

R-55A AMATEUR AND SHORTWAVE COMMUNICATIONS RECEIVER

designed for reliable shortwave and amateur listening

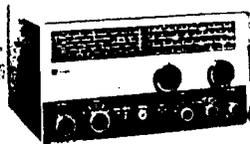
- 5 Bands—Tunes 530 kc to 36 mc and 47 to 54 mc
- Calibrated Electrical Bandsread for Easy Tuning
- Large, Edge-Illuminated Slide Rule Dial
- Two IF Stages for Greater Selectivity
- Fused, Transformer Power Supply
- Built-In Speaker; Front-Panel Phone Jack

The Knight-Kit R-55A is an outstanding general coverage shortwave and Amateur communications receiver. It is designed to meet the initial needs of newcomers to Amateur Radio as well as Technician licensees. Shortwave listeners, "armchair adventurers," electronics enthusiasts, and hobbyists will find the R-55A meets the high standards needed for reliable 'round-the-world radio listening.

The frequency range (530 kilocycles through 36 megacycles) covers standard, medium and shortwave broadcasts including all Amateur bands from 160 through 10 meters. A separate Amateur band for 6 meters has 47 through 54 megacycles frequency coverage. The receiver uses a separate bandsread tuning capacitor to simplify the tuning of crowded stations. All Amateur bands from 80 through 6 meters have electrical bandsread individually calibrated to read frequency directly in megacycles.

A self-contained speaker peaks communication frequencies. Headphones may be used at the front-panel jack, if desired. Deluxe circuitry includes: Automatic Volume Control; an effective noise filter; adjustable Beat Frequency Oscillator, and an antenna trimmer for maximum signal strength. The R-55A is transformer-operated and fused for safety.

Whether you're a beginning Ham or a seasoned shortwave listening fan—the Knight-Kit R-55A will place a new world of exciting listening at your finger tips.



- Tuning shaft and two C washers. See Figure 17. Place a C washer in the groove near the center of the shaft. Lock it in place by pinching the ends of the washer with your longnose pliers. From the back of the control panel, insert the shaft through the $\frac{3}{8}$ " bushing marked BANDSPREAD. Place the second C washer in the remaining groove and lock it in place with your longnose pliers.

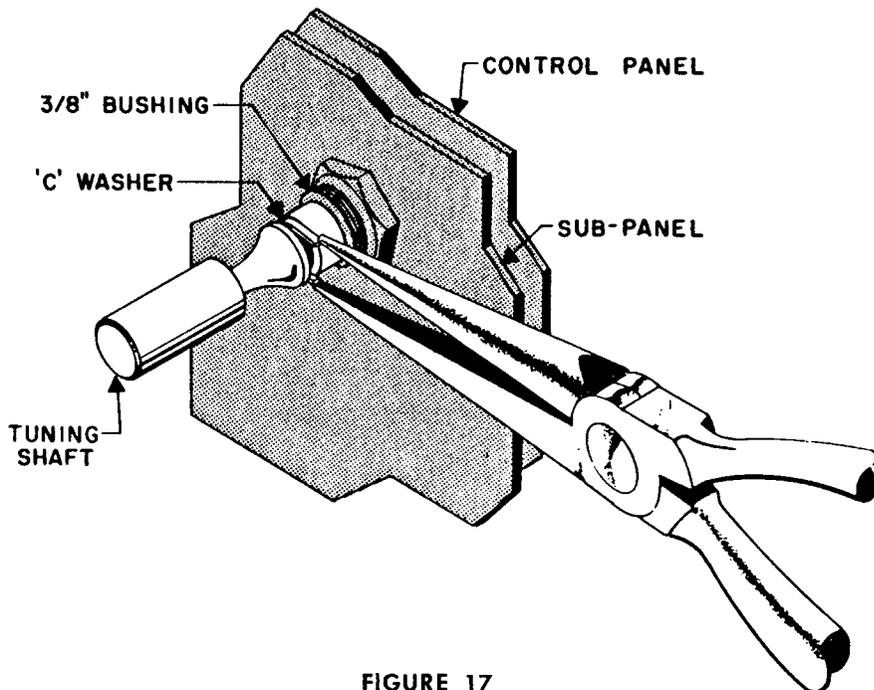


FIGURE 17

- Tuning shaft and two C washers. Similarly mount this tuning shaft in the bushing marked MAIN TUNING.

SEE FIGURE 18.

- Dial cord for stringing C-1, main tuning capacitor. See detail A. Loosely tie one end of the cord around a length of yellow tubing. Remove the tubing. From the knot, measure off $51\frac{1}{2}$ ". At this point tie another loop around the yellow tubing. Remove the tubing. Cut OFF the excess cord length.

- Place one of the loops on the tab of the large pulley (C-1) labeled START in Figure 18. Bring the cord up through the rim opening and half way around the pulley. Follow arrows. The cord leaves the bottom of the large pulley, is threaded around small pulleys 1 and 2 (2 is closer to sub-panel), around the tuning shaft for $2\frac{1}{2}$ turns and back over the top of the large pulley for 1 turn. Hook a spring in the loop at the end of the cord. Feed the cord through the rim opening and hook the end of the spring around the tab labeled FINISH. By rotating the tuning shaft, the capacitor should open and close freely. Make sure sections of the dial cord DO NOT RUB against each other as you rotate the shaft.

- Red dial pointer. See Figure 18, Detail B. Rotate the tuning shaft of the MAIN TUNING capacitor until the plates are fully open. Make sure the pointer is not bent and that it is properly seated on the sub-panel. Slide the pointer as far as you can toward small pulley wheel 1. Place the cord between the tabs of the pointer. Bend the center tab of the pointer over the cord to hold the pointer firmly in place. Rotate the shaft; the pointer should slide smoothly across the dial plate.

SEE FIGURE 19.

- Dial cord for stringing C-2, bandspread capacitor. See detail A. Tie two loops in the cord exactly $50\frac{1}{2}$ " apart. Remove excess cord length.
- Place one of the loops on the tab of the large pulley labeled START. Bring the cord up through the rim opening and half way around the pulley. Follow arrows. The cord leaves the bottom of the pulley and is threaded around small pulleys 3 and 4, around the tuning shaft for $2\frac{1}{2}$ turns and back over the top of the large pulley for 1 turn. Hook the remaining spring in the loop at the end of the cord. Bring the cord through the rim opening and hook the end of the spring around the tab labeled FINISH. Make sure the cord DOES NOT RUB at any point and that the capacitor opens and closes freely when you rotate the shaft.
- Green dial pointer. See Figure 19, Detail B. Rotate the shaft of the BANDSPREAD capacitor so the plates are fully closed. Slide the dial pointer as far as you can toward pulley wheel 4 and clamp the center tab of the pointer over the dial cord to hold the pointer firmly in place. Bend the three tabs that hold the dial cord at a slight upward angle, being careful that the pointer remains clamped on the cord. Rotate the shaft; the pointer should slide smoothly across the dial plate and come to rest just to the right of SET MAIN TUNING. If the pointer does not travel this far, increase the upward angle of the pointer tabs.

FIGURE 18

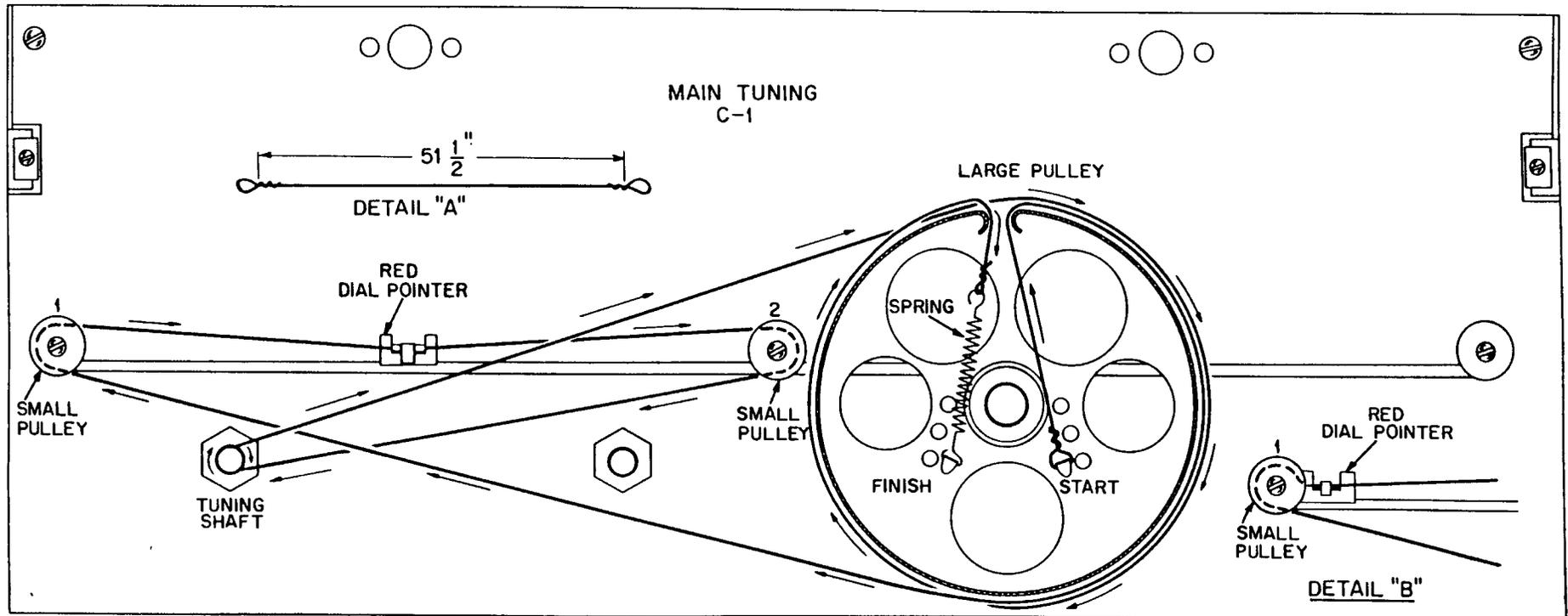
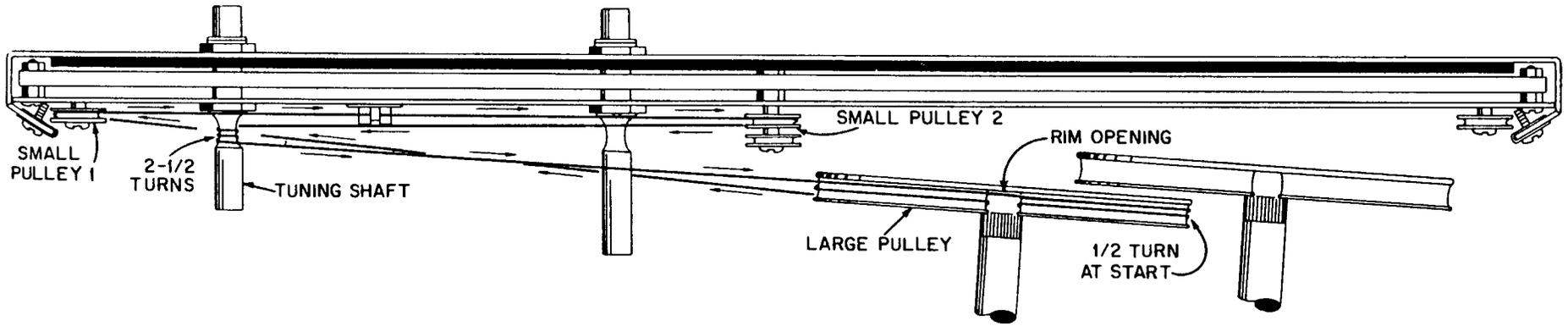
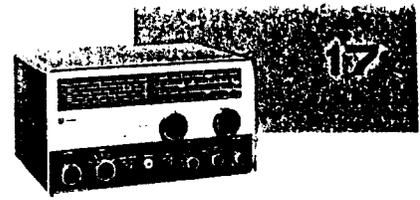




FIGURE 19

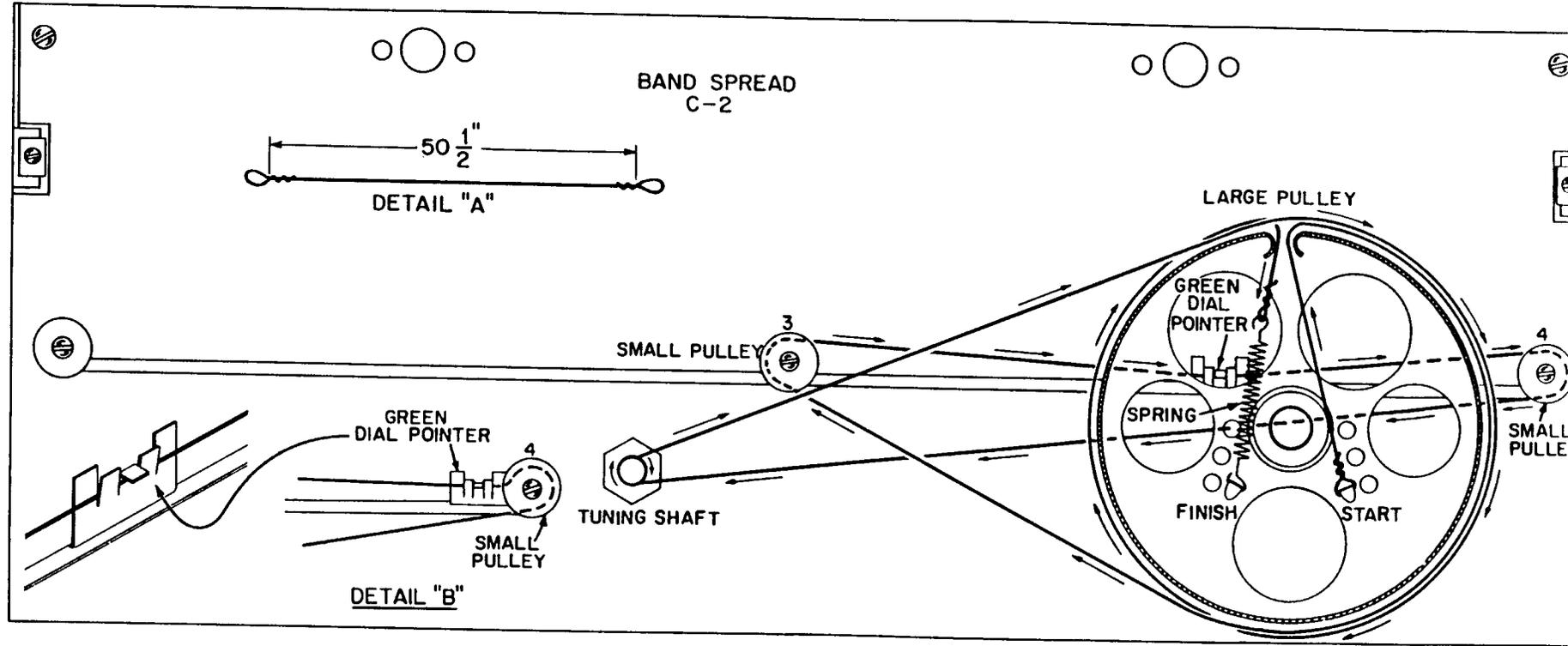
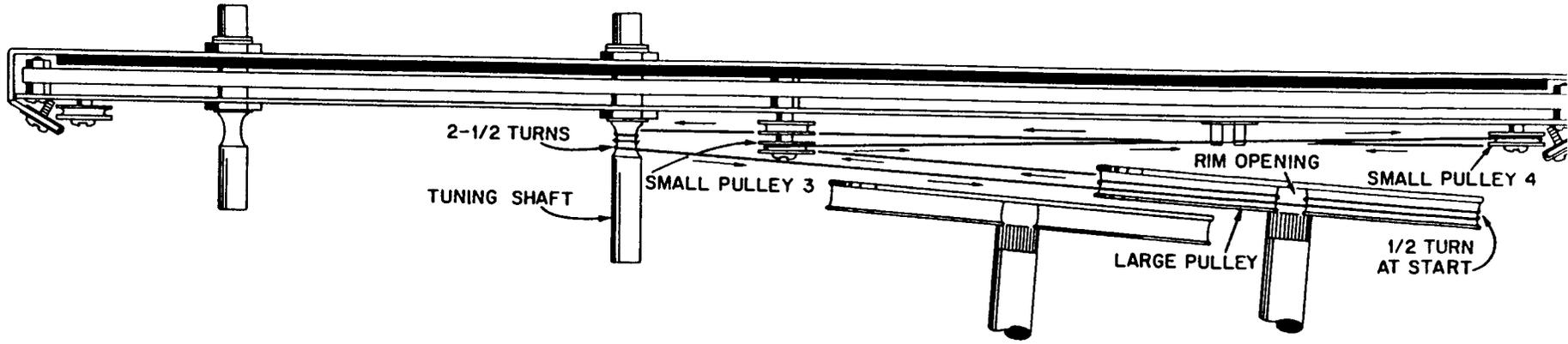
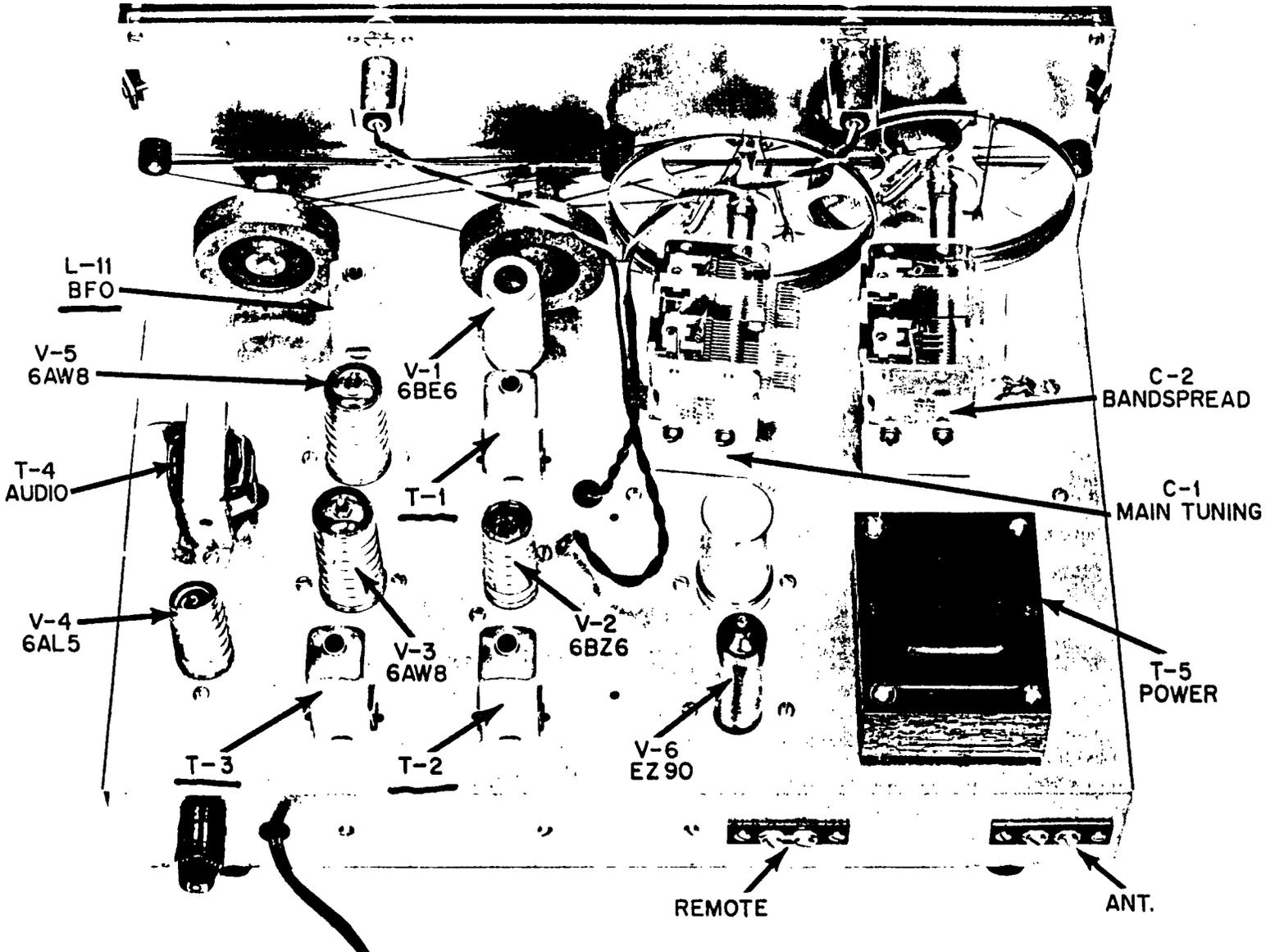
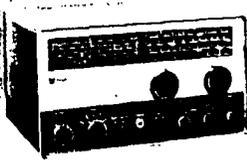


FIGURE 32





ON THE AIR ALIGNMENT

For alignment of all bands, the controls should be set as follows unless otherwise stated.

VOLUME set to maximum

BFO set to OFF

NOISE LIMITER set to OFF

STANDBY-MVC-AVC-CAL set to MVC

BANDSPREAD pointer set to SET MAIN TUNING

BAND SWITCH set to band being aligned

I.F. ALIGNMENT. See Figure 32.

BAND A

.53mc to 1.9mc (broadcast band)

Connect an antenna to terminal 1 of TS-1 (marked ANT on the chassis). See section on antenna.

Plug the AC line cord in a 110 v. 60 cycle outlet.

At the low end of BAND A tune in a local broadcast station with the MAIN TUNING dial.

Insert the plastic tuning rod through the top of T-3 until it engages the bottom tuning slug. Adjust this slug for maximum volume, then adjust the top tuning slug for maximum.

NOTE: Adjust I.F. transformers from the *top* of the chassis only.

Similarly adjust T-2, then T-1.

NOTE: L-1 to L-10 have been preadjusted at the factory. Only a slight adjustment will be necessary to peak these coils. These adjustments are made from the bottom of the chassis with the bottom cover attached.

BAND A

At the HIGH END of the band, tune in a local broadcast station whose frequency of transmission is known.

Simultaneously adjust the MAIN TUNING and C-6 until the signal being received is loudest and at the correct location on the dial.

Tune in a known frequency at the LOW END of the band.

Simultaneously adjust the MAIN TUNING and L-6 until the signal being received is loudest and at the correct location on the dial.

Without changing the MAIN TUNING dial, adjust L-1 for maximum volume. Because of interaction between C-6 and L-6 it will be necessary to repeat these adjustments several times for best accuracy.

BAND B

1.8mc to 6.3mc (80 meters)

Rotate the ANTENNA control until it is almost counterclockwise.

Tune in station WWV at 5mc. In some areas, WWV can only be received at night.

Simultaneously adjust the MAIN TUNING and L-7 until WWV is loudest and the dial pointer reads 5mc.

Adjust L-2 for maximum volume.

BAND C

6mc to 14.4mc (20 and 40 meters)

ANTENNA control to center of rotation.

Tune to station WWV at 10mc.

Simultaneously adjust the MAIN TUNING and L-8 until WWV is loudest and the dial pointer reads 10mc.

Tune L-3 for maximum volume.

BAND D

11.5mc to 33mc (10 and 15 meters)

ANTENNA control almost fully counterclockwise.

Tune to station WWV at 15mc. WWV can be received best during the day.

Simultaneously adjust MAIN TUNING and L-9 until WWV is loudest and the dial pointer reads 15mc.

Tune L-4 for maximum volume.

BAND E

47mc to 54mc (6 meters)

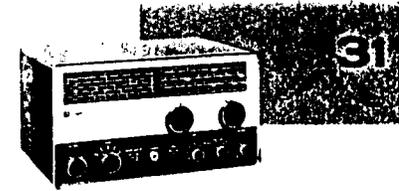
ANTENNA control almost fully clockwise.

MAIN TUNING set to 6 METERS.

Rotate the BANDSPREAD to a strong signal of known frequency.

Simultaneously adjust the BANDSPREAD and L-10 until the signal is loudest and at the correct location on the BANDSPREAD dial.

Tune L-5 for maximum volume.



BFO

STANDBY-MVC-AVC-CAL set to MVC

BFO set to ON

Tune to a strong signal on any band except the broadcast band (A).

As you rotate the BFO control a whistle should be heard. If not, adjust L-11 from the top of the chassis.

ALIGNMENT WITH INSTRUMENTS

EQUIPMENT REQUIRED

Voltmeter capable of reading down to 0.5 volts AC.

Signal generator with ranges from 530kc to 54mc. 30% modulation at 400 cycles.

300 $\mu\mu\text{f}$ capacitor.

SEE FIGURE 33.

Connect the coaxial cable to the generator as shown.

Connect one lead of the 300 $\mu\mu\text{f}$ capacitor to the ANT terminal. Connect the other lead to the center conductor of the coaxial cable coming from the signal generator. Connect the shield wire of the cable to the GR terminal of the receiver.

Connect the leads of the voltmeter to the speaker terminals.

STANDBY-MVC-AVC-CAL set to MVC

NOISE LIMITER set to OFF

BFO set to OFF

NOTE: As the MAIN TUNING pointer is moved up scale, the ANTENNA control should be increased proportionately. That is, when the MAIN TUNING pointer is at the high end of the band the ANTENNA control should be almost fully clockwise (open); at the center of the band the ANTENNA control should be at mid-rotation; at the low end of the band the ANTENNA control should be almost fully counterclockwise (closed).

Follow the instructions on the alignment chart.

ALIGNMENT CHART

BAND	MAIN TUNING MC	BAND SPREAD	SIGNAL GENERATOR MC	ANTENNA CONTROL	ADJUST FOR MAXIMUM
A	.53	SET MAIN TUNING	1.65	*OPEN	T-3 TOP & BOTTOM
A	SAME	SAME	SAME	SAME	T-2
A	SAME	SAME	SAME	SAME	T-1

REPEAT FIRST THREE STEPS

A	.53	SET MAIN TUNING	.53	**CLOSED	L-6
A	1.9	SAME	1.9	OPEN	C-6

REPEAT ABOVE TWO STEPS

A	.6	SET MAIN TUNING	.6	ALMOST CLOSED	L-1
B	1.9	SAME	1.9	SAME	L-7
B	2.5	SAME	2.5	¼ OPEN	L-2
C	6.0	SAME	6.0	SAME	L-B
C	6.0	SAME	6.0	SAME	L-3
D	11.5	SAME	11.5	SAME	L-9
D	11.5	SAME	11.5	SAME	L-4
E	6M	50	50	ALMOST OPEN	L-10

***SET GENERATOR AT 46.8Mc AND CHECK FOR IMAGE

E	6M	50	50	ALMOST OPEN	L-5
---	----	----	----	-------------	-----

*OPEN means clockwise.

**CLOSED means counterclockwise.

***Leave MAIN TUNING of 50 Mc and set generator at 46.8 Mc. An image of the tone heard at 50 Mc should be heard at reduced volume. If you cannot hear this image, L-10 is tuned incorrectly.



CONTROLS AND THEIR FUNCTIONS

ANTENNA CONTROL: Matches the RF tuned circuit to the antenna when there is a major change in frequency.

BAND SWITCH: Selects the band of frequencies desired.

NOISE LIMITER SWITCH: Reduces impulse noises generated by automobile ignitions and household appliances.

PHONES: Jack provided for headphone listening. When this jack is used the loudspeaker is muted.

BFO SWITCH AND CONTROL: The switch turns the BFO ON or OFF. The control varies the pitch of the audio tone in the speaker. The **STANDBY-MVC-AVC-CAL** switch should always be set to the MVC position when using the BFO.

STANDBY-MVC-AVC-CAL.

STANDBY: Keeps the receiver energized but mutes the speaker.

MVC: Manual volume control used for receiving weak signals.

AVC: Automatic volume control helps keep volume at a constant level.

CAL: Use in conjunction with crystal calibrator to check frequency alignment of the receiver.

OFF-VOLUME CONTROL: Used to vary loudness of signal from speaker and turns power ON or OFF.

MAIN TUNING: Selects a specific signal from a band of frequencies.

BANDSPREAD: Expanded scale of the frequencies contained in the band for which **MAIN TUNING** is set. Allows you to more accurately tune a specific signal.

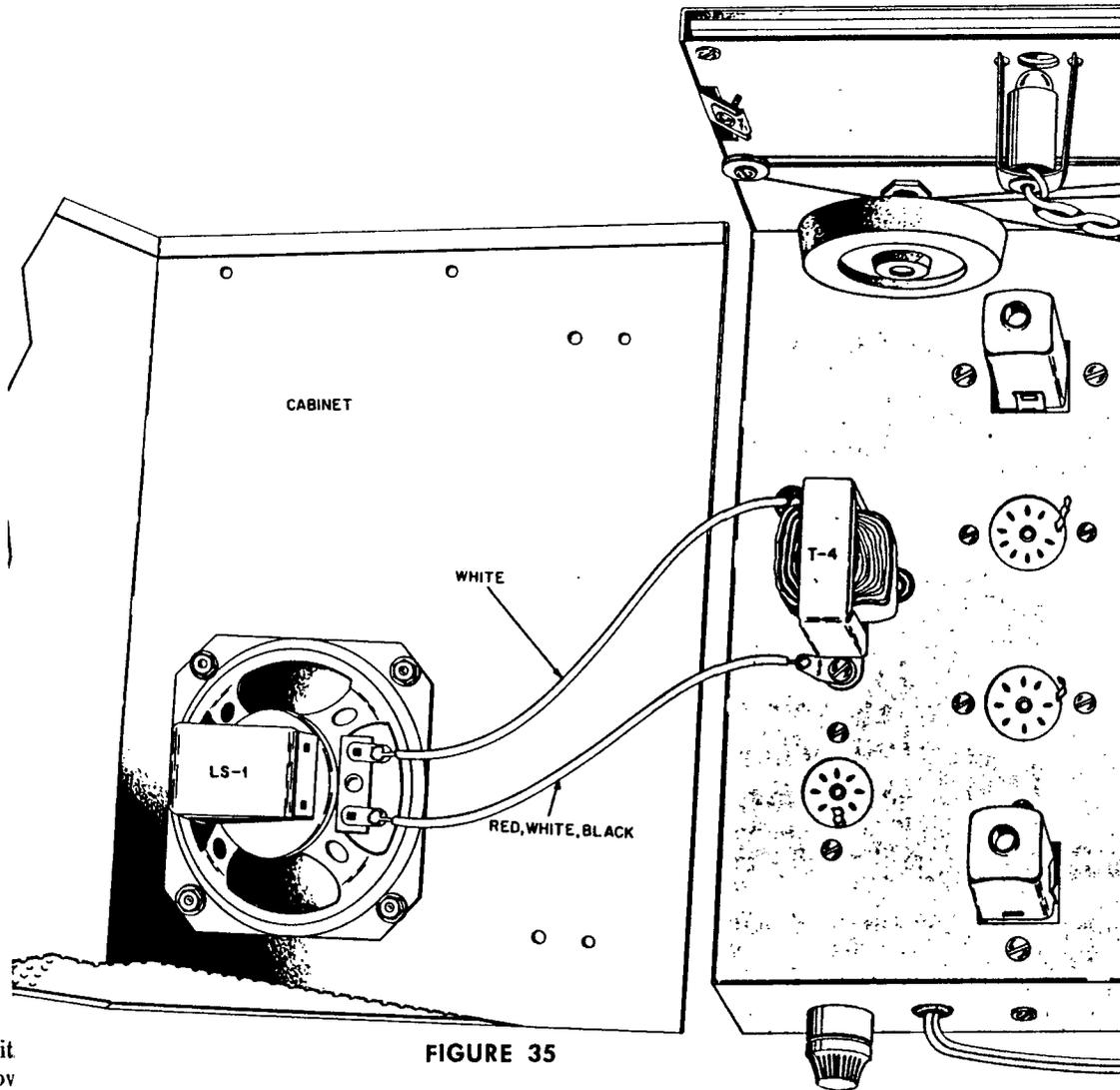
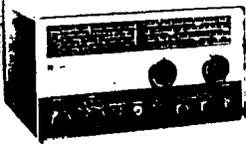


FIGURE 35

Cabinet with
to remov
w for eas



OPERATING INSTRUCTIONS

For the beginning Amateur operator or new short wave listener, we suggest that these instructions be followed closely. The extra care used in tuning will be well rewarded by bringing in many distant (DX) stations. The section on the best time for shortwave listening will also be very helpful.

CONTROL SETTINGS FOR STANDARD BROADCAST RECEPTION

STANDBY-MVC-AVC-CAL	AVC
BFO	OFF
BAND	A
MAIN TUNING	Turn dial to desired station. (Bandspread dial must be turned all the way to the right.)

BANDSPREAD: Not needed for local stations. Use for fine tuning for DX (distant) reception.

ANTENNA CONTROL: Adjust for strongest signal.

VOLUME: Adjust for desired volume.

CONTROL SETTINGS FOR SHORT WAVE LISTENING

Set controls same as for standard broadcasts above, except:

PHONE RECEPTION

BAND: Switch to B, C, D or E depending on frequency of station wanted.

BANDSPREAD: Set to SET MAIN TUNING.

MAIN TUNING: Turn dial to desired station. For Amateur phone reception, set the MAIN TUNING dial at the index mark for the desired Amateur band (80M-40M-20M-15M-10M-6M). Then tune in stations on the calibrated BANDSPREAD scale.

6-METER RECEPTION: Set the BANDSWITCH to band E. Set the MAIN TUNING dial to the 6-meter mark on band D. Tune in stations on the calibrated BANDSPREAD scale.

CW (CODE) RECEPTION

BFO	ON
BAND	Set to desired band
VOLUME	full
STANDBY-MVC-AVC-CAL	MVC (must always be in this position for CW reception)

MAIN TUNING: Set the MAIN TUNING dial at the index mark for the desired Amateur band.

BANDSPREAD: Slowly turn the BANDSPREAD dial until the desired station is heard.

BFO: Adjust the BFO control for the most pleasing note.

AMATEUR FREQUENCIES

BAND SETTING	AMATEUR BAND	FREQUENCY RANGE
B	80M	3.5 - 4.0mc
C	40M	7.0 - 7.3mc
C	20M	14.0 - 14.35mc
D	15M	21.0 - 21.45mc
D	10M	28 - 29.7mc
E	6M	50 - 54mc

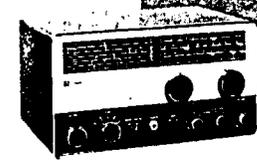
SINGLE SIDEBAND RECEPTION

MAIN TUNING: To index mark for desired Amateur band.

BANDSPREAD: Precedence has established the use of SSB transmitters in certain sections of each Amateur band. At the present time, these are:

80 meter band	high frequency end
40 meter band	high and low freq. ends
20 meter band	high frequency end
15 meter band	high frequency end
10 meter band	around 28.65mc
6 meter band	low frequency end

A standard AM transmitted signal consists of an RF carrier and two sidebands, which results from the modulation of the RF carrier. A SSB signal is characterized by the suppression of the carrier and one of the side bands. Thus the transmitted signal consists of one sideband only. It is fast becoming an increasingly popular method of transmission because it occupies less space in the radio spectrum and because there



is considerably less interference encountered among SSB signals during reception.

Reception of SSB signals requires the reinsertion of a carrier before the signal can be demodulated. This is done by the BFO.

Start by tuning to the portion of an Amateur band containing SSB signals. While tuning, turn the volume control up until loud, but unintelligible sounds are heard. It will sound something like duck quacking. Carefully tune the BFO control until intelligible sound is heard. The BFO control may be left at its setting while the BANDSPREAD dial is tuned to other stations. However, a change in sideband transmission from "lower" to "upper" sideband or vice-versa requires a readjustment of the BFO control.

REMOTE CONTROL

The two terminals marked REMOTE at the rear of the chassis can be connected to the transmit-receive switch of a transmitter, or to the contacts of a transmit-receive relay. By operating this switch or relay, the B+ voltage for the plates of the tubes can be turned on or off.

CRYSTAL CALIBRATOR (ACCESSORY)

The crystal calibrator is not supplied with this kit, but may be purchased as an accessory. It supplies a 100Kc signal for accurate frequency calibration of your receiver.

NOTE: DO NOT ADD THIS UNIT WHILE THE RECEIVER IS PLUGGED INTO A POWER OUTLET.

- Remove the cabinet from the chassis.
- Mount the Crystal Calibrator to the top of the chassis behind C-1 using two 4-40 x 3/8" screws, lockwashers and nuts.

There are four wires coming from the Crystal Calibrator. Feed these wires through the grommet containing the pilot lamp leads and connect as follows. (It is important that the leads be cut to the proper length to eliminate unnecessary slack.)

- Solder the red wire to terminal 3 of S-2.
- Solder the green wire to terminal 1 of TS-1.
- Solder the black wire to the solder lug attached to TS-2.
- Solder the brown wire to terminal 1 of TS-4.

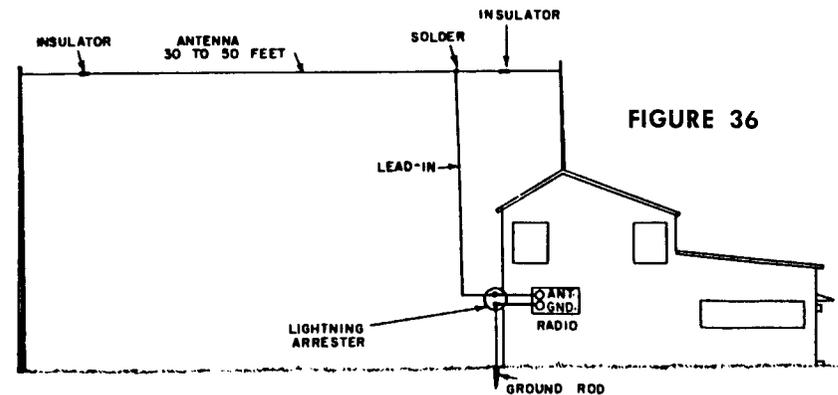
- Leave the Crystal Calibrator switch in the ON position to control the Calibrator from the front panel of the receiver.
- Remount the cabinet.

You are now ready to use the Crystal Calibrator with your receiver. Simply turn the STANDBY-MVC-AVC-CAL SWITCH to CAL and calibrate your receiver as explained in the Crystal Calibrator manual

INSTALLING AN ANTENNA

A good antenna will enable you to obtain maximum performance from your receiver. A half-wave dipole is recommended for top performance on a particular band of frequencies such as an amateur band. A single wire antenna of between 30 to 50 feet provides the best all-round reception for short-wave listening.

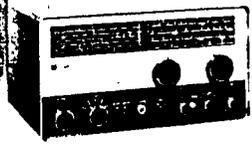
If you prefer to use a single-wire antenna, see Figure 36 for suggested installation. For the exact specifications of a half-wave dipole antenna, see the section on antennas in the "Amateur Handbook," published by the ARRL.



Regardless of the type antenna used, it is always advisable to mount the antenna as high as possible. Height adds to the effectiveness of the antenna.

HEADPHONES

If you wish to use headphones instead of the loudspeaker, simply plug the phones in the jack labeled PHONES. This automatically mutes the loudspeaker. The impedance of the headphones is not critical. Headphones with impedances ranging from 3Ω to 2000Ω will work satisfactorily.



WHEN TO LISTEN

Under normal atmospheric conditions, with patience and practice, it's possible to hear stations from all over the world in a single evening—at times even within a few minutes. All you need is your receiver, a good antenna, a knowledge of *where* and *when* to listen—plus persistence.

Short-wave radio transmitters include land communications stations, maritime stations, aeronautical stations, Amateur (Ham) stations, and broadcasting stations. Of these, the broadcasting and Amateur (Ham) stations are of most interest to the short-wave listener (SWL). However, there are many other "specialties" to listen to such as international radio telegraph or telephone point-to-point communications; shipping and coastal radio; plane and ground communications; weather station reports and time signals; special expeditions, and other unusual events.

By international agreement, each type of station is assigned certain bands for operations.

You'll find that the short-wave portions of the dial on your receiver are calibrated in megacycles. A megacycle is 1000 kilocycles (kc).

Short-wave stations operate in these megacycle bands—5.95 to 6.20mc; 7.0 to 7.3mc amateur band; 9.5 to 9.8mc; 11.7 to 12.0mc; 14.0 to 14.3mc amateur band; 15.10 to 15.45mc; 17.5 to 17.7mc and 28.0 to 29.7mc amateur band. Sometimes these bands are given in terms of meters (m)—such as the 49, 41, 50, 31, 25, 20, and 19 meter bands. Thus, **megacycles refer to frequency; meters refer to wavelength.**

Reception conditions on each of the short-wave broadcast bands vary a lot at different times of the day and night, and also at different seasons of the year. Experience will teach you when to listen on each band.

In general, for SWL's in North America, the best reception on each of these bands during the fall and spring months should be:

The 6mc band—evening for Latin America and Europe.

The 7mc bands—late afternoon and evening for Europe; evening and early morning for Amateur stations.

The 9mc band—morning (6 to 8 a.m. your local time) for Asia and Australia; afternoon for Europe and Africa; evening for Europe and Latin America.

The 11mc band—morning (6 to 9 a.m. your local time) for Asia and Australia; afternoon for Europe and Africa; evening for Latin America.

The 14mc band—late morning and afternoon for Amateur stations.

The 15mc band—morning and afternoon for Europe and North America; evening for North and South America.

The 29mc band—daylight hours for Amateur stations.

During the winter months, the best bands for evening reception are lower than during the fall and spring. For instance, the 9mc band becomes poor for reception from Europe during the evening hours, and the 6mc band becomes the best band for European reception. However, the 29mc Amateur band is best during winter months, especially at the peak of the sunspot cycle.

In the summer months, the best evening reception shifts to the higher bands. Evening reception from Europe becomes good in the 11mc band, although the 9mc band remains good for reception from that area.

Year-around DX (Distant reception) bands are the 9mc and 11mc bands, although consideration there must be given to receiving different parts of the world best in summer or winter.

The expected reception just outlined is for normal conditions. The factors which affect long-distance radio transmissions vary from day to day. On some days, for instance, reception will be quite good, but at times, generally for periods of several consecutive days, transmission conditions will be "disturbed" and only the more powerful stations can be heard.

Here's a special caution: Short-wave broadcasting stations often change their schedules and/or frequencies with little or no prior notice. Always be on the alert for announcements of such changes.

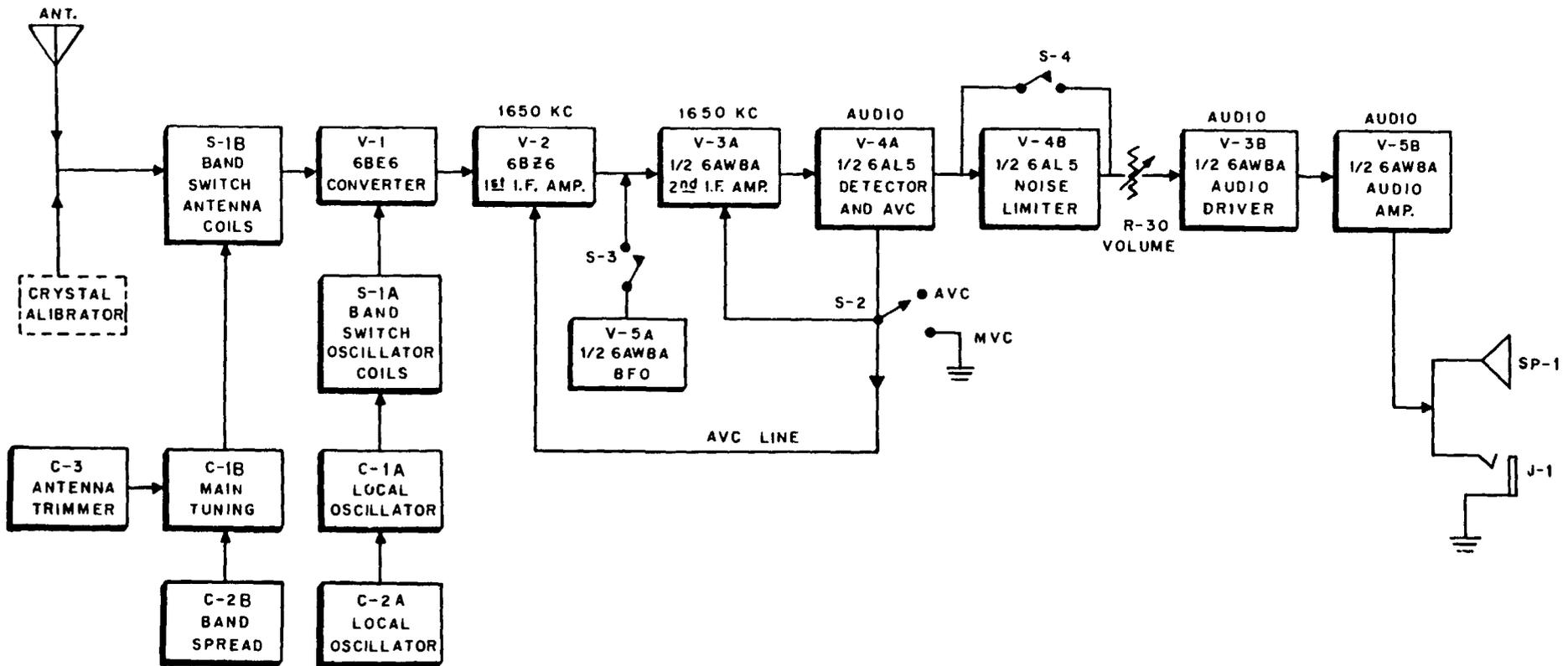
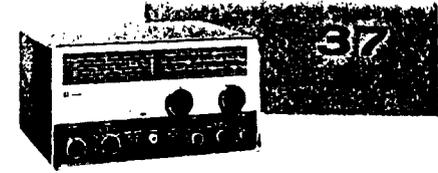
HOW IT WORKS

BAND SELECTION. By rotating band switch S-1B (see block diagram), one of the five antenna coils is switched into the antenna circuit which has the ability to accept a given band of frequencies and reject all others.

TUNING. Tuning capacitor C-1B is wired in parallel with the switched antenna coil, forming a parallel resonant circuit. When this capacitor is set for some specific value, it tunes in a signal corresponding in frequency to the pointer setting on the main tuning dial. The remaining frequencies in the band are rejected.

BANDSPREAD. The bandspread capacitor C-2B is connected in parallel with the main tuning capacitor. When rotated, this capacitor changes

FIGURE 37



BLOCK DIAGRAM



HOW IT WORKS

the resonant point of the receiver slightly to either side of the setting on the main tuning dial.

ANTENNA TRIMMER. Capacitor C-3 is in parallel with the main tuning and bandspread capacitors. When rotated, this capacitor more accurately tunes the antenna circuit to the desired signal frequency, resulting in a louder and more readable signal.

LOCAL OSCILLATOR. The local oscillator is composed of the five oscillator (one for each band) coils and capacitors C-1A and C-2A. This oscillator generates a signal whose frequency is always 1650kc above or below the RF signal being received.

CONVERTER. Tube V-1 heterodynes or mixes the selected RF signal from the antenna with the signal from the local oscillator to produce a third signal called the IF (intermediate frequency) whose value is 1650kc.

IF AMPLIFIERS. The IF signal, coming from the plate of V-1, is inductively coupled to the grid of V-2 by T-1. V-2 amplifies this signal and passes it on to V-3A for the second stage of amplification.

DETECTOR and AVC. V-4A separates the audio component from the IF signal by furnishing a low impedance path to ground for the high frequency portion. It also acts as an AVC (automatic volume control) by feeding a portion of the detected IF signal back to the grids of V-2 and V-3A. This feedback helps keep the volume constant by regulating the amount of amplification these tubes give the incoming signal.

NOISE LIMITER. V-4B will remove or reduce in amplitude interfering signals of high amplitude and short duration, such as automobile ignition noises and disturbances from household appliances. When a noise peak of sufficient amplitude reaches V-4B, the tube is driven to cut-off. Because the tube has momentarily ceased conducting, limiting occurs. Switch S-4 allows the signal to bypass this circuit when the noise limiter is not needed.

AUDIO AMPLIFIERS. The detected portion of the IF signal (audio) goes through R-50 (volume control) and onto the grid of V-3B, audio driver. The signal is amplified and passed onto the grid of V-5B, audio amplifier, where it receives sufficient amplification to drive loudspeaker SP-1 or a pair of headphones plugged into J-1.

BFO. L-11, C-14 and V-5A form the beat frequency oscillator. The BFO generates a signal whose frequency is equal to the IF (1650kc). By rotating C-14, the frequency of the BFO can be varied about 3kc. When the BFO signal is heterodyned with the IF signal an audible

tone can be heard in the loudspeaker. This tone is the difference between the IF and BFO frequencies. The heterodyning of these signals is accomplished at V-3A. Switch S-3 removes the BFO from the circuit when not needed.

POWER SUPPLY. The built-in power supply is operated from 117 volts AC 50/60 cycle house current. It supplies the DC and filament voltages needed to operate the tubes. The center tap of power transformer T-5 is brought out to terminal strip TS-2 for remote control of the B+ voltage.

SPECIFICATIONS

TUNING RANGES	BAND A	.53mc to 1.9mc
	BAND B	1.8mc to 6.3mc
	BAND C	6mc to 14.5mc
	BAND D	11.5mc to 33mc
	BAND E	47mc to 54mc
ANTENNA INPUT IMPEDANCE	52 Ω	
AUDIO OUTPUT IMPEDANCE	3.2 Ω	
MAXIMUM AUDIO OUTPUT	1 watt	
INTERMEDIATE FREQUENCY	1650kc	
IMAGE REJECTION	From 42 db at 80M to 14 db at 6M	
SENSITIVITY	80M-4 μ v; 40M-6 μ v; 20M-8 μ v; 15M-7 μ v; 10M-6 μ v; 6M-10 μ v.	
TUBE COMPLEMENT	6BE6 (converter and oscillator) 6BZ6 (1st IF amplifier) 6AW8 (2nd IF amplifier) 6AL5 (detector and noise limiter) 6AW8 (audio output and BFO) EZ90 (rectifier)	
POWER CONSUMPTION	60 watts, 110-130 volts, 60 cycle	
DIMENSIONS	11" deep, 14 $\frac{1}{4}$ " wide, 8 $\frac{3}{8}$ " high.	
NET WEIGHT	19 lbs.	



The proper operating voltages are found on the circuit diagram. The proper resistances are found in the resistance chart. Never measure resistances with the receiver turned on.

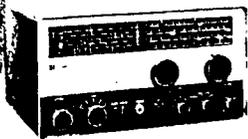
RESISTANCE CHART

TUBE	PIN								
	1	2	3	4	5	6	7	8	9
V-1	22K	1Ω	0	0	12.5K*	20K*	1Ω
V-2	2.2 Meg	180Ω	0	0	11.5K*	30K*	0
V-3	2.7K	100K	220K*	0	0	180Ω	1.3 Meg	60K*	11K*
V-4	0	1 Meg	0	0	850K	N.C.	500K
V-5	∞	50K	320K*	0	0	150Ω	470K	0*	10K*
V-6	80Ω	N.C.	0	0	N.C.	80Ω	10K*

All measurements made with reference to chassis ground unless otherwise specified.
*Measured from terminal 2 of C-36.

Set controls as follows for resistance measurements:
Band switch to A—BFO OFF—Volume open—AVC—Noise limiter OFF

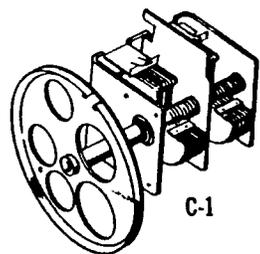
TROUBLE	POSSIBLE CAUSE	SERVICE PROCEDURE
Receiver dead	Defective tube(s)	Replace defective tubes.
	Tubes in wrong sockets or not seated. Line cord not in AC outlet	Visual inspection
Poor sensitivity on all bands	Fuse open	Check fuse. Look for power supply shorts.
	Low B+ voltages	Check C-36
	Defective tubes	Check tubes
Output distorts on strong AM signals when receiver is in AVC position	IF stages misaligned	Realign.
	AVC line is grounded	Check S-2 wiring.
HUM	Open filter capacitor. Shorted tube. Short circuit which draws excessive current	C-36 defective. Test tubes. Look for wrong connections and uninsulated wires shorting.
	Beat frequency oscillator does not function	Bad 6AW8A L-11 not properly adjusted



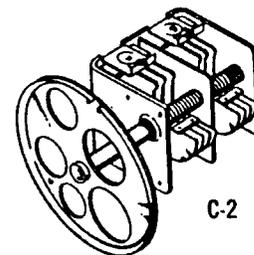
PARTS LIST

CAPACITORS

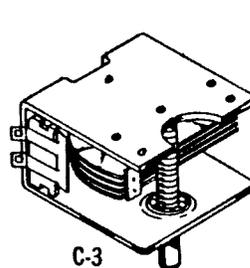
Symbol Number	Description	Part Number
C-1	Main tuning capacitor	282021
C-2	Bandsread	282022
C-3	Antenna trimmer	281022
C-4	75 μf , 5% silver mica	264759
C-5	20 μf , disc	296014
C-6	8-100 μf , trimmer	286079
C-7	500 μf , 5% silver mica	294008
C-8	.001 μf , disc	276016
C-9	.05 μf , disc	275506
C-10	.0047 μf , disc	276477
C-11	.05 μf , disc	275506
C-12	.02 μf , disc	276025
C-13	6.2 μf , 5% tubular	296033
C-14	BFO adjustment	281023
C-15	100 μf , silver mica	266017
C-16	.01 μf , disc	276015
C-17	.01 μf , disc	276015
C-18	1000 μf , silver mica	266014
C-19	150 μf , disc	276158
C-20	10 μf , disc	276018
C-23	.05 μf , disc	275506
C-24	470 μf , disc	276478
C-25	50 μf , electrolytic 10v	221500
C-27	.01 μf , disc	276015
C-28	.001 μf , disc	276016
C-29	.01 μf , disc	276015
C-30	470 μf , 5% disc	276478
C-31	50 μf , electrolytic 10v	221500
C-32	100 μf , disc	276017
C-33	.01 μf , disc	276015
C-34	.01 μf , disc	276015
C-35	.01 μf , disc	276015
C-36	40-40-40-40 μf , electrolytic 350v	236404
C-37	.001 μf , disc	276016
C-41	620 μf , 5% silver mica	264628
C-42	.01 μf , disc	276015
C-43	.01 μf , disc	276015
C-44	.01 μf , disc	276015
C-45	.01 μf , disc	276015



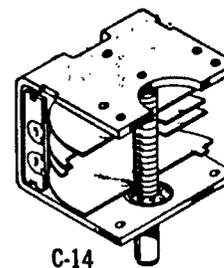
C-1



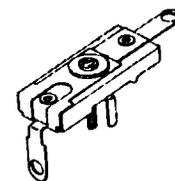
C-2



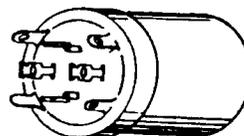
C-3



C-14



C-6



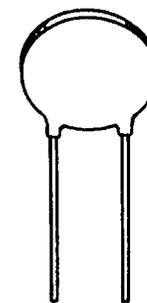
C-36



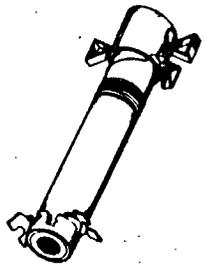
C-4, C-7, C-41



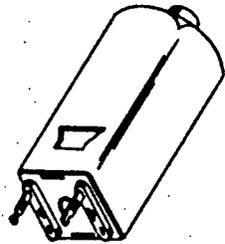
C-15, C-18



DISC



L-1 to L-10



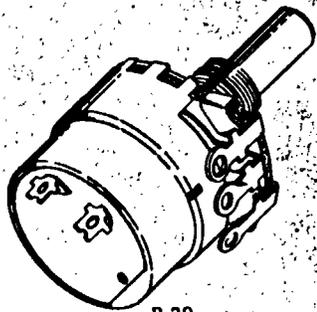
L-11



1/2 WATT RESISTOR



1 WATT RESISTOR



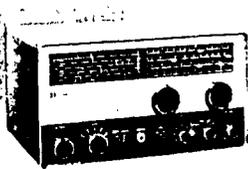
R-30

COILS

Symbol Number	Description	Part Number
L-1	band A Antenna coil	162033
L-2	band B Antenna coil	162034
L-3	band C Antenna coil	162035
L-4	band D Antenna coil	162036
L-5	band E Antenna coil	162037
L-6	band A Oscillator coil	162038
L-7	band B Oscillator coil	162039
L-8	band C Oscillator coil	162040
L-9	band D Oscillator coil	162041
L-10	band E Oscillator coil	162042
L-11	BFO coil	162032

RESISTORS

R-1	22K	301223
R-2	12K, 2 watt	307123
R-3	2.7K	301272
R-4	100K	301104
R-5	180Ω	301181
R-6	22K	301223
R-7	47K	301473
R-8	39K	301393
R-9	100K	301104
R-10	220K	301224
R-11	1.8K	301182
R-12	100K	301104
R-13	4.7 meg	301475
R-15	2.7K	301272
R-16	220K	301224
R-17	1 meg	301105
R-18	180Ω	301181
R-19	47K	301473
R-20	1.3K, 5%	302132
R-21	2.2 meg	301225
R-22	47K	301473
R-23	470K	301474
R-24	150Ω	301151
R-25	10K, 1 watt	304103
R-26	100K	301104
R-27	470K	301474
R-28	470K	301474
R-29	470K	301474
R-30	1 meg control with switch	390005
R-31	33Ω	301330
R-32	1 meg	301105
R-33	100Ω, 1 watt	304101
R-34	100K	301104
R-35	330Ω, 1 watt	304331



PARTS LIST

SWITCHES

Symbol Number	Description	Part Number
S-1	band switch and bracket.....	040084
S-2	STANDBY-MVC-AVC-CAL switch	432137
S-3	BFO	431003
S-4	noise limiter	431003

TERMINAL STRIPS

TS-1 ✓	2-screw terminal	441201
TS-2 ✓	2-screw terminal	441201
TS-3	3-terminal	440301
TS-4 ✓	4-terminal	440401
TS-5 ✓	4-terminal	440401
TS-6 ✓	3-terminal	440301
TS-7 ✓	6-terminal	440602
TS-8 ✓	6-terminal	440601
TS-9 ✓	2-terminal	440202

TRANSFORMERS

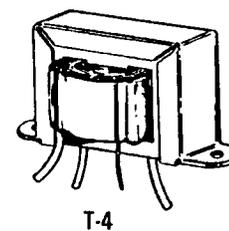
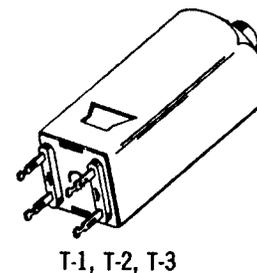
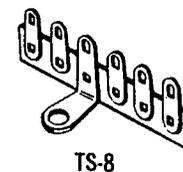
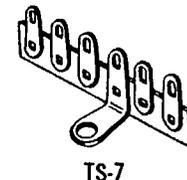
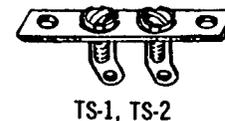
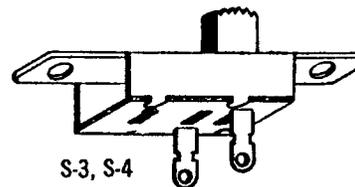
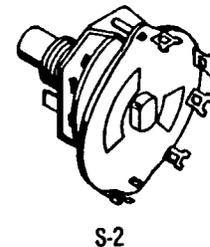
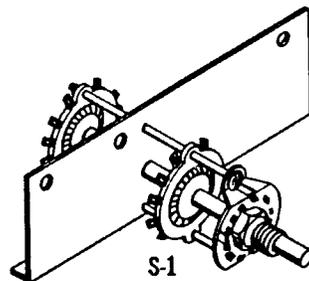
T-1	IF transformer	122216
T-2	IF transformer	122217
T-3	IF transformer	122218
T-4	Output transformer	102218
T-5	Power transformer	101325

TUBES

V-1	6BE6	610045
V-2	6BZ6	610050
V-3	6AW8A	611026
V-4	6AL5	611005
V-5	6AW8A	611026
V-6	EZ90/6X4	610023

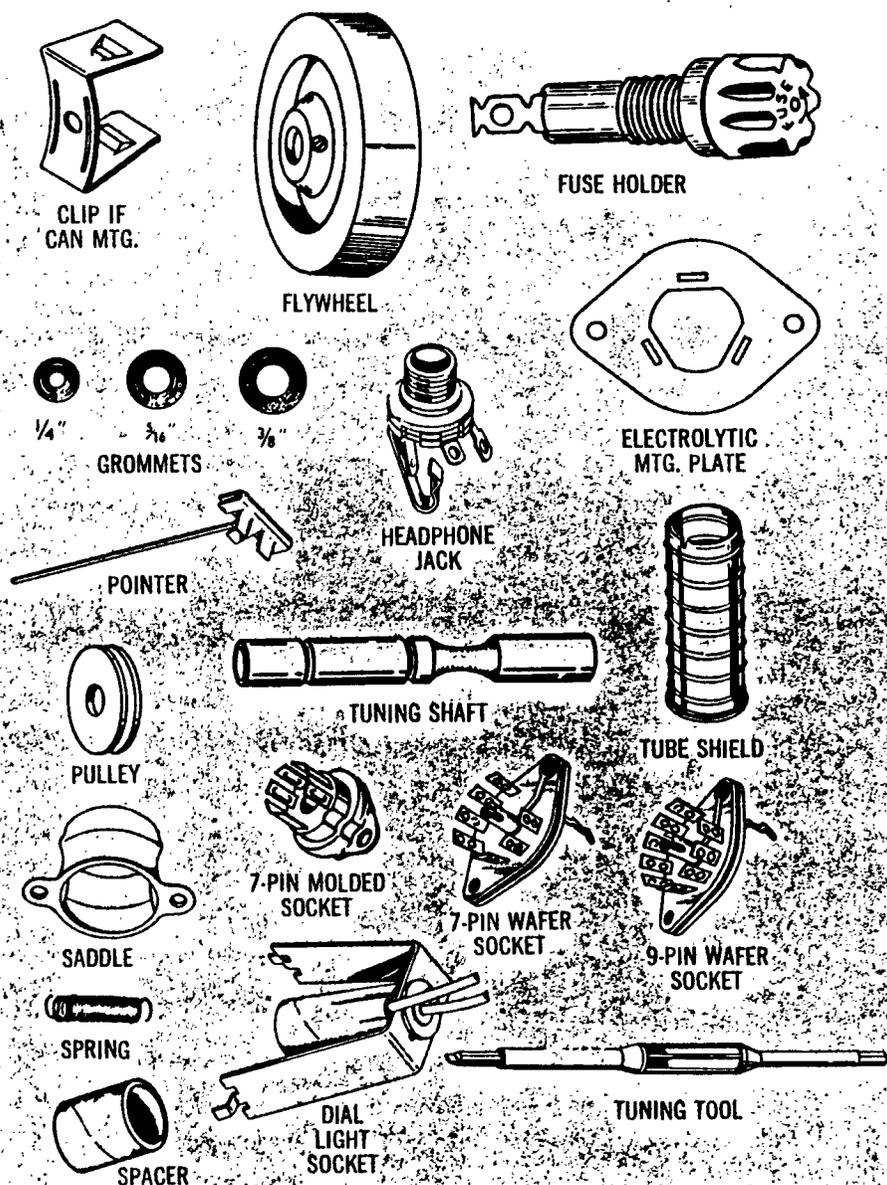
MISCELLANEOUS

Description	Quantity	Part Number
Bracket, for bandspread and main tuning capacitors..	2.....	470283
Bracket, for antenna coils	1.....	470285
Bracket, for oscillator coils	1.....	470286
Bracket, shield	1.....	470284

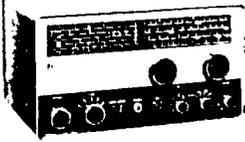




MISCELLANEOUS (Continued)



Description	Quantity	Part Number
Bracket, for C-3	1	470289
Bracket, trimmer	1	470288
Cabinet	1	702075
Chassis	1	461355
Clip, IF can	4	532008
Dial light bulb, #47	2	640002
Dial string, 6'	2	860017
Flywheel	2	485085
Foot, rubber	4	831001
Fuse, 1 amp.	1	491001
Fuse holder	1	492200
Grommet, 1/4"	8	830001
Grommet, 5/16"	6	830100
Grommet, 3/8"	1	830200
Jack, headphone	1	502228
Knob, large	2	761400
Knob, large with white dot	2	761304
Knob, small	3	765075
Panel, front	1	463531
Panel, plexiglass	1	462704
Panel, sub	1	470571
Plate, electrolytic mounting	1	501542
Pointer, red	1	470429
Pointer, green	1	470428
Pulley, plastic	4	880051
Rubber pad	1	840011
Shaft, tuning	2	470281
Shield, braid, 2 1/2"	2	804133
Shield, for V-1	1	510006
Shield, ribbed for V-2, 2"	1	510002
Shield, ribbed for V-4	1	510012
Shield, 9-pin tube, ribbed	2	510003
Shield, saddle	1	511005
Socket, 7-pin molded	1	501170
Socket, 7-pin wafer	1	501070
Socket, 7-pin wafer with shield clip	2	501073
Socket, 9-pin wafer with shield clip	2	501093
Socket, dial light	2	501731
Spacer, paper	2	850063
Speaker, 3 1/2"	1	730022
Spring	2	470076
Tuning tool	1	957007



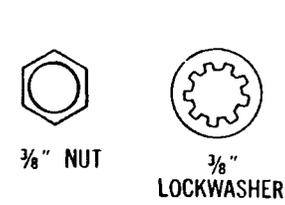
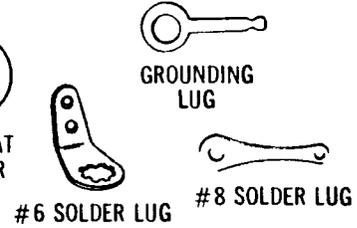
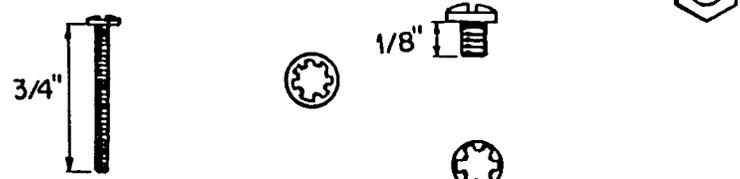
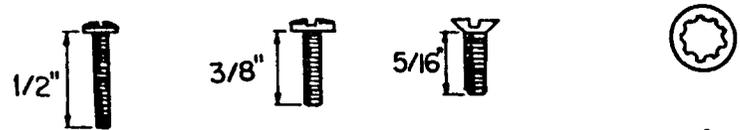
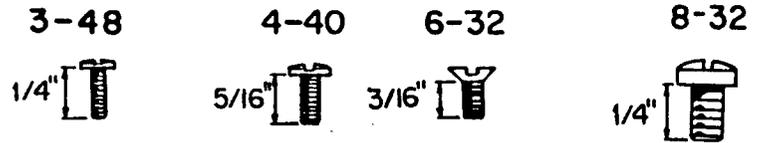
PARTS LIST

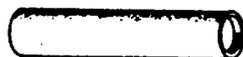
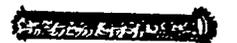
HARDWARE

Description	Quantity	Part Number
Bushing $\frac{3}{8}$ "	2	470075
Clip nut, #4	2	534056
Clip nut, #6	4	531009
"C" Washer	4	585002
Eyelets, small diameter	4	551008
Eyelets, large diameter	5	551009
Grounding lug	1	553001
Lockwasher, #4	42	582200
Lockwasher, #6	6	582300
Lockwasher, #8	11	582400
Lockwasher, $\frac{3}{8}$ "	1	582700
Solder lug, #6	20	553005
Solder lug, #8	1	553002
Screw, 3-48 x $\frac{1}{4}$ "	2	560112
Screw, 3-48 x $\frac{9}{16}$ "	2	560116
Screw, 3-48 x $\frac{3}{4}$ "	1	560117
Screw, 4-40 x $\frac{5}{16}$ "	2	560223
Screw, 4-40 x $\frac{3}{8}$ "	40	560224
Screw, 6-32 x $\frac{1}{2}$ ", black	4	569774
Screw, 6-32 x $\frac{1}{4}$ "	3	560340
Screw, 6-32 x $\frac{3}{16}$ ", flat head	6	563347
Screw, 6-32 x $\frac{5}{16}$ ", flat head	4	563373
Screw, 8-32 x $\frac{1}{4}$ "	8	563442
Screw, self-tapping, #4 x $\frac{3}{8}$ ", black	4	569345
Screw, self-tapping, #6 x $\frac{5}{16}$ "	4	562393
Screw, self-tapping, #6 x $\frac{3}{8}$ "	6	563394
Set screw	2	569001
Nut, 3-48	7	570110
Nut, 4-40	40	570220
Nut, 6-32	4	570340
Nut, 8-32	4	570440
Nut, $\frac{3}{8}$ "	6	570840
Washer, flat metal, #4	12	580200
Washer, flat metal, $\frac{3}{8}$ "	6	580702



HARDWARE (ACTUAL SIZE)

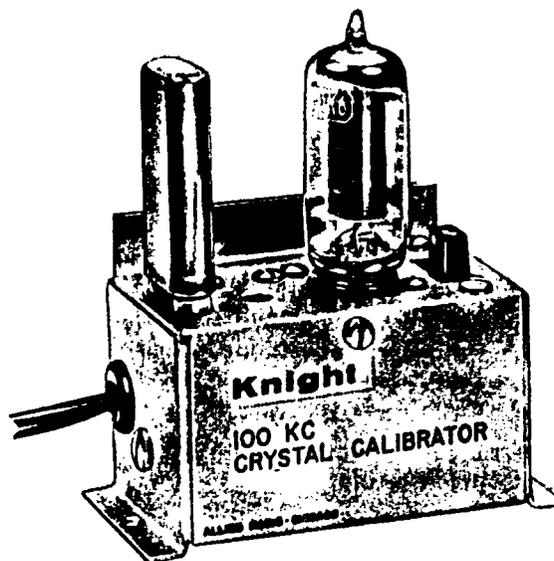




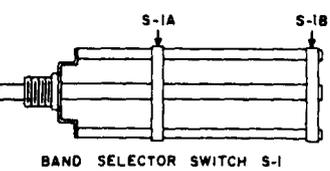
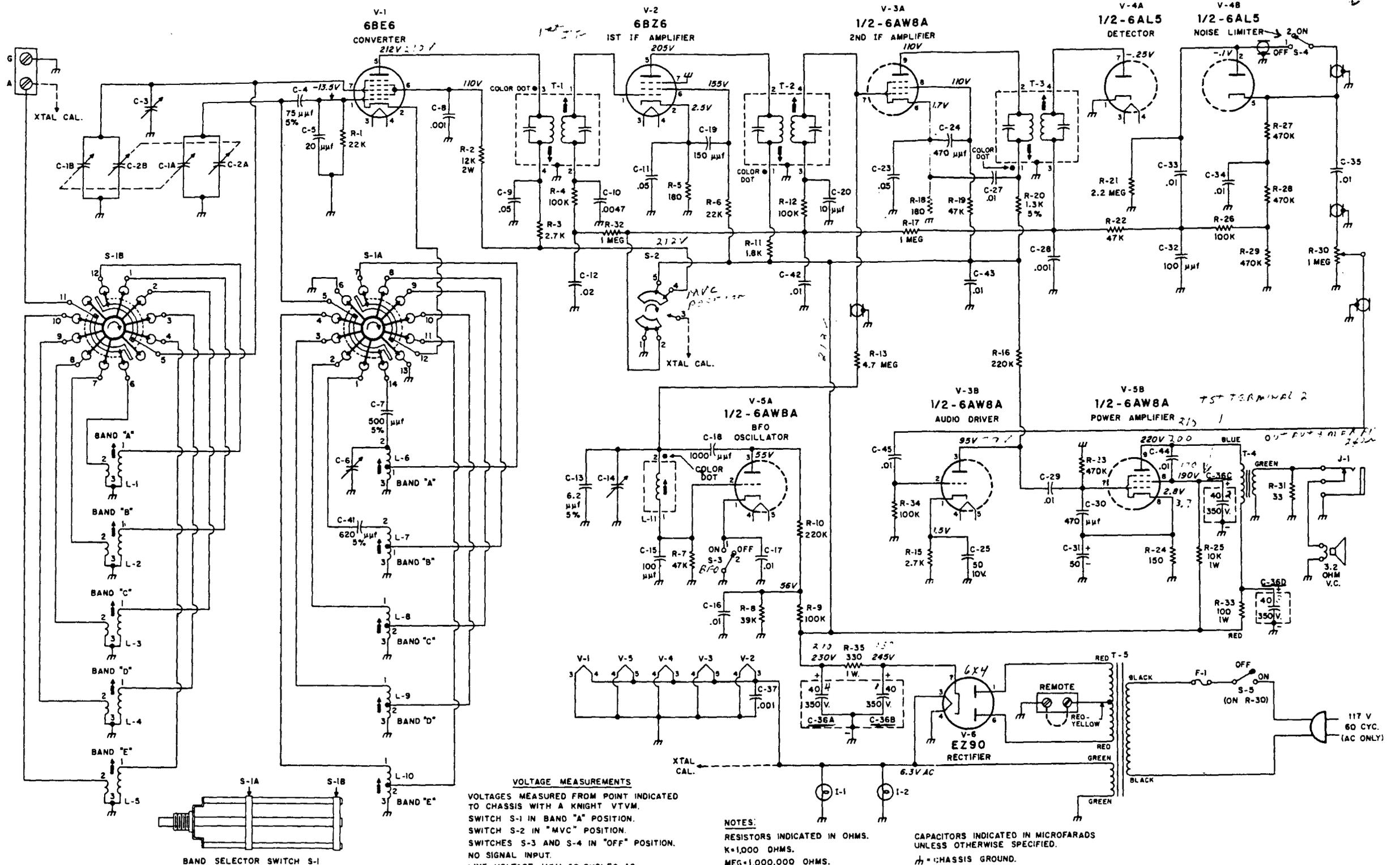
TUBING

WIRE, SOLDER AND TUBING

Description	Quantity	Part Number
Bare wire, heavy, 95"	1	806495
Bare wire, thin, 12"	1	806012
Cable, 2-conductor shielded, 26"	1	803075
Cable, single-conductor shielded, 36"	2	803071
Line cord	1	802001
Solder, 12'	1	930005
Tubing, black, 26"	1	812019
Tubing, yellow, 8"	4	812021
Tubing, large black, 2"	1	813169
Wire, 2", red	10	801002
Wire, 3", orange	10	801003
Wire, 4", yellow	6	801004
Wire, 5", green	7	801005
Wire, 6", blue	5	801006
Wire, 7", violet	1	801007
Wire, 9", white	1	801009
Wire, 10", brown	1	801010
Wire, 20", white-red-black	1	801020
Wire, 28", white	1	801034



100-kc Crystal Calibrator kit for the R-55A Receiver. Provides marker every 100 kc up to 54 mc. Has trimmer for zero beating with WWV. Obtains power from R-55A Receiver.



VOLTAGE MEASUREMENTS
 VOLTAGES MEASURED FROM POINT INDICATED TO CHASSIS WITH A KNIGHT VTVM.
 SWITCH S-1 IN BAND "A" POSITION.
 SWITCH S-2 IN "MVC" POSITION.
 SWITCHES S-3 AND S-4 IN "OFF" POSITION.
 NO SIGNAL INPUT.
 LINE VOLTAGE = 117 V. 60 CYCLES AC.
 TOLERANCE ± 20%.

NOTES:
 RESISTORS INDICATED IN OHMS.
 K=1,000 OHMS.
 MEG=1,000,000 OHMS.

CAPACITORS INDICATED IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
 ♁ = CHASSIS GROUND.

117 V. 60 CYC. (AC ONLY)