INSTRUCTION BOOK

TRANSCEIVER

KWM-2

COLLINS RADIO COMPANY

COLLINS

COLLINS AMATEUR EQUIPMENT GUARANTEE

The Collins Amateur Equipment described herein is sold under the following guarantee:

Collins agrees to repair or replace, without charge, any equipment, parts, or accessories which are defective as to workmanship or materials and which are returned to Collins at its factory, transportation prepaid, provided:

(a) Buyer has completed and returned to Collins promptly following his purchase the Registration Card included in the Instruction Book or furnished with the equipment.

(b) Notice of the claimed defect is given Collins or an authorized service agency, or an authorized distributor, in writing, within 90 days from the date of purchase and goods are returned in accordance with Collins instructions.

(c) Equipment, accessories, tubes, and batteries not manufactured by Collins or from Collins designs are subject to only such adjustments as Collins may obtain from the supplier thereof.

(d) Any failure due to use of equipment in excess of that contemplated in normal amateur operations shall not be deemed a defect within the meaning of these provisions.

The guarantee of these paragraphs is void if equipment is altered or repaired by others than Collins or its authorized service center.

Collins reserves the right to make any change in design or to make addition to, or improvements in, Collins products without imposing any obligations upon Collins to install them in previously manufactured Collins products.

No other warranties, expressed or implied, shall be applicable to said equipment, and the foregoing shall constitute the Buyer's sole right and remedy under the agreements contained in these paragraphs. In no event shall Collins have any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of the products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

IMPORTANT: It is necessary that the business reply card included herewith be filled out and mailed to the Company promptly in order for this guarantee to be effective.

INQUIRIES: If there are any questions concerning the operation of this equipment, first contact the distributor from which you purchased the equipment or the distributor nearest you. They are qualified to make the proper recommendations to you.

NOTE: See Distributor List.

WARRANTY REPAIRS

On the opposite page are listed the Service Agencies authorized to perform warranty repair on Collins Amateur Equipments.

If you should wish to return material or equipment direct to Collins under the guarantee, you should notify Collins, giving full particulars including the details listed below, insofar as applicable. If the item is thought to be defective, such notice must give full information as to nature of defect and identification (including part number if possible) of part considered defective. Upon receipt of such notice, Collins will promptly advise you respecting the return. Failure to secure our advice prior to the forwarding of the goods or failure to provide full particulars may cause unnecessary delay in handling of your returned merchandise.

ADDRESS:

Collins Radio Company
Amateur Product Office
Cedar Rapids, Iowa

INFORMATION NEEDED:

(A) Type number, name and serial number of equipment
(B) Date of delivery of equipment
(C) Date placed in service
(D) Number of hours of service
(E) Nature of trouble
(F) Cause of trouble if known
(G) Name of distributor from whom the equipment was purchased

OUT OF WARRANTY REPAIR, MODIFICATIONS, ADDITION OF ACCESSORIES, ALIGNMENT, ETC.:

For information on service of this type write to the address shown below. If you wish to return your equipment for repairs, etc., without prior correspondence, be sure to include the following information attached to the equipment inside the packing carton:

(1) Complete instructions detailing work to be performed.
(2) Your return address.
(3) Method of shipment by which the equipment should be returned.
(4) Special instructions.

DIRECT YOUR CORRESPONDENCE TO:

Collins Radio Company
Service Repair Department
Service Building, Main Plant
Cedar Rapids, Iowa

HOW TO ORDER REPLACEMENT PARTS.

When ordering replacement parts, you should direct your order to one of the listed Collins distriburors.

Please furnish the following information insofar as applicable:

INFORMATION NEEDED:

(A) Quantity required
(B) Collins part number (9 or 10 digit number) and description
(C) Item or symbol number obtained from parts list or schematic
(D) Collins type number, name, and serial number of principal equipment
(E) Unit subassembly number (where applicable)

NOTE: See Distributor List.

COLLINS AUTHORIZED AMATEUR DISTRIBUTORS AND SERVICE AGENCIES

ALABAMA

Ack Radio Supply Company
3101 4th Avenue S.
Birmingham 3
Phone: FAirfax 2-0588
Rep: E. C. Atkerson
SEE ALSO: Atlanta, Georgia

ALASKA

Alaskan Electronics Supply, Inc.
833 Gambell Street
Anchorage
Phone: 6-2844
Rep: Harold W. Green

ARIZONA

Elliott Electronics, Inc.
418 No. 4th Avenue
Tucson
Phone MAin 4-2473
Rep: T. M. Elliott

Southwest Wholesale Radio, Inc.
(P.O. Box 3647) 126 S. 2nd Street
Phoenix
Phone: ALpine 2-1743
Rep: Herman A. Middleton

ARKANSAS

Lavender Radio Supply Company, Inc.
(P.O. Box 596) 529 E. 4th Street
Texarkana
Phone: 2-4195
Rep: Joe Lavender

Moory's Radio & Appliance Company
12th & Jefferson
DeWitte
Phone: WHitney
Rep: Ed Moory

CALIFORNIA

Dow Radio, Inc.
1759 East Colorado Street
Pasadena 4
SYcamore 3-1196
Rep: Arthur Duhamell

Eckert Enterprises
17647 Sherman Way
Van Nuys
Phone: DI 2-5143
Rep: Fred Rice

Elmar Electronics,
140 11th Street at Madison
Oakland 7
Phone: HIgate 4-7011 (TWX-OA73)
Rep: Elvin Feige/Mario Chirone

**Henry Radio
(P.O. Box 64398)
11240 W. Olympic Blvd.
Los Angeles 64
Phone: GRanite 7-6701
Rep: Ted Henry

Larry Lynde Electronics
1526 E. 4th Street
Long Beach
Phone: HEmlock 7-4807
Rep: Larry Lynde

Northern California Amateur Supply
3425 Balboa Street
San Francisco
Phone: SKyline 1-4661
Rep: John Mayes

Frank Quement, Inc.
P.O. Box 527
161 San Fernando
San Jose
Phone: CYpress 4-0464
Rep: Frank Quement

Radio Products Sales, Inc.
1501 S. Hill Street
Los Angeles 15
Phone: RIchmond 9-7471
Rep: Ken Rausin

Valley Electronic Supply Company
1302 W. Magnolia Blvd.
Burbank
Phone: THornwall 5-1521
Rep: Frank Eckert

Western Radio & TV Supply Company
(P.O. Box 1728) 1415 India Street
San Diego 1
Phone: BElmont 9-0361
Rep: Wayne Prather/Lorin Lee

COLORADO

Radio Products Sales Company
1237 16th Street
Denver 2
Phone: CHerry 4-6591
Rep: Walter Nettles/Willard Wright

CONNECTICUT

Hatry of Hartford, Inc.
203 Ann Street
Hartford
Phone: JAckson 7-1881
Rep: Edward Gedney

Radio Shack Corp.
230 Crown Street
New Haven 10
Phone: SPruce 7-6871
Rep: Myron Friedman

SEE ALSO: Boston, Massachusetts

SERVICE AGENCY ONLY:

Huntress Electronics
93 Talcott Road
West Hartford 10
Phone: ADams 6-0990
Rep: Bob Resconsin

DELAWARE

Willard S. Wilson, Inc.
403-405 Delaware Avenue
Wilmington 1
Phone: OLympia 5-4321
Rep: W. S. Wilson

DISTRICT OF COLUMBIA

Electronic Wholesalers, Inc.
2345 Sherman Avenue NW
Washington 1
Phone: HUdson 3-5200
Rep: Ray Avey

FLORIDA

**Electronic Supply Company
61 N.E. 9th Street
Miami 32
Phone: FRanklin 7-2511
Rep: Frank Gantz

Grice Electronics, Inc.
(P.O. Box 1911) 300 E. Wright Street
Pensacola
Phone: HEmlock 3-4616
Rep: F. G. Grice, Jr.

**Kinkade Radio Supply
1719 Grand Central Avenue
Tampa
Phone: 8-6043
Rep: Elmer Kinkade

Peard Electronic Supply Company
535 Washington Street
Jacksonville
Phone: ELgin 5-3473
Rep: Robert C. Peard

GEORGIA

Ack Radio Supply Company
331 Luckie Street NW
Atlanta 13
Phone: JA 4-8477
Rep: T. E. Atkerson

Specialty Distributing Company, Inc.
763 Juniper Street NE
Atlanta 8
Phone: TRinity 3-2521
Rep: J. E. Eaton

HAWAII

Kaimuki Radio Company, Ltd.
3620 Waialae Avenue
Honolulu 16
Phone: 709085
Rep: Thomas Teruya

ILLINOIS

Allied Radio Corp.
100 N. Western Avenue
Chicago 80
Phone: HAymarket 1-6800
Rep: Oliver Goold/Lewis T. Stein

Klaus Radio & Electric Company
403 E. Lake
Peoria
Phone: RH 8-3401
Rep: Clifford Morris

Newark Electric Company
223 W. Madison Street
Chicago 6
Phone: STate 2-2944
Rep: John Mack/A. L. Poncher/ Ireal Treger

INDIANA

Graham Electronics Supply, Inc.
122 S. Senate Street
Indianapolis 4
Phone: MElrose 4-8487
Rep: Clair Gould/Thorton Graham

Radio Distributing Company
(P.O. Box 1499) 1212 High Street
South Bend 15
Phone: ATlantic 8-4665
Rep: William A. Davidson

IOWA

Bob and Jack's
611 Forest Avenue
Des Moines 14
Phone: ATlantic 2-0852
Rep: Robert M. Evans/Jack Landis

Ken-Els Radio Supply Company
428 Central Avenue
Fort Dodge
Phone: 3-8801
Rep: Ken Stinogel

Radio Trade Supply Company
1224 Grand Avenue
Des Moines 9
Phone: ATlantic 8-7237
Rep: Vince Davis

World Radio Laboratories, Inc.
3415-27 W. Broadway
Council Bluffs
Phone: 2-0277
Rep: Alan McMillan/Leo Meyerson/ C. H. Williams

KANSAS

The Overton Electric Company, Inc.
522 Jackson Street
Topeka
Phone: CEntral 3-1367
Rep: S. D. Thacher

KENTUCKY

Radio Equipment Company
(P.O. Box 1212) 480 Skain Avenue
Lexington
Phone: 3-1577
Rep: A. A. Abraham

LOUISIANA

**Radio Parts, Inc.
807 Howard Avenue
New Orleans 12
Phone: JAckson 2-0217
Rep: Irvine J. Levi

MARYLAND

Amateur Radio Center
2203 Fulton Avenue
Baltimore 17
Phone: LAfayette 3-5215
Rep: Ernest Dobos

EMCO Electronic Wholesalers
1123 Fidler Lane
Silver Spring
Phone: JUniper 5-1800
Rep: Richard Alexander

MASSACHUSETTS

DeMambro Radio Supply, Inc.
1095 Commonwealth Avenue
Boston 15
Phone: ALgonquin 4-9000
Rep: Frank DeMambro

Radio Shack Corp.
730 Commonwealth Avenue
Boston 17
Phone: REgency 4-1000
Rep: A. E. Coe

SERVICE AGENCY ONLY:

Douglas Instrument Laboratory
176 Norfolk Avenue
Boston 19
Phone: HIghland 5-4836
Rep: H. D. Miller

MICHIGAN

SERVICE AGENCY ONLY:

Communication Service Company
201 S. Lincoln
Charlotte
Phone: 1770-W
Rep: Bart Rypstra

M.N. Duffy & Company
2040 Grand River Avenue W.
Detroit 26
Phone: WOodward 3-2270
Rep: M. N. Duffy/Joe Gardella

Purchase Radio Supply
327 E. Hoover Avenue
Ann Arbor
Phone: NOrmandy 8-8696 or 8-8262
Rep: Roy J. Purchase

Warren Radio Company
1710 Westnedge
Kalamazoo
Phone FIreside 2-5720 or 2-7127
Rep: Frank Smith

MINNESOTA

Lew Bonn Company
1211 LaSalle Avenue
Minneapolis 3
Phone: FEderal 9-6351
Rep: Lew Bonn/Bob Woodrow

**Electronic Center, Inc.
107 3rd Avenue N.
Minneapolis 1
Phone: FEderal 8-8678
Rep: Ward Jensen

Stark Radio Supply Company
154 W. University Avenue
St. Paul 3
Phone: CApitol 2-8705
Rep: Pep Huber/Dale G. Hagen (Hall Electric Co.)

MISSISSIPPI

Swan Distributing Company
342 N. Gallatin Street
Jackson
Phone: FLeetwood 2-5516
Rep: Leo Swan

MISSOURI

Walter Ashe Radio Company
1125 Pine Street
St. Louis 1
Phone: CHestnut 1-1125
Rep: Walter Ashe/Joe Novak

Burstein-Applebee Company
1012-1014 McGee Street
Kansas City 6
Phone: BAltimore 1-1155
Rep: R. H. Friesz

Henry Radio Company
221 North Main
Butler
Phone: ORchard 9-3127
Rep: Bob Henry/Helen DeArmond

Radiolab
1612 Grand Avenue
Kansas City 8
Phone: HArrison 1-0171
Rep: Bob Smith/Bud Willis/ E. Krahenbuhl

MONTANA

Modern Equipment Company
113 Central Avenue
Great Falls
Phone: GL 2-6451
Rep: Frank Anderson

**ALSO AUTHORIZED SERVICE AGENCY

NEW HAMPSHIRE

**Evans Radio
(P.O. Box 312) Bow Junction
Route 3A
Concord
Phone: CApital 5-3358
Rep: Roger Britton

NEW JERSEY

Federated Purchaser, Inc.
1021 U.S. Route 22
Mountainside
Phone: ADams 2-8200
Rep: Hal Thorne

Hudson Radio & Television Corp.
35 Williams Street
Newark 2
Phone: MArket 4-5154
Rep: Joseph Prestia

SERVICE AGENCY ONLY:

Warner Engineering Company, Inc.
239 Lorraine Avenue
Upper Montclair
Phone: PIoneer 6-7900
Rep: Charles Atwater

NEW YORK

Adirondack Radio Supply
(P.O. Box 88) 185-191 W. Main Street
Amsterdam
Phone: VIctor 2-8350
Rep: Ward Hinkle

Ft. Orange Radio Distributing Co., Inc.
904-16 Broadway
Albany 7
Phone: ALbany 5-1594
Rep: Harry Miller

Genessee Radio & Parts Company
2550 Delaware Avenue
Buffalo 16
Phone: CLeveland 1970
Rep: Martin Feigenbaum

Harrison Radio Corporation
225 Greenwich Street
New York 7
Phone: BArclay 7-7777
Rep: W. E. Harrison/Ben Snyder

Harvey Radio, Inc.
103 W. 43rd Street
New York 18
Phone: JUdson 2-1500
Rep: Harvey Sampson/George Zarrin

NORTH CAROLINA

Dalton-Hege Radio Supply Co., Inc.
938 Burke Street
Winston-Salem
Phone: PArk 5-8711
Rep: Wayne Yelverton

**Freck Radio & Supply Company
38 Biltmore Avenue
Asheville
Phone: ALpine 3-3631
Rep: T. T. Freck

Southeastern Radio & Supply Co., Inc.
414 Hillsboro Street
Raleigh
Phone: TE 3-1936
Rep: Stanley Kahn

OHIO

Custom Electronics, Inc.
1918 S. Brown Street,
Dayton 9
Phone: BAldwin 3-3157
Rep: Richard Sauer/Clem Wolford

Pioneer Electronic Supply Company
2103 E. 21st Street
Cleveland 15
Phone: SUperior 1-5277
Rep: Dick Brainard/Herb Farr

Selectronic Supplies, Inc.
3185 Bellevue Road
Toledo 6
Phone: GReenwood 4-5477
Rep: D. E. Petty

Steinberg's Inc.
633 Walnut Street
Cincinnati 2
Phone: CHerry 1-1880
Rep: Jule Burnett

**Universal Service
114 N. Third Street
Columbus 15
Phone: CApitol 1-2335
Rep: Francis R. Gibb

OKLAHOMA

General Electronics, Inc.
1032 Classen Blvd
Oklahoma City
Phone: FO 5-1448
Rep: Fred F. Zelinger

Radio, Inc.
1000 South Main Street
Tulsa
Phone: GIbson 7-9127
Rep: Ronnie Durham

OREGON

Portland Radio Supply Company
1234 S.W. Stark Street
Portland 5
Phone: CApitol 8-8647
Rep: C. B. Lucas

PENNSYLVANIA

George D. Barbey Company
155-157 Penn Street
Reading
Phone: FR 6-7451
Rep: Lee Wentzil

Cameradio Company
1121 Penn Avenue
Pittsburgh 22
Phone: EXpress 1-4000
Rep: Harry Kaplin

Radio Electric Service Co. of Pa., Inc.
N.W. Cor. 7th & Arch Streets
Philadelphia 6
Phone: WAlnut 5-5840
Rep: Edward Miller

RHODE ISLAND

W. H. Edwards
94-96 Broadway
Providence 3
Phone: GAspee 1-6158
Rep: Sal Infantilino

SOUTH DAKOTA

Burghardt Radio Supply
(P.O. Box 746) 621 4th Street S.E.
Watertown
Phone: TUrner 6-5749
Rep: Stan Burghardt

TENNESSEE

Electra Distributing Company
1914 West End Avenue
Nashville 4
Phone: ALpine 5-8444
Rep: Richard B. Harris

W. & W. Distributing Company
(P.O. Box 436) 644-646 Madison Ave.
Memphis
Phone: JAckson 7-4628
Rep: Mrs. S. D. Wooten, Jr.

TEXAS

**Busacker Electronic Equiment Co.
1216 W. Clay Street
Houston 19
Phone: JAckson 6-2578
Rep: Garth Johnson

Central Electronics
4117 Maple Avenue
Dallas
Phone: LAkeside 6-8675
Rep: Clayton Baker

Crabtree's Wholesale Radio
2608 Ross Avenue
Dallas
Phone: RIverside 8-5361
Rep: R. B. Bryant/Harold Gross

Electronic Equipment Co., Inc.
917 Florence Street
Ft. Worth
Phone: ED 6-5591
Rep: R. J. Crump/Jim Seigler

Electronic Equipment & Engineering Co.
805 S. Staples Street
Corpus Christi
Phone: TUlip 3-9271
Rep: Bob Douglas

The Hargis-Austin Company
(P.O. Box 716) 410 Baylor Street
Austin
Phone: GReenwood 8-6618
Rep: Mrs. Paul Hargis/Bill Chapman

Howard Radio
1475 Pine Street
Abilene
Phone: ORchard 2-9501
Rep: R. L. Howard

Modern Electronics Company
(P.O. Box 1361) 2000 Broadway
San Antonio
Phone: CApitol 7-7388
Rep: Fro Holtz

Radio & Television Parts Company
1828 N. Saint Mary's Street
San Antonio 2
Phone: CApitol 7-7503
Rep: Don Fitzsimon

WASHINGTON

**C & G Radio Supply Company
2502-6 Jefferson Avenue
Tacoma 2
Phone: BRoadway 2-3181
Rep: Lloyd Norberg

Northwest Electronics Distributors
East 730 First Avenue
Spokane 3
Phone: KE 4-2644
Rep: J. P. McGoldrick

WISCONSIN

Harris Radio Corporation
289 N. Main Street
Fond du Lac
Phone: WAlnut 2-4670
Rep: Harry Sterman/Terry Sterman

Amateur Electronic Supply
3832 West Lisbon Avenue
Milwaukee 8
Phone: WEst 3-3262
Rep: Terry Sterman

Satterfield Electronics, Inc.
1900 S. Park Street
Madison 5
Phone: ALpine 7-4801
*Rep: A. W. Satterfield/Bill Uhalt/
Don Wentland*

COLLINS AUTHORIZED SERVICE AGENCIES

CALIFORNIA

**Henry Radio
(P.O. Box 64398)
11240 W. Olympic Blvd.
Los Angeles 64
Phone: GRanite 7-6701
Rep: Ted Henry

CONNECTICUT

*Huntress Electronics
93 Talcott Road
West Hartford 10
Phone: ADams 6-0990
Rep: Bob Resconsin

FLORIDA

**Electronic Supply Co.
61 N.E. 9th Street
Miami 32
Phone: FRanklin 7-2511
Rep: Frank Gantz

**Kinkade Radio Supply
1719 Grand Central Ave.
Tampa
Phone: 8-6043
Rep: Elmer Kinkade

LOUISIANA

**Radio Parts, Inc.
807 Howard Avenue
New Orleans 12
Phone: JAckson 2-0217
Rep: Irvine J. Levi

MASSACHUSETTS

*Douglas Instrument Lab.
176 Norfolk Avenue
Boston 19
Phone: HIghland 5-4836
Rep: H. D. Miller

MICHIGAN

*Communication Service Co.
201 South Lincoln
Charlotte
Phone: 1770-W
Rep: Bart Rypstra

MINNESOTA

**Electronic Center, Inc.
107 Third Avenue N.
Minneapolis 1
Phone: FEderal 8-8678
Rep: Ward Jensen

NEW HAMPSHIRE

**Evans Radio
(P.O. Box 312)
Bow Junction, Route 3A
Concord
Phone: CApital 5-3358
Rep: Roger Britton

NEW JERSEY

*Warner Engineering Co., Inc.
239 Lorraine Avenue
Upper Montclair
Phone: PIoneer 6-7900
Rep: Charles Atwater

NORTH CAROLINA

**Freck Radio & Supply Co.
38 Biltmore Avenue
Asheville
Phone: ALpine 3-3631
Rep: T. T. Freck

OHIO

**Universal Service
114 N. Third Street
Columbus 15
Phone: CApitol 1-2335
Rep: Francis R. Gibb

TEXAS

**Busacker Electronic Equip. Co.
1216 W. Clay Street
Houston 19
Phone: JAckson 6-2578
Rep: Garth Johnson

WASHINGTON

**C & G Radio Supply Co.
2506-2 Jefferson Avenue
Tacoma 2
Phone: BRoadway 2-3181
Rep: Lloyd Norberg

*SERVICE AGENCY ONLY
**ALSO AUTHORIZED DISTRIBUTOR

INSTRUCTION BOOK

KWM-2
TRANSCEIVER

520 5964 00
3rd EDITION, 15 DECEMBER 1959

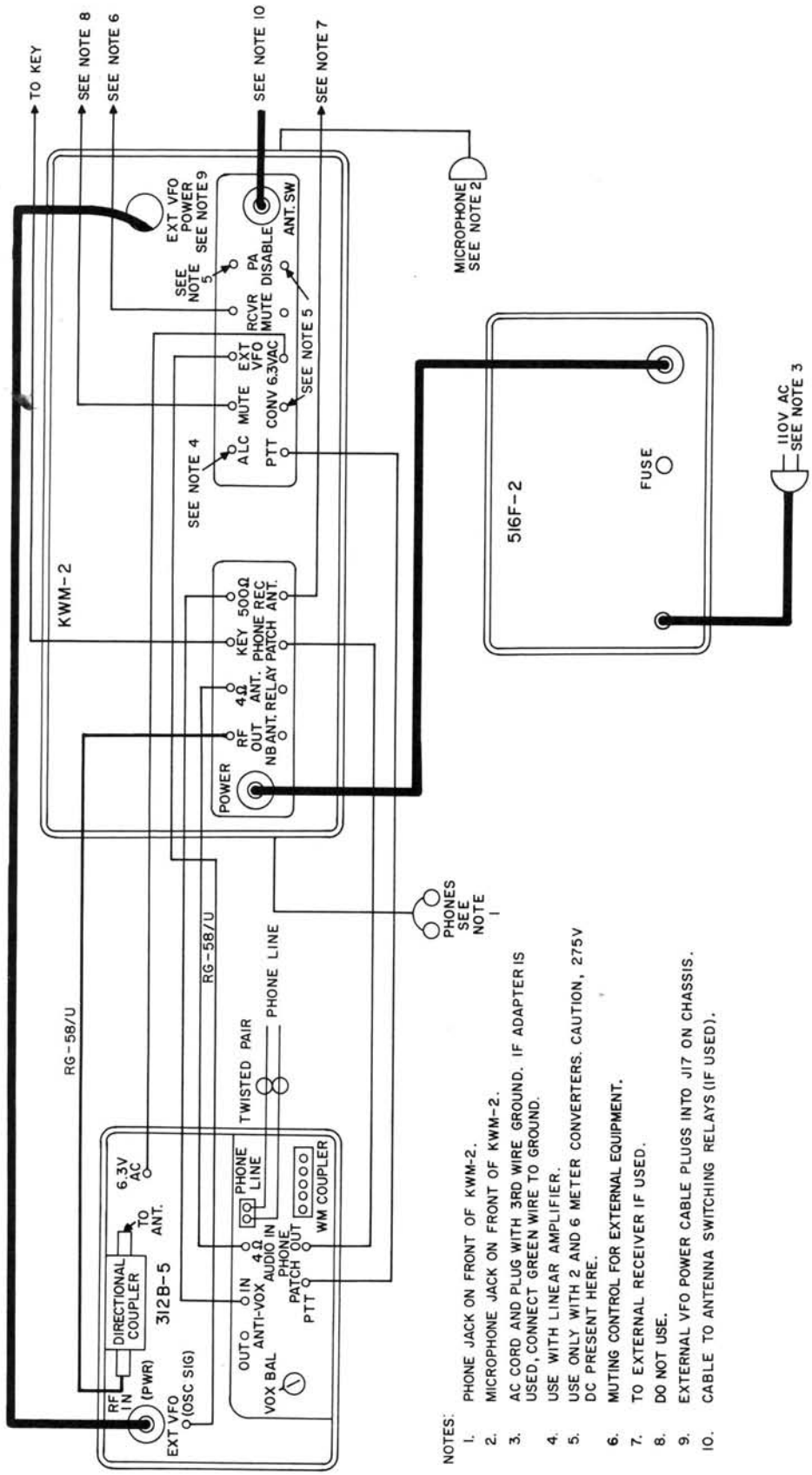
CEDAR RAPIDS, IOWA, U.S.A.

PRINTED IN THE UNITED STATES OF AMERICA

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES



NOTES:

1. PHONE JACK ON FRONT OF KWM-2.
2. MICROPHONE JACK ON FRONT OF KWM-2.
3. AC CORD AND PLUG WITH 3RD WIRE GROUND. IF ADAPTER IS USED, CONNECT GREEN WIRE TO GROUND.
4. USE WITH LINEAR AMPLIFIER.
5. USE ONLY WITH 2 AND 6 METER CONVERTERS. CAUTION, 275V DC PRESENT HERE.
6. MUTING CONTROL FOR EXTERNAL EQUIPMENT.
7. TO EXTERNAL RECEIVER IF USED.
8. DO NOT USE.
9. EXTERNAL VFO POWER CABLE PLUGS INTO J17 ON CHASSIS.
10. CABLE TO ANTENNA SWITCHING RELAYS (IF USED).

Figure 1-1. KWM-2 Fixed Station Interconnections

SECTION I
INSTALLATION

1.1 UNPACKING.

Open carton carefully to avoid damaging transceiver. Carefully lift the transceiver out of the packing material. Examine for visible damage. If transceiver has been damaged in shipment, save box and packing material and notify the transportation company. Look for warranty card inside the unit. Fill out and mail the customer service card. Check that all tubes and crystals are properly seated in sockets. Check tuning controls and switches for freedom of action. Remove shipping blocks from 516F-2 Power Supply; plug in tubes.

1.2 MOUNTING AND CABLING.

1.2.1 GENERAL.

For fixed station installation, refer to figure 1-1 or 1-2. For mobile installation, refer to figure 1-3.

1.2.2 FIXED STATION INSTALLATION.

Connect associated equipment to the KWM-2 as shown in figure 1-1 or 1-2.

1.2.3 MOBILE INSTALLATION.

a. Select location in car, and mount KWM-2. Allow clearance on all sides to assure adequate ventilation. If vox operation is desired, leave enough space above the KWM-2 to allow opening the top cover for adjustment of VOX and ANTI-VOX gain controls, S-meter zero, etc. Drill holes and mount adapter bracket to transmission hump with self-tapping screws. Mount the 351D-2 Mobile Mount to the bracket. Swing the cantilever supports forward. Remove the plastic dust covers from the 351D-2 plugs, and store them in the recesses of the mount. Slide the KWM-2 onto the mount and push back until the mount plugs have entered the transceiver sockets. Tighten the wing nuts on the sides of the KWM-2. See 351D-2 Instruction Sheet for mobile mount installation.

b. Select location in car for mounting the 516E-1 Power Supply. This location must be as clean and dry as possible. Location in luggage compartment, under seat, or on passenger side of fire wall is satisfactory. DO NOT MOUNT IN ENGINE COMPARTMENT.

c. Determine necessary length of power cable (furnished with 351D-2 Mobile Mount) to connect the 516E-1 to the KWM-2, and cut to required length. Connect power supply, speaker, and microphone as shown in figure 1-3.

CAUTION

Be sure to observe correct polarity of car battery when making connections to the 12-volt terminals of power supply. DO NOT connect the 516E-1 Power Supply to a system which has a positive ground. To do so will destroy all six transistors in the power supply. A special power supply (part number 522 0846 025) is available for 12-volt positive ground operation.

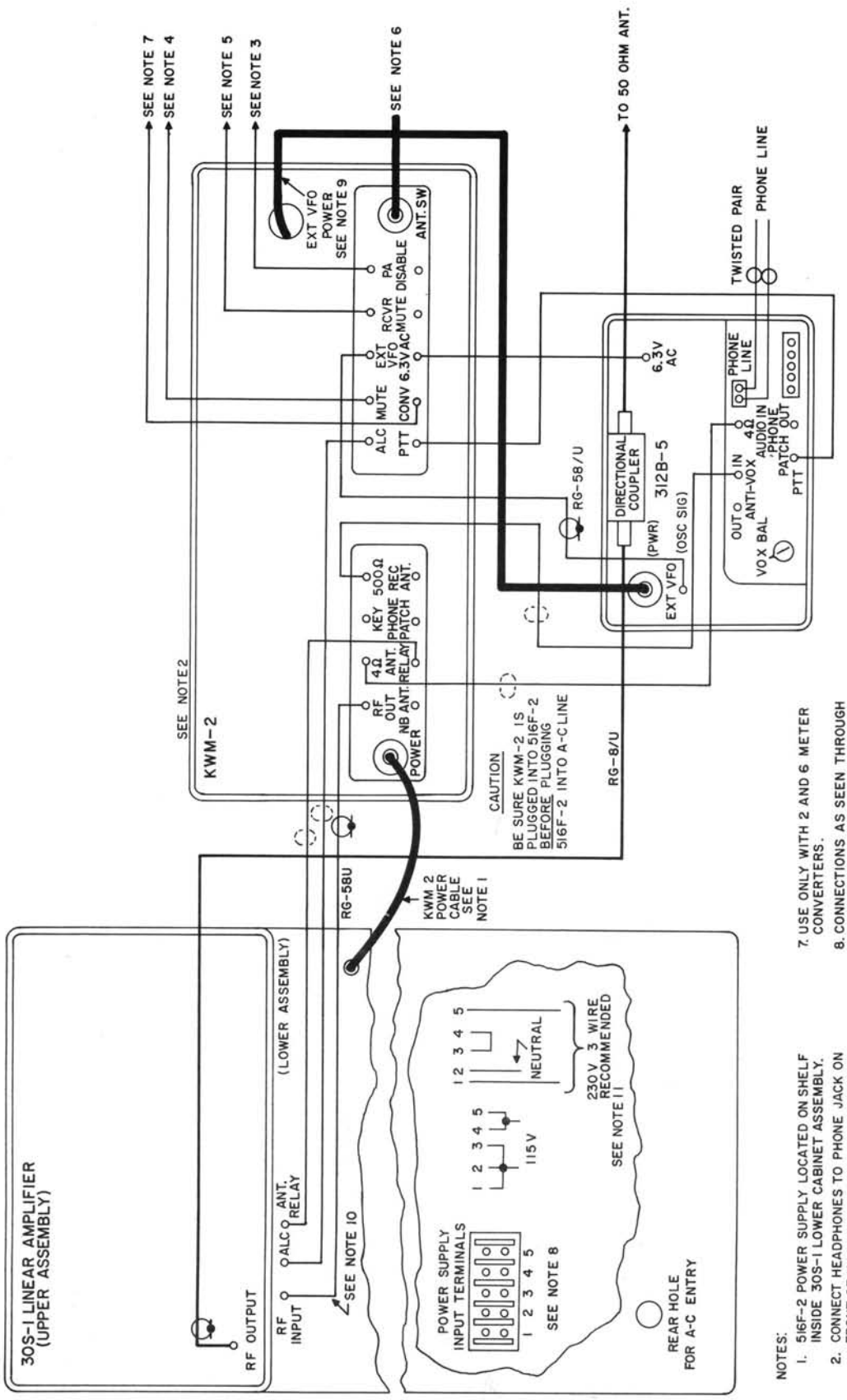
After the power cable and 12-volt power leads are connected, replace the terminal board cover on the power supply.

d. If desired, the speaker leads may be connected in parallel with the car radio speaker voice coil terminals. If the car radio has transistor output stage, connect the speaker and external switch as in figure 1-3.

e. For suppression of noise encountered in mobile operation, the following suggestions may be helpful. Use resistor-type spark plugs, and install coaxial bypass capacitors at ignition coil, generator and voltage regulator leads. Use bracket-mounted coaxial capacitors in the battery and generator leads to the voltage regulator and a 0.005-microfarad (or smaller) disk ceramic or mica capacitor from the field lead to ground. If capacitor bypasses are not satisfactory here, remove them, and use chokes in series with the leads from field and armature terminals of generator. Place these chokes as close to the voltage regulator as possible. For the field lead choke, wind 12 turns of no. 18 wire on a 1/4-inch powdered iron core. For the armature lead, wind 12 turns of no. 14 or larger wire on a 1/4-inch powdered iron core. If bypass capacitor is used from field lead (to regulator) to ground, do not use larger value than 0.005 uf unless a 4-ohm resistor is placed in series with it. Ground the rear end of the exhaust pipe to the car body, using copper braid. General information concerning the problem of ignition noise and suggested methods of noise suppression are available in current handbooks.

1.3 INITIAL CHECKS. (Refer to figure 2-1.)

Set MIC GAIN control (4) full counterclockwise until the switch clicks. Set OFF-ON-NB-CAL switch (1) to ON. Set meter switch (8) to PLATE, and EMISSION switch (2) to LOCK. The transceiver is in receive condition during warmup, so the meter will read full scale until filaments have come to temperature. This is normal S-meter action. When the S-meter falls back to zero, the circuits will have switched to transmit condition, and the meter will indicate PA plate current. Read the no-signal PA plate current. It should be approximately 40 ma. If plate current is other than 40 ma, adjust BIAS ADJUST potentiometer on top rear of power supply chassis to set plate current to 40 ma.



NOTES:

1. 516F-2 POWER SUPPLY LOCATED ON SHELF INSIDE 30S-1 LOWER CABINET ASSEMBLY.
2. CONNECT HEADPHONES TO PHONE JACK ON FRONT OF KWM-2. CONNECT MICROPHONE TO MIC JACK ON FRONT OF KWM-2.
3. USE ONLY WITH 2 AND 6 METER CONVERTERS. (CAUTION +275V DC PRESENT HERE)
4. DO NOT USE.
5. EXTERNAL RECEIVER MUTING.
6. CABLE TO ANTENNA SWITCHING RELAYS. (IF USED)
7. USE ONLY WITH 2 AND 6 METER CONVERTERS.
8. CONNECTIONS AS SEEN THROUGH FRONT DOOR ON LOWER ASSEMBLY.
9. EXTERNAL VFO POWER CABLE PLUGS INTO J17 ON CHASSIS.
10. THIS CABLE IS FURNISHED WITH 30S-1 IN 20.5 FT LENGTH. DO NOT CUT.
11. 10 FT LENGTH OF 3 WIRE (EACH NO. 12) CONDUCTOR WITH LUGS ON ONE END. CONNECT OTHER END TO SWITCHBOX OR PLUG AS DESIRED.

Figure 1-2. High-Power Station Interconnections

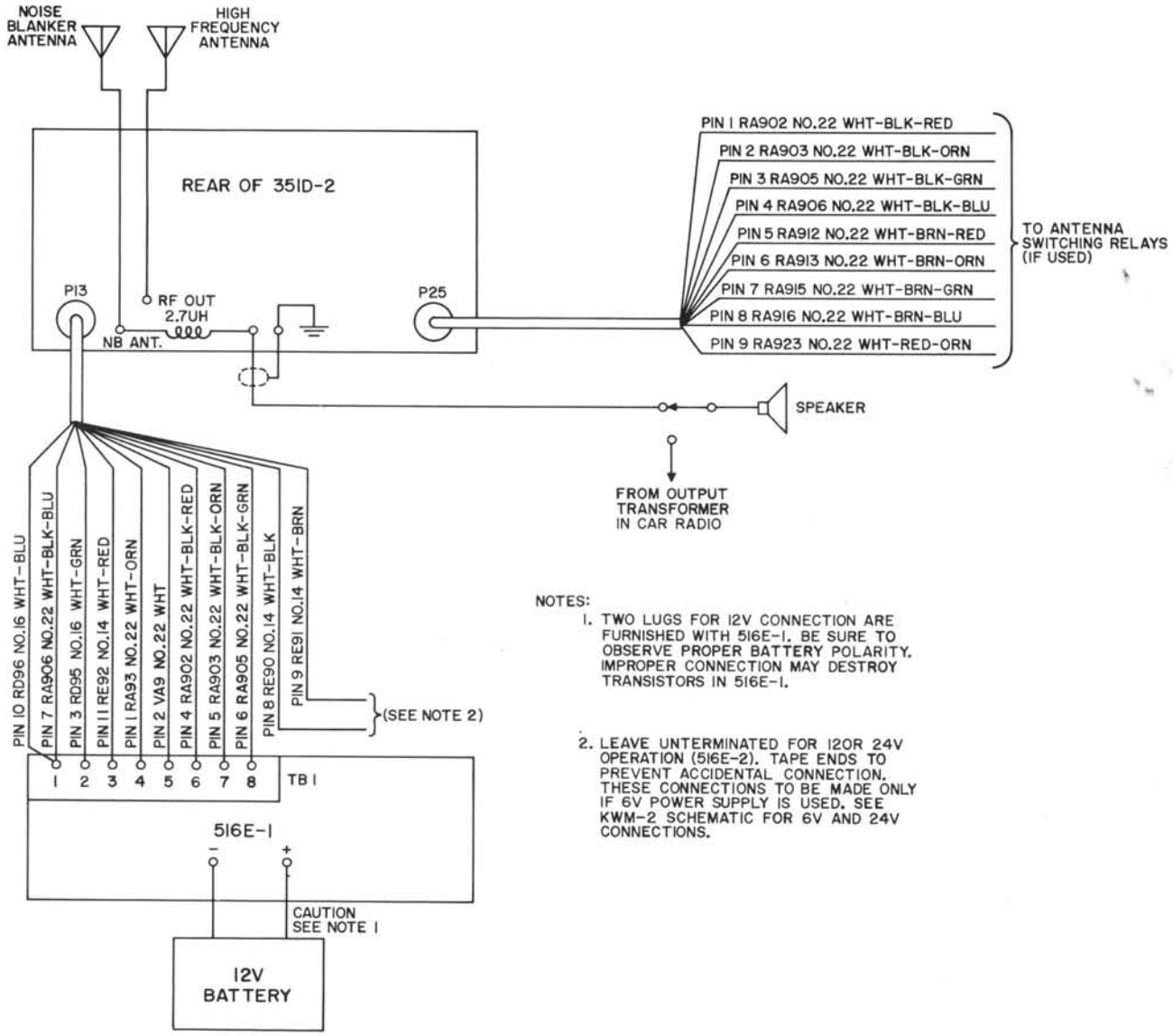


Figure 1-3. Mobile Station Interconnections

SECTION II
OPERATION

2.1 RECEIVER TUNING.

a. Set function switch (1) to ON. This is the switch labeled OFF-ON-NB-CAL.

b. Set EMISSION switch (2) to desired sideband (USB or LSB position). Set BAND switch (3) to desired band.

c. Set the MIC GAIN control (4) full counterclockwise. Set R.F. GAIN control (10) full clockwise.

d. Set VOX GAIN control (under top cover) full counterclockwise.

e. Set ANTI VOX GAIN control (under top cover) full counterclockwise.

f. Adjust the A.F. GAIN control (5) until some receiver noise is heard in speaker.

g. Adjust the EXCITER TUNING control (6) to white portion of scale indicating the desired band. Rock this control slightly to peak the receiver noise output. The transceiver is now ready to receive and the selected 200-kc band may be tuned with the tuning control. Dial frequency can be determined by adding the dial reading to the BAND switch (3) setting.

h. Turn function switch to CAL position. Tune dial to nearest 100-kc point (0, 100, or 200), and decrease R.F. GAIN control (10) as necessary for comfortable listening level. Adjust tuning until the calibrate signal is zero beat. When the calibrate signal is zero beat in the receiver, set the hairline on the 100-kc mark with the zero set knob. Set function switch (1) to ON and tune dial to the desired portion of the 200-kc band selected. If checking calibrate circuit against WWV is desired, see section IV, paragraph 4.5.2.3.

WARNING

DO NOT operate transmit circuits while the KWM-2 is tuned to receive outside the amateur band in use. The KWM-2 transmit frequency is always locked to the receive frequency. If the receiver is tuned into the foreign DX band and push-to-talk or vox action is initiated (with modulation) the transmit frequency will be out of the band. Keep the transceiver tuned within the band, or return tuning to within band before transmitting.

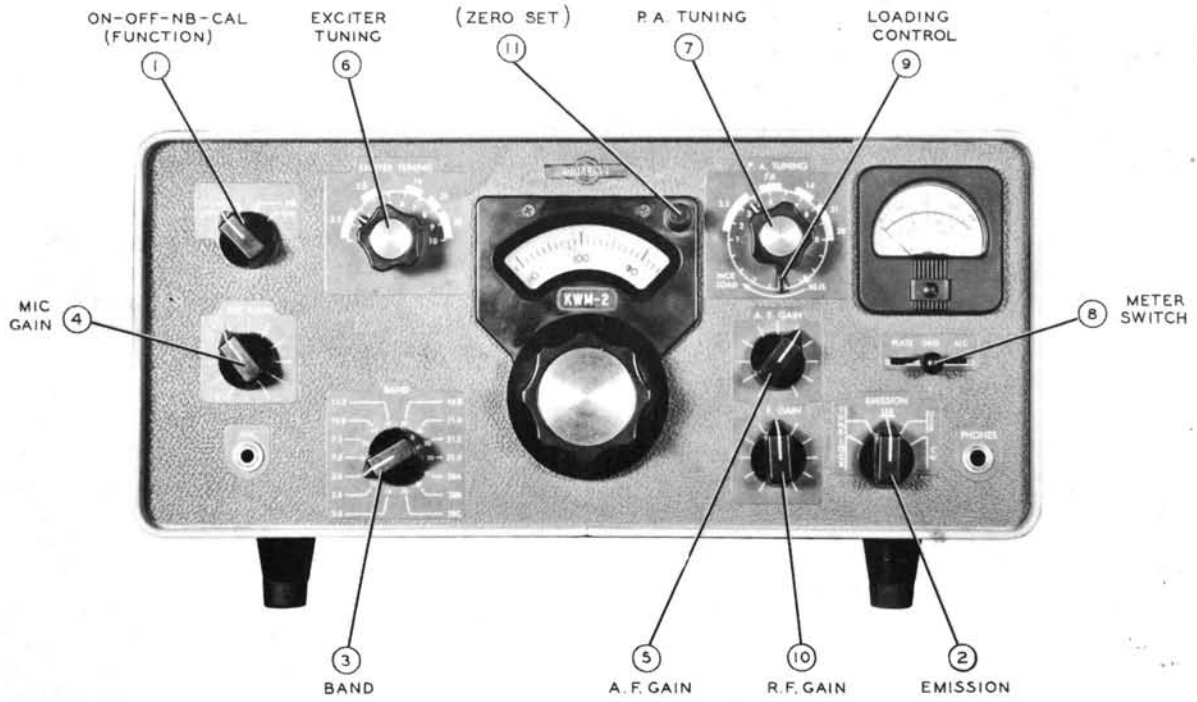


Figure 2-1. Panel Operating Controls

2.2 TRANSMITTER TUNING.

2.2.1 GENERAL.

a. Set up for receive function as in paragraph 2.1.

b. Set EMISSION switch (2) to TUNE position. Set P.A. TUNING control (7) to white portion of dial indicating the desired band.

c. Set meter switch (8) to PLATE position. Advance the MIC GAIN control (4) full clockwise, and rock the EXCITER TUNING control (6) until maximum plate current is obtained. Dip the plate current immediately with the P.A. TUNING control (7), and return the MIC GAIN control (4) to full counterclockwise position.

d. Set the meter switch (8) to GRID position. Advance MIC GAIN control (4) until grid current is obtained. Rock the EXCITER TUNING control (6) to obtain a peak in grid current indication. After grid current has been peaked with the EXCITER TUNING control (6), adjust MIC GAIN control (4) to set grid current to full scale on meter.

NOTE

During operation, do not repeak the EXCITER TUNING control for maximum receiver signal after setting it for peak grid drive. Driver grid circuit capacitance (in transmit function) will detune the r-f amplifier plate circuit. Leave this control peaked for maximum PA grid drive.

e. Set the EMISSION switch (2) to LOCK position.

f. Adjust MIC GAIN setting (4) to 3/4 full scale.

g. Set meter switch (8) to PLATE position.

h. Alternately dip plate current with P.A. TUNING control (7), and increase loading with INCR LOAD control (9) until plate current is 230 ma at the dip.

i. Set EMISSION switch (2) to desired sideband or to CW position.

CAUTION

If transceiver frequency is changed by any great amount, be sure to redip the power amplifier plate current and check the loading. This will be most important on the 80- and 40-meter bands. Some operating experience will indicate the amount of frequency excursion possible without readjustment.

2.2.2 SINGLE-SIDEBAND OPERATION.

a. Set up receiver operation and transmitter operation completely as in paragraphs 2.1 and 2.2.1.

b. Close-talk into the microphone, increasing VOX GAIN control setting until vox relay just operates. For vox operation, it is desirable to close-talk the microphone to prevent background noises from tripping the KWM-2 into transmit function.

c. Set meter switch (8) to ALC position. Increase setting of MIC GAIN control (4) to obtain S6 average reading on voice.

d. Leave MIC GAIN control (4) as set in step c above. Leave microphone in normal operating position. Set function switch to CAL position, tune in calibrate signal, and adjust A.F. GAIN control (5) for comfortable listening level.

e. Adjust the tuning control for approximately 1000-cps beat note. If the vox relay trips, increase ANTI VOX GAIN setting to minimum point necessary to prevent speaker output from tripping vox. It may be necessary to increase VOX GAIN setting slightly after this anti vox gain adjustment in order to compensate for the anti vox gain.

NOTE

Do not use more vox gain nor more anti vox gain than necessary to control vox operation.

f. Set function switch to ON position. The KWM-2 is now ready for transmit operation in SSB service. Speaking into the microphone transfers from receive function to transmit function through the vox circuit action. If the receiver is tuned to a different frequency, the transmitter is tuned to the new frequency. After changing frequency on the lower bands (3.4 to 4.0 mc), switch EMISSION switch (2) to LOCK position and make the following checks: Switch meter switch (8) to GRID position, and rock the EXCITER TUNING control (6) gently to check that PA grid drive current is peaked. Switch the meter switch (8) to PLATE, and check the dip in PA plate current with the P.A. TUNING control (7). Set the EMISSION switch back to the desired sideband position and make the call.

2.2.3 CW OPERATION.

a. Set the function switch to ON.

b. Set up receiver and transmitter operation completely as in paragraphs 2.1 and 2.2.1.

c. Depress key and adjust A.F. GAIN control (5) for comfortable monitoring level.

d. Hold key down, and increase VOX GAIN control setting until the vox relay operates.

e. Set meter switch (8) to ALC position. While sending a series of dots, adjust MIC GAIN control (4) for S2 meter indication of alc.

f. When receiving, leave the A.F. GAIN control (5) set for comfortable monitoring level, and adjust the receive level with the R.F. GAIN control (10). When the KWM-2 is receiving, the received signal is indicated in S units. The S-meter will read correctly with the R.F. GAIN (10) at less than maximum setting, provided the received signal level is high enough to kick the S-meter. For example, if the R.F. GAIN control (10) is set for no-signal reading of S8 and kicks to S9 with signal, the received signal is S9.

NOTE

The CW output signal frequency is 1350 cps higher than the dial reading.

2.2.4 MOBILE OPERATION.

The vox and anti vox circuits will operate in mobile operation, but push-to-talk operation is recommended, since high-level background noises will produce

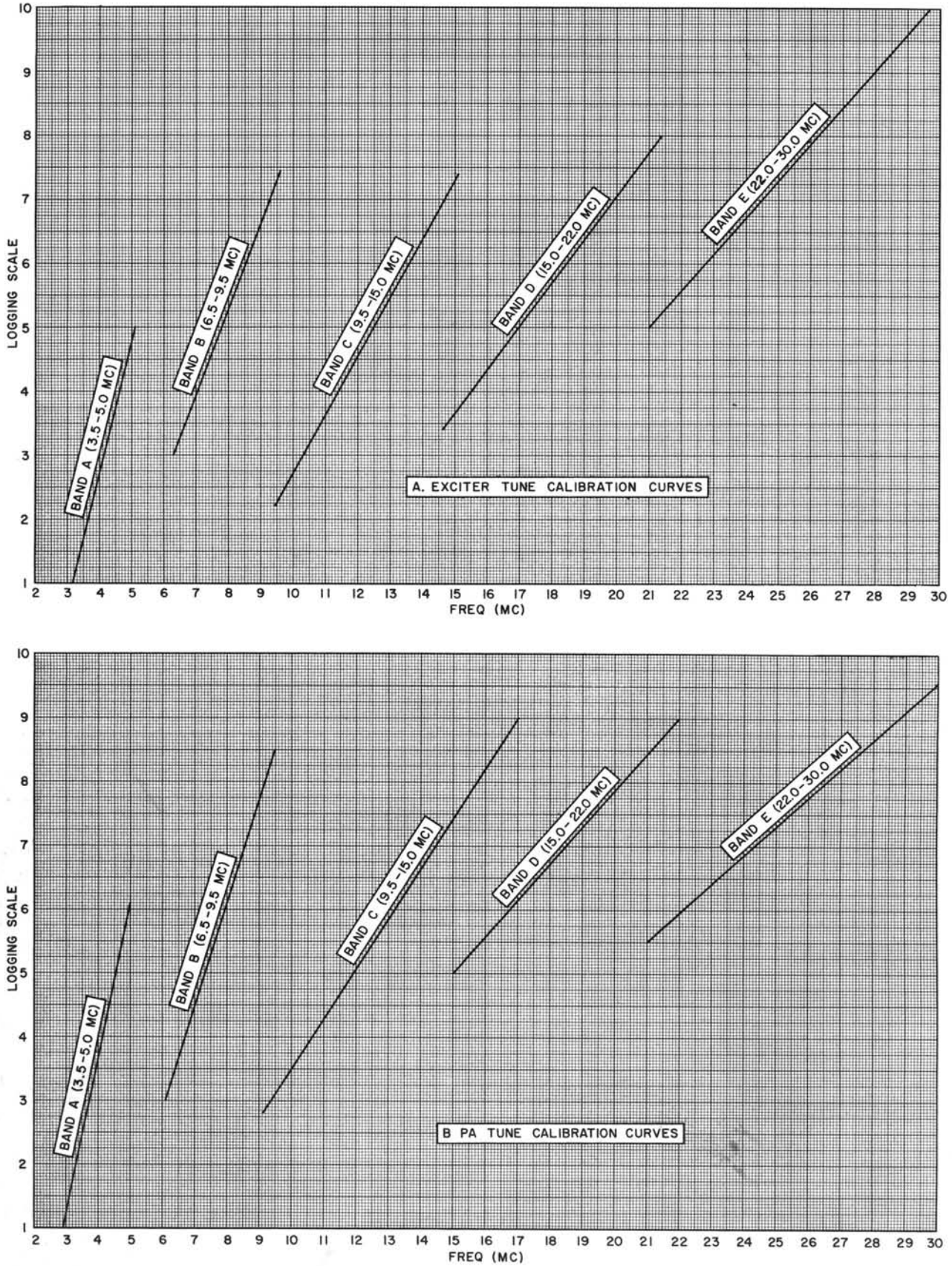


Figure 2-2. Logging Scale Calibration Curves

undesirable vox switchover. Set VOX GAIN and ANTI-VOX GAIN controls full counterclockwise before installation. If vox operation is desired, leave clearance in installation so top cover can be opened. For mobile operation, load the power amplifier to 210 ma plate current.

2.3 OPERATION OUTSIDE AMATEUR BANDS.

All amateur bands are completely covered except the 10-meter band for which only one crystal is furnished (for 28.5 to 28.7 mc). Two extra sockets are provided for additional crystals in the 10-meter band.

The transmitter can be operated at other frequencies outside the specified amateur bands (MARS frequencies) or at other 10-meter frequencies by plugging the proper crystals into the mounting board. Operation at frequencies outside the amateur bands will result in slightly decreased receiver sensitivity and transmitter PA grid drive, unless the tuned circuits of the transceiver are retuned to peak their responses in the desired portions of the high-frequency spectrum. For operation outside amateur bands, disregard the amateur band markings on the EXCITER TUNING and P.A. TUNING scales and use the logging scales. Figure 2-2 shows logging scale calibration curves, and figure 2-3 shows crystal socket locations. Select these crystals as follows:

a. If the lower edge of the desired 200-kc band is less than 11.8 mc, the required frequency is equal to the lower edge of the desired band plus 3.155 mc. As an example, if the desired band is 4.0 to 4.2 mc, 4.0 mc plus 3.155 mc equals 7.155 mc.

b. If the lower edge of the desired 200-kc band is 12.00 mc or higher, the required crystal frequency is half the sum of the lower edge of the desired band and 3.155 mc. As an example, if the desired band is 14.4 to 14.6 mc,

$$\frac{14.4 + 3.155}{2} = 8.7775 \text{ mc.}$$

The plate circuit of the oscillator is tuned to twice the crystal frequency when required injection frequencies are this high.

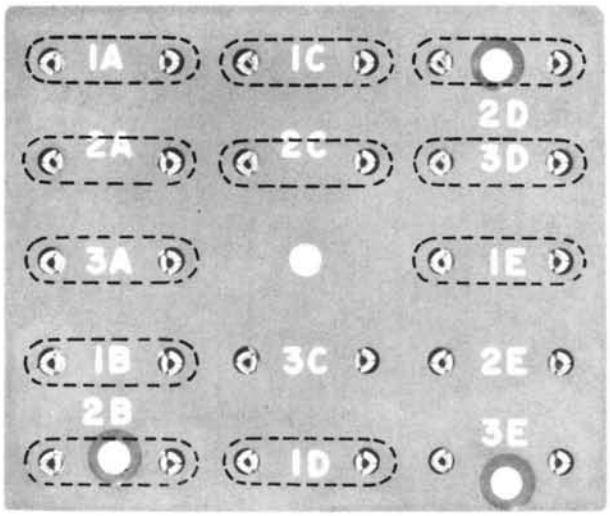


Figure 2-3. Crystal Socket Locations

CAUTION

Avoid transmitter operation between 5.0 and 6.5 mc. In this range, the second harmonic of the variable i-f frequency is nearly the same as desired frequency. In transmit function, some of this energy will pass through the tuned circuits and become spurious emission.

c. Substitute or extra crystals should be plugged into the appropriate socket on the mounting board according to the best location in one of the five bands. The example cited, in step b above, should place the crystal in one of the sockets marked C. If two additional 10-meter crystals are used, they should be plugged into the sockets marked E. Table 2-1 lists crystal socket designations, switch positions (BAND), crystal frequencies furnished, and frequency range limitations. For extra coverage crystals available, see section VI, Parts List.

TABLE 2-1. CRYSTAL FREQUENCIES AND OPERATING BANDS

BAND-SWITCH POSITION	FREQUENCY BAND	CRYSTAL SUPPLIED	CRYSTAL SOCKET CONNECTED	TOTAL COVERAGE
1A - 3.4	3.4 - 3.6 mc	6.555 mc	1A	
2A - 3.6	3.6 - 3.8 mc	6.7555 mc	2A	A 3.4 - 5.0 mc
3A - 3.8	3.8 - 4.0 mc	6.955 mc	3A	
1B - 7.0	7.0 - 7.2 mc	10.155 mc	1B	
2B - 7.2	7.2 - 7.4 mc	10.355 mc	2B	B 6.5 - 9.5 mc

TABLE 2-1. CRYSTAL FREQUENCIES AND OPERATING BANDS (Cont)

BAND-SWITCH POSITION	FREQUENCY BAND	CRYSTAL SUPPLIED	CRYSTAL SOCKET CONNECTED	TOTAL COVERAGE
1C - 14.0	14.0 - 14.2 mc	8.5775 mc	1C	
2C - 14.2	14.2 - 14.4 mc	8.6775 mc	2C	C 9.5 - 15.0 mc
3C - 14.8	14.8 - 15.0 mc	8.9775 mc	3C	
1D - 21.0	21.0 - 21.2 mc	12.0775 mc	1D	
2D - 21.2	21.2 - 21.4 mc	12.1775 mc	2D	D 15.0 - 22.0 mc
3D - 21.4	21.4 - 21.6 mc	12.2775 mc	3D	
1E - 28A	28.5 - 28.7 mc	15.8275 mc	1E	
2E - 28B	As selected	Not furnished	2E	E 22.0 - 30.0 mc
3E - 28C	As selected	Not furnished	3E	

SECTION III
PRINCIPLES OF OPERATION

3.1 BLOCK DIAGRAM.

Refer to figure 3-1. The KWM-2 is an SSB or CW transceiver operating in the range between 3.4 and 30.0 mc. It consists of a double-conversion receiver and a double-conversion exciter-transmitter. The transmitter and receiver circuits use common oscillators, common mechanical filter, and common r-f amplifier. The transmitter low-frequency i-f and the receiver low-frequency i-f is 455 kc. The high-frequency i-f for both is 2.955 to 3.155 mc. This is a band-pass i-f which accommodates the full 200-kc bandwidth. Figure 7-1 is a schematic diagram of the KWM-2, and figure 7-2 is a schematic diagram of the 516F-2 Power Supply.

3.2 TRANSMITTER CIRCUITS.

3.2.1 A-F CIRCUITS.

Microphone or phone-patch input is connected to the grid of the first audio amplifier V1A, amplified, and coupled to the grid of the second audio amplifier, V11B. Output from V11B is coupled to the grid of cathode follower V3A through the MIC GAIN control, R8. Output from the cathode follower is fed to the resistive balance point of the balanced modulator. In TUNE, LOCK, and CW positions of the EMISSION switch, output from the tone oscillator, V2B, is fed to the grid of the second audio amplifier. Amplifier tone oscillator signal is taken from the plate of V11B to the grid of the vox amplifier to activate the vox circuits in CW operation. This signal is also fed to the grid of the first receiver a-f amplifier, V16A, for CW monitoring.

3.2.2 BALANCED MODULATOR AND LOW-FREQUENCY I-F CIRCUITS.

Audio output from the cathode of V3A and the bfo voltage are fed to the wiper of the carrier balance potentiometer, R15. Both upper and lower sideband outputs from the balanced modulator are coupled through i-f transformer T1 to the grid of the i-f amplifier, V4A. Output from the i-f amplifier is fed to the mechanical filter, FL1. The pass band of FL1 is centered at 455 kc. This passes either upper or lower sideband, depending upon the sideband polarity selected when the EMISSION switch connects bfo crystal Y16 or Y17. The signal-sideband output of FL1 is connected to the grids of the first transmitter mixer in push pull.

3.2.3 BALANCED MIXERS.

The 455-kc single-sideband signal is fed to the first balanced mixer grids in push pull. The plates of the mixer are connected in push pull, and vfo signal is fed to the two grids in parallel. The mixer cancels the vfo signal energy and translates the 455-kc single-sideband signal to a 2.955- to 3.155-mc single-sideband signal. The coupling network between the plates of the first mixer and the grid of the second balanced mixer is broadbanded to provide a uniform response to the band-pass i-f frequency. The transmit frequency is determined within the pass band by the vfo frequency. The band-pass i-f signal is fed to one of the grids of the second balanced mixer, and the high-frequency injection signal energy from crystal oscillator V13A is fed to the signal input cathode and to the other grid. This arrangement

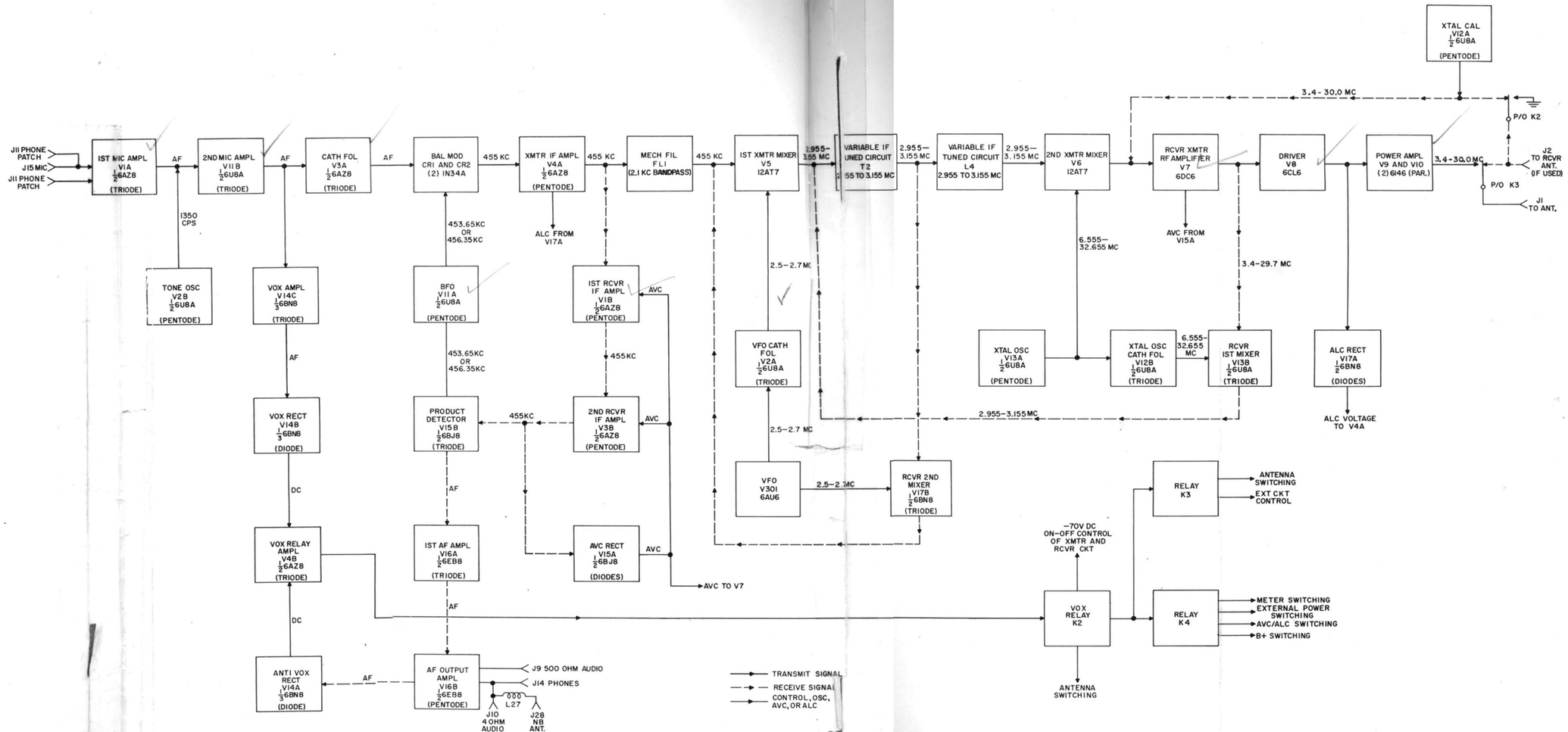


Figure 3-1. KWM-2 Transceiver, Block Diagram

cancels the high-frequency injection signal energy within the mixer and translates the band-pass i-f signal to the desired operating band.

3.2.4 R-F CIRCUITS.

The slug-tuned circuits coupling V6 to V7, V7 to V8, and V8 to the power amplifier are ganged to the EXCITER TUNING control. The signal is amplified by the r-f amplifier, V7, and the driver, V8, to drive the power amplifier, V9 and V10. Output from the parallel power amplifiers is tuned by a pi-network and fed to the antenna through contacts of transmit-receive relay K3. Negative r-f feedback from the PA plate circuit to the driver cathode circuit permits a high degree of linearity at the high power level of the PA tubes. Both the driver and PA stages are neutralized to ensure stability. On signal peaks, the detected envelope from the PA grids is rectified by the alc rectifier, V17A. D-c output from V17A is filtered and used to control the gain of V4A and V7. This prevents overdriving the power amplifier.

3.3 RECEIVER CIRCUITS.

3.3.1 R-F CIRCUITS.

Signal input from the antenna is connected through relay contacts to the tuned input circuit, T3. The signal is applied from T3 to the grid of the receiver-transmitter r-f amplifier, V7. Amplified signal from V7 is applied from the tuned circuit consisting of L10 and band-switch-selected capacitors to the grid of the receiver first mixer, V13B.

3.3.2 RECEIVER MIXERS.

The input r-f signal is fed to the grid of V13B, and the high-frequency oscillator injection signal is fed to the cathode of V13B. The difference product of the first mixer is applied from the plate of the tube to variable i-f transformer T2. Output of T2 in the range of 2.955 to 3.155 megacycles is applied to the grid of the second receiver mixer, V17B, across parallel-tuned trap circuit Z5. This trap circuit minimizes a spurious response which would otherwise result from harmonics of the high-frequency crystal oscillator. When signal input is applied to the grid of V17B and vfo injection signal is applied to the cathode of V17B, the 455-kc difference product is fed from V17B plate to mechanical filter FL1.

3.3.3 I-F CIRCUITS.

The output from FL1 is applied to the grid of the first i-f amplifier, V1B. The i-f signal is amplified by V1B and V3B and applied through T5 to avc rectifier V15A and the grid of product detector V15B. Beat-frequency oscillator signal is applied to the cathode of V15B, and the product of mixing is the detected audio signal. Output of the avc rectifier circuit is applied to the two receiver i-f amplifiers and through contacts of relay K4 to the receiver-transmitter r-f amplifier. This avc voltage controls the gain of the receiver and prevents overloading.

3.3.4 A-F CIRCUITS.

Output from the product detector is applied through the A.F. GAIN control, R92, to the grid of the first a-f amplifier, V16A. Amplified audio output of V16A is coupled to the grid of the a-f output amplifier, V16B, which produces the power to operate speaker, headphones, or phone patch.

3.4 OSCILLATORS.

The transceiver contains five oscillators. They are the tone oscillator, the beat-frequency oscillator, the variable-frequency oscillator, the high-frequency crystal oscillator, and the crystal calibrator.

3.4.1 TONE OSCILLATOR.

The tone oscillator operates when the EMISSION switch is in LOCK, TUNE, or CW position. It is a phase-shift oscillator operating at approximately 1350 cps. Its output is fed to the transmitter audio circuits for tuneup signal and to the balanced modulator to produce a carrier frequency 1350 cps removed from the dial reading. This signal allows carrier to be applied to the power amplifier grids for CW or tuneup. Some of the output from the tone oscillator is applied to the receiver audio circuits for sidetone monitoring in CW operation.

3.4.2 BEAT-FREQUENCY OSCILLATOR.

The bfo is crystal controlled at either 453.650 or 456.350 kilocycles, depending upon whether Y16 or Y17 is selected by the EMISSION switch section S9H. The unused crystal is shorted out by this switch section. These crystal frequencies are matched to the pass band of the mechanical filter, FL1, so that the carrier frequency is placed approximately 20 db down on the skirts of the filter response. This 20-db carrier attenuation is in addition to the 30-db suppression provided by the balanced modulator.

3.4.3 VARIABLE-FREQUENCY OSCILLATOR.

The vfo operates in the range of 2.5 to 2.7 mc. The value of the cathode choke is selected so that switching a small trimmer across it shifts the oscillator frequency. This compensates for switching bfo frequency and keeps dial calibration accurate, no matter which sideband is selected. This bfo switching is done by applying a positive or negative bias to diode CR301. When the diode bias is positive, the diode impedance is lowered, and C308 is effectively in parallel with L304. When the bias is negative, diode impedance is high, and C308 is effectively switched out of the circuit.

3.4.4 HIGH-FREQUENCY CRYSTAL OSCILLATOR.

The high-frequency crystal oscillator, V13A, is crystal controlled by one of 14 crystals selected by BAND switch S2. Output from the high-frequency crystal oscillator is fed to the transmitter second mixer

and to the crystal oscillator cathode follower. The cathode follower provides isolation and impedance match between the crystal oscillator and the receiver first mixer cathode. The output frequency of this oscillator is always 3.155 mc higher than the lower edge of the desired band. This high-frequency injection signal is the crystal fundamental frequency for all desired signals below 12 megacycles, but for operating frequencies higher than 12 mc, the crystal frequency is doubled in the plate circuit of the oscillator. Instructions for calculating crystal frequencies for the desired bands are given in section II.

3.4.5 CRYSTAL CALIBRATOR.

The 100-kc crystal calibrator, V12A, is the pentode section of a type 6U8A tube. Its output is coupled to the antenna coil, T3. The calibrator may be trimmed to zero beat with WWV (or any other desired frequency standard) by adjustment of capacitor C76.

3.5 VOX AND ANTI VOX CIRCUITS.

Audio output voltage from the second microphone amplifier, V11B, is coupled to the VOX GAIN control, R39. A portion of this voltage is amplified by vox amplifier V14B and fed to vox rectifier which is one of the diodes of V14. The positive d-c output of the vox rectifier is applied to the grid of vox relay amplifier V4B, causing it to conduct current and actuate the vox relay, K2. Contacts of K2 switch the receiver antenna lead, the other relay coils, and the -70-volt d-c muting and bias voltage. Relays K3 and K4 switch the metering circuits from receive to transmit, the low plate voltages from receive to transmit tubes, and the avc and alc leads.

The anti vox circuit provides a threshold voltage to prevent loudspeaker output (picked up by the microphone circuits) from tripping the KWM-2 into transmit function. Some of the receiver output audio voltage is connected through C235 to the ANTI VOX GAIN control, R45. Signal from the slider of this potentiometer is rectified by the anti vox rectifier, which is the other diode of V14. Negative d-c output voltage from the anti vox rectifier, connected to the grid of V4B, provides the necessary anti vox threshold. ANTI VOX GAIN control R45 adjusts the value of the anti vox voltage threshold so that loudspeaker output will not produce enough positive d-c output from the vox rectifier to exceed the negative d-c output from the anti vox rectifier and cause V4B to actuate K2. However, speech energy into the microphone will cause the positive vox voltage to overcome the negative anti vox voltage and produce the desired action of K2.

SECTION IV
SERVICE INSTRUCTIONS

4.1 GENERAL.

Included in this section are signal tracing procedures, alignment and neutralization procedures, and voltage and resistance measurements. If any soldered parts are removed or replaced at terminals to which diodes CR1, CR2, CR3, or CR4 are connected, be sure to attach an alligator clip to the diode lead. This acts as a heat sink to protect the diode.

4.2 TRANSMITTER SIGNAL TRACING.

Table 4-1 lists significant test points and normal signal levels. Figure 4-1 shows location of adjustments. Before making measurements, set EMISSION switch to USB, and disable the power amplifier by disconnecting the jumper between J5 and J6 and removing the high-voltage rectifier tube from its socket. Set meter switch to GRID. Peak EXCITER TUNING and turn VOX GAIN control full counterclockwise. Short PTT jack J16 to ground to key the KWM-2 to transmit. Connect signal generator output to test points indicated in table 4-1, and adjust signal generator output attenuator until PA grid current just begins to show on the meter. Attenuator reading is signal voltage necessary at that point. Voltages given in the table are nominal and may vary plus or minus 20 percent. Be careful, each time, to set signal generator to frequency shown in the table. Oscillator output voltage may be measured with a vacuum-tube voltmeter.

TABLE 4-1. TRANSMITTER SIGNAL LEVELS

TEST POINT	BAND-SWITCH POSITION	SIGNAL GENERATOR FREQUENCY	SIGNAL VOLTAGE AT TEST POINT
V8-2 (grid)	3.8	3.9 mc	0.5 volt
	7.2	7.3 mc	0.41 volt
	14.2	14.3 mc	0.5 volt
	21.4	21.5 mc	0.2 volt
	28A	28.6 mc	0.75 volt

TABLE 4-1. TRANSMITTER SIGNAL LEVELS (Cont)

TEST POINT	BAND-SWITCH POSITION	SIGNAL GENERATOR FREQUENCY	SIGNAL VOLTAGE AT TEST POINT
V7-1 (grid)	3.8	3.9 mc	40,000 microvolts
	7.2	7.3 mc	22,000 microvolts
	14.2	14.3 mc	43,000 microvolts
	21.4	21.5 mc	30,000 microvolts
	28A	28.6 mc	32,000 microvolts
	28B, 28C	According to crystal used	
V6-2 (grid)	14.2	3.055 mc	32,000 microvolts
V5-2 (grid)	14.2	3.055 mc	62,000 microvolts
V4A-6 (grid)	14.2	455 kc	12,000 microvolts
For following, disconnect signal generator, remove J16 short, set EMISSION switch to TUNE, and adjust MIC GAIN for grid current threshold. Measure with vtvm.			
V3A-7 (cathode)	Any	*1350 cps	0.014 volt
V3A-9 (grid)	Any	*1350 cps	0.06 volt
V11B-9 (grid)	Any	*1350 cps	2.8 volts
For following, turn EMISSION switch to USB, and connect audio oscillator to J11 through a 40-db pad. Set MIC GAIN fully clockwise, and adjust audio oscillator output for PA grid current threshold. Measure input at oscillator output with a-c vtvm.			
V1A-9 (grid) or J11 PHONE PATCH	Any	1350 cps	35 millivolts through a 40-db pad.
For following, short J16 to ground; peak EXCITER TUNING for each band; and measure at test point with vtvm.			
V6-3	3.6		1.0 to 1.8 volts
	7.0		1.0 to 1.4 volts
	14.0		1.0 to 1.4 volts
	21.2		1.0 to 1.4 volts
	38.5		1.0 to 1.4 volts
V5-2 or 7	Vfo set at 100		1.0 to 1.4 volts
Wiper of R15	Any		1.0 to 1.4 volts

*Frequency of internal tone oscillator.

4.3 RECEIVER SIGNAL TRACING.

Table 4-2 lists significant test points and normal signal levels. Figure 4-1 shows location of test points and adjustments. All r-f and i-f measurements were made by connecting a vacuum-tube voltmeter to the avc bus and increasing signal generator output until the avc threshold is reached. The avc threshold voltage is the point at which the d-c vtvm indication just changes with increased signal level. The receiver was tuned to 14.1 mc for these measurements and test signal injected at indicated test points. Signal voltage values are taken from signal generator output attenuator. All values are nominal and may vary ±20% without degrading performance.

4.4 VOLTAGE AND RESISTANCE MEASUREMENTS.

Table 4-3 lists voltage and resistance of all tube sockets of the KWM-2 except that of the vfo tube, V301. DO NOT OPEN the oscillator can. Measurements were made under the following conditions:

a. All measurements with vtvm and with all tubes in sockets. Unless otherwise noted in table, all measurements made with R.F. GAIN at maximum, A.F. GAIN at minimum, EMISSION switch in USB position, BAND switch in 14.2 position, vfo dial at 100, OFF-ON-NB-CAL switch in ON position. All voltages on transmitter tubes are taken with PTT jack J16 shorted to ground and MIC GAIN control full counterclockwise, but not far enough to close S14.

TABLE 4-2. RECEIVER SIGNAL LEVELS

TEST POINT	FREQUENCY	VOLTAGE
V15B-8	455 kc	1.1 volt
V15B-9	455 kc	*1.4 volts
V3B-6	455 kc	8000 microvolts
V1B-6	455 kc	220 microvolts
V17B-9	2.5-2.7 mc	*0.6 volt
V17B-8	3.055 mc	180 microvolts
*Injection voltage, measured with vacuum-tube voltmeter.		

TEST POINT	FREQUENCY	VOLTAGE
V13B-8	High-frequency oscillator injection signal (17.155 mc)	1.8 to 3.0 volts*
V13B-9	14.1 mc	55 microvolts
V7-1	14.1 mc	6.5 microvolts
J2 (RCVR ANT) or J1 (OUTPUT)	14.1 mc	2.3 microvolts

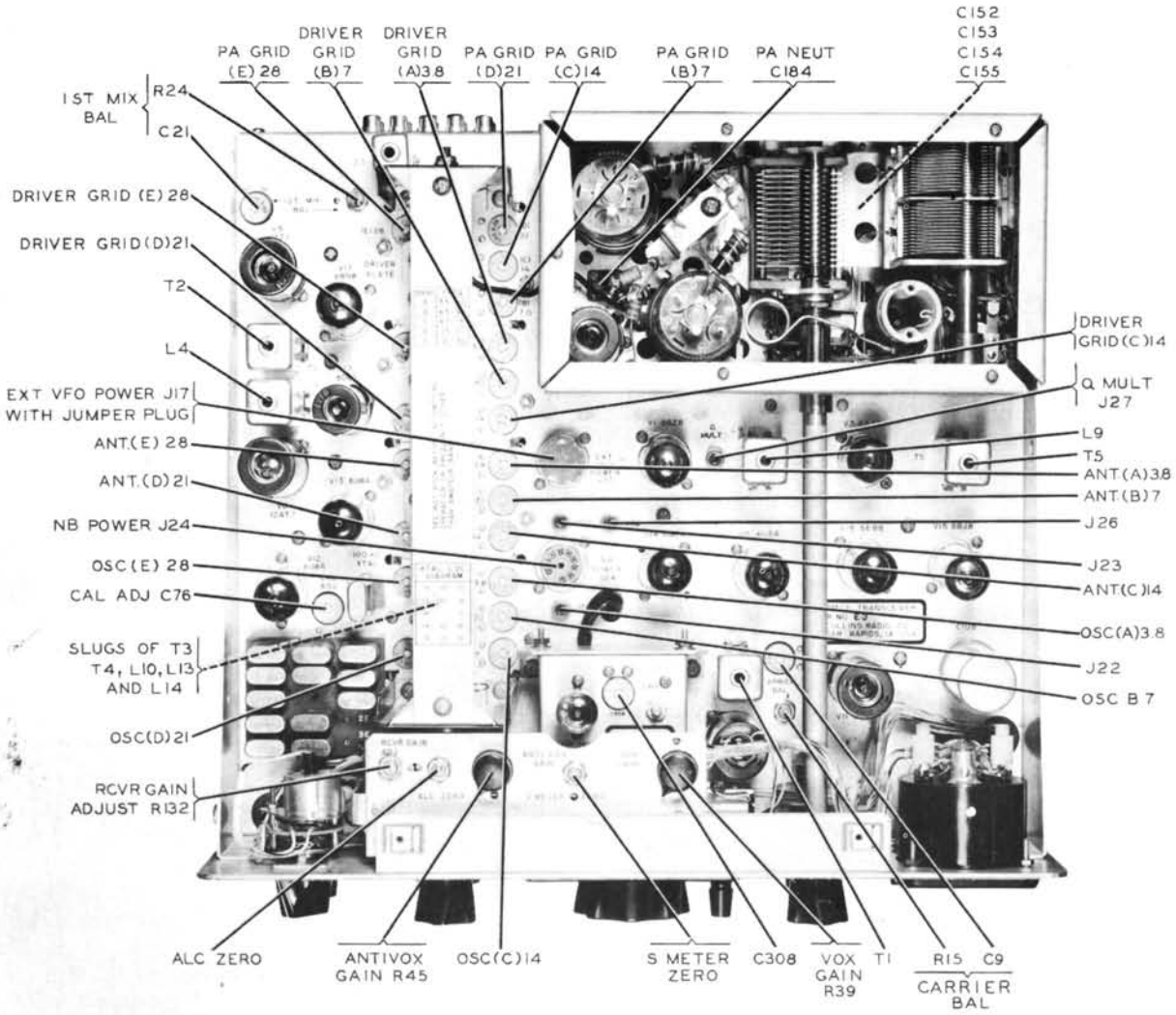


Figure 4-1. Locations of Test Points and Adjustments

b. Resistances of less than 0.9 ohm listed as zero.

c. Voltage measurements made with the tube under test operating normally, J16 shorted to ground, no audio input to transmitter, no transmitter power output.

d. Resistance measurements made with power supply plug removed from J13.

e. All measurements made from tube socket pin to ground.

f. When two voltages are given for same tube pin, the first is for receive condition and the second for transmit condition.

WARNING

Do not attempt any measurements of power amplifier plate voltage without special high-voltage test probe. Voltage here is 800 volts d-c. Do not make any other voltage or resistance measurements on KWM-2 with high voltage applied. Remove high-voltage rectifier from socket in power supply.

TABLE 4-3. VOLTAGE AND RESISTANCE MEASUREMENTS

TUBE		PIN NUMBER									PLATE CAP
		1	2	3	4	5	6	7	8	9	
V1	D-C V A-C V Ohms	300/-1 13K	200/-1 38K	4.6/0 9 to 960	- 6.3 0	0 0 0	-1.15/-14.2 4.4 meg	0.45 165	36/41 77K	-0.25 950K	
V2	D-C V A-C V Ohms	289/268 13K	0 1.7 meg	300/280 110K	- 6.3 0	0 0 0	292/270 58K	51/49 ∞	130/120 6500	128/118 57K	
V3	D-C V A-C V Ohms	294/-1 14K	162/-1 39K	0.7/0 40	- 6.3 0	0 0 0	-1.7/-14.2 4.4 meg	0.3/34 1000	-0.4/282 10K	0 0	
V4	D-C V A-C V Ohms	-0.4/282 10.5K	-0.1/950 23K	0.1/0.7 70	- 6.3 0	0 0 0	-0.61/-8.6 3.5 meg	20/0 2K	283/90 21K	-0.1/-0.6 10 meg	
V5	D-C V A-C V Ohms	290/262 13.5K	-60/0 520K	0/1.8 180	0 0 0	0 0 0	290/265 13.5K	-60/0 520K	0/2.2 300	- 6.3 0	
V6	D-C V A-C V Ohms	-0.15/246 12.5K	-0.6/0 96K	0/2.2 225	0 6.3 0	0 6.3 0	-0.3/245 12.5K	-0.7/0 95K	0/1.9 220	0 0 0	
V7	D-C V A-C V Ohms	-1.1/-0.9 7 meg	0 0	0 0 0	0 6.3 0	290/265 13.2K	132/110 29K	0 0			
V8	D-C V A-C V Ohms	0/3 98	-62/0 40K	-0.4/145 35K	0 0 0	0 6.3 0	300/285 12.5K	0 0	-0.4/145 35K	-62/0 40K	
V9	D-C V A-C V Ohms	0 1.4	0 0 1.2	-0.4/262 10K	0 1.5	-62 55K	0 1.6	0 6.3 0.7	0 0		∞
V10	D-C V A-C V Ohms	0 1.4	0 1.2	-0.4/262 10K	0 1.5	-62 55K 23K	0 1.4	0 6.3 0.9	0 0		∞

TABLE 4-3. VOLTAGE AND RESISTANCE MEASUREMENTS (Cont)

TUBE		PIN NUMBER									PLATE CAP
		1	2	3	4	5	6	7	8	9	
V11	D-C V A-C V Ohms	50/63 62K	-5.8/-7.1 120K	90/105 220K	0 6.3 0	0 0 0	300/270 20K	0 0	1.1/1.3 330	0 480K	
V12	D-C V A-C V Ohms	285/-1.1 13.5K	0 1 meg	300/0 68K	0 6.3 0	0 0 0	300/0 240K	37/1.8 ∞	130/0.2 7.6K	125/-2 58K	
V13	D-C V A-C V Ohms	158/262 24K	-21/-19 1 meg	210/195 60K	0 6.3 0	0 0 0	300/282 12.5K	0 0	1.8/0 145	0/-64 195K	
V14	D-C V A-C V Ohms	-1.2/-1.25 17 meg	0.9/0.9 0-500K	1.1 17 meg	0 6.3 0	0 0 0	0 275K	90/82 110K	0 200K	0.65/0.6 330	
V15	D-C V A-C V Ohms	-1.2/-15 3.4 meg	3/4 6K	3/4 6K	0 6.3 0	0 0 0	-1.2/-15 3.4 meg	83/239 48K	0/-60 1 meg	+2.5/0 800	
V16	D-C V A-C V Ohms	3/4 6K	1.9/2.85 2.3 meg	85/95 230K	0 6.3 0	0 0 0	2.2/0.2 68	0/-12 650K	115/240 28K	190/245 15K	
V17	D-C V A-C V Ohms	0 ∞	2.65/2.4 *2300	0 ∞	0 0 0	0 6.3 0	-0.45/-0.6 4 meg	300/-0.6 12.6K	0/-64 100K	-3.5/0 1000	

*Selected in final test.

4.5 ALIGNMENT PROCEDURES.

4.5.1 TRANSMITTER CIRCUITS ALIGNMENT.

4.5.1.1 TEST EQUIPMENT REQUIRED. A signal generator, a vacuum-tube voltmeter, a general coverage communications receiver, and a 100-watt 50-ohm dummy load are required for complete alignment and neutralization. If only touch-up alignment is necessary, and if the transmitter develops 50 to 60 volts r-f at PA grids, alignment with PA grid current indication is satisfactory.

4.5.1.2 455-KC I-F ALIGNMENT. (Refer to figure 4-1 for location of adjustments.)

a. Disconnect the high voltage (800 volts) from the transmitter by removing the high-voltage rectifier tube from the power supply.

b. Disable the screen circuit of the PA tubes by unsoldering one end of the jumper between the P.A. DISABLE jacks, J5 and J6.

c. Connect the r-f probe of a vtvm across the mechanical filter input (junction of C15 and C14 at one of FL1 terminals) or at V4-1. Refer to figure 6-2 for location of C15 and C14.

d. Set EMISSION switch to TUNE position. Set MIC GAIN full counterclockwise.

e. Any voltage appearing on the vtvm is due to carrier. Adjust carrier balance potentiometer R15 for minimum vtvm indication. This is a coarse adjustment.

f. Set MIC GAIN control fully clockwise.

g. Start with the bottom slug nearly out and peak primary and secondary of T1 for peak vtvm indication. Disconnect vtvm.

NOTE

The bottom slug may be adjusted to produce two peaks. Use the peak indication which occurs with the slug nearest the bottom.

4.5.1.3 BAND-PASS I-F ALIGNMENT.

a. Turn on KWM-2. Set EMISSION switch to TUNE. Tune and load KWM-2 into a dummy load at 14.3 mc. Switch meter to GRID position.

b. Make a swamping tool by connecting a 1000-ohm resistor and a 0.01-uf capacitor in series and connecting clips to their free pigtails. Connect this swamping tool across terminal 3 (secondary winding) of T2 to ground. This terminal is connected to the T2 end of coupling capacitor C25.

c. Keep grid current to approximately midscale or lower by adjusting MIC GAIN control, and peak the primary of T2 with tuning tool such as Walsco 2543. The primary slug for T2 is at the bottom of the can. Use grid current as peak indication.

d. Remove the swamping tool from the secondary of T2, and connect it across the primary of T2 (between pins 1 and 6 of the first mixer, V5). Peak the secondary of T2 (slug at top of shield can). Remove the swamping tool.

e. Retune and reload the KWM-2 to 14.255 mc. Without swamping any of the tuned circuits, peak L4 for grid current indication.

4.5.1.4 R-F CIRCUITS ALIGNMENT.

NOTE

For all trimmer adjustments, make only small changes.

a. Set EXCITER TUNING to 2.0 on the logging scale. Set BAND switch to 3.6. Set EMISSION switch to TUNE. Set METER switch to GRID. Disable the PA plate and screen connections as in paragraph 4.5.1.2. Set the dial to 100.

b. Adjust MIC GAIN control for some grid current indication. Peak all (A)3.8 trimmers for maximum grid current indication. Reduce the MIC GAIN setting as necessary to keep the grid current indication at S6 or less.

c. Set EXCITER TUNING to 3.75 on the logging scale. Set the BAND switch at 7.0. Set the dial at 100. Peak all (B)7.0 trimmers for maximum grid current indication, keeping grid current at S6 or less by adjustment of MIC GAIN control as necessary.

d. Set EXCITER TUNING to 6.5 on the logging scale. Set BAND switch to 14.2. Set dial at 100. Set (C) 14.0 DRIVER trimmer at 1/3 capacitance. This can be determined by setting the "N750" part of lettering so it is centered between the trimmer mounting screws. Peak L14 for maximum grid current. Keep grid current at S6 or less by reducing the setting of MIC GAIN control as necessary. Adjust all (C)14.0 trimmers for peak grid current indication. Keep grid current below S6.

e. Set EXCITER TUNING to 7.6 on the logging scale. Set BAND switch at 21.2. Set dial at 100. Peak all (D)21.0 trimmers for maximum grid current indication. Adjust MIC GAIN as necessary to keep grid current at S6 or less.

f. Set EXCITER TUNING to 9.0 on the logging scale. Set BAND switch at 28A. Set dial at 100. Peak all (E)28.0 trimmers for maximum grid current indication. Adjust MIC GAIN as necessary to keep grid current at S6 or less.

g. This alignment of r-f circuits is complete for both transmit and receive circuits. No further alignment of these circuits is required except the oscillator fine tuning adjustments of paragraph 4.5.1.5.

4.5.1.5 CRYSTAL OSCILLATOR ALIGNMENT.

a. This procedure is a refinement which peaks the oscillator plate circuits in the center of the 200-kc tuning range. Turn the tuning dial to 100.

b. Set BAND switch to 28A. Adjust EXCITER TUNING control for a peak on the PA grid current meter. Set EMISSION switch to TUNE. Increase MIC GAIN setting, if necessary, to obtain grid current indication.

c. Repeak the (E)28 trimmer in the crystal oscillator plate circuit.

d. Set the BAND switch to 21.2, and adjust EXCITER TUNING control for peak in grid current.

e. Repeak the (D)21 trimmer in the oscillator plate circuit.

f. Repeat this procedure with BAND-switch settings of 14.0, 7.0, and 3.6, adjusting the crystal oscillator plate circuit trimmers (C)14, (B)7.0, and (A)3.8 respectively.

4.5.1.6 PA NEUTRALIZING.

a. Disable PA plate and screen circuits as in paragraph 4.5.1.2, steps a and b.

b. Connect a 50-ohm, noninductive, 100-watt dummy load to OUTPUT jack J1.

c. Remove the cover on the power amplifier shielded compartment, and connect the r-f probe of the vtvm at the top of PA plate choke L17.

d. Set BAND switch to 14.0, EMISSION switch to LOCK, and meter switch to GRID.

e. Advance MIC GAIN setting as necessary, and adjust EXCITER TUNING for peak PA grid current.

f. Adjust P.A. TUNING control for maximum r-f voltage indication on vtvm. Adjust MIC GAIN as necessary to keep this indication below 0.5 volt.

g. From bottom chassis, adjust the PA neutralizing capacitor, C184, for a dip in the vtvm indication. This voltage is PA plate feedthrough.

h. Remove the r-f probe connection from the top of L17, and replace the PA compartment cover.

4.5.1.7 DRIVER NEUTRALIZING.

a. Connect the high-voltage plate supply to the PA tubes by replacing the rectifier tube. Connect the jumper between J5 and J6 (PA DISABLE) jacks to energize PA screen grids.

b. Remove the filament voltage to the driver tube, V8, by unsoldering L29 from C241. See figure 6-3. If an old 6CL6 tube, having no shorts, is available, clip its filament pins off and substitute it for V8.

c. Connect the r-f probe of the vtvm across the dummy load at J1. Connect a piece of insulated wire to r-f probe tip and wrap two turns around the ungrounded end of the dummy load. Ground the probe case to the common ground.

d. Set the BAND switch to 14.0, EMISSION switch to LOCK, and meter switch to PLATE.

e. Adjust the bias control in the power supply for 40-ma no-signal PA plate current. It will be necessary to have the EMISSION switch in LSB or USB position and MIC GAIN full counterclockwise for this adjustment. Reset EMISSION switch to LOCK position.

f. Increase MIC GAIN setting, and adjust EXCITER TUNING and P.A. TUNING controls for maximum voltage across the 50-ohm load. This level will be less than 0.3 volt.

g. Adjust the driver neutralizing capacitor, C117, for a voltage dip. This capacitor is located on the

shield partition closest to the shield can. Refer to figure 6-3.

h. Restore V8 to normal operation.

4.5.1.8 FEEDBACK NEUTRALIZING.

a. Set BAND switch to 28A position, EMISSION switch to TUNE, and meter switch to PLATE position.

b. Adjust EXCITER TUNING control for a peak in PA plate current.

c. Dip the PA plate current with the P.A. TUNING control.

d. Repeat steps b and c above.

e. Adjust the feedback neutralizing capacitor, C120, (on driver-PA shield below chassis and farthest from shield cans) until PA plate current dip and power output peak coincide. Readjust the MIC GAIN as necessary to hold PA plate current below saturation during this adjustment (150 ma).

f. Set BAND switch to 21.2, peak EXCITER TUNING control, and dip PA plate current with P.A. TUNING control.

g. Check that PA plate current dip and power output peak occur at same setting of P.A. TUNING control.

h. Repeat this check on bands 14.2, 7.0, and 3.6.

4.5.1.9 VFO SIDEBAND FREQUENCY-SHIFT ADJUSTMENT.

a. Set BAND switch to 3.6 position. Set EXCITER TUNING to approximately 1.9 on logging scale. Set EMISSION switch to LSB, and set OFF-ON-NB-CAL switch to CAL position. Tune dial near 100 until calibrate signal is zero beat, and do not touch for following procedure.

b. Switch to USB; adjust C308 (on vfo) to zero beat.

4.5.1.10 CARRIER BALANCE ADJUSTMENT.

a. Set BAND switch to 14.2. Set dial to 14.3. Connect dummy load to transmitter output J1. Tune and load transmitter.

b. Set EMISSION switch to LSB position, turn MIC GAIN control full counterclockwise.

c. Connect an r-f vtvm across dummy load and set to lowest scale, or use lowest scale on an r-f wattmeter connected in series with load.

d. Key to transmit by shorting PTT jack J16 to ground. If vtvm indication is 0.2 volt or more, adjust CARRIER BAL potentiometer R15 and trimmer C9 until the vtvm indication is less than 0.2 volt. These adjustments interact, so adjust first one and then the other until neither produces any further decrease in vtvm indication.

e. If vtvm indication is still more than 0.2 volt, check first mixer balance balance as in paragraph 4.5.1.11.

4.5.1.11 FIRST MIXER BALANCE ADJUSTMENT.

a. Tune and load the transmitter into dummy load at 14.1 mc. Loosely couple a general coverage communications receiver to the transmitter output. Tune the communications receiver back and forth across 14.555 mc until the signal is heard.

b. Adjust the mixer balance potentiometer, R24, and the trimmer, C21, for minimum output. These adjustments interact, so adjust first one and then the other until neither produces further decrease in output.

4.5.1.12 ALC ZERO ADJUSTMENT.

a. Turn MIC GAIN full counterclockwise until switch clicks.

b. Set meter switch to ALC position.

c. Short PTT jack to ground.

d. Check alc bias at ALC jack with d-c vtvm. If this bias exceeds -1.8 volt ±20%, replace V17 to bring this voltage into correct limits. Adjust ALC ZERO potentiometer R36 (top of chassis near R45) until meter indicates zero.

4.5.2 RECEIVER CIRCUITS ALIGNMENT.

If the transmitter circuits are aligned first, the r-f amplifier tuned circuits, the high-frequency crystal oscillator tuned circuits, the vfo sideband frequency-shift adjustment, and the band-pass i-f transformer alignment will aready be completed for the receiver alignment. The only alignments remaining for the receiver circuits are the i-f alignment, the r-f gain adjustment, the S-meter zero adjustment, and crystal calibrator trimmer adjustment.

4.5.2.1 455-KILOCYCLE I-F ALIGNMENT.

a. Remove vfo tube V301 from socket.

b. Set EMISSION switch to USB.

c. Connect signal generator to pin 8 of V17B, and increase signal generator output until S-meter shows slight indication (S3). Rock the signal generator frequency to center the signal at the approximate center of the filter pass band.

NOTE

If a vtvm is available, it may be connected to avc bus and used as alignment peak indicator.

d. Adjust the slugs of L9 and T5 for peak indication on the S-meter. Reduce signal generator output as necessary to keep S-meter indication low. Repeak L9 and T5 as in any standard alignment procedure.

e. Replace vfo tube.

4.5.2.2 R-F GAIN AND S-METER ZERO ADJUSTMENTS.

a. Set receiver to middle of favorite operating band, and peak EXCITER TUNING control for maximum output. Set R.F. GAIN control (front panel) to maximum clockwise position. Tune calibrated signal generator to same frequency as receiver, and set A.F. GAIN control to maximum counterclockwise position.

b. Short RCVR ANT. jack J2 to ground; adjust S-METER ZERO potentiometer R121 so S-meter reads zero.

c. Remove short from J2, and apply 2.5 microvolts from calibrated signal generator with a 47-ohm, non-inductive resistor in parallel. Adjust RCVR GAIN ADJUST (R132) until S-meter just kicks off zero (1/2 S-unit or less).

d. Repeat step b.

4.5.2.3 CRYSTAL CALIBRATOR ADJUSTMENT.

a. Tune WWV to zero beat at 15.0 mc at a time when Station WWV is not transmitting a tone.

b. Turn the function switch to CAL position. Adjust CAL ADJUST trimmer C76 for zero beat of calibration signal.

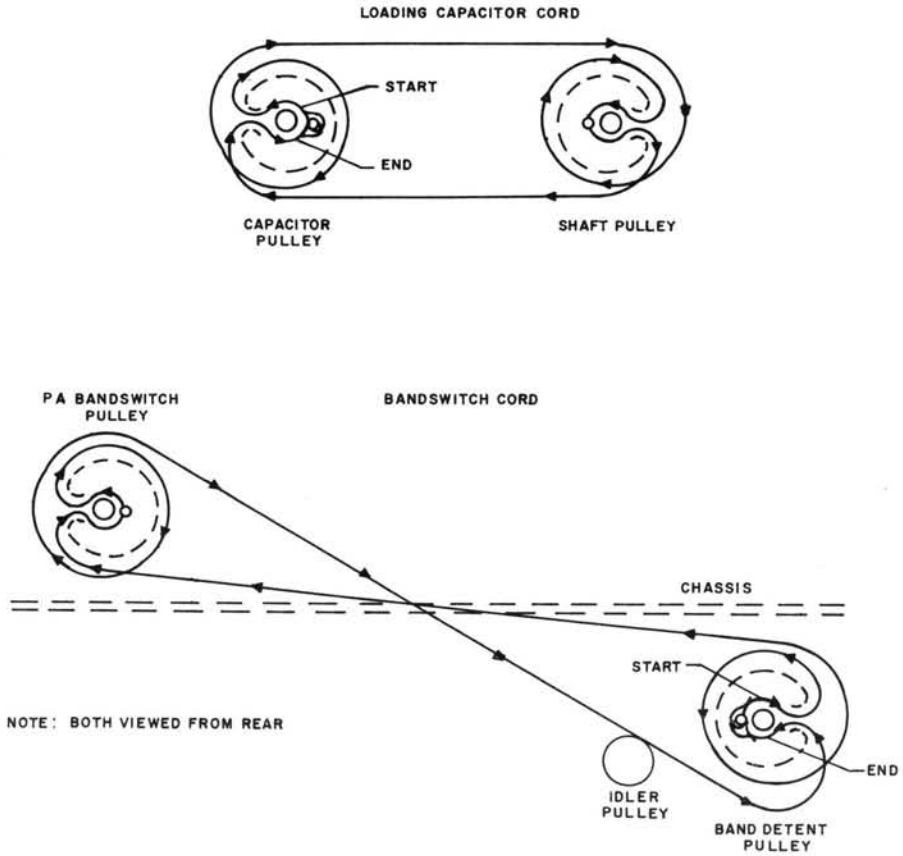


Figure 4-2. Dial Cord Stringing Diagram

4.6 DIAL CORD REPLACEMENT. (Refer to figure 4-2.)

4.6.1 BANDSWITCH CORD.

a. Place BAND switch in position 2A. Remove all power from KWM-2, and remove the PA compartment cover. Short the PA plates to ground with a screwdriver blade. Check to see that the movable contacts of both S7 and S8 are at position 13 and 14. This may be determined by counting clockwise on the wafer from the X-mark, looking at the wafer on the side marked with the X, and beginning with the first position clockwise from the X-mark as 1. Count all positions, including the holes in the empty spaces where there are no lugs mounted.

b. Use a knife blade or small screwdriver and pry open the tab far enough to release the old cord. This tab is located on the inner face of the pulley. Remove the broken or defective cord from the band-switch pulleys near the front panel; one is located above the chassis and the other below the chassis. Loosen the idler pulley so it will not be in the way during restringing.

c. Replace the old cord with three feet of new cord, Collins part number 432 1009 00. When ordering dial cord, be sure to state the desired length in feet.

d. String the cord according to the appropriate part of figure 4-2. Make sure the cord turns do not overlap on the pulleys. Pull the cord tight and tie to the tab. Mash the tab down to clamp the cord securely. Tighten the idler to bring the cord to tension.

e. Check again that the switch sections S7 and S8 are positioned properly according to the instructions of step a above. If they are not, loosen the shaft coupler and turn the switch shaft to bring the contacts to proper position. Tighten the shaft coupler.

f. Apply a little airplane cement on the dial cord knots to help keep them tight. After the cement is dry, trim the loose ends back NO CLOSER than one-half inch from the knot.

4.6.2 LOADING CAPACITOR CORD.

a. Place INCR LOAD control at 10 on the logging scale. This positions the INCR LOAD control horizontally and points it at the meter. Remove all power from the KWM-2, and remove the PA compartment top cover. Short the PA plate caps to ground with a screwdriver blade. Check that the loading capacitor is fully meshed. If not, position the capacitor plates manually so they are fully meshed.

b. Use a knife or small screwdriver and pry the tab open far enough to release old cord. Remove broken or defective dial cord from loading capacitor pulleys.

c. Replace the old cord with two feet of new cord, Collins part number 432 1009 00. When ordering dial cord, be sure to state the desired length in feet.

d. String the cord according to the appropriate part of figure 4-2. Make sure the cord turns do not overlap on the pulleys. Pull the cord tight and tie to the tab. Mash the tab down to clamp the cord securely.

e. Check to see that the INCR LOAD control is at 10 on the logging scale, and that the loading capacitor is fully meshed. If not, loosen the shaft coupler, mesh capacitor plates manually, and retighten the coupler.

f. Apply a little airplane cement on the knots in the dial cords to help hold them tight. After the cement is dry, trim the loose ends back NO CLOSER than one-half inch from the knot.

SECTION V
SPECIFICATIONS

5.1 KWM-2 TRANSCEIVER.

The KWM-2 Transceiver receives and transmits single-sideband or CW signals in all amateur bands between 3.4 and 30.0 mc.

5.2 FREQUENCY COVERAGE.

The transceiver coverage is in 14 bands, each 200 kilocycles wide. With crystals furnished, they cover the entire amateur bands of 80 meters, 40 meters, 20 meters, 15 meters, a 14.8- to 15.0-mc band including WWV, and the 28.5- to 28.7-mc portion of the 10-meter band. The two remaining crystal sockets may be used for crystals selected to provide two additional 200-kc bands within the 10-meter band. Other crystals may be substituted for those furnished to place the transceiver at other frequencies through the range.

5.3 REQUIREMENTS FOR OPERATION.

The transceiver requires a 110-volt, 50- to 60-cycle-per-second, a-c power source and a power supply, such as the 516F-2, for fixed-station operation. It consumes approximately 235 watts of power from the line in receive function and approximately 475 watts in transmit function. The transceiver may be operated mobile by using a power supply, such as the 516E-1 for 12-volt d-c operation or a 516E-2 for 24- to 28-volt operation. In mobile operation the transceiver requires 800 volts d-c at 250 ma; 275 volts d-c at approximately 175 ma; a bias supply adjustable between -60 and -80 volts; and 6, 12, or 24 volts d-c filament supply at 11.0, 5.5, or 2.75 amperes respectively. Any high-impedance crystal or dynamic microphone may be used. A 4-ohm speaker is required. The antenna and feed system must present a 50-ohm load with swr not exceeding 2.0 to 1.

5.4 SPECIFICATIONS.

Frequency range . . . . . .3.4 to 30.0 megacycles. With crystals furnished, bands are as follows:

80 meters - 3.4 to 3.6 mc, 3.6 to 3.9 mc, and 3.8 to 4.0 mc.

40 meters - 7.0 to 7.2 mc, and 7.2 to 7.4 mc.

20 meters - 14.0 to 14.2 mc, and 14.8 to 15.0 mc (WWV).

	15 meters - 21.0 to 21.2 mc, 21.2 to 21.4 mc, and 21.4 to 21.6 mc.
	10 meters - 28.5 to 28.7 mc.
Mode	Single sideband (either sideband selectable) or CW.
Type of service	SSB-continuous; CW-50% duty cycle.
Power consumption from a-c line	235 watts in receive function 475 watts in transmit function.
Plate power input	175 watts PEP on SSB, 160 watts on CW.
Power output	100 watts PEP (nominal) into 50 ohms.
Microphone input impedance	High impedance.
R-f output impedance	50 ohms with not more than 2.0-to-1 swr.
R-f input impedance	50 ohms.
Matching speaker impedance	4 ohms.
Matching phone-patch impedance	500 to 600 ohms, receive output to phone patch; high impedance phone-patch input to transmitter.
Frequency stability	Total variation after warmup not more than 100 cps.
Calibration accuracy	1 kilocycle.
Keying	Break-in.
Audio-frequency response	300-2400 cps ±6 db.
Carrier suppression	Carrier 40 db down from output signal.
Unwanted sideband	50 db down from output signal.
Oscillator feedthrough or mixer products (undesired)	50 db down from output signal.
Second harmonic radiation	50 db down from output signal.
Third order distortion	30 db down from output signal.
Receiver sensitivity	0.5 microvolt for 10-db signal to noise ratio for SSB operation in amateur bands.
Receiver selectivity	2.1 kc bandwidth at 6 db down, 4.2 kc bandwidth at 60 db down.
Receiver spurious responses	Image rejection better than 50 db. Internal spurious signals below one microvolt equivalent antenna input.
Receiver output level	1.0 watt maximum.
Size	7-3/4 inches high, 15-1/8 inches wide, 13-3/4 inches deep, overall
Weight	18 pounds, 3 ounces.

5.5 TUBE AND SEMICONDUCTOR COMPLEMENT.

TABLE 5-1. TUBES AND SEMICONDUCTORS

SYMBOL	FUNCTION	TYPE
V1A	First microphone amplifier	1/2 6AZ8
V1B	First receiver i-f amplifier	1/2 6AZ8
V2A	Vfo cathode follower	1/2 6U8A
V2B	Tone oscillator	1/2 6U8A
V3A	Microphone amplifier cathode follower	1/2 6AZ8
V3B	Receiver second i-f amplifier	1/2 6AZ8
V4A	Transmitter i-f amplifier	1/2 6AZ8
V4B	Vox relay amplifier	1/2 6AZ8
V5	First transmitter mixer	12AT7
V6	Second transmitter mixer	12AT7
V7	Receiver-transmitter r-f amplifier	6DC6
V8	Transmitter driver	6CL6
V9	Transmitter power amplifier	6146
V10	Transmitter power amplifier	6146
V11A	Beat-frequency oscillator	1/2 6U8A
V11B	Second microphone amplifier	1/2 6U8A
V12A	Crystal calibrator	1/2 6U8A
V12B	Crystal oscillator cathode follower	1/2 6U8A
V13A	High-frequency crystal oscillator	1/2 6U8A
V13B	Receiver first mixer	1/2 6U8A
V14A	Vox rectifier (one diode), anti vox rectifier (other diode)	2/3 6BN8
V14B	Vox amplifier	1/3 6BN8
V15A	Avc rectifier (both diodes)	2/3 6BJ8
V15B	Product detector	1/3 6BJ8
V16A	Receiver first a-f amplifier	1/2 6EB8
V16B	Receiver a-f output amplifier	1/2 6EB8
V17A	Alc rectifier (both diodes)	2/3 6BN8
V17B	Receiver second mixer	1/3 6BN8
V301	Variable-frequency oscillator	6AU6

5.6 AVAILABLE ACCESSORIES.

TABLE 5-2. AVAILABLE ACCESSORIES

ITEM	FUNCTION	COLLINS PART NUMBER
136B-2 Noise Blanker	Eliminates noise pulses when the noise components present on the antenna have energy distribution in the 40-mc portion of the spectrum and when the noise pulses have a repetition rate not in excess of 100,000 pulses per second.	522 1661 00
312B-3 Speaker Box	Station speaker.	522 1166 00
312B-4 Station Control	Speaker, phone patch, directional wattmeter, and station control switches.	522 1167 00
399C-1 External VFO	Speaker, extra 70K-2 vfo, and vfo control switches for operating transmitter and/or receiver in different portions of 200-kc band.	522 1597 00

TABLE 5-2. AVAILABLE ACCESSORIES (Cont)

ITEM	FUNCTION	COLLINS PART NUMBER
312B-5 Station Control	Combinations of features and functions of 312B-4 and 399C-1 accessories.	522 1668 00
351E-4 Mounting Plate	Mount on table or bench.	522 1482 003
351D-2 Mobile Mount	Mount for mobile operation.	522 1726 00
516F-1 A-C Power Supply*	A-c power supply.	522 0847 00
516F-2 A-C Power Supply	A-c power supply.	522 1170 00
516E-1 D-C Power Supply	Mobile power supply for 12-14-volt source.	522 0846 005
516E-2 D-C Power Supply	Mobile power supply for 24-28-volt source.	522 0846 00
PJ-068	Microphone plug.	361 0001 00
302C-3 Directional Wattmeter	Measure forward and reflected power.	522 1696 00

*Use with special cable adapter, Collins part number 543 8791 00.

SECTION VI
PARTS LIST

KWM-2 Transceiver

ITEM	DESCRIPTION	COLLINS PART NO.
KWM-2 TRANSCEIVER		522 1611 00
C1, C17, C48, C56, C216, C224, C260	CAPACITOR, FIXED, CERAMIC: 0.02 uf, +100% -20%, 500 v dc	913 2142 00
C2	CAPACITOR, FIXED, MICA: 220 uuf, ±10%, 500 v dc	912 2841 00
C3, C4, C24, C96, C100, C103, C104, C127, C256	CAPACITOR, FIXED, CERAMIC: 4700 uuf, +100% -20%, 500 v dc	913 3012 00
C5, C82, C123, C137, C228, C230, C241	CAPACITOR, FIXED, CERAMIC: 1000 uuf, +80% -20%, 500 v dc	913 1292 00
C6, C160	CAPACITOR, FIXED, CERAMIC: 0.47 uf, +80% -20%, 25 v dc	913 3804 00
C7, C8, C20, C43, C47, C71, C75, C80, C89, C92, C107, C108, C122, C126, C139, C146, C148, C156, C169, C188, C193, C196, C200, C202, C211, C212, C222, C229, C235, C252	CAPACITOR, FIXED, CERAMIC: 10,000 uuf, +100% -20%, 500 v dc	913 3013 00

ITEM	DESCRIPTION	COLLINS PART NO.
C9, C21, C35, C116, C134, C136	CAPACITOR, VARIABLE, CERAMIC: 5 uuf min., 37.5 uuf max.; 350 v dc	917 1073 00
C10	CAPACITOR, FIXED, MICA: 33 uuf, ±10%, 500 v dc	912 2781 00
C11, C15, C23, C27, C40, C41, C44, C45, C58, C59, C61, C62, C72, C83, C91, C124, C186, C187, C219, C220, C226, C232, C234	CAPACITOR, FIXED, CERAMIC: 1000 uuf, +100% -20%, 500 v dc	913 3009 00
C1, C17, C48, C56, C216, C224, C260	CAPACITOR, FIXED, CERAMIC: 0.02 uf, +100% -20%, 500 v dc	913 2142 00
C2	CAPACITOR, FIXED, MICA: 220 uuf, ±10%, 500 v dc	912 2841 00
C3, C4, C24, C96, C100, C103, C104, C127, C256	CAPACITOR, FIXED, CERAMIC: 4700 uuf, +100% -20%, 500 v dc	913 3012 00
C5, C82, C123, C137, C228, C230, C241	CAPACITOR, FIXED, CERAMIC: 1000 uuf, +80% -20%, 500 v dc	913 1292 00
C6, C160	CAPACITOR, FIXED, CERAMIC: 0.47 uf, +80% -20%, 25 v dc	913 3804 00

KWM-2 Transceiver

ITEM	DESCRIPTION	COLLINS PART NO.
C7, C8, C20, C43, C47, C71, C75, C80, C89, C92, C107, C108, C122, C126, C139, C146, C156, C158, C169, C188, C193, C196, C200, C202, C211, C212, C222, C229, C235, C252	CAPACITOR, FIXED, CERAMIC: 10,000 uuf, +100% -20%, 500 v dc	913 3013 00
C9, C21, C36, C116, C134, C136	CAPACITOR, VARIABLE, CERAMIC: 5 uuf min., 37.5 uuf max.; 350 v dc	917 1073 00
C10	CAPACITOR, FIXED, MICA: 33 uuf, ±10%, 500 v dc	912 2781 00
C11, C15, C23, C27, C40, C41, C44, C45, C58, C59, C61, C62, C72, C83, C91, C124, C186, C187, C219, C220, C226, C232, C234	CAPACITOR, FIXED, CERAMIC: 1000 uuf, +100% -20%, 500 v dc	913 3009 00
C12/13, C18/19, C28/29, C78/237, C85/86, C147, C161/162, C163/164, C165/166, C167/190, C181/182, C191/192, C194/201, C195/197, C198/199, C203/204, C205/206, C207/208, C209/210, C242/243, C244/245, C246/247, C250/251	CAPACITOR, FIXED, CERAMIC: dual type, 0.01 uf, GMV, 500 v dc per section	913 3829 00
C14	CAPACITOR, FIXED, MICA: 100 uuf, ±5%, 500 v dc	912 2816 00
C16	CAPACITOR, FIXED, MICA: 51 uuf, ±5%, 500 v dc	912 2795 00
C22, C35	CAPACITOR, FIXED, MICA: 22 uuf, ±5%, 500 v dc	912 2768 00
C25, C79	CAPACITOR, FIXED, CERAMIC: 3 uuf, ±1/2, 500 v dc	916 0145 00
C26	CAPACITOR, TUBULAR, CERAMIC: 6 uuf, ±1/2 uuf, 500 v dc	916 0122 00
C30, C31, C94	CAPACITOR, FIXED, MICA: 10 uuf, ±10%, 500 v dc	912 2754 00
C32, C34, C37, C63, C65, C67, C68, C70, C76, C109, C113, C115, C120, C129, C130, C132, C184	CAPACITOR, VARIABLE, CERAMIC: 8 to 75 uuf, 350 v dc	917 1075 00
C33, C64, C133	CAPACITOR, FIXED, MICA: 130 uuf, ±5%, 500 v dc	912 2825 00
C38	CAPACITOR, FIXED, MICA: 360 uuf, ±5%, 500 v dc	912 2855 00
C39, C117	CAPACITOR, VARIABLE, CERAMIC: 1.5 to 10.5 uuf, 350 v dc	917 1071 00
C42	NOT USED	
C46, C49, C90, C221, C227, C236, C238	CAPACITOR, FIXED, CERAMIC: 0.1 uf, +80% -20%, 500 v dc	913 3152 00
C50, C51, C52, C105	CAPACITOR, FIXED, MICA: 470 uuf, ±5%, 500 v dc	912 2864 00
C53	CAPACITOR, FIXED, MICA: 22 uuf, ±10%, 500 v dc	912 2769 00
C54	NOT USED	
C55, C66, C74	CAPACITOR, FIXED, MICA: 47 uuf, ±5%, 500 v dc	912 2792 00
C60	CAPACITOR, FIXED, MICA: 20 uuf, ±10%, 500 v dc	912 2766 00
C69	CAPACITOR, FIXED, MICA: 160 uuf, ±2%, 500 v dc	912 2830 00
C73, C81	NOT USED	
C77, C87, C240	CAPACITOR, FIXED, MICA: 100 uuf, ±10%, 500 v dc	912 2817 00
C84, C101, C157 C159, C170, C225, C231, C233, C253	CAPACITOR, FIXED, CERAMIC: 0.1 uf, -30% +80%, 75 v dc	913 3794 00
C88	CAPACITOR, FIXED, MICA: 510 uuf, ±5%, 300 v dc	912 2867 00
C93	CAPACITOR, FIXED, CERAMIC: 0.05 uf, GMV, 100 v dc	913 3679 00
C95	NOT USED	
C97	CAPACITOR, FIXED, MICA: 27 uuf, ±10%, 500 v dc	912 2775 00
C98, C99, C214, C215	CAPACITOR, FIXED, CERAMIC: 470 uuf, +100% -20%, 500 v dc	913 3007 00
C102	CAPACITOR, FIXED, ELECTROLYTIC: 100 uf, -10% +75%, 6 v dc	183 1782 00
C106	CAPACITOR, FIXED, ELECTROLYTIC: 30 uf, 20 uf, 15 uf; each -10% +40%, 350 v dc	183 1702 00
C110	CAPACITOR, FIXED, MICA: 360 uuf, ±5%, 500 v dc	912 2855 00
C111	CAPACITOR, VARIABLE, CERAMIC: 3 uuf min., 18 uuf max, 350 v dc	917 1072 00
C112	CAPACITOR, FIXED, MICA: 240 uuf, ±2%, 500 v dc	912 2842 00
C114, C128, C135	CAPACITOR, FIXED, MICA: 51 uuf, ±10%, 500 v dc	912 2796 00
C118, C138	CAPACITOR, FIXED, CERAMIC: 1.0 uuf, ±1/4 uuf, 500 v dc	916 0070 00
C119	CAPACITOR, FIXED, CERAMIC: 2 uuf, ±1/2, 500 v dc	916 0076 00
C121, C131, C217, C218	CAPACITOR, FIXED, MICA: 220 uuf, ±5%, 500 v dc	912 2840 00
C125	CAPACITOR, FIXED, MICA: 330 uuf, ±2%, 500 v dc	912 2851 00
C140 thru C145, C248, C249	CAPACITOR, FIXED, CERAMIC: 500 uuf, ±10%, 500 v dc	913 0998 00
C148, C149, C168	CAPACITOR, FIXED, CERAMIC: 0.001 uf, +100% -20%, 2000 v dc	913 3537 00
C150	CAPACITOR, VARIABLE, AIR: plate meshing type, 12.0 uuf min. to 250.0 uuf max, 1000 v rms	920 0136 00
C151	CAPACITOR, VARIABLE, AIR: dual section, 13.5 uuf min. to 452.3 uuf max ea section, 360 v ac, 60 cps min. breakdown	920 0138 00
C152, C153, C154	CAPACITOR, VARIABLE, MICA: 100 uuf to 500 uuf, 1000 v dc	918 0006 00
C155	CAPACITOR, VARIABLE, MICA: 15 uuf to 120 uuf, 1000 v dc	918 0005 00
C171	CAPACITOR, MICA: 510 uuf (p/o T1)	
C172	CAPACITOR, MICA: 240 uuf (p/o T2)	
C173	CAPACITOR, MICA: 240 uuf (p/o T2)	
C174	CAPACITOR, MICA: 130 uuf (p/o T2)	
C175	CAPACITOR, MICA: 180 uuf (p/o L4)	
C176	CAPACITOR, MICA: 510 uuf (p/o L4)	
C177	CAPACITOR, MICA: 180 uuf (p/o L9)	
C178	CAPACITOR, MICA: 510 uuf (p/o T5)	
C179	CAPACITOR, MICA: 510 uuf (p/o T5)	
C180, C183	CAPACITOR, FIXED, CERAMIC: 10 uuf, ±10%, 500 v dc	913 0972 00
C185, C189, C213, C239	NOT USED	
C254	CAPACITOR, FIXED, ELECTROLYTIC: 4 uf, -10% +100%, 350 v dc	183 1783 00
C255	NOT USED	
C257, C258	CAPACITOR, FIXED, MICA: 12 uuf, ±10%, 500 v dc	912 2757 00
C259	CAPACITOR, FIXED, ELECTROLYTIC: 8 uf, -15% +100%, 6 v dc	183 1167 00
C261	CAPACITOR, FIXED, MICA: 100 uuf ±10% 500 v dc	912 2817 00
C263	CAPACITOR, FIXED, ELECTROLYTIC: 4 uf -10% +75%, 350 v dc	183 1763 00
CR1, CR2 CR3, CR4	SEMICONDUCTOR DEVICE, DIODE: germanium; Sylvania part no. 1N34A	353 0103 00
DS1	LAMP, INCANDESCENT: 6.3 v, 0.945 w, 0.15 amps; 1-1/8 in. lg max. overall	262 3240 00
DS2	BULB: p/o meter assembly M1	
E1 thru E5	CORE, ADJUSTABLE TUNING: ceramic; 0.5 to 32 mc; 1-1/4 in. lg core body, threaded stud type; 1/2 in. lg	288 2509 00
E6, E7	SHELL, ELECTRICAL CONNECTOR: below surface mtg; steel, cadmium pl, 2-1/16 in. by 1.172 in. by 0.781 in. overall	372 1761 00
E8	CLIP, CRYSTAL: beryllium copper; 0.009 in. thk; 3/8 in. w by 0.393 in. lg by 15/64 in. h; 0.120 in. dia mtg hole	504 8229 001
E9, E10, E13	SHIELD, ELECTRON TUBE: 9 pin medium; cylindrical with flared end; open top; brass; 0.95 in. by 1.065 in.; incl beryllium copper insert	541 6554 003
E11	SHIELD, ELECTRON TUBE: 7 pin medium; brass; incl copper insert and hold-down spring	541 6551 003
E12	SHIELD, ELECTRON TUBE: 9 pin large, brass; incl copper insert and hold-down spring	541 6555 003

KWM-2 Transceiver

ITEM	DESCRIPTION	COLLINS PART NO.
FL1	FILTER, BAND PASS: mechanical, 455.0 kc center frequency; 2.125 kc at 6 db, 5.3 kc at 60 db, terminal impedance 17,000 ohms, resonating capacity 130 uuf	526 9337 00
J1, J18	JACK, TIP: accommodates 1/8 in. plug; ceramic insulation brass contacts	360 0088 00
J2 thru J12, J16 J19 thru J23, J26 J27	JACK, TIP: small banana contact accommodated, (0.125) insulated, plastic	360 0148 00
J13	CONNECTOR, RECEPTACLE, ELECTRICAL: 11 pin male, phenolic insulation, 5 amps, straight shape	372 1757 00
J14	JACK, TELEPHONE: spring leaf contact, J5-2C; 0.253 in. id, 3/4 in. od; thd 1/4 in. barrel 0.276 in. lg; 3/8-32 NEF-2	360 0169 00
J15	JACK, TELEPHONE: spring leaf; 0.728 in. lg by 49/64 in. dia; 2 conductor plug, 23/32 in. lg by 1/4 in. dia shank	358 1050 00
J17, J24	SOCKET, ELECTRON TUBE: 9 pin miniature, top mtg (incl XV1)	220 1054 00
J25, P17	CONNECTOR, PLUG, ELECTRICAL: 9 male contacts; 5 amps; 3800 v ac (incl P17)	372 1841 00
K1	NOT USED	
K2	RELAY, ARMATURE: 2C arrangement, low level RF; 2C arrangement, 300 ma at 275 v dc; 14,000 ohms resistance; continuous duty cycle	970 1940 00
K3	RELAY, ARMATURE: antenna switching type, 2C contact arrangement, 2 amps, 175 w, 2.30 mc; 1 inductive winding, 115 v dc, 10,000 ohms	970 1914 00
K4	RELAY, ARMATURE: 4C arrangement, 150 ma at 250 v dc; 2C arrangement, low level RF; 10,000 ohms resistance; continuous duty cycle	970 1941 00
L1	NOT USED	
L3, L7, L31, L33	COIL, RADIO FREQUENCY: single wound; 3 pi universal wound; unshielded; 2.0 uh, ± 10% at 350 kc; each pi 225 turns of no. 40 AWG copper wire	240 0084 00
L2	COIL, RADIO FREQUENCY: universal pi wound; 6 pies; 10 uh nom inductance	240 0199 00
L4	COIL, ASSEMBLY INTERMEDIATE FREQUENCY: 3.055 mc center freq; 220 kc band pass at 3 db, attenuation 35 db min. from 2.5 mc to 2.7 mc	278 0293 00
L5, L6, L11, L22, L25	COIL, RADIO FREQUENCY: 3 universal wound pi sections, 75 turns ea; no. 36 AWG copper wire; powdered iron coil form; 220 uh inductance, 1 amp	240 0037 00
L9	TUNING UNIT, RADIO FREQUENCY: freq range 440 kc to 470 kc	278 0277 00
L10	COIL, RADIO FREQUENCY: single layer wound; 13 turns no. 28 AWG wire, 1.045 in. lg, panelyte coil form, 0.260 in. id, 0.3544 in. od, 1-11/16 in. lg	544 3135 002
L12	COIL, RADIO FREQUENCY: universal wound; 4 pi, 139 turns no. 36 AWG ea section; 2.0 mh inductance	240 0134 00
L13	COIL, RADIO FREQUENCY: single layer wound, 22 turns #28 AWG wire, panelyte coil form 0.260 in. id, 0.3544 in. od, 1-11/16 in. lg	543 8123 002
L14	COIL, RADIO FREQUENCY: single layer wound, 12 turns, #28 AWG wire, panelyte coil form, 0.260 in. id, 0.3094 in. od, by 1-11/16 in. lg	543 8028 002
L15	COIL: 2 turns of #18 wire (p/o Z1)	
L16	COIL: 2 turns of #18 wire (p/o Z2)	
L17	COIL: RADIO FREQUENCY: single layer wound, 220 turns of no. 32 AWG wire 0.5194 in. dia by 3 in. lg overall	543 8024 00
L18	COIL, RADIO FREQUENCY: 6-1/2 turns single layer wound, #14 AWG copper wire; 5/8 in. id	544 9701 00
L19	COIL, RADIO FREQUENCY: 32 turns no. 18 AWG wire, each turn tapped; 3 in. lg by 1 in. od	506 7848 002
L20	COIL, RADIO FREQUENCY: single layer wound, 39 uh inductance, 2 ohms dc, 500 ma current	240 0171 00
L21	COIL, RADIO FREQUENCY: multiple section duolateral wound; 4 sections; 2.5 mh, 35 to 50 ohms, 0.125 amps	240 2100 00
L23	COIL, RADIO FREQUENCY: single layer wound, 22 uh, 0.30 ohms, 1800 ma	240 0186 00
L24, L28, L32	NOT USED	

ITEM	DESCRIPTION	COLLINS PART NO.
L26, L35	COIL, RADIO FREQUENCY: single layer wound; magnet wire w/enamel or formvar insulation; 10.0 uh, 0.60 ohms, 740 ma current rating	240 0149 00
L27	COIL, RADIO FREQUENCY: single layer wound; tinned no. 21 or 22 AWG; 2.70 uh, 1.20 ohms resistance, 500 ma	240 0069 00
L29	COIL, RADIO FREQUENCY: 20 turns #26 AWG copper wire, single layer wound; powdered iron core; 0.200 in. dia by 1/2 in. lg wire lead terminals	544 9700 00
L30, L34	COIL, RADIO FREQUENCY: 20 turns #18 AWG copper magnet wire, single layer wound; powdered iron core; 0.250 in. dia by 1 in. lg; wire lead terminals	544 9699 00
M1	VOLTMETER: panel type, dc type, measures 0-400 ma or 0-60 db plastic case	458 0491 00
O1 thru O6	KNOB, ASSEMBLY: pointer, push on type, black phenolic, approx. 1-1/8 in. dia. 3/4 in. h, incl spring	543 8039 00
O7	KNOB, ASSEMBLY: fluted, 8 flutes push on type, pin mtg, black phenolic, 2.078 in. dia by 0.859 in. h; incl disc, spring and skirt	543 8041 00
O8	KNOB, ASSEMBLY: fluted, 5 flutes push on type, pin mtg, black phenolic, spring, pointer and disc. incl	543 8044 00
O9	KNOB, ASSEMBLY: fluted, 5 flutes push on type, pin mtg, black phenolic, spring, pointer and disc incl	543 8044 00
P1 thru P12, P16, P19 thru P21	PLUG, TIP: phone type; 1 terminal; 1-1/4 in. lg	361 0062 00
P13	CONNECTOR, RECEPTACLE, ELECTRICAL: 11 female socket contacts	372 1759 00
P14, P18, P22 thru P25	NOT LISTED	
P15	PLUG, TELEPHONE JACK: 3 circuit, 3/16 in. nom. barrel dia. black plastic, straight, 3.218 in. lg by 0.500 in. dia.	361 0001 00
P25	CONNECTOR, RECEPTACLE, ELECTRICAL: 9 female contacts, 5 amps; 3800 v ac	372 1842 00
R1, R91, R138, R139	RESISTOR, FIXED, COMPOSITION: 47,000 ohms, ±10%, 1/4 w	745 0809 00
R2, R13, R63, R74, R78, R93, R171	RESISTOR, FIXED, COMPOSITION: 1 megohm, ±10%, 1/4 w	745 0857 00
R3	RESISTOR, FIXED, COMPOSITION: 180 ohms, ±10%, 1/2 w	745 1321 00
R4, R37	RESISTOR, FIXED, COMPOSITION: 68,000 ohms, ±10%, 1/2 w	745 1429 00
R5, R26, R98, R136, R165	RESISTOR, FIXED, COMPOSITION: 0.47 megohm, %10%, 1/4 w	745 0845 00
R7, R50, R76, R80, R123, R125, R145	RESISTOR, FIXED, COMPOSITION: 47,000 ohms, ±10%, 1/2 w	745 1422 00
R8, S14	RESISTOR, VARIABLE, COMPOSITION: 500,000 ohms ±30%, 1/4 w	376 7404 00
R9, R28, R168	RESISTOR, FIXED, COMPOSITION: 56 ohms, ±10%, 1/4 w	745 0704 00
R12, R57 R58, R64, R77, R102, R117, R135, R149, R159, R169	RESISTOR, FIXED, COMPOSITION: 1000 ohms, ±10%, 1/2 w	745 1352 00
R44	RESISTOR, FIXED, COMPOSITION: 0.27 megohms, ±10%, 1/2 w	745 1454 00
R14, R16	RESISTOR, FIXED, COMPOSITION: 270 ohms, ±10%, 1/4 w	745 0728 00
R15, R24, R36	RESISTOR, VARIABLE, COMPOSITION: 250 ohms, ±20%, 0.2 w	376 4621 00
R17, R27, R31, R59, R60, R62	RESISTOR, FIXED, COMPOSITION: 100,000 ohms, ±10%, 1/4 w	745 0821 00
R18	RESISTOR, FIXED, COMPOSITION: 47,000 ohms, ±10%, 1 w	745 3422 00
R19, R21, R101, R162	RESISTOR, FIXED, COMPOSITION: 47 ohms, ±10%, 1/2 w	745 1296 00
R20, R47	RESISTOR, FIXED, COMPOSITION: 68,000 ohms, ±10%, 2 w	745 5729 00
R22, R174	RESISTOR, FIXED, COMPOSITION: 56 ohms, ±10%, 1/2 w	745 1300 00
R23, R25	RESISTOR, FIXED, COMPOSITION: 120 ohms, ±10%, 1/2 w	745 1314 00
R29, R30	RESISTOR, FIXED, COMPOSITION: 220 ohms, ±10%, 1/2 w	745 1324 00
R32, R104, R106	RESISTOR, FIXED, COMPOSITION: 100 ohms ±10%, 1/2 w	745 1310 00
R33	RESISTOR, FIXED, COMPOSITION: 33,000 ohms, ±10%, 1 w	745 3415 00
R34, R83	RESISTOR, FIXED, COMPOSITION: 3.3 megohms, ±10%, 1/4 w	745 0875 00
R35, R49, R71, R127, R130, R154	RESISTOR, FIXED, COMPOSITION: 0.10 megohms, ±10%, 1/2 w	745 1436 00

KWM-2 Transceiver

ITEM	DESCRIPTION	COLLINS PART NO.
R38	RESISTOR, FIXED, COMPOSITION: 270 ohms, ±10%, 1/2 w	745 1328 00
R39, R45	RESISTOR, FIXED, COMPOSITION: 500,000 ohms, ±30%, 1/4 w	376 7202 00
R40	RESISTOR, FIXED, COMPOSITION: 100,000 ohms, ±10%, 1 w	745 3436 00
R41, R6	RESISTOR, FIXED, COMPOSITION: 330 ohms, ±10%, 1/2 w	745 1331 00
R42, R48	RESISTOR, FIXED, COMPOSITION: 8.2 megohms, ±10%, 1/4 w	745 0890 00
R43	RESISTOR, FIXED, COMPOSITION: 10 megohms, ±10%, 1/4 w	745 0893 00
R46, R115	RESISTOR, FIXED, COMPOSITION: 2200 ohms, ±10%, 1/2 w	745 1366 00
R51, R52	RESISTOR, FIXED, COMPOSITION: 0.39 megohms, ±10%, 1/4 w	745 0842 00
R53	RESISTOR, FIXED, COMPOSITION: 33,000 ohms, ±10%, 1/4 w	745 0803 00
R54	RESISTOR, FIXED, COMPOSITION: 68,000 ohms, ±10%, 1/4 w	745 0815 00
R55, R66, R96, R122	RESISTOR, FIXED, COMPOSITION: 0.22 megohms, ±10%,1/2 w	745 1450 00
R56, R95, *R161	RESISTOR, FIXED, COMPOSITION: 5600 ohms, ±10%, 1/2 w	745 1384 00
R61, R157	RESISTOR, FIXED, COMPOSITION: 150 ohms, ±10%, 1/2 w	745 1317 00
R65, R128	RESISTOR, FIXED, COMPOSITION: 1.0 megohm, ±10%, 1/2 w	745 1478 00
R67, R79, R120, R141	RESISTOR, FIXED, COMPOSITION: 39,000 ohms, ±10%, 1/2 w	745 1419 00
R68	RESISTOR, FIXED, COMPOSITION: 15,000 ohms, ±10%, 1/2 w	745 1401 00
R69, R73	RESISTOR, FIXED, COMPOSITION: 15,000 ohms, ±10%, 1 w	745 3401 00
R70, R105	RESISTOR, FIXED, COMPOSITION: 22,000 ohms, ±10%, 2 w	745 5708 00
R72, R153	RESISTOR, FIXED, COMPOSITION: 6800 ohms, ±10%, 2 w	745 5687 00
R75	RESISTOR, FIXED, COMPOSITION: 10 ohms, ±10%, 1/2 w	745 1268 00
R82	RESISTOR, FIXED, COMPOSITION: 4700 ohms, ±10%, 1/4 w	745 0773 00
R84	RESISTOR, VARIABLE, COMPOSITION: 10,000 ohms, ±30%, 1/4 w	376 7402 00
R85, R99, R178	RESISTOR, FIXED, COMPOSITION: 12,000 ohms, ±10%, 1/2 w	745 1398 00
R86	RESISTOR, FIXED, WIREWOUND: 2500 ohms, ±10%, 7 w	710 9000 00
R87, R179	RESISTOR, FIXED, COMPOSITION: 6800 ohms, ±10%, 1/2 w	745 1387 00
R88, R126, R129	RESISTOR, FIXED, COMPOSITION: 820 ohms, ±10%, 1/2 w	745 1349 00
R89, R164	RESISTOR, FIXED, COMPOSITION: 0.22 megohms, ±10%, 1/4 w	745 0833 00
R90	RESISTOR, FIXED, COMPOSITION: 27,000 ohms, ±10%, 1/2 w	745 1412 00
R92	RESISTOR, VARIABLE, COMPOSITION: 500,000 ohms, ±30%, 1/4 w	376 7405 00
R94	RESISTOR, FIXED, COMPOSITION: 2.2 megohms, ±10%, 1/4 w	745 0869 00
R97	RESISTOR, FIXED, COMPOSITION: 68 ohms, ±10%, 1/2 w	745 1303 00
R100	RESISTOR, FIXED, COMPOSITION: 10 ohms, ±10%, 1 w	745 3268 00
R103	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±10%, 1/4 w	745 0785 00
R107	RESISTOR: 47 ohms, ±10%, 2 w (p/o Z1)	
R108	RESISTOR: 47 ohms, ±10%, 2 w (p/o Z2)	
R109 thru R114	RESISTOR, FIXED, COMPOSITION: 12 ohms, ±10%, 1/2 w	745 1272 00
R116, R133	RESISTOR, FIXED, COMPOSITION: 18,000 ohms, ±10%, 1/2 w	745 1405 00
R118	RESISTOR, FIXED, COMPOSITION: 0.68 megohms, ±10%, 1/4 w	745 0851 00
R119	RESISTOR, FIXED, COMPOSITION: 1.5 megohms, 1/4 watt	745 0863 00
R121	RESISTOR, VARIABLE, COMPOSITION: 100,000 ohms, ±20%, 0.2 w	376 4622 00
R131	RESISTOR, FIXED, COMPOSITION: 33,000 ohms, ±10%, 2 w	745 5715 00
R132	RESISTOR, VARIABLE, COMPOSITION: 1000 ohms, ±29%, 0.2 w	376 4623 00
R134, R160	RESISTOR, FIXED, COMPOSITION: 0.12 megohms, ±10%, 1/2 w	745 1440 00
R137, R147	RESISTOR, FIXED, COMPOSITION: 82,000 ohms, ±10%, 1/2 w	745 1433 00
R140	RESISTOR, FIXED, COMPOSITION: 22,000 ohms, ±10%, 1/4 w	745 0797 00
R142	RESISTOR, FIXED, COMPOSITION: 10,000 ohms, ±10%, 1 w	745 3394 00
R143	RESISTOR, FIXED, COMPOSITION: 1500 ohms ±10%, 1/2 w	745 1359 00
R144	RESISTOR, FIXED, COMPOSITION: 3300 ohms, ±10%, 1/2 w	745 1373 00
R146	RESISTOR, FIXED, WIREWOUND: 15,000 ohms, ±10%, 7 w	710 9001 00
R148	RESISTOR, FIXED, COMPOSITION: 820 ohms, ±10%, 2 w	745 5649 00
R150, R172	RESISTOR, FIXED, COMPOSITION: 82 ohms, ±10%, 1/4 w	745 0710 00
R151, R124	RESISTOR, FIXED, COMPOSITION: 3900 ohms, ±10%, 1/4 w	745 0770 00
R152, R81	RESISTOR, FIXED, COMPOSITION: 5600 ohms, ±10%, 1/4 w	745 0776 00
R155, R156	RESISTOR, FIXED, COMPOSITION: 1.5 megohms, ±10%, 1/2 w	745 1485 00
R158	RESISTOR, FIXED, COMPOSITION: 68 ohms, ±10%, 1/4 w	745 0707 00
*R161	RESISTOR, FIXED, COMPOSITION: 2700 ohms, ±10%, 1/2 w	745 1370 00
*R161	RESISTOR, FIXED, COMPOSITION: 3300 ohms, ±10%, 1/2 w	745 1373 00
*R161	RESISTOR, FIXED, COMPOSITION: 3900 ohms, ±10%, 1/2 w	745 1377 00
*R161	RESISTOR, FIXED, COMPOSITION: 4700 ohms, ±10%, 1/2 w	745 1380 00
R163	RESISTOR, FIXED, WIREWOUND: 6000 ohms, ±10%, 5 w	710 9118 00
R166	RESISTOR, FIXED, COMPOSITION: 680 ohms, ±10%, 1/2 w	745 1345 00
R167	RESISTOR, FIXED, COMPOSITION: 470 ohms, ±10%, 1/2 w	745 1338 00
R173	RESISTOR, FIXED, COMPOSITION: 22 ohms, ±10%, 2 w	745 5582 00
R176	RESISTOR, FIXED, COMPOSITION: 4700 ohms, ±10%, 1 watt	745 3380 00
R177	RESISTOR, FIXED, COMPOSITION: 27,000 ohms, ±10%, 2 w	745 5712 00
S1	NOT USED	
S2	SWITCH, ROTARY: 1 circuit, 14 positions, 1 moving contact, 15 fixed contacts	269 2023 00
S3, S4, S5	SWITCH, ROTARY: 1 pole; 1 moving contact, 10 fixed contacts	269 2048 00
S6	SWITCH SECTION, ROTARY: 2 circuit, 14 positions, 2 moving contact, 17 fixed contacts	269 1983 00
S7	SWITCH SECTION, ROTARY: 1 circuit, 14 positions, 1 section, 20 moving contacts, 20 fixed contacts	269 1981 00
S8	SWITCH SECTION, ROTARY: 1 circuit, 14 positions, 1 section, 2 moving contacts, 12 fixed contacts	269 1982 00
S9	SWITCH, ROTARY: 4 sections, 8 pole, 5 positions; 2 moving contacts, 12 fixed contacts	259 1076 00
S10	NOT USED	
S11	SWITCH, ROTARY: 1 section, 1 pole, 4 positions, 1 moving contact, 4 fixed contacts	259 1075 00
S12	SWITCH, ROTARY: 1 section, 2 pole, 3 positions, 2 moving contacts, 8 fixed contacts	259 1014 00
S13	SWITCH, ROTARY: 1 section, 1 pole, 14 positions, 1 moving contact, 15 fixed contacts	259 1081 00
T1	TRANSFORMER, INTERMEDIATE, FREQUENCY: 440 to 470 kc frequency range circuit application-interstage	278 0276 00
T2	TRANSFORMER INTERMEDIATE FREQUENCY: 3.055 mc center frequency; 220 kc band pass at 3 db, attenuation 35 db min. from 2.5 mc to 2.7 mc	278 0293 00
T3	TRANSFORMER, RADIO FREQUENCY: 3 turns #28 AGW wire, single layer wound, 18 turns #26 AWG wire, single layer wound	544 9715 002
T4	TRANSFORMER, RADIO FREQUENCY: 12 turns #28 AWG wire	544 9712 002
T5	TRANSFORMER, INTERMEDIATE, FREQUENCY: 440 kc to 470 kc frequency range	278 0281 00
T6	TRANSFORMER, AUDIO FREQUENCY: plate coupling type, 8000 ohms primary; 500 ohms secondary w/4 ohm tap; primary 35 ma dc, secondary 0 dc; open frame	667 0368 00
V1, V3, V4	ELECTRON TUBE: triode-pentode; RCA type 6AZ8	255 0333 00
V2, V11, V12, V13	ELECTRON TUBE: triode-pentode; General Electric type 6U8A	255 0328 00
V5, V6	ELECTRON TUBE: glass envelope, twin triode; Tung-Sol Electronics type 12AT7	255 0205 00
V7	ELECTRON TUBE: glass envelope; pentode; Radio Corp. of America type 6DC6	255 0226 00
V8	ELECTRON TUBE: power pentode; RCA type 6CL6	255 0216 00
V9, V10	ELECTRON TUBE: pentode; RCA type 6146	256 0101 00
V14, V15, V17	ELECTRON TUBE: triode-diode; Sylvania type 6BN8	255 0335 00

*Chosen per operational requirement

KWM-2 Transceiver

ITEM	DESCRIPTION	COLLINS PART NO.
V16	ELECTRON TUBE: triode-pentode; Sylvania type 6EB8	255 0336 00
XDS1	LAMP HOLDER: miniature; bayonet; clip mounting	262 1210 00
XV1 thru XV4 XV12 thru XV17	SOCKET, ELECTRON TUBE: noval type; molded construction; low loss composition	220 1054 00
XV5, XV6, XV8, XV11	SOCKET, ELECTRON TUBE: 9 pin miniature; brass & copper w/plastic insulation	220 1103 00
XV7	SOCKET, ELECTRON TUBE: 7 pin miniature; tube socket; molded construction, plastic	220 1111 00
XV9, XV10	SOCKET, ELECTRON TUBE: 8 female contacts	220 1155 00
XY1	SOCKET, CRYSTAL: accommodates 14 crystals; silver plated copper contacts; phenolic body, 21/32 in. by 2-15/32 in. by 2-1/16 in.	544 2825 002
XY2	SOCKET, CRYSTAL: 2 regularly spaced contact positions, 0.486 in. c to c each contact 0.243 in. from center; cadmium plated phosphor bronze or beryllium copper	292 0082 00
Y1	CRYSTAL UNIT QUARTZ: 6.555 kc frequency	290 8728 00
Y2	CRYSTAL UNIT QUARTZ: 6.755 kc frequency	290 8729 00
Y3	CRYSTAL UNIT QUARTZ: 6.955 kc frequency	290 8730 00
Y4	CRYSTAL UNIT QUARTZ: 10.155 kc frequency	290 8731 00
Y5	CRYSTAL UNIT QUARTZ: 10.355 kc frequency	290 8732 00
Y6	CRYSTAL UNIT QUARTZ: 8.5775 kc frequency	290 8733 00
Y7	CRYSTAL UNIT QUARTZ: 8.6775 kc frequency	290 8734 00
Y8	CRYSTAL UNIT QUARTZ: 8.9775 kc frequency	290 8735 00
Y9	CRYSTAL UNIT QUARTZ: 12.0775 kc frequency	290 8736 00
Y10	CRYSTAL UNIT QUARTZ: 12.1775 kc frequency	290 8737 00
Y11	CRYSTAL UNIT QUARTZ: 12.2775 kc frequency	290 8738 00
Y12	CRYSTAL UNIT QUARTZ: 15.777.500 kc 1 sec, ±0.005% tolerance of frequency	290 9134 00
Y13	NOT SUPPLIED	
Y14	NOT SUPPLIED	
Y15	CRYSTAL UNIT QUARTZ: 100.000 kc	290 8454 00
Y16	CRYSTAL UNIT QUARTZ: 453.650 kc	290 8705 00
Y17	CRYSTAL UNIT QUARTZ: 456.350 kc	290 8706 00
Y18	NOT USED	
Y19 thru Y25	NOT SUPPLIED	
Z1, Z2	SUPPRESSOR, PARASITIC: 2 turns #18 AWG copper wire, 470 ohms, 2 w resistor; 0.318 in. dia by 0.688 in. lg	540 5641 00
Z3	OSCILLATOR 70K-2: c/o the 300 series; return equipment to Collins Radio Company for repair	522 1093 00
Z4	SUPPRESSOR, PARASITIC: 4 turns #26 AWG copper wire; 56 ohms, 10 w resistor; 0.250 in. lg, 0.090 in. dia	544 9698 00
Z5	TRAP, RADIO FREQUENCY: 9 to 11.5 mc tuning range; 10.5 mc; incl 15 uuf capacitor	278 0292 00
	70K-2 OSCILLATOR	522 1093 00
	70K-2 Oscillator consists of the following. This equipment should be returned to Collins Radio Company for repair.	
*C301	CAPACITOR, CERAMIC: 20 uuf ±5%, 500 vdcw	913 0053 00
*C301	CAPACITOR, CERAMIC: 20 uuf ±5%, 500 vdcw	913 0054 00
*C301	CAPACITOR, CERAMIC: 20 uuf ±5%, 500 vdcw	913 0055 00
*C301	CAPACITOR, CERAMIC: 20 uuf ±5%, 500 vdcw	913 0056 00
*C301	CAPACITOR, CERAMIC: 20 uuf ±5%, 500 vdcw	913 0057 00
*C301	CAPACITOR, CERAMIC: 20 uuf ±5%, 500 vdcw	913 0058 00
*C301	CAPACITOR, CERAMIC: 20 uuf ±5%, 500 vdcw	913 0232 00
*C301	CAPACITOR, CERAMIC: 20 uuf ±5%, 500 vdcw	913 0233 00
*C301	CAPACITOR, CERAMIC: 20 uuf ±5%, 500 vdcw	913 0234 00
C302	CAPACITOR, MICA: 1000 uuf ±2%, 500 vdcw	912 1737 00
C303	CAPACITOR, MICA: 3000 uuf ±1%, 500 vdcw	912 1748 00
C304	CAPACITOR, MICA: 200 uuf ±2%, 500 vdcw	912 0514 00
**C305	CAPACITOR, CERAMIC: 100 uuf ±2%, 500 vdcw	913 0074 00
**C305	CAPACITOR, CERAMIC: 100 uuf ±2%, 500 vdcw	913 0246 00
C306, C307, C309	CAPACITOR, CERAMIC: 0.02 uf +60% -40%, 250 vdcw	913 2097 00
C308	CAPACITOR, VARIABLE, CERAMIC: 5 uuf min to 37.5 uuf max, 350 vdcw	917 1073 00
CR301	SEMICONDUCTOR DEVICE, DIODE: germanium; Sylvania part no. 1N34A	353 0103 00
L301	COIL, RADIO FREQUENCY: 22 turns #28 AWG double formvar, 2.4 uh inductance	240 0652 00
L302	TRIMMER ASSEMBLY: 9 turns #28 AWG wire, 1 toroid coil and hardware	543 7323 00
L303	INDUCTOR, TUNING: 10 turns #30 AWG wire	543 7333 003
L304	COIL, RADIO FREQUENCY: single layer wound, magnet wire, 3.30 uh	240 0695 00
R301, R303	RESISTOR, COMPOSITION: 0.10 megohms ±10%, 1/2 w	745 1436 00
R302	RESISTOR, COMPOSITION: 82,000 ohms ±5%, 1/2 w	745 1432 00
T301	TRANSFORMER, RADIO FREQUENCY: pri 380 uh nom 790 kc; sec 2.7 uh nom., 2.6 mc	240 0665 00
V301	ELECTRON TUBE: pentode; General Electric type 6AU6	255 0202 00
	516F-2 POWER SUPPLY	522 1170 00
C1	CAPACITOR, FIXED, PAPER: 0.05 uf ±10%, 1000 vdcw	961 4646 00
C2, C3, C4	CAPACITOR, FIXED, ELECTROLYTIC: 30 uf -10% +40%, 400 vdcw	183 1771 00
C5A, C5B	CAPACITOR, FIXED, ELECTROLYTIC: dual section, 15 uf -10% +40%, 400 v; 30 uf -10% +40%, 400 v	183 1781 00
C6	CAPACITOR, FIXED, DRY ELECTROLYTIC: 10 uf -15% +50%, 250 vdcw	183 1046 00
C7	CAPACITOR, FIXED, DRY ELECTROLYTIC: 10 uf -10% +100%, 150 vdcw	183 1040 00
CR1	RECTIFIER, METALLIC: selenium	353 0153 00
F1	FUSE, CARTRIDGE: 4 amps, 125 v, glass enclosed, 4 spares furnished	264 0217 00
L1, L2	REACTOR: 2 coils, 8.0 henrys, 150 ma dc, 200 ohms resistance, ea reactor	668 0300 00
L3	REACTOR: 1 coil, 0.92 henrys, 180 ma dc, 25 ohms resistance	668 0322 00
P1	CONNECTOR, RECEPTACLE, ELECTRICAL: 11 female socket contacts, Amphenol 78-S11T or Cinch 13786; mates w/Amphenol p/n 86CP11T Collins Radio p/n 372 1757 00 Shell for mating connector	372 1759 00
P2	ADAPTER, CONNECTOR: 2 mating ends, 3 contacts ea end, plastic dielectric, a-c plug 110 v, adapts 3 contact male plug to a 2 contact female receptacle	368 0110 00
R1, R2, R3	RESISTOR, FIXED, COMPOSITION: 270K ohms ±10%, 2 w	745 5754 00
R4, R5	RESISTOR, FIXED, WIREWOUND: 25K ohms ±5%, 11 w	710 0080 00
R6	RESISTOR, FIXED, WIREWOUND: 24K ohms ±5%, 25 w	710 0374 00
R7	RESISTOR, FIXED, COMPOSITION: 100 ohms ±10%, 1/2 w	745 1310 00
R8	RESISTOR, FIXED, COMPOSITION: 4700 ohms ±10%, 2 w	745 5680 00
R9	RESISTOR, VARIABLE, WIREWOUND: 2500 ohms ±10%, 2 w	750 0522 00
R10	RESISTOR, FIXED, COMPOSITION: 5600 ohms ±10%, 2 w	745 5684 00
T1	TRANSFORMER, POWER: pri 115 v 50/60 cps, sec. 6.3 5.0 v, 5.0 v, 275 v ct & tapped at 115V, 800 v ct	662 0434 00
V1	ELECTRON TUBE: type 5R4GYA	257 0142 00
V2	ELECTRON TUBE: type 5U4GB	257 0109 00
XF1	FUSEHOLDER: extractor post type, 125 v, 5 amp, accommodates 3AG cartridge fuse	265 1002 00
XV1, XV2	SOCKET, ELECTRON TUBE: 8 contact, octal, phenolic insulation	220 1155 00

*Chosen per operational requirement

**Selected in final test

GENERAL COVERAGE CRYSTALS AVAILABLE								
CRYSTAL FREQUENCY (kc)	FOR OPERATING FREQUENCY (mc)	PART NUMBER	CRYSTAL FREQUENCY (kc)	FOR OPERATING FREQUENCY (mc)	PART NUMBER	CRYSTAL FREQUENCY (kc)	FOR OPERATING FREQUENCY (mc)	PART NUMBER
6555.000	3.4-3.6	290 9009 00	8477.500	13.8-14.0	290 9061 00	12877.500	22.6-22.8	290 9105 00
6755.000	3.6-3.8	290 9010 00	8577.500	14.0-14.2	290 9062 00	12977.500	22.8-23.0	290 9106 00
6955.000	3.8-4.0	290 9011 00	8677.500	14.2-14.4	290 9063 00	13077.500	23.0-23.2	290 9107 00
7155.000	4.0-4.2	290 9012 00	8777.500	14.4-14.6	290 9064 00	13177.500	23.2-23.4	290 9108 00
7355.000	4.2-4.4	290 9013 00	8877.500	14.6-14.8	290 9065 00	13277.500	23.4-23.6	290 9109 00
7555.000	4.4-4.6	290 9014 00	8977.500	14.8-15.0	290 9066 00	13377.500	23.6-23.8	290 9110 00
7755.000	4.6-4.8	290 9015 00	9077.500	15.0-15.2	290 9067 00	13477.500	23.8-24.0	290 9111 00
7955.000	4.8-5.0	290 9016 00	9177.500	15.2-15.4	290 9068 00	13577.500	24.0-24.2	290 9112 00
9755.000	6.6-6.8	290 9025 00	9277.500	15.4-15.6	290 9069 00	13677.500	24.2-24.4	290 9113 00
9955.000	6.8-7.0	290 9026 00	9377.500	15.6-15.8	290 9070 00	13777.500	24.4-24.6	290 9114 00
10155.000	7.0-7.2	290 9027 00	9477.500	15.8-16.0	290 9071 00	13877.500	24.6-24.8	290 9115 00
10355.000	7.2-7.4	290 9028 00	9577.500	16.0-16.2	290 9072 00	13977.500	24.8-25.0	290 9116 00
10555.000	7.4-7.6	290 9029 00	9677.500	16.2-16.4	290 9073 00	14077.500	25.0-25.2	290 9117 00
10755.000	7.6-7.8	290 9030 00	9777.500	16.4-16.6	290 9074 00	14177.500	25.2-25.4	290 9118 00
10955.000	7.8-8.0	290 9031 00	9877.500	16.6-16.8	290 9075 00	14277.500	25.4-25.6	290 9119 00
11155.000	8.0-8.2	290 9032 00	9977.500	16.8-17.0	290 9076 00	14377.500	25.6-25.8	290 9120 00
11355.000	8.2-8.4	290 9033 00	10077.500	17.0-17.2	290 9077 00	14477.500	25.8-26.0	290 9121 00
11555.000	8.4-8.6	290 9034 00	10177.500	17.2-17.4	290 9078 00	14577.500	26.0-26.2	290 9122 00
11755.000	8.6-8.8	290 9035 00	10277.500	17.4-17.6	290 9079 00	14677.500	26.2-26.4	290 9123 00
11955.000	8.8-9.0	290 9036 00	10377.500	17.6-17.8	290 9080 00	14777.500	26.4-26.6	290 9124 00
12155.000	9.0-9.2	290 9037 00	10477.500	17.8-18.0	290 9081 00	14877.500	26.6-26.8	290 9125 00
12355.000	9.2-9.4	290 9038 00	10577.500	18.0-18.2	290 9082 00	14977.500	26.8-27.0	290 9126 00
12555.000	9.4-9.6	290 9039 00	10677.500	18.2-18.4	290 9083 00	15077.500	27.0-27.2	290 9127 00
12755.000	9.6-9.8	290 9040 00	10777.500	18.4-18.6	290 9084 00	15177.500	27.2-27.4	290 9128 00
12955.000	9.8-9.10	290 9041 00	10877.500	18.6-18.8	290 9085 00	15277.500	27.4-27.6	290 9129 00
13155.000	10.0-10.2	290 9042 00	10977.500	18.8-19.0	290 9086 00	15377.500	27.6-27.8	290 9130 00
13355.000	10.2-10.4	290 9043 00	11077.500	19.0-19.2	290 9087 00	15477.500	27.8-28.0	290 9131 00
13555.000	10.4-10.6	290 9044 00	11177.500	19.2-19.4	290 9088 00	15527.500	27.9-28.1	290 9142 00
13755.000	10.6-10.8	290 9045 00	11277.500	19.4-19.6	290 9089 00	15577.500	28.0-28.2	290 9132 00
13955.000	10.8-11.0	290 9046 00	11377.500	19.6-19.8	290 9090 00	15627.500	28.1-28.3	290 9143 00
14155.000	11.0-11.2	290 9047 00	11477.500	19.8-20.0	290 9091 00	15677.500	28.2-28.4	290 9133 00
14355.000	11.2-11.4	290 9048 00	11577.500	20.0-20.2	290 9092 00	15727.500	28.3-28.5	290 9144 00
14555.000	11.4-11.6	290 9049 00	11677.500	20.2-20.4	290 9093 00	15777.500	28.4-28.6	290 9134 00
14755.000	11.6-11.8	290 9050 00	11777.500	20.4-20.6	290 9094 00	15877.500	28.6-28.8	290 9135 00
14955.000	11.8-12.0	290 9051 00	11877.500	20.6-20.8	290 9095 00	15927.500	28.7-28.9	290 9145 00
7577.500	12.0-12.2	290 9052 00	11977.500	20.8-21.0	290 9096 00	15977.500	28.8-29.0	290 9136 00
7677.500	12.2-12.4	290 9053 00	12077.500	21.0-21.2	290 9097 00	16027.500	28.9-29.1	290 9146 00
7777.500	12.4-12.6	290 9054 00	12177.500	21.2-21.4	290 9098 00	16077.500	29.0-29.2	290 9137 00
7877.500	12.6-12.8	290 9055 00	12277.500	21.4-21.6	290 9099 00	16127.500	29.1-29.3	290 9147 00
7977.500	12.8-13.0	290 9056 00	12377.500	21.6-21.8	290 9100 00	16177.500	29.2-29.4	290 9138 00
8077.500	13.0-13.2	290 9057 00	12477.500	21.8-22.0	290 9101 00	16227.500	29.3-29.5	290 9148 00
8177.500	13.2-13.4	290 9058 00	12577.500	22.0-22.2	290 9102 00	16277.500	29.4-29.6	290 9139 00
8277.500	13.4-13.6	290 9059 00	12677.500	22.2-22.4	290 9103 00	16327.500	29.5-29.7	290 9149 00
8377.500	13.6-13.8	290 9060 00	12777.500	22.4-22.6	290 9104 00	16377.500	29.6-29.8	290 9140 00
						16477.500	29.8-30.0	290 9141 00

15827.500 5-7

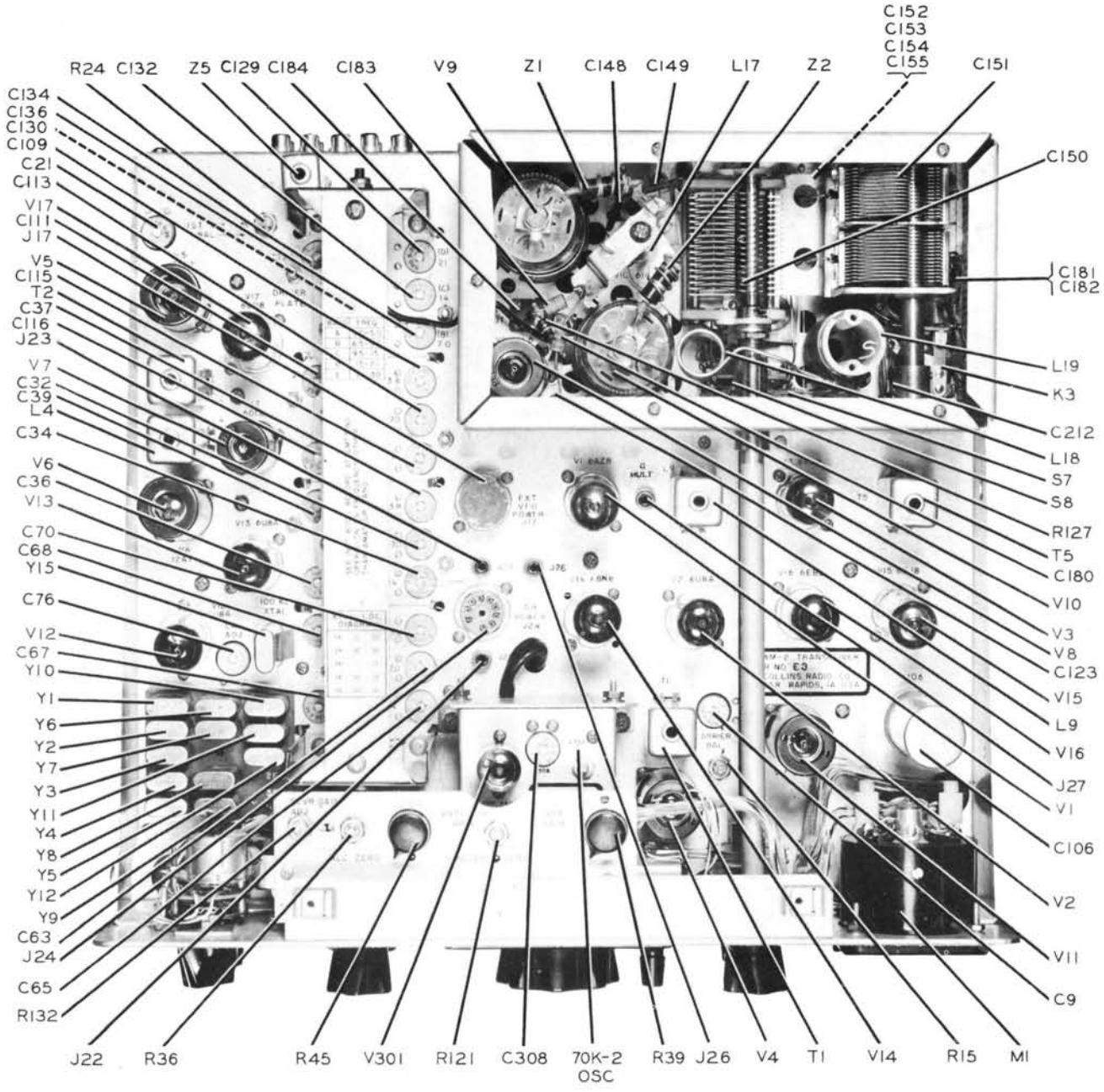


Figure 6-1. Top Chassis, Parts Identification

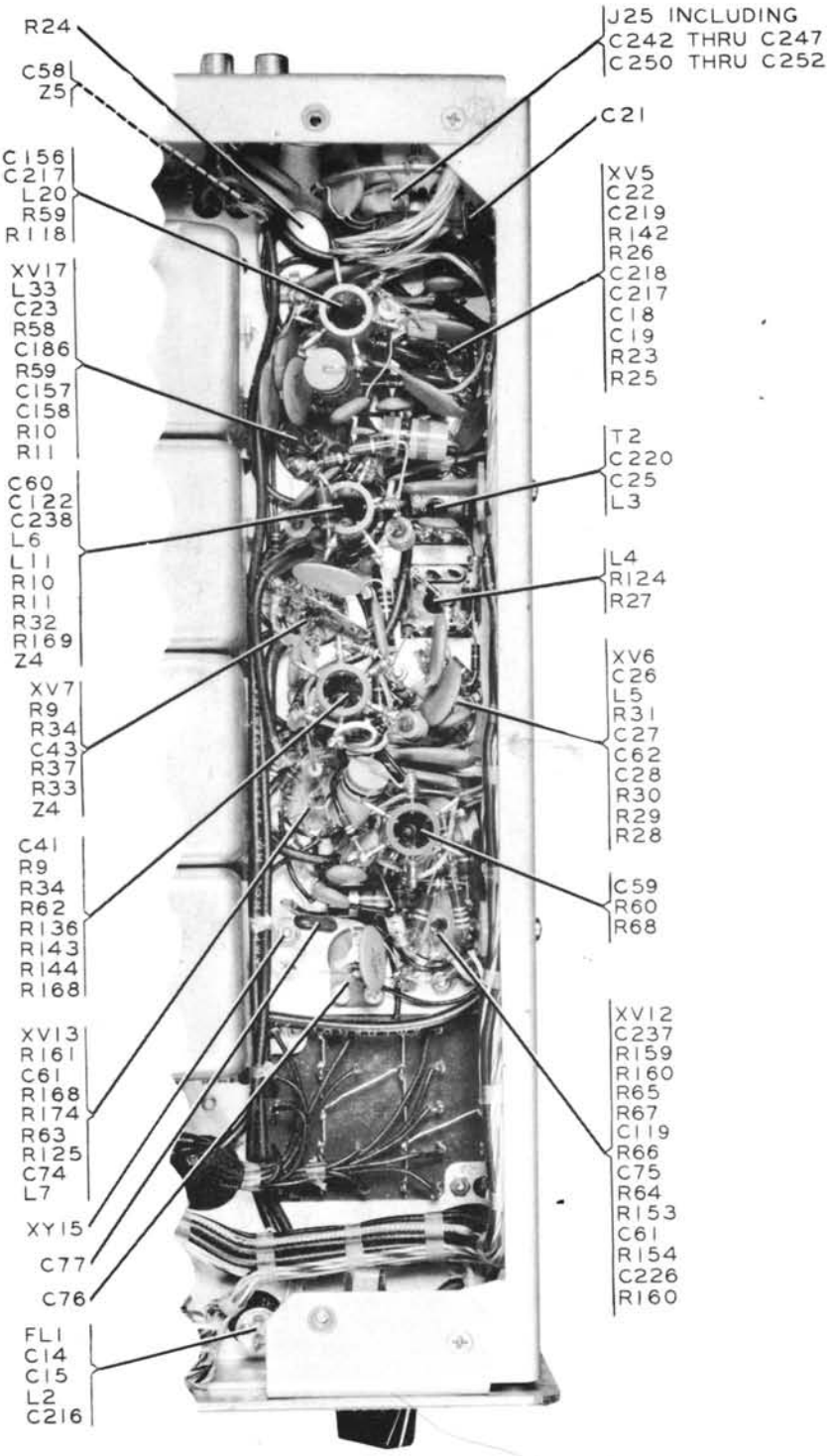


Figure 6-2. Bottom Right View, Parts Identification

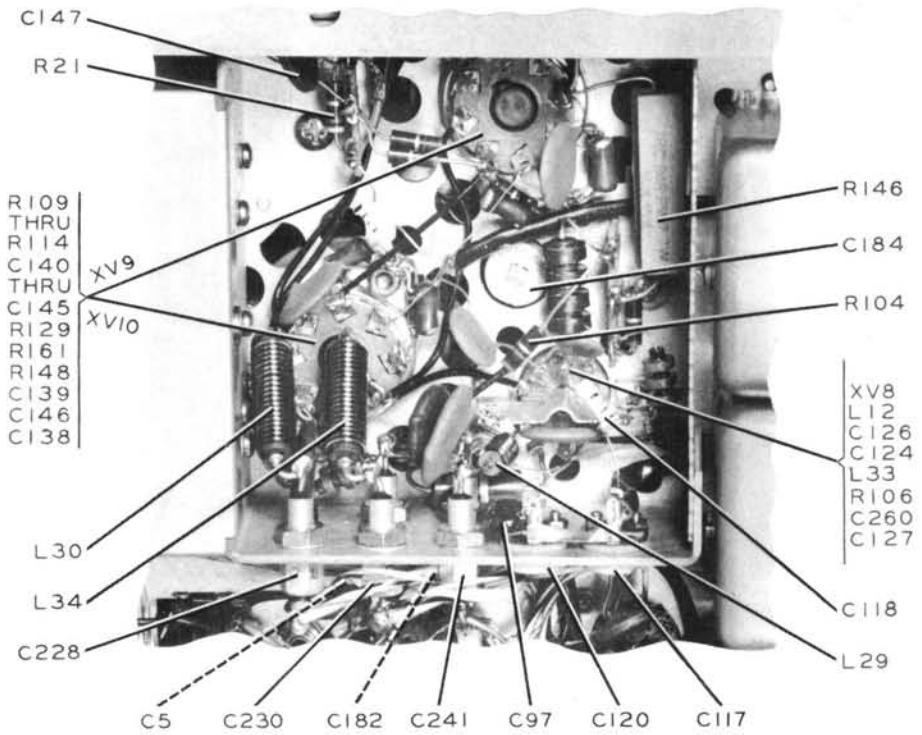


Figure 6-3. PA and Driver Grid Compartment, Parts Identification, Bottom View

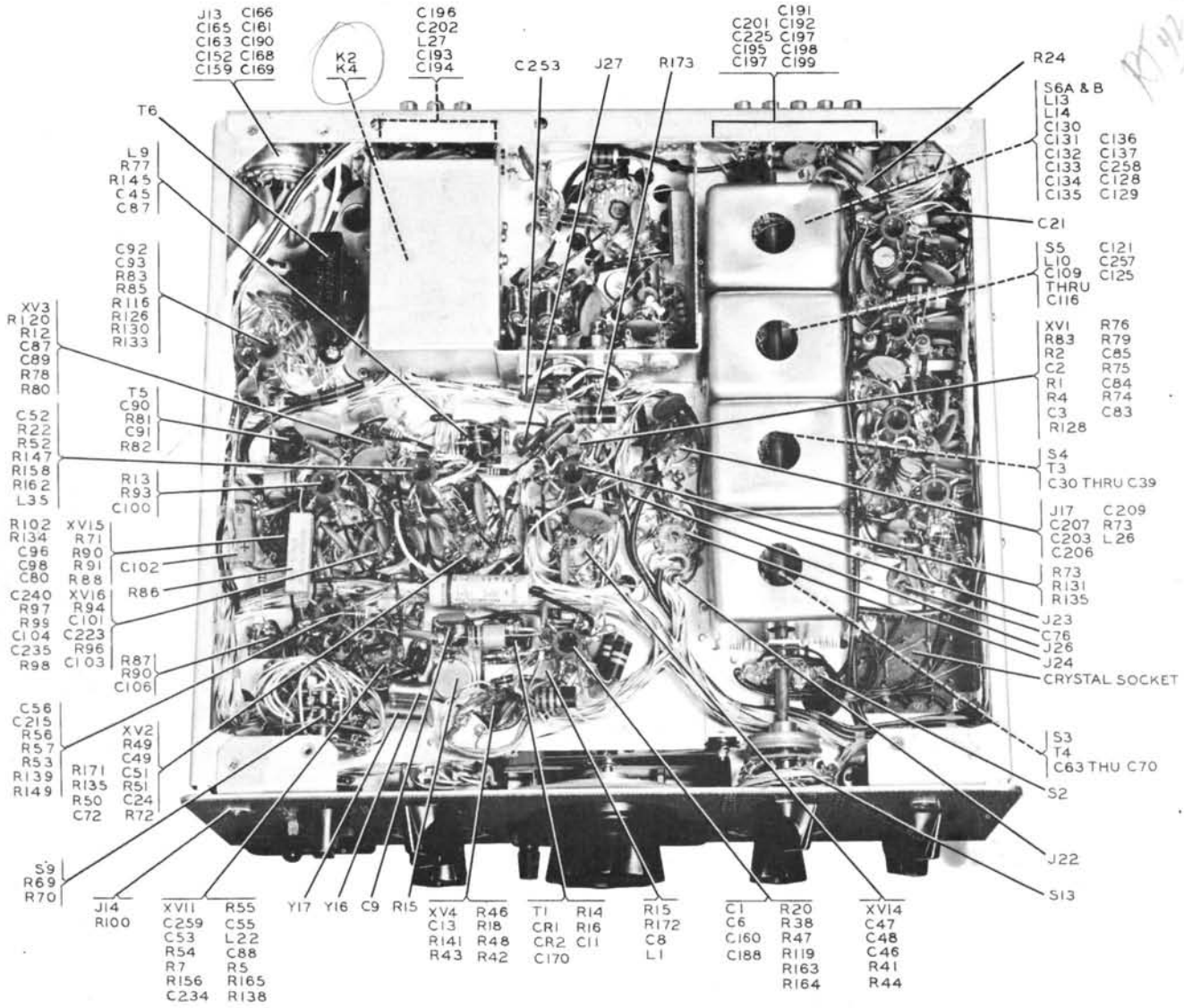


Figure 6-4. Bottom View, Parts Identification

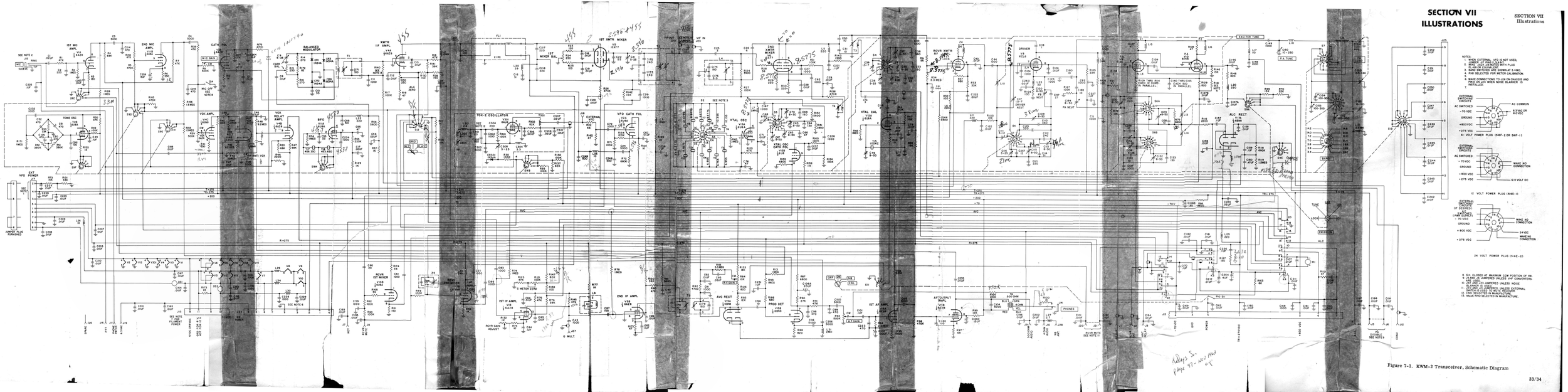


Figure 7-1. KWM-2 Transceiver, Schematic Diagram

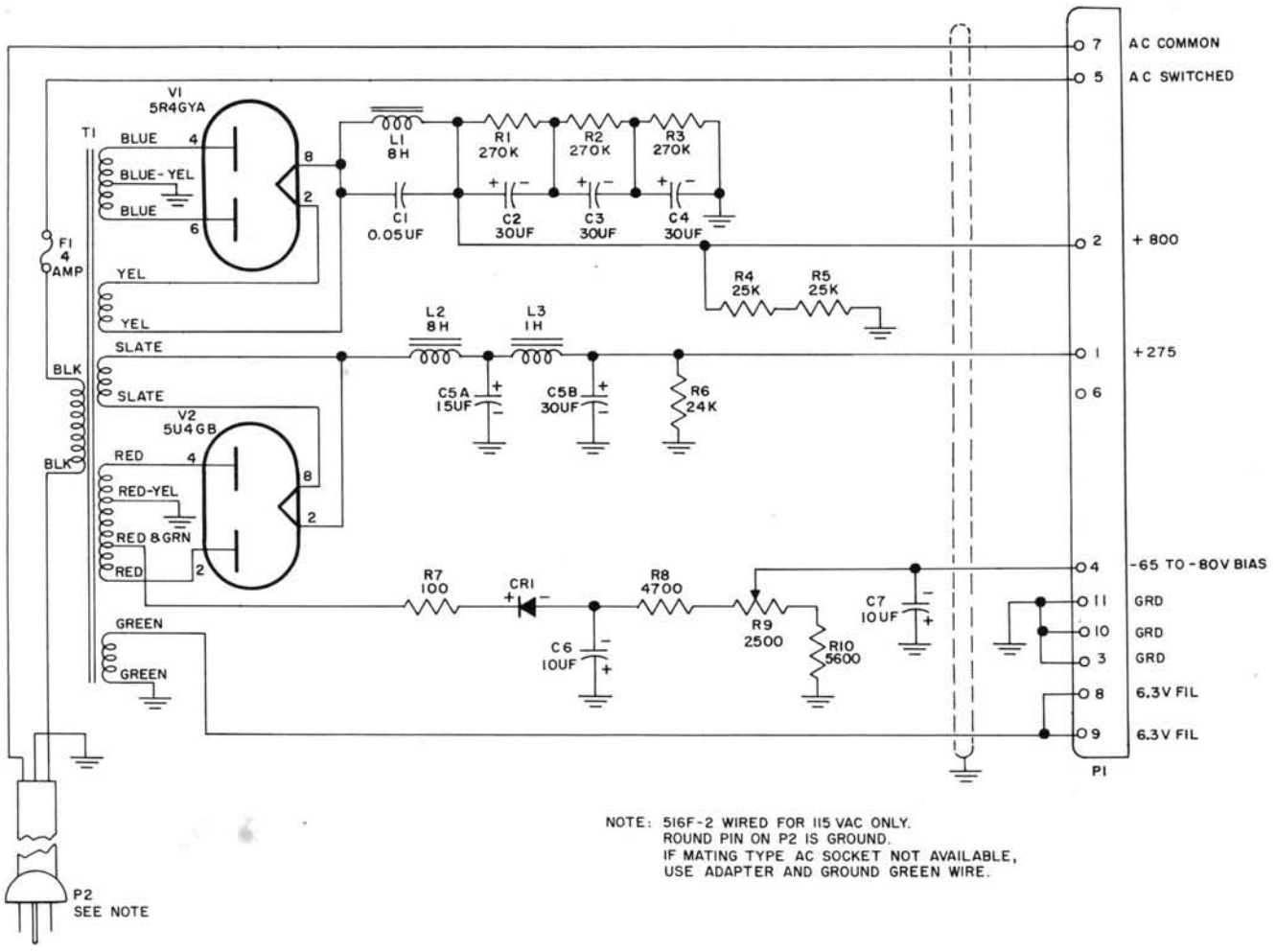


Figure 7-2. 516F-2 Power Supply, Schematic Diagram

44 64.5
44 67.5
4585.0
4582.0

HOOK-UP WIRE CODE

The characteristics of the hook-up wire used in this equipment are indicated by groups of symbols on the diagrams. Each symbol group consists of a maximum of three letters followed by a maximum of three numerals. When three letters are used the first indicates the type of wire, the second represents the size of wire, and the third is the letter "S", used only when the wire is shielded. When two letters are used, the first and second letters indicate either the type and size of wire or the size of wire and shielding, respectively. When one letter is used it indicates the wire size only. The first numeral indicates the color of the wire body and the second and third numerals, if any, represent the colors of tracers, all numerals being in accordance with the standard EIA and MIL-W-16878 color code.

The symbols are assigned according to the following table.

TYPE OF WIRE CODE	
LETTER	TYPE OF WIRE
A	Cotton Braid Over Plastic (Formerly AN-J-C-48)
B	Busbar, Round Tinned
C	MIL-W-16878 Type B (#20 and Larger) (600 Volts)
D	Miniature Wire, MIL-W-16878 Type B (#22 and Smaller)
E	
F	Extra Flexible Varnished Cambric
G	
H	Kel-F (Monochlorotrifluoroethylene)
J	
K	Neon Sign Cable (15,000 Volts)
L	Silicone
M	
N	Single Conductor Stranded (Not Rubber Covered)
P	Single Conductor Stranded (Rubber Covered)
Q	
R	MIL-W-16878 Type C (1000 Volts)
T	Teflon, MIL-W-16878 Type E (600 Volts)
V	MIL-W-16878 Type D (3000 Volts)
W	Teflon, MIL-W-16878 Type EE (1000 Volts)
X	
Y	
Z	Acetate Yarn, Telephone Type

SIZE OF WIRE CODE	
LETTER	SIZE
A	#22 AWG
B	#20
C	#18
D	#16
E	#14
F	#12
G	#10
H	#8
J	#6
K	#4
L	#2
M	#1
N	#0
P	#00
Q	#000
R	#0000
T	#28
V	#26
W	#24
X	#19
Y	#30
Z	

COLOR CODE	
NUMBER OR LETTER	COLOR
0	Black
1	Brown
2	Red
3	Orange
4	Yellow
5	Green
6	Blue
7	Violet
8	Gray (Slate)
9	White
a	Clear
b	Tan
c	Pink
d	Maroon
e	Light Green
f	Light Blue

EXAMPLES

MIL TYPE C, #22AWG, UNSHIELDED WIRE, WHITE WITH RED AND GREEN TRACERS:

R	A	9	25	--	4-1/4
Type of Wire	Size of Wire	Color of Body	Color of Tracers	--	Length of Wire in Inches (Includes Stripping & Tinning)

MIL TYPE C, #16AWG, SHIELDED WIRE (SINGLE), WHITE WITH RED AND GREEN TRACERS:

R	D	S	9	25	--	4-1/4
Type of Wire	Size of Wire	Shielded	Color of Body	Color of Tracers	--	Length of Wire in Inches (Includes Stripping & Tinning)

MIL TYPE B, #22AWG, SHIELDED WIRE (MULTIPLE), WHITE, AND WHITE WITH RED TRACER:

D	A	S	(9)	(92)	--	4-1/4
Type of Wire	Size of Wire	Shielded	First Conductor	Second Conductor	--	Length of Wire in Inches (Includes Stripping & Tinning)

COLLINS RADIO COMPANY