B2

TECHNICAL MANUAL

SERVICE WITH CIRCUIT DIAGRAMS AND IPB

RADIO SET AN/PRC-66B

(COLLINS RADIO COMPANY OF CANADA LTD.)

F19628-69-C-0036

PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

Air Force OC, 25 Aug 72-800

15 SEPTEMBER 1969

CHANGE 4 - 15 AUGUST 1972

LIST OF EFFECTIVE PAGES

Insert latest changed pages; dispose of superseded pages in accordance with applicable regulations.

NOTE: On a changed page, the portion of the text affected by the latest change is indicated by a vertical line, or other change symbol, in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Total number of pages in this manual is 329 consisting of the following:

Page No.	# Change No.	Page No.	# Change No.	Page No.	# Change No.
Title	4	5-7	2	6-16 - 6-23	3
A	4	5-8	3	6-24 - 6-25	0
i - ii	3	5-9	2	6-26 - 6-30	3
iii - vi	0	5-10	1	6-30A.	3
vii	1	5-10A.	3	6-30B Blank	3
viii Blank	0	5-10B.	1	6-31 - 6-32	3
1-0 - 1-1	0	5-10C - 5-10D	3	6-33	0
1-2	3	5-11 - 5-12	0	6-34 - 6-35	3
1-3	0	5-13	1	6-36	0
1-4 - 1-5	3	5-14	3	6-37 - 6-48	3
1-6	4	5-15	1	6-49	0
1-7 - 1-10	1	5-16	0	6-50	3
2-1 - 2-4	0	5-17	2	6-51 - 6-80	1
3-1	0	5-18 - 5-19	1	6-81 - 6-82	3
3-2	3	5-20	4	6-82A	3
3-3 - 3-6	0	5-21 - 5-26	1	6-82B Blank	3
3-7	4	5-27 - 5-40	0	6-83 - 6-90	3
3-8	0	5-41	3	6-90A	3
4-1	0	5-42 - 5-44	0	6-90B Blank	3
4-2 - 4-4	3	5-45	3	6-91	3
4-5	0	5-46	0	6-92 Blank	3
4-6	3	5-47 - 5-72	1	Index 1 - Index 2	3
4-6A	3	5-73 - 5-74	0	Index 3 - Index 4	1
4-6B Blank	3	5-75 - 5-76	1	Index 5	3
4-7 - 4-12	0	5-77	0	Index 6	1
4-13	3	5-78 - 5-79	1	Index 7	3
4-14 - 4-24	0	5-80	0	Index 8 Blank	3
4-25 - 4-27	3	5-81 - 5-87	1	FO-1 - FO-3	3
4-28 - 4-29	0	5-88 - 5-90	0	FO-4	0
4-30 - 4-32	3	5-91 - 5-94	1	FO-5 (Sheet 1)	3
4-33	0	5-95	0	FO-5 (Sheet 2)	0
4-34 - 4-35	3	5-96 - 5-97	1	FO-6	0
4-36 - 4-39	0	5-98 - 5-99	0	FO-7 - FO-10	3
4-40 - 4-43	1	5-100 Blank	0	FO-11 - FO-12	1
4-44	3	6-1	0	FO-13 (Sheet 1)	1
4-45 - 4-54	1	6-2 - 6-4	3	FO-13 (Sheet 2)	0
5-1	0	6-4A - 6-4B	3	FO-14 - FO-16	1
5-2	1	6-5 - 6-7	0	FO-17 - FO-27	1
5-3	3	6-8	1		
5-4 - 5-5	1	6-9 - 6-12	0		
5-6	0	6-13	4		
		6-14 - 6-15	2		

Zero in this column indicates an original page.

TABLE OF CONTENTS

TABLE OF CONTENTS (cont)

CROSS-REFERENCE INDEX

OFFICIAL NOMENCLATURE AND COMMON NAME	CHAPTER 2	CHAPTER 3	CHAPTER 4	CHAPTER 5		
	INSTALLATION	OPERATION	PRINCIPLES OF OPERATION	FIELD MAINTENANCE	ALIGNMENT	SPECIAL MAINTENANCE
Antenna ANTENNA AS-2117/PRC-66	2,4,15 F1,F2	3,5	2,3	2,62 F8 T28		76,93
ANTENNA AS-2117/PRC-66 Antenna	2,4,15 F1,F2	3,5	2,3	2,62 F8 T28		76,93
BATTERY, DRY BA-3515A/PRC-66 Dry Battery	2,4,5,15 F1,F2	3	2	2		76
BATTERY, STORAGE BA-636A/PRC-66 Rechargeable Battery	2,4,15 F1,F2	3,13	2,3	2		76
BOX, BATTERY CY-6327A/PRC-66 Dry Battery Box	2,4,5,15 F1,F2	3	2	2		76
CABLE, SPECIAL PURPOSE CX-12157/PRC-66B Wideband Cable	2,4,15 F1,F2	11		2		76

CROSS-REFERENCE INDEX (cont)

OFFICIAL NOMENCLATURE AND COMMON NAME	CHAPTER 2 OPERATION	CHAPTER 3 OPERATION	CHAPTER 4 PRINCIPLES OF OPERATION	CHAPTER 5 FIELD MAINTENANCE	CHAPTER 5 ALIGNMENT	CHAPTER 5 SPECIAL MAINTENANCE
CASE, TRANSIT, RADIO SET CY-6766/PRC-66B Transit Case	1,14 F1,F2			2		
Dry Battery BATTERY, DRY BA-3515A/PRC-66	2,4,5,15 F1,F2	3	2	2		76
Dry Battery Box BOX, BATTERY CY-6327A/PRC-66	2,4,5,15 F1,F2	3	2	2		76
Handset HANDSET H-250/U	2,4,15 F1,F2	3,5	2,3,46	2		76
HANDSET H-250/U Handset	2,4,15 F1,F2	3,5	2,3,46	2		76
Harness HARNESS, RADIO SET ST-163/PRC-66B	2,7 F1,F2	3	2	2		76
HARNESS, RADIO SET ST-163/PRC-66B Harness	2,7 F1,F2	3	2	2		76

CROSS-REFERENCE INDEX (cont)

OFFICIAL NOMENCLATURE AND COMMON NAME	CHAPTER 2 INSTALLATION	CHAPTER 3 OPERATION	CHAPTER 4 PRINCIPLES OF OPERATION	CHAPTER 5 FIELD MAINTENANCE	CHAPTER 5 ALIGNMENT	CHAPTER 5 SPECIAL MAINTENANCE
RECEIVER-TRANSMITTER RT-865D/PRC-66 RT Unit	2,4,9 F1,F2	1,3,5,10, 11,12,16 F1 T1	1,2,3,6,20, 30,40,51 F1 thru F13, FO-1 thru FO-10 T1 thru T8	2,16,23,27,31, 37,44,50,52 F1 thru F8, FO-11,FO-12, FO-14 thru FO-16 T1 thru T28	64,68,73 F9 T29 thru T31	75,76,77,81,83, 85,87,89,92 F10 thru F12, FO-13 T32 thru T34
Rechargeable Battery BATTERY, STORAGE BA-636A/PRC-66	2,4,15 T1,T2	3,13	2	2		
RT Unit RECEIVER-TRANSMITTER RT-865D/PRC-66	2,4,9 T1,T2	1,3,5,10, 11,12,16 F1 T1	1,2,3,6,20, 30,40,51 F1 thru F13, FO-1 thru FO-10 T1 thru T8	2,16,23,27,31, 37,44,50,52 F1 thru F8, FO-11, FO-12, FO-14 thru FO-16 T1 thru T28	64,68,73 F9 T29 thru T31	75,76,77,81,83, 85,87,89,92 F10 thru F12, FO-13 T32 thru T34
Transit Case CASE, TRANSIT, RADIO SET CY-6766/PRC-66B	1,14 F1,F2			2		
Wideband Cable CABLE,SPECIAL PURPOSE CX-12157/PRC-66B	2,4,15 F1,F2	10		2		

INTRODUCTION

IDENTIFICATION OF EQUIPMENT.

The complete portable UHF transceiver equipment described in this manual is identified for USAF purposes as Radio Set AN/PRC-66B. This equipment is illustrated in the Frontispiece and itemized in Table 1-3.

PURPOSE AND USE OF EQUIPMENT.

The operational units of Radio Set AN/PRC-66B are designed for use in a severe tactical environment requiring flexible short range ground-to-air or ground-to-ground communication facilities. The operating frequency of the radio set can be quickly selected from a total of 3500 frequency channels by means of three frequency selector knobs and associated digital readout windows. When large numbers of the radio set are used, the allocation of frequency channels must be carefully planned to make full use of the communication flexibility and efficiency which is available.

SCOPE OF MANUAL.

The general contents (excluding illustrations and tables) of this technical manual are described under the following chapter headings.

CHAPTER 1. This chapter provides general information relating to the strategic use and organizational service logistics of the AN/PRC-66B equipment.

CHAPTER 2. This chapter provides preparation for use and shipment information.

CHAPTER 3. This chapter provides the operator with information essential to the efficient use of the equipment.

CHAPTER 4. The contents of this chapter describe the functional operation of the transceiver circuits. This information should be referred to during troubleshooting and corrective maintenance of the equipment.

CHAPTER 5. This chapter provides the information required by the field and depot level maintenance concepts. The field level maintenance section includes radio set performance, alignment, adjustment, and trouble analysis procedures. The depot level or special maintenance section calls for inspection and repair as necessary including mechanical disassembly and reassembly, and references post-repair testing procedures.

CHAPTER 6. The Illustrated Parts Breakdown is contained in this chapter.

FOLDOUT ILLUSTRATIONS. All foldout illustrations are placed after the Alphabetical Index.

REFERENCE PUBLICATIONS.

The following Government or recognized agency specifications and standards were used in the preparation of this technical manual:

MIL-M-38784, 1 January 1968; MIL-M-38730 (USAF), 30 April 1965	Manuals, Technical: General Requirements for Preparation of
MIL-T-9941 (USAF)	Technical Manuals: Ground C-E Equipment; Facility, Site, and System; Preparation of
MIL-M-8910	Manuals, Technical: Illustrated Parts Breakdown; Preparation of
MIL-STD-12C	Abbreviations for Use on Drawings and in Technical Type Publications

MIL-STD-15-1	Graphical Symbols for Electrical and Electronic Diagrams
MIL-STD-806B	Graphical Symbols for Logic Diagrams
USAS Y14.15-1966	Electrical and Electronic Diagrams
USAS Y32.16-1968	Reference Designations for Electrical and Electronic Parts and Equipments

CROSS-REFERENCE INDEX

The cross-reference index following the Table of Contents provides text, figure, and table cross-references listed against the radio set equipment nomenclature. Chapters 2 through 5 are covered in the entry columns of this index. The key to the Chapter column entries is as follows:

Paragraph numbers are not prefixed.
Figure numbers are prefixed "F".
Table numbers are prefixed "T".

ALPHABETICAL INDEX

An alphabetical index precedes the foldout illustrations contained in the last portion of this technical manual. This index covers text subjects and titles, figure titles, and table titles.

MIL-STD-15-1	Graphical Symbols for Electrical and Electronic Diagrams
MIL-STD-806B	Graphical Symbols for Logic Diagrams
USAS Y14.15-1966	Electrical and Electronic Diagrams
USAS Y32.16-1968	Reference Designations for Electrical and Electronic Parts and Equipments

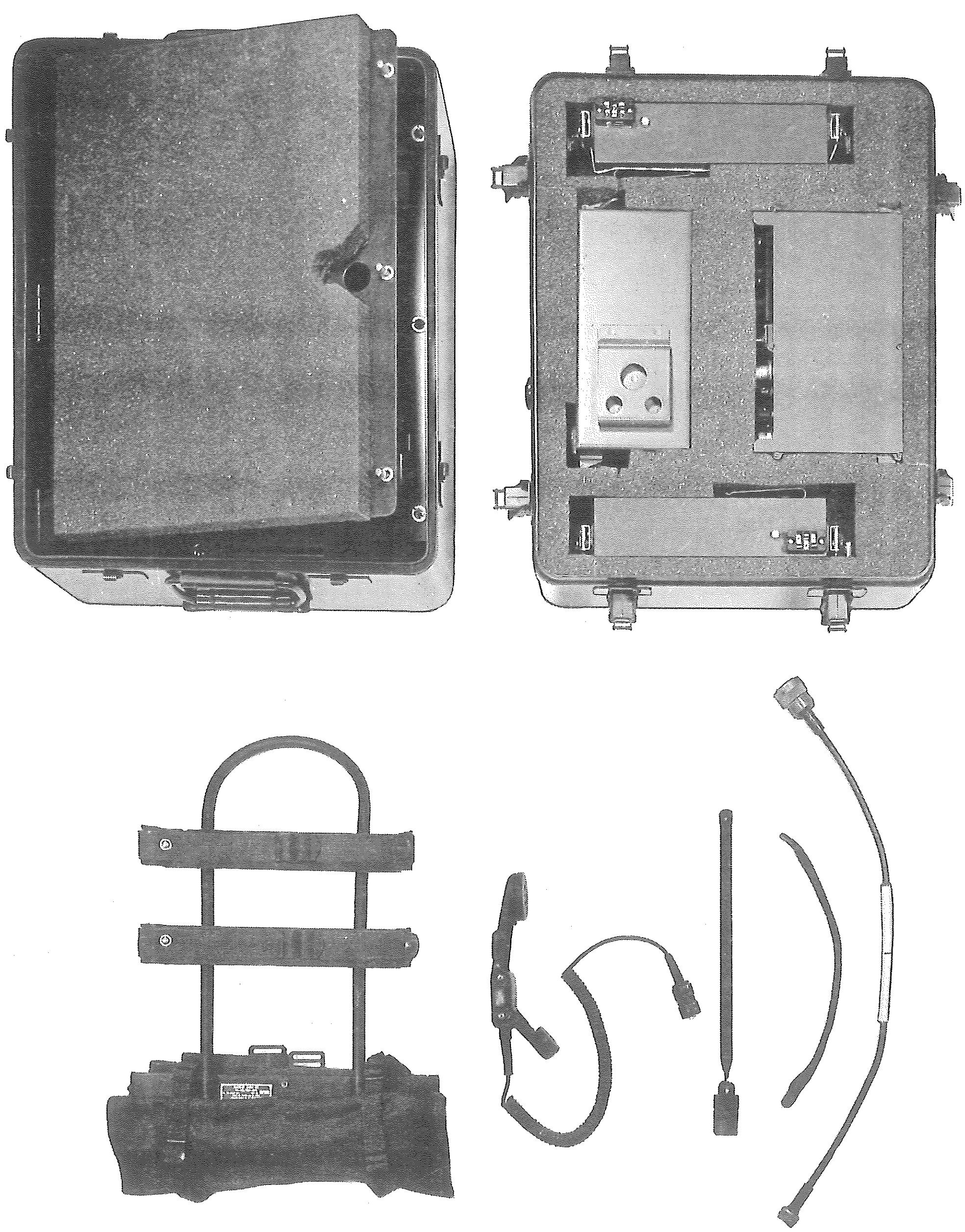
CROSS-REFERENCE INDEX

The cross-reference index following the Table of Contents provides test and figure cross-references listed against the radio set equipment nomenclature. Chapters 2 through 5 are covered in the entry columns of this index. The key to the Chapter column entries is as follows:

Paragraph numbers are not prefixed.
Figure numbers are prefixed "F".
Table numbers are prefixed "T".

ALPHABETICAL INDEX

An alphabetical index precedes the foldout illustrations contained in the last portion of this technical manual. This index covers text subjects and titles, figure titles, and table titles.



Frontispiece. Radio Set AN/PRC-66B

CHAPTER 1
GENERAL INFORMATION

1-1. DESCRIPTION AND PURPOSE OF EQUIPMENT.

1-2. Radio Set AN/PRC-66B is a compact, lightweight-portable, and completely self-contained UHF transceiver. Any one of 3500 frequency channels within the range 225.00 to 399.95 MHz can be quickly selected by setting knob operated digit-dial numerals in three indicator windows. The frequency selector knob settings result in corresponding "step" changes or increments in the output frequency of a frequency synthesizer (which produces the r-f input frequencies to the transmitter and receiver). The r-f output frequencies of the frequency synthesizer are generated by a stabilized master oscillator (SMO), with tuning and frequency division provided by logic circuitry and referenced to a built-in frequency standard. The relatively light weight and small physical size of the receiver-transmitter (RT unit) is mainly due to the use of hybrid thin-film "monolithic" or "integrated" circuit blocks and to miniature discrete parts contained in encapsulated circuit blocks.

1-3. The AN/PRC-66B is designed to provide narrowband (or wideband with external equipment) short range communication between tactical ground and air operations of differing scales. This result is achieved by eliminating communication traffic jams in complex operations and by providing reliable, easily-carried communication facilities for small or isolated operations.

NOTE

Provision exists for the future incorporation of a guard channel receiver. This facility is not covered in this technical manual.

1-4. The radio set is battery-powered by a clip-on pack of alkaline (non-rechargeable) or nickel cadmium (rechargeable) batteries. The operationally usable charge of these batteries is related to the receiver-transmitter duty cycle. For a 9:1 duty cycle (in which the receiver is "on" 9 minutes and the transmitter is "on" 1 minute) repeated continuously, the usable battery charge will exist for not less than 12 hours of normal use, or for 8 hours of use with separate wideband equipment. See Table 1-2 for battery-life details.

1-5. LEADING PARTICULARS.

1-6. The AN/PRC-66B logistic characteristics are listed in Table 1-1.

1-7. CAPABILITIES AND LIMITATIONS.

1-8. The capabilities and limitations of the AN/PRC-66B are listed in Table 1-2.

1-9. EQUIPMENT SUPPLIED.

1-10. Radio Set AN/PRC-66B consists of the eight units listed in Table 1-3. Under applicable conditions, all the units are operational with the exception of Unit 8.

NOTE

Provision exists in Receiver-Transmitter RT-865D/PRC-66 for the future incorporation of a guard receiver module. This module is not covered in this technical manual.

1-11. EQUIPMENT REQUIRED BUT NOT SUPPLIED.

1-12. No additional operational equipment is required to operate Radio Set AN/PRC-66B except that there is a wideband interface provision for equipment not described in this manual. Standard test equipment, special test equipment, and other equipment required for performance tests and maintenance purposes are listed in Table 1-4.

Table 1-1. Logistic Characteristics (Sheet 1 of 2)

CHARACTERISTIC	DESCRIPTION OR REQUIREMENT				
Primary d-c power	24 ± 6 volts from plug-in battery pack containing dry cell or rechargeable storage battery.				
Battery life	Dry battery: minimum 12 hours before replacement. Storage battery: minimum 8 hours before recharge.				
Dimensions and weight (approx inches and pounds)		Width/ Diam	Length/ Height	Depth	Weight
	Unit 1 Receiver-Transmitter RT-865D/PRC-66	5	9	1-5/8	5.5
	Unit 2A Battery, Dry BA-3515A/PRC-66	8-9/16	4-1/16	1-11/16	4.6
	Unit 2B Battery, Storage BB-636A/PRC-66 BB-636/PRC-66	9	3-1/4	2-1/4	5.0
	Unit 3 Handset H-250/U	1-3/4	8 (+5 feet of cable)	3	0.5
	Unit 4 Antenna AS-2117/PRC-66	1	17-1/4		Included with Unit 1
	Unit 5 Cable, Special Purpose CX-12157/PRC-66B	1	24		0.25
	Unit 6 Harness, Radio Set ST-163/PRC-66B	12-1/2	17	5	2.0
	Unit 7 Box, Battery CY-6327A/PRC-66	9	4-7/16	2-1/4	1.2
	Unit 8 Case, Transit, Radio Set CY-6766/PRC-66B	16	20	11	

Table 1-1. Logistic Characteristics (Sheet 2 of 2)

CHARACTERISTIC	DESCRIPTION OR REQUIREMENT
Transportability	Unit 8 (Case, Transit) containing Units 1 through 7 is transportable by any method including air (two-way air pressure equalization valve is incorporated). Units 1 through 7 are operationally man-transportable.
Environmental conditions	Relative humidity: up to 95% Storage temperature range: -54°C (-65°F) to +68°C (+154°F)

Table 1-2. Performance Characteristics (Sheet 1 of 4)

CHARACTERISTIC	DESCRIPTION
A. GENERAL	
Frequency range	225.00 to 399.95 MHz
Number of channels	3500 spaced at 50 kHz intervals
Frequency selection	Knob-operated dials with direct readout
Resetability	Upon rechanneling the set will be within 4 kHz of the frequency dial indication at midband.
Frequency accuracy	± 4 kHz on any channel within the operating frequency range.
Frequency stability	Within 10 parts per million (10 Hz per 1 MHz) per day.
Transmitter duty cycle	Should not exceed 30 minutes continuous transmission.
Primary input voltage	24-vdc nominal from dry cell battery supply. Will operate from 18 to 30 vdc.
Battery life:	For 9 min receive/1 min transmit duty cycle.
Alkaline non-rechargeable:	
Normal mode	At least 12 hours (without Guard Receiver). At least 10 hours (with Guard Receiver).
Wideband mode	At least 8 hours (with Guard Receiver).

Table 1-2. Performance Characteristics (Sheet 2 of 4)

CHARACTERISTIC	DESCRIPTION
A. GENERAL (CONT)	
Nickel-cadmium rechargeable:	
Normal mode	At least 8 hours
Wideband mode	At least 5 hours
B. TRANSMITTER	
RF power output	Not less than 2 watts on any individual channel (90% modulated with 1000 Hz tone) into antenna or 50 ohm load.
Modulation	AM and MCW
Modulation capability	At least 90%
Modulating audio input:	
Normal mode	Accepts output of H-250/U handset.
Wideband mode	Accepts ± 0.6 volt audio input signals into 125 ohm nominal input impedance.
Spurious output	Harmonic output at least 40 db below transmitter fundamental output. Spurious radiation at least 60 db below transmitter fundamental output.
Sidetone Level	Adequate to drive H-250/U handset earphone.
Envelope distortion	Not more than 10% at any frequency between 300 Hz to 23 kHz modulated 64%.
C. RECEIVER	
R-F input impedance	50 ohms, nominal
Sensitivity:	
Normal mode	3 microvolts with an r-f signal modulated 30% at 1000 Hz for a minimum (S+N)/N ratio of 10 db and an audio output of 10 milliwatts into a 500-ohm load.

Table 1-2. Performance Characteristics (Sheet 3 of 4)

CHARACTERISTIC	DESCRIPTION
C. RECEIVER (CONT)	
Wideband mode	10 microvolts with an r-f signal modulated 30% at 1000 Hz for a minimum (S+N)/N ratio of 10 db and an audio output of 0.25 volt across a 22,000 ohm external load.
I-F Selectivity	3 db bandwidth: not less than 60 kHz. 60 db bandwidth: not more than 120 kHz.
Response to spurious signals:	
I-f rejection	Attenuated at least 60 db below desired signal level.
Image rejection	Attenuated with other spurious responses to a level not greater than 60 db relative to the response of a 3 micro-volt input signal.
Agc characteristics	Output constant within 3 db, for a signal input variation of 5 microvolts to 100,000 microvolts.
Carrier squelch	Continuously adjustable for r-f input from 50 uV maximum to 3 uV minimum to open squelch.
Audio distortion	Not more than 15% using a 1000 microvolt r-f signal modulated 30%.
D. OUTPUT AUDIO	
Audio output:	
Normal mode	Not less than 10 mW into 500 ohms for an r-f input of 3 microvolts, 30 percent modulated.
Wideband mode	Not less than 0.25 volts across an external load of 22,000 ohms.
Overall audio response:	
Normal mode	Not more than ±6 db relative to 1000 Hz from 300 to 2700 Hz.
Wideband mode	Not more than -3 db relative to 18.75 kHz from 300 Hz to 23 kHz.
Volume control	10 mW down to minimum discernible output.

Table 1-2. Performance Characteristics (Sheet 4 of 4)

CHARACTERISTIC	DESCRIPTION
E. ENVIRONMENTAL CONDITIONS	
Relative humidity	Up to 95%
Operating temperature range	-30° C(-22° F) to +52° C (+125.5° F)
Non-operating temperature range	-54° C (-65° F) to +71° C (+160° F)

Table 1-3. Equipment Supplied

UNIT NO.	NOMENCLATURE	COMMON NAME	PURPOSE/DESCRIPTION	USABLE ON CODE
	Radio Set AN/PRC-66B consists of:	AN/PRC-66B	Complete radio set.	
1	Receiver-Transmitter RT-865D/PRC-66	RT Unit	Solid-state receiver and transmitter unit.	
2A	Battery, Dry BA-3515A/PRC-66	Dry Battery ALKALINE 30V	Used in Unit 7.	
2B	Battery, Storage BA-636A/PRC-66	Rechargeable Battery, NICAD 25.2VDC	Plugs into and clips on Unit 1.	
3	Handset H-250/U	Handset	Telephone type handset with push-to-talk (transmit) button.	
4	Antenna AS-2117/PRC-66	Antenna	Separate swivel whip antenna. Used with and connects to Unit 1.	
5	Cable, Special Purpose CX-12157/PRC-66B	Wideband Cable	Part of wideband interface facility to connect external equipment to Unit 1.	
6	Harness, Radio Set ST-163/PRC-66B	Harness	Shoulder and back carrying harness for radio set.	
7	Box, Battery CY-6327A/PRC-66	Dry Battery Box	Contains Unit 2A. Assembly plugs into and clips on Unit 1.	
8	Case, Transit, Radio Set CY-6766/PRC-66B	Transit Case	Used for storing or transporting Units 1 through 7.	

Table 1-4. Equipment Required But Not Supplied (Sheet 1 of 2)

ITEM NO.	COMMON NAME	NOMENCLATURE	USED FOR	FEDERAL STOCK NUMBER
A1	Attenuator, 30 db	Microlab AD-30B	R-f power output attenuation.	5905-944-3104-ZX
A2	Attenuator, variable, 0-120 db, T-pad	General Radio 874-GAL	R-f power output attenuation.	
A3	Counter, Electronic	Hewlett-Packard 5245L	Rf and audio frequency measurement.	6625-914-3619
A4	Oscillator, Transfer	Hewlett-Packard 540B	Reduction and interpolation of VHF/UHF frequencies.	6625-973-9267
A5	Oscillator, Audio	O-1025/U (HP204B)	Audio signal source.	5895-986-4625
A6	Generator, R-f Signal	AN/USM-44	R-f signal source.	6625-920-1015
A7	Oscilloscope	Tektronix 453 (Model 703H) or 545B with 1A1 Dual-Trace Plug-In Unit	General purpose testing and trouble-shooting.	6625-131-2751 or 6625-909-7025
A8	Oscilloscope, Plug-in Frame	Hewlett-Packard 140A	Display of fast rise time pulses (with plug-in units). Used with Items A9 and A10.	6625-079-3676
A9	Plug-in Unit, Sampling Vertical Amplifier	Hewlett-Packard 1410A	Dual-channel sampling and preamplifying of fast rise time pulses. Used with Items A8 and A10.	6625-531-5174-YA
A10	Plug-in Unit, Time Base	Hewlett-Packard 1424A	Display time base for fast rise time pulses. Used with Items A8 and A9.	6625-274-5050-YA

Table 1-4. Equipment Required But Not Supplied (Sheet 2 of 2)

ITEM NO.	COMMON NAME	NOMENCLATURE	USED FOR	FEDERAL STOCK NUMBER
A11	Multimeter, 20,000 Ohms/Volt	AN/PSM-6( )	General purpose a-c and d-c voltage and current. D-c resistance measurements.	6625-724-8582
A12	Multimeter, 10 Megohm/Volt	Hewlett-Packard 410C	D-c, a-c, and r-f voltage measurements. D-c current and resistance measurements.	6625-725-8423
A13	Voltmeter, R-f	Ballantine 340	R-f voltage measurement.	6625-965-1357
A14	Analyzer, Distortion	TS-723A/U (HP331A)	Audio percentage distortion measurement.	6625-734-7978
A15	Wattmeter, R-f Average Power	TS-208/U (HP431C)	R-f average power measurement. Used with Item A16.	6625-917-3099
A16	Mount, Thermistor	Hewlett-Packard 478A	R-f power-sensing element. Used with Item A15.	6625-886-1955
A17	Wattmeter, R-f Carrier Level	Bird 43	R-f carrier-level power measurement. Used with Item 18.	6625-649-5070
A18	Element, Wattmeter	Bird 10D	R-f carrier-level power sensing element. Used with Item A17.	6625-915-5175
A19	Detector, R-f	Hewlett-Packard 420B	Demodulation at VHF/UHF frequencies.	5961-811-6466
A20	Power Supply, D-c	Hewlett-Packard 6290A	Test bench d-c power supply.	6625-274-4664-YA
A21	Resistor, Variable, Linear Precision 5K	Helipot T10AR5K	Precision test-bias source resistor.	5905- -Z

CHAPTER 2

INSTALLATION

2-1. OPENING OF TRANSIT CASE AND REMOVAL OF UNITS.

2-2. Referring to Table 1-3 and Figure 2-1, the transit case, Unit 8, contains Units 1 through 7 of the radio set. To remove these units from a closed transit case, proceed as follows:

a. Press the two-way air pressure release valve adjacent to the following marking on the case:

RELIEF VALVE
AUTOMATIC, TWO-WAY
DEPRESS CORE BEFORE
OPENING LID

b. Release the clamp fasteners holding the top and bottom sections of the transit case together.

c. Open the inner cover of the top section. Release the slip fasteners on the straps holding the harness, Unit 6. Remove the harness.

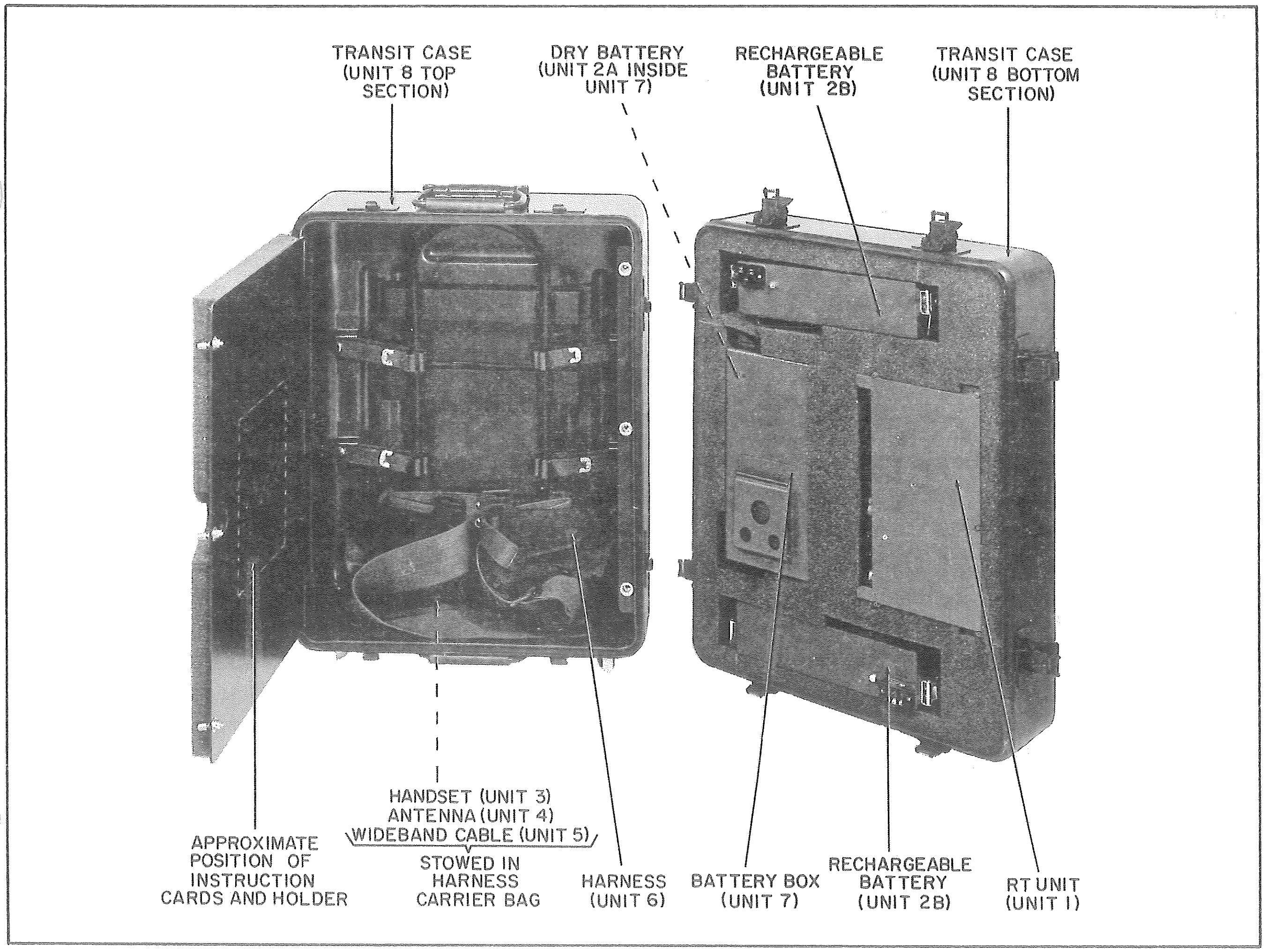


Figure 2-1. Radio Set Shipping Configuration

d. Remove the handset Unit 3, antenna Unit 4, and wideband cable Unit 5 (if applicable) from the harness carrier bag.

e. Remove the receiver-transmitter Unit 1 from the upper section of the case.

f. As applicable, remove battery box Unit 7 (containing dry battery Unit 2A) or rechargeable battery Unit 2B.

g. Align the top and bottom sections of the transit case together. Tighten the clamp fasteners. Ensure that the transit case is placed in safe temporary storage.

2-3. ASSEMBLY OF TRANSCEIVER UNITS.

2-4. To assemble the units comprising the transceiver, proceed as follows:

a. Ensure that the function switch on the RT unit is set to the OFF position.

b. Align the RT unit and battery pack according to the connector position. Press gently but firmly together. Secure the two clamp fasteners.

c. Insert the antenna connector into the ANT jack of the RT unit. Securely hand-tighten the connector locking ring.

d. Insert handset bayonet-type connector into the NORMAL jack on the RT unit.

NOTE

If applicable, the wideband cable Unit 5 is connected to the RT unit WIDEBAND jack.

2-5. REMOVAL AND REPLACEMENT OF DRY BATTERY.

2-6. If it is necessary to replace or install a new dry battery Unit 2A in battery box Unit 7, proceed as follows:

a. On Unit 7, release the clamp fastener and open the cover.

b. If Unit 2A is installed, use a straight pull to gently disconnect the internal 2-pin connector from Unit 2A. Remove Unit 2A.

c. To install Unit 2A in Unit 7, orient the dry battery connector upwards and towards the clamp-fastener end of Unit 7. Similarly orient the battery box connector as the dry battery is inserted.

d. Gently but firmly press together the internal 2-pin connector to connect Unit 2A to Unit 7.

e. Close the cover of Unit 7 and tighten the clamp fastener.

2-7. DESCRIPTION OF BACKPACK.

2-8. Referring to Table 1-3 and Figure 2-2, all units of the radio set, except the transit case, Unit 8, are man-carried as a backpack by means of the harness, Unit 6. The wideband cable, Unit 5, is normally stowed in the harness carrier bag until required. If necessary, the handset Unit 3, and antenna Unit 4, can also be stowed in the carrier bag.

2-9. The basic configuration of the backpack can be seen in Figure 2-2, and does not require assembly instructions except to note the following points:

a. The RT unit (Unit 1) and the battery pack (Unit 2B or 7 containing 2A) are held (as one transceiver assembly) against the harness frame by two straps with standard slip fasteners. Vertical movement of the transceiver assembly is prevented by the RT unit/battery pack clamp fasteners which locate between the horizontal members of the harness frame.

b. An extra Unit 2B or 7 can be hung from the harness waist belt by means of the hanger clip on these units.

2-10. TUNEUP AND TESTING.

2-11. The radio set does not require tuneup or testing before being placed into operational

1-13. SPECIAL SUPPORT EQUIPMENT.

1-14. Special support equipment used with Radio Set AN/PRC-66B is listed in Table 1-5. This equipment consists of special test equipment (STE) which is described and illustrated in Section IV of Chapter 4.

Table 1-5. Special Support Equipment

ITEM NO.	COMMON NAME	NOMENCLATURE	USED FOR	FEDERAL STOCK NUMBER
B1	PA/Modulator Adapter	Adapter, Test MX-8591/PRC-66B	Testing, alignment, and troubleshooting.	6625-455-7314ZX
B2	Frequency Synthesizer Adapter	Adapter, Test MX-8592/PRC-66B	Testing and troubleshooting.	6625-455-7315ZX
B3	Guard Receiver Adapter	Adapter, Test MX-8593/PRC-66B	Testing and troubleshooting.	6625-455-7316ZX
B4	IF/Audio Adapter	Adapter, Test MX-8594/PRC-66B	Testing, adjustment, and troubleshooting.	6625-455-7317ZX
B5	Voltage Regulator Adapter	Adapter, Test MX-8595/PRC-66B	Testing and troubleshooting.	6625-455-7318ZX
B6	Receive RF Adapter	Adapter, Test MX-8597/PRC-66B	Testing, alignment, and troubleshooting.	6625-456-2721ZX
B7	Audio Adapter	Adapter, Test MX-8596/PRC-66B	Testing and troubleshooting.	6625-456-2720ZX
B8	Antenna Adapter	Adapter, Test MX-8599/PRC-66B	Measuring antenna forward/reflected power ratio.	6625-456-2725ZX
B9	Control Head Gauge	Alignment Fixture, Tuner MX-8598/PRC-66B	Mechanical output alignment check of Control Head geartrain.	5220-453-8417ZX
B10	Bench Test Cable	Cable Assembly, Special Purpose, Electrical CX-12158/PRC-66B	Connecting RT unit to d-c power supply.	6625-247-4676ZX
B11	Battery Charger	Charger, Battery PP-6427/PRC-66B	Charging Unit 2B (rechargeable battery)	6130-222-2720UH
B12	Battery Charging Cable	Cable Assembly, Special Purpose, Electrical CX-12159/PRC-66B	Charging Unit 2B from item B11	6130-222-2962UH

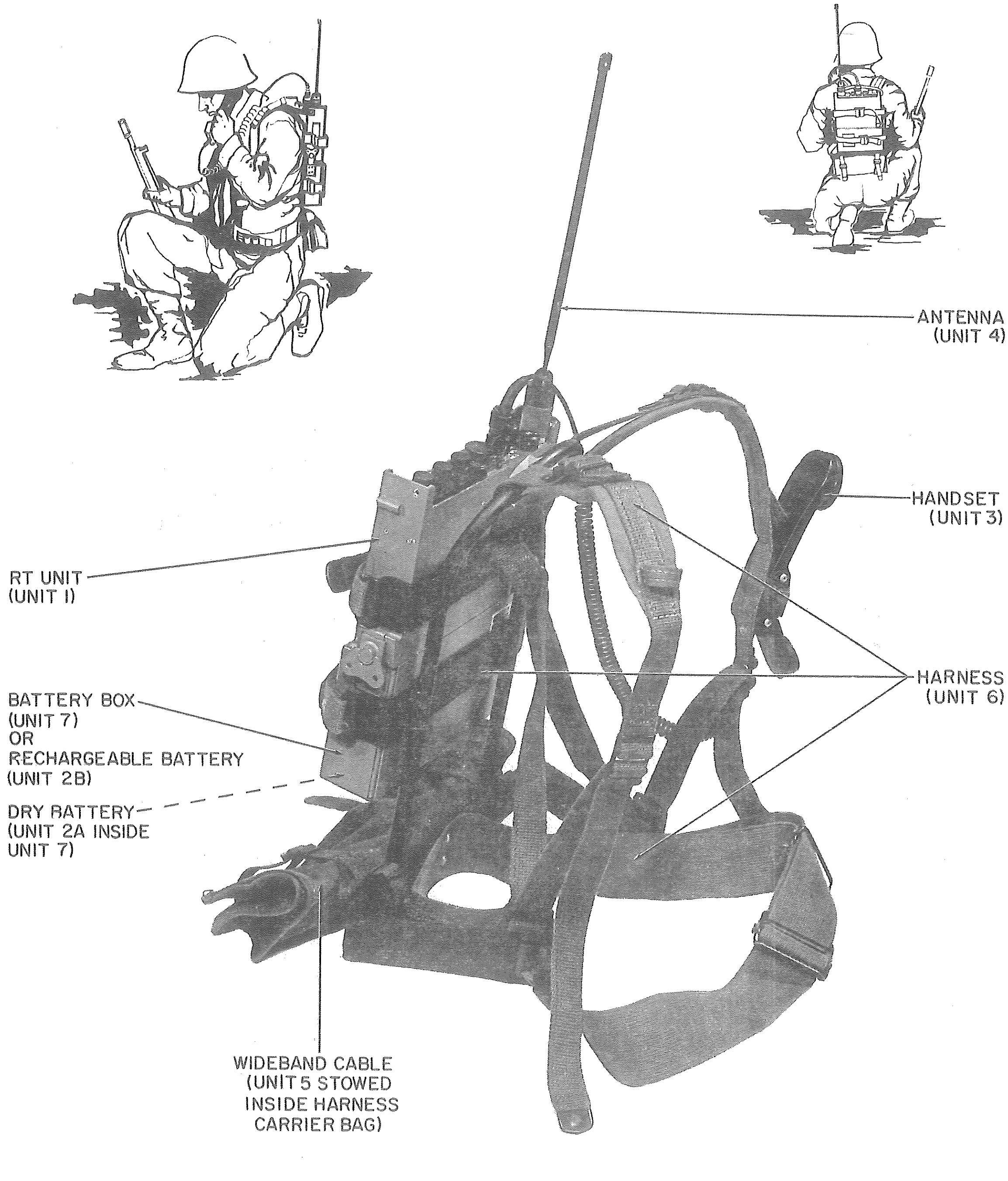


Figure 2-2. Radio Set Backpack Configuration

service by a user organization unless such activity is scheduled by the appropriate authority. However, to check that the radio set performs operationally on receipt by the user organization, the pre-operational check contained under paragraph 3-5 should be performed in full.

2-12. DISASSEMBLY OF TRANSCEIVER UNITS.

2-13. To disassemble the units comprising the transceiver, carry out the procedural steps of paragraph 2-3 in reverse order.

2-14. PREPARATION FOR RESHIPMENT.

2-15. If the radio set is to be shipped, Units 1 through 7 must be placed in the transit case, Unit 8. Proceed as follows:

a. Disassemble the transceiver units (paragraph 2-12).

b. Referring to Figure 2-1, place Units 1, 2B, and 7 (containing 2A) into the top section of the transit case, Unit 8. Ensure that the units fit correctly and snugly into the cutouts of the padding.

c. Place Units 3, 4, and 5 (if applicable) into the carrier bag of the harness, Unit 6.

d. Open the inner cover of the transit case top section. Place the harness, Unit 6, inside the transit case top section and secure with the slip-fastener straps. Close the top section cover and secure.

e. Align the transit case top and bottom sections together. Tighten the clamp fasteners. This completes the preparation for reshipment.

CHAPTER 3
OPERATION

SECTION I
CONTROLS AND INDICATORS

3-1. The identification and location of controls and indicators on Receiver-Transmitter RT-865D/PRC-66 (RT unit) is given by reference to Figure 3-1.

3-2. Table 3-1 lists the controls and indicators by control panel marking or descriptive name against a brief description of each function.

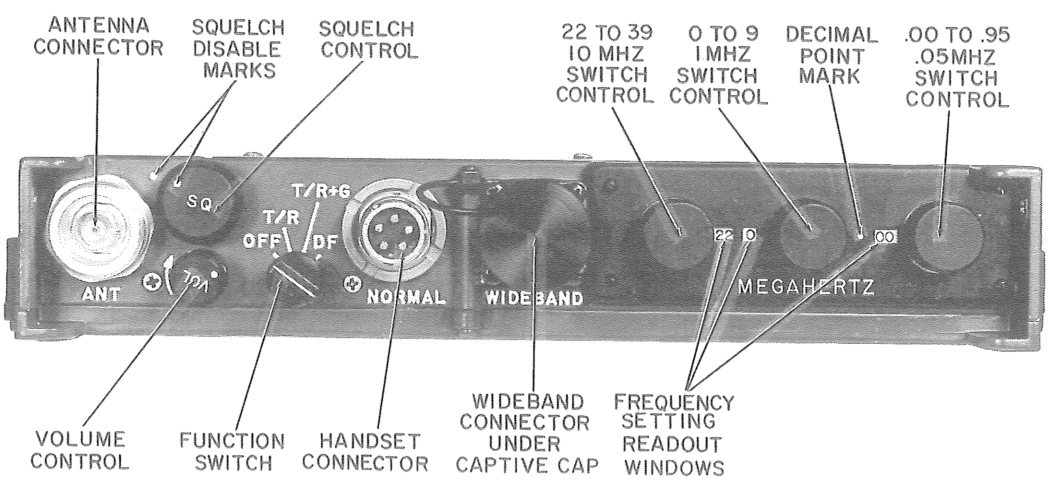


Figure 3-1. Controls and Indicators

Table 3-1. Control and Indicator Functions (Sheet 1 of 2)

MARKING AND/OR NAME	FUNCTION	REF DES
SQ (squelch) control and disable switch knob	When control is rotated clockwise, squelch sensitivity decreases. When control is rotated counterclockwise, squelch sensitivity increases. At full counterclockwise position, squelch is disabled by a mechanically-coupled switch.	1A1R4 and 1A1S2
VOL (volume) control knob	Audio level in handset receiver increases with clockwise rotation.	1A1R3
Function switch knob	Four-position switch for selecting RT unit mode of operation as follows: DF position: transmits continuous 1000 Hz tone-modulated signal for direction finding purposes. T/R+G position: activates guard receiver (if incorporated). Includes T/R position functions (see below). T/R position: receive mode if push-to-talk (PTT) switch on handset is not pressed. If PTT switch is pressed, RT unit operates in transmit mode and antenna connector is switched from receiver to transmitter. OFF position: 24-volt battery power is disconnected from RT unit circuits.	1A1S1
MEGAHERTZ		
Frequency selector switch knob (left-hand)	22 through 39 (X10) MHz frequency selection. Digital readout in adjacent oblong window.	1A1A1S1A and 1A1A2S1B
Frequency selector switch knob (center)	0 through 9 (X1) MHz frequency selection. Digital readout in adjacent small window.	1A1A3S1
Decimal point marking	Separates decimal fraction of selected frequency appearing in oblong readout window to right of decimal point.	
Frequency selector switch knob (right-hand)	.00 through .95 (in .05 MHz increments) frequency selection. Decimal digital readout appears in adjacent oblong window.	1A1A3S2

Table 3-1. Control and Indicator Functions (Sheet 2 of 2)

MARKING AND/OR NAME	FUNCTION	REF DES
ANT (antenna) r-f connector	Connects Antenna, Unit 4, to RT unit.	1J1
NORMAL audio connector	Connects Handset, Unit 3, to RT unit.	4J1
WIDEBAND interface connector	Connects wideband equipment via Special Purpose Cable Assembly, Unit 5, to RT unit.	3J1

SECTION II
OPERATING INSTRUCTIONS

3-3. STARTING, OPERATING, AND STOPPING PROCEDURE.

3-4. The intention of the following procedure is to enable the operator to study and become familiar with the physical motions and visual and aural indications concerned with operation of the radio set. To operate the radio set, proceed as follows:

WARNING

Carry out the steps of this procedure in the exact order given. You will avoid breaking operational or mission security orders.

a. Set the radio set (with carrying harness) on a convenient clean and stable surface. Carry out the following steps:

1. Set function switch to OFF.

2. Set VOL control fully counterclockwise.

3. Set SQ control fully counterclockwise.

4. Ensure that battery pack is properly plugged into RT unit and tightly secured with side fasteners.

5. Ensure that RT unit (with battery pack) is securely strapped to carrying harness frame.

6. Insert connector-end of swivel whip antenna into ANT jack on RT unit. Securely hand-tighten connector locking ring.

NOTE

If available, a compatible dipole antenna (with cable and connector) may be used instead of the swivel whip antenna. The dipole is normally oriented vertically and tied or mounted at maximum height. Do not position near metallic or grounded structures.

7. If carrying harness is to be worn, use shoulder strap loop to position handset on carrying harness.

8. Insert handset bayonet-type connector into NORMAL jack on RT unit.

NOTE

At this point, the carrying harness may be put on or not as applicable (see Figure 2-2). If the harness is to be worn, a second operator is required to perform the remaining steps of this procedure.

b. Use the MEGAHERTZ control knobs to set the authorized operating frequency.

NOTE

The three MEGAHERTZ windows display a direct numerical readout of the selected operating frequency in megahertz. Taking the windows in left-to-right order, the displayed numerals can range from 22 through 39; 0 through 9; decimal point (marked on panel); and .00 through .95 (in .05 steps). For example 332.15 MHz is displayed in the windows as [33] [2] ● [15] . The MEGAHERTZ controls can actually be set for readouts down to 220.00; however, the RT unit will not operate below 225.00 MHz.

c. Set the function switch to T/R. Carry out the following steps:

NOTE

Communication will be ineffective or nonexistent if the antenna is at a large angle with respect to a second antenna. For normal operation, it is assumed that the antenna will be oriented vertically. Also, the proximity of metallic or grounded structures may cause a communication blackout.

1. Rotate VOL control clockwise for comfortable receiver noise level (or voice level of received transmission) at handset earphone.

2. Wait until voice transmission stops. Rotate SQ control slowly clockwise until noise cuts off. Leave SQ control set at noise cut-off point.

NOTE

Under the worst operational conditions, the experience of the operator(s) is an important factor in the intelligibility of a received transmission.

3. Check correct squelch operation for: no receiver noise; and, received voice transmission is understood.

NOTE

For the following steps, the cooperation of a remote operator is required. Channel frequency and time-slot authorization should be obtained in advance.

WARNING

Do not transmit if operational or mission security may be broken unless this contingency is an accepted risk.

d. To transmit voice, proceed to e. below. To transmit DF (direction finding), proceed to f. below.

e. To transmit voice, ensure that the function switch is in a T/R position. Carry out the following steps:

1. Ensure that MEGAHERTZ readout is set to correct authorized frequency channel.

2. Wait until received voice transmission (if any) has stopped.

3. Press and hold push-to-talk (PTT) button on handset. Proceed with voice transmission. Note sidetone (own voice) in handset earphone indicating that transmission is going out. Release PTT button.

4. Await remote voice transmission reply.

5. Repeat steps 2. through 4. as necessary.

6. Proceed to f. or g. below as applicable.

f. To transmit direction finding, carry out the following steps:

1. Ensure that MEGAHERTZ readout is set to correct authorized frequency channel.

2. Set function switch to DF position.

3. Note continuous tone in handset earphone indicating that transmission is going out.

g. To shut down the radio set, set the function switch to the OFF position.

h. If required, remove the carrying harness and set it on the ground. Stow the antenna and handset as applicable.

3-5. PRE-OPERATIONAL CHECK.

3-6. The AN/PRC-66B should be ready for use at any time so that sudden operational demands can be met without fail. This is the purpose of the pre-operational check. To carry out the check, proceed as follows:

NOTE

The cooperation of a remote operator is required for transmit mode checks. Channel frequency and time-slot authorization should be obtained in advance.

Carry out this check to the fullest extent allowed by the operational or mission orders. If the radio set is not operationally serviceable, a replacement unit, or a complete radio set, should be immediately obtained from the nearest field repair or supply depot.

a. Make a thorough check of the equipment supplied (see Table 1-3).

CAUTION

In b. following, do not disassemble any unit, item, or part.

b. Make a thorough visual check of the complete radio set for missing, deformed, broken, cracked, excessively frayed, or corroded items or parts.

c. Ensure that the batteries are new (nonrechargeable type) or fully charged (rechargeable type).

d. Insert the antenna and handset into the ANT and NORMAL jacks respectively.

e. Set the function switch to T/R. Make the following receive mode checks:

1. Set MEGAHERTZ controls to suitable frequency channel.

2. Rotate SQ control fully counterclockwise.

3. With no received voice, rotate VOL control clockwise. Receiver noise level should increase to normal level at handset earphone. "Normal level" is based on experience and indicates normal sensitivity of receiver.

4. With no received voice, slowly rotate SQ control clockwise until receiver noise level cuts off. Leave SQ control at this setting.

5. Check that received voice is easily audible with no receiver noise during voice breaks. This indicates correct squelch operation.

WARNING

Do not transmit if operational or mission security may be broken unless this contingency is an accepted risk.

f. Set the MEGAHERTZ controls to an authorized frequency channel. Make the following transmit and receive mode checks:

1. Wait until channel is not "busy". Press handset PTT button. Use correct code words

to contact remote operator. Note sidetone (own voice) at handset earphone.

2. Request remote operator for his estimate of your transmission quality and strength. This will check your transmitter. Release PTT button.

3. Check received transmission for quality, strength, interference, excessive noise, or any other factor tending to affect the intelligibility of the received information. This checks your receiver and the remote operator's transmitter.

4. Press PTT button. Inform remote operator of your estimation of his transmission. Use correct code words to change frequency channel (see step 5. below), set up DF mode (see g. below), or cease contact as applicable. Release PTT button.

5. If possible, repeat steps 1. through 4. above for several frequency channels.

g. To check the DF mode operation, make the following checks:

1. Set MEGAHERTZ controls to an authorized direction-finding frequency channel (if allocated).

2. Set mode selector switch to DF position.

3. Check that a high-pitched continuous tone is present at the handset earphone.

4. If possible, verify your direction-finding transmission with a remote operator tuned to the same channel.

h. Set the function switch to OFF. If applicable, disconnect and stow the antenna and handset.

3-7. TYPICAL OPERATING SITUATION.

3-8. GENERAL. Radio Set AN/PRC-66B can be used under severe operational and environmental conditions such as may be encountered during tactical operations involving ground and air units. An operation of this kind may require, for example, short range communication between specialized ground elements (combat airstrip set up, maintenance, and defence units, etc.) and various air elements comprising reconnaissance, troop airlift, airdrop, boxcar, and air strike functions or units. For this purpose, all the aircraft are equipped with communication equipment which is compatible with the AN/PRC-66B equipment carried by the ground units.

3-9. CHANNEL ALLOCATION. When large numbers of the radio set are used in a tactical operation, it becomes essential to plan the communications network in great detail so that no confusion will arise. For example, channels may be allocated on the basis of operational function such as ordnance, reconnaissance, air strike, and so on. Other channels may be allocated by command function, map position, or other defined category. Whatever the method of channel allocation, the purpose will be to provide the maximum communication security and flexibility.

3-10. DIRECTION FINDING. If the AN/PRC-66B is operated in the "DF" mode, a second receiver tuned to the particular channel will receive a continuous high-pitched tone. In this way, the AN/PRC-66B can act as a radio beacon for direction-finding receivers, two of which can pinpoint the exact location of the beacon.

3-11. WIDEBAND INTERFACE FACILITY. For certain operational requirements, a wideband input is supplied from separate wideband equipment not described in this technical manual. This input is routed from the wideband equipment via the special purpose cable assembly (Unit 5, Table 1-3) supplied with the AN/PRC-66B. The cable is connected to the WIDEBAND jack on the RT unit.

3-12. GUARD CHANNEL RECEIVER. Provision exists for incorporating a guard channel receiver into Receiver-Transmitter RT-865D/PRC-66 (RT unit). This facility is not covered in this technical manual.

NOTE

A Vehicle Adapter Kit and/or Battery Extension Cable may be incorporated in some versions of the radio set. These items are not included in the radio set described in this technical manual.

3-13. RECHARGING OF BATTERY.

3-14. When the battery pack is discharged, a new alkaline (nonrechargeable) battery, or a fully-charged nickel-cadmium (rechargeable storage) battery, is required as a replacement. The following procedure is concerned with recharging a fully discharged nickel-cadmium battery (Unit 2B). Proceed as follows:

NOTE

A battery charger and a battery charging cable are required. These are items B11 and B12, respectively, in Table 1-5, and are shown in Figures 4-24 and 4-25.

a. Ensure that the input power lead of the battery charger is disconnected from the power outlet.

b. Insert the battery (Unit 2B) connector into the battery charging cable connector. Use the clip-on fasteners to clamp the battery securely. Stand the battery and battery charging cable upright.

c. Insert the red and black plugs of the battery charging cable into the corresponding red and black jacks of the battery charger.

d. On the battery charger, use the CHARGE RATE switch to select the required charging rate (40 or 190 milliamps).

e. Plug the battery charger power lead into a 115v, 50-400 Hz power outlet. The red "power on" lamp should light.

f. Leave the battery on charge for a charging time period selected from the following information:

NOTE

If the battery has not been used for a long period of time, it is advisable to use the 40 mA charging rate for the first recharge. The battery will not be damaged if the 40 mA rate charging time is exceeded. For the 190 mA rate, the charging time should not be significantly exceeded.

Charging Rate	Charging Time (Hours)	Final Charge Value (%)
40 mA	48	80
190 mA	16	100

g. Disconnect the battery charger power lead from the power outlet.

h. Disconnect the battery charging cable from the battery charger.

i. Unclip and remove the battery (Unit 2B) from the battery charging cable.

j. If it is not intended to be used immediately, store the charged battery upright in a low, clean, and dry position.

3-15. CONNECTION OF SEPARATE POWER SUPPLY.

3-16. If the AN/PRC-66B is used continuously in a fixed location, it is preferable to use a separate d-c power supply instead of a battery. To connect a separate power supply, proceed as follows:

NOTE

A d-c power supply (Table 1-4, item A20) and a bench test cable (Table 1-5, item B10) are required. Item B10 is shown in Figure 4-23.

a. On Receiver-Transmitter RT-865D/PRC-66 (RT unit), set the function switch to the OFF position.

b. Unclip and remove the battery pack from the RT unit. Return the battery pack to safe storage according to the authorized procedure.

CAUTION

Do not connect or apply power to the d-c power supply at this time.

c. Insert the bench test cable assembly connector into the battery-pack connector of the RT unit. Use the clip-on fasteners to clamp the cable assembly to the RT unit.

d. On the d-c power supply, strap (connect) the negative (-) terminal to the ground (GND) terminal, using a short piece of insulated wire.

e. Connect the positive (red) lead of the cable assembly to the positive (+) terminal of the d-c power supply.

f. Connect the ground (black) lead of the cable assembly to the ground (GND) terminal of the d-c power supply.

g. Set the d-c power supply controls as follows:

1. VOLTAGE fully counterclockwise (zero).
2. CURRENT approximately to midposition.
3. METER to 1.2A or greater range.

h. On the RT unit, set the function switch to the T/R position.

i. Insert the power lead plug of the d-c power supply into a suitable power outlet. Switch the d-c power supply to "on".

j. Slowly adjust the d-c power supply for a reading of 24 ± 0.5 volts on the meter. The current reading will be approximately 240 ± 10 mA on the meter.

k. Operate the radio set according to the normal procedure (refer to the applicable steps of paragraph 3-4).

l. To stop (shut down) the radio set:

1. Set function switch to OFF.
2. Switch d-c power supply to "off".

CAUTION

In m. following, it is assumed that the d-c power supply control settings have not been disturbed from the settings obtained in j. above.

m. To restart the radio set:

1. Switch d-c power supply to "on".
2. Set function switch to T/R.
3. Operate radio set as normally.

SECTION III
EMERGENCY OPERATION

- NOT APPLICABLE -

CHAPTER 4
PRINCIPLES OF OPERATION

SECTION I
FUNCTIONAL SYSTEM OPERATION

4-1. INTRODUCTION.

4-2. The two basic units of Radio Set AN/PRC-66B are the receiver-transmitter (RT) unit and a 24-vdc battery pack. The battery pack plugs into the base of the RT unit. Auxiliary equipment supplied with the radio set includes an antenna, a carrying harness, and a handset.

4-3. The RT unit features all solid-state design, including monolithic integrated circuits, thin-film hybrid circuits, and miniature discrete component parts. The antenna screws onto a coaxial connector on the control panel of the RT unit. A bayonet-type connector is provided for the handset. The main chassis (reference designation 1) contains components prefixed A1, the control head logic-switching circuitry (A1A1 through A1A3), two circuit boards A1A4 and A1A5, the interconnecting wiring, and the following plug-in modules:

A2	Voltage Regulator module
A3	Frequency Synthesizer module
A4	IF/Audio module
A5	PA/Modulator module
A6	Receive RF module
A7	Guard Receiver module (if incorporated)

4-4. BASIC AN/PRC-66B SYSTEM.

4-5. GENERAL. The AN/PRC-66B is designed to transmit and receive narrowband and wideband (with external equipment) amplitude-modulated signals on any one of 3500 channels in the 225.00 MHz to 399.95 MHz band. In addition, the transmitter will provide a 1000 Hz continuous tone-modulated radiated output for direction finding purposes. A guard receiver may also be incorporated.

4-6. FUNCTIONAL AREAS. Refer to Figure FO-1 for the basic functional blocks of the system. The radio set may be considered to consist of six basic functional areas. These are: operating function selection, d-c power and PTT (push-to-talk), control head and logic switching, frequency synthesis, and transmitter and receiver sections. Except for the plug-in battery pack power source, these functional areas are distributed within the RT unit and between the main chassis/control head and five plug-in modules (if incorporated, a guard receiver comprises a sixth module). The functional areas are separately described under the sub-headings following.

4-7. OPERATING FUNCTION SELECTION. For normal or wideband receive operation, the four-position function switch on the control panel is set to the T/R (transmit-receive) position. If incorporated, a guard receiver channel is also activated in the T/R+G position. For a 1000 Hz continuous tone modulated r-f output, the function switch is set to the DF (direction finding) position.

4-8. D-C POWER AND PTT. In the T/R, T/R+G, or DF position, the 24-volt battery supply is switched into the system and 12-volt and 5-volt regulated outputs are provided by the voltage regulator. In the OFF position, these voltages are removed. In any position of the function switch except OFF and DF, transmit-receive operator control is effected by means of the PTT switch on the handset. For wideband operation, the PTT switch is located on the external equipment.

4-9. When the PTT switch is closed, the transmit-receive (TR) relay transfers the antenna from the receiver r-f input to the transmitter r-f output, and the PTT relays transfer the 12-vdc and 24-vdc activating voltages from the receive to the transmit circuits. A similar action occurs when the function switch is set to DF, which also activates the PTT and TR relays.

4-10. CONTROL HEAD AND LOGIC SWITCHING. Three frequency selector knob controls on the control panel are used to set the channel frequency for both transmit and receive operation. These controls are mechanically coupled via a gear train to tuning shafts on Receive RF module A6 and the PA/Modulator module A5. The controls are also connected to rotary logic-circuit switches which route a set of logic "command" signals (a different set for each frequency channel) to control the frequency synthesizer circuits. The transmit or receive section of the 10 MHz logic switch is activated through a ground switched by a PTT relay contact.

4-11. FREQUENCY SYNTHESIS. The Frequency Synthesizer module A3 provides the required stable frequencies for both the transmitter and receiver. In the receive mode, the coded command signals from the receive section of the 10 MHz switch (and the common 1 MHz and 50 kHz switches) cause the frequency synthesizer to supply a 65.00 to 123.33 MHz output to a tripler in Receive RF module A6. In the transmit mode, the coded command signals from the transmit section of the 10 MHz switch (and the common 1 MHz and 50 kHz switches) cause the frequency synthesizer to provide a 75.00 to 133.33 MHz output to a tripler in the PA/Modulator module. For a given frequency channel, the frequency synthesizer output frequency for the receiver is 10 MHz lower than for the transmitter. The difference, when tripled, represents the 30 MHz receiver intermediate frequency.

4-12. TRANSMITTER SECTION. The transmitter broadband amplifier, tripler, r-f amplifier, modulator and power amplifier stages are located in PA/Modulator module A5. B+ is applied to these circuits only when the PTT switch is actuated. The tripled synthesizer output frequency, or carrier, is routed through the r-f amplifier and power amplifier stages, thence via a transmit-receive relay and a low pass filter to the antenna.

4-13. The voice input from the handset microphone (or from the external wideband carbon microphone energized from the current source on board A1A5) is fed to modulator preamplifier and audio amplifier stages in IF/Audio module A4. This circuit is powered by the 12-volt B+ supply only in the transmit mode. The modulator audio amplifier output is fed to the modulator circuits in PA/Modulator module A5. Modulation power is preset and applied to the transmit r-f and power amplifier stages. Modulation power level compensation for different frequency channels is provided by using cam-operated switches to change the modulator bias supply.

4-14. The transmitter also includes a sidetone detector circuit. Sidetone detected at the r-f output is applied via module A4 to the handset earphone and to the wideband audio amplifier on board A1A5.

4-15. RECEIVER SECTION. The Receive RF module A6 contains a tripler stage and buffer amplifier for the input from the frequency synthesizer, a three stage r-f amplifier section, and a first mixer stage. The mixer produces a 30 MHz output which is fed, via a band-pass filter, to the r-f agc detector and i-f amplifiers in IF/Audio module A4. B+ for the receiver circuits is applied only when the PTT switch is open (released).

4-16. The IF/Audio module A4 contains an r-f agc (automatic gain control) detector/amplifier, 30 MHz i-f amplifier, 29.5 MHz crystal oscillator, a second mixer, two 500 kHz i-f amplifier stages, a combined audio and i-f agc/detector amplifier, squelch circuits, and an audio amplifier. The d-c r-f agc output voltage is applied as B+ to the first r-f amplifier in module A6. The 500 KHz mixer output is amplified and applied to the squelch circuit and to the audio and i-f agc detector. The detected audio is then routed through the squelch gate (if "open") to the audio amplifier, VOL (volume) control, and the handset earphone. The maximum audio level is preset by a screwdriver control. For wideband operation, the detector audio output is directly applied to a wideband amplifier before being routed to external equipment.

4-17. The i-f agc output voltage is applied (via an amplifier) to the first and second i-f stages and to the squelch circuits via squelch control A1R4 in parallel with resistor A4R6. This causes a Schmitt trigger circuit to operate the squelch gate according to the squelch control setting and the detected r-f carrier level. That is, the squelch threshold can be set to "open" the gate for a detected r-f carrier signal, and "close" the gate for no signal. The squelch gate is disabled (open) when switch A1S2 is closed.

4-18. With the exception of the audio amplifier (also used for sidetone), B+ is applied to the i-f and receive audio circuits only when the PTT switch is open (released).

SECTION II
FUNCTIONAL OPERATION OF ELECTRONIC CIRCUITS

NOTE

Partial reference designations are used in this Section unless otherwise indicated or required.

4-19. D-C POWER DISTRIBUTION.

4-20. GENERAL. Figure FO-2 is a simplified schematic diagram to show the d-c power distribution within the RT unit. The primary power source (battery pack) supplies 24-vdc to the RT unit at connector 2J1, pin 3 positive; and pin 2 negative or "ground". Pin 2J1-1 is not used.

4-21. Voltage Regulator module A2 routes a "continuous" +24 volts via fuse A2F3 to the function selector switch A1S1. In any position except OFF, switch A1S1 routes the "switched" +24 volts back to module A2. (Diode A1A4CR1 provides reverse-voltage protection.) In A2, the 12-volt and 5-volt regulators (shown in block form) are energized from the switched +24 volts to produce the regulated d-c supply voltages used in the RT unit. These +12V and +5V supplies are protected by fuses A2F1 and A2F2.

4-22. The switched +24 volts is also routed to module A3 and to the solenoids of PTT relays A1A2K1, K2. When the PTT switch line is grounded in the handset via connector pin 4J1-C (or in external wideband equipment via 3J1-1), the relays are energized. The PTT relays are also energized in the DF position of the function selector switch. Resistor A1A4R8 reduces voltage surges (it is effectively connected between the +12V RCV and +12V XMT contacts on A1A2K2).

4-23. RECEIVE MODE. If the PTT relays are not energized, the RT unit is in the receive mode of operation. In this case, the switched +24 volts is used only in module A3, and +12 volts is distributed only to the receive sections of the RT unit via contacts A1A2K2-6, 8.

4-24. The transmit-section common contact of the 10-MHz logic switch (not shown) is grounded (via A1A2K2-2, 4) to the same ground line connected to the 1 MHz and 50 kHz logic switches.

4-25. In the T/R position of function switch A1S1, the guard receiver (if incorporated) is disabled by reason of a "ground-for-off" line selected by the switch. That is, the guard receiver is off even though it is supplied with the receive mode +12 volts.

4-26. TRANSMIT MODE. The RT unit is in the transmit mode of operation if the PTT relays A1A2K1, K2 are energized by grounding the PTT line through the push-to-talk switch. This mode is also selected in the DF position of the switch.

4-27. In the transmit mode, the "continuous" +24 volts is switched by PTT relay contacts A1A2K1-1, 6 to the transmit-receive relay A1K1 and to PA/Modulator module A5. (Diode A1CR1 provides transient protection.) Contacts A1A2K2-1, 6 also switch +12 volts to modules A4 and A5. Thus, module A5 is supplied with the transmit +24 and +12 volts, and +12 volts is supplied to the modulator preamplifier circuits of module A4. Relay A1K1 transfers the antenna from the receiver to the transmitter.

4-28. The transmit-section common contact of the 10 MHz logic switch (not shown) is grounded (via A1A2K2-2, 5) to the same ground line connected to the 1 MHz and 50 kHz logic switches.

4-29. If external wideband equipment is used, the external carbon microphone is supplied with current from a constant-current source which is energized from +12 volts.

4-30. R/T UNIT CHASSIS/CONTROL HEAD A1.

4-31. The combined R/T unit chassis and control head (refer to Figure 6-17) are considered as one assembly and given the partial reference designator A1. The electrical parts of the main chassis and the control head logic-switching circuitry are separately described beginning with paragraphs 4-32 and 4-34 respectively.

4-32. CHASSIS, ELECTRICAL.

4-33. The chassis provides mounting facilities for the control head gear train and logic circuitry, one attenuator-filter board, one wideband amplifier board, and the five (six if the Guard Receiver is incorporated) modules. The internal wiring harness provides the interconnections for the control head logic and other circuit boards and the receptacles for the five plug-in modules. The schematic diagram is given in Figure FO-3.

4-34. CONTROL HEAD LOGIC-SWITCHING SECTION.

4-35. The control head logic-switching section is located in the upper part of the RT unit chassis. The section includes the RT unit operating controls, the frequency selection control geartrain, and three printed circuit boards. Figure FO-4 is the schematic diagram.

4-36. PRINTED CIRCUIT BOARD A1A1. This printed circuit board includes section A (receive section) of the X10 MHz frequency selector logic switch A1A1S1A, isolating diodes, and inverter amplifiers for the band switch output lines. The X10 MHz logic switch is described beginning with paragraph 4-60.

4-37. PRINTED CIRCUIT BOARD A1A2. This printed circuit board includes section B (transmit section) of the X10 MHz frequency selector logic switch A1A2S1B, isolating diodes, bias resistors for the switch output lines, and PTT controlled relays A1A2K1 and A1A2K2. The X10 MHz logic switch and the relays are described beginning with paragraph 4-60.

4-38. PRINTED CIRCUIT BOARD A1A3. This printed circuit board includes the X1 MHz logic switch A1A3S1 and 50 kHz logic switch A1A3S2. The X1 MHz logic switch and the 50 kHz logic switch are described in paragraphs 4-68 and 4-69 respectively.

4-39. CONTROL GEARTRAIN. The knob-operated MEGAHERTZ readout window dials (located at the top of the RT unit) are mechanically coupled to the X10 MHz, X1 MHz, and 50 kHz (0.05 MHz) logic-control switches. The shafts of the switches, are in turn, mechanically connected through a gear train and removable couplings to the tuning shafts of PA/Modulator module A5 and Receive RF module A6. The gearing is differentially arranged so that, as the switches are positioned, individually or together, the angular positions coupled to the tuning shafts of modules A5 and A6 are in step with the by a screwdriver control. For wideband operation, the detector audio output is directly applied to a wideband amplifier before being routed to external equipment.

4-17. The i-f agc output voltage is applied to the first and second i-f stages and to the squelch circuits via the squelch control A1R4. This causes a Schmitt trigger circuit to operate the squelch gate according to the squelch control setting and the detected r-f carrier level. That is, the squelch threshold can be set to "open" the gate for a detected r-f carrier signal, and "close" the gate for no signal. The squelch gate is disabled (open) when switch A1S2 is closed.

4-18. With the exception of the audio amplifier (also used for sidetone), B+ is applied to the i-f and receive audio circuits only when the PTT switch is open (released).

SECTION II
FUNCTIONAL OPERATION OF ELECTRONIC CIRCUITS

NOTE

Partial reference designations are used in this Section unless otherwise indicated or required.

4-19. D-C POWER DISTRIBUTION.

4-20. GENERAL. Figure FO-2 is a simplified schematic diagram to show the d-c power distribution within the RT unit. The primary power source (battery pack) supplies 24-vdc to the RT unit at connector 2J1, pin 3 positive; and pin 2 negative or "ground". Pin 2J1-1 is not used.

4-21. Voltage Regulator module A2 routes a "continuous" +24 volts via fuse A2F3 to the function selector switch A1S1. In any position except OFF, switch A1S1 routes the switched +24 volts back to module A2. Breakdown diode A1A4CR1 provides reverse-voltage protection. The 12-volt and 5-volt regulators in A2 (shown in block form) are activated via fuses A2F1 and A2F2 to produce the regulated 12-volt and 5-volt outputs. The direct routing of these voltages can be traced in Figure FO-2.

4-22. The switched +24 volts is also routed to module A3 and to the solenoids of PTT relays A1A2K1, K2. When the PTT switch line is grounded in the handset via connector pin 4J1-C (or in external wideband equipment via 3J1-1), the relays are energized. The PTT relays are also energized in the DF position of the function selector switch.

4-23. RECEIVE MODE. If the PTT relays are not energized, the RT unit is in the receive mode of operation. In this case, the switched +24 volts is used only in module A3, and +12 volts is distributed only to the receive sections of the RT unit via contacts A1A2K2-2, 4.

4-24. The transmit-section common contact of the 10-MHz logic switch (not shown) is grounded (via A1A2K2-2, 4) to the same ground line connected to the 1 MHz and 50 kHz logic switches.

4-25. In the T/R position of function switch A1S1, the guard receiver (if incorporated) is disabled by reason of a "ground-for-off" line selected by the switch. That is, the guard receiver is off even though it is supplied with the receive mode +12 volts.

4-26. TRANSMIT MODE. The RT unit is in the transmit mode of operation if the PTT relays A1A2K1, K2 are energized by grounding the PTT line through the push-to-talk switch. This mode is also selected in the DF position of the switch.

4-27. In the transmit mode, the "continuous" +24 volts is switched by PTT relay contacts A1A2K1-1, 6 to the transmit-receive relay A1K1 and to PA/Modulator module A5. Contacts A1A2K2-1, 6 also switch +12 volts to modules A4 and A5. Thus, module A5 is supplied with the transmit +24 and +12 volts, and +12 volts is supplied to the modulator preamplifier circuits of module A4. Relay A1K1 transfers the antenna from the receiver to the transmitter.

4-28. The transmit-section common contact of the 10 MHz logic switch (not shown) is grounded (via A1A2K2-2, 5) to the same ground line connected to the 1 MHz and 50 kHz logic switches.

4-29. If external wideband equipment is used, the external carbon microphone is supplied with current from a constant-current source which is energized from +12 volts.

4-30. R/T UNIT CHASSIS/CONTROL HEAD A1.

4-31. The combined R/T unit chassis and control head (refer to Figure 6-17) are considered as one assembly and given the partial reference designator A1. The electrical parts of the main chassis and the control head logic-switching circuitry are separately described beginning with paragraphs 4-32 and 4-34 respectively.

4-32. CHASSIS, ELECTRICAL.

4-33. The chassis provides mounting facilities for the control head gear train and logic circuitry, one attenuator-filter board, one wideband amplifier board, and the five (six if the Guard Receiver is incorporated) modules. The internal wiring harness provides the interconnections for the control head logic and other circuit boards and the receptacles for the five plug-in modules. The schematic diagram is given in Figure FO-3.

4-34. CONTROL HEAD LOGIC-SWITCHING SECTION.

4-35. The control head logic-switching section is located in the upper part of the RT unit chassis. The section includes the RT unit operating controls, the frequency selection control geartrain, and three printed circuit boards. Figure FO-4 is the schematic diagram.

4-36. PRINTED CIRCUIT BOARD A1A1. This printed circuit board includes section A (receive section) of the X10 MHz frequency selector logic switch A1A1S1A, isolating diodes, and inverter amplifiers for the band switch output lines. The X10 MHz logic switch is described beginning with paragraph 4-60.

4-37. PRINTED CIRCUIT BOARD A1A2. This printed circuit board includes section B (transmit section) of the X10 MHz frequency selector logic switch A1A2S1B, isolating diodes, bias resistors for the switch output lines, and PTT controlled relays A1A2K1 and A1A2K2. The X10 MHz logic switch and the relays are described beginning with paragraph 4-60.

4-38. PRINTED CIRCUIT BOARD A1A3. This printed circuit board includes the X1 MHz logic switch A1A3S1 and 50 kHz logic switch A1A3S2. The X1 MHz logic switch and the 50 kHz logic switch are described in paragraphs 4-68 and 4-69 respectively.

4-39. CONTROL GEARTRAIN. The knob-operated MEGAHERTZ readout window dials (located at the top of the RT unit) are mechanically coupled to the X10 MHz, X1 MHz, and 50 kHz (0.05 MHz) logic-control switches. The shafts of the switches, are in turn, mechanically connected through a gear train and removable couplings to the tuning shafts of PA/Modulator module A5 and Receive RF module A6. The gearing is differentially arranged so that, as the switches are positioned, individually or together, the angular positions coupled to the tuning shafts of modules A5 and A6 are in step with the corresponding sets of coded command signals sent from the logic switches to Frequency Synthesizer module A3. That is, for any frequency channel selected, the master oscillator in module A3 is caused to generate a frequency to which the transmitter and receiver rf stages are mechanically tuned.

4-40. CONTROL CIRCUITS.

4-41. GENERAL. The RT unit incorporates five basic operator control circuits: function selection, frequency selection, PTT switching, volume control, and squelch control. These control circuits are described under the subheadings following.

4-42. FUNCTION SELECTION. Referring to Figures FO-2 and FO-3, rotary-type function selector switch A1S1 has four positions. These positions are marked: OFF, T/R, T/R + G, and DF.

4-43. In the OFF position of switch A1S1, the continuous +24 volts is applied via module A2 to terminals A1S1-5, 6, 7. There are no circuits which are complete or energized.

4-44. The T/R position connects +24 volts to terminals A1S1-2, 3, 4. This applies +12 volts to the receive mode circuits, and +24 and +5 volts to those circuits common to the receive and transmit modes. A ground is applied via terminals A1S1-11, 12 to module A7 (if incorporated) to disable that module even though the receive mode +12 volts is applied.

4-45. The T/R + G position is the same as T/R except that the ground is removed from mocule A7 (if incorporated), and that module is thus active.

4-46. If the PTT button (located on the handset or external wideband equipment) is pressed, the RT unit is placed in the transmit mode for the T/R or T/R + G positions. This is because the PTT relays A1A2K1, K2 are energized to remove the receive mode +12 volts and to apply +24 and +12 volts to the transmit mode circuits, and +24 volts to the transmit-receive (antenna transfer) relay A1K1.

4-47. If the DF position is selected, two separate functions are activated. The RT unit is placed in the transmit mode because the PTT line is grounded via terminals A1S1-12, 1. The modulator preamplifier/audio amplifier in module A4 is caused to oscillate at 1000 Hz by connecting output to input via switch terminals A1S1-9, 10 and a phase-shifting network on circuit board A1A4.

4-48. FREQUENCY SELECTION. The physical means of selecting any one of 3500 channels in the 225.00 to 399.95 MHz frequency band is provided by three hand-operated MEGAHERTZ selector knobs located on the control head panel (Figure 3-1). The frequency selected is displayed in three figure and two-place decimal form in three readout windows. The left-hand window displays two-column numerals 00 to 39 depending on the X10 MHz (hundreds and tens) frequency selected. The middle window displays numerals 0 to 9 depending on the X1 MHz (units) frequency selected. The fixed decimal point is marked on the panel. The right-hand window displays the two-place decimal 00 to 95 depending on the 50 kHz (0.05 MHz) frequency increment selected.

4-49. The readout window dials are mechanically connected to the shafts of the X10 MHz, X1 MHz, and 50 kHz logic switches. The selected outputs (sets of coded command signals) of these switches are fed to frequency determining circuits in Frequency Synthesizer module A3.

4-50. Module A3 contains a master oscillator comprised of six voltage-controlled oscillators (VCO's), six logic-type frequency divider stages, a phase detector, and a 4.266666 MHz frequency standard. The six VCO's cover the 65.0 to 133.3166 MHz band, each VCO being capable of covering approximately one sixth of the total band. The active VCO is stabilized to the frequency standard via a frequency dividing phase-locked loop comprised of the six logic-type divider stages and a phase detector. The output of this loop is a d-c voltage which fine-tunes the VCO to compensate for any tendency to drift in frequency.

4-51. When the RT unit goes from the receive mode to the transmit mode, the 10 MHz switch is caused to produce a set of coded command output signals which require a frequency increase of 10 MHz from the active VCO. When trebled by the transmitter input stage, this frequency difference is equivalent to the 30 MHz first intermediate frequency of the receiver.

4-52. PTT SWITCHING. The d-c power and ground switching controlled by the PTT relays A1A2K1, K2 (Figure FO-2) is described beginning with paragraph 4-19 above. In Figure FO-4, the heavy vertical line on the right-hand edge of each logic switch represents the common contact referred to in the above mentioned description. The common contacts of A1A3S1 and A2A3S2 are permanently grounded (and the switches are continuously operative) via terminals A3-K, A2-K, and A2E1. The common contact for switch A1A1S1A is grounded via PTT relay contacts A1A2K2-2, 4 in the receive mode only. Similarly, the common contact for switch A1A2S1B is grounded via contacts A1A2K2-2, 5 in the transmit mode only. These switches (which form the receive section A and transmit section B of the 10 MHz logic switch) are therefore operative only for their respective modes. The transfer between sections A and B of the 10 MHz logic switch causes the Frequency Synthesizer module A3 to produce a 10 MHz difference in frequency between the receive and transmit modes. This frequency difference, when tripled in modules A5 and A6, is equivalent to the receiver first intermediate frequency (30 MHz).

4-53. VOLUME CONTROL. Referring to Figure FO-3, VOL control A1R3 controls the level of the audio signal at the handset earphone. Three separate audio signals may be applied to the cw terminal. One input is the normal receiver audio output from module A4 applied via connector pin A4J1-3. Another input is applied from connector pin A7J1-6 (if a guard receiver is incorporated). The third input is the transmitter sidetone (own voice) audio applied via isolating resistor A1A4R7 to the IF/Audio module via pin A4J1-9 and thence back to A1R3 at the cw terminal.

4-54. The ccw terminal of A1R3 is connected through resistor A1R5 to a ground point in module A4. This limits the range of control so that there will always be a discernible signal in the handset earphone. The audio signal at the wiper-arm of A1R3 is taken back to module A4 (via capacitor A1C1) where it is amplified and applied to the handset earphone from connector pin A1A4-13.

4-55. SQUELCH CONTROL. In Figure FO-3, variable resistor A1A4 (marked "SQ") adjusts the receiver squelch sensitivity. This control, acting on a circuit in IF./Audio module A4, sets a squelch threshold level for the r-f input carrier signal after r-f and i-f amplification. For a carrier level greater than the squelch threshold level (normally because a carrier is present), a squelch "gate" is "open" to pass detected audio to the handset earphone. Conversely, for a carrier level less than the threshold (normally because a carrier is not present), the gate is "closed" to receiver noise.

4-56. <u>CIRCUIT BOARDS A1A4 AND A1A5</u>.

4-57. Circuit board A1A4 (Figure FO-3) provides an impedance-matching and attenuator network between the WIDEBAND microphone input at jack-pin 3J1-8 and the NORMAL microphone input at connector-pin A4-20.

4-57A. On circuit board A1A5, transistor-package A1A5Q1 provides voltage amplification for the "wideband" audio output from connector-pin A4-9. The amplified output from terminal A1A5-E5 is routed to WIDEBAND jack-pin 3J1-6 for use in external equipment.

4-57B. Transistor A1A5Q2, with Zener diodes A1A5CR1 and A1A5CR2, provide a stabilized 55 mA current source required for energizing an external microphone connected to WIDEBAND jack-pin 3J1-8.

4-58. CONTROL HEAD LOGIC-SWITCHING CIRCUITS.

4-59. The control head logic-switching circuits produce sets of coded "command" output signals which cause Frequency Synthesizer module A3 to generate the required

transmitter and receiver master oscillator frequencies. The circuits are described separately under the subheadings following. Figures FO-3 and FO-4 are referenced for circuit details. Table 4-1 is placed near the end of the discussion to facilitate easier reference to output states.

NOTE

The frequency synthesizer circuits referred to below are described in detail beginning with paragraph 4-71.

4-60. X10MHZ SWITCH. Referring to Figure FO-4, this switch is a two-section printed circuit rotary type. The receive logic-control section A1S1A (section A) is part of printed circuit board A1A1. The transmit logic-control section A2S1B (section B) is part of printed circuit board A1A2. The switch outputs are applied to counter U4 in module A3.

4-61. In Figure FO-4, the physically concentric printed contacts of the two switch sections are represented by solid vertical lines on a rectangular grid network. The vertical coordinates 22 to 39 represent the X10 MHz switch positions: the horizontal coordinates U, V, W, XY, Y and LW represent the output logic control lines to the U4 counter. Line L is the limiter amplifier voltage control line. Lines B, C, D, E and F are the frequency band control lines to the voltage-controlled oscillators in module A3. The solid horizontal bar on section A, shown connected mechanically (dotted line) to a corresponding bar on section B, represents the switch rotor contact. The heavy vertical line represents the common stationary contact for all positions of the rotor contact.

4-62. Section B provides outputs only in the transmit mode. When the PTT switch is pressed, a ground is applied (through PTT contacts A2K2-2, 5) from the common stationary contact via the rotor contact to various combinations of output lines, depending on the setting of the X10 MHz switch.

NOTE

In the frequency position shown in Figure FO-4 (i.e., 22), when section B is activated for the transmit mode, lines U, Y, B and LW from A2S1B are grounded by the rotor contact and therefore provide logic '0' outputs for these lines. The remaining lines are open and have logic '1' outputs. Table 4-1 lists the logic outputs to module A3.

4-63. In the section B output circuit of lines U, V, W, XY and Y are blocking diodes A2CR1 through A2CR5 to isolate transmit and receive logic outputs. Diode A2CR6 provides the 'XY' function. Resistors A2R1 through A2R5 provide 'pull up' voltage to the logic input of counter U4 when logic '1' (or open state) is applied.

4-64. Lines B, C, D, E and F (in section B) are connected via isolating diodes A2CR7 through A2CR11 and the inverter amplifiers in A1Z1 to the frequency synthesizer voltage controlled oscillators (VCO's) for bands B, C, D, E and F respectively. The ground signal output (e.g., line B in the 22 position) is fed to an inverter, thereby producing an 'open' signal which activates the VCO in the band selected (in this case, band B).

4-65. Line L applies a ground signal to the frequency synthesizer limiter amplifier voltage control line when the frequency selected is the lowest X10 position in its particular band. Diode A2CR13 provides the 'LW' function.

4-66. Section A is the receive logic section. In this case, the common stationary contact is grounded only in the receive mode (through PTT contacts A2K2-2, 4). Note that the switch logic is displaced for corresponding rotor contact positions of the two switch sections. The effect is to cause a 10 MHz difference between the transmitter and receiver frequencies generated by the master oscillator (band VCO) in module A3. After frequency tripling in modules A5 and A6, this difference provides the 30 MHz

Table 4-1. Control Head Logic-Switching Outputs (Sheet 1 of 4)

A. X10 MHZ SWITCH - TRANSMIT MODE											
	COUNTER U4 CONTROL					LIMITER AMPLIFIER	VCO BAND				
	U	V	W	X	Y	L	B	C	D	E	F
XA3P1 Pin No.	9	20	8	19	18	17	16	15	14	5	6
X10 MHZ DIAL SETTING											
22	0	1	0	1	0	0	1	0	0	0	0
23	1	0	0	1	0	1	1	0	0	0	0
24	0	0	0	1	0	1	1	0	0	0	0
25	1	1	1	0	0	0	0	1	0	0	0
26	0	1	1	0	0	1	0	1	0	0	0
27	1	0	1	0	0	1	0	1	0	0	0
28	0	0	1	0	0	0	0	0	1	0	0
29	1	1	0	0	0	1	0	0	1	0	0
30	0	1	0	0	0	1	0	0	1	0	0
31	1	0	0	0	0	1	0	0	1	0	0
32	0	0	0	0	0	0	0	0	0	1	0
33	1	1	1	1	1	1	0	0	0	1	0
34	0	1	1	1	1	1	0	0	0	1	0
35	1	0	1	1	1	1	0	0	0	1	0
36	0	0	1	1	1	0	0	0	0	0	1
37	1	1	0	1	1	1	0	0	0	0	1
38	0	1	0	1	1	1	0	0	0	0	1
39	1	0	0	1	1	1	0	0	0	0	1

NOTE

0 represents a ground condition for counter control and limiter amplifier outputs at various switch positions.

1 represents an open-circuit condition for VCO band selection outputs from an inverter stage at frequency synthesizer connector XA3P1.

Table 4-1. Control Head Logic-Switching Outputs (Sheet 2 of 4)

B. X10 MHZ SWITCH - RECEIVE MODE

	COUNTER U4 CONTROL					LIMITER AMPLIFIER	VCO BAND					
	U	V	W	X	Y	L	A	B	C	D	E	F
XA3P1 Pin No.	9	20	8	19	18	17	7	16	15	14	5	6
X10 MHZ DIAL SETTING												
22	1	0	1	1	0	0	1	0	0	0	0	0
23	0	0	1	1	0	1	1	0	0	0	0	0
24	1	1	0	1	0	1	1	0	0	0	0	0
25	0	1	0	1	0	0	0	1	0	0	0	0
26	1	0	0	1	0	1	0	1	0	0	0	0
27	0	0	0	1	0	1	0	1	0	0	0	0
28	1	1	1	0	0	0	0	0	1	0	0	0
29	0	1	1	0	0	1	0	0	1	0	0	0
30	1	0	1	0	0	1	0	0	1	0	0	0
31	0	0	1	0	0	0	0	0	0	1	0	0
32	1	1	0	0	0	1	0	0	0	1	0	0
33	0	1	0	0	0	1	0	0	0	1	0	0
34	1	0	0	0	0	0	0	0	0	1	0	0
35	0	0	0	0	0	0	0	0	0	0	1	0
36	1	1	1	1	1	1	0	0	0	0	1	0
37	0	1	1	1	1	1	0	0	0	0	1	0
38	1	0	1	1	1	1	0	0	0	0	1	0
39	0	0	1	1	1	0	0	0	0	0	0	1

NOTE

In the receive mode, the frequency synthesizer output after tripling is 30 MHz lower than corresponding transmit mode output; therefore, the control logic outputs are transposed 30 MHz.

Table 4-1. Control Head Logic-Switching Outputs (Sheet 3 of 4)

C. X1 MHZ SWITCH

	COUNTER U3 CONTROL			
	W	X	Y	Z
XA3P1 Pin No.	26	29	27	28
X1 MHZ DIAL SETTING				
0	0	0	0	0
1	1	1	1	1
2	0	1	0	1
3	1	1	0	1
4	1	0	0	1
5	0	0	0	1
6	1	1	1	0
7	0	1	0	0
8	1	1	0	0
9	1	0	0	0

D. 50 KHZ SWITCH

	COUNTER U2 CONTROL				COUNTER U1 CONTROL
	W	X	Y	Z	n
XA3P1 Pin No.	25	23	24	22	4
50 KHZ DIAL SETTING					
00	0	0	0	0	0
05	0	0	0	0	1
10	1	1	1	1	0
15	1	1	1	1	1
20	0	1	0	1	0
25	0	1	0	1	1

Table 4-1. Control Head Logic-Switching Outputs (Sheet 4 of 4)

D. 50 KHZ SWITCH (CONT)					
	COUNTER U2 CONTROL				COUNTER U1 CONTROL
	W	X	Y	Z	n
XA3P1 Pin No.	25	23	24	22	4
50 KHZ DIAL SETTING					
30	1	1	0	1	0
35	1	1	0	1	1
40	1	0	0	1	0
45	1	0	0	1	1
50	0	0	0	1	0
55	0	0	0	1	1
60	1	1	1	0	0
65	1	1	1	0	1
70	0	1	0	0	0
75	0	1	0	0	1
80	1	1	0	0	0
85	1	1	0	0	1
90	1	0	0	0	0
95	1	0	0	0	1

intermediate frequency in the receiver (the transmitter frequency is 30 MHz higher than that of the receiver).

4-67. Isolation diodes are used in the output lines of the switch because the corresponding lines of each section are connected to a common output. For example, diode A1CR11 prevents a possible ground via other lines from U of section B from being fed back to line U of section A and hence to the common contact when in the receive mode. Lines V, W, X and Y of section B are isolated from the corresponding lines of section A by diodes A2CR2 through A2CR5 on the section B side and A1CR1 through A1CR4 on the section A side. Lines X and Y are common for the 250 MHz through 320 MHz positions. Diode A2CR6 isolates the X and Y lines in the 220 MHz through 240 MHz frequency positions. Line A (Band A) is used only in the receive mode. Diodes A2CR7 and A2CR8 isolate lines B and C and block any grounding of the lines in the receive mode. Diodes A2CR9, A2CR10 and A2CR11, and corresponding diodes A1CR6, A1CR7, and A1CR8 isolate lines D, E, and F respectively of sections A and B. Diodes A2CR12 and A1CR9 isolate lines L in each switch section. Diodes A2C13 and A1CR10 isolate the shared portions of lines L and W in sections A and B respectively.

4-68. X1MHZ SWITCH CIRCUIT. The X1 MHz switch A3S1 on printed circuit board A3 is a logic switch common to both the transmit and the receive modes. In this case, the common stationary contact and the rotor contact are permanently at ground potential provided at terminal A3-K. The equivalent frequency range is from 0 to 9 MHz in 1 MHz steps. Lines W, X, Y and Z provide ground or open-circuit control outputs to counter control U3 in Frequency Synthesizer module A3.

4-69. 50 KHZ SWITCH CIRCUIT. The 50 kHz switch A3S2 is also a switch common to both the transmit and receive modes. The common stationary and rotor contact are permanently grounded at A3-K. The equivalent frequency range is from .00 to .95 MHz in .05 MHz steps. Grounded or ungrounded control outputs are applied to counters U2 and U1 in module A3. Lines W, X, Y and Z provide the control inputs for U2, and line n provides the control input for U1.

4-70. OUTPUT INVERTER CIRCUIT. The coded command signals on output lines A, B, C, D, E and F from the X10 MHz switch are fed to signal inverters (in inverter amplifier circuit block A1Z1) before being applied to the appropriate voltage-controlled oscillators (VCO) in Frequency Synthesizer module A3. The inverters transform the ground signals from the X10 MHz switch into 'open' signals which 'enable' the VCO's to oscillate. Each switch output is connected to a different VCO; e.g., line A is connected to the 65 to 73.3 MHz band VCO.

4-71. FREQUENCY SYNTHESIZER MODULE A3.

4-72. GENERAL. Frequency Synthesizer module A3 contains the reference frequency standard, voltage-controlled oscillators (VCO's), and frequency dividers for establishing the RT unit operating frequency. Table 4-2 lists the circuit blocks contained in the module. Refer to Figure 4-1 for the basic signal flow, and to Figure FO-5 for the combined schematic and logic diagram. Other references are given as required.

NOTE

A useful acronym for the Frequency Synthesizer module is "SMO" (Stabilized Master Oscillator).

4-73. The control inputs to the frequency synthesizer divider stages are provided by the X10 MHz, X1 MHz and 50 kHz frequency control logic switches as described under paragraph 4-58. The X10 MHz switch also provides the band selection inputs to the voltage-controlled oscillators.

4-74. The fundamental frequency source of the Frequency Synthesizer is one of six voltage-controlled oscillators (VCO's). Three VCO packets (each with two VCO circuits) are contained on circuit board A1. The frequency bands of the VCO's are as follows:

Band	Frequency (MHz)
A	65 - 73.3
B	73.3 - 83.3
C	83.3 - 93.3
D	93.3 - 106.6
E	106.6 - 120.0
F	120.0 - 133.3

4-75. The frequency band is selected by means of the X10 MHz selector switch as described under the heading of paragraph 4-58 above. The exact output frequency of the VCO in use is determined by a d-c control voltage which electronically tunes the voltage variable capacitors in the VCO. This voltage is derived by phase locking the frequency dividers to a reference frequency.

4-76. There are six digital frequency dividers or counters in Frequency Synthesizer A3. These are designated U0, U1, U2, U3,

Table 4-2. Frequency Synthesizer Module A3, List of Circuit Blocks

PARTIAL REF DESIG	COMMON NAME
A1	Sub-board Assembly
A1A1	Voltage-controlled Oscillator (Bands A and B)
A1A2	Voltage-controlled Oscillator (Bands C and D)
A1A3	Voltage-controlled Oscillator (Bands E and F)
A1A4	Buffer Regulator
A1A5	Preamplifier
A1FL1	Low-pass Filter
A2	Binary Divider U0
A3	Digital U1
A4	Counter U2 Driver
A5	Dual JK Flipflop (part of Counter U2)
A6	Same as A5
A7	Dual RST Flipflop (part of Counter U2)
A8	Logic Gate Block (part of Counter U2)
A9	Decade Counter U3
A10	Digital Counter U4
A11	Fixed Divider U5
A12	Buffer Amplifier
A13	Voltage Regulator
A14	Frequency Standard
A15	Resistor Assembly

NOTE

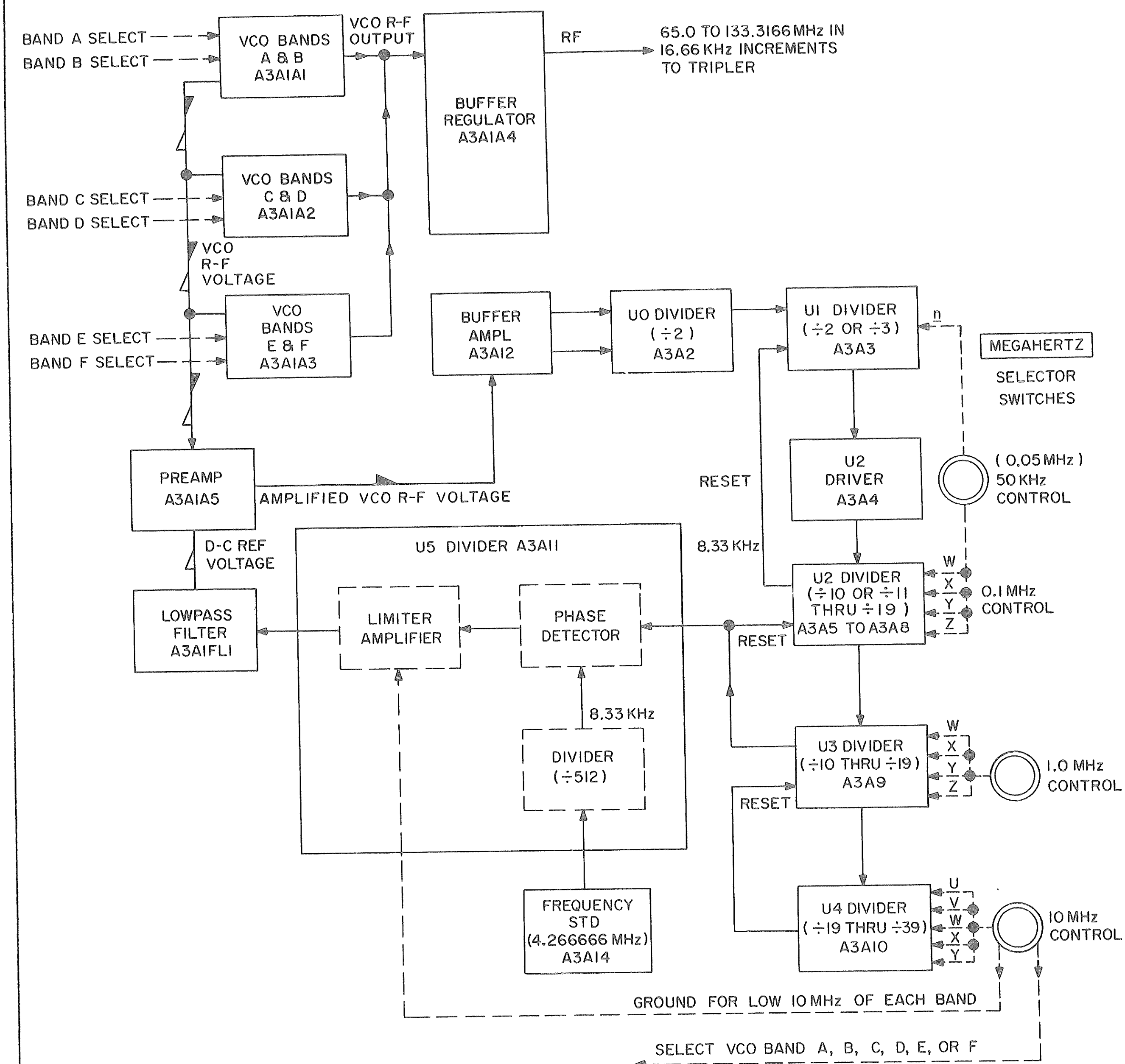
All circuit blocks are thin-film packet or monolithic integrated-circuit assembly type except A1FL1, A4, and A15.

U4 and U5. The first counter U0 is a fixed divide-by-2 counter. Counters U1 through U4 are variable division ratio counters which are set for the required division ratio by means of the logic output from the frequency selector controls. A frequency standard source of 4.266666 MHz provides an input to counter U5 which is a fixed divide-by-512 counter. The output from this counter is the 8.33 kHz reference frequency.

4-77. Counters U0 through U4 divide the VCO output frequency by a preselected divisor to reduce it to the reference frequency of 8.33 kHz. The output from this counter chain and the 8.33 kHz reference frequency output from counter U5 are both fed to a phase detector from which an output is applied to a limiter amplifier stage.

4-78. The limiter amplifier output is fed via low-pass filter A1FL1, a lag network, and a resistor in the preamplifier packet A1A5 to the VCO. The VCO r-f voltage superimposed on the VCO control line (pin 3 on each VCO circuit block) is amplified by preamplifier A1A5 and fed (via buffer amplifier A12) into the divider chain.

4-79. Initially, the VCO is unlocked and the counter chain output and the reference frequency output to the phase detector are not equal. If the counter chain output frequency is lower than the reference frequency, then



NOTES:

1. ___ INDICATES PATH OF LOGIC-SWITCH COMMAND SIGNALS TO MODULE A3 CIRCUITS.

2. INDICATES PATH OF R-F RIPPLE VOLTAGE AT VCO FREQUENCY.

3. INDICATES PATH OF D-C REFERENCE VOLTAGE TO VCO.

4. PREAMP A3A1A5 COMPLETES D-C CONNECTING PATH FOR D-C REFERENCE VOLTAGE.

Figure 4-1. Frequency Synthesizer Module 1A3, Functional Block Diagram the d-c control voltage fed back to the VCO is increased and the VCO output frequency is corrected. A phase locked condition is thus achieved. Conversely, if the counter chain input frequency is higher than the reference frequency, the d-c control voltage to the VCO is decreased until phase lock is again achieved.

4-80. The VCO r-f output is routed via buffer regulator A1A4 and a hybrid transformer to the broadband amplifier and tripler stages in PA/Modulator module A5 and the tripler stage in Receive RF module A6.

4-81. U0 COUNTER. The U0 counter A2 is a thin-film packet containing a single flipflop with a fixed frequency division ratio of 2:1. The maximum steady state input frequency from the VCO and buffer stages is 133.3166 MHz. The counter accepts a balanced input from the buffer amplifier. A pulse-shaping network within the circuit block produces a square-wave at half the VCO frequency. The square wave is amplified and applied to the input of the U1 counter.

4-82. U1 COUNTER. The U1 counter A3 is a thin-film packet containing two flipflops, and associated control gates. A logic representation of the U1 counter is given in Figure 4-2. This counter accepts an input from the U0 counter and provides an output to the U2 counter. Counter U1 provides a continuous divide-by-two function except that, upon receipt of an $\overline{H2}$ pulse (which occurs at a 8-1/3 kHz rate), it performs a single division by three, provided that the 50 kHz control switch is set to a position that ends in 5 (e.g., .05, .15, .25, etc.). Waveforms are shown in Figure 4-3.

NOTE

By changing the division ratio of the U1 counter from 2 to 3 over a 8.33 kHz period, the overall output frequency of the Frequency Synthesizer is changed by 2 x 8.33 = 16.66 kHz. After passing through a tripler stage, the frequency change is 16.66 x 3 = 50 kHz. This is the desired channel separation frequency.

4-83. When the 50 kHz switch is in any position such that the last digit is 0 (i.e., .00, .10, .20, etc.), the $\underline{n}$ line is grounded. Point C is then held low and flipflop B output remains at 0. This output is connected to the reset terminal R_{DC} of flipflop A, permitting it to divide by two continuously.

4-84. When the 50 kHz switch is in any position such that the last digit is 5 (i.e., .05, 1.5, .25, etc.), the $\underline{n}$ line is open, enabling flipflop B to be controlled by $\overline{H2}$ and $\overline{A}$ inputs. The H2 pulse and the related input and output pulses of U1 are shown in Figure 4-3. Waveform A is the input (clock) waveform to the U1 counter from the U0 counter. Waveform B is the U1 output $\overline{A}$ from the inverter. Waveform C is the reset input $\overline{H2}$ from the U2 counter: the frequency is 8.33 kHz. Waveform D is the summed input $\overline{A.H2.N}$ to the S terminal of flipflop B. This input pulse permits flipflop B to change only when a ground input is received at $\underline{n}$ (i.e., when the 50 kHz switch is set to .-5). Waveform E is the resultant output B waveform from flipflop B to the reset terminal (R_{DC}) of flipflop A: this inhibits flipflop A and produces the long 3:1 pulse shown in waveform B.

NOTE

In Figure 4-3, waveforms D and E cannot be monitored as they are internal to the U1 thin-film packet, but are included to show the pulse sequence for the divide-by-three function.

4-85. U2 COUNTER. Synchronous decade counter U2 is the highest frequency programmable decade counter in the counter chain. The counter is comprised of four thin-film packets: two manufacturers' type 10-1 dual flipflops A5, A6, one type 10-2 dual flipflop A7, and one type 10-3 logic gate block A8. For logic details refer to Figure 4-4. The input and output waveforms are shown in Figure 4-5.

4-86. The output of counter U1 is fed via driver assembly A4 to counter U2. The U2 output is applied to counter U3. The maximum

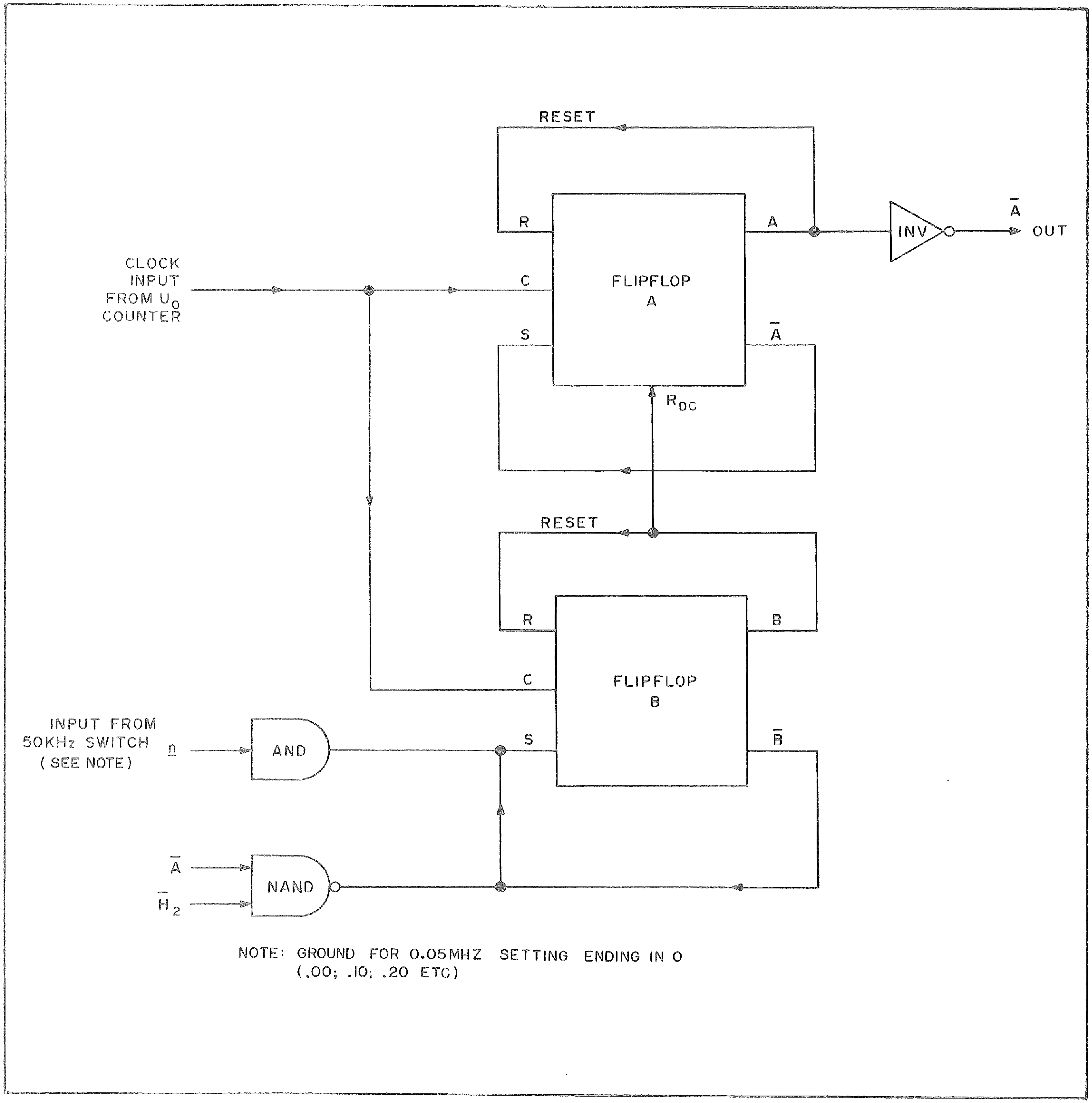


Figure 4-2. Counter U1, Logic Diagram

frequency of counter U2 is approximately 133 ÷ 4 = 33.3 MHz. Continuous division by 10 is performed, except that, upon receiving an $\overline{H3}$ pulse (8.33 kHz), a single long count of between 10 and 19 is performed. The length of this long count is determined by the .1 MHz digit selected by the 50 kHz (i.e., .05 to .95 MHz) control.

NOTE

By changing the division ratio of the U2 counter by one over a 8.33 kHz period, the overall output of the frequency synthesizer is changed by 2 x 2 x 8.33 = 33.33 kHz. After passing through the tripler stage, the frequency change is 100 kHz or 0.1 MHz.

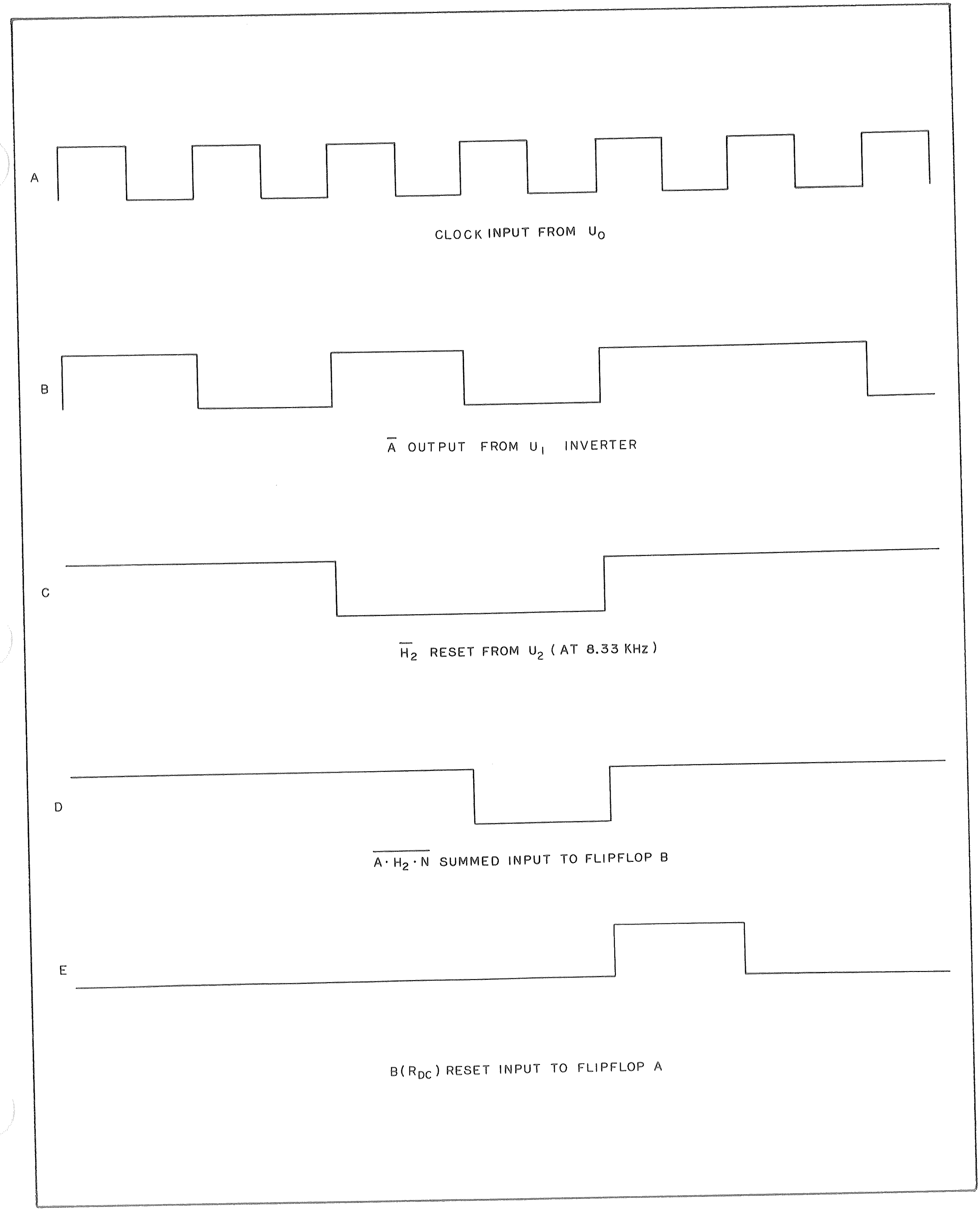
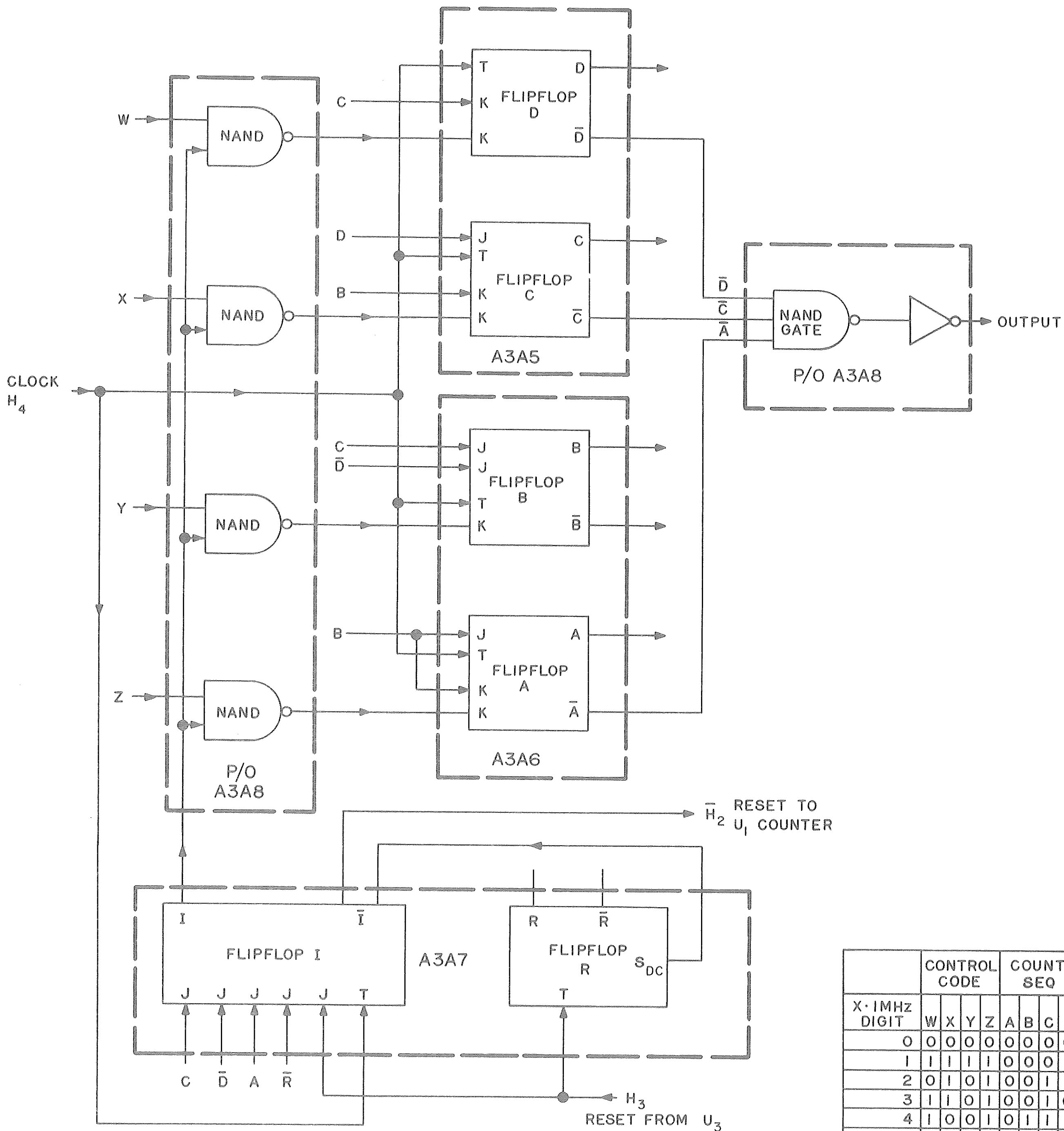


Figure 4-3. Counter U1, Pulse Timing Diagram



X·1MHz DIGIT	CONTROL CODE W	X	Y	Z	COUNT SEQ A	B	C	D
0	0	0	0	0	0	0	0	0
1	1	1	1	1	0	0	0	1
2	0	1	0	1	0	0	1	1
3	1	1	0	1	0	0	1	0
4	1	0	0	1	0	1	1	1
5	0	0	0	1	1	0	0	0
6	1	1	1	0	1	0	0	1
7	0	1	0	0	1	0	1	1
8	1	1	0	0	1	0	1	0
9	1	0	0	0	1	1	1	1

Figure 4-4. Counter U2, Logic Diagram

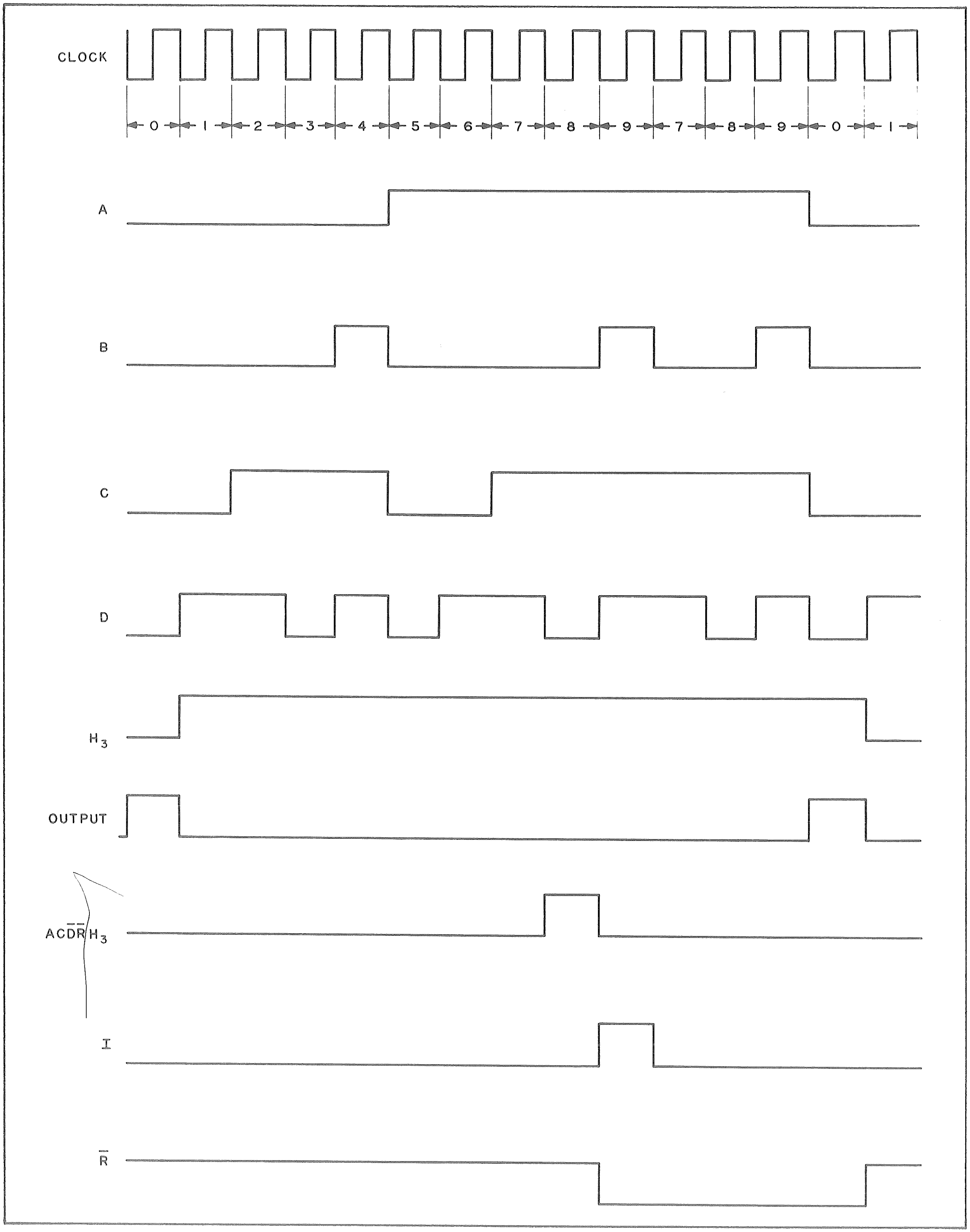


Figure 4-5. Counter U2, Pulse Timing Diagram (Seventh State)

4-87. The count sequence of the U2 counter is shown in Table 4-3. The associated control code inputs from the .1 MHz contact of the 50 kHz frequency switch for each 'long count' (i.e., division by 10 to 19) are also given: the '0' represents a ground input and the '1' represents an open input on a positive potential. Note that the count sequence is not in normal binary number order: the sequence used simplifies the basic decade gating circuitry.

4-88. Normally, with the H3 reset pulse absent, the resetting flipflops I and R remain in the 0 state, and this output from the I binary forms one input of each of the four reset NAND gates, forcing their outputs to the 1 state regardless of the control code input (W, X, Y or Z). These 1's are ANDed with the other inputs to the K terminals of the basic flipflops A through D (see Figure 4-5), permitting the counter to perform continuous division by 10. The output state is the all 0 state since it is not used when performing the long count. Note also that the function $\overline{H2}$ is normally at a 1 level.

4-89. When the counter is to perform its single long count, H3 becomes a 1 and the function $AC\overline{D}RH3$ recognizes the 8th counter state (1010) and sets up the J terminal of the I flipflop so that the next incoming pulse changes its output to a 1. This same clock pulse also sets the basic counter to the 9th state (1111). As soon as this occurs (and before the next clock pulse), R is set to a 1 by its S_{DC} terminal. The 1 output of the I binary is NANDed with the control input code produced by the .1 MHz frequency selector switch, thus generating a 1 on the K terminals

Table 4-3. Counter U2, Count Sequence and Control Codes

STATE NO.	COUNT SEQUENCE	DIVIDE BY	CONTROL CODE (0 = GND 1 = OPEN)	0.1 MHZ DIAL SETTING
	ABCD		WXYZ	
0	0000*	10	0000	0
1	0001	19	1000	9
2	0011	18	1100	8
3	0010	17	0100	7
4	0111	16	1110	6
5	1000	15	0001	5
6	1001	14	1001	4
7	1011	13	1101	3
8	1010	12	0101	2
9	1111	11	1111	1

NOTE

* State 0 is the output state.

of those basic flipflops (A through D) which require resetting to 0 to enter the desired counter state for the counter ratio required. Conversely, a 0 is generated on the K terminals of those flipflops which are to remain 1.

4-90. The next clock pulse effects this transition into the desired state as well as resetting the I binary to 0 (since its K terminal is a 1). Note that the I flipflop cannot return to a 1 again (when passing through the count sequence) until H3 has returned to a 0, since the function $AC\overline{D}\overline{R}H3$ on the J terminal of I is held to a 0 by $\overline{R}$, and the R binary is clocked by H3.

4-91. The circuit action of the counter flipflops can be more readily understood by referring to Table 4-4, which is the JK flipflop table. The next output of the counter is determined by the present state and the state of the ANDed J and K inputs.

4-92. The normal counting sequence of the basic flipflops A through D is as follows. Assume that all counter outputs are in the 0 state. The normal output I of flipflop I is an 0 level. This is applied together with the control code inputs W, X, Y and Z to the four NAND gates. The 0 input from the I flipflop and the 0 or 1 control code input always produce a 1 output from the NAND gate. This output is applied to the K terminal of the corresponding flipflop, together with a feedback input from one of the other flipflops. The state of the ANDed K input or J input determines the next state of the counter: refer to Table 4-3. At flipflop A, the 0 input at J from flipflop B establishes the next output state as 0. At flipflop B, the C output at J (0 state) and the D input at J (1 state) produces an AND gate output of 0: this establishes the next output state as 0. Similarly at flipflop C, the D input at J (0 state) establishes the next output of 0. Finally, at flipflop D, the 1 status of J (no input) establishes the next output state as 1. The resulting counter outputs ABCD are thus changed from 0000 to 0001. In Figure 4-5, the timing and counter pulse relationship is shown with the counter reset to the seventh state (i.e., the frequency control switch is in the .3 MHz position).

Table 4-4. Counter U2, JK Flipflop Truth Table

TRUE OUTPUT		ANDED INPUT*	
PRESENT	NEXT	J	K
0	0	0	-
0	1	1	-
1	0	-	1
1	1	-	0

* where $J = J_1 . J_2$

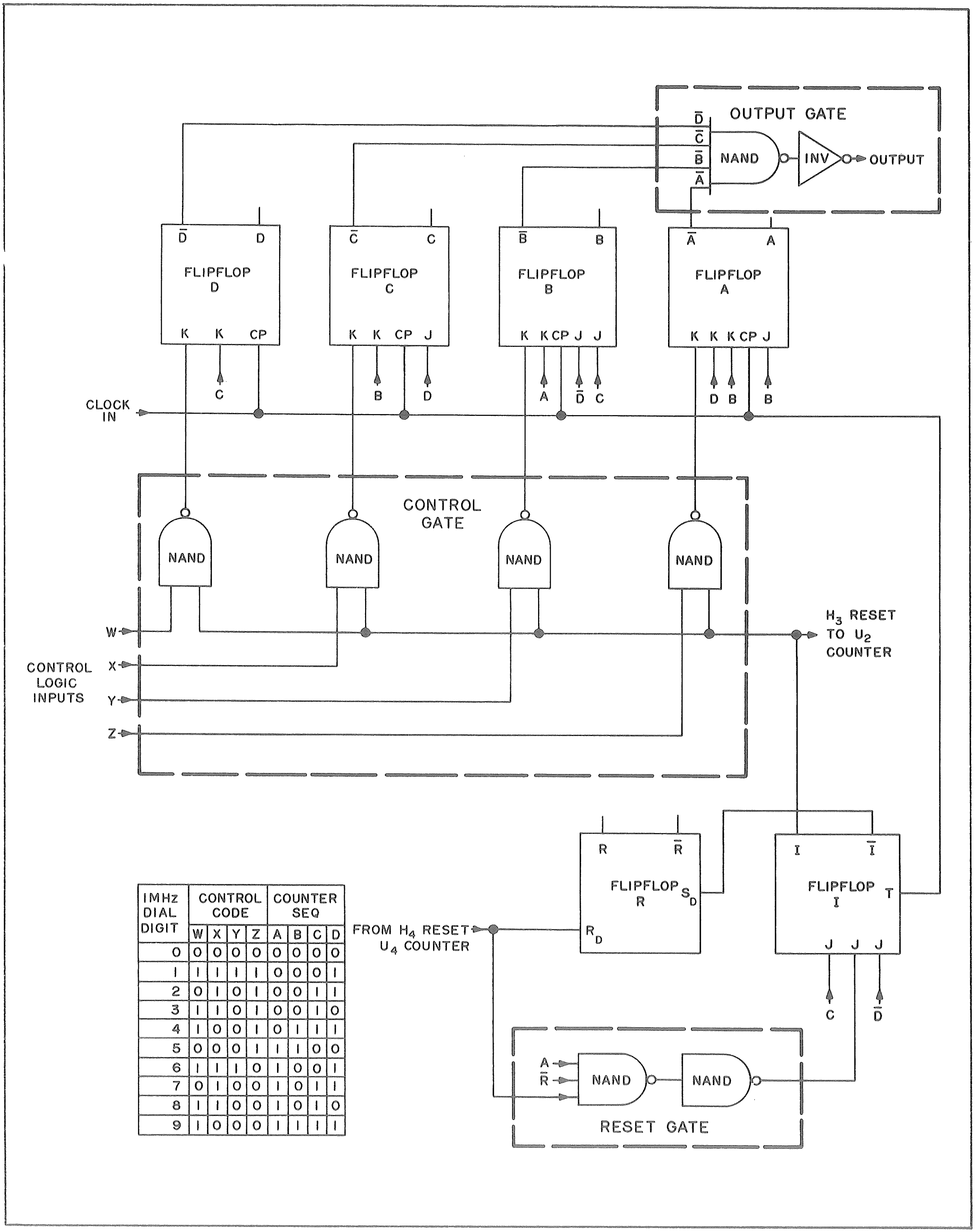
$K = K_1 . K_2$

4-93. U3 COUNTER. Synchronous counter U3 employs nine integrated circuits mounted on a common board A9. These circuits consist of five basic JK flipflops, one RS (reset) flipflop, and three multiple gate circuits (control, reset, and output gates). The maximum input frequency is 3.33 MHz. When the U3 division ratio is changed by one over the 8.33 kHz period, the frequency synthesizer output is changed by 2 x 2 x 10 x 8.33 = 333.33 kHz. After tripling, the final radio output frequency change is 1.0 MHz.

4-94. For the logic circuit diagram of the U3 counter, refer to Figure 4-6. The basic function of the U3 logic circuit is similar to that of the U2 logic. However, it does differ in the following respects:

a. The reset control inputs to the J terminal of flipflop I are applied via two NAND gates in the reset gate circuit block.

b. The reset input H4 from the U4 counter is applied to the d-c reset terminal R_D of flipflop R and not the clock terminal as in counter U2.



1MHz DIAL DIGIT	CONTROL CODE				COUNTER SEQ			
	W	X	Y	Z	A	B	C	D
0	0	0	0	0	0	0	0	0
1	1	1	1	1	0	0	0	1
2	0	1	0	1	0	0	1	1
3	1	1	0	1	0	0	1	0
4	1	0	0	1	0	1	1	1
5	0	0	0	1	1	1	0	0
6	1	1	1	0	1	0	0	1
7	0	1	0	0	1	0	1	1
8	1	1	0	0	1	0	1	0
9	1	0	0	0	1	1	1	1

Figure 4-6. Counter U3, Logic Diagram

c. The reset output H3 to the U2 counter is taken from the true output terminal of flipflop I, whereas in the U2 counter, the corresponding reset output $\overline{H2}$ to the U1 counter is taken from the $\overline{I}$ terminal of flipflop I.

d. An additional K input is provided for flipflops A and B (inputs D and A respectively). This modifies the counter sequence so that the number 5 state of the counter sequence for flipflops ABCD is 1100, whereas for the U2 counter it is 1000.

4-95. The basic cycling of the counter chain and the counter reset action producing a long pulse are the same as for the U2 counter. In this case, the W, X, Y and Z control inputs are provided by the X1 MHz switch.

4-96. U4 COUNTER. Asynchronous counter U4 (A10, the last stage in the controlled divider chain), accepts an input from counter U3 and provides a reset output to counter U3. The counter has the lowest input frequency (333 kHz maximum).

4-97. Included in the U4 circuit are six integrated circuit flipflops A through F, four gate circuit blocks and discrete components CR1, C1, and R1. See Figure FO-6 for the logic path.

4-98. Table 4-5 shows the count sequence and control codes for counter U4. This counter is basically a long-chain, divide-by-64 asynchronous counter of which not all the possible 64 states are used. The count sequence for this particular counter is in normal binary number order, in contrast to the sequence of counters U2 and U3.

4-99. The reset cycle for the U4 counter is as follows: assume that the counter has counted through the state 63 (flipflop ABCDEF outputs are 11111). The next clock pulse will reset all true outputs to 0. The $\overline{E}$ and $\overline{F}$ outputs from the corresponding E and F flipflops are applied to two NAND gates in series. The function $\overline{E.F}$ and the output of the second NAND gate is 1 when both E and F are in the 0 state. This function is NANDed with the control line signals on lines U, V, W, X and Y from the X10 MHz control switch, thereby producing a 0 level on the d-c set (S_D) terminal of each flipflop whose associated control line is in the 1 state. This 0 setting causes the true output of the flipflop to change to 1. The true output of the flipflops whose associated control lines U, V, W, X and Y are in the 0 state will remain at 0.

4-100. As shown in Figure FO-6, the Y control input is fed to the control NAND gate of flipflop E and also via an inverter to the control NAND gate of flipflop F. Consequently the NAND gate inputs to the set (S_D) terminals of the two flipflops are of opposite state. Therefore either flipflop E or F will be reset. The setting function $\overline{E.F}$ then reverts to the 0 state. The next clock pulse will initiate counting, starting at the counter state into which the counter was reset (i.e., it will continue counting toward state 63).

4-101. U5 COUNTER/PHASE DETECTOR/LIMITER. This counter subassembly (A11) consists of nine integrated circuit blocks (A11A1 through A11A9) forming the basic counter, a phase detector integrated circuit block (A11A10), and a limiter amplifier (A11Q1, Q2) comprised of discrete components. See Figure 4-7 for logic details.

a. Divide-by-512 Counter. This counter is the simplest of the integrated circuit counters. It consists of nine RST flipflops connected in a long-chain, asynchronous, divide-by-512 configuration. No reset facilities are provided; so that the count ratio is fixed. The 4.26666 MHz output from the frequency standard is applied to the input of the counter. The counter then divides this input by 512, in divide-by-two stages, and produces a final output of 8.33 kHz which is used as the standard reference frequency. The output provides one input to the phase detector.

b. Phase Detector. The phase detector compares two inputs; one is the H3 input from counter U3 in the basic divider chain, and the other is the 8.33 kHz reference frequency from the divide-by-512 counter.

Table 4-5. Counter U4, Count Sequence and Control Codes
(Sheet 1 of 2)

COUNT STATE NO.	BINARY COUNT 2^5 F	E	D	C	B	2^0 A	DECIMAL DIVISOR OBTAINED BY COUNT RESET	COUNT STATE CONTROL CODE U	V	W	X	Y	BAND	10 MHz CONTROL TX	RX
25	0	1	1	0	0	1	39	1	0	0	1	1	F	39	--
26	0	1	1	0	1	0	38	0	1	0	1	1		38	--
27	0	1	1	0	1	1	37	1	1	0	1	1		37	--
28	0	1	1	1	0	0	36	0	0	1	1	1		36	39
29	0	1	1	1	0	1	35	1	0	1	1	1	E	35	38
30	0	1	1	1	1	0	34	0	1	1	1	1		34	37
31	0	1	1	1	1	1	33	1	1	1	1	1		33	36
32	1	0	0	0	0	0	32	0	0	0	0	0		32	35
33	1	0	0	0	0	1	31	1	0	0	0	0	D	31	34
34	1	0	0	0	1	0	30	0	1	0	0	0		30	33
35	1	0	0	0	1	1	29	1	1	0	0	0		29	32
36	1	0	0	1	0	0	28	0	0	1	0	0		28	31
37	1	0	0	1	0	1	27	1	0	1	0	0	C	27	30
38	1	0	0	1	1	0	26	0	1	1	0	0		26	29
39	1	0	0	1	1	1	25	1	1	1	0	0		25	28
40	1	0	1	0	0	0	24	0	0	0	1	0	B	24	27
41	1	0	1	0	0	1	23	1	0	0	1	0		23	26
42	1	0	1	0	1	0	22	0	1	0	1	0		22	25
43	1	0	1	0	1	1	21	1	1	0	1	0	A	--	24
44	1	0	1	1	0	0	20	0	0	1	1	0		--	23
45	1	0	1	1	0	1	19	1	0	1	1	0		--	22

NOTE: 0 indicates ground, 1 indicates open for positive voltage.

Table 4-5. Counter U4, Count Sequence and Control Codes (Sheet 2 of 2)

COUNT STATE NO.	BINARY COUNT 2^5 2^0 F E D C B A	DECIMAL DIVISOR OBTAINED BY COUNT RESET	COUNT STATE CONTROL CODE U V W X Y BAND	10 MHz CONTROL TX RX
46	1 0 1 1 1 0			
47	1 0 1 1 1 1			
48	1 1 0 0 0 0			
49	1 1 0 0 0 1			
50	1 1 0 0 1 0			
51	1 1 0 0 1 1			
52	1 1 0 1 0 0			
53	1 1 0 1 0 1			
54	1 1 0 1 1 0			
55	1 1 0 1 1 1			
56	1 1 1 0 0 0			
57	1 1 1 0 0 1			
58	1 1 1 0 1 0			
59	1 1 1 0 1 1			
60	1 1 1 1 0 0			
61	1 1 1 1 0 1			
62	1 1 1 1 1 0			
63	1 1 1 1 1 1	← Output state		
0	0 0 0 0 0 0	← Transitory resetting state		

The output pulse width (Figure 4-8) is proportional to the lead or lag of the H3 pulses with respect to the U5 pulses. Increasing lag results in increasing pulse width, and conversely, increasing lead in decreasing pulse width. The phase detector output is passed through isolating diodes CR1 and CR2 (R1 acts as a pull-up resistor) to the limiter amplifier Q1.

c. Limiter Amplifier. Limiter amplifier Q1 controls the phase detector output-pulse amplitude at the input to low pass filter A1FL1. In the lowest 10 MHz portion of each VCO band (22, 25, 28, 32, 36 for transmit; 22, 25, 28, 31, 35, 39 for receive), the base of limiter-control A11Q2 is grounded through isolating diode CR5 and the 10 MHz switch. With A11Q2 conducting, the collector of limiter A11Q1 can fall to a lower voltage level. This action reduces the phase-lock loop gain at the lowest end of each frequency band, thus compensating for the increased sensitivity of the VCO's at the low-end of each

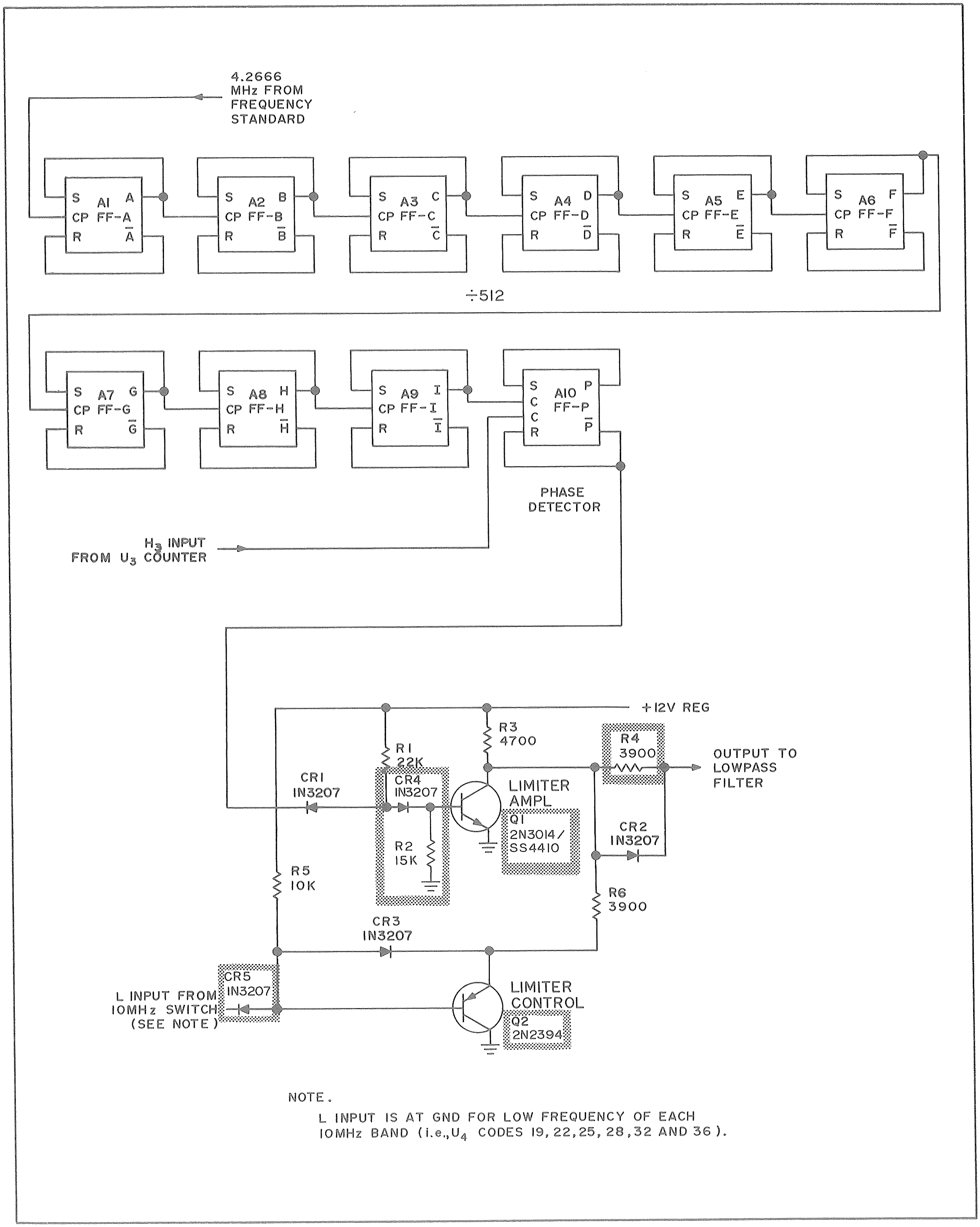


Figure 4-7. Counter U5/Phase Detector/Limiter, Logic Diagram

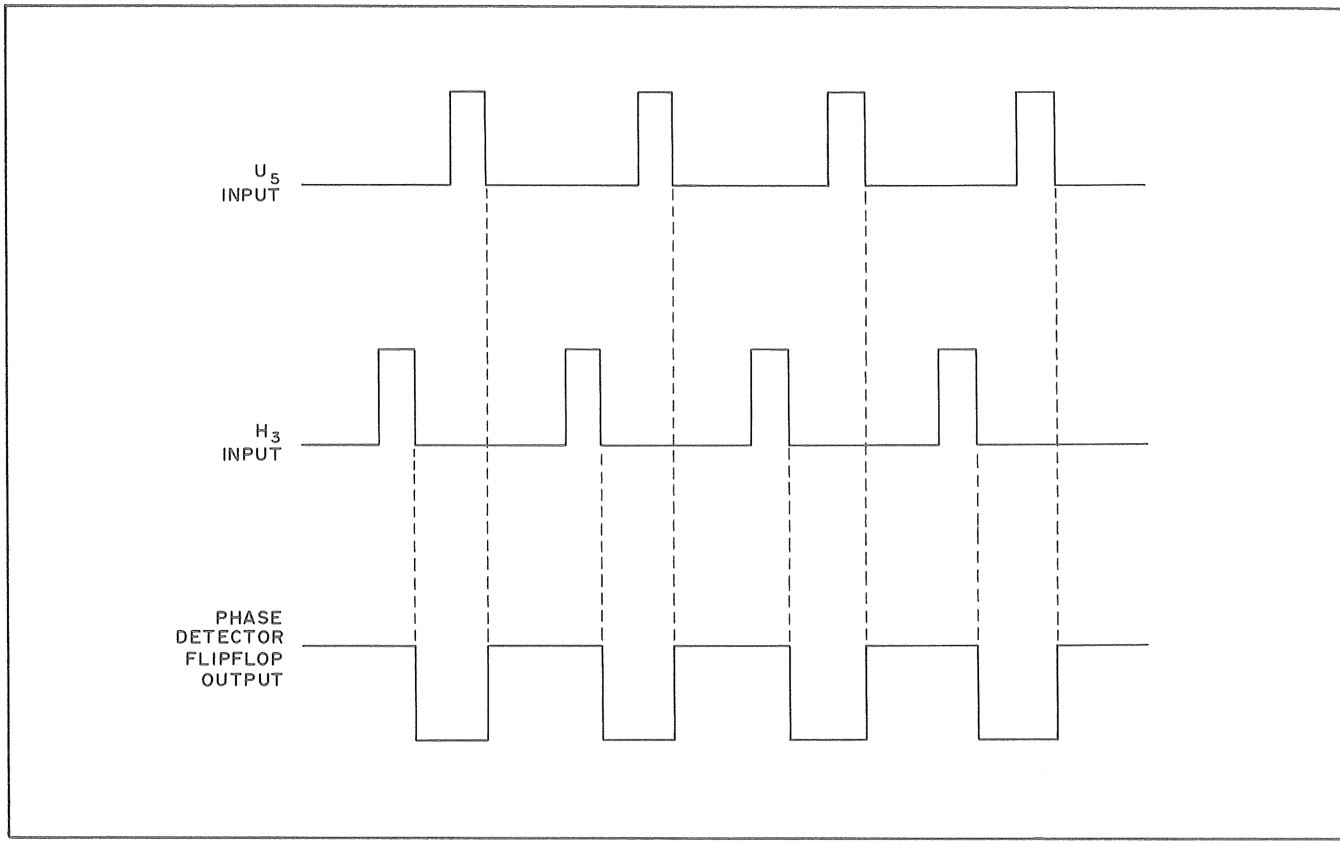


Figure 4-8. Phase Detector Waveforms

band. The limiter amplifier output is applied to low-pass filter terminal A1FL1-1.

4-102. LOW-PASS FILTER. Low-pass filter A1FL1 extracts the d-c component of the phase detector output (via limiter amplifier A11Q1). The mean voltage-value of this d-c component represents the phase-locked condition for the active VCO. This A1FL1 output is applied (via a level-offset network) to preamplifier terminal A1A5-5, thence, via a resistor in A1A5, to terminal 3 of all the VCO packets A1A1 through A1A3.

4-103. VOLTAGE-CONTROLLED OSCILLATORS. Thin-film packets A1A1 through A1A3 each contain two separate VCO circuits. As selected by the X10 MHz switch, only one VCO circuit is active (at any one time) to operate in the desired frequency band (Table 4-6). The active VCO output, at terminal 8 of the packet, is buffered through A1A4 to provide the module r-f output at plug-pin A3P1-31. This same frequency is also an output at terminal 3 of the packet, and is fed back along the d-c input frequency control line to enter the divider chain at preamplifier terminal A1A5-3 (paragraph 4-78).

4-104. The VCO frequency is referenced to the frequency standard (A14) frequency by means of the two dividing chains which provide the two inputs to the phase detector (paragraph 4-101). Any detected VCO frequency "error" causes the low-pass filter output to tune the VCO to the phase-lock frequency, thus stabilizing the phase-lock loop and the VCO output.

4-105. BUFFER/REGULATOR. Buffer/regulator A1A4, mounted on the sub-board, is a thin-film packet consisting of two basic circuits. A voltage regulator circuit accepts a 12-vdc input from the main chassis voltage regulator module A2 and provides a nominal 6-vdc regulated output to the VCO's. The other

Table 4-6. Voltage Controlled Oscillator Frequency Bands

CIRCUIT BLOCK	BAND	FREQUENCY RANGE (MHZ)
A1A1	A	65 to 73.3
	B	73.3 to 83.3
A1A2	C	83.3 to 93.3
	D	93.3 to 106.6
A1A3	E	106.6 to 120.0
	F	120.0 to 133.3

circuit is a buffer amplifier which amplifies the r-f output from the selected VCO and provides the final r-f output from the frequency synthesizer.

4-106. BUFFER AMPLIFIER. Buffer amplifier A12 is a thin-film packet which accepts the amplified VCO r-f output from preamplifier A1A5 and provides a balanced output to U0 counter A2. The circuit is designed so that spurious outputs generated by counter U0 are not fed back to the r-f output line of the frequency synthesizer. The 6-vdc supply for this circuit is obtained from voltage regulator A12.

4-107. PREAMPLIFIER. Preamplifier A1A5 connects the d-c reference voltage from low pass filter A1FL1 to the VCO's, pin 3. It also amplifies the VCO r-f ripple voltage on the voltage control line and applies it to buffer amplifier A12.

4-108. VOLTAGE REGULATOR. Voltage regulator A13 is a thin-film packet. It has two separate circuits. The first circuit provides regulated 6-vdc outputs to the VCO's and buffer/amplifier derived from 12-vdc obtained from the external voltage regulator module A2. The second circuit operates from 24 vdc and provides regulated 12-vdc outputs to frequency standard A14 and the phase detector (part of A11).

4-109. FREQUENCY STANDARD. Frequency standard A14 is a potted circuit module containing an integrated circuit block connected as a crystal controlled oscillator and an output buffer amplifier. The crystal frequency is 4.266666 MHz. This output is fed to the divide-by-512 counter U5 which in turn provides the reference frequency of 8.33 kHz. The 12-vdc regulated supply for the frequency standard is obtained from voltage regulator A13.

4-110. U2 DRIVER. The U2 driver (A4) is a potted discrete component circuit module. The output from counter U1 is applied via the U2 driver to counter U2. It is necessary to include this driver stage in order to supply the high input load requirements of counter U2.

4-111. RECEIVE RF MODULE.

4-112. The functional stages of the Receive RF module A6 are shown in block form in Figure 4-9. For complete circuit details, refer to Figure FO-7.

4-113. When the PTT pushbutton is open (released) and function switch A1S1 is set to

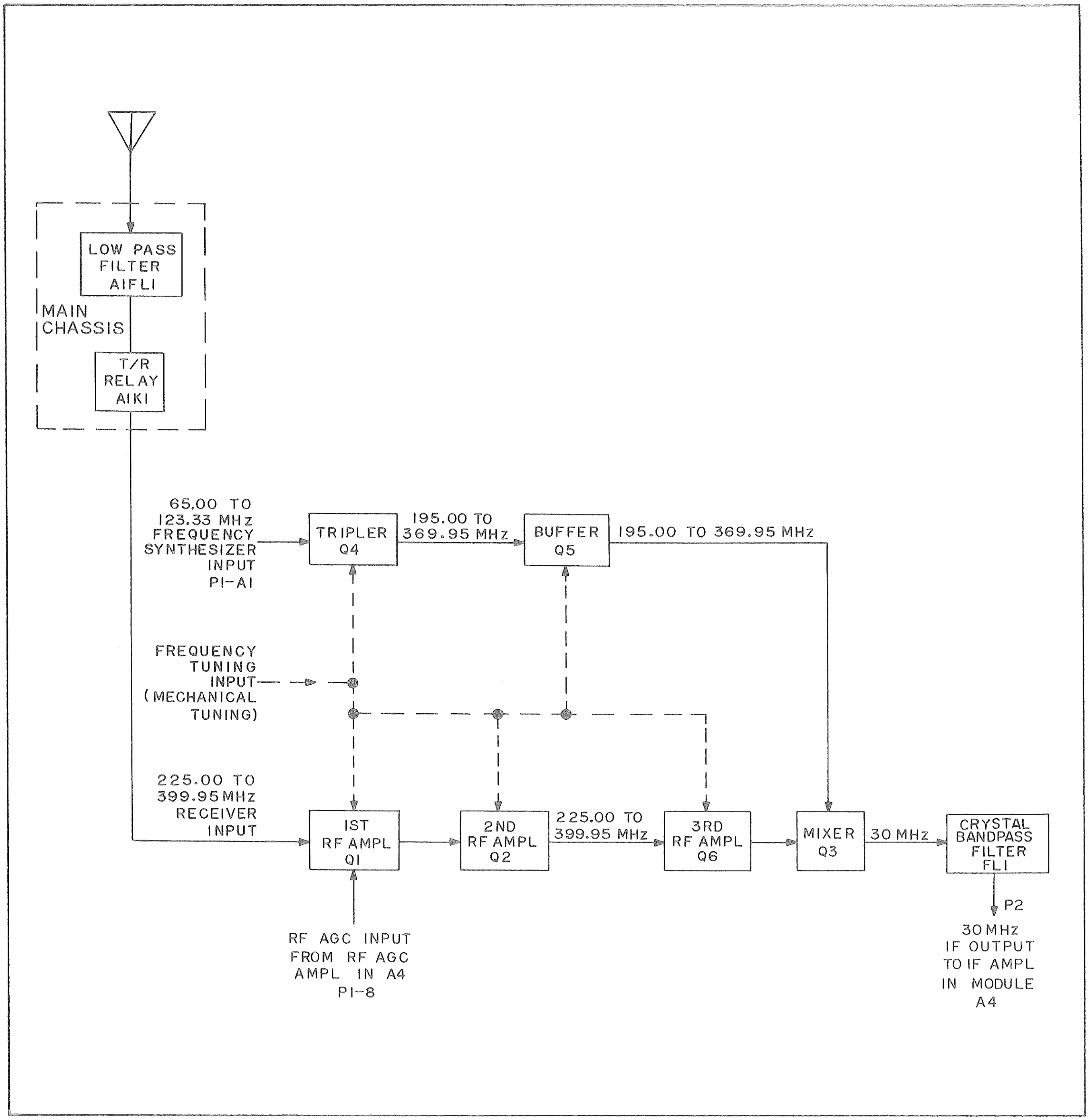


Figure 4-9. Receive RF Module 1A6, Functional Block Diagram

T/R or T/R + G, 12-vdc is applied via pin 5 of P1 to the receive B+ line. The r-f input received at the antenna is fed via low pass filter A1FL1 and deenergized T/R switching relay A1K1 to pin A2 of P1, then via input tuning network Z1 to the base of the first r-f amplifier Q1.

4-114. The six similar networks Z1 through Z6 represent vane-type tuning elements ganged to a common shaft and coupled via a gear mechanism to the 10 MHz, 1.0 MHz, and 50 kHz frequency selector switches. In network Z1, the mechanically tuned portion is represented by C3 and L1. Capacitors C1 and C5 are input and output coupling capacitors. Variable capacitor C2 is a factory-preset trimming capacitor.

4-115. Three r-f amplifier stages (Q1, Q2 and Q6) are coupled via tuning networks Z2 and Z3. The output of Q6 is applied via tuning network Z4 to one input of receiver mixer Q3.

4-116. R-f agc for the first r-f amplifier stage (Q1) is supplied from the agc amplifier in module A4, and applied via pin 8 of P1 through decoupling network C6, L14, C10, and coil L2 to the collector of Q1.

4-117. The other input to mixer Q3 is supplied from Frequency Synthesizer module A3. This SMO r-f input, in the 65.0 to 123.316 MHz frequency band, is fed to tripler stage Q4. The tripled output in the 195.00 to 369.95 MHz frequency band is then applied via tuning network Z6, buffer amplifier Q5, and tuning network Z5 to the base of mixer Q3.

4-118. When the received r-f signal in the 225.00 to 399.95 MHz frequency range is mixed with the tripled output of the frequency synthesizer in the 195.0 to 369.95 MHz frequency range, a 30 MHz signal is obtained. The mixer output is then applied via the 30 MHz crystal bandpass filter FL1 and coaxial output connector P2 to the 30 MHz i-f amplifier in module A4.

4-119. PA/MODULATOR MODULE A5.

4-120. The functional stages of PA/Modulator module A5 are shown in block form in Figure 4-10. Refer to Figure FO-8 for complete circuit details.

4-121. VOLTAGE INPUTS. When the function switch (A1S1) is set to the T/R or T/R + G positions (PTT pushbutton pressed), or to the DF position, the PTT relays are activated and 12-vdc is applied via pin 5 of P1 to the transmit B+ line. Also in this mode, 24-vdc is applied to the modulator B+ line via pin 7 of P1. Thermistors RT1 and RT2 provide constant base-bias voltage for Q3 and Q4 under varying temperature conditions.

4-122. TRIPLER CIRCUIT. The 75.00 to 133.33 MHz output from the frequency synthesizer is applied via pin A1 of P1, center-tapped autotransformer T1 and coupling capacitor C1 to the base of input amplifier Q1. The amplified output from Q1 collector is coupled via C3 and center-tapped autotransformer T2 to the base of tripler Q2. Parallel-tuned network Z1 (in the collector circuit of Q2) is tuned to the third harmonic of the frequency synthesizer input. The Q2, Z1 tripler circuit produces an output in the 225.0 to 399.95 MHz range which is applied to the base of first r-f amplifier Q3.

4-123. TUNING NETWORKS. There are five tuning networks (Z1 through Z5) in the overall circuit. These are rotary vane-type tuning elements ganged to a common shaft and coupled by means of a gear mechanism to the 10 MHz, 1.0 MHz, and 50 kHz frequency selector switches. Networks Z1 and Z2 are parallel-tuned circuits, each including a factory preset trimming capacitor. Networks Z3 and Z4 in the power output circuit are series-tuned to provide optimum impedance matching and power transfer. Network Z5 is capacitively-tuned and includes a center-tapped inductor.

4-124. R-F AMPLIFIER CIRCUITS. The 225.00 to 399.95 MHz input at first r-f amplifier Q3 base is tuned and amplified through the Z2, Q4, and Z3 stages, thence applied to the base of power amplifier Q5. Base self-bias for Q5 is developed across C24/R10 by diode CR6. Finally, the output from Q5 is applied via C25 and tuning network Z4 to output amplifier Q6, thence via tuning network Z5 to the r-f output connector P2.

4-125. MODULATOR CIRCUIT. The basic r-f signal flow discussed in the previous paragraph is amplitude-modulated by the output from modulator Q9. The audio input from the modulator preamplifier in module A4 is applied to pin 1 of P1. This input is fed to the base of modulator driver Q7. The output of Q7 is coupled via transformer T5 to the input-base terminal of the compound pair Q8/Q9, which

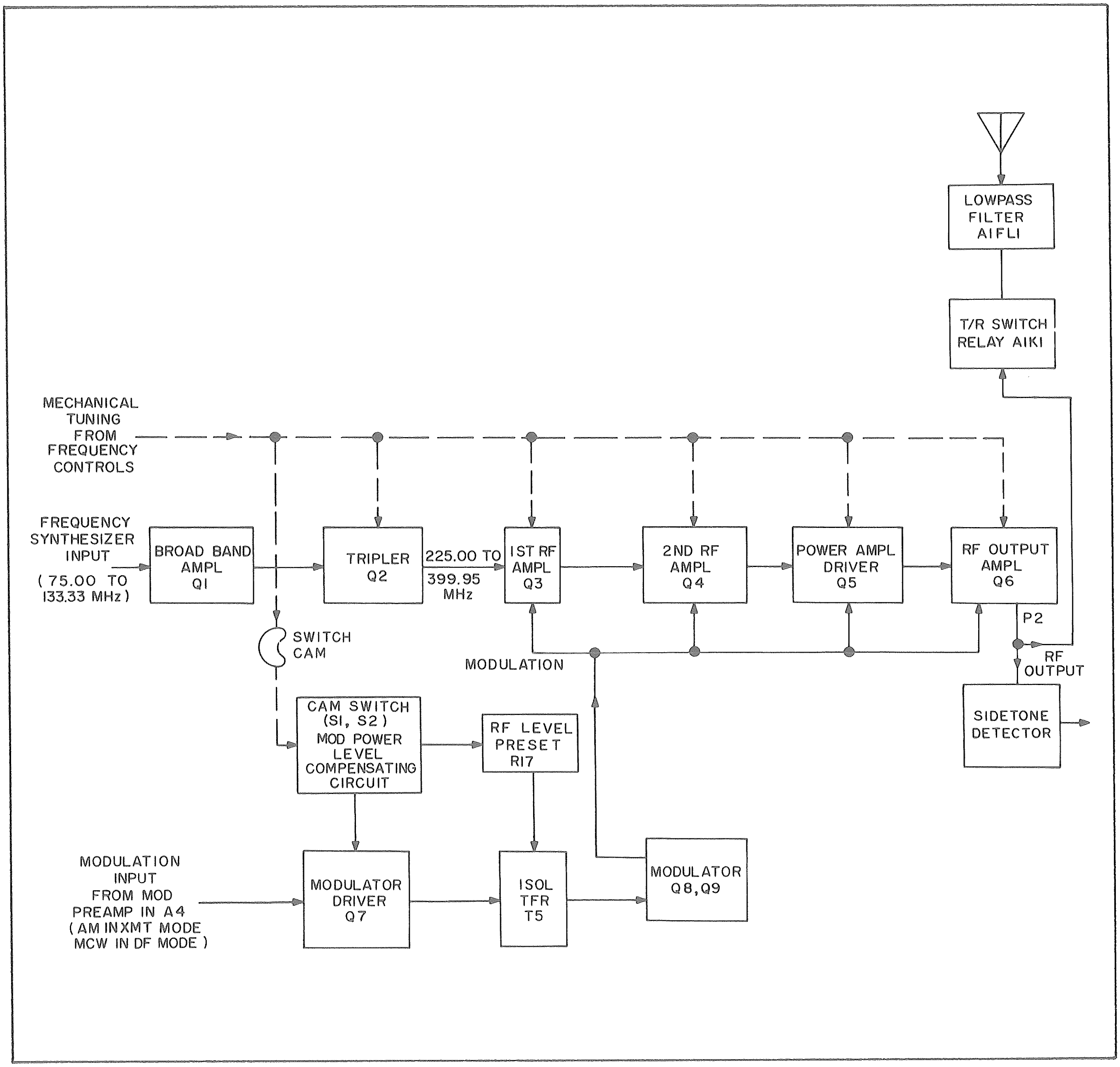


Figure 4-10. PA/Modulator Module 1A5, Functional Block Diagram

provide the modulation power output at the emitter of Q9.

4-126. One side of the secondary winding of T5 is connected to a modulation and a power output level-control circuit (see next paragraph). The Q9 modulator output is applied as B+ power via inductors and feedthrough capacitors to the collectors of Q3, Q4, Q5 and Q6 and also to the base terminals of Q4 and Q5 through resistors R8 and R11 respectively. The modulated r-f output is applied via P2, the T/R switching relay 1A1K1 and an output low-pass filter 1A1FL1 to the antenna connector 1J1.

4-127. MODULATION AND POWER OUTPUT CIRCUIT. The voltage at the emitter of Q9 determines the power output level. At higher frequencies (360 MHz to 399.95 MHz), the voltage at this point must be 15 volts dc in order to obtain an output of 2 watts. As the frequency is lowered, the voltage required at Q9 emitter is reduced to 10 volts in order to produce a 2-watt output.

4-128. Potentiometer R17, connected to the secondary of transformer T5, is the preset r-f power level adjustment control. The slider of R17 is also connected via a switched resistor network to ground. The values of the resistors in this network are predetermined during initial tests for the particular module.

4-129. The action of the switched resistor circuit is to change the bias level at R17 (and consequently at Q9 emitter) in accordance with the frequency selected. Two cam-operated switches, S1 and S2, actuated by a cam mounted on the end of the tuning shaft, perform the switching function.

4-130. When a frequency in the low frequency range (225 to 300 MHz) is selected, the switch positions will be as shown in Figure FO-8, and resistor R21 will be connected between R17 slider and ground. The emitter bias of Q9 will then be approximately 10 volts.

4-131. If a frequency in the 300 to 360 MHz range is selected, switch S2 will be switched by the cam to the second position and resistor R22 will be connected to potentiometer R17. The voltage at Q9 emitter will then be approximately 13 volts.

4-132. For a frequency in the 360 to 399.95 MHz range, switch S1 will be actuated by the cam and switch S2 will remain in the second position. Therefore all shunt resistors will be removed (diode CR4 blocks any dc voltage through R23 and R24) and the voltage at Q9 emitter will rise to 15 volts.

4-133. If the preamplifier input level (preset in IF/Audio module A4) is correct, resistor R14 connected to Q7 emitter is adequate for 90 to 100% modulation in the 225 to 300 MHz frequency range. However to modulate the higher voltage levels at Q9 emitter when the frequency is higher than 300 MHz, it is necessary to increase the modulation output from Q7. This is accomplished in a similar manner to that for power level switching. In this case, when the frequency selected is in the 300 to 360 MHz range, S2 is actuated and resistor R23 is connected in parallel with R14. This reduces the emitter bias of Q7 and increases the gain. In the 360 to 399.95 MHz range, switch S1 is actuated and resistor R24 is now shunted across resistor R14. This increases the gain of Q7 such that 90% or higher modulation can be obtained at the higher frequencies.

4-134. SIDETONE CIRCUIT. A sidetone output approximately 3 dB below the normal output level is obtained by sampling the r-f output from output tuning network Z5. This output is coupled via capacitor C41, balanced detector CR2/CR5, capacitor C40 and resistor R19 to P1, pin 10. The detected output is then fed via 6800 ohm resistor 1A1A4R7 to the audio circuit in IF/Audio module A4 (via pin 9 on A4P1) and also to terminal E1 on wideband amplifier board 1A1A5.

4-135. IF/AUDIO MODULE A4.

4-136. GENERAL. Table 4-7 is a list of the packets contained in IF/Audio module A4. The functional stages of the module are shown in block form in Figure 4-11. Refer to Figure FO-9 for interconnecting circuit details.

4-137. D-C POWER. Referring to Figure 4-11, the B+ power is applied to the module according to the mode of operation of the RT unit. In all modes, +12 volts is continuously applied to circuit block A5. In the receive mode only, +12 volts is applied to circuit blocks A3, A7, and A10, and through resistor R3 to the voltage regulator in block A2. The voltage regulator d-c output, preset by R4, is applied to blocks A1 and A6, and through isolating diode CR2, to A4. Diode CR1 provides reverse-bias protection for blocks A1 and A6. In transmit mode only, +12 volts is applied to circuit block A9, and from A9 via a filter network, to block A8.

4-138. RECEIVE MODE. In the receive mode, a 30 MHz first intermediate frequency signal is applied to circuit blocks A1 and A4.

Table 4-7. IF/Audio Module A4, List of Circuit Blocks

PARTIAL REF DESIG	COMMON NAME(S)
A1	30 MHz I-f Amplifier
A2	Receiver Second Mixer, 500 kHz I-f Amplifier, Squelch Expander Amplifier, and Voltage Regulator
A3	500 kHz I-f Amplifier, Combined Audio and Agc Detector, and Agc Amplifier
A4	R-f Agc Detector/Amplifier
A5	Squelch Gate and Audio Amplifier
A6	30 MHz I-f Amplifier
A7	29.5 MHz Crystal Oscillator
A8	Modulator Preamplifier
A9	Modulator Audio Amplifier
A10	Squelch Amplifier, Detector, and Schmitt Trigger
A11	Component Pack

NOTE

All circuit blocks are thin-film packet type except A7 and A11 (potted discrete parts).

Block A4 produces a d-c voltage (inversely proportional to carrier level) which is used as a B+ r-f agc voltage in module A6. Blocks A1 and A6 amplify the 30 MHz signal for application to the receiver second mixer stage (part of circuit block A2).

4-139. The output of the second mixer is a 500 kHz second intermediate frequency signal representing the difference between the 30 MHz input and a 29.5 MHz crystal-controlled local oscillator (A7) input. The signal is then passed through two 500 kHz amplifiers, one contained in packet A2, and the other in packet A3.

4-140. The audio output of the audio and agc detector (part of A3) is used in two ways. In the first case, the audio is taken directly from the top of the preset control R2 and routed outside the RT unit to the wideband equipment (if used). In the second case, the output from the wiper arm of preset R2 is applied (via a squelch gate) to the audio amplifier in block A5. The final output level is set by the VOL control (located on the main chassis) and applied to the handset earphone.

4-141. The d-c agc output of the audio and agc detector is amplified and applied to the i-f stages as an agc bias voltage. This bias is also applied through the SQ control (located on the main chassis) to the squelch expander amplifier in block A2. The gain of the expander amplifier is variable according to the level of the agc bias and the setting of the SQ control.

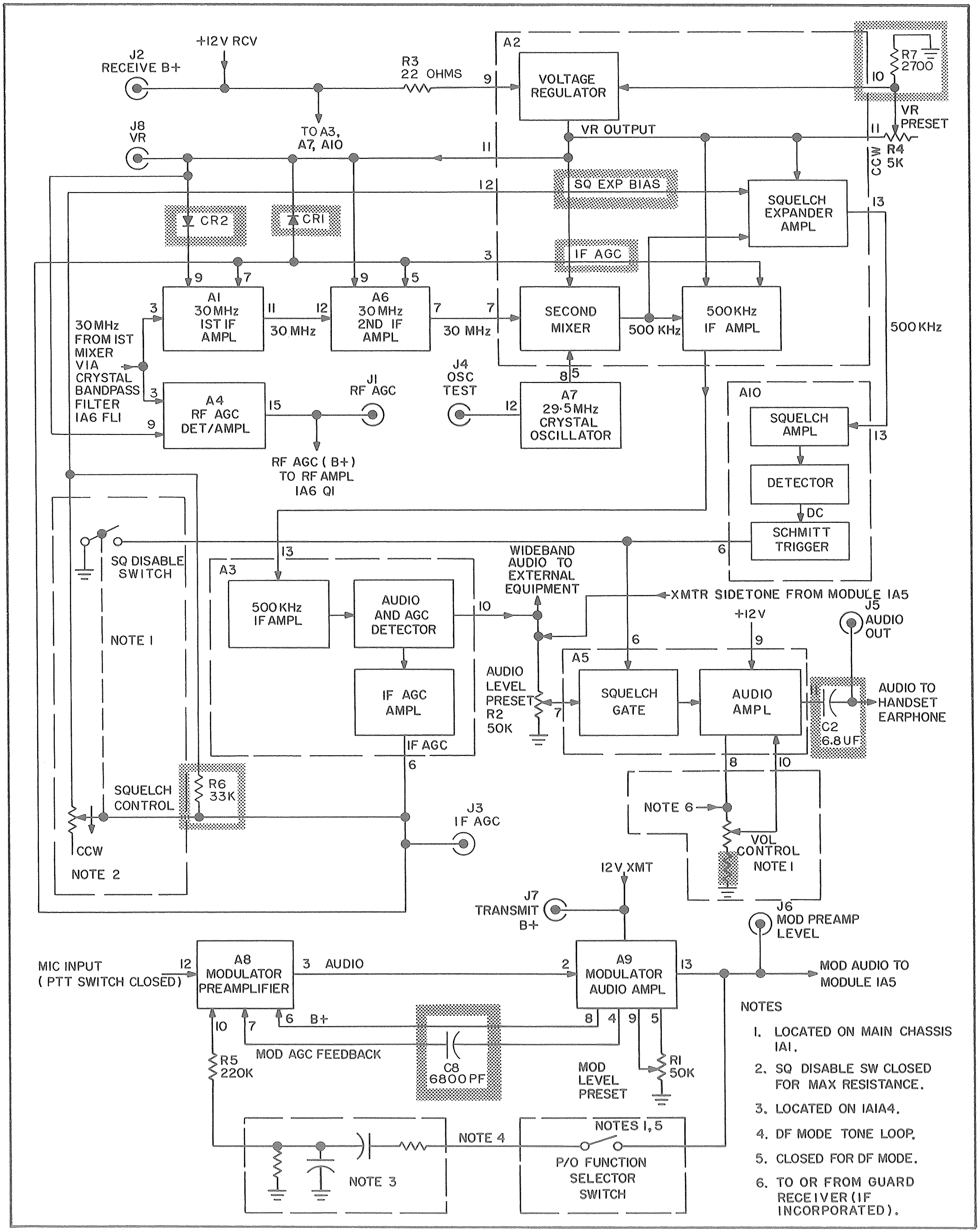


Figure 4-11. IF/Audio Module 1A4, Functional Block Diagram

4-142. The 500 kHz squelch expander output of block A2 is amplified, detected, and converted (in block A10) to a high or low d-c output derived from a Schmitt trigger circuit. The output state of the Schmitt trigger depends on the setting of voltage regulator preset control R4, the operator setting of the SQ control, and the presence or absence of a received r-f carrier signal. The operator sets the squelch control such that the Schmitt trigger is caused to change output state at the instant of transition from no received carrier to received carrier, and conversely. The effect is to open the squelch gate (in block A5) only when an r-f carrier is present, so allowing the audio signal to pass through the gate. When no r-f carrier is present, the squelch gate is closed to the receiver noise. Note that the squelch gate is "disabled" (continuously open) when the squelch control is in the maximum counterclockwise position.

4-143. It will be seen that squelch control is adjustable to the strength of the r-f carrier signal. That is, the squelch threshold or "gate open" point is a function of the gain of the squelch expander amplifier (set by the agc bias level as applied through the squelch control). If the r-f carrier is weak, the squelch expander amplifier gain can be increased accordingly by adjustment of the squelch control, and vice versa.

4-144. TRANSMIT MODE. The microphone audio input is applied (push-to-talk switch closed) to circuit block A8 for preamplification. Further amplification (preset by resistor R1) is provided by block A9 before the modulation audio is routed to module A5. Overmodulation of the transmitter is prevented by audio feedback from A9 to A8 via C8. This feedback is rectified in A8 to provide an internal agc bias.

NOTE

Transmitter sidetone audio is applied to block A5 from pin A4P1-9 via preset A4R2. The sidetone is thus audible in the handset earphone.

4-145. When the function switch on the control head is set to the DF position, a Wein-bridge oscillator is created by completing an output-to-input loop between circuit blocks A8 and A9 via external circuits. The effect is to produce a continuous oscillation at 1000 Hz which modulates the transmitter for direction-finding purposes.

4-146. VOLTAGE REGULATOR MODULE A2.

4-147. GENERAL. Voltage regulator module A2 is provided with a 24-vdc input from the battery pack. The module contains two ripple-controlled switching type regulator circuits which produce regulated outputs of 5 vdc and 12 vdc (see Figure 4-12). Figure FO-10 is the schematic diagram.

4-148. Both regulator circuits are of the step-down switching variety. The circuit operation is basically that of an ON-OFF feedback control system in which the switching element is a series pass transistor made to operate alternately in its saturated (ON state) and cut-off (OFF state) conditions. The switching transistor does not operate in the linear region except for short intervals when transferring from the ON state to the OFF state, and vice versa. Voltage regulation is obtained by varying the ratio of the ON and OFF periods or in other words, the duty cycle, of the switching transistor.

4-149. The main advantage of the switching (non-linear) type of voltage regulator over a linear series voltage regulator is that regulation can be achieved with high efficiency, typically 80 percent. This degree of efficiency is obtained by making the transition periods between the ON and OFF states of the switching transistor as short as possible. The regulator circuits are separately described below.

4-150. 12-VDC REGULATOR CIRCUIT. Referring to Figure FO-10, 24-vdc is applied to the emitter of transistor Q11 when the RT unit is switched to the T/R or DF mode. At this instant, the output voltage at plug-pin P1-5 is zero, the voltage at the emitter of Q4 is zero, and the voltage at the base of Q1 is +24 volts. Therefore, the Darlington-pair

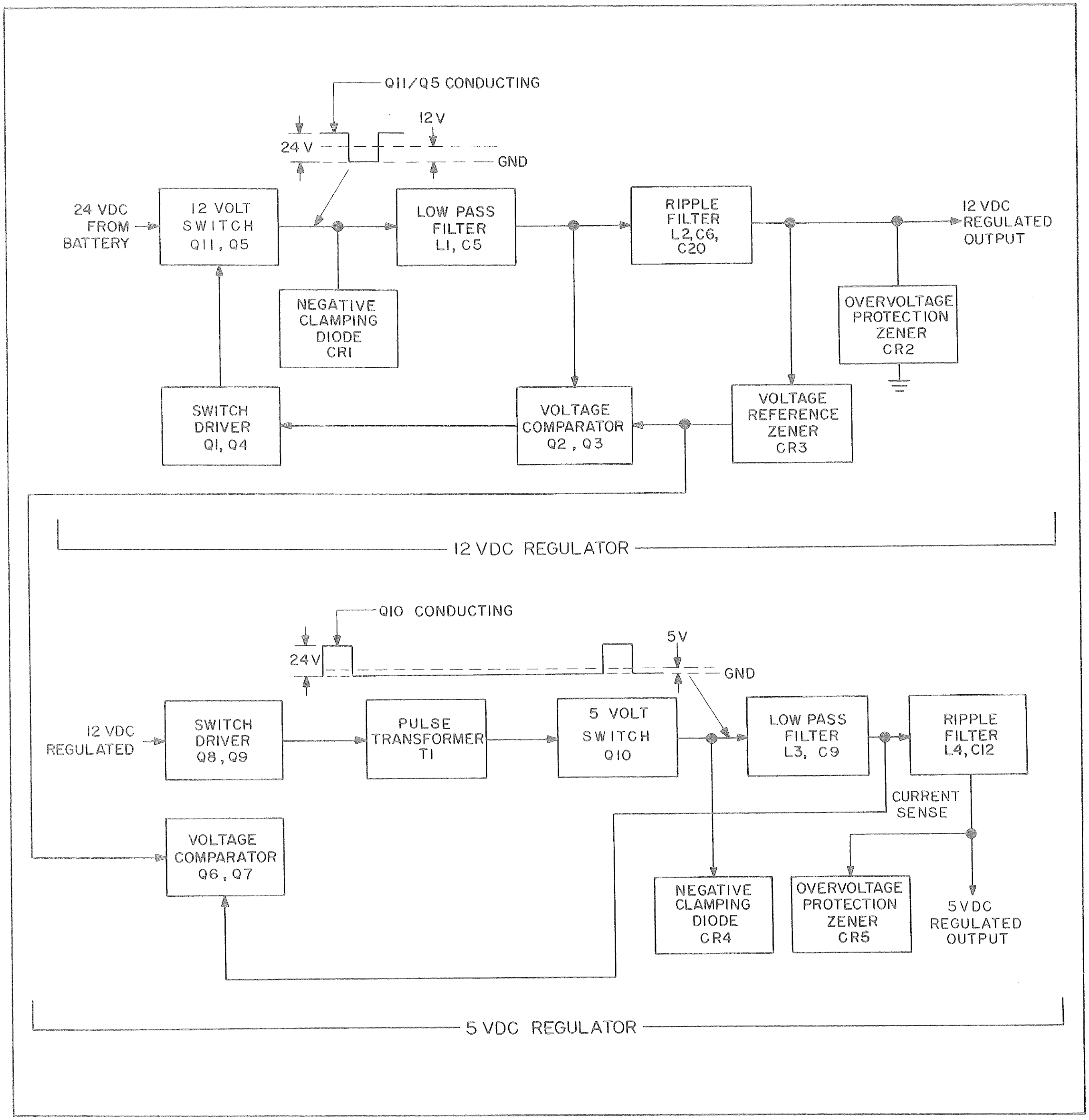


Figure 4-12. Voltage Regulator Module 1A2, Functional Block Diagram

Q1, Q4 is turned on, and this results in turning on Q11 and Q5. With Q5 turned on, the voltage at the collector of Q5 rises, almost instantaneously, to approximately +24 volts. Under these conditions, the fly-back diode CR1 is reverse-biased and inductor L1 begins to charge up through the load. Thus, the output current and voltage increase until the point is reached at which the voltages applied to the bases of Q2 and Q3 are equal.

4-151. An increase in the output voltage beyond the equilibrium point causes Q2 to turn on, which turns off Q1, Q4, Q11 and Q5.

When Q5 turns off, the back emf of L1 causes CR1 to be forward biased. CR1, therefore, clamps the collector of Q5 virtually to ground and allows the stored charges in the filter inductors and capacitors to be delivered to the load. The current delivered to the load, and therefore the output voltage, begins to decrease. This condition persists until the output voltage decreases beyond the value at which the bases of Q2 and Q3 are at the same voltage. When this happens, Q2 turns off, which results in turning on Q1, Q4, Q11 and Q5, and +24 volts is again applied to the cathode of CR1. This switching cycle repeats continuously to maintain +12 volts at plug-pin P1-5. The switching frequency is determined by the overall loop gain of the voltage regulator.

4-152. The filtering of L1 and C5 results in a triangular waveform which is further filtered by L2 and C6. R-f capacitor C14 is added to increase the attenuation of high-frequency switching harmonics. Overvoltage protection is provided by CR2 which prevents the output at P1-5 from exceeding 14 volts.

4-153. 5-VDC REGULATOR CIRCUIT. This voltage regulator operates in a similar manner to the 12-volt regulator. The two regulators are effectively connected in tandem, with the 12-volt regulator supplying power to the comparator and driver circuits of the 5-volt regulator. Consequently, the 5-volt regulator will not operate unless the 12-volt regulator is operative.

4-154. Initially, when the RT unit is turned on, the voltage at the base of Q6 rises to 5.1 volts, and reference voltage. However, the voltage at the base of Q7 is zero at this instant. Therefore, Q6 conducts to turn on Q8 and Q9. The polarity of the step-down transformer T1 is arranged in such a way that the conduction of Q9 causes Q10 also to conduct. Q10, like Q5, operates alternately in the saturation and cut-off states. When Q10 turns on, the voltage at the cathode of fly-back diode CR4 rises instantaneously to the battery (or power supply) voltage. L3 begins to charge up through the load and the output voltage will increase to a value which will cause the voltage at the base of Q7 to equal that at the base of Q6. Beyond this value, Q6 will cut off, causing Q8, Q9 and Q10 to cut off in turn. This action will continue cyclically to maintain the output at the required regulated voltage. Overvoltage protection at P1-4 is provided by CR4.

SECTION III
FUNCTIONAL OPERATION OF MECHANICAL ASSEMBLIES

4-155. GENERAL.

4-156. The functional operation of the moving mechanical and related parts of the RT unit is described beginning with paragraph 4-159. These mechanical parts are physically located in the main chassis control head, and are comprised of the geartrain items shown "exploded" in Figures 6-17 and 6-21. When the MEGAHERTZ controls are rotated, the geartrain rotates switch-rotor "finger" contact assemblies located on shafts extending through the switch-stator printed circuit boards shown in Figure 6-19. In addition, the geartrain drives the mechanical output couplers to the Receive RF and PA/Modulator modules.

4-157. Figure 4-13 is a mechanical schematic of the control head geartrain. The figure is a partial composite representation of parts shown in Figures 6-17, 6-19 and 6-21. In the figure, the MEGAHERTZ control knobs, dials, readout window panel, main chassis casting, and all other parts not

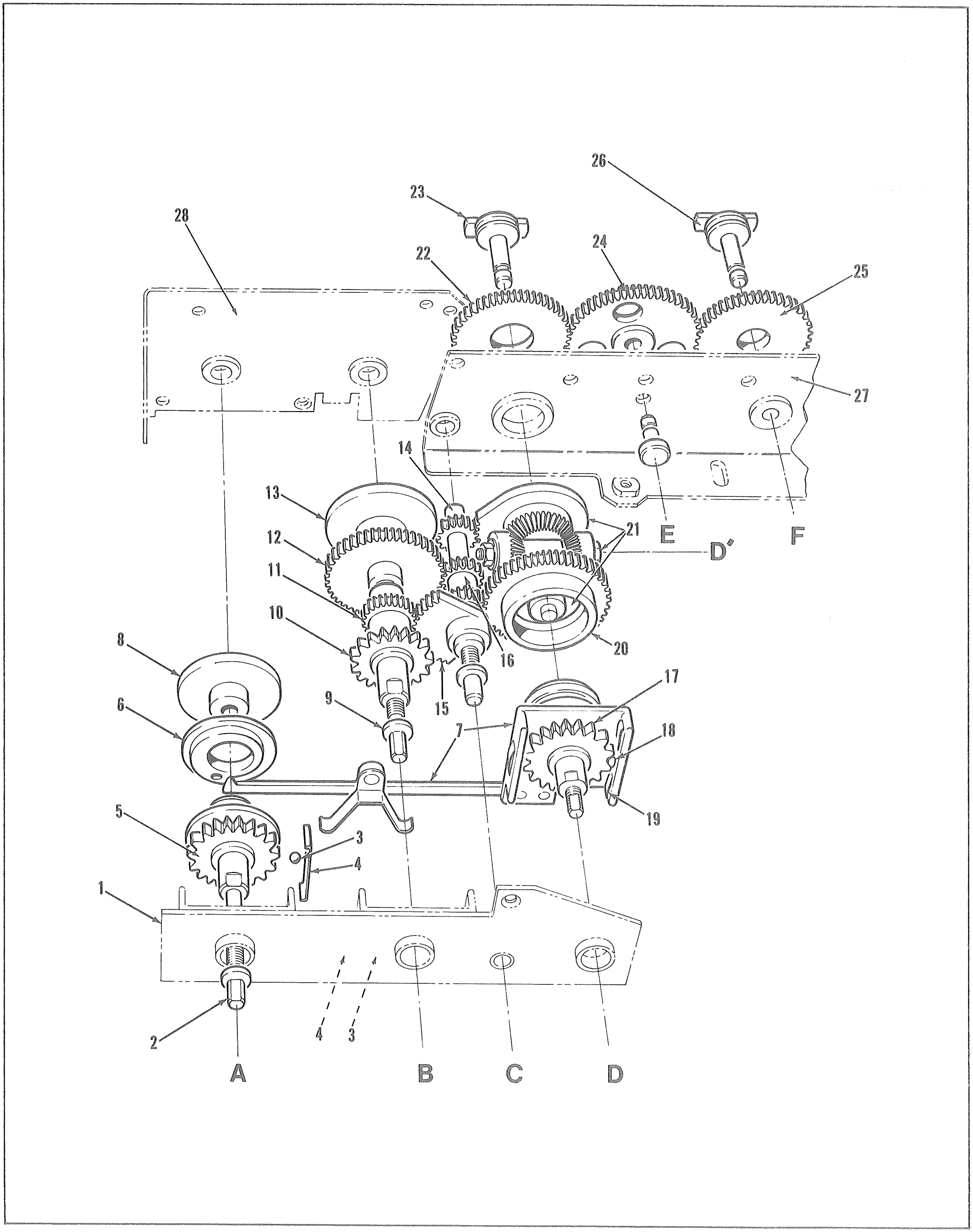


Figure 4-13. Geartrain Mechanical Schematic

relevant to the functional description are omitted. The Figure 4-13 callouts are cross-referenced in Table 4-8 to the item callouts on Figures 6-17, 6-19 and 6-21.

4-158. GEARTRAIN FUNCTIONAL DESCRIPTION.

4-159. Referring to Figure 4-13, all geartrain rotational axes are lettered A through F. The "flatted" ends of the MEGAHERTZ control knob shafts project through plate (1) on axes A, B, and D for the 0.05 MHz, 1 MHz, and 10 MHz control knobs respectively. The D-axis drive shaft (23) and the F-axis drive shaft (26) are mechanically coupled (not shown) directly to the PA/Modulator and Receive RF modules respectively to provide the equivalent mechanical element of the transmitter and receiver tuning.

Table 4-8. Geartrain Schematic Parts Cross-Reference

FIGURE-INDEX ITEM CALLOUT NUMBER			
FIGURE 4-13	FIGURE 6-17	FIGURE 6-19	FIGURE 6-21
-1			-28
-2	-8		
-3	-48		
-4	-49		
-5			-4
-6			-2
-7			-23
-8	-20		
-9	-7		
-10			-25
-11			-24
-12	-17		
-13	-19		
-14			-15
-15			-11
-16			-12
-17			-19
-18			-17
-19			-16
-20			-21
-21			-22
-22			-5
-23			-10
-24	-44		
-25	-40		
-26	-42		
-27			-9
-28		-21	

NOTE

Figure 4-13 axes A through F can also be located in Figures 6-17, 6-19 and 6-21 since the orientation of parts in the latter figures is the same.

4-160. When the 0.05 MHz control shaft (2) on the A axis (Figure 4-13) is rotated, all shaft items (5), (6), and (8) rotate with the shaft. The detent wheel (5) is positioned to 0.05 MHz angular increments by balls (3) and detent springs (4). Cam (6) rotates cam bar detent assembly (7) on the D axis (see paragraph 4-164). The finger contacts of switch rotor (8) wipe the 0.05 MHz switch stator (left-hand concentric printed circuit on item 17 of Figure 5-19).

4-161. When the 1 MHz control shaft (9) on the B axis is rotated, shaft items (10), (11), and (13) rotate with the shaft. Item (12) is not fixed to shaft (9). The detent wheel (10) is positioned to 1 MHz angular increments by balls (3) and detent springs (4). The finger contacts of switch rotor (13) wipe the 1 MHz switch stator (right-hand concentric printed circuit on item 17 of Figure 5-19). Gear (11) rotates and meshes with sector gear (15) on the C axis.

4-162. Sector gear (15) is fixed to gear idler shaft (14) on the C axis. Gear idler pinion (16) is not fixed to gear idler shaft (14). When the B axis shaft is rotated, sector gear (15) and gear idler shaft (14) are rotated. The pinion gear on shaft (14) meshes with the sector/bevel gear on differential assembly (21). This is discussed further in paragraph 4-166 below.

4-163. The D/D' axis carriage block of differential assembly (21) is fixed to gear (22) via drive draft (23) which extends through plate (27) on the D axis. The D axis sector/bevel gear on item (21) meshes with the D'-axis carriage block bevel gears, but is not fixed to drive shaft (23). Similarly, the D-axis flange bevel gear on item (21) meshes with the D'-axis carriage block bevel gears but is not fixed to drive shaft (23). Thus, the D/D'-axis carriage block and drive shaft (23) are normally fixed in position if the D-axis flange bevel and sector/bevel gears are fixed in position.

4-164. When the 10 MHz shaft and detent wheel assembly (17) on the D-axis is rotated, all items (17), (20), and the D-axis flange bevel gear on item (21) rotate together. The detent wheel on item (17) is positioned to 10 MHz angular increments by balls (18) and detent springs (19), but the detent angular position on the D-axis is also variable by small increments inserted by cam bar detent assembly (7) which carries the detent frame casting (refer to paragraph 4-160 above). Each angular increment inserted by item (7) is electrically equivalent to 0.05 MHz of tuning for modules A5 and A6, and the total range of the increments is equivalent to 1 MHz.

4-165. The D-axis gear (20) meshes with gear idler pinion (16) which in turn meshes with gear/switch rotor (12). The finger contacts of item (12) wipe the 10 MHz receive and transmit mode switch stators (concentric printed circuits on Items 5 and 10 respectively of Figure 5-19). Gear (20) also rotates the D-axis flange bevel gear on item (21), thus rotating the carriage block of item (21) around the D and D' axes because the sector/bevel gear on item (21) is fixed in position. Drive shaft gear (23) is rotated by the D-axis motion of the carriage block to drive E-axis idler gear (24), gear (25), and drive shaft (26) on the F-axis.

4-166. When the C-axis idler gear shaft (14) is rotated (from the B-axis), the D-axis flange gear of item (21) is fixed. Thus, the carriage block of item (21) rotates around the D/D' axes, and drive shaft (23) is rotated by the D-axis motion of the carriage block. This action is similar to that described in the previous paragraph.

4-167. To briefly summarize the mechanical routing of the geartrain input to the output drive shaft (23):

a. The 0.05 MHz input is routed via A-axis cam (6), D-axis cam bar detent assembly (7), and as described in c. below.

b. The 1 MHz input is routed via B-axis gear (11), C-axis sector gear (15), gear idler shaft (14), and the D-axis sector bevel gear and D/D'-axis carriage block of differential assembly (21).

c. The 10 MHz input is routed via D-axis gear (20) and the flange gear on item (21) through the D/D' axes of the carriage block.

relevant to the functional description are omitted. The Figure 4-13 callouts are cross-referenced in Table 4-8 to the item callouts on Figures 6-17, 6-19 and 6-21.

4-158. GEARTRAIN FUNCTIONAL DESCRIPTION.

4-159. Referring to Figure 4-13, all geartrain rotational axes are lettered A through F. The "flatted" ends of the MEGAHERTZ control knob shafts project through plate (1) on axes A, B, and D for the 0.05 MHz, 1 MHz, and 10 MHz control knobs respectively. The D-axis drive shaft (23) and the F-axis drive shaft (26) are mechanically coupled (not shown) directly to the PA/Modulator and Receive RF modules respectively to provide the equivalent mechanical element of the transmitter and receiver tuning.

Table 4-8. Geartrain Schematic Parts Cross-Reference

FIGURE-INDEX ITEM CALLOUT NUMBER			
FIGURE 4-13	FIGURE 6-17	FIGURE 6-19	FIGURE 6-21
-1			-28
-2	-8		
-3	-48		
-4	-49		
-5			-4
-6			-2
-7			-23
-8	-20		
-9	-7		
-10			-25
-11			-24
-12	-17		
-13	-19		
-14			-15
-15			-11
-16			-12
-17			-19
-18			-17
-19			-16
-20			-21
-21			-22
-22			-5
-23			-10
-24	-44		
-25	-40		
-26	-42		
-27			-9
-28		-21	

NOTE

Figure 4-13 axes A through F can also be located in Figures 6-17, 6-19 and 6-21 since the orientation of parts in the latter figures is the same.

4-160. When the 0.05 MHz control shaft (2) on the A axis (Figure 4-13) is rotated, all shaft items (5), (6), and (8) rotate with the shaft. The detent wheel (5) is positioned to 0.05 MHz angular increments by balls (3) and detent springs (4). Cam (6) rotates cam bar detent assembly (7) on the D axis (see paragraph 4-164). The finger contacts of switch rotor (8) wipe the 0.05 MHz switch stator (left-hand concentric printed circuit on item 17 of Figure 5-19).

4-161. When the 1 MHz control shaft (9) on the B axis is rotated, shaft items (10), (11), and (13) rotate with the shaft. Item (12) is not fixed to shaft (9). The detent wheel (10) is positioned to 1 MHz angular increments by balls (3) and detent springs (4). The finger contacts of switch rotor (13) wipe the 1 MHz switch stator (right-hand concentric printed circuit on item 17 of Figure 5-19). Gear (11) rotates and meshes with sector gear (15) on the C axis.

4-162. Sector gear (15) is fixed to gear idler shaft (14) on the C axis. Gear idler pinion (16) is not fixed to gear idler shaft (14). When the B axis shaft is rotated, sector gear (15) and gear idler shaft (14) are rotated. The pinion gear on shaft (14) meshes with the sector/bevel gear on differential assembly (21). This is discussed further in paragraph 4-166 below.

4-163. The D/D' axis carriage block of differential assembly (21) is fixed to gear (22) via drive draft (23) which extends through plate (27) on the D axis. The D axis sector/bevel gear on item (21) meshes with the D'-axis carriage block bevel gears, but is not fixed to drive shaft (23). Similarly, the D-axis flange bevel gear on item (21) meshes with the D'-axis carriage block bevel gears but is not fixed to drive shaft (23). Thus, the D/D'-axis carriage block and drive shaft (23) are normally fixed in position if the D-axis flange bevel and sector/bevel gears are fixed in position.

4-164. When the 10 MHz shaft and detent wheel assembly (17) on the D-axis is rotated, all items (17), (20), and the D-axis flange bevel gear on item (21) rotate together. The detent wheel on item (17) is positioned to 10 MHz angular increments by balls (18) and detent springs (19), but the detent angular position on the D-axis is also variable by small increments inserted by cam bar detent assembly (7) which carries the detent frame casting (refer to paragraph 4-160 above). Each angular increment inserted by item (7) is electrically equivalent to 0.05 MHz of tuning for modules A5 and A6, and the total range of the increments is equivalent to 1 MHz.

4-165. The D-axis gear (20) meshes with gear idler pinion (16) which in turn meshes with gear/switch rotor (12). The finger contacts of item (12) wipe the 10 MHz receive and transmit mode switch stators (concentric printed circuits on Items 5 and 10 respectively of Figure 5-19). Gear (20) also rotates the D-axis flange bevel gear on item (21), thus rotating the carriage block of item (21) around the D and D' axes because the sector/bevel gear on item (21) is fixed in position. Drive shaft gear (23) is rotated by the D-axis motion of the carriage block to drive E-axis idler gear (24), gear (25), and drive shaft (26) on the F-axis.

4-166. When the C-axis idler gear shaft (14) is rotated (from the B-axis), the D-axis flange gear of item (21) is fixed. Thus, the carriage block of item (21) rotates around the D/D' axes, and drive shaft (23) is rotated by the D-axis motion of the carriage block. This action is similar to that described in the previous paragraph.

4-167. To briefly summarize the mechanical routing of the geartrain input to the output drive shaft (23):

a. The 0.05 MHz input is routed via A-axis cam (6), D-axis cam bar detent assembly (7), and as described in c. below.

b. The 1 MHz input is routed via B-axis gear (11), C-axis sector gear (15), gear idler shaft (14), and the D-axis sector bevel gear and D/D'-axis carriage block of differential assembly (21).

c. The 10 MHz input is routed via D-axis gear (20) and the flange gear on item (21) through the D/D' axes of the carriage block.

SECTION IV

FUNCTIONAL OPERATION OF SPECIAL TEST EQUIPMENT

4-168. GENERAL.

4-169. The special test equipment items listed in Table 1-5 are shown in Figures 4-14 through 4-25. These items, as applicable, are used to facilitate troubleshooting, alignment, performance testing, and general maintenance of the RT unit and the six plug-in modules. The separate schematic diagrams are contained in Figures FO-17 through FO-27 (item B9 does not have a schematic diagram). The functional operation of each item is separately described under one of the common-name headings which follow.

NOTE

Maintenance procedures using the following equipment are contained in Chapter 5, Section 1.

4-170. PA/MODULATOR ADAPTER.

4-171. This module test adapter (Figure 4-14 and Table 1-5, item B1) provides physical accessibility and test point facilities for alignment, troubleshooting, and testing of PA/ Modulator module 1A5 while the module is electrically connected to the RT unit chassis (paragraph 5-79). In addition, the adapter provides a mechanical tuning shaft output to module 1A5 from a detented mechanical MHZ switch. The MHZ switch dial positions are calibrated for mechanically corresponding RT unit MEGAHERTZ settings of 225, 230 through 390 in increments of 10, and the maximum setting of 399.95.

NOTE

On adapter item B1, the MHZ dial window is designed to accommodate three-figure markings only. Thus, in one case only, the required RT unit MEGAHERTZ setting is 399.95 (maximum setting), and the corresponding item B1 MHZ setting is 400. This setting difference is not electrically significant because the tuning of module 1A5 does not determine the operating frequencies of the module.

4-172. Referring to Figure FO-17, it is seen that the electrical function of the adapter is completely passive, but that normally inaccessible test points are brought out to marked test jacks.

4-173. The mechanical tuning shaft output is set to a selected MHZ dial marking by the dial knob. The MHZ dial is accurately positioned for each MHZ marking by a dial detent disc. One surface of the detent disc has small precision-made depressions which are angularly spaced near the disc periphery. A spring-loaded ball plunger "seats" in one of the disc depressions for each MHz dial position.

4-174. FREQUENCY SYNTHESIZER ADAPTER.

4-175. This module test adapter (Figure 4-15 and Table 1-5, item B2) provides physical accessibility and test point facilities for troubleshooting and testing of Frequency Synthesizer module 1A3 while the module is electrically connected to the RT unit chassis (paragraph 5-80). In addition, the logic level combinations or states of the four sets of logic outputs produced by the RT unit control head are displayed by means of six indicating lights. Any one of the four sets of logic signals may be selected for display by means of a four-position switch.

4-176. In Figure FO-18, it is seen that the electrical function of the adapter is passive with respect to module 1A3. The d-c voltage inputs to module 1A3 are brought out on marked test jacks J9 through J12. The +24 voltage at J10 is also used as the bias supply to the adapter printed circuit boards A1 and A2 with return to ground (J9). Indicator lights DS1 through DS6 are each connected between +24 volts and the collector of a corresponding switching transistor. Each light is normally off until the corresponding switching transistor is caused to conduct.

4-177. The six pole, 4-position switch S1 can select any one of four sets of RT unit control head logic output signals. Each signal set consists of up to six "1" or "0" logic levels (logic 1 = +5 volts, logic 0 = 0 volts). Some or all of these logic signals may vary according to the MEGAHERTZ readout selected by the frequency selector controls on the RT unit. These logic signals control the r-f frequency output of module 1A3, which appears at coaxial test jack J8.

4-178. The six outputs of switch S1 are separately applied to corresponding test jacks J1 through J6 and also to corresponding printed circuit board terminals, A1E4, A1E6, A1E8, A2E4, A2E6, and A2E8. These are the input terminals to six identical switching circuits controlling the corresponding indicator lights DS1 through DS6. One of these circuits is described in the following two paragraphs.

4-179. Normally, switch transistor A2Q1 is cut off by reason of the logic "0" (ground) potential applied from switch terminal S1-C1 via diode A2CR3 to the lower end of resistor A2R1, and thus to the base of A2Q1. With transistor A2Q1 cut off, indicator light DS1 is "off" to indicate a logic 0 input signal.

4-180. When the signal at switch terminal S1-C1 changes to logic 1, the cathode potential of diode A2CR3 is raised to +5 volts from ground potential. Temperature compensating diodes A2CR1 and A2CR2 then conduct to complete the potential divider consisting of resistors A2R1 and A2R2. The rise of potential at the base of A2Q1 is limited to +5 volts by diode A2CR3. Transistor A2Q1 conducts, and indicator light DS1 is "on" to indicate a logic 1 input signal.

4-181. GUARD RECEIVER ADAPTER.

4-182. This module test adapter (Figure 4-16 and Table 1-5, item B3) provides physical accessibility and test point facilities for alignment, troubleshooting, and testing of a guard receiver module 1A7 while the module is electrically connected to the RT unit chassis (paragraph 5-81).

NOTE

Provision exists in Receiver-Transmitter RT-865D/PRC-66 (RT unit) for the future provision of a guard receiver module. This module is not covered in this technical manual.

4-183. The electrical function of the adapter is completely passive, as can be seen in Figure FO-19. All the test points are parallel-connected except for the r-f input coaxial connector J6.

4-184. IF/AUDIO ADAPTER.

4-185. This module test adapter (Figure 4-17 and Table 1-5, item B4) provides physical accessibility and test point facilities for troubleshooting, adjustment, and testing of IF/Audio module 1A4 while the module is electrically connected to the RT unit chassis (paragraph 5-82).

4-186. Figure FO-20 shows that the adapter is completely passive with parallel-connected test points.

4-187. VOLTAGE REGULATOR ADAPTER.

4-188. This module test adapter (Figure 4-18 and Table 1-5, item B5) provides physical accessibility and test point facilities for troubleshooting and testing Voltage Regulator module 1A2 while the module is electrically connected to the RT unit chassis (paragraph 5-83). Four test jack jumper links are removable for current measurements. In addition, the loading conditions for the +12 and +5 regulated voltage outputs of module 1A2 may be selected by a three-position toggle switch. The switch selects built-in dummy loads, no load, or the normal RT unit loads.

4-189. Referring to Figure FO-21, test jacks J1, J4, J7, J8, and J13, are all parallel-connected and marked according to voltage function. Except for J13 (ground), these test jacks are connected to the "live" side of series test jack pairs J2/J3, J5/J6, J8/J9, and J11/J12. A current-measuring meter may be substituted for any removable jumper link normally plugged into a pair of series jacks.

4-190. Two-pole, three-position switch S1 selects the load conditions for the regulated voltage outputs of module 1A2 according to the marked switch positions. Resistors R1 and R2 are, respectively, the 12-volt and 5-volt load resistors.

4-191. RECEIVE RF ADAPTER.

4-192. This module test adapter (Figure 4-19 and Table 1-5, item B6) provides physical accessibility and test point facilities for alignment, troubleshooting, and testing of Receive RF module 1A6 while the module is electrically connected to the RT unit chassis (paragraph 5-84). In addition, the adapter provides a mechanical tuning shaft output to module 1A6 from a detented mechanical MHZ switch. The MHZ switch dial positions are calibrated for mechanically corresponding RT unit MEGAHERTZ settings of 225, 230 through 390 in increments of 10, and the maximum setting of 399.95.

NOTE

On adapter item B6, the MHZ dial window is designed to accommodate three-figure markings only. Thus, in one case only, the required RT unit MEGAHERTZ setting is 399.99 (maximum setting), and the corresponding item B6 MHZ setting is 400. This setting difference is not electrically significant because the tuning of module 1A6 does not determine the operating frequencies of the module.

4-193. Referring to Figure FO-22, it is seen that the electrical function of the adapter is completely passive, but that normally inaccessible test points are brought out to marked test jacks. However, the antenna r-f input signal (called "RCV RF IN") is not routed directly through the adapter. Instead, an equivalent signal must be generated by an r-f oscillator and applied to module 1A6 via the adapter RCVR O/P jack J5.

4-194. The mechanical tuning shaft output is set to a selected MHZ dial marking by the dial knob. The MHZ dial is accurately positioned for each MHZ marking by a dial detent disc. One surface of the detent disc has small precision-made depressions which are angularly spaced near the disc periphery. A spring-loaded ball plunger "seats" in one of the disc depressions for each MHZ dial position.

4-195. AUDIO ADAPTER.

4-196. This test adapter (Figure 4-20 and Table 1-5, item B7) provides break-in and break-out test terminals for the RT unit microphone input and receiver audio output, and contains built-in input matching and audio output loads. Three toggle-type switches control the transmit and receive mode functions of the RT unit. The RT unit WIDEBAND interface facility jack is used to connect the audio adapter to the RT unit (paragraph 5-85).

4-197. Referring to Figure FO-23, the position of RCV/XMT switch S1, as indicated by the markings, determines the mode of operation of the RT unit. Terminals S1-1, 2 are placed in parallel with the RT unit PTT line, and in the XMT position, complete the ground return for the PTT relays. Also, in the XMT position, terminals S1-4, 5 insert resistor R3 in series with WB MIC CURRENT jacks J12/J13 (normally jumpered). Resistor R3 simulates an external wideband equipment load for the RT unit 55 ma constant-current source.

4-198. The input to WB MIC HI IN jacks J7/J8 is provided by an audio oscillator. This input simulates the audio output of a carbon microphone normally located in external wideband equipment. Capacitor C1 blocks the d-c current supplied to resistor R3. (This resistor simulates the carbon microphone resistance.) The WB IN MEASURE test jack J11 allows direct measurement (using an a-c vtvm) of the WB MIC HI IN audio voltage at the input to the RT unit. This avoids ambiguous input measurements due to the presence of capacitor C1 between the oscillator input jack J7 and actual input to the RT unit at connector pins P1-8, 9.

4-199. The input to MIC HI (HANDSET) jacks J1/J2 is provided by an audio oscillator. This input simulates the audio output of a dynamic microphone, which is normally applied from Unit 3 (handset) of the radio set. When this simulated input is used, the TX MODE switch S3 is placed in the HANDSET position. Resistors R1 and R2 then form an approximate 1000:1 input matching network in conjunction with the 500-ohm (open circuit) input impedance to the RT unit at connector pins P1-2, 3. In the RT unit, the HANDSET position of S3 also has the effect of isolating any input which may be present at jacks J7/J8. When the WIDEBAND MIC HI IN jacks J7/J8 are being used, switch S3 is placed in the WIDEBAND position. This effectively isolates any input which may be present at jacks J1/J2.

4-200. Resistor R4 simulates the handset (Unit 3) earphone load. The audio voltage across this load can be measured with an ac vtvm at AUDIO OUT jacks J3/J4. Similarly, resistor R5 simulates a wideband audio load normally located in external wideband equipment. The audio voltage across this load can be measured with an ac vtvm at WB AUDIO jacks J5/J6.

4-201. The GD SQ DSBL (TEST) IN switch S2 controls the state of the squelch circuit in the RT unit guard receiver (when incorporated). In the OFF position of S2, the guard receiver squelch circuit is operative. In the ON position of S2, the guard receiver squelch circuit is disabled.

4-202. Jack J9 is placed in parallel with the +24V (SWITCHED) OUT line in the RT unit, with ground return on J10.

4-203. ANTENNA ADAPTER.

4-204. This test adapter (Figure 4-21 and Table 1-5, item B8) is used for testing the forward/reflected power ratio of the Antenna, Unit 4. The adapter provides a type "N" connector and antenna ground plane with cable extension (Figure FO-24). The adapter is connected to the RT unit through an rf wattmeter incorporating forward and reflected power measuring elements (paragraph 5-86).

4-205. CONTROL HEAD GAUGE.

4-206. This precision-made gauge (Figure 4-22 and Table 1-5, item B9) is used to check the mechanical alignment of the RT unit control head geartrain tuning couplers when the MEGAHERTZ setting is 225.00 (paragraph 5-87). These geartrain output couplers can be seen in Figure 4-13 (items 23 and 26), Figure 5-4, and Figure 5-11 (D and F axes).

4-207. BENCH TEST CABLE.

4-208. The bench test cable (Figure 4-23 and Table 1-5, item B10) is used to adapt a separate d-c power supply for use in place of the battery pack (Units 2A and 7, or 2B). The adapter-end of the cable is physically similar to the battery pack, including plug-in connector and clip-on fasteners. The other end of the cable consists of two tip plugs with alligator clips. (For connection information, refer to paragraph 5-88.)

4-209. In Figure FO-25, diode CR1 provides polarity protection. Capacitor C1 provides a bypass for stray r-f potentials.

4-210. BATTERY CHARGER.

4-211. This battery charger (Figure 4-24 and Table 1-5, item B11) is used to charge the Rechargeable Battery, Unit 2B. The charger is connected to Unit 2B (paragraph 5-89) by means of the battery charging cable, item B12, described under paragraph 4-215.

4-212. In Figure FO-26, 115v, 60 Hz power obtained from power plug P1 (via terminals TB1, 3 and fuse F1), is applied across the two series-connected primary windings of power transformer T1 through POWER pushbutton switch S2. Contacts S2-1, 2 have a snap action, and are alternately locked closed or open when the pushbutton is pressed. For the closed position (POWER "on"), the glow lamp built into the translucent red pushbutton is illuminated via ballast resistor R3.

4-213. The chassis is grounded through terminal TB1-2 and the ground (center) pin of the power plug. The primary windings of transformer T1 have equal turns, and the turns ratio between the series-connected primary and the secondary is 2:1. The maximum secondary current is approximately 0.9 ampere. The primary and secondary windings are both isolated and electrostatically shielded.

4-214. Diode CR1 is a half-wave rectifier. The CHARGE RATE switch S1 selects series current-limiting resistor R1 or R2 as indicated by the switch-position markings. The unsmoothed d-c output is applied to output jacks J1 and J2, positive to J1. The actual voltage and current at the output is a function of the charging characteristics of the load (Unit 2B).

4-215. BATTERY CHARGING CABLE.

4-216. This cable adapter (Figure 4-25 and Table 1-5, item B12) is used to connect the battery charger, item B11 (described under paragraph 4-210) to the Rechargeable Battery, Unit 2B. The adapter-end of the cable is physically similar to the RT unit main chassis, including receptacle connector and clip-on fasteners. The other end of the cable consists of two tip plugs for connection to item B11. (For connection information, refer to paragraph 5-90.)

4-217. Referring to Figure FO-27, the purpose of diode CR1 is to provide polarity protection for Unit 2B.

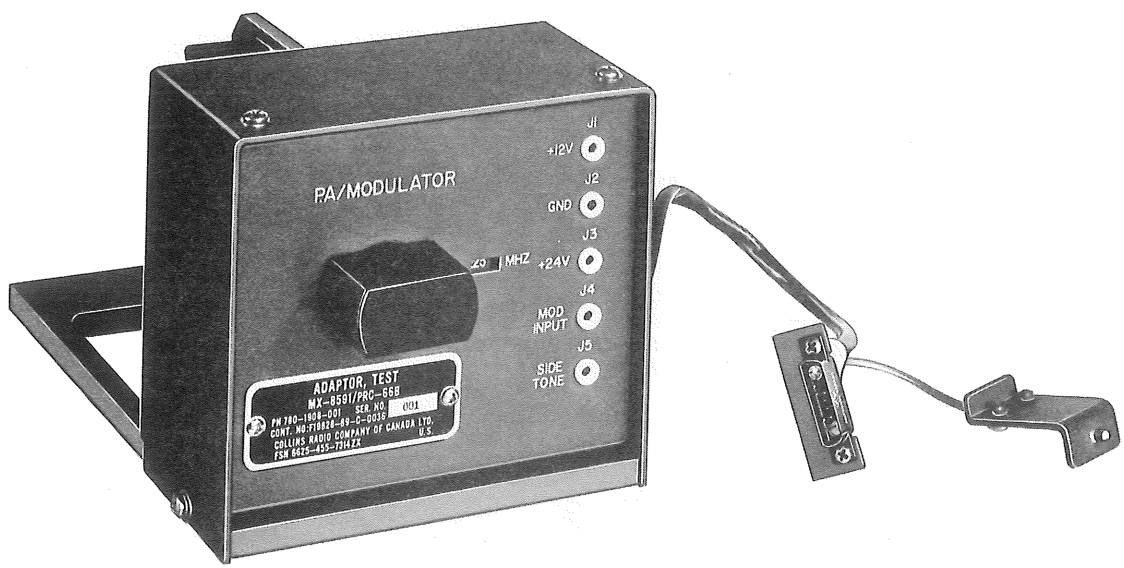


Figure 4-14. PA/Modulator Adapter (B1)

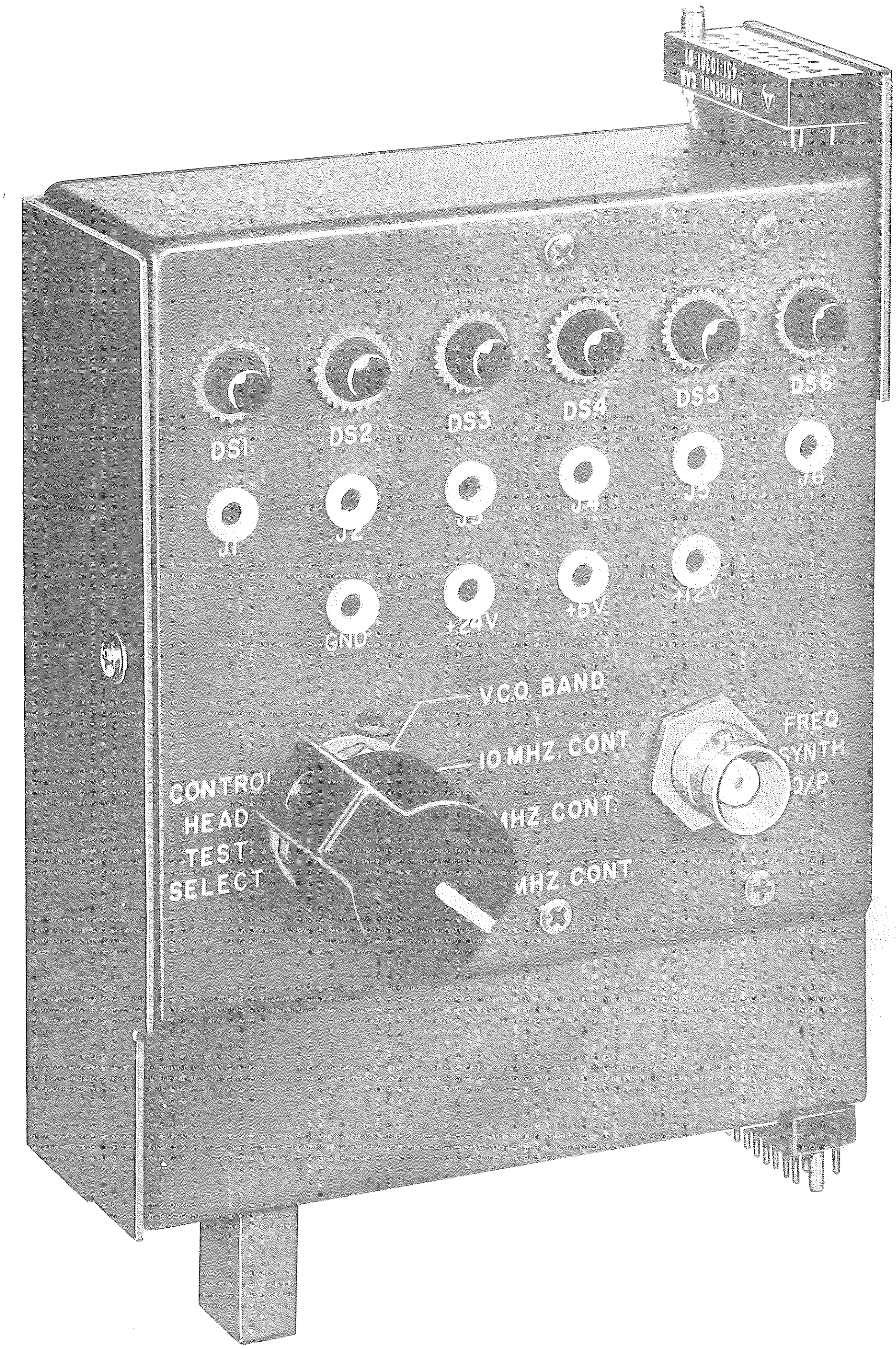


Figure 4-15. Frequency Synthesizer Adapter (B2)

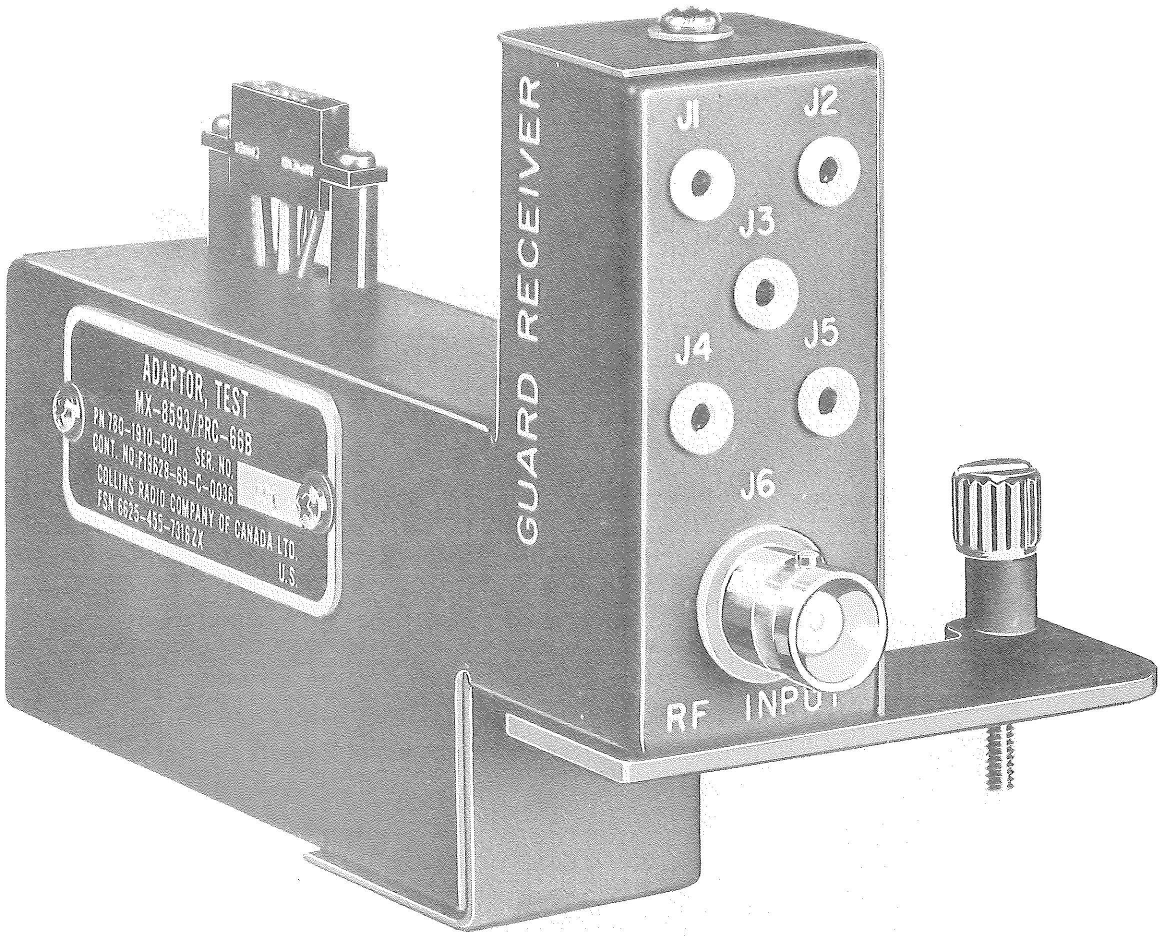


Figure 4-16. Guard Receiver Adapter (B3)

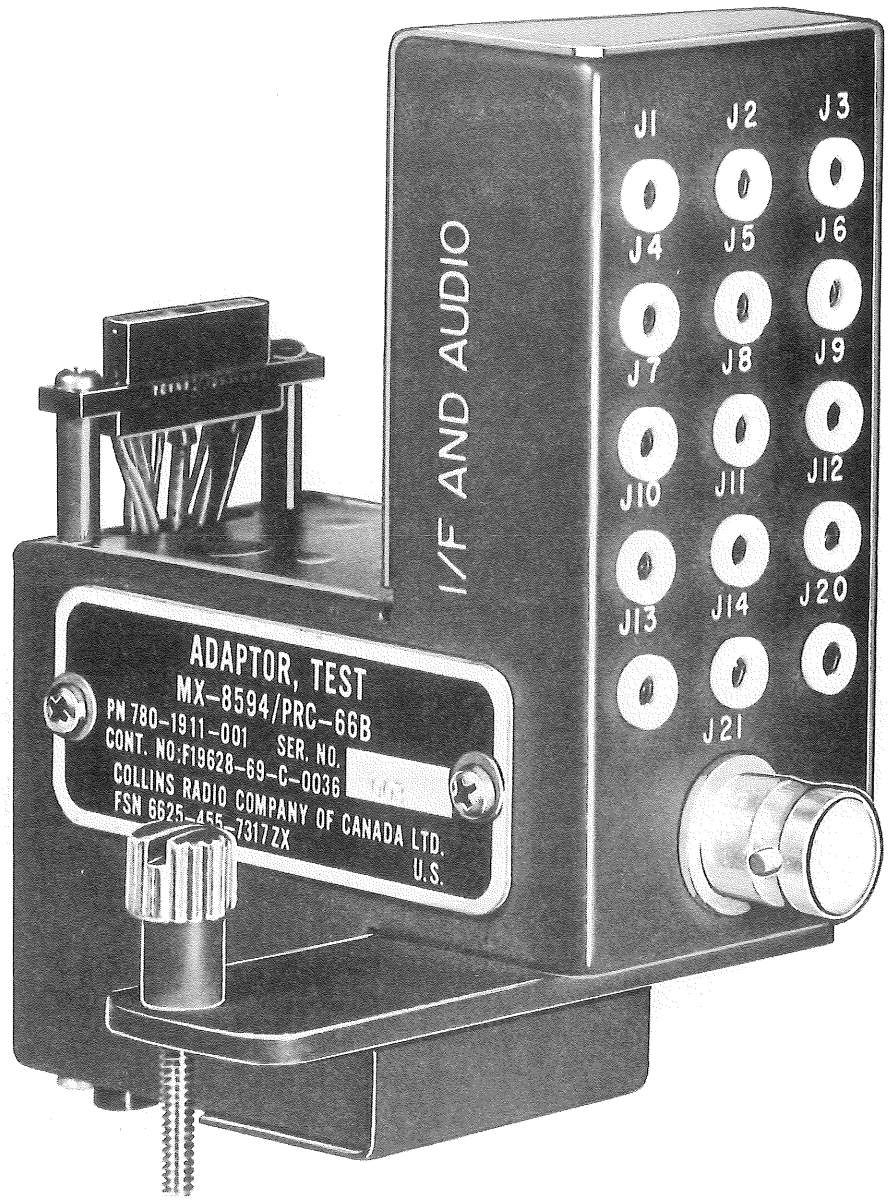


Figure 4-17. IF/Audio Adapter (B4)

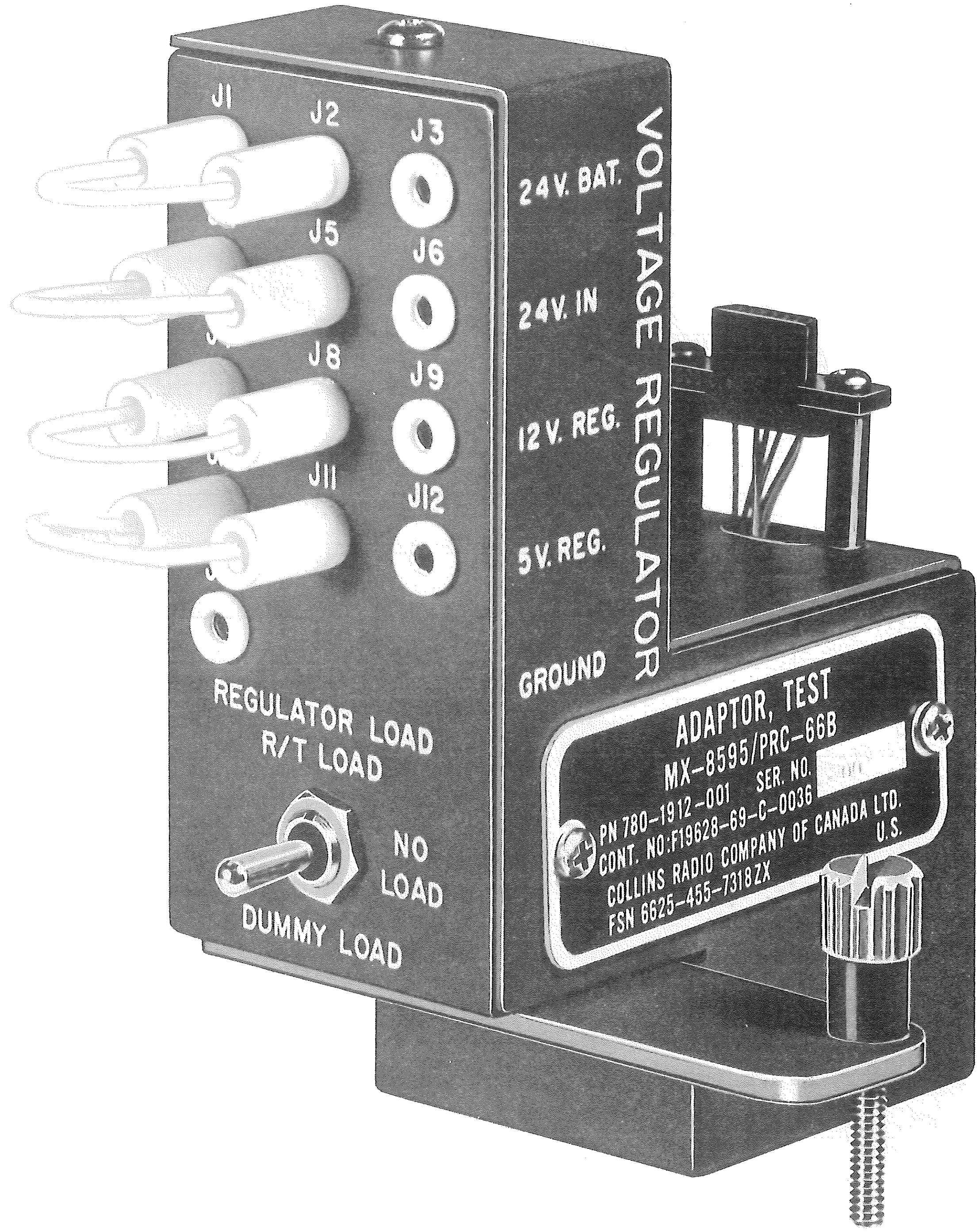


Figure 4-18. Voltage Regulator Adapter (B5)

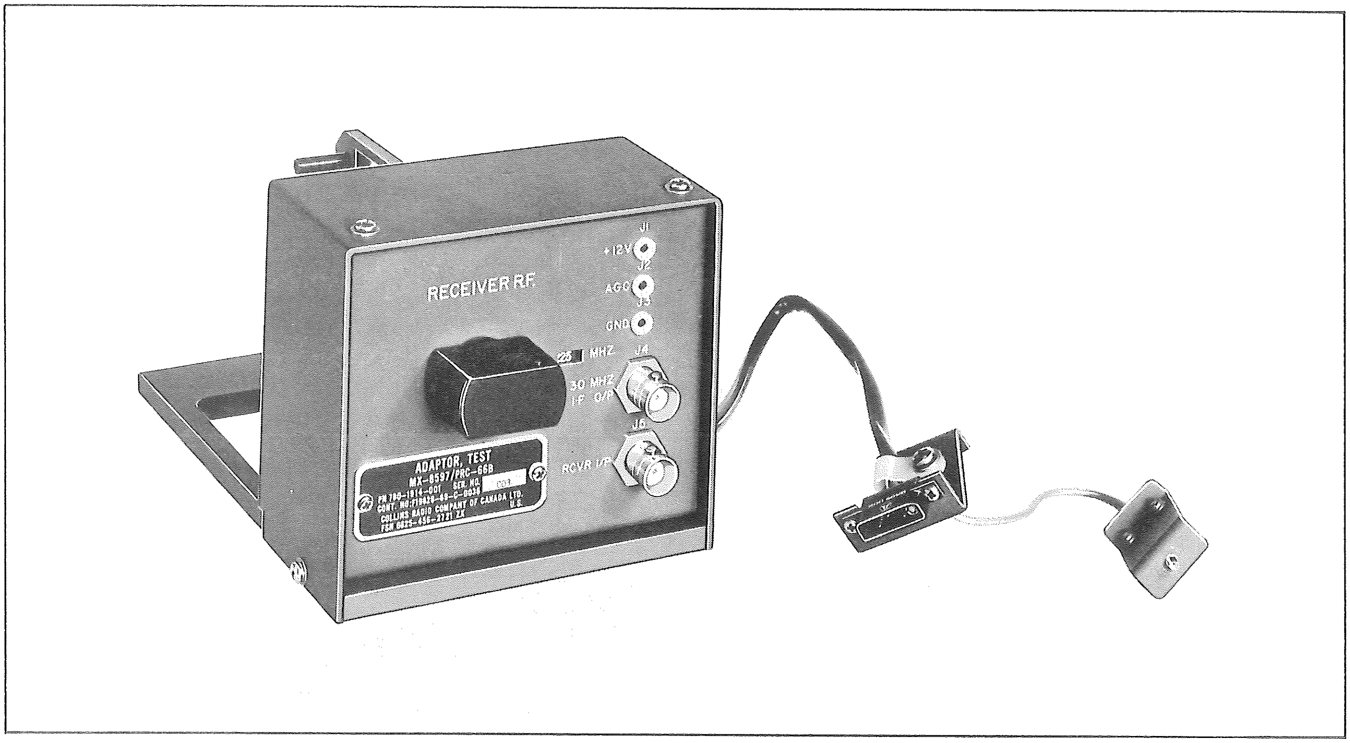


Figure 4-19. Receive RF Adapter (B6)

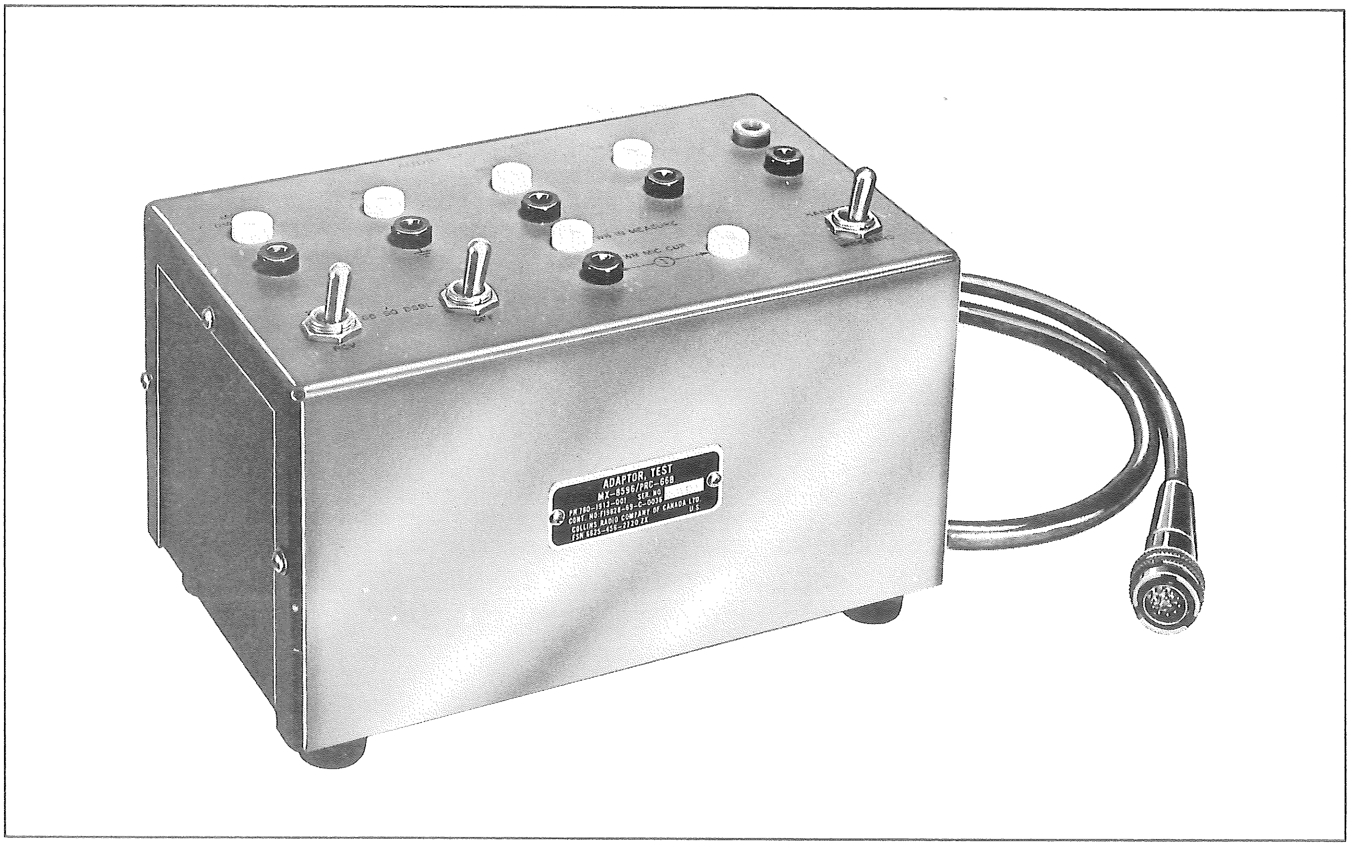


Figure 4-20. Audio Adapter (B7)

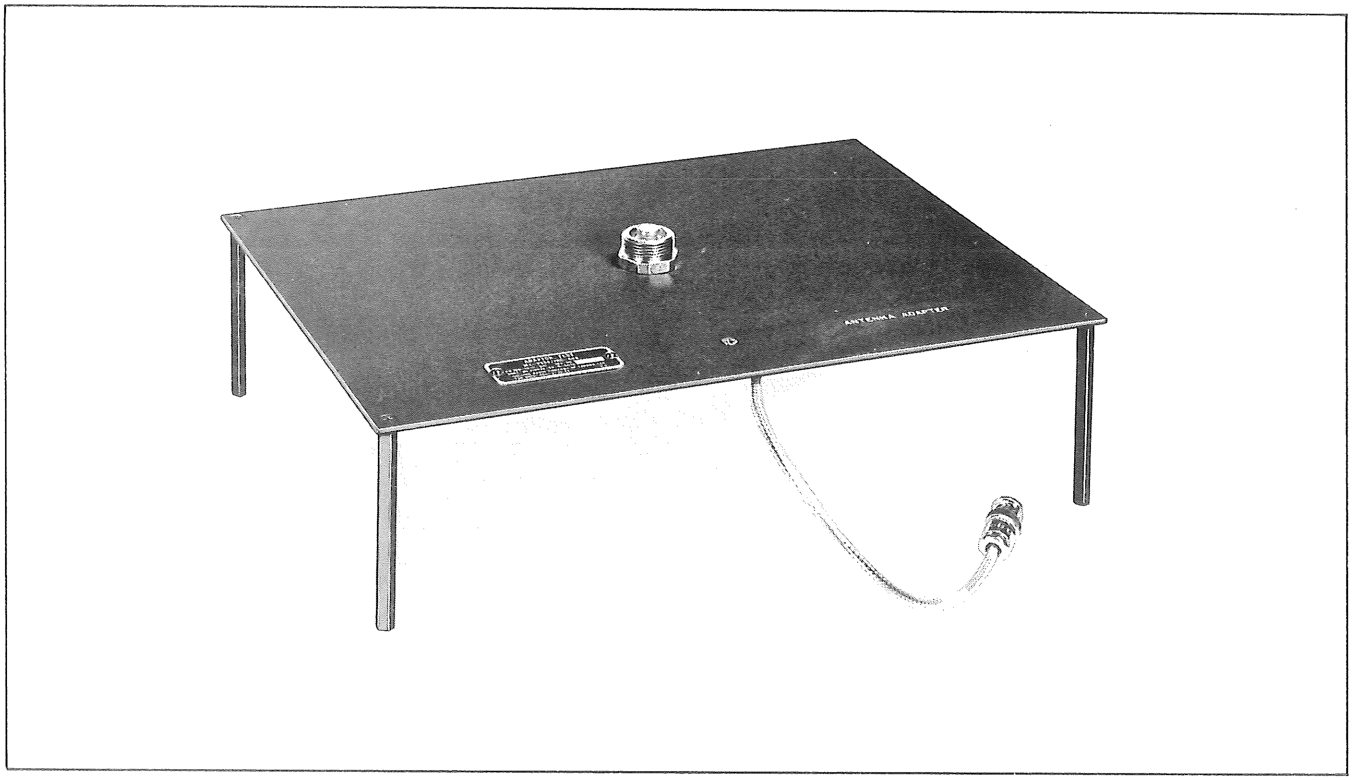


Figure 4-21. Antenna Adapter (B8)

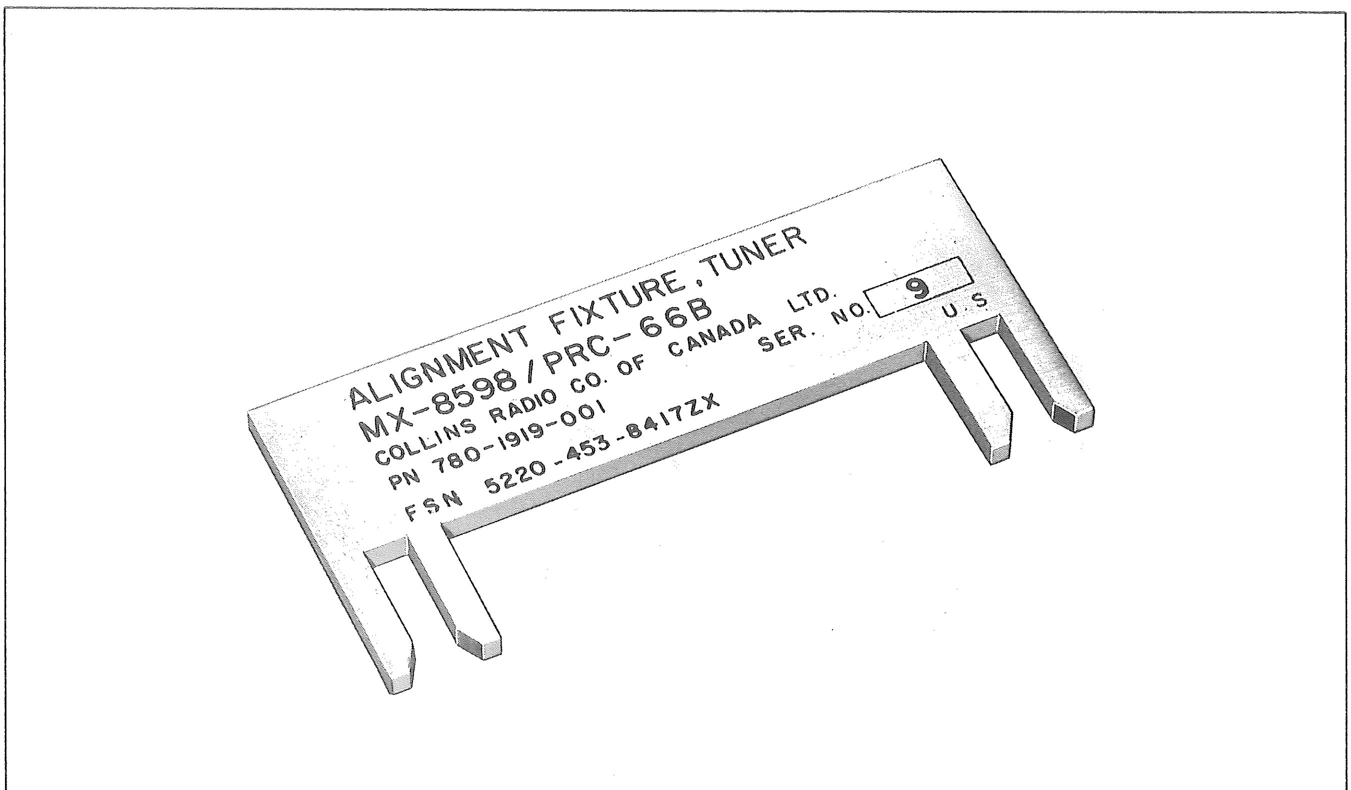


Figure 4-22. Control Head Gauge (B9)

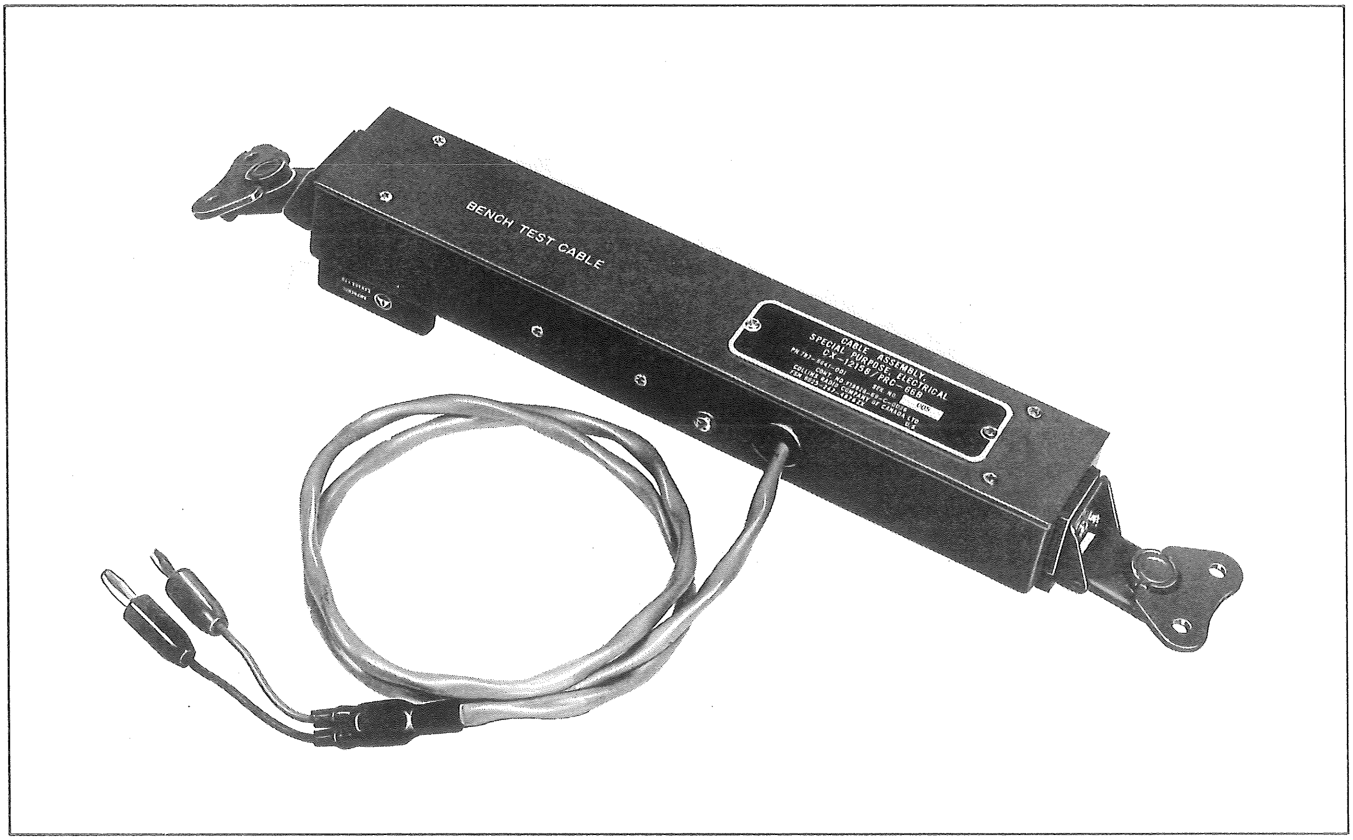


Figure 4-23. Bench Test Cable (B10)

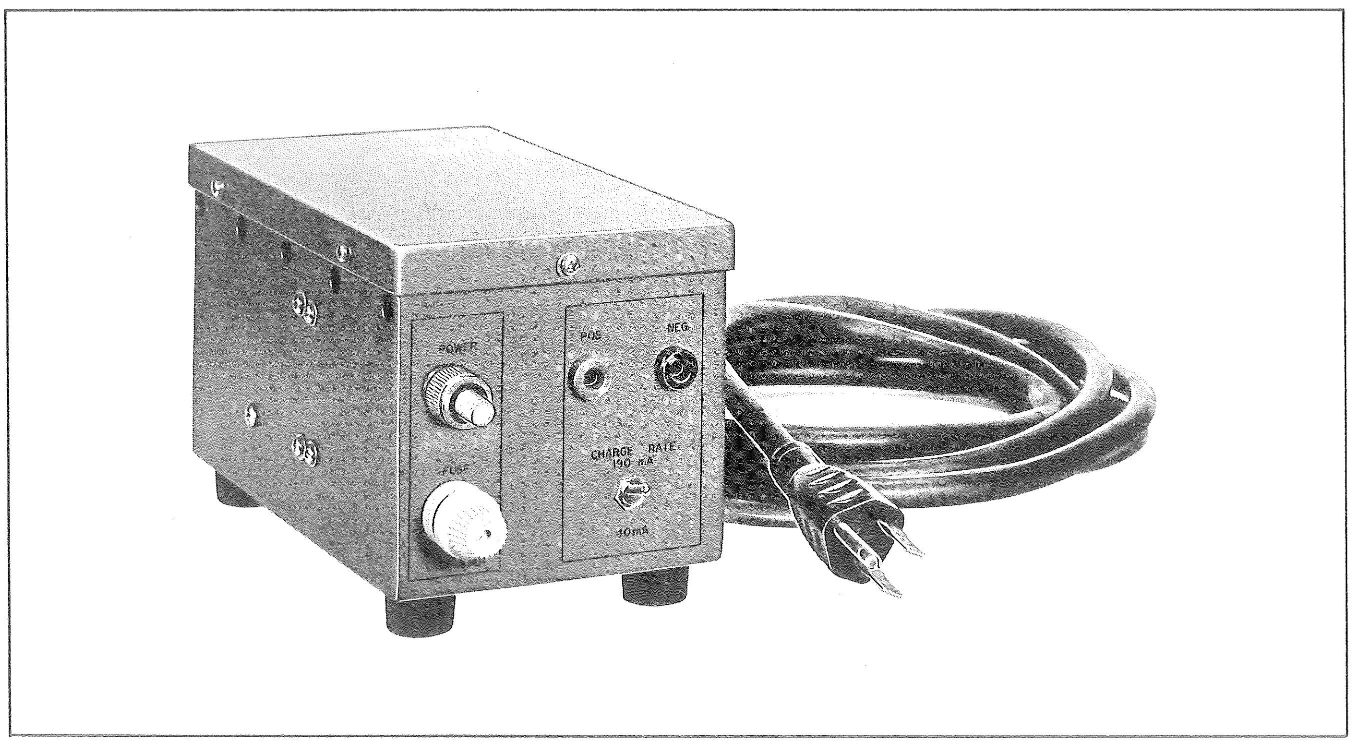


Figure 4-24. Battery Charger (B11)

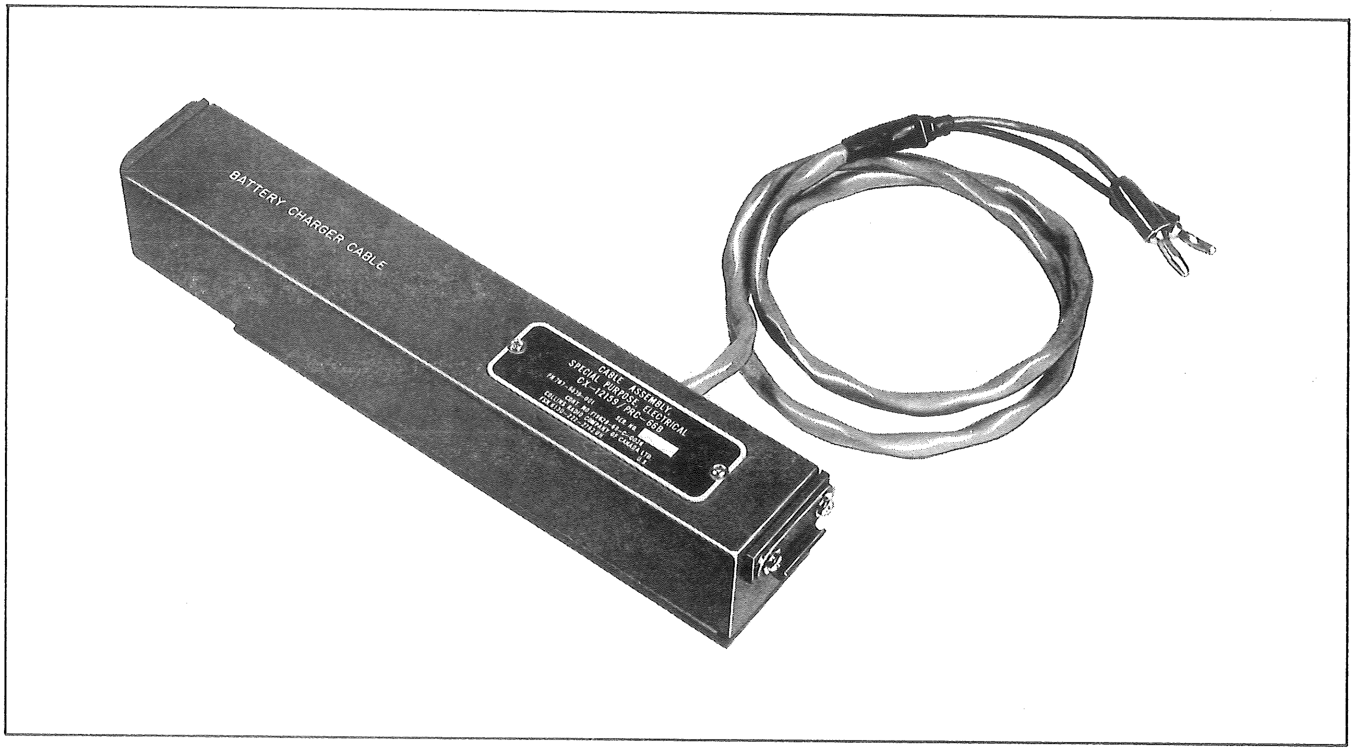


Figure 4-25. Battery Charging Cable (B12)

CHAPTER 5
MAINTENANCE

SECTION I
FIELD MAINTENANCE

5-1. GENERAL.

NOTE

User level scheduled preventive maintenance inspections are contained in T. O. 31R2-2PRC66-6WC-1 (Preventive Maintenance Work Cards). The user maintenance actions consist of visual external inspection, external cleaning, functional checking, renewal of batteries, and the return of unserviceable radio sets to a designated field repair facility.

5-2. The field maintenance concept for Radio Set AN/PRC-66B is dependent on the exercise of optimum self-sufficiency at the field maintenance base level backed up by the special repair activity (depot). This concept can be indirectly defined as consisting of the following phases:

NOTE

All required substitution and replacement items are assumed to be supplied.

a. Replacing defective units of the radio set with serviceable units.

b. RT unit performance test procedures. These procedures are used in three ways: for performance analysis to accurately determine the operating condition of a returned unit; for acceptance test procedures following repair; and for scheduled preventive maintenance inspections if applicable.

c. Module and main chassis performance tests. These tests are used for the modules and main chassis in a way similar to b. above.

d. Troubleshooting the RT unit based on an analytical sectionalization procedure (in chart form) to locate faulty modules, or a faulty main chassis, and to replace such modules or the main chassis with known serviceable items.

e. Troubleshooting the RT unit main chassis and modules based on an analytical localization procedure (in chart form) to locate a fault to a circuit block or stage of the main chassis or a module. Further troubleshooting, where applicable, may consist of isolating faulty discrete parts by standard techniques using resistance, voltage and current measurements and signal tracing.

f. As an alternative method to d. and e. above, sectionalization, localization, and further troubleshooting may also consist of a deductive process based on the results of the RT unit and module test procedures (b. and c. above).

g. Repair of electrical and mechanical parts by replacement only. This covers all parts that have replacement parts supplied. The repair process is thus dependent on the lowest possible part or next higher assembly affected by the repair. Defective thin-film pack and encapsulated circuit blocks are not repairable (except by replacement).

h. Adjustment and alignment procedures to follow a. through g. above as applicable.

i. All units, modules, and electrical and mechanical assemblies which cannot be repaired at field maintenance level are to be returned to the designated repair depot.

5-3. TEST EQUIPMENT.

5-4. The standard and special test equipment required for field maintenance is listed in Table 5-1 (the item numbers are taken from Tables 1-4 and 1-5). Using procedures for the special test equipment are contained under paragraph 5-75.

5-5. (Deleted)

5-6. (Deleted)

5-7. (Deleted)

5-8. (Deleted)

5-9. (Deleted)

5-10. (Deleted)

5-11. (Deleted)

5-12. TEST POINTS.

5-13. The test points used for the RT unit performance test procedures are listed in Table 5-2. In Table 5-2, the 'TEST POINTS OR MARKING' column lists the test points that are marked either on the applicable special test equipment or on the RT unit equipment (prefixed 'A4' in the column). The 'STE' column locates the test point to a "B" section item in Table 5-1. The 'CIRCUIT POINT' column locates the actual point of testing to the nearest connector pin, circuit component, or circuit block pin (refer to the schematic diagrams in the foldout section). The TEST FUNCTION column describes the type of circuit functions that can be measured at the corresponding test points. The test points located on module A4 can be seen in Figures 5-3 and 5-4.

NOTE

Table 5-2 does not list all possible test points. For example, the test points on a module test adapter may make connections to all the connector pins of the applicable module. These additional test points can be used for troubleshooting purposes.

5-14. FUSE LOCATION.

5-15. Three plug-in type fuses are located in Voltage Regulator module A2 and can be seen in Figure 5-2.

5-16. REMOVAL AND REPLACEMENT OF MODULES.

CAUTION

Before removing or replacing modules, ensure that the RT unit function switch is set to the OFF position.

5-17. GENERAL. To gain access to the RT unit modules, remove the seven screws attaching the cover plate on the RT unit. Figure 5-3 shows the locations of the RT unit modules. To remove the modules, carry out the instructions contained under the subheadings following. Figure 5-4 shows the modules removed from the main chassis. The modules are replaced in reverse order of the applicable steps.

NOTE

Where applicable, the following procedures may also be used in conjunction with the procedures contained under paragraph 5-75.

5-18. VOLTAGE REGULATOR MODULE A2. To remove the voltage regulator module, detach the battery pack from the RT unit or switch off the bench power supply, whichever is applicable, then carefully lift the module from the chassis using the module puller. Unscrew the four retaining screws to remove the top cover and the two screws on the connector to remove the module from the case.

5-19. FREQUENCY SYNTHESIZER MODULE A3. To remove this module, carefully lift the module from the chassis using the module puller. To remove the top cover plate, unscrew the five slot head screws attaching the cover plate. To remove the case, unscrew the four Phillips head screws (two at each end).

5-20. IF/AUDIO MODULE A4. To remove this module, carefully lift the module from the chassis using the module puller. Unscrew the four cover retaining screws to remove the module cover. Remove the two connector retaining screws to remove the module chassis.

5-21. POWER AMPLIFIER/MODULATOR MODULE A5. To remove this module, proceed as follows:

a. Rotate the MEGAHERTZ conrols to 225.00 MHz. The tongue of the Oldham coupler should be in the vertical position (viewed from top).

CAUTION

Note the setting of the frequency dials before removing the module. To ensure that the module shaft is not incorrectly rotated through 180° when reinserting the module, check that the rotor blades are fully meshed at 225.00 MHz.

b. Unscrew the four mounting screws securing the module to the chassis.

c. Carefully lift the module from the chassis using the module puller.

d. Remove the cover retaining screws, then remove the cover.

5-22. RECEIVE RF MODULE A6. To remove this module, proceed as follows:

a. Rotate the MEGAHERTZ settings to 225.00 MHz. The tongue on the Oldham coupler which mates with the coupler on the end of the r-f tuning shaft should lie in the vertical position (looking down on the module).

CAUTION

Note the setting of the frequency dials before removing the module. To ensure that the module shaft is not incorrectly rotated through 180° when reinserting the module, check that the rotor blades are fully meshed at 225. 00 MHz.

b. Unscrew the four mounting screws on the base of the module.

c. Carefully lift the module from the chassis using the module puller.

d. Remove the top, side and bottom cover retaining screws; then remove the covers.

5-23. CLEANING.

WARNING

When using a compressed air jet, use eye shields. When using solvents: provide proper ventilation; avoid prolonged contact; do not smoke.

Solvents must meet all pertinent specifications regarding toxicity, flammability, and allergenic effect.

CAUTION

Compressed air must be clean, dry, and at a maximum gauge pressure of 28 pounds/square inch.

5-24. EXTERNAL. Remove the MEGAHERTZ escutcheon plate on the RT unit control panel. Clean the exterior of the complete radio set by using an air jet. If accumulated dirt cannot be removed by air jet alone, use a medium-stiff camel's hair or similar brush to aid the air jet action.

5-25. An approved solvent or detergent may be used to remove grease, oil, or other external contaminants, provided that it is not allowed to contact or run into the insulated sleeving of cablé assemblies and wiring. Certain solvents will damage insulation. The shafts of the MEGAHERTZ control must also be avoided. All solvents tend to cause binding if allowed to seep into shaft bearings or other moving parts. Replace the RT unit MEGAHERTZ escutcheon plate.

5-26. INTERNAL. Normally, the interior of the RT unit will not require cleaning. If required, however, clean the interior as indicated above for the exterior. Do not overlook the force of the air jet when cleaning delicate parts. Do not use solvent unless absolutely necessary.

5-27. <u>VISUAL AND MECHANICAL INSPECTION.</u>

5-28. Visually and mechanically inspect the complete radio set including RT unit, battery pack, and all disassembled and cleaned items according to the following general instructions:

a. Check the complete radio set for missing or damaged units.

b. Check the RT unit main chassis as follows:

1. Check chassis for punctures, deformation, corrosion, and broken, cracked, or blackened parts and wiring. Check cover for punctures, dents, and deformation.

2. Examine connectors for cracked or broken insulation, and broken or deformed pins or sockets.

3. Operate all controls to check for stiffness, looseness, binding, or defective mechanical operation of the control head gear train.

4. Check control head for broken, cracked, or otherwise damaged printed circuit boards. Check for broken terminal connections.

5. Rotate MEGAHERTZ controls to visually check wiper contacts on logic-switch shafts for deformation or damage. Visually check printed sectors of logic switches for damage.

c. Check the PA/Modulator and Receive RF modules as follows:

1. Rotate tuning shaft to check looseness, binding, or other defective movement.

2. Check tuning shaft rotors and stators for shorting or broken condition.

3. On main frame, check for broken feed-through capacitors and insulators, corrosion, and other forms of damage.

4. Check connector pins and insulation.

5. Check for broken, cracked, or blackened parts and wiring.

d. Check modules for damaged thin-film or encapsulated circuit blocks. Check for broken or damaged terminals, connector pins, and insulation. Check parts and wiring for cracked or blackened appearance.

e. Check cable assemblies for damaged or broken wires, connectors, and frayed insulation.

f. Check carrying harness for significant cuts, abrasions, deformation, and wear. Check operation of fasteners.

g. Check battery pack for deformation, punctures, and wear. Check connector for damaged insulation and broken or deformed pins. Check operation of fasteners.

h. Check handset for damage, and for significant wear of wiring and connector.

i. Check antenna for signs of damage or deformation.

j. If applicable, check transit case for damage or deformation.

5-29. LUBRICATION.

5-30. No lubrication is required at field maintenance level.

5-31. RT UNIT TEST-BENCH SETUPS.

5-32. The RT unit must be performance tested in both the transmit and receive modes of operation. Each mode requires a different arrangement of the test equipment complement required for RT unit testing. The different requirements are described under the subheadings following.

NOTE

The field and depot maintenance test-bench setups may differ only by certain test equipment items. That is, all tests for which test equipment is available may be carried out at field level.

5-33. RECEIVE MODE TEST SETUP. Figure 5-5 shows the receive mode test setup. The test equipment is identified by description, part/nomenclature, and item number as listed in Tables 1-4 and 5-1. The dotted line connections indicate either that the particular item is not always in use, or alternatively, that it is used in two places. The switches are intended to simplify the calling up of different groups of test equipment in the test procedures. In practice, for example, the r-f switch may instead consist of the applicable standard coaxial connectors. Similarly, the a-f switch may consist of standard connections. All audio output loads are contained in Item B7.

CAUTION

Do not set the RCV/XMT switch on item B7 to the XMT position.

5-34. To prepare for receive mode tests, obtain the test equipment shown in Figure 5-5 and make the indicated connections. Do not apply power until it is required. Refer to paragraph 5-37 for the test procedure information.

5-35. TRANSMIT MODE TEST SETUP. Figure 5-6 shows the transmit mode test setup. The same general remarks apply to this test setup as are contained under the previous heading. All audio input matching loads are contained in Item B7.

5-36. To prepare for transmit mode tests, obtain the test equipment shown in Figure 5-6 and make the indicated connections. Do not apply power until it is required. Refer to paragraph 5-37 for the test procedure information.

5-37. RT UNIT PERFORMANCE TEST PROCEDURES.

5-38. The RT unit must be in correct adjustment and alignment before the performance test standards can be met. However, misadjustment or misalignment may not be evident until some or all of the performance test procedures are actually carried out. Table 5-3 lists the adjustment and alignment procedures which may have to be performed in addition to the performance test procedures. Tables 5-4 through 5-23, and Figure 5-7, cover the RT unit performance test procedures. The procedures are arranged in a convenient order, but may be performed in any order. Procedural steps must be performed without alteration of order. If adjustment or alignment is required to meet the required performance test standards, the performance tests affected by the adjustment or alignment must be repeated.

NOTE

The procedural steps in Tables 5-4 through 5-22 are numbered according to the following scheme: plain "Step" column numbers indicate that no special operating condition is specified; Step numbers prefixed "A" indicate normal transmit or receive mode operation; and Step numbers prefixed "B" indicate wideband transmit or receive mode operation.

5-39. To perform one or more of the performance tests, refer to paragraph 5-31 and to the applicable performance procedure table(s). Carry out the procedural steps of the table(s).

CAUTION

Switch off the power before making or breaking test connections.

NOTE

In all test procedures, the r-f or audio input signal amplitude requirements are given as closed-circuit rms voltages. All voltage and current measurements imply rms values unless otherwise stipulated.

5-40. ADJUSTMENT PROCEDURES.

5-41. GENERAL. Three preset adjustments are required in the RT unit. The adjustments are: receiver audio level; squelch threshold; and transmit modulation level. These adjustments must be initially correct in order to meet the applicable performance test standards. Table 5-24 lists the three preset adjustment controls. The preset adjustment controls can be located by reference to Figure 5-3.

NOTE

The procedure for the adjustment of transmit output power is contained in the alignment procedure for module A5.

5-42. TEST SETUPS. The RT unit adjustment procedure test setups are the same as the receive and transmit mode (as applicable) test setups described under paragraph 5-31.

5-43. PROCEDURES. Tables 5-25 through 5-27 are the RT unit adjustment procedures. To perform one or more of the procedures, refer to the applicable table(s) and carry out the procedural steps in strict order.

5-44. TROUBLESHOOTING (RT UNIT).

5-45. GENERAL. The RT unit is designed to a modular concept, so that troubleshooting should consist of a fault sectionalization process intended to return the unit to a serviceable condition in the least possible time. "Sectionalization" is defined as the action of locating a fault to a module or the main chassis of the RT unit. The fault sectionalization process consists of an analytical method or procedure which is adaptable to a chart format.

5-46. For troubleshooting purposes, there must be available sufficient quantities of known-serviceable plug-in modules (and the main chassis) that can be used for substitution during troubleshooting and for permanent replacement to repair the faulty unit.

5-47. TEST SETUP. The basic RT unit troubleshooting setup consists only of the complete RT unit and the battery pack. The use of additional special test equipment is detailed as applicable in the troubleshooting chart (see below).

5-48. TROUBLESHOOTING CHART. Figure FO-11 is a chart or diagram of the troubleshooting procedure. The chart is used by beginning at the 'START' position and proceeding along a directional flow path routed through the rectangular "action" and diamond "statement" blocks until a FINISH position is reached. The actual path followed during the procedure is dependent on the 'YES' or 'NO' answers resulting from the statement blocks. The oval blocks are general action blocks for control operation or similar requirements. All the blocks in the diagram represent procedural steps and must be strictly followed in the indicated order.

5-49. TROUBLESHOOTING PROCEDURE. Refer to Figure FO-11 and carry out the procedural steps represented by the action and statement blocks until a finish position is reached.

5-50. RT UNIT REPAIR AND TESTING.

5-51. Repair and test the RT unit according to the following sequence:

a. Replace defective modules or the main chassis (as applicable) with serviceable items.

b. Perform the adjustment procedures contained in Tables 5-25 through 5-27.

c. Carry out the performance test procedures contained in Tables 5-4 through 5-22.

d. When all performance standards (c. above) are met, mark or identify the unit as serviceable.

e. If the RT unit cannot be made serviceable, return the complete unit to the designated repair depot.

5-52. PERFORMANCE TESTS (MODULES AND MAIN CHASSIS).

5-53. GENERAL. Performance testing of the RT unit modules and main chassis is based on the RT unit performance test procedures. Thus, a given module (or the main chassis) is tested by carrying out those RT unit procedures which require a performance standard having significance to the performance of the module. For this purpose, the radio set equipment which forms the test bed must be known to be serviceable. References to the applicable RT unit performance test procedures are contained under the subheadings following.

5-54. VOLTAGE REGULATOR MODULE A2. To test module A2, carry out the procedural steps of Table 5-4.

5-55. FREQUENCY SYNTHESIZER MODULE A3. For testing of module A3, refer to paragraph 5-81.

5-56. IF/AUDIO MODULE A4. To test module A4, proceed as follows:

a. Carry out the procedural steps of Tables 5-25 through 5-27.

b. Carry out the procedural steps of Tables 5-5 through 5-8, 5-11 through 5-13, 5-16, 5-17, and 5-19.

5-57. PA/MODULATOR MODULE A5. To test module A5, proceed as follows:

a. If necessary, carry out the procedural steps of Table 5-31.

b. Carry out the procedural steps of Tables 5-14 through 5-18, 5-20, and 5-21.

5-58. RECEIVE RF MODULE A6. To test module A6, proceed as follows:

a. If necessary, carry out the procedural steps of Table 5-30.

b. Carry out the procedural steps of Tables 5-5, 5-6 and 5-10.

5-59. ATTENUATOR-FILTER BOARD A1A4. To test the attenuator-filter board A1A4, refer to the schematic diagram contained in Figure FO-3 and make continuity and resistance measurements.

5-60. WIDEBAND BOARD A1A5. To test wideband board A1A5, proceed as follows:

a. Use the test setup of Figure 5-6 to measure the current source output at Item B7 test point WB MIC CUR. Current value must equal 55 ± 10 mA.

b. Carry out the procedural steps of the B-sections in Tables 5-5, 5-7, and 5-8.

5-61. RT UNIT MAIN CHASSIS. To test the main chassis, proceed as follows:

a. Remove modules A2 through A6.

b. Refer to the schematic diagrams Figures FO-3 and FO-4. Make a continuity and resistance check of the complete wiring including switches and relays except do not check the diode logic (see f. below) or boards A1A4 and A1A5 (see g. below).

c. Check the operation of the transmit-receive and PTT relays by applying 24 vdc to the solenoid pins.

d. Set MEGAHERTZ controls to 225.00.

e. Using test equipment Item B9, check that the two control head mechanical output couplers to modules A5 and A6 are properly aligned. This is done by sliding the slots of the B9 gauge over the ribs of the couplers. Do not use force. The couplers are properly aligned if the gauge slides over them without difficulty.

f. Carry out the procedural steps of Table 5-22.

g. Carry out the procedures contained in paragraphs 5-59 and 5-60 above.

5-62. ANTENNA FORWARD/REFLECTED POWER TEST.

5-63. Table 5-28 provides a performance testing procedure for Antenna AS-2117/PRC-66. To test the antenna, carry out the procedural steps of Table 5-28.

5-64. ALIGNMENT PROCEDURES.

5-65. GENERAL. The PA/Modulator and Receive RF modules, A5 and A6 respectively, may require r-f alignment (tuning) at field maintenance level. This requirement will only arise because the applicable performance test standards cannot be met (as may occur, for example, following repair). Table 5-29 lists the components affecting alignment. The alignment components can be located by reference to Figure 5-9 and Table 5-29.

CAUTION

The r-f alignment of modules A5 and A6 is a lengthy procedure. Do not disturb the alignment of these modules unless absolutely necessary.

5-66. TEST SETUPS. The alignment test setups for the PA/Modulator and Receive RF modules are the same as the receive and transmit mode (as applicable) test setups described under paragraph 5-31. The use of additional special test equipment is detailed in the alignment procedures (next paragraph).

5-67. PROCEDURES. Tables 5-30 and 5-31 are the r-f alignment procedures for modules A5 and A6 respectively. To perform one or both procedures, refer to the applicable table(s) and carry out the procedural steps in strict order.

5-68. TROUBLESHOOTING (MODULES AND MAIN CHASSIS).

NOTE

The extent of module and main chassis troubleshooting should be related to the field maintenance base repair capability.

5-69. GENERAL. Troubleshooting of the RT unit modules and main chassis is based on a fault localization and isolating process. "Localization" is defined as the action of locating a fault to a circuit section, block, or stage. "Isolating" means the action of locating a discrete part. Localization procedures are adaptable to a chart format; isolating procedures generally consist of the application of standard voltage, current, resistance, and signal tracing methods. In addition, module troubleshooting can sometimes be carried out by careful interpretation of the results of the RT unit performance test procedures. In the case of the RT unit main chassis, troubleshooting must be based on interpretation of the results of the procedures called up in paragraph 4-61 above.

5-70. TEST SETUPS. The module test setups are basically the same as the receive and transmit mode (as applicable) test setups described under paragraph 5-31. These test setups may be modified by the troubleshooting procedures (see below). The use of additional special test equipment is also detailed as applicable.

5-71. TROUBLESHOOTING CHARTS. Figures FO-12 through FO-16 are charts or diagrams of the troubleshooting procedures for the RT unit modules. The charts are used in a way similar to that for the RT unit chart described under paragraph 5-48.

5-72. TROUBLESHOOTING PROCEDURES. Refer to Figures FO-12 through FO-16 (as applicable) and carry out the procedural steps represented by the action and statement blocks until a finish position is reached.

5-73. <u>MODULES AND MAIN CHASSIS REPAIR AND TESTING.</u>

5-74. Repair and test the modules and main chassis (as applicable) according to the following sequence:

a. Replace defective circuit sections, blocks, stages, or discrete parts (as applicable) with new items.

b. Carry out the applicable performance test(s) called up under paragraph 5-52.

c. When all performance standards have been met (b. above), mark or identify the module or main chassis as serviceable.

d. If a module or main chassis cannot be made serviceable, return the complete defective item to the designated repair depot.

NOTE

The functional operation of the following equipment is covered in Chapter 4, Section IV.

5-75. <u>USING PROCEDURES FOR SPECIAL TEST EQUIPMENT.</u>

5-76. GENERAL. The using procedures provided hereunder cover the installing, connection, general operating use, and removal, of the special test equipment items listed in the "B" section of Table 5-1. These procedures are automatically referenced, as applicable, when any item of the special test equipment is used. The special test equipment items are called up for use in pertinent troubleshooting, alignment, and adjustment procedures.

5-77. The using procedures may be performed in any order. The order of the procedural steps within a given using procedure is arranged to reduce wear and tear of the equipment and to indicate the general application. The specific use of any special test equipment item is governed by the requirements of the pertinent troubleshooting, alignment, and adjustment procedure.

5-78. PROCEDURES. The special test equipment using procedures are contained under the twelve common-name subheadings which follow. The item designations are included in the subheadings to facilitate reference to Table 5-1.

5-79. PA/MODULATOR ADAPTER (B1). The adapter (paragraph 4-170) is installed and used between module 1A5 and the RT unit chassis according to the following procedure:

Figure 5-1. (Deleted)

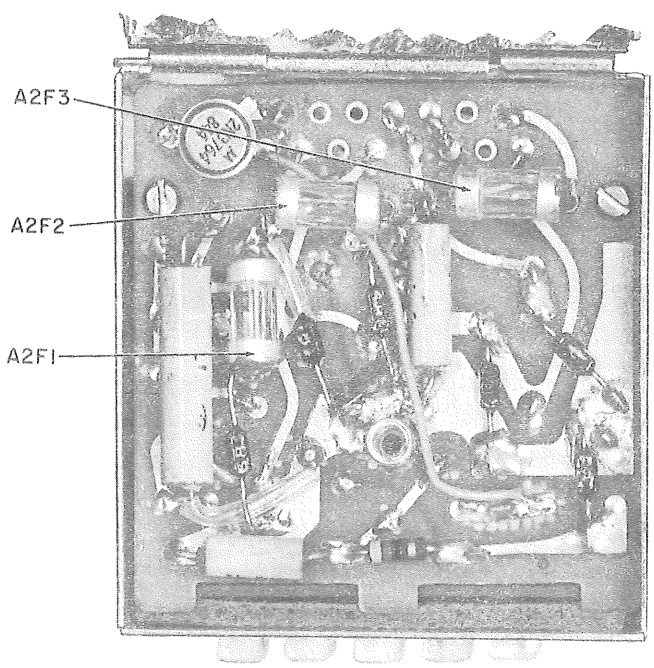


Figure 5-2. Module A2, Fuse Location

a. On the RT unit, set the function switch to OFF. Set the MEGAHERTZ controls to obtain a readout of 225.00. Remove module 1A5 (refer to paragraph 5-21).

b. Insert the adapter cable-end plug-in connectors P1A and P2A (coax) into the corresponding RT unit chassis connectors 1A5J1 and 1A5J2 respectively.

c. On the RT unit, set the MEGAHERTZ reading to 225.00.

d. On the adapter, set the MHZ dial to 225. Partially insert module 1A5 plug-in connectors into the adapter connectors. Ensure a correct lining-up between the adapter and module mechanical couplers. (The module rotor blades must be fully meshed with the stator blades.) Firmly press home the module plug-in connectors, then tighten the captive mounting screws. Ensure that a positive detent action occurs for all MHZ dial readout positions.

NOTE

For adapter MHZ dial position 225, the top flat surface of the tongue on the adapter mechanical coupling assembly is parallel to the base plate surface within a factory-adjusted tolerance of 0.001 inch.

e. Refer to the Note following paragraph 4-171. As required, set the RT unit MEGAHERTZ readout to equal the adapter MHZ dial setting for all MHZ settings used. Set the RT unit function switch to the applicable operating position.

f. To remove the module adapter, and to re-install module 1A5 in the RT unit, proceed as follows:

1. Set the RT unit function switch to OFF.

2. Disconnect the adapter plug-in connectors P1A and P2A.

3. Set the adapter MHZ dial to 225.

4. Remove module 1A5 from the adapter.

5. Set the RT unit MEGAHERTZ reading to 225.00.

6. Install module 1A5 in the RT unit, ensuring that the module shaft coupler is correctly lined up with the RT unit control head coupler.

7. Set the RT unit MEGAHERTZ reading to 225.00. Visually check that the 1A5 module rotor blades are fully meshed with the stator blades. This verifies that there is no 180° displacement of the RT unit and module mechanical couplers.

5-80. FREQUENCY SYNTHESIZER ADAPTER (B2). The adapter (paragraph 4-174) is installed and used between module 1A3 and the RT unit chassis according to the following procedure:

a. On the RT unit, set the function switch to OFF. Remove module 1A3 (see under paragraph 5-16).

b. Insert the adapter plug-in connector P1A into RT unit connector 1A3J1.

c. Insert module 1A3 plug-in connector into the adapter connector J7 and firmly press home.

d. On the RT unit, set the function switch to the applicable operating position. Select the MEGAHERTZ readout as required by e. following.

e. On the adapter, use the CONTROL HEAD TEST SELECT switch to select the required set of RT unit control head logic output signals. Observe the indicator light display to determine the states of the logic output signals for each RT unit MEGAHERTZ readout setting. (Refer to Table 5-23.)

NOTE

For maintenance information regarding Frequency Synthesizer module 1A3, refer to paragraph 5-55.

f. To remove the adapter, set the RT unit function switch to OFF. Perform the pertinent installing steps in reverse order.

5-81. GUARD RECEIVER ADAPTER (B3). The adapter (paragraph 4-181) is installed and used between module 1A7 and the RT unit chassis according to the following procedure:

a. On the RT unit, set the function switch to OFF. Remove module 1A7 (when applicable, see under paragraph 5-16).

b. Insert the adapter plug-in connector P1A into RT unit connector 1A7J1. Hand-tighten the knurled captive screw into the corresponding threaded hole on the RT unit chassis.

c. Insert module 1A7 plug-in connector into the adapter connector J1A and firmly press home.

d. Connect the output of the r-f oscillator (Table 5-1, item A6) to RF INPUT connector J6.

e. On the RT unit, set the function switch to the T/R + G position.

f. To remove the adapter, set the RT unit function switch to OFF. Perform the pertinent installing steps in reverse order.

5-82. IF/AUDIO ADAPTER (B4). The adapter (paragraph 4-184) is installed and used between module 1A4 and the RT unit chassis according to the following procedure:

a. On the RT unit, set the function switch to OFF. Remove module 1A4 (see under paragraph 5-16).

b. Insert the adapter plug-in connector P1A into RT unit connector 1A4J1. Hand-tighten the knurled captive screw into the corresponding threaded hole on the RT unit chassis.

c. Insert module 1A4 plug-in connector into the adapter connector J1A and firmly press home.

d. If it is desired to provide a separate 30 MHz i-f test input to module 1A4, carry out the following additional steps before proceeding to e. below.

1. Install the Receive RF module adapter (refer to paragraph 5-84), but do not connect the adapter cable-end connector P2A (coax). This opens the 30 MHz i-f input line from module 1A6.

2. Connect the output of the r-f oscillator (Table 5-1, item A6) to J21 (coax) on the IF/Audio adapter.

e. On the RT unit, set the function switch to the applicable operating position.

f. To remove the adapter(s), set the RT unit function switch to OFF. Perform the pertinent installing steps in reverse order.

5-83. VOLTAGE REGULATOR ADAPTER (B5). The adapter (paragraph 4-187) is installed and used between module 1A2 and the RT unit chassis according to the following procedure:

a. On the RT unit, set the function switch to OFF. Remove module 1A2 (see under paragraph 5-16).

b. Insert the adapter plug-in connector P1A into RT unit connector 1A2J1. Hand-tighten the knurled captive screw into the corresponding threaded hole on the RT unit chassis.

c. Insert module 1A2 plug-in connector into the adapter connector J1A and firmly press home.

d. On the adapter, ensure that the four jumper links are properly plugged into series test jack pairs J2/J3, J5/J6, J8/J9, and J11/J12. Proceed to e. and/or f. below as required.

e. On the adapter, remove the P2/P3 jumper link normally plugged into test jacks J2/J3. Connect the d-c current terminals of a multimeter (Table 5-1, item A11) to J2/J3, positive to J2. Set the multimeter d-c current range to maximum. (The other series test jacks may be similarly utilized as required.)

f. Set the REGULATOR LOAD switch to the DUMMY LOAD position.

g. On the RT unit, set the function switch to the applicable operating position. Proceed to h. and/or i. below as required.

h. If a multimeter is connected, adjust the d-c current range downwards until the pointer deflection is satisfactory.

i. Set the REGULATOR LOAD switch to the R/T LOAD position or as required.

j. To remove the adapter, set the RT unit function switch to OFF. Perform the pertinent installing steps in reverse order.

5-84. RECEIVE RF ADAPTER (B6). The adapter (paragraph 4-191) is installed and used between module 1A6 and the RT unit chassis according to the following procedure:

a. On the RT unit, set the function switch to OFF. Set the MEGAHERTZ controls to obtain a readout of 225.00. Remove module 1A6 (refer to paragraph 5-22).

b. Insert the adapter cable-end connectors P1A and P2A (coax) into the corresponding RT unit chassis connectors 1A6J1 and 1A6J2 respectively.

c. On the RT unit, set the MEGAHERTZ reading to 225.00.

d. On the adapter, set the MHz dial to 225. Partially insert module 1A6 plug-in connectors into the adapter connectors. Ensure a correct lining-up between the adapter and module mechanical couplers. (The module rotor blades must be fully meshed with the stator blades.) Firmly press home the module plug-in connectors, then tighten the captive mounting screws. Ensure that a positive detent action occurs for all MHZ dial readout positions.

NOTE

For adapter MHZ dial position 225, the top flat surface of the tongue on the adapter mechanical coupling assembly is parallel to the base plate surface within a factory-adjusted tolerance of 0.001 inch.

e. Connect the output of an r-f oscillator (Table 5-1, item A6) to the RCVR O/P jack on the adapter. Set the r-f oscillator audio modulation as required. Adjust the r-f oscillator output frequency so that it equals the RT unit MEGAHERTZ setting (see f. following). Unless otherwise stipulated, maintain the equality of the r-f oscillator output frequency to the MEGAHERTZ setting for all MEGAHERTZ settings used.

f. Refer to the Note following paragraph 4-192. As required, set the RT unit MEGAHERTZ readout to equal the adapter MHz dial setting for all MHZ settings used. Set the RT unit function switch to the applicable operating position.

g. To remove the module adapter, and to re-install module 1A6 in the RT unit, proceed as follows:

1. Set the RT unit function switch to OFF.

2. Disconnect the r-f oscillator and the adapter plug-in connectors P1A and P2A.

3. Set the adapter MHZ dial to 225.

4. Remove module 1A6 from the adapter.

5. Set the RT unit MEGAHERTZ reading to 225.00.

6. Install module 1A6 in the RT unit, ensuring that the module shaft coupler is correctly aligned with the RT unit control head coupler.

7. Set the RT unit MEGAHERTZ reading to 225.00. Visually check that the 1A6 module rotor blades are fully meshed with the

stator blades. This verifies that there is no 180° displacement between the RT unit and module mechanical couplers.

5-85. AUDIO ADAPTER (B7). The adapter (paragraph 4-195) connections to the RT unit are made with reference to the test setups shown in Figures 5-5 and 5-6, Table 5-1, and according to the following using procedure:

a. On the RT unit, set the function switch to OFF. Remove the captive covering cap from the WIDEBAND connector.

b. Insert the adapter cable-end connector into the WIDEBAND connector on the RT unit.

c. Jumper the WB MIC CUR jacks when these jacks are not connected to a milliameter.

d. When the MIC HI (HANDSET) jacks are in use, set the TX MODE switch to the HANDSET position. When the WB MIC HI IN jacks are in use, set the TX MODE switch to the WIDEBAND position.

e. On the adapter, set the RCV/XMT switch to the RCV position. Set the GD SQ DSBL (TEST) IN switch to either position as required.

f. On the RT unit, set the function switch to the applicable operating position.

g. Set the RCV/XMT switch to either position as required.

h. To remove the adapter, set the RT unit function switch to OFF. Perform the pertinent disconnecting steps in reverse order.

5-86. ANTENNA ADAPTER (B8). The adapter (paragraph 4-203) connections are made with reference to the test setup shown in Figure 5-8 and according to the following using procedure:

a. On the RT unit, set the function switch to OFF. Remove the Antenna, Unit 4, from the RT unit.

b. Connect the Antenna, Unit 4, to the type "N" connector on the antenna adapter.

c. Connect an r-f wattmeter and element (items A17 and A18 used together) to the antenna adapter, using the cable-end connector of the adapter.

d. Connect the r-f wattmeter (item A17) to the ANT jack on the RT unit, using the cable supplied with item A17.

e. Set the RT unit function switch to the applicable operating position.

f. To remove the adapter, perform the pertinent disconnecting steps in reverse order.

5-87. CONTROL HEAD GAUGE (B9). The gauge (paragraph 4-205) is used with reference to paragraph 5-61, e.; Figure 5-11, Note 5; and according to the following procedure:

a. Set the RT unit function switch to OFF.

b. Remove modules 1A5 and 1A6 (see under paragraph 5-16).

c. With the MEGAHERTZ readout set to 225.00, slide the gauge over the ribs of the tuning-shaft output couplers of the geartrain. Do not use force. The gauge must slide over the couplers without difficulty.

d. After performing the coupler check, remove the gauge and perform, as applicable, the foregoing steps in reverse order.

5-88. BENCH TEST CABLE (B10). The bench test cable (paragraph 4-207) is connected and used according to the procedure contained under paragraph 3-15. Note that a current-measuring meter may be connected in series with the cable as indicated in Figures 5-5 and 5-6.

5-89. BATTERY CHARGER (B11). The battery charger (paragraph 4-210) is connected and used in conjunction with the battery charging cable (item B12) according to the procedure contained under paragraph 3-13.

5-90. BATTERY CHARGING CABLE (B12). The battery charging cable (paragraph 4-215) is connected and used in conjunction with the battery charger (item B11) according to the procedure contained under paragraph 3-13.

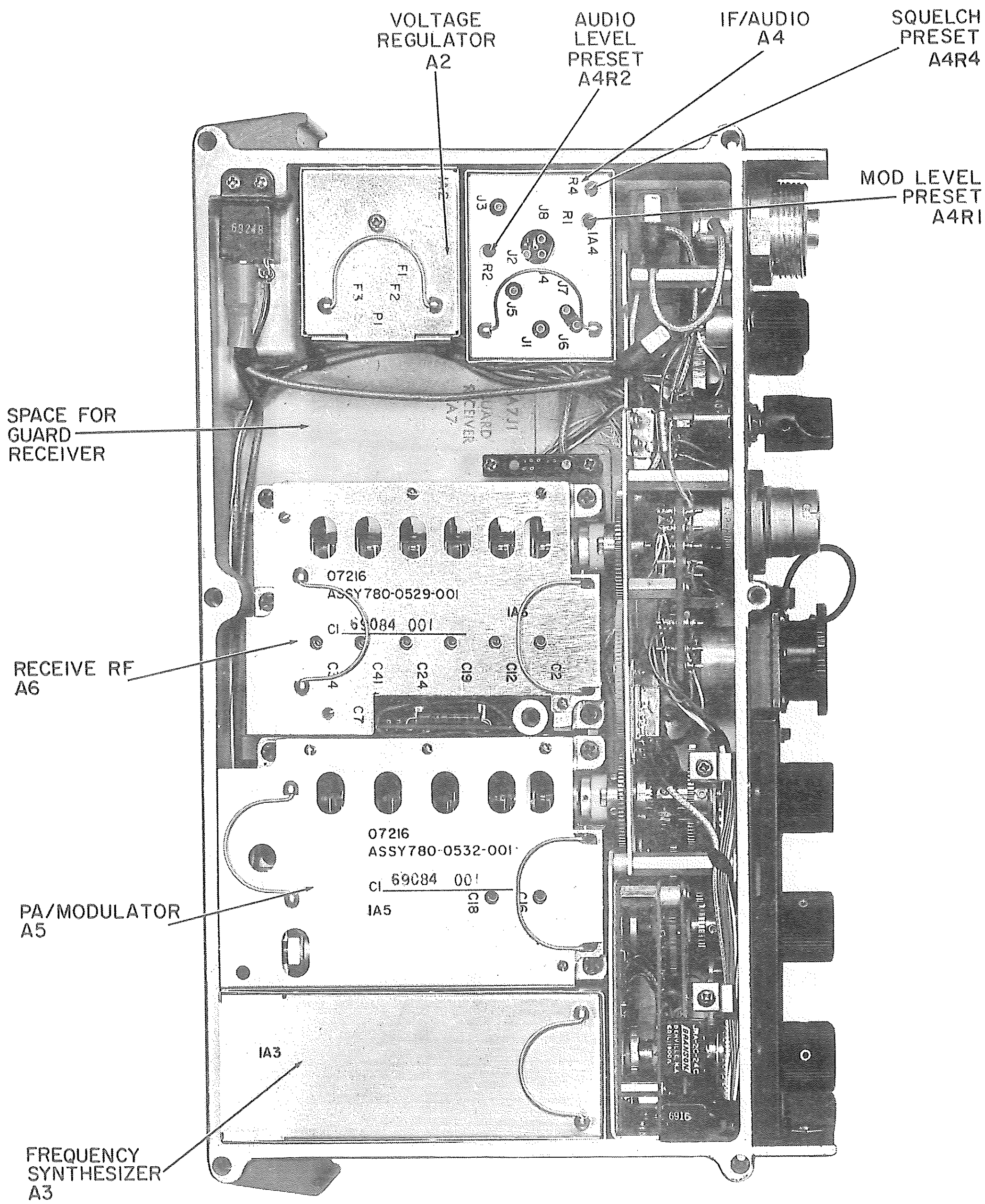


Figure 5-3. RT Unit, Module Location

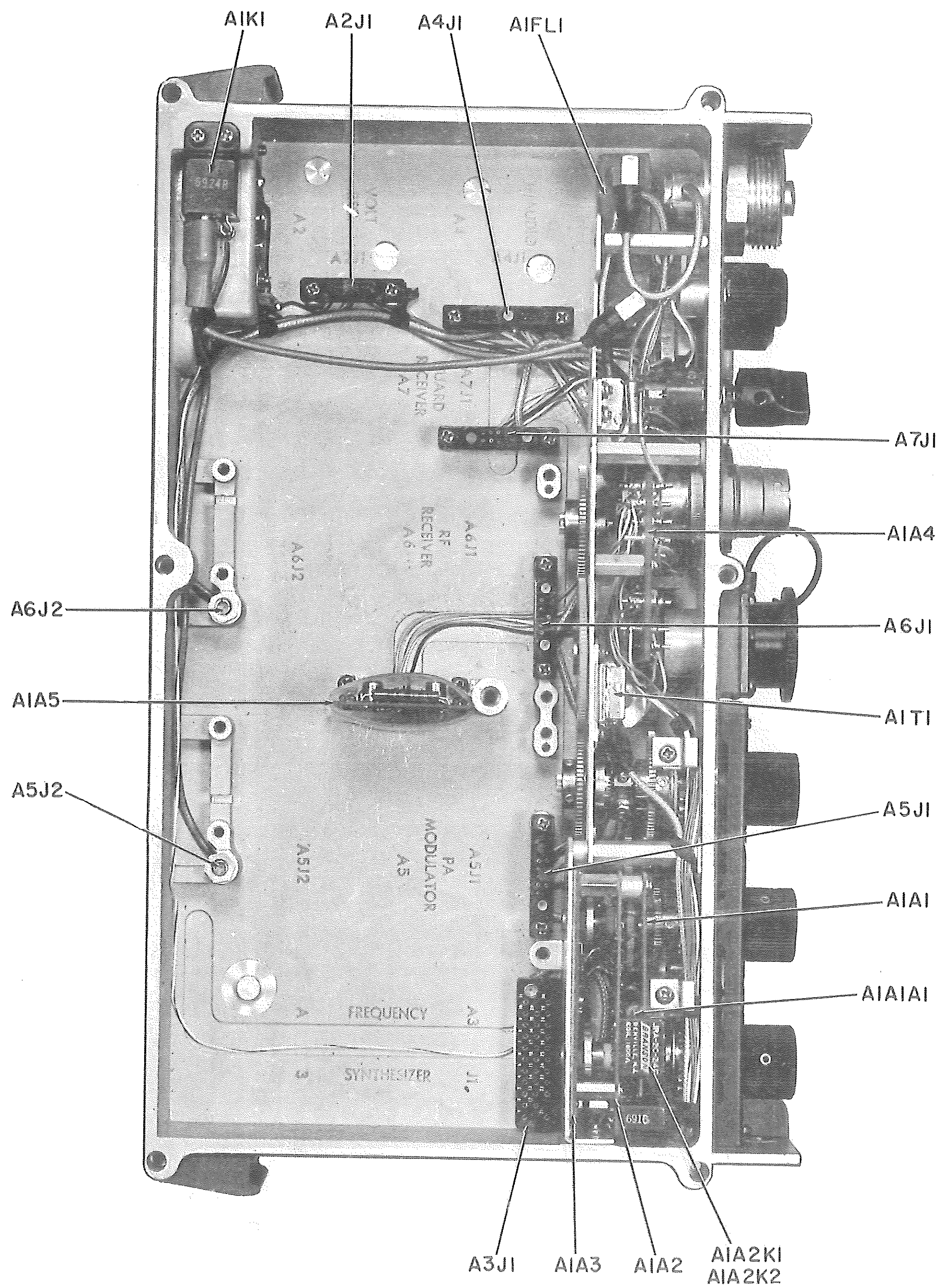
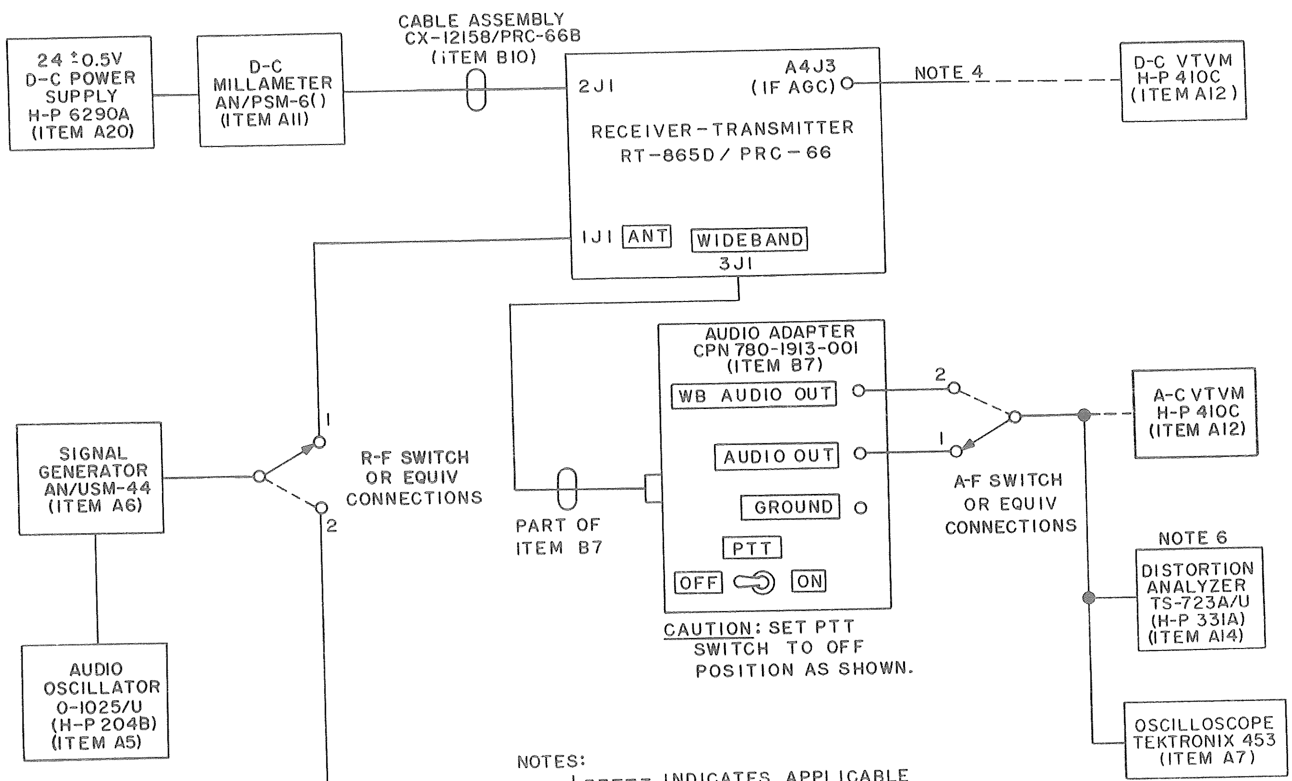


Figure 5-4. RT Unit, Modules Removed



NOTES:

1. ----- INDICATES APPLICABLE SEPARATE CONNECTIONS FOR TEST EQUIPMENT ITEM(S).
2. GROUND RETURNS NOT SHOWN.
3. INDICATES MULTI—CONDUCTOR CABLE ASSEMBLY.
4. REMOVE RT UNIT COVER IF REQUIRED.
5. ITEM NUMBERS REFER TO TABLES 1-4 AND 5-1.
6. ITEM A14 IS SUPPLIED TO DEPOT ONLY.

Figure 5-5. Receive Mode Test Setup

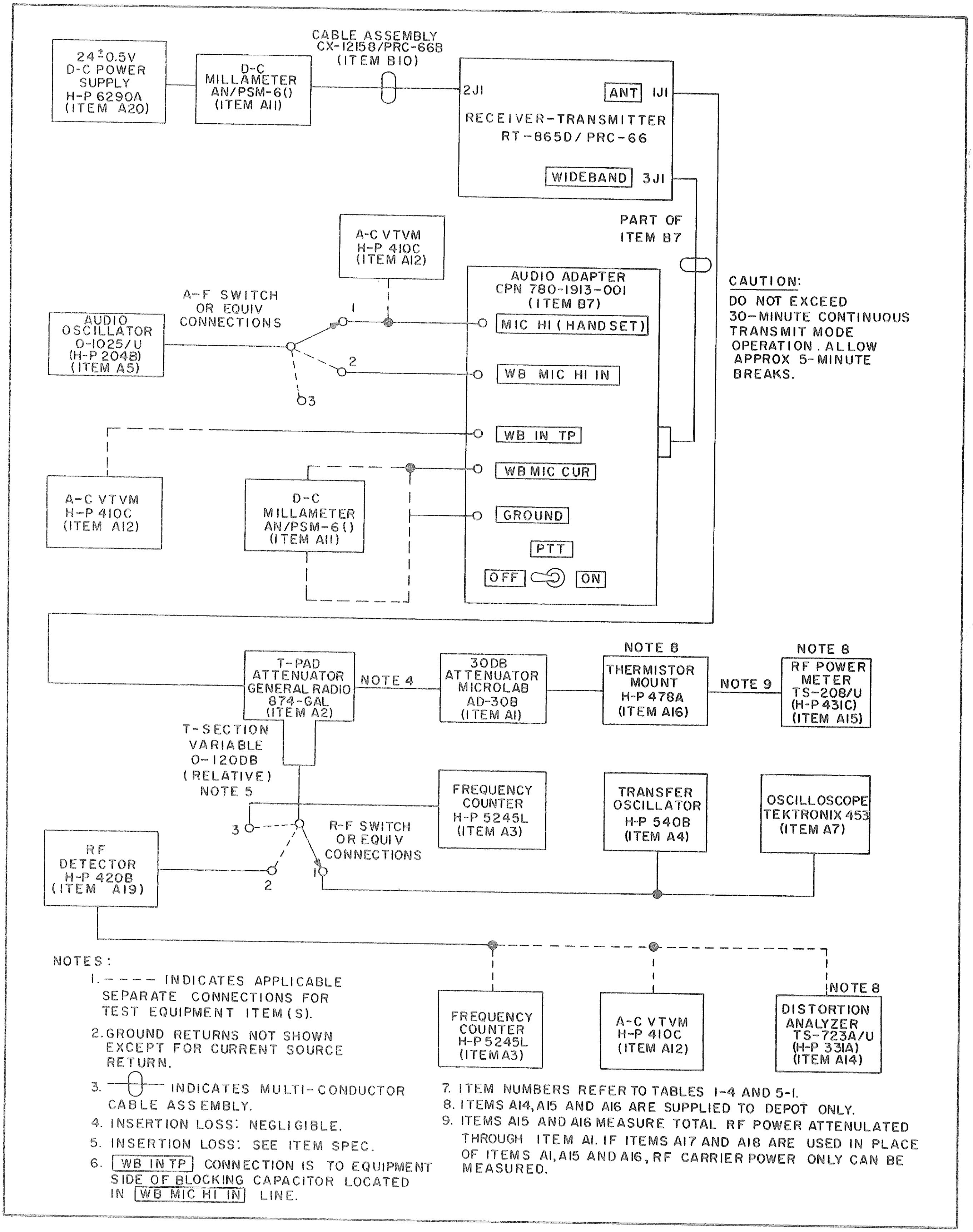
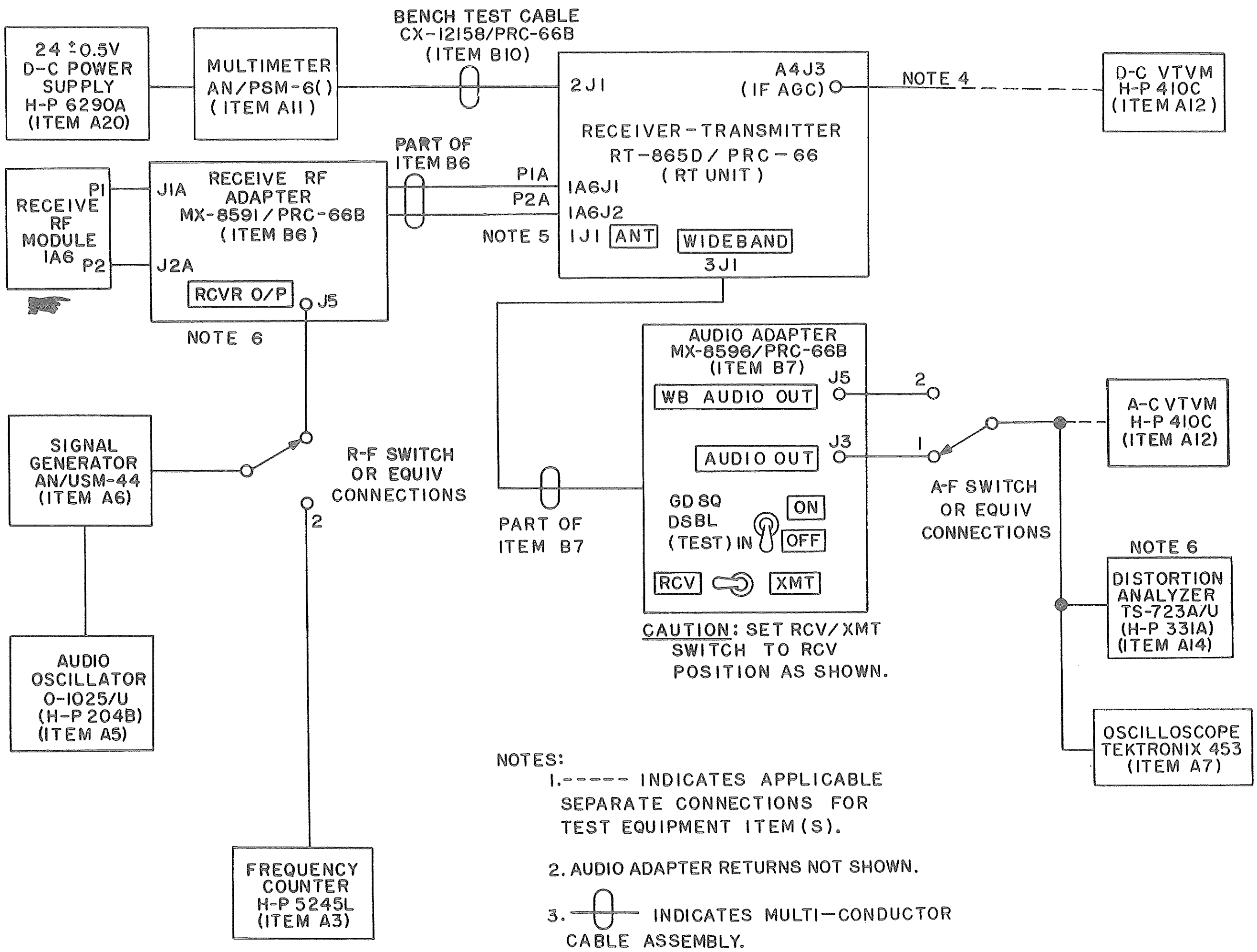


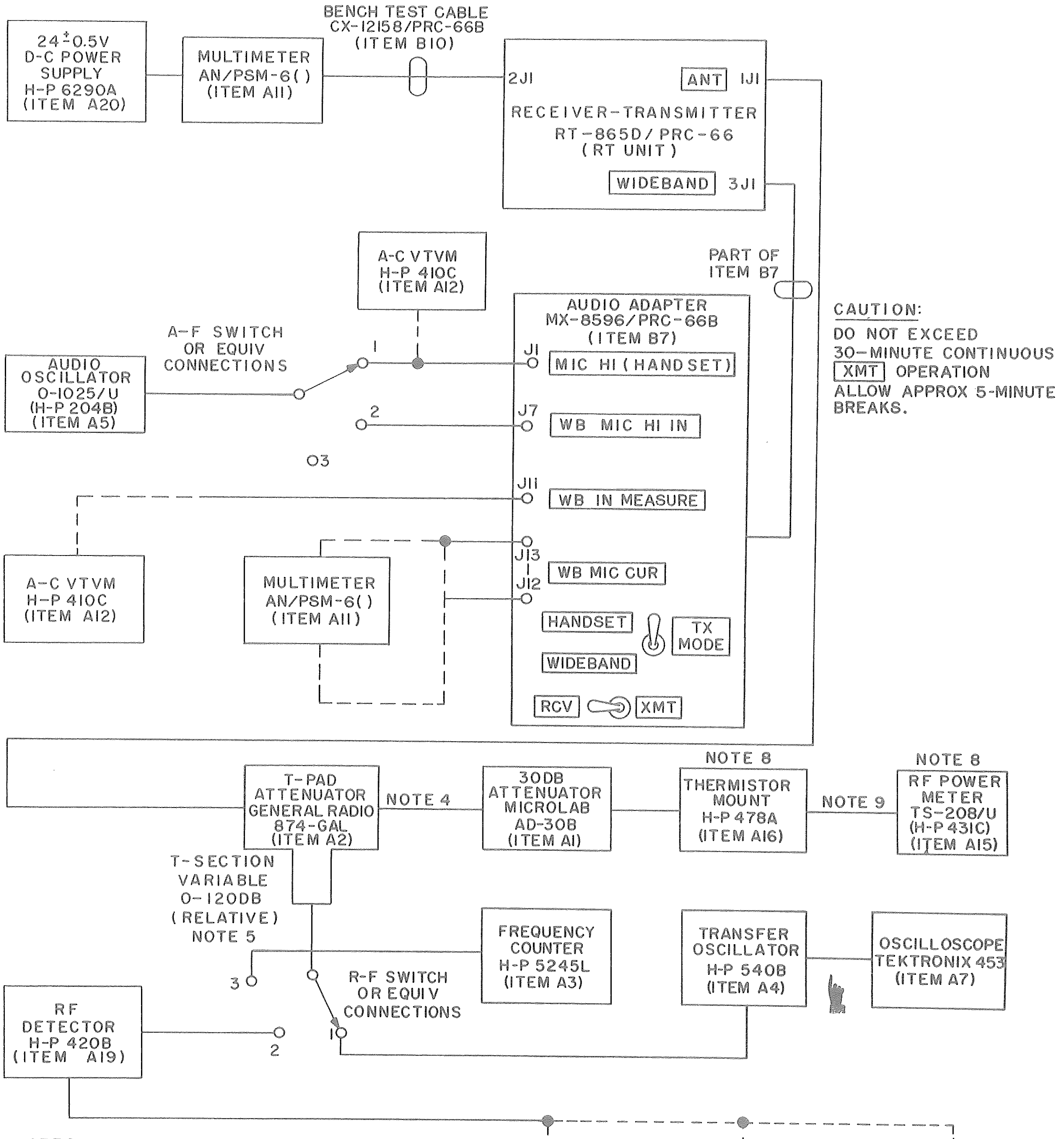
Figure 5-6. Transmit Mode Test Setup



NOTES:

1. ----- INDICATES APPLICABLE SEPARATE CONNECTIONS FOR TEST EQUIPMENT ITEM(S).
2. AUDIO ADAPTER RETURNS NOT SHOWN.
3. INDICATES MULTI-CONDUCTOR CABLE ASSEMBLY.
4. ITEM NUMBERS REFER TO TABLES 1-4 AND 1-5.
5. TO PROVIDE TRANSMIT MODE R-F LOAD, CONNECT ANT JACK AS IN FIGURE 5-6.
6. IF ITEM B6 NOT REQUIRED, RETURN MODULE 1A6 TO RT UNIT. CONNECT R-F SWITCH (POSITION 1) TERMINAL DIRECT TO ANT JACK.
7. ITEM A14 IS SUPPLIED TO DEPOT ONLY.

Figure 5-5. Receive Mode Test Setup



NOTES:

1. ---- INDICATES APPLICABLE SEPARATE CONNECTIONS FOR TEST EQUIPMENT ITEM(S).
2. AUDIO ADAPTER RETURNS NOT SHOWN EXCEPT FOR WB MIC CUR RETURN.
3. INDICATES MULTI-CONDUCTOR CABLE ASSEMBLY.
4. INSERTION LOSS: NEGLIGIBLE.
5. INSERTION LOSS: SEE ITEM SPEC.
6. WB IN MEASURE CONNECTION IS TO EQUIPMENT SIDE OF BLOCKING CAPACITOR LOCATED IN WB MIC HI IN LINE.
7. ITEM NUMBERS REFER TO TABLES 1-4 AND 1-5.
8. ITEMS A14, A15 AND A16 ARE SUPPLIED TO DEPOT ONLY.
9. ITEMS A15 AND A16 MEASURE TOTAL RF POWER ATTENUATED THROUGH ITEM A1. IF ITEMS A17 AND A18 ARE USED IN PLACE OF ITEMS A1, A15 AND A16, RF CARRIER POWER ONLY CAN BE MEASURED.
10. ITEM A1 PROVIDES R-F LOAD TO RT UNIT ANT CONNECTOR VIA ITEM A2.

Figure 5-6. Transmit Mode Test Setup

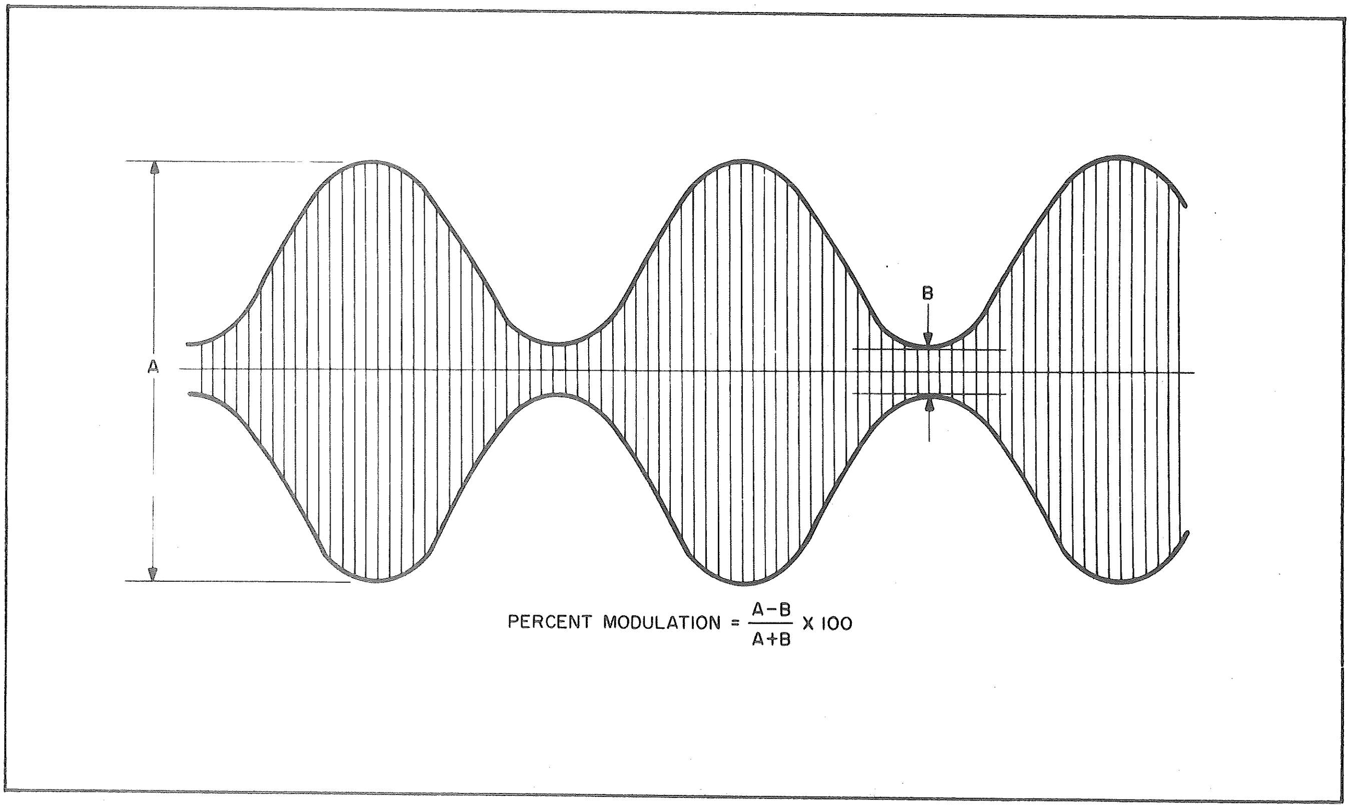


Figure 5-7. Modulated R-f Output Waveform

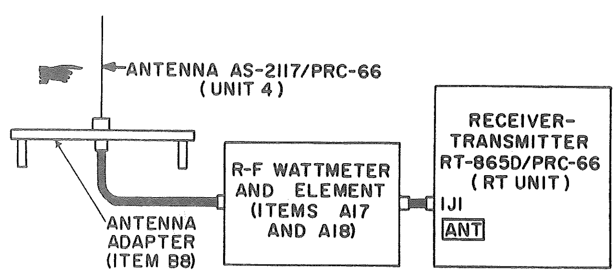


Figure 5-8. Antenna Forward/Reflected Power Test Setup

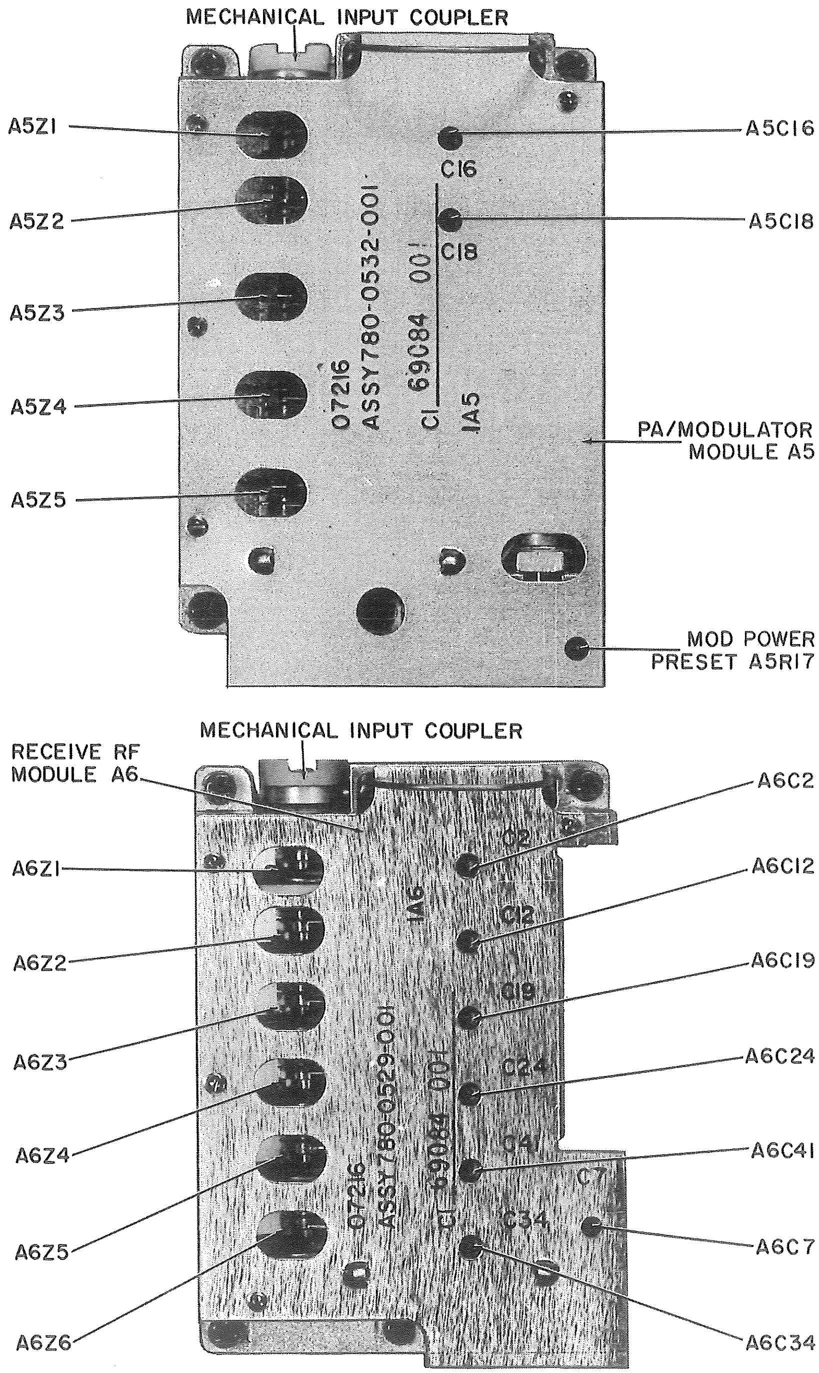


Figure 5-9. Location of Alignment Controls

Table 5-1. List of Field Maintenance Test Equipment (Sheet 1 of 4)

ITEM NO	COMMON NAME	MIL TYPE DES OR PART/MODEL NO	CHARACTERISTICS
A. STANDARD TEST EQUIPMENT			
A1	Attenuator, 30 dB	Microlab AD-30B	30 dB, 0 to 4 KMHz; VSWR 1.2, 15W; 50 ohm.
A2	Attenuator, Variable	General Radio 874-GAL	Direct insertion loss: negligible; T-section insertion loss: max 34 dB. Freq: 100 MHz to 4 GHz. Power: inversely proportional to freq, 300W at 1 GHz, output power not to exceed 1/2W. Output VSWR less than 5 from 1 to 4 GHz.
A3	Counter, Electronic, With Frequency Converter	Hewlett-Packard 5245L Hewlett-Packard 5253B	0 to 50 MHz without plug-in 0 to 500 MHZ with Converter
A4	Oscillator, Transfer	Hewlett-Packard 540B	Fundamental freq range 100 MHz to 220 MHz; harmonic range to 12.4 GHz. Provides frequency interpolation for Item A7.
A5	Oscillator, Audio	0-1025/U (H-P204B)	3 Hz to 560 KHz; accuracy ± 3%; 10 mW into 600 ohms.
A6	Generator, R-f Signal	AN/USM-44	10 to 480 MHz: check points with crystal calibrator at every other 1 MHz point 130 to 270 MHz, and at every 5 MHz point above 270 MHz. Output adjustable from 0.1 uV to 1.0 V into 50 ohms (resistive); calibrated in volts and dBm (0 dBm = 1 mW in 50 ohms).
A7	Oscilloscope	Tektronix 453 (Model 703H) or 545B with 1A1 Dual-trace Plug-in Unit	DC-33MHz, dual trace with X5 sweep magnifier. Deflection factor 50 mV/cm to 20 V/cm.
A11	Multimeter	AN/PSM-6( )	Accuracy ± 5%. Meter impedance 20,000 ohms/volt.

Table 5-1. List of Field Maintenance Test Equipment (Sheet 2 of 4)

ITEM NO	COMMON NAME	MIL TYPE DES OR PART/MODEL NO	CHARACTERISTICS
		A. STANDARD TEST EQUIPMENT (CONT)	
A12	Multimeter	Hewlett-Packard 410C	10 megohm a-c/d-c vtvm 15 mV to 1500 V; accuracy ± 2% of scale (any range). D-c ammeter 1.5 uA to 150 mA; accuracy ± 3% of scale (any range). Ohmmeter 10 ohms to 10 megohms; accuracy ± 5% from .3 to 3 on scale.
A13	Voltmeter, RF	Ballantine 340	Covers r-f measurement requirements between 50 KHz to 400 MHz.
A17	Wattmeter, R-f Carrier Level	Bird 43	Measures carrier level of forward and reverse power. Accuracy: ± 5%.
A18	Element, Wattmeter	Bird 10D	R-f carrier level sensing to 5W over required frequency range. Used with Item A17.
A19	Detector, R-f	Hewlett-Packard 420B	1 to 4 GHz square-law detector.
A20	Power Supply, D-c	Hewlett-Packard 6290A	Variable 0-4 vdc, 0-3A. Constant voltage regulation: 0.01% plus 1 mV. Constant current regulation: 0.05% plug 1 mA. Meter accuracy: 3%.
		B. SPECIAL TEST EQUIPMENT	
B1	PA/Modulator Adapter	MX-8591/PRC-66B	Connects module 1A5 to main chassis by cable extension. Test points parallel connected to module connector pins. Mechanical detent switch for shaft rotation.
B2	Frequency Synthesizer Adapter	MX-8592/PRC-66B	Raises module 1A3 above main chassis. Visual lamp indication of control logic states (selected (cont)

Table 5-1. List of Field Maintenance Test Equipment (Sheet 3 of 4)

ITEM NO	COMMON NAME	MIL TYPE DES OR PART/MODEL NO	CHARACTERISTICS
		B. SPECIAL TEST EQUIPMENT (CONT)	
B2 (cont)			by four-position switch). Test points parallel connected to module connector pins.
B3	Guard Receiver Adapter	MX-8593/PRC-66B	For use with module 1A7 (if incorporated). Raises module above main chassis. Test points parallel connected to module connector pins except for r-f input.
B4	IF/Audio Adapter	MX-8594/PRC-66B	Raises module 1A4 above main chassis. Test points parallel connected to module connector pins.
B5	Voltage Regulator Adapter	MX-8595/PRC-66B	Raises module 1A2 above main chassis. Test points series or parallel connected to module connector pins. Plug-in links are removable from series test points to allow current measurement. Dummy load switch and built-in loads provided.
B6	Receive RF Adapter	MX-8597/PRC-66B	Connects module 1A6 to main chassis by cable extension. Similar to Item B1 except for coax receiver jack.
B7	Audio Adapter	MX-8596/PRC-66B	Provides break-in points to RT unit main chassis interconnections via WIDEBAND connector. Contains audio input matching and output loads with connecting terminals. Toggle-type switches for controlling RT unit.
B8	Antenna Adapter	MX-8599/PRC-66B	Provides connection to Item A18 for antenna forward/reflected power ratio measurement.
B9	Control Head Gauge	MX-8598/PRC-66B	Used to check alignment of geartrain output couplers.
B10	Bench Test Cable	CX-12158/PRC-66B	Connects between external power supply and 2J1 connector on RT unit. Built-in polarity protection.

Table 5-1. List of Field Maintenance Test Equipment (Sheet 4 of 4)

ITEM NO	COMMON NAME	MIL TYPE DES OR PART/MODEL NO	CHARACTERISTICS
B. SPECIAL TEST EQUIPMENT (CONT)			
B11	Battery Charger	PP-6427/PRC-66B	Contains rectifier circuit operating from 50-400 Hz. Switch selects charging rate of 40 ma or 90 ma. Used with Item B12 to charge Unit 2B.
B12	Battery Charging Cable	CX-12159/PRC-66B	Enables Unit 2B to be charged from Item B11 by means of adapter connector. Built-in polarity protection.

Table 5-2. RT Unit Performance Test Points (Sheet 1 of 3)

TEST POINT OR MARKING	STE ITEM	CIRCUIT POINT	TEST FUNCTION
ANT		1J1	Antenna r-f input or output under matched conditions. Test input is usually direct. Test output is via attenuator to power meter, or via attenuator to frequency counter, oscilloscope (via transfer oscillator), or r-f detector.
AUDIO OUT	B7	3J1-4/4J1-B	Normal receive audio voltage across dummy load.
MIC HI (HANDSET)	B7	3J1-2/4J1-D	Audio oscillator modulation input for normal mode.
WB AUDIO OUT	B7	3J1-6	Wideband receive audio voltage across dummy load.
WB IN MEASURE	B7	3J1-8	Amplitude measuring point for audio oscillator modulation input (wideband mode).
WB MIC HI IN	B7	3J1-8	Audio oscillator modulation input for wideband mode.
		A2Q5-C	Resistance to ground (return line) from collector of transistor A2Q5 (power off and fuses A2F1, F2 removed).

Table 5-2. RT Unit Performance Test Points (Sheet 2 of 3)

TEST POINT OR MARKING	STE ITEM	CIRCUIT POINT	TEST FUNCTION
		A2Q9-C	Resistance to ground (return line) from collector of transistor A2Q9 (power off. and fuses A2F1, F2 removed).
5V REG	B5	A2P1-4	5-volt regulated output across normal load, no load, or dummy load.
12V REG	B5	A2P1-5	12-volt regulated output across normal load, no load, or dummy load.
J2/J3 (normally jumpered)	B5	A2P1-1	Total current taken by voltage regulator from 24-volt source.
VCO BAND (switch position) and indicator lamps.	B2	A3P1-7, 16, 15, 14, 5, 6	VCO bands A, B, C, D, E, F control logic. Control state shown by indicator lamps.
10 MHZ CONT (switch position) and indicator lamps.	B2	A3P1-9, 20, 8 19, 18, 17	Counter U4 and limiter amplifier control logic U, V, W, X, Y, L. Control state shown by indicator lamps.
1 MHZ CONT (switch position) and indicator lamps.	B2	A3P1-26, 29, 27, 28	Counter U3 control logic W, X, Y, Z. Control state shown by indicator lamps.
0.1 MHZ CONT (switch position) and indicator lamps.	B2	A3P1-25, 23, 24, 22, 4	Counter U2 and counter U1 Control logic W, X, Y, Z, n. Control state shown by indicator lamps
FREQ SYNTH O/P	B2	A3P1-31	Frequency synthesizer r-f output.
A4J1		A4P1-5	R-f agc voltage.
A4J2		A4P1-4	Receive B+ voltage.
A4J3		A4A3-6	I-f agc voltage.
A7J4		A4A7-12	Oscillator test voltage.
A4J5		A4P1-13	Normal receive audio output.

Table 5-2. RT Unit Performance Test Points (Sheet 3 of 3)

TEST POINT OR MARKING	STE ITEM	CIRCUIT POINT	TEST FUNCTION
A4J6		A4P1-7	Modulator preamplifier output.
A4J7		A4P1-6	Transmit B+ voltage.
A4J8		A4A2-11	Voltage regulator output.

Table 5-3. List of Adjustment and Alignment Procedures

TABLE NO.	PROCEDURE	
	ADJUSTMENT	ALIGNMENT
5-25	Receiver Audio Preset	
5-26	Squelch Preset	
5-27	Transmitter Modulation Preset	
5-30		Receive RF
5-31		PA/Modulator

Table 5-4. Regulated Voltage Test (Sheet 1 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1			Remove cover from RT unit. Remove Voltage Regulator module A2. Remove covers from module A2. Remove fuses A2F1 and A2F2.	
2	Using multimeter (Item A11), measure resistance from emitter of 12-volt switch transistor A2Q5 to ground line pin A2P1-11 (negative lead of multimeter to A2P1-11.	Transistor pin A2Q5-E		Greater than 20K.
3	Using multimeter, measure resistance from collector of 5-volt switch transistor A2Q10 to A2P1-11 (negative lead of multimeter to A2P1-11).	A2Q10-C		Greater than 20K.
4			Restore fuses A1F1 and A2F2 to module A2.	
5	Obtain voltage regulator module adapter Item B5. On Item B5, set REGULATOR LOAD switch to DUMMY LOAD position. Mate module A2 to Item B5.		Mate Item B5 (with module A2) to main chassis connector 1A2J1.	

Table 5-4. Regulated Voltage Test (Sheet 2 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
6	Refer to Figure 5-6. Connect test equipment to RT unit except use only items A1, A2, A20, B7, and B10. On audio adapter (Item B7), set RCV/XMT switch to RCV. NOTE Multimeter Item A11 may be used for all d-c current and voltage measurements in this procedure.		Set MEGAHERTZ to 399.95. Function switch to OFF. VOL fully ccw. SQ fully ccw.	
7	Set d-c power supply (Item A20) output to 18 volts.	24V BAT on Item B5 (A2P1-1)		
8	Measure and record d-c current supplied by power supply.	J2/J3 on Item B5 (in series with fuse A2F3)		Not more than 0.340 amp for 18 vdc power source.
9	Measure and record nominal 12-volt regulated output across load.	12V REG on Item B5 (A2P1-5)		12 ± 0.5 vdc for 18 vdc power source.
10	Measure and record nominal 5-volt regulated output across load.	5V REG on Item B5 (A2P1-4)		5 ± 0.25 vdc for 18 vdc power source.

Table 5-4. Regulated Voltage Test (Sheet 3 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
11	Increase power supply output to 30 volts.	24V BAT on Item B5 (A2P1-1)		
12	Measure and record d-c current supplied by power supply.	J2/J3 on Item B5 (in series with fuse A2F3)		Not more than 0.20 amp for 30 vdc power source.
13	Measure and record nominal 12-volt regulated output across load.	12V REG on Item B5 (A2P1-5)		12 ± 0.5 vdc for 30 vdc power source.
14	Measure and record nominal 5-volt regulated output across load.	5V REG on Item B5 (A2P1-4)		5 ± 0.25 vdc for 30 vdc power source.
15	Set power supply output to 24 volts.	24V BAT on Item B5 (A2P1-1)		
16	Measure and record d-c current supplied by power supply.	J2/J3 on Item B5 (in series with fuse A2F3)		Not more than 0.25 amp for 24 vdc power source.
17	Measure and record nominal 12-volt regulated output across load.	12V REG on Item B5 (A2P1-5)		12 ± 0.5 vdc for 24 vdc power source.

Table 5-4. Regulated Voltage Test (Sheet 4 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
18	Measure and record nominal 5-volt regulated output across load.	5V REG on Item B5 (A2P1-4)		5 ± 0.25 vdc for 24 vdc power source.
19	Measure a-c ripple on 12-volt output (use oscilloscope, item A7).	12V REG on Item B5 (A2P1-5)		100 mv max peak-to-peak.
20	Measure a-c ripple on 5-volt output. NOTE If a comparison check of the regulator switching frequencies is required, use oscilloscope Item A7. Place the probe at pin A2Q5-C (12-volt circuit) or pin A2Q10-E (5-volt circuit).	5V REG on Item B5 (A2P1-4)		100 mv max peak-to-peak.
21	Switch off d-c power supply (Item A20).		Replace module A2 covers. Return module A2 to RT unit. Replace RT unit cover.	
22	Disconnect all equipment.			

Table 5-5. Receiver Sensitivity/Audio Power Output Test (Sheet 1 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL RECEIVE MODE		
A1	Connect test equipment to RT unit as shown in Figure 5-5. Set r-f and a-f switches to position 1.		Set MEGAHERTZ to 399.95. Function switch to T/R. VOL fully ccw. SQ fully ccw. NOTE The d-c voltage present at test point A4J7 must be within the range 1.25 to 3.5 volts (use d-c vtvm).	
A2	Adjust signal generator for 3 uV, 1000 Hz, 30% modulated signal tuned to MEGAHERTZ setting.			
A3	Record a-c vtvm reading in dB. This is 0 dB reference level.	AUDIO OUT	Set VOL fully cw.	
A4	Remove modulation from signal generator. Record a-c vtvm reading in dB. Difference in dB between step 3 and step 4 reading is signal plus noise-to-noise ratio = (S+N)/N.	AUDIO OUT		

Table 5-5. Receiver Sensitivity/Audio Power Output Test (Sheet 2 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL RECEIVE MODE (CONT)		
A5	Slowly decrease signal generator r-f signal to lowest value which will provide (S+N)/N = 10 dB. Record r-f signal level in uV.	ANT r-f input and AUDIO OUT		Not more than 3 uV for 10 dB signal plus noise-to-noise ratio.
A6	Readjust signal generator to 3 uV. Record a-c vtvm reading in volts.	AUDIO OUT		Not less than 2.24 volts (equivalent to 10 mW into 500 ohm load) for 3 uV r-f input signal.
A7	Repeat steps A2 through A6 at nine MEGAHERTZ settings.	AUDIO OUT and ANT r-f input	Repeat step A1 except, in turn, set MEGAHERTZ to nine frequencies spaced approximately 17 MHz in the 399.95 to 225.00 MHz band. Set VOL fully cw.	Same as steps A5 and A6 at each MEGAHERTZ setting.
		B. WIDEBAND RECEIVE MODE		
B1	Repeat step A1 except set a-f switch to position 2.			
B2	(see Sheet 3)			

Table 5-5. Receiver Sensitivity/Audio Power Output Test (Sheet 3 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		B. WIDEBAND RECEIVE MODE (CONT)		
B2	Repeat steps A2 through A6 at five MEGAHERTZ frequency settings except use 10 uV as r-f signal reference level.	WB AUDIO OUT and ANT r-f input	Repeat step A1 except, in turn, set MEGAHERTZ to 225.00; 275.50; 312.00; 350.75; and 399.95. Set VOL fully cw.	Not more than 10 uV for 10 dB signal plus noise-to-noise ratio at each MEGAHERTZ setting. Not less than 0.25 volts for 10 uV r-f input signal at each MEGAHERTZ setting.

Table 5-6. Receiver Agc Dynamic Range Test (Sheet 1 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1	Connect test equipment to RT unit as shown in Figure 5-5. Set r-f and a-f switches to position 1. NOTE If agc voltage comparison checks are required, locate test points A4J1 (r-f agc) and A4J3 (i-f agc). Use a d-c vtvm to measure and record these voltages for the specified r-f signal inputs.		Set MEGAHERTZ to 399.95. Function switch to T/R. VOL fully ccw. SQ fully ccw.	
2	Adjust signal generator for 5 uV, 1000 Hz, 30% modulated signal tuned to MEGAHERTZ setting.			
3	Record a-c vtvm reading in dB and milliwatts. This is 0 dB reference level.	AUDIO OUT	Adjust VOL for 5 mW output (equivalent to 1.58 volts across 500 ohms).	
4	In turn, set r-f input level to 10; 100; 1000; 10,000; and 100,000 uV while observing a-c vtvm reading in dB.	AUDIO OUT		Not more than 3 dB change referred to 0 dB level.

Table 5-6. Receiver Agc Dynamic Range Test (Sheet 2 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
5	Repeat steps 2 through 4 at two MEGAHERTZ settings.	AUDIO OUT	Repeat steps A1 and A3, except, in turn, set MEGAHERTZ to 312.00 and 225.00	Same as step 4 at each MEGAHERTZ setting.

Table 5-7. Receiver Audio Frequency Response Test (Sheet 1 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL RECEIVE MODE		
A1	Connect test equipment to RT unit as shown in Figure 5-5. Set a-f switch to position 1. Set r-f switch to position 1 or 2 as applicable.		Set MEGAHERTZ to 399.95. Function switch to T/R. VOL fully ccw. SQ fully ccw.	
A2	Adjust signal generator and audio oscillator for 1000 uV, 1000 Hz, 30% modulated signal tuned to MEGAHERTZ setting using frequency counter.			
A3	Record a-c vtvm reading in dB and volts. This is 0 dB reference level.	AUDIO OUT	Adjust VOL for 5 mW output (equivalent to 1.58 volts across 500 ohms).	
A4	In turn, set audio oscillator to 300; 600; 2000; and 2700 Hz. Maintain 30% modulation level. Record a-c vtvm reading for each setting.	AUDIO OUT		Not more than +2, -6 dB change in output for each audio frequency referred to reference level.
A5	Repeat steps A3 and A4 at two MEGAHERTZ settings.	AUDIO OUT	Repeat step A1 except, in turn, set MEGAHERTZ to 312.00 and 225.00.	Same as step A4 for each MEGAHERTZ setting.

Table 5-7. Receiver Audio Frequency Response Test (Sheet 2 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		B. WIDEBAND RECEIVE MODE		
B1	Repeat step A1 except set a-f switch to position 2.			
B2	Repeat step A2 except set audio oscillator to 18,750 Hz.		Repeat step A1.	
B3	Record a-c vtvm reading in dB and volts. This is 0 dB reference level.	WB AUDIO OUT	Measurement is across 22K load.	
B4	In turn, set audio oscillator to 300; 1000; 10,000; 23,000; 29,000; 32,000; 36,000; and 40,000 Hz. Maintain 30% modulation level. Record a-c vtvm reading for each setting.	WB AUDIO OUT		Output change limit in dB for each audio frequency referred to reference level: Freq. — Limit (dB) 300 — -3 1000 — -3 10,000 — -3 23,000 — -3 29,000 — -10 32,000 — -12 36,000 — -20 40,000 — -30

Table 5-7. Receiver Audio Frequency Response Test (Sheet 3 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
B. WIDEBAND RECEIVE MODE (CONT)				
B5	Repeat steps B2 through B4 at two MEGAHERTZ settings.	WB AUDIO OUT	Repeat step A1 except, in turn, set MEGAHERTZ to 312.00 and 225.00.	Same as step B4 at each MEGAHERTZ setting.

Table 5-8. Receiver Audio Distortion Test (Sheet 1 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL RECEIVE MODE		
A1	Connect test equipment to RT unit as shown in Figure 5-5. Set r-f and a-f switches to position 1.		Set MEGAHERTZ to 399.95. Function switch to T/R. VOL fully ccw. SQ fully ccw. NOTE Pins 13 and 14 on thin-film packet A4A5 may be or may not be grounded. If A4A5 is new, the ground selection is made by increasing the percentage modulation (and if necessary, amplitude) of the r-f input signal to a point where clipping occurs on the audio output waveform (observed on the oscilloscope). Starting with pin 14, pins 14 or 13 or both are then grounded or ungrounded in turn. The final selection is that which produces the best waveform.	NOTE The distortion analyzer (Item A14) required for this test may not be supplied to field maintenance level.

Table 5-8. Receiver Audio Distortion Test (Sheet 2 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL RECEIVE MODE (CONT)		
A2	Adjust signal generator and audio oscillator for 1000 uV, 1000 Hz, 30% modulated signal tuned to MEGAHERTZ setting.			
A3	Record a-c vtvm reading in mW and volts. This is 0 dB reference level.	AUDIO OUT	Adjust VOL for 10 mW output (equivalent to 2.24 volts across 500 ohms).	
A4	In turn, set audio oscillator to 300; 1000; and 2700 Hz. Maintain 30% modulation level. Using distortion analyzer, measure and record percentage distortion for each audio setting.	AUDIO OUT		Not more than 15% distortion for each audio frequency setting and 10 mW output.
A5	Repeat steps A2 through A4 at two MEGAHERTZ settings.	AUDIO OUT	Repeat steps A1 and A3 except, in turn, set MEGAHERTZ to 312.00 and 225.00.	Same as steps A3 and A4 at each MEGAHERTZ setting.
		B. WIDEBAND RECEIVE MODE		
B1	Repeat step A1 except set a-f switch to position 2.			

Table 5-8. Receiver Audio Distortion Test (Sheet 3 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		B. WIDEBAND RECEIVE MODE (CONT)		
B2	Repeat step A2.		Repeat step A1.	
B3	In turn, set audio oscillator to 300; 1000; 10,000; and 23,000 Hz. Maintain 30% modulation level. Using distortion analyzer, measure and record percentage distortion for each audio setting.	WB AUDIO OUT		Same as step A4 at each audio frequency setting.
B4	Repeat steps B2 and B3 at two MEGAHERTZ settings.	WB AUDIO OUT	Repeat step A1 except, in turn, set MEGAHERTZ to 312.00 and 225.00.	Same as step A4 at each MEGAHERTZ setting.

Table 5-9. Receiver Volume Control Attenuation Test

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1	Connect test equipment to RT unit as shown in Figure 5-5. Set r-f and a-f switches to position 1.		Set MEGAHERTZ to 399.95. Function switch to T/R. VOL fully ccw. SQ fully ccw.	
2	Adjust signal generator for 1000 uV, 1000 Hz, 30% modulated signal tuned to MEGAHERTZ setting.			
3	Record a-c vtvm reading in dB. This is 0 dB reference level.	AUDIO OUT	Set VOL fully cw.	
4	Record a-c vtvm reading in dB.	AUDIO OUT	Set VOL fully ccw.	Minimum change dB referred to reference level.
5	Do not disturb controls. Remove power. Disconnect audio adapter at RT unit WIDEBAND connector.			
6	Connect Handset H-250/U to RT unit NORMAL connector. Re-apply power.	Handset earphone (subjective test)		Discernible audio (tone) level at handset earphone.

Table 5-10. Receiver I-f Selectivity Test (Sheet 1 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1	Connect test equipment to RT unit as shown in Figure 5-5. Set r-f and a-f switches to position 1.		Set MEGAHERTZ to 399.95. Function switch to T/R. VOL fully ccw. SQ fully ccw. NOTE The d-c voltage present at test point A4J4 must be within the range 1.25 to 3.5 volts (use d-c vtvm).	
2	Set r-f switch to position 2. Adjust signal generator (no modulation) to sufficient level to operate frequency counter. Using frequency counter, tune signal generator to MEGAHERTZ setting.			
3	Set r-f switch to position 1. Adjust signal generator r-f signal to 3 uV.			
4	Record the signal generator output level for step 3. This is r-f input reference level (3 uV).	ANT r-f input		

Table 5-10. Receiver I-f Selectivity Test (Sheet 2 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
5	Record d-c vtvm reading for step 3. This is agc reference level.	A4J3		
6	Increase signal generator r-f signal 3 dB (to 4.2 uV).	ANT r-f input		
7	Slowly decrease signal generator r-f frequency to point where agc voltage again equals reference level.	A4J3		
8	Set r-f switch to position 2. Use frequency counter to measure and record signal generator frequency for step 7. This lower-limit frequency is designated f_{lo}.	ANT r-f input		
9	Repeat steps 3 through 6.	ANT r-f input and A4J3		
10	Slowly increase signal generator r-f frequency to point where agc voltage again equals reference level.	A4J3		

Table 5-10. Receiver I-f Selectivity Test (Sheet 3 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
11	Set r-f switch to position 2. Use frequency counter to measure and record signal generator frequency for step 10. This upper-limit frequency is designated f_{hi}.	ANT r-f input		
12	Repeat steps 2 through 11 three times, using (in turn) for step 6, increases of 6 dB (to 6 uV); 30 dB (to 95 uV); and 60 dB (to 3000 uV).			
13	Calculate receiver i-f bandwidth at 3 dB, 6 dB, 30 dB, and 60 dB points. Use four sets of recorded data (steps 8 and 11) as follows: Bandwidth = $f_{hi} - f_{lo}$			DB Points / Limits (kHz): 3 — NLT 60 6 — NLT 69 30 — NLT 75 60 — NMT 120 NOTE NLT = not less than NMT = not more than
14	In turn, repeat steps 2 through 13 at two MEGAHERTZ settings.	ANT r-f input and A4J3	Repeat step 1 except, in turn, set MEGAHERTZ to 312.00 and 225.00.	Same as step 13 at each MEGAHERTZ setting.

Table 5-11. Receiver Squelch Sensitivity and Disable Test (Sheet 1 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1	Connect test equipment to RT unit as shown in Figure 5-5. Set a-f switch to position 1. Set r-f switch to position 1 or 2 as applicable.		Set MEGAHERTZ to 399.95. Function switch to T/R. VOL fully cw. SQ fully cw.	
2	Adjust signal generator for 3 uV, 1000 Hz, 30% modulated signal tuned to MEGAHERTZ setting using frequency counter.			
3	Observe a-c vtvm reading.	AUDIO OUT	Slowly rotate SQ ccw. Carefully set SQ to point where a-c vtvm reading just increases.	Squelch gate "open" and audio frequency is present across load.
4	Set r-f input signal to zero. Observe a-c vtvm reading. This should suddenly decrease when r-f input is removed.	AUDIO OUT		Squelch gate "closed"; no audio frequency across load. Squelch "disable" switch A1S2 (mechanically coupled to SQ control) is not actuated at this SQ setting (not fully ccw for 3 uV).
5	Observe a-c vtvm reading. This should increase slightly when SQ control is fully ccw.	AUDIO OUT	Set SQ control fully ccw. Squelch disable switch A1S1 actuates.	Squelch gate is disabled (open) and audio frequency (receiver noise) is present across load.

Table 5-11. Receiver Squelch Sensitivity and Disable Test (Sheet 2 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
6	Slowly increase r-f input signal. Set to point where a-c vtvm reading just increases. Record r-f input signal in microvolts for this setting.	ANT r-f input and AUDIO OUT	Set SQ fully cw.	R-f input level setting is not more than 50 uV and not less than 10 uV to open squelch gate.
7	Repeat steps 2 through 6 at four MEGAHERTZ settings.	AUDIO OUT and ANT r-f input	Repeat steps 1 and 3 through 6 except, in turn, set MEGAHERTZ to 358.05; 312.00; 269.30; and 225.00.	Same as steps 3 through 6 at each MEGAHERTZ setting.

Table 5-12. Receiver Squelch Quieting Test

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1	Connect test equipment to RT unit as shown in Figure 5-5. Set r-f and a-f switches to position 1.		Set MEGAHERTZ to 399.95. Function switch to T/R. VOL fully cw. SQ fully ccw.	
2	Adjust signal generator for 3 uV, 1000 Hz, 30% modulated signal tuned to MEGAHERTZ setting.			
3	Observe a-c vtvm reading. Record reading in dB at decrease point.	AUDIO OUT	Slowly rotate SQ cw. Carefully set to point where a-c vtvm reading just decreases.	Squelch gate "closed": no audio frequency across load.
4	Observe a-c vtvm reading. Record reading in dB at increase point.	AUDIO OUT	Slowly rotate SQ ccw. Carefully set to point where a-c vtvm reading just increases.	Squelch gate "open" and audio frequency is present across load.
5	Calculate difference in dB reading between step 3 and step 4.			Difference is not less than 40 dB.
6	Repeat steps 2 through 5 at four MEGAHERTZ settings.	AUDIO OUT	Repeat steps 1, 3, and 4 except, in turn, set MEGAHERTZ to 358.05; 312.00; 369.30; and 225.00.	Same as steps 3 through 5 at each MEGAHERTZ setting.

Table 5-13. Receiver Squelch Overlap Test (Sheet 1 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1	Connect test equipment to RT unit as shown in Figure 5-5. Set r-f and a-f switches to position 1.		Set MEGAHERTZ to 399.95. Function switch to T/R. VOL fully cw. SQ fully ccw.	
2	Adjust signal generator for 3 uV, 1000 Hz, 30% modulated signal tuned to MEGAHERTZ setting.			
3	Observe a-c vtvm reading.	AUDIO OUT	Slowly rotate SQ cw. Carefully set to point where d-c vtvm reading just decreases.	Squelch gate "closed": no audio frequency across load.
4	Slowly increase r-f input signal. Set to point where a-c vtvm reading just increases. Record r-f voltmeter reading in dB for this setting.	AUDIO OUT and ANT r-f input		Squelch gate "open".
5	Slowly decrease r-f input signal. Set to point where a-c vtvm reading just decreases. Record r-f voltmeter reading in dB for this setting.	AUDIO OUT and ANT r-f input		Squelch gate "closed".
6	Calculate difference in dB reading between step 4 and step 5.			Difference is not more than 6 dB.

Table 5-13. Receiver Squelch Overlap Test (Sheet 2 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
7	Repeat steps 2 through 6 at four MEGAHERTZ settings.	AUDIO OUT and ANT r-f input	Repeat steps 1 and 3 except, in turn, set MEGAHERTZ to 358.05; 312.00; 269.30; and 225.00.	Same as steps 3 through 6 at each MEGAHERTZ setting.

Table 5-14. Transmitter R-f Power Output Test (Sheet 1 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL TRANSMIT MODE		
A1	Connect test equipment to RT unit as shown in Figure 5-6. Set a-f and r-f switches to position 1. On audio adapter, set RCV/XMT switch to RCV and TX MODE switch to HANDSET.		Set MEGAHERTZ to 399.95. Set function switch to T/R. VOL fully ccw. SQ fully ccw.	NOTE Referring to Figure 5-6 (for transmitter tests, alignment, and trouble-shooting), the Bird 43 wattmeter (with 10D element) may be substituted for the Micro-lab AD-30B attenuator and Hewlett-Packard 431C power meter (with 478A thermistor mount). Using the Bird 43 test setup, carrier power only can be measured, not total power. For example, for 2 watts total power, approximately 1.5 watts carrier power will be indicated.
A2	On audio adapter, set RCV/XMT switch to XMT. Set variable attenuator to approximately 0 dB. Set audio oscillator for 1000 Hz input signal.			
A3	Tune transfer oscillator to obtain r-f modulation pattern on oscilloscope (see Figure 5-7).	ANT r-f output via T-pad		
A4	Set audio input signal for 90% modulation as defined in Figure 5-7.	ANT r-f output via T-pad		
A5	Use r-f power meter to record total r-f power output in watts.	ANT r-f output via 30 db attenuator		Not less than 2 watts total power for 90% modulation at 1000 Hz.

Table 5-14. Transmitter R-f Power Output Test (Sheet 2 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
			A. NORMAL TRANSMIT MODE (CONT)	
A6	On audio adapter, set RCV/XMT switch to RCV.			
A7	Repeat steps A2 through A6 for thirty-two RT unit MEGAHERTZ settings except readjust percentage modulation to 90% only at MEGAHERTZ settings 351.10; 308.70; 258.25; and 225.00.	ANT r-f output via T-pad and via 30 db attenuator	Repeat step A1 except, in turn, set MEGAHERTZ to following frequencies (MHz): 394.55; 385.40; 380.30; 374.30; 369.25; 363.20; 358.15 thru 319.80 separated by 5.05; 313.75 thru 286.50 separated alternately by 5.05 and 6.05 in respective order; 280.45 thru 236.05 separated alternately by 7.05 and 4.05 in respective order; 230.00; 229.05; and 225.00.	Same as step A5 at each MEGAHERTZ setting.
			B. WIDEBAND TRANSMIT MODE	
B1	Repeat step A1 except set a-f switch (Figure 5-6) to position 2 and TX MODE switch to WIDEBAND.			
B2	Repeat steps A2 through A6 for ten RT unit MEGAHERTZ settings except readjust percentage modulation to 90% only at MEGAHERTZ settings 399.95; 304.40; and 225.00.	ANT r-f output via T-pad and via 30 db attenuator	Repeat step A1 except, in turn, set MEGAHERTZ to following frequencies (MHz): 399.95; 388.80; 367.75; 346.60 thru 283.35 separated by 21.05; 262.20; 241.15; and 225.00.	Same as step A5 at each MEGAHERTZ setting.

Table 5-15. Transmitter Envelope Distortion Test (Sheet 1 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL TRANSMIT MODE		
A1	Connect test equipment to RT unit as shown in Figure 5-6. Set a-f and r-f switches to position 1. On audio adapter set RCV/XMT switch to RCV and TX MODE switch to HANDSET.		Set MEGAHERTZ to 399.95. Set function switch to T/R. VOL fully ccw. SQ fully ccw.	NOTE The distortion analyzer (Item A14) required for this test may not be supplied to field maintenance level. Referring to Figure 5-6, the Bird 43 wattmeter (with 10D element) may be substituted for the Microlab AD-30B attenuator and Hewlett-Packard 431C power meter (with 478A thermistor mount).
A2	On audio adapter, set RCV/XMT switch to XMT. Set variable attenuator to approximately 0 dB. Set audio oscillator for 1000 Hz input signal.			
A3	Tune transfer oscillator to obtain r-f modulation pattern on oscilloscope (see Figure 5-7).	ANT r-f output via T-pad		
A4	Set audio input signal for 64% modulation as defined in Figure 5-7.	ANT r-f output via T-pad		
A5	Set r-f switch (Figure 5-6) to position 2.			

Table 5-15. Transmitter Envelope Distortion Test (Sheet 2 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL TRANSMIT MODE (CONT)		
A6	Using distortion analyzer, measure and record percentage distortion of r-f detector audio output.	ANT r-f output via T-pad and via detector		Not more than 10% distortion.
A7	On audio adapter, set RCV/XMT switch to RCV.			
A8	Repeat steps A2 through A7 except for step A2, in turn, use audio frequencies of 300 and 2700 Hz.	ANT r-f output via T-pad and via detector		Same as step A6 for each audio frequency.
A9	Repeat steps A2 through A8 for four RT unit MEGAHERTZ settings.	ANT r-f output via T-pad and via detector	Repeat step A1 except, in turn, set MEGAHERTZ, to 358.05; 312.00; 269.30; and 225.00.	Same as steps A6 and A8 for each MEGAHERTZ setting.
A10	On audio adapter, set RCV/XMT switch to RCV.			

Table 5-15. Transmitter Envelope Distortion Test (Sheet 3 of 3)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		B. WIDEBAND TRANSMIT MODE		
B1	Repeat step A1 except set a-f switch (Figure 5-6) to position 2 and TX MODE switch to WIDEBAND.			
B2	Repeat steps A2 through A7.	ANT r-f output via T-pad and via detector	Repeat step A1.	Same as step A6.
B3	Repeat step A8 except, in turn, use audio frequencies of 1000; 10,000; and 23,000 Hz.	ANT r-f output via T-pad and via detector		Same as step A6 for each audio frequency.
B4	Repeat steps B2 and B3 for four RT unit MEGAHERTZ settings.	ANT r-f output via T-pad and via detector	Repeat step A1 except, in turn, set MEGAHERTZ to 358.05; 312.00; 269.30; and 225.00.	Same as steps A6 and A8 for each MEGAHERTZ setting.
B5	On audio adapter, set RCV/XMT switch to RCV.			

Table 5-16. Transmitter Modulation Frequency Response Test (Sheet 1 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL TRANSMIT MODE		
A1	Connect test equipment to RT unit as shown in Figure 5-6. Set a-f and r-f switches to position 1. On audio adapter, set RCV/XMT switch to RCV and TX MODE switch to HANDSET.		Set MEGAHERTZ to 399.95. Set function switch to T/R. VOL fully ccw. SQ fully ccw.	NOTE Referring to Figure 5-6, the Bird 43 wattmeter (with 10D element) may be substituted for the Microlab AD-30B attenuator and Hewlett-Packard 431C power meter (with 478A thermistor mount).
A2	On audio adapter, set RCV/XMT switch to XMT. Set variable attenuator to approximately 0 dB. Set audio oscillator for 1000 Hz input signal.			
A3	Tune transfer oscillator to obtain r-f modulation pattern on oscilloscope (see Figure 5-7).	ANT r-f output via T-pad		
A4	Set audio input signal for 90% modulation as defined in Figure 5-7.	ANT r-f output via T-pad		
A5	Use a-c vtvm to measure and record audio input signal in microvolts. This is audio input reference level.	MIC HI (HANDSET) on Item B7 (input to 3J1-2)		
A6	Set r-f switch (Figure 5-6) to position 2.			

Table 5-16. Transmitter Modulation Frequency Response Test (Sheet 2 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL TRANSMIT MODE (CONT)		
A7	Use a-c vtvm to measure and record output level of r-f detector in dB. This is the reference level for demodulated carrier audio.	ANT r-f output via T-pad and detector		
A8	In turn, set audio oscillator input frequency to 300 and 2700 Hz, maintaining step A5 input reference level. Measure and record output level in dB of r-f detector for each audio frequency.	MIC HI (HANDSET) on Item B7 (input to 3J1-2) and ANT r-f output via T-pad and detector		
A9	Record change in dB readings between steps A7 and A8 for each audio frequency.			Difference not more than +2, -6 dB referred to reference level (for each audio frequency.
A10	On audio adapter, set RCV/XMT switch to RCV.			
A10	Repeat steps A2 through A10 for two RT unit MEGAHERTZ settings.	ANT r-f output via T-pad and detector	Repeat step A1 except, in turn, set MEGAHERTZ to 312.00 and 225.00.	Same as step A9 for each MEGAHERTZ setting.

Table 5-16. Transmitter Modulation Frequency Response Test (Sheet 3 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		B. WIDEBAND TRANSMIT MODE		
B1	Repeat step A1 except set a-f switch (Figure 5-6) to position 2 and audio adapter TX MODE switch to WIDEBAND			
B2	Repeat steps A2 through A7 except, for step A2, use 18,750 Hz reference frequency.	ANT r-f output via T-pad and detector and WB IN MEASURE on Item B7 (3J1-8)	Repeat step A1.	
B3	Repeat step A8 except, in turn, use audio frequencies of 300; 1000; 23,000; 29,000; 32,000; 36,000; and 40,000 Hz.	WB IN MEASURE on Item B7 (3J1-8) and ANT r-f output via T-pad and detector		
B4	Record change in dB readings between steps A7 and B3 for each audio frequency.			Output change limit in dB for each audio frequency referred to reference level: Freq / Change Limit (dB) 300 / -3 1000 / -3 23,000 / -3 (cont)

Table 5-16. Transmitter Modulation Frequency Response Test (Sheet 4 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		B. WIDEBAND TRANSMIT MODE (CONT)		
B4 (cont)				Freq / Change Limit (dB): 29,000 / -10 32,000 / -12 36,000 / -20 40,000 / -30
B5	Repeat steps B2 through B4 for two RT unit MEGAHERTZ settings.	ANT r-f output via T-pad and WB IN MEASURE on Item B7 (3J1-8)	Repeat step A1 except, in turn, set MEGAHERTZ to 312.00 and 225.00.	Same as step B4 for each MEGAHERTZ setting.
B6	On audio adapter, set RCV/XMT switch to RCV.			

Table 5-17. Transmitter Modulation Capability Test (Sheet 1 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL TRANSMIT MODE		
A1	Connect test equipment to RT unit as shown in Figure 5-6. Set a-f and r-f switches to position 1. On audio adapter, set RCV/XMT switch to RCV and TX MODE switch to HANDSET.		Set MEGAHERTZ to 399.95. Set function switch to T/R. VOL fully ccw. SQ fully ccw.	NOTE Referring to Figure 5-6, the Bird 43 wattmeter (with 10D element) may be substituted for the Microlab AD-30B attenuator and Hewlett-Packard 431C power meter (with 478A thermistor mount).
A2	On audio adapter, set RCV/XMT switch to XMT. Set variable attenuator to approximately 0 dB. Set audio oscillator for 1000 Hz input signal.			
A3	Tune transfer oscillator to obtain r-f modulation pattern on oscilloscope (see Figure 5-7).	ANT r-f output via T-pad		
A4	Set audio input signal for maximum percentage modulation (percentage modulation is defined in Figure 5-7). Record maximum percentage modulation obtained.	ANT r-f output via T-pad		Not less than 90%.
A5	Repeat steps A2 through A4, except for step A2, in turn, use audio frequencies of 300 and 2700 Hz.	ANT r-f output via T-pad		Same as step A4 (for each audio frequency).

Table 5-17. Transmitter Modulation Capability Test (Sheet 2 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
		A. NORMAL TRANSMIT MODE (CONT)		
A6	On audio adapter, set RCV/XMT switch to RCV.			
A7	Repeat steps A2 through A6 for four RT unit MEGAHERTZ settings.	ANT r-f output via T-pad	Repeat step A1 except, in turn, set MEGAHERTZ to 358.05; 312.00; 269.30; and 225.00.	Same as steps A4 and A5 for each MEGAHERTZ setting.
		B. WIDEBAND TRANSMIT MODE		
B1	Repeat step A1 except set a-f switch (Figure 5-6) to position 2 and audio adapter TX MODE switch to WIDEBAND.			
B2	Repeat steps A2 through A4.	ANT r-f output via T-pad	Repeat step A1.	Same as step A4.
B3	Repeat step A5 except, in turn, use audio frequencies of 300; 1000; and 23,000 Hz.	ANT r-f output via T-pad		Same as step A4 (for each audio frequency).
B4	Repeat steps B2 and B3 for four RT unit MEGAHERTZ settings.	ANT r-f output via T-pad	Repeat step A1 except, in turn, set MEGAHERTZ to 358.05; 312.00; 269.30; and 225.00.	Same as steps A4 and A6 for each MEGAHERTZ setting.
B5	On audio adapter, set RCV/XMT switch to RCV.			

Table 5-18. Transmitter Frequency Accuracy Test

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1	Connect test equipment to RT unit as shown in Figure 5-6. Set a-f switch to position 3. Set r-f switch to position 3. On audio adapter, set RCV/XMT switch to RCV.		Set MEGAHERTZ to 399.95. Set function switch to T/R. VOL fully ccw. SQ fully ccw.	NOTE Referring to Figure 5-6, the Bird 43 wattmeter (with 10D element) may be substituted for the Microlab AD-30B attenuator and Hewlett-Packard 431C power meter (with 478A thermistor mount).
2	On audio adapter, set RCV/XMT switch to XMT. Adjust variable attenuator to level just sufficient to operate frequency counter in step 3.			
3	Record transmitter r-f output frequency.	ANT r-f output via T-pad		
4	Using step 3 frequency reading, calculate frequency error compared to RT unit MEGAHERTZ setting.			Not more than ±4 kHz frequency error.
5	On audio adapter, set RCV/XMT switch to RCV.			
6	Repeat steps 2 through 5 for nineteen RT unit MEGAHERTZ settings.	ANT r-f output via T-pad	Repeat step 1 except, in turn, set MEGAHERTZ to following: 396.90; 384.85; 373.80; 360.75; 358.70; 347.65; 334.60; 321.55; 318.50; 307.45; 293.40; 281.35; 279.30; 275.25; 262.20; 250.15; 236.05; 225.00.	Same as step 4 for each MEGAHERTZ setting.

Table 5-19. Transmitter DF Modulation Capability and Tone Frequency Test (Sheet 1 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1	Connect test equipment to RT unit as shown in Figure 5-6. Set a-f switch to position 3. Set r-f switch to position 1. On audio adapter, set RCV/XMT switch to RCV.		Set MEGAHERTZ to 399.95. Set function switch to DF. VOL fully ccw. SQ fully ccw.	NOTE Referring to Figure 5-6, the Bird 43 wattmeter (with 10D element) may be substituted for the Microlab AD-30B attenuator and Hewlett-Packard 431C power meter (with 478A thermistor mount).
2	On audio adapter, set RCV/XMT switch to XMT. Adjust variable attenuator to level sufficient to obtain oscilloscope pattern in step 3.			
3	Tune transfer oscillator to obtain r-f modulation pattern on oscilloscope (see Figure 5-7).	ANT r-f output via T-pad		
4	Measure and record percentage modulation as defined in Figure 5-7.	ANT r-f output via T-pad		
5	Set r-f switch (Figure 5-6) to position 2.			
6	Use frequency counter to measure and record frequency of r-f detector output (DF tone).	ANT r-f output via T-pad and via detector		1000 ± 150 Hz.

Table 5-19. Transmitter DF Modulation Capability and Tone Frequency Test (Sheet 2 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
7	On audio adapter, set RCV/XMT switch to RCV.			
8	Repeat steps 2 through 7 for four RT unit MEGAHERTZ settings.	ANT r-f output via T-pad and via detector	Repeat step A1 except, in turn, set MEGAHERTZ to 358.05; 312.00; 269.30; and 225.00.	Same as steps A4 and A6 for each MEGAHERTZ setting.

Table 5-20. Transmitter Sidetone Operation Test (Sheet 1 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1	Refer to Figure 5-5. Connect a-c vtvm directly to AUDIO OUT terminal of audio adapter.			NOTE Referring to Figure 5-6, the Bird 43 wattmeter (with 10D element) may be substituted for the Microlab AD-30B attenuator and Hewlett-Packard 431C power meter (with 478A thermistor mount).
2	Connect test equipment to RT unit as shown in Figure 5-6. Set a-f and r-f switches to position 1. On audio adapter, set RCV/XMT switch to RCV and TX MODE switch to HANDSET.		Set MEGAHERTZ to 399.95. Set function switch to T/R. VOL fully ccw. SQ fully ccw.	
3	On audio adapter, set RCV/XMT switch to XMT. Set variable attenuator to approximately 0 dB. Set audio oscillator for 1000 Hz input signal.	ANT r-f output via T-pad		
4	Tune transfer oscillator to obtain r-f modulation pattern on oscilloscope (see Figure 5-7).	ANT r-f output via T-pad		
5	Set audio input signal for 90% modulation as defined in Figure 5-7.	ANT r-f output via T-pad		
6	Record a-c vtvm reading in volts.	AUDIO OUT (3J1-4)	Set VOL control fully cw.	

Table 5-20. Transmitter Sidetone Operation Test (Sheet 2 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
7	On audio adapter, set RCV/XMT switch to RCV.			
8	Repeat steps A2 through A7 for four RT unit MEGAHERTZ settings.	ANT r-f output via T-pad and AUDIO OUT (3J1-4)	Repeat steps A1 and A6 except, in turn, set MEGAHERTZ to 358.05; 312.00; 269.30; and 225.00.	Same as step A6 for each MEGAHERTZ setting.

Table 5-21. Transmitter Carrier Noise Level (Wideband Mode) Test (Sheet 1 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1	Connect test equipment to RT unit as shown in Figure 5-6. Set a-f switch to position 2. Set r-f switch to position 1. On audio adapter, set RCV/XMT switch to RCV and TX MODE switch to WIDEBAND.		Set MEGAHERTZ to 399.95. Set Function switch to T/R. VOL fully ccw. SQ fully ccw.	NOTE Referring to Figure 5-6, the Bird 43 wattmeter (with 10D element) may be substituted for the Microlab AD-30B attenuator and Hewlett-Packard 431C power meter (with 478A thermistor mount).
2	On audio adapter, set RCV/XMT switch to XMT. Set variable attenuator to approximately 0 dB. Set audio oscillator for 1000 Hz input signal.			
3	Tune transfer oscillator to obtain r-f modulation pattern on oscilloscope (see Figure 5-7).	ANT r-f output via T-pad		
4	Set audio input signal for 90% modulation as defined in Figure 5-7.	ANT r-f output via T-pad		
5	Set r-f switch (Figure 5-6) to position 2.			
6	Using a-c vtvm, measure and record output of r-f detector in dB. This is 0 dB reference level for demodulated carrier audio plus noise.			

Table 5-21. Transmitter Carrier Noise Level (Wideband Mode) Test (Sheet 2 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
7	Set a-f switch (Figure 5-6) to position 3.			
8	Measure and record output of r-f detector (carrier noise) in dB.	ANT r-f output via T-pad and via detector		
9	Calculate difference in dB between steps 6 and 8.			Difference not less than -40 dB.
10	On audio adapter, set RCV/XMT switch to RCV. Set a-f switch (Figure 5-6) to position 2.			
11	Repeat steps 2 through 10 for two RT unit MEGAHERTZ settings.	ANT r-f output via T-pad and via detector	Repeat step A1 except, in turn, set MEGAHERTZ to 312.00 and 225.00.	Same as step 9 for each MEGAHERTZ setting.

Table 5-22. Control Head Logic-Switching Outputs Test (Sheet 1 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1			Remove cover from RT unit. Remove Frequency Synthesizer module A3.	NOTE Tables 4-1 and 5-23 are essentially equivalent. Table 4-1 separately lists all control head logic-switching outputs in "0" and "1" form. Table 5-23 lists the corresponding visual readout on module adapter Item B2.
2	Obtain frequency synthesizer module adapter Item B2. Mate module A3 to Item B2.		Mate Item B2 (with module A3) to main chassis connector 1A3J1.	
3	Connect test equipment to RT unit as shown in Figure 5-6 except use only items A1, A2, A11, A20, B7, and B10. On audio adapter, set RCV/XMT switch to RCV.		Set function switch to T/R. VOL fully ccw. SQ fully ccw. Set MEGAHERTZ as required by following steps.	
4	On module adapter (Item B2), set CONTROL HEAD TEST SELECT switch to VCO BAND. Observe readout lamps DS1 through DS6 in left-to-right order. Readout lamps indicate output state of VCO band selection logic.	Applicable connector pins on connector A3P1.	Set MEGAHERTZ to 390.00.	Readout agrees with Table 5-23 for receive-mode position 39 of X10 MHz switch on MEGAHERTZ panel.
5	Same as step 4.	Same as step 4.	In turn, set MEGAHERTZ to 380.00 through 220.00 in 10 MHz steps.	Readout agrees with Table 5-23 for receive-mode positions 38 through 22 of X10 MHz switch on MEGAHERTZ panel.

Table 5-22. Control Head Logic-Switching Outputs Test (Sheet 2 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
6	Same as step 4 except set audio adapter RCV/XMT switch to XMT.	Same as step 4.	MEGAHERTZ at 220.00.	Readout agrees with Table 5-23 for transmit-mode position 22 of X10 MHz switch on MEGAHERTZ panel.
7	Same as step 6.	Same as step 4.	In turn, set MEGAHERTZ to 230.00 through 390.00 in 10 MHz steps.	Readout agrees with Table 5-23 for transmit-mode positions 23 through 39 of X10 MHz switch on MEGAHERTZ panel.
8	On audio adapter, set RCV/XMT switch to RCV.			
9	On module adapter (Item B2), set CONTROL HEAD TEST SELECT switch to 10 MHZ CONT. Observe readout lamps DS1 through DS6 in left-to-right order. Readout lamps indicate output state of U4 counter control and limiter amplifier logic.	Applicable connector pins on connector A3P1.	MEGAHERTZ at 390.00.	Readout agrees with Table 5-23 for receive-mode position 39 of X10 MHz switch on MEGAHERTZ panel.
10	Same as step 9.	Same as step 9.	In turn, set MEGAHERTZ to 380.00 through 220.00 in 10 MHz steps.	Readout agrees with Table 5-23 for receive-mode position 39 of X10 MHz switch on MEGAHERTZ panel.

Table 5-22. Control Head Logic-Switching Outputs Test (Sheet 3 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
11	Same as step 9 except set audio adapter RCV/XMT switch to XMT.	Same as step 9.	MEGAHERTZ at 220.00.	Readout agrees with Table 5-23 for transmit-mode position 22 of X10 MHz switch on MEGAHERTZ panel.
12	Same as step 11.	Same as step 9.	In turn set MEGAHERTZ to 230.00 through 390.00 in 10 MHz steps.	Readout agrees with Table 5-23 for transmit-mode positions 23 through 39 of X10 MHz switch on MEGAHERTZ panel.
13	On audio adapter, set RCV/XMT switch to RCV.			
14	On module adapter (Item B2), set CONTROL HEAD TEST SELECT switch to 1 MHZ CONT. Observe readout lamps DS1 through DS6 in left-to-right order. Readout lamps indicate output state of U3 counter control logic.	Applicable connector pins on connector A3P1.	MEGAHERTZ at 390.00.	Readout agrees with Table 5-23 for position 0 of X1 MHz switch on MEGAHERTZ panel.
15	Same as step 14.	Same as step 14.	In turn, set MEGAHERTZ to 291.00 through 399.00 in 1 MHz steps.	Readout agrees with Table 5-23 for positions 1 through 9 of X1 MHz switch on MEGAHERTZ panel.

Table 5-22. Control Head Logic-Switching Outputs Test (Sheet 4 of 4)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
16	On module adapter (Item B2), set CONTROL HEAD TEST SELECT switch to 0.1 MHZ CONT. Observe readout lamps DS1 through DS6 in left-to-right order. Readout lamps indicate output state of U2 and U1 counter control logic.	Applicable connector pins on connector A3P1.	Set MEGAHERTZ to 399.95.	Readout agrees with Table 5-23 tor position 95 of 50 KHz (0.05 MHz) increment switch on MEGAHERTZ panel.
17	Same as step 16.	Same as step 16.	In turn, set MEGAHERTZ to 399.90; 399.85; 399.80; 399.75 (and so on in 0.05 steps) to 399.00.	Readout agrees with Table 5-23 for positions 90 through 00 (in 05 steps) of 50 KHz (0.05 MHz) increment switch on MEGAHERTZ panel.
18	Switch off power supply.			
19	Disconnect all equipment.		Return module A3 to RT unit. Replace RT unit cover.	

Table 5-23. Control Head Logic State Readout (Sheet 1 of 4)

NOTE

On frequency synthesizer module adapter, Item B2, indicator lamps DS1 through DS6 are 'on' for corresponding logic '1' states of control head outputs. Table section headings represent selected positions of CONTROL HEAD TEST SELECT switch.

V.C.O. BAND

CONTROL HEAD 10 MHz SWITCH POSITION	LOGIC STATE TRANSMIT MODE						LOGIC STATE RECEIVE MODE					
	DS1 A	DS2 B	DS3 C	DS4 D	DS5 E	DS6 F	DS1 A	DS2 B	DS3 C	DS4 D	DS5 E	DS6 F
22	0	1	0	0	0	0	1	0	0	0	0	0
23	0	1	0	0	0	0	1	0	0	0	0	0
24	0	1	0	0	0	0	1	0	0	0	0	0
25	0	0	1	0	0	0	0	1	0	0	0	0
26	0	0	1	0	0	0	0	1	0	0	0	0
27	0	0	1	0	0	0	0	1	0	0	0	0
28	0	0	0	1	0	0	0	0	1	0	0	0
29	0	0	0	1	0	0	0	0	1	0	0	0
30	0	0	0	1	0	0	0	0	1	0	0	0
31	0	0	0	1	0	0	0	0	0	1	0	0
32	0	0	0	0	1	0	0	0	0	1	0	0
33	0	0	0	0	1	0	0	0	0	1	0	0
34	0	0	0	0	1	0	0	0	0	1	0	0
35	0	0	0	0	1	0	0	0	0	0	1	0
36	0	0	0	0	0	1	0	0	0	0	1	0
37	0	0	0	0	0	1	0	0	0	0	1	0
38	0	0	0	0	0	1	0	0	0	0	1	0
39	0	0	0	0	0	1	0	0	0	0	0	1

Table 5-23. Control Head Logic State Readout (Sheet 2 of 4)

10 MHZ CONT.												
CONTROL HEAD 10 MHz SWITCH POSITION	LOGIC STATE TRANSMIT MODE						LOGIC STATE RECEIVE MODE					
	DS1	DS2	DS3	DS4	DS5	DS6	DS1	DS2	DS3	DS4	DS5	DS6
	U4	V4	W4	X4	Y4	L	U4	V4	W4	X4	Y4	L
22	0	1	0	1	0	0	1	0	1	1	0	0
23	1	0	0	1	0	1	0	0	1	1	0	1
24	0	0	0	1	0	1	1	1	0	1	0	1
25	1	1	1	0	0	0	0	1	0	1	0	0
26	0	1	1	0	0	1	1	0	0	1	0	1
27	1	0	1	0	0	1	0	0	0	1	0	1
28	0	0	1	0	0	0	1	1	1	0	0	0
29	1	1	0	0	0	1	0	1	1	0	0	1
30	0	1	0	0	0	1	1	0	1	0	0	1
31	1	0	0	0	0	1	0	0	1	0	0	0
32	0	0	0	0	0	0	1	1	0	0	0	1
33	1	1	1	1	1	1	0	1	0	0	0	1
34	0	1	1	1	1	1	1	0	0	0	0	1
35	1	0	1	1	1	1	0	0	0	0	0	0
36	0	0	1	1	1	0	1	1	1	1	1	1
37	1	1	0	1	1	1	0	1	1	1	1	1
38	0	1	0	1	1	1	1	0	1	1	1	1
39	1	0	0	1	1	1	0	0	1	1	1	0

Table 5-23. Control Head Logic State Readout (Sheet 3 of 4)

1 MHZ. CONT.							
CONTROL HEAD 1 MHz SWITCH POSITION	LOGIC STATE						
	DS1	DS2	DS3	DS4	DS5	DS6	
	W3	X3	Y3	Z3	-	-	
1	1	1	1	1	0	0	
2	0	1	0	1	0	0	
3	1	1	0	1	0	0	
4	1	0	0	1	0	0	
5	0	0	0	1	0	0	
6	1	1	1	0	0	0	
7	0	1	0	0	0	0	
8	1	1	0	0	0	0	
9	1	0	0	0	0	0	
0	0	0	0	0	0	0	

0.1 MHZ. CONT.							
CONTROL HEAD 50 kHz SWITCH POSITION	LOGIC STATE						
	DS1	DS2	DS3	DS4	DS5	DS6	
	W2	X2	Y2	Z2	n	-	
00	0	0	0	0	0	0	
05	0	0	0	0	1	0	
10	1	1	1	1	0	0	
15	1	1	1	1	1	0	
20	0	1	0	1	0	0	

Table 5-23. Control Head Logic State Readout (Sheet 4 of 4)

0.1 MHZ. CONT. (CONTINUED)							
CONTROL HEAD 50 kHz SWITCH POSITION	LOGIC STATE						
	DS1	DS2	DS3	DS4	DS5	DS6	
	W2	X2	Y2	Z2	n	-	
25	0	1	0	1	1	0	
30	1	1	0	1	0	0	
35	1	1	0	1	1	0	
40	1	0	0	1	0	0	
45	1	0	0	1	1	0	
50	0	0	0	1	0	0	
55	0	0	0	1	1	0	
60	1	1	1	0	0	0	
65	1	1	1	0	1	0	
70	0	1	0	0	0	0	
75	0	1	0	0	1	0	
80	1	1	0	0	0	0	
85	1	1	0	0	1	0	
90	1	0	0	0	0	0	
95	1	0	0	0	1	0	

Table 5-24. List of Adjustment Controls

PARTIAL REF DESIGNATION	LOCATION	FUNCTION
A4R1	IF/Audio module A4	Percentage modulation preset
A4R2	IF/Audio module A4	Normal receive audio output preset
A4R4	IF/Audio module A4	Squelch preset

Table 5-25. Receiver Audio Preset Adjustment Procedure

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ADJUSTMENT REQUIREMENT
1	Connect test equipment to RT unit as shown in Figure 5-5. Set r-f and a-f switches to position 1.		Set MEGAHERTZ to 300.00. Set function switch to T/R. VOL fully cw. SQ fully ccw.	
2	Adjust signal generator for 3 uV, 1000 Hz, 30% modulated signal tuned to MEGAHERTZ setting.			
3	Observe a-c vtvm reading.	AUDIO OUT	Locate audio preset control A4R2 and set for a-c vtvm reading of 2.45 volts.	2.45 vrms = 12 mW into 500 ohm load.

Table 5-26. Receiver Squelch Preset Adjustment Procedure

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ADJUSTMENT REQUIREMENT
1	Connect test equipment to RT unit as shown in Figure 5-5. Set r-f and a-f switches to position 1.		Set MEGAHERTZ to 399.95. Set function switch to T/R. VOL fully cw. SQ fully ccw.	
2	Adjust signal generator for 35 uV, 1000 Hz, 30% modulated signal tuned to MEGAHERTZ setting.		Set SQ fully cw.	Squelch not disabled and at maximum sensitivity.
3	Observe a-c vtvm reading.	AUDIO OUT	Locate squelch preset control A4R4. Set A4R4 fully ccw. NOTE The adjustment range of A4R4 must cover 4.5 volts (fully cw) to 11.0 volts (fully ccw) measured at A4J8 (use d-c vtvm).	Squelch gate "closed"; no audio signal across load.
4	Observe a-c vtvm reading.	AUDIO OUT	Slowly rotate preset squelch control A4R4 cw. Carefully set to point where a-c vtvm reading just increases.	Squelch gate set to "open" at 35 uV r-f input signal (with SQ control fully cw).

Table 5-27. Transmitter Modulation Preset Adjustment Procedure

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ADJUSTMENT REQUIREMENT
1	Connect test equipment to RT unit as shown in Figure 5-6. Set a-f and r-f switches to position 1. On audio adapter, set RCV/XMT switch to XMT and TX MODE switch to HANDSET.		Set MEGAHERTZ to 300.00. Set function switch to T/R. VOL fully ccw. SQ fully ccw.	
2	Set variable attenuator to approximately 0 dB. Set audio oscillator for 1000 Hz input signal. Adjust audio input signal level to 1250 uV.	MIC IN (HANDSET) on Item B7 (input to 3J1-2)		
3	Tune transfer oscillator to obtain r-f modulation pattern on oscilloscope (see Figure 5-7).	ANT r-f output via T-pad		
4	Observe r-f modulation pattern on oscilloscope	ANT r-f output via T-pad	Locate transmitter modulation preset control A4R1. Set A4R1 for 90% modulation as defined in Figure 5-7.	Transmitter percentage modulation = 90% for a-f input of 1250 uV.
5	On audio adapter, set RCV/XMT switch to RCV.			

Table 5-28. Antenna Forward/Reflected Power Test

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1	Connect test equipment to RT unit as shown in Figure 5-6 except, for ANT (1J1) connection, use items A17, A18, and B8 with Antenna Unit 4 (see Figure 5-8). Set a-f switch (Figure 5-6) to position 3. On audio adapter, set RCV/XMT switch to RCV.		Set MEGAHERTZ to 225.00. Set function switch to T/R. VOL fully CCW. SQ fully CCW.	
2	On audio adapter, set RCV/XMT switch to XMT. Use r-f wattmeter (Item A17 with Item A18) to measure ratio of forward to reflected r-f output power.	Antenna input (1J1)		Forward/reflected power ratio must not be less than 4:1.
3	On audio adapter, set RCV/XMT switch to RCV.		Set function switch to OFF.	
4	Disconnect test equipment as applicable.			

Table 5-29. List of Alignment Components

PARTIAL REF DESIGNATION	LOCATION	FUNCTION
A5C16 (part of Z1)	PA/Modulator module A5	Trimmer for MEGAHERTZ 399.95 setting only (tripler stage)
A5C17 (part of Z1)	PA/Modulator module A5	Rotor/stator tuner (tripler stage)
A5C18 (part of Z2)	PA/Modulator module A5	Trimmer for MEGAHERTZ 399.95 setting only (first r-f stage)
A5C19 (part of Z2)	PA/Modulator module A5	Rotor/stator tuner (first r-f stage)
A5C23 (part of Z3)	PA/Modulator module A5	Rotor/stator tuner (second r-f stage)
A5C28 (part of Z4)	PA/Modulator module A5	Rotor/stator tuner (power amplifier driver stage)
A5C33 (part of Z5)	PA/Modulator module A5	Rotor/stator tuner (r-f output stage)
A5R17	PA/Modulator module A5	R-f power level preset
A6C2 (part of Z1)	Receive RF module A6	Trimmer for MEGAHERTZ 399.95 setting only (r-f input stage)
A6C3 (part of Z1)	Receive RF module A6	Rotor/stator tuner (r-f input stage)
A6C7	Receive RF module A6	Crystal filter tuning
A6C12 (part of Z2)	Receive RF module A6	Trimmer for MEGAHERTZ 399.95 setting only (first r-f stage)
A6C13 (part of Z2)	Receive RF module A6	Rotor/stator tuner (first r-f stage)
A6C19 (part of Z3)	Receive RF module A6	Trimmer for MEGAHERTZ 399.95 setting only (second r-f stage)
A6C20 (part of Z3)	Receive RF module A6	Rotor/stator tuner (second r-f stage)
A6C23 (part of Z4)	Receive RF module A6	Rotor/stator tuner (third r-f and mixer input stage)
A6C24 (part of Z4)	Receive RF module A6	Trimmer for MEGAHERTZ 399.95 setting only (third r-f and mixer input stage)
A6C34 (part of Z6)	Receive RF module A6	Trimmer for MEGAHERTZ 399.95 setting only (tripler stage)
A6C35 (part of Z6)	Receive RF module A6	Rotor/stator tuner (tripler stage)
A6C41 (part of Z5)	Receive RF module A6	Trimmer for MEGAHERTZ 399.95 setting only (buffer stage)
A6C42 (part of Z5)	Receive RF module A6	Rotor/stator tuner (buffer stage)

Table 5-30. Receive R-f Alignment Procedure (Sheet 1 of 5)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
1			Remove cover from RT unit. Remove Receive RF module A6.	
2			On module A6, check rotor shaft rotation in both directions through 360°. Check for binding, sticking, catching, or touching of rotor and stator blades and tabs. Carefully check that wiper arms make proper contact over full tuning range.	
	CAUTION Ensure that rotor and stator blades and tabs do not touch throughout this procedure.			
3	Obtain receive rf module adapter Item B6. Set mechanical shaft coupler switch to 400 MHZ detent position. Mate module A6 electrically and mechanically to Item B6. On module A6, ensure that tips of rotor blades are set line to line and just out of mesh with stators (minimum capacitance).		Set MEGAHERTZ to 399.95. Mate module extender (with A6) to main chassis connectors A6J1 an and A6J2. Set function switch to OFF. VOL fully ccw. SQ fully ccw. See following NOTE.	

Table 5-30. Receive R-f Alignment Procedure (Sheet 2 of 5)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
3 (cont)	CAUTION Except for 400/399.95 position, ensure that MHZ setting of detent switch on Item B6 agrees at all times with RT unit MEGAHERTZ setting.		NOTE Except for 400/399.95 position, MHZ settings on module adapter are equivalent to MEGAHERTZ settings on RT unit.	
4	Connect test equipment to RT unit as shown in Figure 5-5. Set r-f and a-f switches to position 1. CAUTION The RT unit total d-c input current (measured with item A11) must not exceed 250 mA for the receive mode of operation. If the input current is excessive, immediately switch off the input power. Eliminate the fault condition before proceeding.		Set function switch to T/R.	
5	Set r-f switch (Figure 5-5) to position 2. Adjust signal generator (no modulation) to sufficient level to (cont)		Set VOL fully cw.	

Table 5-30. Receive R-f Alignment Procedure (Sheet 3 of 5)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
5 (cont)	operate frequency counter. Using frequency counter, tune signal generator to MEGAHERTZ setting.			
6	Set r-f switch to position 1. Adjust signal generator r-f signal to 3 uV. Readjust as necessary to obtain most sensitive indication on d-c vtvm in subsequent steps.	A4J3	NOTE In the subsequent steps, note that trimmer capacitors A6C2, A6C12, A6C19, A6C24, A6C34, and A6C41 are tuned at MEGAHERTZ setting 399.95 only. Tank circuits A6Z1 thru A6Z6 are each provided with rotor tabs for tracking at all frequency settings. CAUTION All trimming adjustments and tab bending must be done with a non-conducting tuning rod inserted through the tank circuit compartment openings.	Relative d-c voltage level (see subsequent steps).

Table 5-30. Receive R-f Alignment Procedure (Sheet 4 of 5)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
7	Repeat step 6 as applicable.	A4J3	Tune A6C2 for max dip in if-agc voltage.	If-agc voltage level is set to max dip for first r-f input stage at MEGAHERTZ setting of 399.95.
8	Repeat step 6 as applicable.	A4J3	In turn, tune A6C12, A6C19, A6C24, A6C34, and A6C41, obtaining max if-agc voltage dip for each.	If-agc voltage level is set to max dip for all r-f stages at MEGAHERTZ setting of 399.95.
9	On Item B6, set MHZ shaft coupler switch to 390 detent position.		Set MEGAHERTZ to 390.00.	
10	Repeat steps 5 and 6.	A4J3	At mechanical-coupler end of rotor shaft, bend fully meshed rotor tab for max dip in if-agc voltage.	If-agc voltage level is set to max dip for first tank circuit at MEGAHERTZ setting of 390.00.
11	Repeat step 6 as applicable.	A4J3	In turn, proceeding away from mechanical-coupler end, bend fully meshed rotor tabs in all tank circuits A6Z1 thru A6Z6, obtaining max if-agc voltage dip for each.	If-agc voltage level is set to max dip for all tank circuits A6Z1 thru A6Z6 at MEGAHERTZ setting of 390.00.

Table 5-30. Receive R-f Alignment Procedure (Sheet 5 of 5)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
12	On Item B6, set MHZ switch to RT unit MEGAHERTZ settings as applicable. Repeat steps 5 and 6 as applicable.	A4J3	In turn, set MEGAHERTZ to all channels spaced 10 MHz including 225.00 MHz. At each MEGAHERTZ setting repeat steps 10 and 11.	Same as steps 10 and 11 extended to all selected MEGAHERTZ settings.
13	Repeat steps 5 through 12 as applicable.	A4J3	If necessary (because of recheck results in next column) make adjustments according to steps 8 thru 13 as applicable.	Recheck if-agc voltage level dips for steps 7, 8, and 10 through 12. If recheck is satisfactory, alignment of Receive RF is completed.

Table 5-31. PA/Modulator Alignment Procedure (Sheet 1 of 8)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
1			Remove cover from RT unit. Remove PA/Modulator module A5. Remove both covers of PA/Modulator module.	NOTE Referring to Figure 5-6 (for transmitter tests, alignment, and troubleshooting), the Bird 43 wattmeter (with 10D element) may be substituted for the Microlab AD-30B attenuator and Hewlett-Packard 431C power meter (with 478A thermistor mount). Using the Bird 43 test setup, carrier power only can be measured, not total power. For example, for 2 watts total power, approximately 1.5 watts carrier power will be indicated. Step 13 below and all subsequent steps require the use of the H-P 431C test setup.
2	CAUTION Ensure that rotor and stator blades and tabs do not touch throughout this procedure.		On module A5, check rotor shaft rotation in both directions through 360°. Check for binding, sticking, catching, or touching of rotor and stator blades and tabs. Carefully check that wiper arms make proper contact over full tuning range.	
3	Obtain pa/modulator module adapter Item B1. Set mechanical shaft coupler switch to 400 MHZ detent position. Mate module A5 electrically and mechanically to Item B1. On module A5, ensure that tips of rotor blades are set line		Set MEGAHERTZ to 399.95. Mate module extender (with A5) to main chassis connectors A5J1 and A5J2. Set function switch to OFF. VOL fully ccw. SQ fully ccw. See following NOTE.	

(cont)

Table 5-31. PA/Modulator Alignment Procedure (Sheet 2 of 8)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
3 (cont)	to line and just out of mesh with stators (minimum capacitance). **CAUTION** Except for 400/399.95 position, ensure that MHZ setting of detent switch on Item B1 agrees at all times with RT unit MEGAHERTZ setting.		NOTE Except for 400/399.95 position, MHZ settings on module adapter are equivalent to MEGAHERTZ settings on RT unit.	
4	Connect test equipment to RT unit as shown in Figure 5-6. Set a-f and r-f switches to position 1. On audio adapter, set RCV/XMT switch to RCV. Set a-f switch (Figure 5-6) to position 3. **CAUTION** The RT unit total d-c input current (measured with item A11) must not exceed 800 mA for the transmit mode of operation. If the input current is excessive, immediately switch off the input power. Eliminate the fault condition before proceeding.			

Table 5-31. PA/Modulator Alignment Procedure (Sheet 3 of 8)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
5	On audio adapter, set RCV/XMT switch to XMT. Use d-c vtvm (Item A12) to measure d-c voltage at emitter of A5Q9.	A5Q9-E	Set function switch to T/R. A5R17 is preset at the factory. Do not disturb setting unless voltage at A5Q9-E exceeds 16 vdc. Only adjust if necessary. NOTE In the subsequent steps, note that trimmer capacitors A5C16, A5C18 are provided for tank circuits A5Z1, A5Z2 only, and are tuned at MEGAHERTZ setting 399.95 only. Tank circuits A5Z3, A5Z4, A5Z5 are each provided with an additional set of 360° rotor tabs for tracking at all frequency settings. CAUTION All trimmer adjustments and tab bending must be done with a non-conducting tuning rod inserted through the tank circuit compartment openings.	16 vdc or less at A5Q9-E.

Table 5-31. PA/Modulator Alignment Procedure (Sheet 4 of 8)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
6	Use r-f power meter to observe relative r-f power output.	ANT r-f output via 30 dB attenuator	Adjust trimmers A5C16, A5C18 for max r-f power output.	A5C16, A5C18 set for max r-f power output (no modulation) at 399.95 MHz.
7	Repeat step 6.	ANT r-f output via 30 dB attenuator	Adjust fully meshed tabs only on 360° rotors of A5Z3, A5Z4, A5Z5 for max r-f power output.	A5Z3, A5Z4, A5Z5 tuned for max r-f power output (no modulation) at 399.95 MHz.
8	On Item B1, set MHZ switch to 390. Repeat step 6.	ANT r-f output via 30 dB attenuator	Set MEGAHERTZ to 390.00. Adjust rotor tabs (which have just come into mesh) on A5Z1 thru A5Z5 for max r-f power output.	A5Z1 thru A5Z5 tuned for max r-f power output (no modulation) at 390.00 MHz.
9	On Item B1, set MHZ switch to RT unit MEGAHERTZ setting as applicable. Repeat step 6.	ANT r-f output via 30 dB attenuator	Repeat step 8 except use frequency settings spaced 10 MHz throughout band down to and including 225.00 MHz.	Same as step 8 for each frequency setting.
10	Repeat step 6.	ANT r-f output via 30 dB attenuator	Recheck steps 6 thru 9. Readjust if necessary.	Same as steps 6 thru 9.

Table 5-31. PA/Modulator Alignment Procedure (Sheet 5 of 8)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
11	Check the transmitter r-f power output by performing the procedure contained in Table 5-14.	As in Table 5-14.	As in Table 5-14.	If the performance standards of Table 5-14 are met, proceed to step 12. If the performance standards are not met, proceed to step 13.
12	Check the transmitter modulation capability by performing the procedure contained in Table 5-17.	As in Table 5-17.	As in Table 5-17.	If the performance standards of Table 5-17 are met, the PA/Modulator alignment is completed. If the performance standards are not met, proceed to step 13.
13	Repeat step 4. Operate test equipment as applicable for requirements of succeeding steps. NOTE All subsequent steps require the use of H-P 431C test setup as shown in Figure 5-6. CAUTION Except for 400/399.95 position, ensure that MHZ setting on Item B1 agrees at all times with MEGAHERTZ setting on RT unit.		Operate RT unit as applicable for requirements of succeeding steps.	ADDITIONAL ADJUSTMENTS. The succeeding procedural steps are required only if the transmitter r-f power output and/or modulation capability do not meet the required performance standards. The r-f power output and modulation percentage are set by the adjustment of preset potentiometer A5R17 and (cont)

Table 5-31. PA/Modulator Alignment Procedure (Sheet 6 of 8)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
13 (cont)				the selection of individual values for resistors A5R21 through A5R24. Proceed to step 14.
14			Check that microswitch actuation is at correct frequency; A5S1 at approx 360 MHz; A5S2 at approx 270 MHz. NOTE If necessary, adjust switch actuating cam to agree with tracking requirement.	Microswitches A5S1 and A5S2 actuate at approx 360 MHz and 270 MHz respectively.
15	Set output of audio oscillator to level required to obtain between 90 and 100% modulation (see Figure 5-7).	ANT r-f output via 30 dB attenuator and via T-pad.	Set MEGAHERTZ to 399.95. Adjust A5R17 for approx 2.2 W. NOTE Do not readjust A5R17 for the following steps.	R-f power output at 399.95 MHz is set to approx 2.2 watts for 90 to 100% modulation.
16	If necessary, adjust audio oscillator input level to 90% modulation for selected value of A5R21.	ANT r-f output via 30 dB attenuator and via T-pad.	Set MEGAHERTZ to 225.00. Select value of A5R21 to produce r-f power output of approx 2.5 W when modulated 90%.	R-f power output at 225.00 MHz is set to approx 2.5 watts with 90% modulation.

Table 5-31. PA/Modulator Alignment Procedure (Sheet 7 of 8)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
17	Do not disturb audio oscillator input level set in step 16.	ANT r-f output via 30 dB attenuator and via T-pad.	Advance MEGAHERTZ setting in 10 MHz steps. Stop at setting where A5S2 actuates.	R-f power output is at least 2 watts with 90% or better modulation until A5S2 actuates.
18	If necessary, adjust aduio oscillator input level to 90% modulation for selected value of A5R22.	ANT r-f output via 30 dB attenuator and via T-pad.	Select value of A5R22 to produce r-f power output of approx 2.5 W. Select value of A5R23 to produce 90% modulation.	R-f power output at approx 270 MHz (A5S2 actuated) is at least 2.5 watts with 90% modulation.
19	Do not disturb audio oscillator input level set in step 18.	ANT r-f output via 30 dB attenuator and via T-pad.	Advance MEGAHERTZ setting in 10 MHz steps. Stop at setting where A5S1 actuates.	R-f power output is at least 2 watts with 90% modulation until A5S1 actuates.
20	Do not disturb audio oscillator input level set in step 18.	ANT r-f output via 30 dB attenuator and via T-pad.	Select value of A5R24 for approx 90% modulation.	With A5S1 actuated, modulation level is approx 90%.

Table 5-31. PA/Modulator Alignment Procedure (Sheet 8 of 8)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	ALIGNMENT REQUIREMENT
21		ANT r-f output via 30 dB attenuator and via T-pad.	Beginning with 399.95 MHz, check operation of all channels separated by 10 MHz and including 225.00 MHz.	All selected channels operate properly. Alignment and adjustment of PA/Modulator is completed.

SECTION II
SPECIAL MAINTENANCE

5-91. GENERAL.

5-92. The depot level (special maintenance activity) maintenance concept for the radio set can be indirectly defined from the following depot level maintenance requirements:

a. Inspect and repair as necessary.

b. Repair electrical or mechanical parts or sections by replacement only according to the lowest discrete part or next higher assembly supplied.

c. Repair thin-film packets and encapsulated discrete-part circuit blocks by replacement only.

d. Carry out all actions and procedures necessary to ensure that the equipment meets all assembly, module, unit, and radio set performance standards.

5-93. TEST EQUIPMENT REQUIRED.

5-94. The special maintenance test equipment complement is identical to that listed in Table 5-1 with the addition of the items listed in Table 5-32 (the item numbers are taken from Table 1-4).

5-95. BENCH-TEST SETUPS.

5-96. The bench-test setups required for special maintenance are identical to those described in Section I of this chapter.

5-97. TEST TABLES AND TROUBLESHOOTING CHARTS.

5-98. Tables 5-33 and 5-34 with Figure FO-13 provide test and troubleshooting information for Frequency Synthesizer module A3 (refer also to Figure FO-5). All other required performance, adjustment, alignment, and troubleshooting tables and charts are contained or referenced in Section I of this chapter.

5-99. DISASSEMBLY (MECHANICAL).

5-100. No special instructions are required for mechanical disassembly.

5-101. CLEANING.

5-102. Refer to paragraph 5-23 for a description of the basic cleaning principles. In addition, observe the following requirements:

a. All disassembled parts which are to be used again must be clean and free from contaminants.

b. Solvent or detergent can be used freely on separate parts, but must not be used on insulation or sealed bearings, or on assembled moving parts.

5-103. REPAIR AND REPLACEMENT.

5-104. There are no repairs which require special instructions. The repair of thin-film and encapsulated discrete-part circuit blocks and other economically irreparable items is by replacement only.

5-105. REASSEMBLY AND TESTING (MECHANICAL).

5-106. REASSEMBLY. The following special instructions must be observed when reassembling the main chassis and control head (Figure 6-17).

a. The orientation of the "flats" on the 0.05 MHz, 1 MHz, and 10 MHz control knob shafts must conform to Figure 5-10 for a MEGAHERTZ setting of 220.00.

b. Refer to Figure 5-11 to orientate and position the following:

1. 10 MHz/0.05 MHz cam and cam arm detent assembly.

2. Sector gears.

3. Mechanical output couplers.

c. Refer to Figure 5-12 for orientation of the 10 MHz, 1 MHz, and 0.05 MHz switch rotor contacts with respect to the printed circuit board stators.

d. Use an approved liquid staking compound for all threaded items not otherwise mechanically secured.

5-107. TESTING. Refer to paragraph 5-61 for the main chassis and control head testing procedures. The following points should be noted:

a. After assembly, the mechanical operation of the control head geartrain and logic switches should be carefully checked for evidence of sticking, binding, or looseness.

b. Accurate testing of the control head geartrain and logic switches can only be carried out electronically.

5-108. POST-REPAIR TESTING.

5-109. All radio set equipment must receive final acceptance performance testing. Proceed according to the following sequence:

a. Performance test all operating and repaired modules and main chassis according to paragraph 5-52. Tag or identify all modules and main chassis which meet the performance standards.

b. Make up RT units from the modules and main chassis obtained as a result of a. above.

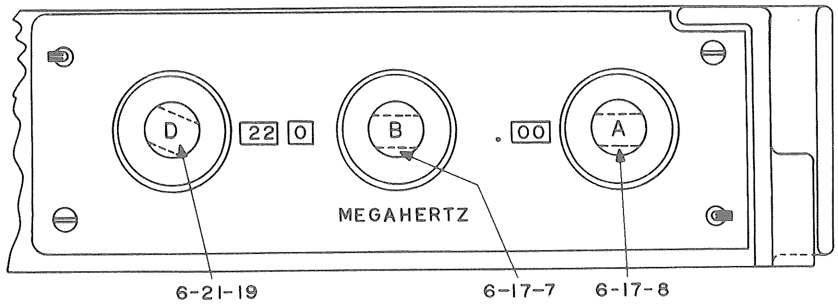
c. Adjust operating and repaired RT units according to Tables 5-25 through 5-27.

d. Performance test adjusted and repaired RT units according to Tables 5-4 through 5-22. Tag or identify all RT units which meet the performance standards.

e. Performance test all antennas according to Table 5-28 and Figure 5-18. Tag and identify as serviceable.

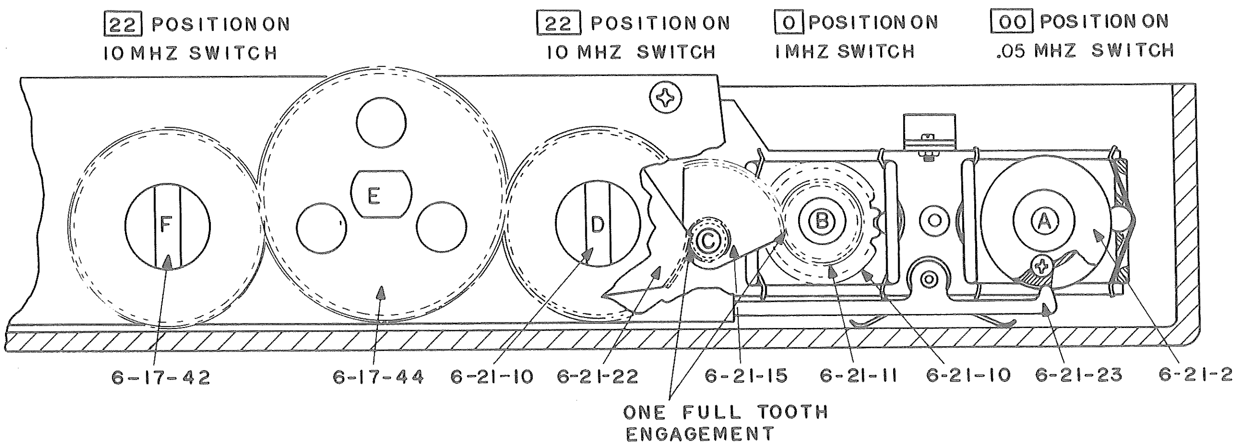
f. Make up radio sets from the RT units obtained as a result of d. and e. above and from the other repaired and serviceable units.

g. Carry out operational tests on complete radio sets obtained as a result of f. above. Tag or identify all radio sets meeting the operational tests.



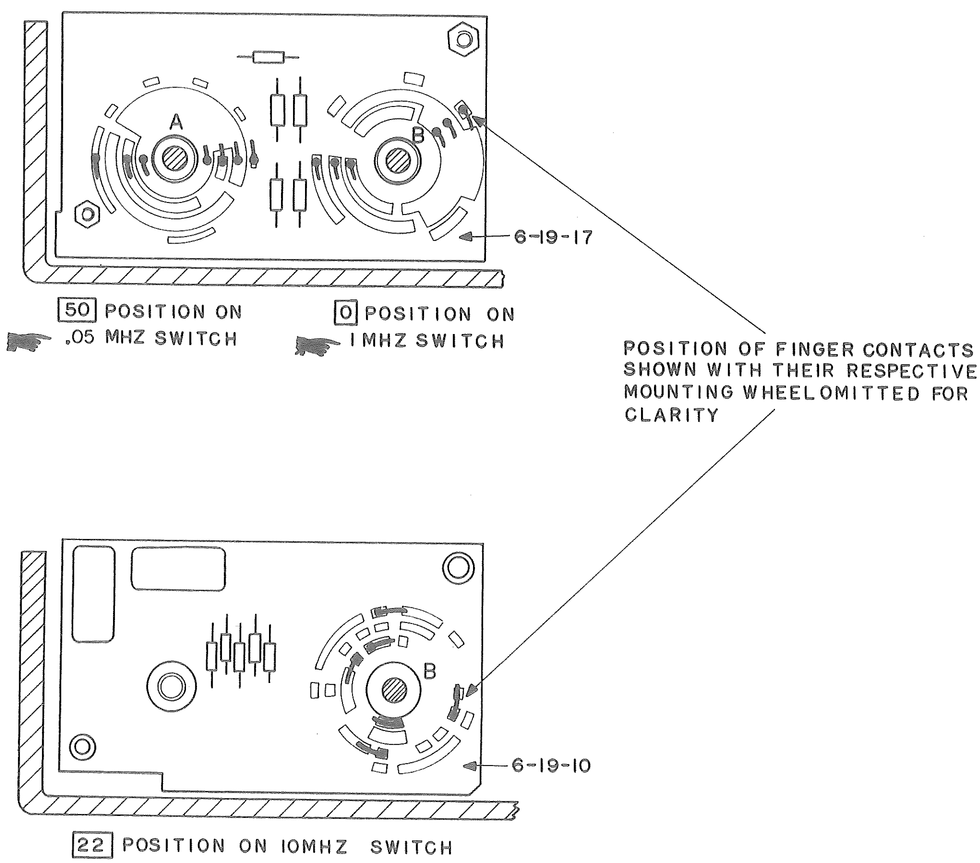
NOTES:
1. PHANTOM VIEW OF FLATS ON CONTROL KNOB SHAFTS FOR MEGAHERTZ 220.00 SETTING.
2. CALLOUT FIGURES REFER TO CALLOUT ITEMS SHOWN IN FIGURES 6-17 AND 6-21.
3. LETTERS REFER TO AXES MARKED IN FIGURE 4-13.

Figure 5-10. Control Knob Shaft "Flat" Orientation Diagram



NOTES:
1. CALLOUT FIGURES REFER TO CALLOUT ITEMS SHOWN IN FIGURES 6-17 AND 6-21.
2. LETTERS REFER TO AXES MARKED IN FIGURE 4-13.
3. WITH DIAL SET AT .00 MHZ, POSITION CAM RIDER (6-21-23) AT MAXIMUM HEIGHT AND SET CAM (6-21-2) IN POSITION WITH SCREW SHOWN. CARE MUST BE TAKEN TO ENSURE THAT CAM RIDER WILL NEVER FALL INTO LOW POSITION OF CAM WHEN DIAL IS SET AT .00 MHZ.
4. CIRCUIT CONTROL, FIGURE 6-19, OMITTED FOR CLARITY.
5. USE ALIGNMENT GAUGE (TABLE 5-1, ITEM B9) TO CHECK ORIENTATION SHOWN FOR COUPLER ITEMS 6-17-42 AND 6-21-10.

Figure 5-11. Geartrain Orientation and Positioning Diagram



NOTES:

1. CALLOUT FIGURES REFER TO CALLOUT ITEMS SHOWN IN FIGURE 6-19.
2. LETTERS REFER TO AXES MARKED IN FIGURE 4-13.

Figure 5-12. Logic Switch Rotor Orientation Diagram

Table 5-32. List of Additional Test Equipment Required for Depot Level Maintenance

ITEM NO	COMMON NAME	NOMENCLATURE OR PART NO	CHARACTERISTICS
A8	Oscilloscope, Plug-in Frame	Hewlett-Packard 140A	See Items A9 and A10.
A9	Plug-in Unit, Sampling Vertical Amplifier	Hewlett-Packard 1410A	Deflection factor 1 mV/cm at 1 GHz. A and B channels, DC -1 GHz. Used with Item A8.
A10	Plug-in Unit, Time Base	Hewlett-Packard 1424A	Twenty-four ranges: 10 ps/cm to 500 us/cm, accuracy ± 3%. Triggering to 5 GHz without external count down. Used with Item A8.
A14	Analyzer, Distortion	TS-723A/U (HP331A)	Accuracy: ± 3% over required audio frequency range.
A15	Voltmeter, R-f Average Power	TS-208/U (HP431C)	Accuracy: ± 5% over required power range.
A16	Mount, Thermistor	Hewlett-Packard 478A	10 MHz to 10 GHz: VSWR 1.3 over required frequency range. Used with Item A15.
A21	Resistor Variable, Linear Precision	Helipot T10AR5K	5K ± 1%, 6.9W; ten turn (3600°) counting dial.

Table 5-33. Frequency Synthesizer R-f Outputs Test (Sheet 1 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
1			Remove cover from RT unit. Remove frequency synthesizer module A3.	
2	Obtain frequency synthesizer module adapter Item B2. Mate module A3 to Item B2.		Mate Item B2 (with A3) to main chassis connector 1A3J1	
3	Connect test equipment to RT unit as shown in Figure 5-6 except use only Items A1, A2, A11, A20, B7, and B10. At Item B2 FREQ SYNTH O/P jack, connect the following as applicable: Items A8, A9, A10 (sampling oscilloscope for r-f waveform observation and amplitude measurements); or Item A3 (frequency counter for r-f output frequency measurement). On audio adapter, set RCV/XMT switch to RCV.		Set MEGAHERTZ to 330.00. Set function switch to OFF. VOL fully ccw. SQ fully ccw. NOTE In the receive mode, the r-f output frequency of the frequency synthesizer is equal to the MEGAHERTZ frequency divided by 3 minus 10 MHz.	
4	Observe and record frequency counter readout within first 60 seconds of setting RT unit function switch to T/R position (that is, module A3 must start from "cold").	FREQ SYNTH O/P on Item B2 (A3P1-31)	Set function switch to T/R.	Frequency synthesizer r-f output frequency is 100 ± 0.001 MHz.

Table 5-33. Frequency Synthesizer R-f Outputs Test (Sheet 2 of 2)

STEP	OPERATION OF TEST EQUIPMENT	POINT OF TEST	CONTROL SETTINGS AND OPERATION OF EQUIPMENT	PERFORMANCE STANDARD
5	Observe and record frequency counter readouts for module A3 receive mode r-f output frequencies at RT unit MEGAHERTZ settings. Round off readouts to three decimal places and check off against Table 5-34.	FREQ SYNTH O/P on Item B2 (A3P1-31)	In turn, set MEGAHERTZ to channel megahertz frequencies listed in Table 5-34.	Check-off agrees with Table 5-34 for receive mode nominal frequencies.
6	On audio adapter, set RCV/XMT switch to XMT. Observe and record frequency counter readouts for module A3 transmit mode r-f output frequencies at RT unit MEGAHERTZ settings. Round off readouts to three decimal places and check off against Table 5-34.	FREQ SYNTH O/P on Item B2 (A3P1-31)	In turn, set MEGAHERTZ to channel megahertz frequencies listed in Table 5-34.	Check-off agrees with Table 5-34 for transmit mode nominal frequencies.
7	Use sampling oscilloscope to measure and record module A3 peak-to-peak r-f output voltages at RT unit MEGAHERTZ settings.	FREQ SYNTH O/P on Item B2 (A3P1-31)	In turn, set MEGAHERTZ to 399.95; 330.00; 290.00; 260.00; 230.00; and 220.00.	Comparison check only.

Table 5-34. Frequency Synthesizer Nominal Test Frequencies (Sheet 1 of 2)

MEGAHERTZ SETTING	RECEIVE MODE FREQUENCY (MHZ)	TRANSMIT MODE FREQUENCY (MHZ)
399.95	123.317	133.317
399.80	123.266	133.266
399.70	123.233	133.233
399.60	123.200	133.200
399.50	123.166	133.166
399.40	123.133	133.133
399.30	123.100	133.100
399.20	123.066	133.066
399.10	123.033	133.033
399.00	123.000	133.000
398.95	122.983	132.983
397.95	122.650	132.650
396.95	122.316	132.316
395.95	121.983	131.983
394.95	121.650	131.650
393.95	121.316	131.316
392.95	120.983	130.983
391.95	120.650	130.650
390.95	120.316	130.316
380.00	116.667	126.667
370.00	113.333	123.333

Table 5-34. Frequency Synthesizer Nominal Test Frequencies (Sheet 2 of 2)

MEGAHERTZ SETTING	RECEIVE MODE FREQUENCY (MHZ)	TRANSMIT MODE FREQUENCY (MHZ)
369.95	133.316	123.316
360.00	110.000	120.000
359.95	109.983	119.983
340.00	103.333	113.333
330.00	100.000	110.000
329.95	99.983	109.983
320.00	96.666	106.666
319.95	96.650	106.650
300.00	90.000	100.000
290.00	86.666	96.666
289.95	86.650	96.650
280.00	83.333	93.333
279.95	83.316	93.316
260.00	76.666	86.666
259.95	76.650	86.650
250.00	73.333	83.333
249.95	73.316	83.316
230.00	66.666	76.666
229.95	66.650	76.650
225.00	65.000	75.000

CHAPTER 6
ILLUSTRATED PARTS BREAKDOWN

SECTION I
INTRODUCTION

6-1. GENERAL.

6-2. This chapter illustrates, lists, and describes parts necessary to support Radio Set AN/PRC-66B manufactured by Collins Radio Company of Canada Limited, under Air Force Contract No. F19628-69-C-0036.

6-3. The chapter is divided into four sections: Section I, Introduction; Section II, Group Assembly Parts List; Section III, Numerical Index; Section IV, Reference Designation Index.

6-4. GROUP ASSEMBLY PARTS LIST.

6-5. Section II, Group Assembly Parts List, consists of a breakdown of the radio set into major assemblies and subsequent breakdowns of each of the different major assemblies into component parts.

6-6. FIGURE AND INDEX NUMBER COLUMN. The first two numbers in the column are the figure number of the illustration. The figure number is not repeated thereafter except when listings are continued on succeeding pages. The index numbers are arranged numerically and are used mainly to assist in the location of a part after the part has been found in Section III, Numerical Index.

6-7. Identical parts occurring in the same general location in the equipment are illustrated and indexed once only, except where clarity would suffer by such treatment. Where identical parts must be repeated in the illustration for clarity, the several identical parts are assigned the same index number and listed once. Identical parts widely separated in the equipment are illustrated and indexed separately for each occurrence.

6-8. PART NUMBER COLUMN. The part number column contains the part number of each item in the equipment. Three types of part numbers are used. These are as follows:

a. Government Standard Part Numbers (MS, AN, NAS, JAN or MIL).

b. Collins Radio Company of Canada Limited Drawing Numbers.

c. Vendor Part Numbers.

6-9. DESCRIPTION COLUMN. This column contains the basic name of each part followed by the remaining modifying words included in the engineering drawing title block.

6-10. The indention system employed in the "Description" column permits the determination of the next higher assembly to which a part pertains and also all the detail parts which make up any assembly. The assembly illustrated is always listed first without indention. Component parts and/or subassemblies are listed with the indention of one space. Component parts of subassemblies are listed immediately after the subassembly with an indention of two spaces. This system is continued to the extent of indention necessary.

6-11. UNITS PER ASSEMBLY COLUMN. This column indicates the number of units required for the assembly or subassembly in which the part appears. The abbreviation "REF" is used when the part has been listed previously, and is listed here for reference only. The quantities listed for assemblies in the "Units per Assy" column of the group assembly parts list are the total quantities used per assembly. The quantities listed for the component parts indented under the assemblies are the quantities of component parts only.

6-12. USABLE ON CODE COLUMN. Variations in part usage between similar assemblies are indicated by a code letter or combination of code letters in the "USABLE ON CODE" column of the Group Assembly Parts List pages.

6-13. VENDOR CODE.

6-14. Various parts listed in Section II, Group Assembly Parts List, are identified by vendors' part numbers. In these instances, the vendors' five digit code number obtained from Cataloging Handbooks H 4-1 and H 4-2 is shown in parentheses immediately following the description of the item. The following is a list of vendor codes used in this chapter and the corresponding vendor name and address.

CODE	VENDOR NAME AND ADDRESS
00136	McCoy Electronics Co. Watts-Chestnut St. Mt. Holly Springs, P.A. 17065
00141	PIC Design Corporation 477 Atlantic Ave. East Rocaway, N.Y. 11518
00243	The R.Y. Ferner Co. Inc. Malden, Mass.
00287	C.E.M. Co. Inc. 24 School Danielson, Conn.
01226	Vlier Engineering Corp. 89 Santa Monica Los Angeles, Calif. 90069
01939	Sprague Electric Co. of Wisconsin Grafton, Wisconsin
02289	HI-G Inc. Spring St. at Route 75 Windsor Locks, Conn. 06096
02697	Parker Seal Co. Cleveland, Ohio
02988	Armet Industries Ltd. Guelph, Ontario, Canada
03038	Long-Lok Corp. 4101 Redwood Ave. Los Angeles, Calif.
03554	Amphenol Canada Ltd. Toronto, Ontario, Canada
04713	Motorola Semiconductor Products Inc. 5005 East McDowell Road Phoenix, Ariz. 85008
04865	Nyltite Corp. of America 280 Badger Ave. Newark, N.J. 07108
05411	Du Page Mfg. Co. 425 Maple Ave. Downers Grove Ill. 60515
06184	Conelco Components 465 West 5th St. San Bernardino Calif. 92401
07216	Collins Radio Co. of Canada Ltd. 150 Bartley Drive Toronto 16, Ontario, Canada
07322	Minnesota Rubber Co. 3630 Wooddale Ave. Minneapolis, Minn. 55416

CODE	VENDOR NAME AND ADDRESS
07886	National Radio Co. Inc. 37 Washington St. Melrose, Mass. 02176
08150	Union Carbide Canada Ltd. Toronto, Ontario, Canada
08664	The Bristol Co. Bristol Plts. Mls. Waterbury, Conn. 06720
08795	Rayclad Tubes Inc. Oakside Ave-Northside Ave. Redwood City, Calif. 94063
08806	General Electric Co. Nela Park, Ohio
09026	Babcock Relays Inc. Costa Mesa, Calif.
09380	Superite Gear and Instrument Corp. 140 Oak Dr. Sydsset Long Island, N.Y. 11791
09992	Burndy Corporation Norwalk, Conn.
10646	Carborundum Co. Buffalo Ave. Niagara Falls, N.Y. 14302
12294	Erie Technological Products of Canada Limited Trenton, Ontario, Canada
12954	Dickson Electronics Corp. 302 S. Wells Fargo Ave. Scottsdale, Ariz.
12969	Unitrode Corp. 580 Pleasant St. Watertown, Mass. 02172
14298	American Components Inc. 8th Ave. Harry Conshohocken, Pa. 19428

CODE	VENDOR NAME AND ADDRESS
15409	Thermotech Industries Booker and Wallestad Div. Hopkins, Minn.
16546	U.S. Capacitor Corp. 8917 Melrose Los Angeles, Calif. 90069
17537	Los Angeles Miniature Products Inc. 17000 S. Western Gardena, Calif. 90247
17549	Gremar Connectors Canada Ltd. 23 Racine Road Rexdale, Ontario, Canada
19080	The Robinson Co. Hewthrone, Calif.
19178	Zero Mfg. Co. Monson, Mass.
20754	KMC Semiconductor Corp. Parker Road Long Valley, N.J. 07853
21030	Beckman Industries Inc. Helipot Division 901 Oxford Street Toronto, Ontario, Canada
21242	American Electronics Components Corp. P.O. Box 27087 Cincinnati, Ohio
21845	Solitron Devices Inc. Transistor Division 1177 Blue Heron Blfd. Riviera Beach, Fla. 33404
24036	Clemens Canvas and Mfg. 823 Tenth St. Southwest Cedar Rapids, Iowa 52404

CODE	VENDOR NAME AND ADDRESS
24044	Westinghouse Electric Corp. Molecular Electronics Div. P.O. Box 7377 Elkridge, Md. 21227
24445	General Electric Company Cleveland, Ohio
24446	General Electric Company 1 River Road Schenectady, N.Y. 12305
27545	Hartford Steel Ball Co. 1022 Elm St. Rocky Hill, Conn. 06067
37942	Mallory P.R. and Co. Inc. 3029 East Washington St. Indianapolis, Ind. 46206
40920	Miniature Precision Bearings Inc. West Lebanon Rd. Keene, N.H. 03766
56289	Sprague Electric Co. North Adams, Mass.
61957	United Shoe Machinery Corp. Boston, Mass.
70318	Allmetal Screw Products Co. Inc. 821 Stewart Ave. Garden City, N.Y.
70417	Oilite-Chrysler Div. Chrysler Corp. Detroit, Mich.
70674	ADC Products Inc. 6405 Cambridge St. Minneapolis, Minn. 55426
70998	Bird Electronic Corp. 30303 Aurora Rd. Cleveland, Ohio
71279	Cambridge Thermionic Corp. 430 Concord Avenue Cambridge, Mass.

CODE	VENDOR NAME AND ADDRESS
71400	Bussman Mfg. Div. of McGraw-Edison Co. 2538 W. University St. St. Louis, Mo.
61600	The Cornish Wire Company New York, N.Y.
71785	Howard Jones Division Cinch Mfg. Co. 1026 S. Homan Ave. Chicago, Ill.
72259	Nytronics Inc. Berkeley Heights, N.J. 07922
72656	Indiana General Corp. Kearby, N.J.
72765	Drake Mfg. Company 4626 N. Olcott Ave. Chicago, Ill. 60656
72962	Elastic Stop Nut Corp. of America 230 Vauxhall Rd. Union, N.J. 07083
72982	Erie Technological Products Inc. 644 W. 12th St. Erie, Pa. 16512
73138	Beckman Instruments Inc. Helipot Div. 2500 Harbor Blvd. Fullerton, Calif. 92634
73899	J.F.D. Electronics Corp. 15th at 62nd St. Brooklyn, N.Y.
74284	Skydyne Inc. River View Port Jerirs, N.Y.
74970	E.F. Johnson Co. 297 Tenth Avenue S.W. Waseca, Minn. 56093

CODE	VENDOR NAME AND ADDRESS
75543	Lavelle Rubber Company 424 N. Wood Chicago, Ill.
76545	Mueller Electric Company 1583 E. 31st Street Cleveland, Ohio 44114
76854	Oak Manufacturing Co. South Main St. Crystal Lake, Ill.
77147	Patton McGuyer Co. Edgewood Station Providence, R.I.
77250	Pheoll Mfg. Co. Chicago, Ill.
77820	The Bendix Corp. Scintilla Division Sidney, N.Y. 13838
79136	Waldes Kohinoor Inc. 47-16 Austel Place Long Island City, N.Y. 11101
79807	Wrought Washer Mfg. Co. Milwaukee, Wis.
81073	Grayhill Inc. 561 Hillgrove Ave. La Grange, Ill. 60525
81095	Triad Transformer Corp. 4055 Redwood Ave. Venice, Calif. 90293
81134	Electro Voice Inc. Cecil-Carrol Streets Buchanan, Mich. 49107
81349	Allen-Bradley Co. Milwaukee, Wisc.
82240	Simmons Fastener Corp. 1761 N. Broadway Albany, N.Y.

CODE	VENDOR NAME AND ADDRESS
86335	Glenco Corp. 212 Durham Ave. Metuchen, N.J. 08841
87034	Marco Industries Co. Anaheim, Calif.
90634	Gulton Industries Inc. 212 Durham Ave. Metuchen, N.J. 08840
91293	Johanson Mfg. Co. P.O. Box 329 Boonton, N.J. 07005
91314	Lewis Spring and Mfg. Company 2652 W. North Ave. Chicago, Ill. 60647
91637	Dale Electronics Inc. P.O. Box 609 Columbus, Nebr. 68601
93332	Sylvanie Electric Products Inc. Semiconductor Products Div. 100 Sylvan Rd. Woburn, Mass.
94375	Automatic Metal Products Co. 315 Berry Brooklyn, N.Y.
96906	Illinois Tool Works (Shakeproof Div.) Elgin, Illinois
98003	Nielsen Hardware Corp. 770 Weathersfield Ave. Hartford, Conn.
98278	Microdot Inc. 220 Pasadena Ave. South Pasedena, Calif.
98291	Sealectro Corp. 225 Hoyt Mamaroneck, N.Y. 10544

CODE	VENDOR NAME AND ADDRESS
99378	Atlee Corporation Winchester, Mass.
99800	Delevan Electronics Corp. 270 Quaker Rd. East Aurora, N.Y.
99928	Branson Corp. P.O. Box 845 Dennville, N.J. 07834

6-15. ABBREVIATIONS.

6-16. Abbreviations used in this chapter are in accordance with MIL-STD-12B and are listed immediately following.

ABBREVIATION	WORD
AGC	automatic gain control
amp	ampere
AP	attaching part

ABBREVIATION	WORD
ASSY	assembly
cres	corrosion resisting steel
hex	hexagon
GMV	guaranteed minimum value
IF	intermediate frequency
in	inch
lg	long
max	maximum
MHz	megahertz
NC	national coarse
NF	national fine
NHA	next higher assembly
no	number
pF	picofarads
REF	reference
RF	radio frequency
SCD	specification control drawing
uF	microfarads
UNC	unified national coarse
UNF	unified national fine
VDCW	volts direct current working

6-17. ILLUSTRATIONS.

6-18. Listings of parts follow views of each assembly as closely as possible. Views are exploded when necessary to show parts that are hidden or otherwise obscured. Where it is impracticable to illustrate completely all the component subassemblies in one view, the illustration is divided into several sheets. Subassemblies shown on the initial view as assembled units are referenced to subsequent illustrations in which they are illustrated separately. These separate views may, in turn, contain components which are referenced to still further illustrations.

6-19. NUMERICAL INDEX.

6-20. Section III, Numerical Index, contains tabular information which is divided into five columns. The columns are explained in the following paragraphs.

6-21. PART NUMBER COLUMN. This column contains all the part numbers that appear in Section II, Group Assembly Parts List.

6-22. All parts are arranged in the following numerical sequence:

a. First Position Arrangement:

1. Letters A through Z

2. Numerals 0 through 9

b. Second and Succeeding Position Arrangements:

1. Space (blank column)

2. Diagonal (slant) /

3. Point (period) .

4. Dash (-)

5. Letters A through Z

6. Numerals 0 through 9

NOTE

The letter "o" is considered as a numerical zero.

6-23. FIGURE AND INDEX NUMBER COLUMN. This column contains the figure and index numbers of the parts listed in Section II, Group Assembly Parts List. In cases where the item has not been assigned an index number, only the figure number is shown.

6-24. QUANTITY PER ARTICLE COLUMN. This column lists the quantity of each item in Section II, Group Assembly Parts List.

6-25. SOURCE CODE COLUMN. The purpose of source coding is to establish knowledge in the field relative to the source of parts; i.e., those which are to be fabricated locally or by depots, and those neither purchased nor intended for manufacture.

6-26. Policies, general information, and procedures for changing source and maintenance coding are contained in T.O. 00-25-195. Generally, the source codes, and maintenance repair level codes, herein (see Source Code and Repair Code columns) were assigned by Air Force personnel when this equipment was purchased. Assignment of codes was influenced by (a) maintenance policies of the Air Force base self-sufficiency program, (b) predicted maintenance actions, (c) base facilities and capabilities, (d) economic considerations. Definitions of these codes follow:

a. Code "P" - Parts under inventory stock control.

1. Code P is applied to parts on which usage is anticipated or known. Code P parts may be requisitioned and installed at any maintenance level unless followed by the letter "D" (depot), which designation restricts requisitions and replacement to depot level only. Restricted service manufacture is considered practicable, but only after an attempt has been made to procure from supply sources. Examples of parts to which this code number applies are washers, pins, studs, etc.

2. Code P1 is applied to parts which are very difficult, impracticable, or uneconomical to manufacture. Code P1 parts may be requisitioned and installed at any maintenance level unless followed by the letter "D" (depot), which designation restricts requisition and replacement to depot level only. Examples of parts to which this code number applies are pumps, valves, relays, etc.

3. Code P2 is applied to parts on which usage is known or anticipated to be relatively low. Code P2 parts are very difficult, impracticable, or uneconomical to manufacture, but may be requisitioned and installed at any maintenance level. These items may require infrequent replacement as a result of accidents or other unexpected occurrences. Examples of parts to which this code number applies are large castings and forgings, primary structures, etc.

b. Code "M" - Manufacture, parts not procured.

1. Code M is applied to parts which are within the capabilities of any activity to manufacture. Procurement is not justified because of relatively infrequent usage, or storage and installation factors. Needs are to be met by local manufacture only as required. Examples of parts to which this code number applies are gussets, flat aluminum sheets, tubing, etc.

2. Code M1 is applied to parts which can be manufactured only by a facility having depot capabilities. Procurement and stocking of these parts is not justified because of low anticipated usage, or storage and installation factors. The needs of all activities are to be met through manufacture or by requisition from the nearest appropriate depot. Special tooling is normally required to manufacture M1 type items. Examples of parts to which this code number applies are formed or contoured parts, close-tolerance machined or milled parts, welded assemblies, etc.

c. Code "A" - Assembly, assembly not procured.

1. Code A is applied to assemblies made up of two or more parts, at least one of which is purchased and carries an individual part number and description, and which may be assembled at any maintenance level. Examples of parts to which this code number applies are motor-driven pump assemblies, etc.

2. Code A1 is applied to assemblies made up of two or more parts, at least one of which is purchased and carried an individual part number and description, and which may

be assembled only by activities having depot facilities.

d. Code "X" - Parts considered impracticable for manufacture or procurement.

1. Code X is applied to parts which are not procured, and which, if required, would need extensive overhauling or retirement from service. Examples of parts to which this code number applies are major structure assemblies, large extruded sections such as H-beams, channels, etc.

2. Code X1 is applied to parts which are not procured as such, but which are part of a next higher assembly. Examples of parts to which this code number applies are welded segments inseparable from their assembly, parts machined in a matched set, etc.

3. Code X2 is applied to parts which are not procured for stock, but which may be acquired for use through salvage. If not obtainable from salvage, such parts shall be requisitioned through normal supply channels with supporting justification. Repeated requests for items coded X2 shall justify a source code change to P1. Examples of parts to which this code number applies are structure assemblies, large contoured and milled skin segments, etc.

e. Code "U" - Parts not procured, manufactured or stocked. Code U is applied to installation drawings, diagrams, instruction sheets, field service drawing numbers, and obsolete parts which cannot be procured or service-manufactured.

f. Code "C" - Cure-dated components repair kit. Code C is applied to kits containing replacements for parts such as rubber gaskets, seals, and O-rings, subject to deterioration because of aging or exposure to aromatic fuels. C-Kits are available to maintenance activities authorized to replace expired cure-dated parts as necessary for overhaul, or minor repair or at other times as required by pertinent directives. This kit may include non-cure-dated gaskets, packings, etc, necessary for reassembly after technical order compliance or repair.

g. Code "D" - Major overhaul (repair) kit. Code D is applied to kits which are available only to maintenance activities authorized to perform depot or major overhaul. These kits do not contain cure-dated parts.

h. Code "F" - Minor or field repair kit. Code F is applied to kits which are available to maintenance activities authorized to perform minor or field repairs, including overhaul activities in support of field activities. These kits do not contain cure-dated parts.

i. Code "KC" - Component of C-Kit. Code KC is applied to items which are components of a C-Kit. These items are also stocked separately in the appropriate code class if followed by the letter P.

j. Code "KD" - Component of D-Kit. Code KD is applied to items which are components of a D-Kit. These items are also stocked separately in the appropriate code class if followed by the letter P.

k. Code "KF" - Component of F-Kit. Code KF is applied to items which are components of an F-Kit. These items are also stocked separately in the appropriate code class if followed by the letter P.

l. Code "KB" - Components of D- and F-Kits. These items are also stocked separately in the appropriate code class if followed by the letter P.

6-27. REPAIR CODE COLUMN. The entry in this column identifies the reparable or non-reparable character of equipment and parts, and identifies the depth of repair and the level of maintenance at which repair will be accomplished. The following are the maintenance repair level codes and their definitions.

a. Code "S" - No Repair. Code S identifies items which are non-reparable and have no reclamation value. When these items fail they will be disposed of at user level as condemned material.

b. Code "B" - No Repair; Recondition. Code B identifies assemblies or parts that will be reconditioned at user level by adjusting, cleaning soldering broken connections, etc. If these items cannot be returned to serviceable condition by such means they will be disposed of at user level as condemned material. No repair parts or tools are specially procured for maintenance of these items.

c. Code "F" - Field Level Maintenance. Code F identifies items which will be repaired by the field level maintenance activities or contracted for repair at base level in accordance with T.O. 00-25-68. Normal servicing will be done by organizational level maintenance. Selected parts, tools, and technical order data are procured and provided to applicable field level maintenance activities for repair of these items. No specialized repair activity (SRA) is established for these items. If they cannot be returned to serviceable condition by the field level maintenance activity with the parts and tools provided, they will be disposed of as condemned material. "H-Valu" and "Critical" items, however, will be turned in to supply, and disposition instructions obtained from the applicable instruction manual.

d. Code "D" - Limited Field Repair; Depot Overhaul. Code D identifies items on which a limited degree of repair can be accomplished by field level maintenance activities. Normal servicing will be done at organizational level. SRA is established for overhaul of these items. A range of repair parts, tools, and technical order data consistent with the capability of repair are procured and provided to applicable field maintenance activities. Because of the design characteristics and complexity of repair, the degree of repair which is authorized on these items at field maintenance level is necessarily determined by the degree of technical skills required and the cost of special tools, special test equipment, spare parts, and the predicted frequency of failure generation. If these items cannot be returned to serviceable condition with authorized parts and tools they will be returned to supply for shipment to the designated SRA.

e. Code "DM" - Limited Field Repair; Mobile Depot Overhaul. Code "DM" identifies items to which all the conditions of Code D apply except that repair beyond field capability will be done by the Mobile Depot Activity (MDA). If the MDA cannot repair these items, they will determine whether these items should be condemned or sent to the SRA.

f. Code "L" - Depot Level Maintenance Only. Code L identifies items that will be repaired only by designated SRA. Repair parts and tools for repair are procured and provided only to these authorized activities. Required functional checkout and bench check equipment may be provided to applicable organizational and field level maintenance activities for accomplishing external adjustment or calibration and for verifying serviceability of these items. If they are found unserviceable they will be turned into supply for shipment to the SRA.

g. Code "LM" - Depot Level Maintenance Only; Mobile Depot Activity. Code LM identifies items to which all conditions of Code L apply except that repair will be accomplished by MDA. If MDA cannot repair these items they will determine whether these items should be condemned or sent to the SRA.

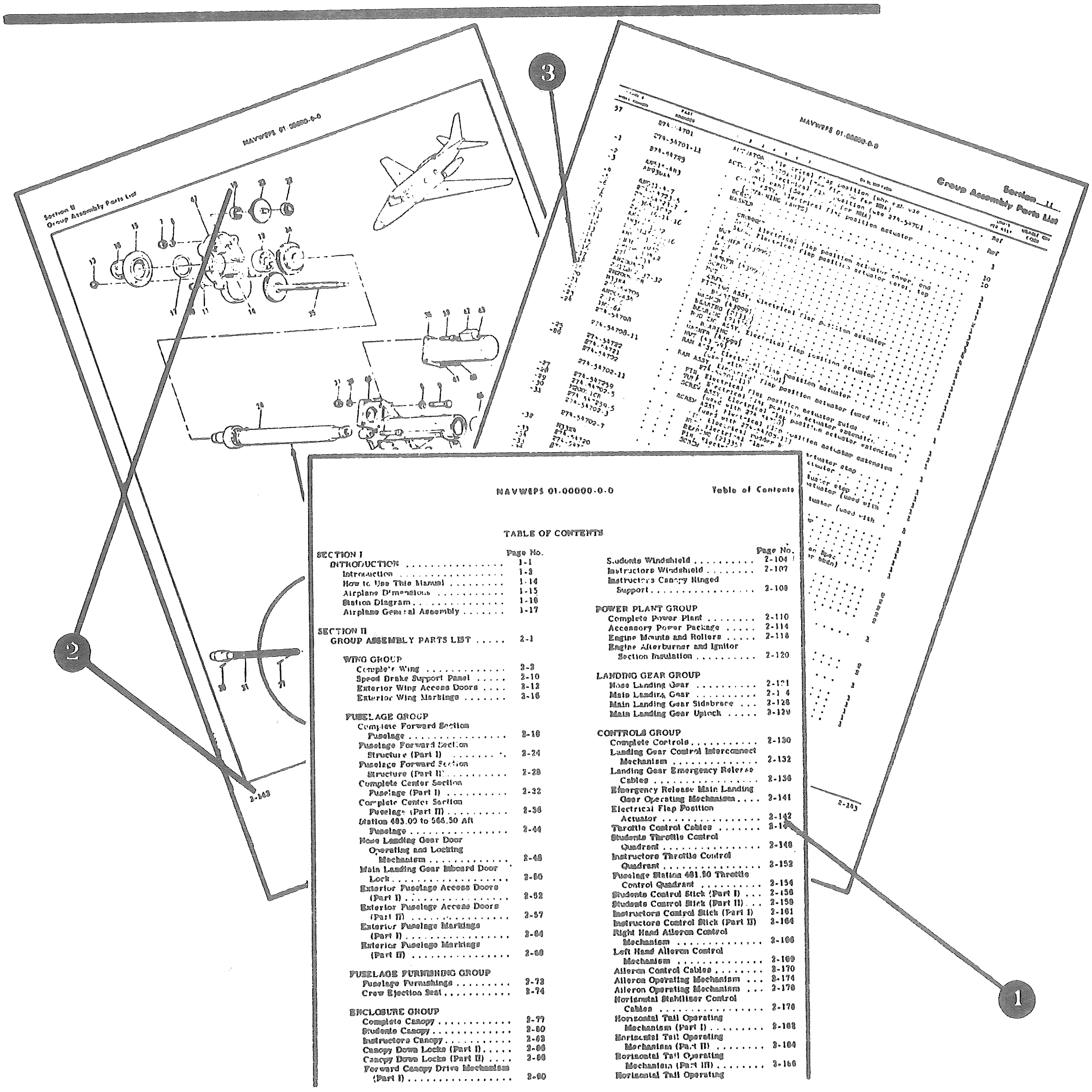
6-28. REFERENCE DESIGNATION INDEX.

6-29. Section IV lists the alpha-numerical reference designation symbols used in this technical manual to identify electrical and electronic parts. The corresponding part numbers and figure/index numbers are listed against these symbols. For parts located in the Special Test Equipment (STE), the symbols include a hyphenated prefix, eg, B2-A1R5. This prefixed reference designation locates resistor A1R5 to STE item B2 (refer to Table 1-5). To indicate the auxiliary status of the STE equipment, the STE symbols follow the main equipment symbols in the list.

6-30. CROSS INDEX SYSTEM.

6-31. For an explanation of how to use this Illustrated Parts Breakdown, see examples on the following pages.

HOW TO USE THE ILLUSTRATED PARTS BREAKDOWN



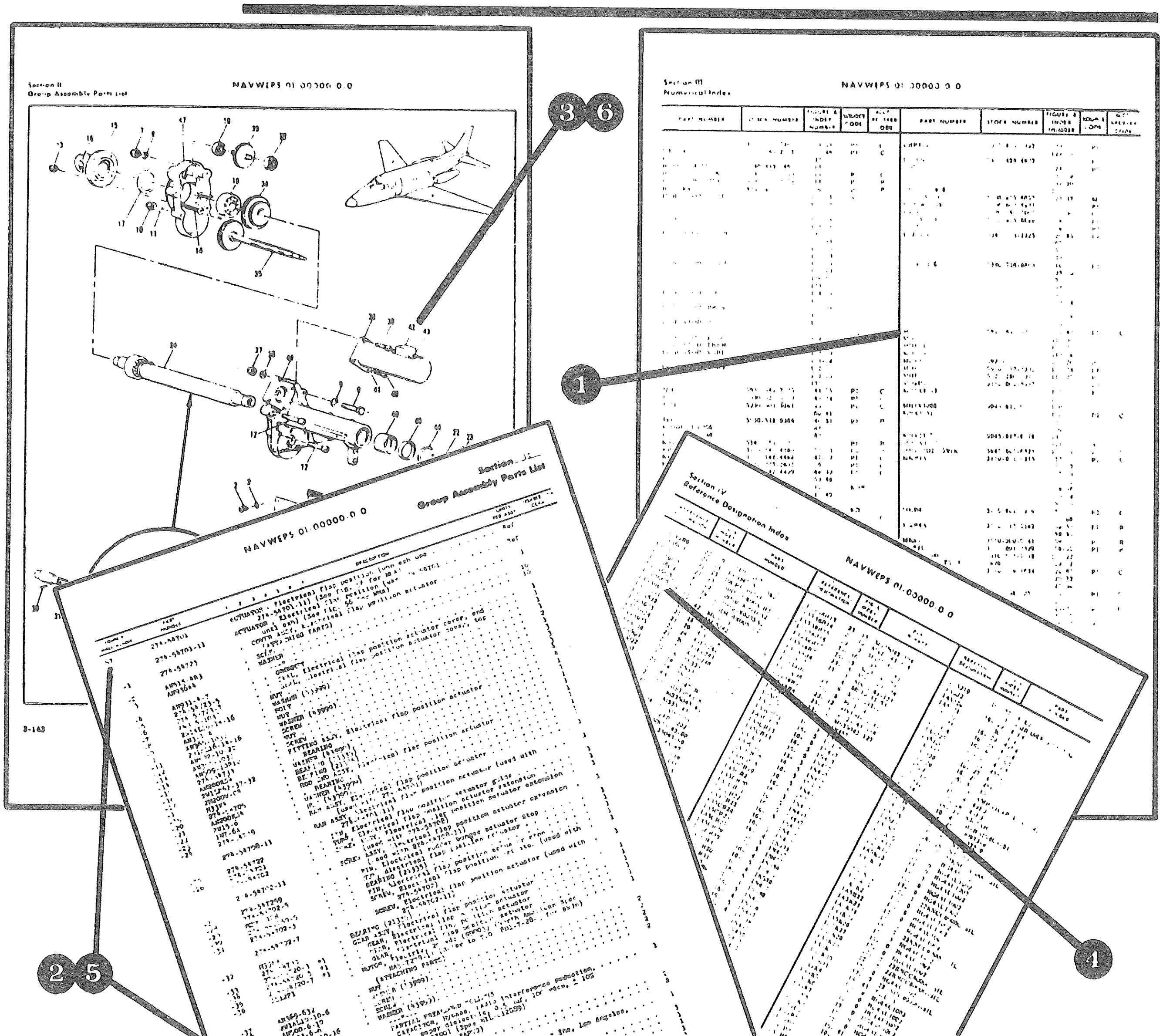
WHEN THE PART NUMBER IS NOT KNOWN

1. Determine the function and application of the part required. Turn to the Table of Contents and select the most appropriate title. Note the illustration page number.

2. Turn to the page indicated and locate the desired part on the illustration.

3. From the illustration, obtain the index number assigned to the part desired. Refer to the accompanying description for specific information regarding the part.

HOW TO USE THE ILLUSTRATED PARTS BREAKDOWN



WHEN THE PART NUMBER OR REFERENCE DESIGNATION IS KNOWN

1. When the part number is known, refer to Section III, Numerical Index. Locate the part number and note the figure and index number assigned to the part number.

2. Turn to the figure number indicated and locate the index number referenced in the Numerical Index.

3. If a pictorial representation of the part, or its location is desired, refer to the same index number on the accompanying illustration.

4. When the reference designation is known, refer to Section IV, Reference Designation Index. Locate the reference designation and note the figure and index number and the part number assigned.

5. Turn to the figure indicated and locate the index number referenced in the Reference Designation Index.

6. If a pictorial representation of the part, or its location is desired, refer to the same index number on the accompanying illustration.

SECTION II
GROUP ASSEMBLY PARTS LIST

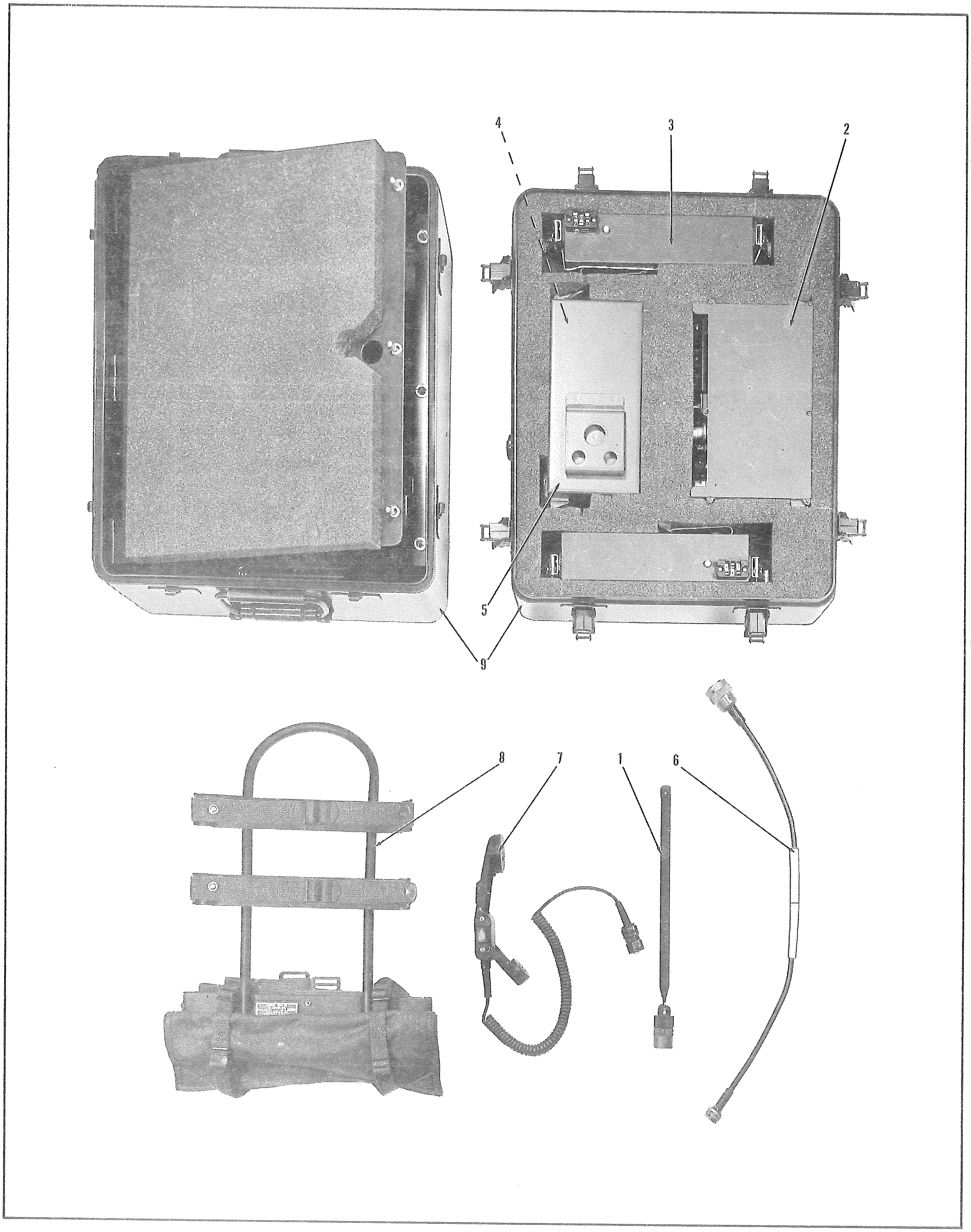


Figure 6-1. Radio Set AN/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-1-	787-6530-002	RADIO SET AN/PRC-66B	1	
-1	567-7687-001	. ANTENNA AS-2117/PRC-66 (See figure 2 for breakdown)	1	
-2	787-6531-001	. RECEIVER-TRANSMITTER RT-865D/PRC-66 (See figure 3 for breakdown)	1	
	787-6532-001	. BATTERY, STORAGE BB-636A/PRC-66	1	
-3		. . BATTERY, Storage, rechargeable, nickel-cadmium, 25.2 vdc (07216 SCD 221-0063-010)	1	
	787-6533-001	. BATTERY, DRY BA-3515A/PRC-66	1	
-4	Y-1133( )	. . BATTERY, Dry, non-rechargeable, alkaline, 30 vdc (08150) (07216 SCD 221-0052-010)	1	
-5	787-6534-001	. BOX, BATTERY CY-6327A/PRC-66 (See figure 22 for breakdown)	1	
-6	787-6570-001	. CABLE ASSY, SPECIAL PURPOSE ELECTRICAL CX-12157/PRC-66B	1	
	787-6535-001	. HANDSET H-250/U	1	
-7	H-250/U	. . HANDSET (81134) (07216 SCD 977-0139-010)	1	
-8	787-6569-001	. HARNESS, RADIO SET ST-163/PRC-66B	1	
	787-6571-001	. CASE, RADIO SET CY-6766/PRC-66B (When failed use ST-138/PRC-25, FSN 5820-892-8094.)	1	
-9	NO NUMBER	. . CASE, Transit (19178) or (74284) (07216 SCD 021-0423-010)	1	

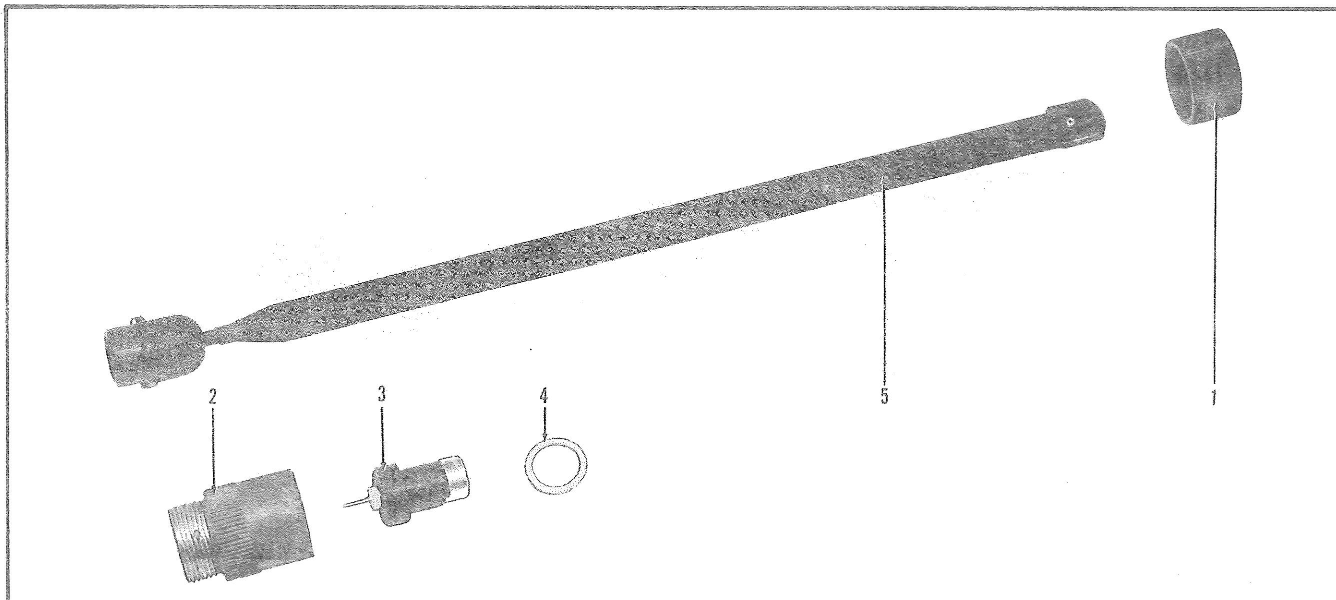


Figure 6-2. Antenna AS-2117/PRC-66

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-2-	567-7687-001	ANTENNA AS-2117/PRC-66 (See item 1 figure 1 for location in NHA)	REF	
-1	567-9005-001	. NUT, Retainer	1	
-2	567-9052-001	. RETAINER, Pressed	1	
-3	567-9053-001	. INSULATOR ASSY	1	
-4	AN6227-7	. GASKET	1	
-5	567-9055-001	. ELEMENT ASSY	1	

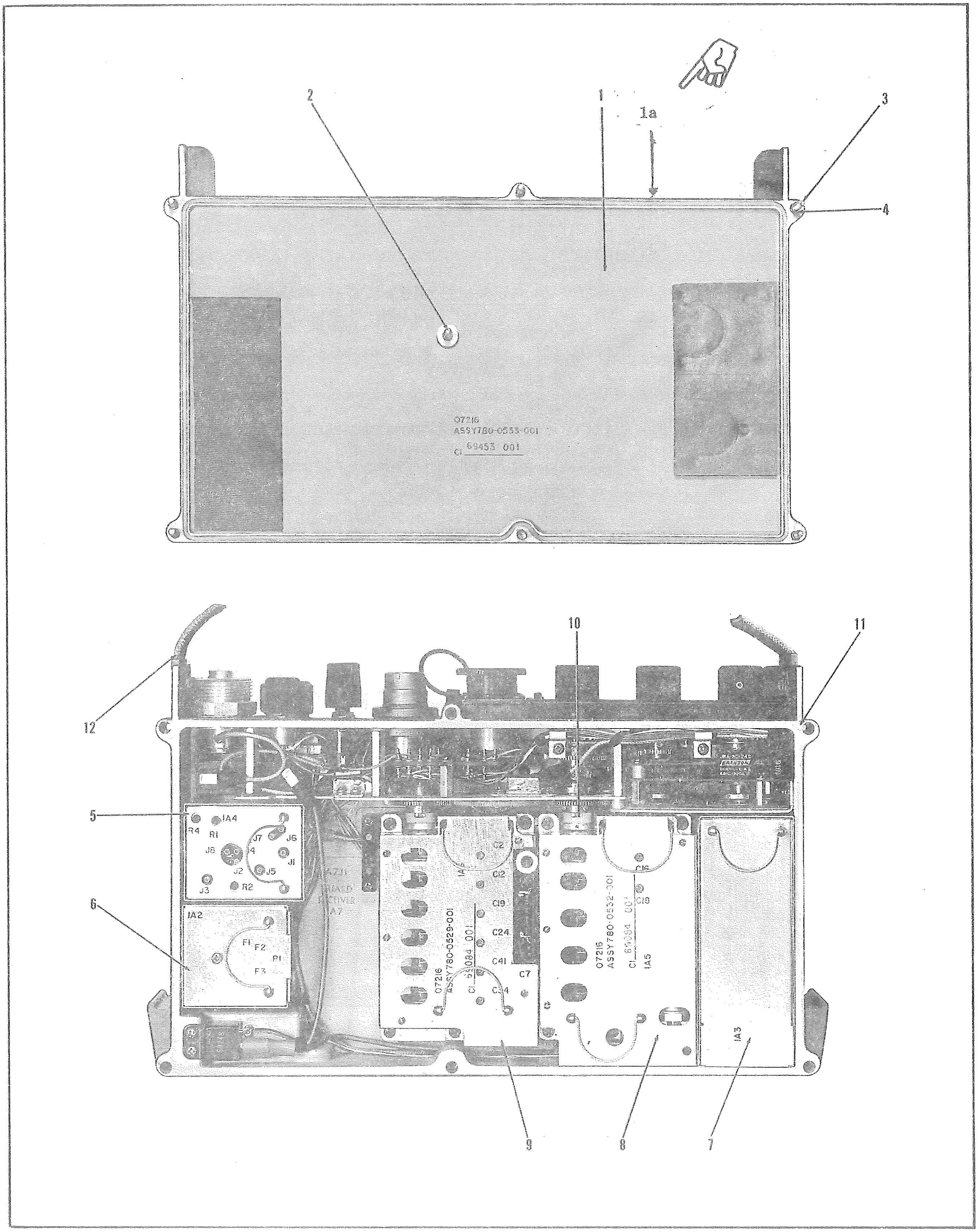


Figure 6-3. Receiver-Transmitter RT-865D/PRC-66

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-3-	787-6531-001	RECEIVER-TRANSMITTER, RADIO RT-865D/PRC-66	REF	
-1	780-0534-0011	. COVER ASSY	1	
-1a	780-1062-001	. COVER GASKET	1	
-2	780-0826-001	. . SCREW, Cover retaining (AP)	1	
-3	780-0827-001	. . SCREW, Cover retaining (AP)	6	
-4	340-0644-000	. . SLEEVE, Retaining (AP)	7	
	6W	. . WASHER, Nylon (04865) (07216 SCD .... 302-0645-020) (AP)	1	
-5	780-0526-001	. IF AUDIO MODULE (See figure 4 for breakdown)	1	
-6	780-0596-001	. VOLTAGE REGULATOR MODULE (See figure 5 for ..... breakdown)	1	
-7	780-0492-001	. FREQUENCY SYNTHESIZER MODULE (See figure 6 for . breakdown)	1	
-8	780-0532-001	. PA MODULATOR MODULE (See figure 11 for .... breakdown)	1	
-9	780-0529-001	. RECEIVE RF MODULE (See figure 15 for breakdown) ..	1	
-10	780-0477-001	. DISC COUPLER	2	
-11	780-0536-001	. MAIN CHASSIS AND CONTROL HEAD (See figure 17 .... for breakdown)	1	
-12	NO NUMBER	. HANDLE, Carrying, canvas (24036) .... (07216 SCD 015-3398-010)	1	
	P343-0090-000	. SCREW, Machine, cres, black oxide, pan head, ... 8-32 UNC-2A x 5/16 in. lg (77250) (07216 SCD 343-0090-000) (AP)	2	
	MS35333-72	. WASHER (AP)	4	

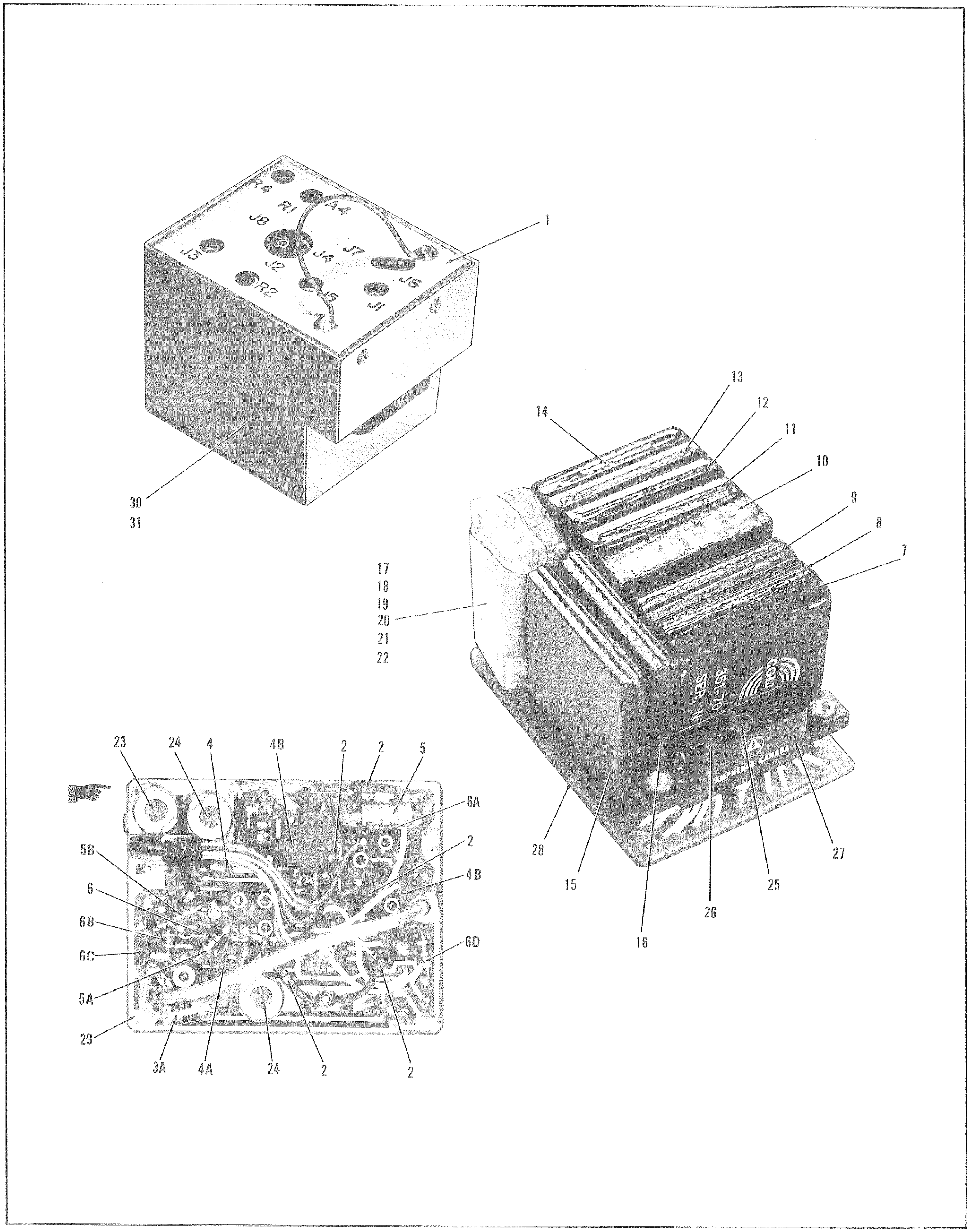


Figure 6-4. IF/Audio Module

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-4-	780-0526-001	IF/AUDIO MODULE (See item 5 figure 3 for location in NHA)	REF	
-1	780-0622-001	. COVER ASSY	1	
	322-0149-000	. SCREW, Machine, brass, nickel plated, flat head, 0-80 UNF-2A x 1/8 in. lg (AP)	4	
	780-0525-001	. CIRCUIT BOARD, IF/Audio	1	
	MS51957-2	. SCREW (AP)	2	
	310-0070-000	. WASHER, Lock, cres, passivated, No. 2 (AP)	2	
	310-0044-000	. WASHER, Flat, cres, passivated, No. 2 (AP)	2	
-2	C11A682K	. . CAPACITOR, Fixed, ceramic, 6800 pF ±10%, 100 VDCW (16546) (07216 SCD 913-4248-040)	5	
-3	162D475X0010BA2	. . CAPACITOR, Fixed, tantalum, 4.7 uF ±20%, 10 VDCW (56289) (07216 SCD 184-9077-010)	2	
-4	C11A152K	. . CAPACITOR, Fixed, ceramic, 1500 pF ±10%, 100 VDCW (16546) (07216 SCD 913-4248-020)	1	
-4A	GL10-101M	. CAPACITOR, Fixed, ceramic, 100 pF ± 20% (90634) (07216 SCD 913-3114-010)	1	
-4B	SSM-001-64	. . CAPACITOR, Fixed, ceramic, 1000 PFD ± 20%, 50 VDCW (90634) (07216 SCD 913-1299-010)	2	
-5	1025-12	. . COIL, RF, 0.47 microhenries ± 10% (99800) (07216 SCD 240-2019-000)	1	
-5A	1N3064	. . DIODE	2	
-6	RC05GF220J	. . RESISTOR	1	
-6A	RC05GF224J	. . RESISTOR	1	
-6B	RC05GF333J	. . RESISTOR	1	
-6C	RC05GF272J	. . RESISTOR	1	
-6D	RC05GF473J	. . RESISTOR	1	
-7	351-7051-010	. . RF AGC AMPLIFIER	1	
-8	351-7321-050	. . AUDIO AMPLIFIER	1	
-9	351-7050-030	. . DETECTOR AGC AMPLIFIER	1	
-10	567-8314-001	. . CRYSTAL OSCILLATOR	1	
-11	351-7320-010	. . SQUELCH AMPLIFIER	1	
-12	351-7319-010	. . RECEIVE MIXER/SQUELCH EXPANDER	1	
-13	351-7053-010	. . AMPLIFIER, 30 Mhz	1	
-14	351-7049-010	. . AMPLIFIER, 30 Mhz	1	
-15	351-7054-030	. . MODULATOR PREAMPLIFIER	1	
-16	351-7055-030	. . MODULATOR DRIVER	1	
	567-8323-001	. . DISCRETE COMPONENT PACK	1	
-17	145D686X0020E2	. . . CAPACITOR, Fixed, polarized electrolytic, wet type, 6.8 uF ± 20%, 20 VDCW (56289) (07216 SCD 184-9071-160)	1	
-18	145D606X0020H2	. . . CAPACITOR, Fixed, polarized electrolytic, wet type, 60 uF ± 20%, 20 VDCW (56289) (07216 SCD 184-9071-070)	2	
-19	MTP156M020P1A	. . . CAPACITOR, Fixed, polarized electrolytic, wet type, 15 uF ± 20%, 20 VDCW (37942) (07216 SCD 184-9071-170)	1	
-20	162D475X0010BA2	. . . CAPACITOR, Fixed, tantalum, 4.7 uF ± 20%, 10 VDCW (56289) (07216 SCD 184-9077-010)	2	
-21	RC05GF474J	. . . RESISTOR	1	
-22	567-8320-001	. . . BOARD, Printed circuit	1	
	780-0524-001	. . BOARD ASSY, Master	1	
-23	62PR5K	. . . RESISTOR, Variable, 5 kilohms ± 30%, 1/2 watt (73138) (07216 SCD 382-0008-090)	1	
-24	62PR50K	. . . RESISTOR, Variable, 50 kilohms ± 30%, 1/2 watt (73138) (07216 SCD 382-0008-130)	2	
	780-0523-001	. . . CONNECTOR ASSY	1	
-25	460-105	. . . . RECEPTACLE, Coaxial connector (03554) (07216 SCD 357-7321-020)	1	
-26	470-0022	. . . . CONTACT, Socket (03554) (07216 SCD 370-0015-060)	18	
-27	567-8335-001	. . . . CONNECTOR, Modified	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-4-28	780-0663-001	. . . INSULATOR	1	
-29	780-0660-001	. . . BOARD, Staked	1	
-30	567-8407-001	. PAD, Compression	1	
-31	567-8337-001	. CHASSIS, Pressed	1	

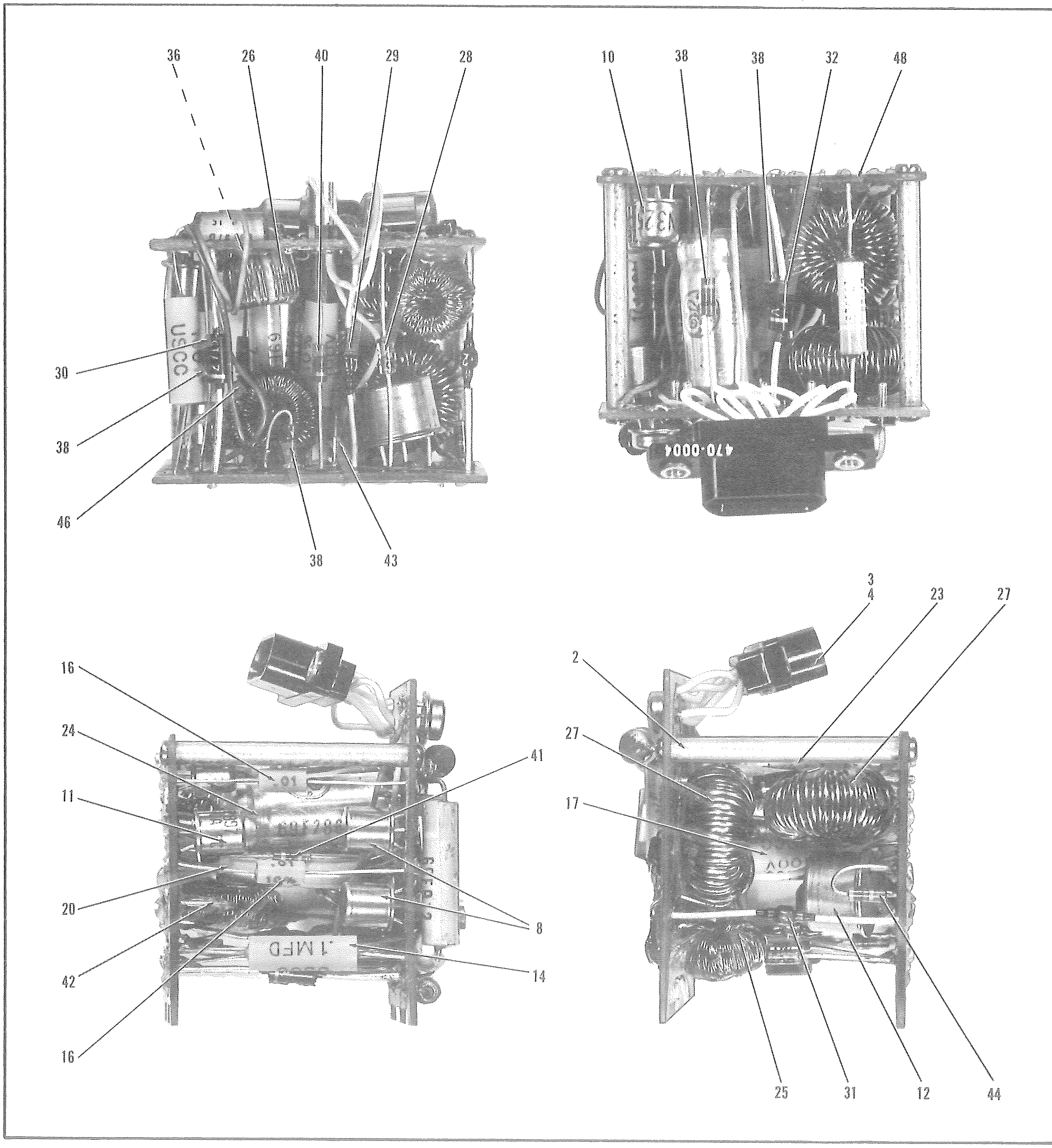


Figure 6-5. Voltage Regulator Module (Sheet 1 of 2)

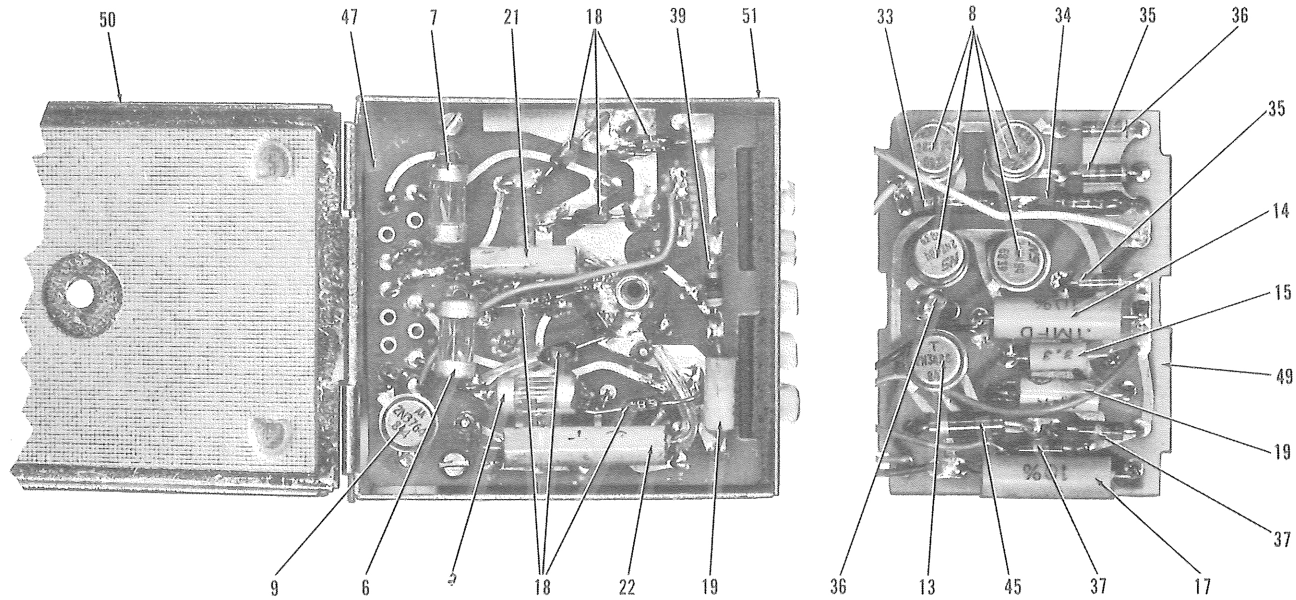


Figure 6-5. Voltage Regulator Module (Sheet 2 of 2)

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-5-	780-0596-001	VOLTAGE REGULATOR MODULE .... (See item 6 figure 3 for location in NHA)	REF	
-1	567-8417-001	. PULLER, Module	1	
	780-0597-001	. CIRCUIT BOARD ASSY	1	
	LP57D26P4WHQ	. SCREW, Machine, self-locking, stainless steel, ... passivated, pan head, 2-56 UNC-2AX 1/4 in. lg (03038) (07216 SCD 330-2633-000) (AP)	2	
	P343-0297-000	. SCREW, Machine, brass, nickel plated, pan head, ... 2-56 UNC-2AX 1/8 in. lg (77250) (07216 SCD 343-0297-000) (AP)	1	
	310-0070-000	. WASHER, Lock, cres, passivated, No. 2 (AP)	1	
	310-0129-000	. WASHER, Flat, brass, No. 2 (05411) (07216 .... SCD 310-0129-000) (AP)	1	
-2	567-8455-001	. . POST	2	
	P323-0303-010	. . SCREW, Machine, cres, passivated, pan head, ... 0-80 UNF-2A X 5/32 in. lg (77250) (07216 SCD 323-0303-010) (AP)	4	
	567-8398-001	. . CONNECTOR ASSY	1	
-3	470-0022	. . . CONTACT, Socket (03554) .... (07216 SCD 370-0015-060)	10	
-4	567-8399-001	. . . CONNECTOR, Modified	1	
-5	GLN3-10	. . FUSE, Cartridge, subminiature, 0.30 amp, ... 125 volts max. (71400) (07216 SCD 264-0942-210)	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-5-6	GLN4-10	. . FUSE, Cartridge, 0.40 amp, 125 volts max. .... (71400) (07216 SCD 264-0942-220)	1	
-7	GL1-1-1-2	. . FUSE, Cartridge, 1-1/2 amp, 125 volts max. ...... (71400) (07216 SCD 264-0942-330)	1	
-8	2N2484	. . TRANSISTOR	6	
-9	2N3764	. . TRANSISTOR	1	
-10	2N3251	. . TRANSISTOR	1	
-11	2N2897	. . TRANSISTOR	1	
-12	2N4225	. . TRANSISTOR	1	
-13	2N3486	. . TRANSISTOR	1	
-14	C10A104K	. . CAPACITOR, fixed, ceramic, 100,000 pF ± 10%, ... 100 VDCW (16546) (07216 SCD 913-4242-310)	2	
-15	GL10-101K	. . CAPACITOR, fixed, ceramic, 100 pF ± 10%, ... 100 VDCW (16546) (07216 SCD 913-3114-010)	1	
-16	C10A103K	. . CAPACITOR, fixed, ceramic, 10,000 pF ± 10%, ... 100 VDCW (16546) (07216 SCD 913-4242-040)	2	
-17	C10A104K	. . CAPACITOR, fixed, ceramic, 0.10 uF ± 10%,...... 100 VDCW (16546) (07216 SCD 913-4242-310)	2	
-18	C11A682K	. . CAPACITOR, fixed, ceramic, 6800 pF ± 10%,...... 100 VDCW (16546) (07216 SCD 913-4248-040)	6	
-19	MTP475M035PID	. . CAPACITOR, Fixed, electrolytic, 4.7 uF ± 20%, ... 35 VDCW (37942) (07216 SCD 184-9071-190)	2	
-20	MTP306M050PIB	. . CAPACITOR, Fixed, electrolytic, 30 uF ± 20%, ... 50 VDCW (37942) (07216 SCD 184-9071-130)	1	
-21	MTP106M035PIA	. . CAPACITOR, Fixed, electrolytic, 10 uF ± 20%, ... 35 VDCW (37942) (07216 SCD 184-9071-180)	1	
-22	MTP606M020PIB	. . CAPACITOR, Fixed, electrolytic, 60 uF ± 20%, ... 20 VDCW (37942) (07216 SCD 184-9071-070)	1	
-23	MTP106M035P1A	. . CAPACITOR, Fixed, electrolytic, 10 uF ± 20%, ... 35 VDCW (37942) (07216 SCD 184-9071-180)	1	
-24	130D336X9050F2	. . CAPACITOR, Fixed, electrolytic, 33 uF ± 10%, ... 50 VDCW (56289) (07216 SCD 184-7999-090)	1	
-25	567-8390-001	. . COIL, RF, No. 1	1	
-26	567-8391-001	. . COIL, RF, No. 2	1	
-27	567-8392-001	. . COIL, RF, No. 3	2	
-28	UTX205	. . DIODE (04713) (07216 SCD 353-6493-010)	1	
-29	UZ714	. . DIODE (12969) (07216 SCD 353-6456-020)	1	
-30	SZ 51224	. . DIODE (04713) (07216 SCD 353-0414-020)	1	
-31	UTX205	. . DIODE (12969) (07216 SCD 353-6493-010)	1	
-32	1N4665	. . DIODE	1	
-33	RN55D6981F	. . RESISTOR	1	
-34	RN55D4991F	. . RESISTOR	1	
-35	RC05GF473J	. . RESISTOR	2	
-36	RC05GF472J	. . RESISTOR	3	
-37	RC05GF102J	. . RESISTOR	2	
-38	RC05GF101J	. . RESISTOR	4	
-39	RC05GF470J	. . RESISTOR	1	
-40	RC05GF222J	. . RESISTOR	1	
-41	RC05GF332J	. . RESISTOR	1	
-42	RC05GF152J	. . RESISTOR	1	
-43	RC05GF180J	. . RESISTOR	1	
-44	RC05GF471J	. . RESISTOR	1	
-45	RC07GF122K	. . RESISTOR	1	
-46	567-8393-001	. . TRANSFORMER, Pulse	1	
-47	780-0598-001	. . BOARD, Printed circuit, No. 1	1	
-48	567-8396-001	. . BOARD, Printed circuit, No. 2	1	
-49	567-8397-001	. . BOARD, Printed circuit, No. 3	1	
	780-0932-001	. CHASSIS, Voltage regulator	1	
-50	780-0625-001	. . COVER ASSY	1	
	780-0935-001	. . PIN, Hinge (AP)	1	
-51	567-8338-001	. . CHASSIS, Voltage regulator	1	

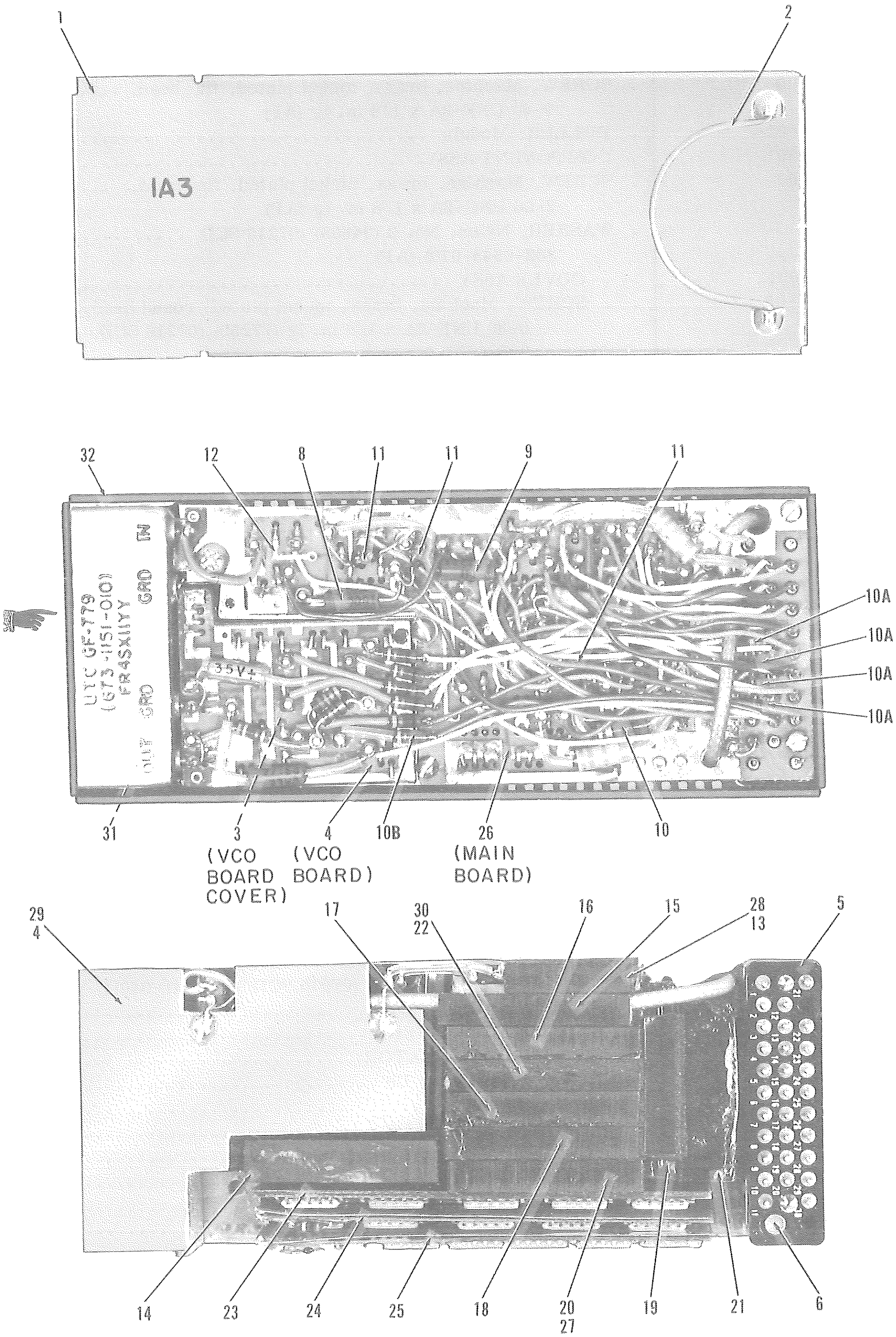


Figure 6-6. Frequency Synthesizer Module

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-6-	780-0492-001	FREQUENCY SYNTHESIZER MODULE (See item 7 figure 3 . for location in NHA)	REF	
-1	567-8817-001	. COVER	1	
	322-0149-00	. SCREW, Machine, brass, nickel plated, flat head, 0-80 UNF-2A x 1/8 in. lg (AP)	5	
-2	567-8417-001	. PULLER, Module	1	
	780-0497-001	. COMPONENT ASSY	1	
	342-0141-00	. SCREW, Machine, brass, nickel plated, flat head, 2-56 UNC-2A x 1/8 in. lg (AP)	4	
	2W	. WASHER, Nylon, No. 2 (04865) (07216 SCD 302-0645-010) (AP)	4	
-3	780-0547-001	. . COVER ASSY	1	
	P320-0007-00	. . SCREW, Machine, brass, nickel plated, round head, 0-80 UNF-2A x 1/8 in. lg (77250) (07216 SCD 320-0007-00) (AP)	3	
-4	780-0504-001	. . COMPONENT ASSY, Sub-board (See figure 7 for breakdown)	1	
	P343-0298-00	. . SCREW, Machine, brass, nickel plated, pan head, 2-56 UNC-2A x 3/16 in. lg (77250) (07216 SCD 343-0298-00) (AP)	1	
	310-0129-00	. . WASHER, Flat, brass, No. 2 (05411) (07216 SCD 310-0129-00) (AP)	1	
-5	451-20301-01	. . CONNECTOR, Receptacle, electrical, 30 filtered pin contacts (03554) (07216 SCD 370-0012-080)	1	
	P323-0303-020	. . SCREW, Machine, cres, passivated, pan head, 0-80 UNF-2A x 7/32 in. lg (77250) (07216 SCD 323-0303-020) (AP)	2	
-6	20C-46002-03	. . PLUG, Coaxial connector, with 12 inch cable (RG-178B/U) (03554) (07216 SCD 426-0005-010)	1	
-7	1025-36	. . COIL, RF, 4.7 microhenries ± 10% (99800) (07216 SCD 240-2031-00)	4	
-8	RS-1/4 100 OHM 3 PCT G	. . RESISTOR, Fixed, wirewound, 100 ohm ± 3%, 1/4 watt (91637) (07216 SCD 746-3149-010)	1	
-9	RS-1/4 220 OHM 1 PCT G	. . RESISTOR, Fixed, wirewound, 220 ohms ± 1%, 1/4 watt (91637) (07216 SCD 746-3149-020)	1	
-10	RC07GF101K	. . RESISTOR	1	
-10A	RC05GF513J	. . RESISTOR	4	
-10B	RC05GF102J	. . RESISTOR	6	
-11	C11A682K	. . CAPACITOR, Fixed, ceramic, 6800 pF ± 10%, 100 VDCW (16546) (07216 SCD 913-4248-040)	3	
-12	567-9526-001	. . CLIP, Terminal	25	
-13	351-7068-010	. . BUFFER AMPLIFIER	1	
-14	351-7069-010	. . VOLTAGE REGULATOR	1	
-15	351-7070-010	. . BINARY DIVIDER, U0	1	
-16	351-7071-010	. . COUNTER, U1	1	
-17	351-7144-060	. . COUNTER (Part of U2)	1	
-18	351-7144-070	. . COUNTER (Part of U2)	1	
-19	351-7145-030	. . COUNTER (Part of U2)	1	
-20	351-7146-020	. . COUNTER (Part of U2)	1	
-21	780-0499-001	. . FREQUENCY STANDARD	1	
-22	780-0500-001	. . DRIVER, U2	1	
-23	780-0501-001	. . COUNTER ASSY, U3 (See figure 8 for breakdown)	1	
-24	780-0502-001	. . COUNTER ASSY, U4 (See figure 9 for breakdown)	1	
-25	780-0503-001	. . DIVIDER ASSY, U5 (See figure 10 for breakdown)	1	
-26	780-0498-001	. . BOARD ASSY, Main	1	
-27	780-0493-001	. HEATSINK ASSY, No. 1	6	
-28	780-0494-001	. HEATSINK ASSY, No. 2	1	
-29	780-0495-001	. HEATSINK ASSY, No. 3	1	
-30	780-0496-001	. HEATSINK ASSY, No. 4	1	
-31	567-8729-001	. PAD, Chassis	1	
-32	567-8730-001	. CHASSIS	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-7-	780-0504-001	COMPONENT ASSY, Sub-board (See item 4 figure 6 ...... for location in NHA)	REF	
-1	D11176	. FILTER, Low pass (70674) (07216 SCD 673-1151-010) ..	1	
	780-0512-001	. BOARD ASSY	1	
-2	DR47T35JU	. . CAPACITOR, Fixed, electrolytic, 0.47 uF ± 5%, ... 35 VDCW (12954) (07216 SCD 154-9072-010)	1	
-3	RC05GF563J	. . RESISTOR	1	
-4	1N445	. . DIODE	1	
-5	RS-1/4 100 OHM 3 PCT G	. . RESISTOR, Fixed, wirewound, 100 ohms ± 3%, ... 1/4 watt (91637) (07216 SCD 746-3149-010)	1	
-5A	RC05GF562J	. . RESISTOR	1	
-6	567-9526-001	. . CLIP, Terminal	34	
-7	351-7143-010	. . BUFFER/REGULATOR	1	
-8	351-7309-010	. . PREAMPLIFIER	1	
-9	351-7279-010	. . VOLTAGE CONTROLLED OSCILLATOR	1	
-10	351-7277-010	. . VOLTAGE CONTROLLED OSCILLATOR	1	
-11	351-7278-010	. . VOLTAGE CONTROLLED OSCILLATOR	1	
-12	780-0513-001	. . BOARD ASSY	1	
-13	567-8728-001	. PAD, Inner shield	1	
-14	780-0511-001	. SHIELD ASSY, Ground	1	

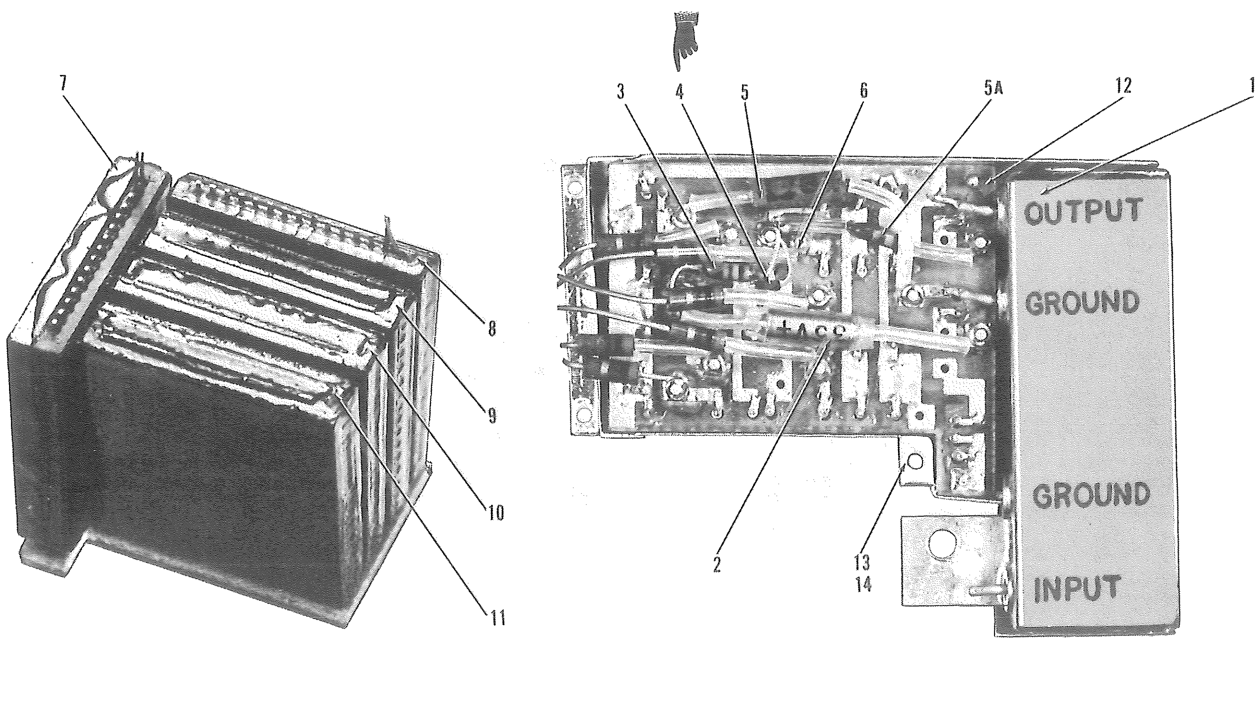


Figure 6-7. Component Assembly

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-8-	780-0501-001	COUNTER ASSY, U3 (See item 23 figure 6 for location .... in NHA)	REF	
-1	SG41	. LOGIC GATE, U3 (93332) (07216 SCD 351-7077-020)	2	
-2	SG141	. LOGIC GATE, U3 (93332) (07216 SCD 351-7093-020)	1	
-3	SF31	. FLIPFLOP, Counter U3 (93332) (07216 SCD .... 351-7105-020)	1	
-4	SF50	. FLIPFLOP, Counter U3 (93332) (07216 SCD .... 351-7107-010)	1	
-5	SF51	. FLIPFLOP, Counter U3 (93332) (07216 SCD .... 351-7107-020)	4	
-6	780-0507-001	. BOARD, U3	1	

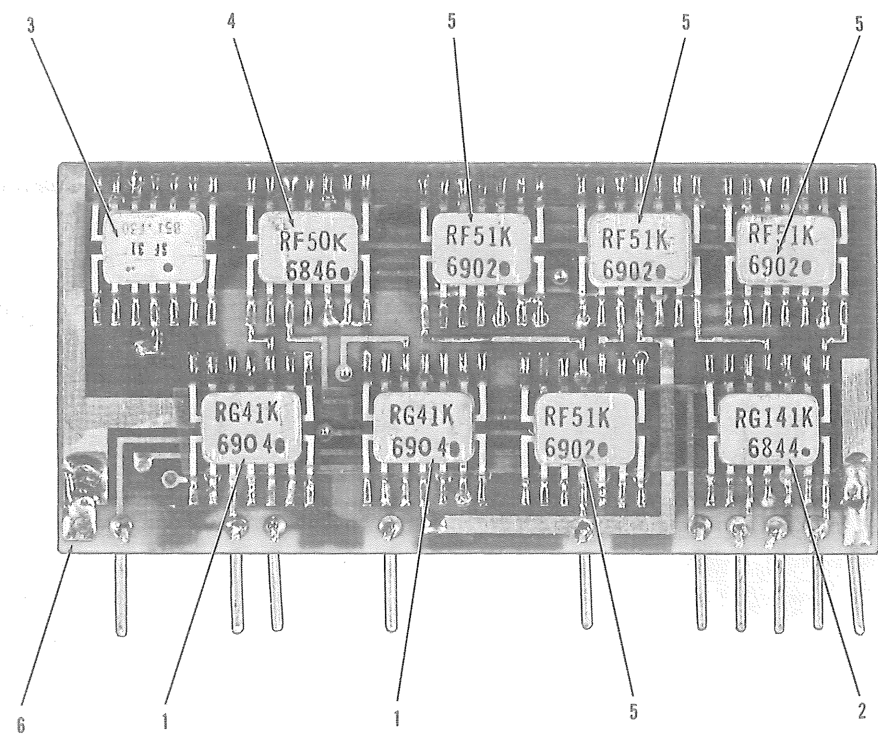


Figure 6-8. Counter Assembly, U3

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-9-	780-0502-001	COUNTER ASSY, U4 (See item 24 figure 6 for location .... in NHA)	REF	
-1	CE-1/8-10K-1-C1	. RESISTOR, Fixed, film, 10 kilohms ± 1%, 1/8 watt .... (14298) (07216 SCD 705-1446-070)	1	
-2	1N3207	. DIODE	1	
-3	C11A181K	. CAPACITOR, Fixed, ceramic, 180 pF ± 10%, ... 100 VDCW (16546) (07216 SCD 913-4248-010)	1	
-4	SG121	. LOGIC GATE, U4 (93332) (07216 SCD 351-7089-020) ...	1	
-5	SG141	. LOGIC GATE, U4 (93332) (07216 SCD 351-7093-020) ...	3	
-6	SF31	. FLIPFLOP, Counter U4 (93332) (07216 SCD .... 351-7105-020)	5	
-7	SF51	. FLIPFLOP, Counter U4 (93332) (07216 SCD .... 351-7107-020)	1	
-8	780-0508-001	. BOARD, U4	1	

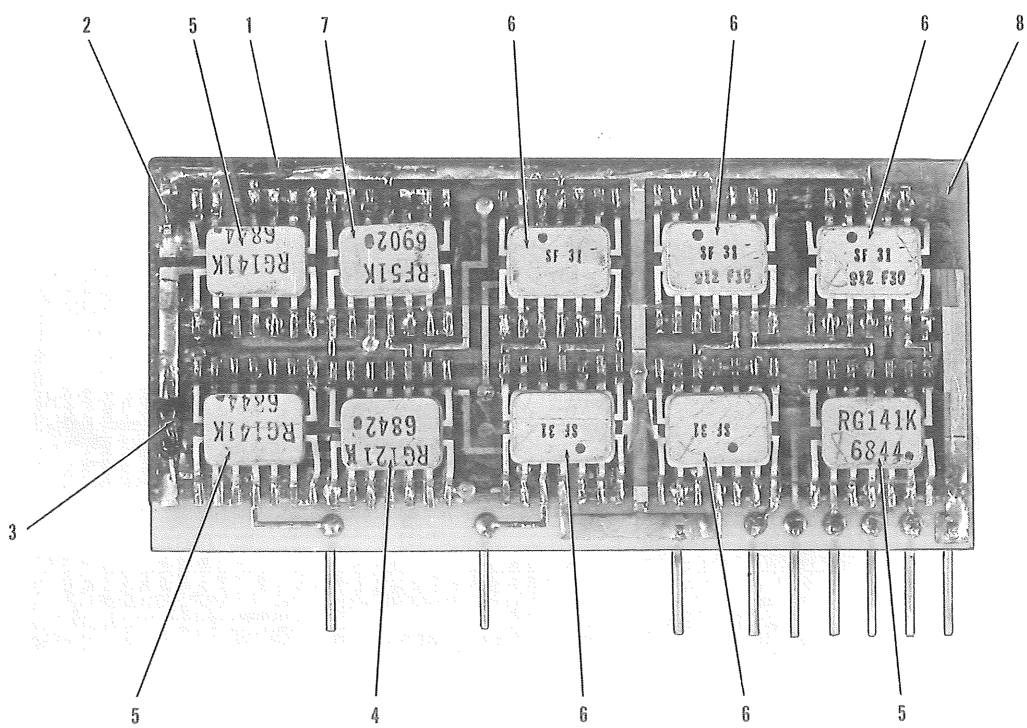


Figure 6-9. Counter Assembly, U4

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-10-	780-0503-001	DIVIDER ASSY, U5 (See item 25 figure 6 for location in NHA)	REF	
-1	2N3014/SS4410	. TRANSISTOR	1	
-2	2N2394	. TRANSISTOR	1	
-3	1N3207	. DIODE	5	
-4	RC05GF392J	. RESISTOR	2	
-5	RC05GF472J	. RESISTOR	1	
-6	RC05GF103J	. RESISTOR	1	
-7	RC05GF153J	. RESISTOR	1	
-8	RC05GF223J	. RESISTOR	1	
-9	SF31	. FLIPFLOP, Counter U5 (93332) (07216 SCD 351-7105-020)	10	
-10	780-0509-001	. BOARD, U5	1	

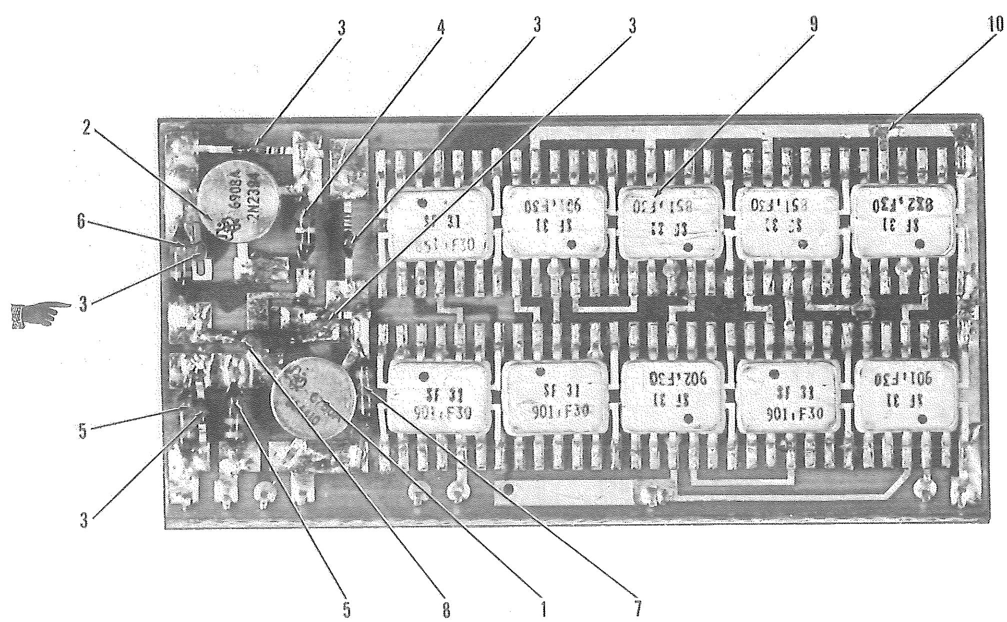


Figure 6-10. Divider Assembly, U5

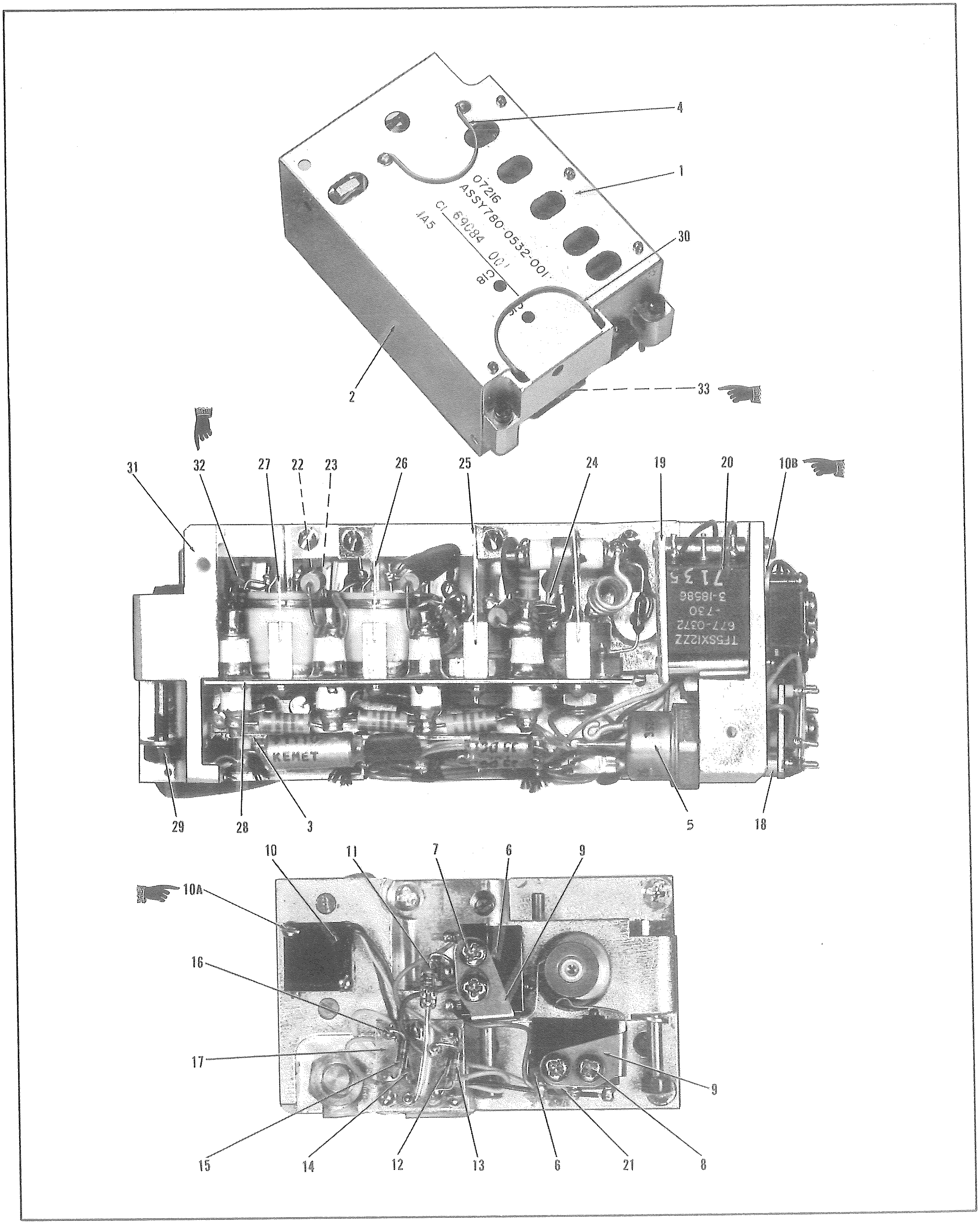


Figure 6-11. PA/Modulator Module

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-11-	780-0532-001	PA/MODULATOR MODULE (See item 8 figure 3 for location in NHA)	REF	
-1	780-0623-001	. COVER, Top	1	
	322-0149-000	. SCREW, Machine, brass, nickel plated, flat head, 0-80 UNF-2A x 1/8 in. lg (AP)	2	
	P320-0010-000	. SCREW, Machine, brass, nickel plated, round head, 0-80 UNF-2A x 3/16 in. lg (77250) (07216 SCD 320-0010-000) (AP)	4	
	310-0274-000	. WASHER, Lock, bronze, nickel plated (AP)	4	
-2	567-8462-001	. COVER, Bottom	1	
	322-0149-000	. SCREW, Machine, brass, nickel plated, flat head, 0-80 UNF-2A x 1/8 in. lg (AP)	6	
-3	567-8527-001	. BRACKET ASSY, Component mounting (See figure 13 for breakdown)	1	
	P320-0007-000	. SCREW, Machine, brass, nickel plated, round head, 0-80 UNF-2A x 1/8 in. lg (77250) (07216 SCD 320-0007-000) (AP)	3	
	310-0274-00	. WASHER, Lock, bronze, nickel plated (AP)	3	
-4	567-8626-001	. PULLER, Module	1	
-5	SDT6466	. TRANSISTOR (21845) (07216 SCD 352-0757-020)	1	
	334-1008-000	. NUT, Special, hex, brass, nickel plated, 10-32 NF-2B (AP)	1	
	MS35338-138	. WASHER (AP)	1	
	310-0059-00	. WASHER, Flat, brass, nickel plated, No. 10 (79807) (07216 SCD 310-0059-00) (AP)	1	
-6	MS24547-1	. SWITCH	2	
-7	P343-0300-000	. SCREW, Machine, brass, nickel plated, pan head, 2-56 UNC-2A x 5/16 in. lg (77250) (07216 SCD 343-0300-000) (AP)	2	
-8	P343-0301-000	. SCREW, Machine, brass, nickel plated, pan head, 2-56 UNC-2A x 3/8 in. lg (77250) (07216 SCD 343-0301-000) (AP)	2	
	310-0094-000	. WASHER, Lock, phosphor bronze, cadmium plated, No. 2 (AP)	2	
	P313-0050-000	. NUT, Hex, brass, nickel plated, 2-56 UNC-2B (77250) (07216 SCD 313-0050-000) (AP)	2	
-9	567-8546-001	. ADAPTOR	2	
-10	0512-1-20K	. RESISTOR, Variable, wirewound, 20 kilohms ± 5%, 3/4 watt (06184) (07216 SCD 381-1847-020)	1	
-10A	P320-0008-000	. SCREW, Machine, brass, nickel plated, round head, 0-80 UNF-2A (77250) (07216 SCD 320-0008-000) (AP)	2	
-10B	310-0128-000	. WASHER, Flat, brass, silver-plated, No. 0 (05411) (07216 SCD 310-0128-00)	2	
-11	1N3064	. DIODE	1	
-12	RC05GF103J	. RESISTOR	1	
	RC05GF123J	. RESISTOR	1	
	RC05GF153J	. RESISTOR	1	
	RC05GF183J	. RESISTOR	1	
	RC05GF223J	. RESISTOR	1	
	RC05GF273J	. RESISTOR	1	
	RC05GF333J	. RESISTOR	1	
	RC05GF393J	. RESISTOR	1	
	RC05GF473J	. RESISTOR	1	
	RC05GF563J	. RESISTOR	1	
	RC05GF683J	. RESISTOR	1	
	RC05GF823J	. RESISTOR	1	
		1A5R21 to be selected in test from above list.		

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-11-13	RC05GF103J	. RESISTOR	1	
	RC05GF123J	. RESISTOR	1	
	RC05GF153J	. RESISTOR	1	
	RC05GF183J	. RESISTOR	1	
	RC05GF223J	. RESISTOR	1	
	RC05GF273J	. RESISTOR	1	
	RC05GF333J	. RESISTOR	1	
	RC05GF393J	. RESISTOR	1	
	RC05GF473J	. RESISTOR	1	
	RC05GF563J	. RESISTOR	1	
	RC05GF683J	. RESISTOR	1	
	RC05GF823J	. RESISTOR	1	
		1A5R22 to be selected in test from above list.		
-14	RC05GF681J	. RESISTOR	1	
	RC05GF821J	. RESISTOR	1	
	RC05GF102J	. RESISTOR	1	
	RC05GF122J	. RESISTOR	1	
	RC05GF152J	. RESISTOR	1	
	RC05GF182J	. RESISTOR	1	
	RC05GF222J	. RESISTOR	1	
	RC05GF272J	. RESISTOR	1	
	RC05GF332J	. RESISTOR	1	
	RC05GF392J	. RESISTOR	1	
	RC05GF472J	. RESISTOR	1	
	RC05GF562J	. RESISTOR	1	
		1A5R23 to be selected in test from above list.		
-15	RC05GF681J	. RESISTOR	1	
	RC05GF821J	. RESISTOR	1	
	RC05GF102J	. RESISTOR	1	
	RC05GF122J	. RESISTOR	1	
	RC05GF152J	. RESISTOR	1	
	RC05GF182J	. RESISTOR	1	
	RC05GF222J	. RESISTOR	1	
	RC05GF272J	. RESISTOR	1	
	RC05GF332J	. RESISTOR	1	
	RC05GF392J	. RESISTOR	1	
	RC05GF472J	. RESISTOR	1	
	RC05GF562J	. RESISTOR	1	
		1A5R24 to be selected in test from above list.		
	567-8563-001	. BRACKET, Pressed	1	
	P320-0010-000	. SCREW, Machine, brass, nickel plated, round head, 0-80 UNF-2A x 3/16 in. lg (77250) (07216 SCD 320-0010-000) (AP)	3	
	310-0274-00	. WASHER, Lock, bronze, nickel plated (AP)	3	
-16	DP-289-304	. . TERMINAL, Standoff, insulated (21242) (07216 SCD 306-2543-010)	6	
-17	567-8495-001	. . BRACKET, Terminal mounting	1	
-18	567-8460-001	. SPACER, Bracket mounting	3	
-19	567-8531-001	. HOLDER, Transformer	1	
	322-0162-000	. SCREW, Machine, stainless steel, passivated, flat head, 0-80 UNF-2A x 1/4 in. lg (AP)	2	
-20	3-18586	. TRANSFORMER, Audio frequency (70674) (07216 SCD 677-0372-730)	1	
-21	567-8459-001	. BRACKET. Switch mounting	1	
	P343-0298-000	. SCREW, Machine, brass, nickel plated, pan head, 2-56 UNC-2A x 3/16 in. lg (77250) (07216 SCD 343-0298-000) (AP)	2	
	310-0094-000	. WASHER, Lock, phosphor bronze, cadmium plated No. 2 (AP)	2	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-11-22	CC60CG8R2D	. CAPACITOR, Fixed, ceramic, 8.2 pF ± 0.5 pF, 75 VDCW (81349) (07216 SCD 913-1098-160)	1	
-23	TC3-9-5	. CAPACITOR, Fixed, ceramic, 3.9 pF ± 0.25 pF, 75 VDCW (90634) (07216 SCD 913-1098-220)	2	
-24	567-8465-001	. INDUCTOR, Buss	1	
-25	567-8547-001	. SHIELD, No. 1	1	
-26	567-8548-001	. SHIELD, No. 3	1	
-27	567-8549-001	. SHIELD, No. 4	1	
	P320-0007-000	. SCREW, Machine, brass, nickel plated, round head, 0-80 UNF-2A x 1/8 in. lg (77250) (07216 SCD 320-007-000) (AP)	6	
	310-0274-000	. WASHER, Lock, bronze, nickel plated (AP)	6	
-28	567-8526-001	. SHIELD AND BRACKET ASSY (See figure 14 for breakdown)	1	
	P320-0007-000	. SCREW, Machine, brass, nickel plated, round head, 0-80 UNF-2A x 1/8 in. lg (77250) (07216 SCD 320-0007-000) (AP)	3	
	310-0274-00	. WASHER, Lock, bronze, nickel plated (AP)	3	
-29	567-8539-001	. SCREW, Special	4	
	MS35338-135	. WASHER	4	
-30	567-8417-001	. PULLER, Module	1	
-31	780-0531-001	. FRAME ASSY, Transmitter (See figure 12 for breakdown)	1	
-32	8111-062-C0G0439D	. CAPACITOR, Fixed, ceramic, 4.3 pF ± 0.5 pF, 75 VDCW (72982) (07216 SCD 913-1098-120)	1	
-33	F1913-1-01	. BEAD, Ferrite (72656) (07216 SCD 288-2154-000)	5	

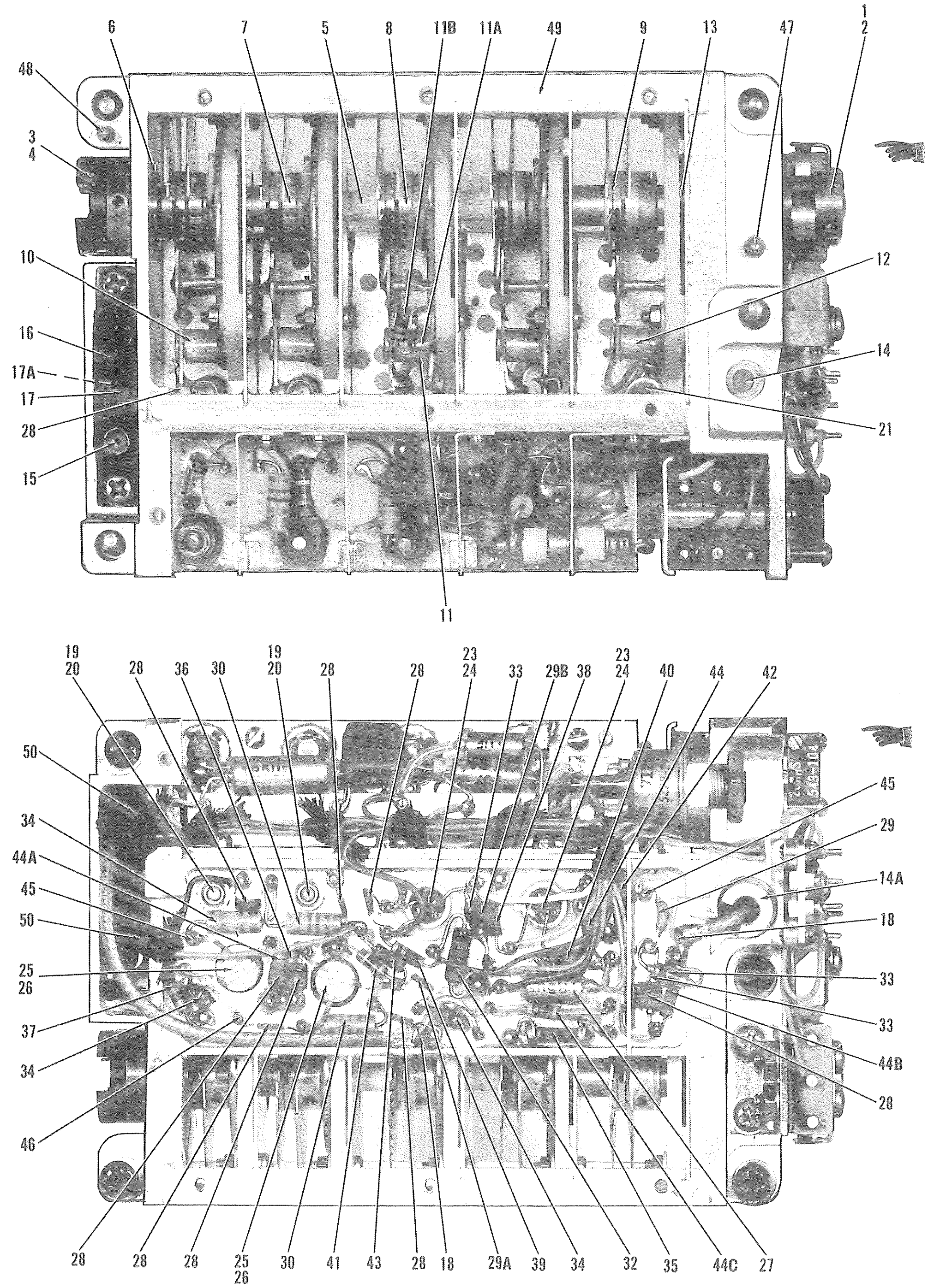


Figure 6-12. Frame Assembly, Transmitter

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-12-	780-0531-001	FRAME ASSY, Transmitter (See item 31 figure 11 for location in NHA)	REF	
-1	567-8478-001	. CAM, Switch actuating	1	
	328-0266-000	. SETSCREW, Cres steel, passivated, 0-80 UNF-3A x 0.062 +0.000/-0.010 in. lg (08664) (07216 SCD 328-0266-000) (AP)	2	
-2	567-8468-001	. RETAINER, Threaded	1	
-3	567-8467-001	. COUPLER	1	
	328-0266-000	. SETSCREW, Cres steel, passivated, 0-80 UNF-3A x 0.062 +0.000/-0.010 in. lg (08664) (07216 SCD 328-0266-000) (AP)	2	
-4	544-7455-003	. CONTACT, Electrical-ground spring	1	
-5	567-8551-001	. SHAFT, Insulated	1	
-6	S5532FCP25L02	. BEARING, Ball, annular (40920) (07216 SCD 309-1420-000)	2	
-7	567-8555-001	. ROTOR, No. 1	2	
-8	567-8556-001	. ROTOR, No. 2	2	
-9	567-8557-001	. ROTOR, No. 4	1	
	328-0266-000	. SETSCREW, Cres steel, passivated, 0-80 UNF-3A x 0.062 +0.000/-0.010 in. lg (08664) (07216 SCD 328-0266-000) (AP)	10	
-10	567-8552-001	. STATOR, Inductor No. 1	2	
-11	567-8553-001	. STATOR, Inductor No. 2	2	
-11A	780-1917-001	. LUG, Solder	1	
	92-1660-00	. NUT, Hex, locking, brass, cadmium plated, 0-80 UNF-3B (72962) (07216 SCD 333-1405-010) (AP)	1	
-11B	RC05GF222J	. RESISTOR	1	
-12	567-8554-001	. STATOR, Inductor No. 4	1	
	P323-0303-020	. SCREW, Machine, cres, passivated, pan head, 0-80 UNF-2A x 7/32 in. lg (77250) (07216 SCD 323-0303-020) (AP)	15	
	567-8471-001	. WASHER, Flat (AP)	30	
	334-1390-00	. NUT, Hex, plain, brass, nickel plated, 0-80 UNF-2B (00243) (07216 SCD 334-1390-00) (AP)	14	
-13	018-1390-020	. RING, Electrical contact	4	
-14	20C-46012-01	. PLUG, Coaxial connector (With 6 in. RG178B/U coaxial cable) (03554) (07216 SCD 426-0004-010)	1	
-14A	780-3638-002	. INSERT, Retaining	1	
	780-0530-001	. CONNECTOR ASSY	1	
	LP57D26P4WHQ	. SCREW, Machine, self-locking, pan head, stainless steel, passivated, 2-56 NC-2A x 1/4 in. lg (03038) (07216 SCD 330-2633-00) (AP)	2	
-15	20C-46001-03	. . RECEPTACLE, Coaxial connector (With 12 in. RG-178B/U coaxial cable) (03554) (07216 SCD 426-0005-020)	1	
-16	471-0001	. . PIN, Contact (03554) (07216 SCD 370-0009-030)	6	
-17	471-0004	. . SHELL, Connector (03554) (07216 SCD 370-0009-020)	1	
-17A	471-0005	. . PIN, Guide (03554) (07216 SCD 370-0009-050)	2	
-18	SE-23 BRASS-TIN-P	. EYELET, Metallic (61957) (07216 SCD 307-1214-000)	2	
-19	7209	. CAPACITOR, Variable, glass, 0.5 to 7.5 pF, 250 VDCW (91293) (07216 SCD 922-3045-010)	2	
-20	567-8470-001	. SPACER, Trimmer	2	
-21	567-9617-001	. CHOKE	1	
-22	NOT USED			
-23	2N956	. TRANSISTOR	2	
-24	GA-2112	. HOLDER, Transistor (15409) (07216 SCD 352-9939-000)	2	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-12-25	2N918/50	. TRANSISTOR	2	
-26	567-8469-001	. HOLDER, Transistor	2	
-27	150D155X0020A2	. CAPACITOR, Fixed, tantalum, 1.5 uF ± 20%, ... 20 VDCW (56289) (07216 SCD 184-7658-000)	1	
-28	SSM-001-64	. CAPACITOR, Fixed, ceramic, 1000 pF ± 20%, ... 50 VDCW (90634) (07216 SCD 913-1299-010)	9	
-29	UY011ROC	. CAPACITOR, Fixed, ceramic, 1 pF ± 0.25 pF, ... 300 VDCW (73899) (07216 SCD 914-3098-130)	1	
-29A	CC62UG470G	. CAPACITOR, Fixed, ceramic, 47 PFD ± 10%, ... 100 VDC (81349) (07216 SCD 913-1098-190)	1	
-29B	SSM-100-51	. CAPACITOR, Fixed, ceramic, 100 PFD ± 10%, ... 100 VDC (90634) (07216 SCD 913-1299-030)	1	
-30	1025-08	. COIL, Radio frequency, 0.33 microhenries ± 10% ..... (99800) (07216 SCD 240-2017-000)	2	
-31	1025-12	. COIL, Radio frequency, 0.47 microhenries ± 10% ..... (99800) (07216 SCD 240-2019-000)	1	
-32	1N968B	. DIODE	1	
-33	1N3064	. DIODE	3	
-34	567-8558-001	. COIL, Toroidal	2	
-35	997H-5	. RESISTOR, Thermal, 10,000 ohms ± 10%, 1/2 watt .... (10646) (07216 SCD 714-1757-000)	1	
-36	RC05GF221J	. RESISTOR	1	
-37	RC05GF331J	. RESISTOR	1	
-38	RC05GF821J	. RESISTOR	1	
-39	RC05GF102J	. RESISTOR	1	
-40	RC05GF272J	. RESISTOR	1	
-41	RC05GF392J	. RESISTOR	1	
-42	RC05GF472J	. RESISTOR	1	
-43	RC05GF822J	. RESISTOR	1	
-44	RC05GF333J	. RESISTOR	1	
-44A	RC05GF391J	. RESISTOR	1	
-44B	RC05GF153J	. RESISTOR	1	
-44C	RC05GF104J	. RESISTOR	1	
	RC05GF333J	. RESISTOR	1	
	RC05GF473J	. RESISTOR	1	
	RC05GF683J	. RESISTOR	1	
-45	FT-2SM-1164	. . TERMINAL, Feedthru, insulated (98291) .... (07216 SCD 306-1276-000)	2	
-46	DP-289-304	. . TERMINAL, Standoff, insulated (21242) .... (07216 SCD 306-2543-010)	26	
-47	MS16555-609	. . PIN, Dowel	1	
-48	MS16555-603	. . PIN, Dowel	1	
-49	567-8564-001	. . FRAME, Machined	1	
-50	F1913-1-01	. BEAD, Ferrite (72656) (07216 SCD 288-2154-000)	9	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-13-	567-8527-001	BRACKET ASSY, Component mounting (See item 3 figure 11 for location in NHA)	REF	
-1	RC05GF471J	. RESISTOR	1	
-2	SMCB-01-150	. CAPACITOR, Fixed, ceramic, 10,000 pF ± 20%, 200 VDCW (90634) (07216 SCD 913-1299-020)	1	
-3	150D105X0035A2	. CAPACITOR, Fixed, electrolytic, 1.0 uF ± 20%, 35 VDCW (56289) (07216 SCD 184-7398-000)	2	
-4	150D155X0035B2	. CAPACITOR, Fixed, electrolytic, 1.5 uF ± 20%, 35 VDCW (56289) (07216 SCD 184-7688-000)	1	
	567-8536-001	. BRACKET, Terminal mounting	1	
-5	567-8476-001	. . TERMINAL, Ground	2	
-6	DP-289-304	. . TERMINAL, Standoff, insulated (21242) (07216 SCD 306-2543-010)	3	
-7	567-8479-001	. BRACKET, Pressed	1	

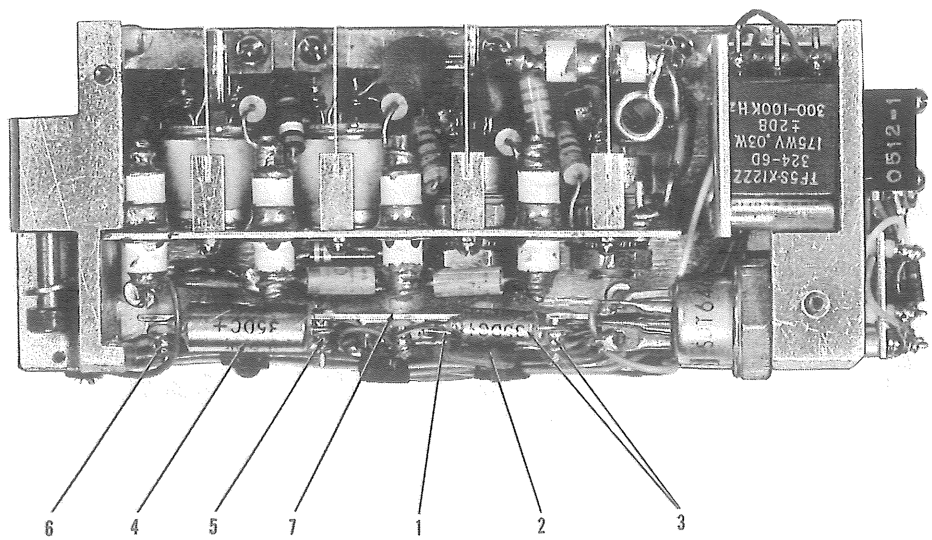


Figure 6-13. Bracket Assembly

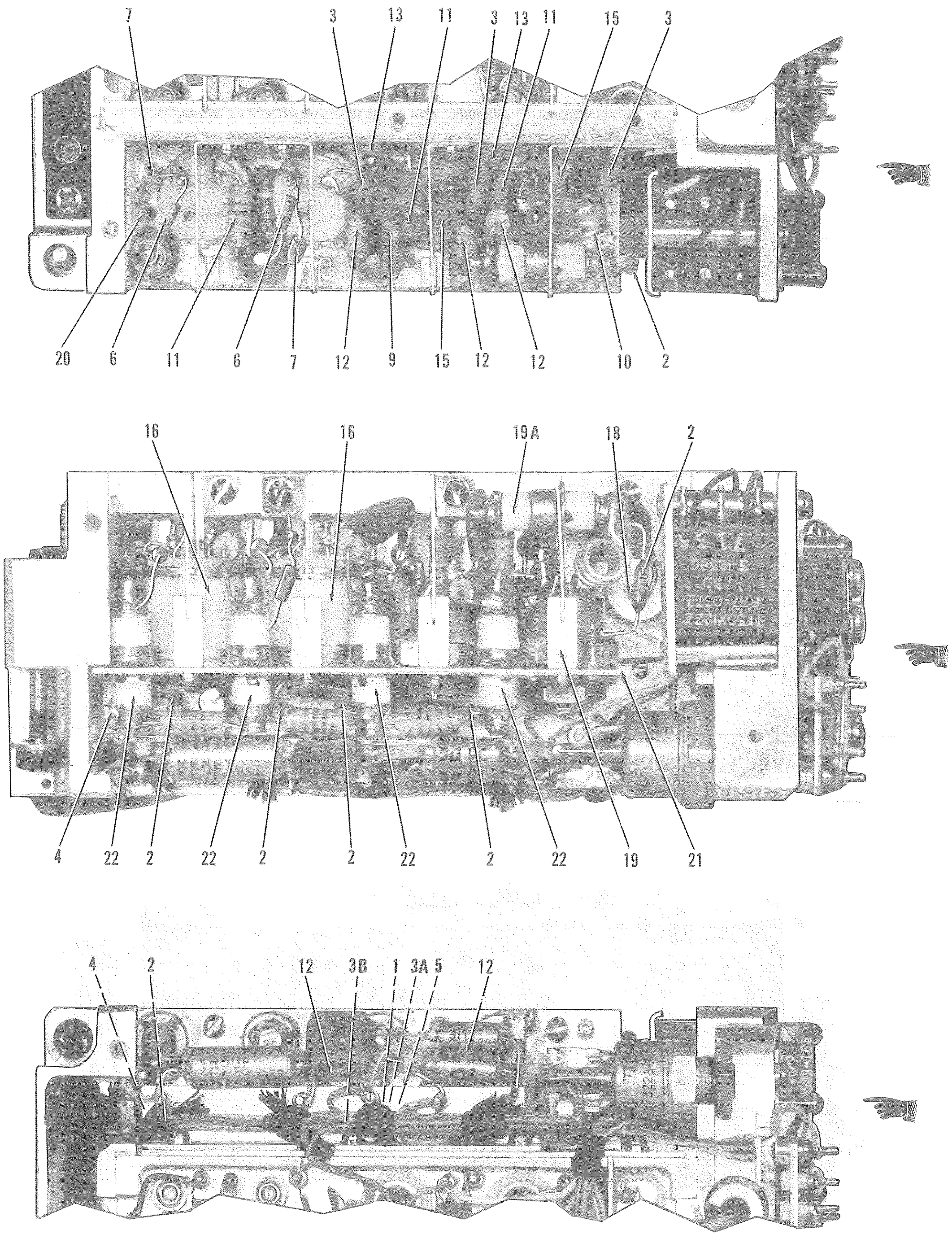


Figure 6-14. Shield and Feedthru Assembly

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-14-	567-8526-001	SHIELD AND FEEDTHRU ASSY (See item 28 figure 11 ..... for location in NHA)	REF	
-1	SSM-001-64	. CAPACITOR, Fixed, ceramic, 1000 pF ± 20%, ... 50 VDCW (90634) (07216 SCD 913-1299-010)	1	
-2	C11A223K	. CAPACITOR, Fixed, ceramic, 22,000 pF ±20%, ... 100 VDCW (16546) (07216 SCD 913-4248-050)	5	
-3	40C73A1	. CAPACITOR, Fixed, ceramic, 1000 pF ± 20%, ... 500 VDCW (01939) (07216 SCD 913-3009-000)	3	
-3A	TC-2.12	. CAPACITOR, Fixed, ceramic, 2.0 PFD ± 0.5 PFD, ... 75 VDCW (86335) (07216 SCD 913-1098-100)	1	
	TC-5.6-20	. CAPACITOR, Fixed, ceramic, 5.6 PFD ± 0.5 PFD, ... 75 VDCW (86335) (07216 SCD 913-1098-130)	1	
	TC-4.3-12	. CAPACITOR, Fixed, ceramic, 4.3 PFD ± 0.5 PFD, ... 75 VDCW (86335) (07216 SCD 913-1098-120)	1	
-3B	1N3064	. DIODE	1	
-4	997F-18	. RESISTOR, Thermal, 100 ohms ± 10%, 1/2 watt ...... (10646) (07216 SCD 714-1723-000)	2	
-5	RC05GF820J	. RESISTOR	1	
-6	RC05GF562J	. RESISTOR	2	
-7	RC05GF391J	. RESISTOR	2	
-8	RC05GF152J	. RESISTOR	1	
-9	RC05GF221J	. RESISTOR	1	
	RC05GF391J	. RESISTOR	1	
	RC05GF561J	. RESISTOR	1	
-10	567-8601-001	. COIL, Inductor	1	
-11	1025-00	. COIL, Radio frequency, 0.15 microhenries ± 10% ...... (99800) (07216 SCD 240-2013-000)	2	
-12	1025-08	. COIL, Radio frequency, 0.33 microhenries ± 10% ...... (99800) (07216 SCD 240-2017-000)	5	
-13	567-8473-001	. COIL, Tank	2	
-14	NOT USED			
-15	2N3375	. TRANSISTOR	2	
	334-1008-000	. NUT, Special, hex, brass, nickel plated, ... 10-32 NF-2B (AP)	2	
	MS35338-138	. WASHER (AP)	2	
-16	2N3866	. TRANSISTOR	2	
-17	567-9493-001	. RETAINER, Transistor	2	
	P320-0007-000	. SCREW, Machine, brass, nickel plated, round head, ... 0-80 UNF-2A x 1/8 in. lg (77250) (07216 SCD 320-0007-000) (AP)	2	
	310-0274-000	. WASHER, Lock, bronze, nickel plated (AP)	1	
	310-0550-000	. WASHER, Flat, cres, passivated, inside diam .... 0.062 in, outside diam 5/32 in, thk 0.015 in, (79807) (07216 SCD 310-0550-00)	2	
	567-8562-001	. SHIELD, No. 2, feedthru	1	
	P320-0007-000	. SCREW, Machine, brass, nickel plated, round head, ... 0-80 UNF-2A x 1/8 in. lg (77250) (07216 SCD 320-0007-000) (AP)	1	
	310-0274-000	. WASHER, Lock, bronze, nickel plated (AP)	1	
-18	FT-2SM-1164	. . TERMINAL, Feedthru, insulated (98291) .... (07216 SCD 306-1276-000)	1	
-19	567-8569-001	. . SHIELD, No. 2	1	
-19A	2465-008W5T0102P	. . CAPACITOR, Fixed, ceramic, feedthru, ... 1000 pF guaranteed minimum value, 500 VDCW (12294) (07216 SCD 913-3208-000)	1	
	567-8560-001	. BRACKET, Feedthru and terminal	1	
-20	FT-2SM-1164	. . TERMINAL, Feedthru, insulated (98291) .... (07216 SCD 306-1276-000)	3	
-21	567-8567-001	. . BRACKET, Ground terminal assy	1	
-22	2465-008W5T0102P	. . CAPACITOR, Fixed, ceramic, feedthru, ... 1000 pF guaranteed minimum value, 500 VDCW (12294) (07216 SCD 913-3208-000)	4	

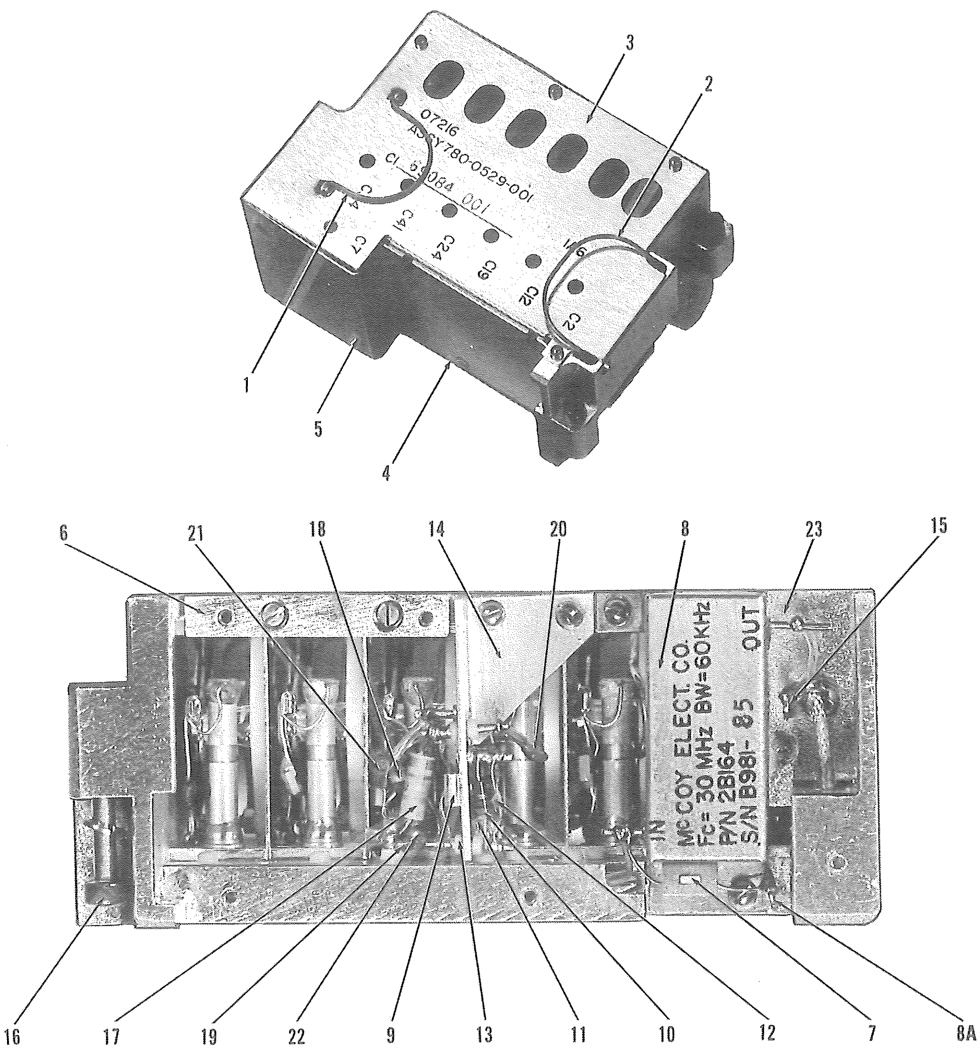


Figure 6-15. Receive RF Module

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-15-	780-0529-001	RECEIVE RF MODULE (See item 9 figure 3 for location in NHA)	REF	
-1	567-8626-001	. PULLER, Module	1	
-2	567-8417-001	. PULLER, Module	1	
-3	780-0528-001	. COVER, Top	1	
	P320-0007-000	. SCREW, Machine, brass, nickel plated, round head, 0-80 UNF-2A x 1/8 in. lg (77250) (07216 SCD 320-0007-000) (AP)	7	
	310-0274-000	. WASHER, Lock, bronze, nickel plated, No. 2 (AP)	7	
	LP57J00S2	. SCREW, Machine, self-locking, stainless steel, flat head, 0-80 UNF-2A x 1/8 in. lg (03038) (07216 SCD 330-4028-010) (AP)	1	
-4	567-8523-001	. COVER, Bottom	1	
	LP57J00S2	. SCREW, Machine, self-locking, stainless steel, flat head, 0-80 UNF-2A x 1/8 in. lg (03038) (07216 SCD 330-4028-010) (AP)	7	
-5	780-0566-001	. COVER, Side	1	
	P320-0007-000	. SCREW, Machine, nickel plated, round head, 0-80 UNF-2A x 1/8 in. lg (77250) (07216 SCD 320-0007-000) (AP)		
	310-0274-000	. WASHER, Lock, bronze, nickel plated, No. 2 (AP)	2	
	LP57J00S2	. SCREW, Machine, self-locking, stainless steel, flat head, 0-80 UNF-2A x 1/8 in. lg (03038) (07216 SCD 330-4028-010) (AP)	1	
-6	567-8657-001	. BLOCK, Frame	1	
	P323-0303-040	. SCREW, Machine, cres, passivated, pan head, 0-80 UNF-2A x 3/16 in. lg (77250) (07216 SCD 323-0303-040) (AP)	2	
	780-0527-001	. FILTER, Mounted	1	
	P320-0009-000	. SCREW, Machine, brass, nickel plated, round head, 0-80 UNF-2A x 5/32 in. lg (77250) (07216 SCD 320-0009-000) (AP)	1	
	310-0274-000	. WASHER, Lock, bronze, nickel plated, No. 2 (AP)	1	
	P320-0007-000	. SCREW, Machine, brass, nickel plated, round head, 0-80 UNF-2A x 1/8 in. lg (77250) (07216 SCD 320-0007-000) (AP)	1	
	310-0274-000	. WASHER, Lock, bronze, nickel plated, No. 2 (AP)	1	
-7	MT120	. . CAPACITOR, Variable, ceramic, 3.5 pF to 20 pF, 50 VDCW (73899) (07216 SCD 917-1251-110)	1	
-8	2B164	. . FILTER, Bandpass-crystal, 30 megahertz (00136) (07216 SCD 293-1209-030)	1	
-8A	4040-2HD	. LUG, Ground (77147) (07216 SCD 304-0331-000)	1	
	567-8585-001	. BRACKET ASSY	1	
	P320-0007-000	. SCREW, Machine, brass nickel plated, round head, 0-80 UNF-2A x 1/8 in. lg (77250) (07216 SCD 320-0007-000) (AP)	2	
	310-0274-000	. WASHER, Lock, bronze, nickel plated, No. 2 (AP)	2	
-9	2N918/50	. . TRANSISTOR	1	
-10	RC05GF471J	. . RESISTOR	1	
-11	RC05GF472J	. . RESISTOR	1	
-12	SSM-001-64	. . CAPACITOR, Fixed, ceramic, 1000 pF ± 20%, 50 VDCW (90634) (07216 SCD 913-1299-010)	1	
	567-8586-001	. . BRACKET, Terminal assy	1	
-13	FT-2SM-1164	. . . TERMINAL, Feedthru, insulated (98291) (07216 SCD 306-1276-000)	3	
-14	567-8587-001	. . . BRACKET	1	
-15	4040-2HD	. LUG, Ground (77147) (07216 SCD 304-0331-000)	1	
	P343-0297-000	. SCREW, Machine, brass, nickel plated, pan head, 2-56 UNC-2A x 1/4 in. lg (77250) (07216 SCD 343-0297-000) (AP)	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-15-	310-0094-000	. WASHER, Lock, phosphor bronze, cadmium plated, No. 2 (AP)	1	
-16	567-8539-001	. SCREW, Special	4	
	MS35338-135	. WASHER, Lock	4	
-17	1025-12	. COIL, RF, 0.47 microhenrie ± 10% (99800) (07216 SCD 240-2019-000)	1	
-18	RC05GF102J	. RESISTOR	1	
-19	RC05GF153J	. RESISTOR	1	
-20	TC-2.12	. CAPACITOR, Fixed, ceramic, 2 pF ± 0.5 pF, 75 VDCW (86335) (07216 SCD 913-1098-100)	1	
-21	SSM-001-64	. CAPACITOR, Fixed, ceramic, 1000 pF ± 20%, 50 VDCW (90634) (07216 SCD 913-1299-010)	1	
-22	UY011ROC	. CAPACITOR, Fixed, ceramic, 1 pF ± .25 pF, 300 VDCW (73899) (07216 SCD 914-3098-130)	1	
-23	567-8572-001	. FRAME ASSY, Receiver (See figure 16 for breakdown)	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-16-	567-8572-001	FRAME ASSY, Receiver (See item 23 figure 15 for location in NHA)	REF	
	567-8583-001	. CONNECTOR ASSY	1	
	MS51957-2	. SCREW (AP)	2	
	310-0129-000	. WASHER, Flat, brass, nickel plated, No. 2 (05411) (07216 SCD 310-0129-000) (AP)	2	
-1	20C-46001-03	. . RECEPTACLE, Coaxial connector (With 12 in. RG-178B/U coaxial cable) (03554) (07216 SCD 426-0005-020)	2	
-2	471-0001	. . PIN, Contact (03554) (07216 SCD 370-0009-030)	3	
-3	471-0004	. . SHELL, Connector (03554) (07216 SCD 370-0009-020)	1	
-4	SE-23 BRASS-TIN-PLATE	. EYELET, Metallic (61957) (07216 SCD 307-1214-000)	2	
-5	20C-46012-01	. PLUG, Coaxial connector (With 6 in. RG 178B/U coaxial cable) (03554) (07216 SCD 426-0004-010)	1	
-6	TC-2.12	. CAPACITOR, Fixed, ceramic, 2 pF ± 0.5 pF, 75 VDCW (86335) (07216 SCD 913-1098-100)	6	
-7	UY011ROC	. CAPACITOR, Fixed, ceramic, 1 pF ± .25 pF, 300 VDCW (73899) (07216 SCD 914-3098-130)	4	
-8	7209	. CAPACITOR, Variable, glass, 0.5 to 7.5 pF, 250 VDCW (91293) (07216 SCD 922-3045-010)	6	
-9	567-8470-001	. SPACER, Trimmer	6	
-10	567-8467-001	. COUPLER	1	
	328-0373-000	. SETSCREW, Alloy steel, cadmium plated, 0-80 NF-3A X 1/8 in. lg (08664) (07216 SCD 328-0373-000) (AP)	2	
-11	544-7455-003	. CONTACT, Electrical-ground spring	1	
-12	567-8468-001	. RETAINER, Threaded	1	
-13	567-8640-001	. SHAFT	1	
-14	567-8555-001	. ROTOR NO. 1	4	
-15	567-8582-001	. ROTOR NO. 3	2	
	328-0372-000	. SETSCREW, Alloy steel, cadmium plated, 0-80 NF-3A X 1/16 in. lg (08664) (07216 SCD 328-0372-000) (AP)	12	
-16	S5532FCP25L02	. BEARING, Ball, annular (40920) (07216 SCD 309-1420-000)	2	

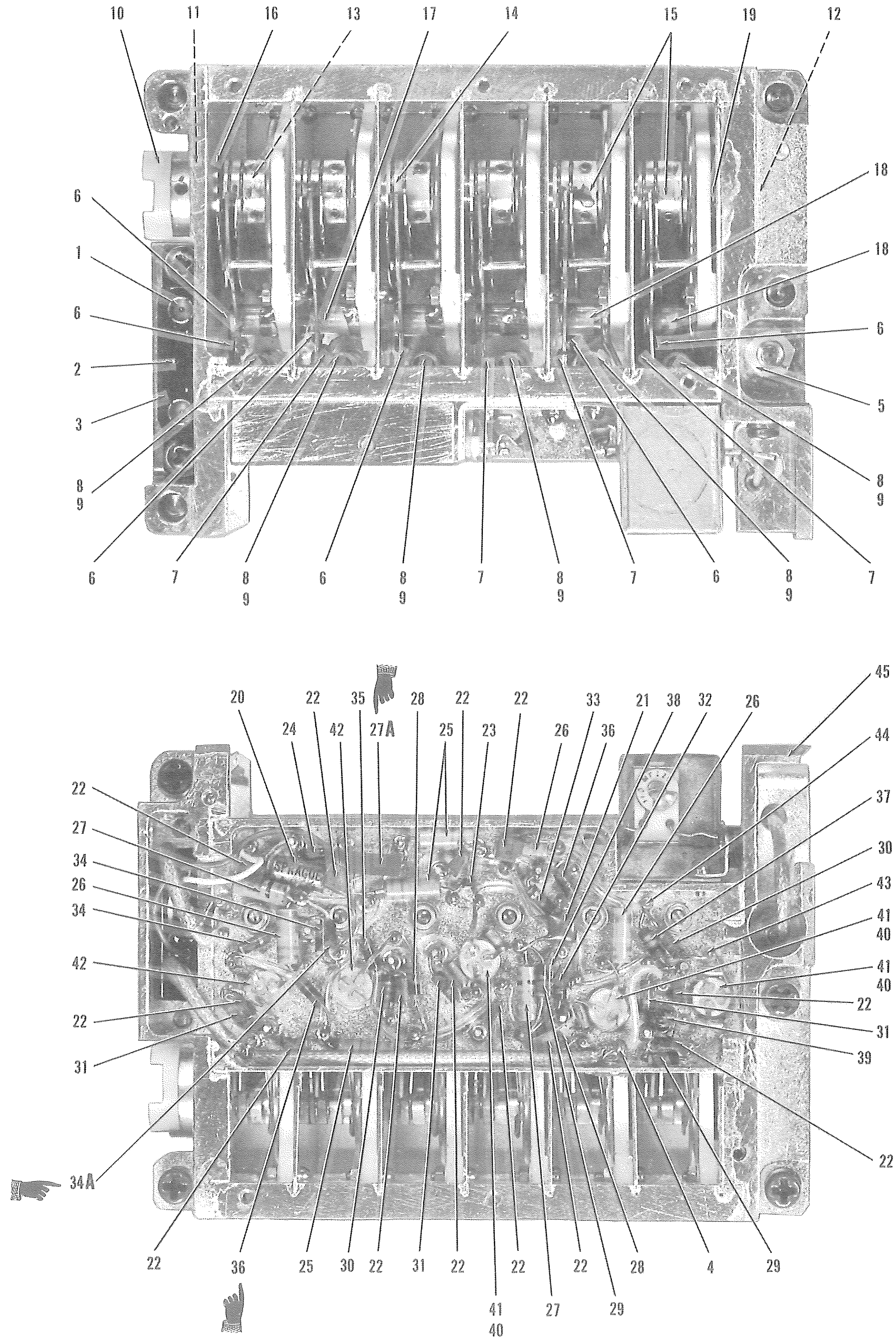


Figure 6-16. Frame Assembly, Receiver

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-16-17	567-8552-001	. STATOR, Inductor No. 1	4	
-18	567-8579-001	. STATOR, Inductor No. 3	2	
	P320-0010-000	. SCREW, Machine, brass, nickel plated, round head, 0-80 UNF-2A x 3/16 in. lg (77250) (07216 SCD 320-0010-000) (AP)	18	
	567-8471-001	. WASHER, Flat (AP)	18	
	334-1390-00	. NUT, Hex, brass, nickel plated, 0-80 UNF-2B (AP)	18	
-19	018-1390-00	. RING, Electrical contact	6	
-20	150D105X0035A2	. CAPACITOR, Fixed, electrolytic, 1 uF ± 20%, 35 VDCW (56289) (07216 SCD 184-7398-000)	1	
-21	TC-5.6-13	. CAPACITOR, Fixed, ceramic, 5.6 pF ± 0.5 pF, 75 VDCW (86335) (07216 SCD 913-1098-131)	1	
-22	SSM-001-64	. CAPACITOR, Fixed, ceramic, 1000 pF ± 20%, 50 VDCW (90634) (07216 SCD 913-1299-010)	13	
-23	GL10-101M	. CAPACITOR, Fixed, ceramic, 100 pF ± 20%, 50 VDCW (90634) (07216 SCD 913-3114-010)	1	
-24	C11A682K	. CAPACITOR, Fixed, ceramic, 6800 pF ± 10%, 100 VDCW (16546) (07216 SCD 913-4298-040)	1	
-25	1025-08	. COIL, RF, 0.33 microhenries ± 10% (99800) (07216 SCD 240-2017-000)	3	
-26	1025-12	. COIL, RF, 0.47 microhenries ± 10% (99800) (07216 SCD 240-2019-000)	3	
-27	1025-48	. COIL, RF, 15.0 microhenries ± 10% (99800) (07216 SCD 240-2037-000)	2	
-27A	RC05GF100J	. RESISTOR	1	
-28	RC05GF331J	. RESISTOR	2	
-29	RC05GF471J	. RESISTOR	2	
-30	RC05GF681J	. RESISTOR	2	
-31	RC05GF102J	. RESISTOR	1	
-32	RC05GF272J	. RESISTOR	1	
-33	RC05GF392J	. RESISTOR	1	
-34	RC05GF472J	. RESISTOR	1	
-34A	RC05GF222J	. RESISTOR	1	
-35	RC05GF123J	. RESISTOR	1	
-36	RC05GF822J	. RESISTOR	2	
-37	RC05GF103J	. RESISTOR	1	
-38	RC05GF153J	. RESISTOR	2	
-39	567-8558-001	. TRANSFORMER, Balun	1	
-40	2N918/50	. TRANSISTOR	3	
-41	567-8469-001	. HOLDER, Transistor	3	
-42	K2107	. TRANSISTOR (20754) (07216 SCD 352-0875-000)	2	
	567-8573-001	. FRAME AND TERMINAL ASSY	1	
-43	FT-2SM-1164	. . TERMINAL, Feedthru (98291) (07216 SCD 306-1276-000)	11	
-44	DP-289-304	. . TERMINAL, Standoff (21242) (07216 SCD 306-2543-000)	25	
-45	567-8574-001	. . FRAME, Machined	1	

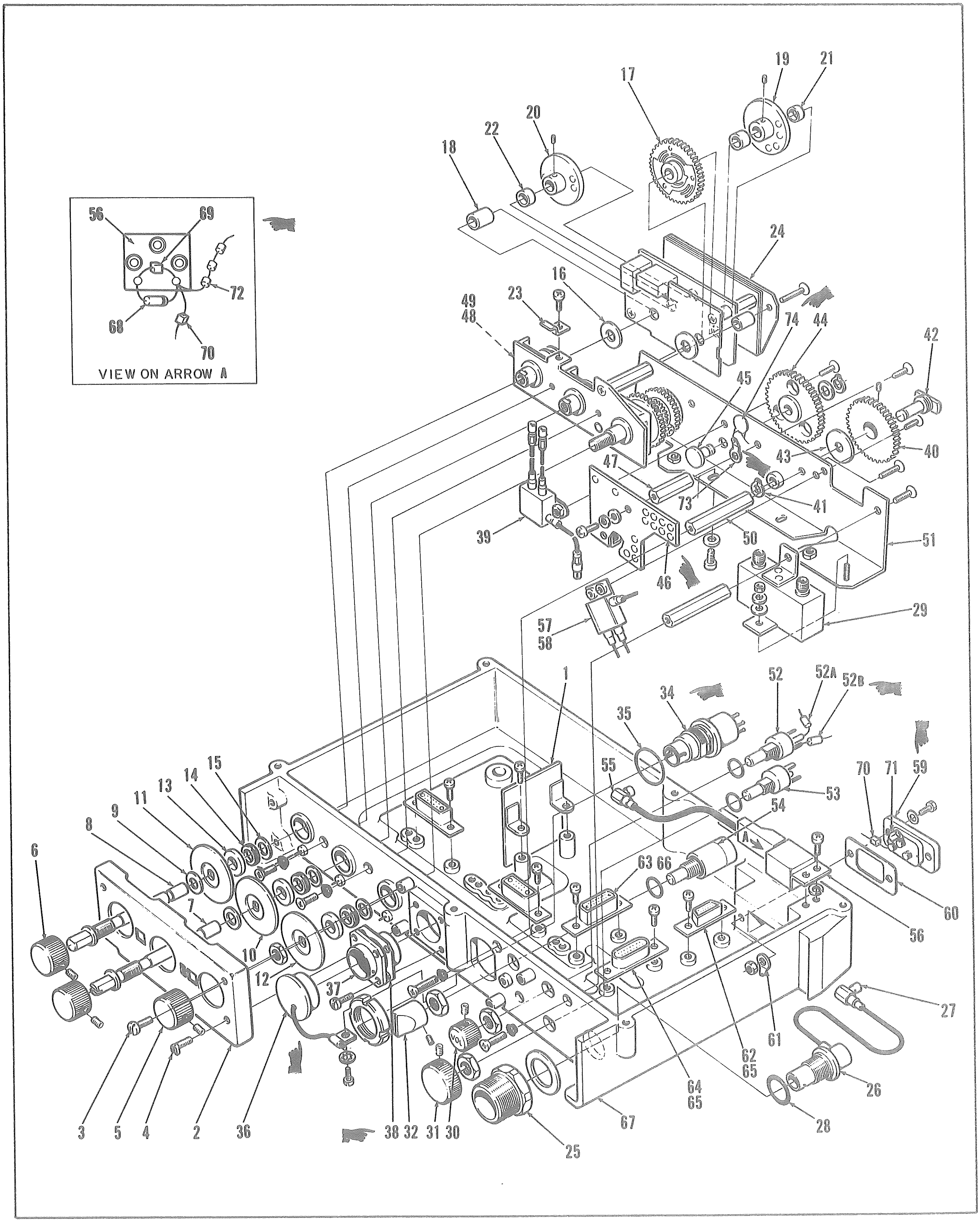


Figure 6-17. Main Chassis and Control Head

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-17-	780-0536-001	MAIN CHASSIS AND CONTROL HEAD (See item 11 .... figure 3 for location in NHA)	REF	
-1	780-0645-001	. AMPLIFIER, Wideband (See figure 18 for breakdown) ...	1	
	P347-0005-000	. SCREW, Machine, stainless steel, passivated, ... fillister head, 4-40 UNC-2A x 3/16 in. lg (77250) (07216 SCD 347-0005-000) (AP)	2	
	310-0278-000	. WASHER, Lock, cres, passivated, No. 4 (AP)..........	2	
-2	780-0581-001	. COVER PLATE, Front	1	
-3	780-1838-001	. SCREW, Special (AP)*..............................	2	
-4	780-1839-001	. SCREW, Special (AP)*..............................	2	
-5	780-0931-002	. KNOB, Control	1	
-6	780-0931-001	. KNOB, Control	2	
	MS51963-9	. SETSCREW (AP)	6	
-7	567-8777-001	. SHAFT, Detent No. 2	1	
-8	567-8778-001	. SHAFT, Detent No. 3	1	
-9	NAS-1598D(-04)Y	. WASHER, Sealing (02697) (07216 SCD 200-0704-010)	2	
-10	780-0583-001	. DIAL, No. 2	1	
-11	780-0584-001	. DIAL, No. 3	1	
-12	780-0582-001	. DIAL, No. 1	1	
	P334-0265-000	. NUT, Plain, hexagon, cres, passivated, 10-32 UNF-2B . (77250) (07216 SCD 334-0265-000) (AP)	1	
-13	780-0930-001	. SPACER, Dial....................................	3	
-14	Q4011	. GASKET, Quad ring (07322) (07216 SCD 200-2390-030) ..	3	
-15	567-8776-001	. WASHER, Flat, no. 2	3	
-16	567-8779-001	. WASHER, Non-metallic	2	
-17	567-8851-001	. CONTACT, Electrical, no. 1	1	
-18	567-8788-002	. SPACER, Sleeve	1	
-19	567-8858-001	. CONTACT, Electrical, no. 2	1	
-20	567-8864-001	. CONTACT, Electrical, no. 3	1	
	328-0368-000	. SETSCREW, Multiple spline, alloy steel, cadmium ..... plate, 2-56 NC-3A x 3/32 in. lg (08664) (07216 SCD 328-0368-000) (AP)	4	
-21	567-8788-001	. SPACER, Sleeve	2	
-22	567-8788-003	. SPACER, Sleeve	2	
-23	567-9396-001	. BRACKET, Mounting	2	
	MS51957-2	. SCREW (AP)	2	
-24	567-8873-001	. CIRCUIT CONTROL ASSY (See figure 19 for breakdown) .	1	
	MS51959-3	. SCREW (AP)	2	
	2W	. WASHER, Nylon (04865) (07216 SCD 302-0645-010) (AP) .	2	
-25	567-8906-001	. NUT, Adaptor	1	
	567-8869-001	. CONNECTOR ASSY, Antenna	1	
-26	4037	. . CONNECTOR, Receptacle, electrical (17549) .... (07216 SCD 357-7506-010)	1	
-27	52-204	. . CONNECTOR, Plug, electrical (98278) (07216 .... SCD 357-9440-010)	1	
-28	A200-2376-080	. GASKET (02988) (07216 SCD 200-2376-080)	1	
-29	5412	. FILTER, Low pass, 400 MHZ (70998) (07216 SCD ...... 241-0574-010)	1	
	310-0070-000	. WASHER, Lock, cres, passivated, no. 2 (79807) .... (07216 SCD 310-0070-000)	1	
	310-6320-000	. WASHER, Flat, cres, passivated, no. 2 (79807) .... (07216 SCD 310-6320-000) (AP)	1	
	MS35649-224	. NUT (AP)	1	
-30	N281-0624-080	. KNOB, Control, aluminum (07886) (07216 SCD .... 281-0624-080)	1	
-31	780-1077-001	. KNOB, Squelch control	1	
-32	780-0919-001	. KNOB, Control	1	
	MS51963-9	. SETSCREW (AP)	6	
-33	NOT USED			
		* When replacement is required, use screw P/N CPN 343-0667-000 (07216) FSN 5305-722-2989		

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-17-34	CSK 314	. CONNECTOR (12294) (07216 SCD 370-0018-010)	1	
-35	A200-2376-070	. GASKET (02988) (07216 SCD 200-2376-070)	1	
-36	780-2074-001	. CAP, Protection	1	
	343-0669-000	. SCREW, Machine, stainless steel, chemical black, ... pan head, 2-56 UNC-2A x 3/16 in. lg (77250) (07216 SCD 343-0669-00)	1	
	373-8500-000	. WASHER, Lock, internal tooth, cres, passivated, ... No. 2 (96906) (07216 SCD 373-8500-00) (AP)	1	
-37	CSK2285	. CONNECTOR, Receptacle, electrical .... (77820) (07216 SCD 371-9018-010)	1	
	P343-0019-000	. SCREW, Machine, stainless steel, chemical black, ... pan head, 4-40 UNC-2A x 1/4 in. lg (77250) (07216 SCD 343-0019-000) (AP)	4	
-38	10-101949-10	. GASKET, Flange (77820) (07216 SCD 371-8502-000)	1	
-39	567-8884-001	. TRANSFORMER	1	
	MS51959-2	. SCREW (AP)	2	
-40	567-8740-001	. GEAR, 80 teeth	1	
	MS51981-1	. SETSCREW (AP)	2	
-41	MS16633-1018	. RING, Retaining	1	
-42	567-8739-001	. SHAFT	1	
-43	567-8915-001	. SPACER, No. 4	1	
-44	567-8903-001	. GEAR, Idler, 104 teeth	1	
	MS16633-1018	. RING, Retaining (AP)	1	
	310-0150-000	. WASHER, Spring (79807) (07216 SCD 310-0150-000)	1	
-45	780-0476-001	. SHAFT, Stub	1	
-46	780-0603-001	. ATTENUATOR ASSY (See figure 20 for breakdown)	1	
	MS51959-2	. SCREW (AP)	3	
	MS51957-2	. SCREW (AP)	1	
	310-6320-000	. WASHER, Flat, cres, passivated, no. 2 (79807) .... (07216 SCD 310-6320-000) (AP)	1	
-47	780-0687-001	. POST, Hex, 7/16 in. lg	1	
-48	1/8SS BALL TYPE E440GR100	. BALL, Bearing, 1/8 in. diameter, stainless steel ..... (27545) (07216 SCD 309-0019-000)	4	
-49	567-8766-001	. SPRING, Detent, flat	4	
-50	567-8741-001	. POST, Hex	2	
	MS51959-3	. SCREW (AP)	2	
	2W	. WASHER, Nylon (04865) (07216 SCD 302-0645-010) (AP).	2	
	MS51959-4	. SCREW (AP)	2	
-51	780-0541-001	. DIFFERENTIAL ASSY, Mounted (See figure 21 for ..... breakdown)	1	
	MS51959-3	. SCREW (AP)	2	
	2W	. WASHER, Nylon (04865) (07216 SCD 302-0645-010) (AP).	2	
	MS51959-4	. SCREW (AP)	2	
-52	SX2887-15K	. RESISTOR, Variable, 15 kilohms (21030) (07216 SCD ... 382-0010-020)	1	
-52A	RC05GF470J	. RESISTOR	1	
-52B	172D825X9015L2	. CAPACITOR, Fixed, tantalum, tubular insulated, ... 8.2 uF ± 10%, 15/10 VDCW (56289) (07216 SCD 184-9079-040)	1	
-53	NO NUMBER	. RESISTOR, Variable, 15 kilohms, 1/2 W (21030) ...... (07216 SCD 382-0021-010)	1	
-54	NO NUMBER	. SWITCH, Rotary (76854) (07216 SCD 259-2758-010)	1	
	780-0540-001	. RELAY ASSY	1	
	MS51957-2	. SCREW (AP).......................................	2	
	310-0070-000	. WASHER, Lock, cres, passivated, no. 2 (79807) ...... (07216 SCD 310-0070-000) (AP)	2	
-55	52-204	. . CONNECTOR, Plug, electrical (98278) (07216 SCD .. 357-9440-010)	1	
-56	RFC-126	. . RELAY, Armature (02289) (07216 SCD .... 974-1091-010)	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-17-57	780-0938-001	. . COVER, T-junction	1	
-58	780-0939-001	. . BOX, T-junction	1	
-59	491-101	. CONNECTOR, Plug, shell and 3 pin contacts (03554) (07216 SCD 370-0017-010)	1	
	MS51957-15	. SCREW (AP)	1	
	MS51957-16	. SCREW (AP)	1	
	4W	. SEAL, Washer, nylon, No. 2 (04865) (07216 SCD 302-0645-000)	2	
	P313-0156-000	. NUT, Plain, hex, brass, nickel plated, 4-40 UNC-2B (77250) (07216 SCD 313-0156-000)	1	
-60	567-8913-001	. GASKET	1	
-61	4007-4HT	. TERMINAL, Lug, copper, tin plated (77147) (07216 SCD 304-0015-000)	1	
-62	470-0003	. CONNECTOR SHELL, Plug (03554) (07216 SCD 370-0014-020)	1	
-63	471-0003	. CONNECTOR SHELL, Plug (03554) (07216 SCD 370-0009-010)	3	
-64	470-0007	. CONNECTOR SHELL, Plug (03554) (07216 SCD 370-0015-030)	1	
	LP35216-3M	. SCREW, Self-locking, stainless steel, passivated, 2-56 NC-2A x 1/4 in. lg (03038) (07216 SCD 330-2633-000) (AP)	10	
-65	470-0021	. CONTACT, Pin (03554) (07216 SCD 370-0015-050)	24	
-66	471-0002	. CONTACT, Socket (03554) (07216 SCD 370-0009-040)	14	
-67	780-0537-001	. CHASSIS	1	
-68	1N3064	. DIODE	1	
-69	SSM-001-64	. CAPACITOR, Fixed, ceramic, 1000 pF ± 20%, 50 VDCW (90634) (07216 SCD 913-1299-010)	1	
-70	MINT47K	. CAPACITOR, Fixed, ceramic, 47 pF ± 10%, 100 VDCW (90634) (07216 SCD 913-1098-190)	2	
-71	C11A152K	. CAPACITOR, Fixed, ceramic, 1500 pF ± 10%, 100 VDCW (16546) (07216 SCD 913-4248-020)	1	
-72	F1913-1-01	. BEAD, Ferrite (72656) (07216 SCD 288-2154-000)	3	
-73	4040-2HDSPL	. TERMINAL, Lug (77147) (07216 SCD 304-0331-00)	1	
-74	40C73A1	. CAPACITOR, Fixed, ceramic, 1000 pF ± 20%, 500 VDCW (01939) (07216 SCD 913-3009-000)	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-18-	780-0645-001	AMPLIFIER, Wideband (See item 1 figure 17 for location .. in NHA)	REF	
-1	150D224X9035A2	. CAPACITOR, Fixed, electrolytic, 0.22 uF ± 10%, ... 35 VDCW (56289) (07216 SCD 184-7722-000)	1	
-2	150D155X9020A2	. CAPACITOR, Fixed, electrolytic, 1.5 uF ± 10%, ... 35 VDCW (56289) (07216 SCD 184-9063-050)	1	
-3	TC-100-144	. CAPACITOR, Fixed, ceramic, 100 pF ± 5%, ... 100 VDCW (90634) (07216 SCD 913-4490-160)	1	
-4	1N4663	. DIODE	1	
-5	1N4656	. DIODE	1	
-6	WEE1000-8	. COIL, RF, 1.0 microhenries ± 2% (72259) (07216 ...... SCD 240-1065-000)	1	
-7	2N997	. TRANSISTOR	1	
-8	2N2907	. TRANSISTOR	1	
-9	RS-1B100J	. RESISTOR, Fixed, wirewound, 100 ohms ± 5%, 1W ... (91637) (07216 SCD 746-9777-000)	1	
-10	RC05GF124J	. RESISTOR	1	
-11	RC05GF684J	. RESISTOR	1	
-12	RC05GF392J	. RESISTOR	1	
-13	RC05GF102J	. RESISTOR	1	
-14	RC05GF182J	. RESISTOR	1	
-15	780-0761-001	. INSULATOR, Transistor	2	
-16	780-0648-001	. BOARD, Printed circuit	1	
-17	RC05GF103J	. RESISTOR	2	

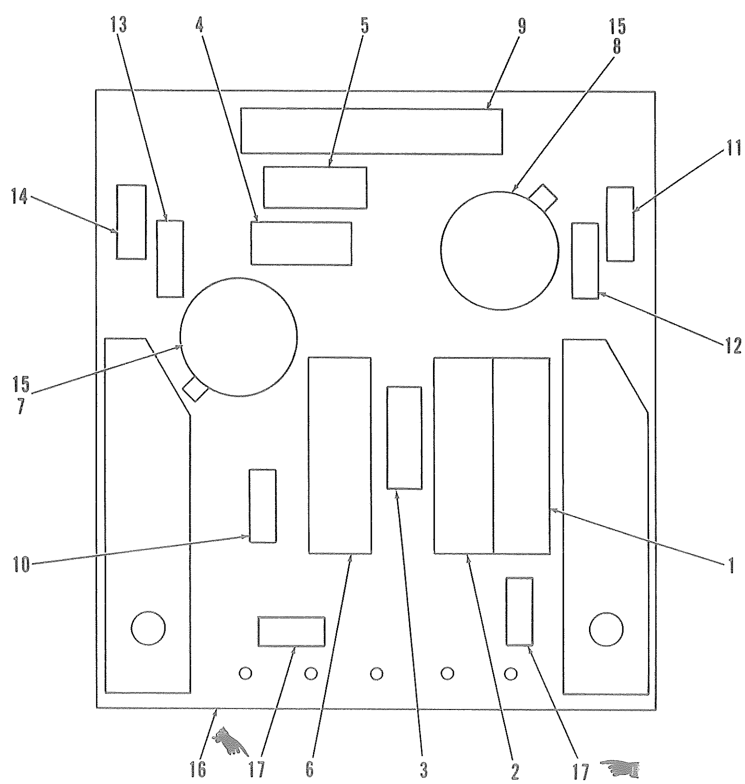


Figure 6-18. Wideband Amplifier

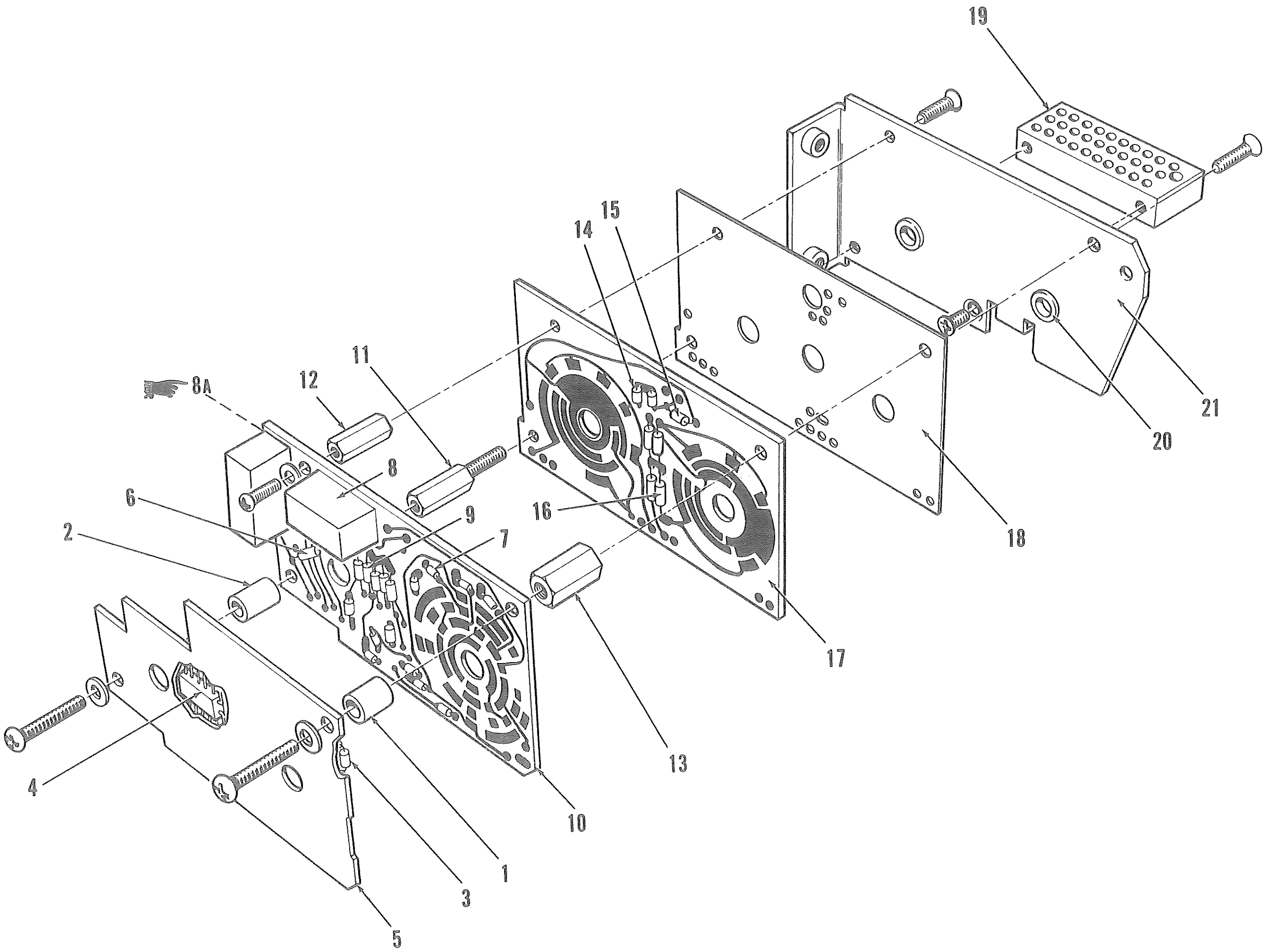


Figure 6-19. Circuit Control Assembly

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-19-	567-8873-001	CIRCUIT CONTROL ASSY (See item 24 figure 17 for ...... location in NHA)	REF	
	567-8875-001	. CIRCUIT ASSY, No. 1	1	
	MS51957-6	. SCREW (AP)	1	
	P323-0303-040	. SCREW, Machine, cres, passivated, pan head, ... 0-80 UNF-2A x 3/8 in. lg (77250) (07216 SCD 323-0303-040) (AP)	1	
	310-0129-000	. WASHER, Flat, brass, nickel plated, no. 2 (05411) .... (07216 SCD 310-0129-000) (AP)	1	
	310-0128-000	. WASHER, Flat, brass, silver plated, no. 0 (05411) .... (07216 SCD 310-0128-000) (AP)	1	
-1	567-8920-002	. SPACER (AP)	1	
-2	567-8920-001	. SPACER (AP)	1	
-3	1N3207	. . DIODE	11	
-4	WM286G	. . INTEGRATED CIRCUIT, DTL NAND GATE (24044) .. (07216 SCD 351-7256-010)	1	
-5	567-8876-001	. . BOARD, Printed circuit, no. 1	1	
	567-8877-001	. CIRCUIT ASSY, No. 2	1	
	P323-0303-020	. SCREW, Machine, cres, passivated, pan head, ... 0-80 UNF-2A x 7/32 in. lg (77250) (07216 SCD 323-0303-020) (AP)	1	
	310-0128-000	. WASHER, Flat, brass, silver plated, no. 0 (05411) .... (07216 SCD 310-0128-000) (AP)	1	
-6	1N3064	. . DIODE	1	
-7	1N3207	. . DIODE	13	
-8	BR44-510	. . RELAY, Armature (09026) (07216 SCD 974-1080-030).	2	
-8A	RCRP500020-1A	. . INSULATOR, Relay, plastic (19080) .... (07216 SCD 150-0684-100)	2	
-9	RC05GF513J	. . RESISTOR	5	
-10	567-8878-001	. . BOARD, Printed circuit, no. 2	1	
-11	567-8919-001	. POST, Spacer	1	
-12	567-8922-001	. POST, Hex	1	
	P322-0169-000	. SCREW, Machine, stainless steel, passivated, flat .... head, 0-80 UNF-2A x 3/16 in. lg (77250) (07216 SCD 332-0169-000) (AP)	1	
-13	567-8921-001	. POST, Spacer	1	
	MS51959-3	. SCREW (AP)	1	
	567-8880-001	. CIRCUIT ASSY, No. 3	1	
-14	1N3207	. . DIODE	2	
-15	RC05GF103J	. . RESISTOR	1	
-16	RC05GF513J	. . RESISTOR	4	
-17	567-8881-001	. . BOARD, Printed circuit, no. 3	1	
-18	567-8918-001	. BOARD, Insulator	1	
-19	451-10301-00	. CONNECTOR, Receptacle, electrical, 30 socket .... contacts, 1 coax receptacle (03554) (07216 SCD 370-0012-020)	1	
	MS51959-2	. SCREW (AP)	1	
	567-8874-001	. PLATE, Bottom, no. 2	1	
-20	567-8925-001	. . BEARING, No. 4	2	
	R-22NCFMA1-26	. . NUT, Self-locking, carbon steel, cadmium plate, ... olive drab colored chromate treatment, 2-56 UNC-3B (72962) (07216 SCD 333-0837-000)	2	
-21	567-8924-001	. . PLATE, Mounting, no. 2	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-20-	780-0603-001	ATTENUATOR ASSY (See item 46 figure 17 for location in NHA)	REF	
-1	172D825X9015L2	. CAPACITOR, Fixed, tantalum, tubular insulated 8.2 uF ± 10%, 15 VDCW (56289) (07216 SCD 184-9079-040)	1	
-2	C12A104K	. CAPACITOR, Fixed, ceramic, 0.10 uF ± 10%, 100 VDCW (16546) (07216 SCD 913-5012-020)	2	
-3	UTX-205	. DIODE, Semiconductor, silicon, fast recovery switching (12969) (07216 SCD 353-6493-010)	1	
-4	RC05GF152J	. RESISTOR	2	
-5	RC05GF393J	. RESISTOR	1	
-6	RC05GF121J	. RESISTOR	1	
-7	RC05GF242J	. RESISTOR	2	
-8	RC05GF682J	. RESISTOR	1	
-9	RC05GF183J	. RESISTOR	1	
-10	780-0604-001	. BOARD ASSY, Staked	1	

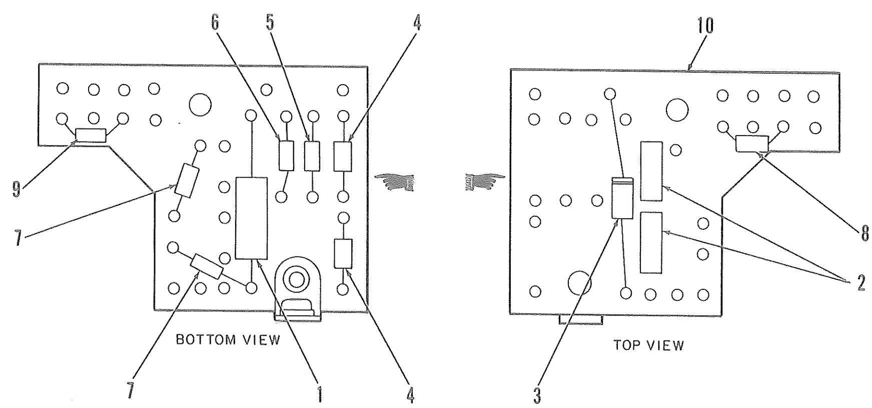


Figure 6-20. Attenuator Assembly

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-21-	780-0541-001	DIFFERENTIAL ASSY, Mounted (See item 51 figure 17 for location in NHA)	REF	
-1	567-8741-001	. POST, Hex	1	
	P330-2284-000	. SCREW, Machine, cres, passivated, flat head, 2-56 UNC-2A x 3/16 in. lg (77250) (07216 SCD 330-2284-000) (AP)	2	
-2	567-8748-001	. CAM, Control	1	
	MS16998-2	. SCREW (AP)	1	
-3	567-8747-001	. WASHER, Cam	1	
-4	567-8746-001	. WHEEL, Detent, no. 3	1	
-5	567-8740-001	. GEAR, 80 teeth	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-21-	MS51053-102	. SETSCREW (AP)	2	
	780-0542-001	. PLATE, Mounting, bottom	1	
-6	567-8758-001	. . BEARING, No. 1	1	
-7	567-8759-001	. . BEARING, No. 3	1	
-8	567-8760-001	. . BEARING, No. 5	1	
-9	780-0543-001	. . PLATE, Bottom, staked	1	
-10	567-8914-001	. SHAFT	1	
	MS51053-102	. SETSCREW (AP)	2	
-11	567-8745-001	. GEAR, Spur, no. 3, 18 teeth	1	
	328-0368-000	. SETSCREW, Alloy steel, cadmium plated, 2-56 NC-3A x 3/32 in. lg (08664) (07216 SCD 328-0368-000) (AP)	2	
-12	567-8743-001	. PINION, Spur, 21 teeth	1	
-13	567-8744-001	. WASHER, Spacing	1	
-14	MS16633-1012	. RING, Retaining	1	
-15	567-8742-001	. SHAFT, Idler	1	
	567-8847-001	. DETENT, No. 1	1	
-16	567-8766-002	. . SPRING, Detent, flat, no. 4	2	
-17	1/8SS BALL TYPE E440GR100	. . BALL, Bearing, stainless steel, 1/8 in. diameter (27545) (07216 SCD 309-0019-000)	2	
-18	5614CHH-3P15U02	. . BEARING, Ball, annular (40920) (07216 SCD 309-1522-000)	1	
-19	567-8765-001	. . WHEEL, Detent	1	
-20	567-8763-001	. . WASHER	1	
-21	567-8764-001	. . GEAR, 75 teeth	1	
	328-0368-000	. . SETSCREW, Alloy steel, cadmium plated, 2-56 NC-3A x 3/32 in. lg (08664) (07216 SCD 328-0368-000) (AP)	2	
-22	S.1.101F-3021	. . DIFFERENTIAL GEAR UNIT, Flange type (09380) (07216 SCD 990-0956-010)	1	
-23	567-8848-001	. . ARM, Cam	1	

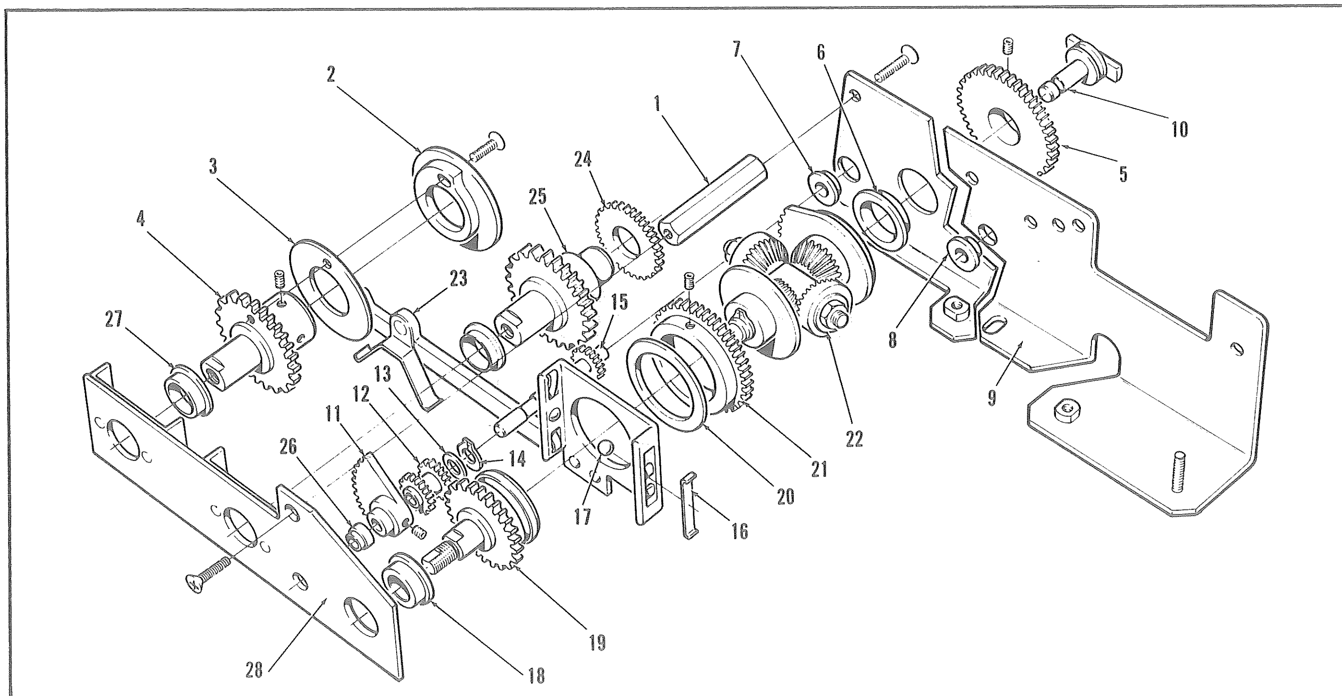


Figure 6-21. Differential Assembly

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-21-	567-8850-001	. WHEEL, Detent, no. 2	1	
-24	567-8774-001	. . GEAR, Spur, no. 4, 32 teeth	1	
-25	567-8773-001	. . WHEEL, Detent, no. 2	1	
	567-8841-001	. PLATE, Mounting, top	1	
-26	567-8750-001	. . BEARING, No. 2	1	
-27	5614CHH-3P15U02	. . BEARING, Ball, annular (40920) (07216 SCD 309-1522-000)	2	
-28	567-8842-001	. . PLATE, Mounting, top, riveted	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-22-	787-6534-001	BOX, BATTERY CY-6327A/PRC-66 (See item 5 figure 1 for location in NHA)	REF	
-1	780-1865-001	. CONNECTOR ASSY	1	
	P343-0022-000	. SCREW, Machine, stainless steel, chemical black, pan head, 4-40 UNC-2A x 7/16 in. lg (77250) (07216 SCD 343-0022-000) (AP)	2	
-2	780-2906-001	. . PAD, End	1	
	780-1867-001	. BOX, Sub-assy	1	
-3	VHC 340-2 (black passivate)	. . CATCH, Spring, cres, black passivated (98003) (07216 SCD 015-1097-020)	1	
-4	VHS 340 (black passivate)	. . STRIKE, Catch, cres, black passivated (98003) (07216 SCD 015-1097-040)	1	
	MS51959-2	. . SCREW (AP)	4	
-5	780-1937-001	. . ENCLOSURE ASSY	1	

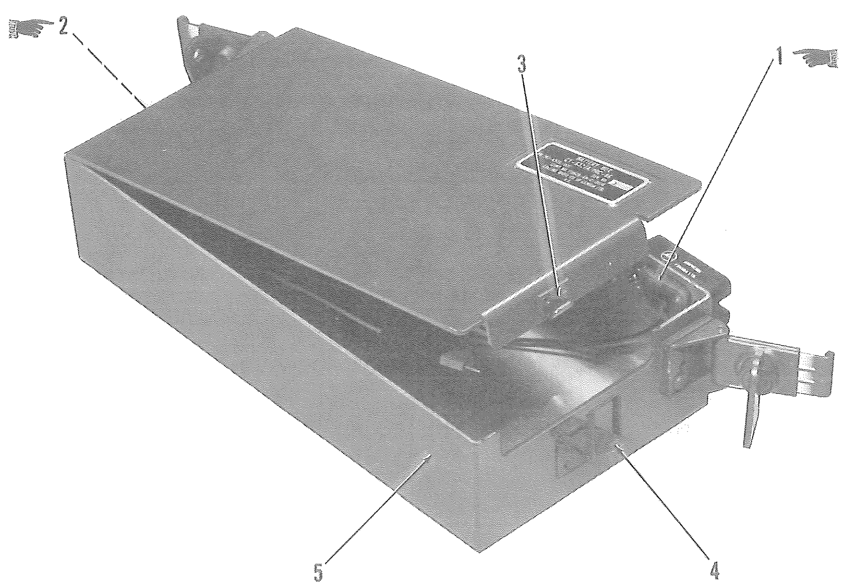


Figure 6-22. Box, Battery CY-6327A/PRC-66

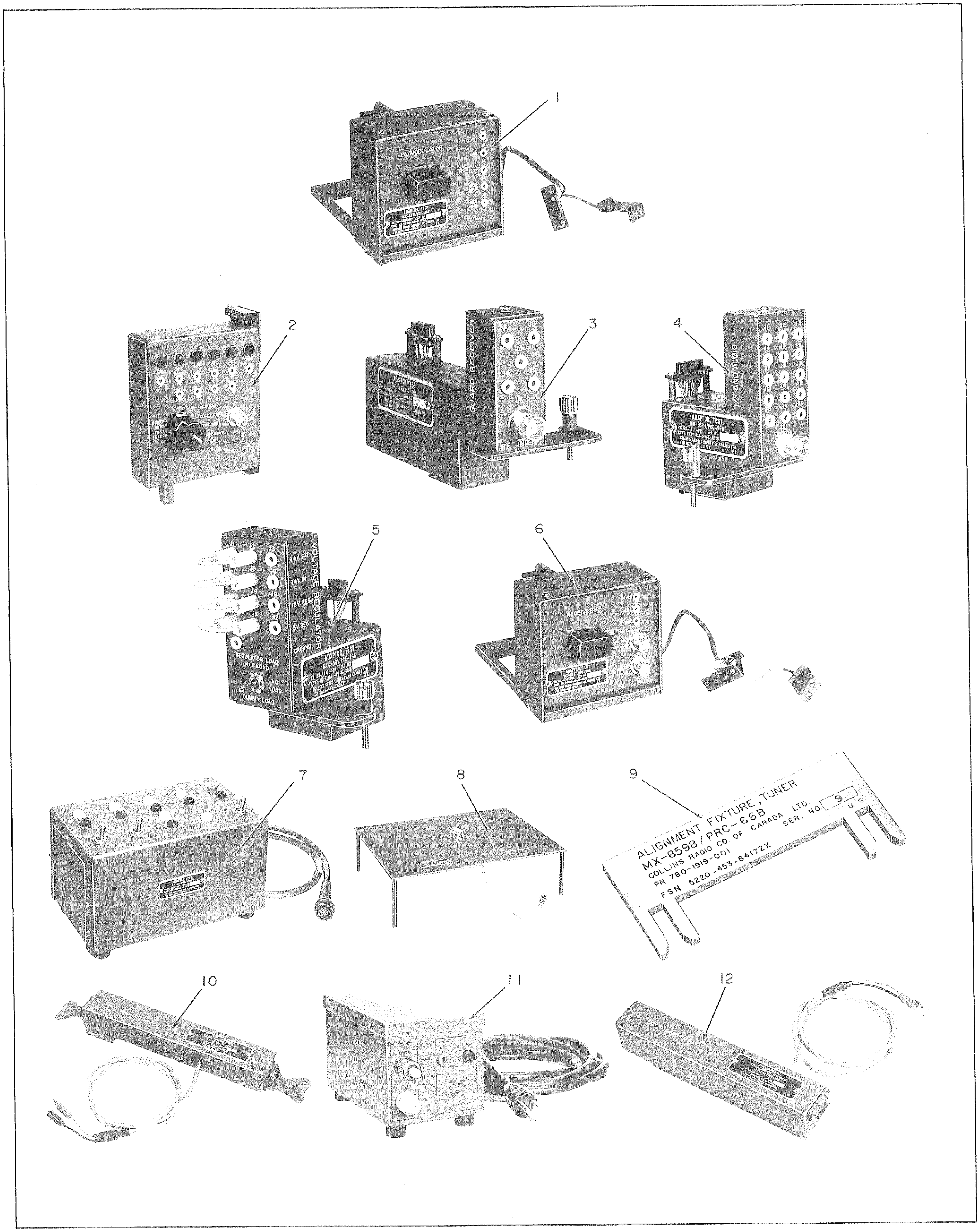


Figure 6-23. Special Support Equipment

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-23-	LIST ONLY	SPECIAL SUPPORT EQUIPMENT		
-1	780-1908-001	. ADAPTER, TEST MX-8591/PRC-66B .... (See figure 24 for breakdown)	1	
-2	780-1905-001	. ADAPTER, TEST MX-8592/PRC-66B .... (See figure 25 for breakdown)	1	
-3	780-1910-001	. ADAPTER, TEST MX-8593/PRC-66B .... (See figure 26 for breakdown)	1	
-4	780-1911-001	. ADAPTER, TEST MX-8594/PRC-66B .... (See figure 27 for breakdown)	1	
-5	780-1912-001	. ADAPTER, TEST MX-8595/PRC-66B .... (See figure 28 for breakdown)	1	
-6	780-1914-001	. ADAPTER, TEST MX-8597/PRC-66B .... (See figure 29 for breakdown)	1	
-7	780-1913-001	. ADAPTER, TEST MX-8596/PRC-66B .... (See figure 30 for breakdown)	1	
-8	780-1915-001	. ADAPTER, TEST MX-8599/PRC-66B .... (See figure 31 for breakdown)	1	
-9	780-1919-001	. ALIGNMENT FIXTURE, TUNER MX-8598/PRC-66B ... (See figure 32 for breakdown)	1	
-10	787-6841-001	. CABLE ASSY, SP, ELECT CX-12158/PRC-66B .... (See figure 33 for breakdown)	1	
-11	780-1920-001	. CHARGER, BATTERY PP-6427/PRC-66B .... (See figure 34 for breakdown)	1	
-12	787-6839-001	. CABLE ASSY, SP, ELECT CX-12159/PRC-66B .... (See figure 35 for breakdown)	1	

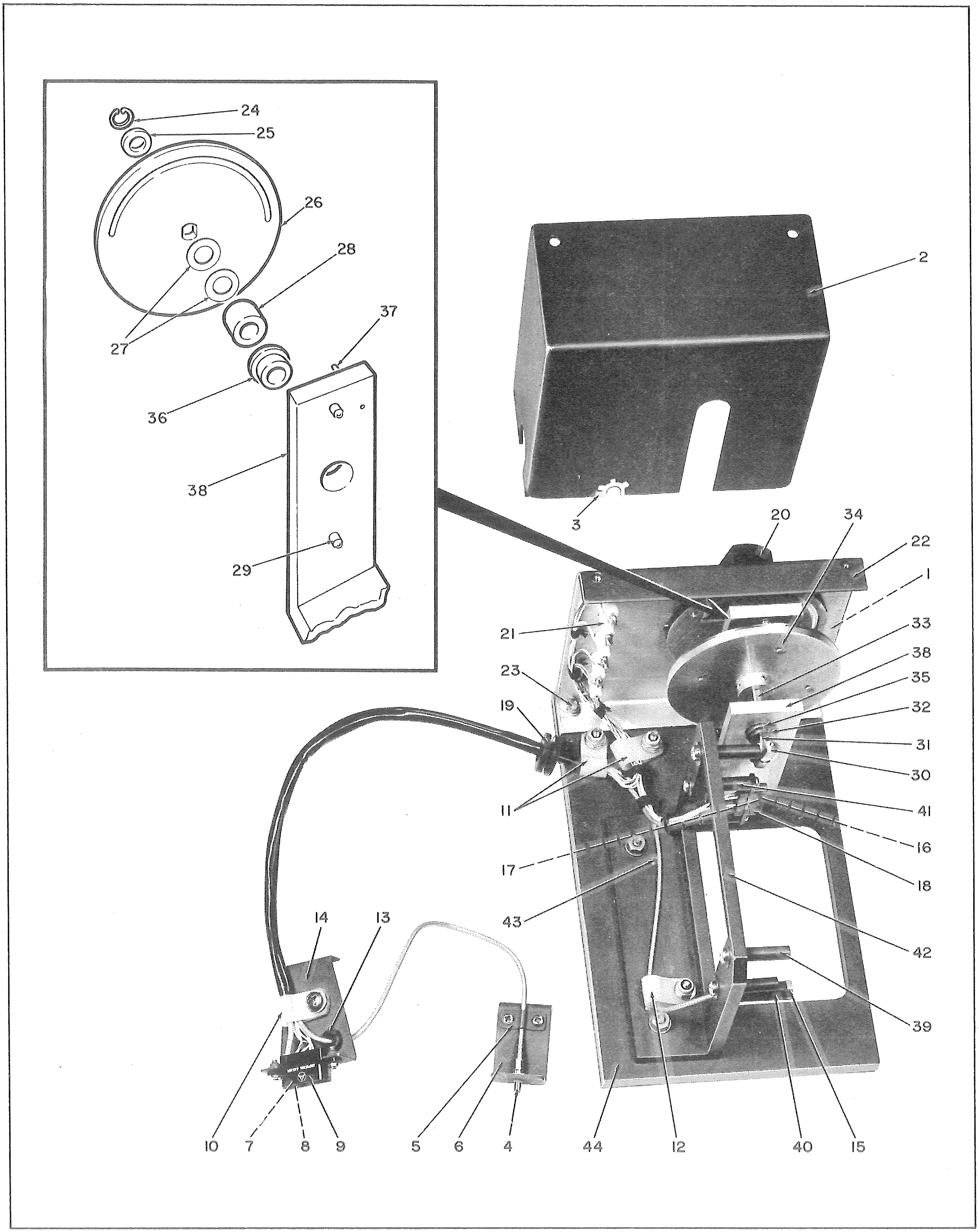


Figure 6-24. Adapter, Test MX-8591/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-24-	780-1908-001	ADAPTER, TEST MX-8591/PRC-66B (See item 1 figure 23 for location in list)	REF	
-1	780-3318-001	. PLATE, Identification	1	
	MS51957-14	. SCREW (AP)	2	
-2	780-2444-001	. PLATE, Rear	1	
	MS51957-18	. SCREW (AP)	4	
	310-6340-000	. WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	4	
-3	MS21266-2N	. PLASTIC CHANNEL	1	
-4	460-206	. CONNECTOR ASSY, Coaxial plug (03554) (07216 SCD 357-7320-010)	1	
-5	780-3719-001	. CLAMP, Cable	1	
	MS51957-14	. SCREW (AP)	2	
-6	780-3718-001	. PLATE, Relief	1	
-7	471-0001	. PIN, Contact (03554) (07216 SCD 370-0009-030)	5	
-8	460-205	. CONNECTOR ASSY, Coaxial, plug (03554) (07216 SCD 357-7321-010)	1	
-9	470-0004	. CONNECTOR, Shell, receptacle (03554) (07216 SCD 370-0009-020)	1	
	MS51957-3	. SCREW (AP)	2	
-10	MS25281-5	. CLAMP, Loop	1	
	MS51957-28	. SCREW (AP)	1	
	310-0046-000	. WASHER, Flat, cres, No. 6 small (07216 SCD 310-0046-000) (AP)	1	
-11	MS25281-5	. CLAMP, Loop	2	
	342-0157-000	. SCREW, Machine, pan head Phillips, brass, nickel plated, 4-40UNC-2A x 5/8 in. lg (07216 SCD 342-0157-000) (AP)	2	
	310-0045-000	. WASHER, Flat, cres, No. 4 (07216 SCD 310-0045-000) (AP)	2	
	68NM40	. NUT, Hex, self-locking, aluminum, 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000) (AP)	2	
-12	MS25281-5	. CLAMP, Loop	1	
	342-0159-000	. SCREW, Machine, flat head Phillips, brass, nickel plated, 4-40UNC-2A x 7/8 in. lg. (07216 SCD 342-0159-000) (AP)	1	
	310-0045-000	. WASHER, Flat, cres, No. 4 (07216 SCD 310-0045-000) (AP)	1	
	68NM40	. NUT, Hex, self-locking, aluminum, 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000) (AP)	1	
-13	MS35489-1	. GROMMET, Rubber	1	
-14	780-2446-001	. PLATE, Relief	1	
-15	460-105	. CONNECTOR ASSY, Coaxial receptacle (03554) (07216 SCD 357-7321-20)	1	
-16	471-0002	. SOCKET, Contact (03554) (07216 SCD 370-0009-040)	5	
-17	20C-46001-03	. CONNECTOR ASSY, Coaxial receptacle, with 12-inch RG-178B/U cable (03554) (07216 SCD 426-0005-020)	1	
-18	470-0003	. CONNECTOR, Shell, plug (03554) (07216 SCD 370-0009-010)	1	
	LP57D26P4HQ	. SCREW, Machine, self-locking, stainless steel, 2-56NC-2A x 1/4 in. lg. (03038) (07216 SCD 330-2633-000) (AP)	2	
-19	MS35489-6	. GROMMET, Rubber	1	
-20	567-3853-002	. KNOB, Control	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-24-21	SKT-0804	. JACK, Tip, teflon insulation, white color (98291) (07216 SCD 360-0479-010)	5	
-22	780-2450-001	. PLATE, Front	1	
-23	MS51959-16	. SCREW (AP)	2	
	780-2447-001	. FRAME ASSEMBLY	REF	
-24	5100-25C	. . RING, Retaining, beryllium copper, for 3/16 in. shaft (79136) (07216 SCD 340-0038-000)	1	
-25	AJ3W	. . WASHER, Thrust, hardened steel, 0.255 in. inside diam, 0.5 in. outside diam (00141) (07216 SCD 310-0772-020)	1	
-26	780-2443-001	. . DIAL, Wheel	1	
-27	331-2020-000	. . SHIM, Plain, brass, 0.002 in. thick, 1/4 in. inside diam, 1/2 in. outside diam (07216 SCD 331-2020-000)	2	
-28	780-2456-001	. . SPACER	1	
-29	SSB-50N	. . PLUNGER, Ball, detent, 8-36 self-locking Class 2A threads (01226) (07216 SCD 015-3270-050)	2	
-30	780-3516-001	. . COUPLER, Shaft	1	
	335-0277-010	. . SETSCREW, Multiple-spline, oval point, alloy steel, cadmium plated, 0-80 UNF x 1/8 in. lg (07216 SCD 335-0277-010) (AP)	2	
-31	MS16624-18	. . RING, Reta'ning	1	
-32	AJ2W	. . WASHER, Thrust, hardened steel, 0.192 in. inside diam, 0.375 in. outside diam (00141) (07216 SCD 310-0772-010)	1	
-33	780-2438-001	. . SHAFT	1	
-34	780-3761-001	. . WHEEL, Detent	1	
	MS51981-1	. . SETSCREW (AP)	1	
	780-2445-001	. . SUPPORT ASSY, Angle	REF	
	MS51959-18	. . SCREW (AP)	4	
	310-6340-000	. . WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6430-000) (AP)	4	
	310-0278-000	. . WASHER, Lock, light spring, split, cres, 0.115 in. inside diam (07216 SCD 310-0278-000) (AP)	4	
	68NM4O	. . NUT, Hex, self-locking, aluminum, 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000) (AP)	4	
-35	F311C	. . . BEARING, Sleeve, flanged, porous bronze, 0.182 in. inside diam, 0.317 in. outside diam x 1/4 in. lg. (70417) (07216 SCD 309-0077-000)	1	
-36	F310C	. . . BEARING, Sleeve, flanged, porous bronze, 0.250 in. inside diam, 0.381 in. outside diam x 3/16 in. lg. (70417) (07216 SCD 309-0083-000)	1	
-37	062-626MDP	. . . PIN, Spring, spiral, medium duty, self-locking, stainless steel, 0.062 in. nom. diam x 5/8 in. lg. (00287) (07216 SCD 311-0458-000)	1	
-38	780-2445-002	. . . SUPPORT, Angle	1	
-39	780-2439-001	. . SUPPORT, Module	4	
	MS51957-16	. . SCREW (AP)	4	
	310-6340-000	. . WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	4	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-24-40	780-2440-001	. . SUPPORT, Coaxial	1	
-41	780-2441-001	. . SUPPORT, Connector	2	
	MS51957-6	. . SCREW (AP)	2	
	310-6320-000	. . WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
-42	780-2437-001	. . PLATE, Mounting	1	
	MS51959-18	. . SCREW (AP)	2	
	310-6340-000	. . WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	2	
	68NM40	. . NUT, Hex, self-locking, aluminum, 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000) (AP)	2	
-43	MS16555-626	. . PIN, Dowel	2	
	780-2436-001	. . PLATE, Base	1	

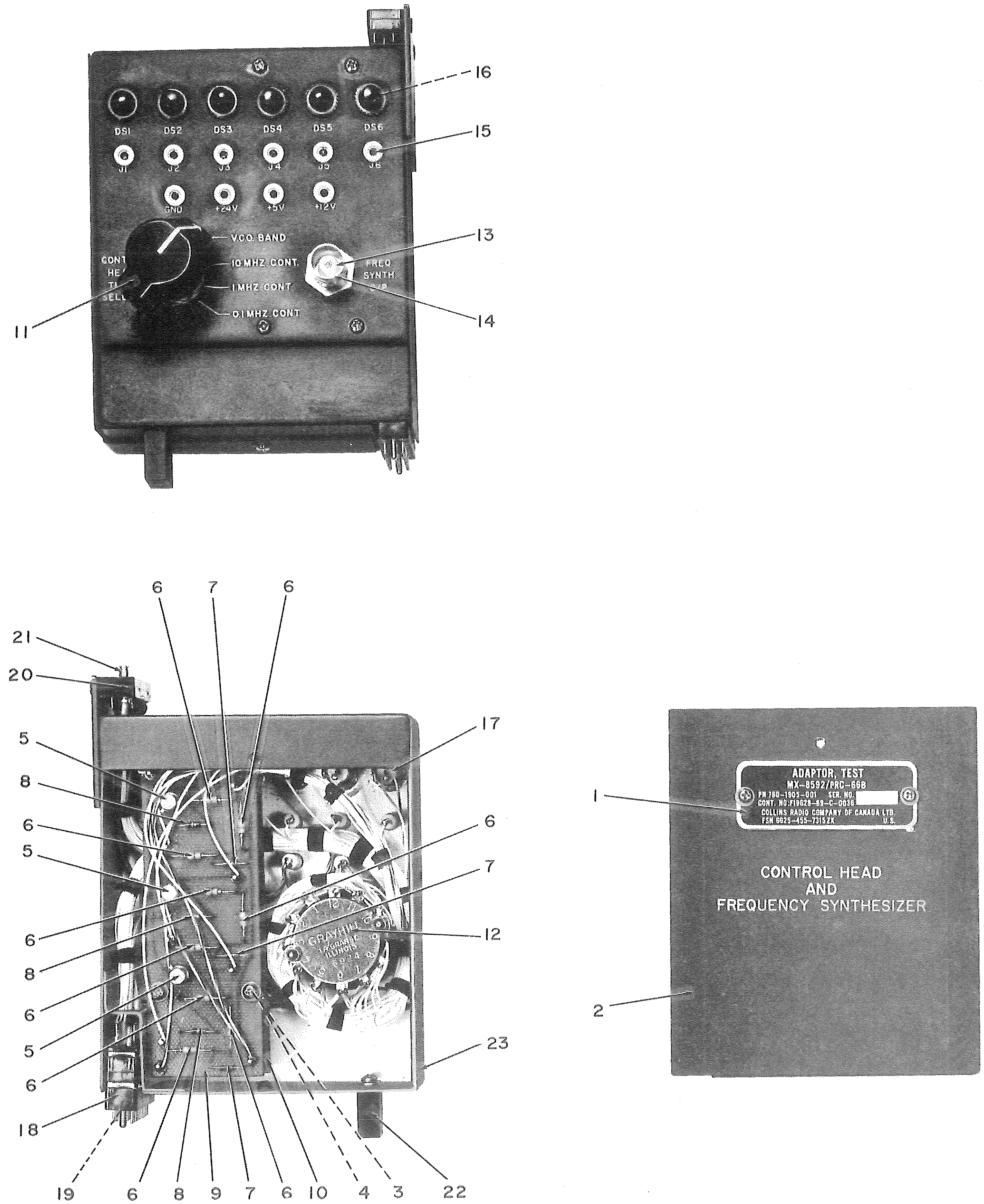


Figure 6-25. Adapter, Test MX-8592/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-25-	780-1905-001	ADAPTER, TEST MX-8592/PRC-66B (see item 2 figure 23 for location in list)	REF	
-1	780-3318-002	. PLATE, Identification	1	
	MS51957-2	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
-2	780-2852-001	. COVER	1	
	MS51957-3	. SCREW (AP)	3	
	780-2912-001	. BOARD ASSY	REF	
	MS51957-6	. SCREW (AP)	4	
-3	780-2922-001	. . POST, Spacer	4	
-4	780-2921-001	. . POST, Spacer	4	
	MS51957-2	. . SCREW (AP)	4	
	310-6320-000	. . WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	4	
	310-0070-000	. . WASHER, Lock, light spring, split, cres, No. 2 (07216 SCD 310-0070-000)	4	
	780-2914-001	. . BOARD, Component, A1 (Top)	REF	
	780-2918-001	. . BOARD, Component, A2 (Bottom)	REF	
-5	JAN2N2221	. . . TRANSISTOR	3	
-6	1N914	. . . DIODE, Semiconductor, max forward volts 1v at 10 ma, max reverse volts 75v, power dissipation 250 mw (07688) (07216 SCD 353-2906-000)	9	
-7	RCR05G822JS	. . . RESISTOR, Fixed	3	
-8	RCR05G103JS	. . . RESISTOR, Fixed	3	
-9	780-3373-001	. . . BOARD, Pressed, A1 (Top)	1	
-10	780-3468-001	. . . BOARD, Pressed, A2 (BOTTOM)	1	
-11	MS91528-1P2B	. KNOB	1	
-12	44A30-02-3-4N	. SWITCH, Rotary, 6 pole, 4 position (81073) (07216 SCD 259-9475-700)	1	
-13	UG-625B/U	. CONNECTOR, Coaxial	1	
-14	0167-3	. TERMINAL, Lug, brass, tin plated, 0.385 in. inside diam, 7/8 in. ear extension with 0.093 in. hole (94375) (07216 SCD 304-1196-000)	1	
-15	360-0479-010	. JACK, Tip, teflon insulation, white color (98291) (07216 SCD 360-0479-010)	10	
-16	64	. LAMP, Incandescent, midget flanged base, T-1 type 28v, 0.024 amp, (17537) (07216 SCD 262-2204-090)	6	
-17	5160-458-604-RED	. LIGHT, Indicator, holder, red lens, subminiature (72763) (SCD 262-2322-070)	6	
-18	451-20301-01	. CONNECTOR, Plug, 30 pin contacts without coax plug (03554) (07216 SCD 370-0012-080)	1	
-19	20C-46002-03	. CONNECTOR ASSY, Coaxial plug, with 12-inch RG-178B/U cable (03554) (07216 SCD 426-0005-010)	1	
	MS51959-1	. SCREW (AP)	2	
-20	451-10301-01	. CONNECTOR, Receptacle, 30 socket contacts without coax receptacle (03554) (07216 SCD 370-0012-070)	1	
-21	20C-46001-03	. CONNECTOR ASSY, Coaxial receptacle, with 12-inch RG-178B/U cable (03554) (07216 SCD 426-0005-020)	1	
	MS51957-2	. SCREW (AP)	2	
-22	780-2851-001	. BLOCK, Chassis	1	
	MS51957-6	. SCREW (AP)	2	
-23	780-2843-001	. CHASSIS	1	

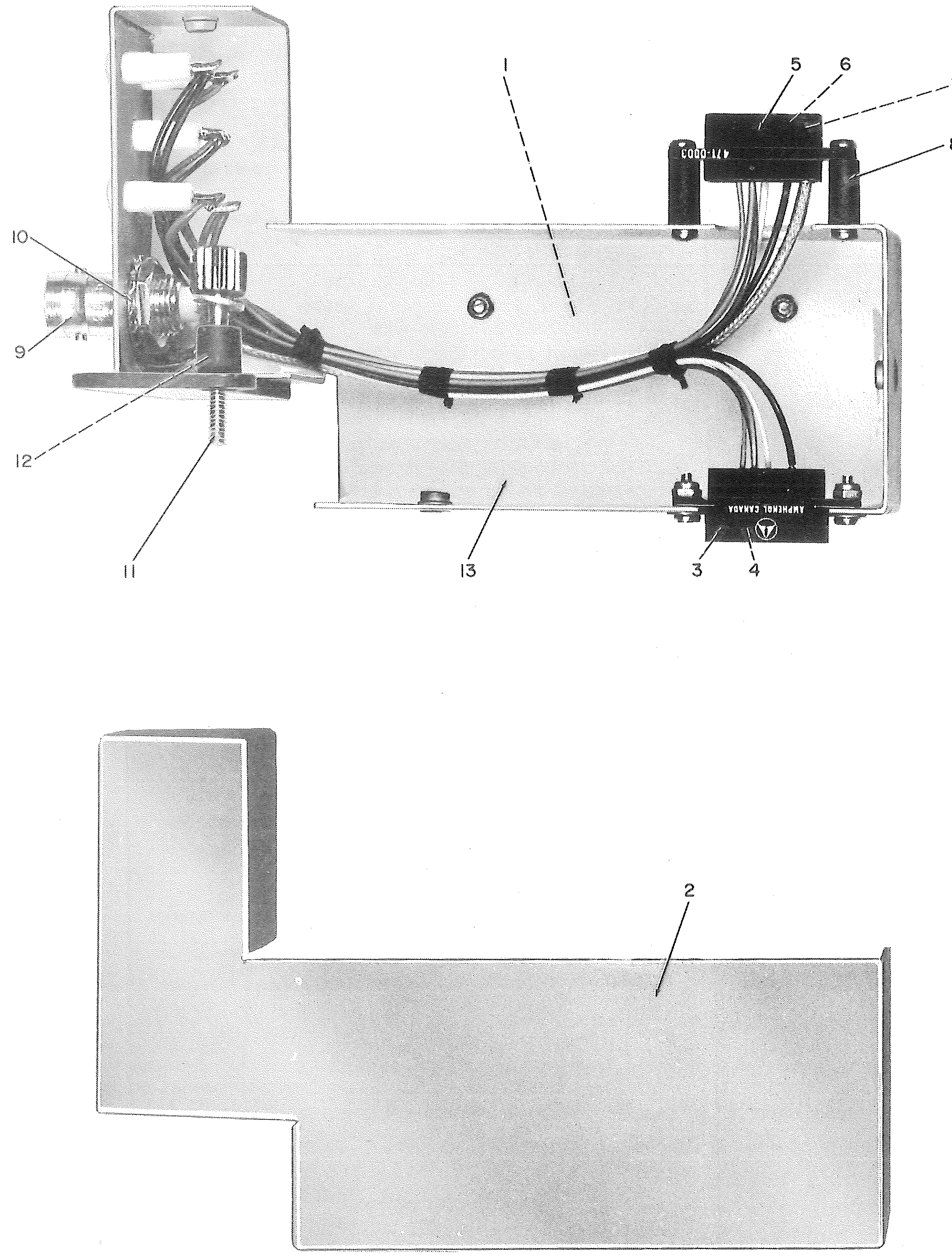


Figure 6-26. Adapter, Test MX-8593/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-26-	780-1910-001	ADAPTER, TEST MX-8593/PRC-66B (See item 3 figure 23 for location in list)	REF	
-1	780-3318-001	. PLATE, Identification	1	
	MS51957-2	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
-2	780-2422-001	. COVER	1	
	MS51957-13	. SCREW (AP)	3	
	310-6340-000	. WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	3	
-3	470-0004	. CONNECTOR, Shell, receptacle (03554) (07216 SCD 370-0009-020)	1	
-4	471-0001	. PIN, Contact (03554) (07216 SCD 370-0009-030)	5	
	MS51957-3	. SCREW (AP)	2	
	68NM26	. NUT, Hex, self-locking, aluminum, 2-56UNC-2B x 0.143 in. (72962) (07216 SCD 333-0327-000) (AP)	2	
-5	470-0003	. CONNECTOR, Shell, plug (03554) (07216 SCD 370-0009-010)	1	
-6	20C-46001-03	. CONNECTOR ASSY, Coaxial receptacle, with 12-inch RG-178B/U cable (03554) (07216 SCD 426-0005-020)	1	
-7	471-0002	. SOCKET, Contact (03554) (07216 SCD 370-0009-040)	5	
	MS51957-2	. SCREW (AP)	2	
-8	780-2421-001	. POST, Spacer	2	
	MS51957-2	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
-9	UG-625B/U	. CONNECTOR, Coaxial	1	
-10	0167-3	. TERMINAL, Lug, brass, tin plated, 0.385 in. inside diam, 7/8 in. ear extension with 0.093 hole (94375) (07216 SCD 304-1196-000)	1	
-11	780-3005-001	. SCREW, Special, captive	1	
-12	340-0644-000	. SLEEVE, Spring, split, beryllium copper, for retaining No. 4 captive screw (07216 SCD 340-0644-000)	1	
	SKT-0804	. JACK, Tip, teflon insulation, white color (98291) (07216 SCD 360-0479-010)	5	
-13	780-2415-001	. CHASSIS	1	

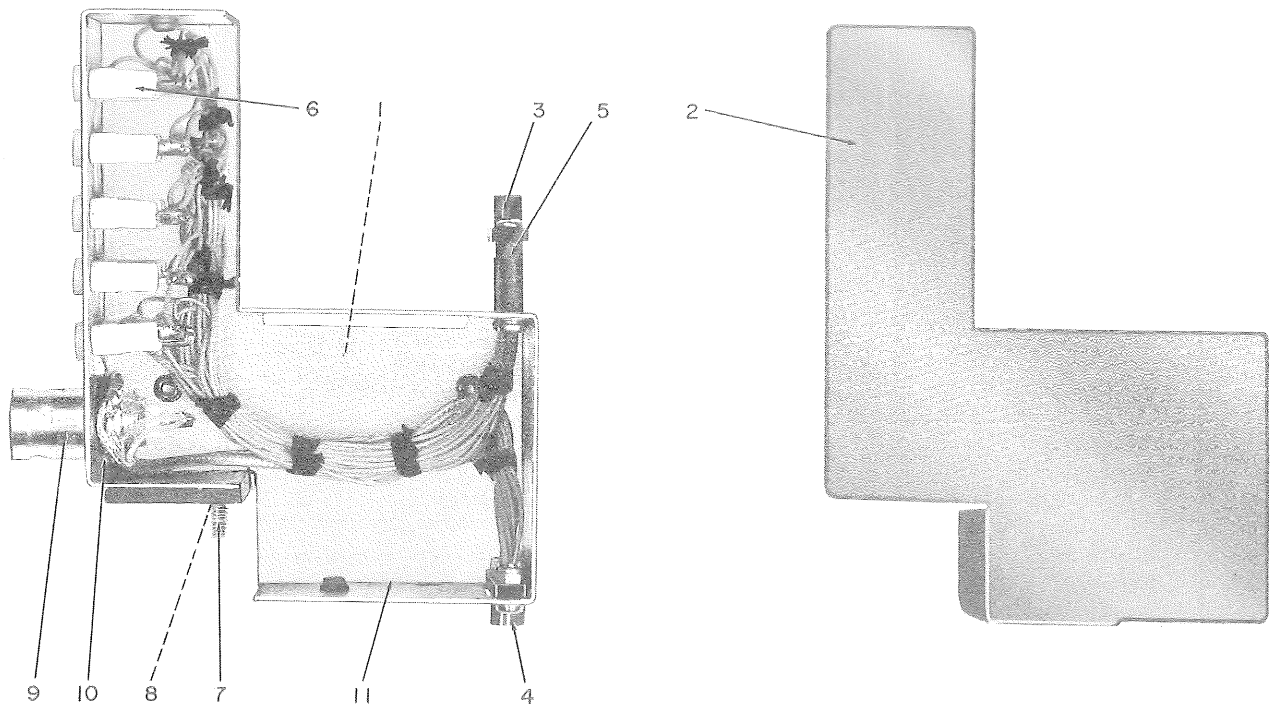


Figure 6-27. Adapter, Test MX-8594/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-27-	780-1911-001	ADAPTER, TEST MX-8594/PRC-66B (See item 4 figure 23 for location in list)	REF	
-1	780-3318-004	. PLATE, Identification	1	
	MS51957-2	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
-2	780-2372-001	. COVER	1	
	MS51957-2	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
-3	470-10201-01	. CONNECTOR, Receptacle, 20 socket contacts and one coax socket with 12-inch RG-178B/U cable (03554) (07216 SCD 370-0015-020)	1	
	MS51957-3	. SCREW (AP)	2	
-4	470-20201-01	. CONNECTOR, Plug, 20 pin contacts and one coax plug with 12-inch RG-178B/U cable (03554) (07216 SCD 370-0015-010)	1	
	MS51957-2	. SCREW (AP)	2	
	68NM26	. NUT, Hex, self-locking, aluminum, 2-56UNC-2B x 0-143 in. (72962) (07216 SCD 333-0327-000) (AP)	2	
-5	780-2377-001	. SUPPORT, Module	2	
	MS51957-3	. SCREW (AP)	2	
	310-0070-000	. WASHER, Lock, light spring, split, cres, No. 2 (07216 SCD 310-0070-000) (AP)	2	
-6	SKT-0804	. JACK, Tip, teflon insulation, white color (98291) (07216 SCD 360-0479-010)	15	
-7	780-3005-001	. SCREW, Special, captive	1	
-8	340-0644-000	. SLEEVE, Spring, split, beryllium copper, for retaining No. 4 captive screw (07216 SCD 340-0644-000)	1	
-9	UG-625B/U	. CONNECTOR, Coaxial	1	
-10	0167-3	. TERMINAL, Lug, brass, tin plated, 0.385 in. inside diam, 7/8 in. ear extension with 0.093 hole (94375) (07216 SCD 304-1196-000)	1	
-11	780-2373-001	. CHASSIS	1	

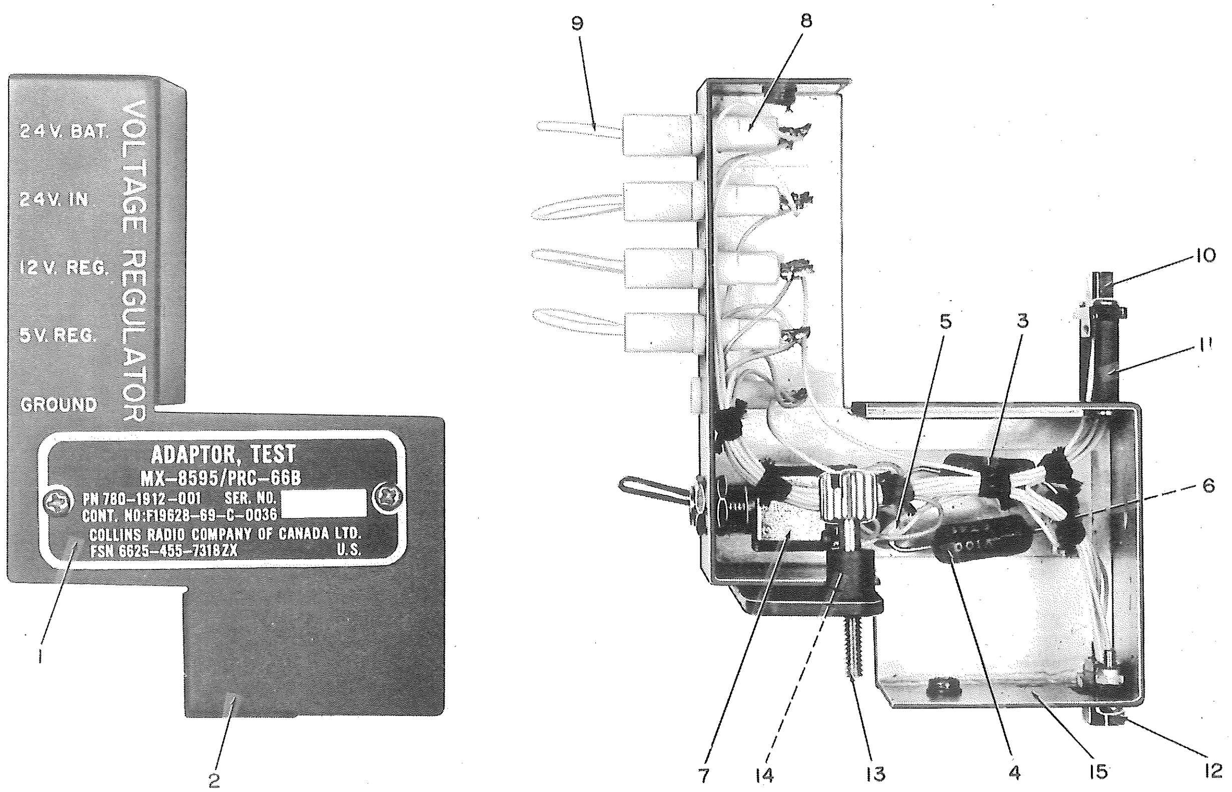


Figure 6-28. Adapter, Test MX-8595/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-28-	780-1912-001	ADAPTER, TEST MX-8595/PRC-66B (See item 5 figure 23 for location in list)	REF	
-1	780-3318-005	. PLATE, Identification	1	
	MS51957-12	. SCREW (AP)	2	
-2	780-2388-001	. COVER	1	
	MS51957-12	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
-3	RW69V101	. RESISTOR, Fixed, wirewound	1	
-4	RW69V100	. RESISTOR, Fixed, wirewound	1	
-5	4878-1-0516	. TERMINAL, Standoff, insulated, 0.179 in. solder turret, 3/16 in. body height with 5/64 in. x 2-56 mounting hole (71279) (07216 SCD 306-2293-000)	3	
	MS51959-1	. SCREW (AP)	3	
	310-0070-000	. WASHER, Lock, light spring, split, cres, No. 2 (07216 SCD 310-0070-000) (AP)	3	
-6	4007-4HT	. TERMINAL, Lug, copper, tin plated, No. 4 mounting hole, 17/32 in. ear extension with 0.082 in. hole (77147) (07216 SCD 304-0015-000)	1	
-7	MS75029-21	. SWITCH, Toggle	1	
-8	SKT-0804	. JACK, Tip, teflon insulation, white color (98291) (07216 SCD 360-0479-010)	13	
-9	780-3147-001	. LEAD, Electrical	4	
-10	470-20150-01	. CONNECTOR, Plug, 15 pin contacts (03554) (07216 SCD 370-0014-010)	1	
	LP57D26P4HQ	. SCREW, Machine, self-locking, stainless steel, 2-56NC-2A x 1/4 in. lg. (03038) (07216 SCD 330-2633-000) (AP)	2	
-11	780-2393-001	. SUPPORT, Module	2	
	MS51957-3	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216)SCD 310-6320-000) (AP)	2	
-12	470-10150-01	. CONNECTOR, Receptacle, 15 socket contacts (03554) (07216 SCD 370-0013-010)	1	
	MS51957-12	. SCREW (AP)	2	
	68NM26	. NUT, Hex, self-locking, aluminum, 2-56UNC-2B x 0.143 in. (72962) (07216 SCD 333-0327-000) (AP)	2	
-13	780-3005-001	. SCREW, Special, captive	1	
-14	340-0644-000	. SLEEVE, Spring, split, beryllium copper, for retaining No. 4 captive screw (07216 SCD 340-0644-000)	1	
-15	780-2391-001	. CHASSIS	1	

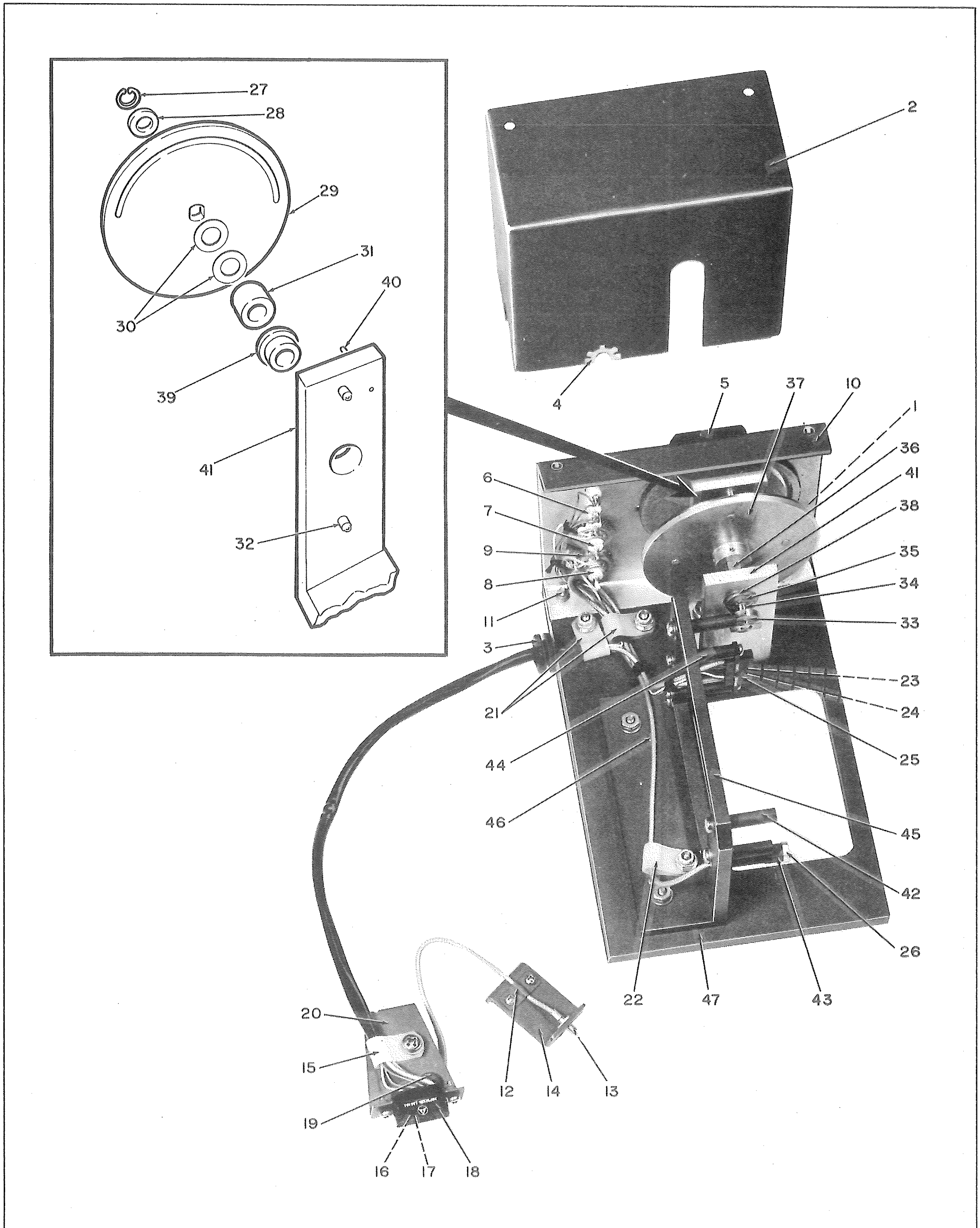


Figure 6-29. Adapter, Test MX-8597/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-29-	780-1914-001	ADAPTER, TEST MX-8597/PRC-66B (See item 6 figure 23 for location in list)	REF	
-1	780-3318-007	. PLATE, Identification	1	
	MS51957-3	. SCREW (AP)	2	
-2	780-2444-001	. PLATE, Rear	1	
	MS51957-13	. SCREW (AP)	4	
	310-6340-000	. WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	4	
-3	MS35489-6	. GROMMET, Rubber	1	
-4	MS21266-2N	. PLASTIC CHANNEL	1	
-5	567-3853-002	. KNOB, Control	1	
-6	SKT-0804	. JACK, Tip, teflon insulation, white color (98291) (07216 SCD 360-0479-010)	3	
-7	UG-625B/U	. CONNECTOR, Coaxial	1	
-8	357-7506-000	. CONNECTOR, Coaxial, receptacle (07216 SCD 357-7506-000)	1	
-9	0167-3	. TERMINAL, Lug, brass, tin plated, 0.385 in. inside diam, 7/8 in. ear extenstion with 0.093 hole (94375) (07216 SCD 304-1196-000)	1	
-10	780-2432-001	. PLATE, Front	1	
-11	MS51959-16	. SCREW (AP)	2	
-12	780-3719-001	. CLAMP, Cable	1	
	MS51957-3	. SCREW (AP)	2	
-13	460-206	. CONNECTOR ASSY, Coaxial plug (03554) (07216 SCD 357-7320-010)	1	
-14	780-3718-001	. PLATE, Relief	1	
-15	MS25281-5	. CLAMP, Loop	1	
	MS51957-28	. SCREW (AP)	1	
	310-0046-000	. WASHER, Flat, cres, No. 6 small (07216 SCD 310-046-000)	1	
-16	471-0001	. PIN, Contact (03554) (07216 SCD 370-0009-030)	3	
-17	460-205	. CONNECTOR ASSY, Coaxial, plug (03554) (07216 SCD 357-7321-010)	1	
-18	470-0004	. CONNECTOR, Shell, receptacle (03554) (07261 SCD 370-0009-020)	1	
	MS51957-3	. SCREW (AP)	2	
-19	MS35489-1	. GROMMET, Rubber	1	
-20	780-2446-001	. PLATE, Relief	1	
-21	MS25281-5	. CLAMP, Loop	2	
	342-0157-000	. SCREW, Machine, brass, nickel plated, 4-40UNC-2A x 5/8 in. lg (77250) (07216 SCD 342-0157-000) (AP)	2	
	310-0045-000	. WASHER, Flat, cres, No. 4 (07216 SCD 310-0045-000) (AP)	2	
	68NM40	. NUT, Hex, self-locking, aluminum, 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000) (AP)	2	
-22	MS25281-5	. CLAMP, Loop	1	
	P342-0159-000	. SCREW, Machine, brass, nickel plated, 4-40UNC-2A x 7/8 in. lg. (77250) (07216 SCD 342-0159-000) (AP)	1	
	310-0045-000	. WASHER, Flat, cres, No. 4 (07216 SCD 310-0045-000) (AP)	1	
	68NM40	. NUT, Hex, self-locking, aluminum, 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000) (AP)	1	
-23	471-0002	. SOCKET, Contact (03554) (07216 SCD 370-0009-040)	3	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-29-24	20C-46001-03	. CONNECTOR ASSY, Coaxial receptacle, with 12-inch RG-178B/U cable, (03554) (07216 SCD 426-0005-020)	2	
-25	470-0003	. CONNECTOR, Shell, plug (03554) (07216 SCD 370-0009-010)	1	
	MS51957-6	. SCREW (AP)	2	
-26	20C-46031-02	. CONNECTOR ASSY, Coaxial receptacle (03554) (07216 SCD 426-0004-020)	1	
	780-2447-001	. FRAME, ASSY	REF	
-27	5100-25C	. . RING, Retaining, beryllium copper, for 3/16 in. shaft (79136) (07216 SCD 340-0038-000)	1	
-28	AJ3W	. . WASHER, Thrust, hardened steel, 0.255 in. inside diam, 0.5 in. outside diam (00141) (07216 SCD 310-0772-020)	1	
-29	780-2443-001	. . DIAL, Wheel	1	
-30	331-2020-000	. . SHIM, Plain, brass, 0.002 in. thick, 1/4 in. inside diam, 1/2 in. outside diam (07216 SCD 331-2020-000)	2	
-31	780-2456-001	. . SPACER	1	
-32	SSB-50N	. . PLUNGER, Ball, detent, 8-36 self-locking Class 2A threads (01226) (07216 SCD 015-3270-050)	2	
-33	780-3516-001	. . COUPLER, Shaft	1	
	335-0277-010	. . SETSCREW, Multiple-spline, oval point, alloy steel, cadmium plated, 0-80UNF x 1/8 in. lg. (08664) (07216 SCD 335-0277-010) (AP)	2	
-34	MS16624-18	. . RING, Retaining	1	
-35	AJ2W	. . WASHER, Thrust, hardened steel, 0.192 in. inside diam, 0.375 in. outside diam (00141) (07216 SCD 310-0772-010)	1	
-36	780-2438-001	. . SHAFT	1	
-37	780-3761-001	. . WHEEL, Detent	1	
	MS51981-1	. . SETSCREW (AP)	1	
	780-2445-001	. . SUPPORT ASSY, Angle	REF	
	MS51959-18	. . SCREW (AP)	4	
	310-6340-000	. . WASHER, Flat, stainless steel, No. 4 (79807) (07216 SCD 310-0340-000) (AP)	4	
	310-0278-000	. . WASHER, Lock, light spring, cres, 0.115 in. inside diam (07216 SCD 310-0278-000) (AP)	4	
	68NM40	. . NUT, Hex, self-locking, aluminum, 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-0347-000) (AP)	4	
-38	F311C	. . . . BEARING, Sleeve, flanged, porous bronze, 0.182 in. inside diam, 0.317 in. outside diam x 1/4 in. lg. (70417) (07216 SCD 309-0077-000)	1	
-39	F310C	. . . . BEARING, Sleeve, flanged, porous bronze, 0.250 in. inside diam, 0.381 in. outside diam x 3/16 in. lg. (70417) (07216 SCD 309-0083-000)	1	
-40	062-626MDP	. . . . PIN, Spring, spiral, medium duty, self-locking, stainless steel, 0.062 in. nom. diam x 5/8 in. lg. (00287) (07216 SCD 311-0458-000)	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-29-41	780-2445-002	. . . SUPPORT, Angle	1	
-42	780-2439-001	. . SUPPORT, Module	4	
	MS51957-16	. . SCREW (AP)	4	
	310-6340-000	. . WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	4	
-43	780-2440-001	. . SUPPORT, Coaxial	1	
-44	780-2441-001	. . SUPPORT, Connector	2	
	MS51957-6	. . SCREW (AP)	2	
	310-6320-000	. . WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
-45	780-2437-001	. . PLATE, Mounting	1	
	MS51959-18	. . SCREW (AP)	2	
	310-6340-000	. . WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	2	
	68NM40	. . NUT, Hex, self-locking, aluminum, 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000) (AP)	2	
-46	MS16555-626	. . PIN, Dowel	2	
-47	780-2436-001	. . PLATE, Base	1	

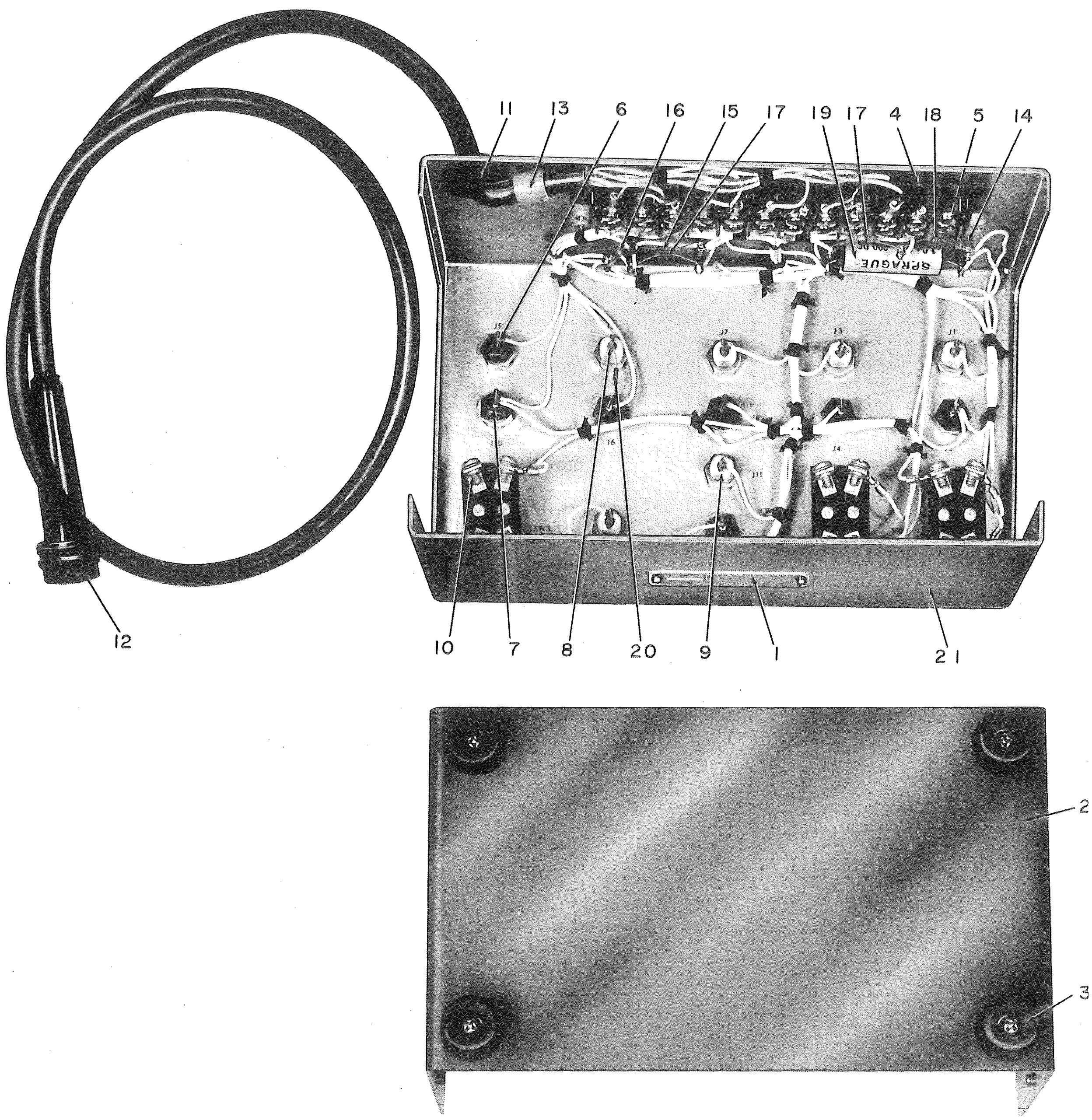


Figure 6-30. Adapter, Test MX-8596/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-30-	780-1913-001	ADAPTER, TEST MX-8596/PRC-66B .... (See item 7 figure 23 for location in list)	REF	
-1	780-3318-006	. PLATE, Identification	1	
	MS51957-2	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, ... 0.219 in. outside diam (07216 SCD 310-6320-000)	2	
-2	780-2407-001	. COVER	1	
	MS51957-14	. SCREW (AP)	6	
-3	747R	. BUMPER, Rubber, 11/64 in. inside diam, ... with 5/16 in. diam recess, 23/32 in. outside diam (75543) (07216 SCD 200-5010-000)	4	
	MS51957-29	. SCREW (AP)	4	
	310-0046-000	. WASHER, Flat, cres, No. 6 small .... (07216 SCD 310-0046-000) (AP)	4	
-4	353-11-12-001	. TERMINAL BOARD, barrier type, ... 12 dual terminals with 5-40NC-2B screws (71785) (07216 SCD 367-0124-000)	1	
-5	MS12-140	. STRIP, Marker, fibre, plain, ... marked 1 thru 12 (96906) (07216 SCD 367-1845-620)	1	
	MS51957-17	. SCREW (AP)	4	
	310-6340-000	. WASHER, Flat, stainless steel No. 4 .... (07216 310-6340-000) (AP)	4	
	68NM40	. NUT, Hex, self-locking, aluminum, ... 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000) (AP)	4	
-6	108-902	. JACK, Tip, nylon body, red color (74970) .... (07216 SCD 360-0240-000)	1	
-7	108-903	. JACK, Tip, nylon body, black color (74970) .... (07216 SCD 360-0241-000)	6	
-8	108-901	. JACK, Tip, nylon body, white color (74970) .... (07216 SCD 360-0239-000)	6	
-9	MS35333-75	. WASHER, Lock	13	
-10	MS35059-22	. SWITCH, Toggle	3	
-11	MS35489-9	. GROMMET, Rubber	1	
-12	MS27336PB10-13P	. CONNECTOR, Plug	1	
-13	150-1541-000	. CLAMP, Loop, molded nylon, for .... for 0.22 in. max clamping diam, 0.173 in. mounting hole (09922) (07216 SCD 150-1541-000)	1	
	MS51957-14	. SCREW (AP)	1	
	310-6340-000	. WASHER, Flat, stainless steel, No. 4 .... (07216 SCD 310-6340-000)	1	
	68NM40	. NUT, Hex, self-locking, aluminum, ... 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000)	1	
-14	4878-1-0516	. TERMINAL, Standoff, insulated, ... 0.179 in. solder turret, 3/16 in. body height with 5/64 in. x 2-56 mounting hole (71279) (07216 SCD 306-2293-000)	9	
	MS51957-1	. SCREW (AP)....................................	9	
	MS35333-69	. WASHER (AP)	9	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-30-15	RCR05G820JS	. RESISTOR, Fixed	1	
-16	4007-4HT	. TERMINAL, Lug, copper, tin plated, No. 4 mounting hole, 17/32 in. ear extension with 0.082 in. hole (77147) (07216 SCD 304-0015-000)	1	
-17	RCR05G511JS	. RESISTOR, Fixed	2	
-18	RCR05G244JS	. RESISTOR, Fixed	1	
-19	CH08A3NC105M	. CAPACITOR, Fixed	1	
-20	RCR05G224JS	. RESISTOR, Fixed	1	
-21	780-2405-001	. CHASSIS	1	

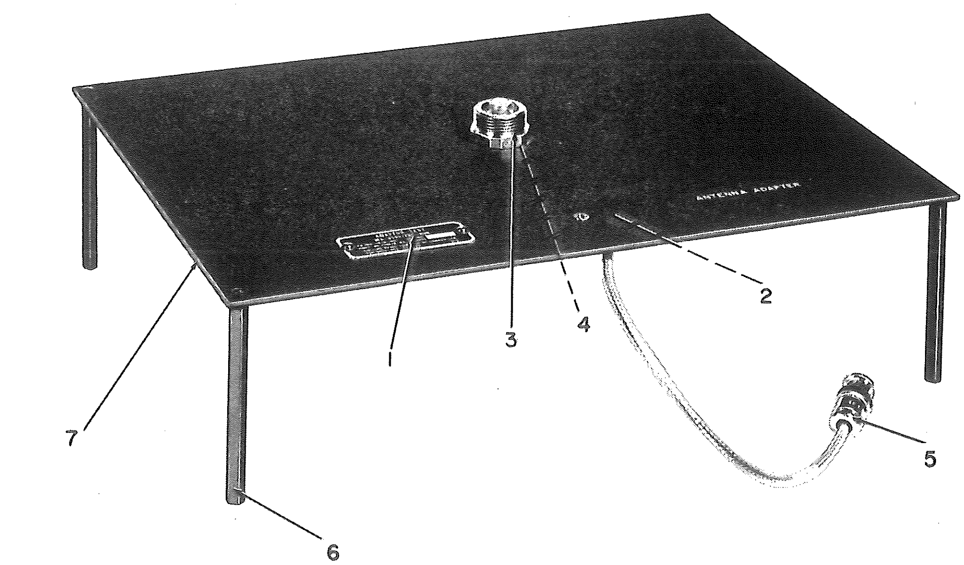


Figure 6-31. Adapter, Test MX-8599/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-31-	780-1915-001	ADAPTER, TEST MX-8599/PRC-66B (See item 8 figure 23 for location in list)	REF	
-1	780-3318-008	. PLATE, Identification	1	
	MS51957-3	. SCREW (AP)	2	
	310-0044-000	. WASHER, Flat, cres, No. 2 (07216 SCD 310-0044-000) (AP)	2	
-2	MS25281-2	. CLAMP, Loop	1	
	MS51959-30	. SCREW (AP)	1	
	310-0046-000	. WASHER, Flat, cres, No. 6 small (07216 SCD 310-0046-000) (AP)	1	
	68NM62	. NUT, Hex, self-locking, aluminum 6-32-2B x 0.178 in. (72962) (07216 SCD 333-0368-000) (AP)	1	
	780-2854-001	. CABLE ASSY	REF	
-3	567-8906-001	. NUT, Adapter	1	
	MS35333-78	. WASHER, Lock	1	
-4	357-7506-010	. . CONNECTOR, Coaxial, receptacle, 90° elbow, 50-ohm (07216 SCD 357-7506-010)	1	
-5	UG-88E/U	. . CONNECTOR, Coaxial	1	
-6	780-2944-001	. POST	4	
	MS51959-28	. SCREW (AP)	4	
-7	780-2857-001	. PLATE	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-32	780-1919-001	ALIGNMENT FIXTURE, TUNER MX-8598/PRC-66B ...... (See item 9 figure 23 for location in list)	1	

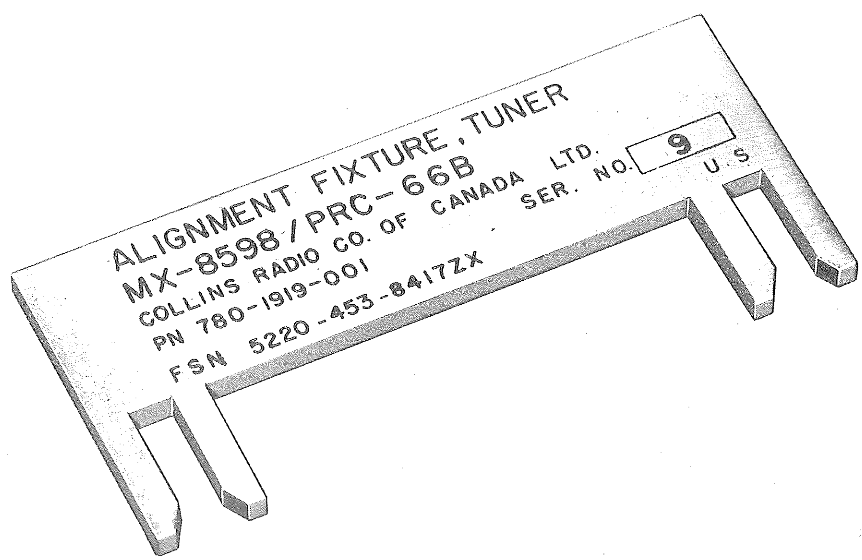


Figure 6-32. Alignment Fixture, Tuner MX-8598/PRC-66B

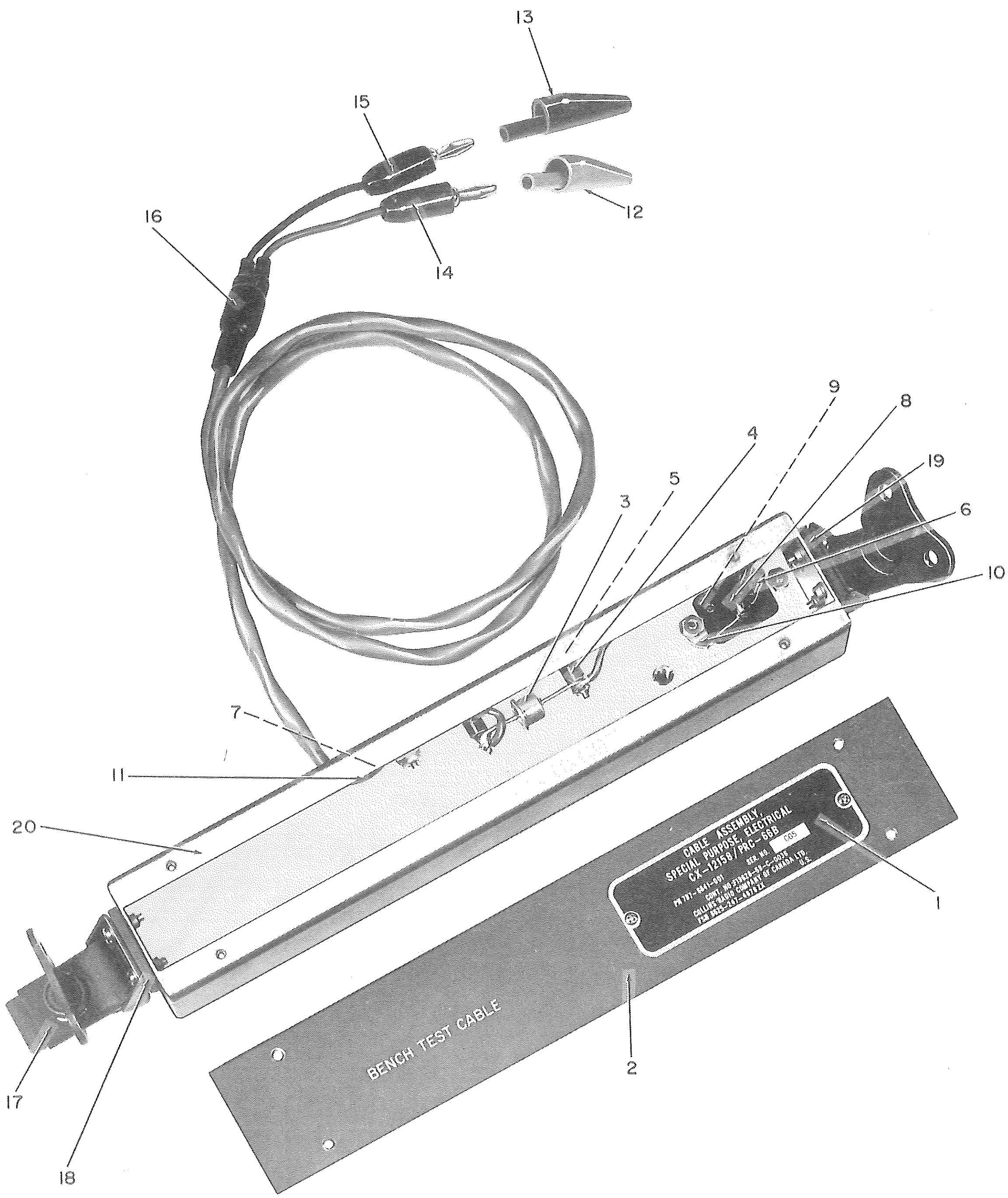


Figure 6-33. Cable Assy, SP, Elect CX-12158/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-33-	787-6841-001	CABLE ASSY, SP, ELECT CX-12158/PRC-66B (See item 10 figure 23 for location in list)	REF	
-1	780-3502-001	. PLATE, Identification	1	
	MS51957-3	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
-2	780-2928-001	. COVER	1	
	MS51957-13	. SCREW (AP)	4	
	310-6340-000	. WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	4	
-3	1N4720	. DIODE, Semiconductor, max forward volts 0.9 v at 3 amp (25°C), max reverse volts 100v (repetitive) (07688) (07216 SCD 353-6471-020)	1	
-4	4878-1-0516	. TERMINAL, Standoff, insulated, 0.179 in. solder turret, 3/16 in. body height with 5/64 in. x 2-56 mounting hole (71279) (07216 SCD 306-2293-000)	2	
-5	4007-4HT	. TERMINAL, Lug, copper, tin plated, No. 4 mounting hole, 17/32 in. ear extension with 0.082 in. hole (77147) (07216 SCD 304-0017-000)	1	
	MS51957-1	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
	310-0070-000	. WASHER, Lock, light spring, split, cres, No. 2 (07216 SCD 310-0070-000)	2	
-6	CM05ED820J03	. CAPACITOR, Fixed	1	
-7	MS25281-3	. CLAMP, Loop	1	
	MS51957-15	. SCREW (AP)	1	
	310-6340-000	. WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	2	
	68NM40	. NUT, Hex, self-locking, aluminum, 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000) (AP)	1	
-8	491-100	. CONNECTOR, Receptacle, 3 socket contacts (03554) (07216 SCD 370-0017-020)	1	
-9	780-2935-001	. SPACER	1	
-10	4007-4HT	. TERMINAL, Lug, copper, tin plated, No. 4 mounting hole, 17/32 in. ear extension with 0.082 in. hole (77147) (07216 SCD 304-0017-000)	1	
	MS51957-16	. SCREW (AP)	2	
	310-0278-000	. WASHER, Lock, light spring, split, cres, No. 4 (07216 SCD 310-0278-000) (AP)	2	
	313-0132-000	. NUT, Hex, plain, steel, cadmium plated, 4-40UNC (07216 SCD 313-0132-000) (AP)	2	
-11	MS35489-4	. GROMMET, Rubber	1	
-12	63 RED	. CLIP, Electrical, alligator, red insulation (76545) (07216 SCD 362-0030-10)	1	
-13	63 BLACK	. CLIP, Electrical, alligator, black insulation (76545) (07216 SCD 362-0030-020)	1	
-14	108-302	. PLUG, Tip, solderless, nylon insulation, red color (74970) (07216 SCD 361-0335-020)	1	
-15	108-303	. PLUG, Tip, solderless, nylon insulation, black color (74970) (07216 SCD 361-0335-020)	1	
-16	382A012-3	. SLEEVE, Branched, 45°, polyolefin plastic shrink type (08795) (07216 SCD 152-4658-000)	1	
-17	015-3390-010	. FASTENER, Link, 180° cam lock with wing nut (07216 SCD 015-3390-010)	2	
-18	780-2932-001	. PAD, Right-hand	1	
-19	780-2933-001	. PAD, Left-hand	1	
	MS51957-15	. SCREW (AP)	4	
	310-6340-000	. WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	4	
-20	780-2930-001	. CHASSIS	1	

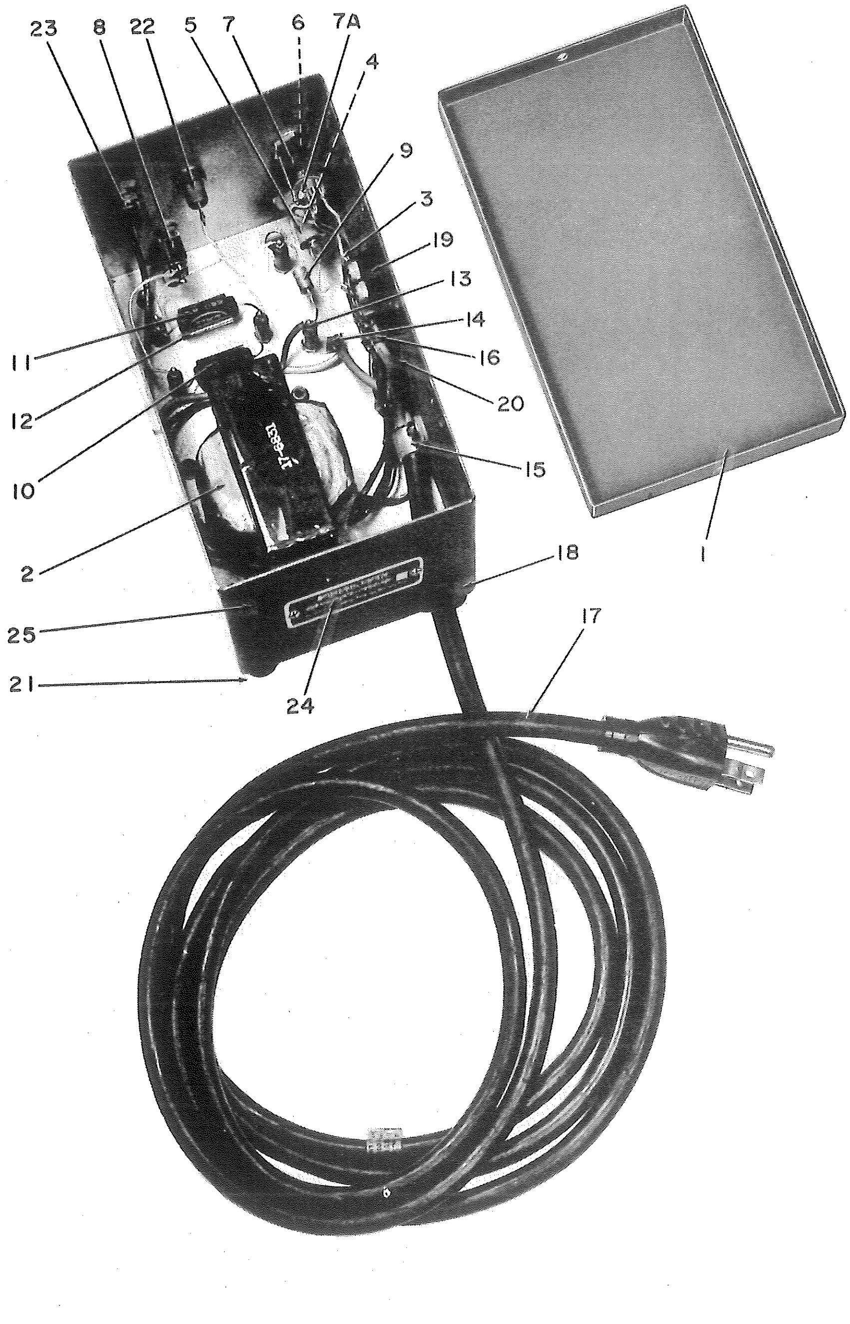


Figure 6-34. Charger, Battery PP-6427/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-34-	780-1920-001	CHARGER, BATTERY PP-6427/PRC-66B (See item 11 figure 23 for location in list)	REF	
-1	780-2358-001	. COVER	1	
	MS51957-14	. SCREW (AP)	6	
	310-6340-000	. WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	6	
-2	N68X	. TRANSFORMER, Power, isolating, 230V/115V input, 115V output at 0.435 amp (81095) (07216 SCD 662-0150-000)	1	
	MS51957-28	. SCREW (AP)	2	
	310-0046-000	. WASHER, Flat, cres, No. 6 small (07216 SCD 310-0046-000) (AP)	2	
	68NM-62	. NUT, Hex, self-locking, aluminum, 6-32UNC-2B x 0.178 (72962) (07216 SCD 333-0368-000) (AP)	2	
-3	1024-6HT	. TERMINAL, Wire, brass, tin plated, with crimp tabs and No. 6 hole (77147) (07216 SCD 304-0140-000)	5	
-4	F02B250V1-2AS	. FUSE, Cartridge	1	
-5	FHN26G	. FUSEHOLDER	1	
-6	A1H	. LAMP, Glow, neon, 105-125 VRMS, 2500 hours average life with 47K series resistor (08806) (07216 SCD 262-1288-010)	1	
-7	616-6-1	. SWITCH, Pushbutton, illuminated translucent red cap, alternate snap action, single pole double throw, 115 VAC, 5 amp (87034) (07216 SCD 266-6787-020)	1	
-7A	RC07GF473K	. RESISTOR	1	
-8	MS75028-23	. SWITCH	1	
-9	JAN1N3190	. DIODE	1	
-10	RW67V560	. RESISTOR	1	
-11	RW67V391	. RESISTOR	1	
-12	100-200-5-0	. CLIP, Spring, component holder, 5/8 in. lg., for 0.195 in. diam component (99378) (07216 SCD 139-0746-000)	2	
	MS51957-2	. SCREW (AP)	4	
-13	4878-1-0516	. TERMINAL, Standoff, insulated, 0.179 in. solder turret, 3/16 in. body height with 5/64 in. x 2-56 mounting hole (71279) (07216 SCD 306-2293-000)	5	
-14	4007-4HT	. TERMINAL, Lug, copper, tin plated, No. 4 mounting hole, 17/32 in. ear extension with 0.082 in. hole (77147) (07216 SCD 304-0015-000)	1	
	MS51957-1	. SCREW (AP)	5	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	5	
-15	HP6N	. CLAMP, Loop, cable, molded nylon, for 0.33 in. diam max, 0.19 in. diam mounting hole (09922) (07216 SCD 150-1543-000)	1	
	MS51957-15	. SCREW (AP)	1	
	310-6340-000	. WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	1	
	68NM40	. NUT, Hex, self-locking, aluminum, 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000) (AP)	1	
-16	1024-6HT	. TERMINAL, Wire, copper alloy with colored thermoplastic crimp-grip collar, for No. 14/16 wire, No. 6 hole (00779) (07216 SCD 367-7112-000)	2	
-17	0220-18	. CABLE ASSY, Power, 3-pin power plug molded to 9J cable jacket, 3-wire No. 16 x 10 feet (71700) (07216 SCD 426-1467-000)	1	

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-34-18	MS35489-11	. GROMMET	1	
-19	353-11-03-001	. TERMINAL BOARD, barrier type, 3 dual terminals with 5-40NC-2B screws (71785) (07216 SCD 367-0119-000)	1	
-20	MS3-140	. STRIP, Marker, fibre, plain, marked 1 thru 3 (96906) (07216 SCD 367-1845-530)	1	
	MS51957-15	. SCREW (AP)	4	
	310-6340-00	. WASHER, Flat, stainless steel, No. 4 (07216 SCD 310-6340-000) (AP)	4	
	68NM40	. NUT, Hex, self-locking, aluminum, 4-40UNC-2B x 0.143 in. (72962) (07216 SCD 333-0347-000) (AP)	4	
-21	747R	. BUMPER, Rubber, 11/64 in. inside diam with 5/16 in. recess, 23/32 in. outside diam (75543) (07216 SCD 200-5010-000)	4	
	MS51957-29	. SCREW (AP)	4	
	310-0046-00	. WASHER, Flat, cres, No. 6 small (07216 SCD 310-0046-000) (AP)	4	
-22	108-902	. JACK, Tip, nylon body, red color (74970) (07216 SCD 360-0240-000)	1	
-23	108-903	. JACK, Tip, nylon body, black color (74970) (07216 SCD 360-0241-000)	1	
-24	780-3318-009	. PLATE, Ident	1	
-25	780-2361-001	. CHASSIS	1	

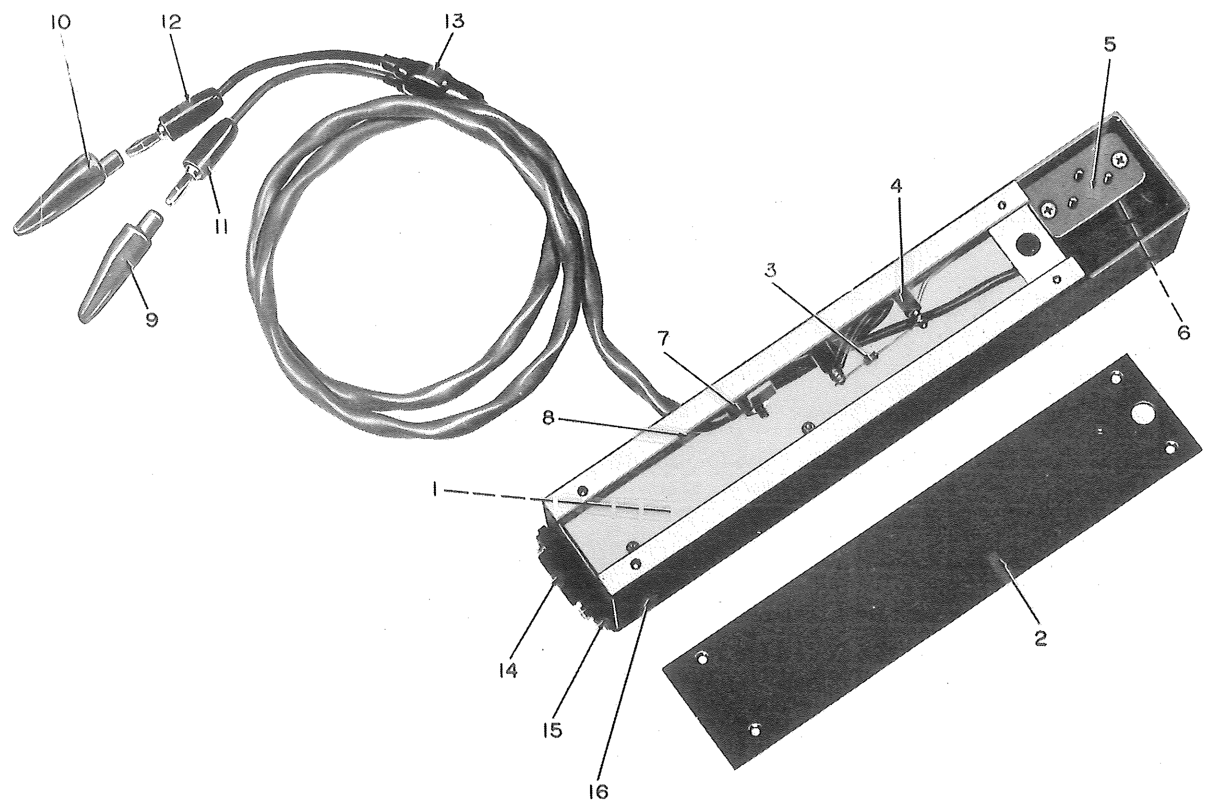


Figure 6-35. Cable Assy, SP, Elect CX-12159/PRC-66B

FIG. & INDEX NO.	PART NO.	DESCRIPTION 1 2 3 4 5 6 7	UNITS PER ASSY	USABLE ON CODE
6-35-	787-6839-001	CABLE ASSY, SP, ELECT CX-12159/PRC-66B .... (See item 12 figure 23 for location in list)	REF	
-1	780-3502-002	. PLATE, Identification	1	
	MS51957-3	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, ... 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
-2	780-2942-001	. COVER	1	
	342-0153-000	. SCREW, Machine, flat head Phillips, brass, ... nickel plated, 4-40UNC-2A x 5/16 in. lg. (07216 SCD 342-0153-000) (AP)	4	
-3	1N4002	. DIODE, Semiconductor, max forward volts 1.1 v ...... at 1 amp (25°C), max reverse volts 100 v (07688) (07216 SCD 306-2293-000)	1	
-4	4878-1-0516	. TERMINAL, Standoff, insulated, 0.179 in. .... solder turret, 3/16 in. body height with 5/64 in. x 2-56 mounting hole (71279) (07216 SCD 306-2993-000)	2	
	MS51957-1	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, ... 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	4	
-5	491-101	. CONNECTOR, Plug, 3 pin contacts (03554) .... (07216 SCD 320-0017-010)	1	
-6	780-2935-001	. SPACER, Connector	2	
	MS51957-4	. SCREW (AP)	2	
	310-6320-000	. WASHER, Flat, cres, 0.092 in. inside diam, ... 0.219 in. outside diam (07216 SCD 310-6320-000) (AP)	2	
-7	MS25281-2	. CLAMP, Loop	1	
	MS51957-30	. SCREW (AP)	1	
	310-0046-000	. WASHER, Flat, cres, No. 6 small .... (07216 SCD 310-0046-000) (AP)	2	
	68NM62	. NUT, Hex, self-locking, aluminum, 6-32-2B x .... 0.178 in. (72962) (07216 SCD 333-0368-000) (AP)	1	
-8	MS35489-1	. GROMMET, Rubber	1	
-9	63RED	. CLIP, Electrical, alligator, red insulation .... (76545) (07216 SCD 362-0030-010)	1	
-10	63BLACK	. CLIP, Electrical, alligator, black insulation .... (76545) (07216 SCD 362-0030-020)	1	
-11	108-302	. PLUG, Tip, solderless, nylon insulation, ... red color (74970) (07216 SCD 361-0335-020)	1	
-12	108-303	. PLUG, Tip solderless, nylon insulation, ... black color (74970) (07216 SCD 361-0335-010)	1	
-13	2T14-1927STF	. SLEEVE, Branched, 45°, polyolefin plastic............ shrink type (08795) (07216 SCD 152-4658-000)	1	
-14	B1900-334	. LATCH, Keeper, plate, for use with cam lock .... fastener (82240) (07216 SCD 015-0830-000)	2	
	343-0145-000	. SCREW, Machine, pan head Phillips, brass, ... nickel plated, 4-40-2A x 7/16 in. lg (07216 SCD 343-0145-000) (AP)	4	
	310-6340-000	. WASHER, Flat, stainless steel, No. 4 .... (07216 SCD 310-6340-000) (AP)	4	
-15	780-2943-001	. PAD, Latch	2	
-16	780-2938-001	. CHASSIS	1	

SECTION III

NUMERICAL INDEX

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
AJ2W	24-32	2	P1	NS
	29-35			
AJ3W	24-25	2	P1	NS
	29-28			
AN6227-7	2-4	1		
A1H	34-6	1	P1	NS
A200-2376-070	17-35	1		
A200-2376-080	17-28	1		
BR44-S10	19-8	2	P1	NS
B1900-334	35-14	2		
CASE	1-9	1		
CC60CG8R2D	11-22	1	P1	NS
CE-1/8-10K-1-C1	9-1	1	P1	NS
CH08A3NC105M	30-19	1	P1	NS
CM05ED820J03	33-6	1	P1	NS
CSK2285	17-37	1	P1	NS
CSK314	17-34	1	P1	NS
C10A103K	5-16	2	P1	NS
C10A104K	5-14	4	P1	NS
	5-17			
C11A152K	4-4	1	P1	NS
	17-71	1	P1	NS
C11A181K	9-3	1	P1	NS
C11A223K	14-2	5	P1	NS
C11A682K	4-2	16	P1	NS
	5-18			
	6-11			
	16-24			
C12A104K	20-2	3	P1	NS
DP-289-304	11-16	60		
	12-46			
	13-6			
	16-44			
DR47T35JU	7-2	1	P1	NS
D11176	7-1	1	P1	NS
FHN26G	34-5	1	P1	NS
FT-2SM-1164	12-45	20		
	14-18			
	14-20			
	15-13			
	16-43			
F02B250V1-2AS	34-4	1	P1	NS
F1913-1-01	11-33	17	P1	NS
	12-50			
	17-72			
F310C	24-36	2	P1	NS
	29-39			
F311C	24-35	2	P1	NS
	29-38			
GA-2112	12-24	2		
GLN3-10	5-5	1	P1	NS
GLN4-10	5-6	1	P1	NS
GL1-1-1-2	5-7	1		
GL10-101K	5-15	1	P1	NS
GL10-101M	4-4A	2	P1	NS
	16-23			
H-250/U	1-7	1	P1	PF
HANDLE	3-12	1		
HP6N	34-15	1	P1	NS
JAN1N3190	34-9	1	P1	NS
JAN2N2221	25-5	3	P1	NS

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
JT102C-10-13S(003)	17-37	1	P1	NS
K2107	16-42	2	P1	NS
LP35216-3M	17-	10		
LP57D26P4HQ	24-	4	P1	NS
	28-			
LP57D26P4WHQ	5-			
	12-			
LP57J00S2	15-	3	P1	NS
MINT 47K	17-70	2	P1	NS
MS12-140	30-5	1	M	S
MS16555-603	12-48	1	P1	NS
MS16555-609	12-47	1	P1	NS
MS16555-626	24-43	4	P1	NS
	29-46			
MS16624-18	24-31	2	P1	NS
	29-34			
MS16633-1018	17-	2	P1	NS
	17-41			
MS16633-102	21-14	1	P1	NS
MS16998-2	21-2	1	P1	NS
MS21266-2N	24-3	2	X2	S
	29-4			
MS24547-1	11-6	2	P1	NS
MS25281-2	31-2	2		
	35-7			
MS25281-3	33-7	1	P1	NS
MS25281-5	24-10	8	P1	NS
	24-11			
	24-12			
	29-15			
	29-21			
	29-22			
MS27336PB10-13P	30-12	1	P1	NS
MS3-140	34-20	1	X1	
MS35059-22	30-10	3	P1	NS
MS35333-69	30-	9	P1	NS
MS35333-72	3-	4	P1	NS
MS35333-75	30-9	13	P1	NS
MS35333-78	31-	1		
MS35338-135	11-	8		
	15-			
MS35338-138	11-	3	P1	NS
	14-			
MS35489-1	24-13	3	P1	NS
	29-19			
	35-8			
MS35489-11	34-18	1	P1	NS
MS35489-4	33-11	1	P1	NS
MS35489-6	24-19	2	P1	NS
	29-3			
MS35489-9	30-11	1	P1	NS
MS35649-224	17-	1	P1	NS
MS51053-102	21-	4	P1	NS
MS51957-1	4-	20	P1	NS
	30-			
	33-			
	34-			
	35-			
MS51957-12	28-	6	P1	NS
MS51957-13	26-	11	P1	NS
	29-			
	33-			

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
MS51957-14	24-	17	P1	NS
	30-			
	34-			
MS51957-15	17-	11	P1	NS
	33-			
	34-			
MS51957-16	17-	11	P1	NS
	24-			
	29-			
	33-			
MS51957-17	30-	4	P1	NS
MS51957-18	24-	4	P1	NS
MS51957-2	16-	33	P1	NS
	17-			
	25-			
	26-			
	27-			
	30-			
	34-			
MS51957-28	24-	4	P1	NS
	29-			
	34-			
MS51957-29	30-	8	P1	NS
	34-			
MS51957-3	24-	25	P1	NS
	25-			
	26-			
	27-			
	28-			
	29-			
	31-			
	33-			
	35-			
MS51957-30	35-	1	P1	NS
MS51957-4	35-	2	P1	NS
MS51957-6	19-	13	P1	NS
	24-			
	25-			
	29-			
MS51959-1	25-	5	P1	NS
	28-			
MS51959-16	24-23	4	P1	NS
	29-11			
MS51959-18	24-	12	P1	NS
	29-			
MS51959-2	17-	10	P1	NS
	19-			
	22-			
MS51959-28	31-	4	P1	NS
MS51959-3	17-	7	P1	NS
	19-			
MS51959-30	31-	1	P1	NS
MS51959-4	17-	4	P1	NS
MS51963-9	17-	12	P1	NS
MS51981-1	17-	4	P1	NS
	24-			
	29-			
MS75028-23	34-8	1	P1	NS

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
MS75029-21	28-7	1	P1	NS
MS91528-1P2B	25-11	1	P1	NS
MTP106M035P1A	5-21	2	P1	NS
	5-23			
MTP156M020P1A	4-19	1	X1	
MTP306M050P1A	5-20	1	P1	NS
MTP475M035P1D	5-19	2	P1	NS
MTP606M020P1B	5-22	1	X1	
MT120	15-7	1	P1	NS
NAS-1598D(-04)Y	17-9	2	P1	NS
N281-0624-080	17-30	1		
N68X	34-2	1	P1	NS
P310-0128-000	11-10B	2	P1	NS
P313-0050-000	11-	2	P1	NS
P313-0156-000	17-	1	P1	NS
P320-0007-000	6-	29	P1	NS
	11-			
	14-			
	15-			
P320-0008-000	11-10A	2	P1	NS
P320-0009-000	15-	1	P1	NS
P320-0010-000	11-	25	P1	NS
	16-			
P322-0169-000	19-	1	P1	NS
P323-0303-010	5-	4	P1	NS
P323-0303-020	6-	18	P1	NS
	12-			
	19-			
P323-0303-040	15-	3	P1	NS
	19-			
P330-2284-000	21-	2		
P334-0265-000	17-	1	P1	NS
P342-0159-000	29-	1	P1	NS
P343-0019-000	17-	4	P1	NS
P343-0022-000	22-	2	P1	NS
P343-0090-000	3-	2	P1	NS
P343-0297-000	5-	2	P1	NS
	15-			
P343-0298-000	6-	3	P1	NS
	11-			
P343-0300-000	11-7	2	P1	NS
P343-0301-000	11-8	2	P1	NS
P347-0005-000	17-	2	P1	NS
Q4011	17-14	3	P1	NS
RN-22NCFMA1-26	19-	2		
RCRP500020-1A	19-8A	2		
RCR05G103JS	25-8	3	P1	NS
RCR05G224JS	30-20	1	P1	NS
RCR05G244JS	30-18	1	P1	NS
RCR05G511JS	30-17	2	P1	NS
RCR05G820JS	30-15	1	P1	NS
RCR05G822JS	25-7	3	P1	NS
RC05GF100J	16-27A	1	P1	NS
RC05GF101J	5-38	4	P1	NS
RC05GF102J	5-37	15	P1	NS
	6-10B			
	11-			
	12-39			
	15-18			
	16-31			
	18-13			
RC05GF103J	10-6	7	P1	NS
	11-12			
	11-13			
	16-37			
	18-17			
	19-15			
RC05GF121J	20-6	1	P1	NS
RC05GF122J	11-	2	P1	NS
RC05GF123J	11-	3	P1	NS
	16-35			

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
RC05GF124J	18-10	1	P1	NS
RC05GF152J	5-42	6		
	11-			
	14-8			
	20-4			
RC05GF153J	10-7	7	P1	NS
	11-			
	12-44B			
	15-19			
	16-38			
RC05GF180J	5-43	1	P1	NS
RC05GF182J	11-	3	P1	NS
	18-14			
RC05GF183J	11-	3	P1	NS
	20-9			
RC05GF220J	4-6	1	P1	NS
RC05GF221J	12-36	2	P1	NS
	14-9	1	P1	NS
RC05GF222J	11-	5	P1	NS
	11-11B		P1	NS
	5-40			
	16-34A			
RC05GF223J	10-8	3	P1	NS
	11-			
RC05GF224J	4-6A	1	P1	NS
RC05GF242J	20-7	2	P1	NS
RC05GF272J	4-6C	5	P1	NS
	11-			
	12-40			
	16-32			
RC05GF273J	11-	2	P1	NS
RC05GF331J	12-37	3	P1	NS
	16-28			
RC05GF332J	5-41	1	P1	NS
RC05GF333J	4-6B	4	P1	NS
	11-			
	12-44			
RC05GF391J	12-44A	4	P1	NS
	14-7			
	14-9			
RC05GF392J	10-4	7	P1	NS
	11-14			
	11-15			
	12-41			
	16-33			
	18-12			
RC05GF393J	11-	3	P1	NS
	20-5			
RC05GF470J	5-39	2	P1	NS
	17-52A			
RC05GF471J	5-44	5	P1	NS
	13-1			
	15-10			
	16-29			
RC05GF472J	5-36	10	P1	NS
	10-5			
	11-14			
	11-15			
	12-42			
	15-11			
	16-34			
RC05GF473J	6-4D	5	P1	NS
	4-35			
	11-			
RC05GF474J	4-21	1	X1	
RC05GF513J	6-10A	13	P1	NS
	19-16			
RC05GF561J	14-9	1	P1	NS
RC05GF562J	7-5A	5	P1	NS
	11-14			
	11-15			
	14-6			

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
RC05GF563J	7-3	3	P1	NS
	11-12			
	11-13			
RC05GF681J	11-14	4	P1	NS
	11-15			
	16-30			
RC05GF682J	20-8	1	P1	NS
RC05GF683J	11-12	2	P1	NS
	11-13			
RC05GF823J	11-12	2	P1	NS
	11-13			
RC05GF684J	18-11	1	P1	NS
RC05GF821J	11-	3	P1	NS
	12-38			
RC05GF822J	12-43	3	P1	NS
	16-36			
RC07GF101K	6-10	1	P1	NS
RC07GF122K	4-45	1	P1	NS
RC07GF152K	14-7	2		
RC07GF222K	14-8	1	P1	NS
RC07GF391K	14-6	2	P1	NS
RC07GF473K	34-7A	1	P1	NS
RC07GF820K	14-5	1	P1	NS
RESISTOR	17-53	1		
RFC-126	17-56	1		
RN55D4991F	5-34	1	P1	NS
RN55D6981F	5-33	1	P1	NS
RS-1/4100OHM3PCTG	6-8	2	P1	NS
	7-5			
RS-1/4220OHM1PCTG	6-9	1	P1	NS
RS-1B100J	18-9	1	P1	NS
RW67V391	34-11	1	P1	NS
RW67V560	34-10	1	P1	NS
RW69V100	28-4	1	P1	NS
RW69V101	28-3	1	P1	NS
S.1.101F-3021	21-22	1	P1	NS
SDT6466	11-5	1	P1	NS
SE-23BRASS-TIN-P	12-18	2	X2	
	16-5			
SF31	8-3	16	P1	NS
	9-6			
	10-9			
SF50	8-4	1	X1	
SF51	8-5	5	P1	NS
	9-7			
SG121	9-4	1	P1	NS
SG141	8-2	4	P1	NS
	9-5			
SG41	8-1	2	X1	
SKT-0804	24-21	41	P1	NS
	26-			
	27-6			
	28-8			
	29-6			
SMCB-01-150	13-2	1	P1	NS
SSB-50N	24-29	4	P1	NS
	29-32			
SSM-001-64	4-4B	30	P1	NS
	12-28			
	14-1			
	15-12			
	15-21			
	16-22			
	17-69			
SSM-100-51	12-29B	1	P1	NS
SWITCH	17-54	1		
SX2887-15K	17-52	1	P1	NS
SZ51224	5-30	1	P1	NS
S5532FCP25L02	12-6	4	P1	NS
	16-16			
TC-100-144	18-3	1		

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE	PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE	PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
TC-2.12	14-3A	7	P1	NS										
	15-20													
	16-6	1	P1	NS										
TC-3.9-5	11-23	2	P1	NS										
TC-4.3-12	14-3A	1	P1	NS										
TC-5.6-13	16-21	1	P1	NS										
TC-5.6.20	14-3A	1												
U-183/U	17-34													
UG-625B/U	25-13	4	P1	NS										
	26-9													
	27-9													
	29-7													
UG-88E/U	31-5	1												
UTX205	5-28	3	P1	NS										
	5-31													
	20-3													
UY011R0C	12-29	6	P1	NS										
	15-22													
	16-7													
UZ714	5-29	1	P1	NS										
VHC340-2 (black passivate)	22-3	1	P1	NS										
VHS340 (black passivate)	22-4	1	P1	NS										
WEE1000-8	18-6	1	P1	NS										
WM286G	19-4	1	P1	NS										
Y-1133( )	1-4	1	P1	NS										
015-3390-010	33-17	2	P1	NS										
0167-3	25-14	4	P1	NS										
	26-10													
	27-10													
	29-9													
018-1390-000	16-19	6												
018-1390-020	12-13	4												
0220-18	34-17	1	P1	NS										
0512-1-20K	11-10	1	P1	NS										
062-626MDP	24-37	2	P1	NS										
	29-40													

PART NO.	FIG.& INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
1/8SSBALLTYPE	17-48	6	P1	NS
E440GR100	21-17			
1N3064	4-5A	9	P1	NS
	11-11			
	12-33			
	14-3B			
	17-68			
	12-33			
	19-6			
1N3207	9-2	33	P1	NS
	10-3			
	19-3			
	19-7			
	19-14			
1N4002	35-3	1		
1N445	7-4	1	P1	NS
1N4656	18-5	1	P1	NS
1N4663	18-4	1	P1	NS
1N4665	5-32	1	P1	NS
1N4720	33-3	1	P1	NS
1N4732A	18-4	1	P1	NS
1N4735A	18-5	1	P1	NS
1N4753A	20-4	1	P1	NS
1N914	25-6	9	P1	NS
1N968B	12-32	1	P1	NS
10-101949-10	17-38	1	X2	
100-200-5-0	34-12	2	P1	NS
1024-6HT	34-3	7	P1	NS
	34-16			
1025-00	14-11	2	P1	NS
1025-08	12-30	12	P1	NS
	14-12			
	16-25			
	20-5			
1025-12	4-5	6	P1	NS
	12-31			
	15-17			
	16-36			
1025-36	6-7	4	P1	NS
1025-48	16-27	2	P1	NS
108-302	33-14	2	P1	NS
	35-11			
108-303	33-15	2	P1	NS
	35-12			
108-901	30-8	6	P1	NS
108-902	30-6	2	P1	NS
	34-22			
108-903	30-7	7	P1	NS
	34-23			
130D336X9050F2	5-24	1	P1	NS
145D606X0020H2	4-18	2		
145D686X0020E2	4-17	1		
150-1541-000	30-13	1	P1	NS
150D105X0035A2	13-3	3	P1	NS
	16-20			
150D155X0020A2	12-27	1	P1	NS
150D155X0035B2	13-4	1	P1	NS
150D155X9020A2	18-2	1	P1	NS
150D224X9035A2	18-1	1	P1	NS
162D475X0010BA2	4-20	2	X1	
172D825X9015L2	17-52B	2	P1	NS
	20-1			
2B164	15-8	1	X1	
2N1132	10-2	1	P1	NS
2N2394	10-2	1	P1	NS
2N2484	5-8	6	P1	NS
2N2897	5-11	1	P1	NS
2N2907	18-8	1	P1	NS
2N3014/SS4410	10-1	1	P1	NS
2N3251	5-10	1	P1	NS
2N3375	14-15	2		
2N3486	5-13	1	P1	NS
2N3764	5-9	1	P1	NS
2N3866	14-16	2	P1	NS
2N4225	5-12	1	P1	NS
2N918/50	12-25	6		
	15-9			
	16-40			
2N956	12-23	2	P1	NS
2N997	18-7	1	P1	NS
2T14-1927STF	35-13	1		
2W	6-	10	P1	NS
	17-			
20C-46001-03	12-15	8	X1	
	16-1			
	24-17			
	25-21			
	26-6			
	29-24			
20C-46002-03	6-6	2	P1	NS
	25-19			
20C-46012-01	12-14	2	P1	NS
	16-5			
20C-46031-02	29-26	1	P1	NS
21R-190	1-3	1	P1	NS
2465-008W5T0102P	20-1	3	P1	NS
3-18586	11-20	1	P1	NS
310-0044-000	4-	4	P1	NS
	31-			
310-0045-000	24-	6	P1	NS
	29-			
310-0046-000	24-	15	P1	NS
	29-			
	30-			
	31-			
	34-			
	35-			
310-0059-000	11-	1	P1	NS
310-0070-000	4-	17	P1	NS
	5-			
	17-			
	25-			
	27-			
	28-			
	33-			
310-0094-000	11-	5	P1	NS
	15-			
310-0128-000	11-10B	4	P1	NS
	19-			
310-0129-000	5-	7	P1	NS
	6-			
	16-			
	19-			
310-0150-000	17-	1	P1	NS
310-0274-000	11-28	34	P1	NS
	14-			
	15-			
310-0278-000	17-	12	P1	NS
	24-			
	29-			
	33-			
310-0550-000	14-	2	P1	NS
310-6320-000	17-	43	P1	NS
	24-			
	25-			
	26-			
	27-			
	28-			
	29-			
	30-			
	33-			
	34-			
	35-			
310-6340-000	24-	61	P1	NS
310-6340-000	26-			
	29-			
	30-			
	33-			
	34-			
	35-			
313-0132-000	33-	2	P1	NS
322-0149-000	4-	23		
	6-			
	11-			
322-0162-000	11-	2		
328-0266-000	12-	14	P1	NS
328-0368-000	17-	8	P1	NS
	21-			
328-0372-000	16-	12	P1	NS
328-0373-000	16-	2	P1	NS
331-2020-000	24-27	4	M	S
	29-30			
334-1008-000	11-	3	P1	NS
	14-			
334-1390-000	12-	33	P1	NS
	16-			
335-0277-010	24-	4	P1	NS
	29-			
340-0644-000	3-4	10	P1	NS
	26-12			
	27-8			
	28-14			
342-0141-00	6-	4		
342-0153-000	35-	4		
342-0157-000	24-	4	P1	NS
	29-			
342-0159-000	24-	1	P1	NS
343-0145-000	35-	4		
343-0669-000	17-	1		
351-7049-010	4-14	1	P1	NS
351-7050-030	4-9	1	P1	NS
351-7051-010	4-7	1	P1	NS
351-7053-010	4-13	1	P1	NS
351-7054-030	4-15	1	P1	NS
351-7055-030	4-16	1	P1	NS
351-7068-010	6-13	1	P1	NS
351-7069-010	6-14	1	P1	NS
351-7070-010	6-15	1	P1	NS
351-7071-010	6-16	1	P1	NS
351-7143-010	7-7	1	X1	
351-7144-060	6-17	1	P1	NS
351-7144-070	6-18	1	P1	NS
351-7145-030	6-19	1	P1	NS
351-7146-020	6-20	1	P1	NS
351-7277-010	7-10	1	X1	
351-7278-010	7-11	1	X1	
351-7279-010	7-9	1	X1	
351-7309-010	7-8	1	X1	
351-7319-010	4-12	1	P1	NS
351-7320-010	4-11	1	P1	NS
351-7321-050	4-8	1	P1	NS
353-11-03-001	34-19	1	P1	NS
353-11-12-001	30-4	1	M	S
353-3404-000	17-68	1		
357-7506-000	29-8	1	P1	NS
357-7506-010	31-4	1		
360-0479-010	25-15	10	P1	NS
373-8500-000	17-	1		
382A012-3	33-16	1	M1	S
4W	17-	2		
40C73A1	14-3	4	P1	NS
	17-14			
4007-4HT	17-61	1	X2	
	28-6	5	M	S
	30-16			

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
4007-4HT	33-5			
	33-10			
	34-14			
4037	17-26	1	X1	
4040-2HD	15-8A	2	P1	NS
	15-15			
4040-2HDSPL	17-73	1		
44A30-02-3-4N	25-12	1	P1	NS
451-10301-00	19-19	1		
451-10301-01	25-20	1	P1	NS
451-20301-01	6-5	2	P1	NS
	25-18			
457-0009	17-	2	P1	NS
460-105	4-25	2	X1	
	24-15			
460-205	24-8	2	P1	NS
	29-17			
460-206	24-4	2	P1	NS
	29-13			
470-0003	17-62	4	P1	NS
	24-18			
	26-5			
	29-25			
470-0004	24-9	3	P1	NS
	26-3			
	29-18			
470-0007	17-64	1	P1	NS
470-0021	17-	24	P1	NS
470-0022	5-3	10		
470-10150-01	28-12	1	P1	NS
470-10201-01	27-3	1	A	F
470-20150-01	28-10	1	P1	NS
470-20201-01	27-4	1	A	F
471-0001	12-16	22	X1	
	16-2			
	24-7			
	26-4			
	29-16			
471-0002	17-66	27	P1	NS
	24-16			
	26-7			
	29-23			
471-0003	17-63	3		
471-0004	12-17	2		
	16-3			
471-0005	12-17A	2		
4878-1-0516	28-5	21	P1	NS
	30-14			
	33-4			
	34-13			
	35-4			
491-100	33-8	1	P1	NS
491-101	17-59	2	P1	NS
	35-5			
5100-25C	24-24	2	P1	NS
	29-27			
5160-458-604-RED	25-17	6	P1	NS
52-204	17-27	2	X1	
	17-55			
5412	17-29	1	P1	NS
544-7455-003	12-4	2	P1	NS
	16-11			
5614CHH-3P15U02	21-18	3		
	21-27			
567-3853-002	24-20	2	P1	NS
	29-5			
567-7687-001	1-1	1	A	
	2-			
567-8314-001	4-10	1	P1	NS
567-8320-001	4-22	1	X1	
567-8323-001	6-4-16	1	P1	NS

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
567-8335-001	4-27	1	X1	
567-8337-001	4-31	1		
567-8338-001	5-51	1	X1	
567-8390-001	5-25	1	P1	NS
567-8391-001	5-26	1	P1	NS
567-8392-001	5-27	2	P1	NS
567-8393-001	5-46	1	P1	NS
567-8396-001	5-48	1	P1	NS
567-8397-001	5-49	1	P1	NS
567-8398-001	5-	1	P1	NS
567-8399-001	5-4	1	X1	
567-8407-001	4-30	1	M	
567-8417-001	5-1	4	P1	NS
	6-2			
	11-30			
	15-2			
567-8455-001	5-2	2	P1	NS
567-8459-001	11-21	1	M	
567-8460-001	11-18	3	P1	NS
567-8462-001	11-2	1	M	
567-8465-001	11-24	2	M	
567-8467-001	12-3	2	P1	NS
	16-10			
567-8468-001	12-2	2	P1	NS
	16-12			
567-8469-001	12-26	5	X2	
	16-41			
567-8470-001	12-20	8	X2	
	16-9			
567-8471-001	12-	48	P1	NS
	16-			
567-8473-001	14-13	2	P1	NS
567-8476-001	13-5	2	X2	
567-8478-001	12-1	1	P1	NS
567-8479-001	13-7	1	X2	
567-8495-001	11-17	1	X2	
567-8523-001	15-4	1	M	
567-8526-001	11-28	1	A	
	14-			
567-8527-001	11-3	1	A	
	13-			
567-8531-001	11-19	1	X2	
567-8536-001	13-	1	X2	
567-8539-001	11-29	8	P1	NS
	15-16			
567-8546-001	11-9	2	P1	NS
567-8547-001	11-25	1	X2	
567-8548-001	11-26	1	X2	
567-8549-001	11-27	1	X2	
567-8550-001	12-	1	X2	
567-8551-001	12-5	1	P1	NS
567-8552-001	12-10	6	P1	NS
	16-17			
567-8553-001	12-11	2	P1	NS
567-8554-001	12-12	1	P1	NS
567-8555-001	12-7	6	P1	NS
	16-14			
567-8556-001	12-8	2	P1	NS
567-8557-001	12-9	1	P1	NS
567-8558-001	12-34	3	P1	NS
	16-39			
567-8560-001	14-	1	X2	
567-8562-001	14-	1	A	
567-8563-001	11-	1	A	
567-8564-001	12-49	1	X2	
567-8567-001	14-21	1	X2	
567-8569-001	14-19	1	X2	
567-8572-001	15-23	1	A	

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
567-8572-001	16-			
567-8573-001	16-	1	X2	
567-8574-001	16-45	1	X2	
567-8579-001	16-18	2	P1	NS
567-8582-001	16-15	2	P1	NS
567-8583-001	16-	1	P1	NS
567-8585-001	15-	1	A	
567-8586-001	15-	1	X2	
567-8587-001	15-14	1	X2	
567-8601-001	14-10	1	P1	NS
567-8626-001	11-4	2	P1	NS
	15-1			
567-8640-001	16-13	1	P1	NS
567-8657-001	15-6	1	X2	
567-8728-001	7-13	1	M1	
567-8729-001	6-31	1	M1	
567-8730-001	6-32	1		
567-8739-001	17-42	1	P1	NS
567-8740-001	17-40	2	P1	NS
	21-5			
567-8741-001	17-50	3	M1	
	21-1			
567-8742-001	21-15	1	P1	NS
567-8743-001	21-12	1	P1	NS
567-8744-001	21-13	1	P1	NS
567-8745-001	21-11	1	P1	NS
567-8746-001	21-4	1	P1	NS
567-8747-001	21-3	1	P1	NS
567-8748-001	21-2	1	P1	NS
567-8750-001	21-26	1	P1	NS
567-8758-001	21-6	1	X1	
567-8759-001	21-7	1	X1	
567-8760-001	21-8	1	X1	
567-8763-001	21-20	1	P1	NS
567-8764-001	21-21	1	P1	NS
567-8765-001	21-19	1	P1	NS
567-8766-001	17-49	4	P2	NS
567-8766-002	21-16	2	P2	NS
567-8773-001	21-25	1	X1	
567-8774-001	21-24	1	X1	
567-8776-001	17-15	3	P1	NS
567-8777-001	17-7	1	P1	NS
567-8778-001	17-8	1	P1	NS
567-8779-001	17-16	2	P1	NS
567-8788-001	17-21	2	P1	NS
567-8788-002	17-18	1	P1	NS
567-8788-003	17-22	2	P1	NS
567-8817-001	6-1	1	P2	NS
567-8841-001	21-	1	X2	
567-8842-001	21-28	1	P1	NS
567-8847-001	21-	1	Q1	
567-8848-001	21-23	1	P1	NS
567-8850-001	21-	1	P1	NS
567-8851-001	17-17	1	P1	NS
567-8858-001	17-19	1	P1	NS
567-8864-001	17-20	1	P1	NS
567-8869-001	17-	1	P1	NS
567-8873-001	17-24	1	A	
	19-			
567-8874-001	19-	1	X2	
567-8875-001	19-	1	P1	PF
567-8876-001	19-5	1	X1	
567-8877-001	19-	1	P1	XF
567-8878-001	19-10	1	X1	
567-8880-001	19-	1	P1	PF
567-8881-001	19-17	1	X1	
567-8884-001	17-39	1	P1	NS
567-8903-001	17-44	1	P1	NS

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
567-8906-001	17-25	2	P1	NS
	31-3			
567-8913-001	17-60	1	M	
567-8914-001	21-10	1	P1	NS
567-8915-001	17-43	1	M	
567-8918-001	19-18	1	X2	
567-8919-001	19-11	1	M1	
567-8920-001	19-2	1	M1	
567-8920-002	19-1	1	M1	
567-8921-001	19-13	1	M1	
567-8922-001	19-12	1	M1	
567-8924-001	19-	1	X1	
567-8925-001	19-20	2	P1	NS
567-9005-001	2-1	1	P1	NS
567-9052-001	2-2	1	P1	NS
567-9053-001	2-3	1	P1	PF
567-9055-001	2-5	1	P1	NS
567-9396-001	17-23	2	X2	
567-9493-001	14-17	2	P1	NS
567-9526-001	6-12	157	X2	
	7-6			
567-9617-001	12-21	1	P1	NS
6W	3-	1		
61PNR50K	4-24	2	X1	
616-6-1	34-7	1	P1	NS
62PR5K	4-23	1	X1	
62PR50K	4-24	2	X1	
63BLACK	33-13	2	X2	S
	35-10			
63RED	33-12	2	X2	S
	35-9			
64	25-16	6	P1	NS
68NM-62	34-	2	P1	NS
68NM26	26-	6	P1	NS
	27-			
	28-			
68NM40	24-	29	P1	NS
	29-			
	30-			
	33-			
	34-			
68NM62	31-	2	P1	NS
	35-			
7209	12-19	8	P1	NS
	16-8			
747R	30-3	8	P1	NS
	34-21			
780-0476-001	17-45	1	P2	NS
780-0477-001	3-10	2	P1	NS
780-0492-001	3-7	1	P1	TD
	6-			
780-0493-001	6-27	6	P1	NS
780-0494-001	6-28	1	P1	NS
780-0495-001	6-29	1	P1	NS
780-0496-001	6-30	1	P1	NS
780-0497-001	6-	1	P1	TD
780-0498-001	6-26	1	X2	
780-0499-001	6-21	1	P1	NS
780-0500-001	6-22	1	P1	NS
780-0501-001	6-23	1	P1	NS
	8-			
780-0502-001	6-24	1	P1	PF
	9-			
780-0503-001	6-25	1	P1	XF
	10-			
780-0504-001	6-4	1	P1	TD
	7-			
780-0507-001	8-6	1	X1	
780-0508-001	9-8	1	X1	
780-0509-001	10-10	1	X1	

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
780-0511-001	7-14	1		
780-0512-001	7-	1	X1	
780-0513-001	7-12	1	X1	
780-0523-001	4-	1	P1	NS
780-0524-001	4-	1	P1	PF
780-0525-001	4-	1	P1	TD
780-0526-001	3-5	1	P1	TD
	4-			
780-0527-001	15-	1	P1	NS
780-0528-001	15-3	1	M	
780-0529-001	3-9	1	P1	TD
	15-			
780-0530-001	12-	1	P1	NS
780-0531-001	11-31	1	A	
	12-			
780-0532-001	3-8	1	P1	TD
	11-			
780-0533-001	3-1	1	A	
780-0536-001	3-11	1	P1	TD
	17-			
780-0537-001	17-67	1	X2	
780-0540-001	17-	1	P1	PF
780-0541-001	17-51	1	P2	TD
	21-			
780-0542-001	21-	1	P1	NS
780-0543-001	21-9	1	X1	
780-0547-001	6-3	1	P2	NS
780-0566-001	15-5	1	M	
780-0581-001	17-2	1	M1	
780-0582-001	17-12	1	P2	NB
780-0583-001	17-10	1	P2	NB
780-0584-001	17-11	1	P2	NB
780-0596-001	3-6	1	P1	TD
	5-			
780-0597-001	5-	1	A	
780-0598-001	5-47	1	P1	NS
780-0603-001	17-46	1	P1	PF
	20-			
780-0604-001	20-10	1	X1	
780-0622-001	4-1	1	P2	NS
780-0623-001	11-1	1	M	
780-0625-001	5-50	1	X1	
780-0645-001	17-1	1	P1	PF
	18-			
780-0648-001	18-16	1	X2	
780-0660-001	4-29	1	X1	
780-0663-001	4-28	1	X1	
780-0687-001	17-47	1	X2	
780-0761-001	18-15	2	P1	NS
780-0826-001	3-2	1	X2	
780-0827-001	3-3	6	X2	
780-0919-001	17-32	1	P1	NS
780-0930-001	17-13	3	M1	
780-0931-001	17-6	2	P1	NS
780-0931-002	17-5	1	P1	NS
780-0932-001	5-	1	P2	NS
780-0935-001	5-	1	X1	
780-0938-001	17-57	1	X1	
780-0939-001	17-58	1	X1	
780-1062-001	3-1a	1	P1	NS
780-1077-001	17-31	1	P1	NS
780-1792-001	17-36	1		
780-1838-001	17-3	2		
780-1839-001	17-4	2		
780-1865-001	22-1	1	P1	NS
780-1867-001	22-	1	X2	
780-1905-001	23-2	1		

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
780-1908-001	23-1	1		
780-1910-001	23-3	1		
780-1911-001	23-4	1		
780-1912-001	23-5	1		
780-1913-001	23-7	1		
780-1914-001	23-6	1		
780-1915-001	23-8	1		
780-1917-001	12-11A	1		
780-1919-001	23-9	1		
780-1920-001	23-11	1		
780-1937-001	22-5	1	X2	
780-2074-001	17-36	1		
780-2358-001	34-1	1	P1	NS
780-2361-001	34-25	1	P1	PF
780-2372-001	27-2	1	M	S
780-2373-001	27-11	1	M	S
780-2377-001	27-5	2	P1	NS
780-2388-001	28-2	1	M	S
780-2391-001	28-15	1	A	F
780-2393-001	28-11	2	P1	NS
780-2405-001	30-21	1	A	F
780-2407-001	30-2	1	M	S
780-2415-001	26-13	1	A	F
780-2421-001	26-8	2	M	S
780-2422-001	26-2	1	M	S
780-2432-001	29-10	1	M	S
780-2436-001	24-44	2	M1	S
	29-47			
780-2437-001	24-42	2	M	S
	29-45			
780-2438-001	24-33	2	P1	NS
	29-36			
780-2439-001	24-39	8	M	S
	29-42			
780-2440-001	24-40	2	P1	NS
	29-43			
780-2441-001	24-41	4	M	S
	29-44			
780-2443-001	24-26	2	P1	NS
	29-29			
780-2444-001	24-2	2	M	S
	29-2			
780-2445-001	24-	2	A	F
	29-			
780-2445-002	24-38	2	M	S
	29-41			
780-2446-001	24-14	2	M	S
	29-20			
780-2447-001	24-	2	A	F
	29-			
780-2450-001	24-22	1	A	F
780-2456-001	24-28	2	M	S
	29-31			
780-2843-001	25-23	1	M	S
780-2851-001	25-22	1	M	S
780-2852-001	25-2	1	A	F
780-2854-001	31-	1		
780-2857-001	31-7	1		
780-2906-00)	22-2			
780-2912-001	25-	1	A	F
780-2914-001	25-	1	A	F
780-2918-001	25-	1	A	F
780-2921-001	25-4	4	P1	NS
780-2922-001	25-3	4	M	S
780-2928-001	33-2	1	M	S
780-2930-001	33-20	1	M	S
780-2932-001	33-18	1	M	S
780-2933-001	33-19	1	M	S
780-2935-001	33-9	3	M	S
	35-6			
780-2938-001	35-16	1		
780-2942-001	35-2	1		

PART NO.	FIG. & INDEX NO.	QTY PER ART.	SOURCE CODE	REPAIR CODE
780-2943-001	35-15	2		
780-2944-001	31-6	4		
780-3005-001	26-11	3	P1	NS
	27-7			
	28-13			
780-3147-001	28-9	4	A	F
780-3318-001	24-1	2	X2	S
	26-1			
780-3318-002	25-1	1	X2	S
780-3318-004	27-1	1	X2	S
780-3318-005	28-1	1	X2	S
780-3318-006	30-1	1	X2	S
780-3318-007	29-1	1	X2	S
780-3318-008	31-1	1		
780-3318-009	34-24	1	X1	
780-3373-001	25-9	1	P1	NS
780-3468-001	25-10	1	P1	NS
780-3502-001	33-1	1	X2	S
780-3502-002	35-1	1		
780-3516-001	24-30	2	P1	NS
	29-33			
780-3638-002	12-14A	1		
780-3718-001	24-6	2	X2	S
	29-14			
780-3719-001	24-5	2	M	S
	29-12			
780-3761-001	24-34	2	P1	NS
	29-37			
787-6530-002	1-	1	P1	SD
787-6531-001	1-2	1	P1	TD
	3-			
787-6532-001	1-	1		
787-6533-001	1-	1		
787-6534-001	1-5	1	P2	PF
	22-			
787-6535-001	1-	1		
787-6569-001	1-8	1		
787-6570-001	1-6	1	P1	NS
787-6571-001	1-	1	P2	NB
787-6839-001	23-12	1		
787-6841-001	23-10	1		
8111-062-C0G0439D	11-32	1	P1	NS
92-1660-00	12-	1		
997F-18	14-4	2	P1	NS
997H-5	12-35	1	P1	NS

SECTION IV
REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG. AND INDEX NO.	PART NO.
UNIT 1	1-2	787-6531-001
UNIT 2	1-3	787-6532-001
UNIT 2	1-4	787-6533-001
UNIT 3	1-7	H-250/U
UNIT 4	1-1	567-7687-001
UNIT 5	1-6	787-6570-001
UNIT 6	1-8	787-6569-001
UNIT 7	1-5	787-6534-001
UNIT 8	1-9	787-6571-001
1A1	3-11	780-0536-001
1A1A1	19-	567-8875-001
1A1A1A1	19-4	WM286G
1A1A1CR1 thru 1A1A1CR11	19-3	1N3207
1A1A2	19-	567-8877-001
1A1A2CR1 thru 1A1A2CR13	19-7	1N3207
1A1A2CR14	19-6	1N3064
1A1A2K1 thru 1A1A2K2	19-8	BR44-S10
1A1A2R1 thru 1A1A2R5	19-9	RC05GF513J
1A1A3	19-	567-8880-001
1A1A3CR1 thru 1A1A3CR2	19-14	1N3207
1A1A3R1 thru 1A1A3R4	19-16	RC05GF513J
1A1A3R5	19-15	RC05GF103J
1A1A4	17-46	780-0603-001
1A1A4C1	20-1	172D825X9015L2
1A1A4C2 thru 1A1A4C3	20-2	C12A104K
1A1A4CR1	20-3	UTX205
1A1A4R1 thru 1A1A4R2	20-4	RC05GF152J
1A1A4R3	20-5	RC05GF393J
1A1A4R4	20-6	RC05GF121J
1A1A4R5 thru 1A1A4R6	20-7	RC05GF242J
1A1A4R7	20-8	RC05GF682J
1A1A4R8	29-9	RC05GF183J
1A1A5	17-1	780-0645-001
1A1A5C1	18-1	150D224X9035A2
1A1A5C2	18-2	150D155X9020A2
1A1A5C3	18-3	RC-100-144
1A1A5CR1	18-4	1N4663
1A1A5CR2	18-5	1N4656
1A1A5L1	18-6	WEE1000-8
1A1A5Q1	18-7	2N997
1A1A5Q2	18-8	2N2907
1A1A5R1	18-9	RS-1B100J
1A1A5R2	18-10	RC05GF124J
1A1A5R3	18-11	RC05GF684J
1A1A5R4	18-12	RC05GF392J
1A1A5R5	18-13	RC05GF102J
1A1A5R6	18-14	RC05GF182J
1A1A5R7 thru 1A1A5R8	18-17	RC05GF103J
1A1C1	17-52B	172D825X9015L2
1A1C2	17-71	C11A152K
1A1C3	17-69	SSM-001-64
1A1C4 thru 1A1C5	17-70	MINT 47K
1A1C6	17-74	40C7301
1A1CR1	17-68	1N3064
1A1FL1	17-29	5412
1A1FL1P1	17-27	52-204
1A1FL1P2	17-55	52-204
1A1K1	17-56	RFC-126
1A1L1 thru 1A1L3	17-72	F1913-1-01
1A1R1	Not Used	
1A1R2	17-52B	RC05GF682J
1A1R3	17-52	SX2887-15K
1A1R4	17-53	RESISTOR
1A1R5	17-52A	RC05GF470J
1A1S1	17-54	SWITCH
1A1T1	17-39	567-8884-001
1A2	3-6	780-0596-001
1A2C1	5-14	C10A104K
1A2C2	5-19	MTP475M035P1D
1A2C3	5-15	GL10-101K
1A2C4	5-17	C10A104K
1A2C5	5-20	MTP306M050P1B
1A2C6	5-19	MTP475M035P1D
1A2C7	5-14	C10A104K
1A2C8	5-16	C10A103K
1A2C9	5-23	MTP106M035P1A
1A2C10	5-24	130D336X9050F2
1A2C11	5-17	C10A104K
1A2C12	5-21	MTP106M035P1A
1A2C13 thru 1A2C14	5-18	C11A682K
1A2C15	5-16	C10A103K
1A2C16 thru 1A2C19	5-18	C11A682K
1A2C20	5-22	MTP606M020P1B
1A2CR1	5-28	UTX-205
1A2CR2	5-29	UZ714
1A2CR3	5-30	SZ51224
1A2CR4	5-31	UTX205
1A2CR5	5-32	1N4665
1A2F1	5-5	GLN3-10
1A2F2	5-6	GLN4-10
1A2F3	5-7	GL1-1-1-2
1A2J1	17-62	470-0003
1A2L1	5-25	567-8390-001
1A2L2	5-26	567-8391-001
1A2L3 thru 1A2L4	5-27	567-8392-001

REFERENCE DESIGNATION	FIG. AND INDEX NO.	PART NO.
1A2P1	5-	567-8398-001
1A2Q1 thru 1A2Q4	5-8	2N2484
1A2Q5	5-9	2N3764
1A2Q6 thru 1A2Q7	5-8	2N2484
1A2Q8	5-10	2N3251
1A2Q9	5-11	2N2897
1A2Q10	5-12	2N4225
1A2Q11	5-13	2N3486
1A2R1	5-33	RN55D6981F
1A2R2	5-34	RN55D4991F
1A2R3 thru 1A2R4	5-35	RC05GF473J
1A2R5 thru 1A2R6	5-36	RC05GF472J
1A2R7	5-37	RC05GF102J
1A2R8	5-45	RC07GF122K
1A2R9	5-38	RC05GF101J
1A2R10	5-39	RC05GF470J
1A2R11	5-40	RC05GF222J
1A2R12	5-38	RC05GF101J
1A2R13	5-41	RC05GF332J
1A2R14	5-36	RC05GF472J
1A2R15 thru 1A2R16	5-38	RC05GF101J
1A2R17	5-42	RC05GF152J
1A2R18	5-43	RC05GF180J
1A2R19	5-44	RC05GF471J
1A2R20	5-37	RC05GF102J
1A2T1	5-46	567-8393-001
1A3	3-7	780-0492-001
1A3A1	6-4	780-0504-001
1A3A1A1	7-10	351-7277-010
1A3A1A2	7-11	351-7278-010
1A3A1A3	7-9	351-7279-010
1A3A1A4	7-7	351-7143-010
1A3A1A5	7-8	351-7309-010
1A3A1C1	7-2	DR47T35JU
1A3A1CR1	7-4	1N445
1A3A1FL1	7-1	D11176
1A3A1R1	7-5	RS-1/41000HM3PCTG
1A3A1R2	7-3	RC05GF563J
1A3A1R3	7-5A	RC05GF562J
1A3A2	6-15	351-7070-010
1A3A3	6-16	351-7071-010
1A3A4	6-22	780-0500-001
1A3A5	6-17	351-7144-040
1A3A6	6-18	351-7144-050
1A3A7	6-19	351-7145-020
1A3A8	6-20	351-7146-010
1A3A9	6-23	780-0501-001
1A3A9A1 thru 1A3A9A4	8-5	SF51
1A3A9A5	8-4	SF50
1A3A9A6	8-3	SF31
1A3A9A7	3-2	SG141
1A3A9A8 thru 1A3A9A9	8-1	SG41
1A3A10	6-24	780-0502-001
1A3A10A1 thru 1A3A10A5	9-6	SF31
1A3A10A6	9-7	SF51
1A3A10A7	9-5	SG141
1A3A10A8	9-4	SG121
1A3A10A9 thru 1A3A10A10	9-5	SG141
1A3A10C1	9-3	C11A181K
1A3A10CR1	9-2	1N3207
1A3A10R1	9-1	CE-1/8-10K-1-C1
1A3A11	6-25	780-0503-001
1A3A11A1 thru 1A3A11A10	10-9	SF31
1A3A11CR1 thru 1A3A11CR5	10-3	1N3207
1A3A11Q1	10-1	2N3014/SS4410
1A3A11Q2	10-2	2N2394
1A3A11R1	10-8	RC05GF223J
1A3A11R2	10-7	RC05GF153J
1A3A11R3	10-5	RC05GF472J
1A3A11R4	10-4	RC05GF392J
1A3A11R5	10-6	RC05GF103J
1A3A11R6	10-4	RC05GF392J
1A3A12	6-13	351-7068-010
1A3A13	6-14	351-7069-010
1A3A14	6-21	780-0499-001
1A3A15R1 thru 1A3A15R6	6-10B	RC05GF102J
1A3C1 thru 1A3C3	6-11	C11A682K
1A3J1	19-19	451-10301-00
1A3L1 thru 1A3L4	6-7	1025-36
1A3P1	6-5	451-20301-01
1A3R1	6-9	RS-1/4220OHM1PCTG
1A3R2	6-8	RS-1/4100OHM3PCTG
1A3R3	6-10	RC07GF101K
1A3R4 thru 1A3R7	6-10A	RC05GF513J
1A4	3-5	780-0526-001
1A4A1	4-14	351-7049-010
1A4A2	4-12	351-7319-010
1A4A3	4-9	351-7050-030
1A4A4	4-7	351-7051-010
1A4A5	4-8	351-7321-050
1A4A6	4-13	351-7053-010
1A4A7	4-10	567-8314-001
1A4A8	4-15	351-7054-030
1A4A9	4-16	351-7055-030
1A4A10	4-11	351-7320-010
1A4A11	4-	567-8323-001
1A4A11C1	4-19	MTP156M020P1A
1A4A11C2	4-17	145D686X0020E2
1A4A11C3 thru 1A4A11C4	4-20	162D475X0010BA2
1A4A11C5 thru 1A4A11C6	4-18	145D606X0020H2
1A4A11R1	4-21	RC05GF474J
1A4C1 thru 1A4C4	4-3	C11A682K

REFERENCE DESIGNATION	FIG. AND INDEX NO.	PART NO.
1A4C5	Not Used	
thru		
1A4C6		
1A4C7	4-4	162D475X0010BA2
1A4C8	4-3	C11A682K
1A4C9	4-4	C11A152K
1A4C10	4-4A	GL10-101M
1A4C11	4-4B	SSM-001-64
thru		
1A4C12		
1A4CR1	4-5A	1N3064
thru		
1A4CR2		
1A4J1	17-64	470-0007
1A4L1	4-5	1025-12
1A4P1	4-	780-0523-001
1A4R1	4-24	62PR50K
thru		
1A4R2		
1A4R3	4-6	RC05GF220J
1A4R4	4-23	62PR5K
1A4R5	4-6A	RC05GF224J
1A4R6	4-6B	RC05GF333J
1A4R7	4-6C	RC05GF272J
1A4R8	4-6D	RC05GF473J
1A5	3-8	780-0532-001
1A5C2	12-28	SSM-001-64
thru		
1A5C7		
1A5C8	14-2	C11A223K
1A5C9	14-14	2465-008W5T0102P
thru		
1A5C10		
1A5C11	14-2	C11A223K
1A5C12	12-28	SSM-001-64
1A5C13	11-23	8111-062-C0G0439D
1A5C14	11-22	CC60CG8R2D
1A5C15	11-23	TC3-4-5
1A5C16	12-19	7209
1A5C17	Not Used	
1A5C18	12-19	7209
1A5C19	Not Used	
1A5C20	14-14	2465-008W5T0102P
1A5C21	14-2	C11A223K
1A5C22	14-3	40C73A1
1A5C23	Not Used	
1A5C24	14-1	SSM-001-64
1A5C25	14-3	40C73A1
1A5C26	14-14	2465-008W5T0102P
1A5C27	14-2	C11A223K
1A5C28	Not Used	
1A5C29	14-14	2465-008W5T0102P
1A5C30	14-2	C11A223K
1A5C31	14-3	40C73A1
1A5C32	Not Used	
thru		
1A5C35		
1A5C36	12-27	150D155X0020A2
1A5C37	13-3	150D105X0035A2
1A5C38	13-2	SMCB-01-150
1A5C39	13-4	150D155X0035B2
1A5C40	12-28	SSM-001-64
1A5C41	12-29	UY011R0C
1A5C42	13-3	150D105X0035A2
1A5C43	12-28	SSM-001-64
thru		
1A5C44		
1A5C45	12-29B	SSM-100-51
1A5C46	14-3A	TC-2.12
		TC-4.3-12
		TC-5.6-20

REFERENCE DESIGNATION	FIG. AND INDEX NO.	PART NO.
1A5CR1	12-33	1N3064
thru		
1A5CR2		
1A5CR3	12-32	1N968B
1A5CR4	11-11	1N3064
thru	12-33	
1A5CR6	14-3B	
1A5J1	17-63	471-0003
1A5L1	12-30	1025-08
thru		
1A5L2		
1A5L3	Not Used	
1A5L4	12-31	1025-12
1A5L5	Not Used	
1A5L6	14-2	1025-08
1A5L7	Not Used	
thru		
1A5L8		
1A5L9	14-12	1025-08
thru		
1A5L11		
1A5L12	Not Used	
1A5L13	14-11	1025-00
1A5L14	14-12	1025-08
thru		
1A5L15		
1A5L16	Not Used	
1A5L17	14-10	567-8601-001
1A5L18	12-21	567-9617-001
1A5L19	Not Used	
1A5L20	14-11	1025-00
1A5L21	11-33	F1913-1-01
thru		
1A5L34		
1A5P1	12-15	780-0530-001
1A5P2	12-14	20C-46012-01
1A5Q1	12-25	2N918/50
thru		
1A5Q2		
1A5Q3	14-16	2N3866
thru		
1A5Q4		
1A5Q5	14-15	2N3375
thru		
1A5Q6		
1A5Q7	12-23	2N956
thru		
1A5Q8		
1A5Q9	11-5	SDT6466
1A5R1	12-43	RC05GF822J
1A5R2	12-41	RC05GF392J
1A5R3	12-36	RC05GF221J
1A5R4	12-37	RC05GF331J
1A5R5	12-44A	RC05GF391J
1A5R6	14-6	RC07GF562J
1A5R7	14-7	RC07GF391K
1A5R8	14-6	RC07GF562J
1A5R9	14-7	RC07GF391K
1A5R10	11-5	RC07GF820K
1A5R11	14-8	RC07GF152J
1A5R12	12-44	RC05GF333J
1A5R13	12-42	RC05GF472J
1A5R14	12-38	RC05GF821J
1A5R15	12-40	RC05GF272J
1A5R16	13-1	RC05GF471J
1A5R17	11-10	0512-1-20K
1A5R19	12-44B	RC05GF153J
1A5R20	12-39	RC05GF102J
1A5R21	11-12	RC05GF103J
		RC05GF123J
		RC05GF153J

REFERENCE DESIGNATION	FIG. AND INDEX NO.	PART NO.
1A5R21		RC05GF183J
		RC05GF223J
		RC05GF273J
		RC05GF333J
		RC05GF393J
		RC05GF473J
		RC05GF563J
		RC05GF683J
		RC05GF823J
1A5R22	11-13	RC05GF103J
		RC05GF123J
		RC05GF153J
		RC05GF183J
		RC05GF223J
		RC05GF273J
		RC05GF333J
		RC05GF393J
		RC05GF473J
		RC05GF563J
		RC05GF683J
		RC05GF823J
1A5R23	11-14	RC05GF681J
		RC05GF821J
		RC05GF102J
		RC05GF122J
		RC05GF152J
		RC05GF182J
		RC05GF222J
		RC05GF272J
		RC05GF392J
		RC05GF472J
		RC05GF562J
1A5R24	11-15	RC05GF681J
		RC05GF821J
		RC05GF102J
		RC05GF122J
		RC05GF152J
		RC05GF182J
		RC05GF222J
		RC05GF272J
		RC05GF392J
		RC05GF472J
		RC05GF562J
1A5R25	12-44C	RC05GF104J
		RC05GF333J
		RC05GF473J
		RC05GF683J
1A5R26	14-9	RC05GF221J
		RC05GF391J
		RC05GF561J
1A5RT1	14-4	997F-18
thru		
1A5RT2		
1A5RT3	12-35	997H-5
1A5S1	11-6	MS24547-1
thru		
1A5S2		
1A5T1	12-34	567-8558-001
thru		
1A5T2		
1A5T3	14-13	567-8473-001
thru		
1A5T4		
1A5T5	11-20	324-6D
1A6	3-9	780-0529-001
1A6C1	16-6	TC-2.12
1A6C2	16-8	7209
1A6C3	Not Used	
thru		
1A6C4		
1A6C5	16-6	TC-2.12
1A6C6	16-22	SSM-001-64
1A6C7	15-7	MT120
1A6C8	16-22	SSM-001-64
thru		
1A610		
1A6C11	16-6	TC-2.12
1A6C12	16-8	7209
1A6C13	Not Used	
thru		
1A6C14		
1A6C15	16-7	UY011R0C
1A6C16	16-22	SSM-001-64
thru		
1A6C17		
1A6C18	16-6	TC-2.12
1A6C19	16-8	7209
1A6C20	Not Used	
thru		
1A6C21		
1A6C22	15-22	UY011R0C
1A6C23	Not Used	
1A6C24	16-8	7209
1A6C25	Not Used	
1A6C26	16-7	UY011R0C
1A6C27	16-23	GL10-101M
1A6C28	16-21	TC-5.6-13
1A6C29	16-22	SSM-001-64
1A6C30	16-20	150D105X0035A2
1A6C31	16-22	SSM-001-64
thru		
1A6C32		
1A6C33	16-6	TC-2.12
1A6C34	16-8	7209
1A635	Not Used	
thru		
1A636		
1A6C37	16-7	UY011R0C
1A6C38	16-22	SSM-001-64
thru		
1A6C39		
1A6C40	16-6	TC-2.12
1A6C41	16-8	7209
1A6C42	Not Used	
thru		
1A6C43		
1A6C44	16-7	UY011R0C
1A6C45	16-22	SSM-001-64
1A6C46	16-24	C11A682K
1A6C47	15-21	SSM-001-64
1A6C48	15-20	TC-2.12
1A6C49	15-12	SSM-001-64
1A6FL1	15-8	2B164
1A6J1	17-63	471-0003
1A6L1	Not Used	
1A6L2	16-26	1025-12
1A6L3	16-25	1025-08
1A6L4	Not Used	
thru		
1A6L7		
1A6L8	16-25	1025-08
1A6L9	16-27	1025-48
1A6L10	Not Used	
thru		
1A6L11		
1A6L12	16-26	1025-12
1A6L13	Not Used	
1A6L14	16-27	1025-48
1A6L15	16-25	1025-08
1A6L16	16-26	1025-12
1A6L18	15-17	1025-12
1A6P1	16-	567-8583-001

REFERENCE DESIGNATION	FIG. AND INDEX NO.	PART NO.	REFERENCE DESIGNATION	FIG. AND INDEX NO.	PART NO.
1A6P2	16-5	20C-46012-01			
1A6Q1 thru 1A6Q2	16-42	K2107			
1A6Q3 thru 1A6Q5	16-40	2N918/50			
1A6Q6	15-9	2N918/50			
1A6R1	16-36	RC05GF822J			
1A6R2	16-34	RC05GF472J			
1A6R3	16-31	RC05GF120J			
1A6R4	16-35	RC05GF123J			
1A6R5	16-34	RC05GF472J			
1A6R6	16-30	RC05GF681J			
1A6R7	16-38	RC05GF153J			
1A6R8	16-32	RC05GF272J			
1A6R9	16-31	RC05GF102J			

REFERENCE DESIGNATION	FIG. AND INDEX NO.	PART NO.
1A6R10	16-37	RC05GF103J
1A6R11	16-31	RC05GF102J
1A6R12	16-29	RC05GF471J
1A6R13	16-36	RC05GF822J
1A6R14	16-33	RC05GF392J
1A6R15	16-28	RC05GF331J
1A6R16	Not Used	
1A6R17	16-30	RC05GF681J
1A6R18	16-29	RC05GF471J
1A6R19	15-19	RC05GF153J
1A6R20	15-11	RC05GF472J
1A6R21	15-10	RC05GF471J
1A6R22	16-28	RC05GF331J
1A6R23	15-18	RC05GF102J
1A6R24	16-27A	RC05GF100J
1A6R26	16-34A	RC05GF222J
1A6T1	16-39	567-8558-001
1A7J1	17-63	471-0003
1J1	17-26	4037
2J1	17-59	491-101
3J1	17-37	CSK2285
4J1	17-34	CSK314
B1	23-1	780-1908-001
B1-J1 thru B1-J5	24-21	SKT-0804
B1-J1A	24-18	470-0003
B1-J2A	24-15	460-105
B1-P1A	24-9	470-0004
B1-P2A	24-4	460-206
B2	23-2	780-1905-001
B2-A1	25-	780-2914-001
B2-A1CR1 thru B2-A1CR9	25-6	1N914
B2-A1Q1 thru B2-A1Q3	25-5	JAN2N2221
B2-A1R1, B2-A1R3, B2-A1R5	25-7	RCR05G822JS
B2-A1R2, B2-A1R4, B2-A1R6	25-8	RCR05G103JS
B2-A2	25-	780-2918-001
B2-DS1 thru B2-DS6	25-16	64
B2-J1 thru B2-J6, B2-J9 thru B2-J12	25-15	360-0479-010
B2-J7	25-20	451-10301-01
B2-J8	25-13	UG-625B/U
B2-P1	25-18	451-20301-01
B2-XDS1 thru B2-XDS6	25-17	5160-458-604-RED
B3	23-3	780-1910-001
B3-J1 thru B3-J5	26-	SKT-0804
B3-J6	26-9	UG-625B/U
B3-J7A	26-5	470-0003
B3-P7A	26-3	470-0004
B4	23-4	780-1911-001
B4-J1 thru B4-J14, B4-J20	27-6	SKT-0804

REFERENCE DESIGNATION	FIG. AND INDEX NO.	PART NO.
B4-J1A	27-3	470-10201-01
B4-J21	27-9	UG-625B/U
B4-P1A	27-4	470-20201-01
B5	23-5	780-1912-001
B5-E1 thru B5-E3	28-5	4878-1-0516
B5-J1 thru B5-J13	28-8	SKT-0804
B5-J1A	28-10	470-20150-01
B5-P1A	28-12	470-10150-01
B5-R1	28-3	RW69V101
B5-R2	28-4	RW69V100
B5-S1	28-7	MS75029-21
B6	23-6	780-1914-001
B6-J1 thru B6-J3	29-6	SKT-0804
B6-J1A	29-25	470-0003
B6-J2A	29-26	20C-46031-02
B6-J4	29-7	UG-625B/U
B6-J5	29-8	357-7506-000
B6-P2A	29-13	460-206
B7	23-7	780-1913-001
B7-C1	30-19	CH08A3NC105M
B7-J2, B7-J4, B7-J6, B7-J8, B7-J10, B7-J13	30-7	108-903
B7-J9	30-6	108-902
B7-J12	30-8	108-901
B7-J14	30-12	MS27336PB10-13P
B7-R1	30-18	RCR05G244JS
B7-R2, B7-R4	30-17	RCR05G511JS
B7-R3	30-15	RCR05G820JS
B7-R5	30-20	RCR05G224JS
B7-S1 thru B7-S3	30-10	MS35059-22
B7-TB1	30-4	353-11-12-001
B8	23-8	780-1915-001
B9	23-9	780-1919-001
B10	23-10	787-6841-001
B10-C1	33-6	CM05ED820J03
B10-CR1	33-3	1N4720
B10-E1, B10-E2	33-4	4878-1-0516
B10-E3	33-5	4007-4HT
B10-E4	33-10	4007-4HT
B10-J1	33-8	491-100
B10-P1	33-14	108-302
B10-P2	33-15	108-303
B11	23-11	780-1920-001
B11-CR1	34-9	JAN1N3190
B11-DS1	34-6	A1H
B11-F1	34-4	F02B250V1-2AS
B11-J1	34-22	108-902
B11-J2	34-23	108-903
B11-R1	34-11	RW67V391
B11-R2	34-10	RW67V560
B11-S1	34-8	MS75028-23
B11-TB1	34-19	353-11-03-001
B11-T1	34-2	N68X
B11-XDS1	34-7	616-6-1
B11-XF1	34-5	FHN26G
B12	23-12	787-6839-001
B12-CR1	35-3	1N4002
B12-P1	35-5	491-101
B12-P2	35-11	108-302
B12-P3	35-12	108-303

ALPHABETICAL INDEX

Subject	Paragraph Figure, Table, Number

ALPHABETICAL INDEX (cont)

ALPHABETICAL INDEX (cont)

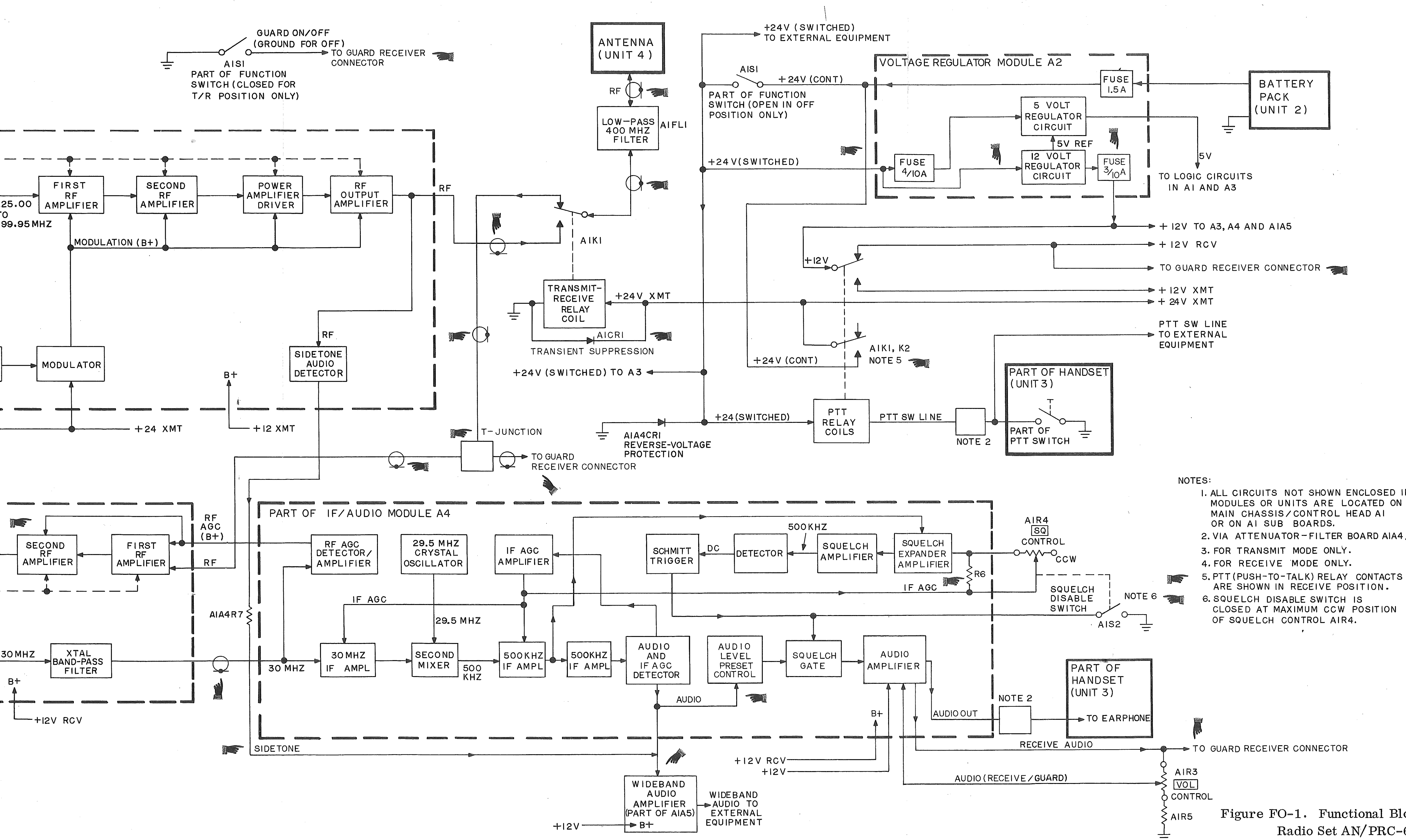
ALPHABETICAL INDEX (cont)

ALPHABETICAL INDEX (cont)

ALPHABETICAL INDEX (cont)

ALPHABETICAL INDEX (cont)

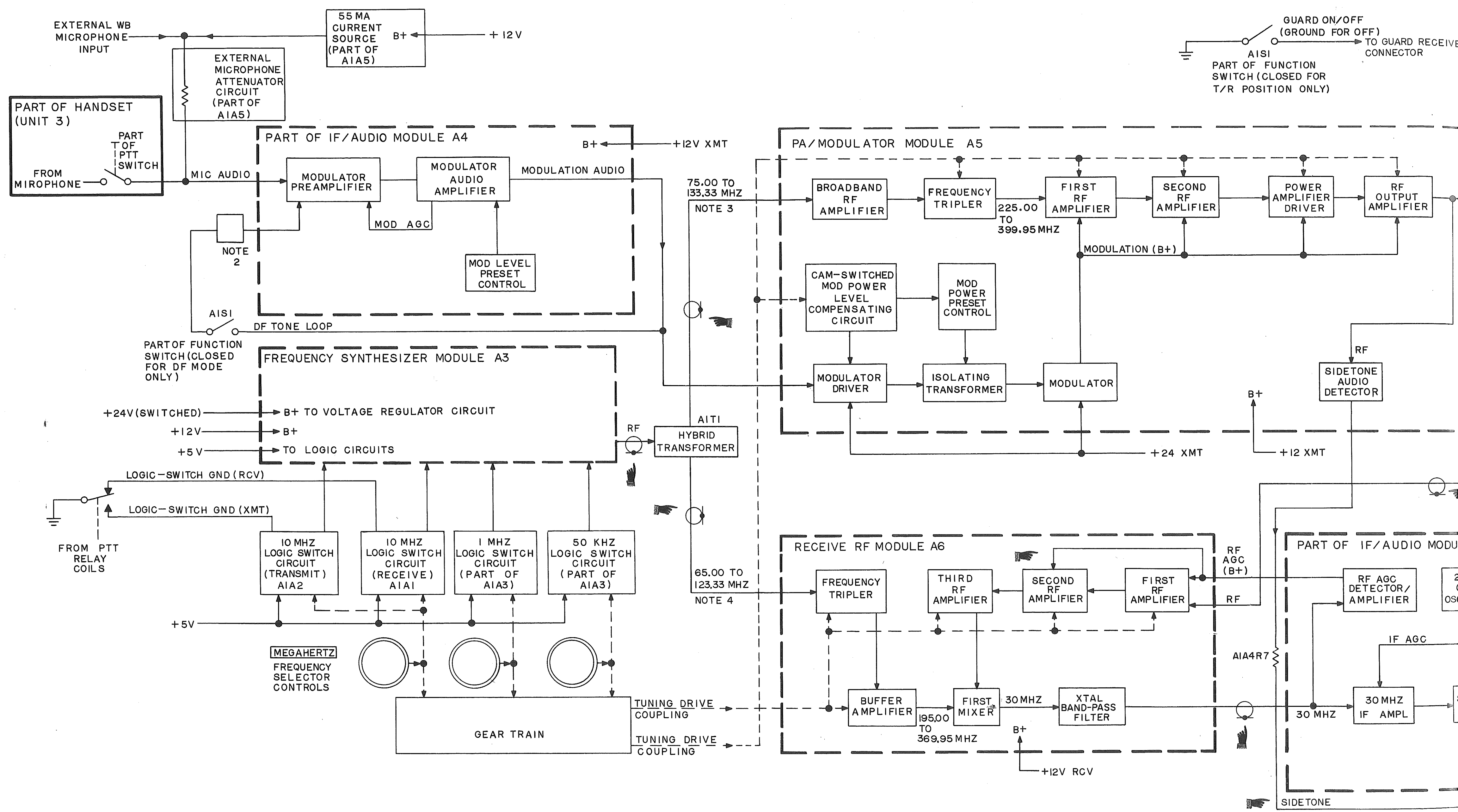
☆ U. S. GOVERNMENT PRINTING OFFICE: 1972—769-143/OC-8242



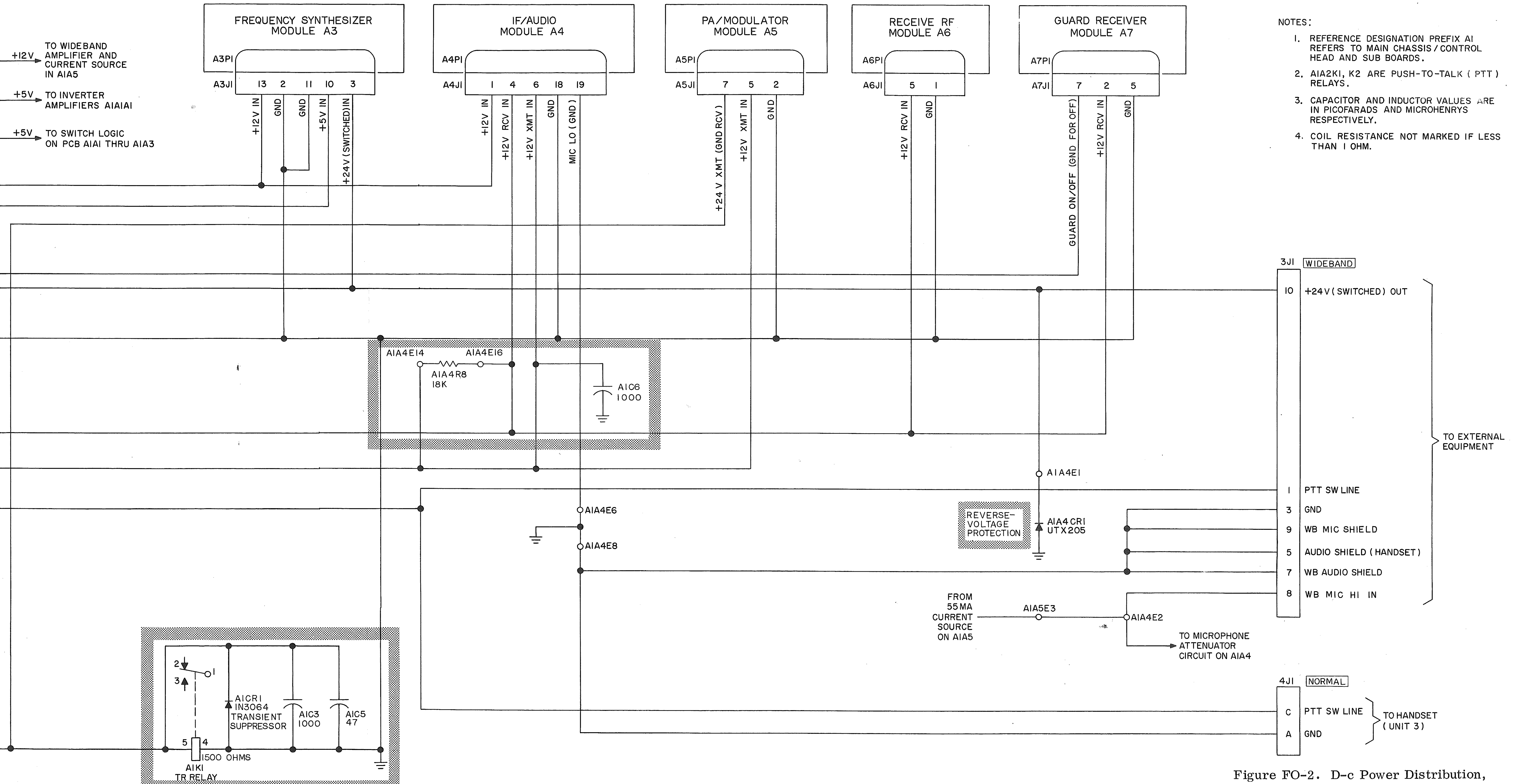
NOTES:

1. ALL CIRCUITS NOT SHOWN ENCLOSED IN MODULES OR UNITS ARE LOCATED ON MAIN CHASSIS/CONTROL HEAD A1 OR ON A1 SUB BOARDS.
2. VIA ATTENUATOR-FILTER BOARD A1A4.
3. FOR TRANSMIT MODE ONLY.
4. FOR RECEIVE MODE ONLY.
5. PTT (PUSH-TO-TALK) RELAY CONTACTS ARE SHOWN IN RECEIVE POSITION.
6. SQUELCH DISABLE SWITCH IS CLOSED AT MAXIMUM CCW POSITION OF SQUELCH CONTROL A1R4.

Figure FO-1. Functional Block Diagram Radio Set AN/PRC-66B



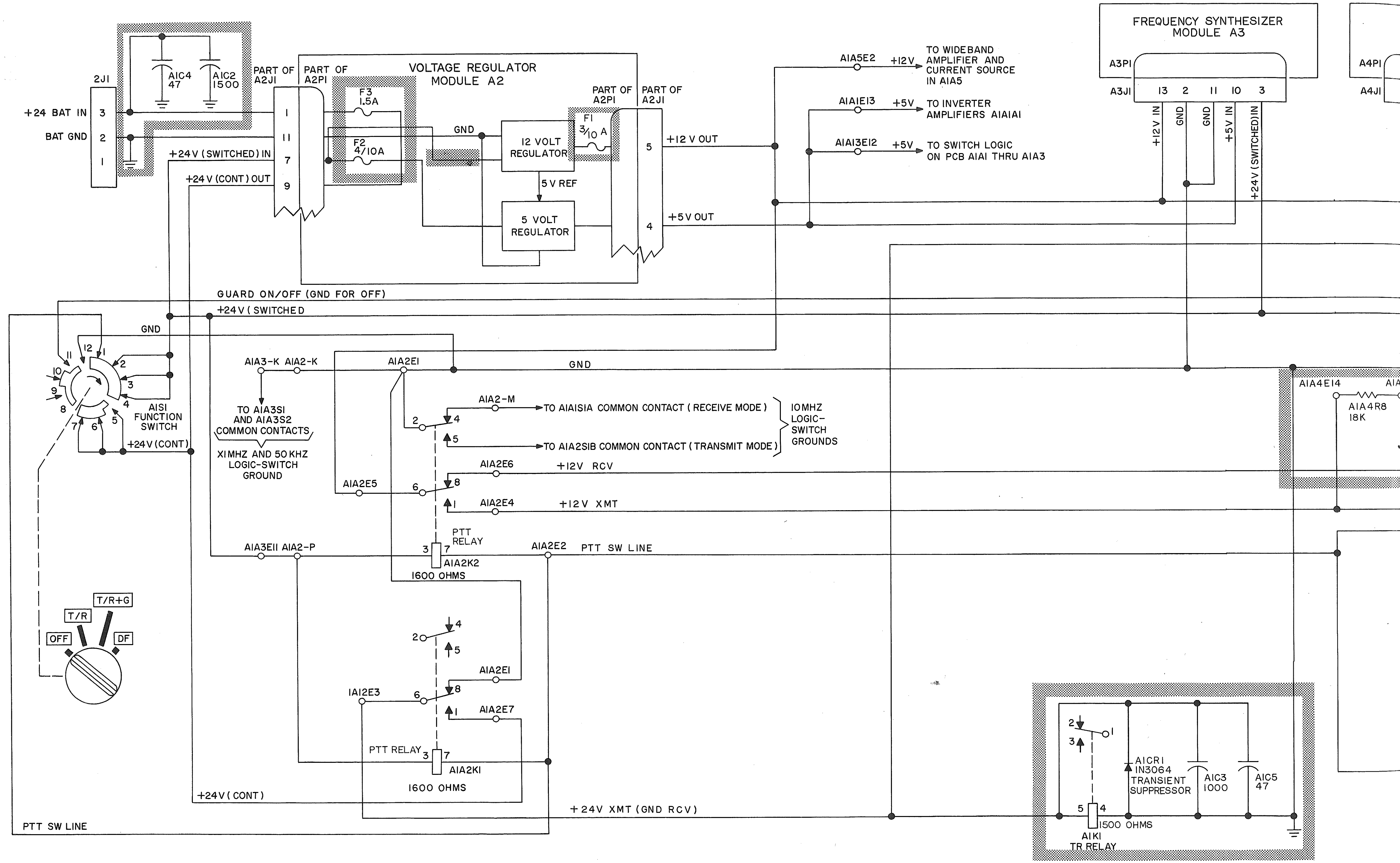
EXTERNAL WB MICROPHONE INPUT
55 MA CURRENT SOURCE (PART OF A1A5)
B+
+12V
EXTERNAL MICROPHONE ATTENUATOR CIRCUIT (PART OF A1A5)
PART OF HANDSET (UNIT 3)
PART OF PTT SWITCH
FROM MIROPHONE
MIC AUDIO
PART OF IF/AUDIO MODULE A4
MODULATOR PREAMPLIFIER
MODULATOR AUDIO AMPLIFIER
MODULATION AUDIO
MOD AGC
MOD LEVEL PRESET CONTROL
+12V XMT
NOTE 2
A1S1
DF TONE LOOP
PART OF FUNCTION SWITCH (CLOSED FOR DF MODE ONLY)
FREQUENCY SYNTHESIZER MODULE A3
+24V (SWITCHED)
B+ TO VOLTAGE REGULATOR CIRCUIT
+12V
+5V
TO LOGIC CIRCUITS
RF
A1T1
HYBRID TRANSFORMER
LOGIC-SWITCH GND (RCV)
LOGIC-SWITCH GND (XMT)
FROM PTT RELAY COILS
10 MHZ LOGIC SWITCH CIRCUIT (TRANSMIT) A1A2
10 MHZ LOGIC SWITCH CIRCUIT (RECEIVE) A1A1
1 MHZ LOGIC SWITCH CIRCUIT (PART OF A1A3)
50 KHZ LOGIC SWITCH CIRCUIT (PART OF A1A3)
MEGAHERTZ
FREQUENCY SELECTOR CONTROLS
GEAR TRAIN
TUNING DRIVE COUPLING
TUNING DRIVE COUPLING
75.00 TO 133.33 MHZ
NOTE 3
65.00 TO 123.33 MHZ
NOTE 4
PA/MODULATOR MODULE A5
BROADBAND RF AMPLIFIER
FREQUENCY TRIPLER
225.00 TO 399.95 MHZ
FIRST RF AMPLIFIER
SECOND RF AMPLIFIER
POWER AMPLIFIER DRIVER
RF OUTPUT AMPLIFIER
MODULATION (B+)
CAM-SWITCHED MOD POWER LEVEL COMPENSATING CIRCUIT
MOD POWER PRESET CONTROL
MODULATOR DRIVER
ISOLATING TRANSFORMER
MODULATOR
+24 XMT
B+
+12 XMT
RF
SIDETONE AUDIO DETECTOR
GUARD ON/OFF (GROUND FOR OFF)
TO GUARD RECEIVE CONNECTOR
A1S1
PART OF FUNCTION SWITCH (CLOSED FOR T/R POSITION ONLY)
RECEIVE RF MODULE A6
FREQUENCY TRIPLER
THIRD RF AMPLIFIER
SECOND RF AMPLIFIER
FIRST RF AMPLIFIER
BUFFER AMPLIFIER
195.00 TO 369.95 MHZ
FIRST MIXER
30 MHZ
XTAL BAND-PASS FILTER
B+
+12V RCV
RF AGC (B+)
RF
A1A4R7
PART OF IF/AUDIO MODU
RF AGC DETECTOR/ AMPLIFIER
IF AGC
30 MHZ
30 MHZ IF AMPL
SIDETONE



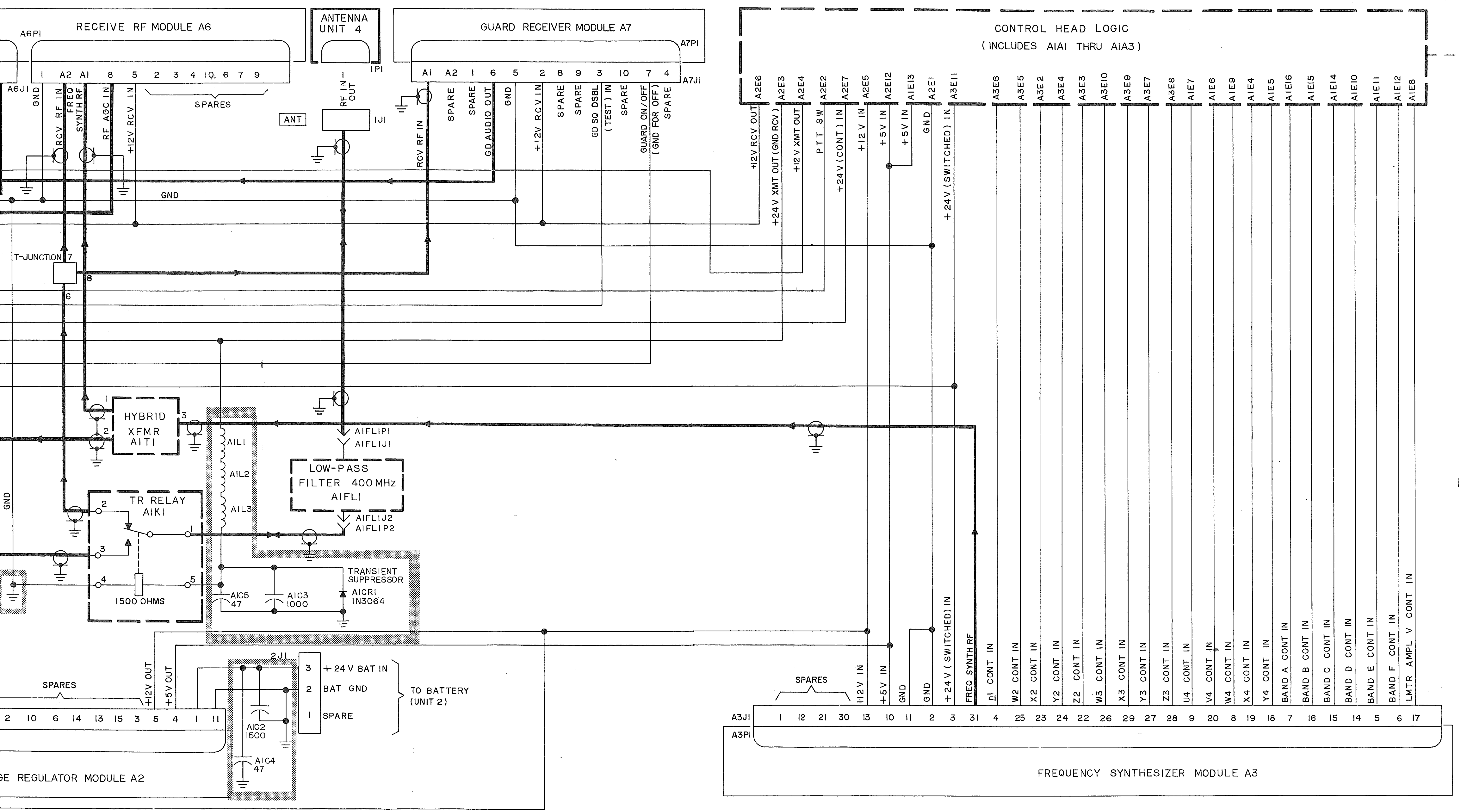
NOTES:

1. REFERENCE DESIGNATION PREFIX A1 REFERS TO MAIN CHASSIS/CONTROL HEAD AND SUB BOARDS.
2. A1A2K1, K2 ARE PUSH-TO-TALK (PTT) RELAYS.
3. CAPACITOR AND INDUCTOR VALUES ARE IN PICOFARADS AND MICROHENRYS RESPECTIVELY.
4. COIL RESISTANCE NOT MARKED IF LESS THAN 1 OHM.

Figure FO-2. D-c Power Distribution, Simplified Schematic Diagram, Radio Set AN/PRC-66B



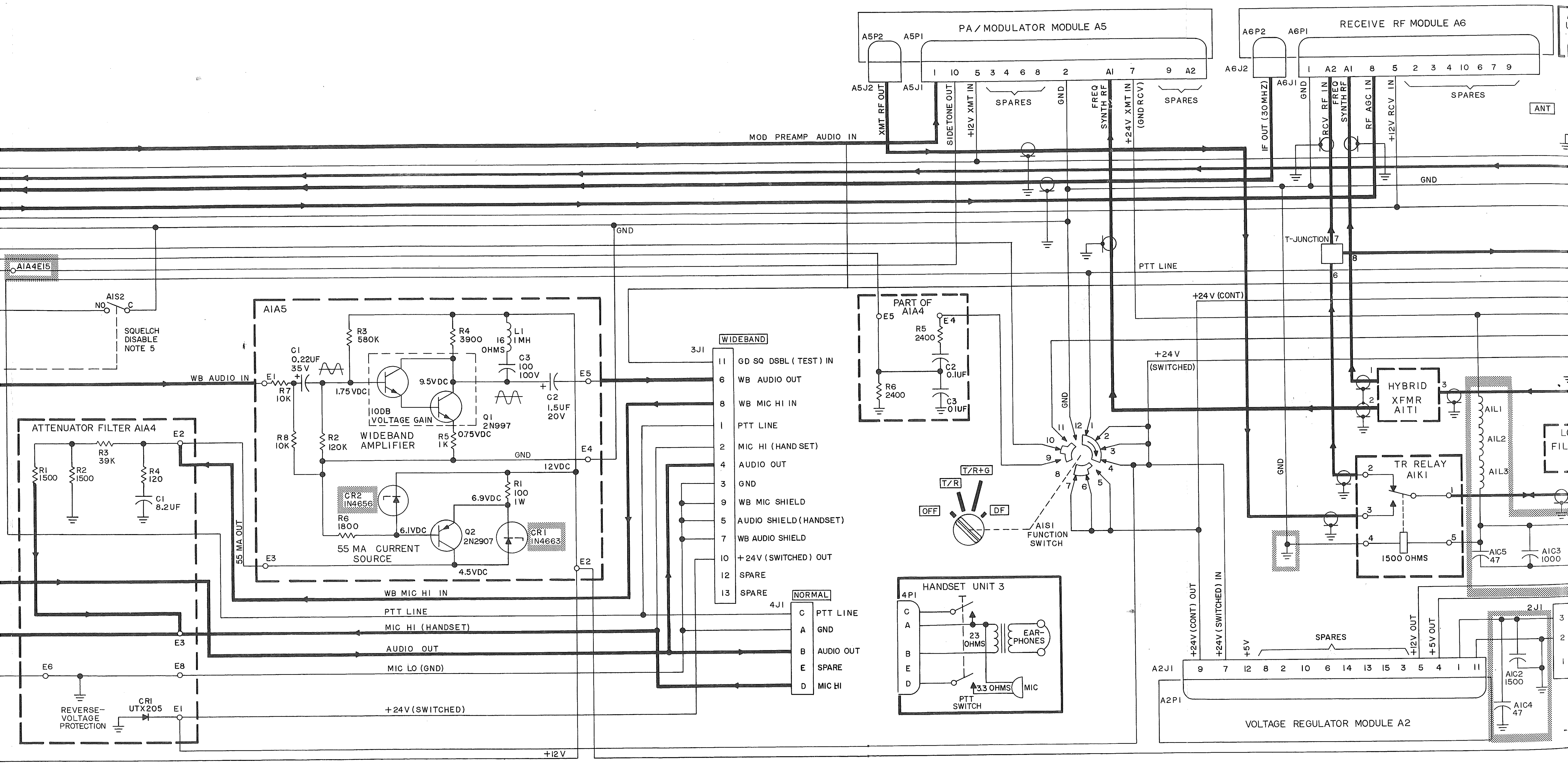
VOLTAGE REGULATOR MODULE A2
FREQUENCY SYNTHESIZER MODULE A3
+24 BAT IN
BAT GND
2J1
A1C4 47
A1C2 1500
PART OF A2J1
PART OF A2P1
F3 1.5A
F2 4/10A
F1 3/10 A
GND
12 VOLT REGULATOR
5 V REF
5 VOLT REGULATOR
+24V (SWITCHED) IN
+24V (CONT) OUT
+12 V OUT
+5V OUT
A1A5E2 +12V TO WIDEBAND AMPLIFIER AND CURRENT SOURCE IN A1A5
A1A1E13 +5V TO INVERTER AMPLIFIERS A1A1A1
A1A13E12 +5V TO SWITCH LOGIC ON PCB A1A1 THRU A1A3
A3P1
A3J1
+12V IN
GND
+5V IN
+24V (SWITCHED) IN
A4P1
A4J1
GUARD ON/OFF (GND FOR OFF)
+24V (SWITCHED
GND
A1S1 FUNCTION SWITCH
+24V (CONT)
A1A3-K A1A2-K
TO A1A3S1 AND A1A3S2 COMMON CONTACTS
X1MHZ AND 50 KHZ LOGIC-SWITCH GROUND
A1A2E1
A1A2-M
TO A1A1S1A COMMON CONTACT (RECEIVE MODE)
TO A1A2S1B COMMON CONTACT (TRANSMIT MODE)
10MHZ LOGIC-SWITCH GROUNDS
A1A2E6 +12V RCV
A1A2E5
A1A2E4 +12V XMT
PTT RELAY
A1A3E11 A1A2-P
A1A2E2 PTT SW LINE
A1A2K2
1600 OHMS
A1A4E14
A1A4R8 18K
T/R+G
T/R
OFF
DF
A1A2E1
1A12E3
A1A2E7
PTT RELAY
A1A2K1
1600 OHMS
+24V (CONT)
+24V XMT (GND RCV)
PTT SW LINE
A1CR1 1N3064 TRANSIENT SUPPRESSOR
A1C3 1000
A1C5 47
1500 OHMS
A1K1 TR RELAY

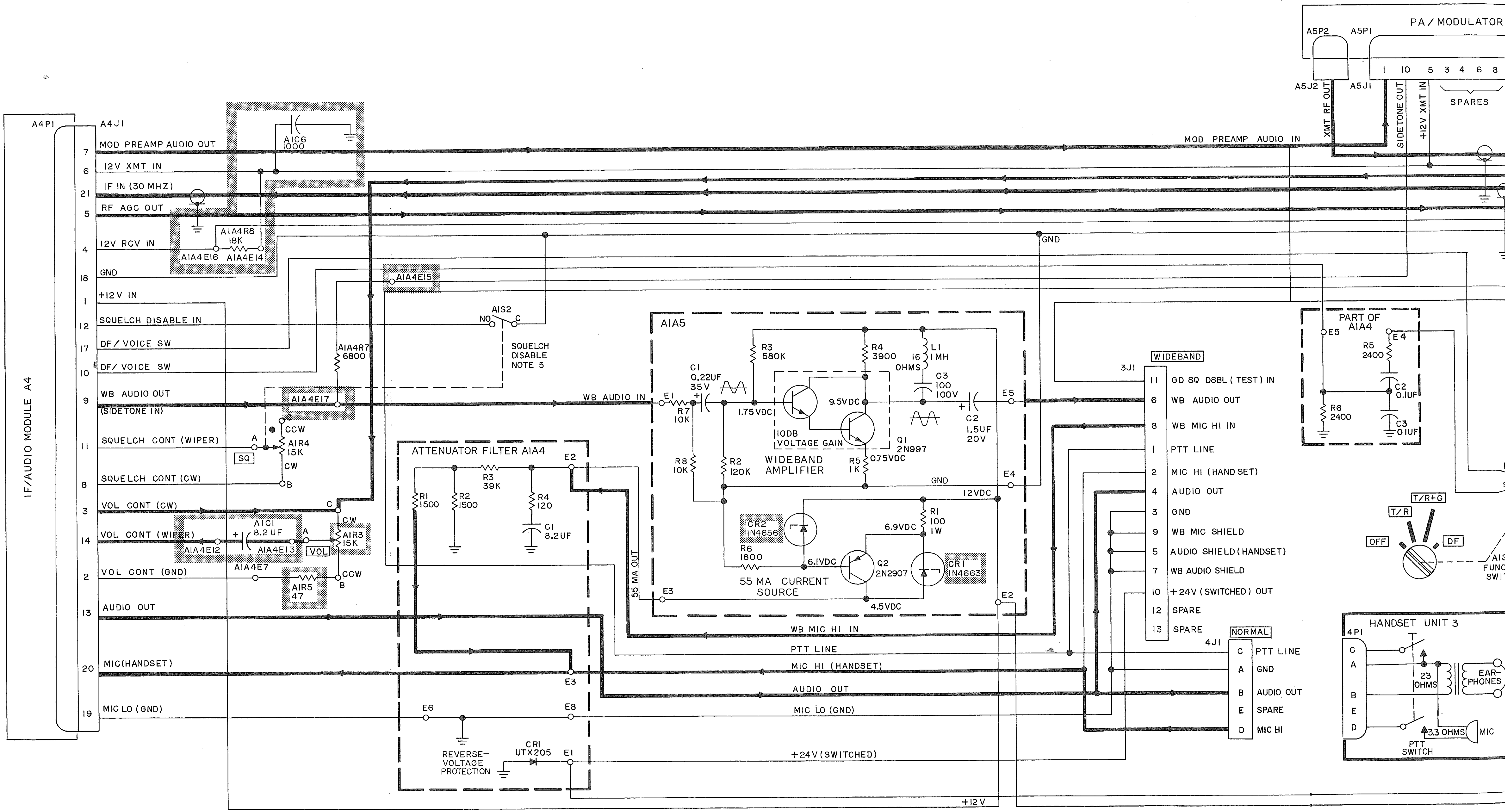


NOTES:

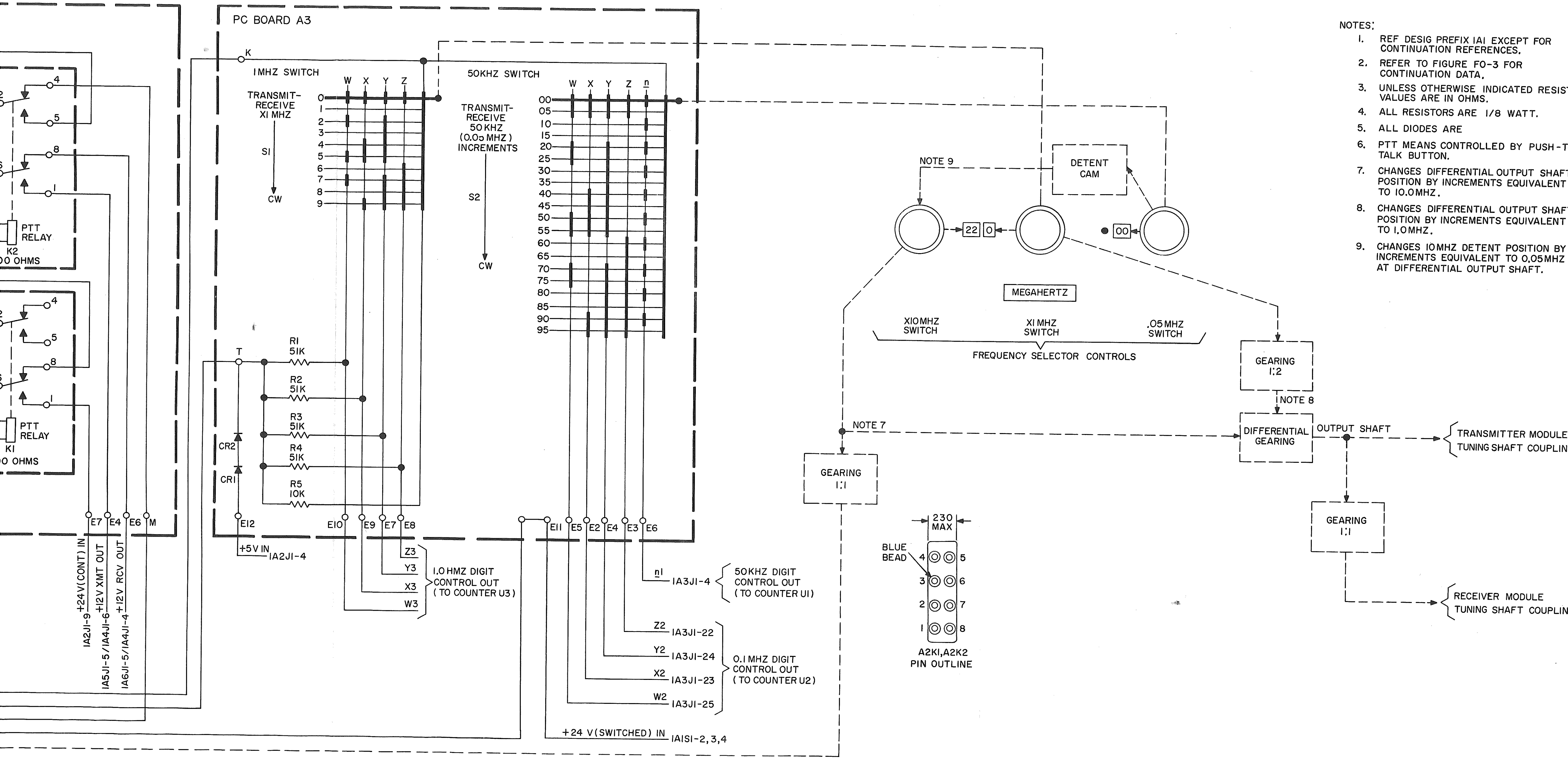
1. REF DESIG PREFIX I EXCEPT IJI THRU 4JI.
2. REFER TO FIGURE FO-4 FOR CONTINUATION DATA.
3. UNLESS OTHERWISE INDICATED RESISTOR CAPACITOR AND INDUCTOR VALUES ARE IN OHMS PICOFARADS AND MICROHENRYS RESPECTIVELY.
4. ALL RESISTORS ARE 1/8 WATT UNLESS OTHERWISE INDICATED.
5. SQUELCH DISABLE SWITCH AIS2 IS CLOSED IN MAXIMUM CCW POSITION OF SQUELCH CONTROL AIR4.
6. COIL RESISTANCE NOT MARKED IF LESS THAN I OHM. AILI THRU AIL3 ARE FERRITE BEADS.

Figure FO-3. Electrical Chassis, Schematic Diagram


PA / MODULATOR MODULE A5
A5P2
A5P1
A5J2
A5J1
XMT RF OUT
SIDETONE OUT
+12V XMT IN
SPARES
GND
FREQ SYNTH RF
+24V XMT IN (GND RCV)
RECEIVE RF MODULE A6
A6P2
A6P1
A6J2
A6J1
IF OUT (30 MHZ)
RCV RF IN
FREQ SYNTH RF
RF AGC IN
+12V RCV IN
ANT
MOD PREAMP AUDIO IN
GND
PTT LINE
T-JUNCTION
+24 V (CONT)
A1A4E15
A1S2
NO
C
SQUELCH DISABLE NOTE 5
A1A5
WB AUDIO IN
C1 0.22UF 35 V
R7 10K
R8 10K
R3 580K
R4 3900
L1 1MH
16 OHMS
C3 100 100V
9.5VDC
1.75VDC
10DB VOLTAGE GAIN
Q1 2N997
C2 1.5UF 20V
R2 120K
WIDEBAND AMPLIFIER
R5 1K
0.75VDC
12VDC
CR2 1N4656
R1 100 1W
6.9VDC
R6 1800
6.1VDC
Q2 2N2907
CR1 1N4663
55 MA CURRENT SOURCE
4.5VDC
55 MA OUT
ATTENUATOR FILTER A1A4
R1 1500
R2 1500
R3 39K
R4 120
C1 8.2UF
WIDEBAND
3J1
GD SQ DSBL (TEST) IN
WB AUDIO OUT
WB MIC HI IN
PTT LINE
MIC HI (HAND SET)
AUDIO OUT
GND
WB MIC SHIELD
AUDIO SHIELD (HANDSET)
WB AUDIO SHIELD
+24V (SWITCHED) OUT
SPARE
SPARE
NORMAL
4J1
PTT LINE
GND
AUDIO OUT
SPARE
MIC HI
WB MIC HI IN
PTT LINE
MIC HI (HANDSET)
AUDIO OUT
MIC LO (GND)
+24V (SWITCHED)
+12V
REVERSE-VOLTAGE PROTECTION
CR1 UTX205
PART OF A1A4
R5 2400
C2 0.1UF
R6 2400
C3 .01UF
+24V (SWITCHED)
T/R
T/R+G
OFF
DF
A1S1 FUNCTION SWITCH
HANDSET UNIT 3
4P1
23 OHMS
EAR-PHONES
3.3 OHMS
MIC
PTT SWITCH
HYBRID XFMR A1T1
TR RELAY A1K1
1500 OHMS
A1L1
A1L2
A1L3
A1C5 47
A1C3 1000
A2J1
A2P1
SPARES
+24V (CONT) OUT
+24V (SWITCHED) IN
+5V
+12V OUT
+5V OUT
VOLTAGE REGULATOR MODULE A2
A1C2 1500
A1C4 47
2J1



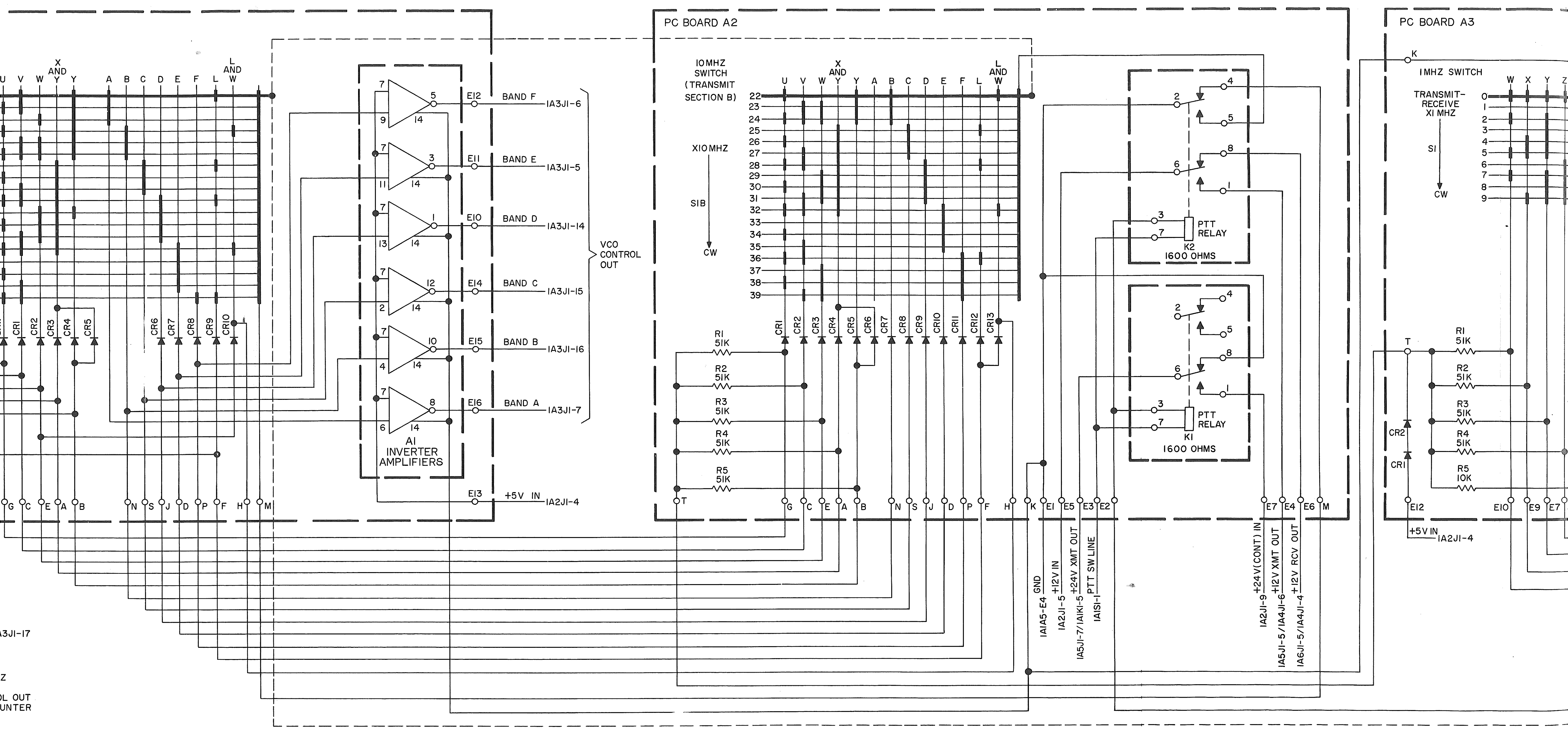
IF/AUDIO MODULE A4
A4P1
A4J1
MOD PREAMP AUDIO OUT
12V XMT IN
IF IN (30 MHZ)
RF AGC OUT
12V RCV IN
GND
+12V IN
SQUELCH DISABLE IN
DF/ VOICE SW
DF/ VOICE SW
WB AUDIO OUT
(SIDETONE IN)
SQUELCH CONT (WIPER)
SQUELCH CONT (CW)
VOL CONT (CW)
VOL CONT (WIPER)
VOL CONT (GND)
AUDIO OUT
MIC(HANDSET)
MIC LO (GND)
A1C6
1000
A1A4R8
18K
A1A4E16
A1A4E14
A1A4E15
A1S2
NO
C
SQUELCH
DISABLE
NOTE 5
A1A4R7
6800
A1A4E17
A1R4
15K
CCW
CW
SQ
A1C1
8.2 UF
A1A4E12
A1A4E13
VOL
A1R3
15K
A1A4E7
A1R5
47
ATTENUATOR FILTER A1A4
R1
1500
R2
1500
R3
39K
R4
120
C1
8.2UF
E2
E3
E6
E8
E1
REVERSE-
VOLTAGE
PROTECTION
CR1
UTX205
55 MA OUT
A1A5
WB AUDIO IN
C1
0.22UF
35V
R7
10K
1.75VDC
R3
580K
R4
3900
L1
1MH
16 OHMS
C3
100
100V
9.5VDC
10DB
VOLTAGE GAIN
Q1
2N997
WIDEBAND
AMPLIFIER
R8
10K
R2
120K
R5
1K
0.75VDC
C2
1.5UF
20V
E5
E4
GND
12VDC
CR2
1N4656
R1
100
1W
6.9VDC
R6
1800
6.1VDC
Q2
2N2907
CR1
1N4663
55 MA CURRENT
SOURCE
4.5VDC
E3
E2
WB MIC HI IN
PTT LINE
MIC HI (HANDSET)
AUDIO OUT
MIC LO (GND)
+24V (SWITCHED)
+12V
GND
WIDEBAND
3J1
GD SQ DSBL (TEST) IN
WB AUDIO OUT
WB MIC HI IN
PTT LINE
MIC HI (HAND SET)
AUDIO OUT
GND
WB MIC SHIELD
AUDIO SHIELD (HANDSET)
WB AUDIO SHIELD
+24V (SWITCHED) OUT
SPARE
SPARE
NORMAL
4J1
PTT LINE
GND
AUDIO OUT
SPARE
MIC HI
PA/MODULATOR MO
A5P2
A5P1
A5J2
A5J1
XMT RF OUT
SIDETONE OUT
+12V XMT IN
SPARES
MOD PREAMP AUDIO IN
PART OF
A1A4
E5
E4
R5
2400
R6
2400
C2
0.1UF
C3
0.1UF
T/R+G
T/R
OFF
DF
A1S1
FUNCTIO
SWITCH
HANDSET UNIT 3
4P1
23
OHMS
EAR-
PHONES
33 OHMS
MIC
PTT
SWITCH



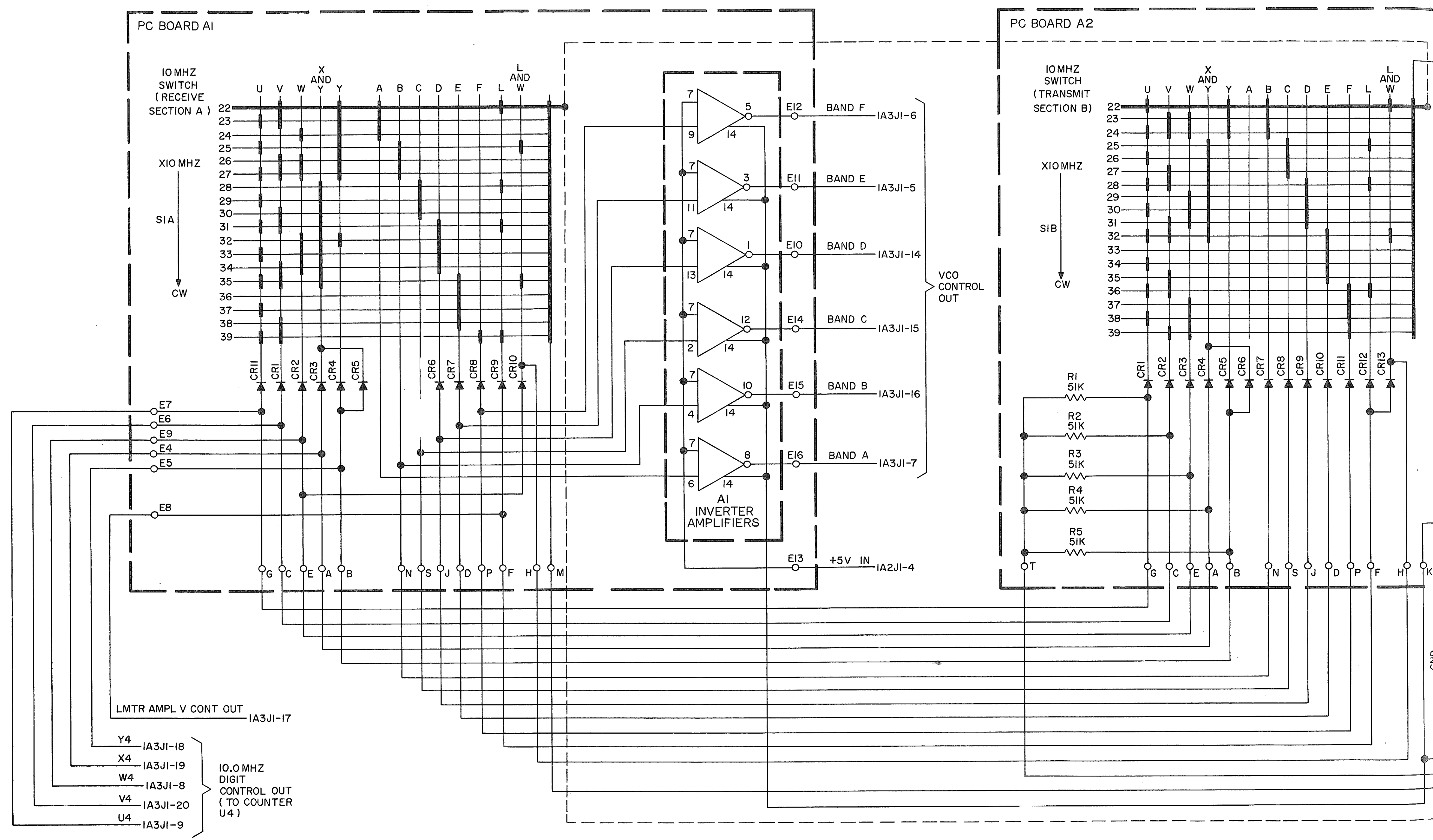
NOTES:

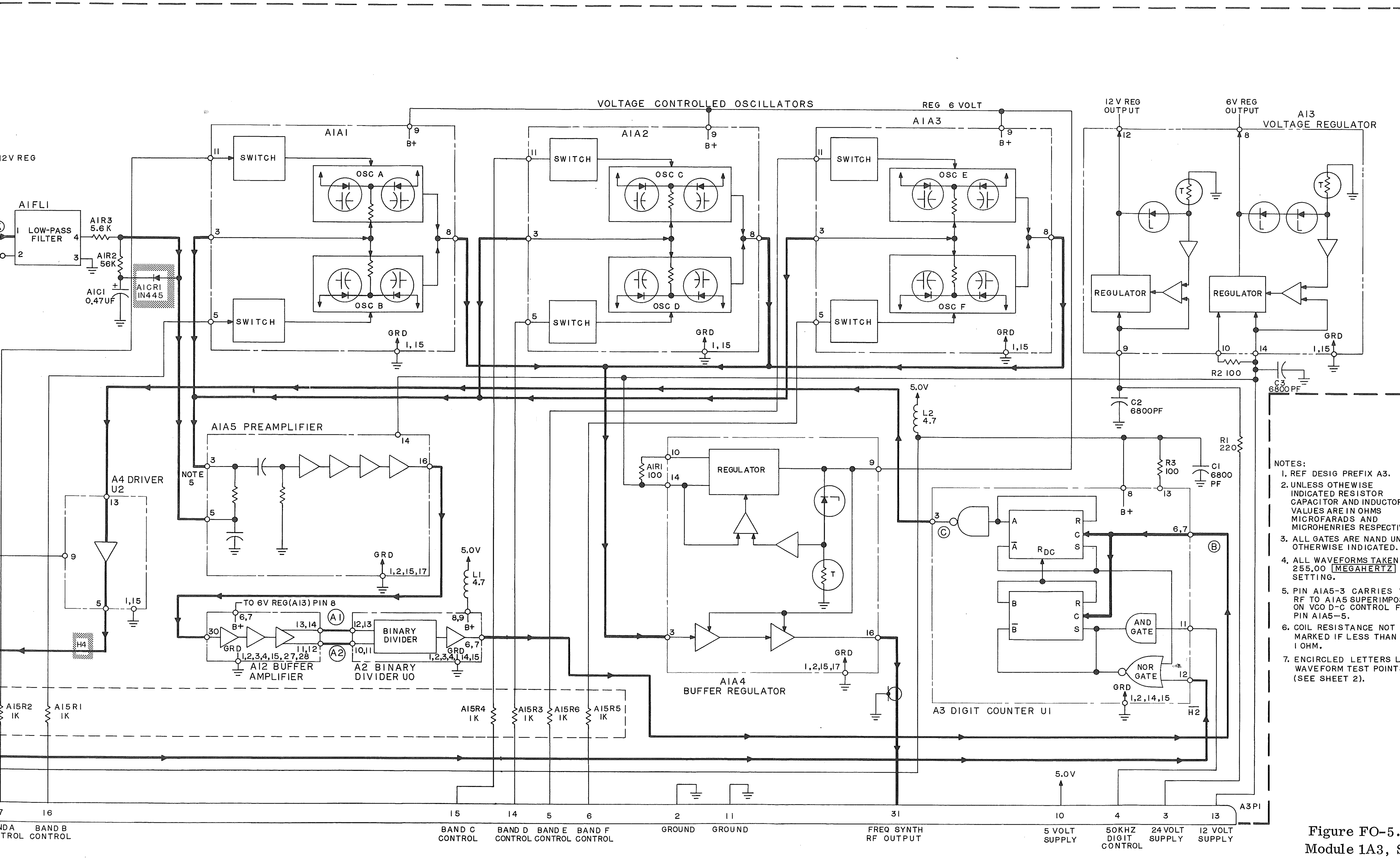
1. REF DESIG PREFIX 1A1 EXCEPT FOR CONTINUATION REFERENCES.
2. REFER TO FIGURE FO-3 FOR CONTINUATION DATA.
3. UNLESS OTHERWISE INDICATED RESISTOR VALUES ARE IN OHMS.
4. ALL RESISTORS ARE 1/8 WATT.
5. ALL DIODES ARE
6. PTT MEANS CONTROLLED BY PUSH-TO-TALK BUTTON.
7. CHANGES DIFFERENTIAL OUTPUT SHAFT POSITION BY INCREMENTS EQUIVALENT TO 10.0MHZ.
8. CHANGES DIFFERENTIAL OUTPUT SHAFT POSITION BY INCREMENTS EQUIVALENT TO 1.0MHZ.
9. CHANGES 10MHZ DETENT POSITION BY INCREMENTS EQUIVALENT TO 0.05MHZ AT DIFFERENTIAL OUTPUT SHAFT.

Figure FO-4. Control Head Logic Switching, Schematic Diagram



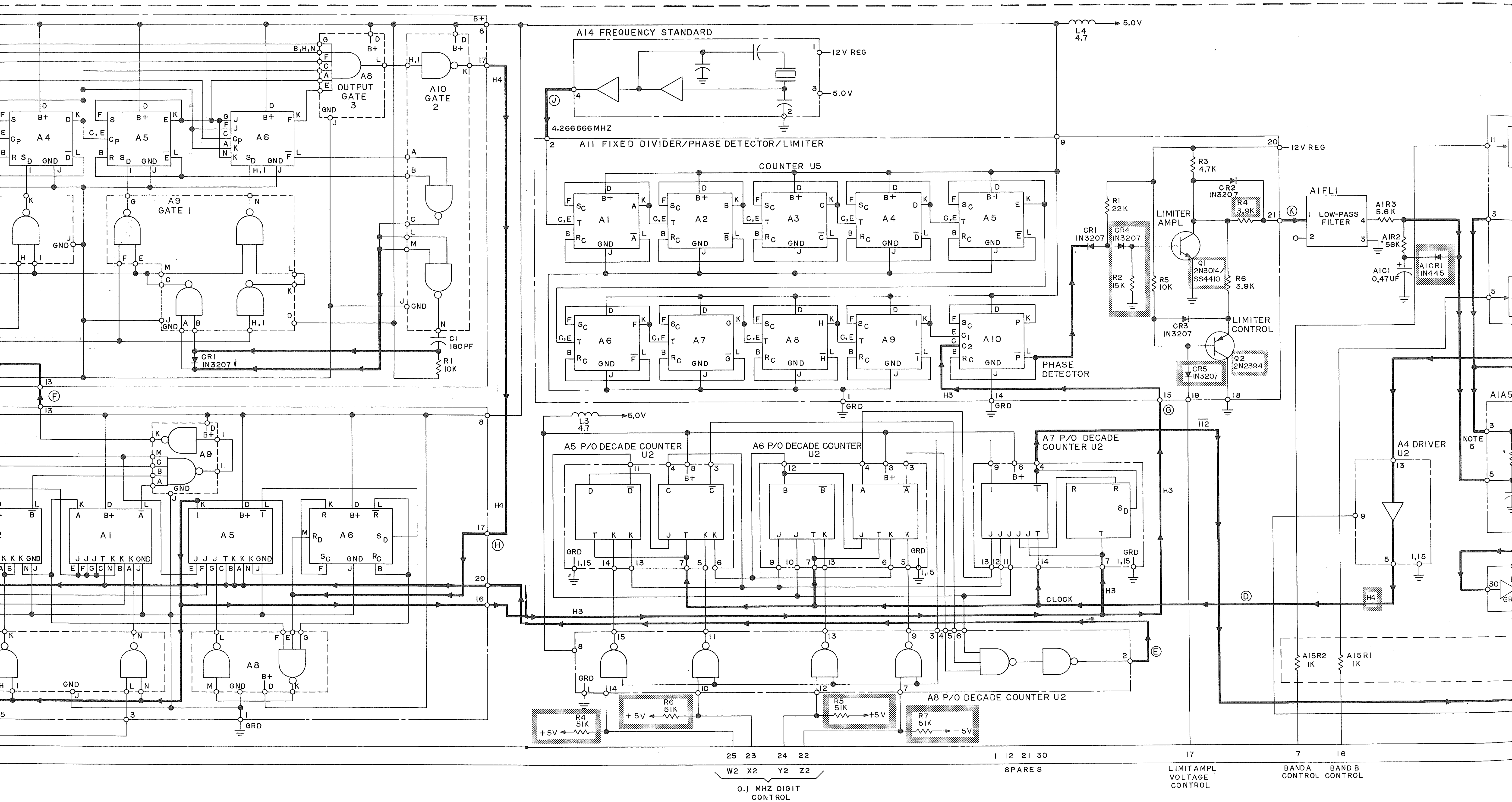
PC BOARD A2
PC BOARD A3
10MHZ SWITCH (TRANSMIT SECTION B)
X10MHZ
S1B
CW
A1 INVERTER AMPLIFIERS
BAND F 1A3J1-6
BAND E 1A3J1-5
BAND D 1A3J1-14
BAND C 1A3J1-15
BAND B 1A3J1-16
BAND A 1A3J1-7
VCO CONTROL OUT
+5V IN 1A2J1-4
PTT RELAY
K2 1600 OHMS
K1 1600 OHMS
1MHZ SWITCH
TRANSMIT-RECEIVE X1 MHZ
S1
GND 1A1A5-E4
+12V IN 1A2J1-5
+24V XMT OUT 1A5J1-7/1A1K1-5
PTT SW LINE 1A1S1-1
+24V (CONT) IN 1A2J1-9
+12V XMT OUT 1A5J1-5/1A4J1-6
+12V RCV OUT 1A6J1-5/1A4J1-4
+5V IN 1A2J1-4
1A3J1-17
OL OUT
UNTER

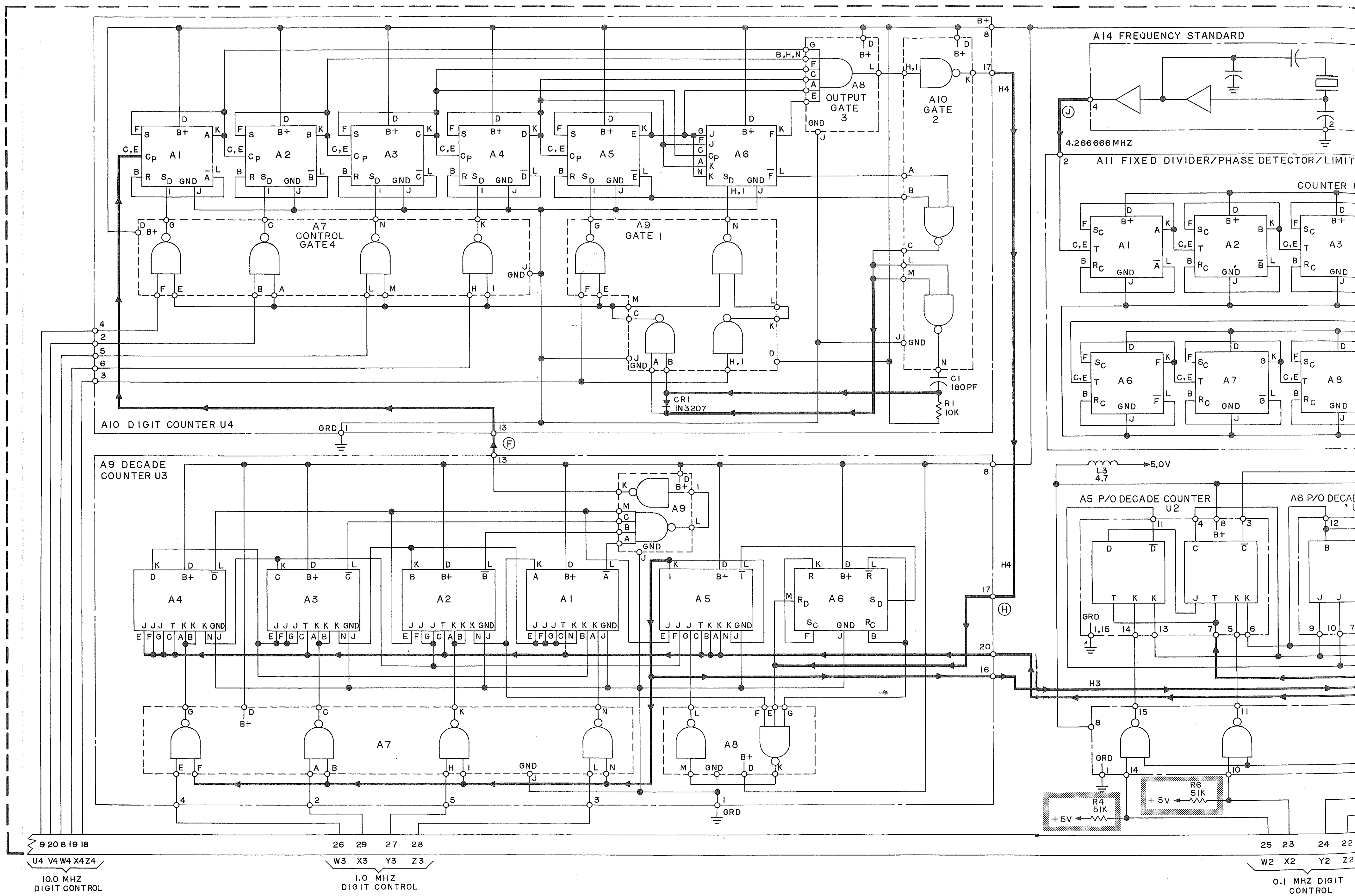

PC BOARD A1
10 MHZ SWITCH (RECEIVE SECTION A)
X10 MHZ
S1A
CW
A1 INVERTER AMPLIFIERS
BAND F 1A3J1-6
BAND E 1A3J1-5
BAND D 1A3J1-14
BAND C 1A3J1-15
BAND B 1A3J1-16
BAND A 1A3J1-7
VCO CONTROL OUT
+5V IN 1A2J1-4
LMTR AMPL V CONT OUT 1A3J1-17
Y4 1A3J1-18
X4 1A3J1-19
W4 1A3J1-8
V4 1A3J1-20
U4 1A3J1-9
10.0 MHZ DIGIT CONTROL OUT (TO COUNTER U4)
PC BOARD A2
10 MHZ SWITCH (TRANSMIT SECTION B)
X10 MHZ
S1B
CW
R1 51K
R2 51K
R3 51K
R4 51K
R5 51K

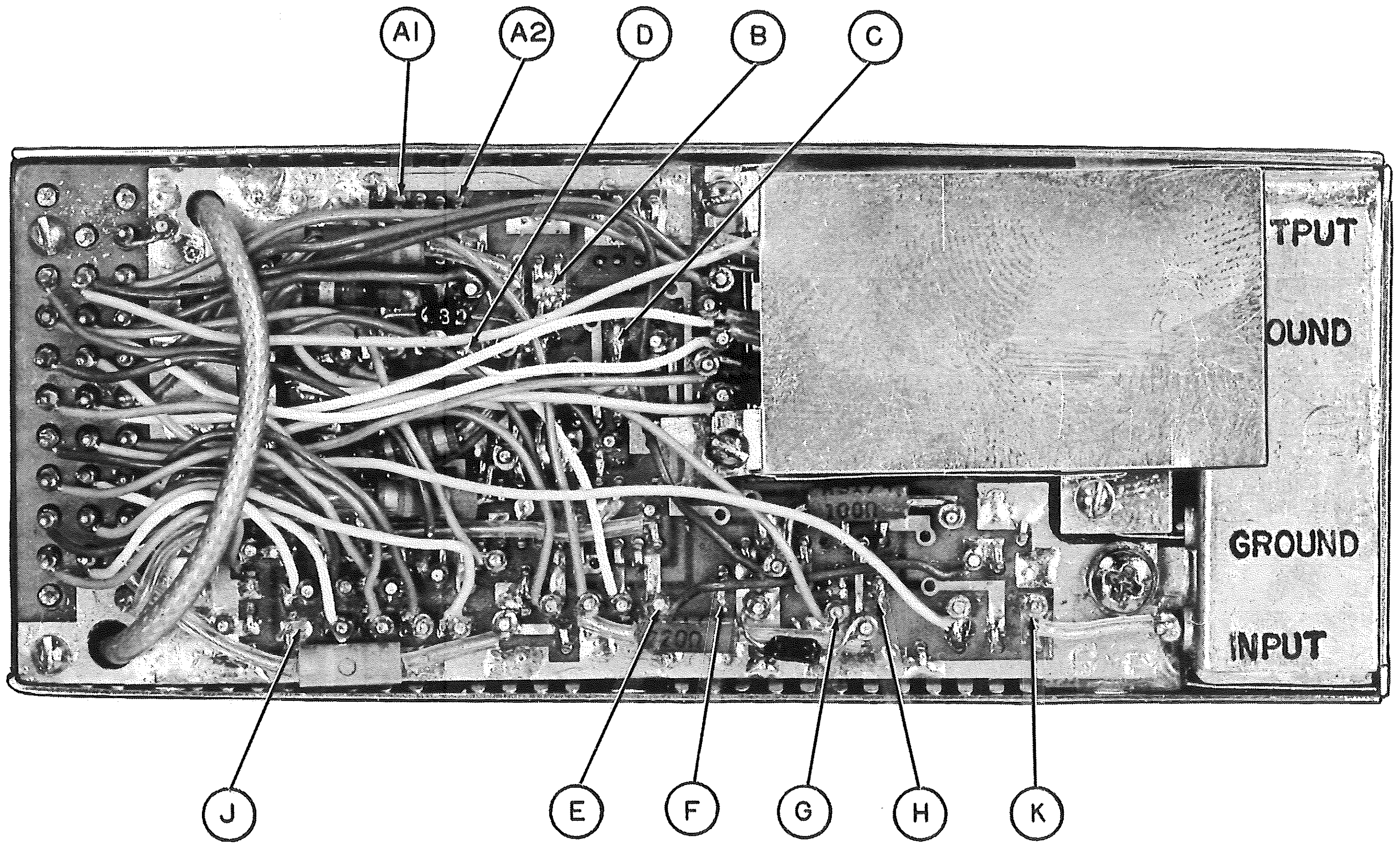


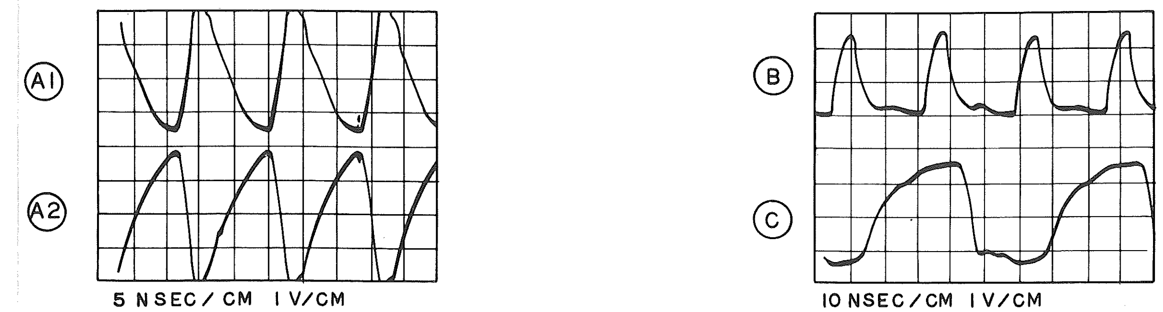
NOTES:
1. REF DESIG PREFIX A3.
2. UNLESS OTHEWISE INDICATED RESISTOR CAPACITOR AND INDUCTOR VALUES ARE IN OHMS MICROFARADS AND MICROHENRIES RESPECTIVELY.
3. ALL GATES ARE NAND UNLESS OTHERWISE INDICATED.
4. ALL WAVEFORMS TAKEN AT 255.00 MEGAHERTZ SETTING.
5. PIN A1A5-3 CARRIES VCO RF TO A1A5 SUPERIMPOSED ON VCO D-C CONTROL FROM PIN A1A5-5.
6. COIL RESISTANCE NOT MARKED IF LESS THAN 1 OHM.
7. ENCIRCLED LETTERS LOCATE WAVEFORM TEST POINTS (SEE SHEET 2).

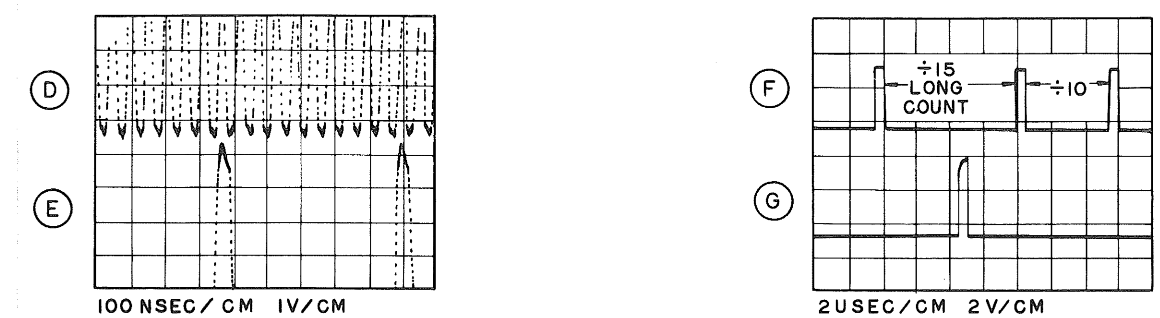
Figure FO-5. Frequency Synthesizer Module 1A3, Schematic/Logic Diagram (Sheet 1 of 2)

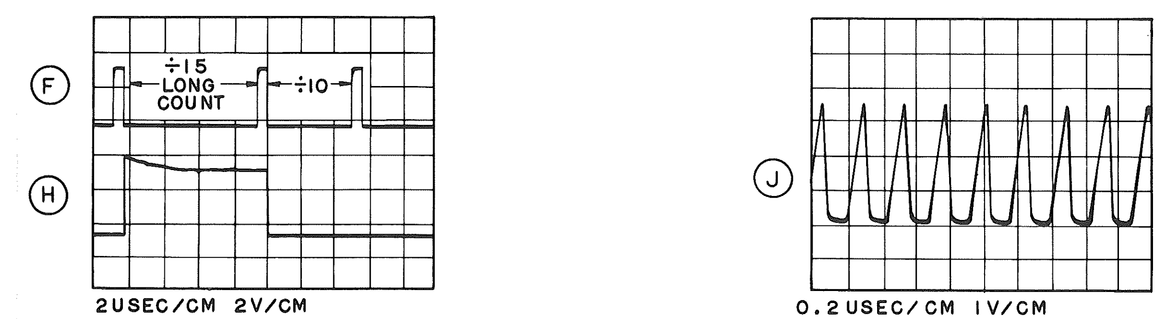

A14 FREQUENCY STANDARD
12V REG
5.0V
4.266666 MHZ
A11 FIXED DIVIDER/PHASE DETECTOR/LIMITER
COUNTER U5
LIMITER AMPL
LIMITER CONTROL
PHASE DETECTOR
A1FL1
LOW-PASS FILTER
A8 OUTPUT GATE 3
A10 GATE 2
A9 GATE 1
A5 P/O DECADE COUNTER U2
A6 P/O DECADE COUNTER U2
A7 P/O DECADE COUNTER U2
A8 P/O DECADE COUNTER U2
A4 DRIVER U2
CLOCK
NOTE 5
0.1 MHZ DIGIT CONTROL
SPARES
LIMIT AMPL VOLTAGE CONTROL
BAND A CONTROL
BAND B CONTROL

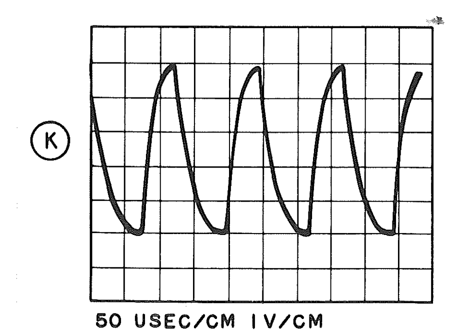

A14 FREQUENCY STANDARD
4.266666 MHZ
A11 FIXED DIVIDER/PHASE DETECTOR/LIMIT
COUNTER
A8 OUTPUT GATE 3
A10 GATE 2
A7 CONTROL GATE 4
A9 GATE I
C1 180 PF
R1 10K
CR1 1N3207
A10 DIGIT COUNTER U4
A9 DECADE COUNTER U3
L3 4.7
5.0V
A5 P/O DECADE COUNTER U2
A6 P/O DECAD
R4 51K
+5V
R6 51K
+5V
10.0 MHZ DIGIT CONTROL
1.0 MHZ DIGIT CONTROL
0.1 MHZ DIGIT CONTROL





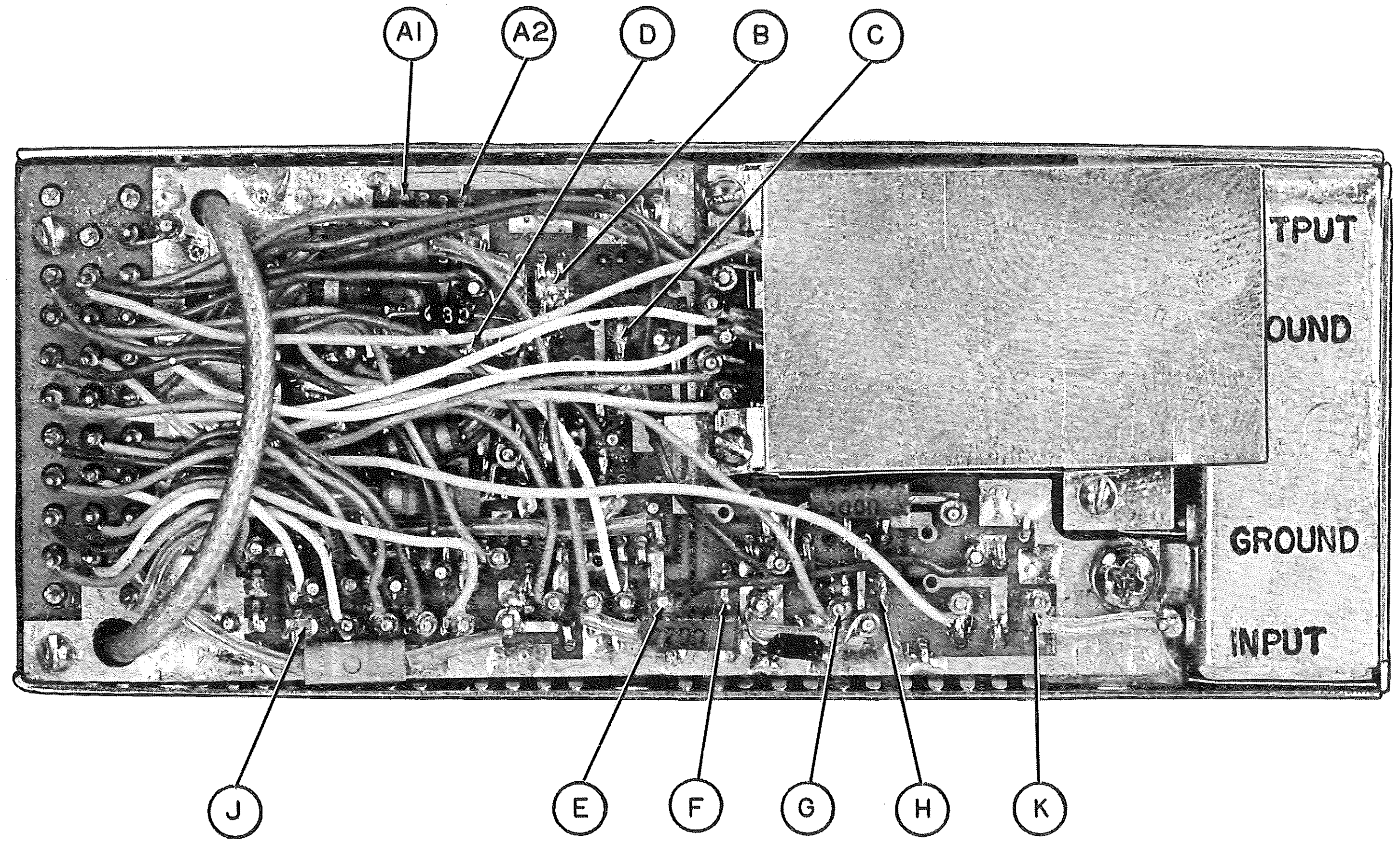


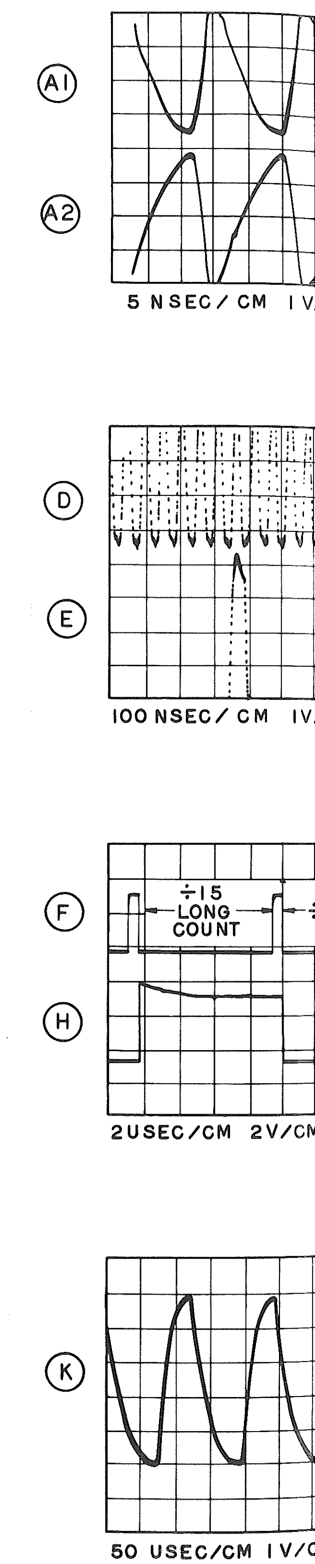


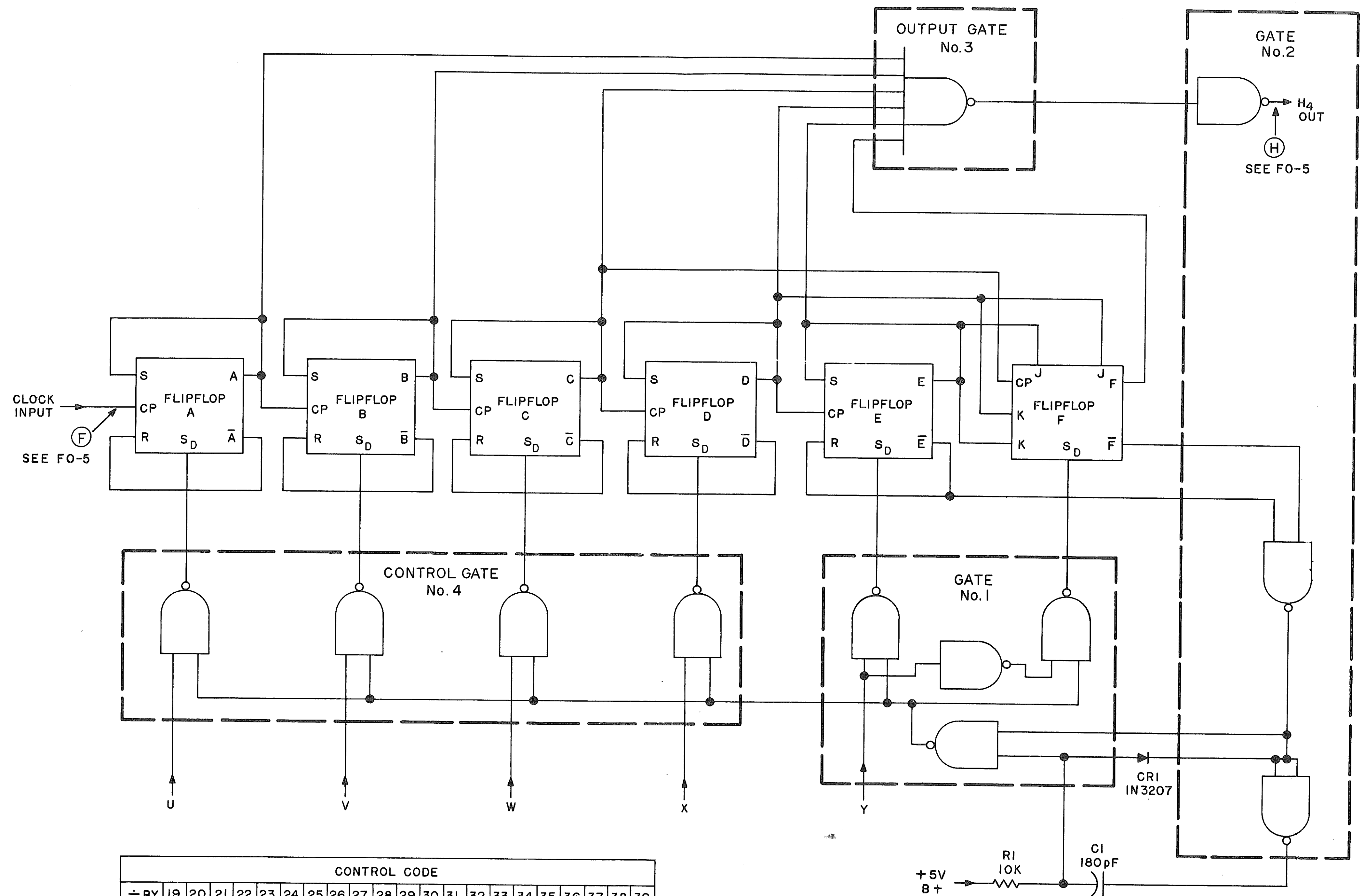


NOTE
ENCIRCLED LETTERS LOCATE WAVEFORM TEST POINTS (SEE SHEET 1).

Figure FO-5. Frequency Synthesizer Module 1A3, Schematic/Logic Diagram (Sheet 2 of 2)


A1
A2
D
B
C
TPUT
OUND
GROUND
INPUT
J
E
F
G
H
K

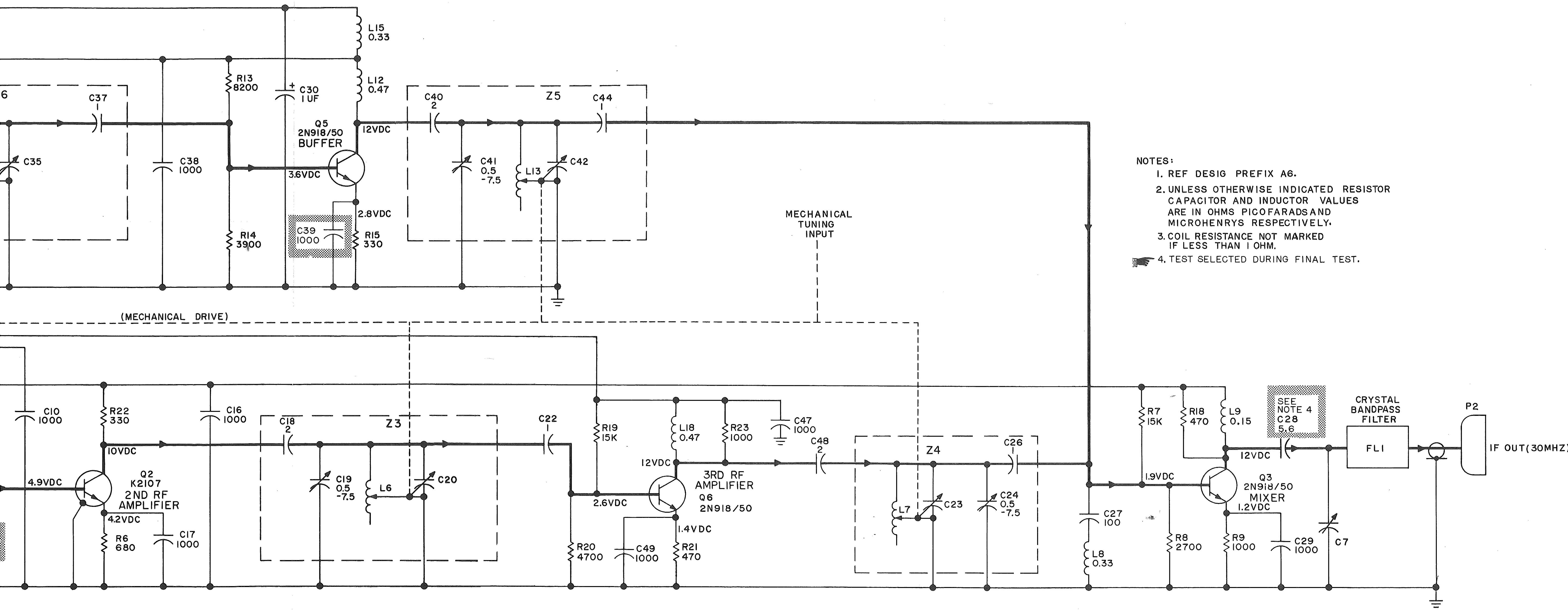

A1
A2
5 NSEC/CM 1V
D
E
100 NSEC/CM 1V
F
÷15
LONG
COUNT
H
2USEC/CM 2V/CM
K
50 USEC/CM 1V/C



CONTROL CODE																					
÷ BY	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
U	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
V	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0
W	1	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0
X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
BAND	A			B			C			D				E				F			

NOTE.
ALL GATES ARE NAND.

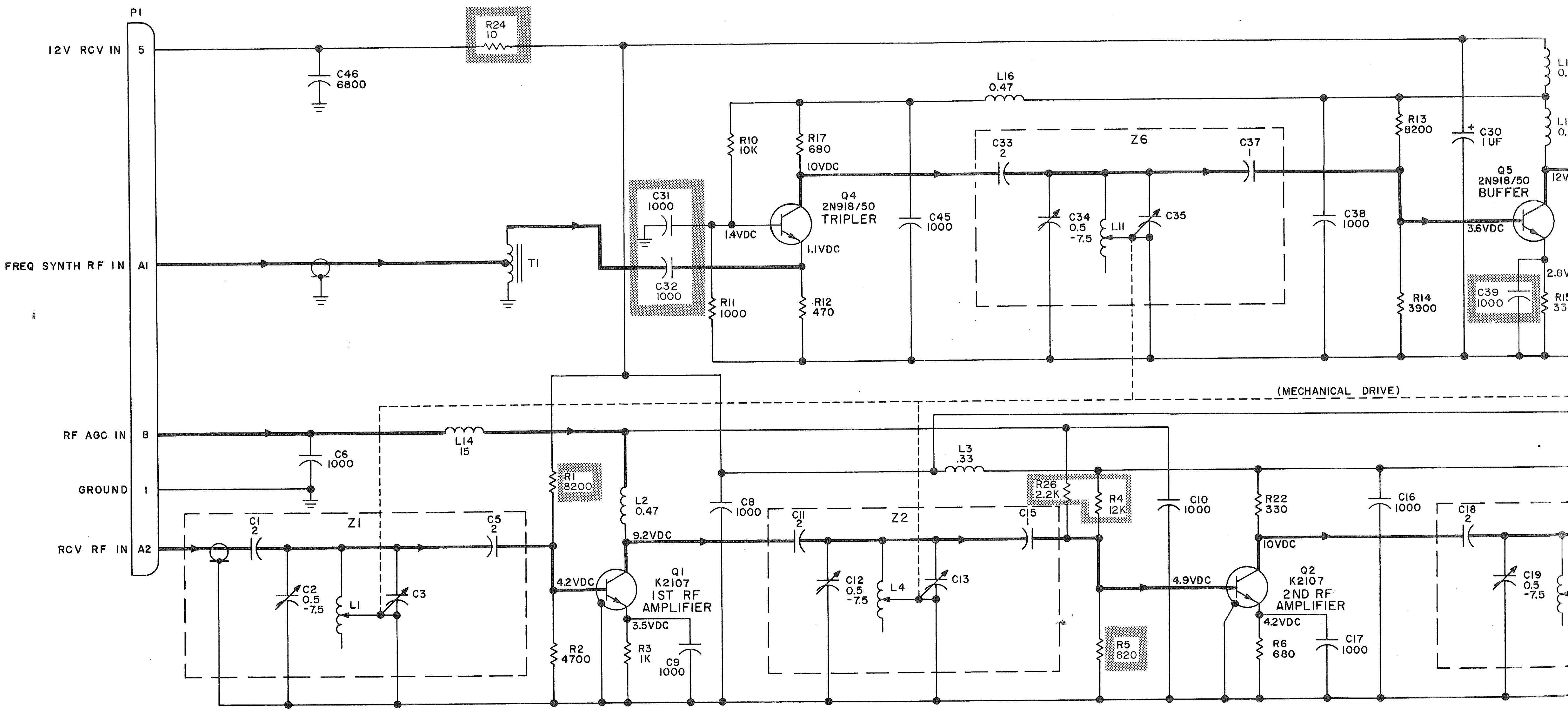
Figure FO-6. Counter U4, Logic Diagram

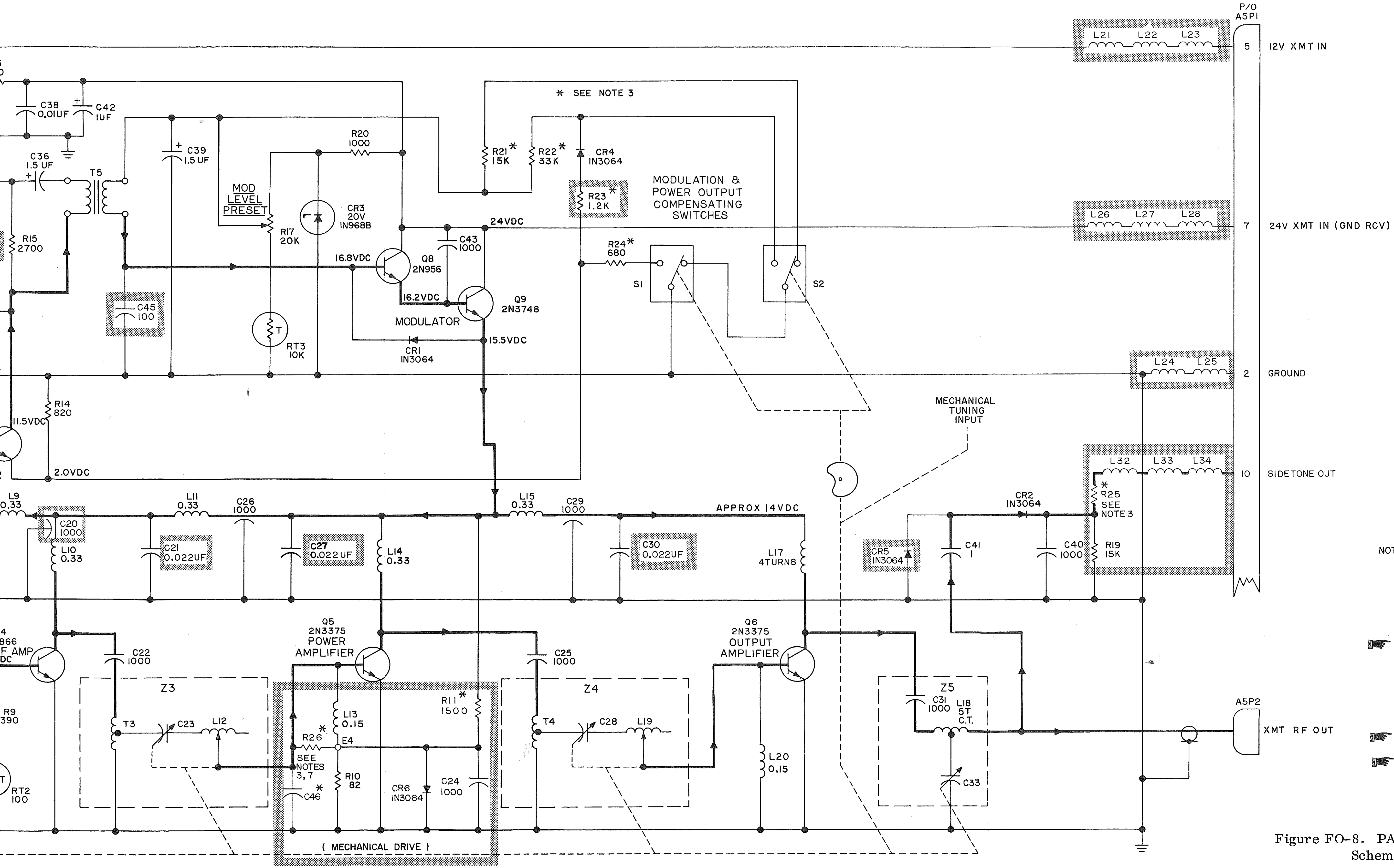


NOTES:

1. REF DESIG PREFIX A6.
2. UNLESS OTHERWISE INDICATED RESISTOR CAPACITOR AND INDUCTOR VALUES ARE IN OHMS PICOFARADS AND MICROHENRYS RESPECTIVELY.
3. COIL RESISTANCE NOT MARKED IF LESS THAN 1 OHM.
4. TEST SELECTED DURING FINAL TEST.

Figure FO-7. Receive RF Module 1A6, Schematic Diagram

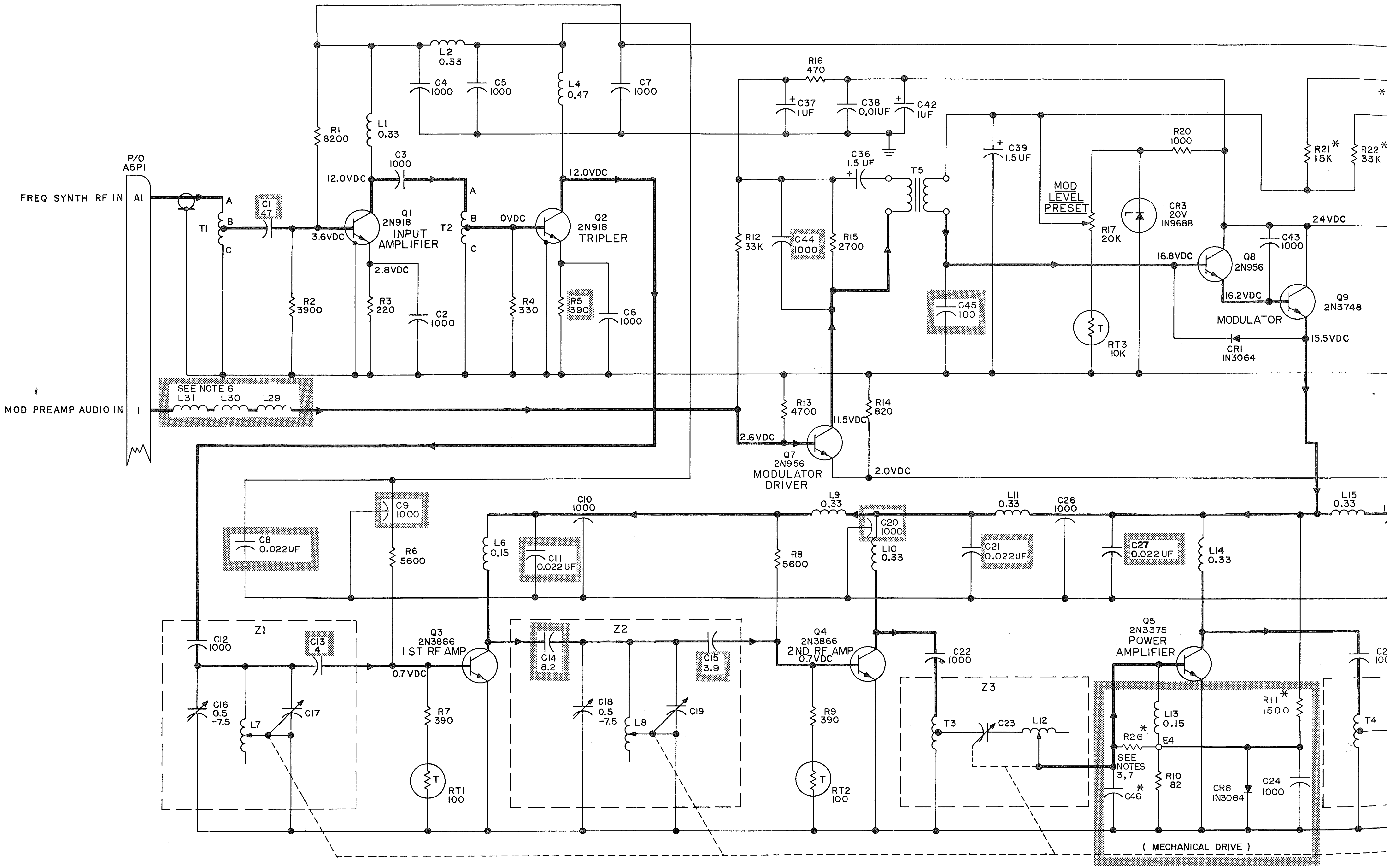

P1
12V RCV IN
5
R24
10
C46
6800
FREQ SYNTH RF IN
A1
T1
C31
1000
C32
1000
R10
10K
R17
680
10VDC
1.4VDC
Q4
2N918/50
TRIPLER
1.1VDC
R11
1000
R12
470
L16
0.47
C45
1000
C33
2
Z6
C37
1
C34
0.5
-7.5
L11
C35
C38
1000
R13
8200
C30
1 UF
Q5
2N918/50
BUFFER
3.6VDC
R14
3900
C39
1000
2.8V
(MECHANICAL DRIVE)
RF AGC IN
8
C6
1000
L14
15
GROUND
1
RCV RF IN
A2
C1
2
Z1
C5
2
C2
0.5
-7.5
L1
C3
R1
8200
L2
0.47
9.2VDC
4.2VDC
Q1
K2107
1ST RF
AMPLIFIER
3.5VDC
R2
4700
R3
1K
C9
1000
C8
1000
L3
.33
C11
2
Z2
C15
1
C12
0.5
-7.5
L4
C13
R26
2.2K
R4
12K
R5
820
C10
1000
4.9VDC
R22
330
10VDC
Q2
K2107
2ND RF
AMPLIFIER
4.2VDC
R6
680
C17
1000
C16
1000
C18
2
C19
0.5
-7.5



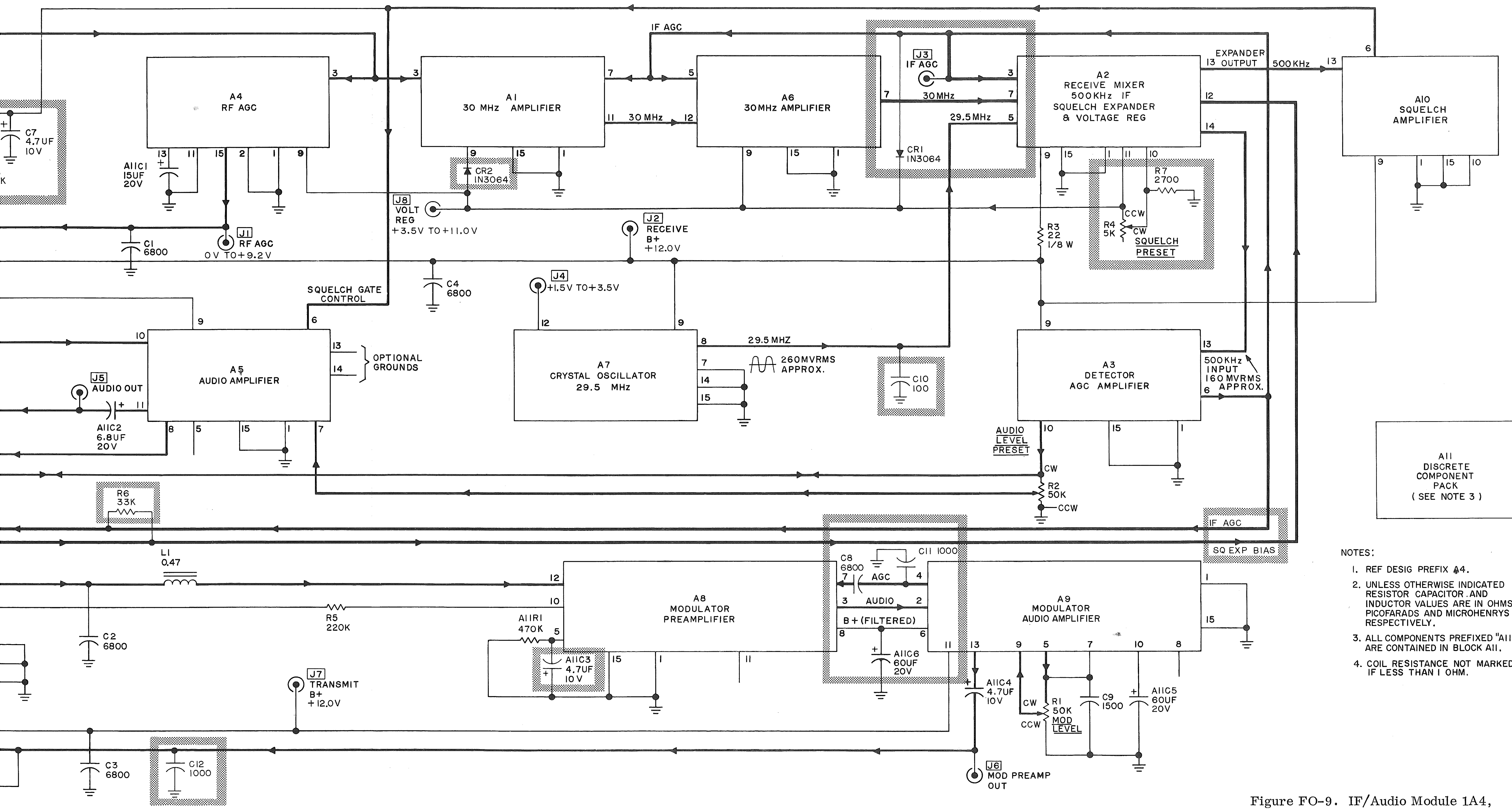
NOTES:

1. REF DESIG PREFIX A5.
2. UNLESS OTHERWISE INDICATED RESISTOR CAPACITOR AND INDUCTOR VALUES ARE IN OHMS PICOFARADS AND MICROHENRYS RESPECTIVELY.
3. * VALUES ARE DETERMINED DURING ASSEMBLY.
4. ALL D-C VOLTAGES ARE MEASURED WITH FREQUENCY SYNTHESIZER MODULE REMOVED FROM RT UNIT.
5. COIL RESISTANCE NOT MARKED IF LESS THAN 1 OHM.
6. L21 THRU L34 ARE FERRITE BEADS.
7. FOR ALTERNATE BIAS CONTROL OF Q5, DISCONNECT L13/R26 FROM E4, THEN CONNECT L13/R26 TO GROUND.

Figure FO-8. PA/Modulator Module 1A5, Schematic Diagram



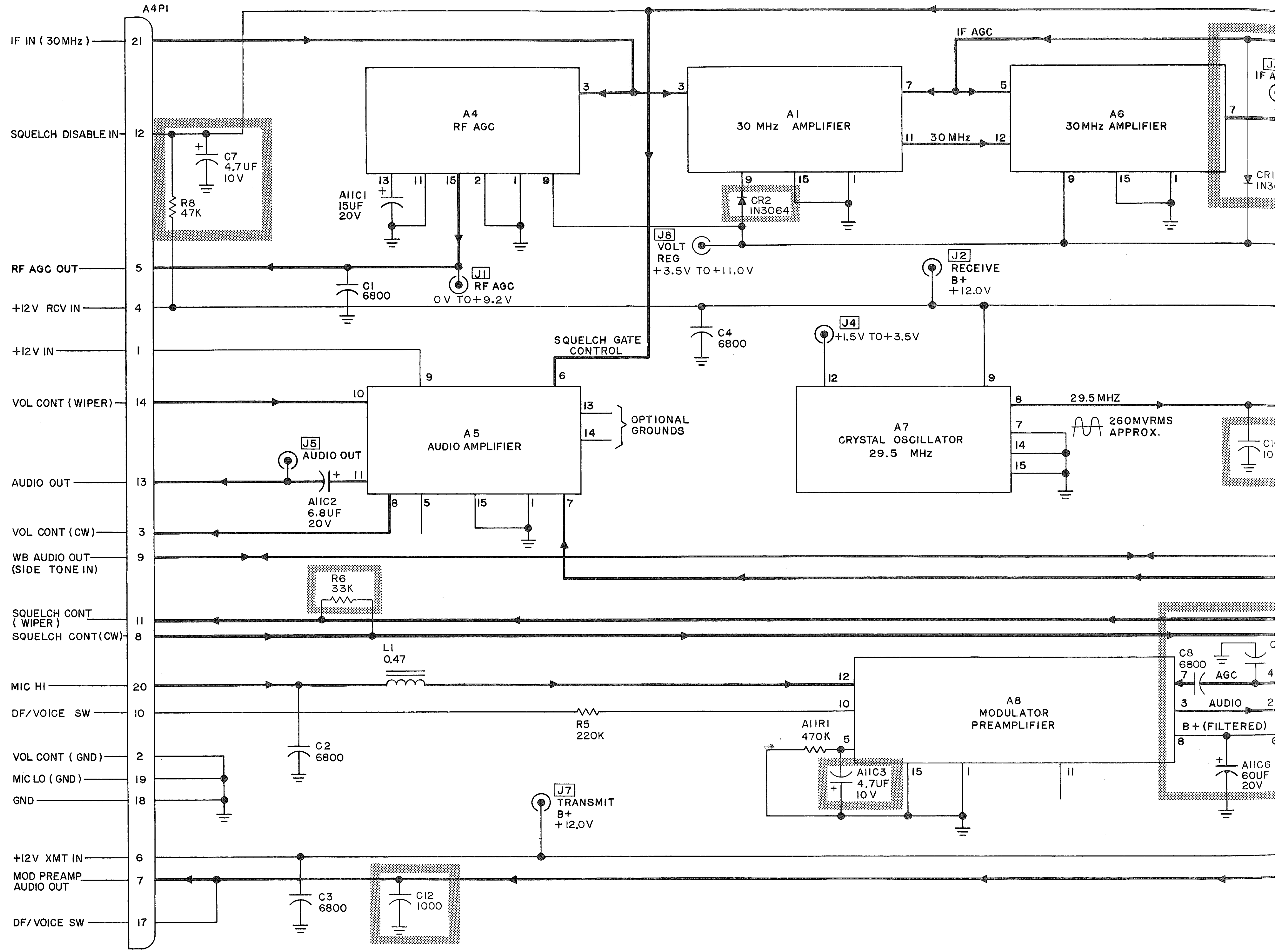
P/O
A5P1
FREQ SYNTH RF IN
A1
MOD PREAMP AUDIO IN
1
T1
A
B
C
C1
47
R1
8200
L1
0.33
L2
0.33
C4
1000
C5
1000
L4
0.47
C7
1000
12.0VDC
C3
1000
Q1
2N918
INPUT
AMPLIFIER
3.6VDC
2.8VDC
R2
3900
R3
220
C2
1000
T2
0VDC
Q2
2N918
TRIPLER
R4
330
R5
390
C6
1000
SEE NOTE 6
L31
L30
L29
R16
470
C37
1UF
C38
0.01UF
C42
1UF
C36
1.5 UF
T5
C39
1.5 UF
R20
1000
R21*
15K
R22*
33K
R12
33K
C44
1000
R15
2700
C45
100
MOD
LEVEL
PRESET
R17
20K
CR3
20V
1N968B
24VDC
C43
1000
16.8VDC
Q8
2N956
16.2VDC
Q9
2N3748
MODULATOR
RT3
10K
CR1
1N3064
15.5VDC
R13
4700
R14
820
11.5VDC
2.6VDC
Q7
2N956
MODULATOR
DRIVER
2.0VDC
C8
0.022UF
C9
1000
R6
5600
C10
1000
L6
0.15
C11
0.022UF
L9
0.33
C20
1000
L10
0.33
R8
5600
L11
0.33
C21
0.022UF
C26
1000
C27
0.022UF
L14
0.33
L15
0.33
Z1
C12
1000
C13
4
C16
0.5
-7.5
L7
C17
Q3
2N3866
1ST RF AMP
0.7VDC
R7
390
RT1
100
Z2
C14
8.2
C15
3.9
C18
0.5
-7.5
L8
C19
Q4
2N3866
2ND RF AMP
0.7VDC
R9
390
RT2
100
C22
1000
Z3
T3
C23
L12
Q5
2N3375
POWER
AMPLIFIER
L13
0.15
R26*
E4
SEE
NOTES
3,7
C46*
R10
82
CR6
1N3064
C24
1000
R11*
1500
T4
(MECHANICAL DRIVE)

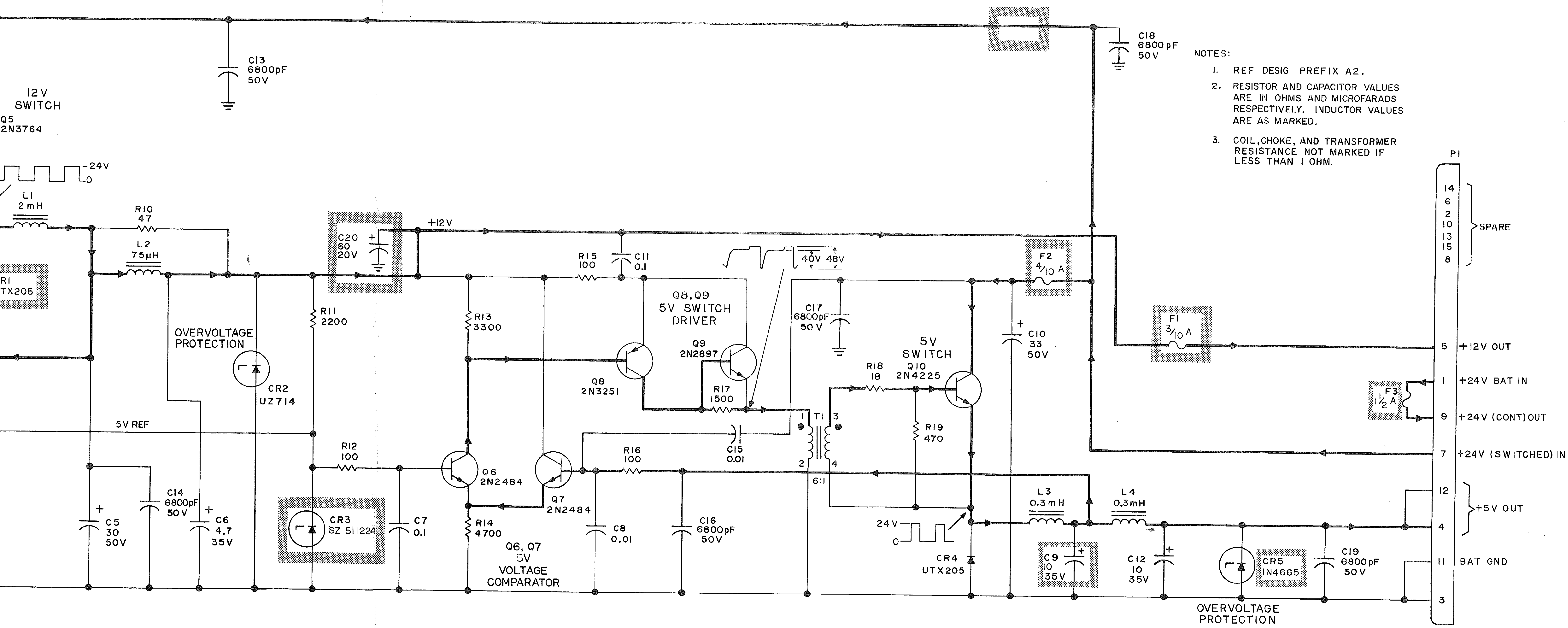


NOTES:

1. REF DESIG PREFIX 1A4.
2. UNLESS OTHERWISE INDICATED RESISTOR CAPACITOR AND INDUCTOR VALUES ARE IN OHMS PICOFARADS AND MICROHENRYS RESPECTIVELY.
3. ALL COMPONENTS PREFIXED "A11" ARE CONTAINED IN BLOCK A11.
4. COIL RESISTANCE NOT MARKED IF LESS THAN 1 OHM.

Figure FO-9. IF/Audio Module 1A4, Schematic Diagram

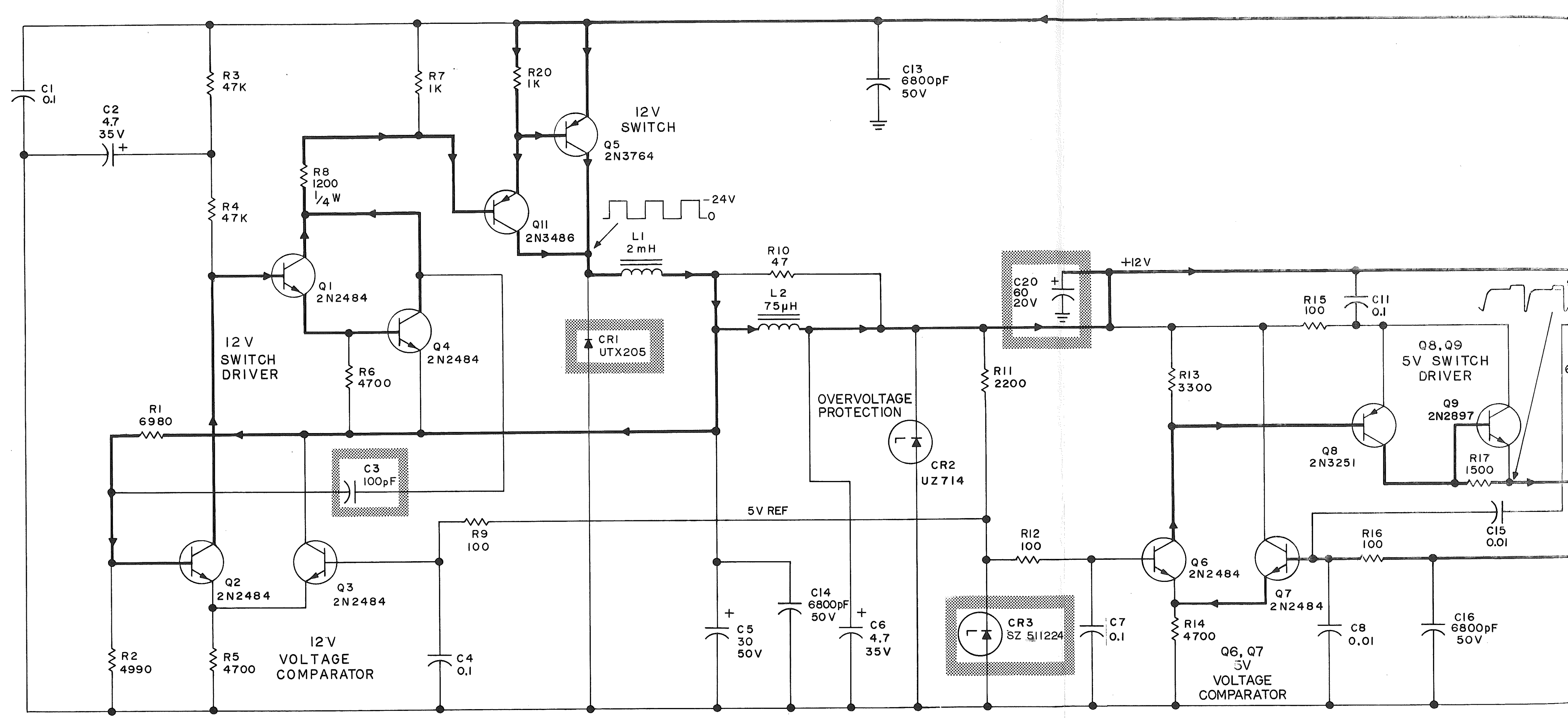

A4P1
IF IN (30MHz) 21
SQUELCH DISABLE IN 12
RF AGC OUT 5
+12V RCV IN 4
+12V IN 1
VOL CONT (WIPER) 14
AUDIO OUT 13
VOL CONT (CW) 3
WB AUDIO OUT (SIDE TONE IN) 9
SQUELCH CONT (WIPER) 11
SQUELCH CONT (CW) 8
MIC HI 20
DF/VOICE SW 10
VOL CONT (GND) 2
MIC LO (GND) 19
GND 18
+12V XMT IN 6
MOD PREAMP AUDIO OUT 7
DF/VOICE SW 17
C7 4.7UF 10V
R8 47K
A4 RF AGC
A11C1 15UF 20V
C1 6800
J1 RF AGC 0V TO +9.2V
A1 30 MHz AMPLIFIER
CR2 IN3064
J8 VOLT REG +3.5V TO +11.0V
IF AGC
30 MHz
A6 30MHz AMPLIFIER
J2 RECEIVE B+ +12.0V
C4 6800
SQUELCH GATE CONTROL
J4 +1.5V TO +3.5V
A5 AUDIO AMPLIFIER
OPTIONAL GROUNDS
J5 AUDIO OUT
A11C2 6.8UF 20V
A7 CRYSTAL OSCILLATOR 29.5 MHz
29.5 MHZ
260MVRMS APPROX.
R6 33K
L1 0.47
A8 MODULATOR PREAMPLIFIER
R5 220K
A11R1 470K
A11C3 4.7UF 10V
C2 6800
C8 6800
AGC
AUDIO
B+ (FILTERED)
A11C6 60UF 20V
J7 TRANSMIT B+ +12.0V
C3 6800
C12 1000



NOTES:

1. REF DESIG PREFIX A2.
2. RESISTOR AND CAPACITOR VALUES ARE IN OHMS AND MICROFARADS RESPECTIVELY. INDUCTOR VALUES ARE AS MARKED.
3. COIL, CHOKE, AND TRANSFORMER RESISTANCE NOT MARKED IF LESS THAN 1 OHM.

Figure FO-10. Voltage Regulator Module 1A2, Schematic Diagram


C1 0.1
C2 4.7 35V
R3 47K
R4 47K
R7 1K
R20 1K
12V SWITCH
Q5 2N3764
C13 6800pF 50V
R8 1200 1/4 W
Q11 2N3486
-24V
0
L1 2mH
R10 47
L2 75μH
Q1 2N2484
Q4 2N2484
R6 4700
12V SWITCH DRIVER
CR1 UTX205
C20 60 20V
+12V
R15 100
C11 0.1
Q8, Q9 5V SWITCH DRIVER
R11 2200
R13 3300
OVERVOLTAGE PROTECTION
CR2 UZ714
Q9 2N2897
Q8 2N3251
R17 1500
R1 6980
C3 100pF
5V REF
R9 100
R12 100
R16 100
C15 0.01
Q2 2N2484
Q3 2N2484
C14 6800pF 50V
C5 30 50V
C6 4.7 35V
CR3 SZ 511224
C7 0.1
Q6 2N2484
Q7 2N2484
R14 4700
C8 0.01
C16 6800pF 50V
R2 4990
R5 4700
12V VOLTAGE COMPARATOR
C4 0.1
Q6, Q7 5V VOLTAGE COMPARATOR

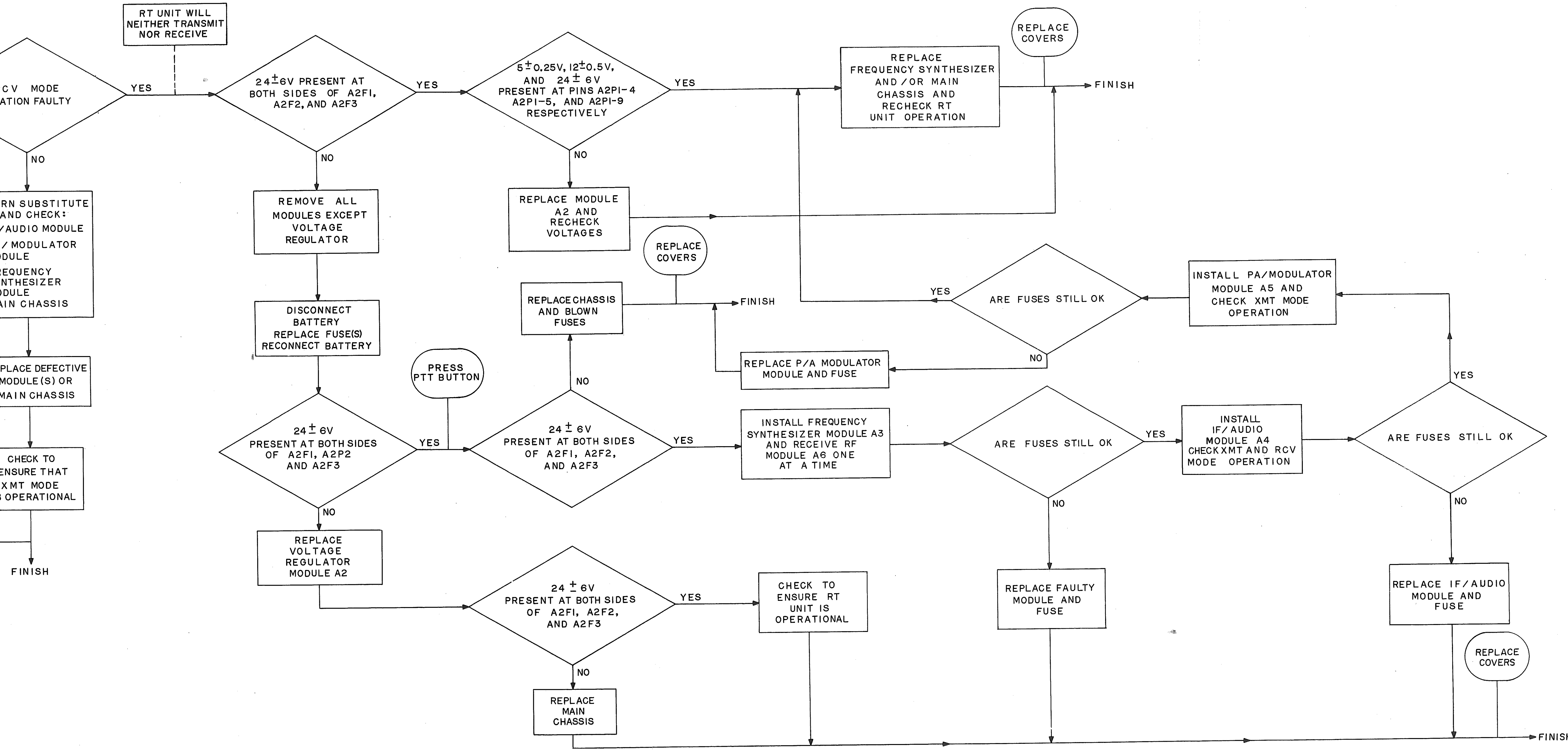
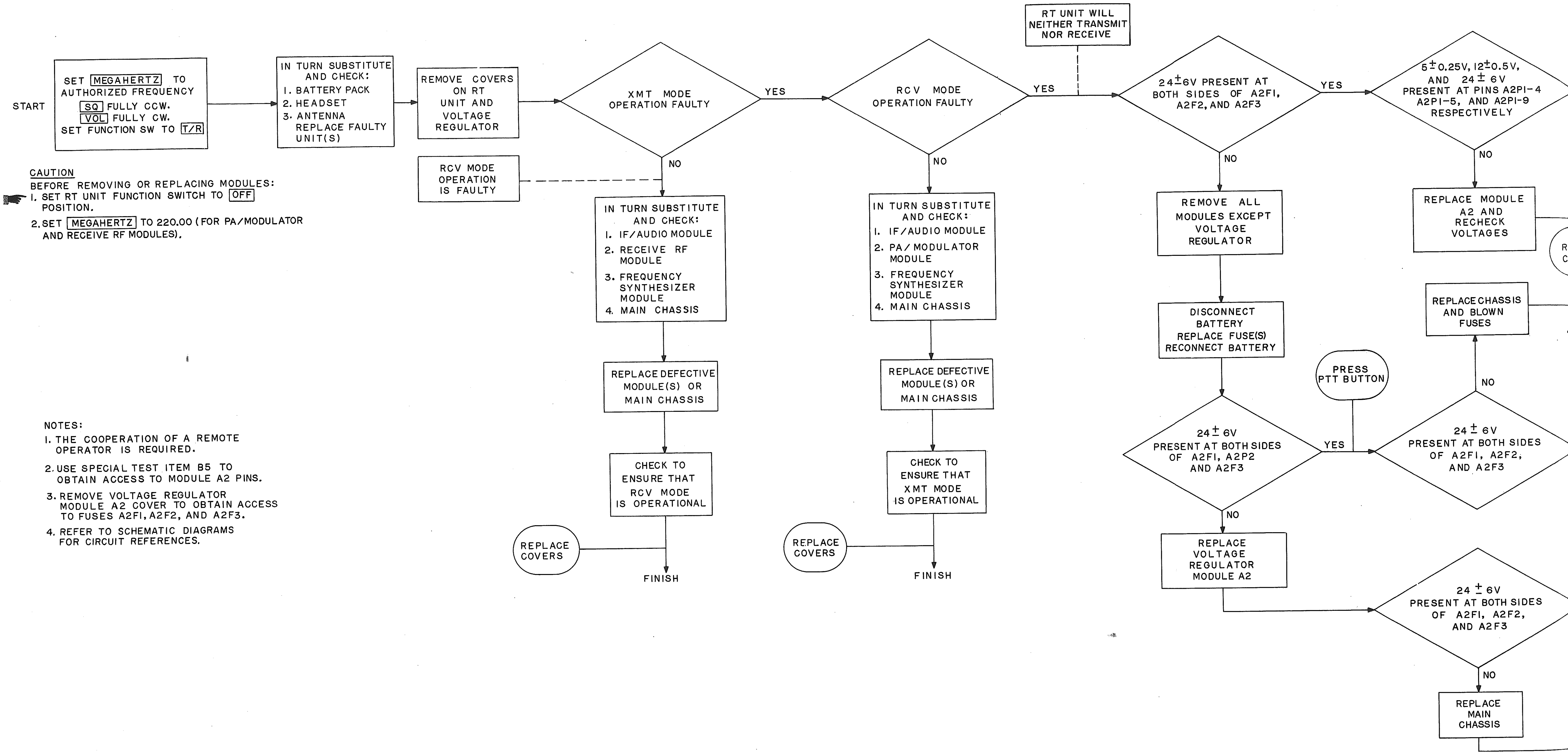


Figure FO-11. RT Unit Fault Sectionalization Diagram



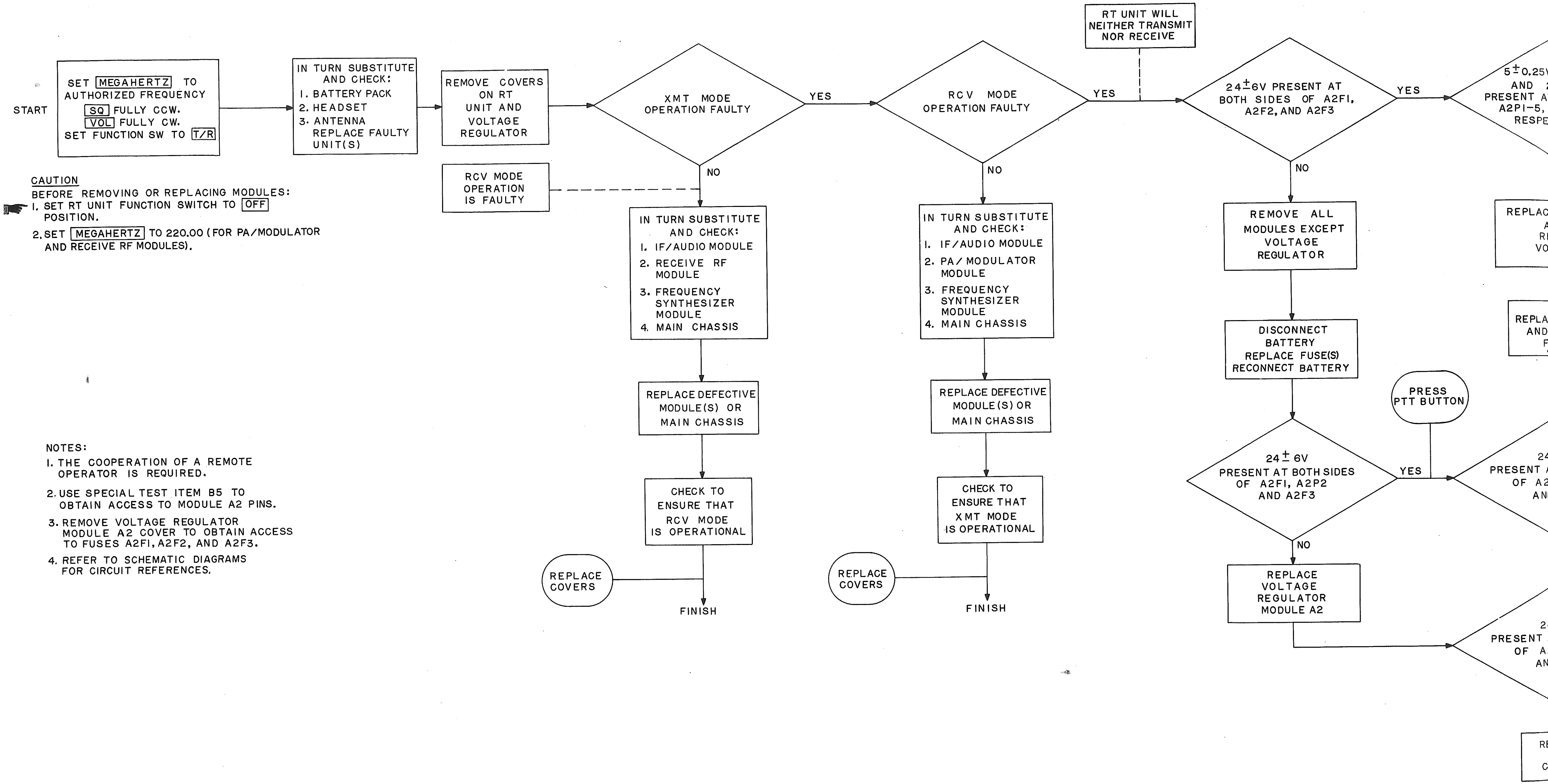
CAUTION

BEFORE REMOVING OR REPLACING MODULES:

1. SET RT UNIT FUNCTION SWITCH TO OFF POSITION.
2. SET MEGAHERTZ TO 220.00 (FOR PA/MODULATOR AND RECEIVE RF MODULES).

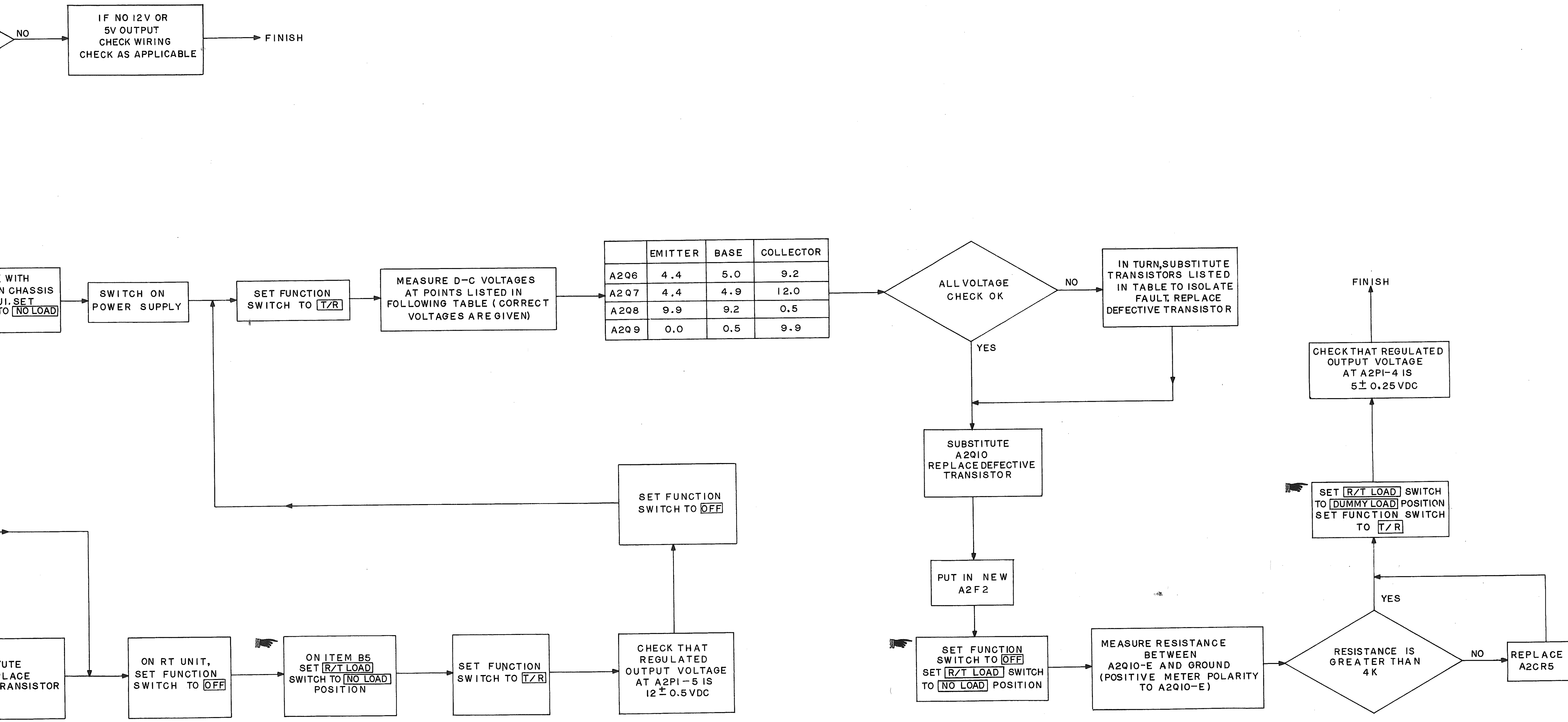
NOTES:

1. THE COOPERATION OF A REMOTE OPERATOR IS REQUIRED.
2. USE SPECIAL TEST ITEM B5 TO OBTAIN ACCESS TO MODULE A2 PINS.
3. REMOVE VOLTAGE REGULATOR MODULE A2 COVER TO OBTAIN ACCESS TO FUSES A2F1, A2F2, AND A2F3.
4. REFER TO SCHEMATIC DIAGRAMS FOR CIRCUIT REFERENCES.



CAUTION
BEFORE REMOVING OR REPLACING MODULES:
1. SET RT UNIT FUNCTION SWITCH TO OFF POSITION.
2. SET MEGAHERTZ TO 220.00 (FOR PA/MODULATOR AND RECEIVE RF MODULES).

NOTES:
1. THE COOPERATION OF A REMOTE OPERATOR IS REQUIRED.
2. USE SPECIAL TEST ITEM B5 TO OBTAIN ACCESS TO MODULE A2 PINS.
3. REMOVE VOLTAGE REGULATOR MODULE A2 COVER TO OBTAIN ACCESS TO FUSES A2F1, A2F2, AND A2F3.
4. REFER TO SCHEMATIC DIAGRAMS FOR CIRCUIT REFERENCES.



	EMITTER	BASE	COLLECTOR
A2Q6	4.4	5.0	9.2
A2Q7	4.4	4.9	12.0
A2Q8	9.9	9.2	0.5
A2Q9	0.0	0.5	9.9

Figure FO-12. Voltage Regulator Fault Localization Diagram

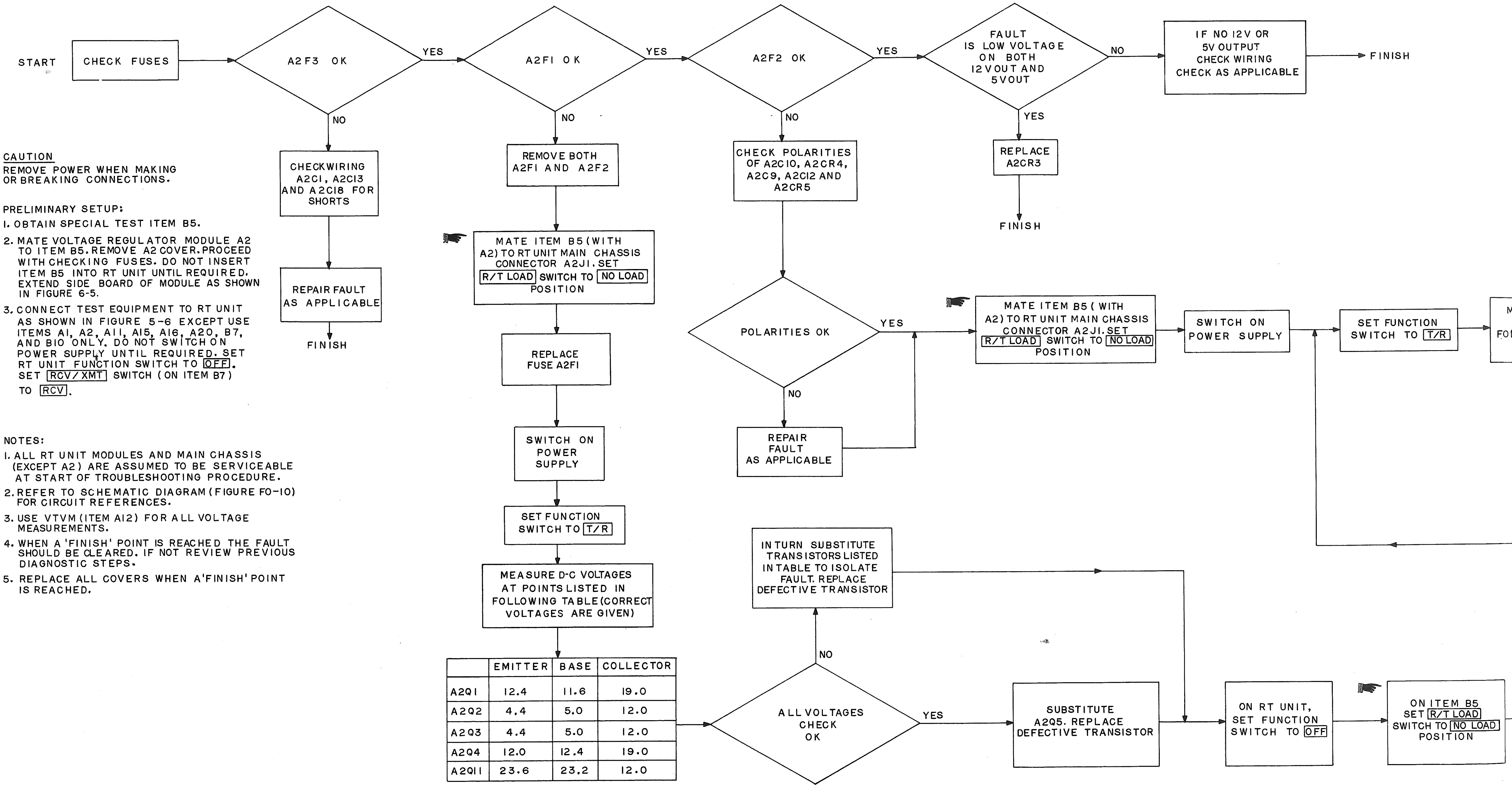
CAUTION
REMOVE POWER WHEN MAKING OR BREAKING CONNECTIONS.

PRELIMINARY SETUP:

1. OBTAIN SPECIAL TEST ITEM B5.
2. MATE VOLTAGE REGULATOR MODULE A2 TO ITEM B5. REMOVE A2 COVER. PROCEED WITH CHECKING FUSES. DO NOT INSERT ITEM B5 INTO RT UNIT UNTIL REQUIRED. EXTEND SIDE BOARD OF MODULE AS SHOWN IN FIGURE 6-5.
3. CONNECT TEST EQUIPMENT TO RT UNIT AS SHOWN IN FIGURE 5-6 EXCEPT USE ITEMS A1, A2, A11, A15, A16, A20, B7, AND B10 ONLY. DO NOT SWITCH ON POWER SUPPLY UNTIL REQUIRED. SET RT UNIT FUNCTION SWITCH TO [OFF]. SET [RCV/XMT] SWITCH (ON ITEM B7) TO [RCV].

NOTES:

1. ALL RT UNIT MODULES AND MAIN CHASSIS (EXCEPT A2) ARE ASSUMED TO BE SERVICEABLE AT START OF TROUBLESHOOTING PROCEDURE.
2. REFER TO SCHEMATIC DIAGRAM (FIGURE FO-10) FOR CIRCUIT REFERENCES.
3. USE VTVM (ITEM A12) FOR ALL VOLTAGE MEASUREMENTS.
4. WHEN A 'FINISH' POINT IS REACHED THE FAULT SHOULD BE CLEARED. IF NOT REVIEW PREVIOUS DIAGNOSTIC STEPS.
5. REPLACE ALL COVERS WHEN A 'FINISH' POINT IS REACHED.



	EMITTER	BASE	COLLECTOR
A2Q1	12.4	11.6	19.0
A2Q2	4.4	5.0	12.0
A2Q3	4.4	5.0	12.0
A2Q4	12.0	12.4	19.0
A2Q11	23.6	23.2	12.0

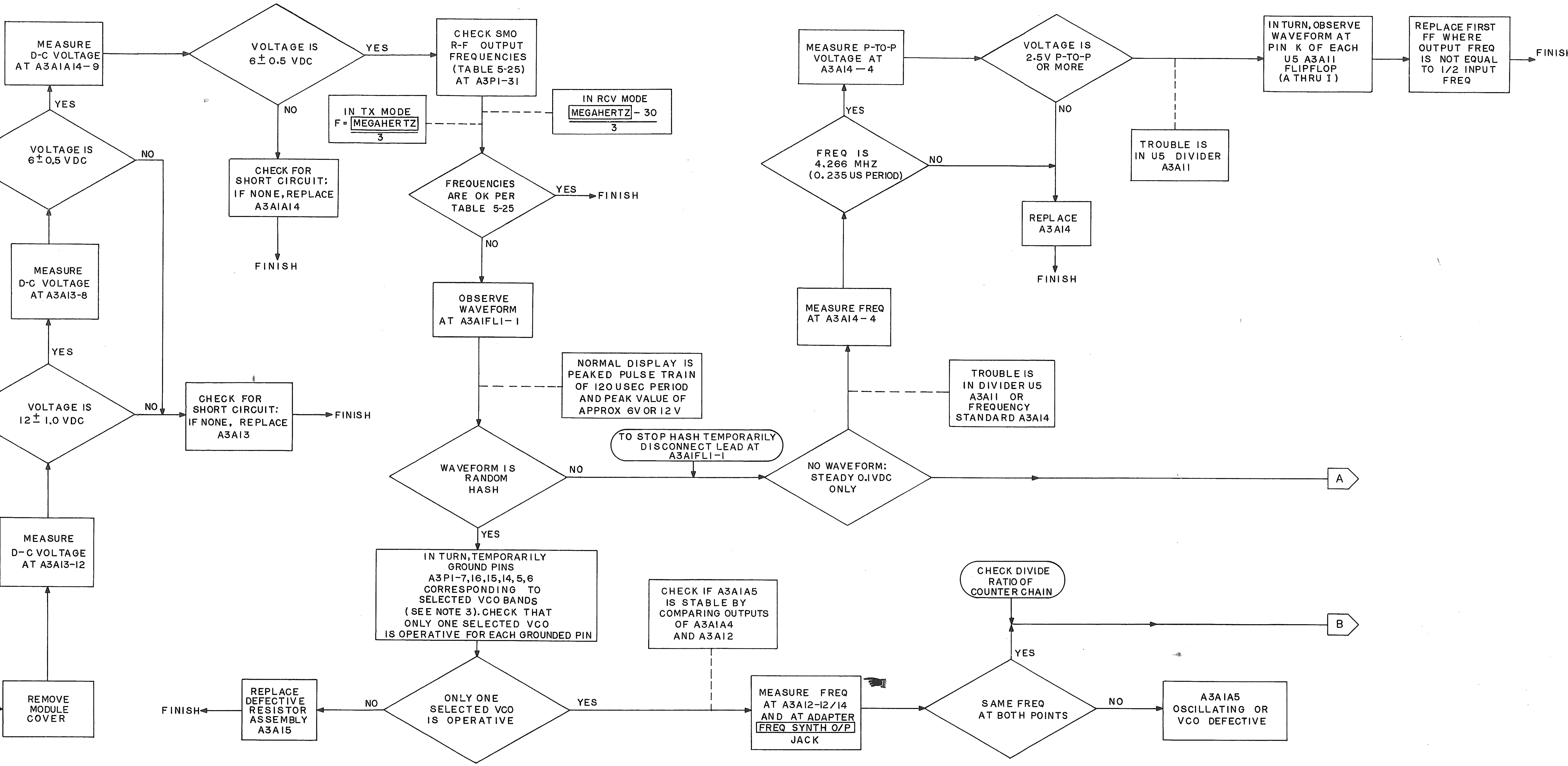


Figure FO-13. Frequency Synthesizer Fault Localization Diagram (Sheet 1 of 2)

PRELIMINARY SETUP:

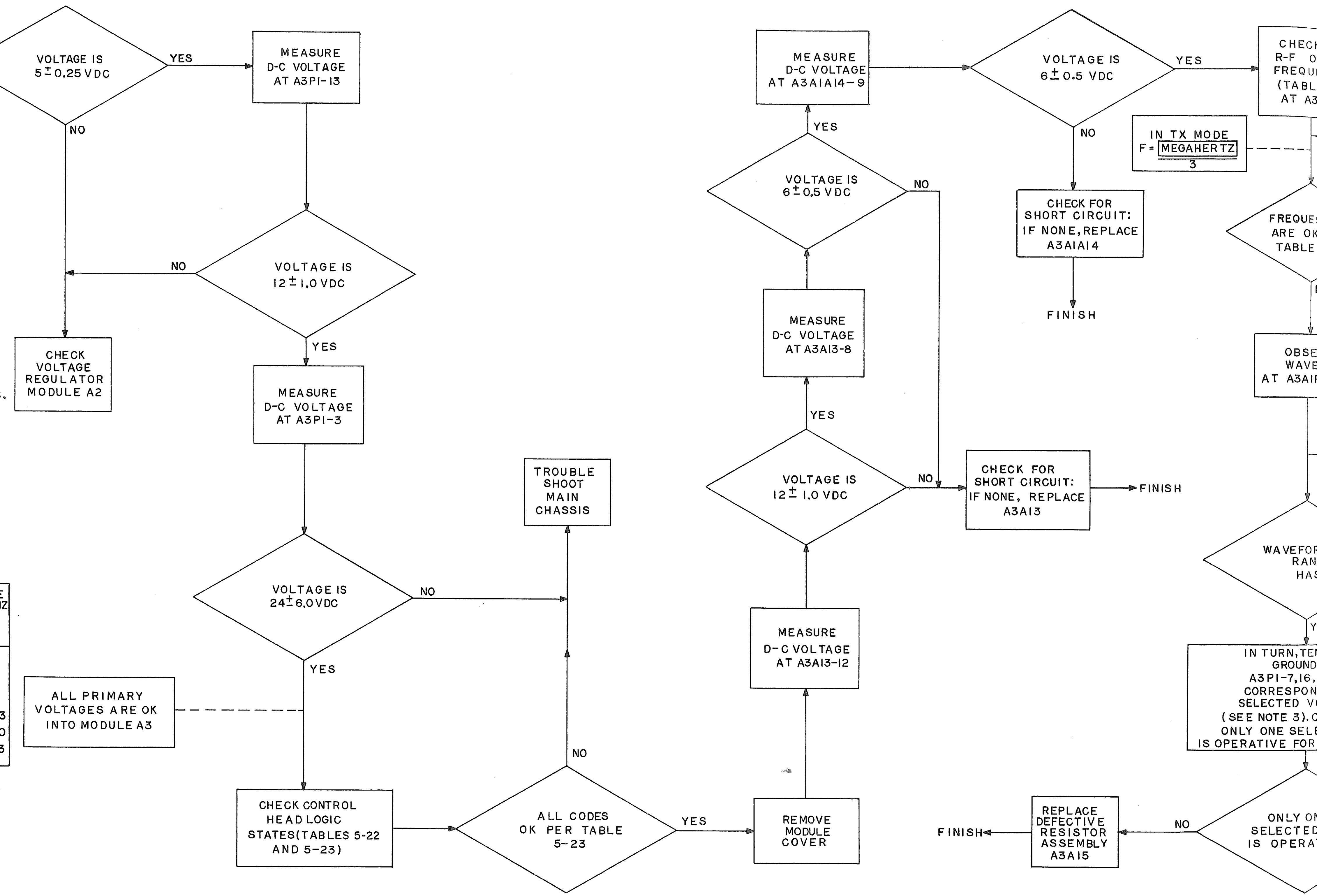
1. OBTAIN SPECIAL TEST ITEM B2.
2. MATE FREQUENCY SYNTHESIZER MODULE A3 TO ITEM B2. MATE ITEM B2 (WITH A3) TO MAIN CHASSIS CONNECTOR A3J1.
3. CONNECT TEST EQUIPMENT TO RT UNIT AS SHOWN IN FIGURE 5-6 EXCEPT USE TEST ITEMS A1, A2, A11, A15, A16, A20, AND B7 ONLY.
4. USE ITEMS A8, A9 AND A10 (SAMPLING OSCILLOSCOPE AND PLUG-INS) FOR WAVEFORM OBSERVATION AND AMPLITUDE MEASUREMENTS. USE ITEMS A3 AND A4 (FREQUENCY COUNTER AND TRANSFER OSCILLATOR) FOR R-F OUTPUT FREQUENCY MEASUREMENT.
5. USE ITEM A12 FOR D-C VOLTAGE MEASUREMENTS.

NOTES:

1. ALL RT UNIT MODULES AND MAIN CHASSIS (EXCEPT MODULE A3) ARE ASSUMED TO BE SERVICEABLE AT START OF TROUBLESHOOTING PROCEDURE.
2. REFER TO SCHEMATIC DIAGRAM (FIGURE FO-5) FOR CIRCUIT REFERENCES.
3. GROUND ('0') STATES FOR VCO BANDS:

VCO BAND	GROUND AT A3P1 PIN NO	RECEIVE MODE FREQ RANGE MHZ	TRANSMIT MODE FREQ RANGE MHZ
A	7	65.0 TO 73.3	
B	16	73.3 TO 83.3	75.0 TO 83.3
C	15	83.3 TO 93.3	83.3 TO 93.3
D	14	93.3 TO 106.6	93.3 TO 113.3
E	5	106.6 TO 120.0	113.3 TO 120.0
F	6	120.0 TO 123.3	120.0 TO 133.3

4. WHEN A 'FINISH' POINT IS REACHED THE FAULT SHOULD BE CLEARED. IF NOT, REVIEW PREVIOUS DIAGNOSTIC STEPS.
5. REPLACE COVER AT 'FINISH' POINT.



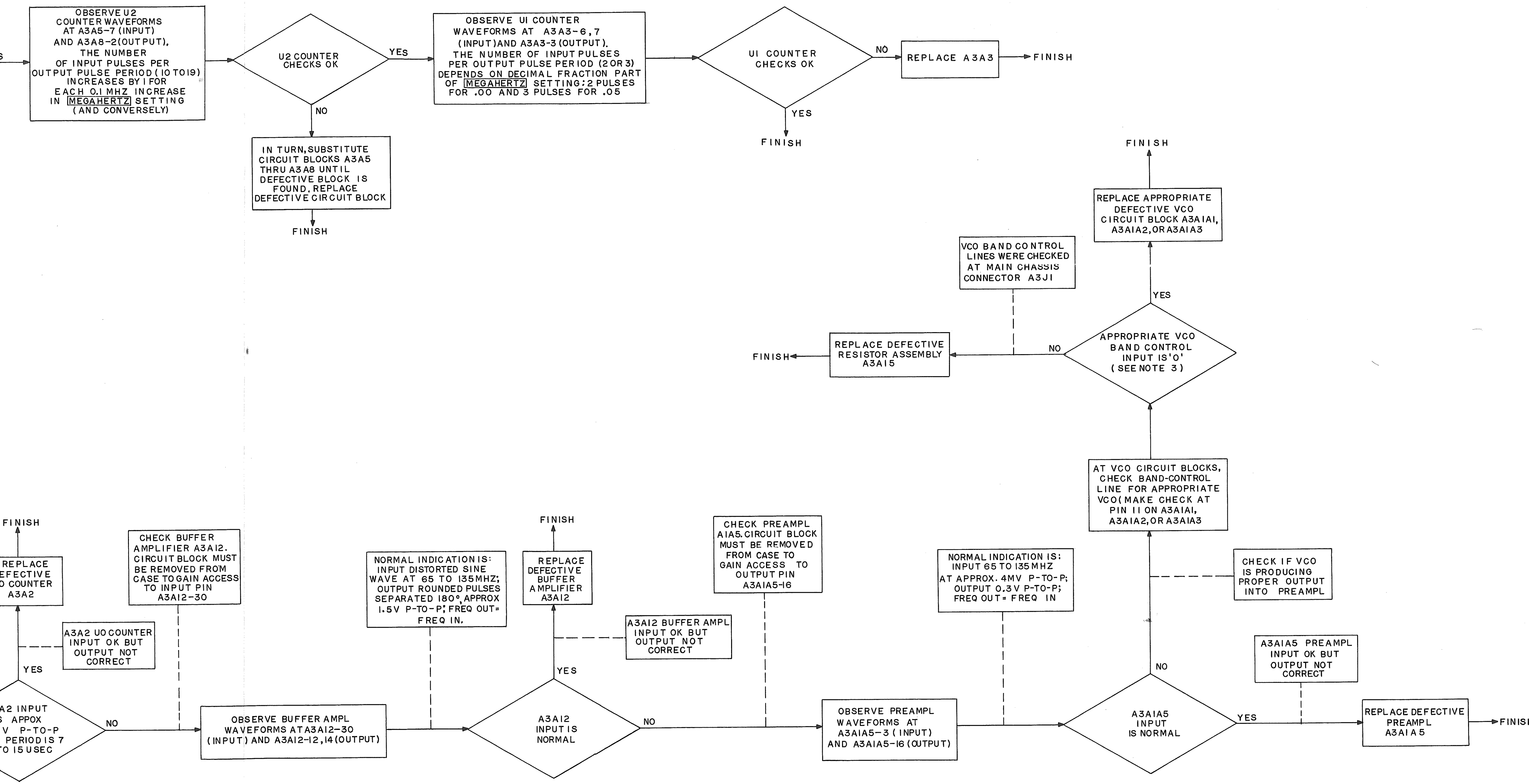
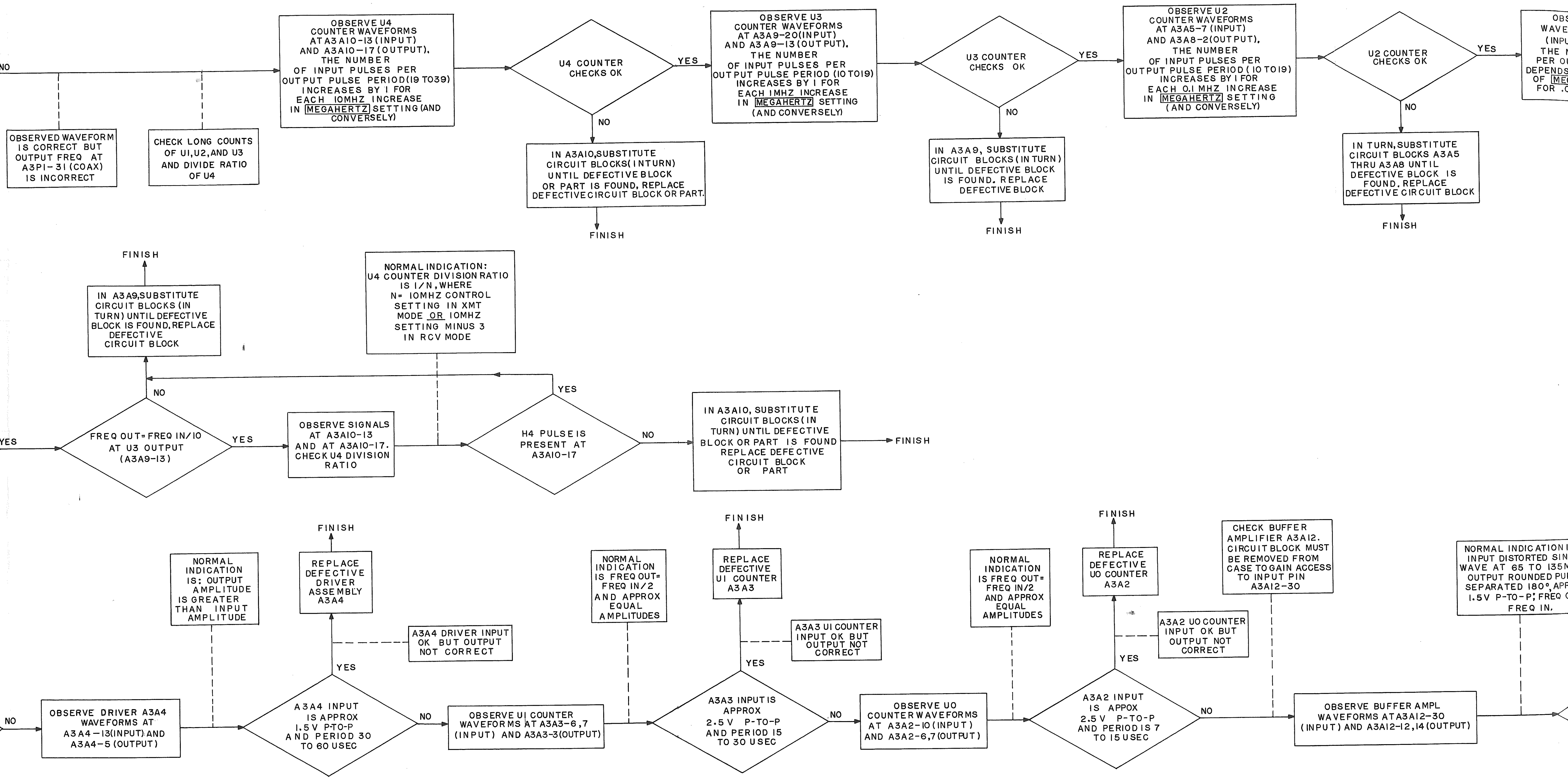
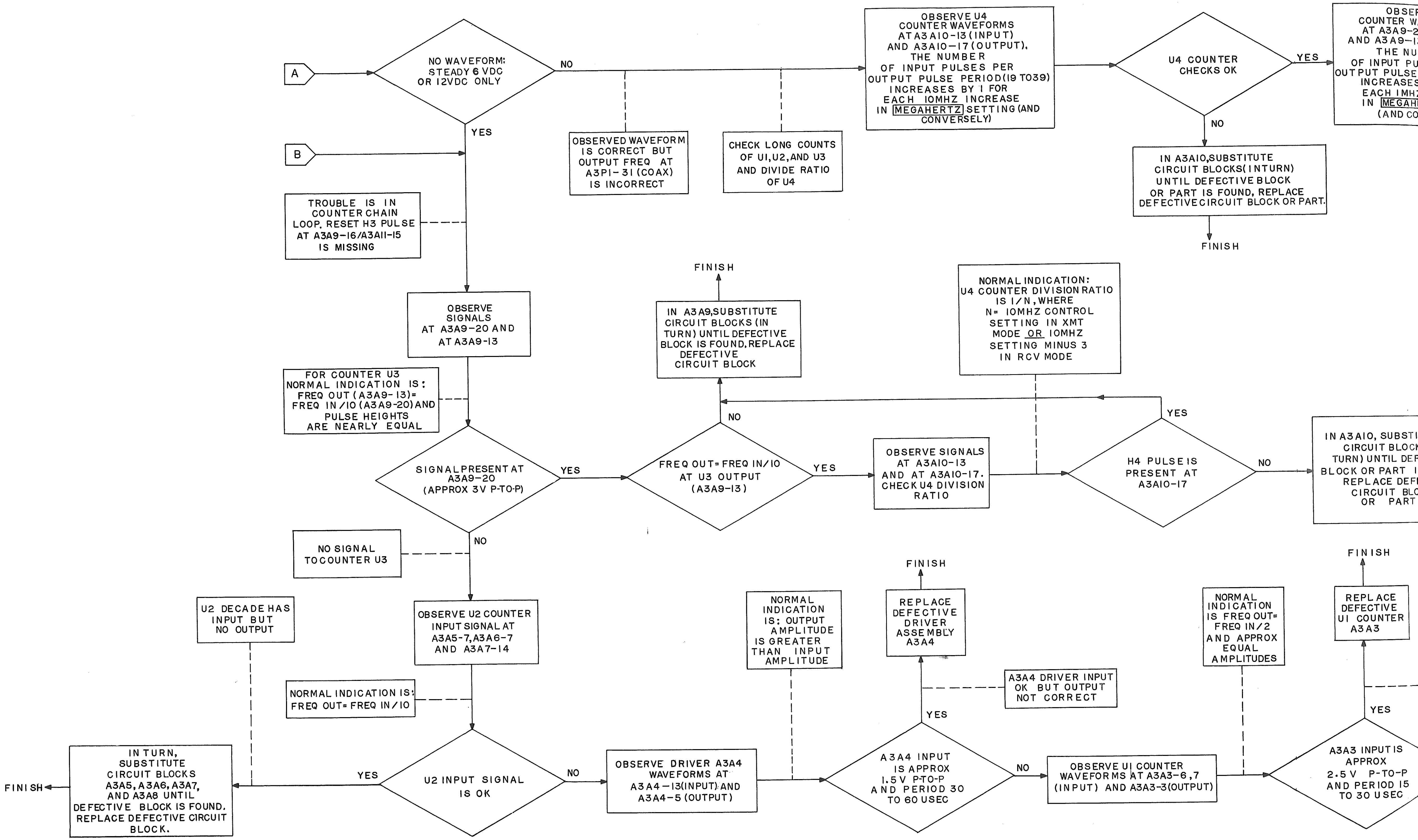


Figure FO-13. Frequency Synthesizer Fault Localization Diagram (Sheet 2 of 2)


NO
OBSERVED WAVEFORM IS CORRECT BUT OUTPUT FREQ AT A3P1-31 (COAX) IS INCORRECT
CHECK LONG COUNTS OF U1,U2,AND U3 AND DIVIDE RATIO OF U4
OBSERVE U4 COUNTER WAVEFORMS AT A3A10-13 (INPUT) AND A3A10-17 (OUTPUT). THE NUMBER OF INPUT PULSES PER OUTPUT PULSE PERIOD (19 TO 39) INCREASES BY 1 FOR EACH 10MHZ INCREASE IN MEGAHERTZ SETTING (AND CONVERSELY)
U4 COUNTER CHECKS OK
YES
NO
IN A3A10, SUBSTITUTE CIRCUIT BLOCKS (IN TURN) UNTIL DEFECTIVE BLOCK OR PART IS FOUND, REPLACE DEFECTIVE CIRCUIT BLOCK OR PART.
FINISH
OBSERVE U3 COUNTER WAVEFORMS AT A3A9-20 (INPUT) AND A3A9-13 (OUTPUT). THE NUMBER OF INPUT PULSES PER OUTPUT PULSE PERIOD (10 TO 19) INCREASES BY 1 FOR EACH 1MHZ INCREASE IN MEGAHERTZ SETTING (AND CONVERSELY)
U3 COUNTER CHECKS OK
YES
NO
IN A3A9, SUBSTITUTE CIRCUIT BLOCKS (IN TURN) UNTIL DEFECTIVE BLOCK IS FOUND. REPLACE DEFECTIVE BLOCK
FINISH
OBSERVE U2 COUNTER WAVEFORMS AT A3A5-7 (INPUT) AND A3A8-2 (OUTPUT). THE NUMBER OF INPUT PULSES PER OUTPUT PULSE PERIOD (10 TO 19) INCREASES BY 1 FOR EACH 0.1 MHZ INCREASE IN MEGAHERTZ SETTING (AND CONVERSELY)
U2 COUNTER CHECKS OK
YES
NO
IN TURN, SUBSTITUTE CIRCUIT BLOCKS A3A5 THRU A3A8 UNTIL DEFECTIVE BLOCK IS FOUND. REPLACE DEFECTIVE CIRCUIT BLOCK
FINISH
OBS WAVE (INPU THE N PER OU DEPENDS OF MEG FOR .C
FINISH
IN A3A9, SUBSTITUTE CIRCUIT BLOCKS (IN TURN) UNTIL DEFECTIVE BLOCK IS FOUND, REPLACE DEFECTIVE CIRCUIT BLOCK
NORMAL INDICATION: U4 COUNTER DIVISION RATIO IS 1/N, WHERE N= 10MHZ CONTROL SETTING IN XMT MODE OR 10MHZ SETTING MINUS 3 IN RCV MODE
YES
NO
YES
FREQ OUT=FREQ IN/10 AT U3 OUTPUT (A3A9-13)
YES
OBSERVE SIGNALS AT A3A10-13 AND AT A3A10-17. CHECK U4 DIVISION RATIO
H4 PULSE IS PRESENT AT A3A10-17
NO
IN A3A10, SUBSTITUTE CIRCUIT BLOCKS (IN TURN) UNTIL DEFECTIVE BLOCK OR PART IS FOUND REPLACE DEFECTIVE CIRCUIT BLOCK OR PART
FINISH
FINISH
NORMAL INDICATION IS: OUTPUT AMPLITUDE IS GREATER THAN INPUT AMPLITUDE
REPLACE DEFECTIVE DRIVER ASSEMBLY A3A4
A3A4 DRIVER INPUT OK BUT OUTPUT NOT CORRECT
YES
NO
OBSERVE DRIVER A3A4 WAVEFORMS AT A3A4-13(INPUT) AND A3A4-5 (OUTPUT)
A3A4 INPUT IS APPROX 1.5V P-TO-P AND PERIOD 30 TO 60 USEC
NO
OBSERVE U1 COUNTER WAVEFORMS AT A3A3-6,7 (INPUT) AND A3A3-3(OUTPUT)
NORMAL INDICATION IS FREQ OUT= FREQ IN/2 AND APPROX EQUAL AMPLITUDES
FINISH
REPLACE DEFECTIVE U1 COUNTER A3A3
A3A3 U1 COUNTER INPUT OK BUT OUTPUT NOT CORRECT
YES
A3A3 INPUT IS APPROX 2.5V P-TO-P AND PERIOD 15 TO 30 USEC
NO
OBSERVE U0 COUNTER WAVEFORMS AT A3A2-10 (INPUT) AND A3A2-6,7 (OUTPUT)
NORMAL INDICATION IS FREQ OUT= FREQ IN/2 AND APPROX EQUAL AMPLITUDES
FINISH
REPLACE DEFECTIVE U0 COUNTER A3A2
A3A2 U0 COUNTER INPUT OK BUT OUTPUT NOT CORRECT
YES
A3A2 INPUT IS APPOX 2.5V P-TO-P AND PERIOD IS 7 TO 15 USEC
NO
CHECK BUFFER AMPLIFIER A3A12. CIRCUIT BLOCK MUST BE REMOVED FROM CASE TO GAIN ACCESS TO INPUT PIN A3A12-30
OBSERVE BUFFER AMPL WAVEFORMS AT A3A12-30 (INPUT) AND A3A12-12,14 (OUTPUT)
NORMAL INDICATION I INPUT DISTORTED SIN WAVE AT 65 TO 135M OUTPUT ROUNDED PU SEPARATED 180°, APP 1.5V P-TO-P; FREQ C FREQ IN.



A
NO WAVEFORM: STEADY 6 VDC OR 12VDC ONLY
NO
YES
B
OBSERVED WAVEFORM IS CORRECT BUT OUTPUT FREQ AT A3P1-31 (COAX) IS INCORRECT
CHECK LONG COUNTS OF U1, U2, AND U3 AND DIVIDE RATIO OF U4
OBSERVE U4 COUNTER WAVEFORMS AT A3A10-13 (INPUT) AND A3A10-17 (OUTPUT). THE NUMBER OF INPUT PULSES PER OUTPUT PULSE PERIOD (19 TO 39) INCREASES BY 1 FOR EACH 10MHZ INCREASE IN MEGAHERTZ SETTING (AND CONVERSELY)
U4 COUNTER CHECKS OK
YES
NO
IN A3A10, SUBSTITUTE CIRCUIT BLOCKS (IN TURN) UNTIL DEFECTIVE BLOCK OR PART IS FOUND, REPLACE DEFECTIVE CIRCUIT BLOCK OR PART.
FINISH
TROUBLE IS IN COUNTER CHAIN LOOP. RESET H3 PULSE AT A3A9-16/A3A11-15 IS MISSING
OBSERVE SIGNALS AT A3A9-20 AND AT A3A9-13
FINISH
IN A3A9, SUBSTITUTE CIRCUIT BLOCKS (IN TURN) UNTIL DEFECTIVE BLOCK IS FOUND. REPLACE DEFECTIVE CIRCUIT BLOCK
NORMAL INDICATION: U4 COUNTER DIVISION RATIO IS 1/N, WHERE N= 10MHZ CONTROL SETTING IN XMT MODE OR 10MHZ SETTING MINUS 3 IN RCV MODE
FOR COUNTER U3 NORMAL INDICATION IS: FREQ OUT (A3A9-13)= FREQ IN/10 (A3A9-20) AND PULSE HEIGHTS ARE NEARLY EQUAL
YES
NO
SIGNAL PRESENT AT A3A9-20 (APPROX 3V P-TO-P)
YES
FREQ OUT= FREQ IN/10 AT U3 OUTPUT (A3A9-13)
YES
OBSERVE SIGNALS AT A3A10-13 AND AT A3A10-17. CHECK U4 DIVISION RATIO
H4 PULSE IS PRESENT AT A3A10-17
NO
NO
NO SIGNAL TO COUNTER U3
FINISH
FINISH
U2 DECADE HAS INPUT BUT NO OUTPUT
OBSERVE U2 COUNTER INPUT SIGNAL AT A3A5-7, A3A6-7 AND A3A7-14
NORMAL INDICATION IS: OUTPUT AMPLITUDE IS GREATER THAN INPUT AMPLITUDE
REPLACE DEFECTIVE DRIVER ASSEMBLY A3A4
NORMAL INDICATION IS FREQ OUT= FREQ IN/2 AND APPROX EQUAL AMPLITUDES
REPLACE DEFECTIVE U1 COUNTER A3A3
NORMAL INDICATION IS: FREQ OUT= FREQ IN/10
A3A4 DRIVER INPUT OK BUT OUTPUT NOT CORRECT
YES
YES
FINISH
IN TURN, SUBSTITUTE CIRCUIT BLOCKS A3A5, A3A6, A3A7, AND A3A8 UNTIL DEFECTIVE BLOCK IS FOUND. REPLACE DEFECTIVE CIRCUIT BLOCK.
YES
U2 INPUT SIGNAL IS OK
NO
OBSERVE DRIVER A3A4 WAVEFORMS AT A3A4-13 (INPUT) AND A3A4-5 (OUTPUT)
A3A4 INPUT IS APPROX 1.5 V P-TO-P AND PERIOD 30 TO 60 USEC
NO
OBSERVE U1 COUNTER WAVEFORMS AT A3A3-6, 7 (INPUT) AND A3A3-3 (OUTPUT)
A3A3 INPUT IS APPROX 2.5 V P-TO-P AND PERIOD 15 TO 30 USEC

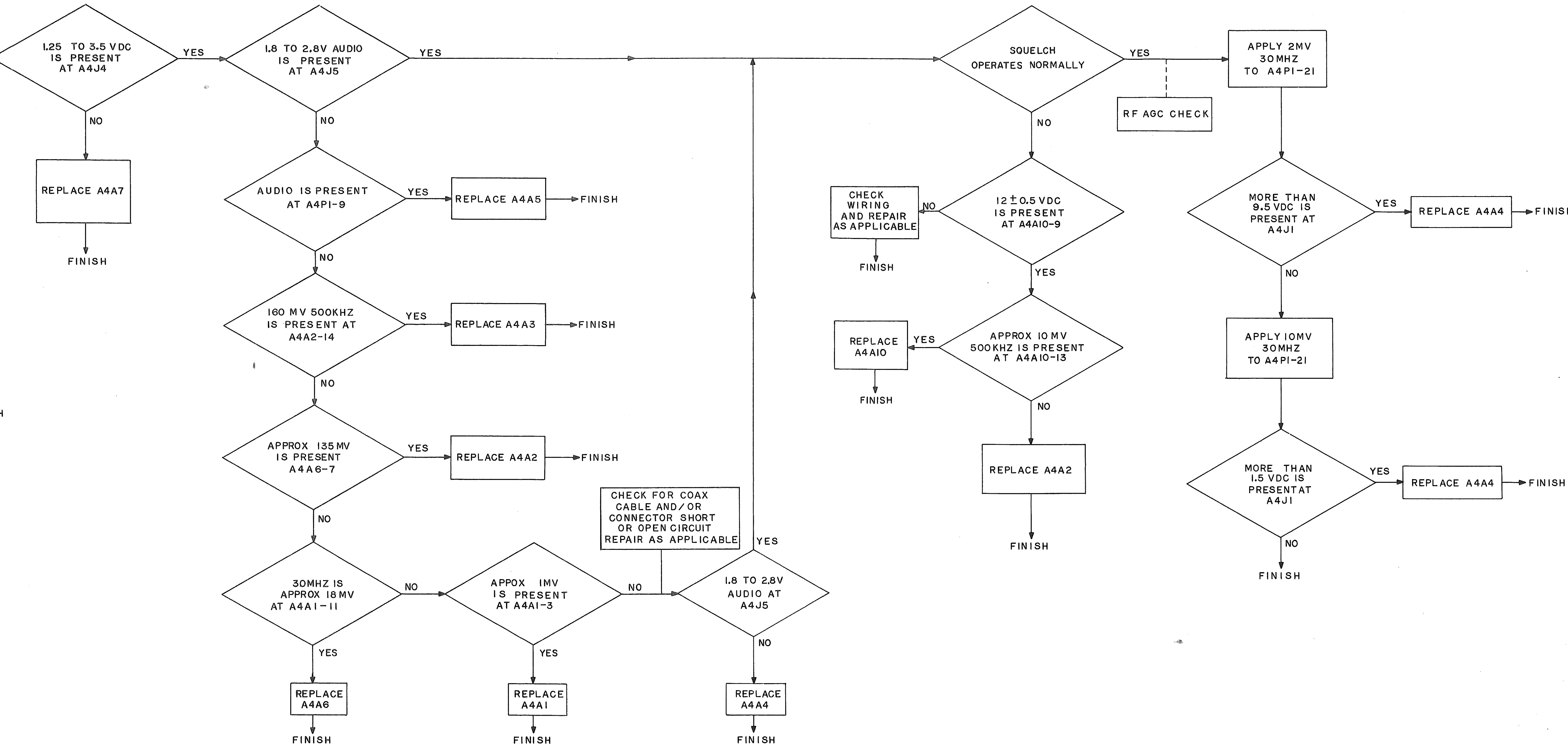
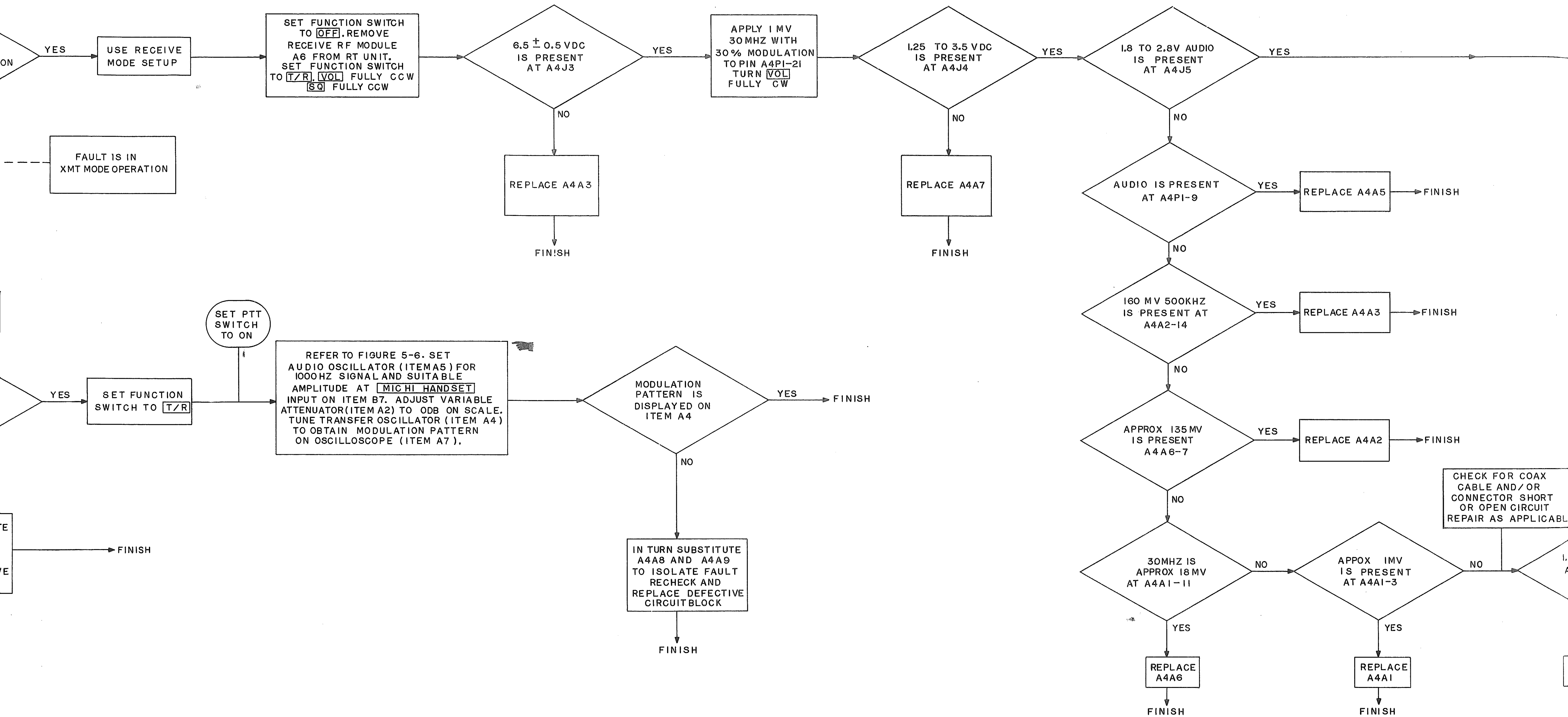


Figure FO-14. IF/Audio Fault Localization Diagram


ON
YES
USE RECEIVE MODE SETUP
SET FUNCTION SWITCH TO OFF. REMOVE RECEIVE RF MODULE A6 FROM RT UNIT. SET FUNCTION SWITCH TO T/R, VOL FULLY CCW SQ FULLY CCW
6.5 ± 0.5 VDC IS PRESENT AT A4J3
YES
NO
REPLACE A4A3
FINISH
APPLY 1 MV 30 MHZ WITH 30% MODULATION TO PIN A4P1-21 TURN VOL FULLY CW
1.25 TO 3.5 VDC IS PRESENT AT A4J4
YES
NO
REPLACE A4A7
FINISH
1.8 TO 2.8V AUDIO IS PRESENT AT A4J5
YES
NO
AUDIO IS PRESENT AT A4P1-9
YES
REPLACE A4A5
FINISH
NO
160 MV 500KHZ IS PRESENT AT A4A2-14
YES
REPLACE A4A3
FINISH
NO
APPROX 135 MV IS PRESENT A4A6-7
YES
REPLACE A4A2
FINISH
NO
30MHZ IS APPROX 18 MV AT A4A1-11
NO
YES
REPLACE A4A6
FINISH
APPOX 1MV IS PRESENT AT A4A1-3
NO
YES
REPLACE A4A1
FINISH
CHECK FOR COAX CABLE AND/OR CONNECTOR SHORT OR OPEN CIRCUIT REPAIR AS APPLICABL
FAULT IS IN XMT MODE OPERATION
YES
SET FUNCTION SWITCH TO T/R
SET PTT SWITCH TO ON
REFER TO FIGURE 5-6. SET AUDIO OSCILLATOR (ITEM A5) FOR 1000 HZ SIGNAL AND SUITABLE AMPLITUDE AT MIC HI HANDSET INPUT ON ITEM B7. ADJUST VARIABLE ATTENUATOR (ITEM A2) TO 0DB ON SCALE. TUNE TRANSFER OSCILLATOR (ITEM A4) TO OBTAIN MODULATION PATTERN ON OSCILLOSCOPE (ITEM A7).
MODULATION PATTERN IS DISPLAYED ON ITEM A4
YES
FINISH
NO
IN TURN SUBSTITUTE A4A8 AND A4A9 TO ISOLATE FAULT RECHECK AND REPLACE DEFECTIVE CIRCUIT BLOCK
FINISH
TE
VE
FINISH

TRANSMIT MODE SETUP:

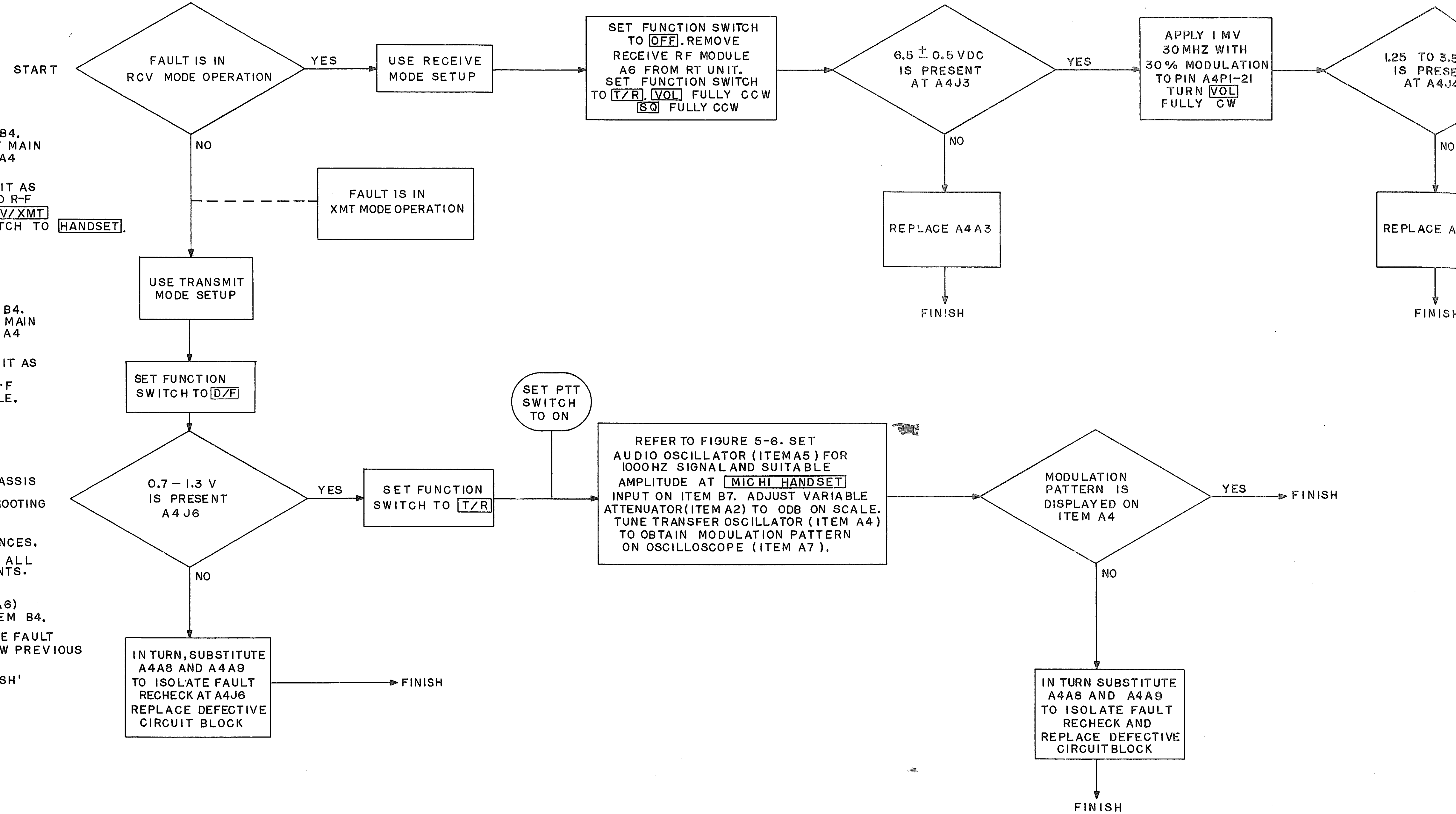
1. SET MEGAHERTZ TO 399.95.
2. OBTAIN SPECIAL TEST ITEM B4.
3. MATE IF/AUDIO MODULE A4 TO ITEM B4. MATE ITEM B4 (WITH A4) TO RT UNIT MAIN CHASSIS CONNECTOR A4J1. REMOVE A4 COVER.
4. CONNECT TEST EQUIPMENT TO RT UNIT AS SHOWN IN FIGURE 5-6. SET A-F AND R-F SWITCHES AS APPLICABLE. SET RCV/XMT SWITCH TO RCV. SET TX MODE SWITCH TO HANDSET.

RECEIVE MODE SETUP:

1. SET MEGAHERTZ TO 399.95.
2. OBTAIN SPECIAL TEST ITEM B4.
3. MATE IF/AUDIO MODULE A4 TO ITEM B4. MATE ITEM B4 (WITH A4) TO RT UNIT MAIN CHASSIS CONNECTOR A4J1. REMOVE A4 COVER.
4. CONNECT TEST EQUIPMENT TO RT UNIT AS SHOWN IN FIGURE 5-5. MODIFY CONNECTIONS AS REQUIRED. SET R-F AND A-F SWITCHES AS APPLICABLE. SET RCV/XMT SWITCH TO RCV.

NOTES:

1. ALL RT UNIT MODULES AND MAIN CHASSIS (EXCEPT A4) ARE ASSUMED TO BE SERVICEABLE AT START OF TROUBLESHOOTING PROCEDURE.
2. REFER TO SCHEMATIC DIAGRAM (FIGURE FO-9) FOR CIRCUIT REFERENCES.
3. USE R-F VOLTMETER (ITEM A13) FOR ALL AUDIO AND I-F VOLTAGE MEASUREMENTS.
4. ALL I-F VOLTAGES ARE RMS.
5. USE R-F SIGNAL GENERATOR (ITEM A6) FOR INJECTING I-F SIGNALS VIA ITEM B4.
6. WHEN 'FINISH' POINT IS REACHED, THE FAULT SHOULD BE CLEARED. IF NOT, REVIEW PREVIOUS DIAGNOSTIC STEPS.
7. REPLACE ALL COVERS WHEN A 'FINISH' POINT IS REACHED.



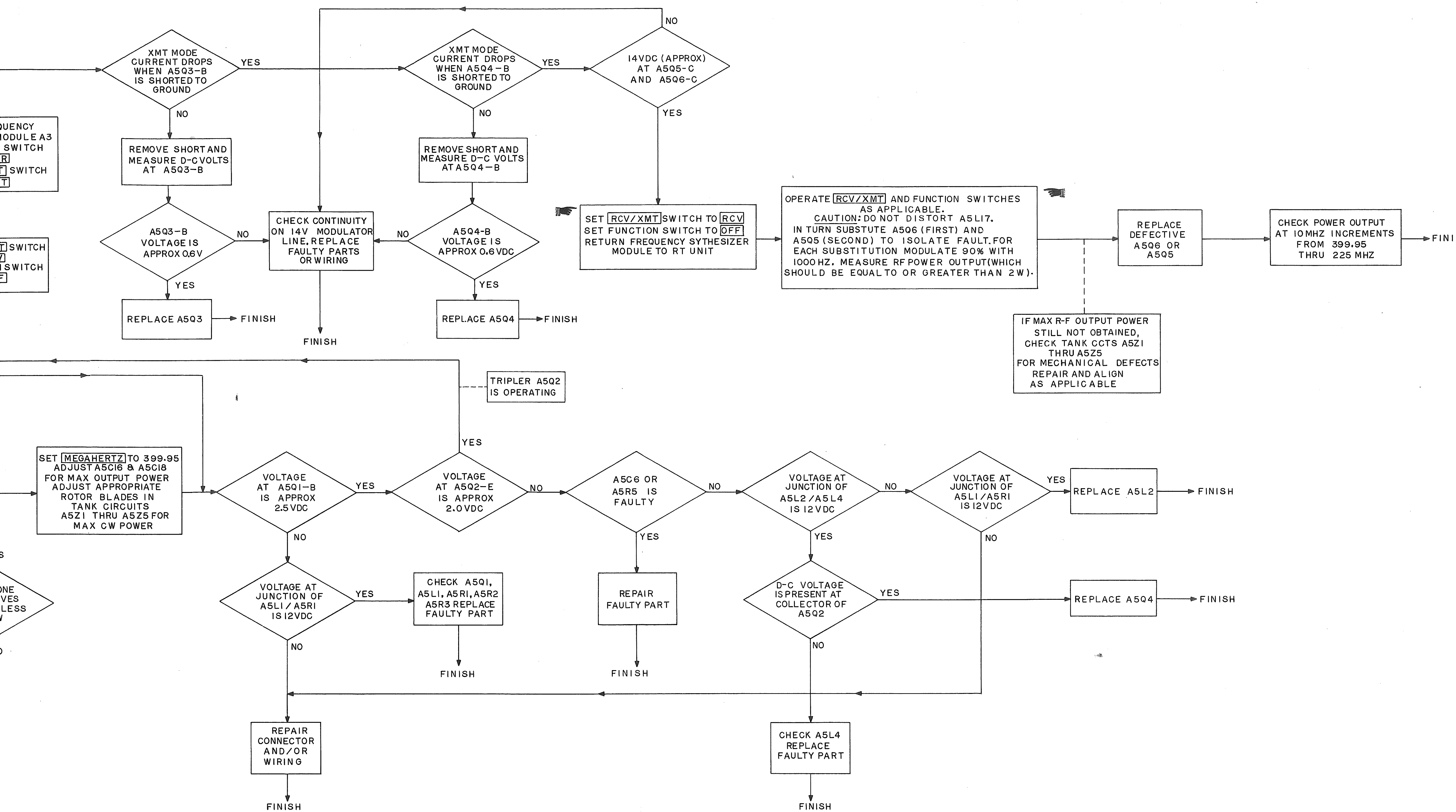
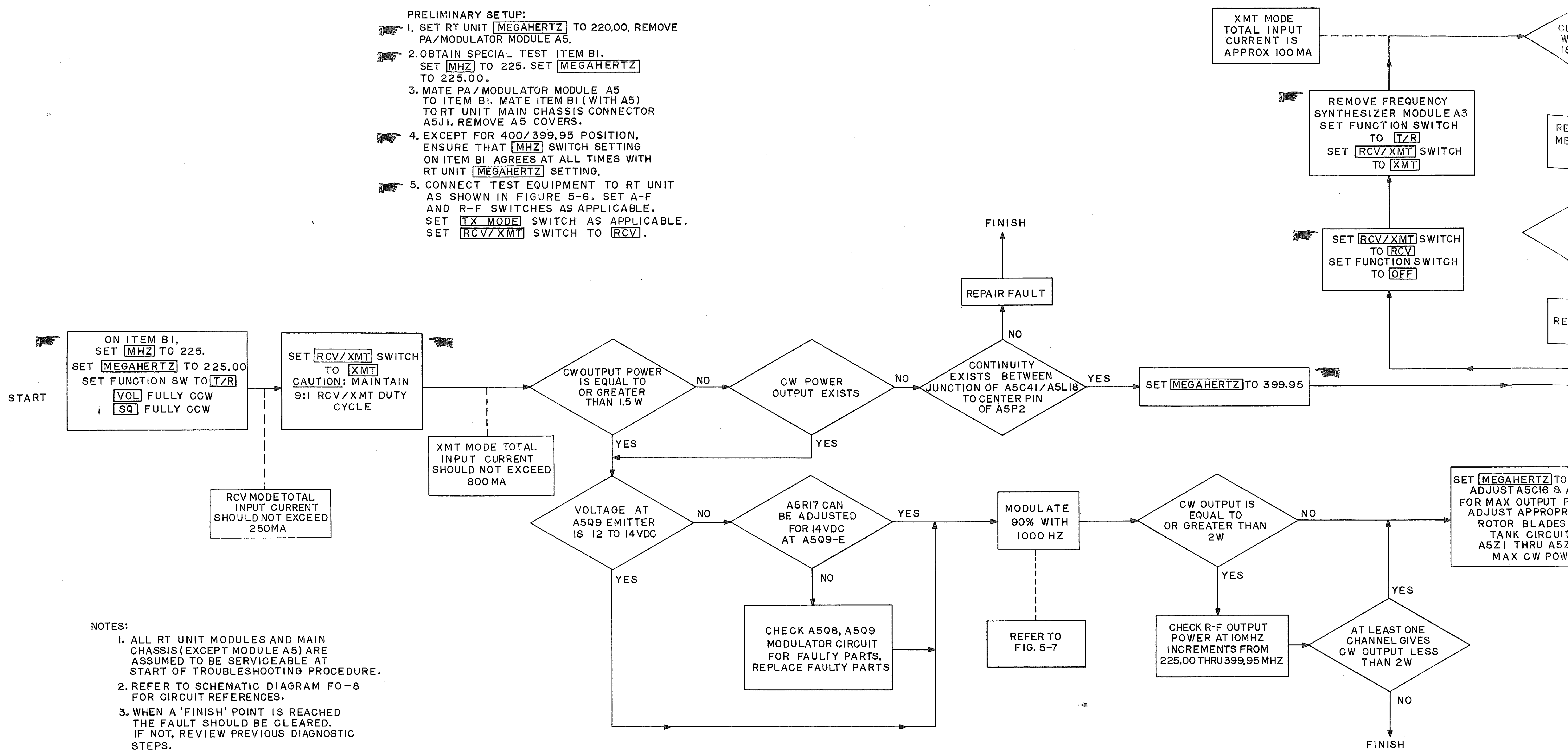


Figure FO-15. PA/Modulator Fault Localization Diagram

PRELIMINARY SETUP:

1. SET RT UNIT MEGAHERTZ TO 220.00. REMOVE PA/MODULATOR MODULE A5.
2. OBTAIN SPECIAL TEST ITEM B1. SET MHZ TO 225. SET MEGAHERTZ TO 225.00.
3. MATE PA/MODULATOR MODULE A5 TO ITEM B1. MATE ITEM B1 (WITH A5) TO RT UNIT MAIN CHASSIS CONNECTOR A5J1. REMOVE A5 COVERS.
4. EXCEPT FOR 400/399.95 POSITION, ENSURE THAT MHZ SWITCH SETTING ON ITEM B1 AGREES AT ALL TIMES WITH RT UNIT MEGAHERTZ SETTING.
5. CONNECT TEST EQUIPMENT TO RT UNIT AS SHOWN IN FIGURE 5-6. SET A-F AND R-F SWITCHES AS APPLICABLE. SET TX MODE SWITCH AS APPLICABLE. SET RCV/XMT SWITCH TO RCV.



NOTES:

1. ALL RT UNIT MODULES AND MAIN CHASSIS (EXCEPT MODULE A5) ARE ASSUMED TO BE SERVICEABLE AT START OF TROUBLESHOOTING PROCEDURE.
2. REFER TO SCHEMATIC DIAGRAM FO-8 FOR CIRCUIT REFERENCES.
3. WHEN A 'FINISH' POINT IS REACHED THE FAULT SHOULD BE CLEARED. IF NOT, REVIEW PREVIOUS DIAGNOSTIC STEPS.
4. REPLACE ALL COVERS WHEN A 'FINISH' POINT IS REACHED.

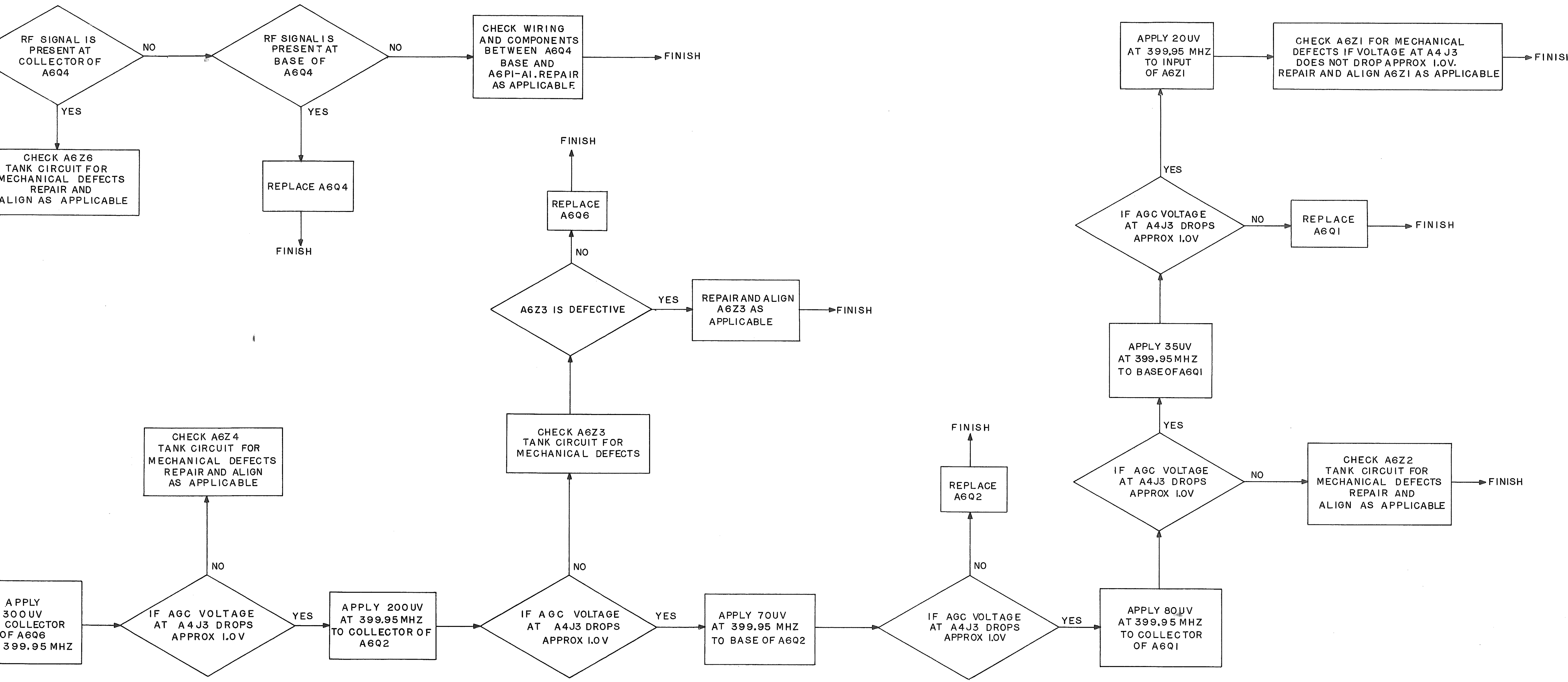
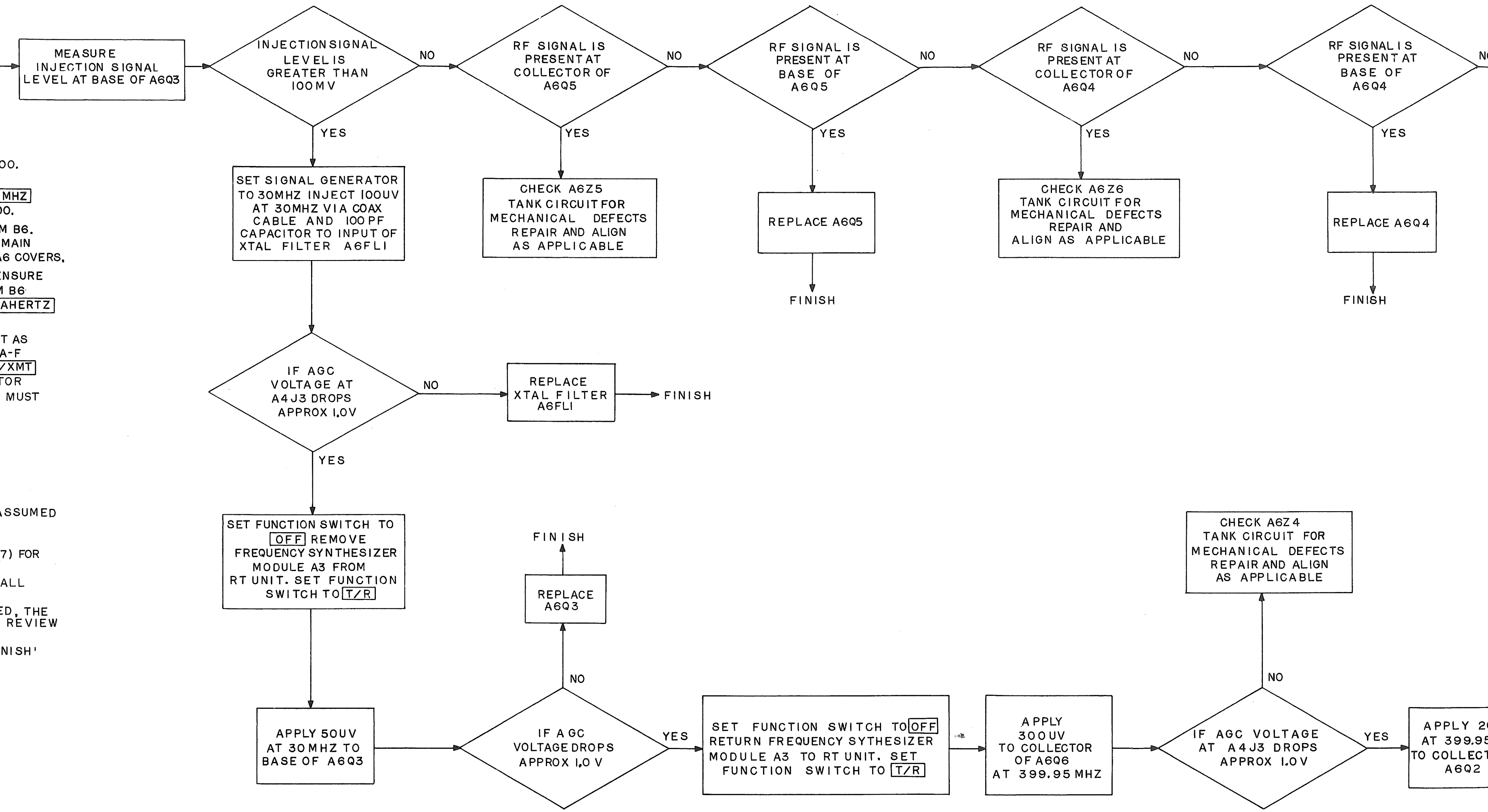


Figure FO-16. Receive RF Fault Localization Diagram

SET [MEGAHERTZ] TO 399.95
ON ITEM B6, SET [MHZ]
SWITCH TO 400
SET FUNCTION SWITCH TO [T/R]
[VOL] FULLY CCW
[SQ] FULLY CCW



PRELIMINARY SETUP:

1. SET RT UNIT [MEGAHERTZ] TO 220.00. REMOVE RECEIVE RF MODULE A6.
2. OBTAIN SPECIAL TEST ITEM B6. SET [MHZ] TO 225. SET [MEGAHERTZ] TO 225.00.
3. MATE RECEIVE RF MODULE A6 TO ITEM B6. MATE ITEM B6 (WITH A6) TO RT UNIT MAIN CHASSIS CONNECTOR A6J1. REMOVE A6 COVERS.
4. EXCEPT FOR 400/399.95 POSITION, ENSURE THAT [MHZ] SWITCH SETTING ON ITEM B6 EQUALS AT ALL TIMES RT UNIT [MEGAHERTZ] SETTING.
5. CONNECT TEST EQUIPMENT TO RT UNIT AS SHOWN IN FIGURE 5-5. SET R-F AND A-F SWITCHES AS APPLICABLE. SET [RCV/XMT] SWITCH TO [RCV]. SIGNAL GENERATOR (ITEM A6) R-F INPUT FREQUENCY MUST EQUAL [MEGAHERTZ] SETTING.

NOTES:

1. ALL RT UNIT MODULES AND MAIN CHASSIS (EXCEPT MODULE A6) ARE ASSUMED TO BE SERVICEABLE AT START OF TROUBLESHOOTING PROCEDURE.
2. REFER TO SCHEMATIC (FIGURE FO-7) FOR CIRCUIT REFERENCES.
3. USE R-F VOLTMETER (ITEM A13) FOR ALL R F VOLTAGE MEASUREMENTS.
4. WHEN A 'FINISH' POINT IS REACHED, THE FAULT SHOULD BE CLEARED. IF NOT, REVIEW PREVIOUS DIAGNOSTIC STEPS.
5. REPLACE ALL COVERS WHEN A 'FINISH' POINT IS REACHED.

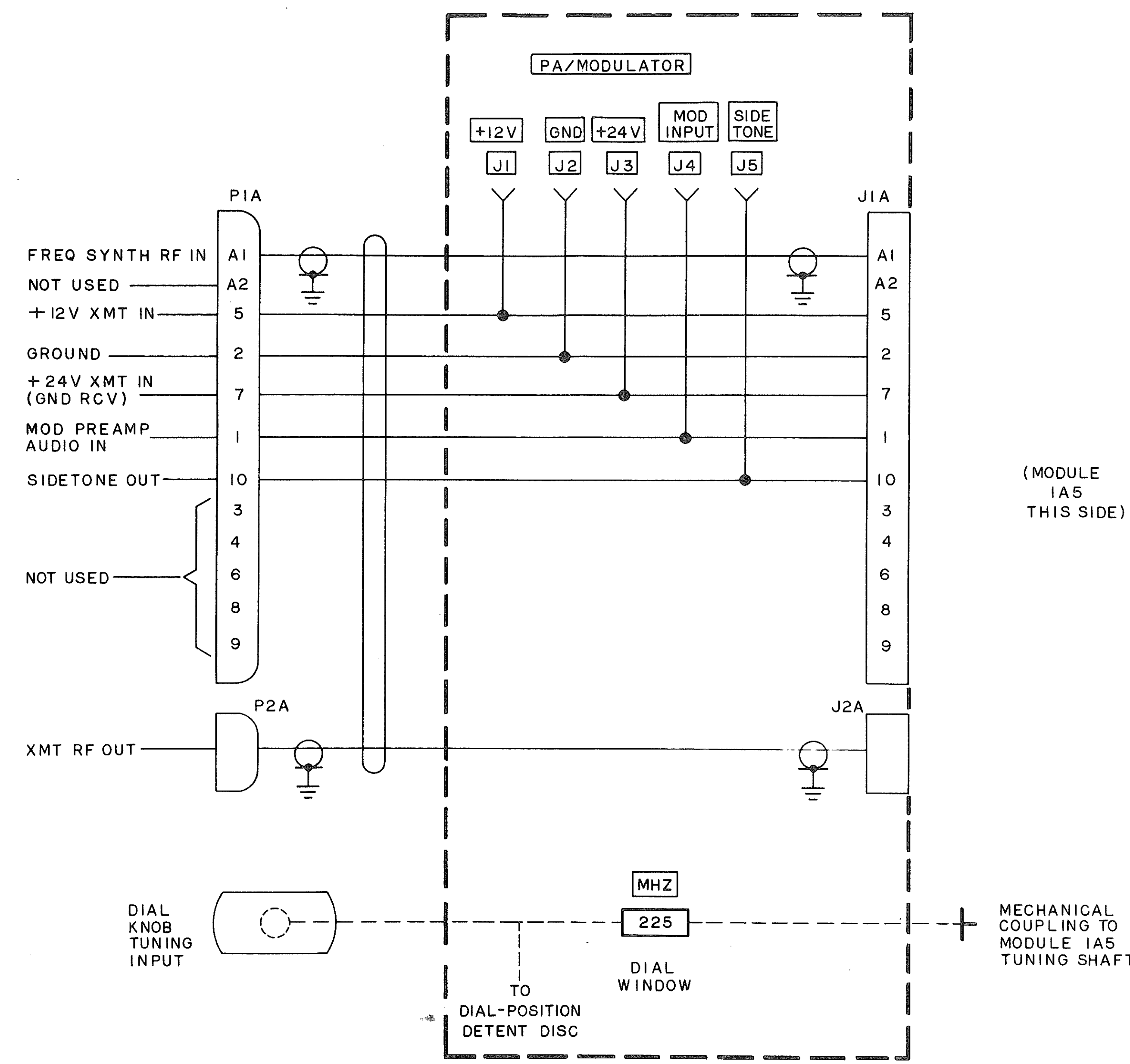
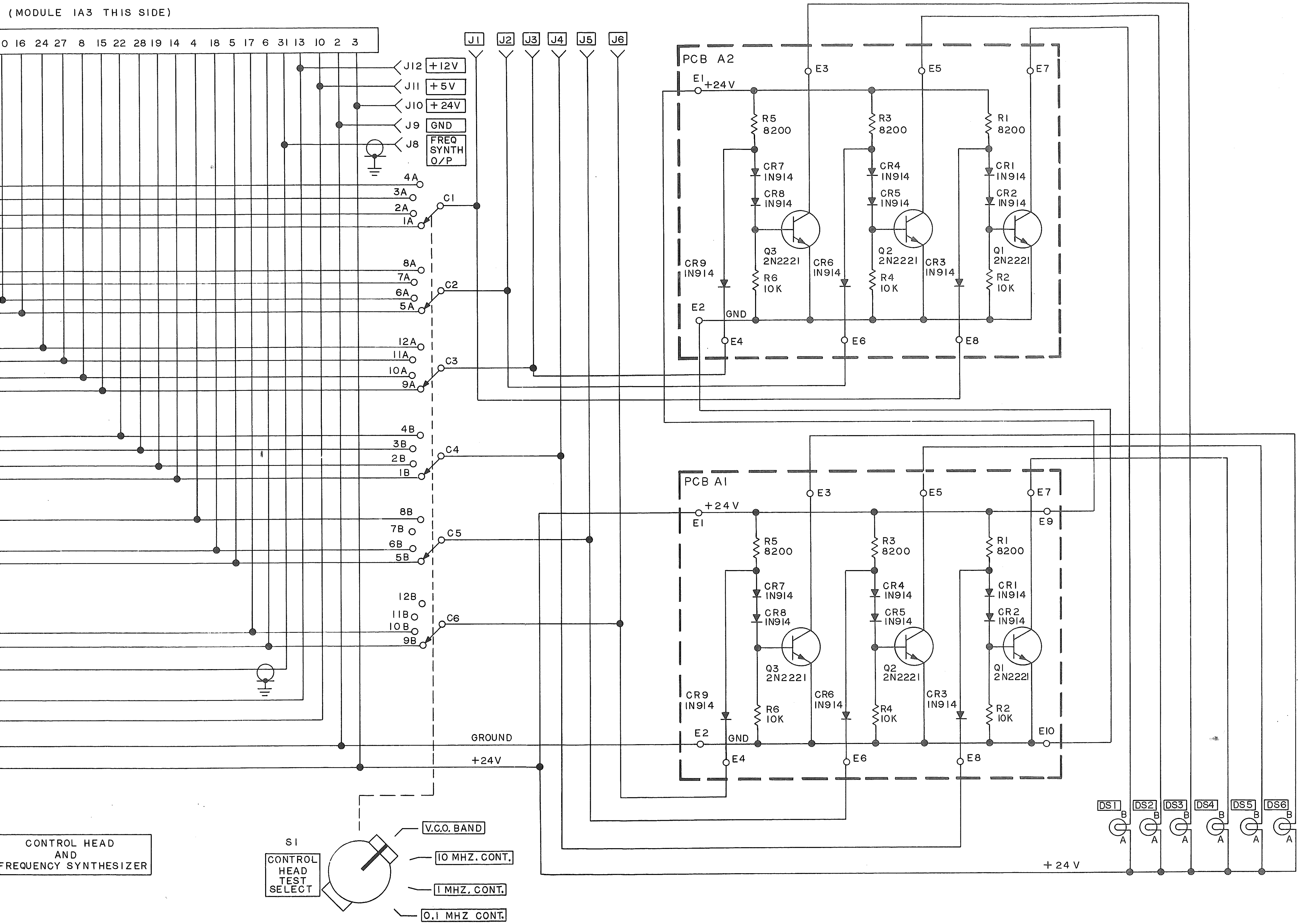


Figure FO-17. PA/Modulator Adapter, Schematic Diagram



NOTES:

1. THE MARKED S1 SWITCH POSITIONS SELECT THE FOLLOWING GROUPS OF FREQUENCY SYNTHESIZER MODULE IA3 CONNECTOR PINS:

S1 POSITION	IA3 PIN NUMBERS*
VCO BAND	7, 16, 15, 14, 5, 6
10 MHZ CONT	9, 20, 8, 19, 18, 17,
1 MHZ CONT	26, 29, 27, 28,
0.1 MHZ CONT	25, 23, 24, 22, 4

* ARRANGED IN ORDER OF THE SIGNAL NAMES IN THE GROUP.

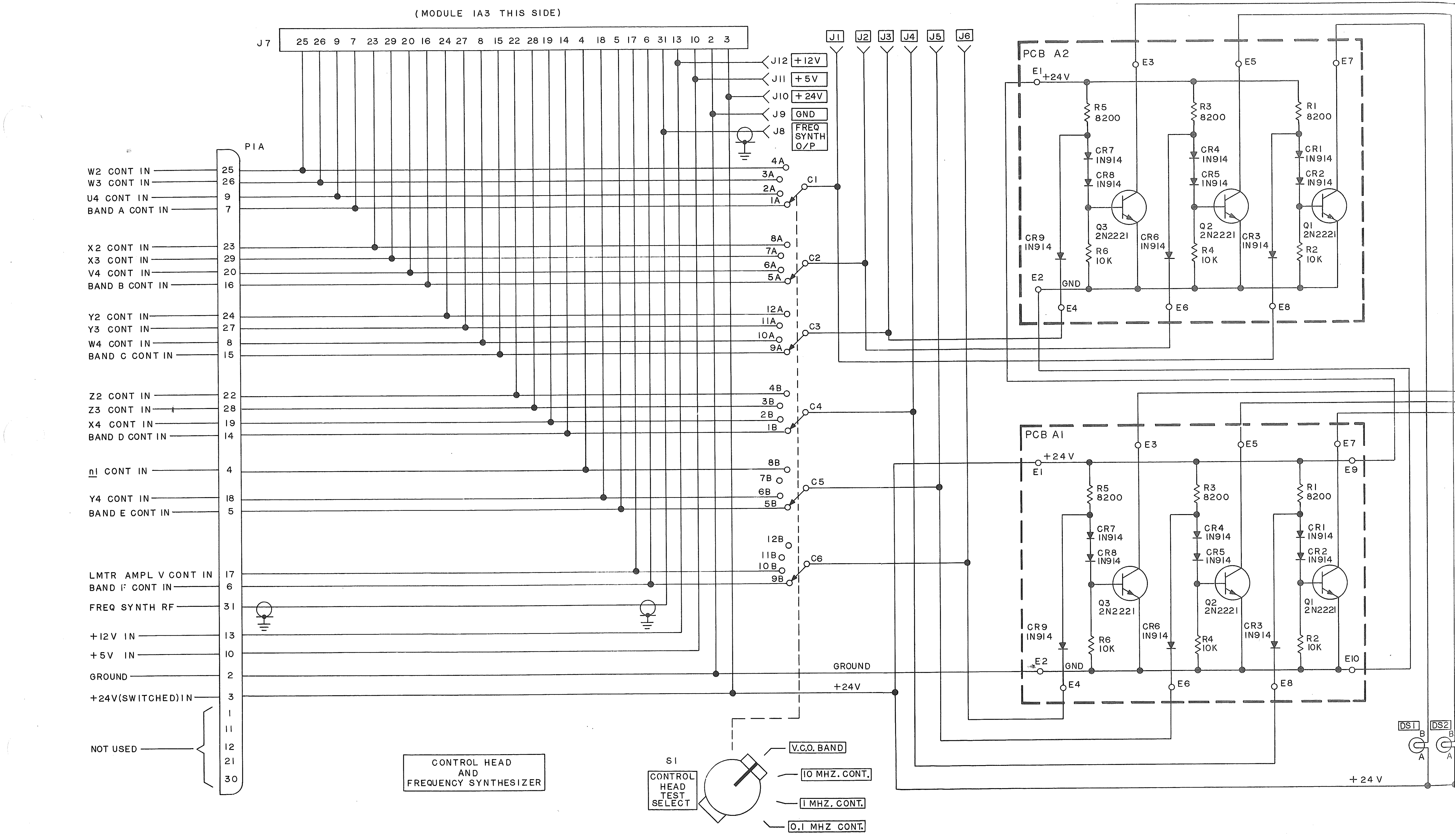
2. LAMPS DS1 THRU DS6 INDICATE THE STATE* OF THE FOLLOWING CONTROL HEAD LOGIC SIGNALS:

S1 POSITION	DS1	DS2	DS3	DS4	DS5	DS6
VCO BAND	A	B	C	D	E	F
10 MHZ CONT	U4	V4	W4	X4	Y4	L
1 MHZ CONT	W3	X3	Y3	YZ	—	—
0.1 MHZ CONT	W2	X2	Y2	Z2	n	—

* LAMPS LIGHT FOR "LOGIC 1".

3. UNLESS OTHERWISE INDICATED, RESISTOR VALUES ARE IN OHMS.

Figure FO-18. Frequency Synthesizer Adapter, Schematic Diagram


(MODULE 1A3 THIS SIDE)
J7
25 26 9 7 23 29 20 16 24 27 8 15 22 28 19 14 4 18 5 17 6 31 13 10 2 3
J12 +12V
J11 +5V
J10 +24V
J9 GND
J8 FREQ SYNTH O/P
J1 J2 J3 J4 J5 J6
P1A
W2 CONT IN 25
W3 CONT IN 26
U4 CONT IN 9
BAND A CONT IN 7
X2 CONT IN 23
X3 CONT IN 29
V4 CONT IN 20
BAND B CONT IN 16
Y2 CONT IN 24
Y3 CONT IN 27
W4 CONT IN 8
BAND C CONT IN 15
Z2 CONT IN 22
Z3 CONT IN 28
X4 CONT IN 19
BAND D CONT IN 14
n1 CONT IN 4
Y4 CONT IN 18
BAND E CONT IN 5
LMTR AMPL V CONT IN 17
BAND F CONT IN 6
FREQ SYNTH RF 31
+12V IN 13
+5V IN 10
GROUND 2
+24V(SWITCHED) IN 3
NOT USED 1 11 12 21 30
4A 3A 2A 1A C1
8A 7A 6A 5A C2
12A 11A 10A 9A C3
4B 3B 2B 1B C4
8B 7B 6B 5B C5
12B 11B 10B 9B C6
GROUND
+24V
PCB A2
PCB A1
E1 +24V
E2 GND
E3 E4 E5 E6 E7 E8 E9 E10
R5 8200
R3 8200
R1 8200
CR7 1N914
CR8 1N914
CR4 1N914
CR5 1N914
CR1 1N914
CR2 1N914
Q3 2N2221
Q2 2N2221
Q1 2N2221
CR9 1N914
CR6 1N914
CR3 1N914
R6 10K
R4 10K
R2 10K
DS1 DS2
A B
+24 V
CONTROL HEAD AND FREQUENCY SYNTHESIZER
S1
CONTROL HEAD TEST SELECT
V.C.O. BAND
10 MHZ. CONT.
1 MHZ. CONT.
0.1 MHZ CONT.

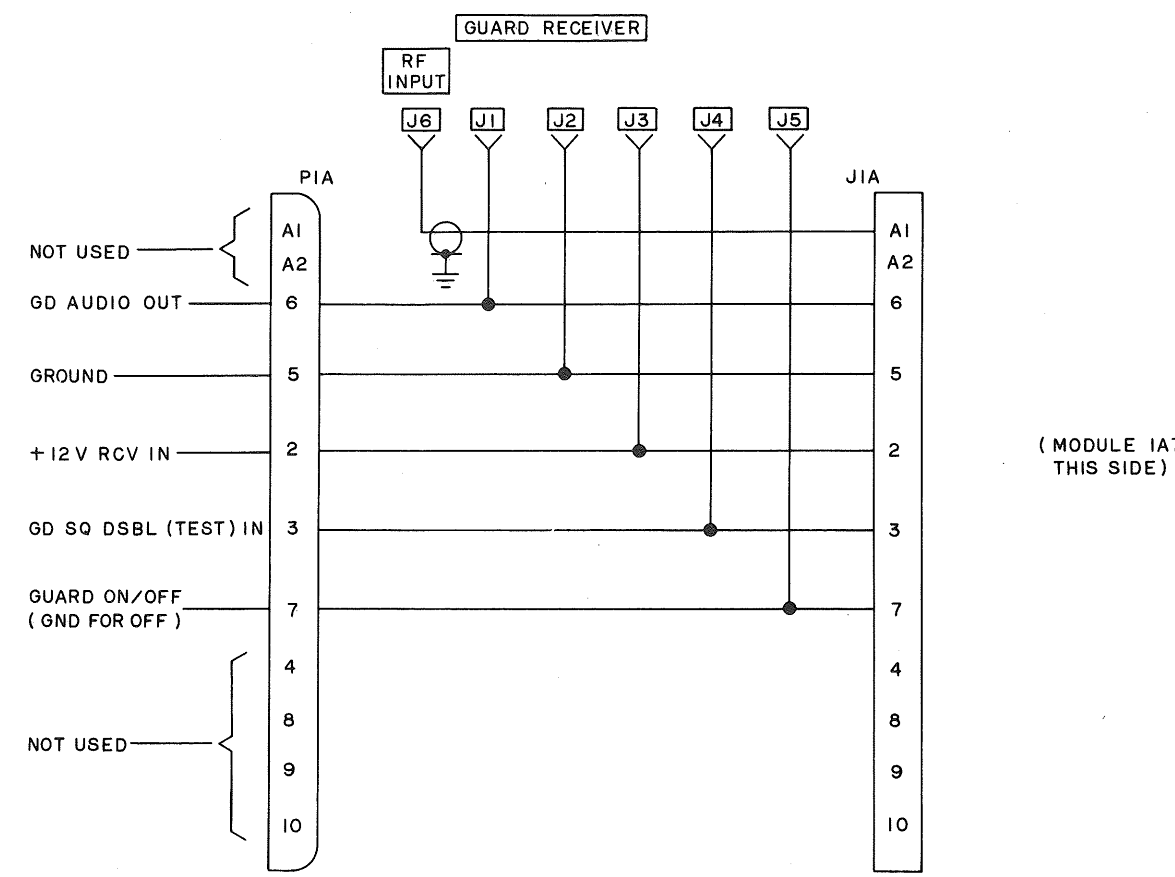


Figure FO-19. Guard Receiver Adapter, Schematic Diagram

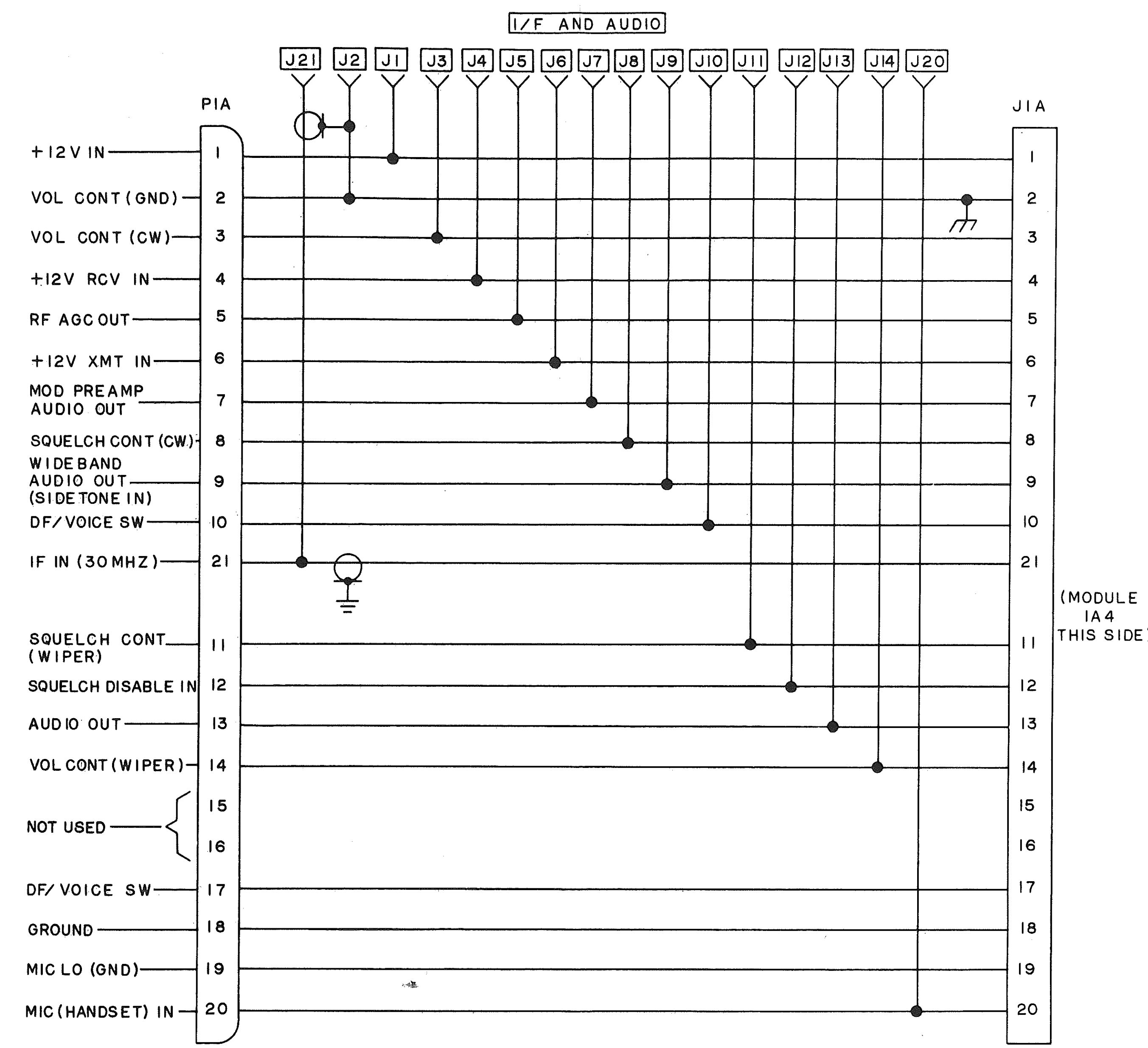


Figure FO-20. IF/Audio Adapter, Schematic Diagram

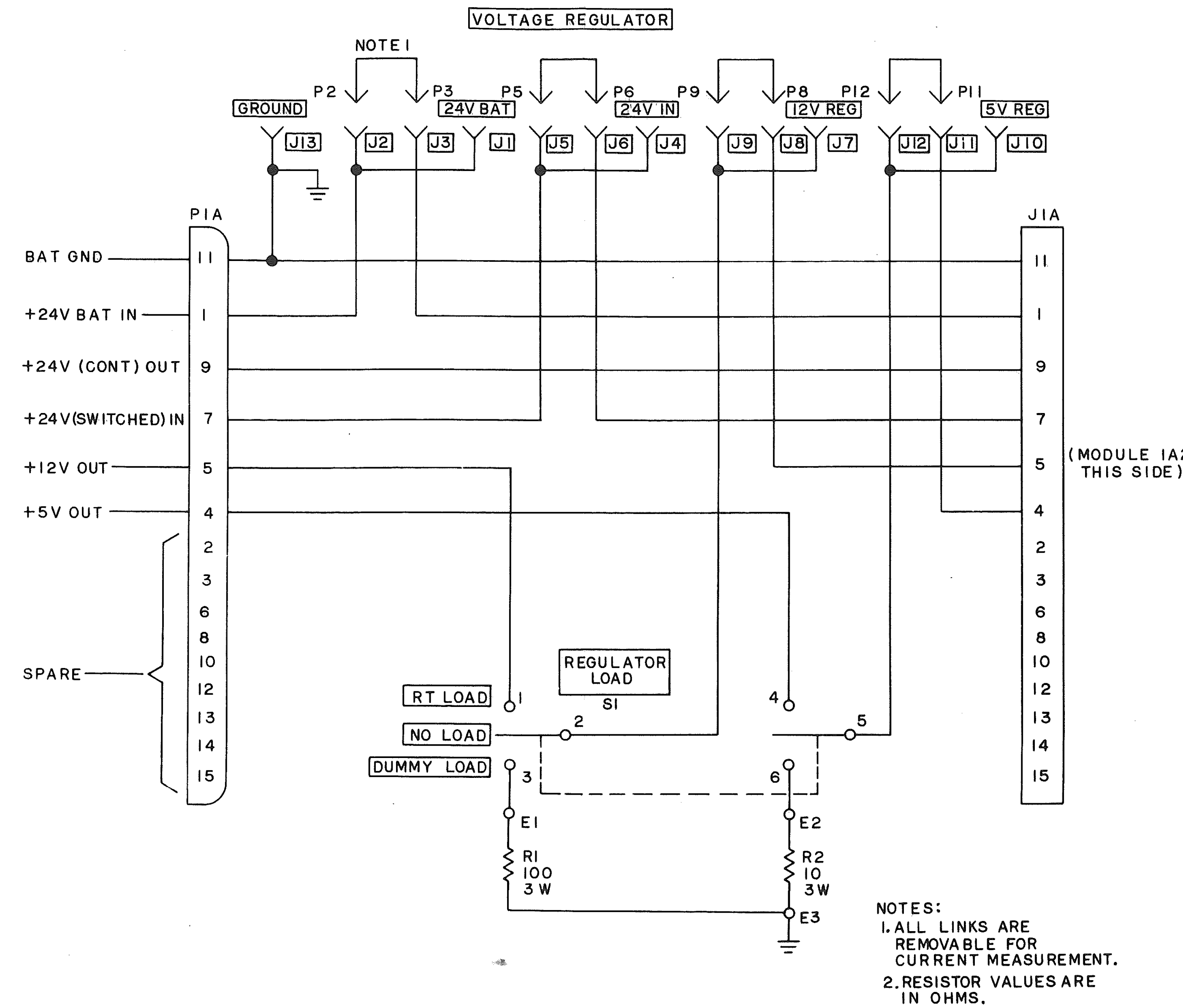


Figure FO-21. Voltage Regulator Adapter, Schematic Diagram

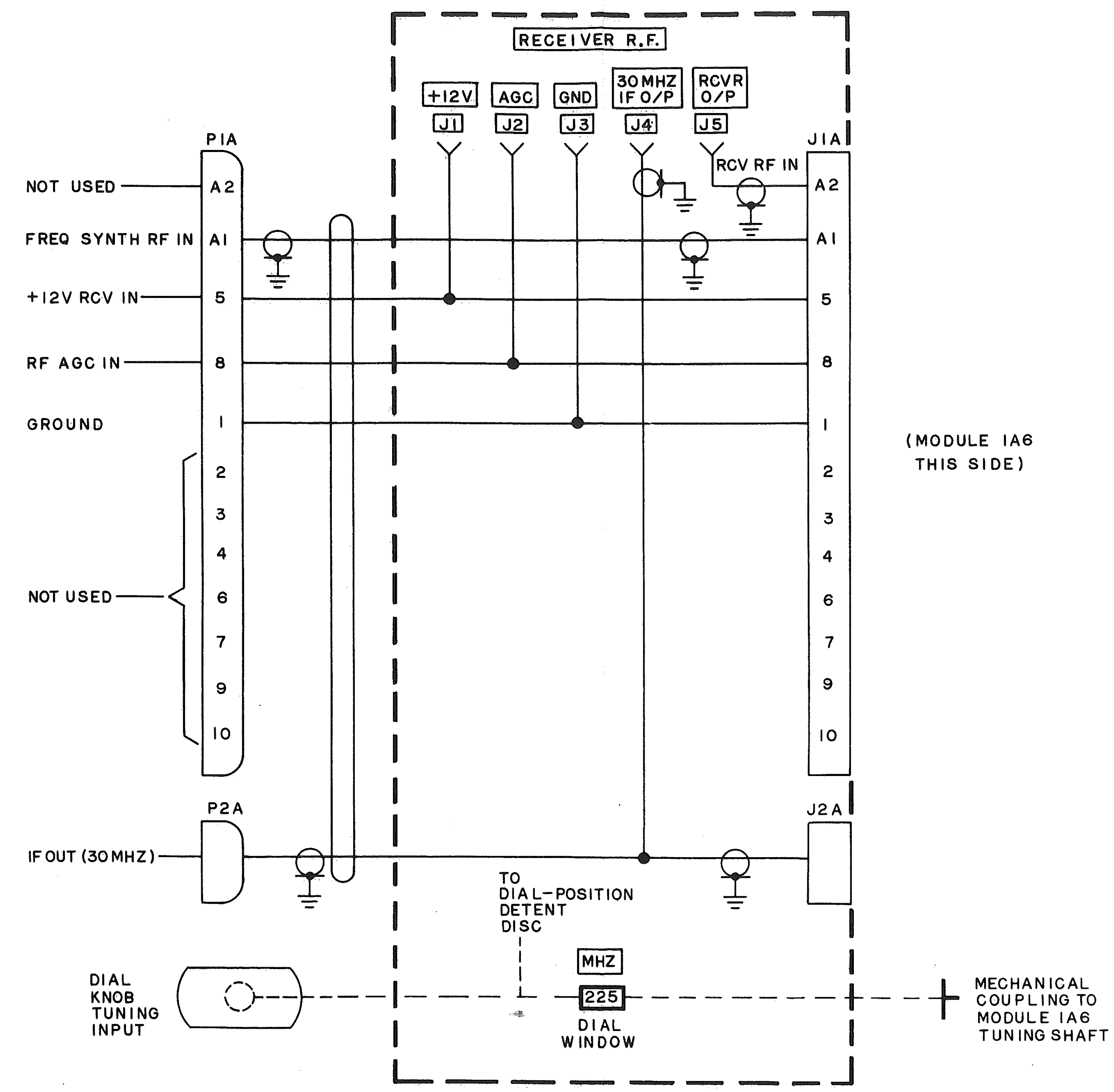
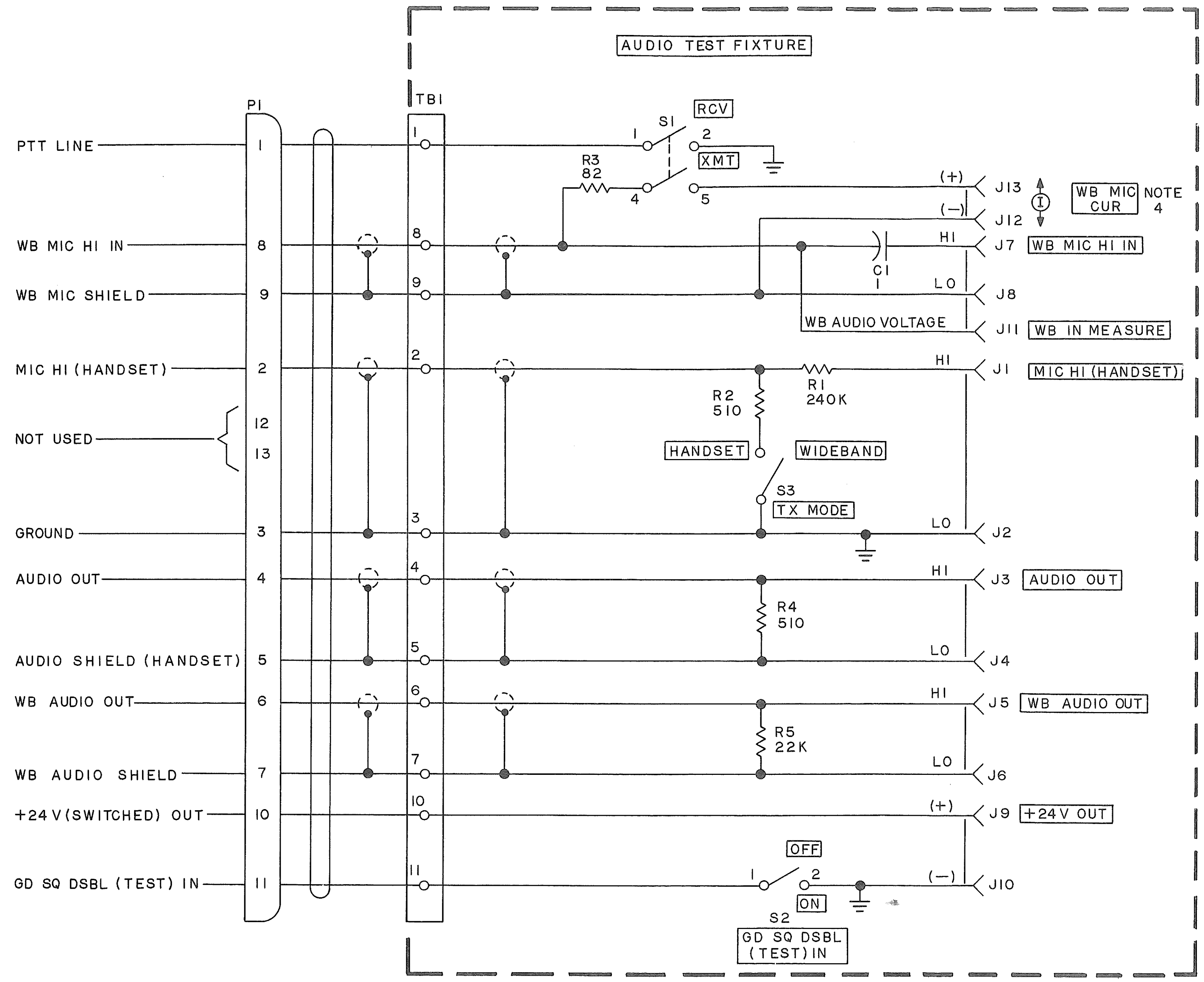


Figure FO-22. Receive RF Adapter, Schematic Diagram



NOTES:

1. INDICATES ADJACENTLY LOCATED TEST JACKS.
2. UNLESS OTHERWISE INDICATED RESISTOR AND CAPACITOR VALUES ARE IN OHMS AND MICROFARADS RESPECTIVELY.
3. TEST JACK COLORS ARE:
   RED J9
   WHITE J1, J3, J5, J7, J9, J11, J13
   BLACK J2, J4, J6, J8, J10, J12
4. IN THE XMT POSITION OF S1, RESISTOR R3 SIMULATES AN EXTERNAL CARBON MICROPHONE LOAD. THEREFORE WB MIC CUR JACKS J13 AND J12 MUST BE NORMALLY JUMPERED WHEN NOT CONNECTED TO A MILLIAMETER.

Figure FO-23. Audio Adapter, Schematic Diagram

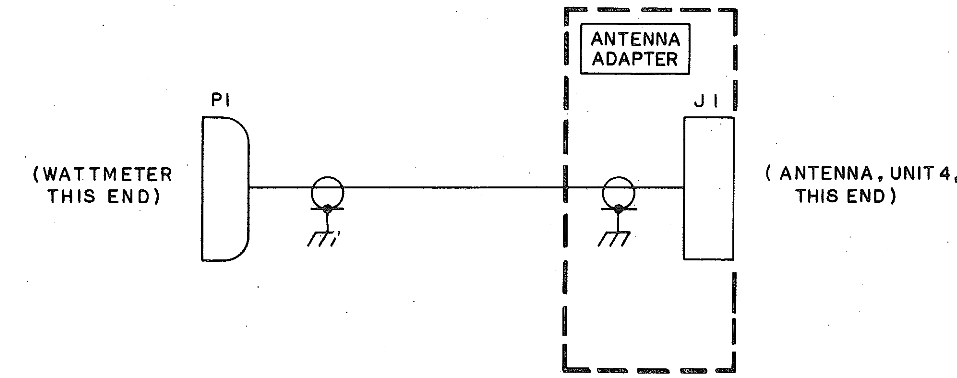
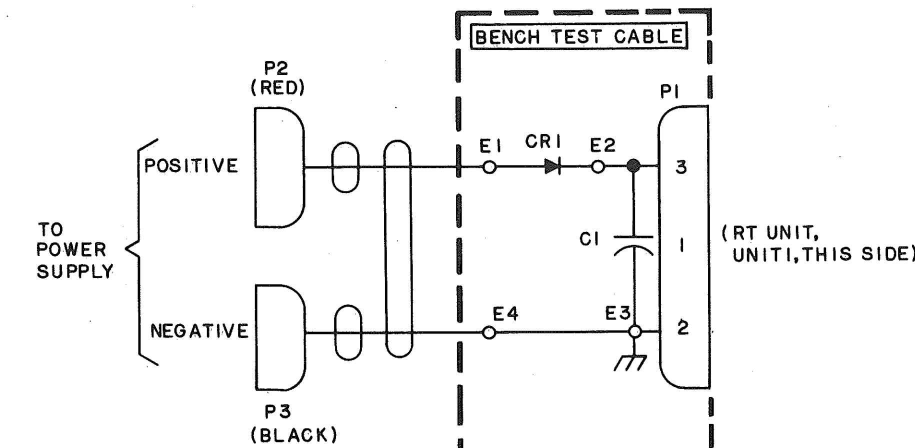
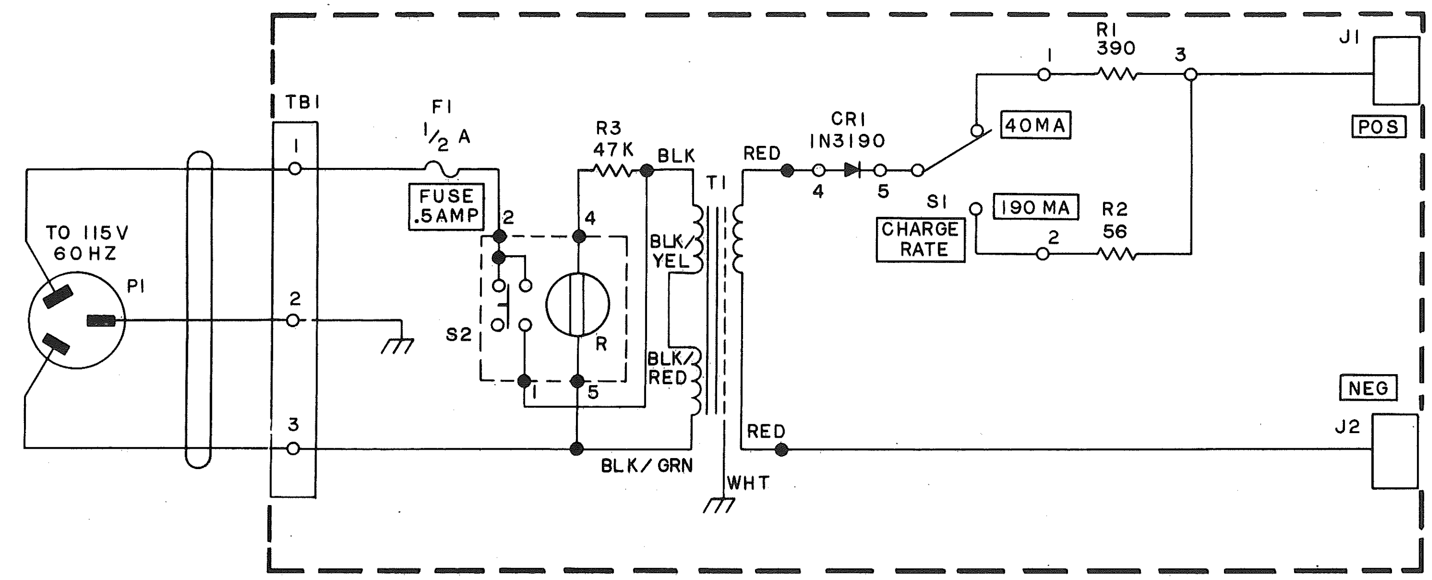


Figure FO-24. Antenna Adapter,
Schematic Diagram



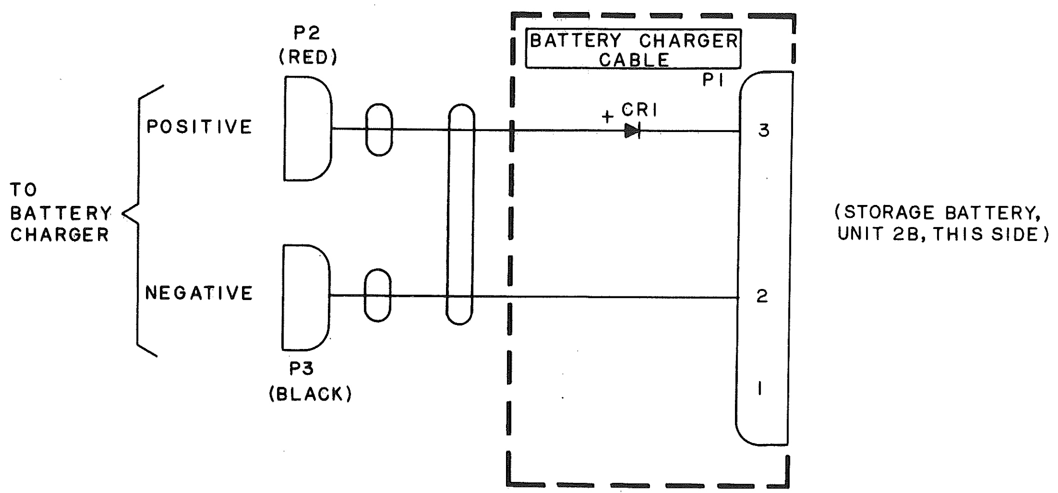
NOTES:
1. P1 AND P2 INCLUDE INSULATED ALLIGATOR CLIPS.
2. CR1 PROVIDE POLARITY PROTECTION.

Figure FO-25. Bench Test Cable, Schematic Diagram



NOTES:
1. RESISTOR VALUES IN OHMS EXCEPT WHERE INDICATED.
2. RESISTORS R1 AND R2 ARE 6.5 WATT.

Figure FO-26. Battery Charger, Schematic Diagram



NOTES:
1. P1 AND P2 INCLUDE INSULATED ALLIGATOR CLIPS.
2. CR1 PROVIDES POLARITY PROTECTION.

Figure FO-27. Battery Charging Cable, Schematic Diagram