

TM-8129000504

REMOTE CONTROL UNIT
for
RT-9000B HF/SSB
TRANSCEIVER

RCU-9310B

OPERATION AND MAINTENANCE
MANUAL



SUNAIR 3005 Southwest Third Avenue, Fort Lauderdale, Florida 33315-3312

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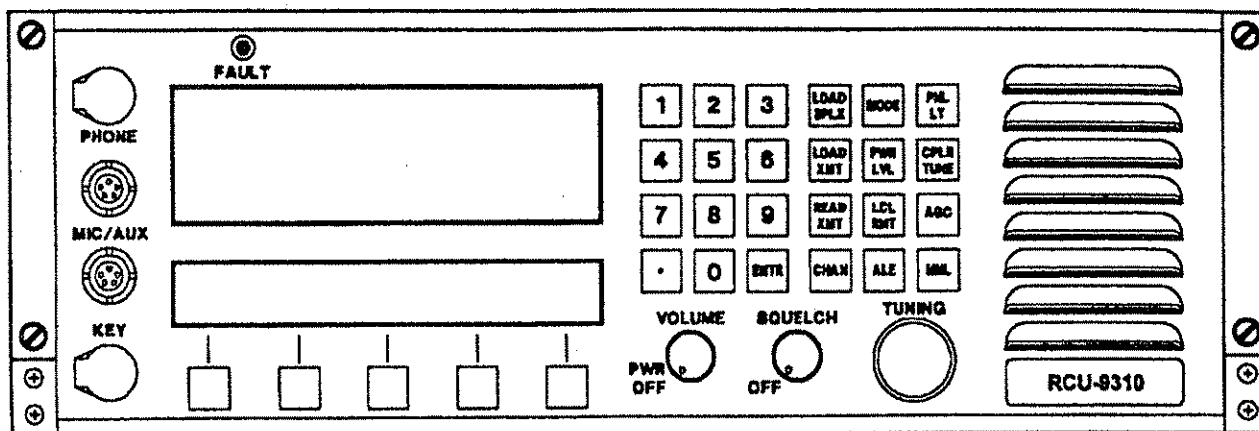
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SUNAIR ELECTRONICS, INC.



RCU-9310 REMOTE CONTROL UNIT

OPERATION AND MAINTENANCE MANUAL

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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 RCU-9310 Remote Control Unit. 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 RCU-9310 Remote Control Unit is designed to provide complete operational control of a remotely-located RT-9000 Transceiver.

The RCU-9310 allows an operator at a remote site to access and perform all transceiver primary functions: selecting the transmission mode and power level; establishing operating frequencies; automatically tuning the transmitter and associated antenna coupler; manual tuning; and loading, scanning, and operating with preset frequency channels.

The RCU-9310 also enables the remote operator to perform several non-operational, periodic, functions related to equipment setup and maintenance. Diagnostic tests -- to the lowest repairable unit (LRU) -- can be selectively executed on both the transceiver and the remote control unit itself. Other functions include: selection of CW keying speed and filtering options; connection of external devices to the transceiver's audio input and output lines; local I/O port conditioning; transceiver memory dump (i.e., clearing all preprogrammed channels); and transceiver metering at the remote control panel.

In addition, the RCU-9310 allows the remote operator to access and use the transceiver's advanced automated functions: receiver scanning of preprogrammed channels; programming and execution of Automatic Link Establishment (ALE) operations; "sounding" (broadcasting to selected stations in a predefined network); and "network call" (broadcasting to all stations in a network).

1.3 GENERAL DESCRIPTION

The RCU-9310 is intended for use on table tops or in base station 19-inch rack installations. However, its rugged package makes the RCU-9310 adaptable to various environments. Internally, the RCU-9310 is designed with the service technician in mind. Built-in test equipment (BITE), with descriptive front-panel readouts, 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 faulty modules immediately. The RCU-9310 is lightweight for its capability, weighing only 20 pounds. Available in Olive Drab (OD) or Grey, the RCU-9310 is compatible with most radio station color schemes. (If a particular color other than OD or Grey is required, contact the Sunair Marketing Department for information concerning changes to the standard colors.)

The RCU-9310 has a simple, easily understood, front panel that duplicates the functions of the RT-9000 Transceiver. First time users can operate the equipment without extensive training. The wide screen liquid crystal display (LCD) is continuously updated by the microprocessor with operational status such as Frequency, Channel, Mode, BFO, AGC, Power, Local or Remote Control. The LCD also contains a bar graph meter which selectively indicates signal strength, forward RF power, reverse RF power and Remote transmit and receive audio

The built-in-test routines include power amplifier and antenna coupler status in plain English messages which appear in the display. 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

REMOTE INTERFACE: RS232/422/485 FSK Tone.

NOTE: Must be hardwired between RCU-9310 and RT-9000(A) for mode selected.

TRANSCEIVER INTERFACE: Transmit and receive audio, 0 dBm adjustable into 600 ohms.

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

INPUT POWER: +26 VDC $\pm 15\%$; 120/240 VAC $\pm 15\%$; AC/DC Auto Changeover.

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

SQUELCH: Syllabic.

AUDIO INPUT: Microphone, aux. connector, and two selectable 600 ohm lines at -20 dBm to +10 dBm.

SIZE: (CM): 15.2H X 45.3W X 26.04L.
(INCHES) 5.96H X 17.83W X 10.25L

WEIGHT: (KG): 9.1
(LBS): 20

CONSTRUCTION: Modular plug-in assemblies.

1.5 ENVIRONMENTAL SPECIFICATIONS

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 514.3.

1.6 EQUIPMENT SUPPLIED

The following is a list of equipment, with appropriate Sunair part numbers, supplied with the RCU-9310 Remote Control Unit.

<u>SUPPLIED EQUIPMENT:</u>	<u>SUNAIR MODEL /PART NUMBERS:</u>
RCU-9310 Remote Control Unit	8078001291 O.D. 8078001258 GRAY
Hand Held Microphone Assembly	8076000602
Operation and Installation Manual	8078000502
Mating Connector Kit	8078000499
Power Cord Assembly, 115VAC	8076002095
or Power Cord Assembly, 230VAC	8076002192

1.7 OPTIONS AVAILABLE

The following is a list of optional equipment or accessories available for use with the RCU-9310 Remote Control Unit.

<u>OPTIONAL EQUIPMENT/ACCESSORIES:</u>	<u>SUNAIR MODEL /PART NUMBERS:</u>
Headset	0840200005
Headset (Lightweight)	1010690027
CW Key with Phone Plug	5024000994
Handset Assembly	8076000793
Desktop Microphone	8076000891
Shroud Kit for Rackmounting	1004770014 O.D. 1004770022 GRAY
Power Cord Assembly, DC	8101002294
Real-Time Clock (Smart Watch)	1011190010
Phone Line Interface	8078500092
12/28 VDC Converter PS-9015	8078600097
Cable Assembly Audio and Control (made to length)	8078004591
Field Module Kit	8078905092
Audio to External Data Modems Cable Assembly	8076004594

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SECTION II

INSTALLATION

2.1 GENERAL

Section II contains all necessary instructions for unpacking, inspection, and, if required, reshipment of the equipment or parts. Information regarding location and mounting considerations, power requirements, ground system hookups, and cabling considerations 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(s) and associated packing materials should it be necessary to reship the 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, Sunair will make arrangements for repair or replacement.

2.3 RETURN OF EQUIPMENT TO FACTORY

The shipping carton for the RCU-9310 has been designed to protect the equipment during shipment. The container and its associated packing materials should be used to reship the equipment.

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 (e.g., STYROFOAM PEANUTS) FOR PACKING PROTECTION; it 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 - \$(Amt.)

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 operation with KW equipment, modems, and other peripherals, use this manual in conjunction with their respective operating manuals for complete installation information.

Before starting installation, carefully plan equipment locations to ensure that the operating environment is suitable and that adequate access for maintenance is provided.

If operated on DC power, check for correct polarity before applying power.

The RCU-9310 Remote Control Unit and RT-9000 Transceiver are interconnected as shown in Figure 2.4.1.2.

NOTE:

Figure 2.4.1.2 illustrates the direct cabling method for interconnecting the remote control unit and transceiver. While other interface methods may be employed, the relationship between remote control unit and transceiver signals must be maintained.

Connection of the RCU-9310 to power sources and other equipment may be accomplished as follows:

RCU-9310 CONNECTIVITY GUIDE.

TO ADD	CONNECTION(s)	NOTE
AC Power	AC source to J1 on rear panel.	See Figure 2.4.1.1.
DC Power (option)	DC source to J2 on rear panel.	See Figure 2.4.1.1.
Microphone	Microphone to J3 on front panel.	See Figure 2.4.1.1.
Headphones	Headphones to J2 on front panel.	See Figure 2.4.1.1.
CW Key	CW Key to J1 on front panel.	See Figure 2.4.1.1.
Transceiver(RT-9000)	Control Lines from J6 on rear panel to remote connector J8 on rear panel of RT-9000.	See Figures 2.4.1.1, 2.4.1.2, 2.4.1.3, and consult RT-9000 manual. Must be hardwired for mode that the system will use (i.e. RS-232, etc.)
	Audio lines from J4 on rear panel to Audio connector J5 on rear panel of RT-9000.	See Figures 2.4.1.1, 2.4.1.2, 2.4.1.4, and consult RT-9000 manual.
External Data Modems (Direct connection RCU-9310)	Connect modem audio and keyline to J3 on rear panel of RCU-9310.	See Figures 2.4.1.1 and 2.4.1.5.

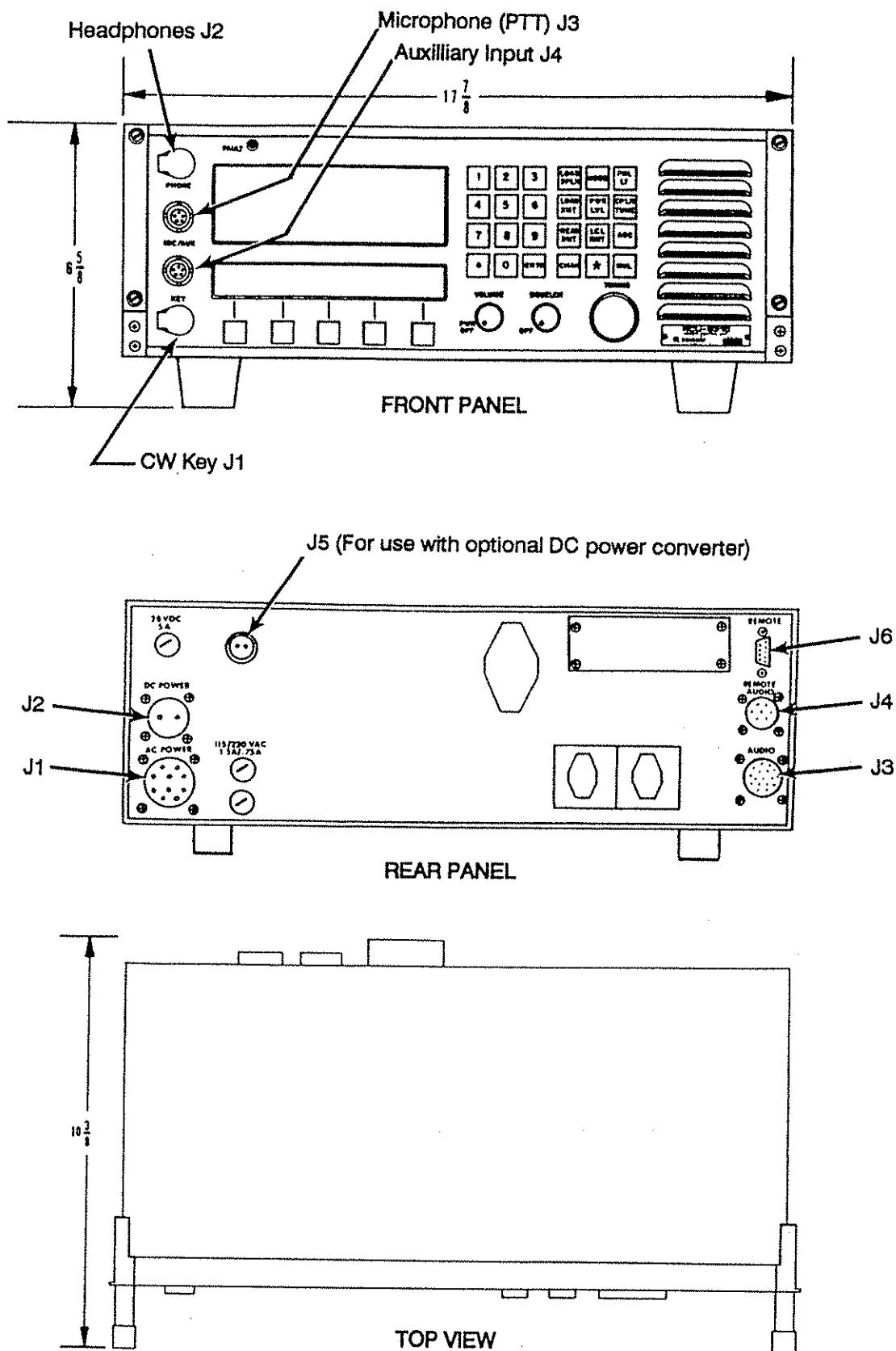


Figure 2.4.1.1 RCU-9310 Outline Dimensions and Connector Locations.

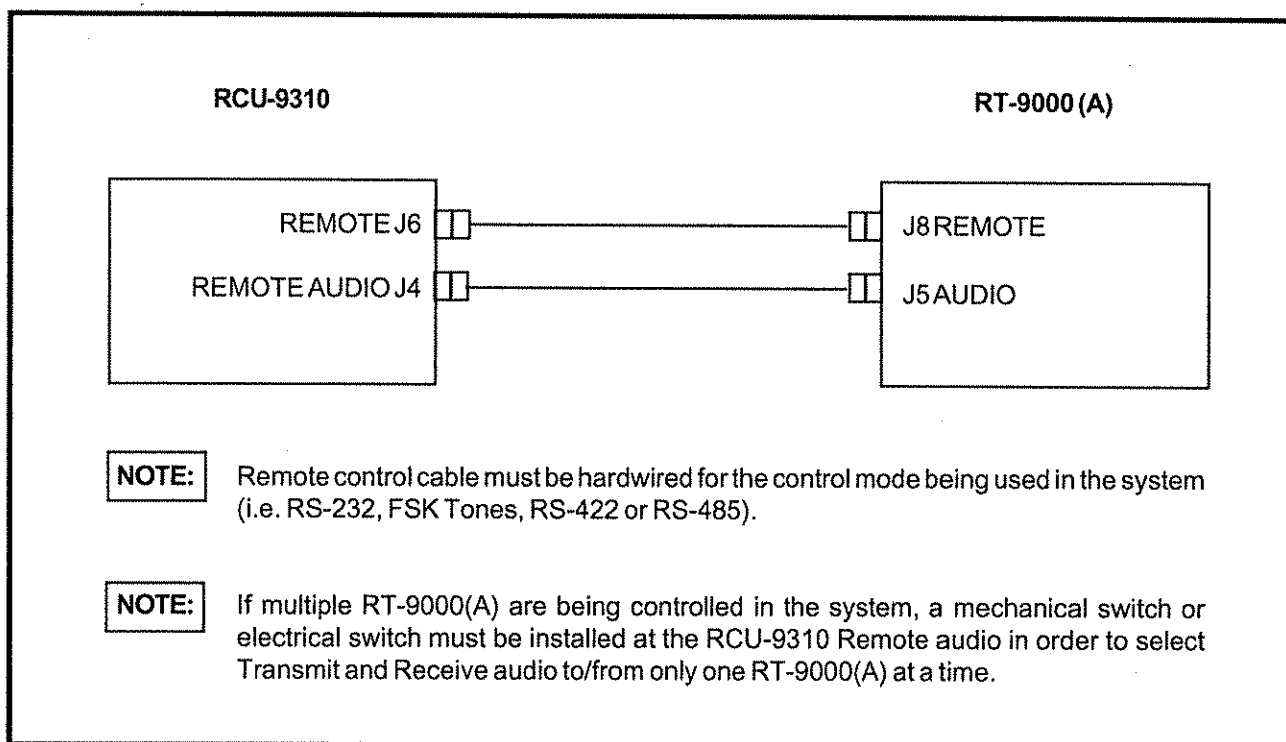


Figure 2.4.1.2 Interconnection of RCU-9310 Remote Control Unit and RT-9000 Receiver.

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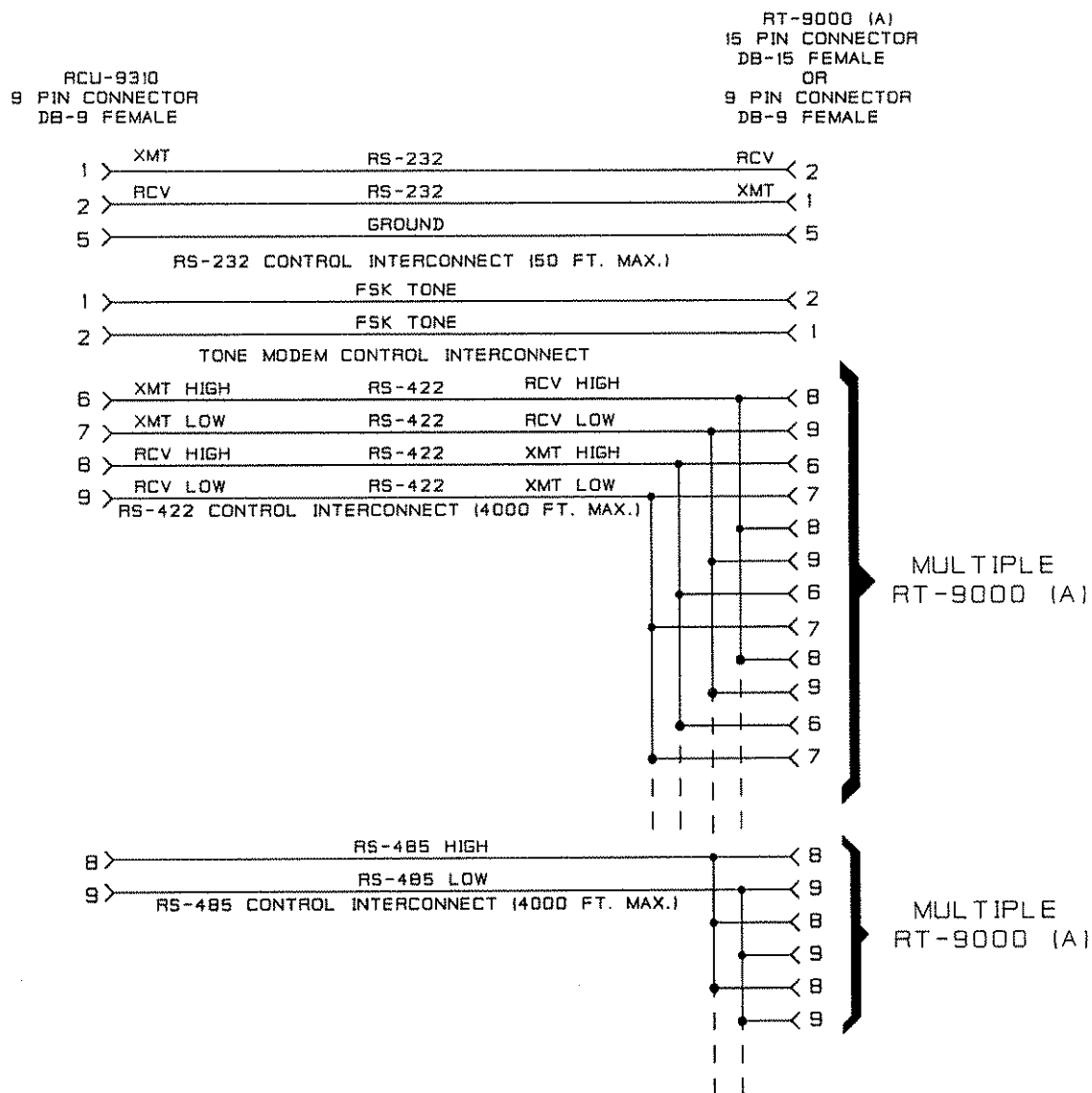


Figure 2.4.1.3 FSK, RS232, RS-422, or RS485 Wiring Diagrams.

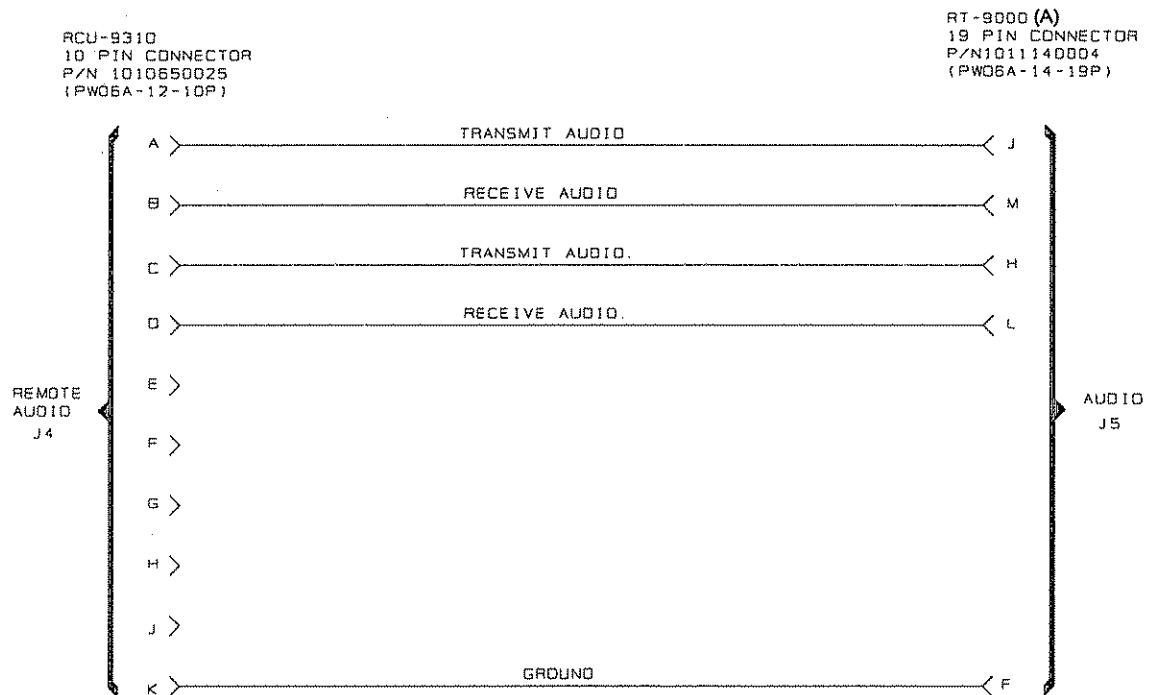


Figure 2.4.1.4 RCU-9310 Remote Audio to RT-9000 (A) Audio Wiring Diagram.

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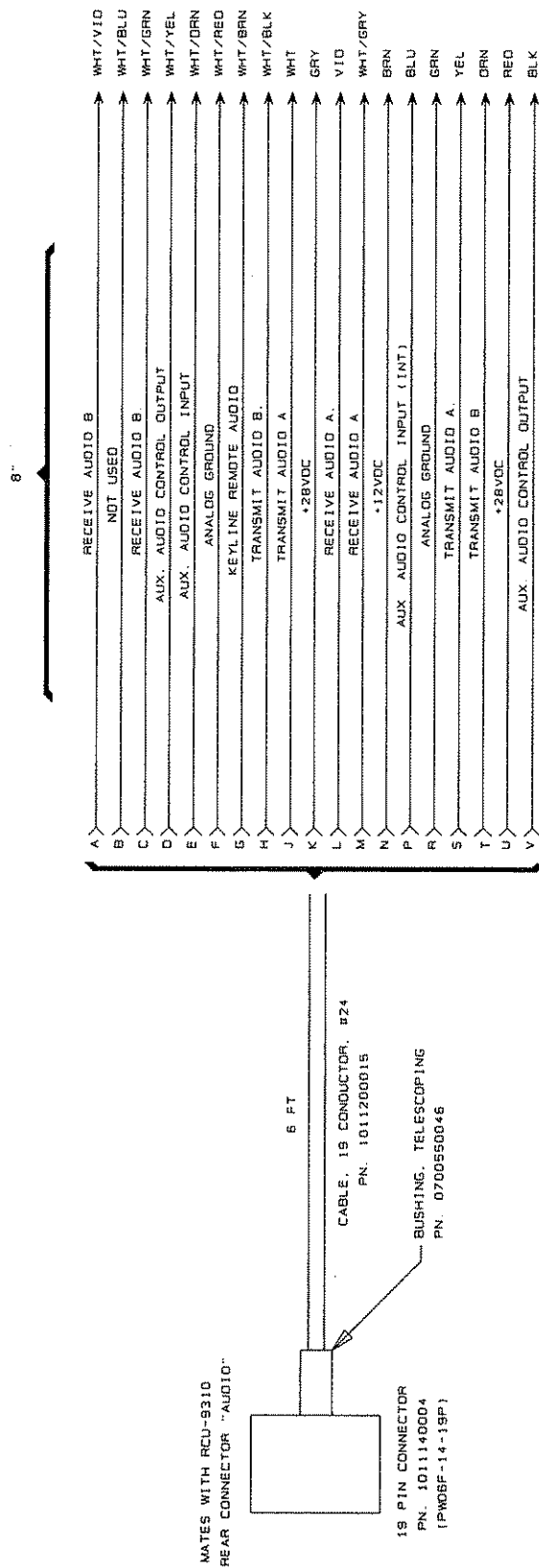


Figure 2.4.1.5 RCU-9310 Audio to External Data Modems Wiring Diagram.

2.4.2 BASE STATION INSTALLATION

The RCU-9310 is equipped with rubber feet so that it can be placed directly on a table, desk, or similar flat surface. 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 air flow. Figure 2.4.1.1, shows the applicable outline dimensions of the equipment and the location of input/output connectors for microphones, remote units, modems, signal lines, and AC and DC power.

2.4.3 RACK INSTALLATIONS

The remote control unit may be mounted in a standard nineteen-inch (19") rack using the Shroud Kit, Sunair p/n 1004770014(OD) or 1004770022(Gray). The kit includes rack mounting brackets, filler panels and trim strips, and associated hardware. In the rack-mounted configuration, the remote control unit requires a standard panel space of seven inches (7") high. Refer to Figure 2.4.3 below, for assembly details.

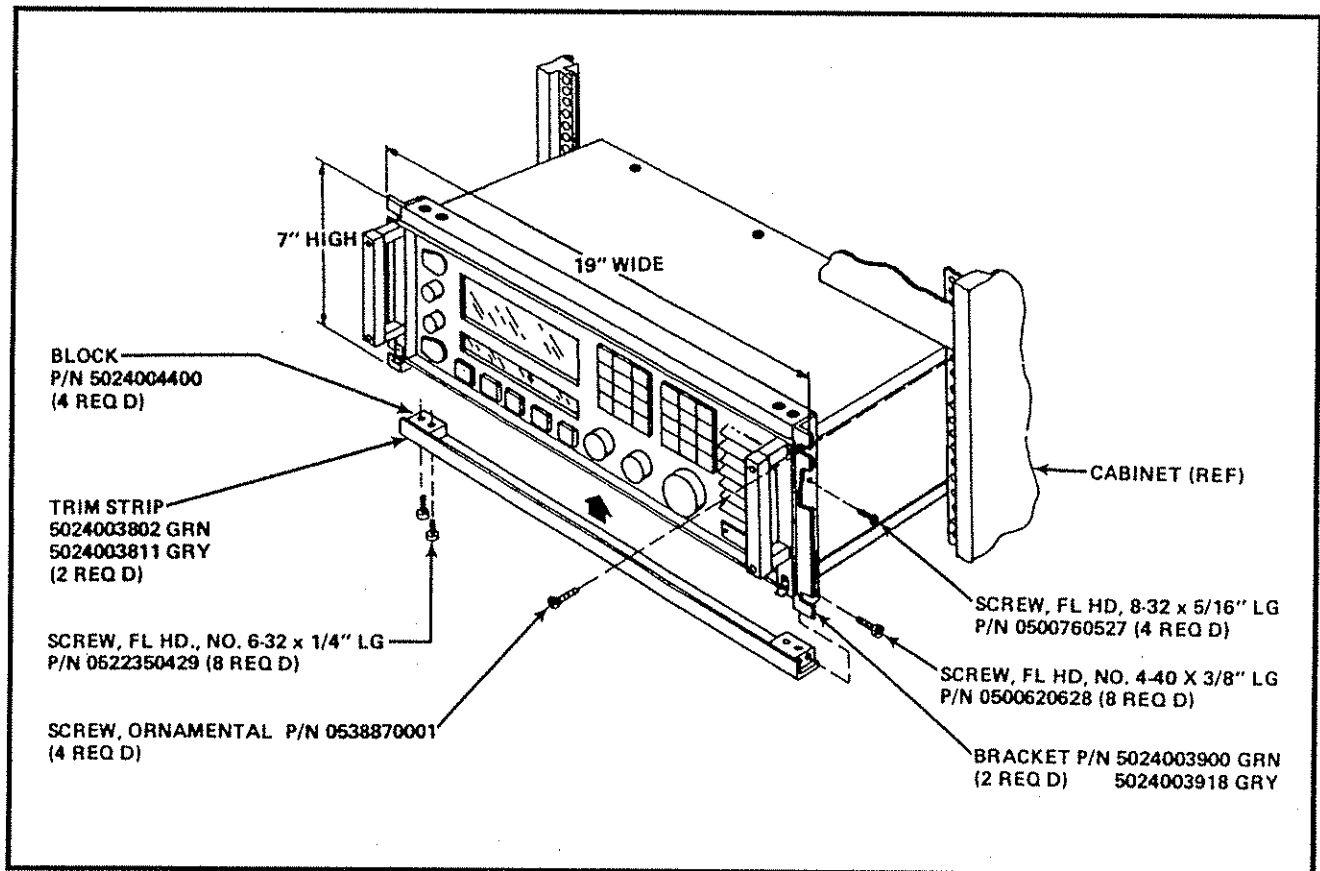


Figure 2.4.3 Installation of RCU-9310 in Equipment Rack.

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RCU-9310B

Remote Control Unit

Please refer to Section VI Supplement of this manual for RCU-9310B Operating Instructions.

SECTION IV

THEORY OF OPERATION

4.1 REMOTE CONTROL UNIT-TRANSCIVER INTERFACE AND INTERACTION

The RCU-9310 Remote Control Unit and its companion RT-9000 Transceiver interconnect and communicate by means of two I/O ports and two sets of audio lines. The I/O ports -- one each on the remote unit and transceiver -- provide the communications path for all operational, or control, data:

- a) channel number and frequency information
- b) mode selection and tuning commands
- c) transmit and receive commands
- d) automatic scan and ALE setup and activation
- e) operator messages

I/O port connections are provided by the 'Remote' connector (J6) on the remote control unit's rear panel.

Receive audio input and transmit audio output are applied, respectively, to the remote unit from the transceiver and to the transceiver from the remote unit over separate pairs of audio lines. The Receive Audio Input and the Transmit Audio Output connections are provided by the 'Remote Audio' connector (J4) on the remote control unit's rear panel.

From an operational standpoint, the RCU-9310 can be viewed as a remote control panel that essentially duplicates the primary operator functions of the RT-9000 Transceiver. When the RCU-9310 assumes control of the transceiver, the transceiver's primary operator controls are inoperative. The reverse is true when the transceiver has control.

Both the RCU-9310 and the RT-9000 are software-controlled, microprocessor-based units, using similar devices and technology. The remote unit's software provides the control and interface capability for the front panel display, processes incoming and outgoing messages, and -- when in control -- generates functional commands to the transceiver.

4.2 REMOTE CONTROL UNIT

The RCU-9310 Remote Control Unit contains the circuitry to allow the remote operator to control all of the primary functions of the RT-9000 Transceiver.

The major functional assemblies of the RCU-9310 Remote Control Unit are listed below and described in the following paragraphs.

- (1) Front Panel Assembly 3A1
- (2) CPU Assembly 3A2A1
- (3) Audio/Remote Audio Assembly 3A2A2/3A2A4
- (4) I/O Assembly 3A2A3
- (5) AC and DC Power Supplies 3A3A1/3A3A2

Figure 4.1, the overall block diagram of the RCU-9310, illustrates the functional relationship between these assemblies; schematic diagrams are included in Section V of this manual.



Figure 4.1 RCU-9310 Remote Control Unit Block Diagram.

4.2.1 FRONT PANEL ASSEMBLY 3A1

The front panel assembly contains the circuitry necessary to provide analog and control interfacing with the appropriate subassemblies. It also provides and accepts digital information through the control/data bus via the microprocessor assembly with the various other assemblies. A wide screen Liquid Crystal Display (LCD) indicates (Transceiver) operating status such as frequency, channel, mode, BFO, AGC release time, RF power level, and local/remote control as selected by a front panel keypad. The LCD contains a bar graph display which can selectively indicate receive signal strength, transmit forward/reflected power, and 600-ohm transmit/receive audio levels.

Built-In Test Equipment (BITE) monitors the status of the remote control unit's plug-in assemblies. In addition, the transceiver's BITE can be activated and monitored from the remote control unit front panel. Plain language messages are displayed on the LCD, providing assurance of the continuing functionality of the remote control unit or the transceiver.

Selecting the 'Local BITE' function exercises a comprehensive test routine (contained in the remote control unit's microprocessor software) that checks all plug-in subassemblies to the the Lowest Repairable Unit (LRU). If a fault is detected, the 'FAULT' Light Emitting Diode (LED) in the upper left corner of the panel will light and a message on the LCD will indicate which LRU is inoperative. Similarly, selecting the 'Remote BITE' function will activate the test routines in the transceiver's microprocessor software and the remote control unit LCD will monitor the testing the transceiver's LRU's.

A 'soft-key' menu LCD located directly below the primary display permits the selection of several enhanced functions, such as Scan, Sounding, Automatic Link Establishment (ALE), Local and Remote BITE, Time-of-Day, etc. The soft keys also provide access to meter selection, I/O port configuration, remote audio, and speaker control.

4.2.2 CPU ASSEMBLY 3A2A1

4.2.2.1 GENERAL

The CPU Assembly provides overall control of RCU-9310 functions. It enables most Front Panel controls and status indications and executes the RCU-9310's internal BITE routines. When the RCU-9310 assumes control of transceiver operations, the microprocessor provides message control and generates commands to the transceiver. These commands are decoded by the transceiver to execute the appropriate (transceiver) software routines and perform the designated function(s).

Communications between the Microprocessor Assembly and the other major functional assemblies are provided by the control/data bus.

4.2.2.2 MICROPROCESSOR U2

The 8-bit 80C85 microprocessor, U2, is the primary control for all RCU-9310 functions. It executes the instructions (software) stored in EPROM'S U13 and U14. U2 controls and communicates with the other circuits on the CPU Assembly by means of a multiplexed address/data bus.

4.2.2.3 ERASABLE PROGRAMMABLE READ-ONLY MEMORY (EPROM) U13 AND U14

The EPROM'S, U13 and U14, stores the program(s) or software executed by the microprocessor U2 to control the RCU-9310 functions.

4.2.2.4 ELECTRICALLY ERASABLE PROGRAMMABLE READ ONLY MEMORY (EEPROM) U8

Long term storage of the RCU-9310 ALE functions is handled by the non-volatile memory in U8. 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 years with or without power applied.

4.2.2.5 STATIC RANDOM ACCESS MEMORY (SRAM) U3

The SRAM provides temporary storage that is used as a "scratch pad" by microprocessor U2 during the execution of its program with U13 and U14.

4.2.2.6 OPTIONAL SMART WATCH U14(A)

Smart Watch is an optional device that is "piggy-backed" into socket U14. It keeps track of: hundredths of seconds, seconds, minutes, hours, days of the week, days of the month, months, and years. An embedded lithium energy cell maintains time information when the equipment is turned off. The above information is available to microprocessor U2 for selective display on the Front Panel LCD as time-of-day clock.

NOTE: The Smart Watch in the remote control unit is completely independent of the Smart Watch in the transceiver.

4.2.3 OPTOCOUPLER ASSEMBLY 3A2A1A1

The Optocoupler, a subassembly that plugs onto the CPU Assembly, contains optically-coupled isolators. The Optocoupler electronically isolates the CPU's multiplexed address/data bus from the control/data bus to prevent noise transfer to/from the microprocessor (U2).

4.2.4 AUDIO/REMOTE AUDIO ASSEMBLIES 3A2A2/3A2A4

The Audio/Remote Audio Assemblies process the Remote Receive Audio input signal from the transceiver to drive the front panel speaker, headphones, and to provide two selectable 600-ohm audio outputs to external modems.

Audio input from a microphone, CW key, or selected external device is processed by the Audio/Remote Audio Assemblies to produce an amplified 600 ohm Transmit Audio output signal that is applied to the transceiver over the transmit audio lines.

After converting the receive 600 ohm audio to single ended output in the Remote Audio Assembly, the Receive Audio signal is amplified and routed to the 600-ohm line drivers to provide a balanced 600-ohm output to the connected external device ('A' or 'B', as determined by the 'Line Audio' selection described in Section 3.3.9). The amplified input signal can be electronically switched through a CW Narrowband Audio Filter or bypassed-switched to the Syllabic Squelch and Electronic Volume Control circuits. The output of the Electronic Volume Control is amplified and switched (controlled by a designed-in Mute function or Squelch ON/OFF) and routed to the Speaker Driver. The output is dropped through R111 and routed to the front panel for headphone audio. Full power audio is routed through an energized relay (K3) to the front panel speaker.

NOTE: When headphones are plugged into the front panel, relay K3 is de-energized, disabling the audio to the speaker.

The Squelch circuit is a true syllabic type that operates on voice characteristics and rejects other types of received audio, such as noise, data, etc. The Receive Audio input is sampled in the Syllabic Squelch circuit and -- if it has voice characteristics -- turns on the Receive Audio switch and passes through to the Speaker Driver. The Syllabic Squelch circuit is designed to remain inactive (i.e., audio unsquelched) during voice poises or short fades, minimizing the effects of nuisance interruptions.

NOTE: This is a function in the RCU-9310 and does not put the remote transceiver into squelch operation.

During Transmit operation, input to the Audio Assembly originates from one of three sources:

- a) Microphone,
- b) 600-ohm balanced lines, or
- c) CW key.

The microphone input signal from the front panel is routed to the Audio Assembly where it is amplified and electronically switched to the Microphone/600-ohm Audio Switch circuits. This microphone output level is controlled by an internal adjustment. The output may be fed through the Transmit Audio Compressor circuits, or switched to bypass them. The microphone audio is then amplified, switched to the Transmit Audio Amplifier, and applied to a line driver on the Remote Audio Assembly to provide a 600-ohm Transmit Audio signal to the Transceiver.

The 600-ohm balanced audio from external input level is controlled by an internal adjustment. This signal is buffered and electronically switched through the Microphone/600-ohm Audio Switch circuits. This audio signal can also be internally switched to pass through, or bypass, the Transmit Audio Compressor circuits. The 600-ohm audio signal then follows the same path as the microphone signal.

Keying the CW key enables the CW Sidetone Switch. The CW tone is buffered and coupled to the Transmit Audio Amplifier. A second buffer and internal level control provides sidetone to the Speaker Driver.

4.2.5 I/O ASSEMBLY 3A2A3

The I/O Assembly contains two independent I/O ports, designated 'A' and 'B'. Port B is an RS-232, 9600-baud port that is dedicated to be used for future specific predetermined operations. Port A provides the control interface between the remote control unit and its companion transceiver. 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, 19200 baud or FSK tones at 300 baud only.

NOTE: Port A may be used for communications over telephone lines with the FSK Tone Modem (3A2A3A1) and optional PC Assemblies Phone Line Select (3A2A6) and Phone Interface (3A3A4).

I/O Port functions are implemented by a Dual Universal Asynchronous Receiver/Transmitter (DUART) circuit (U9) under control of the I/O Assembly's microprocessor (U10). The I/O Assembly microprocessor executes special instructions (software contained in EPROM U20) in response to messages from the transceiver or commands from the Front Panel or Microprocessor Assembly.

The organization of the I/O Assembly hardware and software is such that both ports can be active simultaneously.

4.2.6 POWER SUPPLY ASSEMBLIES 3A3, 3A3A1, and 3A3A2

The RCU-9310 operates from either a +26 VDC or 120/220 VAC power source. When both power sources are connected, the RCU-9310 operates from the AC line input, using the +26 VDC input as a backup power source. The supply will sense AC line reductions or failure and automatically switch to the backup voltage source. When AC line returns, the unit will automatically switch back to AC line power.

The AC power supply assembly (3A3) produces unregulated DC that is regulated to +28 VDC in PC assembly 3A3A1. This +28 VDC is routed to PC assembly 3A3A2 where the +28 VDC is fuse (3A3A2 F1) protected before being routed to the circuitry in the RCU-9310. The +28 VDC is also sent thru R1 and R2 to 3A3A2 U1 to produce the +12 VDC regulated output routed to RCU-9310 circuitry and to 3A3A2 U2 producing the +5 VDC regulated output for the RCU-9310 circuitry.

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 paragraph.

5.2.1 TOP OR BOTTOM COVER REMOVAL

Refer to Figure 5.2.1.1

- a) Remove the three screws at the rear of the cover.
- b) Pull the cover up and back from the front panel.

5.3 TEST SET UP

5.3.1 PRELIMINARY

- a) Connect RCU-9310 to AC or DC power and turn ON.

WARNING: For personal safety and to prevent damage to voltage sensitive components in the remote control unit, always turn OFF the RCU-9310 whenever reseating printed circuit cards (PC), LRU'S and when replacing fuses.

5.4 BITE

5.4.1 PRELIMINARY

The BITE of the RCU-9310 provides immediate LRU faults. The Surveillance BITE is controlled by the microprocessor on CPU Assembly 3A2A1. It checks the operational status of the LRU's with the exception of the +28 V Regulator 3A3A1. This LRU has a self-surveillance BITE non-dependent upon CPU Assembly 3A2A1. The front panel "LCD" will display a plain language "FAULT MESSAGE", the "FAULT" Red LED will illuminate on the front panel (See Figure 5.4.1.1 and on the faulty LRU (see Figure 5.4.1.3)). The RCU-9310 Remote Control Unit can be tested independently, with or without a transceiver connected. With RCU-9310 connected to selected input power turn ON remote unit and refer to figure 5.4.1.1 and perform the following steps to access the BITE menu.

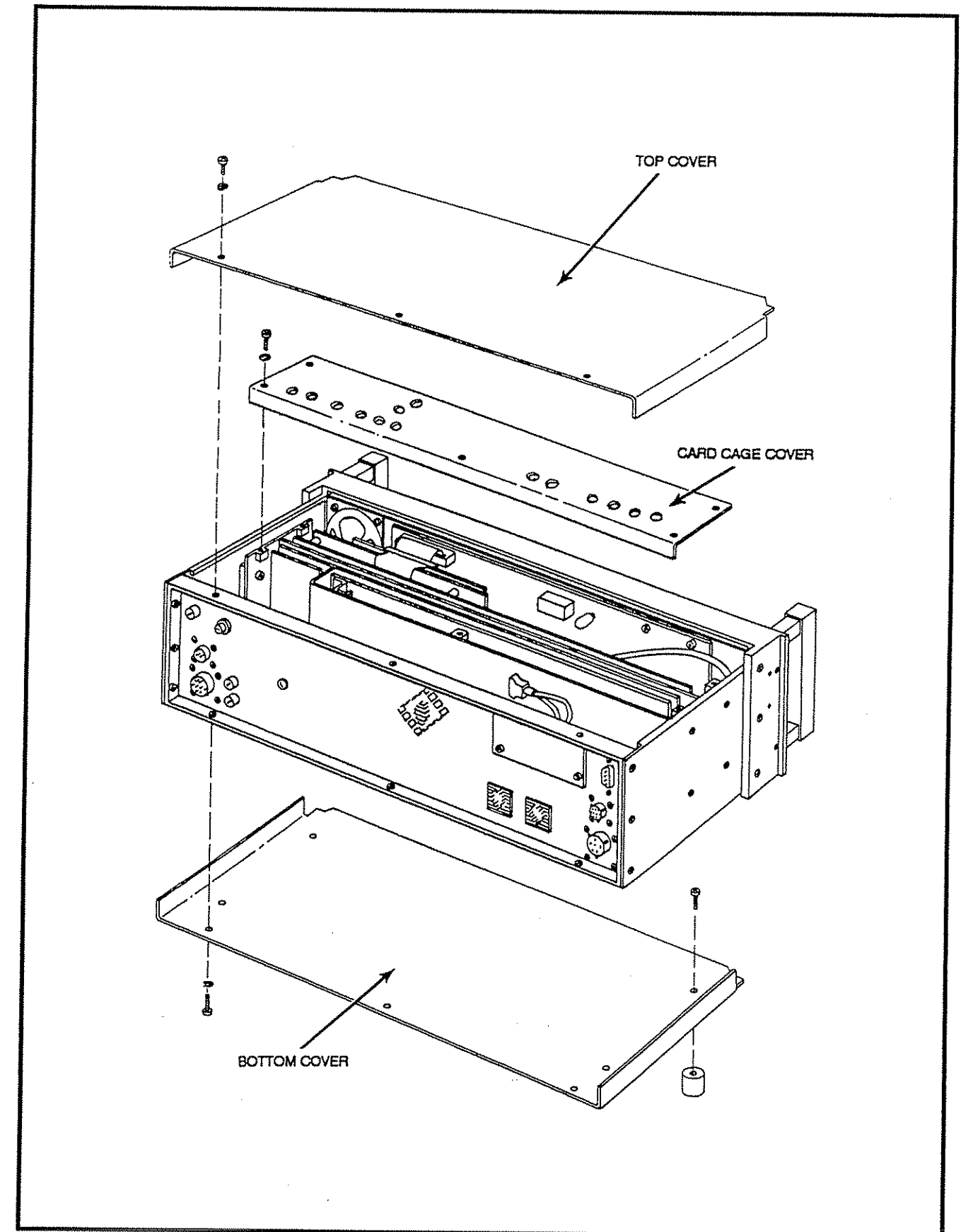


Figure 5.2.1.1 Top/Bottom and Card Cage Covers Removal.

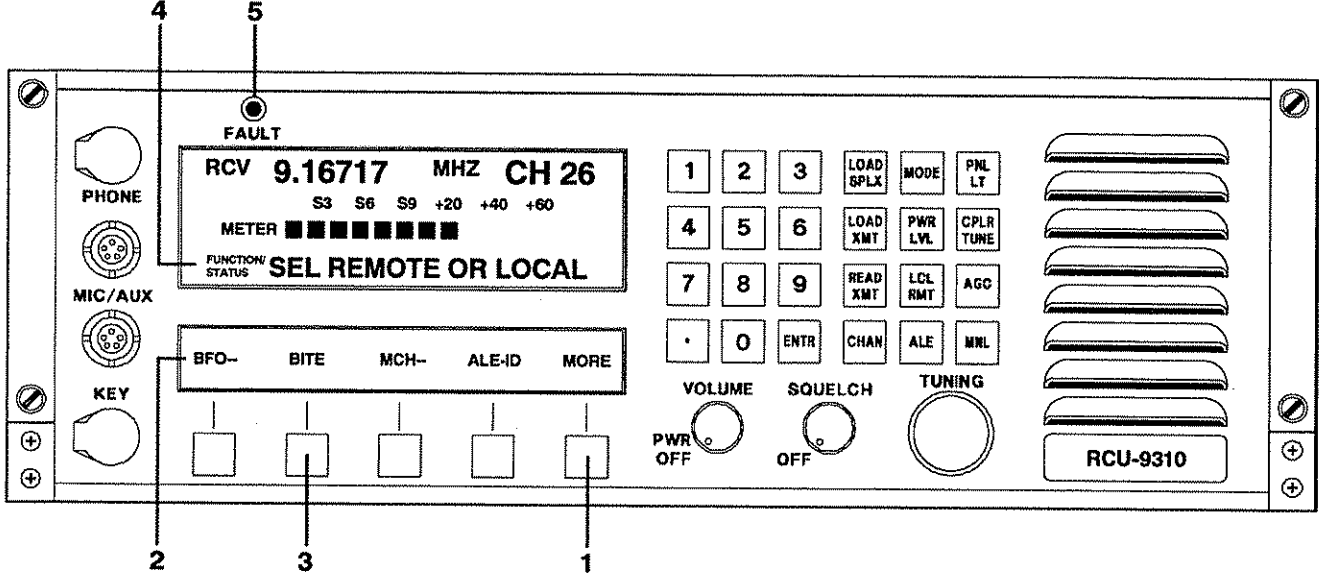


Figure 5.4.1.1 RCU-9310 Feature Menu, BITE Selection.

Depress the 'MORE' key 1 successively until the feature menu 2 shown in Figure 5.4.1.2 appears.

Depress the 'BITE' key 3 . The message:

'SEL REMOTE OR LOCAL'

will appear on the status display screen 4 , and the BITE submenu shown in Figure 5.4.1.2 will be displayed on the 'Feature' screen.

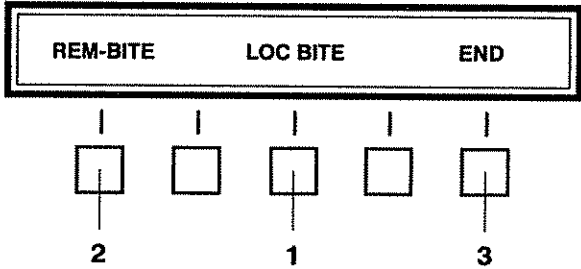


Figure 5.4.1.2 RCU-9310 BITE Submenu.

Depress the 'LOC BITE' key 1 . The RCU-9310 will initiate a self-test routine and will display messages and/or results on the status screen. The initial message will be:

'BITE IN PROGRESS'

As each modules tested, a corresponding message will appear briefly on the screen in the following order:

'FRONT PANEL O.K.'

'CPU O.K.'

'POWER SUPPLY O.K.'

'I/O O.K.'

1000 Hz Audio Tone heard in speaker at this point.

'AUDIO O.K.'

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

'FRONT PANEL FAULT'

'CPU FAULT'

'POWER SUPPLY FAULT'

'I/O FAULT'

'AUDIO FAULT'

5.4.2 COMMON MODULES

NOTE:

Refer to Figures 5.2.1.1, 5.4.2.1 and 5.4.2.2 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 3A1A1.

- a) Turn RCU-9310 OFF and remove Front Panel Module 3A1. See Figure 5.4.2.2 on the following page.
- b) Remove and replace Front Panel PC Board Assembly 3A1A1. See Figure 5.4.2.2.
- c) Reinstall Front Panel Module 3A1. Turn RCU-9310 ON.
- d) Repeat "BITE TEST". Upon completion of successful test, return RCU-9310 to operational status and return failed 3A1A1 PC to factory for repair.
- e) If in step d) above, test fails the Front Panel test again, turn OFF RCU-9310 and remove 3A1 Module; replace with original 3A1A1 PC Assembly. Return the failed 3A1 Module to factory for repair.

5.4.2.2 CPU FAULT

This is an indication of a failure on the PC Assembly CPU 3A2A1. Check position of DIP Switch S1. (See Figures 5.8.4 and 5.7.3.1).

- a) Turn the RCU-9310 OFF and remove and replace PC Assembly 3A2A1. See Figures 5.4.2.1 thru 5.4.2.4.
- b) Turn ON RCU-9310 and repeat "BITE TEST". Upon completion of a successful test, return RCU-9310 to operational status.
- c) Return failed PC Assembly 3A2A1 to factory for repair.

5.4.2.3 I/O FAULT

This is an indication of a failure on PC Assembly I/O 3A2A3.

- a) Turn the RCU-9310 OFF and remove and replace PC Assembly 3A2A3. See Figures 5.4.2.1 thru 5.4.2.4.
- b) Turn ON RCU-9310 and repeat "BITE TEST". Upon completion of a successful test return RCU-9310 to operational status.
- c) Return failed PC Assembly 3A2A3 to factory for repair.

5.4.2.4 AUDIO FAULT

This is an indication of a failure on the Audio PC Board Assembly 3A2A2. Check DIP Switch S1. See Figure 5.8.6.

- Turn RCU-9310 OFF and remove and replace 3A2A2. See Figure 5.4.2.1.
- Turn RCU-9310 ON. Repeat "BITE TEST". Upon completion of successful test, return RCU-9310 to operational status. Return failed 3A2A2 to factory for repair.

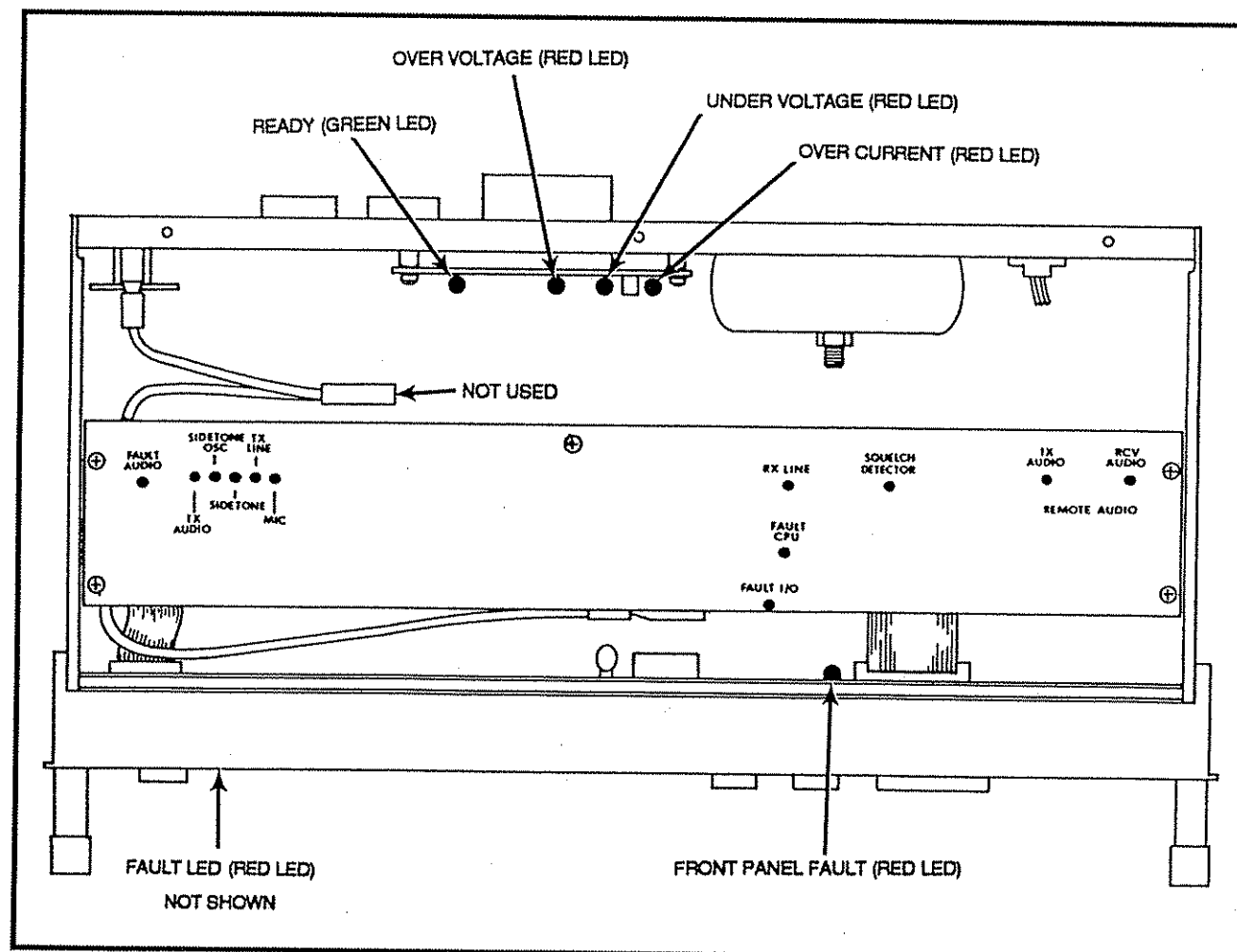


Figure 5.4.1.3 Top View RCU-9310 LRU "Fault Indicators".

5.4.2.5 POWER SUPPLY FAULT

This indicates a failure of the +28VDC out of PC Assembly 3A3A2 usually 3A3A2-F1.

- a) Turn OFF RCU-9310 and check 3A3A2-F1, replace as required.
- b) If 3A3A2-F1 is not blown, use normal troubleshooting procedures and check the +28VDC lines on Mother Board assembly 3A2A5-J2 pins 23 and 24. If this is correct, the fault is on the CPU assembly 3A2A1.

1) Turn RCU-9310 Off and remove and replace PC assembly 3A2A1. See Figures 5.4.2.1 thru 5.4.2.4.

2) Turn ON RCU-9310 and repeat "BITE TEST". Upon completion of a successful test, return RCU-9310 to operational status.

3) Return failed PC Assembly 3A2A1 to factory for repair.

5.5 TROUBLESHOOTING WITH SELF-SURVEILLANCE BITE

Refer to Figure 5.4.1.3.

5.5.1 AC POWER SUPPLY

The Self-Surveillance Bite for the AC power supply consists of the following LED's (See Figure 5.4.1.3)

- a) GREEN = READY (3A3A1-CR8)
- b) RED = OVER VOLTAGE (3A3A1-CR7)
- c) RED = UNDER VOLTAGE (3A3A1-CR6)
- d) RED = OVER CURRENT (3A3A1-CR3)

TROUBLESHOOTING GUIDE.

SYMPTOM(s)	POSSIBLE TROUBLE(s)	CHECKS & CORRECTIVE ACTION(s)
<div>AC POWER ONLY: Unable to turn unit ON. No LED's lit on 3A3A1.</div>	<div>1. No AC Power.</div> <div>2. Open AC fuses 3A3F1 or F2.</div>	<div>1. Check AC power input and take appropriate action.</div> <div>2. Replace F1 or F2. If fuse opens again use normal trouble-shooting procedures, locate and repair short in AC power supply.</div>

TROUBLESHOOTING GUIDE (CONT...)

SYMPTOM(s)	POSSIBLE TROUBLE(s)	CHECKS & CORRECTIVE ACTION(s)
Unable to turn unit ON and GREEN READY LED on 3A3A1 lit.	1. 3A3A2-K2 or associated circuitry 3A3A2-Q2 or Q3 faulty.	1. Troubleshoot and repair or replace faulty component. 2. Remove and replace PC Assembly 3A3A2.
Unable to turn unit ON and RED UNDER VOLTAGE LED on 3A3A1 lit.	1. 3A3A1-Q1 faulty. 2. Faulty component(s) on 3A3A1.	1. Replace Q1. 2. Troubleshoot and replace faulty components, or remove and replace PC Assembly 3A3A1.
AC or DC POWER:		
Unit turns ON, unable to turn ON Front Panel LCD back lite. Run local BITE. Unit displays "POWER SUPPLY FAULT". No audio tone during audio test and displays "AUDIO FAULT" and Front Panel FAULT LED is lit.	1. 3A3A2-F1 open.	1. Replace F1, if fuse opens again use normal troubleshooting procedures, locate and repair short on +28VDC lines in unit.
Unit turns on, Front Panel LCD glows, but no information is displayed. Unit has no RED FAULT LED's lit. GREEN READY LED on 3A3A1 is lit.	1. 3A3A2-U1 or associated circuitry faulty.	1. Replace U1. 2. Troubleshoot and replace faulty components or remove and replace PC Assembly 3A3A2.
Unit turns on, Front Panel LCD glows, but no information is displayed. Unit has no RED FAULT LED's lit. With AC power applied GREEN READY LED ON 3A3A1 is lit. With DC only READY LED will not be lit.	1. 3A3A2-U2 or associated circuitry faulty.	1. Replace U2. 2. Troubleshoot and replace faulty components or remove and replace 3A3A2.
DC POWER ONLY:		
Unable to turn unit on.	1. No DC power. 2. 3A3A-F3 open. 3. 3A3A2-K1, K2 or associated circuitry faulty.	1. Check DC power input and take appropriate action. 2. Replace F3, if fuse opens again, use normal troubleshooting procedures, locate and repair short in DC circuitry. 3. Troubleshoot and replace faulty component(s) or remove and replace PC Assembly 3A3A2.

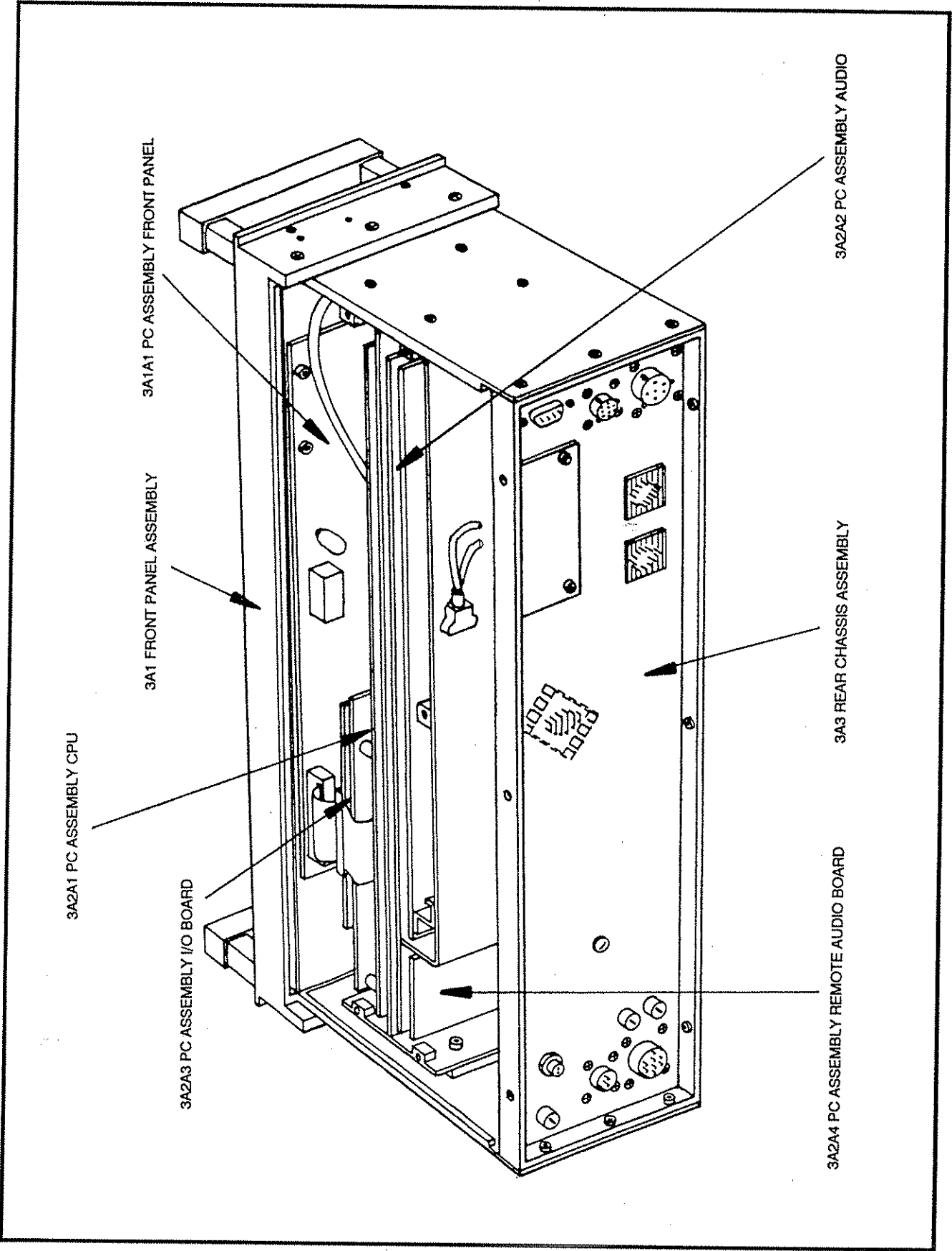


Figure 5.4.2.1 Major Assembly Locations.

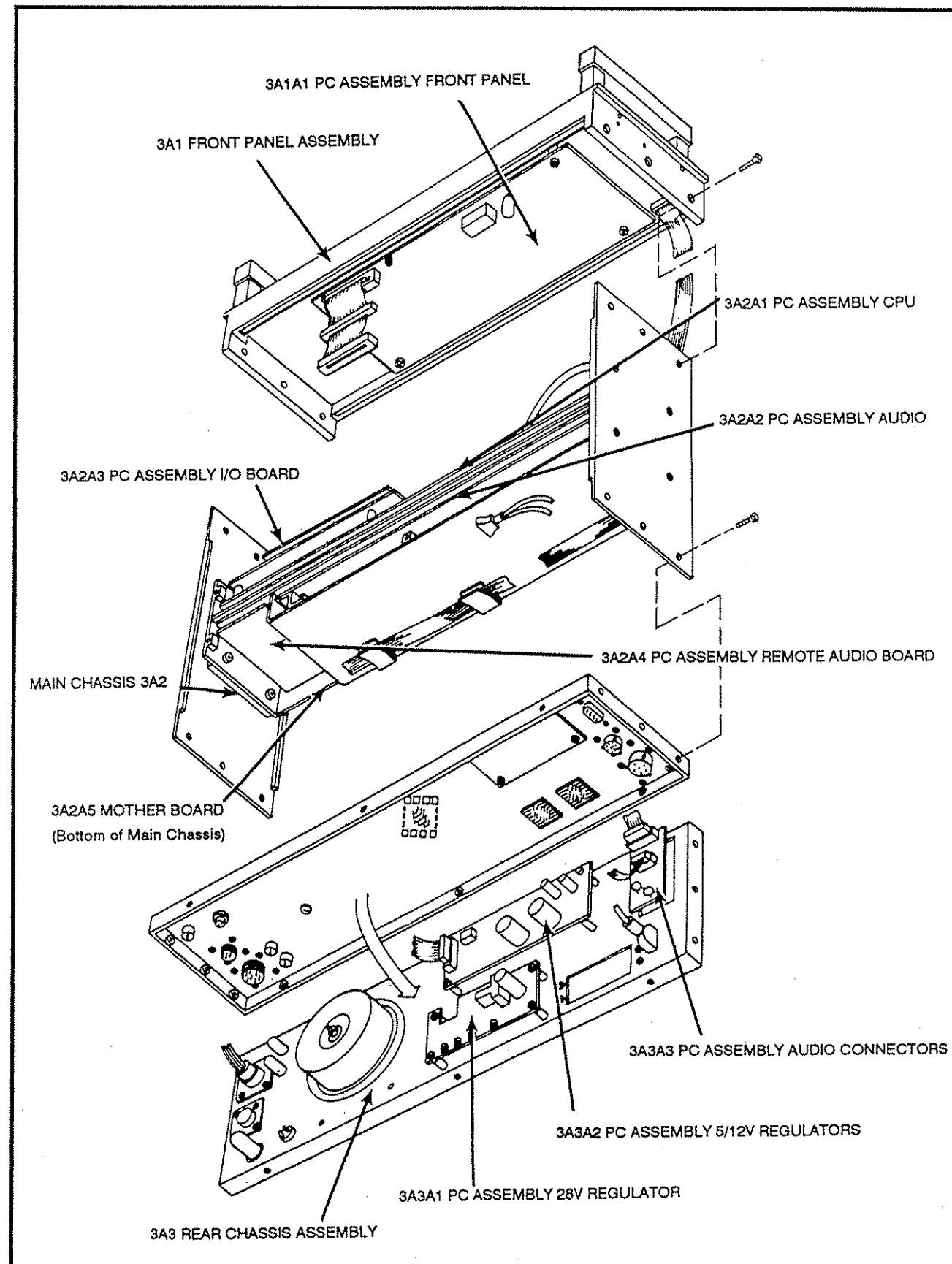
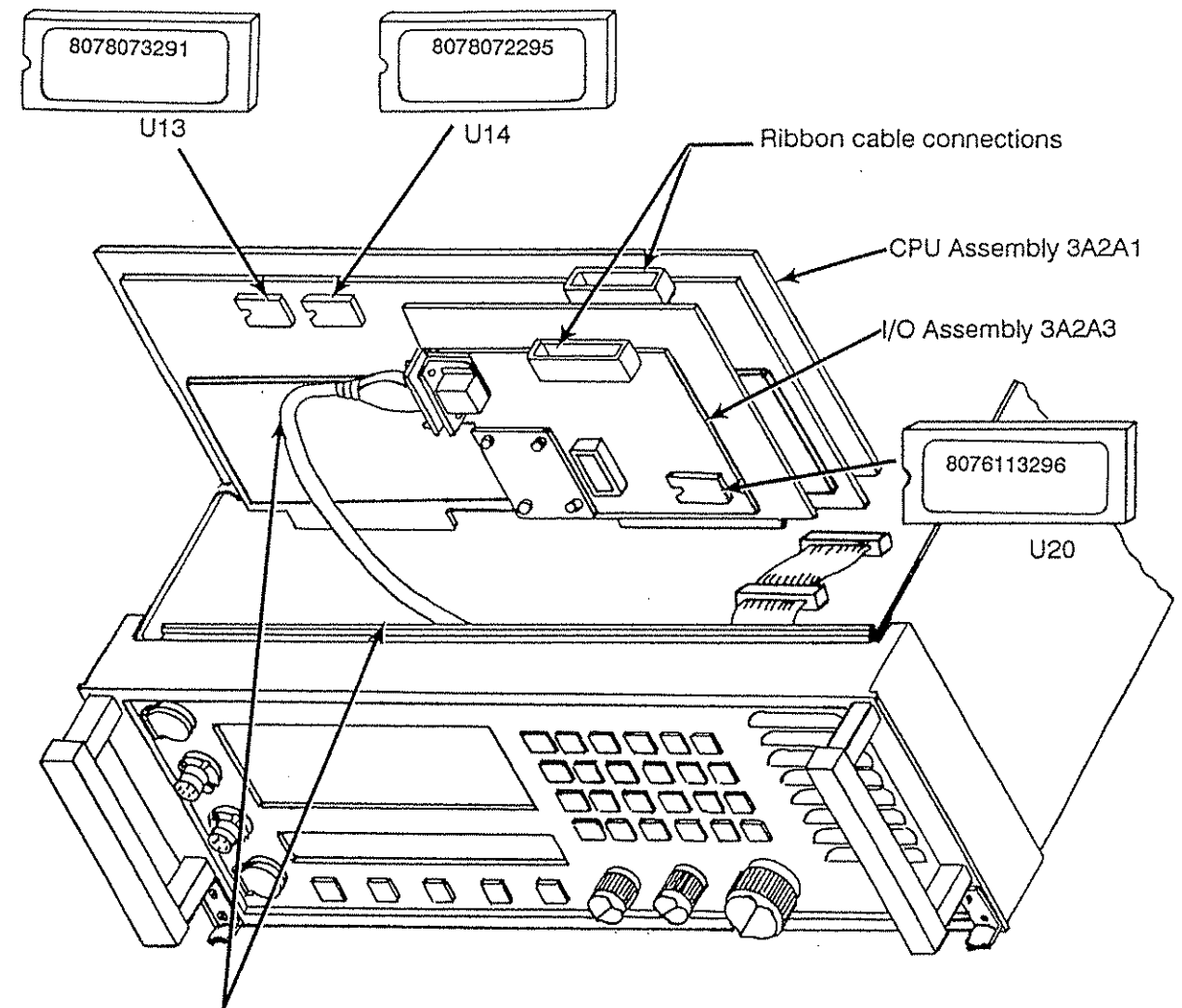


Figure 5.4.2.2 Removal of Front and Rear Panel and Major Assemblies Locations.



WARNING
Make sure I/O cable doesn't catch on the black transformer located on the Front Panel as the CPU Assembly is removed and replaced.

Figure 5.4.2.3 Removal / Replacement of CPU 3A2A1 and I/O 3A2A3.

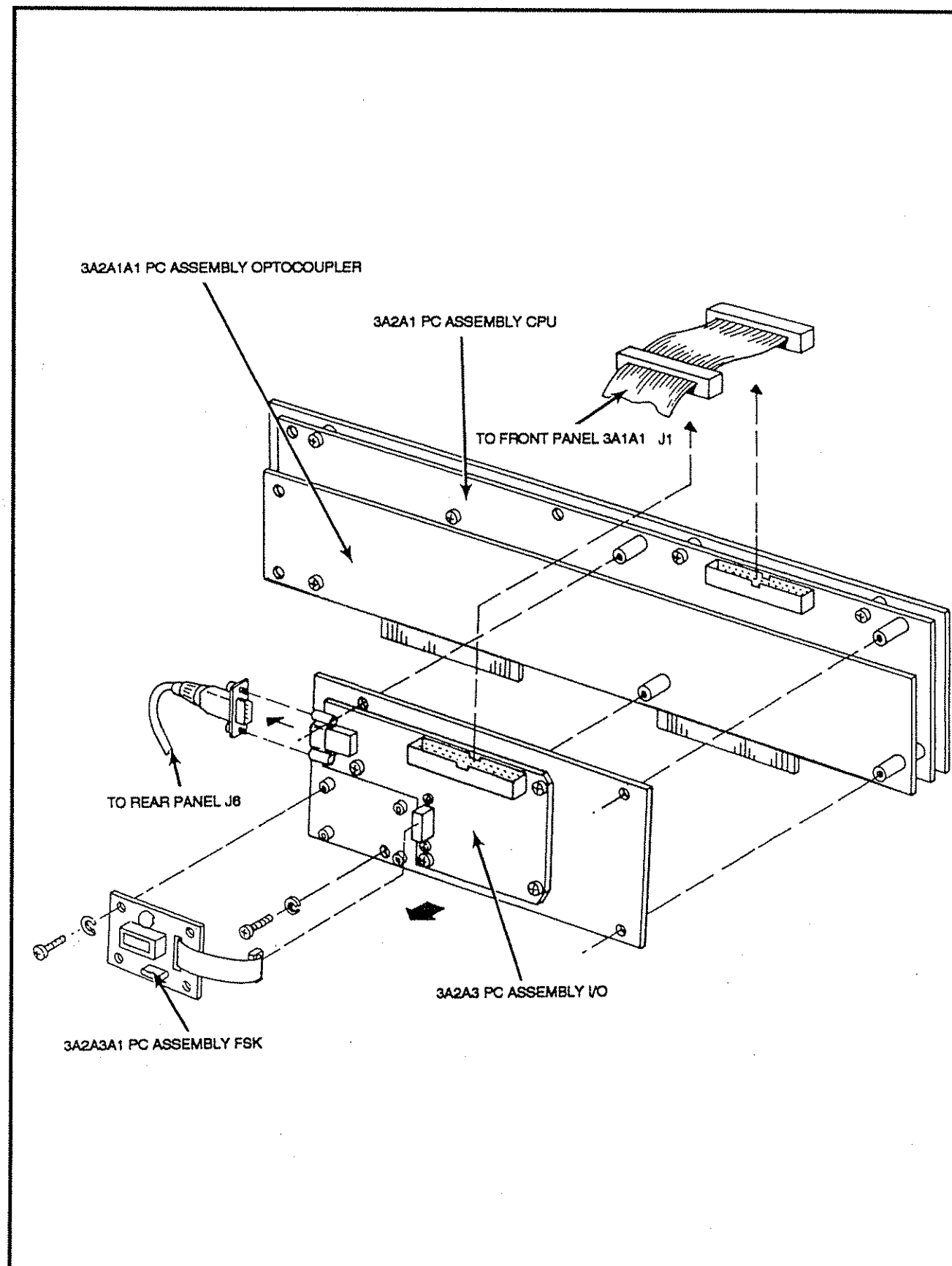


Figure 5.4.2.4 Removal / Replacement of I/O 3A2A3 or FSK 3A2A3A1.

5.5.2 INSTALLATION OF NEW BACKLIGHTING DEVICES FOR FRONT PANEL LCDs.

The Backlighting 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 Backlighting devices the longest possible life. This is accomplished by depressing the 'PNLLT' push button on the Front Panel to turn OFF the Backlighting and depressing it again to turn the Back- lighting ON again when needed. Once the Backlighting devices have lost their luminescence, the backlight may be renewed by ordering replacement Backlighting devices for the applicable LCD and installing per Figures 5.5.2.1 through 5.5.2.3.

1. Custom LCD, Full Function, P/N 8076040604.
Replacement Backlight, Assembly P/N 8076040892.
2. Custom LCD, 1 x 40 Character, Assembly P/N 8076041791.
Replacement Backlight, P/N 8076041708.

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

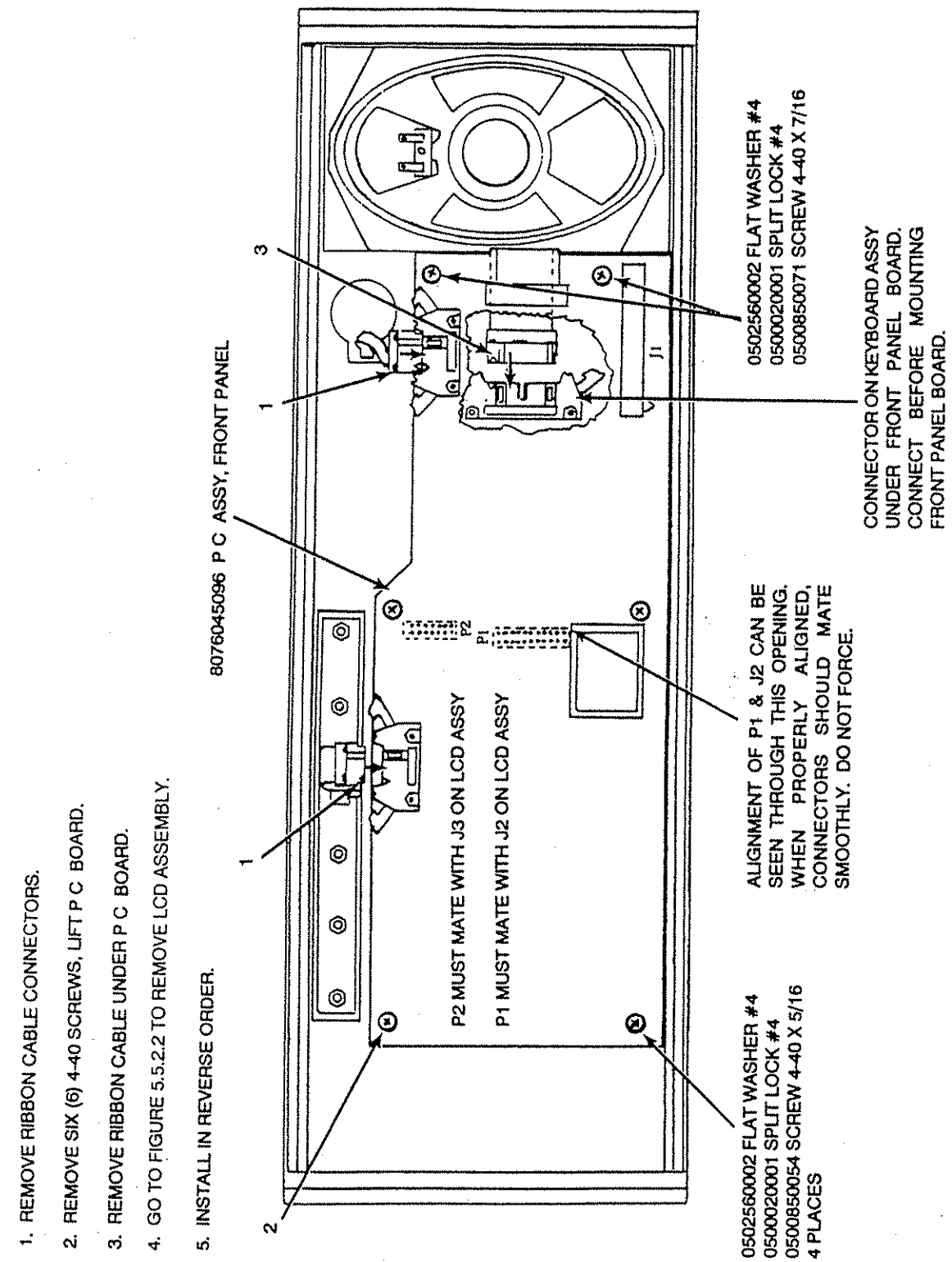


Figure 5.5.2.1 Removal and Installation of Front Panel PC Assembly.

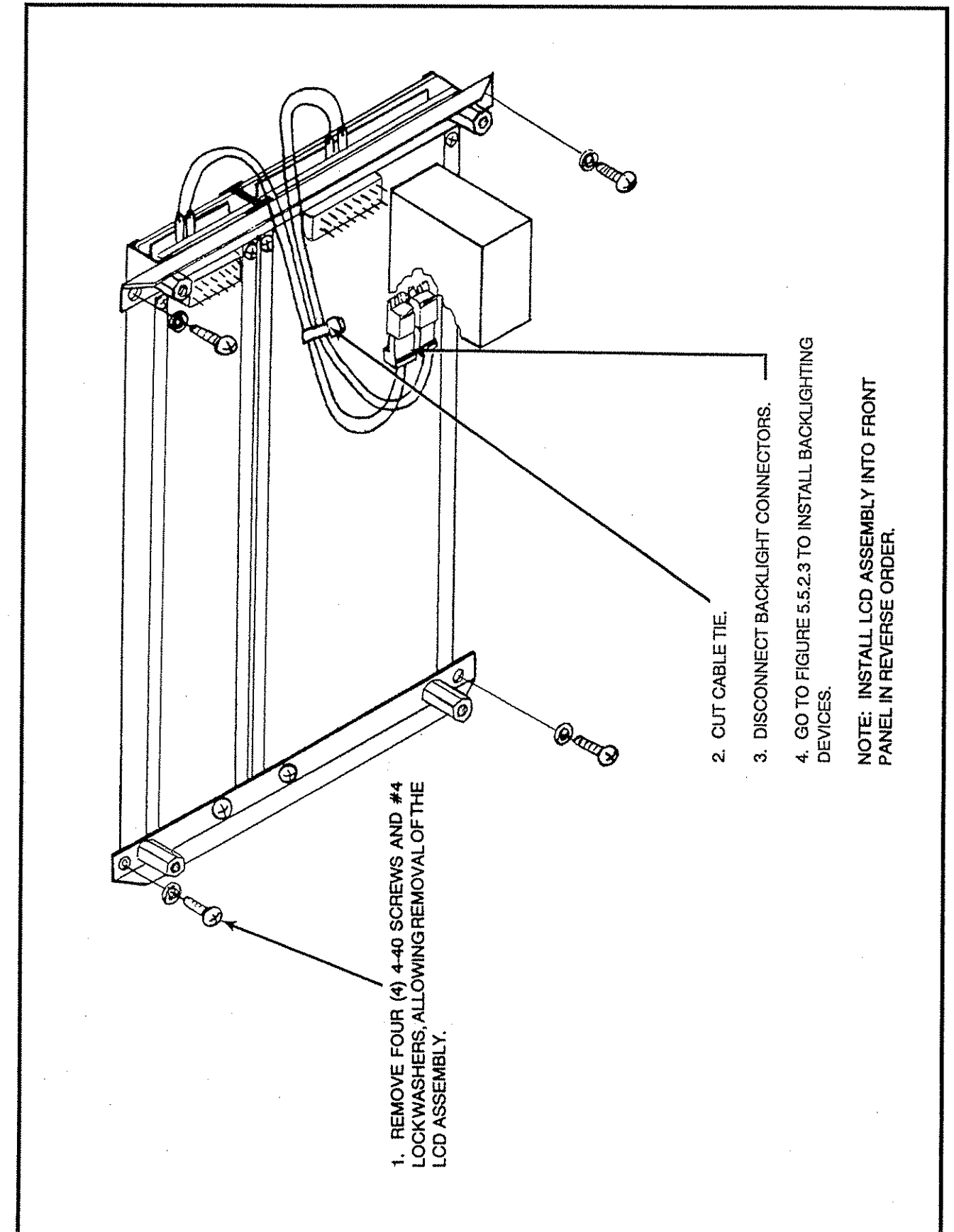


Figure 5.5.2.2 Removal and Installation of LCD Assembly.

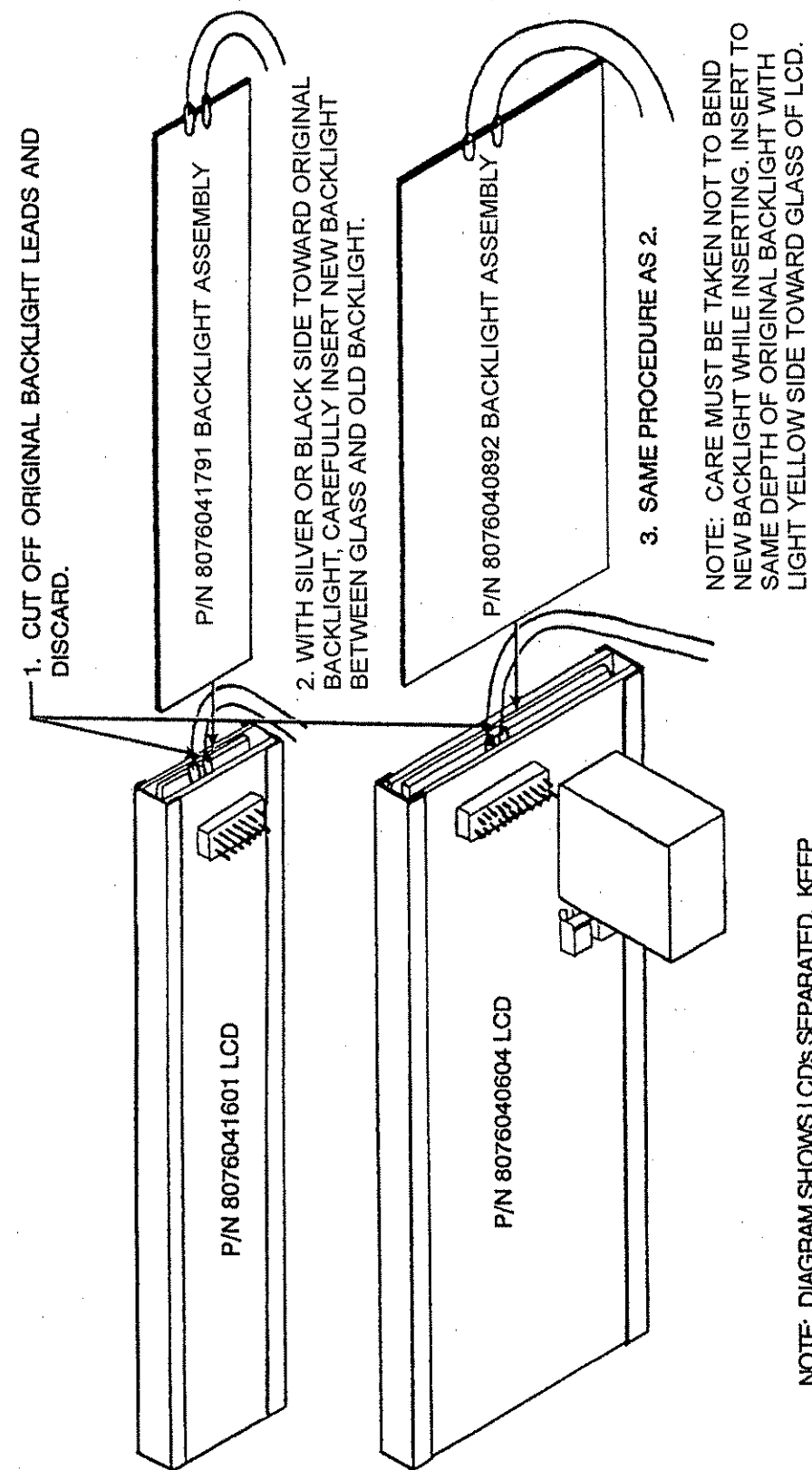


Figure 5.5.2.3 Installation of Backlighting Devices.

5.6 TEST EQUIPMENT REQUIRED OR EQUIVALENT

Multimeter	Simpson 260
Digital Multimeter	Leader LDM-853A
Audio Generator	Leader Model LAG-120B
Audio Voltmeter	Leader Model LMV-181A
Frequency Counter	Systron-Donner Model 6050
Oscilloscope 100 MHZ Bandwith	Tektronix 465
Microphone	Sunair P/N 8076000602
CW Key	Sunair P/N 5024000994
Card Extender	Sunair P/N 8076003091
600 ohm 1/4 Watt Resistors	

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 RCU-9310. See Figures 5.7.1.1 and 5.7.2.1 for test equipment connections.

5.7 TEST AND ALIGNMENT

5.7.1 TRANSMIT REMOTE AUDIO

The RCU-9310 transmit audio circuits have been factory adjusted to output OdBm audio signal to the transceiver.

The RCU-9310 is checked and aligned as a stand alone unit by connecting unit and test equipment as shown in Figure 5.7.1.1 and accomplishing the following checks and alignments. Use Figures 5.7.1.2. and 5.7.1.3

- a) Turn on RCU-9310, go to I/O menu and turn 'OFF' the I/O. Select 'LOCAL', 'MTR-XMT', 'LINE' and 'LINE AUDIO A' and 'MODE CW'.
- b) On Audio Board Assembly 3A2A2 set S1 all segments to 'OFF'. Connect CW Key to front panel J1 and key unit or connect a ground to 3A2A5 J3 pin 6.
 - 1) 1000 Hz audio tone should be heard from front panel speaker. Measure audio level at 3A2A5 J3 pins E and C and adjust 3A2A2 R42 as required for .245 VRMS. With a 600 ohm resistor across rear panel J4 pins A and C measure the audio level at 3A2A5 J5 pins 3 and C and adjust 3A2A4 R1 for OdBm. The CW tone heard in the speaker may be adjusted for loudness with 3A2A2 R29, as volume control has no effect. Unkey unit.
 - 2) Change mode to USB and connect Audio Oscillator to microphone audio J3/J4 pins A and D, adjusted for 1000 Hz at 100 millivolts and a key switch across pins C and A or ground 3A2A5 J4 pin 5 to key unit. Measure the audio at 3A2A5 J3 pins E and C and adjust 3A2A2 R8 for .245 VRMS and check the output at 3A2A5 J5 pins 3 and C for OdBm. Unkey the unit.
 - 3) With Audio Oscillator set to 1000 Hz at OdBm connected to rear panel J3 pins S and J and a key switch across pins G and R or ground 3A2A5 J3 pin 20 to key the unit. Measure the audio level at 3A2A5 J3 pins E and C and adjust 3A2A2 R58 as required for .245 VRMS. Check the output at 3A2A5 J5 pins 3 and C for OdBm.

- 4) Adjust R162 as required for bar meter on RCU-9310 front panel to display OdBm \pm one bar. (You will have to have 3A2A2 on card extender P/N 8076003091 to adjust R162).
- 5) Set 3A2A2 S1 segments 1 and 3 to 'ON'. Measure the audio at 3A2A5 J3 pins E and C and adjust 3A2A2 R21 for .245 VRMS. Check output at 3A2A5 J5 pins 3 and C for OdBm.
- 6) Checking the output at 3A2A5 J5 pins 3 and C vary the Audio Oscillator output from -10dBm to +10dBm. The output at J5 should remain constant at OdBm. Front panel bar meter should display from -10dBm to +10dBm while varying the Audio Oscillator. Unkey the unit.

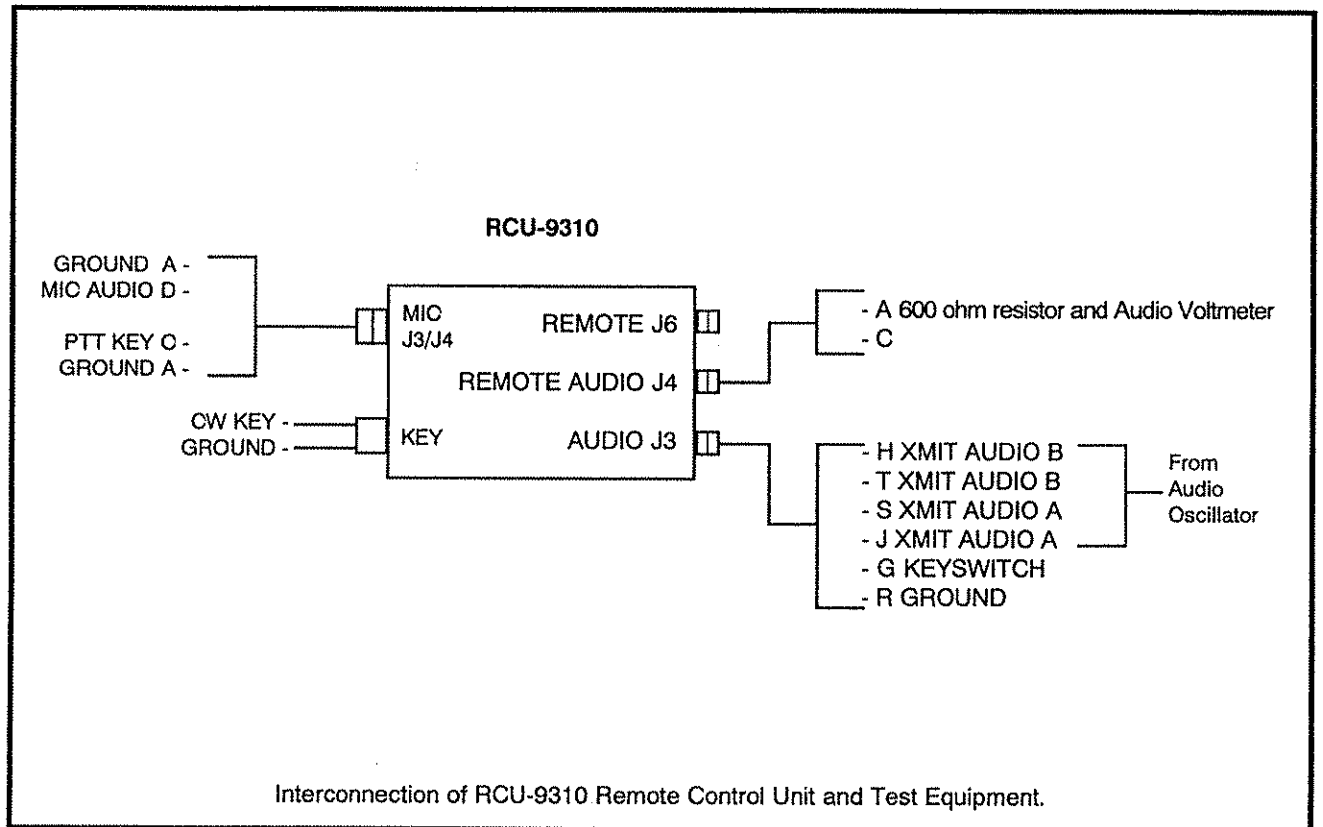


Figure 5.7.1.1 RCU-9310 Stand Alone Audio Test Set Up.

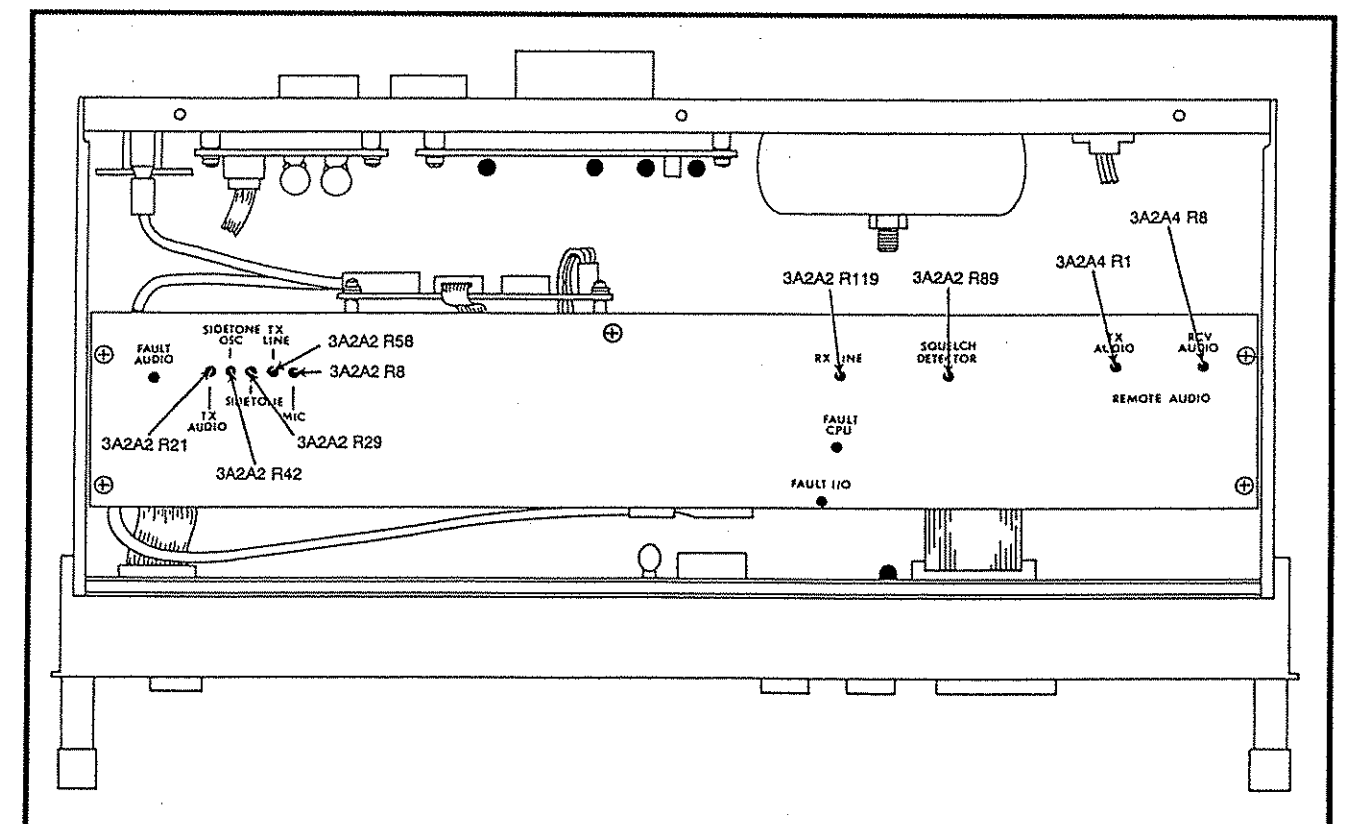


Figure 5.7.1.2 Top View RCU-9310 Alignment Adjustment Locations.

A21201

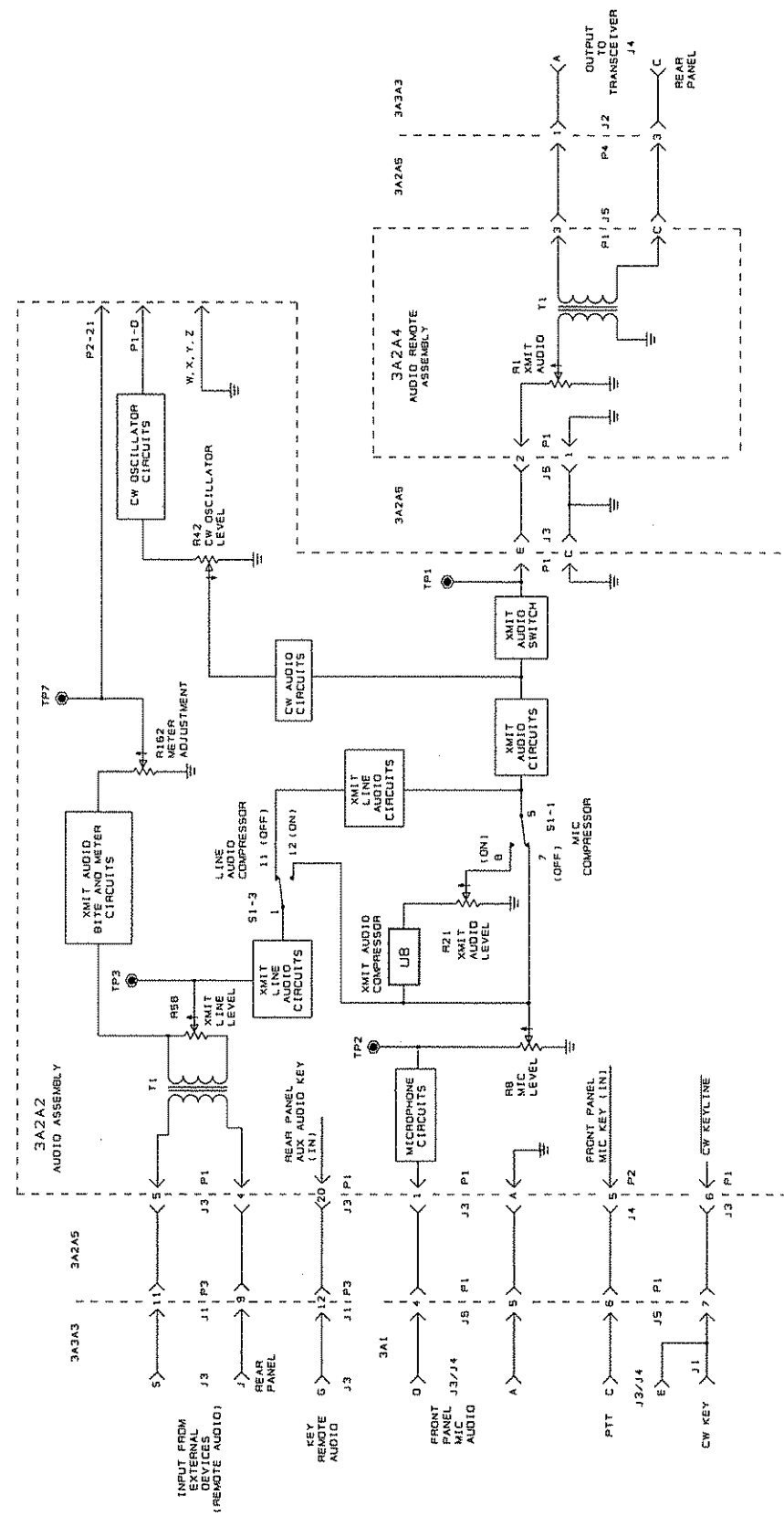


Figure 5.7.1.3 Transmit Path Audio A.

5.7.2 RECEIVE REMOTE AUDIO

The RCU-9310 receive audio circuits have been factory adjusted to provide an OdBm output signal from an OdBm input signal from transceiver.

The RCU-9310 is checked and aligned as a stand alone unit by connecting the unit and test equipment as shown in Figure 5.7.2.1. and accomplishing the following checks and alignments. Use Figures 5.7.1.2 and 5.7.2.2.

- a) Turn on RCU-9310, go to I/O menu and turn 'OFF' the I/O. Select 'LOCAL', 'MTR-RCV', 'LINE' and 'LINE AUDIO A'.
 - 1) With 1000 Hz OdBm input at Remote Audio J4 pins B and D, check for OdBm level at 3A2A5 J5 pins 5 and E.
 - 2) Measure audio level at 3A2A5 J3 pins H and J and adjust 3A2A4 R8 as required for a reading of .180 VRMS.
 - 3) Measure audio level at 3A2A5 J4 pins 1 and 2 and adjust 3A2A2 R1 19 as required for a reading of OdBm with 600 ohm resistor connected across rear panel J3 pins M and L.
 - 4) Bar meter on RCU-9310 front panel should display OdBm \pm one bar. Turn 'OFF' RCU-9310.
 - 5) With DVM measure resistance between right side of 3A2A2 R142 and ground. Adjust 3A2A2 R89 for a 2K ohm reading. Turn RCU-9310 'ON'.
 - 6) Turn the Squelch Control fully clockwise, the audio output of the RCU-9310 speaker should be squelched. Change the Audio Oscillator to 10kHz and return to 1000Hz. The speaker audio should be active and squelched approximately two (2) seconds after the speaker audio is first heard. This completes receive remote audio check and alignment. Turn 'OFF' and remove test equipment and return RCU-9310 to normal operation.

NOTE:

If problems occur during the check and alignment, remove and replace Audio Assembly 3A2A2 or use normal troubleshooting procedures to check and repair defective circuits. Faulty Audio Assembly may be sent to Sunair for repairs.

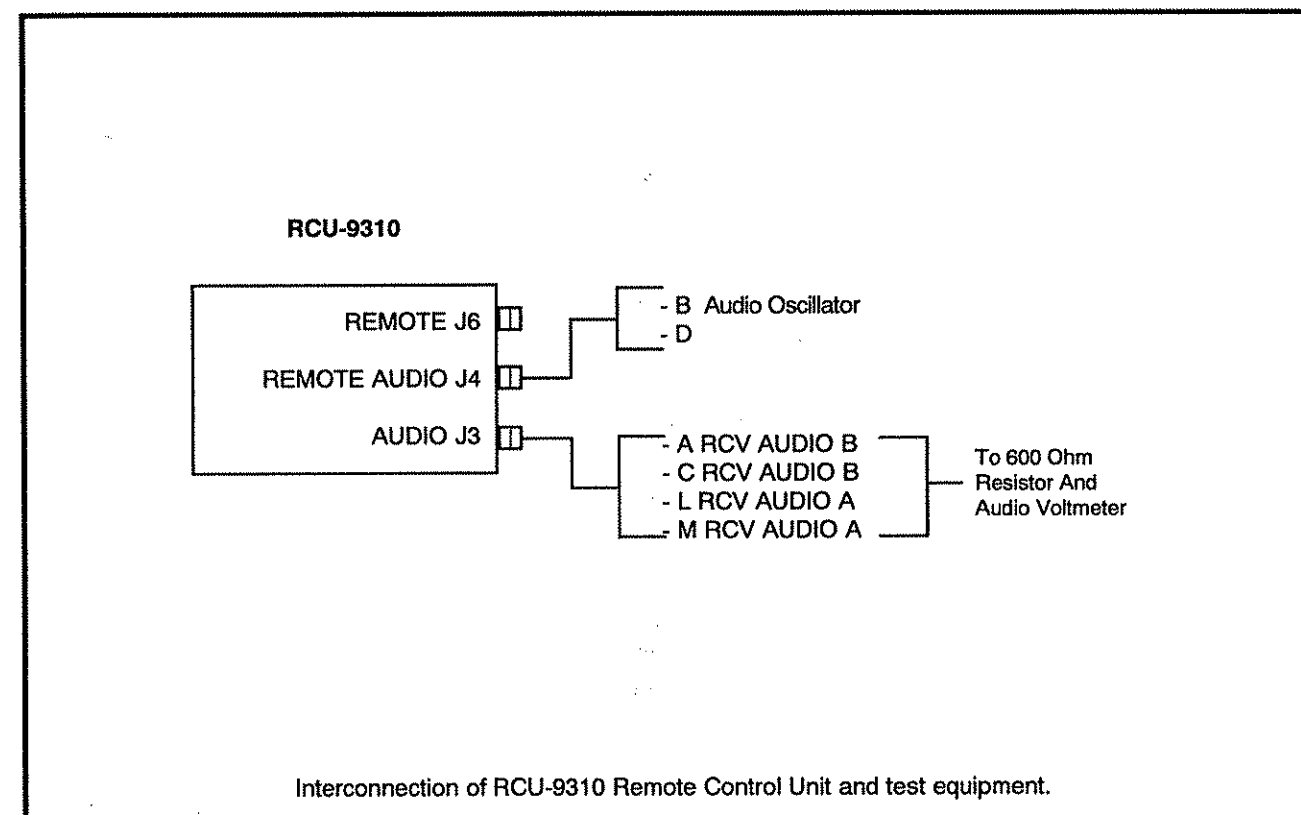


Figure 5.7.2.1 RCU-9310 Stand Alone Audio Test Set Up.

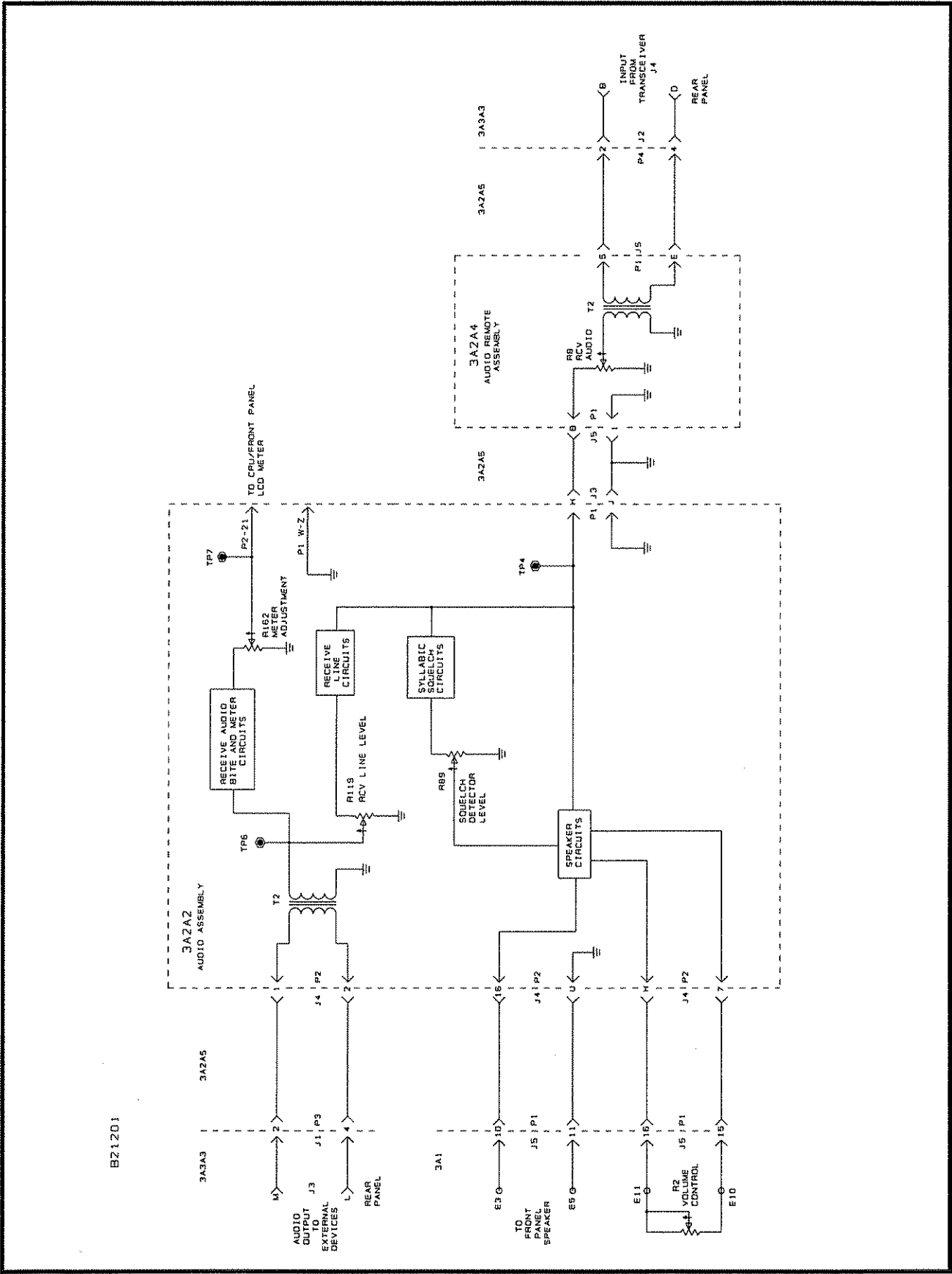


Figure 5.7.2.2 Receive Path Audio A.

5.7.3 SOFTWARE SWITCH SETTING CHECKS

Figure 5.7.3.1 shows the software switch settings on CPU PC Assembly 3A2A1 for RCU-9310 options.
SOFTWARE SWITCH SETTINGS ON CPU PC ASSEMBLY 3A2A1 for RCU-9310 OPTIONS.

NOTE: S1 Sections 1 through 8 are normally set to OPEN position (all rocker switches are raised at open side, see Figure 5.9.4). If while performing maintenance on the RCU-9310 the 3A2A1 is replaced, make sure 3A2A1 S1 is configured for non-optionized or for the applicable options installed in the remote operated transceiver.

S1 SECTION	SELECTION		OPTION/FUNCTION
	RAISED AT OPEN	RAISED AT NUMBER	
1	OPEN		Spare Function / Not used at this time.
			Spare Function / Not used at this time.
2	OPEN		Normal 1A2A3A1 Lincompex not installed at remote operated transceiver.
		2	Optional 1A2A3A1 Lincompex installed at remote operated transceiver.
3	OPEN		Normal ALE/Modem not installed at remote operated transceiver.
		3	Optional ALE/Modem installed at remote operated transceiver.
4	OPEN		Spare Function / Not used at this time.
5	OPEN		Normal No 1A2A4 FL5 installed at remote operated transceiver.
		5	Optional 1A2A4 FL5 installed at remote operated transceiver.
6	OPEN		Normal F-9800 Preselector/Postselector not installed at remote operated transceiver.
		6	Optional F-9800 Preselector/Postselector installed at remote operated transceiver.
7	OPEN		Not Connected / Not used at this time.
8	OPEN		Not Connected / Not used at this time.

Figure 5.7.3.1 Switch Settings for 3A2A1 S1.

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5.8 SCHEMATICS AND PARTS LISTS

The following pages contain schematics and parts lists for the RCU-9310, see Figure 5.8 below.

DESIGNATOR		DESCRIPTION	SUNAIR PART NUMBER
ASSEMBLY	SUBASSEMBLY		
3A1		FRONT PANEL ASSEMBLY	80760400XX
	3A1A1	PC ASSEMBLY FRONT PANEL	8076045096
	3A1A2	KEYBOARD, 6X4	8076046807
	3A1A3	CUSTOM LCD, FULL FUNCTION	8076040604
	3A1A3A1	EL BACKLIGHT	8076040892
	3A1A4	CUSTOM LCD, 1X40 CHARACTER	8076041601
	3A1A4A1	EL BACKLIGHT	8076041791
	3A1A5	KEYBOARD, 1X5	8076046505
3A2		MAIN CHASSIS P/O CHASSIS ASSEMBLY	80780100XX
	3A2A1	PC ASSEMBLY, CPU	8076070091
	3A2A1A1	PC ASSEMBLY, OPTOCOUPLER	8076075092
	3A2A2	PC ASSEMBLY, AUDIO	8076090091
	3A2A3	PC ASSEMBLY, I/O BOARD	8076110092
	3A2A3A1	PC ASSEMBLY, FSK MODEM	8076115094
	3A2A4	PC ASSEMBLY, REMOTE AUDIO	8078085095
	3A2A5	PC ASSEMBLY, MOTHER BOARD	8078017090
3A3		REAR CHASSIS P/O CHASSIS ASSEMBLY	80780100XX
	3A3A1	PC ASSEMBLY, 28V REGULATOR 5 AMP	8078021496
	3A3A2	PC ASSEMBLY, 5/12V REGULATORS	8078025092
	3A3A3	PC ASSEMBLY, AUDIO CONNECTORS	8078018096

Figure 5.8 RCU-9310 Assemblies and Subassemblies.

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FINAL TESTED RCU-9310

3A2A1	FINAL TESTED RCU-9310	80780012XX
3A2A2	PC ASSY, CPU	8076070091
3A2A3	PC ASSY, AUDIO	8076090091
3A2A3A1	PC ASSY. I/O BOARD	8076110092
3A2A4	PC ASSY. FSK MODEM	8076115094
3A2A4	PC ASSY, REMOTE AUDIO BOARD	8078085095
3A3	CHASSIS ASSY RCU-9310	80780100XX
3A2A1U13	EPROM W/RCU9310 SOFTWARE	8078073291
3A2A1U14	EPROM W/RCU9310 SOFTWARE	8078072295
3A2A3U20	EPROM W/I/O SOFTWARE	8076113296
	BUMPER 13/16 OD 13/16 LG	0508140005
	COVER, CARD CAGE RCU-9310	8078011903
	COVER, TOP RCU-9310	80780123XX
	COVER, BOTTOM RCU-9310	80780125XX

CONNECTOR KIT

P3	CONNECTOR KIT	8078000499
	CONNECTOR, POWER, 19 PIN MALE	1011140004
	CABLE CLAMP, MS3057-8A	1000200001
P4	CONNECTOR, POWER, 10 PIN MALE	1010650025
P6	CONNECTOR, POWER, DB-9, 9 PIN FEM	1011960010
	HOOD, W/SCREW LOCK, DB-9	1011970015

CHASSIS ASSEMBLY 3A2/3A3

3A1	CHASSIS ASSEMBLY 3A2/3A3	80780100XX
3A2	FRONT PANEL ASSY	80760400XX
3A2A5	CHASSIS, CARD CAGE, REMOTE	8078011504
3A3A1	PC ASSY. MOTHER BOARD	8078017090
3A3A2	PC ASSY, 28V REGULATOR, 5 AMP	8078021496
3A3A3	PC ASSY, 5/12V REGULATORS	8078025092
3A3J1	PC ASSY. AUDIO CONNECTORS	8078018096
3A3J2	CONNECTOR, POWER, 10 PIN, MALE	1011050005
3A3J5	CONNECTOR, POWER, 2 PIN ROUND	1010510037
3A3J6	CONNECTOR, POWER, 2 PIN ROUND	1011230011
	CONNECTOR, POWER, 9 PIN MALE	1012380025
	JUNCTION SHELL, DB-9	1011130017
	CABLE, RIBBON, 9 COND, 28 AWG	1011150018
3A3CR1	DIODE, BRIDGE CBR25-040	1010630024
3A3F1	FUSE, MDL, 1.5 AMP, 125V	0896540006
3A3F2	FUSE, MDL, 1.5 AMP, 125V	0896540006
3A3F3	FUSE, MDQ, 5 AMP, 250V	0858660008
HSQ1	HEATSINK, TO-3 TRANSISTOR	1005130001
HSQ1	HEATSINK, TO-3 TRANSISTOR	1010710028
HSU1	HEATSINK, TO-3 TRANSISTOR	1005130001
HSU1	HEATSINK, TO-3 TRANSISTOR	1010700022
HSU2	HEATSINK, TO-3 TRANSISTOR	1005130001
HSU2	HEATSINK, TO-3 TRANSISTOR	1010700022
IQ1	INSULATOR, TO-3 SIL ELASTOMER	0841560005
IU1	INSULATOR, TO-3 SIL ELASTOMER	0841560005
1U2	INSULATOR, TO-3 SIL ELASTOMER	0841560005
3A3AQ1	TRANSISTOR, PNP, MJ11031	1010990012
3A3R1	RESISTOR 5, 5% 20W	1000080021
3A3R2	RESISTOR 5, 5% 20W	1000080021
3A3T1	TRANSFORMER, AC, 200VA	1010670026
3A3A2U1	IC. LINEAR LM350K	1010600028
3A3A2U2	IC. LINEAR LM350K	1010600028
XF1	FUSEHOLDER, PANEL MOUNT	0849030005
XF2	FUSEHOLDER, PANEL MOUNT	0849030005
XF3	FUSEHOLDER, PANEL MOUNT	0849030005
3A3ZS1	VARISTOR, MOV V140LA5	1011300010
3A3ZS2	VARISTOR, MOV V140LA5	1011300010
	CAP, PROTECTIVE .485 DIA.X 3/4	1009060015
	CLAMP, CABLE, FLAT 1 1/16 WIDE	1008650005
	CONNECTOR, RIBBON, 10 PIN FEM	1008070017
	CONNECTOR, HOUSING, 20 PIN	1009070011
	COVER, REAR PANEL	8078015305
	LH SIDE PANEL	80780103XX
	RH SIDE PANEL	80780102XX
	STANDOFF, F-F, 4-40 .375 L	1010830023
	PANEL, REAR, REMOTE	8078015101

Figure 5.8.1 Final Tested RCU-9310, Chassis Assembly 3A3, and Connector Kit.

FRONT PANEL ASSEMBLY 3A1		
3A1A1	FRONT PANEL ASSEMBLY 3A1	80760400XX
3A1A2	PC ASSY, FRONT PANEL	8076045096
3A1A3	KEYBOARD, 6X4	8076046807
3A1A3A1	CUSTOM LCD, FULL FUNCTION	8076040604
3A1A4	EL BACKLIGHT	8076040809
3A1A4A3	CUSTOM LCD, 1 X 40 CHARA	8076041601
3A1A5	EL BACKLIGHT	8076041708
C1	KEYBOARD, 1X5	8076046505
C2	CAP. .01μF, 50V, X7R 20%	0281730008
C3	CAP. .01μF, 50V, X7R 20%	0281730008
C4	CAP. .01μF, 50V, X7R 20%	0281730008
C5	CAP. .01μF, 50V, X7R 20%	0281730008
C6	CAP. .01μF, 50V, X7R 20%	0281730008
CR1	DIODE, LED, RED	1006710001
J1	CONNECTOR, 1/4 IN JACK, 2 COND	0840850000
J2	CONNECTOR, PHONE JACK, 2 COND.	0754430006
J3	CONNECTOR, AUDIO, 5 PIN	1003300022
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.	1008790028
R2/S2	POT. 25K W/SPST SW.	1008790028
	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, .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	80760402XX
	SHAFT ENCODER	1008810029
	SPACER, HANDLE	5024043502
	STANDOFF, F-F, 4-40 X.437LG	1011240009
	STANDOFF, M-F, 4-40 X.312LG	1011250004

1150BP

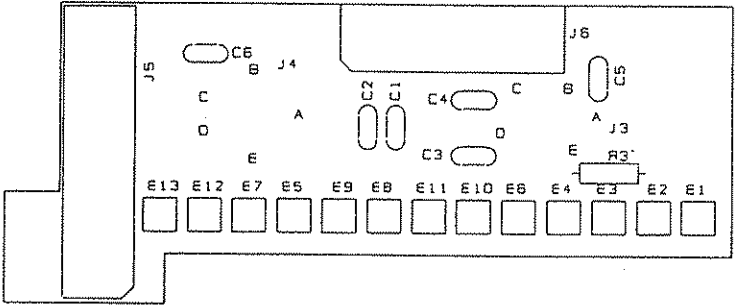


Figure 5.8.2 Front Panel Assembly 3A1, page 1 of 6.

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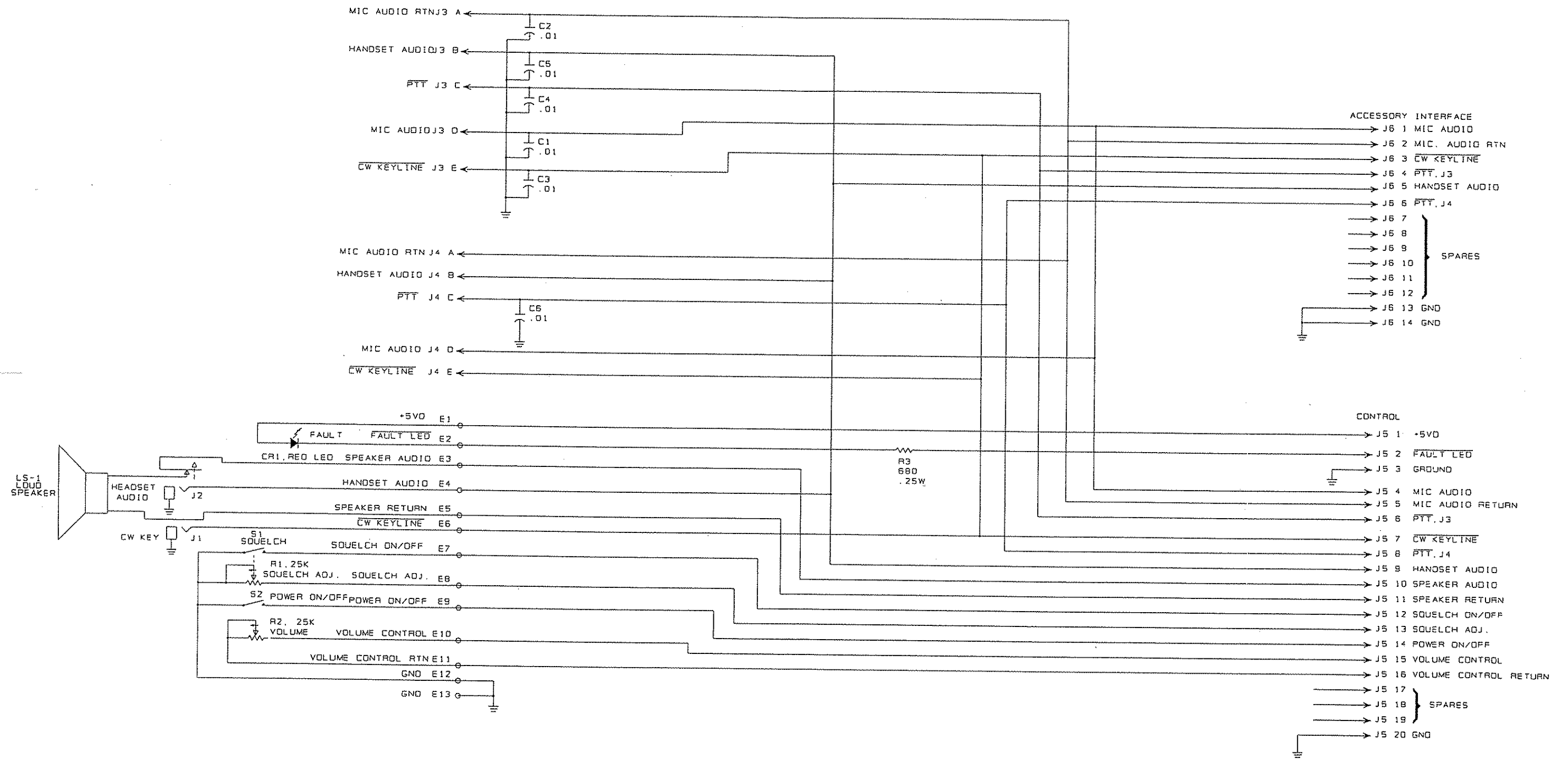


Figure 5.8.2 Front Panel Assembly 3A1, page 2 of 6.

PC ASSY, FRONT PANEL 3A1A1		
	PC ASSY, FRONT PANEL 3A1A1	8076045096
C1	CAP. .47μF, 50V, X7R 20%	0283377771
C2	CAP. 0.1μF, 50V, X7R, 20%	0281610002
C3	CAP. 0.047 μF, 50V, X7R, 10%	1010740008
C4	CAP. 100μF 20V 20%	1005120030
C5	CAP. 47μF, 35V	0282190007
C6	CAP. 0.001μF, 100V, X7R, 20%	0281630003
C7	CAP. 0.001μF, 100V, X7R, 20%	0281630003
C10	CAP. .01μF, 50V, X7R 20%	0281730008
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. 22μF, 15V, T368	0296660001
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
C45	CAP. 22μF, 15V, T368	0296660001
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 MC14504	1006090037
U19	IC. DIGITAL MC14504	1006090037
U20	IC. DIGITAL MC14504	1006090037
U21	IC. DIGITAL MC14504	1006090037
U22	IC. DIGITAL MC14504	1006090037
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 3A1A1, page 3 of 6.

1113DP

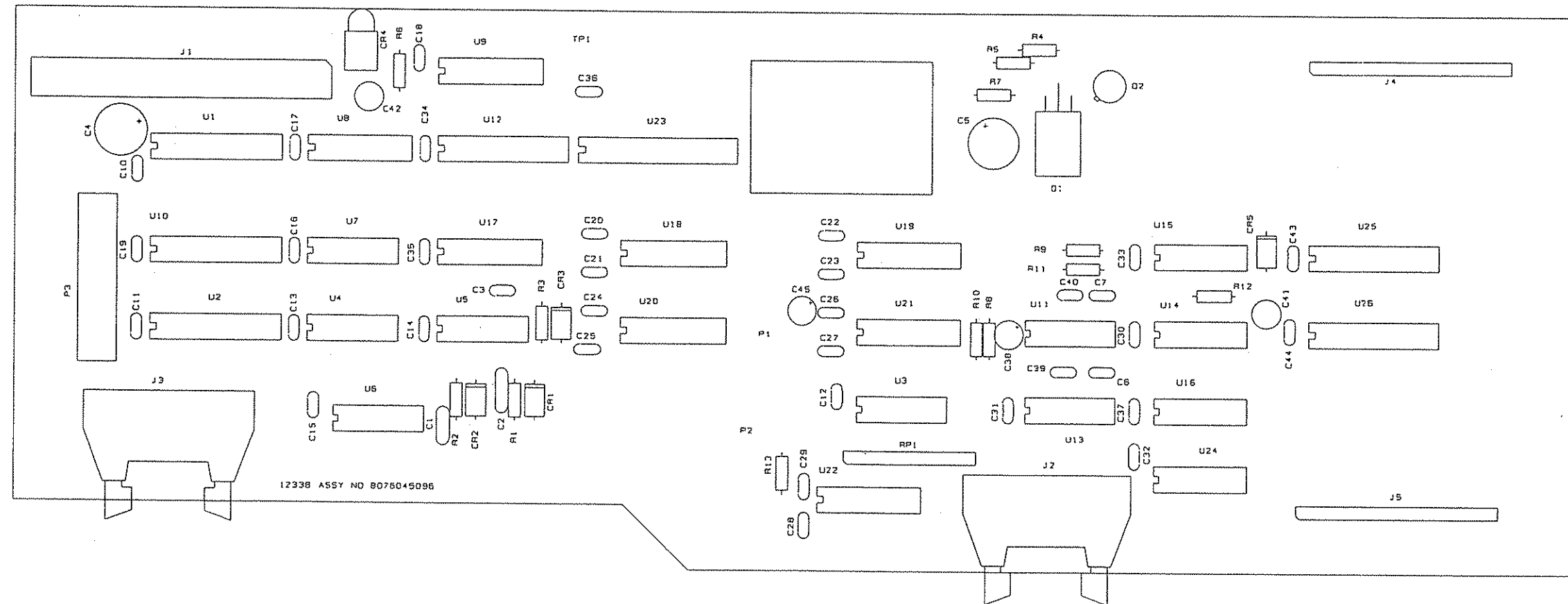


Figure 5.8.2 Front Panel Assembly 3A1A1, page 4 of 6.

A1113E

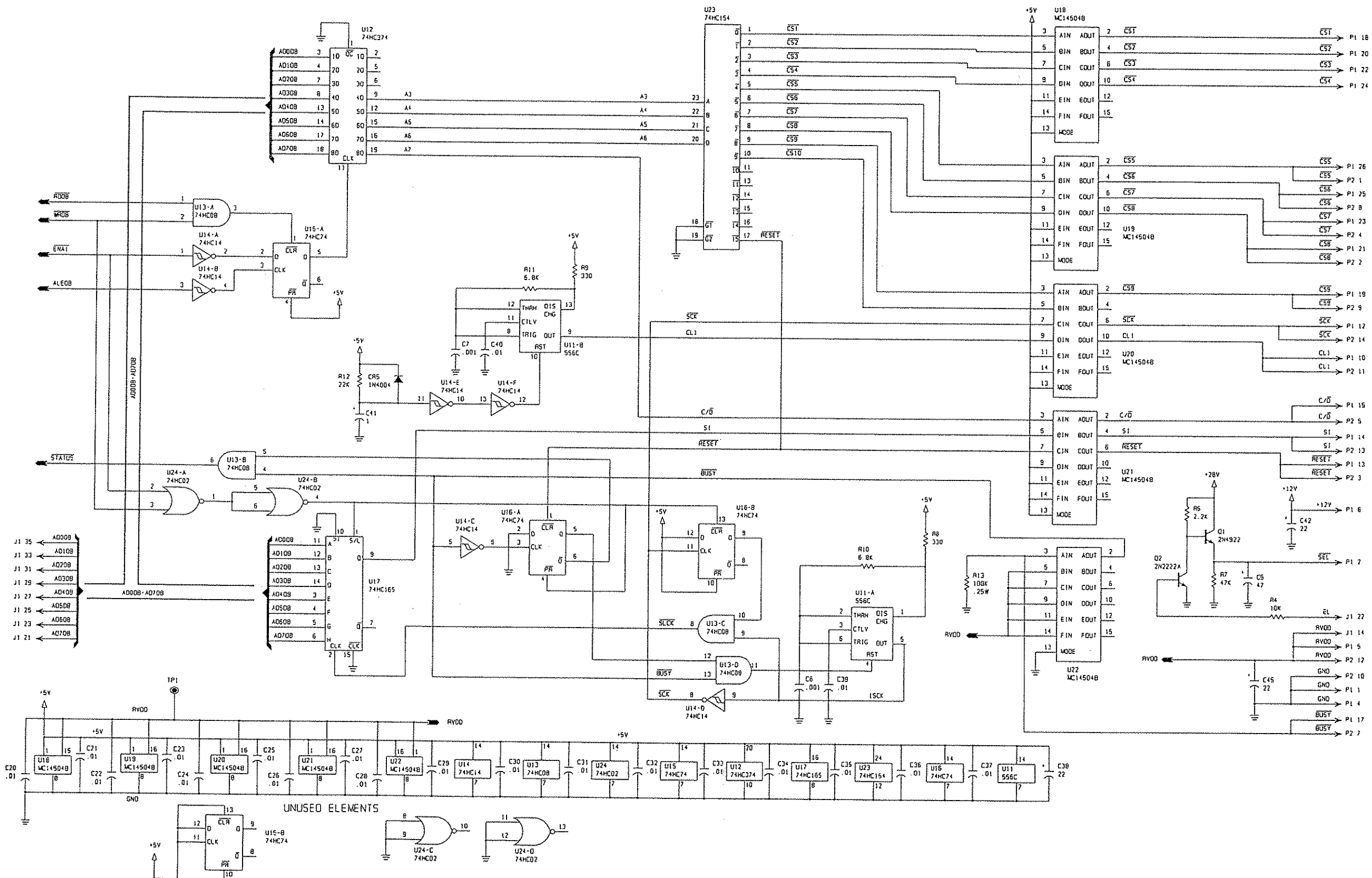


Figure 5.8.2 Front Panel Assembly 3A1A1, page 5 of 6.

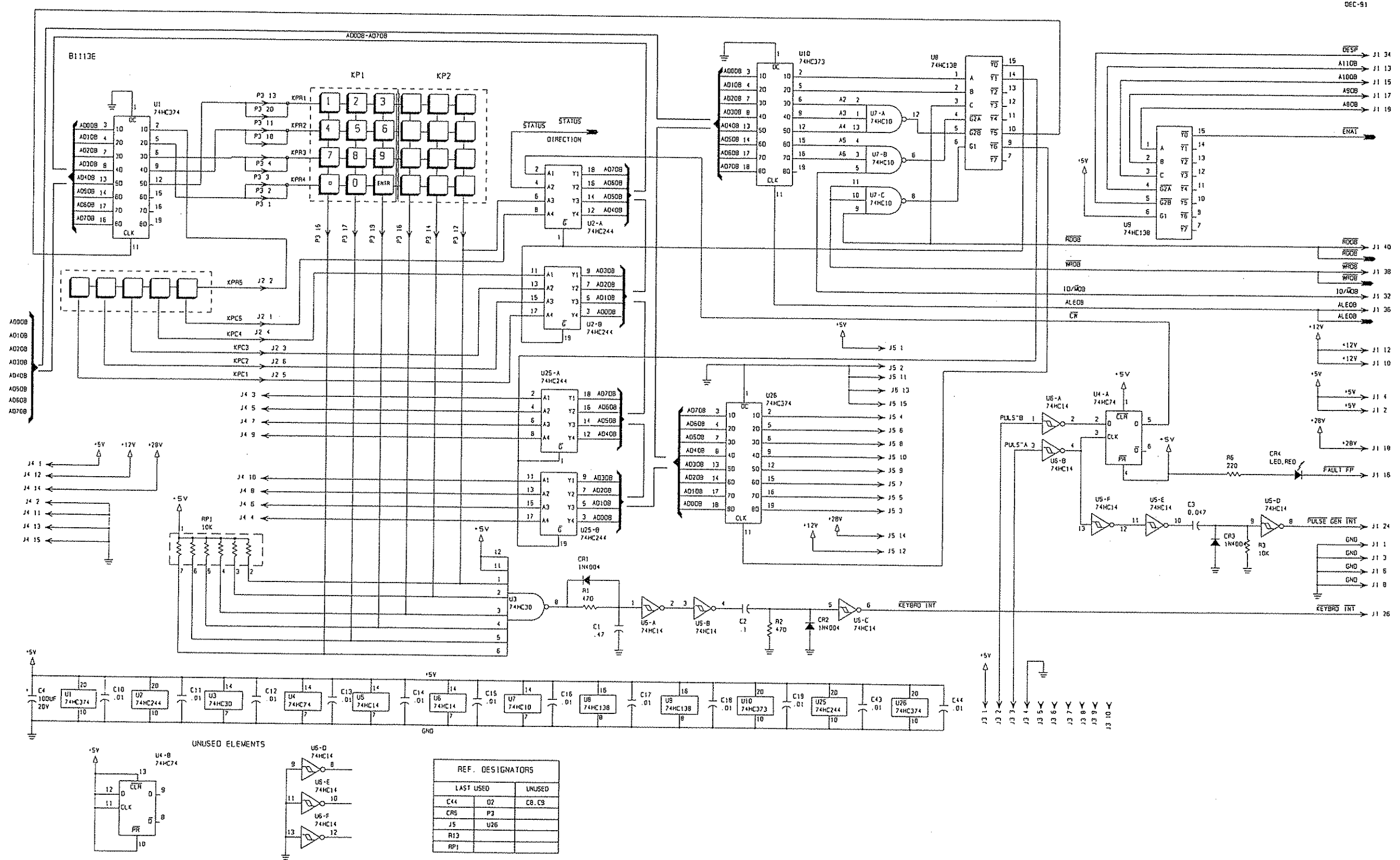


Figure 5.8.2 Front Panel Assembly 3A1A1, page 6 of 6.

PC ASSY, MOTHER BOARD 3A2A5

	PC ASSY, MOTHER BOARD 3A2A5	8078017090
C1	CAP. .01μF, 50V, X7R 20%	0281730008
C2	CAP. .01μF, 50V, X7R 20%	0281730008
C3	CAP. .01μF, 50V, X7R 20%	0281730008
C4	CAP. .01μF, 50V, X7R 20%	0281730008
C5	CAP. .01μF, 50V, X7R 20%	0281730008
C6	CAP. .47μF, 50V, X7R 20%	0283377771
C7	CAP. 15μF, 15V, 196D	0281720002
C8	CAP. 15μF, 15V, 196D	0281720002
C9	CAP. .01μF, 50V, X7R 20%	0281730008
C10	CAP. .01μF, 50V, X7R 20%	0281730008
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, 6 PIN DUAL, FEM	1011160005
L1	CHOKE, POWER	8076104700
L2	CHOKE, POWER	8076104700
L3	CHOKE, POWER	8076104700
L4	CHOKE, POWER	8076104700
P1	CONNECTOR, RIBBON, 20 PIN FEM	1008120031
P2	CONNECTOR, RIBBON, 26 PIN FEM	1008340031
P3	CONNECTOR, RIBBON, 20 PIN FEM	1008120031
P4	CONNECTOR, RIBBON, 10 PIN FEM	1008070017
U1	CRYSTAL OSCILLATOR, 5.00 MHZ	1010580027
XP1	CONNECTOR,PCB,TRANSITION,20PIN	1011090201
XP2	CONNECTOR,PCB,TRANSITION,26PIN	1011090261
XP3	CONNECTOR,PCB,TRANSITION,20PIN	1011090201
XP4	CONNECTOR,PCB,TRANSITION,10PIN	1011090104
	CABLE, FLAT, 20 COND. 28AWG	1008080004
	CABLE, RIBBON, 10 CONDUCTOR	1008340014
	CABLE, FLAT, 26 COND. 28AWG	1011180006

Figure 5.8.3 PC Assembly, Mother Board 3A2A5, page 1 of 4.

1088CP

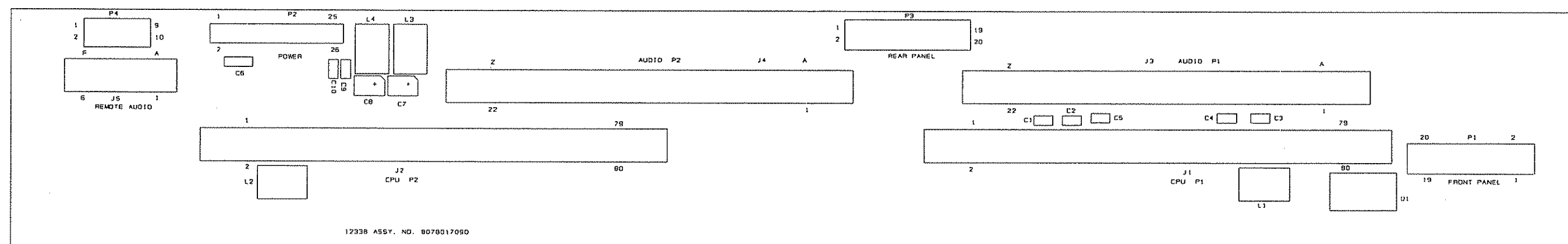


Figure 5.8.3 PC Assembly, Mother Board 3A2A5, page 2 of 4.

A10880

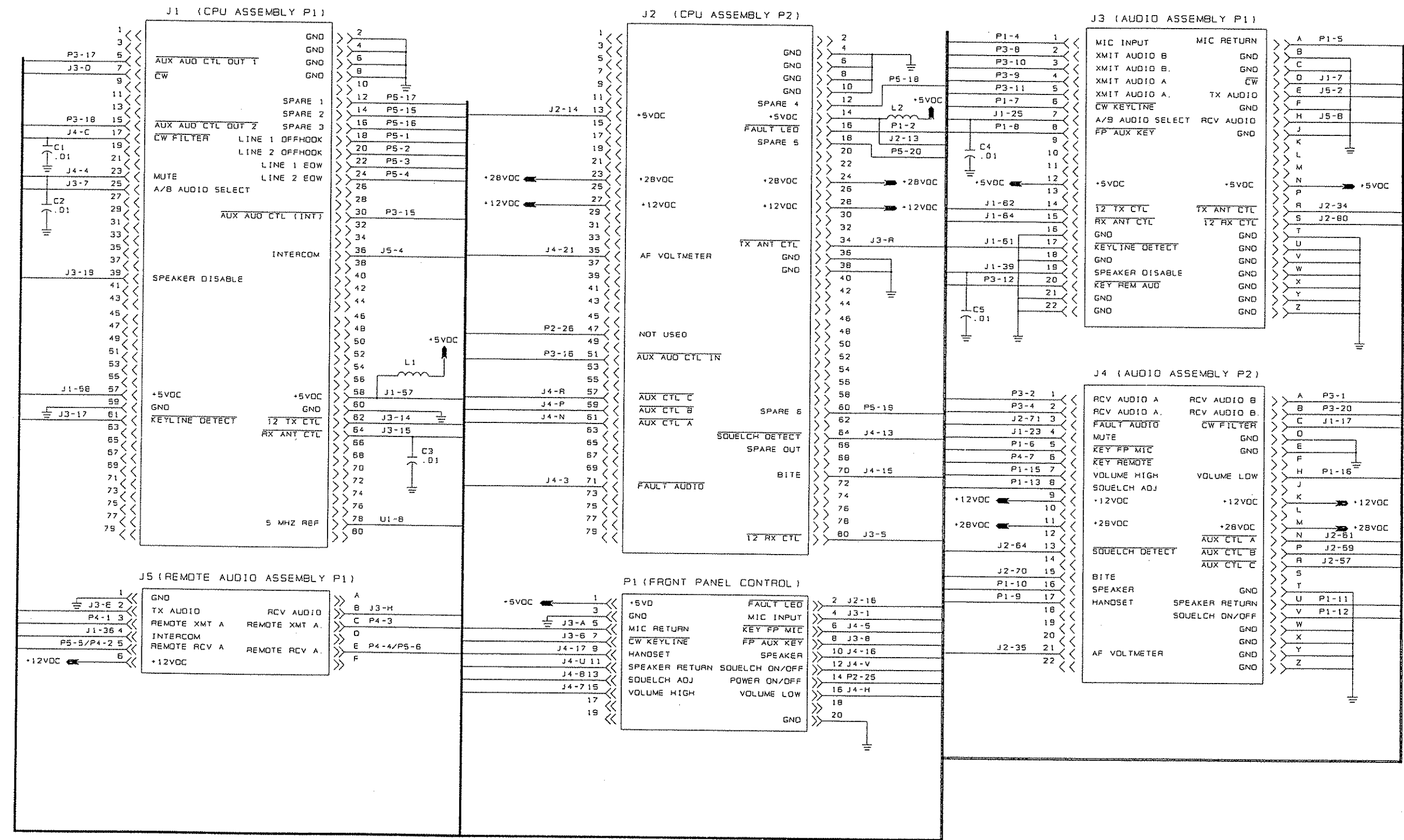


Figure 5.8.3 PC Assembly, Mother Board 3A2A5, page 3 of 4.

B10880

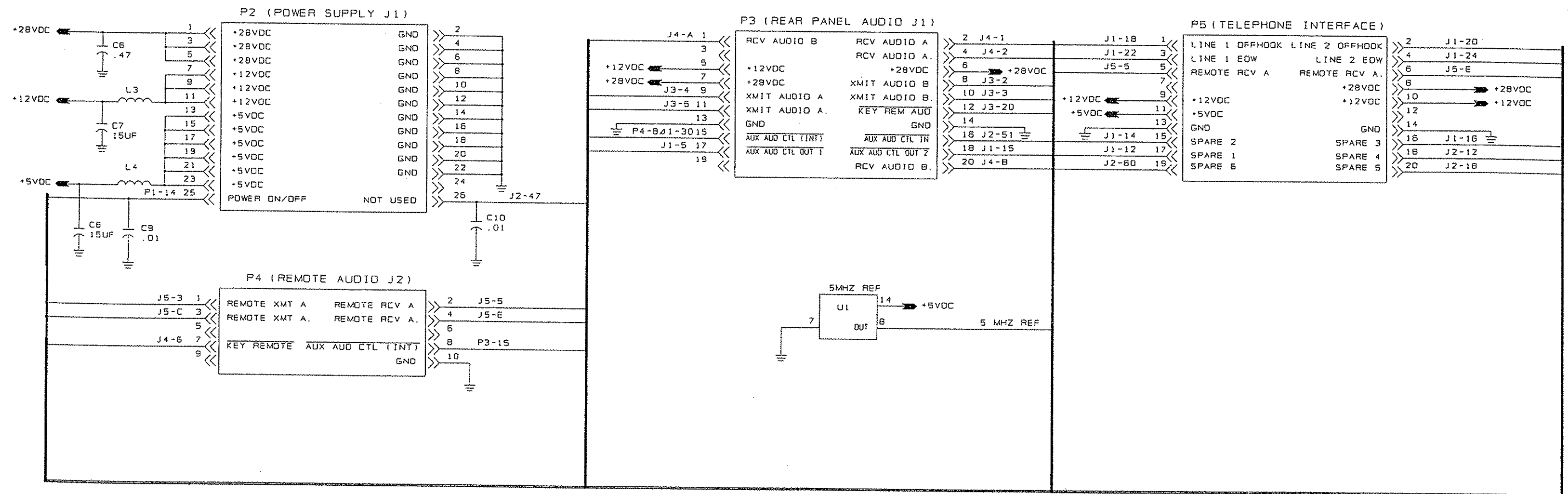


Figure 5.8.3 PC Assembly, Mother Board 3A2A5, page 4 of 4.

PC ASSY, CPU 3A2A1		
3A2A1A1	PC ASSY, CPU 3A2A1	8076070091
C3	CAP. .01μF, 50V, X7R 20%	0281730008
C5	CAP. 47μF, 20V, 196D	0281700001
C8	CAP. 6.8μF, 20V, T368	0296780006
C9	CAP. .01μF, 50V, X7R 20%	0281730008
C11	CAP. 0.001μF, 100V, X7R, 20%	0281630003
C12	CAP. 68μF, 15V,	0296540005
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. 10μF, 20V	1007290005
C28	CAP. .01μF, 50V, X7R 20%	0281730008
C29	CAP. 10μF, 20V	1007290005
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
C39	CAP. .01μF, 50V, X7R 20%	0281730008
C40	CAP. .01μF, 50V, X7R 20%	0281730008
C41	CAP. .01μF, 50V, X7R 20%	0281730008
C42	CAP. .01μF, 50V, X7R 20%	0281730008
C43	CAP. .01μF, 50V, X7R 20%	0281730008
C44	CAP. .01μF, 50V, X7R 20%	0281730008
C45	CAP. .01μF, 50V, X7R 20%	0281730008
C47	CAP. .01μF, 50V, X7R 20%	0281730008
C48	CAP. .01μF, 50V, X7R 20%	0281730008
C49	CAP. .01μF, 50V, X7R 20%	0281730008
C50	CAP. .01μF, 50V, X7R 20%	0281730008
C51	CAP. .01μF, 50V, X7R 20%	0281730008
C52	CAP. .01μF, 50V, X7R 20%	0281730008
C54	CAP. .01μF, 50V, X7R 20%	0281730008
C55	CAP. .01μF, 50V, X7R 20%	0281730008
C56	CAP. .01μF, 50V, X7R 20%	0281730008
C57	CAP. .01μF, 50V, X7R 20%	0281730008
C60	CAP. .01μF, 50V, X7R 20%	0281730008
C62	CAP. .01μF, 50V, X7R 20%	0281730008
C68	CAP. .01μF, 50V, X7R 20%	0281730008
C69	CAP. .01μF, 50V, X7R 20%	0281730008
C92	CAP. .01μF, 50V, X7R 20%	0281730008

C93	CAP. .01μF, 50V, X7R 20%	0281730008
C94	CAP. .01μF, 50V, X7R 20%	0281730008
C95	CAP. .01μF, 50V, X7R 20%	0281730008
C96	CAP. .01μF, 50V, X7R 20%	0281730008
C98	CAP. .01μF, 50V, X7R 20%	0281730008
C99	CAP. .01μF, 50V, X7R 20%	0281730008
C100	CAP. .01μF, 50V, X7R 20%	0281730008
C101	CAP. .01μF, 50V, X7R 20%	0281730008
C102	CAP. .01μF, 50V, X7R 20%	0281730008
C103	CAP. .01μF, 50V, X7R 20%	0281730008
C104	CAP. .01μF, 50V, X7R 20%	0281730008
C105	CAP. .01μF, 50V, X7R 20%	0281730008
C106	CAP. .01μF, 50V, X7R 20%	0281730008
C107	CAP. .01μF, 50V, X7R 20%	0281730008
C108	CAP. .01μF, 50V, X7R 20%	0281730008
C109	CAP. .01μF, 50V, X7R 20%	0281730008
C111	CAP. .01μF, 50V, X7R 20%	0281730008
C112	CAP. .01μF, 50V, X7R 20%	0281730008
C113	CAP. .01μF, 50V, X7R 20%	0281730008
C114	CAP. .01μF, 50V, X7R 20%	0281730008
C123	CAP. .01μF, 50V, X7R 20%	0281730008
C124	CAP. .01μF, 50V, X7R 20%	0281730008
C125	CAP. .01μF, 50V, X7R 20%	0281730008
C131	CAP. .01μF, 50V, X7R 20%	0281730008
C132	CAP. .01μF, 50V, X7R 20%	0281730008
C133	CAP. .01μF, 50V, X7R 20%	0281730008
C134	CAP. .01μF, 50V, X7R 20%	0281730008
C135	CAP. .01μF, 50V, X7R 20%	0281730008
C136	CAP. .01μF, 50V, X7R 20%	0281730008
C137	CAP. .01μF, 50V, X7R 20%	0281730008
C138	CAP. .01μF, 50V, X7R 20%	0281730008
C139	CAP. .01μF, 50V, X7R 20%	0281730008
C140	CAP. .01μF, 50V, X7R 20%	0281730008
C141	CAP. .01μF, 50V, X7R 20%	0281730008
C142	CAP. .01μF, 50V, X7R 20%	0281730008
C143	CAP. .01μF, 50V, X7R 20%	0281730008
C144	CAP. .01μF, 50V, X7R 20%	0281730008
C145	CAP. .01μF, 50V, X7R 20%	0281730008
C146	CAP. 3.3μF, 35V, 196D	0281680001
CR1	DIODE, SIGNAL, GERM. 1N270	0405510004
CR2	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR5	DIODE, RECTIFIER 1N4004	0405180004
CR7	DIODE, LED, RED, PC MOUNT	1008480029
CR9	DIODE, TRANSIENT SUPR.TVS505	1010720007
CR10	DIODE, ZENER 1N5227B	0405250002
CR11	DIODE, SIGNAL, SIL. 1N4454	0405270003
FB1	BEAD, FERRITE .200OD, .437LG	1010910019
FB2	FERRITE BEAD, 5000 PERM	1010980017
J1	SOCKET, BOARDMOUNT, 11 PIN	1011010119
J2	SOCKET, BOARDMOUNT, 11 PIN	1011010119
J3	SOCKET, BOARDMOUNT, 11 PIN	1011010119
J4	SOCKET, BOARDMOUNT, 11 PIN	1011010119
J5	SOCKET, BOARDMOUNT, 11 PIN	1011010119
J6	SOCKET, BOARDMOUNT, 11 PIN	1011010119
J7	SOCKET, BOARDMOUNT, 11 PIN	1011010119

Figure 5.8.4 PC Assembly, CPU 3A2A1, page 1 of 8.

L1	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L2	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L3	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L4	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L5	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L6	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L7	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L8	INDUCTOR, MOLDED, 33 μ H, 5%	0646300008
L9	INDUCTOR, MOLDED, 33 μ H, 5%	0646300008
L12	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L13	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L15	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L16	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L17	INDUCTOR, MOLDED, 33 μ H, 5%	0659690004
L18	INDUCTOR, MOLDED, 33 μ H, 5%	0646300008
P3	CONNECTOR, HEADER 40 PIN	1010780000
Q1	TRANSISTOR, NPN, SI. 2N4124	0448010003
Q2	TRANSISTOR, NPN, SI. 2N4124	0448010003
R3	RESISTOR 1K, 10%, 1/4W	0171560001
R5	RESISTOR 470, 5%, 1/4W	0184110009
R6	RESISTOR 10K, 10%, 1/4W	0170410005
R12	RESISTOR 22K, 10%, 1/4W	0172230004
R13	RESISTOR 10K, 10%, 1/4W	0170410005
R14	RESISTOR 10, 5%, 1/4W	0177160004
R15	RESISTOR 1M, 10%, 1/4W	0170650006
R16	RESISTOR 3.9K, 10%, 1/4W	0178830003
R18	RESISTOR 220, 10%, 1/4W	0171320000
R21	RESISTOR 4.7K, 5%, 1/4W	0170770001
R22	RESISTOR 5.1 1K, 1%, 1/8W	1003120016
R23	RESISTOR 28K 1%, 1/8W	1004050038
R40	RESISTOR 1.91K 1%, 1/8W	1008530018
R41	RESISTOR 6.81K, 1%, 1/8W	0196350000
R42	RESISTOR 1.91K 1%, 1/8W	1008530018
R43	RESISTOR 6.81K, 1%, 1/8W	0196350000
R46	RESISTOR 10K, 1%, 1/8W	1003050026
R47	RESISTOR 10K, 1%, 1/8W	1003050026
R54	RESISTOR 10K, 10%, 1/4W	0170410005
R55	RESISTOR 470, 5%, 1/4W	0184110009
R56	RESISTOR 15, 10%, 1/4W	0181740001
R79	RESISTOR 10K, 10%, 1/4W	0170410005
R80	RESISTOR 10K, 10%, 1/4W	0170410005
R81	RESISTOR 22K, 5%, 1/4W	0172230004
R88	RESISTOR 5.11K, 1%, 1/8W	1003120016
R89	RESISTOR 5.11K, 1%, 1/8W	1003120016
R90	RESISTOR 2.2K, 5%, 1/4W	0178070009
R91	RESISTOR 2.2K, 5%, 1/4W	0178070009
R92	RESISTOR 2.2K, 5%, 1/4W	0178070009
R93	RESISTOR 2.2K, 5%, 1/4W	0178070009
R94	RESISTOR 2.2K, 5%, 1/4W	0178070009
R95	RESISTOR 2.2K, 5%, 1/4W	0178070009
R96	RESISTOR 2.2K, 5%, 1/4W	0178070009
R97	RESISTOR 10K, 10%, 1/4W	0170410005
R98	RESISTOR 680, 10%, 1/4W	0176630007
R99	RESISTOR 10K, 10%, 1/4W	0170410005
R100	RESISTOR 1.91K 1%, 1/8W	1008530018

R101	RESISTOR 6.81K, 1%, 1/8W	0196350000
R102	RESISTOR 7.87K 1%, 1/8W	1004090021
R103	RESISTOR 6.81K, 1%, 1/8W	0196350000
R104	RESISTOR 1K, 10%, 1/4W	0171560001
R105	RESISTOR 22K, 5%, 1/4W	0172230004
RP1	RES NTWK 10 PIN SIP 10K COM	1006130021
RP2	RES NTWK 10 PIN SIP 10K COM	1006130021
RP3	RES NTWK 10 PIN SIP 10K COM	1006130021
RP4	RES NTWK 10 PIN SIP 10K COM	1006130021
RP5	RES NTWK 10 PIN SIP 10K COM	1006130021
RP7	RES NTWK 10 PIN SIP 10K COM	1006130021
RP8	RES NTWK 10 PIN SIP 10K COM	1006130021
RP9	RES NTWK 10 PIN SIP 22K COM	1006570012
RP13	RES NTWK 10 PIN SIP 10K COM	1006130021
RP18	RES NTWK 10 PIN SIP 10K COM	1006130021
RP19	RES NTWK 10 PIN SIP 10K COM	1006130021
S1	SWITCH, SPST, ROCKER DIP	1010210025
S2	SWITCH, PUSHBUTTON, SPST	1010710001
U2	IC. DIGITAL 80C85A	1007400013
U3	IC. DIGITAL RAM 6264	1010650009
U4	IC. DIGITAL 74HC244	1006460039
U5	IC. DIGITAL 74HC245	1006470034
U6	IC. DIGITAL 74HC244	1006460039
U7	IC. DIGITAL 74HC373	1006480030
U8	IC. DIGITAL 28C64	1010660004
U9	IC. DIGITAL 74HC139	1006770038
U10	IC. DIGITAL 74HC244	1006460039
U11	IC. DIGITAL 74HC244	1006460039
U12	IC. DIGITAL 74HC374	1006450033
U13	EPROM W/RCU-9310 SOFTWARE	8078073291
U14	EPROM W/RCU-9310 SOFTWARE	8078072295
U15	IC. DIGITAL 74HC00	1008190004
U16	IC. DIGITAL 74HC08	1006490019
U17	IC. DIGITAL ADC0804	1010670000
U18	IC. DIGITAL 74HC374	1006450033
U19	IC. LINEAR LM358	1010680005
U22	IC. DIGITAL 74HC245	1006470034
U23	IC. DIGITAL 74HC244	1006460039
U24	IC. DIGITAL 4067B	1006800034
U25	IC. DIGITAL 74HC244	1006460039
U28	IC DIGITAL 74HC154	1010160028
U29	IC DIGITAL 74HC154	1010160028
U30	IC. DIGITAL 74HC138	1006480013
U32	IC. DIGITAL 74HC374	1006450033
U33	IC. DIGITAL 74HC374	1006450033
U34	IC. DIGITAL 7417	1003870007
U35	IC. DIGITAL 74HC374	1006450033
U36	IC. DIGITAL 74HC374	1006450033
U39	IC. DIGITAL 74HC374	1006450033
U41	IC. DIGITAL 74HC374	1006450033
U42	IC. DIGITAL 74HC374	1006450033
U45	IC. DIGITAL 74HC14	1006490027
U46	IC. DIGITAL 74HC244	1006460039
U47	IC. DIGITAL 74HC14	1006490027

NOTE: U13/U14 are not part of this PC Assembly.

Figure 5.8.4 PC Assembly, CPU 3A2A1, page 2 of 8.

U48	IC. LINEAR	556C/3456	1005620032
U49	IC. DIGITAL	74HC14	1006490027
U50	IC. DIGITAL	8259A	1006800018
U51	IC. DIGITAL	74HC244	1006460039
U53	IC. DIGITAL	74HC244	1006460039
U54	IC. DIGITAL	74HC374	1006450033
U55	IC. DIGITAL	74HC244	1006460039
U56	IC. DIGITAL	74HC08	1006490019
U58	IC. DIGITAL	74HC14	1006490027
U59	IC. DIGITAL	74HC374	1006450033
U60	IC. DIGITAL	74HC192	1010690001
U61	IC. DIGITAL	74HC74	1008000019
U67	IC. DIGITAL	74HC139	1006770038
U75	IC. DIGITAL	5369 REPL.	1010700006
U77	IC. DIGITAL	2501-4	1010630008
U100	IC. DIGITAL	2501-4	1010630008
U107	IC. DIGITAL	74HC244	1006460039
XU2	SOCKET, IC, 40 PIN TAILLESS		1006620010
XU3	SOCKET, IC, 28 PIN TAILLESS		1006620001
XU8	SOCKET, IC, 28 PIN TAILLESS		1006620001
XU13	SOCKET, IC, 28 PIN TAILLESS		1006620001
XU14	SOCKET, IC, 28 PIN TAILLESS		1006620001
	MOUNTING PLATE, CPU		8076070805

Figure 5.8.4 PC Assembly, CPU 3A2A1, page 3 of 8.

1001CP

NOTE: NORMAL SETTING FOR S1: SEGMENTS 1 THRU 8, ALL SEGMENTS DEPRESSED TO NUMBERED END.

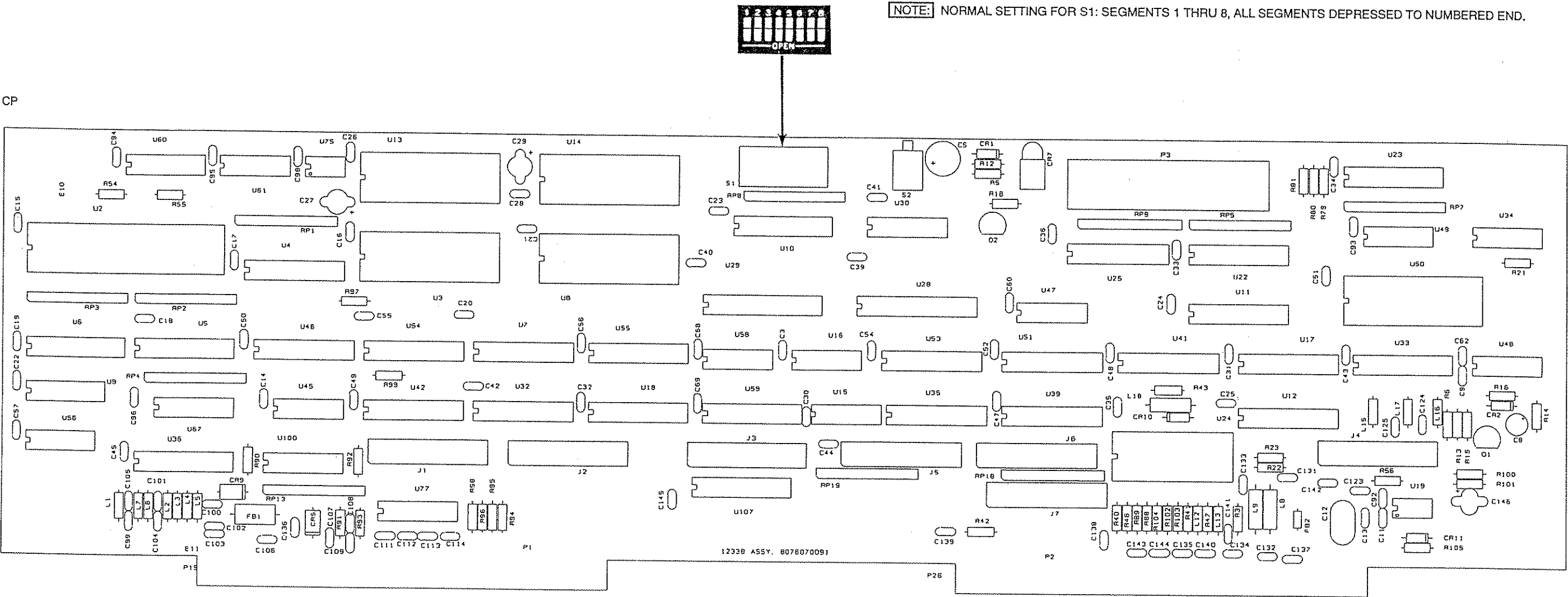


Figure 5.8.4 PC Assembly, CPU 3A2A1, page 4 of 8.

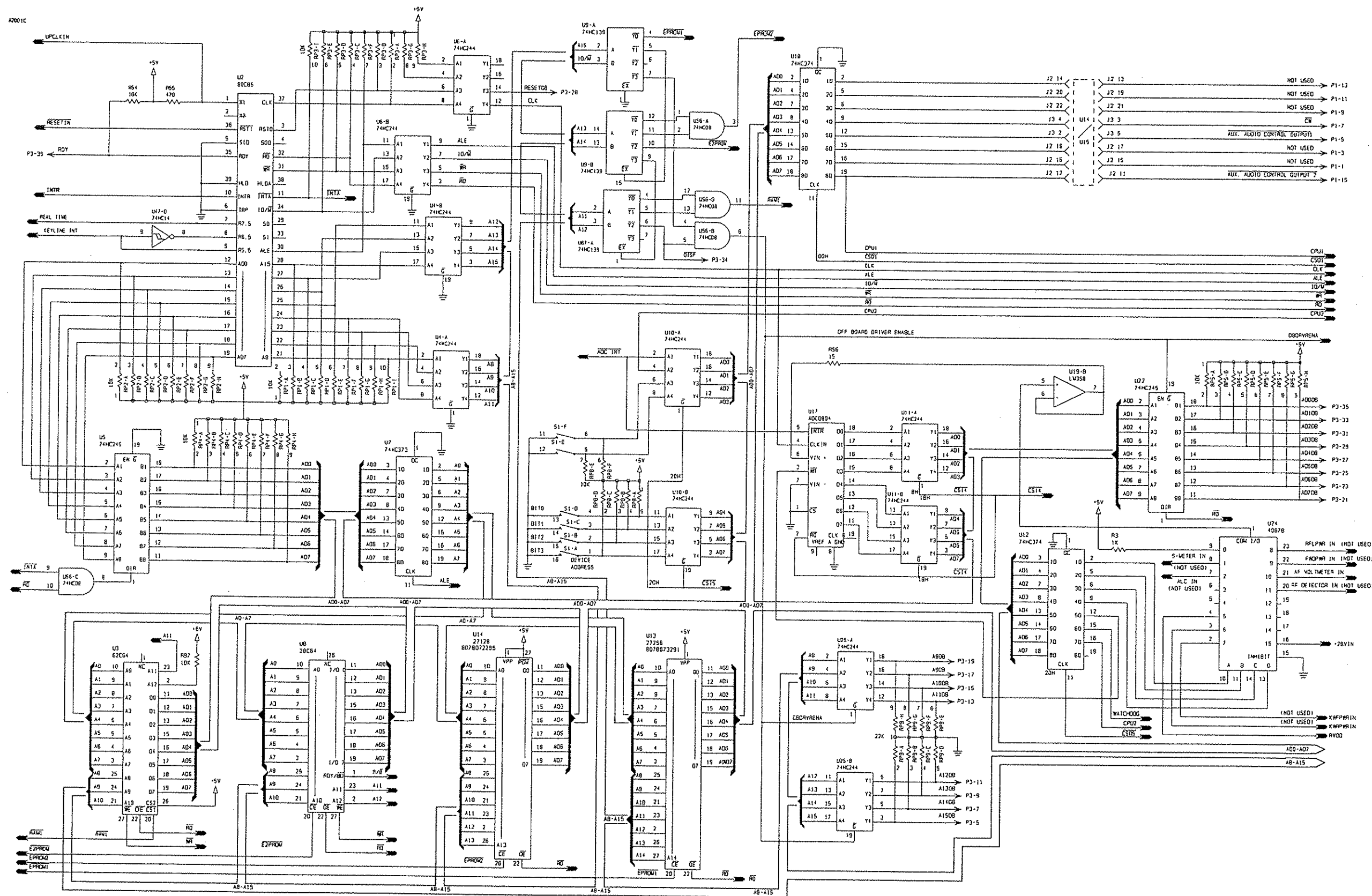


Figure 5.8.4 PC Assembly, CPU 3A2A1, page 5 of 8.

B2001C

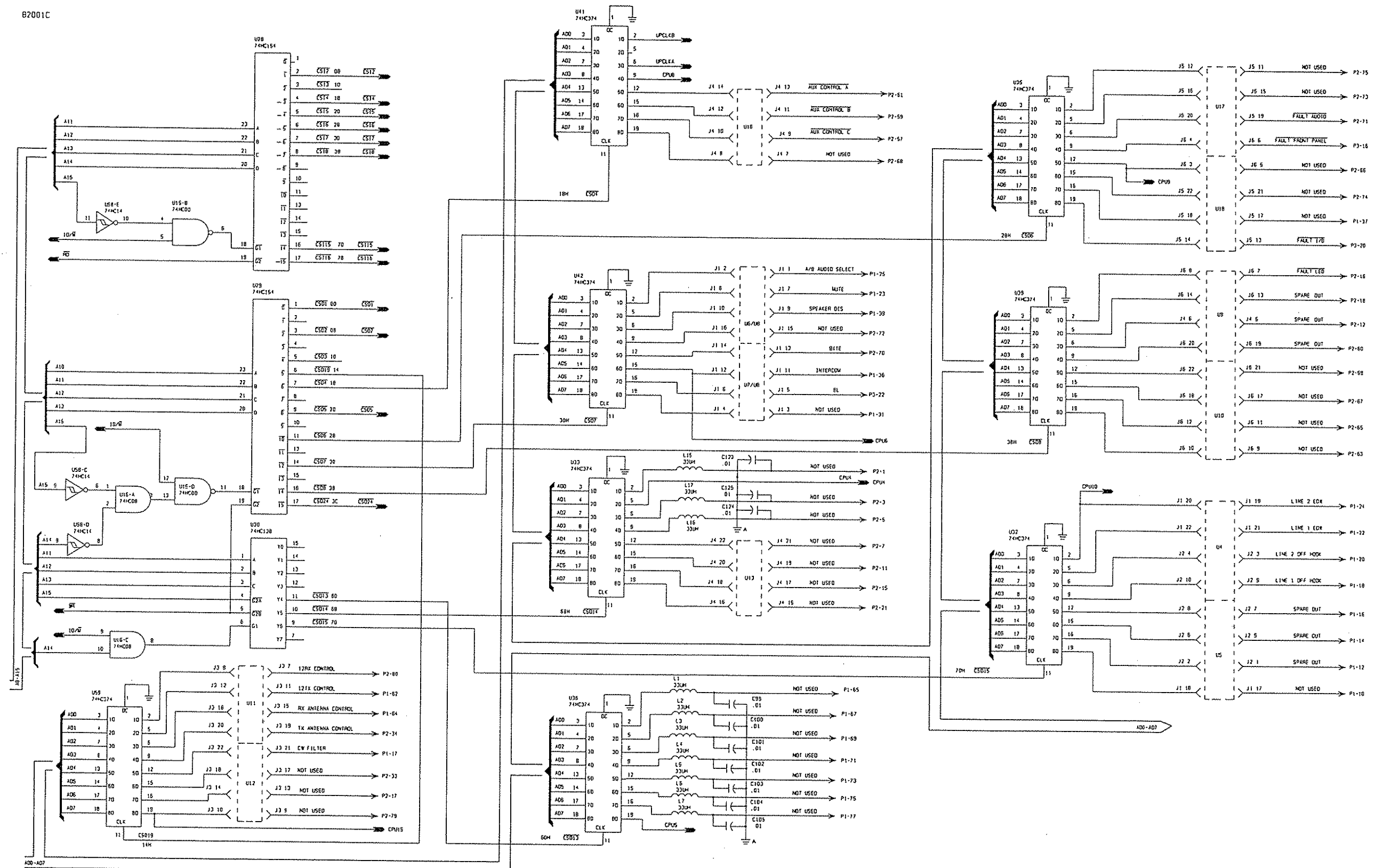
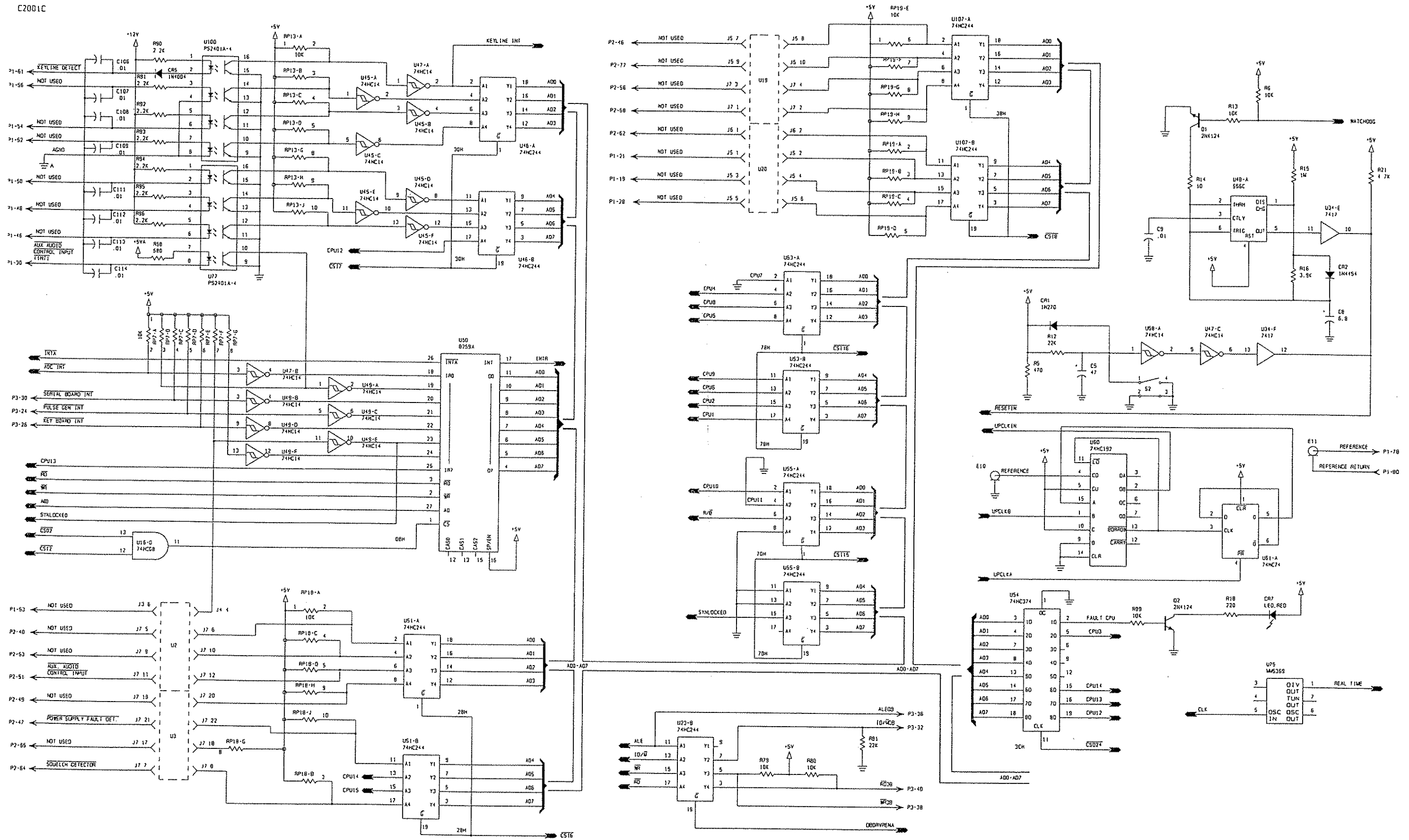


Figure 5.8.4 PC Assembly, CPU 3A2A1, page 6 of 8.

C2001C



02001C

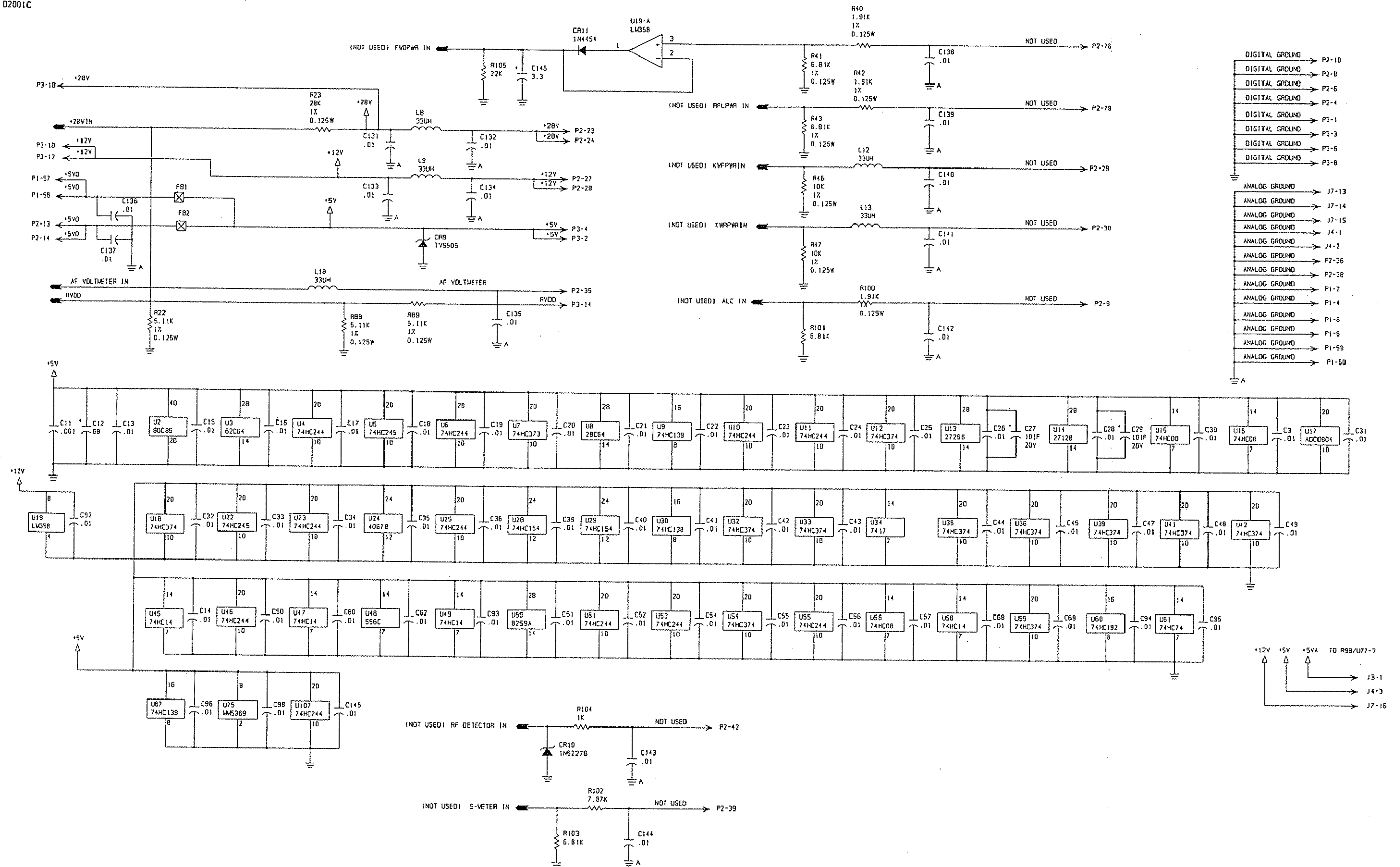


Figure 5.8.4 PC Assembly, CPU 3A2A1, page 8 of 8.

PC ASSY, OPTOCOUPLER 3A2A1A1		
C1	PC ASSY, OPTOCOUPLER 3A2A1A1	8076075092
C2	CAP. .47μF, 50V, X7R 20%	0283377771
C3	CAP. 1μF, 35V, T368	0283630001
C4	CAP. .01μF, 50V, X7R 20%	0281730008
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. .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. .01μF, 50V, X7R 20%	0281730008
C42	CAP. .01μF, 50V, X7R 20%	0281730008
C43	CAP. .01μF, 50V, X7R 20%	0281730008
C44	CAP. .01μF, 50V, X7R 20%	0281730008
C45	CAP. .01μF, 50V, X7R 20%	0281730008
C46	CAP. .01μF, 50V, X7R 20%	0281730008
C47	CAP. .01μF, 50V, X7R 20%	0281730008
C48	CAP. .01μF, 50V, X7R 20%	0281730008
C49	CAP. .01μF, 50V, X7R 20%	0281730008
C50	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
C56	CAP. .01μF, 50V, X7R 20%	0281730008
C57	CAP. .01μF, 50V, X7R 20%	0281730008
C58	CAP. .01μF, 50V, X7R 20%	0281730008
C59	CAP. .01μF, 50V, X7R 20%	0281730008
C60	CAP. .01μF, 50V, X7R 20%	0281730008
C61	CAP. .01μF, 50V, X7R 20%	0281730008
C62	CAP. .01μF, 50V, X7R 20%	0281730008
C63	CAP. .01μF, 50V, X7R 20%	0281730008
C64	CAP. .01μF, 50V, X7R 20%	0281730008
C65	CAP. .01μF, 50V, X7R 20%	0281730008
C66	CAP. .01μF, 50V, X7R 20%	0281730008
C67	CAP. .01μF, 50V, X7R 20%	0281730008
C68	CAP. .01μF, 50V, X7R 20%	0281730008
C69	CAP. .01μF, 50V, X7R 20%	0281730008
C70	CAP. .01μF, 50V, X7R 20%	0281730008
C71	CAP. .01μF, 50V, X7R 20%	0281730008
C72	CAP. .01μF, 50V, X7R 20%	0281730008
C73	CAP. .01μF, 50V, X7R 20%	0281730008
C74	CAP. .01μF, 50V, X7R 20%	0281730008
C75	CAP. .01μF, 50V, X7R 20%	0281730008
C76	CAP. .01μF, 50V, X7R 20%	0281730008
C77	CAP. .01μF, 50V, X7R 20%	0281730008
C78	CAP. .01μF, 50V, X7R 20%	0281730008
C79	CAP. .01μF, 50V, X7R 20%	0281730008
C80	CAP. .01μF, 50V, X7R 20%	0281730008
C81	CAP. .01μF, 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

Figure 5.8.5 PC Assembly, OPTOCOUPLER, 3A2A1A1, page 1 of 3.

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

1151BP

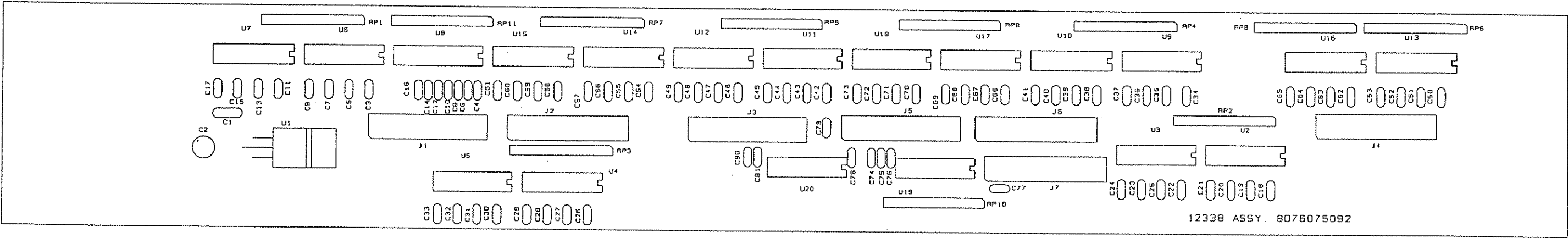


Figure 5.8.5 PC Assembly, OPTOCOUPLER, 3A2A1A1, page 2 of 3.

A1151B

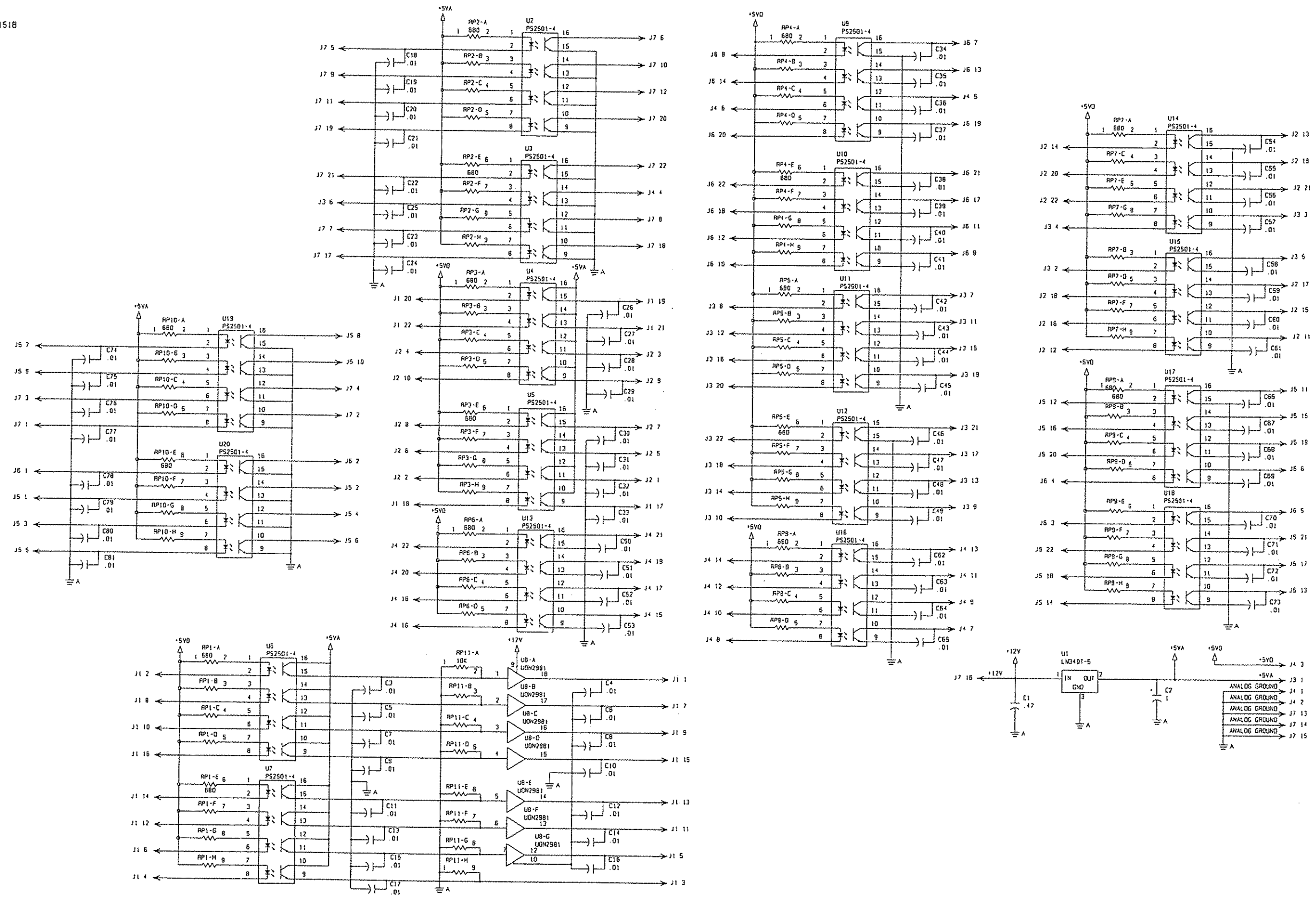


Figure 5.8.5 PC Assembly, OPTOCOUPLER, 3A2A1A1, page 3 of 3.

PC ASSY, AUDIO 3A2A2

	PC ASSY, AUDIO 3A2A2	
C1	CAP. 6.8 μ F, 20V, T368	8076090091
C2	CAP. .01 μ F, 50V, X7R 20%	0296780006
C3	CAP. .01 μ F, 50V, X7R 20%	0281730008
C4	CAP. .01 μ F, 50V, X7R 20%	0281730008
C5	CAP. .01 μ F, 50V, X7R 20%	0281730008
C6	CAP. 1 μ F, 35V, 196D	0281660000
C7	CAP. 1 μ F, 35V, 196D	0281660000
C8	CAP. 1 μ F, 35V, 196D	0281660000
C9	CAP. 1 μ F, 35V, 196D	0281660000
C10	CAP. 1 μ F, 35V, 196D	0281660000
C11	CAP. 1 μ F, 35V, 196D	0281660000
C12	CAP. 22 μ F, 15V, T368	0296660001
C13	CAP. 3.3 μ F, 35V, 196D	0281680001
C14	CAP. 1 μ F, 35V, 196D	0281660000
C15	CAP. 2.2 μ F, 35V, T368	0273950002
C16	CAP. 6.8 μ F, 20V, T368	0296780006
C17	CAP. 22 μ F, 15V, T368	0296660001
C18	CAP. 150PF, 500V, DM15, 5%	0274980002
C19	CAP. 3.3 μ F, 35V, 196D	0281680001
C20	CAP. 1 μ F, 35V, 196D	0281660000
C21	CAP. 2.2 μ F, 35V, T368	0273950002
C22	CAP. 0.1 μ F, 50V, X7R	1011180014
C23	CAP. 1 μ F, 35V, 196D	0281660000
C24	CAP. 0.1 μ F, 50V, X7R	1011180014
C25	CAP. 0.1 μ F, 50V, X7R	1011180014
C26	CAP. .47 μ F, 50V, X7R 20%	0283377771
C27	CAP. 1 μ F, 35V, 196D	0281660000
C28	CAP. 0.0068 μ F, 100V, NPO, 5%	1011450020
C29	CAP. 0.0068 μ F, 100V, NPO, 5%	1011450020
C30	CAP. 22 μ F, 15V, T368	0296660001
C32	CAP. .01 μ F, 50V, X7R 20%	0281730008
C34	CAP. 2.2 μ F, 35V, T368	0273950002
C35	CAP. .01 μ F, 50V, X7R 20%	0281730008
C36	CAP. .01 μ F, 50V, X7R 20%	0281730008
C37	CAP. 2.2 μ F, 35V, T368	0273950002
C38	CAP. .01 μ F, 50V, X7R 20%	0281730008
C39	CAP. .01 μ F, 50V, X7R 20%	0281730008
C40	CAP. 2.2 μ F, 35V, T368	0273950002
C41	CAP. .01 μ F, 50V, X7R 20%	0281730008
C42	CAP. .01 μ F, 50V, X7R 20%	0281730008
C43	CAP. 22 μ F, 15V, T368	0296660001
C44	CAP. 1 μ F, 35V, 196D	0281660000
C45	CAP. .47 μ F, 50V, X7R 20%	0283377771
C46	CAP. 22 μ F, 15V, T368	0296660001
C47	CAP. .01 μ F, 50V, X7R 20%	0281730008
C48	CAP. .033 μ F, 50V, 10/20%	0281770000
C49	CAP. .033 μ F, 50V, 10/20%	0281770000
C50	CAP. .01 μ F, 50V, X7R 20%	0281730008
C51	CAP. .47 μ F, 50V, X7R 20%	0283377771
C52	CAP. .033 μ F, 50V, 10/20%	0281770000
C53	CAP. 2.2 μ F, 35V, T368	0273950002

C54	CAP. 22 μ F, 15V, T368	0296660001
C55	CAP. .47 μ F, 50V, X7R 20%	0283377771
C56	CAP. 0.001 μ F, 100V, X7R, 20%	0281630003
C57	CAP. 22 μ F, 15V, T368	0296660001
C58	CAP. .47 μ F, 50V, X7R 20%	0283377771
C60	CAP. 47 μ F, 35V	0282190007
C61	CAP. 0.1 μ F, 50V, X7R	1011180014
C62	CAP. .47 μ F, 50V, X7R 20%	0283377771
C64	CAP. 470 μ F, 50V, TAL	0280890001
C65	CAP. 1 μ F, 35V, 196D	0281660000
C66	CAP. 22 μ F, 15V, T368	0296660001
C67	CAP. 22 μ F, 15V, T368	0296660001
C68	CAP. 820PF, 300V, DM15, 5%	0288750004
C69	CAP. .01 μ F, 50V, X7R 20%	0281730008
C70	CAP. 22 μ F, 15V, T368	0296660001
C71	CAP. 0.1 μ F, 50V, X7R	1011180014
C72	CAP. 22 μ F, 15V, T368	0296660001
C73	CAP. 22 μ F, 15V, T368	0296660001
C74	CAP. 0.1 μ F, 50V, X7R	1011180014
C75	CAP. 0.1 μ F, 50V, X7R	1011180014
C76	CAP. 0.1 μ F, 50V, X7R	1011180014
C77	CAP. 0.1 μ F, 50V, X7R	1011180014
C78	CAP. 0.1 μ F, 50V, X7R	1011180014
C79	CAP. 0.1 μ F, 50V, X7R	1011180014
C80	CAP. 0.1 μ F, 50V, X7R	1011180014
C81	CAP. 0.1 μ F, 50V, X7R	1011180014
C82	CAP. 22 μ F, 15V, T368	0296660001
C85	CAP. .01 μ F, 50V, X7R 20%	0281730008
C86	CAP. .01 μ F, 50V, X7R 20%	0281730008
C87	CAP. .01 μ F, 50V, X7R 20%	0281730008
C88	CAP. .01 μ F, 50V, X7R 20%	0281730008
C89	CAP. 0.1 μ F, 50V, X7R	1011180014
C90	CAP. .01 μ F, 50V, X7R 20%	0281730008
C91	CAP. 0.1 μ F, 50V, X7R	1011180014
C92	CAP. 0.1 μ F, 50V, X7R	1011180014
C93	CAP. 0.1 μ F, 50V, X7R	1011180014
C94	CAP. .01 μ F, 50V, X7R 20%	0281730008
C95	CAP. .01 μ F, 50V, X7R 20%	0281730008
C96	CAP. 0.1 μ F, 50V, X7R	1011180014
C97	CAP. 0.1 μ F, 50V, X7R	1011180014
C98	CAP. 0.1 μ F, 50V, X7R	1011180014
C99	CAP. 0.1 μ F, 50V, X7R	1011180014
C100	CAP. .01 μ F, 50V, X7R 20%	0281730008
C101	CAP. .01 μ F, 50V, X7R 20%	0281730008
C102	CAP. 0.1 μ F, 50V, X7R	1011180014
C103	CAP. 0.1 μ F, 50V, X7R	1011180014
C104	CAP. .01 μ F, 50V, X7R 20%	0281730008
C105	CAP. .01 μ F, 50V, X7R 20%	0281730008
C106	CAP. .01 μ F, 50V, X7R 20%	0281730008
C107	CAP. .01 μ F, 50V, X7R 20%	0281730008
C108	CAP. 6.8 μ F, 20V, T368	0296780006
C109	CAP. .47 μ F, 50V, X7R 20%	0283377771
C110	CAP. 6.8 μ F, 20V, T368	0296780006
C111	CAP. .01 μ F, 50V, X7R 20%	0281730008

Figure 5.8.6 PC Assembly, Audio 3A2A2, page 1 of 9.

C112	CAP. .01μF, 50V, X7R 20%	0281730008
C113	CAP. 15μF, 35V	0282240004
C114	CAP. 0.1μF, 50V, X7R	1011180014
C115	CAP. 0.1μF, 50V, X7R	1011180014
C116	CAP. 0.1μF, 50V, X7R	1011180014
C117	CAP. 0.1μF, 50V, X7R	1011180014
C118	CAP. 1μF, 35V, 196D	0281660000
C119	CAP. 1μF, 35V, 196D	0281660000
C120	CAP. 6.8μF, 20V, T368	0296780006
C121	CAP. 0.1μF, 50V, X7R	1011180014
C122	CAP. 6.8μF, 20V, T368	0296780006
C123	CAP. 6.8μF, 20V, T368	0296780006
C124	CAP. 0.1μF, 50V, X7R	1011180014
C125	CAP. 0.1μF, 50V, X7R	1011180014
C126	CAP. 0.1μF, 50V, X7R	1011180014
C127	CAP. .47μF, 50V, X7R 20%	0283377771
C128	CAP. 0.1μF, 50V, X7R	1011180014
C129	CAP. 0.001μF, 100V, X7R, 20%	0281630003
C130	CAP. .02μF, 25V, Y5U/Y5P	0269130004
C131	CAP. .47μF, 50V, X7R 20%	0283377771
C132	CAP. .47μF, 35V	0282190007
C133	CAP. 15μF, 35V	0282240004
C134	CAP. 2.2μF, 35V, T368	0273950002
C135	CAP. .01μF, 50V, X7R 20%	0281730008
C136	CAP. .01μF, 50V, X7R 20%	0281730008
C137	CAP. .01μF, 50V, X7R 20%	0281730008
C138	CAP. .01μF, 50V, X7R 20%	0281730008
C139	CAP. 390PF, 500V, DM15, 2%	0281040001
C140	CAP. .01μF, 50V, X7R 20%	0281730008
C141	CAP. .01μF, 50V, X7R 20%	0281730008
C142	CAP. .01μF, 50V, X7R 20%	0281730008
C143	CAP. 22μF, 15V, T368	0296660001
C144	CAP. .01μF, 50V, X7R 20%	0281730008
C145	CAP. .47μF, 50V, X7R 20%	0283377771
CR1	DIODE, RECTIFIER 1N4004	0405180004
CR2	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR3	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR4	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR5	DIODE, RECTIFIER 1N4004	0405180004
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, RECTIFIER 1N4004	0405180004
CR11	DIODE, RECTIFIER 1N4004	0405180004
CR12	DIODE, RECTIFIER 1N4004	0405180004
CR13	DIODE, RECTIFIER 1N4004	0405180004
CR14	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR15	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR16	DIODE, RECTIFIER 1N4004	0405180004
CR17	DIODE, LED, RED, PC MOUNT	1008480029
CR18	DIODE, RECTIFIER 1N4004	0405180004
CR19	DIODE, RECTIFIER 1N4004	0405180004
CR20	DIODE, RECTIFIER 1N4004	0405180004

CR21	DIODE, RECTIFIER 1N4004	0405180004
CR22	DIODE, RECTIFIER 1N4004	0405180004
CR23	DIODE, RECTIFIER 1N4004	0405180004
CR24	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR25	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR28	DIODE, RECTIFIER 1N4004	0405180004
CR29	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR30	DIODE, RECTIFIER 1N4004	0405180004
CR31	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR32	DIODE, RECTIFIER 1N4004	0405180004
CR33	DIODE, RECTIFIER 1N4004	0405180004
CR34	DIODE, RECTIFIER 1N4004	0405180004
CR35	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR36	DIODE, SIGNAL, SIL. 1N4454	0405270003
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, P-CH, FET J175	1010840002
Q3	TRANSISTOR, N-CH, FET MTP3055E	1010750011
Q4	TRANSISTOR, NPN, SI. 2N4124	0448010003
Q5	TRANSISTOR, NPN, SI. 2N4124	0448010003
Q6	TRANSISTOR, NPN, SI. 2N2222A	0448580004
Q7	TRANSISTOR, NPN, SI. 2N2222A	0448580004
R1	RESISTOR 100K, 5%, 1/8W	1010801040
R2	RESISTOR 10K, 5%, 1/8W	1010801031
R3	RESISTOR 47K, 5%, 1/8W	1010804731
R4	RESISTOR 10K, 5%, 1/8W	1010801031
R5	RESISTOR 47K, 5%, 1/8W	1010804731
R6	RESISTOR 10K, 5%, 1/8W	1010801031
R7	RESISTOR 68K, 5%, 1/8W	1010806831
R8	POT. 1K, 10% 3/4W, 15 TURNS	0338490019
R9	RESISTOR 4.7K, 5%, 1/8W	1010804723
R10	RESISTOR 10K, 5%, 1/8W	1010801031
R11	RESISTOR 10K, 5%, 1/8W	1010801031
R12	RESISTOR 10K, 5%, 1/8W	1010801031
R13	RESISTOR 4.7K, 5%, 1/8W	1010804723
R14	RESISTOR 1K, 5%, 1/8W	1010801023
R15	RESISTOR, 6.8M, 5%, 1/4W	1010910001
R16	RESISTOR 10, 5%, 1/8W	1010801007
R17	RESISTOR 1M, 10%, 1/4W	0170650006
R18	RESISTOR 4.7K, 5%, 1/8W	1010804723
R19	RESISTOR 100K, 5%, 1/8W	1010801040
R20	RESISTOR 100, 5%, 1/8W	1010801015
R21	POT. 500, 10% 3/4W, 15 TURNS	0338490078
R22	RESISTOR 10K, 5%, 1/8W	1010801031
R23	RESISTOR 10K, 5%, 1/8W	1010801031
R24	RESISTOR 1K, 5%, 1/8W	1010801023
R25	RESISTOR 10K, 5%, 1/8W	1010801031
R26	RESISTOR 1.8K, 5%, 1/8W	1010801821
R27	RESISTOR 4.7K, 5%, 1/8W	1010804723
R28	RESISTOR 10K, 5%, 1/8W	1010801031
R29	POT. 10K, 10% 3/4W, 15 TURNS	0338490043

Figure 5.8.6 PC Assembly, Audio 3A2A2, page 2 of 9.

R30	RESISTOR 10K, 5%, 1/8W	1010801031
R31	RESISTOR 100K, 5%, 1/8W	1010801040
R32	RESISTOR 15K, 5%, 1/8W	1010801538
R33	RESISTOR 270K, 5%, 1/8W	1010802747
R34	RESISTOR 10K, 5%, 1/8W	1010801031
R35	RESISTOR 10K, 5%, 1/8W	1010801031
R36	RESISTOR 470K, 5%, 1/8W	1010804740
R37	RESISTOR 470K, 5%, 1/8W	1010804740
R38	RESISTOR 1K, 5%, 1/8W	1010801023
R39	RESISTOR 1K, 5%, 1/8W	1010801023
R40	RESISTOR 10K, 5%, 1/8W	1010801031
R41	RESISTOR 10K, 5%, 1/8W	1010801031
R42	POT. 10K, 10% 3/4W, 15 TURNS	0338490043
R43	RESISTOR 56K, 5%, 1/8W	1010805631
R44	RESISTOR 10K, 5%, 1/8W	1010801031
R45	RESISTOR 10K, 5%, 1/8W	1010801031
R46	RESISTOR, 56.2K, 1%, 1/8W	1008910015
R47	RESISTOR 12.1K, 1%, 1/8W	1008900010
R48	RESISTOR 1K AT 25C	0196110009
R49	RESISTOR 390, 5%, 1/8W	1010803913
R50	RESISTOR, 4.99K, 1%, 1/8W	1005510032
R51	RESISTOR 10K, 5%, 1/8W	1010801031
R52	RESISTOR 28.7K 1%, 1/8W	1004090005
R53	RESISTOR 28.7K 1%, 1/8W	1004090005
R54	RESISTOR 10K, 5%, 1/8W	1010801031
R55	RESISTOR 2.2K, 5%, 1/8W	1010802224
R56	RESISTOR 10K, 5%, 1/8W	1010801031
R57	RESISTOR 100, 5%, 1/8W	1010801015
R58	POT. 500, 10% 3/4W, 15 TURNS	0338490078
R59	RESISTOR 1K, 5%, 1/8W	1010801023
R60	RESISTOR 1K, 5%, 1/8W	1010801023
R61	RESISTOR 47K, 5%, 1/8W	1010804731
R62	RESISTOR 47K, 5%, 1/8W	1010804731
R63	RESISTOR 1.5K, 5%, 1/8W	1010801520
R64	RESISTOR 180K, 5%, 1/8W	1010801848
R65	RESISTOR 47K, 5%, 1/8W	1010804731
R66	RESISTOR 3.3K, 5%, 1/8W	1010803328
R67	RESISTOR 180K, 5%, 1/8W	1010801848
R68	RESISTOR 180K, 5%, 1/8W	1010801848
R69	RESISTOR 2.2K, 5%, 1/8W	1010802224
R70	RESISTOR 10K, 5%, 1/8W	1010801031
R71	RESISTOR 10K, 5%, 1/8W	1010801031
R72	RESISTOR 10K, 5%, 1/8W	1010801031
R73	RESISTOR 10K, 5%, 1/8W	1010801031
R74	RESISTOR 10K, 5%, 1/8W	1010801031
R75	RESISTOR 3.3K, 5%, 1/8W	1010803328
R76	RESISTOR, 3.3M, 5%, 1/4W	1010820001
R77	RESISTOR 3.3K, 5%, 1/8W	1010803328
R78	RESISTOR 330K, 5%, 1/8W	1010803344
R79	RESISTOR 47K, 5%, 1/8W	1010804731
R80	RESISTOR 100K, 5%, 1/8W	1010801040
R81	RESISTOR 100K, 5%, 1/8W	1010801040
R82	RESISTOR 100K, 5%, 1/8W	1010801040
R83	RESISTOR 100K, 5%, 1/8W	1010801040

R84	RESISTOR 1K, 5%, 1/8W	1010801023
R85	RESISTOR 1K, 5%, 1/8W	1010801023
R86	RESISTOR 270K, 5%, 1/8W	1010802747
R87	RESISTOR 330K, 5%, 1/8W	1010803344
R88	RESISTOR, 3.3M, 5%, 1/4W	1010820001
R89	POT. 10K, 10% 3/4W, 15 TURNS	0338490043
R90	RESISTOR 10K, 5%, 1/8W	1010801031
R91	RESISTOR 10K, 5%, 1/8W	1010801031
R92	RESISTOR 1M, 10%, 1/4W	0170650006
R93	RESISTOR 1M, 10%, 1/4W	0170650006
R94	RESISTOR 330K, 5%, 1/8W	1010803344
R95	RESISTOR 22K, 5%, 1/8W	1010802232
R96	RESISTOR 10K, 10%, 1/4W	0170410005
R97	RESISTOR 22K, 5%, 1/8W	1010802232
R98	RESISTOR 10K, 5%, 1/8W	1010801031
R99	RESISTOR 10K, 5%, 1/8W	1010801031
R100	RESISTOR 100K, 5%, 1/8W	1010801040
R101	RESISTOR 10K, 5%, 1/8W	1010801031
R102	RESISTOR 10K, 5%, 1/8W	1010801031
R103	POT. 25K, 10% 3/4W, 15 TURNS	0338490094
R107	RESISTOR 10K, 5%, 1/8W	1010801031
R108	RESISTOR 470, 10%, 1/2W	0173900003
R109	RESISTOR 18, 5%, 1/2W	0184730007
R110	RESISTOR 33, 10%, 1W	0165660007
R111	RESISTOR 47, 10%, 2W	0163720002
R112	RESISTOR 10K, 5%, 1/8W	1010801031
R113	RESISTOR 1M, 10%, 1/4W	0170650006
R114	RESISTOR 10K, 5%, 1/8W	1010801031
R115	RESISTOR 10K, 5%, 1/8W	1010801031
R116	RESISTOR 10K, 5%, 1/8W	1010801031
R117	RESISTOR 6.8K, 5%, 1/8W	1010806823
R118	RESISTOR 3.3K, 5%, 1/8W	1010803328
R119	POT. 10K, 10% 3/4W, 15 TURNS	0338490043
R120	RESISTOR 10K, 5%, 1/8W	1010801031
R121	RESISTOR 33K, 5%, 1/8W	1010803336
R122	RESISTOR 10K, 5%, 1/8W	1010801031
R123	RESISTOR 10K, 5%, 1/8W	1010801031
R124	RESISTOR 22, 5%, 1/8W	1010802208
R125	RESISTOR 2.2K, 5%, 1/8W	1010802224
R126	RESISTOR 56K, 5%, 1/8W	1010805631
R127	RESISTOR 1K, 5%, 1/8W	1010801023
R128	RESISTOR 10K, 5%, 1/8W	1010801031
R129	RESISTOR 10K, 5%, 1/8W	1010801031
R130	RESISTOR 100K, 5%, 1/8W	1010801040
R131	RESISTOR 100K, 5%, 1/8W	1010801040
R132	RESISTOR 10K, 5%, 1/8W	1010801031
R133	RESISTOR 100K, 5%, 1/8W	1010801040
R134	RESISTOR 100K, 5%, 1/8W	1010801040
R135	RESISTOR 10K, 5%, 1/8W	1010801031
R136	RESISTOR 100K, 5%, 1/8W	1010801040
R137	RESISTOR 10K, 5%, 1/8W	1010801031
R138	RESISTOR 100K, 5%, 1/8W	1010801040
R139	RESISTOR 10K, 5%, 1/8W	1010801031
R140	RESISTOR 1K, 5%, 1/8W	1010801023

Figure 5.8.6 PC Assembly, Audio 3A2A2, page 3 of 9.

R141	RESISTOR 1K, 5%, 1/8W	1010801023
R142	RESISTOR 1K, 5%, 1/8W	1010801023
R144	RESISTOR 68K, 5%, 1/8W	1010806831
R145	RESISTOR 10K, 5%, 1/8W	1010801031
R146	RESISTOR 47K, 5%, 1/8W	1010804731
R148	RESISTOR 3.3K, 5%, 1/8W	1010803328
R149	RESISTOR 2.7K, 5%, 1/8W	1010802721
R150	RESISTOR 10K, 5%, 1/8W	1010801031
R151	RESISTOR 10K, 5%, 1/8W	1010801031
R152	RESISTOR 39K, 5%, 1/8W	1010803930
R153	RESISTOR 1, 10%, 1/2W	0194770001
R154	RESISTOR 10K, 5%, 1/8W	1010801031
R155	RESISTOR 39K, 5%, 1/8W	1010803930
R156	RESISTOR 10K, 5%, 1/8W	1010801031
R157	RESISTOR 10K, 5%, 1/8W	1010801031
R158	RESISTOR 4.7K, 5%, 1/8W	1010804723
R159	RESISTOR 18K, 5%, 1/8W	1010801830
R160	RESISTOR 1K, 5%, 1/8W	1010801023
R161	RESISTOR 47K, 5%, 1/8W	1010804731
R162	POT. 1K, 10% 1/2, 4 TURNS	1000850021
R163	RESISTOR 22K, 5%, 1/8W	1010802232
R164	RESISTOR 100K, 5%, 1/8W	1010801040
R165	RESISTOR 100K, 5%, 1/8W	1010801040
R166	RESISTOR 4.7K, 5%, 1/8W	1010804723
R167	RESISTOR 22K, 5%, 1/8W	1010802232
R168	RESISTOR 22K, 5%, 1/8W	1010802232
R169	RESISTOR 22K, 5%, 1/8W	1010802232
R170	RESISTOR 150, 5%, 1/8W	1010801511
R171	RESISTOR 4.7K, 5%, 1/8W	1010804723
R172	RESISTOR 10K, 5%, 1/8W	1010801031
R173	RESISTOR 4.7K, 5%, 1/8W	1010804723
R174	RESISTOR 10K, 5%, 1/8W	1010801031
R175	POT. 5K, 10% 1/2W, 25 TURNS	1004720025
R176	RESISTOR 10K, 5%, 1/8W	1010801031
R177	RESISTOR 1K, 5%, 1/8W	1010801023
R178	RESISTOR 4.7K, 5%, 1/8W	1010804723
R179	RESISTOR 4.7K, 5%, 1/8W	1010804723
R180	RESISTOR 47K, 5%, 1/8W	1010804731
RP1	RES NTWK 6 PIN SIP 10K COM	1006130004
S1	SWITCH, DPST,DIP, 3 SECTION	1010880004
T1	TRANSFORMER, AUDIO, PC MOUNT	0491650001
T2	TRANSFORMER, AUDIO, PC MOUNT	0491650001
TP1	TERMINAL, TURRET SWGD .071 MTG	0525580000
TP2	TERMINAL, TURRET SWGD .071 MTG	0525580000
TP3	TERMINAL, TURRET SWGD .071 MTG	0525580000
TP4	TERMINAL, TURRET SWGD .071 MTG	0525580000
TP5	TERMINAL, TURRET SWGD .071 MTG	0525580000
TP6	TERMINAL, TURRET SWGD .071 MTG	0525580000
TP7	TERMINAL, TURRET SWGD .071 MTG	0525580000
U1	IC. DIGITAL 74HC14	1006490027
U2	IC. DIGITAL 74HC14	1006490027
U3	IC. DIGITAL 74HC00	1008190004
U4	IC. DIGITAL 74HC08	1006490019
U5	IC. LINEAR UDN2935Z	1010830007
U6	IC. LINEAR UDN2935Z	1010830007

U7	IC. LINEAR MC3358P1	1010110012
U8	IC. LINEAR LC403	1010850008
U9	IC. LINEAR MC3358P1	1010110012
U10	IC. LINEAR MC3358P1	1010110012
U11	IC. LINEAR LF-347	1007500026
U12	IC. DIGITAL 4584B	1005190011
U13	IC. DIGITAL 4066BC	1004460023
U14	IC. LINEAR LF-347	1007500026
U15	IC. LINEAR LF-347	1007500026
U16	IC. LINEAR LF-347	1007500026
U17	IC. LINEAR TDA1524A	1010780026
U18	IC. LINEAR TDA2008	1003140025
U19	IC. DIGITAL 4001B	1004660022
U20	IC. DIGITAL 4066BC	1004460023
U21	IC. LINEAR 5532	1006270019
U22	IC. LINEAR LM311N	1005760021
U23	IC. DIGITAL 4066BC	1004460023
U24	IC. DIGITAL 4081B	1006280031
U25	IC. DIGITAL 4066BC	1004460023
U26	IC. LINEAR MC3358P1	1010110012
U28	IC. DIGITAL 75372	1010760017
U29	IC. LINEAR NE570	1011500001
U30	IC. LINEAR LF-347	1007500026
U31	IC. DIGITAL 4066BC	1004460023
	HEATSINK, SPEAKER DRIVER	8076092205
	INSULATOR, MICA TO-220AB	0448670003
	MOUNTING PLATE, AUDIO BOARD	8076091608

Figure 5.8.6 PC Assembly, Audio 3A2A2, page 4 of 9.

S1-1 MIC COMPRESSOR ON OR OFF
 S1-2 XMIT SQUELCH ON OR OFF
 S1-3 LINE AUDIO COMPRESSOR ON OR OFF

NORMAL SETTINGS FOR S1-1THRU 3 SHOWN.



ON
OFF

1002DP

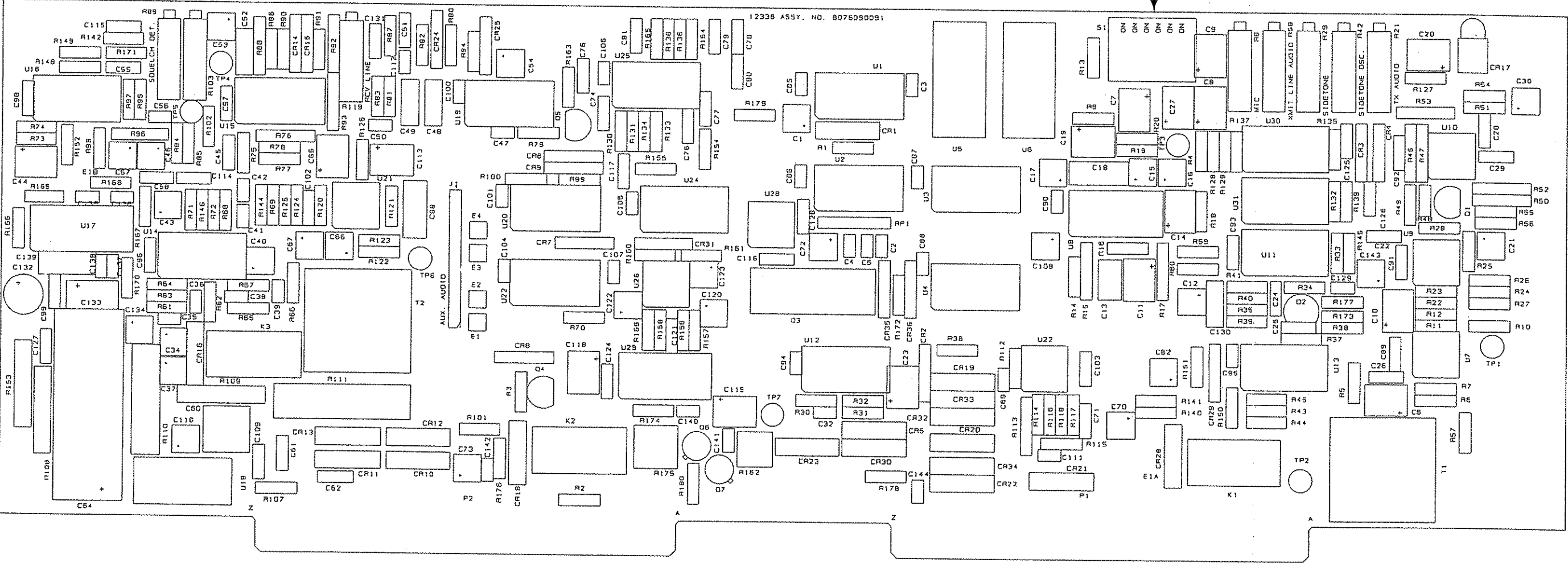


Figure 5.8.6 PC Assembly, Audio 3A2A2, page 5 of 9.

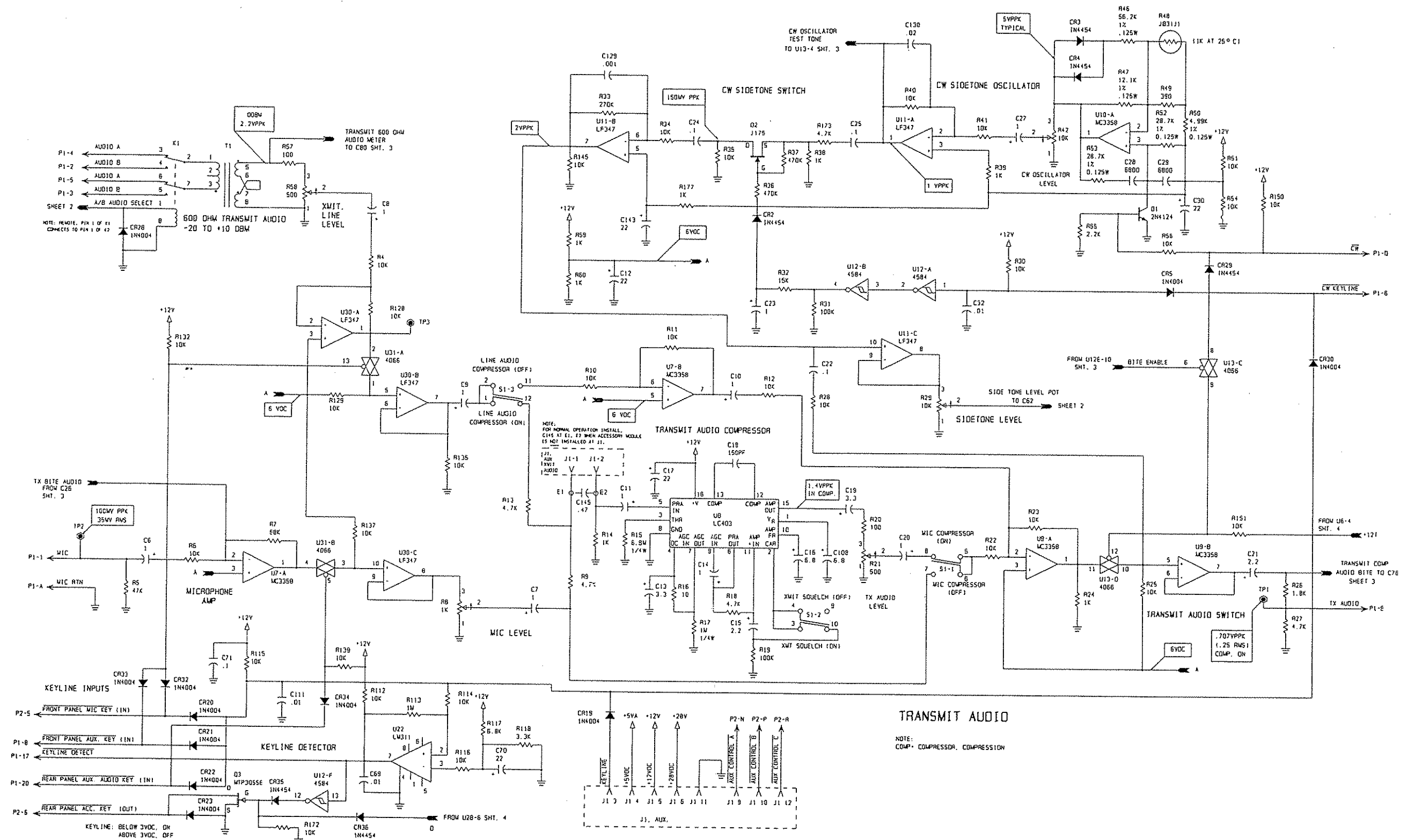


Figure 5.8.6 PC Assembly, Audio 3A2A2, page 6 of 9.

B1002E

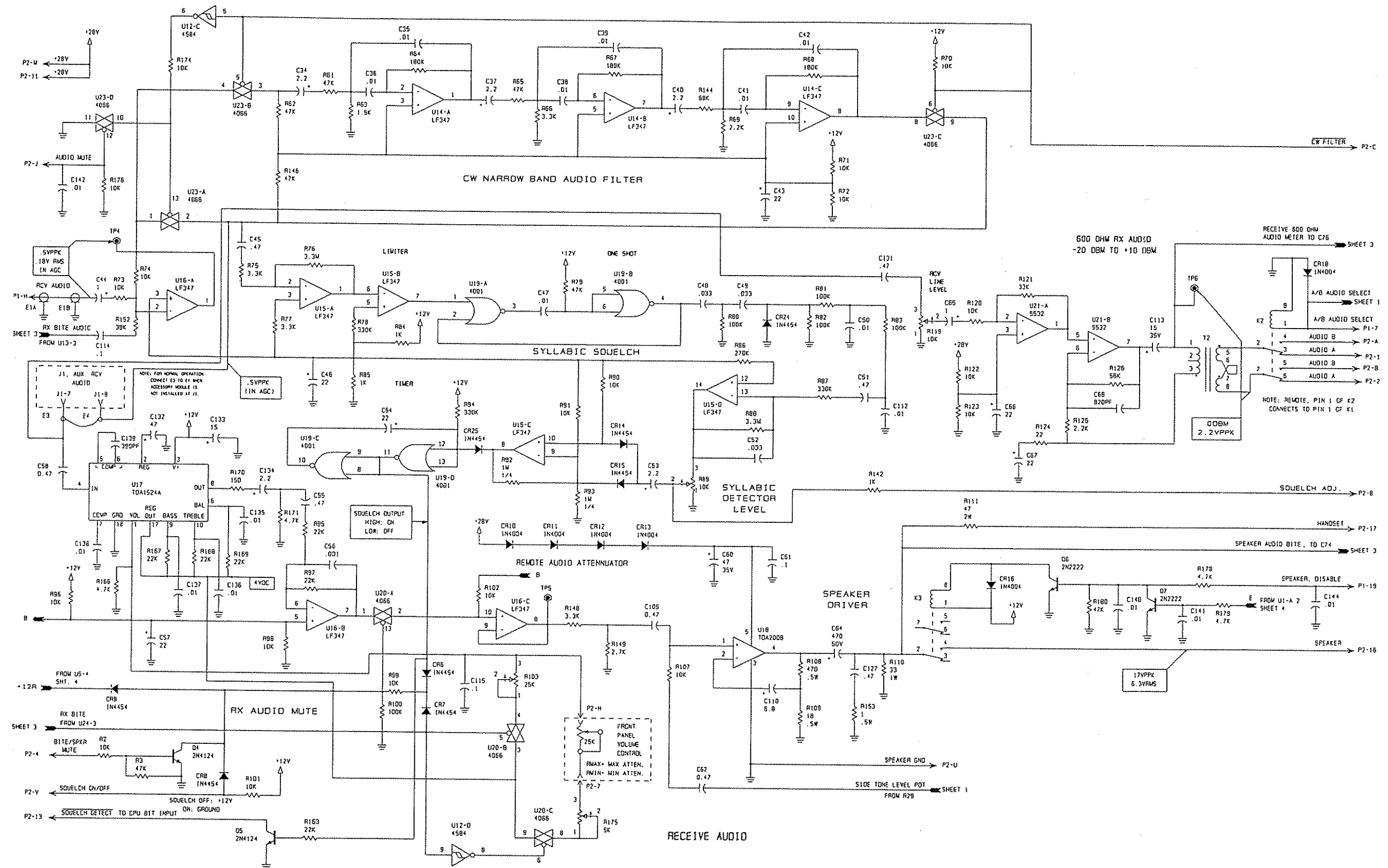
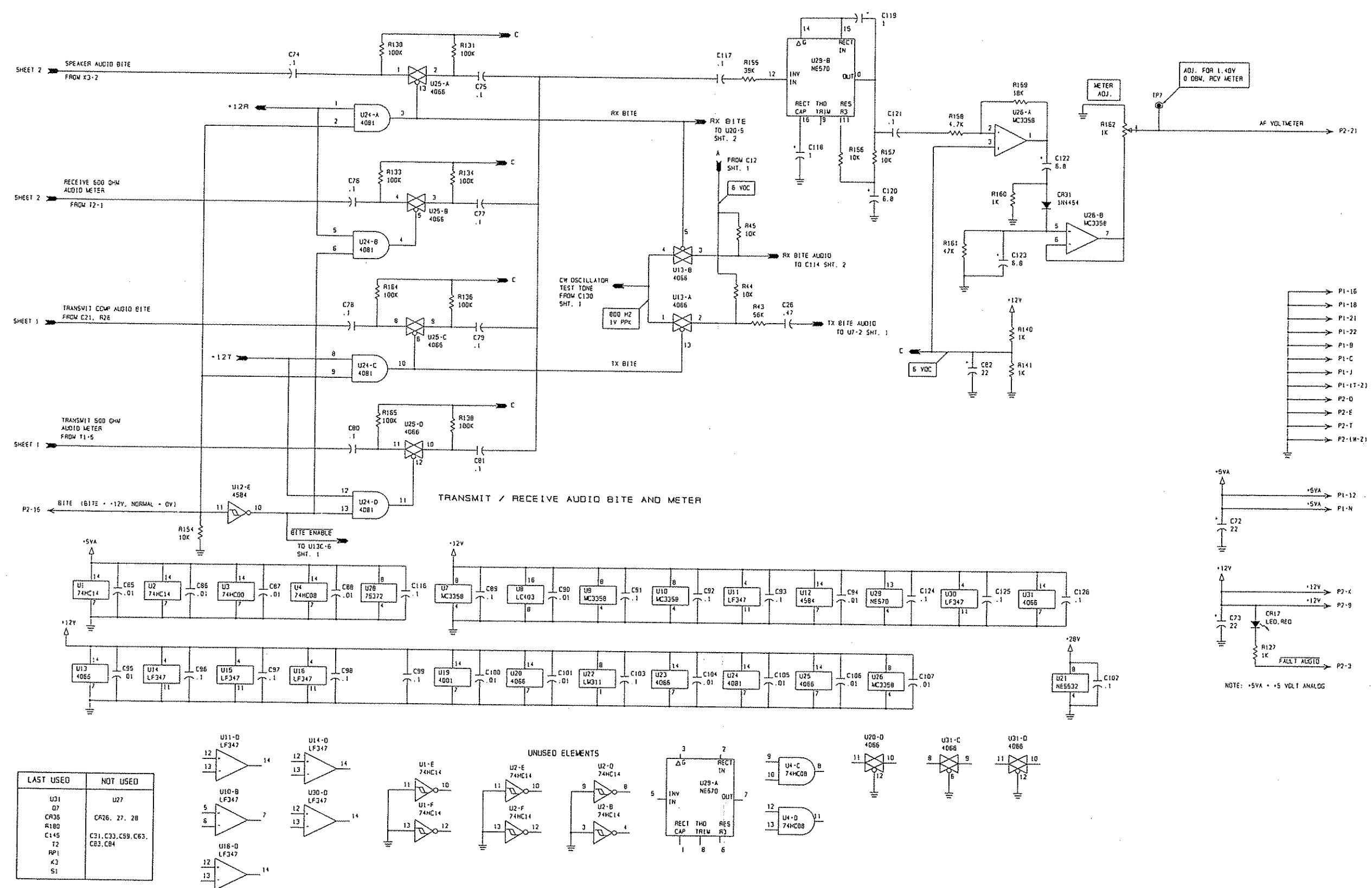


Figure 5.8.6 PC Assembly, Audio 3A2A2, page 7 of 9.

C1002E



D1002E

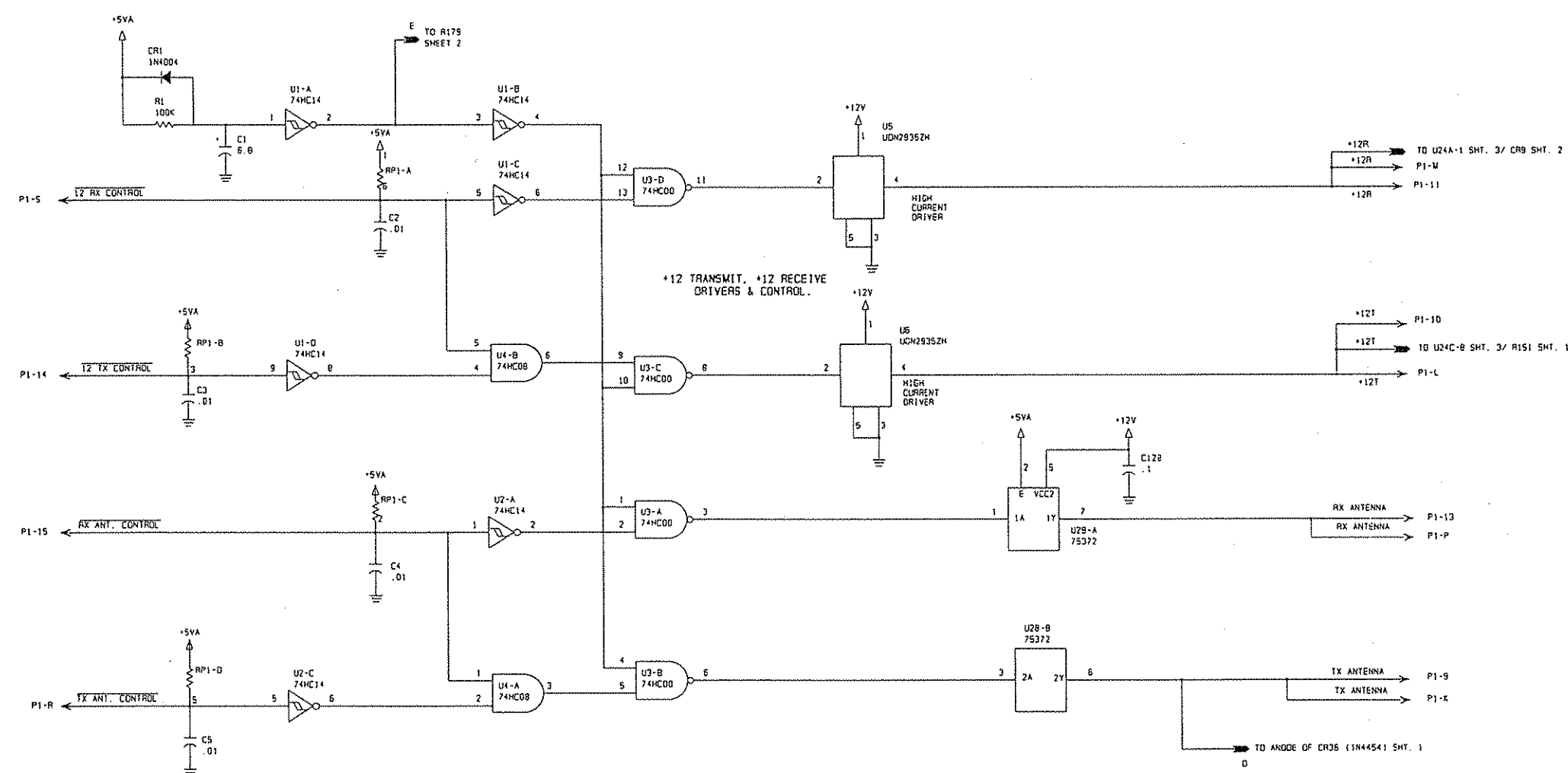


Figure 5.8.6 PC Assembly, Audio 3A2A2, page 9 of 9.

PC ASSY, AUDIO REMOTE 3A2A4

	PC ASSY, AUDIO REMOTE 3A2A4	8078085095
C1	CAP. 2.2μF, 35V, T368	0273950002
C2	CAP. 15μF, 15V, 196D	0281720002
C3	CAP. 15μF, 15V, 196D	0281720002
C4	CAP. 15μF, 15V, 196D	0281720002
C5	CAP. 15μF, 15V, 196D	0281720002
CR1	DIODE, RECTIFIER 1N4004	0405180004
CR2	DIODE, RECTIFIER 1N4004	0405180004
K1	RELAY, DPDT, 12VDC	1005090009
K2	RELAY, DPDT, 12VDC	1005090009
R1	POT. 10K, 10% 3/4W, 15 TURNS	0338490043
R2	RESISTOR 10K, 10%, 1/4W	0170410005
R3	RESISTOR 10K, 10%, 1/4W	0170410005
R4	RESISTOR 10K, 10%, 1/4W	0170410005
R5	RESISTOR 56K, 10%, 1/4W	0171440005
R6	RESISTOR 2.2K, 5%, 1/4W	0178070009
R7	RESISTOR 22, 10%, 1/4W	0192690001
R8	POT. 1K, 10% 3/4W, 15 TURNS	0338490019
R9	RESISTOR 1.5K, 10%, 1/4W	0172470005
R10	RESISTOR 10K, 10%, 1/4W	0170410005
T1	TRANSFORMER, AUDIO, PC MOUNT	0491650001
T2	TRANSFORMER, AUDIO, PC MOUNT	0491650001
U1	IC. LINEAR 5532	1006270019

1167AP

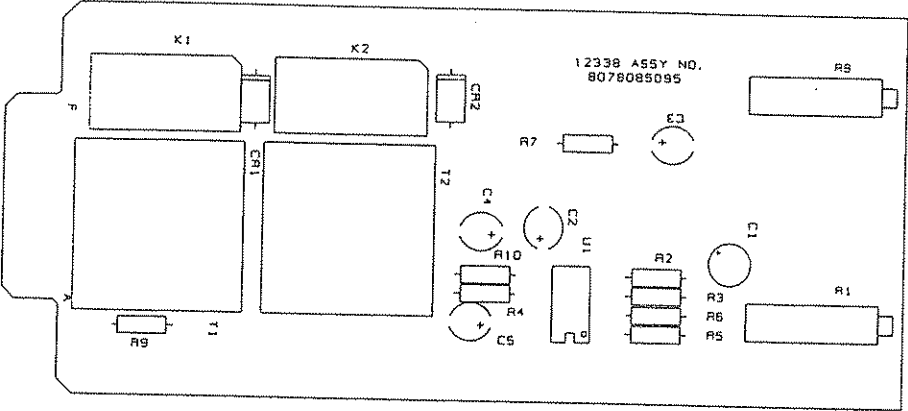


Figure 5.8.7 PC Assembly, Audio Remote 3A2A4, page 1 of 2.

A1167A

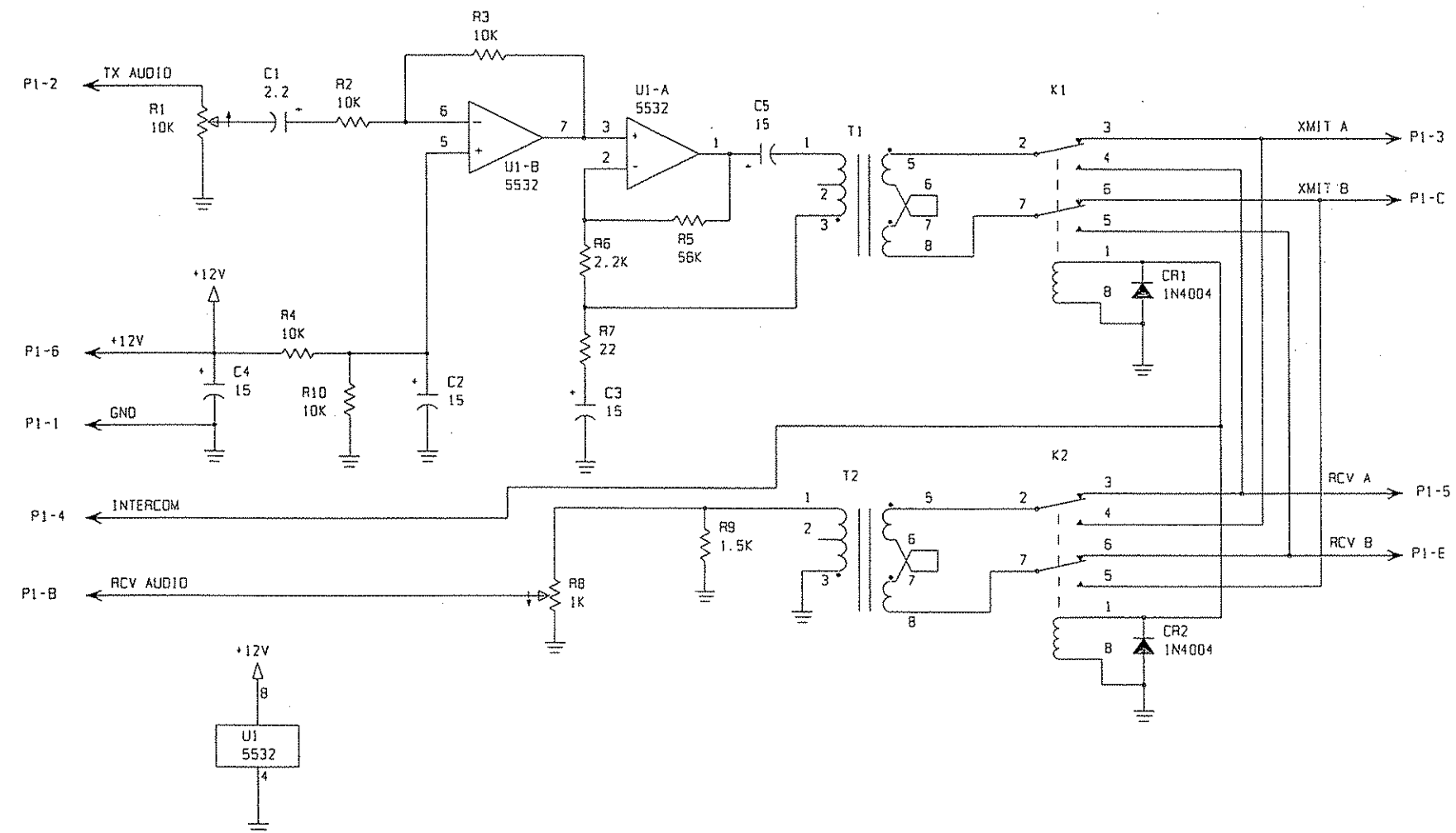


Figure 5.8.7 PC Assembly, Audio Remote 3A2A4, page 2 of 2.

PC ASSY, I/O BOARD 3A2A3		
	PC ASSY, I/O BOARD 3A2A3	8076110092
C1	CAP. .01μF, 50V, X7R 20%	0281730008
C2	CAP. 6.8μF, 20V, T368	0296780006
C3	CAP. .01μF, 50V, X7R 20%	0281730008
C4	CAP. .01μF, 50V, X7R 20%	0281730008
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. 22μF, 15V, 196D	0281690006
C10	CAP. 22μF, 15V, 196D	0281690006
C11	CAP. 47μF, 20V, 196D	0281700001
C12	CAP. .01μF, 50V, X7R 20%	0281730008
C13	CAP. .01μF, 50V, X7R 20%	0281730008
C14	CAP. .01μF, 50V, X7R 20%	0281730008
C15	CAP. 10μF, 20V	1007290005
C16	CAP. 22μF, 15V, 196D	0281690006
C17	CAP. 22μF, 15V, 196D	0281690006
C18	CAP. .01μF, 50V, X7R 20%	0281730008
C19	CAP. 47μF, 20V, 196D	0281700001
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
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
L9	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
R10	RESISTOR 82, 10%, 1/4W	0184610001
R11	RESISTOR 10K, 5%, 1/8W	1010801031
R12	RESISTOR 68, 5%, 1/8W	1010806807
R13	RESISTOR 68, 5%, 1/8W	1010806807
R14	RESISTOR 68, 5%, 1/8W	1010806807
R15	RESISTOR 68, 5%, 1/8W	1010806807
RP1	RES NTWK 10 PIN SIP 10K COM	1006130021
RP2	RES NTWK 10 PIN SIP 10K COM	1006130021
RP3	RES NTWK 10 PIN SIP 10K COM	1006130021
U1	CRYSTAL OSCILLATOR, 7.3728MHZ	1008850012
U2	IC. DIGITAL 74HC00	1008190004
U3	IC. DIGITAL 74HC00	1008190004
U4	IC. DIGITAL 4078B	1010460030
U5	IC. DIGITAL 74HC374	1006450033
U6	IC. DIGITAL 74HC374	1006450033
U7	IC. DIGITAL 74HC04	1010280023
U8	IC. DIGITAL 74HC32	1006470026
U9	IC. DIGITAL 2681	1008790010
U10	IC. DIGITAL 80C85A	1007400013
U11	IC. DIGITAL 74HC138	1006480013
U12	IC. DIGITAL 74HC125	1008810011
U13	IC. DIGITAL 74HC373	1006480030
U14	IC. DIGITAL 74HC32	1006470026
U15	IC. DIGITAL RAM UPD446D	1006430008
U16	IC. DIGITAL ICL232	1010510011
U17	IC. DIGITAL ICL232	1010510011
U18	IC. DIGITAL 75176	1011100011
U19	IC. DIGITAL 75176	1011100011
U20	EPROM, W/IO SOFTWARE RCU-9310	8078113293
XU9	SOCKET, IC, 40 PIN TAILLESS	1006620010
XU10	SOCKET, IC, 40 PIN TAILLESS	1006620010
XU20	SOCKET, IC, 28 PIN TAILLESS	1006620001
	FERRITE BEAD, 850 PERM	1010410032
	MOUNTING PLATE, I/O BOARD	8076111200

NOTE: U20 EPROM is not part of PC ASSY
I/O BOARD 3A2A3 P/N 8076110092.

Figure 5.8.8 PC Assembly, I/O Board 3A2A3, page 1 of 4.

1079P

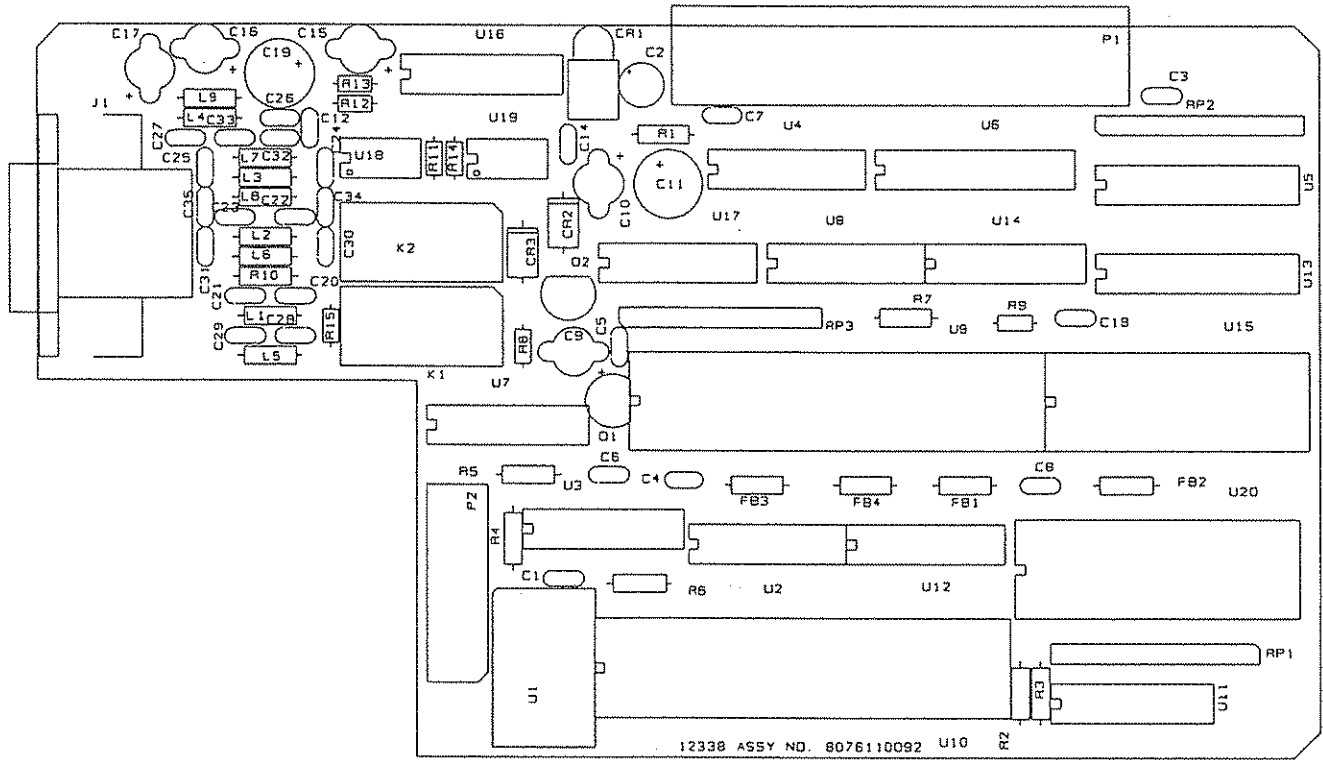


Figure 5.8.8 PC Assembly, I/O Board 3A2A3, page 2 of 4.

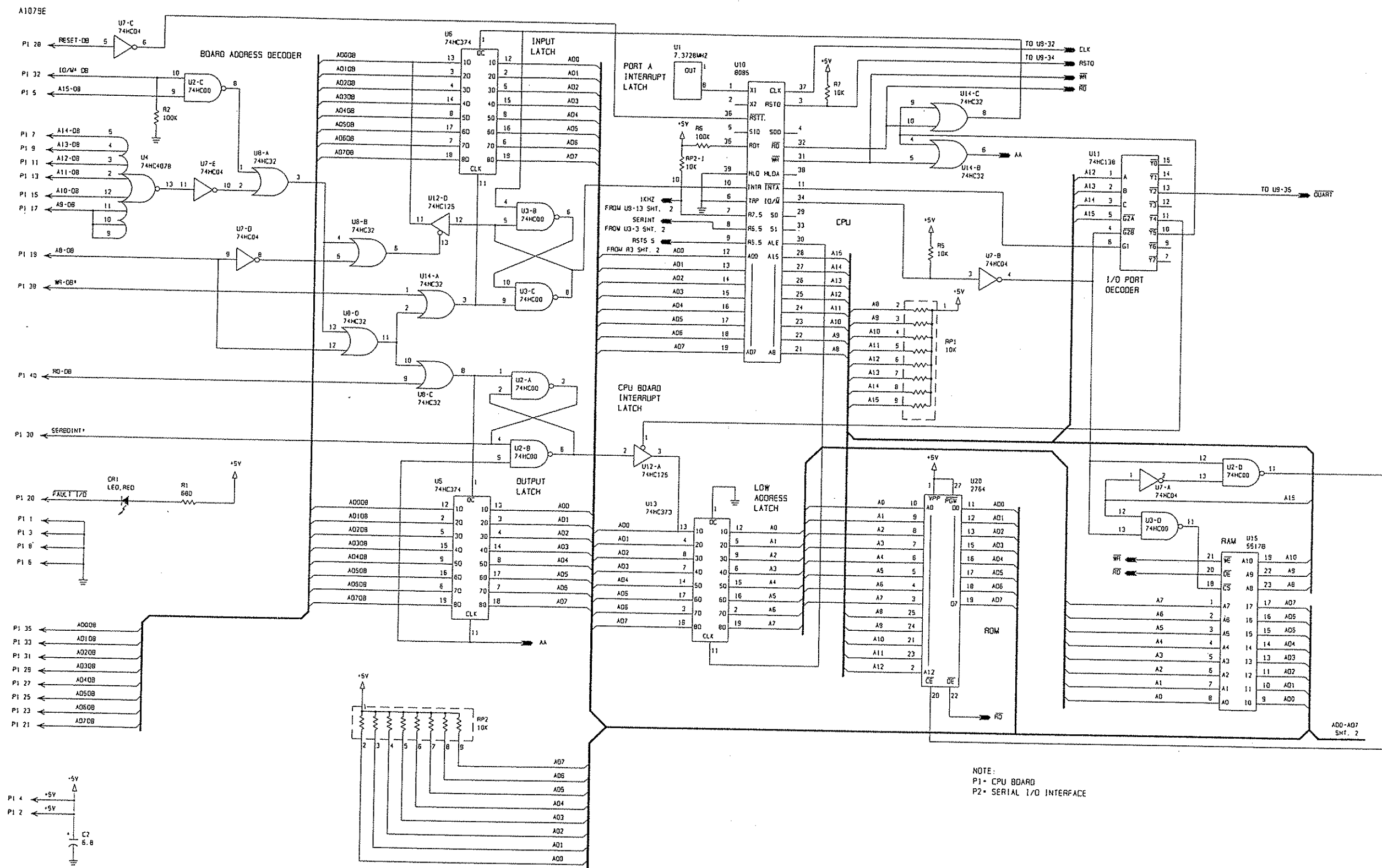


Figure 5.8.8 PC Assembly, I/O Board 3A2A3, page 3 of 4.

810796

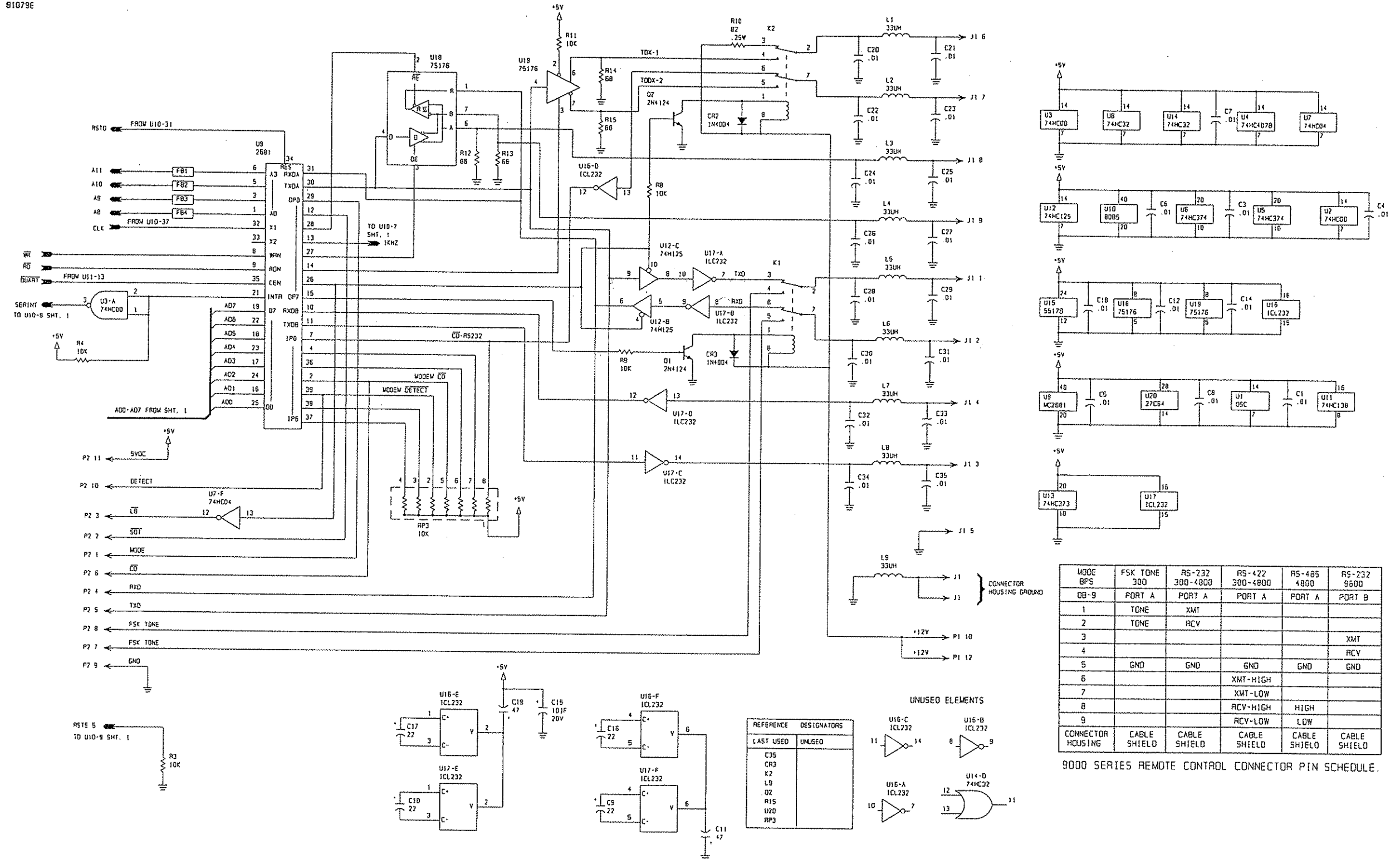


Figure 5.8.8 PC Assembly, I/O Board 3A2A3, page 4 of 4.

PC ASSY, FSK MODEM 3A2A3A1		
C1	PC ASSY, FSK MODEM 3A2A3A1	8076115094
C2	CAP. 10μF, 20V	1007290005
C3	CAP. 0.001μF, 100V, X7R, 20%	0281630003
C4	CAPACITOR 0.1μF, 50V, X7R	1011180014
C5	CAPACITOR 0.1μF, 50V, X7R	1011180014
C6	CAPACITOR 0.1μF, 50V, X7R	1011180014
P1	CAPACITOR 0.1μF, 50V, X7R	1011180014
R1	CONNECTOR, RIBBON, 14 PIN FEM	1008350001
R2	RESISTOR 604, 1%, 1/8W	0193980002
R3	RESISTOR 5.6K, 5%, 1/8W	1010805622
R4	RESISTOR 10K, 5%, 1/8W	1010801031
R5	RESISTOR 10K, 5%, 1/8W	1010801031
T1	RESISTOR 10K, 5%, 1/8W	1010801031
U1	TRANSFORMER, MODEM	1011340011
X1	IC. DIGITAL MC145443	1011330016
XP1	CRYSTAL, 3.579545 MHZ	1006270001
ZS1	CONNECTOR,PCB,TRANSITION,14PIN	1011090147
	VARISTOR, MOV V230LA20A	1010720023
	CABLE, FLAT, 14 COND. 28AWG	1011170001
	SCREW, PH4-40 X 5/16 LG.	0500850054
	WASHER, SPLIT #4	0500020001
	WASHER, FLAT #4 .219 OD	0502560002

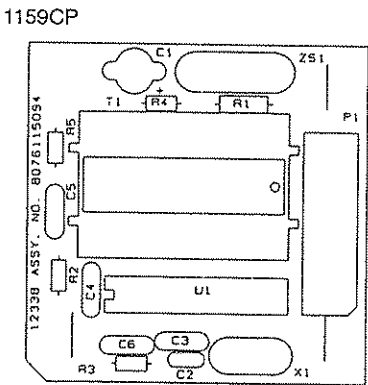


Figure 5.8.9 PC Assembly, FSK Modem 3A2A3A1, page 1 of 2.

A1159C

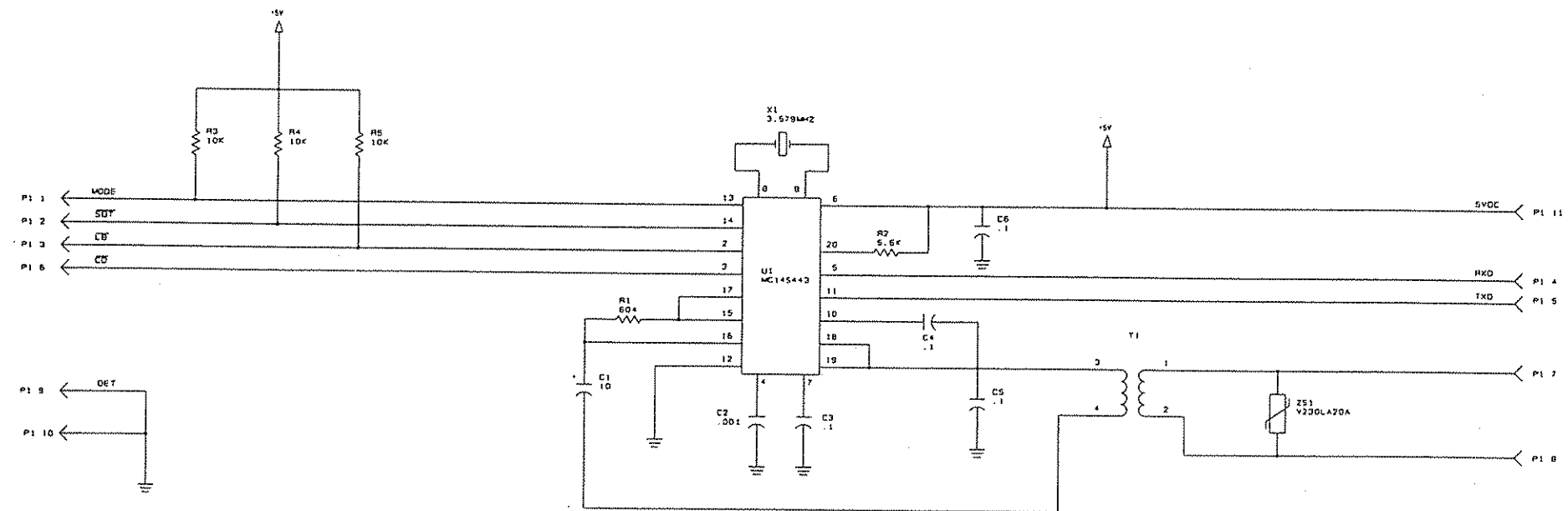


Figure 5.8.9 PC Assembly, FSK Modem 3A2A3A1, page 2 of 2.

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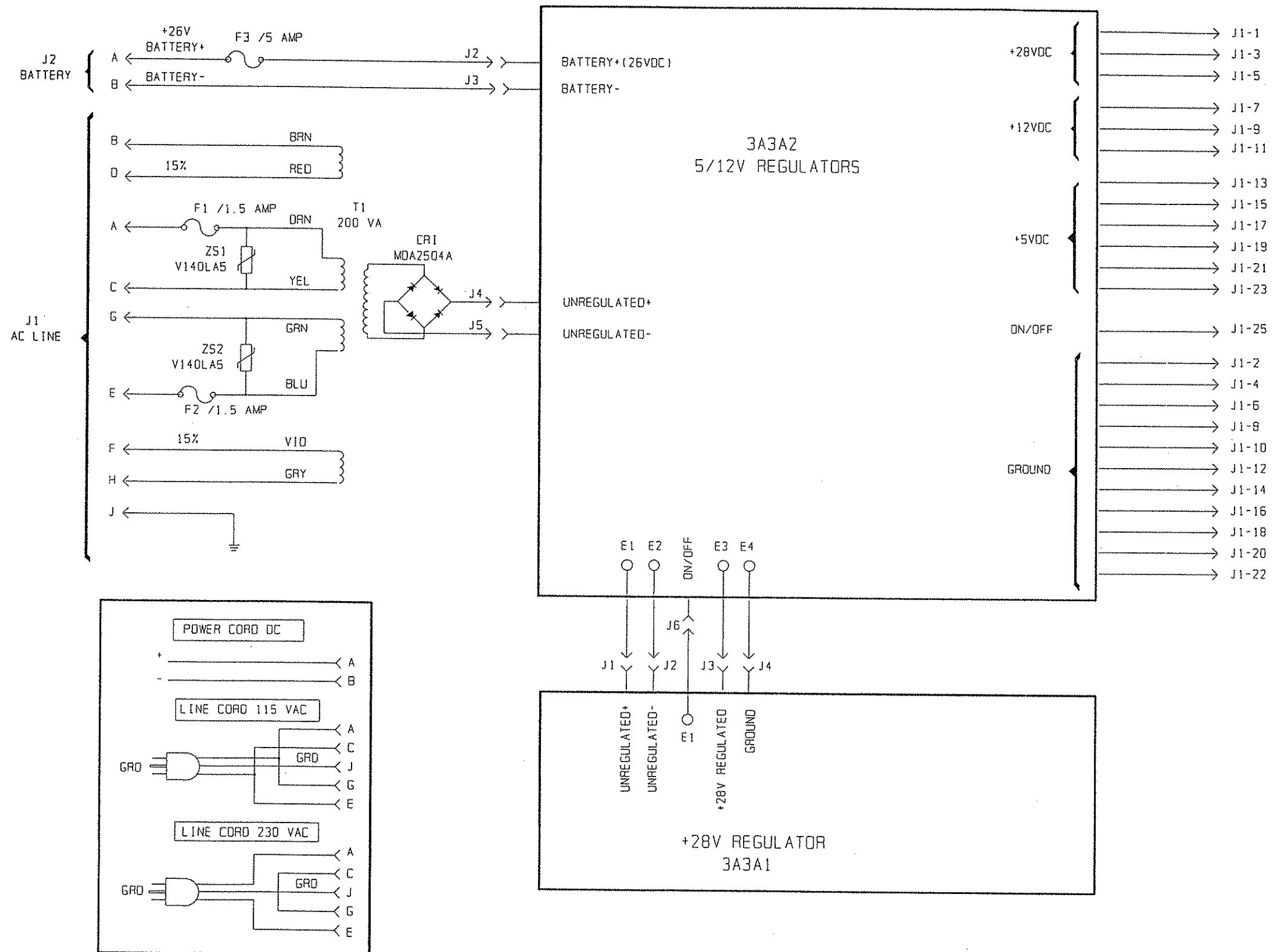


Figure 5.8.10 AC/DC Power Supply Chassis and Interconnect Diagram, page 1 of 1.

PC ASSY, 28V REGULATOR, 5 AMP 3A3A1

	PC ASSY, 28V REG, 5 AMP 3A3A1	8078021496
C1	CAP. .47μF, 50V, X7R 20%	0283377771
C2	CAPACITOR 0.1μF, 50V, X7R	1011180014
C3	CAP. 0.047 μF, 50V, X7R, 10%	1010740008
C4	CAP. 2.2μF, 35V, T368	0273950002
C5	CAP. .01μF, 50V, X7R 20%	0281730008
C6	CAP. 1μF, 35V, 196D	0281660000
C7	CAPACITOR 0.1μF, 50V, X7R	1011180014
C8	CAP. 2.2μF, 35V, T368	0273950002
C9	CAP. .01μF, 50V, X7R 20%	0281730008
C10	CAP. .01μF, 50V, X7R 20%	0281730008
C11	CAP. 1μF, 35V, 196D	0281660000
C12	CAPACITOR 0.1μF, 50V, X7R	1011180014
C13	CAP. .47μF, 50V, X7R 20%	0283377771
C15	CAP. 1000μF, 63V, 20%, 105C	1011350009
C16	CAP. 22μF, 15V, T368	0296660001
CR1	DIODE, SIGNAL, SIL. 1N4454	0405270003
CR2	DIODE, ZENER 1N5358B	0404900003
CR3	DIODE, LED, RED, PC MOUNT	1008480029
CR4	DIODE, ZENER 1N5364B	0405230001
CR5	DIODE, RECTIFIER 1N4004	0405180004
CR6	DIODE, LED, RED, PC MOUNT	1008480029
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
CR11	DIODE, RECTIFIER 1N4004	0405180004
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

*Installed on rear panel heat sink.

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
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
R32	RESISTOR 2.2K, 5%, 1/4W	0178070009
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

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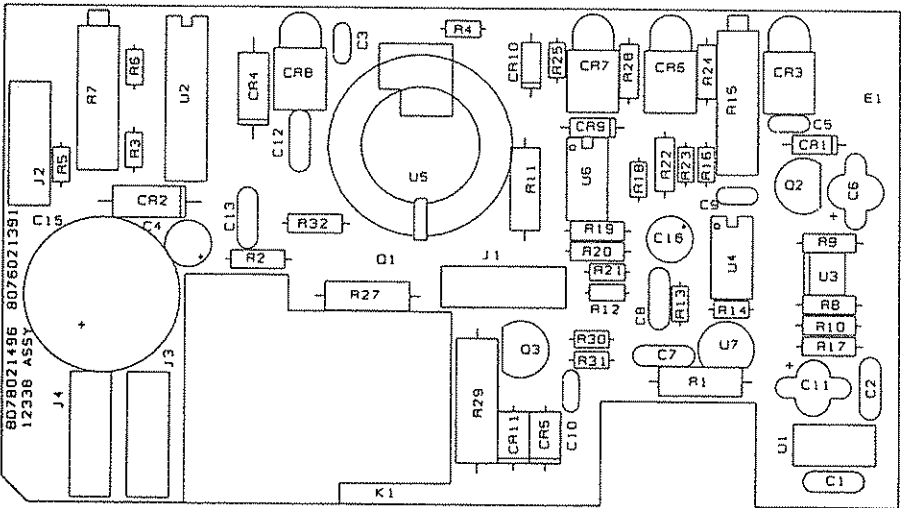


Figure 5.8.11 PC Assembly, 28V Regulator, 5 Amp 3A3A1, page 1 of 2.

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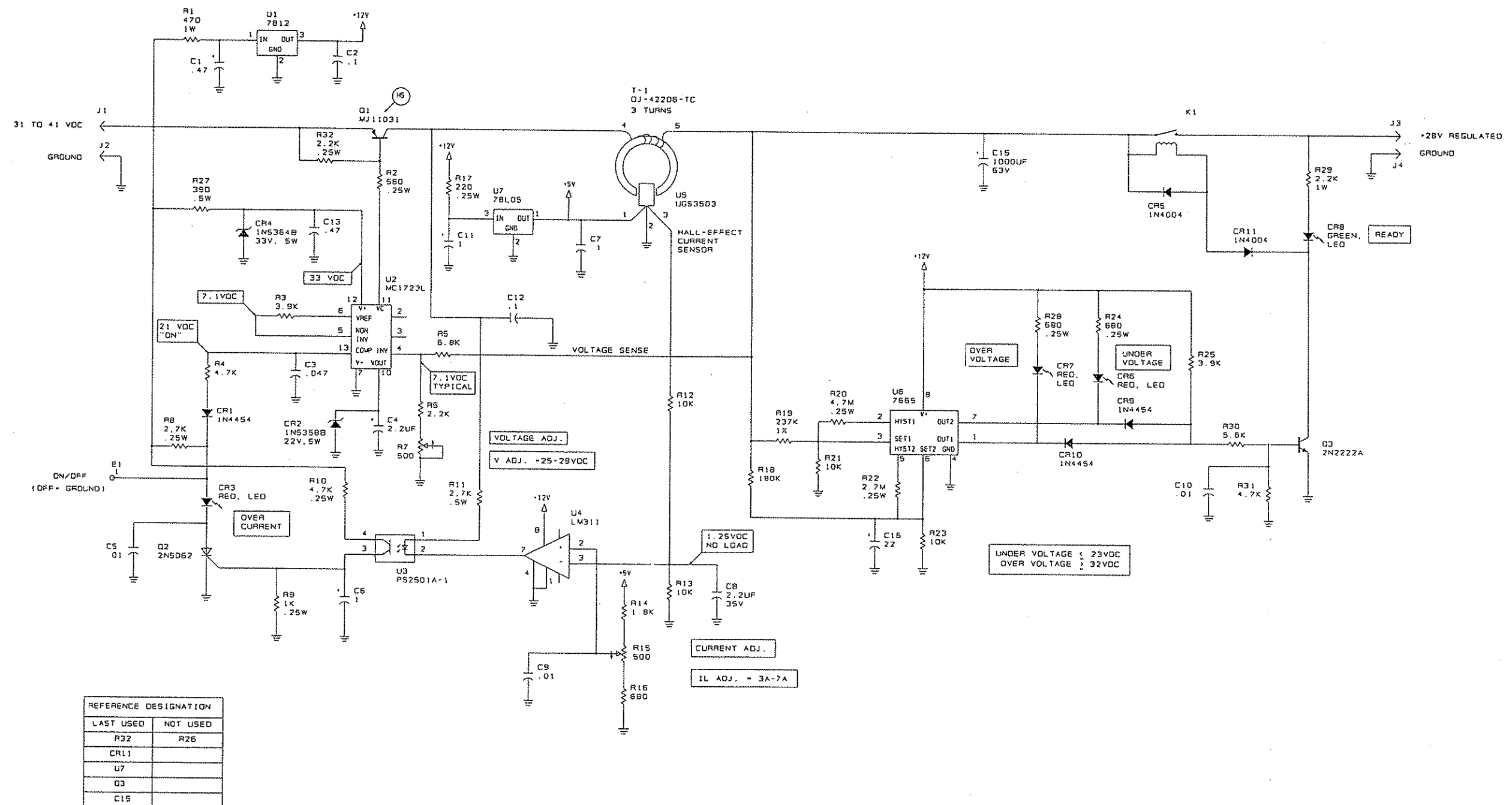


Figure 5.8.11 PC Assembly, 28V Regulator, 5 Amp 3A3A1, page 2 of 2.

PC ASSY, 5/12 V REGULATORS 3A3A2

	PC ASSY, 5/12 V REGULATORS 3A3A2	8078025092
C1	CAP. 6800 μ F, 63V, 20%, 105C	1010800019
C2	CAP. 6800 μ F, 63V, 20%, 105C	1010800019
C3	CAPACITOR 0.1 μ F, 50V, X7R	1011180014
C4	CAP. 6.8 μ F, 50V, T350	1008980013
C5	CAP. 6.8 μ F, 50V, T350	1008980013
C6	CAPACITOR 0.1 μ F, 50V, X7R	1011180014
C7	CAP. 1 μ F, 35V, 196D	0281660000
C8	CAPACITOR 0.1 μ F, 50V, X7R	1011180014
C9	CAP. 6.8 μ F, 50V, T350	1008980013
C10	CAPACITOR 0.1 μ F, 50V, X7R	1011180014
C11	CAP. 10 μ F, 20V	1007290005
C12	CAP. 1 μ F, 35V, 196D	0281660000
C13	CAP. 10 μ F, 20V	1007290005
C14	CAP. 1 μ F, 35V, 196D	0281660000
C15	CAP. 1000 μ F, 63V, 20%, 105C	1011350009
C16	CAP. 1000 μ F, 63V, 20%, 105C	1011350009
CR1	DIODE, RECTIFIER 1N4004	0405180004
CR2	DIODE, ZENER 1N5242B	0400120003
CR3	DIODE, RECTIFIER 1N4004	0405180004
CR4	NOT USED	
CR5	DIODE, RECTIFIER 1N4004	0405180004
CR6	DIODE, RECTIFIER 1N4004	0405180004
CR7	DIODE, RECTIFIER 1N4004	0405180004
CR8	DIODE, RECTIFIER 1N4004	0405180004
CR9	DIODE, RECTIFIER 1N4004	0405180004
F1	FUSE, MDL, 1.5 AMP, 125V	0896540006
J1	CONNECTOR, HEADER, 26 PIN MALE	1010810022
J2	TERMINAL, PC MOUNT, 3/16" MALE	1008550027
J3	TERMINAL, PC MOUNT, 1/4" MALE	1008330035
J4	TERMINAL, PC MOUNT, 3/16" MALE	1008550027
J5	TERMINAL, PC MOUNT, 1/4" MALE	1008330035
J6	TERMINAL, PC MOUNT, 3/16" MALE	1008550027
J7	TERMINAL, PC MOUNT, 3/16" MALE	1008550027
J8	TERMINAL, PC MOUNT, 3/16" MALE	1008550027
K1	RELAY, SPST, 24VDC, PC MOUNT	1010310038
K2	RELAY, SPDT, 24V, REED	1003400001
L1	INDUCTOR, POWER, 180 μ H	1008690015
Q1	DIODE, TRANSZORB 1N5646A	1006680021
Q2	TRANSISTOR, NPN, SI. 2N2222A	0448580004
Q3	TRANSISTOR, NPN, SI. 2N2222A	0448580004
R1	RESISTOR 100, 10%, 1/2W	0174790007
R2	RESISTOR 10K, 10%, 1/4W	0170410005
R3	RESISTOR 5.6K, 10%, 1/4W	0183060008
R4	RESISTOR 100, 10%, 1/2W	0174790007
R5	RESISTOR 1K, 10%, 1/4W	0171560001
R6	RESISTOR 10K, 10%, 1/4W	0170410005
R7	RESISTOR 1050, 1%, 1/8W	1010620029
R8	RESISTOR 121, 1%, 1/8W	0195320000
R9	RESISTOR 374, 1%, 1/8W	1011030039
R10	RESISTOR 121, 1%, 1/8W	0195320000
XU1	SOCKET, TRANSISTOR TO-3	0841550000
XU2	SOCKET, TRANSISTOR TO-3	0841550000
	FUSECLIP, PC MOUNT	0534610005
	KEY, POLARIZING	1008070033

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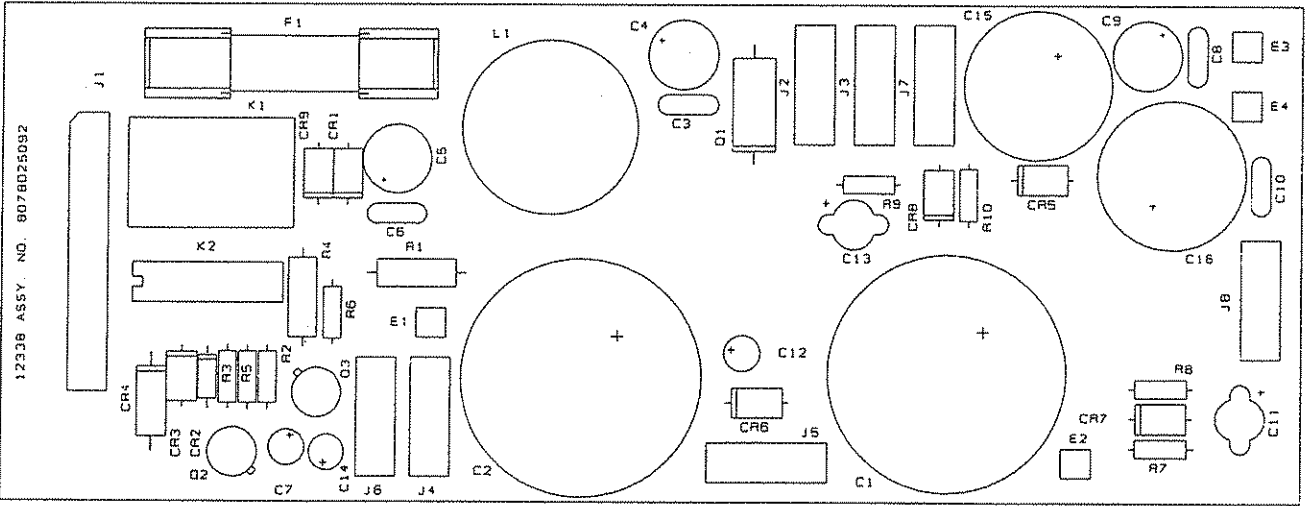


Figure 5.8.12 PC Assembly, 5/12V Regulators 3A3A2, page 1 of 2.

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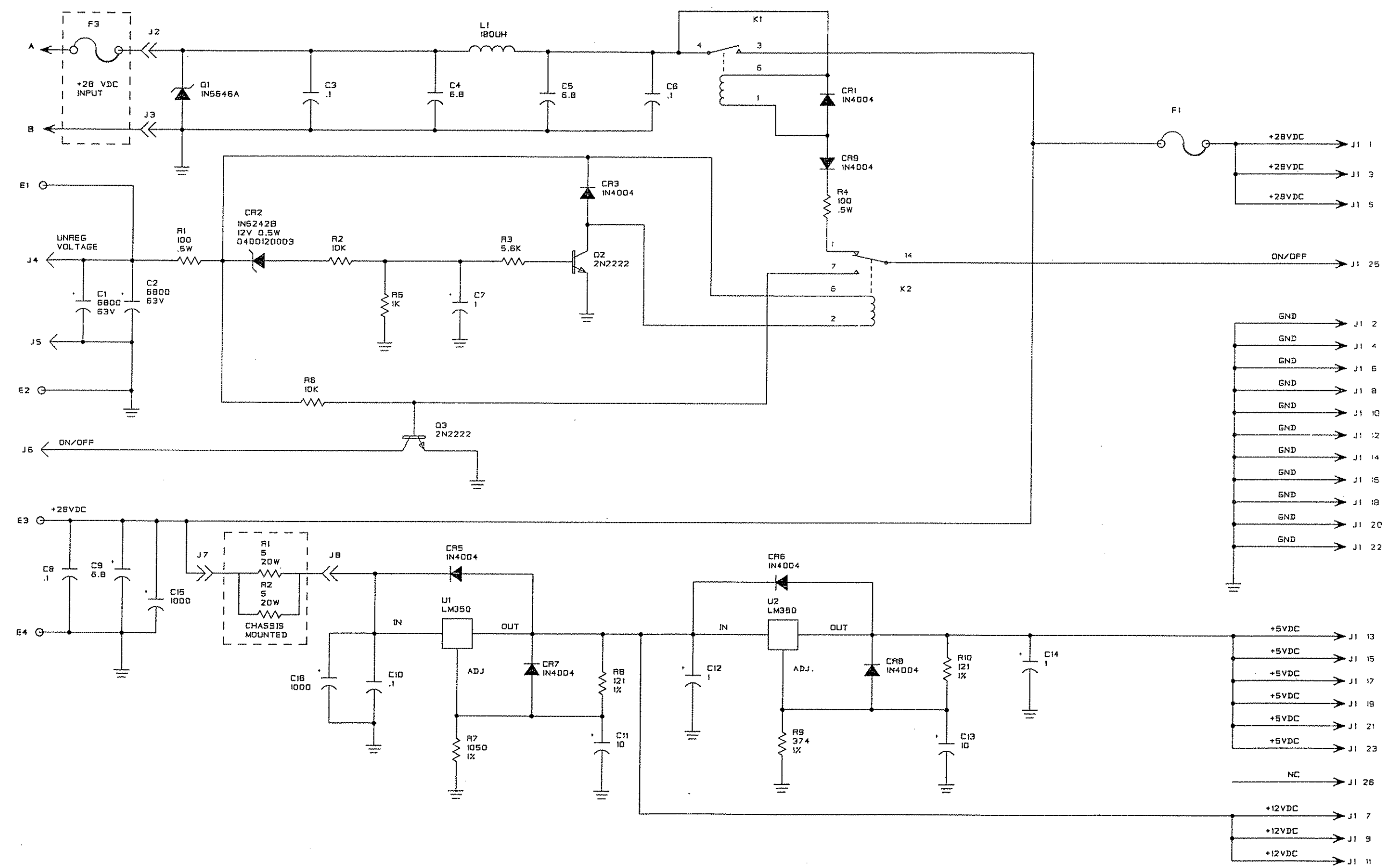


Figure 5.8.12 PC Assembly, 5/12V Regulators 3A3A2, page 2 of 2.

PC ASSY, AUDIO CONNECTORS 3A3A3		
	PCASSY,AUDIO CONNECTORS 3A3A3	8078018096
C1	CAP. .01μF, 50V, X7R 20%	0281730008
C2	CAP. .01μF, 50V, X7R 20%	0281730008
C3	CAP. .01μF, 50V, X7R 20%	0281730008
C4	CAP. .01μF, 50V, X7R 20%	0281730008
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. .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
J1	CONNECTOR, HEADER, 20 PIN MALE	1011210207
J2	CONNECTOR, HEADER, 10 PIN MALE	1010800027
J3	CONNECTOR, POWER, 19 PIN, FEM	1011110008
J4	CONNECTOR, POWER, 10 PIN FEM	1010640020
ZS1	VARISTOR, MOV V230LA20A	1010720023
ZS2	VARISTOR, MOV V230LA20A	1010720023

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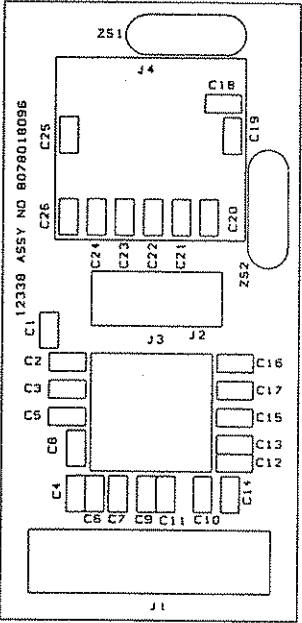


Figure 5.8.13 PC Assembly, Audio Connectors 3A3A3, page 1 of 2.

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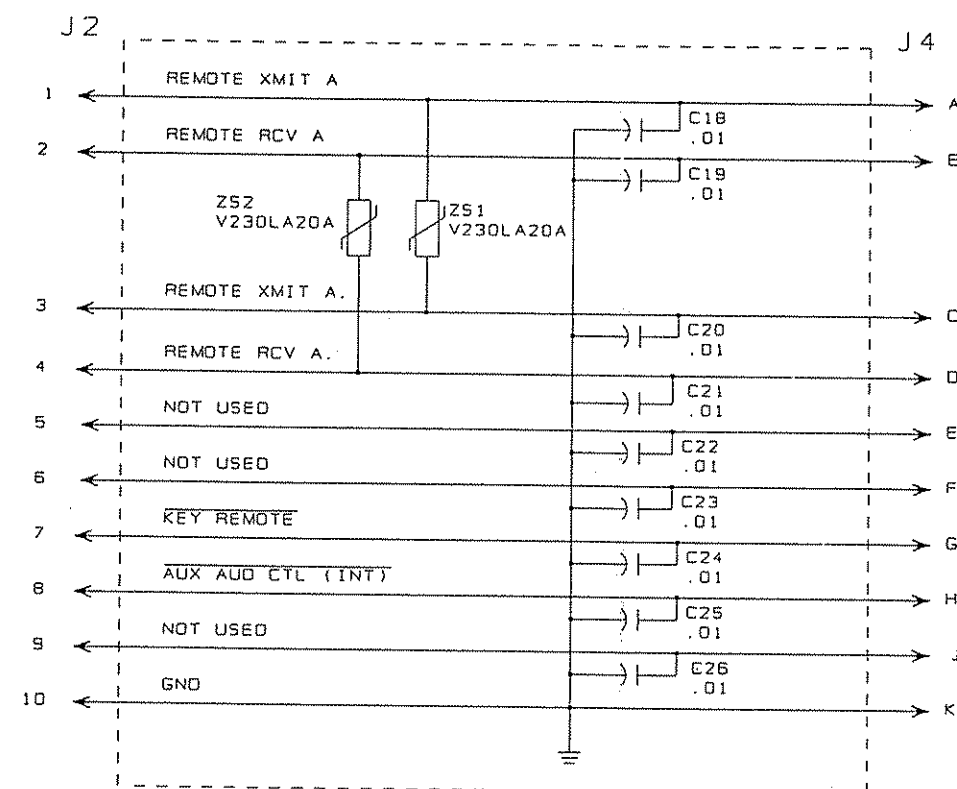
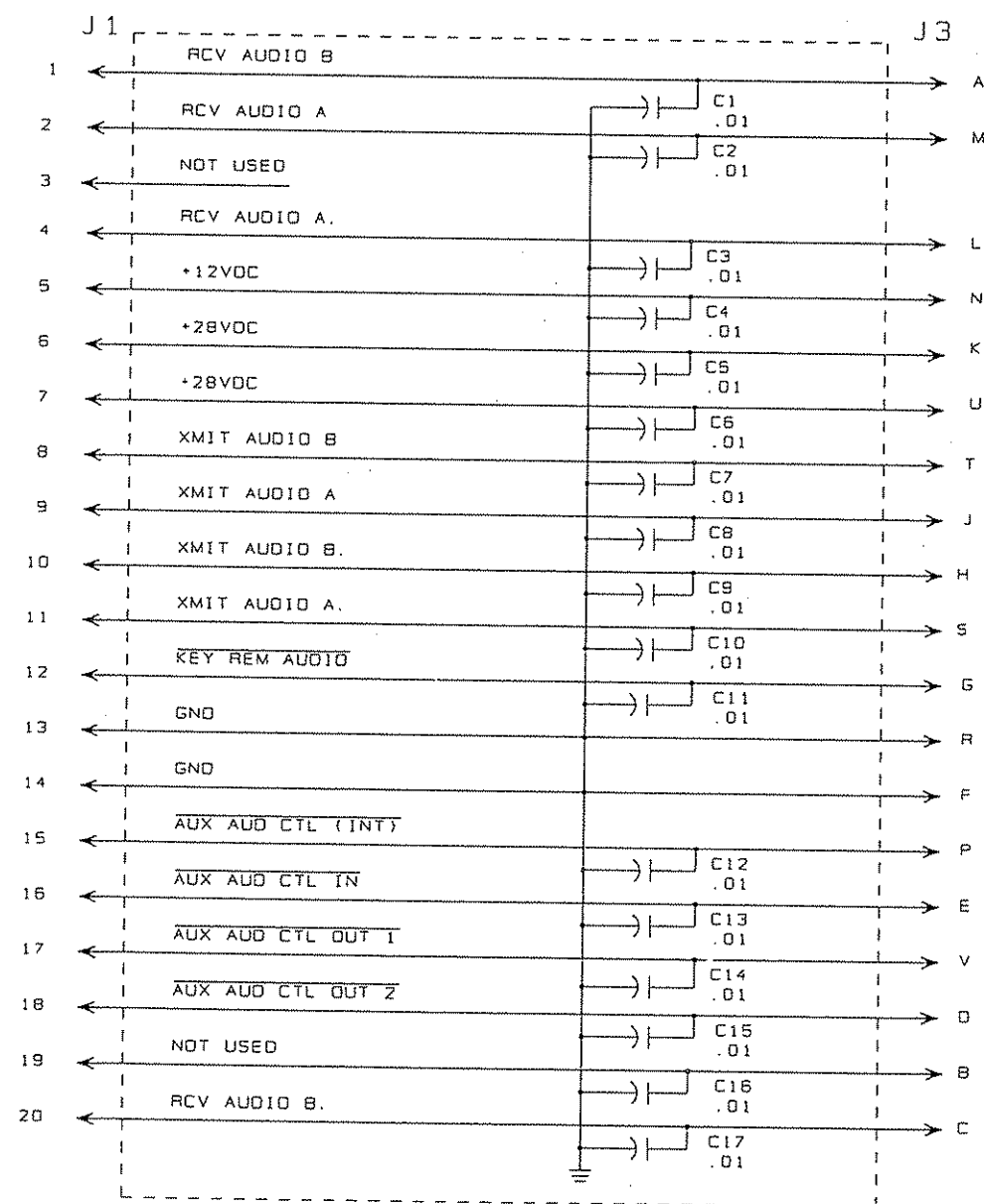


Figure 5.8.13 PC Assembly, Audio Connectors 3A3A3, page 2 of 2.

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TM - 8129000563

REMOTE CONTROL UNIT
for
RT-9000B HF/SSB
TRANSCEIVER

RCU-9310B

SPECIFICATIONS and
OPERATION SUPPLEMENT



SUNAIR 3005 Southwest Third Avenue, Fort Lauderdale, Florida 33315-3312

Revision Record

Revision	Date	ECN	Description
N1B	29 Sep 04	8129-0001	Release for production

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SECTION 6.I

GENERAL INFORMATION

6.1.1 PURPOSE OF EQUIPMENT

The RCU-9310B Remote Control Unit is designed to provide complete operational control of one or more remote located RT-9000B 125 Watt HF/SSB Digital Transceiver(s) that provide communications from 1.6 to 29.99999 MHz (receive 100 kHz to 29.99999 MHz). Modes of operation include USB, LSB, AM equivalent, CW, and DATA (with external modems). The RCU-9310B is designed to be used in fixed station or mobile environments and may be computer or remotely controlled using RS232, RS422, or FSK tones communications formats.

The RCU-9310B is also capable controlling all aspects of Automatic Link Establishment (ALE) Set up and Operation.

6.1.2 GENERAL DESCRIPTION

The RCU-9310B can be used in base station 19-inch equipment rack installations, on tabletops, in mobile installations or transportable cases. Its rugged package makes the RCU-9310B ideal for all environments. Internally, the RCU-9310B is designed with the service technician in mind. The Built-In-Test-Equipment (BITE) capability provides descriptive front panel readouts about the operating status of modularized plug-in assemblies. LED indicators located on the each module permits helps the technician rapidly identify a faulty module.

The RCU-9310B has a simple, easily understood front panel. First time users may operate the RCU-9310B without extensive training. A large LCD display provides continuous status of major operating parameters such as Operating Frequency, Channel, Emission Mode, Power Output, Local/Remote control status and Receiver AGC and BFO settings. Extensive metering functions allow the operator to monitor Transmit functions such as Forward and Reverse power, ALC action, and Line Audio input levels and Receive functions such as Signal Strength and Line Audio Output Levels. Metering is displayed as a bar graph. Internal test routines handle and display easily understood status messages about external equipment, when present, such as a Linear Power Amplifier and/or Antenna Coupler.

The front panel contains two (2) keypads. A function-oriented keypad provides ready access to basic operating functions such as mode and setup selections, while a numeric keypad provides convenient entry of channel numbers, operating frequencies, and other numeric data. In addition to the Main Display and keypads, a set of five (5) variable function keys with a dedicated display, together comprises an effective system of additional operating controls. The set of function keys and its display are referred to as "Feature Keys" and "Feature Menu", respectively. The RCU-9310B's Feature Key And Menu system offers a flexible means of presenting the operator with additional control and feature selections and is under software control. This arrangement also permits context related feature choices and eases new feature implementation.

Gray is the standard color. If a particular color other than Gray is required, contact the Sunair Marketing Department for information about changes to the standard color.

6.1.3 TECHNICAL SPECIFICATIONS

6.1.3.1 GENERAL

REMOTE INTERFACE: RS-232, RS-422, and 300-Baud FSK Tone Modem

Must be hardwired between RCU-9310B and RT-9000B for Interface type used

TRANSCIVER INTERFACE: Transmit and Receive audio, 0 dBm adjustable into 600-Ohms

MEMORY RETENTION: Non-Volatile

BITE (Built-In-Test-Equipment): Fault isolated to Lowest Replaceable Unit (LRU) module
Module status provided at front panel and individual module

POWER INPUT: 115/230 VAC \pm 15%, 50/60 Hz; +26 VDC \pm 15%.
With both input power types connected, unit will execute AC/DC Auto Changeover.

POWER CONSUMPTION: 64.8 Volt Amps, + 0.75PF

SIZE: Inches (cm): High: 5.96" (15.2) X Wide: 17.83" (45.4) X Deep: (See below)

Front Panel-to-rearward extreme: 8.75" (22.2)

Front Panel protrusion: 1.56" (4.0)
(Handles & Controls)

Rack-mounted installations must provide 3.0" (7.6) minimum
additional clearance for air circulation and cable clearance.

WEIGHT: Lbs (Kg): 20 lbs (9.1)

CONSTRUCTION: Modular plug-in assemblies

AUDIO OUTPUT: Internal Speaker: 5 Watts, less than 5% THD
Headset: Low impedance
Two (2) selectable 600-Ohm lines. Output level: -20 dBm to +10 dBm

AUDIO INPUTS: Microphone
Aux. Connector
Two (2) selectable 600-Ohm lines. Input level: -20 dBm to +10 dBm

AUDIO COMPRESSION: 10 dB Nominal (Internal Disable)

6.1.3.5 ENVIRONMENTAL

TEMPERATURE: -30°C to +50°C

HUMIDITY: 100% at 50°C

RAIN: MIL-STD-810F, Method 506.4

SHOCK: MIL-STD-810F, Method 516.5, Procedure 1

VIBRATION: MIL-STD-810F, Method 514.5

6.1.4 EQUIPMENT SUPPLIED & AVAILABLE OPTIONS

The following charts list the supplied items and available options for the RCU-9310B Remote Control Unit.

Supplied Items		Sunair Part No.
Remote Control Unit, RCU-9310B, Gray		8129xxxxxx
Microphone Assembly, Handheld		8076000602
Manual Supplement, RCU-9310B Specifications and Operation		8129000503 (Section VI)
Mating Connector Kit, RCU-9310 / B		8078000499
AC Power Cord Assembly	115 VAC	8076002095
	230 VAC	8076002192

6.1.5 OPTIONAL ACCESSORIES

The following chart lists optional accessories available for use with the RCU-9310B Remote Control Unit.

Description	Sunair Part No.	Remarks
Desktop Kit	8076000009	Color - Gray
Headset	0840200005	
Headset, Lightweight	1011190010	
CW Key with Phone Plug	5024000994	
Handset Assembly	8076000793	
Desktop Microphone	8076000891	
Shroud Kit for Rackmounting (No Slides)	1004770022	Color - Gray
Rackmount Kit with Slides	8076004853	Color - Gray
DC Power Cord Assembly	8101002294	
PS-9015 12-to-28 VDC Converter	8078600097	
Running Spares Kit (Fuses)	8078904096	
Service Kit, 9000 Series	8076003393	Contains the following items: Repair Alignment Tools -1011480034 PCB Extender Assy ----- 8076003091 PCB Card Puller ----- 8076003105
Field Module Kit, RCU-9310B	8129905094	
Cable Assembly, Audio and Control	8078004591	Made to length
Cable Assembly, Audio-to-External Devices	8076004594	

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SECTION 6.3

OPERATION

6.3.1 GENERAL

This section provides the operator with the location and use of the RCU-9310B 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 6.3.1.1 below, shows the location of the control groups, displays, and their general purpose.

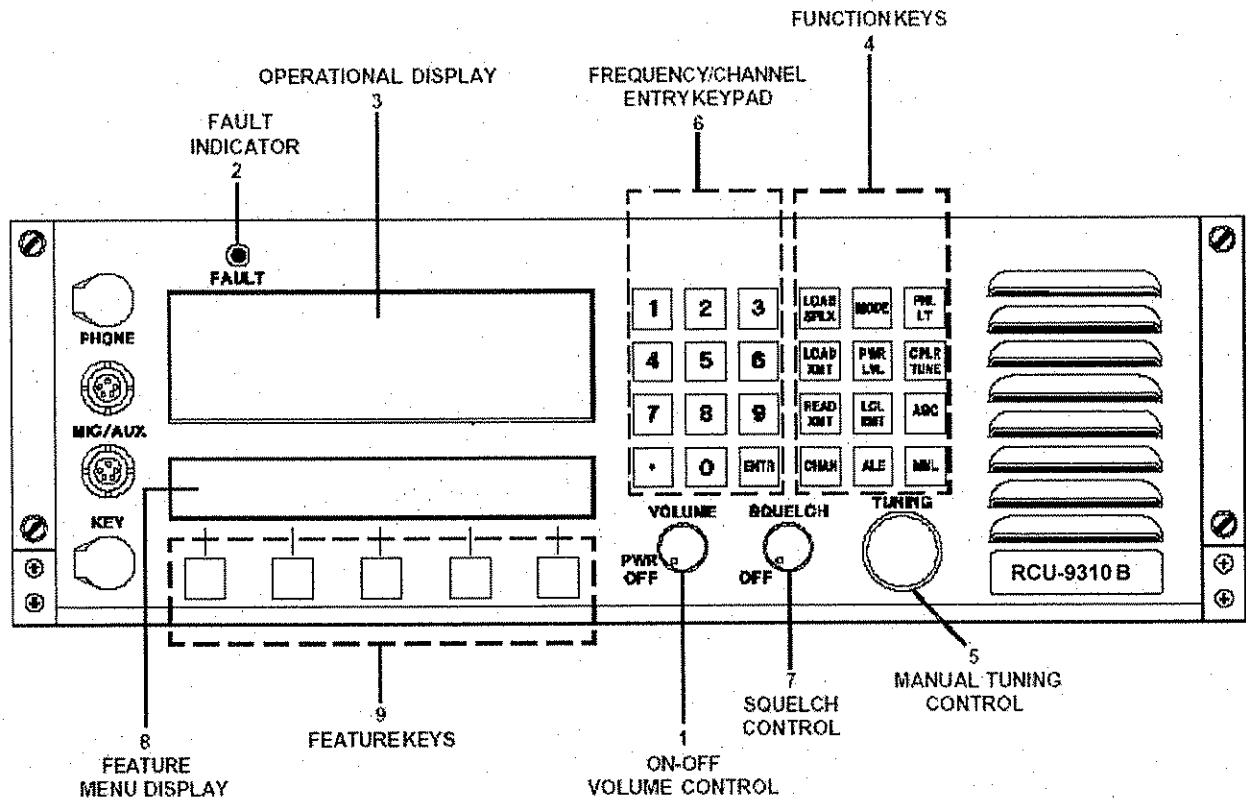


Figure 6.3.1.1 RCU-9310B Front Panel Controls

1 ON/OFF VOLUME CONTROL

When this control is in the full counter clockwise position, the equipment is OFF. To power-up the unit, rotate the control clock-wise. Once on, the internal speaker audio output level is initially at minimum. Rotating the volume control clock-wise increases the speaker audio output level.

NOTE: The setting of this control does not affect the level of the Remote Audio Line outputs from the equipment rear panel.

2 FAULT INDICATOR

This Red indicator is lit if a 'FAULT' condition is detected in the RCU-9310B Remote Control Unit. Check the installation and proceed to the section on BITE (Built-In-Test-Equipment), located in section 6.3.3.1 of this manual. Fault conditions detected when executing a 'REMOTE BITE' which tests the remote controlled RT-9000B Transceiver will NOT operate and light this indicator.

3 OPERATIONAL DISPLAY

This Liquid Crystal Display (LCD), provides a variety of information required to operate the equipment. Information is displayed in four primary areas of the display as indicated in Figure 6.3.1.2.

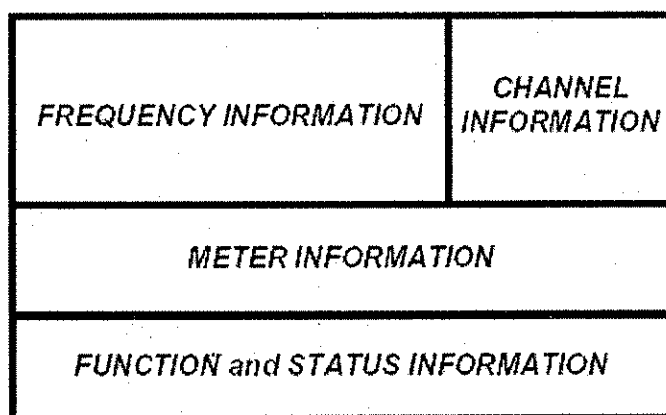


FIG 6.3.1.2 RCU-9310B Operational Display - Information Location

4 FUNCTION KEYS

This group of twelve (12) keys is used to control the primary operating functions of the remote RT-9000B Transceiver such as Mode selection, Channel selection, Channel loading, AGC characteristic selection, power output level selection, Coupler Tune command, and manual tuning. The Local/Remote ('LCL/RMT') and Panel Illumination ('PNL LT') refer to local RCU-9310B control functions.

5 MANUAL TUNING CONTROL

This control is used to control manual tuning of the RT-9000B Transceiver frequency or channel selection. Actual frequency setting or channel selection is indicated in the Operational Display.

6 FREQUENCY/CHANNEL ENTRY KEYS

This group of twelve (12) numeric keys is primarily used for frequency information entry. This keypad may be used to enter, select, or load a specific operating frequency or Channel Number. This keypad may also be used to enter other numerical settings and parameters.

7 SQUELCH CONTROL

This control is used to set the silencing threshold for the squelch circuit. When this control is set to the full counter-clockwise position, the squelch circuit is disabled and the equipment is unsquelched (fully unsilenced).

Rotating the control clock-wise enables the squelch circuit and sets its silencing threshold. When the control is initially moved, a click will be felt indicating the Squelch switch has been actuated. Clock-wise control rotation is continued until the Receiver noise just silences (or is "Squelched").

When set as described above, the squelch circuit is active but maximum Receiver sensitivity has been maintained. Further clock-wise Squelch control rotation increases the signal strength required to "open" the squelch and allow an incoming signal to be heard. This action also effectively decreases Receiver sensitivity.

8 FEATURE KEY MENU DISPLAY

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

9 FEATURE KEYS

This group of five (5) "Soft" keys enables various functions as indicated in the display located directly above these keys.

NOTE: An asterisk (*) appearing at the right-hand side of a function in the display indicates that the feature preceding it is enabled, selected, or 'ON'.

The RCU-9310B Remote Control Unit controls can be divided into three categories:

- A. Primary Operations (Section 6.3.2)
- B. Equipment Set-Up (Section 6.3.3)
- C. Advanced Operations (Section 6.3.4)

6.3.2 PRIMARY OPERATIONS

Unless otherwise noted, all processes and procedures are based on operating a remote located RT-9000B Transceiver from the RCU-9310B Remote Control Unit described in this manual. Before performing any operations, the RCU-9310B must be physically connected as described in Section II – Installation and have its I/O Port set up as described in section 6.3.3.7 I/O Port Set Up.

The data handling capability (Baud Rate) of the wiring used to interconnect the RCU-9310B and remote RT-9000B Transceiver will affect some operational features. The impact of the System I/O Baud Rate setting and its effect on system operation will be explained as appropriate. The User, however, must know their System I/O Baud-rate settings to determine which operating instructions apply to their system.

6.3.2.1 LOCAL/REMOTE OPERATION

Before attempting to remote control an RT-9000B Transceiver with the RCU-9310B Remote Control Unit, ensure the Transceiver is properly connected and powered up. Perform the following steps to establish control of the RT-9000B from the RCU-9310B.

Refer to Figure 6.3.2.1. Power up the RCU-9310B Remote Control Unit by rotating the Volume Control at **1** clock-wise to a comfortable listening level. The Operational Display will appear as indicated in Figure 6.3.2.1, except for the Pre-set Channel settings at last power down (shown at **11**). The segment at **8** indicates the point of control with respect to the RCU-9310B. At power up, 'RMT' will be displayed and indicate that the point of control for the RT-9000B Transceiver is currently at the remote Transceiver.

When the RCU-9310B is in the process of taking control of the remote RT-9000B, two (2) slightly different sequence of events will occur. The System I/O Data Rate setting determines which sequence will occur. The following paragraphs describe these sequences.

System I/O Data Rate - 2400 Baud or lower

Depressing the 'LCL/RMT' key at **9** will cause a 'PLEASE WAIT' message to appear in the Operational Display 'FUNCTION STATUS' field (at **3, 5, 6, and 8**) while Local Control Acquisition is underway. The completion time for this process depends on the System I/O Baud Rate setting. Refer to the below table for approximate times. During this time, the displayed Frequency (at **10**) and Channel Number (at **11**) segments of the Operational Display will change to those currently selected and displayed at the RT-9000B Transceiver.

Local Control Acquisition Time	
System I/O Baud Rate	Time (seconds)
300	42
600	21
1200	14
2400	11

After Local Control Acquisition process is finished, the 'PLEASE WAIT' message will automatically clear and be replaced by the settings for the current RT-9000B Pre-set Channel. These settings determine Mode, Receiver AGC speed characteristic, and Power Output Level and are shown at **3**, **5**, and **6**, respectively).

Systems I/O Data Rate - 4800 Baud or higher

Depressing the 'LCL/RMT' key at **9** will cause a 'PLEASE WAIT' message to appear in the Operational Display 'FUNCTION STATUS' field (at **3**, **5**, **6**, and **8**) for approximately ten (10) seconds before changing to the next message. During this time, the displayed Frequency (at **10**) and Channel Number (at **11**) segments of the Operational Display will change to those currently selected and displayed at the RT-9000B Transceiver.

The previous 'PLEASE WAIT' message will clear and be replaced by a 'CHANNEL DOWNLOAD' message. The Channel Number segment at **11** will change to 'CH01' and begin rapidly counting upward to 'C127'. The Channel Number initially displayed before the counting step routine will reappear. This process takes approximately 25-35 seconds to complete.

After this routine finishes, the 'CHANNEL DOWNLOAD' message will clear and be replaced by the settings for the current RT-9000B Pre-set Channel. These settings determine Mode, Receiver AGC speed characteristic, and Power Output Level and are shown at **3**, **5**, and **6**, respectively).

After either of the above sequences finish, a 'LCL' (Local) indication will appear in the segment at **8**. This indicates the RCU-9310B is now the point of control for the remote RT-9000B Transceiver. At the remote RT-9000B, a 'RMT' will appear at **8** in its Operational Display and indicate it is being remotely controlled.

NOTE: If the remote-controlled RT-9000B Transceiver is not powered up, the connection is not intact, or not otherwise communicating with the RCU-9310B Remote Control Unit, the following sequence of messages will be displayed after the Local/Remote ('LCL/RMT') key is depressed:

1. 'PLEASE WAIT' (15 seconds)
2. 'NO REPLY FROM REMOTE' (5 seconds)
3. (return to original display)

Local control may be returned to the remote RT-9000B Transceiver by performing either of the following actions. In both cases, the transfer of control is immediate and requires no time to complete.

- At the RCU-9310B, depressing the 'LCL/RMT' key will immediately return control back to the remote RT-9000B. This will be indicated by the RCU-9310B display at **8** changing from 'LCL' (Local) to 'RMT' (Remote). At the remote RT-9000B Transceiver, the 'RMT' (Remote) indication will change back to 'LCL' (Local).
- At the remote RT-9000B, depressing the 'LCL/RMT' key will immediately take back control from the RCU-9310B. This will be indicated by the RT-9000B display at **8** changing from 'RMT' (Remote) back to 'LCL' (Local). At the RCU-9310B Remote Control Unit, the 'LCL' (Local) indication will change to 'RMT' (Remote).

NOTE: When the RCU-9310B is in Remote ('RMT') condition, any attempt at the RT-9000B Transceiver to change or use its normal control functions, will cause the following message sequence to appear:

- 'FUNCTION DISALLOWED' (1 second)
- 'UNIT IN REMOTE MODE' (2 seconds)

These messages will clear automatically and the Operational Display will return to its normal display state.

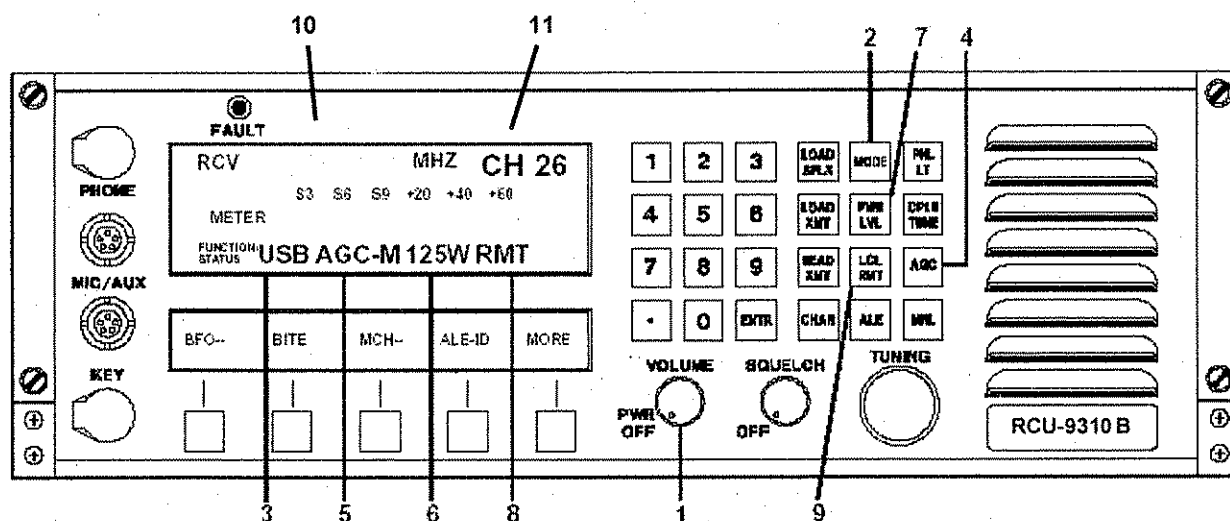


Figure 6.3.2.1 RCU-9310B Operational Display

6.3.2.2 REMOTE TRANSCEIVER MODE, AGC, AND TRANSMIT POWER SET UP

These settings determine the basic operating characteristics for the Receiver and Transmitter sections of the RT-9000B transceiver. These settings are Transceiver Emission Mode, Receiver AGC speed characteristic, and Transmitter RF Power output.

When the RCU-9310B is controlling the RT-9000B Transceiver, there may be minor but perceptible differences as to the RCU-9310B reacts to setting changes as compared to the RT-9000B. As an example, when selecting a different Power Output level, an erroneous Power Output level indication may momentarily appear but quickly disappear. This is a normal response and is caused by system's automatic accessory detection circuitry and the Data Communications link speed between the RCU-9310B and RT-9000B units.

Unless otherwise noted, refer to Figure 6.3.2.1 for the location of controls and features.

Transceiver Emission Mode Selection

To select the Emission Mode, depress 'MODE' key successively at **2** until the desired selection appears in Operational Display segment at **3**. This selection applies to both Receive and Transmit operation. The choices are 'USB', 'LSB', 'CW', and 'AM'. If the Data filter option has been installed in the RT-9000B Transceiver, a 'DATA' choice will also be displayed and be available.

Receiver AGC Speed Characteristic

To select the Receiver AGC speed characteristic, depress 'AGC' key successively at **4** until the desired selection appears in the Operational Display segment at **5**. The choices are 'AGC-S' (Slow), 'AGC-M' (Medium), and 'AGC-F' (Fast). The 'Slow' AGC characteristic is generally desirable with speech transmission. The Fast AGC characteristic is desirable for data transmission.

Transmitter Power Output Selection

Transmitter RF power output is indicated in the Operational Display segment at **7**. Normally, this setting will be set to the '125W' (Watts) power output level by default. If the '65W' (Watts) RF power output level is desired, depress the 'PWR LVL' (Power Level) Key at **7**. The indicated power level output will change accordingly.

NOTE: An external Linear Power Amplifier is frequently used with the RT-9000B Transceiver. The system will automatically detect when this optional equipment is present and automatically adjust the available Power Output Level choices. Depending on the specific amplifier model, the additional Power Output Level choices will be '500W' (500 Watts) or '1000W' (1000 Watts).

NOTE: When the RCU-9310B is in Remote ('RMT') condition, any attempt at the RT-9000B Transceiver to change or use its normal control functions, will cause the following message sequence to appear:

- 'FUNCTION DISALLOWED' (1 second)
- 'UNIT IN REMOTE MODE' (2 seconds)

These messages will clear automatically and the Operational Display will return to its normal display state.

THE BASIC OPERATING SETTINGS OF THE REMOTE TRANSCEIVER HAVE NOW BEEN ESTABLISHED.

6.3.2.3 ESTABLISHING AN OPERATING FREQUENCY

To establish an operating frequency, place the system in the Manual Tuning mode. Refer to Figure 6.3.2.2. If the RCU-9310B Operational Display does not indicate an 'M' (Manual Tuning mode) at **1**, depress the Manual ('MNL') key at **2**. The display will change to the 'M' at **1**. The Feature Menu Display also will change to the "Frequency Step Feature Menu" shown at **7**. The Manual Tuning mode operates only in "Simplex" operating mode (alternate receive and transmit using the same frequency).

Depressing the Load Simplex ('LOAD SPLX') key at **3** will cause the "Frequency Display" at **4** of the Operational Display to go blank. The Numeric Keypad at **5**, may now be used to key in the desired operating frequency up to seven (7) digits long. As each frequency digit is keyed in, the digits will appear in order of entry (left to right) on the Operational Display at **4**. After the complete operating frequency has been keyed in, depress the Enter ('ENTR') key at **6** to enter the selection into the system and remote controlled RT-9000B Transceiver.

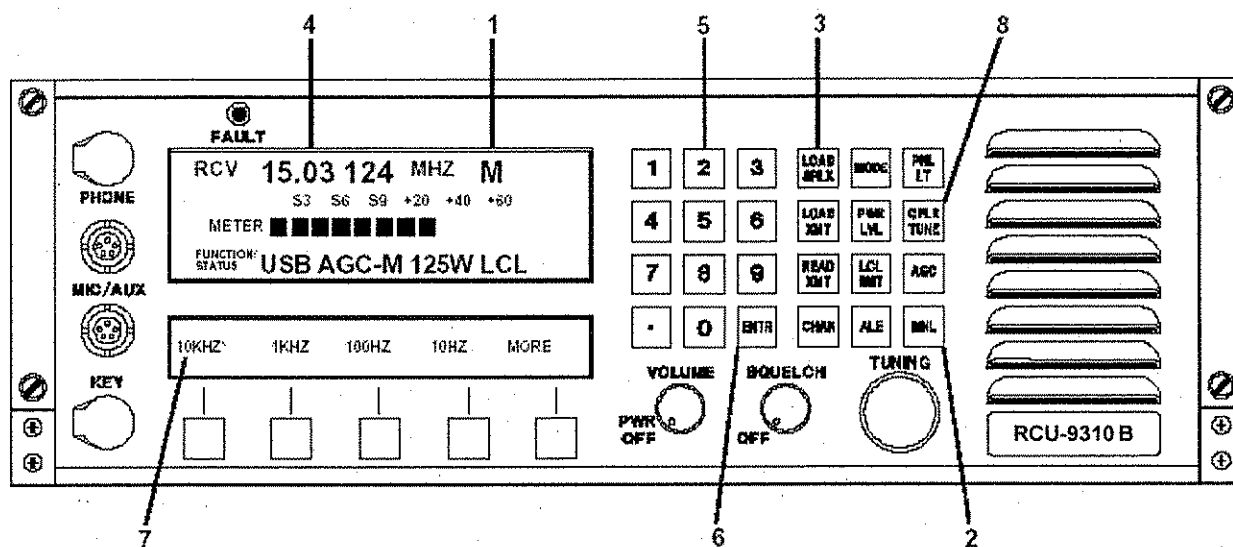


Figure 6.3.2.2 Operating Frequency Controls

THE TRANSCEIVER IS NOW OPERATIONAL ON THE ENTERED FREQUENCY

Because the system is in Manual Tuning mode, the User may change the above-entered frequency with the 'TUNING' dial. The rate (or "steps") that the dial movement will change the operating frequency and other Manual Tuning details are covered later in 6.3.2.6.

NOTE: After the Load Simplex ('LOAD SPLX') key is depressed, the Feature Menu Display shown in Figure 6.3.2.3 will appear. An 'ERASE' selection at **10** will be present. Depressing this key allows the user to erase an in-progress frequency entry, one digit at a time, beginning with the last digit entered (most right-hand). When the desired digits are erased, simply resume frequency entry using the Numeric Keypad. DO NOT depress the 'END' key at **20**.

Depressing the 'END' key at **20** will abort frequency selection and cause the channel to revert to the frequency currently stored.

NOTE: RT-9000B Transceiver Operating Frequency entries between 100 kHz and 1.59999 MHz will be accepted and its Receiver will function normally. However, when its Transmitter is keyed, the frequency display will flash at 4. An 'ILLEGAL XMT FREQ' message will briefly appear in the Operational Display.

NOTE: Frequency entries below 100 kHz will not be accepted and the frequency display will flash at 4.

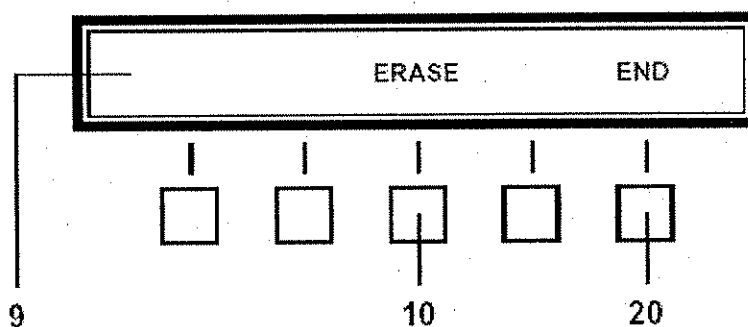


Figure 6.3.2.3 Erase Feature Menu

6.3.2.4 TRANSMIT TUNING

After an operating frequency has been entered as described in section 6.3.2.3, the Transmitter portion of the remote controlled RT-9000B will automatically be tuned to the entered frequency. The RT-9000B will operate in "Simplex" mode. If the RT-9000B Transceiver output is feeding a Broadband Antenna directly, the Transmitter will automatically be tuned. Similarly, if the RT-9000B Transceiver is driving a broadband Linear Power Amplifier (such as the LPA-9600) that is also feeding a Broadband Antenna directly, the entire Transmitter equipment chain will automatically be tuned.

THE REMOTE TRANSCEIVER IS NOW FULLY OPERATIONAL

6.3.2.5 ANTENNA COUPLER TUNING

When the remote controlled RT-9000B uses a Non-resonant Antenna, an Antenna Coupler must be installed between the RT-9000B and Antenna. When the RT-9000B is driving an external Linear Power Amplifier (such as the LPA-9600) that uses a Non-resonant Antenna, an Antenna Coupler must be installed between the LPA-9600 and Antenna. In both cases, the Antenna Coupler becomes the feed point for the Antenna. Transmitter RF Output Power capability is a primary factor in determining which Antenna Coupler model must be used. Typically, the RT-9000B Transceiver and the LPA-9600 Linear Power Amplifier will use models CU-9125 and CU-9150 Antenna Couplers, respectively.

Refer to Figure 6.3.2.2. When an Antenna Coupler is present in the system, depressing the Coupler Tune ('CPLR TUNE') key at **8**, will initiate an Antenna Coupler "Tune Cycle". During the Tune Cycle, the RCU-9310B Operational Display will display the following message:

'COUPLER TUNING'

After the Antenna Coupler Tune Cycle finishes and successfully tunes the Antenna, a message will appear in the RCU-9310B Operational Display and tell the operator the system is ready for use. This message will appear for about three (3) seconds and then automatically return to the normal channel information display. This message is as follows:

'SYSTEM READY'

If the Antenna Coupler is not able to tune the Antenna within 20 seconds, a message will be displayed informing the operator of that result. This message will appear for about three (3) seconds and then automatically return to the normal channel information display. If this result occurs, the Antenna Coupler and Antenna should be checked for any obvious problem. If all appears to be in order, consult the troubleshooting section of the Antenna Coupler manual.

'SYSTEM FAULT'

If the Antenna Coupler develops a Fault or the remote RT-9000B does not receive the expected handshake signals from the Antenna Coupler, the following message will be displayed. This message will appear for about three (3) seconds and then automatically return to the normal channel information display. If this result occurs, consult the troubleshoot section of the Antenna Coupler manual. This message is as follows:

'COUPLER FAULT'

6.3.2.6 MANUAL TUNING

The RCU-9310B can control the manual tuning function of the remote RT-9000B Transceiver. This permits the operating frequency to be changed by rotating the 'TUNING' control. After an operating frequency has been established as described in section 6.3.2.3, rotating the 'TUNING' control clockwise increases frequency; counter-clockwise rotation decreases it. The rate of operating frequency change for a given amount of 'TUNING' control rotation is selectable. Four (4) different Tuning Rates (or "steps") are available.

To manually tune the remote RT-9000B Transceiver, the unit must be in Manual mode and have an operating frequency established according to section 6.3.2.3. Refer to Figure 6.3.2.4.

The rate the operating frequency is changed is indicated in the Feature Menu Display at **3**. Four (4) different Frequency Step choices are available and are selected using the Feature keys directly below the Frequency Step values shown in the Feature Menu Display. An asterisk (*) will appear immediately to the right of the selected Frequency Step value.

As an example, in Figure 6.3.2.4, the asterisk beside '10KHZ' shown at **4** indicates this is the current Frequency Step value. Selecting any of the other values immediately enables that value. By using the "TUNING" dial and the available Frequency Step values, the operator may easily and rapidly train in on a specific frequency or range of frequencies.

If the user wishes to make large changes in operating frequency which would not be practical using the 'TUNING' control, the Load Simplex ('LOAD SPLX') key may also be used to enter the new operating frequency. To do this, depress the 'LOAD SPLX' key. Key in the new frequency with the Numeric Keypad and depress the Enter ('ENTR') key. The operator may then continue to operate the system as previously described on the newly entered frequency.

All operating frequency entries in the Manual Tuning mode operate exclusively as Simplex frequencies. If the User attempts to load a different Transmit frequency using the 'LOAD XMT' key, the following message will briefly appear in the Operational Display and then automatically clear.

'DISALLOWED IN MANUAL'

NOTE: Systems having an Antenna Coupler present and operating in 'Manual Tuning' must be re-tuned whenever the current operating frequency is changed before Transmitting. Refer to the previous section 6.3.2.5 for details.

To exit Manual Tuning ('MNL') mode, depress the 'CHAN' key at **7**. Refer to section 6.3.2.8 for details about operating with Pre-set Channels.

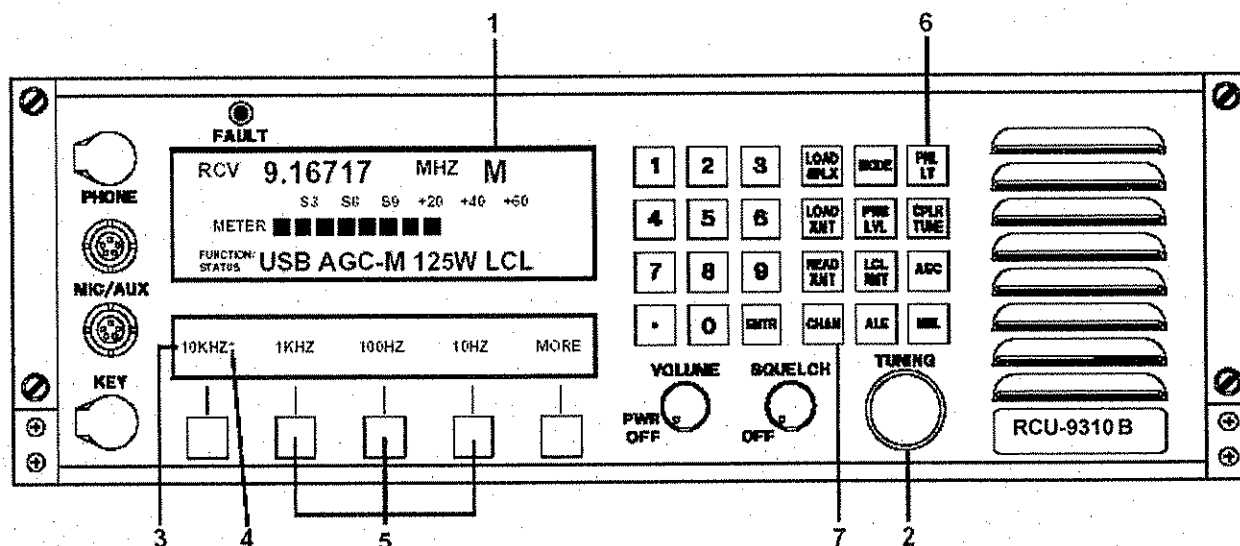


Figure 6.3.2.4 Manual Tuning Controls

6.3.2.7 DISPLAY ILLUMINATION

The Front Panel display will illuminate when the RCU-9310B is first powered up. If no keyboard activity is detected for about 30 minutes, the display illumination will automatically turn OFF. Depressing the 'PNL LT' key will cause both the Operational and Feature Menu Display illumination to turn back ON. A second depression turns it OFF. The user may also turn OFF the display illumination immediately at power up.

NOTE: The backlighting components for both the Operational and Feature Menu Display LCD displays gradually lose luminescence over time. If the display illumination is not needed, the display illumination Panel Light ('PNL LT') should be turned OFF to prolong the life of the backlighting components. See Section V for replacement of backlighting components.

6.3.2.8 OPERATING WITH PRE-SET CHANNELS

Operation using Pre-set Channels requires that the desired operating frequencies and their related settings have been previously entered into the RT-9000B Transceiver's memory. If this has not been previously done, refer to section 6.3.2.10 ahead before continuing.

Refer to Figure 6.3.2.5. Depress the Channel ('CHAN') key at **2**. The numerical portion of the Channel Number at **3** will go blank. Key in desired Channel Number from '0' to '127' using the Numeric Keypad at **4**. The Channel Number may be one, two, or three digits long; no leading zeros are required. The keyed in Channel Number will appear on the display at **3**.

Depress the Enter ('ENTR') key at **5**. The operating frequency stored for the Channel Number entered will now appear on the display at **6**.

NOTE: If the entered Channel Number has been set up for Half-Duplex operation (different Transmit and Receive frequencies), the Receive frequency will be displayed when using these steps. To confirm the Transmit frequency, depress the Read Transmit ('READ XMT') key at **7**. The Transmit frequency will display at **6** for about four (4) seconds and then revert back to the Receive frequency.

If an Antenna Coupler is present in the system, an Antenna Coupler "Tune Cycle" may now be started by depressing the Coupler Tune ('CPLR TUNE') key at **8**. If the Antenna Coupler successfully tunes the Antenna, a 'SYSTEM READY' message will briefly appear and automatically clear. If any other messages appear, the User should refer back section 6.3.2.5 for guidance.

If the Antenna Coupler has Pre-set Channel capability, the coupler will record into its memory its internal settings for a successful "Tune Point". This permits the coupler to quickly return to this "Tune Point" when this particular Channel Number is selected in the future.

If the user has reason to believe the Antenna is no longer properly tuned or Antenna conditions materially change, the User may depress the Coupler Tune ('CPLR TUNE') and start a new "Tune Cycle". Every new "Tune Cycle" is treated as an update to any tuning information currently stored in the Antenna Coupler's memory for any given Channel Number.

THE SYSTEM IS NOW FULLY OPERATIONAL ON THE SELECTED CHANNEL

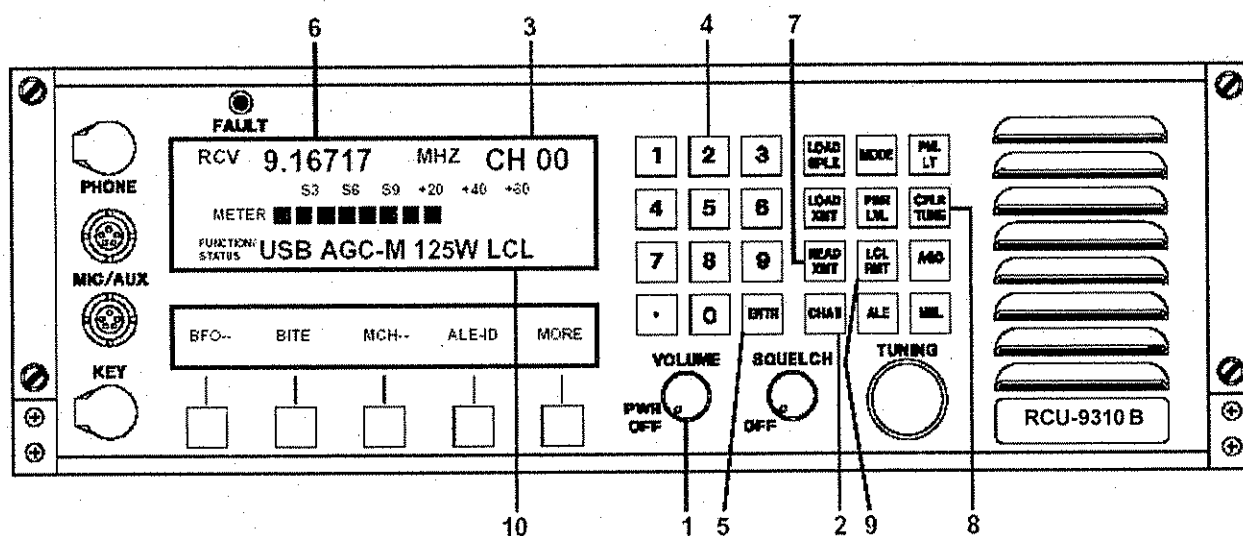


Figure 6.3.2.5 Pre-set Channel Operating Controls

6.3.2.9 MANUAL CHANNEL SELECTION

Manual Channel Selection is a type of Pre-set Channel operation. This type of operation allows Pre-set Channel selection using the 'TUNING' control instead of the Numeric Keypad.

Refer to Figure 6.3.2.6. If not already in Pre-set Channel operation, select it now by depressing the 'CHAN' key. Depress the Feature Menu 'MORE' key successively at 1 until the Feature Menu Display at 2 appears.

Depress Manual Channel key ('M CH-') at 3. The Channel designator, 'CH' immediately preceding the Channel Number on the Operational Display at 4 will change to the Manual Channel designator, 'MC'. An asterisk (*) will appear next to 'MCH -' in the Feature Menu Display to indicate this selection has been enabled.

Rotating the 'TUNING' control at 5 increases or decreases the selected Channel Number in numerical order. The Channel Number is displayed at 6 and its Pre-set operating frequency will appear in the Operational Display at 7.

NOTE: Transceiver operating 'MODE', Receiver 'AGC' Characteristic', and Transmitter RF Output 'Power Level' settings are pre-set and stored for each channel. As the 'TUNING' control is rotated, these settings will change to reflect the settings for the currently selected Channel Number.

Systems using an Antenna Coupler operate in the same manner as previously discussed in section 6.3.2.8. The only operational difference between these modes is the operator's ability to more rapidly change Channels and its possible effect on an Antenna Coupler. Modern Antenna Couplers with Pre-set Channel capability typically re-tune a Pre-set Channel from memory in from 10 to 30 milliseconds and should be able to track RT-9000B Manual Channel Selection.

NOTE: This Channel selection method provides a convenient, rapid means of verifying current Pre-set Channels or logging unknown Channel information.

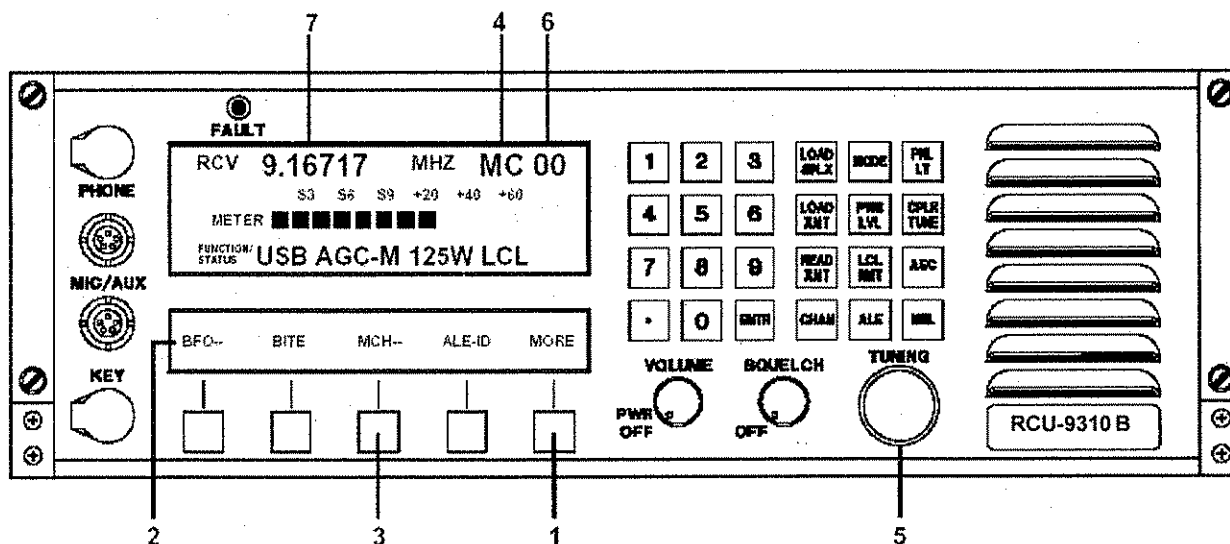


Figure 6.3.2.6 Manual Channel Operating Controls

To exit Manual Channel Selection operation, depress the 'M CH-' Feature Menu key at 3 again. The asterisk (*) beside 'M CH-' in the Feature Menu Display will disappear. The 'MC' designator at 4 will revert back to the 'CH' designator. The Channel Number selected immediately before leaving Manual Channel Selection will continue to be selected.

6.3.2.10 ESTABLISHING OR MODIFYING PRE-SET CHANNELS

The RCU-9310B can perform all operations required to establish or modify Pre-set Channels in a remote controlled RT-9000B Transceiver. These operations allow the user to create, enter and store a Pre-set Channel into the remote RT-9000B Transceiver's memory. Up to 128 Pre-set Channels (Channel Numbers 0 through 127) may be stored. Once a Pre-set Channel has been properly set up, the remote RT-9000B Transceiver will be able to recall all settings whenever that particular Channel Number is selected. Pre-set Channel information is stored in non-volatile memory.

This section describes how to create a New Pre-set Channel and enter the required settings. It also describes how to modify any of those settings. In actuality, modifying a setting merely repeats the original entry process except different setting information is used.

The RT-9000B Transceiver also automatically provides Channel Number information, as an output, for use by external peripheral equipment. This information allows external equipment having Pre-set Channel capability to operate properly and efficiently. Typical examples might include Pre-selectors, Linear Power Amplifiers, and Antenna Couplers. No operator action associated with this capability is required during normal operation.

The following headings listed below appear later in this section and describe how to enter settings for new or existing Pre-set Channels. Unless otherwise noted, refer to Figure 6.3.2.7 for the location of controls and displays.

- Operating Frequency

Simplex Operation	Alternate Receive & Transmit using same frequency
Half-Duplex Operation	Alternate Receive & Transmit using different frequencies

- Transceiver Emission Mode
- Receiver AGC Speed Characteristic
- Transmitter Power Output Level
- External Equipment Set up and Initialization

6.3.2.10.1 Channel Number Selection

The steps in this section form a selection process, which must be performed for either new or existing Channels. This process establishes the Pre-set Channel Number where later setting choices will be stored. User actions after this step will depend on whether an existing Channel is being selected for modification or a new Channel is being established.

If the user is modifying an existing Pre-set Channel setting, proceed as follows: Complete the selection process described in this heading. Proceed directly to the heading that covers the setting to be modified.

If the user is establishing a new Pre-set Channel, complete the selection process described in this heading. Complete ALL remaining headings in this section.

Channel Selection Process

Depress the Channel key ('CHAN') at **2**. The Operational Display will display 'CH' at **3** and Channel Digits at **4** will go blank.

Using the Numeric Keypad at **5**, key in the desired Channel Number to be selected. The keyed in Channel Number now will appear at **4**. Depress the Enter ('ENTR') key at **6** to select the keyed in Channel Number. All later settings entry and storage steps will be associated with this Channel Number.

Proceed to the next step as previously described.

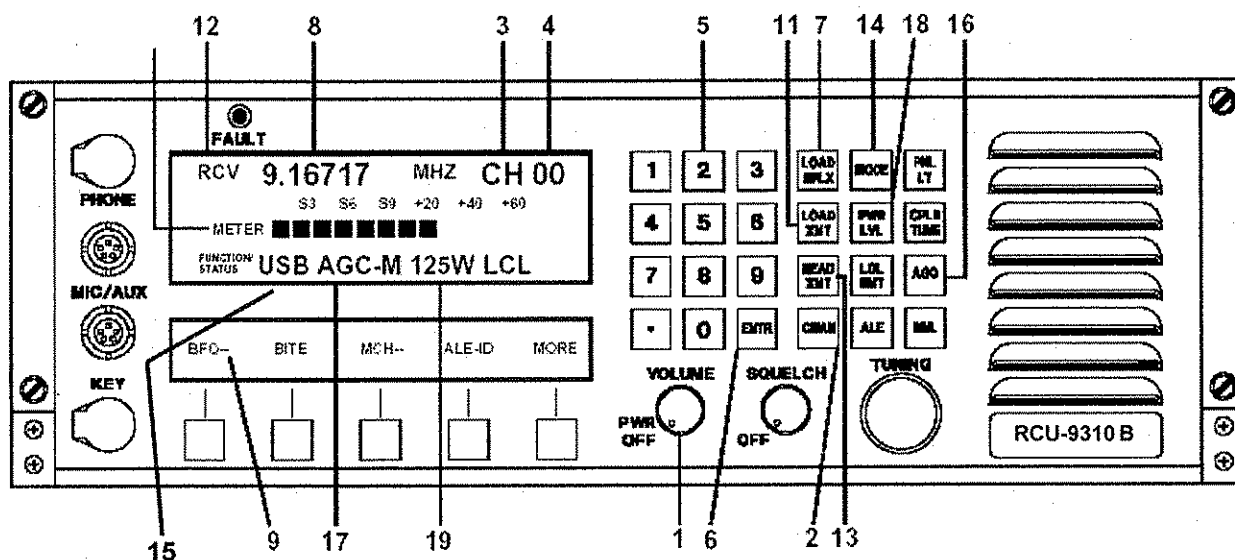


Figure 6.3.2.7 Pre-set Channel Entry Controls

6.3.2.10.2 Operating Frequency Entry

Simplex Operation

Depress the Load Simplex ('LOAD SPLX') key at 7. The frequency display at 8 will go blank and the "Receive/Transmit" mode designator at 12 will continue to display the Receive 'RCV' indication.

Using the Numeric Keypad at 5, key in the desired Operating Frequency (between 100 kHz and 29.99999 MHz). As each digit is keyed in, it will appear in the Operational Display at 8 in order of entry (left to right).

After the Operating Frequency has been completely keyed in, depress the Enter ('ENTR') key at 6 to store it in the currently selected Channel Number. Immediately after depressing the 'ENTR' key, the frequency display in the Operational Display will momentarily blink but remain on the entered frequency.

NOTE: After the 'LOAD SPLX' key is depressed, the Feature Menu Display shown in Figure 6.3.2.8 will appear and provide an Erase ('ERASE') choice at 10. This allows the user to erase a frequency just entered, one digit at a time, beginning with the last digit entered (most right-hand). After the desired digit(s) are erased, simply resume the frequency entry process using the Numeric Keypad. DO NOT depress the End ('END') key at 20.

The 'END' key aborts the frequency entry process and causes the currently selected Pre-Channel to revert to its original settings.

Completing the "Simplex Operation" process prepares the RT-9000B Transceiver to Receive and Transmit using the *SAME* operating frequency for the currently selected Pre-set Channel. If this type of operation desired, skip over the following "Half-Duplex Operation" heading and proceed directly to the later headings dealing with entering or modifying the required Pre-set Channel settings.

If Half-Duplex operation is desired, continue to next heading, "Half-Duplex Operation" and complete the described steps before proceeding.

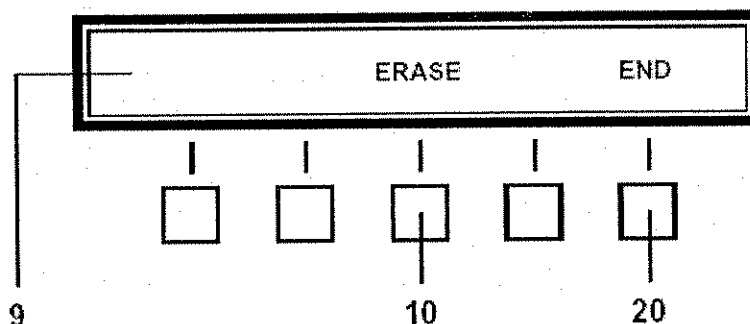


Figure 6.3.2.8 Erase Feature Menu

Half-Duplex Operation

Complete all previously outlined steps for Simplex Operation. This process enters the Receive Operating Frequency.

Depress the Load Transmit ('LOAD XMT') key at **11**. The frequency display at **8** will go blank and the "Receive/Transmit" mode designator at **12** will change from the Receive ('RCV') to Transmit ('XMT') indication.

Using the Numeric Keypad at **5**, key in the desired Transmit frequency (between 1.6 MHz and 29.99999 MHz). As each digit is keyed in, it will appear in the Operational Display at **8** in order of entry (left to right).

After the desired Transmit frequency has been completely keyed in, depress the Enter ('ENTR') key at **6** to enter it into the currently selected Channel Number. Immediately after depressing the 'ENTR' key, the frequency display in the Operational Display will momentarily blank and return to the stored Receive frequency. Additionally, the "Receive/Transmit" mode designator at **12** also will revert back to the Receive ('RCV') indication.

NOTE: After the 'LOAD XMT' key is depressed, the Feature Menu Display shown in Figure 7.3.2.9.2 will appear and provide an Erase ('ERASE') choice at **10**. This allows the user to erase a frequency just entered, one digit at a time, beginning with the last digit entered (most right-hand). After the desired digit(s) are erased, simply resume the frequency entry process using the Numeric Keypad. DO NOT depress the End ('END') key at **20**.

Completing the "Half-Duplex Operation" process prepares the RT-9000B Transceiver to Transmit and Receive using *DIFFERENT* Operating Frequencies (but not simultaneously) for the currently selected Pre-set Channel.

NOTE: The Transmit frequency for currently selected Pre-set Channel may be viewed by depressing the Read Transmit ('READ XMT') key at **13**. The stored Transmit frequency will be displayed for about three (3) seconds before reverting back displaying the stored Receive frequency.

If this type of operation is desired and the required Operating Frequencies have been entered for the currently selected Pre-set Channel, proceed now to the next Heading. Continue entering or modifying the required Pre-set Channel settings.

6.3.2.10.3 Transceiver Emission Mode Entry

Depress the 'MODE' key at **14** successively until the desired Emission Mode appears on the Operational Display at **15**. The displayed Mode indicates the current RT-9000B Emission Mode selection. Four (4) choices are available: 'USB', 'LSB', 'CW', or 'AM'. Depress the Enter ('ENTR') key at **6** to store this selection into the currently selected Pre-set Channel.

NOTE: A fifth Mode choice, 'DATA', will be displayed only if the optional Data filter is installed in the remote RT-9000B Transceiver. Both the RT-9000B Transceiver and RCU-9310B Remote Control Unit CPU Software DIP switch settings must also be properly set for this option. (Refer to Section V of the appropriate equipment Operation and Maintenance Manuals).

NOTE: When Continuous Wave ('CW') Emission Mode is selected, CW Key Release Time and Filter settings automatically default to 'Medium' and 'Normal' settings, respectively. Other choices are available and are covered in section 6.3.3.8 of this manual.

After the desired Emission Mode setting has been entered for the currently selected Pre-set Channel, proceed to the next Heading. Continue entering or modifying the required Pre-set Channel settings.

6.3.2.10.4 Receiver AGC Speed Characteristic Entry

Depress the 'AGC' key at **16** successively until the desired Receiver AGC Speed Characteristic appears on the Operational Display at **17**. The displayed AGC Speed indicates the current Receiver AGC Speed selection. Three (3) choices are available: Slow ('AGC-S'), Medium ('AGC-M'), or Fast ('AGC-F'). Depress the Enter ('ENTR') key at **6** to store this selection into the currently selected Pre-set Channel.

After the desired AGC Speed Characteristic setting has been entered for the currently selected Pre-set Channel, proceed to the next Heading. Continue entering or modifying the required Pre-set Channel settings.

6.3.2.10.5 Transmitter Power Output Level Entry

Depress the Power Level ('PWR LVL') key at **18** successively until desired Power Level appears on the Operational Display at **19**. The available choices depend on whether an external Linear Power Amplifier is present in the system and its power output capability. The available choices are: '65W' or '125W' when an external amplifier IS NOT present. When an external amplifier IS present, the additional choices will be: '500W' for the LPA-9500 Amplifier or '500W' and '1000W' for the LPA-9600 Amplifier. Depress the Enter key ('ENTR') at **6** to permanently store a new Power Level selection into the currently selected Pre-set Channel.

After the desired Power Level setting has been entered for the currently selected Pre-set Channel, proceed to the next heading if other equipment is being used in conjunction with the RT-9000B Transceiver. If no other equipment is being used, skip the next Heading and go directly to the end of this section.

6.3.2.10.6 External Equipment Set up and initialization

If the remote RT-9000B Transceiver is part of a system with external equipment having Pre-set Channel capability, this equipment should now be set up and initialized as described in the appropriate equipment manuals.

The most common type of external equipment will be an Antenna Coupler. The User should refer to section 6.3.2.5 for guidance.

After completing entry of all settings in this section, the remote RT-9000B Transceiver is now ready for control on this Pre-set Channel by the RCU-9310B Remote Control Unit. Additional Pre-set Channels may be set up by repeating the preceding steps 6.3.2.9.1 through 6.3.2.9.5 for each new Channel Number.

6.3.2.11 BFO OPERATION

A Beat Frequency Oscillator (BFO) originally was required to receive Continuous Wave (CW) and later, various suppressed-carrier mode signals such as Single Sideband (SSB). Modern Receiving equipment, like the RT-9000B, instead uses a Product Detector circuit to perform the detection (or demodulation) for these signal types.

Even though the BFO function is no longer used for its original purpose, it still performs a useful function in today's equipment. The BFO function is a receive-only feature that provides fine frequency adjustment or compensation for incoming signals. This permits the RT-9000B to faithfully receive off-frequency signals without affecting the RT-9000B's transmitting frequency. Up to a ± 1.99 kHz frequency deviation from the indicated or nominal receive frequency can be handled.

A common use of the BFO is to use it in voice modes as a "Clarifier" to correct unpleasant speech output caused by a frequency offset. Other possible uses might include improving the operation of external tone operated devices or modems.

To use the BFO function, depress the 'MORE' key from the main menu successively until the Feature Menu Display shown in Figure 6.3.2.10 appears.

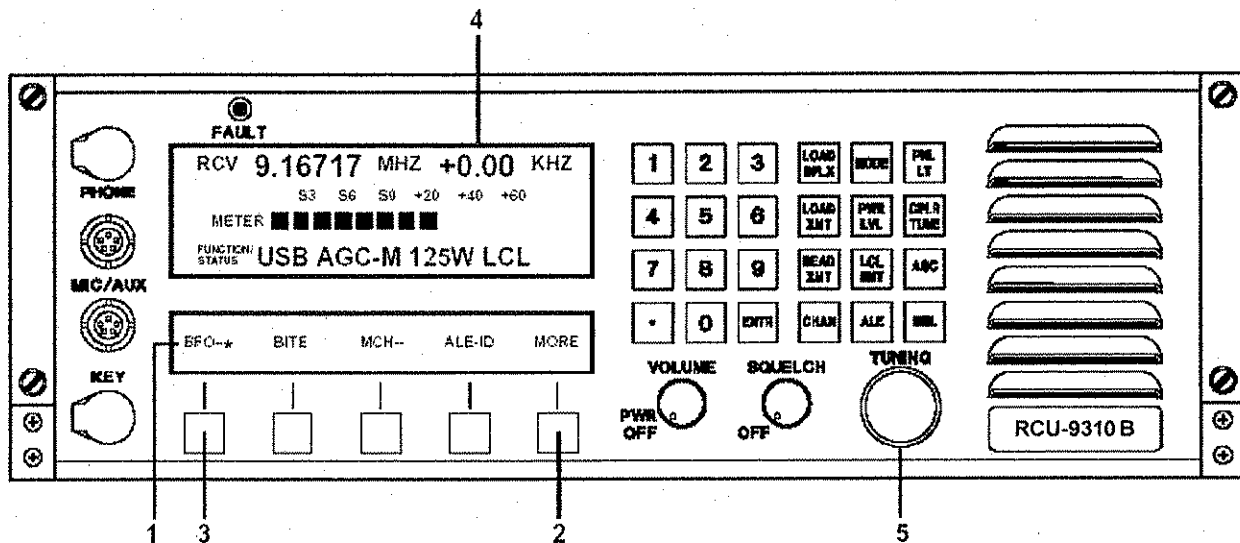


Figure 6.3.2.9 RCU-9310B Displays with BFO Enabled

Depress the 'BFO' feature key at 3. An asterisk (*) will appear next to 'BFO' in the Feature Menu Display indicating this function is now enabled. The Channel Number information (Channel designator, 'CH' and Number) shown at 4 in the Operational Display will be replaced with the BFO Offset Frequency and "± Polarity Indicator" (initially: + 0.00 kHz).

The BFO Offset Frequency may now be set at any point within a ± 1.99 kHz range by rotating the 'TUNING' control at 5. The BFO Offset Frequency increases in 10 Hz steps with clockwise rotation of the control and decreases with counter-clockwise rotation.

The BFO is disabled by depressing the 'BFO' feature key at 3 once again.

NOTE: The BFO feature is Receive-only function and can only be selected if USB, LSB, CW, or Data Emission Modes are selected. Transmitter frequency and operation is not affected by BFO operation.

NOTE: The BFO feature operates only in "Channelized" operating modes. If 'Manual' Tuning mode is currently selected, any attempt to enable the BFO feature will be rejected and cause the following message to briefly appear in the Operational Display:

'DISALLOWED IN MANUAL'

NOTE: If the BFO feature is currently selected and 'Manual' Tuning mode is then selected, 'Manual' mode will be selected but the BFO feature will automatically be disabled.

6.3.3 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.

6.3.3.1 BITE (Built-In-Test-Equipment)

The RCU-9310B Remote Control Unit and the RT-9000B Transceiver that it controls are both equipped with self-diagnostic routines allow the operator to verify that all LRUs (LRU stands for Lowest Repairable Unit) are functioning correctly. If a fault is found, these test routines will help identify which LRU is faulty. The BITE function operates independently of any mode in which the equipment was operating before the BITE function was enabled.

Two (2) different BITE test routines are available from the RCU-9310B front panel. These BITE test routines individually test the RCU-9310B Remote Control Unit and remote RT-9000B Transceiver and are referred to as "Local BITE" and "Remote BITE", respectively.

The Local BITE test routine checks all RCU-9310B internal modules. RCU-9310B Local BITE should always be performed first when diagnosing a problem. This allows the operator or technician to confirm their local hardware is operating correctly before performing the "Remote BITE" tests on the remote controlled RT-9000B Transceiver. This method provides the best test credibility to both BITE test routines.

The Remote BITE test routine causes all three (3) RT-9000B Transceiver resident BITE test routines to execute sequentially and effectively run as a single test. The order of execution of the RT-9000B BITE tests is: 1.) General BITE, 2.) Transmit (TX) BITE, and 3.) Receive (RX) BITE. The RCU-9310B Remote BITE test sequence causes the remote RT-9000B to execute the same tests and same limits as when executed from its own front panel.

6.3.3.1.1 Local BITE

The RCU-9310B Local BITE ('LOC - BITE') test routine may be executed under the following two (2) different operating conditions:

- RCU-9310B - not connected to OR not actually controlling a remote RT-9000B Transceiver
- RCU-9310B - connected and actually controlling a remote RT-9000B Transceiver

Different control settings, however, are used for each of these operating conditions. The following paragraphs describe the usage, required settings, and details concerning Local BITE operation for each operating condition. As mentioned earlier, when diagnosing a problem the Local BITE test should always be performed first. Of the two (2) conditions described above that Local BITE can be performed, the condition where the RCU-9310B is not connected OR not controlling a remote RT-9000B Transceiver will be the most meaningful. If a severe problem develops, this may be the only way to perform RCU-9310B Local BITE testing.

RCU-9310B Operation - Not connected OR not controlling remote RT-9000B

This condition will occur when the RCU-9310B is outside the system environment and is not connected to an RT-9000B Transceiver. A typical example of this condition would be when the RCU-9310B is being bench tested without being connected to other equipment. Another equivalent condition would be when the RCU-9310B is still connected to a remote RT-9000B Transceiver BUT the RT-9000B is not powered up.

Executing the RCU-9310B Local BITE test under this condition requires the RCU-9310B I/O Port be disabled. To reset the RCU-9310B for this condition and execute the Local BITE test, perform the following step sequence:

1. Power up the RCU-9310B Remote Control Unit.
2. Depress the Feature Menu 'MORE' key successively until the Feature Menu shown in Figure 6.3.3.1 appears.

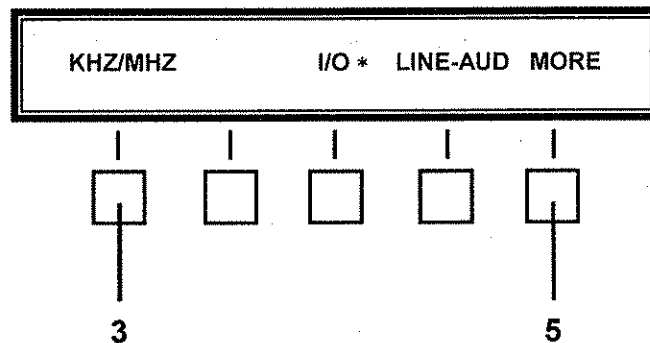


Figure 6.3.3.1 Main Menu containing I/O Port Selection

3. Depress the 'I/O' key. An 'ENTER CODE NUMBER' message will appear in the Operational Display.
4. Using the Numeric Keypad, key in code '2580'. The Feature Menu shown in Figure 6.3.3.2 will appear.

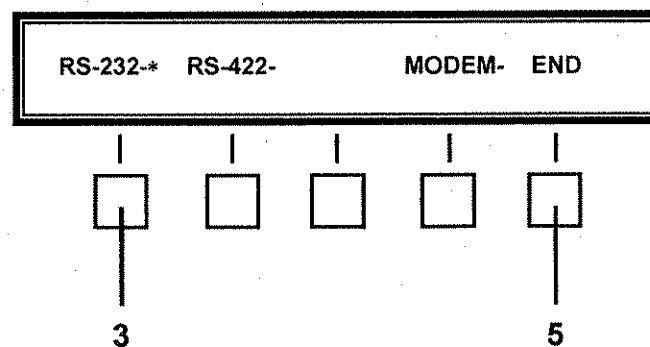


Figure 6.3.3.2 I/O Port Set Up Feature Menu

5. Note which Feature Menu I/O selection and settings are currently enabled (by having an asterisk beside it). Depress the Feature Key for this selection. This will cause the selection to be disabled (and the asterisk to disappear).

Note: The user should carefully note the original I/O settings before disabling the I/O Port. These same settings will be used to restore the I/O Port to normal operation after the Local BITE test is completed.

6. Depress the 'END' key. A 'NO CONFIGURATION' message will briefly appear in the Operational Display and then automatically clear. The RCU-9310B I/O Port is now disabled.
7. Depress the Local/Remote ('LCL/RMT') key. The 'RMT' indication in the Operational Display will change to 'LCL'.

The RCU-9310B Local BITE test routine may now be started by performing the following steps. Depress the Feature Menu 'MORE' key successively until the Feature Menu shown in Figure 6.3.3.3 appears.

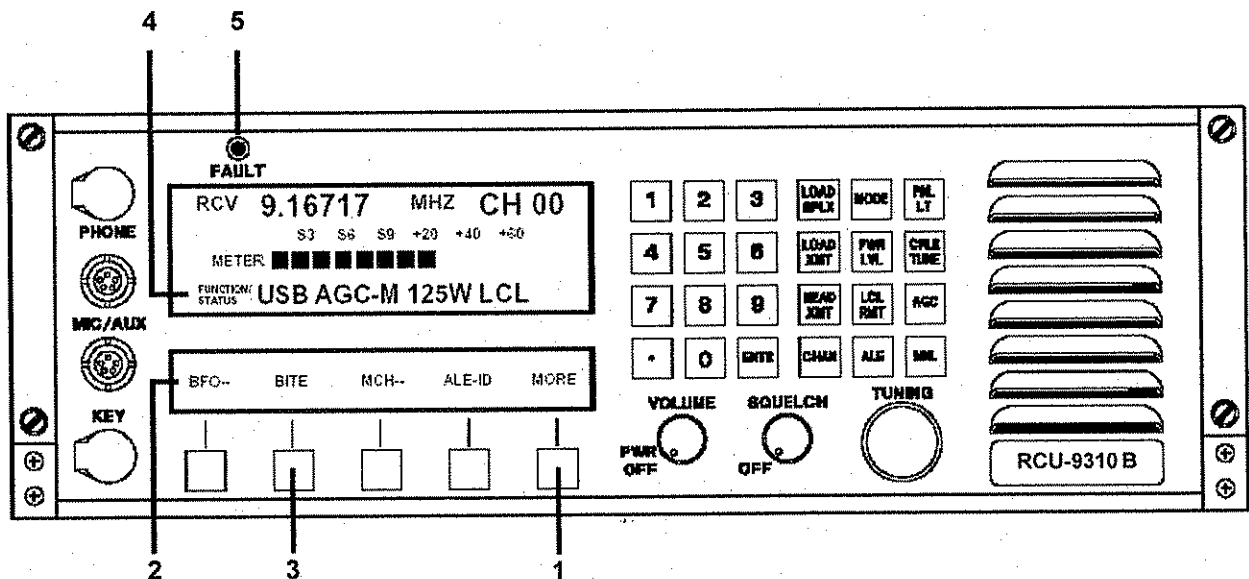


Figure 6.3.3.3 Main Menu containing BITE Selection

Depress the 'BITE' key at 3. A 'SEL REMOTE OR LOCAL' message will appear in the Operational Display at 4 and the Feature Menu will change to that shown in Figure 6.3.3.4. Depress the Local BITE ('LOC - BITE') key at 6.

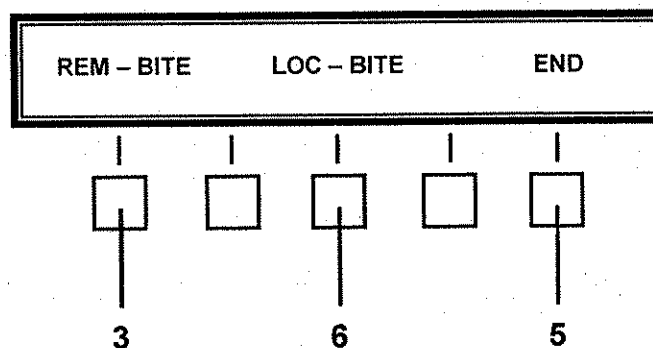


Figure 6.3.3.4 BITE Select Sub-Menu

The RCU-9310B will start executing the Local BITE test routine. After depressing the 'LOC-BITE' key, a 'BITE IN PROGRESS' message will briefly appear in the Operational Display. This message will clear automatically and be replaced with test result messages that will briefly appear for each of the five (5) module types listed below. As the Local BITE test runs, it will stop on the first Fault found. This Fault must be remedied before proceeding. If there are additional Faults in the RCU-9310B, the above Local BITE test process must be repeated until Faults are no longer found. The below listing is the order in which the Local BITE module tests are performed and test result messages will appear.

'FRONT PANEL O.K.'	or	'FRONT PANEL FAULT'
'CPU O.K.'	or	'CPU FAULT'
'POWER SUPPLY O.K.'	or	'POWER SUPPLY FAULT'
'I/O O.K.'	or	'I/O FAULT'

An audio tone will be briefly heard from the front panel speaker.
--

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

If the RCU-9310B Local BITE test finds a Fault, the following actions will typically occur:

1. The RCU-9310B Local BITE test routine will halt.
2. The Module Name, followed by the word *FAULT*, will be displayed at **4** in the Operational Display.
3. The Red 'FAULT' lamp on the Front Panel at **5** will be lit.

Proceed to Section V of this manual for fault isolation and repair procedures.

After the Local BITE test has successfully finished, a 'TEST COMPLETED' message will appear in the Operational Display. The User may repeat the Local BITE test simply by depressing the 'LOC-BITE' key again.

Depress the 'END' key to leave the BITE mode and return to normal operation.

The RCU-9310B I/O Port must be re-enabled and restored to its original settings before it can again control the remote RT-9000B Transceiver. Refer to section 6.3.3.7 for instructions as to how to set up the I/O Port. The I/O Port should be set up to the original settings noted earlier (in step 5) before the I/O Port was disabled.

RCU-9310B Operation – Controlling remote RT-9000B

This condition will occur when the RCU-9310B is in its normal configuration and controlling a remote RT-9000B Transceiver. Performing the Local BITE test under this condition requires the RCU-9310B actually be in control of the remote RT-9000B Transceiver.

To execute the RCU-9310B Local BITE test under this condition, perform the following steps:

Ensure the RCU-9310B is in Local Control ('LCL') of the remote RT-9000B Transceiver. Unless otherwise noted, refer to Figure 6.3.3.3. Depress the Feature Menu 'MORE' key from the main menu successively until the Feature Menu shown in Figure 6.3.3.3 appears.

Depress the 'BITE' key at **3**. A 'SEL REMOTE OR LOCAL' message will appear in the Operational Display at **4** and the Feature Menu will change to that shown in Figure 6.3.3.4. Depress the Local BITE ('LOC - BITE') key at **6**.

The RCU-9310B will start the Local BITE test routine. After depressing the 'LOC-BITE' key, a 'BITE IN PROGRESS' message will briefly appear in the Operational Display. This message will clear automatically and be replaced with test result messages that will briefly appear for each of the five (5) module types listed below. As the Local BITE test runs, it will stop on the first Fault found. This Fault must be remedied before proceeding. If there are additional Faults in the RCU-9310B, the above Local BITE test process must be repeated until Faults are no longer found. The below listing is the order in which the Local BITE module tests are performed.

'FRONT PANEL O.K.'	or	'FRONT PANEL FAULT'
'CPU O.K.'	or	'CPU FAULT'
'POWER SUPPLY O.K.'	or	'POWER SUPPLY FAULT'
'I/O O.K.'	or	'I/O FAULT'

An audio tone will be briefly heard from the front panel speaker

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

If the RCU-9310B Local BITE test finds a Fault, the following actions will typically occur:

1. The RCU-9310B Local BITE test routine will halt.
2. The Module Name, followed by *FAULT*, will be displayed at **4** in the Operational Display.
3. The Red 'FAULT' lamp on the Front Panel at **5** will be lit.

Proceed to Section V of this manual for fault isolation and repair procedures

After the Local BITE test has successfully finished, a 'TEST COMPLETED' message will appear in the Operational Display. The User may repeat the Local BITE test simply by depressing the 'LOC-BITE' key again.

Depress the 'END' key to leave the BITE mode and return to normal operation.

6.3.3.1.2 Remote BITE

Overview

The RCU-9310B Remote BITE test routine enables all three (3) RT-9000B Transceiver resident BITE test routines to execute sequentially and effectively run as a single test. These tests verify all RT-9000B LRUs are functioning correctly and also perform tests to test Antenna System condition. Antenna System problems may adversely affect Transmitter performance. The type of Antenna testing performed will be determined by the type of Antenna used and whether an Antenna Coupler is being used. The following summarizes these tests:

- If the remote RT-9000B Transceiver is feeding a Broadband Antenna directly and does not use an Antenna Coupler, a VSWR test will be performed on eight (8) selected test frequencies.
- If the remote RT-9000B Transceiver is using an Antenna Coupler to feed a Non-Resonant Antenna, a "Tuning Test" is performed using the same eight (8) selected test frequencies.

These Antenna-related tests will also be performed if an external Linear Power Amplifier is present. During BITE testing the External Power Amplifier is switched out or bypassed and the RT-9000B Transceiver is temporarily connected to the Amplifier's Antenna System. This arrangement allows the RT-9000B Transceiver to perform its normal tests on the station Antenna and for both types of Antenna Systems earlier discussed.

The User should be aware that Antenna System testing is done to avoid having an Antenna System problem degrade overall station performance. Antenna System indicated problems are problems that are external to the RT-9000B Transceiver and need to be approached from that perspective.

Procedure

The RCU-9310B Remote BITE test routine is performed when the RCU-9310B is in its normal operating configuration and actually controlling the remote RT-9000B Transceiver. To execute the RCU-9310B Remote BITE test, perform the following steps:

Ensure the RCU-9310B is in Local Control ('LCL') of the remote RT-9000B Transceiver. Unless otherwise noted, refer to Figure 6.3.3.3. Depress the Feature Menu 'MORE' key from the main menu successively until the Feature Menu shown in Figure 6.3.3.3 appears.

Depress the 'BITE' key at **3**. A 'SEL REMOTE OR LOCAL' message will appear in the Operational Display at **4** and the Feature Menu will change to that shown in Figure 6.3.3.4. Depress the Remote BITE ('REM - BITE') key.

The RCU-9310B will start the Remote BITE test routine. After depressing the 'REM-BITE' key, a 'REMOTE BITE IN PROG' message will appear in the Operational Display. This message will be continuously displayed until the Remote BITE test routine finishes. Various tones may be heard from the RCU-9310B front panel speaker while the Remote BITE test is proceeding.

At the conclusion of the Remote BITE test routine, if all Module tests were successfully completed, a 'TEST COMPLETED' message will appear in the Operational Display. The User may repeat the Remote BITE test simply by depressing the 'REM-BITE' key again.

Depressing the 'END' key will cause the RCU-9310B to leave the BITE mode and return to normal operation.

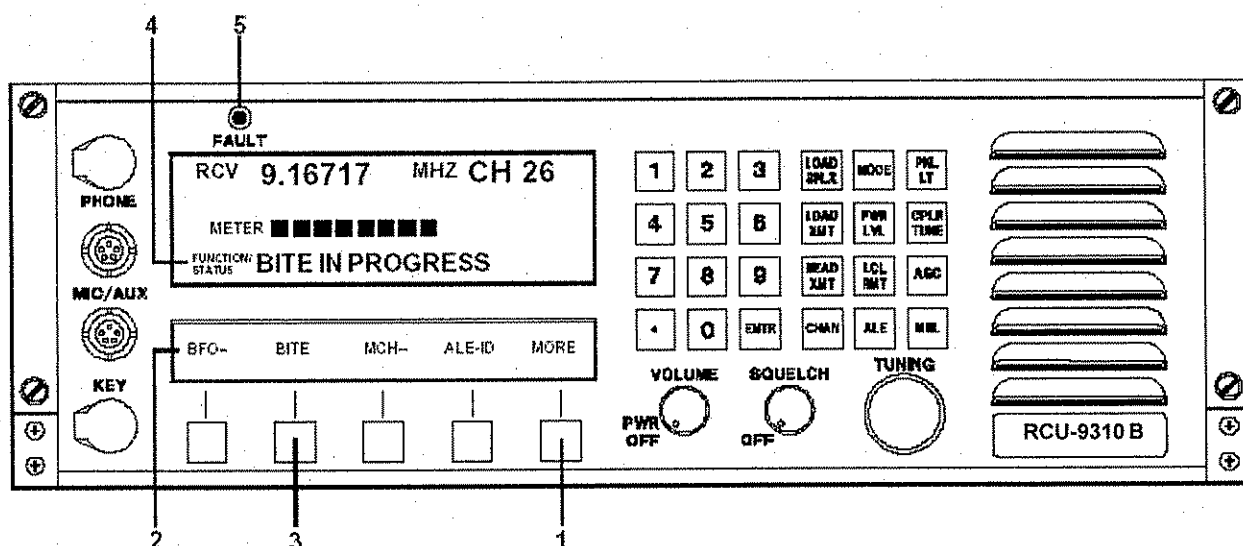


Figure 6.3.3.5 BITE Message Display

Fault Indications

If a Fault condition is found during the Remote BITE test routine, several different indications may be displayed. The following paragraphs summarize these indications and their meaning.

- If a Module Fault is found, the Remote BITE test routine will halt and display in the Operational Display the failing Module Name followed by the word *FAULT*.

NOTE: Certain Fault conditions may develop that can fundamentally affect RT-9000B operation and may prevent the Remote BITE test routine from starting or operating correctly. If such a condition occurs; the indications, responses, and messages described for the BITE test will be significantly different than described or not occur at all. These are probable symptoms of such a Fault type.

- If Antenna System problems are found, several different messages may be displayed. These messages will depend on 1.) Type of Antenna System being used (Broadband Antenna or Non-Resonant) and 2.) Whether the problem occurred at only one (1) test frequency or two (2) or more test frequencies.

Unlike a Module failure, Antenna System-related problems will not cause the Remote BITE test routine to halt. Antenna System messages will display for about five (5) seconds and then clear.

automatically. The Antenna System-related messages that can appear are as follows:

Broadband Antenna (No Antenna Coupler)

'VSWR HI AT ~~XX XX~~ MHZ'

'VSWR HI AT MULT MHZ'

Non-Resonant Antenna (Antenna Coupler present)

'NO TUNE AT ~~XX XX~~ MHZ'

'NO TUNE AT MULT MHZ'

NOTE: In the above messages, ~~XX XX~~ indicates the Test Frequency where the 'VSWR HI' or 'NO TUNE' condition was found. The decimal point is not displayed.

Examples: 3 75 MHZ = 3.75 MHZ

16 75 MHZ = 16.75 MHZ

Fault Clearing & Correction

When a Module Fault is indicated, the User should note the affected Module type for later Fault isolation actions. Depressing the 'END' key will cause the RCU-9310B to leave the BITE mode and return to normal operation. The User should proceed to section V of the RT-9000B Operation and Maintenance Manual for Fault isolation and repair procedures.

When an Antenna System problem is indicated during the RCU-9310B Remote BITE test routine, the User should note the exact problem message content as previously described for later Fault isolation actions. These messages display for about five (5) seconds and clear automatically. The User should proceed to section V of the RT-9000B Operation and Maintenance Manual for Fault isolation and repair procedures.

6.3.3.2 METER FUNCTIONS

Several metering functions are available for both Receive-state and Transmit-state conditions. Refer to Figure 6.3.3.6. These Meter choices appear in the Operational Display at 1.

The available Meter functions are as follows:

RECEIVE:

- 'LINE' - 600-Ohm Line Audio Output
- 'S MTR' - Signal Strength Meter (shown in Figure 6.3.3.6)

TRANSMIT:

- 'LINE' - 600 Ohm Line Audio Input
- 'ALC' - Automatic Level Control voltage
- 'FWD' - Forward RF Power Output
- 'RFLD' - Reflected RF Power

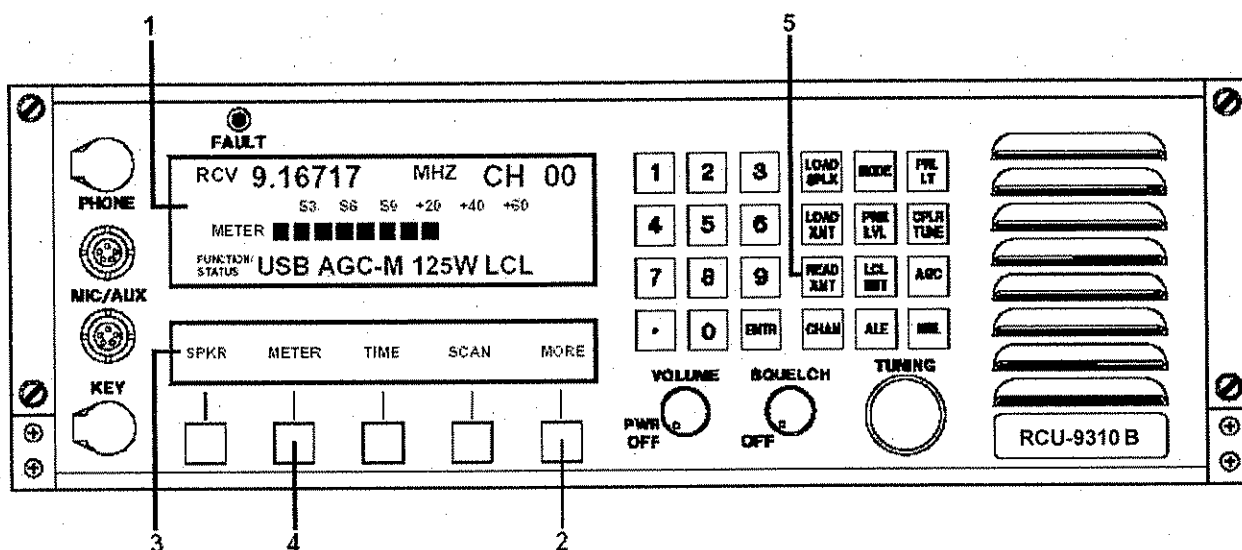


Figure 6.3.3.6 Main Menu containing Meter Selection

To select the desired meter choices, depress the Feature Menu 'MORE' key successively at 2 until the Feature Menu shown in Figure 6.3.3.6 appears. Depressing the 'METER' function key at 4 will cause the Feature Menu shown in Figure 6.3.3.7 to appear.

Depressing the Receive Meter ('MTR RCV') key at 4 or Transmit Meter (MTR-XMT') key at 6 will cause new and appropriate Feature Menus to appear. The User may make Receive or Transmit Meter selections as described in following sections 6.3.3.2.1 or 6.3.3.2.2, respectively. After completing these selections, the user will be returned back to this same Feature Menu.

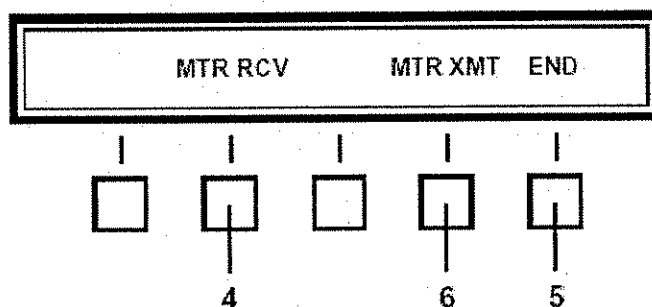


Figure 6.3.3.7 Meter Select Sub-Menu

After completing the Receive and Transmit Meter selections, the User is returned to the Feature Menu shown in Figure 6.3.3.7.

Depressing the 'END' key at 5 will cause the Meter selection to end and return the user back to the main menu.

6.3.3.2.1 Receive Meter Selection

To select Receive-state Meter functions, depress the 'MTR RCV' (Meter Receive) key at **4**. The Feature Menu shown in Figure 6.3.3.8 will appear.

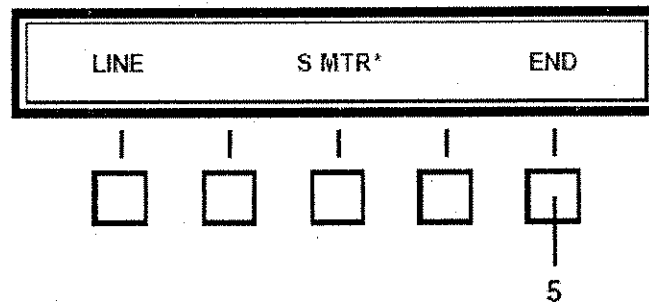


Figure 6.3.3.8 Receive Meter Feature Menu

Depress the Function key beneath the desired selection to select it. An asterisk (*) will appear next to the selected choice to indicate it has been chosen.

When the RCU-9310B is displaying the remote RT-9000B Receive-state activity, the selected Receive Meter will now display the desired output type and values as shown at **1** in Figure 6.3.3.6.

Once the Receive Meter selection is made, depress the 'END' key at **5**. The Feature Menu Display will revert to that shown in Figure 6.3.3.7.

6.3.3.2.2 Transmit Meter Selection

To select Transmit-state Meter functions, depress the 'MTR XMT' (Meter Transmit) at **6**. The Feature Menu shown in Figure 6.3.3.9 will appear.

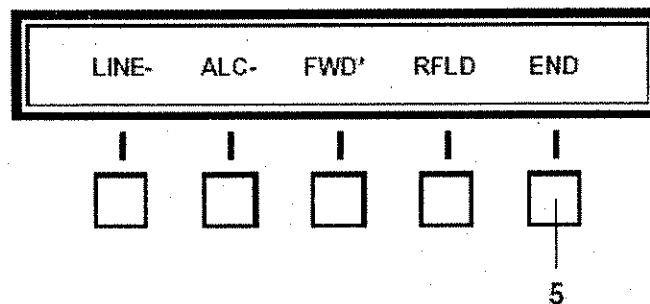


Figure 6.3.3.9 Transmit Meter Feature Menu

Depress the Function key beneath the desired selection to select it. An asterisk (*) will appear next to the selected choice to indicate it has been chosen.

When the RCU-9310B is displaying the remote RT-9000B Transmit-state activity, the selected Transmit Meter will now display the desired output type and values as shown at **1** in Figure 6.3.3.6.

In addition to displaying the Transmit Meter readings while the Transmitter is keyed, the Transmit Meter readings may also be view another way. Depressing the Read Transmit ('READ XMT') key at **5** in Figure 6.3.3.6 will cause all Transmit related Operational Display readings to briefly display without actually keying the Transmitter. The Transmit-state readings will appear for about four (4) seconds after the 'READ XMT' key is depressed before reverting back to Receive-state readings.

Once the Transmit Meter selection has been made, depress the 'END' key at **5**. The Feature Menu Display will revert to that shown in Figure 6.3.3.7.

6.3.3.3 SPEAKER ON/OFF FUNCTION

The front panel speaker in the RCU-9310B is by default normally enabled at power-up. An asterisk present at the right-hand side of the 'SPKR' Feature Menu selection indicates the speaker is enabled. To disable the speaker, depress the Feature Menu 'MORE' key at **1** successively until the display shown in Figure 6.3.3.10 appears.

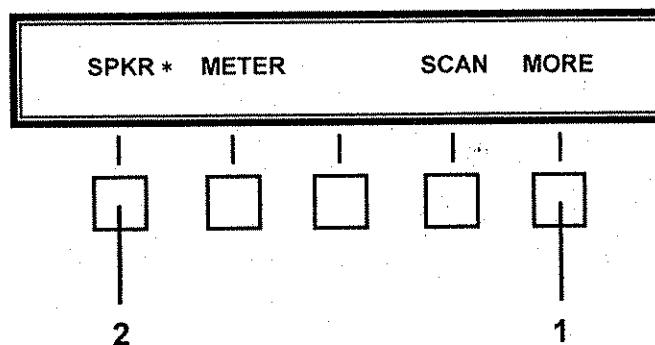


Figure 6.3.3.10 Main Menu containing Speaker ON/OFF Selection

Depress the Feature Menu 'SPKR' key at **2**. The asterisk next to the 'SPKR' selection will disappear. The RCU-9310B speaker will be disabled. Depressing the Feature Menu 'SPKR' key once again will re-enable the speaker.

NOTE: After the RCU-9310B has been powered-down or primary power has been interrupted, the Speaker ON/OFF Selection function will automatically revert back to its default state.

6.3.3.4 'MHz' or 'kHz' FREQUENCY DISPLAY

The Operating Frequency display may be selected to display the frequency units expressed in Megahertz (MHz) or Kilohertz (kHz).

Depress the Feature Menu 'MORE' key at **1** successively until the Feature Menu shown in Figure 6.3.3.11 appears.

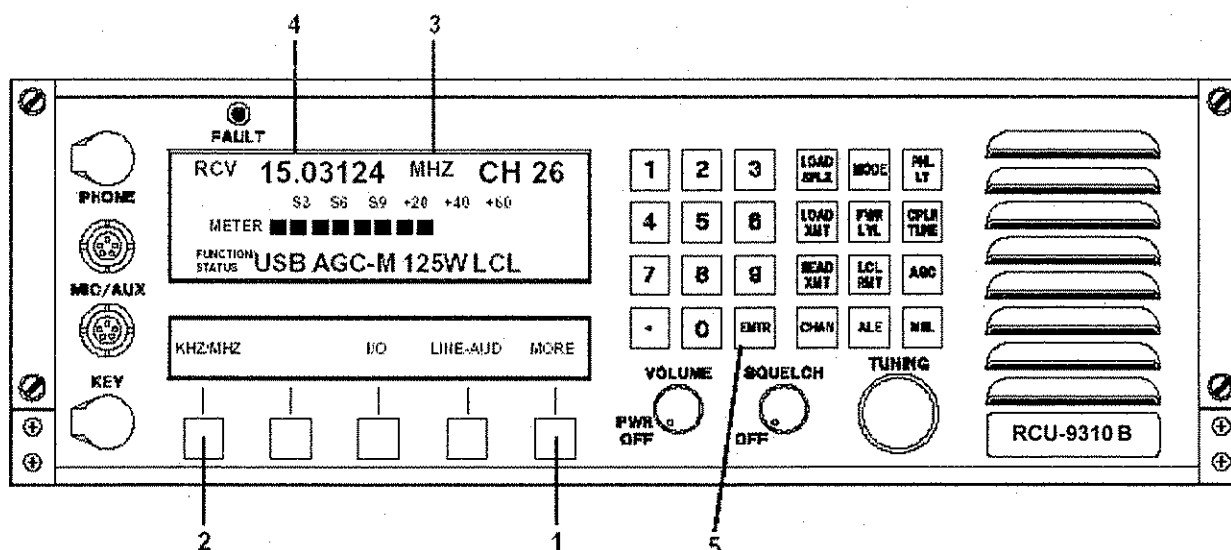


Figure 6.3.3.11 Main Menu containing MHz / kHz Frequency Display Selection

Depressing the 'kHz/MHz' Feature key at **2** will cause the Operating Frequency units in the Operational Display at **3** to toggle between 'MHz' (MegaHertz) and 'kHz' (kilohertz). As an example, in Figure 6.3.3.11 note if 'KHZ' units is selected that the decimal point at **4** will move three (3) digits to the right and the 'MHz' indication shown at **3** will change to 'KHZ'.

Depressing the 'ENTER' key at **5** will cause this selection to be stored in memory for the currently selected Channel Number. This Frequency Display MHz/kHz selection is made and stored separately for each Pre-set Channel. Each Channel may be programmed to display frequency in the units selected as described.

6.3.3.5 SOFTWARE REVISION LEVEL

To view the installed Software Revision Level, depress the 'MORE' key from the main menu successively until the Feature Menu shown in Figure 6.3.3.12 appears. To view the installed Software Revision Level, depress the 'REV' key at **5**. The Software Revision Levels will appear at **6** in the Operational Display and are formed as follows:

'REV CPU-XXX IO-XXX'

- NOTES:
1. XXX = Installed Software Revision Levels.
 2. Software Revision Levels are alphanumeric and may be two (2) or three (3) characters long.

Depressing the 'REV' key at **5** again will cause the Operational Display to return to normal.

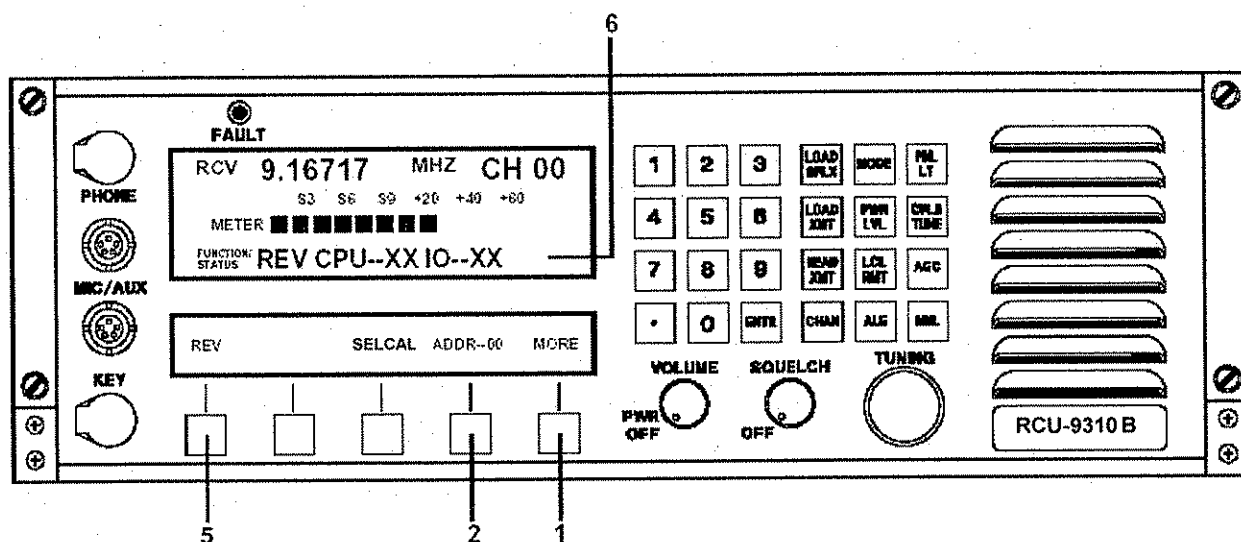


Figure 6.3.3.12 Main Menu containing Software Revision Level and Control Address Selections

6.3.3.6 CONTROL ADDRESS

The RCU-9310B can control more than one (1) remote RT-9000B. Remote control is implemented using RS-422 communications and a switchable audio matrix. While the RCU-9310B can control multiple RCU-9310B Transceivers, it can control only one at any one time. This system capability requires each RCU-9310B I/O Port be setup with a unique address. This Control Address is used by the RCU-9310B to control a specific remote RT-9000B, which has been set up with that particular unique Control Address.

RS-422 communications systems are specified to operate with up to ten (10) units total. The RCU-9310B Control Address can be set to assume any address between '00' and '99'. An RS-422 communications network with more than ten units, however, will require additional external line amplification.

The Control Address the RCU-9310B is currently set up to communicate with is visible from the Main Menu. Depress the 'MORE' successively until the Feature Menu shown in Figure 6.3.3.12 appears. In the portion of the Feature Menu above the key at 2 and immediately to the right of 'ADDR-', a two (2) digit number will be present. This number is the current Control Address setting.

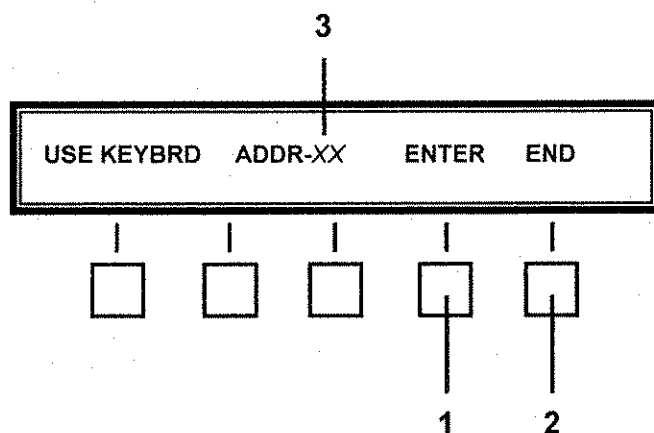
If this is the Control Address of the RT-9000B Transceiver to be remote-controlled, no further action is required and normal operations may continue.

To setup or change a Control Address, perform the following steps. Navigate to the Feature Menu shown in Figure 6.3.3.12 and depress the 'ADDR-XX' key (where XX = the current setting).

An 'ENTER CODE NUMBER' message will appear in the Operational Display. Using the Frequency/Channel Entry Keypad, key in the four-digit (4) code '2580'. As each code digit is entered, a small square block along the extreme right-hand side of the operational display will appear for each entered digit. After entering the last code digit, the Feature Menu will change to that shown in Figure 6.3.3.13

NOTE: If any four-digit code, other than '2580' is entered, an 'INVALID CODE NUMBER' message will be displayed. This message will clear automatically within a few seconds and the operational display will revert back to that shown in Figure 6.3.3.12. Code entry may now be repeated.

NOTE: This code entry routine is designed solely to help prevent accidental changing of Control Address settings. The code is not intended to be an access security measure and cannot be changed.



XX = Current RCU-9310 B Control Address Setting

Figure 6.3.3.13 Control Address Entry Menu

Use the Numeric Keypad to enter the new two-digit Control Address. As the digits are entered, they will appear at **3** in the Feature Menu display. Depress the 'ENTER' Key at **1** to store this new Control Address into the system memory. The Feature Menu display will revert to Figure 6.3.3.13 and display the new Control Address.

Depressing the 'END' key at **2** causes an immediate return to the Main Menu without making any changes.

NOTE: In systems where the RCU-9310B is controlling only one (1) remote RT-9000B Transceiver, Control Address '00' is usually used.

6.3.3.7 'I/O' PORT SET-UP

This section describes how to set up the RCU-9310B I/O Port that is used to communicate with remote RT-9000B Transceiver(s). This port is terminated in a rear-panel mounted male DB-9 connector, labeled as 'REMOTE'. Refer to Figure 6.3.3.14 to locate this connector. The RCU-9310B I/O Port is designated as 'Port A' and is used to interconnect with other equipment in the system environment.

Port A is intended to communicate with User external accessory equipment. All required operating settings may be selected from the RCU-9310B Front Panel. These settings will be determined by the external equipment requirements and the data handling capability of interconnecting wiring. Refer to the chart in Figure 6.3.3.20 at the end of this section for details about Communication Formats.

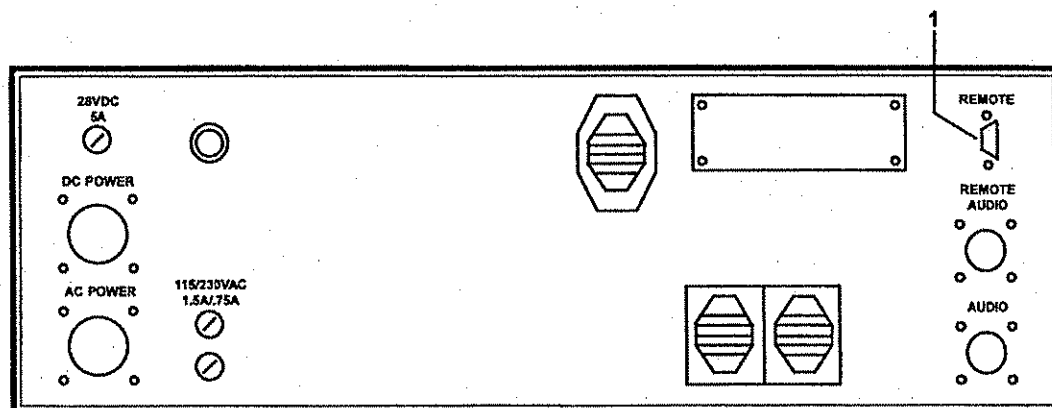


Figure 6.3.3.14 RCU-9310B Rear Panel Connectors

To set up Port A, perform the following steps. Determine the desired communications format. Depress the Feature Menu 'MORE' key at 1 successively until the display shown in Figure 6.3.3.15 appears.

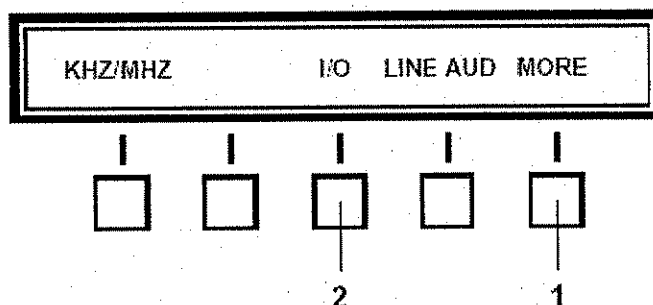


Figure 6.3.3.15 Main Menu containing I/O Port Selection

Depress the 'I/O' key at 2. The Operational Display will display an 'ENTER CODE NUMBER' message. Using the Frequency/Channel Entry Keypad, key in the four-digit (4) code '2580'. As each code digit is entered, a small square block along the extreme right-hand side of the Operational Display will appear for each entered digit. After entering the last code digit, the Feature menu will change to that shown in Figure 6.3.3.16.

NOTE: If any four-digit code, other than '2580' is entered, an 'INVALID CODE NUMBER' message will be displayed. This message will clear automatically within a few seconds and the operational display will revert back to that shown in Figure 6.3.3.15. Code entry may now be repeated.

NOTE: This code entry routine is designed solely to help prevent accidental changing of I/O settings. The code is not intended to be an access security measure and cannot be changed.

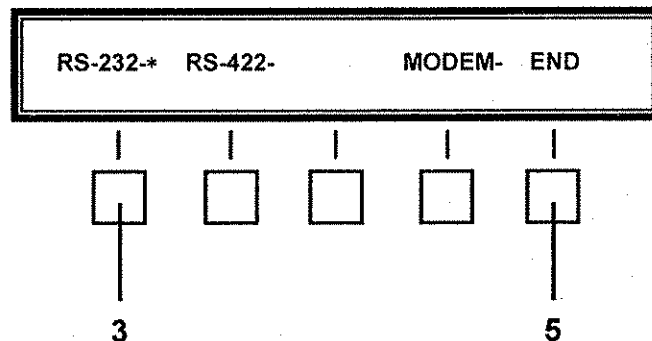
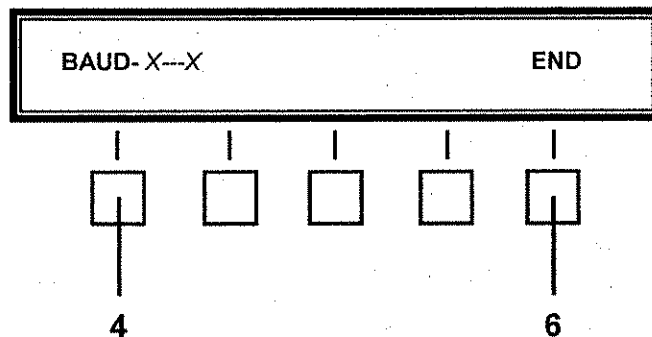


Figure 6.3.3.16 Port 'A' Set Up Feature Menu

Select the desired communications format by depressing the key beneath the format indicated in the Feature Menu. After a selection is made, the display will change to that shown in Figure 6.3.3.17.

NOTE: When changing Baud Rate settings for a currently selected communication format (rather than changing from one format to another), the currently selected format must first be deselected and then immediately reselected before the Feature Menu display shown in Figure 6.3.3.17 will appear.



NOTES: X---X = Currently selected I/O Port Baud Rate Setting

Figure 6.3.3.17 Baud Rate Display Feature Menu

The Feature Menu shown in Figure 6.3.3.17 displays the current RCU-9310B I/O Port Baud Rate setting.

If the Baud Rate shown is NOT the desired selection, depress the Feature key at **4** beneath the 'BAUD-X---X' indication in the Feature Menu display. The Feature Menu shown in Figure 6.3.3.18 will appear and provide the operator with four (4) Baud Rate choices. An asterisk immediately to the right-hand side of a displayed choice indicates this choice is currently selected.

The Baud Rate shown in Figure 6.3.3.17 will have the asterisk present upon entering the Baud Rate Selection Menus 1 or 2 before a new selection is made. As an example, in the Figure 6.3.3.18, '2400' Baud is shown as currently selected and would have been the displayed as the 'Baud-' selection in the previous Figure 6.3.3.17.

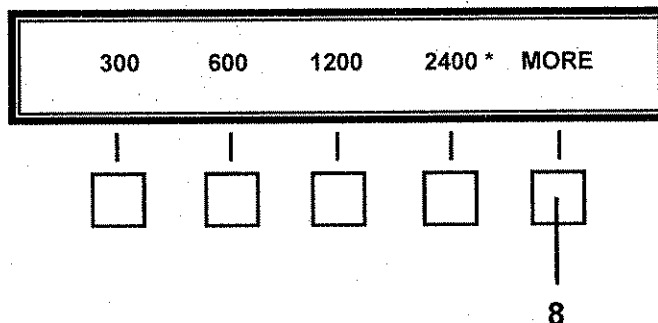


Figure 6.3.3.18 Baud Rate Selection Menu 1

If the desired choice is not present, depress the Feature key beneath 'MORE' indication. A second Feature Menu shown in Figure 6.3.3.19 will appear and provide the user with three (3) additional Baud Rate choices. Depressing the 'MORE' key will cause Baud Rate Selection Menu 1 to reappear.

Depressing any Feature key selection will enter that Baud Rate selection and cause the Feature Menu shown in Figure 6.3.3.17 to reappear. The newly selected Baud Rate will be reflected in this Feature Menu display. Press 'END' to exit this menu and return to the main menu.

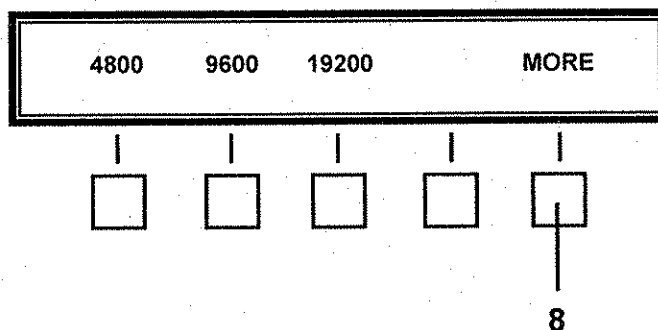


Figure 6.3.3.19 Baud Rate Selection Menu 2

Communications Format	Maximum Baud Rate	Maximum Distance (Feet)
RS-232	19200	50
RS-422	19200	4000
'MODEM' (FSK Tones)	300 (fixed)	N/A

Figure 6.3.3.20 Communication Format Parameters

6.3.3.8 'CW' FILTER AND KEY BREAK-TIME OPTIONS

To select or change CW Filter and/or Key Break-Time Options, the CW-Mode must first be selected. To do this, depress the 'MODE' Function key successively until 'CW Mode' appears in the Operational Display. The Feature Menu shown in Figure 6.3.3.21 will appear.

If the CW-Mode was already selected, momentarily leave 'CW-Mode' and immediately re-select it by successively depressing the 'MODE' key until 'CW-Mode' re-appears in the Operational Display. The Feature Menu shown in Figure 6.3.3.21 will appear. This menu will appear only after CW-Mode is selected.

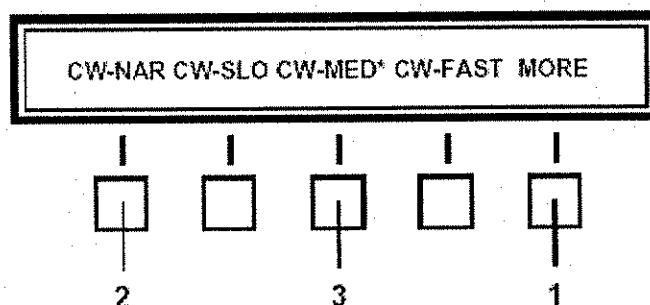


Figure 6.3.3.21 CW-Mode Filter Selection Feature Menu

The RCU-9310B is equipped with a Narrow-Band Audio CW filter. If this filtering function is desired, depress the key beneath 'CW-NAR' on Feature Menu to switch in this filter. An asterisk (*) will appear next to the Feature Menu 'CW-NAR' choice indicating it has been enabled.

CW Key Break-Time is a system setting that controls the amount of time the remote RT-9000B Transceiver remains in Transmit mode after an operator stops sending Morse code. Three (3) CW Key Break-Time choices are available to the operator and are described in the following chart.

CW Key Break-Time Settings		
RCU-9310B Feature Menu Choice	Description	Operator Sending Speed (wpm)
'CW-SLO'	CW-Slow	Less than 10
'CW-MED'	CW-Medium	Between 10 and 20
'CW-FAST'	CW-Fast	Greater than 20
Note: wpm = words per minute		

The CW Key Break-Time setting is normally set to "CW-Medium" when the equipment is shipped from the factory. This setting will normally meet most operator sending speeds. If the operator wishes to change this setting, perform the following steps.

Select CW-Mode as previously described for CW Filter. The Feature Menu described in Figure 6.3.3.21 will appear. Depress the key beneath desired Feature Menu choices as described in the above table. An asterisk (*) will appear next to the Feature Menu choice indicating it has been enabled.

Depress the 'MORE' key to leave the CW-Mode Options menu and return to the main menu.

To change CW Filter and/or Key Break-Time settings if currently in CW mode, depress the 'MODE' key successively until 'CW' Mode reappears in the Operational Display. This action will cause the Feature Menu shown in Figure 6.3.3.21 to reappear and allow the operator a new choice as previously described.

6.3.3.9 LINE AUDIO SELECTION

The rear panel 'AUDIO' connector provides two sets of 600-Ohm input and output lines and connects one of two external audio devices to the RCU-9310B. A typical use of this capability might be to allow convenient switching in or out specialized terminal equipment such as audio processors, encryption equipment, etc.

To select either External Audio Line, depress the Feature Menu 'MORE' key successively until the display shown in Figure 6.3.3.22 appears.

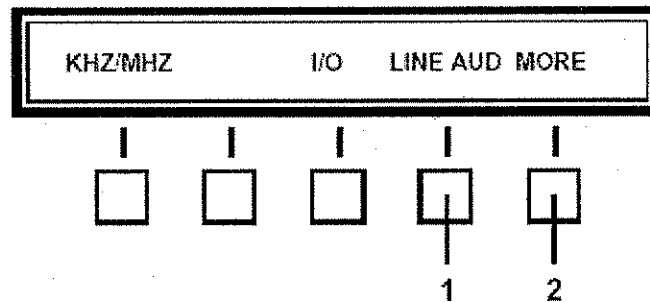


Figure 6.3.3.22 Main Menu containing Line Audio Selection

Depress the 'LINE-AUD' key at 1, the Line Audio Selection Sub-Menu shown in Figure 6.3.3.23 will appear.

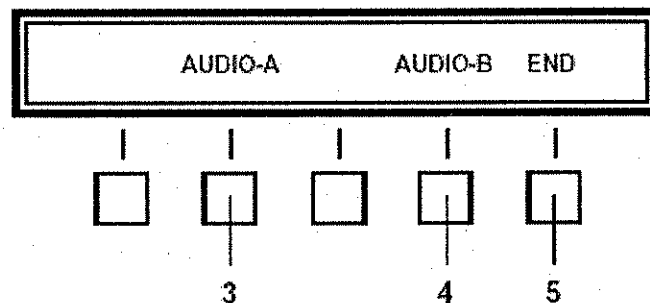


Figure 6.3.3.23 Line Audio Selection Sub-Menu

Depress the 'AUDIO-A' Feature key at **3** to connect the external device on Line A to the RCU-9310B. Similarly, depressing 'AUDIO-B' Feature key at **4** connects the device on line B to the RCU-9310B. Connection occurs as soon as the selection key is depressed. An asterisk (*) will appear next to the selected Line Feature Menu choice indicating it has been enabled.

NOTE: Only one external device may be selected at any one time. If only ONE (1) device is used, it should be connected to Line 'A'.

Depress the 'END' key at **5** to leave the Line Audio selection menu and return to the main menu shown in Figure 6.3.3.22.

6.3.4 ADVANCED OPERATIONS

This section addresses those features and functions that are specialized or invoke some of the unique features of the RT-9000B Transceiver as presented in the prior two sections of this manual, as well as an understanding of the referenced modems or peripherals.

6.3.4.1 RECEIVER SCANNING

The RT-9000B has the ability to perform a rudimentary Receiver scanning function of all valid Pre-set Channels or any block of Pre-set Channels between '0' and '127'. The Operating Frequencies and other essential settings are stored in Pre-set Channels as described in section 6.3.2.10 of this manual.

The RT-9000B will scan all properly set up Pre-set Channels between the entered Start and Stop Channel limits. If there are no currently Pre-set Channels set up between those limits, scanning will not start. If this occurs, the User should inspect the Channel limits and Pre-set Channels and make appropriate changes.

Starting the Scan Process

To start scanning a block of Channels, the RT-9000B must be in the Pre-set Channel operating mode (refer to section 6.3.2.8). The displays will appear as shown in Figure 6.3.4.1.

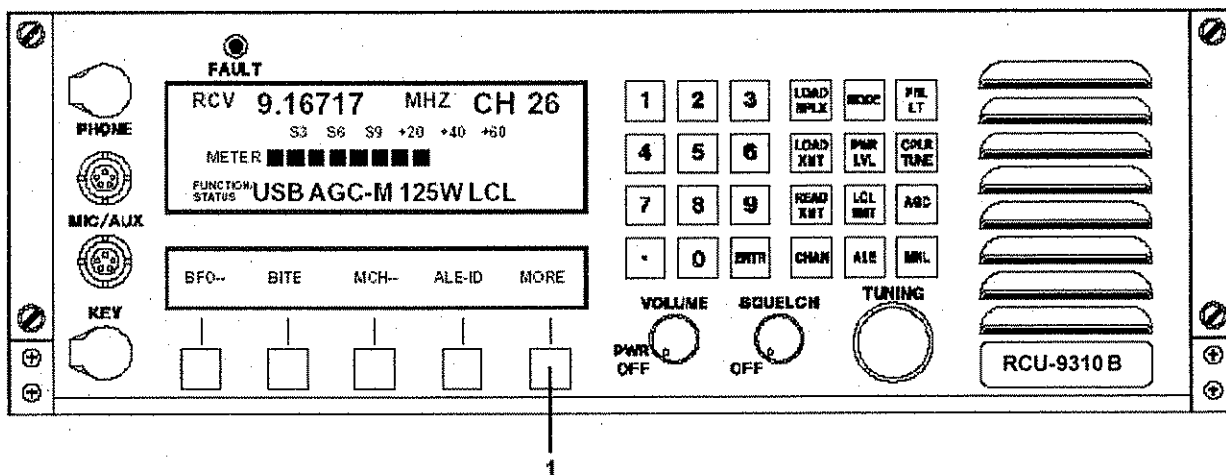


Figure 6.3.4.1 Pre-set Channel Mode Displays

Depress the Feature Menu 'MORE' key at 1 successively until the Feature Menu Display appears as shown in Figure 6.3.4.2.

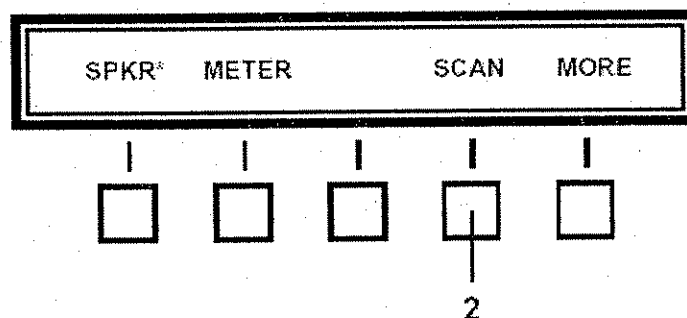


Figure 6.3.4.2 Main Menu containing Scan Selection

Depressing the 'SCAN' key at 2 will cause the Operational and Feature Menu displays to change to those shown in Figure 6.3.4.3.

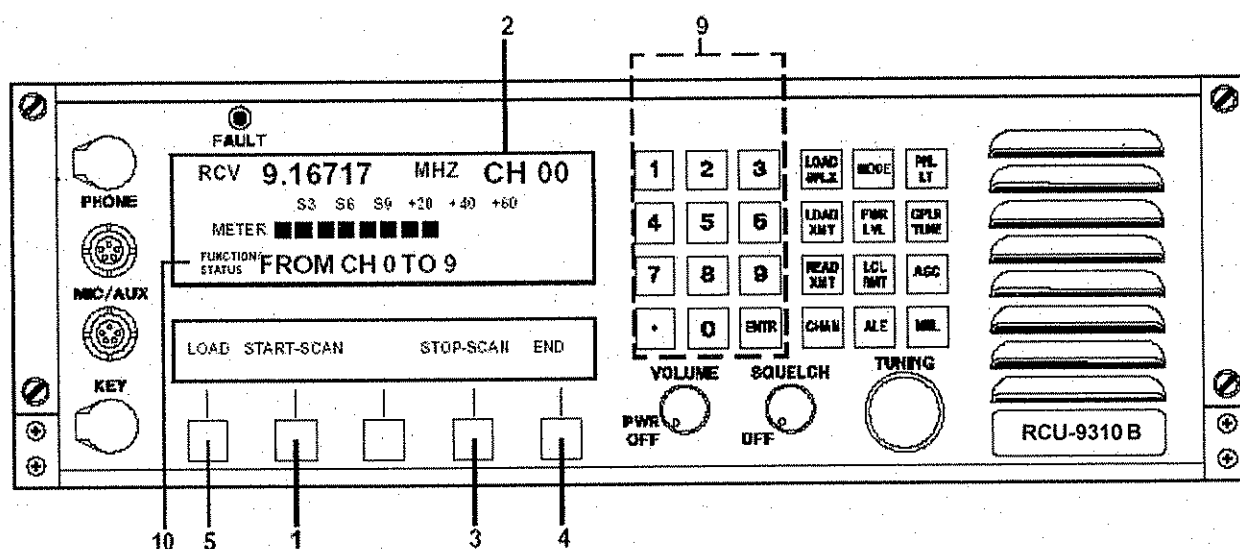


Figure 6.3.4.3 Scan function Feature Menu

Depress the 'START SCAN' key at 1 to actually begin scanning. As scanning proceeds, the instantaneous operating frequency and Channel number will appear at 2 in the Operational Display. To stop the scanning process, simply depress the 'STOP SCAN' key at 3. To leave the Receiver Scanning function, depress the 'END' key at 4. The User will be returned to Pre-set Channel operation.

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.

Loading Start and Stop Channel Numbers

To Load a block of desired channels, depress the 'LOAD' key at **5**. The Feature Menu Display will change to that shown in Figure 6.3.4.4.

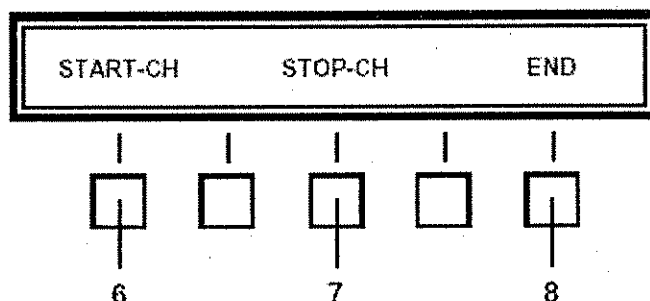


Figure 6.3.4.4 Scan function 'LOAD' Feature Menu

The Operational Display will briefly display a 'USE KEYB FOR NUMBERS' message and then change to a 'FROM CH **XXX** TO **YYY**' message. The **XXX** and **YYY** represent 'Start' and 'Stop' Channel Numbers. Any Channel Numbers appearing in the 'Start' and 'Stop' positions when entering this set up process will be those entered from the 'SCAN' feature's previous use. Channel Number entries may be one, two, or three digits long, as appropriate to the Channel Number's digits. No leading zeros are required.

To select or change a Start Channel, depress the 'START-CH' Feature key at **6**. Key in the desired Channel Number (0-127) using the Numeric Keypad at **9**. The newly selected Start Channel will be displayed in the '**XXX**' position of the 'FROM CH **XXX** TO **YYY**' message at **10**. If a Stop Channel entry is going to be also made, depress the 'STOP-CH' key. This action both enters the keyed-in Start Channel Number into memory and also moves to Stop Channel selection process. Selection may proceed as described later.

If the Start Channel is only being changed, depress the 'END' at **8** to leave this Feature Menu and return to that shown in Figure 6.3.4.3.

To select or change a Stop Channel, depress the 'STOP-CH' key at **7**. Key in the desired Channel Number (0-127) using the Numeric Keypad at **9**. The newly selected Stop Channel will be displayed in the '**YYY**' position of the 'FROM CH **XXX** TO **YYY**' message at **10**. If the user wishes to also change the Start Channel, depress the 'STOP-CH' key. This action both enters the keyed-in Stop Channel Number into memory and also moves back to Start Channel selection process. Selection may proceed as previously described.

If the Stop Channel is only being changed, depress the 'END' at **8** to leave this Feature Menu and return to that shown in Figure 6.3.4.3.

After Start Channel or Stop Channel selections are complete, the Start Channel must be lower than the Stop Channel. If this is not requirement is not observed, a 'START MUST BE LESS' message will be displayed briefly when using the 'END' key to exit this Feature Menu. This situation must be corrected before the system will allow the User to proceed.

6.3.4.2 AUTOMATIC LINK ESTABLISHMENT (ALE) SET UP

6.3.4.2.1 GENERAL

Special Note

These ALE procedures describe Set Up and Operation of a remote-located RT-9000B Transceiver controlled from the RCU-9310B Remote Control Unit. Due to the complex nature of the RT-9000B & ALE system, these instructions are probably more easily understood if the existence of the RCU-9310B is ignored. RCU-9310B operation is essentially transparent to the User. Accordingly, these ALE procedures will be described as if they are being performed from the RT-9000B rather than the RCU-9310B.

All of the control functions to perform Automatic Link Establishment (ALE) to FED-STD 1045 interoperability requirements are contained within the RT-9000B Transceiver and can be accessed from the RCU-9310B Remote Control Unit when present in the system.

The ALE System requires all Network operating frequencies be entered and stored in Pre-set Channel positions as described in Section 6.3.2.10. The Operating Frequencies may be stored in any order; but as a general rule, entering frequencies in order of most probable use may shorten ALE Linking times.

It is beyond the scope of this manual to define network structures and operating disciplines.

The ALE subsystem uses multiple frequencies stored in Pre-set Channels during normal operation and selects the best one when communicating with other Network stations. These Channels are organized in Channel Groups. A Channel Group is a group of frequencies that can be enabled under ALE Subsystem control and have a common relationship.

A Channel Group may have up to ten (10) Channels. There can be up to ten (10) separate Channel Groups. Channel Groups are identified by their Group Number, which is determined by first digit of the Channel Numbers it contains. The following table illustrates how these groups are organized.

Channel Group Organization		
Group Number	Channel Number	
	Lowest	Highest
0	00	09
1	10	19
2	20	29
3	30	39
4	40	49
5	50	59
6	60	69
7	70	79
8	80	89
9	90	99

Channel Groups are formed simply by setting up the appropriate Pre-set Channel frequencies into the RT-9000B's memory using the procedures described in section 6.3.2.10. However, the Channel numbering in these groups must comply with organization described in this section. ALE systems require at least two (2) or more frequencies for effective operation.

If ten (10) or fewer frequencies are available, they would normally all be set up in the same Channel Group (usually Group 0). If more than ten (10) frequencies are available, they could be arranged in groups with some meaningful order and grouping. For example, 'Daytime' frequencies could be stored in Group 0 and 'Nighttime' frequencies in Group 1.

NOTE: Remember, ALE operation and scanning can use only one (1) Channel Group at a time.

6.3.4.2.2 ESTABLISHING ALE-IDs

The RT-9000B ALE Subsystem is capable of operating with multiple ALE Networks. The ALE system can support a Network structure of up to twenty (20) separate ALE Networks. Each Network may contain a station SELF ID for the RT-9000B Transceiver plus station "CALL IDs" for up to nine (9) other Network stations. When entering ALE IDs into the RT-9000B, the user must follow a prescribed order to avoid confusion and ensure correct entry.

Section 6.3.4.2.2 is divided into four (4) parts and describes entry of four (4) different types of ALE ID information into the RT-9000B's memory. When establishing a new ALE Network, the order of entry of this ALE ID information will be as follows:

1. Establish and Enter Network ID (NET ID) Name
2. Select and Enter (SELF ID) Time Slot Position
3. Enter SELF ID Name
4. Enter Network Station CALL IDs (Time Slot Position and Name)

Additionally, this same sequence of operations must be repeated for EACH separate ALE Network (including SELF & CALL ID entries). If the user will be using more than one Network, all entry steps should be completed for the Network-at-hand before proceeding to and setting up the next Network.

While the steps in this section are primarily used to establish ALE Networks and enter ALE ID information, the Network ID (NET ID) and CALL ID entry steps are also used as Selection steps for certain ALE operating functions described later. The procedures used for both entry and Selection and are flagged when they occur during the appropriate ALE operations.

NOTE: In the remainder of the ALE sections of this manual, 'TUNING' knob, TUNING' control and DIAL, all refer to the RT-9000B front panel "TUNING" knob.

To establish a new ALE Network and enter all required ALE IDs, complete the following steps and sections 6.3.4.2.2.1 through 6.3.4.2.2.4.

Depress the Feature Menu select key 'MORE' at **1** successively until the Feature Menu Display at **2** appears as shown in Figure 6.3.4.5. Depressing the 'ALE-ID' select key at **3** will cause the Feature Menu shown in Figure 6.3.4.6 to appear.

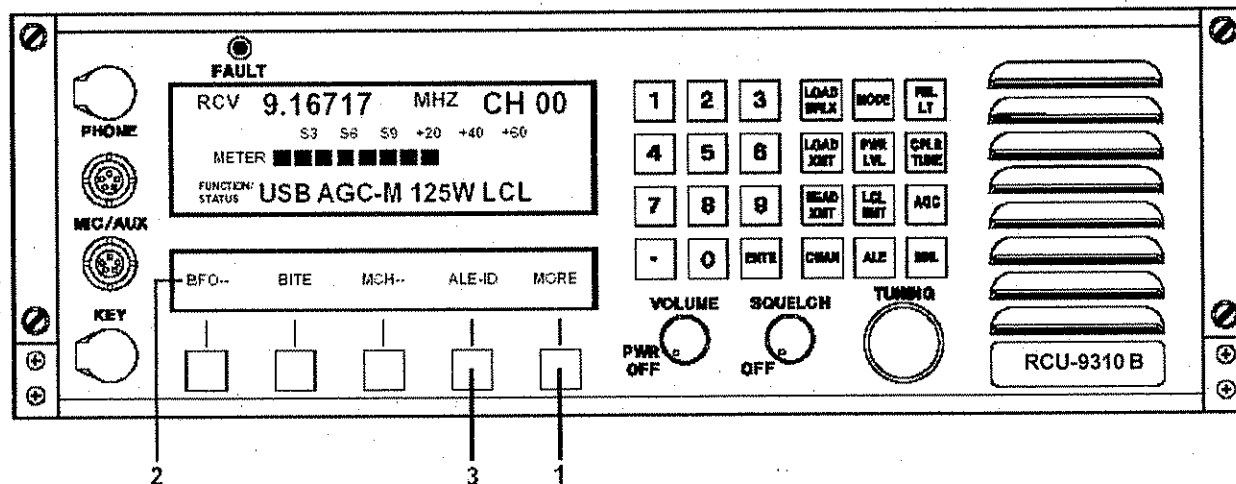


Figure 6.3.4.5 Main Menu containing ALE-ID Selection

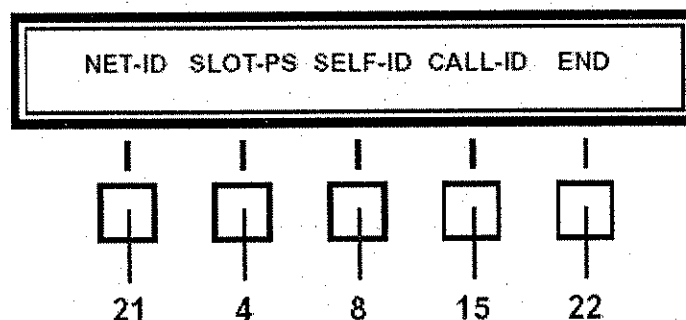


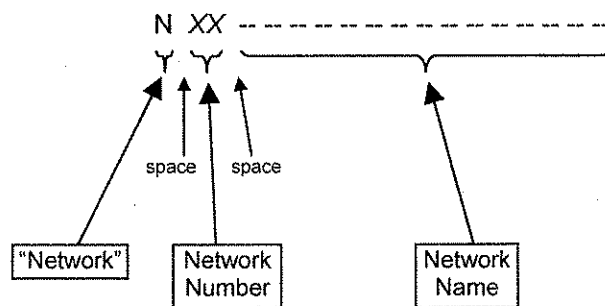
Figure 6.3.4.6 'ALE-ID' Select Feature Menu

6.3.4.2.2.1 Establishing and Entering Network ID (NET ID) Name

Referring to Figure 6.3.4.6, depress the 'NET ID' key at **21**. The Feature Menu and Operational Display will change to that shown in Figure 6.3.4.8 and briefly display an 'ENTER CODE WITH DIAL' message at **9**. This message will automatically clear and be replaced with the following display.

'N XX -----'

A sequence of fifteen dashes (---) or alphanumeric characters, representing the "Network Name" will appear following 'N XX'. Any combination of up to fifteen alphanumeric characters may be used.



For new, unestablished ALE Networks XX = 01

For a presently used ALE Network XX = Network Number of
Current Network

Figure 6.3.4.7 ALE Network ID Display Detail

In this display the "N" indicates "Network", "XX" indicates the "Network Number", and the sequence of fifteen (15) dashes serves as placeholders for the corresponding "Network Name".

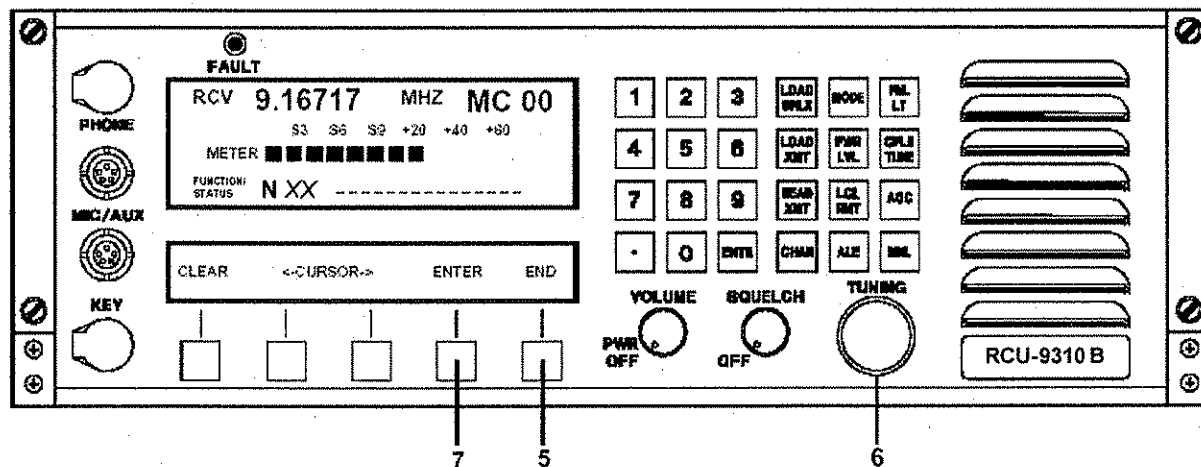


Figure 6.3.4.8 ALE Network ID Selection Displays

NOTE: The Network Number associated with the ALE Network setup procedures in this section is strictly a local RT-9000B reference number. This "Network Number" has no meaning in the ALE Network environment or to other ALE Network Stations.

When the above information initially appears in the Operational Display, the blinking cursor will be positioned in "Network Number" portion of the above displayed information. The user should now rotate the 'TUNING' knob until the desired "Network Number" appears. Using the cursor right arrow (→), the user now should move the cursor to the first character position of the "Network Name" portion of the above displayed information.

If there is information other than dashes (--) in the Network Name positions or the user is changing an established Network Name, depress the 'CLEAR' feature select key at **10** to clear the positions and ease new name entry.

The first character position, or dash (--) will flash to indicate the specific position where a user selected character is to be entered. If the first character is satisfactory as is, depressing the right arrow (→) key at **11** will move the flashing cursor one position to the right. Alternately, depressing the left arrow (←) key at **12** will move the cursor one position to the left.

As each character position is selected, characters '0' through '9' and 'A' through 'Z' may be selected by rotating the 'TUNING' knob at **6** either clockwise or counter-clockwise. Once the desired character appears in view, depress the right arrow key (→) at **11**. The flashing cursor will move to the next character position. This character selection process is repeated until the desired NET ID "Network Name" has been formed.

Once all characters for the "Network Name" have been selected, depress the Enter ('ENTR') key at **13** to enter the selected 'NET ID' information ("Network Number" and "Network Name") into the RT-9000B's memory. Depress the 'END' key at **14** to exit the Network ID entry process and return to the Feature Menu shown in Figure 6.3.4.6.

Depressing the 'END' key at **14** without first depressing the Enter ('ENTR') key at **13** will also cause the Feature Menu to revert to that shown in Figure 6.3.4.6 except any changes made during this process will NOT be entered into the RT-9000B's memory.

The Network selected and entered using the Enter ('ENTR') key at **13** becomes the active ALE Network for all RT-9000B ALE operations that requiring Network selection. This Network is referred to as the **Current Network** and is primarily associated with ALE Transmit functions. This selection remains in force until changed and will be retained both, after leaving ALE modes and, during power-off periods. The user may now proceed to paragraph 6.3.4.2.2.2 Entering (SELF ID) Time Slot Position.

If the user is only changing the **Current Network** to a different Network for use in ALE operating mode, perform following actions. Navigate to the 'ALE-ID' Select Feature Menu and depress the 'NET ID' key as described earlier in this section. Rotate the 'TUNING' knob and stop when the desired Network Name and Number appears in the Operational Display. Depress the Enter ('ENTR') key at **13**, then the 'END' key at **14**. The newly selected Network is now the **Current Network** and will remain so, as previously described. These steps will cause the Feature Menu to revert to the display shown in Figure 6.3.4.6.

Depress the 'END' key at **22** to return to the display shown in Figure 6.3.4.5. The user may now enter ALE operating mode using the new **Current Network**.

6.3.4.2.2.2 Selecting and Entering (SELF ID Time) Slot Position

Referring to Figure 6.3.4.6, depress the 'SLOT-PS' Key at 4. The Feature Menu and Operational Display shown in Figure 6.3.4.9 will appear and briefly display an 'ENTER CODE WITH DIAL' message. This message will automatically clear and be replaced with the following indication:

'XX SLOT POSITION'

For new, unestablished ALE Networks XX = 01

For a presently used ALE Network XX = Present (SELF ID Time) Slot Position setting

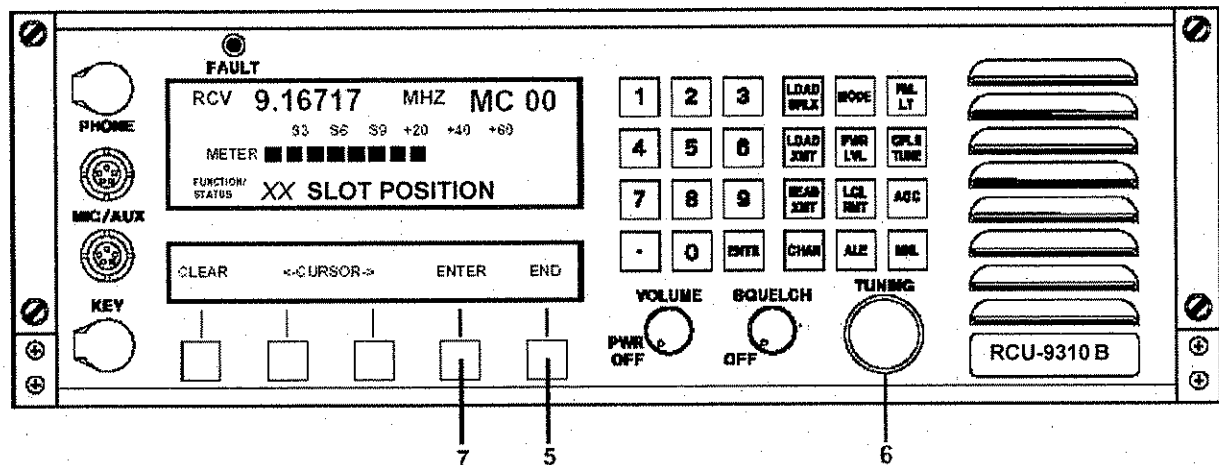


Figure 6.3.4.9 ALE Slot Position Selection Displays

Rotate the 'TUNING' knob at 6 until the required (SELF ID Time) SLOT POSITION appears. Only numbers '01' through '10' are valid selections.

NOTE: Under certain conditions, it is possible to display numbers from '11' through '19'. These numbers are NOT VALID selections and should not be used.

Depress the Enter ('ENTR') key at 7 to enter this selection into the RT-9000B's memory. The Feature Menu Display will revert to that shown in Figure 6.3.4.6. The user may now proceed to paragraph 6.3.4.2.2.3 Entering a SELF ID Name.

Depressing the 'END' key at 5 without first depressing the Enter ('ENTR') will also cause the Feature Menu Display will revert to that shown in Figure 6.3.4.6 except any changes made during this process will NOT be entered into the RT-9000B's memory.

6.3.4.2.2.3 Entering SELF ID Name

Referring to Figure 6.3.4.6, depress the 'SELF ID' key at **8**. The Feature Menu and Operational Display shown in Figure 6.3.4.10 will appear and briefly display an 'ENTER CODE WITH DIAL' message at **9**. This message will automatically clear and be replaced with the following display.

'S ID -----'

A sequence of fifteen dashes (--) or alphanumeric characters, representing the SELF ID ('S ID') Name will appear following 'S ID'. Any combination of up to fifteen alphanumeric characters may be used.

If there is information other than dashes (--) in SELF ID Name positions or the user is changing a current SELF ID Name, depress the 'CLEAR' feature select key at **10** to clear the positions and ease new name entry.

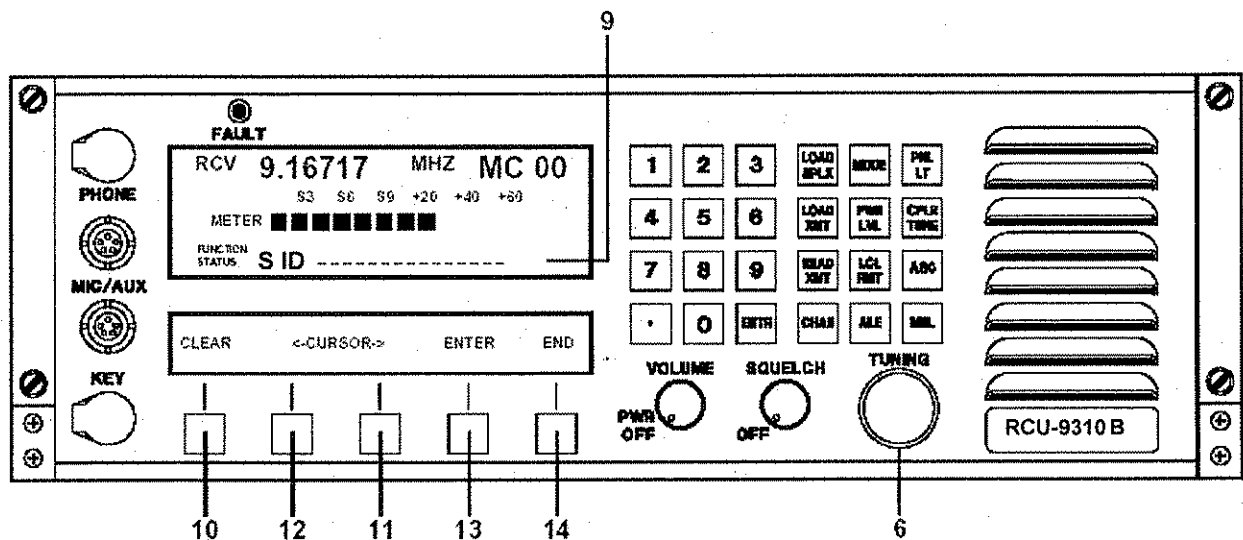


Figure 6.3.4.10 ALE SELF ID Selection Displays

The first character position, or dash (--), will flash to indicate the specific position where a user selected character is to be entered. If the first character is satisfactory as is, depressing the right arrow (→) key at **11** will move the flashing cursor one position to the right. Alternately, depressing the left arrow (←) key at **12** will move the cursor one position to the left.

As each character position is selected, characters '0' through '9' and 'A' through 'Z' may be selected by rotating the 'TUNING' knob at **6** either clockwise or counter-clockwise. Once the desired character appears in view, depress the right arrow key (→) at **11**. The flashing cursor will move to the next character position. This character selection process is repeated until the desired SELF ID ('S ID') "Name" has been formed.

Once all characters for the SELF ID ('SID') "Name" have been selected, depress the Enter ('ENTR') key at **13** to enter the SELF ID ('S ID') "Name" into the RT-9000B's memory. Depress the 'END' key at **14** to exit the SELF ID ('S ID') Name entry process and return to the Feature Menu shown in Figure 6.3.4.6. The user may now proceed to paragraph 6.3.4.2.2.4 Entering Network Station CALL IDs (Time Slot Position and Name)

Depressing the 'END' key at **14** without first depressing the Enter ('ENTR') key at **13** will also cause the Feature Menu to revert to that shown in Figure 6.3.4.6 except any changes made during this process will NOT be entered into the RT-9000B's memory

6.3.4.2.2.4 Entering Network Station CALL IDs (Time Slot Position and Name)

Referring to Figure 6.3.4.6, depress the 'CALL ID' key at **15**. The Feature Menu and Operational Display will change to that shown in Figure 6.3.4.12 and briefly display an 'ENTER CODE WITH DIAL' message at **18**. This message will automatically clear and be replaced with the following display.

'C XX -----'

For new, unestablished ALE Networks XX = 01

For a presently set up ALE Network XX = Currently Selected CALL ID
(Time Slot Position) Number

A sequence of fifteen dashes (---) or alphanumeric characters, representing a Network Station CALL ID Name will appear following 'C XX'. Any combination of up to fifteen alphanumeric characters may be used.

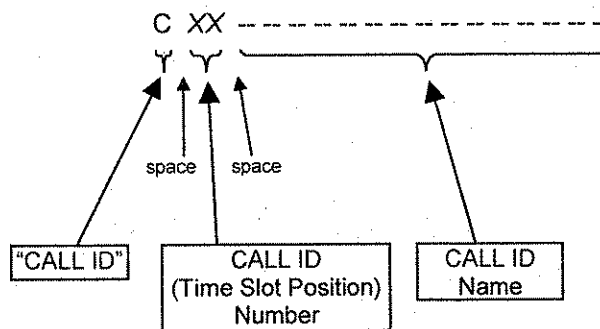


Figure 6.3.4.11 ALE CALL ID Display Detail

Figure 6.3.4.11 indicates In this display the "C" indicates "CALL ID", "XX" indicates a "CALL ID (Time Slot Position) Number", and the sequence of fifteen (15) dashes serves as placeholders for the corresponding station CALL ID Name.

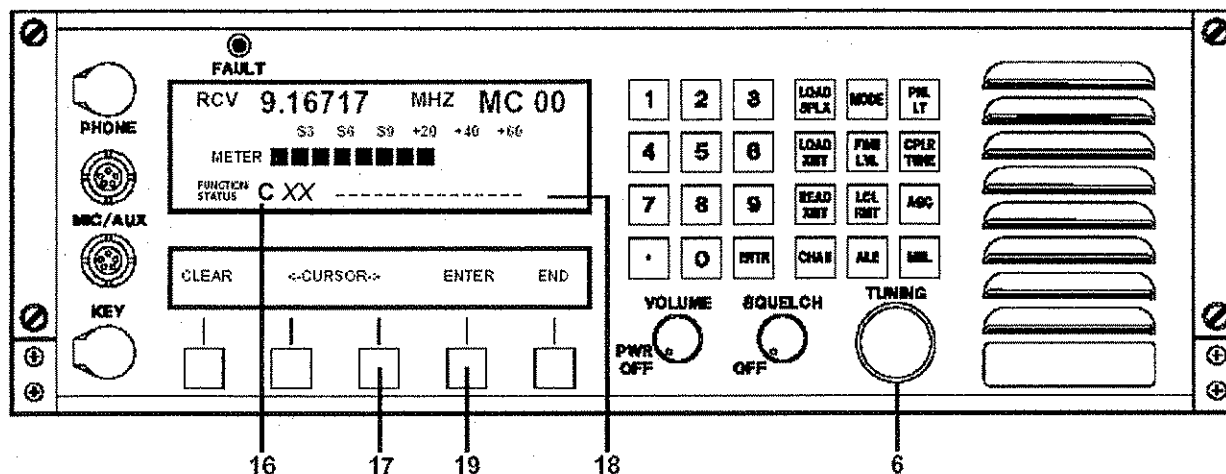


Figure 6.3.4.12 ALE CALL ID Selection Displays

When the above information initially appears in the Operational Display, the blinking cursor will be positioned in "CALL ID (Time Slot Position) Number" portion of the above displayed information. The user should now rotate the 'TUNING' knob at 6 until the desired "CALL ID (Time Slot Position) Number" appears. Using the cursor right arrow (→) at 17, the user now should move the cursor to the first character position of the CALL ID "Name" portion of the above displayed information. Only the numbers '01' through '10' are valid selections.

NOTE: Under certain conditions, it is possible to display numbers from "11" to "19". These numbers are not valid selections and should not be used.

NOTE: When setting up an ALE Network, the Network Time Slot Position assignments should first use Time Slot One, then Time Slot Two next and so on until all Time Slot Assignments have been completed. There should be no unused Time Slots between the SELF ID and any of the CALL IDs. Failure to observe this precaution may result in incorrect operation.

If there is information other than dashes (--) in the CALL ID Name positions or the user is changing the current CALL ID Name, depress the 'CLEAR' feature select key to clear the positions and ease new name entry.

The first position, or dash (--) will flash to indicate the specific position where a user selected character is to be entered. If the first character is satisfactory as is, depressing the right arrow (→) key at 17 will move the flashing cursor one position to the right. Alternately, depressing the left arrow (←) key at 17 will move the cursor one position to the left.

As each character position is selected, characters '0' through '9' and 'A' through 'Z' may be selected by rotating the 'TUNING' knob at 6 either clockwise or counter-clockwise. Once the desired character appears in view, depress the right arrow key (→) at 17. The flashing cursor will move to the next character position. The character selection process is repeated until the desired Network Station CALL ID Name has been formed.

Once all characters for the CALL ID Name have been selected, depress the Enter ('ENTR') key at **19** to enter the CALL ID information (Time Slot Position Number and Name) into the RT-9000B's memory. Depress the 'END' key to exit the CALL ID entry process and return to the Feature Menu shown in Figure 6.3.4.6.

If additional Network Station CALL IDs will be entered, depress the CALL ID key at **15** again and repeat the above steps to enter the additional CALL ID information. Repeat the process as required to enter all CALL IDs for the **Current Network**. Up to nine (9) CALL IDs, in addition to the Station's SELF ID, may be entered in each of the 20 separate ALE Networks.

When selecting CALL ID (Time Slot Position) Numbers with the 'TUNING' knob and the previously selected SELF ID (Time) Slot Position Number is reached, a 'THIS IS OUR SELF ID' message will appear in the Operational Display. This alerts the user that this is the SELF ID Time Slot Position for the **Current Network**.

Depressing the 'END' key without first depressing the Enter ('ENTR') key will also cause the Feature Menu to revert to that shown in Figure 6.3.4.6 except any entries or changes made during this process will NOT be entered into the RT-9000B's memory.

If the user is only selecting a Network Station 'CALL ID' for use later in a Point-to-Point ALE call, rotate the 'TUNING' knob until the desired station 'CALL ID' (Time) Slot Number and Name appears in the Operational Display. Depress the Enter ('ENTR') key, and then depress the 'END' key. This procedure selects a 'CALL ID' and causes the Feature Menu to revert to the display shown in Figure 6.3.4.6. Depress the 'END' Key once again to return to the display shown in Figure 6.3.4.5. The user may now enter ALE Operating mode and transmit a Point-to-Point ALE Call using the newly selected 'CALL ID'.

6.3.4.3 AUTOMATIC LINK ESTABLISHMENT (ALE) OPERATION

Special Note

The Operational Display illustrations appearing in this section depict ALE operation using 4800 Baud or higher data rates between the RT-9000B and RCU-9310B units. If 2400 Baud (or slower) data rates are used, only the information appearing in the "Function/Status" field of the Operational Display will be displayed during ALE operation. The remainder of the display will be blank.

After all required ALE Network and identity information has been entered as described in previous section 6.3.4.2, the system is ready for operation. Operation is not difficult. The operator need only confirm (or select) the correct operating frequency Channel Group (used for both ALE Receive and Transmit operations) and confirm (or select) the correct ALE Network (used for ALE Transmit operations).

The RT-9000B ALE system supports four (4) different ALE calling methods used to communicate with other Network Stations. Each method has a specific purpose, station calling selectivity, and response requirements. These ALE calling methods are:

- 1.) Point-to-Point Calling
- 2.) Sounding
- 3.) NET CALL Calling
- 4.) ALL CALL Calling

The RT-9000B Transceiver and internal ALE modem combination both Receives (and initiates an appropriate Answer, if required) and Originates (Transmits) ALE calls for the above calling methods. Specific procedures, requirements, and indications are covered in detail later in this section when each type of calling method is used to Transmit or Receive a call.

6.3.4.3.1 Channel Group Selection

When initially entering ALE mode, the operator must confirm or select the correct operating frequency Channel Group that ALE system will use to communicate with other Network stations. This is essential for proper ALE system operation. Channel Group selection is solely an operator responsibility. Perform the following steps to confirm or change Channel Groups:

1. Depress the '*'/'ALE' key at **1** as shown in Figure 6.3.4.13. The Feature Menu shown in this figure will appear.
2. Observe the Operational Display shown at **3** and note the first digit following 'MC'. This is the currently selected Channel Group.
3. If the currently selected Channel Group IS the desired one, no action is required. The user may continue operations and skip steps 4, 5 and 6.
4. If the currently selected Channel Group IS NOT the desired one, depress the 'MORE' key at **10**. The Feature Menu Display shown in Figure 6.3.4.14 will appear.

5. Depress the Select Group ('SEL-GRP') key. The Feature Menu Display shown in Figure 6.3.4.15 will appear and display the message 'SELECT GROUP 0-9'. (Depressing the 'END' key aborts the Channel Group selection process and causes the Feature Menu Display to revert to that shown in Figure 6.3.4.14).
6. Enter the desired Channel Group number using the Numeric Keypad shown at 8 in Figure 6.3.4.13. The newly entered Channel Group will appear as described in step 2. The Feature Menu Display will revert to that shown in Figure 6.3.4.13.

NOTE: If the Channel Group Number entered does NOT have at least one (1) valid Channel entered into the RT-9000B's memory, a 'THIS GROUP NOT SETUP' message will appear in the Operational Display.

7. The user may continue with all other ALE operations.

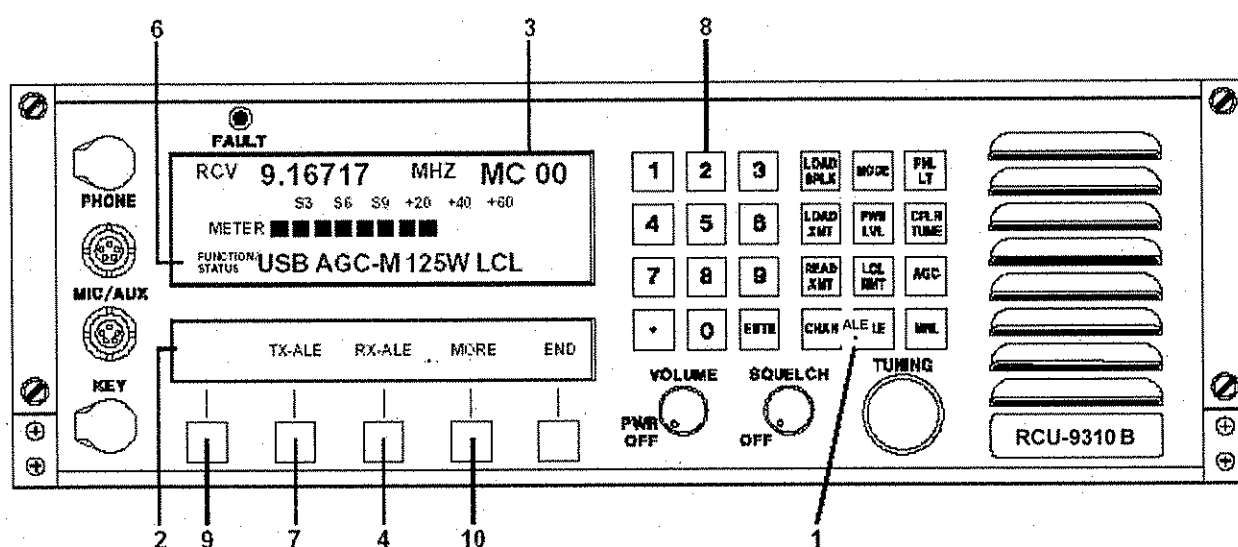


Figure 6.3.4.13 ALE Operation Feature Menu

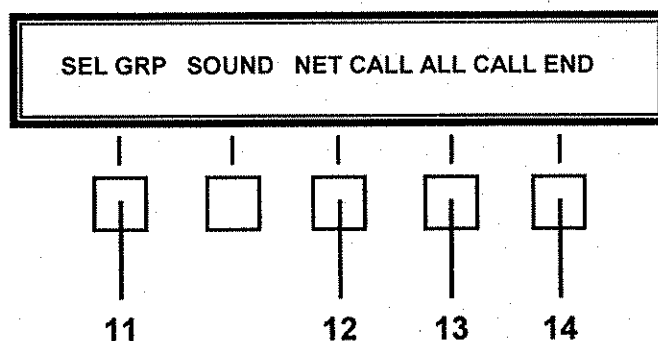


Figure 6.3.4.14 ALE Calling Feature Menu

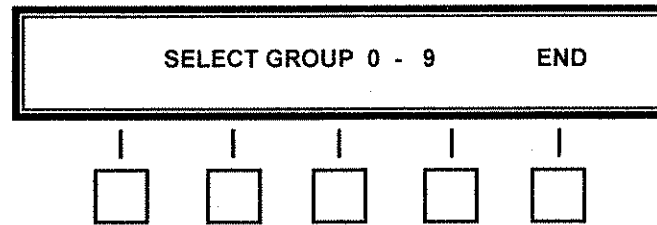


Figure 6.3.4.15 ALE Channel Group 'Select Group' Feature Menu

6.3.4.3.2 ALE Receive Operation

ALE Receive operation places the RT-9000B's Receiver and ALE system in a mode that permits the RT-9000B to monitor and automatically respond to ALE calls from other Network Stations. The RT-9000B MUST BE set in Receive scan ('RX-ALE') mode for these capabilities to function. Perform the following steps to enable ALE Receive scanning and operation:

1. Depress the '*/ALE' key at **1** as shown in Figure 6.3.4.13. The Feature Menu shown in this same figure will appear after the key is depressed.
2. Confirm or select the correct Channel Group as described in the previous section (6.3.4.3.1).
3. Depress the 'RX -ALE' key at **4** to start the ALE Receive scanning process. The Operational Display may initially display a 'PLEASE WAIT' message for approximately 7-10 seconds immediately following 'RX-ALE' key depression. This message will automatically clear and change to 'ALE RECEIVE' with all other normal Receive information disappearing. After Receiver scanning begins, the 'TX-ALE' and 'RX-ALE' selections in the Feature Menu Display will also disappear.
4. After the 'ALE RECEIVE' message appears in the Operational Display, the Receiver will begin scanning. The operating frequency and Channel information sections of the Operational Display will begin changing approximately every 1/2 second to indicate the instantaneous Receiver settings during Receiver scanning.

RT-9000B ALE Receive operation is designed to receive and to appropriately react to ALE calls from other Network stations. The RT-9000B will respond to the four (4) supported calling methods previously specified.

The ALE system automatically monitors all incoming ALE calls that are addressed, or apply, to any of your station SELF IDs for each established ALE Network. This capability DOES NOT require any ALE Network selection nor operation action for proper operation.

RT-9000B responses to received ALE calls are covered in detail for each supported calling method later in this section.

To cause Receiver scanning to stop, depress either the 'END' key or the 'MORE' key on the Feature Menu. No other choices appear on the Feature Menu Display.

- Depressing the 'END' key causes Receiver scanning to stop and immediately leave ALE mode and return to the Main Menu.
- Depressing the 'MORE' key causes Receiver scanning to also stop but the Feature Menu will revert to that shown in Figure 6.3.4.14.

After returning to Feature Menu shown in Figure 6.3.4.14, the user may choose any of the following actions:

- a) Perform any of the ALE functions appearing on the Feature Menu shown in Figure 6.3.4.14.
- b) Return to ALE Receive operation and resume scanning. Depressing the 'ALE/*' key at **1** as shown in Figure 6.3.4.13 will cause the Feature Menu shown in Figure 6.3.4.13 to reappear. Depress 'RX-ALE' to resume ALE Receive scanning.
- c) Leave ALE Operating mode and return to the Main Menu. Depressing the 'END' key at **14** will cause the Feature Menu shown in Figure 6.3.4.13 to reappear. Depress 'END' again to return to the Main Menu.

6.3.4.3.3 ALE Transmit Operation

The RT-9000B ALE system supports four (4) different ALE calling methods used to communicate with other Network Stations. The following supported calling methods are covered in detail later in this section.

- A) Point-to-Point Calling
- B) Sounding
- C) NET CALL Calling
- D) ALL CALL Calling

Before initiating any ALE call, the operator must confirm or select the following: 1.) operating frequency Channel Group and 2.) the **Current Network** ALE Network

Unless the operator is changing to new operating frequencies, the Channel Group selection used for ALE Transmit operations will be the same Channel Group used for ALE Receive operation. No operator action will be required.

Confirmation or selection of the correct ALE **Current Network** is absolutely essential for proper ALE system function. Perform the following steps to confirm or change the ALE **Current Network**.

1. Navigate to the RT-9000B front panel display shown in Figure 6.3.4.5.
2. Depress the 'ALE-ID' key. The Feature Menu Display shown in Figure 6.3.4.6 will appear.
3. Depress the 'NET-ID' key. The Feature Menu Display will change to that shown in Figure 6.3.4.8 as described in the beginning of the paragraph dealing with Network ID Entry. Inspect the appropriate area of the Operational Display and note the Network Number and Name when it first appears.
4. If the indicated Network (which is the **Current Network**) IS the desired Network, depress the 'END' key. The Feature Menu Display shown in Figure 6.3.4.6 will re-appear. Depress the 'END' key again. The RT-9000B front panel display shown in Figure 6.3.4.5 will reappear. The user may continue operations and skip steps 5, 6 and 7.

5. If the indicated Network (which is the **Current Network**) IS NOT the desired Network, select the desired Network by rotating the 'TUNING' knob until the desired appears and stop..
6. Depress the Enter ('ENTR') key, then the 'END' key. The Feature Menu Display shown in Figure 6.3.4.6 will re-appear.
7. Depress the 'END' key again. The RT-9000B front panel display shown in Figure 6.3.4.5 will reappear. The user may return to ALE Operation and continue ALE Transmit calling operations.

Once the operating frequency Channel Group and the ALE **Current Network** is confirmed, the operator may proceed to detailed operating instructions that follow for each calling method.

6.3.4.4 Point-to-Point Calling

The Point-to-Point Calling method is used to call a specific Network Station on all frequencies (or Channels) in the currently selected Channel Group. A Point-to-Point Call expects a response from the Called Station.

When the RT-9000B initiates a Point-to-Point Call, it will transmit its call on the first frequency in the Channel Group and then listen for a response before it moves to the next frequency and repeats the process. Calling will continue until a response is received or the Point-to-Point Calling sequence ends. The initiating station of a Point-to-Point Call will proceed through the selected Channel Group (calling and listening on each frequency, in sequence) up to two (2) complete times if a response is NOT received.

6.3.4.4.1 Transmitting a Point-to-Point Call

To transmit a Point-to-Point ALE call to another Network station, perform the following steps:

1. Select the CALL ID of the Called Station for a Point-to-Point Call using the process described at the end of section 6.3.4.2.2.4 Entering Network Station CALL IDs.
2. Depress the '*//ALE' key. The front panel display shown in Figure 6.3.4.13 will appear.
3. Depress the 'TX-ALE' (Transmit ALE) key at 7 to initiate the call to the selected station on the frequencies in the selected Channel Group.
4. While the calling process is underway, the Operational Display will indicate the CALL ID of the station being called and the frequency & Channel Number being used at that instant to transmit the call. Transmission on each channel continues for approximately 3 seconds before changing to the next channel in the Channel Group.
5. ALE signaling tones may also be heard during the Initiating Station's Receive period as they being transmitted back from the from the Called Station.
6. Figure 6.3.4.16 shows an example of how the Operational Display appears during the calling process.

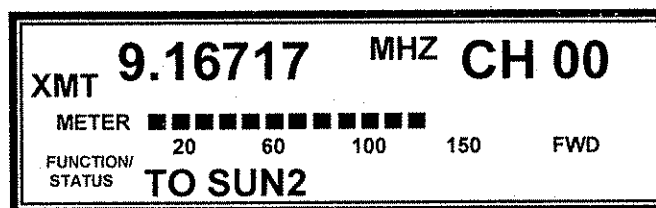


Figure 6.3.4.16 ALE Point-to-Point Call - Initiating Station Display

When Linking occurs, ALE Transmit calling (TX-SCAN) will cease and the message shown in Figure 6.3.4.17 will appear. Immediately after Linking, four (4) loud tones approximately 1/2 second long, in an On-Off sequence, will be emitted from the Front Panel Speaker and signify Linking has occurred. The audio output level of these alerting tones is fixed and not affected by the Front Panel 'VOLUME' control setting. Disabling the Front Panel Speaker, however (as described earlier in 6.3.3.3), will silence the tones.

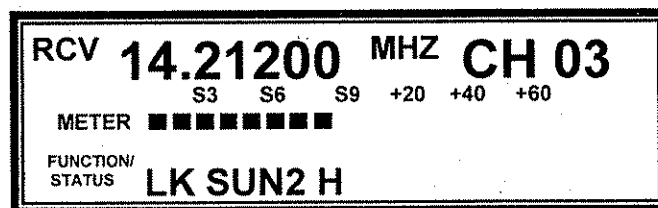


Figure 6.3.4.17 ALE Point-to-Point Call - Initiating Station - After Linking

The Operational Display shown in Figure 6.3.4.17 indicates the following information: 1) Operating frequency and Channel Number used for Link, 2) 'LK' = a Link has been completed, 3) 'SUN2' = station CALL ID of the station "Linking back" to the Initiating Station, and 4) 'H' = Link Quality Analysis (LQA) value of the received frequency. The table shown in Figure 6.3.4.18 gives Displayed Link Quality Analysis (LQA) Value vs. SINAD conversion values.

Selecting or depressing any Feature Menu key while a Link is intact will cause a "Link Terminate" message to be transmitted and the "Break Link Process" to occur. A 'LINK TERMINATE' message will briefly appear in the Operational Display and then automatically clear. This "Break Link Process" provides a means for the Initiating Station to abandon an existing Link and perform other tasks.

If the Initiating Station calls and attempts to Link with the Called Station two (2) times on each frequency and is unable to complete a Link, Calling (Transmit scanning) will cease and the following message will appear in the Operational Display.

'TX-SCAN TERMINATED'

At this point, the Initiating Station originating the call may do the following:

- Repeat the Point-to-Point Call. Depressing the 'ALE/*' key at 1 as shown in Figure 6.3.4.13 will cause the Feature Menu shown in Figure 6.3.4.13 to reappear. Depress 'TX-ALE' to repeat the Point-to-Point call.
- Repeat the Point-to-Point Call using a different Channel Group with different operating frequencies, if available.
- Place the RT-9000B in ALE Receive scan and try to Link later. The Called station may be busy or propagation unfavorable at this time.
- Perform other ALE operations.
- Leave ALE Operating mode and return to the Main Menu. Depressing the 'END' key will cause the RT-9000B to immediately leave ALE mode, return to the Main Menu, and resume normal operation.

Displayed LQA Value vs SINAD Measurement					
Displayed LQA Value	dB SINAD	Displayed LQA Value	dB SINAD	Displayed LQA Value	dB SINAD
1	1	B	11	L	21
2	2	C	12	M	22
3	3	D	13	N	23
4	4	E	14	O	24
5	5	F	15	P	25
6	6	G	16	Q	26
7	7	H	17	R	27
8	8	I	18	S	28
9	9	J	19	T	29
A	10	K	20	U	30

Notes:

- LQA = Link Quality Analysis
- SINAD = Signal + Noise + Distortion - to - Noise + Distortion Ratio

Figure 6.3.4.18 Link Quality Analysis Values vs. SINAD Values

6.3.4.4.2 Receiving a Point-to-Point Call

To receive an ALE Point-to-Point, the RT-9000B must currently be in ALE Receive ('RX-ALE') mode and scanning. The Channel Group currently selected should include all or most of the same frequencies being used by the Initiating Station.

The following describes the sequence of events when receiving a Point-to-Point Call:

- With the RT-9000B-equipped Distant Station in ALE Receive ('RX-ALE') mode and scanning, the RT-9000B will stop scanning on the received frequency when it receives an ALE transmission. Non-ALE transmissions on any frequency(s) in the Channel Group will only pass through during the brief 1/2 second scan interval but NOT cause the Receiver to stop scanning.

2. If the ALE transmission DOES NOT contain the station CALL ID of the RT-9000B-equipped station hearing the call, the RT-9000B will pass through the ALE signaling tones but NOT transmit an ALE response.
3. If the ALE transmission DOES contain the station CALL ID of the RT-9000B-equipped station hearing the call, the RT-9000B will pass through the ALE signaling tones, determine the appropriate action, and transmit an ALE response.
4. The Initiating Station will normally transmit the ALE Point-to-Point call on every frequency (Channel) in the selected Channel Group and measure the received responses BEFORE Linking. In this way, both Initiating and Called stations acquire the data needed to calculate Link Quality Analysis (LQA) values for each frequency and its current condition. For large Channel Groups with many frequencies, this step and its actions may occupy more time than the user might expect without an apparent result.
5. After working through the Channel Group once, the Initiating Station will normally proceed directly to the frequency (Channel) with the best LQA value and attempt to Link with the Called Station.

NOTE: If the Initiating and Called stations were previously Linked within approximately the last two (2) hours but not currently Linked, a new attempt to re-establish the Link will usually proceed directly to the last used Linking frequency. If either station's equipment was been powered down or the previous Link was terminated more than two (2) hour ago, Linking attempts will likely execute the entire calling process without any shortcuts.

6. Figure 6.3.4.19 shows an example of how the Called Station's Operational Display appears after the Linking process is finished.
7. Once the Link is established, the same alerting tones as those used for "Transmitting a Point-to-Point Call" are sounded to alert the operator that a call was received and a Link established. This alerting feature is particularly useful in operating environments where operators are doing many different things at the same time and need an effective notification mechanism..
8. This Link will remain intact for up to approximately two (2) hours. If no activity occurs with this time period, the RT-9000B will transmit a "Link Terminate" message and abandon the Link. Any activity within the two (2) hour interval resets the timer to its original time limit. The transmission information displayed in Figure 6.3.4.19 will remain intact until more recent ALE activity overwrites it or the operator leaves ALE mode.

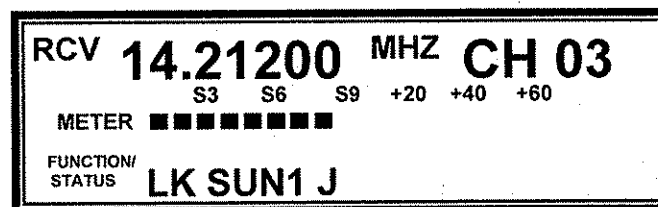


Figure 6.3.4.19 ALE Point-to-Point Call - Called Station Display - After Linking

The Operational Display shown in Figure 6.3.4.19 indicates the following information: 1) Operating frequency and Channel Number, 2) 'LK' = Link established, 3) 'SUN1' = station CALL ID this station is Linked with, and

4) 'J' = Link Quality Analysis (LQA) value of the Linking frequency. The table shown in Figure 6.3.4.18 gives Displayed Link Quality Analysis (LQA) Value vs. SINAD conversion values.

Selecting or depressing any Feature Menu key while a Link is intact will cause a "Link Terminate" message to be Transmitted and the "Break Link Process" to occur. A 'LINK TERMINATE' message will briefly appear in the Operational Display and then automatically clear.

If the Initiating Station terminates the link, this station (the Called Station) will automatically revert to ALE Receive ('RX-ALE') mode and resume scanning.

6.3.4.5 SOUNDING

Sounding is a calling method that transmits a one-way signal on each frequency in the currently selected Channel Group to all Network stations. Sounding, of course, does not expect a response.

Sounding transmissions are used to update the signal propagation information stored in each Network Station's equipment. This information allows Network Stations to establish ALE links more quickly by choosing frequencies with the best current conditions. The Sounding process is not required for contact with other stations employing SUNAIR ALE Modems, since Link Quality Analysis (LQA) exchanges are always performed as part of the Linking process and retained in memory for approximately 2 hours.

6.3.4.5.1 Manually Transmitting a SOUND

To manually transmit a Sound, depress the '*/ALE' key at **1** as shown in Figure 6.3.4.13. Depressing the 'MORE' key at **10** will cause the Feature Menu display shown in Figure 6.3.4.20 to appear.

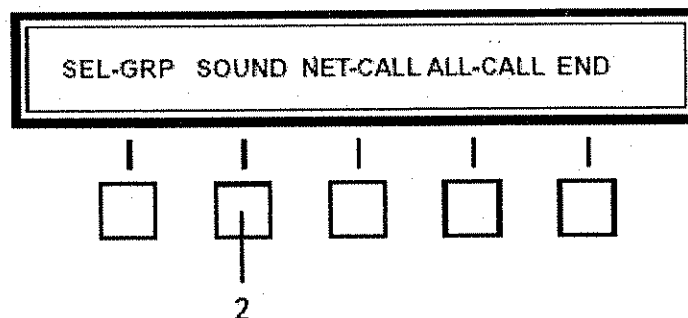


Figure 6.3.4.20 ALE Calling Feature Menu

Depressing the 'SOUND' key at **2** will cause the Feature Menu shown in Figure 6.3.4.21 to appear.

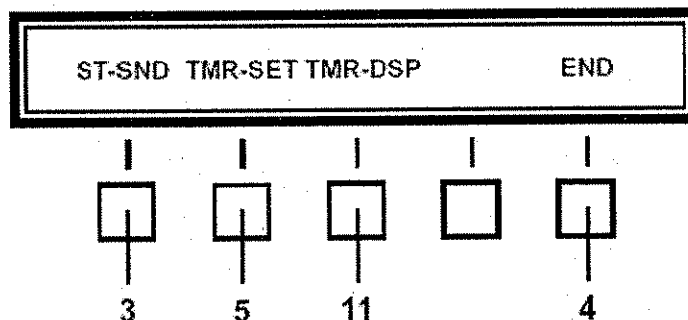


Figure 6.3.4.21 ALE Sounding Feature Menu

Depressing the 'ST-SND' (Start Sound) key at 3 will initiate the Sounding process and transmit on every frequency (Channel) in the currently selected Channel Group. The Operational Display shown in Figure 6.3.4.22 will appear and indicate the following information: 1) Transmitter operation ('XMT'), 2) Operating frequency and Channel Number, and 3) 'SOUNDING' = Sounding transmission is being transmitted.

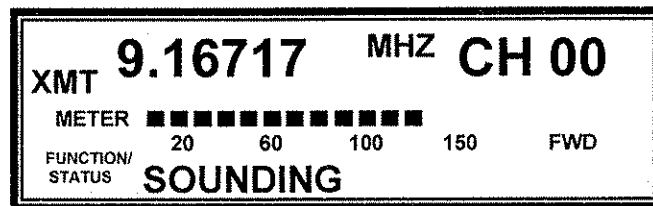


Figure 6.3.4.22 ALE Sounding – Initiating Station Display

After the Sounding process has finished, the Operational Display will continuously display a 'TX-SCAN TERMINATED' message. The Feature Menu will remain unchanged from that shown in Figure 6.3.4.21.

At this point, the station Transmitting the Sounding call may do the following:

- a) Repeat the Sounding transmission. Depressing the 'ST-SND' (Start Sound) key again will re-transmit the Sounding transmission.
- b) Leave the 'Sounding' Menu and return to the ALE Transmit ('TX-ALE') and Receive ('RX-ALE') menu. Depressing the 'END' key at 4 will cause the Feature Menu shown in Figure 6.3.4.13 to reappear. Normal ALE operation may continue.
- c) Leave ALE Operating mode and return to the Main Menu. After returning to ALE Transmit ('TX-ALE') and Receive ('RX-ALE') menu as described in step b) above, depressing the 'END' key once again will cause the RT-9000B to immediately leave ALE mode, return to the Main Menu, and resume normal operation.

NOTE: From time to time, the sounding process may skip certain channels and not sound on those frequencies. This is a normal occurrence; the system monitors each channel before Sounding. Depending on the channel activity, the RT-9000B may or may not transmit if the Channel is busy.

6.3.4.5.2 Receiving a SOUND

To receive an ALE Sounding transmission, the RT-9000B must currently be in ALE Receive ('RX-ALE') mode and scanning. The Channel Group currently selected should include all or most of the same frequencies being used by the Initiating Station. When the RT-9000B receives a Sounding transmission, Receiver scanning will stop on the frequency of the Sounding transmission.

The Operational Display shown in Figure 6.3.4.23 will indicate the following information: 1) Operating frequency and Channel Number, 2) 'SO' = Sounding transmission is being received, 3) 'SUN1' = station CALL ID of the station transmitting the Sound, and 4) 'F' = Link Quality Analysis (LQA) value of the received Sounding frequency.

As each Sounding transmission is received, the Receiver will stop scanning and display the received signal characteristics. When the Sounding station briefly stops transmitting to change to the next Sounding frequency, the Receiving station will momentarily resume scanning until receiving the new frequency and then stop scanning again. If the Sounding station transmits using any transmitting frequency(s) the Receiver does not have, the Receiver will merely revert to scanning while those transmissions are occurring but stop again when receiving the remaining Sounding transmissions. Due to signal processing delays, the displayed LQA value is actually that of the previous Sounding frequency immediately preceding the current one.

When the Sounding transmission concludes, the Receiver Operational Display will continue to display the last received Sounding transmission information until more recent ALE activity overwrites it or the operator leaves ALE mode.

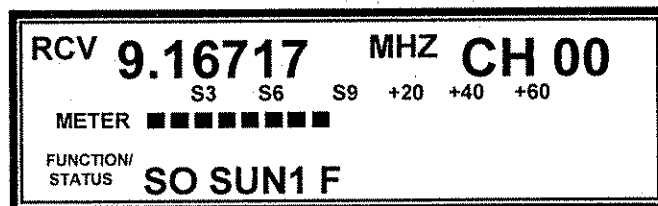


Figure 6.3.4.23 ALE Sounding – Receiving Station Display

6.3.4.5.3 Automatically Transmitting a SOUND

Automatic Sounding capability is available and automates the Sounding process. Depressing the 'TMR-SET' (Timer Setting) key at 5 as shown in Figure 6.3.4.21 will cause the Feature Menu shown in Figure 6.3.4.24 to appear. Automatic Sounding may be programmed to occur from 1 to 90 minutes in one-minute steps.

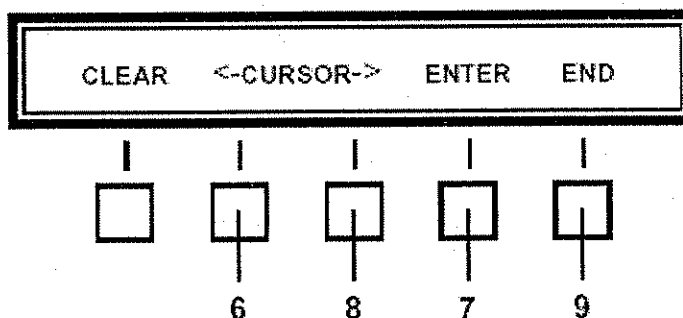


Figure 6.3.4.24 ALE Sounding - ALE Automatic Sounding Timer Feature Menu

The Operational Display will briefly display an 'ENTER CODE WITH DIAL' message and will automatically change to:

'XX TIME INTERVAL'

Where, XX = Current Sounding Timer Setting

When the Sounding Timer Display first appears, the blinking cursor will be positioned in the minute units (or right-hand most digit). Rotate the 'TUNING' dial to select any digit between '0' and '9'. Once the desired digit appears in the first position, depress the '<-- CURSOR' key at **6** to move the blinking cursor to the minute tens position (or left-hand most digit).

Once the time interval has been selected, depressing the 'ENTER' key at **9**, will return the display to that shown in Figure 6.3.4.21. Depressing 'END' once again returns the display to that shown in Figure 6.3.4.13.

Depress the 'RX-ALE' key at **4** to enter ALE RECEIVE mode. The RT-9000B must be in ALE RECEIVE mode for the Automatic Sounding capability to operate. Sounding signals will now be automatically transmitted on each frequency in order, unless the equipment is in the process of linking or is already linked.

Once a Sounding transmission has been completed, it will automatically repeat at intervals determined by the preceding Sounding Timer entry. Automatic Sounding may be disabled by entering a Sounding interval of '00 Minutes' in the Sounding Timer. The length of time until the next Sounding transmission may be checked as follows:

1. While the RT-9000B is in ALE RECEIVE mode, depress the 'MORE' key at **10**. The Feature Menu Display will change to that shown in Figure 6.3.4.20.
2. Depressing the 'SOUND' key at **2** will cause the Feature Menu Display to change to that shown in Figure 6.3.4.21.
3. Depress the 'TMR-DSP' key at **11**. The time to next Sound will be given in a message that appears in the Operational Display. This message will appear as follows:

'XX TIME INTERVAL'

Where, XX = Current Sounding Timer Setting

4. Depressing the 'END' key at **4** will cause the Feature Menu Display to revert to that shown in Figure 6.3.4.13.

6.3.4.6 NET CALL

The NET CALL calling method calls all Network stations on a single frequency (or Channel) during the same call. A NET CALL expects responses from all Network Stations that hear the call.

6.3.4.6.1 Transmitting a NET CALL

Depressing the '**/ALE' key will cause the Feature Menu shown in Figure 6.3.4.13 to appear. Select the desired Calling frequency (Channel) by rotating 'TUNING' knob until the desired is viewed.

Depress the 'MORE' key at **10** as shown in Figure 6.3.4.13. The Feature Menu Display will change to that shown in Figure 6.3.4.14. Depress the 'NET-CALL' key at **12**. The system will begin calling all Network stations. The Operational Display will change to that shown in Figure 6.3.4.25.

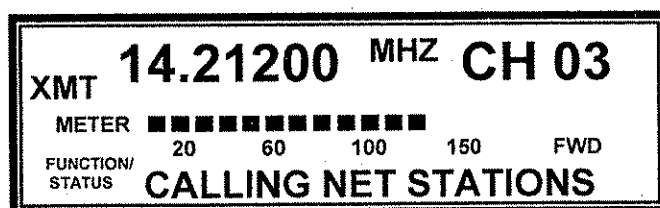
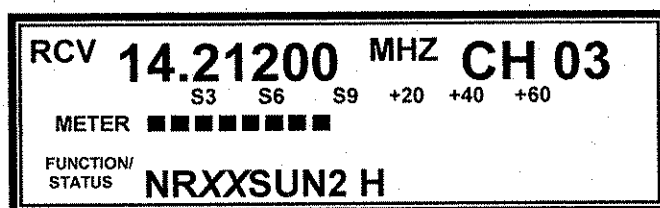


Figure 6.3.4.25 ALE 'NET CALL' - Initiating Station Display

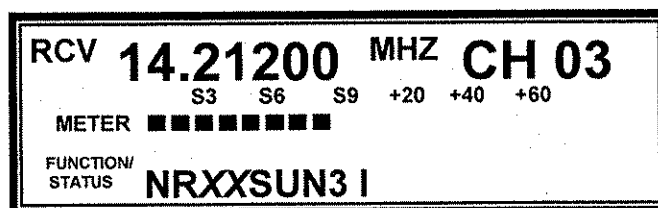
At the end of the NET CALL Transmission, the RT-9000B will revert to Receive scanning and listen for Network responses. If the NET CALL transmission was heard by other stations in the Network, their responses will begin to appear on the Operational Display as shown in Figures 6.3.4.26 and 6.3.4.27 and in their pre-determined time slots (approximately 2 seconds apart). The RT-9000B supports multiple-network capability and will append the RT-9000B's local ALE Network Number where the responding station's CALL ID resides to the "NR" Operation Indicator.



In this example, **NRXXSUN2 H** XX = The RT-9000B Network Number in which the Responding station's CALL ID, **SUN2** is contained.

Figure 6.3.4.26 ALE 'NET CALL' - Initiating Station - Response Display (from SUN2)

Figure 6.3.4.27 shows the same type of "Net Response" (NR) information as shown in Figure 6.3.4.26, except that it shows a different Station is responding to the same NET CALL transmission.



In this example, **NRXXSUN3 I** XX = The RT-9000B Network Number in which the Responding station's CALL ID, **SUN3** is contained.

Figure 6.3.4.27 ALE 'NET CALL' - Initiating Station - Response Display (from SUN3)

All responses and associated Link Quality Analysis (LQA) values will automatically be stored in memory for future use. After all responses (if any) are finished, the RT-9000B will broadcast an acknowledgement and establish a Link. General traffic may be passed at this time.

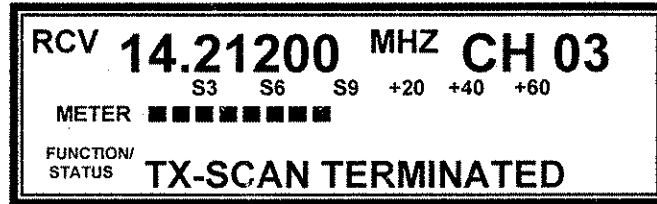


Figure 6.3.4.28 ALE 'NET CALL' – Initiating Station – 'Transmit Scan Terminated' Display

After the NET CALL process is finished, the Operational Display will appear as shown in Figure 6.3.4.28. The RT-9000B will remain on the same frequency (Channel) used for the NET CALL but the ALE system is in an inactive state. The following message will appear in the Operational Display:

'TX-SCAN TERMINATED'

The Feature Menu will appear as shown in Figure 6.3.4.14. At this point, the Initiating Station originating the NET CALL may do the following:

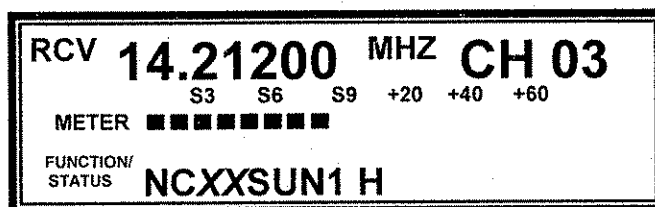
- Repeat the NET CALL. Depressing the 'NET CALL' key at 12 will re-transmit the NET CALL on the same frequency (Channel).
- Repeat the NET CALL on a different frequency (Channel). Manually select a new Channel by rotating the 'TUNING' knob. Depress the 'NET CALL' key again to repeat the NET CALL.
- Perform other ALE operations.
- Leave ALE Operating mode and return to the Main Menu. Depressing the 'END' key will cause the RT-9000B to immediately leave ALE mode, return to the Main Menu, and resume normal operation.

6.3.4.6.2 Receiving a NET CALL

To receive an ALE NET CALL, the RT-9000B must currently be in ALE Receive ('RX-ALE') mode and scanning. The Channel Group currently selected must contain, as a minimum, the same frequency being used by the Initiating Station to transmit the NET CALL.

A better practice would be to have the selected Channel Group contain all of the same frequencies being used by the other Network stations. This suggestion is based on the fact that prevailing signal propagation conditions might require the NET CALL be re-transmitted on more than one frequency to reach the intended Network stations. Network stations must be prepared to use alternate frequencies.

Figure 6.3.4.29 shows the RT-9000B response when initially receiving a NET CALL. The RT-9000 supports multiple-network capability and will append the RT-9000B's local ALE Network Number where the Initiating station's CALL ID resides to the "NC" Operation Indicator.



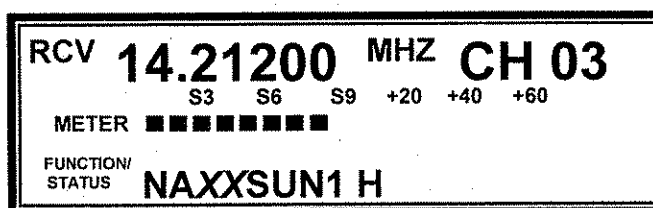
In this example, **NCXXSUN1 H** XX = The RT-9000B Network Number in which the Initiating station's CALL ID, **SUN1** is contained.

Figure 6.3.4.29 ALE 'NET CALL' – Receiving Station Display

After listening for responses from Network stations, the Initiating station will broadcast a "Net Acknowledgement" ('NA') message to all Network stations. After general traffic has been passed, the RT-9000B-equipped station will continue to listen. If no additional traffic is heard for approximately 30 seconds, the RT-9000B-equipped station will automatically resume Receive scanning.

Figure 6.3.4.30 shows the "Net Acknowledgement" message received and displayed by the RT-9000B-equipped station. The RT-9000B will append the RT-9000B's local ALE Network Number where the Initiating station's SELF ID resides to the "NA" Operation Indicator.

After the NET CALL process is finished, the RT-9000B will resume Receiver scanning but continue to display the last NET CALL transmission information until more recent ALE activity overwrites it or the operator leaves ALE mode.



In this example, **NAXXSUN1 H** XX = The RT-9000B Network Number in which the Initiating station's CALL ID, **SUN1** is contained.

Figure 6.3.4.30 ALE 'NET CALL' – Receiving Station – 'Net Acknowledgement' Display

6.3.4.7 ALL CALL

The ALL CALL calling method calls all Network Stations on a single frequency (or Channel) during the same call. An ALL CALL does not expect a response.

The ALL CALL calling method can be used to broadcast a message, usually an Automatic Message Display (AMD) message to all stations. Using the AMD capability requires use of an external terminal for message composition and reception. Refer to Section VI of the RT-9000A Operation and Maintenance manual for details.

6.3.4.7.1 Transmitting an ALL CALL

Depressing the '*'/'ALE' key will cause the Feature Menu shown in Figure 6.3.4.13 to appear. Select the desired Calling frequency (Channel) by rotating 'TUNING' knob until the desired is viewed.

Depress the 'MORE' key at **10** as shown in Figure 6.3.4.13. The Feature Menu Display will change to that shown in Figure 6.3.4.14. Depress the 'ALL-CALL' key at **13**. The system will begin calling all Network stations and the Operational Display will change to that shown in Figure 6.3.4.31.

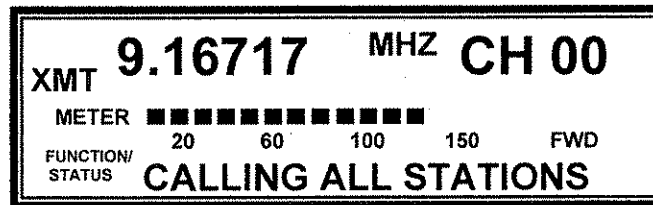


Figure 6.3.4.31 ALE 'ALL CALL' - Initiating Station Display

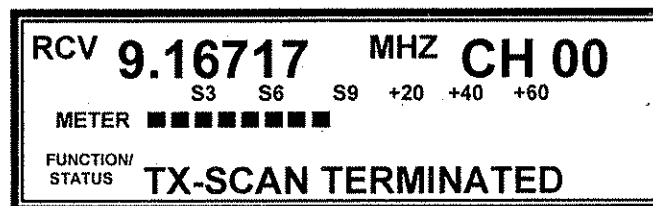


Figure 6.3.4.32 ALE 'ALL CALL' - Initiating Station - 'Transmit Scan Terminated' Display

After the ALL CALL process is finished, the Operational Display will appear as shown in Figure 6.3.4.32. The RT-9000B will remain on the same frequency (Channel) used for the ALL CALL but the ALE system will be inactive and displaying a 'TX-SCAN TERMINATED' message. The Feature Menu Display will appear as shown in Figure 6.3.4.14. At this point, the Initiating Station may do the following:

- Repeat the ALL CALL. Depressing the 'ALL CALL' key at **13** will re-transmit the ALL CALL on the original frequency (Channel).
- Repeat the ALL CALL on a different frequency (Channel). Manually select a new Channel by rotating the 'TUNING' knob. Depress the 'ALL CALL' key again to re-transmit the ALL CALL on the new Channel.
- Perform other ALE operations.
- Leave ALE Operating mode and return to the Main Menu. Depressing the 'END' key will cause the RT-9000B to immediately leave ALE mode, return to the Main Menu, and resume normal operation.

6.3.4.7.2 Receiving an ALL CALL

To receive an ALE ALL CALL, the RT-9000B must currently be in ALE Receive ('RX-ALE') mode and scanning. The Channel Group currently selected must contain, as a minimum, the same frequency being used by the Initiating Station to transmit the ALL CALL.

A better practice would be to have the selected Channel Group contain all of the same frequencies being used by the other Network stations. This suggestion is based on the fact that prevailing signal propagation conditions might require the ALL CALL be re-transmitted on more than one frequency to reach all intended Network stations. Network stations must be prepared to use alternate frequencies.

The Operational Display shown in Figure 6.3.4.33 indicates the following information: 1) Operating frequency and Channel Number, 2) 'AC' = an ALL CALL is being received, 3) 'SUN1' = station CALL ID of station transmitting the ALL CALL, and 4) 'E' = Link Quality Analysis (LQA) value of the received frequency. The table shown in Figure 6.3.4.18 gives Displayed Link Quality Analysis (LQA) Value vs. SINAD conversion values.

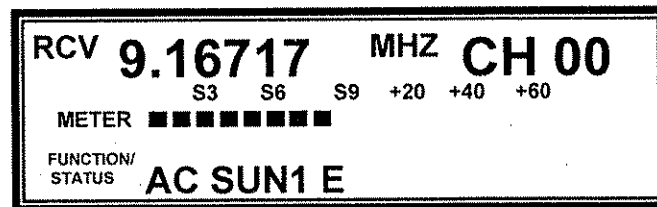


Figure 6.3.4.33 ALE 'ALL CALL' – Receiving Station Display

At the conclusion of the ALL CALL broadcast, the RT-9000B will remain on the frequency (Channel) and allow the Initiating Station to send further messages. If no message is received within 30 seconds, the RT-9000B will resume Receiver scanning. The Operational Display will continue to indicate the last ALL CALL transmission information until more recent ALE activity overwrites it or the operator leaves ALE mode.

6.3.4.8 BREAK LINK PROCESS

From time to time it may be necessary to break a Link with another station, particularly if it is unmanned. This allows both stations to abandon the current Link and resume other operations. Either linked station may initiate the Break Link action.

Depressing any key selection on the Feature Menu Display shown in Figure 6.3.4.34 will cause the RT-9000B to transmit a "Link Terminate" message and achieve this result.

If an RT-9000B-equipped station receives a "Link Terminate" message, it will take the appropriate action and resume Receiver scanning.

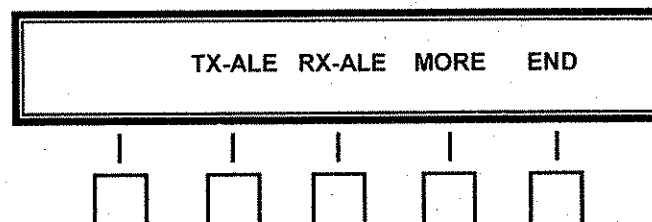


Figure 6.3.4.34 ALE Break Link Keys

6.3.4.9 OPTIONS

6.3.4.9.1 DATA Filter

Depress 'MODE' key and mode selected will be displayed on Operational Display. Choices are 'USB', 'LSB', 'CW', 'AM', and 'DATA' (see section 6.3.2.2).

If the software selection switch S1-section V on CPU PC Assembly 3A2A1 is improperly set, an erroneous indication may result and indicate that data filters are present. Consult Section V for the correct switch settings.

6.3.4.9.2 Radio Security

The RCU-9310B Remote Control Unit may be equipped with a selectable security feature that prevents unauthorized personnel from 1.) viewing the remote RT-9000B Transceiver's frequency settings from the RCU-9310B's Operational Display or 2.) changing the remote RT-9000B Transceiver's frequency settings. This feature is particularly useful if the RCU-9310B Remote Control Unit is to be left unattended but operational.

To enable the security feature and set access Code Number, navigate to the main menu Feature Menu Display shown in Figure 6.3.4.35. If the optional Radio Security feature has been installed, 'SECURE' will appear on the Main Menu Feature Menu Display between the 'REV' and 'SELCAL' selections.

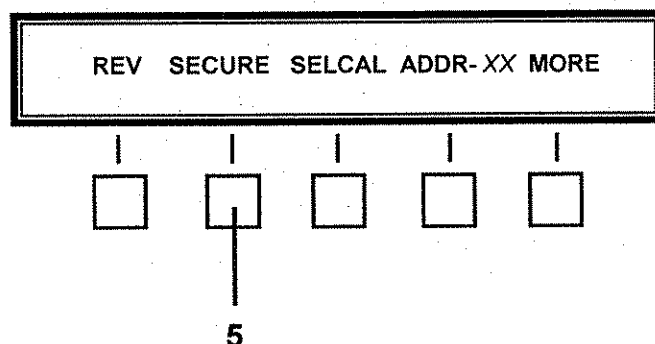


Figure 6.3.4.35 Main Menu containing Radio Security Selection

Depress the 'SECURE' key at 5. The following message will appear in the Operational Display:

'ENTER CODE NUMBER'

A four-digit Code Number is then entered using the Numeric Keypad. The starting Code Number, as shipped from the factory, is 0000. As each Code Number digit is entered, a black square will appear on the right hand side of the Function/Status screen for each digit entered. After the last digit of the Code Number is entered, the Feature Menu will change to that indicated in Figure 6.3.4.36. If the Code Number entry is not completed within sixteen (16) seconds or an incorrect Code Number is entered, the following message will appear in the operational display:

'INVALID CODE NUMBER'

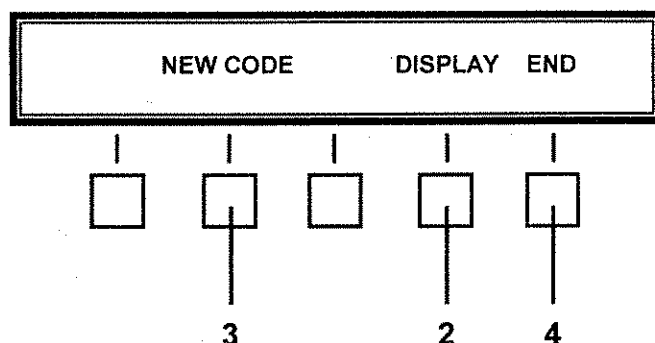


Figure 6.3.4.36 Radio Security Feature Menu

Depressing the 'DISPLAY' key at **2** will cause the front panel to return to that shown in Figure 6.3.3.12 except now the frequency portion of the Operational Display will be blank. Additionally, the three (3) Frequency-related keypad keys will become inoperative. These keys are as follows:

'LOAD SPLX'
'LOAD XMT'
'READ XMT'

To restore the keypad keys back to operation and the Operational Display back to its normal state, depress the 'SECURE' key at **1**. The message following message will again appear in the Operational Display:

'ENTER CODE NUMBER'

Entering the four-digit Code Number will cause the Feature Menu display to change to that shown in Figure 6.3.4.36. Depressing the 'DISPLAY' key at **2** will return the Operational Display and the three (3) disabled keypad keys back to normal operation.

NOTE: If the wrong Code Number is entered or entry is not completed within twelve (12) seconds, the Operational Display will briefly display the following message:

'INVALID CODE NUMBER'

To change the Code Number to another four-digit number, perform the following procedure. This procedure also applies to initial operation and setting up a new Code Number from the initial factory setting of 0000. Depress the 'SECURE' key at 1. The following message will appear:

'ENTER CODE NUMBER'

Enter the current four-digit Code Number, the Feature Menu will change to that shown in Figure 6.3.4.36. Depressing the 'NEW CODE' key 3 will cause the following message to appear:

'ENTER CODE NUMBER'

Enter the NEW four-digit Code Number using the Numeric Keypad. The display will then revert back to that shown in Figure 6.3.4.35 and only the NEW Code Number will permit access.

Before changing the Code Number, make sure that the NEW Code Number is written down in a safe place. Once entered, it becomes the ONLY means of accessing this function to either engage or disengage radio controls.

6.3.4.9.3 Pre/Postselector

Depress the 'MORE' key successively at 1 until the Feature Menu display shown in Figure 6.3.4.36 appears.

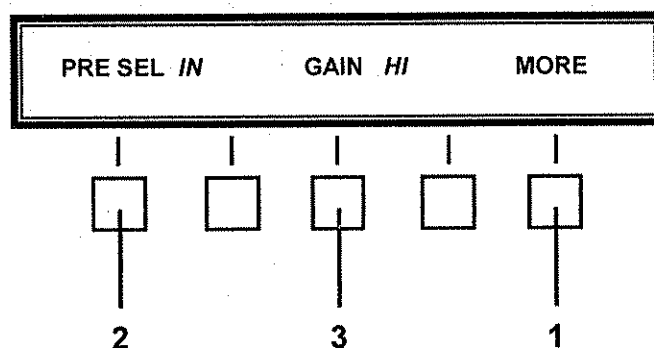


Figure 6.3.4.37 Main Menu containing Pre/Postselector Selections


Depressing the 'PRE SEL' key at **2** causes the optional Pre/Postselector to alternately switch between 'IN' and 'OUT' of operation in the System. Depressing the 'GAIN' key at **3** causes the Pre/Postselector 'GAIN' setting to alternately switch between the 'HI' and 'LO' setting ('HI' = 0 dB or 'LO' = -10 dB).

NOTE: When the optional Pre/Postselector is present in the system, the 'IN/OUT' and 'GAIN' Feature Menu selections will default to the following settings:
1) 'PRE SEL' = IN and 2) 'GAIN' = HI. Both selections will assume these default settings at Power-up, regardless of their settings when the RCU-9310 B was last powered-down.

If the software selection switch, S1- 6, on CPU PC Assembly 3A2A1 is improperly set, an erroneous indication may result about the presence or absence of a Pre/Postselector. Consult Section V for the correct switch settings.

- End of Specifications and Operation Supplement -

SERVICE BULLETIN

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NUMBER: 9310-001

DATE: 7 December 2001

EQUIPMENT: RCU-9310, RCU-9310R and RCU-9310T

SUBJECT: Clarification of operational issues

PURPOSE: This advisory clarifies three operational issues in TM-8078000502, RCU-9310 OPERATIONS and MAINTENANCE MANUAL, SECTION III.

TEXT:

1. Remote BITE (Built in Test Equipment):

Installation/Operating Advice:

Before operating the BITE, ensure that the RCU-9310 remote control and audio wiring is in place and correct before conducting either REM-BITE or LOC-BITE.

Please consult the RCU-9310 Operation and Maintenance Manual, Section 3.3.1 BITE (Built in Test Equipment). This section details the use of the submenu END Key to restore unit to the operational state after the BITE is complete.

2. Line audio and meter selection:

Consult section 3.3.2 Meter functions.

Select: MTR RCV then LINE

Select: MTR XMT then LINE

Installation/Operating Advice:

For normal operation the transmit and receive meter functions must be placed in the Line Audio Mode. During testing or trouble shooting, the meter may be used to display the desired measurement parameter. After the testing or troubleshooting is completed, the transmit and receive meters must be restored to LINE.

3. I/O Configuration:

Section 3.1 Operating Mode:

Consult section 3.3.6 I/O Port Set Up for I/O operating instructions. Select RS-485.

Note: Remote control wiring dependent. Consult your installation documentation before proceeding.

Installation/Operating Advice:

The selection of the operating mode RS-232, RS-422, RS-485 or modem depends on the remote control to transceiver wiring configuration. Only one operating mode should be wired. Ensure that the selected operating mode in RT-9000A and RCU-9310 agrees with your remote control wiring documentation and implementation.

Section 3.2 Baud Rate:

Consult section 3.3.6 I/O Port Set up for I/O operating instructions. Select: 4,800 baud.

Installation/Operating Advice:

A single RCU-9310 controlling five or fewer RT-9000A transceivers is best served with the I/O configured for 4,800 baud. This baud rate offers excellent system performance while maintaining a high degree of noise immunity. The 4,800 baud rate also reduces the electrical performance requirements for the interconnecting remote control cable. The 19,200 I/O baud rate is normally used for systems employing a large number of radio assets using conditioned high-speed data cables.

Section 3.3 Radio Operator: I/O Configuration:

Installation/Operating Advice:

Once the system has been configured by the installation team, the I/O operating mode and baud rate should not be changed by the operator. If the operator inadvertently changes either the mode or baud rate, they should be restored to the installation setting and the power recycled on each unit.

