



sunair electronics, inc.

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OPERATION AND MAINTENANCE MANUAL

SSB TRANSCEIVER

ASB — 100A

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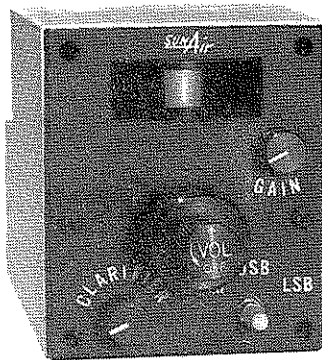
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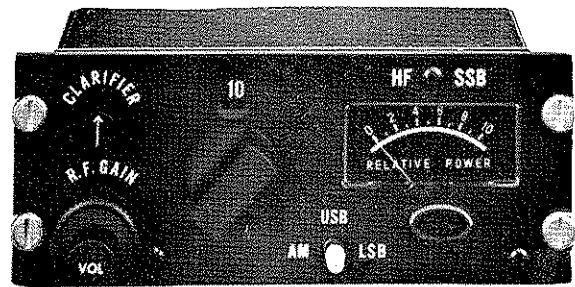
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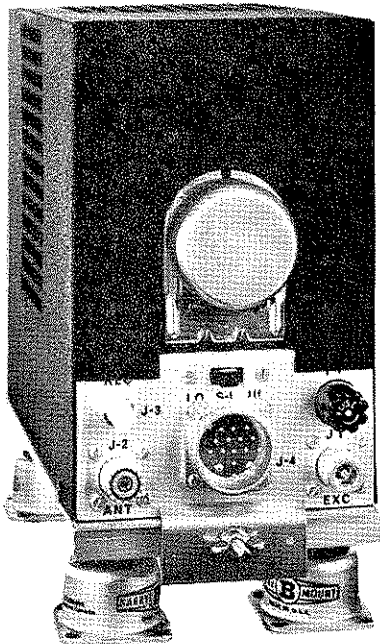
SUNAIR ASB-100A



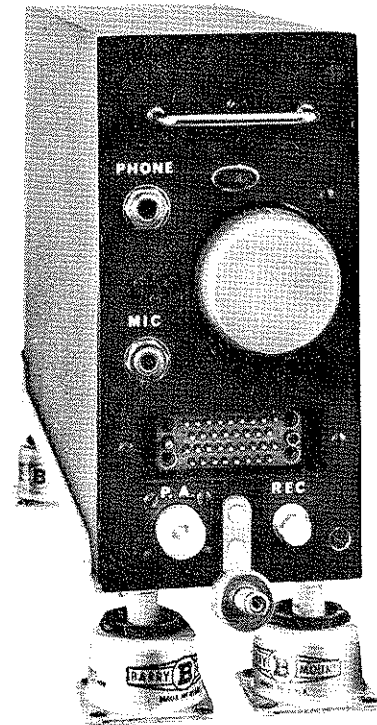
MCU-30
CONTROL UNIT
(OPTIONAL)



SCU-10 CONTROL UNIT



PA-1010A POWER AMPLIFIER/
POWER SUPPLY



RE-1000 RECEIVER/
EXCITER

Figure 1.1. ASB-100A SSB Communications Equipment

SECTION 1

GENERAL INFORMATION

1.1 SYSTEM DESCRIPTION

The ASB-100A SSB Communication Equipment is a lightweight, airborne 10-channel, single sideband (SSB) and compatible amplitude modulated (AM) transmitting-receiving system designed for long range voice communications in the 2-18 MHz frequency range. The system consists of three units: RE-1000 Receiver/Exciter, PA-1010A Power Amplifier/Power Supply, and SCU-10 Control unit. (The optional MCU-30 Miniature Control unit can be substituted for the SCU-10.)

1.2 SPECIFICATIONS

Qualified under FAA Technical Standard Order C31b and C32b, environmental category CAAAAAX.

Type accepted under FCC Regulations, Parts 83, 85 and 87.

Frequency Range2,000 to 18,000 KHz

Number of Channels ...10 single or double frequency simplex

Channel frequencyUnlimited spacing

Channeling time2 seconds maximum

Modes of operationCompatible amplitude modulation, receive and transmit

Upper sideband, receive and transmit

Lower sideband, receive and transmit

Input Power:

Receive:3 amps at 14 volts 2.5
amps at 28 volts

Transmit:14 amps at 14 volts 9
amps at 28 volts

TRANSMITTER:

Power Output AM: 25 Watts Carrier
SSB: 100 Watts PEP
nominal

Output Impedance50 ohms, nominal

Frequency Stability±20 Hz

SidetoneAdjustable to 100mw
into 500 ohms

Duty Cycle.....Continuous

RECEIVER:

Input Impedance.....50 ohms nominal

Frequency Stability0.0025%

ClarifierProvided for tone
control

SelectivityAM: 6.0 kHz, 6db
down
20 kHz, 60db
down
SSB: 2.0 kHz, 6db
down
6.5 kHz, 60db
down

SensitivityAM: 2uv for 6db signal-
plus-noise to noise
ratio or better
SSB: 0.7uv for 10db
signal-plus-noise
to noise ratio or
better

SUNAIR ASB-100A

Gain Not more than 10uv for
100mw output

AGC Output will not vary
more than 10db with an
input from 10 to
500,000uv

Audio Output 100mw into 500 ohms

Audio Response Output will not vary
more than 8db from 350
to 3,000 cps

Audio Distortion AM: Not more than
20% at 100mw
SSB: Not more than
10% at 100mw

Spurious Response 60db down from channel
frequency at ± 10 kHz
AM and ± 6.5 kHz SSB

1.3 EQUIPMENT SUPPLIED

The following table is a list of equipment, with appropriate Sunair part numbers, supplied with the ASB-100A system.

		SUNAIR PART NO.
1.3.1 Receiver/Exciter, RE-1000	14 V	0999110004
	28 V	0999120000
1.3.2 Power Amplifier/Power Supply, PA-1010A	14 V	0999130005
	28 V	0999140001
1.3.3 Control Unit, SCU-10	14 V	0998950009
	28 V	0998970000
	5 V	0998890006
1.3.4 Shockmount, RE-1000		0999150006
1.3.5 Shockmount, PA-1010A		0999160001
1.3.6 Connector Kit, PA/RE		0972220003
1.3.7 Plug Assembly, mates RE-1000 to SCU-10 (2 each)		0747400008
1.3.8 Operation and Maintenance Manual		0993980007

1.4 EQUIPMENT REQUIRED BUT NOT SUPPLIED

1.4.1 Antenna Coupler, CU-110 with connectors	14 V	0998161101	—
	28 V	0998161209	—
1.4.2 Automatic Antenna Coupler, ACU-150A	28 V (only)	8042100094	
1.4.3 Antenna:			
a. HF Anti-Precipitation Static Antenna Kit		0951580001	
b. HF Bare Wire Fixed Antenna Kit		0951460005	
1.4.4 Microphone			
1.4.5 Headset			
1.4.6 Installation Cable		Custom Made	
1.4.7 Coax Cables Set		Custom Made	

1.5 OPTIONAL EQUIPMENT (NOT SUPPLIED)

1.5.1	Coax Relay Kit	14 V	0986810002
		28 V	0986930008
1.5.2	Switch, DPDT, to operate Coax Relay		0321180003
1.5.3	ASB-100A Test Set (without cables)		0999170007
1.5.4	ASB-100A Test Set Cables		0999180002
1.5.5	Control Unit, MCU-30	14 V	0996760008
		28 V	0996770003
1.5.6	1000 Hz Tone Oscillator		0978230001

1.6 DESCRIPTION**1.6.1 SCU-10 CONTROL UNIT (Figure 1.1)**

Operation of the ASB-100A system is remotely controlled by the SCU-10 Control Unit. The controls located in the SCU-10 unit are:

1. RF gain control
2. Volume control
3. On-off switch
4. Clarifier
5. Mode selector
6. Channel selector

The RF gain control, volume control, and on-off switch is a dual potentiometer with a DPST switch. The RF gain control provides the operator a means of adjusting the receiver sensitivity to a desired level while the volume control is used to adjust the audio level. The DPST switch is operated by the volume control shaft. One section of this switch operates the on-off power relay located in the PA-1010A and the other section is used as an on-off switch for the SCU-10 panel lights. A clarifier control provides the operator an adjustment for obtaining natural voice quality audio. The mode selector is used to select the mode of operation desired, upper sideband (USB), lower sideband (LSB), or compatible amplitude modulation (AM).

The meter located on the front of the SCU-10 provides the operator a means of checking the operation of the transmitter and fixed antenna system and

can be used as a tuning indicator for a trailing wire antenna. The meter indicates relative transmitter power output.

1.6.2 RE-1000 RECEIVER/EXCITER (Figure 1.1)

The complete receiver section and the exciter portion of the transmitter for the ASB-100A system are contained in the RE-1000 Receiver/Exciter unit. Channeling of this unit is accomplished by means of a rotary solenoid remotely controlled by the SCU-10 control unit. There is a microphone jack, a head-phone jack, and connectors for inter-unit cabling located on the front of the RE-1000. The sidetone potentiometer for adjusting the sidetone output level is accessible from the front of the unit. The shockmount supplied with the unit can be assembled, to mount the unit either horizontally or vertically. See page 2.4 for details.

1.6.3 PA-1010A POWER AMPLIFIER/POWER SUPPLY (Figure 1-1)

The PA-1010A Power Amplifier/Power Supply unit contains the amplifier driver, power amplifier and power supply for the ASB-100A system. Channeling of this unit is accomplished by means of a rotary solenoid controlled by the master wafer located in the RE-1000 Receiver/Exciter Unit. All connectors for inter-unit cabling, the A+ fuse and the HI-LO power switch are located on the front of the unit. A shockmount is supplied for mounting the PA-1010A unit.

1.6.4 ACCESSORIES

The ASB-100A system can be used with either a fixed antenna system or a trailing wire antenna. A fixed antenna system includes a fixed antenna, either bare wire type or anti-precipitation type, with an antenna coupler tuned to the fixed antenna. A trailing wire antenna can be either manually or electrically operated.

1.6.5 OPTIONS.

The MCU-30 (Figure 1-1), miniaturized control unit is an option which can be substituted for the SCU-10 in installations where cockpit space is a problem. It provides all the functions to the ASB-100A system as does the SCU-10 except that it does not come equipped with a meter.

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.

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SECTION 2

INSTALLATION

2.1 GENERAL

Adherence to the suggestions and instructions contained in this section will assure an easier and more satisfactory installation of the ASB-100A SSB Communication System.

2.2 UNPACKING

Unpack and inspect all parts and equipment as soon as received. Do not accept a shipment where there are visible signs of damage to the cartons until a complete inspection is made. If there is a shortage of items or if any 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 a shipment has been accepted, notify the carrier immediately, in writing, and await his inspection before making any disposition of the shipment. A full report of the damage should also be forwarded to Sunair. Include the following:

- a) Order number
- b) Model and serial number
- c) Name of transportation agency

When Sunair receives this information, arrangements will be made for repair or replacement.

2.3 RESHIPPING

The shipping cartons for the ASB-100A have been carefully designed to protect the Receiver/Exciter, PA and their accessories during shipment. These cartons and their associated packing materials, should be used to reship the radio.

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 controls, connectors, and other protrusions from the radio. Rigid cardboard should be placed at the corners of the equipment to protect against denting.

When returning one or more subassemblies for repair, please ship AIR PARCEL POST consigned to:

SUNAIR ELECTRONICS, INC.
3101 SW 3rd Avenue
Ft. Lauderdale, Florida 33315
U.S.A.

Plainly mark with, indelible ink, all mailing documents as follows:

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

and be sure to mark on all sides of the package

"FRAGILE - ELECTRONIC EQUIPMENT"

NOTE

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

2.4 INSTALLATION CONSIDERATIONS AND MOUNTING INFORMATION

The location and installation of the ASB-100A system will depend on the type of aircraft in which the equipment is to be installed; however, the following general requirements, applicable to all types of aircraft, should be considered when planning the installation.

SUNAIR ASB-100A

2.4.1 TYPE AND LOCATION OF ANTENNA TO BE INSTALLED

It is recommended that a fixed antenna with an antenna coupler be installed as the primary antenna system. If this is not desirable or a secondary or back-up system is required, then a trailing wire antenna can be installed.

2.4.2 FACTORS TO CONSIDER BEFORE INSTALLATION OF A FIXED ANTENNA

2.4.2.1 Recommended Type and Length.

Refer to antenna coupler manual (ACU-150A or CU-110) for recommended antenna configuration and installation.

2.4.2.2 Location of Antenna Coupler.

The antenna coupler should be installed within 12 inches of the feed-through insulator.

2.4.2.3 Antenna Wire.

It is recommended that #18 bare copperweld wire with a minimum breaking strength of 153 pounds or anti-precipitation static antenna wire with a minimum conductor breaking strength of 250 pounds be used. The fittings used should meet or exceed the breaking strength of the wire. See paragraph 1.4, page 1-2, for listing of Sunair antenna kits available.

2.4.3 INSTALLATION OF SCU-10 CONTROL UNIT

Installation dimensions for the SCU-10 Control Unit are shown in Figure 2.1. The SCU-10 should be installed within convenient view and reach of the operator. The SCU-10 is designed for installation on a standard AN console panel. It is secured to the console by means of four Dzus fasteners.

2.4.4 INSTALLATION OF RE-1000 RECEIVER/EXCITER AND PA-1010A POWER AMPLIFIER/POWER SUPPLY

Locate the RE-1000 and PA-1010A units so that they are accessible for inspection and maintenance, and in an area that is free from excessive vibration and heat. Allow sufficient space for shockmount travel and sway. Installation dimensions for the PA-1010A and RE-1000 are shown in Figures 2-2 and 2-3. The RE-1000 unit can be mounted in either a horizontal or vertical position. To change the mounting position of the RE-1000 shockmount:

- a) Remove the fastener and ground straps from the shockmount
- b) Remove the four shock isolators
- c) Remove the six screws holding the side rails to the front and rear brackets
- d) Rotate the front and rear brackets 90° and align side rail holes to front and rear bracket holes
- e) Install the six screws for securing the side rails to the front and rear brackets
- f) Replace shock isolators, fastener and ground straps.

To change the mounting position of the RE-1000 Receiver/Exciter unit:

- a) Remove the dust cover from the unit
- b) Remove the crystal oven cover
- c) Remove the two locating pins on the rear of the unit and re-install pins in the two holes not being used
- d) Replace crystal oven cover
- e) Change location of the retaining hook on the front panel as shown in Figure 2.3
- f) Replace dust cover.

2.4.5 STATIC DISCHARGERS

It is recommended that static dischargers be installed on the aircraft. Consult the aircraft maintenance manual or the aircraft manufacturer for information pertaining to type, location, and quantity to be installed.

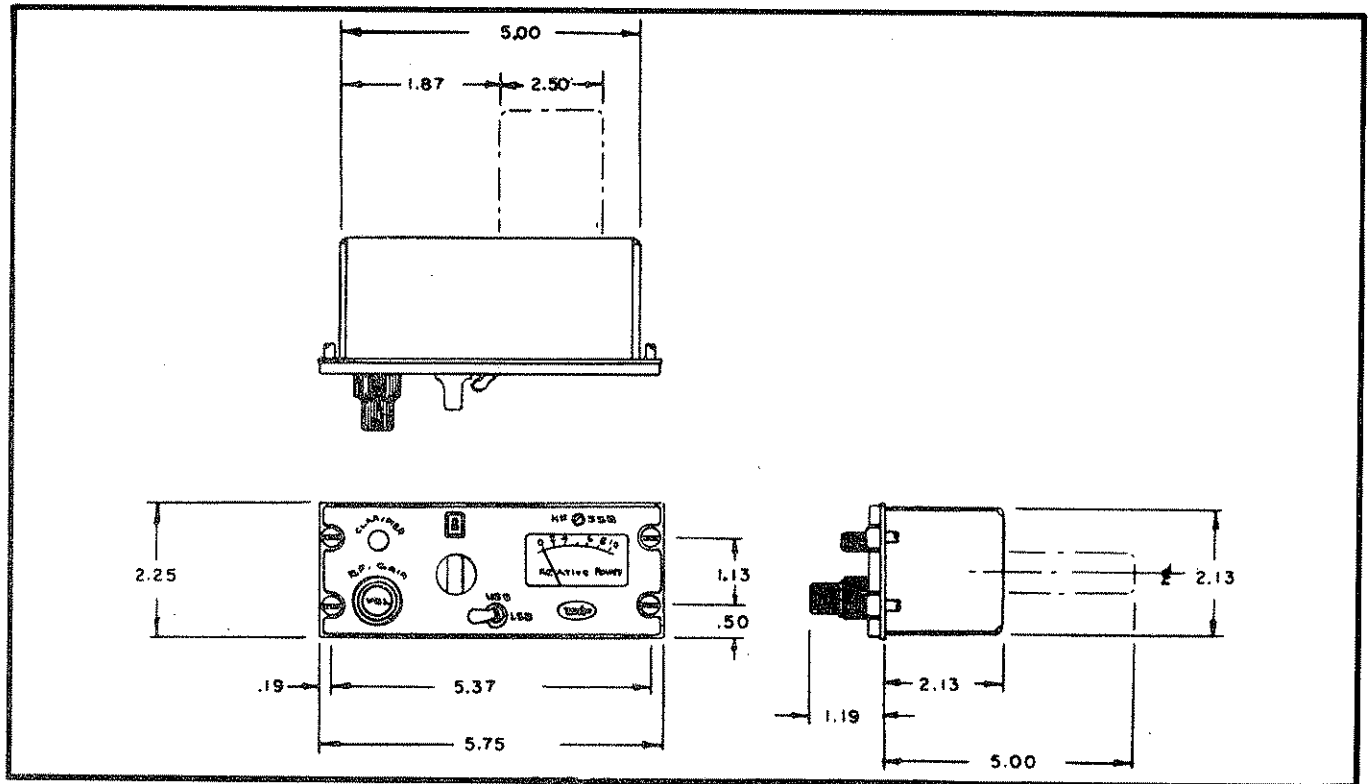


Figure 2.1. Installation Dimensions, SCU-10 Control Unit

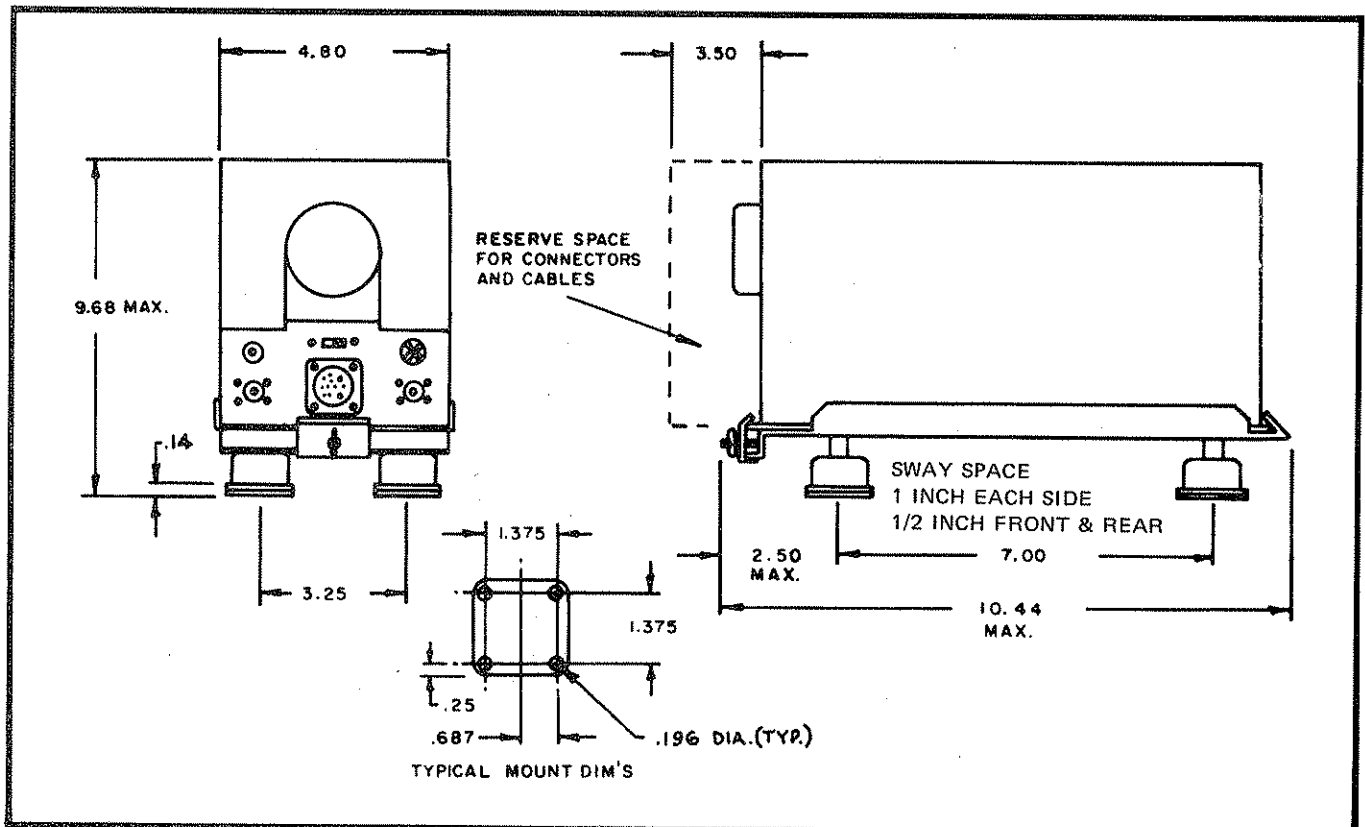


Figure 2.2 Installation Dimensions, PA-1010A Power Amplifier/Power Supply

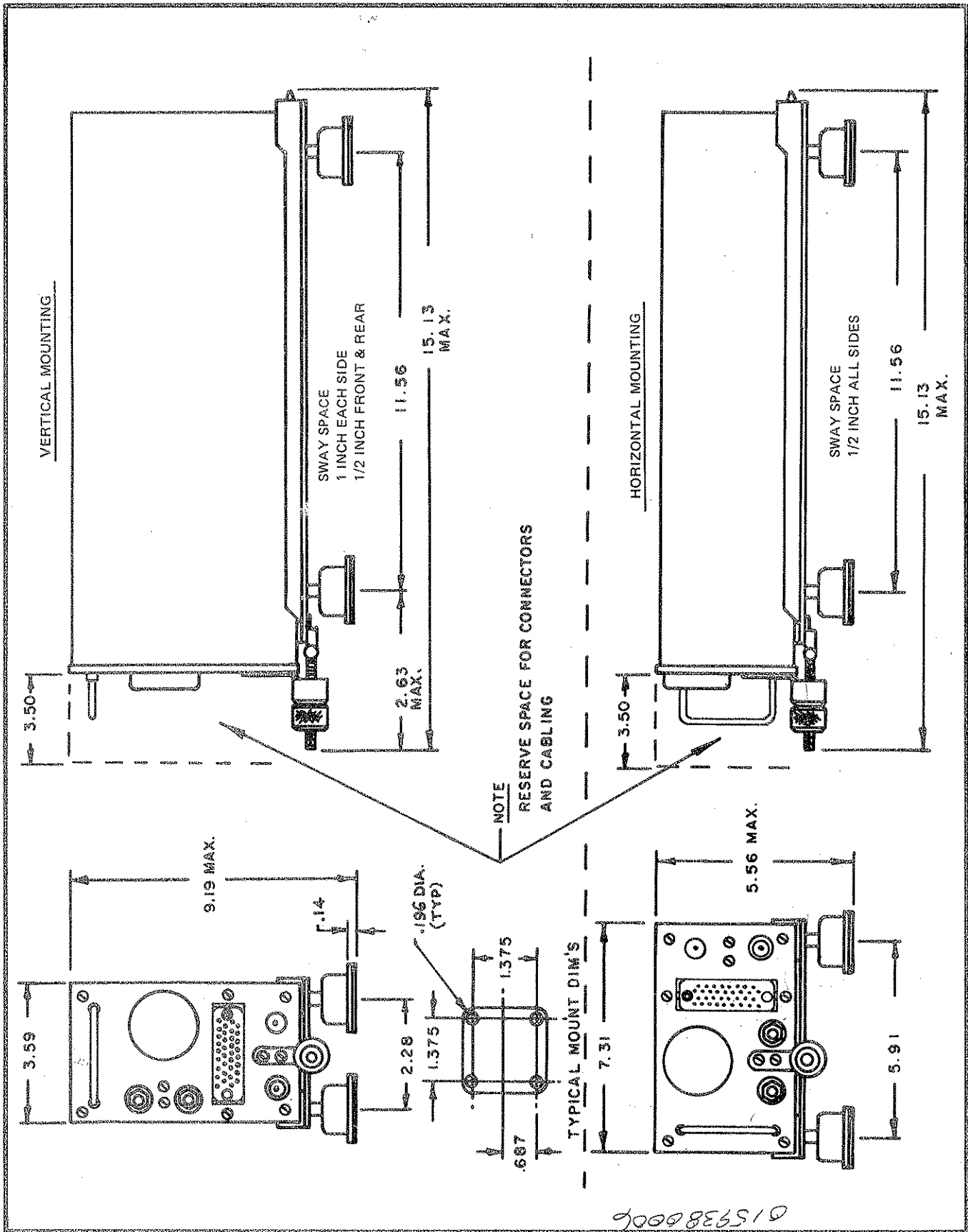


Figure 2.3. Installation Dimensions, RE-1000 Receiver/Exciter

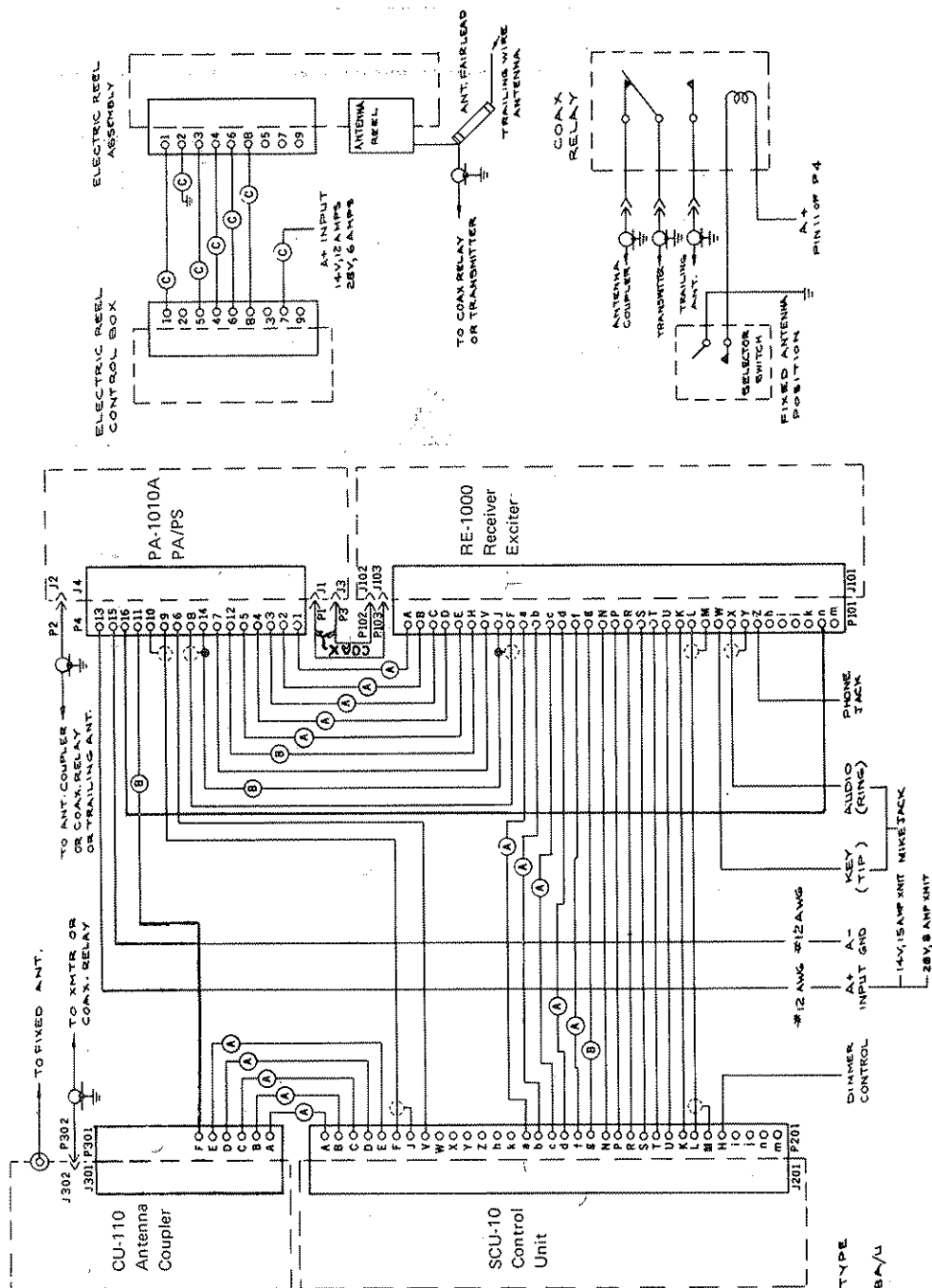
PART NO	DESCRIPTION	VENDOR PN	REFERENCE DESIGNATION	TY COM	ECN	EG D P QUANTITY	UM
9999150006	SHOCKMOUNT	RE-1000	MEG	2110 D		EA	
COMPONENT							
0118030001	STRAP, GROUND, SILVER PLATED			O/P 010	054-050	2. EA	
0118150006	ISOLATOR, SHOCK/VIB. 5-10 LBS			PUR 015		4. EA	
0158970004	PLATE, BASE, FRONT	L44-BA-10 BARRY		PUR 010		1. EA	
0159020000	RAIL, PH			PUR 010		1. EA	
0159140005	RAIL, LH			PUR 010		1. EA	
0159380006	PLATE, BASE, REAR			PUR 010		1. EA	
0500040001	WASHER, SPLIT #6	NSN 5310009296395		PUR 501	054-050 Z	3. EA	
		MS35338-136					
0500060002	WASHER, SPLIT #8	NSN 5310009338119		PUR 501	054-040	4. EA	
		MS35338-137					
0500200009	WASHER, FLAT #6 .312 OD	96304 FEDERAL		PUR 502	054-050	1. EA	
0500620041	SCREW, FH 4-40 X 1/4 LG.	NSN 5310001070270		PUR 544	2110 Z	6. EA	
0500760063	SCREW, FH 8-32 X 3/8 LG.	AN507C		PUR 547	054-040	4. EA	
0501910000	NUT, HEX 6-32 X 1/4 AF	70206 FEDERAL		PUR 520	054-050 Z	3. EA	
		NSN 5310001393008					
0513840001	RETAINER, FRONT	AN507C-632-5		PUR 016	054-050	1. EA	
0522350054	SCREW, FH 6-32 X 5/16 LG.	NSN 5305009696495		PUR 546	054-050	3. EA	
		MS24693C-25					
0524170002	WASHER, ET #6 .312 OD	99504 FEDERAL		PUR 504	054-050	2. EA	

END OF REPORT

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P1	07474020001
P2	0742070000/0742190005
P3	07440300005
P4	0747260001
P101	0747400008
P102	0744030005
P103	0747020001
P201	0747400008
P301	0750930004/0751100005
P302	0742070000/0742190005

WIRE	LENGTH	SIZING
A	LESS THAN 24 FEET MORE THAN 24 FEET BUT LESS THAN 39 FEET MORE THAN 39 FEET BUT LESS THAN 52 FEET	# 20 # 18 # 16
B	LESS THAN 12 FEET MORE THAN 12 FEET BUT LESS THAN 20 FT. MORE THAN 20 FEET BUT LESS THAN 31 FT. MORE THAN 31 FEET BUT LESS THAN 50 FT.	# 20 # 18 # 16 # 14
C	LESS THAN 10 FEET MORE THAN 10 FEET BUT LESS THAN 18 FT. MORE THAN 18 FEET BUT LESS THAN 25 FT.	# 16 # 14 # 12

NOTE:

1. UNLESS OTHERWISE INDICATED Wires (INCLUDING SHIELDING) SHOULD BE AWG #24 OR LARGER
2. A ALL SHIELDING WIRE INSULATED BY 10 MILS
3. COAXIAL CABLES SHALL BE 1/2" OR GREATER

Figure 2.4. Interconnect Diagram, ASB-100A/CU-110 System

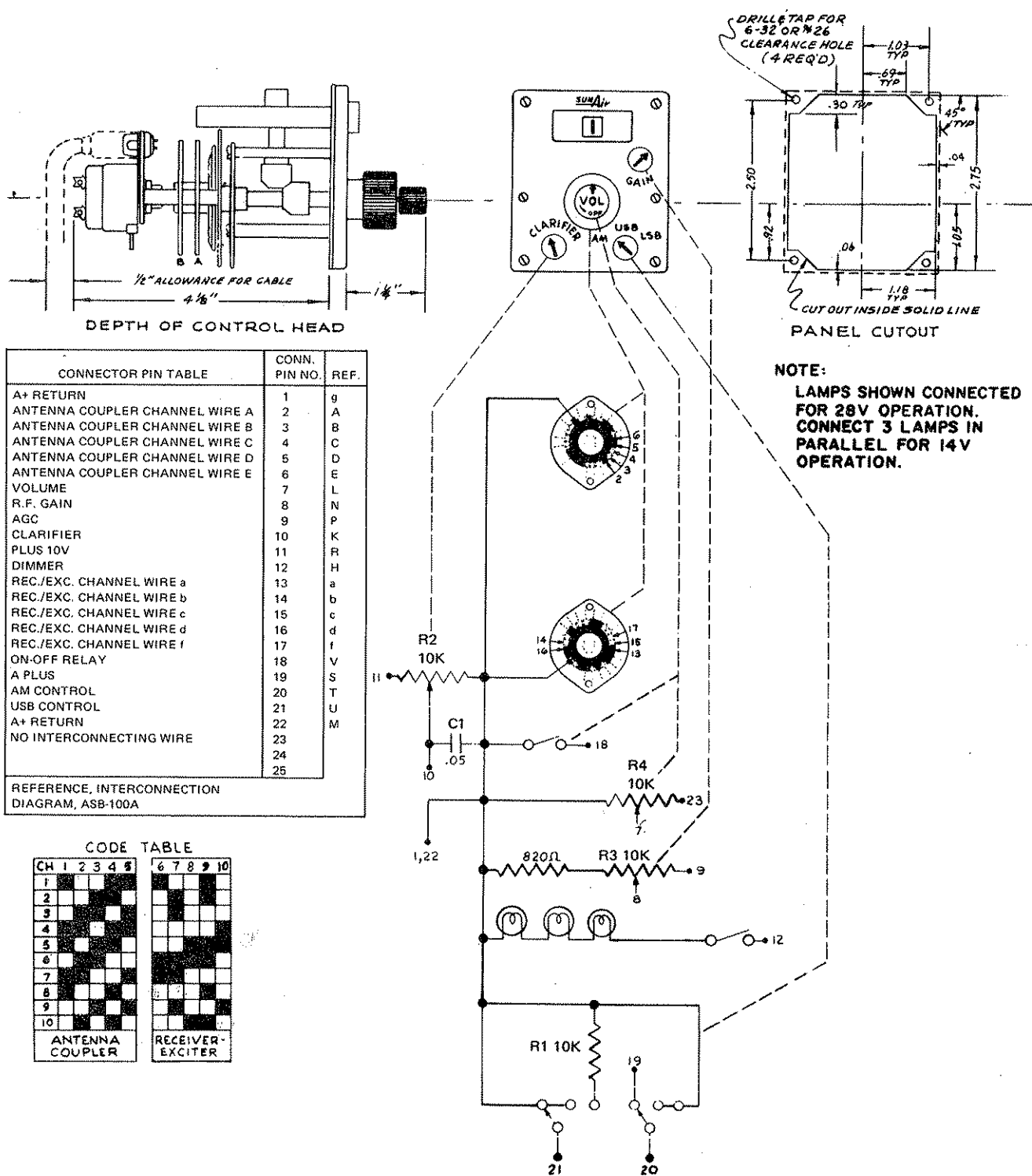


Figure 2.5. MCU-30, ASB-100A, Control Head Schematic and Mounting Diagram

0996770003K CONTROL HEAD, MCU-30

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CONTROL HEAD, MCU-30	0996770003
C1	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
R1	Pot, 10K, Audio Taper, DPST SW	0340510005
R2	Resistor, 10K, 10%, 1/4 W	0170410005
R3	Control Rework, MCU-30	0996770011
R4	Control Rework, MCU-30	0996770011
	Cap, Toggle Switch, White	0336930003
	Connector, Power, 25 Pin Rect.	0749080001
	Filter, Lamp, Blue	0871370000
	Knob, .38 D, Black, White Line	0339540001
	Knob, .50 D, Black, Marked	0339920009
	Knob, .87 D, Black	0326750002
	Lamp, Wire Term. T-1 3/4 Clear	0871490005
	Switch Toggle, DP3T	0334730007

0998280003B CONNECTOR KIT, MCU-30

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CONNECTOR KIT, MCU 30	0998280003
	Connector Power, 25 Pin Rectifier	0748930001
	Hood, Connector, W/Cable Clamp	0749100001
	Screwlock Assembly, Male	0749220007

2.4.6 MICROPHONE

A noise cancelling, transistorized microphone is recommended to be used. A carbon microphone can be used with the system, however, random movement of the carbon particules due to vibration or hand motion while the transmitter is keyed will cause spurious outputs and degrade the quality of the transmitted audio.

2.5 CABLING

The ASB-100A installation cables should be fabricated according to the interconnection diagrams, Figures 2.4 and 2.6. The connectors required for the cables are supplied, but individual wires are not. The length of the installation cable will depend on the location of the equipment in the aircraft. Cables should be arranged so that shockmount travel is not restricted. No sharp bends should be made in any of the cables.

If factory fabricated installation cables are desired, furnish the following information when ordering:

- a) Cable length from SCU-10 to RE-1000
- b) Cable length from RE-1000 to PA-1010A
- c) If the antenna installation is to be:
 1. Fixed antenna ONLY - cable length from PA-1010A to antenna coupler.
 2. Trailing wire antenna ONLY — cable length from PA-1010A to trailing wire antenna *and* cable length from electric reel control box to electric reel assembly.
 3. BOTH fixed antenna and trailing wire antenna-cable length from PA-1010A to coax relay *and* cable length from coax relay to antenna coupler and to trailing wire antenna. Also, cable length from electric reel control box to electric reel assembly.

2.6 CHECKS AND ADJUSTMENTS AFTER INSTALLATION

Apply ground power to the aircraft and check for proper voltage, 13.75 or 27.5 volts DC. Turn the ASB-100A system on.

2.6.1 CHANNELING

Check the channeling of the RE-1000, PA-1010A and antenna coupler by listening to the channeling of the units while the channel selector is slowly turned from 1 to 10 and then from 10 to 1, or by visual inspection of the PA-1010A and antenna coupler wafer switches as the channel selector is turned. If the PA-1010A is channeling properly, the RE-1000 is also channeling properly.

2.6.2 TRANSMITTER OUTPUT — AM

Connect a wattmeter and a dummy load to J2. Check the transmitter output on all active channels with the mode selector in the AM position. The meter located in the SCU-10 Control Unit will be indicating the relative transmitter output. A wattmeter reading of 20 to 30 watts is normal.

2.6.3 TRANSMITTER OUTPUT — SSB

The microphone that is to be installed in the aircraft should be used for this check. Set the mode selector to USB position. Press the microphone button and speak into the microphone. Notice there is power output only when speaking into the microphone. The wattmeter should show peak readings of 25 to 30 watts when speaking in a normal tone of voice. The microphone level has been adjusted at the factory for a Shure model 488T microphone. If a different type microphone is used, it may be necessary to adjust R101, microphone level control.

To adjust microphone level:

- a) Remove the cover from the RE-1000 unit.
- b) Key the microphone, and, while speaking in a normal tone of voice, adjust R101 for peak readings of 25 to 30 watts on the wattmeter. R101 is located to the rear of J101, main cable connector, with the shaft toward the rear of the chassis.

2.6.4 SIDETONE

After the microphone level has been adjusted, adjust the sidetone level. Talk into the microphone while listening to the sidetone on a headset and adjust R1003 for desired level. R1003 is accessible through the hole in the face plate which is centered between the mounting of the handle.

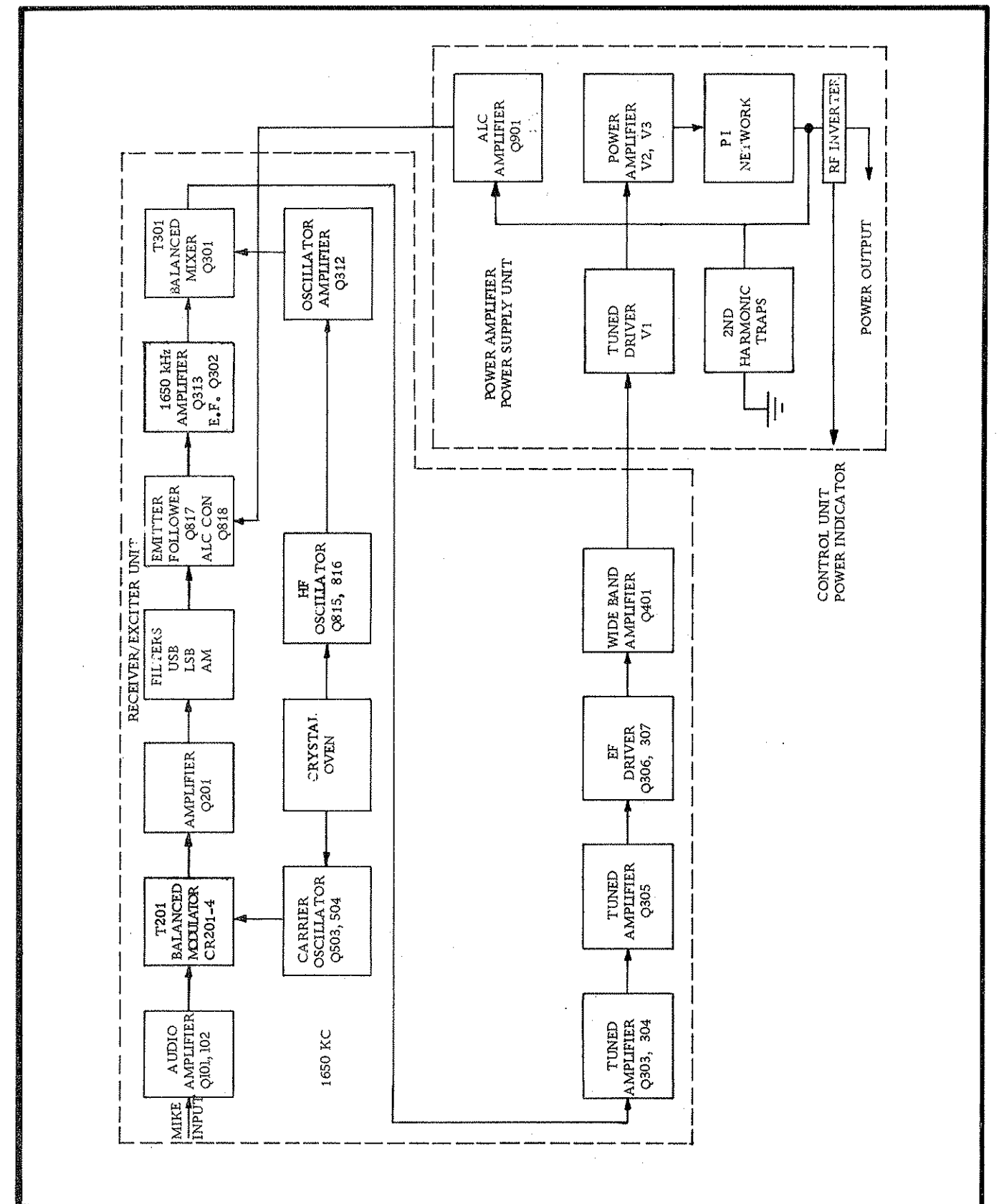


Figure 3.1: Block Diagram, Exciter and Power Amplifier

3.3.3 CARRIER OSCILLATOR Z500A

The Carrier Oscillator (Q503 and Q504) is a crystal-controlled, Pierce oscillator with a resonant frequency of 1650 kHz. The crystal is housed in a constant-temperature oven at +75° C to prevent frequency variations due to temperature changes. The output of the oscillator is applied to the Balanced Modulator to combine with the audio frequency signal to produce the sidebands.

3.3.4 AMPLIFIER Z200

Amplifier, Q201, amplifies the output from the Balanced Modulator and presents the correct impedance to the sideband filters.

3.3.5 FILTER

There are two crystal bandpass filters which can be selected by a switch on the Control Unit—one for upper and one for lower sideband. The filters are highly selective and only allow the selected sideband to pass. The other sideband and all unwanted frequencies are attenuated greater than 60 db.

NOTE

In the United States, Canada and various other countries, ONLY UPPER SIDEBAND MAY BE USED. Use of the lower sideband is prohibited.

The AM filter shown in the block diagram is used only while receiving AM transmission and will be discussed in the receiver section.

3.3.6 EMITTER FOLLOWER AND AUTOMATIC LEVEL CONTROL (ALC) Z800

The output from the filters drives an Emitter Follower (Q817) which presents the correct load impedance to the filters. The output from Q817 is coupled to the Automatic Level Control transistor (Q818). The ALC amplifier limits the level of the modulator output signal sent to the balanced mixer and consequently controls the signal through the

rest of the circuitry to limit the final output to 100 watts PEP in SB mode and 20 to 30 watts average in AM mode. The ALC circuit is driven by the ALC amplifier which is physically located in the power amplifier section.

3.3.7 COMPATIBLE—AM MODE

To communicate with stations which do not have a single sideband receiver, it is necessary to transmit a carrier frequency in addition to the sideband signal. This is done in the ASB-100A by reinserting the carrier (which was originally suppressed in the Balanced Modulator) back into the signal path. The resulting transmission is commonly referred to as compatible-AM, as it allows communication with AM stations. When in AM mode, the control voltage through the carrier reinsertion resistor (R211) biases and unbalances the balanced modulator circuit, allowing the 1650 kHz carrier to be reinserted in the signal path.

The carrier reinsertion resistor (R211) can be wired to operate automatically. Wafer switch SW-1B can be wired for this function.

3.3.8 1650 kHz AMPLIFIER AND EMITTER FOLLOWER Z300

These stages (Q313 and Q302) provide amplification of the 1650 kHz signal and present a proper match between the ALC stage and the Balanced Modulator.

3.3.9 BALANCED MIXER

The Balanced Mixer translates the intelligence frequency to the assigned channel frequency. The sideband signal from the Emitter Follower (Q302) is fed into the mixer through potentiometer, R314, which is adjusted to give equal signals to the mixer diodes, M301. The signal from the Channel Oscillator is fed into the balanced mixer through phase splitter Q301. The selected sideband and the oscillator signals are cancelled at the output of the Balanced Mixer. The mixer action will produce the sum and the difference of the two input signals plus the sideband and oscillator signals, both considerably reduced in amplitude.

3.3.10 CHANNEL OSCILLATOR

The Channel Oscillator is a crystal-controlled, Pierce oscillator (Q815) driving an Emitter Follower (Q816). Specially manufactured crystals, mounted on gold-plated electrodes and housed in a +75° C oven, maintain the frequency to the specified stability of ± 20 cps. This high degree of frequency stability is necessary for high quality SSB transmission and it is absolutely necessary that only crystals procured from Sunair be installed in the unit. Failure to do so will void Sunair's responsibility to meet FCC Rules and Regulations and the operating specifications contained in this manual. Zener diode, CR810, provides additional voltage regulation to further insure frequency stability. Each of the 10 oscillator circuits is resonant 1650 kHz above the channel frequency.

3.3.11 TUNED AMPLIFIERS Z300

The output of the Balanced Mixer appears on the secondary of transformer T301, where it passes into two tuned amplifiers, Q303 and Q305. The sum and difference of the sideband frequency and the Channel Oscillator frequency appear on the output of T301. The two tuned amplifiers select the difference frequency and amplify it to the desired level. Figure 3.3 shows an example of the frequency relationships. Q304, Q306 and Q307 are Emitter Followers which provide impedance matching and circuit isolation.

3.3.12 EMITTER FOLLOWER-DRIVER Z300

Q306 and Q307 provide additional impedance matching, circuit isolation and power gain to drive the Wide-band Amplifier.

3.3.13 WIDE-BAND AMPLIFIER Z400

The Wide-band Amplifier, Q401, is a class-A amplifier with approximately 20 db of voltage gain to drive the tuned vacuum tube amplifier, V1, which is located in the Power Amplifier/Power Supply unit.

3.4 POWER AMPLIFIER/POWER SUPPLY

The final power amplifier stages and the associated

power supply are housed in a separate chassis. This unit functions only with the Exciter and has no function for the Receiver except to route the A+ and antenna signal to the Receiver. Figure 3.1 shows the block diagram; Figure 7.1 is the schematic.

3.4.1 AMPLIFIER SECTION

3.4.1.1 Driver V1

The exciter signal from the wide-band amplifier in the receiver/exciter unit drives the control grid of the tuned amplifier, V1. The signal, which has been at a relatively low level throughout the previous portions of the exciter is now amplified approximately 30 db to drive the final amplifier.

3.4.1.2 Power Amplifier, V2, V3

The final power amplifier stage is a linear amplifier operated class AB1 and consists of two tubes, V2 and V3. For linear operation, zero signal tube current is set to 35 ma per tube by adjusting R24. This corresponds to approximately -50 VDC bias level and 0.7 VDC on the two cathodes. If V2 or V3 is replaced, they should be checked for approximately equal zero signal current. For 100 watts PEP output with a standard two-tone test signal input, the power input to each tube is approximately 60 watts average; 75 ma with plate voltage at 800 VDC.

3.4.1.3 ALC Detector

The automatic level control detector, CR901 and Q901, receives its signal from the 50 ohm output of V2 and V3. It functions as a wide-band detector and DC amplifier which detects and responds to any change in power output from that originally set by adjusting R901. When this condition is detected, the ALC detector amplifier puts out a correcting DC voltage that increases or decreases the exciter output and subsequent power output of the amplifier. Potentiometer R901 is used to set the threshold of the ALC detector and, consequently, the upper limit of output power. For normal operation, R901 is set to limit the power output at 100 watts PEP. In AM mode, selected value resistor R910 limits the power output to 25-30 watts AVE. (Peak envelope power, by definition, is the peak power contained in one

cycle of the RF signal. PEP is normally obtained by multiplying the average power reading, as measured on a Bird Model 43 Wattmeter or equivalent, by 2.5 for a two tone output or by 2 for a single tone output.)

3.4.1.4 Pi Network

The output from amplifiers V2 and V3 is connected to a tuned, capacitive input pi network that transforms the plate impedance to a 50 ohm resistive output and attenuates harmonics of the fundamental frequency. Second harmonic traps are connected to the output to further attenuate the second harmonic to greater than 60 db below the fundamental frequency.

3.4.1.5 Resultant Power Detector (RF Inverter)

The detector is designed as a standing wave detector and will detect standing waves in the forward and reverse direction with respect to the amplifier output. The two detected signals are added algebraically and connected to the meter in the control panel. Therefore, for 100% reflected power, the detector output would be zero and the meter would read zero. For a perfect match, the reflected power would be zero and the meter would be driven to maximum deflection.

3.4.2 POWER SUPPLY

The power supply furnishes high voltages for the driver V1, and the power amplifier, V2 and V3. A+ voltage is supplied to transistors (Q1 and Q2) which are connected to the square loop transformer, T1. The transistors and transformer form an oscillator circuit that oscillates at approximately 1 kHz and couples a square wave output to the bridge rectifiers, CR1-CR4, and half wave rectifier, CR5. The output of the bridge circuit is approximately 800 VDC for the two final amplifiers. The output winding is center tapped and supplies 400 VDC to the driver, V1. High B+ is generated by the oscillator only when the microphone is keyed and relay K3 actuated. Rectifier CR5 output is -100 VDC which is regulated to approximately -65 VDC by CR8 and is the bias supply for V2 and V3. The 400 VDC output is also regulated by CR9 at approximately

210 VDC and is the screen grid supply for V2 and V3. Regulating the grid supplies results in improved power stability and linearity over input voltage variations.

3.5 RECEIVER

The Receiver operates as a single sideband receiver or an AM receiver. The principal difference between the two modes of operation is the method of signal demodulation. For SSB reception, the Balanced Modulator (CR201-204) is used in the reverse direction as a Product Detector to demodulate the signal; in the AM mode, a standard Envelope Detector (Q814) is used. Also, the correct filter must be selected for SSB or AM. Switching from SSB to AM reception is accomplished by forward-biasing diode CR807 in the Audio Amplifier and reverse-biasing CR805 in the IF Amplifier and selecting the AM Filter via relays K201 and K202. The following circuits are used for both the transmit and receive mode of operation: 1650 kHz Amplifier (Q201), SSB Filters and Emitter Follower (Q817), and (for SSB only) the Product Detector (Balanced Modulator). Figure 3.2 is a block diagram of the functional units of the Receiver; Figure 7.2 is the schematic.

3.5.1 SSB MODE

3.5.1.1 RF Amplifier

The incoming signals pass from the antenna through two tuned circuits to Emitter Follower, Q801. A shunt (R801, CR801) protects the amplifier from very strong signals. A tuned, common-base amplifier (Q802) amplifies the signal and provides further selectivity. The GAIN potentiometer in the Control Head varies voltage to the bases of Q801, Q802, and Q803 which control RF gain.

3.5.1.2 Receiver Mixer

The Mixer (Q804) converts the received signal frequency to the intermediate frequency, 1650 kHz. The received signal and the Receiver Oscillator frequency (channel frequency + 1650 kHz) are fed to the Mixer. The collector output of Q804 is fed into a parallel resonant circuit, resonant at 1650 kHz, which selects the difference frequency between the

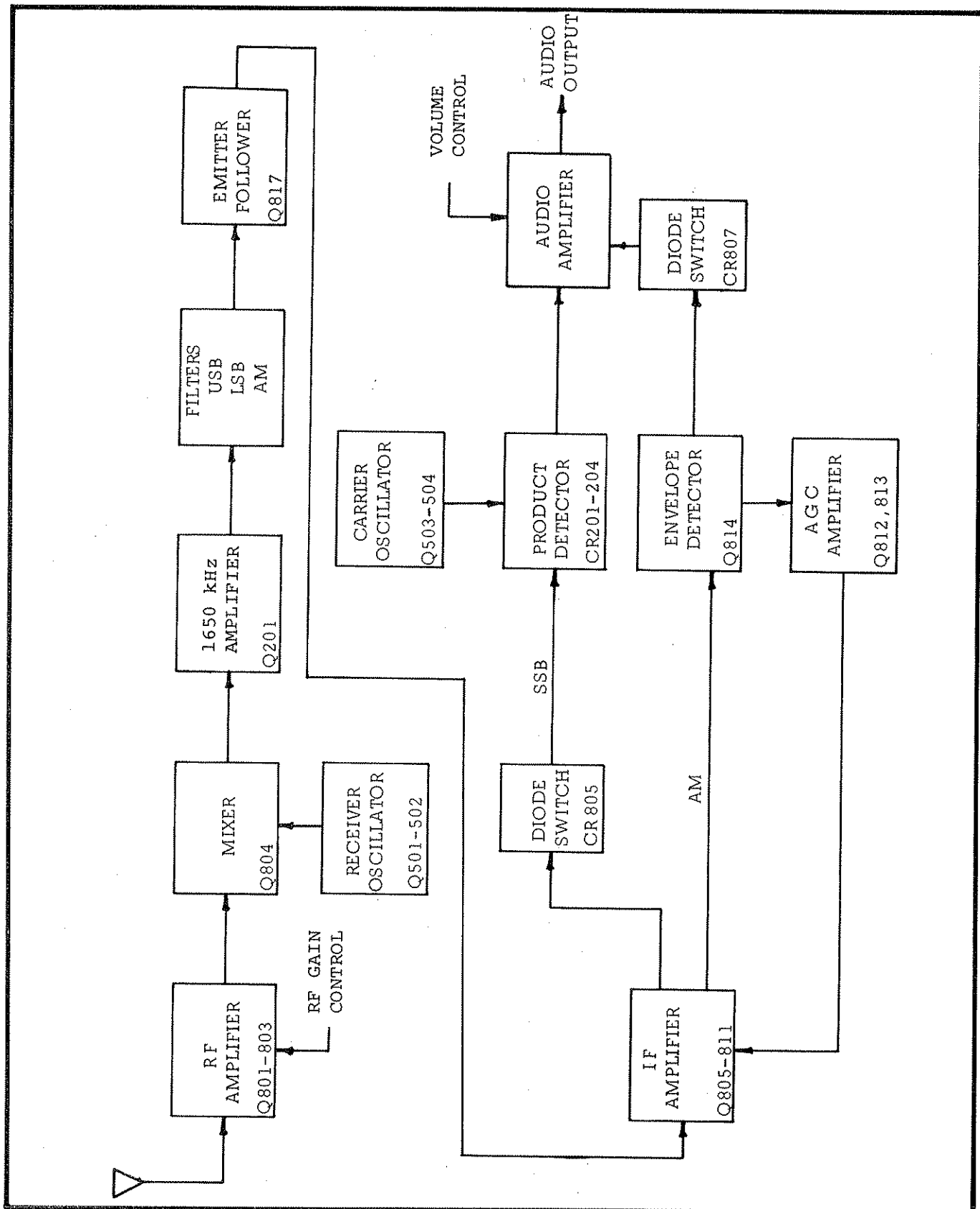


Figure 3.2. Block Diagram, Receiver

received signal and the Oscillator frequency. Thus the incoming signal is converted to an intermediate frequency of 1650 kHz. Figure 3.3 shows the frequency relationships in various parts of the circuit.

3.5.1.3 Receiver Oscillator Z500

The Receiver Oscillator is a crystal-controlled, Pierce oscillator similar to the Channel Oscillator in the Exciter, except that the crystals are not housed in an oven. Each of the 10 circuits is tuned to oscillate 1650 kHz higher than the assigned channel frequency. This oscillator contains a voltage-variable capacitor (CR501) in shunt with the crystal. A change in the voltage across the varicap will change its capacitance and consequently the frequency of the oscillator. This control voltage is provided by the clarifier potentiometer located in the Control Unit unit.

3.5.1.4 Amplifier

The signal from the Mixer Q804 enters Amplifier, Q201, through relay, K203-1. This amplifier is the same as used in the Exciter circuit and is used to match the filter impedance.

3.5.1.5 Filters

In the receiver mode, the filters provide high selectivity. When AM is being received, the AM filter allows passage of both sidebands. The SSB filters are used during SSB reception and provide a narrow passband, 2150 Hz, for the selected sideband.

3.5.1.6 Emitter Follower

Emitter Follower, Q817, provides impedance matching for the filters and supplies the signal to the I.F. Amplifier. The Emitter Follower is the same one used in the Exciter.

3.5.1.7 I.F. Amplifier

The Intermediate Frequency Amplifier is designed to operate in the frequency range of 1650 kHz. It provides the major (approximately 70 db) amplification, additional selectivity, and automatic gain

control. The I.F. Amplifier is composed of the following six transistors; (Q805, 806, 807, 808, 810, 811). Q809 and diodes CR803, CR804 are driven by the AGC Amplifier for automatic gain control. The I.F. Amplifier output is connected to diode switch CR805 and the Envelope Detector, Q814. For SSB reception, CR805 is switched "ON" and the signal is routed to the Product Detector. For AM reception, the diode is switched "OFF" and the AM signal is routed to the Envelope Detector.

3.5.1.8 Product Detector

The Product Detector is the Balanced Modulator used in reverse to demodulate the signal. The signal from the I.F. Amplifier enters transformer, T201. The oscillator signal (1650 kHz) enters through potentiometer R201. The Product Detector effectively removes the intermediate frequency, leaving the audio frequency signal which goes to the Audio Amplifier.

3.5.1.9 Carrier Oscillator

The Carrier Oscillator (Q503 and Q504) operates the same for SSB-receive and SSB-transmit.

3.5.1.10 Audio Amplifier

The Audio Amplifier (Q308, 309, 310, 311) amplifies the audio signal to 100mw maximum at 500 ohms to drive the headset or speaker amplifier.

3.5.2 AM MODE

In the AM mode, the signal path is exactly the same as in the SSB mode except that the AM Filter is used and the Envelope Detector is used instead of the Product Detector.

3.5.2.1 Filter

The AM Filter allows the passage of both sidebands and the carrier. The filter input and output is controlled by the Control Unit switch or automatically by SW-1B which activates relays K201-1 and K202-1.

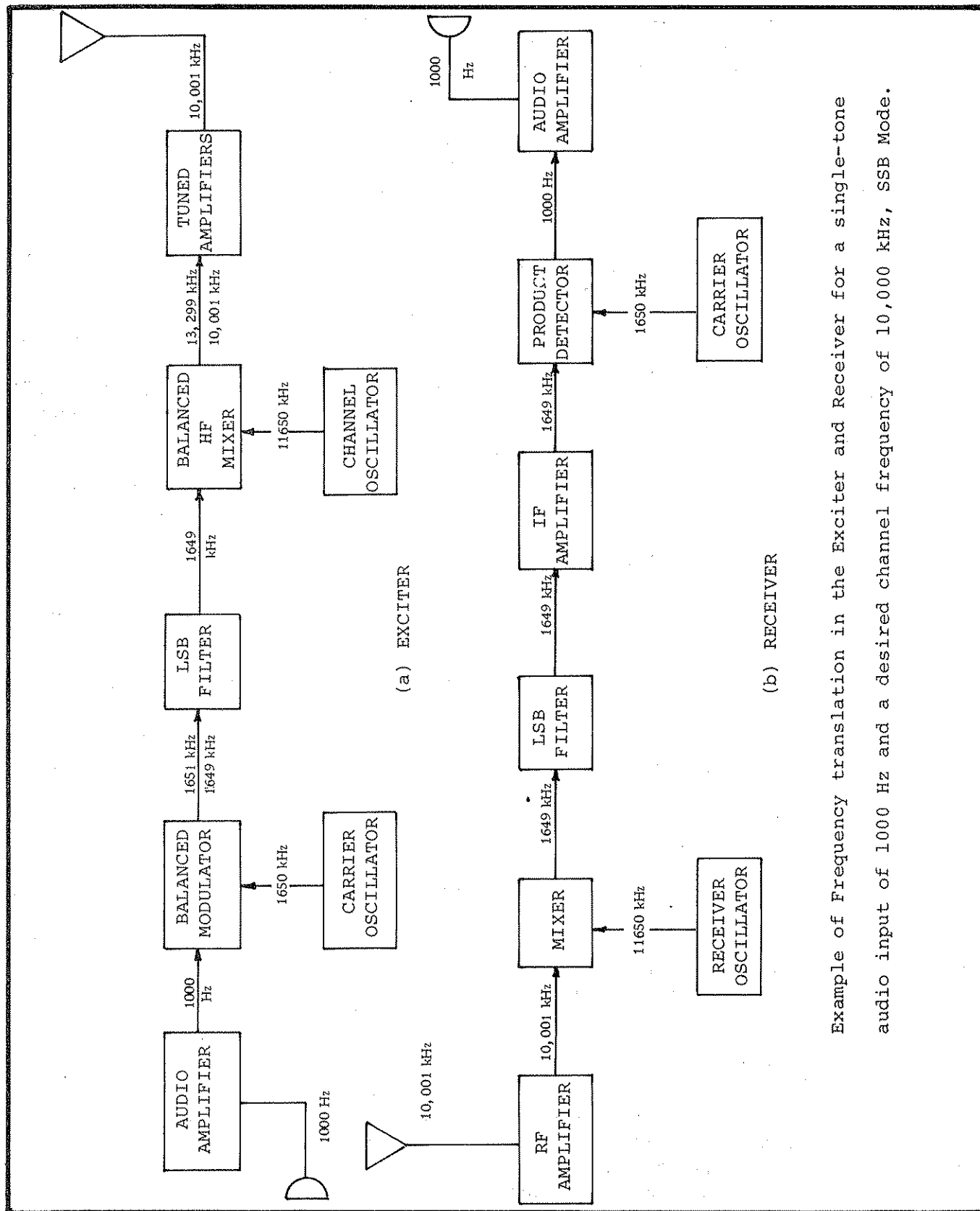


Figure 3.3. Example of Frequency Relationships

3.5.2.2 Detector

By reverse-biasing diode switch CR805 in the I.F. Amplifier, the I.F. signal is routed only to the Envelope Detector, Q814, via R845 and C866. The 1650 kHz component of the signal is passed to ground through C865 while the audio frequency component is detected and switched into the Audio Amplifier.

3.5.2.3 Audio Amplifier

In the AM mode, diode switch CR807 is forward-biased to allow the AM signal to pass into the Audio Amplifier. During the SSB mode, the diode is reverse-biased, and signals through this path are blocked.

3.5.2.4 AGC Amplifier

The Automatic Gain Control Amplifier, Q812, Q813, is driven by the Envelope Detector. The AGC amplifier detects the average signal level passing through the detector and alters the gain of the I.F. Amplifier accordingly.

3.6 CONTROLS AND INDICATORS

3.6.1 GENERAL CONTROLS

The press-to-talk switch is located on the microphone and is not considered a part of the ASB-100A system; but it is explained here because of the functions it initiates. When it is pressed, it activates relays K203 and K204. When energized, K203 connects the Balanced Modulator output to the 1650 kHz Amplifier (Q201); K204 connects +10 VDC, regulated to the Exciter and disconnects power to the Receiver.

In the Power Amplifier/Power Supply, the PTT Switch activates relays K1 and K3. Relay K1 connects the Power Amplifier output to the antenna connector; relay K3 supplies 14/28 VDC to the Power Supply.

3.6.1.1 Hi-Lo Power Switch

This switch is located on the front of the Power Amplifier/Power Supply unit. When switched to

Lo, a 120 K resistor, R9, is inserted in the circuit lowering the voltage to the screen grids of V2 and V3. This switch lowers the power output of the transmitter to permit antenna coupler tuning and bench alignment

3.6.2 CONTROL UNIT

3.6.2.1 On-Off Switch

The On-Off Switch is actuated at the extreme counter-clockwise position of volume control knob located on Control Unit. When switched to On, it supplies A+ power to the Power Amplifier/Power Supply and to the Receiver/Exciter through relay K2. The circuit is protected by fuse F1, 20 amp/14V or 10 amp/28V.

3.6.2.2 Channel Selector

The Channel Selector is used to select the desired channel in the Receiver/Exciter and Power Amplifier/Power Supply unit. Figure 5-6 shows how the wafer switch and the stepping motors are connected.

3.6.2.3 AM/USB/LSB Switch

This switch is used to select upper sideband, lower sideband, or compatible-AM.

NOTE

Only upper sideband use is allowed in most countries.

When the switch is in the USB position, the control wire is at ground potential, and relays K201 and K202 are not energized. This leaves the *lower* sideband filter in the system. (The lower sideband filter is used for upper sideband propagation and the upper sideband filter for lower sideband propagation because of the frequency translation in the Balanced Mixer. See Figure 3-3 for an example of the frequency relationships.) Resistor R211 is at ground potential which prevents the carrier from being reinserted into the signal. Diode CR805 is forward-biased, routing received SSB signals to the Product Detector (Balanced Modulator). Diode CR807 is reverse-biased blocking the path of AM signals into the Audio Amplifier.

In the LSB mode, relays K205 and K206 are activated, routing the signal through the upper sideband filter. The diodes are biased in the same manner as for USB.

In the AM transmitting mode, the control wire is at A+ potential. Relay K203 is energized and relays K201 and K202 are not energized, thus selecting the LSB filter. Resistor R211 receives A+ from the control voltage, and allows the 1650 kHz carrier frequency to be reinserted in the signal path.

In the AM receive mode, K203 is open while K201 and K202 are closed, thus selecting the AM filter. The A+ potential reverse-biases CR805, blocking the signal path to the Product Detector. At the same time CR807 is forward-biased, thus opening the signal path from the AM Detector to the Audio Amplifier.

3.6.2.4 Volume Control

The Volume Control consists of a grounded potentiometer which varies the audio signal applied to the base of amplifier Q310 in the Audio Amplifier.

3.6.2.5 RF Sensitivity

A grounded potentiometer is used to vary the base voltages in the RF Amplifier and Mixer (Q801, 802, 803, 804) thus increasing or decreasing the gain of the amplified RF signal.

3.6.2.6 Clarifier

The purpose of the Clarifier is to vary slightly the tone of the voice output. This is accomplished by applying a bias voltage to a voltage-sensitive diode (varicap) CR501 with a potentiometer in the Control Head. The change in bias changes the capacitance of the varicap and thus changes the frequency of the Receiver Channel Oscillator.

3.6.2.7 Power Indicator

The power indicator meter in the Control Unit indicates power output and the correct tuning of the antenna system. For sideband operation, the meter

deflects only when actually speaking into the microphone. For AM operation, the meter indicates carrier level when the PTT switch is closed.

3.6.3 AUTOMATIC CONTROLS

3.6.3.1 AM-Select

The FCC requires that certain frequencies be reserved for AM transmission only. For this reason, it is necessary to automatically reinsert the carrier when transmitting on these frequencies. This is accomplished by wiring those channels on wafer switch SW-1B to A+ voltage. This will provide bias for the balanced modulator diodes via R211, allowing the carrier to be reinserted in the signal. The same function is accomplished manually by the USB/LSB/AM Switch on the Control Unit when switched to AM.

3.6.3.2 Automatic Level Control (ALC)

The ALC control loop limits transmitter output power to 100 watts PEP in SSB mode and 50 watts PEP in AM mode. (See Figure 3.1.) ALC Amplifier CR901 and Q901 detects the voltage at the output of the Pi network in the Power Amplifier. This voltage is set by potentiometer R901 which controls R.F. to the detector and consequently the transmitter power output level. The DC output of the ALC amplifier in turn feeds the gate of the Automatic Level Control field effect transistor Q818. This DC output biases the Q818 throughout the range of "on" and "off" conditions, changing its impedance and consequently limiting the level of the 1650 kHz signal into the Balance Mixer.

3.6.3.3 Automatic Gain Control

The AGC loop goes from the Detector through the AGC Amplifier to the I.F. Amplifier. The Detector output, consisting of a DC signal with audio superimposed on it, drives Q813. Q813 is a DC amplifier that amplifies and filters the signal from the Detector until pure DC is left; this DC drives Emitter Follower Q812. The positive output of Q812 passes through diode CR806 into the circuits of Q805, Q806 and Q808. When a weak signal is received, the output of Detector Q814 is low and will not bias

Q813 "ON". As Q813 is in the Off stage, its DC resistance between collector and emitter is very high and consequently the supply voltage of +10 VDC will appear at the collector of Q813. This voltage will drive Q812 into saturation, and also diodes CR803, CR804 and transistor Q809; being in saturation their impedances are at a minimum, bypassing the emitters of Q805, Q806 and Q808, and increasing the gain the these stages. When a strong signal is received, the output of Q814 will saturate Q813 and essentially short its collector to its emitter. The output of Q813 will not saturate CR803, CR804 and Q809, and the emitter impedances remain high, and the gain of the amplifier stages will then be reduced.

The AGC loop is linked to the RF Gain Control so that a change in the RF gain potentiometer changes the AGC level fed to the RF Amplifier. As the

voltage fed to the bases of transistors Q801, Q802 and Q804 decreases, the stages are being biased "OFF" and the gain will start to decrease.

3.6.3.4 Automatic Reduced Carrier Operation

Some public correspondence telephone stations, for best performance of their equipment, require, when operating SSB, a carrier reduced by 16 ± 2 db, below rated power output. For those channels that require the reduced carrier operation, switch SW-11 is wired to allow the correct level of carrier to be inserted in the balanced mixer. Since SW-11 is controlled by the channel selector, mode selection is completely automatic and does not require any mode selection by the operator. The amount of carrier necessary is determined by R516, which is a selected value.

SECTION 4

ALIGNMENT PROCEDURE

4.1 GENERAL

Frequency stability and accuracy are much more important in an SSB transceiver than in an AM transceiver. In order to insure that the transceiver is performing properly and is within specifications, it is recommended that the frequencies be checked every six to twelve months by a qualified technician. It is also recommended that the frequencies be checked after each frequency change.

The tuning components may be located by the identification symbols printed on the circuit boards and chassis. These components may also be located by referring to Figures 0.0 through 0.0. Figure 0.0 gives a handy summary of all frequency-dependent parts affected by a frequency change.

4.2 TEST EQUIPMENT

The following test equipment or equivalent is required to perform the alignment procedures:

- a) ASB-100A TEST SET or a control unit with applicable cables
- b) DC Power Supply — 0-40 VDC, 35A
- c) Oscilloscope — Tektronic 465B
- d) Frequency Counter — Systron Donner Model 6242A
- e) RF Signal Generator — Wavetek Model 3001
- f) Two-tone Audio Generator (two separate audio generators may also be used)
- g) 100 watt Wattmeter — Bird Model 43
- h) Dummy load, 50 ohms @ 150W - Bird Model 8135
- i) VOM — Simpson Model 260 (20k ohms/volts)

- j) VTVM — HP Model 410C
- k) Audio VTVM - HP Model 400D
- l) RF Voltmeter — Boonton Model 92C
- m) Step Attenuator
- n) Tunable Receiver (4-36 MHz with S meter)

NOTE

All pertinent test voltages, currents and wave forms are shown on the schematics.

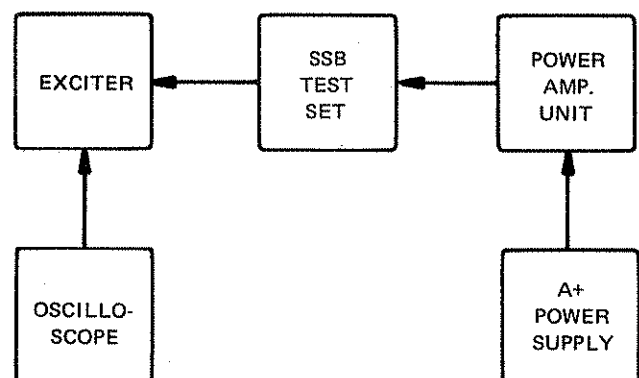
4.3 ALIGNMENT OF RECEIVER/EXCITER UNIT

CAUTION

When aligning the Receiver/Exciter unit, disconnect the Exciter output J103 from the Power Amplifier input J1 and place HI-LO switch on the Power Amplifier in the LO position.

4.3.1 ADJUSTMENT OF BALANCED MODULATOR

- a) Test Setup:



SUNAIR ASB-100A

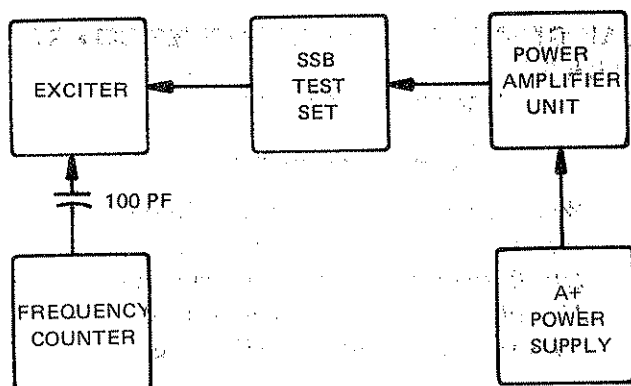
1. Connect test set to Power Supply/Power Amplifier unit and the Receiver/Exciter unit.
2. Turn ON-OFF switch in test set to ON.
3. Turn AM/USB/LSB switch to USB position.
4. Connect scope probe to Q201 collector and set scope sensitivity to .005V/CM.
5. Turn XMIT switch to XMIT position.
5. Set channel selector to channel one.
6. Turn XMIT switch to XMIT.

b) Test Procedure:

Alternately tune the balancing controls, R201 and C203, located in Balanced Modulator board Z200, until a null is observed on the scope. Tune the two controls as many times as necessary for minimum signal on the scope. The signal shall not exceed 10mv P-P.

4.3.2 ALIGNMENT OF OSCILLATORS

a) Test Setup:



1. Connect units as shown.
2. Switch control test set ON.

NOTE

Allow 20 minutes for Transmitter and Carrier Oscillator crystals to reach operating temperature and stabilize.

3. Turn AM/USB/LSB switch to USB.
4. Connect frequency counter through a 100pf capacitor to C881 in the Channel Oscillator circuitry on board Z800.

1. Transmitter Channel Oscillator. Tune the piston trimmer, C884, until the counter indicates 1650 kHz ± 2 Hz above the channel frequency. Repeat the procedure for the remaining channels, using trimmers C885-C893 for subsequent channels.

2. Carrier Oscillator. Connect the frequency counter through the 100pf capacitor to the junction of R201 and R202 located on board Z200. Tune C524 located on board Z500 until the frequency counter reads 1650.0000 kHz.

3. Receiver Oscillator. Use the same setup as above, except:

— Turn XMIT switch OFF

— Set CLARIFIER control midway

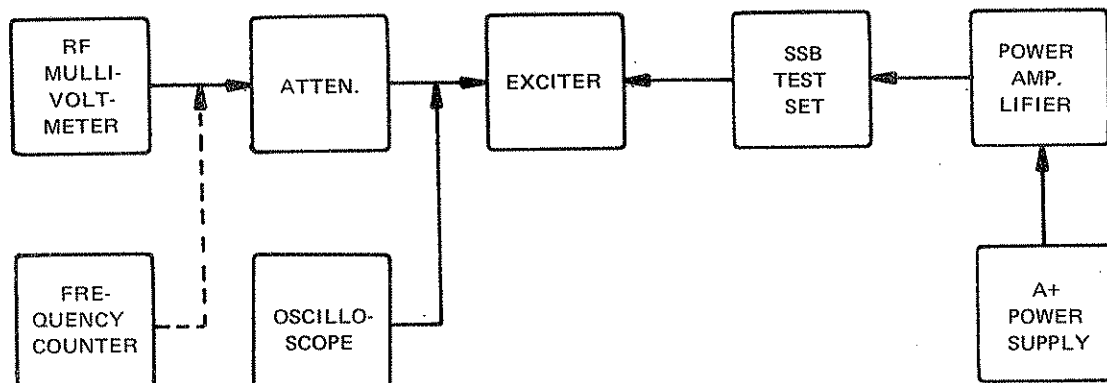
Connect the counter through a 100pf capacitor to C518 on board Z500. Tune the ceramic trimmers, C501 through C510, corresponding to channels 1 through 10, for a counter reading of 1650 kHz ± 10 Hz above the channel frequency.

NOTE

The above procedure is sufficient for the Receiver Oscillator. However, further trimming will have to be done to the Transmitter Channel Oscillator due to the loading effect of the counter. (See Paragraph 4b[5] through [9]).

4.3.3 EXCITER TUNING

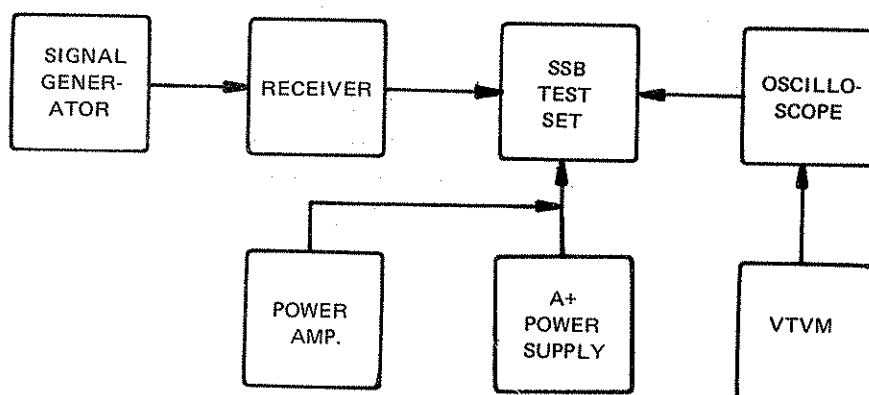
a) Test Setup:



1. Turn ON-OFF switch ON.
 2. Turn AM/USB/LSB switch to AM.
 3. Connect scope at Exciter output, J103.
 4. Connect step attenuator through coaxial cable to the Exciter output.
 5. Connect RF millivoltmeter to attenuator output.
 6. Set attenuator at 20 db attenuation.
 7. Set RF millivoltmeter to attenuator output.
 8. Turn XMIT switch to XMIT.
 3. Switch to channel 2 and tune L822 and C702 in the same manner. Repeat procedure for remainder of channels, using L823-L830 and C703-C710.
 4. Select any channel around 6 to 8 MHz and set AM/USB/LSB switch on the test set to LSB.
 5. Tune R314 on board Z300 for a null indication on the scope.
 6. Switch to USB and again tune for a null using controls R201 and C203.
 7. Set switch back to AM.
 8. Connect counter in place of RF millivoltmeter, set attenuator at 10 db, and check output frequencies of all ten channels.
 9. If necessary, retune piston trimmers C884 through C893 until the appropriate transmitter frequency ± 2 Hz is obtained.
- b) Test Procedure:
1. Switch channel selector switch on test set to channel 1.
 2. Tune L821 and C701 for peak reading on millivoltmeter.

4.3.4 RECEIVER TUNING:

a) Test Setup:



1. Turn ON-OFF switch in test set to ON.
2. Turn XMIT switch to OFF.
3. Turn AM/USB/LSB switch to AM.
4. Set channel switch to channel 1.
5. Turn RF GAIN control fully clockwise (high).
6. Turn volume control fully clockwise (high).
7. Connect oscilloscope and VTVM to audio output of SSB test set.
8. Set signal generator to selected channel frequency, and set its modulation to 1000 Hz, modulated 30%.
9. Connect signal generator to Receiver input connector of Receiver/Exciter unit, J102.
2. Reduce or increase the level of the signal until 1.0 to 1.5V is read on the VTVM.
3. Tune C848 and C842 for a peak reading on the VTVM, and reduce the signal input so that the VTVM reading is lowered back to 1.0-1.5V.
4. Tune the corresponding tuned circuits for channel one (L801, C601 and L811), reducing the input signal as necessary to keep the VTVM in the 1.0-1.5V range.
5. Repeat the above procedure (except paragraph [3]) for all other channels; reset the signal generator for each channel.
6. Set level of signal generator to 10 microvolts; the VTVM should show 7 to 10 volts.
7. Switch AM/USB/LSB switch to USB and switch off the modulation in the signal generator.
8. Tune the signal generator for a peak meter indication; the VTVM should read within the limits of 7 to 10 volts.
9. Repeat steps (6) through (8) for all channels.

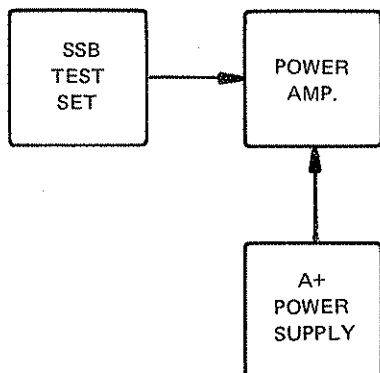
b) Test Procedure:

1. Increase the level of the signal generator until an indication is obtained in the scope; vary the frequency back and forth for maximum indication.

4.4 ALIGNMENT OF POWER AMPLIFIER

4.4.1 BIAS ADJUSTMENT

a) Test Setup:



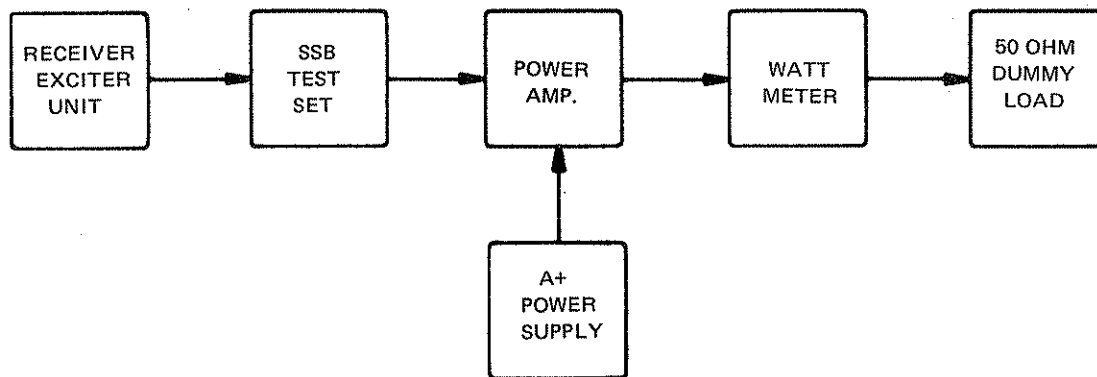
1. Connect equipment as shown.
2. Turn ON-OFF switch located on the test set to ON.
3. Allow a few minutes for tubes to warm up.
4. Set HI-LO switch on front of Power Amplifier to HI.

b) Test Procedure:

1. Connect VTVM to cathode of V2 and V3.
2. Switch XMIT switch to XMIT.
3. Adjust the bias control, R24, for a meter reading of 0.8 volts.

4.4.2 DRIVER AND POWER AMPLIFIER TUNING

a) Test Setup:



1. Switch XMIT switch to OFF.
2. Connect Exciter output to input of Power Amplifier.
3. Connect dummy load to output of Power Amplifier through a wattmeter.
4. Set AM/USB/LSB switch to AM position and set channel selector to channel one.
5. Switch XMIT switch back to XMIT.

CAUTION

Do not key the Transmitter continuously during these tests. Key only when necessary.

b) Test Procedure:

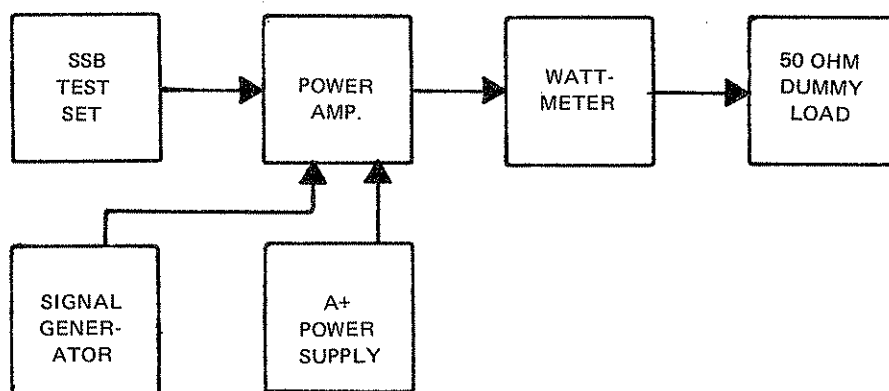
1. Tune driver coil, L2, and pi-network coil, L15, for maximum power indicated on the wattmeter.

2. Switch to channel two and tune L3 and L16 for maximum power.

3. Repeat procedure for the remaining channels, tuning the appropriate coils.

4.4.3 ADJUSTMENT OF NEUTRALIZING CAPACITOR

a) Test Setup:



1. Disconnect the Receiver/Exciter and connect signal generator as shown.
2. Set signal level of signal generator to approximately 1 volt.
3. Select highest frequency used in transmitter (usually channel 10) with selector switch.
4. Turn HI-LO power switch to LO position.
5. Connect temporary jumper from pin 3 of V2 to ground.
6. Key transmitter.

3. Reduce signal generator output and simultaneously increase oscilloscope sensitivity to maximum.

4. Adjust C-33 for minimum output on oscilloscope.

5. Unkey transmitter.

6. Remove jumper from pin 3 of V2.

4.4.4. Pi-NETWORK TUNING

a) Test Setup: (same as 4.4.2.a)

1. Disconnect signal generator and connect Exciter to input of Power Amplifier.

2. Switch HI-LO switch to HI.

b) Test Procedure:

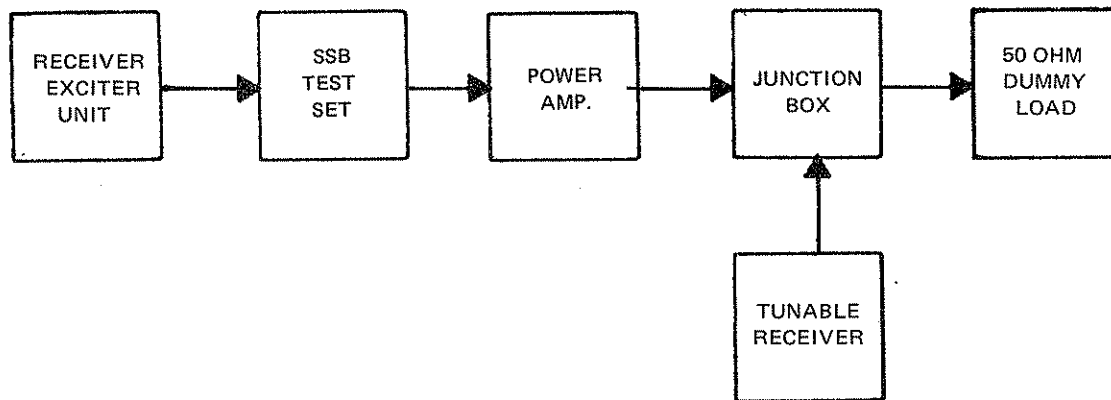
1. Adjust signal generator frequency for peak wattmeter reading.
2. Connect oscilloscope 50V/CM to 50 ohm dummy load.

b) Test Procedure:

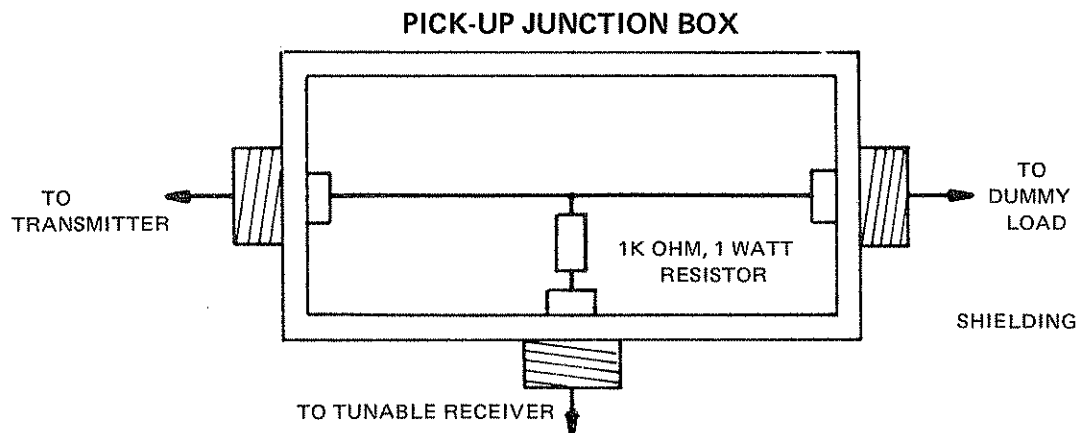
Retune each pi-network coil (L15 through L24) for maximum power.

4.4.5 SECOND HARMONIC TRAP ADJUSTMENT

a) Test Setup:



1. Connect a pick-up junction box (shown below) between Power Amplifier and 50 ohm dummy load.
2. Connect a tunable Receiver or field strength meter covering the range from 4 to 36 MHz.



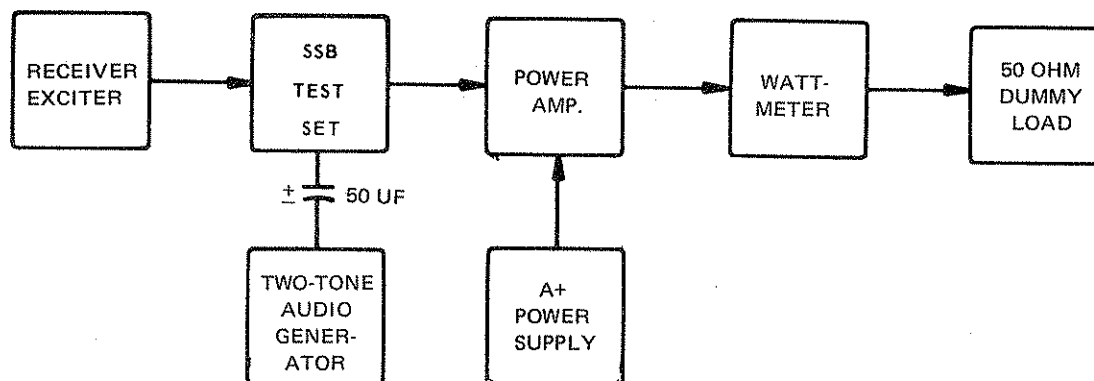
b) Test Procedure:

1. Select channel one and tune Receiver to second harmonic of channel frequency.
2. Tune L25 for a null in the Receiver meter indicator.
3. Repeat procedure for each channel.

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4.4.6 ALC ADJUSTMENT

a) Test Setup:



1. Connect units as shown.

2. Connect a two-tone audio generator to the microphone input through a 50uf capacitor with its negative lead toward the audio generator.

3. Set AM/USB/LSB switch to USB position.

4. Set audio generator frequencies to 800 and 1800 Hz with the combined output level at 0.1 volts.

b) Test Procedure:

1. Power switch in HI position (PA-1010A).

2. Turn channel selector switch to Channel 1.

3. Key transmitter and record output in watts.

4. Repeat steps 2 and 3 for all active channels.

5. Return to channel with lowest power output and adjust R901 for 40W average on watt-meter.

4.4.7 SIDETONE ADJUSTMENT

a) Test Setup: (same as 4.4.6, except):

1. Disconnect audio generator.

2. Connect microphone and headset to be used in the system to the corresponding jacks in the test set.

b) Test Procedure:

1. Talk into microphone while listening on headset.

2. Adjust sidetone level by adjusting R1003 in the Receiver/Exciter unit.

3. If the microphone has high gain, adjust R101 to desired level.

NOTE

A high-gain microphone may over-modulate the transmitter, causing distortion.

SECTION 5

MAINTENANCE AND TROUBLESHOOTING

5.1 PREVENTIVE MAINTENANCE

As indicated in Section 4, the transceiver frequencies should be checked every six to twelve months to insure optimum operation. At this time, it would be well to check the Balanced Modulator and Balanced Mixer. Refer to Section 4 for test procedure.

It is not necessary to realign the Power Amplifier unless the power output is below specifications. A visual inspection should be made of all relays, connectors and switch contacts for dirt, corrosion or evidence of contact pitting or arcing.

5.2 GENERAL MALFUNCTIONS

The ASB-100A has been designed for high reliability and minimum maintenance. A large safety factor was included in the design and consequently each component in the set works well below its maximum rating. Catastrophic failures during normal operations are therefore unlikely and most trouble will be

the result of the unit slowly drifting out of tolerance over a period of time. This can be corrected or prevented by following the six-month prevention maintenance check. However, in the event problems other than the above occur, a troubleshooting chart is supplied to aid in the location of faults.

5.2.1 POWER LOSS

Power loss is probably the most common malfunction which might occur. Power loss can be caused by faulty relay contacts, improper connections, blown fuses, short circuits, or faulty components.

5.2.2 RELAYS, CONNECTORS, AND SWITCHES

Relays, connectors, and switches are subject to corrosion, mechanical failure, and blocking with foreign matter. Relays should be inspected periodically to insure the contacts are clean and working freely. The ASB-100A contains the relays listed in Table 5.1.

SYMBOL	FUNCTION	LOCATION	TYPE
K1	Connects XTER output to antenna and also antenna to Receiver input	PA/PS	SPDT
K2	Connects A+ power to system	PA/PS	SPST
K3	Connects A+ power to Power Supply	PA/PS	SPST
K201-1	Switches between inputs of sideband filters and inputs of AM filter	REC/EXC	DPDT
K202-1	Switches between outputs of sideband filters and output of AM filter	REC/EXC	DPDT
K202-2	Energize 1650 kHz oscillator in XMIT and in Rec. SSB	REC/EXC	DPDT

Table 5.1. ASB-100A Relays

SYMBOL	FUNCTION	LOCATION	TYPE
K203-1	Switches Balanced Modulator to a different path between XMIT and Rec.	REC/EXC	DPDT
K203-2	Energizes K201-202 for switching the AM filter during AM-Rec. mode	REC/EXC	DPDT
K204-1	Switches between Vol. or sidetone cont.	REC/EXC	DPDT
K204-2	Switches +10V Reg. to Exciter section or Receiver section	REC/EXC	DPDT
K205	Switches inputs of USB and LSB filters	REC/EXC	DPDT
K206	Switches outputs of USB and LSB filters		

Table 5.1. ASB-100A Relays (Continued)

5.2.3 EFFECTS OF DAMAGE

The several types of damage possible to the unit:

- SHOCK.** Severe shock may cause damage to the case and break wiring connections. In the Power Amplifier, shock may damage tubes.
- VIBRATION.** Severe vibration will cause frequency distortion and, in time, may cause failure of wiring connections.
- VOLTAGE SURGE.** A severe voltage surge, such as caused by lightning or inadvertently connecting the unit to a high voltage, may damage transistors, diodes and capacitors.
- CORROSION.** Corrosion is unlikely unless the unit is operated in a very humid or marine environment. Terminals and connectors will be affected by corrosion, causing increased impedance across the connection.

5.3 TROUBLE LOCATION AND TESTING

When a malfunction occurs, locate the cause by first isolating the source of the trouble in one of the three units - Receiver/Exciter, Power Amplifier/Power Supply, or Control Head. Next, further isolate the

source of trouble in a specific circuit or functional unit (see block diagrams, Section III). Finally, find the faulty component and replace it, if necessary. When the trouble cannot be readily pinpointed, use the standard troubleshooting method: Inject a signal into the circuit and follow it through the system with a detecting device (preferably an oscilloscope). Test voltages and wave forms are shown on the schematic diagram to assist in troubleshooting.

In the unlikely event that an NPN Transistor fails, it can be tested in the following manner: Check the DC voltage at the emitter, collector and the base of the transistor. When properly biased, the DC voltage of the base will be between +0.5 and +0.6 volts higher than the DC voltage of the emitter. The collector voltage will be at least +1 volt higher than the emitter voltage.

5.4 EXCITER

The Exciter is fully transistorized and operates at low power. If malfunction occurs, the most likely cause will be misalignment. The next most likely trouble sources would be faulty relays, wrong crystals, no A+ voltage, open wires, and finally, component failure. If the problem cannot be located in the Exciter Troubleshooting Table 5.2, use standard troubleshooting procedures.

TROUBLE	POSSIBLE CAUSE	REMEDY
1. No Exciter output, or very low output when in AM mode	Channel Oscillator inoperative due to defective crystal, open or shorted connections, defective SW8 switch wafer, defective components	Replace or repair as necessary
	Carrier Oscillator (1650 kHz) inoperative due to defective crystal, open or shorted connections, defective components	Replace or repair as necessary
	Defective relays K201, K202, K203, K204, K205 K206	Check, clean contacts, adjust or replace
	Open or shorted wires in Exciter circuitry	Locate and repair
	Open coils L821-L830	Repair or replace
	Defective trimmer capacitors C701-710	Replace
	Misalignment of tuning networks	Align Exciter; See Section 4
2. Exciter has output when in SSB position with no audio input	No control voltage	Check for short or open circuit
	Balanced Modulator is unbalanced	Adjust R201 and C203 according to alignment procedures
	Misalignment of Balanced Mixer	Adjust R314 for minimum indication
	Defective diode module M301	Replace module
	Defective diode bridge in Balanced Modulator	Replace
3. Good exciter output, but all channels off frequency	Carrier Oscillator (1650 kHz) off frequency	Tune Oscillator according to alignment procedures
	Defective Oven	Replace
	Defective Zener Diode CR810	Test for $+8.2V \pm 0.8V$ at CR810, replace if necessary
	Channel Oscillator misaligned	Adjust trimmers C884-C893 according to alignment procedures
	No A+ to the oven	Find open wire and correct condition

Table 5.2. Exciter Troubleshooting

TROUBLE	POSSIBLE CAUSE	REMEDY
4. One or more channels off frequency	Defective Crystal	Replace
	Misaligned or defective trimmer capacitors C884-C893	Adjust or replace
	Wrong crystals	Use only proper Sunair Crystals
5. Over Modulation in AM Mode	R101 out of Adjustment	Adjust according to Alignment Procedures
6. Good Exciter output in AM but no output in SSB with modulations present	Defective Microphone	Replace Microphone
	Defective Mike GAIN	Replace R101
	Defective Mike Amplifier	Check transistors and/or components in mike amp. board, replace faulty components
	Open wires going in or out of Mike Amplifier	Check and correct if necessary
	Defective Balance Modulator	Check for faulty components in balance modulator board and replace if necessary
	Defective SSB Filter	Check both lower and upper sideband filters. Replace if necessary

Table 5.2. Exciter Troubleshooting (Continued)

5.5 RECEIVER

Like the Exciter, the Receiver is fully transistorized and operates at low power levels. Principal sources of trouble will be in the alignment and the relays. If

the trouble cannot be located using the Receiver Troubleshooting Table 5.3, use standard troubleshooting methods. Test voltages and wave forms are shown on schematic diagram.

TROUBLE	POSSIBLE CAUSE	REMEDY
1. Dead Receiver, no audio output	Defective Relays	Check, clean contacts or replace
	No AGC voltage (+6V) at I.F. amplifier; defective transistor Q812	Remove and replace

Table 5.3. Receiver Troubleshooting

TROUBLE	POSSIBLE CAUSE	REMEDY
2. Weak receiver, low sensitivity	No AGC Voltage (+5V) at RF amplifier	Correct open connection from AGC line to RF GAIN line
	Receiver oscillator inoperative due to defective component	Locate faulty component and replace. Realign.
	Defective audio output transistor, Q311	Test, remove and replace
	Short in volume control lead	Locate and correct
	Defective diode CR807 (AM position only)	Test, remove and replace
	Defective diode CR805 (SSB position only)	Test, remove and replace
	Defective antenna relay, K1 in PS/PA unit	Check, clean contacts or replace
	Ledex motor inoperative	Check for open A+ connection and correct
	Defective component	Locate and replace
	NOTE	
	<i>If this condition exists in all channels, trouble is in the circuitry; if the condition exists only in a few channels, the problem is probably in the tuning circuits: misalignment, defective components, etc.</i>	
	Misalignment of I.F. amplifier	Tune C848; see alignment procedures
	Misalignment of RF amplifier	Tune C842; tune appropriate tuned circuits. See alignment procedures
	Open RF coils, L801-L820	Locate and repair or replace
	Open or shorted wires	Locate and repair
	Defective trimmer capacitors C601-C610	Replace
	Defective wafer switches	Locate and repair or replace
	Defective component	Locate and replace

Table 5.3. Receiver Troubleshooting (Continued)

5.6 POWER AMPLIFIER/POWER SUPPLY

In contrast to the Receiver/Exciter unit, the Power Supply/Power Amplifier operates at a relatively high power level using tubes for the final amplification. The major sources of trouble will be alignment,

relay failure, tube failure, or power supply failure. Use PA/PS Troubleshooting Table 5.4 to locate trouble or use standard troubleshooting methods. Test voltages and wave forms are indicated on the schematic diagram.

TROUBLE	POSSIBLE CAUSE	REMEDY
1. No power output, filaments dark	Fuse Defective relay, K2 Open filament in tubes V1, V2 or V3	Replace fuse Check, clean contacts or replace Replace
2. No power output, filaments lit, no transformer switching noise, high A+ input current when unit is keyed	Switching transistor failure, Q1-Q2 Defective rectifier diodes CR1-CR4 Defective bias resistors R18, R19, or R21 Defective component in Power Supply Defective bias rectifier CR5	Check and replace if necessary Check & replace if necessary Check & replace Locate & replace Check and replace if necessary
3. No power output, switching noise present, tubes lit	Defective B+ relay K3 Open B+ wires to V1, V2, V3 Defective antenna relay, K1 Defective tubes, V1, V2, V3 Ledex motor not switching or switching to wrong channel	Check, clean contacts replace Trace with DC voltmeter and correct Check, clean contacts or replace Replace Align to proper channel position and tighten coupling between motor and switch; replace motor if defective; check for open resistor in series with Ledex A+
(no power in some channels)	Open or shorted antenna wire Open or shorted Exciter input wire Open coils in driver (L11-L20) or output (L15-L24) Defective capacitors in driver tuned circuit or output tank	Locate and correct Locate and correct Remove and replace, or repair Check, remove and replace

Table 5.4. Power Amplifier/Power Supply Troubleshooting

TROUBLE	POSSIBLE CAUSE	REMEDY
4. Low power output	<div style="border: 1px solid black; padding: 2px; display: inline-block; text-align: center;">NOTE</div> <i>Low power output is usually due to malfunction of the Power Amplifier.</i> HI-LO power switch in LO position Incorrect setting of ALC potentiometer, R901 Defective tubes, V1, V2, V3 High bias voltage at grid of final tubes V2 and V3 Driver and final coils out of tune Defective neutralizing capacitor, C33 Faulty component	Switch to HI Adjust according to alignment procedures Replace Readjust according to alignment procedures, Section 4 Retune according to alignment procedures Remove, replace and adjust according to alignment procedures Locate, remove and replace
	5. High power output Incorrect setting of potentiometer R901 Defective diode CR901 and/or transistor Q901 Open antenna coaxial wire	Adjust R901 according to alignment procedures Test and replace if necessary Locate and correct

Table 5.4. Power Amplifier/Power Supply Troubleshooting (Continued)

5.7 CONTROL UNIT, SCU-10

In the unlikely event that trouble does occur in the Control unit, the possible sources of trouble would be: faulty meter, defective AM/USB/LSB switch,

open CLARIFIER potentiometer; defective potentiometer for RF GAIN-VOLUME control. Some malfunctions which may appear to be in Control Head may actually be in the Receiver/Exciter, RF GAIN, VOLUME, CLARIFIER, AM/USB/LSB, etc.

TROUBLE	POSSIBLE CAUSE	REMEDY
1. CLARIFIER does not function	Open CLARIFIER wires in Receiver unit or Control Head Defective varicap, CR501 Defective potentiometer in Control Head	Locate and correct Remove and replace Remove and replace
2. VOLUME at a maximum and uncontrolled	Open VOLUME control wire in Receiver or in Control Head	Locate and correct
3. Very low sensitivity and not controlled by RF GAIN control	Open RF GAIN wire in Receiver or Control Head	Locate and correct

Table 5.5. SCU-10 Troubleshooting

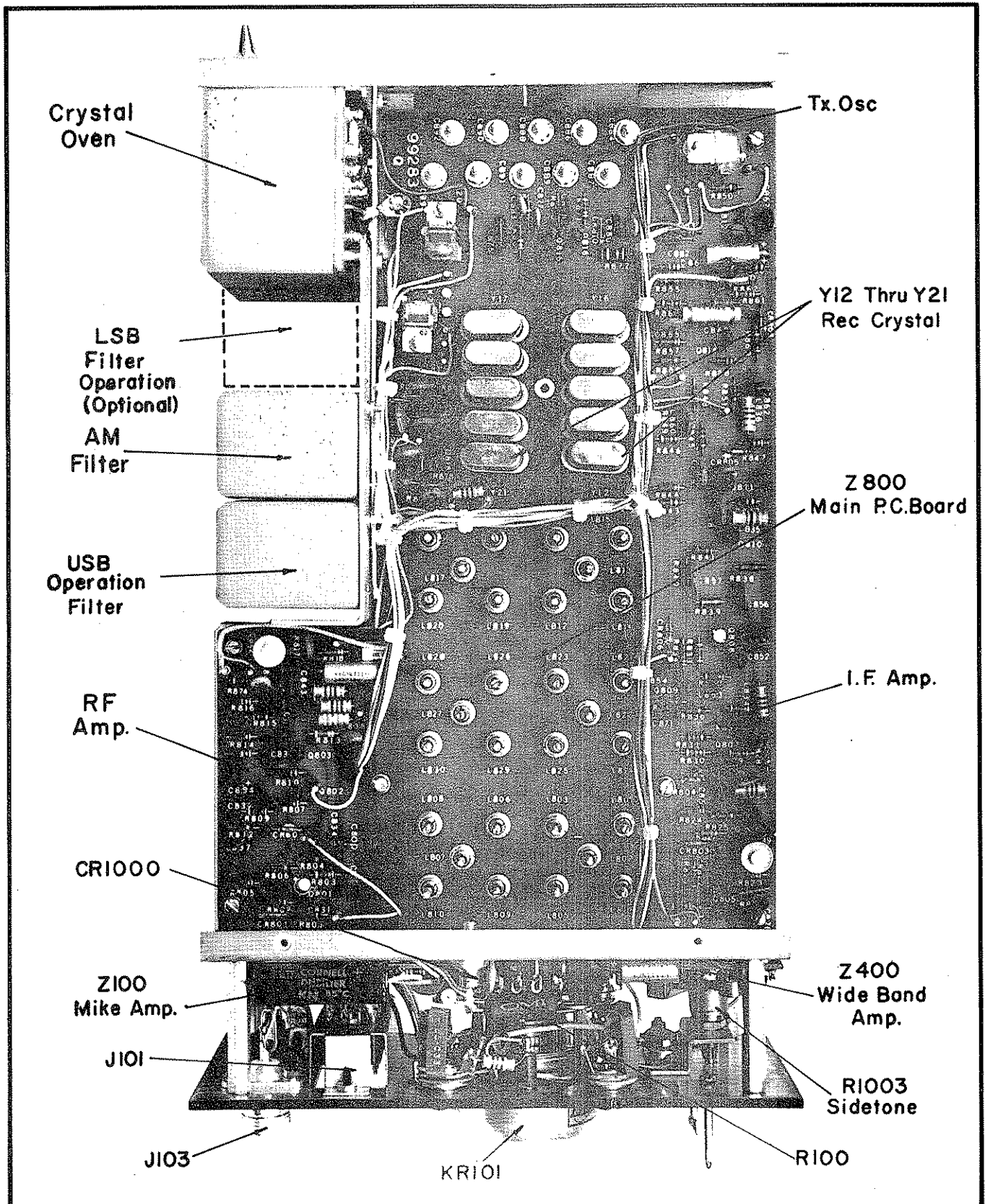


Figure 5.1. Receiver/Exciter, Top View

SUNAIR ASB-100A

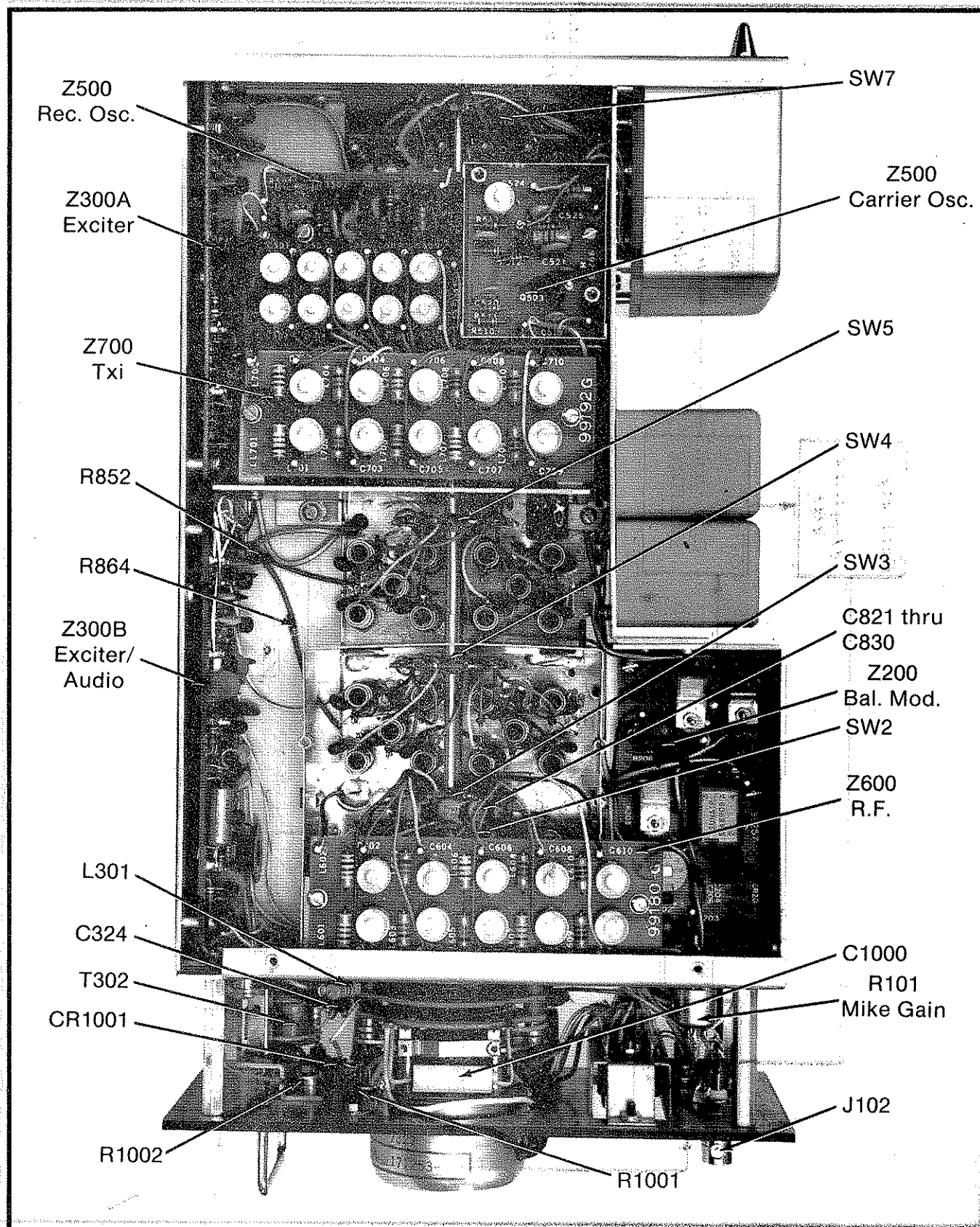


Figure 5.2. Receiver/Exciter, Bottom View

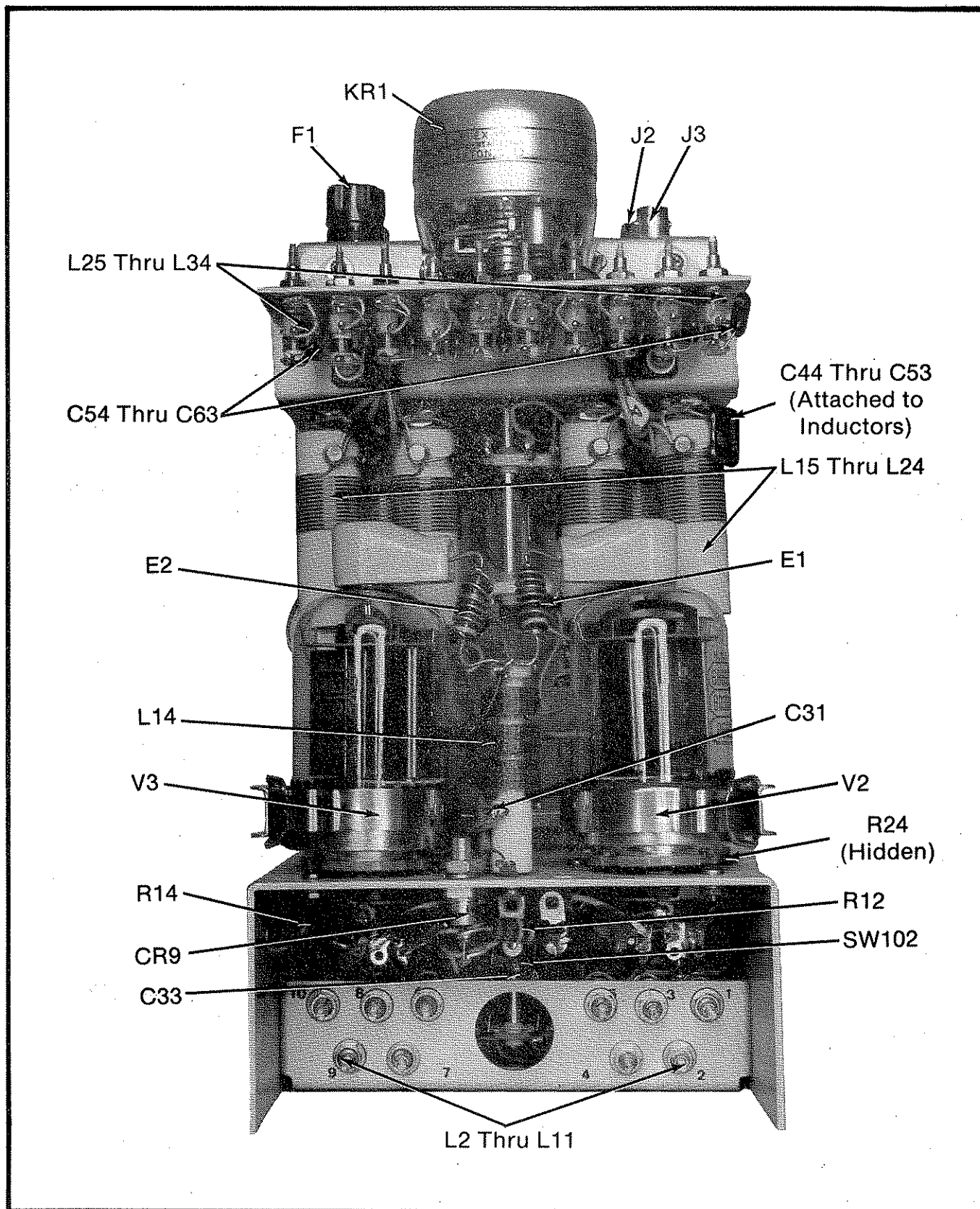


Figure 5.3. Power Amplifier/Power Supply, Top View

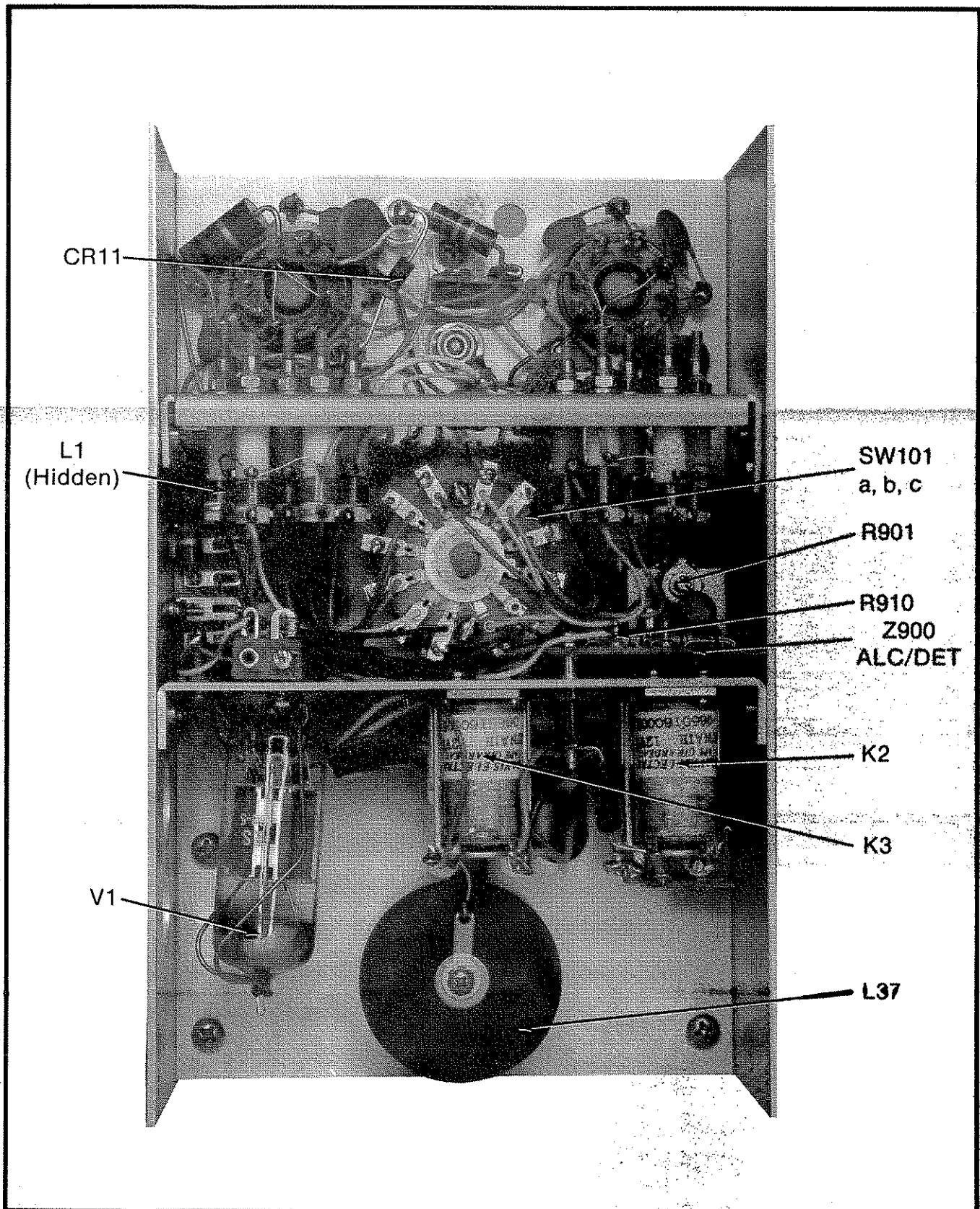


Figure 5.4. Power Amplifier/Power Supply, Front View

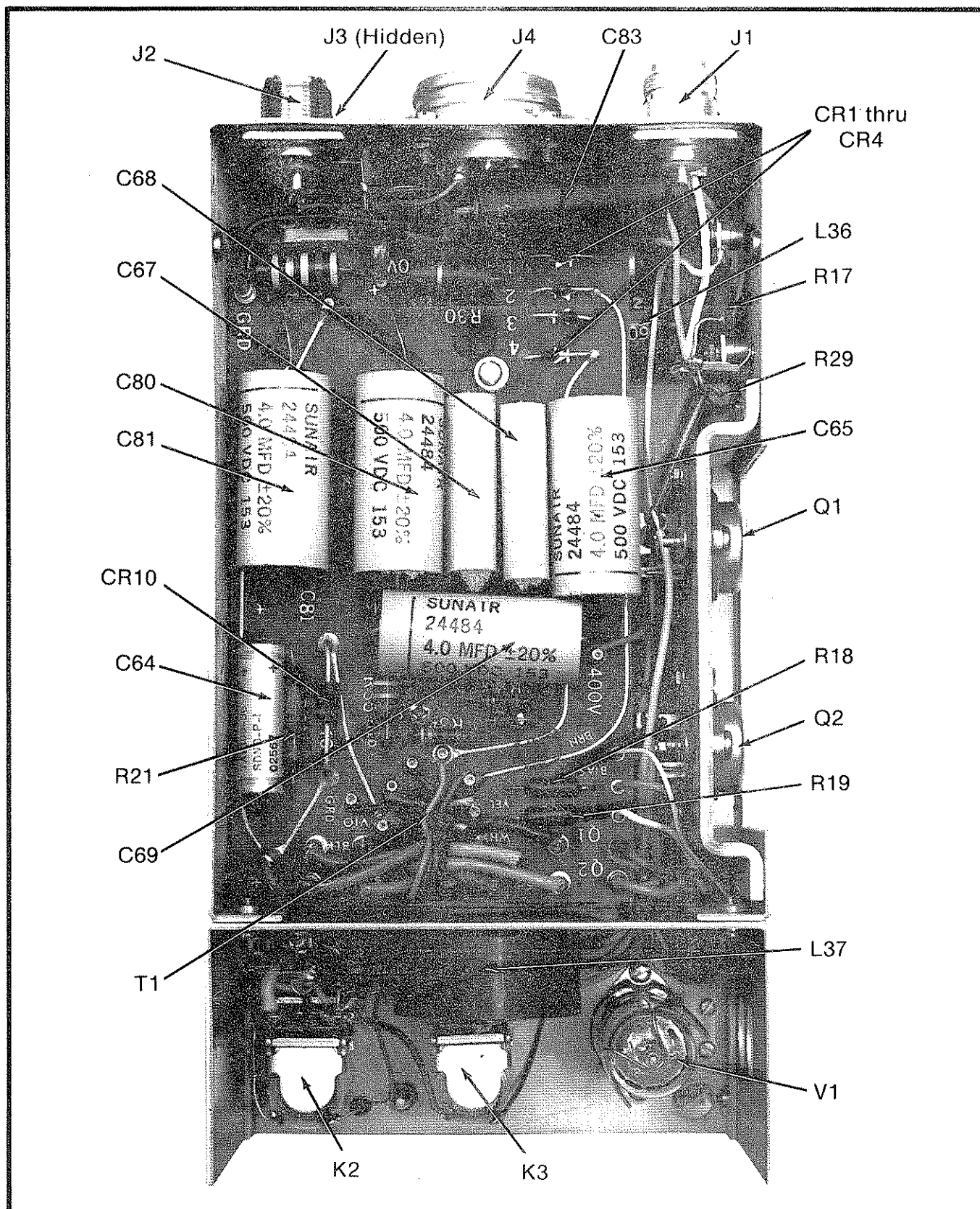


Figure 5.5. Power Amplifier/Power Supply, Bottom View

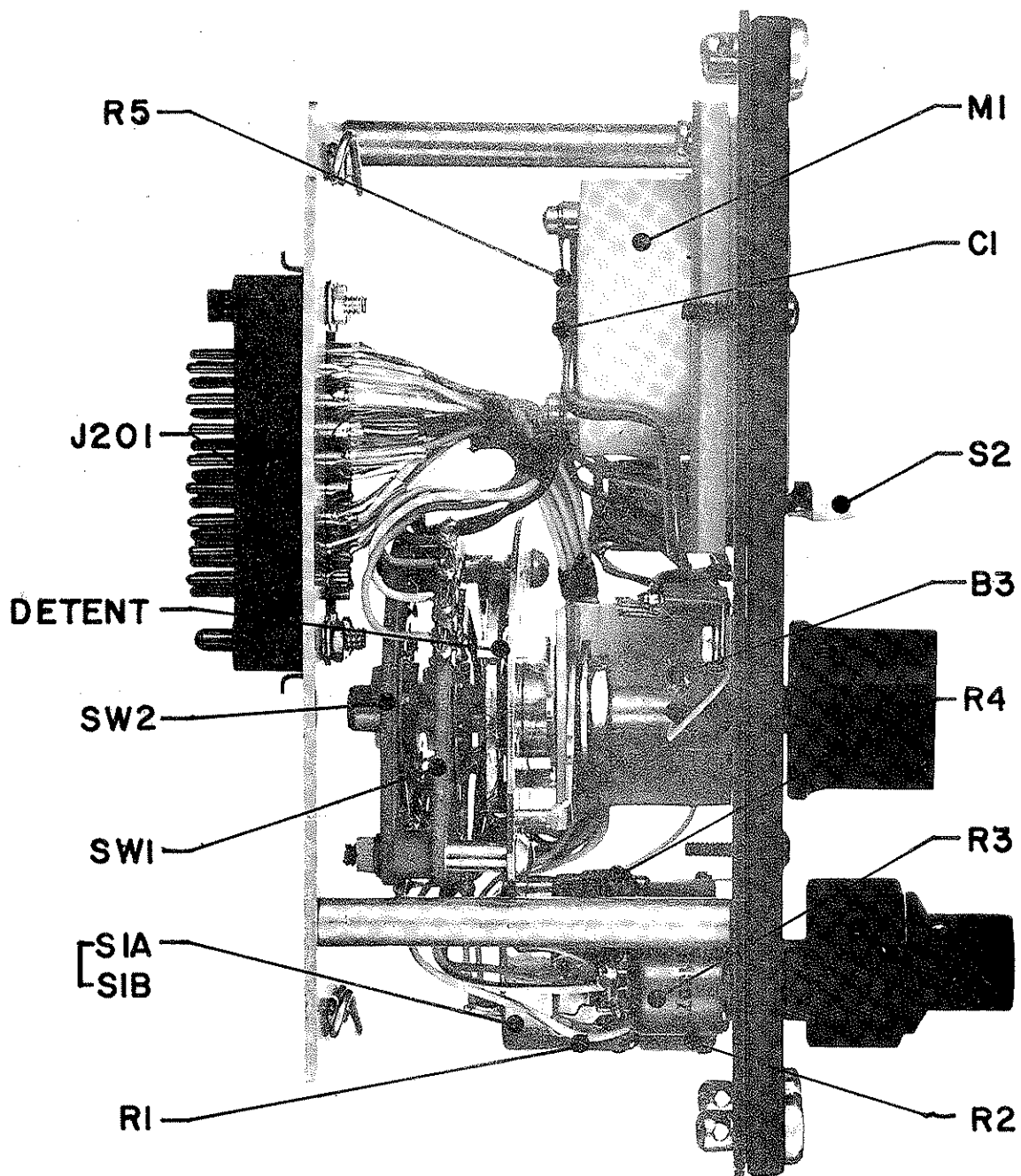
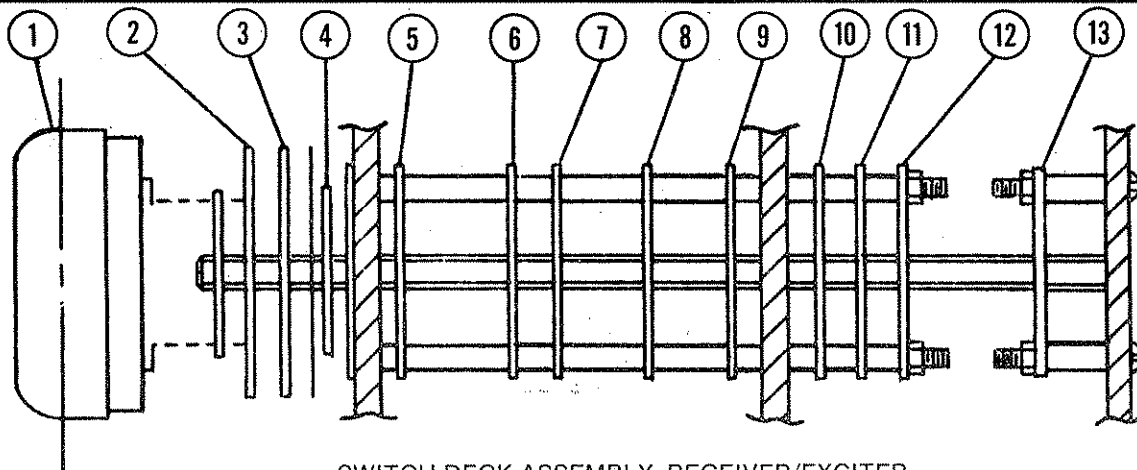
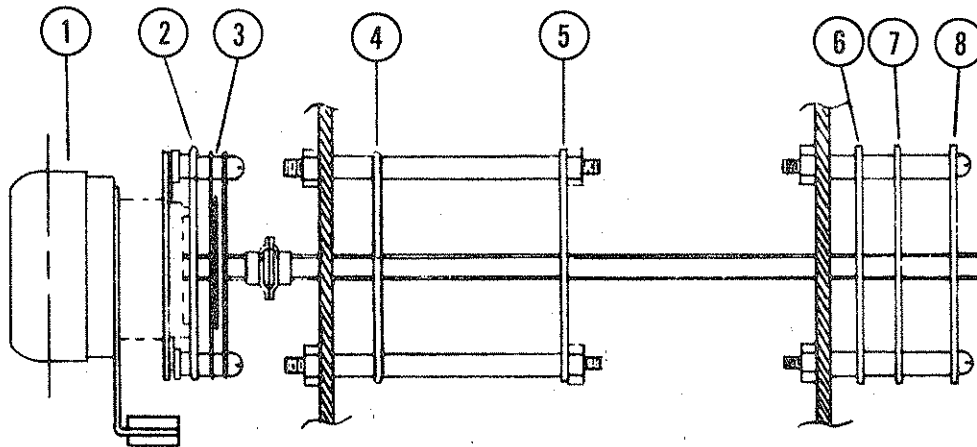


Figure 5.6. Control Unit SCU-10, Top View



SWITCH DECK ASSEMBLY, RECEIVER/EXCITER

ITEM	SYMBOL	DESCRIPTION
1	KR101 <i>P/N 0336050003</i>	Solenoid, Rotary
2	SW9	Channeling Slave Wafer
3	SW10	Channeling Master Wafer, PA/PS
4		Detent Assembly
5	SW1A	Antenna Tuned Circuit, Input
	SW1B	Compatible-AM Selector
6	SW2	Antenna Tuned Circuit, Output
7	SW3	RF Amplifier Tuned Circuit (Q801)
8	SW4	Exciter Tuned Circuit (Q305)
9	SW5	RF Amplifier Tuned Circuit (Q802)
10	SW6	Exciter Tuned Circuit (Q304)
11	SW7	Receiver Oscillator
12	SW11	Reduced Carrier Selector
13	SW8	HF Oscillator

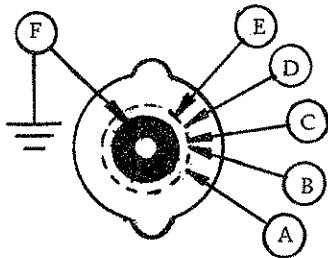


SWITCH DECK ASSEMBLY, POWER SUPPLY/POWER AMPLIFIER

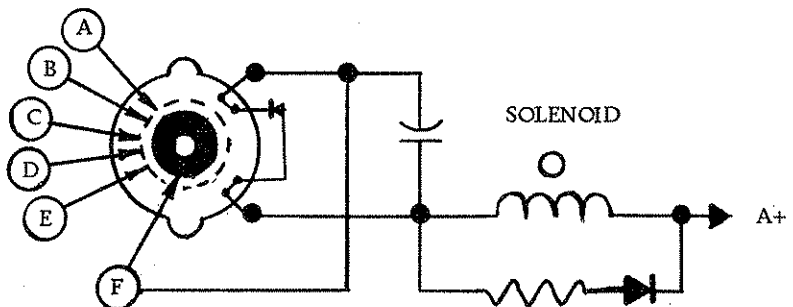
ITEM	SYMBOL	DESCRIPTION
1	KR1	Solenoid, Rotary
2	SW102	Channeling Slave Wafer
3		Detent Assembly
4	SW101e	Pi Network, Output
5	SW101d	Pi Network, Input
6	SW101b	Terminal Wafer
7	SW101c	Driver Tuned Circuit, Output
8	SW101a	Driver Tuned Circuit, Input

Figure 5.7. Wafer Switch Diagrams

SUNAIR ASB-100A



MASTER WAFER



SLAVE WAFER

				MASTER					SLAVE				
				A	B	C	D	E	A	B	C	D	E
			7	X	X	0	0	0	0	0	X	X	X
				X	0	0	0	X	0	X	X	X	0
			8	0	0	0	X	0	X	X	X	0	X
				0	0	X	0	0	X	X	0	X	X
			9	0	X	0	0	X	X	0	X	X	0
1				X	0	0	X	X	0	X	X	0	0
2	10			0	0	X	X	0	X	X	0	0	X
3				0	X	X	0	X	X	0	0	X	0
4				X	X	0	X	X	0	0	X	0	0
5				X	0	X	X	0	0	X	0	0	0
6				0	X	X	0	0	X	0	0	X	X
7				X	X	0	0	X	0	0	X	X	0
8	1			X	0	0	X	0	0	X	X	0	X
9				0	0	X	0	X	X	X	0	X	0
10	2			0	X	0	X	0	X	0	X	0	X
				X	0	X	0	0	0	X	0	X	X
			3	0	X	0	0	0	X	0	X	X	X
				X	0	0	0	0	0	X	X	X	X
			4	0	0	0	0	X	X	X	X	0	0
				0	0	0	X	X	X	X	0	0	0
			5	0	0	X	X	X	X	X	0	0	0
				0	X	X	X	X	X	0	0	0	0
			6	X	X	X	X	0	0	0	0	0	X
				X	X	X	0	0	0	0	0	X	X

X INDICATES CONNECTION OF WAFER PINS A, B, C, D, or E TO PIN F.

0 INDICATES CONNECTION OF PINS A, B, C, D, OR E TO EACH OTHER.

MASTER WAFER CONTACT NUMBERS AND CORRESPONDING CONNECTOR PIN NUMBERS					
					Contact Number of Master Wafer Shown.
A	B	C	D	E	
					Pin Number of J201 (RE-1000 Master Wafer Located in SCU-10).
a	b	c	d	f	
					Pin No. of J201 (CU-110 Master Wafer Located in SCU-10)
A	B	C	D	E	
					Pin No. of J101 (PA-1010 A Master Wafer located in RE-1000).
A	B	C	D	E	

SLAVE WAFER CONTACT NUMBERS AND CORRESPONDING CONNECTOR PIN NUMBERS					
					Contact Number of Slave Wafer Shown.
A	B	C	D	E	
					Pin No. of J101 (RE-1000 Slave Wafer Located in RE-1000).
a	b	c	d	f	
					Pin No. of J301 (CU-110 Slave Wafer located in CU-110).
A	B	C	D	E	
					Pin No. of J1 (PA-1010A Slave Wafer Located in PA-1010A).
1	2	3	4	5	

Figure 5.8. Channeling Diagram

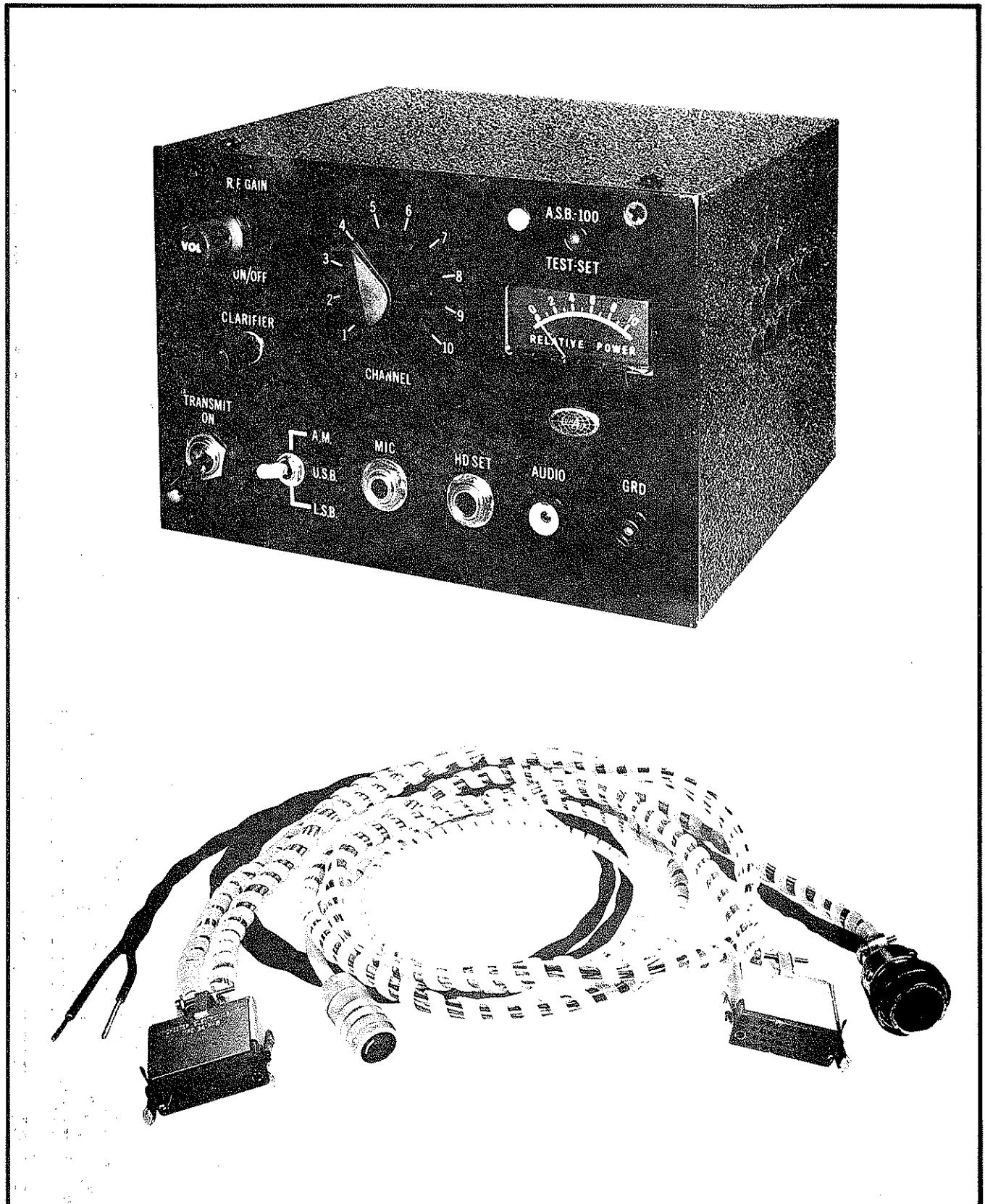
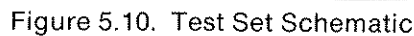


Figure 5.9. ASB-100A Test Set



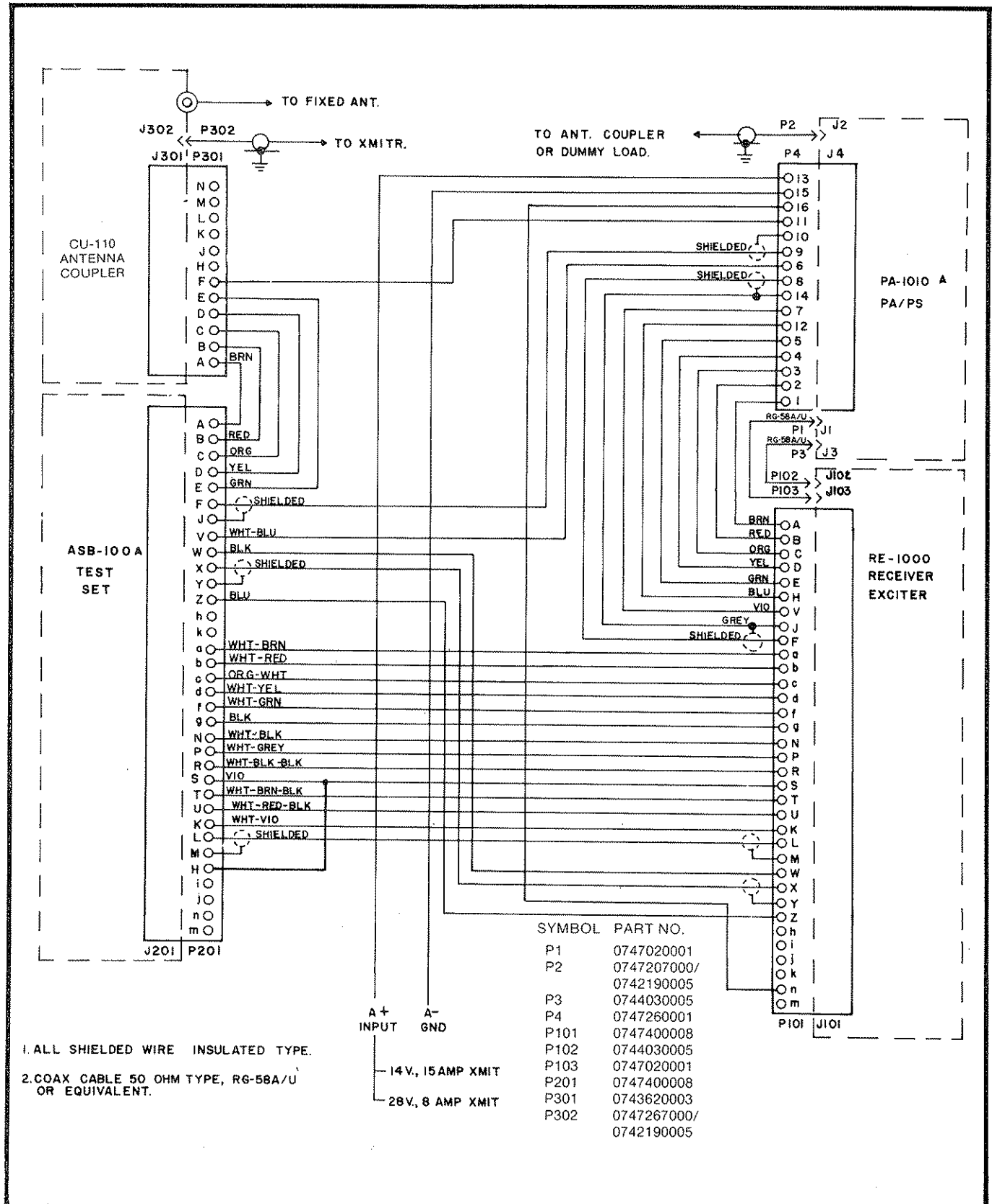


Figure 5.11. Test Set Interconnection Diagram

SECTION 6

INSTRUCTIONS FOR FREQUENCY CHANGE

6.1 METHOD OF FREQUENCY CHANGE

Channel frequencies are set to customer's requirements at the factory. For small changes of frequency (on the order of several kHz), it is only necessary to change crystals and retune the circuits. For large changes of frequency, it is necessary, in addition, to replace certain Capacitors and Inductors with ones designed to operate in the new frequency range.

NOTE

*Even though changing frequency is a relatively simple task, it is absolutely mandatory that it be done correctly. This requires that **only** SunAir-supplied crystals be installed and that a frequency counter is used that will allow setting the Transmitter Oscillator to within ± 2 Hz after the frequency change. Test procedures are contained in Section IV. Failure to install the correct crystals will result in seriously degraded performance, in addition to violating the U.S. Federal Communications Rules and Regulations, under which the unit is licensed for operation.*

Table 6.1 lists the part numbers for the customizing component kits for all frequencies and the part numbers for the transmit and receive crystal.

INSTRUCTIONS ON USE OF TABLE 6.1

(Example). You have an ASB-100A R/E and PA/PS and wish to change the transmit and receive frequency of Channel 1 from 2461 kHz to

2987 kHz. You will need to order a set of PA customizing components P/N 1002710065, a set of Exciter customizing components P/N 1002700027, and a set of Receiver customizing components P/N 1002690030. Also, one transmit crystal P/N 0816900001 and one receive crystal P/N 0817050001 both with the frequency of 2987.

6.2 REPLACING COMPONENTS

There are 5 sets of replaceable, frequency-dependent components in the Receiver/Exciter unit, and 3 in the Power Supply/Power Amplifier unit. The printed circuit boards are marked showing the locations of these components. These parts may also be located by referring to the photographs, Figures 5.1 through 5.4. A capacitor or inductor in a series may be matched with its channel by counting in ascending order. For example, C501 tunes channel 1, C502 tunes channel 2, etc. In the series C884-C893, C884 is channel 1, C885 is channel 2, etc.

6.3 WIRING FOR COMPATIBLE-AM MODE

If a frequency is set in the ASB-100A for use in AM, the Exciter must be wired to automatically reinsert the carrier for compatible-AM mode when the channel is selected. This is done by connecting a lead from the cathode side of diode CR1002 to the appropriate channel of wafer switch SW-1B in the Receiver/Exciter unit. With the switch wired in this manner, the Exciter will transmit in the compatible-AM mode, regardless of the position of the mode selector switch.

6.4 TUNING PROCEDURE

For detailed tuning instructions, see Section IV.

SUNAIR ASB-100A

FREQ.	PA	EXCITER	RECEIVER
2.0-2.3	1002710014	1002700019	1002690013
2.3-2.4	1002710022	1002700027	1002690021
2.4-2.5	1002710031	1002700027	1002690030
2.5-2.7	1002710049	1002700027	1002690030
2.7-2.9	1002710057	1002700027	1002690030
2.9-3.0	1002710065	1002700027	1002690030
3.0-3.2	1002710073	1002700035	1002690048
3.2-3.5	1002710081	1002700035	1002690056
3.5-3.7	1002710090	1002700043	1002690064
3.7-3.9	1002710090	1002700051	1002690072
3.9-4.0	1002710111	1002700060	1002690081
4.0-4.2	1002710111	1002700078	1002690099
4.2-4.5	1002710120	1002700078	1002690099
4.5-4.8	1002710138	1002700078	1002690099
4.8-5.0	1002710146	1002700078	1002690099
5.0-5.2	1002710154	1002700086	1002690102
5.2-5.4	1002710162	1002700094	1002690111
5.4-5.8	1002710171	1002700108	1002690129
5.8-6.0	1002710189	1002700116	1002690137
6.0-6.3	1002710197	1002700116	1002690137
6.3-6.4	1002710201	1002700116	1002690137
6.4-6.7	1002710201	1002700124	1002690145
6.7-6.9	1002710219	1002700124	1002690153
6.9-7.2	1002710227	1002700124	1002690153
7.2-7.3	1002710235	1002700124	1002690153
7.3-7.5	1002710235	1002700124	1002690161
7.5-7.7	1002710235	1002700132	1002690170
7.7-8.4	1002710243	1002700132	1002690170
8.4-8.8	1002710251	1002700132	1002690188
8.8-9.2	1002710260	1002700132	1002690196
9.2-9.8	1002710278	1002700132	1002690196
9.8-10.3	1002710286	1002700141	1002690200
10.3-10.8	1002710294	1002700159	1002690218
10.8-11.2	1002710308	1002700167	1002690226
11.2-11.5	1002710316	1002700167	1002690226
11.5-11.8	1002710324	1002700167	1002690226
11.8-12.5	1002710332	1002700167	1002690226
12.5-13.5	1002710341	1002700175	1002690234
13.5-14.0	1002710359	1002700175	1002690234
14.0-14.5	1002710367	1002700183	1002690242
14.5-15.0	1002710375	1002700183	1002690242
15.0-16.0	1002710383	1002700191	1002690251
16.0-17.0	1002710391	1002700205	1002690269
17.0-18.0	1002710405	1002700213	1002690277

Transmit Crystal Part Number 0816900001

Receive Crystal Part Number 0817050001

Table 6.1. Customizing Components and Crystals

MARIO TURNER
FAX: 305-513-4496

POWER AMPLIFIER/1 ER SUPPLY

Page 1 of 2

87517

Frequency Range (MHz)	Driver, V1 L2-11	Driver, V1 C6-15	Driver, V1 C6-25	PI-NETWORK L15-24	PI-NETWORK C34-43	PI-NETWORK C44-53	TRAP C54-63
From To	P/N ID	P/N ID	P/N ID	P/N ID	P/N ID	P/N ID	P/N ID
2.0 2.3	63363 A-5 620	27527 620	27527 620	64719	27761 330	24915 750	28875 820
2.3 2.4	" " 470	27591 470	" " 470	" "	" "	" "	" "
2.4 2.5	" " 360	27515 360	27515 360	" "	27747 270	24185 600	28624 680
2.5 2.7	" " 470	" " 470	" " 470	" "	27735 250	25531 560	" "
2.7 2.9	" " 360	" " 360	" " 360	64721	27723 240	24915 750	27591 470
2.9 3.0	" " 470	" " 470	" " 470	" "	27711 220	24874 620	" "
3.0 3.2	" " 360	" " 360	" " 360	" "	" "	24915 750	27515 360
3.2 3.5	" " 470	" " 470	" " 470	" "	27709 200	25555 680	" "
3.5 3.9	63105 A3R 270	" " 270	" " 270	" "	027682-2 170	24915 750	27503 270
3.9 4.2	" " 200	27503 200	" " 200	" "	25892 150	25555 680	" "
4.2 4.5	" " 150	" " 150	" " 150	" "	28777 130	24874 620	28583 180
4.5 4.7	" " 100	" " 100	" " 100	" "	25907 120	25531 560	" "
4.7 5.0	" " 68	" " 68	" " 68	64745	" "	" "	27498 150
5.0 5.2	63117 A2R 200	" " 200	" " 200	" "	27577 110	25529 530	" "
5.2 5.5	" " 150	" " 150	" " 150	" "	" "	25505 470	" "
5.5 5.7	" " 100	25804 100	" " 100	" "	28791 91	25490 430	" "
5.7 6.0	63143 D-6 200	" " 200	" " 200	" "	" "	25505 470	27474 100
6.0 6.3	" " 150	" " 150	" " 150	" "	28789 82	25490 430	" "
6.3 6.7	" " 100	" " 100	" " 100	" "	25921 75	25488 390	" "
6.7 6.9	" " 68	" " 68	" " 68	" "	" "	25490 430	28874 68
6.9 7.2	" " 150	" " 150	" " 150	64757	" "	" "	" "
7.2 7.7	" " 100	27498 100	" " 100	" "	28806 62	25488 390	" "
7.7 8.4	63155 D-5 200	" " 200	" " 200	" "	" "	25476 360	28873 47
8.4 8.8	" " 150	" " 150	" " 150	" "	25933 50	25464 330	" "
8.8 9.2	" " 100	" " 100	" " 100	" "	28818 43	25452 300	" "
9.2 9.8	" " 68	27890 68	" " 68	" "	28820 39	" "	27450 36
9.8 10.3	63167 D-4 200	" " 200	" " 200	" "	25945 30	25440 270	" "
10.3 10.8	" " 150	" " 150	" " 150	" "	" "	25438 250	" "
10.8 11.2	" " 100	" " 100	" " 100	" "	28832 22	" "	" "
11.2 11.5	" " 68	" " 68	" " 68	64769	25957 20	" "	" "
11.5 11.8	" " 150	" " 150	" " 150	" "	" "	25373 230	" "
11.8 12.5	" " 100	" " 100	" " 100	" "	" "	25438 250	26054 22
12.5 13.5	63179 D-3 200	27876 200	" " 200	" "	28844 18	25373 230	" "
13.5 14.0	" " 150	" " 150	" " 150	" "	25969 10	25426 200	" "
14.0 14.5	" " 100	" " 100	" " 100	64771	" "	" "	" "
14.5 15.0	" " 68	" " 68	" " 68	" "	" "	25402 180	28872 15
15.0 16.0	" " 150	" " 150	" " 150	" "	Note (1)	" "	" "
16.0 17.0	" " 100	" " 100	" " 100	" "	Note (1)	25414 150	" "
17.0 18.0	63181 D-2 200	" " 200	" " 200	" "	Note (1)	" "	" "

NOTE (1): Use no capacitor; leave circuit open.

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RECEIVER/EXCITER

EQUENY MGE (MC) TOM TO	EXCITER				RECEIVER					
	OSCILLATOR Y1-10 P/N (1) ID	TUNED AMP. 1 L701-710 P/N (2) ID	TUNED AMP. 2 L821-830 P/N ID	ANTENNA L801-810 P/N (2) ID	COUPLING CAP. C1101-1110 P/N (3) ID	ANTENNA CAP. C801-810 P/N (3) ID	RF AMP. 2 L601-610 P/N (2) ID	RF AMP. 2 L811-820 P/N ID	RF AMP. 2 C811-820 P/N (3) ID	OSCILLATOR Y12-21 P/N (1) ID
0 2.3	81690 P/N	64666 120	63363 A-5	64393 Bm	26834 10.0	27632 300	64666 120	63363 A-5	27632 300	81705 P/N
3 2.4	" &	" "	63375 A-4	64408 Red	" "	27620 230	" "	63375 A-4	27620 230	" &
4 2.5	" Freq	" "	" "	" "	26248 6.8	" "	" "	" "	" "	" "
5 3.0	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
0 3.2	" "	64654 82	" 25828 180	64410 Orn	" "	25828 180	64654 82	" "	25828 180	" "
2 3.5	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
5 3.7	" "	64642 47	" 27618 140	" "	" "	" "	64642 47	" "	" "	" "
7 3.9	" "	" "	" "	" "	" "	" "	" "	" "	27618 140	" "
9 4.0	" "	" "	63105 A3R	64422 Yel	" "	27618 140	" "	63105 A3R	" "	" "
0 4.2	" "	64630 33	" "	" "	26236 4.7	" "	64630 33	" "	" "	" "
2 4.5	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
5 5.0	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
0 5.2	" "	" "	" 25775 110	64434 Grn	" "	25775 110	" "	" "	25775 110	" "
2 5.4	" "	64329 22	" 26212 82	" "	" "	" "	64329 22	" "	" "	" "
4 5.8	" "	64628 15	" "	" "	26224 3.3	" "	64628 15	" "	26212 82	" "
8 6.4	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
4 6.7	" "	" "	63117 A2R	64446 Blu	" "	26212 82	" "	63117 A2R	" "	" "
7 7.2	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
2 7.3	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
3 7.5	" "	" "	" "	" "	25000 2.2	" "	" "	" "	" "	" "
5 8.4	" "	64616 10	63143 D-6	" "	" "	" "	64616 10	63143 D-6	26107 68	" "
4 8.8	" "	" "	" "	64458 Vio	" "	" "	" "	" "	" "	" "
8 9.2	" "	" "	" "	" "	" "	26107 68	" "	" "	" "	" "
2 9.8	" "	" "	" 26004 50	" "	" "	" "	" "	" "	" "	" "
8 10.3	" "	" "	" "	" "	" "	" "	" "	" "	26004 50	" "
3 10.5	" "	64604 6.8	" "	" "	26925 1.0	" "	64604 6.8	" "	" "	" "
5 10.8	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
8 11.0	" "	" "	63155 D-5	64460 Gry	" "	26004 50	" "	63155 D-5	" "	" "
0 11.2	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
2 12.5	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
5 13.5	" "	64599 4.7	" "	" "	" "	" "	64599 4.7	" "	" "	" "
5 14.0	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
0 14.5	" "	" "	63167 D-4	64472 Whit	" "	27606 39	" "	" "	27606 39	" "
5 15.0	" "	" "	" "	" "	" "	" "	" "	" "	" "	" "
0 16.0	" "	64587 3.3	" "	" "	" "	" "	64587 3.3	" "	" "	" "
0 17.0	" "	" "	63179 D-3	" "	" "	" "	" "	63179 D-3	" "	" "
0 18.0	" "	63454 2.2	" "	" "	" "	" "	63454 2.2	" "	" "	" "

NOTES: (1) Use only SunAir Crystals.
(2) Value in microhenries.
(3) Value in picofarads.
(4) Color dot on coil form.

(5) When operating frequencies are below 2.5 MHz, an IF trap is used.
See Schematic No. 15885 (ASB-100) and 10016 (GSB-100).

FIGURE VI-1. Frequency-Dependent Replaceable Parts (Sheet 1 of 2)

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SCHEMATIC SYMBOL	FUNCTION	UNIT	LOCATION	ACTION NEC.
L2-L11	Driver Coils	PA/PS	Top Rear on Bracket	RT
C6-C25	Driver Capacitors	PA/PS		R
L15-L24	Pi-network Coils	PA/PS	Top Front, Above Stepping Motor	RT
L25-L34	Harmonic Trap Coils	PA/PS	Top Front, Above Stepping Motor	T
C34-C43	Pi-network Input Capacitors	PA/PS	Top Front, Below L15-L24	R
C44-C53	Pi-network Output Capacitors	PA/PS		R
C54-C63	Trap Capacitors	PA/PS	Beneath V2 and V3	R
Y1-Y10	Transmitter Channel Osc. Crystals	EXC.	Oven, Bottom Rear	R
C884-C893	Transmitter Channel Osc. Trimmers	EXC.	Rear, Left Side on Main P.C. Board	T
L701-L710	Tuned Amp. #1 Coils	EXC.	P.C. Board, Right Side	R
C701-C710	Tuned Amp. #1 Trimmers	EXC.	P.C. Board, Right Side	T
L821-L830	Tuned Amp. #2 Coils	EXC.	P.C. Board, Left Side	RT
C821-C830	Tuned Amp. #2, Capacitors	EXC.	P.C. Board, Left Side	R
C801-C810	Antenna Input Capacitors	REC	P.C. Board, Right Front Side	R
L801-L810	Antenna Input Coils	REC	P.C. Board, Left Front Side	RT
C1101-C1110	Coupling Capacitor	REC	P.C. Board, Right Front Side	R
L601-L610	RF Amp. #1 Coils	REC	P.C. Board, Right Front Side	R
C601-C610	RF Amp. #1 Trimmers	REC	P.C. Board, Right Front Side	T
L811-L820	RF Amp. #2 Coils	REC	P.C. Board, Left Middle Side	RT
C811-C820	RF Amp. #2, Capacitors	REC	P.C. Board, Right Middle Side	R
Y12-Y21	Receiver Crystals	REC	Left Side, Under Cover	R
C501-C510	Rec. Osc. Trimmers	REC	Right Rear Side	T

R = Remove for Frequency Change

RT = Remove and/or Tune

T = Tune Only

Table 6.2. Summary of Frequency-dependent Components

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SECTION 7

The following pages contain schematic diagrams, printed circuit boards, parts lists and a recommended spare parts list for the assemblies of the ASB-100A Receiver/Exciter, PA-1010A PA/PS, SCU-10 and MCU-30 control units.

AT

0997250003R FINAL ASSEMBLY, PA-1010A

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	FINAL ASSEMBLY, PA-1010A	0997250003
C1-		
C25	Not used	
C26	Capacitor 0.001 UF, 1000 V, X5F, 20%	0256840008
C27-		
C30	Not used	
C31	Capacitor, 0.01 UF, 1600 V, Z5U, GMV	0244100004
C32	Capacitor, 0.0015 UF, 3000 V, Z5U, 20%	0243810008
C33	Capacitor, 1-30 PF, 750 V, Glass	0248500007
C34-		
C73	Not used	
C74	Capacitor, 1 UF, 100 V, Mylar	0272300004
C75	Not used	
C76	Not used	
C77	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C78	Not used	
C79	Not used	
C80	Not used	
C82	Not used	
C82	Not used	
C83	Capacitor, 250 UF, 50 V, BR	0272920002
C84	Not used	
C85	Capacitor, 1 UF, 100 V, Mylar	0272300004
CR1-		
CR6	Not used	
CR7	Diode, Rectifier, 1N4004	0405180004
F1	Fuse, AGC, 5 Amp, 32 V	0848980000
KR1	Switch, Rotary Solenoid, 12 V	0336170009
L1-		
L13	Not used	
L14	Inductor, PI-Wound, 2.5 MH	0560610009
L37	Inductor, Choke, Toroid, 9.0 MH	0937720003
R1-		
R11	Not used	
R12	Resistor, 82K, 10%, 1W	0189660007
R13	Not used	
R14	Not used	
R15	Not used	
R16	Not used	
R17	Resistor, 1, 5%, 10 W	0169680002
R18-		
R28	Not used	
R29	Resistor, 1, 10%, 2 W	0170270009
V1	Tube, Vacuum, 12HG7	0766830004
	Terminal Board, Input Caps	0157060004

0999620002F CHASSIS ASSEMBLY, PS PA-1010A

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CHASSIS ASSEMBLY, PS PA-1010A	0999620002
C1-		
C72	Not used	
C73	Capacitor, 100 UF, 30 V, 40CF117	0245870008
C74	Not used	
C75	Not used	
C76	Not used	
C77	Not used	
C78	Capacitor, 0.05 UF, 100 V, Z5V	0279290004
C79	Capacitor, 0.05 UF, 100 V, Z5V	0279290004
C80	Not used	
C81	Not used	
C82	Not used	
C83	Not used	
C84	Capacitor, 0.05 UF, 100 V, Z5V	0279290004
CR1-		
CR9	Not used	
CR10	Diode, Rectifier, 1N4004	0405180004
J1	Connector, RF, N UG-58/U	0746970005
J2	Connector, RF, UHF S0-239	0741920000
J3	Connector, RF, RNC UG-1094/U	0743740009
J4	Connector, Power, 16 Pin Round	0747140006
K1	Relay, SPDT, 14V Antenna	0662860004
L1-		
L35	Not used	
L36	Inductor, Choke, A+, 40 UH	0563720000
Q1	Transistor, PNP, GE. DTG2400	0445250003
Q2	Transistor, PNP, GE. DTG2400	0445250003
R1-		
R8	Not used	
R9	Resistor, 120 K, 5%, 1/2 W	0183440005
S1A	Switch, Slide, DPDT	0325340005
S1B	Switch, Slide, DPDT	0325340005
	Fuseholder, Panel Mount	0849030005
	Socket, Transistor	0766190005

0999630008M CHASSIS ASSEMBLY PA PA-1010A

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	CHASSIS ASSEMBLY PA PA-1010A	0999630008
C1	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C2	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C3	Capacitor, 10 PF, 1000 V, NPO	0268340005
C4	Capacitor, 0.005 UF, 500 V, X5R, 10%	0276560001
C5	Capacitor, 0.005 UF, 500 V, X5R, 10%	0276560001
C6-		
C26	Not used	
C27	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C28	Capacitor, 0.005 UF, 500 V, X5R, 10%	0276560001
C29	Capacitor, 0.005 UF, 500 V, X5R, 10%	0276560001
C30	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C31-		
C68		
C69	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C70	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C71	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C72	Not used	
C73	Not used	
C74	Not used	
C75	Capacitor, 0.005 UF, 500 V, X5R, 10%	0276560001
C76	Capacitor, 0.02 UF, 150 V, Z5V	0244580006
C77	Not used	
C78	Not used	
C79	Not used	
C80	Not used	
C81	Not used	
C82	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
CR1-		
CR5	Not used	
CR6	Diode, Rectifier 1N4004	0405180004
CR7	Not used	
CR8	Diode, Zener 1N9808	0404520006
CR9	Diode, Zener 1N3015A	0404380000
CR10	Not used Diode Rectifier 1N4004	0405180004
CR11	Diode, Zener 1N5364B	0405230001
K1	Not used	
K2	Relay, SPST, 12V, Power 60A	0660160005
L1	Inductor, Choke, 0.5 MH, 150 MA	0563840005
R1	Resistor, 68, 10%, 1/4 W	0187960003
R2	Resistor, 33, 10%, 1/4 W	0182530001
R3	Resistor, 10K, 10%, 1/4 W	0170410005
R4	Resistor, 12, 10%, 1/2 W	0187080003
R5	Resistor, 27K, 10%, 1 W	0174310005
R6	Resistor, 10, 10%, 1/2 W	0185380000
R7	Resistor, 10, 10%, 1/2 W	0185380000
R8	Resistor, 10, 10%, 2 W	0163840008
R9	Not used	
R10	Resistor, 3K, 5%, 5 W	0188870008
R11	Not used	
R12	Not used	
R13	Resistor, 50, 5%, 10 W	0168410001
R14	Resistor, 75, 5%, 3 W	0169440001
R15	Resistor, 18K, 10%, 1/2 W	0177420006
R16-		
R23	Not used	
R24	Pot, 10K, 10% 3/4 W, 1/8 Shaft	0335900003
R25	Resistor, 10K, 10%, 1/2 W	0167240005
R26	Resistor, 1.5KK, 5%, 10 W	0188750002
R27-		
R36	Not used	
R37	Resistor, 270K, 10%, 1/4 W	0172110009
	Socket, Tube, 8 pin	0760590001
	Socket, Tube 9 Pin Minimum	0752490001

0999570005F COIL MOUNTING BRACKET ASSEMBLY PA-1010A/B

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	COIL MTG BRACKET ASSY PA-1010A/B	0999570005
	Inductor, Var, 1.25-2.08 UH, Qty 10	0645750000
	Switch, Wafer, 10 Position	0335260004

0999640003C 3 WAFER SWITCH ASSEMBLY PA-1010A/B

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	3 WAFER SWITCH ASSY PA-1010A/B	0999640003
	Switch, Wafer, 10 Position	0335400001
	Switch, Wafer, 10 Position	0335140009
	Switch, Wafer, Dummy	0335640001

S102 Switch 0324170009

0993620001A PARASITIC SUPPRESSOR

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
E1	Parasitic Suppressor	0993620001
E2	Parasitic Suppressor	0993620001
	Resistor, 47, 10%, 1 W	0164990003

K3 Relay, SPST, 12V Power 60A 0660160005

SUNAIR ASB-100A

0999131079G

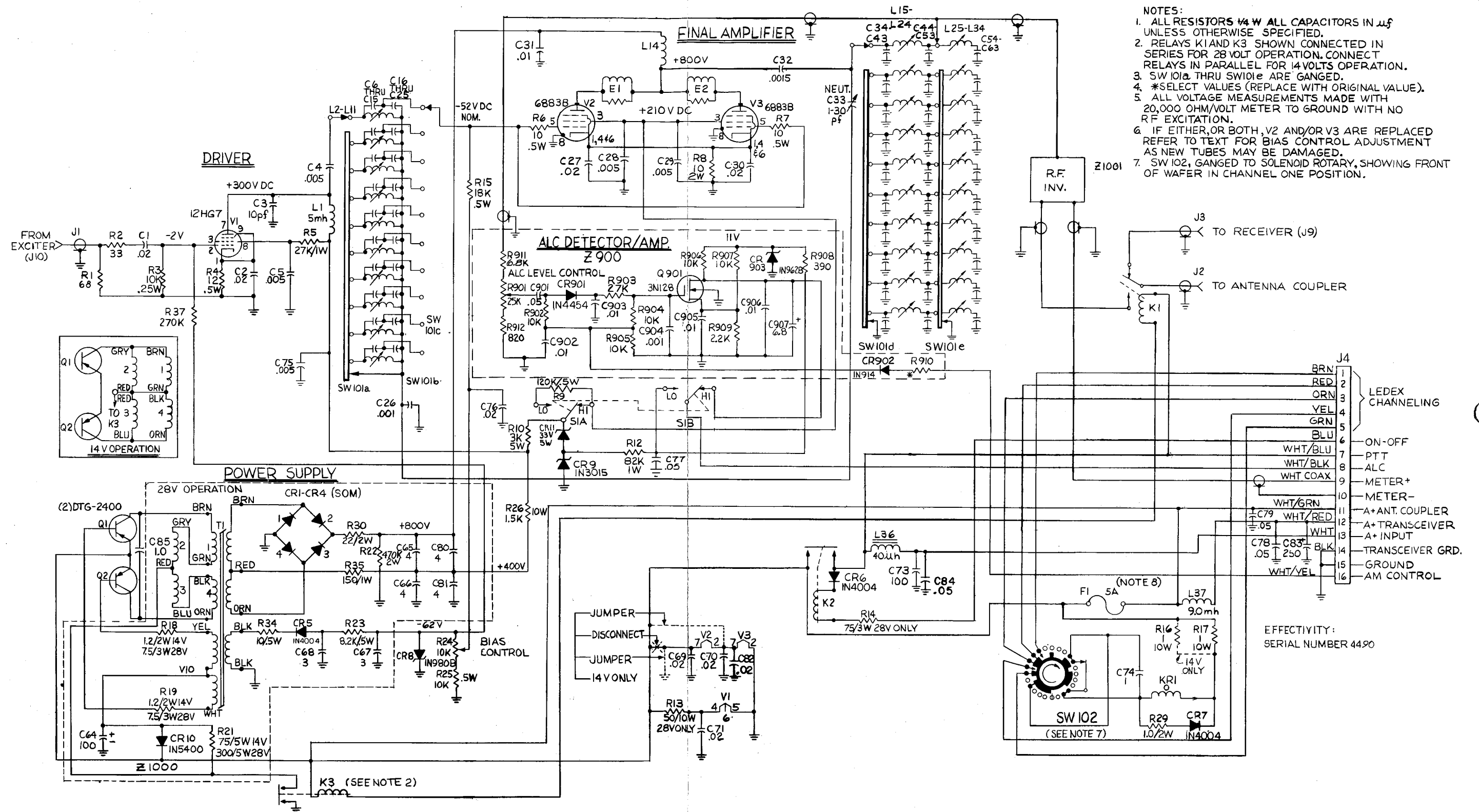


Figure 7.1. PA-1010A PA/PS Schematic

SUNAIR ASB-100A

0999420003G PC ASSY MAIN EXCTR, Z800 RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1-	PC ASSY MAIN EXCTR, Z800 RE-1000	0999420003
C799	Not used	
C800	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C801-		
C830	Not used	
C831	Capacitor, 10 PF, 1000 V, NPO	0268340005
C832	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C833	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C834	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C835	Capacitor, 22 PF, 1000 V, NPO	0268580006
C836	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C837	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C838	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C839	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C840	Capacitor, 68 UF, 15F, TS3	0273830007
C841	Capacitor, 220 PF, 1000 V, X5E, 10%	0250860007
C842	Capacitor, 10-40 PF, 250 V, N750	0263150003
C843	Capacitor, 47 PF, 500 V, DM15, 5%	0288730003
C844	Not used	
C845	Capacitor, 0.068 UF, 100V, Mylar	0272040002
C846	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C847	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C848	Capacitor, 10-40 PF, 250 V, N750	0263150003
C849	Capacitor, 33 PF, 1000 V, NPO	0268600007
C850	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C851	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C852	Capacitor, 33 PF, 1000 V, NPO	0268600007
C853	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C854	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C855	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C856	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C857	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C858	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C859	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C860	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C861	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C862	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C863	Not used	
C864	Capacitor, 68 UF, 15 V, TS3	0273830007
C865	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C866	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C867	Capacitor, 22 UF, 15 V, 196D	0281690006
C868	Capacitor, 1.4 UF, 30 V, CL32B	0274360004
C869	Not used	
C870	Not used	
C871	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C872	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C873	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C874	Capacitor, 33 PF, 300 V, CD6, 5%	0286860007
C875	Capacitor, 180 PF, 500 V, DM15, 5%	0258280000
C876	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C877	Capacitor, 27 PF, 1000 V, N750	0250620006
C878	Capacitor, 56 PF, 1000 V, N750	0252200004
C879	Not used	
C880	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C881	Capacitor, 500 PF, 1000 V, Z5F, 10%	0250980002
C882	Capacitor, 0.47 UF, 50 V, X5V, 20%	0283370009
C883-		
C893	Not used	
C894	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C895	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C896	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C897	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C898	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C899	Capacitor, 0.05 UF, 25 V, Y5U	0273570005

0999420003G PC ASSY MAIN EXCTR, Z800 RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
CR1-		
CR800	Not used	
CR801	Diode, Signal, Silicon 1N914	0442900007
CR802	Diode, Signal, Silicon 1N914	0442900007
CR803	Diode, Signal, Silicon 1N914	0442900007
CR804	Diode, Signal, Silicon 1N914	0442900007
CR805	Diode, Signal, Silicon 1N914	0442900007
CR806	Diode, Signal, Silicon 1N461	0401410005
CR807	Diode, Signal, Silicon 1N461	0401410005
CR808	Diode, Signal, Silicon 1N914	0442900007
CR809	Not used	
CR810	Diode, Zener 1N756	0443050007
K1-		
K201	Not used	
K202	Relay, DPDT, 14 V, General	0663030005
K203	Not used	
K204	Relay, DPDT, 14 V, General	0663030005
K205	Not used	
K206	Relay, DPDT, 14 V, General	0663030005
L1-		
L830	Not used	
L831	Inductor, Molded, 120 UH, 5%	0646660004
L832	Inductor, Molded, 120 UH, 5%	0646660004
L833	Inductor, Molded, 120 UH, 5%	0646660004
L834	Inductor, Molded, 120 UH, 5%	0646660004
L835	Inductor, Molded, 1000 UH, 5%	0643310002
L836	Inductor, Molded, 1000 UH, 5%	0643310002
L837	Inductor, Molded, 3.3 UH, 10%	0645870005
L838	Inductor, Molded, 120 UH, 5%	0646660004
Q1-		
Q800	Not used	
Q801	Transistor, NPN, Silicon 2N5179	0445130008
Q802	Transistor, NPN, Silicon 2N3646	0442520000
Q803	Transistor, NPN, Silicon 2N3646	0442520000
Q804	Transistor, NPN, Silicon 2N3646	0442520000
Q805	Transistor, NPN, Silicon 2N3646	0442520000
Q806	Transistor, NPN, Silicon 2N3646	0442520000
Q807	Transistor, NPN, Silicon 2N3646	0442520000
Q808	Transistor, NPN, Silicon 2N3646	0442520000
Q809	Transistor, NPN, Silicon 2N3646	0442520000
Q810	Transistor, NPN, Silicon 2N3646	0442520000
Q811	Transistor, NPN, Silicon 2N3646	0442520000
Q812	Transistor, NPN, Silicon MPS2925	0444340009
Q813	Transistor, NPN, Silicon 2N3646	0442520000
Q814	Transistor, NPN, Silicon 2N3646	0442520000
Q815	Transistor, NPN, Silicon 2N3563	0443290008
Q816	Transistor, NPN, Silicon 2N3646	0442520000
Q817	Transistor, NPN, Silicon 2N3646	0442520000
Q818	Transistor, N-Channel FET 2N4303	0443930007
R1-		
R800	Not used	
R801	Resistor, 820, 10%, 1/4 W	0178210005
R802	Resistor, 10K, 10%, 1/4 W	0170410005
R803	Resistor, 470, 10%, 1/4 W	0172610001
R804	Resistor, 8.2K, 10%, 1/4 W	0181620006
R805	Resistor, 2.7K, 10%, 1/4 W	0186670001
R806	Resistor, 8.2K, 10%, 1/4 W	0181620006
R807	Resistor, 100, 5%, 1/4 W	0171180003
R808	Not used	
R809	Resistor, 4.7K, 5%, 1/4 W	0170770001
R810	Resistor, 10K, 10%, 1/4 W	0170410005
R811	Resistor, 10K, 10%, 1/4 W	0170410005
R812	Resistor, 8.2K, 10%, 1/4 W	0181620006
R813	Resistor, 470, 10%, 1/4 W	0172610001
R814	Resistor, 1K, 10%, 1/4 W	0171560001
R815	Resistor, 3.3K, 10%, 1/4 W	0170890007

0999420003G PC ASSY MAIN EXCTR, Z800 RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
R816	Resistor, 10K, 10%, 1/4 W	0170410005
R817	Not used	
R818	Resistor, 270, 10%, 1/4 W	0178450006
R819	Resistor, 6.8K, 5%, 1/4 W	0174810008
R820	Resistor, 6.8K, 5%, 1/4 W	0174810008
R821	Resistor, 4.7K, 5%, 1/4 W	0170770001
R822	Resistor, 470, 10%, 1/4 W	0172610001
R823	Resistor, 1.5K, 10%, 1/4 W	0172470005
R824	Resistor, 2.2K, 5%, 1/4 W	0178070009
R825	Resistor, 2.7K, 10%, 1/4 W	0186670001
R826	Resistor, 12K, 10%, 1/4 W	0183180003
R827	Resistor, 12K, 10%, 1/4 W	0183180003
R828	Resistor, 820, 10%, 1/4 W	0178210005
R829	Resistor, 47K, 10%, 1/4 W	0171060008
R830	Resistor, 47K, 10%, 1/4 W	0171060008
R831	Resistor, 3.3K, 10%, 1/4 W	0170890007
R832	Resistor, 470, 10%, 1/4 W	0172610001
R833	Resistor, 4.7K, 5%, 1/4 W	0170770001
R834	Resistor, 1K, 10%, 1/4 W	0171560001
R835	Resistor, 12K, 10%, 1/4 W	0183180003
R836	Resistor, 2.7K, 10%, 1/4 W	0186670001
R837	Resistor, 4.7K, 5%, 1/4 W	0170770001
R838	Resistor, 6.8K, 5%, 1/4 W	0174810008
R839	Resistor, 6.8K, 5%, 1/4 W	0174810008
R840	Resistor, 1K, 10%, 1/4 W	0171560001
R841	Resistor, 220, 10%, 1/4 W	0171320000
R842	Resistor, 10K, 10%, 1/4 W	0170410005
R843	Resistor, 10K, 10%, 1/4 W	0170410005
R844	Resistor, 1K, 10%, 1/4 W	0171560001
R845	Not used	
R846	Resistor, 47K, 10%, 1/4 W	0171060008
R847	Resistor, 22K, 5%, 1/4 W	0172230004
R848	Resistor, 2.7K, 10%, 1/4 W	0186670001
R849	Resistor, 5.6K, 10%, 1/4 W	0183060008
R849	Resistor, 10K, 10%, 1/4 W	0170410005
R850	Resistor, 56, 10%, 1/4 W	0174290004
R851	Resistor, 2.7K, 10%, 1/4 W	0186670001
R852	Not used	
R853	Resistor, 2.7K, 10%, 1/4 W	0186670001
R854	Resistor, 82K, 10%, 1/4 W	0171680006
R855	Resistor, 390, 10%, 1/4 W	0178330001
R856	Resistor, 10K, 10%, 1/4 W	0170410005
R857	Resistor, 1.5K, 10%, 1/4 W	0172470005
R858	Resistor, 82K, 10%, 1/4 W	0171680006
R859	Resistor, 8.2K, 10%, 1/4 W	0181620006
R860	Resistor, 4.7K, 5%, 1/4 W	0170770001
R861	Resistor, 47K, 10%, 1/4 W	0171060008
R862	Resistor, 2.7K, 10%, 1/4 W	0186670001
R863	Resistor, 47K, 10%, 1/4 W	0171060008
R864	Not used	
R865	Resistor, 2.2K, 5%, 1/4 W	0178070009
R866	Resistor, 2.2K, 5%, 1/4 W	0178070009
R867	Resistor, 1K, 10%, 1/4 W	0171560001
R868	Resistor, 150K, 10%, 1/4 W	0176750002
R869	Resistor, 100K, 10%, 1/4 W	0170390004
R870	Resistor, 8.2K, 10%, 1/4 W	0181620006
R871	Resistor, 470, 10%, 1/4 W	0172610001
R972	Resistor, 39, 10%, 1/2 W	0165920009
R873	Resistor, 12K, 10%, 1/4 W	0183180003
R874	Resistor, 47, 10%, 1/4 W	0179360001
R875	Resistor, 12K, 10%, 1/4 W	0183180003
R876	Not used	
R877	Resistor, 820, 10%, 1/4 W	0178210005
R878	Resistor, 390, 10%, 1/4 W	0178330001

0999730002K FACE PLATE ASSEMBLY RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	FACE PLATE ASSEMBLY RE-1000	0999730002
C1-		
C1110	Not used	
C1111	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C1112	Capacitor, 0.05 UF, 100 V, Z5V	0279290004
C1113	Not used	
C1114	Not used	
C1115	Capacitor, 47 UF, 50 V, CL658	0245750002
CR1-		
CR1000	Not used	
CR1001	Diode, Rectifier 1N4004	0405180004
CR1002	Diode, Rectifier 1N4004	0405180004
J1-		
J100	Not used	
J101	Connector, Power, 34 Pin Rectifier	0747380007
J102	Connector, RF, RNC UG-1094/U	0743740009
J103	Connector, RF, N UG-58/U	0746970005
J104	Connector, Mike Jack, 3 Cond.	0840560001
J105	Connector, Headphone	0840850000
L1-		
L1001	Not used	
L1002	Inductor, Molded, 120 UH, 5%	0646660004
R1-		
R1000	Not used	
R1001	Resistor, 1, 10%, 2 W	0170270009
R1002	Resistor, 1, 5%, 10 W	0169680002
R1003	Not used	
R1004	Not used	
R1005	Not used	
R1006	Not used	
R1007	Resistor, 2.2K, 5%, 1/4 W	0178070009

SUNAIR ASB-100A

0999111078E

099980001K FINAL ASSEMBLY RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1-	FINAL ASSEMBLY RE-1000	0999800001
C106	Not used	
C107	Capacitor, 500 UF, 15 V, BR	0273070002
C108-	Not used	
C323	Capacitor, 2.2 UF, 35 V, T368	0273950002
C324	Capacitor, 2.2 UF, 35 V, T368	
C325-	Not used	
C405	Not used	
C406	Capacitor, 47 UF, 50 V, CL65B	0245750002
C407-	Not used	
C1000	Not used 1uF 100V MYLAR	0272300009
C1001	Capacitor, 15 UF, 50 V, 196D	0274000008
C1002	Not used	
C1003	Capacitor, 15 UF, 50 V, 196D	0274000008
C1004	Capacitor, 22 UF, 15 V, T368	0296660001
C1005	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C1006	Capacitor, 22 UF, 15 V, T368	0296660001
CR1-	Not used	
CR999	Diode, Zener 1N2974B	0405340001
CR1000	Not used	
CR1001	Not used	
CR1002	Not used	
CR1003	Not used	
CR1004	Not used	
CR1005	Diode, Rectifier 1N4004	0405180004
L1-	Not used	
L300	Inductor, Molded, 1000 UH, 5%	0643310002
L301	Inductor, Molded, 1000 UH, 5%	
L302-	Not used	
L1000	Inductor, Molded, 1000 UH, 5%	0643310002
L1001	Inductor, Molded, 1000 UH, 5%	
R1-	Not used	
R100	Pot, 250, 10% 3/4 W 1/8 Shaft	0335880002
R101	Not used	
R102-	Not used	
R999	Resistor, 100, 5%, 5W	0174430001
R1000	Not used	
R1001	Not used	
R1002	Not used	
R1003	Not used	
R1004	Resistor, 47, 10%, 1 W	0164990003
T1-	Not used	
T301	Transformer, Audio	0489350003
T302	Transformer, Audio	

0999680005K FINAL EXCITER STEP NO. 1 RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1-	FINAL EXCITER STEP NO. 1 RE-1000	0999680005
C883	Not used	
C884	Capacitor, .8-.8.5 PF	0273690001
C885	Capacitor, .8-.8.5 PF	0273690001
C886	Capacitor, .8-.8.5 PF	0273690001
C887	Capacitor, .8-.8.5 PF	0273690001
C888	Capacitor, .8-.8.5 PF	0273690001
C889	Capacitor, .8-.8.5 PF	0273690001
C890	Capacitor, .8-.8.5 PF	0273690001
C891	Capacitor, .8-.8.5 PF	0273690001
C892	Capacitor, .8-.8.5 PF	0273690001
C893	Capacitor, .8-.8.5 PF	0273690001
C894-	Not used	
C1001	Capacitor, 0.10 UF, 100 V, Mylar	0272160008
C1002	Filter, Crystal, USB, 1650 KHZ	0817310002
FL1	Not used	
FL2	Filter, Crystal, AM, 1650 KHZ	0817290001
H1-	Not used	
H999	Oven, Crystal, 12 Position	0817550003
R1-	Not used	
R875	Resistor, 470, 10%, 1/4 W	0172610001
R876	Resistor, 470, 10%, 1/4 W	
SW1-	Not used	
SW7	Not used	
SW8	Switch, Wafer, 10 Position	0335140009

0978420004C IF TRAP ASSY

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1-	IF TRAP ASSY	0978420004
C1112	Not used	
C1113	Capacitor, 0.0047 UF, 100 V, Mylar	0279550006
C1114	Capacitor, 150 PF, 500 V, DM15, 5%	0274980002
L1-	Not used	
L1002	Inductor, Variable 44.5-75.6 UH A-6	0633510009
L1003	Inductor, Variable 1.90-3.15 UH	0643430008
L1004	Inductor, Variable 1.90-3.15 UH	
R1006	Not used	
R1007	Resistor, 2.2K, 5%, 1/4 W	0178070009

NOTE: Used only when operations are below 2.5 MHz.

0999560000B SWITCH DECK ASSEMBLY RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1-	SWITCH DECK ASSEMBLY RE-1000	0999560000
C869	Not used	
C870	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C871-	Not used	
C878	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C879	Capacitor, 0.01 UF, 100 V, Z5V	
SW1	Switch, Wafer, 10 POS	0337080003
SW2	Switch, Wafer, 10 POS	0335380000
SW3	Switch, Wafer, 10 POS	0335140009
SW4	Switch, Wafer, 10 POS	0335140009
SW5	Switch, Wafer, 10 POS	0335140009
SW6	Switch, Wafer, 10 POS	0335140009
SW7	Switch, Wafer, 10 POS	0335140009
SW8	Not used	
SW9	Not used	
SW10	Not used	
SW11	Switch, Wafer, 10 POS	033540001

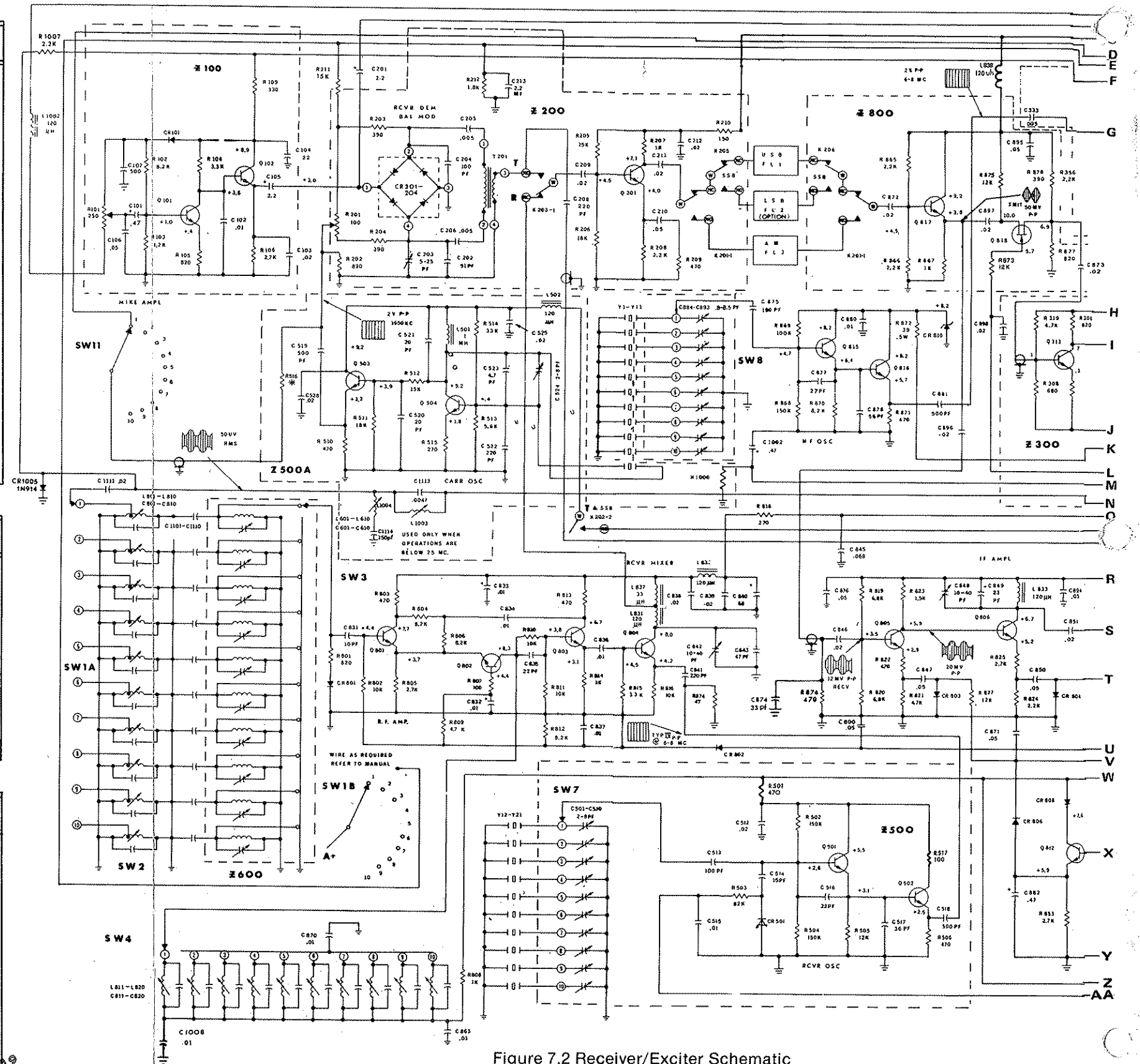
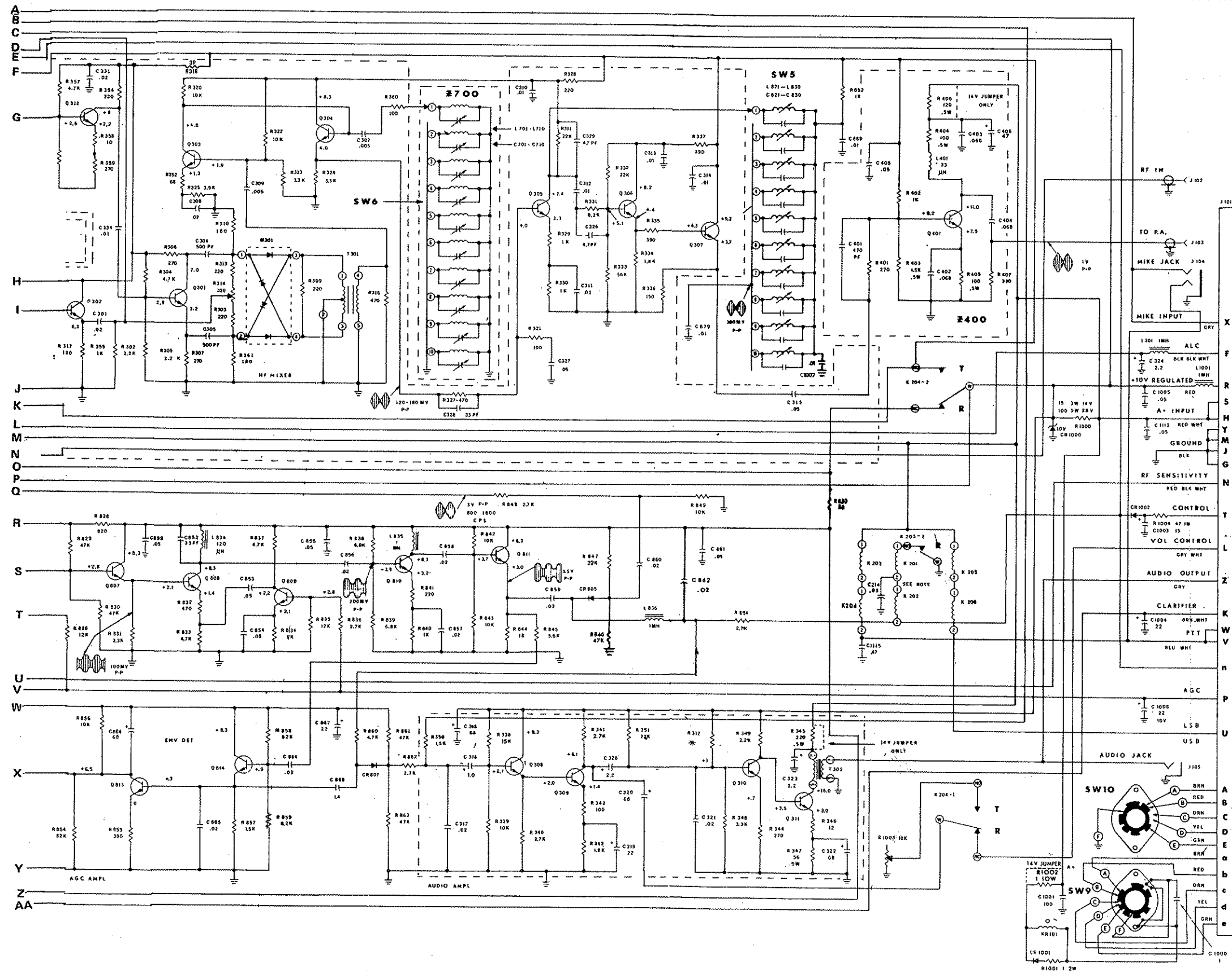
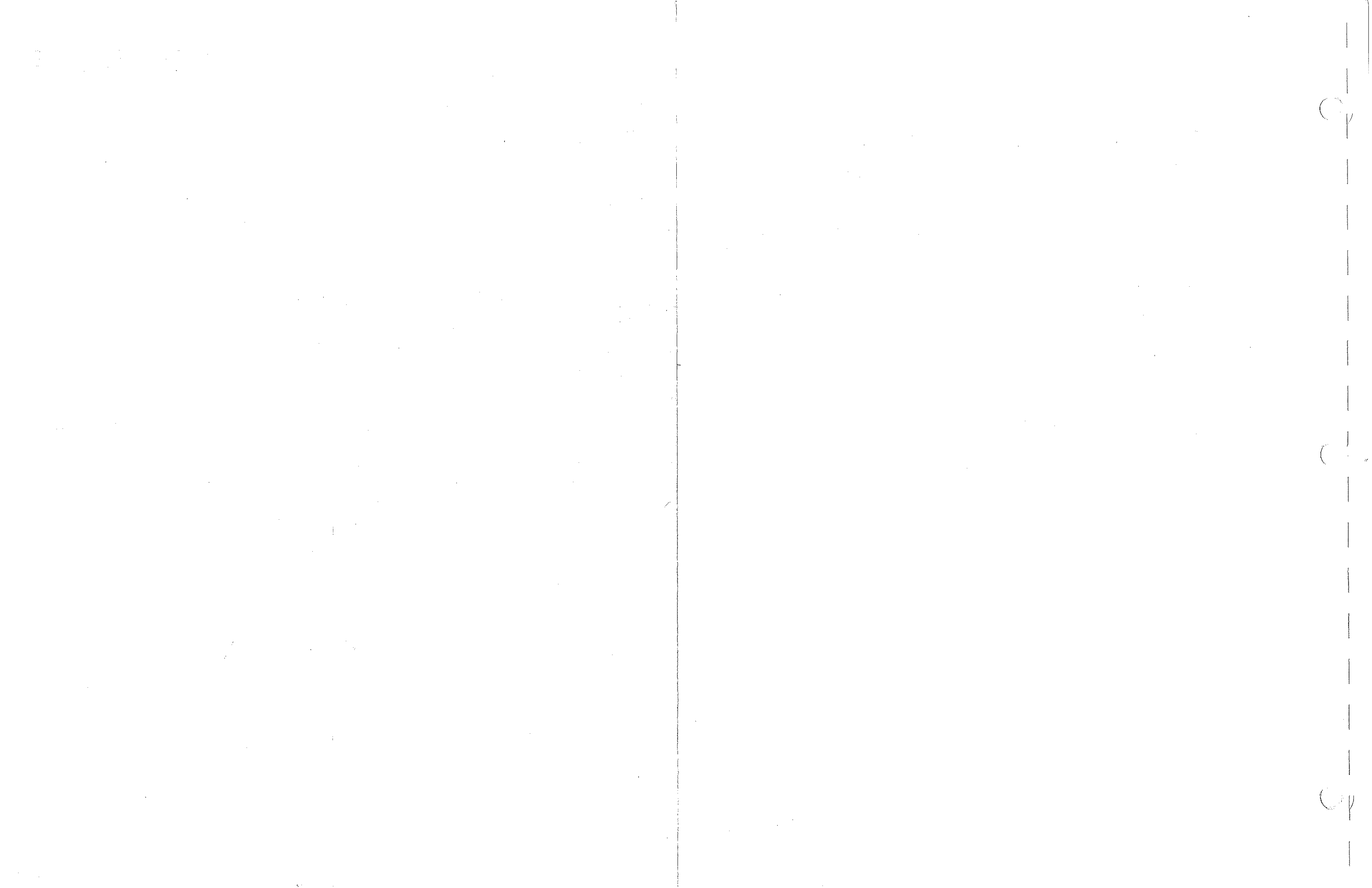


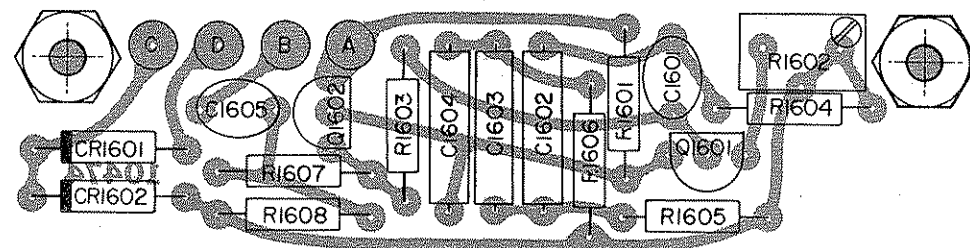
Figure 7.2 Receiver/Exciter Schematic





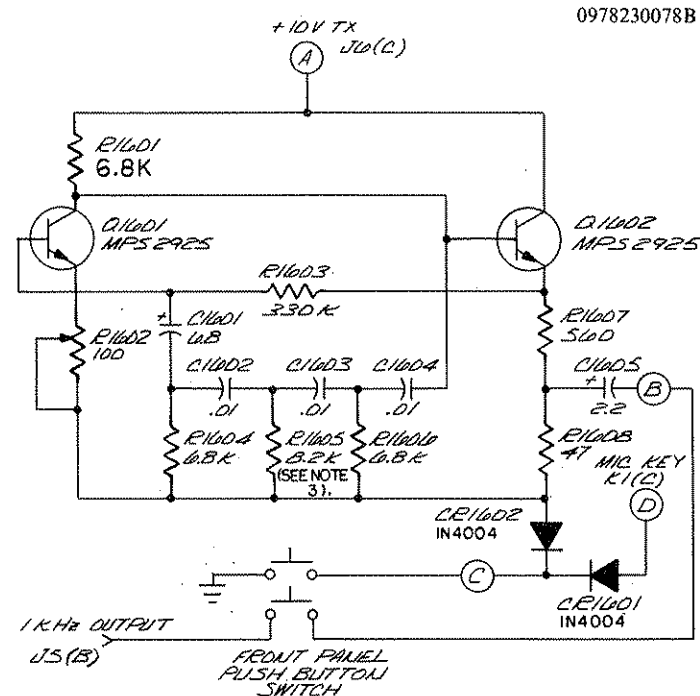
NOTE

This option is installed at Sunair, upon request, in ASB-100A's that are intended for Radio-Telephone communications into Canada.



0978230001F PC ASSEMBLY TONE OSCILLATOR

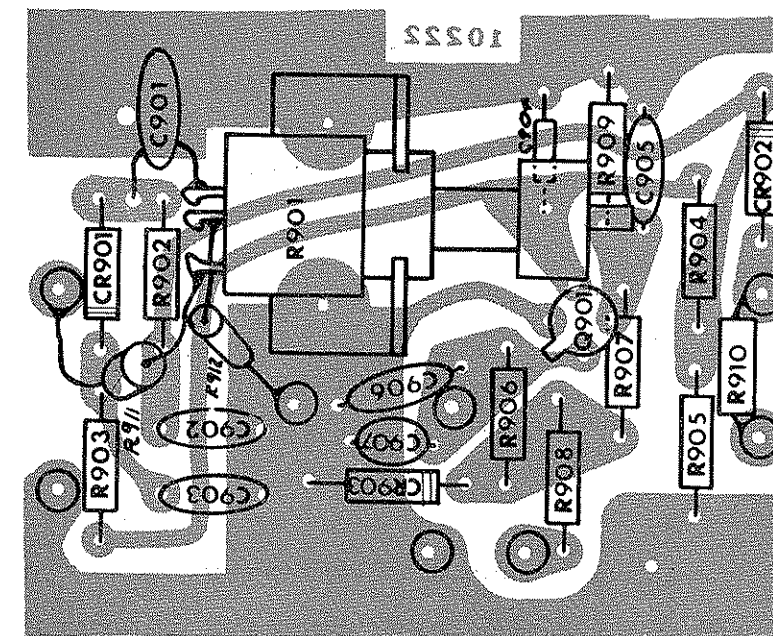
REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSEMBLY TONE OSCILLATOR	0978230001
C1-		
C1600	Not used	
C1601	Capacitor, 6.8 UF, 20 V, T368	
C1602	Capacitor, 0.01 UF, 200 V, Mylar	0271870001
C1603	Capacitor, 0.01 UF, 200 V, Mylar	0271870001
C1604	Capacitor, 0.01 UF, 200 V, Mylar	0271870001
C1605	Capacitor, 2.2 UF, 15 V, T368	0296420000
CR1-		
CR1600	Not used	
CR1601	Diode, Rectifier, 1N4004	0405180004
CR1602	Diode, Rectifier, 1N4004	0405180004
Q1-		
Q1600	Not used	
Q1601	Transistor, NPN, Silicon MPS2925	0444340009
Q1602	Transistor, NPN, Silicon MPS2925	0444340009
R1-		
R1600	Not used	
R1601	Pot, 100, 5% 0.6 W, 15 Turns	031889003
R1601	Resistor, 6.8K, 5%, 1/4 W	0174810008
R1602	Not used	
R1603	Resistor, 330K, 10%, 1/4 W	0174670001
R1604	Resistor, 6.8K, 5%, 1/4 W	0174810008
R1605	Resistor, 8.2K, 10%, 1/4 W	0181620006
R1606	Resistor, 6.8K, 5%, 1/4 W	0174810008
R1607	Resistor, 560, 5%, 1/4 W	0183200004
R1608	Resistor, 47, 10%, 1/4 W	0179360001
	Switch, Push Button, DPDT	0345750004



Notes:

1. All resistors in ohms 1/4 W carbon plus or minus 10% unless noted.
2. All capacitors in uf unless noted.
3. R 1605 is selected value. Value shown is nominal.

Figure 7.3. 1000 Hz Tone Oscillator

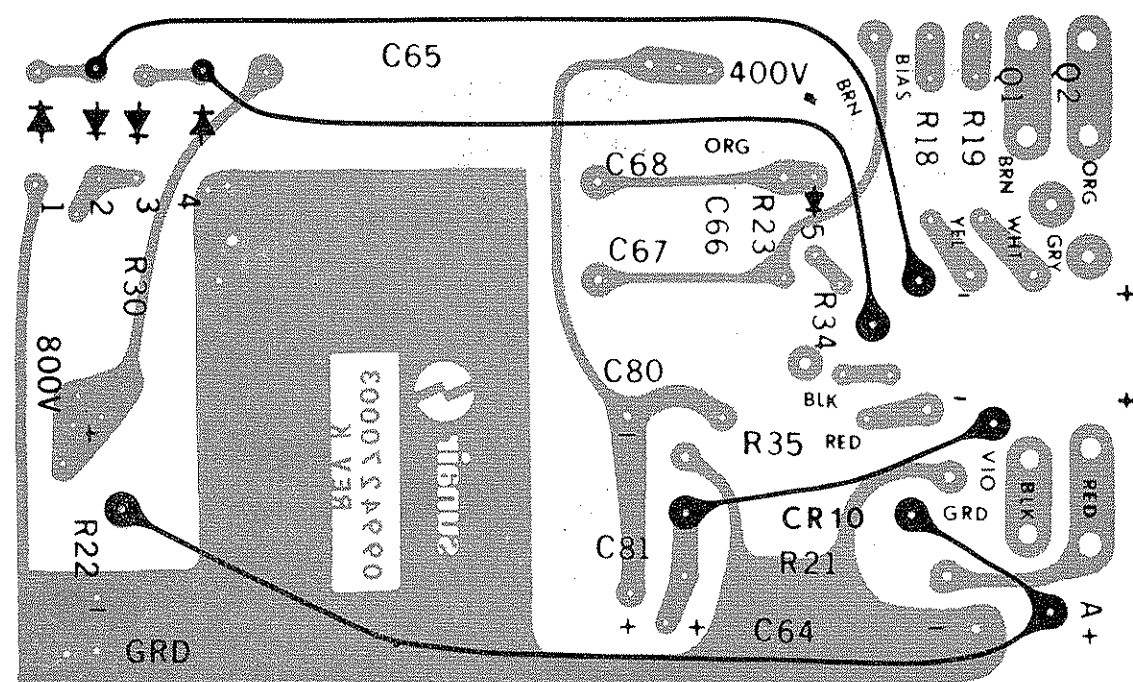


0997230002G PC ASSY ALC, Z900 PA-1010A

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1-	PC ASSEMBLY ALC, Z900 PA-1010A	0997230002
C900	Not used	
C901	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C902	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C903	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C904	Capacitor, 0.001 UF, 100 V, X5E, 10%	0282080007
C905	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C906	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C907	Capacitor, 6.8 UF, 20 V, T368	0296780006
CR1-		
CR900	Not used	
CR901	Diode, Signal, Silicon 1N4454	0405270003
CR902	Diode, Signal, Silicon 1N914	044290007
CR903	Diode, Zener 1N9628	0404640001
Q1-		
Q900	Not used	
Q901	Transistor, N-CH, FET 3N128	0444840001
R1-		
R900	Not used	
R901	Pot, 2.5K, 10% 1/2W, 1/8 Shaft	1001250036
R902	Resistor, 10K, 10%, 1/4 W	0170410005
R903	Resistor, 27K, 10%, 1/4 W	0171200004
R904	Resistor, 10K, 10%, 1/4 W	0170410005
R905	Resistor, 10K, 10%, 1/4 W	0170410005
R906	Resistor, 10K, 10%, 1/4 W	0170410005
R907	Resistor, 10K, 10%, 1/4 W	0170410005
R908	Resistor, 390, 10%, 1/4 W	0178330001
R909	Resistor 2.2K, 5%, 1/4 W	0178070009
R910	Select Value	
R911	Resistor, 6.8K, 10%, 1/2 W	0162290004
R912	Resistor, 820, 10%, 1/4 W	0178210005

Figure 7.4. PCB ALC Amplifier Z900

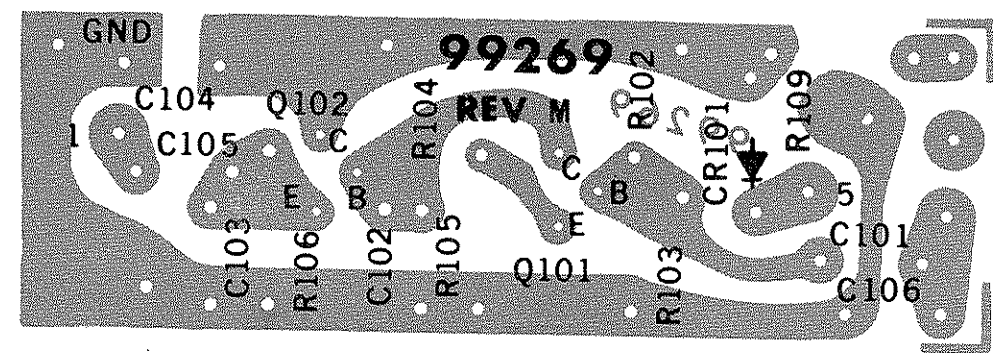
SUNAIR ASB-100A



0999850008D PC ASSEMBLY POWER SUPPLY PA-1010A

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSY POWER SUPPLY PA-1010A	0999850008
C1-		
C63	Not used	
C64	Capacitor, 100 UF, 30 V, 40CF117	0245870008
C65	Capacitor, 4 UF, 500 V, Mylar	0244840008
C66	Capacitor, 4 UF, 500 V, Mylar	0244840008
C67	Capacitor, 3 UF, 200 V, Mylar	0278520006
C68	Capacitor, 3 UF, 200 V, Mylar	0278520006
C69-		
C79	Not used	
C80	Capacitor, 4 UF, 500 V, Mylar	0244840008
C81	Capacitor, 4 UF, 500 V, Mylar	0244840008
CR1	Diode, Rectifier, SOM	0403350000
CR2	Diode, Rectifier, SOM	0403350000
CR3	Diode, Rectifier, SOM	0403350000
CR4	Diode, Rectifier, SOM	0403350000
CR5	Diode, Rectifier, 1N4004	0405180004
CR6	Not used	
CR7	Not used	
CR8	Not used	
CR9	Not used	
CR10	Diode, Rectifier 1N5400	0403970008
R1-		
R17	Not used	
R18	Resistor, 7.5, 5%, 3 W	0178950009
R19	Resistor, 7.5, 5%, 3 W	0178950009
R20	Not used	
R21	Resistor, 300, 5%, 5 W	0161140009
R22	Resistor, 470K, 10%, 2 W	0185260004
R23	Resistor, 8.2K, 5%, 1/2 W	0189540001
R24-		
R29	Not used	
R30	Resistor, 22, 10%, 2 W	0169940004
R31	Not used	
R32	Not used	
R33	Not used	
R34	Resistor, 10, 10%, 1/2 W	0185380000
R35	Resistor, 150, 10%, 1 W	0187840008
T1	Transformer, DC Inverter	0489230008

Figure 7.5. PCB Power Supply

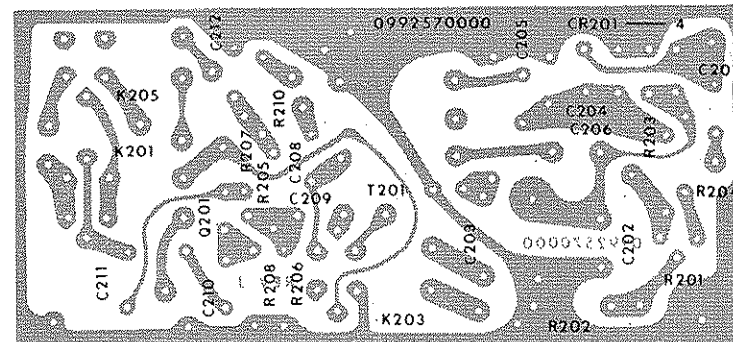


0999490001E PC ASSY MIKE AMPLIFIER Z100 RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1-	PC ASSY MIKE AMPLIFIER Z100 RE-1000	0999490001
C100	Not used	
C101	Capacitor, .47 UF, 35 V, T368	0279170009
C102	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C103	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C104	Capacitor, 22 UF, 15 V, T368	0296660001
C105	Capacitor, 2.2 UF, 35 V, T368	0273950002
C106	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
CR1-		
CR100	Not used	
CR101	Diode, Rectifier 1N4004	0405180004
Q1-		
Q100	Not used	
Q101	Transistor, NPN, Silicon MPS2925	0444340009
Q102	Transistor, NPN, Silicon 2N3646	0442520000
R1-		
R101	Not used	
R102	Resistor, 8.2K, 10%, 1/4 W	0181620006
R103	Resistor, 1.2K, 10%, 1/4 W	0181860007
R104	Resistor, 3.3K, 10%, 1/4 W	0170890007
R105	Resistor, 820, 10%, 1/4 W	0178210005
R106	Resistor, 2.7K, 10%, 1/4 W	0186670001
R107	Not used	
R108	Not used	
R109	Resistor, 330, 5%, 1/4 W	0170910008

Figure 7.6. PCB Mike Amplifier Z100

SUNAIR ASB-100A



0999450000G PC ASSY BALANCE MODULATOR Z200 RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSY BALANCE MOD. Z200 RE-1000	0999450000
C1-		
C200	Not used	
C201	Capacitor, 2.2 UF, 35 V, T368	0273950002
C202	Capacitor, 91 PF, 500 V, DM10, 5%	0284420000
C203	Capacitor, 5-25 PF, 350 V, NPO	0261690001
C204	Capacitor, 100 PF, 500 V, NPO	0276700007
C205	Capacitor, 0.005 UF, 100 V, 75 V	0273330004
C206	Capacitor, 0.005 UF, 100 V, 75 V	0273330004
C207	Not used	
C208	Capacitor, 220 PF, 1000 V, X5E, 10%	0250860007
C209	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C210	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
C211	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C212	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C213	Capacitor, 2.2 UF, 35 V, T368	0273950002
C214	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
CR1-		
CR200	Not used	
CR201	Diode, Hot Carrier	0405280009
CR202	Diode, Hot Carrier	0405280009
CR203	Diode, Hot Carrier	0405280009
CR204	Diode, Hot Carrier	0405280009
K1-		
K200	Not used	
K201	Relay, DPDT, 14 V, General	0663030005
K202	Not used	
K203	Relay, DPDT, 14 V, General	0663030005
K204	Not used	
K205	Relay, DPDT, 14 V, General	0663030005
Q1-		
Q200	Not used	
Q201	Transistor, NPN, Silicon 2N3646	0442520000
R1-		
R200	Not used	
R201	Pot, 100, 5% 0.6 W, 15 Turns	0318890003
R202	Resistor, 820, 10%, 1/4 W	0178210005
R203	Resistor, 390, 10%, 1/4 W	0178330001
R204	Resistor, 390, 10%, 1/4 W	0178330001
R205	Resistor, 15K, 10%, 1/4 W	0172350000
R206	Resistor, 18K, 10%, 1/4 W	0175720002
R207	Resistor, 1K, 10%, 1/4 W	0171560001
R208	Resistor, 2.2K 5%, 1/4 W	0178070009
R209	Resistor, 470, 10%, 1/4 W	0172610001
R210	Resistor, 150, 10%, 1/4 W	0172730007
R211	Resistor, 15K, 10%, 1/4 W	0172350000
R212	Resistor, 1.8K, 5%, 1/2 W	0184970008
T1-		
T200	Not used	
T201	Transformer, Balance Modulator	0489090001

Rw H ECN-2405
Change 470 to 0184110009
Rev I ECN 054-121

Figure 7.7. PCB Balanced Modulator Z200

SUNAIR ASB-100A

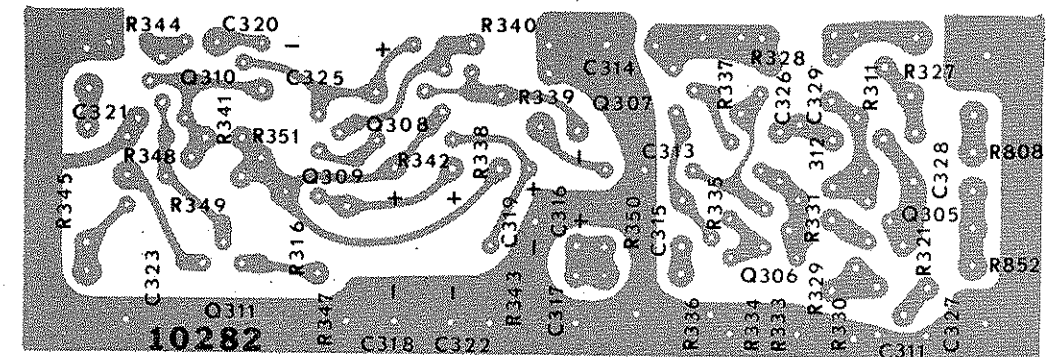
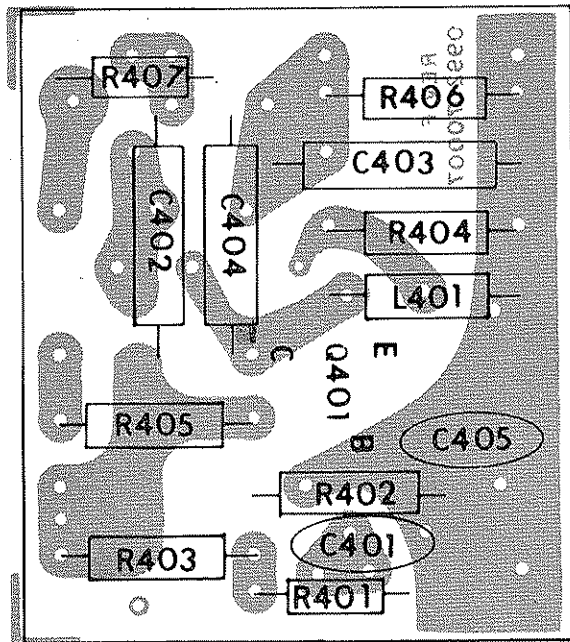


Figure 7.8. PCB Exciter Audio Z300B

Rev D ECU - 2405
Change 470 to 0184110009

Rev E ECU - 2334
chg C315, C397 to 0273577778

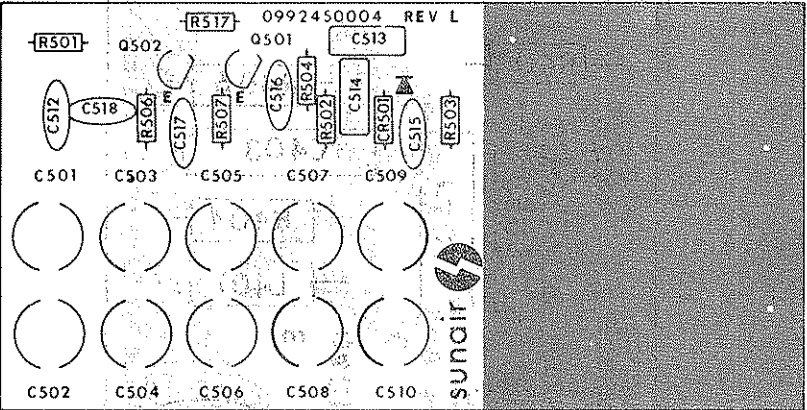


0999500007C PC ASSY WIDEBAND AMP Z400 RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSY WIDEBAND AMP, Z400 RE-1000	0999500007
C1-		
C400	Not used	
C401	Capacitor, 470 PF, 500 V, DM15, 5%	0293930007
C402	Capacitor, 0.068 UF, 100 V, Mylar	0272040002
C403	Capacitor, 0.068 UF, 100 V, Mylar	0272040002
C404	Capacitor, 0.068 UF, 100 V, Mylar	0272040002
C405	Capacitor, 0.05 UF, 25 V, Y5U	0273570005
L1-		
L400	Not used	
L401	Inductor, Molded, 33 UH, 5%	0646300008
Q1-		
Q400	Not used	
Q401	Transistor, NPN, Silicon 2N3866	0448140004
R1-		
R400	Not used	
R401	Resistor, 270, 10%, 1/4 W	0178450006
R402	Resistor, 1K, 10%, 1/2 W	0167480006
R403	Resistor, 1.5K, 10%, 1/2 W	0177300001
R404	Resistor, 100, 10%, 1/2 W	0174790007
R405	Resistor, 100, 10%, 1/2 W	0174790007
R406	Resistor, 120, 10%, 1/2 W	0186430001
R407	Resistor, 330, 5%, 1/4 W	0170910008

Figure 7.9. Wideband Amplifier Z400

SUNAIR ASB-100A

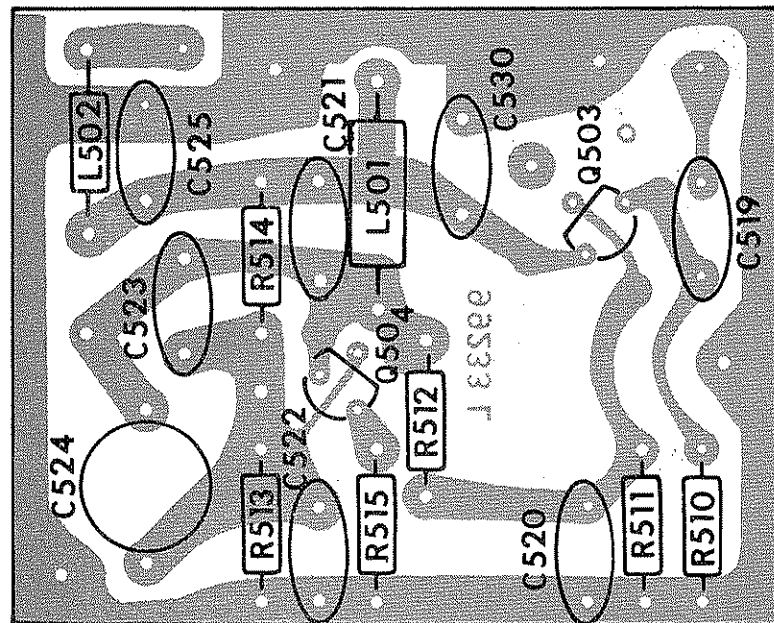


0999430009E PC ASSY RECEIVER OSC, Z500 RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1-	PC ASSY RECEIVER OSC, Z500 RE-1000	0999430009
C500	Not used	
C501	Capacitor, 2-8 PF, 200 V, NPO	0278400001
C502	Capacitor, 2-8 PF, 200 V, NPO	0278400001
C503	Capacitor, 2-8 PF, 200 V, NPO	0278400001
C504	Capacitor, 2-8 PF, 200 V, NPO	0278400001
C505	Capacitor, 2-8 PF, 200 V, NPO	0278400001
C506	Capacitor, 2-8 PF, 200 V, NPO	0278400001
C507	Capacitor, 2-8 PF, 200 V, NPO	0278400001
C508	Capacitor, 2-8 PF, 200 V, NPO	0278400001
C509	Capacitor, 2-8 PF, 200 V, NPO	0278400001
C510	Capacitor, 2-8 PF, 200 V, NPO	0278400001
C511	Not used	
C512	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C513	Capacitor, 100 PF, 500 V, DM10, 5%	0274740001
C514	Capacitor, 15 PF, 500 V, DM10, 5%	0289950009
C515	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C516	Capacitor, 22 PF, 1000 V, N750	0280500001
C517	Capacitor, 36 PF, 1000 V, N220	0284780006
C518	Capacitor, 500 PF, 1000 V, Z5F, 10%	0250980002
CR1-	Not used	
CR500	Not used	
CR501	Diode, Varicap 1N4790	0275530001
Q1-	Not used	
Q500	Not used	
Q501	Transistor, NPN, Silicon 2N3563	0443290008
Q502	Transistor, NPN, Silicon 2N3646	0442520000
R1-	Not used	
R500	Not used	
R501	Resistor, 470, 10%, 1/4 W	0172610001
R502	Resistor, 150K, 10%, 1/4 W	0176750002
R503	Resistor, 82K, 10%, 1/4 W	0171680006
R504	Resistor, 150K, 10%, 1/4 W	0176750002
R505	Resistor, 12K, 10%, 1/4 W	0183180003
R506	Resistor, 470, 10%, 1/4 W	0172610001
R507-	Not used	
R516	Not used	
R517	Resistor, 100, 5%, 1/4 W	0171180003

REV F ECN-2405
Change 470's to 0184110009
REV G ECN 054-117
Change CR501 to MV2104
0405330006

Figure 7.10. PCB Receiver Oscillator Z500



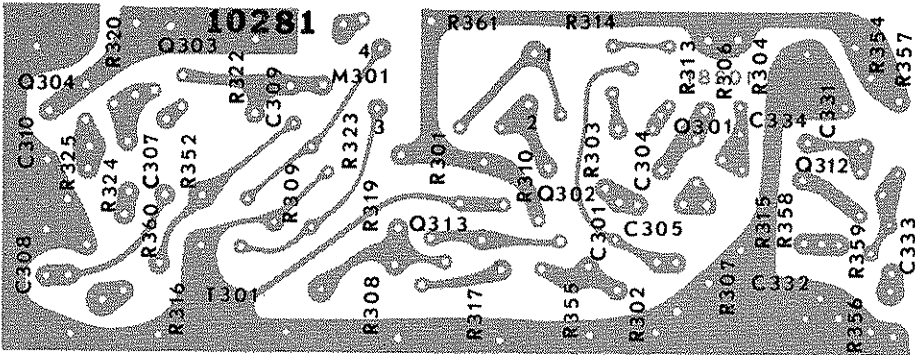
0999440004A PC ASSY CARRIER OSC, Z500A RE-1000

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1-	PC ASSY CARRIER OSC Z500A RE-1000	0999440004
C518	Not used	
C519	Capacitor, 500 PF, 1000 V, Z5F, 10%	0250980002
C520	Capacitor, 20 PF, 1000 V, NPO	0256600007
C521	Capacitor, 20 PF, 1000 V, NPO	0256600007
C522	Capacitor, 200 PF, 1000 V, X5E, 10%	0250860007
C523	Capacitor, 4.7 PF, 1000 V, NPO	0262360004
C524	Capacitor, 2-8 PF, 200 V, NPO	0278400001
C525	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
C526	Not used	
C527	Not used	
C528	Capacitor, 0.02 UF, 100 V, Z5V	0273450000
L1-		
L500	Not used	
L501	Inductor, Molded, 1000 UH, 5%	0643310002
L502	Inductor, Molded, 120 UH, 5%	0646660004
Q1-		
Q502	Not used	
Q503	Transistor, NPN, Silicon 2N3646	0442520000
Q504	Transistor, NPN, Silicon 2N3646	0442520000
R1-		
R509	Not used	
R510	Resistor, 470, 10%, 1/4 W	0172610001
R511	Resistor, 18K, 10%, 1/4 W	0175720002
R512	Resistor, 15K, 10%, 1/4 W	0172350000
R513	Resistor, 5.6K, 10%, 1/4 W	0183060008
R514	Resistor, 33K, 10%, 1/4 W	0177920009
R515	Resistor, 270, 10%, 1/4 W	0178450006
R516	Select Value	

Rev B ECA-2405
Change 470 to 0184110009

Figure 7.11. PCB Carrier Oscillator Z500A

SUNAIR ASB-100A



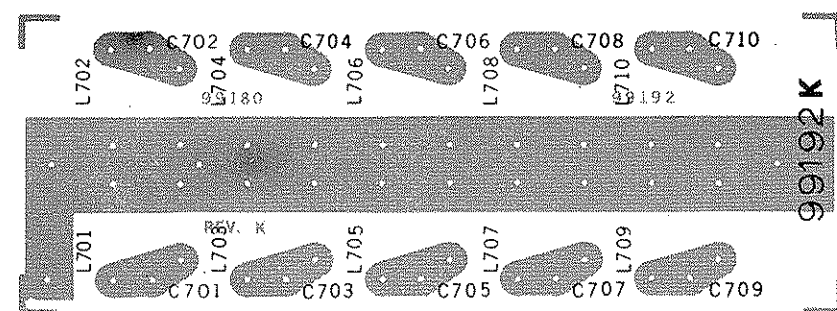
0999540025D PC ASSY EXCITER, Z300A ASB-100A

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1-	PC ASSY EXCITER, Z300A ASB-100A	0999540025
C300	Not used	
C301	Capacitor, 0.02 UF, 100 V Z5V	0273450000
C302	Not used	
C303	Not used	
C304	Capacitor, 500 PF, 1000 V, Z5F, 10%	0250980002
C305	Capacitor, 500 PF, 1000 V, Z5F, 10%	0250980002
C306	Not used	
C307	Capacitor, 0.005 UF, 100 V, Z5V	0273330004
C308	Capacitor, 0.02 UF, 100 V Z5V	0273450000
C309	Capacitor, 0.005 UF, 100 V, Z5V	0273330004
C310	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C311-		
C330	Not used	
C331	Capacitor, 0.02 UF, 100 V Z5V	0273450000
C332	Not used	
C333	Capacitor, 0.005 UF, 100 V, Z5V	0273330004
C334	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
M1-		
M300	Not used	
M301	Diode, Bridge	0403230004
Q1-		
Q300	Not used	
Q301	Transistor, NPN, Silicon 2N3563	0443290008
Q302	Transistor, NPN, Silicon 2N3646	0442520000
Q303	Transistor, NPN, Silicon 2N3563	0443290008
Q304	Transistor, NPN, Silicon 2N3563	0443290008
Q305-		
Q311	Not used	
Q312	Transistor, NPN, Silicon 2N3646	0442520000
Q313	Transistor, NPN, Silicon 2N3646	0442520000
R1-		
R300	Not used	
R301	Resistor, 820, 10%, 1/4 W	0178210005
R302	Resistor, 2.2K, 5%, 1/4 W	0178070009

0999540025D PC ASSY EXCITER, Z300A ASB-100A

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
R303	Resistor, 220, 10%, 1/4 W	0171320000
R304	Resistor, 4.7K, 5%, 1/4 W	0170770001
R305	Resistor, 2.2K, 5%, 1/4 W	0178070009
R306	Resistor, 270, 10%, 1/4 W	0178450006
R307	Resistor, 270, 10%, 1/4 W	0178450006
R308	Resistor, 680, 10%, 1/4 W	0176630007
R309	Resistor, 220, 10%, 1/4 W	0171320000
R310	Resistor, 180, 10%, 1/4 W	0175220000
R311	Not used	
R312	Not used	
R313	Resistor, 220, 10%, 1/4 W	0171320000
R314	Pot, 100, 5%, 1 W PC Mount	0335760007
R315	Not used	
R316	Resistor, 470, 10%, 1/4 W	0172610001
R317	Resistor, 120, 10%, 1/4 W	0186560006
R318	Resistor, 39, 10%, 1/4 W	0182890007
R319	Resistor, 4.7K, 5%, 1/4 W	0170770001
R320	Resistor, 10K, 10%, 1/4 W	0170410005
R321	Not used	
R322	Resistor, 10K, 10%, 1/4 W	0170410005
R323	Resistor, 3.3K, 10%, 1/4 W	0170890007
R324	Resistor, 3.3K, 10%, 1/4 W	0170890007
R325	Resistor, 3.9K, 10%, 1/4 W	0178830003
R326-		
R351	Not used	
R352	Resistor, 68, 10%, 1/4 W	0187960003
R353	Not used	
R354	Resistor, 220, 10%, 1/4 W	0171320000
R355	Resistor, 1K, 10%, 1/4 W	0171560001
R356	Resistor, 2.2K, 5%, 1/4 W	0178070009
R357	Resistor, 4.7K, 5%, 1/4 W	0170770001
R358	Resistor, 10, 5%, 1/4 W	0177160004
R359	Resistor, 270, 10%, 1/4 W	0178450006
R360	Resistor, 100, 5%, 1/4 W	0171180003
R361	Resistor, 180, 10%, 1/4 W	0175220000

Figure 7.12. PCB Exciter Z300A

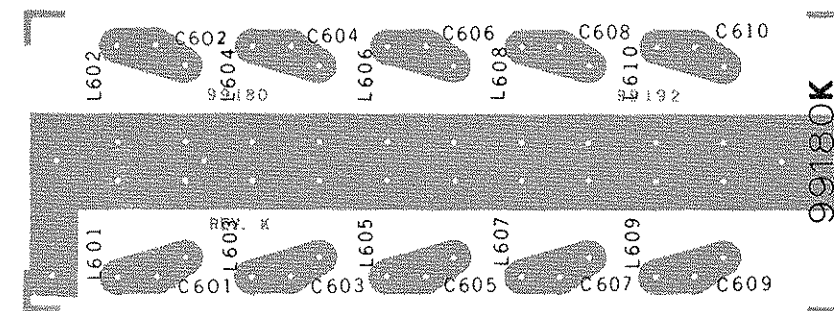


0999480006A PC ASSY TRIMMER Z700 RE-1000		
REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSY TRIMMER Z700 RE-1000 Capacitor, 10-40 PF, 250 V N750	0999480006 0263150003

Figure 7.13. PCB Exciter Tune Circuit Z700

NOTE

Inductors are customized components.



0999470001A PC ASSY TRIMMER Z600 RE-1000

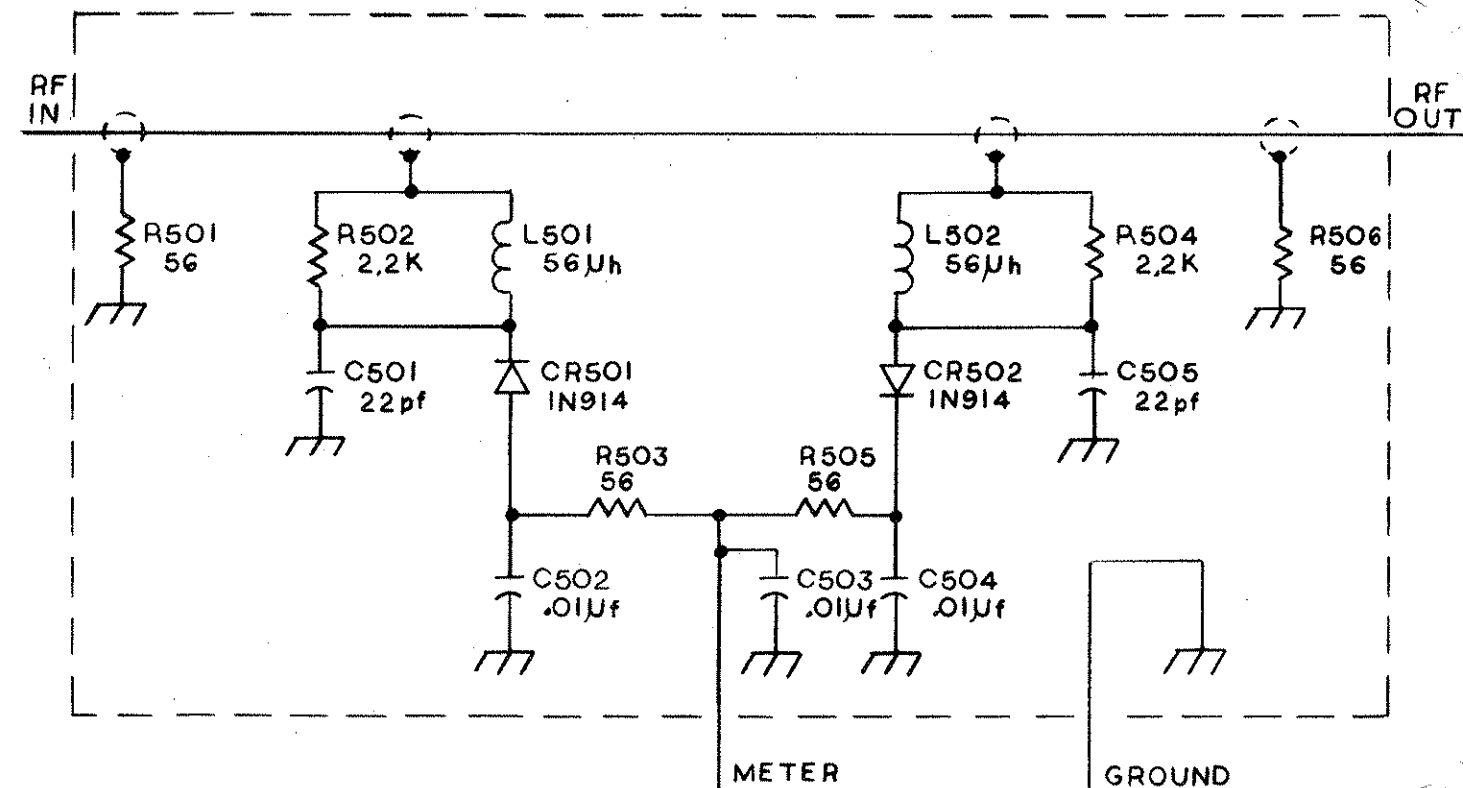
REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
	PC ASSY TRIMMER Z600 RE-1000 Capacitor, 10-40 PF, 250 V N750	0999470001 0263150003

Figure 7.14. PCB Receive Tune Circuit Z600

NOTE

Inductors are customized components.

09886300



0988630001C R.F. INVERTER ASSEMBLY

REF SYMBOL	DESCRIPTION	SUNAIR PART NO.
C1-	R.F. INVERTER ASSEMBLY	0988630001
C500	Not used	
C501	Capacitor, 22 PF, 500 V, DM10, 5%	0260540005
C502	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C503	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C504	Capacitor, 0.01 UF, 100 V, Z5V	0273210009
C505	Capacitor, 22 PF, 500 V, DM10, 5%	0260540005
CR1-	Not used	
CR500	Not used	
CR501	Diode, Signal, Si, 1N914	0442900007
CR502	Diode, Signal, Si, 1N914	0442900007
L1-	Not used	
L500	Not used	
L501	Inductor, Molded, 56 UH, 10%	0639110002
L502	Inductor, Molded, 56 UH, 10%	0639110002
R1-	Not used	
R500	Not used	
R501	Resistor, 56, 10% 1/4 W	0174290004
R502	Resistor, 2.2K, 5%, 1/4 W	0178070009
R503	Resistor, 56, 10%, 1/4 W	0174290004
R504	Resistor, 2.2K, 5%, 1/4 W	0178070009
R505	Resistor, 56, 10%, 1/4 W	0174290004
R506	Resistor, 56, 10%, 1/4 W	0174290004
	Can & Lug, RF Inverter Assy	0488940001
	Shield, RF Inverter	0154570001
	Tubing, No. 24 Red DNP	0594650003
	Tubing, Shrink, Blk .187ID DNP	0600860001
	Wire Kit, RF Inverter Assy.	0988630010

Figure 7.16. RF Inverter Assembly Z1001

SUNAIR ASB-100A

Quantity Required for supporting indicated numbers of units per year				MODEL ASB-100A	Voltage
1	5	10	25	SunAir P/N	Description
1	3	6	10	0443290008	Transistor
1	2	3	4	0443310009	Transistor
1	2	3	4	0448140004	Transistor
—	1	2	2	0489090001	Transformer
—	1	2	2	0996930001	Transformer
—	1	2	3	0489230008	Transformer
—	1	2	2	0489350003	Transformer
2	4	6	8	0663030005	Relay
—	—	—	1	0747140006	Connector
—	—	—	1	0747380007	Connector
2	6	8	12	0766690008	Tube
1	2	3	4	0766830004	Tube
—	1	1	2	0817170006	Crystal, Carrier
—	—	1	1	0817290001	Filter
—	—	1	1	0817310002	Filter
5	10	10	15	0848980000	Fuse (28 V only)
1	2	3	4	0849030005	Fuseholder
—	—	1	2	0870100017	Meter
—	—	1	2	0988630001	Inverter
1	2	3	4	0662860004	Relay
1	2	3	4	0660160005	Relay
2	4	6	8	0263150003	Capacitor, Variable
1	2	4	6	0273690001	Capacitor, Variable
1	2	3	4	0274360004	Capacitor
1	2	4	6	0275530001	Diode
2	4	6	8	0278400001	Capacitor, Variable
1	2	3	4	0244840008	Capacitor
1	2	4	6	0334730007	Switch
—	—	1	1	0336050003	Motor, Channeling
—	—	1	1	0336170009	Motor, Channeling
—	—	1	2	0336430001	Resistor, Dual Var.
4	4	8	16	0403350000	Diode
1	2	4	8	0401410005	Diode
1	3	6	10	0405180004	Diode
1	2	3	4	0405340001	Diode
1	2	3	4	0405280009	Diode
1	2	3	4	0441730001	Transistor
4	10	15	20	0442520000	Transistor
1	2	4	6	0444340009	Transistor
1	5	10	15	0442900007	Diode
1	2	3	4	0443050007	Diode
2	4	6	10	0445250003	Transistor

Table 7.1. Recommended Spare Parts List

EQUIPMENT SPECIFICATION

FOR

ASB-100 (A) SINGLE
SIDE BAND AIRBORNE
TRANSCEIVER

APPROVED BY

PROJECT ENGINEER

E. J. G. S.

DATE

3/19/74

CHIEF ENGINEER


R. O. C.

DATE

3/19/74

								PREP. BY		
								TYPED BY	<i>bjb</i>	
								PROJ. ENG		
								CHECKER		
ISS.	DATE	CH. ORDER NO.	CHK.	ISS.	DATE	CH. ORDER NO.	CHK.		NAME	DATE

ENGINEERING SPECIFICATIONS

 SUNAir ELECTRONICS FORT LAUDERDALE FLORIDA	TITLE EQUIPMENT SPECIFICATION ASB-100 (A)	SPEC. NO. 2010-0000	ISSUE
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SCOPE

This specification covers the SUNAIR type ASB-100(A) single sideband high frequency airborne transceiver. This equipment is intended for use in single and multi-engine fixed wing and rotary wing type aircraft to provide a long range communications capability.

PUBLICATIONS AND DOCUMENTS

ASB-100(A) Family Tree Assembly	2010-0001
ASB-100(A) Production Test & Alignment	30019
FAA TSO Test Report	30002
Declaration of Design and Performance	30000
Quality Control Final Test Procedure	30001
Operating and Maintenance Manual	99398
Installation Manual	99403
FCC Test Report	

LICENSING

The ASB-100(A) transceiver has been licensed and or accepted by the following authorities to the listed categories or restrictions:

- 1- U.S. Federal Communications Commission, Parts 83, 85, 87
- 2- U.S. Federal Aviation Administration TSO-C31b and C32b
Category: CAAAAAX
- 3- Britain, Air Registration Board, Ref. VC.214
- 4- New Zealand, Dept. of Civil Aviation
- 5- West Germany, Office of Civil Aeronautics
- 6- France, S.T.N.A. Category II
- 7- Canada, Dept. of Transport


GENERAL CHARACTERISTICS

The ASB-100(A) transceiver system is composed of three units: a panel mounted control head, a remote mounted receiver/exciter and a remote mounted power amplifier/power supply. It is capable of operation on 10 preset crystal controlled channels in the frequency range of 2.0 to 18.0 MHz with a transmit power output of 100 watts PEP. It is compatible with antenna couplers CU-110, CU-1000 and SAC-69.

SPECIFICATIONS

Frequency Range	2.0-18.0 MHz
Number of Channels	10, 2 Frequency Simplex
Channel Frequency Spacing	No Restriction
Channeling Time	2 seconds maximum
Operating Modes	A3A, A3H, A3J USB, (LSB-optional)
Input Power: Receiver	3

ENGINEERING SPECIFICATIONS

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Input Power: Receive

Transmit

Power Output

Output Impedance

Frequency Stability, Tx

Sidetone

Frequency Stability, Rec

Clarifier

Selectivity:

Sensitivity:

Gain:

AGC:

Audio Output:

Audio Response:

Audio Distortion:

Spurious Response:

Environmental

Environmental

Temperature

Altitude

Humidity

Shock

Vibration

Size and Weight

Control Head (SCU-10)

Control Head (MCU-30) Optional

Power Amplifier (PA1010A)

Receiver Exciter (RE1000)

3 amps at 14VDC

2.5 amps at 28VDC

14 amps at 14VDC

9 amps at 28VDC

A3H 25 watts carrier

A3J, A3A 100 watts PEP

50 ohms

±20 Hz

Adjustable 100mw max

0.0025%

Provided for Rec tone control

AM: 6.0 kHz 6db down

20 kHz 20db down

SSB: 2.0 kHz 6db down

6.5 kHz 60db down

AM: 2uv for 6db S+N/N

SSB: 0.7uv for 10db S+N/N

10uv for 100 mw out

Not more than 10db variation

in output from 10 to 500,000uv
input

100mw into 500 ohms

Output will not vary more than
3db from 350 to 3000 Hz (AM)

AM: Not more than 20% at

100 mw

SSB: Not more than 10% at 100mw

60db down from channel frequency

at ±10 kHz AM and ±6.5 kHz SSB

-40°C to +55°C

30,000 feet

95% RH at +55°C for 48 hr.

15G, all planes

0.030" excursion 10-55 Hz

5G 55-500 Hz

2 3/8" x 5 3/4" x 2 3/16" LWH

1 lb.

4 1/8" x 2 7/16" x 2 7/8" LWH

3/4 lb.

10 5/32" x 4 7/8" x 7 9/16" LWH

7 3/4 lb.

13 1/2" x 3 19/32" x 7 5/16" LWH

7 1/8 lb.

ENGINEERING SPECIFICATIONS

SUNAir

ELECTRONICS

FORT LAUDERDALE FLORIDA

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Shock Mount Rack (RE)	1 lb.
Shock Mount Rack (PA)	1 lb.

EQUIPMENT SUPPLIED

	<u>Part No.</u>
1 RE-1000 Receiver/Exciter, 14 volt, with dust cover	99911
<u>OR</u>	
1 RE-1000 Receiver/Exciter, 28 volt, with dust cover	99912
1 PA-1010A Power Amplifier/Power Supply, 14 volt, with dust cover	99913
<u>OR</u>	
1 PA-1010A Power Amplifier/Power Supply, 28 volt, with dust cover	99914
1 SCU-10 Control Unit, 14 volt, with red lights	99894
<u>OR</u>	
1 SCU-10 Control Unit, 14 volt, with blue/white lights (standard)	99895
<u>OR</u>	
1 SCU-10 Control Unit, 28 volt, with red lights	99896
<u>OR</u>	
1 SCU-10 Control Unit, 28 volt, with blue/white lights (standard)	99897
<u>OR</u>	
1 MCU-30 28V Blue/White lights	99677
<u>OR</u>	
1 MCU-30 28V Red lights	99675
<u>OR</u>	
1 MCU-30 14V Blue/white lights	99676
<u>OR</u>	
1 MCU-30 14V Red lights	99674
1 Shockmount for PA-1010A	99916
1 Shockmount for RE-1000	99915
1 Plug, Cannon SK-C16-21C-1/2, mates J4 on PA-1010A	74726
2 Plug with hood and lock assembly, Win- chester MRA-34SG7H8VL, mates J101 on RE-1000 and J201 on SCU-10	74740

OPTIONAL

ENGINEERING SPECIFICATIONS

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1 Plug, PL-259 with adapter, mates J2 on PA-1010A	90873
2 Plug, UG-88/U, mates J3 on PA-1010A and J102 on RE-1000	74403
2 Plug, UG-536B/U, mates J1 on PA-1010A and J103 on RE-1000	74702


OPTIONAL EQUIPMENT

Installation Cables	Customized
Radio Test Set less Cables	99917
Cable, Radio Test Set less	99918
LSB Filter	81743

CUSTOMER ORDER INFORMATION REQUIRED

Channel Frequencies (Tx and Rec if different)
Aircraft Voltage
Control Head lamps blue white standard (Specify Red if desired)
Installation Cable lengths if ordered - specify;
Control head to RE, RE to PA, PA to Coupler, Control head to coupler.
LSB Filter if required.

ENGINEERING SPECIFICATIONS

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