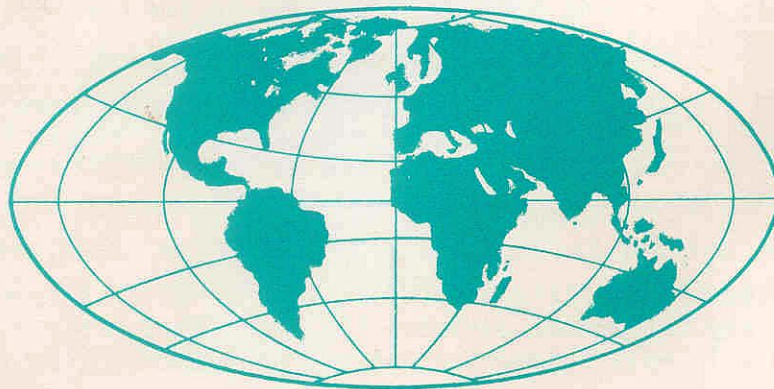




Owners Manual



80-
MODEL R5A

ALLWAVE RECEIVER



DIVISION OF

AEROTRON, INC. ■ RALEIGH, NORTH CAROLINA

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AMECO R5A RECEIVER

Designed for hour after hour of trouble free listening, the R5A Receiver will serve the beginner in short wave listening as well as the experienced amateur operator. Five band coverage allows you to listen all the way from .54 MHz up through 54 MHz. The standard broadcast band; all the foreign broadcast bands; amateur bands from 160 through 6 meters; the 27 MHz CB channels; and the two-way frequencies between 30 to 50 MHz are available with the R5A.

The Ameco R5A uses transistors exclusively, and has a built-in power supply for AC operation. There is an Automatic Noise Limiter to eliminate or reduce impulse noise. A built in beat frequency oscillator is provided for CW and SSB reception.

Read this manual thoroughly before using your new Receiver, and you will be well on your way to a new experience in listening pleasure.

INSTALLATION

When you receive your Ameco R5A Receiver, remove it from the box and inspect it for damage. If the unit is damaged on arrival, file a claim with the carrier immediately. When the unit has been purchased from a local dealer, return the unit as soon as possible for adjustment.

Before deciding on the location of the receiver take the following items into consideration:

CONVENIENCE -- You will enjoy many hours of listening to the R5A Receiver. Make sure it is placed where you can use it comfortably.

ANTENNA -- For working the broadcast band and most of the short wave bands, the wire antenna, shipped with the R5A, will often do an adequate job. Simply connect the antenna wire to the antenna connection on the rear of the set, then tape it to the wall or hang it over a picture for good reception. Refer to the ANTENNA section for more information on outside antennas.

The receiver operates from standard 115/120 volt AC 60 cycle current. Simply plug the power receptacle into any convenient outlet. The Ameco BK-5 Battery Kit is available to permit operation from a 12 volt automobile battery or internal flashlight batteries when portable operation is desired.

TUNING CONTROLS

The main tuning control is most often used for scanning the entire tuning range of each band or to tune in specific frequencies in the broadcast band. When using the main tuning control leave the BANDSPREAD dial pointer on CAL to insure more accurate calibration.

Fine tuning is done with the BANDSPREAD control. As you become more skillful at tuning the R5A, you will find certain points on each band where your main interest will lie. The main tuning control may be set at that point and all the tuning done with the BANDSPREAD control.



CONTROLS

1. MAIN TUNING CONTROL - Used for tuning in Broadcast Band and to scan the short wave bands.
2. BANDSPREAD CONTROL - Used for very fine tuning after locating station desired with MAIN TUNING CONTROL (1). Leave on CAL when using the main tuning dial.
3. RF GAIN - Controls the gain level of all the IF amplifier stages to the receiver. When working with CW and SSB, the RF GAIN is used to adjust receiver sensitivity according to the strength of the signal being received.
4. POWER/OFF - Turns receiver ON and OFF.
5. AM/CW - For normal AM broadcast - Switch to AM position. For CW and SSB signals - Switch to CW position.
6. BAND SELECTOR - Selects any one of five bands.
7. BFO TUNING - Used to adjust the pitch of the sound when a CW signal is tuned in. It is also used to make a Single Sideband Signal readable.
8. OFF-ANL - The ANL (Automatic Noise Limiter) eliminates or reduces impulse noise (ignition noise, etc.) in the receiver. Do not use except when impulse noise is present.
9. PHONES - Phone jack - plug in headphones or external speaker. When a plug is inserted in the PHONES jack, the internal speaker is disconnected. For best results on short wave, use an external speaker or headphones.
10. VOLUME - Turn to right to increase VOLUME.

OPERATION

STANDARD AM BROADCAST BAND

	<u>CONTROL</u>	<u>SETTING</u>
Set the controls as follows:	POWER-OFF	POWER (dial light should come on).
	AM-CW	AM
	OFF-ANL	OFF
	BAND	BAND D or E
	VOLUME	9 o'clock position
	RF GAIN	Maximum clockwise position

Using the main tuning knob, tune to the frequency of the station desired. Adjust the VOLUME control as desired. When tuning signals where the stations are very close together, the main tuning dial may be left at a slightly higher frequency and the fine tuning may be done with the BANDSPREAD control.

SHORT WAVE TUNING

Select the Short Wave Band desired with the bandswitch and set the remaining controls the same as for AM Broadcast. On the short wave bands, the main dial is used only for course tuning and the bandspread control is used for fine tuning, to facilitate faster station location. The main tuning dial should always be set slightly higher than the actual desired frequency, with the bandspread control set at "calibrate" (CAL). The automatic noise limiter (ANL) may be used to reduce noise interference.

For best short wave performance an external speaker or headphones should be used.

CW TUNING

To tune in a CW signal use the following procedure:

1. With the AM-CW switch in AM position, tune the main tuning control until a steady signal is found.
2. Turn the RF GAIN control to the lowest possible point while still retaining an audible signal. The VOLUME control should be at midpoint of its range.
3. Tune in the signal with the BANDSPREAD control.
4. Put the AM-CW switch in CW position and adjust the BFO TUNING for zero beat.
5. Retune the signal with either the main tuning control or the BANDSPREAD control, and adjust the RF GAIN control for the desired tone and volume.
6. When you want to tune in another CW signal use the main or BANDSPREAD tuning and RF GAIN controls.

SINGLE SIDEBAND TUNING

Use the same procedure given for CW TUNING. Tune the BANDSPREAD dial very slowly until the voice being received sounds most natural. Keep the RF GAIN control as low as possible.

FM TUNING

Use the same procedure given for AM tuning. When the signal is tuned in exactly on frequency, it will probably not be as clear as you desire. Tune the radio slightly to one side of the exact frequency, and the voice will become clear and easily understood.

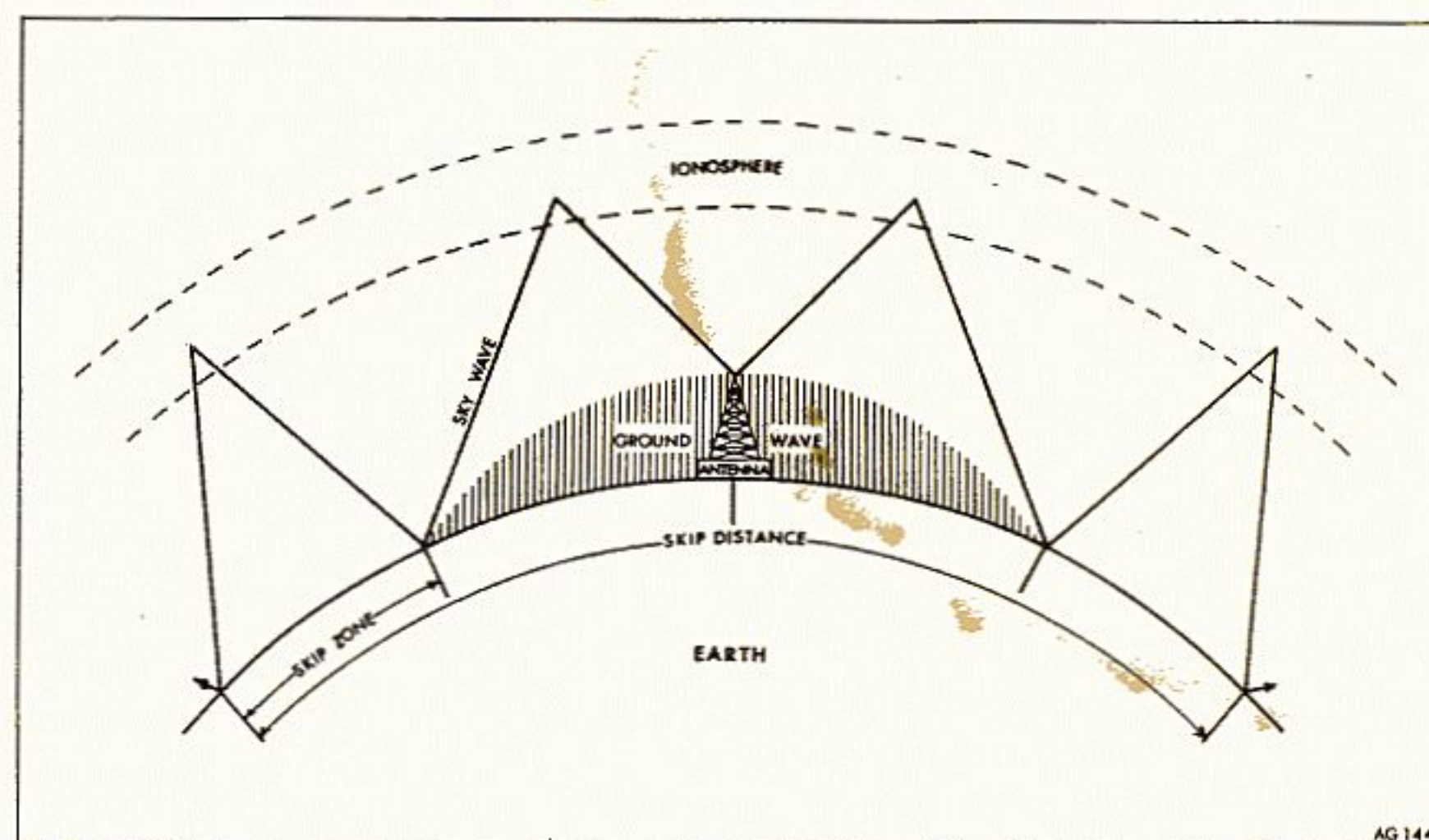
As a general rule, one side will be clearer, so tune both sides of the frequency to achieve the best response.

SHORT WAVE RADIO

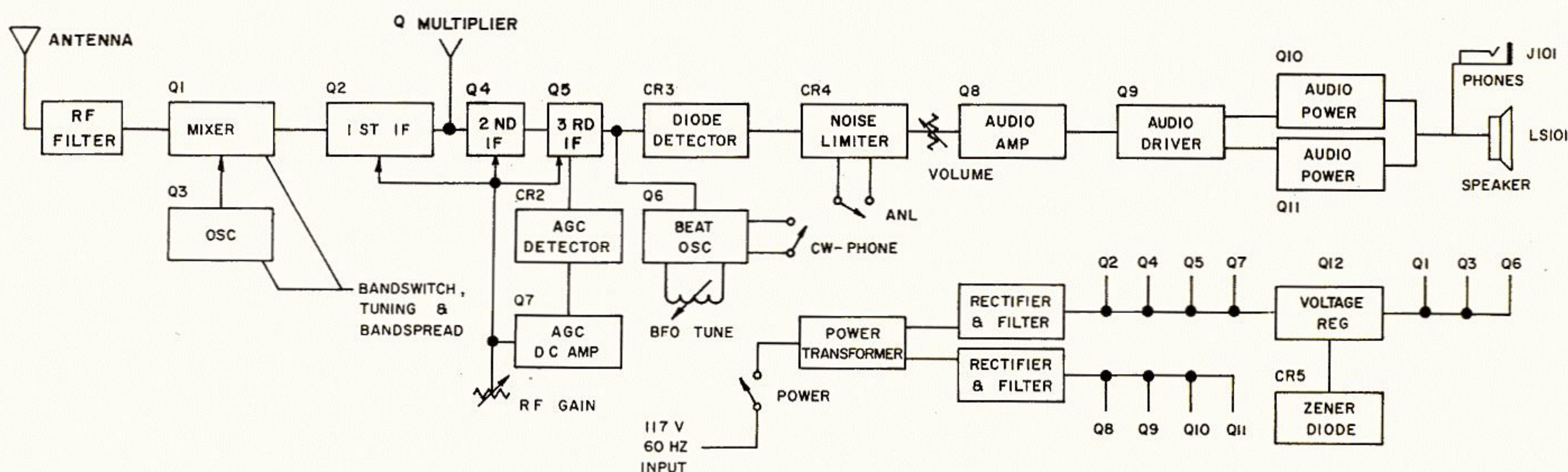
Radio signals travel in waves with the wave length determining the frequency of the transmitted signal. The frequency of the broadcast is the number of complete cycles sent out per second. One cycle per second is called a Hertz, abbreviated Hz. The prefix KILO is used for 1000; MEGA for 1,000,000. 2,100,000 Hz would be written 2.1 MHz or 2100 kHz. Many publications still use the older term, cycles, abbreviated C. The examples above should be written 2.1 Mc or 2100 Kc.

Radio stations throughout the world are licensed to use specific frequencies or bands of frequencies. Standard broadcast stations in the United States are assigned to the band between 540 kHz and 1.6 MHz. The high frequency bands are used by short-wave stations all over the world.

A peculiar characteristic of short waves is their reaction when they contact the gases of the ionosphere. Instead of going on into space, many short wave signals bounce off the ionosphere and are deflected back to earth a long distance from their transmitting site. This bouncing action may occur several times before the signal gets too weak to travel any further. It is possible, therefore, to listen to some short wave broadcasts thousands of miles from their point of origin.



The several regions of the ionosphere, each consisting of one or more layers, vary in height and ionization with the time of day, the season and the solar cycle. Because of these variations, it is good practice to set up your own log of stations received, time of reception and quality of reception. As you accumulate entries, you will find it easier to select appropriate stations at any time of year.



ANTENNAS

Excellent results can be had with an antenna of random length. A typical antenna consists of 25 to 100 feet of wire, strung between two poles, a house and a tree, etc., with one end of the wire run to the antenna terminal of the receiver. The wire should be insulated with glass or porcelain insulators from the wire or rope used to attach it to the poles or other supports. If strong local broadcast stations cause distortion, substitute a short piece of wire for the regular antenna. A good ground to a water pipe, steam pipe or a pipe driven into the ground should be connected to the ground terminal of the receiver. A lightning arrestor must be connected in the shortest path from the antenna to ground, preferably on the outside of the building.

When using your R5A on the frequencies between 27 - 54 MHz, the receiving capabilities may best be utilized by an antenna cut approximately to the frequency to be received. For general scanning of the entire range, an antenna cut for 35 MHz or a TV antenna may be sufficient. For best CB and FM reception the antennas shown below are recommended.

1. Vertical Ground Plane Antenna -- The vertical ground plane antenna is an omnidirectional type antenna that provides optimum performance for reception of signals that are vertically polarized. Virtually all stations transmitting in the Public Safety FM and CB frequencies (frequencies covered by your receiver) use antennas that also are vertically polarized making this type antenna adequate for reception of signals from medium to long range distances.
2. Coaxial Antenna -- The coaxial type antenna is an antenna similar in operation to the ground plane antenna. This type antenna performs as well in most applications as that of the ground plane type. The coaxial antenna is ideal for those installations where a vertical ground plane is not feasible. (Such as the 30-50 MHz band where the length of the ground plane rods may be objectionable.) This antenna, as with the ground plane, is good for the reception of signals from the medium to long range distances.
3. Vertical Beam Antenna -- The vertical beam antenna is a highly efficient directional antenna generally intended for long range reception of signals. An average five-element vertical beam provides an equivalent increase in signal strength of 7 times.



GROUND PLANE



COAXIAL ANTENNA

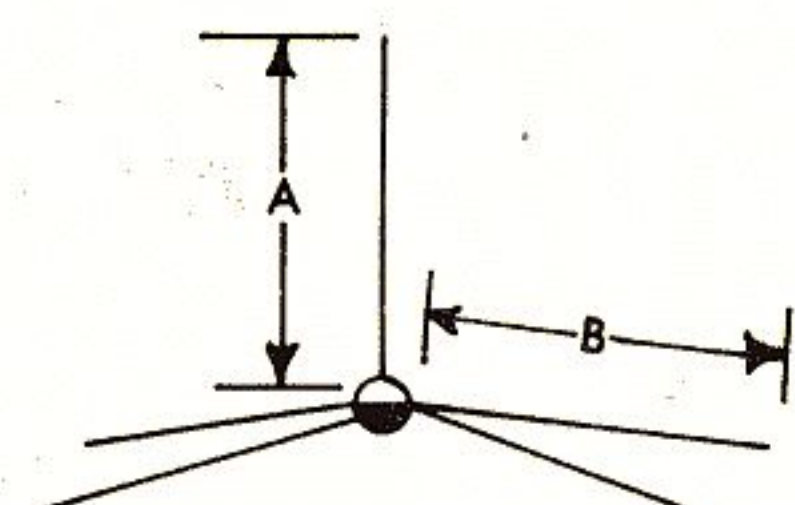


VERTICAL BEAM

By using the chart below you can cut a CB ground plane antenna to correct length for any frequency between 27 and 54 MHz.

FREQUENCY IN MHz	RADIATOR LENGTH (A)	RADIAL LENGTH (B)
27 - 28	105"	108"
29 - 31	95"	100"
32 - 34	88"	91"
35 - 37	81"	85"
38 - 40	75"	79"
41 - 43	70"	74"
44 - 46	65"	68"
47 - 49	61"	64"
50 - 52	58"	61"
53 - 54	54"	57"

FIXED STATIONS
GROUND PLANE ANTENNA
AND RADIAL LENGTHS



LISTENING TO SHORT WAVE

As you become more experienced in using your R5A receiver, you will notice that many foreign stations announce their transmitting frequency in meters, rather than megahertz. Much of the amateur literature will speak of the 80 meter band, or the 40 meter band, or any of the various other widely used frequencies, in meters rather than megahertz. The formula given below may be used in converting meters to megahertz or megahertz to meters.

For Example: $300/\text{Megahertz} = \text{Meters}$

$$\begin{array}{l} 300/12 \text{ MHz} = 25 \\ 12 \text{ MHz} = 25 \text{ meters} \end{array} \quad (\text{or})$$

From meter to megahertz: $300/\text{meters} = \text{megahertz}$

$$\begin{array}{l} \text{For example: } 25 \text{ meters} \\ 300/25 = 12 \text{ MHz} \end{array}$$

Some interesting possibilities for your short wave listening are listed below:

AMATEUR RADIO - Assigned bands between 1.800 MHz to 54 MHz as marked on R5A dial plate.

SHORT WAVE BROADCASTING - Check with a good reference book regarding frequencies used by various countries.

CITIZENS BAND - Frequencies assigned to private citizens in the United States and several other countries - 26.965 to 27.255 MHz.

MILITARY COMMUNICATIONS - Heard over the entire short wave frequency range.

POLICE, FIRE AND COMMERCIAL - Between 30 and 50 MHz.

LISTENING TO THE TWO-WAY RADIO FM BAND

Certain bands of frequencies in the 30 - 50 MHz range are allocated by the U.S. Government to what is known as the Public Safety Channels. This includes police, fire departments, forestry and conservation, and special emergency service. Frequency modulation is used by these services because of its ability to overcome much of the effect of ignition noises. In order to enter this exciting world of emergency communications, it will be necessary to use more rigorous standards in the selection of an antenna. It is recommended that the beginner refer to some standard book on the subject of short wave listening, such as the ARRL Antenna Handbook published by the AMERICAN RADIO RELAY LEAGUE.

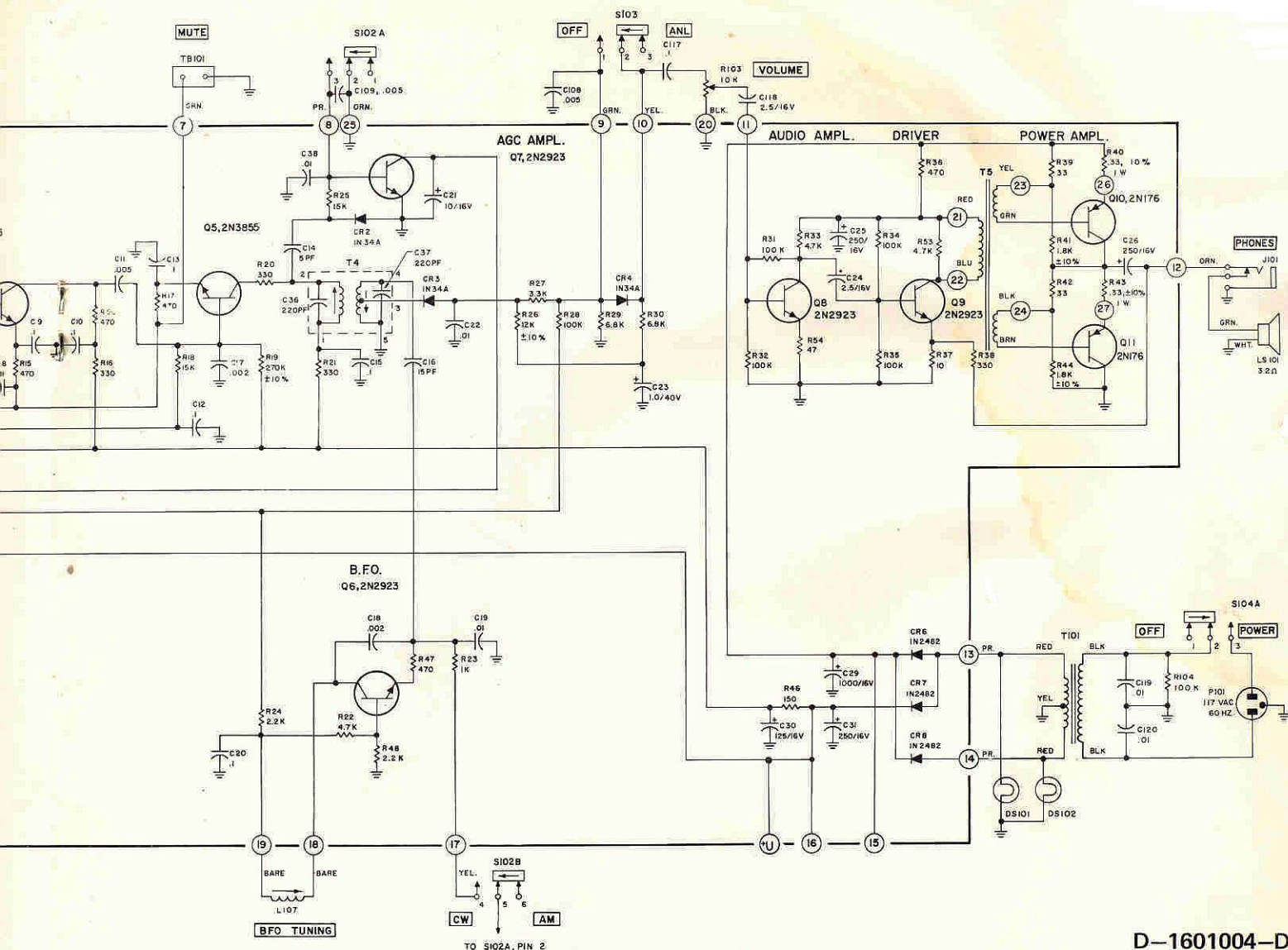
FOR MORE INFORMATION --

There are many sources you may go to for more extensive information concerning short wave radio. Some standard references which offer a wealth of information are listed below:

AMERICAN RADIO RELAY LEAGUE, INC. - The largest organization of radio amateurs.
Newington, Conn. 06111

WORLD RADIO TV HANDBOOK - List of all radio and television stations throughout the world.
May be ordered from: Gilfer Associates, P. O. Box 238,
Park Ridge, New Jersey, 07656.

WHITE'S RADIO LOG - Published in the magazine RADIO-TV EXPERIMENTER. Any three consecutive issues contain a complete issue of the log.



D-1601004-D

ALIGNMENT PROCEDURE

ALIGNMENT PROCEDURE

1. Use an amplitude modulated generator covering 455 KHz to 54 MHz.
2. Connect the output meter across the speaker voice coil.
3. Use non-metallic alignment tools. GC #8606L or similar.
4. Use a standard EIA dummy antenna as shown.
5. VOLUME control near maximum clockwise. BANDSPREAD control at 10. AM-CW switch at AM. OFF-ANL switch in OFF position. RF-GAIN at maximum unless noise exceeds 50 milliwatts with no signal or an unmodulated signal.
6. Refer to Outline Diagram for location of adjustments.
7. Bottom must be on chassis.

GENERATOR FREQUENCY	BAND SELECTOR SETTING	RECEIVER DIAL SETTING	ADJUSTMENT
455 KHz (30% mod.)	E	.54 MHz	L 3, top and bottom of T 2, T 3, T 4 for maximum output. Keep reducing the generator output to keep the output meter below 50 milliwatts.
455 KHz	E	.54 MHz	Tune BFO to zero beat. Adjust knob so pointer aims straight up and tighten setscrew.
1.3 MHz (30% mod.)	E	1.3 MHz	C 107E and C 105E for maximum output as in Step 1.

4.	Same as Step 3	0.6 MHz (30% mod.)	E	0.6 MHz	L 106B and L 103B for maximum output as in Step 1.
5.	Same as Step 3	---	E	---	Repeat steps 3 and 4 until no increase in output can be obtained on either adjustment.
6.	Same as Step 3	3.2 MHz (30% mod.)	D	3.2 MHz	C 107D and C 105D for maximum output as in Step 1.
7.	Same as Step 3	1.5 MHz (30% mod.)	D	1.5 MHz	L 105B and L 102B for maximum output as in Step 1.
8.	Same as Step 3	---	D	---	Repeat steps 6 and 7 until no increase in output can be obtained.
9.	Same as Step 3	8.0 MHz (30% mod.)	C	8.0 MHz	C 107C and C 105C for maximum output as in Step 1.
10.	Same as Step 3	3.8 MHz (30% mod.)	C	3.8 MHz	L 103A and L 106A for maximum output as in Step 1.
11.	Same as Step 3	---	C	---	Repeat steps 9 and 10 until no increase in output can be obtained.
12.	Same as Step 3	21 MHz (30% mod.)	B	21 MHz	C 107B and C 105B for maximum output as in Step 1.
13.	Same as Step 3	10 MHz (30% mod.)	B	10 MHz	L 102A and L 105A for maximum output as in Step 1.
14.	Same as Step 3	---	A	---	Repeat steps 12 and 13 until no increase in output can be obtained.
15.	Same as Step 3	50 MHz	A	50 MHz	C 107A and C 105A for maximum output as in Step 1.
16.	Same as Step 3	25 MHz	A	25 MHz	L 101 and L 104 for maximum output as in Step 1.
17.	Same as Step 1	---	A	---	Repeat Steps 15 and 16 until no increase in output can be obtained.

PARTS LIST

Item	Description	Part No
R5A RECEIVER		
CAPACITORS		
C 101	10 pF, $\pm 10\%$, NPO, disc ceramic	1501 1002 007
C 102	10-333 pF, air variable	1569 3303 004
C 103	6-19 pF, air variable	1569 1902 004
C 104	50 pF, $\pm 10\%$, NPO, disc ceramic	1501 5002 007
C 105	5, 10-35 pF, mica trimmers	1573 3502 004
C 106	22 pF, $\pm 10\%$, NPO, disc ceramic	1501 2202 007
C 107	5, 10-35 pF, mica trimmers	1573 3502 004
C 108	.005 uF, $\pm 20\%$, 500 V, disc ceramic	1510 5004 002
C 109	.005 uF, $\pm 20\%$, 500 V, disc ceramic	1510 5004 002
C 110	.0033 uF, $\pm 5\%$, 50 V, min. mica	1512 3304 003
C 111	.0012 uF, $\pm 5\%$, 50 V, silver mica	1513 1204 008
C 112	500 pF, $\pm 5\%$, 50 V, silver mica	1513 5003 008
C 113	.1 uF, $\pm 80\%$, -20%, 16 V, disc ceramic	1508 1006 003
C 114	.1 uF, $\pm 80\%$, -20%, 16 V, disc ceramic	1508 1006 003
C 115	.01 uF, $\pm 80\%$, -20%, 16 V, disc ceramic	1508 1005 004
C 116	680 pF, $\pm 5\%$, 50 V, silver mica	1513 6803 008
C 117	2.5 uF, $\pm 80\%$, -20%, 16 V, disc ceramic	1508 1006 003
C 118	1 uF, $\pm 80\%$, -10%, 16 V, electrolytic	1518 2507 015
C 119	.01 uF, 1400 V, disc ceramic	1505 1005 001
C 120	.01 uF, 1400 V, disc ceramic	1505 1005 001
C 121	NOT USED	
RESISTORS		
R 101	330 ohm, $\pm 20\%$, 1/2 w, comp.	4701 3303 003
R 102	100 k, $\pm 20\%$, log taper, pot	4731 1006 019
R 103	10 k, $\pm 20\%$, log tap. pot	4731 1005 020
R 104	100 k, $\pm 10\%$, 1/2 w, comp.	4701 1006 001
R 105	100 ohm, $\pm 20\%$, 1/2 w, comp.	4701 1003 003
MISCELLANEOUS		
L 101	Coil, antenna/osc.	1801 1601 032
L 102	Coil, antenna	1801 1601 033
L 103	Coil, antenna	1801 1601 034
L 104	Coil, antenna/osc.	1801 1601 032
L 105	Coil, osc.	1801 1601 035
L 106	Coil, osc.	1801 1601 036
L 107	Coil, BFO	1801 1601 024
LS 101	Speaker, 3 x 5, 3.2 ohm	1302 0000 004
J 101	Phone jack, 3 cond.	2105 0000 013
J 102	Phono jack, RCA type	2111 0000 006
P 101	Cable, AC Power	6053 0000 007
DS 101	Lamp, 14.4 V, 100 MA	3950 0000 003
DS 102	Lamp, 14.4 V, 100 MA	3950 0000 003
S 101	Bandswitch	5112 1601 037
S 102	Switch, slide, DPDT	5133 0000 002
S 103	Switch, slide, SPST	5134 0000 003
S 104	Switch, slide, DPDT	5133 0000 002
T 101	Transformer, power	5610 1601 030
TB 101	Terminal board, 4 terminal	2166 0604 001
XDS 101	Lamp socket	2183 0000 003
XDS 102	Lamp socket	2183 0000 002
Cabinet, RCVR		
	Front panel, RCVR	1418 1601 006
	Dial Panel, background	1408 1601 014
	Bottom plate, RCVR	1404 1601 021
	Dial plate	2413 1601 015
	Drive spindle, drive string	2406 1601 020
	Pointer, dial	2412 1601 023
	Dial cord	2403 0000 002
	Pointer, bandspread	2412 0000 002
	Spring, dial cord	2402 0000 001
	Rubber feet	2806 0000 004
	Knob, black, 7/8" D	2409 0000 014
	Knob, black, w/pointer, 7/8" D	2409 0000 015
	Knob, black w/setscrew	2409 0000 016
	Knob, black, 1-1/2" D	2409 0000 017
	Piano wire, .020 x 2.12 long	2523 0000 002
S 5	Speaker	1921 1622 101

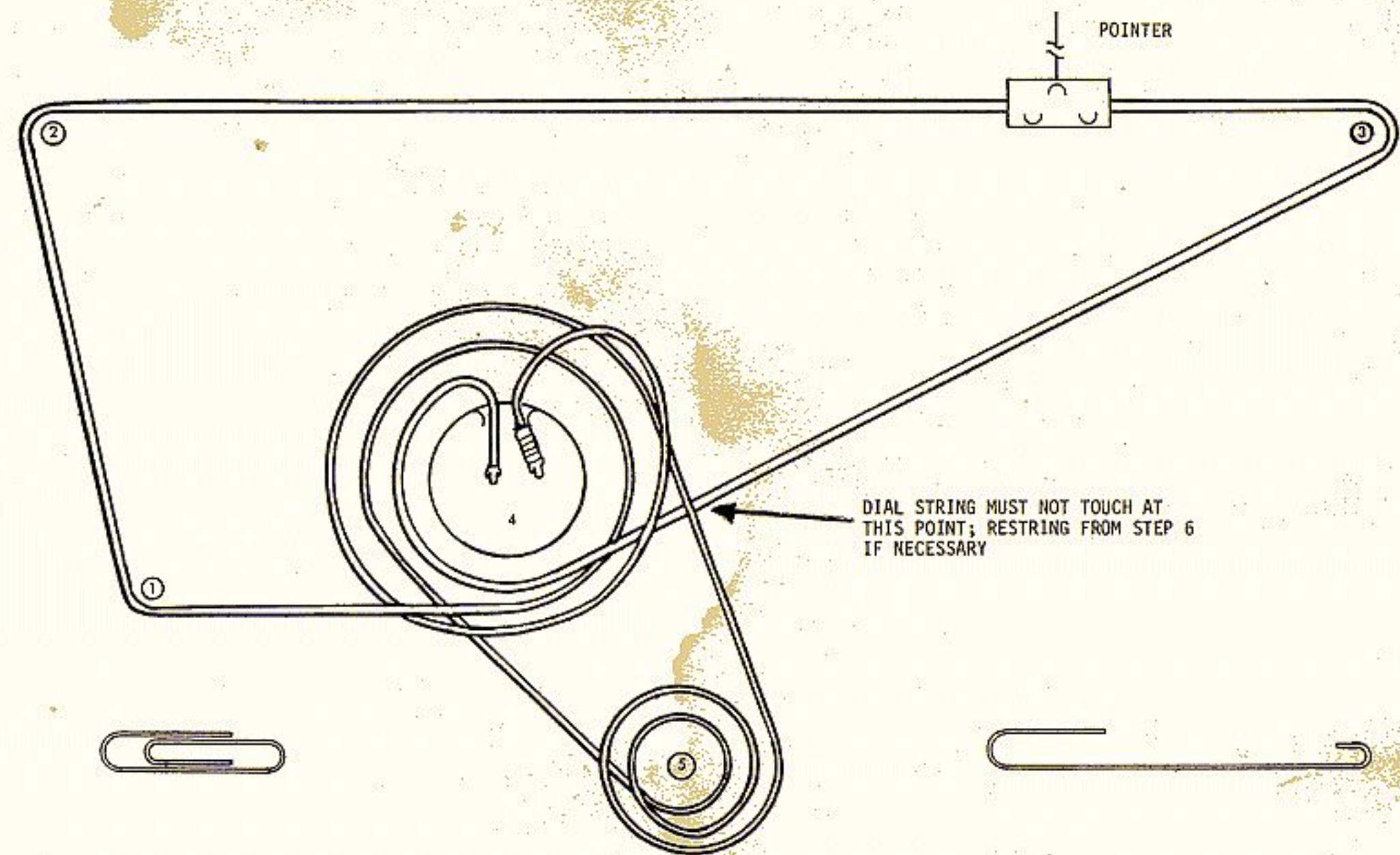
Item	Description	Part No
Component Board Assembly Consists of the following parts:		1929 1601 102
CAPACITORS		
C 1	.005 uF, $\pm 20\%$, 500 V, disc ceramic	1510 5004 002
C 2	.1 uF, $\pm 80\%$, -10%, 16 V, disc ceramic	1508 1006 003
C 3	.1 uF, $\pm 80\%$, -10%, 16 V, disc ceramic	1508 1006 003
C 4	.1 uF, $\pm 80\%$, -10%, 16 V, disc ceramic	1508 1006 003
C 5	.01 uF, $\pm 80\%$, -20%, 50 V, disc ceramic	1508 1005 004
C 6	2.2 pF, $\pm 10\%$, NPO, disc ceramic	1501 2201 007
C 7	.0012 uF, $\pm 5\%$, 50 V, silver mica	1513 1204 008
C 8	.01 uF, $\pm 80\%$, -20%, 50 V, disc ceramic	1508 1005 004
C 9	.1 uF, $\pm 80\%$, -10%, 16 V, disc ceramic	1508 1006 003
C 10	.1 uF, $\pm 80\%$, -10%, 16 V, disc ceramic	1508 1006 003
C 11	.005 uF, $\pm 20\%$, 500 V, disc ceramic	1510 5004 002
C 12	.1 uF, $\pm 80\%$, -10%, 16 V, disc ceramic	1508 1006 003
C 13	.1 uF, $\pm 80\%$, -10%, 16 V, disc ceramic	1508 1006 003
C 14	5 pF, $\pm 10\%$, NPO, disc ceramic	1501 5001 007
C 15	.1 uF, $\pm 80\%$, -10%, 16 V, disc ceramic	1508 1006 003
C 16	15 pF, $\pm 10\%$, NPO, disc cer	1501 1502 007
C 17	.002 uF, $\pm 10\%$, 600 V, disc ceramic	1506 2004 002
C 18	.002 uF, $\pm 5\%$, 50 V, min. mica	1512 2004 003
C 19	.01 uF, $\pm 20\%$, 250 V, flat film	1529 1005 001
C 20	.1 uF, $\pm 80\%$, -10%, 16 V, disc ceramic	1508 1006 003
C 21	10 uF, $\pm 50\%$, -10%, 16 V, elec.	1518 1008 015
C 22	.01 uF, $\pm 80\%$, -20%, 50 V, disc ceramic	1508 1005 004
C 23	1 uF, $\pm 50\%$, -10%, 40 V, elec.	1518 1007 021
C 24	2.5 uF, $\pm 50\%$, -10%, 16 V, elec.	1518 2507 015
C 25	250 uF, $\pm 50\%$, -10%, 16 V, elec.	1518 2509 020
C 26	250 uF, $\pm 50\%$, -10%, 16 V, elec.	1518 2509 020
C 27	250 uF, $\pm 50\%$, -10%, 16 V, elec.	1518 2509 020
C 28	250 uF, $\pm 50\%$, -10%, 16 V, elec.	1518 2509 020
C 29	1000 uF, $\pm 50\%$, -10%, 16 V, elec.	1518 1010 015
C 30	125 uF, $\pm 50\%$, -10%, 16 V, elec.	1518 1259 015
C 31	250 uF, $\pm 50\%$, -10%, 16 V, elec.	1518 2509 020
C 32	220 pF, $\pm 5\%$, 50 V, silver mica	1513 2203 008
C 33	220 pF, $\pm 5\%$, 50 V, silver mica	1513 2203 008
C 34	220 pF, $\pm 5\%$, 50 V, silver mica	1513 2203 008
C 35	220 pF, $\pm 5\%$, 50 V, silver mica	1513 2203 008
C 36	220 pF, $\pm 5\%$, 50 V, silver mica	1513 2203 008
C 37	220 pF, $\pm 5\%$, 50 V, silver mica	1513 2203 008
C 38	.01 uF, $\pm 80\%$, -20%, 50 V, disc ceramic	1508 1005 004
C 39	560 pF, $\pm 10\%$, 50 V, silver mica	1513 5603 008
C 40	5 pF, $\pm 10\%$, NPO, disc ceramic	1501 5001 007
C 41	22 pF, $\pm 10\%$, NPO, disc ceramic	1501 2202 007
C 42	22 pF, $\pm 10\%$, NPO, disc ceramic	1501 2202 007
C 43	5 pF, $\pm 10\%$, NPO, disc ceramic	1501 5001 007
RESISTORS		
Resistors not listed are $\pm 20\%$, 1/2 w, comp.		4712 3300 001
R 40	.33 ohm, $\pm 10\%$, 1 watt, wire wound	4712 3300 001
R 43	33 ohm, $\pm 10\%$, 1 watt, wire wound	4712 3300 001
R 49	2.2 k, $\pm 10\%$, 1/4 watt, comp.	4704 2204 001
MISCELLANEOUS		
Q 1	Transistor, 40242	4811 0000 003
Q 2	Transistor, 2N3855	4811 0000 006
Q 3	Transistor, 40242	4811 0000 003
Q 4	Transistor, 2N3855	4811 0000 006
Q 5	Transistor, 2N3855	4811 0000 006
Q 6	Transistor, 2N2923	4811 0000 008
Q 7	Transistor, 2N2923	4811 0000 008
Q 8	Transistor, 2N2923	4811 0000 008
Q 9	Transistor, 2N2923	4811 0000 008
Q 10	Transistor, 2N176	4820 0001 001
Q 11	Transistor, 2N176	4820 0001 001
Q 12	Transistor, 2N2923	4811 0000 008
CR 1	Diode, Germanium, 1N281 or 1N100	4804 0000 006
CR 2	Diode, Germanium, 1N34A	4804 0001 001
CR 3	Diode, Germanium, 1N34A	4804 0001 001
CR 4	Diode, Germanium, 1N34A	4804 0001 001
CR 5	Diode, Zener, 1N711A	4831 0001 001
CR 6	Diode, silicon, 1N2482	4803 0001 001
CR 7	Diode, silicon, 1N2482	4803 0001 001
CR 8	Diode, silicon, 1N2482	4803 0001 001
CR 9	Diode, Germanium, 1N34A	4804 0001 001
L 1	R.F. choke, 18 mH	1824 1805 002
L 3	Coil, discriminator	1806 0000 002
L 4	R.F. choke, 1.1 uH	1820 1101 001
L 5	R.F. choke, 1.8 uH	1820 1801 001
L 6	R.F. choke, 1.1 uH	1820 1101 001
T 2	Transformer, I.F.	5640 1601 038
T 3	Transformer, I.F.	5640 1601 038
T 4	Transformer, I.F.	5640 1601 038
T 5	Transformer, I.F.	5603 1601 031
Heat sink, transistor Can, I/F. Transformer		4891 1601 022 1405 0000 009

R5A DIAL STRING CABLE

TOOL LIST: Long nose pliers;

Hook made from paper clip;
(See illustration above)

Scotch tape



NOTE: DO NOT allow the dial cable to kink. DO NOT use pliers or tweezers on the cable.
DO NOT let the cable touch grease on the gears.

1. Make the dial cable, using a 1/8" diameter rod to form a loop at one end. Tie the cord securely so that the loop formed will not slip.
2. Tie the straight end of the cable to the centered loop of the coil spring. (The loop that is flat with the side of the spring goes on the pulley.) Adjust the knot to make the length exactly 48-3/4" from the center of the 1/8" rod to the wire of the coilspring, at the knot.

NOTE: The spring is used as a handle at the free end of the cable in the following steps. Maintain a slight tension on the cable while following the procedure given below.

3. With the variable capacitor plates partially out, drop the 1/8" loop at the end of the cable over tab L on the large pulley #4, pass the cable thru the notch in the edge of #4, around #4 in the groove, and then over to and around pulley #3. Pull the cable to turn capacitor plates fully out. A piece of scotch tape can be used to hold the cable between pulley #3 and the pointer.
4. Pass the cable over the 3 tabs on the pointer as shown, then slide the pointer to the high frequency end of the dial. Pass the cable over pulley #2, then pulley #1; remove the scotch tape and use it to hold the cable between pulleys #1 and #4.
5. Pass the cable under and in the groove of pulley #4 between the dial back-ground and the cable already in place; around pulley #4 one turn then thru the slot in the chassis. While holding tension on the cable, remove the scotch tape, then wind the cable counter-clockwise around the groove in the tuning shaft (pulley #5) 2-1/2 turns. Put the scotch tape on the tuning shaft.
6. Pass the cable up thru the slot in the chassis, toward the rear of the chassis from the cable between pulley #3 and #4, into the groove of pulley #4. Remove the scotch tape. While holding tension on the cable, turn pulley #4 with the fingers until the plates of the capacitor are fully meshed, pass the cable into the notch in the #4 and drop the loop of the spring over tab R.

NOTE: If the cable is several inches too long, one loop around pulley #4 was omitted -- go back to step 5 and restring.

7. Turn the tuning knob back and forth over the full range of the dial several times.
8. Turn the tuning knob until the capacitor plates are fully meshed. Slide the pointer along the scale until it is exactly at the extreme left end line beyond the lowest numbers.

SERVICING

The R5A receiver uses transistors exclusively. Under ordinary conditions the radio will give you many hours of trouble-free operation.

Always check the POWER-OFF switch, and the power plug, before using the receiver. If signals are extremely weak, check your antenna to make sure it is correctly connected to the radio. If a high level of impulse noise (ignition noise) is present, move the OFF-ANL switch to ANL position.

For further information and assistance with servicing your R5A receiver, contact the dealer from whom you bought the radio.

NOISE BETWEEN STATIONS

When the receiver is not tuned in to any signal, there will usually be a considerable amount of noise. The strength of the noise will depend on the local and atmospheric noise levels at that particular time and location and also on the position of the RF GAIN control. A good antenna will improve the ratio between the signals and the noise but may have little effect on the noise between stations.

LOUDSPEAKERS AND HEADPHONES

The loudspeaker in the R5A receiver does an excellent job when listening to the broadcast band or for casual shortwave listening. The use of an external speaker or headphones is recommended for all bands except the broadcast band. An external speaker will not affect sensitive components in the receiver and will improve the listening capability of the unit. Earphones are especially good where intense concentration is needed as they shut out all external noises.

When an external speaker or headphones are used, they are plugged into the PHONES jack on the front panel of the R5A. Plugging into the PHONES jack automatically disconnects the internal speaker. Any speaker with a voice coil of from 2 to 16 ohms may be used with the R5A. All types of headphones may be used. Do not connect the R5A to any speaker that is already connected to some other piece of equipment.

Q MULTIPLIER JACK

The R5A has a jack on the rear of the chassis to permit the addition of a Q Multiplier. A Q Multiplier will make the receiver much more selective, permitting separation of closely spaced signals. It is particularly useful in the Amateur bands for CW and SSB signals. Note that it is necessary to use an external speaker or headphones when using the Q Multiplier. The Ameco Model SQ, Speaker and Q Multiplier, is a companion unit to the R5A. The Q Multiplier is powered by an internal battery and plugs into the Q Multiplier jack. The speaker plugs into the "PHONES jack on the panel.

BATTERY OPERATION

The BK5 Battery Kit may be added to the R5A to provide operation from a 12 volt automobile battery or from internal flashlight batteries.

STATIONS FOR INTERNATIONAL LISTENING

There are many radio stations throughout the world which broadcast in English on the short wave frequencies. Some of these stations can be found by "scanning" the appropriate bands on your R5A Receiver. For a comprehensive listing, refer to WORLD RADIO-TV HANDBOOK, or any one of the directories available. The list below will serve as a starting point in your enjoyment of this fascinating hobby.

<u>COUNTRY</u>	<u>CITY</u>	<u>FREQUENCY</u> <u>IN MEGAHERTZ</u>
Albania	Tirana	7.265
Argentina	Buenos Aires	9.690
Australia	Melbourne	15.220-17.840
Bulgaria	Sofia	6.070
China	Peking	1.506-17.680
Cuba	Havana	6.170-11.760
Czechoslovakia	Prague	5.930-7.115-6.345
Denmark	Copenhagen	9.520
Ecuador	Quito	9.745-11.915-15.115
England	London	6.195-7.130-9.510-11.780
Germany	Berlin	5.960-6.160-9730
Ghana	Accra	6.110
Hungary	Budapest	6.235-9.833
Italy	Rome	6.010-9.630
Japan	Tokyo	11.780-15.135
Lebanon	Beirut	9.710
Netherlands Antilles	Bonaire	9.605
Portugal	Lisbon	6.025-6.185
Roumania	Bucharest	5.990-9.570
South Africa	Johannesburg	9.675-11.880
Spain	Madrid	6.130-9.760
Sweden	Stockholm	5.990
Switzerland	Berne	5.965-6.120-9.535
U. A. R.	Cairo	9.475
U.S.S.R.	Kiev	7.120-7.310-9.665
U.S.S.R.	Moscow	7.150-7.205-7.310-9.665
Vatican	Vatican City	5.985-7.250

GLOSSARY OF TERMS

AM - Amplitude Modulation
 ANL - Automatic Noise Limiter
 ANT - Antenna
 AVC - Automatic Volume Control. Also, called AGC - Automatic Gain Control
 BFO - Beat Frequency Oscillator
 CQ - A general call used to establish contact between amateurs
 CW - Continuous wave. Unmodulated signal with the message transmitted by interruptions which produce dots and dashes.
 FM - Frequency modulation
 QRM - Interference from other signals
 QRX - Standby
 QRN - Interference from static
 QSO - Contact between two stations
 QSY - Change operating frequency
 RF GAIN - Controls the sensitivity of the RF and/or IF amplifier stages.
 RST - Readability, Signal Strength, Tone
 SWL - Short wave listener

RETURNING THE UNIT FOR REPAIR

If trouble develops in the receiver and you wish to return the unit for repair (either in or out of warranty), we recommend that you return the receiver to the dealer from which it was purchased. If the unit is to be shipped to the AMECO factory for service, please read the instructions that follows.

SHIPPING

Pack the unit carefully to avoid damage in transit, preferably in the original carton. If the original carton is not available, use a sturdy carton with at least 3 inches of shredded paper or excelsior around the unit. In the latter case, wrap the unit in paper first to avoid particles of packing material getting into it. Include with the unit a letter explaining exactly what difficulties you have encountered (remember to add an extra 6¢ postage and indicate on the outside of the carton that First Class Mail is enclosed). Ship by prepaid express if possible and mark ELECTRONIC EQUIPMENT -- FRAGILE. Clearly address the carton as follows:

AMECO
Division of Aerotron, Inc.
Factory Service Department
P. O. Box 6527
Raleigh, N. C., 27608

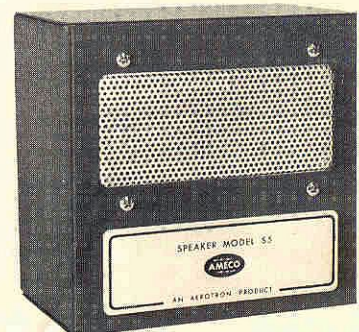
ALSO AVAILABLE

BK-5 BATTERY KIT

Permits the R5A to be used
as a portable receiver \$3.95
(Requires 6 Size "D" Flashlight Cells)

S-5 EXTERNAL SPEAKER

For improved performance,
particularly on the Higher
Frequency Bands \$9.95



Warranty

AEROTRON, INC., Raleigh, N. C., warrants each new radio product manufactured by it to be free from defective material and workmanship and agrees to remedy any such defect or to furnish a new part, in exchange for any part of any unit of its manufacture which under normal installation, use and service disclosed such defect, provided the unit is delivered by the owner to us or to our authorized radio dealer or wholesaler from whom purchased, or authorized service station, intact, for our examination, with all transportation charges prepaid to our factory, within ninety days from the date of sale to original purchaser and provided that such examination discloses, in our judgment, that it is thus defective.

This warranty does not extend to any of our radio products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper installation, unauthorized modifications, or to use in violation of instructions furnished by us, nor extend to units which have been repaired or altered outside of our factory, nor to cases where the serial number thereof has been removed, defaced or changed, nor to accessories used therewith not of our own manufacture.

This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our radio products.



A DIVISION OF AEROTRON, INC.
P. O. BOX 6527
RALEIGH, NORTH CAROLINA 27608

Manufacturer of FM and AM two-way radio, SSB and ISB communications, Controlator fuel control and data equipment, Ameco and Gonset ham, CB and SWL gear.