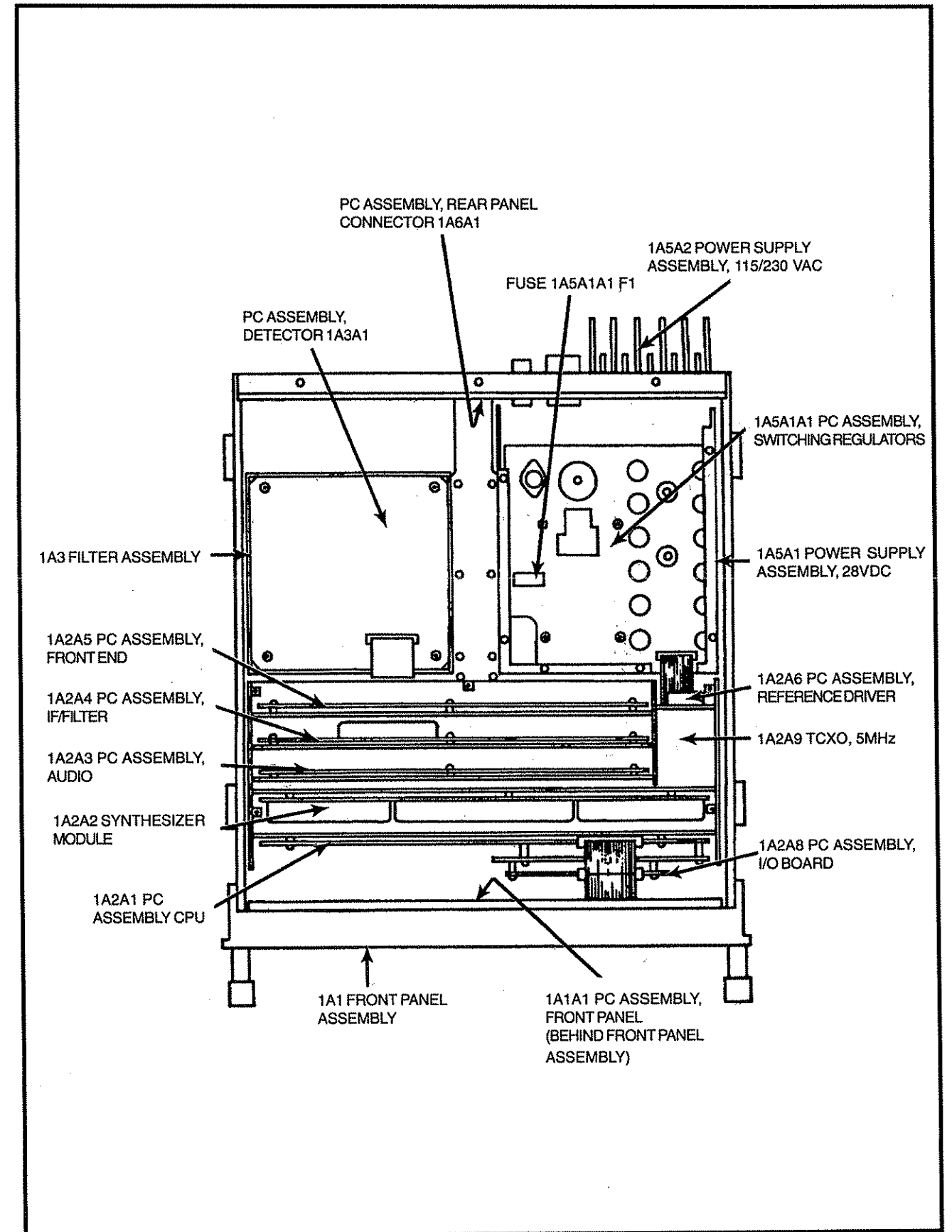


Figure 5.4.1.4 Major Assembly Locations.

Turn 'ON' Receiver and perform the following:

Depress the feature menu 'MORE' key 1 successively until the feature menu shown in Figure 5.4.1.5 is indicated on the feature menu display 2 .

Depress the 'BITE' key 3 . The equipment will initiate a self test routine and will display the results at 4 of the operational display. The initial message will be:

'BITE IN PROGRESS'.

As each module is tested a corresponding message will appear briefly on the operational display in the following order:

'FRONT PANEL O.K.'	or	'FRONT PANEL FAULT'
'CPU O.K.'	or	'CPU FAULT'
'SYNTHESIZER O.K.'	or	'SYNTHESIZER FAULT'
'POWER SUPPLY O.K.'	or	'POWER SUPPLY FAULT'
'I/O O.K.'	or	'I/O FAULT' (Displayed <u>ONLY</u> when I/O selected.)

A 1000 Hz audio tone will then be heard from the front panel speaker. As each module is tested, messages will appear on the operational display in the following order:

'AUDIO O.K.'	or	'AUDIO FAULT'
--------------	----	---------------

As the audio test is completed, the RCV frequency display 6 will automatically shift to first 24.99900 MHz then 25.00100 MHz as each sideband is tested.

'IF O.K.'	or	'IF FAULT'
'FRONT END O.K.'	or	'FRONT END FAULT'

At the successful conclusion of the BITE test, the message:

'TEST COMPLETED'

will appear on the operational display and the equipment will revert automatically to operational status.

NOTE: If any of the modules (LRUs) are faulty, the BITE program will halt, the front panel 'FAULT' indicator 5 will light, and the operational display will display a message indicating the faulty module:

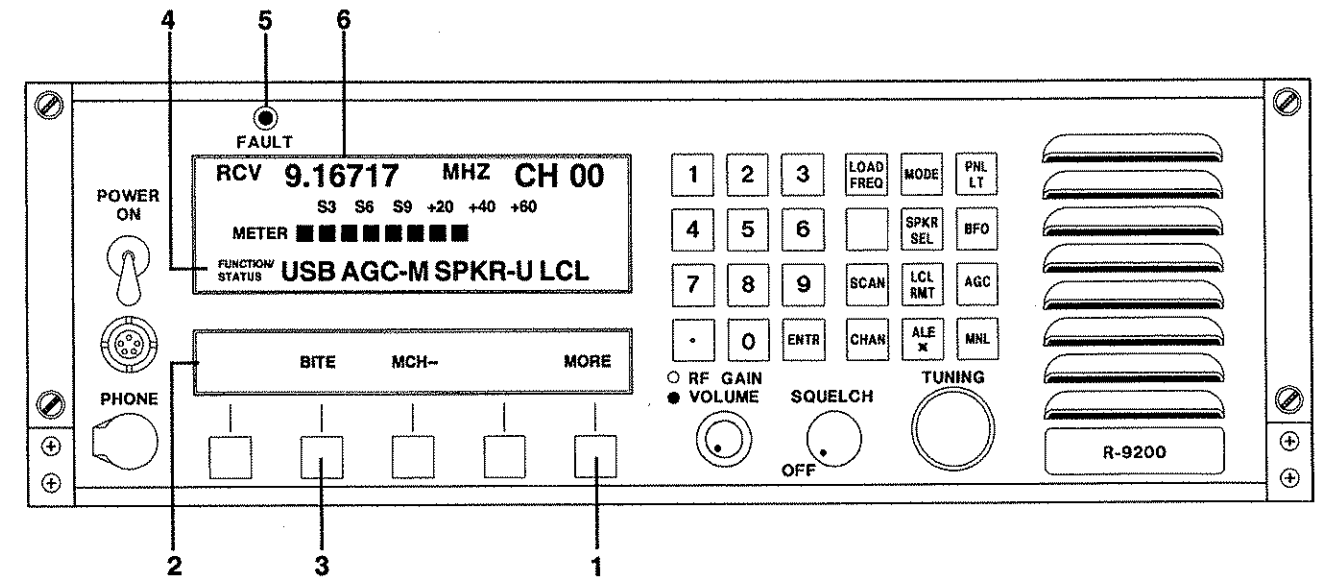


Figure 5.4.1.5 Feature Menu, BITE Selection.

5.4.2 RECEIVER MODULES

NOTE: Refer to Figures 5.4.1.3 and 5.4.1.4 for module cover removal and assembly locations.

5.4.2.1 FRONT PANEL FAULT

This is an indication of a failure on the Front Panel PC Board Assembly 1A1A1.

- Turn Receiver 'OFF' and remove Front Panel Module 1A1. See Figure 5.4.2.1 on the following page.
- Remove and replace Front Panel PC Board Assembly 1A1A1. See Figure 5.4.2.1.
- Reinstall Front Panel Module 1A1. Turn Receiver 'ON'.
- Repeat 'BITE TEST'. Upon completion of successful test, return Receiver to operational status and return failed 1A1A1 PC Assembly to factory for repair.
- If in step d) above, test fails the Front Panel Test again, turn 'OFF' Receiver and remove 1A1 Module; replace with original 1A1A1 PC Assembly. Return the failed 1A1 Module to factory for repair.

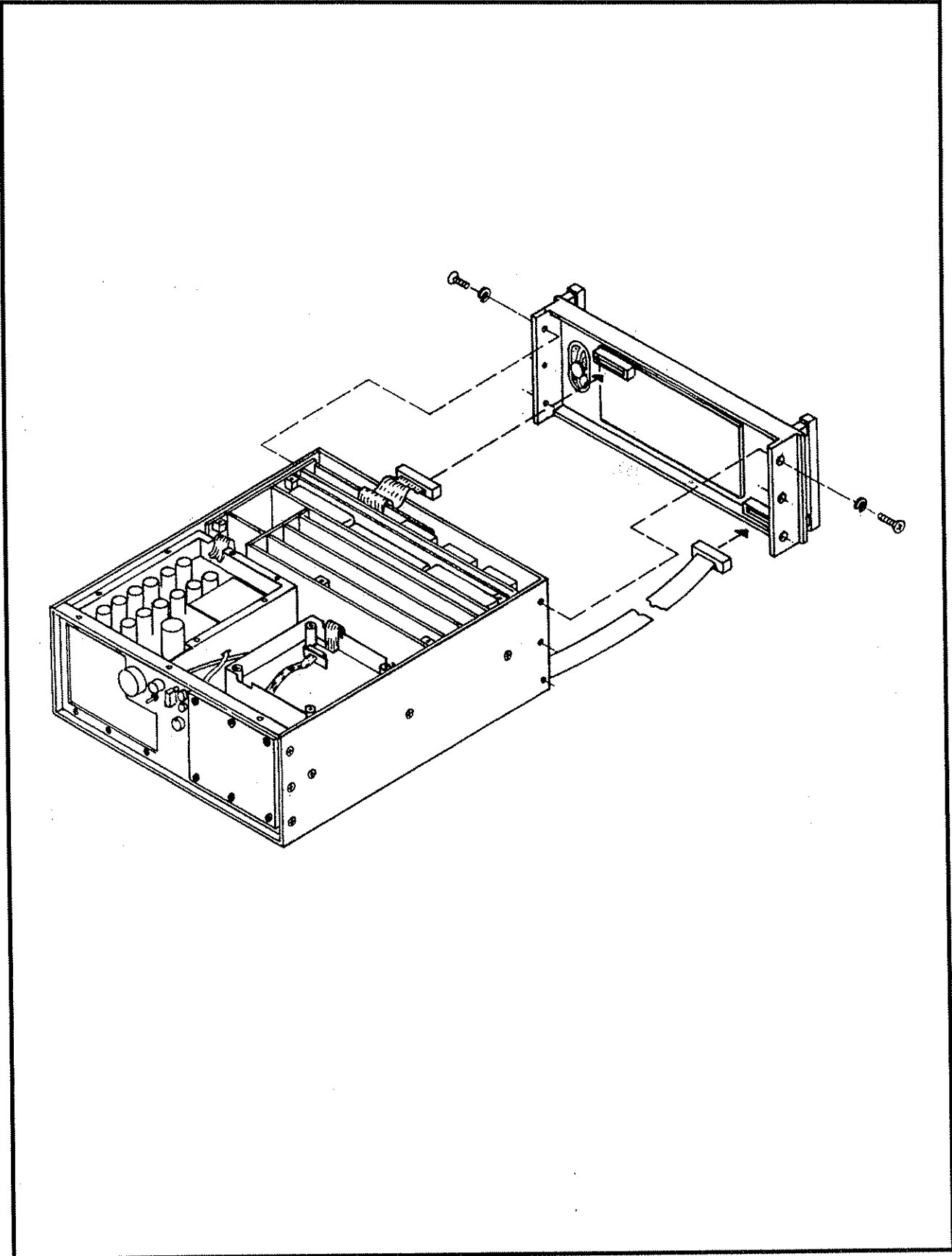


Figure 5.4.2.1 Front Panel (1A1) Removal.

5.4.2.2 CPU FAULT

This is an indication of a failure on the PC Assembly CPU 1A2A1.

- a) Turn the Receiver 'OFF' and remove and replace PC Assembly 1A2A1. See Figures 5.4.1.3, 5.4.1.4, and 5.4.2.2.1 thru 5.4.2.2.2.
- b) Turn 'ON' Receiver and repeat 'BITE TEST'. Upon completion of a successful test, return Receiver to operational status.
- c) Return failed PC Assembly 1A2A1 to factory for repair.

5.4.2.3 SYNTHESIZER FAULT

This is an indication of a failure on the Synthesizer Module 1A2A2.

- a) Turn the Receiver 'OFF' and remove and replace Module. See Figure 5.4.1.3 and 5.4.1.4.
- b) Turn 'ON' Receiver and repeat 'BITE TEST'. Upon completion of a successful test, return Receiver to operational status.
- c) Return failed Module 1A2A2 to factory for repair.

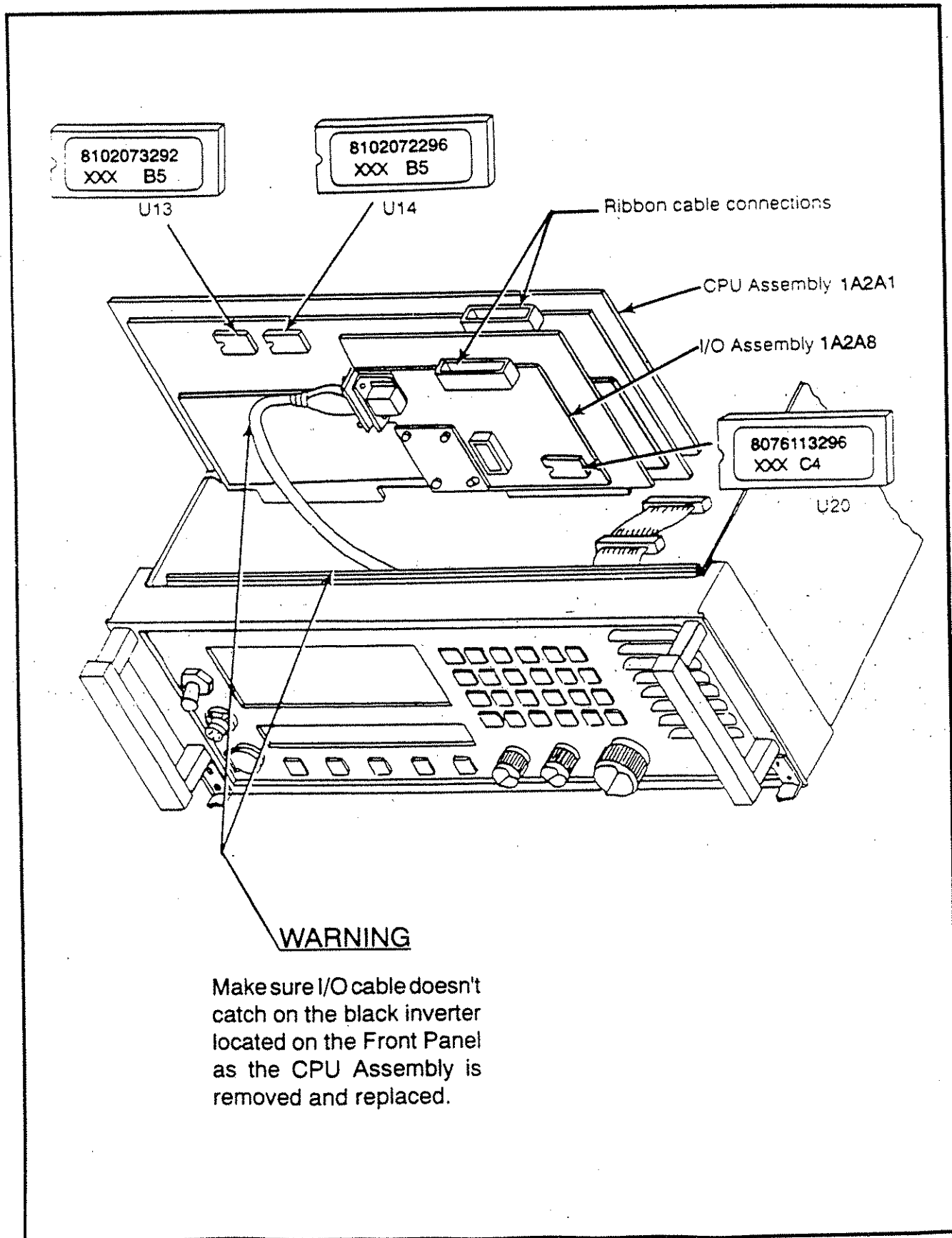


Figure 5.4.2.2.1 Removal/Replacement of CPU 1A2A1, I/O 1A2A8.

Revised 3/15/95

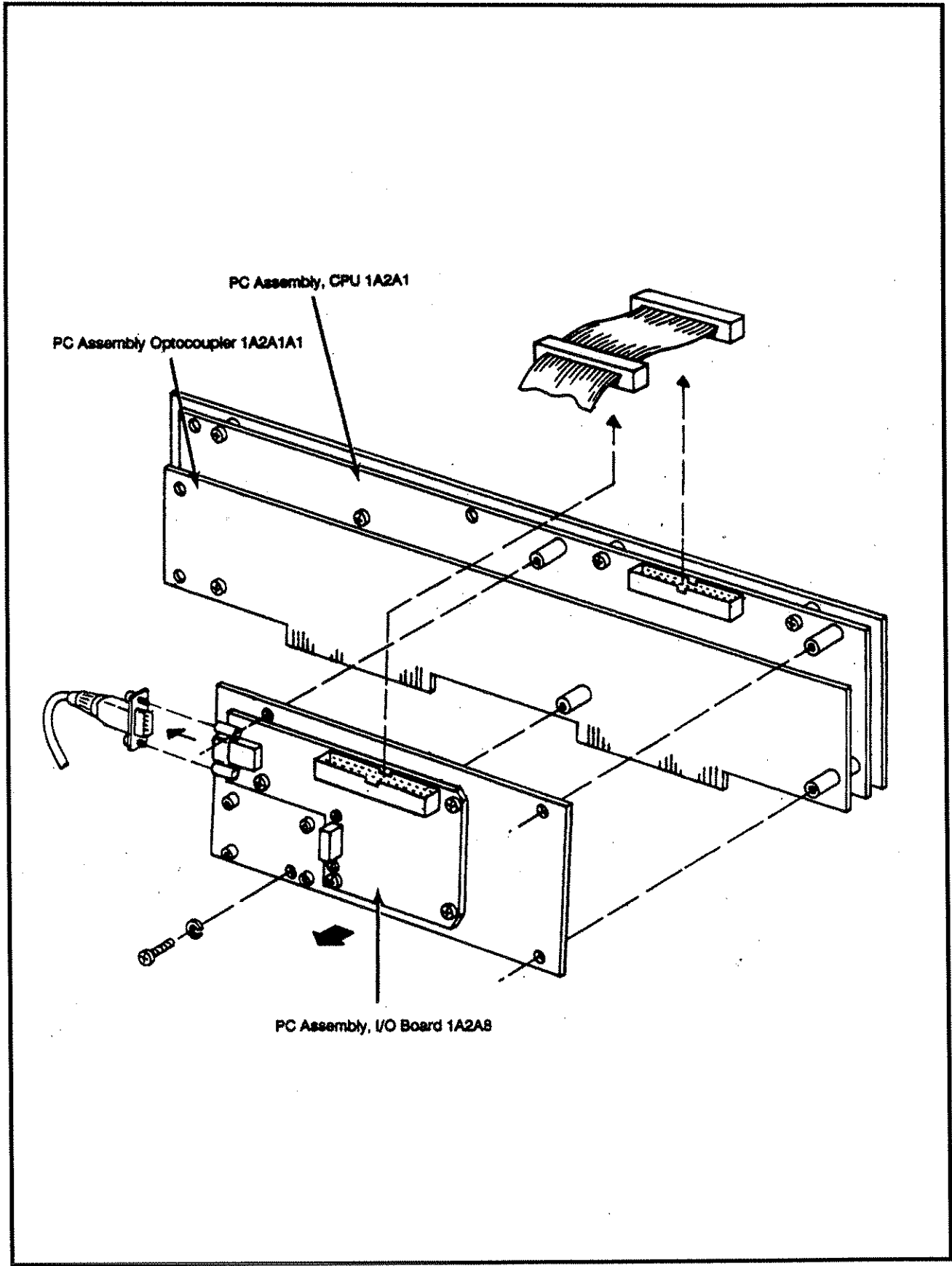


Figure 5.4.2.2.2 Removal/Replacement of 1A2A8.

5.4.2.4 POWER SUPPLY FAULT

This indicates a failure of the 1A5A1A1 +5 VDC analog circuit. The failures are:

- a) +5 VDC analog 'OVER' voltage and,
- b) +5 VDC analog 'UNDER' voltage.

a) +5 VDC analog 'OVER' voltage.

- 1) Turn 'OFF' Receiver and remove and replace PC Assembly 1A5A1A1 (switching regulator board). See Figures 5.4.1.3, 5.4.1.4, and 5.4.2.4.1 thru 5.4.2.4.4.
- 2) Turn 'ON' Receiver; observe Power Supply Fault LEDs (should be 'OFF'); run 'BITE TEST'. Upon completion of successful test, return Receiver to operational status. Return PC Assembly 1A5A1A1 to factory for repair. If above power supply LEDs are 'ON', turn 'OFF' Receiver and remove and replace PC Assembly 1A5A1A2 (Control Logic Board). See Figure 5.4.2.4.3.
- 3) Turn 'ON' Receiver; observe Power Supply Fault LEDs (should be 'OFF'); run 'BITE TEST'. Upon completion of successful test, return Receiver to operational status. Return PC Assembly 1A5A1 to factory for repair.

b) +5 VDC analog 'UNDER' voltage.

- 1) Turn 'OFF' Receiver and remove ribbon connector to Filter Module 1A3J4.
- 2) Turn 'ON' Receiver and observe Power Supply Fault LEDs. If LEDs are 'OFF', a short in the 1A3 Filter Module on the +5 VDC analog line is indicated. Remove and replace 1A3 Module. See Figure 5.4.2.4.4. If LEDs are 'ON', trouble in other circuitry is indicated. Turn 'OFF' receiver and reinstall connector to 1A3J4. Go on to step 3.
- 3) Remove Front End PC Assembly 1A2A5. Turn 'ON' Receiver and observe Power Supply Fault LEDs. If LEDs are 'OFF', a short in the 1A2A5 +5 VDC analog circuitry is indicated; replace 1A2A5. If LEDs are 'ON', trouble in other circuitry is indicated. Turn 'OFF' Receiver and reinstall 1A2A5. Go on to step 4.
- 4) Remove IF PC Board Assembly 1A2A4. Turn 'ON' Receiver and observe Power Supply Fault LEDs. If LEDs are 'OFF', a short in the 1A2A4 +5 VDC analog circuitry is indicated; replace 1A2A4. If LEDs are 'ON', trouble in other circuitry is indicated. Turn 'OFF' Receiver and reinstall 1A2A4. Go on to step 5.
- 5) Remove Audio PC Board Assembly 1A2A3. Turn 'ON' Receiver and observe Power Supply Fault LEDs. If LEDs are 'OFF', a short in the 1A2A3 +5 VDC analog circuitry is indicated; replace 1A2A4. If LEDs are 'ON', trouble in other circuitry is indicated. Turn 'OFF' Receiver and reinstall 1A2A3. Go on to step 6.
- 6) Remove and replace DC Power Supply Switching Regulator Board 1A5A1A1. Turn 'ON' Receiver and observe Power Supply Fault LEDs. If LEDs are 'OFF', this indicates that 1A5A1A1 should be sent to the factory for repair. If LEDs are 'ON', trouble in other circuitry is indicated. Turn 'OFF' Receiver and go to step 7.

- 7) Remove and replace Control Logic PC Board Assembly 1A5A1A2. Turn 'ON' Receiver and observe Power Supply Fault LEDs. If LEDs are 'OFF', this indicates that 1A5A1A2 should be sent to the factory for repair. If LEDs are 'ON', trouble could be on Motherboard 1A2A7 or in the interconnecting ribbon cables. Turn Receiver 'OFF' and use normal troubleshooting procedures to locate the short on the +5 VDC line throughout the Receiver.

Other Power Supply Fault LEDs will be discussed in section 5.5.

5.4.2.5 I/O FAULT

This is an indication of a failure on PC Assembly 1A2A8.

- a) Turn the Receiver 'OFF' and remove and replace PC Assembly 1A2A8. See Figures 5.4.1.3, 5.4.1.4 and 5.4.2.2 thru 5.4.2.2.2.
- b) Turn 'ON' Receiver and repeat 'BITE TEST'. Upon completion of a successful test return the Receiver to operational status.
- c) Return failed PC Assembly 1A2A8 to factory for repair.

5.4.2.6 AUDIO FAULT

This is an indication of a failure on the Audio PC Board Assembly 1A2A3.

- a) Turn Receiver 'OFF' and remove and replace 1A2A3. See Figures 5.4.1.3 and 5.4.1.4.
- b) Turn Receiver 'ON'. Repeat 'BITE TEST'. Upon completion of successful test, return Receiver to operational status. Return failed 1A2A3 to factory for repair.

5.4.2.7 IF FAULT

This is an indication of a failure on the IF PC Board Assembly 1A2A4.

- a) Turn Receiver 'OFF' and remove and replace 1A2A4. See Figures 5.4.1.3 and 5.4.1.4.
- b) Turn Receiver 'ON'. Repeat 'BITE TEST'. Upon completion of successful test, return Receiver to operational status. Return failed 1A2A4 to factory for repair.

5.4.2.8 FRONT END FAULT

This is an indication of a failure on the Front End PC Assembly 1A2A5.

- a) Turn Receiver 'OFF' and remove and replace 1A2A5. See Figures 5.4.1.3 and 5.4.1.4.
- b) Turn Receiver 'ON'. Repeat 'BITE TEST'. Upon completion of successful test, return Receiver to operational status. Return failed 1A2A5 to factory for repair.

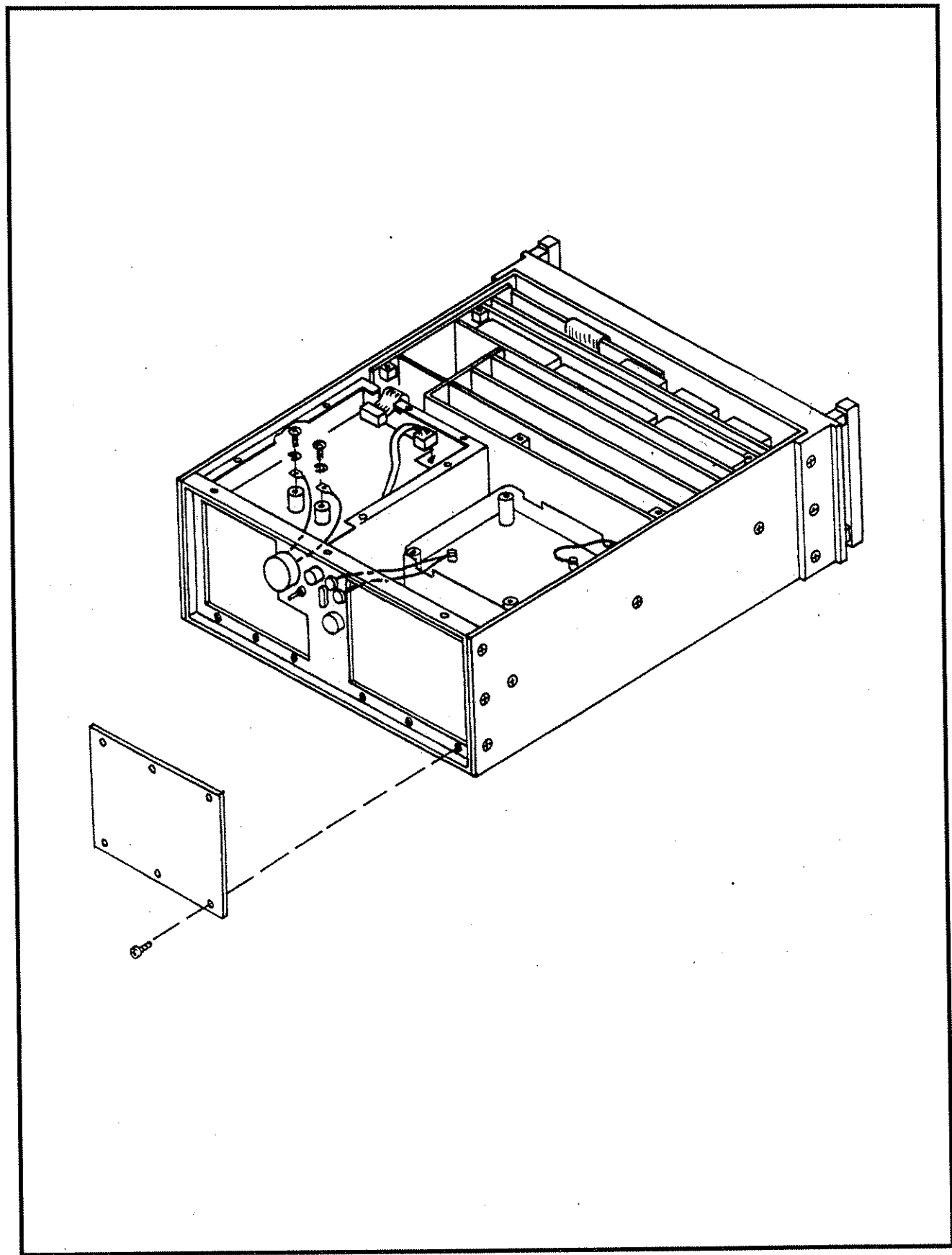


Figure 5.4.2.4.1 Removal/Installation of Modules 1A3 or 1A5.

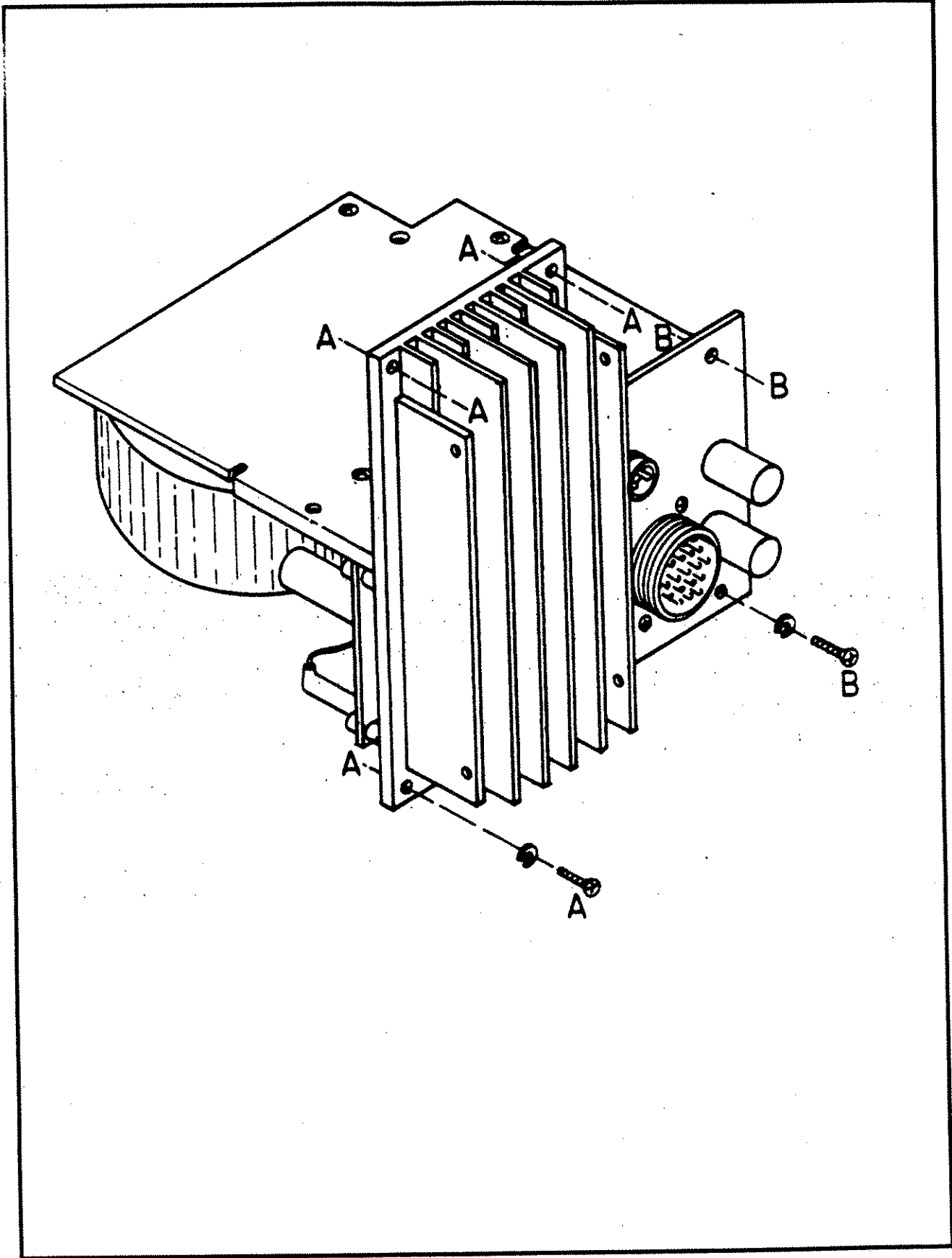


Figure 5.4.2.4.2 Removal/Installation of AC Power Supply Module 1A5A2.

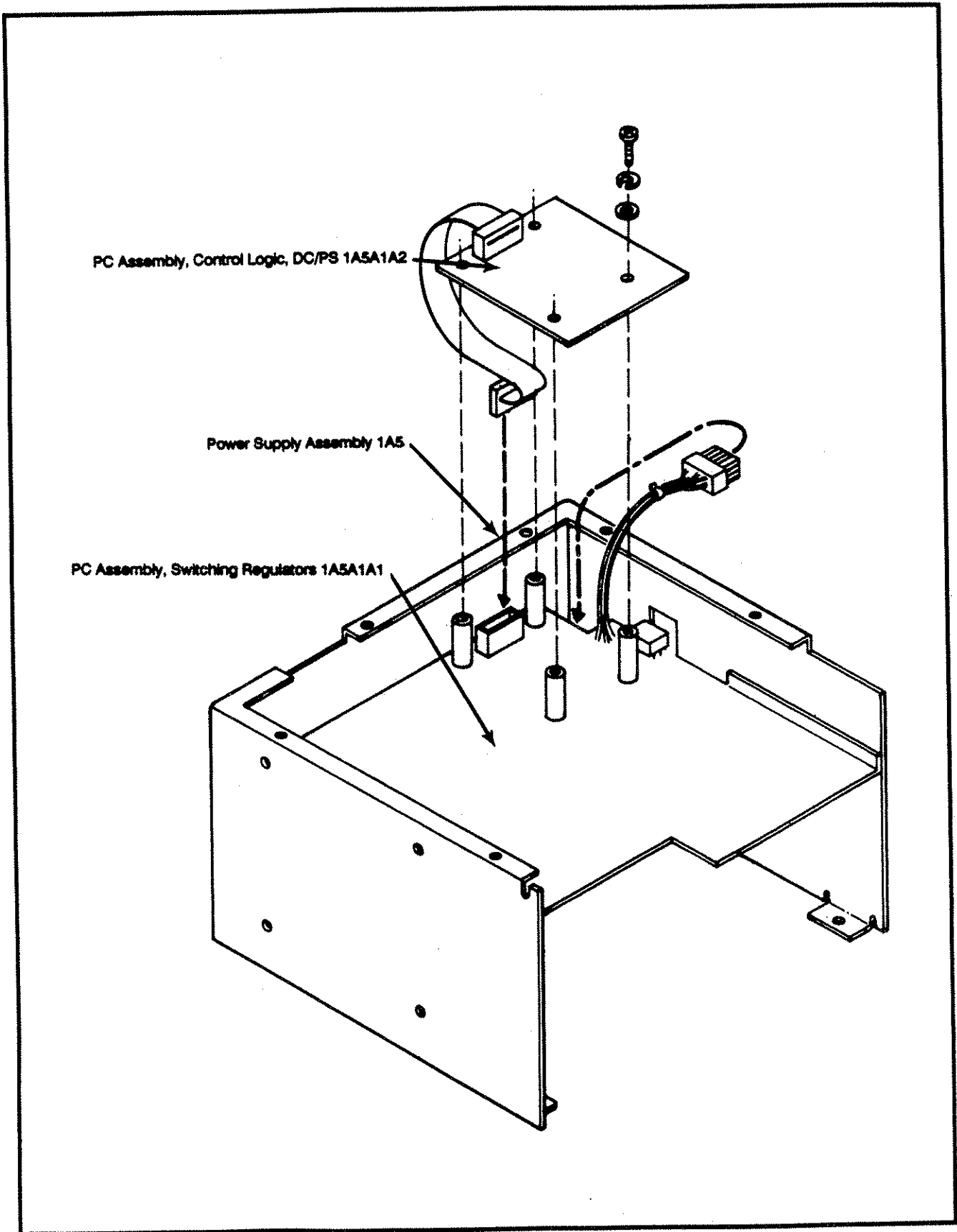


Figure 5.4.2.4.3 Removal/Installation of DC Power Supply PC Board 1A5A1A2.

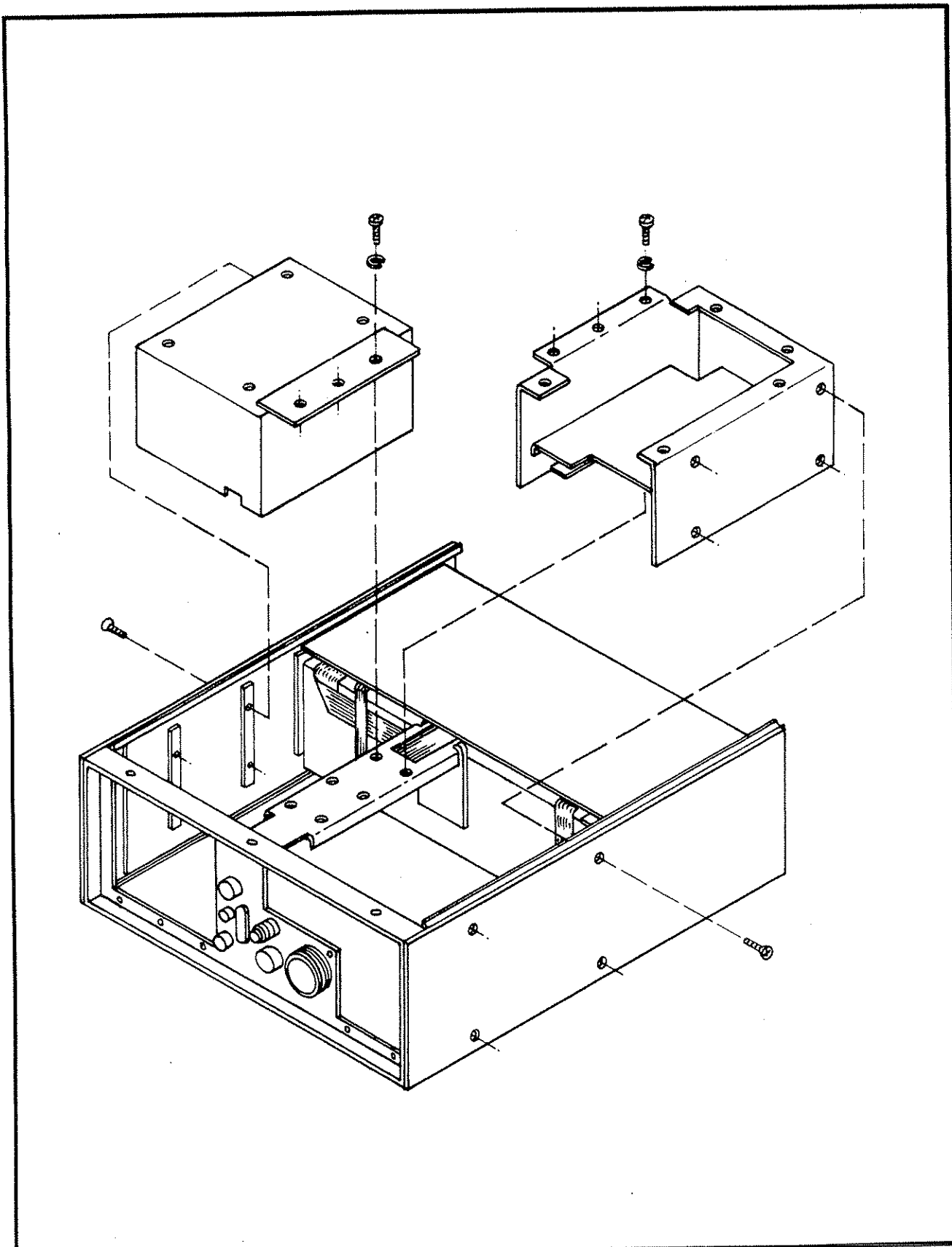


Figure 5.4.2.4.4 Removal/Installation of Module 1A3 and 1A5.

5.5 TROUBLE SHOOTING WITH SELF-SURVEILLANCE BITE

5.5.1 DC TO DC POWER SUPPLY 1A5A1 / 1A5A1A1 / 1A5A1A2

Reference Figure 5.5.1.

5.5.2 AC POWER SUPPLY 1A5A2 / 1A5A2A1 / 1A5A2A2

Reference Figure 5.5.1.

5.5.3 SELECT/DISTRIBUTION REFERENCE AMPLIFIER 1A2A6

Reference Figure 5.5.2.

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LED's X=ON BLANK=OFF	DC TO DC POWER SUPPLY 1A5A1										AC POWER SUPPLY 1A5A2				POSSIBLE TROUBLE	CORRECTIVE ACTION
	READY	FAULT	5D		5A		12 V		28 V		READY	OVER VOLTAGE	UNDER VOLTAGE	OVER CURRENT		
			OVER	UNDER	OVER	UNDER	OVER	UNDER	OVER	UNDER						
1	X										X				No Trouble	No Action Required
2		X								X	X				1. 1A5A1A1 F1 Open. 2. Short in the Transceiver on +28 V line.	Replace fuse as required. If fuse opens again, use normal trouble shooting procedures to locate and repair short.
3															1. No AC power. 2. Open AC Fuses 1A5A2 F1 and F2. 3. Open 1A5A2 F3.	1. Check for AC input. 2. Replace F1 and F2. If fuses open again, remove and replace 1A5A2 power supply. 3. Replace F3. If it opens again, replace power supply.
4											No AC power supply installed or using only DC to DC supply.				1. No DC power. 2. 1A6 F1 open.	1. Check for +28 VDC input. 2. Replace F1. If it opens again, remove and replace 1A5A1 power supply.
5												X			1A5A2 AC power supply.	Replace 1A5A2 assembly.
6													X		1A5A2 AC power supply.	Replace 1A5A2 assembly.
7														X	1. 1A5A2 AC power supply. 2. Short on +28 V line in DC power supply or Radio.	1. Remove 1A5A1 F1 and P3 to radio and check. Use normal trouble shooting procedures to locate and repair short. 2. Replace 1A5A2 assembly.
8		X		X	X			X			X				U5 and associated circuitry in 1A5A1.	Replace 1A5A1 assembly.
9		X	X			X		X			X				U2 and associated circuitry in 1A5A1.	Replace 1A5A1 assembly.
10		X		X		X	X				X				U1 and associated circuitry in 1A5A1.	Replace 1A5A1 assembly.
11		X						X		X	No AC power supply installed or using only DC to DC supply.				DC power input low.	Correct DC input voltage.
12		X							X		No AC power supply installed or using only DC to DC supply.				DC power input high.	Correct DC input voltage.
13		X					X				X				1. U5 and associated circuitry in 1A5A1. 2. Short on +5 V analog line in Transceiver.	1. Replace 1A5A1 assembly. 2. Use normal trouble shooting procedures to locate and repair short.
14		X		X							X				1. U2 and associated circuitry in 1A5A1. 2. Short on +5 V digital line in Transceiver.	1. Replace 1A5A2 assembly. 2. Use normal trouble shooting procedures to locate and repair short.
15		X						X			X				1. U1 and associated circuitry in 1A5A1.	1. Replace 1A5A2 assembly. 2. Use normal trouble shooting procedures to locate and repair short.

Table 5.5.1 DC to DC and AC Power Supply Troubleshooting.

SELECT/DISTRIBUTION REFERENCE AMPLIFIER
1A2A6

NOTE: S1A, S1B, and S1C are accomplished by a jumper plug. Normal factory setting is INTERNAL ONLY. However, this value can be changed by the user to INTERNAL OUT or EXTERNAL IN.

LED's X=ON BLANK=OFF	INT ONLY	INT OUT	EXT IN	FAULT	POSSIBLE TROUBLE	CORRECTIVE ACTION
1	X				Normal indication for factory setting.	No action required.
2	X			X	1. No input to 1A2A6. 2. No output from 1A2A6.	1. Use oscilloscope and check input and output on 1A2A7 Mother board J11 pins 5 and 2. Replace as required 1A2A9 or 1A2A6.
3		X			Normal indication for this setting.	No action required.
4		X		X	1. No input to 1A2A6. 2. No output from 1A2A6.	1. Use oscilloscope and check input and output on 1A2A7 Mother board J11 pins 5, 4, and 2. Replace as required 1A2A9 or 1A2A6.
5			X		Normal indication for this setting. Input is from an external frequency standard.	No action required.
6			X	X	1. No input from external frequency standard. 2. No output from 1A2A6.	1. Use oscilloscope and check input from External Standard at J11 pin 4 and check output at J11 pin 2. Replace as required External Standard or 1A2A6.

Table 5.5.2 Select/Distribution Reference Amplifier Troubleshooting.

5.6 TEST EQUIPMENT REQUIRED OR EQUIVALENT

Multimeter	Simpson 260
Power Supply (optional for DC only), 0-40 V @ 30 Amp	HP-6269
Oscilloscope, 100 MHz bandwidth	Tektronix Model 2235
Audio Generator	Leader Model LAG-120B
Audio Voltmeter (2 each)	Leader Model LMV-181A
RF Signal Generator	Wavetek 3000
Frequency Counter	Systron-Donner Model 6050 with Option 12
Digital Multimeter	Leader LDM-853A
Coaxial Cable (4 each)	RG-58/U with BNC Connectors
Adapter N to BNC (3 each)	UG-201/U
Adapter UHF to BNC (3 each)	UG-273/U
'T' Connector BNC	UG-274/U
Audio Interface Cable	P/N 8076004594
Headset	P/N 0840200005
Coaxial Cable	RG-58/U BNC Connector and Phone Plug

WARNING: The adjustments called out in the following alignments are all that should be attempted. Any other adjustments not called out are factory adjustments and cannot be done in the receiver.

5.7 RECEIVE ALIGNMENT and CHECKS

See Figure 5.7.1 for Test Equipment Connections. (Remove top and bottom covers per Section 5.2.1.)

General: Connect coaxial cable from J4 (Antenna) to RF Signal Generator.

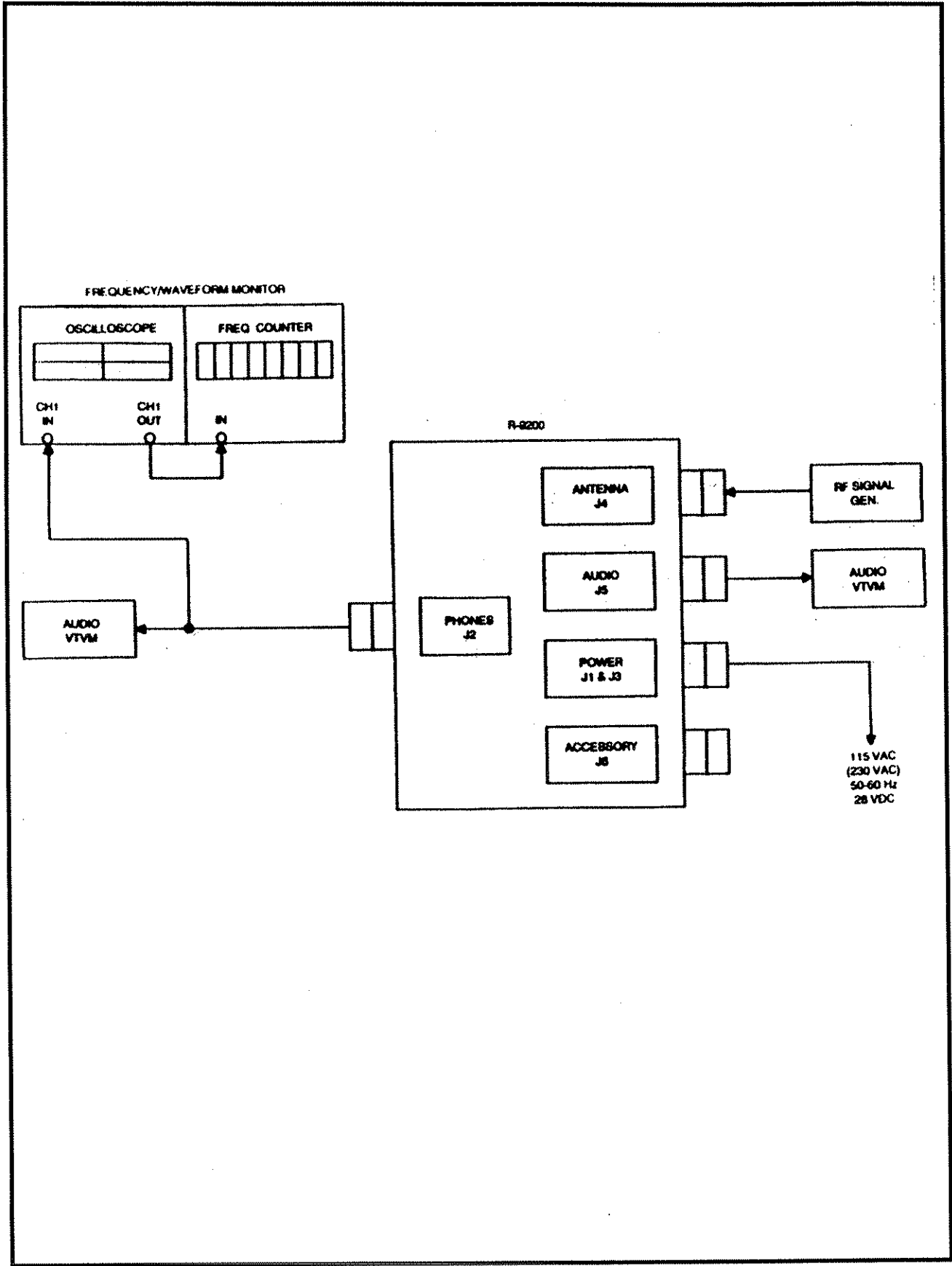


Figure 5.7.1 Receiver Alignment Test Equipment Connections.

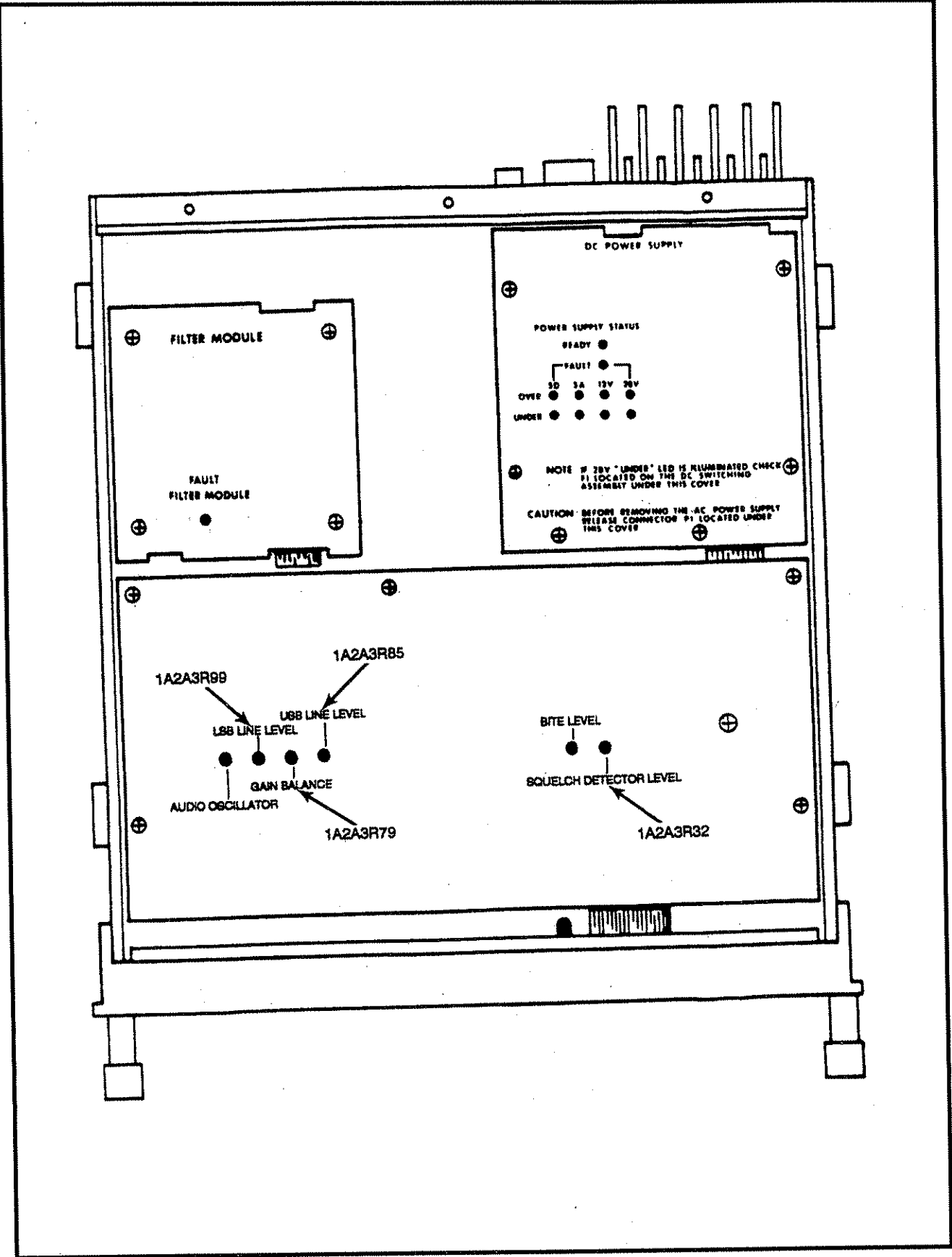


Figure 5.7.2 Alignment Adjustment Locations.

5.7.1 REFERENCE OSCILLATOR (TCXO)

- a) Turn on receiver 'ON' and rotate 'VOLUME' control clockwise until noise is heard in speaker.

Connect the frequency counter to 'VERT OUT' of Oscilloscope. Connect Oscilloscope Channel 1 input to Motherboard (1A2A7) J12 pin 6 (TCXO OUT). The frequency must be 5.0 MHz \pm 5.0 Hz.

NOTE: If it is necessary to adjust the 'TCXO', first remove the Receiver Module cover, then remove the 'TCXO' top cover screw (see Figures 5.4.1.3 and 5.4.1.4) and adjust trimmer in the 'TCXO' to the frequency stamped on the cover. This adjustment should only be done with 'TCXO' at room temperature. If unable to adjust, or 'TCXO' drifts more than 10 Hz, remove and replace the 'TCXO' (1A2A9).

5.7.2 SENSITIVITY USB

NOTE: Internal generated spurious is 99.5% of available frequencies from 100 kHz to 30 MHz at or below 0.2 microvolt equivalent input at antenna terminal. If you encounter a 'SPUR' on the frequency you are checking, change the frequency to a couple 100 kHz above or below to get away from the 'SPUR'.

- a) With RF Signal Generator connected to Antenna Connector (J4), set RF Signal Generator to 2.606 MHz, CW mode, 0.5 microvolt output.
- b) Set Receiver to 'MANUAL' operation, 2.605 MHz, USB mode. A 1000 Hz tone should be heard in the speaker.
- c) Connect Audio Voltmeter to Phone Jack (J2) using a phone plug terminated coaxial cable. The speaker should be 'OFF' when phone plug is connected to J2. Connect Oscilloscope Channel 1 input to Audio Voltmeter input. (See Figure 5.7.1.)
- d) Detune RF Signal Generator by at least 1 MHz, adjust 'VOLUME' control for -10 dB level on a convenient Audio Voltmeter scale, and adjust the Oscilloscope gain to a convenient level.
- e) Retune the RF Signal Generator to 2.606 MHz and adjust the output of the RF Signal Generator until Audio Voltmeter level is 10 dB above step d). The output level of RF Signal Generator should not be more than 0.5 microvolt.
- f) Change the mode of the Receiver to LSB. The audio output should decrease at least 10 dB. Set the RF Signal Generator to 2.604 MHz. The audio level must increase at least 10 dB. Adjust 1A2A3 R79 'GAIN BALANCE' control (see Figures 5.7.2 and 5.9.12) so that the LSB audio output level is the same as in step e).

NORMAL: Return test equipment and Receiver to settings in step e). Go on to Step g).

ABNORMAL: Remove and replace the following LRUs, one at a time, and re-accomplish steps a) through e) each time:

IF/FILTER ASSEMBLY 1A2A4
FRONT END ASSEMBLY 1A2A5
FILTER MODULE 1A3
AUDIO ASSEMBLY 1A2A3

- g) Measure sensitivity at 1 MHz intervals from 2.605 to 29.605 MHz in USB mode. At all frequencies the sensitivity should be +10 dB for an input of 0.5 microvolt or less.

NORMAL: Go on to step h).

ABNORMAL: Remove and replace the following LRUs, one at a time, and re-accomplish steps a) through e) each time:

IF/FILTER ASSEMBLY 1A2A4
FRONT END ASSEMBLY 1A2A5
FILTER MODULE 1A3
AUDIO ASSEMBLY 1A2A3

- h) Set Receiver mode to LSB and set RF Signal Generator to 29.604 MHz. Measure sensitivity should be 1 MHz intervals from 29.605 to 2.605 MHz. At all frequencies the sensitivity should be +10 dB for an input of 0.5 microvolt or less.

NORMAL: Go on to step i).

ABNORMAL: Remove and replace the following LRUs, one at a time, and re-accomplish steps a) through e) each time:

IF/FILTER ASSEMBLY 1A2A4
FRONT END ASSEMBLY 1A2A5
FILTER MODULE 1A3
AUDIO ASSEMBLY 1A2A3

- i) Set Receiver mode to CW and selectivity to narrow. Adjust audio output to -10 dB reference level. Set RF Signal Generator to 2.606 MHz, CW mode. Adjust Signal Generator output for a 10 dB increase on the Audio Voltmeter. The RF Signal Generator output should not exceed 0.3 microvolt. Measure sensitivity at 1 MHz intervals from 2.605 to 29.605. Sensitivity should be +10 dB for an input of 0.3 microvolt or less.

NORMAL: Go on to step j).

ABNORMAL: Remove and replace the following LRUs, one at a time, and re-accomplish step i) each time:

IF/FILTER ASSEMBLY 1A2A4
FRONT END ASSEMBLY 1A2A5
FILTER MODULE 1A3
AUDIO ASSEMBLY 1A2A3

- j) Set receiver mode to AM. Set RF Signal Generator to 29.605 MHz, 3.0 microvolt, AM modulation at 30%. Adjust volume control for 0 dB reading on Audio Voltmeter. Remove modulation from Signal Generator. The Audio Voltmeter reading must decrease at least 10 dB. Check sensitivity in 1 MHz intervals from 29.605 to 2.605 MHz, should be +10 dB for an input of 3.0 microvolt or less.

NORMAL: Go on to step k).

ABNORMAL: Remove and replace the following LRUs, one at a time, and re-accomplish step j) each time:

IF/FILTER ASSEMBLY 1A2A4
FRONT END ASSEMBLY 1A2A5
FILTER MODULE 1A3
AUDIO ASSEMBLY 1A2A3

- k) Measure the sensitivity in USB, LSB, and AM at 1.000 MHz in the same manner as previous steps.

Sensitivity should be +10 dB at 10 microvolt RF input in USB and LSB mode, and 30 microvolt RF input in AM mode.

NORMAL: Go to step l).

ABNORMAL: Remove and replace the following LRUs, one at a time, and re-accomplish step k) each time:

IF/FILTER ASSEMBLY 1A2A4
FRONT END ASSEMBLY 1A2A5
FILTER MODULE 1A3
AUDIO ASSEMBLY 1A2A3

- l) Measure the sensitivity in USB, LSB, and AM at 1.605 MHz in the same manner as previous steps. Sensitivity should be +10 dB at 1.0 microvolt RF input in USB and LSB mode, and 6.0 microvolt in AM mode.

NORMAL: Go to section 5.7.3.

ABNORMAL: Remove and replace the following LRUs, one at a time, and re-accomplish step l) each time:

IF/FILTER ASSEMBLY 1A2A4
FRONT END ASSEMBLY 1A2A5
FILTER MODULE 1A3
AUDIO ASSEMBLY 1A2A3

5.7.3 SPEAKER AUDIO OUTPUT

Set Receiver to 29.605 USB mode. Set RF Signal Generator to 3.0 microvolt, CW mode, 29.606 MHz. Adjust 'VOLUME' control clockwise until audio displayed on Oscilloscope begins to clip or flattop. The audio level must not be less than 6.3 VRMs as measured on the Audio Voltmeter.

NORMAL: Go on to section 5.7.4.

ABNORMAL: Remove and replace Audio board 1A2A3 and re-accomplish above test.

5.7.4 AUTOMATIC GAIN CONTROL

- a) Reduce the RF Signal Generator output to 0.7 microvolt. Adjust the 'VOLUME' control so that the audio level is -10 dB on a convenient scale of the Audio Voltmeter. Increase the RF Signal Generator output by 10 dB. The Audio Voltmeter must not increase by more than 6 dB.

- b) Readjust the audio level, if desired, to indicate -5 dB on Audio Voltmeter. Increase the output of the RF Signal Generator to 220 millivolts. The Audio Voltmeter must not increase by more than 6 dB.

NORMAL: Adjust RF Signal Generator to 100 microvolt and go to section 5.7.5.

ABNORMAL: Remove and replace IF/Filter Assembly 1A2A4 and re-accomplish section 5.7.4.

5.7.5 REMOTE AUDIO OUT

- a) Connect a second Audio Voltmeter (see Figure 5.7.1) to Remote Receive Audio Output J5 pins M and L. The measured output should be 0 dBm \pm 2 dB. Select the proper features key and depress the 'SPKR' key to mute the speaker. There should be no change in the audio displayed on the Oscilloscope. Remove the phone plug from 'PHONE' jack (J2). There should be NO audio heard from the speaker. Depress the 'SPKR' key again and audio will be heard from the speaker. Disconnect second Audio Voltmeter and proceed to step b).
- b) Set Receiver to 3.515 MHz, ISB mode and select USB speaker. Connect the Oscilloscope and Audio Voltmeter to J5 pins J and H. Set RF Signal Generator to 3.514 MHz, CW mode, 100 microvolt output.
- c) Select the 'LINE AUD' menu on R-9200 and depress the 'LSB-A' feature key. Adjust 1A2A3 R-99 LSB 'LINE LEVEL' for 0 dBm on the Audio Voltmeter.
- d) Depress 'LSB-B' feature key. Move the Oscilloscope and Audio Voltmeter to J5 pins T and S. Audio Voltmeters displayed level should be within 0.5 dB of level in c).
- e) Depress 'USB-C' feature key. Move the Oscilloscope and Audio Voltmeter to J5 pins M and L. Set RF Signal Generator to 3.516. Adjust 1A2A3 R-85 USB 'LINE LEVEL' for 0 dBm on the Audio Voltmeter.
- f) Depress 'USB-D' feature key. Move the Oscilloscope and Audio Voltmeter to J5 pins A and C. Audio Voltmeters displayed level should be within 0.5 dB of level in e).

NORMAL: Go on to step g).

ABNORMAL: Remove and replace Audio Assembly 1A2A3 and re-accomplish steps b) through f).

- g) With RF Signal Generator set to 3.516, CW mode, 100 microvolt output, set Receiver to 3.515 MHz, ISB mode. Select feature menu for 'METER' and depress 'METER' key. Select 'SMTR'. The bar meter on the operational display should indicate S9.

NORMAL: Go on to step h).

ABNORMAL: Remove and replace Audio Assembly 1A2A3 and re-accomplish step g).

- h) With same set up as in step g), select 'LINE' meter on features menu. The bar meter should display 0 dB plus or minus one (1) bar segment.

NORMAL: Go on to section 5.7.6.

ABNORMAL: Remove and replace Audio Assembly 1A2A3 and re-accomplish step h).

5.7.6 UNWANTED SIDEBAND REJECTION

- a) Set Receiver to 3.5145, ISB mode and select 'USB-C' line audio. Connect Oscilloscope and Audio Voltmeter to J5 pins M and L. Set RF Signal Generator to 4.516, CW mode, 30 microvolt output. Note the reading on the voltmeter.
- b) Set RF Signal Generator to 3.516 MHz, CW mode. Adjust RF Signal Generator output level to produce a reading on the Audio Voltmeter that is 10 dB higher than the reading in step a).

- c) Move Oscilloscope and Audio Voltmeter to J5 pins J and H. Select 'LSB-A' on Receiver. Increase the output level of the RF Signal Generator by 50 dB. The audio output measured on the Audio Voltmeter should NOT increase beyond the reading observed in step b). Reduce the output level of RF Signal Generator by 50 dB and note the reading on the voltmeter.
- d) Change the frequency of the RF Signal Generator to 3.513 MHz and adjust RF Signal Generator output level to produce a reading on Audio Voltmeter that is 10 dB higher than the reading noted at the end of step c).
- e) Connect Oscilloscope and Audio Voltmeter to J5 pins M and L. Increase the output level of RF Signal Generator by 50 dB. The audio output should NOT increase beyond that observed in step d).

NORMAL: Go on to section 5.7.7.

ABNORMAL: Remove and replace IF/Filter Assembly 1A2A4 and re-accomplish steps a) through e).

5.7.7 SQUELCH

- a) Set Receiver to 3.515 MHz, USB mode. Set RF Signal Generator to 3.516, CW mode, 30 microvolt output. Audio should be heard from speaker.
- b) Turn Receiver Front Panel Squelch Control fully clockwise. After a short delay the audio from speaker will quiet. Change the 1 KHz on RF Signal Generator to 8 KHz and then back to 6 KHz. Squelch should break, Receiver will output audio from speaker for a short time and then should quiet again.

NORMAL: This completes test and alignments. Return R-9200 to normal operation.

ABNORMAL: With Receiver Squelch Control fully clockwise and audio heard from speaker adjust 1A2A3 R32 (Squelch Detector Level) until Receiver squelches (no audio from speaker). Re-accomplish step b). If still unable to accomplish step b), remove and replace Audio Assembly 1A2A3 and retest steps a) and b).

5.7.8 SOFTWARE SWITCH SETTING CHECKS

Figure 5.7.8.1 shows the software switch settings on CPU PC Assembly 1A2A1 for R-9200 options.

SOFTWARE SWITCH SETTINGS ON CPU PC ASSEMBLY 1A2A1 for R-9200 OPTIONS.

NOTE: S1 Sections 1 through 8 are normally set to OPEN position (all rocker switches are raised at open side, see Figure 5.8.4). If while performing maintenance on the R-9200 the 1A2A1 is replaced, make sure 1A2A1 S1 is configured for non-optionized or for the applicable options installed in the Receiver.

S1 SECTION	SELECTION		OPTION/FUNCTION
	RAISED AT OPEN	RAISED AT NUMBER	
1	OPEN		Normal 1A2A9 TCXO installed.
		1	Optional High Stability 1A2A9 TCXO installed.
2	OPEN		Spare Function / Not used at this time.
3	OPEN		Spare Function / Not used at this time.
4	OPEN		Normal LSB Filter 1A2A4 FL2 installed.
		4	LSB Filter 1A2A4 FL2 plus optional LSB Data Filter 1A2A4 FL3 installed.
5	OPEN		Normal USB Filter 1A2A4 FL4 installed.
		5	USB Filter 1A2A4 FL4 plus optional USB Data Filter 1A2A4 FL5 installed.
6	OPEN		Normal R-9200 / Stand alone Receiver.
		6	Optional external Preselector used with R-9200.
7	OPEN		Not Connected / Not used at this time.
8	OPEN		Not Connected / Not used at this time.

Table 5.7.8.1 Switch Settings for 1A2A1 S1.

5.8 SCHEMATICS AND PARTS LISTS

The following pages contain schematics and parts lists for the R-9200, see Table 5.8.1 below.

DESIGNATOR		DESCRIPTION	SUNAIR PART NUMBER
ASSEMBLY	SUBASSEMBLY		
1A1	1A1A1	<u>FRONT PANEL ASSEMBLY</u> PC ASSEMBLY FRONT PANEL	81020400XX 8076045096
	1A1A2	KEYBOARD, 6X4	8102046805
	1A1A3	CUSTOM LCD, FULL FUNCTION	8076040604
	1A1A4	CUSTOM LCD, 1X40 CHARA	8076041601
	1A1A5	KEYBOARD, 1X5	8076046505
	1A2	1A2A1	<u>RECEIVER</u> PC ASSEMBLY, CPU
	1A2A1A1	OPTOCOPLER	8076075092
	1A2A2	SYNTHESIZER MODULE	8076060095
	1A2A2A1	PC ASSEMBLY, FIRST L.O.	8076068096
	1A2A2A2	PC ASSEMBLY, SECOND L.O.	8076066093
	1A2A2A3	PC ASSEMBLY, BFO	8076062098
	1A2A2A4	PC ASSEMBLY, REF LOOP AND DOUBLER	8076064091
	1A2A2A5	PC ASSEMBLY, MOTHERBOARD (SYN)	8076061091
	1A2A3	PC ASSEMBLY, AUDIO	8102090090
	1A2A4	PC ASSEMBLY, IF/FILTER	8102080094
	1A2A5	PC ASSEMBLY, FRONT END	8076100097
	1A2A6	PC ASSEMBLY, REFERENCE DRIVER	8076120098
	1A2A7	PC ASSEMBLY, MOTHERBOARD (RCV)	8102017091
	1A2A8	PC ASSEMBLY, I/O BOARD	8076110092
	1A2A8A1	PC ASSEMBLY, FSK MODEM (OPTION)	8076115094
	1A2A9	OCXO, 5 MHz, HIGH STABILITY	5024013701
1A3	1A3A1	<u>FILTER ASSEMBLY</u> PC ASSEMBLY, DETECTOR	8076050090 8076053099
	1A3A2	PC ASSEMBLY, BANDS 1-4	8076057094
	1A3A3	PC ASSEMBLY, BANDS 5-8	8076055091
1A5	1A5A1	<u>POWER SUPPLY MODULE</u> POWER SUPPLY ASSEMBLY, 28 VDC	8103020095
	1A5A1A1	PC ASSEMBLY, SWITCHING REGULATORS	8103022098
	1A5A1A2	PC ASSEMBLY, CONTROL LOGIC	8076024099
	1A5A2	POWER SUPPLY ASSEMBLY, 115/230 VAC	8102025093
	1A5A2A1	PC ASSEMBLY, FILTER AC/PS	8076021197
	1A5A2A2	PC ASSEMBLY, 28 V REGULATOR 5 AMP	8078021496
1A6	1A6A1	<u>REAR PANEL</u> PC ASSEMBLY, REAR PANEL CONNECTOR	8102011092
1A7		<u>CHASSIS ASSEMBLY</u>	81020100XX

Table 5.8.1 R-9200 Table of Assemblies.

CONNECTOR KIT			FINAL TESTED R-9200		
	CONNECTOR KIT	8102000490		FINAL TESTED R-9200	81020012XX
	ADAPTER, RF, FOR PL-259	0742070000	1A2A1	PC ASSY, CPU	8076070091
P4	CONNECTOR, RF, UHF PL-259	0742190005	1A2A2	SYNTHESIZER ASSY	8076060095
P7	CONNECTOR, RF, BNC UG-88/U	0744030005	1A2A3	PC ASSY, AUDIO	8102090090
P8	CONNECTOR, POWER, 9 PIN FEMALE	1011120011	1A2A4	PC ASSY, IF	8102080054
P5	CONNECTOR, POWER, 19 PIN MALE	1011140004	1A2A5	PC ASSY, FRONT END	8076100097
	JUNCTION SHELL, DB-9	1011130017	1A2A6	PC ASSY, REFERENCE DRIVER	8076120098
			1A2AB	PC ASSY, I/O BOARD	8076110092
			1A5A2	POWER SUPPLY ASSY, 115/230VAC	8102021098
			1A7	CHASSIS ASSY	81020100XX
			U13	EPROM W/R-9200 SOFTWARE, #1	8102072296
			U14	EPROM W/R-9200 SOFTWARE, #2	8102073292
			U20	EPROM, W/O SOFTWARE	8076113296
				BUMPER 13/16 OD 13/16 LG	0508140005
				BUMPER 1/4-20 X 1 3/8 DIA.	050B150001
				BUMP-ONS, SELF ADHESIVE	9187040239
				CATCH, HOLD DOWN BLACK	0526370017
				STRIKE, BLACK	0526520001
				COVER, REC	8102011904
				COVER, TOP	80760123XX
				COVER, BOTTOM	80760125XX
				COVER, TOP, DC/PS	8076020905
				COVER, AC POWER SUPPLY	8076021405
				COVER, FILTER MODULE	8076050600
				GASKIT, TOP/BOTTOM COVERS	8076012201
			CHASSIS ASSEMBLY 1A7		
			1A1	CHASSIS ASSEMBLY 1A7	81020100XX
			1A2A7	FRONT PANEL ASSY	81020400XX
			1A3	PC ASSY, MOTHER BOARD	8102017091
			1A5A1	FILTER ASSY	8076050090
			1A6A1	POWER SUPPLY ASSY, 28VDC	8076020093
				PC ASSY, REAR PANEL CONNECTOR	8102011092
				BRACKET, CENTER CHANNEL	8076011507
				CABLE, RIBBON, 9 COND, 28 AWG	1011150018
				CHASSIS, CARD CAGE, REC	8076011507
				CONNECTOR, RF, BNC UG-1094/U	0743740009
				CONNECTOR, RF, UHF	0753300001
				CONNECTOR, HOUSING, 6PIN, FEM	1010840011
				CONNECTOR, RF, RIGHT ANGLE	1010890018
				CONNECTOR, POWER, 2 PIN, MALE	1011070006
				CONNECTOR, POWER, 9 PIN MALE	1011110016
				FUSE, MDL, 30AMP,32V	0896660001
				FUSEHOLDER, PANEL MOUNT	1004740018
				JACK SOCKET KIT, D SUB	1011140012
				JUNCTION SHELL, DB-9	1011130017
				REAR PANEL	8076015103
				RH SIDE PLATE	80760102XX
				LH SIDE PLATE	80760103XX
				STANDOFF, F-F, 6-32 .625L	1005880018
			1A2A9	TCXO, 5MHZ GROUND EQPT.	5024012704

Figure 5.8.1 Final Tested R-9200, Connector Kit, and Chassis Assembly 1A7.

A1150C

FRONT PANEL ASSEMBLY 1A1		
1A1A1	FRONT PANEL ASSEMBLY 1A1	81020400XX
1A1A2	PC ASSY, FRONT PANEL	8076045096
1A1A3	KEYBOARD, 6X4	8102046805
1A1A4	CUSTOM LCD, FULL FUNCTION	8076040604
1A1A5	CUSTOM LCD, 1 X 40 CHARA	8076041601
1A1A5	KEYBOARD, IX5	8076046505
C1	CAP. .01µF, 50V, X7R 20%	0281730005
C2	CAP. .01µF, 50V, X7R 20%	0281730008
C3	CAP. .01µF, 50V, X7R 20%	0281730003
C4	CAP. .01µF, 50V, X7R 20%	0281730003
C5	CAP. .01µF, 50V, X7R 20%	0281730005
C6	CAP. .01µF, 50V, X7R 20%	0281730008
CR1	DIODE, LED, RED	1006710001
J2	CONNECTOR, PHONE JACK, 2 COND.	0754430006
J4	CONNECTOR, AUDIO, 5 PIN	1003300022
J5	CONNECTOR, HEADER, 20 PIN MALE	1011210207
J6	CONNECTOR, HEADER, 14 PIN MALE	1011210142
LS1	SPEAKER, 3X5 OVAL, 8 OHM, 5W	0877970009
R3	RESISTOR 680,10%,1/4W	0176630007
R1/S1	POT. 25K W/SPST SW.	1008790023
R2/R3	POT. TANDEM 5K/25K, 20%	1010730029
S2	SWITCH, TOGGLE DPST	
	BOOT, TOGGLE SWITCH 15/32-32	0346450004
	MOUNTING BRACKET, KEYBOARD	8076040507
	BRACKET, SPEAKER	8076041309
	CABLE, RIBBON, 40 COND.	1008080012
	CONNECTOR, RIBBON, 10 PIN FEM	1008070017
	CONNECTOR, RIBBON, 40 PIN FEM	1008110035
	JACK COVER, CONNECTOR	0840860005
	PROTECTIVE COVER, LCD MODULE	8076042500
	GASKET KIT, FRONT PANEL	8076042305
	HANDLE	5024043600
	KEY, POLARIZING	1008070033
	KNOB, .50D, BLK, W/D BR SCREW	0346420008
	KNOB, .70D, BLK, SK BR SCREW	0346700001
	KNOB, .70 D, BLK, WHT DOT,SKRT	0346060001
	KNOB, 1.25D, BLK, SKIRTED	1011490005
	MTG RAIL, RH, LCD MODULE	8076042607
	MTG RAIL, LH, LCD MODULE	8076042704
	PANEL, FRONT	81020402XX
	SHAFT ENCODER	1008810029
	SPAGER,HANDLE	5024043502
	STANDOFF, F-F, 4-40 X.437LG	1011240009
	STANDOFF, M-F, 4-40 X.312LG	1011250004

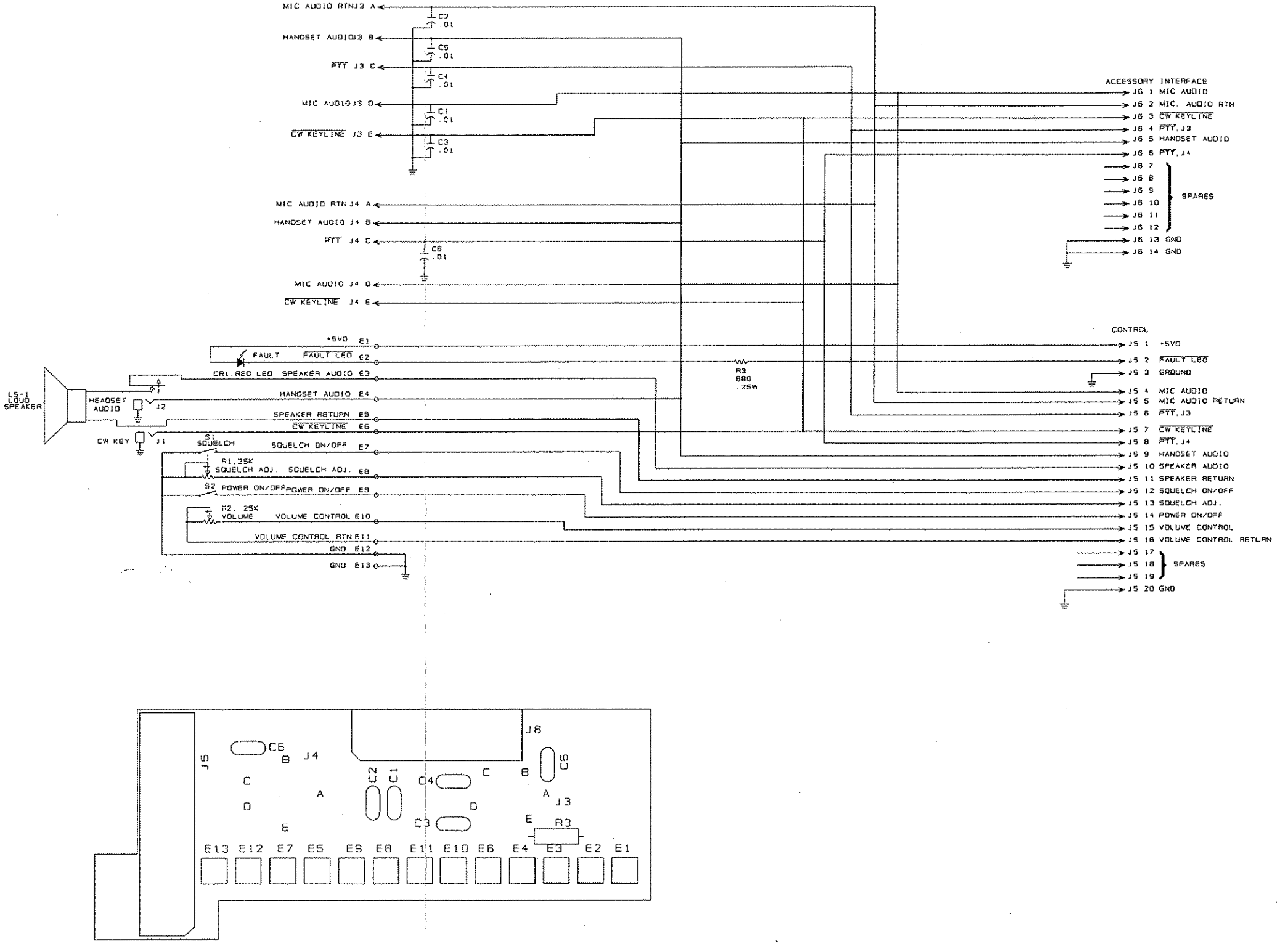
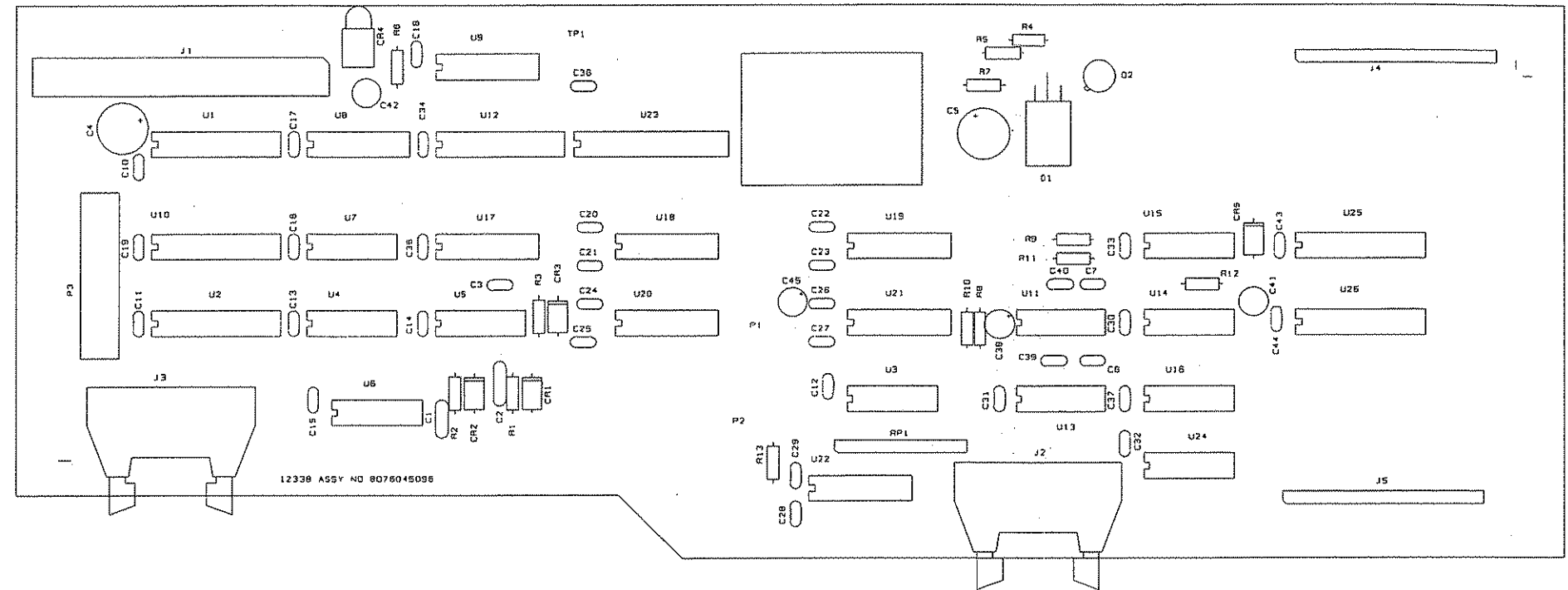


Figure 5.8.2 Front Panel Assembly 1A1, page 1/4.

PC ASSY, FRONT PANEL 1A1A1

C1	PC ASSY, FRONT PANEL 3A1A1	8076045096
C2	CAP. .47µF, 50V, X7R, 20%	0283377771
C3	CAP. 0.1µF, 50V, X7R, 20%	0281610002
C4	CAP. 0.047 µF, 50V, X7R, 10%	1010740008
C5	CAP. 100µF 20V 20%	1005120030
C6	CAP. 47µF, 35V	0282190007
C7	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C10	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C11	CAP. .01µF, 50V, X7R, 20%	0281730008
C12	CAP. .01µF, 50V, X7R, 20%	0281730008
C13	CAP. .01µF, 50V, X7R, 20%	0281730008
C14	CAP. .01µF, 50V, X7R, 20%	0281730008
C15	CAP. .01µF, 50V, X7R, 20%	0281730008
C16	CAP. .01µF, 50V, X7R, 20%	0281730008
C17	CAP. .01µF, 50V, X7R, 20%	0281730008
C18	CAP. .01µF, 50V, X7R, 20%	0281730008
C19	CAP. .01µF, 50V, X7R, 20%	0281730008
C20	CAP. .01µF, 50V, X7R, 20%	0281730008
C21	CAP. .01µF, 50V, X7R, 20%	0281730008
C22	CAP. .01µF, 50V, X7R, 20%	0281730008
C23	CAP. .01µF, 50V, X7R, 20%	0281730008
C24	CAP. .01µF, 50V, X7R, 20%	0281730008
C25	CAP. .01µF, 50V, X7R, 20%	0281730008
C26	CAP. .01µF, 50V, X7R, 20%	0281730008
C27	CAP. .01µF, 50V, X7R, 20%	0281730008
C28	CAP. .01µF, 50V, X7R, 20%	0281730008
C29	CAP. .01µF, 50V, X7R, 20%	0281730008
C30	CAP. .01µF, 50V, X7R, 20%	0281730008
C31	CAP. .01µF, 50V, X7R, 20%	0281730008
C32	CAP. .01µF, 50V, X7R, 20%	0281730008
C33	CAP. .01µF, 50V, X7R, 20%	0281730008
C34	CAP. .01µF, 50V, X7R, 20%	0281730008
C35	CAP. .01µF, 50V, X7R, 20%	0281730008
C36	CAP. .01µF, 50V, X7R, 20%	0281730008
C37	CAP. .01µF, 50V, X7R, 20%	0281730008
C38	CAP. .01µF, 50V, X7R, 20%	0281730008
C39	CAP. .01µF, 50V, X7R, 20%	0281730008
C40	CAP. .01µF, 50V, X7R, 20%	0281730008
C41	CAP. 1µF, 35V, T368	0283630001
C42	CAP. 22µF, 15V, T368	0296660001
C43	CAP. .01µF, 50V, X7R, 20%	0281730008
C44	CAP. .01µF, 50V, X7R, 20%	0281730008
CR1	DIODE, RECTIFIER 1N4004	0405180004
CR2	DIODE, RECTIFIER 1N4004	0405180004
CR3	DIODE, RECTIFIER 1N4004	0405180004
CR4	DIODE, LED, RED, PC MOUNT	1008480029
CR5	DIODE, RECTIFIER 1N4004	0405180004
J1	CONNECTOR, HEADER, 40PIN	1010740016
J2	CONNECTOR, PC, 10 PIN HEADER	1008070009
J3	CONNECTOR, PC, 10 PIN HEADER	1008070009
J4	SOCKET, BOARDMOUNT, 15 PIN	1011010151
J5	SOCKET, BOARDMOUNT, 15 PIN	1011010151
P1	CONNECTOR, MOLEX 26 PIN	1008720020
P2	CONNECTOR, MOLEX 14 PIN	1008730025
P3	CONNECTOR, RIBBON, 20 PIN FEM	1008120031
Q1	TRANSISTOR, NPN, SI. 2N4922	0445490004
Q2	TRANSISTOR, NPN, SI. 2N2222A	0448580004
R1	RESISTOR 470, 5%, 1/4W	0184110009
R2	RESISTOR 470, 5%, 1/4W	0184110009
R3	RESISTOR 10K, 10%, 1/4W	0170410005
R4	RESISTOR 10K, 10%, 1/4W	0170410005
R5	RESISTOR 2.2K, 5%, 1/4W	0178070009



R6	RESISTOR 220, 10%, 1/4W	0171320000
R7	RESISTOR 47K, 10%, 1/4W	0171060008
R8	RESISTOR 330, 5%, 1/4W	0170910008
R9	RESISTOR 330, 5%, 1/4W	0170910008
R10	RESISTOR 6.8K, 5%, 1/4W	0174810008
R11	RESISTOR 6.8K, 5%, 1/4W	0174810008
R12	RESISTOR 22K, 5%, 1/4W	0172230004
R13	RESISTOR 100K, 10%, 1/4W	0170390004
RP1	RES NTWK 10 PIN SIP 10K COM	1006130021
U1	IC. DIGITAL 74HC374	1006450033
U2	IC. DIGITAL 74HC244	1006460039
U3	IC. DIGITAL 74HC30	1010240021
U4	IC. DIGITAL 74HC74	1008000019
U5	IC. DIGITAL 74HC14	1006490027
U6	IC. DIGITAL 74HC14	1006490027
U7	IC. DIGITAL 74HC10	1008010006
U8	IC. DIGITAL 74HC138	1006480013
U9	IC. DIGITAL 74HC138	1006480013
U10	IC. DIGITAL 74HC373	1006480030
U11	IC. LINEAR LM556	1011170019
U12	IC. DIGITAL 74HC374	1006450033
U13	IC. DIGITAL 74HC08	1006490019
U14	IC. DIGITAL 74HC14	1006490027
U15	IC. DIGITAL 74HC74	1008000019
U16	IC. DIGITAL 74HC74	1008000019
U17	IC. DIGITAL 74HC165	1008710016
U18	IC. DIGITAL CD40109	1008720011
U19	IC. DIGITAL CD40109	1008720011
U20	IC. DIGITAL CD40109	1008720011
U21	IC. DIGITAL CD40109	1008720011
U22	IC. DIGITAL CD40109	1008720011
U23	IC. DIGITAL 74HC154	1010160028
U24	IC. DIGITAL 74HC02	1010290029
U25	IC. DIGITAL 74HC244	1006460039
U26	IC. DIGITAL 74HC374	1006450033
	CABLE, FLAT, 20 COND. 28AWG	1008080004
	CONNECTOR,PCB,TRANSITION,20PIN	1011090201
	KEY, POLARIZING	1008070033

Figure 5.8.2 Front Panel Assembly 1A1, page 2/4.

A1113E

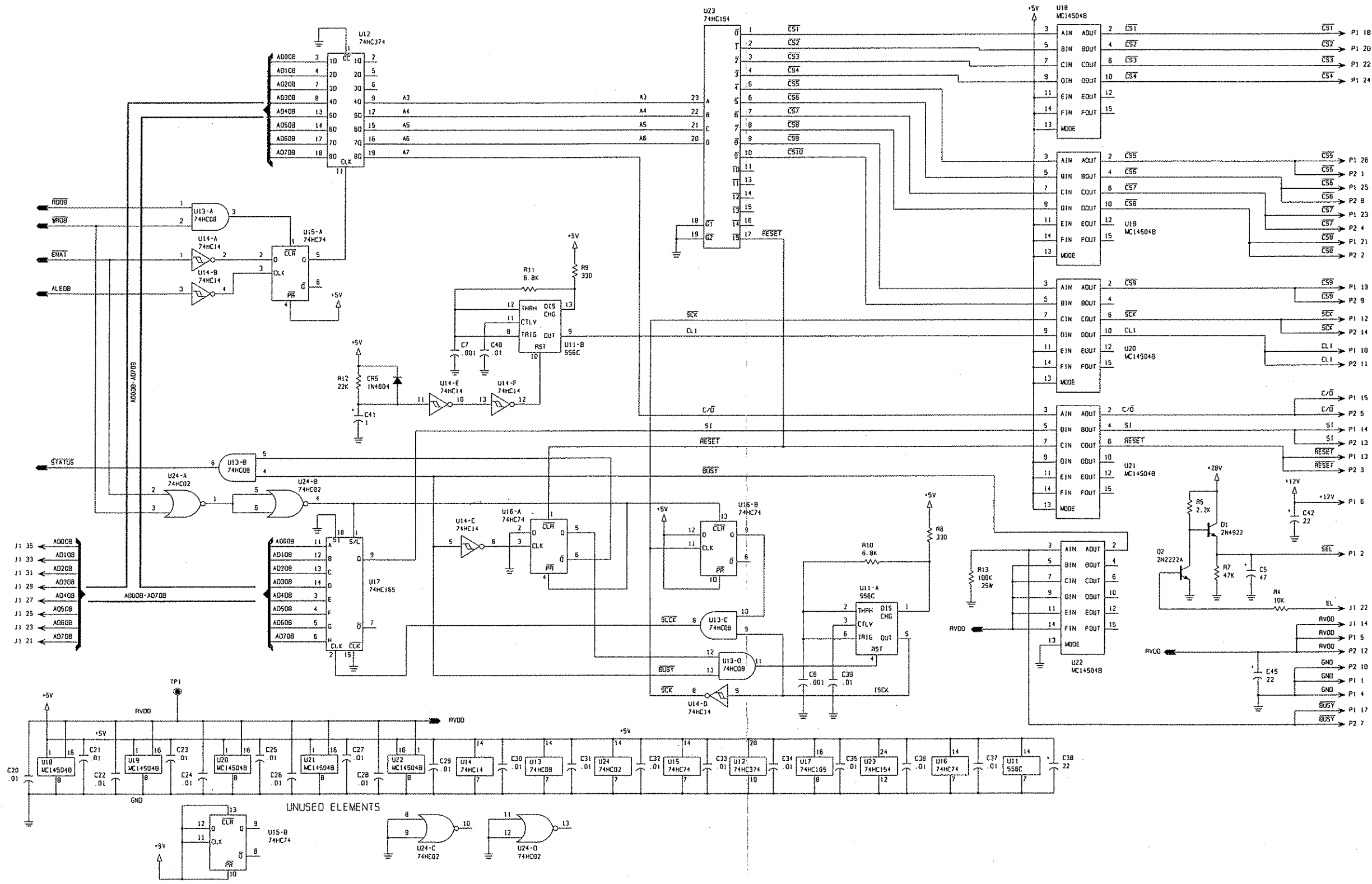
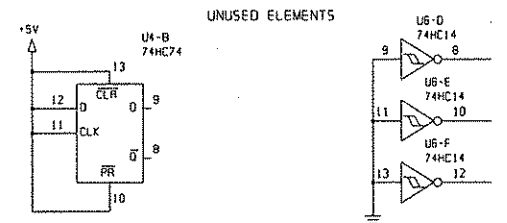
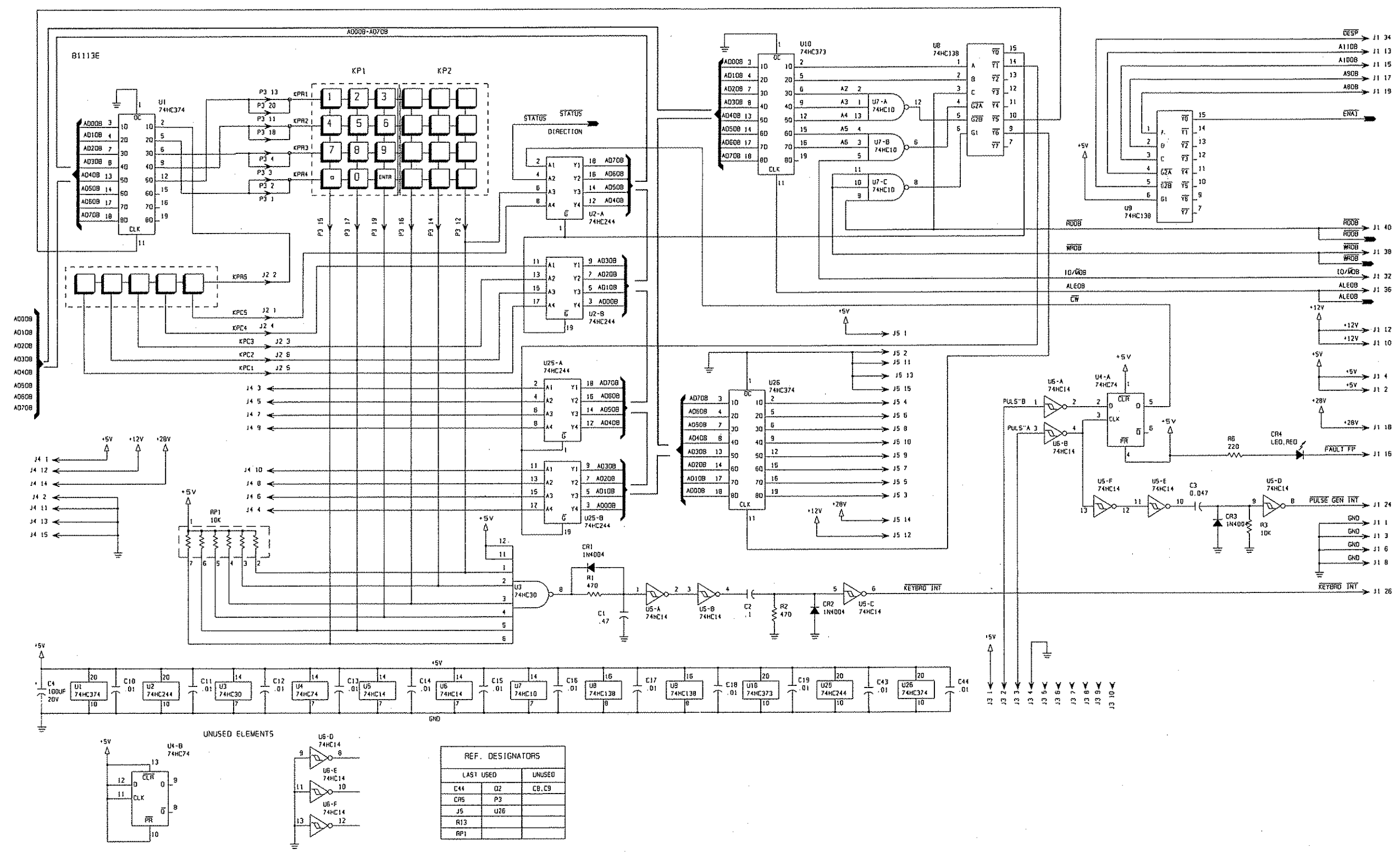


Figure 5.8.2 Front Panel Assembly 1A1, page 3/4.



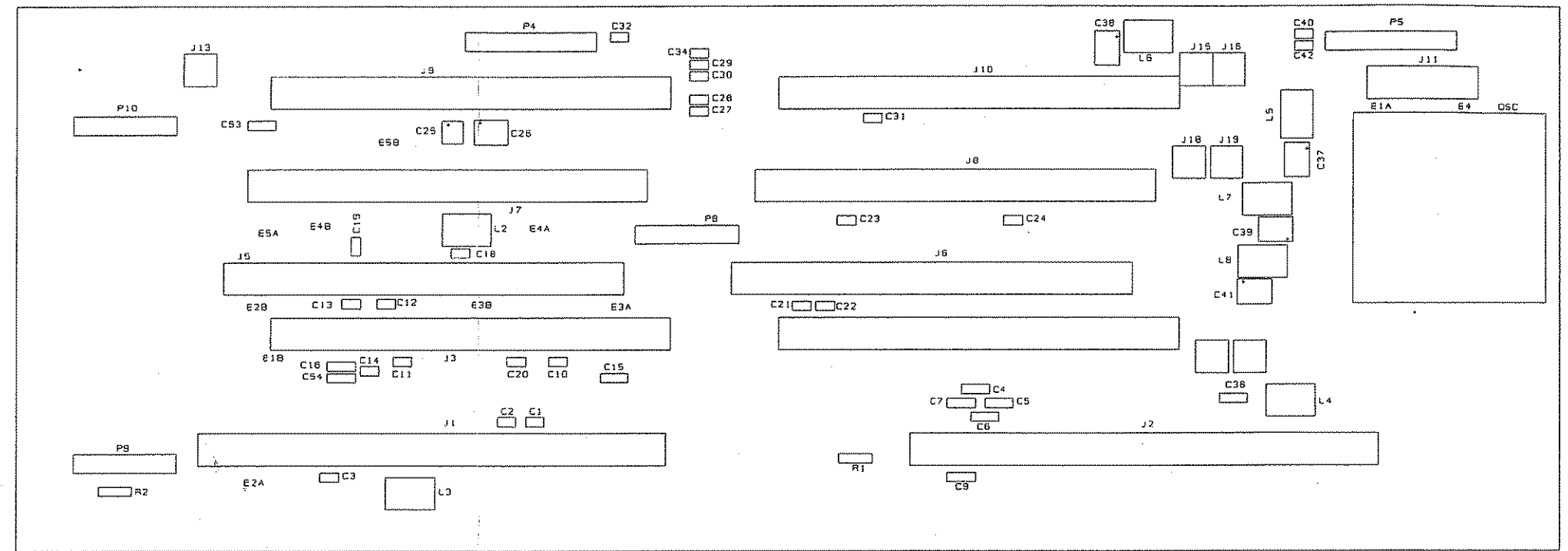
REF. DESIGNATORS

LAST USED	UNUSED
C44	O2, C8, C9
CR5	P3
J5	U26
R13	
RP1	

Figure 5.8.2 Front Panel Assembly 1A1, page 4/4.

1171CP

PC ASSY., MOTHER BOARD 1A2A7



Ref	Description	Part No.
PC ASSEMBLY, MOTHER BOARD		
C1	CAP. .01UF, 50V, X7R 20%	8102017091
C2	CAP. .01UF, 50V, X7R 20%	0281730008
C3	CAP. .01UF, 50V, X7R 20%	0281730008
C4	CAPACITOR 0.1UF, 50V, X7R	1011180014
C5	CAPACITOR 0.1UF, 50V, X7R	1011180014
C6	CAPACITOR 0.1UF, 50V, X7R	1011180014
C7	CAPACITOR 0.1UF, 50V, X7R	1011180014
C9	CAPACITOR 0.1UF, 50V, X7R	1011180014
C10	CAP. .01UF, 50V, X7R 20%	0281730008
C11	CAP. .01UF, 50V, X7R 20%	0281730008
C12	CAP. .01UF, 50V, X7R 20%	0281730008
C13	CAP. .01UF, 50V, X7R 20%	0281730008
C14	CAP. .01UF, 50V, X7R 20%	0281730008
C15	CAPACITOR 0.1UF, 50V, X7R	1011180014
C16	CAPACITOR 0.1UF, 50V, X7R	1011180014
C17	CAP. 47UF, 20V, 196D	0281700001
C18	CAP. .01UF, 50V, X7R 20%	0281730008
C19	CAP. .01UF, 50V, X7R 20%	0281730008
C20	CAP. .01UF, 50V, X7R 20%	0281730008
C21	CAP. .01UF, 50V, X7R 20%	0281730008
C22	CAP. .01UF, 50V, X7R 20%	0281730008
C23	CAP. .01UF, 50V, X7R 20%	0281730008
C24	CAP. .01UF, 50V, X7R 20%	0281730008
C25	CAP. 2.2UF, 35V, T368	0273950002
C26	CAP. .47UF, 50V, X7R 20%	0283377771
C27	CAP. .01UF, 50V, X7R 20%	0281730008
C28	CAP. .01UF, 50V, X7R 20%	0281730008
C29	CAP. .01UF, 50V, X7R 20%	0281730008
C30	CAP. .01UF, 50V, X7R 20%	0281730008
C31	CAP. .01UF, 50V, X7R 20%	0281730008
C32	CAP. .01UF, 50V, X7R 20%	0281730008
C34	CAP. .01UF, 50V, X7R 20%	0281730008
C35	CAP. .01UF, 50V, X7R 20%	0281730008
C36	CAP. .47UF, 50V, X7R 20%	0283377771
C37	CAP. 15UF, 15V, 196D	0281720002
C38	CAP. 15UF, 15V, 196D	0281720002
C39	CAP. 15UF, 15V, 196D	0281720002
C40	CAP. .01UF, 50V, X7R 20%	0281730008
C41	CAP. 15UF, 15V, 196D	0281720002
C42	CAP. .01UF, 50V, X7R 20%	0281730008
C53	CAPACITOR 0.1UF, 50V, X7R	1011180014
C54	CAPACITOR 0.1UF, 50V, X7R	1011180014
J1	CONNECTOR, PC, 40 PIN DUAL	1010920006
J2	CONNECTOR, PC, 40 PIN DUAL	1010920006
J3	CONNECTOR, PC, 22PIN DUAL,FEM	1008830003
J4	CONNECTOR, PC, 22PIN DUAL,FEM	1008830003
J5	CONNECTOR, PC, 22PIN DUAL,FEM	1008830003
J6	CONNECTOR, PC, 22PIN DUAL,FEM	1008830003
J7	CONNECTOR, PC, 22PIN DUAL,FEM	1008830003
J8	CONNECTOR, PC, 22PIN DUAL,FEM	1008830003
J9	CONNECTOR, PC, 22PIN DUAL,FEM	1008830003
J10	CONNECTOR, PC, 22PIN DUAL,FEM	1008830003
J11	CONNECTOR, PC, 6 PIN DUAL, FEM	1011160005
J13	CONNECTOR, RF, JACK	1010810006
J15	CONNECTOR, RF, JACK	1010810006

J16	CONNECTOR, RF, JACK	1010810006
J18	CONNECTOR, RF, JACK	1010810006
J19	CONNECTOR, RF, JACK	1010810006
J21	CONNECTOR, RF, JACK	1010810006
J22	CONNECTOR, RF, JACK	1010810006
L1	CONNECTOR, RF, JACK	1010810006
L2	CONNECTOR, RF, JACK	1010810006
L3	INDUCTOR, MOLDED, 47UH, 5%	0646420003
L4	CHOKE, POWER	8076104700
L5	CHOKE, POWER	8076104700
L6	CHOKE, POWER	8076104700
L7	CHOKE, POWER	8076104700
L8	CHOKE, POWER	8076104700
P4	CHOKE, POWER	8076104700
P5	CHOKE, POWER	8076104700
P8	CONNECTOR, RIBBON, 26 PIN FEM	1008340031
P9	CONNECTOR, RIBBON, 26 PIN FEM	1008340031
P10	CONNECTOR, RIBBON, 20 PIN FEM	1008120031
R1	CONNECTOR, RIBBON, 20 PIN FEM	1008120031
XP4	CONNECTOR, RIBBON, 20 PIN FEM	1008120031
XP5	RESISTOR, 6040, 1%, 1/8W	1010580019
XP8	CONNECTOR,PCB,TRANSITION,26PIN	1011090261
XP9	CONNECTOR,PCB,TRANSITION,26PIN	1011090261
XP10	CONNECTOR,PCB,TRANSITION,20PIN	1011090201
	CONNECTOR,PCB,TRANSITION,20PIN	1011090201
	CONNECTOR,PCB,TRANSITION,20PIN	1011090201
	CABLE, FLAT, 20 COND. 28AWG	1008080004
	CABLE, FLAT, 26 COND. 28AWG	1011180006
	CONNECTOR, RF, SUBMINIATURE	0753700000
	JACK, PCB, SOLDER MOUNT	1008920002

Figure 5.8.3 PC Assembly, Mother Board 1A2A7, page 1/4.

1171CA

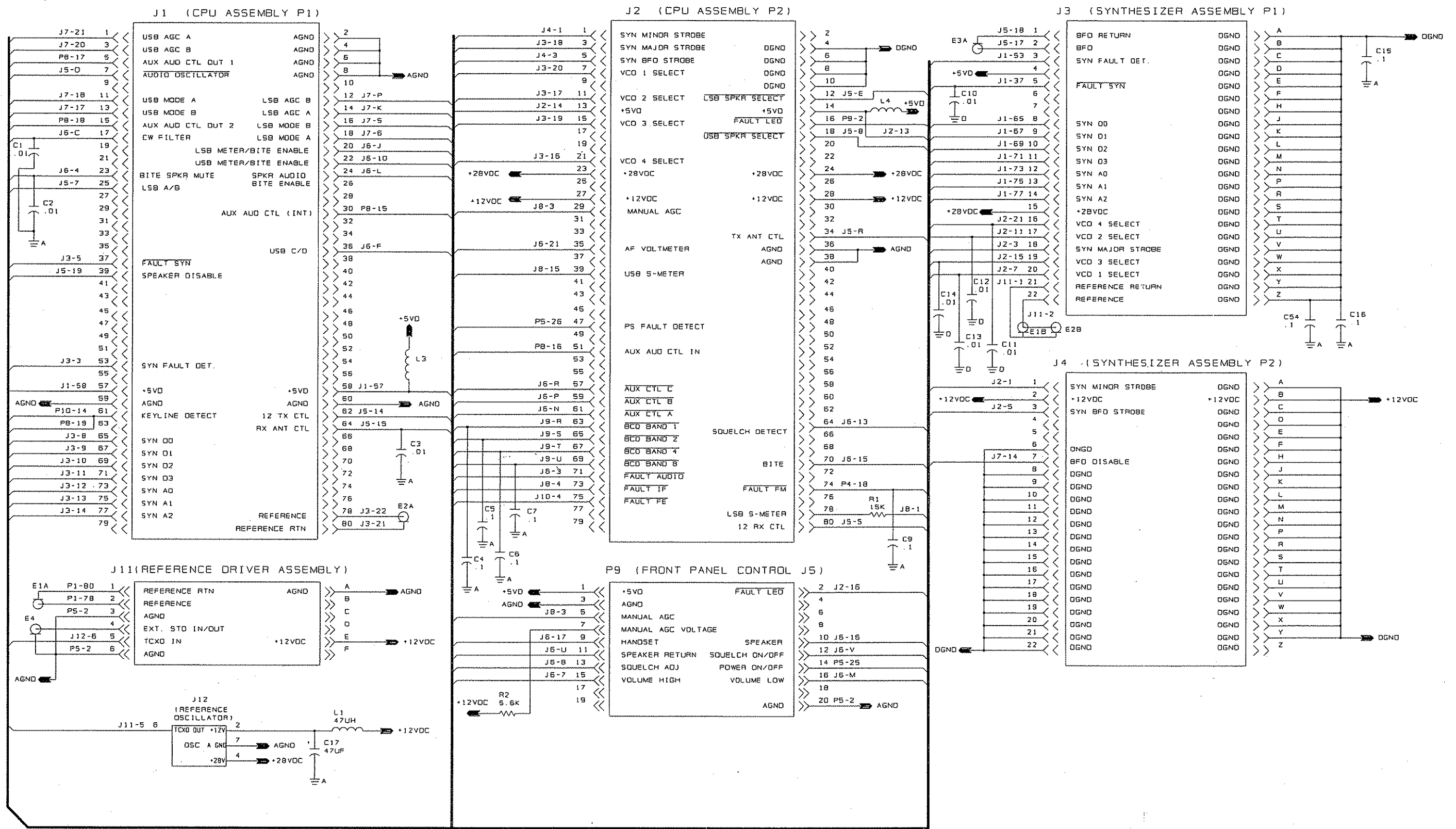


Figure 5.8.3 PC Assembly, Mother Board 1A2A7, page 2/4.

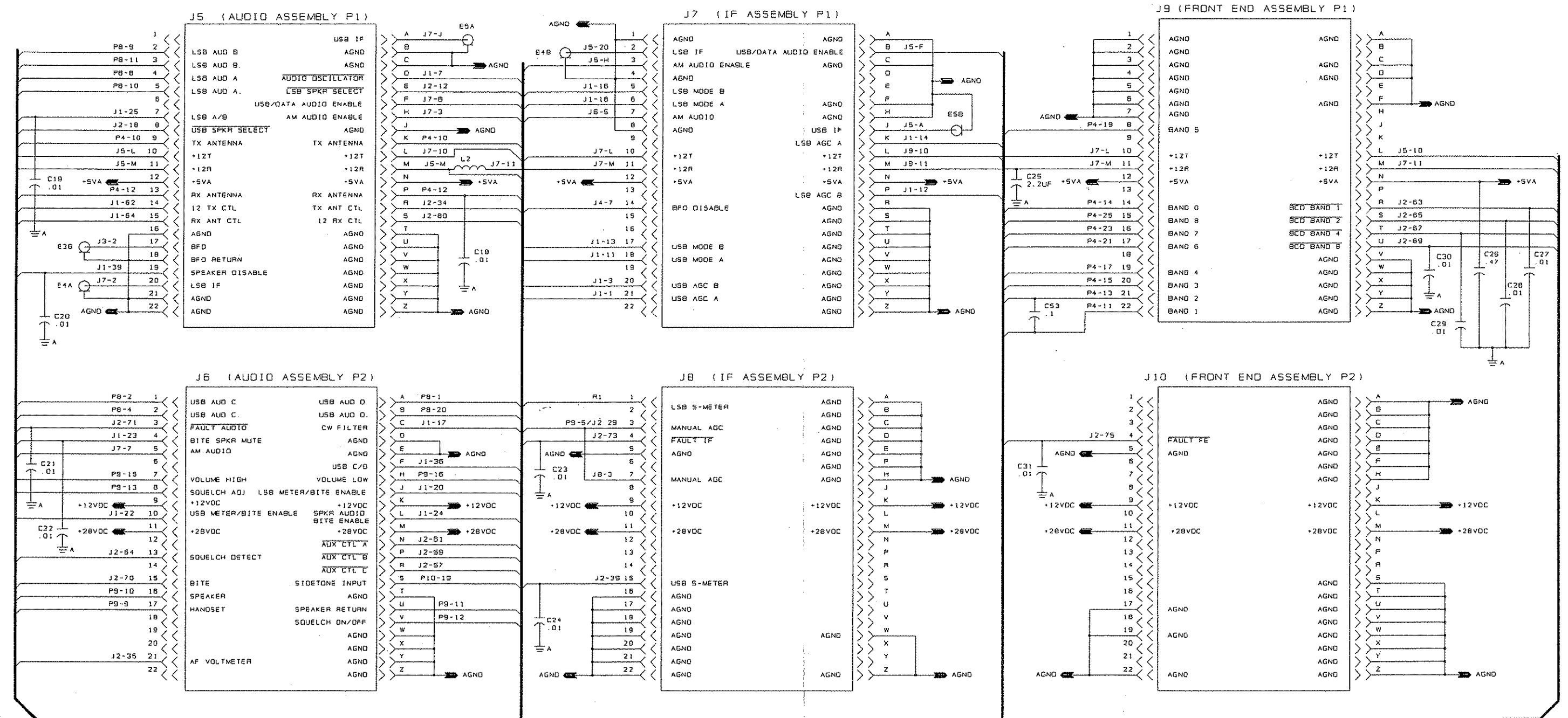


Figure 5.8.3 PC Assembly, Mother Board 1A2A7, page 3/4.

1171CC

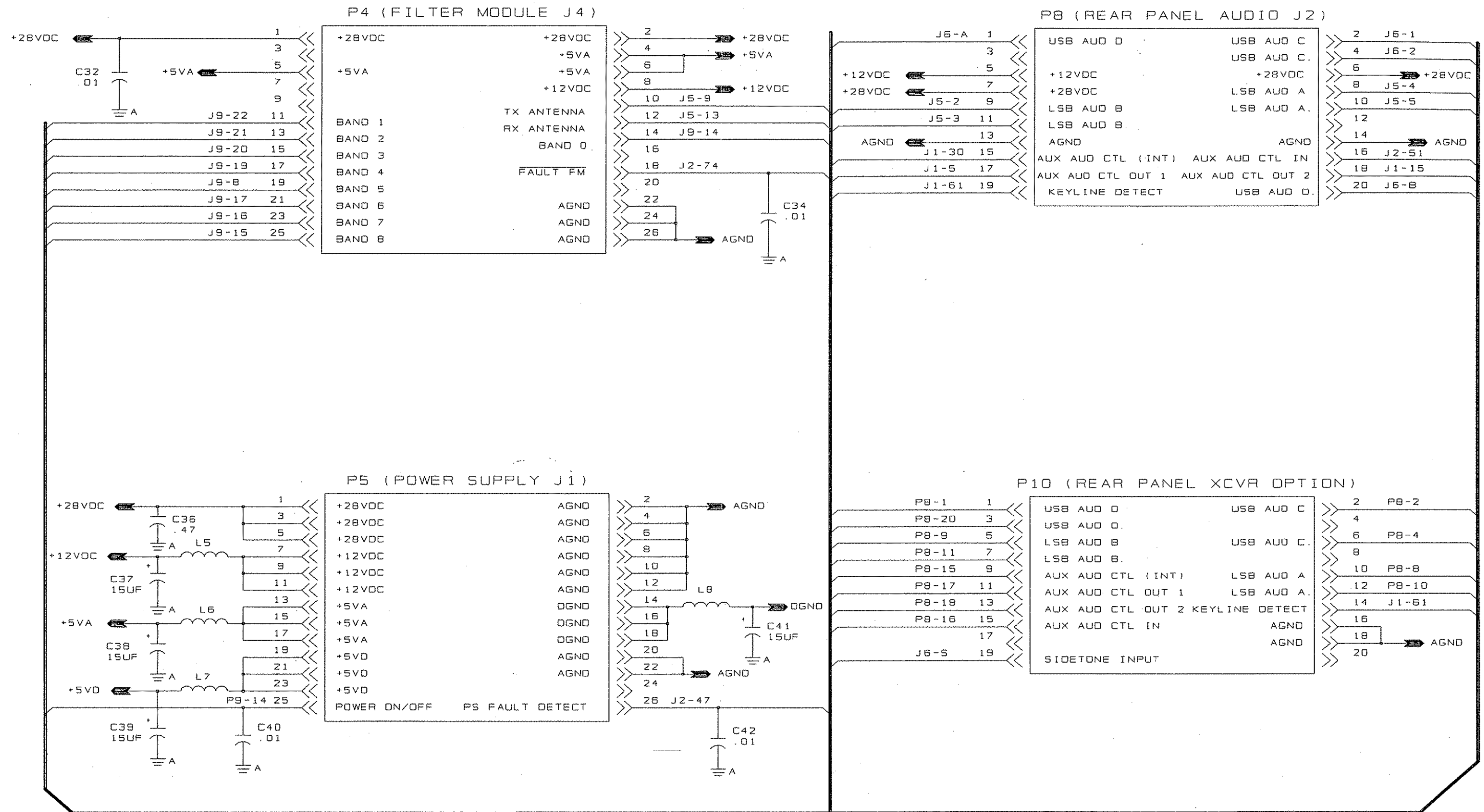


Figure 5.8.3 PC Assembly, Mother Board 1A2A7, page 4/4.

PC ASSY, CPU 1A2A1														
C3	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C102	CAP. 0.01UF, 50V, X7R, 20%	0281730008	P3	CONNECTOR,HEADER 40 PIN	1010780000	U6	IC. DIGITAL	74HC244		1006460039	
C5	CAP. 47UF, 20V	0281700001	C103	CAP. 0.01UF, 50V, X7R, 20%	0281730008	Q1	TRANSISTOR, NPN, SI. 2N4124	0448010003	U7	IC. DIGITAL	74HC373		1006480030	
C8	CAP. 6.8UF, 20V	0296780006	C104	CAP. 0.01UF, 50V, X7R, 20%	0281730008	Q2	TRANSISTOR, NPN, SI. 2N4124	0448010003	U8	IC. DIGITAL	28C64		1010660004	
C9	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C105	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R3	RESISTOR 1K, 10%, 1/4W	0171560001	U9	IC. DIGITAL	74HC139		1006770038	
C11	CAP. 0.001UF, 100V, X7R, 20%	0281630003	C106	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R5	RESISTOR 470, 5%, 1/4W	0184110009	U10	IC. DIGITAL	74HC244		1006460039	
C12	CAP. 68UF, 15V	0296540005	C107	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R6	RESISTOR 10K, 10%, 1/4W	0170410005	U11	IC. DIGITAL	74HC244		1006460039	
C13	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C108	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R12	RESISTOR 22K, 5%, 1/4W	0172230004	U12	IC. DIGITAL	74HC374		1006450033	
C14	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C109	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R13	RESISTOR 10K, 10%, 1/4W	0170410005	U15	IC. DIGITAL	74HC00		1008190004	
C15	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C111	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R14	RESISTOR 10, 5%, 1/4W	0177160004	U16	IC. DIGITAL	74HC08		1006490019	
C16	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C112	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R15	RESISTOR 1M, 10%, 1/4W	0170650006	U17	IC. DIGITAL	ADC0804		1010670000	
C17	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C113	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R16	RESISTOR 3.9K, 10%, 1/4W	0178830003	U18	IC. DIGITAL	74HC374		1006450033	
C18	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C114	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R18	RESISTOR 220, 10%, 1/4W	0171320000	U19	IC. LINEAR	LM358		1010680005	
C19	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C123	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R21	RESISTOR 4.7K, 5%, 1/4W	0170770001	U22	IC. DIGITAL	74HC245		1006470034	
C20	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C124	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R22	RESISTOR 5.11K, 1%, 1/8W	1003120016	U23	IC. DIGITAL	74HC244		1006460039	
C21	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C125	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R23	RESISTOR 28K, 1%, 1/8W	1004050038	U24	IC. DIGITAL	4067B		1006800034	
C22	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C131	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R40	RESISTOR 1.91K, 1%, 1/8W	1008530018	U25	IC. DIGITAL	74HC244		1006460039	
C23	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C132	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R41	RESISTOR 6.81K, 1%, 1/8W	0196350000	U28	IC. DIGITAL	74HC154		1010160028	
C24	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C133	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R42	RESISTOR 1.91K, 1%, 1/8W	1008530018	U29	IC. DIGITAL	74HC154		1010160028	
C25	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C134	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R43	RESISTOR 6.81K, 1%, 1/8W	0196350000	U30	IC. DIGITAL	74HC138		1006480013	
C26	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C135	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R46	RESISTOR 10K, 1%, 1/8W	1003050026	U32	IC. DIGITAL	74HC374		1006450033	
C27	CAP. 10UF, 20V	1007290005	C136	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R47	RESISTOR 10K, 1%, 1/8W	1003050026	U33	IC. DIGITAL	74HC374		1006450033	
C28	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C137	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R54	RESISTOR 10K, 10%, 1/4W	0170410005	U34	IC. DIGITAL	7417		1003870007	
C29	CAP. 10UF, 20V	1007290005	C138	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R55	RESISTOR 470, 5%, 1/4W	0184110009	U35	IC. DIGITAL	74HC374		1006450033	
C31	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C139	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R56	RESISTOR 15, 10%, 1/4W	0181740001	U36	IC. DIGITAL	74HC374		1006450033	
C32	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C140	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R79	RESISTOR 10K, 10%, 1/4W	0170410005	U39	IC. DIGITAL	74HC374		1006450033	
C33	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C141	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R80	RESISTOR 10K, 10%, 1/4W	0170410005	U41	IC. DIGITAL	74HC374		1006450033	
C34	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C142	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R81	RESISTOR 22K, 5%, 1/4W	0172230004	U42	IC. DIGITAL	74HC374		1006450033	
C35	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C143	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R88	RESISTOR 5.11K, 1%, 1/8W	1003120016	U45	IC. DIGITAL	74HC14		1006490027	
C36	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C144	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R89	RESISTOR 5.11K, 1%, 1/8W	1003120016	U46	IC. DIGITAL	74HC244		1006460039	
C39	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C145	CAP. 0.01UF, 50V, X7R, 20%	0281730008	R90	RESISTOR 2.2K, 5%, 1/4W	0178070009	U47	IC. DIGITAL	74HC14		1006490027	
C40	CAP. 0.01UF, 50V, X7R, 20%	0281730008	C146	CAP. 3.3UF, 35V	0281680001	R91	RESISTOR 2.2K, 5%, 1/4W	0178070009	U48	IC. LINEAR	556C/3456		1005620032	
C41	CAP. 0.01UF, 50V, X7R, 20%	0281730008	CR1	DIODE, SIGNAL, GERM. 1N270	0405510004	R92	RESISTOR 2.2K, 5%, 1/4W	0178070009	U49	IC. DIGITAL	74HC14		1006490027	
C42	CAP. 0.01UF, 50V, X7R, 20%	0281730008	CR2	DIODE, SIGNAL, SIL. 1N4454	0405270003	R93	RESISTOR 2.2K, 5%, 1/4W	0178070009	U50	IC. DIGITAL	8259A		1006800018	
C43	CAP. 0.01UF, 50V, X7R, 20%	0281730008	CR5	DIODE, RECTIFIER 1N4004	0405180004	R94	RESISTOR 2.2K, 5%, 1/4W	0178070009	U51	IC. DIGITAL	74HC244		1006460039	
C44	CAP. 0.01UF, 50V, X7R, 20%	0281730008	CR7	DIODE, LED, RED 550-2405	1008480029	R95	RESISTOR 2.2K, 5%, 1/4W	0178070009	U53	IC. DIGITAL	74HC244		1006460039	
C45	CAP. 0.01UF, 50V, X7R, 20%	0281730008	CR9	DIODE, TRANSIENT SUPR. TVS505	1010720007	R96	RESISTOR 2.2K, 5%, 1/4W	0178070009	U54	IC. DIGITAL	74HC374		1006450033	
C47	CAP. 0.01UF, 50V, X7R, 20%	0281730008	CR10	DIODE, ZENER 1N5227B	0405250002	R97	RESISTOR 10K, 10%, 1/4W	0170410005	U55	IC. DIGITAL	74HC244		1006460039	
C48	CAP. 0.01UF, 50V, X7R, 20%	0281730008	CR11	DIODE, SIGNAL, SIL. 1N4454	0405270003	R98	RESISTOR 680, 10%, 1/4W	0176630007	U56	IC. DIGITAL	74HC08		1006490019	
C49	CAP. 0.01UF, 50V, X7R, 20%	0281730008	FB1	BEAD, FERRITE .200OD, .437LG	1010910019	R99	RESISTOR 10K, 10%, 1/4W	0170410005	U58	IC. DIGITAL	74HC14		1006490027	
C50	CAP. 0.01UF, 50V, X7R, 20%	0281730008	FB2	FERRITE BEAD, 5000 PERM	1010980017	R100	RESISTOR 1.91K, 1%, 1/8W	1008530018	U59	IC. DIGITAL	74HC374		1006450033	
C51	CAP. 0.01UF, 50V, X7R, 20%	0281730008	J1	SOCKET, BOARDMOUNT, 11 PIN	1011010119	R101	RESISTOR 6.81K, 1%, 1/8W	0196350000	U60	IC. DIGITAL	74HC192		1010690001	
C52	CAP. 0.01UF, 50V, X7R, 20%	0281730008	J2	SOCKET, BOARDMOUNT, 11 PIN	1011010119	R102	RESISTOR 7.87K, 1%, 1/8W	1004090021	U61	IC. DIGITAL	74HC74		1008000019	
C54	CAP. 0.01UF, 50V, X7R, 20%	0281730008	J3	SOCKET, BOARDMOUNT, 11 PIN	1011010119	R103	RESISTOR 6.81K, 1%, 1/8W	0196350000	U67	IC. DIGITAL	74HC139		1006770038	
C55	CAP. 0.01UF, 50V, X7R, 20%	0281730008	J4	SOCKET, BOARDMOUNT, 11 PIN	1011010119	R104	RESISTOR 1K, 10%, 1/4W	0171560001	U75	IC. DIGITAL 5369 REPLACEMENT			1010700006	
C56	CAP. 0.01UF, 50V, X7R, 20%	0281730008	J5	SOCKET, BOARDMOUNT, 11 PIN	1011010119	R105	RESISTOR 22K, 5%, 1/4W	0172230004	U77	IC. DIGITAL	2501-4		1010630008	
C57	CAP. 0.01UF, 50V, X7R, 20%	0281730008	J6	SOCKET, BOARDMOUNT, 11 PIN	1011010119	RP1	RES NTWK 10 PIN SIP 10K COM	1006130021	U100	IC. DIGITAL	2501-4		1010630008	
C60	CAP. 0.01UF, 50V, X7R, 20%	0281730008	J7	SOCKET, BOARDMOUNT, 11 PIN	1011010119	RP2	RES NTWK 10 PIN SIP 10K COM	1006130021	U107	IC. DIGITAL	74HC244		1006460039	
C62	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L1	INDUCTOR, MOLDED, 33UH, 5%	0659690004	RP3	RES NTWK 10 PIN SIP 10K COM	1006130021	XU2	SOCKET, IC, 40 PIN TAILLESS			1006620010	
C68	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L2	INDUCTOR, MOLDED, 33UH, 5%	0659690004	RP4	RES NTWK 10 PIN SIP 10K COM	1006130021	XU3	SOCKET, IC, 28 PIN TAILLESS			1006620001	
C69	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L3	INDUCTOR, MOLDED, 33UH, 5%	0659690004	RP5	RES NTWK 10 PIN SIP 10K COM	1006130021	XU8	SOCKET, IC, 28 PIN TAILLESS			1006620001	
C92	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L4	INDUCTOR, MOLDED, 33UH, 5%	0659690004	RP7	RES NTWK 10 PIN SIP 10K COM	1006130021	XU13	SOCKET, IC, 28 PIN TAILLESS			1006620001	
C93	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L5	INDUCTOR, MOLDED, 33UH, 5%	0659690004	RP8	RES NTWK 10 PIN SIP 10K COM	1006130021	XU14	SOCKET, IC, 28 PIN TAILLESS			1006620001	
C94	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L6	INDUCTOR, MOLDED, 33UH, 5%	0659690004	RP9	RES NTWK 10 PIN SIP 22K COM	1006570012		MOUNTING PLATE, CPU			8076070805	
C95	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L7	INDUCTOR, MOLDED, 33UH, 5%	0659690004	RP13	RES NTWK 10 PIN SIP 10K COM	1006130021		PC ASSY, OPTOCOUPLER			8076075092	
C96	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L8	INDUCTOR, MOLDED, 33UH, 5%	0646300008	RP18	RES NTWK 10 PIN SIP 10K COM	1006130021		SPACER, .115 ID, .187 OD, .250L			0521420041	
C98	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L9	INDUCTOR, MOLDED, 33UH, 5%	0646300008	RP19	RES NTWK 10 PIN SIP 10K COM	1006130021						
C99	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L12	INDUCTOR, MOLDED, 33UH, 5%	0659690004	S1	SWITCH, SPST, ROCKER DIP	1010210025						
C100	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L13	INDUCTOR, MOLDED, 33UH, 5%	0659690004	S2	SWITCH, PUSHBUTTON, SPST	1010710001						
C101	CAP. 0.01UF, 50V, X7R, 20%	0281730008	L15	INDUCTOR, MOLDED, 33UH, 5%	0659690004	U2	IC. DIGITAL 80C85A	1007400013						
			L16	INDUCTOR, MOLDED, 33UH, 5%	0659690004	U3	IC. DIGITAL, RAM 6264	1010650009						
			L17	INDUCTOR, MOLDED, 33UH, 5%	0659690004	U4	IC. DIGITAL 74HC244	1006460039						
			L18	INDUCTOR, MOLDED, 33UH, 5%	0646300008	U5	IC. DIGITAL 74HC245	1006470034						

Figure 5.8.4 PC Assembly, CPU 1A2A1, page 1/6.

NOTE: NORMAL SETTINGS FR S1: SEGMENTS 1 THROUGH 8,
ALL SEGMENTS DEPRESSED TO NUMBERED END.
SEE TABLE 5.7.8.1 FOR OPTIONS.

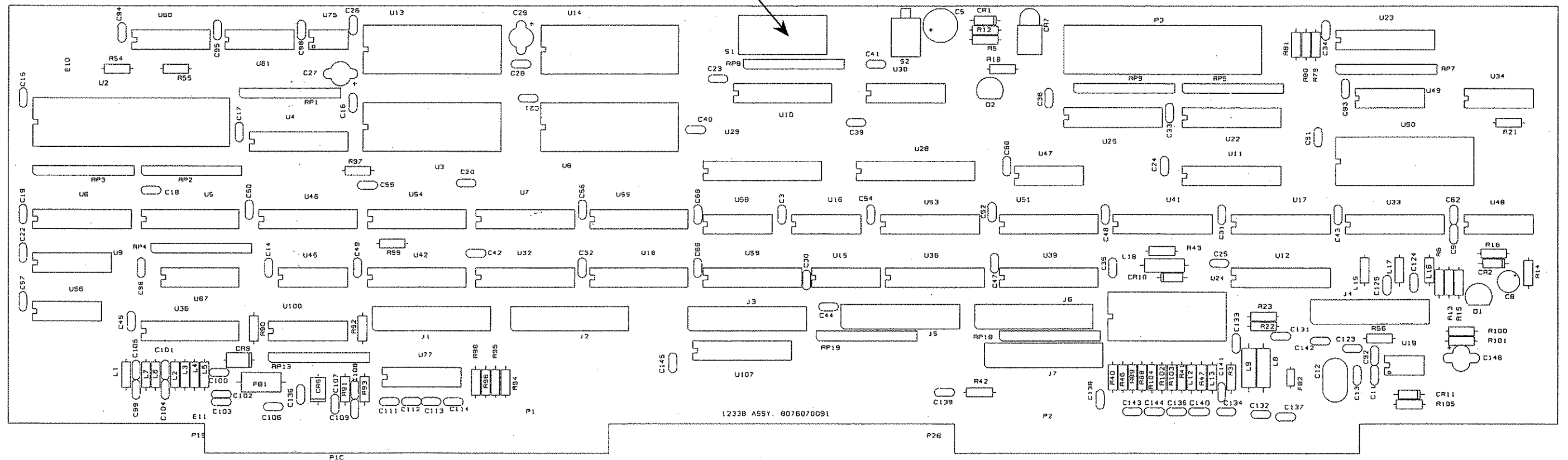
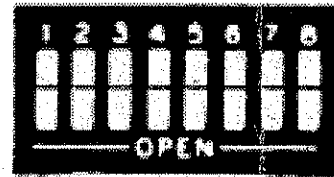


Figure 5.8.4 PC Assembly, CPU 1A2A1, page 2/6.

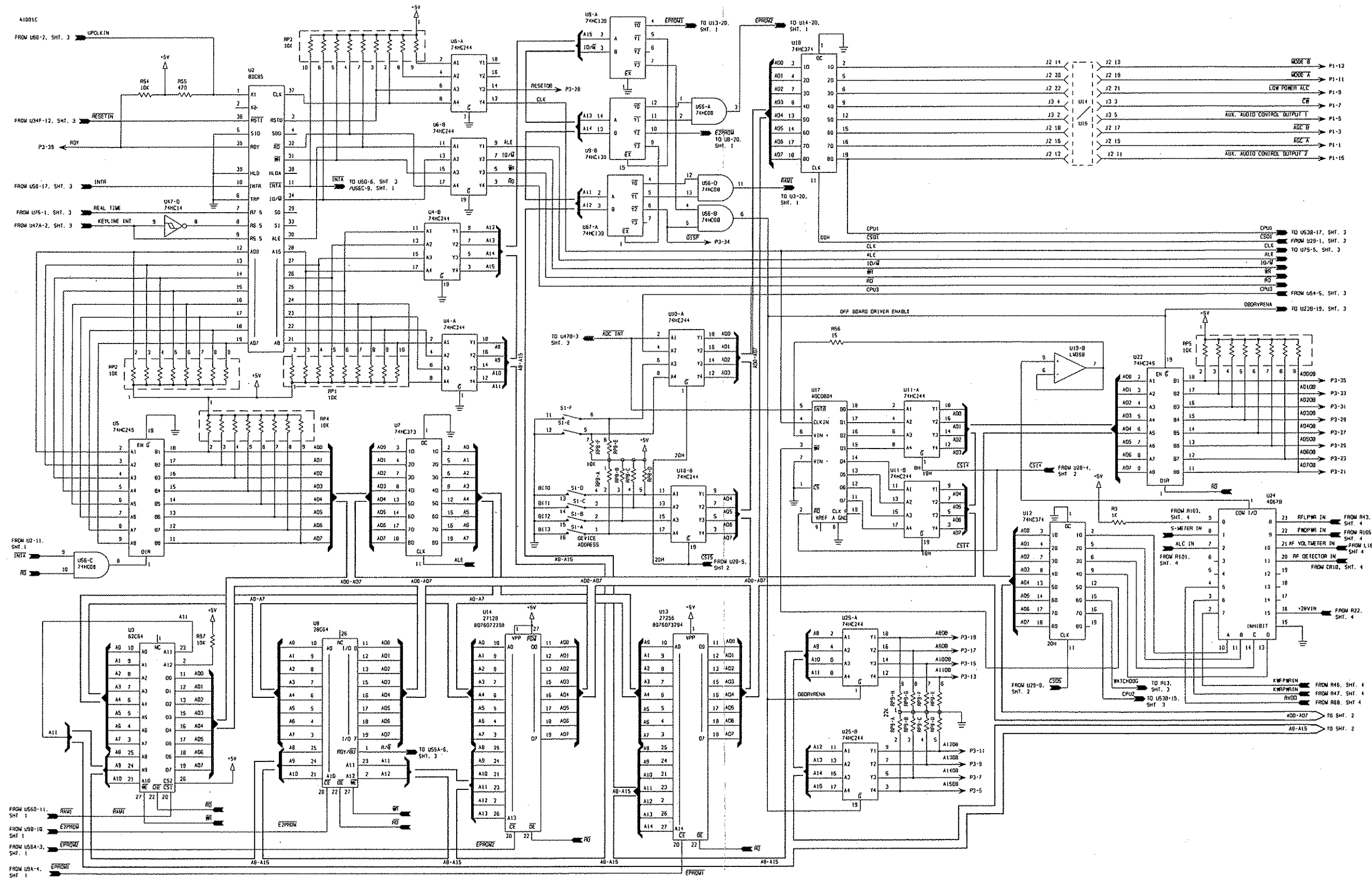


Figure 5.8.4 PC Assembly, CPU 1A2A1, page 3/6.

81001C

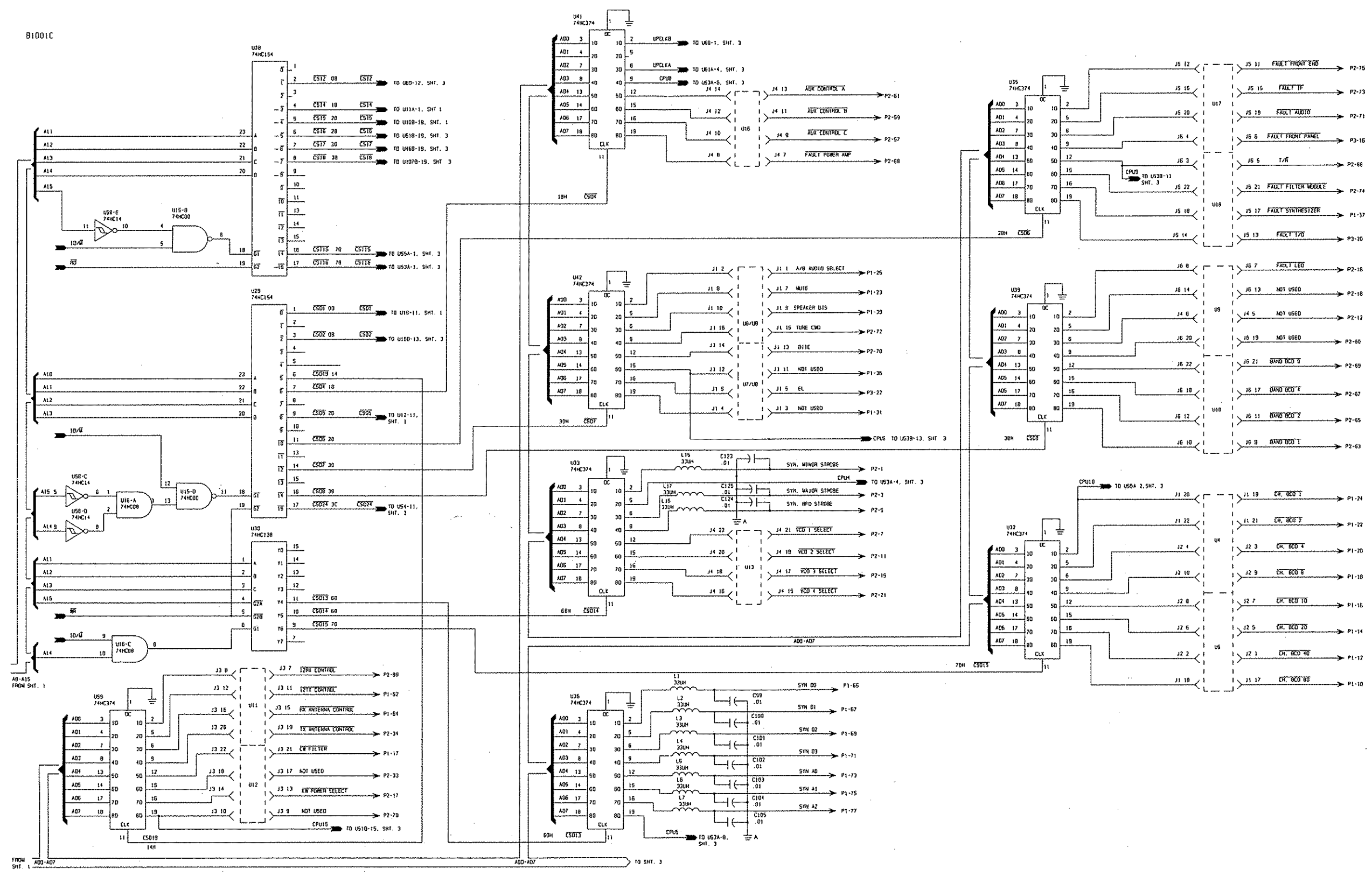


Figure 5.8.4 PC Assembly, CPU 1A2A1, page 4/6.

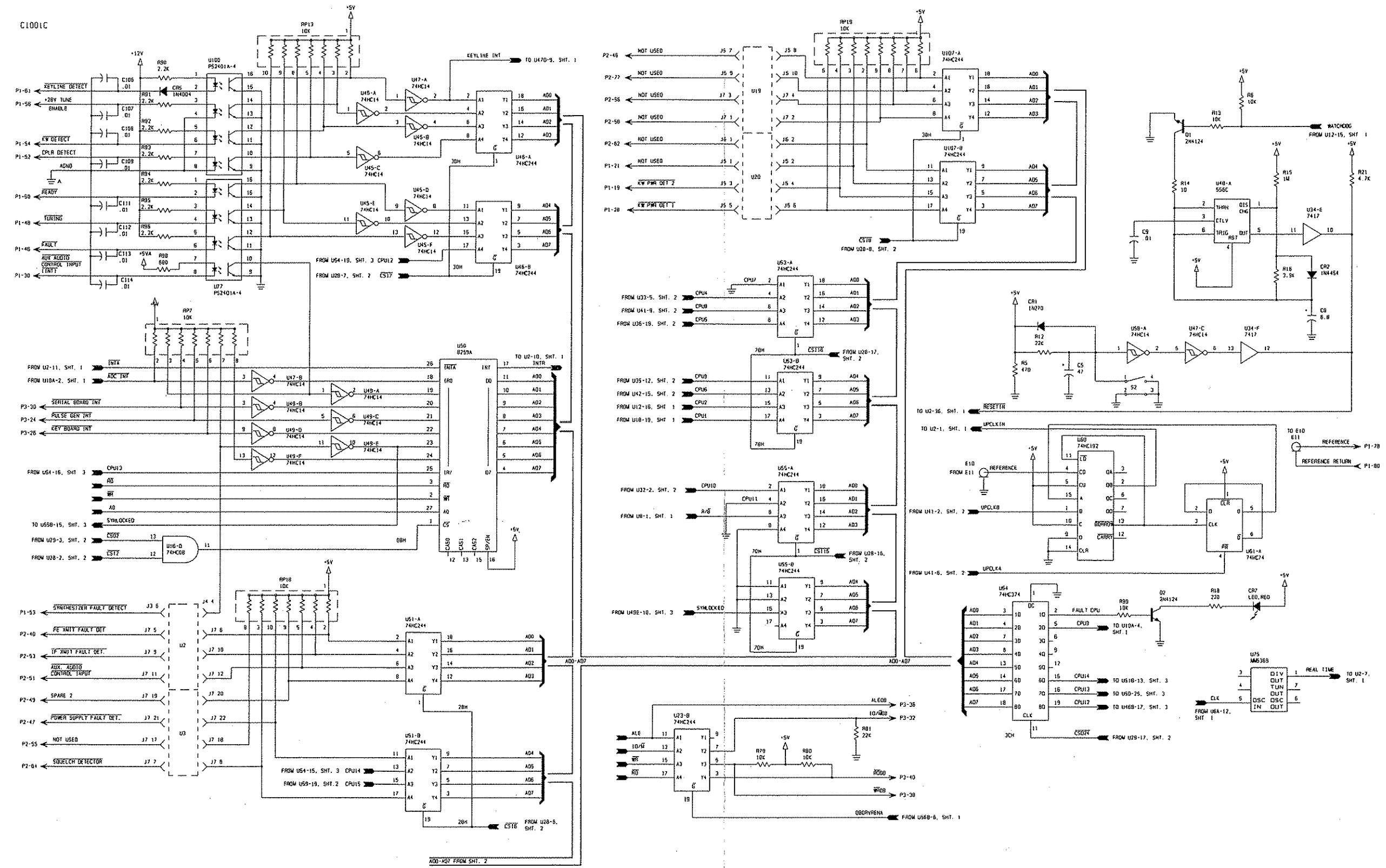


Figure 5.8.4 PC Assembly, CPU 1A2A1, page 5/6.

D1801C

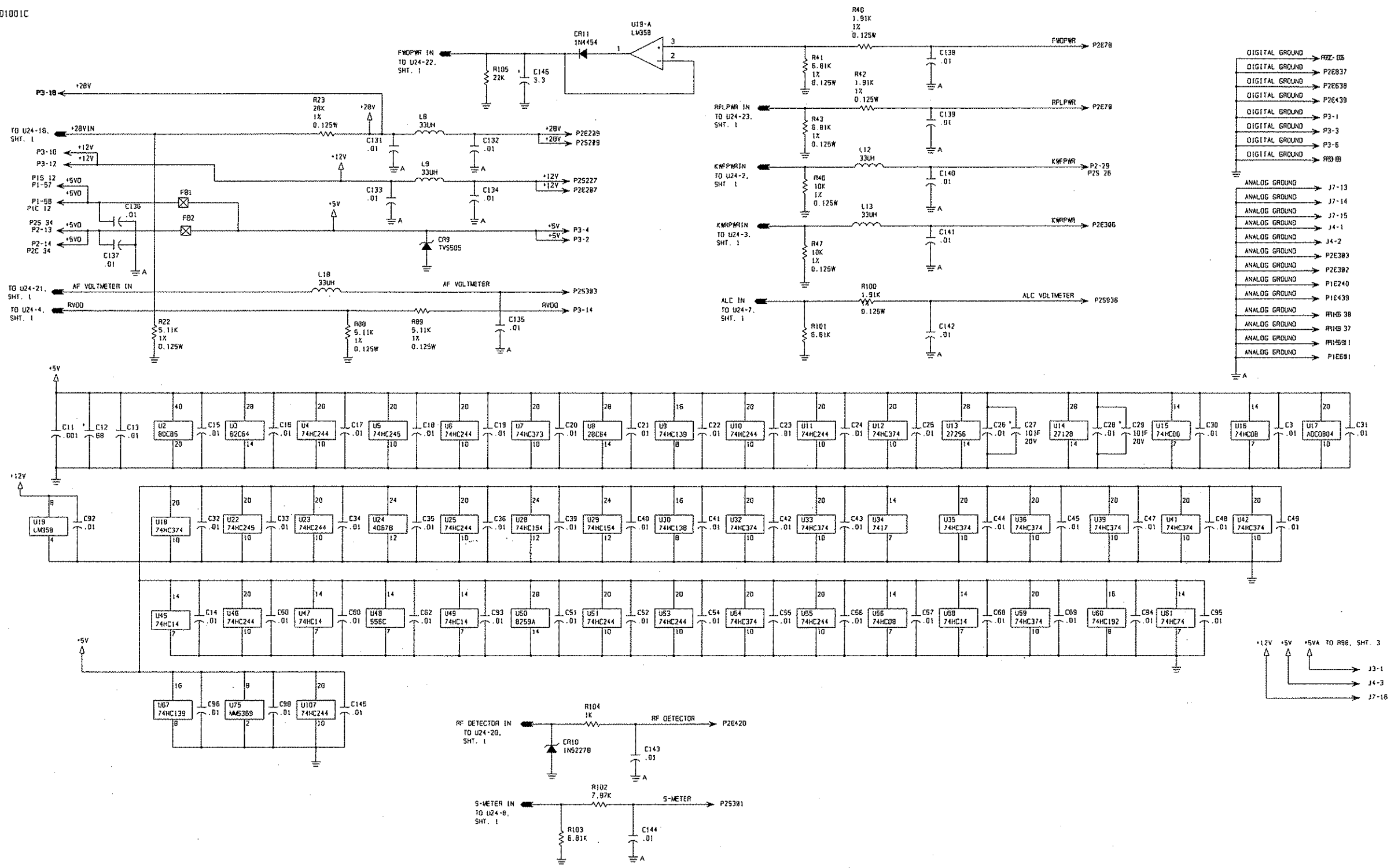
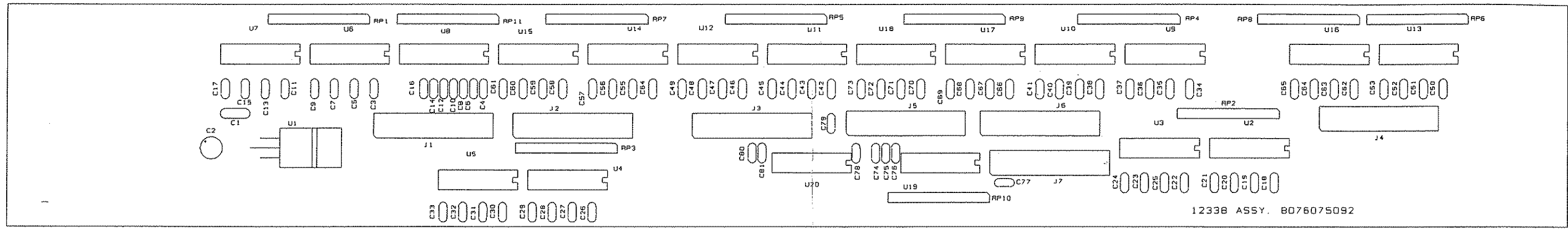


Figure 5.8.4 PC Assembly, CPU 1A2A1, page 6/6.



PC ASSY, OPTOCOUPLER 1A2A1A1

C1	PC ASSY, OPTOCOUPLER 1A2A1A1	8076075092
C2	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C3	CAP. 1UF, 35V	0283630001
C4	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C5	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C6	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C7	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C8	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C9	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C10	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C11	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C12	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C13	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C14	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C15	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C16	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C17	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C18	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C19	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C20	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C21	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C22	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C23	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C24	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C25	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C26	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C27	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C28	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C29	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C30	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C31	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C32	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C33	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C34	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C35	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C36	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C37	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C38	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C39	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C40	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C41	CAP. 0.01UF, 50V, X7R, 20%	0281730008

C42	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C43	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C44	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C45	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C46	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C47	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C48	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C49	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C50	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C51	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C52	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C53	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C54	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C55	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C56	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C57	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C58	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C59	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C60	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C61	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C62	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C63	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C64	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C65	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C66	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C67	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C68	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C69	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C70	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C71	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C72	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C73	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C74	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C75	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C76	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C77	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C78	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C79	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C80	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C81	CAP. 0.01UF, 50V, X7R, 20%	0281730008
J1	HEADER, PIN STRIP, 22 PIN	1010930010
J2	HEADER, PIN STRIP, 22 PIN	1010930010
J3	HEADER, PIN STRIP, 22 PIN	1010930010

J4	HEADER, PIN STRIP, 22 PIN	1010930010
J5	HEADER, PIN STRIP, 22 PIN	1010930010
J6	HEADER, PIN STRIP, 22 PIN	1010930010
J7	HEADER, PIN STRIP, 22 PIN	1010930010
RP1	RES NTWK 10 PIN SIP 680 COM	1010640003
RP2	RES NTWK 10 PIN SIP 680 COM	1010640003
RP3	RES NTWK 10 PIN SIP 680 COM	1010640003
RP4	RES NTWK 10 PIN SIP 680 COM	1010640003
RP5	RES NTWK 10 PIN SIP 680 COM	1010640003
RP6	RES NTWK 10 PIN SIP 680 COM	1010640003
RP7	RES NTWK 10 PIN SIP 680 COM	1010640003
RP8	RES NTWK 10 PIN SIP 680 COM	1010640003
RP9	RES NTWK 10 PIN SIP 680 COM	1010640003
RP10	RES NTWK 10 PIN SIP 680 COM	1010640003
RP11	RES NTWK 10 PIN SIP 10K COM	1006130021
U1	IC. LINEAR LM340T5	0448600005
U2	IC. DIGITAL 2501-4	1010630008
U3	IC. DIGITAL 2501-4	1010630008
U4	IC. DIGITAL 2501-4	1010630008
U5	IC. DIGITAL 2501-4	1010630008
U6	IC. DIGITAL 2501-4	1010630008
U7	IC. DIGITAL 2501-4	1010630008
U8	IC. DIGITAL UDN-2981	1006330038
U9	IC. DIGITAL 2501-4	1010630008
U10	IC. DIGITAL 2501-4	1010630008
U11	IC. DIGITAL 2501-4	1010630008
U12	IC. DIGITAL 2501-4	1010630008
U13	IC. DIGITAL 2501-4	1010630008
U14	IC. DIGITAL 2501-4	1010630008
U15	IC. DIGITAL 2501-4	1010630008
U16	IC. DIGITAL 2501-4	1010630008
U17	IC. DIGITAL 2501-4	1010630008
U18	IC. DIGITAL 2501-4	1010630008
U19	IC. DIGITAL 2501-4	1010630008
U20	IC. DIGITAL 2501-4	1010630008

Figure 5.8.5 PC Assembly Optocoupler 1A2A1A1, page 1/2.

A11518

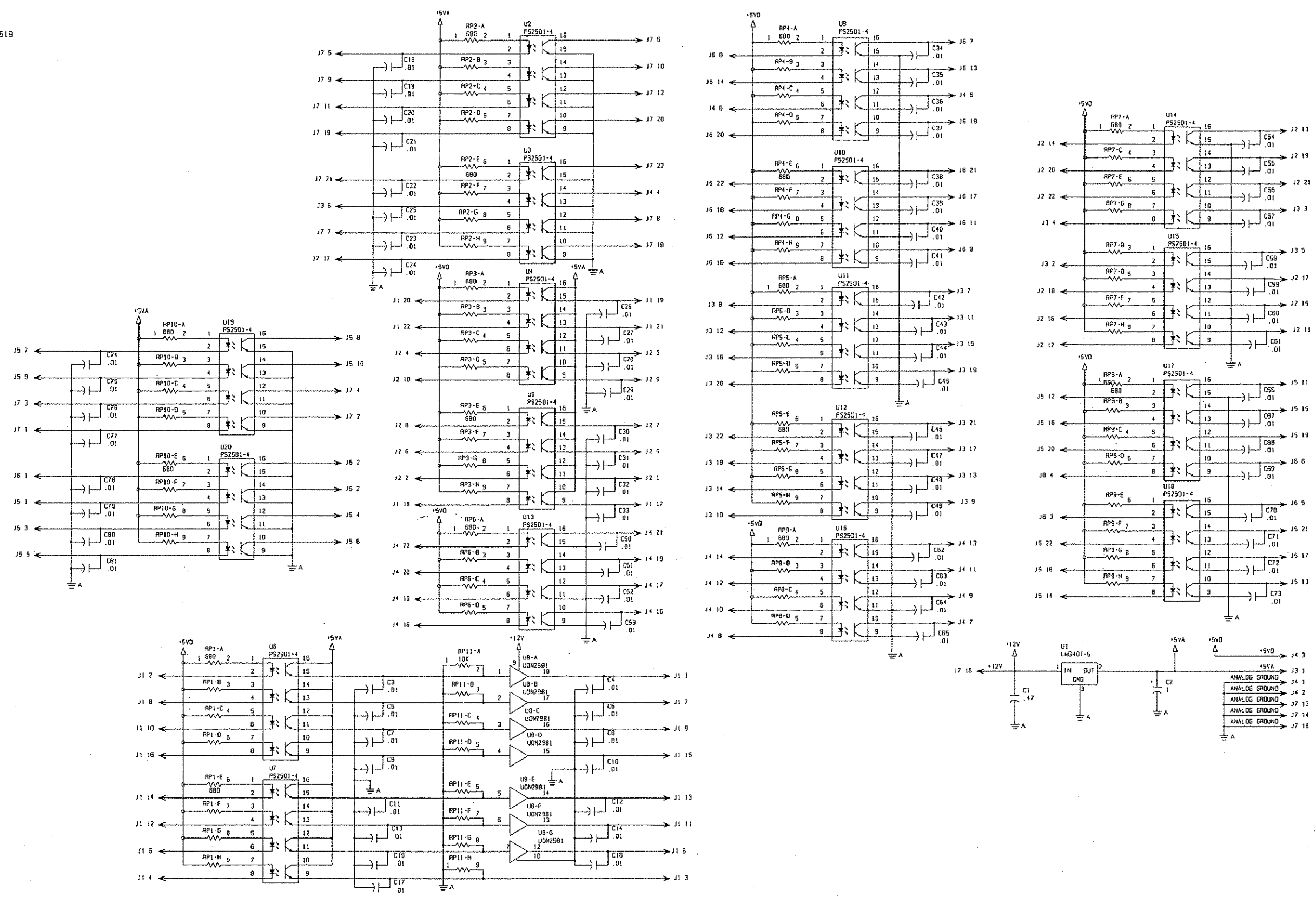


Figure 5.8.5 PC Assembly Optocoupler 1A2A1A1, page 2/2.

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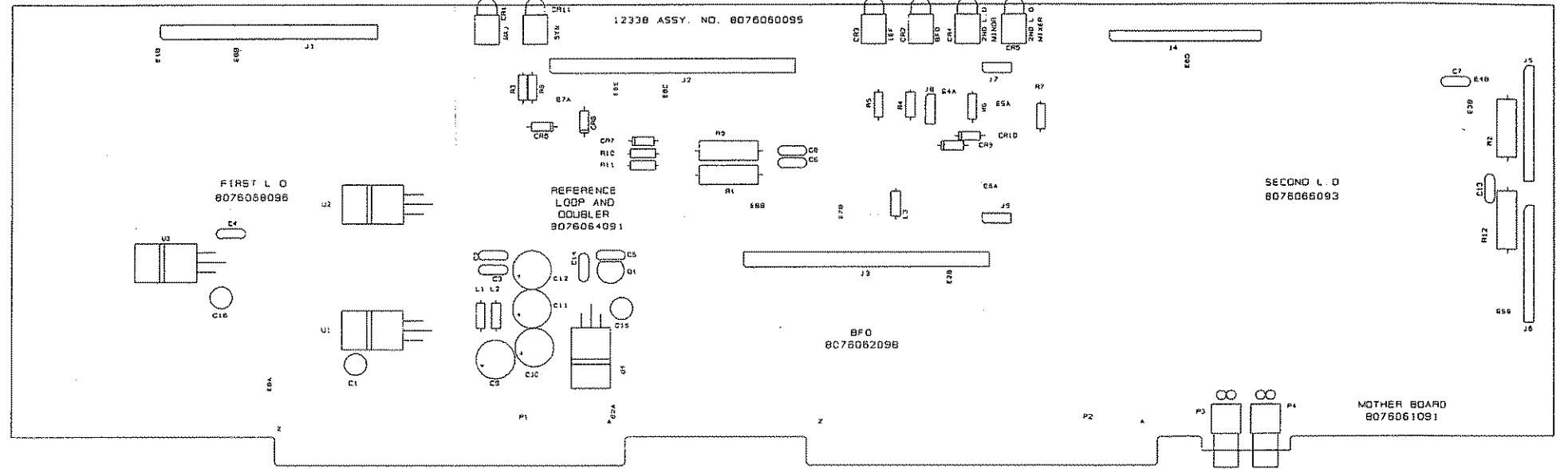
SYNTHESIZER MODULE 1A2A2

	SYNTHESIZER MODULE 1A2A2	8076060095
	COVER, BFO ASSY	8076062501
	COVER, REFERENCE LOOP ASSY	8076064503
	COVER, SECOND L.O. ASSY	8076066506
	COVER, FIRST L.O. ASSY	8076068509
	MOUNTING PLATE, SYNTHESIZER	8076060800
1A2A2A5	PC ASSY, SYN MOTHER BOARD	8076061091
1A2A2A3	PC ASSY, BFO	8076062098
1A2A2A4	PC ASSY, REF LOOP AND DOUBLER	8076064091
1A2A2A2	PC ASSY, SECOND L.O.	8076066093
1A2A2A1	PC ASSY, FIRST L.O.	8076068096
	STANDOFF, M-F, 4-40 X. 500L	1011000008

Figure 5.8.6 Synthesizer Module 1A2A2 PC Assembly, page 1/1.

PC ASSY, SYNTHESIZER MOTHER BOARD 1A2A2A5

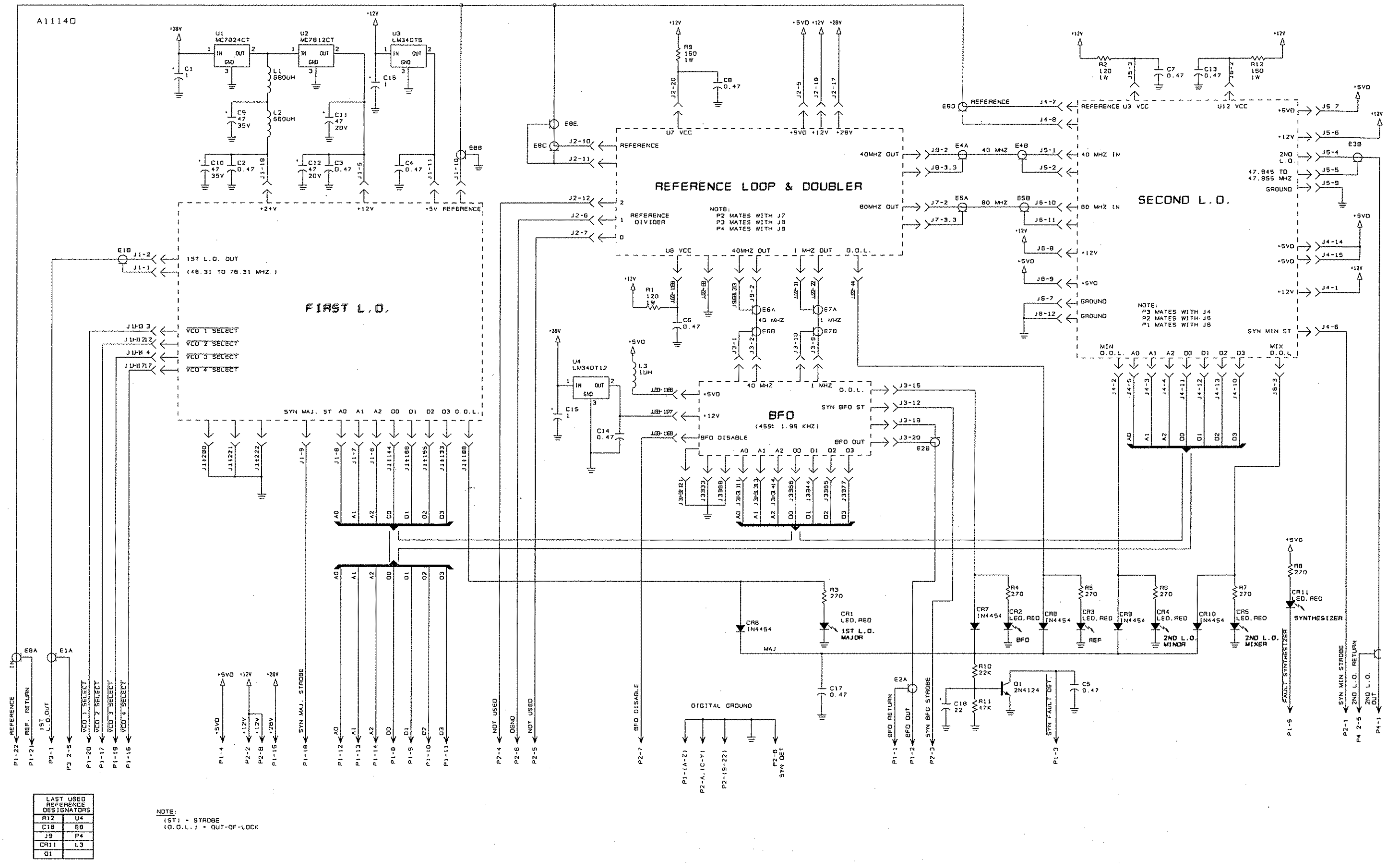
PC ASSY, SYN MOTHER BOARD 1A2A2A5	8076061091	
C1	CAP. 1μF, 35V, T368	0283630001
C2	CAP. .47μF, 50V, X7R 20%	0283377771
C3	CAP. .47μF, 50V, X7R 20%	0283377771
C4	CAP. .47μF, 50V, X7R 20%	0283377771
C5	CAP. .47μF, 50V, X7R 20%	0283377771
C6	CAP. .47μF, 50V, X7R 20%	0283377771
C7	CAP. .47μF, 50V, X7R 20%	0283377771
C8	CAP. .47μF, 50V, X7R 20%	0283377771
C9	CAP. .47μF, 35V	0282190007
C10	CAP. .47μF, 35V	0282190007
C11	CAP. .47μF, 20V, 196D	0281700001
C12	CAP. .47μF, 20V, 196D	0281700001
C13	CAP. .47μF, 50V, X7R 20%	0283377771
CR1	DIODE, LED, RED, PC MOUNT	1008480029
CR2	DIODE, LED, RED, PC MOUNT	1008480029
CR3	DIODE, LED, RED, PC MOUNT	1008480029
CR4	DIODE, LED, RED, PC MOUNT	1008480029
CR5	DIODE, LED, RED, PC MOUNT	1008480029
CR6	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR7	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR8	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR9	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR10	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR11	DIODE, LED, RED, PC MOUNT	1008480029
J1	SOCKET, BOARDMOUNT, 22 PIN	1011010224
J2	SOCKET, BOARDMOUNT, 25 PIN	1011010259
J3	SOCKET, BOARDMOUNT, 25 PIN	1011010259
J4	SOCKET, BOARDMOUNT, 15 PIN	1011010151
J5	SOCKET, BOARDMOUNT, 12 PIN	1011010127
J6	SOCKET, BOARDMOUNT, 12 PIN	1011010127
J7	SOCKET, BOARDMOUNT, 3 PIN	1011010038
J8	SOCKET, BOARDMOUNT, 3 PIN	1011010038
J9	SOCKET, BOARDMOUNT, 3 PIN	1011010038
L1	INDUCTOR, MOLDED, 680μH, 10%	0664320007
L2	INDUCTOR, MOLDED, 680μH, 10%	0664320007
L3	INDUCTOR, MOLDED, 1000μH, 10%	0664940005
Q1	TRANSISTOR, NPN, SI. 2N4124	0448010003
R1	RESISTOR, 120, 10%, 1W	0197600000
R2	RESISTOR, 120, 10%, 1W	0197600000
R3	RESISTOR 270, 10%, 1/4W	0178450006
R4	RESISTOR 270, 10%, 1/4W	0178450006
R5	RESISTOR 270, 10%, 1/4W	0178450006
R6	RESISTOR 270, 10%, 1/4W	0178450006
R7	RESISTOR 270, 10%, 1/4W	0178450006
R8	RESISTOR 270, 10%, 1/4W	0178450006
R9	RESISTOR 150, 10%, 1W	0187840008
R10	RESISTOR 10K, 10%, 1/4W	0170410005
R11	RESISTOR 47K, 10%, 1/4W	0171060008
R12	RESISTOR 150, 10%, 1W	0187840008
U1	IC. LINEAR MC7824CT	0448480000
U2	IC. LINEAR LM340/7812	1003410022
U3	IC. LINEAR LM340T5	0448600005
	CONNECTOR, RF, RIGHT ANGLE	1010730002



J4	CONNECTOR, PC, 22PIN DUAL, FEM	1008830003
J5	CONNECTOR, PC, 22PIN DUAL, FEM	1008830003
J6	CONNECTOR, PC, 22PIN DUAL, FEM	1008830003
J7	CONNECTOR, PC, 22PIN DUAL, FEM	1008830003
J8	CONNECTOR, PC, 22PIN DUAL, FEM	1008830003
J9	CONNECTOR, PC, 22PIN DUAL, FEM	1008830003
J10	CONNECTOR, PC, 22PIN DUAL, FEM	1008830003
J11	CONNECTOR, PC, 6 PIN DUAL, FEM	1011160005
J13	CONNECTOR, RF, JACK	1010810006
J14	CONNECTOR, RF, JACK	1010810006
J15	CONNECTOR, RF, JACK	1010810006
J16	CONNECTOR, RF, JACK	1010810006
J17	CONNECTOR, RF, JACK	1010810006
J18	CONNECTOR, RF, JACK	1010810006
J19	CONNECTOR, RF, JACK	1010810006
J20	CONNECTOR, RF, JACK	1010810006
J21	CONNECTOR, RF, JACK	1010810006
J22	CONNECTOR, RF, JACK	1010810006
L1	INDUCTOR, MOLDED, 47μH, 5%	0646420003
L2	CHOKE, POWER	8076104700
L3	CHOKE, POWER	8076104700
L4	CHOKE, POWER	8076104700

L5	CHOKE, POWER	8076104700
L6	CHOKE, POWER	8076104700
L7	CHOKE, POWER	8076104700
L8	CHOKE, POWER	8076104700
P4	CONNECTOR, RIBBON, 26 PIN FEM	1008340031
P5	CONNECTOR, RIBBON, 26 PIN FEM	1008340031
P6	CONNECTOR, RIBBON, 20 PIN FEM	1008120031
P7	CONNECTOR, RIBBON, 20 PIN FEM	1008120031
P8	CONNECTOR, RIBBON, 20 PIN FEM	1008120031
P9	CONNECTOR, RIBBON, 20 PIN FEM	1008120031
XP4	CONNECTOR, PCB, TRANSITION, 26PIN	1011090261
XP5	CONNECTOR, PCB, TRANSITION, 26PIN	1011090261
XP6	CONNECTOR, PCB, TRANSITION, 20PIN	1011090201
XP7	CONNECTOR, PCB, TRANSITION, 20PIN	1011090201
XP8	CONNECTOR, PCB, TRANSITION, 20PIN	1011090201
XP9	CONNECTOR, PCB, TRANSITION, 20PIN	1011090201
	BEAD, FERRITE, .200OD, .437LG	1010910019
	CABLE, FLAT, 20 COND. 28AWG	1008080004
	CABLE, FLAT, 20 COND. 28AWG	1011180006
	CONNECTOR, RF, DUBMINIATURE	0753700000
	JACK, PCB, SOLDER MOUNT	1008920002

Figure 5.8.7 Synthesizer Mother Board 1A2A2A5, page 1/2.



LAST USED REFERENCE DESIGNATORS	
R12	U4
C18	E6
J9	P4
CR11	L3
Q1	

NOTE:
 (ST) = STROBE
 (O.O.L.) = OUT-OF-LOCK

Figure 5.8.7 Synthesizer Mother Board 1A2A2A5, page 2/2.

PC ASSY, FIRST L.O. 1A2A2A1

C1	PC ASSY, FIRST L.O. 1A2A2A1	8076068096
C2	CAP. 22µF, 15V, T368	0296660001
C3	CAP. .01µF, 50V, X7R 20%	0281730008
C4	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C5	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C6	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C7	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C8	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C9	CAP. .01µF, 50V, X7R 20%	0281730008
C10	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C11	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C12	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C13	CAP. 0.1µF, 50V, X7R, 20%	0281610002
C14	CAP. .01µF, 50V, X7R 20%	0281730008
C15	CAP. .01µF, 50V, X7R 20%	0281730008
C16	CAP. 220PF, 500V, DM10, 2%	1010870009
C17	CAP. 7PF, 500V, DM10	0292400004
C18	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C19	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C20	CAP. 5PF, 500V, DM10	0261190008
C21	CAP. 10PF, 500V, DM10	0259830003
C22	CAP. 110PF, 500V, DM10, 5%	0257750002
C23	CAP. 10PF, 500V, DM10	0259830003
C24	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C25	CAP. 8PF, 500V, DM10	0293310009
C26	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C27	CAP. 18PF, 500V, DM10, 5%	0260300004
C28	CAP. 110PF, 500V, DM10, 5%	0257750002
C29	CAP. 10PF, 500V, DM10	0259830003
C30	CAP. 0.1µF, 50V, X7R, 20%	0281610002
C31	CAP. 18PF, 500V, DM10, 5%	0260300004
C32	CAP. 8PF, 500V, DM10	0293310009
C33	CAP. 12PF, 500V, DM10, 5%	0260280003
C34	CAP. 7PF, 500V, DM10	0292400004
C35	CAP. 220PF, 500V, DM10, 2%	1010870009
C36	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C37	CAP. 5PF, 500V, DM10	0261190008
C38	CAP. 220PF, 500V, DM10, 2%	1010870009
C39	CAP. 7PF, 500V, DM10	0292400004
C40	CAP. 8PF, 500V, DM10	0293310009
C41	CAP. 5PF, 500V, DM10	0261190008
C42	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C43	CAP. 10PF, 500V, DM10	0259830003
C44	CAP. 110PF, 500V, DM10, 5%	0257750002
C45	CAP. 10PF, 500V, DM10	0259830003
C46	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C47	CAP. 18PF, 500V, DM10, 5%	0260300004
C48	CAP. 18PF, 500V, DM10, 5%	0260300004
C49	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C50	CAP. 8PF, 500V, DM10	0293310009
C51	CAP. 110PF, 500V, DM10, 5%	0257750002
C52	CAP. 10PF, 500V, DM10	0259830003
C53	CAP. 12PF, 500V, DM10, 5%	0260280003
C54	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C55	CAP. 5PF, 500V, DM10	0261190008
C56	CAP. 220PF, 500V, DM10, 2%	1010870009
C57	CAP. 7PF, 500V, DM10	0292400004
C58	CAP. .01µF, 50V, X7R 20%	0281730008
C59	CAP. .01µF, 50V, X7R 20%	0281730008
C60	CAP. .01µF, 50V, X7R 20%	0281730008
CR1	DIODE, ZENER 1N5235B	0405200005
CR2	DIODE, VARICAP MV409	1007060018
CR3	DIODE, VARICAP MV409	1007060018
CR4	DIODE, HCT CARRIER 5082-2835	0405280009
CR5	DIODE, PIN 5082-3168	1005260001

CR6	DIODE, HCT CARRIER 5082-2835	0405280009
CR7	DIODE, PIN 5082-3168	1005260001
CR8	DIODE, VARICAP MV409	1007060018
CR9	DIODE, VARICAP MV409	1007060018
CR10	DIODE, VARICAP MV409	1007060018
CR11	DIODE, VARICAP MV409	1007060018
CR12	DIODE, HCT CARRIER 5082-2835	0405280009
CR13	DIODE, PIN 5082-3168	1005260001
CR14	DIODE, PIN 5082-3168	1005260001
CR15	DIODE, HCT CARRIER 5082-2835	0405280009
CR16	DIODE, VARICAP MV409	1007060018
CR17	DIODE, VARICAP MV409	1007060018
CR18	DIODE, SIGNAL, SIL. 1N4454	0405270003
L1	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L2	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L3	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L4	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L6	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L7	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L8	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L9	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L10	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L12	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L13	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L14	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L15	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L17	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L18	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L19	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L20	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L21	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L22	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L24	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L25	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L26	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L27	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L28	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L29	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
L30	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
P1	HEADER, PIN STRIP, 22.PIN	1011020220
Q1	TRANSISTOR, N-CH. FET U310	1007050039
Q2	TRANSISTOR, PNP, SI 2N4126	0448020009
Q3	TRANSISTOR, N-CH. FET U310	1007050039
Q4	TRANSISTOR, N-CH. FET U310	1007050039
Q5	TRANSISTOR, N-CH. FET U310	1007050039
Q6	TRANSISTOR, N-CH. FET U310	1007050039
Q7	TRANSISTOR, PNP, SI 2N4126	0448020009
Q8	TRANSISTOR, PNP, SI 2N4126	0448020009
Q9	TRANSISTOR, N-CH. FET U310	1007050039
Q10	TRANSISTOR, N-CH. FET U310	1007050039
Q11	TRANSISTOR, N-CH. FET U310	1007050039
Q12	TRANSISTOR, N-CH. FET U310	1007050039
Q13	TRANSISTOR, PNP, SI 2N4126	0448020009
R1	RESISTOR 82, 10%, 1/2W	1010200038
R2	RESISTOR 47, 10%, 1/4W	0179360001
R3	RESISTOR 47, 10%, 1/4W	0179360001
R4	RESISTOR 47, 10%, 1/4W	0179360001
R5	RESISTOR 5.6K, 10%, 1/4W	0183060008
R6	RESISTOR 390, 10%, 1/4W	0178330001
R7	RESISTOR 47, 10%, 1/4W	0179360001
R8	RESISTOR 120, 10%, 1/4W	0186550006
R10	RESISTOR 390, 10%, 1/4W	0178330001
R11	RESISTOR 2.7K, 10%, 1/4W	0186670001
R12	RESISTOR 120, 10%, 1/4W	0186550006
R13	RESISTOR 27K, 10%, 1/4W	0171200004
R14	RESISTOR 100, 5%, 1/4W	0171180003
R15	RESISTOR 100, 5%, 1/4W	0171180003
R16	RESISTOR 10, 5%, 1/4W	0177160004

R17	RESISTOR 47, 10%, 1/4W	0179360001
R18	RESISTOR 1.8K, 10%, 1/4W	0178190004
R19	RESISTOR 6.8K, 5%, 1/4W	0174810008
R20	RESISTOR 10K, 10%, 1/4W	0170410005
R21	RESISTOR 47, 10%, 1/4W	0179360001
R22	RESISTOR 47K, 10%, 1/4W	0171060008
R23	RESISTOR 4.7K, 5%, 1/4W	0170770001
R24	RESISTOR 10K, 10%, 1/4W	0170410005
R25	RESISTOR 10K, 10%, 1/4W	0170410005
R26	RESISTOR 10K, 10%, 1/4W	0170410005
R27	RESISTOR 47, 10%, 1/4W	0179360001
R28	RESISTOR 47, 10%, 1/4W	0179360001
R29	RESISTOR 47K, 10%, 1/4W	0171060008
R30	RESISTOR 120, 10%, 1/4W	0186550006
R31	RESISTOR 1.8K, 10%, 1/4W	0178190004
R32	RESISTOR 120, 10%, 1/4W	0186550006
R33	RESISTOR 47, 10%, 1/4W	0179360001
R34	RESISTOR 47, 10%, 1/4W	0179360001
R35	RESISTOR 10K, 10%, 1/4W	0170410005
R36	RESISTOR 1.8K, 10%, 1/4W	0178190004
R37	RESISTOR 47K, 10%, 1/4W	0171060008
R38	RESISTOR 10K, 10%, 1/4W	0170410005
R39	RESISTOR 10K, 10%, 1/4W	0170410005
R40	RESISTOR 47K, 10%, 1/4W	0171060008
R41	RESISTOR 1.8K, 10%, 1/4W	0178190004
R42	RESISTOR 10K, 10%, 1/4W	0170410005
R43	RESISTOR 47, 10%, 1/4W	0179360001
R44	RESISTOR 47, 10%, 1/4W	0179360001
R45	RESISTOR 820, 10%, 1/4W	0178210005
R46	RESISTOR 120, 10%, 1/4W	0186550006
R47	RESISTOR 390, 10%, 1/4W	0178330001
T1	TRANSFORMER, POWER SPLITTER, 1LO	8076068801
U1	IC, DIGITAL MC145146P	1007070005
U2	IC, DIGITAL MC1697	1010370022
U3	IC, DIGITAL SP8716	1010890000
U4	IC, DIGITAL 7404	1003950001
U5	IC, LINEAR CA3096	1005860033

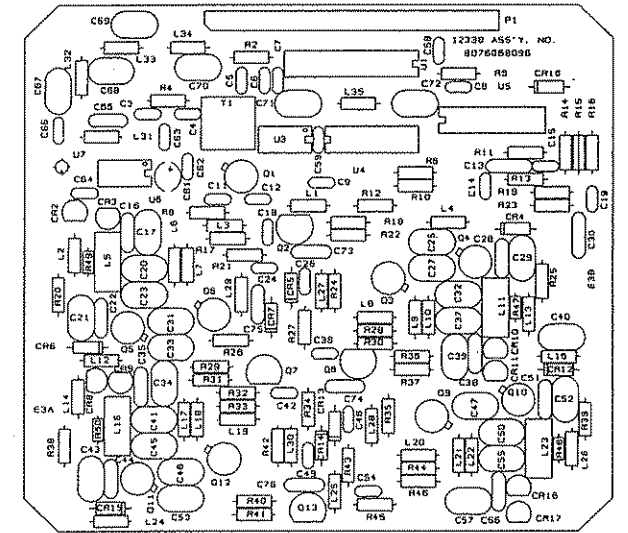


Figure 5.8.8 PC Assembly, First L.O. 1A2A2A1, page 1/2.

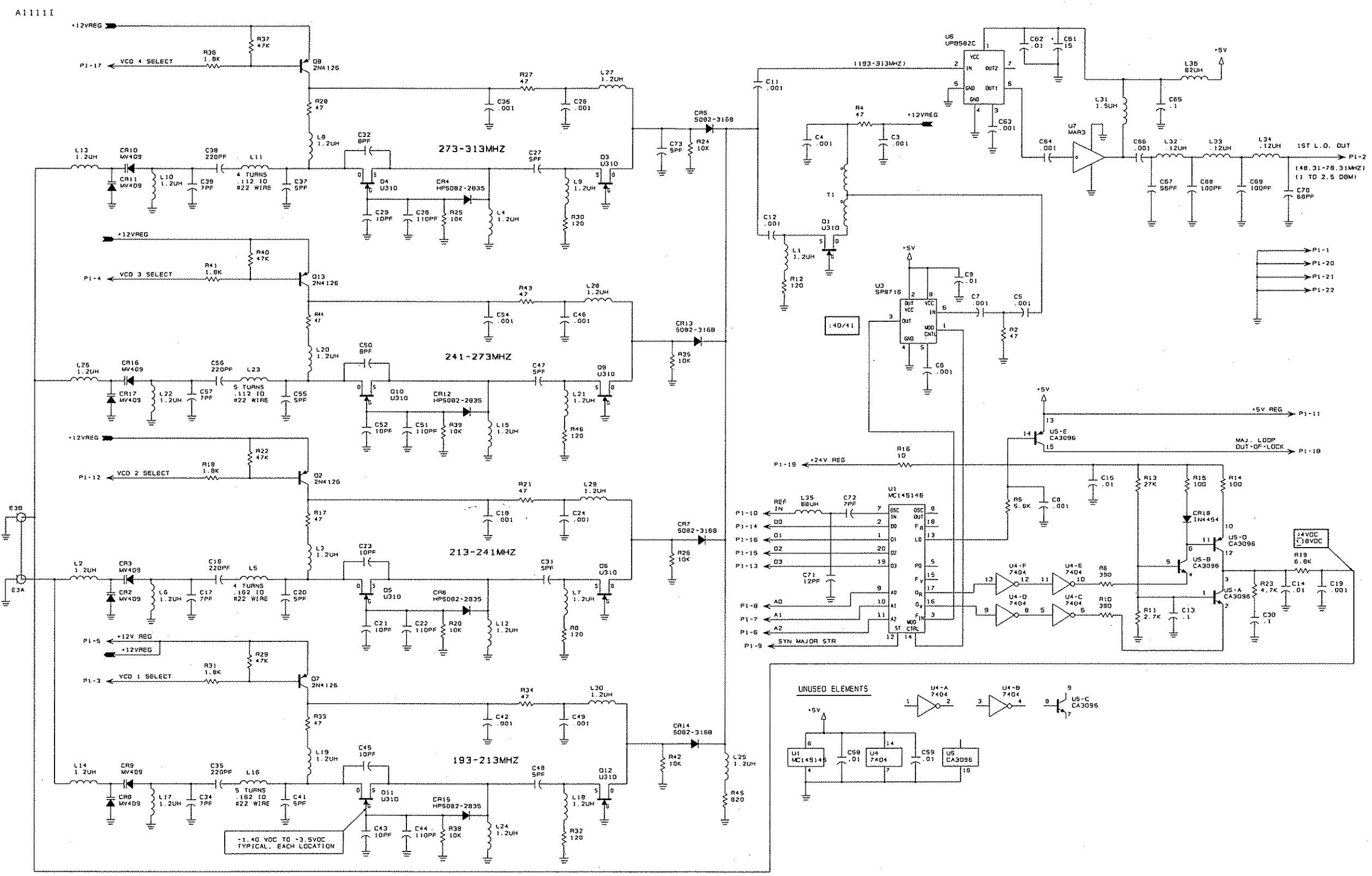


Figure 5.8.8 PC Assembly, First L.O. 1A2A2A1, page 2/2.

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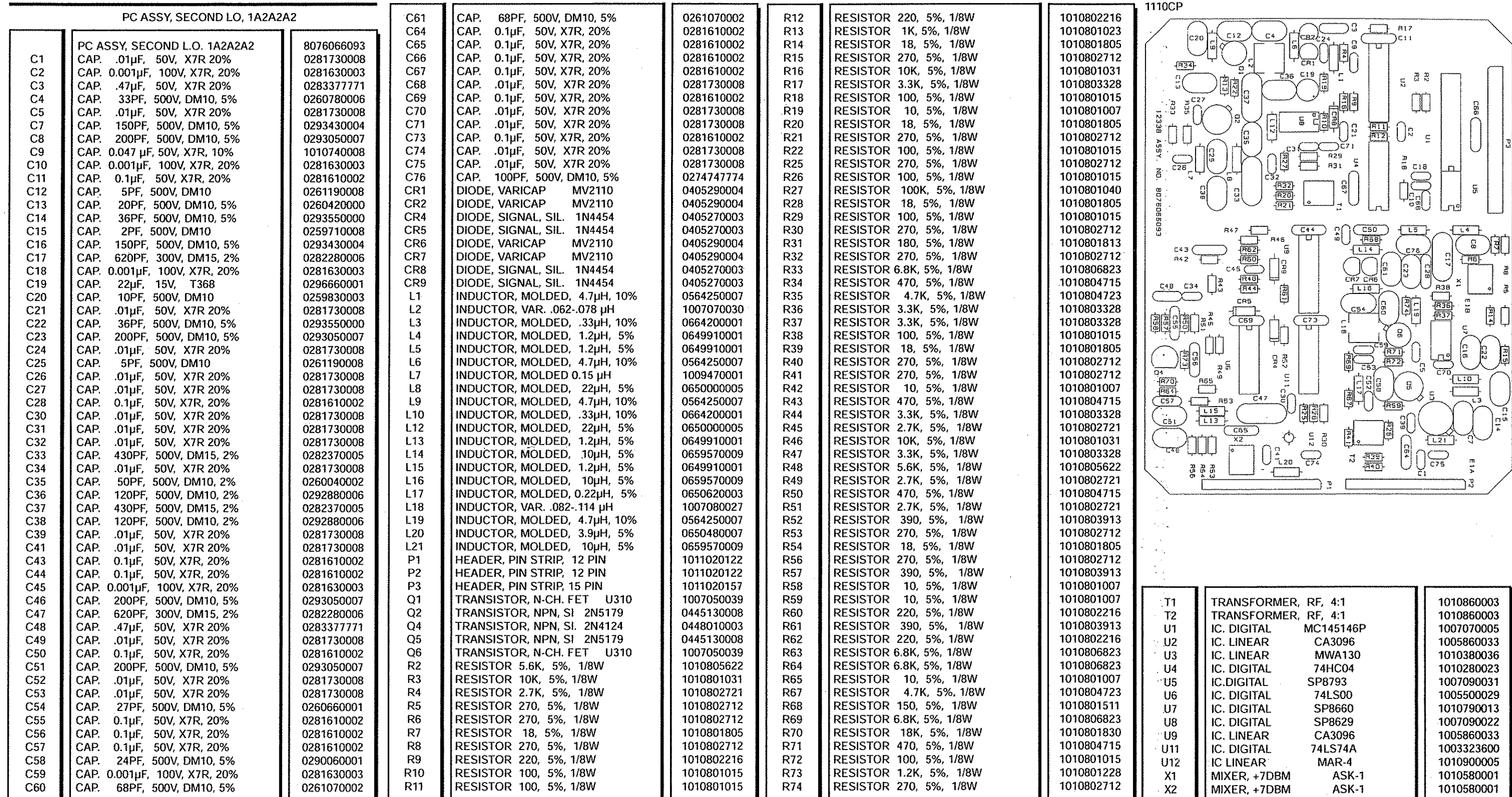


Figure 5.8.9 PC Assembly, Second L.O. 1A2A2A2, page 1/3.

A11100

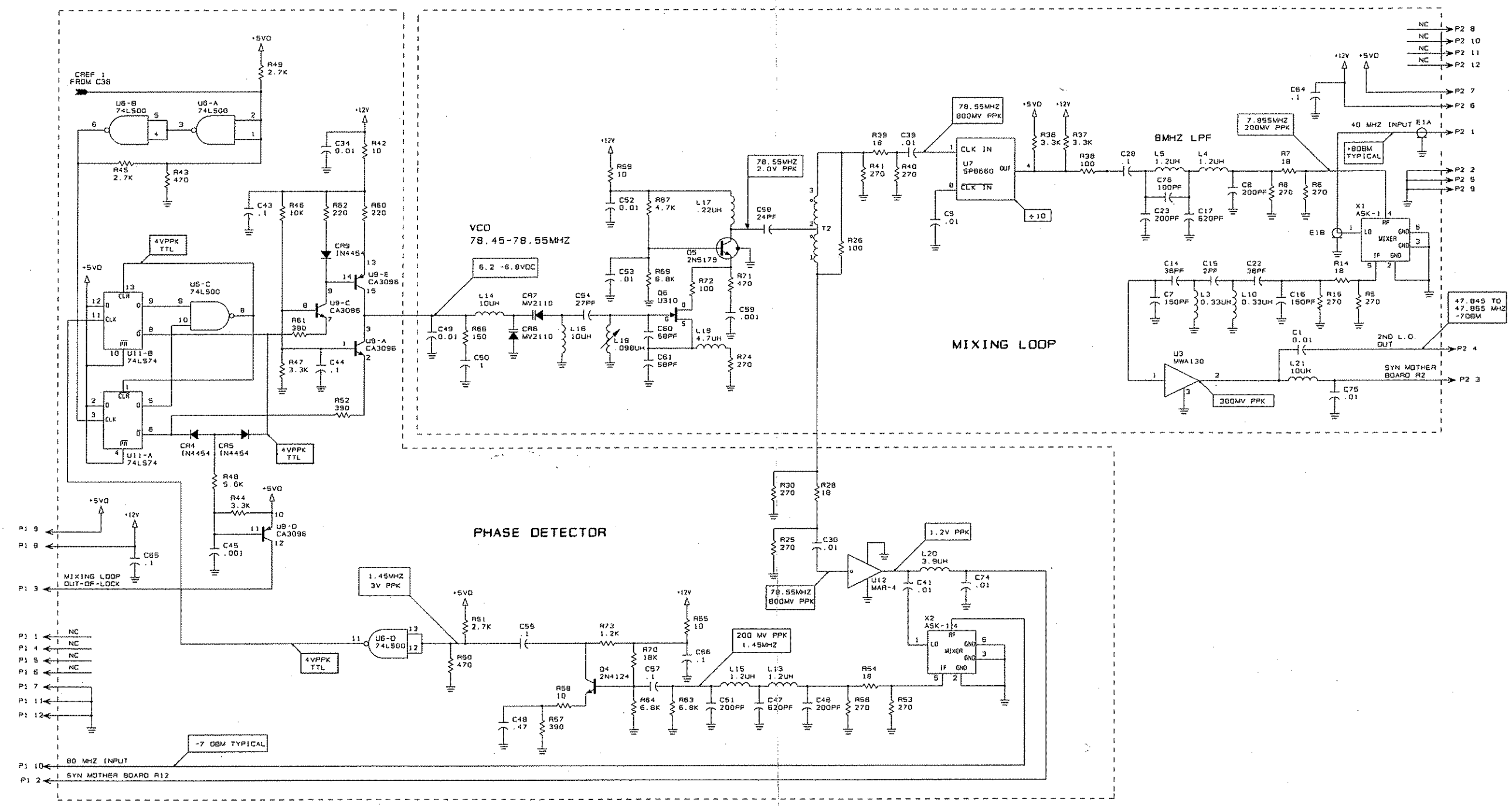
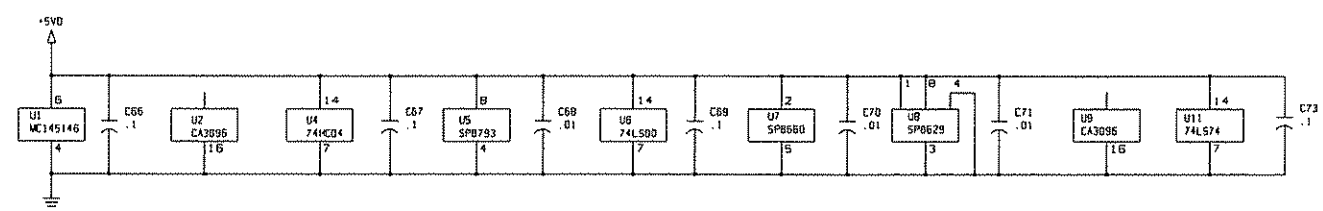
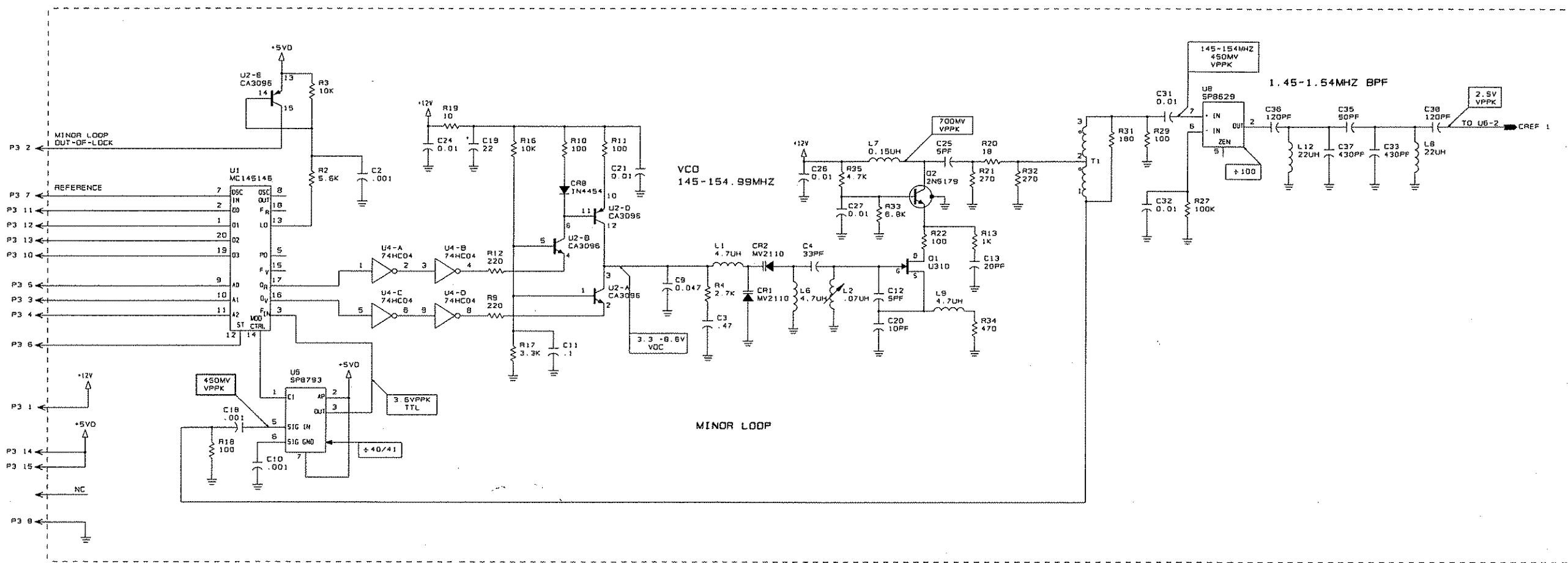
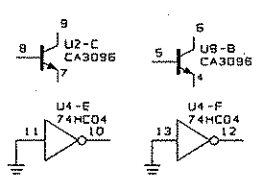


Figure 5.8.9 PC Assembly, Second L.O. 1A2A2A2, page 2/3.

B11100



UNUSED ELEMENTS



LAST USED	NOT USED
C75	C6, 29, 40, 42, 62, 63, 72
CR9	CR3
L21	L11
D6	D3
R74	R1, 23, 24, 40, 55, 66
T2	
U12	
X-2	U10

Figure 5.8.9 PC Assembly, Second L.O. 1A2A2A2, page 3/3.

PC ASSY, BFO 1A2A2A3

C1	PC ASSY, BFO 1A2A2A3	8076062098
C2	CAP. .01μF, 50V, X7R 20%	0281730008
C3	CAP. .01μF, 50V, X7R 20%	0281730008
C4	CAP. 22μF, 15V, T368	0296660001
C5	CAP. 15PF, 500V, DM10, 5%	0259950009
C6	CAP. 12PF, 500V, DM10, 5%	0260280003
C7	CAP. .01μF, 50V, X7R 20%	0281730008
C8	CAP. 27PF, 500V, DM10, 5%	0260660001
C9	CAP. 0.1μF, 50V, X7R, 20%	0281610002
C10	CAP. .01μF, 50V, X7R 20%	0281730008
C11	CAP. 20PF, 500V, DM10, 5%	0260420000
C12	CAP. .01μF, 50V, X7R 20%	0281730008
C13	CAP. 22μF, 15V, T368	0296660001
C14	CAP. 27PF, 1000V, N750	0250620006
C15	CAP. 0.1μF, 50V, X7R, 20%	0281610002
C16	CAP. .01μF, 50V, X7R 20%	0281730008
C17	CAP. 27PF, 500V, DM10, 5%	0260660001
C18	CAP. 22μF, 15V, T368	0296660001
C19	CAP. 0.1μF, 50V, X7R, 20%	0281610002
C20	CAP. .01μF, 50V, X7R 20%	0281730008
C21	CAP. 0.1μF, 50V, X7R, 20%	0281610002
C22	CAP. .01μF, 50V, X7R 20%	0281730008
C23	CAP. 0.001μF, 100V, X7R, 20%	0281630003
C24	CAP. 0.0056μF, 100V, NPO, 5%	1010770004
C25	CAP. 110PF, 500V, DM10, 5%	0257750002
C26	CAP. 0.0027μF, 200V, NPO, 5%	1010760009
C27	CAP. .01μF, 50V, X7R 20%	0281730008
C28	CAP. .01μF, 50V, X7R 20%	0281730008
C29	CAP. 15PF, 500V, DM10, 5%	0259950009
C30	CAP. .01μF, 50V, X7R 20%	0281730008
C31	CAP. 0.1μF, 50V, X7R, 20%	0281610002
C32	CAP. 0.1μF, 50V, X7R, 20%	0281610002
C35	CAP. 22PF, 500V, DM10, 5%	0260540005
CR1	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR2	DIODE, VARICAP MV2110	0405290004
CR3	DIODE, SIGNAL, SIL. 1N4454	0405270003
L1	INDUCTOR, MOLDED, 1.0μH, 5%	0649150007
L2	INDUCTOR, MOLDED, 120μH, 10%	0659330008
L3	INDUCTOR, VAR. .502-.620μH	1007080001
L4	INDUCTOR, MOLDED, 10μH, 5%	0659570009
L5	INDUCTOR, MOLDED, 68μH, 5%	0651650003
L6	INDUCTOR, MOLDED, 150μH, 5%	0659190001
L7	INDUCTOR, MOLDED, 82μH, 5%	0659450003
L8	INDUCTOR, MOLDED, 82μH, 5%	0659450003
L9	INDUCTOR, MOLDED, 10μH, 5%	0659570009
L10	INDUCTOR, MOLDED, 1.0μH, 5%	0649150007
P1	HEADER, PIN STRIP, 25 PIN	1011020254
Q1	TRANSISTOR, NPN, SI. 2N4124	0448010003
Q2	TRANSISTOR, NPN, SI. 2N4124	0448010003
Q3	TRANSISTOR, N-CH. FET U310	1007050039
Q4	TRANSISTOR, N-CH, FET MFE209	1007090014
R1	RESISTOR 10K, 5%, 1/8W	1010801031
R2	RESISTOR 5.6K, 5%, 1/8W	1010805622
R3	RESISTOR 1.2K, 5%, 1/8W	1010801228
R4	RESISTOR 1.2K, 5%, 1/8W	1010801228
R5	RESISTOR 4.7K, 5%, 1/8W	1010804723
R6	RESISTOR 3.3K, 5%, 1/8W	1010803328
R7	RESISTOR 100, 5%, 1/8W	1010801015

R8	RESISTOR 10K, 5%, 1/8W	1010801031
R9	RESISTOR 100K, 5%, 1/8W	1010801040
R10	RESISTOR 100, 5%, 1/8W	1010801015
R11	RESISTOR 470, 5%, 1/8W	1010804715
R12	RESISTOR 470, 5%, 1/8W	1010804715
R13	RESISTOR 18K, 5%, 1/8W	1010801830
R14	RESISTOR 2.2K, 5%, 1/8W	1010802224
R15	RESISTOR 10, 5%, 1/8W	1010801007
R16	RESISTOR 2.2K, 5%, 1/8W	1010802224
R17	RESISTOR 4.7K, 5%, 1/8W	1010804723
R18	RESISTOR 10K, 5%, 1/8W	1010801031
R19	RESISTOR 12K, 5%, 1/8W	1010801236
R20	RESISTOR 10K, 5%, 1/8W	1010801031
R21	RESISTOR 120, 5%, 1/8W	1010801210
R22	RESISTOR 10K, 5%, 1/8W	1010801031
R23	RESISTOR 100K, 5%, 1/8W	1010801040
R24	RESISTOR 12K, 5%, 1/8W	1010801236
R25	RESISTOR 10K, 5%, 1/8W	1010801031
R26	RESISTOR 4.7K, 5%, 1/8W	1010804723
R27	RESISTOR 33, 5%, 1/8W	1010803301
R28	RESISTOR 560, 5%, 1/8W	1010805614
R29	RESISTOR 180, 5%, 1/8W	1010801813
R30	RESISTOR 560, 5%, 1/8W	1010805614
R31	RESISTOR 560, 5%, 1/8W	1010805614
R32	RESISTOR 33, 5%, 1/8W	1010803301
R33	RESISTOR 560, 5%, 1/8W	1010805614
R34	RESISTOR 100, 5%, 1/8W	1010801015
T1	TRANSFORMER, RF, 4:1	1010860003
U1	I.C. DIGITAL MC145145	1007100001
U2	I.C. LINEAR CA3096	1005860033
U3	I.C. DIGITAL SP8792A	1007100028

1108AP

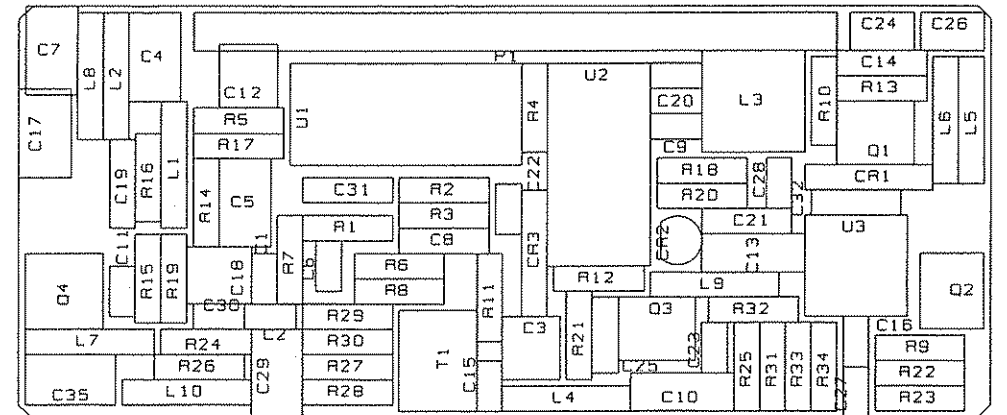
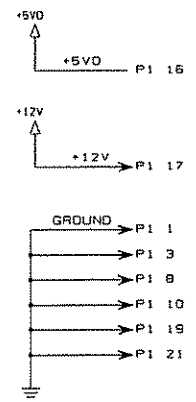
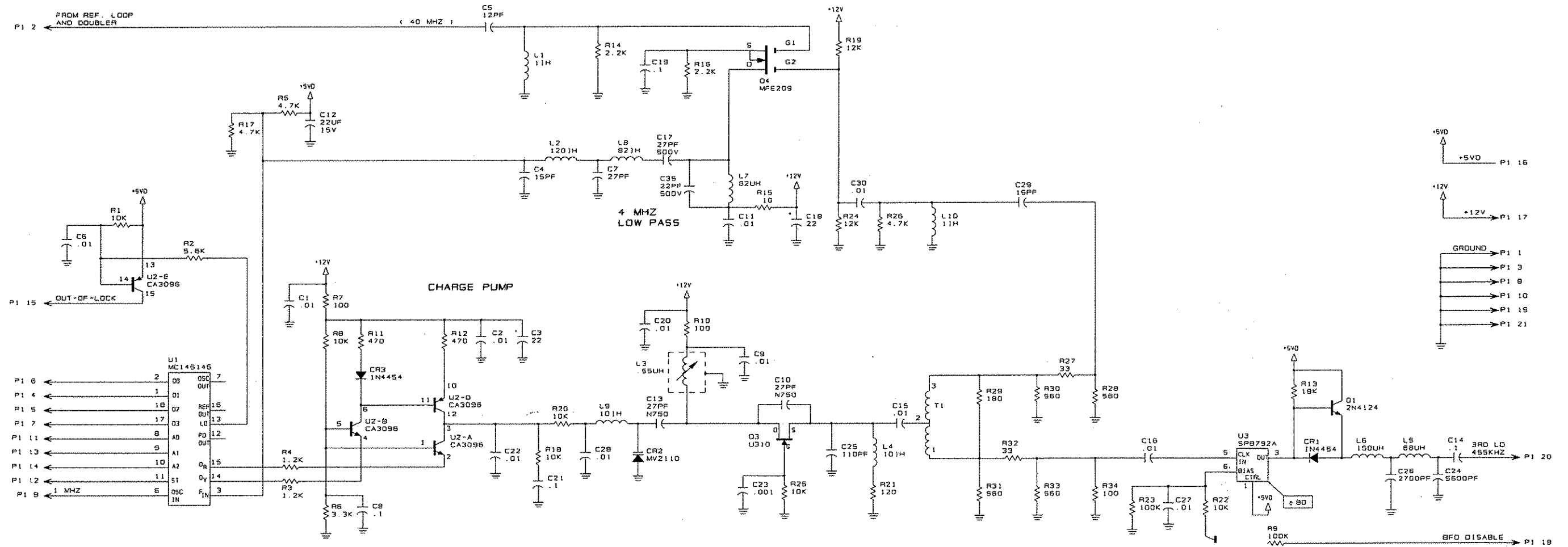


Figure 5.8.10 PC Assembly, BFO 1A2A2A3, page 1/2.

A1108B



NOTE: ALL RESISTORS 1/8W UNLESS OTHERWISE SPECIFIED

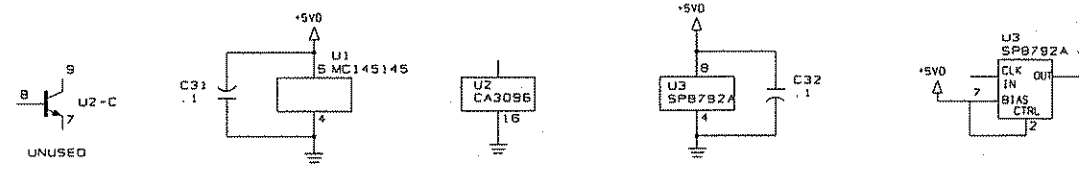


Figure 5.8.10 PC Assembly, BFO 1A2A2A3, page 2/2.

PC ASSY, REF LOOP AND DOUBLER 1A2A2A4		
C1	CAP. 10PF, 1000V, N750	0250480000
C2	CAP. 33PF, 500V, DM10, 5%	0260780006
C3	CAP. 0.1µF, 50V, X7R, 20%	0281610002
C4	CAP. 0.1µF, 50V, X7R, 20%	0281610002
C5	CAP. 200PF, 500V, DM10, 5%	0293050007
C6	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C7	CAP. 68PF, 500V, DM10, 5%	0261070002
C8	CAP. .01µF, 50V, X7R 20%	0281730008
C9	CAP. .01µF, 50V, X7R 20%	0281730008
C10	CAP. .01µF, 50V, X7R 20%	0281730008
C11	CAP. .01µF, 50V, X7R 20%	0281730008
C12	CAP. 15µF, 35V	0282240004
C13	CAP. .01µF, 50V, X7R 20%	0281730008
C14	CAP. .47µF, 50V, X7R 20%	0283377771
C15	CAP. 180PF, 500V, DM10, 5%	0294100008
C16	CAP. 50PF, 500V, DM10, 2%	0260040002
C17	CAP. 0.1µF, 50V, X7R, 20%	0281610002
C18	CAP. .01µF, 50V, X7R 20%	0281730008
C20	CAP. .01µF, 50V, X7R 20%	0281730008
C21	CAP. .01µF, 50V, X7R 20%	0281730008
C22	CAP. 3PF, 300V, CD6	0288560001
C23	CAP. .01µF, 50V, X7R 20%	0281730008
C24	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C25	CAP. .01µF, 50V, X7R 20%	0281730008
C26	CAP. 18PF, 500V, DM10, 5%	0260300004
C27	CAP. 3.3µF, 35V, 196D	0281680001
C28	CAP. 0.001µF, 100V, X7R, 20%	0281630003
C29	CAP. .01µF, 50V, X7R 20%	0281730008
C30	CAP. .01µF, 50V, X7R 20%	0281730008
C31	CAP. 56PF, 500V, DM10, 5%	0293170002
C32	CAP. 18PF, 500V, DM10, 5%	0260300004
C33	CAP. 56PF, 500V, DM10, 5%	0293170002
C34	CAP. .01µF, 50V, X7R 20%	0281730008
C35	CAP. 0.1µF, 50V, X7R, 20%	0281610002
C36	CAP. 0.1µF, 50V, X7R, 20%	0281610002
CR1	DIODE, ZENER 1N5245B	0405210001
CR2	DIODE, VARICAP MV409	1007060018
CR3	DIODE, VARICAP MV409	1007060018
CR4	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR5	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR6	DIODE, HOT CARRIER 5082-2835	0405280009
CR7	DIODE, HOT CARRIER 5082-2835	0405280009
CR8	DIODE, SIGNAL, SIL. 1N4454	0405270003
L1	INDUCTOR, VAR, 3.30µH	0647930005
L2	INDUCTOR, MOLDED, 15µH, 5%	0659070006
L3	INDUCTOR, MOLDED, 15µH, 5%	0659070006
L4	INDUCTOR, MOLDED, 0.39µH, 5%	0649770005
L5	INDUCTOR, MOLDED, 12µH, 5%	0652700004
L6	INDUCTOR, MOLDED, 1.0µH, 5%	0649150007
L7	INDUCTOR, MOLDED, 3.9µH, 5%	0650480007
L8	INDUCTOR, MOLDED, 0.22µH, 5%	0650620003
L9	INDUCTOR, MOLDED, 0.22µH, 5%	0650620003
L10	INDUCTOR, MOLDED, 68µH, 5%	0651650003
L11	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001
P1	HEADER, PIN STRIP, 25 PIN	1011020254
P2	HEADER, PIN STRIP, 3 PIN	1011020033
P3	HEADER, PIN STRIP, 3 PIN	1011020033
P4	HEADER, PIN STRIP, 3 PIN	1011020033
Q1	TRANSISTOR, NPN, SI 2N5179	0445130008
Q2	TRANSISTOR, NPN, SI 2N5179	0445130008
R1	RESISTOR 270, 5%, 1/8W	1010802712
R2	RESISTOR 560, 5%, 1/8W	1010805614
R3	RESISTOR 5.6K, 5%, 1/8W	1010805622
R4	RESISTOR 1.8K, 5%, 1/8W	1010801821
R5	RESISTOR 560, 5%, 1/8W	1010805614
R6	RESISTOR 10K, 5%, 1/8W	1010801031
R7	RESISTOR 10, 5%, 1/8W	1010801007
R8	RESISTOR 820, 5%, 1/8W	1010808214
R10	RESISTOR 27K, 5%, 1/8W	1010802739
R11	RESISTOR 2.7K, 5%, 1/8W	1010802721
R12	RESISTOR 5.6K, 5%, 1/8W	1010805622
R13	RESISTOR 330, 5%, 1/8W	1010803310
R14	RESISTOR 47, 5%, 1/8W	1010804707
R15	RESISTOR 5.6K, 5%, 1/8W	1010805622
R16	RESISTOR 3.3K, 5%, 1/8W	1010803328
R17	RESISTOR 1.8K, 5%, 1/8W	1010801821
R18	RESISTOR 1.8K, 5%, 1/8W	1010801821
R19	RESISTOR 560, 5%, 1/8W	1010805614
R20	RESISTOR 33, 5%, 1/8W	1010803301
R21	RESISTOR 560, 5%, 1/8W	1010805614
R22	RESISTOR 150, 5%, 1/8W	1010801511
R23	RESISTOR 560, 5%, 1/8W	1010805614
R24	RESISTOR 560, 5%, 1/8W	1010805614
R25	RESISTOR 33, 5%, 1/8W	1010803301
R26	RESISTOR 33, 5%, 1/8W	1010803301
R27	RESISTOR 560, 5%, 1/8W	1010805614
R28	RESISTOR 270, 5%, 1/8W	1010802712
R29	RESISTOR 18, 5%, 1/8W	1010801805
R30	RESISTOR 270, 5%, 1/8W	1010802712
R31	RESISTOR 10, 5%, 1/8W	1010801007
R32	RESISTOR 5.6K, 5%, 1/8W	1010805622
R33	RESISTOR 270, 5%, 1/8W	1010802712
R34	RESISTOR 18, 5%, 1/8W	1010801805
R35	RESISTOR 560, 5%, 1/8W	1010805614
R36	RESISTOR 150, 5%, 1/8W	1010801511
R37	RESISTOR 68, 5%, 1/8W	1010806807
R38	RESISTOR 270, 5%, 1/8W	1010802712
R39	RESISTOR 270, 5%, 1/8W	1010802712
R40	RESISTOR 68, 5%, 1/8W	1010806807
R41	RESISTOR 10K, 5%, 1/8W	1010801031
R42	RESISTOR 10K, 5%, 1/8W	1010801031
R43	RESISTOR 10K, 5%, 1/8W	1010801031
T1	TRANSFORMER, RF, 4:1	1010860003
T2	TRANSFORMER, RF, 4:1	1010860003
T3	TRANSFORMER, RF, 4:1	1010860003
U1	IC. DIGITAL 74LS192	1010770012
U2	IC. LINEAR CA3096	1005860033
U3	IC. DIGITAL 74LS00	1005500029
U4	IC. DIGITAL 74LS74A	1003323600
U5	IC. DIGITAL SP8793	1007090031
U6	IC. LINEAR MWA130	1010380036
U7	IC. LINEAR MAR-4	1010900005
Y1	CRYSTAL, 40 MHZ HC-18/U	1007100036
	MOUNTING PAD, TRANSISTOR	0502710004

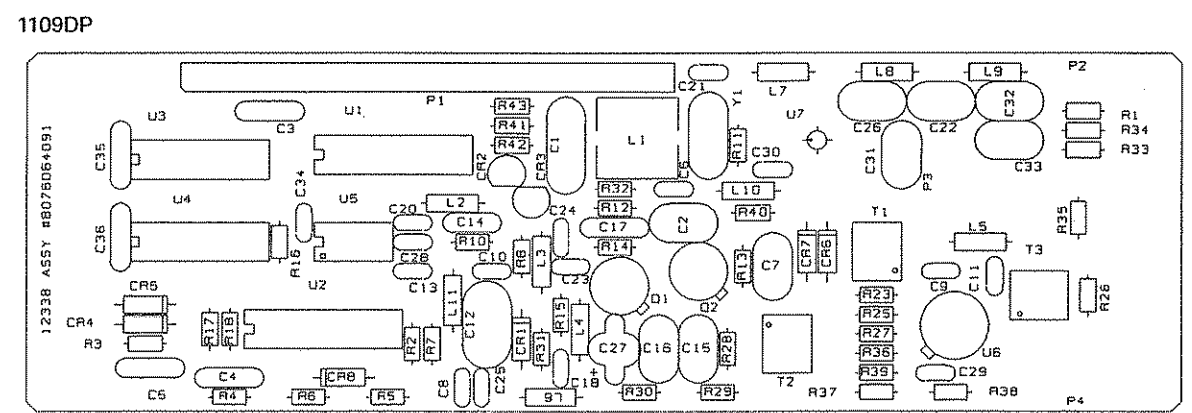


Figure 5.8.11 PC Assembly, Reference Loop and Doubler 1A2A2A4, page 1/2.

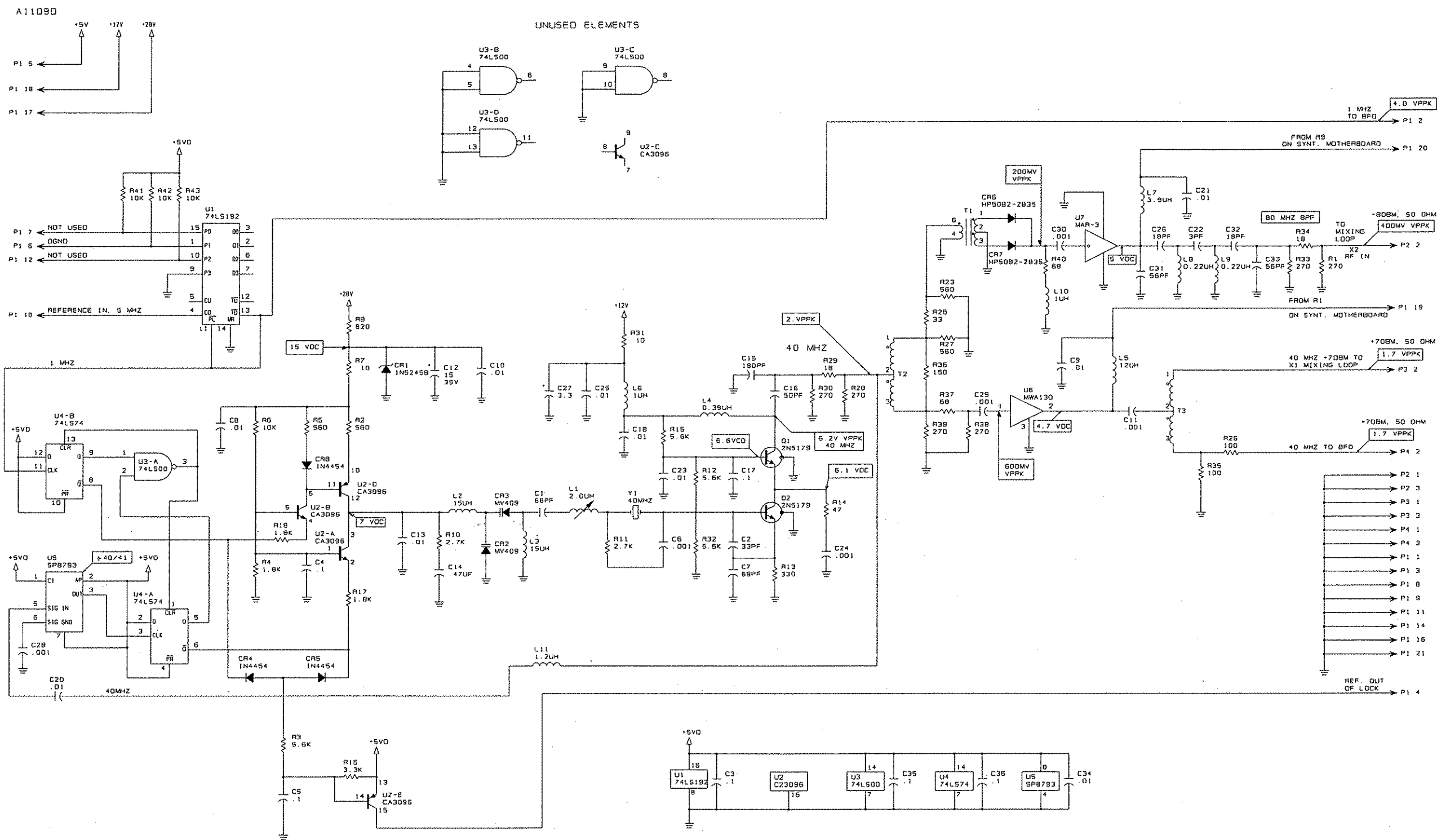


Figure 5.8.11 PC Assembly, Reference Loop and Doubler 1A2A4, page 2/2.

PC ASSY, AUDIO 1A2A3		
	PC ASSEMBLY, AUDIO	8102090090
C1	CAP. 1UF,	0281660000
C2	50V, X7R, 20%	0281610002
C3	CAP. 2.2UF, 35V, T368	0273950002
C4	CAP. .01UF, 50V, X7R 20%	0281730008
C5	CAP. .01UF, 50V, X7R 20%	0281730008
C6	CAP. 2.2UF, 35V, T368	0273950002
C7	CAP. .01UF, 50V, X7R 20%	0281730008
C8	CAP. .01UF, 50V, X7R 20%	0281730008
C9	CAP. 2.2UF, 35V, T368	0273950002
C10	CAP. .01UF, 50V, X7R 20%	0281730008
C11	CAP. .01UF, 50V, X7R 20%	0281730008
C12	CAP. 22UF, 15V, T368	0296660001
C13	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C14	CAP. 22UF, 15V, T368	0296660001
C15	CAP. .01UF, 50V, X7R 20%	0281730008
C16	CAP. .033UF, 50V,10/20%	0281770000
C17	CAP. .033UF, 50V,10/20%	0281770000
C18	CAP. .01UF, 50V, X7R 20%	0281730008
C19	CAP. .47UF, 50V, X7R 20%	0283377771
C20	CAP. .01UF, 50V, X7R 20%	0281730008
C21	CAP. .033UF, 50V,10/20%	0281770000
C22	CAP. 2.2UF, 35V, T368	0273950002
C23	CAP. 22UF, 15V, T368	0296660001
C24	CAP. .47UF, 50V, X7R 20%	0283377771
C25	CAP. 0.0033UF, 100V, NPO, 10%	0282580000
C26	CAP. .47UF, 50V, X7R 20%	0283377771
C27	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C28	CAP. 22UF, 15V, T368	0296660001
C29	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C30	CAP. .47UF, 50V, X7R 20%	0283377771
C31	CAP. 47UF, 35V	0282190007
C32	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C33	CAP. 6.8UF, 20V, T368	0296780006
C34	CAP. .47UF, 50V, X7R 20%	0283377771
C35	CAP. .47UF, 50V, X7R 20%	0283377771
C36	CAP. 470UF, 50V, TAL	0280890001
C37	CAP. 1UF, 35V, 196D	0281660000
C38	CAP. 0.0056UF, 100V, NPO, 5%	1010770004
C39	CAP. 0.0056UF, 100V, NPO, 5%	1010770004
C40	CAP. 22UF, 15V, T368	0296660001
C41	CAP. 22UF, 15V, T368	0296660001
C42	CAP. 1UF, 35V, 196D	0281660000
C43	CAP. 1UF, 35V, 196D	0281660000
C44	CAP. 1UF, 35V, 196D	0281660000
C45	CAP. .47UF, 50V, X7R 20%	0283377771
C46	CAP. .47UF, 50V, X7R 20%	0283377771
C47	CAP. 22UF, 15V, T368	0296660001
C48	CAP. 15UF, 35V	0282240004
C49	CAP. 820PF, 300V, DM15, 5%	0288750004
C50	CAP. 22UF, 15V, T368	0296660001
C51	CAP. .47UF, 50V, X7R 20%	0283377771
C52	CAP. .47UF, 50V, X7R 20%	0283377771
C53	CAP. 1UF, 35V, 196D	0281660000
C54	CAP. 22UF, 15V, T368	0296660001
C55	CAP. 22UF, 15V, T368	0296660001
C56	CAP. 820PF, 300V, DM15, 5%	0288750004
C57	CAP. 15UF, 35V	0282240004

C58	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C59	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C60	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C61	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C62	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C63	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C64	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C65	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C66	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C67	CAP. 1UF, 35V, 196D	0281660000
C68	CAP. 1UF, 35V, 196D	0281660000
C69	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C70	CAP. 6.8UF, 20V, T368	0296780006
C71	CAP. 6.8UF, 20V, T368	0296780006
C72	CAP. 6.8UF, 20V, T368	0296780006
C73	CAP. 22UF, 15V, T368	0296660001
C74	CAP. 22UF, 15V, T368	0296660001
C75	CAP. 22UF, 15V, T368	0296660001
C76	CAP. 6.8UF, 20V, T368	0296780006
C78	CAP. .01UF, 50V, X7R 20%	0281730008
C79	CAP. .01UF, 50V, X7R 20%	0281730008
C80	CAP. .01UF, 50V, X7R 20%	0281730008
C81	CAP. .01UF, 50V, X7R 20%	0281730008
C82	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C83	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C84	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C85	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C86	CAP. .01UF, 50V, X7R 20%	0281730008
C87	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C88	CAP. .01UF, 50V, X7R 20%	0281730008
C89	CAP. .01UF, 50V, X7R 20%	0281730008
C90	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C91	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C92	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C93	CAP. .01UF, 50V, X7R 20%	0281730008
C94	CAP. .01UF, 50V, X7R 20%	0281730008
C95	CAP. .01UF, 50V, X7R 20%	0281730008
C96	CAP. .01UF, 50V, X7R 20%	0281730008
C97	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C98	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C99	CAP. .01UF, 50V, X7R 20%	0281730008
C100	CAP. .01UF, 50V, X7R 20%	0281730008
C101	CAP. .01UF, 50V, X7R 20%	0281730008
C102	CAP. 0.1UF, 50V, X7R, 20%	0281610002
C103	CAP. 0.1UF, 50V, X7R, 20%	0281610002
CR1	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR2	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR3	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR4	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR5	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR6	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR7	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR8	DIODE, RECTIFIER 1N4004	0405180004
CR9	DIODE, RECTIFIER 1N4004	0405180004
CR10	DIODE, RECTIFIER 1N4004	0405180004
CR11	DIODE, RECTIFIER 1N4004	0405180004
CR12	DIODE, RECTIFIER 1N4004	0405180004
CR13	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR14	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR15	DIODE, SIGNAL, SIL. 1N4454	0405270003

CR16	DIODE, RECTIFIER 1N4004	0405180004
CR17	DIODE, RECTIFIER 1N4004	0405180004
CR18	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR19	DIODE, LED, RED, PC MOUNT	1008480029
CR20	DIODE, RECTIFIER 1N4004	0405180004
J1	SOCKET, BOARDMOUNT, 12 PIN	1011010127
K1	RELAY, DPDT, 12VDC	1005090009
K2	RELAY, DPDT, 12VDC	1005090009
K3	RELAY, DPDT, 12VDC	1005090009
Q1	TRANSISTOR, NPN, SI. 2N4124	0448010003
Q2	TRANSISTOR, NPN, SI. 2N4124	0448010003
Q3	TRANSISTOR, NPN, SI. 2N4124	0448010003
R1	RESISTOR 10K, 5%, 1/8W	1010801031
R2	RESISTOR 10K, 5%, 1/8W	1010801031
R3	RESISTOR 39K, 5%, 1/8W	1010803930
R4	RESISTOR 47K, 5%, 1/8W	1010804731
R5	RESISTOR 47K, 5%, 1/8W	1010804731
R6	RESISTOR 47K, 5%, 1/8W	1010804731
R7	RESISTOR 1K, 5%, 1/8W	1010801023
R8	RESISTOR 390K, 5%, 1/8W	1010803948
R9	RESISTOR 47K, 5%, 1/8W	1010804731
R10	RESISTOR 680, 5%, 1/8W	1010806815
R11	RESISTOR 390K, 5%, 1/8W	1010803948
R12	RESISTOR 68K, 5%, 1/8W	1010806831
R13	RESISTOR 3.3K, 5%, 1/8W	1010803328
R14	RESISTOR 390K, 5%, 1/8W	1010803948
R15	RESISTOR 10K, 5%, 1/8W	1010801031
R16	RESISTOR 10K, 5%, 1/8W	1010801031
R17	RESISTOR 10K, 5%, 1/8W	1010801031
R18	RESISTOR 3.3K, 5%, 1/8W	1010803328
R19	RESISTOR, 3.3M, 5%, 1/4U	1010820001
R20	RESISTOR 3.3K, 5%, 1/8W	1010803328
R21	RESISTOR 330K, 5%, 1/8W	1010803344
R22	RESISTOR 1K, 5%, 1/8W	1010801023
R23	RESISTOR 1K, 5%, 1/8W	1010801023
R24	RESISTOR 47K, 5%, 1/8W	1010804731
R25	RESISTOR 100K, 5%, 1/8W	1010801040
R26	RESISTOR 100K, 5%, 1/8W	1010801040
R27	RESISTOR 100K, 5%, 1/8W	1010801040
R28	RESISTOR 100K, 5%, 1/8W	1010801040
R29	RESISTOR 330K, 5%, 1/8W	1010803344
R30	RESISTOR 270K, 5%, 1/8W	1010802747
R31	RESISTOR, 3.3M, 5%, 1/4U	1010820001
R32	POT. 10K, 10% 3/4W, 15 TURNS	0338490043
R33	RESISTOR 1M, 10%, 1/4W	0170650006
R34	RESISTOR 10K, 5%, 1/8W	1010801031
R35	RESISTOR 10K, 5%, 1/8W	1010801031
R36	RESISTOR 330K, 5%, 1/8W	1010803344
R37	RESISTOR 10K, 5%, 1/8W	1010801031
R38	RESISTOR 22K, 5%, 1/8W	1010802232
R39	RESISTOR 22K, 5%, 1/8W	1010802232
R40	RESISTOR 10K, 5%, 1/8W	1010801031
R41	RESISTOR 10K, 5%, 1/8W	1010801031
R42	RESISTOR 10K, 5%, 1/8W	1010801031
R43	RESISTOR 100K, 5%, 1/8W	1010801040
R44	RESISTOR 10K, 5%, 1/8W	1010801031
R45	RESISTOR 47K, 5%, 1/8W	1010804731
R46	RESISTOR 10K, 5%, 1/8W	1010801031
R47	RESISTOR 22K, 5%, 1/8W	1010802232
R48	RESISTOR 10K, 5%, 1/8W	1010801031

Figure 5.8.12 PC Assembly, Audio 1A2A3, page 1/9.

R49	POT. 5K, 10% 1/2W, 4 TURNS	0197510001	R110	RESISTOR 100K, 5%, 1/8W	1010801040
R50	RESISTOR 3.3K, 5%, 1/8W	1010803328	R111	RESISTOR 100K, 5%, 1/8W	1010801040
R51	RESISTOR 2.7K, 5%, 1/8W	1010802721	R112	RESISTOR 100K, 5%, 1/8W	1010801040
R52	RESISTOR 10K, 5%, 1/8W	1010801031	R113	RESISTOR 100K, 5%, 1/8W	1010801040
R53	RESISTOR 470, 10%, 1/2W	0173900003	R114	RESISTOR 100K, 5%, 1/8W	1010801040
R54	RESISTOR 18, 5%, 1/2W	0184730007	R115	RESISTOR 100K, 5%, 1/8W	1010801040
R55	RESISTOR 1, 10%, 1/2W	0194770001	R116	RESISTOR 100K, 5%, 1/8W	1010801040
R56	RESISTOR 33, 10%, 1W	0165660007	R117	RESISTOR 100K, 5%, 1/8W	1010801040
R57	RESISTOR 1K, 5%, 1/8W	1010801023	R118	RESISTOR 39K, 5%, 1/8W	1010803930
R58	RESISTOR 47, 10%, 2W	0163720002	R119	RESISTOR 10K, 5%, 1/8W	1010801031
R59	RESISTOR 1K, 5%, 1/8W	1010801023	R120	RESISTOR 10K, 5%, 1/8W	1010801031
R60	RESISTOR 10K, 5%, 1/8W	1010801031	R121	RESISTOR 4.7K, 5%, 1/8W	1010804723
R61	RESISTOR 10K, 5%, 1/8W	1010801031	R122	RESISTOR 18K, 5%, 1/8W	1010801830
R62	POT. 10K, 10% 3/4W, 15 TURNS	0338490043	R123	RESISTOR 1K, 5%, 1/8W	1010801023
R63	RESISTOR, 56.2K, 1%, 1/8W	1008910015	R124	RESISTOR 47K, 5%, 1/8W	1010804731
R64	RESISTOR 1K AT 25C	0196110009	R125	POT. 1K, 10% 1/2, 4 TURNS	1000850021
R65	RESISTOR 12.1K, 1%, 1/8W	1008900010	R126	RESISTOR 1K, 5%, 1/8W	1010801023
R66	RESISTOR 390, 5%, 1/8W	1010803913	R127	RESISTOR 1K, 5%, 1/8W	1010801023
R67	RESISTOR 28.7K 1%, 1/8W	1004090005	R128	RESISTOR 1K, 10%, 1/4W	0171560001
R68	RESISTOR 28.7K 1%, 1/8W	1004090005	R129	RESISTOR 100K, 5%, 1/8W	1010801040
R69	RESISTOR, 4.99K, 1%, 1/8W	1005510032	R130	RESISTOR 10K, 5%, 1/8W	1010801031
R70	RESISTOR 10K, 5%, 1/8W	1010801031	R131	RESISTOR 10K, 5%, 1/8W	1010801031
R71	RESISTOR 10K, 5%, 1/8W	1010801031	R132	RESISTOR 10K, 5%, 1/8W	1010801031
R72	RESISTOR 10K, 5%, 1/8W	1010801031	R133	RESISTOR 1M, 10%, 1/4W	0170650006
R74	RESISTOR 10K, 5%, 1/8W	1010801031	R733	RESISTOR 2.2K, 5%, 1/8W	1010802224
R75	RESISTOR 10K, 5%, 1/8W	1010801031	RP1	RES NTWK 6 PIN SIP 10K COM	1006130004
R76	RESISTOR 10K, 5%, 1/8W	1010801031	T1	TRANSFORMER, AUDIO, PC MOUNT	0491650001
R77	RESISTOR 10K, 5%, 1/8W	1010801031	T2	TRANSFORMER, AUDIO, PC MOUNT	0491650001
R78	RESISTOR 4.7K, 5%, 1/8W	1010804723	U1	IC. LINEAR LF-347	1007500026
R79	POT. 10K, 10% 3/4W, 15 TURNS	0338490043	U2	IC. LINEAR LF-347	1007500026
R80	RESISTOR 4.7K, 5%, 1/8W	1010804723	U3	IC. LINEAR LF-347	1007500026
R81	RESISTOR 10K, 5%, 1/8W	1010801031	U4	IC. DIGITAL 4066BC	1004460023
R82	RESISTOR 10K, 5%, 1/8W	1010801031	U5	IC. LINEAR MC3340P	0448850001
R83	RESISTOR 4.7K, 5%, 1/8W	1010804723	U6	IC. DIGITAL 4066BC	1004460023
R84	RESISTOR 47K, 5%, 1/8W	1010804731	U7	IC. LINEAR TDA2008	1003140025
R85	POT. 10K, 10% 3/4W, 15 TURNS	0338490043	U8	IC. DIGITAL 4584B	1005190011
R86	RESISTOR 10K, 5%, 1/8W	1010801031	U9	IC. LINEAR MC3358P1	1010110012
R87	RESISTOR 10K, 5%, 1/8W	1010801031	U10	IC. LINEAR MC3358P1	1010110012
R88	RESISTOR 10K, 5%, 1/8W	1010801031	U11	IC. DIGITAL IH5041	1010130013
R89	RESISTOR 10K, 5%, 1/8W	1010801031	U12	IC. LINEAR MC3358P1	1010110012
R90	RESISTOR 22, 5%, 1/8W	1010802208	U13	IC. LINEAR 5532	1006270019
R91	RESISTOR 2.2K, 5%, 1/8W	1010802224	U14	IC. LINEAR 5532	1006270019
R92	RESISTOR 56K, 5%, 1/8W	1010805631	U15	IC. DIGITAL 4066BC	1004460023
R93	RESISTOR 47K, 5%, 1/8W	1010804731	U16	IC. DIGITAL 4081B	1006280031
R94	RESISTOR 100K, 5%, 1/8W	1010801040	U17	IC. DIGITAL 4584B	1005190011
R95	RESISTOR 100K, 5%, 1/8W	1010801040	U18	IC. DIGITAL 4066BC	1004460023
R96	RESISTOR 100K, 5%, 1/8W	1010801040	U19	IC. LINEAR NE570	1011500001
R97	RESISTOR 100K, 5%, 1/8W	1010801040	U20	IC. LINEAR MC3358P1	1010110012
R98	RESISTOR 47K, 5%, 1/8W	1010804731	U21	IC. DIGITAL 74HC14	1006490027
R99	POT. 10K, 10% 3/4W, 15 TURNS	0338490043	U22	IC. DIGITAL 74HC08	1006490019
R100	RESISTOR 10K, 5%, 1/8W	1010801031	U23	IC. DIGITAL 74HC00	1008190004
R101	RESISTOR 10K, 5%, 1/8W	1010801031	U24	IC. LINEAR UDN2935Z	1010830007
R102	RESISTOR 10K, 5%, 1/8W	1010801031	U25	IC. LINEAR UDN2935Z	1010830007
R103	RESISTOR 10K, 5%, 1/8W	1010801010	U26	IC. DIGITAL 75372	1010760017
R104	RESISTOR 22, 5%, 1/8W	1010802208	U27	IC. DIGITAL 4001B	1004660022
R105	RESISTOR 2.2K, 5%, 1/8W	1010802224		HEATSINK, SPEAKER DRIVER	8076092205
R106	RESISTOR 56K, 5%, 1/8W	1010805631		MOUNTING PLATE, AUDIO BOARD	8076091608
R107	RESISTOR 10K, 5%, 1/8W	1010801031			
R108	RESISTOR 10K, 5%, 1/8W	1010801031			
R109	RESISTOR 10K, 5%, 1/8W	1010801031			

Figure 5.8.12 PC Assembly, Audio 1A2A3, page 2/9.

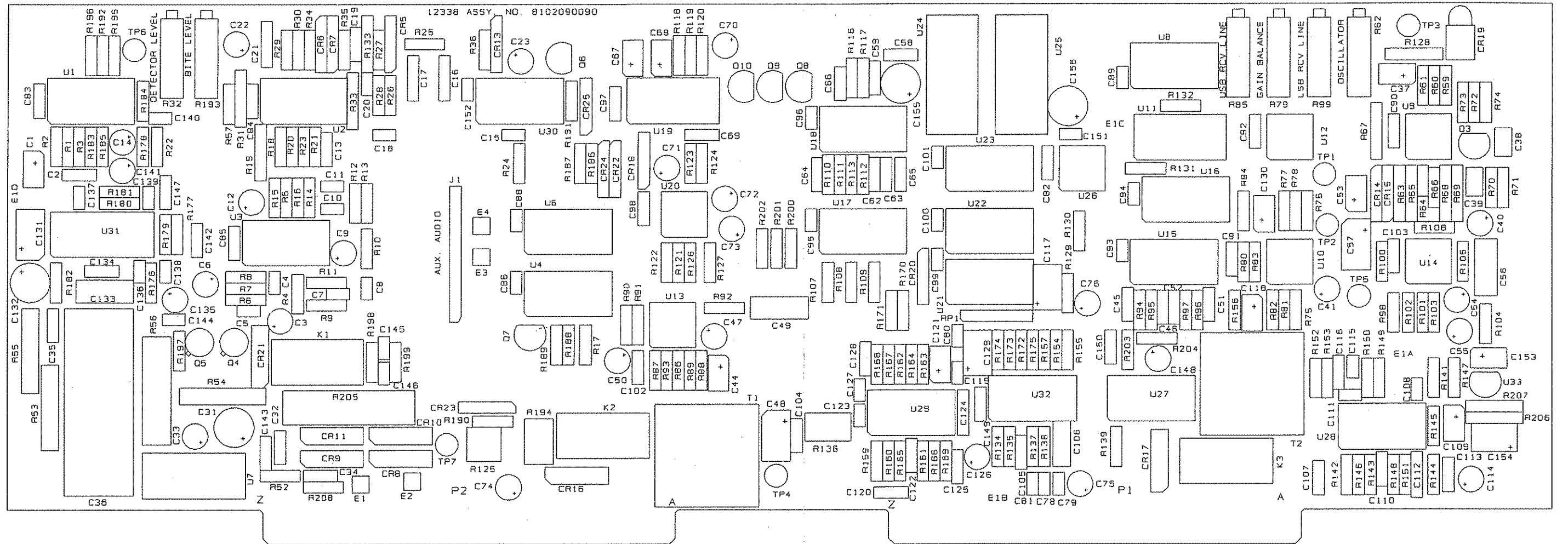


Figure 5.8.12 PC Assembly, Audio 1A2A3, page 3/9.

A1157C

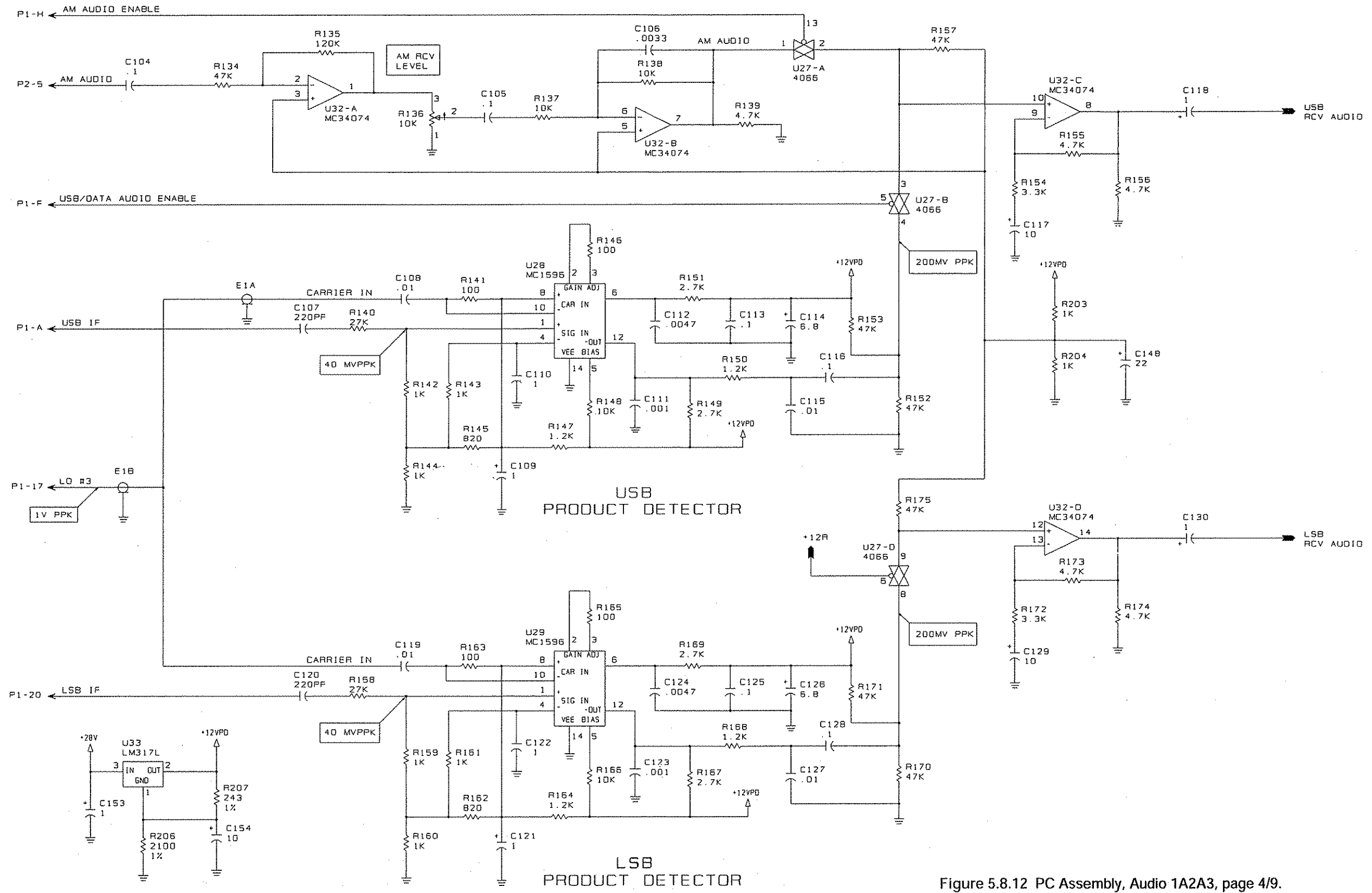


Figure 5.8.12 PC Assembly, Audio 1A2A3, page 4/9.

SUNAIR R-9200

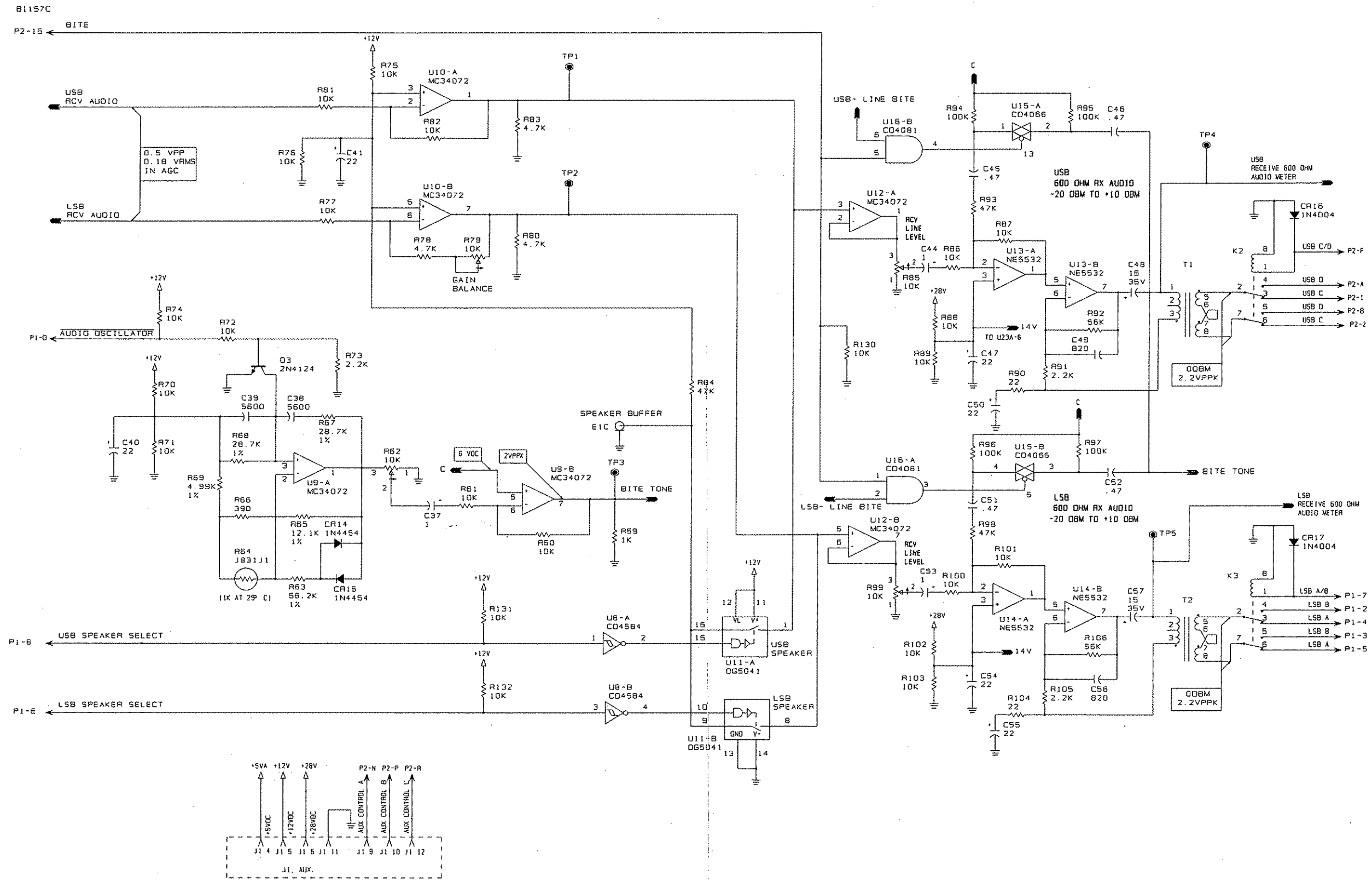


Figure 5.8.12 PC Assembly, Audio 1A2A3, page 5/9.

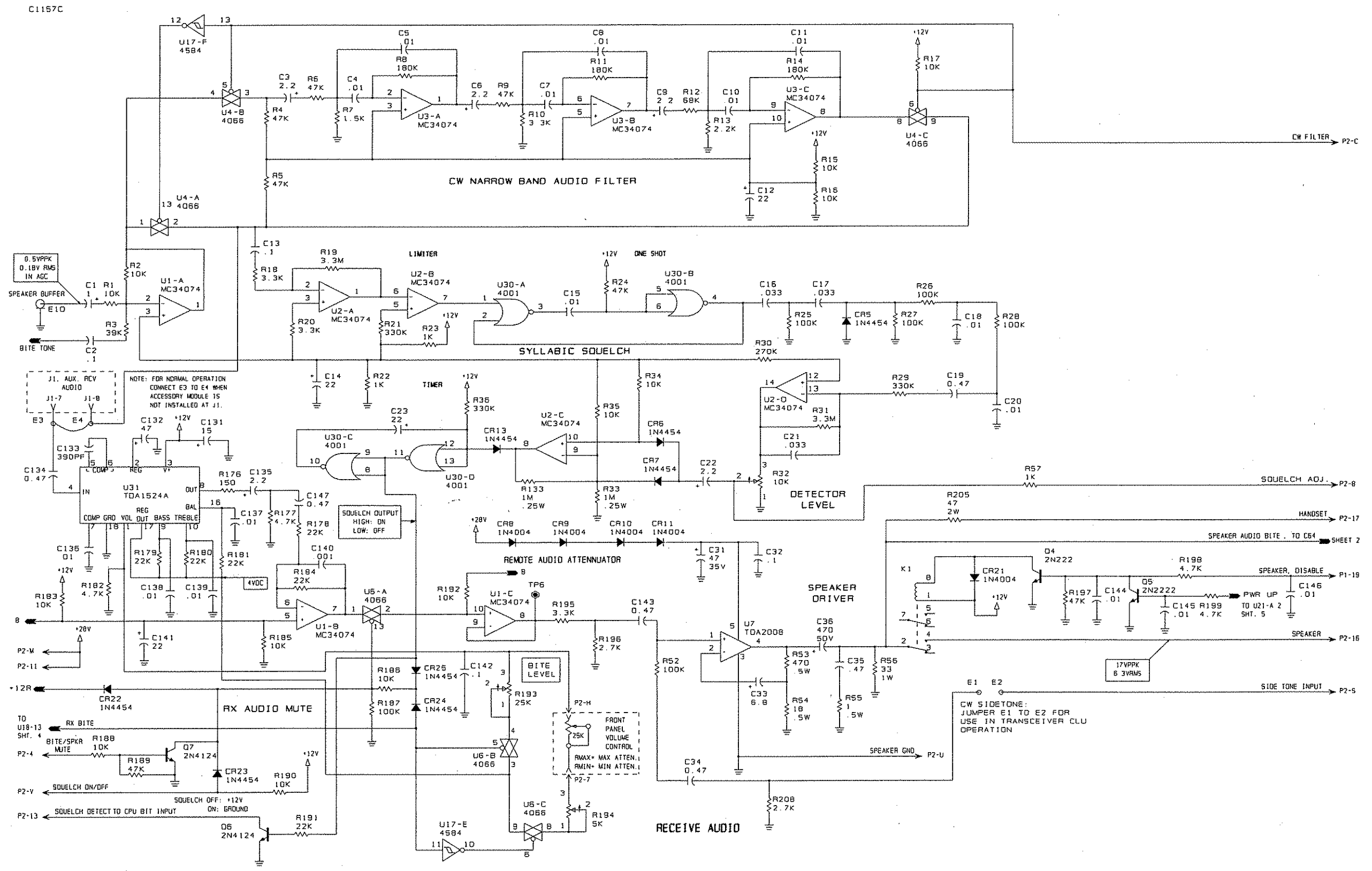


Figure 5.8.12 PC Assembly, Audio 1A2A3, page 6/9.

D1157C

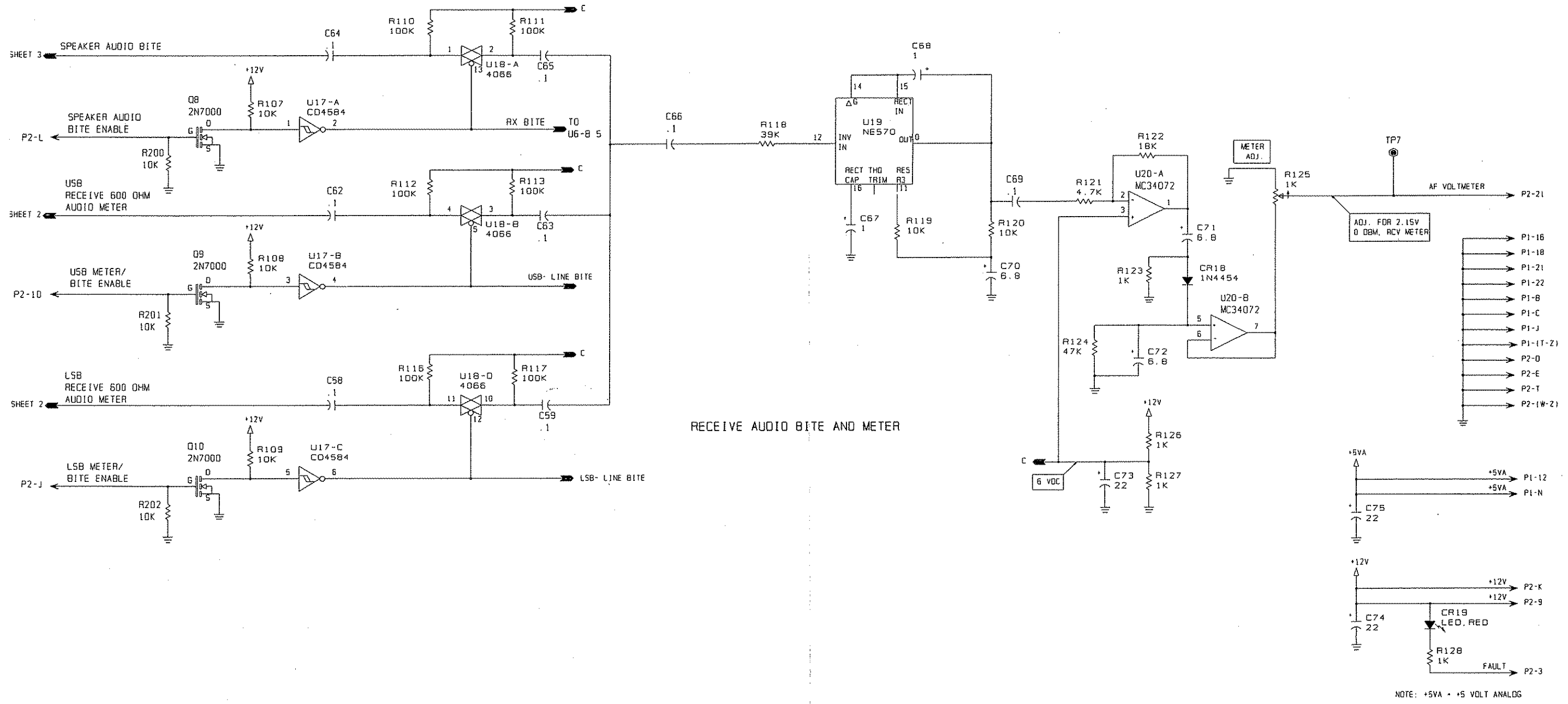


Figure 5.8.12 PC Assembly, Audio 1A2A3, page 7/9.

E1157C

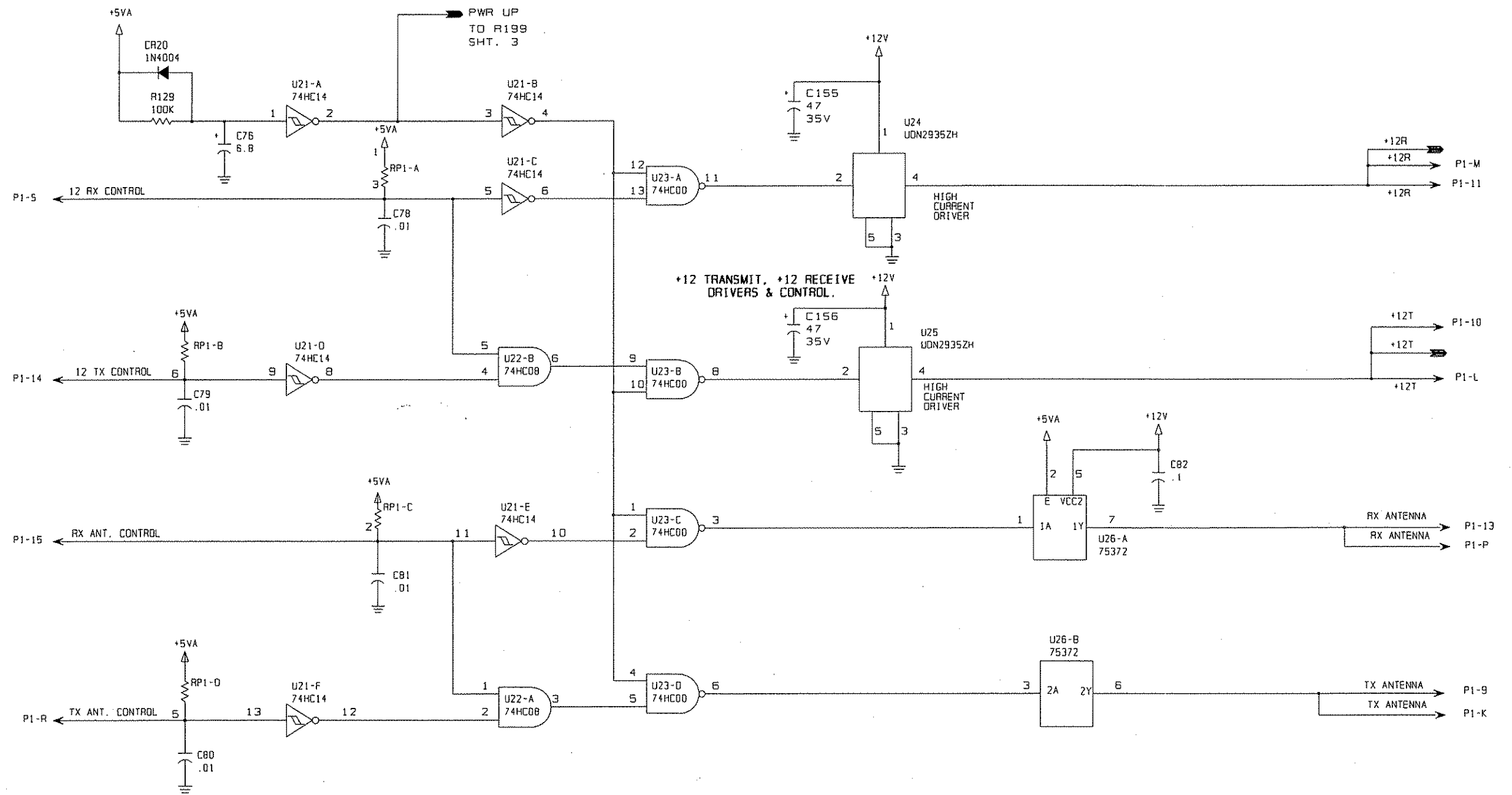
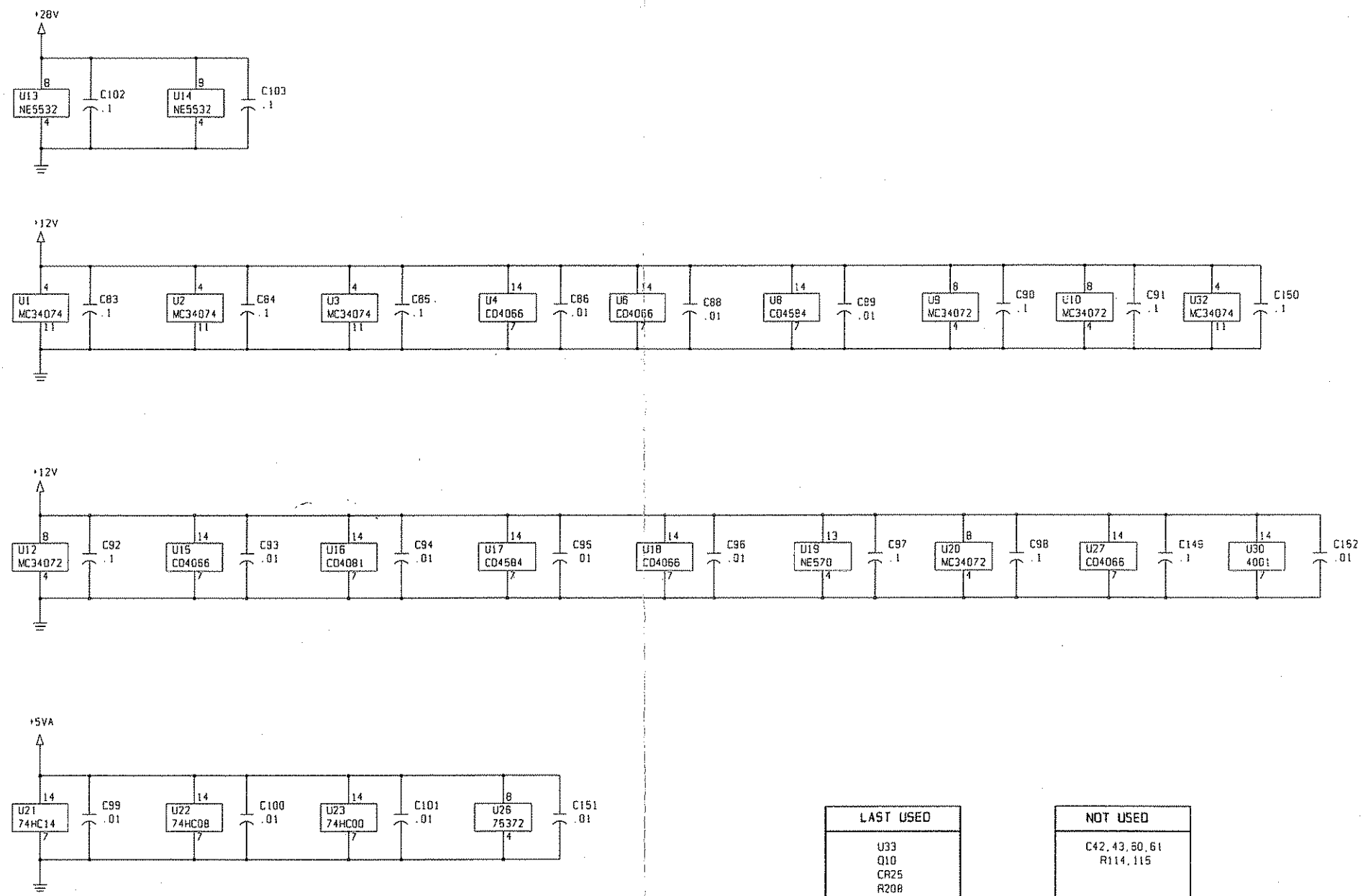


Figure 5.8.12 PC Assembly, Audio 1A2A3, page 8/9.

F1197C



NOTE: U7 SPEAKER DRIVER

LAST USED
U33
Q10
CR25
R20B
C156
T2
RP1
K3

NOT USED
C42, 43, 50, 61
R114, 115

Figure 5.8.12 PC Assembly, Audio 1A2A3, page 9/9.

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PC ASSEMBLY, IF/FILTER 1A2A4		
	PC ASSEMBLY, IF/FILTER	8102080094
C1	CAP. 15PF, 500V, DM10, 5%	0259950009
C2	CAP. 15PF, 500V, DM10, 5%	0259950009
C3	CAP. .01UF, 50V, X7R 20%	0281730008
C4	CAP. .01UF, 50V, X7R 20%	0281730008
C5	CAP. 6.8UF, 20V, T368	0296780006
C6	CAP. .01UF, 50V, X7R 20%	0281730008
C7	CAP. .01UF, 50V, X7R 20%	0281730008
C8	CAP. .01UF, 50V, X7R 20%	0281730008
C9	CAP. .01UF, 50V, X7R 20%	0281730008
C10	CAP. .01UF, 50V, X7R 20%	0281730008
C11	CAP. .01UF, 50V, X7R 20%	0281730008
C12	CAP. 15UF, 15V, 196D	0281720002
C13	CAP. .01UF, 50V, X7R 20%	0281730008
C14	CAP. .01UF, 50V, X7R 20%	0281730008
C15	CAP. .01UF, 50V, X7R 20%	0281730008
C16	CAPACITOR 0.1UF, 50V, X7R	1011180014
C17	CAPACITOR 0.1UF, 50V, X7R	1011180014
C18	CAPACITOR 0.1UF, 50V, X7R	1011180014
C19	CAP. .01UF, 50V, X7R 20%	0281730008
C20	CAPACITOR 0.1UF, 50V, X7R	1011180014
C21	CAP. .01UF, 50V, X7R 20%	0281730008
C22	CAPACITOR 0.1UF, 50V, X7R	1011180014
C23	CAP. .01UF, 50V, X7R 20%	0281730008
C24	CAP. 110PF, 500V, DM10, 5%	0257750002
C25	CAP. 180PF, 500V, DM10, 5%	0294100008
C26	CAP. 110PF, 500V, DM10, 5%	0257750002
C27	CAP. .01UF, 50V, X7R 20%	0281730008
C28	CAP. .01UF, 50V, X7R 20%	0281730008
C29	CAPACITOR 0.1UF, 50V, X7R	1011180014
C30	CAP. .01UF, 50V, X7R 20%	0281730008
C31	CAP. .01UF, 50V, X7R 20%	0281730008
C32	CAPACITOR 0.1UF, 50V, X7R	1011180014
C33	CAPACITOR 0.1UF, 50V, X7R	1011180014
C34	CAPACITOR 0.1UF, 50V, X7R	1011180014
C35	CAPACITOR 0.1UF, 50V, X7R	1011180014
C36	CAP. .01UF, 50V, X7R 20%	0281730008
C37	CAP. .01UF, 50V, X7R 20%	0281730008
C38	CAP. 15UF, 15V, 196D	0281720002
C39	CAP. .01UF, 50V, X7R 20%	0281730008
C40	CAP. .01UF, 50V, X7R 20%	0281730008
C41	CAP. .01UF, 50V, X7R 20%	0281730008
C42	CAP. .01UF, 50V, X7R 20%	0281730008
C43	CAP. .01UF, 50V, X7R 20%	0281730008
C44	CAP. .01UF, 50V, X7R 20%	0281730008
C45	CAP. .01UF, 50V, X7R 20%	0281730008
C46	CAP. 6.8UF, 20V, T368	0296780006
C47	CAP. .01UF, 50V, X7R 20%	0281730008
C48	CAP. .01UF, 50V, X7R 20%	0281730008
C49	CAP. .01UF, 50V, X7R 20%	0281730008
C50	CAP. .01UF, 50V, X7R 20%	0281730008
C51	CAP. .01UF, 50V, X7R 20%	0281730008
C52	CAPACITOR 0.1UF, 50V, X7R	1011180014
C53	CAP. 10PF, 500V, DM10	0259830003
C54	CAP. 10PF, 500V, DM10	0259830003
C55	CAP. 1UF, 35V, 196D	0281660000
C56	CAP. .01UF, 50V, X7R 20%	0281730008
C57	CAP. .01UF, 50V, X7R 20%	0281730008

C58	CAP. 10PF, 500V, DM10	0259830003
C59	CAPACITOR 0.1UF, 50V, X7R	1011180014
C60	CAP. 1UF, 35V, 196D	0281660000
C61	CAP. .01UF, 50V, X7R 20%	0281730008
C62	CAP. 10PF, 500V, DM10	0259830003
C63	CAPACITOR 0.1UF, 50V, X7R	1011180014
C64	CAP. 110PF, 500V, DM10, 5%	0257750002
C65	CAP. 110PF, 500V, DM10, 5%	0257750002
C66	CAPACITOR 0.1UF, 50V, X7R	1011180014
C67	CAP. 15UF, 35V	0282240004
C68	CAPACITOR 0.1UF, 50V, X7R	1011180014
C69	CAP. 22UF, 15V, T368	0296660001
C70	CAP. 15UF, 35V	0282240004
C71	CAPACITOR 0.1UF, 50V, X7R	1011180014
C72	CAP. 22UF, 15V, T368	0296660001
C73	CAPACITOR 0.1UF, 50V, X7R	1011180014
C74	CAPACITOR 0.1UF, 50V, X7R	1011180014
C75	CAP. .01UF, 50V, X7R 20%	0281730008
C76	CAP. .01UF, 50V, X7R 20%	0281730008
C77	CAPACITOR 0.1UF, 50V, X7R	1011180014
C78	CAP. 110PF, 500V, DM10, 5%	0257750002
C79	CAP. .01UF, 50V, X7R 20%	0281730008
C80	CAPACITOR 0.1UF, 50V, X7R	1011180014
C81	CAP. 10PF, 500V, DM10	0259830003
C82	CAP. 1UF, 35V, 196D	0281660000
C83	CAP. 10PF, 500V, DM10	0259830003
C84	CAP. .01UF, 50V, X7R 20%	0281730008
C85	CAP. .01UF, 50V, X7R 20%	0281730008
C86	CAP. 10PF, 500V, DM10	0259830003
C87	CAPACITOR 0.1UF, 50V, X7R	1011180014
C88	CAP. 10PF, 500V, DM10	0259830003
C89	CAP. 1UF, 35V, 196D	0281660000
C90	CAP. .01UF, 50V, X7R 20%	0281730008
C91	CAP. .01UF, 50V, X7R 20%	0281730008
C92	CAPACITOR 0.1UF, 50V, X7R	1011180014
C93	CAP. 1UF, 35V, 196D	0281660000
C94	CAP. .01UF, 50V, X7R 20%	0281730008
C101	CAP. 110PF, 500V, DM10, 5%	0257750002
C102	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C103	CAPACITOR 0.1UF, 50V, X7R	1011180014
C104	CAPACITOR 0.1UF, 50V, X7R	1011180014
C105	CAP. 6.8UF, 20V, T368	0296780006
C106	CAPACITOR 0.1UF, 50V, X7R	1011180014
C107	CAPACITOR 0.1UF, 50V, X7R	1011180014
C108	CAPACITOR 0.1UF, 50V, X7R	1011180014
C109	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C110	CAPACITOR 0.1UF, 50V, X7R	1011180014
C111	CAPACITOR 0.1UF, 50V, X7R	1011180014
C112	CAPACITOR 0.1UF, 50V, X7R	1011180014
C113	CAPACITOR 0.1UF, 50V, X7R	1011180014
C114	CAPACITOR 0.1UF, 50V, X7R	1011180014
C115	CAPACITOR 0.1UF, 50V, X7R	1011180014
C116	CAPACITOR 0.1UF, 50V, X7R	1011180014
C117	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C118	CAPACITOR 0.1UF, 50V, X7R	1011180014
C119	CAPACITOR 0.1UF, 50V, X7R	1011180014
C120	CAPACITOR 0.1UF, 50V, X7R	1011180014
C121	CAPACITOR 0.1UF, 50V, X7R	1011180014
C122	CAPACITOR 0.1UF, 50V, X7R	1011180014
C123	CAP. 0.001UF, 100V, X7R, 20%	0281630003

C124	CAPACITOR 0.1UF, 50V, X7R	1011180014
C125	CAPACITOR 0.1UF, 50V, X7R	1011180014
C126	CAP. 6.8UF, 20V, T368	0296780006
C127	CAPACITOR 0.1UF, 50V, X7R	1011180014
C128	CAPACITOR 0.1UF, 50V, X7R	1011180014
C129	CAPACITOR 0.1UF, 50V, X7R	1011180014
C130	CAPACITOR 0.1UF, 50V, X7R	1011180014
C131	CAPACITOR 0.1UF, 50V, X7R	1011180014
C132	CAPACITOR 0.1UF, 50V, X7R	1011180014
C133	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C134	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C135	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C136	CAPACITOR 0.1UF, 50V, X7R	1011180014
C137	CAP. .01UF, 50V, X7R 20%	0281730008
C138	CAP. 15UF, 15V, 196D	0281720002
C139	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C140	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C141	CAPACITOR 0.1UF, 50V, X7R	1011180014
C142	CAPACITOR 0.1UF, 50V, X7R	1011180014
C143	CAP. .01UF, 50V, X7R 20%	0281730008
C144	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C145	CAPACITOR 0.1UF, 50V, X7R	1011180014
C146	CAPACITOR 0.1UF, 50V, X7R	1011180014
C147	CAP. .01UF, 50V, X7R 20%	0281730008
C148	CAP. .01UF, 50V, X7R 20%	0281730008
C149	CAP. .01UF, 50V, X7R 20%	0281730008
C150	CAPACITOR 0.1UF, 50V, X7R	1011180014
C151	CAP. .02UF, 25V, Y5U/Y5P	0269130004
C152	CAP. 15UF, 15V, 196D	0281720002
C153	CAP. 22UF, 15V, T368	0296660001
C154	CAPACITOR 0.1UF, 50V, X7R	1011180014
C155	CAP. .01UF, 50V, X7R 20%	0281730008
C156	CAPACITOR 0.1UF, 50V, X7R	1011180014
C157	CAP. .47UF, 50V, X7R 20%	0283377771
C158	CAP. .47UF, 50V, X7R 20%	0283377771
C159	CAP. .47UF, 50V, X7R 20%	0283377771
C160	CAP. .01UF, 50V, X7R 20%	0281730008
C161	CAP. .01UF, 50V, X7R 20%	0281730008
C162	CAP. 220PF, 500V, DM10, 2%	1010870009
C163	CAPACITOR 0.1UF, 50V, X7R	1011180014
C164	CAP. 1UF, 35V, 196D	0281660000
C165	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C166	CAP.0.0047UF, 50V,5/10%	0281540004
C167	CAPACITOR 0.1UF, 50V, X7R	1011180014
C168	CAP. 6.8UF, 20V, T368	0296780006
C169	CAP. .01UF, 50V, X7R 20%	0281730008
C170	CAPACITOR 0.1UF, 50V, X7R	1011180014
C171	CAP. 10UF, 20V	1007290005
C172	CAP. 1UF, 35V, 196D	0281660000
C173	CAP. .01UF, 50V, X7R 20%	0281730008
C174	CAPACITOR 0.1UF, 50V, X7R	1011180014
C175	CAPACITOR 0.1UF, 50V, X7R	1011180014
C176	CAP. .01UF, 50V, X7R 20%	0281730008
C177	CAP. 15UF, 15V, 196D	0281720002
C178	CAP. 0.001UF, 100V, X7R, 20%	0281630003
C179	CAP. .02UF, 25V, Y5U/Y5P	0269130004
C180	CAP. 110PF, 500V, DM10, 5%	0257750002
C181	CAPACITOR 0.1UF, 50V, X7R	1011180014
C182	CAP. .01UF, 50V, X7R 20%	0281730008
C183	CAP. .02UF, 25V, Y5U/Y5P	0269130004

Figure 5.8.13 PC Assembly, IF 1A2A4, page 1/9.

C184	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR16	DIODE, PIN 1N5767	0405570007	L12	INDUCTOR, MOLDED, 47UH, 5%	0646420003
C185	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR17	DIODE, PIN 1N5767	0405570007	L13	INDUCTOR, MOLDED, 47UH, 5%	0646420003
C186	CAP. .01UF, 50V, X7R 20%	0281730008	CR18	DIODE, PIN 1N5767	0405570007	L14	INDUCTOR, MOLDED, 1000UH, 10%	0664940005
C187	CAP. .01UF, 50V, X7R 20%	0281730008	CR19	DIODE, LED, RED, PC MOUNT	1008480029	L15	INDUCTOR, MOLDED, 1000UH, 10%	0664940005
C188	CAP. .01UF, 50V, X7R 20%	0281730008	CR20	DIODE, SIGNAL, SIL. 1N4454	0405270003	L16	INDUCTOR, MOLDED, 1000UH, 10%	0664940005
C189	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR21	DIODE, SIGNAL, SIL. 1N4454	0405270003	L17	INDUCTOR, MOLDED, 1000UH, 10%	0664940005
C190	CAP. .02UF, 25V, Y5U/Y5P	0269130004	CR22	DIODE, SIGNAL, SIL. 1N4454	0405270003	L19	INDUCTOR, MOLDED, 150UH, 5%	0659190001
C191	CAP. 15UF, 15V, 196D	0281720002	CR23	DIODE, PIN 1N5767	0405570007	L20	INDUCTOR, MOLDED, 150UH, 5%	0659190001
C192	CAP. 22UF, 15V, T368	0296660001	CR24	DIODE, PIN 1N5767	0405570007	L22	INDUCTOR, MOLDED, 1000UH, 10%	0664940005
C193	CAP. .01UF, 50V, X7R 20%	0281730008	CR25	DIODE, PIN 1N5767	0405570007	L23	INDUCTOR, MOLDED, 1000UH, 10%	0664940005
C194	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR26	DIODE, PIN 1N5767	0405570007	L24	INDUCTOR, MOLDED, 1000UH, 10%	0664940005
C195	CAP. .47UF, 50V, X7R 20%	0283377771	CR27	DIODE, PIN 1N5767	0405570007	L25	INDUCTOR, MOLDED, 0.18UH, 5%	0648740005
C196	CAP. .47UF, 50V, X7R 20%	0283377771	CR28	DIODE, PIN 1N5767	0405570007	L26	INDUCTOR, MOLDED, 0.18UH, 5%	0648740005
C197	CAP. .47UF, 50V, X7R 20%	0283377771	CR31	DIODE, PIN 1N5767	0405570007	P3	CONNECTOR, RF, RIGHT ANGLE	1010730002
C198	CAP. .01UF, 50V, X7R 20%	0281730008	CR32	DIODE, PIN 1N5767	0405570007	P4	CONNECTOR, RF, RIGHT ANGLE	1010730002
C199	CAP. 0.0033UF, 100V, NPO, 10%	0282580000	CR33	DIODE, PIN 1N5767	0405570007	Q1	TRANSISTOR, N-CH, FET U310	1007050039
C200	CAP. .01UF, 50V, X7R 20%	0281730008	CR34	DIODE, PIN 1N5767	0405570007	Q2	TRANSISTOR, N-CH, FET U310	1007050039
C201	CAP. 220PF, 500V, DM10, 2%	1010870009	CR35	DIODE, PIN 1N5767	0405570007	Q3	TRANSISTOR, N-CH, FET 2N5457	1010120026
C202	CAP. 1UF, 35V, 196D	0281660000	CR36	DIODE, PIN 1N5767	0405570007	Q4	TRANSISTOR, N-CH, FET 2N5457	1010120026
C203	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR37	DIODE, PIN 1N5767	0405570007	Q5	TRANSISTOR, N-CH, FET 2N5457	1010120026
C204	CAP. 0.001UF, 100V, X7R, 20%	0281630003	CR38	DIODE, PIN 1N5767	0405570007	Q6	TRANSISTOR, N-CH, FET 2N5457	1010120026
C205	CAP. .01UF, 50V, X7R 20%	0281730008	CR39	DIODE, PIN 1N5767	0405570007	Q7	TRANSISTOR, N-CH, FET 2N7000	1011050013
C206	CAP.0.0047UF, 50V,5/10%	0281540004	CR40	DIODE, PIN 1N5767	0405570007	Q8	TRANSISTOR, N-CH, FET 2N7000	1011050013
C207	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR41	DIODE, PIN 1N5767	0405570007	Q9	TRANSISTOR, N-CH, FET 2N7000	1011050013
C208	CAP. 6.8UF, 20V, T368	0296780006	CR42	DIODE, PIN 1N5767	0405570007	Q10	TRANSISTOR, NPN, SI. 2N2222A	0448580004
C209	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR43	DIODE, SIGNAL, SIL. 1N4454	0405270003	Q11	TRANSISTOR, NPN, SI. 2N2222A	0448580004
C210	CAP. 10UF, 20V	1007290005	CR44	DIODE, SIGNAL, SIL. 1N4454	0405270003	Q12	TRANSISTOR, N-CH, FET 2N7000	1011050013
C211	CAP. 1UF, 35V, 196D	0281660000	CR45	DIODE, SIGNAL, SIL. 1N4454	0405270003	Q13	TRANSISTOR, N-CH, FET 2N7000	1011050013
C212	CAP. .01UF, 50V, X7R 20%	0281730008	CR46	DIODE, SIGNAL, SIL. 1N4454	0405270003	Q14	TRANSISTOR, N-CH, FET 2N7000	1011050013
C213	CAP. .01UF, 50V, X7R 20%	0281730008	CR47	DIODE, SIGNAL, SIL. 1N4454	0405270003	Q15	TRANSISTOR, NPN, SI. 2N2222A	0448580004
C214	CAP. .01UF, 50V, X7R 20%	0281730008	CR48	DIODE, SIGNAL, SIL. 1N4454	0405270003	Q16	TRANSISTOR, NPN, SI. 2N2222A	0448580004
C215	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR49	DIODE, SIGNAL, SIL. 1N4454	0405270003	R1	RESISTOR 47, 5%, 1/8W	1010804707
C216	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR50	DIODE, SIGNAL, SIL. 1N4454	0405270003	R2	RESISTOR 1.8K, 5%, 1/8W	1010801821
C218	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR51	DIODE, SIGNAL, SIL. 1N4454	0405270003	R3	RESISTOR 1.8K, 5%, 1/8W	1010801821
C219	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR52	DIODE, SIGNAL, SIL. 1N4454	0405270003	R4	RESISTOR 2.2K, 5%, 1/8W	1010802224
C220	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR53	DIODE, SIGNAL, SIL. 1N4454	0405270003	R5	RESISTOR 2.2K, 5%, 1/8W	1010802224
C221	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR54	DIODE, SIGNAL, SIL. 1N4454	0405270003	R6	RESISTOR 100, 10%, 1W	0165540001
C222	CAP. .01UF, 50V, X7R 20%	0281730008	CR55	DIODE, PIN 1N5767	0405570007	R7	RESISTOR 100, 5%, 1/8W	1010801015
C223	CAP. .01UF, 50V, X7R 20%	0281730008	CR56	DIODE, PIN 1N5767	0405570007	R8	RESISTOR 1.8K, 5%, 1/8W	1010801821
C224	CAP. 0.001UF, 100V, X7R, 20%	0281630003	CR57	DIODE, SIGNAL, SIL. 1N4454	0405270003	R9	RESISTOR 47, 5%, 1/8W	1010804707
C225	CAPACITOR 0.1UF, 50V, X7R	1011180014	CR58	DIODE, SIGNAL, SIL. 1N4454	0405270003	R10	RESISTOR 1.8K, 5%, 1/8W	1010801821
C226	CAPACITOR 0.1UF, 50V, X7R	1011180014	FB1	FERRITE BEAD, 5000 PERM	1010980017	R11	RESISTOR 2.2K, 5%, 1/8W	1010802224
C227	CAP. .01UF, 50V, X7R 20%	0281730008	FB2	FERRITE BEAD, 5000 PERM	1010980017	R12	RESISTOR 2.2K, 5%, 1/8W	1010802224
C227	CAPACITOR 0.1UF, 50V, X7R	1011180014	FB3	FERRITE BEAD, 5000 PERM	1010980017	R13	RESISTOR 220, 10%, 1/2W	0172850002
C228	CAP. .01UF, 50V, X7R 20%	0281730008	FB4	FERRITE BEAD, 5000 PERM	1010980017	R14	RESISTOR 150, 5%, 1/8W	1010801511
C229	CAPACITOR 0.1UF, 50V, X7R	1011180014	FL1	FILTER, CRYSTAL 48.305 MHZ	1010430017	R15	RESISTOR 150, 5%, 1/8W	1010801511
C230	CAP. .01UF, 50V, X7R 20%	0281730008	FL2	FILTER, USB (LSB OPERATION)	8076083303	R16	RESISTOR 150, 5%, 1/8W	1010801511
CR1	DIODE, PIN 1N5767	0405570007	FL4	FILTER, LSB (USB OPERATION)	8076082501	R17	RESISTOR 39, 5% 1/8W	1010803905
CR2	DIODE, PIN 1N5767	0405570007	FL6	FILTER, CERAMIC, AM 455KHZ	1010380010	R18	RESISTOR 150, 5%, 1/8W	1010801511
CR3	DIODE, PIN 1N5767	0405570007	L1	INDUCTOR, MOLDED, 0.68UH, 5%	0649030001	R19	RESISTOR 150, 5%, 1/8W	1010801511
CR4	DIODE, PIN 1N5767	0405570007	L2	INDUCTOR, MOLDED, 0.68UH, 5%	0649030001	R20	RESISTOR 39, 5% 1/8W	1010803905
CR5	DIODE, PIN 1N5767	0405570007	L3	INDUCTOR, MOLDED, 1000UH, 10%	0664940005	R21	RESISTOR 150, 5%, 1/8W	1010801511
CR6	DIODE, PIN 1N5767	0405570007	L4	INDUCTOR, MOLDED, 8.2UH, 5%	0652060005	R22	RESISTOR 150, 5%, 1/8W	1010801511
CR7	DIODE, PIN 1N5767	0405570007	L5	INDUCTOR, MOLDED, 8.2UH, 5%	0652060005	R23	RESISTOR 150, 5%, 1/8W	1010801511
CR8	DIODE, PIN 1N5767	0405570007	L6	INDUCTOR, MOLDED, 8.2UH, 5%	0652060005	R24	RESISTOR 220, 10%, 1/2W	0172850002
CR9	DIODE, PIN 1N5767	0405570007	L7	INDUCTOR, MOLDED, 8.2UH, 5%	0652060005	R25	RESISTOR 2.2K, 5%, 1/8W	1010802224
CR10	DIODE, PIN 1N5767	0405570007	L8	INDUCTOR, MOLDED, 1000UH, 10%	0664940005	R26	RESISTOR 2.2K, 5%, 1/8W	1010802224
CR11	DIODE, PIN 1N5767	0405570007	L9	INDUCTOR, MOLDED, 1000UH, 10%	0664940005	R27	RESISTOR 1.8K, 5%, 1/8W	1010801821
CR12	DIODE, PIN 1N5767	0405570007	L10	INDUCTOR, MOLDED, 1000UH, 10%	0664940005	R28	RESISTOR 47, 5%, 1/8W	1010804707
CR15	DIODE, PIN 1N5767	0405570007	L11	INDUCTOR, MOLDED, 1000UH, 10%	0664940005	R29	RESISTOR 100, 10%, 1W	0165540001

Figure 5.8.13 PC Assembly, IF 1A2A4, page 2/9.

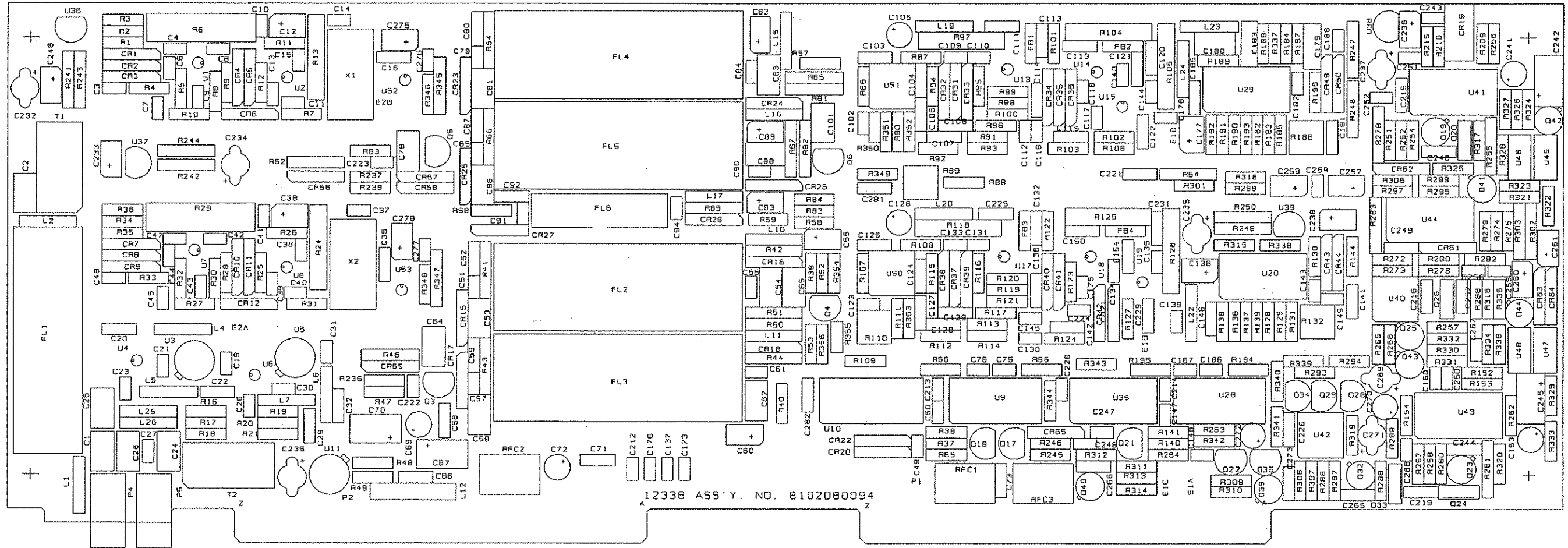


Figure 5.8.13 PC Assembly, IF 1A2A4, page 4/9.

A1163C

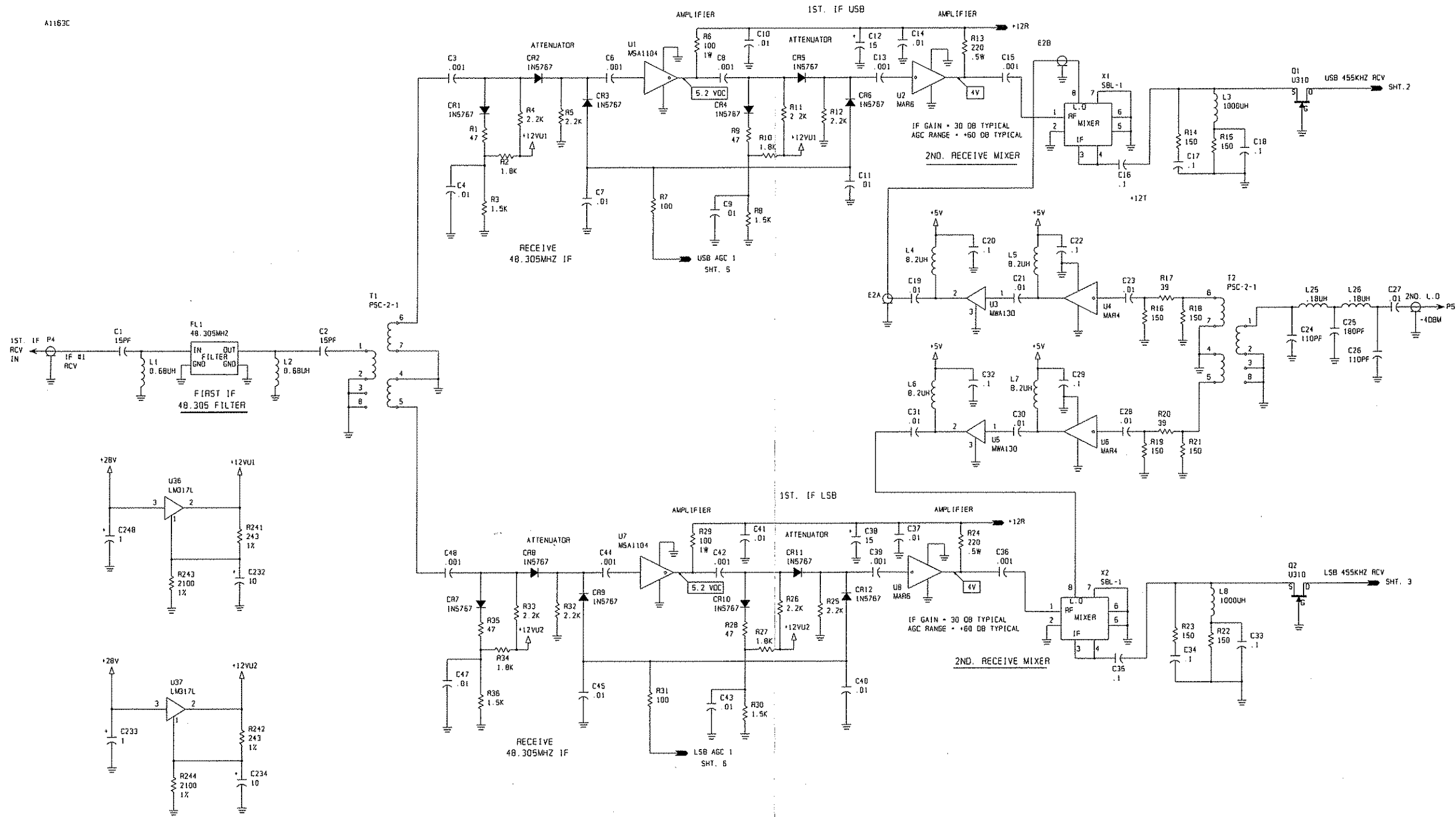


Figure 5.8.13 PC Assembly, IF 1A2A4, page 5/9.

81163C

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DATA	1	0
AM	0	1

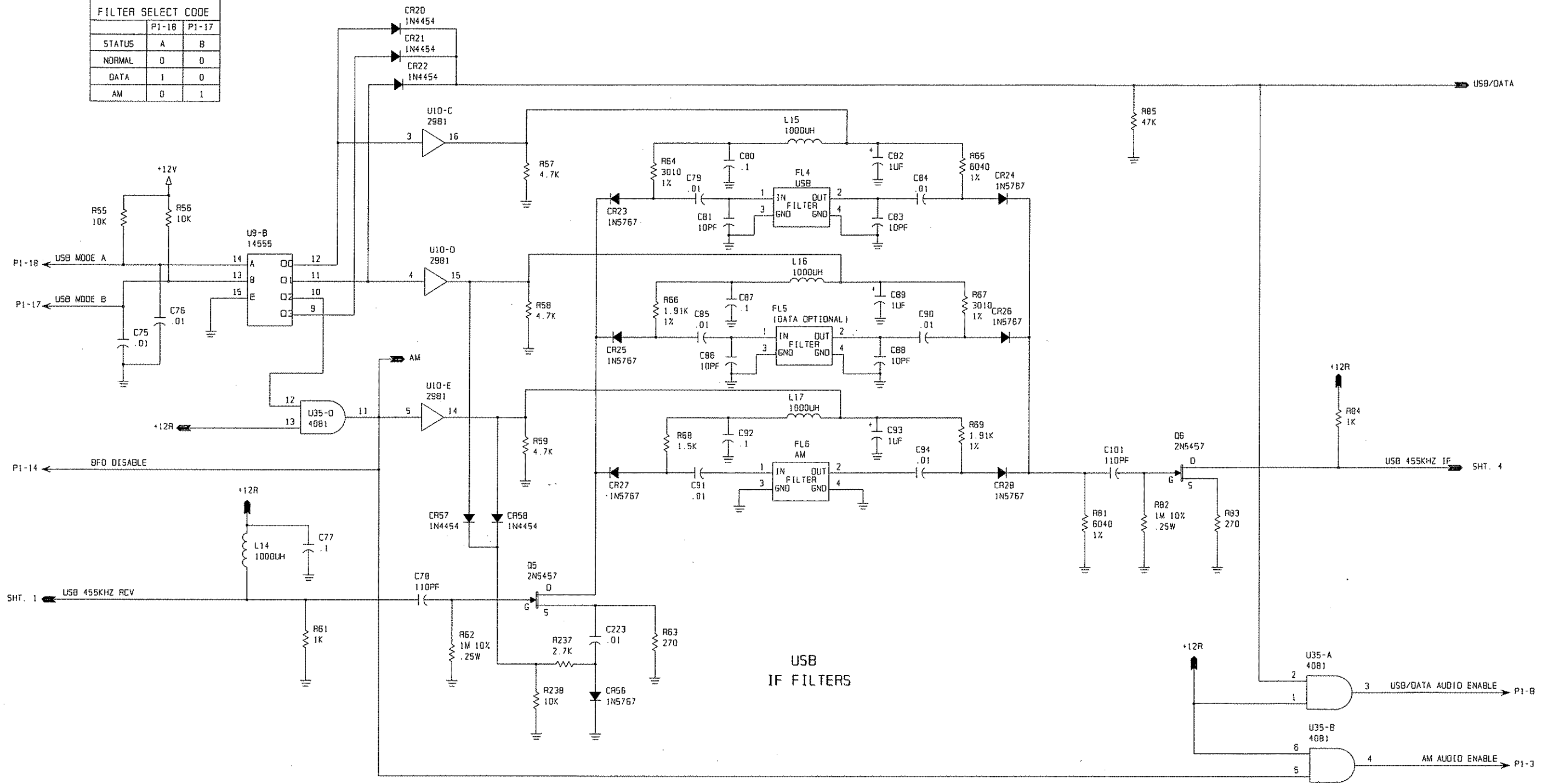


Figure 5.8.13 PC Assembly, IF 1A2A4, page 6/9.

C1163C

FILTER SELECT CODE		
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NORMAL	I	I
DATA	I	O

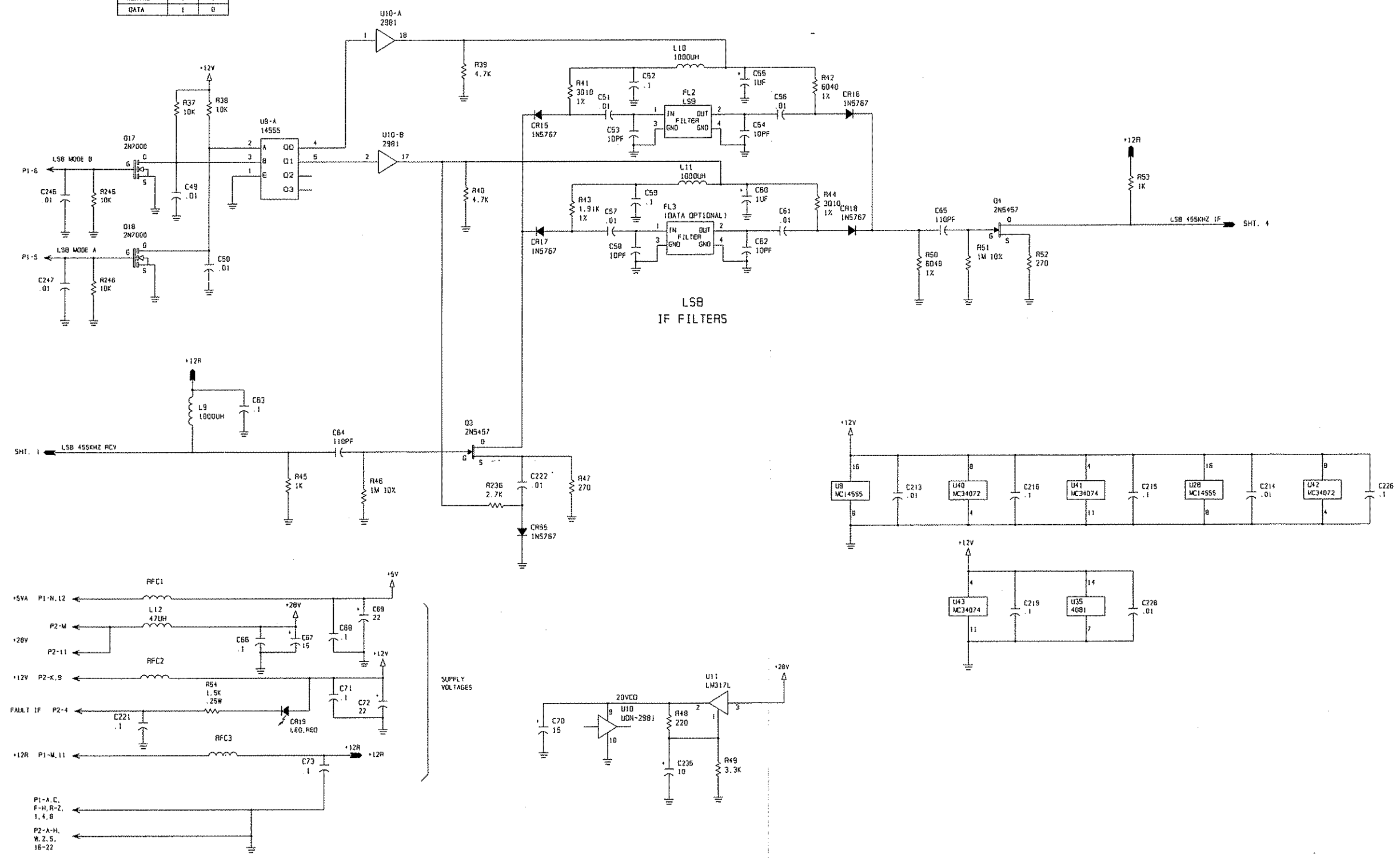


Figure 5.8.13 PC Assembly, IF 1A2A4, page 7/9.

01163C

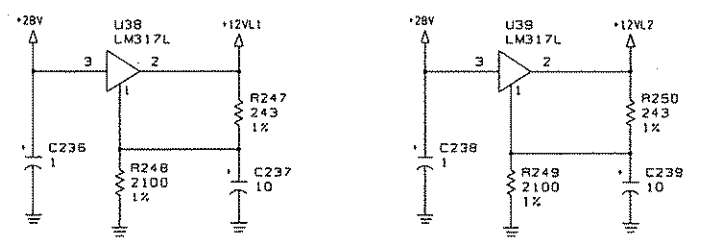
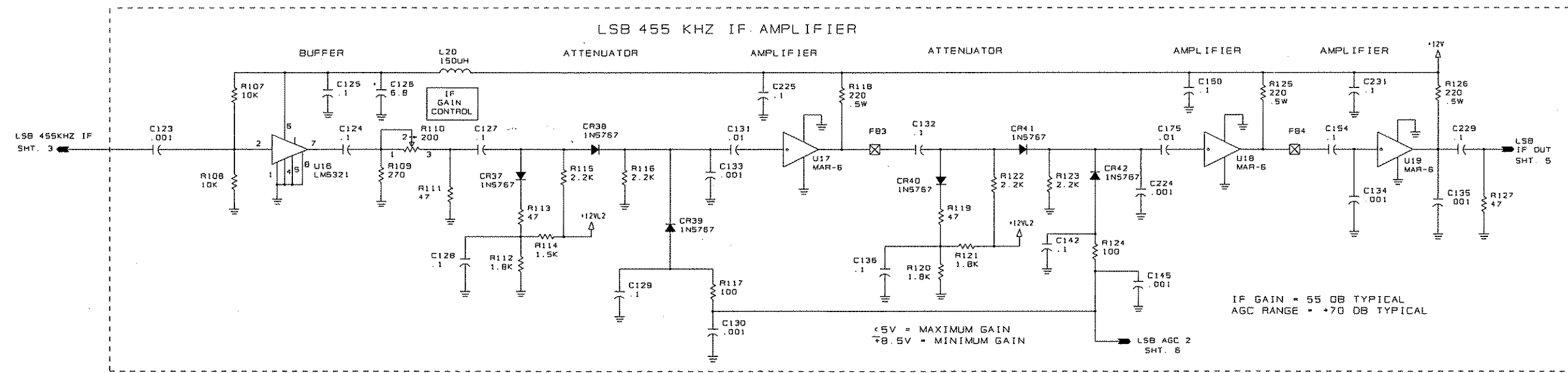
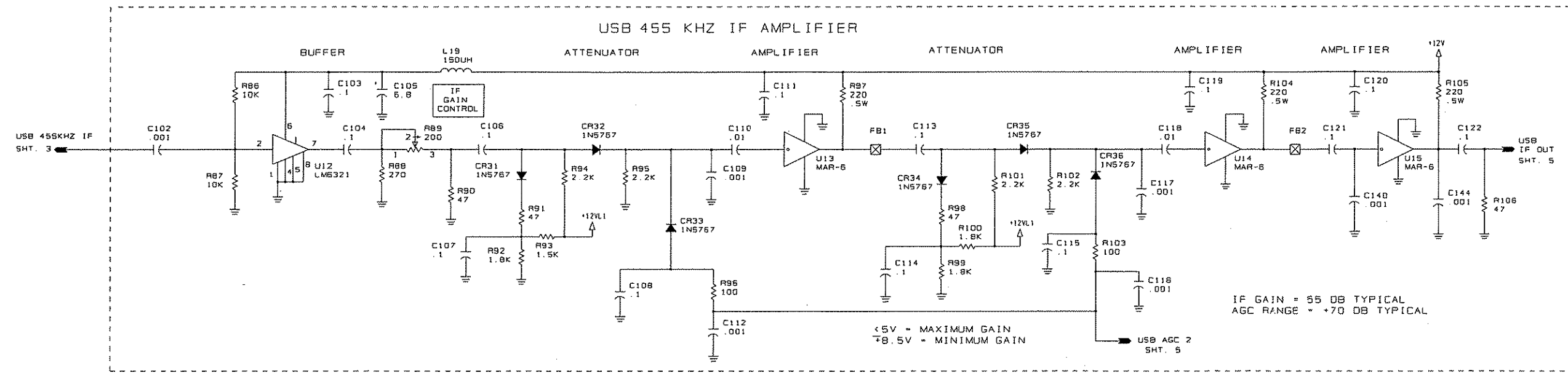


Figure 5.8.13 PC Assembly, IF 1A2A4, page 8/9.

SUNAIR R-9200

E1163C

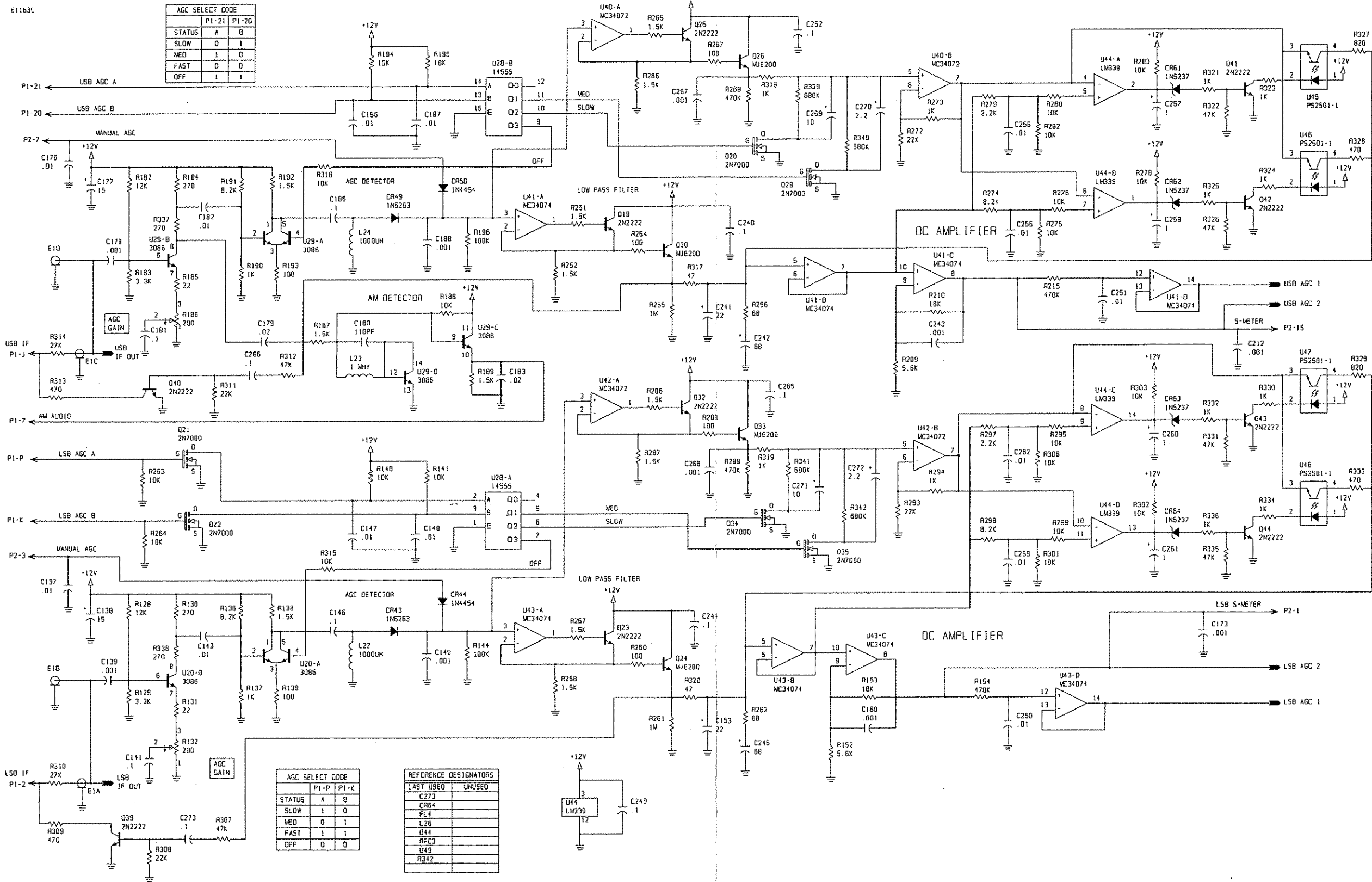
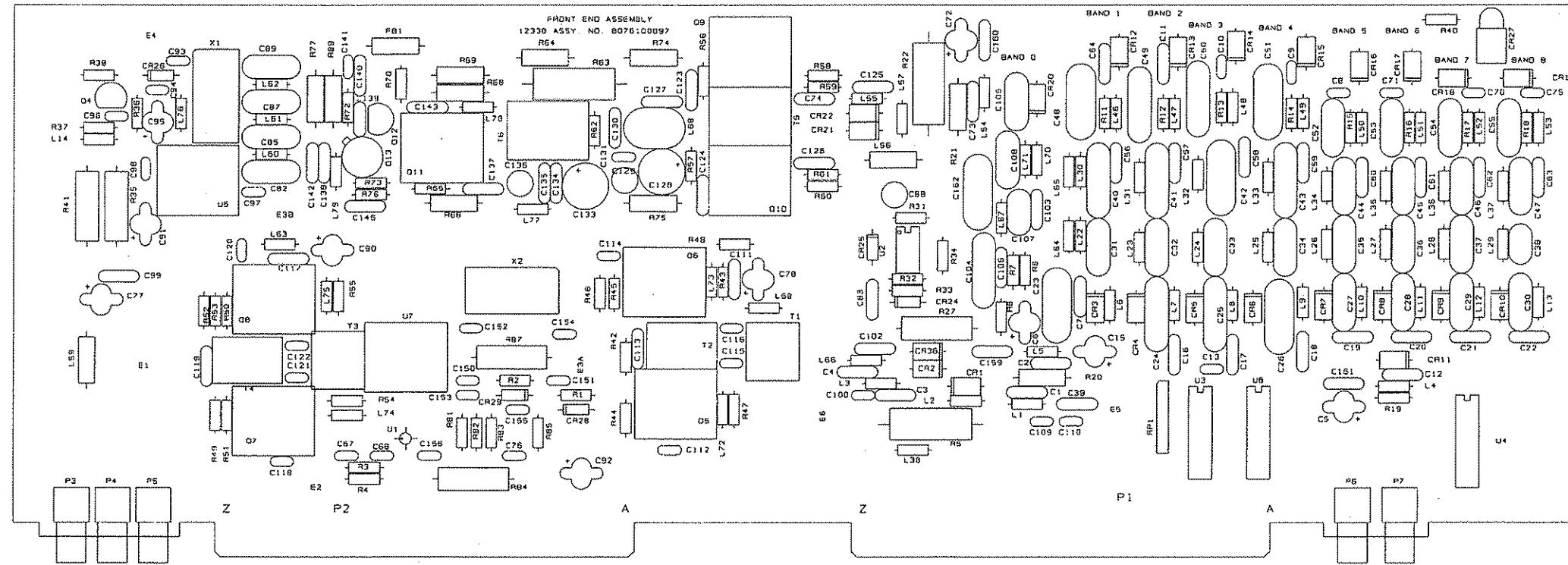


Figure 5.8.13 PC Assembly, IF 1A2A4, page 9/9.

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PC ASSY, FRONT END 1A2A5			PC ASSY, FRONT END 1A2A5			PC ASSY, FRONT END 1A2A5			PC ASSY, FRONT END 1A2A5			PC ASSY, FRONT END 1A2A5		
C1	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C62	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C136	CAP. 1µF, 35V, 196D	0281660000	L8	INDUCTOR, MOLDED, 2.2µH, 5%	0649890001			
C2	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C63	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C137	CAP. 0.1µF, 50V, X7R, 20%	0281610002	L9	INDUCTOR, MOLDED, 1.5µH, 5%	0649270002			
C3	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C64	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C138	CAP. 0.1µF, 50V, X7R, 20%	0281610002	L10	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001			
C4	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C67	CAP. .01µF, 50V, X7R 20%	0281730008	C139	CAP. 150PF, 500V, DM10, 5%	0293430004	L11	INDUCTOR, MOLDED, 0.75µH, 5%	1010480022			
C5	CAP. 1µF, 35V, 196D	0281660000	C70	CAP. .01µF, 50V, X7R 20%	0281730008	C140	CAP. 0.1µF, 50V, X7R, 20%	0281610002	L12	INDUCTOR, MOLDED, 0.47µH, 5%	0649410009			
C6	CAP. 1µF, 35V, 196D	0281660000	C71	CAP. .01µF, 50V, X7R 20%	0281730008	C141	CAP. .01µF, 50V, X7R 20%	0281730008	L13	INDUCTOR, MOLDED, 0.33µH, 5%	1010490028			
C7	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C72	CAP. 22µF, 15V, 196D	0281690006	C142	CAP. 0.1µF, 50V, X7R, 20%	0281610002	L14	INDUCTOR, MOLDED, 22µH, 5%	0650000005			
C8	CAP. .01µF, 50V, X7R 20%	0281730008	C73	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C143	CAP. 0.1µF, 50V, X7R, 20%	0281610002	L22	INDUCTOR, MOLDED, 5.6µH, 5%	0650360001			
C9	CAP. .01µF, 50V, X7R 20%	0281730008	C74	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C145	CAP. 0.1µF, 50V, X7R, 20%	0281610002	L23	INDUCTOR, MOLDED, 3.9µH, 5%	0650480007			
C10	CAP. .01µF, 50V, X7R 20%	0281730008	C75	CAP. .01µF, 50V, X7R 20%	0281730008	C150	CAP. .01µF, 50V, X7R 20%	0281730008	L24	INDUCTOR, MOLDED, 3.0µH, 5%	1010500023			
C11	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C76	CAP. .01µF, 50V, X7R 20%	0281730008	C151	CAP. .01µF, 50V, X7R 20%	0281730008	L25	INDUCTOR, MOLDED, 2.0µH, 5%	1010000039			
C12	CAP. .47µF, 50V, X7R 20%	0283377771	C77	CAP. 15µF, 35V	0282240004	C152	CAP. .01µF, 50V, X7R 20%	0281730008	L26	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001			
C13	CAP. .01µF, 50V, X7R 20%	0281730008	C78	CAP. 1µF, 35V, 196D	0281660000	C153	CAP. .01µF, 50V, X7R 20%	0281730008	L27	INDUCTOR, MOLDED, 0.82µH, 5%	0652320007			
C15	CAP. 1µF, 35V, 196D	0281660000	C82	CAP. 30PF, 500V, DM15, 2%	1010440021	C154	CAP. .01µF, 50V, X7R 20%	0281730008	L28	INDUCTOR, MOLDED, 0.56µH, 5%	0649530004			
C16	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C83	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C155	CAP. .01µF, 50V, X7R 20%	0281730008	L29	INDUCTOR, MOLDED, 0.39µH, 5%	0649770005			
C17	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C85	CAP. 130PF, 500V, DM15, 2%	0281010005	C156	CAP. .01µF, 50V, X7R 20%	0281730008	L30	INDUCTOR, MOLDED, 33µH, 5%	0659690004			
C18	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C87	CAP. 130PF, 500V, DM15, 2%	0281010005	C159	CAP. 0.1µF, 50V, X7R, 20%	0281610002	L31	INDUCTOR, MOLDED, 33µH, 5%	0659690004			
C19	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C88	CAP. 2.2µF, 35V, T368	0273950002	C160	CAP. 0.1µF, 50V, X7R, 20%	0281610002	L32	INDUCTOR, MOLDED, 18µH, 5%	1010040031			
C20	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C89	CAP. 30PF, 500V, DM15, 2%	1010440021	C161	CAP. 0.1µF, 50V, X7R, 20%	0281610002	L33	INDUCTOR, MOLDED, 15µH, 5%	0659070006			
C21	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C90	CAP. 1µF, 35V, 196D	0281660000	C162	CAP. 2200PF, 500V, DM19, 5%	0299650006	L34	INDUCTOR, MOLDED, 12µH, 5%	0652700004			
C22	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C91	CAP. 22µF, 15V, 196D	0281690006	C163	CAP. 10PF, 500V, DM10	0259830003	L35	INDUCTOR, MOLDED, 7.5µH, 5%	1010050036			
C23	CAP. 1800PF, 500V, DM19, 2%	0281300003	C92	CAP. 22µF, 15V, 196D	0281690006	C164	CAP. 220PF, 500V, DM10, 2%	1010870009	L36	INDUCTOR, MOLDED, 4.7µH, 5%	0651910005			
C24	CAP. 1300PF, 500V, DM19, 2%	0281380007	C93	CAP. .01µF, 50V, X7R 20%	0281730008	C165	CAP. .01µF, 50V, X7R 20%	0281730008	L37	INDUCTOR, MOLDED, 3.3µH, 5%	0658920006			
C25	CAP. 910PF, 500V, DM19, 2%	0281450005	C94	CAP. .01µF, 50V, X7R 20%	0281730008	C166	CAP. .01µF, 50V, X7R 20%	0281730008	L38	INDUCTOR, MOLDED, 22µH, 5%	0650000005			
C26	CAP. 680PF, 500V, DM19, 2%	0282290001	C95	CAP. 22µF, 15V, 196D	0281690006	C167	CAP. .01µF, 50V, X7R 20%	0281730008	L46	INDUCTOR, MOLDED, 47µH, 5%	0652680003			
C27	CAP. 430PF, 500V, DM15, 2%	0282370005	C96	CAP. .01µF, 50V, X7R 20%	0281730008	C168	CAP. .01µF, 50V, X7R 20%	0281730008	L47	INDUCTOR, MOLDED, 3.3µH, 5%	0658920006			
C28	CAP. 270PF, 500V, DM15, 2%	0280970005	C97	CAP. .01µF, 50V, X7R 20%	0281730008	CR1	DIODE, RECTIFIER 1N4004	0405180004	L48	INDUCTOR, MOLDED, 2.2µH, 5%	0649890001			
C29	CAP. 200PF, 500V, DM15, 2%	1010430025	C98	CAP. .01µF, 50V, X7R 20%	0281730008	CR2	DIODE, RECTIFIER 1N4004	0405180004	L49	INDUCTOR, MOLDED, 1.5µH, 5%	0649270002			
C30	CAP. 130PF, 500V, DM15, 2%	0281010005	C99	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR3	DIODE, RECTIFIER 1N4004	0405180004	L50	INDUCTOR, MOLDED, 1.2µH, 5%	0649910001			
C31	CAP. 230PF, 500V, DM15, 5%	0276200004	C100	CAP. .01µF, 50V, X7R 20%	0281730008	CR4	DIODE, RECTIFIER 1N4004	0405180004	L51	INDUCTOR, MOLDED, 0.75µH, 5%	1010480022			
C32	CAP. 130PF, 500V, DM15, 2%	0281010005	C102	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR5	DIODE, RECTIFIER 1N4004	0405180004	L52	INDUCTOR, MOLDED, 0.47µH, 5%	0649410009			
C33	CAP. 120PF, 500V, DM15, 2%	0281180008	C103	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR6	DIODE, RECTIFIER 1N4004	0405180004	L53	INDUCTOR, MOLDED, 0.33µH, 5%	1010490028			
C34	CAP. 68PF, 500V, DM15, 2%	1000050041	C104	CAP. 1000PF, 500V, DM19, 5%	0249270005	CR7	DIODE, RECTIFIER 1N4004	0405180004	L54	INDUCTOR, MOLDED, 47µH, 5%	0652680003			
C35	CAP. 43PF, 500V, DM15, 2%	1001240031	C105	CAP. 750PF, 300V, DM15, 5%	0275410005	CR8	DIODE, RECTIFIER 1N4004	0405180004	L55	INDUCTOR, MOLDED, 47µH, 5%	0652680003			
C36	CAP. 30PF, 500V, DM15, 2%	1010440021	C106	CAP. .47µF, 50V, X7R 20%	0283377771	CR9	DIODE, RECTIFIER 1N4004	0405180004	L56	INDUCTOR, MOLDED, 120µH, 5%	0646660004			
C37	CAP. 22PF, 500V, CD15, 2%	1000050025	C107	CAP. 220PF, 500V, DM15, 5%	0285957775	CR10	DIODE, RECTIFIER 1N4004	0405180004	L57	INDUCTOR, MOLDED, 47µH, 5%	0652680003			
C38	CAP. 12PF, 500V, DM10, 5%	0260280003	C108	CAP. 680PF, 300V, DM15, 5%	0286240009	CR11	DIODE, RECTIFIER 1N4004	0405180004	L58	INDUCTOR, MOLDED, 22µH, 5%	0650000005			
C39	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C109	CAP. .01µF, 50V, X7R 20%	0281730008	CR12	DIODE, RECTIFIER 1N4004	0405180004	L59	INDUCTOR, MOLDED, 6.8µH, 10%	0646040006			
C40	CAP. 1300PF, 500V, DM19, 2%	0281380007	C110	CAP. .01µF, 50V, X7R 20%	0281730008	CR13	DIODE, RECTIFIER 1N4004	0405180004	L60	INDUCTOR, MOLDED, 0.27µH, 5%	0649390008			
C41	CAP. 1100PF, 500V, DM19, 2%	0281000000	C111	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR14	DIODE, RECTIFIER 1N4004	0405180004	L61	INDUCTOR, MOLDED, 0.39µH, 5%	0649770005			
C42	CAP. 680PF, 500V, DM19, 2%	0282290001	C112	CAP. 0.1µF, 50V, X7R, 20%	0281730008	CR15	DIODE, RECTIFIER 1N4004	0405180004	L62	INDUCTOR, MOLDED, 0.27µH, 5%	0649390008			
C43	CAP. 560PF, 500V, DM19, 2%	0281060002	C113	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR16	DIODE, RECTIFIER 1N4004	0405180004	L63	INDUCTOR, MOLDED, 22µH, 5%	0650000005			
C44	CAP. 360PF, 500V, DM15, 2%	0281160007	C114	CAP. .01µF, 50V, X7R 20%	0281730008	CR17	DIODE, RECTIFIER 1N4004	0405180004	L64	INDUCTOR, MOLDED, 3.9µH, 5%	0650480007			
C45	CAP. 240PF, 500V, DM15, 2%	0281140006	C115	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR18	DIODE, RECTIFIER 1N4004	0405180004	L65	INDUCTOR, MOLDED, 3.9µH, 5%	0650480007			
C46	CAP. 160PF, 500V, DM15, 2%	1010460021	C116	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR19	DIODE, RECTIFIER 1N4004	0405180004	L66	INDUCTOR, MOLDED, 47µH, 5%	0652680003			
C47	CAP. 110PF, 500V, DM15, 2%	0281460001	C117	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR20	DIODE, RECTIFIER 1N4004	0405180004	L67	INDUCTOR, MOLDED, 4.7µH, 5%	0651910005			
C48	CAP. 1800PF, 500V, DM19, 2%	0281300003	C118	CAP. .01µF, 50V, X7R 20%	0281730008	CR21	DIODE, RECTIFIER 1N4004	0405180004	L68	CHOKE, POWER	8076104700			
C49	CAP. 1300PF, 500V, DM19, 2%	0281380007	C119	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR22	DIODE, RECTIFIER 1N4004	0405180004	L70	INDUCTOR, MOLDED, 120µH, 10%	0659330008			
C50	CAP. 910PF, 500V, DM19, 2%	0281450005	C120	CAP. .01µF, 50V, X7R 20%	0281730008	CR24	DIODE, SIGNAL, SIL. 1N4454	0405270003	L71	INDUCTOR, MOLDED, 2.7µH, 5%	0652180001			
C51	CAP. 680PF, 500V, DM19, 2%	0282290001	C121	CAP. .01µF, 50V, X7R 20%	0281730008	CR25	DIODE, SIGNAL, SIL. 1N4454	0405270003	L76	INDUCTOR, MOLDED, 3.9µH, 5%	0650480007			
C52	CAP. 430PF, 500V, DM15, 2%	0282370005	C122	CAP. .01µF, 50V, X7R 20%	0281730008	CR26	DIODE, PIN 1N5767	0405570007	L77	INDUCTOR, MOLDED, 22µH, 5%	0650000005			
C53	CAP. 270PF, 500V, DM15, 2%	0280970005	C123	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR27	DIODE, LED, RED, PC MOUNT	1008480029	L78	INDUCTOR, MOLDED, 220µH, 5%	0650500008			
C54	CAP. 200PF, 500V, DM15, 2%	1010430025	C124	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR28	DIODE, PIN 1N5767	0405570007	L79	INDUCTOR, MOLDED, 430µH, 5%	0659100002			
C55	CAP. 130PF, 500V, DM15, 2%	0281010005	C125	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR29	DIODE, PIN 1N5767	0405570007	L80	FERRITE BEAD, 850 PERM	1010410032			
C56	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C126	CAP. 0.1µF, 50V, X7R, 20%	0281610002	CR36	DIODE, SIGNAL, SIL. 1N4454	0405270003	L81	FERRITE BEAD, 850 PERM	1010410032			
C57	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C127	CAP. 0.1µF, 50V, X7R, 20%	0281610002	FB1	FERRITE BEAD, .400L	1010900013	L82	FERRITE BEAD, 850 PERM	1010410032			
C58	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C128	CAP. 47µF, 20V, 196D	0281700001	L1	INDUCTOR, MOLDED, 68µH, 5%	0651650003	L83	FERRITE BEAD, 850 PERM	1010410032			
C59	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C129	CAP. 1µF, 35V, 196D	0281660000	L2	INDUCTOR, MOLDED, 47µH, 5%	0652680003	L84	FERRITE BEAD, 850 PERM	1010410032			
C60	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C130	CAP. 0.1µF, 50V, X7R, 20%	0281610002	L3	INDUCTOR, MOLDED, 47µH, 5%	0652680003	L85	FERRITE BEAD, 850 PERM	1010410032			
C61	CAP. 0.1µF, 50V, X7R, 20%	0281610002	C131	CAP. .01µF, 50V, X7R 20%	0281730008	L4	INDUCTOR, MOLDED, 120µH, 10%	0659330008	L86	FERRITE BEAD, 850 PERM	1010410			

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P5	CONNECTOR, RF,RIGHT ANGLE	1010730002	R19	RESISTOR 10K, 10%, 1/4W	0170410005	R56	RESISTOR 560, 5%, 1/4W	0183200004	T4	TRANSFORMER, FEEDBACK,RF AMP	8076108900
P6	CONNECTOR, RF,RIGHT ANGLE	1010730002	R20	RESISTOR .82, 10%, 1/2W	1010200038	R57	RESISTOR 560, 5%, 1/4W	0183200004	T5	TRANSFORMER, OUTPUT,PREDR	8076104904
P7	CONNECTOR, RF,RIGHT ANGLE	1010730002	R21	RESISTOR 82, 10%, 1/2W	1010200038	R58	RESISTOR, 4.7, 5%, 1/4W	1001060024	T6	TRANSFORMER,INTERSTAGE,PREDR	8076104807
Q4	TRANSISTOR, NPN, SI. 2N4124	0448010003	R22	RESISTOR 220, 2W	1008150029	R59	RES.2.7, 10%, 1/4W	1010040022	U1	IC LINEAR MAR-4	1010900005
Q5	TRANSISTOR, NPN, SI. 2N3866	0448140004	R27	RESISTOR 47, 10%, 1W	0164990003	R60	RESISTOR, 4.7, 5%, 1/4W	1001060024	U2	IC. LINEAR LM311N	1005760021
Q6	TRANSISTOR, NPN, SI. 2N3866	0448140004	R31	RESISTOR 100K, 10%, 1/4W	0170390004	R61	RES.2.7, 10%, 1/4W	1010040022	U3	IC DIGITAL 74HC238	1011430002
Q7	TRANSISTOR, NPN, SI. 2N3866	0448140004	R32	RESISTOR 12K, 10%, 1/4W	0183180003	R62	RESISTOR 68, 10%, 1/4W	0187960003	U4	IC. DIGITAL ULN2003A	1005630038
Q8	TRANSISTOR, NPN, SI. 2N3866	0448140004	R33	RESISTOR 1K, 10%, 1/4W	0171560001	R63	RESISTOR 120, 10%, 2W	0194530001	U5	IC. LINEAR MWA130	1010380036
Q9	TRANSISTOR 2N3553	1010320025	R34	RESISTOR 10K, 10%, 1/4W	0170410005	R64	RESISTOR 18, 5%, 1/2W	0184730007	U6	IC. DIGITAL ULN2003A	1005630038
Q10	TRANSISTOR 2N3553	1010320025	R35	RESISTOR 150, 10%, 1W	0187840008	R65	RESISTOR 22, 10%, 1/4W	0192690001	U7	IC. LINEAR MWA130	1010380036
Q11	TRANSISTOR, NPN, SI. 2N3866	0448140004	R36	RESISTOR 10K, 10%, 1/4W	0170410005	R66	RESISTOR 39, 10%, 1/2W	0165920009	X1	MIXER, TAK-1H	1010400029
Q12	TRANSISTOR, PNP, SI. 2N2907A	0448390001	R37	RESISTOR 1K, 10%, 1/4W	0171560001	R68	RESISTOR 180, 10%, 1/2W	0173640001	X2	MIXER, TAK-1H	1010400029
Q13	TRANSISTOR, NPN, SI. 2N3866	0448140004	R38	RESISTOR 18, 10%, 1/4W	0184590001	R69	RESISTOR 120, 10%, 1/2W	0186430001	XQ5	HEATSINK, CUP CLIP, TO-5	1011440008
R1	RESISTOR 820, 10%, 1/4W	0178210005	R40	RESISTOR 1K, 10%, 1/4W	0171560001	R70	RESISTOR 270, 10%, 1/4W	0178450006	XQ6	HEATSINK, CUP CLIP, TO-5	1011440008
R2	RESISTOR 820, 10%, 1/4W	0178210005	R41	RESISTOR 100, 10%, 1W	0165540001	R72	RESISTOR 56, 10%, 1/4W	0174290004	XQ7	HEATSINK, CUP CLIP, TO-5	1011440008
R3	RESISTOR 47, 10%, 1/4W	0179360001	R42	RESISTOR 1K, 10%, 1/4W	0171560001	R73	RESISTOR 180, 10%, 1/4W	0175220000	XQ8	HEATSINK, CUP CLIP, TO-5	1011440008
R4	RESISTOR 390, 10%, 1/4W	0178330001	R43	RESISTOR 10, 5%, 1/4W	0177160004	R74	RESISTOR, 1.5, 10%, 1/2W	1010350021	XQ9	HEATSINK, CUP CLIP, TO-5	1011440008
R5	RESISTOR, 220, 2W	1008150029	R44	RESISTOR 270, 10%, 1/4W	0178450006	R75	RESISTOR, 1.5, 10%, 1/2W	1010350021	XQ10	HEATSINK, CUP CLIP, TO-5	1011440008
R6	RESISTOR 270, 10%, 1/4W	0178450006	R45	RESISTOR 1K, 10%, 1/4W	0171560001	R76	RESISTOR 560, 5%, 1/4W	0183200004	XU5	HEATSINK, CUP CLIP, TO-5	1011070014
R7	RESISTOR 18, 10%, 1/4W	0184590001	R46	RESISTOR 270, 10%, 1/4W	0178450006	R77	RESISTOR 680, 10%, 1/2W	0167500007	XU7	HEATSINK, CUP CLIP, TO-5	1011070014
R8	RESISTOR 270, 10%, 1/4W	0178450006	R47	RESISTOR 47, 10%, 1/4W	0179360001	R84	RESISTOR 100, 10%, 1W	0165540001			
R11	RESISTOR 10K, 10%, 1/4W	0170410005	R48	RESISTOR 47, 10%, 1/4W	0179360001	R85	RESISTOR 820, 10%, 1/4W	0178210005			
R12	RESISTOR 10K, 10%, 1/4W	0170410005	R49	RESISTOR 1K, 10%, 1/4W	0171560001	R87	RESISTOR 100, 10%, 1W	0165540001			
R13	RESISTOR 10K, 10%, 1/4W	0170410005	R50	RESISTOR 10, 5%, 1/4W	0177160004	R89	RESISTOR 150, 10% 1/2W	1010400037			
R14	RESISTOR 10K, 10%, 1/4W	0170410005	R51	RESISTOR 270, 10%, 1/4W	0178450006	R90	RESISTOR 470, 5%, 1/8W	1010804715			
R15	RESISTOR 10K, 10%, 1/4W	0170410005	R52	RESISTOR 1K, 10%, 1/4W	0171560001	RP1	RES NTWK 6 PIN SIP 4.7K COM	1006200037			
R16	RESISTOR 10K, 10%, 1/4W	0170410005	R53	RESISTOR 270, 10%, 1/4W	0178450006	T1	TRANSFORMER, INPUT, RF AMP	8076108705			
R17	RESISTOR 10K, 10%, 1/4W	0170410005	R54	RESISTOR 47, 10%, 1/4W	0179360001	T2	TRANSFORMER, FEEDBACK,RF AMP	8076108900			
R18	RESISTOR 10K, 10%, 1/4W	0170410005	R55	RESISTOR 47, 10%, 1/4W	0179360001	T3	TRANSFORMER, INPUT, RF AMP	8076108705			

Figure 5.8.14 PC Assembly, Front End 1A2A5, page 2/4.

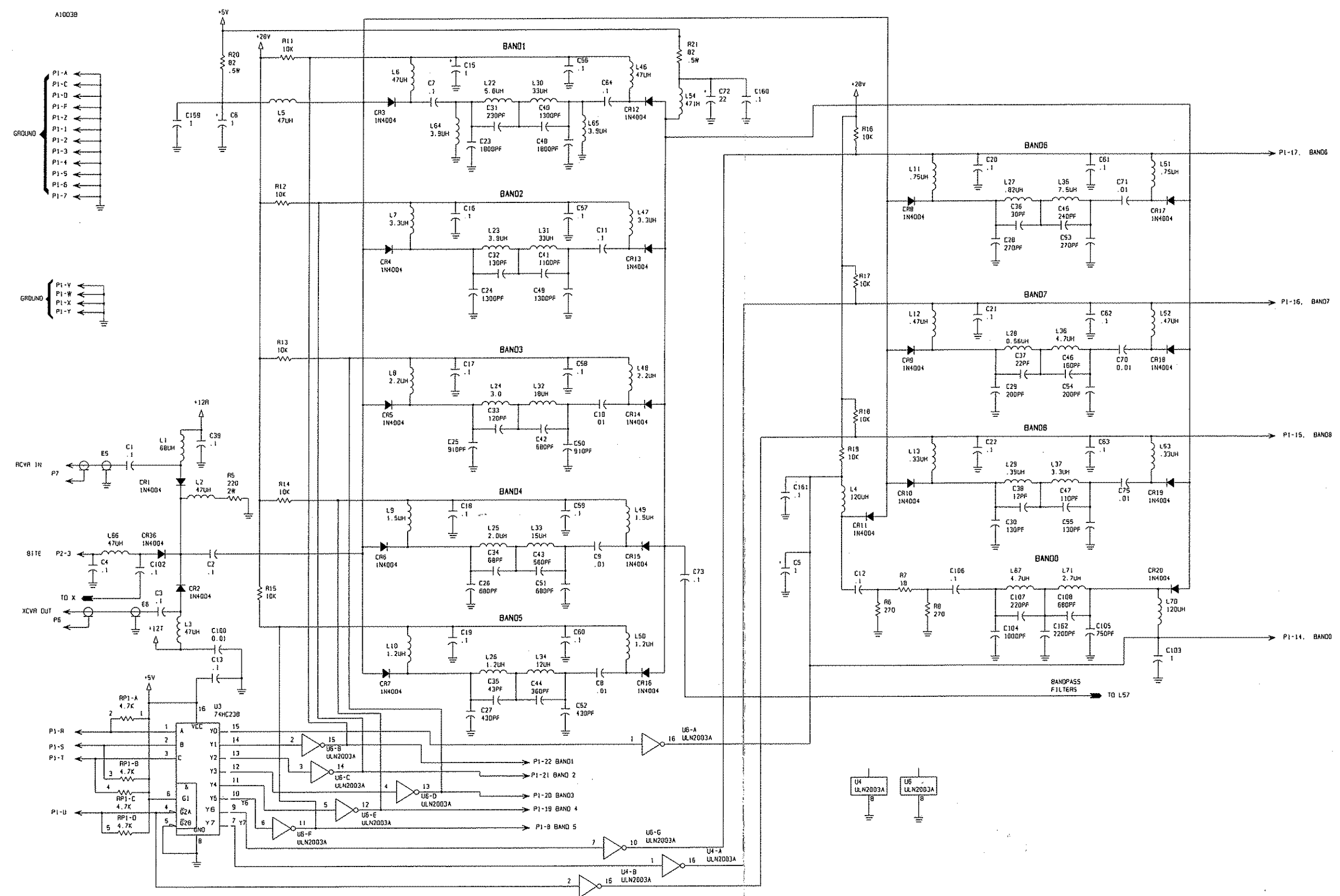


Figure 5.8.14 PC Assembly, Front End 1A2A5, page 3/4.

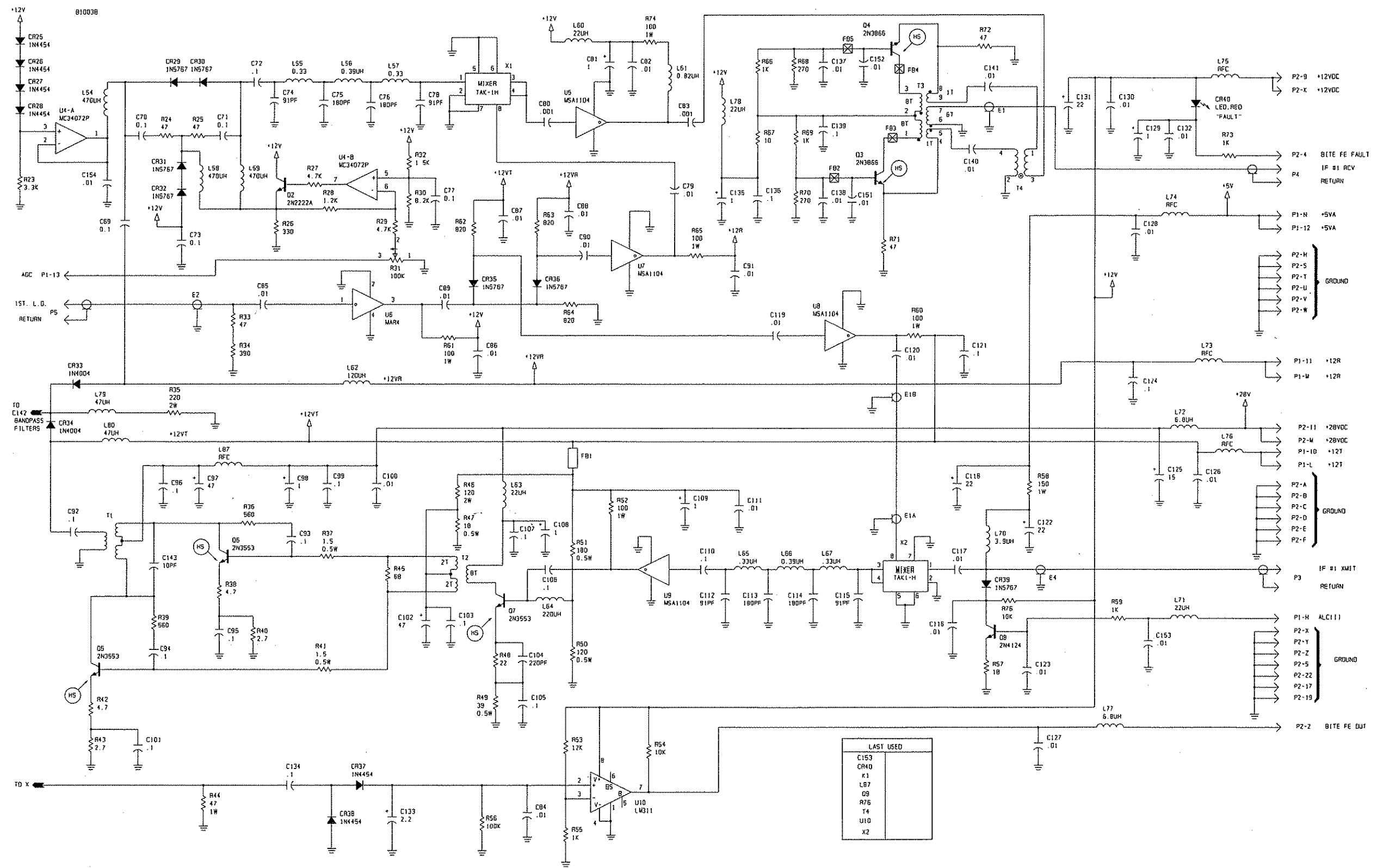


Figure 5.8.14 PC Assembly, Front End 1A2A5, page 4/4.

PC ASSY, REFERENCE DRIVER 1A2A6

	PC ASSY, REFERENCE DRIVER 1A2A6	
C1	CAP. .47μF, 50V, X7R 20%	0283377771
C2	CAP. .47μF, 50V, X7R 20%	0283377771
C3	CAP. .47μF, 50V, X7R 20%	0283377771
C4	CAP. .47μF, 50V, X7R 20%	0283377771
C5	CAP. .01μF, 50V, X7R 20%	0281730008
C6	CAP. .01μF, 50V, X7R 20%	0281730008
C7	CAP. .01μF, 50V, X7R 20%	0281730008
C8	CAP. .01μF, 50V, X7R 20%	0281730008
C9	CAP. .01μF, 50V, X7R 20%	0281730008
C10	CAP. .01μF, 50V, X7R 20%	0281730008
C11	CAP. 0.001μF, 100V, X7R, 20%	0281630003
C12	CAP. 22μF, 15V, T368	0296660001
CR1	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR2	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR3	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR4	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR5	DIODE, LED, AMBER PC MOUNT	1011480000
CR6	DIODE, LED, AMBER PC MOUNT	1011480000
CR7	DIODE, LED, AMBER PC MOUNT	1011480000
CR8	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR9	DIODE, LED, RED, PC MOUNT	1008480029
L1	INDUCTOR, MOLDED, 47μH, 5%	0652680003
L2	INDUCTOR, MOLDED, 47μH, 5%	0652680003
Q1	TRANSISTOR, NPN, SI. 2N4124	0448010003
Q2	TRANSISTOR, PNP, SI. 2N4126	0448020009
Q3	TRANSISTOR, NPN, SI. 2N4124	0448010003
Q4	TRANSISTOR, PNP, SI. 2N4126	0448020009
R1	RESISTOR 47, 5%, 1/8W	1010804707
R2	RESISTOR 47, 5%, 1/8W	1010804707
R3	RESISTOR 1.8K, 5%, 1/8W	1010801821
R4	RESISTOR 22, 5%, 1/8W	1010802208
R5	RESISTOR 1.8K, 5%, 1/8W	1010801821
R6	RESISTOR 22, 5%, 1/8W	1010802208
R7	RESISTOR 2.2K, 5%, 1/8W	1010802224
R8	RESISTOR 10, 5%, 1/8W	1010801007
R9	RESISTOR 10, 5%, 1/8W	1010801007
R10	RESISTOR 2.2K, 5%, 1/8W	1010802224
R11	RESISTOR 390, 5%, 1/8W	1010803913
R12	RESISTOR 3.3K, 5%, 1/8W	1010803328
R13	RESISTOR 6.8K, 5%, 1/8W	1010806823
R14	RESISTOR 390, 5%, 1/8W	1010803913
R15	RESISTOR 1K, 5%, 1/8W	1010801023
R16	RESISTOR 560, 10%, 1/2W	0185900003
R17	RESISTOR 270, 10%, 1/4W	0178450006
R18	RESISTOR 4.7K, 5%, 1/8W	1010804723
R19	RESISTOR 5.6K, 5%, 1/8W	1010805622
R20	RESISTOR 10K, 5%, 1/8W	1010801031
U1	IC. LINEAR LM340T5	0448600005
U2	IC. DIGITAL 74HC14	1006490027
	HEADER, PIN STRIP, 8 PIN	1010700014
	SHIELD, CAN	8040051509
	SHUNT, 8 PIN, .100 SPACING	1010720015
	STANDOFF, M-F, 4-40 X. 500L	1011000008

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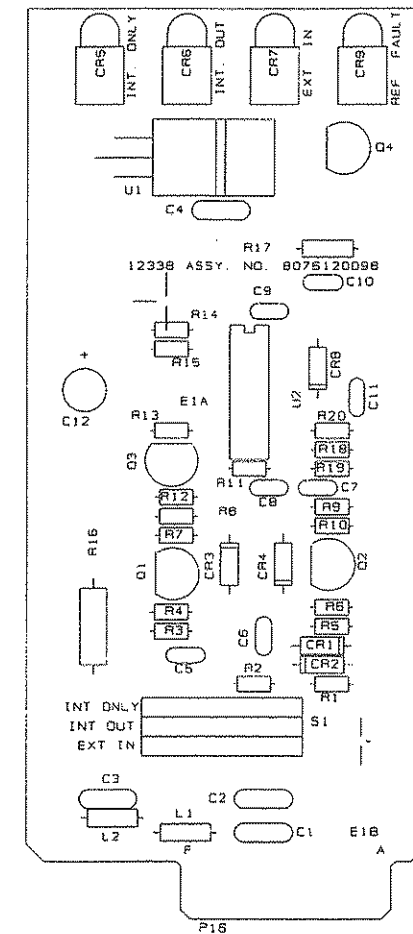


Figure 5.8.15 PC Assembly, Reference Driver 1A2A6, page 1/2.

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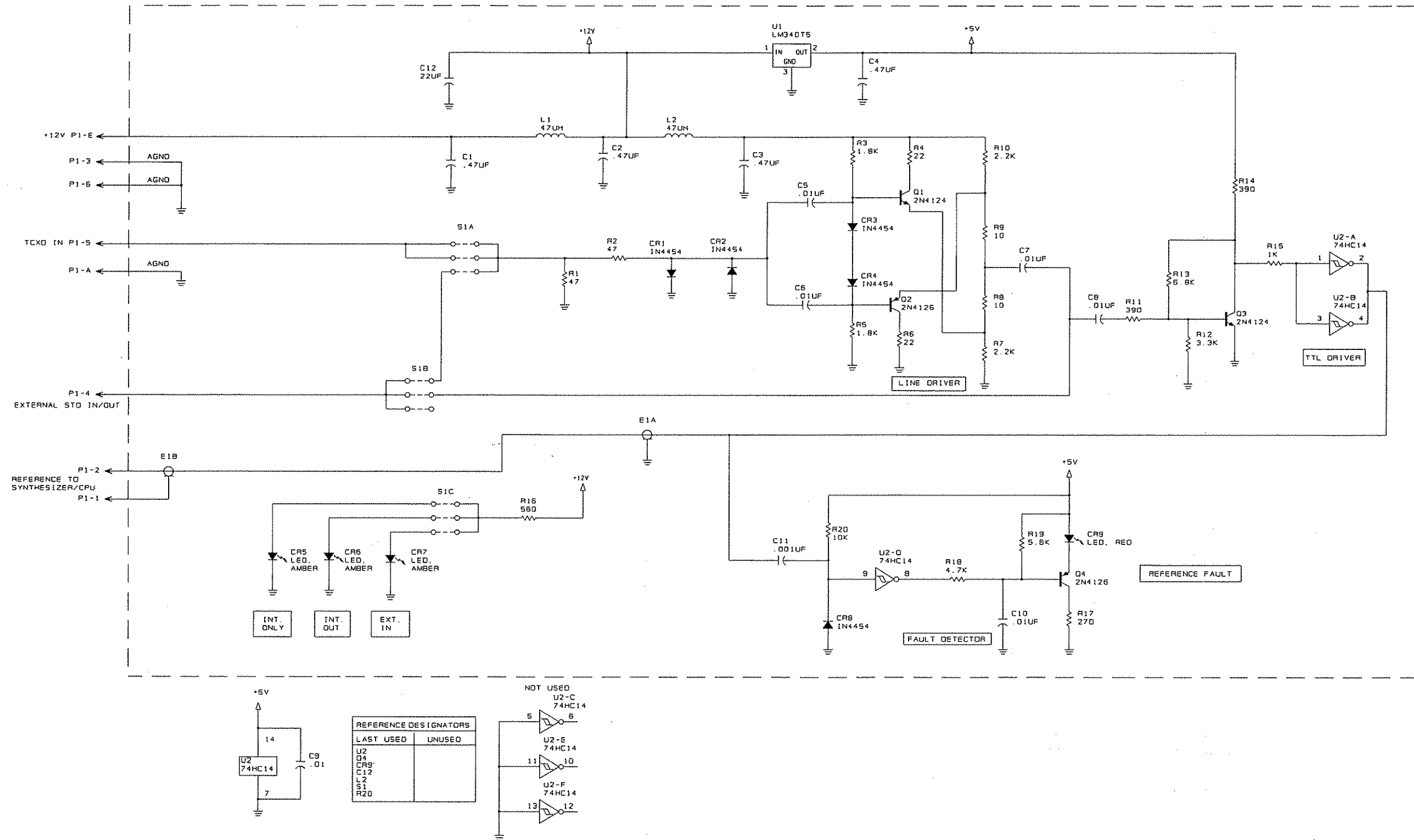


Figure 5.8.15 PC Assembly, Reference Driver 1A2A6, page 2/2.

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PC ASSY, I/O BOARD 1A2A8

C1	PC ASSY, I/O BOARD 3A2A3	8076110092	R10	RESISTOR 82, 10%, 1/4W	0184610001
C2	CAP. .01µF, 50V, X7R 20%	0281730008	R11	RESISTOR 10K, 5%, 1/8W	1010801031
C3	CAP. 6.8µF, 20V, T368	0296780006	R12	RESISTOR 68, 5%, 1/8W	1010806807
C4	CAP. .01µF, 50V, X7R 20%	0281730008	R13	RESISTOR 68, 5%, 1/8W	1010806807
C5	CAP. .01µF, 50V, X7R 20%	0281730008	R14	RESISTOR 68, 5%, 1/8W	1010806807
C6	CAP. .01µF, 50V, X7R 20%	0281730008	R15	RESISTOR 68, 5%, 1/8W	1010806807
C7	CAP. .01µF, 50V, X7R 20%	0281730008	RP1	RES NTWK 10 PIN SIP 10K COM	1006130021
C8	CAP. .01µF, 50V, X7R 20%	0281730008	RP2	RES NTWK 10 PIN SIP 10K COM	1006130021
C9	CAP. .01µF, 50V, X7R 20%	0281730008	RP3	RES NTWK 10 PIN SIP 10K COM	1006130021
C10	CAP. 22µF, 15V, 196D	0281690006	U1	CRYSTAL OSCILLATOR, 7.3728MHZ	1008850012
C11	CAP. 22µF, 15V, 196D	0281690006	U2	IC, DIGITAL 74HC00	1008190004
C12	CAP. 47µF, 20V, 196D	0281700001	U3	IC, DIGITAL 74HC00	1008190004
C13	CAP. .01µF, 50V, X7R 20%	0281730008	U4	IC, DIGITAL 4078B	1010460030
C14	CAP. .01µF, 50V, X7R 20%	0281730008	U5	IC, DIGITAL 74HC374	1006450033
C15	CAP. .01µF, 50V, X7R 20%	0281730008	U6	IC, DIGITAL 74HC374	1006450033
C16	CAP. 10µF, 20V	1007290005	U7	IC, DIGITAL 74HC04	1010280023
C17	CAP. 22µF, 15V, 196D	0281690006	U8	IC, DIGITAL 74HC32	1006470026
C18	CAP. 22µF, 15V, 196D	0281690006	U9	IC, DIGITAL 2681	1008790010
C19	CAP. .01µF, 50V, X7R 20%	0281730008	U10	IC, DIGITAL 80C85A	1007400013
C20	CAP. .01µF, 50V, X7R 20%	0281730008	U11	IC, DIGITAL 74HC138	1006480013
C21	CAP. .01µF, 50V, X7R 20%	0281730008	U12	IC, DIGITAL 74HC125	1008810011
C22	CAP. .01µF, 50V, X7R 20%	0281730008	U13	IC, DIGITAL 74HC373	1006480030
C23	CAP. .01µF, 50V, X7R 20%	0281730008	U14	IC, DIGITAL 74HC32	1006470026
C24	CAP. .01µF, 50V, X7R 20%	0281730008	U15	IC, DIGITAL RAM UPD446D	1006430008
C25	CAP. .01µF, 50V, X7R 20%	0281730008	U16	IC, DIGITAL ICL232	1010510011
C26	CAP. .01µF, 50V, X7R 20%	0281730008	U17	IC, DIGITAL ICL232	1010510011
C27	CAP. .01µF, 50V, X7R 20%	0281730008	U18	IC, DIGITAL 75176	1011100011
C28	CAP. .01µF, 50V, X7R 20%	0281730008	U19	IC, DIGITAL 75176	1011100011
C29	CAP. .01µF, 50V, X7R 20%	0281730008	U20	EPROM, W/IO SOFTWARE RCU-9310	8078113293
C30	CAP. .01µF, 50V, X7R 20%	0281730008	XU9	SOCKET, IC, 40 PIN TAILLESS	1006620010
C31	CAP. .01µF, 50V, X7R 20%	0281730008	XU10	SOCKET, IC, 40 PIN TAILLESS	1006620010
C32	CAP. .01µF, 50V, X7R 20%	0281730008	XU20	SOCKET, IC, 28 PIN TAILLESS	1006620001
C33	CAP. .01µF, 50V, X7R 20%	0281730008		FERRITE BEAD, 850 PERM	1010410032
C34	CAP. .01µF, 50V, X7R 20%	0281730008		MOUNTING PLATE, I/O BOARD	8076111200
C35	CAP. .01µF, 50V, X7R 20%	0281730008			
CR1	DIODE, LED, RED, PC MOUNT	1008480029			
CR2	DIODE, RECTIFIER 1N4004	0405180004			
CR3	DIODE, RECTIFIER 1N4004	0405180004			
J1	CONNECTOR, POWER, 9 PIN FEMALE	1011090015			
K1	RELAY, DPDT, 12VDC	1005090009			
K2	RELAY, DPDT, 12VDC	1005090009			
L1	INDUCTOR, MOLDED, 33µH, 5%	0659690004			
L2	INDUCTOR, MOLDED, 33µH, 5%	0659690004			
L3	INDUCTOR, MOLDED, 33µH, 5%	0659690004			
L4	INDUCTOR, MOLDED, 33µH, 5%	0659690004			
L5	INDUCTOR, MOLDED, 33µH, 5%	0659690004			
L6	INDUCTOR, MOLDED, 33µH, 5%	0659690004			
L7	INDUCTOR, MOLDED, 33µH, 5%	0659690004			
L8	INDUCTOR, MOLDED, 33µH, 5%	0659690004			
P1	CONNECTOR, HEADER 40 PIN	1010780000			
P2	CONNECTOR, HEADER, 14 PIN MALE	1011210142			
Q1	TRANSISTOR, NPN, SI. 2N4124	0448010003			
Q2	TRANSISTOR, NPN, SI. 2N4124	0448010003			
R1	RESISTOR 680, 10%, 1/4W	0176630007			
R2	RESISTOR 100K, 10%, 1/4W	0170390004			
R3	RESISTOR 10K, 10%, 1/4W	0170410005			
R4	RESISTOR 10K, 10%, 1/4W	0170410005			
R5	RESISTOR 10K, 10%, 1/4W	0170410005			
R6	RESISTOR 100K, 10%, 1/4W	0170390004			
R7	RESISTOR 10K, 10%, 1/4W	0170410005			
R8	RESISTOR 10K, 5%, 1/8W	1010801031			
R9	RESISTOR 10K, 5%, 1/8W	1010801031			

1079DP

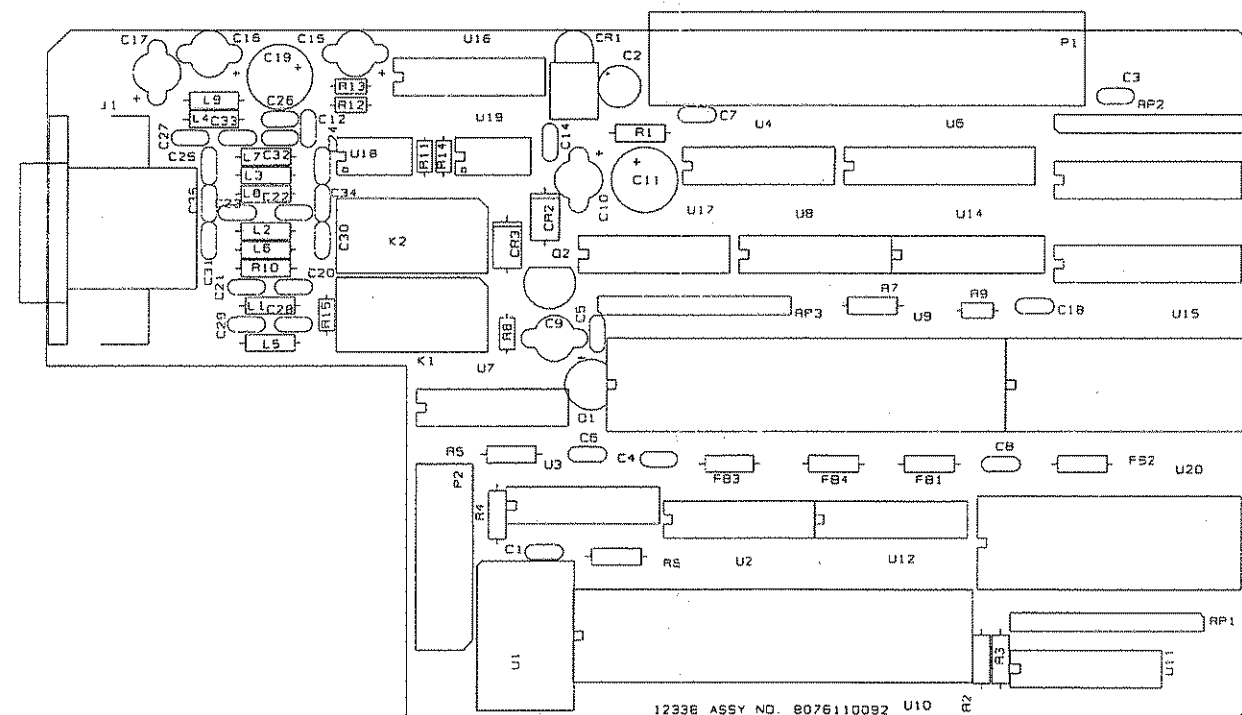
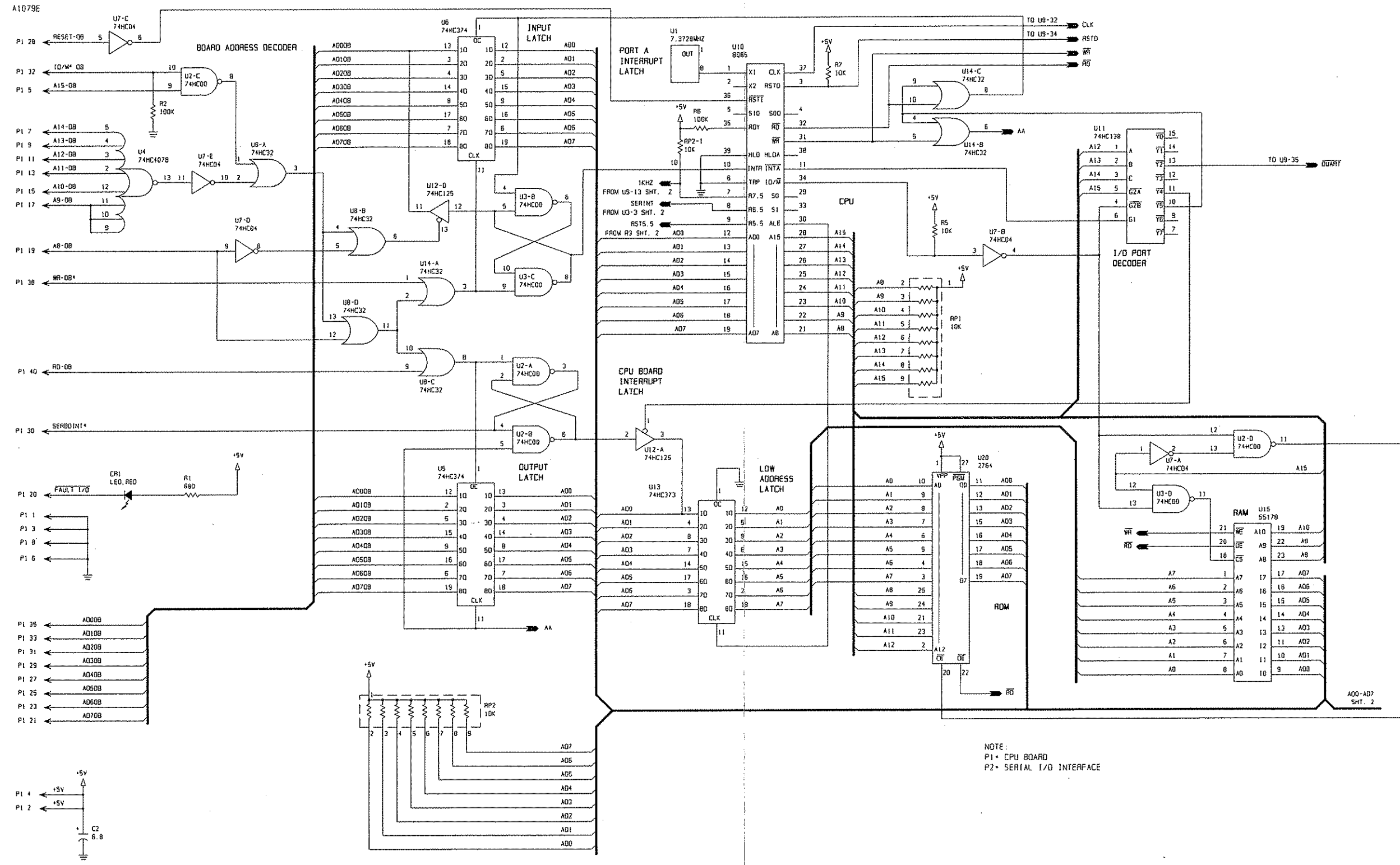


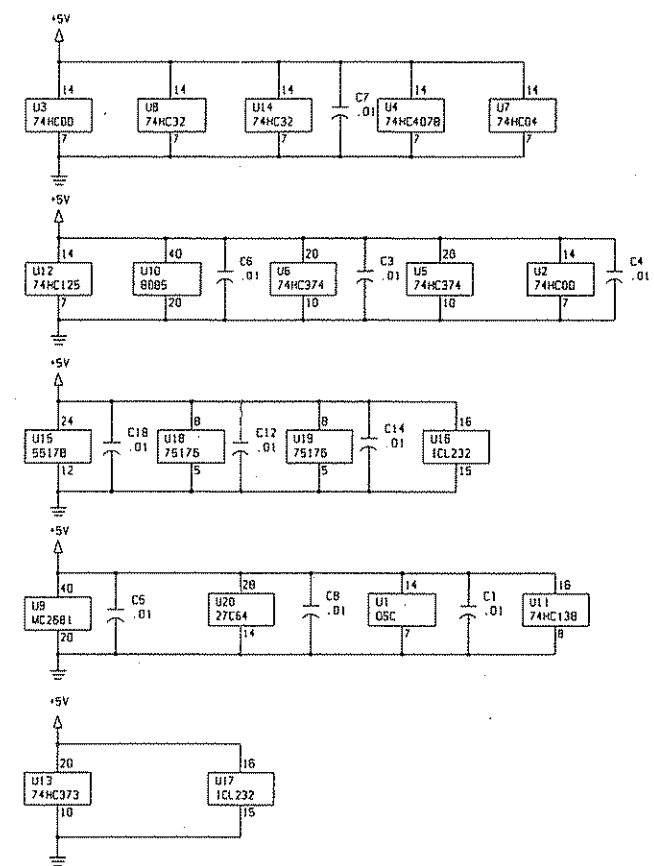
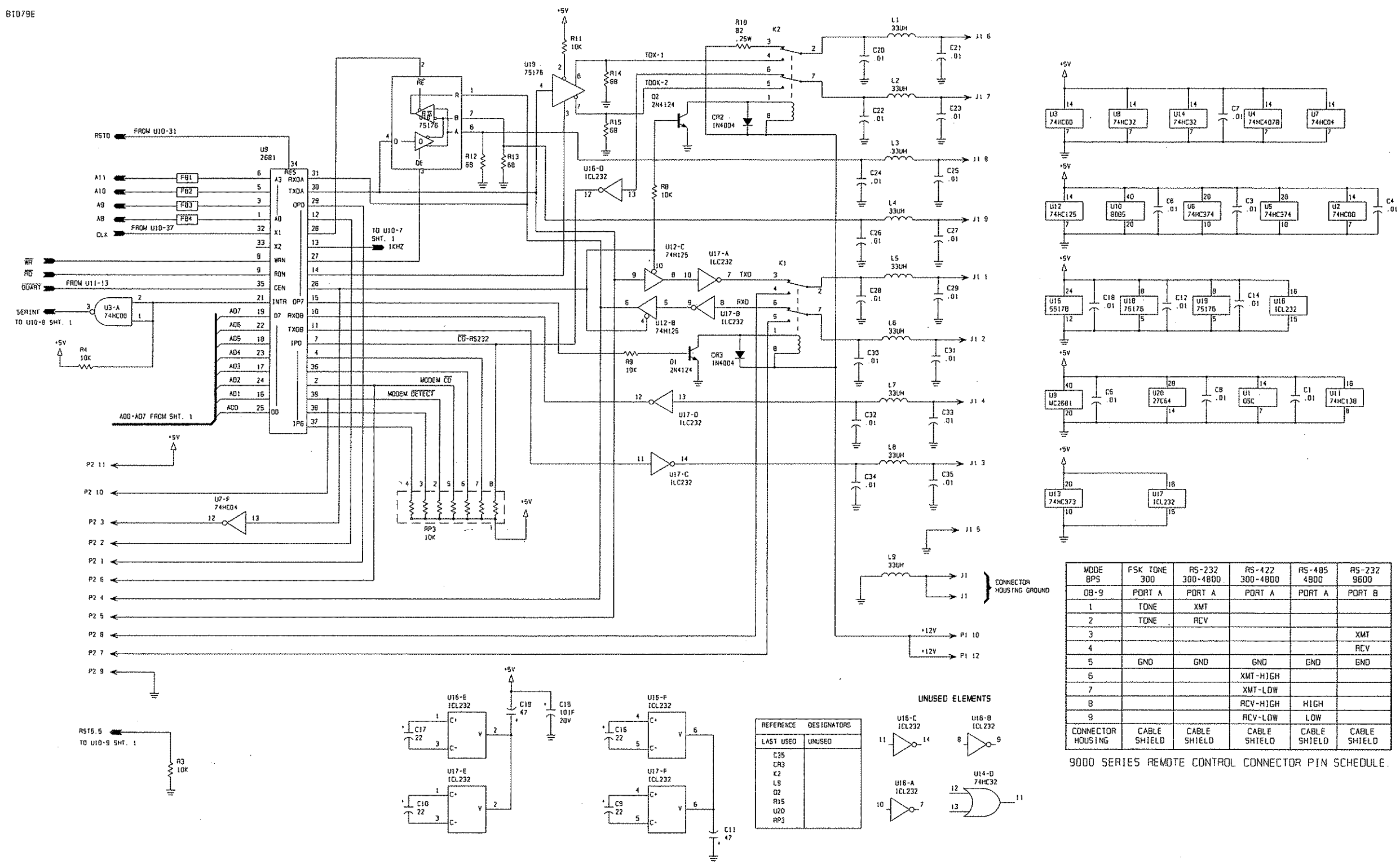
Figure 5.8.16 PC Assembly, I/O Board 1A2A8, page 1/3.



NOTE:
P1* CPU BOARD
P2* SERIAL I/O INTERFACE

Figure 5.8.16 PC Assembly, I/O Board 1A2A8, page 2/3.

81079E



MODE BPS	FSK TONE	RS-232 300-4800	RS-422 300-4800	RS-485 4800	RS-232 9600
0B-9	PORT A	PORT A	PORT A	PORT A	PORT B
1	TONE	XMT			
2	TONE	RCV			
3					XMT
4					RCV
5	GND	GND	GND	GND	GND
6			XMT-HIGH		
7			XMT-LOW		
8			RCV-HIGH	HIGH	
9			RCV-LOW	LOW	
CONNECTOR HOUSING	CABLE SHIELD	CABLE SHIELD	CABLE SHIELD	CABLE SHIELD	CABLE SHIELD

9000 SERIES REMOTE CONTROL CONNECTOR PIN SCHEDULE.

REFERENCE	DESIGNATORS
LAST USED	UNUSED
C15	
CR3	
K2	
L9	
Q2	
R15	
U20	
RP3	

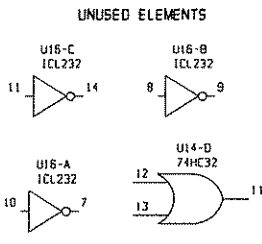
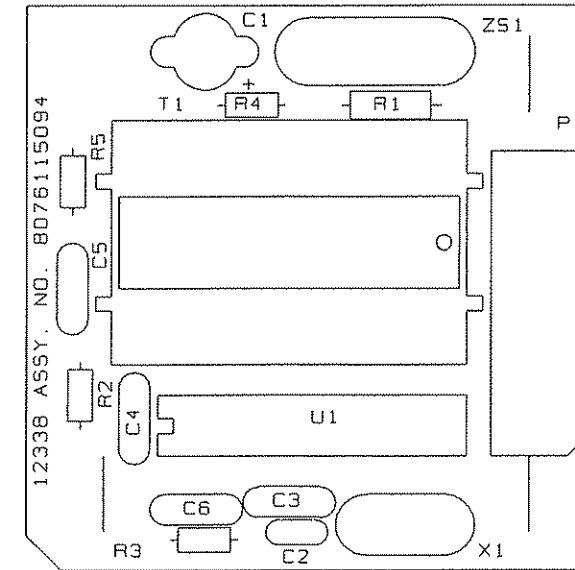


Figure 5.8.16 PC Assembly, I/O Board 1A2A8, page 3/3.

1159CP



PC ASSY, FSK MODEM 1A2A8A1

	PC ASSY, FSK MODEM 3A2A3A1	8076115094
C1	CAP. 10 μ F, 20V	1007290005
C2	CAP. 0.001 μ F, 100V, X7R, 20%	0281630003
C3	CAPACITOR 0.1 μ F, 50V, X7R	1011180014
C4	CAPACITOR 0.1 μ F, 50V, X7R	1011180014
C5	CAPACITOR 0.1 μ F, 50V, X7R	1011180014
C6	CAPACITOR 0.1 μ F, 50V, X7R	1011180014
P1	CONNECTOR, RIBBON, 14 PIN FEM	1008350001
R1	RESISTOR 604, 1%, 1/8W	0193980002
R2	RESISTOR 5.6K, 5%, 1/8W	1010805622
R3	RESISTOR 10K, 5%, 1/8W	1010801031
R4	RESISTOR 10K, 5%, 1/8W	1010801031
R5	RESISTOR 10K, 5%, 1/8W	1010801031
T1	TRANSFORMER, MODEM	1011340011
U1	IC. DIGITAL MC145443	1011330016
X1	CRYSTAL, 3.579545 MHZ	1006270001
XP1	CONNECTOR,PCB,TRANSITION,14PIN	1011090147
ZS1	VARIATOR, MOV V230LA20A	1010720023
	CABLE, FLAT, 14 COND. 28AWG	1011170001

Figure 5.8.17 PC Assembly, FSK Modem 1A2A8A1, page 1/2.

A1159C

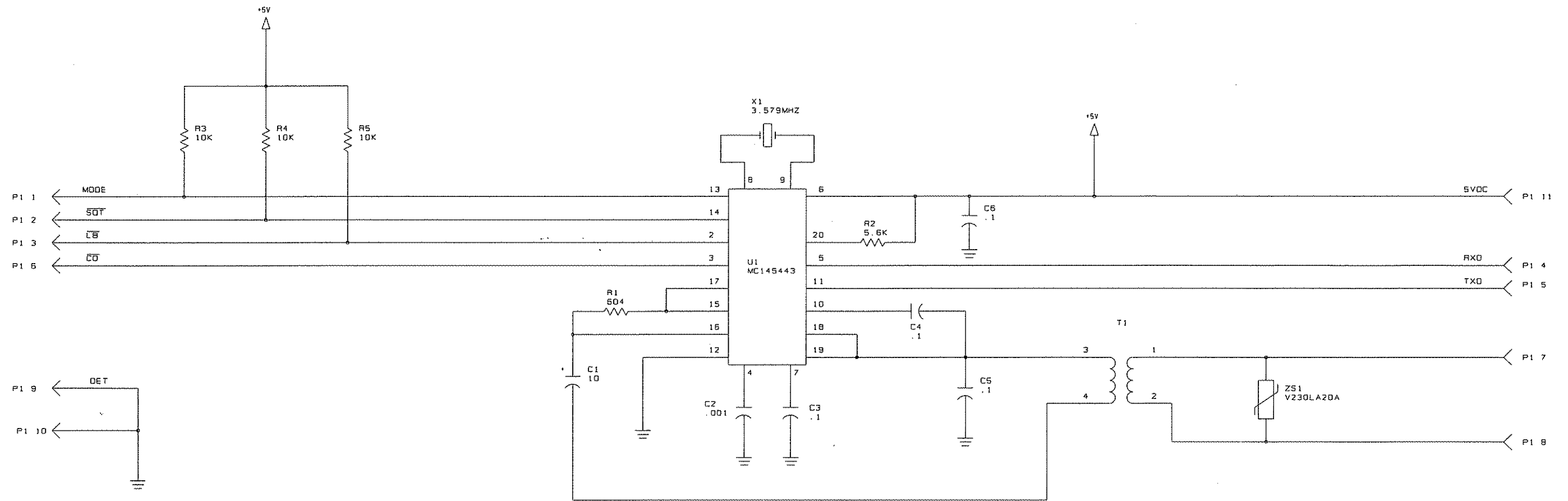


Figure 5.8.17 PC Assembly, FSK Modem 1A2A8A1, page 2/2.

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FILTER ASSY 1A3		
1A3A1	FILTER ASSY 1A3	8076050090
1A3A2	PC ASSY. DETECTOR	8076053099
1A3A3	PC ASSY. BANDS 1-4	8076057094
	PC ASSY. BANDS 5-8	8076055091
	ENCLOSURE, FILTER MODULE	8076050502

Figure 5.8.18 Filter Assembly 1A3, page 1/1.

PC ASSY, DETECTOR 1A3A1

C1	PC ASSY, DETECTOR 1A3A1	8076053099
C2	CAP. 30 PF, 2KV, N750	1008230014
C3	CAP. 100PF 2KV N750	1008250031
C4	CAP. .01μF, 50V, X7R 20%	0281730008
C5	CAP. 30 PF, 2KV, N750	1008230014
C6	CAP. 30 PF, 2KV, N750	1008230014
C7	CAP. 30 PF, 2KV, N750	1008230014
C8	CAP. .01μF, 50V, X7R 20%	0281730008
C9	CAP. .01μF, 50V, X7R 20%	0281730008
C10	CAP. .01μF, 50V, X7R 20%	0281730008
C11	CAP. .01μF, 50V, X7R 20%	0281730008
C12	CAPACITOR, 0.1μF, 200V, X7R	1011190001
C13	CAPACITOR, 0.1μF, 200V, X7R	1011190001
C14	CAP. 1μF, 50V, 198D	0280910002
C15	CAP. 56 PF, 2KV, N750	1008240028
C16	CAP. 56 PF, 2KV, N750	1008240028
C17	CAP. 15-60PF, 200V, N1500	0252680006
C18	CAP. .01μF, 50V, X7R 20%	0281730008
C19	CAP. .01μF, 50V, X7R 20%	0281730008
C20	CAP. .01μF, 50V, X7R 20%	0281730008
CP1	CAPACITOR, NTWK, 10 PIN, .01μF	1006540016
CR1	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR2	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR3	DIODE, RECTIFIER 1N4004	0405180004
CR4	DIODE, PIN UM4001CR	0405440006
CR5	DIODE, PIN UM4001C	0405430001
CR6	DIODE, RECTIFIER 1N4004	0405180004
CR7	DIODE, RECTIFIER 1N4004	0405180004
CR8	DIODE, RECTIFIER 1N4004	0405180004
CR9	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR10	DIODE, LED, RED	1004350023
DSP1	DIODE, LED, RED, BAR GRAPH	1010690019
J1	CONNECTOR, RF, JCM	0753600005
J2	CONNECTOR, RF, JCM	0753600005
J3	CONNECTOR, RF, SNAP-ON	1000170012
J5	CONNECTOR, HEADER, 26 PIN MALE	1011200261
K1	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K2	RELAY, SPST, 24VDC, PC MOUNT	1010310038
L1	INDUCTOR, AIR WOUND, 303 NH	8076053501
L2	INDUCTOR, AIR WOUND, 303 NH	8076053501
P1A	CONNECTOR, RIBBON, 10 PIN FEM	1008070017
P1B	CONNECTOR, RIBBON, 10 PIN FEM	1008070017
P2	CONNECTOR, RIBBON, 10 PIN FEM	1008070017
Q1	TRANSISTOR, NPN, SI. 2N4124	0448010003
Q2	TRANSISTOR, NPN, SI. 2N4124	0448010003
R1	RESISTOR, 51, 5%, 1/4W	0197020003
R2	RESISTOR 10K, 10%, 1/4W	0170410005
R3	RESISTOR, 51, 5%, 1/4W	0197020003
R4	RESISTOR 10K, 10%, 1/4W	0170410005
R5	RESISTOR 4.7K, 5%, 1/4W	0170770001
R6	RESISTOR 10K, 10%, 1/4W	0170410005
R7	RESISTOR 4.7K, 5%, 1/4W	0170770001
R8	RESISTOR 10K, 10%, 1/4W	0170410005

R9	RESISTOR 12K, 10%, 1/4W	0183180003
R10	RESISTOR 4.7K, 10%, 2W	0164130004
R11	RESISTOR 1K, 10%, 1/4W	0171560001
R12	RESISTOR 180, 10%, 1/4W	0175220000
RP1	RES NTWK 10 PIN SIP 680 COM	1010640003
T1	TRANSFORMER, 20:1, DETECTOR	8076053706
T2	TRANSFORMER, 20:1, DETECTOR	8076053706
	CABLE, FLAT, 20 COND. 28AWG	1008080004
	CABLE, RIBBON, 10 CONDUCTOR	1008340014
	CONNECTOR,PCB,TRANSITION,10PIN	1011090104
	CONNECTOR,PCB,TRANSITION,20PIN	1011090201
	KEY, POLARIZING	1008070033

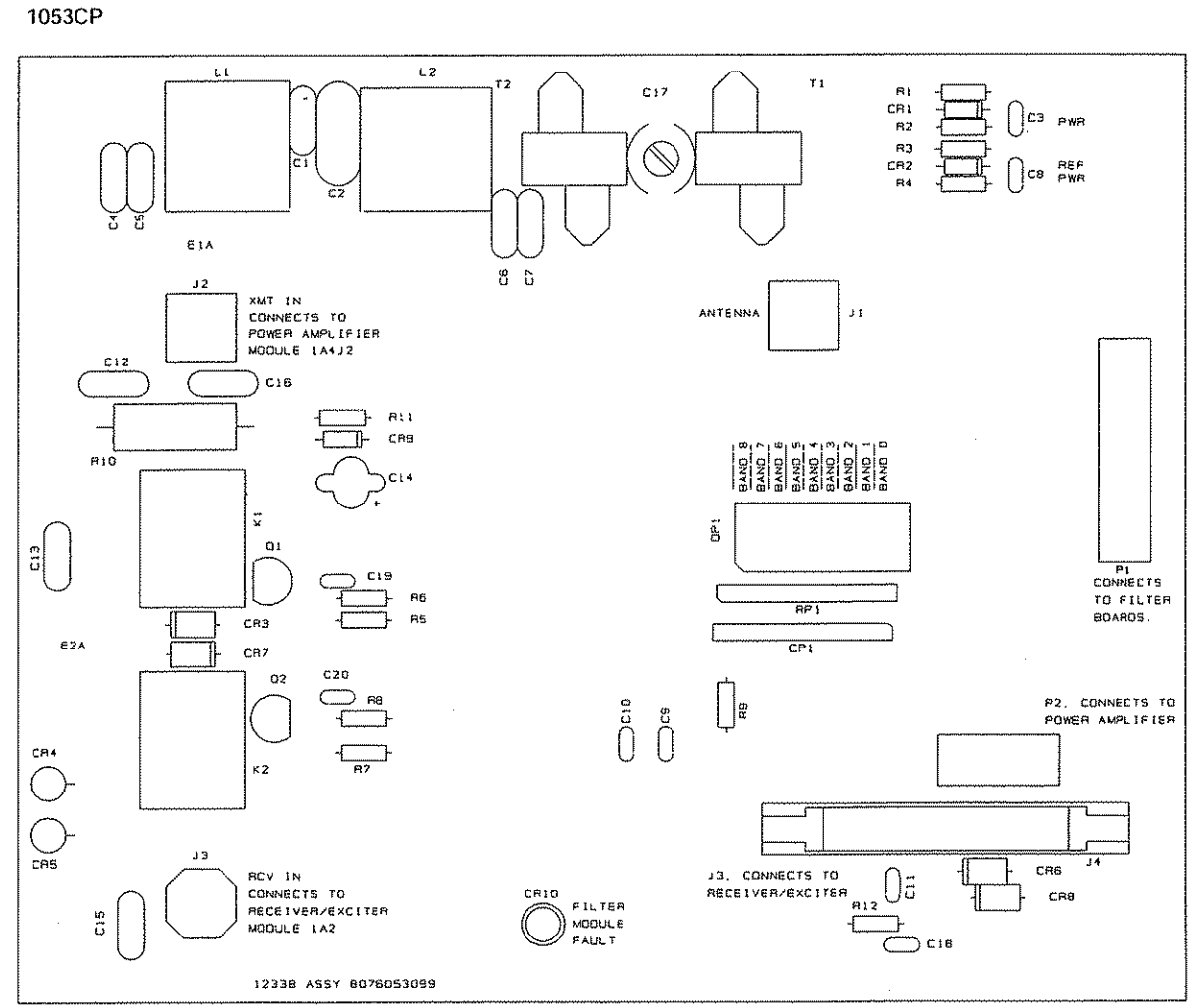


Figure 5.8.19 PC Assembly, Detector 1A3A1, page 1/2.

A10530

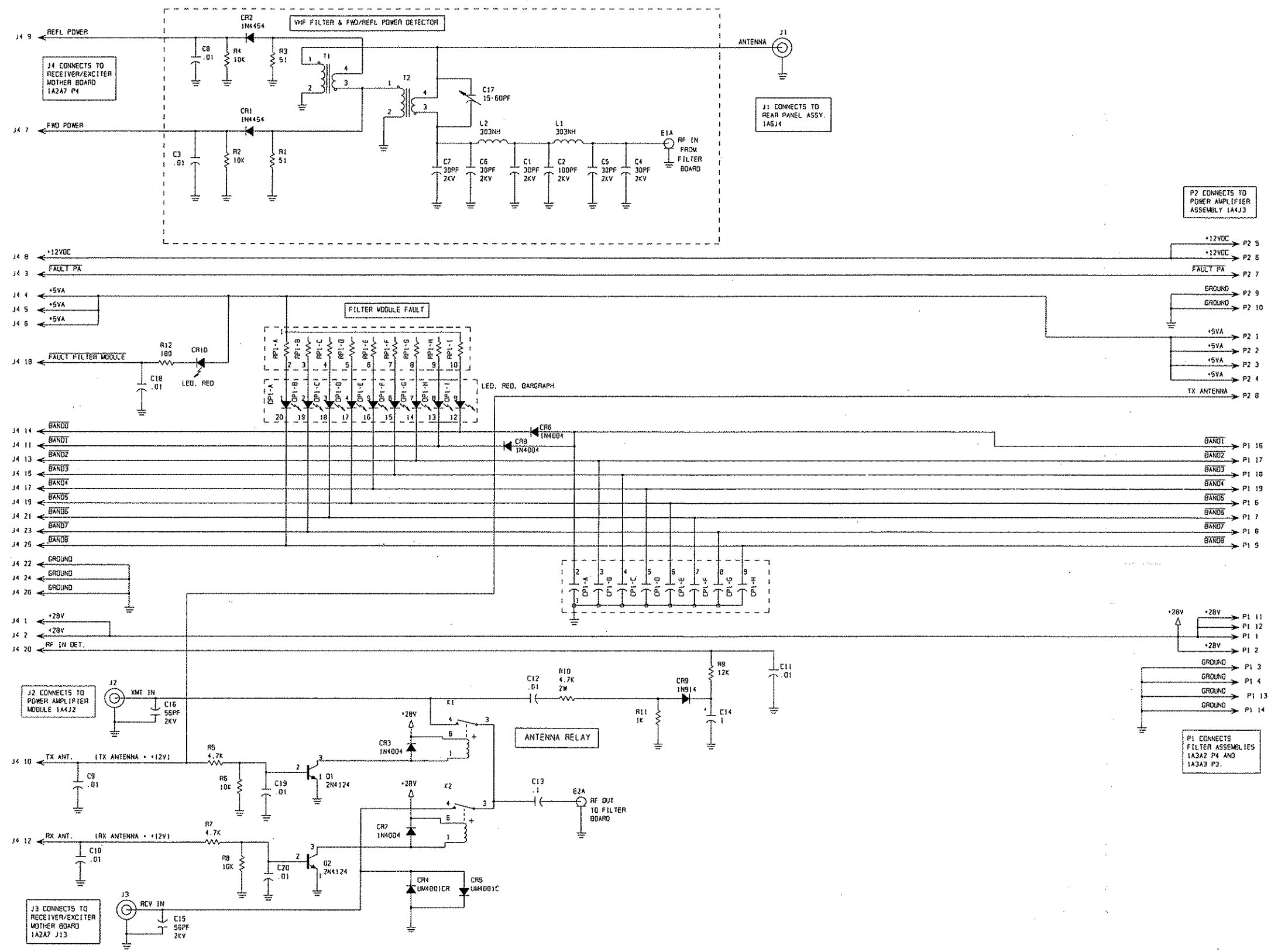


Figure 5.8.19 PC Assembly, Detector 1A3A1, page 2/2.

PC ASSY, BANDS 1-4 1A3A2

C57	PC ASSY, BANDS 1-4 1A3A2	8076057094
C58	CAP. 82 PF 2KV N750	1008270024
C59	CAP. 82 PF 2KV N750	1008270024
C60	CAP. 91 PF, 2KV N750	1008250023
C61	CAP. 300PF 2KV N750	1008470015
C62	CAP. 27 PF, 2KV, N750	1008230006
C63	CAP. 700PF, 500V, DM19, 5%	0249410001
C64	CAP. 120PF 2KV N750	1008260011
C65	CAP. 390PF, 500V, DM19, 2%	0282640002
C66	CAP. 33 PF, 2KV, N750	1008230022
C67	CAP. 700PF, 500V, DM19, 5%	0249410001
C68	CAP. 56 PF, 2KV, N750	1008240028
C69	CAP. 33 PF, 2KV, N750	1008230022
C70	CAP. 300PF 2KV N750	1008470015
C71	CAP. 130PF 2KV N750	1008260029
C72	CAP. 68 PF, 2KV N750	1008250007
C73	CAP. 180PF 2KV N750	1008270008
C74	CAP. 27 PF, 2KV, N750	1008230006
C75	CAP. 560PF, 500V, DM19, 2%	0281060002
C76	CAP. 800PF, 500V, DM19, 5%	0249530007
C77	CAP. 300PF 2KV N750	1008470015
C78	CAP. 430PF, 500V, DM19, 5%	0254900003
C79	CAP. 330PF 2KV N750	1008280038
C80	CAP. 800PF, 500V, DM19, 5%	0249530007
C81	CAP. 300PF 2KV N750	1008470015
C82	CAP. 91 PF, 2KV N750	1008250023
C83	CAP. 43PF 2KV N750	1008470023
C84	CAP. 330PF 2KV N750	1008280038
C85	CAP. 360PF, 500V, DM19, 2%	0282650008
C86	CAP. 150PF 2KV N750	1008260037
C87	CAP. 180PF 2KV N750	1008270008
C88	CAP. 430PF, 500V, DM19, 5%	0254900003
C89	CAP. 300PF 2KV N750	1008470015
C90	CAP. 910PF, 500V, DM19, 2%	0281450005
C91	CAP. 620PF, 500V, DM19, 5%	0299150003
C92	CAP. 430PF, 500V, DM19, 5%	0254900003
C93	CAP. 620PF, 500V, DM19, 5%	0299150003
C94	CAP. 910PF, 500V, DM19, 2%	0281450005
C95	CAP. 620PF, 500V, DM19, 5%	0299150003
C96	CAP. 130PF 2KV N750	1008260029
C97	CAP. 50 PF, 2KV, N750	1008240010
C98	CAP. 330PF 2KV N750	1008280038
C99	CAP. 600PF, 500V, DM19, 5%	0241850002
C100	CAP. 27 PF, 2KV, N750	1008230006
C101	CAP. 470PF, 500V, DM19, 5%	0255050003
C102	CAP. 390PF, 500V, DM19, 2%	0282640002
C103	CAP. 750PF, 500V, DM19, 2%	0280990006
C104	CAP. 270PF 2KV N750	1008280020
C105	CAP. 2000PF, 500V, DM19, 5%	0298500001
C106	CAP. 820PF, 500V, DM19, 2%	0281280002
C107	CAP. 750PF, 500V, DM19, 2%	0280990006
C108	CAP. 620PF, 500V, DM19, 5%	0299150003
C109	CAP. 1600PF, 500V, DM19, 2%	0281220000
C110	CAP. 200PF 2KV N750	1008270016

C111	CAP. 75 PF, 2KV N750	1008250015
C112	CAP. 820PF, 500V, DM19, 2%	0281280002
C113	CAP. 510PF, 500V, DM19, 2%	0282630007
CR5	DIODE, RECTIFIER 1N4004	0405180004
CR6	DIODE, RECTIFIER 1N4004	0405180004
CR7	DIODE, RECTIFIER 1N4004	0405180004
CR8	DIODE, RECTIFIER 1N4004	0405180004
CR15	DIODE, RECTIFIER 1N4004	0405180004
CR16	DIODE, RECTIFIER 1N4004	0405180004
CR17	DIODE, RECTIFIER 1N4004	0405180004
CR18	DIODE, RECTIFIER 1N4004	0405180004
K5	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K6	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K7	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K8	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K13	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K14	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K15	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K16	RELAY, SPST, 24VDC, PC MOUNT	1010310038
L13	INDUCTOR, AIR WOUND, 634 NH	8076057507
L14	INDUCTOR, AIR WOUND, 729NH	8076057604
L15	INDUCTOR, TOROID, 1.43 µH	8076057701
L16	INDUCTOR, TOROID, 0.95 µH	8076057809
L17	INDUCTOR, TOROID, 1.18 µH	8076057906
L18	INDUCTOR, TOROID, 2.00 µH	8076058007
L19	INDUCTOR, TOROID, 1.47 µH	8076058104
L20	INDUCTOR, TOROID, 1.70 µH	8076058201
L21	INDUCTOR, TOROID, 2.74 µH	8076058309
L22	INDUCTOR, TOROID, 2.22 µH	8076058406
L23	INDUCTOR, TOROID, 2.52 µH	8076058503
L24	INDUCTOR, TOROID, 4.30 µH	8076058601
P4	CONNECTOR, HEADER, 10 PIN MALE	1011200104
	KEY, POLARIZING	1008070033

1055BP

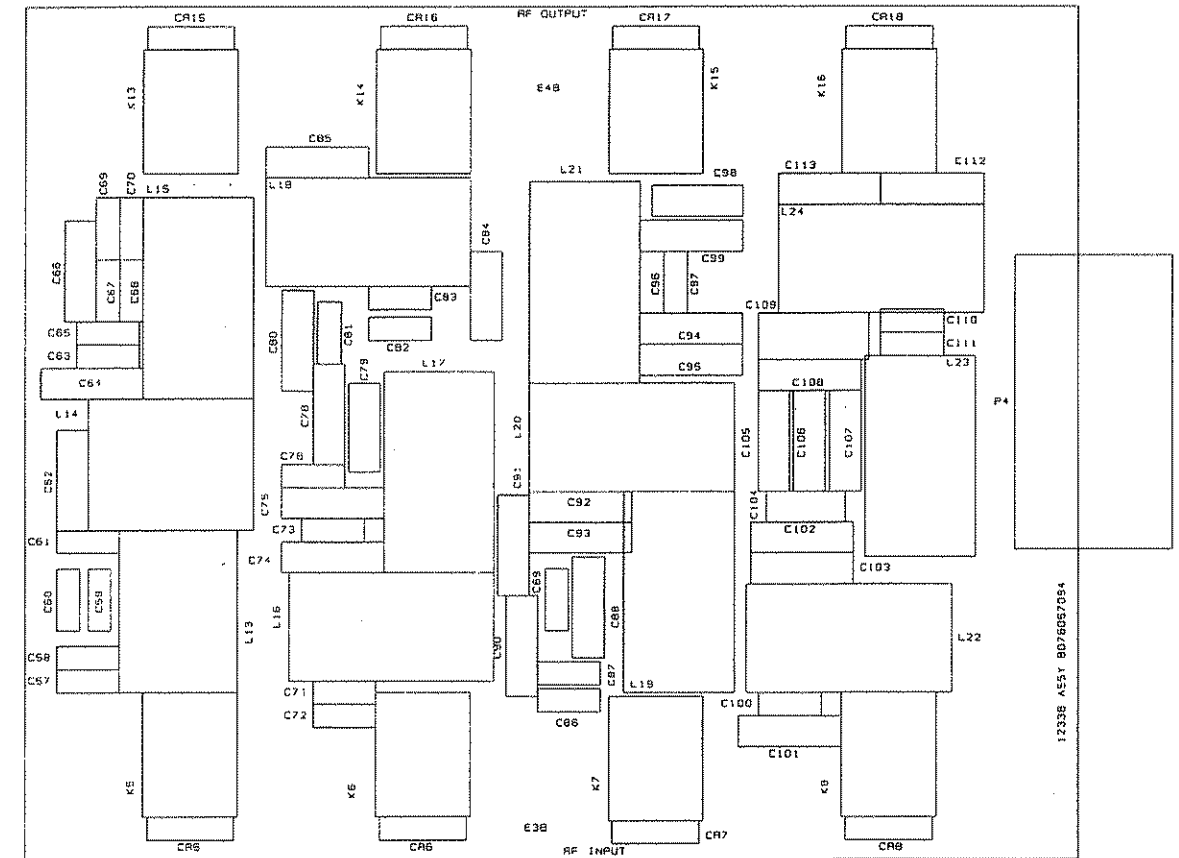
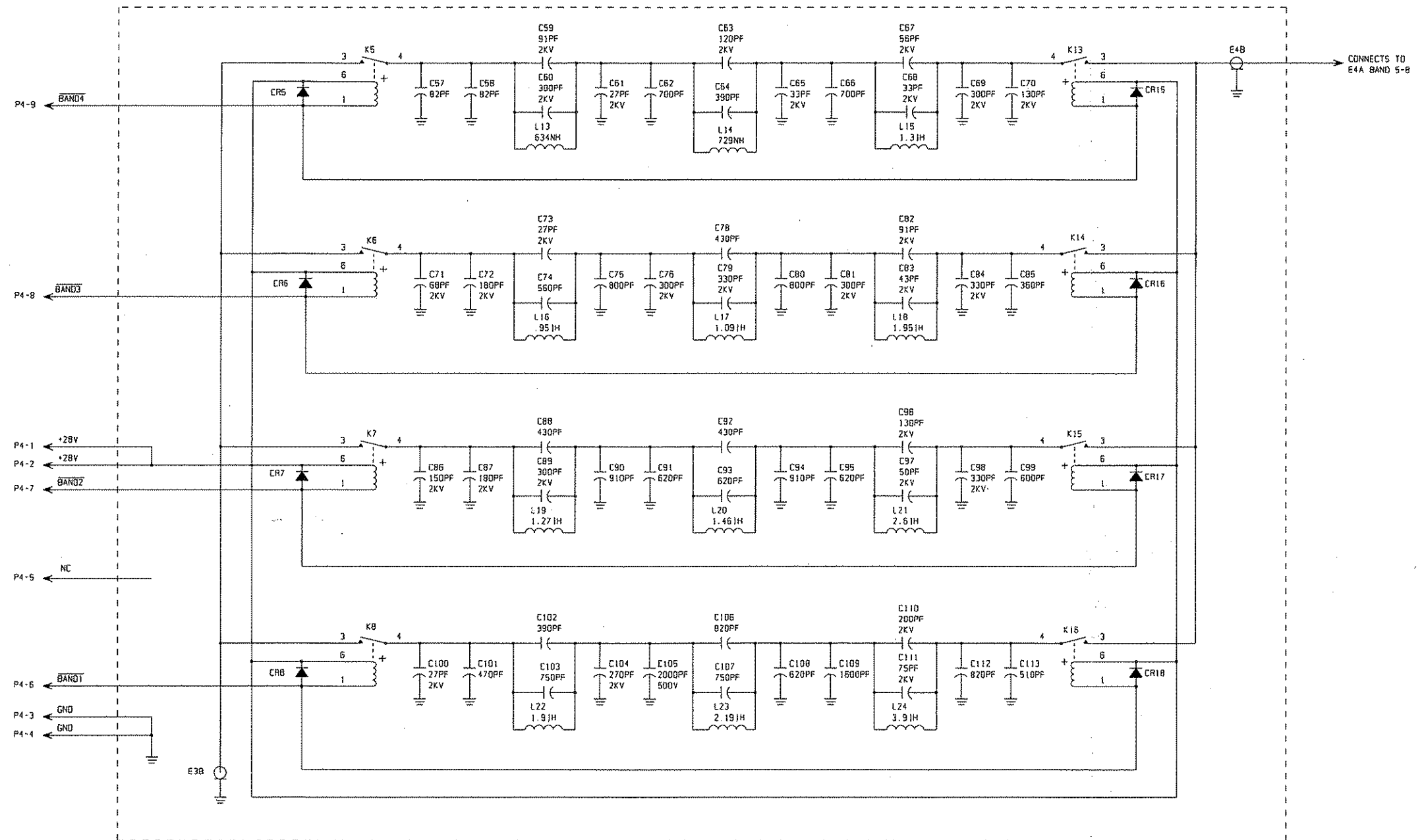


Figure 5.8.20 PC Assembly, Bands 1-4 1A3A2, page 1/2.

A1055B



NOTE:
DIODES ARE 1N4004 UNLESS SPECIFIED

Figure 5.8.20 PC Assembly, Bands 1-4 1A3A2, page 2/2.

PC ASSY, BANDS 5-8 1A3A3

	PC ASSY, BANDS 5-8 1A3A3	8076055091
C2	CAP. 20 PF, 2KV, N750	1008220027
C3	CAP. 56 PF, 2KV, N750	1008240028
C4	CAP. 62 PF, 2KV, N750	1008240036
C5	CAP. 100PF 2KV N750	1008250031
C6	CAP. 100PF 2KV N750	1008250031
C7	CAP. 50 PF, 2KV, N750	1008240010
C8	CAP. 62 PF, 2KV, N750	1008240036
C9	CAP. 100PF 2KV N750	1008250031
C10	CAP. 100PF 2KV N750	1008250031
C11	CAP. 10 PF, 2KV, N750	1008210021
C12	CAP. 15 PF, 2KV, N750	1008220001
C13	CAP. 68 PF, 2KV, N750	1008250007
C17	CAP. 50 PF, 2KV, N750	1008240010
C18	CAP. 100PF 2KV N750	1008250031
C19	CAP. 110PF 2KV N750	1008260002
C20	CAP. 110PF 2KV N750	1008260002
C21	CAP. 50 PF, 2KV, N750	1008240010
C22	CAP. 91 PF, 2KV, N750	1008250023
C23	CAP. 62 PF, 2KV, N750	1008240036
C24	CAP. 150PF 2KV N750	1008260037
C25	CAP. 15 PF, 2KV, N750	1008220001
C26	CAP. 15 PF, 2KV, N750	1008220001
C28	CAP. 56 PF, 2KV, N750	1008240028
C31	CAP. 100PF 2KV N750	1008250031
C32	CAP. 56 PF, 2KV, N750	1008240028
C33	CAP. 56 PF, 2KV, N750	1008240028
C34	CAP. 270PF 2KV N750	1008280020
C35	CAP. 27 PF, 2KV, N750	1008230006
C36	CAP. 200PF 2KV N750	1008270016
C37	CAP. 56 PF, 2KV, N750	1008240028
C38	CAP. 270PF 2KV N750	1008280020
C39	CAP. 10 PF, 2KV, N750	1008210021
C40	CAP. 30 PF, 2KV, N750	1008230014
C42	CAP. 130PF 2KV N750	1008260029
C43	CAP. 30 PF, 2KV, N750	1008230014
C44	CAP. 75 PF, 2KV, N750	1008250015
C45	CAP. 91 PF, 2KV, N750	1008250023
C46	CAP. 150PF 2KV N750	1008260037
C47	CAP. 160PF 2KV N750	1008270032
C48	CAP. 330PF 2KV N750	1008280038
C49	CAP. 330PF 2KV N750	1008280038
C50	CAP. 27 PF, 2KV, N750	1008230006
C51	CAP. 160PF 2KV N750	1008270032
C52	CAP. 330PF 2KV N750	1008280038
C53	CAP. 30 PF, 2KV, N750	1008230014
C54	CAP. 30 PF, 2KV, N750	1008230014
C55	CAP. 160PF 2KV N750	1008270032
C56	CAP. 120PF 2KV N750	1008260011
CR1	DIODE, RECTIFIER 1N4004	0405180004
CR2	DIODE, RECTIFIER 1N4004	0405180004
CR3	DIODE, RECTIFIER 1N4004	0405180004
CR4	DIODE, RECTIFIER 1N4004	0405180004
CR11	DIODE, RECTIFIER 1N4004	0405180004

CR12	DIODE, RECTIFIER 1N4004	0405180004
CR13	DIODE, RECTIFIER 1N4004	0405180004
CR14	DIODE, RECTIFIER 1N4004	0405180004
K1	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K2	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K3	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K4	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K9	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K10	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K11	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K12	RELAY, SPST, 24VDC, PC MOUNT	1010310038
L1	INDUCTOR, AIR WOUND, 102 NH	8076055504
L2	INDUCTOR, AIR WOUND, 147 NH	8076055601
L3	INDUCTOR, AIR WOUND, 221 NH	8076055709
L4	INDUCTOR, AIR WOUND, 153 NH	8076055806
L5	INDUCTOR, AIR WOUND, 221 NH	8076055709
L6	INDUCTOR, AIR WOUND, 384 NH	8076055903
L7	INDUCTOR, AIR WOUND, 282 NH	8076056004
L8	INDUCTOR, AIR WOUND, 324 NH	8076056101
L9	INDUCTOR, AIR WOUND, 577 NH	8076056209
L10	INDUCTOR, AIR WOUND, 423 NH	8076056306
L11	INDUCTOR, AIR WOUND, 486 NH	8076056403
L12	INDUCTOR, AIR WOUND, 866 NH	8076056501
P3	CONNECTOR, HEADER, 10 PIN MALE	1011200104
	KEY, POLARIZING	1008070033

1054BP

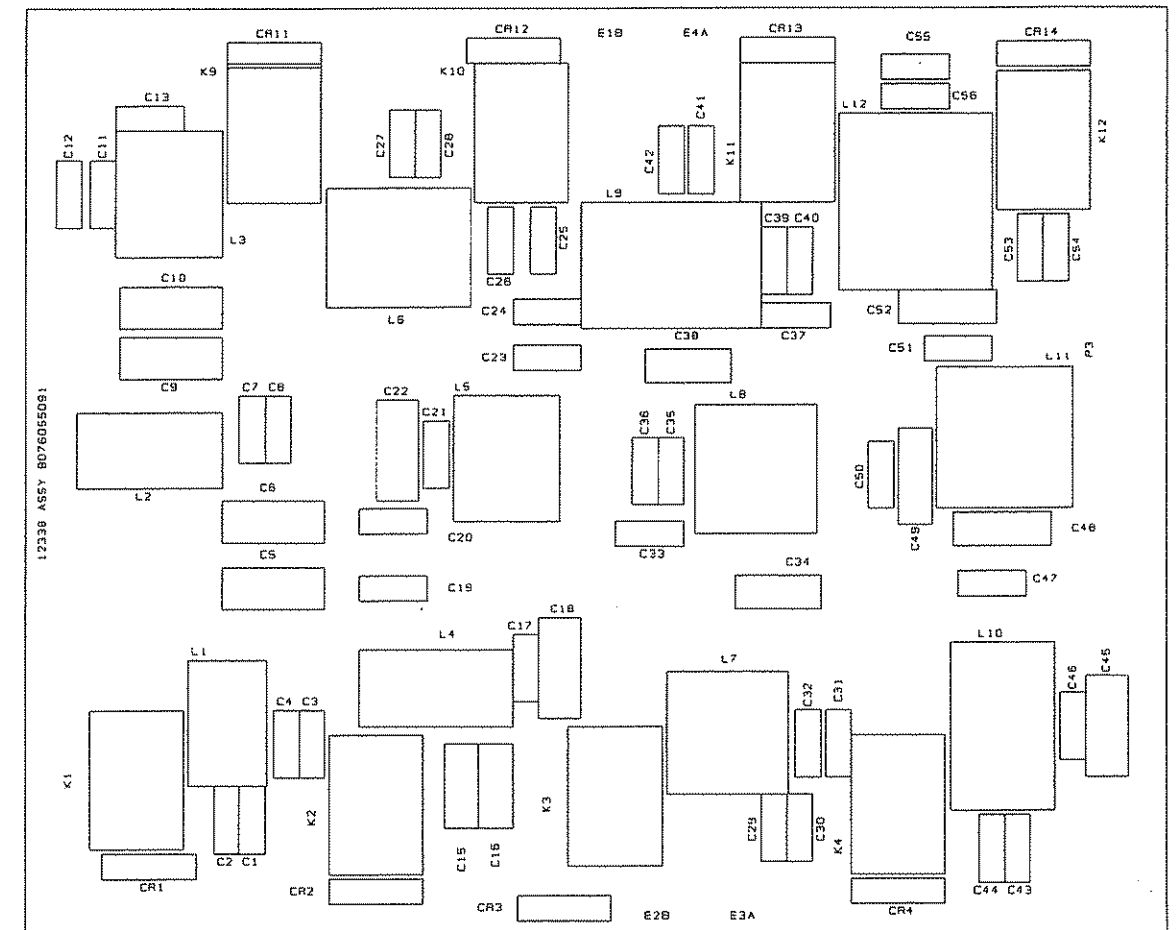


Figure 5.8.21 PC Assembly, Bands 5-8 1A3A3, page 1/2.

A10548

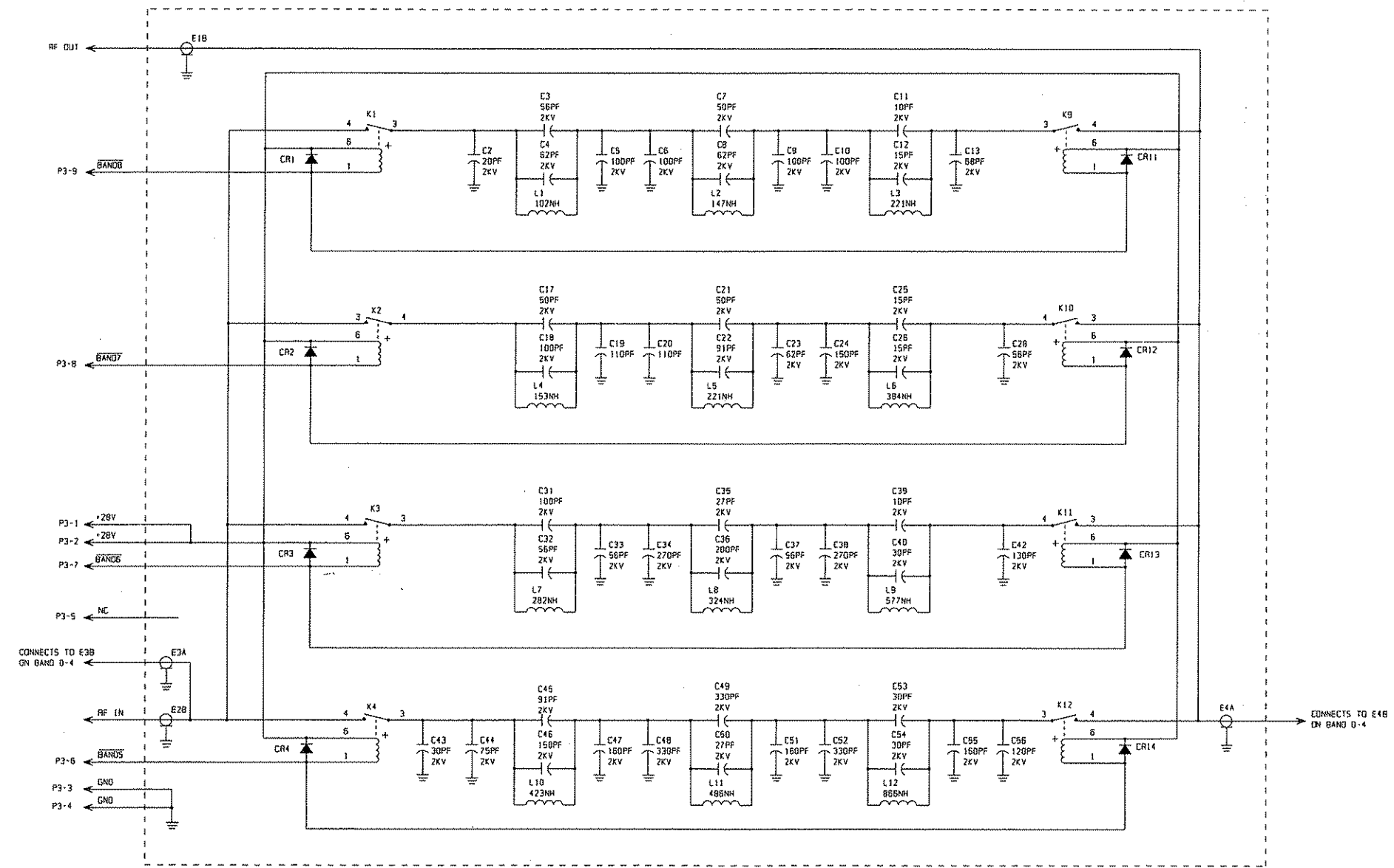


Figure 5.8.21 PC Assembly, Bands 5-8 1A3A3, page 2/2.

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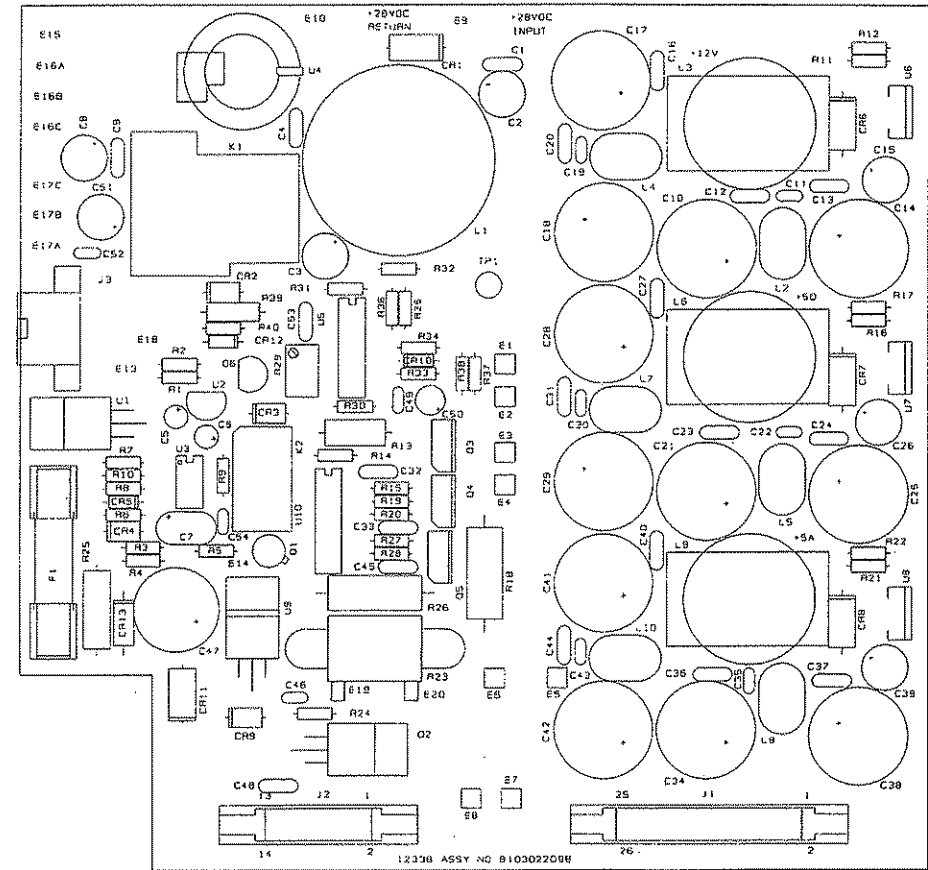
POWER SUPPLY ASSEMBLY, 28VDC 1A5A1

1A5A1A1	POWER SUPPLY ASSY, 28VDC 1A5A1	8103020095
1A5A1A2	CHASSIS, POWER SUPPLY	8103020702
	PC ASSY. SWITCHING REGULATORS	8103022098
	PC ASSY CONTROL LOGIC, DC/PS	8076024099

Figure 5.8.22 Power Supply Assembly 1A5A1, page 1/1.

PC ASSY, SWITCHING REGULATORS 1A5A1A1		
REV C	PC ASSY, SWITCHING REGULATORS	8103022098
C1	CAP. 0.1UF, 50V, X7R	1011180014
C2	CAP. 6.8UF, 50V	1008980013
C3	CAP. 6.8UF, 50V	1008980013
C4	CAP. 0.1UF, 50V, X7R	1011180014
C5	CAP. 1UF, 35V	0281660000
C6	CAP. 1UF, 35V	0281660000
C7	CAP. 68UF, 15V	0296540005
C8	CAP. 6.8UF, 50V	1008980013
C9	CAP. 0.1UF, 50V, X7R	1011180014
C10	CAP. 1000UF, 63V, 105C	1011350009
C11	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C12	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C13	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C14	CAP. 1000UF, 63V, 105C	1011350009
C15	CAP. 6.8UF, 50V	1008980013
C16	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C17	CAP. 1000UF, 63V, 105C	1011350009
C18	CAP. 1000UF, 63V, 105C	1011350009
C19	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C20	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C21	CAP. 1000UF, 63V, 105C	1011350009
C22	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C23	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C24	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C25	CAP. 1000UF, 63V, 105C	1011350009
C26	CAP. 6.8UF, 50V	1008980013
C27	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C28	CAP. 1000UF, 63V, 105C	1011350009
C29	CAP. 1000UF, 63V, 105C	1011350009
C30	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C31	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C32	CAP. 0.1UF, 50V, X7R	1011180014
C33	CAP. 0.1UF, 50V, X7R	1011180014
C34	CAP. 1000UF, 63V, 105C	1011350009
C35	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C36	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C37	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C38	CAP. 1000UF, 63V, 105C	1011350009
C39	CAP. 6.8UF, 50V	1008980013
C40	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C41	CAP. 1000UF, 63V, 105C	1011350009
C42	CAP. 1000UF, 63V, 105C	1011350009
C43	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C44	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C45	CAP. 0.1UF, 50V, X7R	1011180014
C46	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C47	CAP. 1000UF, 35V, 105C	1011420031
C48	CAP. 0.47UF, 50V, X7R, 20%	0283377771
C49	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C50	CAP. 0.22UF, 35V	0283510005
C51	CAP. 6.8UF, 50V	1008980013
C52	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C53	CAP. 0.1UF, 50V, X7R	1011180014
C54	CAP. 0.01UF, 50V, X7R, 20%	0281730008
C55	CAP. 0.01UF, 50V, X7R, 20%	0281730008
CR2	DIODE, RECTIFIER 1N4004	0405180004
CR3	DIODE, RECTIFIER 1N4004	0405180004
CR5	DIODE, ZENER 1N5237B	0405240007

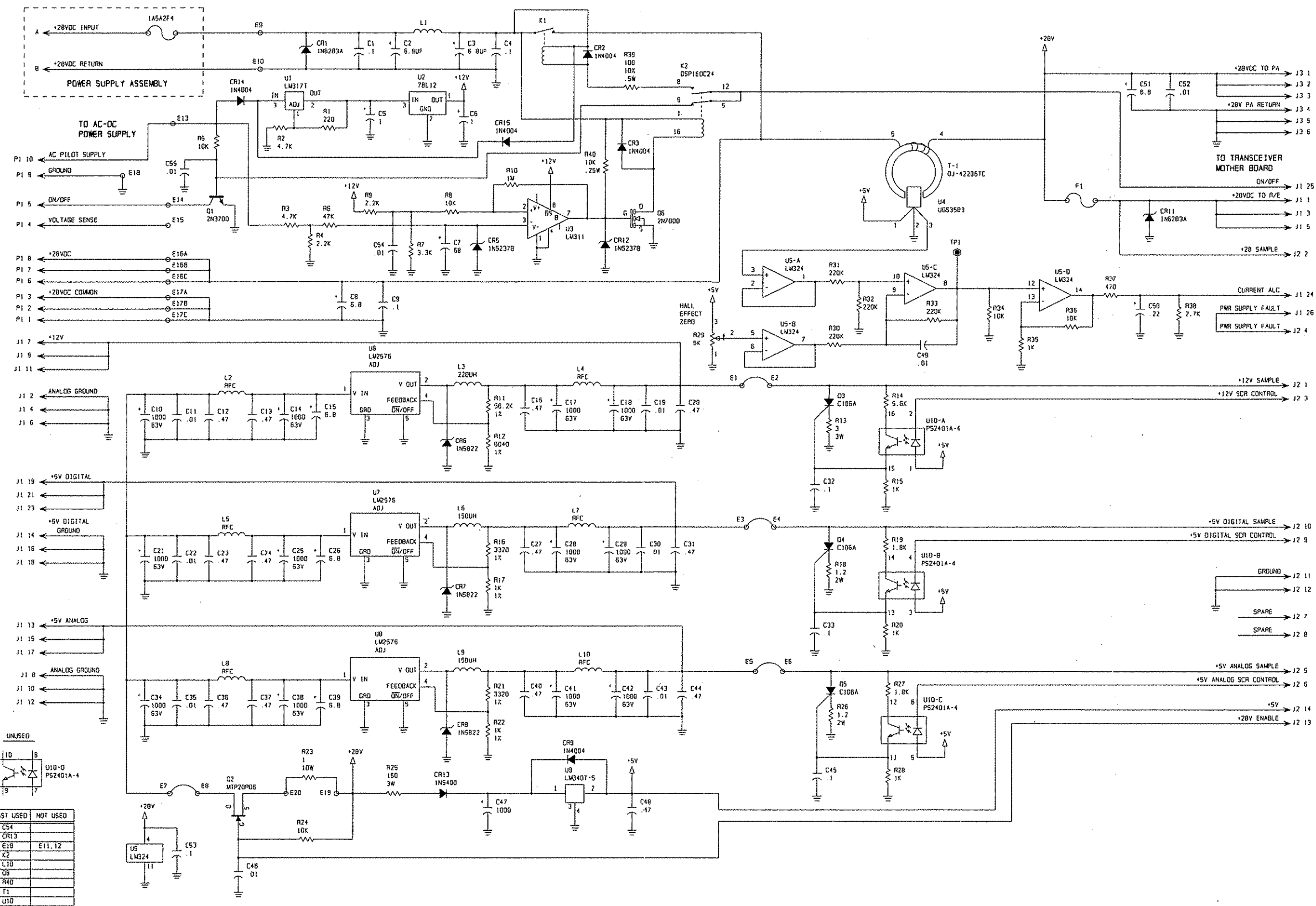
CR6	DIODE, RECTIFIER 1N5822	1010630032
CR7	DIODE, RECTIFIER 1N5822	1010630032
CR8	DIODE, RECTIFIER 1N5822	1010630032
CR9	DIODE, RECTIFIER 1N4004	0405180004
CR11	DIODE, TRANZORB 1N6283A	1011260000
CR12	DIODE, ZENER 1N5237B	0405240007
CR13	DIODE, RECTIFIER 1N5400	0403970008
CR14	DIODE, RECTIFIER 1N4004	0405180004
CR15	DIODE, RECTIFIER 1N4004	0405180004
F1	FUSE, MDL, 1 AMP, 250V	0841100004
J1	CONNECTOR, HEADER, 26 PIN MALE	1011200261
J2	CONNECTOR, HEADER 14 PIN MALE	1011200147
J3	CONNECTOR, PC, 6 PIN HEADER	1010830015
K1	RELAY, SPST, 24V	1008590029
K2	RELAY, SPDT, 24 VDC	1010760025
L1	INDUCTOR, CHOKE, 47UH	1008990019
L2	FERRITE BEAD, .400L	1010900013
L3	INDUCTOR, POWER, 220 UH	1011100037
L4	FERRITE BEAD, .400L	1010900013
L5	FERRITE BEAD, .400L	1010900013
L6	INDUCTOR, TOROID, 150UH	1010650033
L7	FERRITE BEAD, .400L	1010900013
L8	FERRITE BEAD, .400L	1010900013
L9	INDUCTOR, TOROID, 150UH	1010650033
L10	FERRITE BEAD, .400L	1010900013
P1	CONNECTOR, HOUSING, 10 PIN, FEM	1010850016
Q1	TRANSISTOR, NPN, SI. 2N3700	1008500038
Q2	TRANSISTOR, P-CH, FET MTP23P06	1010960008
Q3	DIODE, SCR C106A2	0447070002
Q4	DIODE, SCR C106A2	0447070002
Q5	DIODE, SCR C106A2	0447070002
Q6	TRANSISTOR, N-CH, FET 2N7000	1011050013
R1	RESISTOR 220, 10%, 1/4W	0171320000
R2	RESISTOR 4.7K, 5%, 1/4W	0170770001
R3	RESISTOR 4.7K, 5%, 1/4W	0170770001
R4	RESISTOR 2.2K, 5%, 1/4W	0178070009
R5	RESISTOR 10K, 10%, 1/4W	0170410005
R6	RESISTOR 47K, 10%, 1/4W	0171060008
R7	RESISTOR 3.3K, 10%, 1/4W	0170890007
R8	RESISTOR 10K, 10%, 1/4W	0170410005
R9	RESISTOR 2.2K, 5%, 1/4W	0178070009
R10	RESISTOR 1M, 10%, 1/4W	0170850006
R11	RESISTOR 56.2K, 1%, 1/8W	1008910015
R12	RESISTOR 6040, 1%, 1/8W	1010580019
R13	RESISTOR 3, 5%, 3W	1004600003
R14	RESISTOR 5.6K, 10%, 1/4W	0183060008
R15	RESISTOR 1K, 10%, 1/4W	0171560001
R16	RESISTOR 3320, 1%, 1/8W	1003050000
R17	RESISTOR 1K, 1%, 1/8W	1011380005
R18	RESISTOR 1.2, 10%, 2W	0186290004
R19	RESISTOR 1.8K, 10%, 1/4W	0178190004
R20	RESISTOR 1K, 10%, 1/4W	0171560001
R21	RESISTOR 3320, 1%, 1/8W	1003050000
R22	RESISTOR 1K, 1%, 1/8W	1011380005
R23	RESISTOR 1, 5%, 10W	0169680002
R24	RESISTOR 10K, 10%, 1/4W	0170410005
R25	RESISTOR 150, 5%, 3W	0160110009
R26	RESISTOR 1.2, 10%, 2W	0186290004
R27	RESISTOR 1.8K, 10%, 1/4W	0178190004
R28	RESISTOR 1K, 10%, 1/4W	0171560001
R29	POT. 5K, 10%, 1/2W, 25 TURNS	1004720025



R30	RESISTOR 220K, 10%, 1/4W	0177780002
R31	RESISTOR 220K, 10%, 1/4W	0177780002
R32	RESISTOR 220K, 10%, 1/4W	0177780002
R33	RESISTOR 220K, 10%, 1/4W	0177780002
R34	RESISTOR 10K, 10%, 1/4W	0170410005
R35	RESISTOR 1K, 10%, 1/4W	0171560001
R36	RESISTOR 10K, 10%, 1/4W	0170410005
R37	RESISTOR 470, 5%, 1/4W	0184110009
R38	RESISTOR 2.7K, 10%, 1/4W	0186670001
R39	RESISTOR 100, 10%, 1/2W	0174790007
R40	RESISTOR 10K, 10%, 1/4W	0170410005
T1	TOROID, SLOTTED, HALL EFFECT	1011040018
TP1	TEST POINT, RED	1011130033
U1	IC. LINEAR LM317T	1006920013
U2	IC. LINEAR 78L12	1010840029
U3	IC. LINEAR LM311N	1005760021
U4	IC. LINEAR UGS3503	1011020017
U5	IC. LINEAR LM324N	1003970001
U6	IC. LINEAR LM2576-ADJ	1010610031
U7	IC. LINEAR LM2576-ADJ	1010610031
U8	IC. LINEAR LM2576-ADJ	1010610031
U9	IC. LINEAR LM340T5	0448600005
U10	IC. DIGITAL 2501-4	1010630008
XF1	FUSECLIP, PC MOUNT KEY, POLARIZING HEATSINK PLATE, SWITCHING REG	0534610005 1008070033 8103022501

Figure 5.8.23 PC Assembly, Switching Regulators 1A5A1A1, page 1/2.

A1199C



LAST USED	NOT USED
C54	
CR13	
E18	E11, 12
K2	
L10	
U5	
R40	
T1	
U10	

Figure 5.8.23 PC Assembly, Switching Regulators 1A5A1A1, page 2/2.

PC ASSY, CONTROL LOGIC, DC/PS 1A5A1A2

C1	PC ASSY, CTRL LOGIC, DC/PS 1A5A1A2	8076024099
C2	CAP. .01µF, 50V, X7R 20%	0281730008
C14	CAP. 6.8µF, 20V, T368	0296780006
C37	CAP. .01µF, 50V, X7R 20%	0281730008
C38	CAP. .01µF, 50V, X7R 20%	0281730008
C39	CAP. .01µF, 50V, X7R 20%	0281730008
C51	CAP. .01µF, 50V, X7R 20%	0281730008
C52	CAP. .01µF, 50V, X7R 20%	0281730008
C53	CAP. .01µF, 50V, X7R 20%	0281730008
C54	CAP. .01µF, 50V, X7R 20%	0281730008
C55	CAP. .01µF, 50V, X7R 20%	0281730008
CR1	DIODE, RECTIFIER 1N4004	0405180004
CR2	DIODE, LED, RED	1004350023
CR3	DIODE, LED, RED	1004350023
CR4	DIODE, LED, RED	1004350023
CR5	DIODE, LED, RED	1004350023
CR6	DIODE, LED, RED	1004350023
CR7	DIODE, LED, RED	1004350023
CR8	DIODE, LED, GREEN	1004350015
CR14	DIODE, LED, RED	1004350023
CR15	DIODE, LED, RED	1004350023
CR16	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR17	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR18	DIODE, LED, RED	1004350023
P1	CONNECTOR, RIBBON, 14 PIN FEM	1008350001
R2	RESISTOR 10K, 10%, 1/4W	0170410005
R3	RESISTOR, 237K, 1%, 1/8W	1011310007
R4	RESISTOR 180, 10%, 1/4W	0175220000
R9	RESISTOR, 100K, 1/8W, 1%	1001030036
R10	RESISTOR, 1.8M, 10%, 1/4W	1011300001
R11	RESISTOR 10K, 1%, 1/8W	1003050026
R12	RESISTOR, 80.6K, 1%, 1/8W	1011290006
R13	RESISTOR 1.2M, 10%, 1/4W	0174930003
R14	RESISTOR 10K, 1%, 1/8W	1003050026
R15	RESISTOR 270, 10%, 1/4W	0178450006
R16	RESISTOR 390, 10%, 1/4W	0178330001
R17	RESISTOR 100K, 10%, 1/4W	0170390004
R18	RESISTOR 180, 10%, 1/4W	0175220000
R19	RESISTOR, 4.7M, 10%, 1/4W	1011330008
R20	RESISTOR 180, 10%, 1/4W	0175220000
R21	RESISTOR 10K, 1%, 1/8W	1003050026
R22	RESISTOR 180, 10%, 1/4W	0175220000
R23	RESISTOR, 143K, 1%, 1/8W	1011410001
R24	RESISTOR 270, 10%, 1/4W	0178450006
R26	RESISTOR 680K, 10%, 1/4W	0181480000
R27	RESISTOR 36.5K, 1%, 1/8W	1004050011
R28	RESISTOR 10K, 1%, 1/8W	1003050026
R29	RESISTOR 470K, 10%, 1/4W	0180570005
R30	RESISTOR, 26.1K, 1%, 1/8W	1011280001
R31	RESISTOR 10K, 1%, 1/8W	1003050026
R35	RESISTOR 270, 10%, 1/4W	0178450006
R36	RESISTOR 680K, 10%, 1/4W	0181480000
R37	RESISTOR 36.5K, 1%, 1/8W	1004050011
R38	RESISTOR 10K, 1%, 1/8W	1003050026
R39	RESISTOR 470K, 10%, 1/4W	0180570005

R40	RESISTOR, 26.1K, 1%, 1/8W	1011280001
R41	RESISTOR 10K, 1%, 1/8W	1003050026
R46	RESISTOR 390, 10%, 1/4W	0178330001
R47	RESISTOR 2.7M, 5%, 1/4W	1004900007
R48	RESISTOR 10K, 1%, 1/8W	1003050026
R49	RESISTOR 270, 10%, 1/4W	0178450006
R50	RESISTOR 270, 10%, 1/4W	0178450006
R51	RESISTOR 10K, 10%, 1/4W	0170410005
R52	RESISTOR 10K, 10%, 1/4W	0170410005
R61	RESISTOR 180, 10%, 1/4W	0175220000
R62	RESISTOR 10K, 10%, 1/4W	0170410005
R64	RESISTOR 390, 10%, 1/4W	0178330001
RP1	RES NTWK 8 PIN SIP 10K COM	1005200009
U4	IC. DIGITAL ULN2003A	1005630038
U5	IC. DIGITAL ICL7665S	1010940007
U6	IC. DIGITAL ICL7665S	1010940007
U7	IC. DIGITAL ICL7665S	1010940007
U8	IC. DIGITAL 74HC74	1008000019
U9	IC. DIGITAL 74HC74	1008000019
U10	IC. DIGITAL 74HC14	1006490027
U12	IC. DIGITAL ICL7665S	1010940007
U13	IC. DIGITAL 74HC08	1006490019
U14	IC. DIGITAL 74HC11	1010950002
U16	IC. DIGITAL UDN5703A	1011030004
XP1	CONNECTOR,PCB,TRANSITION,14PIN CABLE, FLAT, 14 COND. 28AWG	1011090147 1011170001

1118AP

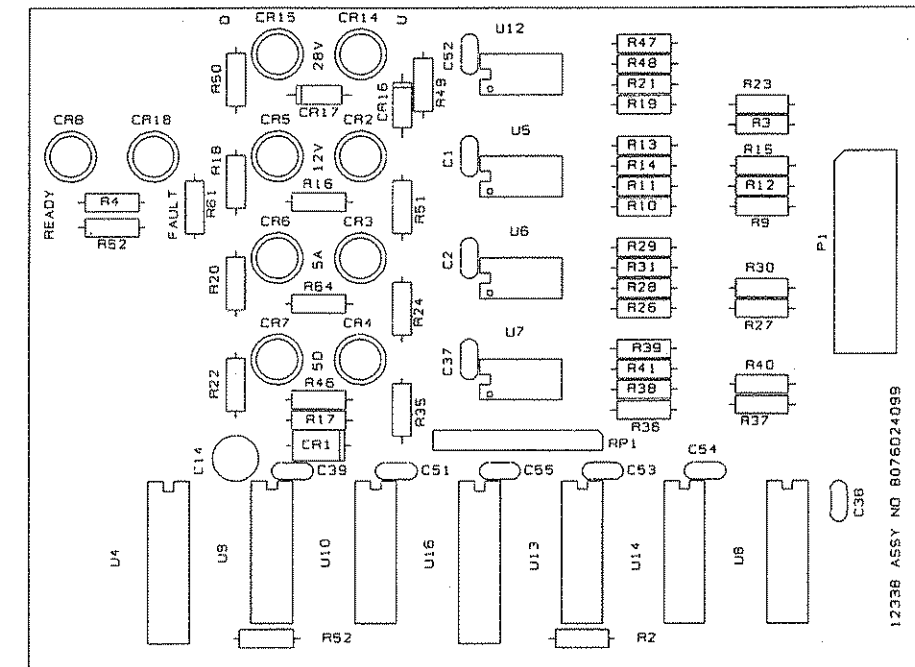


Figure 5.8.24 PC Assembly, Control Logic, DC/PS 1A5A1A2, page 1/2.

A11188

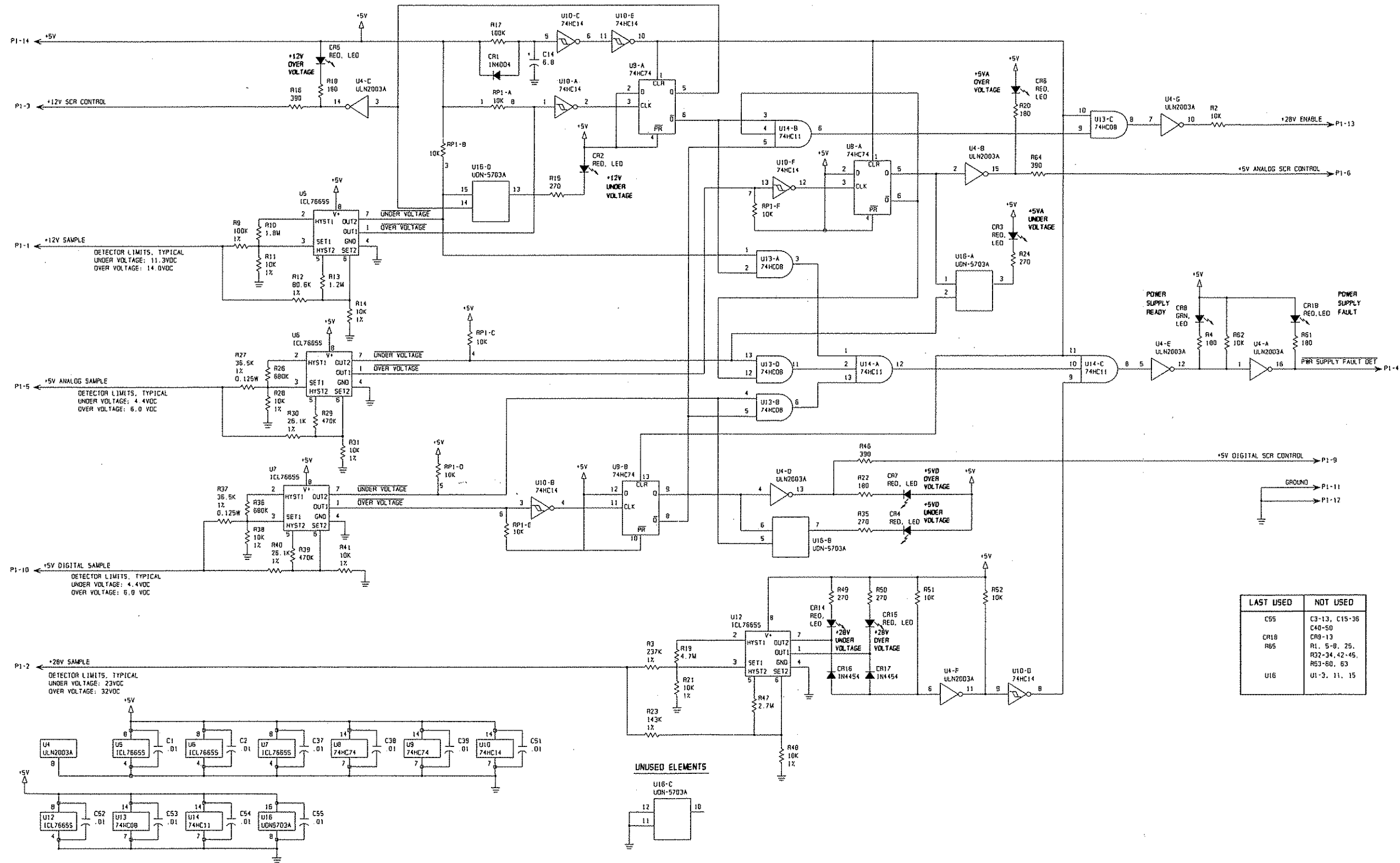
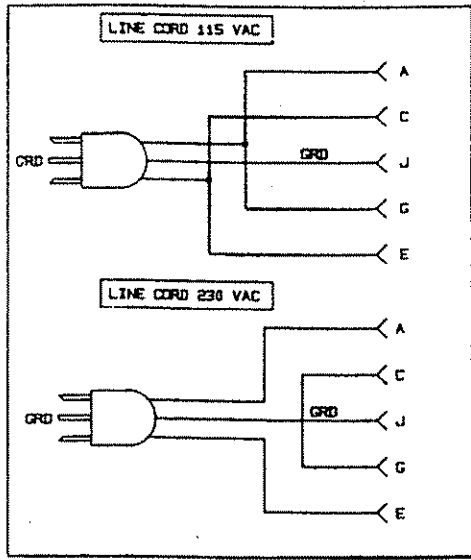
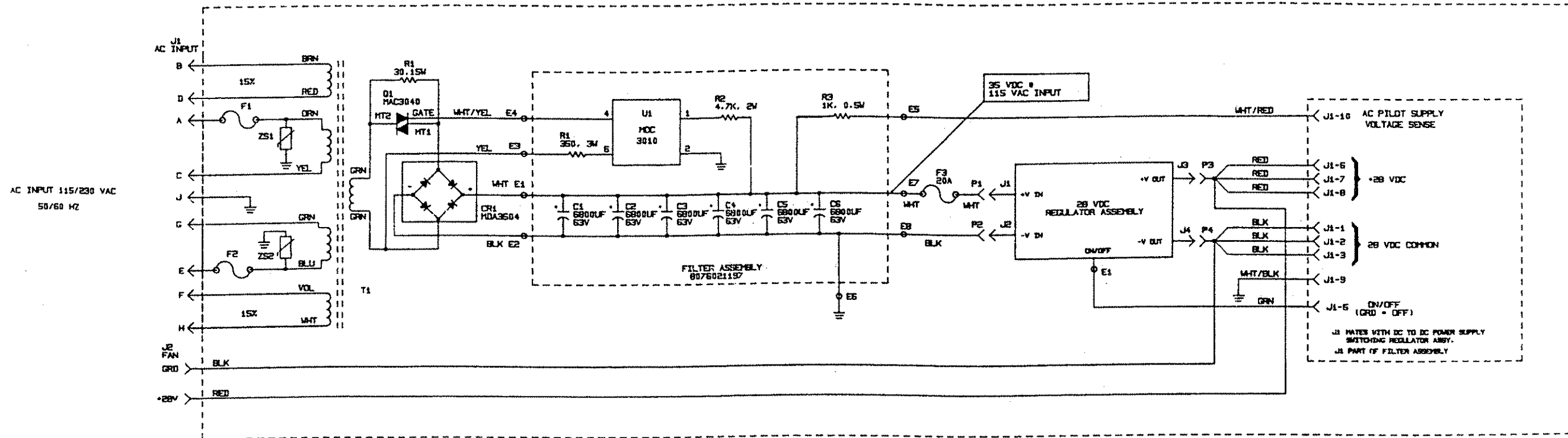


Figure 5.8.24 PC Assembly, Control Logic, DC/PS 1A5A1A2, page 2/2.

POWER SUPPLY ASSEMBLY, 115/230 VAC 1A5A2

1A5A2A1	PWR SUPPLY ASSY, 115/230 VAC 1A5A2	8102025093
1A5A2A2	PC ASSY, FILTER, AC/PS	8076021197
CR1	PC ASSY, 28V REGULATOR, 5 AMP	8078021496
J1	DIODE, BRIDGE, W&400V	1010600010
Q1	CONNECTOR, POWER, 10 PIN, MALE	1011050005
R1	TRLAC MAC3040-401	1010610015
T1	RESISTOR 30, 5%, 1aw	1000860019
XF1	TRANSFORMER, AC, 200VA	1010670026
XF2	FUSEHOLDER, PANEL MOUNT	0849030005
ZS1	FUSEHOLDER, PANEL MOUNT	0849030005
ZS2	VARISTOR, MOV V140LA5	1011300010
	VARISTOR, MOV V140LA5	1011300010
	CHASSIS, AC POWER SUPPLY	8076021502
	CONNECTOR, HOUSING, 10 PIN, MAL	1010860011
	CONNECTOR, POWER, 2 PIN ROUND	1011230011
	FUSE, MDQ, 5 AMP, 250V	0858660008
	FUSE, SFE, 20 AMP, 32V	1011290014
	FUSEMOUNT, 1 POLE W[TERMINALS	0842490001
	HEATSINK, AC POWER SUPPLY	8076021901
	INSULATOR, TO-3 SIL ELASTOMER	0841560005

Figure 5.8.25 Power Supply Assembly 115/230 VAC 1A5A2, page 1/2.



ADD HIGH-LINE LINE CORDS.

Figure 5.8.25 Power Supply Assembly 115/230 VAC 1A5A2, page 2/2.

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1123BP

PC ASSY, FILTER AC/PS 1A5A2A1		
C1	PC ASSY, FILTER, AC/PS 1A5A2A1	8076021197
C2	CAP. 6800 μ F, 63V, 20%, 105C	1010800019
C3	CAP. 6800 μ F, 63V, 20%, 105C	1010800019
C4	CAP. 6800 μ F, 63V, 20%, 105C	1010800019
C5	CAP. 6800 μ F, 63V, 20%, 105C	1010800019
C6	CAP. 6800 μ F, 63V, 20%, 105C	1010800019
R1	RESISTOR 350, 5%, 3W	0162930003
R2	RESISTOR 4.7K, 10%, 2W	0164130004
R3	RESISTOR 100, 10%, 1/2W	0174790007
U1	IC LINEAR MOC3010	1010620011

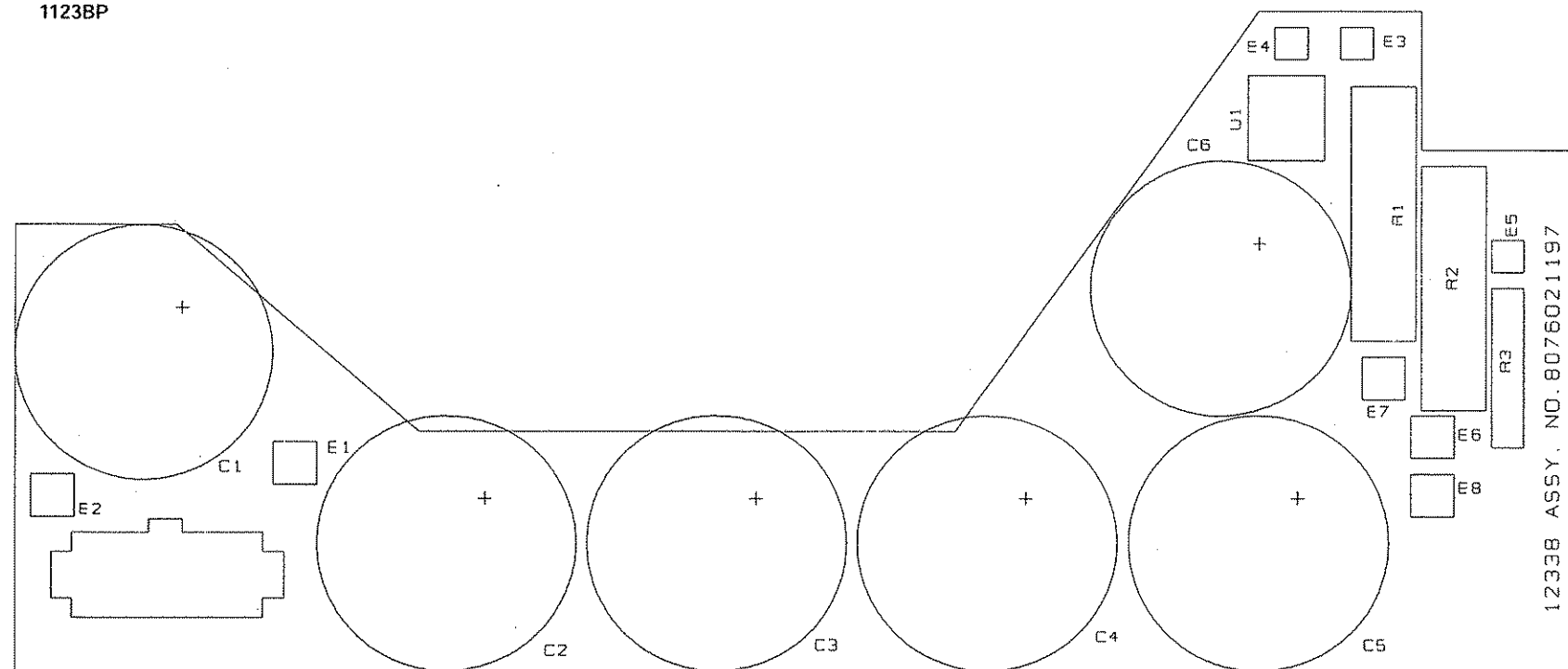


Figure 5.8.26 PC Assembly, Filter, AC/PS 1A5A2A1, page 1/1.

PC ASSY, 28V REGULATOR, 5 AMP 1A5A2A2

C1	PC ASSY, 28V REG, 5 AMP 3A3A1	8078021496
C2	CAP. .47μF, 50V, X7R 20%	0283377771
C3	CAPACITOR 0.1μF, 50V, X7R	1011180014
C4	CAP. 0.047 μF, 50V, X7R, 10%	1010740008
C5	CAP. 2.2μF, 35V, T368	0273950002
C6	CAP. .01μF, 50V, X7R 20%	0281730008
C7	CAP. 1μF, 35V, 196D	0281660000
C8	CAPACITOR 0.1μF, 50V, X7R	1011180014
C9	CAP. .47μF, 50V, X7R 20%	0283377771
C10	CAP. .01μF, 50V, X7R 20%	0281730008
C11	CAP. .01μF, 50V, X7R 20%	0281730008
C12	CAP. 1μF, 35V, 196D	0281660000
C13	CAPACITOR 0.1μF, 50V, X7R	1011180014
C15	CAP. .47μF, 50V, X7R 20%	0283377771
C16	CAP. 1000μF, 63V, 20%, 105C	1011350009
CR1	CAP. 22μF, 15V, T368	0296660001
CR2	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR3	DIODE, ZENER 1N5358B	0404900003
CR4	DIODE, LED, RED, PC MOUNT	1008480029
CR5	DIODE, ZENER 1N5364B	0405230001
CR6	DIODE, RECTIFIER 1N4004	0405180004
CR7	DIODE, LED, RED, PC MOUNT	1008480029
CR8	DIODE, LED, GREEN PC MOUNT	1011030012
CR9	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR10	DIODE, SIGNAL, SIL. 1N4454	0405270003
J1	TERMINAL, PC MOUNT, 3/16" MALE	1008550027
J2	TERMINAL, PC MOUNT, 1/4" MALE	1008330035
J3	TERMINAL, PC MOUNT, 3/16" MALE	1008550027
J4	TERMINAL, PC MOUNT, 1/4" MALE	1008330035
K1	RELAY, SPST, 24V	1008590029
Q1	TRANSISTOR, PNP, MJ11031	1010990012
Q2	DIODE, SCR 2N5062	1011010011
Q3	TRANSISTOR, NPN, SI. 2N2222A	0448580004
R1	RESISTOR 470, 10%, 1W	0165280000
R2	RESISTOR 560, 5%, 1/4W	0183200004
R3	RESISTOR 3.9K, 5%, 1/8W	1010803921
R4	RESISTOR 4.7K, 5%, 1/8W	1010804723
R5	RESISTOR 6.8K, 5%, 1/8W	1010806823
R6	RESISTOR 2.2K, 5%, 1/8W	1010802224
R7	POT. 500, 10% 3/4W, 15 TURNS	0338490078
R8	RESISTOR 2.7K, 10%, 1/4W	0186670001
R9	RESISTOR 1K, 10%, 1/4W	0171560001
R10	RESISTOR 4.7K, 5%, 1/4W	0170770001
R11	RESISTOR 2.7K, 10%, 1/2W	0165780002
R12	RESISTOR 10K, 5%, 1/8W	1010801031
R13	RESISTOR 10K, 5%, 1/8W	1010801031
R14	RESISTOR 1.8K, 5%, 1/8W	1010801821
R15	POT. 500, 10% 3/4W, 15 TURNS	0338490078
R16	RESISTOR 680, 5%, 1/8W	1010806815
R17	RESISTOR 220, 10%, 1/4W	0171320000
R18	RESISTOR 180K, 5%, 1/8W	1010801848
R19	RESISTOR, 237K, 1%, 1/8W	1011310007
R20	RESISTOR, 4.7M, 10 %, 1/4W	1011330008

R21	RESISTOR 10K, 5%, 1/8W	1010801031
R22	RESISTOR 2.7M, 5%, 1/4W	1004900007
R23	RESISTOR 10K, 5%, 1/8W	1010801031
R24	RESISTOR 680, 10%, 1/4W	0176630007
R25	RESISTOR, 3.9K, 5%, 1/8W	1010803921
R27	RESISTOR 390, 10%, 1/2W	0173260004
R28	RESISTOR 680, 10%, 1/4W	0176630007
R29	RESISTOR 2.2K, 10%, 1W	0164510001
R30	RESISTOR 5.6K, 5%, 1/8W	1010805622
R31	RESISTOR 4.7K, 5%, 1/8W	1010804723
T1	TOROID, SLOTTED, HALL EFFECT	1011040018
U1	IC. LINEAR LM340/7812	1003410022
U2	IC. LINEAR MC1723L	1010270036
U3	IC. DIGITAL 2501-1	1011000016
U4	IC. LINEAR LM311N	1005760021
U5	IC. LINEAR UGS3503	1011020017
U6	IC. DIGITAL ICL7665S	1010940007
U7	IC. LINEAR UA78L05 AWC	1010150014
XQ1	SOCKET, XSISTOR, TO-3, HI-PWR	1011220016

2016AP

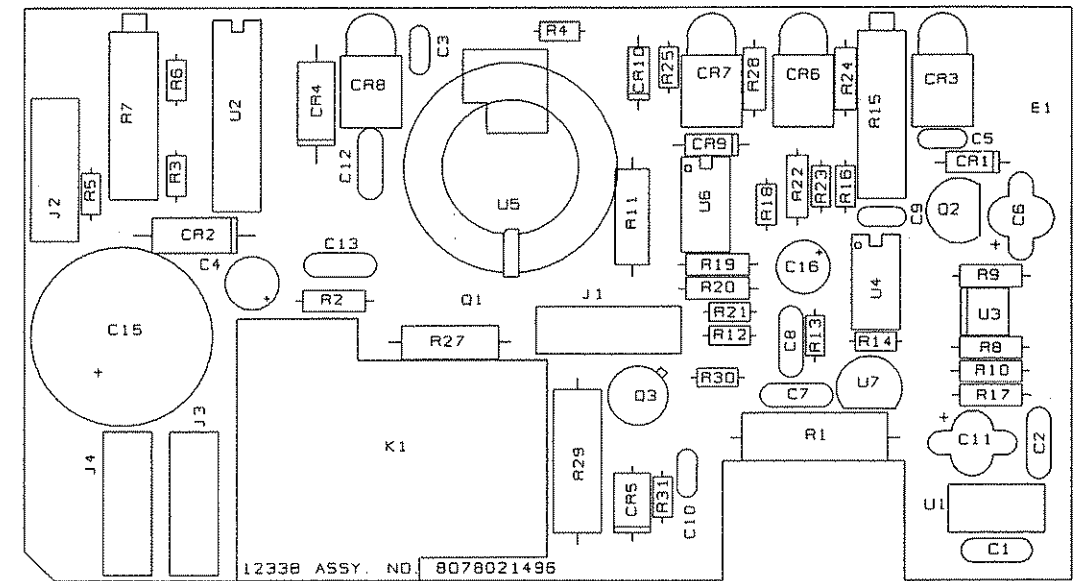
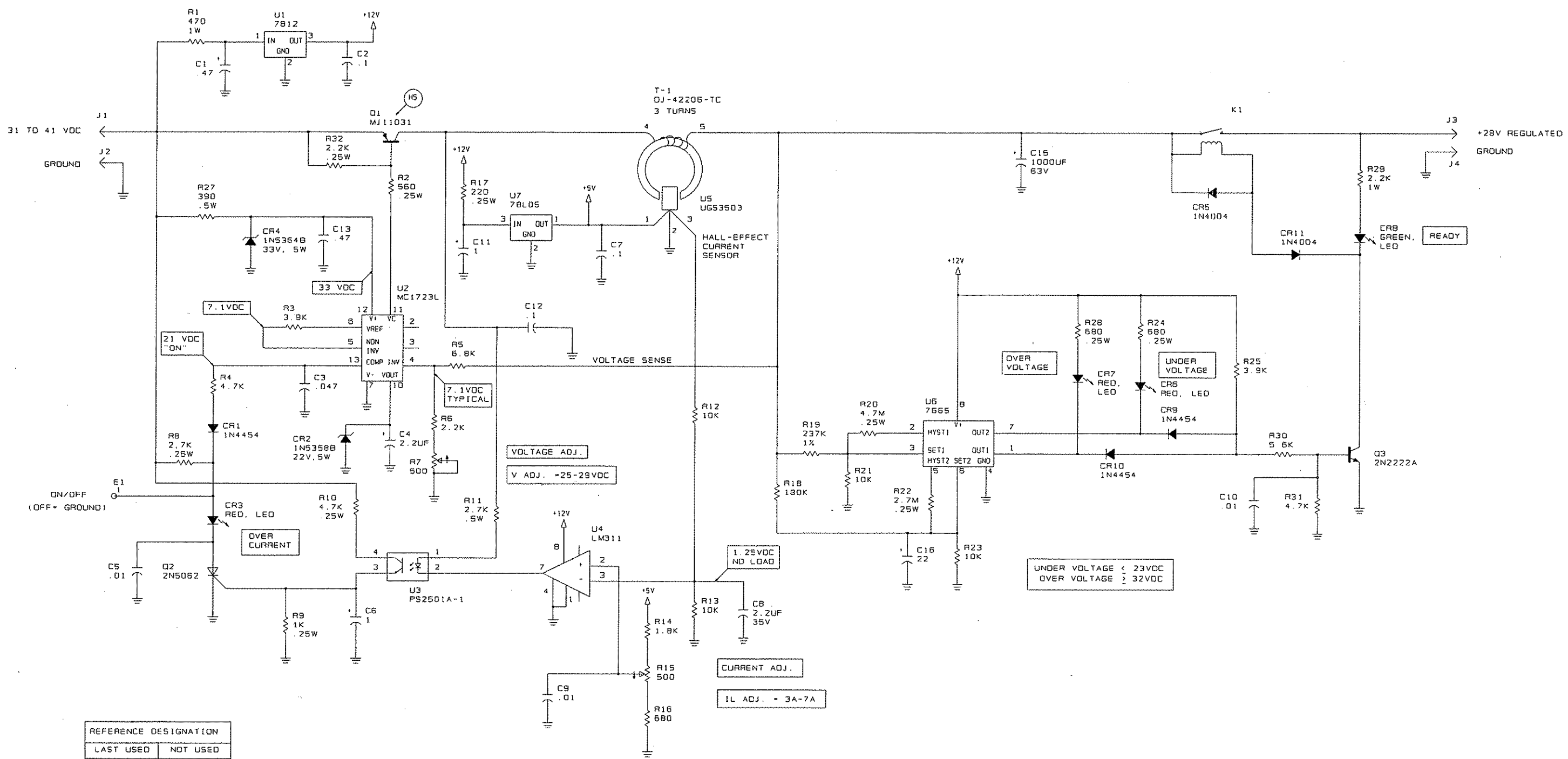


Figure 5.8.27 PC Assembly, 28V Regulator, 5 AMP 1A5A2A2, page 1/2.

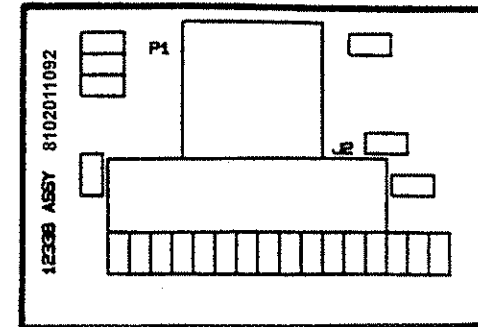
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REFERENCE DESIGNATION	
LAST USED	NOT USED
R32	R26
CR11	
U7	
Q3	
C15	

Figure 5.8.27 PC Assembly, 28V Regulator, 5 AMP 1A5A2A2, page 2/2.

1116AP



PC ASSEMBLY, REAR PANEL CONNECTOR 1A6A1

	PC ASSY, REAR PANEL CONNECTOR	8102011092
C40	CAP. .01UF, 50V, X7R 20%	0281730008
C41	CAP. .01UF, 50V, X7R 20%	0281730008
C42	CAP. .01UF, 50V, X7R 20%	0281730008
C43	CAP. .01UF, 50V, X7R 20%	0281730008
C44	CAP. .01UF, 50V, X7R 20%	0281730008
C45	CAP. .01UF, 50V, X7R 20%	0281730008
C46	CAP. .01UF, 50V, X7R 20%	0281730008
C47	CAP. .01UF, 50V, X7R 20%	0281730008
C48	CAP. .01UF, 50V, X7R 20%	0281730008
C49	CAP. .01UF, 50V, X7R 20%	0281730008
C50	CAP. .01UF, 50V, X7R 20%	0281730008
C53	CAP. .01UF, 50V, X7R 20%	0281730008
C54	CAP. .01UF, 50V, X7R 20%	0281730008
C55	CAP. .01UF, 50V, X7R 20%	0281730008
C56	CAP. .01UF, 50V, X7R 20%	0281730008
C57	CAP. .01UF, 50V, X7R 20%	0281730008
C58	CAP. .01UF, 50V, X7R 20%	0281730008
	CONNECTOR, POWER, 19 PIN, FEM	1011110008
	CONNECTOR, HEADER, 20 PIN MALE	1011210207
	KEY, POLARIZING	1008070033

Figure 5.8.28 PC Assembly, Rear Panel Connector 1A6A1, page 1/2.

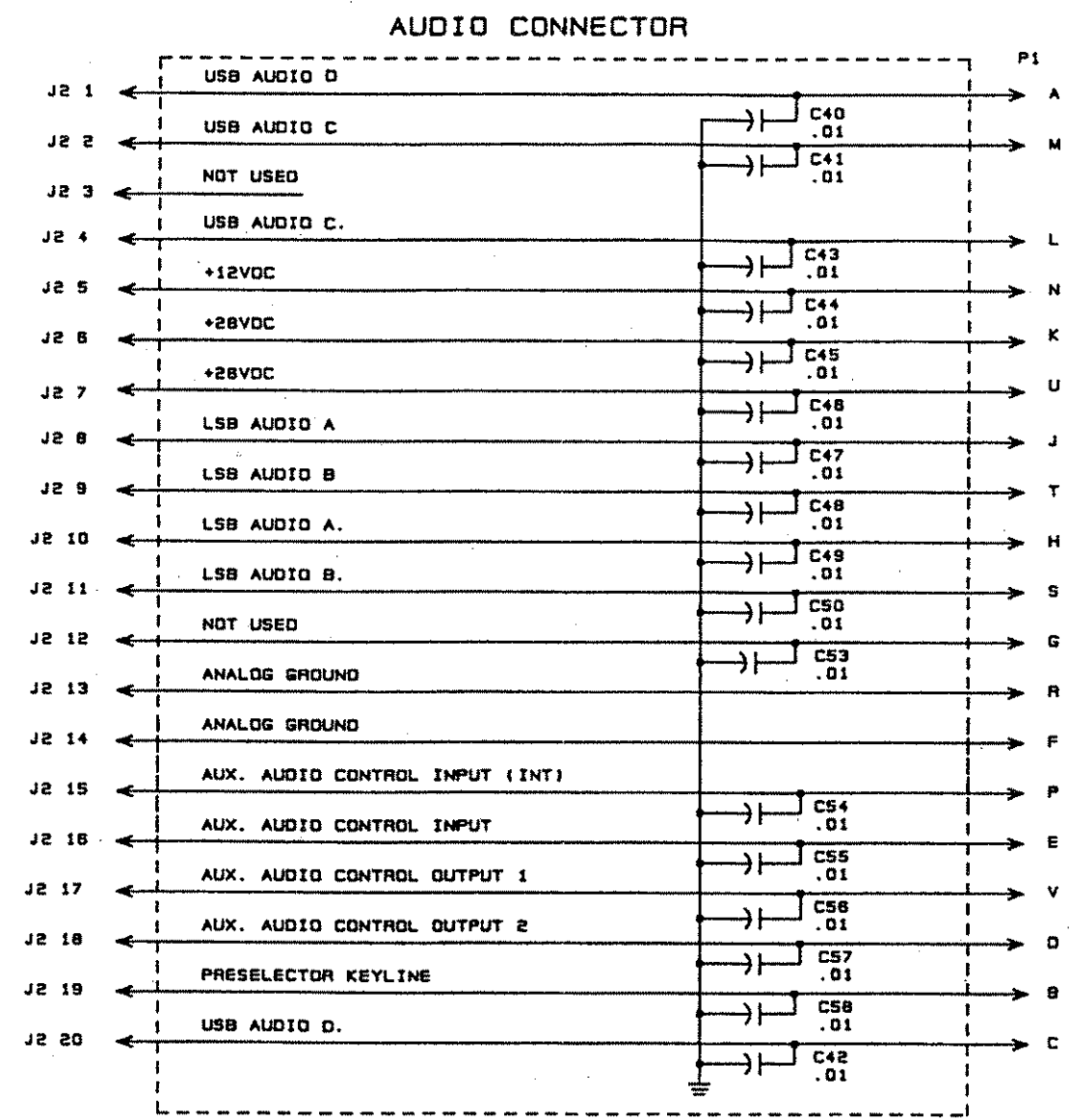


Figure 5.8.28 PC Assembly, Rear Panel Connector 1A6A1, page 2/2.

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SERVICE BULLETIN

Sunair Electronics, LLC.

Customer Service

3400 SW 60th Ave.

Ocala, Fl. 34474 U.S.A.

Phone: 352-873-4000

Fax: 352-854-6238

Email: techsupport@sunairhf.com

NUMBER: 9000-004 / REV 1

DATE: 30 November 1992 / Revised 14 June 1999

ATTENTION: All Dealers and Customers

EQUIPMENT: RT-9000, T-9400, R-9200 and RCU-9310.

SUBJECT: Replacement of Front Panel Liquid Crystal Display's (LCD's) Back Lighting Devices.

REFERENCE: Applicable Operations and Maintenance Manuals and Diagrams 1 through 3 of this Service Bulletin.

PURPOSE: Installation of new Back Lighting devices for Front Panel LCD'S.

TEXT: The Back Lighting devices for the two (2) Front Panel LCD's P/N 8076041791 and P/N 8076040892 will gradually lose their luminescence with time. For this reason operating personnel should turn OFF the panel light when ever it is not needed to give the Back Lighting devices the longest possible life. This is accomplished by depressing the 'PNL LT' push button on the Front Panel to turn OFF the Back lighting and depressing it again to turn the Back Lighting ON again when needed. Once the Back lighting devices have lost their luminescence, the back light may be renewed by ordering replacement Back Lighting devices for the applicable LCD and installing per inclosed instructions.

1. Custom LCD, Full Function, P/N 8076040604.
Replacement Back Light, Assembly P/N 8076040892.
2. Custom LCD, 1 x 40 Character, P/N 8076041601.
Replacement Back Light, Assembly P/N 8076041791.

Replacement of LCD Back Lighting Devices

1. Refer to Section V of applicable Operations and Maintenance Manual.
 - a. Remove equipment top and bottom covers.
 - b. Remove Front Panel 1A1 assembly.
2. Use enclosed diagrams 1 through 3 to install new back lights in the LCD's.
3. Replace Front Panel 1A1 assembly, and top and bottom covers. Return equipment to operational status.
4. Insert this Service Bulletin into Section V of applicable Operations and Maintenance Manual.

NOTE: Once the Back Lights have been replaced initially, they can be replaced again as needed. When the luminescence has decreased remove the installed Back Light and insert a new one in its place.

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Fax: 352-854-6238

Email: techsupport@sunairhf.com

SERVICE BULLETIN

SUNAIR ELECTRONICS, LLC
3400 SW 60TH AVE.
OCALA, FL. 34474

PHONE: 352-873-4000
FAX: 352-854-6238

NUMBER: 9000-006

DATE: 3 July 1996

ATTENTION: All Customers using the following 9000 Series HF/SSB equipment.

EQUIPMENT: RT-9000, RT-9000A, R-9200 and T-9400.

SUBJECT: Front Panel LCD, Operational Display P/N 8076040604.

REFERENCE:

1. RT-9000 Manual P/N 8076000505 pages 5-2, 5-12 and 5-44.
2. R-9200 Manual P/N 8102000503 pages 5-2, 5-9 and 5-34.
3. T-9400 Manual P/N 8103000507 pages 5-2, 5-11 and 5-36.
4. Diagram 1 of this Service Bulletin.

PURPOSE: Eliminate the separation of E.L. Inverter from Front Panel LCD, Operational Display.

TEXT: A small percentage of the LCD, Operational Displays, are experiencing separation of E.L. Inverter from the printed circuit board of the display. This is due to an interference condition between the E.L. Inverter and I/O connector whenever the 1A2A1 CPU and 1A2A8 I/O assembly are removed and replaced. To preclude the possibility of continued separation of E.L. Inverter, Sunair is installing Inverter Cover P/N 8076042801 and Insulator P/N 8076042909 on current production equipment.

For field modification of the Operational Displays, Sunair is providing Kit E.L. Inverter cover P/N 8076043000, containing the following parts:

E.L. Inverter Cover P/N 8076042801
Insulator, E.L. Cover P/N 8076042909
Drawing, Inverter Cover Installation P/N 8076043107

1. See page 5-2 of applicable manual.
 - a) Remove top and bottom covers (6 screws and 8 latches).

2. See applicable page in manual.
 - a) Remove Front Panel Assembly. (6 screws with split washers and disconnect 2 ribbon cables).
3. Using steps on Diagram 1 install the E.L. Inverter Cover in the Front Panel Assembly.
4. Reassemble in reverse and return unit to operational status.

This Service Bulletin should be placed in applicable manual. At the front of Maintenance Section V or Bulletins section.

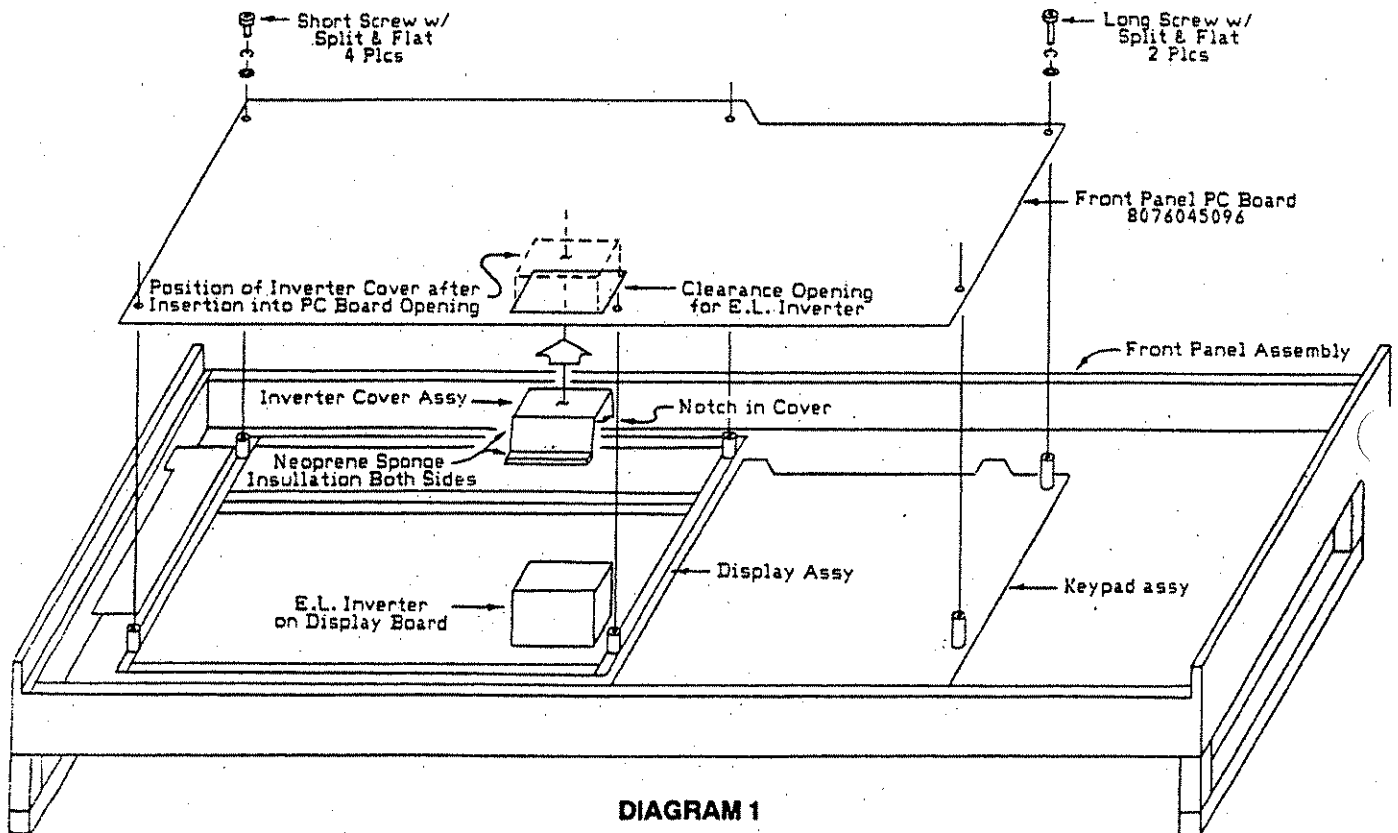


DIAGRAM 1

1. Remove Front Panel PC Board 8076045096 from Front Panel Assembly (6 screws with split and flat washers).
2. Insert E.L. Inverter Cover Assembly into inverter clearance opening in Front Panel PC Board (notch in cover toward center of board).
3. Reinstall Front Panel PC Board on Front Panel Assembly. Being careful to properly align P1 and P2 with J2 and J3 on Front Panel LCD, Operational Display. Connectors should mate smoothly, DO NOT FORCE.

SERVICE BULLETIN

SUNAIR ELECTRONICS, LLC
3400 SW 60TH AVE.
OCALA, FL. 34474

PHONE: 352-873-4000
FAX: 352-854-6238

NUMBER: 9000-007 Reference ECN: 8076-182/182A

DATE: 13 Nov 1996

ATTENTION: All Customers with RT-9000(A) HF/SSB equipment containing PC assembly RF Detector/Coax Keyline in Filter Module assembly 1A3, P/N 8076050090.

EQUIPMENT: RT-9000, RT-9000A supplied with 1A3A1 PC assembly RF Detector/Coax Keyline. P/N 8076052092.

REFERENCE: Manual P/N 8076000505 Section V, pages 5-105 through 5-107.

PURPOSE: Product improvement by providing High-Voltage transient protection for 1A3A1 Q3.
A. CR13 protects Q3 Drain-to-Source.
B. R14 and C32 protects Q3 Gate-to-Source.

TEXT: To improve equipment reliability, Sunair is installing transient protection for Q1 on PC assembly RF Detector/Coax Key used in current production equipment.

For field modification of the PC assembly, Sunair is providing the following Kit and instructions for upgrading your equipment.

1ea	CR13	IN6283A, Diode Tranzorb	1011260000
1ea	R14	10K, 1/8watt, Resistor	1010801031
1ea	C32	0.001 UF Capacitor, 100V, X7R, 20%	0281630003
1ea	Q3	2N7000, Transistor, N-CH, FET	1011050013

Installation instructions:

1. See pages 5-2 and 5-6 of RT-9000(A) manual.
 - a) Remove top cover.
 - b) Remove top cover of 1A3 Filter Module.

2. Referring to supplied page 5-107B.
 - a) Add Diode CR13, by soldering cathode lead to L4 lead connected to TP1. Solder Anode lead of CR13 to R6 lead.
 - b) Desolder Q3's Gate lead (center lead) from PC pad. Using an ohm meter compare installed Q3 with new Q3 supplied. If installed Q3 is damaged, replace with Q3 supplied. Add resistor R14 between Q3 Gate lead and PC pad where the Gate lead was removed.
 - c) Add capacitor C32 from Q3 Gate lead to Q3 Source lead (Bottom lead). Solder all the above connections.

3. Power up RT-9000, select any frequency between 1.6 and 29 MHz, MODE USB. Remove P1 connector at J1 on PC Assembly.
 - a) Using VOM set to RX1 measure J1 on PC Assembly to ground. Should read ∞ .
 - b) Depress PTT on microphone. **DO NOT SPEAK INTO MICROPHONE.** J1 to ground should read 10 ohms or less. Release PTT on microphone. Reconnect P1 connector.

4. Replace covers and return equipment to operation. Place new pages 5-107, 5-107A, 5-107B, and 5-108 in your manuals. Place Service Bulletin in Maintenance or Bulletin section.

1. REMOVE RIBBON CABLE CONNECTORS.
2. REMOVE SIX (6) 4-40 SCREWS, LIFT P.C. BOARD.
3. REMOVE RIBBON CABLE UNDER P.C. BOARD.
4. GO TO DIAGRAM 2 TO REMOVE LCD ASSEMBLY.
5. INSTALL IN REVERSE ORDER.

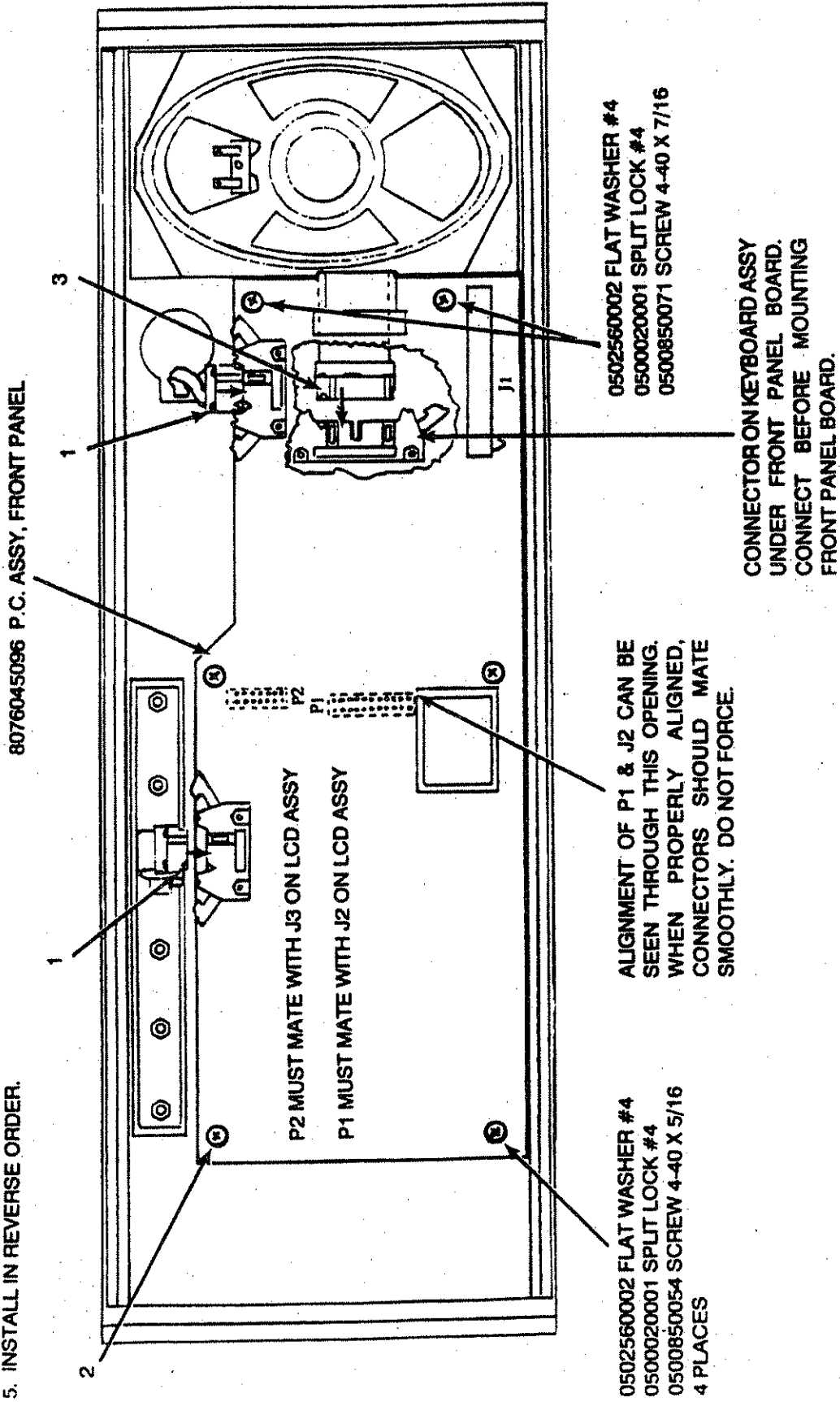
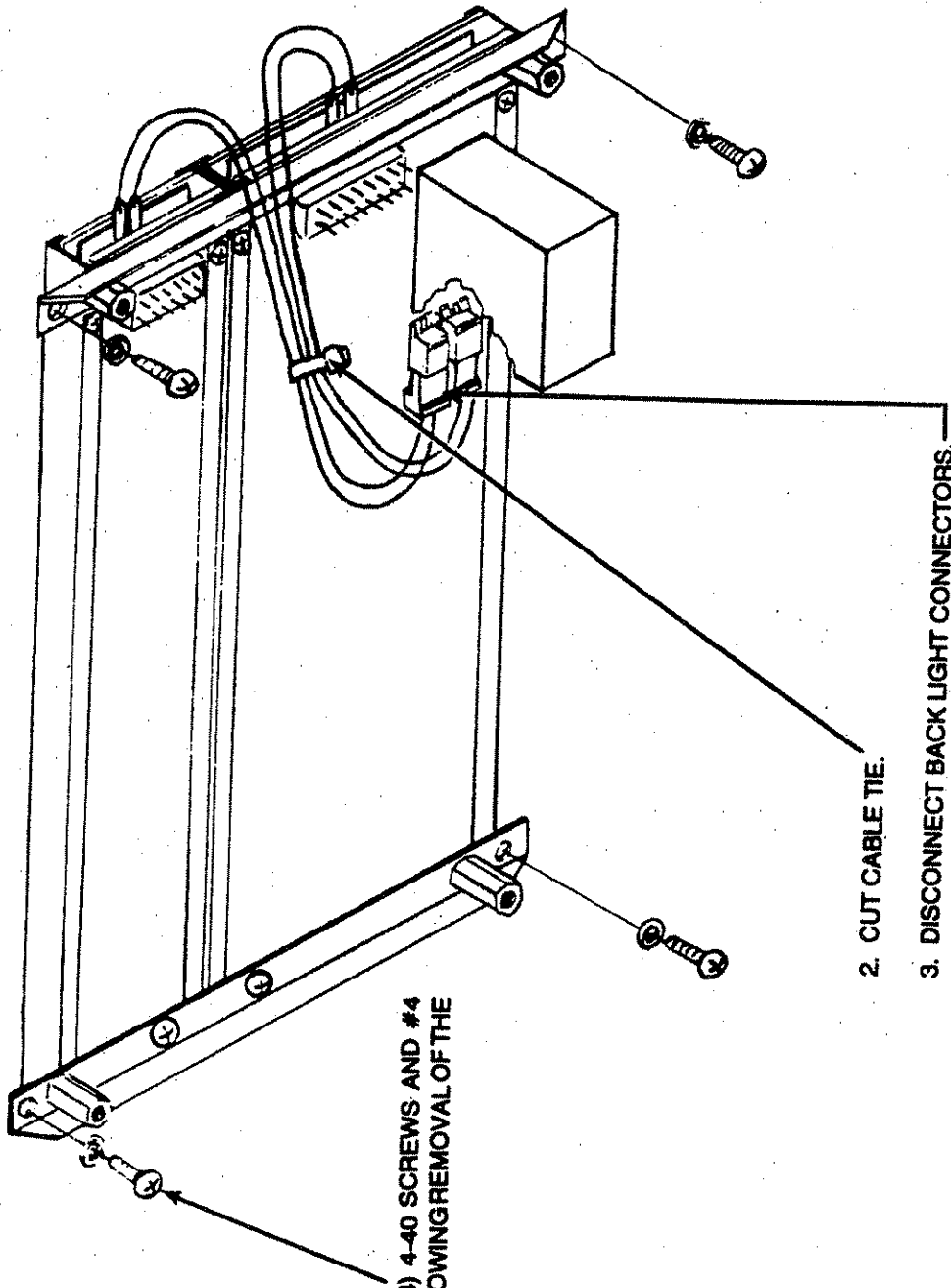


Diagram 1: Removal and Installation of Front Panel P.C. Assembly.



1. REMOVE FOUR (4) 4-40 SCREWS AND #4 LOCK WASHERS, ALLOWING REMOVAL OF THE LCD ASSEMBLY.

2. CUT CABLE TIE.

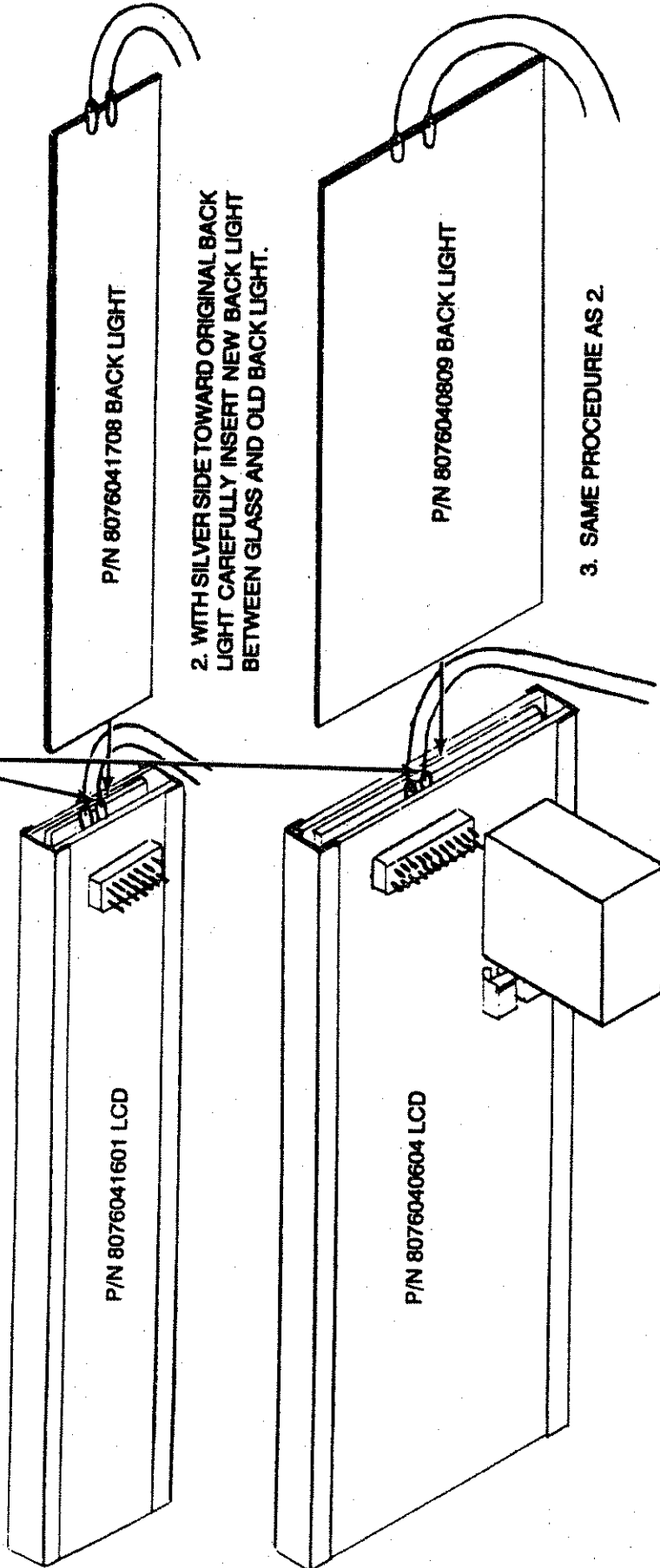
3. DISCONNECT BACK LIGHT CONNECTORS.

4. GO TO DIAGRAM 3 TO INSTALL BACK LIGHTING DEVICES.

NOTE: INSTALL LCD ASSEMBLY INTO FRONT PANEL IN REVERSE ORDER.

Diagram 2: Removal and Installation of LCD Assembly.

1. CUT OFF ORIGINAL BACK LIGHT LEADS AND DISCARD.



2. WITH SILVER SIDE TOWARD ORIGINAL BACK LIGHT CAREFULLY INSERT NEW BACK LIGHT BETWEEN GLASS AND OLD BACK LIGHT.

3. SAME PROCEDURE AS 2.

NOTE: CARE MUST BE TAKEN NOT TO BEND NEW BACK LIGHT WHILE INSERTING. INSERT TO SAME DEPTH OF ORIGINAL BACK LIGHT WITH YELLOW SIDE TOWARD GLASS OF LCD.

NOTE: DIAGRAM SHOWS LCD'S SEPARATED. KEEP THE LCD ASSEMBLY INTACT AS SHOWN IN DIAGRAM 2.

Diagram 3: Installation of Back Lighting Devices.



SERVICE BULLETIN

SUNAIR ELECTRONICS, LLC
3400 SW 60TH AVE.
OCALA, FL. 34474

PHONE: 352-873-4000
FAX: 352-854-6238

NUMBER: 9000-008/ECN Reference 8076-0241
DATE: 22 June, 2001
ATTENTION: All Customers using the following 9000 Series HF/SSB Equipment.
EQUIPMENT: RT-9000, RT-9000A, T-9400, T-9410, R-9200 and R-9210.
SUBJECT: 1A2A2 Synthesizer Module P/N 8076060095 Revision A used in the above equipment. Consisting of the following:

1. PC Assembly 1A2A2A1, First L.O. P/N 8076068096.
2. PC Assembly 1A2A2A2, Second L.O. P/N 8076066093.
3. PC Assembly 1A2A2A3, BFO P/N 8076062098.
4. PC Assembly 1A2A2A4, Ref. Loop and Doubler P/N 8076064091.
5. PC Assembly 1A2A2A5, Mother Board (SYN) P/N 8076061091.

TEXT: This Module and PC Assemblies are no longer manufactured as various parts are unavailable for manufacturing the 1A2A2 Synthesizer Module Revision A. See Figure 1. These replacement spares will be available until inventories are exhausted.

The replacement 1A2A2 Synthesizer PC Assembly P/N 8076060095 Revision B is now being manufactured. See Figure 2. This new release Revision B is a direct replacement, Hybrid Direct-Digital Synthesis (DDS)-Phase Lock Loop single unit structure, which is a form, fit and function backward and forward compatible direct replacement for the 1A2A2 Synthesizer Module and PC Assemblies. All new equipment manufactured after June 2001 will incorporate the new 1A2A2 Synthesizer PC Assembly Revision B.

This PC Assembly is manufactured using Surface Mount Technology (SMT). If future repairs are required and you do not have SMT repair capabilities, the 1A2A2 Synthesizer PC Assembly should be returned to the Sunair Factory for repair in accordance with established procedures for the handling of returned equipment.

If you have Surface Mount Technology repair facilities and require the parts list and schematics, please send your request to:

Sunair Electronics, LLC.
Customer Service
3400 SW 60th Ave.
Ocala, Fl. 34474 U.S.A.
Phone: 352-873-4000
Fax: 352-854-6238

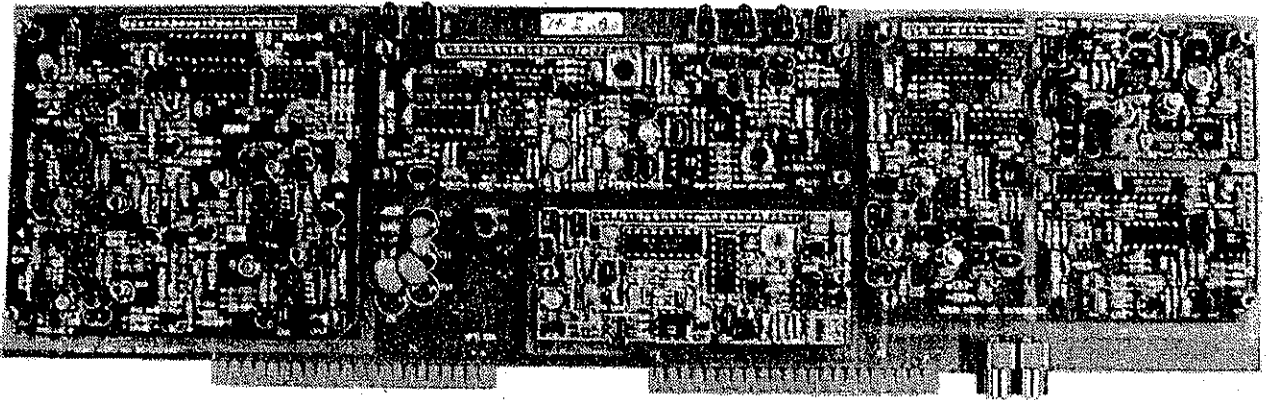


Figure 1 P/N 8076060095 Revision A Synthesizer Module Assembly
(Old Revision)

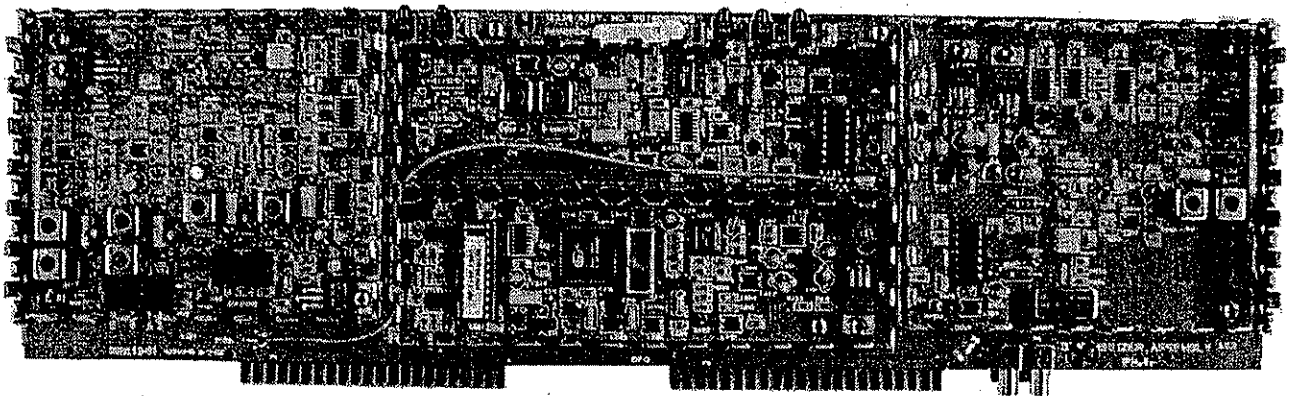


Figure 2 P/N 8076060095 Revision B Synthesizer Printed Circuit Assembly

ADDENDUM

Title : High Stability Reference Oscillator start-up characteristics
Number : 8076-0287
Date : 09 April 03
Equipment(s) Affected : RT-9000A & RT-9000B HF/SSB Transceivers
R-9200 & R-9210 HF/SSB Receivers
T-9400 & T-9410 HF/SSB Transmitter/Exciters
Applicability : Units with High Stability Reference Oscillator option installed
Effectivity : (not applicable)

The following operating provisions apply to units that have the HIGH STABILITY REFERENCE OSCILLATOR option installed. This option utilizes an Ovenized Frequency Standard and requires additional time to attain specified frequency accuracy and stability performance at initial power-up or after prolonged system shutdown. The operator must consider these requirements and their effect on initial performance when operating this equipment. This condition can be avoided by keeping the radio continuously powered-up. This practice is considered normal for equipment with High Stability Frequency Standards. The following statements summarize behavior of a properly configured radio immediately after the initial power-on event:

1. If the unit has just been installed at the customer site or has not been powered-up for a prolonged time, after power-up the unit may intermittently display "Oven Warm Up" messages.
2. If the unit does not display the message described above, it still inhibits the unit's I/O communication facilities from being used for a short time. The I/O capability is required for operation with remote control units, preselectors, or embedded ALE modules.
3. Unit I/O lockout time is directly related to the unit's internal oven temperature at power-up and the ambient operating temperature. This time typically will be between two (2) minutes and 30 minutes under low temperature conditions.
4. After the above I/O lockout time elapses, the unit becomes fully functional but at reduced Frequency Accuracy.
5. During the first hour of operation while the oven is stabilizing at its design temperature, invoking the Built In Test Equipment (BITE) function may produce erroneous failures. After this time, all BITE test failures should be considered genuine and appropriately addressed.
6. Frequency Accuracy is specified to be within one (1) part in 10^7 within one (1) hour after power-up.
7. Frequency Accuracy is specified to be within one (1) part in 10^8 within 72 hours after power-up.
8. The unit must be maintained in a continuous "power on" state to achieve the specified frequency accuracy and stability specifications. The benefits offered by the HIGH STABILITY REFERENCE OSCILLATOR option are available only if this condition is satisfied.
9. Any power interruptions will cause the unit to execute its normal start-up I/O lockout interval as previously described.

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