NAVSHIPS 91392

UNCLASSIFIED
~~RESTRICTED~~
(See Page B)

INSTRUCTION BOOK

for

PORTABLE RADIO TRANSMITTING AND RECEIVING EQUIPMENT NAVY MODEL MAY

RAYTHEON MANUFACTURING COMPANY
WALTHAM, MASSACHUSETTS, U. S. A.

BUREAU OF SHIPS DEPARTMENT OF THE NAVY

Contracts: NXsr-77830
NObsr-43097

Approved by BuShips
10 November 1950

LIST OF EFFECTIVE PAGES

PAGE NUMBERS	CHANGE IN EFFECT	PAGE NUMBERS	CHANGE IN EFFECT
Title Page	Original	4-0 thru 4-8	Original
A thru C	Original	5-1 thru 5-8	Original
i thru vii	Original	6-1 thru 6-3	Original
1-0 thru 1-8	Original	7-0 thru 7-44	Original
2-1 thru 2-14	Original	8-1 thru 8-50	Original
3-1 thru 3-3	Original		

1 June 1951

TEMPORARY CORRECTION T-1 TO INSTRUCTION BOOK FOR PORTABLE RADIO TRANSMITTING AND RECEIVING EQUIPMENT, NAVY MODEL MAY (NAVSHIPS 91392)

This temporary change covers: (a) factory changes to the equipment made subsequent to the printing of the instruction book (applicable to MAY Equipments Serial Nos. 22 and following); and (b) additional corrections and additions (applicable to all MAY Equipments including Serial Nos. 1—21).

Note

The security classification of Portable Radio Transmitting and Receiving Equipment, Navy Model MAY, is changed from "Restricted" to "Unclassified" by authority of BuShips ltr 1772-1436 of 8 March 1951 (Contract NObsr-43097), and by authority of BuShips & Accounts ltr SPG2(mww):ibb(NXsr-77830) of 6 April 1951 (Contract NXsr-77830). The instruction book for this equipment should therefore be declassified accordingly.

FACTORY CHANGES
(Applicable to MAY Equipments Nos. 22 and Following)

The following instruction book pages should be corrected with pen and ink or replaced as indicated below:

Page 2-5.

Delete Figure 2-3 and replace with new Figure 2-3 furnished herewith.

Page 2-9.

Delete Figure 2-5 and replace with new Figure 2-5 furnished herewith.

Page 2-10.

In paragraph 8.*c.*, change the first sentence to read: "Local oscillator voltage from V103 (figure 2-3) is injected at L107 through a short length of RG-58/U coaxial cable which is very loosely coupled to V103 through a 1-mmf series capacitor (C144)." Delete the entire next sentence (beginning "The 1-mmf series capacitors . . .").

Page 7-17.

Delete Figure 7-12 and replace with new Figure 7-12 furnished herewith.

Pages 7-37 and 7-38.

Delete Figure 7-17 and replace with new Figure 7-17 furnished herewith.

Pages 7-43 and 7-44.

Delete Figure 7-20 and replace with new Figure 7-20 furnished herewith.

Page 8-7.

In entry for C107, column headed *All Symbol Designations Involved,* delete "C139"; and in column headed *Total No. Per Equip.*, change "2" to "1."

Pages 8-9 and 8-10.

Delete both pages and replace with new pages furnished herewith.

Page 8-12.

In entry for C223, column headed *Name of Part and Description,* change to read "Same as C145."

Page 8-13.

In entries for C238 and C239, column headed *Name of Part and Description,* change to read "Same as C145."

Page 8-34.

Delete entire entry for R126.

Page 8-46.

Delete entry "RC20BF121K R126." Change *Key Symbol* entry for N16-C-41062-6831 from "C204" to "C145."

Page 8-47.

Delete entry "N16-R-49598-826 R126."

Page 8-48.

Delete entry "3RC20BF121K R126." Change *Key Symbol* entry for 3DA4.700-10 from "C204" to "C145."

ADDITIONAL CORRECTIONS
(Applicable to All MAY Equipments)

Note

Crystal Case CY-591/U, containing 192 quartz crystals in addition to the eight crystals in the Transmitter-Receiver, will be packed in the equipment Carrying Case at the factory for all equipments supplied on contract NXsr-77830, and for the first 60 equipments supplied on contract NObsr-43097. The remaining 860 equipments on the latter contract will be shipped without the Crystal Case, but with 12 spare crystals as specified in Section 1, paragraph 3.*e.*(5), of the instruction book.

The following instruction book pages should be corrected with pen and ink as indicated below:

Page B.

The paragraphs in the promulgating letter relative to security classification no longer apply (see *Note* on page 1 of this correction). Make a notation on the letter to this effect.

Page 2-8.

In paragraph 8.*b.*, line 8, delete the word "air."

Page 6-2.

At the end of paragraph 4., add the following text:

"CAUTION

Contact with petroleum base oil or grease will permanently damage the coil turret plastic parts. Do not attempt to use any such lubricants in this equipment."

Page 7-5.

At the end of paragraph 3.*d.*(11), add this sentence: "See the *Yoke Tuning Chart* packed in the equipment Carrying Case for supplementary data on L105 adjustment."

Page 7-12.

In paragraph 4.*f.*(5), line 2, change "3.8" to "3/8" (typographical error).

Note

The following pages contain illustrations and parts list pages to be inserted as indicated in the foregoing list to replace deleted portions of the MAY Instruction Book.

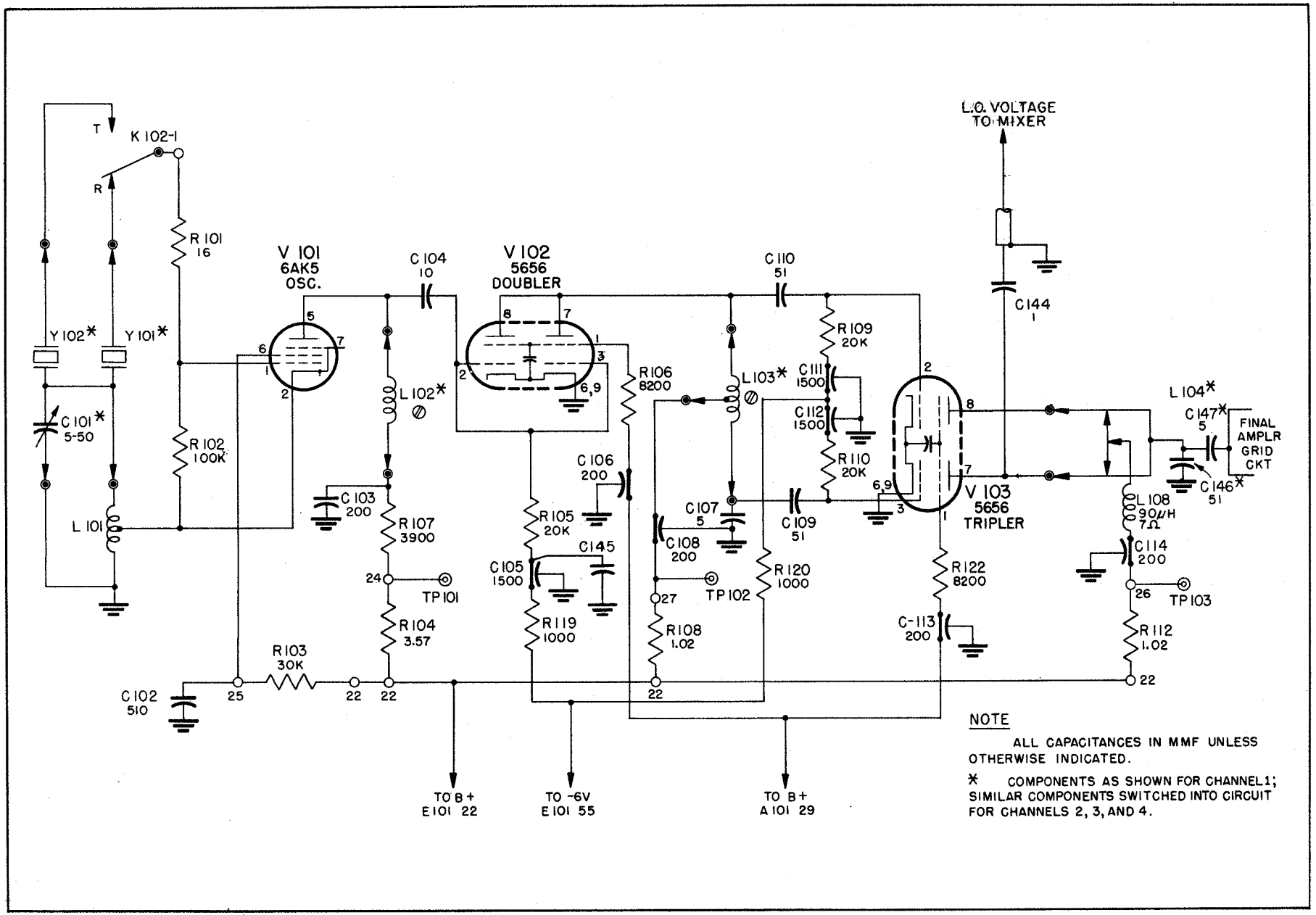

Figure 2-3.—Crystal Oscillator and Frequency Multipliers: Schematic Diagram.

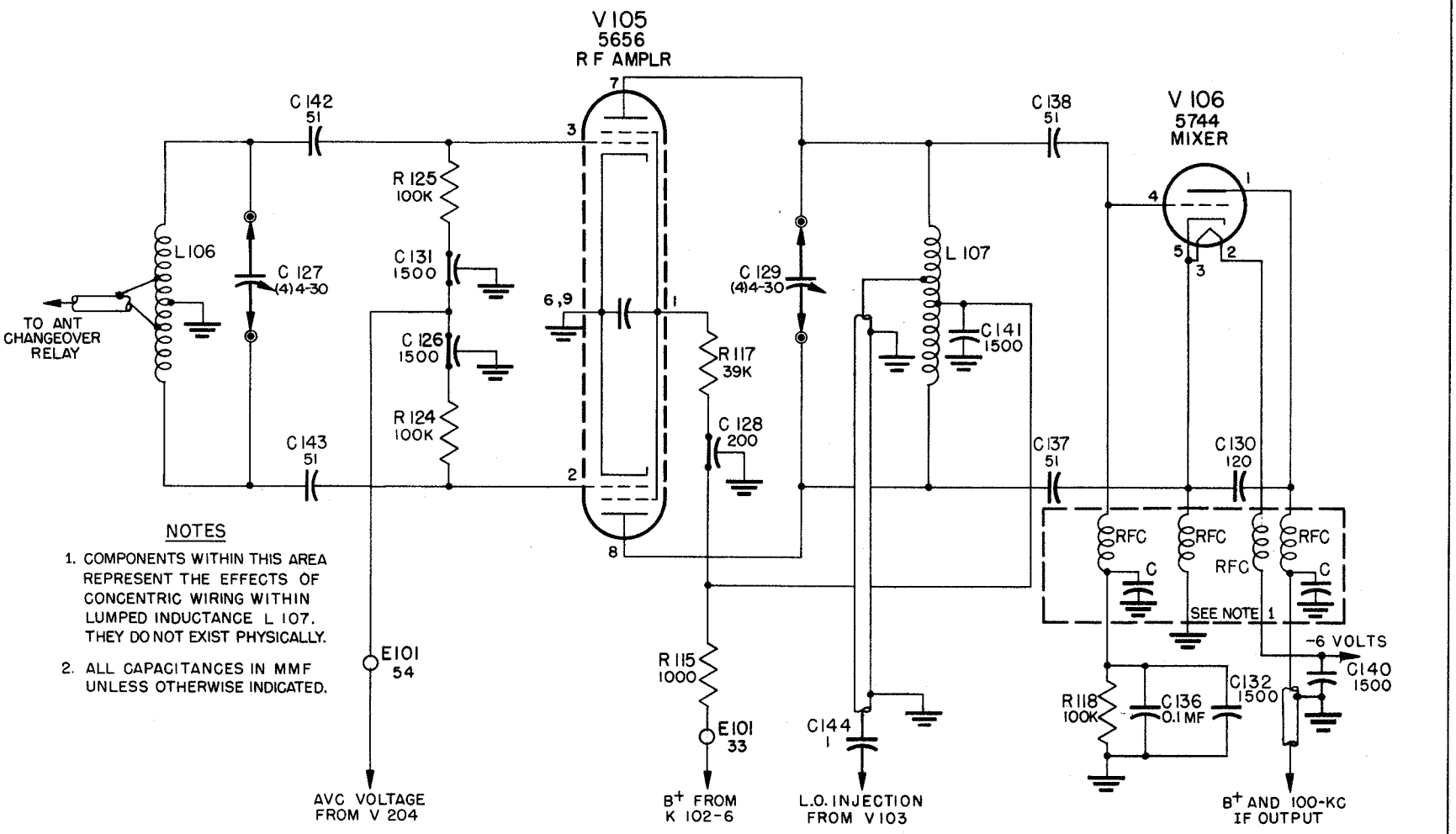

Figure 2-5.—Receiver RF Amplifier and Mixer: Simplified Schematic Diagram.

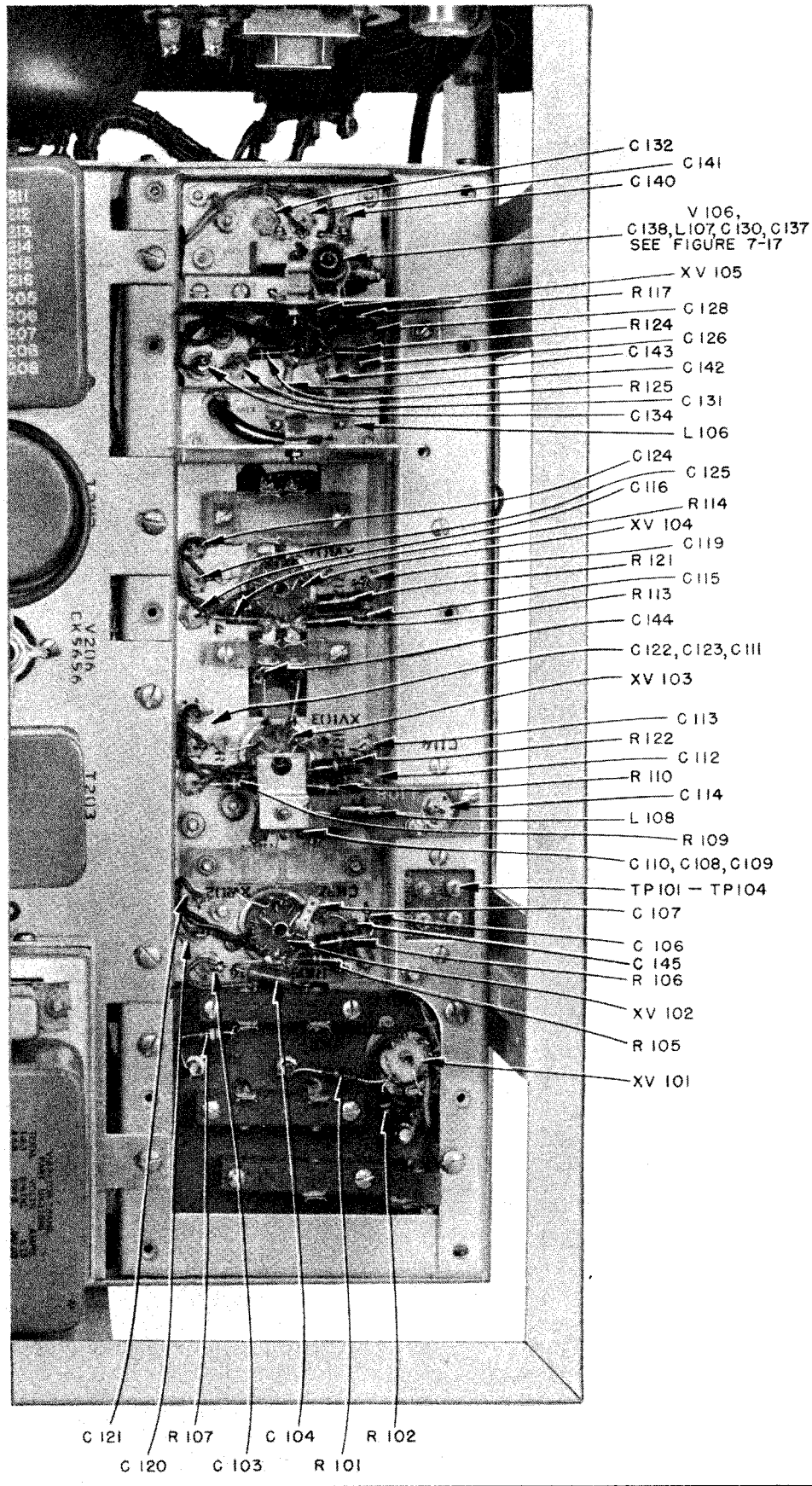

Figure 7-12.—Underside of RF Chassis, Showing Component Locations.

COMPONENT LOCATIONS

SYMBOL	HORIZ	VERT
A103	B	5
C103	F	7
C104	F	7
C105	E	7
C106	E	7
C107	E	6
C108	E	6
C109	E	6
C110	E	6
C111	F	5
C112	E	5
C113	E	5
C114	E	6
C115	E	4
C116	F	4
C117	C	3
C118	C	3
C119	E	4
C120	F	7
C121	F	6
C122	F	5
C123	F	5
C124	F	4
C125	F	4
C126	E	3
C128	E	2
C130	E	1
C131	F	3
C132	B	1
C133	F	2
C134	F	3
C135	C	4
C136	C	1
C137	C	1
C138	F	1
C140	C	1
C141	C	1
C142	F	3
C143	E	3
C144	E	5
C145	E	7
C148	B	3

SYMBOL	HORIZ	VERT
CR101	C	4
E101	A	5
K101	D	3
K102	B	9
L101	C	9
L106	E	3
L107	F	1
L108	E	6
L109	B	6
R101	E	8
R102	E	8
R103	D	5
R104	D	5
R105	E	7
R106	E	7
R107	F	8
R108	D	4
R109	F	5
R110	E	5
R111	D	5
R112	D	4
R113	E	4
R114	F	4
R115	B	2
R116	C	4
R117	E	2
R118	B	2
R119	B	6
R120	B	6
R121	E	4
R122	E	5
R123	D	5
R124	D	6
R125	F	6
TP101	D	6
TP102	D	6
TP103	D	6
TP104	D	6
XV101	E	8
XV102	F	7
XV103	F	5
XV104	F	4
XV105	F	2
XV106	F	2

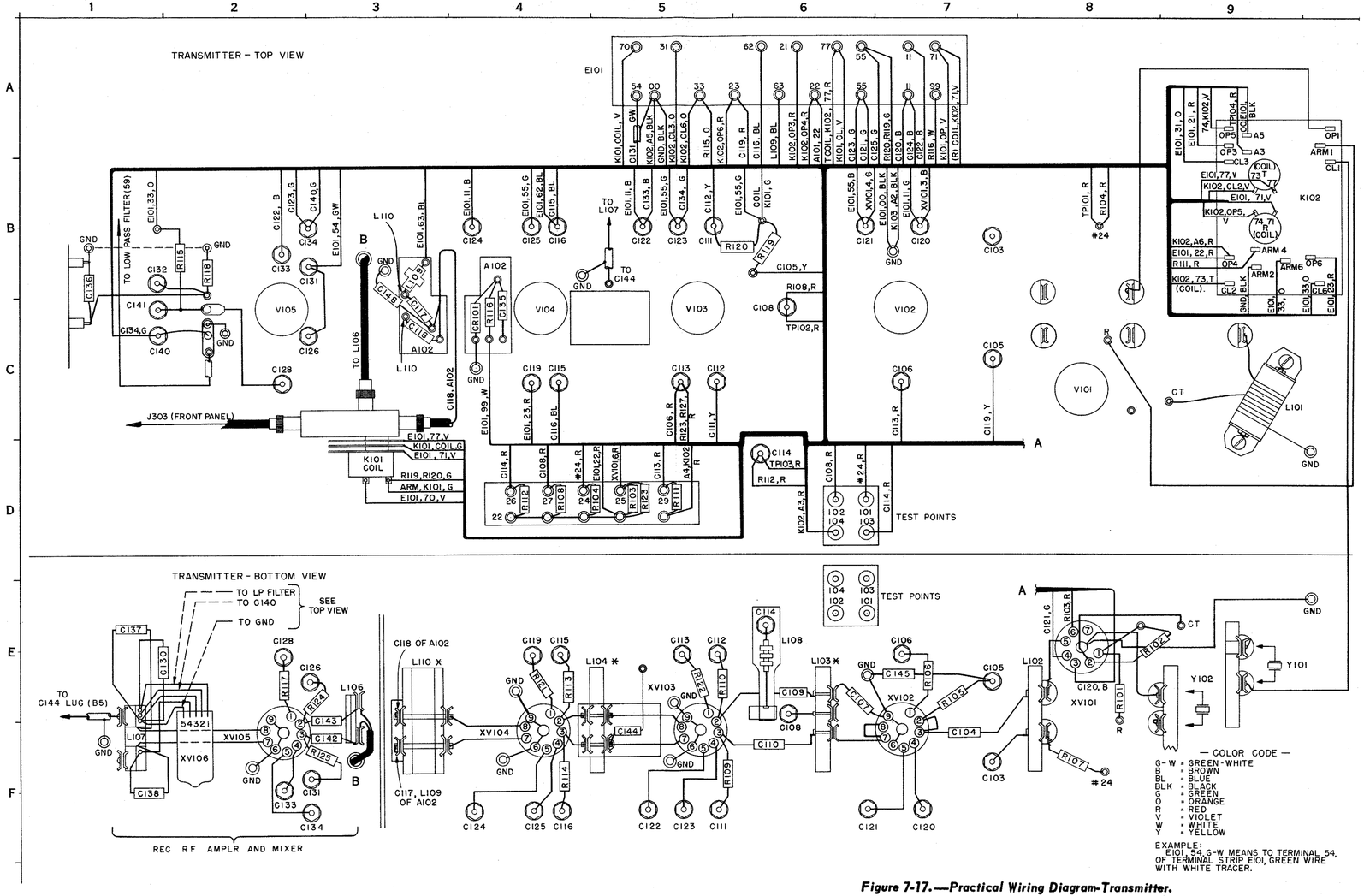

Figure 7-17.—Practical Wiring Diagram-Transmitter.

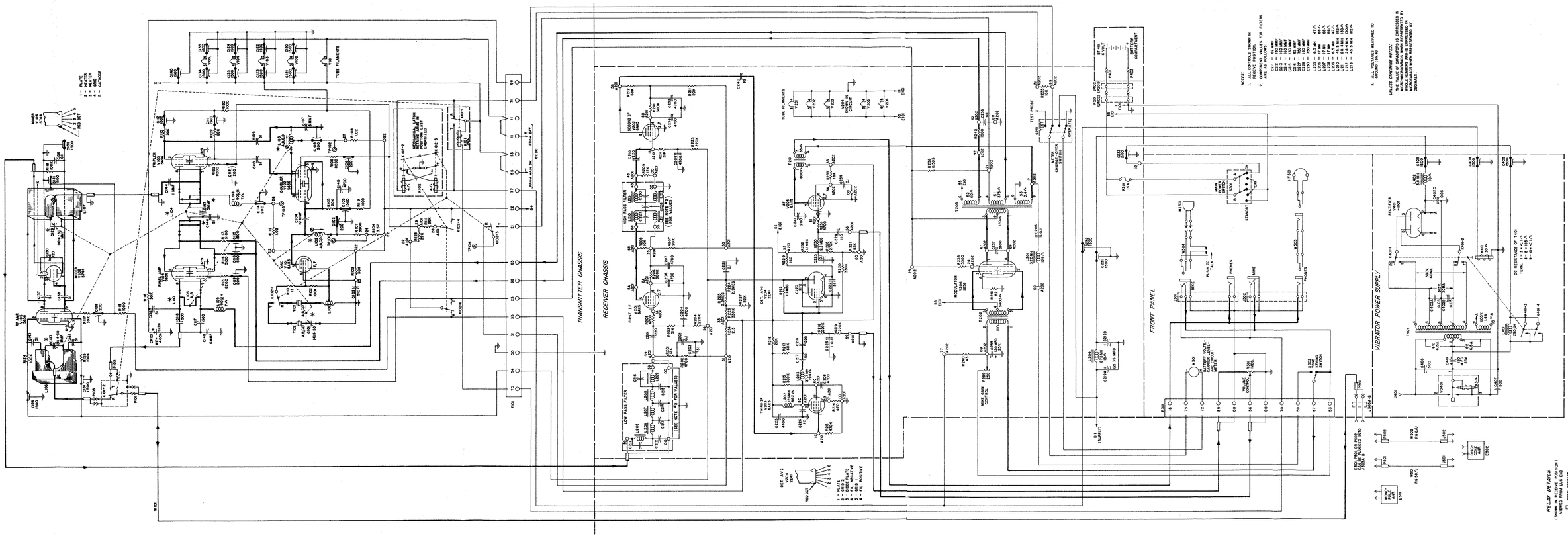

Figure 7-20.—Schematic Diagram.

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
C128	Same as C103	RF amplifier (Rec)screen decoupling													
C129	Same as C127	Mixer tuning condenser													
C130	CAPACITOR, fixed: ceramic dielectric; 120 mmf p/m 10%; negative temp coef 1400 (tol p/m 150) mmf/mf/°C; 500 vdcw; 7/16" lg x 9/64" diam; two radial wire lead term; uninsulated.	Plate cathode by-pass mixer		N16-C-17212-4369 (3D9120-34)	475	type CN2	35-5890P1	C130	1			1			
C131	Same as C105	RF amplifier (Rec)A.V.C. feed thru													
C132	Same as C105	Mixer Grid By-pass													
C133	Same as C105	(Rec)RF amplifier heater by-pass													
C134	Same as C105	RF amplifier Rec heater by-pass													
C135	Same as C109	Carrier indicator coupling													
C136	CAPACITOR, fixed: paper dielectric; 100,000 mmf p/m 20%; 200 vdcw; molded mineral filled plastic case; 1-1/16" lg x 3/8" diam excluding term and mtg; spcl high temp organic matl impr; 2 axial wire lead term 1" lg min, #22 AWG wire; no int gnd connection; term mtg.	Grid by-pass(mixer)		N16-C-45803-3260 (3DA10-472)	2	#65P	35-5882P15	C136,C202,C205,C221, C225,C234,C236.	7			2			
C137	CAPACITOR, fixed: ceramic dielectric; 51 mmf p/m 5%; UJ characteristic; 500 vdcw; 0.400" max lg x 0.200" max diam; radial wire lead term; uninsulated; color coding; Spec JAN-C-20A.	Mixer coupling	CC20UJ510J	N16-C-16597-1215 (3D9051-12)	475	Δ	35-5681P1	C137,C138,C142,C143, C146,4 used.	8						
C138	Same as C137	Mixer coupling													
C139	NOT USED														
C140	Same as C105	Mixer heater by-pass													
C141	Same as C105	RF Amp Plate By-pass													
C142	Same as C137	Coupling RF amplifier grid													
C143	Same as C137	Coupling RF amplifier grid													
C144	CAPACITOR, fixed: ceramic dielectric; 1.0 mmf p/m 0.25 mmf; neg temp coef minus 330 mmf/mf/°C w/ tol ltr L; 500 vdcw; 0.400" max lg x 0.200" max diam; radial wire lead term; uninsulated; Spec JAN-C-20A.	Coupling L.O. injection	CC20SL010C	N16-C-15369-4494 (3D9001-26)	475	Δ	35-5965P1	C144	1						

Δ Same as JAN or Navy Type Number.

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
C145	CAPACITOR, fixed: paper dielectric; 4700 mmf p/m 20%; 200 vdcw; mineral filled plastic case; 11/64" diam x 3/4" lg excluding term and mtg; impr w/spcl high temp organic; 2 axial wire lead term 1" lg min, #22 AWG wire; no int gnd connections; term mtg.	Doubler Grid Decoupling		N16-C-41062-6831 (3DA4.700-10)	2	#75P	35-5882P4	C145, C204, C206, C207, C208, C209, C223, C238, C239	9			2			
C146	Same as C137	Final amplifier grid heli line by-pass													
C147	CAPACITOR, fixed: ceramic dielectric; 5 mmf p/m 0.5 mmf; SL characteristic; 500 vdcw; 0.562" max lg x 0.250" max diam excl term; 2 axial wire lead term #20 or #22 AWG 1-1/4" min lg; ceramic ins; Spec JAN-C-20A.		CC21SL050D	N16-C-15628-9005 (3D9005-109)	35	Δ	35-5640P13	C147, 4 used	4						
C148	CAPACITOR, fixed: ceramic dielectric; 6 mmf p/m 0.5 mmf; neg temp coef minus 330 mmf/mf/°C w/tol ltr L; 500 vdcw; 0.562" max lg x 0.250" max diam excl term; 2 axial wire lead term; ceramic ins; Spec JAN-C-20A.		CC21SL060D	N16-C-15693-1369 (3D9006-33)	35	Δ	35-5640P14	C148	1						
C201	CAPACITOR, fixed: mica; 220 mmf p/m 5%; 500 vdcw; temp coef letter C; 51/64" max lg x 15/32" max wd x 7/32" max thk; molded low loss bakelite case; two axial wire lead term; Spec JAN-C-5.	1st IF grid coupling	CM20C221J (-481626-C5)	N16-C-29370-7601 (3K2022132)	100	Δ	35-5342	C201, C210, C218	3						
C202	Same as C136	Mixer plate decoupling													
C203	Same as C109	Plate by-pass mixer decoupling													
C204	Same as C145	1st I.F. A.V.C. decoupling													
C205	Same as C136	Oscillatory feed back cap.													
C206	Same as C145	1st I.F. screen grid by-pass													
C207	Same as C145	Decoupling 1st I.F. plate													
C208	Same as C145	3rd I.F. screen grid by-pass													
C209	Same as C145	2nd I.F. A.V.C. decoupling													
C210	Same as C201	Grid coupling 2nd I.F.													

Δ Same as JAN or Navy Type Number.

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

DEPARTMENT OF THE NAVY
BUREAU OF SHIPS
WASHINGTON 25, D. C.

IN REPLY REFER TO
Code 993-100
10 November 1950

From: Chief, Bureau of Ships
To: All Activities concerned with the Installation, Operation and Maintenance of the Subject Equipment.

Subj: Instruction Book for Portable Radio Transmitting and Receiving Equipment, Navy Model MAY, NAVSHIPS 91392.

1. NAVSHIPS 91392 is the instruction book for the subject equipment and is in effect upon receipt.

2. NAVSHIPS 91392 is a RESTRICTED, non-registered publication and shall be handled, transported and safeguarded in accordance with U. S. Navy Regulations. When superseded by a later edition, this publication shall be destroyed.

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D. H. CLARK
Chief of Bureau

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LIST OF ILLUSTRATIONS

LIST OF TABLES

GUARANTEE

The equipment including all parts and spare parts, except vacuum tubes, batteries, rubber and material normally consumed in operation, is guaranteed for a period of one year from the date of delivery of the equipment to and acceptance by the Government with the understanding that all such items found to be defective as to material, workmanship or manufacture will be repaired or replaced, f.o.b. any point within the continental limits of the United States designated by the Government, without delay and at no expense to the Government; provided that such guarantee will not obligate the Contractor to make repair or replacement of any such defective items unless the defect appears within the aforementioned period and the Contractor is notified thereof in writing within a reasonable time and the defect is not the result of normal expected shelf life deterioration.

To the extent the equipment, including all parts and spare parts, as defined above, is of the Contractor's design or is of a design selected by the Contractor, it is also guaranteed, subject to the aforegoing conditions, against defects in design with the understanding that if ten per cent (10%) or more of any such said item, but not less than two of any such item, of the total quantity comprising such item furnished under the contract, are found to be defective as to design, such item will be conclusively presumed to be of defective design and subject to one hundred per cent (100%) correction or replacement by a suitable redesigned item.

All such defective items will be subject to ultimate return to the Contractor. In view of the fact that normal activities of the Naval Service may result in the use of equipment in such remote portions of the world or under such conditions as to preclude the return of the defective items for repair or replacement without jeopardizing the integrity of Naval communications, the exigencies of the Service, therefore, may necessitate expeditious repair of such items in order to prevent extended interruption of communications. In such cases the return of the defective items for examination by the Contractor prior to repair or replacement will not be mandatory. The report of a responsible authority, including details of the conditions surrounding the failure, will be acceptable as a basis for affecting expeditious adjustment under the provisions of this contractual guarantee.

The above one year period will not include any portion of time the equipment fails to perform satisfactorily due to any such defects, and any items repaired or replaced by the Contractor will be guaranteed anew under this provision.

INSTALLATION RECORD

Blank spaces in this table shall be filled in at time of installation by operating personnel.

Contract Number: NXsr-77830
NObsr-43097

Date of Contract: 22 September, 1944
30 December, 1948

Serial number of equipment_____

Date of acceptance by the Navy_____

Date of delivery to contract destination_____

Date of completion of installation_____

Date placed in service_____

REPORT OF FAILURE

Report of failure of any part of this equipment, during its service life, shall be made to the Bureau of Ships in accordance with current instructions. The report shall cover all details of the failure and give the date of installation of the equipment. For procedure in reporting failures see Chapter 67 of the "Bureau of Ships Manual," or superseding instructions.

ORDERING PARTS

All requests or requisitions for replacement material should include the following data:

1. Navy stock number or, when ordering from an Army supply depot, the Army stock number.
2. Name of part.

If the Navy stock number has not been assigned, the requisitions should specify the following:

1. Equipment model designation.
2. Name of part and complete description.
3. Manufacturer's designation.
4. Contractor's drawing and part number.
5. AWS, JAN, or Navy type designation.

SAFETY NOTICE

The attention of officers and operating personnel is directed to Chapter 67 of the *Bureau of Ships Manual* or superseding instructions on the subject of radio-safety precautions to be observed.

This equipment employs voltages which are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with the equipment.

While every practicable safety precaution has been incorporated in this equipment, the following rules must be strictly observed:

KEEP AWAY FROM LIVE CIRCUITS:

Operating personnel must at all times observe all safety regulations. Do not change tubes or make adjustments inside equipment with high voltage supply on. Under certain conditions dangerous potentials may exist in circuits with power controls in the off position due to charges retained by capacitors. To avoid casualties, always remove power and discharge and ground circuits prior to touching them.

DON'T SERVICE OR ADJUST ALONE:

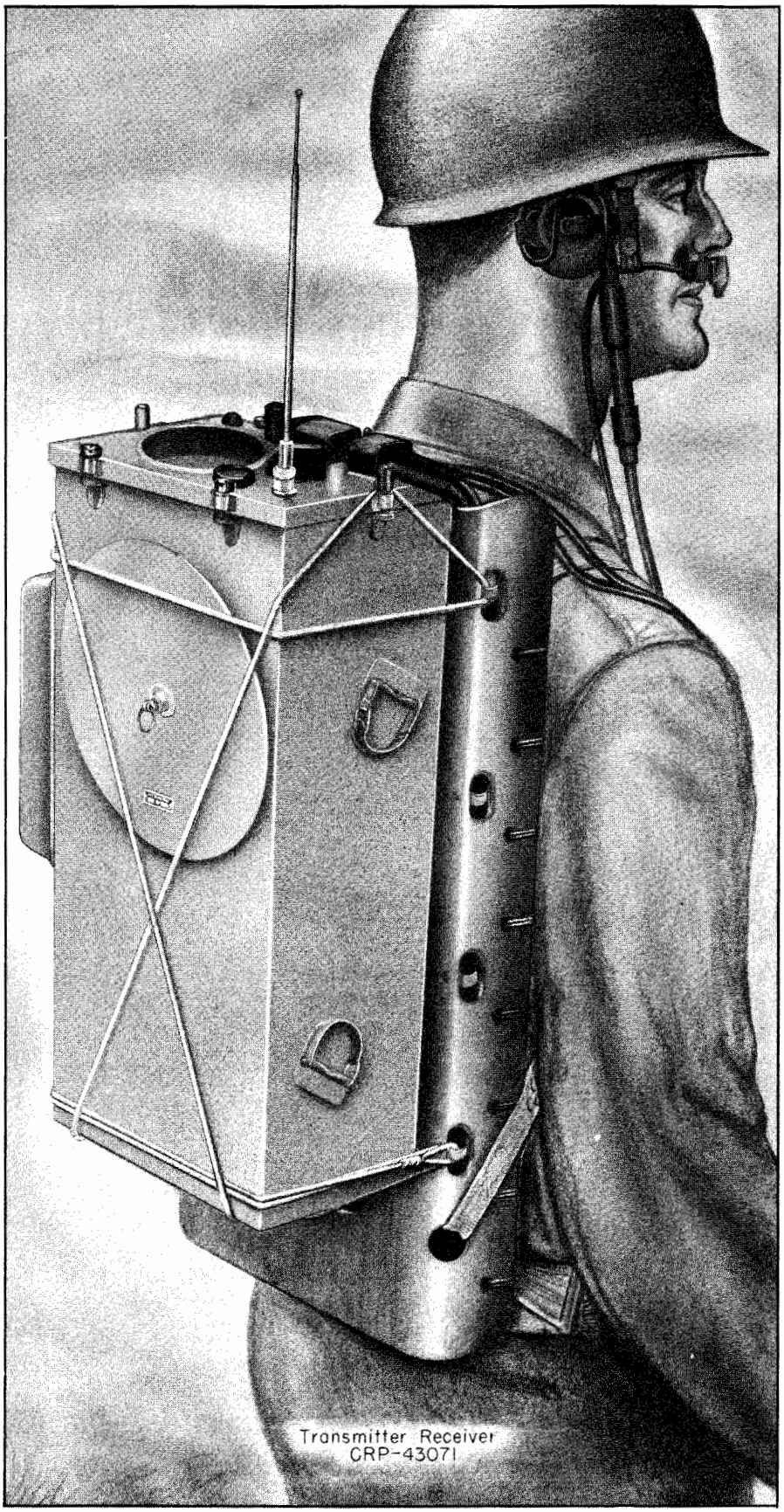
Under no circumstances should any person reach within or enter the enclosure for the purpose of servicing or adjusting the equipment without the immediate presence or assistance of another person capable of rendering aid.

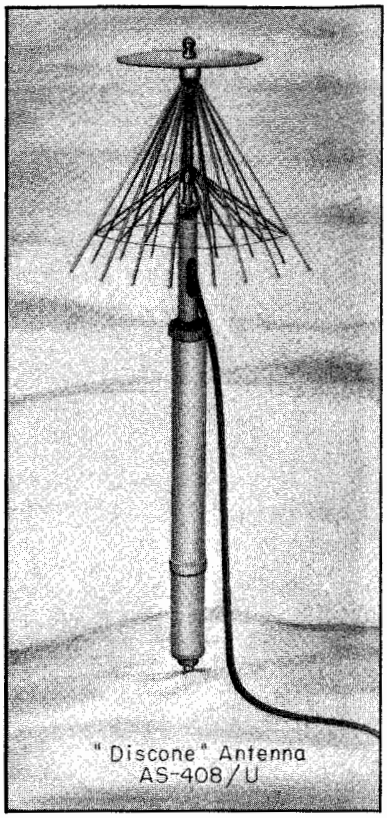
DON'T TAMPER WITH INTERLOCKS:

Do not depend upon door switches or interlocks for protection but always shut down motor generators or other power equipment. Under no circumstances should any access gate, door, or safety interlock switch be removed, short-circuited, or tampered with in any way, by other than authorized maintenance personnel, nor should reliance be placed upon the interlock switches for removing voltages from the equipment.

RESUSCITATION

AN APPROVED POSTER ILLUSTRATING THE RULES FOR RESUSCITATION BY THE PRONE PRESSURE METHOD SHALL BE PROMINENTLY DISPLAYED IN EACH RADIO, RADAR, OR SONAR ENCLOSURE. POSTERS MAY BE OBTAINED UPON REQUEST TO THE BUREAU OF MEDICINE AND SURGERY.





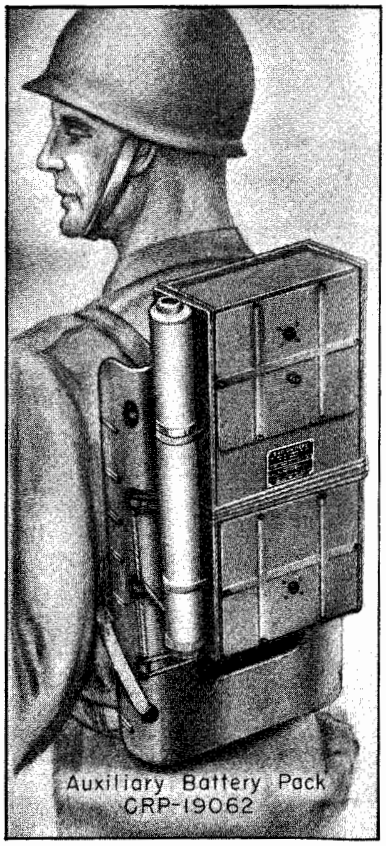


Figure 1-1.—Pictorial View of MAY Equipment.

SECTION 1
GENERAL DESCRIPTION

1. PURPOSE OF EQUIPMENT.

Portable Radio Transmitting and Receiving Equipment, Navy Model MAY, is a two-way battery-operated field set, designed for packboard carry. This set provides voice or MCW communication on any one of four preset channels in the 225—390-mc frequency range.

The electrical design of the equipment is such that it complies with blackout requirements under all conditions of normal operation, while receiver radiation is attenuated more than 40 db below the normal transmitting power level.

The mechanical design of the equipment is such that it will maintain adjustment and provide normal operation during long periods of tropical service. The equipment is submergence proof, buoyant in fresh water, and presents a low silhouette when carried by a man lying prone.

2. PURPOSE OF THIS MANUAL.

Section 1 of this manual gives a general description of each individual unit of the equipment. In addition, the basic principles of electrical and mechanical design are discussed in this section to provide personnel unskilled in radio with a general understanding of the basic theory of operation.

Section 2 provides a detailed discussion of the theory of operation of the entire equipment and is intended only for technical personnel.

Sections 3, 4, and 5 include complete instructions for installation, operation, and minor adjustments, respectively. These sections contain the information required for proper field use of the equipment and for routine maintenance by service personnel (not radio technicians) after a short period of instruction.

Sections 6 and 7 are devoted to preventive and corrective maintenance, respectively. These sections are intended only for personnel skilled in the repair of radio and allied equipment.

Section 8 contains a combined parts and spare parts list which includes a full description of each component.

3. DESCRIPTION OF UNITS.

a. GENERAL

The major units of each MAY Equipment are Transmitter-Receiver CRP-43071 (the basic communications unit), Discone Antenna AS-408/U (used with the basic unit when operating from a fixed location), and Auxiliary Battery Pack CRP-19062 (used

TABLE 1-1.—QUICK REFERENCE DATA

Name and designation of equipment:
Portable Radio Transmitting and Receiving Equipment, Navy Model MAY

Contract number and date:
NXsr-77830 September 22, 1944
NObsr-43097 December 30, 1948

Contractor:
Raytheon Manufacturing Company, Waltham, Mass.

Cognizant Naval Inspector:
Inspector of Naval Material, Boston, Mass.

Frequency range:
225—390 mc

Type of frequency control:
Transmitter: crystal-controlled, 4 preset frequencies
Receiver: crystal-controlled, 4 preset frequencies

Types of emission:
A3 (voice), AM 90% modulation capability
A2 (MCW), 850—1000 cycles, 90% modulation capability

Normal carrier output:
1 watt into 50-ohm noninductive load (A2 or A3 emission)

Type of receiver:
Superheterodyne, 100-kc IF

Receiver characteristics:
Audio output: 25 milliwatts into 300 ohms (phones)
Input impedance: 50 ohms (antenna)
Type of reception: A3 (voice) and A2 (MCW)

Power supply:
Self-contained vibrator power supply

Primary power source:
Self-contained 6-volt lead-acid battery

Crystals:
Navy Type CR-9/U quartz crystals, four each for transmitter and receiver, 0.0025% frequency tolerance at 20° C (68° F)

Antennas:
Telescopic whip antenna: vertically polarized
Broad-band Discone Antenna
Input impedance: 50 ohms
SWR (voltage): less than 1.5-to-1 over the entire 225—390-mc range
Polarization: vertical

TABLE 1-2. EQUIPMENT SUPPLIED

QUANTITY PER EQUIPMENT	NAME OF UNIT	NAVY TYPE DESIGNATION	OVER-ALL DIMENSIONS (IN.)			WEIGHT (LB)
			HEIGHT	WIDTH	DEPTH	
1	Transmitter-Receiver	CRP-43071	23-13/16	13-1/8	10	44*
	1 Headset Assembly	-49507				
	1 Microphone Assembly	-51071				
	1 Headset Extension Cord	-49534				
	1 Microphone Extension Cord and Push-to-Talk Switch	-49561				
	10 ft Coaxial Antenna Cable	—				
1	Auxiliary Battery Pack	CRP-19062	20-5/8	11-7/8	5-1/2	42**
2	Discone Antenna	AS-408/U	20-9/16†	2-5/16†	2-5/16†	2-3/4
1	Carrying Case (containing units listed above and additional accessories listed below)	CRP-10551	14-3/4	30-1/4	20-1/2	160††
1	Set of Equipment Spares ‡					
2	Instruction Books					

ADDITIONAL ACCESSORIES

(Packed in Carrying Case CRP-10551)

1 60-ft antenna cable in Navy Type-10583 canvas bag
12 Type CR-9/U quartz crystals (2 boxes)‡‡
1 Tool Kit
1 Coil Box

---

* Including battery, whip antenna, disc, and self-contained accessories listed immediately below.

** Including two spare batteries, spare tubes, spare vibrator, and Discone Antenna (less disc).

† Folded dimensions; when fully extended: length, 46 in.; largest diameter, 17-1/2 in.

†† Fully packed; case alone, 47 lb.

‡ Contract NObsr-43097 only.

‡‡ In addition to eight crystals mounted in equipment.

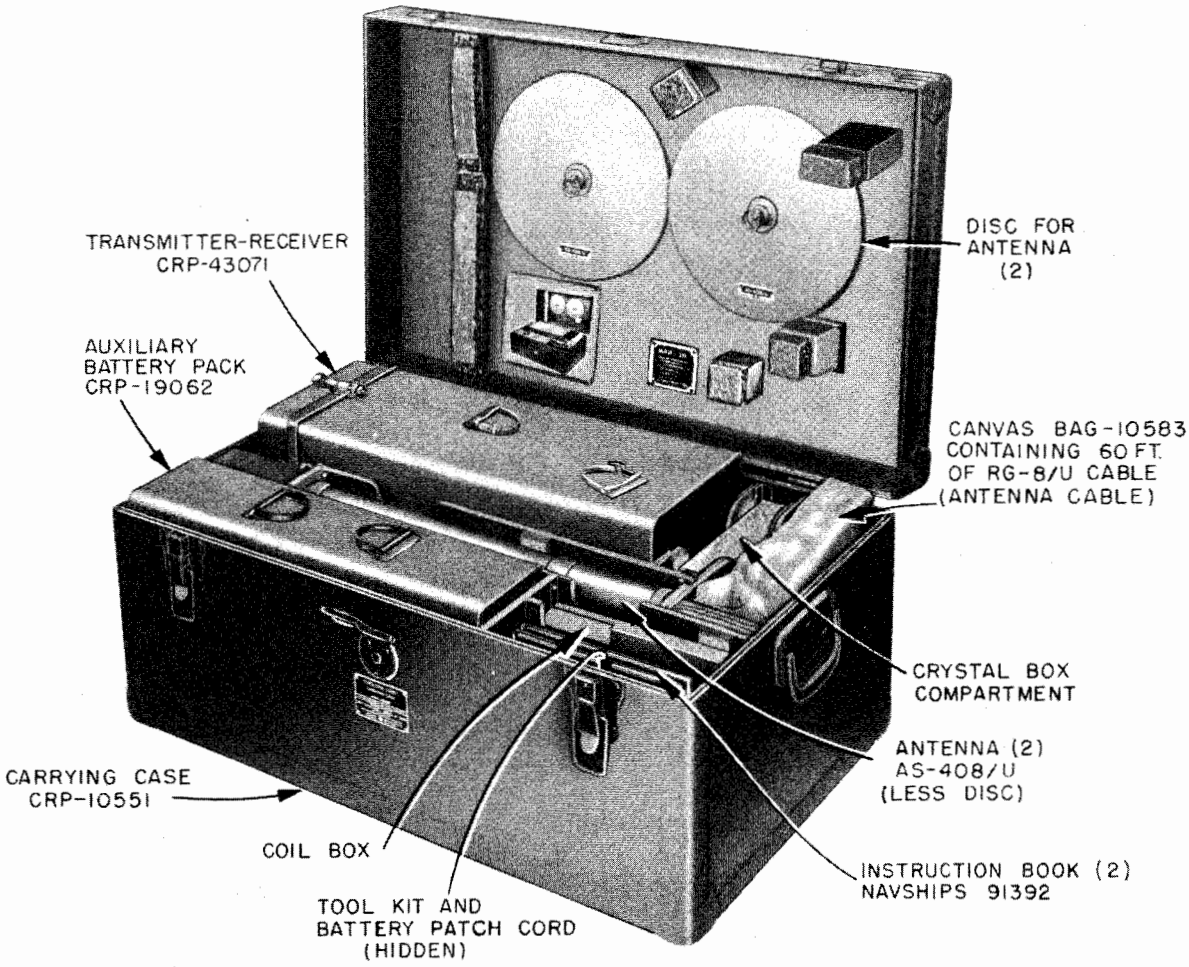


Figure 1-2.—MAY Equipment, Packed in Carrying Case CRP-10551.

only for field transport of spare batteries and spare parts). These units are illustrated in figure 1-1, *Pictorial View of MAY Equipment.*

The entire equipment (as listed in table 1-2, *Equipment Supplied*) is packed for shipment in Carrying Case CRP-10551 (see figure 1-2). The total weight of the equipment so packed is approximately 160 lb.

b. TRANSMITTER-RECEIVER CRP-43071 *(See Figure 1-3).*

The Transmitter-Receiver housing is of formed, welded construction and fabricated of a light-weight aluminum alloy. The main external surfaces are durably finished in green wrinkle enamel, while the control panel and antennas are a flat Marine Corps green. The transmitter and receiver chassis assembly is secured directly to the control panel and occupies the major portion of the housing.

The equipment battery is housed in a separate compartment at the bottom of the package, electrical contact with the transmitter and receiver being established by means of two self-mating knife-blade connectors. A watertight vent in the battery compartment cover prevents the accumulation of gases within the housing. The battery itself measures 4-1/4 x 7 x 7 in., and is of 40 ampere-hour capacity. This capacity is sufficient to run the equipment for a period of four hours on a receive-transmit ratio of 3-to-1 at normal operating temperatures. A meter on the control panel reads battery voltage when the receiver is in use and thus provides a constant indication of the state of charge.

All operating controls are located on the control panel and are readily accessible during packboard carry by reaching over the shoulder. The Channel Selector Switch is so shaped that the operator can determine by touch which of the four channels is in circuit; it can be rotated continuously either clockwise or counterclockwise, and can be conveniently manipulated even by an operator wearing winter gloves.

To place the equipment in operation it is only necessary to connect an antenna, plug in the headset and microphone, select the desired communication channel, and snap on the Power Switch. The push-to-talk switch is an integral part of the microphone cord. The key for A2 (MCW) operation is a panel button. To transmit A2 signals, press the push-to-talk button and work the key.

All accessories required for field operation are carried in the Transmitter-Receiver unit. The telescoping whip antenna and a 10-foot coaxial cable for the Discone Antenna are carried inside the front cover, while the headset and microphone assemblies together with their extension cords and the push-to-talk button are stored within the front panel well (see figure 1-3). The Discone Antenna may be carried either on the Transmitter-Receiver or on the Auxiliary Battery Pack, or it may be split between the two as shown in figure 1-1. With the Discone Antenna carried as shown in this illustration, the total weight of the Transmitter-Receiver is approximately 44 lb.

c. DISCONE ANTENNA AS-408/U
(See Figure 1-4).

The Discone Antenna is a collapsible broad-band antenna of the ground-plane type which may be operated over the entire 225—390-mc frequency range without adjustment of any kind. This Antenna is considerably more efficient than the panel-mounted whip antenna, and it should be used whenever possible. Two lengths of coaxial cable with appropriate connectors attached (10 feet of RG-58/U and 60 feet of RG-8/U) permit placement of the Antenna in a location favorable for communication purposes. In general, improved performance and greater range will be secured by locating the Antenna as high above ground and as much in the clear as possible.

Optional mountings, provided as integral parts of the Antenna assembly, permit hanging the Antenna from a tree limb, securing it to a standard 3/4" pipe-thread mount on a truck, 1/4 ton, 4 x 4, or other vehicle, thrusting its pointed spike into the ground, or setting the Antenna itself directly on the ground or other surface.

The Discone Antenna provides omnidirectional coverage in the horizontal plane, and possesses a vertical pattern suitable for communication with both ground and aircraft equipments. Antenna radiation is vertically polarized.

d. AUXILIARY BATTERY PACK
CRP-19062 *(See Figure 1-5).*

The Auxiliary Battery Pack is fabricated of a lightweight aluminum alloy and its external surfaces are finished in green wrinkle enamel to match the Transmitter-Receiver. This pack has two vented but watertight storage compartments for spare batteries; it also contains one spare tube of each field-replaceable type and a spare vibrator, all securely packed in sponge rubber pockets. Provision is made for carrying a complete Discone Antenna on this pack if desired. The total weight of the Auxiliary Battery Pack including two spare batteries, spare tubes and vibrator, and the cone assembly of the Discone Antenna (figure 1-1) is approximately 42 lb.

e. ACCESSORIES.

The following accessories (except packboards) are packed in Carrying Case CRP-10551, shown in figure 1-2.

(1) CABLE BAG
(See Figure 1-6).

Sixty feet of RG-8/U coaxial cable with connectors attached to permit its use as an optional antenna cable is carried in Navy type-10583 canvas bag with shoulder strap. The weight of the bag and cable is approximately 8 lb.

(2) COIL BOX
(See Figure 1-7).

The extra coils and the extra yokes required to preset the MAY Equipment on all frequencies in the 225—390-mc range are contained in a metal coil box.

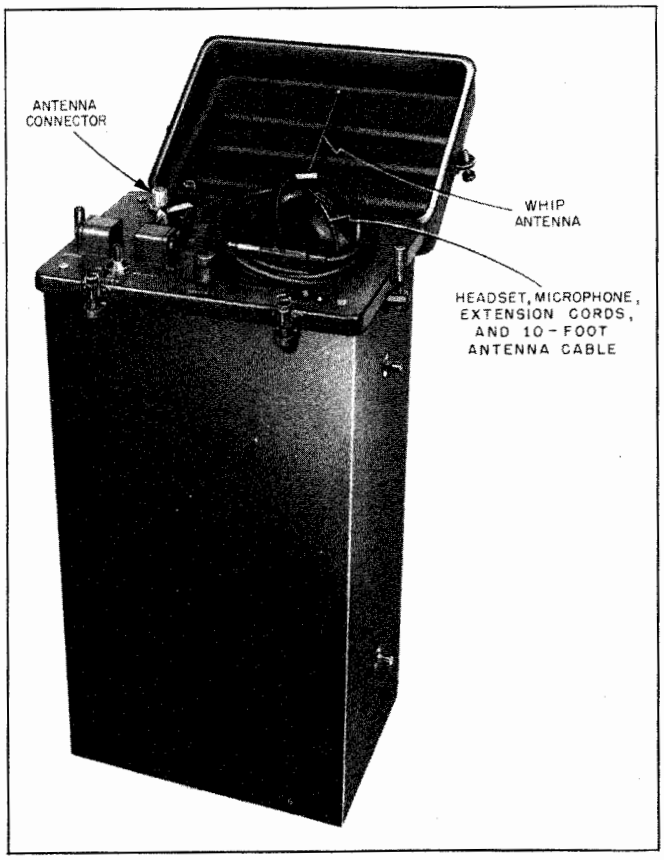


Figure 1-3.—Transmitter-Receiver CRP-43071.

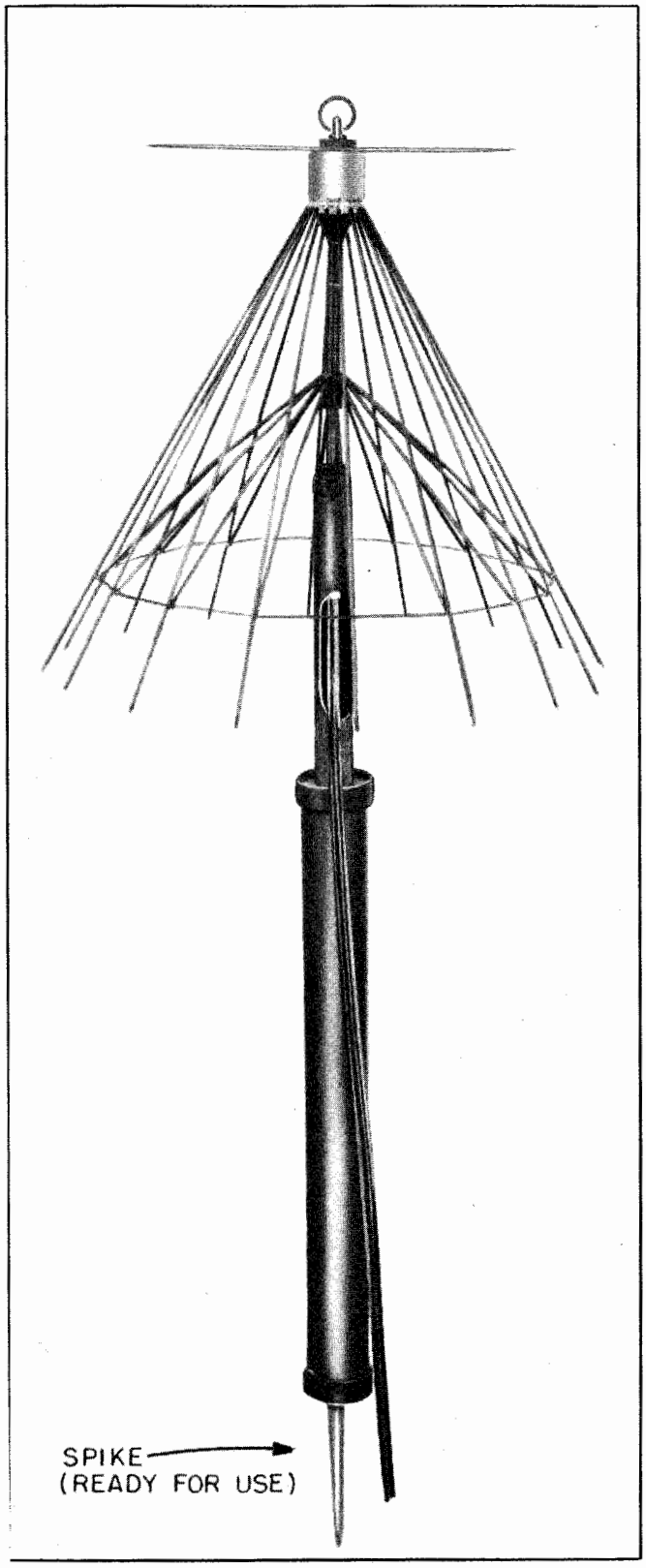


Figure 1-4.—Discone Antenna AS-408/U.

Figure 1-5.—Auxiliary Battery Pack CRP-19062.

Figure 1-6.—Canvas Bag with Shoulder Strap, Navy Type 10583.

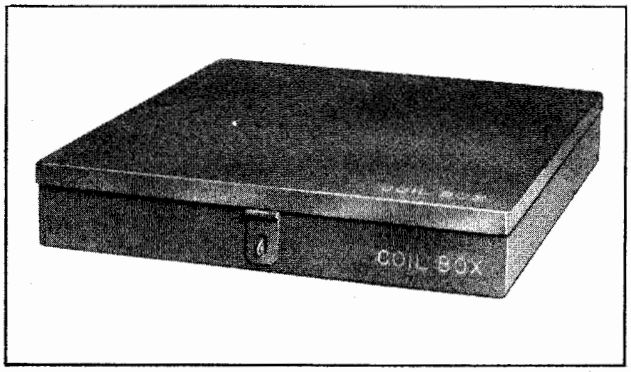


Figure 1-7.—Coil Box.

(3) TOOL KIT.

The special screwdrivers and wrenches required for alignment and disassembly of the Transmitter-Receiver are contained in a canvas tool kit permanently affixed to the right front side of the Carrying Case.

(4) SPARE ANTENNA.

One spare Discone Antenna, in addition to the Discone Antenna used with the equipment, is included among the field accessories packed in the Carrying Case.

(5) CRYSTAL BOX (NOT SUPPLIED).

A metal crystal box of the same size as the coil box and containing 182 Navy Type CR-9/U quartz crystals in addition to the 20 furnished with the Transmitter-Receiver will be supplied by the Government. As shipped from the factory this compartment in the Carrying Case contains 12 CR-9/U crystals packed in two cardboard boxes designed to hold 10 crystals each (the other eight crystals are in the Transmitter-Receiver). Additional packing material is employed to fill the crystal box compartment.

(6) PACKBOARDS (NOT SUPPLIED).

Two packboards with attachments (see table 1-3) are required for field transportation, one each for the Transmitter-Receiver and Auxiliary Battery Pack.

4. BASIC PRINCIPLES OF OPERATION.

A simplified block diagram of the MAY Transmitter-Receiver is given in figure 1-8, quick refer-

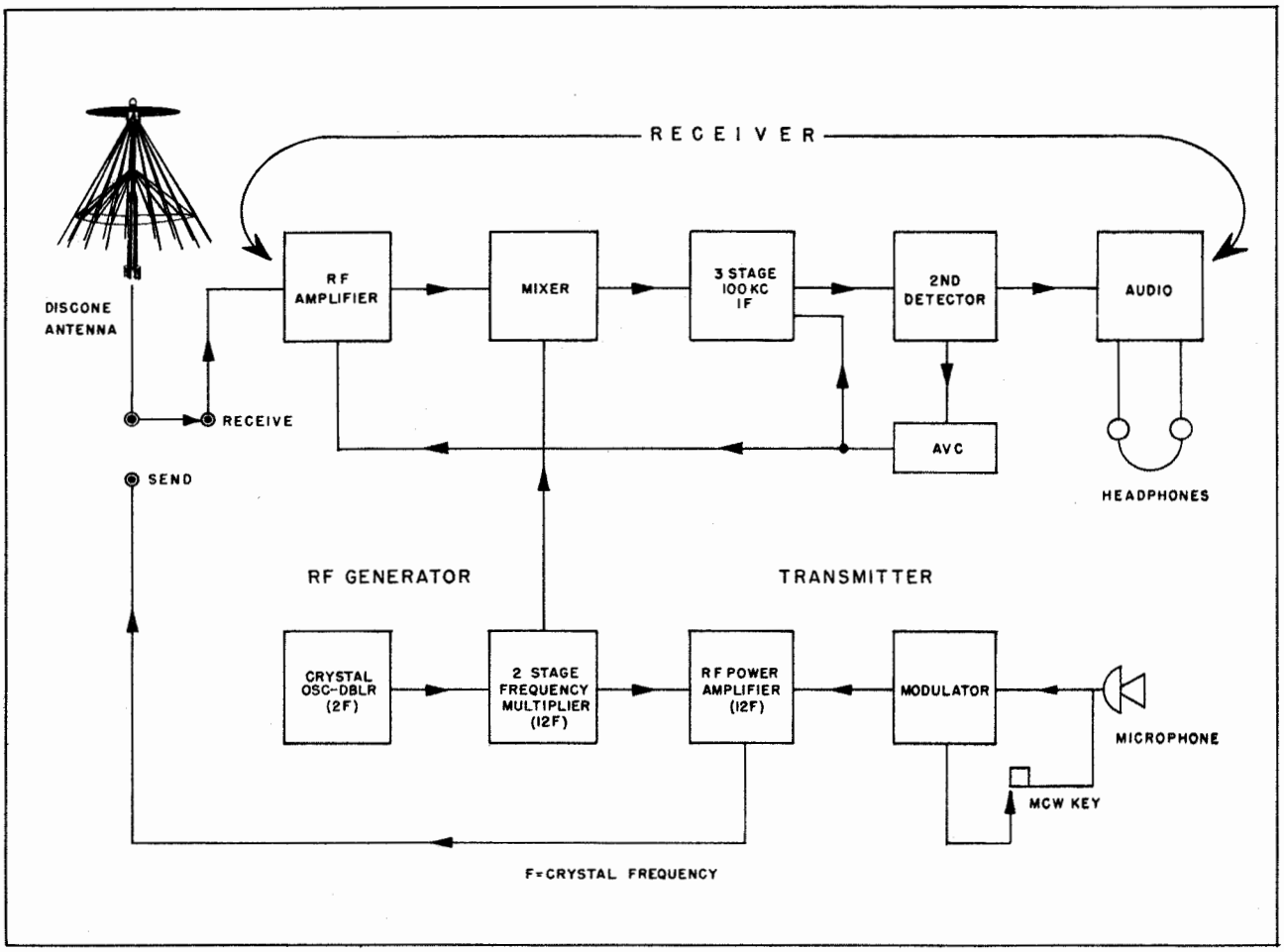


Figure 1-8.—Simplified Block Diagram.

ence data in table 1-1, and the electron tube complement in table 1-5.

The transmitter employs one of four available quartz crystals as a means of frequency determination. Because the output of the transmitter is in the UHF region, it is necessary to multiply the crystal frequency twelve times (in three stages) to reach the desired channel. This is accomplished by an oscillator-doubler, a second frequency doubler, and a frequency tripler in that order. The output of the tripler is fed to a power amplifier, which in turn is coupled to the antenna. Intelligence (voice or MCW) is superimposed upon the power amplifier output by means of a high-level modulator which is directly driven by the microphone for voice (A3) transmission, and which acts as a tone generator for MCW (A2) transmission. Transmitter power output is one watt (minimum) to either the Discone or whip antenna.

The receiver is of the fixed-tuned superheterodyne type. A signal intercepted by the antenna is first amplified and then passed on to the mixer. The transmitter crystal oscillator and frequency multiplier stages, when excited by a second crystal, also serve as a highly stable local oscillator system for the receiver, and inject into the mixer a signal 100 kc removed from the received signal. The oscillator signal beats against the received signal and sets up a 100-kc replica thereof which may be efficiently amplified owing to its low frequency. A three-stage broad-band IF amplifier supplies the additional 100-kc amplification required; the intelligence is removed from the signal in the detector circuit and amplified by the audio amplifier to a point where it will actuate the headset. A minimum of 25 milliwatts of audio power is available at the maximum volume control setting.

Primary power is furnished by the self-contained 6-volt storage battery. A vibrator power supply operated by this battery furnishes the necessary DC plate and screen voltages. This power supply uses an instant-heating gaseous rectifier, the heater of which is supplied with 1 volt AC from a low-voltage winding on the vibrator transformer. All other heaters are energized from the battery circuit.

TABLE 1-3. EQUIPMENT REQUIRED BUT NOT SUPPLIED

QUANTITY PER EQUIPMENT	NAME OF UNIT	REQUIRED USE	REQUIRED CHARACTERISTICS
2	Packboard, Plywood	Field transport of equipment	Army Stock No. 74-P-27-30
2	Attachment, Packboard	Field transport of equipment	Army Stock No. 74-A-33-30
1	Battery Charger	Recharging equipment batteries	Signal Corps Type RA-91, Marine Transportation Corps Allen Charger, or Battery Charger PP-367/U. To charge 6-volt storage battery at a rate not to exceed 4 amperes.
1	Metal Crystal Box	Crystal storage	Will replace cardboard boxes in Carrying Case.
182	CR-9/U Quartz Crystals	Channel determination	In addition to 20 crystals supplied with equipment. To be packed in crystal box listed above.

TABLE 1-4. SHIPPING DATA

SHIPPING BOX NO.	CONTENTS NAME	CONTENTS DESIGNATION	OVER-ALL DIMENSIONS (IN.) HEIGHT	WIDTH	DEPTH	VOLUME (CU FT)	WEIGHT (LB)
1	Carrying Case*, containing: 1 Transmitter-Receiver* 1 Auxiliary Battery Pack* 2 Discone Antenna	CRP-10551 CRP-43071 CRP-19062 AS-408/U	19	38 1/8	24 1/8	10	195
2	Equipment Spares†		‡	‡	‡	‡	‡

*Including accessories listed in table 1-2
†Contract NObsr-43097 only
‡Unavailable at this time

TABLE 1-5. ELECTRON TUBE COMPLEMENT

Transmitter-Receiver CRP-43071

Tube Type	*Quantity*
1007	1
2E41	1
5656	5
5744	1
6AK5	5
Total:	13

SECTION 2
THEORY OF OPERATION

1. GENERAL CIRCUIT DESCRIPTION.

A general circuit description of the MAY Equipment will be found in Section 1, paragraph 4 of this manual. Figure 1-8 is a functional block diagram of the Transmitter-Receiver.

Succeeding paragraphs in this section present first, a description of the Transmitter-Receiver mechanical assembly; secondly, a theoretical analysis of the Transmitter-Receiver electrical circuits; and finally, a detailed description of the Discone Antenna.

2. MECHANICAL ASSEMBLY.

The Transmitter-Receiver, which is the complete communications unit of the MAY Equipment, is housed in a lightweight aluminum alloy case (described in Section 1 of this manual).

The Transmitter-Receiver supporting frame is composed largely of lightweight angle and channel members. The frame is bolted directly to the front panel, thus permitting removal of the entire unit from its case after loosening the six knurled front panel holding screws. Positive knife-blade connectors are employed to break connection with the equipment battery in the rear compartment of the case upon removal of the Transmitter-Receiver unit.

The Transmitter-Receiver unit consists of four major assemblies which are electrically and mechanically interconnected, but which are readily detachable for maintenance or replacement purposes.

These assemblies and the corresponding accessory groups are designated as follows (also see figure 2-1):

Assembly	*Symbol Series*
RF chassis	101—199
IF–AF chassis	201—299
Control panel	301—399
Power supply	401—499
Accessory group (antennas, headset, etc.)	501—599

The coil and crystal turret is considered a part of the RF chassis, although it may be removed from the equipment as a separate mechanical entity. This turret is actually a 4-position detent-action rotary switch, which is manually operated by the Channel Selector Knob on the control panel.

3. POWER AND CONTROL *(See Figure 2-2).*

a. PRIMARY POWER.

All power for the MAY Equipment is taken from the 6-volt replaceable storage battery carried in the bottom compartment of the Transmitter-Receiver. The positive terminal of this battery is grounded to the chassis.

S301 on the control panel is the Main Power Switch; it has three positions: "On," "Off" (center), and "Stand-By."

In the "Off" position of S301 the negative battery lead is open, thus removing all load from the battery and rendering the equipment completely inoperative.

In the "Stand-By" position of S301, the negative battery lead is connected directly to one side of all 6-volt filaments and through voltage dropping resistor R229 to one side of the 1-1/4 volt filament of V204. The other side of each filament is connected to a ground bus and thence to the chassis, thus completing the circuit. The negative battery lead is also connected to the grid returns of doubler V102, tripler V103, final amplifier V104, and modulator V206 to provide these tubes with a fixed bias of -6 volts. The front panel Carrier Indicator Meter M301 is connected across the battery through a 10,000-ohm multiplier (R235), and thus permits direct reading of battery voltage. Total stand-by current drain is 3.2 amp.

In the "On" position of S301, all stand-by connections are duplicated. In addition, the negative battery lead is connected to the contacts of vibrator VD401 through the 15-amp fuse F201 and hash filter choke L401. The vibrator reed is permanently connected to ground; hence, the plate power supply is now energized and the receiver is placed in full operation.

b. RELAY SEQUENCE.

Latching relay K102, relay K401, and relay K101 operated by the push-to-talk button in the microphone cord, perform all functions necessary to transfer the entire equipment from the receive to transmit status. Reference to figure 2-2 and the following text will provide a ready understanding of their operation.

With S301 in the "On" position and the push-to-talk switch open, K102 is in the normal or receive

position. Note that both coils of this latching relay are now open and draw no current.

Upon depressing the push-to-talk button, K101 operates. Contacts K101-1 now energize coil L_2 of K102, causing K102 to move into the transmit position where it mechanically latches. Contacts K102-2 open, deenergizing L_2 and contacts K102-5 close, setting up L_1 for reverse operation of K102 when the push-to-talk button is released. Note that the coils of K102 are energized only momentarily while switching is actually taking place; at all other times both coils are open. Hence, there is no control-circuit current drain on receive and only the small drain of K101 and K401 on transmit. This is an important factor in prolonging battery life.

Relay K401 is also energized by K101-1 upon depressing the push-to-talk button and remains energized until the button is released. This relay steps up the output voltage of the power supply in the transmit position.

The specific function of each set of contacts in the three transmit-receive relays is given in table 2-1. Figure 7-20, the main schematic, includes a sketch of each relay showing the physical details of the contact locations.

TABLE 2-1. FUNCTION OF RELAY CONTACTS
(See also Figures 2-2 and 7-20)

CONTACTS	FUNCTION
K101-1	Actuate latching relay K102.
K101-2	Switch antenna from receiver to transmitter.
K102-1	Select receiving or transmitting crystal bank.
K102-2	Set up coil L_2 of K102.
K102-3	Switch TP104 from mixer plate (receive) to final amplifier plate (transmit).
K102-4	Add R111 in parallel with R123 on transmit to increase doubler and tripler screen voltage.
K102-5	Set up coil L_1 of K102.
K102-6	Switch B+ from receiver circuits to transmitter modulator and final amplifier.
K401-1	Select receive or transmit tap on power transformer secondary.
K401-2	Select receive or transmit tap on power transformer secondary.
K401-3	Short out hash filter L401 on transmit.
K401-4	Parallel K401-3.

c. METERING CIRCUIT.

Panel meter M301 is a 1-1/2-inch 1-ma meter, which is employed in conjunction with multiplying resistor R235 to read battery voltage and in conjunction with crystal rectifier CR101 and multiplier R116 to read relative power output when transmitting. As shown in figure 2-2, K101-1 disconnects the battery from the meter circuit under transmit conditions.

M301 may also be used as a test meter by throwing chassis-mounted switch S201 to the "Test" position. In this position, the positive side of the meter is connected directly to B+, while the negative side is connected to a flexible test lead. This lead terminates in a special probe which fits the numbered test points on the equipment, but which cannot make electrical contact with the chassis; thus the danger of burning out the meter as a result of misuse is minimized.

Each test point connects the meter across an appropriate plate circuit shunt, thus permitting plate current measurement wherever significant. Table 2-2 immediately below, when employed in conjunction with the main schematic, will make this readily understandable.

TABLE 2-2. TEST POINTS

DESIGNATION	METER SHUNT	CURRENT MEASURED	METER READS (Ma)
TP101	R104	Crystal osc plate	0—15
TP102	R108	Doubler plate	0—50
TP103	R112	Tripler plate	0—50
TP104*	R234	Mixer plate	0—5
TP104†	R236	Final amplr plate	0—100

*Receive only
†Transmit only

4. VIBRATOR POWER SUPPLY *(See Figure 2-2).*

Vibrator VD401 is of the full-wave nonsynchronous type and provides, in effect, 6 volts AC across the primary of power transformer T401 when excited by the equipment battery.

With the battery disconnected from the vibrator circuit, the vibrator reed is midway between its two contacts, touching neither. However, upon turning on Main Power Switch S301, the vibrator magnet coil is energized through L401 and the lower half of the primary of T401 (see figure 2-2). The magnet coil now pulls the reed into contact with the lower contact point, causing a surge of current through the lower half of the T401 primary. Simultaneously, the magnet coil is short-circuited and hence deenergized by the reed and contact point. Inertia carries the reed into contact with the upper contact point causing a surge of current through the upper half of the T401 primary. The magnet coil is again energized upon the return swing of the reed and the cycle repeats itself.

Capacitors C406 and C407 remove radiated high-frequency noise from the vibrator circuit. Capacitor

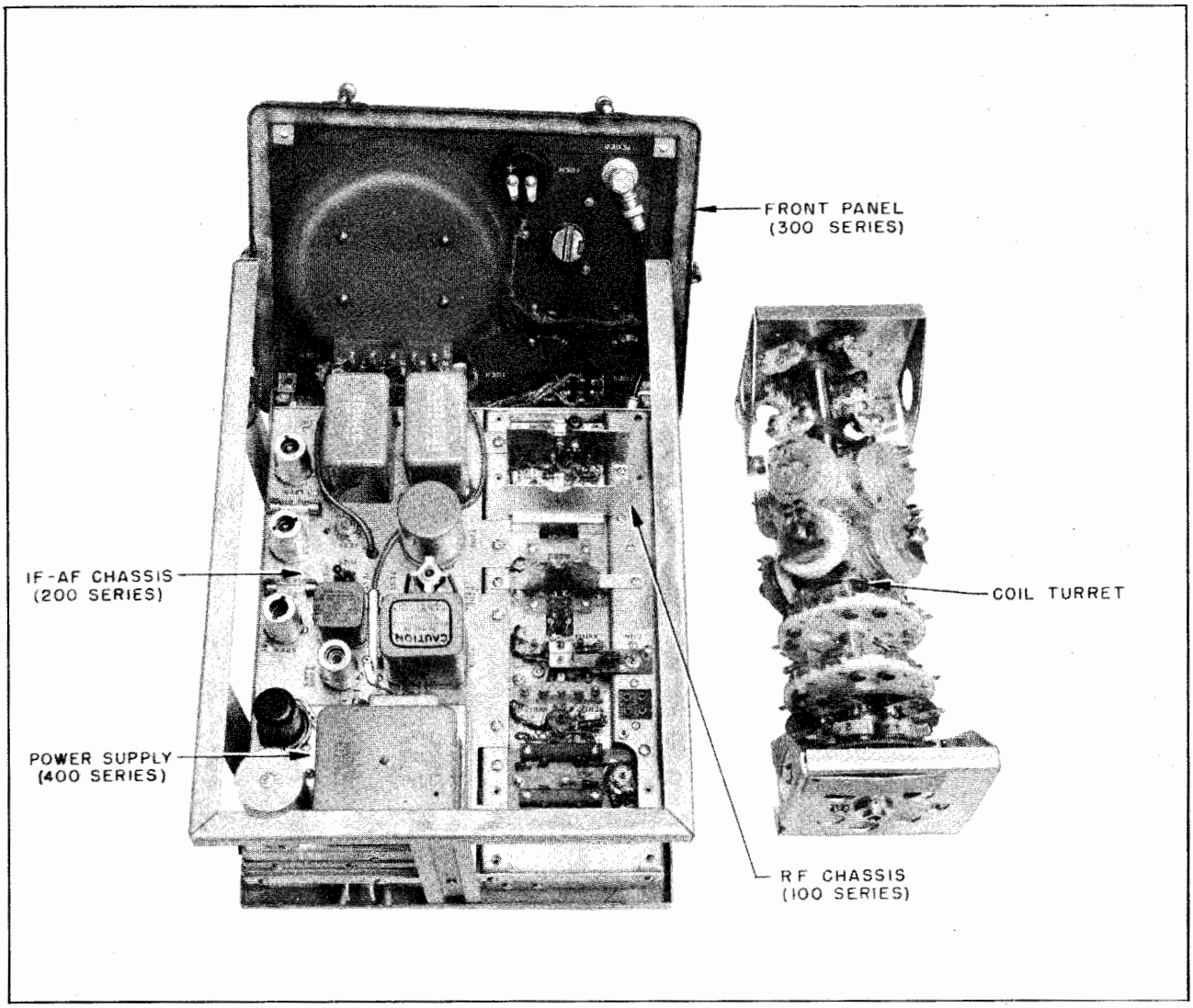


Figure 2-1.—Transmitter-Receiver Major Assemblies.

C401 and choke L401 comprise an LC filter which prevents vibrator hash from feeding back into the receiver filament circuit and creating unwanted noise. Since this additional filtering is unnecessary on transmit, relay contacts K401-3 and K401-4 short out L401 upon depressing the push-to-talk button; thus, slightly higher primary voltage is available for T401 and the power loss in the choke is eliminated. Capacitors C233 and C405 bypass the 6-volt line from S301 to remove any high-frequency transients which might be picked up.

T401 steps up the square-wave vibrator output to approximately 290 volts AC on transmit and to approximately 190 volts AC on receive. Switching between the receive and transmit voltages is accomplished by contacts K401-1 and K401-2, which select the proper winding taps on the T401 secondary. Capacitors C402A and C402B absorb the voltage surge which would otherwise occur upon turning off the primary current.

V401 is a type 1007 gaseous rectifier employed in a conventional full-wave circuit; an auxiliary secondary winding on T401 supplies 1 volt AC at 1.2 amp for the filament of V401. This tube is of the cold-cathode type, filament voltage being applied only to insure reliable operation.

Output filtering for the power supply is accomplished mainly by L402, L204, C219A, and C219B. C402C removes the jagged peak from the rectifier output, while C231 and C403 are high-frequency hash suppressors.

5. CRYSTAL OSCILLATOR AND FREQUENCY MULTIPLIERS *(See Figure 2-3).*

Crystal-controlled oscillator V101 and frequency multipliers V102 and V103 serve a dual function in that they supply RF excitation to the final amplifier on transmit and act as a source of local oscillator voltage on receive. Plate and screen voltages are

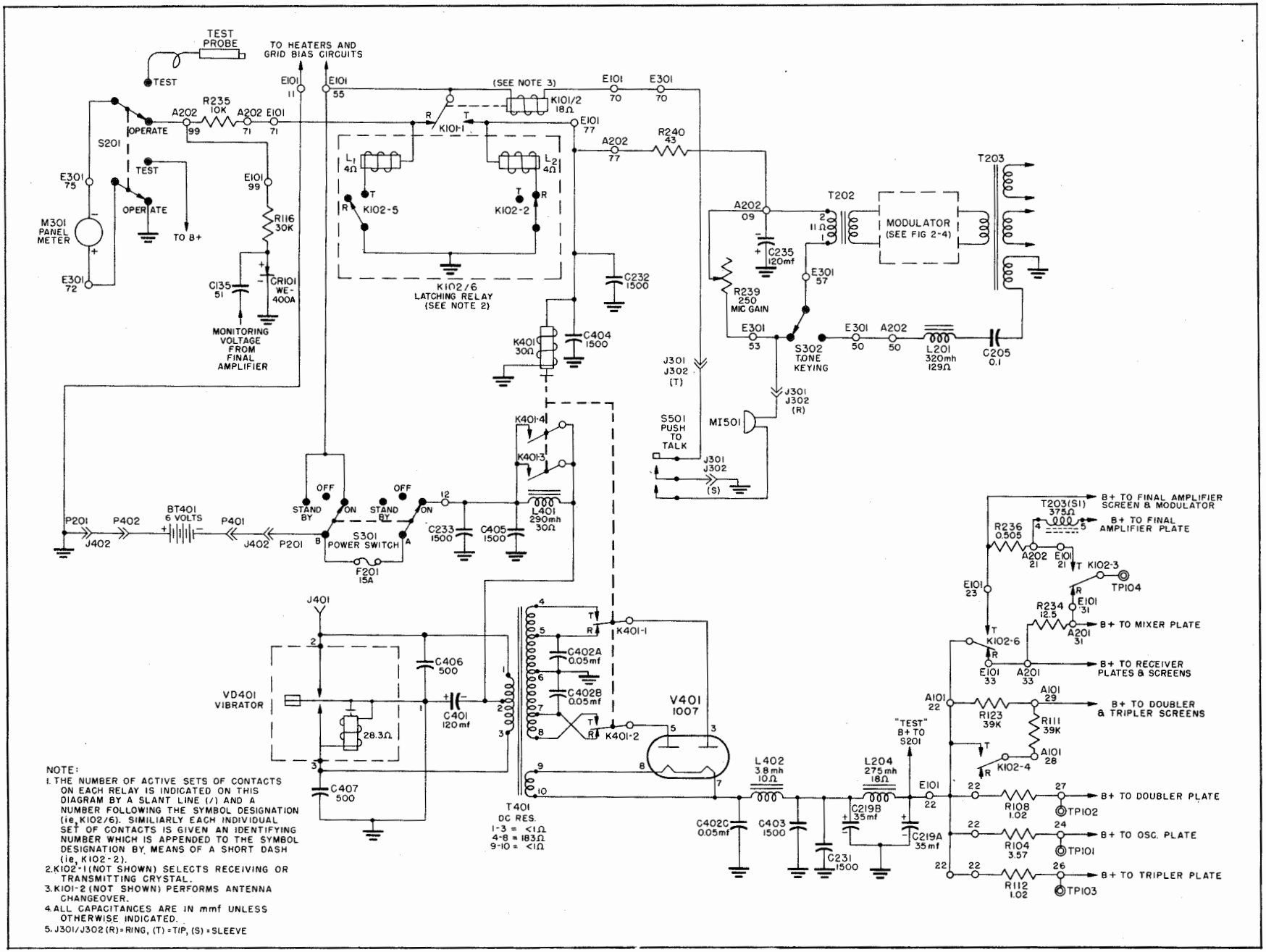


Figure 2-2.—Power and Control Circuits: Schematic Diagram.

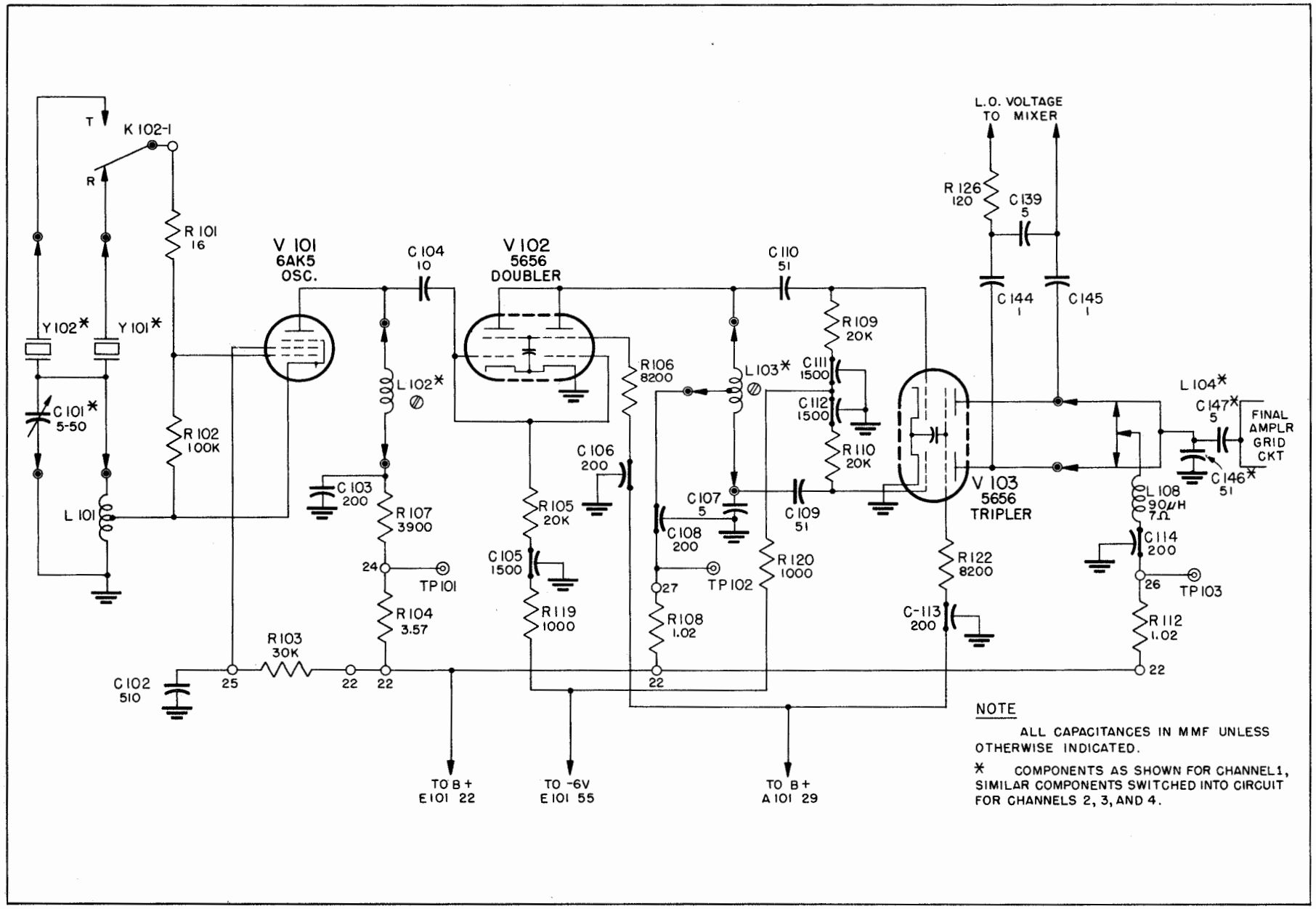


Figure 2-3.—Crystal Oscillator and Frequency Multipliers: Schematic Diagram.

applied to these stages at all times, provided Main Power Switch S301 is in the "On" position.

V101 functions as a harmonic-generating oscillator with its plate circuit tuned to the second harmonic of the crystal frequency. K102-1 switches V101 from the receiver crystal bank to the transmitter crystal bank when the push-to-talk button is depressed. The appropriate crystal from the four in each bank is chosen by the Channel Selector Switch. Note that for a given communication channel the receiver crystal frequency is always approximately 8.3-kc higher than the transmitter crystal frequency. This difference multiplied by 12 provides the 100-kc difference between the local oscillator and signal frequencies necessary to produce the desired intermediate frequency.

L101 and C101 (A, B, C, or D in each case as chosen by the Channel Selector) make up a parallel tuned circuit in series with the crystal and ground. V101 is used in a conventional Hartley circuit in which its cathode is brought to a tap on the coil and therefore operates at an RF potential above ground. The crystal itself operates in series resonance at the third or fifth mechanical overtone. R102 functions as a conventional grid leak and R101 is a current-limiting resistor employed for crystal protection.

Slug-tuned coil L102 (A, B, C, or D as chosen by the Channel Selector) represents the plate load for V101 and is tuned to resonance at the second harmonic of the crystal frequency. R103 and R107 are screen and plate dropping resistors respectively, whereas C102 and C103 serve as screen and plate bypass capacitors. R104 is a meter shunt which permits direct measurement of V101 plate current at TP101, as explained in paragraph 3.c. above.

The output of V101 is capacitively coupled through C104 to the parallel-connected grids of frequency doubler V102. This tube is a type 5656 which consists essentially of two 6AK5's in a single envelope. By connecting its grids and plates in parallel, a plate dissipation of 6 watts may be realized with a filament drain of only 0.4 amp and decided space saving over two individual tubes. V102 is biased to approximately 20 volts on transmit and 13 volts on receive by the flow of grid current through R105 and R119 together with the fixed bias of -6 volts developed by making the grid return to the negative battery terminal rather than to ground. C105, in conjunction with isolation resistor R119, provides grid circuit decoupling.

The plate load of V102 consists of slug-tuned coil L103 (A, B, C, or D), which is center-tapped for plate-voltage feed and provides output voltages of 180° phase difference at either end. C108 is a DC blocking capacitor which provides the plate circuit RF return to ground. R108 is a meter shunt which permits direct measurement of V102 plate current at TP102, as explained in paragraph 3.c. above.

C109 and C110 are the coupling capacitors between the plate circuit of V102 and the grids of push-pull frequency tripler V103. As explained above, the V103 grids are fed 180° out of phase from opposite ends of the V102 plate tank. C107 is a balancing capacitor which serves to equalize the circuit capacities across each grid of V103 and thus equalizes the drive to each section of this tube. R109, R110, C111, C112, and R120 comprise grid bias and RF decoupling circuits similar to those employed for V102, which in this case provide a total operating bias of approximately 30 volts on transmit and 15 volts on receive. R122 is the screen voltage dropping resistor and C113 is the screen bypass capacitor.

The plate circuit of V103 consists of one of four quarter-wave lines (L104) which are capacity-loaded by the tube and which may be set by an adjustable shorting bar to any frequency between 225 and 390 mc. Plate voltage is applied to the electrical center (low impedance point) of this tank through RF choke L108. C114 is a plate circuit bypass capacitor which provides additional RF filtering. R112 is a meter shunt which permits the use of TP103 to measure V103 plate current, as explained in paragraph 3.c. above.

V103 acts both as a source of local oscillator voltage for the receiver and as a driver for the transmitter final amplifier. Hence, voltage is taken from L104 by means of a coupling loop and a twisted-pair line to receiver mixer tube V106, while a second quarter-wave line in the power amplifier grid circuit receives energy by means of inductive coupling when transmitting.

Both sides of the V102 and V103 heaters are bypassed to ground directly at the tube sockets by capacitors C120 — C123. Such precautions are not necessary in the crystal oscillator heater circuit inasmuch as this tube is operating at a relatively low frequency.

6. FINAL AMPLIFIER *(See Figure 2-4).*

V104 is a conventional push-pull class C power amplifier employing one of four tuned lines at L104 and L110 as grid and plate tank circuits. The proper grid and plate line for each channel is connected in circuit upon appropriate rotation of the coil turret. A choice of two plate line coupling yokes (L105A/B) is supplied, one for the higher frequency channels and one for the lower frequency channels. These yokes serve as matching stubs which transform the high plate circuit impedance to the 52-ohm impedance of the antenna.

Each control grid of V104 is biased to approximately 12 volts on transmit by a combination of fixed and automatic bias similar to that used in the preceding stages. R113 and R114 are the grid bias resistors and C115 and C116 are the grid circuit RF bypass capacitors. Plate voltage is applied at a low-impedance point on the plate line through RF choke L109 and one secondary of the modulation transformer. Screen grid voltage is applied through drop-

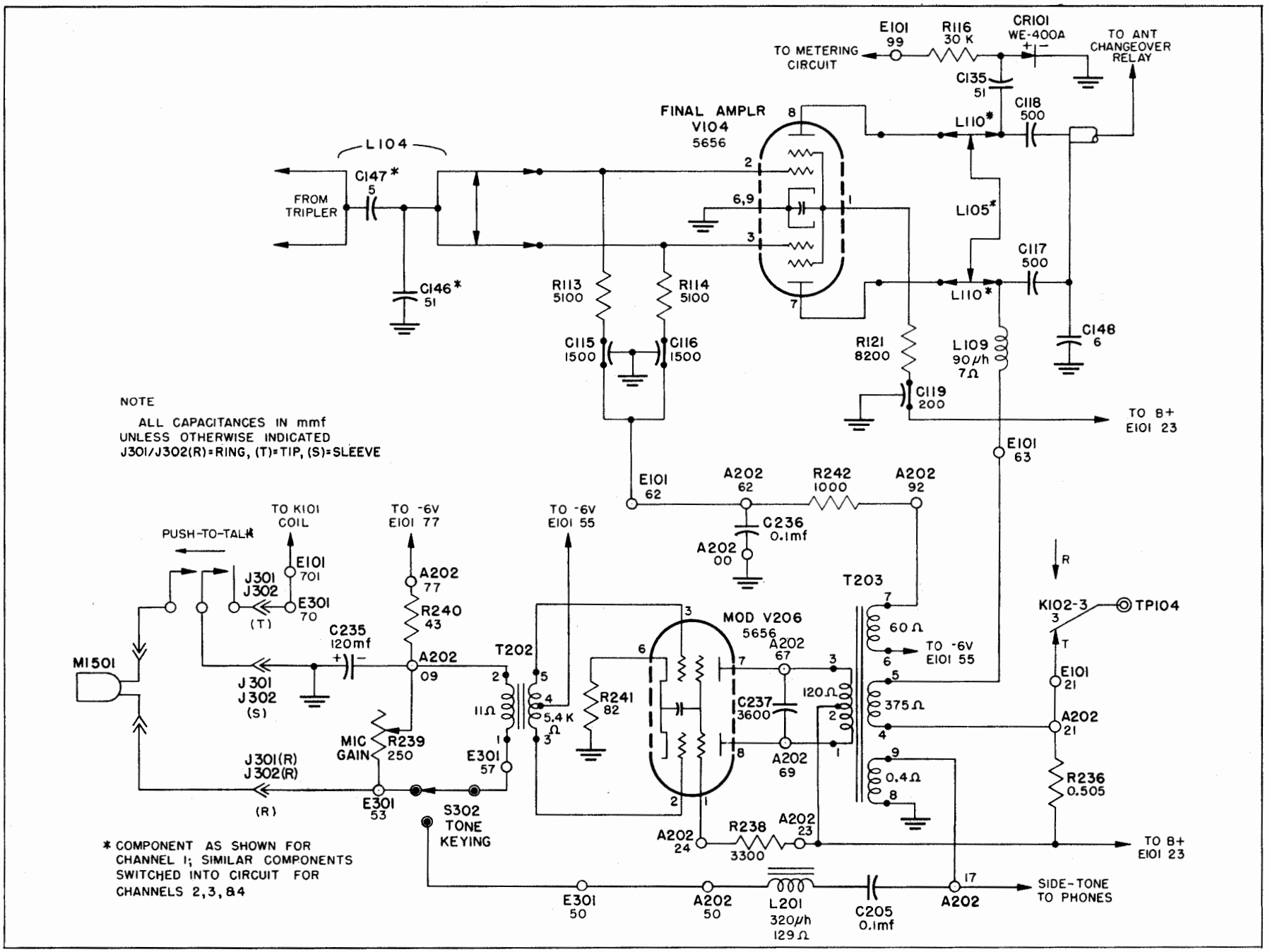


Figure 2-4.—Modulator and Final Amplifier: Schematic Diagram.

ping resistor R121. TP104, in conjunction with R236, permits measurement of plate current in the manner previously described.

Voice or tone modulation is introduced in series with the plate and control grid voltage feeds by separate windings on the modulator output transformer. Thus, 90% modulation may be attained with a minimum of audio power. The screen grid of V104 is bypassed for RF only by C119 and is thus permitted to swing with modulation.

Transmitter output is capacitively coupled from L105 to the coaxial line feeding the antenna relay by means of C117 (to shield) and C118 (to center conductor).

Crystal rectifier CR101 is connected from the final amplifier plate line to ground to provide a DC voltage proportional to the transmitter RF power output. This DC voltage is applied to voltage dropping resistor R116, and thence to the panel metering circuit for transmitter tuning or monitoring purposes. Capacitor C135 serves to isolate the crystal from the transmitter B+ voltage.

7. MODULATOR *(See Figure 2-4).*

A single type 5656 twin-tetrode V206 supplies the necessary speech or tone modulation for the transmitter.

The single-button carbon microphone M1501 is connected across the primary of input transformer T202, as shown in figure 2-4. C235 is a DC blocking capacitor and Microphone Gain Control R239 (a screwdriver adjustment) acts as an audio shunt across the 75-ohm impedance of the transformer primary.

DC button voltage comes from the 6-volt storage battery and is applied across the microphone through dropping resistor R240 and the 11-ohm DC resistance of the transformer primary.

The secondary of T202 presents an impedance of 180,000 ohms to the control grids of V206. A push-pull connection is employed and -6 volts fixed bias from the storage battery is applied at the transformer center-tap. Additional operating bias is secured by means of R241 in the common cathode lead. Total operating bias secured by these means is approximately -7.5 volts, which corresponds to class AB_2 operation.

The primary of T203 represents the plate load of V206 and is center-tapped for B+. C237 is a frequency-compensating capacitor. Screen voltage is obtained through series dropping resistor R238. Three separate secondaries are employed, one each for grid and plate modulation of the power amplifier and the third for feedback and side-tone purposes.

The grid-modulation winding is in series with the final amplifier DC grid return. An AF voltage divider consisting of R242 and C236 applies a portion of the audio output voltage to the final amplifier DC bias circuit, thus providing low-intensity grid modulation.

The plate-modulation winding is connected in series with the final amplifier DC plate voltage feed in the conventional manner.

The total modulation capability of the equipment is in excess of 90%, divided between grid and plate modulation. This combination of grid and plate modulation results in a very high degree of modulation efficiency with resultant savings of space and weight.

The third secondary winding of T203 is employed for feedback purposes when the control panel Tone Key S302 is depressed. Upon depressing S302, the microphone is disconnected and a portion of the modulator output is fed back through a series LC network (L201 and C205) to the high side of input transformer T202. This causes V206 to oscillate at an audio frequency (approximately 1000 cycles) and the transmitter is now modulated with a single tone rather than with speech.

The headphones are connected across the feedback winding as well as the secondary of the receiver output transformer to permit audible monitoring of the modulator output during voice and MCW transmission.

8. RECEIVER RF AMPLIFIER AND MIXER *(See Figure 2-5).*

a. GENERAL.

The receiver RF amplifier and mixer circuits employ lumped inductive elements L106 and L107 in conjunction with capacitors C127 and C129 to form the necessary signal-frequency tuned circuits. Lumped inductive elements offer considerable space savings over tuned lines and provide a ready means of securing proper isolation of RF and IF voltages in the mixer circuits. Figure 7-20, the main schematic, shows these elements in their true form, while figure 2-5 is a simplified schematic in which they have been reduced to their conventional circuit equivalents.

b. RF AMPLIFIER.

An incoming signal from the antenna is applied to L106 through a 52-ohm coaxial line from antenna changeover relay K101-2. As indicated in figure 2-5, a balanced antenna connection is employed to L106 rather than the conventional unbalanced coaxial connection. This is done in order to minimize hash pickup from the power supply vibrator. C127 actually comprises four separate air trimmers, one being selected for each channel by the front panel Channel Selector Switch. Additional tuned circuit inductance of considerable importance is introduced by the capacitor leads.

C142 and C143 are coupling capacitors which apply the signal voltage to the control grids of push-pull amplifier V105. This tube secures its bias and AVC voltage in conventional fashion through resistors R124 and R125, the junction of which is returned to AVC diode V204 (see figure 2-6). C126

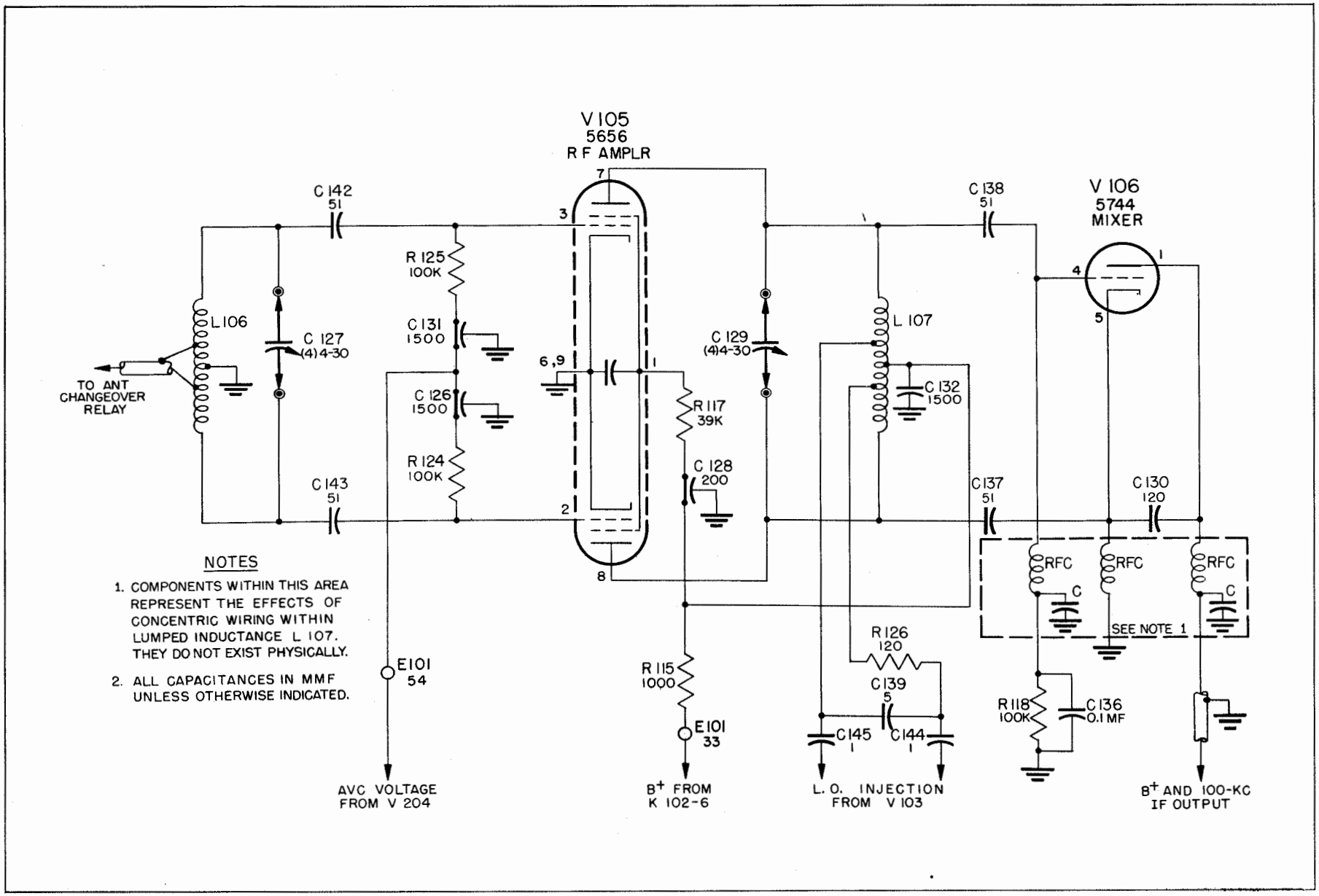


Figure 2-5.—Receiver RF Amplifier and Mixer: Simplified Schematic Diagram.

and C131 are the AVC line RF bypass capacitors. DC screen-grid voltage is applied through series dropping resistor R117, which is bypassed internally within the amplifier tube. Additional screen circuit decoupling is accomplished by C128 in conjunction with plate-screen dropping resistor R115.

One plate of V105 is connected directly to either end of the signal-frequency tuned circuit composed of L107 and C129. C129 is made up of four separate trimmers employed in the same manner as C127 described above. DC plate voltage for V105 is brought through dropping resistor R115 to the mid-point of L107, while C132 establishes an RF return from this point to ground.

c. MIXER.

Local oscillator voltage from V103 (figure 2-3) is injected in balanced fashion at points equidistant from the center of L107. The 1-mmf series capacitors C144 and C145 limit the amplitude of this voltage to the desired value, while C139 and R126 make up an equalization network which maintains relatively constant injection voltage over the entire tuning range.

The signal voltage and the local oscillator voltage (100-kc higher in frequency) are both applied to mixer tube V106 through coupling capacitors C137 and C138. V106 is grid-cathode driven by these two RF voltages and the 100-kc difference frequency is taken from its plate circuit. C130 (120 mmf) returns the RF voltages to the V106 cathode while offering high impedance to the desired 100-kc IF signal. This signal is then fed directly to the IF amplifier low-pass filter through a shielded lead. DC plate voltage is applied to V106 through the low-pass filter (see paragraph 9.*b.*). DC grid bias is obtained by means of grid resistor R118, bypassed by C132.

A feature of the mixer circuit is the use of concentric wiring within L107 to provide the effect of a series RF choke and a shunting capacitor to ground for each lead so wired. This usage is indicated on the main schematic (figure 7-20) by dotted lines, while on the simplified schematic (figure 2-5) the hypothetical circuit elements are shown grouped together in a dotted-line enclosure. Note that the control grid and cathode of V106 are maintained at a high RF potential with respect to ground by these means, while the plate is maintained at a high IF potential. The V106 heater leads are also similarly treated although they are not shown on the simplified schematic.

9. RECEIVER IF, DETECTOR, AND AUDIO STAGES *(See Figure 2-6).*

a. GENERAL.

The IF amplifier comprises three pentode stages and has a center frequency of 100 kc. Bandwidth between the -6 db points is 128 kc; this is accomplished by employing a combination of LC filters and RC video techniques. The second detector–AVC circuit employs a 2E41 subminiature diode-pentode tube. The pentode section is diode-connected and serves as the detector. The diode section is employed as a delayed AVC rectifier which holds the detector output within 8 db between 50 microvolts and 50 millivolts antenna input, and within 12 db between 15 microvolts and 50 millivolts antenna input. A conventional 6AK5 audio amplifier supplies up to 25 milliwatts of audio output to the 300-ohm headset at approximately 5% total harmonic distortion (as measured at 1000 cycles). Over-all audio response is flat within ±4 db over the 400—4000-cycle range.

b. IF AMPLIFIER.

The 100-kc output signal from the mixer is brought through a short length of coaxial cable to the input of the M-derived low-pass filter (L205—L209 and C211—C215, see figure 7-20). Input and output impedances of this filter are approximately 10,000 ohms at the IF center frequency. Also, note that the filter is electrically symmetrical and may thus be physically reversed without affecting operation. Series dropping resistor R201, decoupling filter C202—R202, and RF bypass capacitor C203 comprise the DC plate voltage feed for mixer tube V106. R234 is a meter shunt which permits reading mixer plate current at TP104.

From the low-pass filter, the IF signal is passed through coupling capacitor C201 and stabilizing resistor R205 to the control grid of first IF tube V201. R203 is the grid load resistor for V201, while C204 and R204 provide AVC circuit decoupling. DC screen voltage is applied through series dropping resistor R206, bypassed by C206. R208 is the plate load resistor and C207, in conjunction with R207, provides plate and screen circuit decoupling.

The high-pass filter (L210—L213 and C227, C228, and C230—see figure 7-20) is also a symmetrical M-derived unit with an input and output impedance of approximately 10,000 ohms. This filter is terminated by R209, and from this point the IF signal is passed through coupling capacitor C210 to the control grid of second IF tube V202. R237 is the grid load resistor for V202, while C209 and R223 provide AVC circuit decoupling. DC screen voltage is applied through series dropping resistor R210, bypassed by C238. R212 is the plate load resistor and C239, in conjunction with R211, provides plate and screen circuit decoupling.

C240 is the coupling capacitor to the third IF tube V203. Since this tube is not controlled by the AVC circuit, constant loading is maintained on its associated circuits. IF tube V203 receives conventional control grid and cathode bias from R213 and R214, respectively. DC screen voltage is applied through R215, bypassed by C208; while DC voltage is applied through L202. C223, in conjunction with R216, provides screen and plate circuit de-

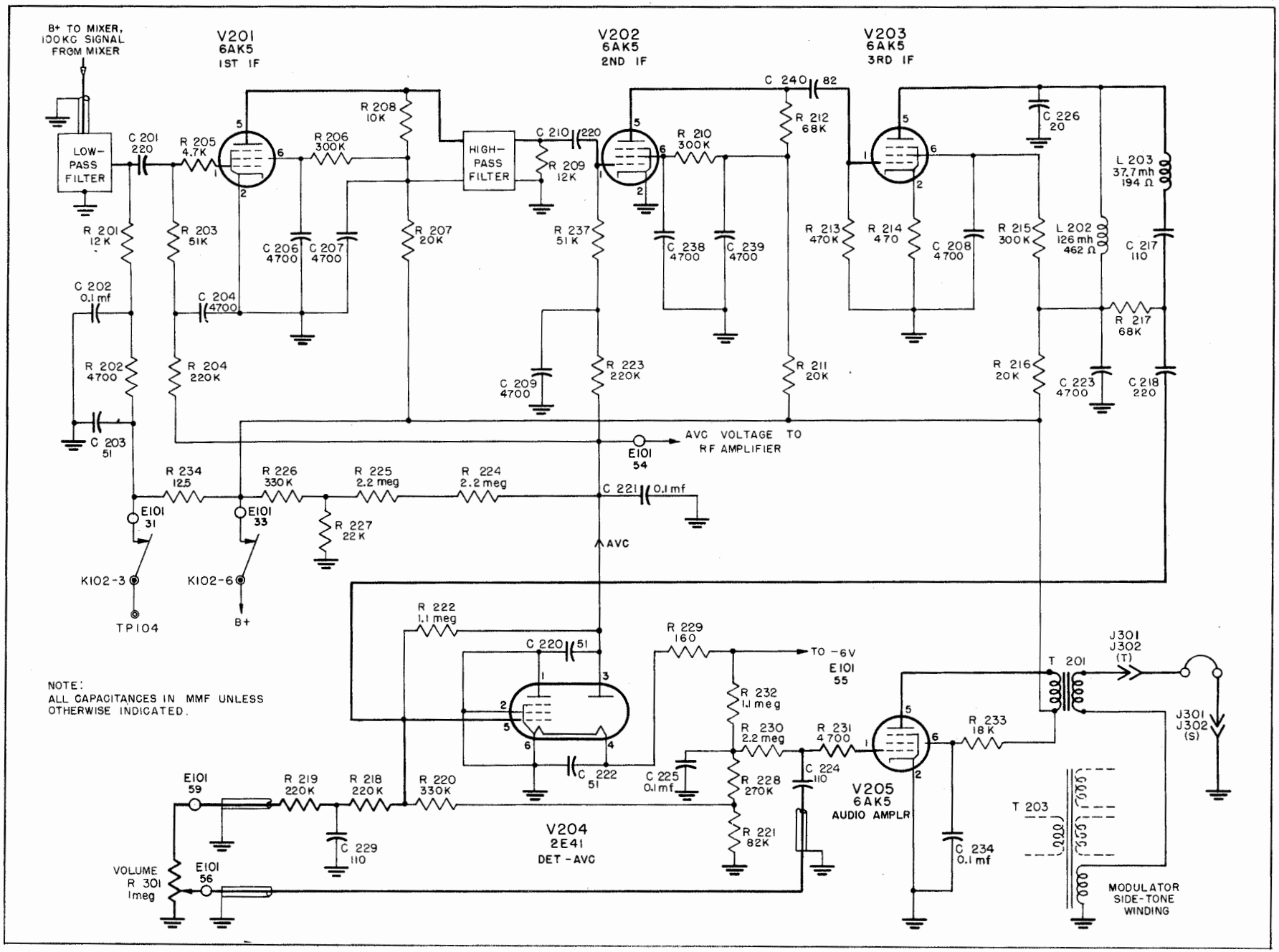


Figure 2-6.—Receiver IF, Detector, and Audio Stages: Schematic Diagram.

coupling. R217 is the resistive plate load for V203, while L202—C226 and L203—C217 form shunt and series LC peaking circuits, respectively, each of which resonates at the IF frequency. C218 is a DC blocking capacitor which couples the IF amplifier output to second detector V204.

The pentode section of subminiature tube V204 functions as a diode detector in which the common plate, screen grid, and cathode connection represents the diode cathode and the control grid represents the diode anode. R218, R219, and C229 form the conventional diode load and RF filter circuit, while front panel Volume Control R301 controls the amplitude of the audio voltage applied through coupling capacitor C224 to V205. Note that the leads to and from the Volume Control are shielded to prevent the pickup of extraneous noise. R232, R228, and R221 form a voltage divider in the -6-volt DC circuit which supplies a very small fixed negative voltage to the audio amplifier grid circuit. Upon arrival of a strong signal, this bias voltage is increased by the rectified signal voltage appearing across the voltage divider composed of R220 and R221, thus reducing the audio amplifier gain and serving as audio AVC. Fixed bias voltage for V205 is applied through its grid load resistor R230. C225 bypasses the cold end of this resistor to ground for audio. Filament voltage for V204 is taken from the -6-volt bus through dropping resistor R229 which provides the required 1-1/4 volts. C222 is the filament bypass capacitor.

The diode section of V204 is employed as a delayed AVC tube. A fixed positive DC voltage is taken from a B+ voltage divider (composed of R226 and R227) and fed through isolation resistors R224 and R225 to the AVC diode plate. This voltage causes the diode to conduct under no signal conditions, thus preventing AVC action. Signal or noise voltage taken from the detector anode through isolation resistor R222 will appear as a negative DC voltage at the diode plate. When this negative voltage becomes slightly greater than the positive DC voltage from the divider, the diode will be cut off and a negative DC bias proportional to noise or signal intensity will appear on the AVC bus, thus reducing the over-all receiver gain. This system of AVC holds the detector output constant within 8 db between 50 microvolts and 50 millivolts antenna input, and within 12 db between 15 microvolts and 50 millivolts antenna input. C220 and C221 serve respectively to remove unwanted high- and low-frequency AC components from the AVC line.

Audio voltage from the second detector is fed through coupling capacitor C224 and stabilizing resistor R231 to the control grid of audio amplifier V205. This tube utilizes a combination of fixed bias and audio AVC as described above. DC plate voltage is applied through the primary of output transformer T201 and screen voltage is applied through dropping resistor R233, bypassed for audio by C234. The primary of T201 acts as plate load for this stage, the secondary is connected in series with the side-tone winding of modulator output transformer T203, and the combination of these two windings offers the required 300-ohm impedance to the headphones. Up to 25 milliwatts of audio output is available at less than 5% over-all harmonic distortion, while the over-all audio response is flat within ±4 db over the 400—4000-cycle range.

10. ANTENNAS.

a. GENERAL.

Two different antennas are supplied with the MAY Equipment. These are the whip antenna and Discone Antenna AS-408/U. Each of these is treated separately below.

b. WHIP ANTENNA.

The whip antenna is a simple telescopic rod which screws directly to the front panel coaxial antenna connector; it functions as a grounded quarter-wave antenna and its radiation is vertically polarized. To secure optimum performance, this antenna must be adjusted in length to correspond with channel frequency. For practical purposes, one of three positions — fully closed, half extended, or fully extended — will suffice for the high, middle, and low frequency sections respectively of the 225—390-mc band. It is expected that the whip antenna will be employed only to provide communication while the set is being carried.

c. DISCONE ANTENNA.

The Discone Antenna (figure 1-4) is a broadband device requiring no adjustment over the 225—390-mc frequency range. It possesses a standing-wave ratio (voltage) of less than 1.5-to-1 over this entire range and has a nominal impedance of 52 ohms.

This antenna may be considered as being equivalent to a biconical horn with an opening angle twice that of the discone. Furthermore, the biconical horn may be considered as being composed of a number of vee antennas, suitably arranged in a circular manner. In general, the power distribution from a vee antenna can be considered as the effect resulting from superposition of the radiated field waves from each side of the vee. This method of approach is also applicable to the discone. The radiation of the antenna is vertically polarized because the part of the field generated by the particular section which is looking straight at the point of reference will generate a purely vertically polarized wave. Although the sections perpendicular to the reference direction will generate horizontal components, such components will cancel out due to the symmetrical construction of the antenna.

Inasmuch as the Discone Antenna is considered equivalent to a biconical horn with an opening twice that of the discone, it must be assumed that the

field produced in the disc is equal to the field produced in the cone. This is accomplished by establishing the proper ratio between the area of the cone and the area of the disc (5.23-to-1). Changing the diameter of the disc will have a substantial effect on the radiation pattern of the antenna, although no important effect will be produced upon its wide-band characteristics. The impedance of the antenna is largely determined by the distance between the top of the cone and the disc.

The Discone Antenna supplied with the MAY Equipment is also applicable to other communications equipment operating in the 225—390-mc range and employing a 52-ohm antenna feed, provided that the transmitter peak power output of such equipment does not exceed 350 watts.

Notes

SECTION 3
INSTALLATION

1. METHOD OF PACKING.

The complete MAY Equipment except the spare parts box* is packed in Carrying Case CRP-10551. The arrangement of the various units in this case is as shown in figure 3-1.

CAUTION

Extreme care should be exercised in uncrating the Carrying Case to prevent scratching or other damage. Always use a nailpuller rather than a hammer; do not attempt to pry the case open with a crowbar.

All tubes and the vibrator are already mounted in their proper sockets within the Transmitter-Receiver. Crystals are installed for four channels as specified by the Government (table 3-1), and the equipment is correctly tuned for operation on these channels.

The equipment battery and the two spare batteries (Willard Type ER-40-6, Navy Stock No. N17-B-69245-7480), partly charged but dry, are packed in their storage compartments within the Transmitter-Receiver and Auxiliary Battery Pack.

The headset and microphone assembly with extension cords, the whip antenna, and the 10-foot length of RG-58/U antenna cable are packed in their field transport positions beneath the Transmitter-Receiver cover (see figure 4-2).

Two Discone Antennas (one of which is a spare) are also packed in the Carrying Case as is the canvas bag containing the 60-foot RG-8/U antenna cable. A metal coil box contains the additional coils necessary for operation on all channels in the 225—390-mc frequency range. Space is also provided for a metal crystal box of the same size (CY-591/U, Government furnished) which is to contain 194 Navy Type CR-9/U quartz crystals in addition to the eight mounted in the Transmitter-Receiver. As shipped from the factory, two cardboard boxes each containing six crystals are packed in this space together with appropriate padding.

A canvas tool kit containing the special tools required for tuning and maintenance is affixed to the right front of the Carrying Case.

When unpacking the equipment for the first time, pay particular attention to the manner in which each component is stowed so that the Carrying Case may be repacked properly. Also refer to figure 3-1 (duplicated inside the cover of the Carrying Case) for an illustration of correct packing.

*Supplied on contract NObsr-43097 only.

2. BATTERY PREPARATION.

After unpacking the equipment it will be necessary to add electrolyte to each of the three batteries and to give each a booster charge. For instructions on removing and replacing the batteries in their storage compartments within the Transmitter-Receiver and Auxiliary Battery Pack see Section 5, paragraph 3*d*. Instructions for initial filling and charging are given below. These instructions will also be found on a tag affixed to the top of each new battery (see figure 3-2).

a. INITIAL FILLING.

(1) Remove and destroy the seal over the vent openings, remove the instruction tag taped across the red filler plug, and remove the plugs from the top of each cell (see figure 3-2).

(2) Fill each cell to approximately 1/8 in. above the level line (figure 3-2) with sulphuric acid of 1.280 specific gravity at 26.7°C (80°F).

(3) Allow the battery to stand for one to four hours. If the electrolyte is low at the end of this period, restore it to the level line by adding acid.

b. INITIAL CHARGING.

(1) With the filler plugs removed, charge the battery for approximately 20 hours at a 4-amp rate. See Section 5, paragraph 3*e*. for charging procedure.

(2) Two hours after completing the initial charge, adjust the electrolyte to the level line. If the electrolyte level is too high, remove enough to bring it down to the line. If the level is too low, bring it up to the line by adding pure water.

(3) Replace the filler plugs. The battery is now ready for use.

3. OPERATIONAL CHECK.

To check out a new equipment, proceed as follows (see figure 4-4):

a. Remove the Transmitter-Receiver control panel cover by loosening the knurled thumbscrew at each end.

To start these screws, use the special screwdriver (H401, figure 5-1) clipped to the bottom of the Transmitter-Receiver, or a coin if more convenient.

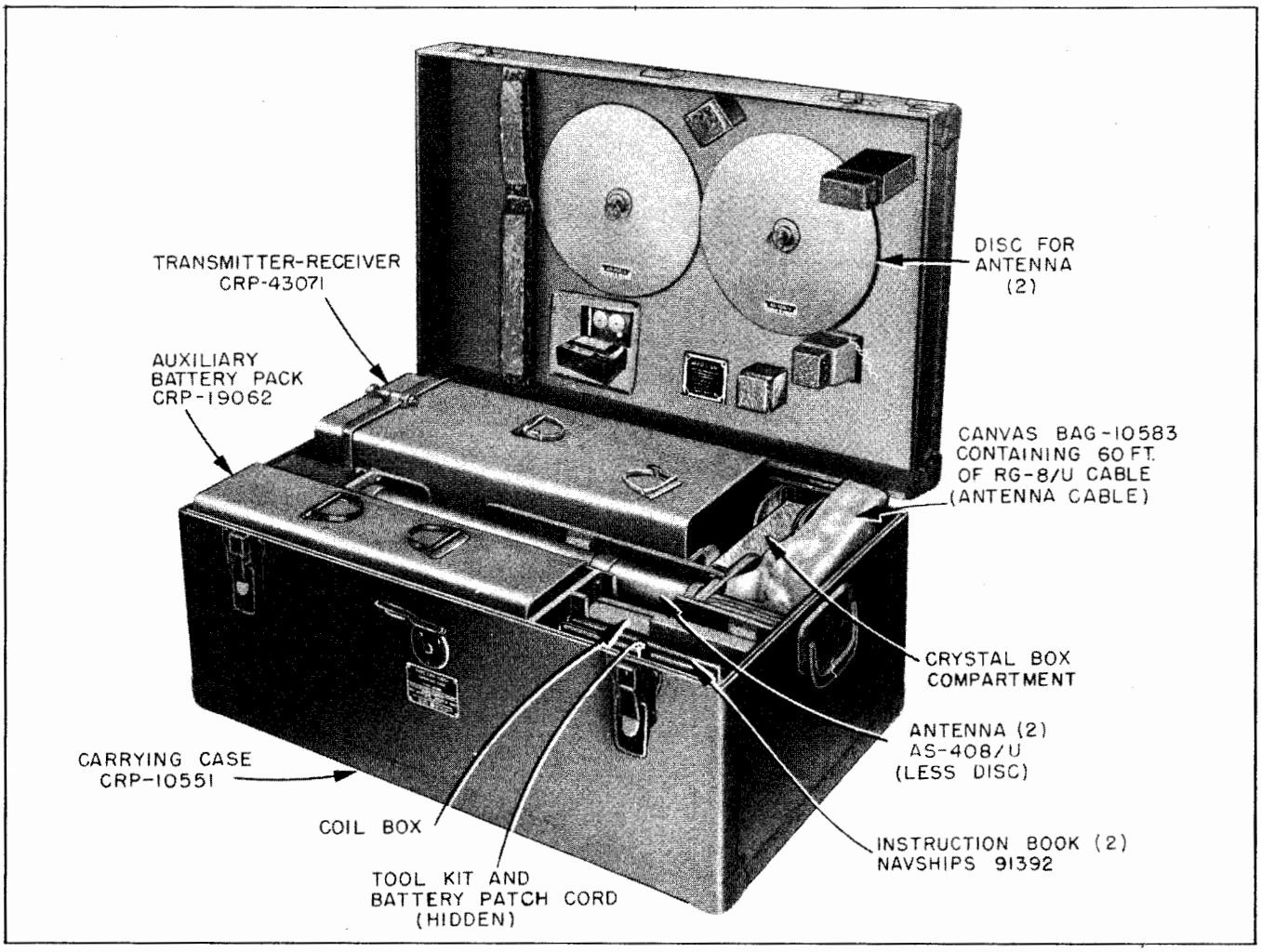


Figure 3-1.—Method of Packing Carrying Case CRP-10551.

b. Remove the whip antenna from inside the cover and screw it directly to the control panel ANT. Connector.

c. Put on the headset and lip microphone as instructed in Section 4, paragraph 3*a.* (3), and plug the headset and microphone extension cords into either set of front panel jacks.

d. Snap the POWER Switch to "Stand-by" and read battery voltage on the CARRIER INDICATOR Meter. A fully charged battery should show a reading of 6.1 to 6.3 volts.

e. After approximately a one minute warmup period, snap the POWER Switch to "On" and adjust the VOLUME Control until background noise is heard. The receiver is now in operation. Turn the CHANNEL Selector to all four channels successively and check for the presence of background noise on each.

f. Check transmitter operation on each channel by first adjusting the whip antenna as stipulated in table 3-1, and then depress the push-to-talk button and speak in a normal voice. The CARRIER INDICATOR Meter should read between "1" and "3" each time, and should show a slight flicker with speech. A slight flicker should also occur when the TONE KEY is operated with the push-to-talk button depressed.

Note

A more positive check for proper operation is to establish actual communication with a second MAY or other equipment capable of operation over the MAY frequency range. Use this method whenever possible.

g. Upon completion of the operational check, turn off the POWER Switch, disconnect the whip antenna and headset, and stow all accessories in their proper places within the control panel well and cover (see

figure 4-2). Replace the control panel cover, taking up the thumbscrews with the special screwdriver until they are tight enough to insure a watertight seal.

CAUTION

Special screwdriver H401 (figure 5-1) is intentionally made fragile to prevent overtightening of the cover screws.

The equipment is now ready for field issue. Instructions for setting up the Transmitter-Receiver on other channels will be found in Section 7, paragraph 3.

TABLE 3-1. SPECIFIED CHANNEL FREQUENCIES

Channel Selector Position	*Channel Frequency (Mc)*	*Whip Antenna Adjustment*
1	250.6	Fully extended
2	285.0	Half extended
3	301.0	Half extended
4	346.6	Fully closed

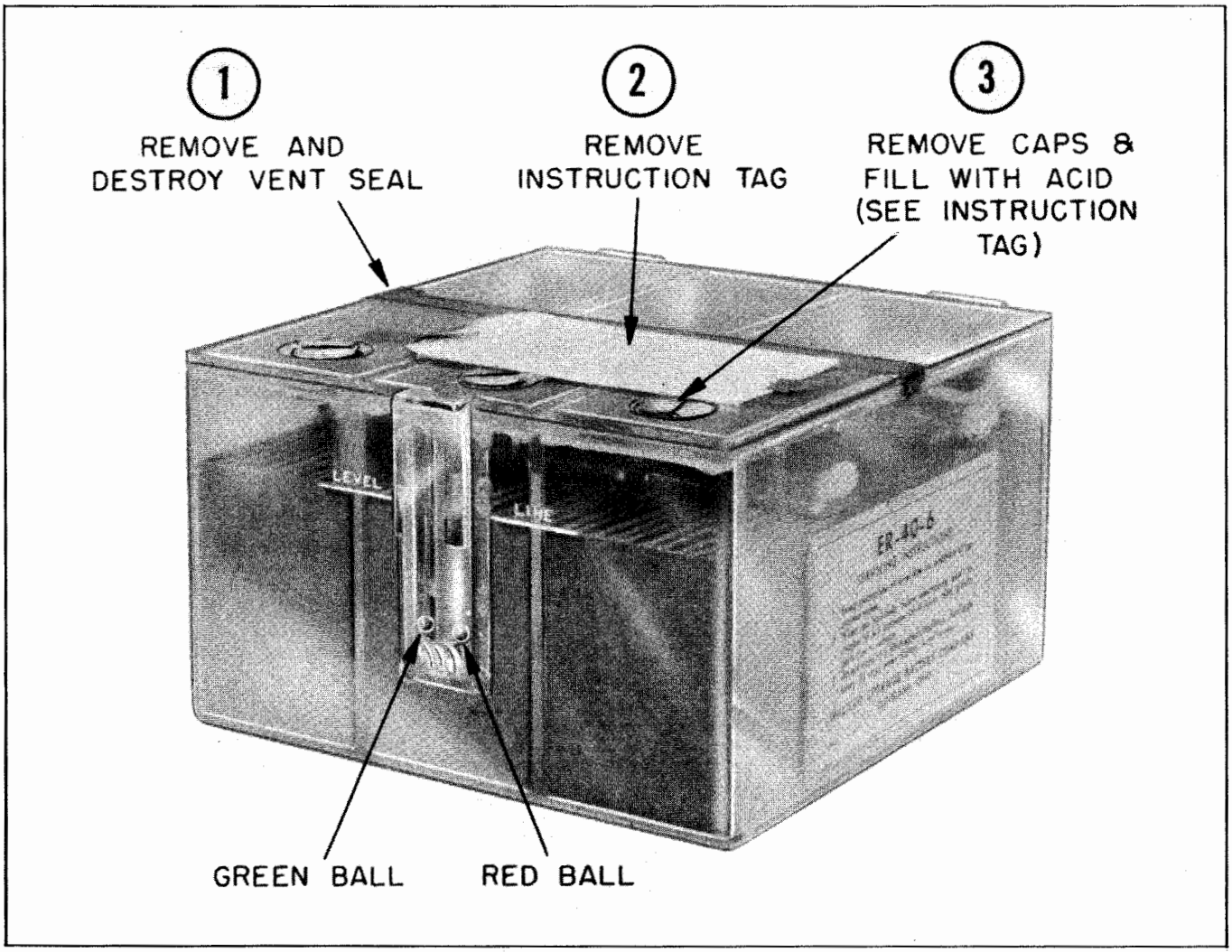
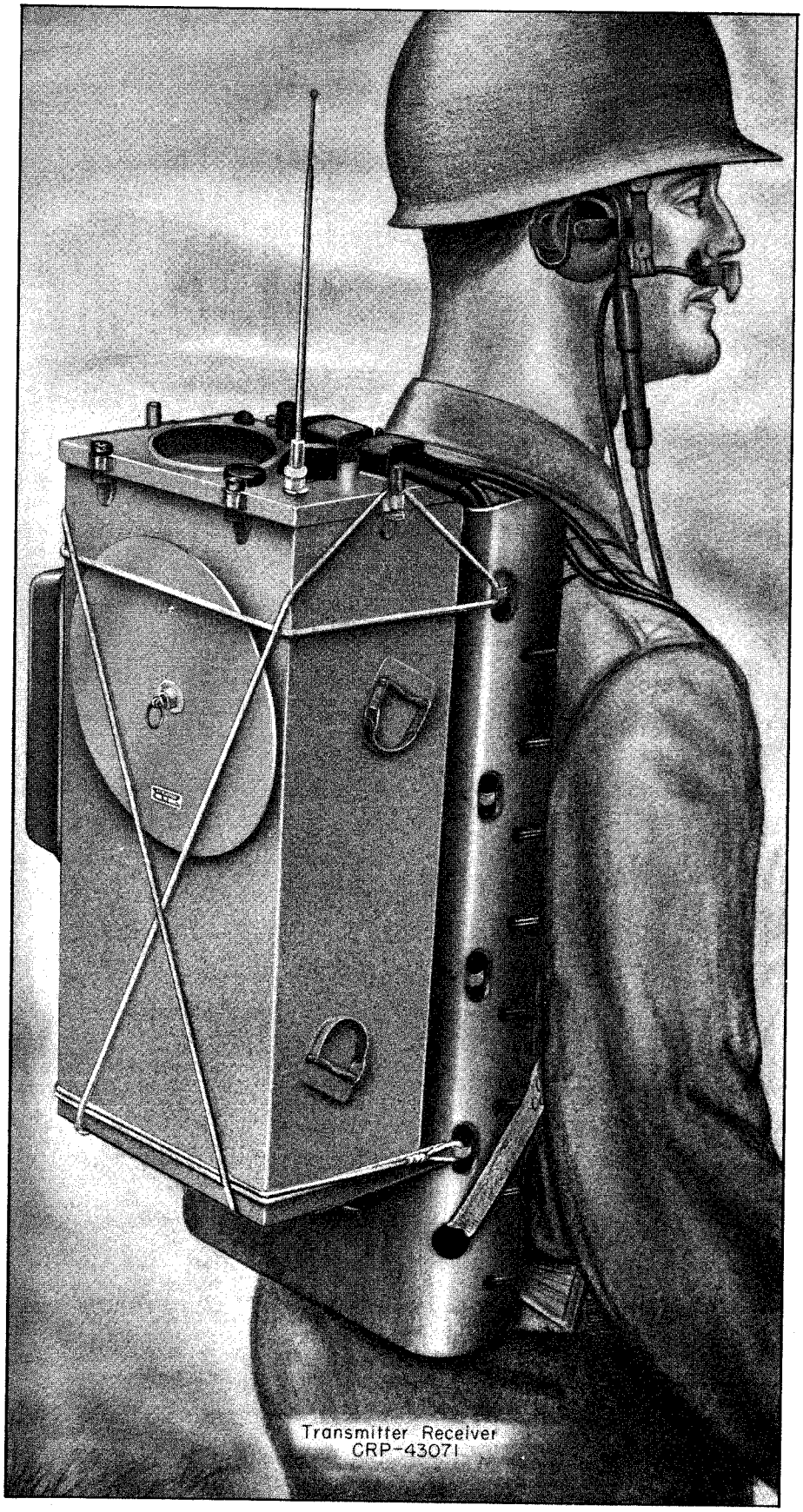
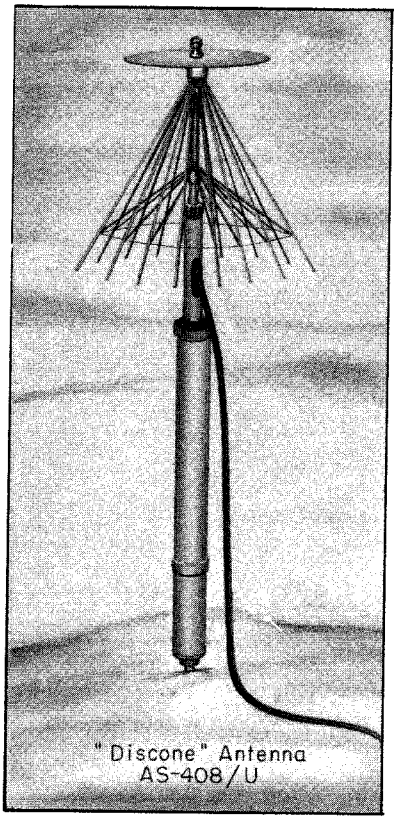


Figure 3-2.—Equipment Battery as Shipped from Factory.





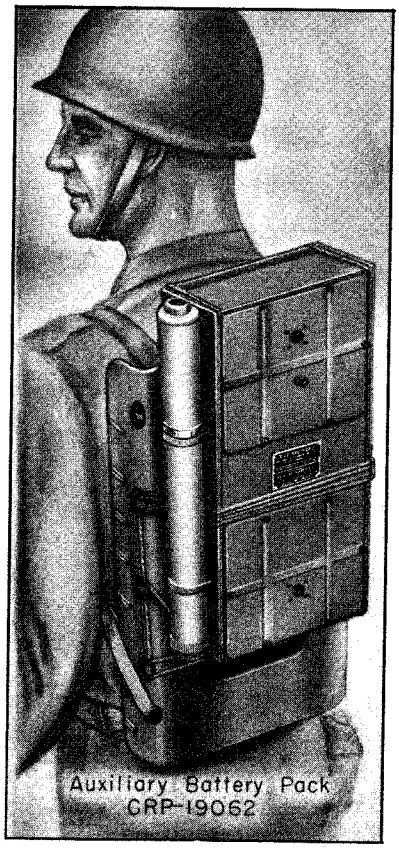


Figure 4-1.—Packboard Carry.

SECTION 4

OPERATION

1. GENERAL CONSIDERATIONS.

Since the MAY Equipment is designed to operate in the UHF region, a brief summary of the results to be expected at these frequencies is given below.

In general, reliable communication is insured over horizon distances plus approximately 10%, provided that there are no serious obstructions between the transmitting and receiving locations. Any increase in the unobstructed height above ground of either the transmitting or the receiving antenna will result in an increase in the effective horizon distance. Thus, it is apparent that the choice of an operating location will have considerable bearing on the quality of communication to be expected. Certain general rules can be laid down which, if followed, will insure optimum results under normal conditions. These are:

a. Choose an *elevated* antenna location whenever possible; avoid ravines, river beds, and tunnels.

b. Choose an *unobstructed* antenna location whenever possible; avoid steel bridges, steel-framed buildings, thick forests, and high hills in the transmission path.

c. If communication is unsatisfactory from a given location, move the antenna experimentally over a small area. A few feet may make a great difference.

d. If communication is unsatisfactory on voice (A3), MCW (A2) transmission will often be perfectly readable.

e. If communication is unsatisfactory when using the whip antenna, changing to the Discone Antenna will often provide readable signals.

2. FIELD TRANSPORT.

Field transport of the MAY Equipment is accomplished by means of two packboards (not supplied), and a canvas bag with shoulder strap which contains the 60-foot antenna cable.

Before lashing the Transmitter-Receiver and Auxiliary Battery Pack to the packboards, check each package for its full complement of accessories as follows:

a. Loosen the knurled screw at each end of the Transmitter-Receiver control panel cover with the special screwdriver (H401, figure 5-1) or a coin, remove the cover, and make sure that the whip antenna, the 10-foot antenna cable, and the headset-microphone assembly and extension cords are properly stowed within as illustrated in figure 4-2. Proper stowage is essential to prevent damage to the whip antenna if forced down on the headset-microphone assembly. Replace the cover and take up the screws firmly and evenly to insure a watertight seal.

CAUTION

The special screwdriver is intentionally made fragile to prevent overtightening of the cover screws.

b. Using the special screwdriver, loosen the six knurled screws at the bottom of the Transmitter-Receiver case and remove the battery compartment cover. Now check the state of charge and electrolyte level of the battery, as described in Section 5, paragraphs 5.*b.* and 5.*c.* Make sure that the battery is properly filled and fully charged; then replace the cover, taking up the screws firmly and evenly to insure a watertight seal.

c. Using the special screwdriver, remove each cover from the Auxiliary Battery Pack and similarly check the state of charge and electrolyte level of the two spare batteries (see figure 5-2). These batteries also should be properly filled and fully charged before entering the field.

d. Make sure that the spare vibrator and the three spare tubes (6AK5, 5656, and 1007) are properly stowed in the Auxiliary Battery Pack (see figure 5-2). Replace the covers and take up the screws firmly and evenly to insure a watertight seal.

e. Screw the disc for the Discone Antenna to the stud on the rear of the Transmitter-Receiver case or on the front of the Auxiliary Battery Pack and affix the Antenna itself to the side of the Transmitter-Receiver or Auxiliary Battery Pack by means of the spring clamps attached to the cases.

Note

Carrying the main assembly of the Discone Antenna on the Auxiliary Battery Pack and the disc on the Transmitter-Receiver case will provide for a nearly equal weight distribution (approximately 44 lb for the Transmitter-Receiver and approximately 42 lb for the Auxiliary Battery Pack) and both units will then float in fresh water. If both sections of the Discone Antenna are carried on the Auxiliary Battery Pack, this unit probably will not float in fresh water but may float in salt water. The Discone Antenna (less disc) weighs approximately 2-1/2 lb and the disc

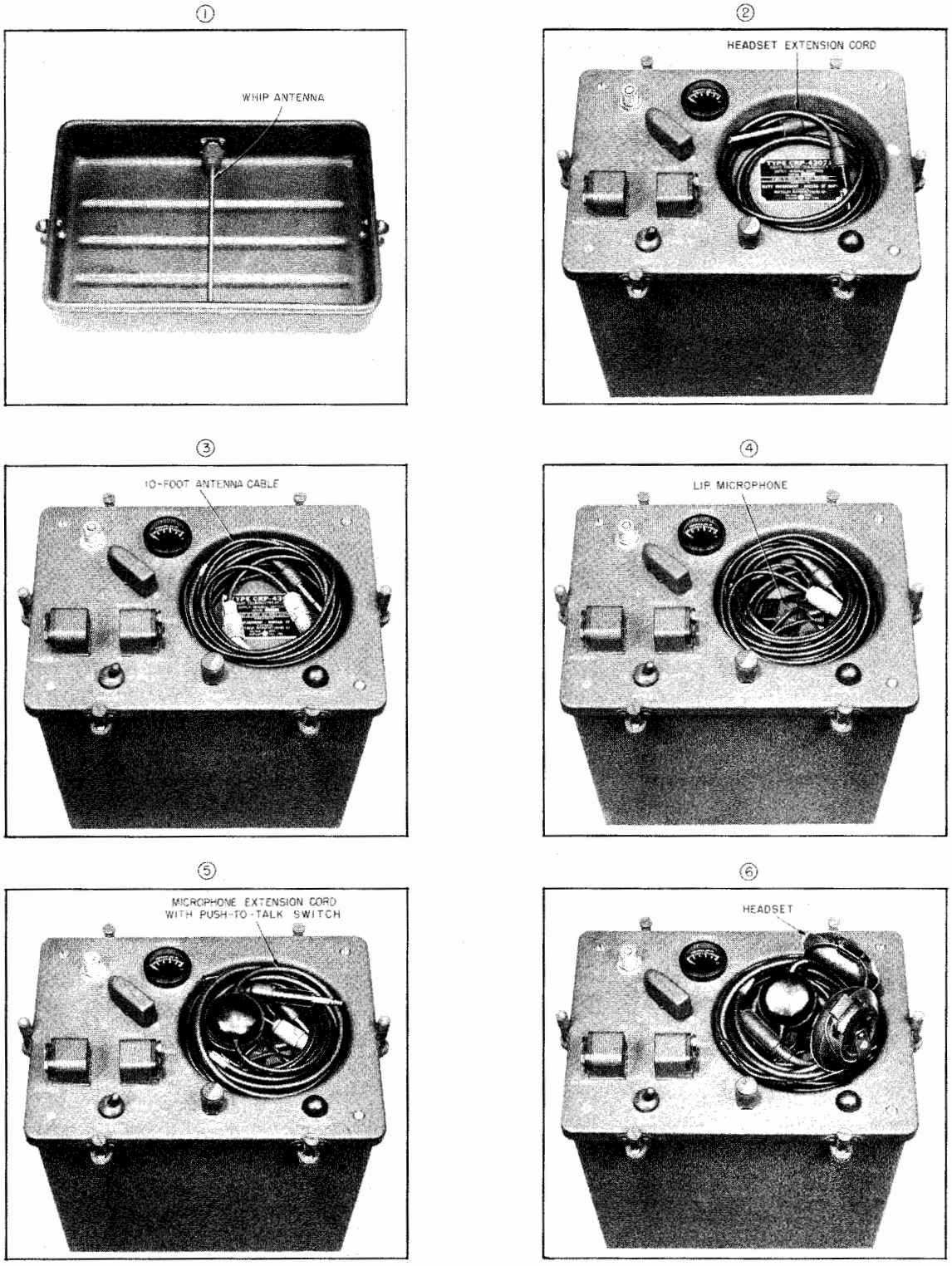


Figure 4-2.—Method of Packing Transmitter-Receiver Accessories.

approximately 1/2 lb. The canvas bag containing the 60-foot antenna cable weighs approximately 8 lb.

f. Make sure that the equipment has been set up for operation on the proper communication channels.

After making the above checks, lash each package to its packboard in the manner shown in figure 4-1. Note that the Transmitter-Receiver is lashed to its packboard with the ANT. Connector *away* from the wearer. The Auxiliary Battery Pack access panels are away from the wearer and unobstructed by the lashing.

3. PREPARATION FOR USE.

a. BASIC PROCEDURE.

The following basic procedure should be followed whenever the Transmitter-Receiver is prepared for use:

(1) Remove the top cover and fasten it to the side of the case (see figure 4-1). Two studs are provided to fit the knurled cover screws. If the whip antenna and/or the 10-foot antenna cable are not to be used, they should be stowed within the cover to prevent loss.

(2) Screw the Discone Antenna cable or the whip antenna itself to the control panel ANT. Connector. Refer to paragraphs *b.*, *c.*, *d.*, and *e.* immediately below for detailed antenna information.

(3) Remove the headset and microphone assembly from the control panel well and place the harness on the head as shown in figure 4-1. The headband should be so adjusted as to position the ear cushions in a manner that will seal the ears as well as possible against noise. The headset is adjusted by sliding the bracket elements up or down on the headband within the synthetic resin cover. The microphone assembly is worn with the microphone on the upper lip. The microphone is adjusted to the face by sliding the supporting cords within the metal loops on the snap fasteners until it is comfortably positioned (snugly but not too tightly) on the upper lip and so that the perforated grid is held closely to the mouth. The cord will slide easily through the snap fastener when the metal loops on the fastener are pressed into line by the fingers.

(4) Plug the headset and microphone extension cords into either set of control panel jacks. The Transmitter-Receiver is now ready for use.

b. USE IN TRANSPORT.

The whip antenna is screwed directly to the control panel ANT. Connector when the Transmitter-Receiver is to be used during packboard carry (see figure 4-1). All controls are accessible to the operator by reaching over the shoulder. The position of the CHANNEL Selector may easily be determined by touch. It will be necessary to adjust the length of the whip antenna to correspond to the channel in use as indicated in table 4-1 below. Note that there are three standard operating positions for this antenna: fully closed, half extended (as indicated by the etched mark on the telescopic section), and fully extended.

TABLE 4-1. ADJUSTMENT OF WHIP ANTENNA

Frequency Range (Mc)	*Antenna Position*
225—279.8	Fully extended
280—334.8	Half extended
335—390	Fully closed

c. ASSEMBLY OF DISCONE ANTENNA.

The Discone Antenna should always be employed when the Transmitter-Receiver is to be used in a fixed location. It will provide superior equipment performance and needs no adjustment of any kind. This Antenna is assembled as follows (see figure 4-3):

(1) Unscrew the disc from its carriage position and release the two spring clips securing the main tubular assembly to the case of the Auxiliary Battery Pack or Transmitter-Receiver.

(2) Hold the top knurled collar of the main tubular assembly with the right hand and turn the lower knurled collar counterclockwise with the left hand until the Antenna is free (figure 4-3A).

(3) Withdraw the Antenna part way, grasp the ribs with the right hand, and withdraw the rest of the way (figure 4-3B).

(4) Holding the Antenna at arms length with the left hand, release the right hand. The Antenna will now spring into the open position (figure 4-3C).

(5) Screw the disc to the top of the Antenna and unscrew the short tubular section from inside the skirt, thus exposing the coaxial cable connector. Attach either the 10-foot or 60-foot Antenna cable to this connector. The Antenna, as shown in figure 4-3D, is now ready for use when placed directly on the ground or suspended from a tree limb or other convenient support by means of the ring at the top of the disc.

(6) To provide a short 3/4" pipe-thread mounting, unscrew the stainless-steel spike at the large end of the short tube, remove the spike, pass the antenna cable through the small end of the tube bringing the Transmitter-Receiver connector out through the slot at the side, and screw the small end of the short tube to the knurled collar inside the Antenna skirt. The Antenna will now appear as shown in figure 4-3E.

(7) To provide an extended 3/4" pipe-thread mounting, the long carrying tube may now be screwed directly to the base of the short tube as shown in figure 4-3F.

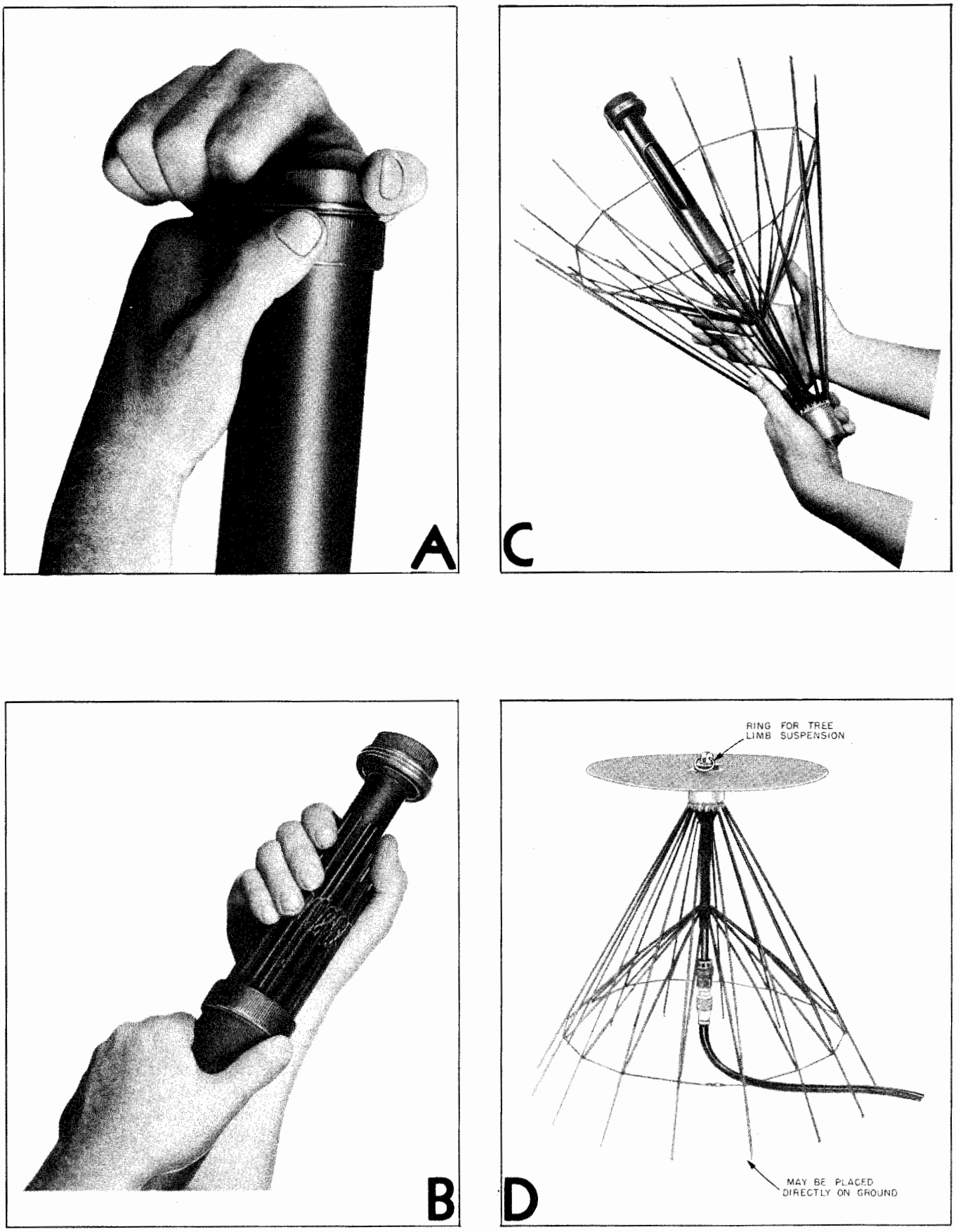
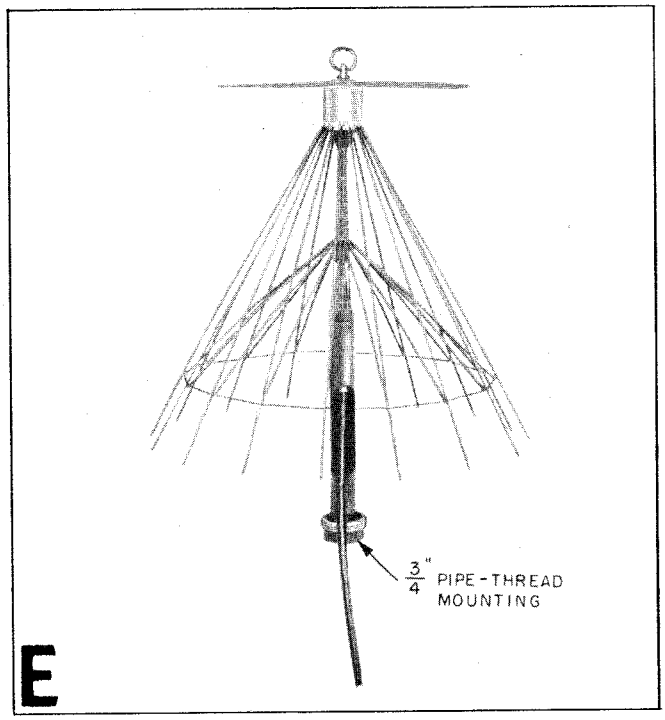
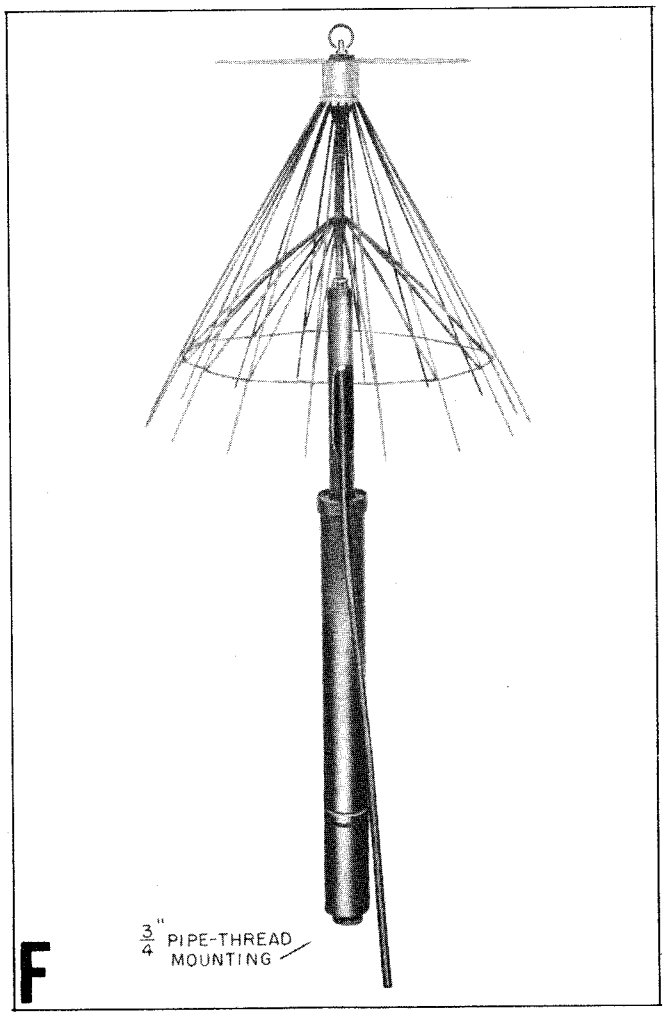


Figure 4-3.—Assembly of Discone Antenna.





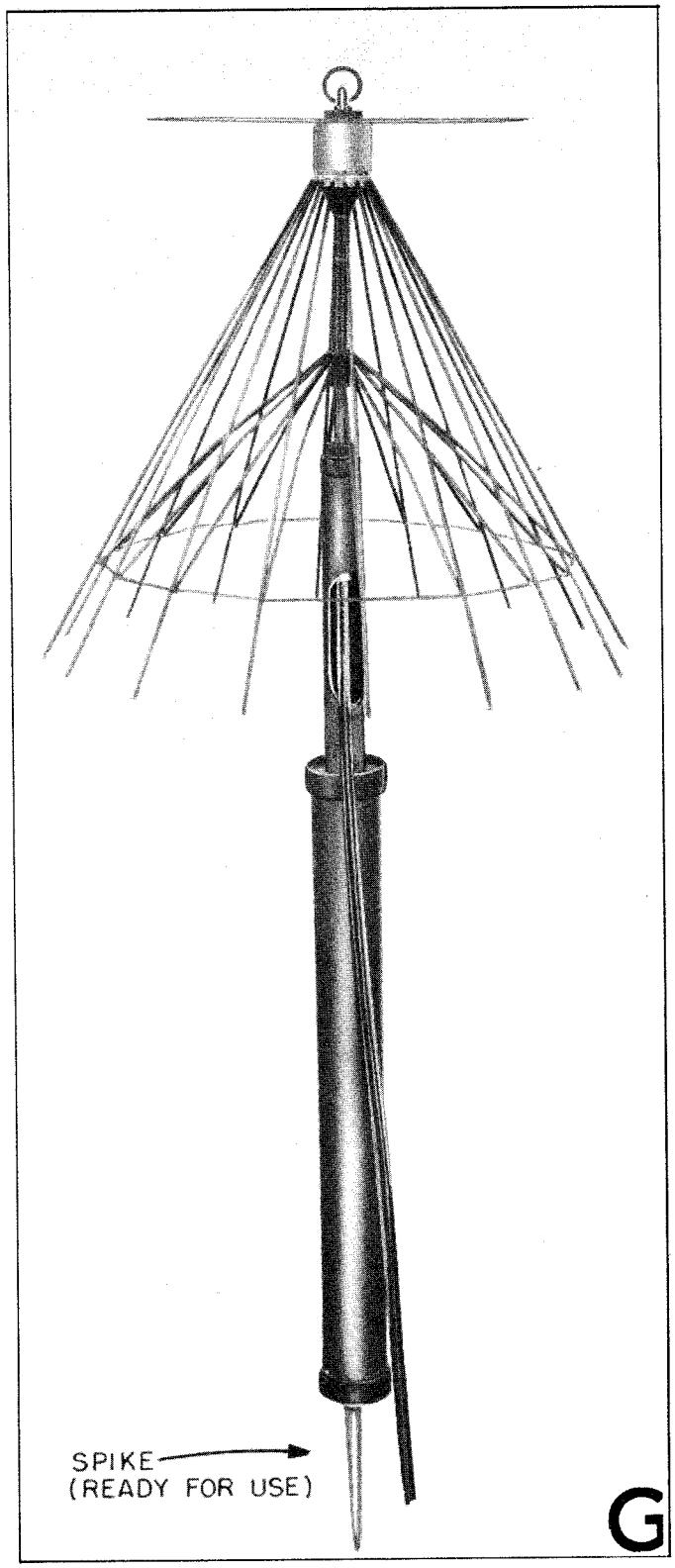


Figure 4-3.—Assembly of Discone Antenna, Cont.

(8) By screwing the spike to the bottom of the long carrying tube *before* attaching this tube to the Antenna, an extension is formed which may be plunged into the ground to provide a secure mounting base. The Antenna is screwed to this extension *after* the spike is plunged into the ground to preclude the possibility of bending the Antenna skirts; the Antenna now appears as shown in figure 4-3G.

WARNING

The Antenna extension with spike attached is a lethal weapon. Handle it with care to prevent injury to personnel.

d. USE IN FIXED LOCATIONS.

When used in a fixed location, the Transmitter-Receiver should be placed in an upright position to secure maximum battery life.

A concealed or inconspicuous operating location is usually selected for tactical reasons, but for optimum performance the Discone Antenna should be located as high and as in the clear as possible.

The 10-foot antenna cable is slightly more efficient than the 60-foot cable. Therefore, the 60-foot cable should be employed only when its use results in an improved antenna location (see paragraph 1. above).

When connecting either cable, make sure that the connectors at both ends are taken up tight. Loose antenna connections often cause noise and erratic performance.

e. VEHICULAR USE.

The Transmitter-Receiver may be installed in a truck, 1/4 ton, 4 x 4, or other vehicle. In such installations the Discone Antenna should be employed. The Antenna assembly pictured in figure 4-3F is particularly adapted to a vehicular installation, and the 10-foot antenna cable is long enough to permit locating the equipment at any convenient point in the vehicle.

CAUTION

Do not attempt to power the MAY Equipment from the vehicle battery unless it is definitely known to be of the 6-volt type *with a positive ground!* Use the self-contained MAY battery unless otherwise instructed.

4. OPERATING PROCEDURE

(see Figure 4-4).

The operating procedure for the MAY Equipment is the same regardless of the type of use. The procedure follows:

a. Choose the desired communications channel by means of the CHANNEL Selector.

CAUTION

Although the action of the CHANNEL Selector is positive, it is possible to stop its pointer between channel numbers. Always make sure that the pointer is properly on channel before attempting to operate the equipment.

b. If the whip antenna is in use, adjust it to the length prescribed for this channel (see paragraph 3.*b.* above). If the Discone Antenna is in use, no adjustment is required.

c. Snap the POWER Switch to "Stand-by." The CARRIER INDICATOR Meter will now read battery voltage; 6.1—6.3 volts represents full charge.

d. After approximately one minute, snap the POWER Switch to "On." The receiver will now be in operation and the VOLUME Control may be adjusted to a comfortable signal or background noise level.

e. To transmit on voice (A3), hold down the push-to-talk button and speak in a normal voice. Do not shout! The CARRIER INDICATOR Meter should read between "1" and "3" and a slight flicker should be noted with speech. Releasing the push-to-talk button automatically restores the equipment to the receive condition.

f. To transmit on MCW (A2) hold down the push-to-talk button and operate the TONE KEY. Release the button to receive.

5. OPERATING PRECAUTIONS.

a. BATTERY LIFE.

The normal operating life for a single battery at a temperature of 26.7°C (80°F) is four hours per charge when alternating five minutes on transmit, fifteen minutes on receive. Battery life will not be appreciably affected by higher operating temperatures, but a decided reduction will be experienced in subfreezing weather. For instance, at -17.8°C (0°F), battery life will be reduced by more than 40% and at -40°C (-40°F), by approximately 70% (see figure 4-5). In terms of battery drain, one minute on transmit is roughly equivalent to two minutes on receive or four minutes on stand-by. Since conserving battery life is of vital importance in field operation, the following precautions should be scrupulously observed:

(1) Never leave the POWER Switch in the "On" position unless the equipment is actually in use.

(2) Never leave the POWER Switch in the "Stand-By" position unless the ability to transmit or receive instantaneously is important. It only takes about one minute for the equipment to warm up from a cold start.

(3) Be brief. Keep all transmissions short and to the point.

(4) Choose the Antenna site with care to insure strong signals, thus minimizing the need for repeat transmissions (see paragraph 1. above).

b. BATTERY REPLACEMENT.

The Transmitter-Receiver battery should be replaced with a spare from the Auxiliary Battery Pack as soon as its voltage, as read on the CARRIER INDICATOR Meter (with the POWER Switch in the "Stand-by" position), is 5.7 volts or less. Reliable communication cannot be achieved with an exhausted battery, and to continue operation under these conditions will reduce the service life of the battery. The procedure for battery replacement, charging, and maintenance will be found in Section 5.

c. PHYSICAL ABUSE.

Although the MAY Equipment is designed to withstand the normal rigors of combat service, it should never be unnecessarily abused. The following precautions especially should always be kept in mind.

(1) When traveling through thick underbrush with the whip antenna in place, be careful it does not strike heavy branches which might inflict damage.

(2) Be careful not to bend the ribs of the Discone Antenna. Bent ribs must be straightened before attempting to stow the Antenna in its tube.

(3) Before undertaking amphibious operations, make sure that all gasketed panels and covers are tight enough to insure a waterproof seal.

CAUTION

If water should ever enter the equipment, open the case and dry the interior thoroughly with a soft cloth before attempting operation. Exposure of the interior to direct sunlight will also assist in drying.

(4) Discharged batteries are susceptible to freezing. Hence they should never be exposed to subfreezing temperatures any longer than necessary. Recharge at the first opportunity.

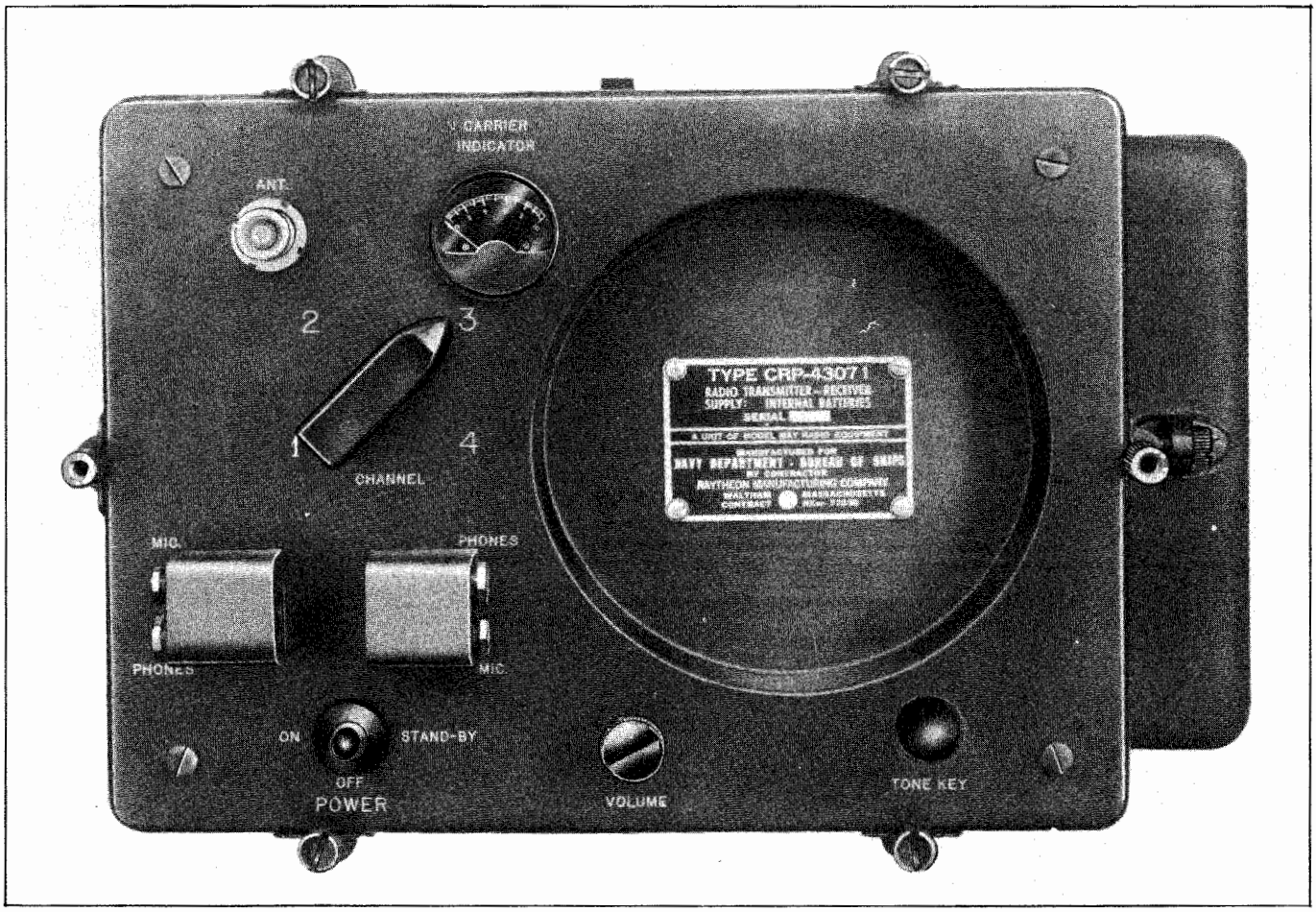


Figure 4-4.—Operating Controls.

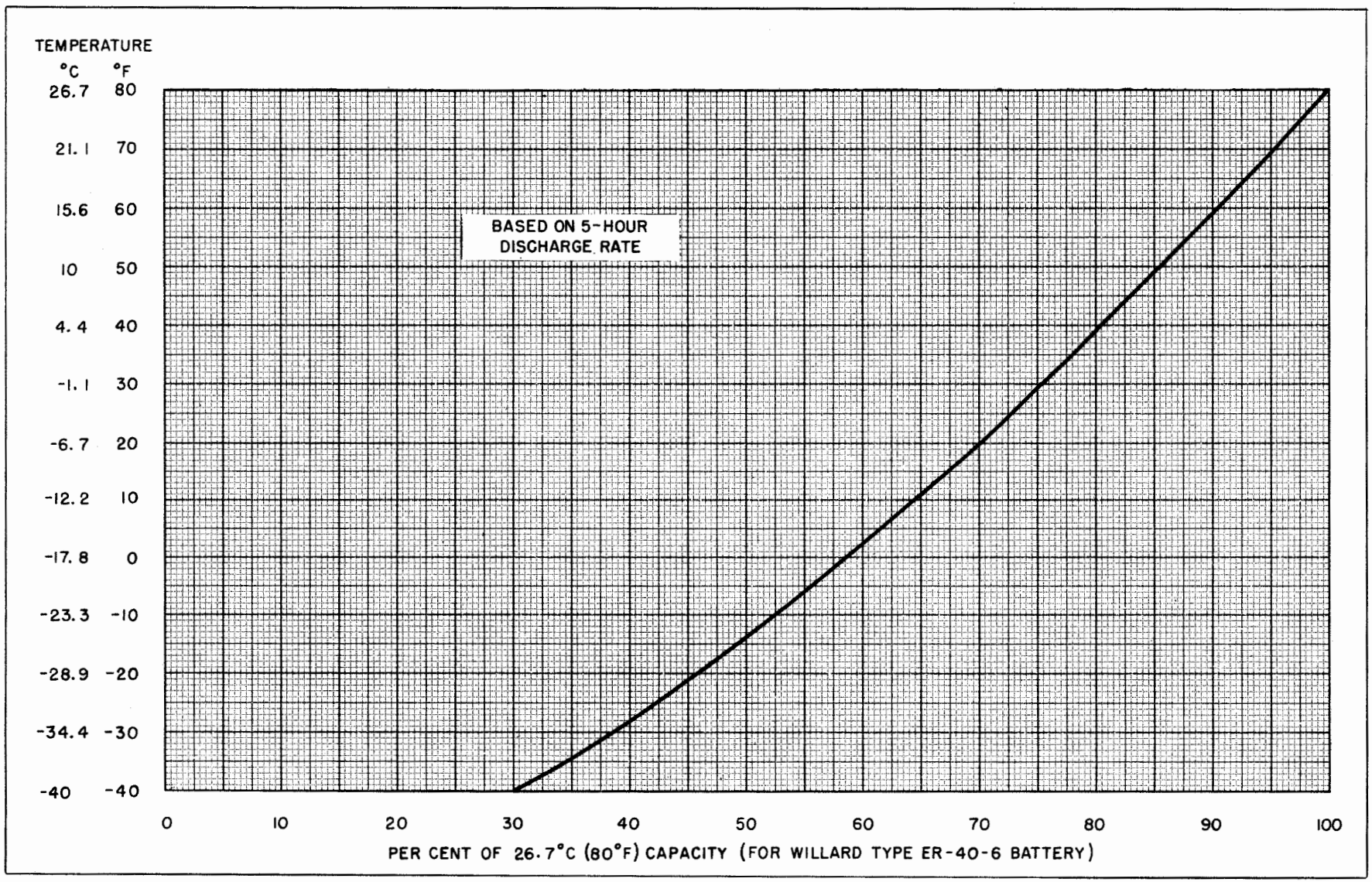


Figure 4-5.—Graph of Battery Life vs Temperature.

SECTION 5
OPERATOR'S MAINTENANCE

1. GENERAL.

The purpose of this section is to instruct a non-technical operator in field maintenance techniques applicable to the MAY Equipment. Included are instructions for routine equipment checks, battery replacement, battery charging, removal of the Transmitter-Receiver from its case, fuse replacement, tube replacement, vibrator replacement, and care of the headset and microphone assembly. No attempt is made to cover any maintenance of a complicated nature, or one requiring special tools or equipment.

2. ROUTINE CHECKS.

Certain routine checks of equipment operation should be made at the commencement of each period of field use and thence hourly during operation, or weekly (see *Table 5-1, Routine Check Chart).*

3. BATTERY MAINTENANCE.

a. GENERAL.

As the condition of the battery governs the operational characteristics of both the receiver and the transmitter, it is essential that a proper state of charge be maintained at all times and that the electrolyte be maintained at the level line.

A fully charged battery will provide approximately four hours of operation when alternating five minutes on transmit and 15 minutes on receive. Thus, it is always desirable to start any extended period of operation with a freshly charged battery in the Transmitter-Receiver.

If the equipment is permitted to stand idle for an extended period of time, the battery will gradually lose its charge even though no power is being used. All batteries should be recharged after 30 days of shelf life.

The following precautions issued by the battery manufacturer appear on the side of each battery:

(1) Keep electrolyte at level line by addition of pure water.
(2) When red ball sinks below electrolyte level, recharge at 4.0 amp for 4 hours after gravity balls rise to surface.
(3) Do not store in a discharged condition. Recharge every 30 days when battery is not in use.

b. CHARGE INDICATION.

Either the terminal voltage of a battery or the specific gravity of its electrolyte will give an accurate indication of its state of charge.

(1) TERMINAL VOLTAGE.

In the MAY Equipment, battery terminal voltage may be read directly from the panel meter with the POWER Switch in the "Stand-by" position. It is also possible to read battery voltage when receiving, although such reading may not be quite as accurate as those taken on stand-by. A meter reading of 6.1 volts indicates full charge, while a meter reading of 5.7 volts indicates the end of useful life. Assuming normal battery life to be four hours on a receive-transmit ratio of 3-to-1, intermediate readings between 5.7 and 6.1 volts may be used as an indication of the number of hours of useful battery life remaining.

CAUTION

Never assume that normal receiver operation is an indication of adequate battery voltage. When the battery is discharged beyond the point of transmitter failure, the receiver will often still operate satisfactorily.

(2) SPECIFIC GRAVITY.

A specific gravity indicator consisting of two colored balls floating within the electrolyte is an integral part of each battery. This indicator is visible only upon removing the Transmitter-Receiver battery from its compartment and thus has no function during operation. It is used as a state of charge indicator for spare batteries and as a charging indicator. When both balls are floating at the level line, the battery is fully charged; when the green ball drops below the level line, the battery is approximately half-charged; and when the red ball drops, the battery is discharged.

Note

After rough handling the balls will sometimes stick within the indicator. They may be dislodged by a sharp rap on the case.

c. ELECTROLYTE LEVEL.

It should never be necessary to add water to the Transmitter-Receiver battery during actual opera-

tion. But be sure that the electrolyte level of unused or spare batteries is maintained at the level line by adding pure water as necessary. The electrolyte level should be watched carefully when recharging.

CAUTION

Use only pure water when filling batteries to prevent undesired chemical reaction with subsequent curtailment of battery life.

d. BATTERY REPLACEMENT.

The Transmitter-Receiver battery must be replaced whenever its terminal voltage as read on the CARRIER INDICATOR Meter is 5.7 volts or less. The replacement procedure follows:

(1) Loosen the six screws securing the Transmitter-Receiver battery compartment cover with the special screwdriver (H401) clipped to the case, and remove the cover (see figure 5-1). Tilt the Transmitter-Receiver until the battery slides out into the hand, then remove the plug connections from the battery terminals by pulling them straight out. Do not pull on the wires but grasp the plugs themselves.

(2) Using the special screwdriver or a coin, loosen the six screws securing one of the Auxiliary Battery Pack compartment covers. Remove the cover and tilt the pack forward until the battery slides out into the hand (see figure 5-2).

(3) Insert the plug connections into the replacement battery being careful to observe the correct polarity. Both plugs will fit snugly when properly inserted. If polarity is reversed, one plug will fit loosely and the other will not fit at all.

(4) Insert the replacement battery in the Transmitter-Receiver compartment as shown in figure 5-1.

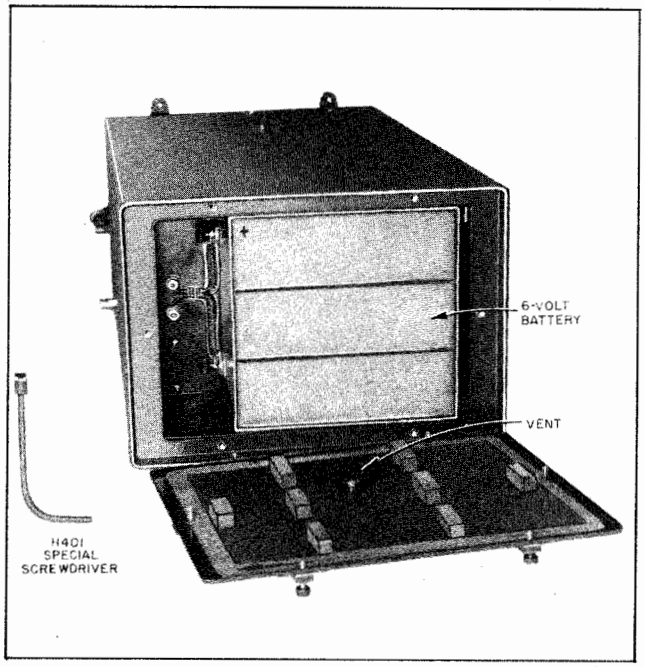


Figure 5-1.—Transmitter-Receiver Battery Compartment.

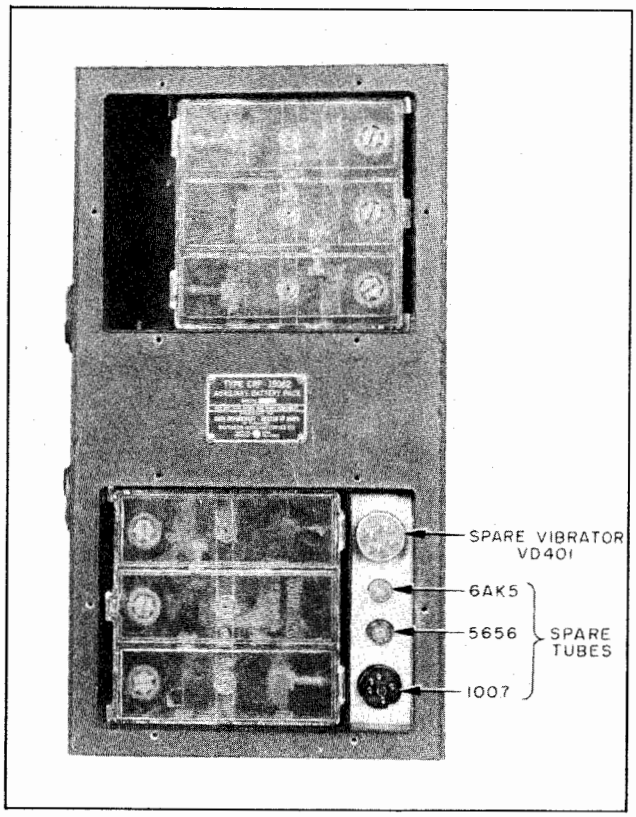


Figure 5-2.—Auxiliary Battery Pack Compartments.

Store the discharged battery in the Auxiliary Battery Pack until it can be recharged.

(5) Replace the battery compartment covers and tighten the screws evenly all around to form a waterproof seal.

CAUTION

The special panel screwdriver H401 is intentionally made fragile to prevent overtightening of the cover screws.

e. BATTERY CHARGING.

(1) WITH CHARGER.

Normally it is expected that exhausted batteries will be recharged upon return to a base. Suitable battery chargers are: Army Signal Corps Type RA-91, Marine Transportation Corps Allen Charger, and Battery Charger PP-367/U. Simply connect the exhausted battery to the charger in conventional fashion (plus to plus and minus to minus), then charge at a 4-ampere rate until four hours after both balls in the specific gravity indicator have risen to the surface of the electrolyte.

CAUTION

The battery filler caps must be off when charging, and the electrolyte must be maintained at the proper level by adding pure water as necessary. Decrease the charging rate upon evidence of gassing.

(2) ABOARD NAVAL VESSELS.

Aboard naval vessels, the regular battery-charging facilities or Power Supply PP-388/U may be used to recharge the batteries provided that the prescribed 4-ampere charging rate is not exceeded.

(3) FIELD CHARGING.

Should it be necessary to recharge a battery in the field where a battery charger is not available, it is permissible to do so by connecting the MAY battery across the 6-volt battery in a jeep or other vehicle (plus to plus and minus to minus). Avoid charging at too high a rate as evidenced by excessive gassing. Should excessive gassing occur, the charging rate may be reduced by employing a low value of series resistance (made up of a length of available wire) in the charging line. Do not attempt to recharge the MAY battery from a 12- or 24-volt vehicular battery without employing series resistance of 1.5 ohms at 50 watts or 4.5 ohms at 100 watts, respectively.

4. HEADSET AND MICROPHONE ASSEMBLY.

a. CARE AND MAINTENANCE.

The headset and microphone assembly is designed to withstand shock and vibration. Reasonable care should be exercised in handling, however, since abusive treatment can cause damage.

For proper functioning, the holes on the front cover of the headphones and the grid holes in the lower part of the microphone housing must be kept free from any obstruction. If dirt should become lodged in the holes it may be removed by gently swishing the unit in clean water. After all dirt has been washed away, the excess water should be shaken from the holes. Never push any type of probe or sharp instrument through the holes to clean them.

b. REPLACING HEADPHONES.

The headphones may be removed from the headband and cord by pulling back the ear cushions so as to give access to the headphone terminal screws (item 2, figure 5-3). When the two terminal screws are loosened the cord tips may be withdrawn. Then by removing the screw and lockwasher (item 3, figure 5-3), the headphone and ear cushion are free from the headband. The headphone may now be removed from the ear cushion for replacement.

c. REPLACING CORD AND HEADBAND COVERING.

Cord and Headband Covering (Navy Type 49503A) is removed from the headband by taking out both screws and lockwashers (item 1, figure 5-3) and then withdrawing the sliding members (item 4, figure 5-3) and stripping the cord and headband covering assembly from the metal headband (item 5, figure 5-3). The metal headband may now be inserted in a new cord and covering assembly. Reassemble in reverse order, the screws (item 1, figure 5-3) being threaded into the loose sleeve.

Because of the special treatment required to assemble the synthetic rubber jacket on the plug attached to the cord, replacement of the plug in the field should not be attempted except by replacing the complete Cord and Headband Covering (Navy Type 49503A). In an emergency, however, if the plug must be replaced or repaired, cut off the synthetic rubber jacket. The plug is then accessible for replacement or repair but is no longer waterproof.

d. REPLACING MICROPHONE AND FACE HARNESS.

A defective Microphone (Navy Type 51066) may be quickly replaced in the face harness by spreading the metal bracket (item 6, figure 5-4) slightly with the fingers, lifting the microphone out, and carefully inserting another.

If the wire in the Face Harness (Navy Type 10312) becomes defective, the complete face harness assembly must be replaced.

When replacing either the microphone or the face harness assembly, make sure that the contact surfaces on the back of the unit and the contact springs in the bracket of the face harness assembly (item 6, figure 5-3) are free from foreign material. The protective wax-like coating normally present on the contact springs and terminals provides moisture protection and should not be wiped off.

5. EMERGENCY MAINTENANCE.

Notice to Operators

Operators shall not perform any of the following emergency maintenance procedures without proper authorization.

All procedures grouped under this heading require removal of the Transmitter-Receiver from its case. To do this, using the special screwdriver (H401, figure 5-1), loosen the four knurled screws at the top and bottom of the control panel and pull the unit straight out. The battery connections are of the knife-switch type which automatically break as the unit is removed and make as it is replaced. Handle the Transmitter-Receiver with especial care when out of the case, and place it on a flat surface for maintenance work. When replacing the unit in its case, make sure that the knurled screws are taken up tight enough to make a waterproof seal.

CAUTION

The special screwdriver is intentionally made fragile to prevent overtightening of the cover screws (which might damage the case).

a. TROUBLE SHOOTING.

Before removing the Transmitter-Receiver from its case be sure to determine whether it is inoperative on both transmit and receive, inoperative on transmit only, or inoperative on receive only. Then

TABLE 5-1. ROUTINE CHECK CHART

WHAT TO CHECK	HOW TO CHECK	PRECAUTIONS
	HOURLY	
Equipment Battery Charge	Snap POWER Switch to "Stand-By" and read battery voltage on panel meter. Replace battery if reading is 5.7 or below.	Conserve battery life by keeping transmissions as short as possible.
	WEEKLY	
Spare Battery Charge	Read specific gravity indicator on batteries. Recharge if red ball is below electrolyte level or if 30 days have elapsed since last charge.	Do not permit batteries to stand in a discharged condition any longer than necessary, particularly in freezing weather.
Spare Battery Water Level	Add pure water if electrolyte level is below level line.	Keep filler caps tight and vents unobstructed.
Headset and Microphone	Examine for dirt in grid holes and rinse in clear water if holes are obstructed.	*Never pick at grid holes with a sharp instrument.*
	AFTER ROUGH HANDLING	
Control Panel Knurled Screws	Tighten evenly all around to insure watertightness.	Do not overtighten.
Headset and Microphone Plugs and Jacks	See that plugs are all the way in. If jacks become filled with dirt, flush with water.	Reinsert plugs in proper jacks if removed.

refer to table 5-2 and follow the appropriate procedure.

b. FUSE REPLACEMENT.

There is only one fuse (F201) in the MAY Equipment. This fuse is located as shown in figure 5-5 and may be removed by pulling straight out. Two spare fuses are mounted on the Transmitter-Receiver chassis as shown in figure 5-4; either one may be used as a replacement.

CAUTION

Should the initial replacement fuse blow, do not attempt further fuse replacement until the vibrator has also been replaced. Never replace F201 with a fuse of higher current rating.

c. VIBRATOR REPLACEMENT.

The Transmitter-Receiver vibrator (figure 5-4) may be easily removed by pulling straight out. A replacement vibrator is carried in the Auxiliary Battery Pack.

d. TUBE REPLACEMENT.

One spare tube of each field-replaceable type (1007, 5656, and 6AK5) is carried in the Auxiliary Battery Pack (see figure 5-2).

All field-replaceable tubes may be removed from their sockets by a straight, even pull, taking care not to bend the tube pins or strike the tube against some other component when withdrawing. Some miniature tubes are protected by shields which push down and turn to release; others (such as V102—V105) employ spring clamps which must be lifted from the top of the tube and swung aside. Refer to figures 5-4 and 5-5 for tube locations.

Replace one tube at a time as instructed on *Table 5-2, Emergency Check Chart,* reinserting the Transmitter-Receiver in its case after each replacement in order to check for normal operation. Always return the original tube to its own socket unless the tube is defective, since interchanging the various tubes of a given type within the set may have an adverse affect on performance.

TABLE 5-2. EMERGENCY CHECK CHART

For location of electron tubes, fuse, and vibrator see figures 5-4 and 5-5		
SYMPTOM	POSSIBLE CAUSE	REMEDY
UNSATISFACTORY COMMUNICATION WITH ANOTHER STATION	1. Low battery	1. Replace battery (see paragraph 3.*d.*)
	2. Poor antenna location	2. Move antenna to a less obstructed location
	3. Loose antenna connection	3. Tighten coaxial connectors
	4. Distance too great	4. Try MCW
RECEPTION NORMAL, BUT TRANSMITTER SEEMS INOPERATIVE	1. If No Reading on Carrier Indicator Meter	
	a. Low battery (will show slight meter reading)	*a.* Replace battery (see paragraph 3.*d.*)
	b. Push-to-talk circuit open	*b.* Reinsert microphone plug in panel jack; try other jack
	c. Tube V104 defective	*c.* Replace V104 (see paragraph 5.*d.*)
	d. Crystal not oscillating	*d.* Snap push-to-talk switch on and off several times; use another channel
	e. Defective meter rectifier	*e.* Will not affect operation, but should be reported at earliest practicable date
	2. If Meter Reading Normal, But No Flicker with Speech	
	a. Microphone circuit open	*a.* Reinsert microphone plug in panel jack; try other jack
	b. Microphone defective	*b.* Use MCW
	c. Tube V206 defective	*c.* Replace V206 (see paragraph 5.*d.*)
	3. If Meter Reading Perfectly Normal	
	a. Defective receiver at other station	*a.* Try contacting a second station
	b. Distance too great	*b.* Try improving antenna location; try MCW
TRANSMISSION NORMAL, BUT RECEIVER INOPERATIVE	1. Headphone plug disconnected	1. Reinsert plug in panel jack; try other jack
	2. Defective tube in Receiver	2. Replace V105, V201, V202, V203, V205 one by one until trouble is corrected (see paragraph 5.*d.*)
	3. Defective transmitter at other station	3. Suspect this if background noise normal; ask for test transmission from another station
	4. Crystal not oscillating	4. Snap Power Switch on and off several times; use another channel

TABLE 5-2. EMERGENCY CHECK CHART (Cont.)

SYMPTOM	POSSIBLE CAUSE	REMEDY
TRANSMITTER AND RECEIVER BOTH INOPERATIVE	1. Dead battery	1. Replace battery (see paragraph 3.*d.*)
	2. Blown fuse	2. Replace F201; if replacement blows also, replace vibrator (see paragraph 5.*b.*)
	3. Defective vibrator	3. Replace vibrator VD401 (see paragraph 5.c.)
	4. Defective rectifier tube	4. Replace V401 (see paragraph 5.*d.*)
	5. Other defective tube	5. Replace V101, V102, V103 one by one until trouble is corrected (see paragraph 5.*d.*)
	6. Water inside case	6. Remove Transmitter-Receiver from case and dry thoroughly; check for gasket leak. Report for overhaul at earliest practicable date.

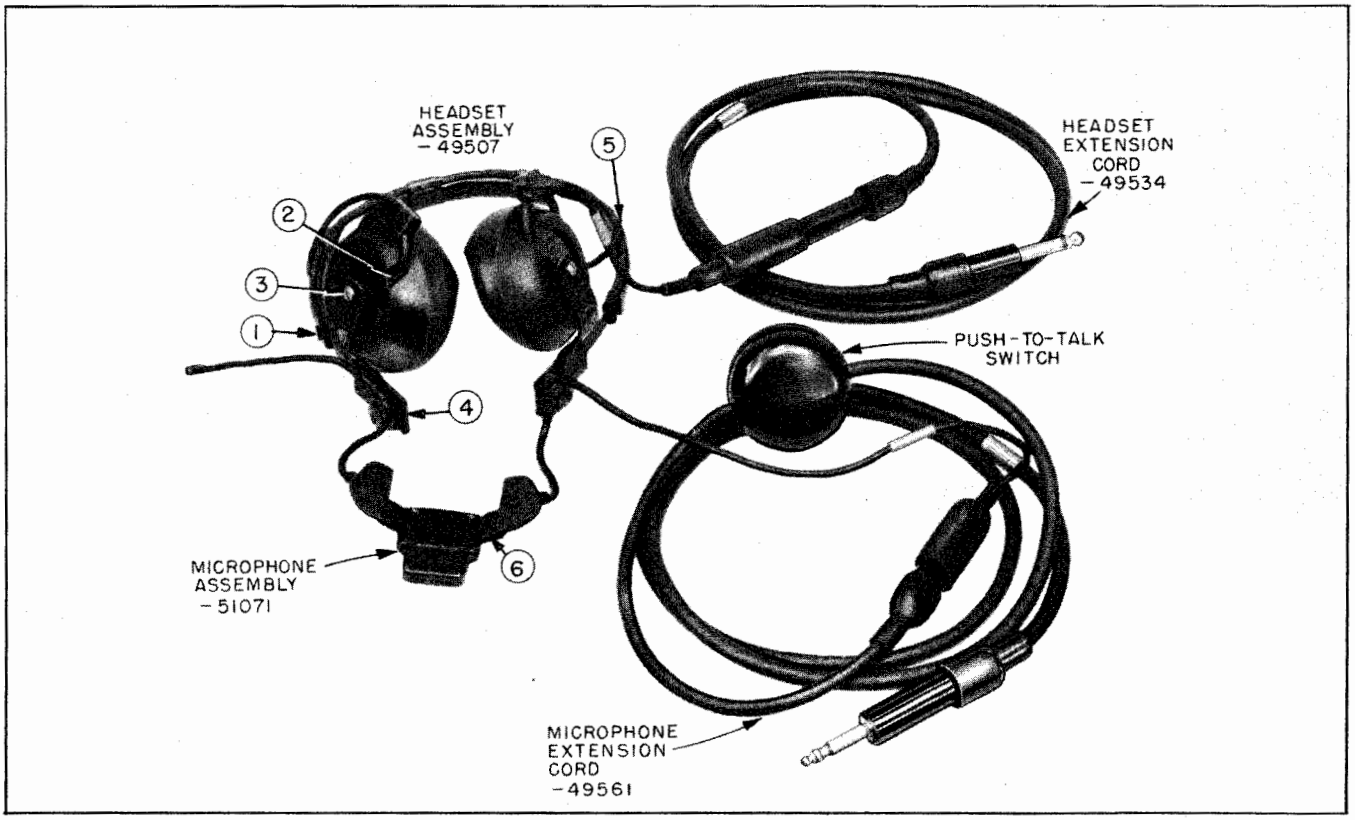


Figure 5-3.—Headset and Microphone Assemblies with Extension Cords.

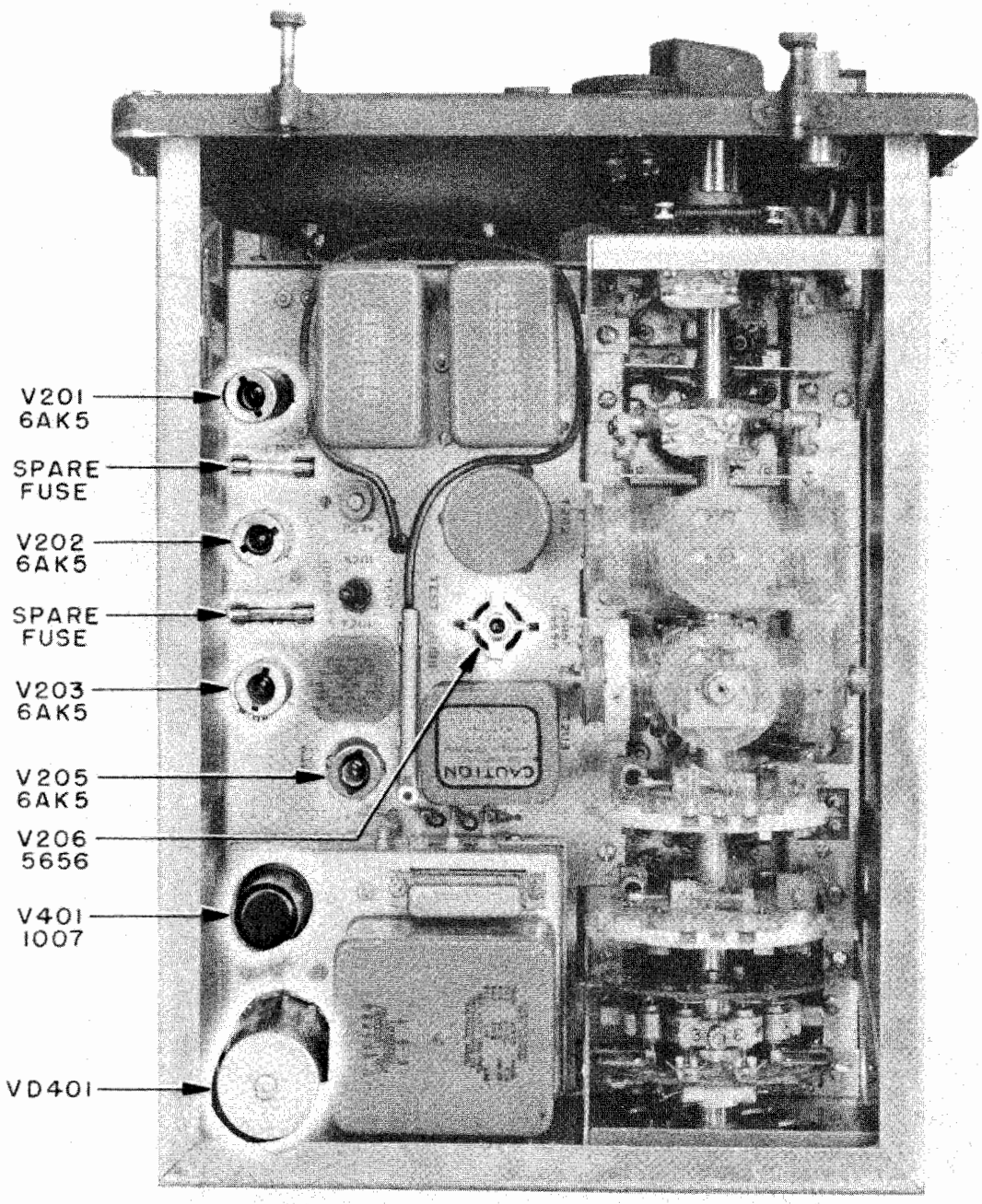


Figure 5-4.—Field Replaceable Tubes, Vibrator, and Spare Fuses.

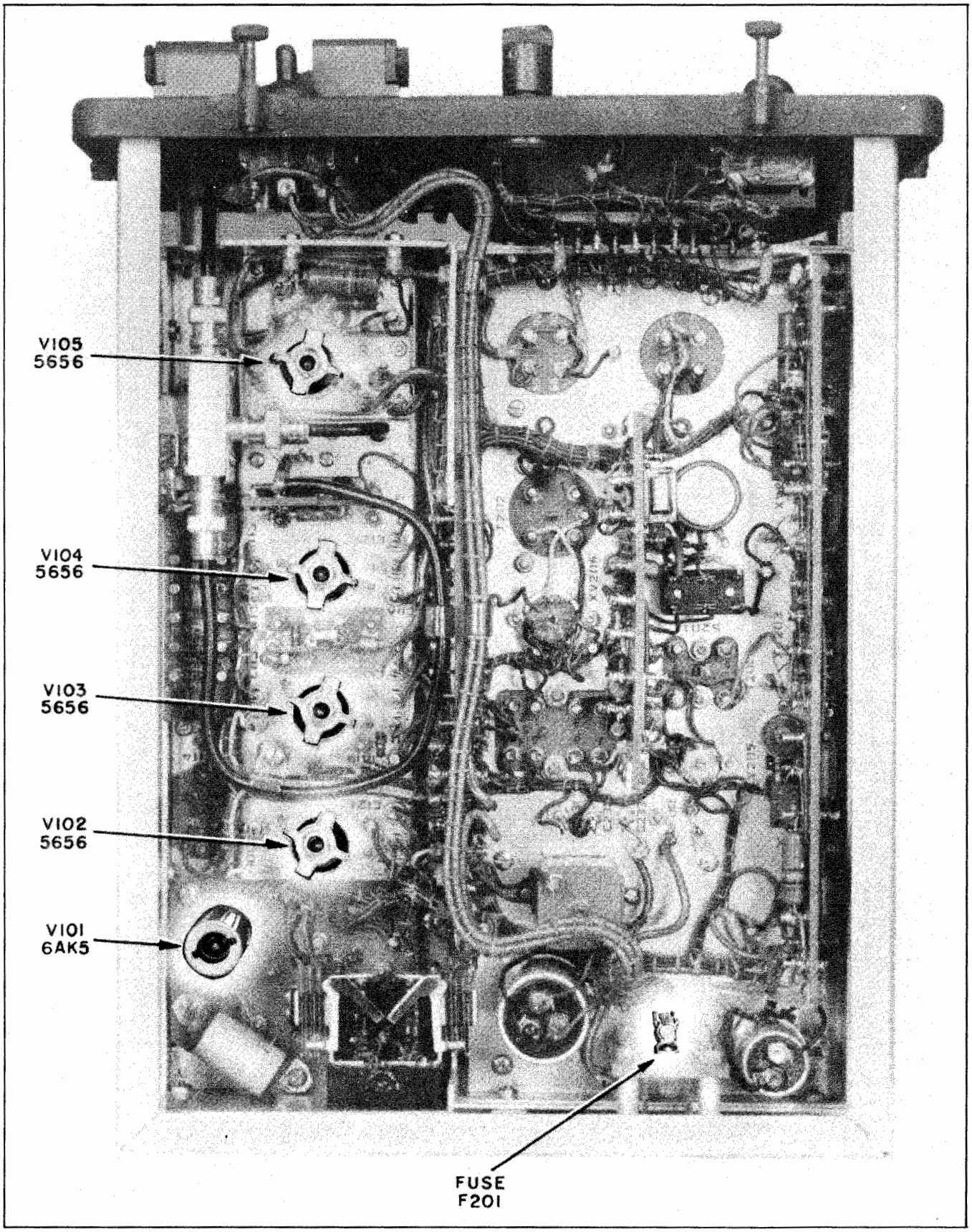


Figure 5-5.—Additional Field Replaceable Tubes and Equipment Fuse.

SECTION 6

PREVENTIVE MAINTENANCE

1. GENERAL.

This section includes maintenance procedures which should be performed periodically by technical personnel to insure normal operation of the equipment. Section 5 (paragraphs 1—4) also contains preventive maintenance information which should be read and applied by the technician as well as by the operator. Table 6-1, *Routine Maintenance Check Chart,* should be carefully followed.

Note

THE ATTENTION OF MAINTENANCE PERSONNEL IS INVITED TO THE REQUIREMENTS OF CHAPTER 67 OF THE "BUREAU OF SHIPS MANUAL," OF THE LATEST ISSUE.

2. SUBMERSION PRECAUTIONS.

All gaskets in the equipment should be inspected frequently for cuts and breaks that would allow the entrance of water into the equipment. All foreign matter such as dirt or twigs should be removed from the gaskets before closing the Transmitter-Receiver or Auxiliary Battery Pack case. As all gaskets take a certain amount of set, make sure the holding screws are tightened periodically to insure a watertight seal of each panel to its case. A replacement procedure for worn out gaskets will be found in Section 7, paragraph 7, of this manual.

3. RE-TROPICALIZATION.

a. GENERAL.

Components, panels, and subchassis of the MAY Equipment have been tropicalized where necessary

TABLE 6-1. ROUTINE MAINTENANCE CHECK CHART

(Refer also to Table 5-1)

CHECK FOR	REMEDY	PRECAUTIONS
	WEEKLY	
Loose tubes	Remove shields and reseat tubes.	Do not bend the tube pins.
	MONTHLY	
Rust or corrosion	Remove and repaint.	———
Fungus growth	Clean affected surfaces and re-tropicalize (see par. 3.)	Never ignore fungus growth.
Loose setscrews	Check all shaft couplings and tighten setscrews.	———
Antenna damage	Check ribs and skirt of discone for damage; repair if necessary.	———
	WHENEVER EQUIPMENT ISSUED	
Spare fuses, tubes, and vibrator	Replace any spares missing from Transmitter-Receiver or Auxiliary Battery Pack.	———
	AFTER EXPOSURE	
Moisture and water leakage	Dry with soft cloth and expose to sun. Replace defective gasket.	Never replace Transmitter-Receiver in its case when unit itself or inside of case is damp.

to prevent fungus accumulation in tropical climates. The frequency of re-tropicalization of equipment components depends on the degree of use and exposure to climatic conditions of temperature and humidity that induce fungus growth. In tropical climates, careful and frequent periodic inspection should be made to detect fungus growth and determine the need for re-tropicalization.

CAUTION

While servicing the equipment, care must be used not to destroy tropicalization seals. Scratches and abrasions that break the surface of the varnish will quickly be acted upon by moisture and fungus growth. Once inside a seal, the growth has a tendency to creep along under the surface of the protective film, thus rapidly spreading the damage.

b. PROCEDURE.

Re-tropicalization is accomplished by applying a fresh coat of approved varnish to tropicalized surfaces, as follows:

(1) Make sure that all parts are sufficiently free from dirt, oil, grease, or other contamination which might interfere with proper adhesion of the varnish.

CAUTION

Do not attempt to clean plastic parts with carbon tetrachloride as such parts are soluble in this cleaner and will be permanently damaged. Use only isopropyl alcohol (from medical stores) or ethylene glycol (Prestone), applying the fluid sparingly and wiping dry at once.
Also wipe dry all other equipment surfaces immediately after cleaning, regardless of the type of cleaner used, to prevent discoloration of symbol number stampings or deterioration of insulation.

(2) After cleaning, apply the varnish by means of a small brush. An even film should be applied, leaving a dried coating at least 0.002" thick.

PRECAUTIONS

Use only Navy approved varnish.

Do not use any material containing chlorinated phenol.

Any of the following varnishes covered by specification JAN-C-173 are acceptable:

Maas & Waldstein Co., Newark, New Jersey
Fungus Resistant Varnish —No. 522A or
—No. 522ASH
Wipe-On Corp., New York, New York
Bakelite Resin Varnish
Tuf-On —No. 74FM,
— No. 74S, or
— No. 74SM
Insl-X Co., Inc., Brooklyn, New York
Air-Dry Varnish —No. 27SA or
—No. 27A

4. LUBRICATION.

No lubrication is required during the service life of the MAY equipment.

Notes

FAILURE REPORTS

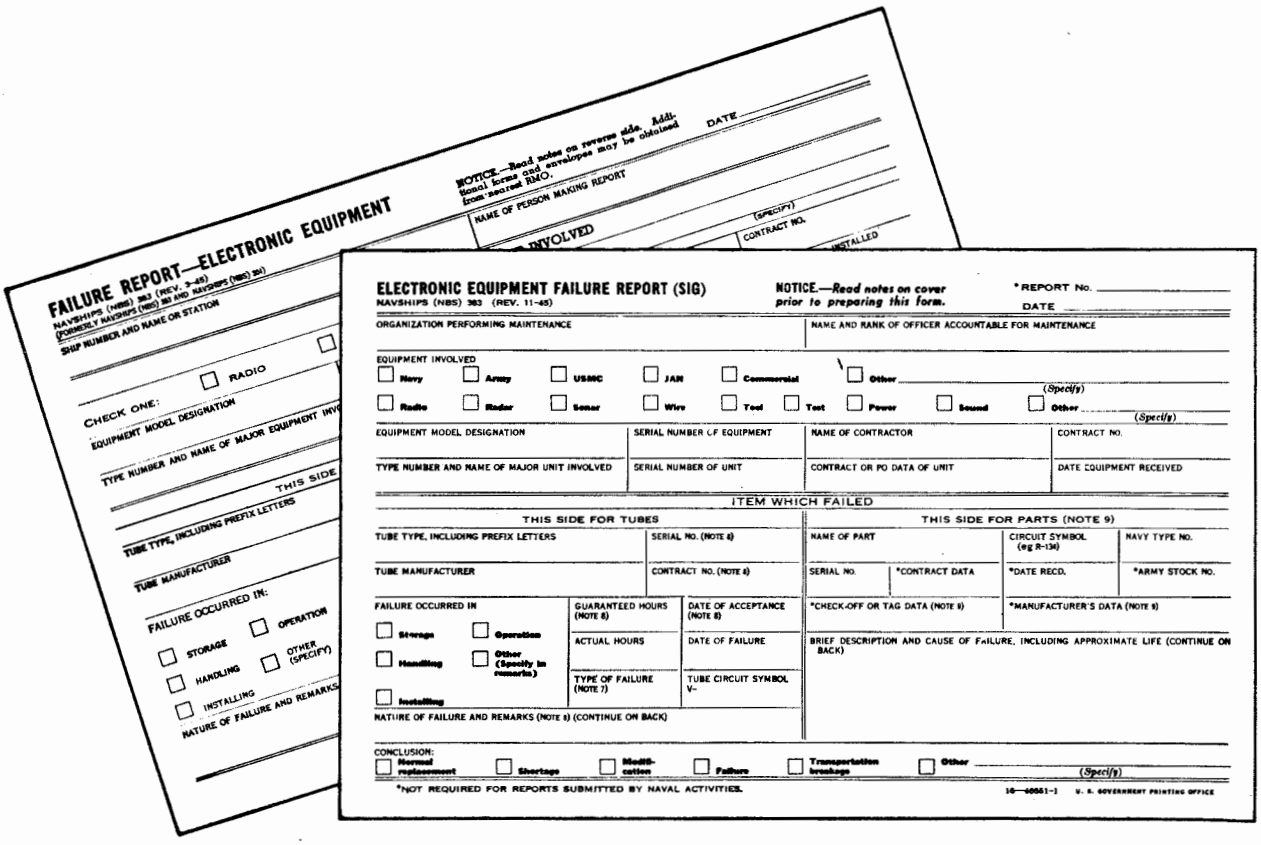
A FAILURE REPORT must be filled out for the failure of any part of the equipment whether caused by defective or worn parts, improper operation or external influences. It should be made on Failure Report, form NBS-383, which has been designed to simplify this requirement. The card must be filled out and forwarded to BUSHIPS in the franked envelope which is provided. Full instructions are to be found on each card.

Use great care in filling the card out to make certain it carries adequate information. For example, under "Circuit Symbol" use the proper circuit identification taken from the schematic drawings, such as T-803, in the case of a transformer, or R-207, for a resistor. Do not substitute brevity for clarity. Use the back of the card to completely describe the cause of failure and attach an extra piece of paper if necessary.

The purpose of this report is to inform BUSHIPS of the cause and rate of failures. The information is used by the Bureau in the design of future equipment and in the maintenance of adequate supplies to keep the present equipment going. The cards you send in, together with those from hundreds of other ships, furnish a store of information permitting the Bureau to keep in touch with the performance of the equipment of your ship and all other ships of the Navy.

This report is not a requisition. You must request the replacement of parts through your Officer-in-Charge in the usual manner.

Make certain you have a supply of Failure Report cards and envelopes on board. They may be obtained from the nearest district Publication and Printing Office.



FAILURE REPORT—ELECTRONIC EQUIPMENT

NOTICE—Read notes on reverse side. Addl. blank forms and envelopes may be obtained from nearest RMO.

DATE

NAME OF PERSON MAKING REPORT

SHIP NUMBER AND NAME OR STATION

CHECK ONE: RADIO

EQUIPMENT MODEL DESIGNATION

TYPE NUMBER AND NAME OF MAJOR EQUIPMENT INVOLVED

CONTRACT NO.

INSTALLED

THIS SIDE

TUBE TYPE, INCLUDING PREFIX LETTERS

TUBE MANUFACTURER

FAILURE OCCURRED IN:

STORAGE OPERATION

HANDLING OTHER (SPECIFY)

INSTALLING

NATURE OF FAILURE AND REMARKS

ELECTRONIC EQUIPMENT FAILURE REPORT (SIG)

NAVSHIPS (NBS) 383 (REV. 11-45)

NOTICE—*Read notes on cover prior to preparing this form.*

*REPORT No.

DATE

ORGANIZATION PERFORMING MAINTENANCE

NAME AND RANK OF OFFICER ACCOUNTABLE FOR MAINTENANCE

EQUIPMENT INVOLVED

Navy Army USMC JAN Commercial Other

Radio Radar Sonar Wire Test Test Power Sound Other (Specify)

EQUIPMENT MODEL DESIGNATION	SERIAL NUMBER OF EQUIPMENT	NAME OF CONTRACTOR	CONTRACT NO.
TYPE NUMBER AND NAME OF MAJOR UNIT INVOLVED	SERIAL NUMBER OF UNIT	CONTRACT OR PO DATA OF UNIT	DATE EQUIPMENT RECEIVED

ITEM WHICH FAILED

THIS SIDE FOR TUBES		THIS SIDE FOR PARTS (NOTE 9)			
TUBE TYPE, INCLUDING PREFIX LETTERS	SERIAL NO. (NOTE 6)	NAME OF PART	CIRCUIT SYMBOL (eg R-134)	NAVY TYPE NO.	
TUBE MANUFACTURER	CONTRACT NO. (NOTE 6)	SERIAL NO.	*CONTRACT DATA	*DATE RECD.	*ARMY STOCK NO.

FAILURE OCCURRED IN: Storage, Operation, Handling, Other (Specify in remarks), Installing

GUARANTEED HOURS (NOTE 8) | DATE OF ACCEPTANCE (NOTE 8) | ACTUAL HOURS | DATE OF FAILURE | TYPE OF FAILURE (NOTE 7) | TUBE CIRCUIT SYMBOL V-

*CHECK-OFF OR TAG DATA (NOTE 9) | *MANUFACTURER'S DATA (NOTE 9)

BRIEF DESCRIPTION AND CAUSE OF FAILURE, INCLUDING APPROXIMATE LIFE (CONTINUE ON BACK)

NATURE OF FAILURE AND REMARKS (NOTE 8) (CONTINUE ON BACK)

CONCLUSION: Normal replacement, Shortage, Modification, Failure, Transportation breakage, Other (Specify)

*NOT REQUIRED FOR REPORTS SUBMITTED BY NAVAL ACTIVITIES.

16—40561-1 U. S. GOVERNMENT PRINTING OFFICE

Figure 7-1.—Failure Report, Sample Form.

SECTION 7
CORRECTIVE MAINTENANCE

1. GENERAL.

This section of the manual is intended only for the use of technical personnel. The corrective maintenance information contained in Section 5, while intended primarily for the nontechnical operator, should also be used in conjunction with Section 7.

Since equipment adjustment and trouble shooting can best be performed with the Transmitter-Receiver connected up for operation outside its case, paragraph 2 explains the preparations necessary for bench testing.

Complete instructions for setting up the equipment on channels other than those for which it was initially adjusted at the factory will be found in paragraph 3.

Succeeding paragraphs include detailed information on trouble shooting, maintenance adjustments, and progressive disassembly of the equipment.

2. PREPARATION FOR BENCH TESTS.

To remove the Transmitter-Receiver from its case and place it in operation on a convenient workbench, proceed as follows (see also Section 5, paragraph 5):

a. Remove the control panel cover and loosen the six knurled holding screws around the edge of the panel. The Transmitter-Receiver may now be removed from its case by pulling straight out since the knife-blade battery contacts at the rear are designed to break automatically.

b. Place the unit on a convenient workbench and connect a fully charged battery to the knife-blade terminals, as shown in figure 7-2. Special test cable W505, packed in the tool kit compartment at the right front of the Carrying Case, is used for interconnection. This cable is polarized to insure that the

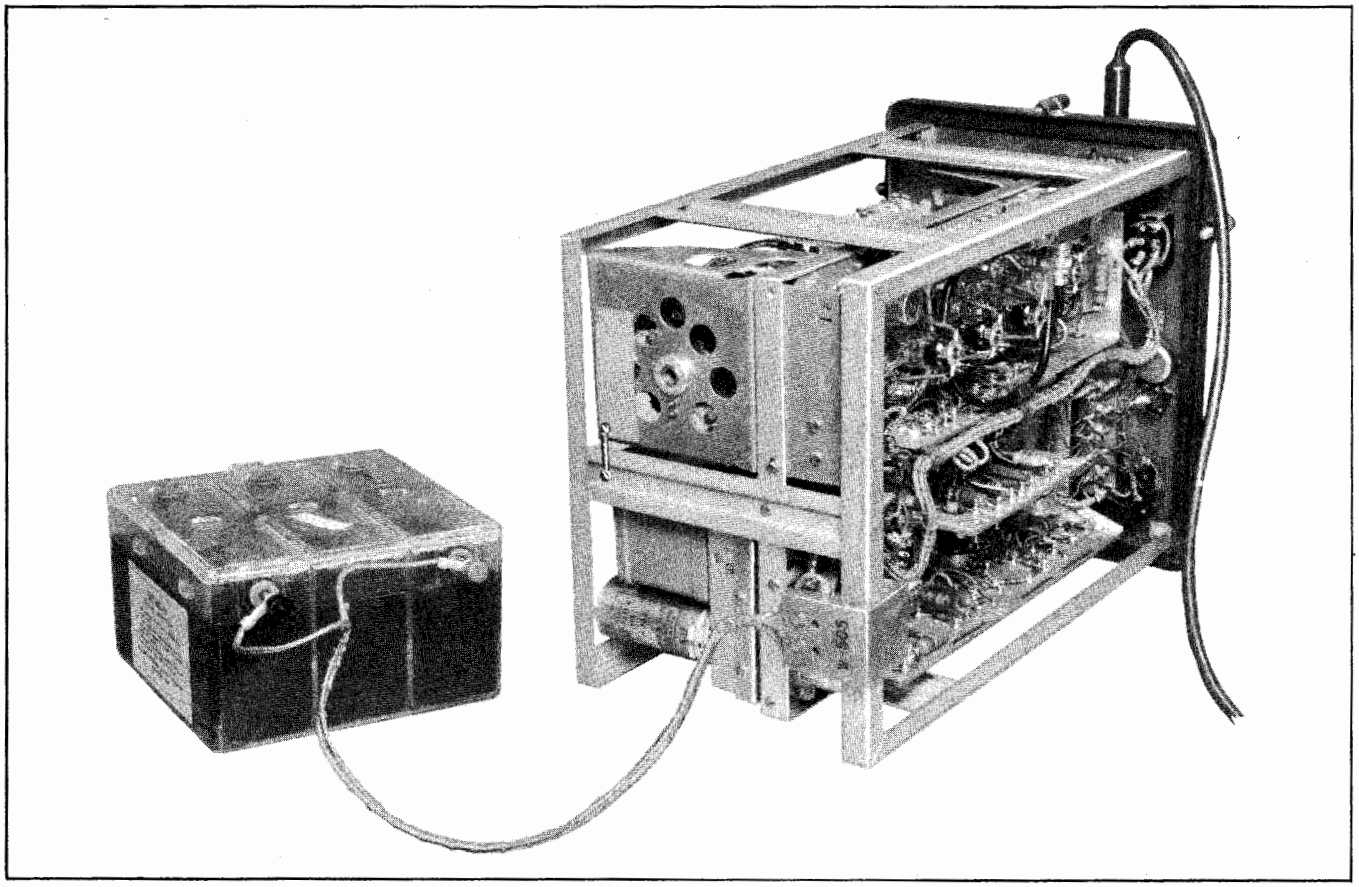


Figure 7-2.—Bench Test Setup.

upper knife blade on the Transmitter-Receiver connects to the negative battery terminal and the lower knife blade to the positive terminal (ground).

c. If transmitter tests are to be made, a 50-ohm 2-watt resistive load (or RF Wattmeter ME-11/U) may be connected to the antenna end of the 10-foot coaxial cable to prevent undesired radiation. This dummy antenna may also be used for all receiver testing other than actual listening tests. Otherwise, if transmitter radiation will not cause interference or violate security, use the Discone Antenna and the 10-foot Antenna cable, making sure that the Antenna is kept as far as possible from personnel and large metallic objects to prevent undesired capacitive loading effects.

d. Plug in the headset and microphone assembly. The Transmitter-Receiver is now ready for bench test operation.

CAUTION

Never attempt to operate the transmitter without an antenna or a dummy load since RF voltages high enough to damage the equipment may exist under such conditions.

3. CHANNEL PRESETTING PROCEDURE.

a. GENERAL.

To preset the equipment for operation on a channel other than the four to which it is already tuned, it will first be necessary to change two crystals and possibly one or two coils and one yoke as well. Whenever circumstances permit, to simplify the task set up the new channel in place of an old channel which uses the same coils and/or yoke. After inserting the new RF components, the equipment must then be retuned for operation on the new frequency.

The entire channel presetting procedure can be accomplished by the technician in the field, using only the panel meter, the noise probe, and the special tools supplied in the tool kit. However, the optional alignment procedure given in paragraph *e.* below will be found most convenient whenever an external test meter of at least 1000-ohms/volt sensitivity is available. In either case, prepare the equipment for bench testing, as described in paragraph 2 above, before alignment.

b. CHANGING CRYSTALS.

To change crystals for any one channel, proceed as follows:

(1) Turn the control panel CHANNEL SELECTOR until the crystals to be removed are uppermost in the turret. The channel number on the crystal lock bar (figure 7-3) will convey this information whereas the CHANNEL SELECTOR position will not.

(2) Lift up the crystal lock bar and turn it 90° from the position shown in the illustration; then, remove both crystals with the fingers and place them in their proper compartments in the crystal box.

(3) Refer to the crystal chart (table 7-1) and select the desired replacement crystals from the crystal box. Remember that the channel frequency is always exactly twelve times that of the transmitting crystal.

(4) Insert the replacement crystals in the equipment holders and lift up and turn the lock bar 90° to secure them in place.

CAUTION

Be absolutely certain that the transmitting and receiving crystals are not reversed. Their correct positions are marked "T" and "R" respectively on the side of the turret (see figure 7-6A). For any given pair of crystals, the frequency of the receiving crystal will always be approximately 0.0085-mc *higher* than that of the transmitting crystal.

c. CHANGING COILS AND YOKES.

Refer to the coil chart (table 7-2) to determine whether or not coils L102 and L103 and also yoke L105 will require replacement for the new frequency. If so, select the proper replacement components from the coil box (figure 7-4), and proceed as follows:

(1) With the CHANNEL SELECTOR positioned so that the correct channel number appears on the crystal lock bar, remove coil L102 and/or coil L103 (figure 7-6A) by loosening the hex bolts at either end of the coil, using the small end of spanner wrench H503 supplied in the tool kit (see figure 7-5).

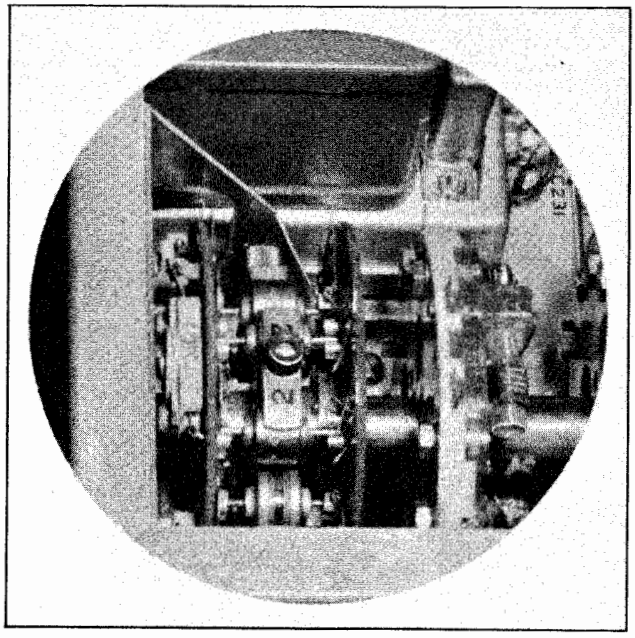


Figure 7-3.—Crystal Mounting Details.

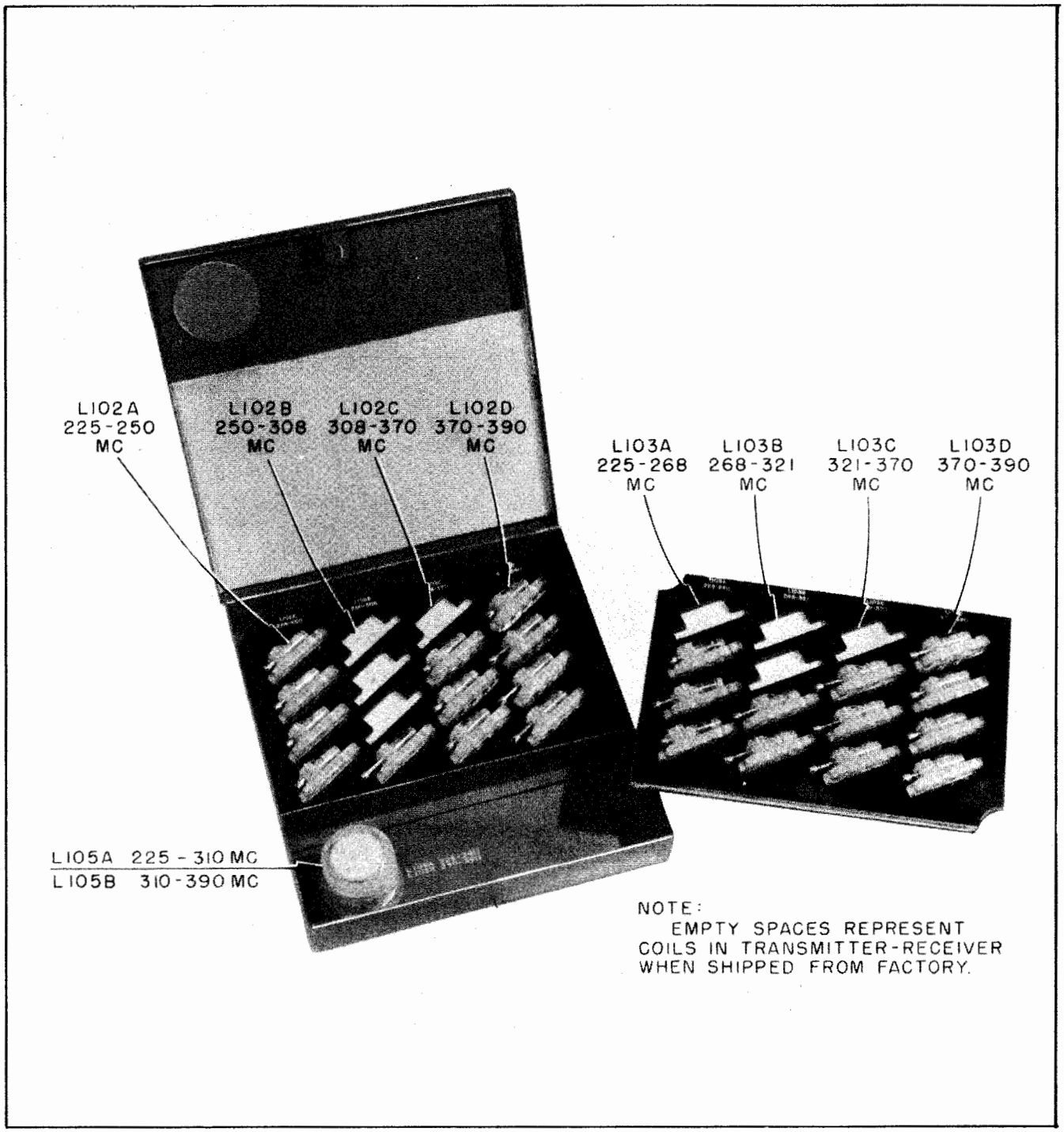


Figure 7-4.—Interior View of Coil Box.

(2) Remove yoke L105 (if necessary) by loosening the two small screws securing the two halves of the yoke, as shown in figure 7-6B. Use jewelers' screwdriver H507 supplied in the tool kit (see figure 7-5).

(3) Place the removed coil(s) and yoke in their correct positions in the coil box (see figure 7-4).

(4) Insert the new coil(s) at L102 and/or L103 and take up on the hex bolts. Make sure that these two coils are not interchanged.

(5) Insert the new yoke at L105 (if necessary) and make sure that the wiper shoes on its inner surface ride properly on the heliline wires. Take up on the two small screws, making sure that the yoke can still be rotated.

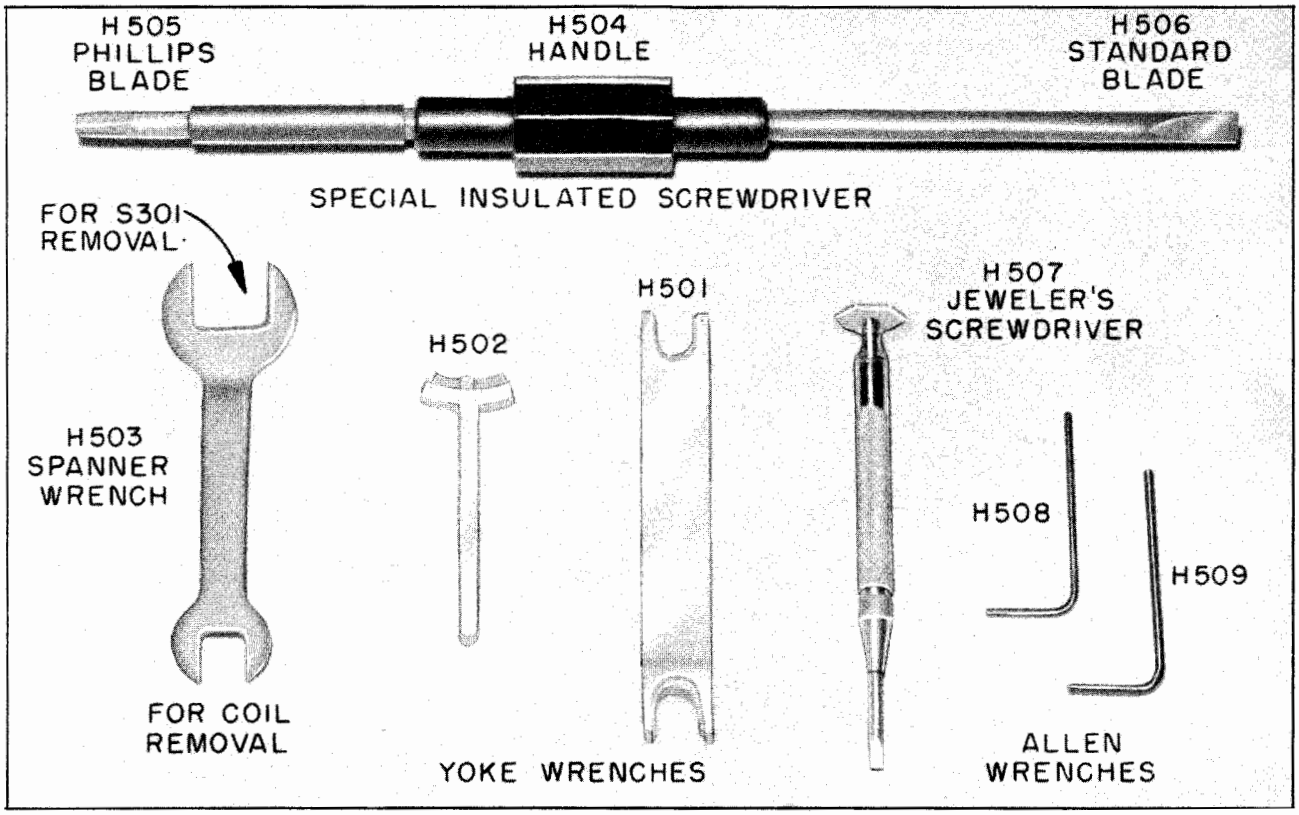


Figure 7-5.—Special Tools.

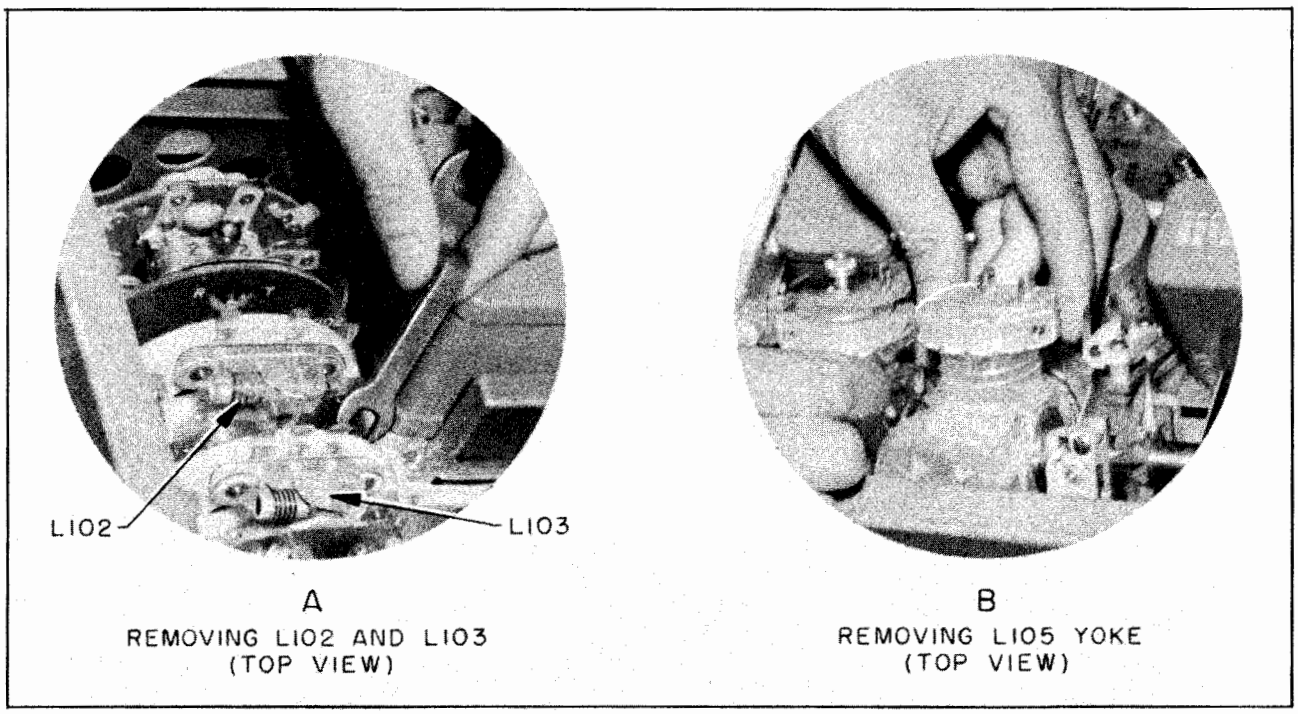


Figure 7-6.—Removal of Coils and Yokes.

d. FIELD ALIGNMENT PROCEDURE.

After inserting the coil(s) and crystals required for operation on the new frequency, it will be necessary to realign the tuned circuits. This can be accomplished in the field using the control panel meter as a tuning indicator. The procedure follows:

(1) Set up the equipment for bench test operation as described in paragraph 2 above, turn the CHANNEL SELECTOR to the proper channel, and turn on the receiver. Use either the Discone Antenna, or a 50-ohm dummy load if transmitter radiation is not permissible.

CAUTION

Never attempt alignment or transmitter operation of any kind without an antenna or dummy load because false meter readings will result. RF voltages high enough to damage the equipment may also appear in the transmitter final amplifier. When using the Discone Antenna, keep it in the clear to prevent stray capacitive loading.

(2) Snap S201 (figure 7-7A) to "Test," unclip the test probe from the chassis, and push the probe onto TP101 (figure 7-7B). The panel meter will now read crystal oscillator (V101) plate current; it should read 3 to 4 units.

(3) Tune C101 (figure 7-7C) with special insulated screwdriver H506 in the tool kit (figure 7-5) for a dip of approximately 1 unit in the meter reading.

Note

On certain channels two dips will be encountered, only one of which is correct. Refer to table 7-3 for identification of the proper dip. Note that the maximum capacity of C101 occurs with the two solder dots adjacent, while minimum capacity is attained by tuning 180° in either direction until the solder dots are farthest apart.

(4) Move the test probe to TP102 (figure 7-7B) to read doubler (V102) plate current and tune L102 through the hole in the side frame (figure 7-7D) for maximum meter reading (approximately 2 units).

CAUTION

When removing the test probe from any test point, be sure to lift it vertically off the test point rather than pull it sideways to prevent breaking its insulated tip.

(5) Retune C101 (figure 7-7C) and L102 (figure 7-7D) for maximum meter reading; repeat these adjustments until an absolute maximum is achieved.

(6) Move the test probe to TP103 (figure 7-7B) to read tripler (V103) plate current and tune L103 (figure 7-7E) for maximum meter reading (approximately 2 units).

(7) Snap the POWER Switch to "Stand-by" and turn the CHANNEL SELECTOR two notches so that the coils in use will be accessible at the top of the unit. Now loosen the knurled locknut on L104 (figure 7-7F) and turn the CHANNEL SELECTOR back to its original position. Snap on the POWER Switch.

(8) Preset L104 (figure 7-7G) to the approximate operating frequency. The complete travel of this adjustment is 1-1/2 turns. Its fully clockwise position represents 225 mc, while its fully counterclockwise position represents 390 mc.

CAUTION

Rotation is limited by stops. Excessive pressure on the tuning tool after the stop is reached will either shatter the tool or jump the stop. If the stop is jumped, the shorting bar will be locked behind the stop thus rendering the heliline useless.

(9) Depress the push-to-talk button and retune L104 (figure 7-7G) for a dip in tripler plate current. Off-resonance plate current will be approximately 4 or 5 units on the panel meter and the dip will be a very slight one—probably no more than 1/2 unit—so watch the meter carefully.

CAUTION

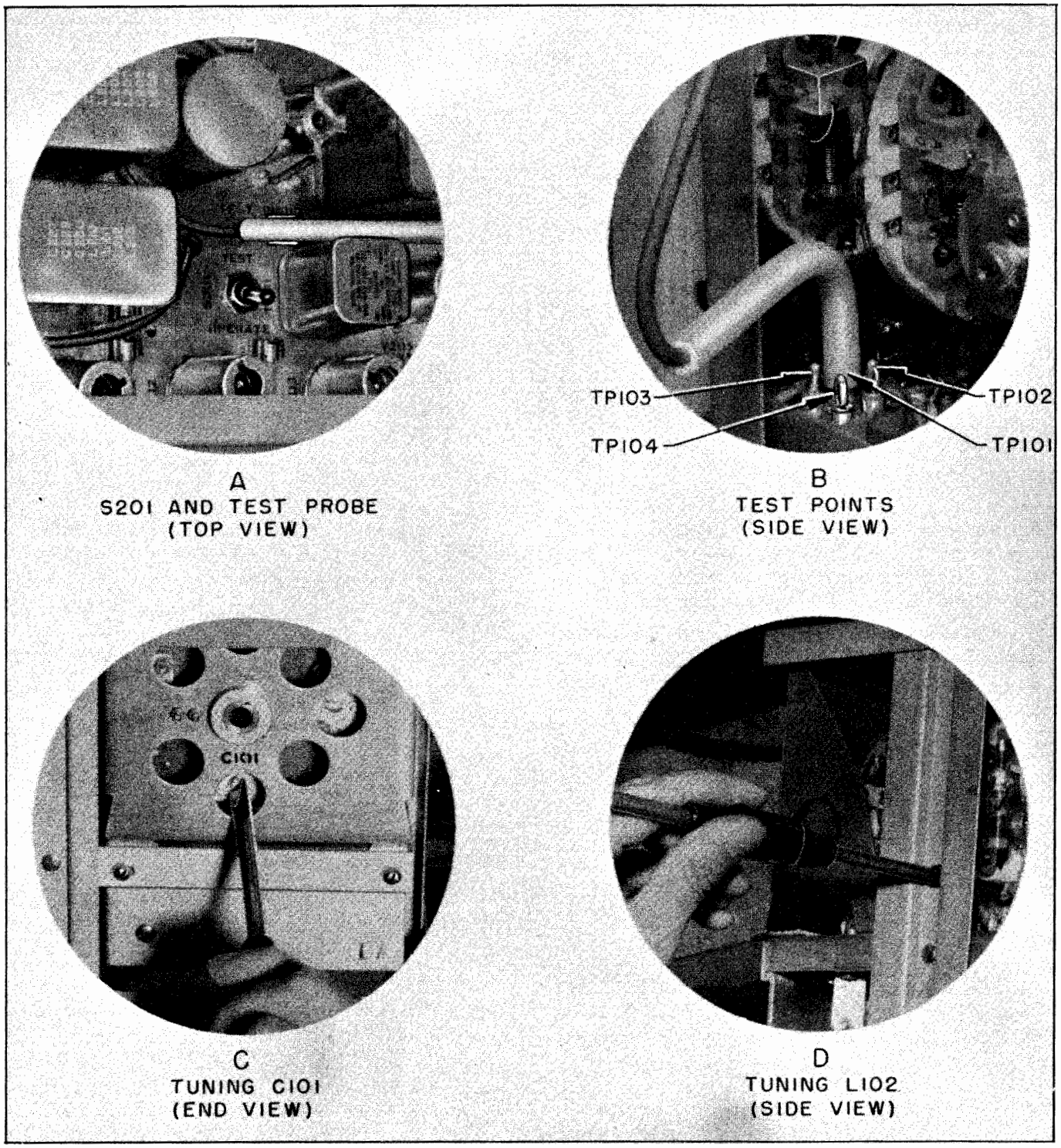
In this and the following steps where the transmitter is operated in an off-resonance condition, it is important to work quickly to make the periods of abnormally high plate dissipation as short as possible. It will probably be found most convenient to keep the push-to-talk button closed by means of any convenient weight, and to snap the POWER Switch to "Stand-by" each time an adjustment is completed.

(10) Move the test probe to TP104 (figure 7-7B) to read final amplifier (V104) plate current and tune the outer yoke of L104 (figure 7-7H) for maximum meter reading. This will be a broad maximum and is not critical. Either one of the two transparent plastic wrenches (H501 or H502, figure 7-5) in the tool kit may be used for yoke adjustment.

(11) Snap S201 (figure 7-7A) to "Operate" and tune the yoke on L105 (figure 7-7H) for maximum carrier level indication on the panel meter. This may be a very small reading at first, perhaps just barely discernible. If no reading is discernible, go back and repeat steps (2) through (10).

(12) Peak up all previous adjustments (especially the L105 yoke) for a maximum carrier level reading on the panel meter. A meter reading of approximately 3 to 4 units may be considered normal.

(13) Release the push-to-talk button and snap S201 to "Test" (see figure 7-7A). The test probe on



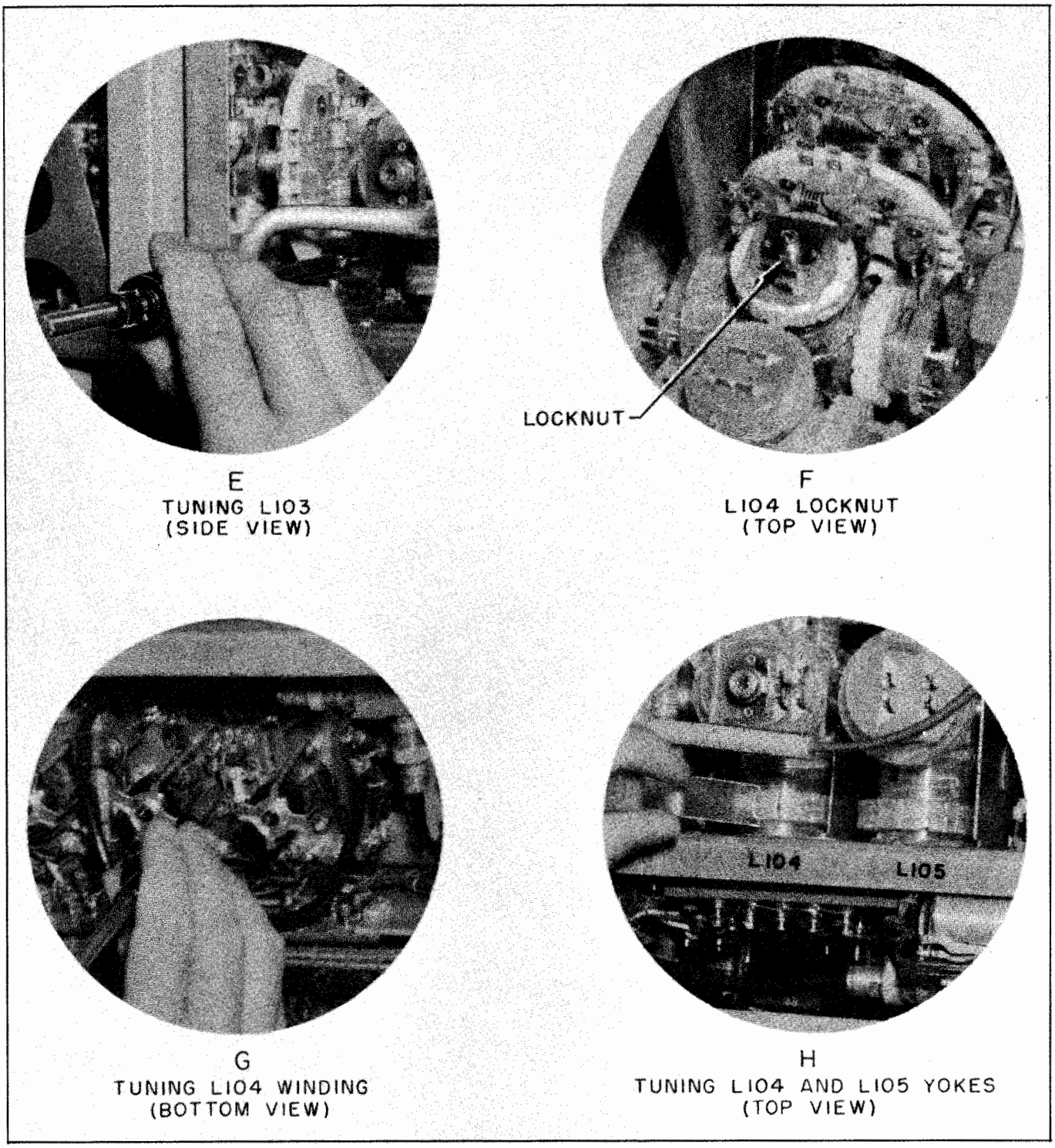
A
S201 AND TEST PROBE
(TOP VIEW)

B
TEST POINTS
(SIDE VIEW)

C
TUNING C101
(END VIEW)

D
TUNING L102
(SIDE VIEW)

Figure 7-7.—Alignment Details.



E
TUNING L103
(SIDE VIEW)

F
L104 LOCKNUT
(TOP VIEW)

G
TUNING L104 WINDING
(BOTTOM VIEW)

H
TUNING L104 AND L105 YOKES
(TOP VIEW)

Figure 7-7.—Alignment Details (Cont.).

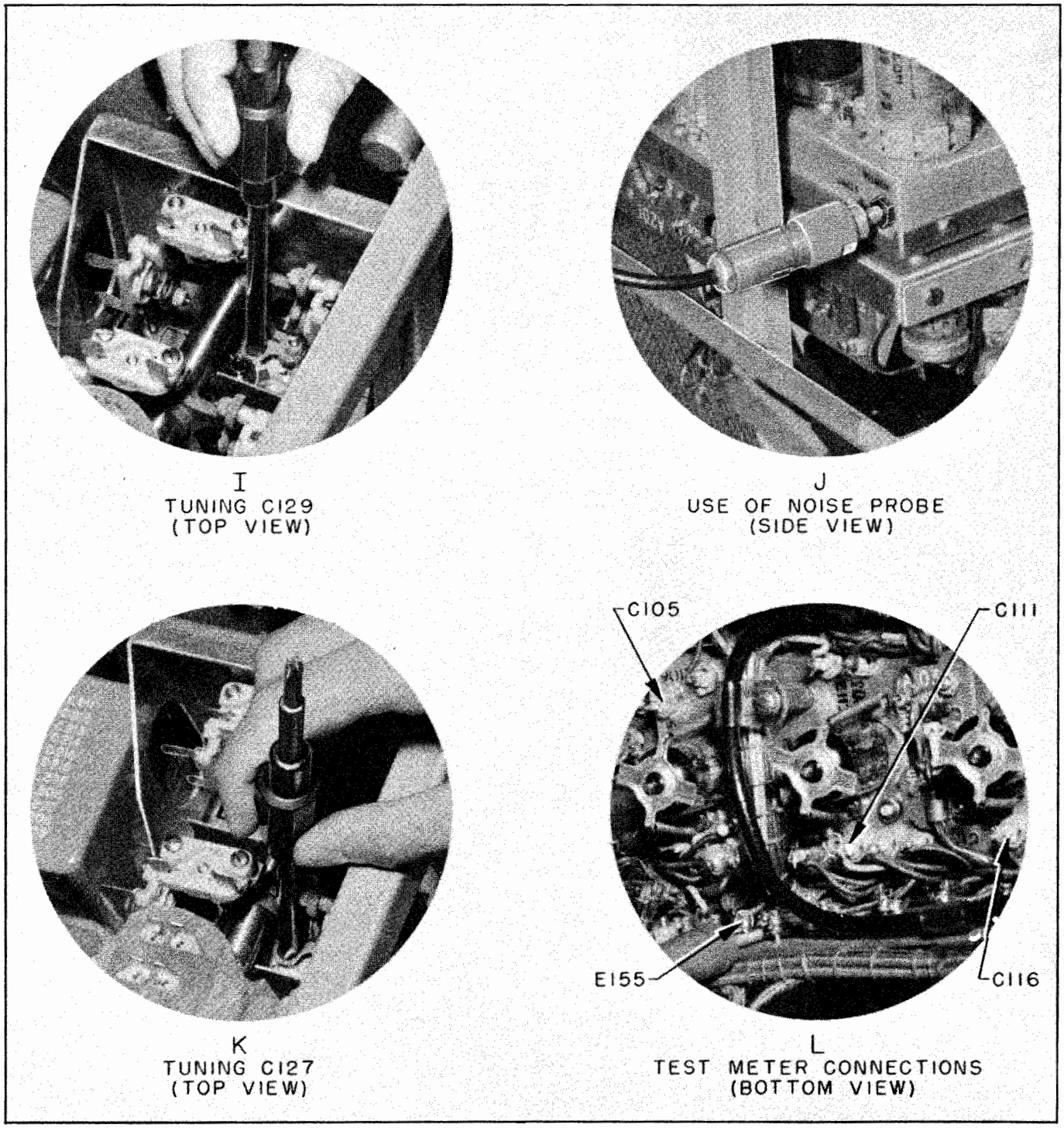


Figure 7-7.—Alignment Details (Cont.).

TP104 will now read receiver mixer (V106) plate current which should be approximately 5 units. Adjust C129 (figure 7-7I) for a 1/2-to 1-unit dip in the meter reading.

(14) Disconnect the antenna or dummy load from the end of the 10-foot antenna cable and attach the noise probe from the tool kit (figure 7-5) to the cable. Insert the probe all the way into J401 (figure 7-7J), put on the headset, and adjust the receiver VOLUME Control for a comfortable background noise level.

(15) Tune C127 (figure 7-7K) for maximum vibrator hash (a characteristic whining hum), pulling the noise probe part way out of J401 to sharpen the maximum when approaching the point of correct alignment. Now return to C129 (figure 7-7I) and peak this adjustment for maximum vibrator hash. Recheck the tuning of C127.

(16) Snap off the POWER Switch, throw S201 to "Operate," restore the test probe to its chassis clip, remove the noise probe from the antenna cable, and repackage all special tools and accessories. Turn the CHANNEL SELECTOR two notches and tighten the L104 locknut (see figure 7-7F). Finally, remove all bench test connections and replace the unit in its case.

e. ALIGNMENT PROCEDURE, USING EXTERNAL METER.

If an external multimeter with a 0—10-volt DC scale and a sensitivity of at least 1000 ohms/volt is available, its use will simplify the alignment procedure. The procedure follows:

(1) Set up the equipment and tune the oscillator as described in paragraph *d.*, steps (1) — (3) above; then repackage the test probe.

(2) Clip the positive meter lead to terminal 55 of E101 (see figure 7-7L). This lead will remain connected to terminal 55 throughout the alignment procedure.

(3) Clip the negative meter lead to C105 (figure 7-7L) and tune L102 (figure 7-7D) for maximum doubler grid current as read on the test meter. Repeak the oscillator by means of C101 (figure 7-7C) for a maximum test meter reading.

(4) Move the negative meter lead to C111 (figure 7-7L) and tune L103 (figure 7-7E) for maximum tripler grid current as read on the test meter.

(5) Move the negative meter lead to C116 (figure 7-7L), depress the push-to-talk button, and tune L104 and its outer yoke (figures 7-7G and 7-7H) for maximum final amplifier grid current as read on the test meter.

CAUTION

In this and following steps where the transmitter is operated in an off-resonance condition, it is important to work quickly to make the periods of abnormally high plate dissipation as short as possible. It will probably be found most convenient to keep the push-to-talk button closed by means of any convenient weight, and to snap the POWER Switch to "Stand-by" each time an adjustment is completed.

(6) Disconnect the test meter and proceed with the final adjustments, as described in paragraph *d.*, steps (11) through (16) above.

f. ALIGNMENT CHECK, USING SIGNAL GENERATOR.

If there should be any question as to whether or not the Transmitter-Receiver is aligned to the proper crystal harmonic, a simple check with a signal generator will provide the answer. To make this check, proceed as follows:

(1) Connect a UHF signal generator (Model LAF-(3), Model AN/URM-26, or equivalent) to the front panel ANT. Connector and tune the signal generator to the channel frequency in use. Use pulsed output from the signal generator to simulate modulation.

(2) Turn on the receiver and check for the presence of a signal in the headphones. A signal generator output of 15 microvolts or less should produce an audible signal.

(3) If no signal is audible, recheck the alignment of all tuned circuits (paragraph *d.* or *e.* above) and repeat steps (1) and (2) immediately above. Make sure that table 7-3 is correctly interpreted, and pay particular attention to paragraph *d.* (8).

CAUTION

Do not attempt to align the oscillator, doubler, or tripler stages for maximum receiver output as these stages should always be tuned for maximum carrier level on transmit. However, the mixer and RF amplifier may be repeaked for maximum output when using the signal generator if the generator is known to be accurately calibrated (see figures 7-7I and 7-7K respectively for the location of these adjustments).

4. TROUBLE SHOOTING.

a. GENERAL PROCEDURE.

When confronted with a faulty equipment, always make sure that the battery is adequately charged (see Section 5, paragraph 3) before looking for more serious trouble. Replace the battery with a fully charged spare if its condition is in the least questionable. Remember too that a low battery may provide normal operation on receive, and yet may be incapable of supplying the extra current required on transmit.

If the battery is in proper condition, give the equipment an operational check to determine whether the entire equipment, the transmitter alone, or the

receiver alone is defective; also determine whether the trouble exists on one or all channels.

Having determined the symptoms of faulty operation, refer to Table 7-4, *Trouble-Shooting Chart,* and investigate the probable causes in the order listed. Instructions for bench testing will be found in paragraph 2. above.

b. FUSE REPLACEMENT.

There is only one fuse (F201) in the MAY Equipment. Its physical location and that of the spare fuses are shown in figures 5-5 and 5-4, respectively. F201 is rated at 15 amp and should never be replaced with one of higher rating.

Should a replacement fuse blow immediately upon insertion, it is probable that a short-circuit exists in the vibrator power supply. Check vibrator VD401 (see paragraph 4.*d.* below) and rectifier tube V401. Replace the fuse a second time only after the shorted component has been located and replaced.

CAUTION

Before replacing the Transmitter-Receiver in its case, make sure that two spare fuses of the correct type and rating are in place within the spare fuse clips. Do not jeopardize the success of a field mission by neglecting this detail.

c. TUBE REPLACEMENT.

(1) GENERAL.

Replacement instructions for field-replaceable tubes will be found in Section 5, paragraph 5.*d.* Also, refer to figures 5-4 and 5-5 for tube locations, and to tables 5-2 and 7-4 for symptoms of tube failure.

Open filaments may be detected by feeling the tubes or tube shields immediately after a period of operation. Each tube or shield should be distinctly warm to touch if the tube filament is normal. (This is not true of V204.)

A blue glow in type 5656 tubes (particularly at V104) does not necessarily mean a gassy or defective tube. If the glow surrounds insulators, support structures, and/or the glass envelope it is fluorescence and not harmful. If the glow appears between elements, however, it is probably gas and the tube should be discarded.

The type 1007 rectifier tube will not fail completely if its filament opens since this tube is designed for cold-cathode operation under certain conditions. However, an open 1007 filament will very likely cause erratic receiver operation (such as failure of the B+ voltage to appear immediately upon switching from "Standby" to "On" after normal warmup).

Weak or defective tubes can best be detected be replacement with a tested spare and noting the effect on performance. If no improvement is noted, replace the original tube in its original socket in all RF circuits since a difference in tube capacities will affect alignment.

Weak or defective tubes can also be detected by means of a standard mutual conductance tube tester. Test each suspected tube and if necessary replace with a tested spare.

Note

ALL TUBES OF A GIVEN TYPE SUPPLIED WITH THE EQUIPMENT SHALL BE CONSUMED PRIOR TO EMPLOYMENT OF TUBES FROM GENERAL STOCK.

Raytheon tubes carry a numerical date code which denotes the year and week of manufacture; for instance, 019 denotes year "0" (1950) and week "19" (May 7-13). Fresh stock may thus be readily identified.

CAUTION

It is vitally important that a full complement of tested spares (one each, type 1007, 5656, and 6AK5) always be kept in the Auxiliary Battery Pack for emergency field maintenance. As these tubes are used, replace them at once from tested spares.

(2) SUBMINIATURE TUBES.

Mixer tube V106 (figure 7-12), and detector-AVC tube V204 (figure 7-13) are of the subminiature type with soldered leads.

V106 is best checked by measuring its plate current on the control panel meter as follows:

(a) With the receiver turned on, snap S201 (figure 7-7A) to "Test," then unclip the adjacent test probe and plug it onto TP104 (see figure 7-7B).

(b) Read V106 plate current on the control panel meter—a reading of 4 to 5 units may be considered normal. Unless the meter reading is decidedly abnormal, try retuning C129, as described in paragraph *d.* steps (13) through (15) above, before replacing the tube.

To replace V106, it will be necessary to remove the coil turret assembly, as described in paragraph 6.*b.* below—the tube is then accessible. Its leads are next unsoldered, the tube removed from its mounting clip, and a replacement inserted.

V204 is best checked by measuring its terminal voltages and comparing them with the normal values given in figure 7-16.

V204 is mounted directly on component panel A201. The method of mounting is clearly visible in figure 7-13. V204 can be replaced by unsoldering the leads and slipping the tube from its mounting clip.

CAUTION

When working on panel A201 with the power on, be specially careful not to short across filament dropping resistor R229 as this will cause the V201 filament to burn out at once. Since this tube shows no visible glow when

operating, an accidental burnout is not easy to detect.

Note that a red dot appears on one side of each subminiature tube. This dot represents the conventional tube base key. The lead closest to the dot is designated No. 1, and the remaining leads are numbered in ascending order away from the dot. Each tube must be placed carefully in its mounting clip with the dot in the position shown in the illustrations so that the proper lead configuration may be achieved.

d. VIBRATOR REPLACEMENT.

Vibrator VD401 (figure 5-4) is of the plug-in type and may be replaced in the same manner as a conventional electron tube.

As a rough check on vibrator operation during bench tests, remember that a normally operating vibrator will produce a faintly audible hum and its vibration will be ascertainable by touch. However, since a vibrator may appear normal and still be defective, the only positive check is by replacement with a new vibrator from spares.

e. CIRCUIT MEASUREMENTS.

If operation is still abnormal after checking suspect tubes, fuse, or vibrator, it will then be necessary to make direct circuit measurements to determine the source of trouble. These may be either current, voltage, or resistance measurements as dictated by convenience or individual preference.

Relative changes in transmitter power output may be observed on the panel meter. However, if it is desired to measure actual power output, a wattmeter such as the RF Wattmeter ME-11/U must be employed. This wattmeter is particularly suited for use with the MAY Equipment, since it has an input impedance of 51.5 ohms, a standing-wave ratio (voltage) of at most 1.1-to-1 over the desired frequency range, and its input fitting (type N) will accept the UG connector on the MAY RG-8/U antenna cable. A 2-watt transmitter output represents a 1/5 scale reading on the wattmeter.

CAUTION

Never attempt to operate the transmitter without an antenna or dummy load because abnormally high peak voltages will result which may damage the equipment.

(1) CURRENT MEASUREMENTS.

If the trouble is localized in either the crystal oscillator, frequency multiplier, final amplifier, or receiver mixer stages, a quick check of any one of these stages may be made by measuring plate current at the appropriate test point. Use the special test probe clipped to the chassis and throw TEST-OPERATE Switch S201 (figure 7-7A) to "Test" to obtain a reading on the control panel CARRIER INDICATOR Meter. Compare the readings taken with those given in paragraph *d. Field Alignment Procedure,* and look for a defective component if wide variance exists. Also remember that abnormally high plate current may indicate misalignment.

(2) VOLTAGE MEASUREMENTS.

Normal operating voltages, as measured at each tube socket pin or adjacent terminal and at other important points in the equipment, are given in figure 7-16. Do not check voltages haphazardly, but employ a logical sequence of measurements using the *Trouble Shooting Chart* (table 7-4) as a guide. Abnormal voltages are a sure sign of component failure and provide a ready means of locating the source of trouble.

(3) RESISTANCE MEASUREMENTS.

The resistance readings from each tube socket pin or adjacent terminal to ground are shown on figure 7-16. Defective components can often be isolated by a resistance check alone, although a more positive means of trouble shooting is to use resistance measurements as a supplement to voltage measurements.

All composition resistors are of ±5% tolerance as originally installed. Resistors of wider tolerance may be used for field replacement in certain instances with no adverse affect on equipment performance, provided that the tolerances stipulated in the Parts List (table 8-2) are not exceeded.

CAUTION

Never attempt to make resistance measurements with power on, since an ohmmeter will not stand the application of voltage.

f. MISCELLANEOUS NOTES.

(1) CERAMIC TRIMMERS C127 and C129.

Partial failure of either of these capacitors for a given channel will be evidenced by excessive receiver noise. Also see if the receiver can be detuned by pressing down on the suspect capacitor. Also check the tuning screw to see if it is too loose or too tight. Replace the capacitor if it appears to be abnormal in any way.

(2) CERAMIC FEED-THROUGH CAPACITORS.

The ceramic feed-through capacitors used as bypass capacitors throughout the set are easily cracked if accidentally struck with a tool or subjected to other undue strain. Such cracks can best be detected by visual inspection. Any cracked capacitor should be replaced, applying the minimum soldering heat necessary to obtain a good joint and yet not melt the capacitor seal.

(3) SOLDERING PRECAUTIONS.

When using a soldering iron in the vicinity of the coil turret, be very careful to keep heat away from the polystyrene coil forms. Should these forms be softened, resulting in distortion of the coils or helilines, the efficiency of the equipment would be seriously impaired.

(4) REPLACEMENT OF S301.

The large end of spanner wrench H503 (figure 7-5) is used for loosening the hex nut securing S301 to the control panel. When replacing the switch be sure to take this nut up tight enough to seal its watertight gasket to the panel. Gasket cement is not used here.

(5) REPLACEMENT OF SOCKET XV104.

When replacing this socket, all terminals of the new socket must be bent down (outward) to 3.8 in. maximum above the chassis. The socket center post must be cut off to 3/32 in. maximum above the insulated surface.

5. MAINTENANCE CONTROLS AND ADJUSTMENTS.

The only maintenance control in addition to the RF alignment controls covered in paragraph 3.*d.* above is microphone gain control R239. There are no tuning adjustments in the IF amplifier.

Relays K101, K102, and K401 must be kept clean and properly adjusted.

a. MICROPHONE GAIN CONTROL R239.

Microphone gain control R239 is located on the modulator chassis, as shown in figure 7-10. This control is set to its maximum (fully clockwise) position for normal speech input. Too much clipping (as evidenced by high distortion and loss of intelligibility) will result from shouting into the microphone and should be cured by lowering the voice rather than by reducing the gain. Only in persistent cases of badly distorted modulation should R239 be turned down.

b. CARE AND ADJUSTMENT OF RELAYS.

K101 is the antenna changeover relay which is located as shown in figure 7-11. The coaxial contacts of K101 are of enclosed construction and hence should not require cleaning during the normal service life of the equipment. In case of trouble with this relay, remove its three coaxial connections, unsolder the two leads from its coil and the three leads from its outboard contacts, and dismount the relay. The outboard contacts may now be inspected and cleaned if necessary; the coaxial contacts may be inspected through the removable side panels. Replace the entire relay from spares if there is any question as to its reliability.

K102 (figure 7-11) is the main transmit-receive relay and is of the self-latching type wherein a mechanical latch retains the relay arms in the position last energized.

CAUTION

Never attempt to hand operate K102 by pushing down on the latching arms as this may alter their critical adjustment. This relay may be hand operated if necessary by pressing down on the armature of the unlatched coil.

The contacts of K102 should be cleaned with a standard burnishing tool only if operation is abnormal. Should the relay stick at any time, release the latch manually (see "Caution" above) while operating the push-to-talk button and switch from receive to transmit several times for further evidence of sticking. Look particularly for a slight burr on one of the latching arms and if found remove the burr with the burnishing tool. Replace the relay from spares if there is any question as to its reliability.

K401 (figure 7-15) is located beneath the power supply chassis and is thus accessible only upon removing this chassis from the equipment (see paragraph 6.*d.* below). Due to its enclosed location, this relay is not likely to collect dirt or become corroded. But, whenever the power supply chassis is removed for servicing, K401 should be carefully inspected and its contacts touched up with a burnishing tool if dirty.

6. DISASSEMBLY.

Partial disassembly of the Transmitter-Receiver will be necessary to effect certain equipment repairs. Procedures for removing the principal subassemblies from the main frame are given below.

a. CONTROL PANEL.

To drop the control panel as shown in figure 7-8, it is only necessary to remove P301 or P101, remove the four corner bolts securing the panel to the longitudinal members of the main frame, and ease the panel forward to disengage the coil turret from the CHANNEL SELECTOR drive. Be careful not to misplace the bolts. All control panel components are now readily accessible.

CAUTION

Make sure to replace the small rubber gaskets under the heads of the four corner bolts when replacing the front panel; otherwise, the waterproofing will be destroyed.

b. COIL TURRET REMOVAL.

Removal of the coil turret assembly is necessary to gain access to receiver mixer tube V106 and to the

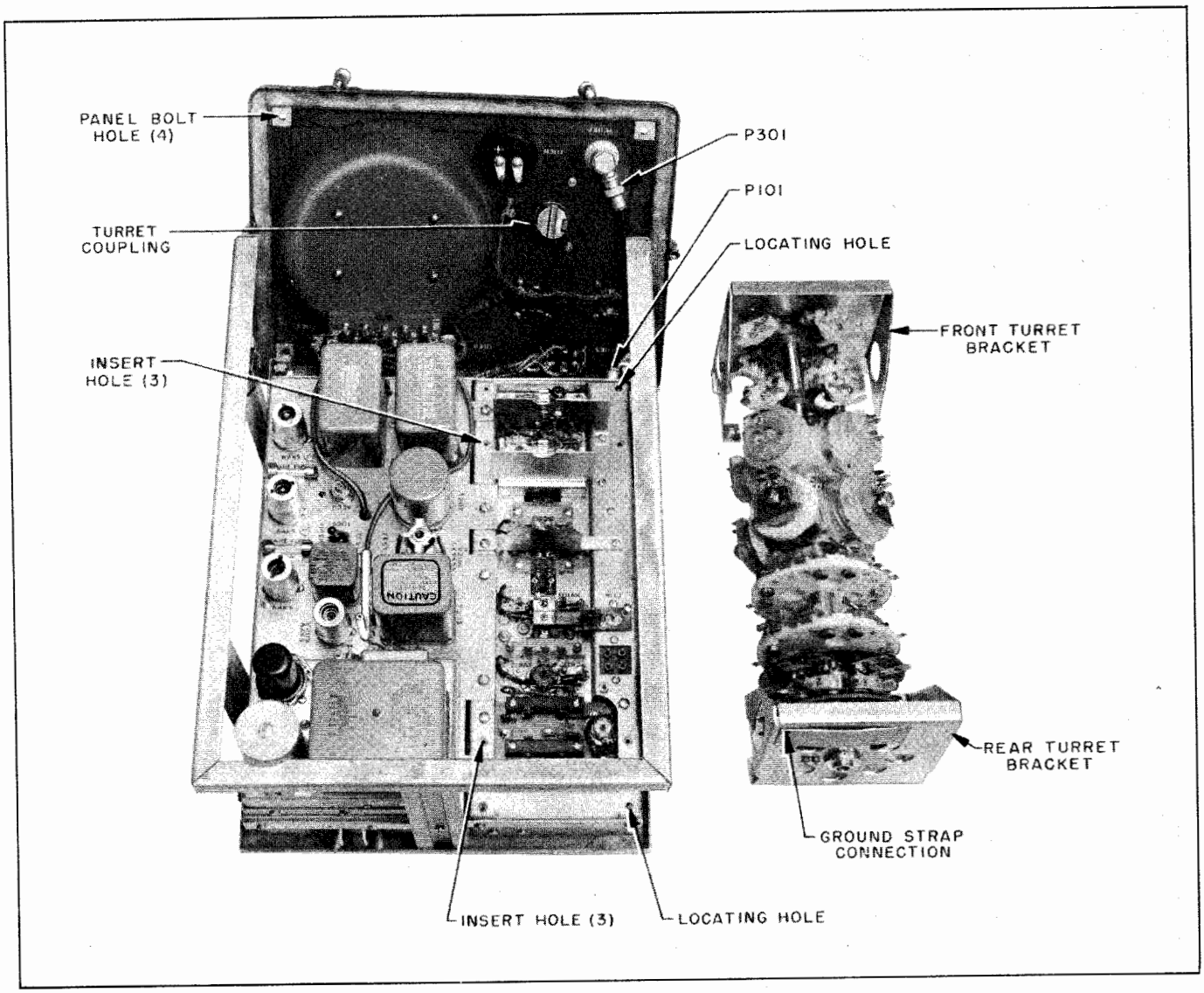


Figure 7-8.—Removal of Coil Turret.

undersides of sockets XV101—XV106 inclusive. It is accomplished as follows (see figure 7-8):

(1) Rotate the turret to a position halfway between any two channels and drop the front panel as described in paragraph *a.* above, swinging it under the main chassis so that it will be flat and entirely out of the way.

(2) Note that the turret assembly is secured by four screws each at the front and rear. The front outside screws and the rear outside screw are locating screws, with nuts and lockwashers. Remove these screws and their nuts and washers first; then remove the three remaining insert screws from both front and rear.

(3) Unscrew the grounding strap from the rear of the turret. Then, lift the turret straight up to disengage the knife-blade switch contacts and push the rear turret bracket forward against the crystal assembly to provide sufficient clearance for removal. Remove the turret by lifting straight up.

(4) When reassembling, first make sure that the turret is halfway between any two channels, and then replace the six insert screws and take them up loosely. Now replace the locating screws, lockwashers, and nuts and take them up tight. Finally, tighten the insert screws and replace the grounding strap and the control panel.

c. COIL TURRET DISASSEMBLY.

The individual coil, crystal, and capacitor assemblies should never be removed from the turret unless physical damage requires their replacement. To remove any or all of these assemblies, proceed as follows:

(1) After removing the turret from the Transmitter-Receiver as described in paragraph *b.* above, pull the front and rear turret brackets off the shaft (see figure 7-8).

(2) Drive out the taper pins securing to the shaft all individual assemblies up to and including

the one to be replaced. Always start from the end of the shaft nearest to the damaged component.

(3) Loosen the Allen setscrews still securing each of these assemblies to the shaft, using the Allen wrenches (H508 and H509, figure 7-5) supplied in the coil box. Then, slide each assembly in turn off the end of the shaft, removing the burrs raised by the setscrews so that the assemblies will not bind at these points.

(4) Replace the damaged assembly from spares, leaving it loose upon the shaft in approximately its correct position.

(5) Return the other assemblies to their exact positions on the shaft and replace their taper pins. Make sure that the *large* hole on the shaft faces the *large* hole on each assembly before attempting to drive home the pins.

(6) Take up on all Allen setscrews *except* those on the new assembly, replace the turret brackets, and return the entire coil turret to its correct position in the Transmitter-Receiver (see paragraph 6.*b.* (4) above).

(7) With the turret correctly positioned for any one of the four channels (all knife-blade contacts except those on the new assembly properly engaged), turn the new assembly by hand until its proper knife-blade contacts are in exactly the correct position for positive mating. Then, secure the new assembly to the shaft by means of its Allen setscrew. Do not attempt to reinsert the taper pin.

d. VIBRATOR POWER SUPPLY.

The vibrator power supply is an easily detachable assembly secured to the main chassis by means of four screws in the power supply bottom plate. To remove this assembly for access to underchassis components, proceed as follows:

(1) Unsolder the external connections to C403, C404, C405, and the adjacent ground terminal (see figure 7-10).

(2) Remove the four screws securing the power supply to the main chassis (figure 7-9) and lower the power supply away from the main unit.

(3) Remove the bottom-plate holding screws.

To reassemble the power supply, reverse the disassembly procedure.

e. FILTER UNITS.

The low-pass and high-pass filter units on the receiver chassis (figure 7-10) are contained in individual shield cans. A notation of the individual components within each can appears on the can itself and on the schematic diagram (see figure 7-20). To gain access to any of these components, remove the two underchassis nuts from the spade bolts at diagonal corners of the appropriate shield can and lift off the cover.

f. FURTHER DISASSEMBLY.

Further disassembly of the equipment should never be necessary for maintenance purposes. However, both the IF–AF chassis and the RF chassis can be removed from the main frame by taking out all mounting screws and unsoldering the appropriate leads. If either the RF or the IF–AF chassis is removed, the proper dimension across the frame ($10\frac{29}{32}$'' +0'' $-\frac{1}{64}$'') must be maintained when reassembling in order to provide proper clearance when replacing the unit in the case. Adjustment is accomplished by means of elongated screw holes at the point where the two chassis are bolted together.

7. REPLACEMENT OF PANEL GASKETS.

The procedure for replacing damaged gaskets on the Transmitter-Receiver or Auxiliary Battery Pack panels is as follows:

a. Slip a warm knife under the damaged gasket and run the blade along between the gasket and panel to break the seal. It will also be helpful to heat the gasket and panel if practicable, but do not heat to more than 66°C (150.8°F).

b. Scrape all old gasket cement from the panel surfaces with a warm knife. Toluene (JAN-T-171) may be used as a solvent if available.

c. Coat the surface of the new gasket and the panel with Bostick 1007 primer (see Parts List). Let dry for one hour or until both surfaces are thoroughly dry.

d. Coat panel and gasket surfaces with Bostick 1021 cement (See Parts List), let dry for five minutes, and press the gasket into position on the panel. The gasket is now ready for use.

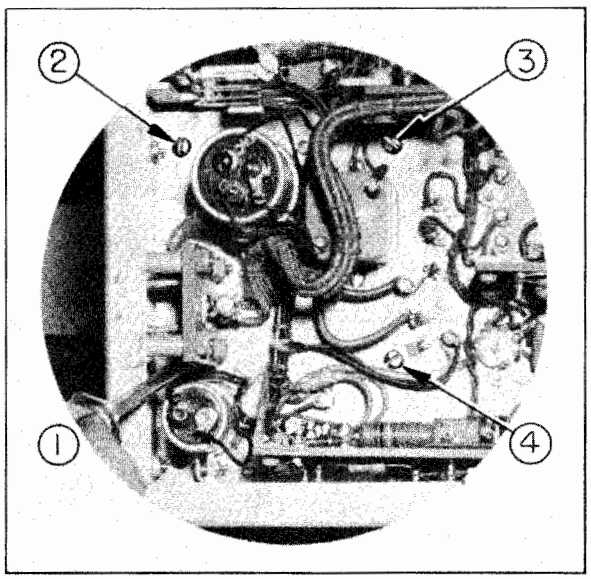


Figure 7-9.—Power Supply Removal.

Note

If the specified primer and cement are not immediately available, standard rubber cement will make a temporary substitute.

8. REPLACEMENT OF CORD ON DISCONE ANTENNA.

The cord between the ribs of the Discone Antenna serves only to maintain the proper cone diameter when the Antenna is open. If the cord should be broken, it may be spliced as required or replaced. Spare nylon cord is packed in the tool kit. When replacing the cord, a clove hitch at each rib is the most satisfactory tie with a carrick bend (preferred) or a square knot at the ends. The correct center-to-center spacing between the ribs is 2-5/8" at the tie-points, and the diameter of the cone at the bottom should equal the length of one rib as measured from the apex of the cone.

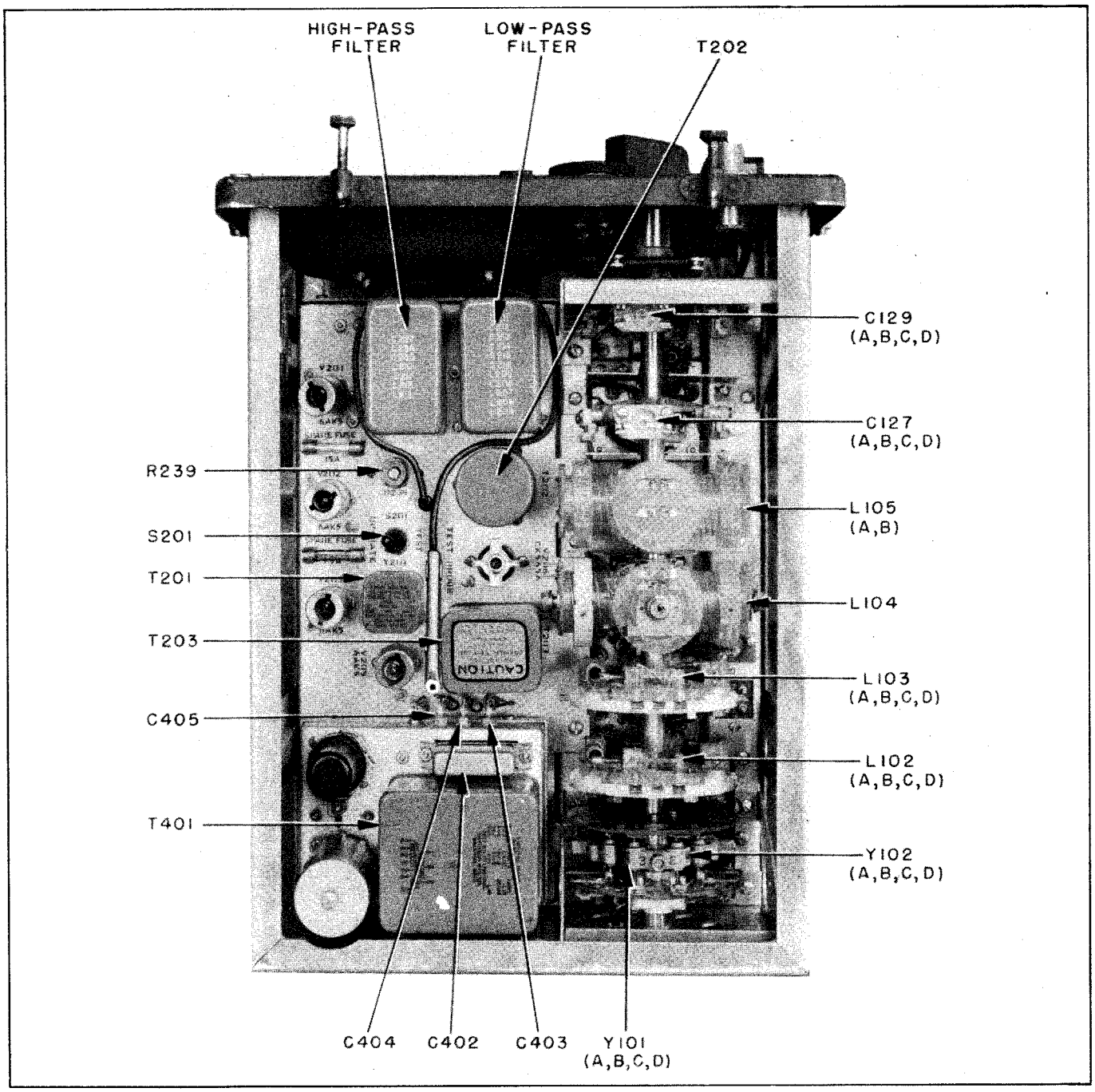


Figure 7-10.—Major Above-Chassis Components.

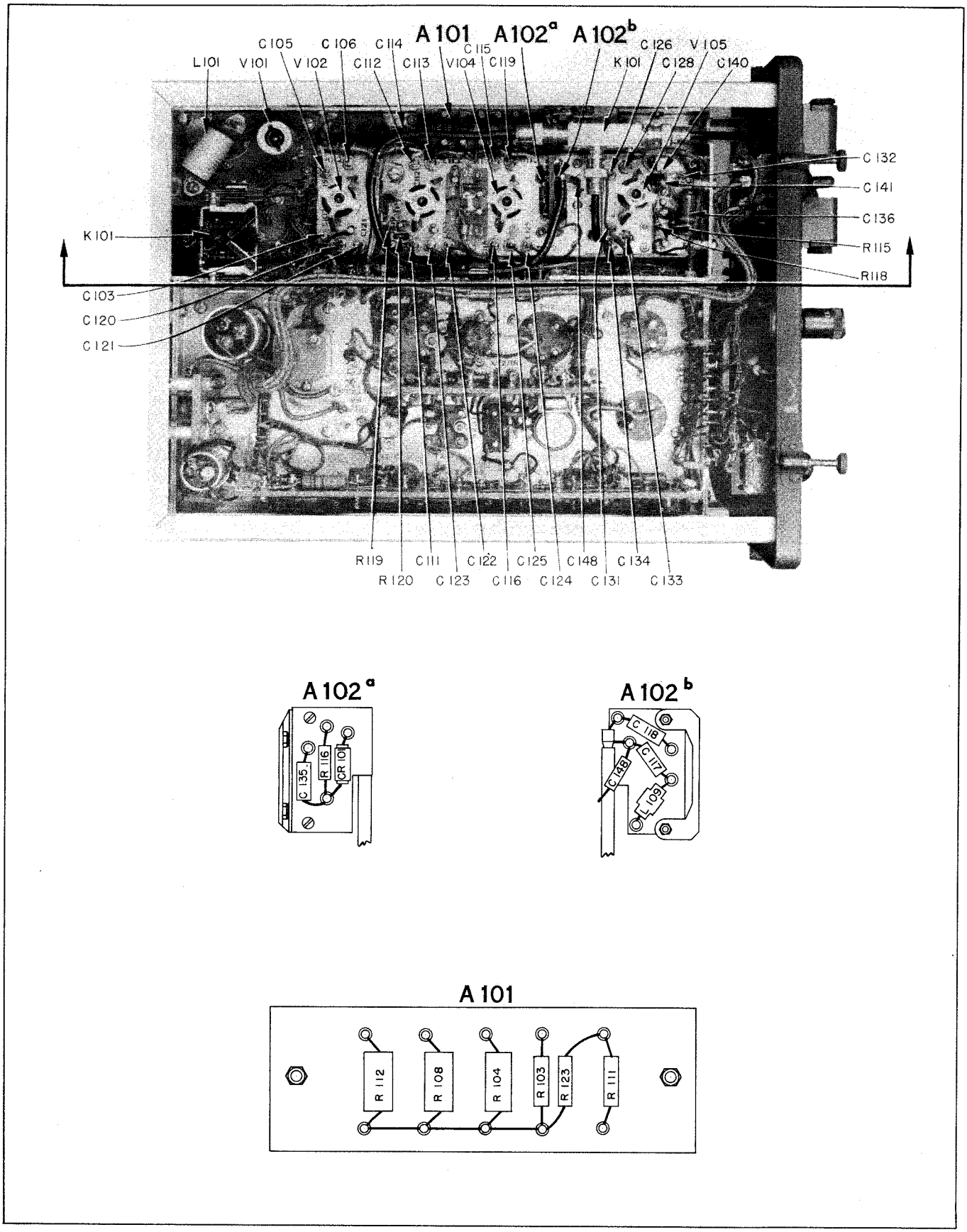


Figure 7-11.—Top View of RF Chassis, Showing Component Locations.

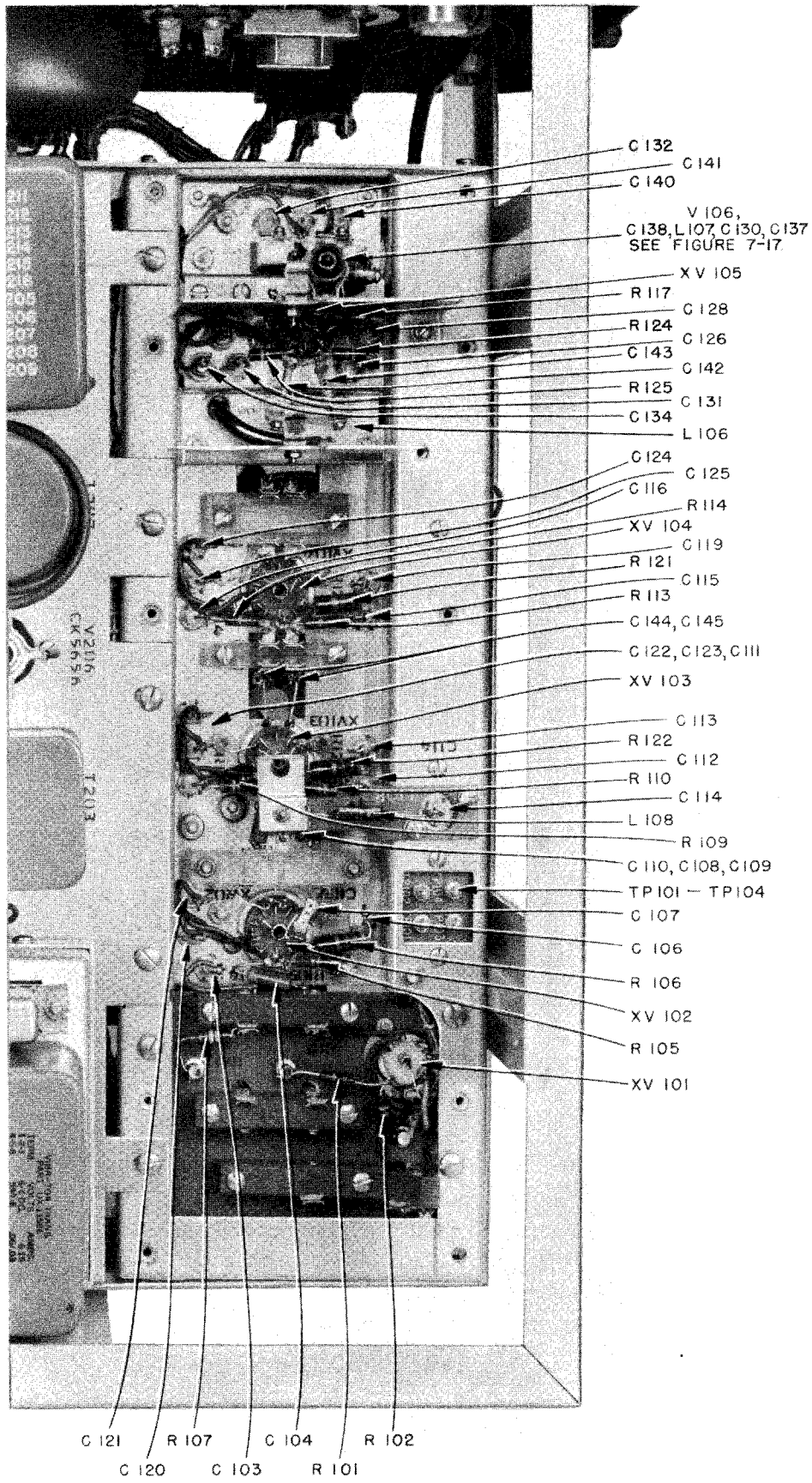


Figure 7-12.—Underside of RF Chassis, Showing Component Locations.

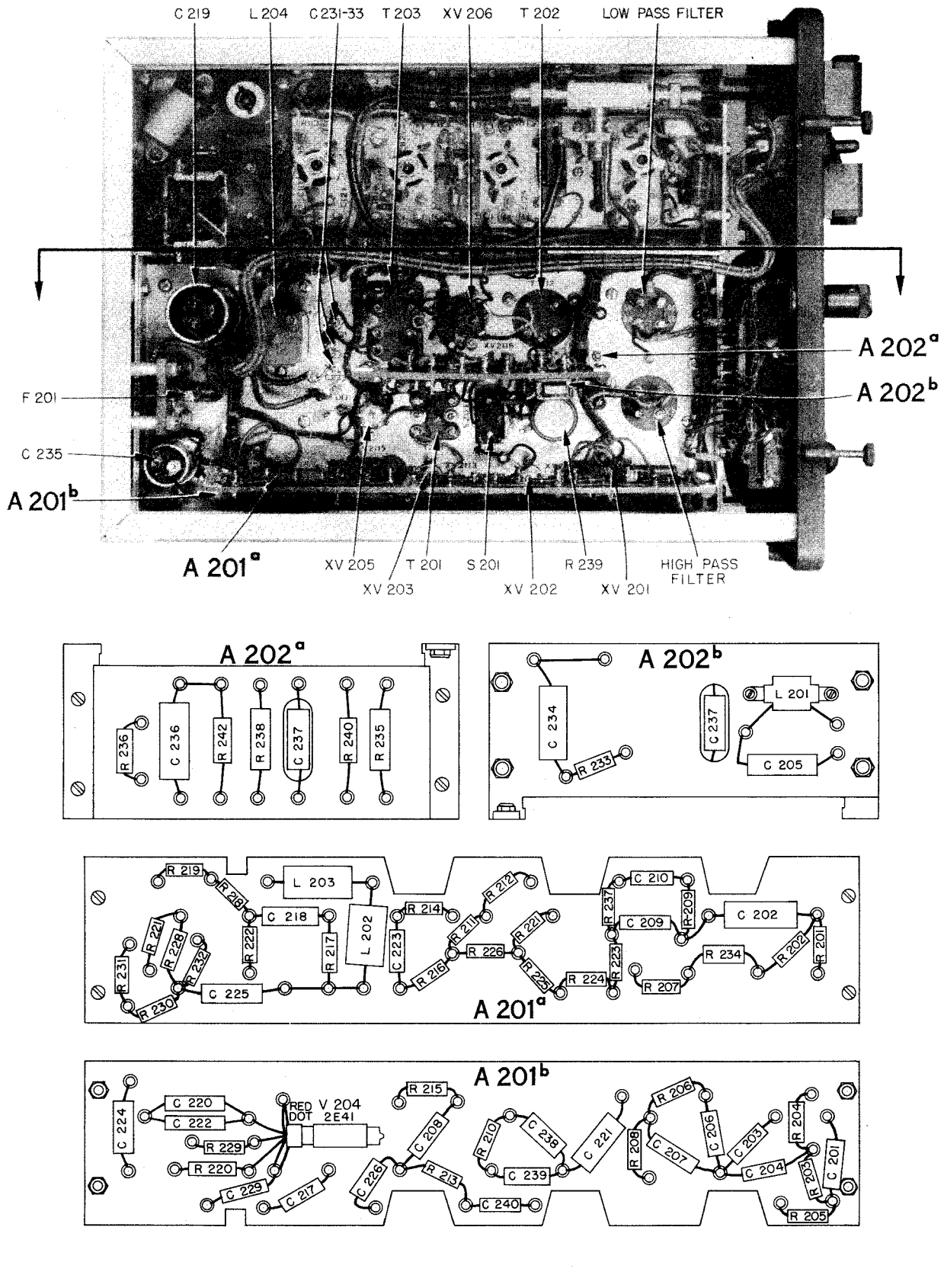


Figure 7-13.—Underside of IF-AF Chassis, Showing Component Locations.

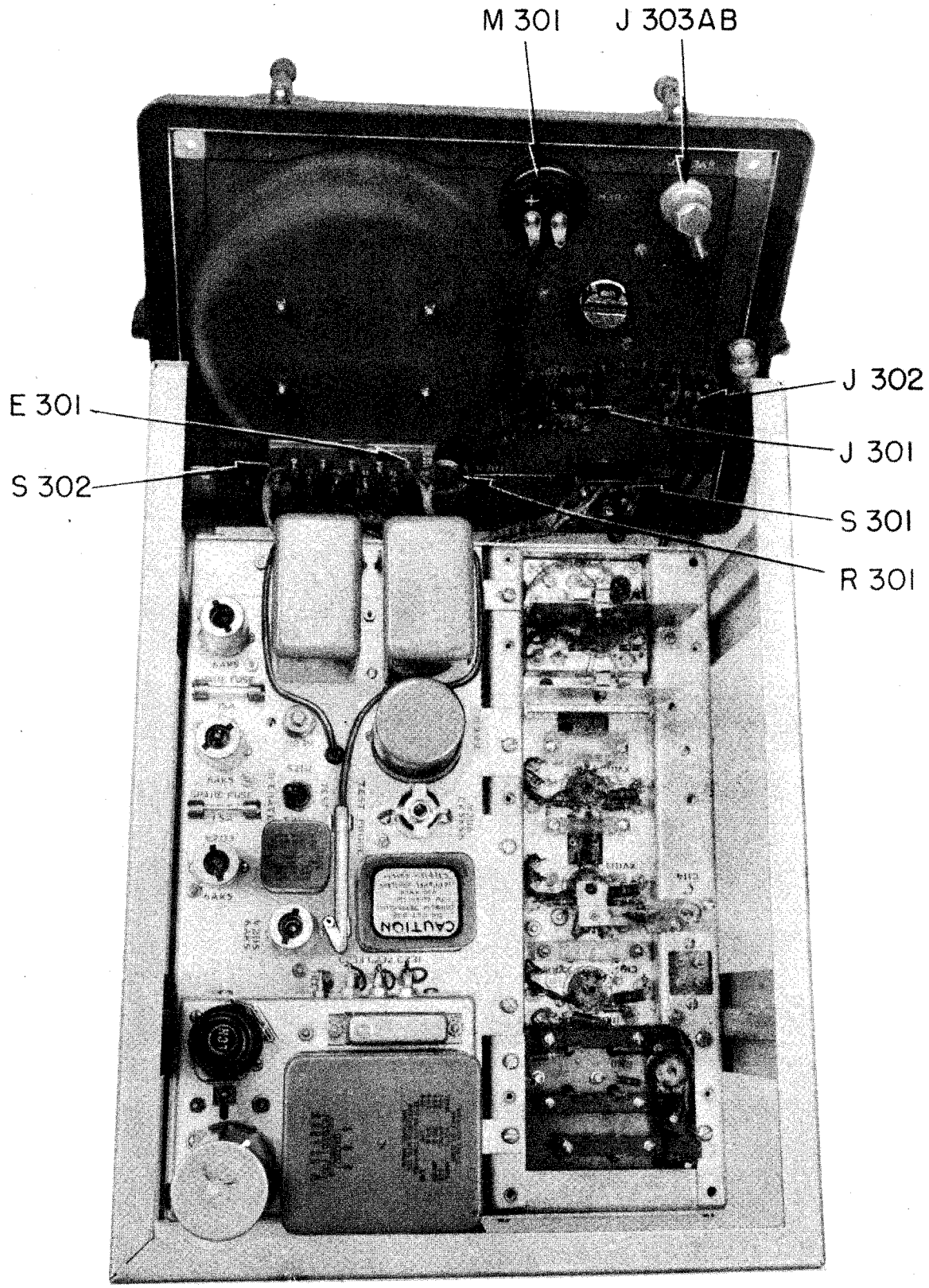


Figure 7-14.—Control Panel Component Locations.

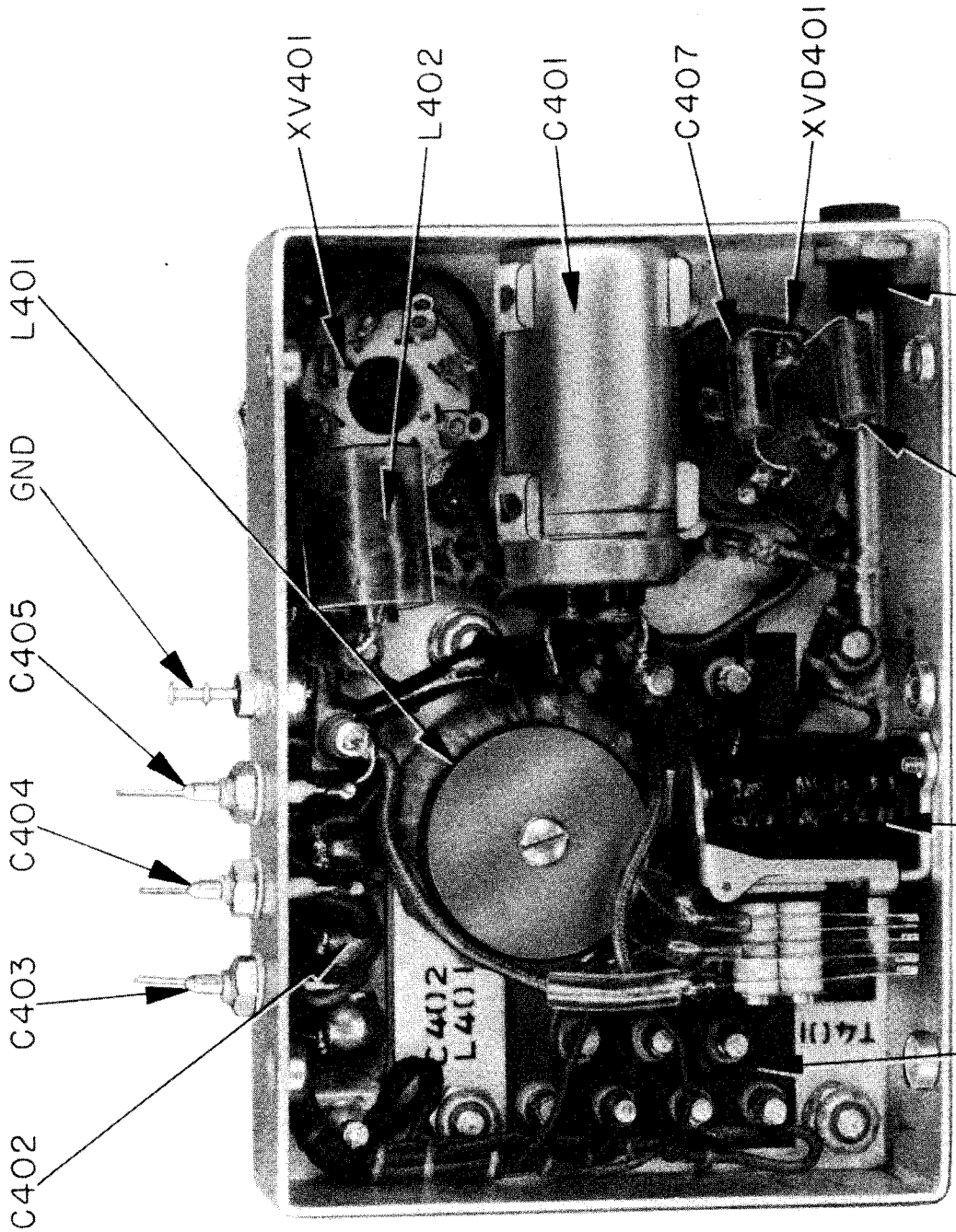


Figure 7-15.—Underside of Power Supply, Showing Component Locations.

TABLE 7-1. CRYSTAL CHART

Crystal and Channel Frequencies for Model MAY Equipment								
	TRANS.	REC' R.	TRANS.	REC' R.	TRANS.	REC' R.	TRANS.	REC' R.
1	19.2833	19.2917	21.5500	21.5583	22.8833	22.8917	25.2167	25.2250
	231.4		258.6		274.6		302.6	
2	19.4833	19.4917	21.8833	21.8917	22.9500	22.9583	25.3500	25.3583
	233.8		262.6		275.4		304.2	
3	19.5500	19.5583	21.9500	21.9583	23.0833	23.0917	25.4167	25.4250
	234.6		263.4		277.0		305.0	
4	19.6833	19.6917	22.0167	22.0250	23.1500	23.1583	25.4833	25.4917
	236.2		264.2		277.8		305.8	
5	19.8167	19.8250	22.0833	22.0917	23.2833	23.2917	25.6167	25.6250
	237.8		265.0		279.4		307.4	
6	20.2500	20.2583	22.1500	22.1583	23.3500	23.3583	25.7500	25.7583
	243.0		265.8		280.2		309.0	
7	20.8167	20.8250	22.2833	22.2917	23.6167	23.6250	25.8833	25.8917
	249.8		267.4		283.4		310.6	
8	20.8833	20.8917	22.3500	22.3583	23.7500	23.7583	26.0167	26.0250
	250.6		268.2		285.0		312.2	
9	20.9500	20.9583	22.4833	22.4917	23.8167	23.8250	26.1500	26.1583
	251.4		269.8		285.8		313.8	
10	21.1500	21.1583	22.5500	22.5583	24.1500	24.1583	26.2833	26.2917
	253.8		270.6		289.8		315.4	
11	21.2833	21.2917	22.6167	22.6250	24.2833	24.2917	26.4167	26.4250
	255.4		271.4		291.4		317.0	
12	21.3500	21.3583	22.7500	22.7583	24.9500	24.9583	26.5500	26.5583
	256.2		273.0		299.4		318.6	
13	21.4833	21.4917	22.8167	22.8250	25.0833	25.0917	26.6833	26.6917
	257.8		273.8		301.0		320.2	
	TRANS.	REC' R.	TRANS.	REC' R.	TRANS.	REC' R.	TRANS.	REC' R.
1	26.8167	26.8250	28.5500	28.5583	29.8167	29.8250	30.9500	30.9583
	321.8		342.6		357.8		371.4	
2	26.9500	26.9583	28.6833	28.6917	29.8833	29.8917	31.1500	31.1583
	323.4		344.2		358.6		373.8	
3	27.0833	27.0917	28.8167	28.8250	29.9500	29.9583	31.8167	31.8250
	325.0		345.8		359.4		381.8	
4	27.2167	27.2250	28.8833	28.8917	30.0833	30.0917	31.9500	31.9583
	326.6		346.6		361.0		383.4	
5	27.3500	27.3583	29.0833	29.0917	30.1500	30.1583	32.0167	32.0250
	328.2		349.0		361.8		384.2	
6	27.4833	27.4917	29.1500	29.1583	30.2167	30.2250	32.0833	32.0917
	329.8		349.8		362.6		385.0	
7	27.5500	27.5583	29.2167	29.2250	30.2833	30.2917	32.1500	32.1583
	330.6		350.6		363.4		385.8	
8	27.7500	27.7583	29.3500	29.3583	30.3500	30.3583	32.2167	32.2250
	333.0		352.2		364.2		386.6	
9	27.8833	27.8917	29.4167	29.4250	30.4833	30.4917	32.2833	32.2917
	334.6		353.0		365.8		387.4	
10	28.0167	28.0250	29.5500	29.5583	30.6167	30.6250	32.4833	32.4917
	336.2		354.6		367.4		389.8	
11	28.1500	28.1583	29.6167	29.6250	30.6833	30.6917		
	337.8		355.4		368.2			
12	28.2833	28.2917	29.6833	29.6917	30.8167	30.8250		
	339.4		356.2		369.8			
13	28.4167	28.4250	29.7500	29.7583	30.8833	30.8917		
	341.0		357.0		370.6			

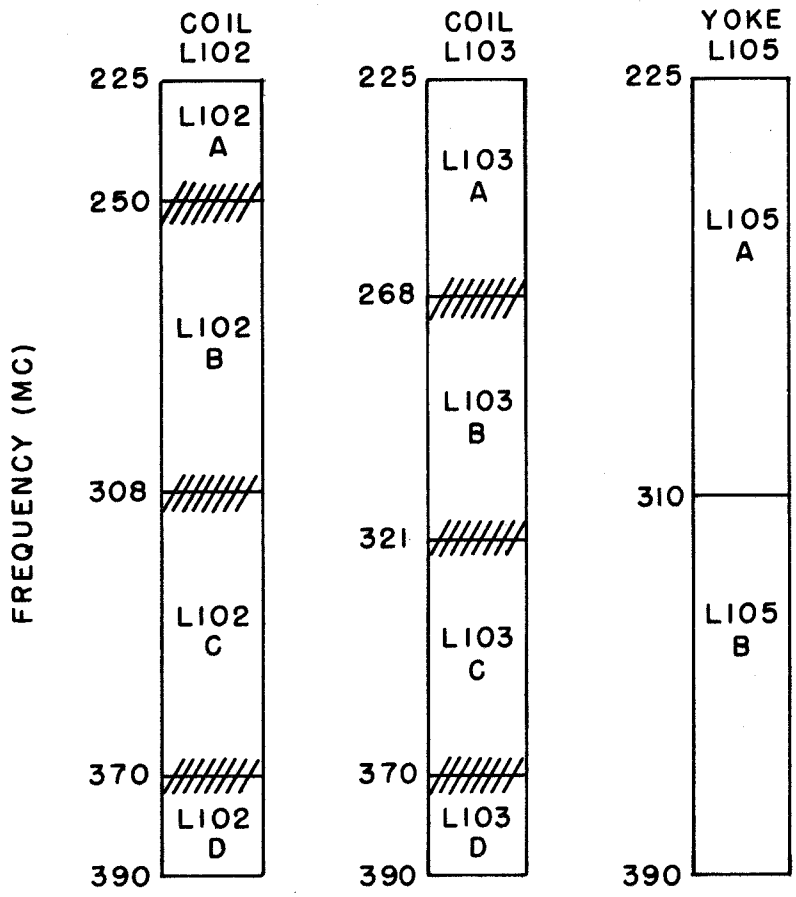
TOP TRAY

BOTTOM TRAY

TOP TRAY

BOTTOM TRAY

TABLE 7-2. COIL CHART



NOTE:
WHEN ASSIGNED FREQUENCY LIES IN SHADED REGION BETWEEN TWO COILS IT MAY BE NECESSARY TO TRY BOTH COILS TO OBTAIN PROPER OPERATION OF EQUIPMENT.

TABLE 7-3. OSCILLATOR TUNING DATA

TUNE C101 FOR CORRECT DIP FOR CHANNEL IN USE, AS STATED BELOW. LC DENOTES THE DIP CLOSEST TO THE LOW-CAPACITY SETTING OF C101; HC DENOTES THE DIP CLOSEST TO THE HIGH-CAPACITY SETTING OF C101. SEE PARAGRAPH 3.d. (3) OF THIS SECTION AND THE INCLUDED "NOTE" FOR FURTHER DETAILS.

HC SETTING OF C101 — LC SETTING OF C101

APPROXIMATE CHANNEL FREQUENCIES (Mc)	CORRECT DIP
225-260	HC
260-350	ONE ONLY
350-390	LC

TABLE 7-4. TROUBLE-SHOOTING GUIDE

NO NOISE IN PHONES; NO CARRIER INDICATION ON TRANSMIT

ALL CHANNELS

If no battery voltage, check	1. Battery connections (P201/J402, P401, and P402) 2. S301B
If low battery voltage, check	1. Battery charge (replace battery)
If normal battery voltage, check	1. F201 2. V401 and VD401 3. Vibrator power supply

SOME NOISE IN PHONES, BUT NO SIGNALS; NO OR VERY LOW CARRIER INDICATION ON TRANSMIT

ALL CHANNELS

If low battery voltage, check	1. Battery charge (replace battery)
If normal battery voltage, check	1. Antenna connections 2. V101, V102, and V103 3. Oscillator and frequency multiplier circuits

ONE CHANNEL ONLY

If other channels normal, check	1. Channel tuning 2. L102, L103, and L104 turret contacts

RECEIVER NORMAL, BUT NO OR VERY LOW CARRIER INDICATION ON TRANSMIT

ALL CHANNELS

If low battery voltage, check	1. Battery charge (replace battery)
If normal battery voltage, check	1. Push-to-Talk Switch 2. V104 3. Relays K101, K102, and K401 4. Transmitter final amplifier circuit
If normal operation, but no carrier reading, check	1. CR101 (panel A102[a], figure 7-11)

TABLE 7-4. TROUBLE-SHOOTING GUIDE (Cont.)

ONE CHANNEL ONLY

If other channels normal, check →
1. L104 and L105 tuning
2. L104 and L105 turret contacts
3. Crystal Y102

RECEIVER NORMAL, CARRIER INDICATION NORMAL EXCEPT NO FLICKER WITH SPEECH

ALL CHANNELS

If no modulation, check →
1. Microphone connections and microphone—try other panel jack
2. V206
3. Setting of R239—should be fully clockwise
4. S302
5. Modulator circuit

TRANSMITTER NORMAL; RECEIVER DEAD (NO OR VERY SLIGHT NOISE IN PHONES)

ALL CHANNELS

If no side-tone audible on MCW, check →
1. Headphone connections and headphones—try other panel jack
2. T201 secondary, S3 of T203

If normal side-tone audible on MCW, check →
1. V105, V106, and V201—V205
2. Relays K101, K102, and K401
3. Low-and high-pass filter coils for possible open circuit
4. RF amplifier, mixer, IF, detector, and audio circuits

ONE CHANNEL ONLY

If other channels normal, check →
1. Crystal Y101
2. C127 and C129 tuning
3. C127 and C129 turret contacts

TABLE 7-5. RATED TUBE CHARACTERISTICS

TUBE TYPE	FILAMENT VOLTAGE (V)	FILAMENT CURRENT (A)	PLATE VOLTAGE (V)	GRID BIAS (V)	SCREEN VOLTAGE (V)	PLATE CURRENT (MA)	SCREEN CURRENT (MA)	AC PLATE RESISTANCE (OHMS)	VOLTAGE AMPLIFICATION FACTOR (MU)	TRANSCONDUCTANCE (MICROHMOS)
1007	1.0*	1.2*	490**	—	—	110	—	—	—	—
2E41										
Pentode	1.25	0.03	45	0	45	1.0†	—	250,000	—	375
Diode	—	—	10	—	—	0.25	—	—	—	—
5656	6.3	0.4	225	-2	150	18‡	3	60,000	—	5800
5744	6.3	0.2	250	-2	—	4.0	—	—	70	4000
6AK5	6.3	0.175	180	-2	120	7.7	2.4	690,000	—	5100

*May be used in certain applications without heater voltage
**Peak
†Cathode current
‡Each section

TABLE 7-6. TYPE 5656 TUBE—SPECIFICATIONS

DESCRIPTION

The 5656 is a heater-cathode type, double tetrode of miniature construction, suitable for push-pull Class A and Class C RF amplifier service up to a frequency of 400 megacycles. The screen grids for the two sections are connected internally and are by-passed to the common cathode terminals by an internal condenser of approximately 15 μμf capacitance. This terminal arrangement, by reducing the RF impedance between the separate screen grids and cathodes, permits the use of push-pull RF circuits which provide higher input impedance and lower plate circuit losses than other miniature tube types in the 200 to 400 megacycle frequency range.

MECHANICAL DATA

ENVELOPE: T-6-1/2 Glass

BASE: Miniature Button 9-Pin

TERMINAL CONNECTIONS:

Pin 1 Grid No. 2 (Both Units)	Pin 6 Cathode (Both Units)
Pin 2 Grid No. 1 (Unit No. 1)	Pin 7 Plate (Unit No. 2)
Pin 3 Grid No. 1 (Unit No. 2)	Pin 8 Plate (Unit No. 1)
Pin 4 Heater	Pin 9 Cathode (Both Units)
Pin 5 Heater	

MOUNTING POSITION: Any

ELECTRICAL DATA

DIRECT INTERELECTRODE CAPACITANCES: Each Unit *(Without External Shield) (μμfds)*

Grid No. 1 to Plate	0.06 max.
Grid No. 1 to all Others Except Plate	3.6
Plate to All Others Except Grid	1.5
Common Screen to Cathode Internal By-pass Condenser (approx.)	15

DESIGN CENTER MAXIMUM RATINGS-CLASS A1:

Heater Voltage (ac or dc)	6.3 ± 10% volts
Plate Voltage	225 volts
Grid No. 2 Voltage	150 volts
Plate Dissipation, Each Section	2.7 watts
Grid No. 2 Dissipation, Each Section	0.65 watts
Plate Current, Each Section	18 ma.
Heater-Cathode Voltage	90 volts
DC Grid No. 1 Circuit Resistance, Each Section	100,000 ohms

CHARACTERISTICS AND TYPICAL OPERATION-CLASS A1: (Each Unit)

Heater Voltage (ac or dc)	6.3 volts
Heater Current (Total for Both Units)	0.40 amps.
Plate Voltage	150 volts
Grid No. 2 Voltage	120 volts
Grid No. 1 Voltage	-2.0 volts
Plate Resistance (approx.)	60,000 ohms
Transconductance	5800 μmhos
Plate Current	15 ma.
Grid No. 2 Current	2.7 ma.
Grid No. 1 Voltage (approx.) for Plate Current = 200 ua.	-8.5 volts

DESIGN CENTER MAXIMUM RATINGS-PUSH-PULL CLASS C TELEGRAPHY: (Cont. Service)

(Values are total for both units unless otherwise noted)

Heater Voltage (ac or dc)	6.3 ± 10% volts
Plate Voltage	200 volts
Grid No. 2 Voltage	150 volts

TABLE 7-6. TYPE 5656 TUBE—SPECIFICATIONS (Cont.)

Negative Grid No. 1 Voltage	-45 volts
Plate Dissipation, Each Section	2.25 watts
Grid No. 2 Dissipation	1.35 watts
Plate Current, Each Section	16 ma.
Grid No. 1 Current, Each Section	3.6 ma.
Heater-Cathode Voltage	90 volts
DC Plate Input Power	6.3 watts
DC Grid No. 1 Circuit Resistance, Each Section	50,000 ohms

DESIGN CENTER MAXIMUM RATINGS-PUSH-PULL CLASS C TELEGRAPHY INTERMITTENT "PUSH-to-TALK" SERVICE.

(Values are total for both units unless otherwise noted)

Heater Voltage (ac or dc)	6.3 ± 10% volts
Plate Voltage	225 volts
Grid No. 2 Voltage	150 volts
Negative Grid No. 1 Voltage	-45 volts
Plate Dissipation, Each Section	3.15 watts
Grid No. 2 Dissipation	1.6 watts
Plate Current, Each Section	22 ma.
Grid No. 1 Current, Each Section	3.6 ma.
Heater-Cathode Voltage	90 volts
DC Plate Input Power	10 watts
DC Grid No. 1 Circuit Resistance, Each Section	50,000 ohms

CHARACTERISTICS AND TYPICAL OPERATION-PUSH-PULL CLASS C 225 MEGACYCLE RF AMPLIFIER.

INTERMITTENT " PUSH-to-TALK" SERVICE:

(Values are total for both units unless otherwise noted)

Heater Voltage (ac or dc)	6.3 volts
Heater Current	0.40 amps.
Plate Voltage	220 volts
Grid No. 2 Voltage (approx.)*	110 volts
DC Grid No. 1 Voltage	-15 volts
or Separate Grid No. 1 Resistance for Each Section†	5,000 ohms
Peak RF Grid No. 1 to Grid No. 1 Voltage	50.0 volts
Plate Current	45 ma.
Grid No. 2 Current	10.5 ma.
Grid No. 1 Current, Each Section	3.0 ma.
DC Plate Input Power	10 watts
Useful RF Power Output, 225 Mc.	4.6 watts

**Adjust for the required plate current.*

†It is recommended that the push-pull RF grid signal be carefully balanced. The use of a separate dc grid resistance for each section, to develop a separate dc grid voltage for each section from the rectified grid current, provides some compensation for unbalanced RF grid drive voltage.

TABLE 7-7 JAN-5656

THIS SHEET OF TEST LIMITS IS A PART OF SPECIFICATION JAN-1A

Description: Push-Pull RF Beam Power Amplifier

Ratings: Absolute Maximum:	Ef V	Eb Vdc	Ec1 Vdc	Ec2 Vdc	Ehk Vdc	Ib mAdc	Ic1/g mAdc	Pp/p W	Pg2 W	Pi W	tk sec. (min.)
C. Teleg. Intermittent:	6.3±10%	250	-50	165	100	50	4	3.5	1.8	11	30
C. Teleg. Continuous:	6.3±10%	220	-50	165	100	35	4	2.5	1.5	7	30
A. Audio: and RF	6.3±10%	250	—	165	100	40	—	3.0	1.5	—	30
Test Cond.:	6.3	150	-2.0	120	—	—	—	—	—	—	—

*Height: Max. 2.19 in.
*Diameter: Max. 0.88 in.
**Base: Button 9-Pin Miniature

**Pin No.:	1	2	3	4	5	6	7	8	9
Element:	g_2	l_{gl}	2_{gl}	h	h	k	2_p	l_p	k
	Note 4					Note 5			Note 5

**Cathode: Coated Unipotential
**Envelope: T-6 1/2 (6-7)

Ref.	*Test*	*Conditions*	*Min.*	*Max.*
D-2	Qualification Approval:	Required for JAN Marking		
F-6a	Drop:			
F-6b(1)	*Vibration:	Rp=10,000; Note 1	Ep: —	1000 mVac
F-6i	Heater Current:		If: 0.36	0.44 A
F-6q	*Insulation:		Ihk: —	20 µAdc
F-6g(1)	Grid Current:	Note 1	Ic1: 0	-1.0 µAdc
F-6f(3)	Screen Current:	Note 1	Ic2: 0	4.0 mAdc
F-6f(1)	Plate Current:	Note 1	Ib: 9	21 mAdc
F-6j	Transconductance:	Note 1	Sm: 4500	7500 µmhos
F-6f(9)	Plate Current:	Ec1=-12Vdc; Note 1	Ib: —	200 µA
F-6d(2)	Power Oscillation (1):	Eb=220Vdc; Ec2/Ib=45mAdc; Po: Ic1/g=3mAdc; Rc1/g=5000 ohms; F=225 Mc; Ef=6.3Vac; Push-Pull Amplifier; Note 6	Po: 4.0	— W
F-6d(2)	Power Oscillation (2):	Power Oscillation (1); Ef=5.7Vac; t=60; Note 6	Po: 3.0	— W
F-6d(2)	*Power Oscillation (3):	Eb=220Vdc; Ecc2=220Vdc; Rc2=8200 ohms; Rc1=5000 ohms: Ic1=2.5 mAdc; Ib=45mAdc; Ef=5.6Vac; F=390Mc; t=300; Push-Pull Amplifier; Note 6	Po: 1.5	— W

TABLE 7-7. JAN-5656 (Cont.)

F-6p	*Capacitance:	Without Shield; Note 2	Cgp: 0.06 µµf Cin: 2.7 4.5 µµf Cout: 1.0 2.0 µµf
F-6c(5)	Peak Emission:	eb=ec1=ec2=75V; Note 1: Note 3	is: 250 — ma
F-4	Life Test:	Group B; 225Mc Push-Pull Class C self Oscillator: Ebb=220Vdc; Ec2/Ik=60mAdc; Ef=6.3Vac; Ic1/g=3.0mAdc; Rc1/g=3000 ohms; Rk=100 ohms; Intermittent Operation, 1 hour on, 1 hour Ef only; t is total Ef Operation and Ef plus Ep Operation.	t: 500 — hrs.
F-4b	Life Test End Point:	Power Oscillation (1)	Po: 3.0 — W

Note 1: Read each unit separately. Control grid of unit not under test shall be connected to minus 45 volts.

Note 2: Duplicate test on each unit separately.

Note 3: Voltage must be applied in pulses such that the tube will not be damaged.

Note 4: The screen grids for the two sections are connected internally and by-passed to cathode by an internal condenser of approximately 25 µµf.

Note 5: Cathodes are connected internally.

Note 6: Po shall be Useful Power Output.

TABLE 7-8—WINDING DATA

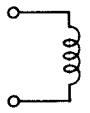
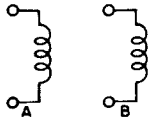
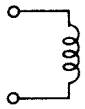
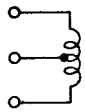
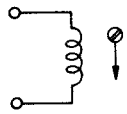
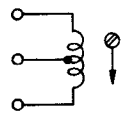
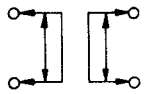
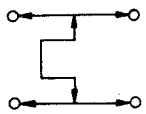
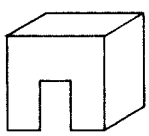
SYMBOL DESIGNATION	MFRS PART NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	MAX D C RES (OHMS)	HIPOT A C VOLTS	REMARKS
			RELAYS					
K101	71-5230P1		single	30EC	1350	18	—	SPDT, 3 amp, 6 v DC; palladium or silver alloy contacts; coil 6 v DC, 330 ma, 18 ohms
K102	71-5252P1		A B	28BS	512	4 4	—	2 coils, 6 v DC, 1.5 amp, 4 ohms each coil
K401	71-5229P1		single	32EC	1500	30	—	Coil 6 v DC, 200 ma 30 ohms. Contacts rated: 6 amp, 6 v DC
			INDUCTORS					
L101	92-5607G1		single	20 silver plated	8-1/2CT	—	—	1-5/8" x 3/4" diam, paper base, laminated phenolic form, air core
L102	92-5896G1 92-5896G2 92-5896G3 92-5896G4	 each section	A B C D	24 22 22 22 all silver plated	14 11 9 7	— — — —	— — — —	All forms polystyrene, adjustable powdered iron core Winding length 0.656" on 15/16" x 0.31 form. Resonant 29-37 mc
L103	92-5896G5 92-5896G6 92-5896G7 92-5896G8	 each section	A B C D	22 22 22 22	8 6 5 4 } CT	— — — —	— — — —	Single layer, on shielded, polystyrene form; powdered iron core A: 225 — 268 mc B: 268 — 321 mc C: 321 — 370 mc D: 370 — 390 mc
L104	51-7569G1		turret type	0.045" diam copper wire	2 (each turret)	—	—	1 hub, 4 RF turret-type coils with yokes, shorting bar, and splined shaft
L105	51-7568G1 51-7568G2		A B	—	—	—	—	Tuning stub RF tuning unit; 2 yokes and shorting loops A and B
L106 L107	51-7530G1 51-7553G1		lumped inductances	—	—	—	—	Special components, to be replaced from spares only

TABLE 7-8 — WINDING DATA (Continued)

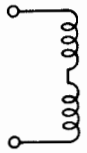
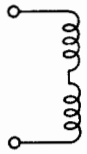
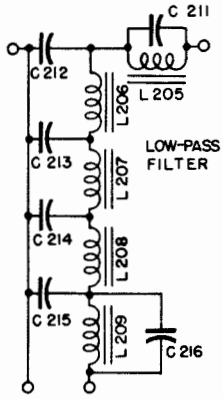
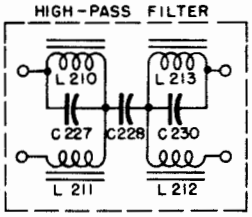
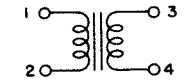
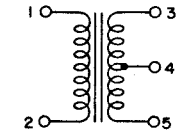
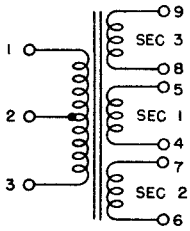
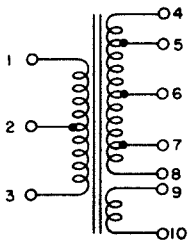
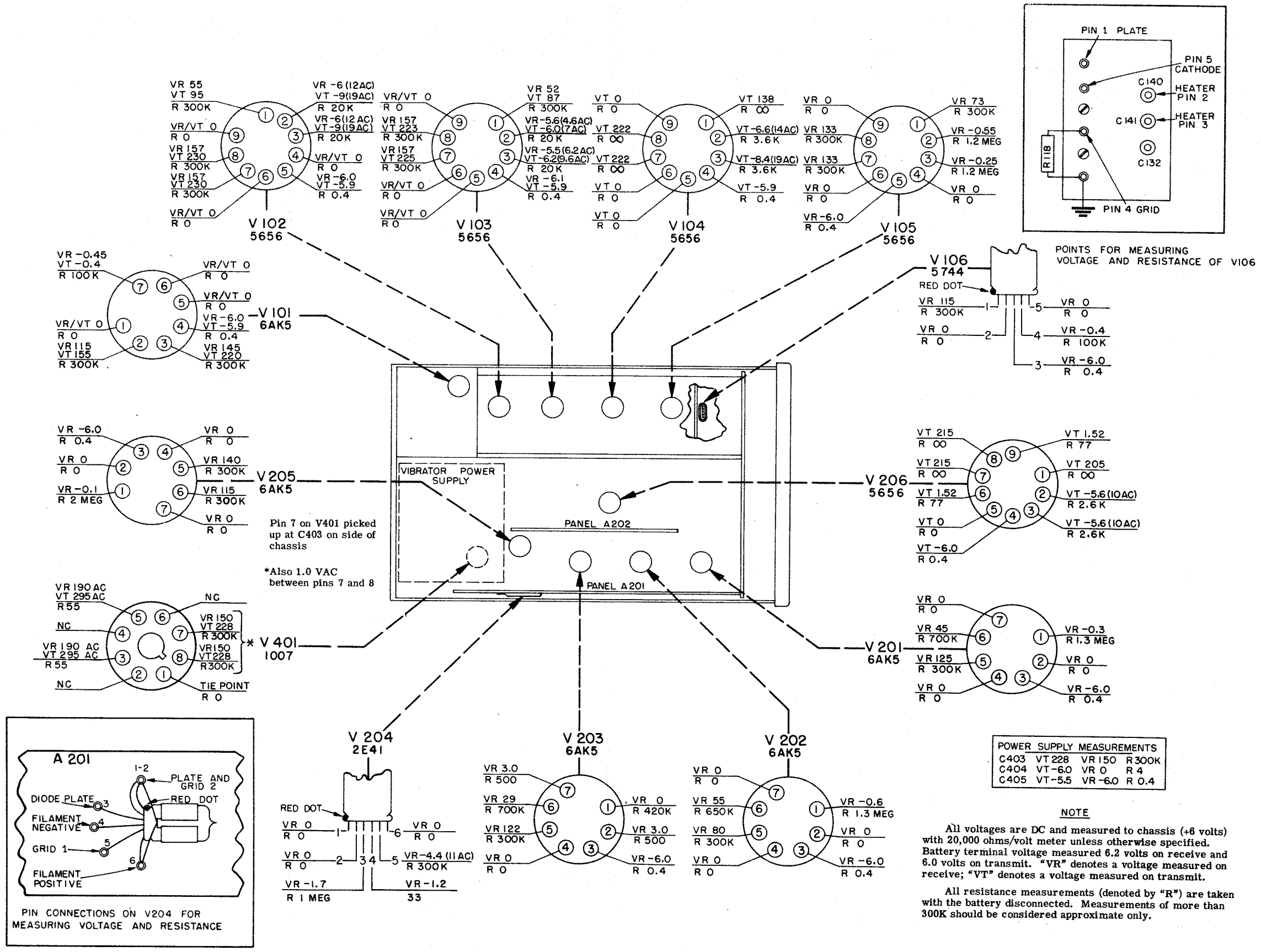
SYMBOL DESIGNATION	MFRS. PART NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	MAX D C RES (OHMS)	HIPOT A C VOLTS	REMARKS
L108 L109	92-5829G1		two pie universal	38E	80 (each pie)	7	—	Inductance: 90 μh
L110	51-7570G1	See L104	turret type	0.045" diam copper wire	2 (each turret)	—	—	1 hub, 4 RF turret-type coils with shorting bar
L201	92-5905P1		single	39E	1100	95	500 RMS	Inductance: 0.32 mh
L202	92-5755P1		two pie universal	40	1065 (each pie)	1620	—	Inductance: 126 mh
L203	92-5756P1		two pie universal	40	850 (each pie)	194	—	Inductance: 37.7 mh
L204	92-5567P1		single	31EN	700-1/2	18	1275 RMS	Inductance: 0.275 mh
L205 L209 L206 L207 L208	92-5568P1 92-5569P1		three pie universal	38	245 (each pie) 400 (each pie)	39 47	— —	Inductance: L205,209 – 6.5 mh; L206,207,208 – 17 mh
L210 L213 L211 L212	92-5582P1 92-5581P1		four pie universal	38	540 (each pie) 520 (each pie)	182 30	—	Inductance: L210, 213 – 45.5 mh, L211, 212 – 28.4 mh
L401	92-5785P1		single	20	60	0.05	—	Inductance: 290 μh
L402	92-5757P1		single	32	500	10	—	Inductance: 3.8 mh

TABLE 7-8 — WINDING DATA (Continued)

SYMBOL DESIGNATION	* MFRS. PART NO.	DIAGRAM	WINDING	WIRE SIZE	TURNS	MAX. D C RES (OHMS)	HIPOT A-C VOLTS	REMARKS
			TRANSFORMERS					
T201	M11592-3 92-5893P1		pri sec	42E 36E	600 330	1800 33	1500 RMS	Impedance: 100,000 ohms, 0.006 amp Impedance: 300 ohms
T202	M11509-1 92-5894P1		pri sec	36E 42E	150 12000 CT	11 5400	1000 RMS	Impedance: 75 ohms 0.040 amp DC Impedance: 480,000 ohms
T203	M11590-3 92-5891P1		pri sec 1 sec 2 sec 3	38E 37E 39E 36E	2100 1050 238 8	375 120 60 0.400	1500 RMS	Impedance: 16,000 ohms CT. 3 sec windings 4300, 1670, 165 ohms max DC; 40,10,0 ma
T401	M11586 92-5890P1		pri sec 4 – 8 sec 9, 10	16E 32E 2X23E	42 2380* 4	0.065 183 0.024	1780 RMS	No load: 6/6 v DC Full load: 590 v 4,8: 590 v AC 5,7: 375 v AC 9,10: 1.0 v AC Rated current (amp) pri 6.15 sec 4,6,8: 0.06 5,6,7: 0.030 9,10 : 1.4

*Tapped at 475, 1190, 1905 turns

Notes



POWER SUPPLY MEASUREMENTS			
C403	VT 228	VR 150	R 300K
C404	VT -6.0	VR 0	R 4
C405	VT -5.5	VR -6.0	R 0.4

NOTE

All voltages are DC and measured to chassis (+6 volts) with 20,000 ohms/volt meter unless otherwise specified. Battery terminal voltage measured 6.2 volts on receive and 6.0 volts on transmit. "VR" denotes a voltage measured on receive; "VT" denotes a voltage measured on transmit.

All resistance measurements (denoted by "R") are taken with the battery disconnected. Measurements of more than 300K should be considered approximate only.

Figure 7-16.—Tube Socket Voltage and Resistance Measurements.

COMPONENT LOCATIONS

SYMBOL	HORIZ	VERT
A103	B	5
C103	F	7
C104	F	7
C105	E	7
C106	E	7
C107	E	6
C108	E	6
C109	E	6
C110	F	6
C111	F	5
C112	E	5
C113	E	5
C114	E	6
C115	E	4
C116	F	4
C117	C	3
C118	C	3
C119	E	4
C120	F	7
C121	F	6
C122	F	5
C123	F	5
C124	F	4
C125	F	4
C126	E	3
C128	E	2
C130	E	1
C131	F	3
C132	B	1
C133	F	2
C134	F	3
C135	C	4
C136	C	1
C137	E	1
C138	F	1
C139	C	4
C140	C	1
C141	C	1
C142	F	3
C143	E	3
C144	F	5
C145	E	5
C148	B	3

SYMBOL	HORIZ	VERT
CR101	C	4
E101	A	5
K101	D	3
K102	B	9
L101	C	9
L106	E	3
L107	F	1
L108	E	6
L109	B	3
R101	E	8
R102	E	8
R103	D	5
R104	D	5
R105	E	7
R106	E	7
R107	F	8
R108	D	4
R109	F	5
R110	E	5
R111	D	5
R112	D	4
R113	E	4
R114	F	4
R115	B	2
R116	C	4
R117	E	2
R118	B	2
R119	B	6
R120	B	6
R121	E	4
R122	E	5
R123	D	5
R124	E	3
R125	F	3
R126	C	5
TP101	D	6
TP102	D	6
TP103	D	6
TP104	D	6
XV101	E	8
XV102	F	7
XV103	F	5
XV104	F	4
XV105	F	2
XV106	F	2

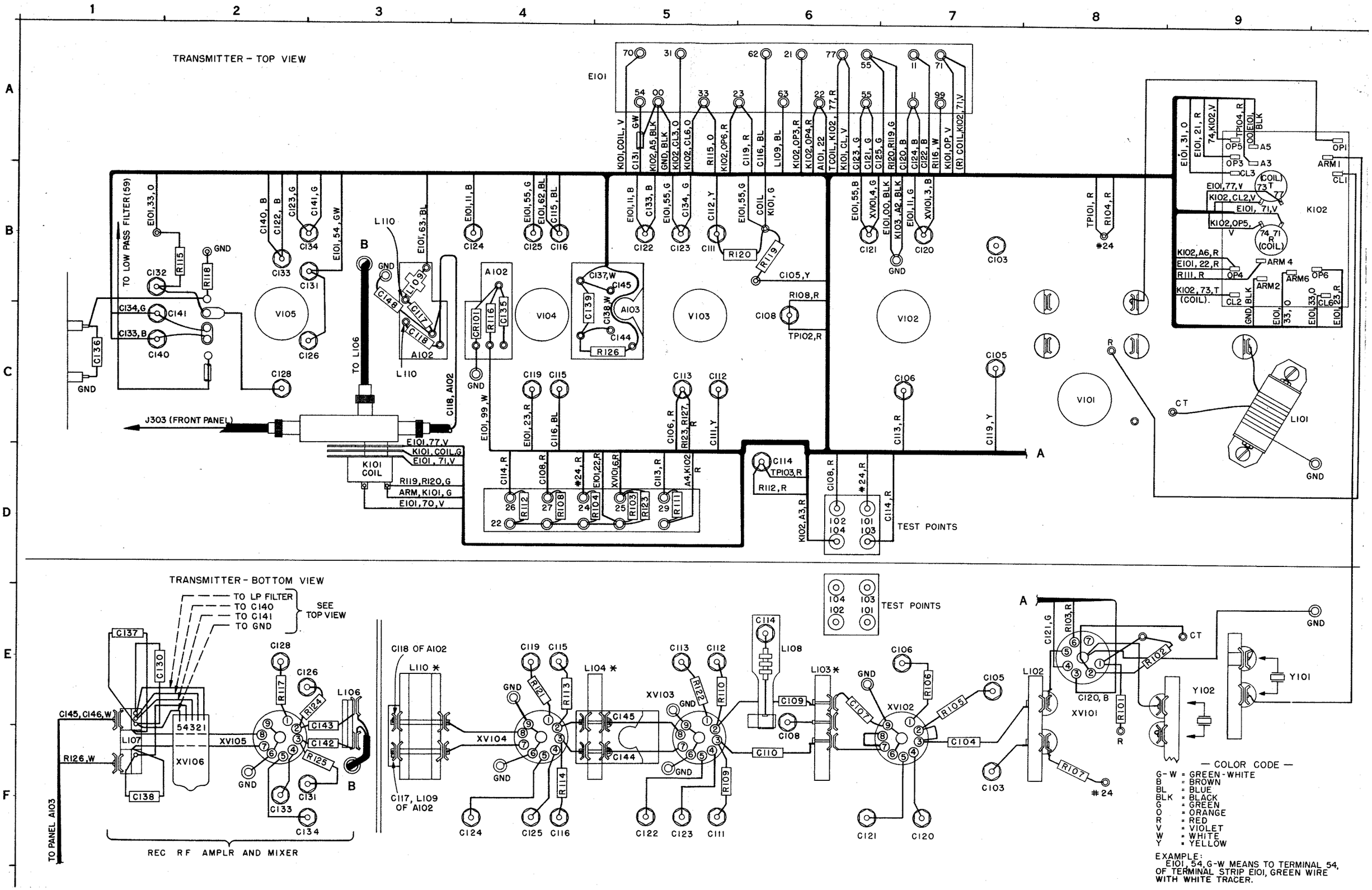


Figure 7-17.—Practical Wiring Diagram-Transmitter.

COMPONENT LOCATIONS

SYMBOL	HORIZ	VERT
A203	E	1
C201	F	14
C202	E	13
C203	F	13
C204	G	13
C205	E	7
C206	F	13
C207	F	13
C208	F	11
C209	E	13
C210	E	12
C217	G	10
C218	E	11
C219	D	2
C220	F	10
C221	F	12
C222	F	10
C223	E	11
C224	F	10
C225	E	10
C226	G	11
C229	G	10
C231	B	3
C232	C	3
C233	C	3
C234	E	5
C235	G	1
C236	D	5
C237	D	7
C238	F	12
C239	G	12
C240	G	12
E101	A	5
E301	B	11
F201	E	1
J301	E	17
J302	F	17
J303	G	20
L201	E	7
L202	E	11
L203	E	11
L204	B	2
M301	D	19
R201	E	13
R202	E	13
R203	G	13
R204	F	13
R205	G	13
R206	F	12
R207	E	13
R208	F	12
R209	E	13
R210	F	12
R211	E	11
R212	E	12
R213	G	11
R214	E	11
R215	F	11
R216	E	11
R217	E	11
R218	E	10
R219	E	10
R220	F	10
R221	E	10
R222	E	10
R223	E	12
R224	E	12
R225	E	12
R226	E	12
R227	E	12
R228	E	10
R229	F	10
R230	E	10
R231	E	10
R232	E	10
R233	E	5
R234	E	13
R235	D	7
R236	D	5
R237	E	12
R238	D	6
R239	F	7
R240	D	7
R242	D	6
R301	E	16
S201	F	6
S301	G	16
S302	C	16
T201	F	5
T202	C	7
T203	C	5
V204	F	11
XV201	D	13
XV202	D	12
XV203	D	11
XV205	F	4
XV206	C	6
High Pass Filter	C	9
Low Pass Filter	B	9

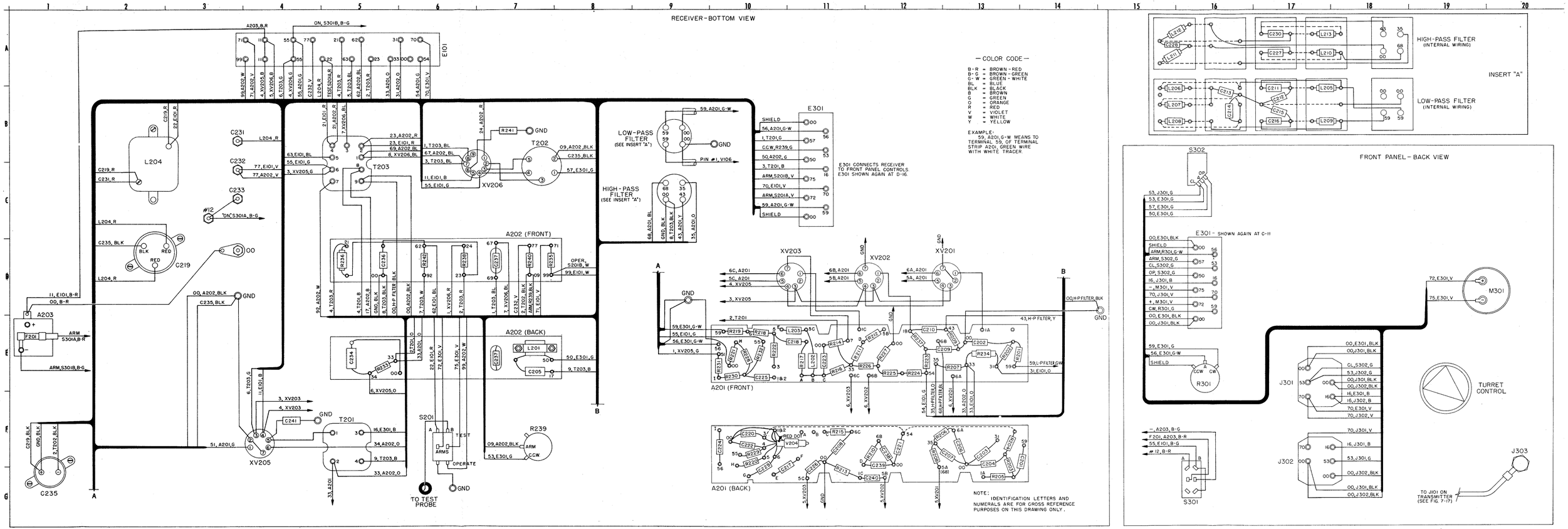


Figure 7-18.—Practical Wiring Diagram-Receiver.

COMPONENT LOCATIONS

SYMBOL	HORIZ	VERT
C401	C	7
C402	C	3
C403	A	2
C404	A	3
C405	A	3
C406	E	7
C407	D	7
J401	E	7
L401	C	3
L402	B	5
K401	F	5
T401	E	3
VD401	E	7
XV401	B	7

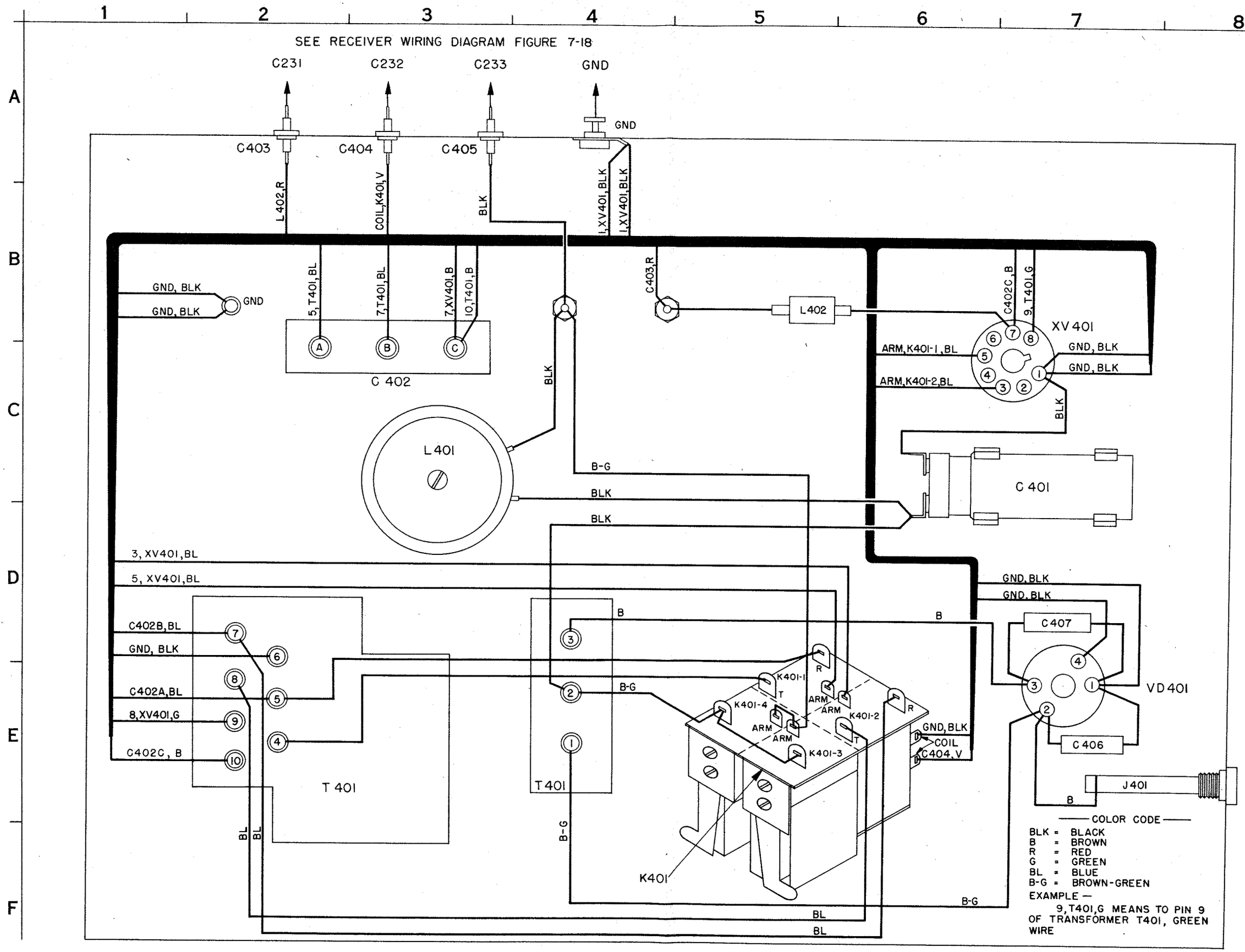


Figure 7-19.—Practical Wiring Diagram-Power Supply.

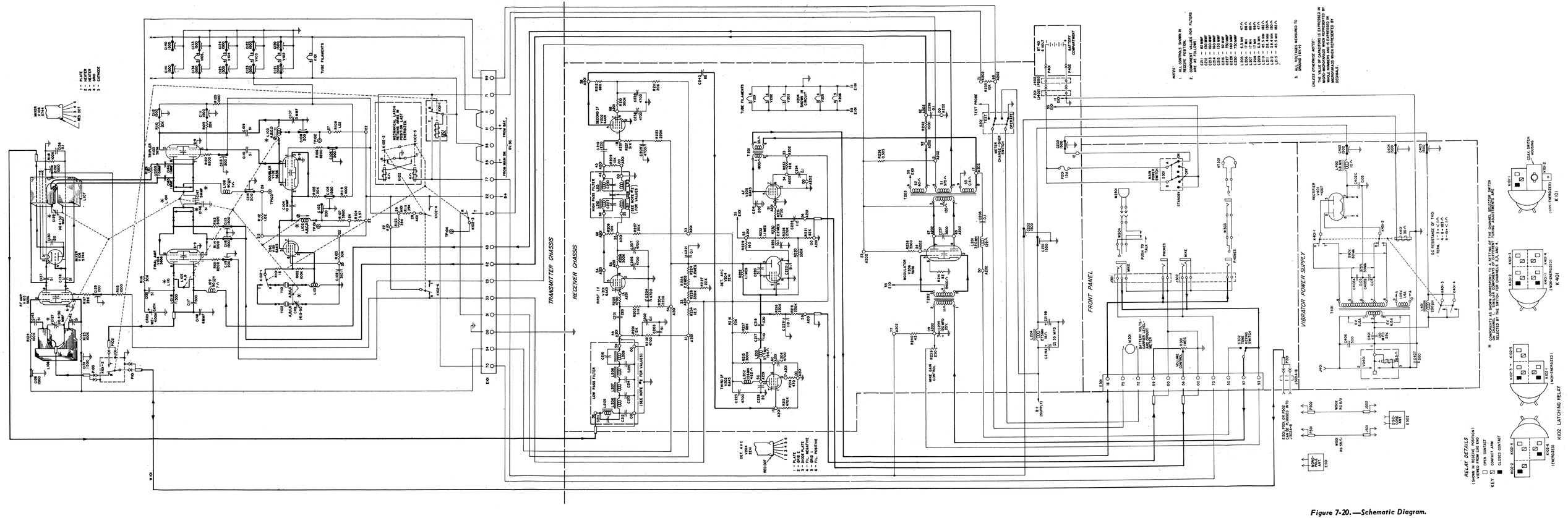


Figure 7-20.—Schematic Diagram.

SECTION 8

PARTS LISTS

Note: Equipment Spares are supplied only on Contract NObsr-43097

TABLE 8-1
WEIGHTS AND DIMENSIONS OF SPARE PARTS BOXES

EQUIPMENT SPARES					
SPARE PARTS BOX	OVERALL DIMENSIONS			VOLUME (cu ft)	WEIGHT (lbs)
	HEIGHT (in)	WIDTH (in)	DEPTH (in)		
1	18	12	9	1.12	37

TABLE 8-2
SHIPPING WEIGHTS AND DIMENSIONS OF SPARE PARTS BOXES

EQUIPMENT SPARES					
SHIPPING BOX NUMBER	OVERALL DIMENSIONS			VOLUME (cu ft)	WEIGHT (lbs)
	HEIGHT (in)	WIDTH (in)	DEPTH (in)		
2	25	17	.10	2.45	57

TABLE 8-3. LIST OF MAJOR UNITS

SYMBOL GROUP	QUANTITY	NAME OF MAJOR UNIT	NAVY TYPE DESIGNATION
101-499	1	TRANSMITTER-RECEIVER	CRP-43071
501-599		ACCESSORIES, includes 2 - ANTENNA AS-408/U	
601-699	1	AUXILIARY BATTERY PACK	CRP-19062
NONE	1	CARRYING CASE	CRP-10551

Contract Nxsr - 77830 NObsr - 43097

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
	RECEIVER-TRANSMITTER RADIO: portable; AM and MCW; xmtr output 2 w; frequency 225-390 mc; any 4 of 101 channels; no ext power sources; incl auxiliary ant, cable for Army-Navy Antenna AS-408/U, Navy type #51071, headset Navy type #49507, headset Cord Navy type #49534, mic cord Navy type #49561; self-contained portable unit; has clamps on side of case for carrying Army-Navy Antenna AS-408/U; Navy Spec #RE13A1071A.		(-43071)	F16-R-35395-3504 (2S9035)	26	RX-1862	99B-3G1		1						
	CASE: field shipping chest for Navy Transmitting and Receiving Equipment, Model MAY; plywood frame w/fibre covering, green lustreless E finish; empty; approx 33-3/4" lg x 20-1/2" wd x 15" h o/a; 7 int compartments; folding handle on ea end of case; trunk lock; Navy Spec #RE13A1071A.		(-10551)	F16-C-170001-347 (2Z1800.116)	26	ΔΔ	20-5664G1		1						
	AUXILIARY BATTERY PACK: maintenance parts for Navy type -43071 Transmitter-Receiver; aluminum, lustreless Marine Corps green wrinkle finish; w/contents; contains 2 Battery, Willard type ER-40-6, 1 ea tube JAN 6AK5, BuShips type 5656, JAN CK1007, 1 Vibrator, Radiart type VN-52; approx 20-3/4" lg x 12" wd x 5-3/8" h o/a; 2 interior compartments; no handles; air-tight case, has clamps on side for carrying Antenna AS-408/U; Navy Spec RE13A1071A.		(-19062)	F17-B-70401-4210 (3B288-1)	26		99F-4G1		1						
A101	BOARD, terminal: for mtg and connecting component parts; 10 post type solder term; 7/16" c to c in 2 rows 11/16" apart; 1/8" thk formica YN-25 board 3-1/8" lg x 1-1/16" wd x 31/64" h o/a; 2 #4-40 elastic stop clinch nuts on 2-3/4" ctr; identification mark in white characters.	For mounting and component parts, R103,R104,R108,R111, R112,C123.		N17-B-77934-8869 (3Z770-10.38)	26	ΔΔ	21-7435G1	A101	1						
A102	BOARD, terminal: mtg and connecting component parts; 7 post type solder term, 2 mtd on 1 side of board, 3 on other side 2 w/feed thru; irregular spacing; 1/8" thk formica YN-25 board, rectangular w/rectangular cutout one corner; 2" lg x 2-3/16"wd x 9/16"d o/a; 2 mtg holes 0.144"diam on 1-1/16"mtg/c; identification mark w/white characters.	For mounting and connecting component parts, C117,C118, C135,CR101,L109,P102,R116. ΔΔ Same as Contractor's Part Number		N17-B-77786-1469 (3Z770-7.14)	26	ΔΔ	21-7512G2	A102	1						

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
A103	BOARD, terminal: connecting component parts; 3 post type solder term; irregular spacing; formica YN-25 board; 1.750" lg x 1" wd x 31/64" d o/a; 2 mtg holes 0.128" diam on 1.375" mtg/c; identification mark in white characters.	For mounting and connecting component parts, C139, C144, C145, R126.		N17-B-77585-4563 (3Z770-3.36)	26	ΔΔ	21-7508G2	A103	1						
A104	BRACKET: front; turret support, aluminum, cad pl; gray paint; rectangular; 4.360" lg x 2-1/2" wd x 4-11/32" h o/a; three mtg holes 0.161" diam and one mtg hole 0.1870" diam on 3-11/16" x 1-25/32" mtg/c; face of bracket has bushing w/0.3750"-0.3755"diam hole for mtg turret shaft.	Turret support front		N16-B-750001-366 (2Z1244-88)	26	ΔΔ	17-7146G1	A104	1						
A105	MOUNTING, amplifier: mts RF amplr; aluminum, anodized, w/gray paint finish; cylindrical hub, 4 radial arms w/flat mtg surface on ea; 2.130" lg x 2.130" wd x 0.574" d o/a; 0.5005" diam hole in hub for mtg on turret shaft, #6-32 NC-2 tapped hole in hub.	Mounts C126		N16-M-58297-5700 (2Z6820.268)	26	ΔΔ	105-8005P3	A105, A106	2						
A106	Same as A105	Mounts C129													
A107	MOUNTING, coil: coil mtg plate, natural lustrex plate, aluminum hub, 12 cont blades in 4 groups of 3 spaced 90 deg apart, 8 captive screws; cir; 3-7/8" diam x 9/16" d approx o/a; 0.5005"diam hole in hub for mtg of turret shaft.	Coil mtg plate		N16-M-61696-4521 (2Z7093-244)	26	ΔΔ	51-7563G3	A107, A108	2						
A108	Same as A107	Coil mtg plate													
A109	RETAINER, crystal holder: xtal mtg plate; c/o 3/32" thk formica YN-25 plate, 8 clips in 4 groups of 2 spaced 90 deg apart; circular; approx 3-25/32"diam x 5/16" thk o/a; 0.6260"-0.625" diam clearance hole in ctr, 4 mtg holes 0.126" diam spaced apart on 0.859" diam; marked "Y101","Y102" in 4 groups on one side, on reverse side also in 4 groups.	Crystal mtg plate ΔΔ Same as Contractor's Part Number.		N16-R-501081-115 (2Z7093-245)	26	ΔΔ	21-7587G1	A109	1						

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
A110	RETAINER, crystal holder: xtal mtg plate; c/o 3/32" thk formica YN-25 plate w/8 clips in 4 groups of 2 spaced 90 deg apart, 4 blade term equally spaced between clip groups; circular; approx 3-25/32" diam x 5/16" thk o/a; 0.6260-0.6265" diam clearance hole in ctr, 4 mtg holes 0.126" diam spaced 90 deg apart on 0.859" diam; marked "C101" in 4 places 90 deg apart on one side.	Crystal mtg plate.		N16-R-501081-116 (2Z7093-246)	26	ΔΔ	21-7586G2	A110	1						
A111	BRACKET: rear turret support; aluminum, cad pl, grey paint; rectangular; 4.360" lg x 2-1/2"wd x 4-11/32" h o/a; 3 mtg holes 0.161" diam and 1 mtg hole 0.187" diam on 3-11/16" x 1-3/4" mtg/c; face of bkt has bushing w/0.500"-0.5005" diam hole for mtg turret shaft, 7 holes 23/32" diam on face of bkt, 1 hole 0.719" to 0.720"on rear of bkt face.	Turret support rear		N16-B-750001-367 (2Z1244-89)	26	ΔΔ	17-7147G1	A111	1						
A201	BOARD, terminal: mtg and connecting component parts; 48 post type solder terms; irregular spaced term on both sides of board; 1/8" thk formica YN-25 board, rectangular w/cutouts along one edge; 10-7/8" lg x 2-5/16" wd x 27/32" d o/a; 4 elastic stop clinch nuts #4-40 on 10.500" x 1/375" mtg/c; marked "A201", incl shield for sub-miniature tube.	For mounting and connecting component parts, C201 thru C204,C206 thru C210,C217, C218,C220 thru C226,C229, C238 thru C240,L202,L203, R201 thru R232,R234,R237, V204.		N17-B-78313-7869 (3Z770-48.3)	26	ΔΔ	21-7650G2	A201	1						
A202	BOARD, terminal: mtg and connecting component parts; 20 post type solder term; irregular spacing on both sides of board; 1/8" thk formica YN-25 board, rectangular; 5-1/2" lg x 2" wd x 27/32" d o/a; 4 elastic stop clinch nuts #4-40 on 5.125"x 1.250" mtg/c; marked "A202".	For mounting and connecting component parts , C205, C234,C236,C237,L201,R233, R235,R236,R238,R240.		N17-B-78138-7669 (3Z770-20.28)	26	ΔΔ	21-7648G2	A202	1						

ΔΔ Same as Contractor's Part Number.

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
C108	Same as C103	Doubler plate circuit by-pass													
C109	CAPACITOR, fixed: ceramic dielectric; 51 mmf p/m 10%; neg term coef 750(tol p/m 120) mmf/mf/deg C; 500 vdcw; 0.562" max lg x .250" max diam; 2 axial wire lead term; molded low loss phenolic insulation; Spec JAN-C-20.	Doubler-tripler coupling	CC21UJ510K	N16-C-16606-5748 (3D9051-10)	35	Δ	35-5284	C109,C110,C135, C203,C220,C222.	6						
C110	Same as C109	Doubler-tripler coupling													
C111	Same as C105	Tripler grid return													
C112	Same as C105	Tripler grid return													
C113	Same as C103	Tripler screen grid decoupling													
C114	Same as C103	Tripler plate by-pass													
C115	Same as C105	Final amplifier grid return													
C116	Same as C105	Final amplifier grid return													
C117	Same as C102	RF power amplifier blocking													
C118	Same as C102	Final amplifier blocking													
C119	Same as C103	Final amplifier screen decoupling													
C120	Same as C105	Doubler heater by-pass													
C121	Same as C105	Doubler heater by-pass													
C122	Same as C105	Tripler heater by-pass													
C123	Same as C105	Tripler heater by-pass													
C124	Same as C105	Heater by-pass final amplifier													
C125	Same as C105	Heater by-pass final amplifier													
C126	Same as C105	R.F. amplifier (Rec.) A.V.C. feed thru													
C127	CAPACITOR, variable: ceramic dielectric; rotary type sect; 4 to 30 mmf; 500 vdcw; neg temp coef 650 mmf/mf/°C; 1.137" lg x 21/32" wd x 13/32" d excluding term; 1 rotor and 1 stator blade cont; 2 mtg holes 0.120" diam on 27/32"mtg/c; scdr adj; ceramic base.	RF amplifier tuning condenser Δ Same as JAN or Navy Type Number.		N16-C-64062-7350 (3D9030V-26)	35		35-5581G2	C127, 4 used C129, 4 used.	8						

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
C128	Same as C103	RF amplifier (Rec)screen decoupling													
C129	Same as C127	Mixer tuning condenser													
C130	CAPACITOR, fixed: ceramic dielectric; 120 mmf p/m 10%; negative temp coef 1400 (tol p/m 150) mmf/mf/°C; 500 vdcw; 7/16" lg x 9/64" diam; two radial wire lead term; uninsulated.	Plate cathode by-pass mixer		N16-C-17212-4369 (3D9120-34)	475	type CN2	35-5890P1	C130	1			1			
C131	Same as C105	RF amplifier (Rec)A.V.C. feed thru													
C132	Same as C105	RF amplifier plate by-pass													
C133	Same as C105	(Rec)RF amplifier heater by-pass													
C134	Same as C105	RF amplifier Rec heater by-pass													
C135	Same as C109	Carrier indicator coupling													
C136	CAPACITOR, fixed: paper dielectric; 100,000 mmf p/m 20%; 200 vdcw; molded mineral filled plastic case; 1-1/16" lg x 3/8" diam excluding term and mtg; spcl high temp organic matl impr; 2 axial wire lead term 1" lg min, #22 AWG wire; no int gnd connection; term mtg.	Grid by-pass(mixer)		N16-C-45803-3260 (3DA10-472)	2	#65P	35-5882P15	C136,C202,C205,C221, C225,C234,C236.	7			2			
C137	CAPACITOR, fixed: ceramic dielectric; 51 mmf p/m 5%; UJ characteristic; 500 vdcw; 0.400" max lg x 0.200" max diam; radial wire lead term; uninsulated; color coding; Spec JAN-C-20A.	Mixer coupling	CC20UJ510J	N16-C-16597-1215 (3D9051-12)	475	Δ	35-5681P1	C137,C138,C142,C143, C146,4 used.	8						
C138	Same as C137	Mixer coupling													
C139	Same as C107	L.O. injection stabilizer													
C140	Same as C105	Mixer heater by-pass													
C141	Same as C105	Mixer heater by-pass													
C142	Same as C137	Coupling RF amplifier grid													
C143	Same as C137	Coupling RF amplifier grid													
C144	CAPACITOR, fixed: ceramic dielectric; 1.0 mmf p/m 0.25 mmf; neg temp coef minus 330 mmf/mf/°C w/ tol ltr L; 500 vdcw; 0.400" max lg x 0.200" max diam; radial wire lead term; uninsulated; Spec JAN-C-20A.	Coupling L.O. injection Δ Same as JAN or Navy Type Number.	CC20SL010C	N16-C-15369-4494 (3D9001-26)	475	Δ	35-5965P1	C144,C145.	2						

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
C145	Same as C144	Coupling L.O. injection													
C146	Same as C137	Final amplifier grid heli line by-pass													
C147	CAPACITOR, fixed: ceramic dielectric; 5 mmf p/m 0.5 mmf; SL characteristic; 500 vdcw; 0.562" max lg x 0.250" max diam excl term; 2 axial wire lead term #20 or #22 AWG 1-1/4" min lg; ceramic ins; Spec JAN-C-20A.		CC21SL050D	N16-C-15628-9005 (3D9005-109)	35	Δ	35-5640P13	C147, 4 used	4						
C148	CAPACITOR, fixed: ceramic dielectric; 6 mmf p/m 0.5 mmf; neg temp coef minus 330 mmf/mf/°C w/tol ltr L; 500 vdcw; 0.562" max lg x 0.250" max diam excl term; 2 axial wire lead term; ceramic ins; Spec JAN-C-20A.		CC21SL060D	N16-C-15693-1369 (3D9006-33)	35	Δ	35-5640P14	C148	1						
C201	CAPACITOR, fixed: mica; 220 mmf p/m 5%; 500 vdcw; temp coef letter C; 51/64" max lg x 15/32" max wd x 7/32" max thk; molded low loss bakelite case; two axial wire lead term; Spec JAN-C-5.	1st IF grid coupling	CM20C221J (-481626-C5)	N16-C-29370-7601 (3K2022132)	100	Δ	35-5342	C201,C210,C218.	3						
C202	Same as C136	Mixer plate decoupling													
C203	Same as C109	Plate by-pass mixer decoupling													
C204	CAPACITOR, fixed: paper dielectric; 4700 mmf p/m 20%; 200 vdcw; mineral filled plastic case; 11/64" diam x 3/4" lg excluding term and mtg; impr w/spcl high temp organic; 2 axial wire lead term 1" lg min, #22 AWG wire; no int gnd connections; term mtg.	1st I.F. A.V.C. decoupling		N16-C-41062-6831 (3DA4.700-10)	2	#75P	35-5882P4	C204,C206,C207,C208, C209,C223,C238,C239.	8			2			
C205	Same as C136	Oscillatory feed back cap.													
C206	Same as C204	1st I.F. screen grid by-pass													
C207	Same as C204	Decoupling 1st I.F. plate													
C208	Same as C204	3rd I.F. screen grid by-pass													
C209	Same as C204	2nd I.F. A.V.C. decoupling													
C210	Same as C201	Grid coupling 2nd I.F.													
	Δ Same as JAN or Navy Type Number.														

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
C211	CAPACITOR, fixed: mica; 82 mmf p/m 5%; 500 vdcw; temp coef letter C; 51/64" max lg x 15/32" max wd x 7/32" max thk; molded low loss bakelite case; two axial wire leads; Spec JAN-C-5.	Input series arm low pass filter	CM20C820J	N16-C-28210-2001 (3K2082032)	100	Δ	35-5333	C211,C216,C240	3						
C212	CAPACITOR, fixed: mica; 130 mmf p/m 5%; 500 vdcw; temp coef letter C; 51/64" max lg x 15/32" max wd x 7/32" max thk; molded low loss bakelite case; two axial wire leads; Spec JAN-C-5.	1st shunt arm low pass filter	CM20C131J (-481450-C5)	N16-C-28816-8201 (3K2013132)	100	Δ	35-5338	C212,C215.	2						
C213	CAPACITOR, fixed: mica; 160 mmf p/m 5%; 500 vdcw; temp coef letter C; 51/64" max lg x 15/32" max wd x 7/32" max thk; molded low loss bakelite case; two axial wire leads; Spec JAN-C-5.	2nd shunt arm low pass filter	CM20C161J (-481632-C5)	N16-C-29080-6201 (3K2016132)	100	Δ	35-5339	C213,C214.	2						
C214	Same as C213	3rd shunt arm low pass filter													
C215	Same as C212	4th shunt arm low pass filter													
C216	Same as C211	Output series arm low pass filter													
C217	CAPACITOR, fixed: mica; 110 mmf p/m 5%; 500 vdcw; temp coef letter C; 51/64" max lg x 15/32" max wd x 7/32" max thk; molded low loss bakelite case; two axial wire leads; Spec JAN-C-5.	Low pass filter 3rd I.F.	CM20C111J (-481066-5)	N16-C-28658-5801 (3K2011132)	100	Δ	35-5336	C217,C224,C229.	3						
C218	Same as C201	Coupling 3rd I.F. to 2nd detector													
C219	CAPACITOR, fixed: electrolytic; 2 sect; 35 mf +150%-10% ea sect; 300 vdcw; oper temp range minus 40° to plus 85°C; 2-1/4" lg x 1-3/8" diam; HS metal case; 3 solder lug term on one end; 2 pos term ins, 1 neg term, no int gnd connections; mtd w/mtg ring, ring not incl.	2 section cap consisting of C219A,C219B.		N16-C-21941-1001 (3DB35-2)	2		35-5758P1	C219	1						
C219A	Part of C219	Power supply hum filter													
C219B	Part of C219	Power supply hum filter													
C220	Same as C109	R.F. by-pass A.V.C. diode													
C221	Same as C136	A.V.C. filter													
C222	Same as C109	R.F. by-pass 2nd detector													
	Δ Same as JAN or Navy Type Number.														

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
C223	Same as C204	3rd I.F. plate filter													
C224	Same as C217	Audio amp A.V.C. blocking													
C225	Same as C136	A.V.C. by-pass A.F. amplifier													
C226	CAPACITOR, fixed: ceramic dielectric; 20 mmf, p/m 10%; negative temp coef 470 (tol +250-450) mmf/mf/°C; 500 vdcw; 0.250" diam x 0.562" lg; axial wire leads; molded plastic ins; Spec JAN-C-20.	Low pass filter 3rd I.F.	CC21TK200K	N16-C-16094-1881	35	Δ	35-5423	C226	1						
C227	CAPACITOR, fixed: 750 mmf p/m 5%; 500 vdcw; temp coef letter C; 53/64" max lg x 53/64" max wd x 11/32" max thk; molded low loss bakelite case; two axial wire leads; Spec JAN-C-5.	Input-series arm hi pass filter	CM35C751J (-481155-C5)	(3K3575132)	100	Δ	35-5367	C227, C230	2						
C228	CAPACITOR, fixed: mica; 180 mmf p/m 5%; 500 vdcw; temp coef letter C; 51/64" max lg x 15/32" max wd x 7/32" max thk; molded low loss bakelite case; two axial wire leads; Spec JAN-C-5.	Middle series arm hi pass filter	CM20C181J (-481518-C5)	N16-C-29133-4001 (3K2018132)	100	Δ	35-5340	C228	1						
C229	Same as C217	I.F. filter 2nd detector													
C230	Same as C227	Output series arm hi pass filter													
C231	Same as C105	Power supply high frequency hash filter													
C232	Same as C105	Power supply high frequency hash filter													
C233	Same as C105	Power supply high frequency hash filter													
C234	Same as C136	Screen by-pass A.F. amplifier													
C235	CAPACITOR, fixed: electrolytic; 120 mfd plus 150, minus 10%; 25 vdcw; oper temp range M40 to 85°C; case dimen 1-3/4" lg x 1" diam; tubular metal case; 2 solder lug term 1 end; no int gnd connection; mtd w/mtg ring, ring not incl; Spec JAN-C-62.	Microphone voltage filter	CE31C121F	N16-C-20259-7500 (3DB120-3)	2	Δ	35-5864P1	C235, C401.	2						
C236	Same as C136	Final amplifier grid bias bypass													

Δ Same as JAN or Navy Type Number.

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
C237	CAPACITOR, fixed: mica dielectric; 3600 mmf p/m 5%; 500 vdcw; temp coef letter C; case dimen 53/64" max lg x 53/64" max wd x 11/32" max thk; molded low loss bakelite case; two axial wire lead term; Spec JAN-C-5.	Modulator H.F. cutoff	CM35C362J	N16-C-32351-4933 (3K3536232)	100	Δ	35-5385	C237	1						
C238	Same as C204	2nd I.F. screen grid by-pass													
C239	Same as C204	Decoupling 2nd I.F. plate													
C240	Same as C211	3rd I.F. grid coupling													
C241	CAPACITOR, fixed: mica; 200 mmf p/m 5%; 500 vdcw; temp coef letter C; 51/64" max lg x 15/32" max wd x 7/32" max thk; molded low loss bakelite case; 2 axial wire leads; Spec JAN-C-5.	Audio HF cutoff	CM20C201J (-48675-C5)	N16-C-29265-3001 (3K2020132)	100	Δ	235-1005P57	C241	1						
C401	Same as C235	Hash filter vibrator primary													
C402	CAPACITOR, fixed: paper dielectric; three sect; ea sect 50,000 mmf +20-10%; 1000 vdcw; HS metal magnetic case; 1-3/4" lg x 41/64" max wd x 1-1/2" h excluding term; mineral oil filled and impr; 3 solder lug term on bottom; int gnd fixed channel mtg w/two 0.156" wd slots on 2-1/8" mtg/c.	3 section cap consisting of C402A, C402B, C402C.			2		35-5762P2	C402	1						
C402A	Part of C402	Buffer & hash filter high voltage													
C402B	Part of C402	Buffer & hash filter high voltage													
C402C	Part of C402	Buffer & hash filter high voltage													
C403	Same as C105	Hash filter													
C404	Same as C105	Hash filter													
C405	Same as C105	Hash filter													
C406	Same as C102	High frequency hash filter													
C407	Same as C102	High frequency hash filter													
CR101	CRYSTAL UNIT, RECTIFYING: carrier indicator rect; xtal diode, germanium; brass and phenolic body; rated peak reverse 60 v min, surge cur 125 ma max, avg anode cur 40 ma max; oper temp 70°C max; 1/2" lg x .236"; term mtd c/o 2 radial wire lead term approx 1-5/8" lg 0.025" diam wire; Spec JAN-1A.	Carrier indicator rectifier Δ Same as JAN or Navy Type Number.	1N43	N16-T-51743 (2J1N43)	21	Δ	122-5016P1	CR101	1						

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
E101	BOARD, terminal: interconnection; 17 feed thru solder lug term; distance between ctrs irregular; 1/8" thk formica YN-25 board; 6" lg x 1" wd x 13/16" thk; 4 mtg holes 0.169" diam on 5-5/8" x 5/16" mtg/c; 1 hole 0.169" diam 2-1/16" from end and 1/4" from sides; marked on both sides of panel w/term #, and E101.	Interconnection general		N17-B-78100-5401 (3Z770-17.11)	26	ΔΔ	47-5194G1	E101	1						
E102	SHIELD, tube: aluminum water dip lacquer; cylindrical, 1/2" diam hole in top; bayonet type mtg; 0.810" ID x 1-3/8" lg o/a, 0.941" max wd across mtg protrusions; 5/8" lg spiral spring inside top.	Shield for V101		N16-S-34520-3863 (2Z8304.214)	26	ΔΔ	82-5043P2	E102, E201, E202, E203, E204.	5						
E201	Same as E102	Shield for V201													
E202	Same as E102	Shield for V202													
E203	Same as E102	Shield for V203													
E204	Same as E102	Shield for V205													
E301	BOARD, terminal: general purpose; 9 brass, tin dipped term lugs; 9/32" between term ctrs; YN-25 for mica, 1/8" thk; 3-1/4" lg x 1" wd x 1/8" thk o/a, approx 1/2" h o/a; 2 mtg holes 0.169" diam on 2-7/8" mtg/c; marked E301.	Term strip front panel		N17-B-77889-1169 (3Z770-9.13)	26	ΔΔ	21-7289G1	E301	1						
E401	INSULATOR, bushing: cylindrical w/ shoulder, non std shape #2; syn, rubber; 0.489" lg o/a; 0.305"diam body, 0.175" diam axial hole, shoulder 13/32" diam o/a, shank 0.161" lg one end, 0.265" lg other end.	Feed thru for W402		N17-I-49969-9301 (3G100-133)	26	ΔΔ	4-5394P1	E401, E404	2						
E402	INSULATOR, bowl: round counterbore; white steatite, grade L-3, glazed top and sides; 3/8" lg o/a; 1/2" OD, 0.200" diam axial hole ctb 0.300" diam x 0.255" d from bottom; JAN Spec #I-10.	Feed thru for W402		N17-I-47366-3950 (3G100-129)	470		22-5183P1	E402, E405.	2						
E403	INSULATOR, bowl: round ctb; white steatite, grade L-3, glazed top & sides; 1/4" lg o/a; 1/2" OD, 0.200" diam axial hole ctb 0.300"x 0.130" d from bottom; JAN Spec #I-10.	Feed thru for W402		N17-I-47366-3865 (3G100-1300)	470		22-5183P2	E403, E406	2						
E404	Same as E401	Feed thru for W402													
E405	Same as E402	Feed thru for W402													

ΔΔ Same as Contractor's Part Number.

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
E406	Same as E403	Feed thru for W402													
E501	ANTENNA: whip type; for transmitting-receiving; SS, painted USMC green; telescopic; 13" extended 7-39/64" collapsed, 3/4"OD; 5/8"-24 NEF-2 thd mtg nut; fixed; 225-390 mc freq range.	Auxiliary Antenna		F16-A-54490-4001 (2A288A-105)	26	ΔΔ	141-6115G1	E501	1						
E502	ANTENNA: Army-Navy Antenna AS-408/U conical type; for receiving and transmitting; aluminum and bronze, silver clad, basic ant, aluminum painted USMC green; collapsible, complete assem c/o basin and (disc and cone) upper tube, lower tube and spike; complete assem extended 44-1/4" h x 16-1/2" max diam of cone, collapsed 20-3/4" x 2-5/16" OD of tube, disc separate 10-1/2" diam x 13/16" thk; fixed; freq range 225-390 mc; characteristic impedance 50 ohm fed by Army-Navy RF cable RG-8/U thru RF plug UG-21/U, broad band ant; Navy Spec #RE13A1071A.	Transmitting and receiving antenna		F16-A-51870-1721 (2A264-408)	26	RX-2125	99H-1G1	E502	2						
E503	ANTENNA SECTION: c/o support tube w/sleeve and cable, ant ribs, connector plug male cont; lustrex ins; approx 17-1/8" lg x 1-5/8" diam closed, 16-1/2" diam opened o/a; coupling nut 15/16"-12 thd.	P/o E502		N16-A-69491-1014 (2A291-43)	26	ΔΔ	99H-1G2	E503	2						
E504	ANTENNA SECTION: c/o disc, spcl retainer nut and hanger; approx 10-1/2" diam x 1.406" h o/a; #10-24 NC-2 tapped mtg hole 0.328" d max.	P/o E502		N16-A-69491-1019 (2A291-44)	26	ΔΔ	105-7555G2	E504	2						
F201	FUSE, cartridge: 15 amp opens 0 to 1 hour at 135% load and 0 to 2 minutes at 200% load, rated continuous at 110 load; 25 v; one time glass body; ferrule term; dimen 1-1/4" lg x 1/4" diam o/a; term 1/4" diam x 1/4" lg.	Primary power fuse	(-28030-15)	N17-F-16245 (3Z2015-1)	50	3AG	26-5015	F201,2 spares	3						
H101	POST, spacing: natural linen base phenolic; cylindrical; 3/16" lg x 1/4" OD x 0.128" ID; tropicalized.	Mounts A103		N17-P-69705-3650 (2Z7259-77)	26	ΔΔ	4-5407P1	H101,H102	2						
H102	Same as H101	Mounts A103													
	ΔΔ Same as Contractor's Part Number.														

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
H103	POST, spacing: natural linen base phenolic; cylindrical; 5/8" lg x 1/4" OD x 0.128" ID; tropicalized.	Mounts A101		N17-P-69713-8615 (2Z7259-76)	26	ΔΔ	4-5407P2	H103,H104.	2						
H104	Same as H103	Mounts A101													
H105	POST, spacing: natural linen base phenolic; cylindrical; 1/16" lg x 1/4" OD x 0.128" ID; tropicalized	Mounts test point assembly		N17-P-69703-1056 (2Z7259-79)	26	ΔΔ	4-5407P3	H105,H106.	2						
H106	Same as H105	Mounts test point assembly													
H107	POST, spacing: natural linen base phenolic; cylindrical; 13/16" lg x 1/4" OD x 0.128" ID; tropicalized.	Mounts coax cable		N17-P-69717-2916 (2Z7259-78)	26	ΔΔ	4-5407P6	H107	1						
H108	CLAMP: cable clamp, loop type; ethyl cellulose plastic; approx 0.872" lg x 0.313" h x 1/2" wd when mtd; for 5/16" diam cable.	Holds coax cable		N17-C-780845-381 (2Z2642.286)	693	CPC-742-5	14-5977P5	H108,H109.	2						
H109	Same as H108	Holds coax cable													
H110	CLAMP: cable clamp, loop type; ethyl cellulose plastic; approx 0.735" lg x 5/16" H x 1/2" wd o/a when mtd; for 3/16" diam cable.	Holds coax cable		N17-C-780704-108 (2Z2642.287)	693	CPC-742-3	14-5977P3	H110,H111	2						
H111	Same as H110	Cable clamp													
H112	CLAMP: for cable; SS; passivated finish; approx 0.550" lg x 1/4" wd x 0.197" d o/a, 0.140" diam mtg hole; holds 11/64" diam cable; 0.025" thk.	Cable clamp		N17-C-780460-501 (2Z2642.302)	26		14-5978P1	H112	1						
H301	SCREW, captive: Woodruff key slotted drive; knurled head, finished; SS, painted USMC green E finish; 1/4"-20 NC-2 thd; 1.280" lg; thd portion 13/32" lg; head 1/2" diam x 17/64" thk; head ctb 0.397" diam x 7/64" d, w/Woodruff #305 key slot 3/16" d.	Secures front panel		N43-S-52893-5710 (6L4774-20.8KF)	26		9-5919P1	H301,H302,H303,H304, H311,H312,H313,H314.	8			4			
H302	Same as H301	Secures front panel													
H303	Same as H301	Secures front panel													
H304	Same as H301	Secures front panel													
H305	NUT, packing: hex; aluminum, black anodized; 3/8"-32 NEF-2 thd; 0.505" thk; 5/8" across flats hex extends 1/8" from bottom, rest of nut machined to 0.468" diam 0.257" diam hole to top w/milled groove, 0.370" diam x 0.070" d inside bottom enc ctb 0.531" diam.	Waterproof bushing for R301 shaft ΔΔ Same as Contractor's Part Number.		N43-N-5917-8375 (6L3800-3)	26		3-5557P1	H305,H306.	2						

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
H306	Same as H305	Waterproof bushing for planetary gear shaft.													
H307	PIN, locking: holds clips for securing ant; 0.062" diam SS wire; loop; 3/4" lg x 0.249" wd x 0.062" d o/a; ends of loop at 90° angle and separated 1/8".	Pin for ant clip		N16-P-315001-100 (2Z6978)	26		93-5549P1	H307,H308,H309,H310, H613,H614,H615,H616.	8						
H308	Same as H307	Pin for ant clip													
H309	Same as H307	Pin for ant clip													
H310	Same as H307	Pin for ant clip													
H311	Same as H301	Secures front cover													
H312	Same as H301	Secures front cover													
H313	Same as H301	Secures front cover													
H314	Same as H301	Secures front cover													
H401	SCREWDRIVER: for slot drive; blade 0.130" lg o/a; bit 0.630" lg x 3/8" wd x 0.186" d; handle 1/4" diam, aluminum tubing, green anodized.	Special screw-driver to fit front panel screws.		N41-S-1413-3910 (6R14982)	26	ΔΔ	118-5438G1	H401	1						
H402 thru H407	SCREW, captive: Woodruff key slot drive; knurled head; finished SS, painted USMC green enamel finish; #10-24 NC-2 thd; 0.750" lg; threaded portion 0.312" lg; head 3/8" diam x 0.187" wd, ctb 0.266" diam x 3/32" d w/Woodruff key slot 0.125" d.	Secures battery compartment cover		N43-S-52893-5060 (6L4770-12.8 KF)	26		9-5916P1	H402 thru H407 H601 thru H612	18			9			
H501	WRENCH: spcl; 3-9/16" lg x 5/16"wd x 17/32" h o/a; clear plexiglass; head offset 20 deg 1 end, 15 deg other; flat straight handle; for yoke.	Special wrench for tuning yokes		N16-W-920001-131 (6R38439-1)	26	ΔΔ	118-5441P1	H501	1						
H502	WRENCH: spcl; 2-5/16"lg x 11/16" wd x 9/32" thk o/a; clear plexiglass; head offset 25 deg; flat straight handle; for yoke; end formed w/key 0.093" x 0.040" thk on 9/16" x 0.718" rad.	Special wrench for tuning yokes		N16-W-920001-133 (6R38439)	26	ΔΔ	118-5454P1	H502	1						
H503	WRENCH: double open end; 0.573"opening 1 end, 0.321"opening other end; 3-15/32"lg x 1"wd x 3/4"d o/a; SS, surfaced hardened; 1 end offset 5/8"; 1"diam at large end, 11/16" diam small end, handle 5/16" wd.	Special wrench		N16-W-920001-132 (6R57522-6)	26	ΔΔ	118-5453P1	H503	1						

ΔΔ Same as Contractor's Part Number.

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
H504	HANDLE: scdr; black ethyl cellulose; 2-3/4" lg o/a, ends cylindrical 7/16" diam x 3/4" lg, ctr portion octagonal 11/16" across flats; notches on ea end for holding blade; 0.248" axial hole ea end.	Handle for H505,H506		N41-H-1433-635 (6Q51223)	26	ΔΔ	118-5442P1	H504	1						
H505	BIT, screwdriver: phillips drive; 7/8" lg; 3-1/4" lg; 1/4" diam shank; natural fabric base phenolic; u/w spcl handle.	Special screw-driver		N41-B-636-1250 (6R38440-1)	26	ΔΔ	118-5443P1	H505	1						
H506	BIT, screwdriver: slot drive; 3/4" lg; 4-3/8" lg; 1/4" diam shank; 1/4" wd x 0.25" thk bit; natural fabric base phenolic; u/w spcl handle.	Special screwdriver		N41-B-637-450 (6R38440)	26	ΔΔ	118-5444P1	H506	1						
H507	SCREWDRIVER: slot drive; 1" lg blade; 3-1/2" lg o/a; 0.100" diam round shank; 0.100"wd x 1/64" thk bit; 1/4" diam knurled handle, steel, nickel pl; jeweler's type, removable blade, hex swivel knot at end of handle, concave to fit finger.	Holds covers		G41-S-1337 (6R19040.8)	519	#555E	118-5423P1	H507							
H508	WRENCH: hex key; 1/16" across flats; 1-27/32" lg x 15/32" wd x 1/16" thk; hardened steel; L shape; for Allen set screw.	For set screws			462	Δ	318-1002P2	H315	1						
H509	WRENCH: key type set screw wrench; 5/64" across flats; L shape long arm 1-31/32" lg, short arm 33/64" lg; hardened steel, heat treated; for Allen #8 set screw.	For set screws		G41-W-2446	462	ΔΔ	318-1002P3	H316	1						
H601 thru H612	Same as H-402	Holds covers													
H613 thru H616	Same as H307	Pin for ant clips													
HT501	HEADSET: radio; magnetic; 600 ohm impedance; rec 21/32" x 3/8" d, headband 8" max wd x 6" lg; used w/infantry stud metal helmet or std armored vehicle crash helmet; c/o 1 Navy Type #49504 headband, 1 Navy Type #49503 cord & headband cover, 2 Navy type #49505 headphones and 2 Navy type #49506 ear cushions.	Phones-receiver	(-49507)		21	D-173329	152-5003G1	HT501	1						

Δ Same as JAN or Navy Type Number.
ΔΔSame as Contractor's Part Number.

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
J301	CONNECTOR ASSEMBLY: receptacle; c/o 1 two circuit receptacle for Sig Corps plug #PL55 and 1 three circuit receptacle for Sig Corps plug #PL68; molded phenolic case; straight type, rectangular case; dimen 1-5/16" lg x 1-1/4" wd x 1-5/32" h excl term; four #4-40 NC-2 thd x 5/16" d mtg holes on 1.015" x .906" x .874" mtg/c.	Jack phone mike and push to talk		N17-J-40202-1121 (2Z3105-14)	26	ΔΔ	76-5087G1	J301,J302	2			1			
J302	Same as J301	Jack phone mike and push to talk													
J303	CONNECTOR, adapter: double end female; 2 round female cont; 90 deg angle type; adapts Type BNC coax to UHF coax; 1-13/16" lg x 1-5/16" wd x 13/16" d o/a; 500 v peak non-constant impedance, characteristic impedance 50 ohms; angular brass silver pl; low loss plastic ins; 1 end bayonet lock type coupling, 1 end 5/8"-24 ext coupling and mtg.	Adapter c/o J303A,J303B		N17-C-67304-5669 (2Z307-104)	437		76-5185P1	J303	1			1			
J303A	Part of J303	Antenna coaxial connector													
J303B	Part of J303	Antenna coaxial connector													
J401	CONNECTOR, receptacle: 1 round female contact; straight type; approx 1/2" diam x 2-3/16" lg o/a; threaded bushing body; 3/8"-32 NEF-2 mtg thd; 0.125" diam hole thru bushing.	Test jack		N17-C-73116-5669 (2Z3062-225)	26	ΔΔ	76-5428G1	J401	1						
J501	CONNECTOR, plug: single round female cont; straight type; 1-29/32" max lg x 11/16" max diam o/a; 500 v peak constant impedance characteristic impedance 52 ohms; cylindrical brass silver pl body; syn resin insert; cable opening for Army-Navy Radio Frequency Cable RG-55/U or RG-58/U cable; 1 end w/ 5/8"-24 ext thd coupling; weatherproof.	Short antenna cable to antenna; p/o W501		N17-C-71115-5701 (2Z3062-224)	437	#35000	76-5195P1	J501	1			1			
J502	CONNECTOR, plug: Army and Navy Radio Frequency Jack UG-23A/U; female; 1 round female cont; straight type; 2"lg x 3/4"diam characteristic impedance 50 ohms, 500 v peak const impedance; cylindrical brass silver pl body; syn resin insert; 0.438" diam cable opening; 1 end w/5/8"-24 ext thd;weatherproof Navy Dwg #RE49F-402.	Long antenna cable to antenna. p/o W502.	UG-23A/U	N17-C-71115-3384 (2Z7390-23A)	22		76-5130P3	J502	1						

ΔΔ Same as Contractor's Part Number.

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
K101	CONNECTOR, plug: 2 round male cont, pol; straight type; 1-11/16" max lg x 1-1/8" max diam; cylindrical aluminum shell; molded black bakelite insert; coupling nut 1-1/8" OD x 7/8"-20 NEF-2 x 3/8" lg thd, conduit thd 3/4"-20 NEF-2 x 3/8" lg; Spec AN-C-591.	Antenna change over coaxial relay	AN 3106-14S-9P		23	Δ	76-5230P1	K101	1			1			
K102	RELAY, armature. 1 C1A1B and 1A2C cont; rated 3 amp 135 v non-inductive; palladium; 2 coils 6 v DC 1.5 amp 4 ohms p/m 10% DC resistance ea coil; solder lug term on coil and cont; 2-7/8" max lg x 1" max wd x 2-1/8" max h o/a; 2 tapped mtg holes #6-32 thd on 3/4" mtg/c; fast acting; tropicalized; Navy Spec 17R6.	Trans-Rec circuit change over latching relay		N17-R-64776-6569 (2Z7599A-228)	633		71-5252P1	K102	1			1			
K401	RELAY, armature: 1A1C and 1A1C cont arrangement; a cont rated 6 amp 6 v DC, c cont 1/4 amp 300 v AC; palladium cont; coil 6 v DC 200 ma 30 ohm DC resistance; solder lug term on coil and cont; 1-9/16" lg x 1" wd x 1-5/8" h max o/a; 2 mtg holes #4-40 NC-2 thd on 0.692" x 0.380" ctr; fast-acting; tropicalized; Navy Spec 17R6.	Trans-Rec power change over.		N17-R-64778-1169 (2Z7599A-223)	633		71-5229P1	K401	1			1			
L101	COIL, RF: osc plate; single wnd; single layer; unshielded; 5-1/2" #20 AWG silver pl wire ct; 1-3/16" lg x 3/4" diam less term; paper base lam phenolic form, air core; 1-3/16" lg x 3/4" OD x 5/8" ID; capacitor tuned w/5 to 50 mmf; mtd by bkt, which is not incl; 3 wire lead term 2" min lg out of side; tropicalized, form grooved to accomodate wnd.	Osc grid inductor		N16-C-71970-2369 (3C1081-48E)	26	ΔΔ	92-5607G1	L101	1						
L102A	COIL, RF: osc plate; single wnd, single layer unshielded; 14 turns #24 AWG wire; 2.055" lg x 0.561" wd x 0.656" h; polystyrene form, powdered iron core; form 15/16"lg x 0.312"/0.310" diam; adj iron core, resonant freq 29 to 37 mc; scdr adj through end; 2 mtg holes 0.213" diam ctb 19/64", on 1-1/2" ctr; 3 cont term on bottom.	Osc plate coils 225 to 250 MC channels		N16-C-76358-9169 (3C1081-48C)	26	ΔΔ	92-5896G1	L102A	4						

Δ Same as JAN or Navy Type Number.
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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
L102B	COIL, RF: osc plate; single wnd, single layer; unshielded; 11 turns #22 AWG wire; 2.055" lg x 0.561"/0.558" wd x 0.656" h; polystyrene form, powdered iron core; for 15/16" lg x 0.312/0.310 diam; adj iron core, resonant freq 35.5 to 46 mc; scdr adj through end; 2 mtg holes 0.213" diam, ctb 19/64", on 1-1/2" ctr; 3 cont term on bottom.	Osc plate coils 250 to 308 MC channels		N16-C-76320-7549 (3C1081-48B)	26	ΔΔ	92-5896G2	L102B	4						
L102C	COIL, RF: osc plate; single wnd, single layer; unshielded; 9 turns #22 AWG wire; 2.055" lg x 0.561"/0.558" wd x 0.656" h; polystyrene form, powdered iron core; form 15/16" lg x 0.312"/0.310" diam; adj iron core, resonant freq 44 to 55 mc; scdr adj through end; 2 mtg holes 0.213" diam, ctb 19/64" on 1-1/2" ctr; 3 cont term on bottom.	Osc plate coils 308 to 370 MC channels		N16-C-76296-2633 (3C1081-48A)	26	ΔΔ	92-5896G3	L102C	4						
L102D	COIL RF: osc plate; single wnd, single layer; unshielded; 7 turns #22 AWG wire; 2.055" lg x 0.561"/0.588" wd x 0.656" h; polystyrene form, powdered iron core; form 15/16" lg x 0.312"/0.310" diam; adj iron core, resonant freq 53 to 66 mc; scdr adj through end; 2 mtg holes 0.213" diam, ctb 19/64", on 1-1/2" ctr; 3 cont term on bottom.	Osc plate coils 370 to 390 MC channels		N16-C-76275-9169 (3C1081-48D)	26	ΔΔ	92-5896G4	L102D	4						
L103A	COIL RF: doubler plate; single wnd, single layer; unshielded; 8 turns #22 AWG wire CT; 2.055" lg x 0.561/0.558" wd x 0.656" h; polystyrene form, powdered iron core; form 15/16" lg x 0.312/0.310"diam; adj iron core, resonant freq 48 to 61 mc; scdr adj through end; 2 mtg holes 0.213" diam, ctb 19/64", on 1-1/2" ctr; 3 cont term on bottom.	Doubler plate coils 225 to 268 MC channels		N16-C-76284-2633 (3C1084Z19-15)	26	ΔΔ	92-5896G5	L103A	4						
L103B	COIL, RF: doubler plate; single wnd, single layer; unshielded; 6 turns #22 AWG wire CT; 2.055" lg x 0.561"/0.558" wd x 0.656" h; polystyrene form powdered iron core; form 15/16" lg x 0.312/0.310 inch diam; adj iron core, resonant freq 58 to 73 MC; scdr adj through end; 2 mtg holes 0.213"diam,ctb 19/64", on 1-1/2" ctr; 3 cont term on bottom.	Doubler plate coils 268 to 321 MC channels ΔΔ Same as Contractor's Part Number.		N16-C-76256-1787 (3C1084Z19-14)	26	ΔΔ	92-5896G6	L103B	4						

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
L103C	COIL, RF: doubler plate; single wnd, single layer; unshielded; 5 turns #22 AWG wire CT; 2.055" lg x 0.561/0.558" wd x 0.656" h; polystyrene form, powdered iron core; form 15/16" lg x 0.312/0.310"diam; adj iron core; resonant freq 71 to 87 mc; scdr adj through end; 2 mtg holes 0.213" diam, ctb 19/64", on 1-1/2" ctr; 3 cont term on bottom.	Doubler plate coils 321 to 370 MC channels		N16-C-76235-6721 (3C1084Z19-13)	26	ΔΔ	92-5896G7	L103C	4						
L103D	COIL RF: doubler plate; single wnd, single layer; unshielded; 4 turns #22 AWG wire CT; 2.055" lg x 0.561/0.558" wd x 0.656" h; polystyrene form, powdered iron core; form 15/16" lg x 0.312/0.310" diam; adj iron core, resonant freq 84 to 100 mc; scdr adj through end; 2 mtg holes 0.213" diam, ctb 19/64", on 1-1/2" ctr; 3 cont term on bottom.	Doubler plate coils 370-390 MC channels		N16-C-76224-6721 (3C1084Z19-12)	26	ΔΔ	92-5896G8	L103D	4						
L104	COIL ASSEMBLY, RF: input heliline; c/o 1 hub, 4 RF turret type coils w/yoke shorting bar and splined shaft; natural lustrex; ea coil,1 int and 1 ext wnd approx 2 parallel turns 0.045" diam beryllium copper wire, variable shorting bar tuned w/special tuning tool; approx 3.812/3.808" lg x 3.812/3.808" wd x 1.437" thk; turret shaft mtg.	Tripler plate final amplifier grid		N16-C-77896-2911 (3C4026)	26	ΔΔ	51-7569G1	L104	1						
L105A	STUB, tuning: for RF tuning unit output heliline; c/o 2 yokes and shorting loop A; Monsanto Chemical natural lustrex;225-390 MC; round shape, straight style; 1.781" OD x 0.260" ID x 0.375" thk o/a.	Tuning adjustment L110		N16-S-88309-3210 (2Z9023-10)	26	ΔΔ	51-7568G1	L105A	4			1			
L105B	STUB, tuning: for RF tuning unit output heliline c/o 2 yokes and shorting loop B; Monsanto Chemical natural lustrex; 225-390 MC;round shape, straight style; 1.781" OD x 1.260" ID x 0.375" thk o/a.	Tuning adjustment L110		N16-S-88309-3214 (2Z9023-9)	26	ΔΔ	51-7568G2	L105B	4			1			
L106	COIL, RF: for RF transformer; no turns, VHF and UHF block; unshielded; 1"lg x 1/4"wd x 0.950" h o/a; brass form air core; turret sw capacitor tuned; spcl tuning tool on turret; spcl base mtg; 2 solder lug term on side. ΔΔ Same as Contractor's Part Number.	Tank inductance RF amplifier		N16-C-71591-4001 (3C1084Z19-16)	26	ΔΔ	51-7530G1	L106	1						

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
L107	COIL, RF: for RF transf; no turns, VHF and UHF block; 1.250" lg x 0.297" wd x 1-19/32" h o/a; brass form air core; turret sw capacitor tuned; spcl tool on turret; spcl ins base mtg; 2 solder lug term on side and 3 feed-thru term.	Tank inductance mixer		N16-C-71592-4640 (3C1084Z19-17)	26	ΔΔ	51-7553G1	L107	1						
L108	COIL, RF: choke; single wnd, 2 pie universal wnd; unshielded; 90 uh p/m 20%; 50 ma max, ea pie 80 turns #38 AWG wire; 160 total turns; 1/2" max lg x 5/16" max diam excluding term; phenolic form, air core; 1/2" lg x 1/8" OD; term mtd, 2 axial wire lead #21 AWG 1-1/4" min lg; tropicalized.	Tripler plate choke		N16-C-73697-7390 (3C307-5.21)	26	ΔΔ	92-5829G1	L108,L109.	2			1			
L109	Same as L108	Final amplifier plate choke													
L110	COIL ASSEMBLY, RF: output heliline; c/o hub and 4 RF turret type coils; natural lustrex; ea coil approx 2 parallel turns, 0.45" diam beryllium copper wire, variable shorting bar tuned w/spcl tuning tool; 3.812/3.808" lg x 3.812/3.808" wd x 1.437" thk; turret shaft mtd.	Final amplifier plate		N16-C-77896-2901 (3C4026-1)	26	ΔΔ	51-7570G1	L110	1						
L201	REACTOR: audio inductor; 320 mh p/m 10%; 0 amp DC; DC resistance 95 ohms; 500 v RMS test; open frame, 1100 turns of #39 E wire; 1-5/16" lg x 9/16" wd x 11/16" h o/a; 2 mtg holes #42(0.093" diam) on 1" ctr; 2 wire lead term; Spec JAN-T-27.	Oscillatory feed back		N16-R-28899-5090 (3C575E-30)	26	UX-12149	92-5905P1	L201	1			1			
L202	COIL, RF: choke; single wnd, 2 pie universal wnd; unshielded; 126 mh p/m 2% at 70.7 kc, 10 ma, ea pie 1065 turns #40 AWG wire, DC resistance 462 ohms; 2130 total turns; 0.875" max lg x 11/16" max diam; polystyrene form, powdered iron core; form 0.875" lg x 0.255"diam; self-resonant freq, 200 kc min; term mtd, 2 axial wire leads #21 AWG, 1-3/8" min lg; encl in vinyl sleeve 7/8" lg.	3rd IF Lo-pass filter		N16-C-75606-2869 (3C307-5.20)	26	ΔΔ	92-5755G1	L202	1			1			
	ΔΔ Same as Contractor's Part Number.														

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
L203	COIL, RF: choke: single wnd, 2 pie universal wnd; unshielded; 37.7 mh p/m 2% at 70.7 kc, 10 ma, ea pie 850 turns #40 AWG wire, DC resistance 194 ohms; 1700 total turns; 0.875" max lg x 15/32"max diam; polystyrene form, powdered iron core; form 0.875" lg x 0.255" diam; self-resonant freq 350 kc min; term mtd, 2 axial wire leads of #21 AWG wire, 1-3/8"min lg; in vinyl sleeve 7/8" lg.	3rd IF Lo-pass filter		N16-C-75404-2488 (3C307-5.19)	26	ΔΔ	92-5756G1	L203	1			1			
L204	REACTOR: filter choke; 275 millihenries p/m 10% 0.1 amp DC; 18 ohms p/m 10% DC resistance; 1275 v RMS test; HS metal case, dry nitrogen filled; 1-9/16" h x 1-9/32" sq excluding term; 2 mtg holes #26-0.147" diam on 1-5/8" ctr; 2 solder term 7/16" h located on top; Navy Spec#RE-13A553E	Hum filter		N16-R-28899-3069 (3C575E-29)	26	U10578B	92-5567P1	L204	1			1			
L205	COIL, RF: choke; single wnd, 3 pie, universal wnd; unshielded; 6.5 mf p/m 2% at 1000 cyc, 15 ma, ea pie 245 turns #38AWG wire, DC resistance 39 ohms, Q of 95 p/m 10% at 150 kc; 735 turns total; 0.875" max lg x 1/2" max diam; powdered iron core, polystyrene form; form 0.875" lg x 0.255" diam; self resonant freq, 400 kc min; term mtg w/2 term 1-3/8" lg; 2 axial wire leads.	1st section Lo-pass filter		N16-C-74970-6561 (3C307-5.18)	26	ΔΔ	92-5568G1	L205,L209	2			1			
L206	COIL, RF: choke; single wnd, 3 pie, universal wnd; unshielded; 17 mh p/m 2% at 1000 cyc, 15 ma, ea pie 400 turns, #38 AWG wire, DC resistance 47 ohms, Q of 90 plus or minus 10% at 150 kcs; 1200 turns total; 0.875" max lg x 5/8" max diam; powdered iron core, polystyrene form; form 0.875" lg x 0.255" diam; self resonant freq 400 kc min; term mtg w/2 1-3/8"lg term; 2 axial wire leads. ΔΔ Same as Contractor's Part Number.	2nd section Lo-pass filter		N16-C-75254-6699 (3C307-5.16)	26	ΔΔ	92-5569G1	L206,L207,L208.	3			1			

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUAN-TITY	TAG NO.	BOX NO.	QUAN-TITY
L207	Same as L206	3rd section Lo-pass filter													
L208	Same as L206	4th section Lo-pass filter													
L209	Same as L205	5th section Lo-pass filter													
L210	COIL, RF: choke; single wnd, 4 pie universal wnd; unshielded; 45.5 mh p/m 2% at 1000 cyc, 150 ma, ea pie 540 turns #38 AWG wire, DC resistance 182 ohms; total turns 2160; 0.875" max lg x 3/4" max diam; powdered iron core, polystyrene form; 0.875" lg x 0.255" diam; self resonant freq, 400 kc min; 2 axial wire leads.	Input series arm high pass filter	(-472104)	N16-C-75441-2359 (3C307-5.17)	26	ΔΔ	92-5582G1	L210,L213	2			1			
L211	COIL, RF: choke; single wnd, 3 pie universal wnd; unshielded; 28.4 mh p/m 2% at 100 cyc, 15 ma, ea pie 520 turns #38 AWG wire, DC resistance 130 ohms Q of 75 p/m 10%; total turns (1560); 0.875" max lg x 5/8" max diam; powdered iron core; polystyrene form; form 0.875" lg x 0.255" diam; self resonant freq 400 kc min; term mtg w/1-3/8" lg term, varnish coated; 2 axial wire leads.	1st shunt arm high pass filter		N16-C-75362-2801 (3C307-5.15)	26		92-5581G1	L211,L212	2			1			
L212	Same as L211	Input shunt arm high pass filter													
L213	Same as L210	Output shunt arm high pass filter													
L401	REACTOR: smoothing choke toroidal; 290 uh p/m 10% at 1000 cps 5.0 amp max; 0.05 ohm max DC resistance; test v 500 RMS; uncased, 60 turns of two #20 AWG wire; dimen 1.437" max diam x 5/8" max h; positive clamp mtg; 2 wire lead term.	Hash filter primary power		N16-R-28800-1433 (3C575E-31)	672	M911	92-5785P1	L401	1			1			
L402	COIL, RF: choke; single wnd, single pie, universal wnd; unshielded; 3.8 mh p/m 10% at 1000 cyc, 63 ma, approx 500 turns #32 AWG wire; 0.875" max lg x 9/16" max diam; polystyrene form, powdered iron core; form 0.875" lg x 0.255"diam; self-resonant freq 250 kc min; 2 axial wire leads #21 AWG, 1-3/8" min lg; encl in vinyl sleeve 7/8" lg. ΔΔ Same as Contractor's Part Number.	Hash filter high voltage		N16-C-74808-5469 (3C307-5.14)	26	ΔΔ	92-5757G1	L402	1			1			

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
M301	METER, arbitrary scale: DC; range 0 to 1 ma; round aluminum black anodized flush mtg case; 1.688" diam fl, 1-1/2" diam body x 3/4" d behind fl; accuracy p/m 2%; 50 mv drop; calibrated for non-magnetic panel; 50 scale div white numerals and pointer w/black background; self-contained; 1-1/2"-32 NF-2 thd mtg w/retainer ring; 2 solder lug term; scale linear 0 to 10.	Battery voltage carrier level and circuit metering		N17-M-21878-2242 (3F891-86)	665	150	45-5041P1	M301	1			1			
M1501	MICROPHONE, carbon: impedance 100 to 150 ohm; freq response 200 to 3000 cyc; uni-directional; 25/32" lg x 1-7/8" wd x 15/16" thk approx o/a; mts to face by Harness, Navy type #10312,	Lip mike- transmitter	(-51071)	N17-M-46589-6471 (2B1750-2)	21	Δ	152-5000G1	M1501	1						
O-101	CAM: detent; annealed SS; round w/ four V shape notches 0.186" d equally spaced around rim; 1.750" OD, 0.687" diam hub w/0.687" diam bore 0.513" d o/a; mts on shaft w/6-32 NC-2 thd set screw; includes coupling section 0.875" lg x 0.186" wd x 0.183" h on face of cam.	Channel selector cam		N16-C-125001-245 (2Z1600-50)	26	ΔΔ	101-5710G1	O-101	1						
O-102	ARM ASSEMBLY: detent latch; c/o two latch arm w/detent rollers; spring and mtg bkt; SS , passivated; 3-3/16" lg x 2-1/16" wd x 5/8" h approx o/a; four 0.169" diam holes on 0.875" x 0.625" mtg/c.	Positioning lock for O-101			26	ΔΔ	51-7779G1	O-102	1			1			
O-103	SHAFT: for turret; tubular SS shaft w/SS stub 1 end; 13-17/32" lg x 0.4995" diam o/a, stub 0.500" lg x 0.3745" lg x 0.3745" diam; mtd in spcl bkt.	Turret shaft		N16-S-21065-3500 (2Z8204-156)	26	ΔΔ	12-5953G1	O-103	1						
O-104 thru O-107	RETAINER, crystal holder: c/o formica retaining yoke w/brass sleeve, spring, screw and hdw; approx 1-1/8" lg x 0.312" wd x 1.405" diam o/a; #4-40 NC-2 mtg thd.	Retaining yoke for transmitting and receiving crystals		N16-R-501081-113 (2Z7780-104)	26	ΔΔ	51-7630G1	O-104 thru O-107	4						
O-108	CLIP: flat spring; gnd clip for turret shaft; 0.007" thk beryllium copper silver pl; 7/8" lg x 1/4" wd x 0.375" d o/a; must deflect to distance of 0.094" and return; 2 mtg holes 0.096" diam on 0.250" mtg/c.	Ground clip for turret shaft		N17-C-812968-950 (2Z2712.148)	26	ΔΔ	105-7992P1	O-108,O-113,O-114	3						

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
O-109	RETAINER, tube: beryllium copper cap and 2 SS springs; cap cross shape, springs attached to opposite ends of 1 arm; approx 1-5/16" h x 1" sq o/a; u/w 9 pin miniature tube socket.	Retainer for V102		N16-R-503580-199 (2Z7780-107)	26	ΔΔ	14-5972G1	O-109,O-110,O-111, O-112,O-201	5						
O-110	Same as O-109	Retainer for V103													
O-111	Same as O-109	Retainer for V104													
O-112	Same as O-109	Retainer for V105													
O-113	Same as O-108	Ground clip for turret shaft													
O-114	Same as O-108	Ground clip for turret shaft													
O-115	CLIP: spring clip; for holding capacitor; phosphor bronze; 1/2" ID x 19/32" lg x 1/2" wd x 5/8" h approx o/a; 9/16" max jaw opening; 2 ears on base 1/2" c to c to prevent rotation; 0.140" diam mtg hole on base.	Mounts V106		N17-C-804575-969 (2Z2712.138)	499	500-500	143-5026P11	O-115	1						
O-116	INSERT, coupling: Polymer's FM 10001 nylon; elliptical; approx dimen 1.125" lg x 0.874" wd x 0.535" thk o/a.	Turret drive		N17-C-98611-1048 (2Z3273-219)	26	ΔΔ	12-5946P1	O-116	1			1			
O-201	Same as O-109	Retainer for V206													
O-202	CLIP: fuse; beryllium copper silver pl; 3/8" lg x 13/32" wd x 9/16" h o/a; 0.171" diam mtg hole in base; 9/32" max jaw opening; withstands a 100 hr 20% salt spray test at 95°F.	Mounts W201		N17-C-804519-901 (2Z2712.145)	50	#123001	143-5046P1	O-202,O-203	2						
O-203	Same as O-202	Mounts W201													
O-204	CLIP: fuse; beryllium copper, silver pl; 11/32" wd x 0.315" h x 29/64" lg o/a; 0.136" diam mtg hole in base; 1/4" max jaw opening	Mounts F201		N17-C-804543-354 (2Z2712.147)	50		143-5034P1	O-204,O-205,O-206, O-207,O-208,O-209, O-408.	7						
O-205	Same as O-204	Mounts F201													
O-206	Same as O-204	Mounts spare fuses													
O-207	Same as O-204	Mounts spare fuses													
O-208	Same as O-204	Mounts spare fuses													
O-209	Same as O-204	Mounts spare fuses													
	ΔΔ Same as Contractor's Part Number														

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
O-210	CLAMP: capacitor mtg; phosphor bronze; cad pl; 1 bolt used; 2-1/4" lg x 1-7/8" wd x 3/4" h o/a, 1-3/8" ID; 4 supporting ft, 2 have 0.144" diam mtg holes on 1-7/8" ctr; holds 1-3/8" diam capacitor.	Clamp for C219		N16-C-303202-371 (2Z2642.284)	26	ΔΔ	14-5971G1	O-210	1						
O-211	CLAMP: capacitor mtg; phosphor bronze; cad pl; 1 bolt used; 1-7/8" lg x 1-1/2" wd x 3/4" h o/a, 1" ID, 4 supporting feet, 2 have 0.144" diam mtg holes on 1-1/2" ctr; holds 1" diam capacitor.	Clamp for C235		N16-C-302640-191 (2Z2642.285)	26	ΔΔ	14-5971G2	O-211	1						
O-301	COVER: weather protection for toggle sw; Hycar #4018; 0.875"OD x 0.218" ID x 0.976" lg o/a.	Waterproof cover for S301		N17-C-945001-844 (2Z3351-191)	541		87-5694P1	O-301	1			1			
O-302	GASKET: for panel; rubatex; single hole; rectangular, 12" lg x 8-7/8" wd x 1/4" thk o/a; 4 outer corners 7/16" rad.	Front panel gasket		N17-G-158040-101 (2Z4868.711)	26	ΔΔ	87-5919P1	O-302	1						
O-303	COVER: on push button; Buna S rubber; semi-circular; 13/16" OD x 5/8" ID x 15/32" lg o/a.	Waterproof cover for S302 control		N17-C-945001-845 (2Z3351-193)	508	#Z-136	39-5161P1	O-303	1			1			
O-304	GASKET: "O" ring hydraulic packing #AN6227-7 syn rubber; round, 1/16" wd x 3/8" ID x 1/2" OD.	Sealing gasket for H305	AN6227-7	N33P-1560-150 (6L54006-18)	268	Δ	87-5844P1	O-304,O-305	2						
O-305	Same as O-304	Sealing gasket for H306													
O-306	GASKET: round ring hydraulic packing; syn rubber; round 11/32" OD x 7/32" ID x 1/16" thk o/a; ANA std AN6227.	Sealing gasket for H305	AN6227-4	N17-G-160986-241	719	Δ	87-5802P1	O-306,O-307	2						
O-307	Same as O-306	Sealing gasket for H306													
O-308	KNOB: round; black phenolic; for 1/4" diam shaft; double #8-32 NC-2 set screw; 0.800" diam x 1" h o/a; brass insert; straight knurl.	Knob for R301		N16-K-700278-286 (2Z5822-406)	26	ΔΔ	3K1-191G1	O-308	1						
O-309	NOT USED														
O-310	KNOB: bar type, round pointed one end; aluminum alloy, black anodize; for 1/4"diam shaft;0.935" diam pin; 2-1/4"lg x 11/16"wd x 7/8"h; shaft hole 0.760/0.740"d.	Channel selector knob		N16-K-700100-251 (2Z5822-407)	26	ΔΔ	31-5711P1	O-310	1						
	Δ Same as JAN or Navy Type Number. ΔΔSame as Contractor's Part Number.														

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
O-311	STRAP, retaining: metal strap w/ buckle lock; secures ant for carrying; SS strap; approx 3/8" wd x 0.025" thk x 2-5/16" ID when mtd; 0.070" hole ea end for mtg.	Holds ant on TR case		N16-S-692001-107 (2Z2712.146)	26	ΔΔ	14-5739G1	O-311, O-312, O-607, O-608.	4						
O-312	Same as O-311	Holds ant on TR case													
O-313	SHELL, connector: secures whip antenna when not in use; die cast aluminum, black anodized; approx 1" sq x 5/8" h o/a; 4 mtg holes 0.120" diam on 23/32" sq mtg/c, 5/8-24 NEF-2 x 3/8" lg coupling thd.	Secures whip ant when not in use		N17-S-250051-134 (2Z8276-55)	23	97-181-10S	76-5134P1	O-313	1						
O-314	CAP: to secure whip antenna, when not in use; rubatex; 1/2" diam x 15/32" lg.	Secures whip ant when not in use		N16-C-149093-101 (2Z7104-29)	26		4-5426P1	O-314	1						
O-315	GASKET: for cover; neoprene #30-40 durometer; single hole; round, 12-15/16" OD, 11-7/8" ID x 5/16" thk o/a; cross sect pear shape 5/16" diam outside 1/8" diam inside, groove 1/16" wd x 3/8" d from inside rim.	Front cover gasket		N17-G-165471-680 (2Z4868.712)	26	ΔΔ	87-5955P1	O-315	1						
O-316	COUPLING SECTION: channel selector; aluminum, anodize; round; 7/8" diam x 25/32" lg; mts on shaft w/ thru radial hole 0.0935" diam centered 7/32" from back end; includes 0.1885" wd x 0.291" d slot and one 1/2" x 0.291" d cutout on face of coupling section.				26	ΔΔ	12-6110P1	O-316							
O-317	SHAFT: channel selector; SS passivate; round; 1-17/32" lg x 0.251" diam; includes 0.0935" diam radial thru hole centered 11/64" from ea end of shaft.				26	ΔΔ	12-6111P1	O-317							
O-401	CLAMP: tube; nickel silver and beryllium copper, nickel pl; 1-7/32" diam when closed, 1-5/16" diam when open; 1-7/32" material clamp holds; 1 mtg bkt w/3/16" diam slotted hole, clasp 125 deg from ctr line of bkt counterclockwise.	Clamp for V401	(-49562)	N16-C-300486-935 (3H948.5-1)	38	ΔΔ	88-5122P1	O-401	1						

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
O-402	CLIP: spring clip; for holding capacitor; phosphor bronze; approx 1" ID x 19/32" d x 1-3/32" h o/a; max jaw opening 1-1/16"; 2 ears on base 1" c to c, 0.140" diam mtg hole.	Mounts C401		N17-C-804732-701 (2Z2712.139)	499	500-1	143-5026P15	O-402,O-403	2			2			
O-403	Same as O-402	Mounts C401													
O-404	CLIP: vibrator mtg and grounding; beryllium copper; silver pl; 1-7/8" lg x 1-5/8" wd x 9/16" d o/a, 1-1/8" diam hole in base, 2 mtg ears w/0.144" diam mtg holes on 1-1/2" mtg/c; 4 clip ears ea side.	Vibrator ground cup		N17-C-814192-501 (2Z2642.301)	26	ΔΔ	14-5837P2	O-404	1						
O-405	GASKET: for cover; rubatex; single hole; rectangular, 9-3/4"lg x 7-5/16" wd x 1/8" thk o/a; 4 outer corners 1/4" rad.	Battery cover gasket		N17-G-157568-961 (2Z4868.710)	26	ΔΔ	87-5914P1	O-405,O-601	2						
O-406	GASKET: for cover; neoprene; 12 holes total; round 1-1/8" diam x 1/32" thk o/a; 4 mtg holes 3/32" diam equally spaced on 7/16" rad, 8 equally spaced holes 1/64" diam.	Vent gasket		N17-G-161206-370 (2Z4868.715)	26	ΔΔ	87-5912P1	O-406,O-603,O-604.	3						
O-407	GASKET: for vent; 5 holes total; round, 1-1/8" OD x 11/16" ID x 1/32" thk o/a; 4 mtg holes 3/32" diam equally spaced on 7/16" rad.	Vent gasket		N17-C-161207-369 (2Z4868.714)	26	ΔΔ	87-5911P1	O-407,O-605,O-606	3						
O-408	Same as O-204	Mounts H401													
O-409	CLIP: fuse; beryllium copper; 29/64" lg x 11/32" wd x 5/16" h o/a; 1 hole 1/8" diam in base; for 1/4" diam, w/o tabs; to withstand 100 hr 20% salt spray test at 95°F.	Mounts H401		N17-C-804543-476 (3Z1013.18)	50	#121002	143-5044P1	O-409	1						
O-601	Same as O-405	Cover gasket													
O-602	GASKET: for cover; rubatex; 2 holes total; rectangular, 9-3/4" lg x 7-5/16" wd x 1/8" thk o/a; 4 outer corners 1/4" rad.	Cover gasket		N17-G-157570-101 (2Z4868.716)	26	ΔΔ	87-5913P1	O-602	1						
O-603	Same as O-406	Vent gasket													
O-604	Same as O-406	Vent gasket													
O-605	Same as O-407	Vent gasket													
O-606	Same as O-407	Vent gasket													
O-607	Same as O-311	Holds ant on case													
O-608	Same as O-311	Holds ant on case													

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
P101	CONNECTOR, plug: single male coax cont; straight type; 31/32" max lg x 27/64" diam o/a; non constant impedance 500 v peak; cyl brass body, silver pl; u/w RF cable RG-58/U; female bayonet coupling.	Ant to Ant relay	UG-88/U	N17-C-71408-3416 (2Z7390-88)	437	1200 Mod	76-5071P2	P101,P102,P103,P301.	4						
P102	Same as P101	Transmitter to Ant relay													
P103	Same as P101	(REC) RF amplifier to ant relay													
P201	CONNECTOR: c/o 2 blade contacts, P201A and P201B.	Primary Power contacts, mount on A203													
P201A	CONTACT, connector: annealed electrolytic copper, silver pl; 1-1/4" lg x 1.094" wd x 1/2" d approx o/a; 2 mtg holes #6-32 NC-2 thd on 0.875" mtg/c.	p/o P201		N17-C-98592-8960 (2Z3193-111)	26	ΔΔ	105-7994P1	P201A,P201B	2						
P201B	Same as P201A	p/o P201													
P301	Same as P101	Front panel to Ant relay													
P401	CONTACT, connector: 1 round male cont; straight type; beryllium copper silver pl head 0.178" to 0.168" taper x 0.547" lg; 1-3/64" lg x 5/16" across flats o/a; cylindrical beryllium silver pl body; mts by 8-32 NC-2 thd 5/16" lg.	Battery plug negative p/o W401		N17-C-78528-5650 (2Z3021-215)	666		76-5194P1	P401	1						
P402	CONTACT, connector: 1 round male cont; straight type; beryllium copper silver pl head 0.224" to 0.212" taper x 0.640" lg; 1-3/64" lg x 5/16" across flats o/a; cylindrical beryllium silver pl body; mts by 8-32 NC-2 thd 5/16" lg.	Battery plug positive p/o W401		N17-C-78528-5660 (2Z3021-214)	666		76-5194P2	P402	1						
P501	CONNECTOR, plug: Sig C Plug PL-259; single round male silver pl cont; straight type; body 1-1/2" lg x 11/16" OD; 50 ohm nominal impedance non-constant type; cylindrical brass body, silver pl; low loss mica filled dielectric insert; cable opening for 1/2" diam cable; has coupling ring w/5/8"-24 int thd; Navy Spec RE49F175D.	Short ant cable to front panel p/o W501	(-49190)	N17-C-71412-8709 (2Z7226-259)	23	83-1SP	79-5046	P501,P502	2						

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
P501A	BUSHING: Army-Navy Adapter UG-175/U; used to adapt Plug Navy Type #49190 for use w/cable RG-58/U, RG-29/U or RG-55/U; brass, silver pl; male; 1" lg x 1/2"OD; 7/16"-14 NC-2 male thd; 0.207"ID axial hole.	Used on Cable W501 to adapt P501 to RG-58/U cable.	UG-175/U	(2Z308-175)	23	83-185	76-5035P1	P501A	1						
P502	Same as P501	Long ant cable to front panel p/o W502													
R101	RESISTOR, fixed: comp; 15 ohm p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Parasitic suppressor oscillator grid	RC20BF150M	N16-R-49294-291 (3RC20BF150M)	13	EB	80-6296P11 **	R101	1			0			
R102	RESISTOR, fixed: comp; 100,000 ohm p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; insulated; salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Oscillator grid bias	RC20BF104M	N16-R-50635-291 (3RC20BF104M)	13	EB	80-6296 P169 **	R102, R118.	2			0			
R103	RESISTOR, fixed: comp; 33,000 ohm p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; insulated; salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Oscillator screen dropping	RC20BF330M	N16-R-50410-291 (3RC20BF330M)	13	EB	80-6296 P147 **	R103.	1			0			
R104	RESISTOR, fixed: WW, non-inductive; 3.57 ohms p/m 3%; 1/2 w at 100° C max continuous oper temp; 1/4" lg x 7/16" diam excluding term; spcl varnish coating, RSW and humidity; 2 wire lead term 1-3/8" min lg protruding from 1 end.	Oscillator plate metering shunt		N16-R-68290-7825 (3Z5993-57)	160	#WM 1/2 Spcl	80-6321P2	R104	1			1			
R105	RESISTOR, fixed: comp; 22,000 ohm p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; insulated; salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Double grid bias	RC20BF220M	N16-R-50365-291 (3RC20BF220M)	13	EB	80-6296 P140 **	R105, R109, R110, R207, R211, R216.	6			0			
R106	RESISTOR, fixed: comp; 8200 ohm p/m 10%; 1 w; F characteristic; 0.562" lg x 0.225" diam; insulated; salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Double screen dropping	RC30BF822K	N16-R-50238-231 (3RC30BF822K)	13	GB	80-6312 P124 **	R106, R121, R122.	3			0			

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
R107	RESISTOR, fixed: comp element; 3900 ohm p/m 10%; 1/2 w; F characteristic; body dimen 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Oscillator plate dropping	RC20BF392K	N16-R-50093-811 (3RC20BF392K)	13	EB	80-6296 P110 **	R107	1			0			
R108	RESISTOR, fixed: WW, non-inductive; 1.02 ohms p/m 3%; 1/2 w at 100° C max continuous oper temp; 1/4" lg x 7/16" diam excluding term; special varnish coating, RSW and humidity; 2 wire lead term 1-3/8" min lg protruding from 1 end.	Doubler plate metering shunt		N16-R-68273-9516 (3Z5991-97)	160	#WM 1/2 Spcl	80-6321P3	R108,R112.	2			1			
R109	RESISTOR, fixed: comp; 22,000 ohm p/m 10%; 1/2 w, F characteristic; 0.375" lg x 0.140" diam; insulated, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Tripler grid bias	RC20BF223K	N16-R-50372 (3RC30BF223K)	13	EB	80-6296 P140 **	R109,R110	2			0			
R110	Same as R109	Tripler grid bias													
R111	RESISTOR, fixed: comp; 39,000 ohm p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; insulated salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Doubler & Tripler screen dropping (Receive & Transmit)	RC20BF393K	N16-R-50444-811 (3RC20BF393K)	13	EB	80-6296 P152 **	R111,R117,R123.	3			0			
R112	Same as R108	Tripler plate metering shunt													
R113	RESISTOR, fixed: comp; 4700 ohm p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Final amplifier grid bias	RC20BF472K	N16-R-50129-811 (3RC20BF472K)	13	EB	80-6296 P116 **	R113,R114.	2			0			
	ALTERNATE														
	RESISTOR, fixed: comp 5600 ohm p/m 10%; 1/2 w; F characteristic;; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.		RC20BF562K	N16-R-50165-811 (3RC20BF562K)											
R114	Same as R113	Final amplifier grid bias													
R115	RESISTOR, fixed: comp; 1000 ohm p/m 20%; 1 w; F characteristic; 0.562" lg x 0.225" diam; insulated, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	R.F. amplifier plate decoupling	RC30BF102M	N16-R-49924-611 (3RC30BF102M)	13	GB	80-6312P85 **	R115	1			0			

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
R116	RESISTOR, fixed: comp; 33,000 ohms p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Load, resistor carrier indicator	RC20BF330K	N16-R-49364-811 (3RC20BF330K)	13	EB	80-6296 P147 **	R116	1						
R117	Same as R111	R.F. amplifier screen dropping													
R118	Same as R102	Mixer bias													
R119	RESISTOR, fixed: comp; 1000 ohm p/m 5%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Doubler grid metering res.	RC20BF102J (-63355-102)	N16-R-49921-431 (3RC20BF102J)	13	EB	80-6296P85	R119,R120,R242.	3			0			
R120	Same as R119	Tripler grid metering res.													
R121	Same as R106	Final amplifier screen dropping													
R122	Same as R106	Tripler screen dropping													
R123	Same as R111	Doubler-tripler screen grid (Rec) dropping													
R124	RESISTOR, fixed: comp; 100,000 ohm p/m 10%; 1/2 w; F characteristic; 0.375" max lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	RF amplifier grid return	RC20BF104K	N16-R-50633-811 (3RC20BF104K)	13	EB	80-6296 P169	R124,R125.	2						
R125	Same as R124	RF amplifier grid return													
R126	RESISTOR, fixed: comp; 120 ohms p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Injection stabilizer	RC20BF121K	N16-R-49598-826 (3RC20BF121K)	13	EB	80-6296P47	R126	1			0			
R201	RESISTOR, fixed: comp; 12,000 ohm p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Low pass filter termination	RC20BF123K	N16-R-50309-811 (3RC20BF123K)	13	EB	80-6296 P131	R201,R209.	2			0			

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
R202	RESISTOR, fixed: comp; 4700 ohms p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Mixer plate decoupling	RC20BF472M	N16-R-50131-291 (3RC20BF472M)	13	EB	80-6296 P113 **	R202,R205,R231.	3			0			
R203	RESISTOR, fixed: comp; 47,000 ohm p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; insulated, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	1st I.F. grid return	RC20BF473M	N16-R-50482-291 (3RC20BF473M)	13	EB	80-6296 P158 **	R203,R237	2			0			
R204	RESISTOR, fixed: comp; 220,000 ohm p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; insulated; salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	A.V.C. decoupling 1st I.F.	RC20BF224M	N16-R-50716-291 (3RC20BF224M)	13	EB	80-6296 P183 **	R204,R218,R219,R223	4			0			
R205	Same as R202	Parasitic suppressor 1st I.F.													
R206	RESISTOR, fixed: comp; 330,000 ohm p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Screen grid dropping 1st I.F.	RC20BF334K	N16-R-50759-811 (3RC20BF334K)	13	EB	80-6296 P189 **	R206,R210,R215	3			0			
	ALTERNATE														
	RESISTOR, fixed: comp; 270,000 ohm p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Screen grid dropping 1st I.F.	RC20BF274K	N16-R-50741-811	13	EB									
R207	Same as R105	1st I.F. plate decoupling													
R208	RESISTOR, fixed: comp; 10,000 ohm p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Plate load resistor 1st I.F.	RC20BF103K	N16-R-50282-811 (3RC20BF103K)	13	EB	80-6296 P127 **	R208	1			0			
R209	Same as R201	High pass filter termination													
R210	Same as R206	Screen grid dropping 2nd I.F.													
R211	Same as R105	Decoupling 2nd I.F. plate													

**Fixed composition resistors supplied by the Contractor in this equipment have a tolerance of p/m 5%. For field replacement resistors within the tolerance limits shown in the description may be used.

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
R212	RESISTOR, fixed: comp; 68,000 ohms p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; insulated, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Plate load resistor 2nd I.F.	RC20BF683K	N16-R-50552-811 (3RC20BF683K)	13	EB	80-6296 P162 **	R212,R217	2			0			
R213	RESISTOR, fixed: comp; 470,000 ohm p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Grid return 3rd I.F.	RC20BF474M	N16-R-50824-291 (3RC20BF474M)	13	EB	80-6296 P197 **	R213	1			0			
R214	RESISTOR, fixed: comp; 470 ohms p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; insulated salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Cathode bias 3rd I.F.	RC20BF471M	N16-R-49771-291 (3RC20BF471M)	13	EB	80-6296 P71 **	R214	1			0			
R215	Same as R206	Screen dropping 3rd I.F.													
R216	Same as R105	Decoupling 3rd I.F. Plate													
R217	Same as R212	Plate load resistor 3rd I.F.													
R218	Same as R204	2nd detector load resistor													
R219	Same as R204	I.F. filter resistor													
R220	RESISTOR, fixed: comp; 330,000 ohm p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Audio A.V.C. filter	RC20BF334M	N16-R-50761-291 (3RC20BF334M)	13	EB	80-6296 P190 **	R220,R226	2			0			
R221	RESISTOR, fixed: comp; 82,000 ohm p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; insulated; salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Grid return audio	RC20BF823K	N16-R-50588-811 (3RC20BF823K)	13	EB	80-6296 P166 **	R221	1			0			
R222	RESISTOR, fixed comp; 1.0 meg p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	A.V.C. load resistor	RC20BF105K	N16-R-50975-811 (3RC20BF105K)	13	EB	80-6296 P214 **	R222	1			0			
	ALTERNATE RESISTOR, fixed: comp; 1.2 meg p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	**Fixed composition resistors supplied by the Contractor in this equipment have a tolerance of p/m 5%. For field replacement resistors within the tolerance limits shown in the description may be used.	RC20BF125K	N16-R-50993-811 (3RC20BF125K)	13	EB									

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
R223	Same as R204	2nd I.F. A.V.C. filter													
R224	RESISTOR, fixed: comp; 2.2 meg p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	A.V.C. filter	RC20BF225M	N16-R-51067-291 (3RC20BF225M)	13	EB	80-6296 P225 **	R224, R225, R230	3			0			
R225	Same as R224	A.V.C. filter													
R226	Same as R220	A.V.C. filter													
R227	RESISTOR, fixed: comp; 22,000 ohm p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; insulated salt water immersion resistant, two axial wire lead term; Spec JAN-R-11.	A.V.C. filter	RC20BF223M	N16-R-50374-291 (3RC20BF223M)	13	EB	80-6296 P141 **	R227	1			0			
R228	RESISTOR, fixed: comp; 270,000 ohm p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Grid return audio	RC20BF274K	N16-R-50741-811 (3RC20BF274K)	13	EB	80-6296 P187 **	R228	1			0			
R229	RESISTOR, fixed: comp; 160 ohm p/m 5%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Detector A.V.C. filament dropping	RC20BF161J (-63355-161)	N16-R-49633-431 (3RC20BF161J)	13	EB	80-6296P53 **	R229	1			0			
R230	Same as R224	Grid return audio													
R231	Same as R202	Audio amplifier parasitic suppressor													
R232	RESISTOR, fixed: comp; 1.0 meg p/m 20%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Audio amplifier grid bias	RC20BF105M	N16-R-50977-291 (3RC20BF105M)	13		80-6296 P214 **	R232	1						
R233	RESISTOR, fixed: comp; 18,000 ohm p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; insulated salt water immersion resistant;; two axial wire lead term; Spec JAN-R-11.	Screen grid dropping audio	RC20BF183K	N16-R-50354-811 (3RC20BF183K)	13	EB	80-6296 P138 **	R233	1			0			
	**Fixed composition resistors supplied by the contractor in this equipment have a tolerance of p/m 5%; For field replacement resistors within the tolerance limits shown in the description may be used.														

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
R234	RESISTOR, fixed: WW, non-inductive; 12.5 ohms p/m 3% 1/2 w at 100° C max continuous oper temp; 1/4" lg x 7/16" diam excluding term; spcl varnish coating, RSW and humidity; 2 wire lead term 1-3/8" min lg protruding from 1 end.	Mixer metering shunt		N16-R-68318-3256 (3Z6001B2-35)	160	#WM 1/2 spcl	80-6321P1	R234	1			1			
R235	RESISTOR, fixed: comp; 10,000 ohms p/m 1%; 1/2 w; F characteristic; 5/8" lg x 9/32" diam, excl term; rubberized enamel ins, resistant to humidity; 2 radial wire lead term 1-1/2" lg, #18 AWG, w/thru center clearance hole for #6-32 screw.	Battery voltage indicator multiplier		N16-R-73500-2501 (3Z6610-313)	653	X-1/2	80-6426P10	R235	1			0			
R236	RESISTOR, fixed: WW, non-inductive 0.505 ohms p/m 3%; 1/2 w at 100° C max continuous oper temp; 1/4" lg x 7/16" diam excluding term; spcl varnish coating, RSW and humidity; 2 wire lead term 1-3/8" min lg protruding from 1 end.	R.F. power amp metering shunt		N16-R-68256-2529 (3Z5985-32)	160	#WM 1/2 spcl	80-6321P4	R236	1			1			
R237	Same as R203	2nd I.F. grid return													
R238	RESISTOR, fixed: comp; 3300 ohm p/m 10%; 1 w; F characteristic; 0.562" lg x 0.225" diam; insulated salt water immersion resistant; two axial wire lead term, Spec JAN-R-11.	Modulator screen dropping resistor	RC30BF332K	N16-R-50067-231 (3RC30BF332K)	13	GB	80-6312 P106 **	R238	1			0			
R239	RESISTOR, variable; comp; 250 ohm p/m 10%; 2 w at 40 deg C max continuous oper temp; 3 solder lug term; enclosed phenolic case 1-1/8" max diam x 5/8" max d; type 2 metal scdr slot shaft 1/4" diam x 5/8" lg; taper 1% of resistance at 20% rotation 5 at 40, 22 at 60, 61 at 80, 100 at 100, Allen Bradley taper A; ins cont arm w/o off position; normal torque; mtg bushing 3/8-32 NEF-2 thd x 1/2" lg non-turn device located on 17/32"														
	**Fixed composition resistors supplied by the Contractor in this equipment have a tolerance of p/m 5%; For field replacement resistors within the tolerance limits shown in the description may be used.														

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
R240	RESISTOR, fixed: comp; 47 ohm p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term ; Spec JAN-R-11.	Microphone voltage filter	RC20BF470K (-63355-430)	N16-R-49427-811 (3RC20BF470K)	13	EB	80-6296P28 **	R240	1			0			
	ALTERNATE														
	RESISTOR, fixed: comp; 39 ohm p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.		RC20BF390K	N16-R-49391-811 (3RC20BF390K)											
R241	RESISTOR, fixed: comp; 82 ohms p/m 10%; 1/2 w; F characteristic; 0.375" lg x 0.140" diam; ins, salt water immersion resistant; two axial wire lead term; Spec JAN-R-11.	Modulator cathode bias	RC20BF820K	N16-R-49535-811 (3RC20BF820K)	13	EB	80-6296P40 **	R241	1			0			
R242	Same as R119	Final amplifier grid bias													
R301	RESISTOR, variable: comp; 1 meg p/m 20%; 2 w at 40°C max continuous oper temp; 3 solder lug term; enclosed phenolic case 1-1/8" max diam x 5/8" max d; type 3 flatted metal shaft 1/4" diam x 1" lg; log taper 1% of resistance at 20% rotation, 5 at 40, 22 at 60, 61 at 80, 100 at 100; Allen Bradley taper A; ins cont arm w/o off position; normal torque; mtg bushing 3/8-32 NEF-2 thd x 3/8" lg; non turn device located on 17/32" rad at 3 and 9 o'clock.	Receiver volume control		N16-R-88342-5296 (3Z7499-1.115)	13	type J	40-5268P1	R301	1			0			

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
S201	SWITCH, toggle: DPDT; rated 5 amp 125 v AC; molded phenolic body, dimen 1-9/32" max lg x 23/32" max wd x 23/32" max h excl term; bat type actuating handle 11/16" lg; locking action 2 normally closed position; solder lug term; single hole mtg bushing 15/32"-32 NS-2 thd x 15/32" lg; dull black finish; Spec JAN-S-23.	Meter change over	ST22N	N17-S-714139-4844 (3Z9849.135)	16	82305B	28-5287P2	S201	1			0			
S301	SWITCH, toggle: DPDT; 25 amp 125 v AC; molded phenolic body; dimen 1-21/64" max lg x 49/64" max wd x 1-1/16" max d; locking action in three positions; on-off-on; solder lug term; single hole mtg bushing 15/32-32 NS-2 thd x 15/32" lg, Spec JAN-S-23.	Main power switch	ST52P	N17-S-74692-4506 (3Z9863-52P)	41	Δ	28-5488P1	S301	1			0			
S302	SWITCH, sensitive: SPDT; 10 amp 115 v AC; molded black phenolic body; 1-3/16" lg x 13/16" wd x 17/64" thk; actuated by SS pin plunger 51/64" lg x 3/32" diam; oper pressure 10 to 15 oz; movement differential 0.007" to 0.012"; max pretravel 1/32"; min-over travel 1/32"; momentary action; solder lug term; 4 holes 3/32" diam on 1" x 5/8" mtg/c.	Tone keying switch		N17-S-69114-8769 (3Z9823-7.13)	436	#3MD3-1A	28-5411P1	S302	1			0			
T201	TRANSFORMER, AF: plate coupling type; impedance pri 100,000 ohms, 6.0 ma DC, secd 300 ohms, DC cur 0, 1500 v RMS test; HS metal case, lam steel core; 1-17/32" h x 1-1/4" sq excluding term and mtg studs; max oper level 50 mw; turns ratio 18.2 to 1, dry nitrogen filled, DC resistance pri 1900 ohms, secd 33 ohms; freq response 400 to 4000 cyc p/m 2.0 db; 4 solder lug term protruding from bottom; 2 mtg studs #6-32 spaced 3/4" c to c; Navy Spec RE13A553B.	Audio plate to phones		N17-T-66576-1001 (2Z9632.559)	26	UX-11592	92-5893P1	T201	1			1			

Δ Same as JAN or Navy Type Number.

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
T202	TRANSFORMER, AF: input type; impedance pri 75 ohms, 40 ma DC, secd 480,000 ohms CT, 1000 v RMS test; HS metal case, lam steel core; 2-1/32" h x 1-11/16" diam excluding term and mtg studs; max oper level negligible; turns ratio 1 to 80 dry nitrogen filled; freq response 400 to 4000 cyc p/m 1.0-3.0 db 5 solder lug term located on bottom; 3 mtg studs #6-32 located on 27/32" rad spaced 120° apart; Navy Spec RE13A553B.	Mike trans.		N17-T-60861-4995 (2Z9631.381)	26	UX-11589	92-5894P1	T202	1			1			
T203	TRANSFORMER, AF: modulation type; impedance, pri 16,000 ohms CT, 3 secd wnd 4300/1670/0.165 ohms, max DC cur 40/10/0 ma, 1500 v RMS test; HS metal case, lam steel core; 2-15/32" h x 2-1/32" lg x 1-21/32" wd excluding term; max oper level 4 w; turns ratio pri to 3 secd 1 to 0.500 and 0.13/0.003, dry nitrogen filled; freq response 400 to 4000 cyc p-m 0-4 db; unshielded; 9 solder lug term located on bottom of case; 2 mtg studs as term #8-32 thd x 23/64" lg on 1-1/8" mtg/c on same end; Navy Spec RE13A553B.	Modulator output		N17-T-63315-5001 (2Z9634.135)	26	UX-11590	92-5891P1	T203	1			1			
T401	TRANSFORMER, power: vibrator; input pri 12 v DC CT, 6.15 amp; output #1 secd, 590/375 v at 0.060/0.030 amp CT, #2 secd, 1.05 v at 1.40 amp; output freq 160 cyc; 1780 v RMS test; dry nitrogen filled; HS metal case; case excluding term 2-1/2" h x 3-3/16" lg x 2-3/4" wd; 10 solder lug term on bottom of case; 4 mtg studs #8-32 NC-2 on 2-5/8" x 2-3/16" mtg/c; Navy Spec RE-13A553B.	Power trans.		N17-T-78522-9369 (2Z9625-66)	26	UX-11586	92-5890P1	T401	1			1			
TP101 thru TP104	CONNECTOR, receptacle: 4 banana type male cont mtd on 0.078" thk formica board #YN-25, plugs located centrally 3/8" sq c to c; straight type; 1-7/16" lg x 15/16" wd x 0.681" h o/a; 2 mtg holes 0.144" diam on 1.125" mtg/c. ΔΔ Same as Contractor's Part Number.			N17-C-73484-7769 (2Z3024-95)	26	ΔΔ	21-7434G1	TP101 thru TP104	1			1			

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TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
V101	TUBE, electron: miniature type UHF pent amplr; Spec JAN-1A.	Crystal oscillator	6AK5	N16-T-56191 (2J6AK5)			90-5137P1	V101, V201, V202, V203, V205, spare.	6			0			
V102	TUBE, electron: beam power amplifier.	Doubler	5656	N16-T-75656-0000 (2J5656)			90-5229P1	V102, V103, V104, V105, V206, spare.	6			0			
V103	Same as V102	Tripler													
V104	Same as V102	Final amplifier													
V105	Same as V102	R.F. amplifier													
V106	TUBE, electron: JAN type #5744; high mu, triode; Spec JAN-1A.	Mixer	5744		26			V106	1			0			
V201	Same as V101	1st I.F. amplifier													
V202	Same as V101	2nd I.F. amplifier													
V203	Same as V101	3rd I.F. amplifier													
V204	TUBE, electron: RMA type #2E41; subminiature diode pentode, detector amplr w/long leads.	Det. A.V.C.		N16-T-52478-0000 (2J2E41)	26	2E41	90-5216P1	V204	1			0			
V205	Same as V101	Audio amplifier													
V206	Same as V102	Modulator													
V401	TUBE, electron: receiving duodiode gas rectifier; Spec JAN-1A.	Rectifier	1007	(2J1007)			90-5207P1	V401, spare	2			0			
VD401	VIBRATOR, non-synchronous: input 6.3 v DC 7.0 amp; single reed, 122 cyc p/m 7 cyc; driving coil 6.3 vdcw; tubular 3-1/8" h x 1-1/2" diam excluding prongs; base connection A2; HS zinc case.	Inverter		N17-V-49253-1215 (3H6691-46)	668	#VN-93C	121-5009P2	VD401, 1 spare	2			0			
W101	CABLE ASSEMBLY, RF: AN cable RG-58/U; 6-3/4" lg excluding terminations; AN conn plug UG-88/U ea end.	Antenna circuit K101 to J303AB		N16-C-11943-2780 (3E7350-1.6.1)	26	ΔΔ	54-6008G1	W101	1			0			
W201	LEAD, test: single cond #20 AWG stranded c/o 41 strands #36 AWG, red syn rubber ins, max working voltage 2500 rms, wrap over cond cotton cellulose acetate or glass fibre, red syn rubber jacket; approx 15-7/8" lg excluding term; Raytheon part #105-7919 ins handle 4" lg x 5/16" diam 1 end, exposed wire 3/8" lg hot tin dipped other end. ΔΔ Same as Contractor's Part Number.	Test Meter Probe Assembly		N17-L-63395-1001 (3E7350-1.15)	26	ΔΔ	51-7543G1	W201	1			1			

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										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
W401	WIRING HARNESS: batt cable; c/o 2 lengths of wire braid w/end shaped drilled 11/64" diam ho and 0.1990" diam hole oth connector plug on 1 end e e; approx 7-1/4" lg x 1-3/64" wd o/a; 2 mtg holes 0.1990" diam 1 end, 2 banana type plugs other end.	Battery Cable		N17-W-300005-701 (3E10000-11)	26	ΔΔ	54-6007G1	W401	1			1			
W402	WIRING HARNESS: batt cable; c/o 2 lengths of wire braid w/ends shaped and drilled; RH and LH receptacles; approx 3-1/4" lg x 1-7/8" wd x 1-1/4" d o/a; 2 mtg studs #10-24 NC-2 thd x 1" lg to mtg surface.	Battery Cable		N17-W-300004-401 (3E10000-11.1)	26	ΔΔ	54-6007G2	W402	1			1			
W501	CABLE ASSEMBLY, radio freq: uses Army-Navy Radio Frequency Cable RG-58/U; approx 10 ft lg excluding terminations; Army-Navy connector Plug Type #N at 1 end and cable adapter for Army-Navy Radio Frequency Cable RG-58/U, Navy Connector Type #49190 other end.	Antenna Cable (short) Includes J501,P501.		N16-C-11945-7501 (3E7350-1.120.2)	26	ΔΔ	54-5930G2	W501	1			0			
W502	CABLE ASSEMBLY, radio frequency: uses Army-Navy Radio Frequency Cable RG-8/U; approx 60 ft lg excluding terminations; Army-Navy Radio Adapter UG-23/AU at 1 end, Navy Connector Type #49190 and #49192 other end.	Antenna cable (long) Includes J502, P502.		N16-C-11595-3631 (3E7350-1-720)	26	ΔΔ	54-5930G1	W502	1			0			
W503	CORD, headset: Sig C cord CD-307; 5 ft 6 inches lg; c/o Sig C Cordage Co-119 close spiral constr, Sig C dwg #SC-C-2019 w/Sig C Jack JK-26 attached one end & Sig C Plug PL-55 on other end.	Headset extension	-49534	N17-C-920001-101 (3E1307-5.6)	21	169955	152-5001P1	W503	1			0			
W504	CORD, microphone: uses Sig C Cordage CO-119-A approx 12" lg and 3 cond tinseled cord, color coded white red and black, neoprene jacketed, 0.270" OD x approx 4 ft lg; approx 60" lg excluding terminations, 64" lg o/a; Sig C Plug PL-68 on 3 cord end and Sig C Jack JK-48 on other end w/WECo Switch and Case Assembly #BO-15422 approx 11" from jack end of cord.	Microphone extension push to talk	-49561	N17-C-920221-101 (3E4035-60.1)	10	#433990-1	152-5002G1	W504	1			0			

ΔΔ Same as Contractor's Part Number

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
W505	LEAD, test: 2 JAN type #SR1R-4 (19) wires, one brown w/red the other brown w/green tr; 28" lg excluding termination; spcl Raytheon connector plug on 1 end and 2 Instrument Specialty #76-5194 banana plugs on other end.	Power Test cable		N17-L-64601-3001 (3E7350-1.28.2)	26	ΔΔ	54-6038G1	W505	1			0			
W506	PROBE, RF: #20 AWG round solid copper wire, solid polyethylene ins; 3-7/16" lg excluding terminations; 1 end terminates in Army-Navy Radio Frequency AN Plug UG-9/U w/shell removed, 1/8" of polyethylene ins sealed over other end.	Receiver alignment pick-up probe		N16-P-87007-6001 (3E7350-1.3.1)	26	ΔΔ	141-6097G1	W506	1			0			
XV101	SOCKET, tube: 7 cont miniature; one piece saddle mtg; two 0.125" diam mtg holes on 0.875" mtg/c; round ceramic base w/shield holder; 25/32" lg x 0.800" diam excluding term; beryllium copper cont silver pl; w/metallic ctr shield; Spec JAN-S-28A.	Socket for V101	TSE7T102	N16-S-62603-6676 (2Z8677.95)	39	Δ	82-5071P1	XV101, XV201, XV202, XV203, XV205.	5			0			
XV102	SOCKET, tube: 9 cont miniature; single piece saddle mtg below chassis mtg; 2 mtg holes 0.095" diam on 1.125" ctr; round low loss mica-filled phenolic base, 1-11/32" lg x 0.940" wd x 23/64" thk excl term; cont micro-process beryllium silver pl; w/ctr shield 0.102" ID w/o shock shield base.	Socket for V102		N16-S-64063-6227 (2Z8679.34)	29	#53F12884	82-5086P1	XV102, XV103, XV104, XV105, XV206.	5			0			
XV103	Same as XV102	Socket for V103													
XV104	Same as XV102	Socket for V104													
XV105	Same as XV102	Socket for V105													
XV201	Same as XV101	Socket for V201													
XV202	Same as XV101	Socket for V202													
XV203	Same as XV101	Socket for V203													
XV205	Same as XV101	Socket for V205													
XV206	Same as XV102	Socket for V206													
XV401	SOCKET, tube: octal type; 1 piece saddle mtg; 2 mtg holes 0.136" diam on 1-5/16" mtg/c; round ceramic body 0.975" diam x 31/64" min h excl term; phosphor bronze silver pl cont.	Socket for V401 Δ Same as JAN or Navy Type Number. ΔΔSame as Contractor's Part Number.		N16-S-63511-1941 (2Z8678.341)	488	#535C1E	81-5041P2	XV401	1			0			

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-4 COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIGNATION	NAME OF PART AND DESCRIPTION	FUNCTION	JAN OR NAVY TYPE DESIGNATION	STANDARD NAVY STOCK NUMBER	MFR. †	MFR'S DESIG.	CONTRACTOR'S PART NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	TOTAL NO. PER EQUIP.	SPARE PARTS PECULIAR					
										EQUIPMENT			STOCK		
										TAG NO.	BOX NO.	QUANTITY	TAG NO.	BOX NO.	QUANTITY
XVD401	SOCKET, tube: 4 cont; single piece saddle mtg; two 5/32" diam mtg holes on 1-1/2" mtg/c; round mica filled bakelite body 1-7/64" diam x 29/64" h excl term; cont phosphor bronze silver pl.	Socket for VD401	-49390-A	N16-S-60852-2121 (2Z8659-5.1)	23	M1P4T	82-5049P1	XVD401	1			0			
Y101A	CRYSTAL UNIT, quartz: harmonic mode xtal unit, pressure mtd type c/o a piezo-electric element in sealed metal holder; -55°C thru +90°C temp range; 2 axial pins, cylindrical metal body 1.055" lg x 0.560" diam o/a; may be any one of 101 frequencies from approx 19.0 mc to approx 32.5 mc; Navy Spec 16C36(43).	Receiver crystal	CR-9/U			GFE		Y101A, Y101B, Y101C, Y101D, Y102A, Y102B, Y102C, Y102D.	20			0			
Y101B	Same as Y101A	Receiver crystal													
Y101C	Same as Y101A	Receiver crystal													
Y101D	Same as Y101A	Receiver crystal													
Y102A	Same as Y101A	Transmitter-crystal													
Y102B	Same as Y101A	Transmitter-crystal													
Y102C	Same as Y101A	Transmitter-crystal													
Y102D	Same as Y101A	Transmitter-crystal													

† FOR NAMES AND ADDRESSES, SEE LIST OF MANUFACTURERS

TABLE 8-5.- CROSS REFERENCE PARTS LIST

JAN Type Designation	Key Symbol	JAN Type Designation	Key Symbol	JAN type Designation	Key Symbol	Navy Type Designation	Key Symbol	Standard Navy Stock Number	Key Symbol	Standard Navy Stock Number	Key Symbol
1N43	CR101	RC20BF123K	R201	RC30BF332K	R238	1007	V401	F16A-51870-1721	E502	N16-C-41062-6831	C204
6AK5	V101	RC20BF125K	Alt R222	RC30BF822K	R106	5744	V106	F16-A-54490-4001	E501	N16-C-45803-3260	C136
AN3106-14S-9P	K101	RC20BF150M	R101	ST22N	S201	10551	20-5664G1	N16-B-110001-107	A505	N16-C-64062-7350	C127
AN6227-4	O-306	RC20BF161J	R229	ST52P	S301	10583	A505	N16-B-750001-366	A104	N16-C-64157-5550	C101
AN6227-7	O-304	RC20BF183K	R233	TSE7T102	XV101	19062	99F-4G1	N16-B-750001-367	A111	N16-C-71591-4001	L106
CE31C121F	C235	RC20BF223K	R109	UG-23A/U	J502	28030-15	F201	N16-C-11595-3631	W502	N16-C-71592-4640	L107
CC20PH050C	C107	RC20BF223M	R227	UG-175/U	P501A	43071	RX-1862	N16-C-11943-2780	W101	N16-C-71970-2369	L101
CC20SL010C	C144	RC20BF224M	R204			49390-A	XVD401	N16-C-11945-7501	W501	N16-C-73697-7390	L108
CC20UJ510J	C137	RC20BF225M	R224			49507	HT501	N16-C-15369-4494	C144	N16-C-74808-5469	L402
CC21SK100D	C104	RC20BF274K	R228			49534	W503	N16-C-15625-1201	C107	N16-C-74970-6561	L205
CC21SL050D	C147	RC20BF330K	R116			49561	W504	N16-C-15628-9005	C147	N16-C-75254-6699	L206
CC21SL060D	C148	RC20BF330M	R103			51071	M1501	N16-C-15693-1369	C148	N16-C-75362-2801	L211
CC21TK200K	C226	RC20BF334K	R206			63355-102	R119	N16-C-15916-8894	C104	N16-C-75404-2488	L203
CC21UJ510K	C109	RC20BF334M	R220			63355-161	R229	N16-C-16094-1881	C226	N16-C-75441-2359	L210
CM20C111J	C217	RC20BF390K	Alt R240			63355-430	R240	N16-C-16597-1215	C137	N16-C-75606-2869	L202
CM20C131J	C212	RC20BF392K	R107			472104	L210	N16-C-16606-5748	C109	N16-C-76224-6721	L103D
CM20C161J	C213	RC20BF393K	R111			48675-C5	C241	N16-C-17212-4369	C130	N16-C-76235-6721	L103C
CM20C181J	C228	RC20BF470K	R240			481066-5	C217	N16-C-17699-7469	C103	N16-C-76256-1787	L103B
CM20C201J	C241	RC20BF471M	R214			481155-C5	C227	N16-C-18211-7950	C102	N16-C-76275-9169	L102D
CM20C221J	C201	RC20BF472K	R113			481450-C5	C212	N16-C-18787-7769	C105	N16-C-76284-2633	L103A
CM20C820J	C211	RC20BF472M	R202			481518-C5	C228	N16-C-20259-7500	C235	N16-C-76296-2633	L102C
CM35C362J	C237	RC20BF473M	R203			481626-C5	C201	N16-C-21941-1001	C219	N16-C-76320-7549	L102B
CM35C751J	C227	RC20BF474M	R213			481632-C5	C213	N16-C-28210-2001	C211	N16-C-76358-9169	L102A
RC20BF102J	R119	RC20BF562K	Alt R113					N16-C-28658-5801	C217	N16-C-77896-2901	L110
RC20BF103K	R208	RC20BF683K	R212					N16-C-28816-8201	C212	N16-C-77896-2911	L104
RC20BF104K	R124	RC20BF820K	R241					N16-C-29080-6201	C213	N16-C-125001-245	O-101
RC20BF104M	R102	RC20BF823K	R221					N16-C-29133-4001	C228	N16-C-170001-346	A504
RC20BF105K	R222	RC30BF102M	R115					N16-C-29265-3001	C241	F16-C-170001-347	20-5664G1
RC20BF105M	R232							N16-C-29370-7601	C201	N16-C-302460-191	O-211
RC20BF121K	R126							N16-C-32351-4933	C237		

TABLE 8-5. CROSS REFERENCE PARTS LIST

Standard Navy Stock Number	Key Symbol	Standard Navy Stock Number	Key Symbol	Standard Navy Stock Number	Key Symbol	Standard Navy Stock Number	Key Symbol	Standard Navy Stock Number	Key Symbol	Army Stock Number	Key Symbol
N16-C-303202-371	O-210	N16-R-50309-811	R201	N16-S-21065-3500	O-103	N17-C-780460-501	H112	N17-S-714139-4844	S201	2A264-408	E502
N16-K-700100-251	O-310	N16-R-50354-811	R233	N16-S-34520-3863	E102	N17-C-780704-108	H110	N17-T-60861-4995	T202	2A288A-105	E501
N16-K-700278-286	O-308	N16-R-50365-291	R105	N16-S-60852-2121	XVD401	N17-C-780845-381	H108	N17-T-63315-5001	T203	2A3393A.1-95	A501
N16-M-58297-5700	A105	N16-R-50374-291	R227	N16-S-62603-6676	XV101	N17-C-920001-101	W503	N17-T-66576-1001	T201	2A3393A.1-96	A502
N16-M-58357-7466	A503	N16-R-50410-291	R103	N16-S-63511-1941	XV401	N17-C-920221-101	W504	N17-T-78522-9369	T401	2B1750-2	M1501
N16-M-61696-4521	A107	N16-R-50444-811	R111	N16-S-64063-6227	XV102	N17-C-945001-844	O-301	N17-V-49253-1215	VD401	2J1007	V401
N16-P-87007-6001	W506	N16-R-50482-291	R203	N16-S-88309-3210	L105A	N17-C-945001-845	O-303	N17-W-300004-401	W402	2J1N43	CR101
N16-P-315001-100	H307	N16-R-50552-811	R212	N16-S-88309-3214	L105B	N17-C-804519-901	O-202	N17-W-300005-701	W401	2J2E41	V204
N16-R-28800-1433	L401	N16-R-50588-811	R221	N16-S-850281-140	A501	N17-C-804543-354	O-204	N33-P-1560-150	O-304	2J6AK5	V101
N16-R-28899-3069	L204	N16-R-50633-811	R124	N16-S-850281-141	A502	N17-C-804575-969	O-115	N41-B-636-1250	H505	2S9035	RX-1862
N16-R-28899-5090	L201	N16-R-50635-291	R101	N16-T-51743	CR101	N17-C-812968-950	O-108	N41-B-637-450	H506	2Z307-104	J303
F16-R-35395-3504	RX-1862	N16-R-50716-291	R204	N16-T-52478-0000	V204	N17-F-16245	F201	N41-H-1433-635	H504	2Z308-175	P501A
N16-R-49294-291	R101	N16-R-50741-811	R228	N16-T-56191	V101	N17-G-158040-101	O-302	G41-S-1337	H507	2Z552-9	A505
N16-R-49364-811	R116	N16-R-50759-811	R206	N16-W-920001-131	H501	N17-I-47366-3865	E403	N41-S-1413-3910	H401	2Z1244-88	A104
N16-R-49391-811	Alt R240	N16-R-50761-291	R220	N16-W-920001-132	H503	N17-I-47366-3950	E402	G41-W-2446	H316	2Z1244-89	A111
N16-R-49427-811	R240	N16-R-50824-291	R213	N16-W-920001-133	H502	N17-I-49969-9301	E401	N43-N-5917-8375	H305	2Z1600-50	O-101
N16-R-49535-811	R241	N16-R-50975-811	R222	N17-B-69245-7480	B1401	N17-J-40202-1121	J301	N43-S-52893-5060	H402	2Z1800.116	20-5664 G1
N16-R-49598-826	R126	N16-R-50977-291	R232	F17-B-70401-4210	99F-4G1	N17-L-63395-1001	W201	N43-S-52893-5710	H301	2Z1800.117	A504
N16-R-49633-431	R229	N16-R-50993-811	Alt R222	N17-B-77585-4563	A103	N17-L-64601-3001	W505			2Z2642.284	O-210
N16-R-49771-291	R214	N16-R-51067-291	R224	N17-B-77786-1469	A102	N17-M-21878-2242	M301			2Z2642.285	O-211
N16-R-49921-431	R119	N16-R-68256-2529	R236	N17-B-77889-1169	E301	N17-M-46589-6471	M1501			2Z2642.286	H108
N16-R-49924-611	R115	N16-R-68273-9516	R108	N17-B-77934-8869	A101	N17-M-81351-3892	A203			2Z2642.287	H110
N16-R-50067-231	R238	N16-R-68290-7825	R104	N17-B-78100-5401	E101	N17-P-69703-1056	H105			2Z2642.302	H112
N16-R-50093-811	R107	N16-R-68318-3256	R234	N17-B-78138-7669	A202	N17-P-69705-3650	H101			2Z2712.138	O-115
N16-R-50129-811	R113	N16-R-73500-2501	R235	N17-B-78313-7869	A201	N17-P-69713-8615	H103			2Z2712.145	O-202
N16-R-50131-291	R202	N16-R-88342-5296	R301	N17-C-67304-5669	J303	N17-P-69717-2916	H107			2Z2712.147	O-204
N16-R-50165-811	Alt R113	N16-R-501081-113	O-104	N17-C-71115-3384	J502	N17-R-64776-6569	K102			2Z2712.148	O-108
N16-R-50238-231	R106	N16-R-501081-115	A109	N17-C-73116-5669	J401	N17-R-64778-1169	K401			2Z3024-95	TP101
N16-R-50282-811	R208	N16-R-501081-116	A110	N17-C-73484-7769	TP101	N17-S-69114-8769	S302			2Z3062-225	J401
		N16-R-503580-199	O-109	N17-C-98611-1048	O-116	N17-S-74692-4506	S301				

TABLE 8-5. CROSS REFERENCE PARTS LIST

Army Stock Number	Key Symbol	Army Stock Number	Key Symbol	Army Stock Number	Key Symbol	Army Stock Number	Key Symbol	Army Stock Number	Key Symbol	Army Stock Number	Key Symbol
2Z3105-14	J301	2Z9632.559	T201	3D9005-113	C107	3K2011132	C217	3RC20BF392K	R107	3Z9823-7.13	S302
2Z3273-219	O-116	2Z9634.135	T203	3D9006-33	C148	3K2013132	C212	3RC20BF393K	R111	3Z9849.135	S201
2Z3351-191	O-301	3B40.2	B1401	3D9010-127	C104	3K2016132	C213	3RC20BF470K	R240	3Z9863-52P	S301
2Z3351-193	O-303	3B288-1	99F-4 G1	3D9030V-26	C127	3K2018132	C228	3RC20BF471M	R214	6L3800-3	H305
2Z4868.711	O-302	3C307-5.14	L402	3D9050V-116	C101	3K2020132	C241	3RC20BF472K	R113	6L4770-12.8KF	H402
2Z5822-406	O-308	3C307-5.15	L211	3D9051-10	C109	3K2022132	C201	3RC20BF472M	R202	6L4774-20.8KF	H301
2Z5822-407	O-310	3C307-5.16	L206	3D9051-12	C137	3K2082032	C211	3RC20BF473M	R203	6L54006-18	O-304
2Z6820.268	A105	3C307-5.17	L210	3D9120-34	C130	3K3536232	C237	3RC20BF474M	R213	6Q51223	H504
2Z6820.269	A503	3C307-5.18	L205	3D9200-107	C103	3K3575132	C227	3RC20BF562K	Alt R113	6R14982	H401
2Z6978	H307	3C307-5.19	L203	3D9500-229	C102	3RC20BF102J	R119	3RC20BF683K	R212	6R19040.8	H507
2Z7093-244	A107	3C307-5.20	L202	3DA1.500-44	C105	3RC20BF103K	R208	3RC20BF820K	R241	6R38439	H502
2Z7093-245	A109	3C307-5.21	L108	3DA4.700-10	C204	3RC20BF104K	R124	3RC20BF823K	R221	5R38439-1	H501
2Z7093-246	A110	3C575E-29	L204	3DA10-472	C136	3RC20BF104M	R102	3RC30BF102M	R115	6R38440	H506
2Z7259-76	H103	3C575E-30	L201	3DB35-2	C219	3RC20BF105K	R222	3RC30BF332K	R238	6R38440-1	H505
2Z7259-77	H101	3C575E-31	L401	3DB120-3	C235	3RC20BF105M	R232	3RC30BF822K	R106	6R57522-6	H503
2Z7259-78	H107	3C1081-48A	L102C	3E1307-5.6	W503	3RC20BF121K	R126	3Z770-3.36	A103		
2Z7259-79	H105	3C1081-48B	L102B	3E4035-60.1	W504	3RC20BF123K	R201	3Z770-4.81	A203		
2Z7390-23A	J502	3C1081-48C	L102A	3E7350-1.3.1	W506	3RC20BF125K	Alt R222	3Z770-7.14	A102		
2Z7599A-223	K401	3C1081-48D	L102D	3E7350-1.6.1	W101	3RC20BF150M	R101	3Z770-9.13	E301		
2Z7599A-228	K102	3C1081-48E	L101	3E7350-1.15	W201	3RC20BF161J	R229	3Z770-10.38	A101		
2Z7780-104	O-104	3C1084Z19-12	L103D	3E7350-1.28.2	W505	3RC20BF183K	R233	3Z770-17.11	E101		
2Z7780-107	O-109	3C1084Z19-13	L103C	3E7350-1.120.2	W501	3RC20BF220M	R105	3Z770-20.28	A202		
2Z8204-156	O-103	3C1084Z19-14	L103B	3E7350-1-720	W502	3RC20BF223M	R227	3Z770-48.3	A201		
2Z8659-5.1	XVD401	3C1084Z19-15	L103A	3E10000-11	W401	3RC20BF224M	R204	3Z2015-1	F201		
2Z8677.95	XV101	3C1084Z19-16	L106	3E10000-11.1	W402	3RC20BF225M	R224	3Z5985-32	R236		
2Z8678.341	XV401	3C1084Z19-17	L107	3F891-86	M301	3RC20BF274K	R228	3Z5991-97	R108		
2Z8679.34	XV102	3C4026	L104	3G100-129	E402	3RC20BF330K	R116	3Z5993-57	R104		
2Z9023-9	L105B	3C4026-1	L110	3G100-133	E401	3RC20BF330M	R103	3Z6001B2-35	R234		
2Z9023-10	L105A	3D9001-26	C144	3G100-1300	E403	3RC20BF334K	R206	3Z6610-313	R235		
2Z9625-66	T401	3D9005-109	C147	3H6691-46	VD401	3RC20BF334M	R220	3Z7499-1.115	R301		
2Z9631.381	T202										

TABLE 8-7. LIST OF MANUFACTURERS

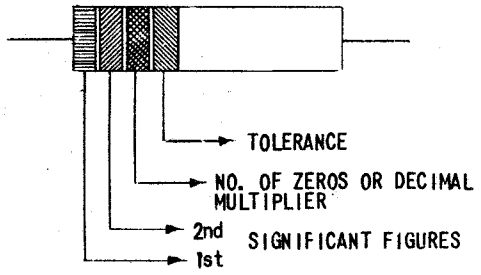
Code No.	Mfr's Prefix	NAME	ADDRESS
2	CSF	Sprague Electric Co.	201 Beaver St., North Adams, Mass.
10	CRC	RCA Mfg. Co.	Harrison, New Jersey
13	CBZ	Allen Bradley	118 W. Greenfield Ave., Milwaukee, Wis.
16	CHH	Arrow, Hart & Hegeman Electric Co.	102 Hawthorne St., Hartford, Conn.
21	CW	Western Electric Co.	120 Broadway, New York 5, N. Y.
22	CUF	Ucinite Co, Div. United Carr Fastener Co.	459 Watertown St., Newton, Mass.
23	CPH	American Phenolic Corp.	1830 S. 54th Ave., Chicago, Ill.
26	CRP	Raytheon Mfg. Co.	190 Willow St., Waltham, Mass.
29	CMG	Cinch Mfg. Co.	2339 W. Van Buren St., Chicago, Ill.
35	CER	Erie Resistor Corp.	644 W. 12th St., Erie, Pa.
39	CEB	Hugh H. Eby	4700 Stenton Ave., Philadelphia, Pa.
41	CAE	Cutler Hammer, Inc.	1333 W St. Paul Ave., Milwaukee, Wis.
50	CLF	Littelfuse, Inc.	4765 Ravenswood Ave., Chicago 40, Ill.
100	CMF	Electro Motive Mfg. Co.	So. Park & John Sts., Willimantic, Conn.
160	CAVS	MEPCO	78 Main St., Madison, N.J.
268		E.F. Houghton & Co.	366 Atlantic Ave., Boston, Mass.
429	CWB	Willard Storage Battery Co.	246 E. 131st St., Cleveland, Ohio
436	CATK	Acro Electric Co.	1305 Superior Ave., Cleveland, Ohio
437	CARO	Industrial Products Co.	Brookfield St., Danbury, Conn.
462	CAYT	Allen Mfg. Co.	133 Sheldon St., Hartford, Conn.
470	CNP	National Ceramic Co.	400 Southard St., Trenton 2, N.J.
475	CASU	Electric Reactance Corp.	3444 Elm St., Franklinville, N.Y.
488	CNZ	National Fabricated Products, Inc.	2650 West Belden Ave., Chicago, Ill.
499		Detroit Harvester Co., Prestole Div.	5450 West Jefferson, Detroit, Michigan
508		Robert H. Hetherington & Sons, Inc.	Box 204 Sharon Hill, Pa.
519		The L.S. Starret Co.	Athol, Mass.
541		Elmhurst Rubber Co., Inc.	Albion St., Elmhurst, L.I., N.Y.
633	CBBG	Cook Electric Co.	2700 N. Southport Ave., Chicago, Ill.
653		Continental Carbon, Inc. Continental Carbon Co.	13900 Lorain Ave., Cleveland, Ohio 295 Madison Ave., N.Y., N.Y.
665		International Instrument Co.	331 East St., New Haven 11, Conn.
668	CRF	Radiart Co.	3571 W. 62nd St., Cleveland, Ohio
672	CBM	Submarine Signal Co.	160 North Washington St., Boston, Mass.
679		George Hoyt Co.	549 Rutherford Ave., Charlestown, Mass.
693		Commercial Plastics Co.	201 No. Wells St., Chicago, Ill.
719		Linear Inc.	6464 State Rd., Philadelphia, Pa.

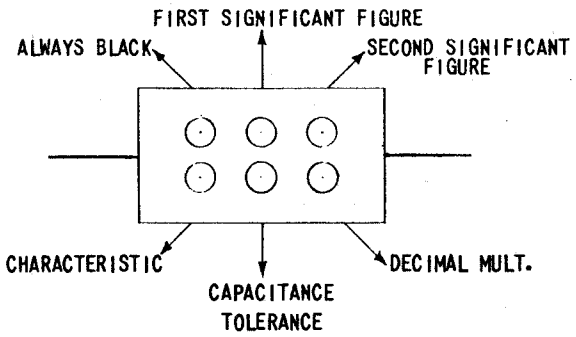
TABLE 8-6
APPLICABLE COLOR CODES AND MISCELLANEOUS DATA

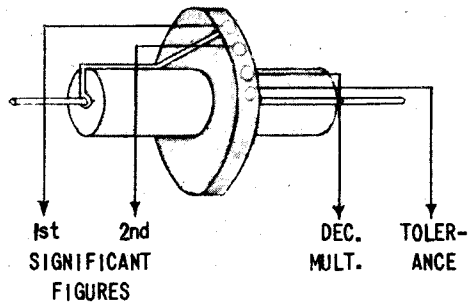
JAN-R-11 COLOR CODE FOR RESISTORS			
COLOR	NUMERAL OR NO. OF ZEROS	DECIMAL MULTIPLIER	TOLERANCE (PERCENT)
BLACK	0	------	-----
BROWN	1	------	-----
RED	2	------	-----
ORANGE	3	------	-----
YELLOW	4	------	-----
GREEN	5	------	-----
BLUE	6	------	-----
VIOLET	7	------	-----
GRAY	8	------	-----
WHITE	9	------	-----
GOLD	------	0.1	5
SILVER	------	.01	10
NO COLOR	------	------	20

JAN-C-5 COLOR CODE FOR MICA CAPACITORS				
COLOR	CAPACITANCE SIGN. FIG.	CAPACITANCE DEC. MULT.	TOLERANCE	CHARACTERISTIC
BLACK	0	1	20	A
BROWN	1	10	----	B
RED	2	100	2	C
ORANGE	3	1000	----	D
YELLOW	4	------	----	E
GREEN	5	------	----	F
BLUE	6	------	----	G
VIOLET	7	------	----	------
GRAY	8	------	----	------
WHITE	9	------	----	------
GOLD	------	0.1	5	------
SILVER	------	.01	10	------
----	------	------	----	------

** R.M.A. COLOR CODE FOR R.F. CHOKES			
COLOR	1ST OR 2ND SIGN. FIG.	DECIMAL MULTIPLIER	TOLERANCE (PERCENT)
BLACK	0	1	20
BROWN	1	10	1
RED	2	100	2
ORANGE	3	1000	------
YELLOW	4	10000	------
GREEN	5	------	------
BLUE	6	------	------
VIOLET	7	------	------
GRAY	8	------	------
WHITE	9	------	------
GOLD	------	0.1	5
SILVER	------	.01	10
------	------	------	------







** RAYTHEON ADAPTATION