



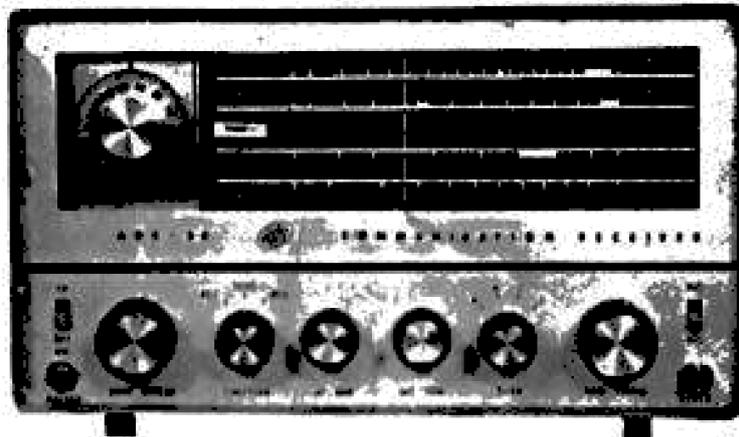
OPERATING MANUAL

A G S 3 8



COMMUNICATIONS RECEIVER

AMERICAN GENERAL SUPPLY
ELECTRONICS, INC., NEW YORK
OF CANADA, LTD., MONTREAL



- 1) The ACS-38 is equipped with a one stage RF amplifier which enables it to receive even a weak radio wave.
- 2) The vernier tuning dial makes it possible to select the station desired easily and accurately.
- 3) BFO (Beat Frequency Oscillator) is provided for reception of CW (Continuous Wave)
- 4) Remote circuit is equipped with relay which makes it possible to use transmitter as combination with automatic operation.
- 5) AVC circuit provides fading-less reception of voice.
- 6) ANL (Automatic Noise Limiter) circuit is provided for noise-free reception.
- 7) A large horizontal vernier tuning dial is equipped with pilot light for easy operation even in the dark.
- 8) All the controls and switches on the front plate are arranged in ideal positions so as to serve their individual purpose.
- 9) Easy to operate, push button power switch.
- 10) Phone Jack is provided for personal enjoyment.

TECHNICAL SPECIFICATIONS

FREQUENCY RANGE	Band A: 0.55 — 1.6 Mc Band B: 1.6 — 4.8 Mc Band C: 4.8 — 14.5 Mc Band D: 10.5 — 30.0 Mc
OPERATION	AM, CW.
INTERMEDIATE FREQUENCY	455Kc.
SENSITIVITY	1 μ V for 10 db S/N ratio.
SELECTIVITY	35 db at 10 Kc.
ANTENNA INPUT	50 — 75 ohms, balanced or unbalanced.
AUDIO OUTPUT	1.0 watts, 8 ohms impedance.
AUXILIARY CIRCUITS	Electrical Bandspread Automatic Noise Limiter AVC-MVC BFO "S"-meter
TUBE COMPLEMENT	V1 6BA6 RF Amp. V2 6BE6 Mixer V3 6BE6 HF Osc. V4 6BA6 IF Amp. V5 6AV6 DET, AVC, ANL & 1st Audio Amp. V6 6AV6 BFO V7 6AQ5 Audio Output Amp.
POWER SOURCE	117 volts, 50/60 cycles AC
POWER CONSUMPTION	55 VA
DIMENSIONS	12.5" w x 7.7" h x 10" d
NET WEIGHT	16.5 lbs

INSTALLATION

POWER SOURCE

The receiver is designed to operate from a 117 volt, 50-60 cycle AC power source. DO NOT OPERATE FROM A DC SOURCE.

SPEAKER CONNECTION

The marking "SPEAKER" on the two-terminal strip is provided on the back side of the receiver to be connected to a 8 ohm impedance PM speaker. Simply connect one lead to the ground terminal "0" and the other lead to the terminal designated 8. The 4-12 inch speaker can be adequately driven by the receiver's output of power.

HEADPHONES

A standard phone jack for headphone reception is provided on the receiver's front panel. For optimum results low impedance (8-16)ohms headphones is recommended. Any speaker attached to the 8 ohms output terminal will automatically be disconnected by the insertion of a phone plug into the jack.

ANTENNAS

The markings "A2" and "E" of the terminals at the rear of receivers are for antennas and ground connections. To obtain satisfactory results, use either of the following types of connection.

INVERTED "L" ANTENNA

This type provides satisfactory performance over the whole tuning range. Simply short A2 and E with a jumper wire, and connect one end of the antenna wire to A1. Place the antenna wire as high as possible and 50-100 feet long for good reception (see Fig. 1). Usually reception can be improved by connecting a wire from terminal "E" to a cold-water pipe.

DOUBLET ANTENNA

On amateur bands especially a doublet antenna gives excellent results. Use 75 ohms balanced transmission line (as shown in Fig. 2), since only at a given frequency will the doublet antenna provide optimum performance, cut it to the length for the most often used band of frequencies. The following formula can be used to determine the overall length of a doublet antenna.

$$L \text{ (Length in feet)} = \frac{468}{\text{Frequency in Megacycles}}$$

Since the doublet antenna displays directional properties broadside to its length it should be installed in such a manner that maximum signal pickup can be realized.

The leads connecting the terminals "A1" and "A2", and the jumper wire between "A2" and "E" is removed when using a balanced transmission line or a twisted pair.

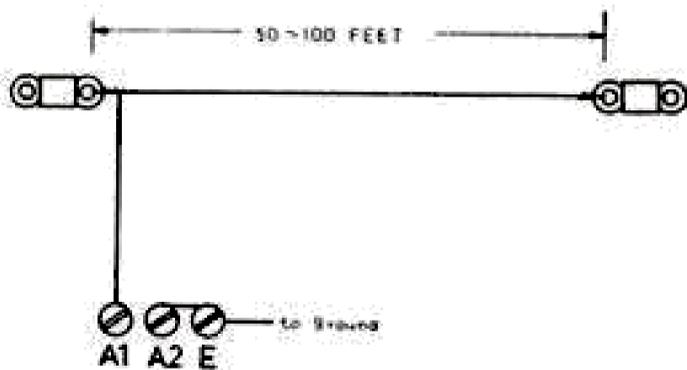


Fig. 1

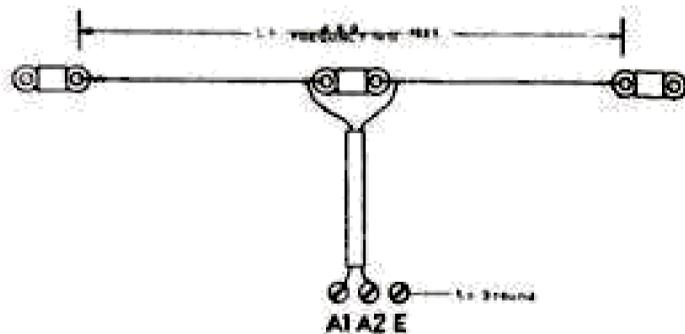


Fig. 2

REMOTE SOCKET

A receiver with a transmitter can be controlled simultaneously by a socket in the back of the receiver. During period of transmission an external switch can be used to make inoperative. In this case, the FUNCTION switch should be placed in REC position. The external switch's contact are made by means of standard AC plug. Disconnect a jumper wire connected internally across REMOTE jack as shown in figure 3. When EXTERNAL SWITCH OF TRANSMITTER IS USED,- the AC plug is then inserted into the REMOTE socket. This way, when the switch is closed, the plate voltage will be applied to the RF stages and signal reception will be instantaneous.

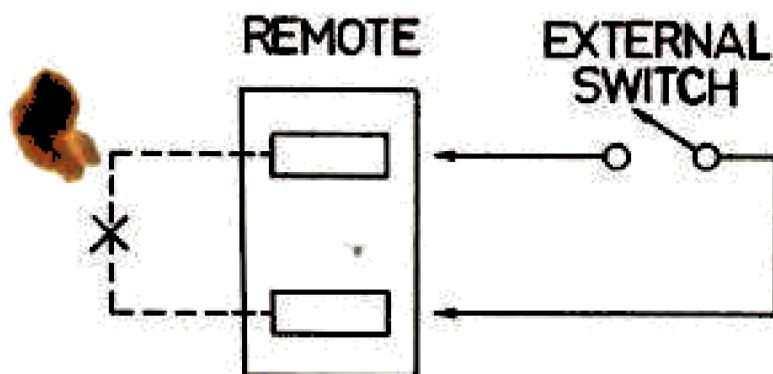


Fig. 3

For normal operating conditions with external switching, place the FUNCTION switch in the REC position, thus providing plate voltage to the RF stages. Plate voltages to the RF stages are cut off when the switch is set to the SEND position which manually disables the receiver. Return switch to REC to provide instantaneous signal reception.

BANDSPREADING

Set the bandspread dial to 100 and the main tuning pointer to the extreme right-hand side (high frequency end) of the amateur band which you wish to tune. Rotating the BANDSPREAD control towards 0 will now tune over the amateur band selected.

FINE TUNING

Set the bandspread dial to 50 and use the tuning control to set the main pointer to the approximate frequency of the desired station. Now use the bandspread control to locate the station by tuning in either direction -- from 50 to 0 and 50 to 100.

ANTENNA TRIMMER

The ANT TRIM control, adjustable from the front panel, acts as a compensating capacitor to permit optimum matching of the receiver to the antenna at all frequencies. To start with set the control to its mid-position (the dot on the front surface of the knob at 12 o'clock position). Always adjust the control for maximum background noise. Each setting will be good only over a limited range of frequencies. Always readjust the trimmer after tuning to the general area where the expected signal is to be found.

AF GAIN

This adjusts the audio output level in the speaker or headphones.

AVC-MVC

This switch, when set to the AVC position, places the automatic volume controls circuit in operation, and provides effective compensation for fading and maintains relatively constant output on either strong or weak signals. The MVC position makes the AVC circuit inoperative and should be used only when added sensitivity is required during the reception of weak signals. If MVC is used with strong signals, overloading and distortion will occur. Note that the S-meter is also inoperative in the MVC position.

ANL

Normally set the switch at "OFF". When excessive noises (as those caused by auto ignition) interfere with reception, set the switch to "ON" and automatically the noise limiter circuit will be in operation. Use this control only when necessary since it tends to reduce the overall efficiency of the receiver.

S-METER

This meter, calibrated in "S" units from 1 to 9, provides a means of measuring the relative strength of incoming signals. It is operative only when the MVC-AVC switch is in the AVC position. An adjustment control at the rear of the receiver permits calibration of the meter, as follows: Remove antenna so that there is no signal input to the receiver and adjust the "S" meter adjust control for a zero reading on the meter.

OPERATION

Following is a brief description of the functions of the various controls on the front panel. Only when you become familiar with each of the control functions will you get full appreciation as well as realization of the capabilities of the receiver.

POWER

A button when pushed will provide AC power, OFF when pushed the second time.

FUNCTIONS

REC — The applying of heater and plate voltages enables the receiver to receive signals.

SEND — This position removes plate voltage to the RF stages, and thus making the receiver inoperative (see previous section "Remote Socket")

BFO — The position makes the beat frequency oscillator in operation for (CW) the reception of code signals. The Bandsread control is used to adjust the pitch of the tone produced on CW signals.

BAND

This switch selects one of the four available frequency bands in the following:

Band A: 0.55 to 1.60 Mc (550 to 1600 Kc)
Band B: 1.60 to 4.80 Mc
Band C: 4.80 to 14.50 Mc
Band D: 10.50 to 30.00 Mc

MAIN TUNING

This control operates the tuning pointer over the main tuning dial which has four calibrated frequency scale, one for each of the four tuning band. All frequencies shown are in Megacycles (Mc). The other three bands covers the short-wave range of 1.60-30.0 Mc. The amateur radio bands are shown with basic wider line, so that they can be recognized easily. Only when the bandsread dial is set to 100 are the Calibration of these scales correct.

A Logging Scale of 0 to 100 are also incorporated in the main tuning dial. This may be used to log any particular short-wave station by noting the position of the Bandsread dial and the main tuning pointer on the Logging Scale. By so doing a record may be kept of both number so that both Bandsread main tuning can be set quickly to receive any of the short-wave station logged this manner.

BANDSPREAD

The bandsread is for providing "fine tuning" over small sections of the main tuning scales. This is especially useful on short-wave frequencies where separation between stations is often very small or almost none-existent. The truly received frequency will be indicated by the main tuning dial when the Bandsread dial is set on 100. Rotating the bandsread dial toward 0 subtracts from the frequency indicated by the main tuning pointer.

Two ways to use the Bandsread control — as a fine tuning device to tune in commercial short wave stations and to provide bandsreading over the amateur bands.

OPERATING INSTRUCTIONS

The chart in the following shows the initial settings of the various controls for each type of operation. From there on, the strength or clarity with which signals will be received will depend on proper readjustment of the various control.

INITIAL CONTROL SETTINGS

CONTROL	AM OPERATION	CW OPERATION
FUNCTION	REC	BFO
BAND	Set for band which includes desired range of frequencies	Set for band which includes desired range of frequencies
ANT TRIM	12 o'clock position	12 o'clock position
AVC-MVC	AVC	MVC
ANL	OFF	OFF
AF GAIN	Adjust for desired audio output	Adjust for desired audio output

AM OPERATION

Place all controls in the positions indicated in the Initial Control Settings chart, for the reception of broadcast stations, use Main and Bandspread tuning controls as indicated in previous sections under MAIN TUNING and Bandspread Controls. Adjust ANT TRIM for highest "S" meter reading on signal or for maximum background noise. If excessive spurious noises such as those caused by auto ignition make reception difficult, place the ANL OFF switch to the ON position.

CW OPERATION

The reception of CW (code signals) are the same as the AM in the control settings required except the function switch is now set to BFO to produce necessary tone. A "zero beat" or "null" will be heard when tuned to the exact frequency of the CW signal. Detuning slightly in either direction (higher or lower in frequency) will produce a "beat" note. The bandspread control can therefore be used to vary the tone and provide clearest reception of the desired CW signal.

SHORT-WAVE LISTENING

Radio stations transmitting from all over the world are to be found on short-wave frequencies, many of which provide English-language broadcasts. The frequencies of which the majority of short-wave broadcast stations operate are found in the two upper bands of the receiver (4.8 to 14.5 Mc and 10.5 to 30 Mc). A characteristic of short-wave is that reception varies with the time of day, the season of the year and with weather conditions.

Listen to the Voices of the World

ENGLISH LANGUAGE SHORT-WAVE BROADCAST STATIONS BEST HEARD IN WESTERN NORTH AMERICA

Readers in the western part of the United States and Canada will find the following list of "Best Heard" stations helpful in tuning the short-wave broadcast bands. The left-hand column lists the hour in Pacific Standard Time for broadcasts in English only; in the middle column, the city and country from which the broadcasts originate are listed with the name of the station used for identification in parentheses; and on the right are the frequencies and call letters for stations using them during their broadcasts.

TIME (PST)	CITY, COUNTRY (NAME)	FREQUENCIES (kc.)
10:30-7:45 a.m.	Wellington, New Zealand (<i>Radio New Zealand</i>)	9540 (ZLJ), 6080 (ZLT)
11:30-11:45 p.m.	Papeete, Tahiti (<i>The Voice of France in the Pacific</i>)	6135
12:00-1:15 a.m.	Manila, Philippines (<i>Call of the Orient</i>)	17865, 15300, 11855, 9730

TIME (PST)	CITY, COUNTRY (NAME)	FREQUENCIES (kc.)
1:00-3:00 a.m.	Manila, Philippines (<i>The Call of the Orient</i>)	11855, 9730
1:30-7:30 a.m.	Djakarta, Indonesia (<i>The Voice of Indonesia</i>)	9710, 4910
7:15-8:15 a.m.	Melbourne, Australia (<i>Radio Australia</i>)	11770 (VLC11)
8:00-8:15 a.m.	Stockholm, Sweden (<i>Radio Sweden</i>)	15155
10:00-1:00 p.m.	London, England (<i>North American Service</i>)	17700
1:00-3:15 p.m.	London, England (<i>General Overseas Service</i>)	17700, 15310
2:15-3:15 p.m.	London, England (<i>General Overseas Service</i>)	15310, 11930
3:00-3:30 p.m.	Tokyo, Japan (<i>Radio Japan</i>)	17825 (JOA21), 15235 (JOB21)
3:00-7:00 p.m.	London, England (<i>General Overseas Service</i>)	11855, 9625
3:00-10:00 p.m.	Moscow, USSR (<i>Radio Moscow</i>)	17865, 15140
4:30-4:50 p.m.	Tokyo, Japan (<i>Radio Japan</i>)	15235 (JOB19), 11705 (JOA4)
4:50-5:45 p.m.	Montreal, Canada (<i>Radio Canada</i>)	15190 (CKCK), 11720 (CHOL)
5:00-7:30 p.m.	Cape Haitien, Haiti (<i>The Evangelistic Voice</i>) - no broadcasts on Wednesday and Thursday	15400, 9650
5:30-7:15 p.m.	Berne, Switzerland (<i>Switzerland Calling</i>)	11965 (HEFR3), 9535 (HEFR4), 9160 (HEFR5)
5:30-9:00 p.m.	Quito, Ecuador (HCJB - <i>The Voice of the Andes</i>) - no broadcasts on Monday	15115, 11915, 9745
6:25-4:45 p.m.	Rome, Italy (<i>Italian Broadcasting & TV System</i>)	9575, 6310
6:30-8:40 p.m.	Cologne, Germany (<i>The Voice of Germany</i>)	11750, 9540
6:30-7:00 p.m.	Warsaw, Poland (<i>Radio Warsaw</i>)	9525, 6025
6:33-7:10 p.m.	Hilversum, Holland (<i>Radio Netherlands</i>)	11920, 9590
6:30-8:00 p.m.	Hilversum, Holland (<i>The Happy Station</i>) - special program on Sundays only	11950, 9590
6:45-7:00 p.m.	Brazzaville, FEA (<i>Radio Brazzaville, French Equatorial Africa</i>)	11970, 9625
6:50-7:30 p.m.	Montreal, Canada (<i>Radio Canada</i>)	11945 (CKNK), 9585 (CKLP)
7:00-7:30 p.m.	Bucharest, Romania (<i>Bucharest Calling</i>)	11937, 9570
7:00-7:30 p.m.	Peking, China (<i>Radio Peking</i>)	17745, 17720, 15350, 15118
7:00-8:30 p.m.	Prague, Czechoslovakia (<i>Radio Prague</i>)	9545, 6170, 6105, 6055
7:00-8:40 p.m.	Guatemala City, Guatemala (TGNA)	9680, 9652
7:15-8:00 p.m.	Madrid, Spain (<i>The Voice of Spain</i>)	9380, 6130
7:30-8:00 p.m.	Copenhagen, Denmark (<i>The Voice of Denmark</i>) - no English on Sundays	9520 (O2F), 15235 (JOB19), 11705 (JOA4)
7:30-8:00 p.m.	Tokyo, Japan (<i>Radio Japan</i>)	15175, 11735, 9540
8:00-8:30 p.m.	Oso, Norway (<i>Radio Norway</i>) - on Sundays only	11910, 9630
8:00-8:30 p.m.	Budapest, Hungary (<i>Radio Budapest</i>)	9700
8:00-8:30 p.m.	Sofia, Bulgaria (<i>Sofia Calling</i>)	9647, 6037
8:00-7:00 p.m.	San Jose, Costa Rica (TIPC - <i>The Lighthouse of the Caribbean</i>)	11965 (HFJRS), 9535 (HEFR4)
8:15-7:00 p.m.	Berne, Switzerland (<i>Switzerland Calling</i>)	9340, 6130
8:15-7:00 p.m.	Madrid, Spain (<i>The Voice of Spain</i>)	11937, 9570
8:30-7:00 p.m.	Taipei, Taiwan (<i>The Voice of Free China</i>)	15225, 11815
8:30-7:30 p.m.	Stockholm, Sweden (<i>Radio Sweden</i>)	9620
8:30-7:30 p.m.	Brazzaville, FEA (<i>Radio Brazzaville, French Equatorial Africa</i>)	11970
8:30-7:30 p.m.	Madrid, Spain (<i>The Voice of Spain</i>)	9360, 6130
8:30-7:30 p.m.	Warsaw, Poland (<i>Radio Warsaw</i>)	9525, 6025
10:30-11:00 p.m.	Taipei, Taiwan (<i>The Voice of Free China</i>)	15225, 11815

NEWS BROADCASTS FOR WESTERN NORTH AMERICA

The following listing of news broadcasts has been prepared for those readers living in the Western United States and Canada. Times are given in Pacific Standard Time and the frequencies in kilocycles.

TIME (PST)	CITY AND COUNTRY	FREQUENCIES (kc.)
4:45 a.m.	Djakarta, Indonesia	9710, 4910
7:00 a.m.	Manila, Philippines	11855, 9730
7:30 a.m.	Melbourne, Australia	11770
8:00 a.m.	Stockholm, Sweden	15155
9:00 a.m.	London, England	17700
12:00 Noon	London, England	17700
3:00 p.m.	Tokyo, Japan	15310, 11930, 9625
3:00 p.m.	Moscow, USSR	17865, 15140
4:00 p.m.	Moscow, USSR	17865, 15140
4:30 p.m.	Delhi, India	17720, 9580
4:30 p.m.	Tokyo, Japan	15235, 11705
5:00 p.m.	Montreal, Canada	15190, 11720
5:00 p.m.	Moscow, USSR	17865, 15140
5:00 p.m.	Karachi, Pakistan	17750, 15325
5:10 p.m.	Montreal, Canada	15190, 11720
5:25 p.m.	Berne, Switzerland	11865, 9525, 6145
6:00 p.m.	London, England	16950, 9625
6:00 p.m.	Moscow, USSR	17865, 15140
6:25 p.m.	Rome, Italy	9575, 6010
6:30 p.m.	Cologne, Germany	11775, 9540
6:30 p.m.	Warsaw, Poland	9525, 6025
6:30 p.m.	Hilversum, Holland (not on Sunday)	11950, 9590
6:30 p.m.	Delhi, India	17820, 15160, 11710
6:45 p.m.	Brazzaville, French Equatorial Africa	11970, 9625
7:00 p.m.	Moscow, USSR	17865, 15140
7:00 p.m.	Montreal, Canada	11945, 9585
7:00 p.m.	Bucharest, Romania	11937, 9570
7:00 p.m.	Peking, China	17745, 17720, 15350, 15118
7:00 p.m.	Prague, Czechoslovakia	9545, 6170, 6105, 6055
7:15 p.m.	Madrid, Spain	9340, 6130
7:15 p.m.	Copenhagen, Denmark (only Mondays)	9520
7:30 p.m.	Tokyo, Japan	15235, 11705
8:00 p.m.	Moscow, USSR	17865, 15140
8:00 p.m.	Oso, Norway (only Sundays)	15175, 11735, 9540
8:00 p.m.	Sofia, Bulgaria	9700
8:15 p.m.	Madrid, Spain	9360, 6130
8:20 p.m.	Berne, Switzerland	11865, 9525
8:30 p.m.	Bucharest, Romania	11937, 9570
9:00 p.m.	Taipei, Taiwan	15225, 11815
9:00 p.m.	Moscow, USSR	17865, 15140
9:00 p.m.	Stockholm, Sweden	9620
9:15 p.m.	Brazzaville, French Equatorial Africa	11970
9:15 p.m.	Madrid, Spain	9360, 6130
9:30 p.m.	Warsaw, Poland	9525, 6025
10:30 p.m.	Taipei, Taiwan	15225, 11815
11:30 p.m.	Wellington, New Zealand	9540, 6080
11:30 p.m.	Papeete, Tahiti	6135
12:30 a.m.	Wellington, New Zealand (not on Sunday)	9540, 6080
1:00 a.m.	Manila, Philippines	11855, 9730
2:30 a.m.	Wellington, New Zealand	9540, 6080

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ENGLISH LANGUAGE SHORT-WAVE BROADCAST STATIONS BEST HEARD IN EASTERN NORTH AMERICA

TIME (EST)	CITY, COUNTRY (NAME)	FREQUENCIES (kc.)	TIME (EST)	CITY AND COUNTRY	FREQUENCIES (kc.)
6:00-6:30 a.m.	Warsaw, Poland (Radio Warsaw)	17000, 15120	5:30 a.m.	Wellington, New Zealand	9540, 6080
7:00-7:15 a.m.	Helsinki, Finland (Finland Calling) - no English on Sundays and holidays	17798, 15190	6:00 a.m.	Warsaw, Poland	17800, 15120
7:15-8:15 a.m.	Warsaw, Poland (Radio Warsaw)	17800, 15120	6:15 a.m.	Djakarta, Indonesia	9710
7:15-8:45 a.m.	Melbourne, Australia (Radio Australia)	11770, (VLA11)	7:00 a.m.	Helsinki, Finland	17798, 15190
8:00-9:30 a.m.	Cape Haitien, Haiti (The Evangelistic Voice) - no broadcast on Thursdays	15390, 9638	7:15 a.m.	Warsaw, Poland	17800, 15120
8:15-8:45 a.m.	Stockholm, Sweden (Radio Sweden)	17840	7:15 a.m.	Melbourne, Australia	11770
10:00-12:15 p.m.	London, England (North American Service)	17700	7:45 a.m.	Warsaw, Poland	17800, 15120
1:00-4:00 p.m.	London, England (North American Service)	17700	8:15 a.m.	Stockholm, Sweden	17840
4:00-5:15 p.m.	London, England (General Overseas Service)	17700, 15310, 9008	8:15 a.m.	Melbourne, Australia	11770
4:31-4:45 p.m.	Hilversum, Holland (Radio Netherlands) - no English on Sundays	15365, 11990	8:45 a.m.	Lisbon, Portugal	21495, 17895
4:36-5:30 p.m.	Jerusalem, Israel (The Voice of Zion)	9008	12:00 Noon	London, England	17700
5:00-5:30 p.m.	Port-au-Prince, Haiti (Radio Commerce) - on Sundays only	9482 (4VC)	12:15 p.m.	Lisbon, Portugal	21799, 17895
5:15-6:15 p.m.	London, England (General Overseas Service)	15310, 11900	12:30 p.m.	Athens, Greece	17700
6:00-6:30 p.m.	Tokyo, Japan (Radio Japan)	17825 (JOA22), 15235 (JOB9)	3:15 p.m.	London, England	15100
6:00-10:00 p.m.	London, England (General Overseas Service)	11900, 9625	3:30 p.m.	Tehran, Iran	17845
6:00-1:00 a.m.	Moscow, USSR (Radio Moscow)	11937, 11890, 11845, 11825, 11805, 11740, 11700, 9700, 9685	4:15 p.m.	Damascus, Syria	17845
6:15-7:00 p.m.	Ankara, Turkey (Radio Ankara)	9815	4:30 p.m.	Hilversum, Holland	15365, 11990
7:15-7:25 p.m.	Rome, Italy (Italian Broadcasting and Television System)	9875, 6010	4:30 p.m.	Jerusalem, Israel	9008
7:30-7:50 p.m.	Tokyo, Japan (Radio Japan)	15235, (JOB9), 11705 (JOA4)	5:15 p.m.	Belgrade, Yugoslavia	6100
7:30-8:00 p.m.	Budapest, Hungary (Radio Budapest)	11910, 9633	6:00 p.m.	London, England	15310, 11920, 9625
7:30-8:00 p.m.	Prague, Czechoslovakia (Radio Prague)	9585, 6170, 6105, 6065	6:00 p.m.	Tokyo, Japan	17825, 15235
7:30-8:30 p.m.	Warsaw, Poland (Radio Warsaw)	9625, 6025	6:00 p.m.	Moscow, USSR	11937, 11890, 11845, 11825, 11805, 11740, 11700, 9700, 9685
7:55-8:45 p.m.	Montreal, Canada (Radio Canada)	15190 (CKCK), 11720 (CHOL)	6:15 p.m.	Ankara, Turkey	9515
8:00-8:30 p.m.	Sofia, Bulgaria (Sofia Calling)	9700	6:30 p.m.	Caracas, Venezuela (Monday-Friday)	4770
8:00-9:30 p.m.	Stockholm, Sweden (Radio Sweden)	9620	7:00 p.m.	Moscow, USSR	11937, 11890, 11845, 11825, 11805, 11740, 11700, 9700, 9685
8:00-10:30 p.m.	Cape Haitien, Haiti (The Evangelistic Voice) - no broadcasts on Wednesdays and Thursdays	15400, 9604, 6105	7:15 p.m.	Rome, Italy	9875, 6010
8:15-9:00 p.m.	Brazzaville, French Equatorial Africa (Radio Brazzaville)	11970, 9625	7:30 p.m.	Tokyo, Japan	15235, 11705
8:30-10:15 p.m.	Berne, Switzerland (Switzerland Calling)	11865 (HERS), 9635 (HERA), 6165 (HERB)	7:30 p.m.	Prague, Czechoslovakia	9585, 6170, 6105, 6065
9:00-9:30 p.m.	Oso, Norway (Radio Norway) - on Sundays only	15175, 11735, 9540	7:30 p.m.	Warsaw, Poland	9525, 6025
9:00-9:30 p.m.	Copenhagen, Denmark (The Voice of Denmark) - no English on Sundays	9620 (OZF)	8:00 p.m.	Moscow, USSR	11890, 11845, 11825, 11805, 11740, 11700, 9685
9:00-12:00 p.m.	Quito, Ecuador (HCJB - The Voice of the Andes) - no broadcasts on Mondays	15115, 11915, 9745	8:00 p.m.	Montreal, Canada	15190, 11720
9:25-9:45 p.m.	Rome, Italy (Italian Broadcasting and Television System)	9875, 6010	8:00 p.m.	Warsaw, Poland	9525, 6025
9:30-9:40 p.m.	Cologne, Germany (The Voice of Germany)	11795, 9640	8:00 p.m.	Sofia, Bulgaria	9700
9:30-10:00 p.m.	Warsaw, Poland (Radio Warsaw)	9625, 6025	8:15 p.m.	Stockholm, Sweden	9620
9:30-10:10 p.m.	Hilversum, Holland (Radio Netherlands)	11900, 9690	8:15 p.m.	Brazzaville, French Equatorial Africa	11970, 9625
9:30-11:00 p.m.	Hilversum, Holland (The Happy Station) - special program on Sundays only	11950, 9680	8:30 p.m.	Montreal, Canada	15190, 11720
9:30-11:00 p.m.	Port-au-Prince, Haiti (Radio Haiti) - on Thursdays only	6192 (4VHW)	8:30 p.m.	Paramaribo, Surinam (Mondays only)	15407, 4752
9:45-10:00 p.m.	Brazzaville, French Equatorial Africa (Radio Brazzaville)	11970, 9625	8:35 p.m.	Berne, Switzerland	11865, 9635, 6165
9:45-10:25 p.m.	Montreal, Canada (Radio Canada)	11945 (CKNK), 9685 (CKLP)	9:00 p.m.	Stockholm, Sweden	9620
10:00-10:30 p.m.	Bucharest, Romania (Bucharest Calling)	11937, 9570	9:00 p.m.	Oso, Norway (Sundays only)	15175, 11735, 9540
10:00-11:00 p.m.	Prague, Czechoslovakia (Radio Prague)	9585, 6170, 6105, 6065	9:00 p.m.	Copenhagen, Denmark (Mondays only)	9620
10:00-11:45 p.m.	Guatemala City, Guatemala (TGNA)	9668, 5952	9:00 p.m.	Moscow, USSR	11890, 11845, 11825, 11805, 11740, 11700, 9700, 9685
10:15-11:00 p.m.	Madrid, Spain (The Voice of Spain)	9360, 6130	9:15 p.m.	Rome, Italy	9875, 6010
10:30-11:00 p.m.	Copenhagen, Denmark (The Voice of Denmark) - no English on Sundays	9620 (OZF)	9:25 p.m.	Cologne, Germany	11795, 9640
11:00-11:30 p.m.	Budapest, Hungary (Radio Budapest)	11910, 9633	9:30 p.m.	Warsaw, Poland	9525, 6025
11:00-11:30 p.m.	Sofia, Bulgaria (Sofia Calling)	9700	9:30 p.m.	Hilversum, Holland (not on Sundays)	11950, 9690
11:00-12:00 p.m.	San Jose, Costa Rica (TIFC - The Lighthouse of the Caribbees)	9647, 6097	9:45 p.m.	Brazzaville, French Equatorial Africa	11970, 9625
11:15-12:00 p.m.	Berne, Switzerland (Switzerland Calling)	11865 (HERS), 9635 (HERA)	10:00 p.m.	Montreal, Canada	11945, 9625
11:15-12:00 p.m.	Madrid, Spain (The Voice of Spain)	9360, 6130	10:00 p.m.	Moscow, USSR	11890, 11845, 11825, 11805, 11740, 11700, 9685
11:30-12:00 p.m.	Bucharest, Romania (Bucharest Calling)	11937, 9570	10:00 p.m.	Bucharest, Romania	11937, 9570
12:00-12:30 a.m.	Stockholm, Sweden (Radio Sweden)	9620	10:15 p.m.	Madrid, Spain	9360, 6130
12:15-12:30 a.m.	Brazzaville, French Equatorial Africa (Radio Brazzaville)	11970	10:30 p.m.	Copenhagen, Denmark (Monday only)	9620
12:15-1:00 a.m.	Madrid, Spain (The Voice of Spain)	9360, 6130	11:00 p.m.	Sofia, Bulgaria	9700
12:30-1:00 a.m.	Warsaw, Poland (Radio Warsaw)	9625, 6025	11:00 p.m.	Moscow, USSR	11890, 11845, 11825, 11805, 11740, 11700
			11:00 p.m.	Madrid, Spain	9360, 6130
			11:15 p.m.	Berne, Switzerland	11865, 9635
			11:20 p.m.	Bucharest, Romania	11937, 9570
			11:30 p.m.	Stockholm, Sweden	9620
			12:00 Midnight	Moscow, USSR	11840, 11840, 11805, 11740, 11700, 9685, 9645, 9610
			12:00 Midnight	Madrid, Spain	9360, 6130
			12:15 a.m.	Brazzaville, French Equatorial Africa	11970
			12:15 a.m.	Warsaw, Poland	9525, 6025

SERVICE

This section contains information which will help qualified service personnel in the servicing and alignment of your receiver.

CHASSIS REMOVAL

The top cover is held by four screws — two on each side. The bottom cover is held by six screws on the underside of the unit.

IF ALIGNMENT

EQUIPMENT REQUIRED:

AC Voltmeter
Calibrated RF Signal Generator
Non-Metallic Alignment Tools

Refer to the diagram which shows the location of IF adjustment points.

1. Connect a loudspeaker to the output terminals. Remove the oscillator V1, 6BE6, from its socket.

2. Set the receiver controls as follows:

FUNCTION switch on REC
AF GAIN control to maximum
MVC-AVC switch on MVC
ANL off
band to A
Main Tuning pointer to 1.60 Mc

3. Connect the voltmeter (3 volt AC range) across the speaker terminals.
4. Connect the signal generator between pin 7 of V2 socket (6BE6 mixer tube) and ground (chassis).
5. Set the signal generator at 455 Kc and modulate it with either 400 or 1000 cycles (10%).
6. Adjust the secondary and primary of IF transformers T2 and T1. Follow the order given — secondary first, then primary in each case. Topside adjustments are secondaries, bottom of chassis adjustments are primaries.

During alignment, lower the generator output progressively to prevent overloading. Repeat alignment until no further improvement is noted.

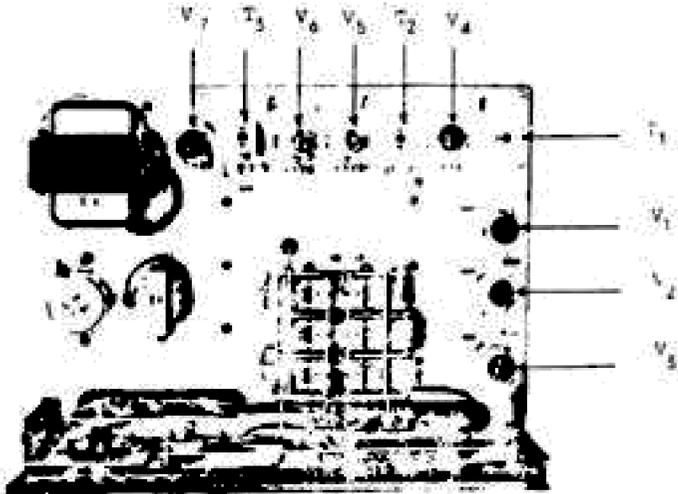
3FO ADJUSTMENT

1. All receiver controls should be set as in the IF alignment with the exception of the following:

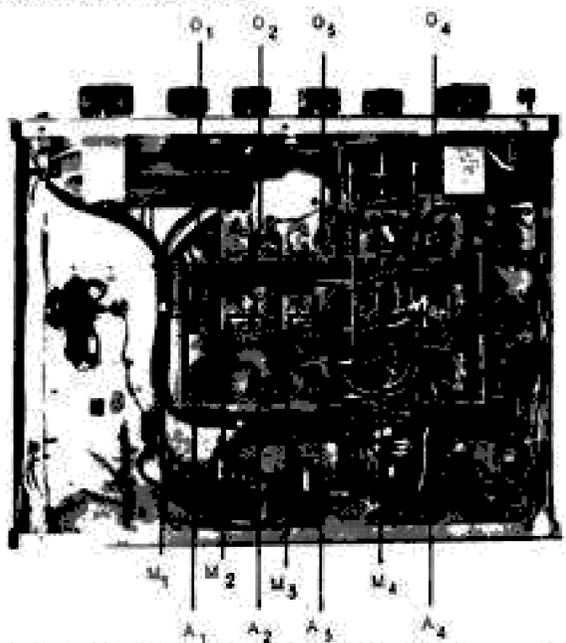
FUNCTION switch to 3FO
Reduce AF GAIN

2. Set the generator to 455 Kc, unmodulated RF.

3. Adjust the crystal frequency to the required value by means of a trimmer capacitor. The trimmer is mounted on the oscillator unit and is accessible through the top cover.
4. Drain oil and disassemble the receiver receiver. Also, disconnect connections from the plate of V_4 .
5. Replace V_7 , AIF oscillator.
6. Replace top and bottom covers of the receiver.



IF ALIGNMENT-TOPSIDE ADJUSTMENT POINTS



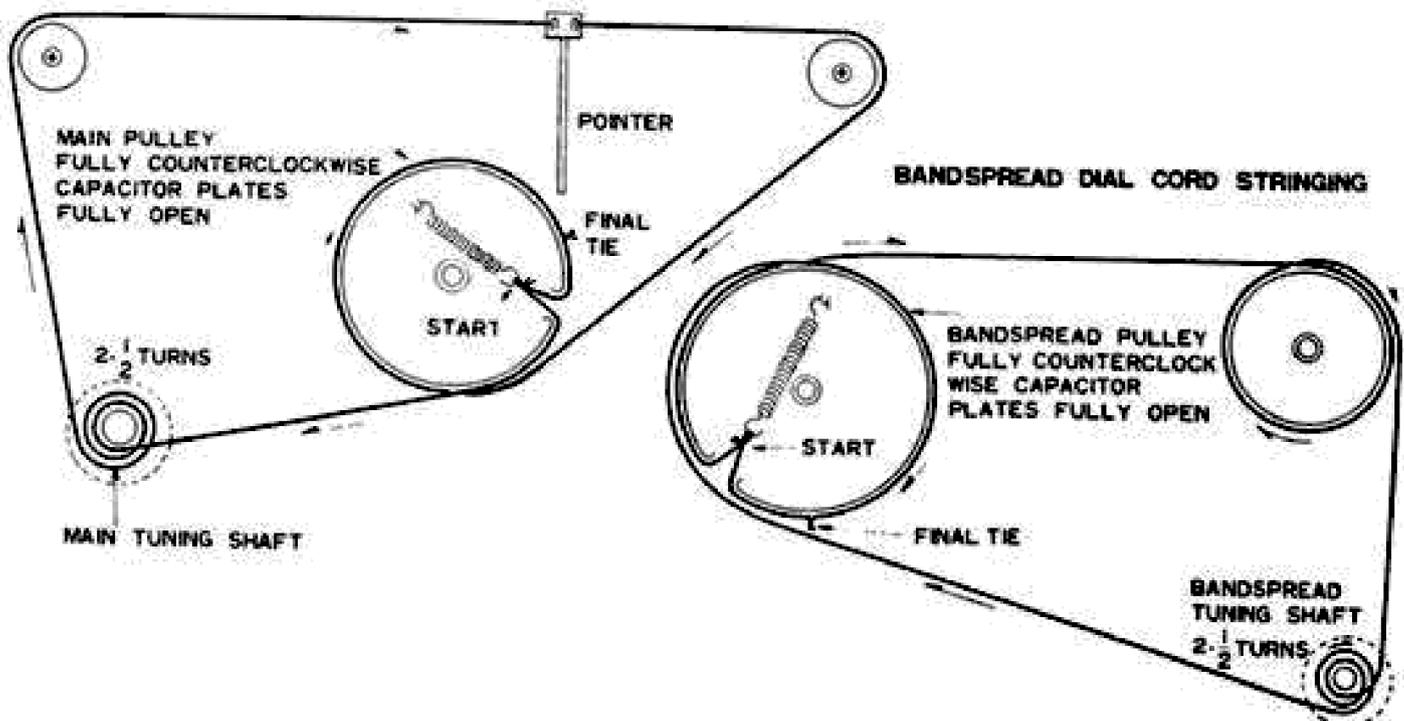
INSIDE ALIGNMENT-ADJUSTMENT POINTS

RF ALIGNMENT

1. Switch receiver on and allow it to warm up for approximately 15 minutes.
2. Using a short jumper, connect antenna terminals A2 and E together.
3. Connect AC voltmeter (3 volt range) and loudspeaker across speaker terminals.
4. Connect the modulated output of the RF signal generator to antenna terminals A1 and E.
5. Rotate the ANT TRIM control until the capacitor plates are half meshed. If the indicator dot on the control knob is not at the 12 o'clock position loosen set screw, place knob in this position and tighten screw again (without disturbing position of capacitor plates). Do not change control from the 12 o'clock position until alignment is completed.
6. Set all receiver controls as for IF alignment. Set BANDSPREAD dial to 100 and make sure FUNCTION switch is on REC.
7. Carry out alignment as indicated in the chart. Use the diagram provided which shows RF adjustment points on the underside of the receiver.

NOTE: Lower generator output progressively to prevent overloading as circuits come into line.

DIAL CORD STRINGING



RF ALIGNMENT CHART

STEP	BAND SWITCH	SIGNAL GENERATOR	MAIN TUNING	ADJUST	REMARKS
1	A	.6 Mc (600 Kc)	.6 Mc	CO5 (Osc)*	Adjust for peak reading on voltmeter
2	A	1.4 Mc(1400 Kc)	1.4 Mc	CO4 (Osc)	
Repeat steps 1 & 2 until calibration is correct at both ends of scale (.6 and 1.4 Mc)					
3	A	1.4 Mc(1400 Kc)	1.4 Mc	CM4 (RF)	Adjust for peak reading on voltmeter
4	B	2.0 Mc	2.0 Mc	LO3 (Osc)	
5	B	4.0 Mc	4.0 Mc	CO3 (Osc)	
Repeat steps 4 & 5 until calibration is correct at both ends of the scale (2.0 and 4.0Mc)					
6	B	2.0 Mc	2.0 Mc	LM3 (RF)	Adjust for peak reading on voltmeter
7	B	4.0 Mc	4.0 Mc	CM3 (RF)	
Repeat steps 6 & 7 until calibration is correct at both ends of the scale (2.0 and 4.0Mc)					
8	B	2.0 Mc	2.0 Mc	LA3 (Ant)	Adjust for peak reading on voltmeter
9	C	5.0 Mc	5.0 Mc	LO2 (Osc)	
10	C	14.0 Mc	14.0 Mc	CO2 (Osc)	
Repeat steps 9 & 10 until calibration is correct at both ends of the scale (5.0 and 14.0Mc)					
11	C	5.0 Mc	5.0 Mc	LM2 (RF)	Adjust for peak reading on voltmeter
12	C	14.0 Mc	14.0 Mc	CM2 (RF)	
Repeat steps 11 & 12 until calibration is correct at both ends of the scale (5.0 and 14.0Mc)					
13	C	5.0 Mc	5.0 Mc	LA2 (Ant)	Adjust for peak reading on voltmeter
14	D	12.0 Mc	12.0 Mc	LO1 (Osc)	
15	D	26.0 Mc	26.0 Mc	CO1 (Osc)	
Repeat steps 14 & 15 until calibration is correct at both ends of scale (12.0 and 26.0Mc)					
16	D	12.0 Mc	12.0 Mc	LM1 (RF)	Adjust for peak reading on voltmeter
17	D	26.0 Mc	26.0 Mc	CM1 (RF)	
Repeat steps 16 & 17 until calibration is correct at both ends of scale (12.0 and 26.0Mc)					
18	D	12.0 Mc	12.0 Mc	LA1 (Ant)	Adjust for peak reading on voltmeter

*NOTE: On all bands, the oscillator is set on the high frequency side of the incoming signal.

