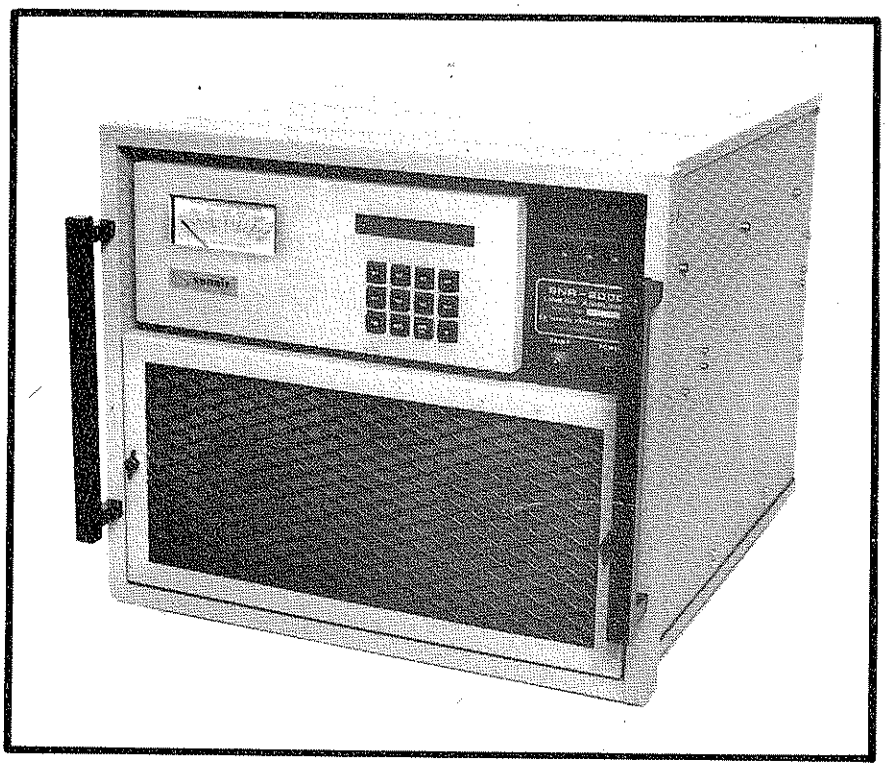
sunair electronics, inc.
3101 S.W. Third Avenue, Fort Lauderdale, Florida 33315-3389 USA



OPERATION AND MAINTENANCE MANUAL

SNR-2000

SOLID STATE KILOWATT LINEAR POWER AMPLIFIER

SECOND EDITION 1 MARCH 1987
MANUAL PART NUMBER 8066000502

TRAINING PROGRAMS

Sunair offers Training Programs of varying lengths to cover operation, service, and maintenance of all Sunair manufactured equipment. Up to eight technicians can be accomodated in these programs.

For more information, contact:

Product Services/Training Supervisor
Sunair Electronics, Inc.
3101 S.W. Third Avenue
Fort Lauderdale, Florida 33315-3389
U.S.A.

Telephone: (305) 525-1505
Telex: 51-4443
Cable: Sunair FTL

IN CASE OF DIFFICULTY

If your Sunair Electronics, Inc. equipment, develops a malfunction, please follow the steps outlined below to expedite your equipment repair.

1. Note all of the symtoms of the problem, i.e, when does it occur; how often; which modes of operation work, which do not; and anything else which might assist in problem solving.
2. Note model number and serial number.
3. When and from whom (dealer, representative or factory) equipment was acquired.
4. Note peripheral equipment being used in conjunction with the Sunair equipment. Is the peripheral equipment working properly?

After determining the answers to the above, contact your dealer or representative and discuss the problem with him, he may be able to fix the problem locally, avoiding shipping delays. If it becomes necessary to return the equipment to the factory, please follow the procedures outlined in Section II of this manual.

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SECTION I

GENERAL INFORMATION

1.1 PURPOSE OF MANUAL

This manual describes the SNR-2000 1KW Linear Solid State Power Amplifier and includes installation details, operating instructions and maintenance procedures Information in this manual applies to all equipment configurations unless otherwise stated in the text or illustrations. The SNR-2000 is designed specifically for operation with Sunair Transceivers and Exciters.

1.1.1 PURPOSE OF EQUIPMENT

The purpose of the SNR-2000 is to amplify the low level RF output of a separate exciter to produce 1.0 KW peak envelope power (PEP) or average power. The SNR-2000 is microprocessor controlled and operates in the frequency range of 1.6 to 30 MHz. It is intended for a 100% unattended duty cycle for HF communications systems networks.

1.2 GENERAL DESCRIPTION

1.2.1 PHYSICAL DESCRIPTION

Outline and mounting dimensions for the SNR-2000 are given in Figure 1-1. Control, power and RF connections to the unit are made on the rear panel. A control panel designed to mount in the transceiver front panel provides control and monitoring functions.

The SNR-2000 is shown in Figure 1-2. The amplifier is a single enclosed unit and is smaller and much lighter, weighing only 90 lbs., than the traditional amplifiers and power supplies contained in separate units. Top and bottom covers provide complete access for servicing. Two blowers are provided behind the front panel filter to force cooling air throughout the amplifier.

The SNR-2000 Control Panel is designated 1A2, and is designed to mount in the front panel cutout of the transceiver/exciter. The control panel provides amplifier status lights and meter indications (some panels provide remote ON/OFF capability).

1.2.2 ELECTRICAL DESCRIPTION

The SNR-2000 1KW Solid State Linear Power Amplifier is a new generation amplifier, combining solid state RF power amplification and microprocessor technology to produce over 1000 watts of reliable HF power into a 50 ohm load. The unit operates in the frequency range of 1.6 to 30 MHz and at a rated output of 1.5 to 1 VSWR. Four amplifier/power supply modules, each capable of producing over 300 watts, in combination deliver a very conservative 1000 watts of peak envelope or continuous RF output power.

The SNR-2000 operates from 115 or 230 VAC (50 to 60 Hz). It is extremely rugged and withstands temperatures up to +65°C while operating at a 100% duty cycle. Forced air cooling, under microprocessor control, is utilized to maintain safe operating temperature.

The unit is capable of providing a reduced power mode (500 watts) and a bypass mode (100 watts) that is locally keyboard selected. Also available by keyboard are status indications of power, individual amplifier voltages and currents. The liquid crystal display (LCD) indicates the specific function selected.

Sophisticated diagnostics, status monitoring and routing housekeeping are all under microprocessor and software control. In the event of malfunction the SNR-2000 automatically selects the next lower safe operating level, flashes a warning light, locally and remotely, and

displays the cause of the malfunction on the LCD. If the malfunction is caused by more than one failure, the operator or technician is able to obtain detailed diagnostics by use of the keyboard.

1.2.2.1 Expected EMP Performance

The SNR-2000 is designed with an EMP environment in mind. All control and power lines into and out of the SNR-2000 are filtered. This filtering on the standard unit is adequate for a mild EMP. But for full EMP hardening, the optional EMP filter, which replaces the existing filter, is required. This filter is designed per approved EMP techniques and decouples every input and output line (except the antenna).

An external coaxial antenna "spark gap" device will protect the antenna from EMP damage to internal components.

Although the output elements in the SNR-2000 are solid state rather than vacuum tube, they are adequately protected from EMP damage by shielding and specially designed filtering and decoupling of all interface lines.

1.3 SPECIFICATIONS

RF OUTPUT POWER: 1 KW ± 1db PEP and average. 500W or 100W output, front panel keyboard selected.

RF INPUT POWER: 75W maximum.

FREQUENCY RANGE: 1.6 to 30.0 MHz.

DUTY CYCLE: Continuous.

TYPE OF EMISSION: AM, SSB, CW or any other type within the bandwidth and power capabilities of the amplifier.

WEIGHT: 90 lbs. (40.8 kg)

DIMENSIONS:
Inches: 17.88W x 19D x 15.75H

CM: 45.42W x 48.26D x 40.01H

INPUT IMPEDANCE: 50 ohms nominal.
2.0:1 VSWR maximum.

OUTPUT IMPEDANCE: 50 ohms unbalanced.

LOAD VSWR: Rated power at 1.5 to 1.0, reduced power up to 2 to 1, protected above 2 to 1.

INPUT VOLTAGE: 115/230 VAC ± 15%, single phase, 50 to 60 Hz.

INPUT VOLTAGE: 3.5 KVA Typical.

INTERMODULATION DISTORTION: 36 db or better below PEP with a standard two tone test signal at rated power output.

HARMONIC ATTENUATION: 73 db or better below carrier at rated power output into a 50 ohm load.

SPURIOUS: 80 db below PEP.

BAND CHANGE TIME: 10 msec maximum.

TUNING TIME: 0 seconds without coupler. With an Automatic Antenna Coupler, tuning time dependent on coupler type.

TEMPERATURE RANGE: Operating: -30°C to +65°C, Storage: -40°C to +85°C.

HUMIDITY: MIL-STD-810C, Method 507.1, Proc. III.

ALTITUDE: 0-10,000 feet.

VIBRATION: MIL-STD-810C, Method 514.2, Equipment Category f, Table 514.2-VI for wheeled vehicles, Figure 514.2-6, Curve V.

MTBF: 6,000 hours (calculated).

MTTR: 15 minutes.

DIAGNOSTICS: Microprocessor controlled with English Language Readout.

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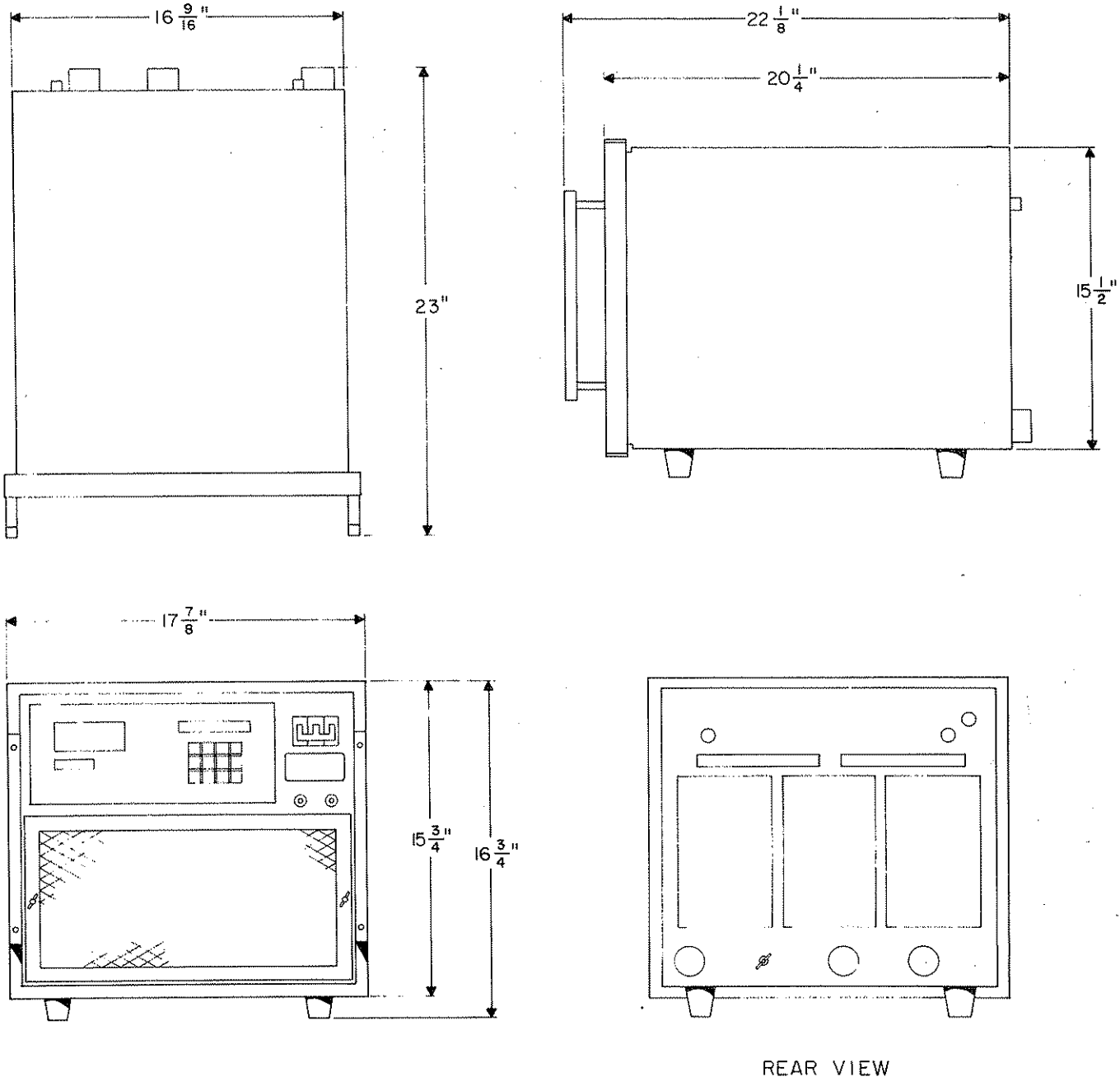
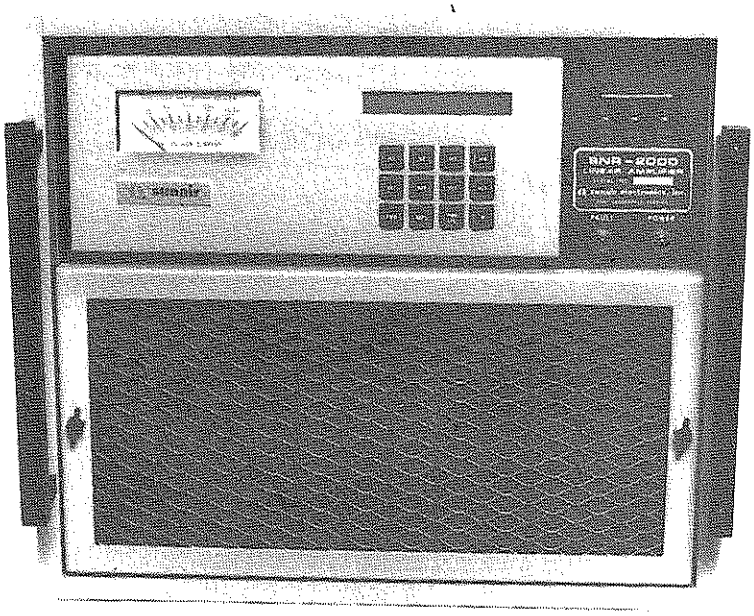


FIGURE 1-1 OUTLINE AND MOUNTING DIMENSIONS, SNR-2000



FRONT PANEL

REAR PANEL

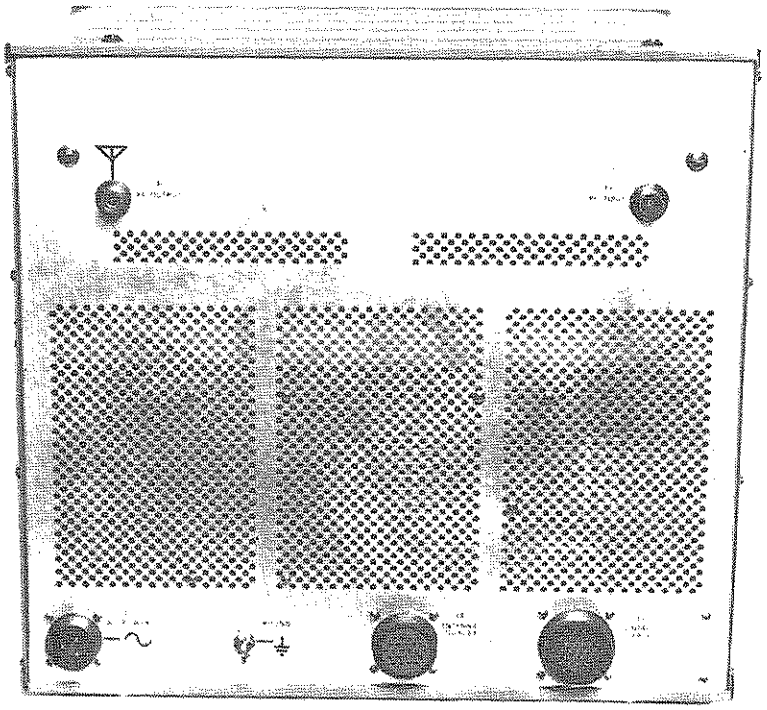


FIGURE 1-2 SNR-2000

1.4 EQUIPMENT SUPPLIED

	SUNAIR PART NO.
SNR-2000, 1 KW Linear Solid State Power Amplifier	8066000359 Gray 8066000391 Green
Power Cable Assembly (10 feet)	8066002297
Operation and Maintenance Manual	8066000502
SNR-2000 Control Panel, 1A2, to mount in specific Transceivers/Exciters	8066XXXXXX Gray 8066XXXXXX Green
Connector Kit Consisting of:	8066000294
2 EA Bushing, Telescoping, .56 ID	0700550054
2 EA Bushing, Telescoping, .62 ID	0700550062
2 EA Bushing, Telescoping, .75 ID	0700550071
1 EA Connector, RF, UHF, PL-259	0742190005
1 EA Connector, RF, N UG-536B/U	0747020001
1 EA Connector, RF, N UG-21B/U	0754140008
1 EA Connector, Power, 37 Pin Round	0754320006
2 EA Clamp, Cable, Connector	0754570002
1 EA Connector Assembly Consisting of:	8066007094
Wire, Buss No. 20	0588990001
Connector, Power, 24 Pin Male	1008390011

1.5 EQUIPMENT REQUIRED, NOT SUPPLIED

		SUNAIR PART NO.
1.	External AC Power Connector	User Supplied
2.	Transceiver or Exciter	Consult Sunair
3.	Coaxial Cable, RG-8A/U	0588640000
4.	Coaxial Cable, RG-58A/U	0588130001
5.	Antenna System, 50 Ohms Nominal	User Supplied
6.	Transceiver to SNR-2000 Control Cable without connectors	0579240002

1.6 OPTIONAL EQUIPMENT

		SUNAIR PART NO.
1.	Running Spares Kit	8066900198
2.	Service Kit (Contains PC Assy Card Extenders)	8066000995

3.	Depot Spares Kit	8066900091
4.	Field Module Kit	8066905793
5.	SNR-2000DAC High Speed Digital Antenna Coupler.	8092001057 Gray 8092001090 Green
6.	KW Automatic Antenna Coupler, GCU-1935	6029001051 Gray 6029001094 Green
7.	SNR-2000 to GCU-1935 Interface Box Cables Assemblies required for operation: Cable Assembly, LPA to Interface Cable Assembly, Interface to Coupler	8066200099 8066202296 6029003003
8.	SNR-2000 to SNR-2000DAC Control Cable	8092500096
9.	Rack Mounting Kit	8066004257 Gray 8066004290 Green
10.	Wired Rack	6032091058 Gray 6032091091 Green
11.	Shockmount Kit, Equipment Rack	6032090892
12.	35 Foot Fiberglass Antenna	0715850008
13.	KW Longwire Antenna Kit	1003090010
14.	TR Auxiliary Relay Kit	8066140096
15.	Peripheral Board A3A2 For use with GCU-1935 Antenna Coupler	8066082096
16.	Peripheral Board A3A2 For use with SNR-2000DAC Antenna Coupler	8066082592
17.	SNR-2000 Control Panel 1A2 for use with Broadband Antennas and GCU-1935	8066150059 Gray 8066150091 Green
18.	SNR-2000 Control Panel 1A2 for use with 900 Series Transceivers/Exciters to control the SNR-2000DAC	8066160054 Gray 8066160097 Green
19.	SNR-2000 Control Panel 1A2 for use with the GSB-900SC/R Transceiver, to control the SNR-2000DAC	8066170050 Gray 8066170092 Green
20.	SNR-2000 Control Panel 1A2 for use with the SC-10 Transceiver, to control the SNR-2000DAC	8066180055 Gray 8066180098 Green

CAUTION

TO INSURE THAT CABLE HAS NOT BEEN DAMAGED DURING SHIPMENT, ALL CABLE ASSEMBLIES MUST BE CHECKED FOR CONTINUITY OR SHORTS, FROM PIN TO PIN, BETWEEN CONNECTORS BEFORE INITIAL RADIO OR SYSTEM POWER UP.

WARNING

CONNECTORS INSTALLED BY THE CUSTOMER MUST BE WIRED IN ACCORDANCE WITH INSTALLATION INSTRUCTIONS PROVIDED IN THE OPERATION AND MAINTENANCE MANUAL. THE CABLE MUST BE CONTINUITY CHECKED AFTER INSTALLATION AND PRIOR TO RADIO OR SYSTEM POWER UP.

SECTION II

INSTALLATION

2.1 UNPACKING AND INSPECTION OF EQUIPMENT

The SNR-2000 1 KW Linear Solid State Power Amplifier is packed in a box using double wall construction. The packing material should be removed carefully and the contents inspected for physical damage. Any claims for shipping damage must be filed promptly with the transportation company. If it is found necessary to file such a claim, retain all packing material.

Do not accept a shipment when there are visible signs of damage to the shipping container until a complete inspection is made. If there is a shortage of items or evidence of damage is noted, 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 should also be forwarded to Sunair.

Include the following:

a) order number
b) model and serial number
c) name of transportation agency
d) applicable dates.

When this information is received by Sunair, arrangements will be made for repair or replacement.

2.2 RETURN OF EQUIPMENT TO FACTORY

The shipping container for the SNR-2000 has been carefully designed to protect the equipment during shipment. The container and its associated packing materials should be used to reship the unit. When necessary to return equipment to Sunair for warranty or non-warranty repair, an authorization number is required. This number can be obtained from our Product Services Department, TELEPHONE: 305-525-1505, TELEX: 51-4443, or CABLE: SUNAIR.

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. Rigid cardboard should be placed at the corners of the equipment to protect against denting. When returning subassemblies or components for repair or replacement, be sure to pack each unit separately, using suitable cushioning material where necessary.

Shipment should be AIR PARCEL POST consigned to:

SUNAIR ELECTRONICS, INC.
PRODUCT SERVICES DEPARTMENT
3101 SW 3rd Avenue
Fort Lauderdale, Florida
33315-3389 U.S.A.

Plainly mark with indelible ink all mailing documents as follows:

U.S. GOODS RETURNED FOR REPAIR
VALUE FOR CUSTOMS - $100.00

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.

2.3 INSTALLATION PROCEDURE

2.3.1 STATION LAYOUT

The SNR-2000 must be installed in a structure which provides protection from the weather. Ambient temperature must be maintained between -30°C (-22°F) and +65°C (144°F).

Reference to Figure 1-1 will provide the necessary outline dimensions required for installation. Floor load is 90 pounds. Allow free circulation of air around the cabinet, and at least six inches air space between the back of the unit and any wall or partition. The companion transceiver may be placed on top of the SNR-2000 for voice or CW modes of communications. For FSK or other modes requiring a full kilowatt of average power output, the transceiver should be located on an adjacent table and have a blower kit. The transceiver may also be rack mounted above the SNR-2000 if blowers are provided in the top of the rack.

2.4 CONFIGURATIONS

Figures 2-1 through 2-5 are illustrations of various SNR-2000 configurations.

2.4.1 TR AUXILIARY RELAY

The TR Auxiliary Relay Option is utilized for simplex or half-duplex operation using a GSR-920, GSE-924 and SNR-2000. See Figures 2-4 and 2-5 for configuration details.

2.5 ANTENNAS AND GROUND SYSTEMS

The SNR-2000 is designed to work into two types of antenna:

a) Nonresonant antennas where an antenna coupler is used and

b) Broadband antennas where the SNR-2000 is connected directly to the antenna.

Figures 2-1 thru 2-3 illustrate configurations where each of these two types of antennas are used.

2.5.1 RANDOM LENGTH NONRESONANT ANTENNAS

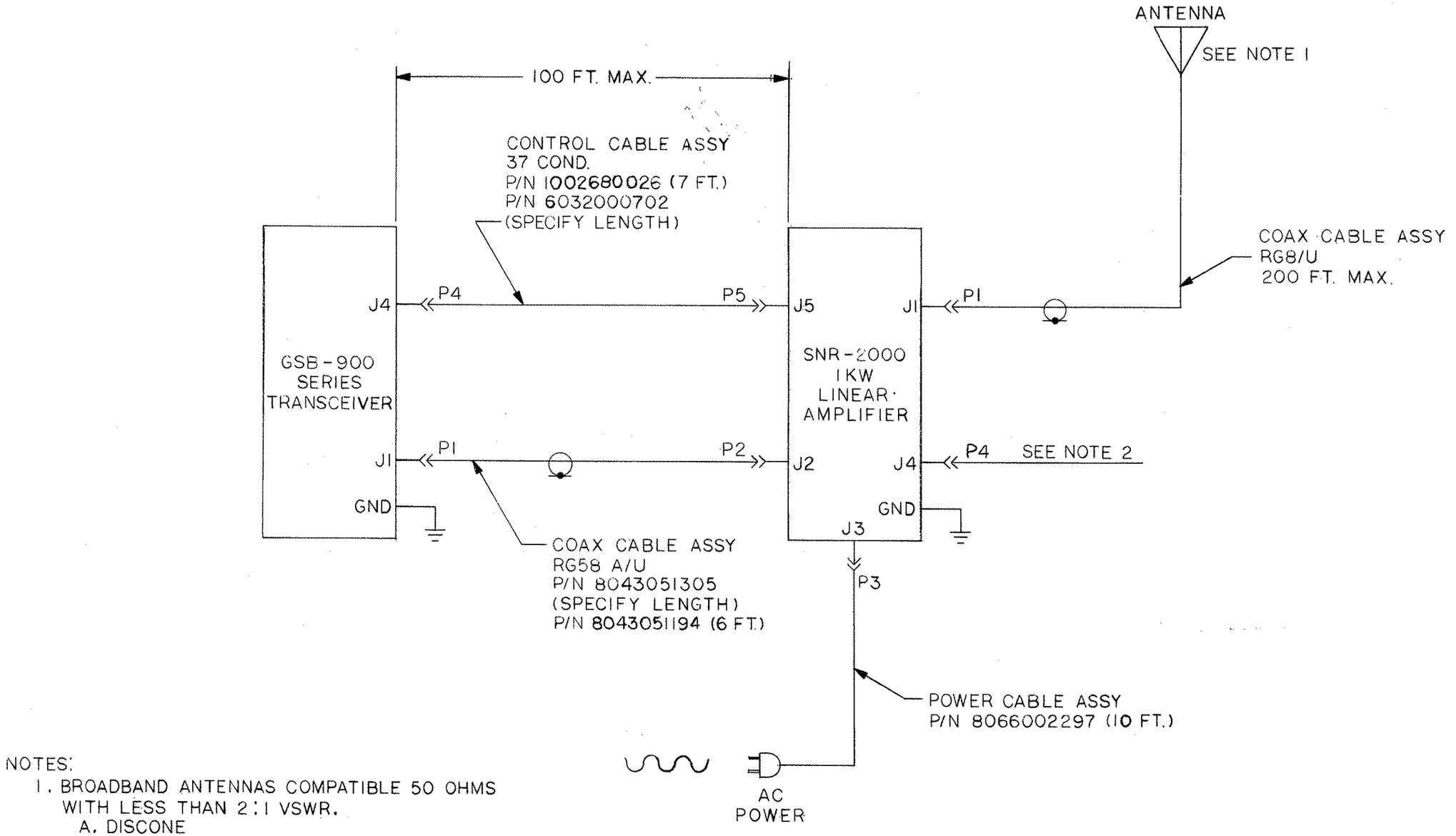
The antenna impedance of nonresonant antennas is dependent on the operating frequency. An antenna coupler must be used to match the antenna to the SNR-2000. Thirty-five foot whip antennas offer a good compromise between practical height and good electrical performance at low operating frequencies. The performance of the 35 foot whip is greatly influenced by its ground system. For Base Station roof top installation refer to Figure 2-2 for grounding details.

Another nonresonant antenna is the longwire. The two most popular length longwire antennas are 75 and 150 feet. Both of these antennas require an antenna coupler to match the antenna to the SNR-2000. Figure 2-6 is an illustration of a 75 foot longwire installation. Note that the feed line from the antenna to the coupler is part of the antenna's length.

2.5.2 Broadband 50 Ohm Antennas

These are generally complex, expensive antennas requiring a large area for installation. Their use is usually limited to high performance base station installations which must operate at diverse frequencies. As this class of antenna has approximately 50 ohm output impedance over the rated band of frequencies, an antenna coupler is not required. Some common types of broadband antenna are the Discone and Log-Periodic. Figure 2-1 is an example of a system configuration utilizing a broadband antenna.

8066403038A

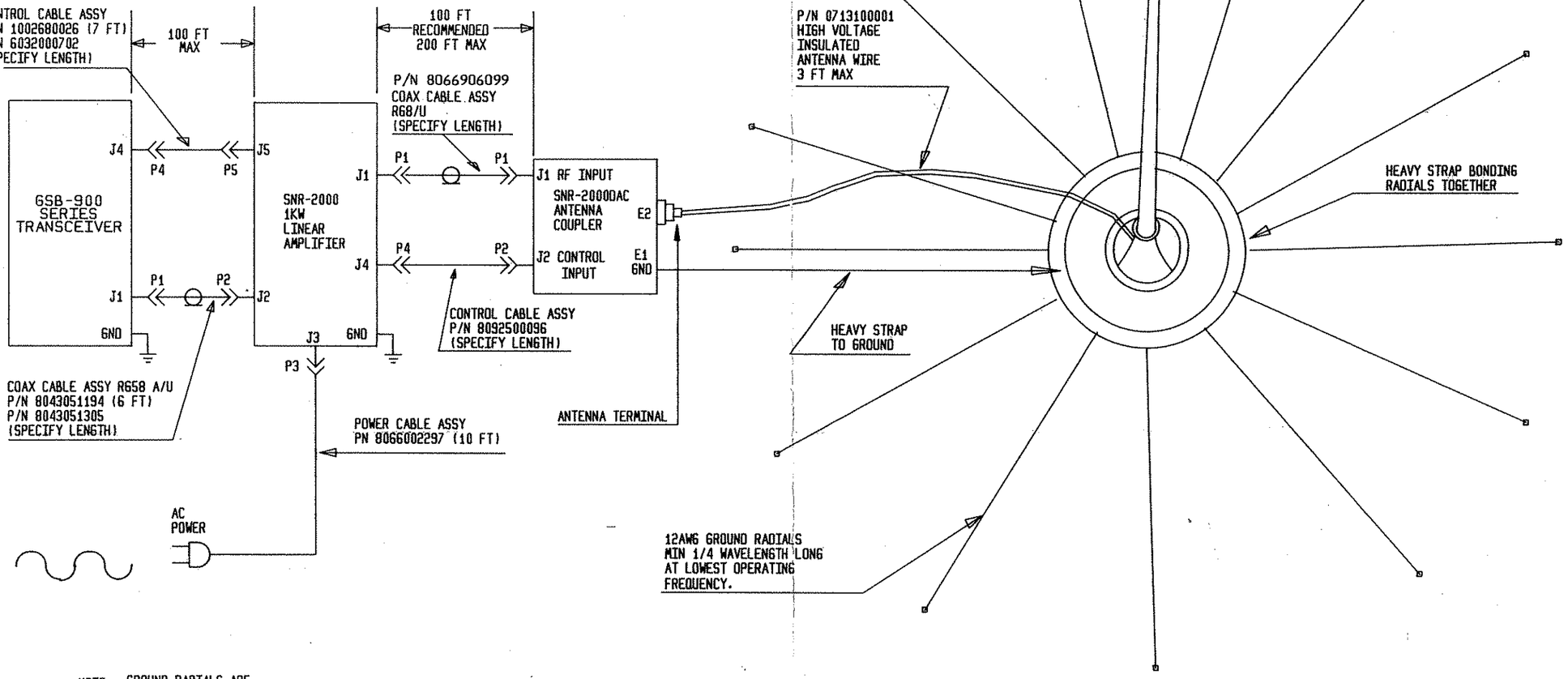


NOTES:

1. BROADBAND ANTENNAS COMPATIBLE 50 OHMS WITH LESS THAN 2:1 VSWR.
   A. DISCONE
   B. LOG PERIODIC
2. IN THIS CONFIGURATION CONNECTOR ASSY P/N 8066007094 MUST BE INSTALLED ON J4.

FIGURE 2-1 SNR-2000 WITH BROADBAND ANTENNA

8066406037A



NOTE: GROUND RADIALS ARE PART OF THE ANTENNA. RECOMMEND MINIMUM OF 12 TO ENHANCE RADIATION PATTERN.

FIGURE 2-2 SNR-2000 W/SNR-2000DAC, 35 FT ANTENNA (Roof Top Installation)

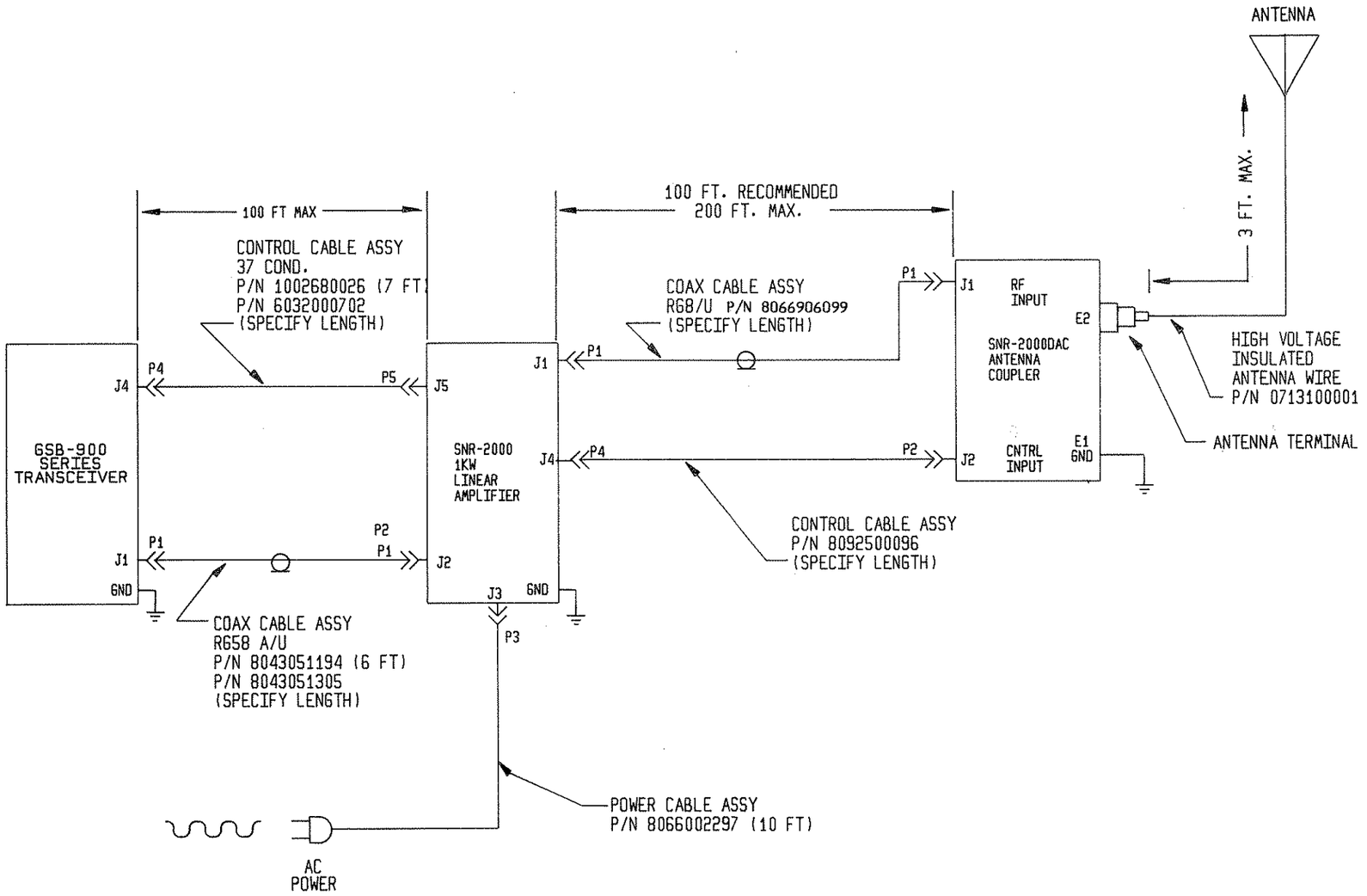
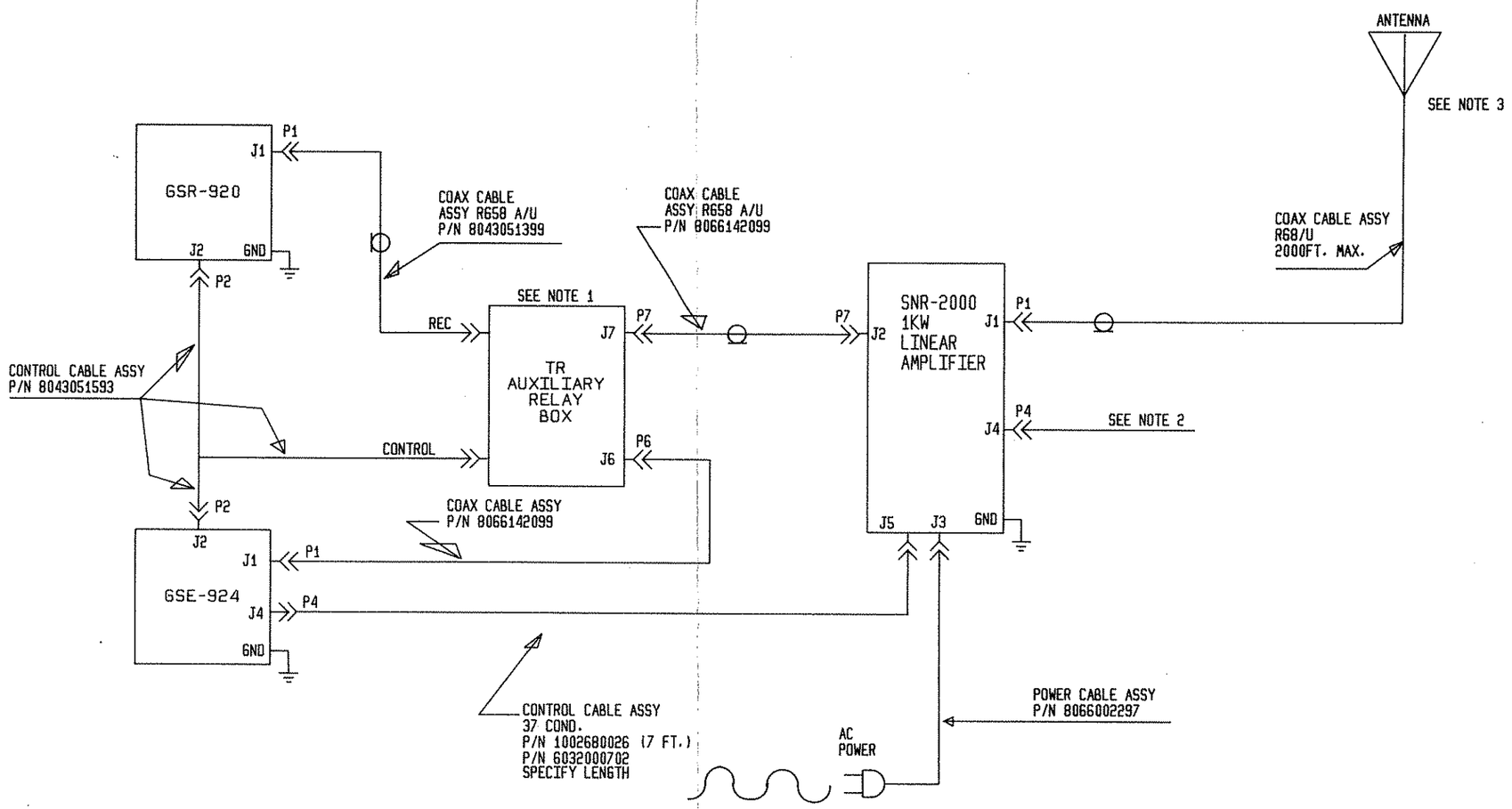


FIGURE 2-3 SNR-2000 W/SNR-2000DAC, NON-RESONANT ANTENNA

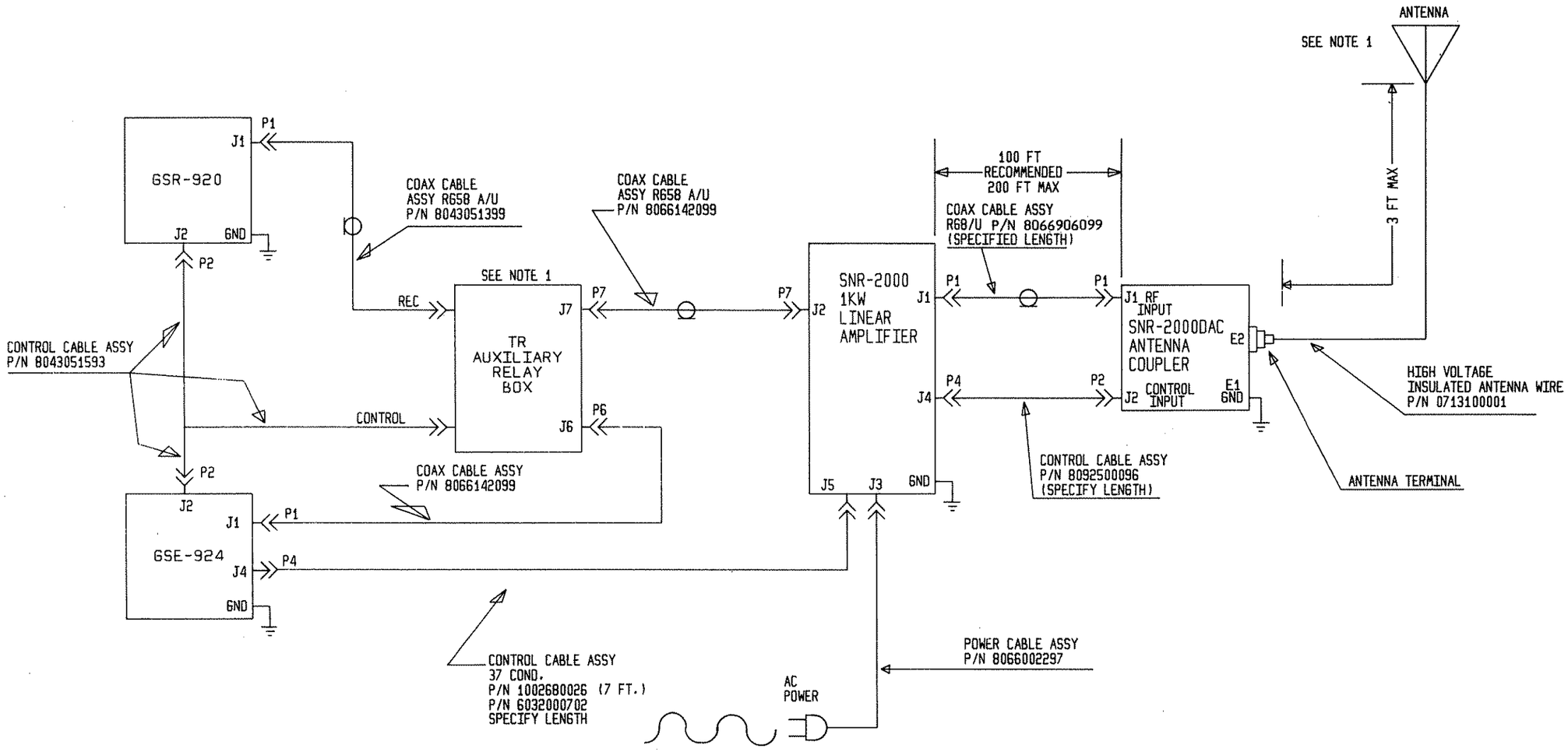


NOTES:

1. TRANSMIT/RECEIVE RELAY KIT
   P/N 8066140096
2. IN THIS CONFIGURATION CONNECTOR ASSY
   PN 8066007094 MUST BE INSTALLED ON J4.
3. BROADBAND ANTENNAS COMPATIBLE 50 OHMS
   WITH LESS THAN 2:1 VSWR
   A. DISCONE
   B. LOG PERIODIC

FIGURE 2-4 SNR-2000 WITH AUXILIARY TR RELAY

8066408030A



NOTES:

1. TRANSMIT/RECEIVE RELAY KIT
   P/N 8066140096

FIGURE 2-5 SNR-2000 W/SNR-2000DAC WITH AUXILIARY TR RELAY

SUNAIR SNR-2000

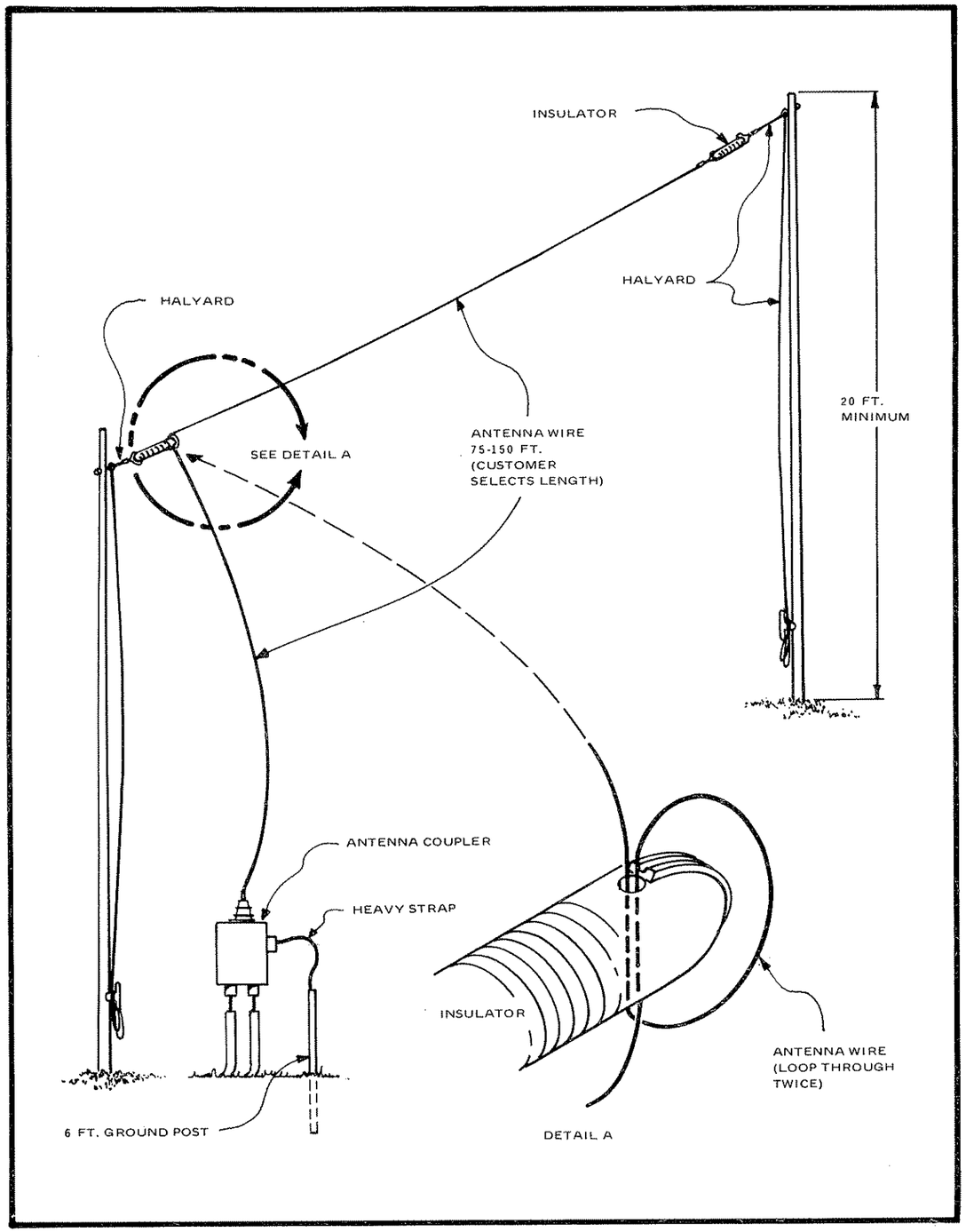


FIGURE 2-6 KW LONGWIRE ANTENNA KIT

2.6 EXTERNAL CONNECTIONS

NOTE

If an antenna coupler is not used be sure Connector Assembly p/n 8066007094 is in place on the rear of the SNR-2000, J4.

2.6.1 PRIMARY POWER CONNECTIONS

The SNR-2000 requires a primary power source than can provide up to 3.5 KVA (115 or 230 VAC).

Whenever possible, the primary power source should be connected to the amplifier through a double-pole, 30 ampere capacity, manual disconnect switch (60 ampere if primary source is 115 VAC). An arrangement of this type will insure that all power has been removed from the unit prior to entrance for servicing. Refer to Figure 2-7 primary power interconnect diagram for the line voltage connection details. The Power Cable Assembly contains three each NO. 10 AWG conductors. The green wire connects to the station primary power ground system. The black and the white wires connect to the 115 or 230 volt power source at the disconnect switch previously described. The standard cable as furnished is 10 feet long.

2.6.2 TRANSCEIVER CONNECTIONS

Separation between the transceiver and the amplifier may be up to 150 feet. The control cable to the transceiver is shown in Figure 2-8. The transceiver accessory plug, 1A8P4, is furnished with the transceiver. The plug P5, is furnished with the SNR-2000. The control cable 0579240002 is 37 conductor, NO. 20 AWG wire, shielded and jacketed. This cable is available in lengths specified by the customer.

The RF coaxial cable is also available in lengths specified by the customer. Type RG-58A/U, p/n 0588130001 is adequate for transceiver to amplifier spacings of less than 50 feet. For distances above 50 feet, RG-8A/U, p/n 0588640000 should be used. Connector kits are provided with the SNR-2000 and the transceiver.

2.6.3 RF OUTPUT CONNECTIONS

The amplifier's RF output connector is also furnished in the Connector Kit. RG-8A/U coaxial cable should be used, regardless of the distance to the antenna or antenna coupler.

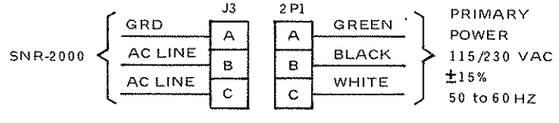
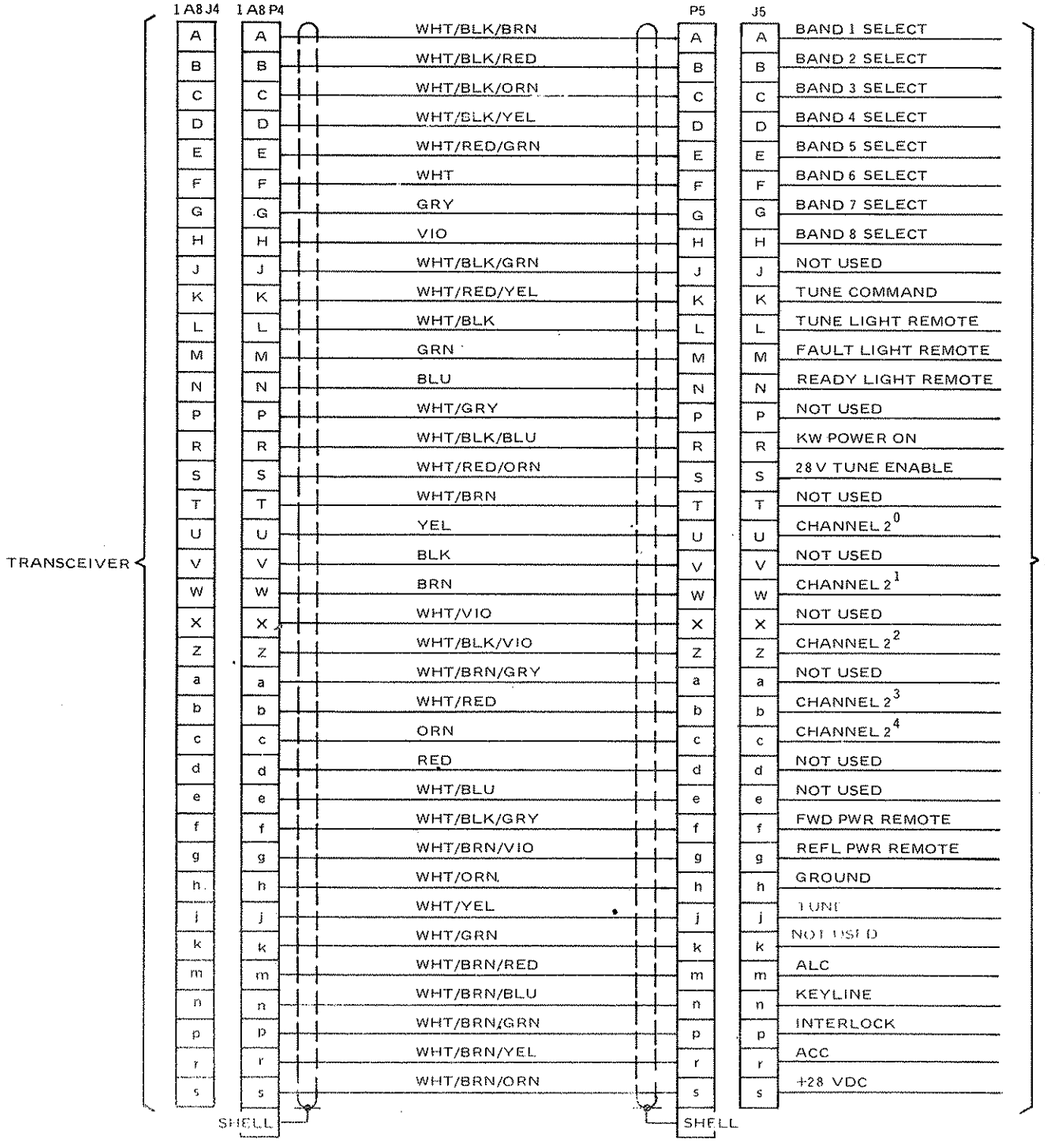


FIGURE 2-7 POWER CABLE ASSEMBLY P/N 8066002297

SUNAIR SNR-2000



1A8P4 COMPLETE: P/O TRANSCEIVER

P5 COMPLETE: P/O CONNECTOR KIT 8066000294

— CABLE: SPECIAL ORDER P/N 0579240002

FIGURE 2-8 TRANSCEIVER TO SNR-2000 CONTROL CABLE

2.6.4 ANTENNA COUPLER CONNECTIONS

Refer to Section VI for additional information.

If an antenna coupler is not used, be sure the Connector Assembly p/n 8066007094 is installed on the rear of the SNR-2000, J4. When an antenna coupler is to be used, the buss wire on connector p/n 1008390011 must be removed, before cable construction is accomplished using this connector.

2.6.5 STATION RF GROUND SYSTEM CONNECTIONS

Grounding terminals are provided on the transceiver, SNR-2000 and antenna coupler for connection to the station RF ground system. Use 1 or 2 inch wide copper strap or NO. 6 AWG wire or larger for this bonding. Keep lead lengths to a minimum.

2.7 PRELIMINARY CHECKS AND ADJUSTMENTS

Determine from the voltage customizing label the proper line voltage for the unit being installed. Connection changes necessary to change voltage customizing are shown in Figures 2-9 and 2-10. Be sure that the Fan Voltage Switch, A1OS1, is in the proper position.

If the SNR-2000 is received as a system with its companion transceiver/exciter, no adjustments should be necessary. Otherwise, set the power levels as follows (see Figure 5-1 for component locations):

a) Set transceiver/exciter MODE to CW, SNR-2000 to 1 KW. Key transceiver/-exciter and adjust A3A2R32 for 1000 watts out.

b) Set SNR-2000 to 500W. Set A3A2R33 for 500 watts out.

c) Set transceiver/exciter to AM, SNR-2000 to 1 KW. Key transceiver/exciter and adjust A3A2R42 for 400 watts out.

d) Set SNR-2000 to 500W. Adjust A3A2R43 for 200 watts out.

2.8 RACK MOUNTING KIT OPTION

An optional slide rack mounting kit is available to facilitate installation of the SNR-2000 in standard E.I.A. equipment racks. See Figures 2-11 and 2-12.

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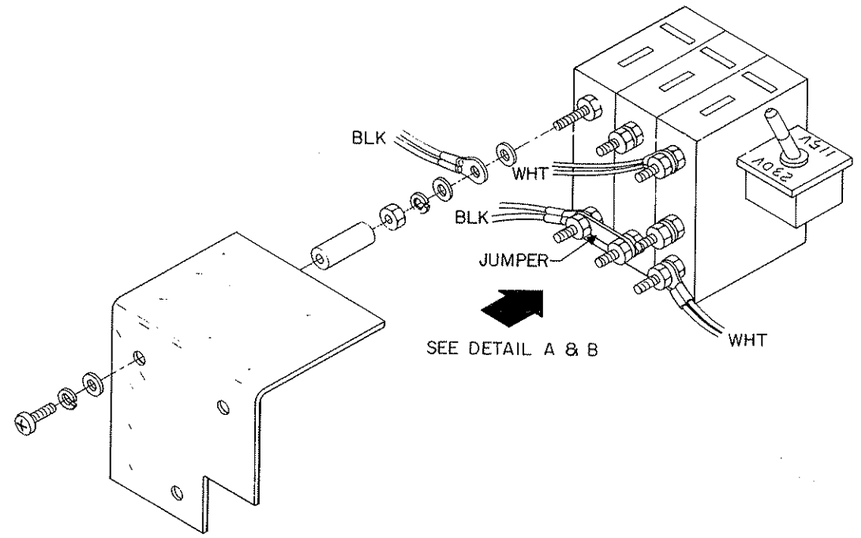

FIGURE 2-9 VOLTAGE CUSTOMIZING - CIRCUIT BREAKER/AUXILIARY POWER SUPPLY

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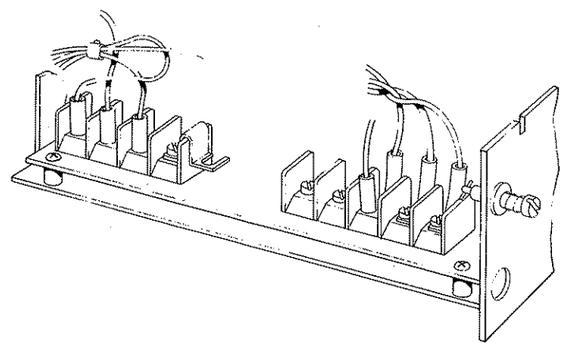
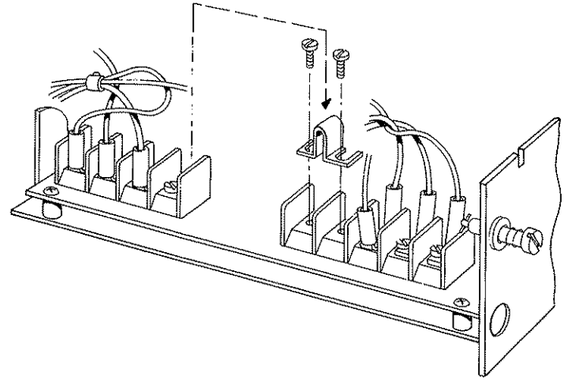


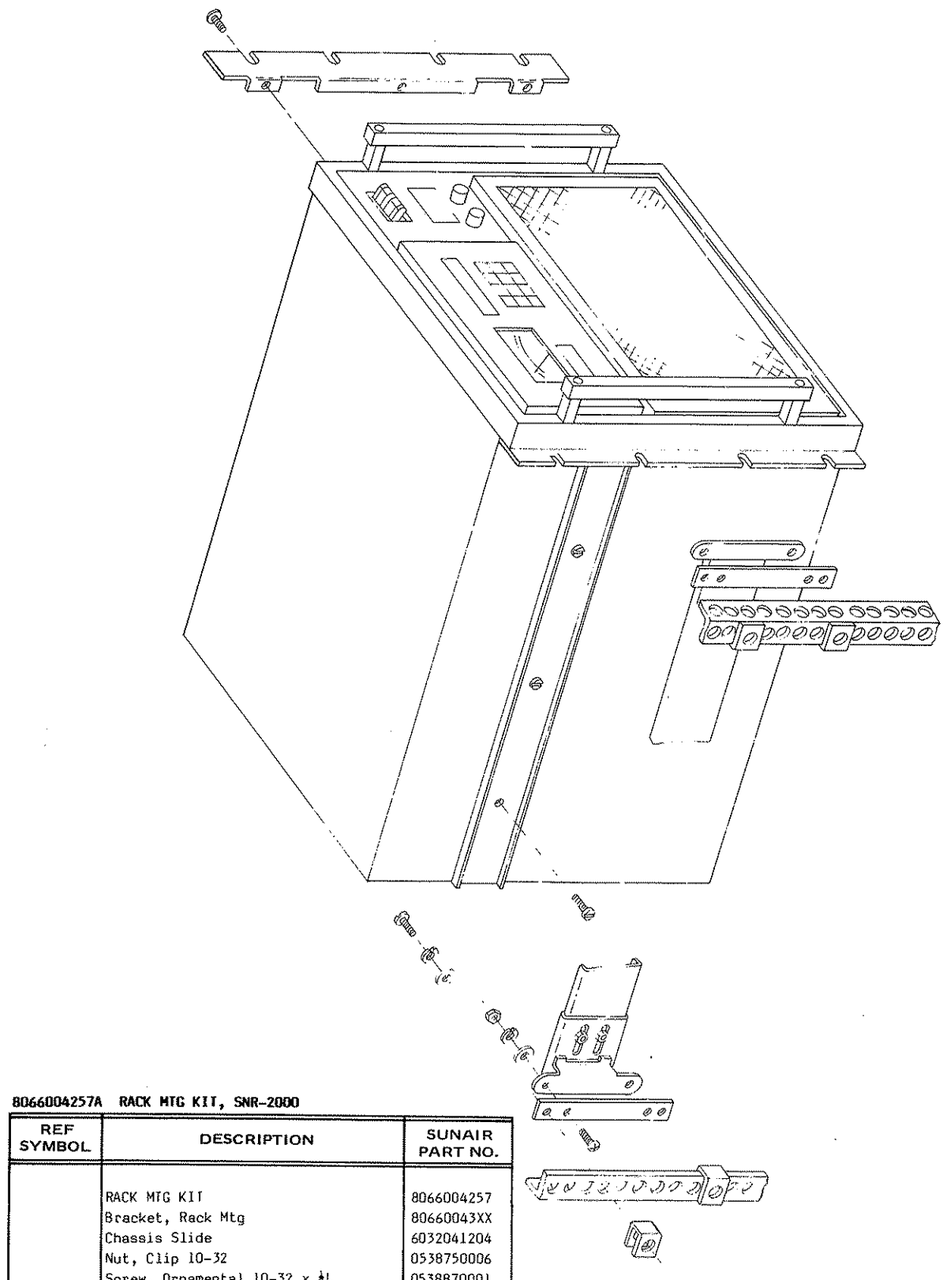
230VAC UNIT



CONVERTING 230VAC UNIT TO 115VAC

FIGURE 2-10 VOLTAGE CUSTOMIZING - RF/PS MODULE A4 (4 EACH)

8066414030A



8066004257A RACK MTG KIT, SNR-2000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	RACK MTG KIT	8066004257
	Bracket, Rack Mtg	80660043XX
	Chassis Slide	6032041204
	Nut, Clip 10-32	0538750006
	Screw, Ornamental 10-32 x ½L	0538870001

FIGURE 2-11 RACK MOUNT SLIDE DETAILS

6032001806A

DIMENSIONS					
SUNAIR P/N	VENDOR P/N	"W"	"D"	"H"	"X"
100244-0009	SFR-124-745-005	22½	25½	50 7/8	51 11/32
~	IE "213	22½	25½	59¼	59 23/32

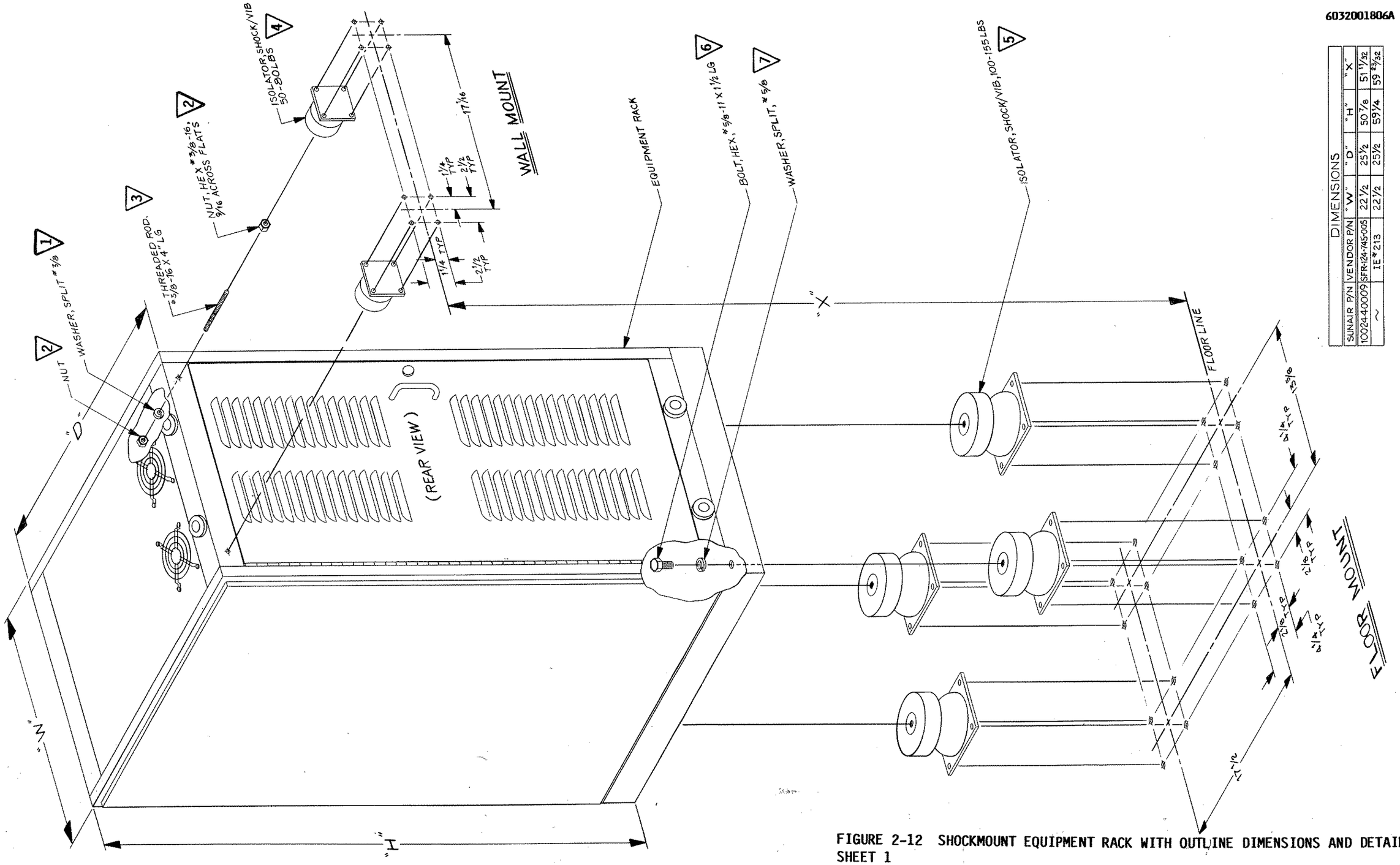
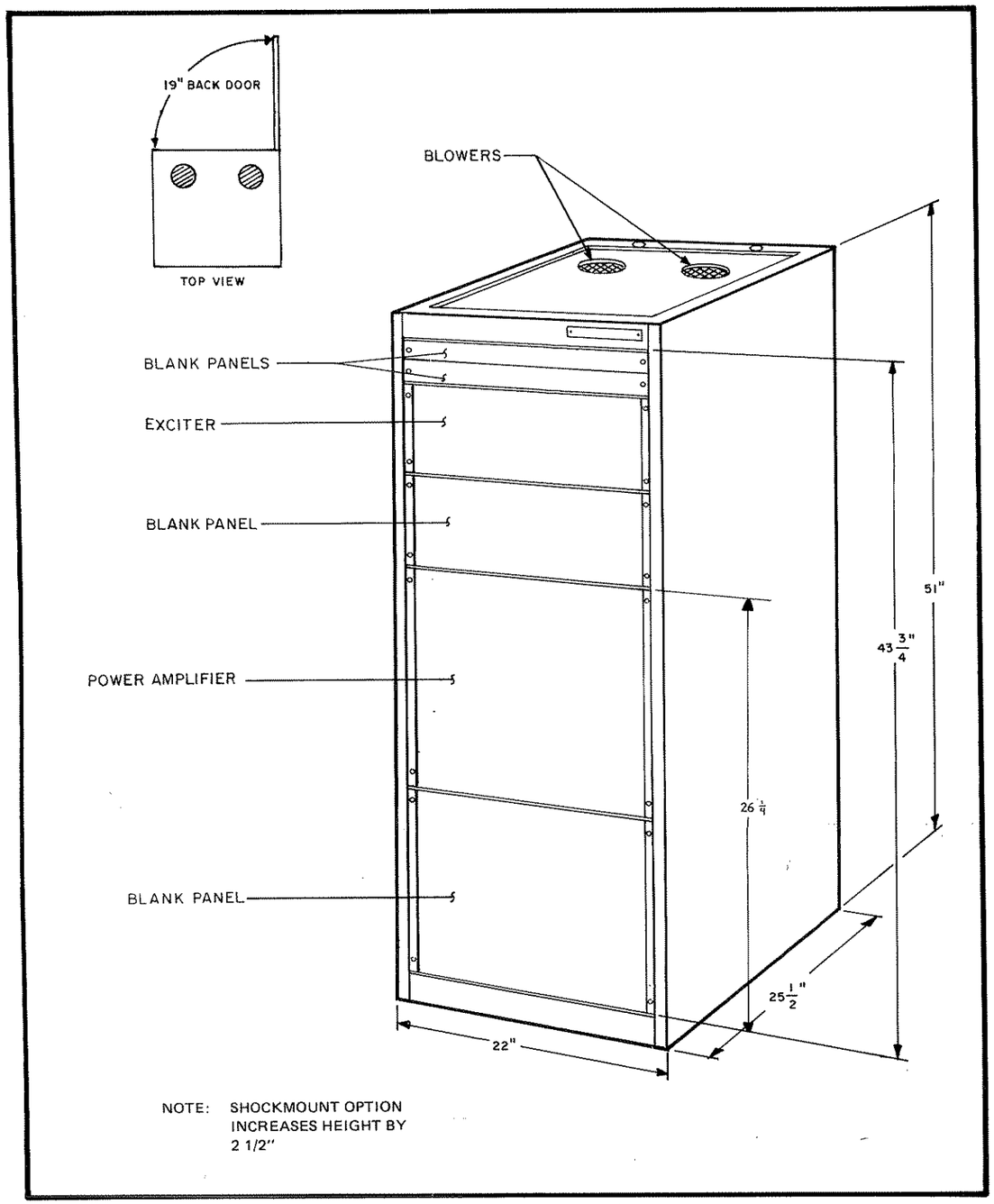


FIGURE 2-12 SHOCKMOUNT EQUIPMENT RACK WITH OUTLINE DIMENSIONS AND DETAILS SHEET 1



SHOCKMOUNT KIT EQUIPMENT RACK P/N 6032090892

ITEM NO	SUNAIR PART NUMBER	DESCRIPTION	QTY
1	0501650008	Washer, Split 3/8	2
2	0501700005	Nut, Hex 3/8-16 x 9/16 AF	4
3	0542880644	Rod, Thd 3/8-16 x 4 Lg	2
4	0841810001	Isolator, Shock/Vib. 50-80 Lbs.	2
5	1001280016	Isolator, Shock Vib. 100-155 Lbs.	4
6	1001290003	Bolt, Hex 5/8-11, 1½ Lg	4
7	1001300009	Washer, Split 5/8	4
	1002980011	Installation Instructions	1

FIGURE 2-12 SHEET 2

SECTION III

OPERATION

3.1 GENERAL

This section provides information and instructions required for operation of a transceiver, the SNR-2000 1 KW Linear Solid State Power Amplifier and an automatic antenna coupler. Refer to the transceiver and the coupler Operation and Maintenance Manuals for detailed information regarding operation of these units.

3.2 FUNCTION AND LOCATION OF CONTROLS AND INDICATORS

Table 3-1 lists the controls and indicators of the SNR-2000 front panel. Locations are shown in Figure 3-1.

3.2.1 SNR-2000 CONTROL PANEL

The SNR-2000 Control Panel mounts in the space provided in the front panel of the transceiver/exciter. The panel provides status lights and forward and reflected power information (some provide remote ON/OFF capability). See Section I for the part number of the control panel required for your equipment configuration.

3.3 OPERATING THE SNR-2000

3.3.1 OPERATION WITH GSB-900, GSB-900DX, GSB-900SC, GSE-924

Insure that the transceiver/exciter and the SNR-2000 are installed properly by referring to Section II in this manual and in the radio manual. If an antenna coupler is being used, insure its proper installation also.

a) Apply power to transceiver/exciter and SNR-2000.

b) Place ON/OFF switch on the SNR-2000 Control Panel to ON (if panel has this capability).

c) On SNR-2000, POWER lamp will light and LCD will display system message:
   1. Without an automatic antenna coupler, "KW SYSTEM OPERATIONAL, METER: FWD, PWR LVL: 1 KW".
   2. With an SNR-2000DAC antenna coupler, "FAULT: COUPLER UNTUNED, METER: FWD, PWR LVL: 1 KW".

d) All lights on the SNR-2000 Control Panel will flash momentarily and
   1. Without an automatic antenna coupler, READY lamp will light and system is ready to operate. If instead the FAULT lamp flashes, this indicates a fault in the SNR-2000. Reset the SNR-2000 by turning the transceiver/exciter off, wait 30 seconds, then turn back on, or by turning ON/OFF switch on SNR-2000 Control Panel OFF then ON, or at the SNR-2000 turn circuit breaker OFF then ON, or using the PWR LVL key on the keyboard reset the SNR-2000. If FAULT does not clear see Section V of this manual.
   2. With an SNR-2000DAC antenna coupler FAULT lamp will burn steadily. Follow steps e through g below.

e) Select operating frequency on transceiver/exciter.

f) Place transceiver/exciter MODE switch in the KW/CPLR TUNE position. Depress PUSH TO TUNE button on the SNR-2000 Control Panel.

g) TUNING lamp will light. On SNR-2000 LCD will display system messages: "COUPLER TUNING", "COUPLER TUNED", "KW SYSTEM OPERATIONAL". After completion of tune, (maximum 2 seconds) READY lamp will light. Place transceiver/exciter MODE switch to desired mode of operation.

1. If after tune attempt, FAULT lamp burns steadily, this indicates a fault in the coupler, antenna or feedline. Attempt retuning. If FAULT does not clear, see Section V of this manual and the transceiver or coupler manual.
2. If FAULT lamp flashes, this indicates a fault in the SNR-2000. Reset SNR-2000. If FAULT does not clear see Section V of this manual.

NOTE

If an antenna coupler is not used, tuning is not required when the operating frequency of the transceiver/-exciter is changed. With an antenna coupler, coupler tuning is not required with each frequency change. However, coupler tuning is recommended to prevent loss of first syllables when push-to-talk button is depressed.

3.3.2 OPERATION WITH SCANCALL® SC-10

Insure that the transceiver and the SNR-2000 are installed properly by referring to Section II in this manual and in the transceiver manual. If an antenna coupler is being used, insure its proper installation also.

INSTALLATION NOTE

To operate the SC-10 with the SNR-2000, the following changes must be/have been accomplished to the SC-10 Transceiver.

1. Remove CR5 (1N5352B) from MIC Connector 1A1J1 pin B and D on the SC-10 front panel. See Figure 5.17 in SC-10 manual.

2. RF Detector Assembly 1A5A4 (5024057097) in the SC-10 is modified by the following changes: Move wire from "E9 to J1-11" to "E9 to J1-16". Move diode CR10 (1N4004) from K2-1 and K2-13, to J1-16 and J1-11, with cathode to J1-11. Connect K2-1 to K2-13 with jumper wire. Add diode CR19 (1N4004) between J1-16 and J1-13, with cathode to J1-13.

a) Apply power to transceiver and SNR-2000.

b) Place ON/OFF switch on the SNR-2000 Control Panel to ON.

c) On SNR-2000, POWER lamp will light and LCD will display system message:
   1. Without and antenna coupler, "KW SYSTEM OPERATIONAL, METER: FWD, PWR LVL: 1 KW".
   2. With an SNR-2000DAC, "FAULT: COUPLER UNTUNED, METER: FWD, PWL LVL: 1 KW".

d) All lights on the SNR-2000 Control Panel will flash momentarily and
   1. Without an automatic antenna coupler, READY lamp will light and system is ready to operate. If instead the FAULT lamp flashes, this indicates a fault in the SNR-2000. Reset the SNR-2000 by turning ON/OFF switch on SNR-2000 Control Panel OFF then ON, or at the SNR-2000 turn circuit breakers OFF then ON, or using the PWR LVL key on the keyboard reset the SNR-2000. If FAULT does not clear see Section V of this manual and the transceiver manual.
   2. With an SNR-2000DAC antenna coupler FAULT lamp will burn steadily. Follow steps e through g below.

e) Select operating frequency on SC-10.

f) Depress PUSH TO TUNE pushbutton on SNR-2000 Control Panel.

g) TUNING lamp will light. On SNR-2000 LCD will display system messages: "COUPLER TUNING", "COUPLER TUNED", "KW SYSTEM OPERATIONAL". After completion of tune, (maximum 2 seconds) READY lamp will light.

1. If after tune attempt, FAULT lamp burns steadily, this indicates a fault in the coupler, antenna or feedline. Attempt retuning. If FAULT does not clear, see Section V of this manual and the transceiver or coupler manual.
2. If FAULT lamp flashes, this indicates a fault in the SNR-2000. Reset SNR-2000. If FAULT does not clear see Section V of this manual.

NOTE

If an antenna coupler is not used, tuning is not required when the operating frequency of the SC-10 is changed. With an antenna coupler, coupler tuning is not required with each frequency change. However, coupler tuning is recommended to prevent loss of first tone burst when transmit scan is to be used. Before scanning, manually tune each channel to be scanned by selecting that channel and depressing the PUSH TO TUNE pushbutton.

3.3.3 OPERATION WITH GSB-900SC/R AND GRC-901 REMOTE CONTROL HEAD

Insure that the GSB-900SC/R, GRC-901, SNR-2000 and SNR-2000DAC (if used) are installed properly by referring to Section II in this manual and in the transceiver, control head and coupler manuals.

3.3.3.1 Local Operation

a) Apply power to the transceiver and SNR-2000. Depress the LOCAL pushbutton on the SNR-2000 Control Panel.

b) On SNR-2000, POWER lamp will light and LCD will display system message:
   1. Without an automatic antenna coupler, "KW SYSTEM OPERATIONAL, METER: FWD, PWR LVL: 1 KW".
   2. With an SNR-2000DAC antenna coupler, "FAULT: COUPLER UNTUNED, METER: FWD, PWR LVL: 1 KW".

c) All lights on the SNR-2000 Control Panel will flash momentarily and
   1. Without an automatic antenna coupler, READY lamp will light and system is ready to operate. If instead the FAULT lamp flashes, this indicates a fault in the SNR-2000. Reset the SNR-2000 by turning GSB-900SC/R OFF for approximately 40 seconds, then turn ON and depress LOCAL pushbutton, or at the SNR-2000 turn circuit breaker OFF, then ON, or using the PWR LVL key on the keyboard reset the SNR-2000. If FAULT does not clear see Section V of this manual and the transceiver manual.
   2. With a SNR-2000DAC antenna coupler FAULT lamp will burn steadily. Follow steps d through f below.

d) Select operating frequency on transceiver.

e) Place transceiver MODE switch in the KW/CPLR TUNE position. Depress PUSH TO TUNE button on the SNR-2000 Control Panel.

f) TUNING lamp will light. On SNR-2000 LCD will display system messages: "COUPLER TUNING", "COUPLER TUNED", "KW SYSTEM OPERATIONAL". After completion of tune, (maximum 2 seconds) READY lamp will light. Place transceiver MODE switch in desired mode of operation.
   1. If after tune attempt, FAULT lamp burns steadily, this indicates a fault in the coupler or outside the SNR-2000. Attempt retuning. If FAULT does not clear see Section V of this manual and the transceiver or coupler manual.
   2. If FAULT lamp flashes this indicates a fault in the SNR-2000. Reset SNR-2000. If FAULT does not clear see Section V of this manual.

NOTE

If an antenna coupler is not used, tuning is not required when the operating frequency of the transceiver is changed. With an antenna coupler, coupler tuning is not required with each frequency change. However, coupler tuning is recommended to prevent loss of first syllables when push-to-talk button is depressed.

3.3.3.2 Remote Operation from GRC-901

a) Turn the GRC-901 Remote Control Head power switch to the ON position. (NOTE: The GSB-900SC/R must be in the LSB, USB, or AM position and the SNR-2000 circuit breaker must be on at the local site.) The WAIT lamp will light then extinguish and the FAULT lamp will illuminate.

b) Select the desired operating channel and mode on the front panel of the GRC-901.

c) Push the PTT button on the microphone. The WAIT lamp will light. When the tune cycle has terminated the WAIT lamp will extinguish and the READY lamp will illuminate. Receipt of a FAULT lamp may indicate one of the following:

1. SNR-2000 failure
2. Antenna coupler or antenna system malfunction
3. Invalid frequency has been loaded into the GSB-900SC/R
4. No power to the GSB-900SC/R
5. Malfunction in the GSB-900SC/R.

Attempt to clear FAULT by pushing PTT on microphone to retune system or turn GRC-901 OFF, for approximately 40 seconds, then ON which will reset the SNR-2000. If FAULT does not clear see Section V of this manual and the control head manual.

3.3.4 OPERATION WITH GRC-970( ) SYSTEM

The SNR-2000 can be used with the GRC-970 System Cases 1 thru 4. However, each case requires different modifications to be made to the system's components. Consult Sunair's Marketing and/or Product Services Departments for the specific modifications required for your system.

3.4 OPERATION OF THE SNR-2000 WITH TRANSCEIVERS/EXCITERS OTHER THAN SUNAIR MODELS

If another model transceiver/exciter is to be used with the SNR-2000, adjustments and control cable connections may differ. Consult manufacturer's manual and this manual for installation considerations and instructions.

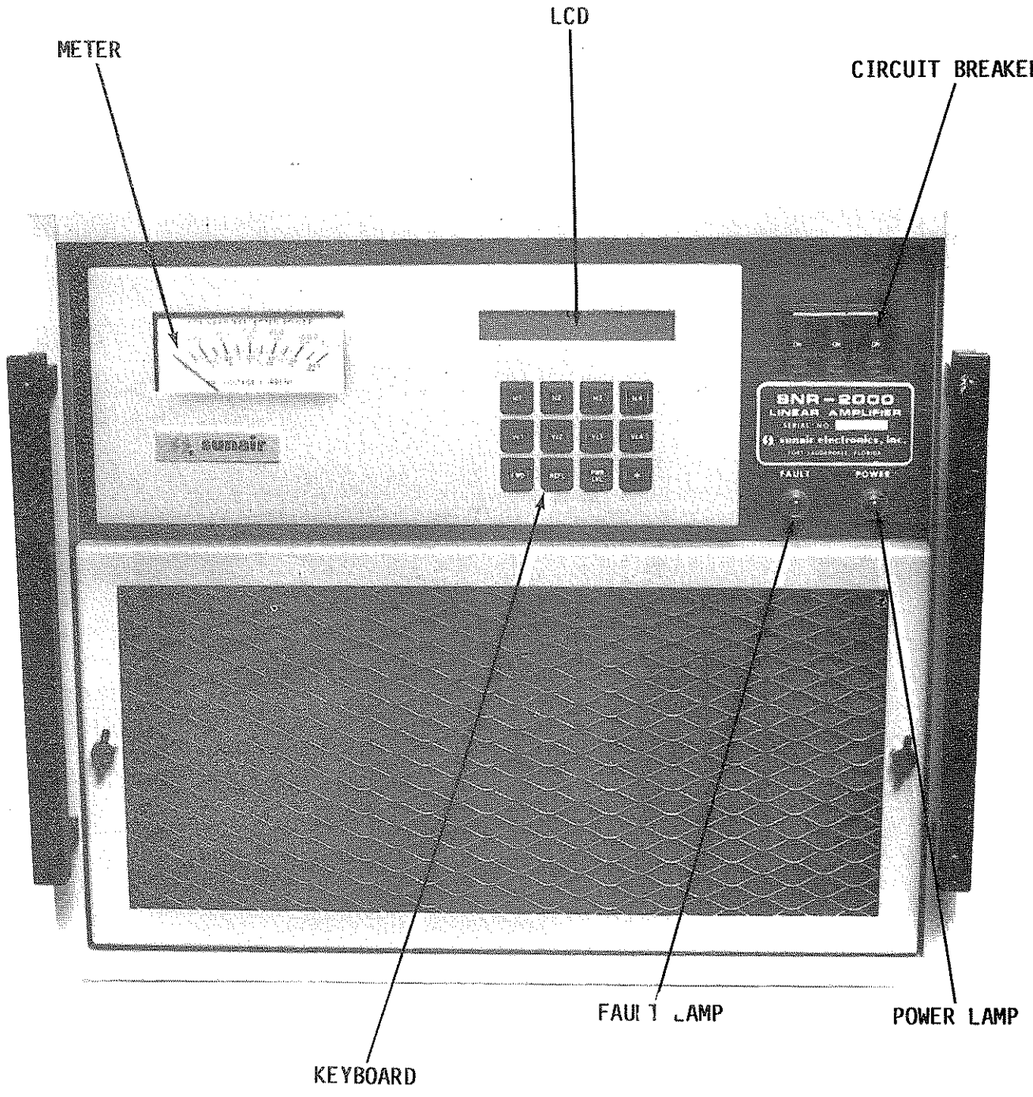


FIGURE 3-1 SNR-2000 CONTROLS AND INDICATORS

TABLE 3-1 CONTROLS AND INDICATORS - FRONT PANEL

CONTROL OR INDICATOR	FUNCTION
Meter, A2M1	Displays the following: 1. 0 - 1400: Forward Power in watts 2. 0 - 140: Reflected Power in watts 3. 0 - 60V: Selected PA's voltage 4. 0 - 18A: Selected PA's current
LCD Assembly, A2A2	This Liquid Crystal Display (LCD) displays all systems messages and conditions.
Circuit Breaker, A2CB1	Applies primary power to the SNR-2000.
FAULT Lamp, A8DS2	A red fault lamp which, when flashing, indicates a fault in the SNR-2000. A steady fault lamp indicates a fault external to the SNR-2000.
POWER Lamp, A8DS1	A green lamp which indicates that primary power has been applied to the SNR-2000.
Keyboard, A2A1S1	The keyboard affords the operator/technician the ability to check individual voltage, current and power levels. The keyboard also provides the operator/technician with the ability to select desired power operating levels and to read failure indications. 1. I_C#1: When depressed displays power supply current of PA#1 on meter. 2. I_C#2: When depressed displays power supply current of PA#2 on meter. 3. I_C#3: When depressed displays power supply current of PA#3 on meter. 4. I_C#4: When depressed displays power supply current of PA#4 on meter. 5. V_C#1: When depressed displays power supply voltage of PA#1 on meter. 6. V_C#2: When depressed displays power supply voltage of PA#2 on meter. 7. V_C#3: When depressed displays power supply voltage of PA#3 on meter. 8. V_C#4: When depressed displays power supply voltage of PA#4 on meter. 9. FWD: When depressed displays forward output power in watts on meter. 10. REFD: When depressed displays reflected output power in watts on meter. 11. PWR LVL: When depressed changes output power level reading on LCD Assembly from 1 KW to 500 watts to 100 watts (bypass). Also used to reset SNR-2000. 12. *: When more then one fault occurs the LCD Assy will read "Fault: MULTIPLE.. PRESS *". Depress this key to display each fault message. A different fault message will be displayed each time the key is depressed until all faults detected have had messages displayed.

SECTION IV

THEORY OF OPERATION

4.1 GENERAL

Refer to Figures 4-1 and 5-4.

The SNR-2000 is an all-solid-state, self-contained, one kilowatt linear power amplifier designed for use with 100 watt transceivers or exciters. The unit is complete in one package and includes rf amplifier modules, power supplies, combining networks, harmonic filters and microprocessor control circuitry. Built-in diagnostics monitor the functional operation of the unit and report malfunctions in English language on a front panel liquid crystal alphanumeric display. In addition to reporting malfunctions, the microprocessor reconfigures the amplifier to a safe operating power level, or shuts it down completely, providing exciter only operation.

The rf circuitry consists of an input power splitter, four broadband rf power amplifier modules, an output power combiner, and a harmonic low pass filter. The input power splitter divides the exciter power equally among the four rf modules. Each rf amplifier module consists of two conservatively rated power amplifiers combined to provide over 300 watts power output capability. The output from the four rf amplifier modules is combined in the output power combiner, providing over 1200 watts output capability in one feedline. The harmonic low pass filter attenuates the harmonic output of the amplifiers by at least 75 db. The filter is split into 8 bands, each a maximum of one-half octave frequency span (1.5 x frequency), automatically selected by the exciter and buffered by the microprocessor circuitry, so that no tuning is required.

Each power amplifier module consists of an rf module, a power supply, and an rf module control assembly. The power supplies are high-efficiency switching regulators, with built-in current foldback and overvoltage protection. The rf module control assembly provides microprocessor-controlled AC power input to the power supplies, and regulated bias voltage to the dual amplifier, ensuring linearity.

4.2 CONTROL PANEL MODULE A2

Refer to Figure 5-5

The Control Panel Module is a plug-in panel arrangement on the front of the SNR-2000 which contains the meter, the LCD Assembly, and the 3 x 4 keyboard. The LCD Assembly A2A1 is used to display the power level selected, the diagnostic information, and the function selected to be displayed on the meter. The 3 x 4 keyboard is used to select the meter display functions. The PC Assembly Control Panel A2A2 provides the interconnections which permit the keyboard to close the proper row to the proper column when a key is depressed and pass the information on to the Computer Mother Board A3A1. The PWR LVL key is used to select the desired operating power level of the SNR-2000. The * key is used to scroll through multiple fault indications. The meter is used to display any of the four collector currents, four collector voltages, and either forward or reflected power.

4.3 COMPUTER ASSEMBLY A3

4.3.1 PC ASSY COMPUTER MOTHER BOARD A3A1

Refer to Figure 5-6

The Computer Mother Board acts as a back plane to interconnect the Peripheral Board A3A2 to the Microprocessor Board A3A3 and to interconnect these two boards to the balance of the SNR-2000. The Microprocessor Board plugs into A3A1J6 and A3A1J7. The Peripheral Board plugs

into A3A1J8 and A3A1J9. Connector A3A1J1 provides routing for the signals to and from the power amplifier assemblies. Connector A3A1J2 interfaces to the Filter Module A5. Connector A3A1J3 connects to the Control Panel Module A2. Connector A3A1J4 interfaces with the transceiver/-exciter and the antenna coupler. Connector A3A1J5 interfaces with the front panel of the SNR-2000 by transferring control signals to the front panel lights, the bypass relay, and over-temperature fan.

4.3.2 PERIPHERAL BOARD A3A2

Refer to Figure 4-2 and 5-7

4.3.2.1 General

The Peripheral Board A3A2 contains much of the analog circuitry used to monitor and control the SNR-2000. Many fault indicators and detectors are located on this board. These circuits are designed to inform Microprocessor A3A3U1 when a fault has occurred in the electronic operation of the SNR-2000. Also provided on one version of the board are circuits which interface it with an SNR-2000DAC Digital 1000W Coupler. Another version of the board contains circuits which interface it to a GCU-1935 Automatic 1000W Coupler. When operating any SNR-2000 KW Amplifier, it is important that it be equipped with the correct Peripheral Board for the type antenna coupler (if any) that is being used.

The Peripheral Board is responsible for the following functions required for proper operation of the SNR-2000:

1. The signal BYPASS which causes the SNR-2000 to be bypassed in the event of a fault which in turn inhibits it from producing its power output.

2. The signals READY LIGHT REMOTE, TUNE LIGHT REMOTE, FAULT LIGHT REMOTE to drive the lamps on the Tranceiver's SNR-2000 Control Panel 1A2.

3. The signal used to drive the fault lamp on the front panel of the SNR-2000.

4. The circuit which interlocks the key-line from the transceiver back into the transceiver except when a tuning operation is occurring in a GCU-1935 antenna coupler.

5. The signal 28 V TUNE ENABLE which instructs the transceiver that an SNR-2000DAC antenna coupler is attached and is tuning.

The Peripheral Board contains the multiplexer circuits which permit ten of the twelve front panel keys on the keyboard to select meter functions. Contained also is a DC to DC converter to provide contrast adjustment for the front panel LCD Assembly. Similarly, a DC to AC inverter is provided which drives the EL (electroluminescent lamp) backlight for night time viewing of the LCD Assembly. Also provided is the ALC/ACC Control Circuit which monitors the forward and reflected power. This circuit is responsible for selecting and producing the proper level of ALC or ACC needed to control the transceiver attached to the SNR-2000.

4.3.2.2 Temperature Sense Comparators U1, U2

The purpose of the Temperature Sense Comparators is to detect when the temperature on any of the four heatsinks on the four individual power amplifiers has reached either of two thresholds. When the temperature on any power amplifier heatsink reaches between 75° and 85°C, Microprocessor A3A3U1 causes the fans to operate at a higher speed. If the temperature continues to increase and reaches between 100°C to 120°C, A3A3U1 shuts down the overheating power amplifier.

4.3.2.3 Overtemperature Buffer U3

The purpose of the Overtemperature Buffer U3 is to provide a means by which Microprocessor A3A3U1 can monitor the temper-

ature of power amplifier assemblies 1, 2, and 3. U3 also acts as a position from which A3A3U1 can monitor a signal called FILTER MODULE FAULT. This signal originates in the Filter Fault Detector U9C, U20A. If this signal is high, A3A3U1 will cause an indication on the LCD Assembly pointing out the faulty filter module. In addition, A3A3U1 will force the SNR-2000 to BYPASS operation to protect the filter module from damage.

4.3.2.4 Gain Fault Comparators U12

The Gain Fault Comparators are a series of four detector circuits used to monitor the power gain of the four individual power amplifier assemblies. The input power to a particular power amplifier assembly is compared to its output power. If the power amplifier is not producing the required amount of power, Microprocessor A3A3U1 is alerted.

4.3.2.5 Gain Fault Buffer U7

The Gain Fault Buffer is the device by which Microprocessor A3A3U1 monitors the status of the gain of the four power amplifier assemblies. When any of the GAIN FAULT signals go high, A3A3U1 will cause a gain fault message to be displayed on the LCD Assembly A2A2. At the same time A3A3U1 will shut down the defective power amplifier reducing the output power from 1000 watts to 500 watts in the SNR-2000. U7 is also used by A3A3U1 to monitor the temperature information from power amplifier number 4 received from the temperature sense comparators. The signal VSWR FAULT is also monitored by A3A3U1 thru U7. If this signal goes high, A3A3U1 will reduce the power produced by the SNR-2000 from 1000 watts to 500 watts. If VSWR FAULT is still high, A3A3U1 will place the SNR-2000 in BYPASS, protecting it from the excessive VSWR.

4.3.2.6 VC Monitor Comparators U11

The purpose of the VC Monitor Comparators comprising U11 is to monitor the individual 48V power supplies that are mounted in each of the four power amplifier assemblies. When the voltage in a power supply falls below 42.3 volts, the output of U11 goes high. Microprocessor A3A3U1 will sense this and remove the defective power supply from operation.

4.3.2.7 Voltage Monitor Comparators U13

The purpose of the Voltage Monitor Comparators comprising U13 is to monitor the 28VDC and 5VDC utilized by the logic control circuitry in the SNR-2000. Microprocessor A3A3U1 monitors the four outputs of U13 to determine if the voltages are too high or too low.

4.3.2.8 VC Monitor/Voltage Monitor Buffer U19

U19 is used by Microprocessor A3A3U1 to determine if any of the four 48V power supplies is producing a voltage that is too low. U19 is also used to determine if the 28V logic control voltage is too low or if the 5V logic control voltage is too high or too low. A3A3U1 periodically samples the inputs of U19. If any of these inputs are high, A3A3U1 takes appropriate action and alerts the operator to the condition.

4.3.2.9 Keyline Interlock Circuit U5D, K1

The purpose of the Keyline Interlock Circuit is to open the keyline connection to the keyline interlock in the SNR-2000, to prevent the transceiver from causing RF to be transmitted through the SNR-2000. This is done during a band change, and during power level changes.

4.3.2.10 Collector Voltage Meter Conditioning Circuit U14

U14 functions as four distinct identical stages. U14A conditions the 48V from PA #1 for display on the meter, U14C conditions the 48V for PA #2, U14B conditions the 48V for PA #3 and U14D conditions the 48V for PA #4. These circuits are voltage follower circuits which function

identically. For example: For PA #1, 48V is applied to U14A through a resistor divider. The resistor divider reduces the 48V to 3V, which when applied through a 33.2 K ohm resistor and U17, the 16 Channel Multiplexer (approximately 470 ohms resistance), supplies approximately 80 µamps to the meter (3.7 K ohms resistance) causing a 48V indication. (Full scale on the meter is 100 µamps.)

4.3.2.11 Collector Current Meter Conditioning Circuit, U16

The Collector Current Meter Conditioning Circuit performs a function similar to that performed by the Collector Voltage Meter Conditioning Circuit U14. U16 is divided into four sections, A thru D, and acts as a unity gain inverting amplifier which inverts a minus voltage to plus voltage for indication on the meter. Each one is capable of conditioning the voltage which is equivalent to the collector current being drawn by each power amplifier assembly and producing a proportionate current source to the meter to deflect it the proper amount. Full scale deflection of the meter is equivalent to 18 amps. If a power amplifier is drawing a current of 9 amps, the meter deflection would indicate a half-scale deflection resulting from a 50 µamp current source produced by the concerned section of U16.

4.3.2.12 16 Channel Multiplexer U17

The purpose of the 16 Channel Multiplexer is to provide a means by which different current sources can be applied to the front panel meter as they are selected by the keyboard. Microprocessor A3A3U1 provides binary input selection which enables U17 to select the proper analog gate circuit output to be supplied to the meter.

4.3.2.13 Multiplexer Switch Selector Latch U18

The purpose of the Multiplexer Switch Selector Latch is to provide a means by which Microprocessor A3A3U1 can select the proper meter information to be sent to the front panel meter to be displayed. U18 provides the binary inputs to U17 to cause U17 to select the proper keyboard selected current source to be supplied to the meter.

4.3.2.14 Overcurrent Detectors U15

The Overcurrent Detectors are comprised of four identical circuits U15 A thru D. U15A monitors the current in PA #1, U15B monitors PA #2, U15C monitors PA #3, and U15D monitors PA #4. The detectors are set to detect a condition of 17.5 amps in the four power amplifier assemblies respectively. If a power amplifier is drawing too much current, then Microprocessor A3A3U1 is alerted to the overcurrent condition by U15. Once the condition is verified, then A3A3U1 removes that amplifier from operation, reducing the output of the SNR-2000 from 1000 to 500 watts.

4.3.2.15 LCD Enable Inverter U6E

A signal called $\overline{\text{LCD E}}$ is produced on the Microprocessor Board A3A3 and needs to be inverted before it can be used by the LCD Assembly A2A2 as an enable. U6E inverts the signal to a signal called E and sends it to the LCD Assembly where it permits the LCD to read or write information from or to Address/Data Bus 0 thru 7.

4.3.2.16 VSWR Fault Detector U9B

The purpose of the VSWR Fault Detector is to alert Microprocessor A3A3U1 that a VSWR fault is occurring indicating that action is required. U9B may be adjusted to trip on VSWR faults of 2:1 or 3:1 using potentiometer A3A2R56. U9B compares the ratio of FWD PWR to REFD PWR. When REFD PWR exceeds the threshold established by R56, the output of U9B goes high alerting A3A3U1 of the excessive VSWR.

4.3.2.17 Filter Fault Detector U9C, U20A

The purpose of the Filter Fault Detector

is to warn Microprocessor A3A3U1 when one of the filters of the eight available is malfunctioning in such a way that power is being sent into the filter assembly but is not exiting from it. U20A monitors the forward power leaving the SNR-2000. U9C compares the power entering the filter modules from the power amplifiers with the power leaving the SNR-2000. A3A3U1 monitors the output of U9C and if it goes high for longer than 50 msec then A3A3U1 causes the SNR-2000 to go to BYPASS by shutting down the power amplifier assemblies, preventing them from damaging the filter module.

4.3.2.18 RF Present Detector Q4

The RF Present Detector is connected to the signal P OUT MONITOR as is U9C of the Filter Fault Detector circuit. If power is present on P OUT MONITOR, Q4 will be turned on, producing a low on U8, the Coupler Interface Buffer. When Microprocessor A3A3U1 detects the low, then it knows through its software that the power amplifiers are producing power. Since certain faults can only be legitimate faults in the presence of RF, A3A3U1 will monitor these only if RF is present.

4.3.2.19 Forward Power Meter Conditioning Circuit U10B

U10B is configured as a voltage follower. Its purpose is to buffer the forward power information that the Peripheral Board receives. U10B produces a voltage which is sent to two places. Through potentiometer A3A2R61 this information is called FWD PWR LOCAL and goes to A3A2U17, the 16 Channel Multiplexer. (R61 is used to adjust the full scale level of FWD PWR LOCAL on the front panel meter of the SNR-2000.) The other signal produced is FWD PWR REMOTE which is transferred to the Control Panel 1A2 meter on the transceiver. The approximate power level of the SNR-2000 is read on this meter.

4.3.2.20 Reflected Power Meter Conditioning Circuit U10A

The function of the Reflected Power Meter Conditioning Circuit is identical to the function of U10B. A3A2R59 is used to adjust the full scale deflection of the reflected power information on the front panel meter of the SNR-2000.

4.3.2.21 Reflected Fault Detector U9D

The purpose of the Reflected Fault Detector is to warn Microprocessor A3A3U1 when a severe reflected fault condition is occurring in the SNR-2000. If the reflected power level reaches and exceeds 200 watts, U9D goes high. A3A3U1 checks the reflected fault condition indicated by the Reflected Fault Detector to insure that it actually exists, and if so, immediately places the SNR-2000 in BYPASS.

4.3.2.22 ALC/ACC Control Circuit U10C, U10D, U20D, Q3, Q7-Q11

The purpose of the ALC/ACC Control Circuit is to provide ACC feedback to the transceiver when operating in AM, and to provide ALC feedback when operating in SSB or CW. The ALC/ACC Control Circuit monitors the summation of forward and reflected power and either increases or decreases the feedback to the transceiver, enabling the transceiver to provide the SNR-2000 with the correct power output level.

The ALC/ACC Control Circuit functions in one of two modes. It functions either as a 1000 watt or as a 500 watt ALC/ACC circuit. The signal 1 KW ALC/ACC is received from the Microprocessor Board A3A3. If this signal is a low it means that the Microprocessor Board wishes to operate in a 1000 watt mode. This low turns on transistors Q10 and Q11 shorting our potentiometers A3A2R33 and R43. With R33 and R43 shorted, A3A2R32 and R42 would be used to adjust the ALC and ACC

control levels. If 1 KW ALC/ACC is a high indicating operation at 500 watts, this high turns off Q10 and Q11. R33 and R43 now become part of the effect controlling the ALC and ACC voltage.

U10C is used as a buffer to amplify the forward power. A3A2R28 is used to adjust the output of U10C. Forward power and reflected power are summed and fed to R32 and R42 where all four potentiometers can affect the relative level. U10D amplifies the level adjusted by R42, or R42 and R43, and drives Q3. If the output of U10D decreases, the output of Q3 will decrease, reducing the ACC to the transceiver which increases the power supplied to the SNR-2000 to compensate. Transistor Q9 prevents the ALC from going low immediately after the SNR-2000 is keyed. Transistors Q7 and Q8 act as a gain amplifier in the ALC circuit. They react to changes in the forward power with respect to the reflected power as provided by R32 and R33. The voltage decreasing at the gate of Q7 reduces the ALC signal causing the transceiver to increase its output to the SNR-2000 to compensate.

4.3.2.23 DC to DC Converter U21

The purpose of U21 is to provide the LCD Assembly A2A2 with a negative voltage which can be used to vary the display contrast and intensity. +5VDC is converted to -5VDC by U21 and applied to potentiometer A3A2R164. R164 is the adjustment for the display contrast and intensity.

4.3.2.24 DC to AC Converter U22

The purpose of U22 is to provide an AC signal to the electroluminescent lamp which backlights the LCD Assembly A2A2. U22 accepts a +5VDC input and produces approximately 90VAC out which excites the electroluminescent backlight permitting night viewing of the LCD display.

4.3.2.25 Coupler Control Circuits

4.3.2.25.1 General

The coupler control circuits employed in the SNR-2000 to permit interfacing with the SNR-2000DAC are all located on the Peripheral Board A3A2. The signals interfacing the SNR-2000DAC to the SNR-2000 include: +28 VOLT TUNE ENABLE, READY LIGHT, FAULT LIGHT, COUPLER PRESENT, and COUPLER OVERTEMP. These signals are inputs to the SNR-2000 from the SNR-2000DAC. Several signals exit the SNR-2000 for use in the transceiver. These are: READY LIGHT REMOTE, TUNE LIGHT REMOTE, and FAULT LIGHT REMOTE.

The SNR-2000 is notified that the SNR-2000DAC is ready to tune when the SNR-2000 receives the signal +28 VOLT TUNE ENABLE. When the SNR-2000 detects this signal, it immediately selects BYPASS operation so that the power being sent through the SNR-2000 to the SNR-2000DAC is the power from the transceiver. Also, the SNR-2000 retains its Keyline Interlock closed during the tune process so that the Keyline Interlock circuitry can be controlled through the SNR-2000DAC. The SNR-2000 monitors signals READY LIGHT and FAULT LIGHT from the SNR-2000DAC. These signals indicate the status of the SNR-2000DAC. The SNR-2000 utilizes these signals in an algorithm which produces the signals sent to the transceiver to light the READY, FAULT and TUNE lamps on the Control Panel 1A2. (Refer to Section III for the description of the lamps and what they indicate and when.)

4.3.2.25.2 Coupler Input Detectors U6A-D, U9A

The purpose of the Coupler Input Detectors is to buffer signals that originate in the SNR-2000DAC. These signals are: +28 VOLT TUNE ENABLE, READY LIGHT, COUPLER PRESENT, COUPLER OVERTEMP, and FAULT LIGHT. Microprocessor A3A3U1 monitors these signals through U8, Coupler Interface Buffer. The +28 VOLT TUNE ENABLE arrives at U9A as a high anytime the SNR-2000DAC wishes to tune. The

signal called $\overline{\text{READY LIGHT}}$ when low, indicates to the SNR-2000 at the end of the tune cycle that the SNR-2000DAC has tuned properly. $\overline{\text{COUPLER OVERTEMP}}$ when low, indicates that the SNR-2000DAC is overheating. If the coupler overheats, the SNR-2000 will go to BYPASS sending only 100 watts through the coupler. COUPLER PRESENT is used by A3A3U1 to detect if an SNR-2000DAC coupler is attached. $\overline{\text{FAULT LIGHT}}$ when low, indicates to the SNR-2000 at the end of the tune cycle that the SNR-2000DAC has failed to tune properly.

4.3.2.25.3 Coupler Interface Buffer U8

The Coupler Interface Buffer is used by Microprocessor A3A3U1 to monitor the signals from the Coupler Input Detectors. U8 also monitors a signal called $\overline{\text{RF PRESENT}}$ which originates in the RF Present Detector Q4. When $\overline{\text{RF PRESENT}}$ is low, this indicates to A3A3U1 that RF is present in the SNR-2000, and that certain fault conditions can be monitored or detected. If the signal is high, meaning RF is not present, A3A3U1 will ignore those fault indications. Another input to U8 is a signal called 28V TOO HIGH. If this signal is high, it is an indication to Microprocessor A3A3U1 that the 28V is out of tolerance on the high side.

4.3.2.25.4 Lamp Driver/Coupler Control/Interlock Control Latch U4

Latch U4 produces the signals which Microprocessor A3A3U1 uses to light the lamps on the Control Panel 1A2 on the front of the transceiver. When READY LIGHT REMOTE, TUNE LIGHT REMOTE and FAULT LIGHT REMOTE are placed high by A3A3U1, then the respective lamp on the transceiver will light. If A3A3U1 causes these signals to oscillate slowly, the lamps will flash. The signal TUNE START COMMAND is controlled by A3A3U1 and is placed high whenever A3A3U1 wishes to interrupt the Keyline Interlock in the SNR-2000 to prevent hot switching of RF. This high is issued anytime a band change is required, and when a power level change is made. The signal BYPASS is produced by A3A3U1 when it wishes the SNR-2000 to operate in BYPASS. This command is issued both when A3A3U1 detects fault conditions within its operation which warrant going to BYPASS, and when the SNR-2000DAC is tuning.

4.3.2.25.5 Lamp Driver/Coupler Control Circuit U5G, Q1, Q5, Q6

The purpose of the Lamp Driver/Coupler Control Circuit is to provide drive capability to the signals exiting Latch U4 to illuminate the lamps on the Control Panel 1A2 of the transceiver and to control the Bypass relay. Transistors Q1, Q5 and Q6 control READY LIGHT REMOTE, TUNE LIGHT REMOTE, and FAULT LIGHT REMOTE respectively. Q6 also controls FAULT LIGHT LOCAL. U5G receives a high anytime Microprocessor A3A3U1 wishes to operate the SNR-2000 in BYPASS. This causes the Bypass relay to energize.

4.3.2.25.6 Keyline Interlock Circuit U5D, K1

Microprocessor A3A3U1 issues a high to U5D, energizing relay K1, briefly opening the Keyline Interlock whenever a band change or power level change is required. The Keyline Interlock in the SNR-2000 is held closed during tuning because the Keyline Interlock in the SNR-2000DAC controls the tuning operation.

4.3.2.26 BITE Bits

The SNR-2000 is capable of self-checking certain elements of its circuit operation. Microprocessor A3A3U1 controls these BITE BITS, monitors them for circuits not operating properly and takes action accordingly.

4.3.3 MICROPROCESSOR BOARD A3A3

4.3.3.1 General

Refer to Figures 4-3 and 5-8

The Microprocessor Board A3A3 produces

three major functions in the SNR-2000. The first function is the interfacing of the Keyboard to the meter. The second function is the driving of the LCD Display providing it with intelligent information. The third function is the controlling of the diagnostic feature, in which all major functions within the SNR-2000 are monitored both to provide failure information and to trigger corrective action if a failure occurs.

Specific to the three major functions, the Microprocessor Board A3A3 is responsible for the following activities of the SNR-2000:

a) Monitors overcurrent signals and reflected fault signals from the Peripheral Board A3A2.

b) Produces drive dump commands to control the Power Amplifier Assemblies A4A3 (4 each).

c) Monitors band information from the transceiver so that it can produce the controlling signals for the Filter Module Assembly A5 to select the proper Band Filter (1 thru 8).

d) Produces buffered address/data AD0 thru AD7 lines to the Peripheral Board and the LCD Assembly A2A2.

e) Produces signals A0 and A1 for the LCD Assembly to indicate to the LCD Assembly whether the information it has received from the Microprocessor Board is a command or a data word.

f) Produces chip selects which are used to enable various bus driven components on the Peripheral Board.

g) Produces signals which drive the power supply relays providing 48VDC to the Power Amplifier assemblies (4 each).

4.3.3.2 Microprocessor U1

The Microprocessor U1 controls the functions of Microprocessor Board A3A3. U1 contains three major busses. The first bus is AD0 thru AD7, a multiplexed address/data bus containing either data or address information. The second bus is A8 thru A15 and always contains address information. The third bus is the control/status bus which contains signals $\overline{RD}$, $\overline{WR}$, IO/$\overline{M}$, and ALE.

When U1 wishes to obtain an instruction from EPROM U9 it produces an address on AD0 thru AD7. U1 then produces an ALE signal which latches that address into Address Latch U8 which forwards it to U9. Once the address is directed to U9, U1 then produces $\overline{RD}$ to U9 and U9 responds by giving the instruction stored at that address onto the AD0 thru AD7 line. U1 reads the instruction, then acts upon it.

When U1 requires a Device Selection mechanism to communicate with its input or output ports it produces the address on the A8 thru A15 address lines causing that port device to become enabled. When the device is enabled, it can either read information from or write information to U1 on the AD0 thru AD7 lines.

The signals present on the control/status bus are used by U1 to transfer information. $\overline{RD}$ is used by U1 when it wishes to obtain (read) information from a device on the AD0 thru AD7 lines. $\overline{WR}$ is used by U1 when it wishes to give (write) information to a device on the AD0 thru AD7 lines. IO/$\overline{M}$ is used by U1 to discriminate between IO and Memory operations. If U1 is reading from or writing to memory, the IO/$\overline{M}$ line is low. If U1 is reading from or writing to IO the IO/$\overline{M}$ line is high. ALE (address latch enable) is pulsed high when U1 wishes to write an address from AD0 thru AD7 lines into the Address Latch U8 to select an instruction from EPROM U9. When data is present on the AD0 thru AD7 lines, ALE is low.

4.3.3.3 Address Latch U8

When Microprocessor U1 produces an address on AD0 thru AD7, it also produces

an ALE signal which latches the address into U8. U8 provides continuous address information A0 thru A7 for the EPROM U9 by sorting out the address from the data information on the AD0 thru AD7 bus. U8 also provides A0 and A1 to drive the LCD address buffer U19.

4.3.3.4 EPROM U9

The EPROM U9 is the storage device where Microprocessor U1's programming code is stored. When U1 wishes to fetch an instruction from U9, it will produce the upper order address of the instruction it wishes to read on lines A8 thru A15, and the lower order address of the instruction it wishes to read on lines AD0 thru AD7. The lower order address on AD0 thru AD7 is connected to address latch U8. When the address information at U8 is correct and present, U1 will issue an ALE signal to latch that information into U8, causing the output of U8, A0 thru A7, to contain the lower order address information of the instruction which U1 wishes to fetch from U9. At the same time, U1 also causes Memory Device Selector U6A, U7, U21A, to issue a signal called $\overline{\text{EPROM}}$ to enable U9. After a short delay U1 will issue a $\overline{\text{RD}}$ signal to U9 causing U9 to deposit on its output lines, AD0 thru AD7, the instruction that was stored at the address selected. When U1 causes the $\overline{\text{RD}}$ signal to make a low to high transition, it will fetch into itself the instruction on AD0 thru AD7 it has selected to act upon.

4.3.3.5 Power Clear Circuit U2C, U4A, U4B

The Power Clear Circuit is necessary to initialize Microprocessor U1 when power is first applied to the SNR-2000. The circuit provides a low on pin 36 of U1 for a time after the voltage is applied to the SNR-2000. This holds U1 reset until transient conditions have passed. At that point U1 is permitted to run because the Power Clear Circuit transfers U1 pin 36 to a high.

4.3.3.6 Crystal Oscillator U34

U34 provides a reference frequency of 6.144 MHz to Microprocessor U1. All activities of U1 occur at rates dependent on the output of U34.

4.3.3.7 Memory Device Selector U6A, U7, U21A

When U7A or U7B produce a low output they are doing so as a result of the addresses being selected properly by Microprocessor U1 on their inputs from bus A8 thru A15. The low output enables a particular memory device, either EPROM U9, RAM U13 or the LCD Assembly, to allow Microprocessor U1 to read from or write to that device.

4.3.3.8 Divide by 2 Circuit U24B

U24B is a flip-flop which receives the clock output of Microprocessor U1. The clock frequency is 3.072 MHz on input pin 11 of the flip-flop. U24B divides its input and produces an output frequency of 1.536 MHz on pin 9 to the timer portion of RAM-IO-TIMER U13.

4.3.3.9 RAM-IO-TIMER U13

U13 contains a RAM (Random Access Memory), three IO ports (has input or output capabilities), and a TIMER which is driven by U24B.

The RAM is used by Microprocessor U1 as a temporary storage facility for information that needs to be stored for future access or which is being acted upon in real time. The IO Ports (Input/Output Ports A, B, C) are all selected by U1 for output operation. Port A (PA0-PA7) provides the BAND 1 thru BAND 8 information for driving the proper relay in the Filter Module A5. Port B (PB0-PB7) outputs the latch signals which drive the power supply relays providing the power amplifier assemblies with 48 VDC. Also output are Drive Enable which disables or enables the PA assemblies' drive capability, Overtemp Command to increase the

speed of the blower fans, $\overline{\text{1 KW ALC/ACC}}$ to tell U1 whether to operate the SNR-2000 at 1000 or 500 watts, and the Bite Bit 2 which allows U1 to self-test various ports on the Microprocessor Board. Port C (PC0-PC5) outputs sequential lows on Rows 1-3 to the Keyboard Assembly, in conjunction with U1 reading the four columns, to determine which key is being depressed. This permits U1 to act accordingly to each key stroke on the Keyboard Assembly. Also output from Port C is the reset for the Watchdog circuit, $\overline{\text{QUICK FAULT RESET}}$ to reset the flip-flop section of the Drive Dump control circuit, and Bite Bit 1 which, like Bite Bit 2, is used as part of the Microprocessor Board's self-diagnostic routine. The TIMER portion of U13 is employed to generate the Real Time Interrupt which is used to relieve U1 of timing routines. The Real Time Interrupt allows U1 to keep track of how much time has transpired simply by counting interrupts while permitting U1 to process other programming code between interrupts.

4.3.3.10 Relay Drivers U14, U15

The purpose of the relay drivers is to accept a high from U13 and convert that signal to a low with sufficient current-carrying capability to energize a relay.

4.3.3.11 Watchdog Circuit Q1, U2B, U3B

The purpose of the watchdog circuit is to monitor the actions of Microprocessor U1 as it processes programming code. If U1 fails to function properly, then the watchdog circuit will time out and re-initialize U1. The watchdog timer U3B is reset preventing it from timing out every time a Real Time Interrupt occurs as long as U1 is processing properly.

4.3.3.12 Input/Output Device Selector U10C, U10D, U11, U12

The purpose of the Input/Output Device Selector is similar to that of the Memory Device Selector U6A, U7, U21A. However the Input/Output Device Selector accesses I/O mapped devices rather than memory mapped devices. U11 functions as the device selector for all input devices and U12 functions as the device selector for all output devices. U11 and U12 are controlled by the IO/$\overline{\text{M}}$ signal. In addition, U11 is controlled by the address signals A12 thru A15 and $\overline{\text{RD}}$. The device accessed by U11, places its information on the AD0 thru AD7 bus allowing U1 to read its contents. U12 functions as does U11 except that it uses the signal $\overline{\text{WR}}$. The device accessed by U12 is written to by U1 with the information contained on the AD0 thru AD7 bus. U10C and U10D permit a device to be controlled which has both input and output capability.

4.3.3.13 Memory I/O Device Selector U10B, U35

This device is present since RAM U13 requires treatment either as a memory device or as an input/output device. U35 uses the address lines A12 thru A15 to select the output desired by Microprocessor U1 to control U13 either as a RAM or as an I/O device.

4.3.3.14 AD0-AD7 Buffer Circuit U2D, U2E, U6C, U20E, U20F, U32

The purpose of the AD0 thru AD7 Buffer Circuit is to prevent any AD0 thru AD7 signals from leaving the Microprocessor Board A3A3 unless the signals are necessary either to write to a device on the Peripheral Board A3A2 or to write to the LCD Assembly A2A2. Containing AD0 thru AD7 on the Microprocessor Board A3A3, except when necessary to communicate off board, minimizes the conducted and radiated RF produced by the bus signals. This circuit also permits Microprocessor U1 to read information from the Peripheral Board and the LCD Assembly which is placed on the AD0 thru AD7 lines.

4.3.3.15 LCD Address Buffer U19

The purpose of U19 is to provide the address signals A0 and A1 to the LCD

Assembly A2A2, only when Microprocessor U1 wishes to read from or write to the LCD. U19 is enabled by the signal SELECT LCD from the Memory Device Selector U7.

4.3.3.16 LCD Enable Circuit U6B, U10A

This is a two gate circuit intended to provide the proper device enable to the LCD Assembly A2A2. When the LCD is enabled by this circuit, Microprocessor U1 will either read or write data or commands from or to the LCD Assembly via the AD0 thru AD7 bus.

4.3.3.17 Wait State Generator U4C, U4D, U4E, U5

The Wait State Generator produces a wait condition which forces Microprocessor U1 to delay one clock cycle when communicating with the LCD Assembly A2A2. The Wait State is necessary because the LCD Assembly A2A2 requires more time to have information written to it or read from it than U1 normally would take. The generator is a dual flip-flop device which is stimulated initially by signal SELECT LCD. A low from the generator on U1 pin 35 RDY, will hold U1 until the LCD Assembly has an opportunity to accept data or to produce data.

4.3.3.18 Drive Dump Control Circuit Q2-Q5, U22, U23, U24A, U26A, U27

The purpose of the Drive Dump Control Circuit is to provide rapid response to certain fault conditions. The circuit produces interrupt signals to the Interrupt Control Circuit U28, U29 anytime a reflected fault or an overcurrent fault occurs.

If a reflected fault occurs, U22A pin 6 goes low causing U26A and U27A-C to output a high on Drive Dump lines 1 through 4 to the power amplifier assemblies. This causes each power amplifier assembly to turn off its input, to protect itself from the effects of the reflected fault. In addition, a high on U22A pin 5 causes U28 to notify Microprocessor U1 that a reflected fault has occurred. This allows U1 to take the appropriate action of placing the SNR-2000 in BYPASS.

If an overcurrent occurs either U22B, U23A, U23B, or U24A will set. The overcurrent function causes an activity similar to that caused by a reflected fault. A Drive Dump is issued to the affected power amplifier assembly(s) and U28 interrupts U1 notifying U1 that an overcurrent has occurred. If the overcurrent condition is continuing, rather than transient, the power will be removed from the affected power amplifier module. The SNR-2000 will continue to operate at 500 watts if only one power amplifier module is affected, but will go to BYPASS if more than one fails.

After either a reflected fault or an overcurrent occurs, Microprocessor U1 instructs U13 to issue a signal called QUICK FAULT RESET. This signal is used to reset U22A, B, U23A, B, or U24A. U1 resets these flip-flops to determine if a fault actually does exist. If the fault condition is genuine and not caused by a transient, the respective flip-flop will be set again by the fault signal again notifying U1. The DRIVE ENABLE signal is used by U1 if it wishes to initiate its own DRIVE DUMP. This occurs during power level changes to protect the Bypass relay and during band changes to protect the band relays.

4.3.3.19 Band Buffer Circuit U30, U31, U33

The purpose of the Band Buffer Circuit is to provide a means by which Microprocessor U1 can determine which filter band has been selected in the transceiver driving the SNR-2000. When a band change occurs, U29 of the Interrupt Control Circuit will detect it and inform U1 that a band change has occurred. The band information is read on bus lines AD0 thru AD7 via U33. When U1 sees that a band change has occurred, U1 will produce an equivalent band change on Port A of RAM U13.

4.3.3.20 Interrupt Control Circuit U28, U29

The purpose of the Interrupt Control Circuit is to notify Microprocessor U1 when an overcurrent has occurred, when a reflected fault has occurred or when a band change has occurred. U1 will stop all activity and act upon the cause of the interrupt.

4.3.3.21 Keyboard Input Buffers U16A-U16D, U18, U20A-D

The purpose of the Keyboard Input Buffers is to provide Microprocessor U1 a means by which it can detect which key of the 3 X 4 keyboard is being pushed. U1 reads Column 1 thru 4 of the keyboard via U18 on the AD0 thru AD7 lines.

4.3.3.22 Keyboard Pushed Interrupt Generator U4F, U16F, U17A

The purpose of the Keyboard Pushed Interrupt Generator is to alert Microprocessor U1 immediately when one of the twelve keys on the front panel keyboard is pushed. A high on RST6.5 interrupts U1, causing U1 to enter its keyboard scan routine to determine which key is being pushed. U1, when it determines which key is being pushed, acts accordingly.

4.3.3.23 12V Generator R36, CR8

The purpose of the 12V Generator is to produce the 12V necessary for the band buffer circuits to permit them to interface with the 12V band signals being supplied from the transceiver. 28 VDC is received at R36 from the Auxiliary Power Supply. CR8 is a zener diode which regulates the 28 VDC to 12 VDC.

4.3.3.24 Voltage Present Indicators CR9-CR11

The Voltage Present Indicators are a series of three LED's which are positioned on the board to indicate the state of three voltages. When the LED's are illuminated, the voltage they represent is correct. CR9 indicates the state of +5VDC, CR10 indicates the state of +12VDC, and CR11 indicates the state of the +28VDC.

4.4 RF/PS MODULE A4

4.4.1 RF MODULE CONTROL ASSEMBLY A4A1

Refer to Figure 5-9

This assembly contains the bias voltage regulators for each of the two pairs of amplifier transistors in a single rf module. The AC power relay, which is energized by the microprocessor circuitry to control input to the module's main power supply, is also a part of this module.

Voltage sensing elements located on the rf power amplifier are used by U1 and U2 to govern the bias voltage for each pair of rf output transistors. Bias adjust potentiometers R10 and R15 are used to initially establish the correct operating idle current for each transistor pair. Actual idle current is supplied by power transistors Q3 and Q4. R6 and R11 provide a current sense feedback to U1 and U2, respectively, to limit the bias supply current to safe limits in case of an amplifier failure.

One complete RF Module Control Assembly is provided for each RF Module Assembly A4.

4.4.2 48VDC SWITCHING POWER SUPPLY A4A2

Refer to Figure 5-10

4.4.2.1 General

The 48 VDC Switching Power Supply is of the pulse-width modulating type, employing high efficiency and small size. The AC input is converted to high voltage DC (Input Section). The DC drives a half-bridge inverter operating at 50 KHz (Inverter Section). The DC output voltage is provided from associated rectification and filtering components via an output transformer driven by the Inverter

Section (Output Section). Sense leads connected to the load provide the regulator with an indication as to whether the pulse-width modulation control voltage must increase or decrease in size, depending on line and load conditions (Control Section). Short circuit protection is provided through a current limit circuit which limits the maximum amount of current available from the supply to 120% of the nominal output current (Current Limiting). Overvoltage protection is provided to insure the power supply will not exceed a preset level (Overvoltage Protection).

4.4.2.2 Input Section

The 110VAC or 220VAC is routed through RFI coil L1 to prevent power supply induced noise from reaching the AC line. Surgistors R1 and R2 limit the in rush current when power is first applied to the power supply. Bridge rectifier CR1 rectifies the AC input voltage. Capacitors C5-C8 provide the inverter section with ±175VDC.

4.4.2.3 Inverter Section

Transformer T1 receives a pulse-width modulated signal from the control section which turns on Q1 and Q2 alternately. CR4-7, CR8-11, and C15-C16 provide negative bias from Q1 and Q2 for faster turn-off. The action of Q1 and Q2 is applied to the primary side of T2 in the form of a pulse-width modulated waveform swinging from +175VDC to -175VDC at a 50 KHz rate.

4.4.2.4 Control Section

The main component of the control section is regulator A1. Pin 1 monitors the output voltage of the power supply and makes the necessary correction to the pulse-width modulator. This correction will be necessary when (1) the voltage adjust pot R35 is moved, (2) the load current has changed, (3) the AC line voltage has changed. The output of the pulse-width modulator may be seen as two signals 180° out of phase at A1 pin 12 and A1 pin 13.

The two signals are used to drive transistors Q4 and Q5. A 20-30 volt bias supply for the control section is generated by T2 winding through CR22, CR23 and filtered by C30. The push-pull circuit derived from Q4, Q5, T1 winding, CR21 provides the necessary control signal required to drive the Inverter Section. R9 and C19 provide the RC time constant for a 100 KHz clock which can be seen at A1, pin 3. This clock is internally divided by two within A1.

4.4.2.5 Output Section

The action of pulse-width modulation through T2 provides a means of increasing or decreasing secondary output voltage even though the peak-to-peak value remains unchanged. The secondary voltage is rectified by CR24 and filtered by L2, L3 and C36 thru C41. C43, C44 and R33, R34 are provided as protection if the sense leads are left open. R32 is used for preload, minimum load to insure proper operation of the pulse-width modulator at a "no load" condition.

4.4.2.6 Current Limiting

Current limiting is accomplished by determining when a certain level of inverter section current has been reached. T3 is in series with T2 and has a single-turn primary side. The secondary side of T3 has 100 turns. R26 connected across T3 will cause a voltage to be generated across R26 proportional to the amount of current going through the primary of T3. Hence, T3 primary current will be proportional to output load current. The voltage generated across R26 is rectified and filtered by CR18, CR19 and C27. This voltage, proportional to load current, is programmed with R24 (current limit adjust) to turn on Q3 when the power supply is loaded to 120% of the nominal output current. When Q3 is on, it will effect the pulse-width modulator such as to limit the output current to 120% of nominal, even with a further

increase in load (i.e., a direct short across the output of the power supply).

4.4.2.7 Overvoltage Protection

When the output voltage increases over 120% of the nominal value, it exceeds the breakdown voltage of CR20. With CR20 on CR12 will turn on and a voltage of .2 volts will be seen on pin 4 of A1 with respect to pin 5 of A1. This condition will cause the pulse-width modulator to go to absolute minimum pulse-width and will cause the output voltage to collapse to nearly zero volts. CR12 will return to "off" condition by removing the AC input.

4.4.3 POWER AMPLIFIER ASSEMBLY A4A3

Refer to Figures 4-4 and 5-11

The four Power Amplifier Assemblies A4A3 contain the solid state power amplifiers which produce the approximate 13 db power gain of the SNR-2000. Refer to Figure 4-4 for the block diagram of one PA Assembly.

A PA Assembly is composed of two push-pull class AB power amplifiers which are interconnected by an input power splitter circuit and an output power combiner circuit. Refer to the schematic diagram Figure 5-11. Notice that the amplifier circuits above and below the splitter and combiner are identical. Therefore, the description of the upper amplifier (Q2-Q3) will apply equally to the lower amplifier (Q4-Q5).

The Input Splitter T1 is a hybrid transformer circuit which splits the 50 ohm module input into two 100 ohm outputs to drive the two push-pull amplifiers. The circuit has isolation between the two 100 ohm outputs which prevents any interaction between the amplifier inputs. Assuming a 50 ohm driver, each amplifier input is presented with a 100 ohm impedance regardless of the other amplifier's input impedance. This preserves the performance of the remaining push-pull stage, should one amplifier fail. In this failure condition, the splitter dump resistors R6-R8 absorb part of the input power that would normally go to the failed amplifier.

Referring to the top amplifier Q2, Q3 the stage input impedance is matched to 100 ohms by the input transformer T3. Computer designed RCL networks R11 thru R20, C10, C12, C13 and L9, L10 establish the stage input impedance and, in conjunction with R34, R35 and feedback from output transformer T7, flatten the gain variation over the 1.6 to 30 MHz frequency range.

Each push-pull stage is biased separately. Temperature sensing diodes CR6, CR7 provide thermal feedback to the bias supply board for bias temperature tracking. Controls for quiescent (idling) current are provided on the bias supply board.

Output transformer T7 matches the stage output impedance to 100 ohms. The 48V collector bias is applied to the high current center tap formed by the shield conductors of the coaxial windings on T7. The balun transformer T5 converts the push-pull output to a 100 ohm unbalanced configuration suitable for driving the output combiner.

T2 combines the two 100 ohm amplifier outputs into a single 50 ohm module output which delivers a nominal output power of 300 watts. This output combiner has properties similar to the input splitter. Each amplifier output is presented a load impedance of 100 ohms, regardless of the condition of the other output. In the event that one amplifier is delivering more output power than the other, half of the power imbalance is dissipated in the combiner dump resistor R40, and the other half appears as additional module output power.

CR2 is a power PIN diode which shorts the module input to ground when certain fault conditions exist. This removes drive

from the power amplifiers during periods of uncertain loading. Normally, 40 volts of reverse bias is applied to the PIN diode thru R5. When Microprocessor A3A3U1 determines that a fault exists, it causes J3 pin 2 to go high, saturating the dump transistor Q1. Q1's collector pulls the cathode of CR2 low. CR2 is then forward biased by current from unregulated 5 volts thru R9, T4, and T1, shunting any input signals to ground.

Input and output BITE samples are developed in CR1, CR3 and associated circuitry. Frequency compensated resistive voltage dividers deliver RF samples to the diodes which develop a positive output voltage for the input BITE sample and a negative voltage for the output BITE sample.

Thermistor RT1 is mounted to the heatsink close to the PA transistors. The resistance of the thermistor is a positive function of heatsink temperature, rising from a nominal resistance of 100 ohms at room temperature to several thousand ohms at 85°C. This change in resistance is monitored by Microprocessor A3A3U1 and a temperature fault is generated when the resistance exceeds the preset threshold.

4.5 FILTER MODULE A5

Refer to Figure 5-12

The Filter Module consists of a fan cooled shielded enclosure, a mother board, eight plug-in filter assemblies, and a plug-in wattmeter assembly.

4.5.1 PLUG-IN FILTER MODULES A5A1 THRU A5A8

The band filters consists of three sections each, and cover a useful frequency span of one-half octave maximum. The bands are divided as follows: 1.6 to 2 MHz, 2 to 3 MHz, 3 to 4 MHz, 4 to 6 MHz, 6 to 9 MHz, 9 to 13.5 MHz, 13.5 to 20 MHz, and 20 to 30 MHz. Harmonic output from the filter modules is at least 75 db below PEP.

4.5.2 PLUG-IN WATTMETER MODULE A5A9

The Wattmeter Board consists of a directional wattmeter, which supplies signals proportional to forward and reflected power, the T/R relay and bypass relays, and a VHF filter. The T/R relay, K17 and K19, provides a straight bypass for the antenna to the transceiver when in receive mode, and inserts the power amplifier when transmitting in the 1 KW or 500W mode. This relay may be disabled by K18, the Bypass relay, which is controlled by Microprocessor A3A3U1. The Bypass relay is energized whenever the linear amplifier has been placed in bypass mode, either manually or by the microprocessor.

The directional wattmeter consists of current transformer T1 and associated components. A current sample of the rf is combined with a voltage sample (from C67 and C68) at CR5 to provide a voltage output proportional to forward rf power. This signal is processed on the Peripheral Board A3A2 and displayed on the front panel meter. Similarly, the reflected power is combined at CR4 to provide reflected power voltage data for meter display.

The VHF filter, consisting of C69-C72 and L29-L31, provides assurance that all harmonics over 30 MHz are adequately attenuated, regardless of the filter band chosen.

4.5.3 MOTHER BOARD ASSEMBLY A5A10

The Mother Board is attached to the enclosure and supplies all rf and control interconnect for the nine plug-in pc assemblies. The band switching relays, K1 thru K16, PA Output Power Monitor, and band line decoupling networks are a part of this assembly. Band switching relays located at either end of the selected filter direct the rf signal through the filter and out to the wattmeter board. All unused filters are terminated to prevent interaction with the active filter.

4.6 OUTPUT POWER COMBINER A6

Refter to Figure 5-13

The Output Power Combiner consists of transformers T1, T2, T3, T4 and T5 plus balancing resistors R9, R10, R11 and R12. Its purpose is to combine the outputs of the four rf modules, summing them to provide the required 1000 watts output. In normal operation, the balancing resistors dissipate a minimal amount of power to balance the outputs from the four modules. However, if a module is lost through failure or physical removal, the balancing resistors dissipate a portion of the output power supplied by the other three remaining active amplifiers to maintain network balance. If the three remaining amplifiers each supply 250 watts to the network, a total of 188 watts is dissipated in the balancing resistors, providing 562.5 watts output. As noted in paragraph 4.3.2.5, if a module is lost or removed, the amplifier automatically resets itself to an output level of 500 watts and continues to operate. The Output Power Combiner is located on the rear screen panel of the amplifier in the cooling airstream to transfer the dissipated power into the air and out of the SNR-2000.

4.7 INPUT POWER SPLITTER ASSEMBLY A7

Refer to Figure 5-14

The Input Power Splitter Assembly consists of transformers T1, T2, T3, T4 and T5 and balancing resistors R1, R2, R3 and R4. The purpose of this network is to divide the input power from the transceiver into four equal parts, providing isolation between each. Under normal operating conditions only a very small amount of power is dissipated by this network, to compensate for slight imbalances in rf module input characteristics. If an rf module input should short or open or a module be removed, the balancing resistor corresponding to that module will absorb excessive input power, maintaining balance and isolation among the three remaining operational rf modules.

4.8 FRONT PANEL A8

The Front Panel Assembly A8 contains the power ON/OFF circuit breaker A8CB1, the overtemperature fans A8B1 and A8B2, and the FAULT and POWER lamps.

4.9 REAR PANEL CONNECTOR ASSEMBLY A9

Refer to Figure 5-15

The Rear Panel Connector Assembly contains the power and control connectors and provides RF filtering on all power and control lines going into and out of the SNR-2000.

4.10 AUXILIARY POWER SUPPLY A10

Refer to Figure 5-16

The Auxiliary Power Supply is a conventional linear regulated supply designed to provide voltages required within the amplifier for relays (28VDC), rf power amplifier bias (unregulated 5VDC), and regulated voltage (5VDC) for all microprocessor circuitry. The power transformer not only supplies low voltage to the 28V and 5V regulators, but it supplies the AC voltage source for high speed and low speed blower operation. The 28VDC regulated supply consists of rectifier bridge CR2, CR3, CR4 and CR5, and regulator U1 with associated components. The 5VDC regulated supply consists of rectifier bridge CR6 and regulator U2 with its associated components. The unregulated 5VDC voltage is taken from the input to the regulator, switched through K2 and sent to each of the four rf amplifier modules for use in the bias supplies. Relay K2 is energized whenever the keyline is closed. Relay K3 prevents bias from being applied to the rf amplifier modules whenever the power amplifier is in the BYPASS mode. Relay K1 switches the blowers from low speed to high speed whenever the heatsink temperatures exceed a preset threshold as determined by Microprocessor A3A3U1.

4.11 CONTROL PANEL 1A2

Refer to Figures 5-17, 5-18, 5-19, 5-20

The Control Panel 1A2 is mounted in the space provided on the transceiver/-exciter front panel. The panel provides the user with remote operation of the SNR-2000. Control panels configured with an ON/OFF switch, allow operators to turn off the SNR-2000 without turning off the transceiver/exciter. The meter provides the operator with approximate values of forward or reflected power. Also provided are three lamps, FAULT, TUNING and READY. These lamps enable the operator to monitor the operational status of the SNR-2000 and an antenna coupler if used. A PUSH TO TUNE button is provided for use when the SNR-2000 is operating with a 1 KW antenna coupler.

8066410034A

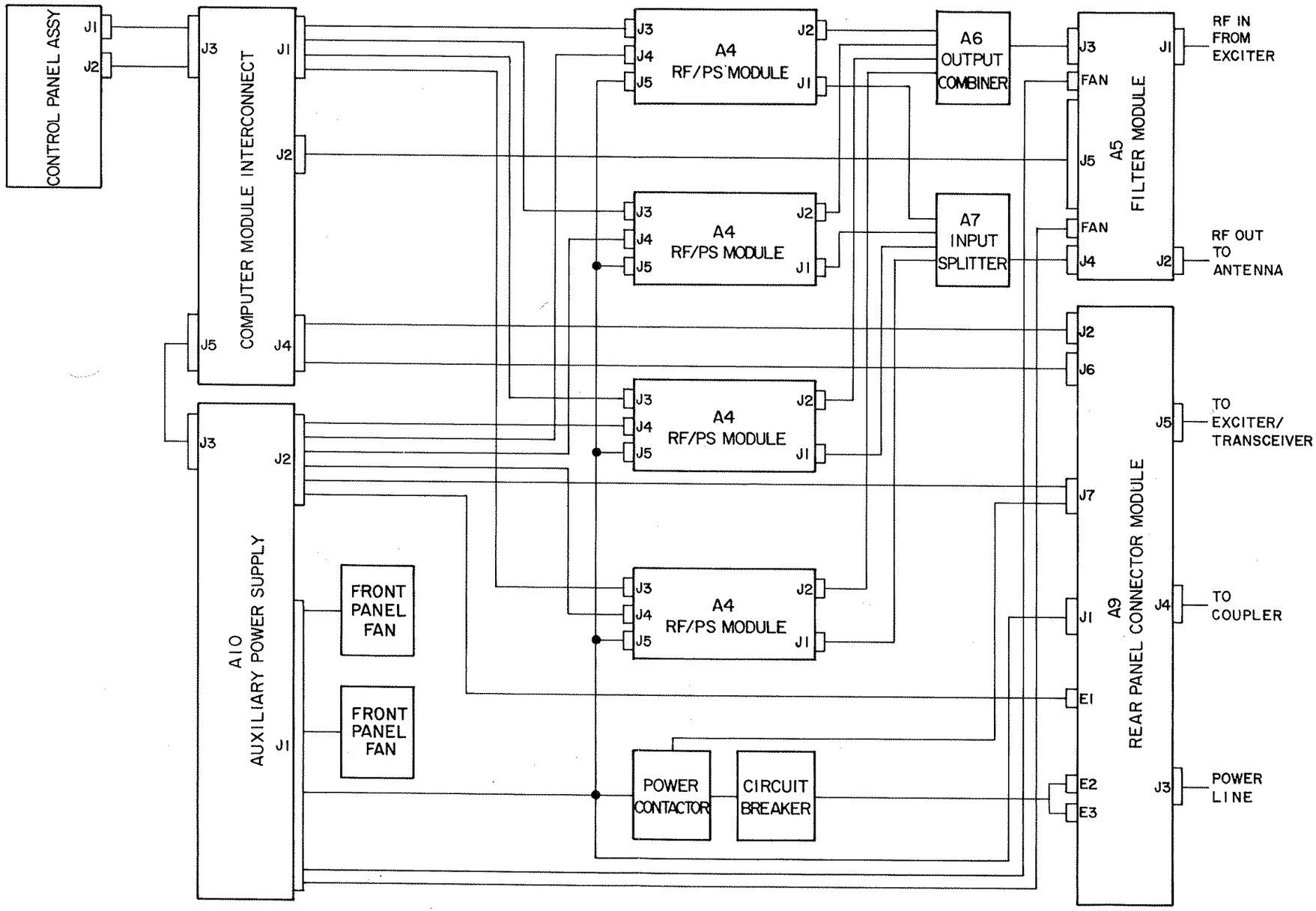


FIGURE 4-1 SNR-2000 OVERALL BLOCK DIAGRAM

8066082568A

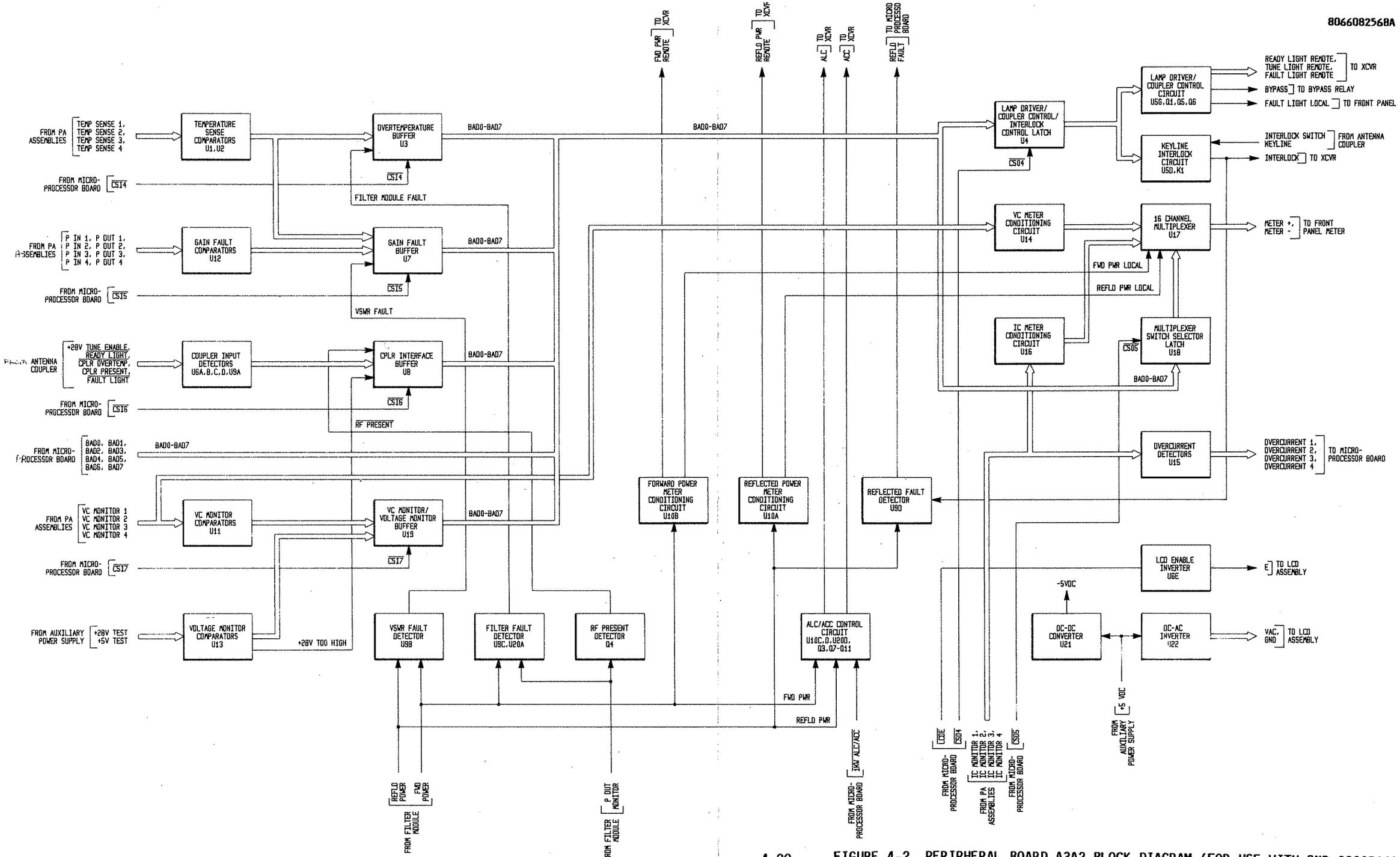


FIGURE 4-2 PERIPHERAL BOARD A3A2 BLOCK DIAGRAM (FOR USE WITH SNR-2000DAC)

8066083068A

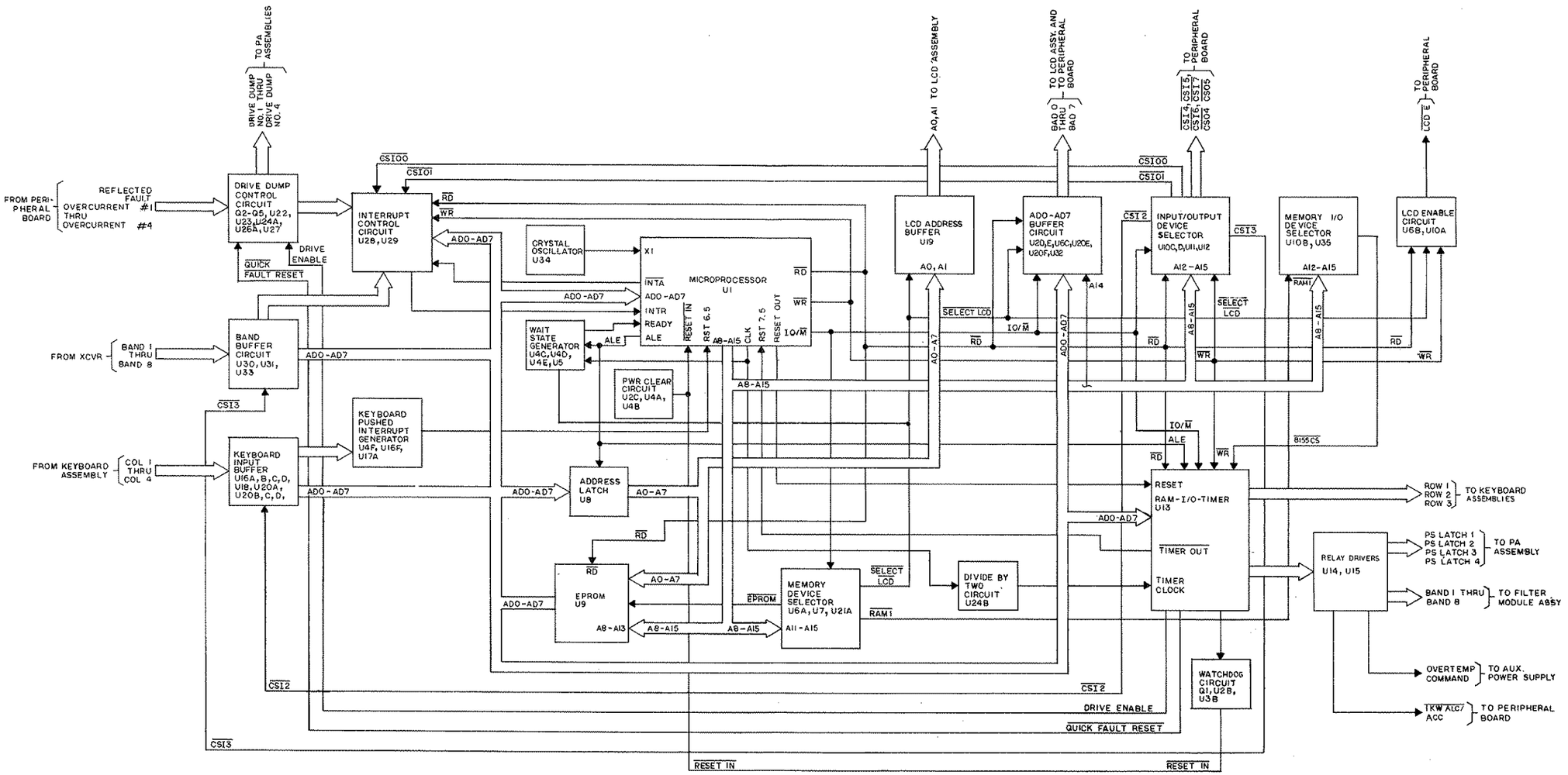


FIGURE 4-3 MICROPROCESSOR BOARD A3A3 BLOCK DIAGRAM

8066416032A

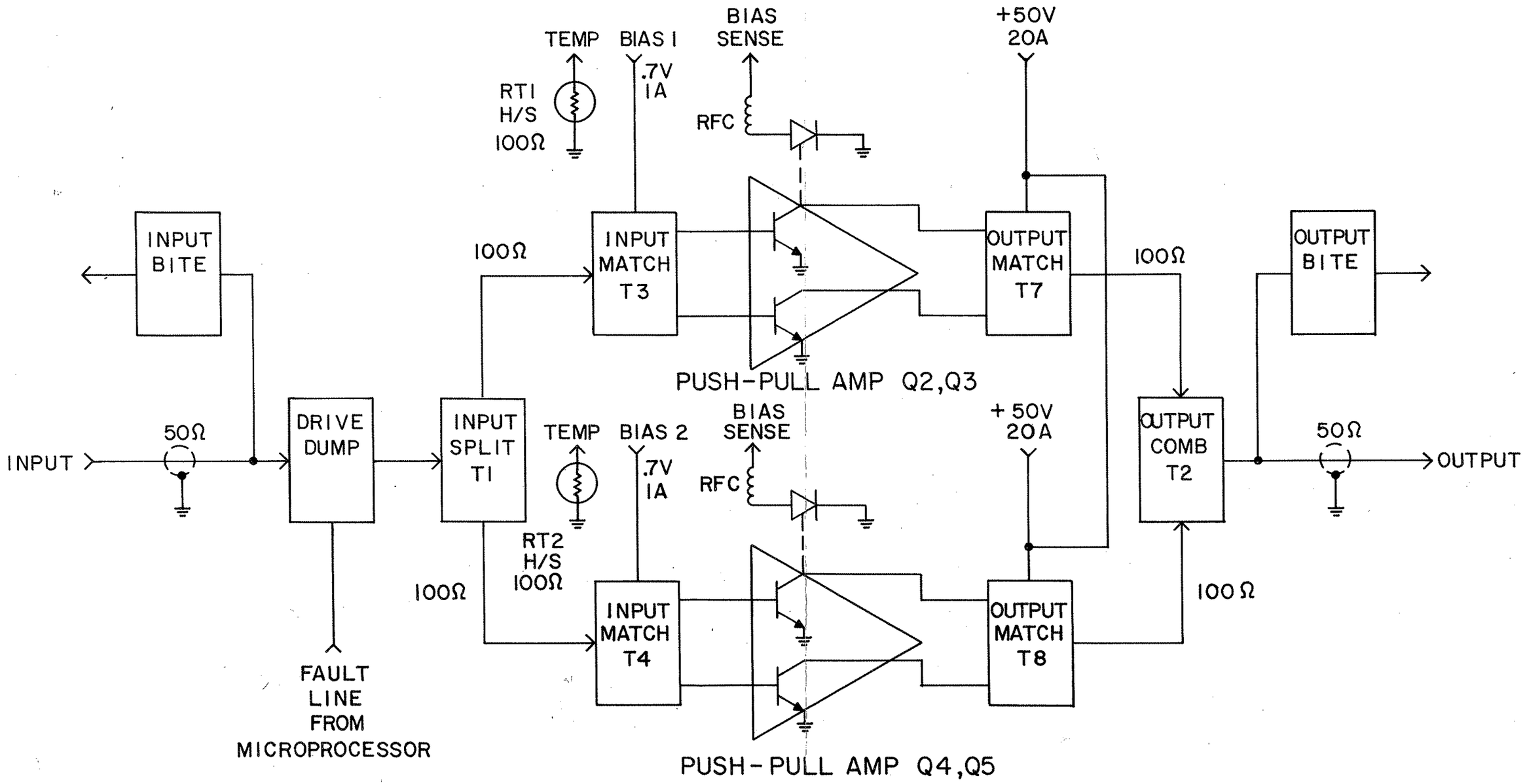


FIGURE 4-4 POWER AMPLIFIER ASSEMBLY A4A3 BLOCK DIAGRAM

SECTION V

MAINTENANCE AND REPAIR

WARNING

115/230 VAC APPEARS ON CIRCUIT BREAKER AND CONNECTOR STRIP. 115/230 VAC APPEARS ON 48V POWER SUPPLY TERMINAL STRIP.

NOTE

All Figures applicable to Section V appear following paragraph 5.5.6.

5.1 PREVENTIVE MAINTENANCE

In the normal service life of any piece of equipment, faults and breakdowns will develop. In order that the necessary repairs may be carried out in a reasonably short time, a logical testing routine must be followed. The maintenance technician should familiarize himself/herself with the circuitry and the physical layout of the equipment prior to the occurrence of trouble. Refer to Figure 5-1 for major assembly locations.

When repairs are necessary, it is recommended that this servicing be done whenever possible by competent technicians, supplied with suitable tools and test equipment.

5.1.1 PERIODIC INSPECTIONS

The SNR-2000 design calls for periodic cleaning of the air filter on the front panel assembly. Remove the air filter and clean by vacuuming or forced air. The air filter should be periodically cleaned with soap and fresh water (air filter must be completely dry before reinstallation). **DO NOT USE ANY FORM OF PETROLEUM BASED FLUID FOR CLEANING OF THE AIR FILTER.** Inspect and clean the air filter a minimum of every three (3) months when the SNR-2000 is installed in a controlled environment. Unusually severe environmental conditions will require more frequent inspections. NOTE: In the case of SNR-2000 faults due to over temperature, always insure that the air filter is clean before progressing with further repair.

No lubrication of any kind is required in the SNR-2000.

5.2 CORRECTIVE MAINTENANCE

5.2.1 TEST EQUIPMENT REQUIRED

The following list of equipment or their equivalent is required to perform the specified tests in this section.

a) Transceiver/Exciter

b) SNR-2000/GCU-1935 Interface Box, Sunair p/n 8066200099 (if required)

c) Wattmeter, Bird Thruline Model 43, Qty. 2

d) Coaxial Dummy Load, 2500 Watt, Bird No. 8890-300, Qty. 2

e) R.F. VTVM, HP-410C, Qty. 1

f) Coaxial Tee, HP-11042A, Qty. 1

g) Multimeter, Simpson 260, Qty. 1

h) Oscilloscope, Tektronix No. 465B, Qty. 1

i) Wattmeter Elements, 1000W and 100W

j) Audio Oscillator, HP-200CD

k) Artificial Antenna

l) Audio Injection Test Cable, see Figure 5-3

5.2.2 CONNECTORS AND CABLES REQUIRED

a) 0754690008, Connector, Power, 37 Pin Round (to transceiver, 1A8J4)

b) Connector Kit, Sunair p/n 8066000294 (see paragraph 1.4 for contents)

c) 0579240002, Cable, 37 Cond.

d) Power Cable Assembly, Sunair p/n 8066002297

e) Miscellaneous coaxial cables:
RG-58A/U for Input
RG-8A/U for Output

f) SNR-2000/GCU-1935 Interface Box Cables (if required), Sunair p/n:
6029003003
8066202296

5.2.3 PRIMARY POWER INPUT

Primary power should be supplied through a switch box with either fuses or circuit breaker protection. It should be capable of supplying 230 VAC at 30 amps or 115 VAC at 60 amps. **INSURE PROPER VOLTAGE CUSTOMIZING BEFORE APPLYING POWER. SEE FIGURES 2-9 AND 2-10.**

5.2.4 TEST CONDITIONS

Set up SNR-2000 and required test equipment as shown in Figure 5-2 or Figure 5-3.

5.3 ALIGNMENT PROCEDURES

The SNR-2000 is tested and aligned at the factory before shipment. The following alignment procedures should be used only by a competent technician after repair has been accomplished to the unit. If the SNR-2000 is to be utilized with an exciter other than the one it was orginally aligned to, it may be necessary to reset the power levels. If during the alignment procedures a failure occurs, refer to the Fault Isolation procedure applicable to the failure.

These alignment procedures must be followed in their entirety to be assured of the correct alignment of the SNR-2000.

5.3.1 PRELIMINARY

a) Connect SNR-2000 to exciter at CONTROL CABLE J5 and appropriate power source at AC POWER J3. Be sure exciter is OFF.

b) Install interlock jumper connector p/n 8066007094 at ANTENNA COUPLER J4.

c) Remove top cover of SNR-2000. On Peripheral Board A3A2, set R28 and R56 fully CW.

d) Set potentiometers R32, R33, R42, R43, R59, R61, R164 on the Peripheral Board A3A2 fully CCW.

e) Connect coaxial cables to RF OUTPUT J1 and RF INPUT J2 of SNR-2000.

5.3.2 POWER UP

a) Set circuit breaker on SNR-2000 to ON.

b) Set MODE switch on exciter to LSB. On Control Panels with ON/OFF switch, turn SNR-2000 on.

c) The lamps on the control panel should flash momentarily and the green READY lamp should illuminate. The green POWER lamp on the SNR-2000 front panel should illuminate. The three power supply LED's on Microprocessor Board A3A3 should illuminate.

d) On Peripheral Board A3A2 adjust R164 until the LCD Assembly A2A2 has its best contrast. The display should read: "KW SYSTEM OPERATIONAL METER: FWD PWR LVL: 1 KW". The SNR-2000 front panel meter should read zero.

5.3.3 KEYBOARD

a) Press pushbuttons IC_1 thru IC_4 in sequence. The display should change

to show that the meter indicates the function selected. The meter should continue to read zero.

b) Press pushbuttons VC_1 thru VC_4 in sequence. The display should change to show that the meter indicates the function selected. The meter should indicate 48V.

c) Press the REFLD pushbutton. The display should change to show that the meter indicates REFLD. The meter should read zero.

d) Press the FWD pushbutton. The display should show that the meter indicates FWD. The meter should read zero.

e) Depress the PWR LVL pushbutton. The display should show a power level of 500 Watts. Depress PWR LVL again. The display should show power level of 100 Watts. Depress PWR LVL again. The display should show 500 Watts. Depress PWL LVL again. The display should show 1000 Watts.

5.3.4 NO BAND FAULT CHECK

a) Set the exciter frequency to 0.0000 MHz. The display should indicate "Fault: NO BANDS" and "BYPASS". The fault lamps on the SNR-2000 and the exciter control panel should be flashing.

b) Set the exciter to 1.6000 MHz. The display should indicate "BAND FAULT CLEARED" for approximately three (3) seconds and then recover to operational status.

5.3.5 POWER ADJUSTMENT

a) Set the exciter MODE switch to CW and depress the CW KEY. On Peripheral Board A3A2 adjust R32 until the HP-410C voltmeter indicates 223 VRMS.

b) While holding the CW KEY down, adjust R61 on the Peripheral Board A3A2 until the SNR-2000 panel meter indicates 1000 watts. On the keyboard depress the REFLD key, which causes the front panel meter to indicate reflected power. On the RF Wattmeter Assembly A5A9 in the Filter Module A5, adjust C62 for minimum indication on the panel meter. On the keyboard, depress the FWD key. Set the exciter to 29.9999 MHz. Depress the CW key, and adjust C68 for maximum indication on panel meter.

c) Select the following frequencies individually on the exciter and observe that the CW power remains within limits of 900 to 1100 watts on each frequency as displayed on the front panel meter.

1.9999 MHz
2.0000 MHz
2.9999 MHz
3.0000 MHz
3.9999 MHz
4.0000 MHz
5.9999 MHz
6.0000 MHz
8.9999 MHz
9.0000 MHz
13.4999 MHz
13.5000 MHz
19.5999 MHz
20.5000 MHz
29.9999 MHz

d) With exciter frequency at 29.9999 MHz, depress CW Key. Select meter function IC_1 thru IC_4 in turn. Observe panel meter and note that IC is not more than 18 amperes. Return meter function to FWD.

5.3.6 500 WATT ADJUSTMENT

a) Set exciter to 1.6000 MHz.

b) Depress PWR LVL pushbutton to select 500 watt power level. Depress CW KEY. On Peripheral Board A3A2 adjust R33 until HP-410C indicates 158 VRMS.

5.3.7 AM POWER

a) Depress PWR LVL pushbutton until 1000 watt power level is selected. Set exciter MODE to AM and depress microphone PTT button.

b) On Peripheral Board A3A2 adjust R42 until HP-410C indicates 141 VRMS.

c) Depress PWR LVL pushbutton to select 500 watt power level. On Peripheral Board A3A2 adjust R43 until HP-410C indicates 100 VRMS. Release PTT button.

5.3.8 VSWR ADJUSTMENT

a) Reverse the SNR-2000 RF INPUT (J2) and RF OUTPUT (J1) cables on rear of unit. Depress PWR LVL pushbutton until 100 watt power level is selected. Depress REFL pusbutton.

b) Set exciter MODE to CW. Depress CW KEY and adjust R59 on the Peripheral Board for a meter reading of 100 watts.

c) Return RF INPUT and RF OUTPUT cables to proper "J" connector. Connect second Bird 2500 watt dummy load in parallel with SNR-2000 load.

d) Connect audio oscillator (set at 1000 Hz) to MIC input through the Audio Injection Test Cable (see Figure 5-3). Key Test Cable and increase audio level into exciter until HP-410C indicates 125 VRMS. On Peripheral Board adjust R28 until HP-410C indicates 94 VRMS.

e) On Peripheral Board A3A2 adjust R56 CCW until the FAULT lamp illuminates and the display indicates "VSWR FAULT @ 500 WATTS". Reduce the audio level to zero.

f) Set the exciter MODE to OFF.

END OF ALIGNMENT PROCEDURES

5.4 FAULT MESSAGES

Failures in the SNR-2000 cause fault messages to be displayed on the LCD Display A2A2. These messages direct attention to the areas in which failures have occurred. If more than one fault occurs, the message "Fault: MULTIPLE.. PRESS *" will be displayed. When this happens, depress the asterisk (*) pushbutton on the keyboard to display the fault messages. A different fault message will be displayed each time the button is depressed, until all fault messages which describe existing malfunctions have been displayed.

Table 5.1 defines the fault messages and indicates the areas in which the problems are most likely to be found. The messages with which the symbol "#" appears, followed by a number, indicate either a particular RF/PS Module A4 (1 through 4) or Filter Band (1 through 8). For the purpose of discussion, the letter **X** will be used in place of any one specific number.

5.5 FAULT ISOLATION PROCEDURES

5.5.1 RF/PS MODULE A4

The RF/PS Module is a self-contained module consisting of the Module Control Assembly A4A1, the 48VDC Power Supply A4A2, and the Power Amplifier Assembly A4A3. The RF/PS Module may be removed as a whole and bench tested, or tests may be performed in the SNR-2000, provided the faults do not activate the SNR-2000 protection circuits. If the RF/PS Module is removed for testing, forced air cooling of the Power Amplifier and 48 VDC Power Supply **MUST** be provided. Failure to provide this cooling may result in failure of the power transistors.

5.5.1.1 Diagnostic Procedure

a. Connect AC power of proper voltage (115 or 230 VAC) and frequency to A4A1J5 pins 1 and 2.

b. Connect +28VDC to A4A1J4 pin 2, with power supply negative to ground.

c. Connect +12VDC between A4J1 pin 1 (positive) and A4A1J4 pin 3 (negative).

d. Connect A4A3J2 through a Bird Thru-Line Wattmeter to a 50 ohm coaxial resistor of at least 500 watt power capacity.

e. Utilize Table 5.2 to perform testing.

5.5.2 PERIPHERAL BOARD A3A2.

See Table 5.3

5.5.3 FILTER MODULE A5

5.5.3.1 Fault, All Bands

If a Fault exists in all bands, proceed as follows:

a. Remove exciter and antenna connections from rear panel.

b. With exciter unkeyed, measure for continuity between exciter and antenna connectors.

   If no continuity is indicated, check A5K17 and A5K19 contacts and check for open connections on the RF Wattmeter Assembly A5A9.

c. If continuity exists, measure resistance from antenna connector J1 to ground. The resistance should be high.

   If a short circuit is indicated check capacitors A5A9C69, C70, C71, C72 for shorted components. Check for bridging of the RF circuit. Check for internal shorts in A5K17 and A5K19.

d. Remove connections from A5J3 and A5J4 on the front of the A5 module.

e. Select 500W or 1KW power level and key exciter.

f. Check for continuity between A5J3 and A5J2 of the A5 module.

   If no continuity exists, check circuits and coax between A5A10E21A and A5A10J22 pin T, U, 16, and 17 and connection between A5J3 and A5A10E9.

g. If continuity exists, check for short circuit from antenna connection to ground.

h. If all measurements fail to indicate a defect, turn power off, and remove RF Wattmeter Assembly A5A9 and inspect for burned or discolored components.

i. If still no defect appears, the antenna system may be at fault. Refer to technical manuals for the antenna coupler and antenna system.

5.5.3.2 Fault, One Band

a. Remove connections from A5J3 and A5J2. Select 500W or 1 KW power level.

b. Select defective band in exciter and key exciter.

c. Measure for continuity between A5J2 and A5J3.

   If no continuity is measured, check appropriate relays A5A10K1 thru K8 and A5A10K9 thru K16.

   Check for open circuits on the filter for the defective band.

d. If continuity exists, measure for short circuit to ground.

   If a short circuit exists, check capacitors on defective band module.

e. Examine the defective band module for burned or discolored components and replace as necessary.

5.5.4 OUTPUT COMBINER A6

Using Figure 5-13 and a multimeter, check for opens and shorts on the Output Com-

biner. Check for visual damage and continuity through the coaxial cables. **OPTION:** If a vector impedance meter is available for troubleshooting use, refer to the following as a means of board check out. Faults in the Output Combiner will show up as an improper impedance into one or more connectors when the others are properly terminated. If any four of the five connections are terminated with 50 ohm load resistors, the impedance measured at the remaining connector should be 52 ≠ 8 ohms with a phase angle of ≠ 10 degrees. This impedance should be measured at a frequency of 10.0 MHz. Impedance will be measured with a vector impedance meter displaying magnitude and phase angle of the impedance. Variations in impedance will be caused by open or shorted coaxial cables or balancing resistors.

5.5.5 INPUT SPLITTER A7

Comments applying to the Output Combiner A6 also apply to the Input Splitter as these devices are identical except for power handling capability.

5.5.6 MICROPROCESSOR BOARD A3A3

Because of the transient nature of signals existing on this board, troubleshooting requires test equipment which is unduly expensive to have in a field service facility. In addition, a particular knowledge of the software is required. For these reasons, it is recommended that if fault is found to be this board, the board must be removed and replaced with a known good board. Repair of this board must be accomplished at depot or factory level.

5.6 DISASSEMBLY INSTRUCTIONS

a) TOP COVER: Loosen 2 zeus screws.

b) BOTTOM COVER: Loosen 2 zeus screws.

c) FILTER MODULE COVER: Loosen 4 zeus screws, lift out and up.

d) FILTER MODULE A5: With unit upright, remove A3A2 and A3A3 assemblies by pulling straight up, one at a time. Disconnect ribbon cable at J5. Disconnect 2 RF connectors at J3 and J4. Disconnect 2 fan connectors. Loosen 4 zeus screws. Lift out and up.

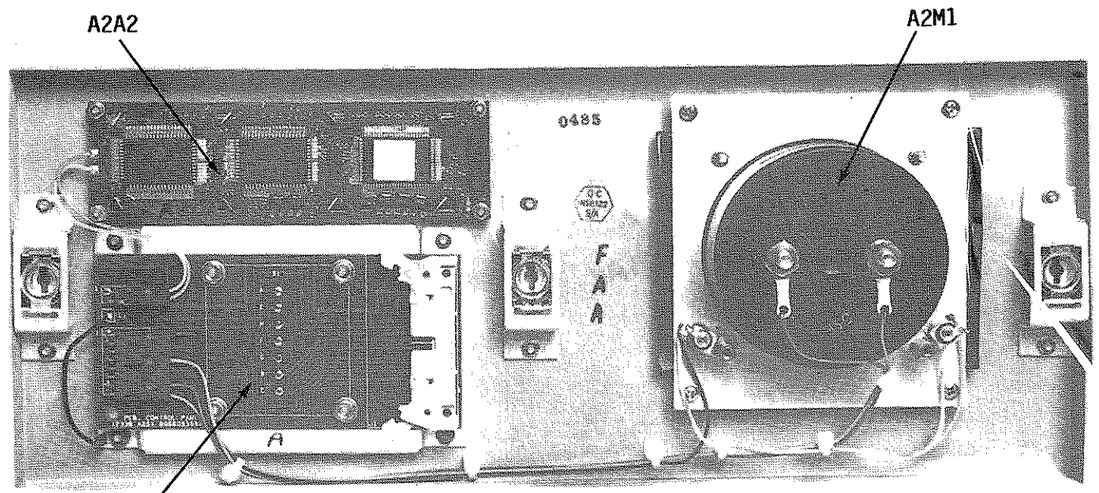
e) RF/PS MODULE A4: With unit upright, disconnect 3 power and control connectors at J3, J4 and J5. Loosen 2 zeus screws. Lift up and out to remove 2 RF connectors at J1 and J2 on bottom of module. (NOTE: Removal is easiest if center module is removed first before removing end modules. Modules are numbered 1 thru 4 with number 1 being the module to the left when facing the front of the unit. Also, RF cables are interchangeable between modules.)

f) POWER AMPLIFIER ASSEMBLY A4A3: To remove the A4A3 from the A4 Module, remove 2 crimp connectors at P1, P2, ribbon cable at P3 and 2 screws. To open power supply loosen 2 zeus screws.

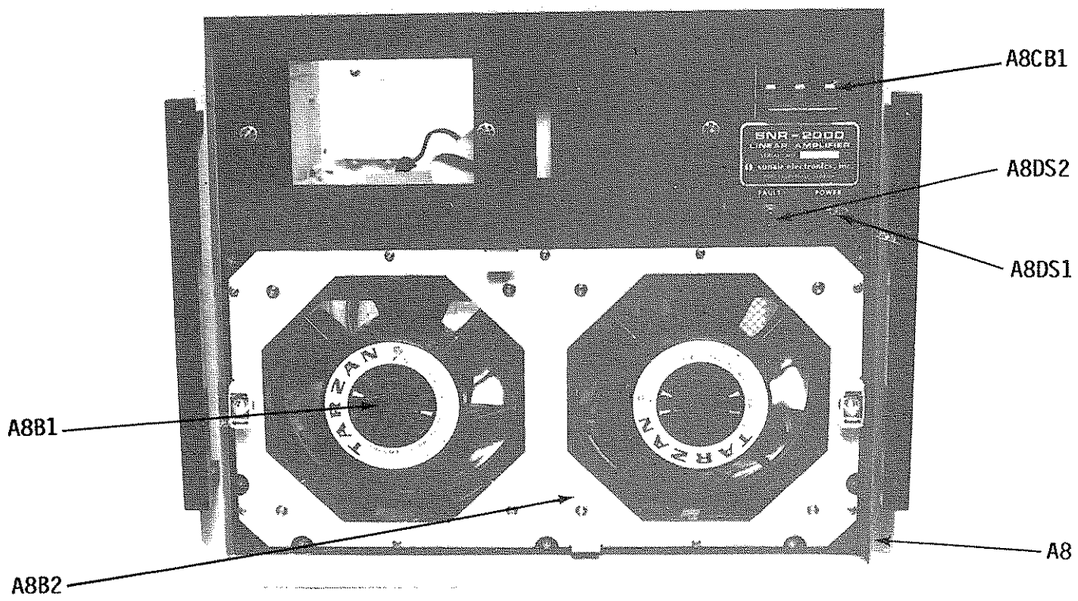
g) AUXILIARY POWER SUPPLY A10: With unit upright, remove the A3A2 and A3A3 assemblies. Remove 3 screws. Lift up and out. Remove 2 connectors at J1 and J2.

h) CONTROL PANEL MODULE A2: With unit upright, remove the A3A2, A3A3 and A5 assemblies. Loosen 3 zeus screws inside front panel. Pull module free from front panel. Remove ribbon cables at J1 and J2.

i) FRONT PANEL AIR FILTER: Loosen 2 zeus fasteners, filter will fall free. See paragraph 5.1.1 for cleaning instructions.

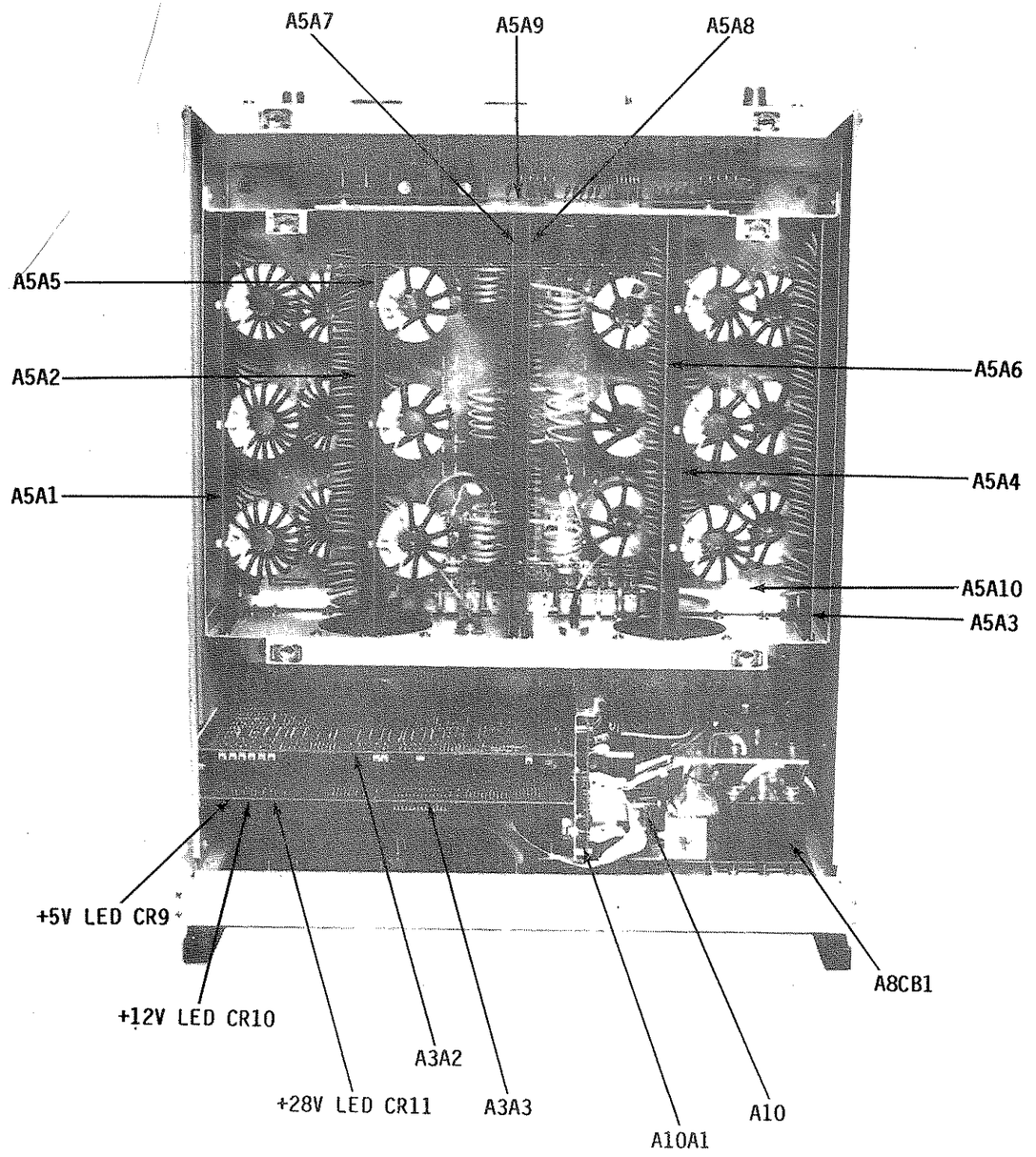


CONTROL PANEL MODULE A2

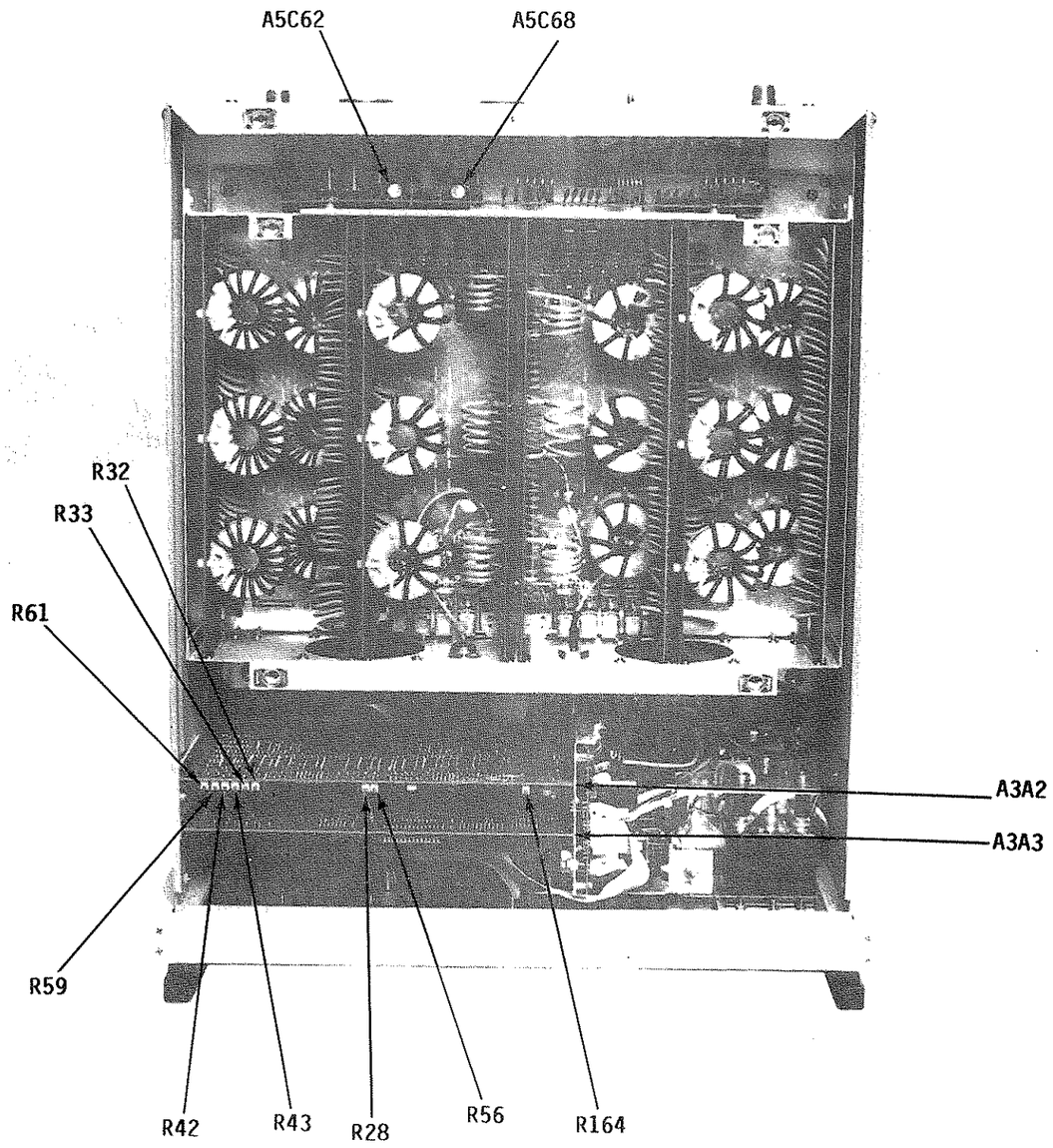


FRONT PANEL WITH CONTROL PANEL MODULE A2 AND FILTER MODULE REMOVED

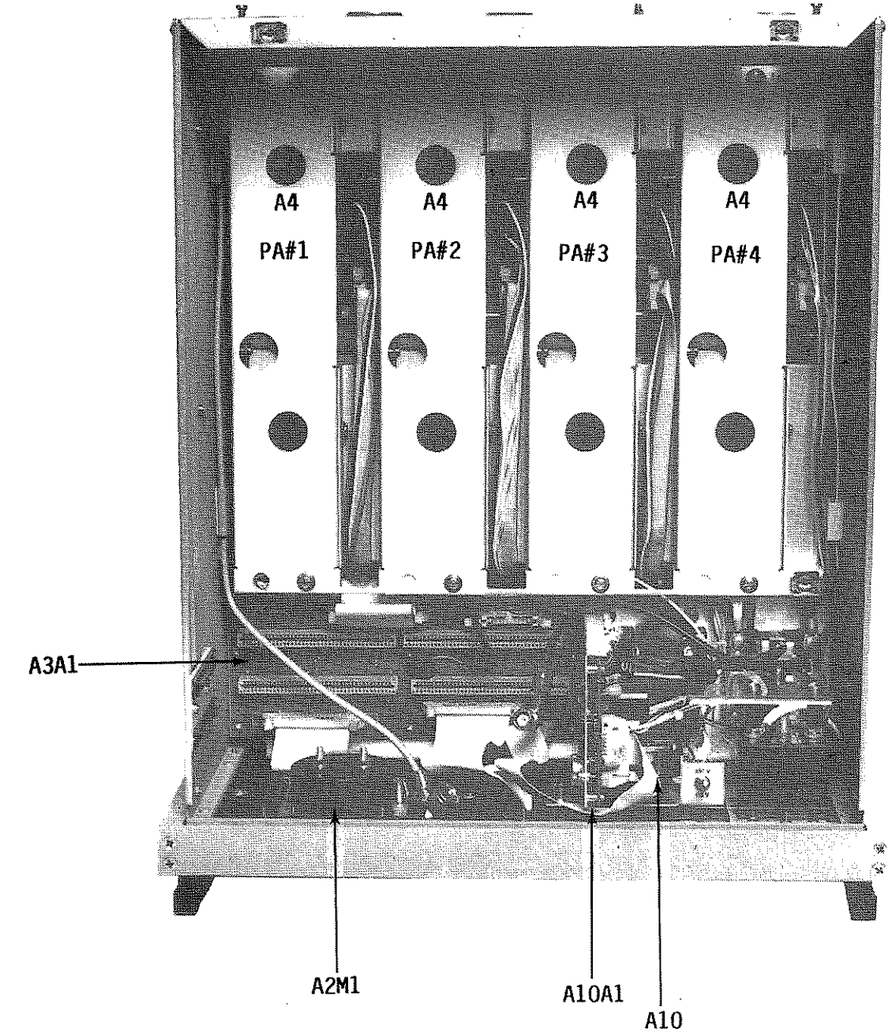
FIGURE 5-1 MAJOR ASSEMBLY LOCATIONS
SHEET 1



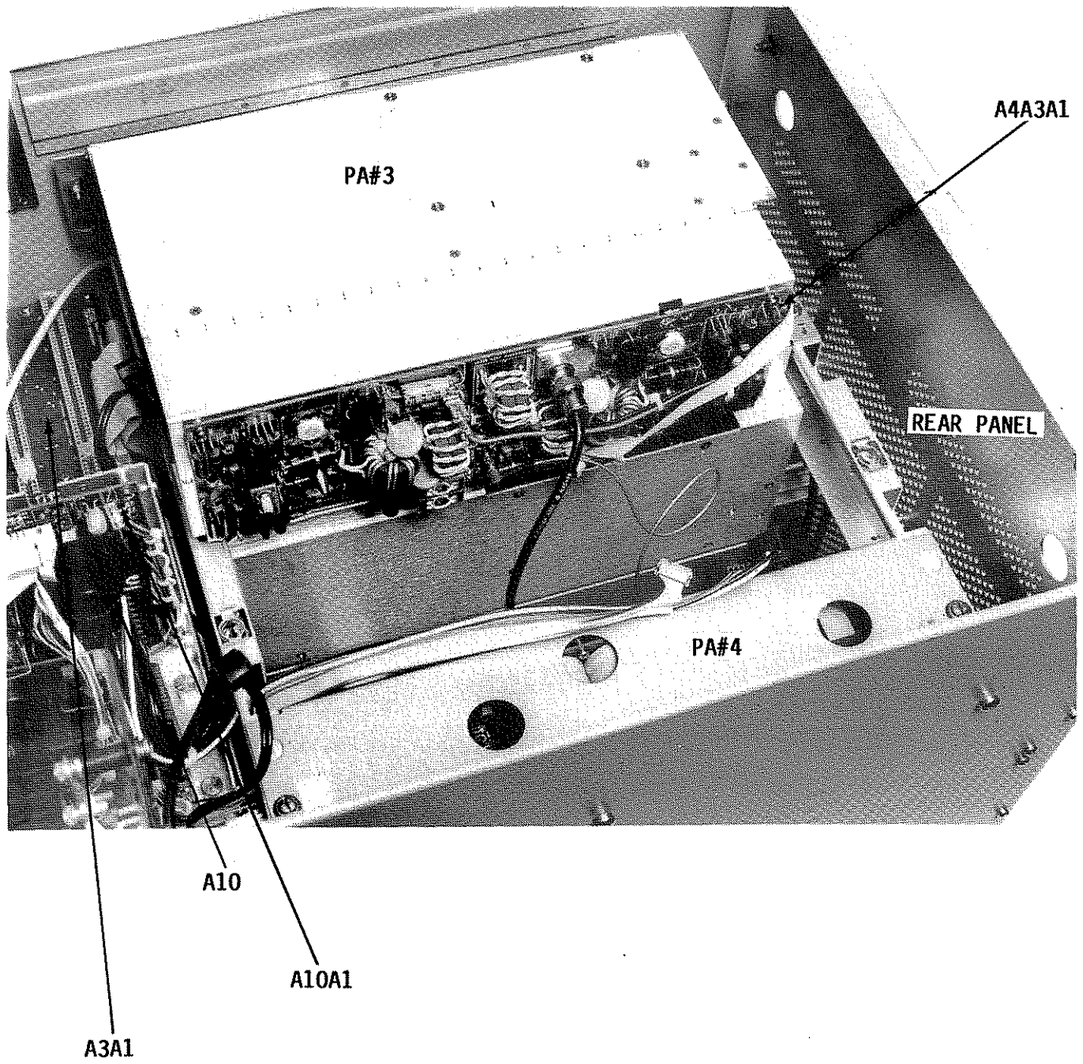
TOP COVERS REMOVED WITH PERIPHERAL BOARD P/N 8066082096
FIGURE 5-1 SHEET 2



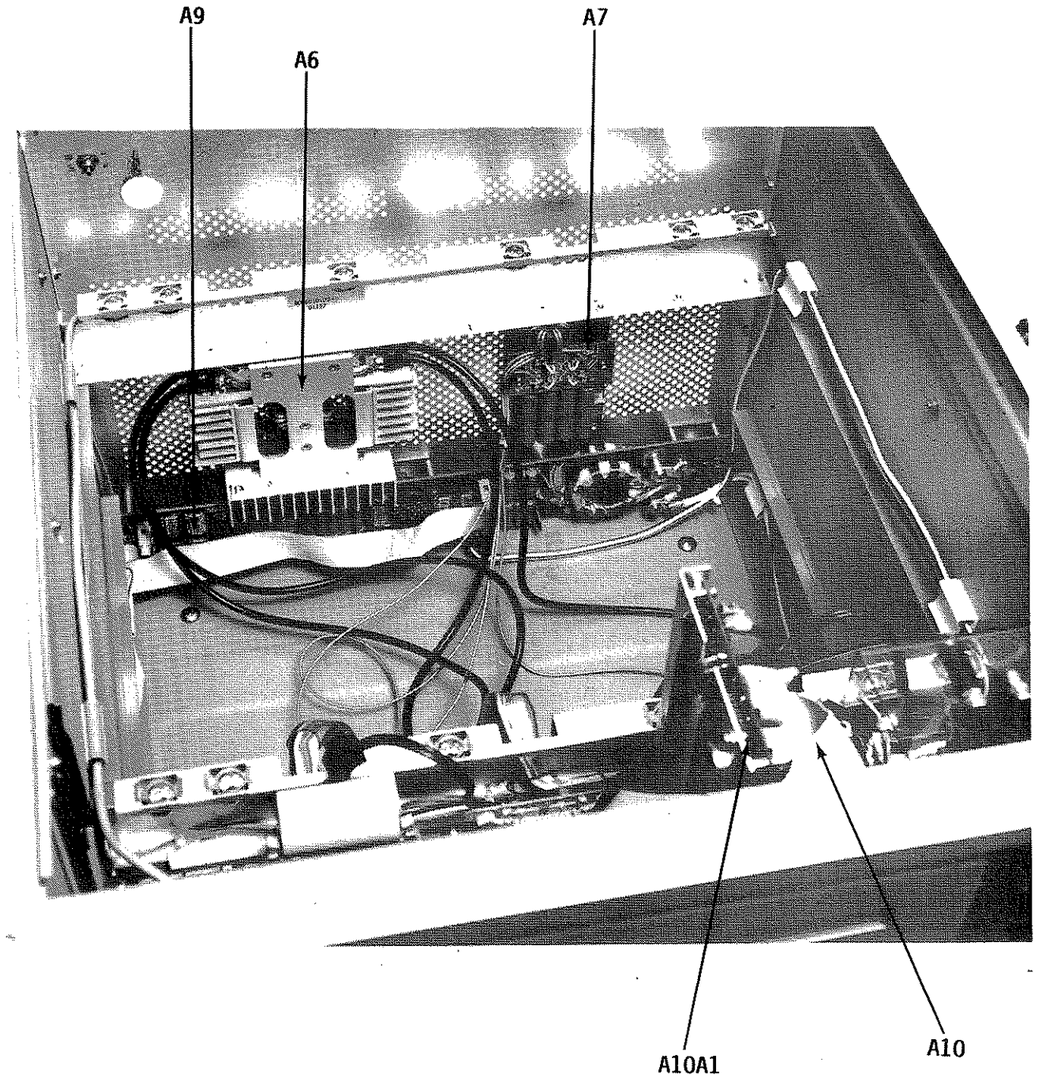
TOP COVERS REMOVED WITH PERIPHERAL BOARD P/N 8066082096
FIGURE 5-1 SHEET 3



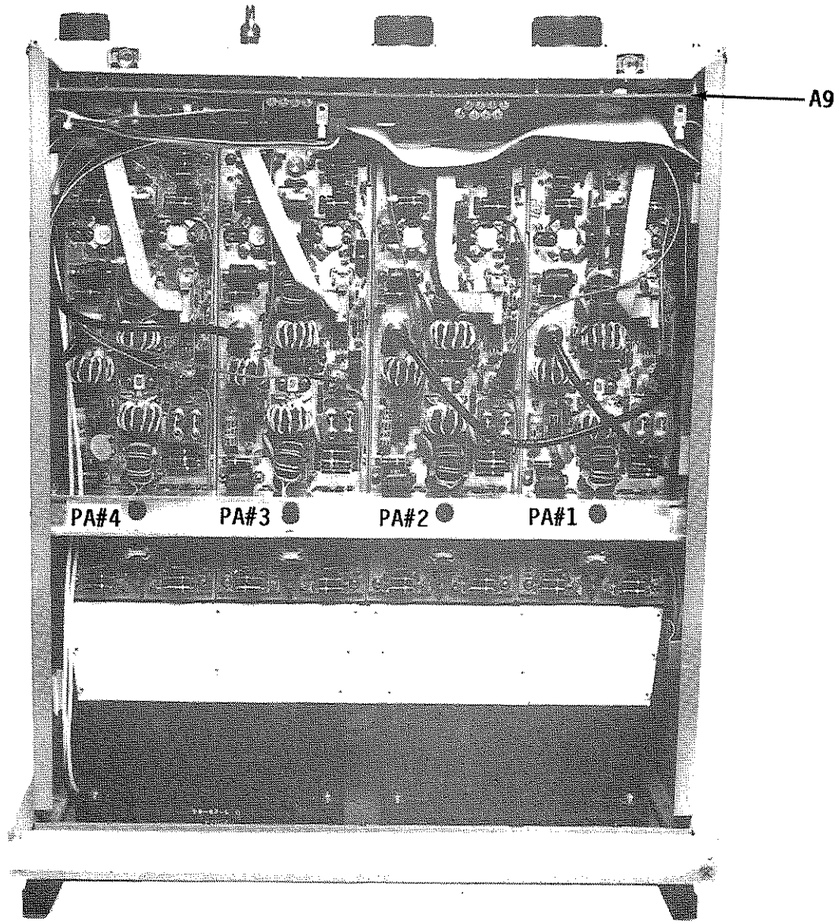
TOP VIEW WITH A3A2, A3A3, A5 REMOVED
FIGURE 5-1 SHEET 4



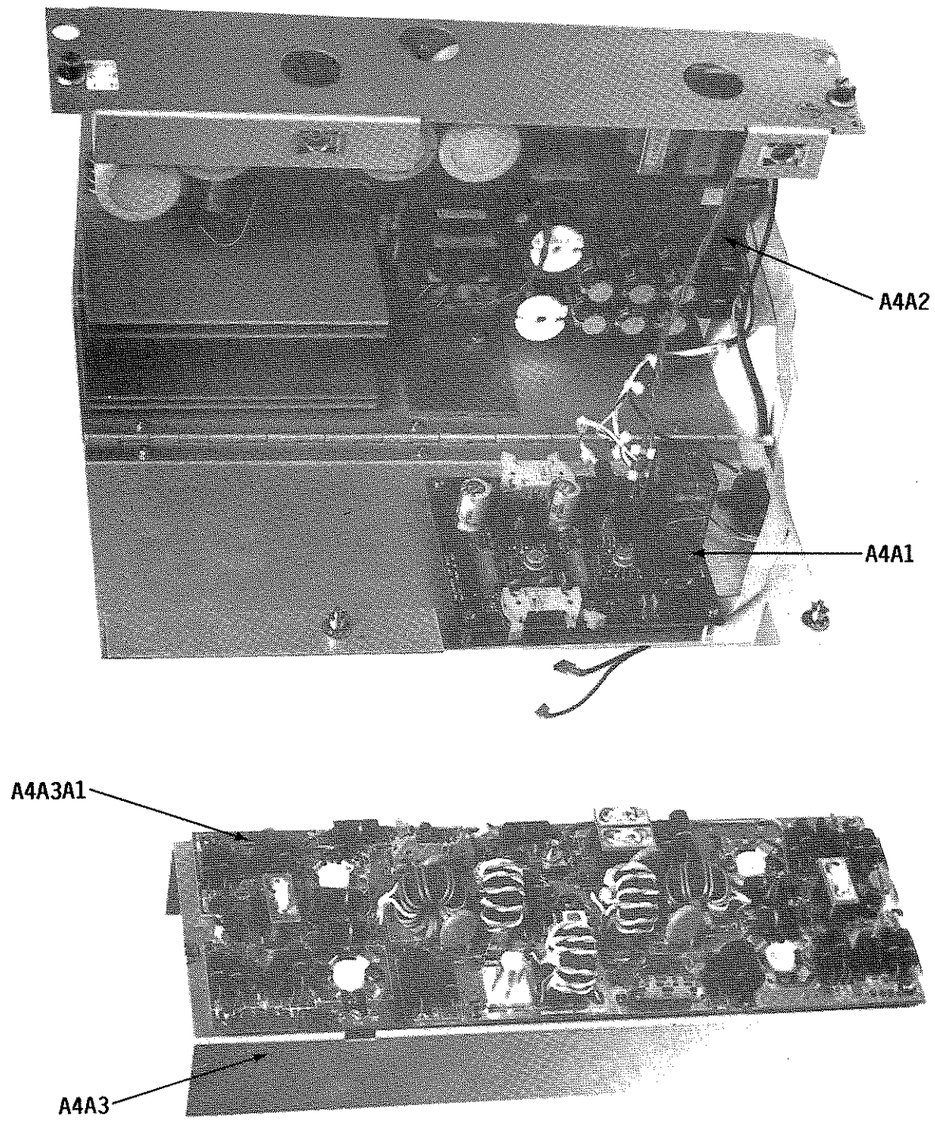
TOP VIEW WITH A3A2, A3A3, A5 REMOVED AND A4#3 PULLED OUT
FIGURE 5-1 SHEET 5



TOP VIEW WITH A3A2, A3A3, A5, A4 (4 each) REMOVED
FIGURE 5-1 SHEET 6



BOTTOM COVER REMOVED
FIGURE 5-1 SHEET 7



RF/PS MODULE A4
FIGURE 5-1 SHEET 8

TABLE 5.1 FAULT MESSAGES

1. **"Fault: PA#X GAIN LOW"**

This indicates that the gain of this RF/PS Module A4 has decreased more than 3 db.

a) Remove bottom cover from SNR-2000 and interchange output coax connections between the defective A4 Module and another A4 Module which is operating.

b) Reset SNR-2000 controls and attempt to transmit.

c) Note the fault message displayed. If this message shows the same A4 Module to be defective, then the trouble lies in this A4 Module. Follow the RF/PS Module A4 fault isolation procedure, paragraph 5.5.1 to locate the fault. If no fault is found, follow the Peripheral Board A3A2 fault isolation procedure, paragraph 5.5.2.

d) If the fault message cites the A4 with which the output connection has been interchanged, then the trouble lies with the output combiner. Follow the Combiner Assembly A6 fault isolation procedure, paragraph 5.5.4.

2. **"Fault: VC#X LOW"**

This indicates that the output voltage from this 48V Power Supply A4A2 is low or missing.

a) Remove SNR-2000 bottom cover and disconnect +48 Volts input from the indicated A4 Module.

b) Reset SNR-2000 controls and observe LCD Display.

c) If fault message is not displayed, then the trouble lies in the A4 Module. Follow the RF/PS Module A4 fault isolation procedure, paragraph 5.5.1.

d) If fault message is still displayed, follow 48V Power Supply A4A2 fault isolation procedure in Table 5.2. If no fault is found, follow Peripheral Board A3A2 fault isolation procedure, paragraph 5.5.2.

3. **"Fault: PA#X OVERTEMP"**

This message indicates that the temperature of this A4 Module has exceeded its limit.

a) Remove and clean or replace the front panel air filter.

b) Check fans for operation and freedom from obstruction.

c) Insure that the fans change to HI SPEED operation before temperature limit occurs.

d) Check air passages for freedom from obstruction.

e) If no fault is found, follow Peripheral Board A3A2 fault isolation procedure, in paragraph 5.5.2.

f) If Peripheral Board is operational, check thermistor on this A4 Module.

4. **"Fault: HIGH VSWR @ 1 KW"**

This indicates a fault in the coupler or antenna system or transmission line. Refer to antenna coupler manual. If a coupler is not installed, follow general maintenance and troubleshooting procedures for the antenna system.

5. **"Fault: TIMEOUT"**

This indicates that the antenna coupler failed to tune. Reset SNR-2000 and attempt retuning. If fault is repeated, refer to antenna coupler manual.

6. **"Fault: COUPLER UNTUNED"**

This message appears when the SNR-2000 is turned on, if an antenna coupler is connected to the SNR-2000. Initiate an antenna coupler tune cycle.

7. **"Fault: IC#X HIGH"**

This message indicates that the Power Supply current drain on this A4 Module has exceeded 17.5 amperes.

a) Remove SNR-2000 bottom cover and interchange output coax connections between the affected A4 Module and an operational module.

b) Reset SNR-2000 controls and attempt to transmit.

c) If the same A4 Module faults, then the trouble lies in the A4 Module. Follow the RF/PS Module A4 fault isolation procedure, paragraph 5.5.1. If no fault is found on the RF/PS Module A4, follow the Peripheral Board A3A2 fault isolation procedure, paragraph 5.5.2.

d) If fault occurs in PA with which outputs have been interchanged, follow Combiner Assembly A6 fault isolation procedure, paragraph 5.5.4.

8. **"Fault: TUNE FAILURE"**

This message indicates that the antenna coupler failed to tune. Reset SNR-2000 and attempt retuning. If fault is repeated refer to antenna coupler manual.

9. **"Fault: NO BANDS"**

This message indicates that no Filter Band has been selected by the transceiver/exciter. This message may indicate that the frequency selected on the transceiver/exciter is below 1.6 MHz.

a) Check transceiver/exciter frequency to insure that it is between 1.6000 and 29.9999 MHz.

b) Check transceiver/exciter for proper operation without the SNR-2000. Refer to transceiver manual.

c) Check interconnecting cables between transceiver/exciter and SNR-2000 for opens or shorts.

d) Check wiring between SNR-2000 control connector and Microprocessor Board A3A3.

e) If no fault found, follow Microprocessor Board A3A3 fault isolation procedure, paragraph 5.5.6.

10. **"Fault: VSWR HIGH @ 500 W"**

This message indicates that a defect exists in the antenna coupler or antenna system. Refer to antenna coupler manual or follow general maintenance procedures for the antenna system.

11. **"Fault: MULTIPLE OVERTEMP"**

This message indicates that more than one RF/PS Module A4 has exceeded its temperature limit.

a) Depress the asterisk (*) pushbutton on the keyboard to determine which A4 Modules have exceeded the temperature limit.

b) Remove and clean or replace the front panel air filter.

c) Check fans for operation and freedom from obstruction.

d) Assure that the fans change to HI SPEED operation before temperature limit occurs.

e) Check air passages for freedom from obstruction.

f) If no fault is found, follow Peripheral Board A3A2 fault isolation procedure, paragraph 5.5.2.

g) If Peripheral Board is operational, check thermistors on the A4 Modules.

12. **"Fault: REFL'D POWER HIGH"**

This message indicates that a defect exists in the antenna coupler or antenna system. Refer to antenna coupler manual or follow general maintenance procedures for the antenna system.

13. **"Fault: FILTER#X"**

This message indicates that RF is present at the Filter A5 input, but is either absent or the level is too low at the output.

a) Check outputs of A3A3U14 and U15 on Microprocessor Board A3A3 for a Low on selected band and High on all other bands.

b) If bands are being selected properly, follow Filter A5 fault isolation procedure, paragraph 5.5.3.

c) If bands are not selected properly, follow Microprocessor Board A3A3 fault isolation procedure, paragrph 5.5.6.

14. **"Fault: BAND#X"**

This message appears in conjunction with the multiple fault message and indicates that more than one filter band is being selected by the transceiver/exciter.

a) Check control cable between transceiver/exciter and SNR-2000 for opens or shorts.

b) Refer to transceiver/exciter manual.

15. **"Fault: 5 VOLT SUPPLY LO"**

This message indicates that the 5 Volt power supply output from the Auxiliary Power Supply A10 is too low.

a) Measure resistance to ground on the 5 Volt line. This can be measured from C14 positive on the Peripheral Board A3A2 while the board is connected to its edge connector. Clear any shorts if they exist.

b) Check input to 5 Volt Regulator (A10U2) of the Auxiliary Power Supply A10.

c) Replace 5 Volt regulator if necessary.

d) Follow Peripheral Board A3A2 fault isolation procedure, paragraph 5.5.2.

16. **"Fault: 5 VOLT SUPPLY HI"**

This message indicates that the 5 Volts is too high.

a) Measure 5 Volt Power Supply A1OU2 output.

b) If output voltage is high, replace 5 Volt regulator.

c) If output voltage is normal, follow Peripheral Board A3A2 fault isolation procedure, paragraph 5.5.2.

17. **"Fault: 28 VOLT SUPPLY LO"**

This message indicates that the 28 Volts is too low.

a) Measure resistance from 28 Volt Power Supply A1OU1 to ground. This can be measured at C16 positive on the Peripheral Board A3A2 while the board is connected. Clear any shorts detected.

b) Check input voltage to 28 Volt Regulator.

c) Replace 28 Volt Regulator if necessary.

d) Follow Peripheral Board A3A2 fault isolation procedure, paragraph 5.5.2.

18. **"Fault: 28 VOLT SUPPLY HI"**

This message indicates that the 28 Volts is too high.

a) Measure 28 Volt Power Supply A1OU1 voltage.

b) If voltage is too high, replace 28 Volt Regulator.

c) If voltage is normal, follow Peripheral Board A3A2 fault isolation procedure, paragraph 5.5.2.

TABLE 5.2 RF/PS MODULE A4 FAULT ISOLATION PROCEDURES

STEP	NORMAL INDICATION	FAILURE PROCEDURE
1. Remove +48 VDC connection from P1 of A4A3. 2. Connect multimeter to read current between 48V supply and A4A3P1.		
3. Ground A4A1J3 pin 4.	a. 600 ma, if so proceed to Step 8.	a. Check collector voltage on A4A3Q2, Q3, Q4, Q5 for +48 VDC. b. If wrong, check 48V Power Supply A4A2. c. If correct, adjust Idle current, see Step 4.
4. Adjust Idle Current by following Steps 5 thru 7 below. 5. Set A4A1R10 and R15 fully clockwise.		
6. Adjust A4A1R10 counter-clockwise until meter indicates 300 ma.	a. 300 ma, if so proceed to Step 7.	a. Check base voltage on A4A3Q2 and Q3 for approximately 0.7 VDC. b. If voltage is wrong and cannot be varied by A4A1R10, check bias regulator #1, A4A1U1. c. If voltage can be varied and current is wrong, replace Q2 and Q3.
7. Adjust A4A1R15 counter-clockwise until meter reads 600 ma.	a. 600 ma, if so proceed to Step 8.	a. Check base voltage on A4A3Q4 and Q5 for +0.7 VDC. b. If voltage is wrong and cannot be varied by A4A1R15, Check bias regulator #2, A4A1U2. c. If voltage can be varied and current is wrong, replace Q4 and Q5.
8. Remove ground from A4A1J3 pin 4 and reconnect P1 to 48V Power Supply A4A2. 9. Connect a source of RF excitation 1.6 to 30 MHz at 0 to 20 watts through a thru-line wattmeter to A4A3J1. Set excitation level to Ø. **BE SURE COOLING FANS ARE OPERATIVE.**		

TABLE 5.2 RF/PS MODULE A4 FAULT ISOLATION PROCEDURES (CONTINUED)

STEP	NORMAL INDICATION	FAILURE PROCEDURE
10. Set exciter frequency to 1.6 MHz and ground A4A1J3 pin 4.		
11. Increase excitation level until output from amplifier is 300 watts, or input from exciter is 20 watts, whichever occurs first.	a. Output 300W, input <20W.	a. Check DCV on collector of A4A3Q1. This should exceed +15VDC. If voltage is low replace Q1.
		b. If output is 100W to 200W, measure RF outputs on collectors of A4A3Q2, Q3, Q4, Q5.
		c. If all output are equal, check 48V supply voltage to assure that it is not decreasing.
		d. If any outputs are low, compare inputs with other transistors.
		e. If inputs are correct, check output circuitry and transistors.
		f. If inputs are low, check input circuitry.
12. If all inputs and outputs are normal, check input and output BITE circuits.	a. Output BITE, nominal -12VDC.	a. Check A4A3R45, R46, C33, CR3, L19, C30, C31.
	b. Input BITE, +2 to +5VDC.	b. Check A4A3R2, R3, C1, C2, C3, L1, CR1.

TABLE 5.3 PERIPHERAL BOARD A3A2 FAULT ISOLATION PROCEDURES

NOTE: The SNR-2000 has been designed to work with the GCU-1935 Automatic Antenna Coupler and the SNR-2000DAC Digital Antenna Coupler. To accomplish this, there are two (2) different Peripheral Boards, one for each coupler configuration. For use with the GCU-1935, assembly p/n 8066082096 is required. For use with the SNR-2000DAC, assembly p/n 8066082592 is required. The following procedures are applicable to both assemblies.

	SYMPTOM	PROCEDURE
1.	ALC and ACC Inop.	a. Check FWD Power input to A3A2R32 and A3A2R42. b. Check A3A2CR4.
2.	ALC Inop.	a. Check operation of A3A2Q7 and A3A2Q8. b. Check A3A2Q9 for short circuit. c. Check A3A2CR25 for open circuit.
3.	ACC Inop.	a. Check operation of A3A2U10D and A3A2Q3.
4.	VSWR Fault.	a. Check operation of A3A2U9B. b. Check FWD and REFL power inputs to A3A2U9B.
5.	REFL Power High Fault	a. Check operation of A3A2U9D. b. Check reference voltage on A3A2U9D pin 10 (2V).
6.	Band #X Fault.	a. Check operation of A3A2U9C. b. Check P Out and FWD Power inputs to A3A2U9C.
7.	PA #X, Overtemp Fault.	a. Check reference potential on A3A2U1B, D and A3A2U2B, D. b. Check operation of A3A2U1 and A3A2U2. c. Check operation of A3A2U3 and A3A2U7.
8.	PA #X Low.	a. Check operation of A3A2U12. b. Check inputs and references of A3A2U12. c. Check operation of A3A2U7.
9.	Vc #X Low.	a. Check inputs and references to A3A2U11. b. Check operation of A3A2U11. c. Check operation of A3A2U19.
10.	Ic #X High.	a. Check inputs and references to A3A2U15. b. Check operation of A3A2U15.
11.	Multiple Overtemp.	a. Check inputs and reference to A3A2U1 and A3A2U2. b. Check operation of A3A2U1 and A3A2U2. c. Check operation of A3A2U3 and A3A2U7.
12.	5-Volt Supply HI or LO.	a. Check inputs and references to A3A2U13B and D. b. Check operation of A3A2U13.
12.	28 Volt Supply HI or LO.	a. Check inputs and references to A3A2U13A and C. b. Check operation of A3A2U13.

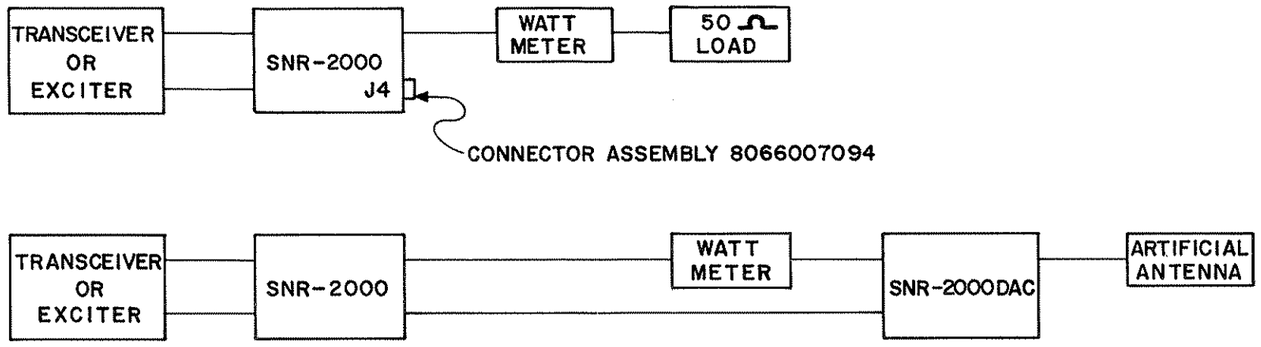


FIGURE 5-2 TEST SETUP WO/W SNR-2000DAC

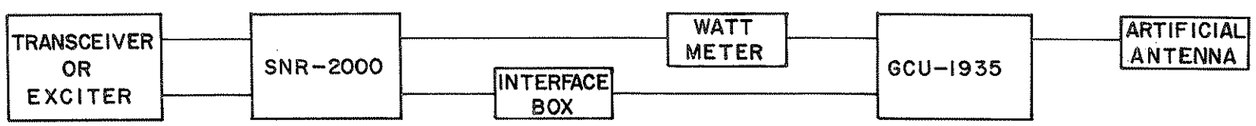
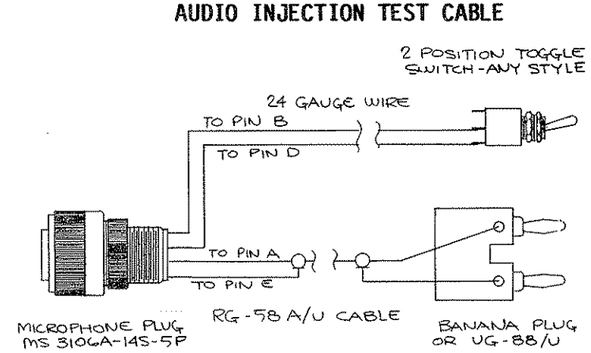


FIGURE 5-3 TEST SETUP W/GCU-1935

AUDIO INJECTION TEST CABLE



80660010XXD FINAL ASSY, TESTED

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	FINAL ASSY, TESTED	80660010XX
	Bumper, Plastic	0507740009
	Fastener, ¼ Turn, Slotted	1008370002
	Final Assy	80660012XX
	Panel, Bottom	80660006XX
	Panel, Top	80660006XX
	Ring, Retainer	1008580007

80660012XXH FINAL ASSY

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	FINAL ASSY	80660012XX
A1	Chassis Assy	80660100XX
A2	Control Panel Module	8066090XXX
A3A2	PC Assy Peripheral/SNR-2000DAC	8066082592
(Optional)	PC Assy Peripheral/GCU-1935	8066082096
A3A3	PC Assy Micro P	8066083092
A4	RF/PS Module (4 each)	8066030096
A5	Filter Module	8066020091
A8	Front Panel Assy	8066015097
	MISCELLANEOUS	
	Block, Fastener, Frame	8066011105
	Cover, Circuit Breaker	8066014201
	Fastener, ¼ Turn, T-Knob, Blk	1007390018
	Filter, Air	8066002301
	Frame, F/P, Bottom	80660117XX
	Frame, F/P, Left Side	80660118XX
	Frame, F/P, Right Side	80660118XX
	Frame, F/P, Top	80660116XX
	Frame, Filter	80660020XX
	Grill, Filter	8066002106
	Handle	8066011504
	Ring, Retainer	1008580007
	Spacer, Handle	8066011407
	Standoff, F-F, 10-32, CKT BRK	1008700002

80660100XXX CHASSIS ASSY A1

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CHASSIS ASSY A1	8066010095
A1CR1	Diode, Rectifier 1N4004	0405180004
A1K1	Relay, DPST, 24V, 30A	1007120011
A3A1	Computer Mother Board	8066081090
A6	Combiner Module	8066060092
A7	Splitter Module	8066070098
A9	PC Assy Connector	8066041098
A10	Auxiliary Power Supply	8066050097
W2A1	Harness Assy, W2A1 Chassis	8066013299
W3A1	Harness Assy, W3A1 Chassis	8066013396
W4A1	Harness Assy, W4A1 Chassis	8066013493
W5A1	Harness Assy, W5A1 Chassis	8066013591
W6A1	Harness Assy, W6A1 Chassis	8066013698
	MISCELLANEOUS	
	Block, Locating	8066012101
	Bottom Brace	8066012209
	Bracket, Module Hold-Down	8066010109
	Bushing, Heyco, Snap 3/8	0874000041
	Card Guide Mtg Hdw Assy	8066012594
	Chassis, Front	8066010508
	Chassis, Rear	8066010206
	Clamp, Cable, Flat 1 1/16 Wide	1008650005
	Clamp, Cable, Flat 9/16 Wide	1008660001
	Cover, Power Connector	8066017201
	Fastener, ¼ Turn, Slotted	1008370002
	J Clip, Adhesive Back	1008640000
	Nut, Wing 4-20	0507730003
	Receptacle, ¼ Turn Fastener	1008360031
	Ring, Retainer	1008580007
	Terminal Strip, 2 Term, 1 Gnd	0848120001
	Side, Chassis, Left	80660113XX
	Side, Chassis, Right	80660113XX

8066013493B HARNESS ASSY, W4A1 CHASSIS

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	HARNESS ASSY, W4A1 CHASSIS	8066013493
W4A1P1	Connector, Ribbon, 40 Pin Fem	1008110035
W4A1P2	Connector, Ribbon, 20 Pin Fem	1008120031
W4A1P3	Connector, Ribbon, 20 Pin Fem	1008120031
	Cable, Ribbon, 40 Cond.	1008080012

8066013299B HARNESS ASSY, W2A1 CHASSIS

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	HARNESS ASSY, W2A1 CHASSIS	8066013299
W2A1P1	Connector, Ribbon, 20 Pin Fem	1008120031
W2A1P2	Connector, Ribbon, 20 Pin Fem	1008120031
	Cable, Ribbon, 20 Cond.	1008080004

8066013591B HARNESS ASSY, W5A1 CHASSIS

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	HARNESS ASSY, W5A1 CHASSIS	8066013591
W5A1P1	Connector, Ribbon, 20 Pin Fem	1008120031
W5A1P2	Connector, Ribbon, 20 Pin Fem	1008120031
	Cable, Ribbon, 20 Cond.	1008080004

8066013396B HARNESS ASSY, W3A1 CHASSIS

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	HARNESS ASSY, W3A1 CHASSIS	8066013396
W3A1P1	Connector, Ribbon, 40 Pin Fem	1008110035
W3A1P2	Connector, Ribbon, 26 Pin Fem	1008340031
W3A1P3	Connector, Ribbon, 14 Pin Fem	1008350001
	Cable, Ribbon, 40 Cond.	1008080012

8066030592E W1A4 HARNESS ASSY

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	W1A4 HARNESS ASSY	8066030592
	Connector, PC, 2 Pin Housing	1008040037
	Terminal, ¼" Female	1008210005
	Terminal, Ring Tongue No. 6	0508460000

8066013698G HARNESS ASSY, W6A1 CHASSIS

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	HARNESS ASSY, W6A1 CHASSIS	8066013698
W1A1P1	Connector, Ribbon, 10 Pin Fem	1008070017
W1A1P2	Connector, Ribbon, 10 Pin Fem	1008070017
W1A1P3	Connector, Ribbon, 10 Pin Fem	1008070017
W1A1P4	Connector, Ribbon, 10 Pin Fem	1008070017
W1A1P5	Connector, Ribbon, 40 Pin Fem	1008110035
W6A1P1	Connector, Housing, 3 Pin Fem	1008050016
W6A1P2	Connector, Housing, 3 Pin Fem	1008050016
W6A1P3	Connector, Housing, 3 Pin Fem	1008050016
W6A1P4	Connector, Housing, 3 Pin Fem	1008050016
W6A1P5	Connector, Housing, 3 Pin Fem	1008050016
W6A1P6	Connector, Housing, 20 Pin Fem	1008090026
W7A1P1	Connector, Block, 3 Pin Fem	1008770001
W7A1P2	Connector, Block, 3 Pin Fem	1008770001
W7A1P3	Connector, Block, 3 Pin Fem	1008770001
W7A1P4	Connector, Block, 3 Pin Fem	1008770001
W7A1P5	Connector, Block, 3 Pin Fem	1008770001
W7A1P6	Connector, Block, 10 Pin Fem	1008100013
W7A1P7	AC Cord, Fan w/plug	0841580006
W7A1P8	AC Cord, Fan w/plug	0841580006
W7A1P9	AC Cord, Fan w/plug	0841580006
W7A1P10	AC Cord, Fan w/plug	0841580006
	MISCELLANEOUS	
	Bracket, Module Hold-Down, Front	8066014503
	Cable, Ribbon, 10 Cond., Shielded	1008780006
	Terminal, ¼", Female	1008210005

80660000294B CONNECTOR KIT

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CONNECTOR KIT	8066000294
	Adapter, RF, For PL-259	0742070000
	Bushing, Telescoping, .56 ID	0700550054
	Bushing, Telescoping, .62 ID	0700550062
	Bushing, Telescoping, .75 ID	0700550071
	Clamp, Cable, Connector	0754570002
	Connector Assembly	8066007094
	Connector, RF, N UG-21B/U	0754140008
	Connector, RF, UHF PL-259	0742190005
	Connector, Power, 37 Pin Round	0754320006

8066015097E FRONT PANEL ASSY A8

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	FRONT PANEL ASSY A8	8066015097
A8B1	Fan, 340 CFM	1007120037
A8B2	Fan, 340 CFM	1007120037
A8CB1	Circuit Breaker, 3 Section	1007120029
A8DS1	Lamp, 28V, .04A, T-1 ¾	1008370011
A8DS2	Lamp, 6V, .20A, T-1 ¾	1008400033
	MISCELLANEOUS	
	Fastener, ¼ Turn, Slotted	1008370002
	Panel, Fan Mounting	8066014104
	Panel, Front	8066011008
	Plate, Mounting, Circuit BRKR	8066010303
	Receptacle, ¼ Turn Fastener	1008360031
	Ring, Retainer	1008580007
	Socket, Lamp, Green Lens	1008380016
	Socket, Lamp, Red Lens	1008380008
	Venturi, Blowers	8066010401

8066002297B POWER CABLE ASSY

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	POWER CABLE ASSY	8066002297
2P1	Connector, Power, 3 Pin Round	0754250008
2XP1	Clamp, Cable, Connector	0754270009
	MISCELLANEOUS	
	Cable, 3 Cond. No. 10	0841050007

8066012594A CARD GUIDE MTG HDW ASSY

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CARD GUIDE MTG HDW ASSY	8066012594
	Card Guide, 3½" Long	1008380032
	Eyelet, No. 36	1008620009
	Spacer, Card Guide Mounting	8066010605

FIGURE 5-4 CHASSIS WIRING DIAGRAM

8066409036A

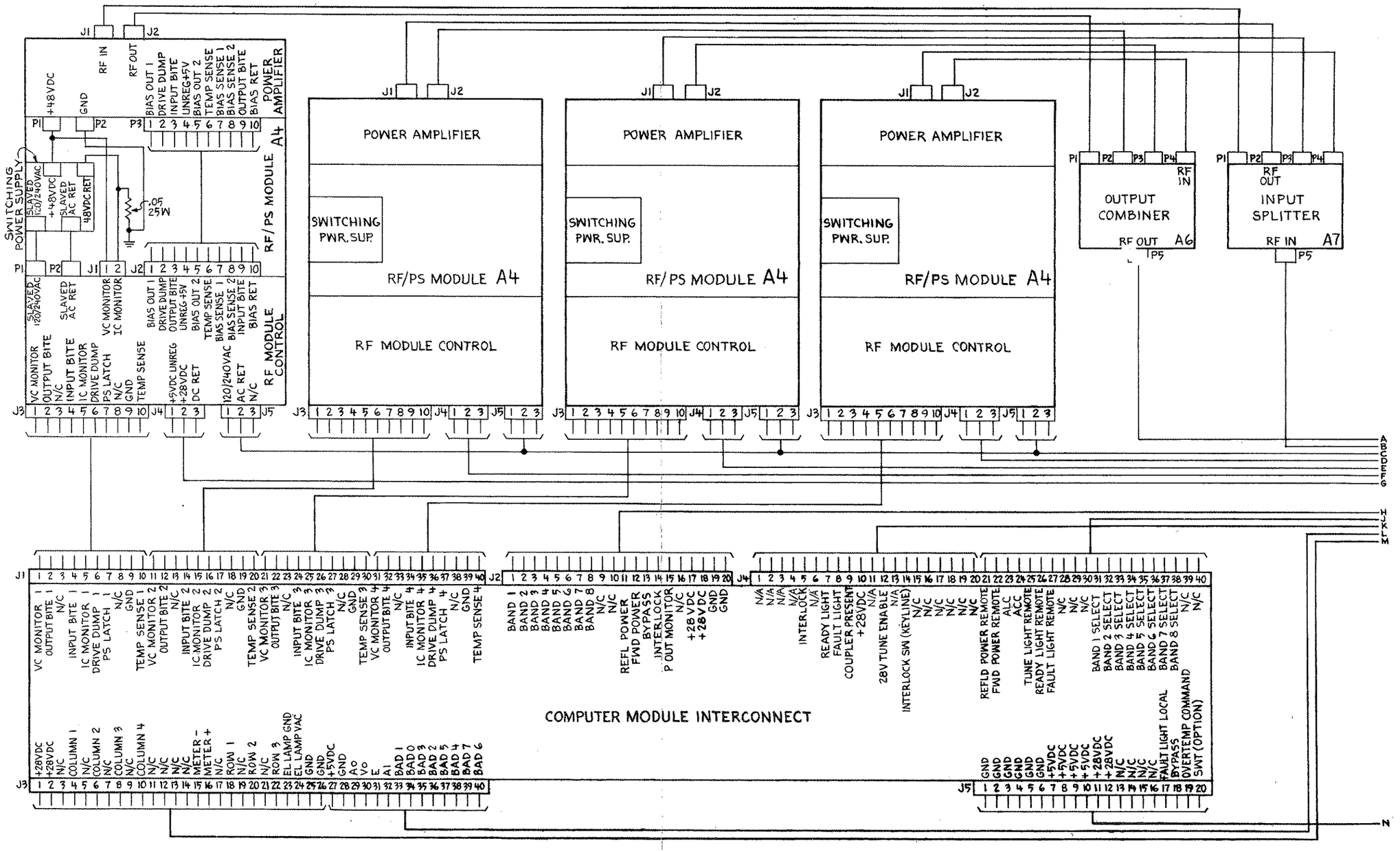
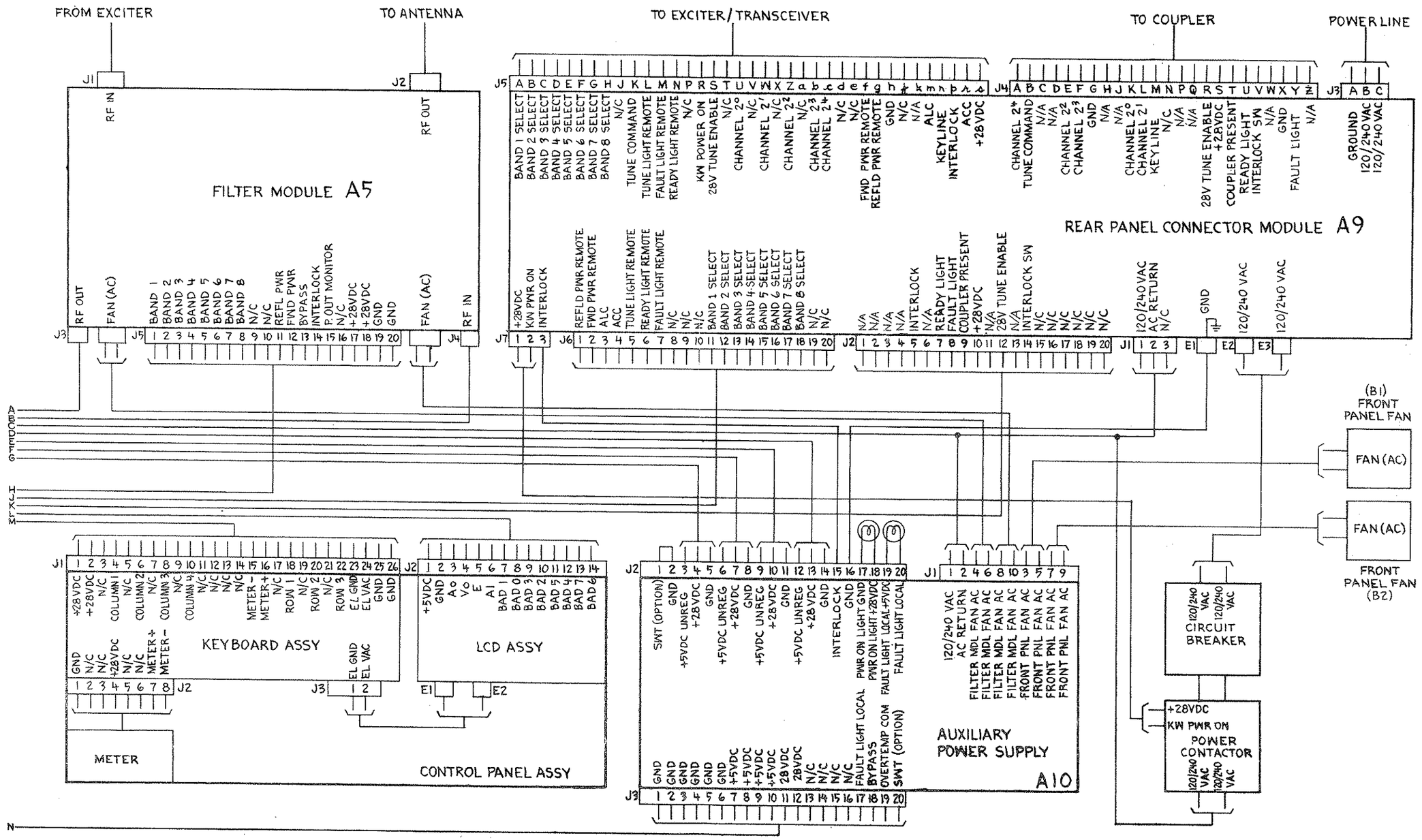


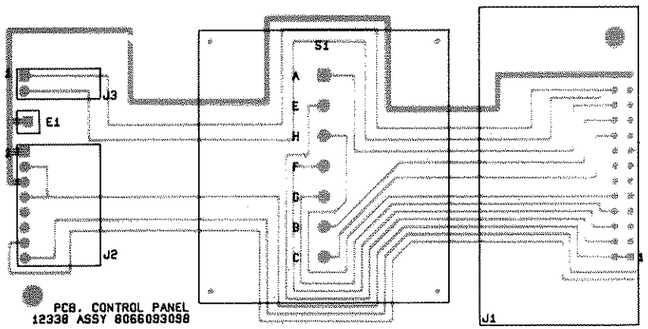
FIGURE 5-4 SHEET 1

8066409036A

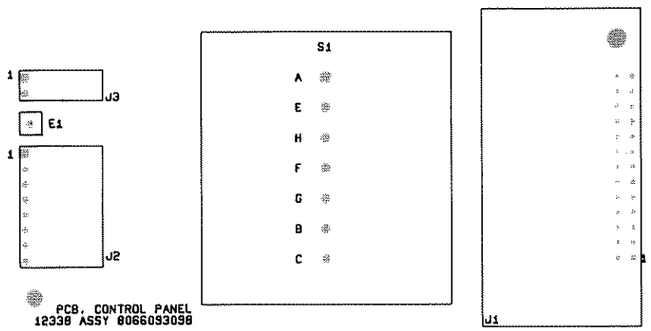


(FOR THE GCU-1935 CONFIGURATION, REFER TO FIGURE 6-11)

FIGURE 5-4 SHEET 2



COMPONENT SIDE



CIRCUIT SIDE

80660900XXF CONTROL PANEL MODULE A2

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CONTROL PANEL MODULE A2	80660900XX
A2A1	PC Assy, Control Panel	8066093098
A2A2	LCD Assy	8066092091
A2M1	Meter, Illuminated	8066090803
W1A2P1	Connector, PC, 8 Pin Housing	1008050032
	MISCELLANEOUS	
	Bracket, Control Panel	8066090404
	Lamp, Midg. Grooved 14.0V .08A	1008680001
	Panel, Control	80660902XX
	Plate, Meter Mounting	8066091109
	Receptacle, ¼ Turn Fastener	1008360031
	Spacer, .112ID, .152OD, .187L	0856100005
	Spacer, .115ID, .187OD, .250L	0521420041

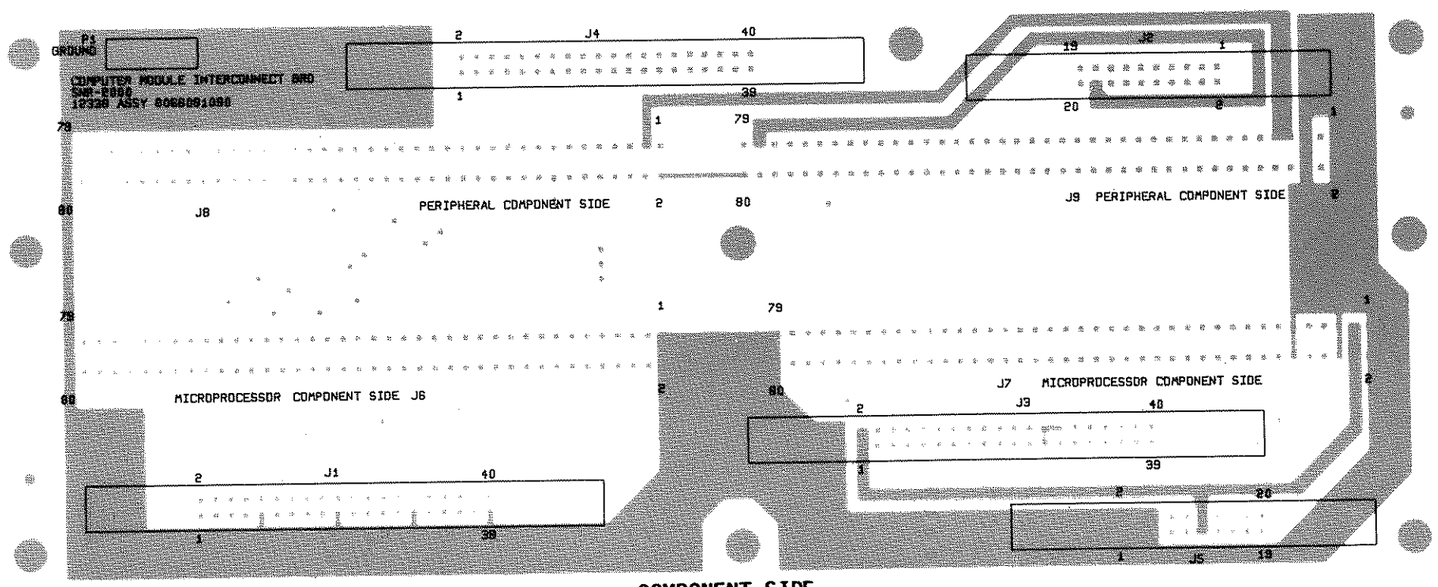
8066093098A PC ASSY, CONTROL PANEL A2A1

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSY, CONTROL PANEL A2A1	8066093098
A2A1J1	Header, PC, 26 Pin Right Angle	1008180025
A2A1J2	Connector, PC, 8 Pin	1008050024
A2A1J3	Connector, PC, 2 Pin	1008040029
A2A1S1	Keyboard	8066093101
	MISCELLANEOUS	
	Bracket, Keyboard Mounting	8066091001
	Key, Polarizing	1008070033

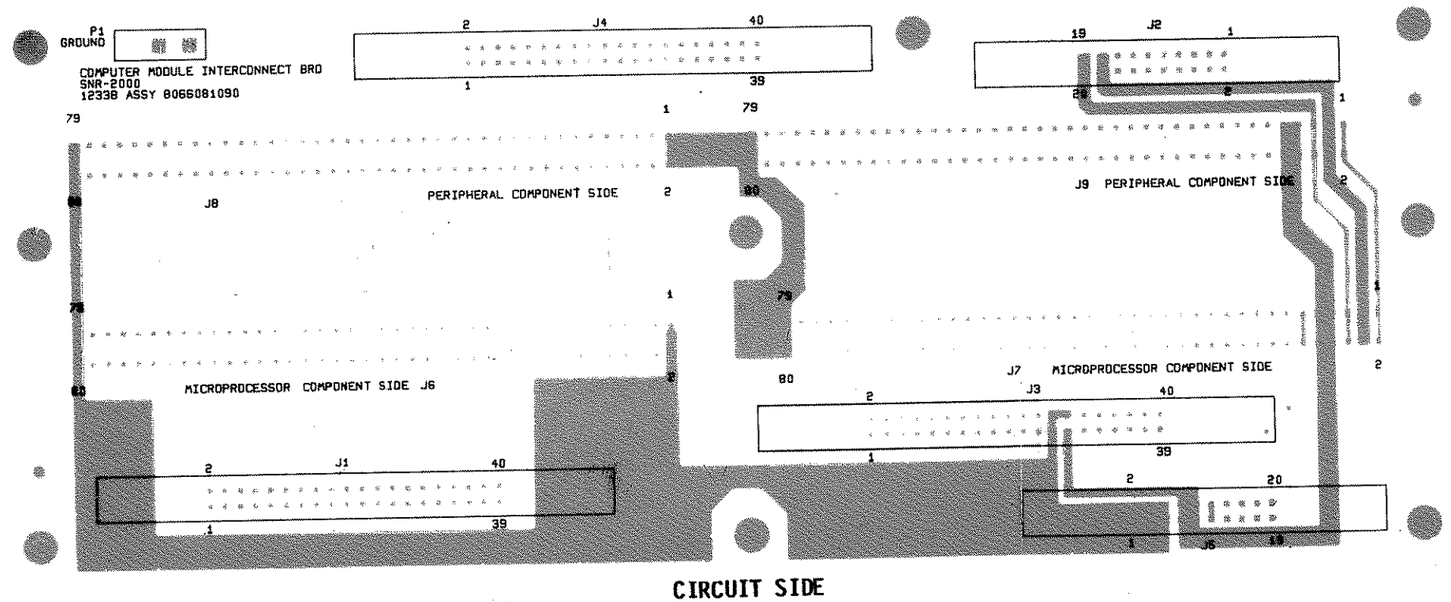
8066092091A LCD ASSY A2A2

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	LCD ASSY A2A2	8066092091
A2A2	Dot Matrix LCD W/E-L Backlight	1008180017
A2A3J1	Header, PC, 14 Pin Dual	1008180009
W1A2A2P1	Connector, PC, 2 Pin Housing	1008040037

FIGURE 5-5 CONTROL PANEL MODULE A2



COMPONENT SIDE



CIRCUIT SIDE

80660810908 PC ASSY. COMPUTER MOTHER BOARD A3A1

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSY. COMPUTER MOTHER BD. A3A1	80660810908
A3A1J1	Connector, PC. 40 Pin. Str.	1008110019
A3A1J2	Connector, PC. 20 Pin. Str.	1008120014
A3A1J3	Connector, PC. 40 Pin. Str.	1008110019
A3A1J4	Connector, PC. 40 Pin. Str.	1008110019
A3A1J5	Connector, PC. 20 Pin. Str.	1008120014
A3A1J6	Connector, PC. 40 Pin Dual	1008130010
A3A1J7	Connector, PC. 40 Pin Dual	1008130010
A3A1J8	Connector, PC. 40 Pin Dual	1008130010
A3A1J9	Connector, PC. 40 Pin Dual	1008130010
	MISCELLANEOUS	
	Key, Polarizing	1008070033
	Terminal, PC Mount, ¼" Wide	1008330035

FIGURE 5-6 COMPUTER MOTHERBOARD A3A1

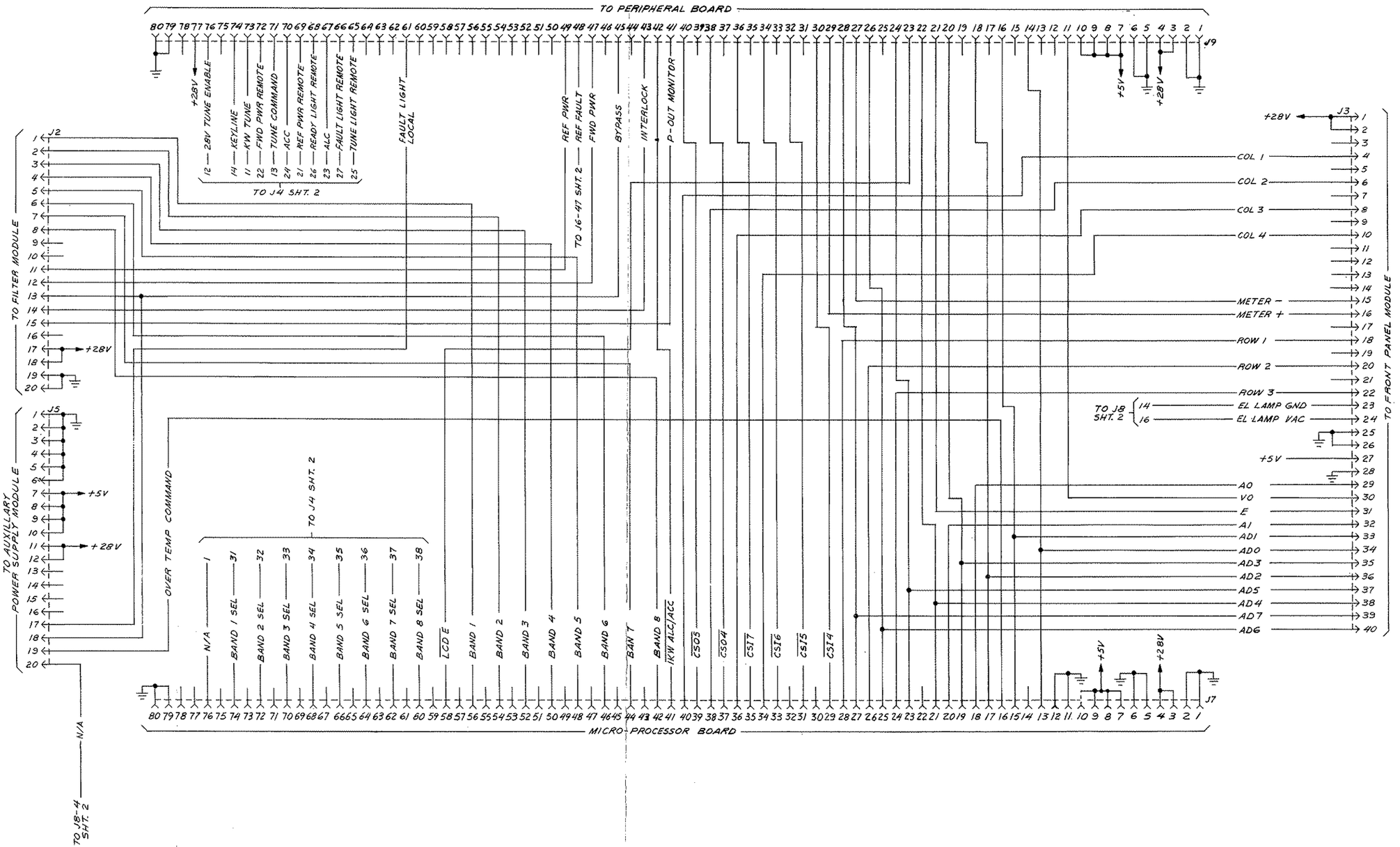


FIGURE 5-6 SHEET 1

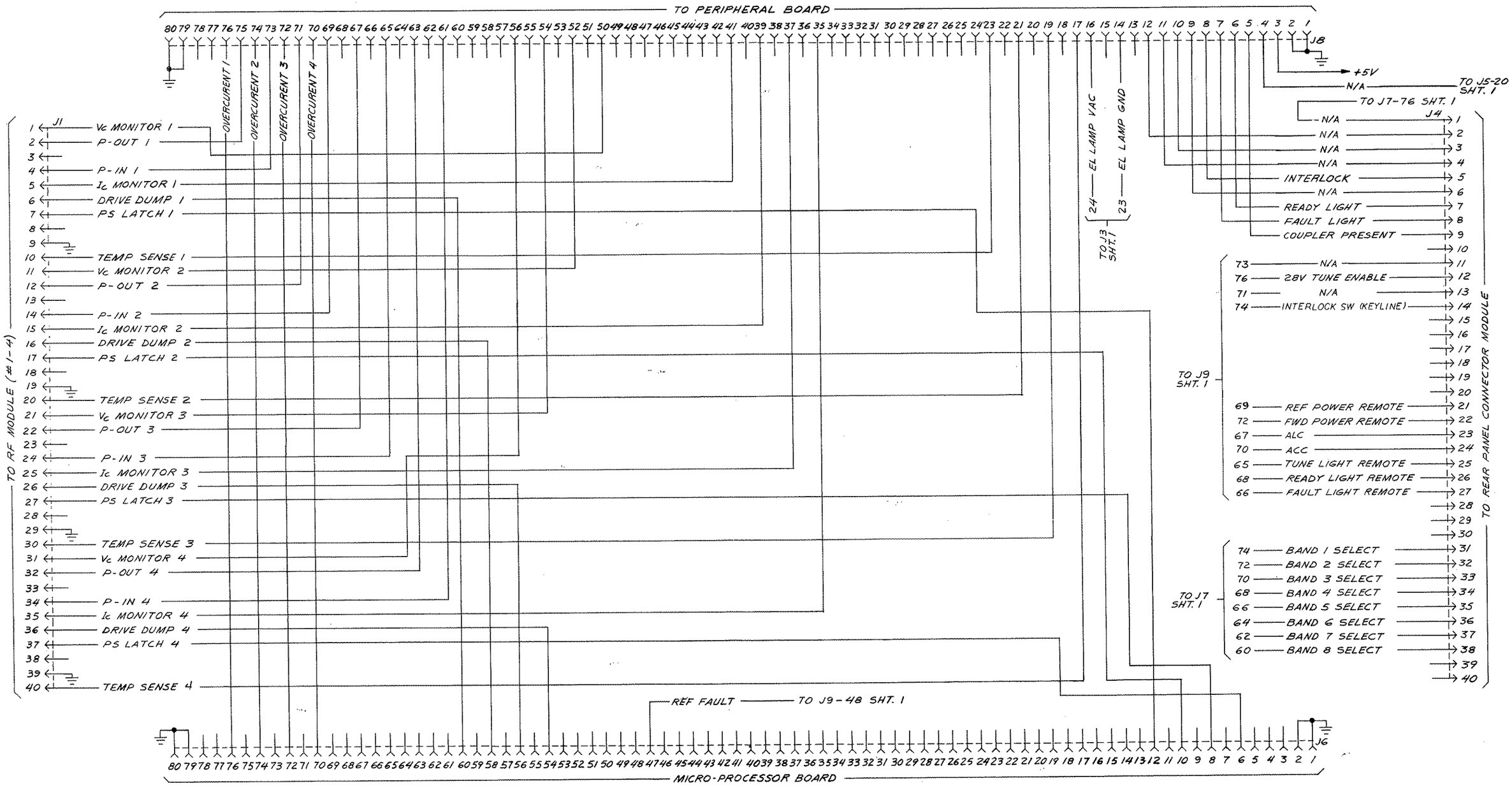
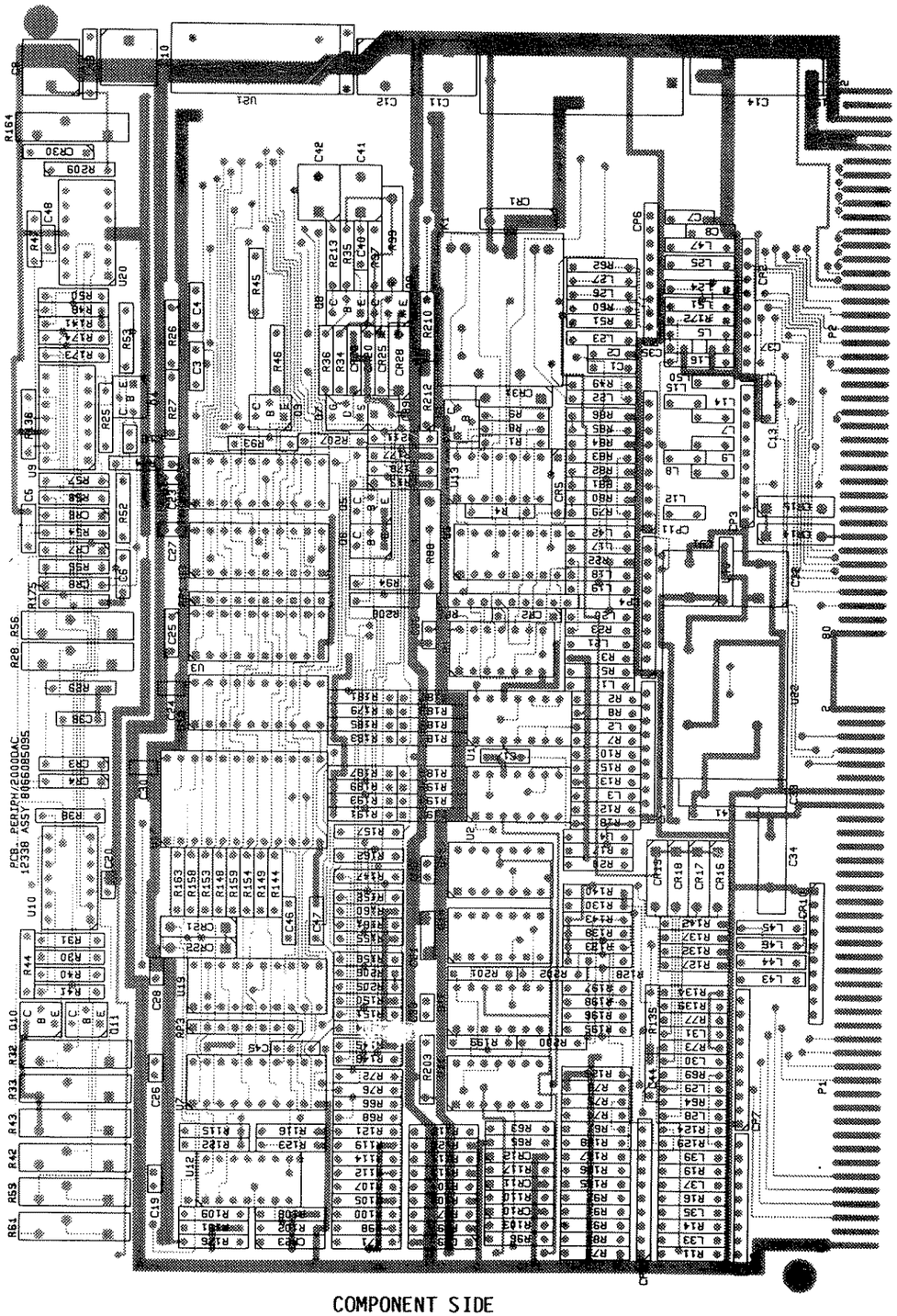
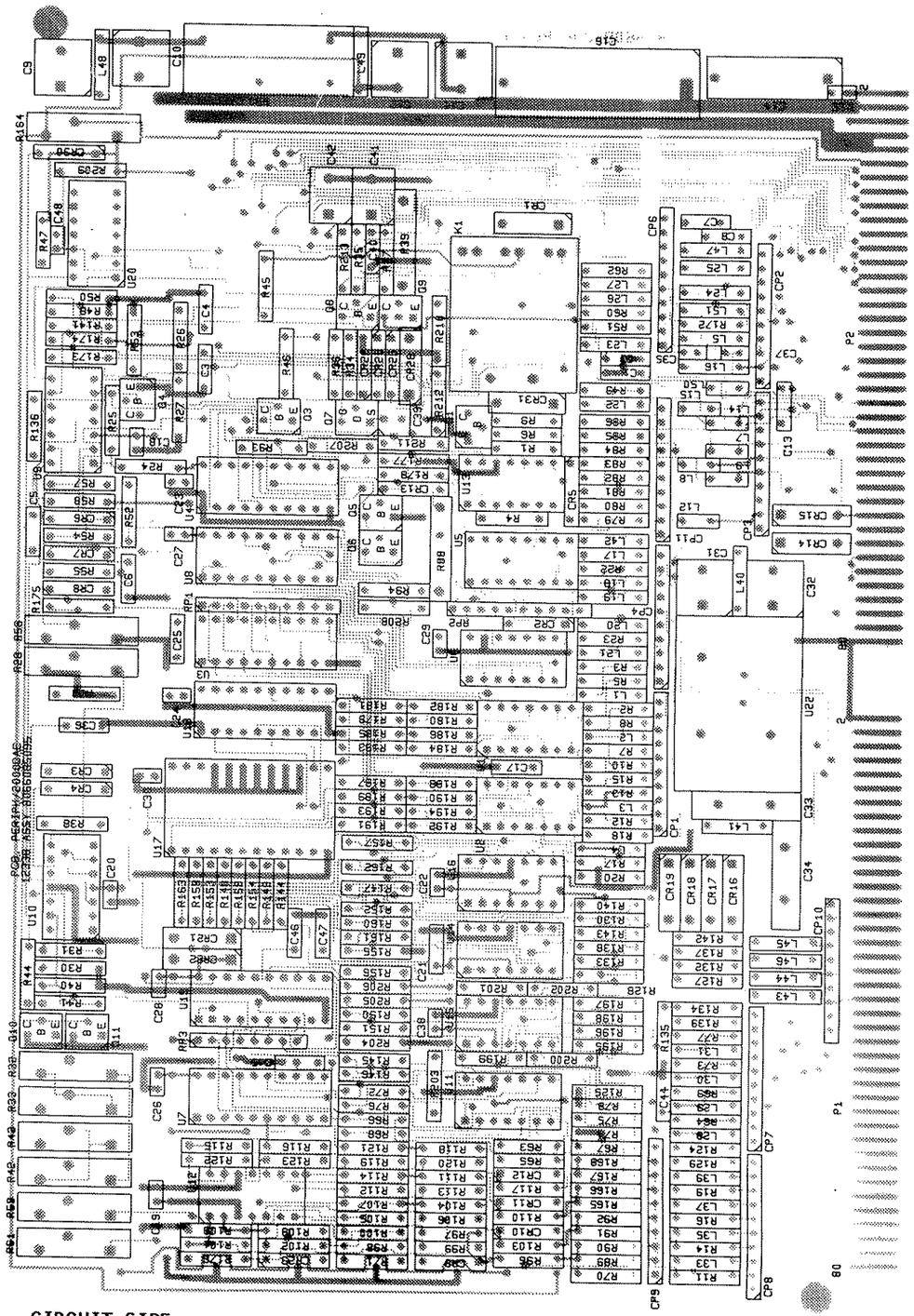


FIGURE 5-6 SHEET 2

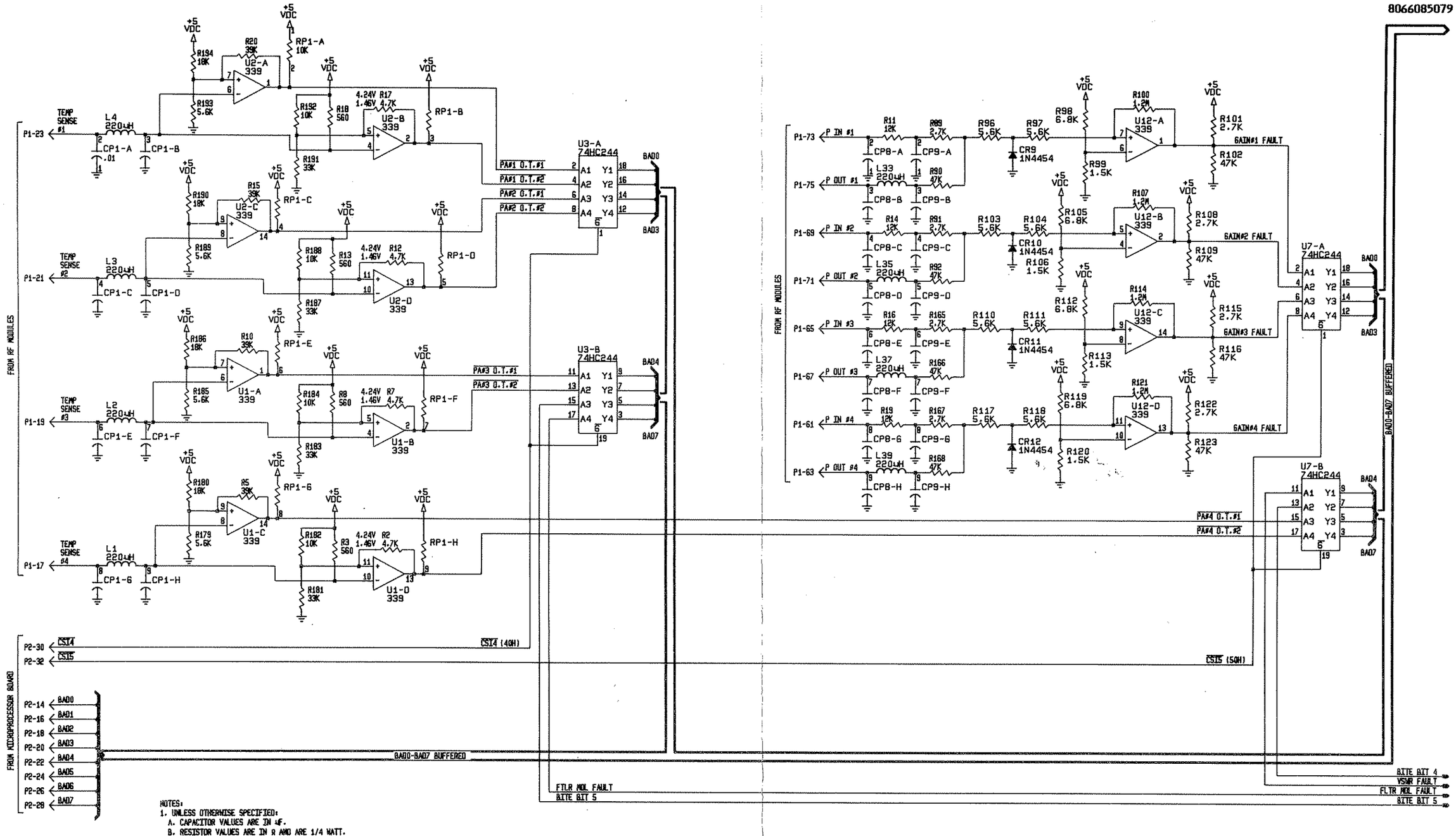


COMPONENT SIDE



CIRCUIT SIDE

FIGURE 5-7 PERIPHERAL BOARD A3A2 (FOR USE WITH SNR-2000DAC)



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. CAPACITOR VALUES ARE IN uF.
   B. RESISTOR VALUES ARE IN R AND ARE 1/4 WATT.

FIGURE 5-7 SHEET 1

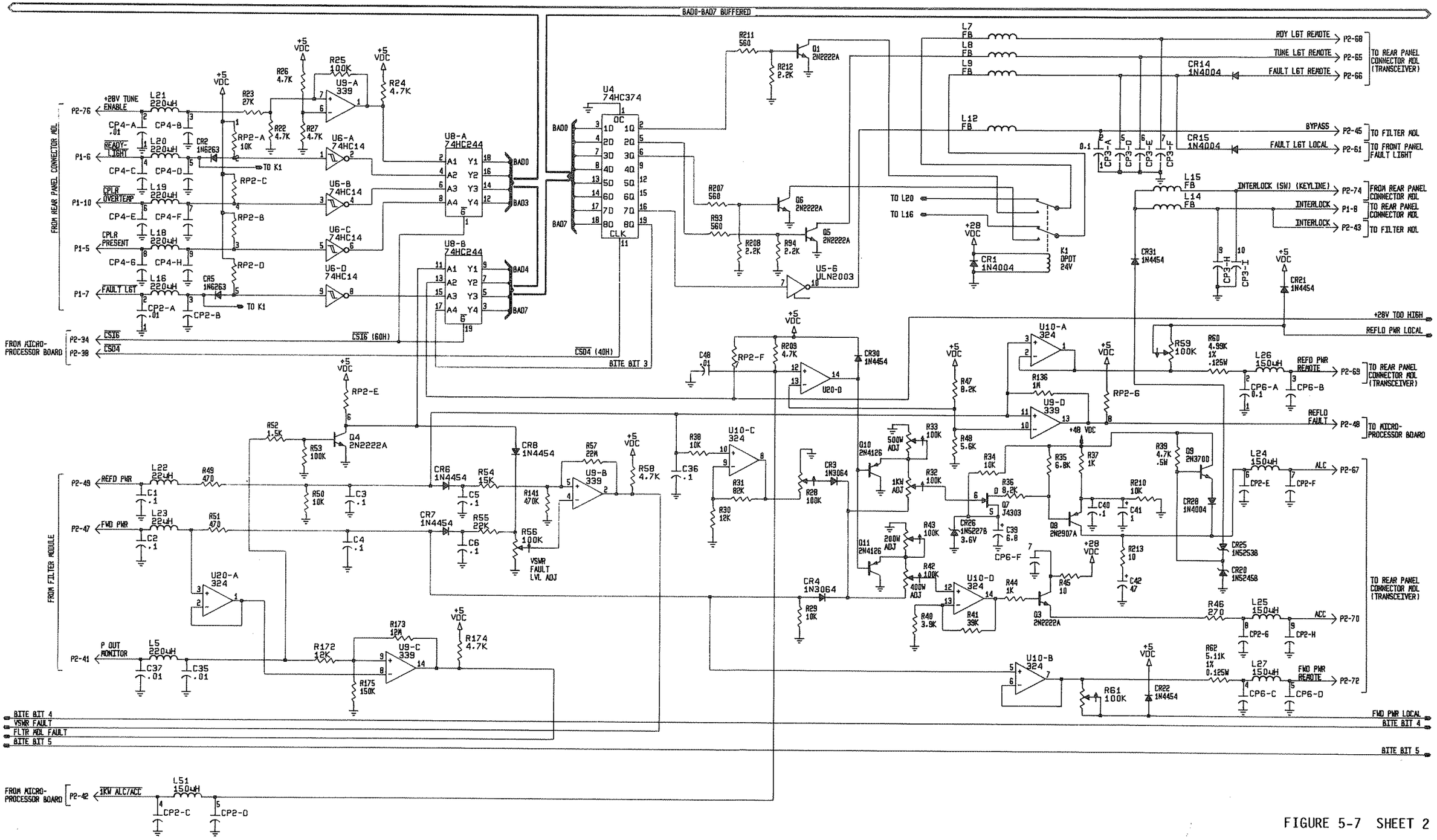


FIGURE 5-7 SHEET 2

8066085079

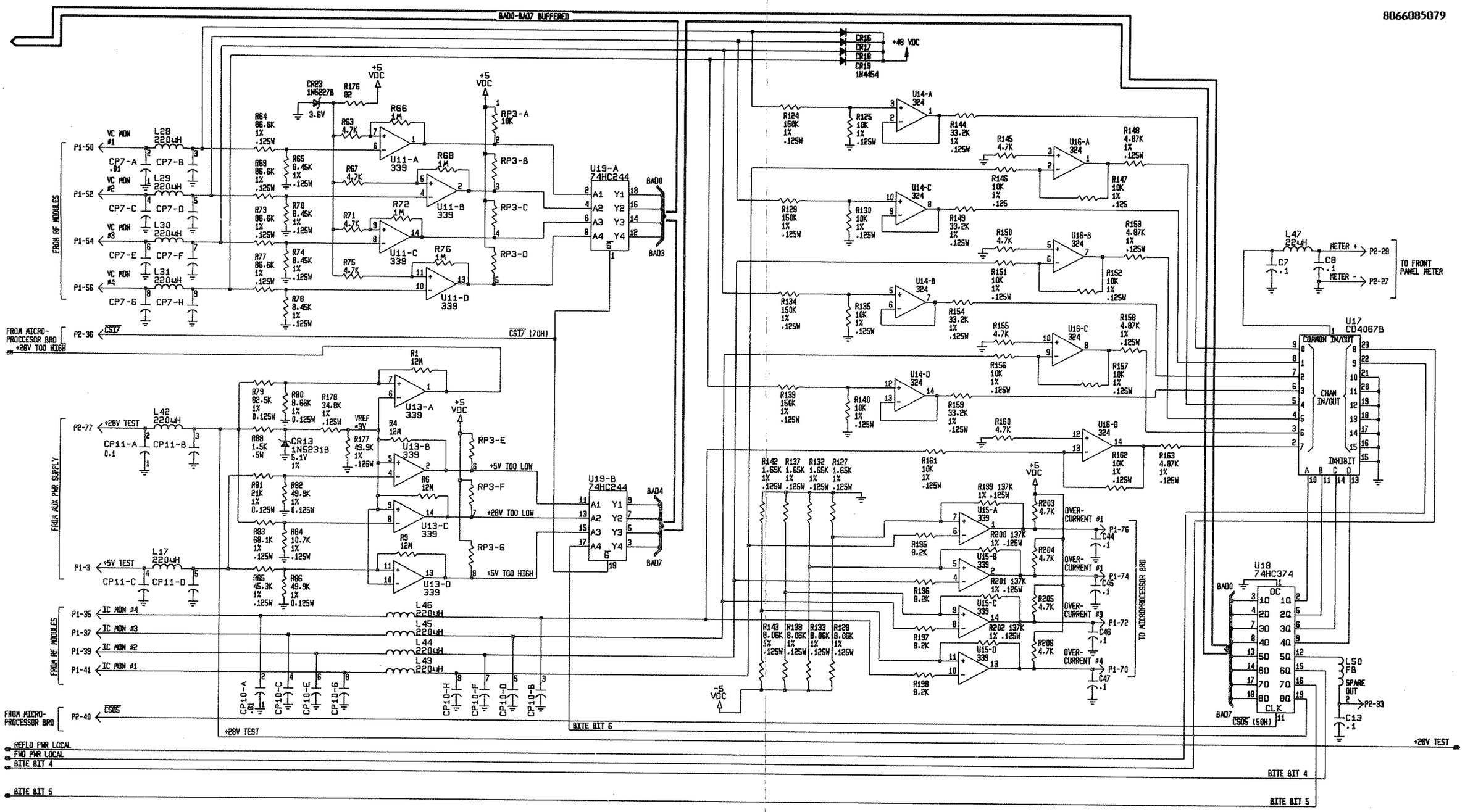
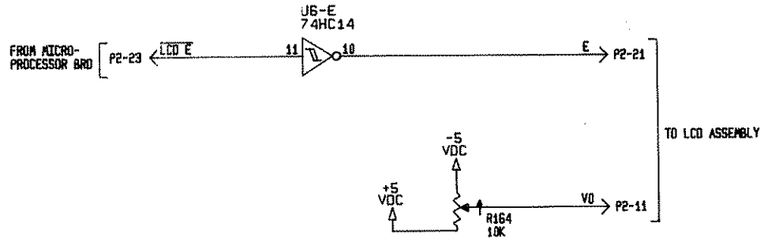
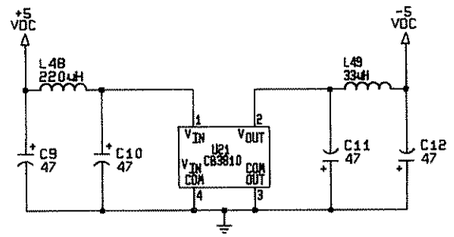
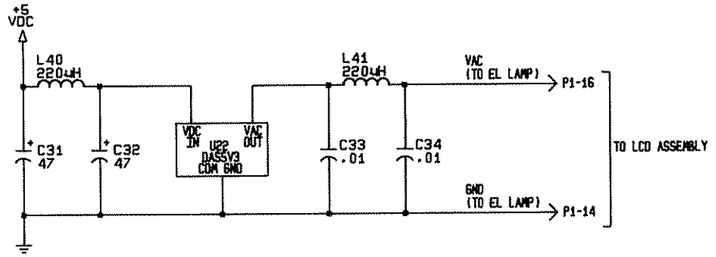
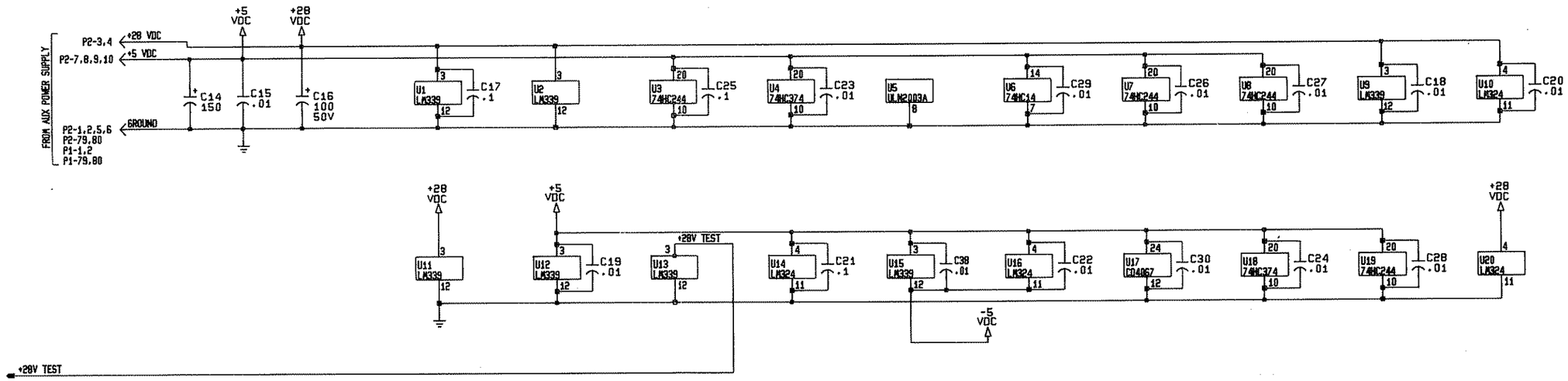


FIGURE 5-7 SHEET 3

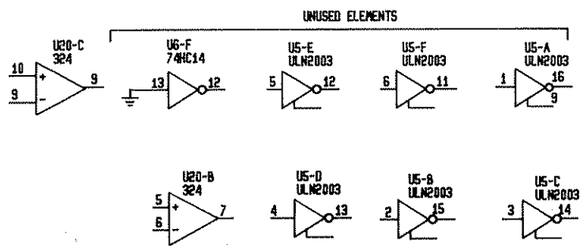








UNUSED ELEMENTS



REFERENCE DESIGNATORS	
LAST USED	UNUSED
U22	
RP3	
R213	R21,87,95,126,131 R169,170,171
K1	
CR31	CR24,27,29
Q11	Q2
CP11	CP5,CP38,C,6
C48	C43
L51	L6,10,11,13

FIGURE 5-7 SHEET 4

8066085095C PC ASSY. PERIPHERAL A3A2

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSY. PERIPHERAL A3A2	8066082096
C1	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C2	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C3	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C4	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C5	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C6	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C7	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C8	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C9	Cap. 47µf, 20V, 196D	0281700001
C10	Cap. 47µf, 20V, 196D	0281700001
C11	Cap. 47µf, 20V, 196D	0281700001
C12	Cap. 47µf, 20V, 196D	0281700001
C13	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C14	Cap. 150µf, 16V	1006150013
C15	Cap. .01µf, 50V, X7R, 20%	0281730008
C16	Cap. 100µf, 50V	1004260016
C17	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C18	Cap. .01µf, 50V, X7R, 20%	0281730008
C19	Cap. .01µf, 50V, X7R, 20%	0281730008
C20	Cap. .01µf, 50V, X7R, 20%	0281730008
C21	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C22	Cap. .01µf, 50V, X7R, 20%	0281730008
C23	Cap. .01µf, 50V, X7R, 20%	0281730008
C24	Cap. .01µf, 50V, X7R, 20%	0281730008
C25	Cap. 0.1µf, 50V, X7R, 20%	0281610002
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. 47µf, 20V, 196D	0281700001
C32	Cap. 47µf, 20V, 196D	0281700001
C33	Cap. 0.01µf, 1000V, Z5U, 20%	0243550006
C34	Cap. 0.01µf, 1000V, Z5U, 20%	0243550006
C35	Cap. .01µf, 50V, X7R, 20%	0281730008
C36	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C37	Cap. .01µf, 50V, X7R, 20%	0281730008
C38	Cap. .01µf, 50V, X7R, 20%	0281730008
C39	Cap. 6.8µf, 20V, T368	0296780006
C40	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C41	Cap. 1µf, 50V, 198D	0280910002
C42	Cap. 47µf, 35V	0282190007
C44	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C45	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C46	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C47	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C48	Cap. .01µf, 50V, X7R, 20%	0281730008
CP1	Cap Ntwk, 10 Pin, .01µf	1006540016
CP2	Cap Ntwk, 10 Pin, .01µf	1006540016
CP3	Cap Ntwk, 10 Pin, .1µf	1006580018
CP4	Cap Ntwk, 10 Pin, .01µf	1006540016
CP6	Cap Ntwk, 10 Pin, .1µf	1006580018
CP7	Cap Ntwk, 10 Pin, .01µf	1006540016
CP8	Cap Ntwk, 10 Pin, .01µf	1006540016
CP9	Cap Ntwk, 10 Pin, .01µf	1006540016
CP10	Cap Ntwk, 10 Pin, .01µf	1006540016
CP11	Cap Ntwk, 10 Pin, .1µf	1006580018
CR1	Diode, Rectifier 1N4004	0405180004
CR2	Diode, Pin 1N6263	0405610009
CR3	Diode, Signal, Sil. 1N3064	0405460007
CR4	Diode, Signal, Sil. 1N3064	0405460007
CR5	Diode, Pin 1N6263	0405610009
CR6	Diode, Signal, Sil. 1N4454	0405270003
CR7	Diode, Signal, Sil. 1N4454	0405270003
CR8	Diode, Signal, Sil. 1N4454	0405270003
CR9	Diode, Signal, Sil. 1N4454	0405270003
CR10	Diode, Signal, Sil. 1N4454	0405270003
CR11	Diode, Signal, Sil. 1N4454	0405270003
CR12	Diode, Signal, Sil. 1N4454	0405270003

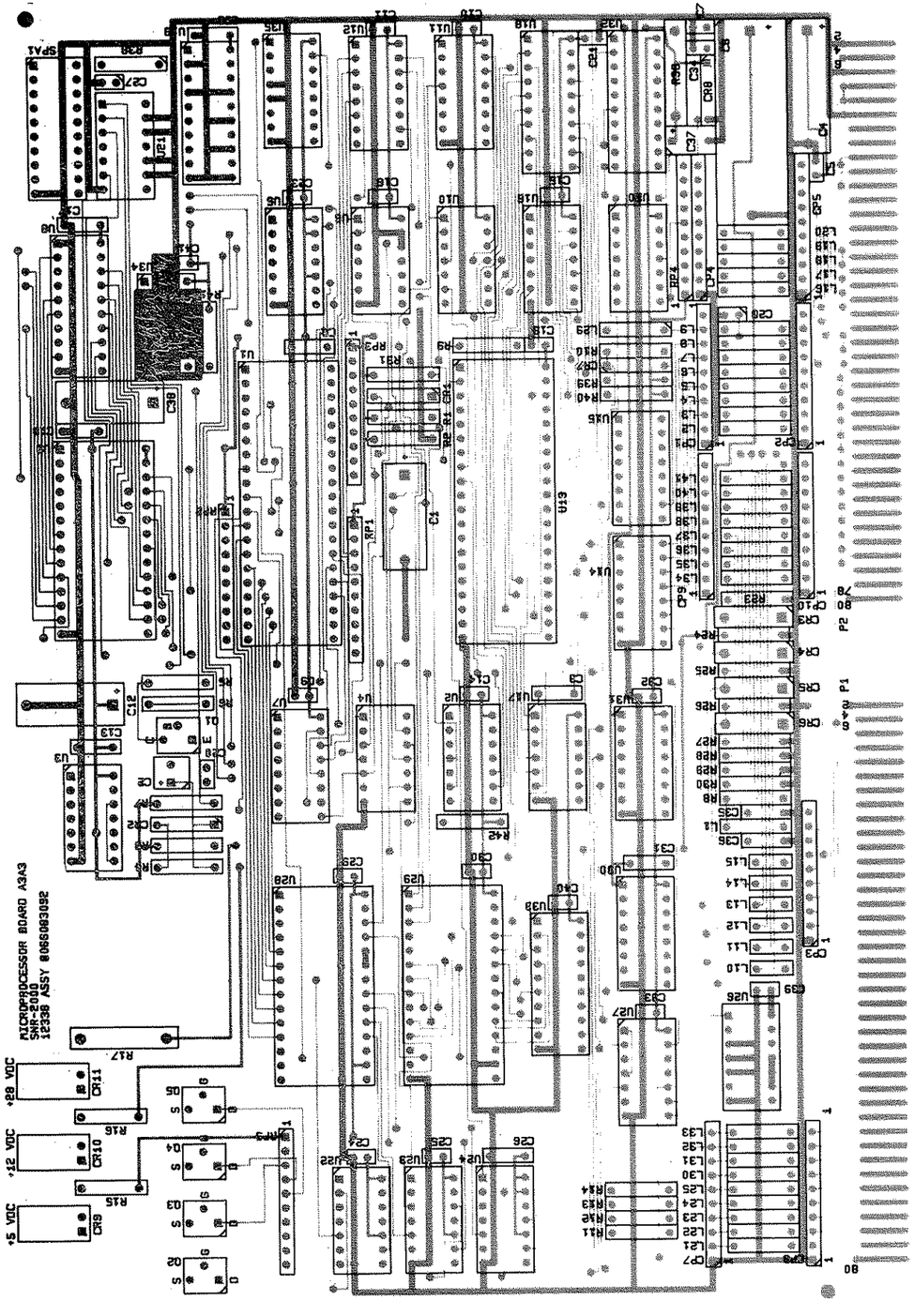
REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
CR13	Diode, Zener 1N5231D	1008530000
CR14	Diode, Rectifier 1N4004	0405180004
CR15	Diode, Rectifier 1N4004	0405180004
CR16	Diode, Signal, Sil 1N4454	0405270003
CR17	Diode, Signal, Sil 1N4454	0405270003
CR18	Diode, Signal, Sil 1N4454	0405270003
CR19	Diode, Signal, Sil 1N4454	0405270003
CR20	Diode, Zener, 1N5245B	0405210001
CR21	Diode, Signal, Sil 1N4454	0405270003
CR22	Diode, Signal, Sil 1N4454	0405270003
CR23	Diode, Zener, 1N5227B	0405250002
CR25	Diode, Zener, 1N5235B	0405200005
CR26	Diode, Zener, 1N5227B	0405250002
CR28	Diode, Rectifier, 1N4004	0405180004
CR29	Diode, Zener, 1N5235B	0405200005
CR30	Diode, Signal, Sil 1N4454	0405270003
CR31	Diode, Signal, Sil 1N4454	0405270003
K1	Relay, DPDT, 24V	1008030023
L1	Inductor, Molded, 220µh, 5%	0650500008
L2	Inductor, Molded, 220µh, 5%	0650500008
L3	Inductor, Molded, 220µh, 5%	0650500008
L4	Inductor, Molded, 220µh, 5%	0650500008
L5	Inductor, Molded, 220µh, 5%	0650500008
L7	Ferrite Bead .047ID .138OD	0564510009
L8	Ferrite Bead .047ID .138OD	0564510009
L9	Ferrite Bead .047ID .138OD	0564510009
L12	Ferrite Bead .047ID .138OD	0564510009
L14	Ferrite Bead .047ID .138OD	0564510009
L15	Ferrite Bead .047ID .138OD	0564510009
L16	Inductor, Molded, 220µh, 5%	0650500008
L17	Inductor, Molded, 220µh, 5%	0650500008
L18	Inductor, Molded, 220µh, 5%	0650500008
L19	Inductor, Molded, 220µh, 5%	0650500008
L20	Inductor, Molded, 220µh, 5%	0650500008
L21	Inductor, Molded, 220µh, 5%	0650500008
L22	Inductor, Molded, 22µh, 5%	0650000005
L23	Inductor, Molded, 22µh, 5%	0650000005
L24	Inductor, Molded, 150µh, 5%	0659190001
L25	Inductor, Molded, 150µh, 5%	0659190001
L26	Inductor, Molded, 150µh, 5%	0659190001
L27	Inductor, Molded, 150µh, 5%	0659190001
L28	Inductor, Molded, 220µh, 5%	0650500008
L29	Inductor, Molded, 220µh, 5%	0650500008
L30	Inductor, Molded, 220µh, 5%	0650500008
L31	Inductor, Molded, 220µh, 5%	0650500008
L33	Inductor, Molded, 220µh, 5%	0650500008
L35	Inductor, Molded, 220µh, 5%	0650500008
L37	Inductor, Molded, 220µh, 5%	0650500008
L39	Inductor, Molded, 220µh, 5%	0650500008
L40	Inductor, Molded, 220µh, 5%	0650500008
L41	Inductor, Molded, 220µh, 5%	0650500008
L42	Inductor, Molded, 220µh, 5%	0650500008
L43	Inductor, Molded, 220µh, 5%	0650500008
L44	Inductor, Molded, 220µh, 5%	0650500008
L45	Inductor, Molded, 220µh, 5%	0650500008
L46	Inductor, Molded, 220µh, 5%	0650500008
L47	Inductor, Molded, 22µh, 5%	0650000005
L48	Inductor, Molded, 220µh, 5%	0650500008
L49	Inductor, Molded, 33µh, 5%	0659690004
L51	Inductor, Molded, 150µh, 5%	0659190001
Q1	Transistor, NPN, SI. 2N2222A	0448580004
Q3	Transistor, NPN, SI. 2N2222A	0448580004
Q4	Transistor, NPN, SI. 2N2222A	0448580004
Q5	Transistor, NPN, SI. 2N2222A	0448580004
Q6	Transistor, NPN, SI. 2N2222A	0448580004
Q7	Transistor, N-CH FET J4303 Only	0443930007
Q8	Transistor, PNP, SI, 2N2907A	0448390001
Q9	Transistor, NPN, SI 2N3700	1008500038
Q10	Transistor, PNP, SI, 2N4126	0448020009
Q11	Transistor, PNP, SI, 2N4126	0448020009

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
R1	Resistor, 12M, 5%, ¼W	1008500020
R2	Resistor, 4.7K, 5%, ¼W	0170770001
R3	Resistor, 560, 5%, ¼W	0183200004
R4	Resistor, 12M, 5%, ¼W	1008500020
R5	Resistor, 39K, 10%, ¼W	0177800003
R6	Resistor, 12M, 5%, ¼W	1008500020
R7	Resistor, 4.7K, 5%, ¼W	0170770001
R8	Resistor, 560, 5%, ¼W	0183200004
R9	Resistor, 12M, 5%, ¼W	1008500020
R10	Resistor, 39K, 10%, ¼W	0177800003
R11	Resistor, 12K, 10%, ¼W	0183180003
R12	Resistor, 4.7K, 5%, ¼W	0170770001
R13	Resistor, 560, 5%, ¼W	0183200004
R14	Resistor, 12K, 10%, ¼W	0183180003
R15	Resistor, 39K, 10%, ¼W	0177800003
R16	Resistor, 12K, 10%, ¼W	0183180003
R17	Resistor, 4.7K, 5%, ¼W	0170770001
R18	Resistor, 560, 5%, ¼W	0183200004
R19	Resistor, 12K, 10%, ¼W	0183180003
R20	Resistor, 39K, 10%, ¼W	0177800003
R22	Resistor, 4.7K, 5%, ¼W	0170770001
R23	Resistor, 27K, 10%, ¼W	0171200004
R24	Resistor, 4.7K, 5%, ¼W	0170770001
R25	Resistor, 100K, 10%, ¼W	0170390004
R26	Resistor, 4.7K, 5%, ¼W	0170770001
R27	Resistor, 4.7K, 5%, ¼W	0170770001
R28	Pot. 100K, 10%, ¾W, 15 Turns	0338490051
R29	Pot. 10K, 10%, ¾W, 15 Turns	0338490043
R30	Resistor, 12K, 10%, ¼W	0183180003
R31	Resistor, 82K, 10%, ¼W	0171680006
R32	Pot. 100K, 10%, ¾W, 15 Turns	0338490051
R33	Pot. 100K, 10%, ¾W, 15 Turns	0338490051
R34	Resistor, 10K, 10%, ¼W	0170410005
R35	Resistor, 6.8K, 5%, ¼W	0174810008
R36	Resistor, 8.2K, 10%, ¼W	0181620006
R37	Resistor, 1K, 10%, ¼W	0171560001
R38	Resistor, 10K, 10%, ¼W	0170410005
R39	Resistor, 4.7K, 10%, ¼W	0169200001
R40	Resistor, 3.9K, 10%, ¼W	0178830003
R41	Resistor, 39K, 10%, ¼W	0177800003
R42	Pot. 100K, 10%, ¾W, 15 Turns	0338490051
R43	Pot. 100K, 10%, ¾W, 15 Turns	0338490051
R44	Resistor, 1K, 10%, ¼W	0171560001
R45	Resistor, 10, 5%, ¼W	0177160004
R46	Resistor, 270, 10%, ¼W	0178450006
R47	Resistor, 8.2K, 10%, ¼W	0181620006
R48	Resistor, 5.6K, 10%, ¼W	0183060008
R49	Resistor, 470, 5%, ¼W	0184110009
R50	Resistor, 10K, 10%, ¼W	0170410005
R51	Resistor, 470, 5%, ¼W	0184110009
R52	Resistor, 1.5K, 10%, ¼W	0172470005
R53	Resistor, 100K, 10%, ¼W	0170390004
R54	Resistor, 15K, 10%, ¼W	0172350000
R55	Resistor, 22K, 5%, ¼W	0172230004
R56	Pot. 100K, 10%, ¾W, 15 Turns	0338490051
R57	Resistor, 22M, 10%, ¼W	0180950002
R58	Resistor, 4.7K, 5%, ¼W	0170770001
R59	Pot. 100K, 10%, ¾W, 15 Turns	0338490051
R60	Resistor, 4.99K, 1%, 1/8W	1005510032
R61	Pot. 100K, 10%, ¾W, 15 Turns	0338490051
R62	Resistor, 5.11K, 1%, 1/8W	1003120016
R63	Resistor, 4.7K, 5%, ¼W	0170770001
R64	Resistor, 86.6K, 1%, 1/8W	1004080000
R65	Resistor, 8.45K, 1%, 1/8W	1005900001
R66	Resistor, 1M, 10%, ¼W	0170650006
R67	Resistor, 4.7K, 5%, ¼W	0170770001
R68	Resistor, 1M, 10%, ¼W	0170650006
R69	Resistor, 86.6K, 1%, 1/8W	1004080000
R70	Resistor, 8.45K, 1%, 1/8W	1005900001
R71	Resistor, 4.7K, 5%, ¼W	0170770001

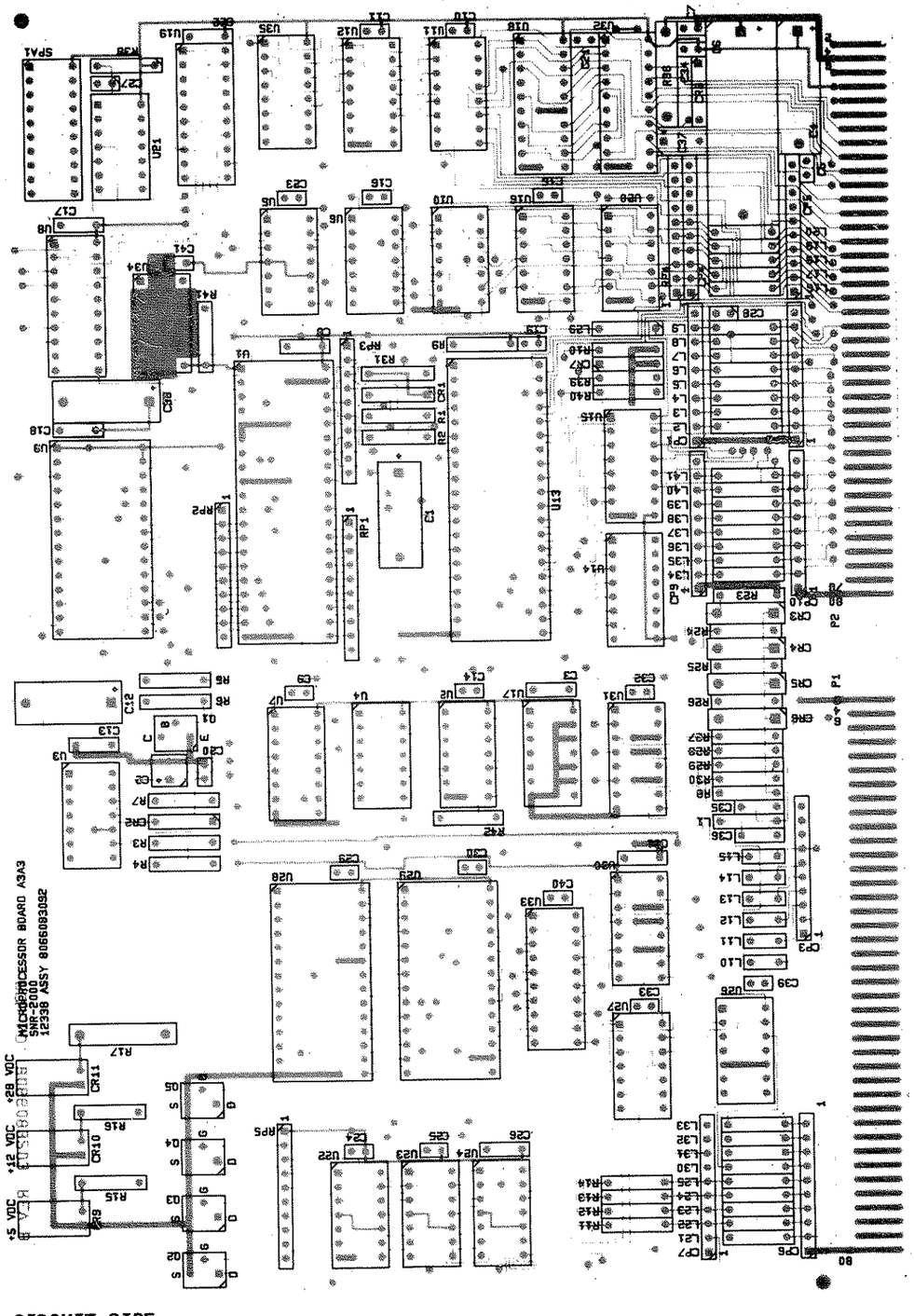
REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
R72	Resistor, 1M, 10%, ¼W	0170650006
R73	Resistor, 86.6K, 1%, 1/8W	1004080000
R74	Resistor, 8.45K, 1%, 1/8W	1005900001
R75	Resistor, 4.7K, 5%, ¼W	0170770001
R76	Resistor, 1M, 10%, ¼W	0170650006
R77	Resistor, 86.6K, 1%, 1/8W	1004080000
R78	Resistor, 8.45K, 1%, 1/8W	1005900001
R79	Resistor, 82.5K, 1%, 1/8W	1008200026
R80	Resistor, 8.66K, 1%, 1/8W	1003120008
R81	Resistor, 21K, 1%, 1/8W	1008190039
R82	Resistor, 49.9K, 1%, 1/8W	1004080026
R83	Resistor, 68.1K, 1%, 1/8W	1004080018
R84	Resistor, 10.7K, 1%, 1/8W	1004070012
R85	Resistor, 45.3K, 1%, 1/8W	1008200000
R86	Resistor, 49.9K, 1%, 1/8W	1004080026
R88	Resistor, 1.5K, 10%, ¼W	0177300001
R89	Resistor, 2.7K, 10%, ¼W	0186670001
R90	Resistor, 47K, 10%, ¼W	0171060008
R91	Resistor, 2.7K, 10%, ¼W	0186670001
R92	Resistor, 47K, 10%, ¼W	0171060008
R93	Resistor, 560, 5%, ¼W	0183200004
R94	Resistor, 2.2K, 5%, ¼W	0178070009
R96	Resistor, 5.6K, 10%, ¼W	0183060008
R97	Resistor, 5.6K, 10%, ¼W	0183060008
R98	Resistor, 6.8K, 5%, ¼W	0174810008
R99	Resistor, 1.5K, 10%, ¼W	0172470005
R100	Resistor, 1.2M, 10%, ¼W	0174930003
R101	Resistor, 2.7K, 10%, ¼W	0186670001
R102	Resistor, 47K, 10%, ¼W	0171060008
R103	Resistor, 5.6K, 10%, ¼W	0183060008
R104	Resistor, 5.6K, 10%, ¼W	0183060008
R105	Resistor, 6.8K, 5%, ¼W	0174810008
R106	Resistor, 1.5K, 10%, ¼W	0172470005
R107	Resistor, 1.2M, 10%, ¼W	0174930003
R108	Resistor, 2.7K, 10%, ¼W	0186670001
R109	Resistor, 47K, 10%, ¼W	0171060008
R110	Resistor, 5.6K, 10%, ¼W	0183060008
R111	Resistor, 5.6K, 10%, ¼W	0183060008
R112	Resistor, 6.8K, 5%, ¼W	0174810008
R113	Resistor, 1.5K, 10%, ¼W	0172470005
R114	Resistor, 1.2M, 10%, ¼W	0174930003
R115	Resistor, 2.7K, 10%, ¼W	0186670001
R116	Resistor, 47K, 10%, ¼W	0171060008
R117	Resistor, 5.6K, 10%, ¼W	0183060008
R118	Resistor, 5.6K, 10%, ¼W	0183060008
R119	Resistor, 6.8K, 5%, ¼W	0174810008
R120	Resistor, 1.5K, 10%, ¼W	0172470005
R121	Resistor, 1.2M, 10%, ¼W	0174930003
R122	Resistor, 2.7K, 10%, ¼W	0186670001
R123	Resistor, 47K, 10%, ¼W	0171060008
R124	Resistor, 150K, 1%, 1/8W	1008320030
R125	Resistor, 10K, 1%, 1/8W	1003050026
R127	Resistor, 1.65K, 1%, 1/8W	1008490032
R128	Resistor, 8.06K, 1%, 1/8W	1008500003
R129	Resistor, 150K, 1%, 1/8W	1008320030
R130	Resistor, 10K, 1%, 1/8W	1003050026
R132	Resistor, 1.65K, 1%, 1/8W	1008490032
R133	Resistor, 8.06K, 1%, 1/8W	1008500003
R134	Resistor, 150K, 1%, 1/8W	1008320030
R135	Resistor, 10K, 1%, 1/8W	1003050026
R136	Resistor, 1M, 10%, ¼W	0170650006
R137	Resistor, 1.65K, 1%, 1/8W	1008490032
R138	Resistor, 8.06K, 1%, 1/8W	1008500003
R139	Resistor, 150K, 1%, 1/8W	1008320030
R140	Resistor, 10K, 1%, 1/8W	1003050026
R141	Resistor, 470K, 10%, ¼W	0180570005
R142	Resistor, 1.65K, 1%, 1/8W	1008490032
R143	Resistor, 8.06K, 1%, 1/8W	1008500003
R144	Resistor, 33.2K, 1%, 1/8W	0196470005
R145	Resistor, 4.7K, 5%, ¼W	0170770001

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
R146	Resistor, 10K, 1%, 1/8W	1003050026
R147	Resistor, 10K, 1%, 1/8W	1003050026
R148	Resistor, 4.87K, 1%, 1/8W	1008520004
R149	Resistor, 33.2K, 1%, 1/8W	0196470005
R150	Resistor, 4.7K, 5%, ¼W	0170770001
R151	Resistor, 10K, 1%, 1/8W	1003050026
R152	Resistor, 10K, 1%, 1/8W	1003050026
R153	Resistor, 4.87K, 1%, 1/8W	1008520004
R154	Resistor, 33.2K, 1%, 1/8W	0196470005
R155	Resistor, 4.7K, 5%, ¼W	0170770001
R156	Resistor, 10K, 1%, 1/8W	1003050026
R157	Resistor, 10K, 1%, 1/8W	1003050026
R158	Resistor, 4.87K, 1%, 1/8W	1008520004
R159	Resistor, 33.2K, 1%, 1/8W	0196470005
R160	Resistor, 4.7K, 5%, ¼W	0170770001
R161	Resistor, 10K, 1%, 1/8W	1003050026
R162	Resistor, 10K, 1%, 1/8W	1003050026
R163	Resistor, 4.87K, 1%, 1/8W	1008520004
R164	Pot. 10K, 10%, ¾W, 15 Turns	0338490043
R165	Resistor, 2.7K, 10%, ¼W	0186670001
R166	Resistor, 47K, 10%, ¼W	0171060008
R167	Resistor, 2.7K, 10%, ¼W	0186670001
R168	Resistor, 47K, 10%, ¼W	0171060008
R172	Resistor, 12K, 10%, ¼W	0183180003
R173	Resistor, 12M, 5%, ¼W	1008500020
R174	Resistor, 4.7K, 5%, ¼W	0170770001
R175	Resistor, 150K, 10%, ¼W	0176750002
R176	Resistor, 82, 10%, ¼W	0184610001
R177	Resistor, 49.9K, 1%, 1/8W	1004080026
R178	Resistor, 34.8K, 1%, 1/8W	1008320021
R179	Resistor, 5.6K, 10%, ¼W	0183060008
R180	Resistor, 18K, 10%, ¼W	0175720002
R181	Resistor, 33K, 10%, ¼W	0177920009
R182	Resistor, 10K, 10%, ¼W	0170410005
R183	Resistor, 33K, 10%, ¼W	0177920009
R184	Resistor, 10K, 10%, ¼W	0170410005
R185	Resistor, 5.6K, 10%, ¼W	0183060008
R186	Resistor, 18K, 10%, ¼W	0175720002
R187	Resistor, 33K, 10%, ¼W	0177920009
R188	Resistor, 10K, 10%, ¼W	0170410005
R189	Resistor, 5.6K, 10%, ¼W	0183060008
R190	Resistor, 18K, 10%, ¼W	0175720002
R191	Resistor, 33K, 10%, ¼W	0177920009
R192	Resistor, 10K, 10%, ¼W	0170410005
R193	Resistor, 5.6K, 10%, ¼W	0183060008
R194	Resistor, 18K, 10%, ¼W	0175720002
R195	Resistor, 8.2K, 10%, ¼W	0181620006
R196	Resistor, 8.2K, 10%, ¼W	0181620006
R197	Resistor, 8.2K, 10%, ¼W	0181620006
R198	Resistor, 8.2K, 10%, ¼W	0181620006
R199	Resistor, 137K, 1%, 1/8W	1008500011
R200	Resistor, 137K, 1%, 1/8W	1008500011
R201	Resistor, 137K, 1%, 1/8W	1008500011
R202	Resistor, 137K, 1%, 1/8W	1008500011
R203	Resistor, 4.7K, 5%, ¼W	0170770001
R204	Resistor, 4.7K, 5%, ¼W	0170770001
R205	Resistor, 4.7K, 5%, ¼W	0170770001
R206	Resistor, 4.7K, 5%, ¼W	0170770001
R207	Resistor, 560, 5%, ¼W	0183200004
R208	Resistor, 2.2K, 5%, ¼W	0178070009
R209	Resistor, 4.7K, 5%, ¼W	0170770001
R210	Resistor, 10K, 10%, ¼W	0170410005
R211	Resistor, 560, 5%, ¼W	0183200004
R212	Resistor, 2.2K, 5%, ¼W	0178070009
R213	Resistor, 10, 5%, ¼W	0177160004
RP1	Res Ntwk 10 Pin Sip 10K Com	1006130021
RP2	Res Ntwk 8 Pin Sip 10K Com	1005200009
RP3	Res Ntwk 8 Pin Sip 10K Com	1005200009
U1	IC. Linear LM339N	1003970028
U2	IC. Linear LM339N	1003970028

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
U3	IC. Digital 74HC244	1006460039
U4	IC. Digital 74HC374	1006450033
U5	IC. Digital ULN2003A	1005630038
U6	IC. Digital 74HC14	1006490027
U7	IC. Digital 74HC244	1006460039
U8	IC. Digital 74HC244	1006460039
U9	IC. Linear LM339N	1003970028
U10	IC. Linear LM324N	1003970001
U11	IC. Linear LM339N	1003970028
U12	IC. Linear LM339N	1003970028
U13	IC. Linear LM339N	1003970028
U14	IC. Linear LM324N	1003970001
U15	IC. Linear LM339N	1003970028
U16	IC. Linear LM324N	1003970001
U17	IC. Digital 4067B	1006800034
U18	IC. Digital 74HC374	1006450033
U19	IC. Digital 74HC244	1006460039
U20	IC. Linear LM324N	1003970001
U21	IC. Digital, DC/DC Converter	1008190012
U22	IC. Digital, DAS5V3 Inverter	1008190021



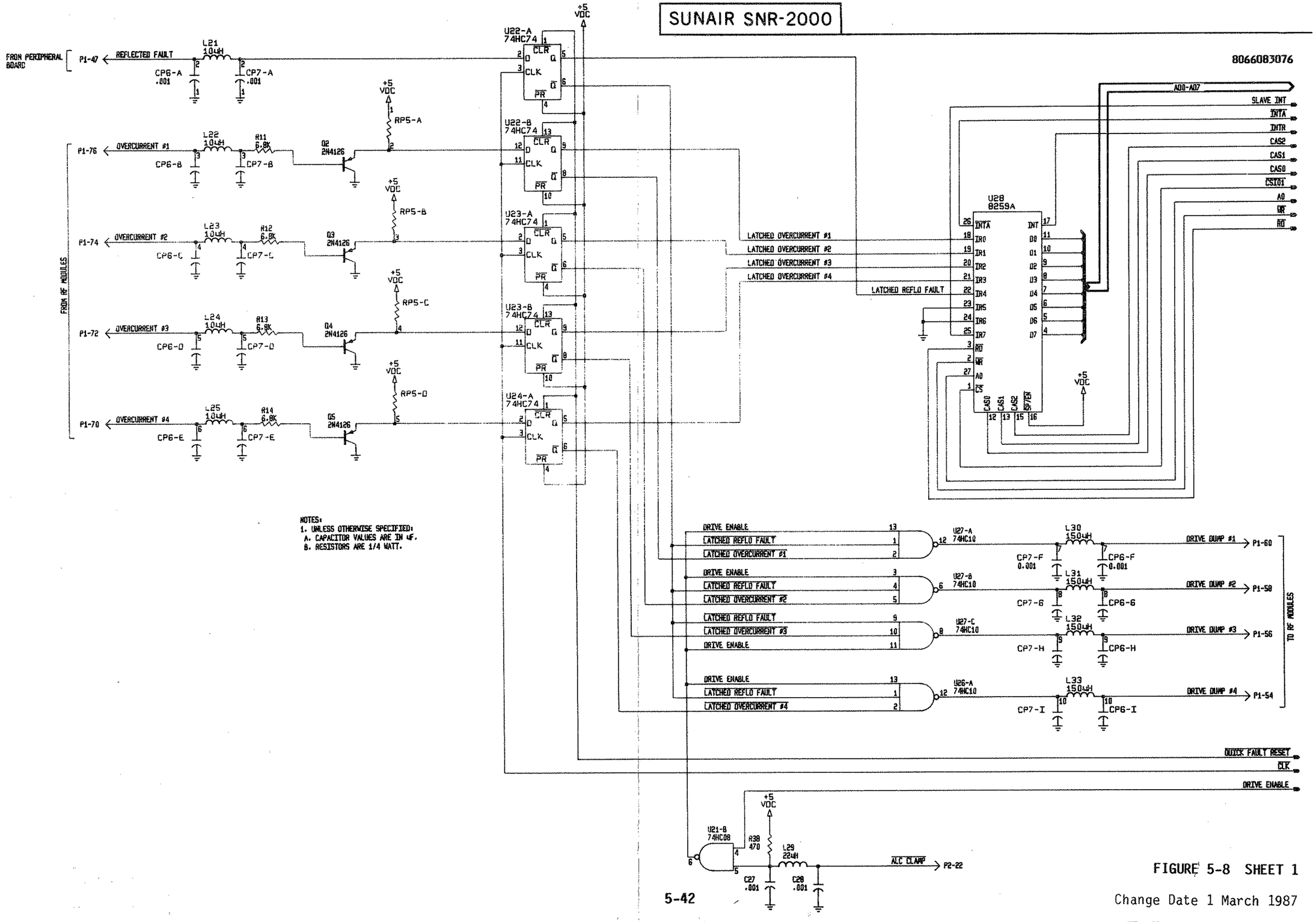
COMPONENT SIDE



CIRCUIT SIDE

FIGURE 5-8 MICROPROCESSOR BOARD A3A3

8066083076



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. CAPACITOR VALUES ARE IN uF.
   B. RESISTORS ARE 1/4 WATT.

FIGURE 5-8 SHEET 1

Change Date 1 March 1987

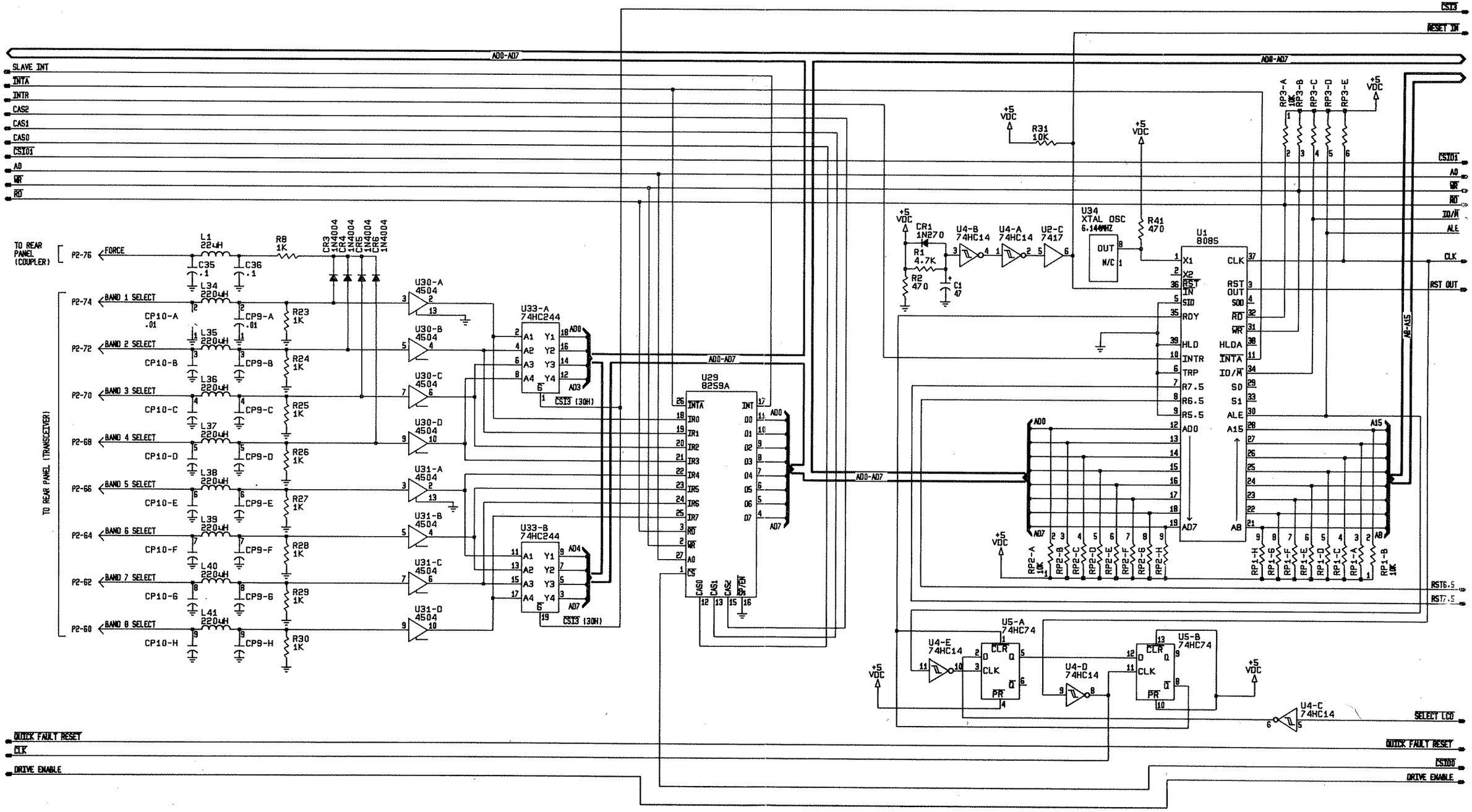


FIGURE 5-8 SHEET 2

8066083076

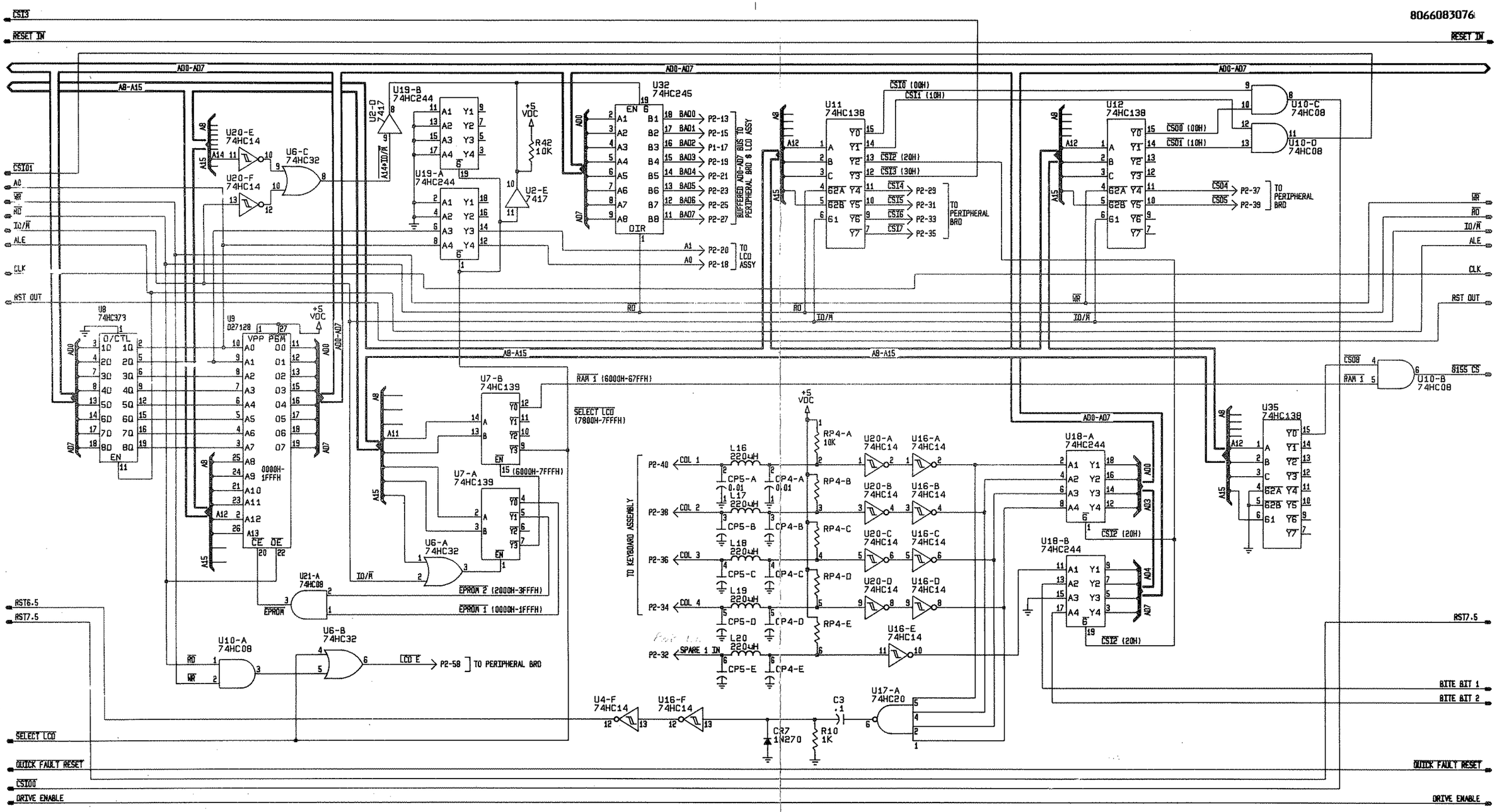
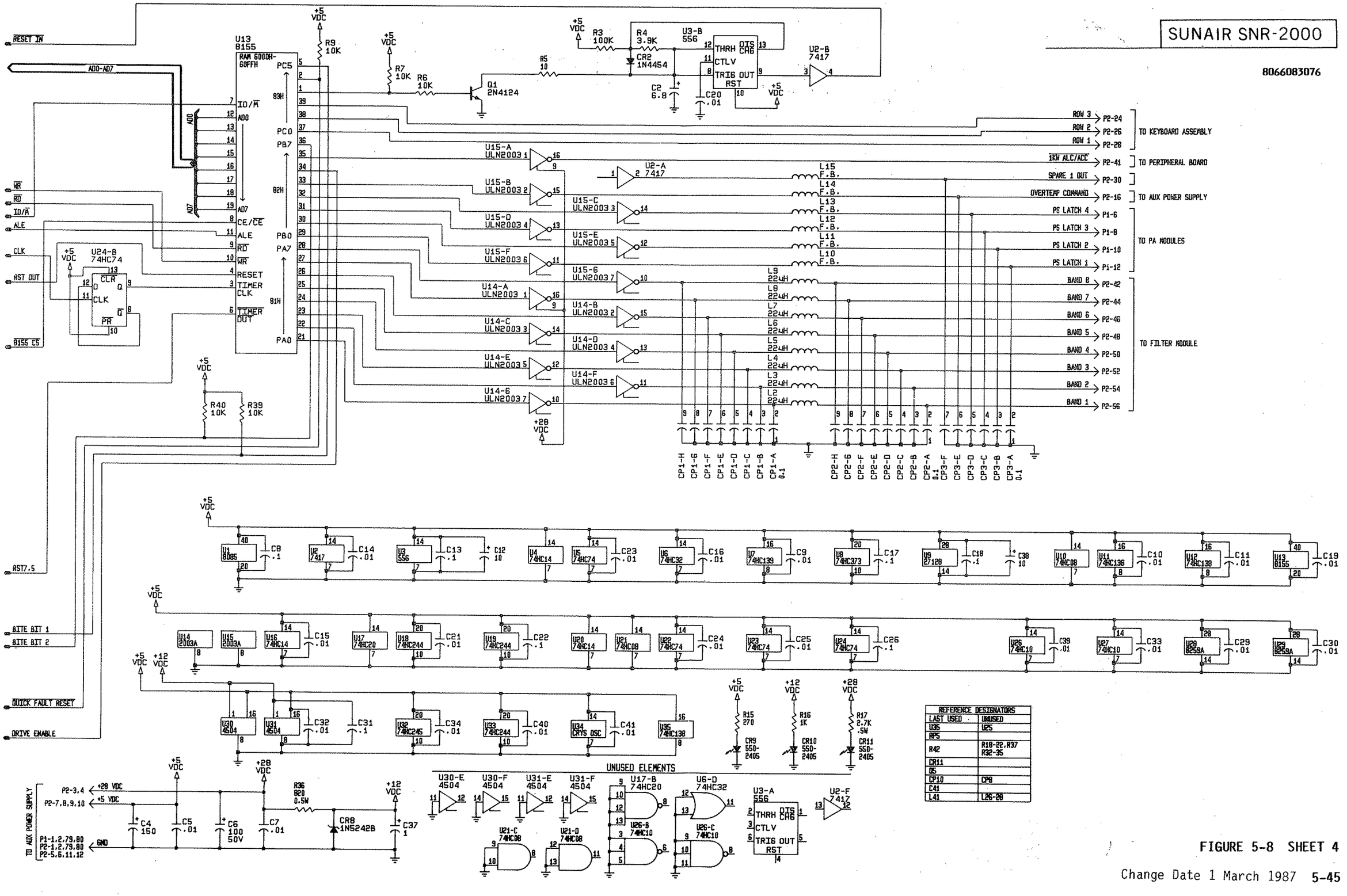


FIGURE 5-8 SHEET 3



REFERENCE DESIGNATORS	
LAST USED	UNUSED
U35	U25
RP5	
R42	R18-22,R37 R32-35
CR11	
D5	
CP10	CP8
C41	
L41	L26-28

FIGURE 5-8 SHEET 4

8066083092F PC ASSY, MICRO P A3A3

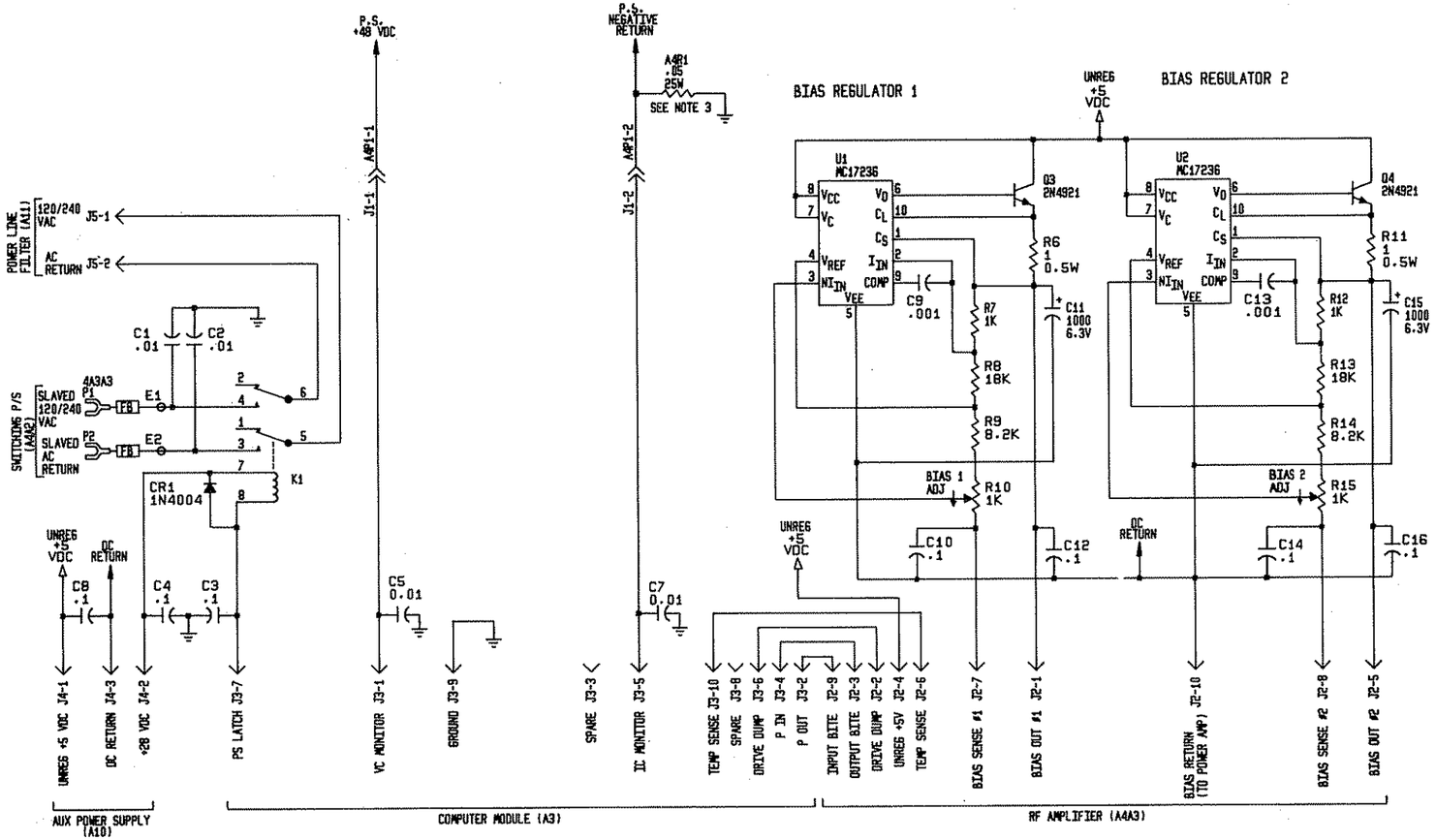
REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSY, MICRO P A3A3	8066083092
C1	Cap. 47µf, 16V	1006150021
C2	Cap. 6.8µf, 20V, T368	0296780006
C3	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C4	Cap. 150µf, 16V	1006150013
C5	Cap. .01µf, 50V, X7R, 20%	0281730008
C6	Cap. 100µf, 50V	1004260016
C7	Cap. .01µf, 50V, X7R, 20%	0281730008
C8	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C9	Cap. .01µf, 50V, X7R, 20%	0281730008
C10	Cap. .01µf, 50V, X7R, 20%	0281730008
C11	Cap. .01µf, 50V, X7R, 20%	0281730008
C12	Cap. 10µf, 25V	1006150005
C13	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C14	Cap. .01µf, 50V, X7R, 20%	0281730008
C15	Cap. .01µf, 50V, X7R, 20%	0281730008
C16	Cap. .01µf, 50V, X7R, 20%	0281730008
C17	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C18	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C19	Cap. .01µf, 50V, X7R, 20%	0281730008
C20	Cap. .01µf, 50V, X7R, 20%	0281730008
C21	Cap. .01µf, 50V, X7R, 20%	0281730008
C22	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C23	Cap. .01µf, 50V, X7R, 20%	0281730008
C24	Cap. .01µf, 50V, X7R, 20%	0281730008
C25	Cap. .01µf, 50V, X7R, 20%	0281730008
C26	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C27	Cap. .001µf, 100V, X7R, 20%	0281630003
C28	Cap. .001µf, 100V, X7R, 20%	0281630003
C29	Cap. .01µf, 50V, X7R, 20%	0281730008
C30	Cap. .01µf, 50V, X7R, 20%	0281730008
C31	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C32	Cap. .01µf, 50V, X7R, 20%	0281730008
C33	Cap. .01µf, 50V, X7R, 20%	0281730008
C34	Cap. .01µf, 50V, X7R, 20%	0281730008
C35	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C36	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C37	Cap. 1µf, 35V, 196D	0281660000
C38	Cap. 10µf, 25V	1006150005
C39	Cap. .01µf, 50V, X7R, 20%	0281730008
C40	Cap. .01µf, 50V, X7R, 20%	0281730008
C41	Cap. .01µf, 50V, X7R, 20%	0281730008
CP1	Cap Ntwk 10 Pin, .1µf	1006580018
CP2	Cap Ntwk 10 Pin, .1µf	1006580018
CP3	Cap Ntwk 10 Pin, .1µf	1006580018
CP4	Cap Ntwk 10 Pin, .01µf	1006540016
CP5	Cap Ntwk 10 Pin, .01µf	1006540016
CP6	Cap Ntwk, .001µf	1008020001
CP7	Cap Ntwk, .001µf	1008020001
CP9	Cap Ntwk 10 Pin, .01µf	1006540016
CP10	Cap Ntwk 10 Pin, .01µf	1006540016
CR1	Diode, Signal, Germ. 1N270	0405510004
CR2	Diode, Signal, Sil. 1N4454	0405270003
CR3	Diode, Rectifier 1N4004	0405180004
CR4	Diode, Rectifier 1N4004	0405180004
CR5	Diode, Rectifier 1N4004	0405180004
CR6	Diode, Rectifier 1N4004	0405180004
CR7	Diode, Signal, Germ. 1N270	0405510004
CR8	Diode, Zener 1N5242B	0400120003
CR9	Diode, LED, Red, PC Mount (+5V)	1008480029
CR10	Diode, LED, Red, PC Mount (+12V)	1008480029
CR11	Diode, LED, Red, PC Mount (+28V)	1008480029
L1	Inductor, Molded, 22µh, 5%	0650000005
L2	Inductor, Molded, 22µh, 5%	0650000005
L3	Inductor, Molded, 22µh, 5%	0650000005
L4	Inductor, Molded, 22µh, 5%	0650000005
L5	Inductor, Molded, 22µh, 5%	0650000005
L6	Inductor, Molded, 22µh, 5%	0650000005
L7	Inductor, Molded, 22µh, 5%	0650000005

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
L8	Inductor, Molded, 22µh, 5%	0650000005
L9	Inductor, Molded, 22µh, 5%	0650000005
L10	Ferrite Bead .047ID .138OD	0564510009
L11	Ferrite Bead .047ID .138OD	0564510009
L12	Ferrite Bead .047ID .138OD	0564510009
L13	Ferrite Bead .047ID .138OD	0564510009
L14	Ferrite Bead .047ID .138OD	0564510009
L15	Ferrite Bead .047ID .138OD	0564510009
L16	Inductor, Molded, 220µh, 5%	0650500008
L17	Inductor, Molded, 220µh, 5%	0650500008
L18	Inductor, Molded, 220µh, 5%	0650500008
L19	Inductor, Molded, 220µh, 5%	0650500008
L20	Inductor, Molded, 220µh, 5%	0650500008
L21	Inductor, Molded, 10µh, 5%	0659570009
L22	Inductor, Molded, 10µh, 5%	0659570009
L23	Inductor, Molded, 10µh, 5%	0659570009
L24	Inductor, Molded, 10µh, 5%	0659570009
L25	Inductor, Molded, 10µh, 5%	0659570009
L29	Inductor, Molded, 22µh, 5%	0650000005
L30	Inductor, Molded, 150µh, 5%	0659190001
L31	Inductor, Molded, 150µh, 5%	0659190001
L32	Inductor, Molded, 150µh, 5%	0659190001
L33	Inductor, Molded, 150µh, 5%	0659190001
L34	Inductor, Molded, 220µh, 5%	0650500008
L35	Inductor, Molded, 220µh, 5%	0650500008
L36	Inductor, Molded, 220µh, 5%	0650500008
L37	Inductor, Molded, 220µh, 5%	0650500008
L38	Inductor, Molded, 220µh, 5%	0650500008
L39	Inductor, Molded, 220µh, 5%	0650500008
L40	Inductor, Molded, 220µh, 5%	0650500008
L41	Inductor, Molded, 220µh, 5%	0650500008
Q1	Transistor, NPN, SI.. 2N4124	0448010003
Q2	Transistor, PNP, SI.. 2N4126	0448020009
Q3	Transistor, PNP, SI.. 2N4126	0448020009
Q4	Transistor, PNP, SI.. 2N4126	0448020009
Q5	Transistor, PNP, SI.. 2N4126	0448020009
R1	Resistor, 4.7K, 5%, ¼W	0170770001
R2	Resistor, 470, 5%, ¼W	0184110009
R3	Resistor, 100K, 10%, ¼W	0170390004
R4	Resistor, 3.9K, 10%, ¼W	0178830003
R5	Resistor, 10, 5%, ¼W	0177160004
R6	Resistor, 10K, 10%, ¼W	0170410005
R7	Resistor, 10K, 10%, ¼W	0170410005
R8	Resistor, 1K, 10%, ¼W	0171560001
R9	Resistor, 10K, 10%, ¼W	0170410005
R10	Resistor, 1K, 10%, ¼W	0171560001
R11	Resistor, 6.8K, 5%, ¼W	0174810008
R12	Resistor, 6.8K, 5%, ¼W	0174810008
R13	Resistor, 6.8K, 5%, ¼W	0174810008
R14	Resistor, 6.8K, 5%, ¼W	0174810008
R15	Resistor, 270, 10%, ¼W	0178450006
R16	Resistor, 1K, 10%, ¼W	0171560001
R17	Resistor, 2.7K, 10%, ¼W	0165780002
R23	Resistor, 1K, 10%, ¼W	0171560001
R24	Resistor, 1K, 10%, ¼W	0171560001
R25	Resistor, 1K, 10%, ¼W	0171560001
R26	Resistor, 1K, 10%, ¼W	0171560001
R27	Resistor, 1K, 10%, ¼W	0171560001
R28	Resistor, 1K, 10%, ¼W	0171560001
R29	Resistor, 1K, 10%, ¼W	0171560001
R30	Resistor, 1K, 10%, ¼W	0171560001
R31	Resistor, 10K, 10%, ¼W	0170410005
R36	Resistor, 820, 10%, ¼W	0175600007
R38	Resistor, 470, 5%, ¼W	0184110009
R39	Resistor, 10K, 10%, ¼W	0170410005
R40	Resistor, 10K, 10%, ¼W	0170410005
R41	Resistor, 470, 5%, ¼W	0184110009
R42	Resistor, 10K, 10%, ¼W	0170410005
RP1	Res Ntwk 10 Pin Sip 10K, Com	1006130021

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
RP2	Res Ntwk 10 Pin Sip 10K, Com	1006130021
RP3	Res Ntwk 6 Pin Sip 10K, Com	1006130004
RP4	Res Ntwk 6 Pin Sip 10K, Com	1006130004
RP5	Res Ntwk 10 Pin Sip 10K, Com	1006130021
U1	IC. Digital 8085A	1005780021
U2	IC. Digital, Hex Driv. SN7417N	1003870007
U3	IC. Linear 556C/3456	1005620032
U4	IC. Digital 74HC14	1006490027
U5	IC. Digital 74HC74	1008000019
U6	IC. Digital 74HC32	1006470026
U7	IC. Digital 74HC139	1006770038
U8	IC. Digital 74HC373	1006480030
U9	**SEE OPTIONAL BELOW**	
U10	IC. Digital 74HC08	1006490019
U11	IC. Digital 74HC138	1006480013
U12	IC. Digital 74HC138	1006480013
U13	IC. Digital P8155H	1005780030
U14	IC. Digital ULN2003A	1005630038
U15	IC. Digital ULN2003A	1005630038
U16	IC. Digital 74HC14	1006490027
U17	IC. Digital 74HC20	1008000035
U18	IC. Digital 74HC244	1006460039
U19	IC. Digital 74HC244	1006460039
U20	IC. Digital 74HC14	1006490027
U21	IC. Digital 74HC08	1006490019
U22	IC. Digital 74HC74	1008000019
U23	IC. Digital 74HC74	1008000019
U24	IC. Digital 74HC74	1008000019
U26	IC. Digital 74HC10	1008010006
U27	IC. Digital 74HC10	1008010006
U28	IC. Digital 8259A	1006800018
U29	IC. Digital 8259A	1006800018
U30	IC. Digital MC14504	1006090037
U31	IC. Digital MC14504	1006090037
U32	IC. Digital 74HC245	1006470034
U33	IC. Digital 74HC244	1006460039
U34	Crystal Oscillator, 6.144 MHz	1008180033
U35	IC. Digital 74HC138	1006480013
XU1	Socket, IC. 40 Pin tailless	1006620010
XU9	Socket, IC. 28 Pin tailless	1006620001

OPTIONAL

EPROM U9 P/N 8066083297 is for use when SNR-2000 is used with a GCU-1935.
EPROM U9 P/N 8066084293 is for use when SNR-2000 is used with a SNR-2000DAC.



NOTES:
1. UNLESS OHERWISE SPECIFIED:
   A. CAPACITOR VALUES ARE IN uF.
   B. RESISTOR VALUES ARE IN Ω'S AND ARE 1/4 WATT.
2. PREFIX ALL DESIGNATORS WITH 4A1.
3. COMPONENT A4R1 IS MOUNTED OFF-BOARD.

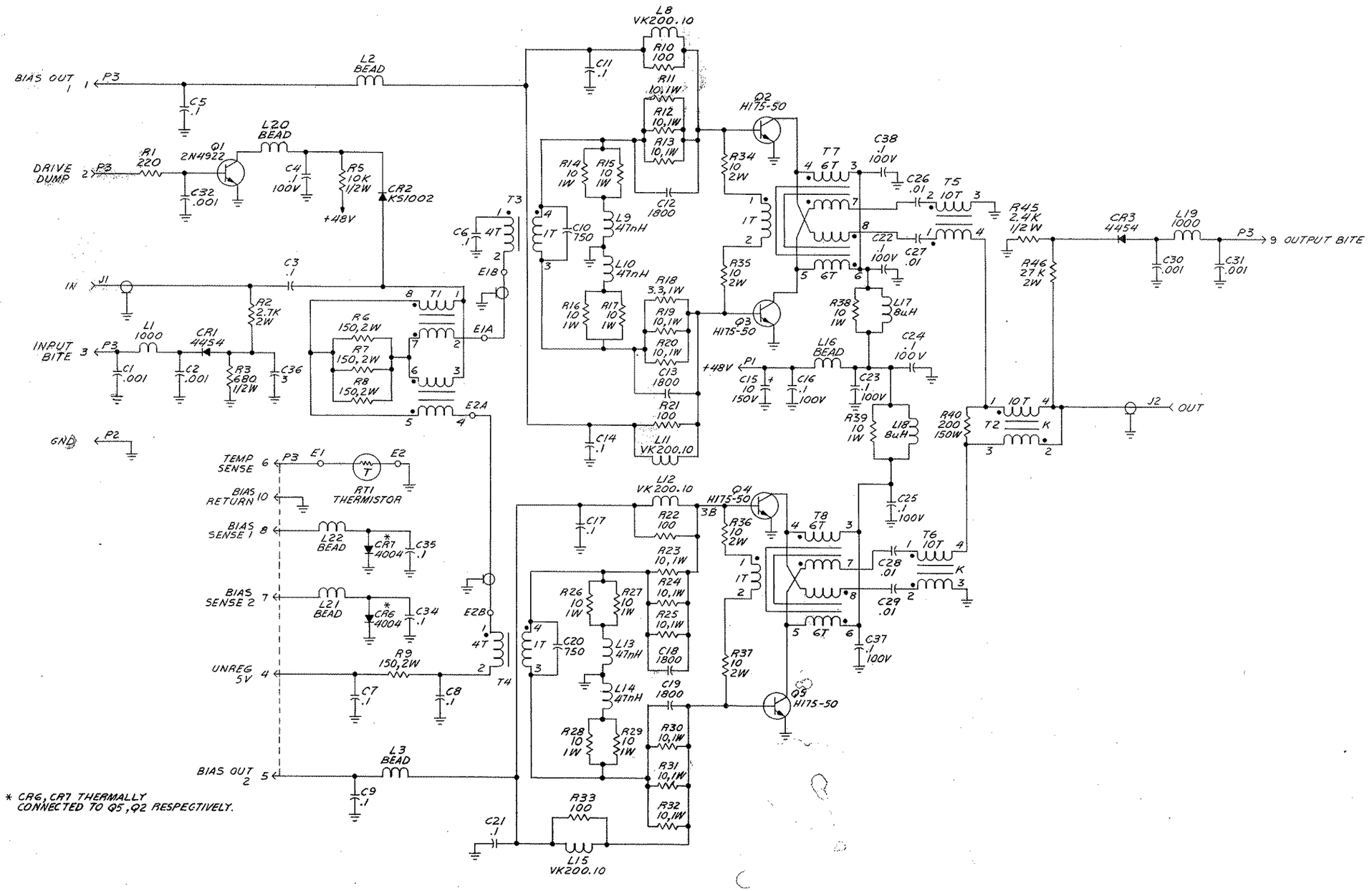
FIGURE 5-9 MODULE CONTROL BOARD A4A1

8066335091A PC ASSEMBLY 48V SWITCHING PS

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSEMBLY 48V SWITCHING PS	8066335091
C1	Capacitor, 1µf, 250VAC 20%	1007280000
C3	Capacitor, 0.02µf, 1000V, Y5U, 20%	1007280018
C4	Capacitor, 0.02µf, 1000V, Y5U, 20%	1007280018
C5	Capacitor, 1000µf, 200V	1007280026
C6	Capacitor, 1000µf, 200V	1007280026
C7	Capacitor, 1000µf, 200V	1007280026
C8	Capacitor, 1000µf, 200V	1007280026
C9	Capacitor, 0.02µf, 1000V, Y5U, 20%	1007280018
C10	Capacitor, 0.02µf, 1000V, Y5U, 20%	1007280018
C11	Capacitor, 0.02µf, 1000V, Y5U, 20%	1007280018
C12	Capacitor, 0.02µf, 1000V, Y5U, 20%	1007280018
C13	Capacitor, 2µf, 200V, 10%	1007280034
C14	Capacitor, 2µf, 200V, 10%	1007280034
C15	Capacitor, 10µf, 20V	1007290005
C16	Capacitor, 10µf, 20V	1007290005
C17	Capacitor, 0.01µf, 1000V, Z5U, 20%	0243550006
C19	Capacitor, 0.0022µf, 200V, Z5F, 10%	0272780006
C20	Capacitor, 10µf, 20V	1007290005
C22	Capacitor, 0.0022µf, 1000V, Y5P, 10%	1007290013
C23	Capacitor, 0.1µf, 50V, X7R, 20%	0281610002
C24	Capacitor, 0.1µf, 50V, X7R, 20%	0281610002
C25	Capacitor, 1µf, 35V, 196D	0281660000
C26	Capacitor, 10µf, 20V	1007290005
C27	Capacitor, 0.1µf, 50V, X7R, 20%	0281610002
C28	Capacitor, 10µf, 20V	1007290005
C29	Capacitor, 0.02µf, 1000V, Y5U, 20%	1007280018
C30	Capacitor, 100µf, 50V	1004260016
C31	Capacitor, 0.001µf, 1000V, Z5R, 10%	0295010002
C32	Capacitor, 0.0047µf, 1000V, Y5U, 20%	1007290021
C33	Capacitor, 0.0022µf, 1000V, Y5P, 10%	1007290013
C34	Capacitor, 0.47µf, 250V, 10%	1007290030
C35	Capacitor, 0.47µf, 250V, 10%	1007290030
C36	Capacitor, 470µf, 100V	1007300001
C37	Capacitor, 470µf, 100V	1007300001
C38	Capacitor, 470µf, 100V	1007300001
C39	Capacitor, 470µf, 100V	1007300001
C40	Capacitor, 470µf, 100V	1007300001
C41	Capacitor, 470µf, 100V	1007300001
C42	Capacitor, 0.47µf, 250V, 10%	1007290030
C43	Capacitor, 10µf, 20V	1007290005
C44	Capacitor, 10µf, 20V	1007290005
C45	Capacitor, 1µf, 35V, 196D	0281660000
C46	Capacitor, 0.001µf, 100V, X7R, 20%	0281630003
CR1	Diode, Bridge KBPC25	1007300027
CR2	Diode, Rectifier 1N4936	1007300035
CR3	Diode, Rectifier 1N4936	1007300035
CR4	Diode, Rectifier 1N5402	1007310006
CR5	Diode, Rectifier 1N5402	1007310006
CR6	Diode, Rectifier 1N5402	1007310006
CR7	Diode, Rectifier 1N5402	1007310006
CR8	Diode, Rectifier 1N5402	1007310006
CR9	Diode, Rectifier 1N5402	1007310006
CR10	Diode, Rectifier 1N5402	1007310006
CR11	Diode, Rectifier 1N5402	1007310006
CR12	Diode, SCR 2N1595	1007330015
CR13	Diode, Rectifier 1N4004	0405180004
CR14	Diode, Rectifier 1N5819	1007310014
CR15	Diode, Rectifier 1N4004	0405180004
CR16	Diode, Rectifier 1N4004	0405180004
CR17	Diode, Rectifier 1N5819	1007310014
CR18	Diode, Rectifier 1N5819	1007310014
CR19	Diode, Rectifier 1N5819	1007310014
CR20	Diode, Zener 1N4758A	1007310022
CR21	Diode, Rectifier 1N4936	1007300035
CR22	Diode, Rectifier 1N4936	1007300035
CR23	Diode, Rectifier 1N4936	1007300035
CR24	Diode, Rectifier, Dual, 2605	1007320010

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
F1	Fuse, MDA, 20 Amp, 250V	1007340002
L1	Inductor, Choke, Input PS	8066335407
L2	Inductor, Choke, Output PS	8066335504
L3	Inductor, Choke, Output PS	8066335504
Q1	Transistor, NPN, SI 2N6678	1007320028
Q2	Transistor, NPN, SI 2N6678	1007320028
Q3	Transistor, NPN, SI 2N3566	1007320036
Q4	Transistor, N-CH FET MPF6661	1007330007
Q5	Transistor, N-CH FET MPF6661	1007330007
R1	Thermistor, NTC, 0.5 at 25C	1007300019
R2	Thermistor, NTC, 5 at 25C	1007320001
R3	Resistor, 240K, 5%, ½W	1007250003
R4	Resistor, 240K, 5%, ½W	1007250003
R6	Resistor, 2K, 1%, ½W	1007260017
R7	Resistor, 2.49K, 1%, ½W	1007260025
R8	Resistor, 27, 10%, ½W	1007250011
R9	Resistor, 4990, 1%, ½W	0193500001
R10	Resistor, 1K, 10%, ½W	0167480006
R11	Resistor, 2.49K, 1%, ½W	1007260025
R12	Resistor, 10.7K, 1%, ½W	1007260033
R13	Resistor, 20.5K, 1%, ½W	1007270004
R14	Resistor, 2.2K, 10%, ½W	0167360001
R15	Resistor, 22K, 10%, ½W	0167120000
R16	Resistor, 45.3K, 1%, ½W	1007270012
R17	Resistor, 97.6, 1%, ½W	1007270021
R18	Resistor, 1K, 10%, ½W	0167480006
R19	Resistor, 2.2K, 10%, ½W	0167360001
R20	Resistor, 2.2K, 10%, ½W	0167360001
R21	Resistor, 3.3K, 5%, ½W	0184090008
R22	Resistor, 3.3K, 5%, ½W	0184090008
R23	Resistor, 10.7K, 1%, ½W	1007260033
R24	Pot. 5K, 10%, ½W, 4 Turns	0197510001
R25	Resistor, 350, 5%, 3W	0162930003
R26	Resistor, 226, 1%, ½W	1007270039
R27	Resistor, 27, 10%, ½W	1007250011
R28	Resistor, 4.7K, 10%, ½W	0169200001
R29	Resistor, 10, 10%, 2W	1007250020
R30	Resistor, 10, 10%, 2W	1007250020
R31	Resistor, 33, 10%, 2W	1007250038
R32	Resistor, 1K, 5%, 5W	0190370009
R33	Resistor, 220, 10%, ½W	0172850002
R34	Resistor, 470, 10%, ½W	0173900003
R35	Pot. 10K, 20%, ½W, PC Mount	0346670004
S1	Thermostat, N.O., 82 DEG C	1007330031
T1	Transformer, Driver, PS	8066335601
T2	Transformer, Power, PS	8066335709
T3	Transformer, Current Sense PS	8066335806
TB1	Barrier Strip, 5 Pos, PC MT	1007340011
TB2	Barrier Strip, 4 Pos, PC MT	1007340029
	MISCELLANEOUS	
	Barrier Jumper, 2 Pos	1007340037
	Fuseclip, PC Mount	0534610005
	Heatsink, Bridge Rectifier	8066336403
	Heatsink, Dual Rectifier	8066336608
	Heatsink, Transistor, PS	8066336802
	Mica Ins. TO-3 Transistor	0440940001
	IC. Linear LM3524	1007330023

PAGES 5-51 and 5-52 have been left blank intentionally.



* CR6, CR7 THERMALLY CONNECTED TO Q5, Q2 RESPECTIVELY.

FIGURE 5-11 POWER AMPLIFIER A4A3

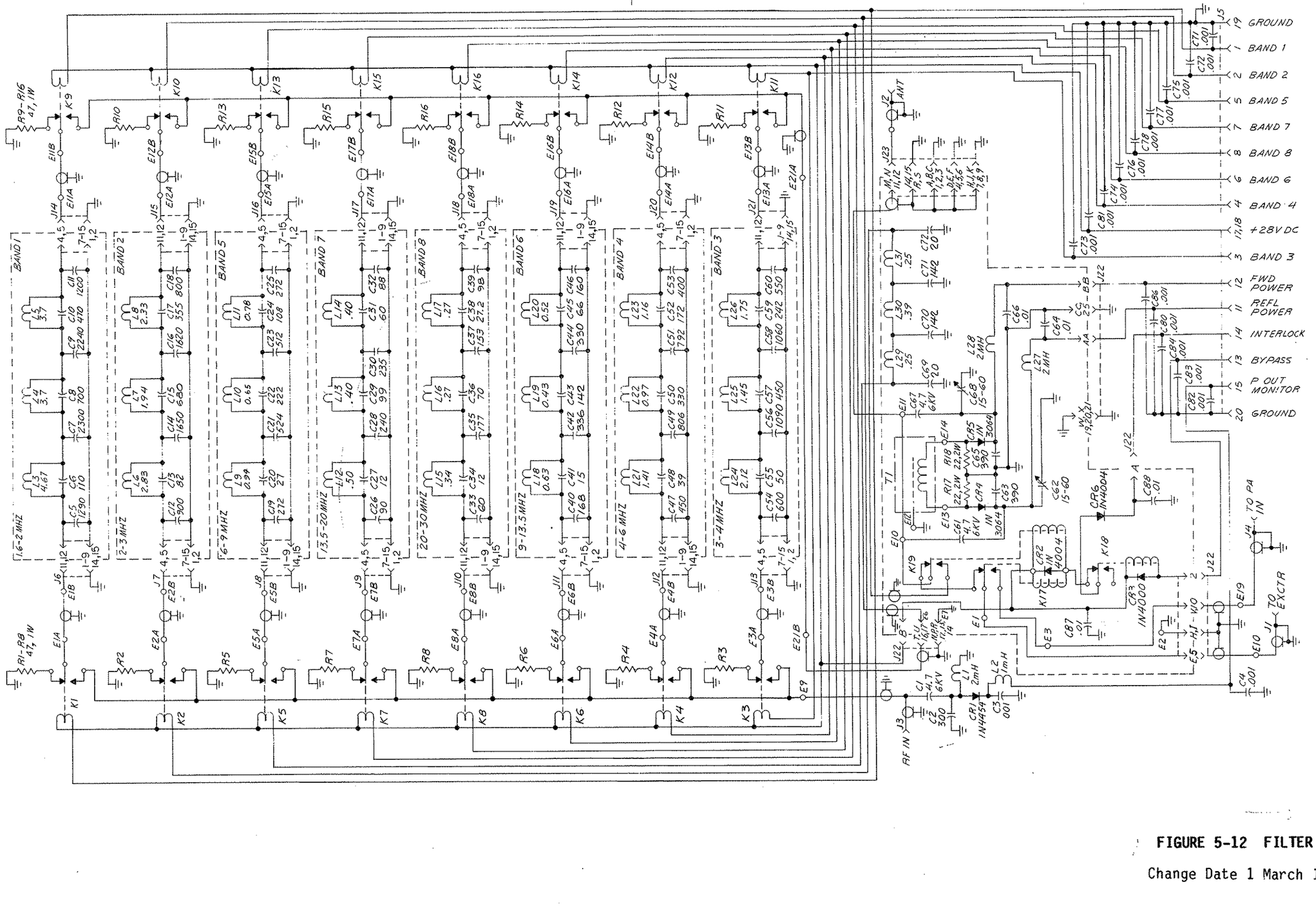
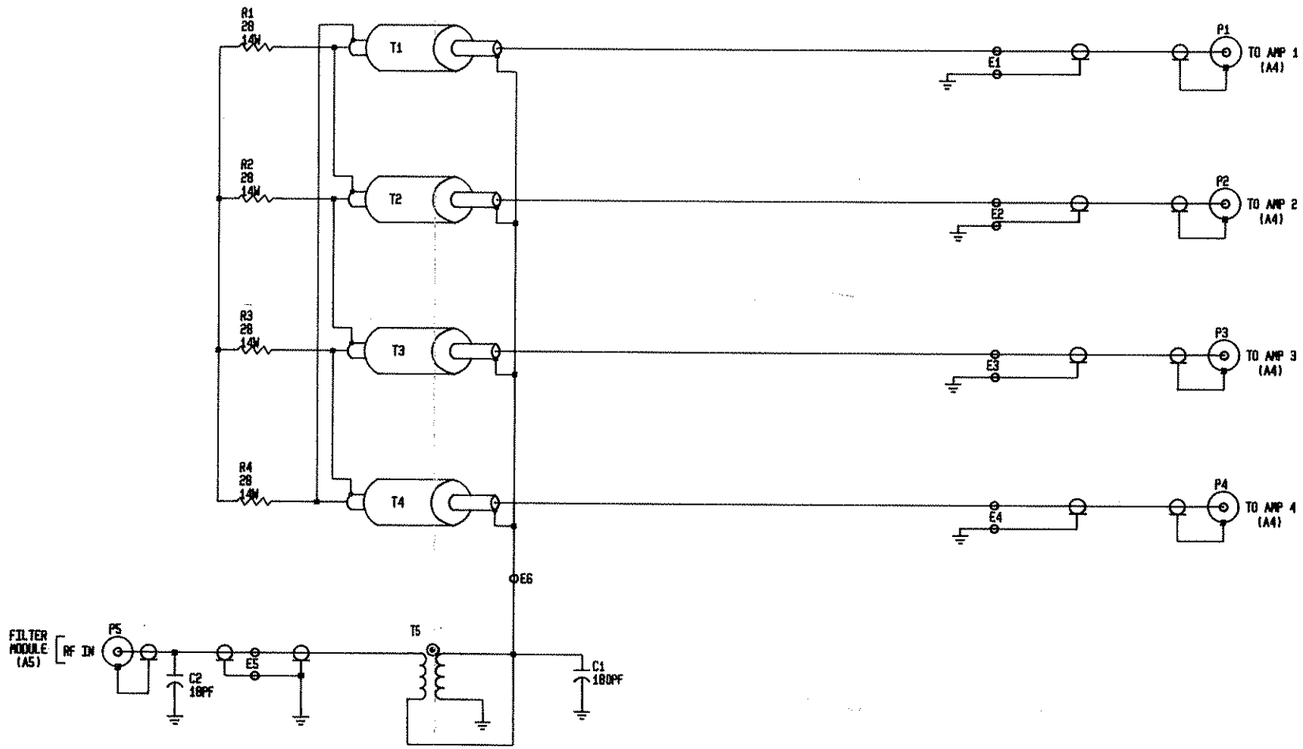


FIGURE 5-12 FILTER MODULE A5

8066070098G SPLITTER MODULE A7

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	SPLITTER MODULE A7	8066070098
A7P1	Connector, RF, Subminiature	0753700000
A7P2	Connector, RF, Subminiature	0753700000
A7P3	Connector, RF, Subminiature	0753700000
A7P4	Connector, RF, Subminiature	0753700000
A7P5	Connector, RF, BNC, UG-913/U	1008460036
C1	Cap. 180pf, 500V, DM15, 2%	0258280000
C2	Cap. 18pf, DM15	0281330000
R1	Resistor, NON-IND 28, 14W	1006910034
R2	Resistor, NON-IND 28, 14W	1006910034
R3	Resistor, NON-IND 28, 14W	1006910034
R4	Resistor, NON-IND 28, 14W	1006910034
	MISCELLANEOUS	
	Clamp, Cable 3/16 ID, 3/8W	0501720006
	Sleeve, .125ID, .370D, .500L	1008390038
	Toriod	1008390020



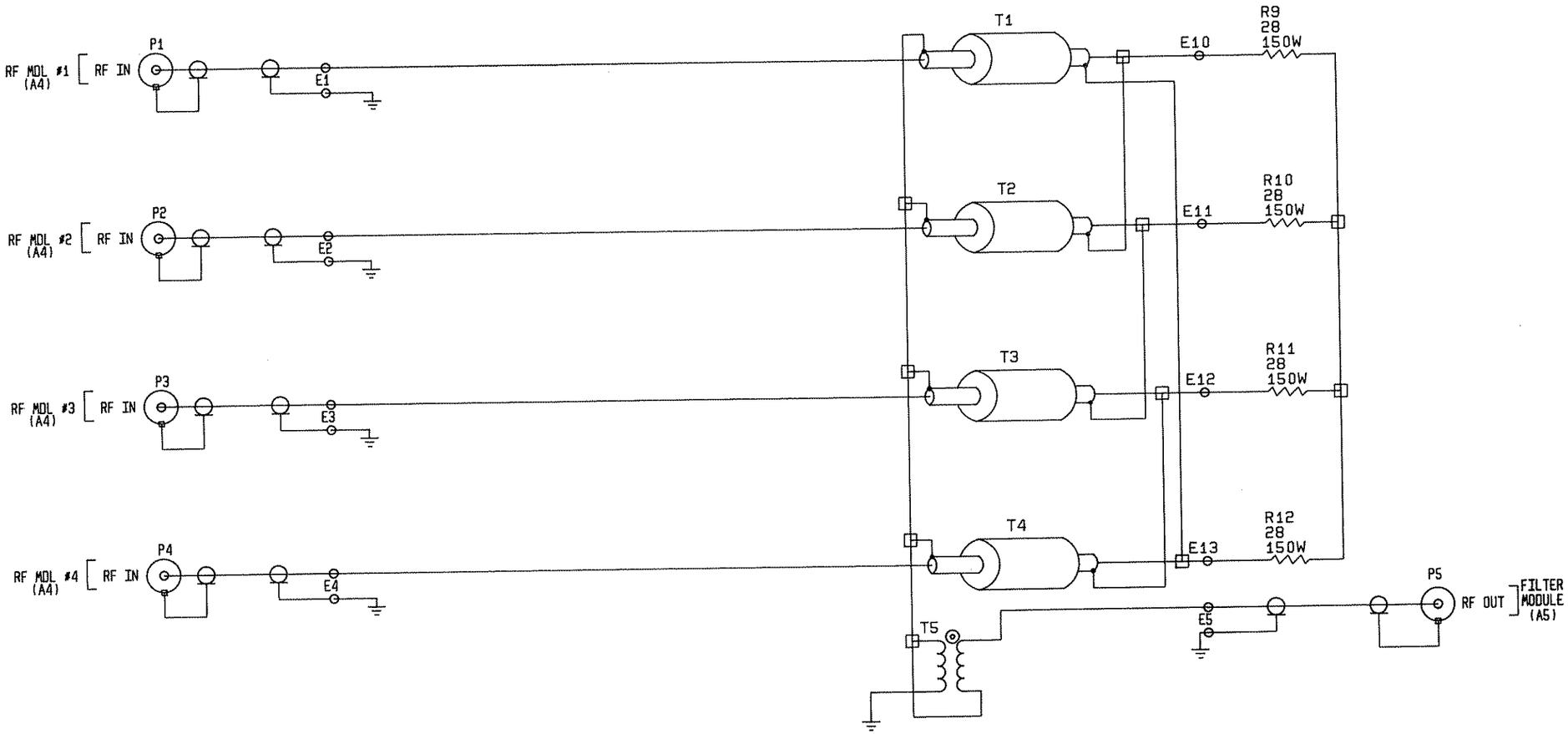
NOTE: PREFIX ALL REFERENCE DESIGNATORS WITH A7.

FIGURE 5-14 SPLITTER MODULE A7

8066060076C

8066060092D COMBINER MODULE A6

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	COMBINER MODULE A6	8066060092
A6P1	Connector, RF, BNC UG-88/U	0744030005
A6P2	Connector, RF, BNC UG-88/U	0744030005
A6P3	Connector, RF, BNC UG-88/U	0744030005
A6P4	Connector, RF, BNC UG-88/U	0744030005
A6P5	Connector, RF, UHF, RT. Angle	1008460028
A6R9	Resistor, Stripline, 28, 150W	1007110023
A6R10	Resistor, Stripline, 28, 150W	1007110023
A6R11	Resistor, Stripline, 28, 150W	1007110023
A6R12	Resistor, Stripline, 28, 150W	1007110023
TS1	Terminal Strip, 6 Term, 1 Gnd	0996700129
TS2	Terminal Strip, 6 Term, 1 Gnd	0996700129
	MISCELLANEOUS	
	Adapter, RF for PL-259	0742070000
	Chassis, Output Combiner	8066062001
	Clip, Component	0533320003
	Core, Ferrite 3/8OD x 3/16LG.	0613650000
	Ferrite, Toriod	1008140007
	Heatsink, Output Combiner	8066062702
	Heatsink, Res. Bank, Combiner	8066062303
	Standoff, F-F, 6-32, 1.000 Lg	0507790006
	Standoff, F-F, 6-32, 1.563 Lg	8033310600

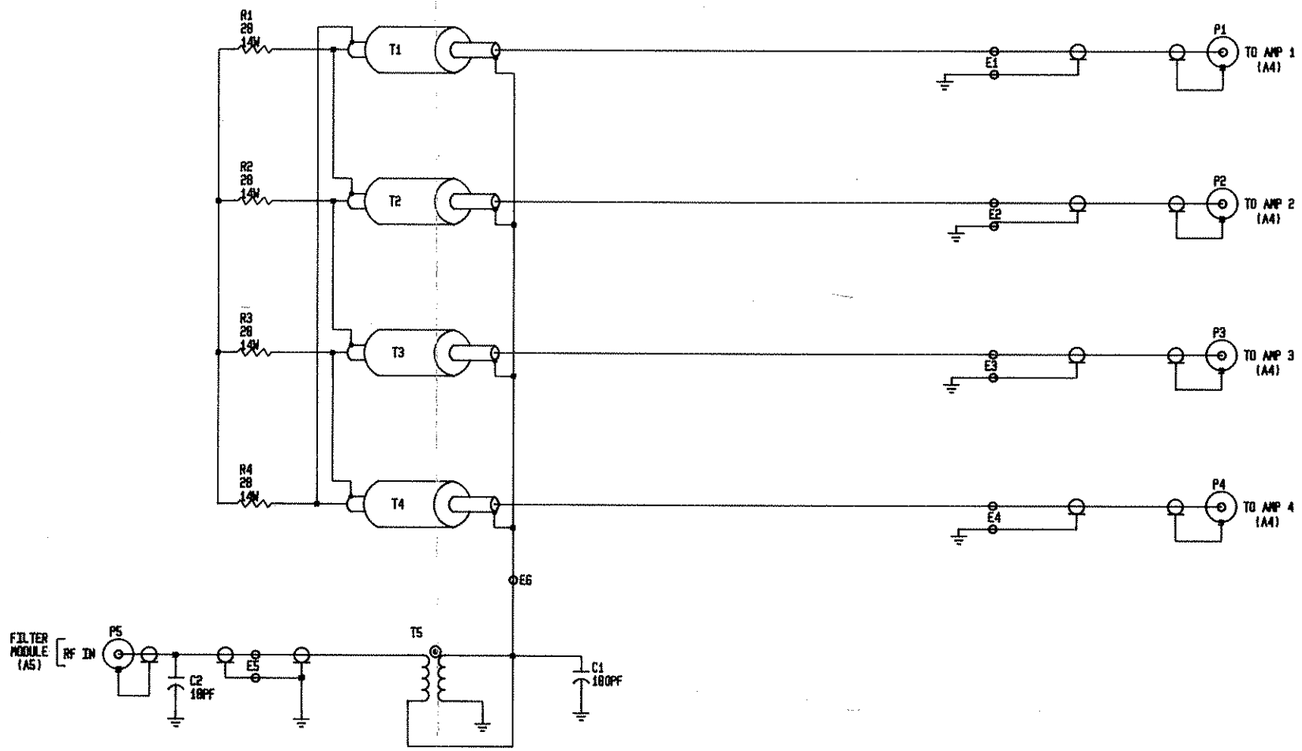


NOTE: PREFIX ALL REFERENCE DESIGNATORS WITH A6.

FIGURE 5-13 COMBINER MODULE A6

8066070098G SPLITTER MODULE A7

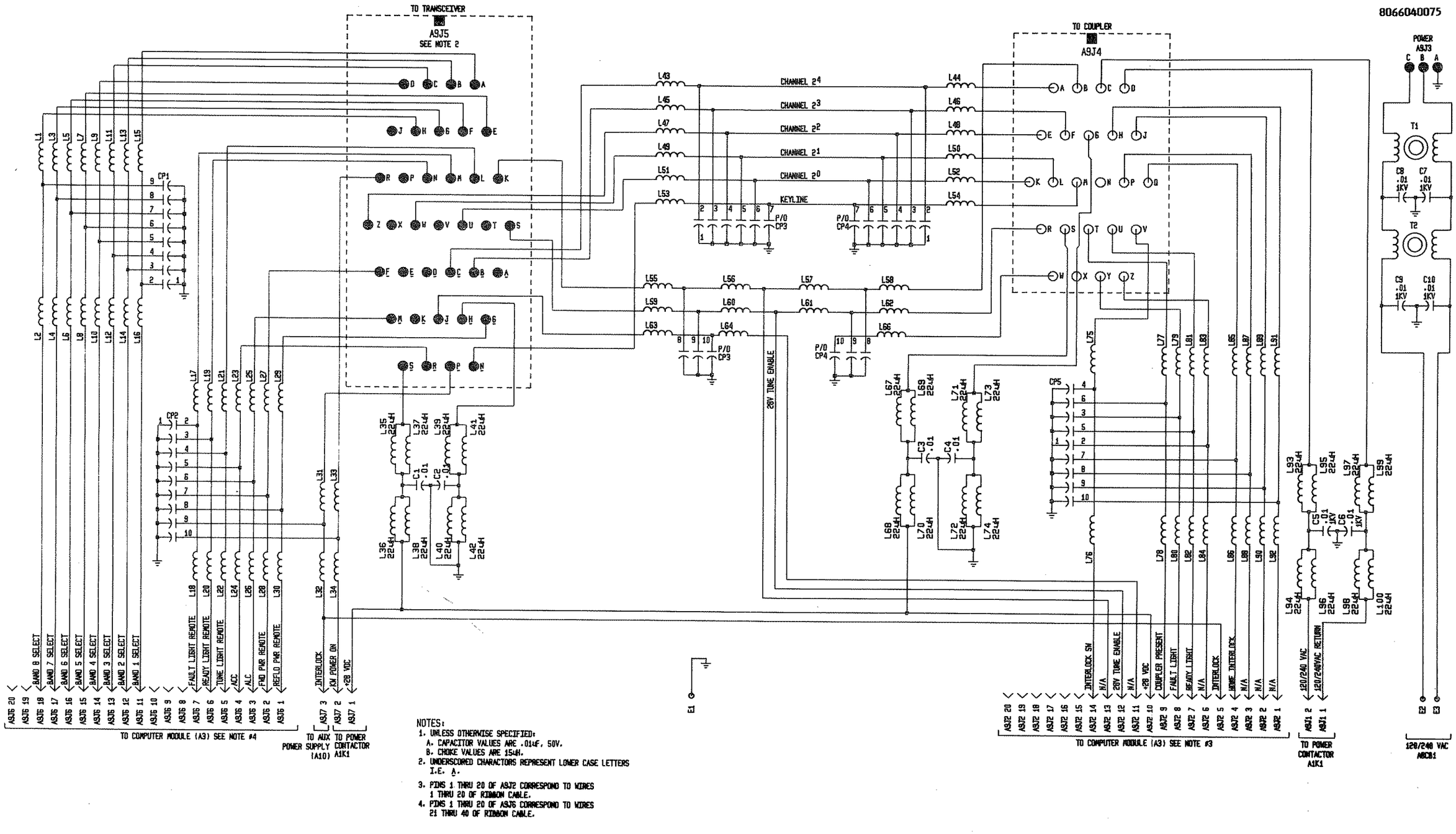
REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	SPLITTER MODULE A7	8066070098
A7P1	Connector, RF, Subminiature	0753700000
A7P2	Connector, RF, Subminiature	0753700000
A7P3	Connector, RF, Subminiature	0753700000
A7P4	Connector, RF, Subminiature	0753700000
A7P5	Connector, RF, BNC, UG-913/U	1008460036
C1	Cap. 180pf, 500V, DM15, 2%	0258280000
C2	Cap. 18pf, DM15	0281330000
R1	Resistor, NON-IND 28, 14W	1006910034
R2	Resistor, NON-IND 28, 14W	1006910034
R3	Resistor, NON-IND 28, 14W	1006910034
R4	Resistor, NON-IND 28, 14W	1006910034
	MISCELLANEOUS	
	Clamp, Cable 3/16 ID, 3/8W	0501720006
	Sleeve, .125ID, .370D, .500L	1008390038
	Toriod	1008390020



NOTE: PREFIX ALL REFERENCE DESIGNATORS WITH A7.

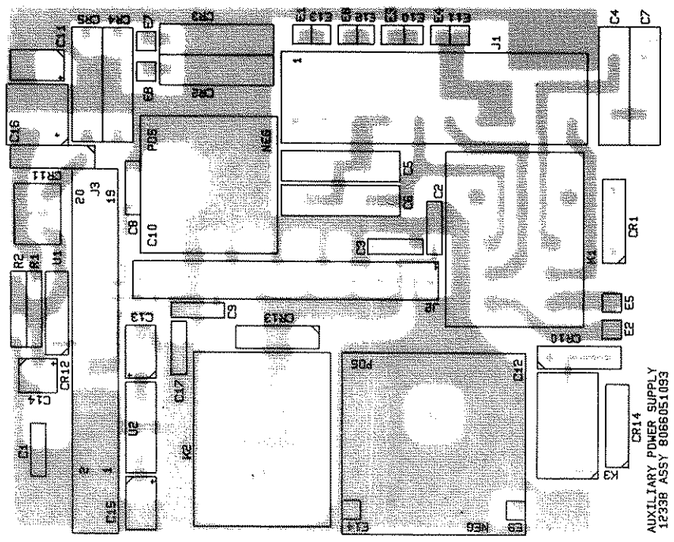
FIGURE 5-14 SPLITTER MODULE A7

8066040075

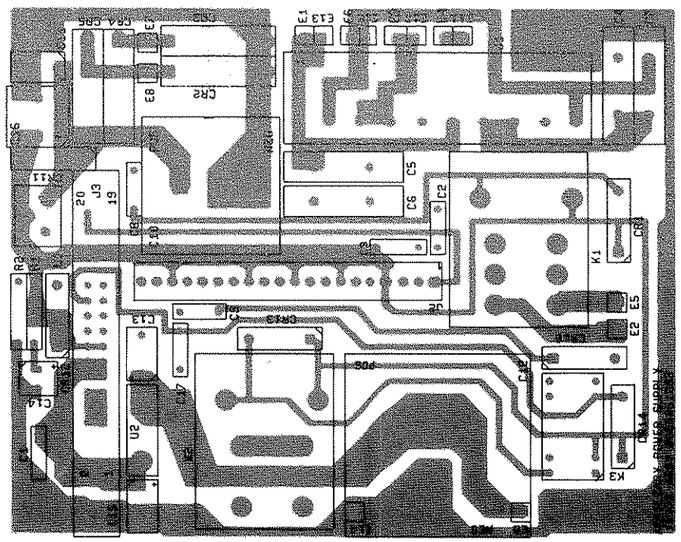


NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. CAPACITOR VALUES ARE .01uF, 50V.
   B. CHOKE VALUES ARE 15uH.
2. UNDERSCORED CHARACTORS REPRESENT LOWER CASE LETTERS
   I.E. A.
3. PINS 1 THRU 20 OF A9J2 CORRESPOND TO WIRES
   1 THRU 20 OF RIBBON CABLE.
4. PINS 1 THRU 20 OF A9J6 CORRESPOND TO WIRES
   21 THRU 40 OF RIBBON CABLE.

FIGURE 5-15 REAR PANEL CONNECTOR MODULE A9



COMPONENT SIDE



CIRCUIT SIDE

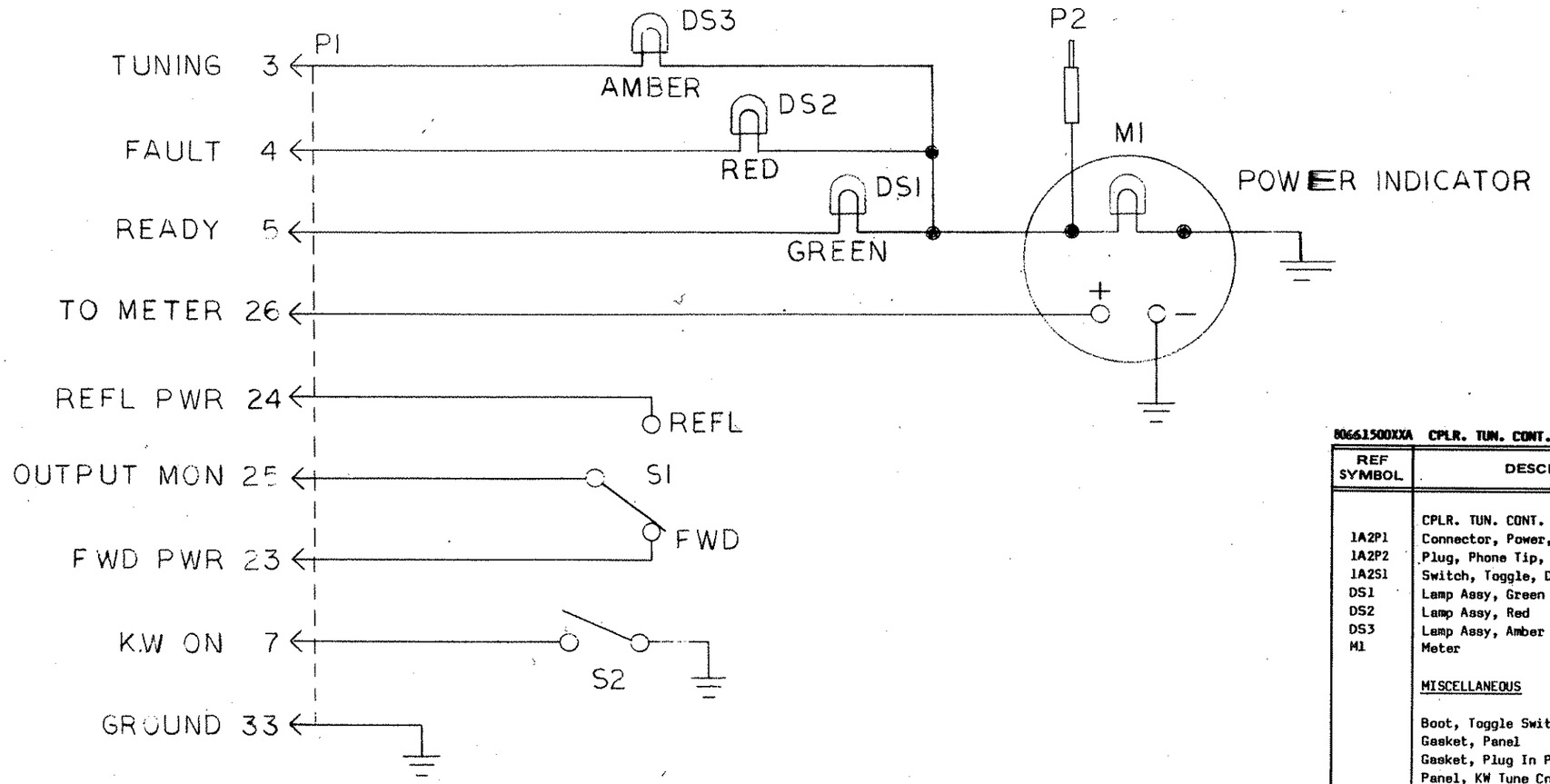
8066050097D AUX. POWER SUPPLY MODULE (A10)

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	AUX POWER SUPPLY MODULE (A10)	8066050097
A10A1	PC Assy, Aux. Power Supply	8066051093
A10T1	Transformer, Power	8066050607
CR6	Diode, Bridge VJ2471T	0405550006
K1	Relay, DPDT, 24VDC, 10A	1006920005
(XK1)	Spring, Relay Socket	1006920021
K2	Relay, DPDT, 24VDC, 10A	1006920005
(XK2)	Spring, Relay Socket	1006920021
S1	Switch, DPDT, 6A	1008410004
U1	IC. Linear LM317T	1006920013
U2	IC. Linear LM223K	1006920030
	MISCELLANEOUS	
	Bushing, Insulating, TO-220AB	1008380024
	Chassis, Aux. Pwr Sup W/Hdwe	8066052197
	Harness Assy, Aux. Pwr Sup	8066050496
	Insulator, Mica TO-220AB	0448670003

8066051093D PC ASSY, AUX. POWER SUPPLY A10A1

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSY, AUX. PWR SUPP A10A1	8066051093
C1	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C2	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C3	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C4	Cap. 0.01µf, 1000V, Z5U, 20%	0243550006
C5	Cap. 0.01µf, 1000V, Z5U, 20%	0243550006
C6	Cap. 0.01µf, 1000V, Z5U, 20%	0243550006
C7	Cap. 0.01µf, 1000V, Z5U, 20%	0243550006
C8	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C9	Cap. 0.1µf, 50V, X7R, 20%	0281610002
C10	Cap. 1000µf, 63V	1008040011
C11	Cap. 1µf, 50V, 20%	1005330018
C12	Cap. 15,000µf, 25V	1008000001
C13	Cap. 1µf, 50V, 20%	1005330018
C14	Cap. 6.8µf, 35V, 20%	1005330034
C15	Cap. 1µf, 50V, 20%	1005330018
C16	Cap. 15µf, 50V, 196D	0274000008
C17	Cap. 0.1µf, 50V, X7R, 20%	0281610002
CR1	Diode, Rectifier 1N4004	0405180004
CR2	Diode, Rectifier 1N5400	0403970008
CR3	Diode, Rectifier 1N5400	0403970008
CR4	Diode, Rectifier 1N5400	0403970008
CR5	Diode, Rectifier 1N5400	0403970008
CR10	Diode, Rectifier 1N4004	0405180004
CR11	Diode, Rectifier 1N4004	0405180004
CR12	Diode, Rectifier 1N4004	0405180004
CR13	Diode, Rectifier 1N4004	0405180004
CR14	Diode, Rectifier 1N4004	0405180004
J1	Connector, Header, 10 Pin Vert.	1008090034
J2	Connector, PC, 20 Pin Straight	1008090018
J3	Connector, PC, 20 Pin Str.	1008120014
K3	Relay, SPDT, 24V, Reed	1003400001
R1	Resistor, 270, 10%, ½W	0178450006
R2	Resistor, 5.6K, 10%, ½W	0183060008
XK1	Socket, Relay	1007130008
XK2	Socket, Relay	1007130008
XU2	Jack, PCB, Press-In	0754100006
	MISCELLANEOUS	
	Key, Polarizing	1008070033
	Socket Strip, 20 Contacts	1007350008

80661500[illegible]75A



NOTE:
PREFIX DESIGNATORS WITH "1A2"

80661500XXA CPLR. TUN. CONT.

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CPLR. TUN. CONT.	806615[illegible]0XX
1A2P1	Connector, Power, 36 Pin Rect.	075407[illegible]000
1A2P2	Plug, Phone Tip, Red	07536B[illegible]009
1A2S1	Switch, Toggle, DPDT	033461[illegible]001
DS1	Lamp Assy, Green	084148[illegible]001
DS2	Lamp Assy, Red	084149[illegible]007
DS3	Lamp Assy, Amber	084150[illegible]002
M1	Meter	502404[illegible]204
	MISCELLANEOUS	
	Boot, Toggle Switch 1/4-40	053112[illegible]007
	Gasket, Panel	502404[illegible]308
	Gasket, Plug In Panel Lamps	100332[illegible]100
	Panel, KW Tune Cntl	806615[illegible]2XX
	Socket, Cartridge Lamp	100332[illegible]000
	Switch, Toggle, DPST	034643[illegible]003
	Boot, Toggle Switch 15/32-32	034645[illegible]004

FIGURE 5-17 CONTROL PANEL 1A2 P/N 806615[illegible]0XX

8066180071

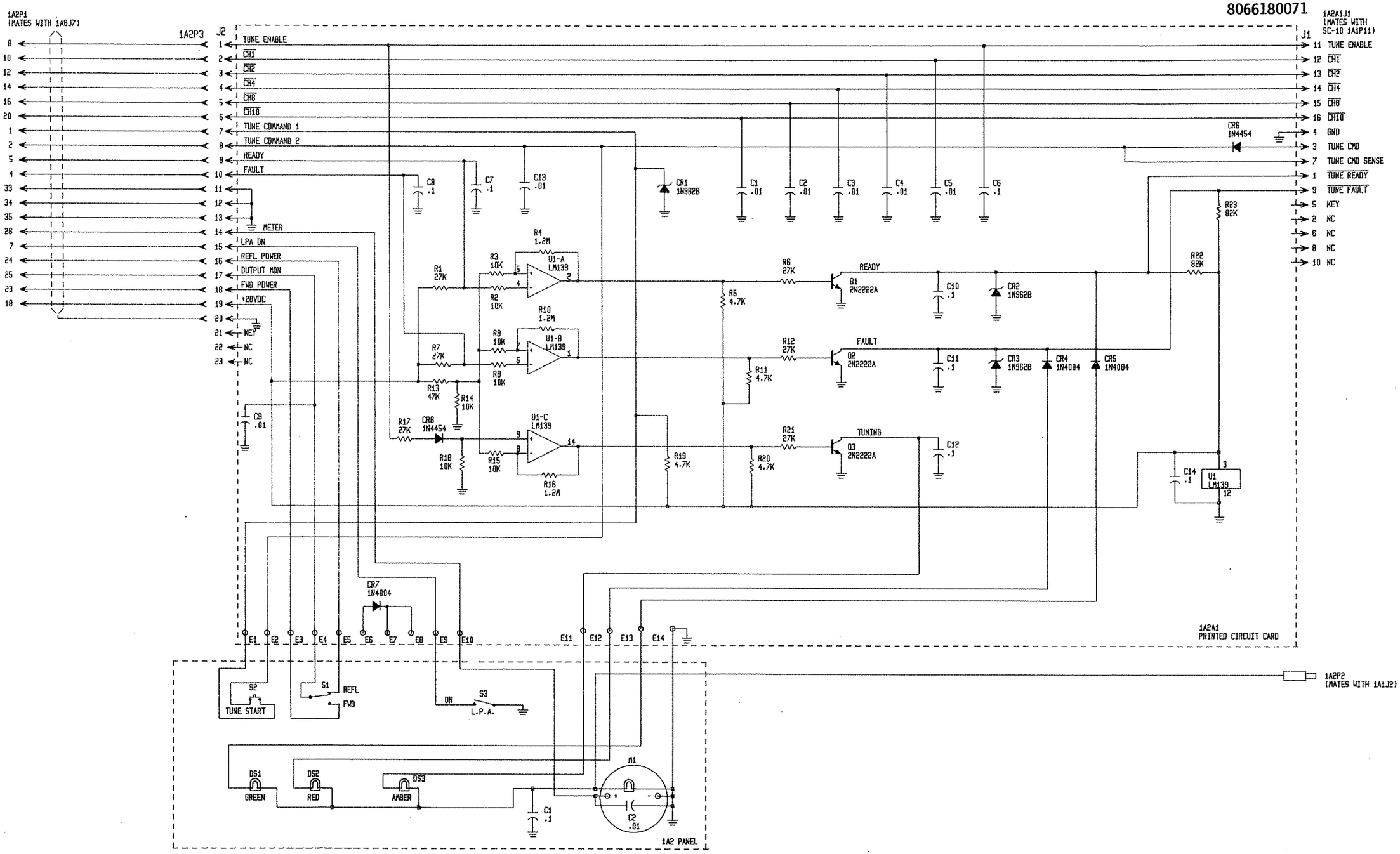
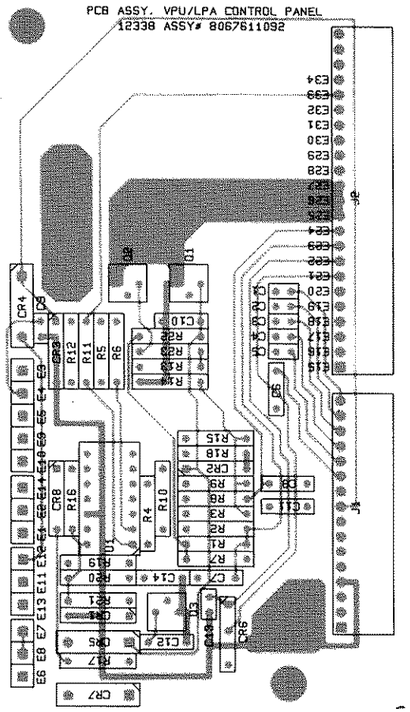
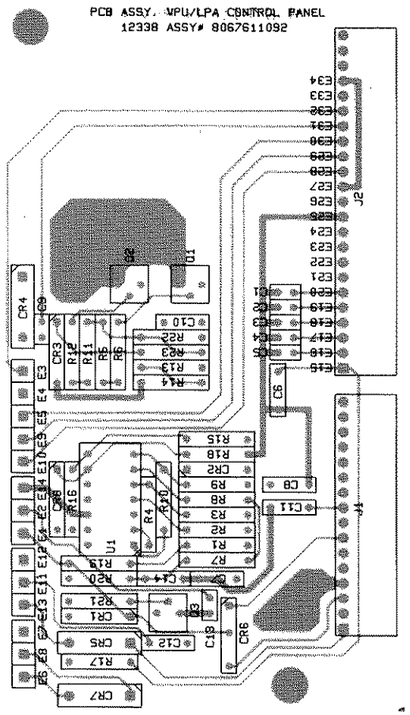


FIGURE 5-20 CONTROL PANEL 1A2 P/N 80661800XX



COMPONENT SIDE



CIRCUIT SIDE

8067611092A PC ASSY INTERFACE CTL PANEL

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
-	PC ASSY INTERFACE, CTL PANEL	8067611092
C1	Capacitor, .01µf, 50V, X7R, 20%	0281730008
C2	Capacitor, .01µf, 50V, X7R, 20%	0281730008
C3	Capacitor, .01µf, 50V, X7R, 20%	0281730008
C4	Capacitor, .01µf, 50V, X7R, 20%	0281730008
C5	Capacitor, .01µf, 50V, X7R, 20%	0281730008
C6	Capacitor, 0.1µf, 50V	1001010027
C7	Capacitor, 0.1µf, 50V	1001010027
C8	Capacitor, 0.1µf, 50V	1001010027
C9	Capacitor, .01µf, 50V, X7R, 20%	0281730008
C10	Capacitor, 0.1µf, 50V	1001010027
C11	Capacitor, 0.1µf, 50V	1001010027
C12	Capacitor, 0.1µf, 50V	1001010027
C13	Capacitor, .01µf, 50V, X7R, 20%	0281730008
C14	Capacitor, 0.1µf, 50V	1001010027
CR1	Diode, Zener 1N962B	0404640001
CR2	Diode, Zener 1N962B	0404640001
CR3	Diode, Zener 1N962B	0404640001
CR4	Diode, Rectifier 1N4004	0405180004
CR5	Diode, Rectifier 1N4004	0405180004
CR6	Diode, Signal, Sil. 1N4454	0405270003
CR7	Diode, Rectifier 1N4004	0405180004
CR8	Diode, Signal, Sil. 1N4454	0405270003
J1	Pin Strap, Right Angle, 16 Pin	1006580034
J2	Connector, PC, 20 Pin	1008740012
Q1	Transistor, NPN, Si. 2N2222A	0448580004
Q2	Transistor, NPN, Si. 2N2222A	0448580004
Q3	Transistor, NPN, Si. 2N2222A	0448580004
R1	Resistor, 27K, 10%, ¼W	0171200004
R2	Resistor, 10K, 10%, ¼W	0170410005
R3	Resistor, 10K, 10%, ¼W	0170410005
R4	Resistor, 1.2M, 10%, ¼W	0174930003
R5	Resistor, 4.7K, 5%, ¼W	0170770001
R6	Resistor, 27K, 10%, ¼W	0171200004
R7	Resistor, 27K, 10%, ¼W	0171200004
R8	Resistor, 10K, 10%, ¼W	0170410005
R9	Resistor, 10K, 10%, ¼W	0170410005
R10	Resistor, 1.2M, 10%, ¼W	0174930003
R11	Resistor, 4.7K, 5%, ¼W	0170770001
R12	Resistor, 27K, 10%, ¼W	0171200004
R13	Resistor, 47K, 10%, ¼W	0171060008
R14	Resistor, 10K, 10%, ¼W	0170410005
R15	Resistor, 10K, 10%, ¼W	0170410005
R16	Resistor, 1.2M, 10%, ¼W	0174930003
R17	Resistor, 27K, 10%, ¼W	0171200004
R18	Resistor, 10K, 10%, ¼W	0170410005
R19	Resistor, 4.7K, 5%, ¼W	0170770001
R20	Resistor, 4.7K, 5%, ¼W	0170770001
R21	Resistor, 27K, 10%, ¼W	0171200004
R22	Resistor, 82K, 10%, ¼W	0171680006
R23	Resistor, 82K, 10%, ¼W	0171680006
U1	IC Linear LM139	1007490004

SECTION VI

OPTIONS AND ACCESSORIES

6.1 GENERAL

This section contains information relating to optional equipment and accessories which may be used with the SNR-2000.

6.2 GCU-1935 1KW AUTOMATIC ANTENNA COUPLER

The GCU-1935 Antenna Coupler may be used with the SNR-2000. However, due to its electromechanical design, certain changes have to be made to the SNR-2000. Also the addition of peripheral equipment and cabling is required for proper operation.

6.2.1 EQUIPMENT REQUIRED

a) SNR-2000 to GCU-1935 Interface Box, Sunair p/n 8066200099.

b) Cable Assembly: LPA to Interface, Sunair p/n 8066202296.

c) Cable Assembly: Interface to Coupler, Sunair p/n 6029003003.

d) Peripheral Board A3A2 Assembly, Sunair p/n 8066082096. (This PC Assembly is required for operation with the GCU-1935. If your SNR-2000 has Peripheral Board p/n 8066082592 installed, it is for use only with an SNR-2000DAC.)

e) Microprocessor Board A3A3 Assembly will require an EPROM change if the board is originally configured for use with the SNR-2000DAC. Please consult Sunair's Marketing Department for further information.

6.2.2 GCU-1935 EXTERNAL CONNECTIONS

Refer to Figures 6.1 thru 6.4 for interconnect details. Also refer to Maintenance Manual Sunair p/n 6029000501 for installation instructions of the GCU-1935.

6.2.3 OPERATION WITH GSB-900, GSB-900DX, GSB-900SC, GSE-924

Refer to Section 3.3.1 steps a thru d, for initial power up procedures.

a) When using a GCU-1935, the FAULT lamp will burn steadily.

b) Select operating frequency on transceiver/exciter.

c) Place transceiver/exciter MODE switch in the KW/CPLR TUNE position.

d) TUNING lamp will light. On SNR-2000 LCD will display system messages: "COUPLER TUNING", "COUPLER TUNED", "KW SYSTEM OPERATIONAL, METER: FWD, PWR LVL: 1 KW". After completion of tune, (maximum 12 seconds) READY lamp will light. Place transceiver/-exciter MODE switch in desired mode of operation.

1. If after tune attempt, FAULT lamp burns steadily, this indicates a fault in the coupler, antenna or feedline. Attempt retuning. If FAULT does not clear, refer to Section V of this manual and the transceiver/exciter or coupler manual.
2. If FAULT lamp flashes, this indicates a fault in the SNR-2000. Reset SNR-2000. If FAULT does not clear refer to Section V of this manual.

NOTE

Coupler retuning is required every time the transceiver frequency is changed.

6.2.4 OPERATION WITH GSB-900SC/R AND GRC-901 REMOTE CONTROL HEAD

6.2.4.1 Local Operation

Refer to Section 3.2.3.1 steps a thru d, for initial power up procedures.

a) When using a GCU-1935, the FAULT lamp will burn steadily.

b) Select operating frequency on transceiver.

c) Place transceiver MODE switch in the KW/CPLR TUNE position.

d) TUNING lamp will light. On SNR-2000 LCD will display system messages: "COUPLER TUNING", "COUPLER TUNED", "KW SYSTEM OPERATIONAL, METER: FWD, PWR LVL: 1 KW". After completion of tune, (maximum 20 seconds) READY lamp will light. Place transceiver/exciter MODE switch in desired mode of operation.
   1. If after tune attempt, FAULT lamp burns steadily, this indicates a fault in the coupler, antenna or feedline. Attempt retuning. If FAULT does not clear, refer to Section V of this manual and the transceiver or coupler manual.
   2. If FAULT lamp flashes, this indicates a fault in the SNR-2000. Reset SNR-2000. If FAULT does not clear refer to Section V of this manual.

NOTE

Coupler retuning is required every time the transceiver frequency is changed.

6.2.4.2 Remote Operation

Refer to Section 3.2.3.2.

6.2.5 PERIPHERAL BOARD COUPLER CONTROL CIRCUITS

Refer to Figures 6-6 and 6-7

6.2.5.1 Coupler Input Detectors U6A-D, U9A

The Coupler Input Detectors are buffer circuits which permit voltages higher than 5 volts to become inputs to the Peripheral Board and to be provided as signals which Microprocessor A3A3U1 can read. U6A is used to buffer the HOME INTERLOCK signal from the GCU-1935 antenna coupler. U6A inverts the signal and sends it to the Coupler Interface Buffer U8. Also, U6B buffers the CPLR SUM signal, U6C buffers the CPLR PRESENT, U6D buffers an unused signal called COVER SAFE SW, and U9A buffers but does not invert the signal KW TUNE.

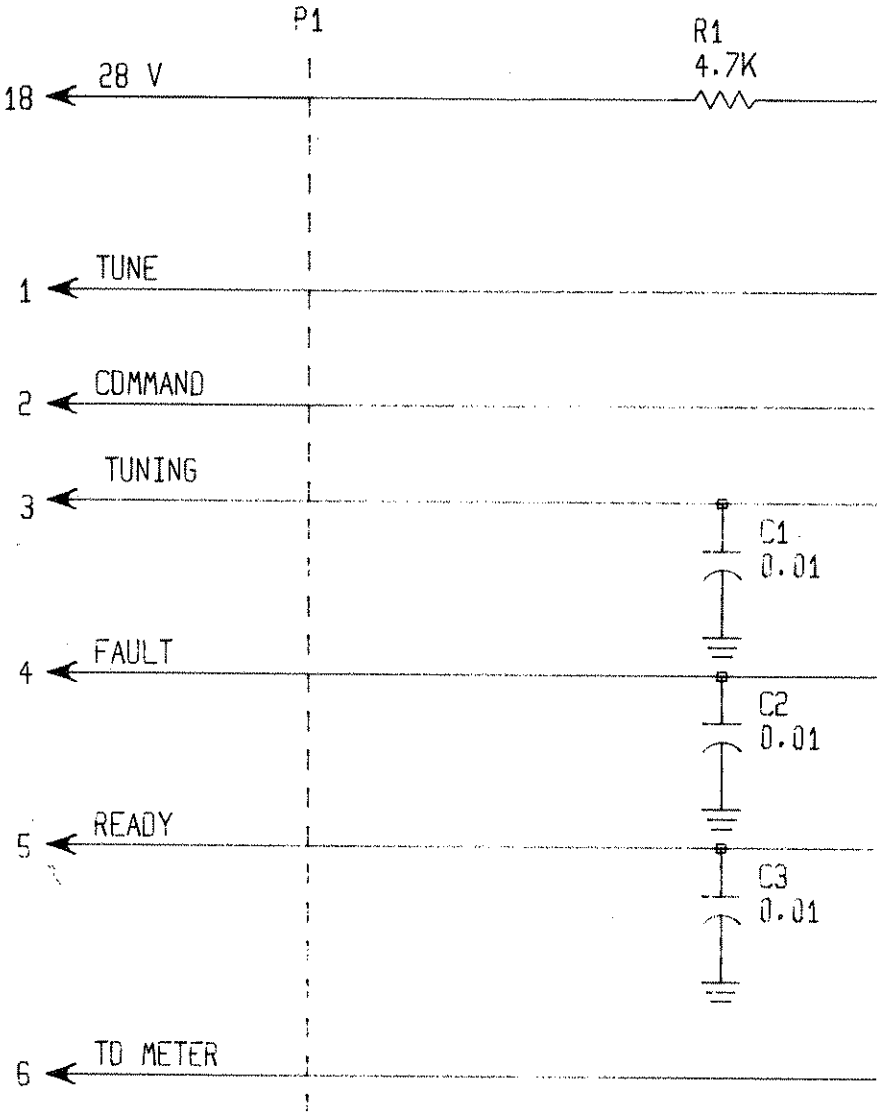
KW TUNE originates in the transceiver when the transceiver goes to the KW/-COUPLER TUNE position indicating that the GCU-1935 requires tuning. HOME INTERLOCK and CPLR SUM are provided to the SNR-2000 by the GCU-1935 to indicate the progress of the tune cycle and completion of the tune cycle respectively. CPLR PRESENT is used by the SNR-2000 to detect if a GCU-1935 antenna coupler is attached. Without a coupler attached, this signal is pulled low by a jumper on connector J4 of the Rear Panel Connector Assembly A9. When the cabling to interconnect the SNR-2000 to the antenna coupler is attached, CPLR PRESENT is high, indicating to Microprocessor A3A3U1 that a coupler is present. U6C inverts the signal and sends it to U8.

6.2.5.2 Coupler Interface Buffer U8

The Coupler Interface Buffer is used by Microprocessor A3A3U1 to monitor the signals KW TUNE, HOME INTERLOCK, CPLR SUM, CPLR PRESENT and COVER SAFE SW. A3A3U1 monitors the balance of these signals if it detects that a coupler is present from the CPLR PRESENT signal. U8 also monitors a signal called $\overline{\text{RF PRESENT}}$ which originates in the RF Present Detector Q4. When $\overline{\text{RF PRESENT}}$ is low, this indicates to A3A3U1 that RF is present in the SNR-2000, and that certain fault conditions can be monitored or detected. If the

80661600XXA CONTROL PANEL ASSY, 900 SERIES

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1	Capacitor, .01µf, 50V, W5R, 20%	0281730075
C2	Capacitor, .01µf, 50V, W5R, 20%	0281730075
C3	Capacitor, .01µf, 50V, W5R, 20%	0281730075
C4	Capacitor, .01µf, 50V, W5R, 20%	0281730075
CR1	Diode, Zener 1N5242B	0400120003
DS1	Lamp Assy, Green	0841480001
DS2	Lamp Assy, Red	0841490007
DS3	Lamp Assy, Amber	0841500002
M1	Meter	5024042204
R1	Resistor, 4.7K, 5%, ½W	0170770001
1A2P1	Connector, Power, 36 Pin Rect	0754070000
1A2P2	Plug, Phone Tip Red	0753680009
1A2S1	Switch, Toggle DPDT	0334610001
1A2S2	Switch, Pushbutton, SPST, N.O.	0346520002
	MISCELLANEOUS	
	Boot, Pushbutton, Switch, ½-40	0346530008
	Boot, Toggle Switch, ½-40	0531120007
	Gasket, Plug In Panel Lamps	1003324100
	Gasket, Panel	5024043308
	Socket, Cartridge Lamp	1003322000



80661700XXB CONTROL PANEL ASSY SC/R

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CONTROL PANEL ASSY SC/R	80661700XX
1A2P1	Connector, Power, 36 Pin Rect	0754070000
1A2S1	Switch, Toggle, DPDT	0334610001
1A2S2	Switch, Pushbutton, SPST. N.O.	0346520002
1A2S3	Switch, Pushbutton, SPST. N.O.	0346520002
CR1	Diode, Zener 1N962B	0404640001
CR2	Diode, Zener 1N962B	0404640001
CR3	Diode, Rectifier 1N4004	0405180004
CR4	Diode, Rectifier 1N4004	0405180004
CR5	Diode, Rectifier 1N4004	0405180004
CR6	Diode, Zener, 1N962B	0404640001
R1	Resistor, 10K, 10%, ¼W	0170410005
R2	Pot. 10K, 10%, ¼W, 1/8 Shaft	0335900003
R3	Resistor, 15K, 10%, ¼W	0172350000
R4	Resistor, 82K, 10%, ¼W	0171680006
R5	Resistor, 82K, 10%, ¼W	0171680006
R6	Resistor, 4.7K, 5%, ¼W	0170770001
TB2	Terminal, Insul, 4-40 Female	0506390004
	MISCELLANEOUS	
	Boot, Pushbutton Switch ½-40	0346530008
	Boot, Toggle Switch ¼-40	0531120007
	Bracket, Term. Strip Mtg.	6035150705
	Connector, PC, 12 Pin Female	1003321402
	Gasket, Panel	5024043308
	Gasket, Plug In Panel Lamps	1003324100
	Lamp Assy. Amber	0841490007
	Lamp Assy. Green	0841480001
	Lamp Assy. Red	0841490007
	Lamp Assy. White	1003324703
	Meter	5024042204
	Pin, Connector, Male Gold FL	1003322409
	Plug, Phone Tip, Red	0753680009
	Socket, Cartridge Lamp	1003322000
	Terminal Strip, 8 Term. 2 Gnd.	0859070000

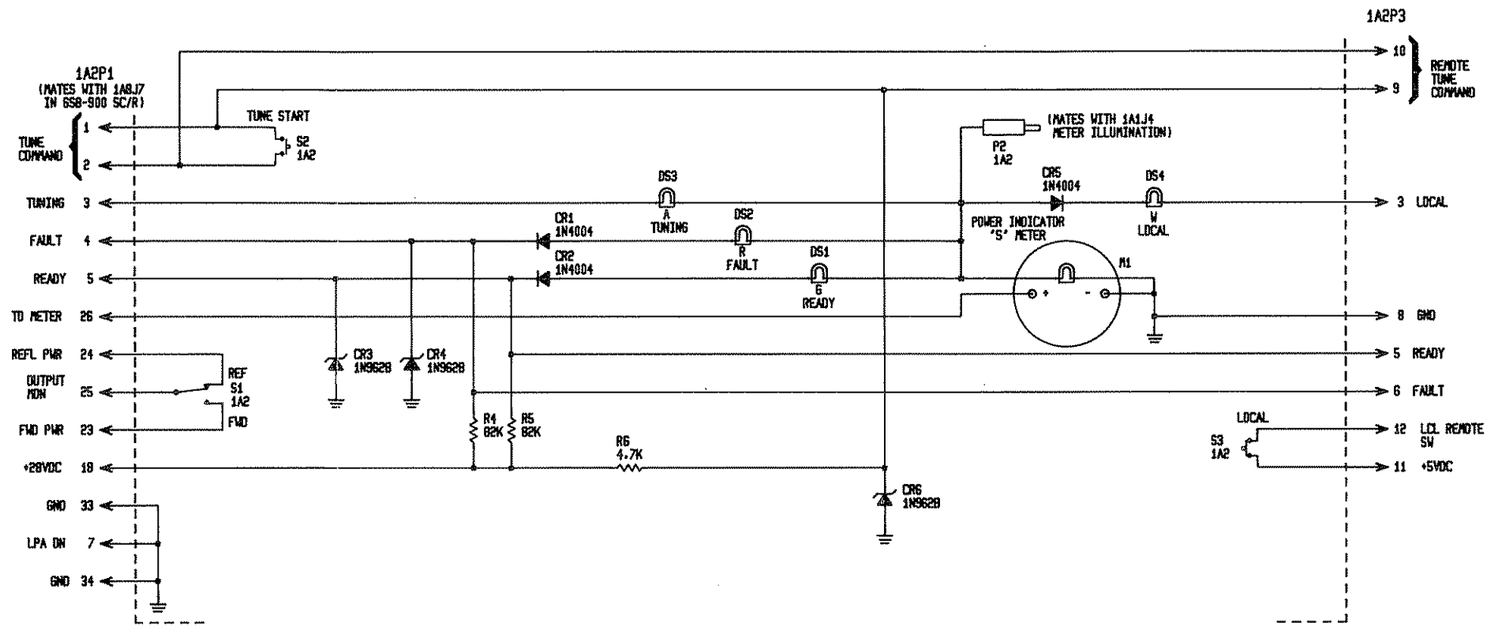
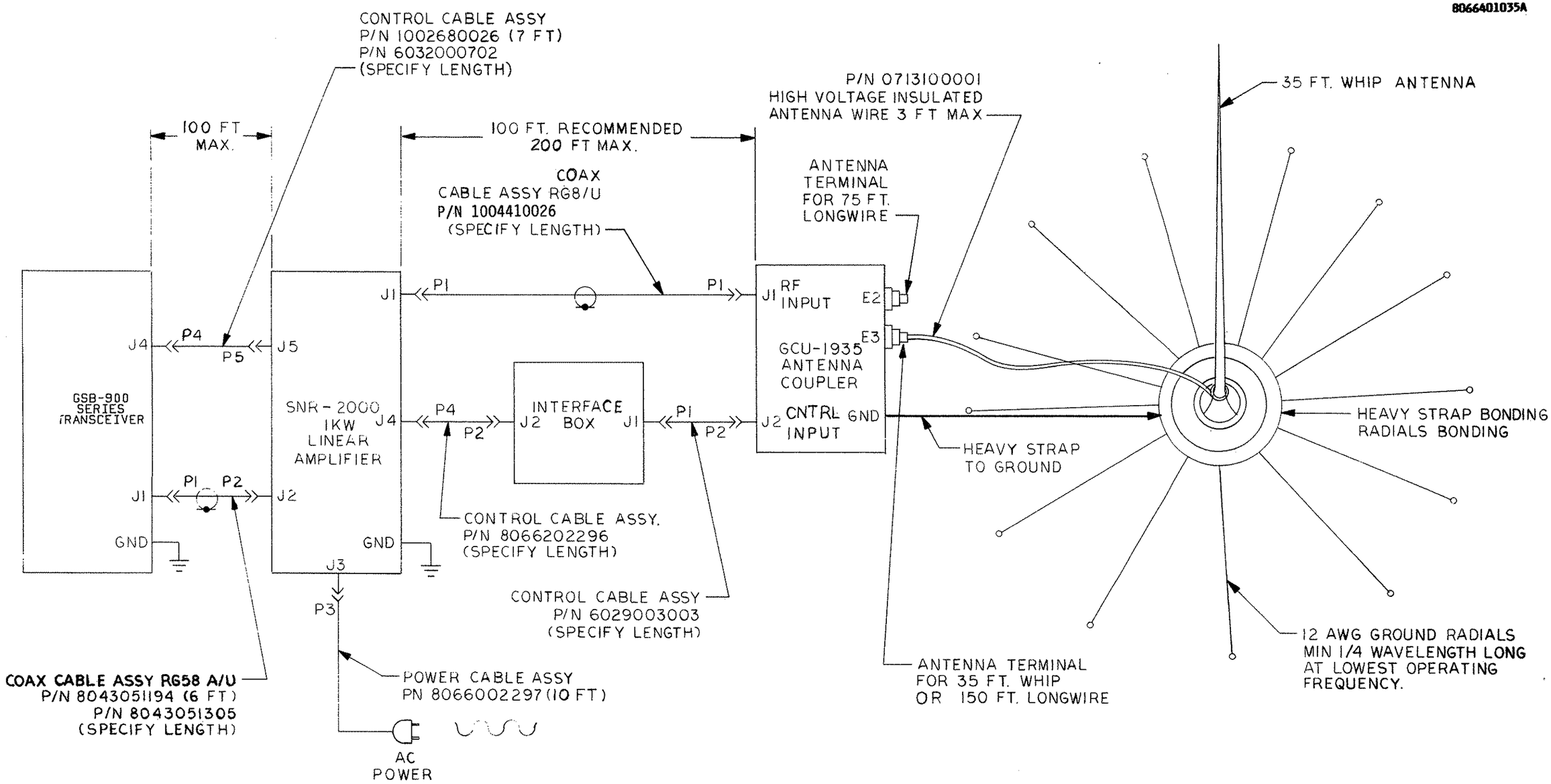


FIGURE 5-19 CONTROL PANEL 1A2 P/N 80661700XX

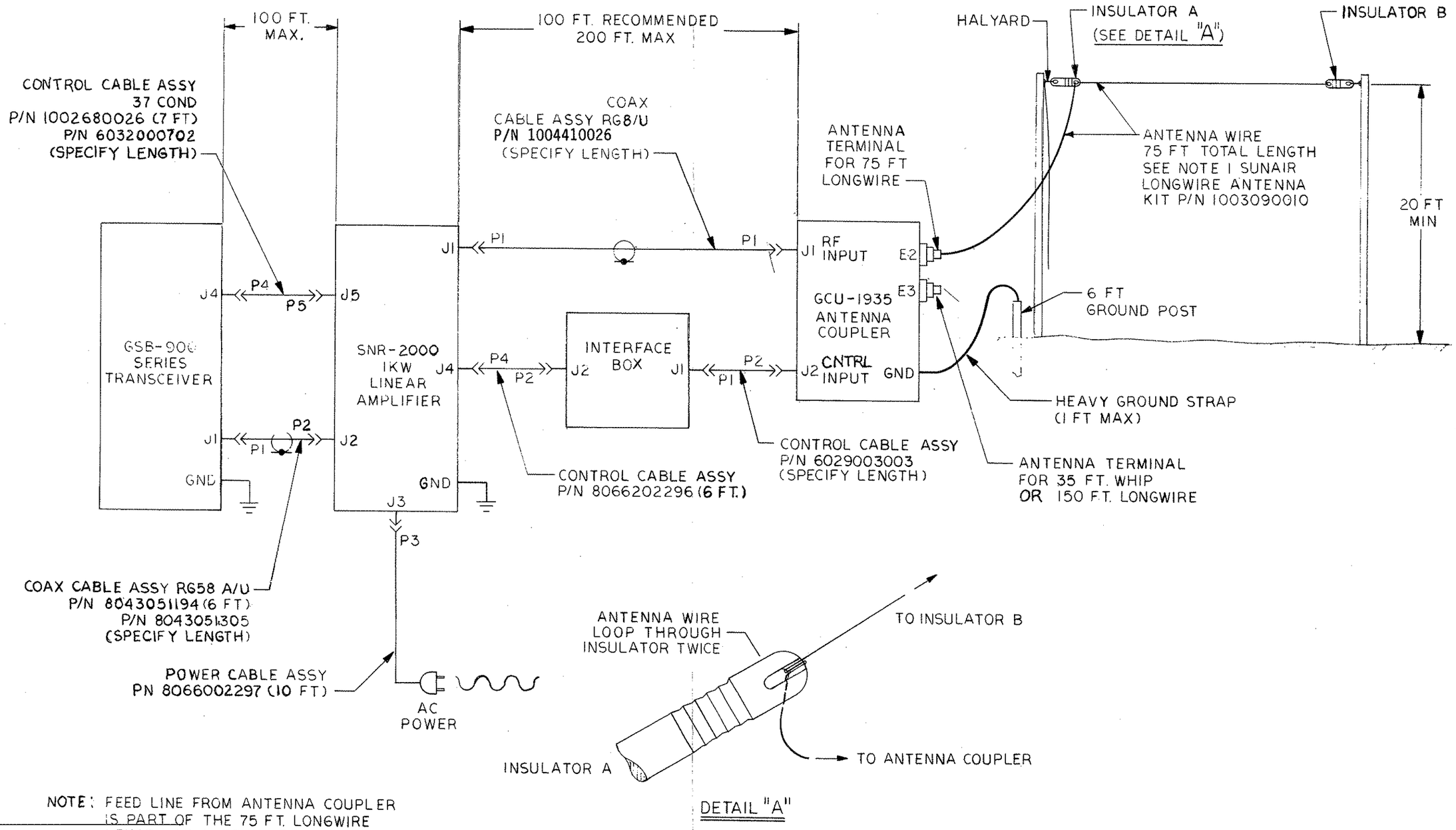
8066401035A



NOTE: GROUND RADIALS ARE PART OF THE ANTENNA. RECOMMEND MINIMUM OF 12 TO ENHANCE RADIATION PATTERN.

FIGURE 6-1 SNR-2000 W/GCU-1935, 35 FT ANTENNA (ROOF TOP INSTALLATION)

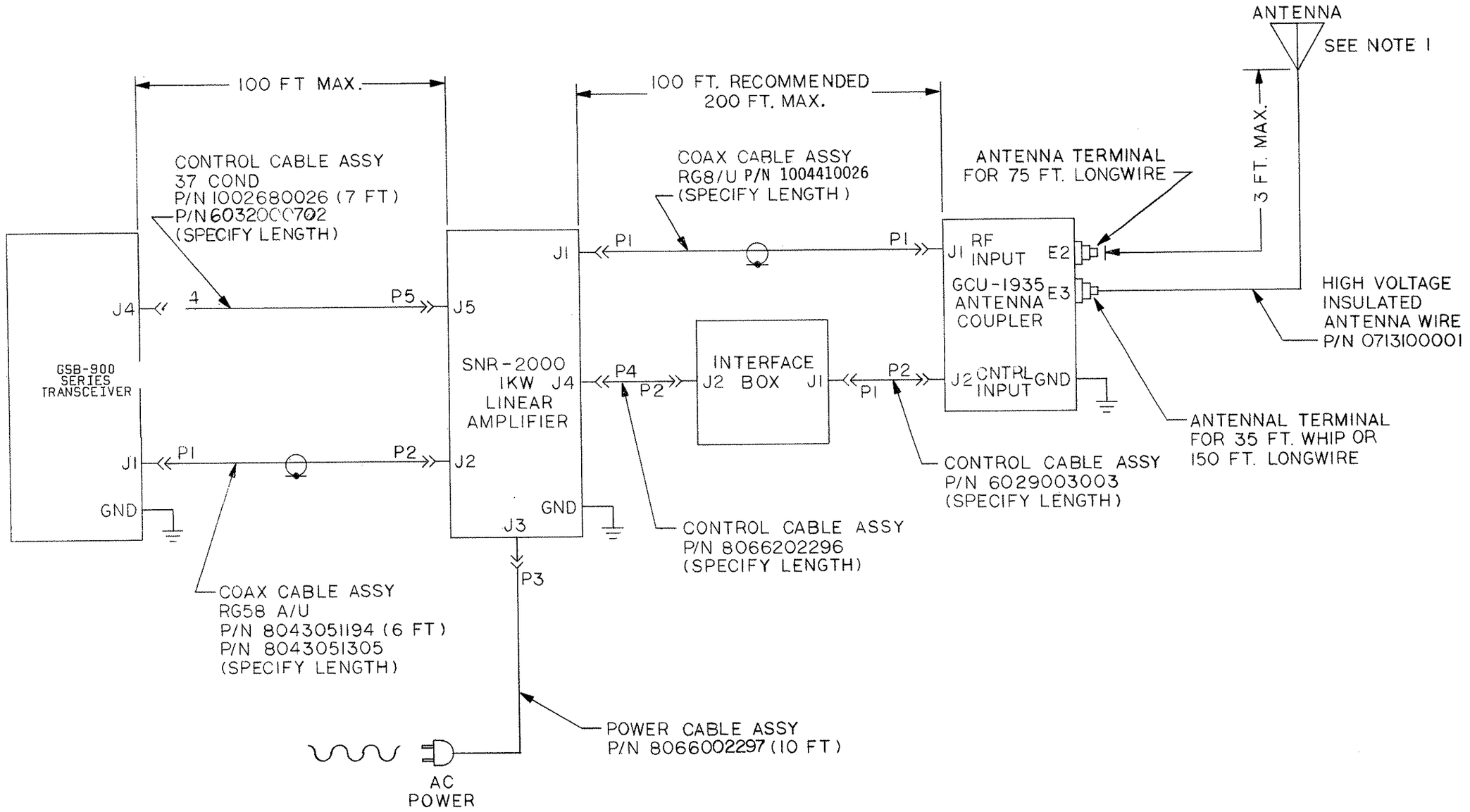
8066402031A



NOTE: FEED LINE FROM ANTENNA COUPLER IS PART OF THE 75 FT. LONGWIRE LENGTH OF ANTENNA BETWEEN INSULATORS SHOULD BE CALCULATED ACCORDINGLY.

FIGURE 6-2 SNR-2000 W/GCU-1935, 75 FT LONGWIRE ANTENNA

8066404034A

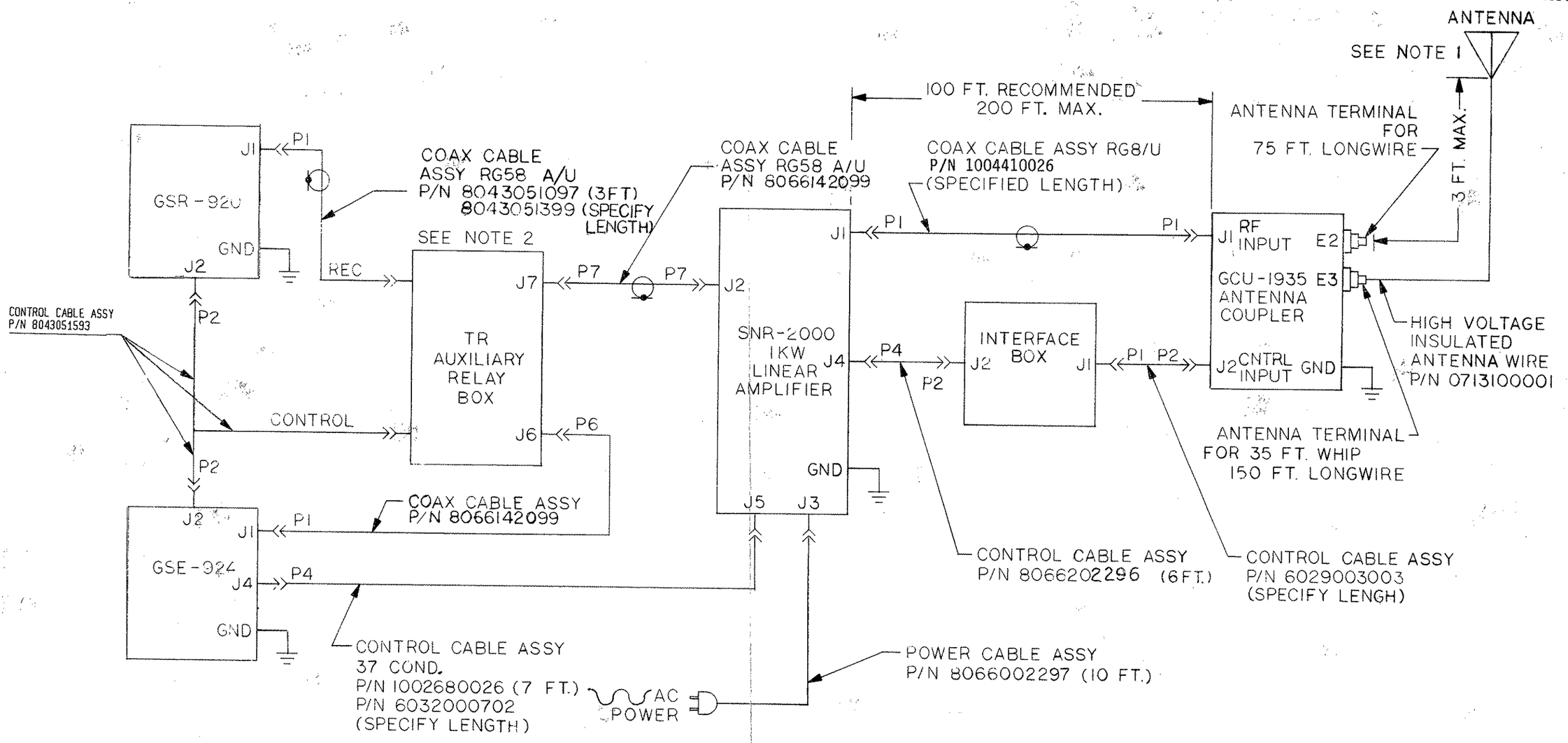


NOTE:

1. NON-RESONANT ANTENNAS COMPATIBLE
   - A. 35 FT. WHIP (SHOWN)
   - B. 75 FT. LONGWIRE
   - C. 150 FT. LONGWIRE

FIGURE 6-3 SNR-2000 W/GCU-1935, NON-RESONANT ANTENNA

8066405031A



NOTES:

1. NON-RESONANT ANTENNAS COMPATIBLE
   A. 35 FT. WHIP (SHOWN)
   B. 75 FT. LONGWIRE
   C. 150 FT. LONGWIRE
2. TRANSMIT/RECEIVE RELAY KIT
   P/N 8066140096

FIGURE 6-4 SNR-2000 W/GCU-1935 WITH AUXILIARY TR RELAY

8066082061

FROM PA ASSEMBLIES [TEMP SENSE 1, TEMP SENSE 2, TEMP SENSE 3, TEMP SENSE 4]
TEMPERATURE SENSE COMPARATORS U1,U2
OVERTEMPERATURE BUFFER U3
FROM MICRO-PROCESSOR BOARD [CS14]
FILTER MODULE FAULT
BAD0-BAD7

FROM PA ASSEMBLIES [P IN 1, P OUT 1, P IN 2, P OUT 2, P IN 3, P OUT 3, P IN 4, P OUT 4]
GAIN FAULT COMPARATORS U12
GAIN FAULT BUFFER U7
FROM MICRO-PROCESSOR BOARD [CS15]
VSWR FAULT

FROM ANTENNA COUPLER [KW TUNE, HOME INTERLOCK, CPLR SUM, CPLR PRESENT, COVER SAFE SW.]
COUPLER INPUT DETECTORS U6A,B,C,D,U9A
CPLR INTERFACE BUFFER U8
FROM MICRO-PROCESSOR BOARD [CS16]
RF PRESENT

FROM MICRO-PROCESSOR BOARD [BAD0, BAD1, BAD2, BAD3, BAD4, BAD5, BAD6, BAD7]

FROM PA ASSEMBLIES [VC MONITOR 1, VC MONITOR 2, VC MONITOR 3, VC MONITOR 4]
VC MONITOR COMPARATORS U11
VC MONITOR/ VOLTAGE MONITOR BUFFER U19
FROM MICRO-PROCESSOR BOARD [CS17]

FROM AUXILIARY POWER SUPPLY [+28V TEST, +5V TEST]
VOLTAGE MONITOR COMPARATORS U13
+28V TOO HIGH

VSWR FAULT DETECTOR U9B
FILTER FAULT DETECTOR U9C,U20A
RF PRESENT DETECTOR Q4

FWD PWR REMOTE [TO XCVR]
REFLD PWR REMOTE [TO XCVR]
ALC [TO XCVR]
ACC [TO XCVR]
REFLD FAULT [TO MICRO PROCESSOR BOARD]

FORWARD POWER METER CONDITIONING CIRCUIT U10B
REFLECTED POWER METER CONDITIONING CIRCUIT U10A
REFLECTED FAULT DETECTOR U9D
ALC/ACC CONTROL CIRCUIT U10C,D,U20D,02, 03,07-011

FWD PWR
REFLD PWR

FROM FILTER MODULE [REFLD POWER, FWD POWER]
FROM FILTER MODULE [P OUT MONITOR]
FROM MICRO-PROCESSOR BOARD [1KW ALC/ACC]

LAMP DRIVER/ COUPLER CONTROL/ INTERLOCK CONTROL LATCH U4
[CS04]
LAMP DRIVER/ COUPLER CONTROL CIRCUIT U5A,B,C,G,Q5,Q6
READY LIGHT REMOTE, TUNE LIGHT REMOTE, FAULT LIGHT REMOTE [TO XCVR]
BYPASS [TO BYPASS RELAY]
FAULT LIGHT LOCAL [TO FRONT PANEL]
TUNE COMMAND, HOME ENABLE [TO ANTENNA COUPLER]
KEYLINE INTERLOCK CIRCUIT U5D,Q1,K1
INTERLOCK SWITCH KEYLINE [FROM ANTENNA COUPLER]
INTERLOCK, +28V TUNE ENABLE [TO XCVR]

VC METER CONDITIONING CIRCUIT U14
16 CHANNEL MULTIPLEXER U17
METER +, METER - [TO FRONT PANEL METER]
FWD PWR LOCAL
REFLD PWR LOCAL

IC METER CONDITIONING CIRCUIT U16
[CS05]
MULTIPLEXER SWITCH SELECTOR LATCH U18
BAD0-BAD7

OVERCURRENT DETECTORS U15
OVERCURRENT 1, OVERCURRENT 2, OVERCURRENT 3, OVERCURRENT 4 [TO MICRO-PROCESSOR BOARD]

LCD ENABLE INVERTER U6E
E [TO LCD ASSEMBLY]

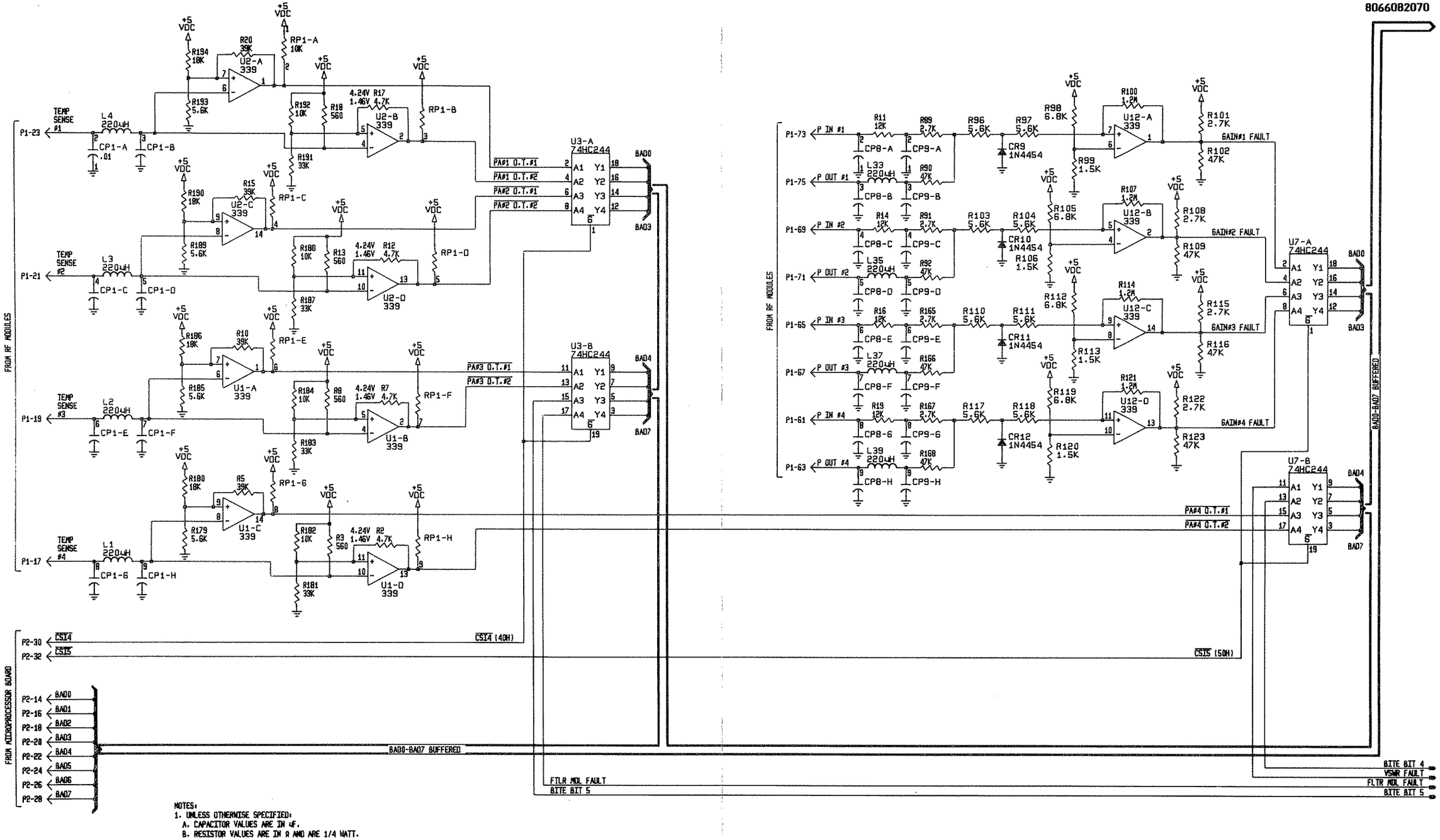
-5VDC
DC-DC CONVERTER U21
DC-AC INVERTER U22
VAC, GND [TO LCD ASSEMBLY]

[+5 VDC FROM AUXILIARY POWER SUPPLY]

[CS06] [CS04] FROM MICRO-PROCESSOR BOARD
[IC MONITOR 1, IC MONITOR 2, IC MONITOR 3, IC MONITOR 4] FROM PA ASSEMBLIES
[CS05] FROM MICRO-PROCESSOR BOARD

FIGURE 6-6 PERIPHERAL BOARD A3A2 BLOCK DIAGRAM

8066082070



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   A. CAPACITOR VALUES ARE IN uF.
   B. RESISTOR VALUES ARE IN Ω AND ARE 1/4 WATT.

FIGURE 6-7 PERIPHERAL BOARD A3A2 (FOR USE WITH GCU-1935) SHEET 1

signal is high, meaning RF is not present, A3A3U1 will ignore those fault indications. Another input to U8 is a signal called 28V TOO HIGH. If this signal is high, it is an indication to Microprocessor A3A3U1 that the 28V is out of tolerance on the high side.

6.2.5.3 Lamp Driver/Coupler Control/-Interlock Control Latch U4

Latch U4 provides several different functions for the SNR-2000. It produces the signals READY, TUNE and FAULT which Microprocessor A3A3U1 uses to light the lamps on the Control Panel 1A2 on the front of the transceiver. The signal TUNE START COMMAND is controlled by A3A3U1 and is placed high whenever A3A3U1 wishes to interrupt the Keyline Interlock in the SNR-2000 to prevent hot switching of RF. This high is issued anytime a band change is required, when a power level change is made or when a GCU-1935 is tuned. A signal called TUNE ENABLE CMD is also an output of U4. A3A3U1 produces a high on this line anytime a GCU-1935 requires tuning. This signal produces a signal called TUNE CMD which is required by the GCU-1935 to initiate a tune cycle. TUNE CMD also grounds the Keyline Interlock through the Keyline Interlock Circuit and Q1. This action causes the transceiver to produce RF through the SNR-2000 to the GCU-1935 to provide it with power to tune. The signal HOME ENABLE is produced by U4. It is provided by A3A3U1 to enable the GCU-1935 to reach its home position early in the tune cycle. The signal BYPASS on U4 is produced by A3A3U1 when it wishes the SNR-2000 to operate in BYPASS. This command is issued anytime A3A3U1 detects fault conditions within its operation which warrant going to 100 watts.

6.2.5.4 Lamp Driver/Coupler Control Circuit U5A, B, C, G, Q5, Q6

The purpose of the Lamp Driver/Coupler Control Circuit is to provide drive capability to the signals exiting Latch U4. From U5A, B, and C the signals READY LGT REMOTE, TUNE LGT REMOTE and FAULT LGT REMOTE respectively provide a logic low with drive capability to illuminate the lamps on the Control Panel 1A2 of the transceiver. FAULT LGT REMOTE also drives the fault lamp on the front panel of the SNR-2000. The signal BYPASS from U5G is used to energize the Bypass Relay in the SNR-2000, sending the SNR-2000 into the BYPASS mode. Q5 and Q6 provide lows to the GCU-1935 on signals TUNE CMD and HOME ENABLE. Transistors are used to provide logic lows which are detectable by the GCU-1935.

6.2.5.5 Keyline Interlock Circuit U5D, Q1, K1

When a KW TUNE signal is received from the transceiver indicating the need to tune the GCU-1935, Microprocessor A3A3U1 issues a high to U5D energizing relay K1, opening the Keyline Interlock. A3A3U1 then proceeds to turn on Q1 causing a low on the interlock line which goes back to the transceiver. This causes the transceiver to produce RF in the tune operation because it sees a keydown condition from Q1. When the tune cycle is complete, A3A3U1 will turn off Q1 and deenergize K1 unkeying the transceiver and deenergize K1 closing the Keyline Interlock again.

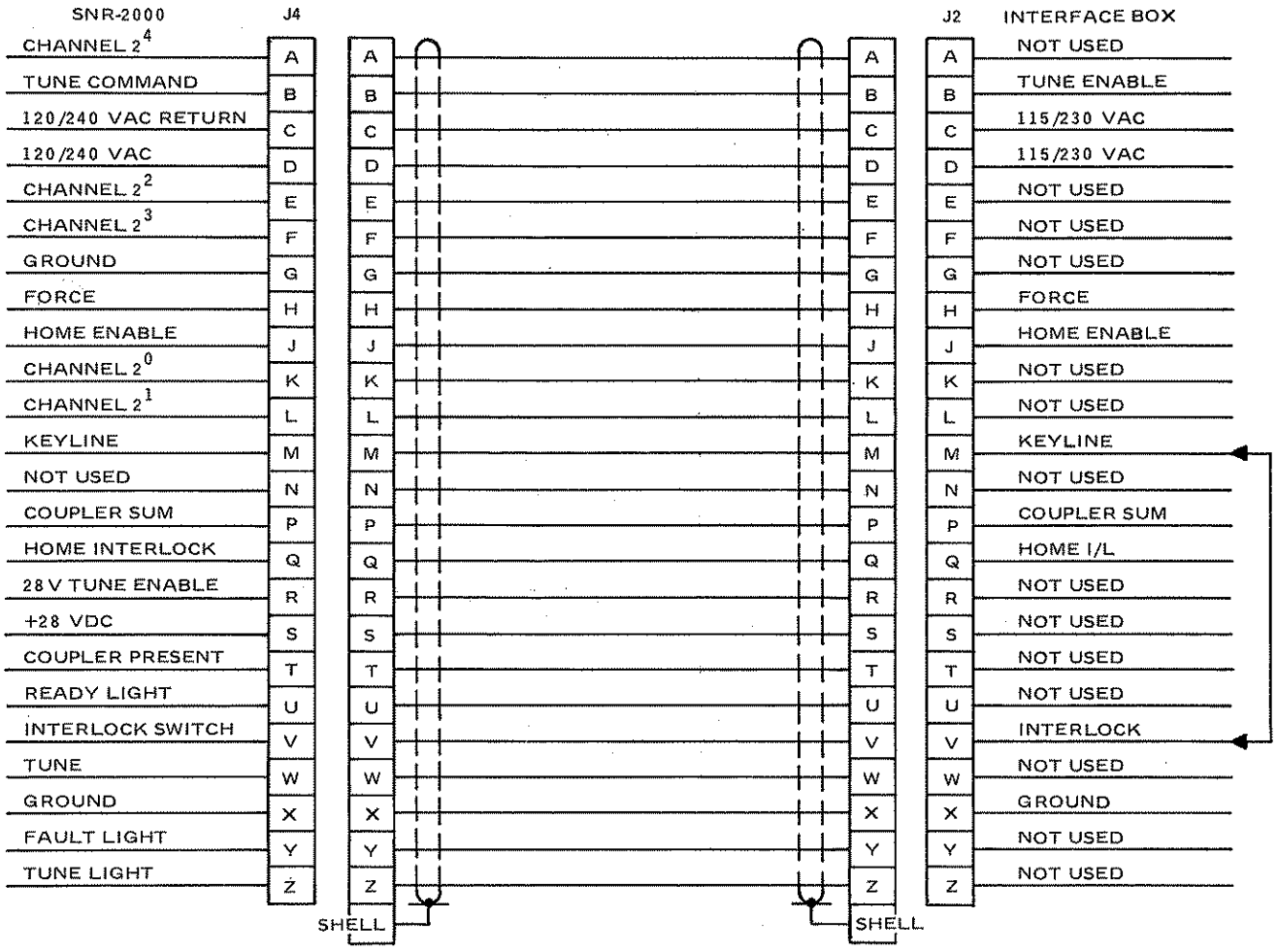
6.2.5.6 Fault Isolation

Refer to paragraph 5.5.2 and Table 5-3.

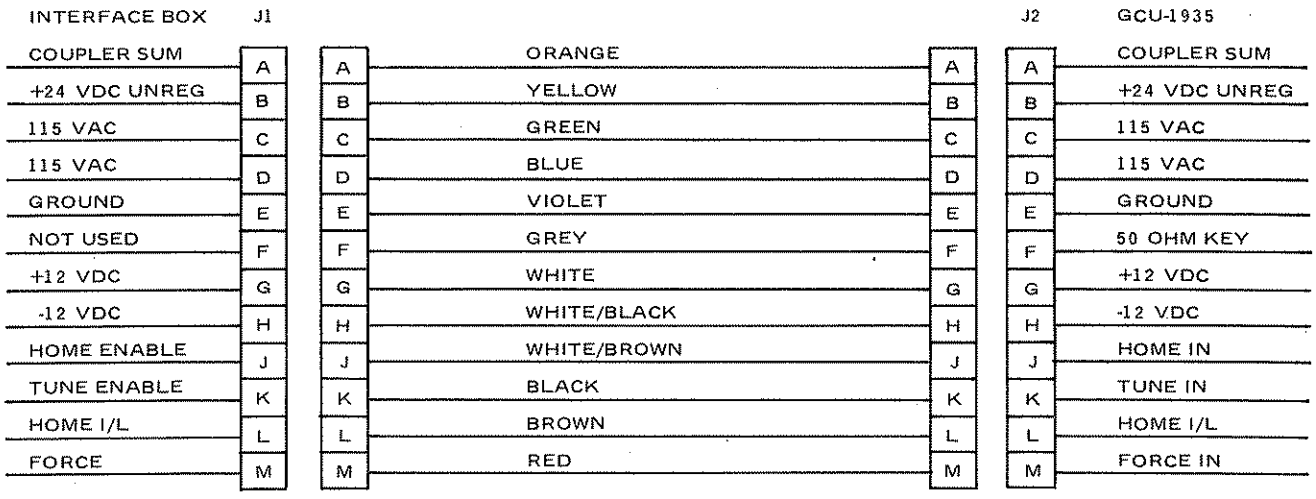
6.3 SNR-2000/GCU-1935 INTERFACE BOX

Refer to Figures 6-8 thru 6-10.

Due to the simplistic nature of the Interface Box, there is no need for a detailed theory of operation. All information required is available in the figures indicated above.



CABLE ASSEMBLY INTERFACE P/N 8066202296



CONTROL CABLE ASSEMBLY P/N 6029003003

FIGURE 6-5 CABLE ASSEMBLIES

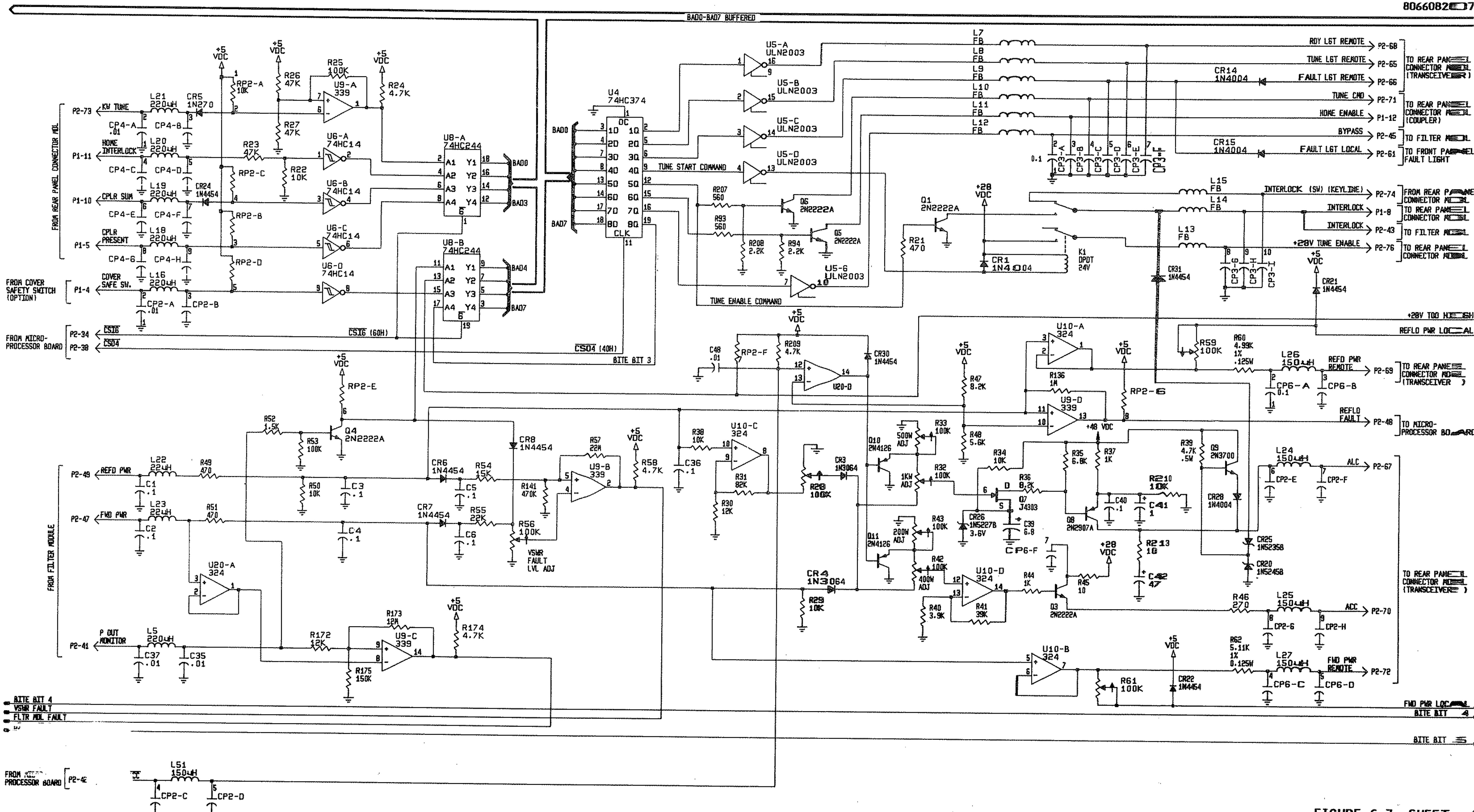


FIGURE 6-7 SHEET

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
R141	Resistor, 470K, 10%, ¼W	0180570005
R142	Resistor, 1.65K, 1%, 1/8W	1008490032
R143	Resistor, 8.06K, 1%, 1/8W	1008500003
R144	Resistor, 33.2K, 1%, 1/8W	0196470005
R145	Resistor, 4.7K, 5%, ¼W	0170770001
R146	Resistor, 10K, 1%, 1/8W	1003050026
R147	Resistor, 10K, 1%, 1/8W	1003050026
R148	Resistor, 4.87K, 1%, 1/8W	1008520004
R149	Resistor, 33.2K, 1%, 1/8W	0196470005
R150	Resistor, 4.7K, 5%, ¼W	0170770001
R151	Resistor, 10K, 1%, 1/8W	1003050026
R152	Resistor, 10K, 1%, 1/8W	1003050026
R153	Resistor, 4.87K, 1%, 1/8W	1008520004
R154	Resistor, 33.2K, 1%, 1/8W	0196470005
R155	Resistor, 4.7K, 5%, ¼W	0170770001
R156	Resistor, 10K, 1%, 1/8W	1003050026
R157	Resistor, 10K, 1%, 1/8W	1003050026
R158	Resistor, 4.87K, 1%, 1/8W	1008520004
R159	Resistor, 33.2K, 1%, 1/8W	0196470005
R160	Resistor, 4.7K, 5%, ¼W	0170770001
R161	Resistor, 10K, 1%, 1/8W	1003050026
R162	Resistor, 10K, 1%, 1/8W	1003050026
R163	Resistor, 4.87K, 1%, 1/8W	1008520004
R164	Pot. 10K, 10%, ¾W, 15 Turns	0338490043
R165	Resistor, 2.7K, 10%, ¼W	0186670001
R166	Resistor, 47K, 10%, ¼W	0171060008
R167	Resistor, 2.7K, 10%, ¼W	0186670001
R168	Resistor, 47K, 10%, ¼W	0171060008
R172	Resistor, 12K, 10%, ¼W	0183180003
R173	Resistor, 12M, 5%, ¼W	1008500020
R174	Resistor, 4.7K, 5%, ¼W	0170770001
R175	Resistor, 150K, 10%, ¼W	0176750002
R176	Resistor, 82, 10%, ¼W	0184610001
R177	Resistor, 49.9K, 1%, 1/8W	1004080026
R178	Resistor, 34.8K, 1%, 1/8W	1008320021
R179	Resistor, 5.6K, 10%, ¼W	0183060008
R180	Resistor, 18K, 10%, ¼W	0175720002
R181	Resistor, 33K, 10%, ¼W	0177920009
R183	Resistor, 33K, 10%, ¼W	0177920009
R184	Resistor, 10K, 10%, ¼W	0170410005
R185	Resistor, 5.6K, 10%, ¼W	0183060008
R186	Resistor, 18K, 10%, ¼W	0175720002
R187	Resistor, 33K, 10%, ¼W	0177920009
R188	Resistor, 10K, 10%, ¼W	0170410005
R189	Resistor, 5.6K, 10%, ¼W	0183060008
R190	Resistor, 18K, 10%, ¼W	0175720002
R191	Resistor, 33K, 10%, ¼W	0177920009
R192	Resistor, 10K, 10%, ¼W	0170410005
R193	Resistor, 5.6K, 10%, ¼W	0183060008
R194	Resistor, 18K, 10%, ¼W	0175720002
R195	Resistor, 8.2K, 10%, ¼W	0181620006
R196	Resistor, 8.2K, 10%, ¼W	0181620006
R197	Resistor, 8.2K, 10%, ¼W	0181620006
R198	Resistor, 8.2K, 10%, ¼W	0181620006
R199	Resistor, 137K, 1%, 1/8W	1008500011
R200	Resistor, 137K, 1%, 1/8W	1008500011
R201	Resistor, 137K, 1%, 1/8W	1008500011
R202	Resistor, 137K, 1%, 1/8W	1008500011
R203	Resistor, 4.7K, 5%, ¼W	0170770001
R204	Resistor, 4.7K, 5%, ¼W	0170770001
R205	Resistor, 4.7K, 5%, ¼W	0170770001
R206	Resistor, 4.7K, 5%, ¼W	0170770001
R207	Resistor, 560, 5%, ¼W	0183200004
R208	Resistor, 2.2K, 5%, ¼W	0178070009
R209	Resistor, 4.7K, 5%, ¼W	0170770001
R210	Resistor, 10K, 10%, ¼W	0170410005
R213	Resistor, 10, 5%, ¼W	0177160004
RP1	Res Ntwk 10 Pin Sip 10K Com	1006130021
RP2	Res Ntwk 8 Pin Sip 10K Com	1005200009
RP3	Res Ntwk 8 Pin Sip 10K Com	1005200009

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
U1	IC. Linear LM339N	1003970028
U2	IC. Linear LM339N	1003970028
U3	IC. Digital 74HC244	1006460039
U4	IC. Digital 74HC374	1006450033
U5	IC. Digital ULN2003A	1005630038
U6	IC. Digital 74HC14	1006490027
U7	IC. Digital 74HC244	1006460039
U8	IC. Digital 74HC244	1006460039
U9	IC. Linear LM339N	1003970028
U10	IC. Linear LM324N	1003970001
U11	IC. Linear LM339N	1003970028
U12	IC. Linear LM339N	1003970028
U13	IC. Linear LM339N	1003970028
U14	IC. Linear LM324N	1003970001
U15	IC. Linear LM339N	1003970028
U16	IC. Linear LM324N	1003970001
U17	IC. Digital 4067B	1006800034
U18	IC. Digital 74HC374	1006450033
U19	IC. Digital 74HC244	1006460039
U20	IC. Linear LM324N	1003970001
U21	IC. Digital, DC/DC Converter	1008190012
U22	IC. Digital, DAS5V3 Inverter	1008190021

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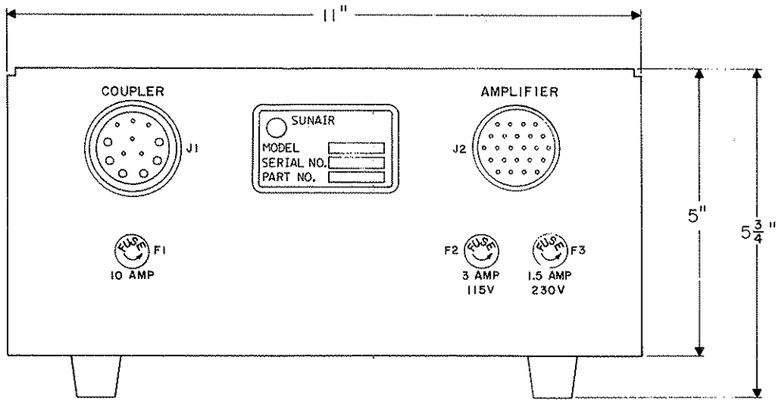

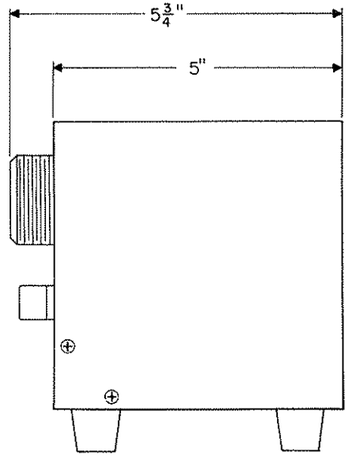

FIGURE 6-8 INTERFACE BOX

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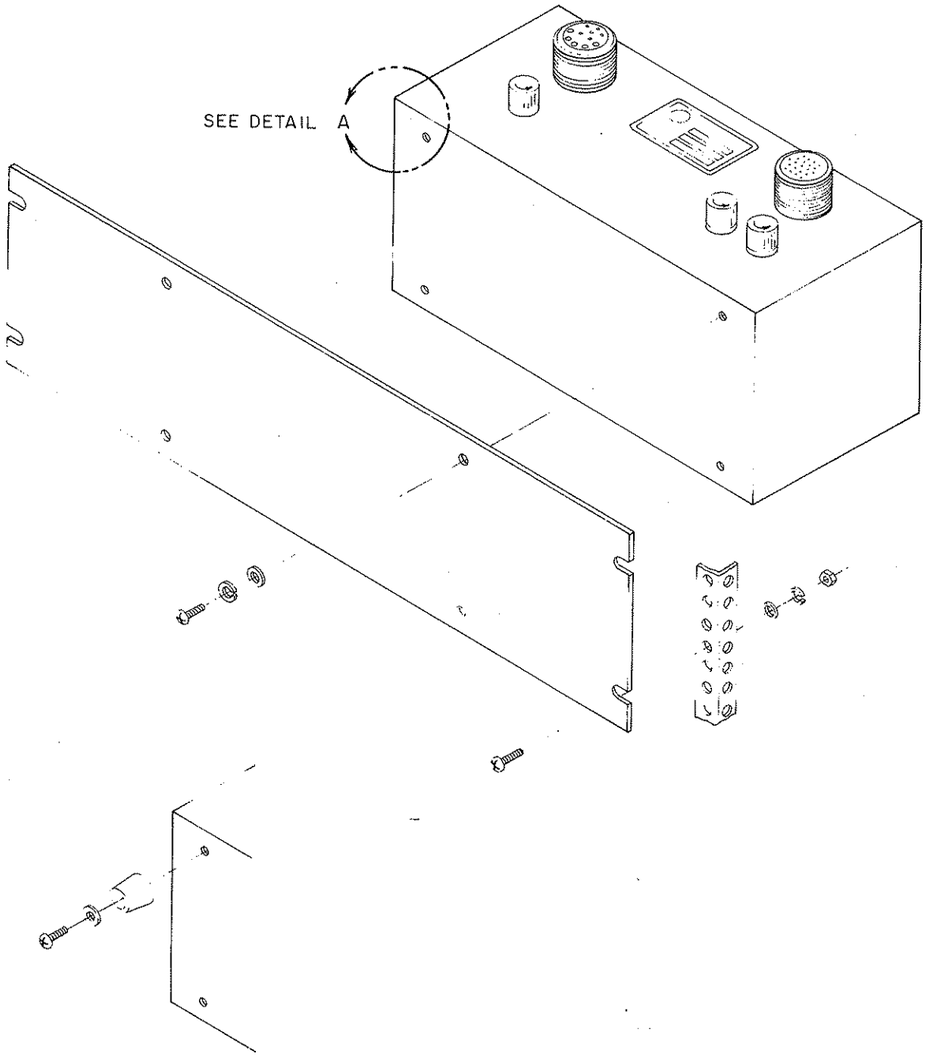


FIGURE 6-9 RACKMOUNT DETAILS

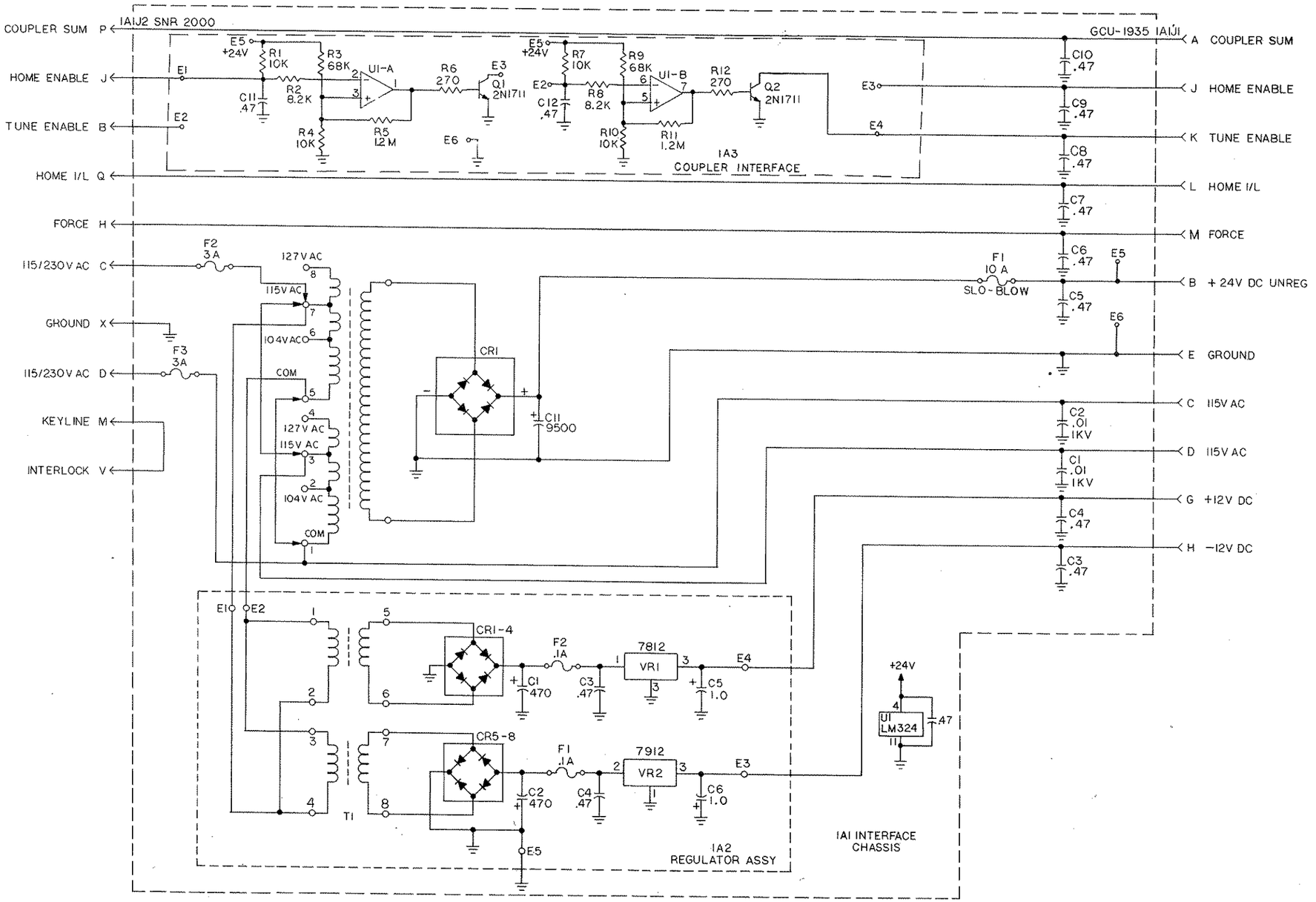
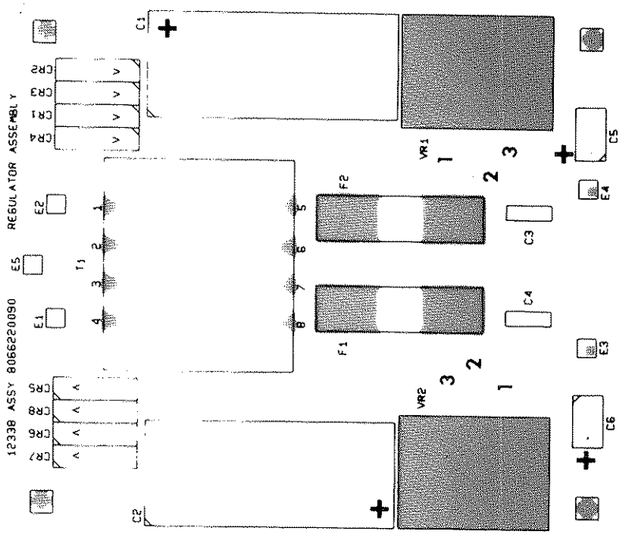
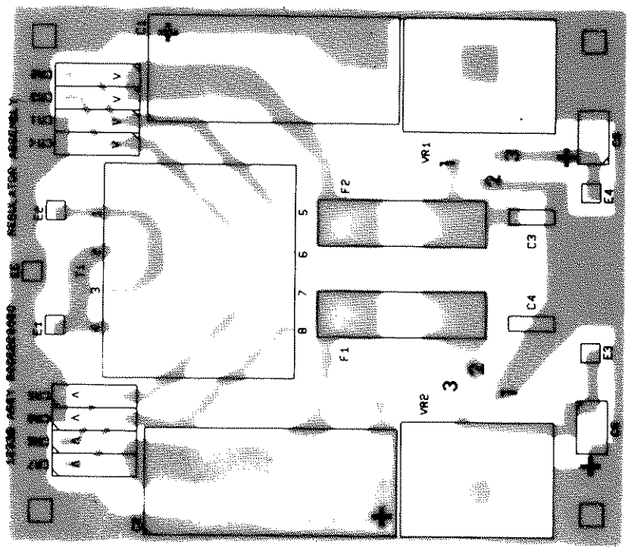


FIGURE 6-10 INTERFACE BOX SCHEMATIC



COMPONENT SIDE



CIRCUIT SIDE

8066230095A PC ASSY VOLTAGE COMPARATOR

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C11	Cap., .47µf, 35V, T368	0279170009
C12	Cap., .47µf, 35V, T368	0279170009
C13	Cap., .47µf, 35V, T368	0279170009
Q1	Transistor, NPN, SI. 2N1711	0448380005
Q2	Transistor, NPN, SI. 2N1711	0448380005
R1	Resistor, 10K, 10%, ½W	0170410005
R2	Resistor, 8.2K, 10%, ½W	0181620006
R3	Resistor, 68K, 10%, ½W	0173520006
R4	Resistor, 10K, 10%, ½W	0170410005
R5	Resistor, 1.2M, 10%, ½W	0174930003
R6	Resistor, 270, 10%, ½W	0178450006
R7	Resistor, 10K, 10%, ½W	0170410005
R8	Resistor, 8.2K, 10%, ½W	0181620006
R9	Resistor, 68K, 10%, ½W	0173520006
R10	Resistor, 10K, 10%, ½W	0170410005
R11	Resistor, 1.2M, 10%, ½W	0174930003
R12	Resistor, 270, 10%, ½W	0178450006
U1	IC Linear LM324N	1003970001

8066210094D CHASSIS ASSY, INTERFACE

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CHASSIS ASSY, INTERFACE	8066210094
C1	Cap. 0.01µf, 1000V, Z5U, 20%	0243550006
C2	Cap. 0.01µf, 1000V, Z5U, 20%	0243550006
C3	Cap. 0.47µf, 50V, X5V, 20%	0283370009
C4	Cap. 0.47µf, 50V, X5V, 20%	0283370009
C5	Cap. 0.47µf, 50V, X5V, 20%	0283370009
C6	Cap. 0.47µf, 50V, X5V, 20%	0283370009
C7	Cap. 0.47µf, 50V, X5V, 20%	0283370009
C8	Cap. 0.47µf, 50V, X5V, 20%	0283370009
C9	Cap. 0.47µf, 50V, X5V, 20%	0283370009
C10	Cap. 0.47µf, 50V, X5V, 20%	0283370009
C11	Cap. 9500µf, 50V, CG	0281470006
CR1	Diode, Bridge SCBA-2	1002650020
F1	Fuse, AGC, 10 Amp, 32V	0848860004
F2	Fuse, AGC, 3 Amp, 250V (for 115V)	1002550009
F2	Fuse, 1.5 Amp AGC Type (for 230V)	1008490008
F3	Fuse, AGC, 3 Amp, 250V (for 115V)	1002550009
F3	Fuse, 1.5 Amp AGC Type (for 230V)	1008490008
J1	Connector, Power, 12 Pin Round	0754350002
J2	Connector, Power, 24 Pin Round	1008490016
T1	Transformer, 230 VAC-240 VAC	1004800029
XF	Fuseholder, Panel Mount	1004740018
	MISCELLANEOUS	
	Bumper 13/16 OD 13/16 LG	0508140005
	Chassis, Interface	8066200102
	Clamp, Cap. Mtg.	0508590001
	Regulator Assy, Interface	8066220090
	Voltage Comparator Assy	8066230095

8066220090C REGULATOR ASSY, INTERFACE

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	REGULATOR ASSY, INTERFACE	8066220090
C1	Cap. 470µf, 50V, TAL	0280890001
C2	Cap. 470µf, 50V, TAL	0280890001
C3	Cap. 0.47µf, 50V, X5V, 20%	0283377771
C4	Cap. 0.47µf, 50V, X5V, 20%	0283377771
C5	Cap. 1µf, 35V, 196D	0281660000
C6	Cap. 1µf, 35V, 196D	0281660000
CR1	Diode, Rectifier 1N4004	0405180004
CR2	Diode, Rectifier 1N4004	0405180004
CR3	Diode, Rectifier 1N4004	0405180004
CR4	Diode, Rectifier 1N4004	0405180004
CR5	Diode, Rectifier 1N4004	0405180004
CR6	Diode, Rectifier 1N4004	0405180004
CR7	Diode, Rectifier 1N4004	0405180004
CR8	Diode, Rectifier 1N4004	0405180004
F1	Fuse, 0.1 Amp, 250VAC Buss AGX	1008670006
F2	Fuse, 0.1 Amp, 250VAC Buss AGX	1008670006
T1	Transformer, AC Power	1006340009
VR-1	IC. Linear 7812CT	0448490005
VR-2	IC. Linear 7912CT	0448500001
XVR1	Heatsink	0841760004
XVR2	Heatsink	0841760004
	MISCELLANEOUS	
	Fuseclip, PC Mount	0534610005

8066201192A INSTALLATION KIT, INTERFACE

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	INSTALLATION KIT, INTERFACE	8066201192
	Bushing, Telescoping, .56 ID	0700550054
	Bushing, Telescoping, .62 ID	0700550062
	Bushing, Telescoping, .75 ID	0700550071
	Clamp, Cable, Connector	0754570002
	Connector, Power, 12 Pin Round	0754340007
	Nut, Hex 10-32 x 3/8 AF	0501940006
	Panel, Rack, Interface	8066203004
	Screw, PH 10-32 x ½Lg.	0500940088
	Washer, Flat #10 .500 OD	0500220000
	Washer, Split, #10	0500070008

8066202296D CABLE ASSY, INTERFACE

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CABLE ASSY, INTERFACE	8066202296
	Bushing, Telescoping, .56 ID	0700550054
	Bushing, Telescoping, .62 ID	0700550062
	Bushing, Telescoping, .75 ID	0700550071
	Cable, 27 Cond/Pairs No. 20	0588680001
	Clamp, Cable, Connector	0754570002
	Connector, Power 24 Pin Male	1008390011
	Connector, Power 24 Pin Round	1008490024
	Lug, Solder, IT No. 8 ¾ L	0502060000
	Nut, Hex 8-32 x 11/32/ AF	0501930001
	Tag, Interconnect Cable	1005830002
	Tie, Cable, 4 LG. ¾ Dia.	0600240002
	Wire Kit, No. 20 Black	1006900004

FOR THE GCU-1935 CHASSIS WIRING CONFIGURATION USE FIGURE 5-4. LISTED BELOW ARE THE PINS WHICH ARE USED IN CONJUNCTION WITH THE SNR-2000DAC CONFIGURATION.

REAR PANEL CONNECTOR MODULE A9

CONNECTOR J5 PIN:	j	TUNE
CONNECTOR J4 PIN:	C	120/240 VAC RETURN
	D	120/240 VAC
	H	FORCE
	J	HOME ENABLE
	P	COUPLER SUM
	Q	HOME INTERLOCK
	W	TUNE
	Z	TUNE LIGHT
CONNECTOR J2 PIN:	1	FORCE
	2	HOME ENABLE
	3	COUPLER SUM
	4	HOME INTERLOCK
	6	TUNE LIGHT
	11	TUNE
	13	TUNE COMMAND

COMPUTER (MOTHERBOARD A3A1) MODULE INTERCONNECT

CONNECTOR J4 PIN:	1	FORCE
	2	HOME ENABLE
	3	COUPLER SUM
	4	HOME INTERLOCK
	6	TUNE LIGHT
	11	TUNE
	13	TUNE COMMAND

FIGURE 6-11 CHASSIS WIRING DIAGRAM FOR GCU-1935 CONFIGURATION