

OPERATING

and

SERVICE

INSTRUCTIONS

for the

BROWNING

EAGLE

RECEIVER R-27

and

TRANSMITTER S-23

BROWNING
LABORATORIES
INC

LACONIA, NEW HAMPSHIRE



603 524-5454

OPERATING AND SERVICE INSTRUCTIONS

BROWNING EAGLE BASE STATION

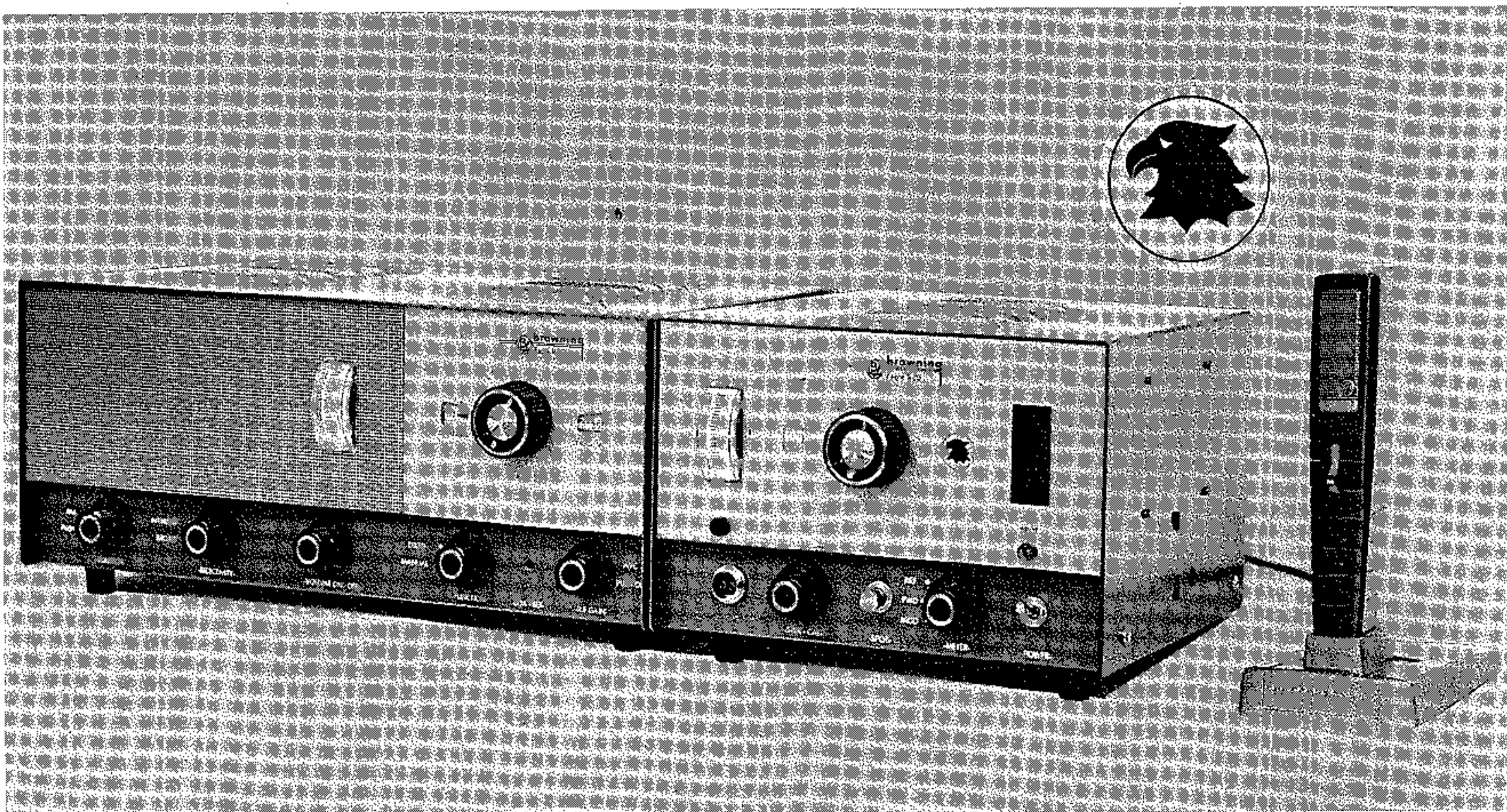
EAGLE RECEIVER MODEL R-27

and

EAGLE TRANSMITTER MODEL S-23

SERIES - 2

Price \$2.00



To be assured of maximum satisfaction with this high quality deluxe base station please read this manual with care. It pays to know your equipment.

BROWNING LABORATORIES, INC.

Laconia, N. H. 03246

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SECTION I

THE BROWNING EAGLE BASE STATION

GENERAL INFORMATION

Your Browning Eagle Base Station represents the ultimate in citizens radio equipment. Browning equipment is well designed, dependable, and ruggedly built. Although it will withstand considerable abuse, it should be accorded the treatment given any fine electronic equipment.

Some of the features which make the Eagle Base Station the finest available are:

EAGLE RECEIVER MODEL R-27

- Cascode nuvistor front end
- Unique dual oscillator double converter
- Choice of selectivity with broad and narrow switch
- RF gain control
- AVC defeat switch
- Large S-Meter
- Exclusive Channel-1ok

EAGLE TRANSMITTER MODEL S-23

- Rear illuminated selector dial
- Precision aircraft type miniature crystal switch assembly
- Clipper filter and Limiter
- Spotting function with tone and visual indicator
- Large meter reads modulation, forward and reflected power
- Neon audio indicator

SECTION 2

ANTENNA REQUIREMENTS

A good quality antenna is most important. By law the power input to your Base Station is limited to 5 watts. With this small amount of power it is apparent that none should be wasted in a poor antenna system. We recommend using the best antenna obtainable. For coverage in all directions a ground plane antenna is satisfactory. For better results a co-linear type antenna is recommended which will increase your signal at the receiving end by 3 or more DB. This is equal to doubling your input power. A 3 element beam antenna when rotated to the direction of the other station will have a gain of approximately 8 DB which gives the same effect as multiplying your input power by 5. A 6 element beam has approximately 11 DB gain and effectively multiplies the power by 10.

It is thus very apparent that while your input power is limited much can be gained by a good antenna system. Mount your antenna in the clear away from surrounding objects, especially wires of any kind and as high as allowed by law. Any feed line over 50 feet long should be RG-8/U. The Eagle Transmitter has a built-in SWR bridge for determining your antenna system efficiency. Refer to Section 6 - OPERATION OF POWER METER.

SECTION 3

INSTALLATION

CONNECTING TOGETHER THE EAGLE TRANSMITTER AND THE EAGLE RECEIVER

Unpack your base station carefully. In the microphone box for each unit there is a "control cable"; this cable has an octal plug at each end. Arrange your station so the units are side by side with the transmitter on the right of the receiver.

Connect the "control cable" to the transmitter by inserting one end of the "control socket" on the rear of transmitter. The key on the octal plug must mate with the keyway in the large center hole of the socket. Do not force, be sure the key and keyway are mated before pushing all the way in. Connect the other end of the control cable to the control socket of the receiver in the same manner. Both ends of the cable are the same so there is no danger of installing this cable incorrectly.

Permanently connected to the transmitter is the antenna cable for the receiver. Connect the PL-259 on this cable to the socket marked ANT on the receiver.

Connect your antenna PL-259 to the socket on the transmitter marked ANT. Never attempt to operate the transmitter without proper connection to an antenna or dummy load.

Place the microphone in its stand in front of the equipment. Unwrap the microphone cable and insert the connector into the microphone socket on the left of the front panel.

After checking the above connections for correctness and tightness insert the power cord from the transmitter into the utility socket of the receiver. This can be done neatly without uncoiling the power cord of the transmitter. Insert the receiver power cord plug into a wall outlet.

Your EAGLE Base Station is now ready for operation.

SECTION 4

OPERATING THE EAGLE BASE STATION

NORMAL OPERATION (Simplified Instructions)

Set the controls on the Receiver and Transmitter as follows:

1. Squelch knob - pushed in and counter-clockwise
2. Selectivity switch - Broad
3. Volume ON-OFF - Turn On and set at approximately 9 o'clock
4. Function - Manual
5. RF - Gain - Pushed IN and MAXIMUM clockwise
6. Set main tuning to desired channel
7. SWR - CAL control - approximately 12 o'clock
8. Meter switch - modulation position
9. Power switch - On
10. Set Channel Selector on desired channel

NOTE: The power to the utility outlet on the rear of the receiver is controlled by the receiver volume ON-OFF control. When the transmitter power cord is plugged into the utility outlet, the power switch on the transmitter may be left on at all times and the power to the complete base station can be switched on and off with the receiver power switch.

The meters and channel indicators will light up when the power is on. Allow at least one minute warm up before transmitting. Now press the push to talk switch on the microphone and you are on the air. Be sure to announce your station call sign anytime you turn on the carrier even for just short tests. Release the switch to turn off the carrier.

Disconnect the antenna connection to the receiver and adjust the S Meter Zero Adj. control. Watch the S Meter while turning the control and set the needle at S1, the lowest line on the meter. This adjustment may vary slightly with changes in line voltage. Now reconnect Antenna Cable.

SECTION 5

OPERATING THE EAGLE RECEIVER (See Fig. 1)

FUNCTION OF OPERATING CONTROLS

5.1 Noise Limiter Switch

This switch is controlled by a pull-push action of the squelch control knob. When pushed ON this places the automatic series gated noise limiter circuit in operation to reduce pulse type noises such as ignition noise and other electrical interference. The limiter is turned OFF by pulling the squelch knob out.

5.2 Squelch Control

When rotated clockwise the squelch control can be set so that the speaker will be silent until a signal comes on. Further clockwise adjustment will keep the speaker silent on weaker signals and turn on the audio only on strong local signals. When set at the maximum counter-clockwise position (about 7 o'clock) the audio will be on all the time.

5.3 Selectivity Control

The selectivity control is used to switch in extra IF stages for better rejection of adjacent channels. The selectivity should normally be set at BROAD for best sounding audio. When set at NARROW some fidelity will be sacrificed, since the added selectivity reduces both adjacent - channel interference and background noise by attenuating the higher audio frequencies.

5.4 Volume On-Off Control

The On-Off switch at the extreme counter clockwise rotation of the volume control, controls the power to the receiver as well as to the utility outlet on the rear of the receiver. The Eagle transmitter can be plugged into this outlet and the power to the complete Eagle Base Station can be controlled by the receiver volume On-Off control.

Clockwise rotation of this control adjusts the audio level in the speaker and the phones, or external speaker jack.

5.5 Function Switch

This switch controls the channel tuning mode. When set at MANUAL the main tuning knob varies the frequency of the second oscillator and the received channel and frequency can be read in the tuning windows.

When set at FIXED the frequency of the received signal is controlled by the CHANNEL-LOK. The dial lights are switched off to remind the operator that the main tuning will not operate when the switch is in the FIXED position.

SECTION 5 (cont'd)

5.6 Channel-Lok

The FIXED channel is set by adjusting with a small screwdriver, the capacitor through the small channel-lok hole. Use the spot switch on the Eagle Transmitter to provide a signal for tuning the channel-lok. Adjust the channel-lok for maximum S-Meter reading when pushing the spot switch with the transmitter set to the desired channel. This feature allows "fixed controlled" receiving without crystals.

5.7 RF - Gain Control

The RF gain control varies the gain of the receiver. Maximum sensitivity is obtained with the control set at maximum clockwise. As the control is rotated counter-clockwise, the bias on the tubes increases with a resultant decrease in gain.

This control can be used in conjunction with the volume control for decreasing the sensitivity to prevent overload from strong signals. To use this function properly, set the volume control for nearly maximum and control the audio level with RF gain control.

5.8 AVC Switch

The AVC can be disabled by pulling OUT on the RF-Gain control knob. The set should be operated with the AVC switch on to prevent blasting when tuning from weak to strong signals. It can be helpful, however, when tuning for very weak stations to disable the AVC for maximum sensitivity.

5.9 "S"Meter

The "S" Meter provides a visual indication of the relative signal strength of an incoming signal. The "S" Meter is calibrated in "S" units from 1 to 9 and in decibels above S-9 to plus 40 DB.

NOTE: The "S" METER WILL NOT OPERATE UNLESS THE RF GAIN IS MAXIMUM CLOCKWISE AND THE AVC SWITCH IS PUSHED ON.

The selectivity switch will affect the "S" Meter readings. When in the narrow position, readings will be slightly lower. For giving accurate signal reports set the selectivity to BROAD.

SECTION 6

OPERATING THE EAGLE TRANSMITTER

6.1 Modulation Meter

The illuminated meter on the front panel varies directly with modulation and reads in percent. This meter will indicate low readings if the operator is too far from the microphone. The meter needle will bounce up and down quite rapidly as you speak into the microphone and will normally reach 100% on voice peaks. These readings are obtained when the meter switch is in the MOD position and the transmitter is "On the Air".

6.2 Audio Light

The red neon indicator just below the meter serves as a simple indication of modulation. It fluctuates in brilliance with audio. This light assures the operator that the transmitter is modulating regardless of the meter switch position. The flickering audio light is easier seen at a distance than the meter.

6.3 On the Air Indicator

The red on the air indicator is lighted by a #47 pilot bulb. This bulb can be replaced by removing four screws and lifting off the transmitter dust cover.

6.4 Channel Selector

The Eagle Transmitter has a built in crystal switch assembly with all 23 crystals factory installed. These miniature type 3rd overtone crystals are made especially for Browning and afford better frequency accuracy than the old larger type.

6.5 Spotting Switch

The spotting switch is for finding your own transmitter signal in the base station receiver. Press the spot button and tune the main tuning dial on the receiver until a strong signal is indicated on the receiver "S" meter. The spotting signal is modulated with a tone for easy identification. The spotting function is useful in setting the fixed tuned channel-lok on the Eagle Receiver. Refer to para. 5.6 for adjustment of the channel-lok, the yellow neon light glows when the spot switch is pressed.

MATCHING THE EAGLE TO YOUR ANTENNA SYSTEM

The Federal Communications Commission allows the adjustments of a citizens band transmitter's antenna loading system providing it does not in any way alter the frequency thereof. The following instructions will not alter the frequency of transmission, therefore, can be done by anyone:

The Eagle transmitter has a built-in RF Power meter for reading both forward and reflected power. This function is useful in determining the efficiency of your antenna system. By using the readings from this meter it is possible to measure the standing wave ratio (SWR) of your antenna system.

For best efficiency, an antenna system must have a low SWR reading. High SWR readings result from a mismatch of impedances between the coaxial feedline and the antenna. In simple language loose connections or broken elements in the antenna system CANNOT be corrected at the transmitter. Retuning of the transmitter will not change the SWR. The power meter in this transmitter will indicate the efficiency of your antenna system, but the efficiency can be changed only at the antenna and not at the transmitter.

If your system is a 52 ohm load for the transmitter, you are ready to operate without any further adjustment. **DO NOT ADJUST TRANSMITTER UNTIL AFTER YOU HAVE HAD IT ON THE AIR AND ARE FAMILIAR WITH ITS OPERATION.**

It is recommended that the first adjustments be made with a "Dummy Load" attached in place of the antenna. This keeps your signal off the air and reduces interference and keeps you "legal" while becoming familiar with the tuning methods involved.

It should be noted here that the meter adjust control has absolutely no effect on the output of the transmitter nor will it affect the reading of the meter when the meter is switched to "Modulation" position. The sole function of this control is to assist in Antenna Loading as explained later.

READ AT LEAST TWICE BEFORE PROCEEDING WITH
ACTUAL ADJUSTMENTS TO THOROUGHLY UNDERSTAND WHAT YOU ARE TO DO

1. Install "Dummy Load" to antenna connector on rear of chassis.
2. Set Meter Switch on "Forward Power".
3. Selector Switch in middle area, ie. Channel 10, 11 or 12.
4. Turn on transmitter and let it warm up at least one minute.

Push the push-to-talk switch on microphone and adjust meter sensitivity control to 50.

With a small screw driver inserted in the opening on the right side of cabinet and nearest the front panel, very, very carefully adjust the plate tuning condenser for the highest reading on meter obtainable. Do not adjust the meter sensitivity control. These adjustments are very critical and the slightest movement, even 1/16", makes a big difference in output. Now do the same to the antenna loading condenser just to the rear again seeking maximum output reading and working, very, very CAREFULLY.

These steps should be repeated at least three (3) times as there is an interaction between these two controls. Always adjust antenna loading last. After making the adjustments once, take transmitter "off the air" with mike switch and wait about one minute to give Dummy load a chance to cool off. **FAILURE TO DO SO MAY RESULT IN BURNING OUT THE DUMMY LOAD.** It is most likely that you will not be able to increase the readings the first time as this adjustment has been made at the factory. There will be a setting on both adjustments beyond which you cannot increase your output reading. This is where your transmitter is working at the absolute maximum output for a 50 - 52 ohm load.

Adjust the meter sensitivity control for a reading of exactly 100. Now switch to Reflected Power and make notation of lowest reading on meter. IT may not be ZERO. DO NOT be concerned if it is not. Control R15 is used for obtaining the deepest null when reading reflected power with a Dummy Load fastened to the output of the transmitter.

Proceed as follows:

Adjust Potentiometer R15 for lowest reading against the Dummy load, a non-inductive load of 50 - 52 Ohms across the coaxial output connector of the transmitter.

This may not read zero. In every case, however, adjust for the lowest reading obtainable with power on, meter switch in reflected power position.

Take transmitter off the air and replace the dummy load with the antenna cable which should be RG8U or RG58U. Again switch to forward power, put transmitter on the air announcing your call letters. Set meter sensitivity control to reading of 100 again and shut off transmitter. You now have your transmitter adjusted to maximum output into a 50-52 Ohm antenna. Nothing you can do at the transmitter will get you any more power into the antenna and no further adjustments should be made.

Now turn the meter switch to "REF" and put the carrier on again. Read the meter and write down the reading. Turn carrier off.

The SWR can be found by referring to the table on Page 12.

SECTION 6 (cont'd)

REFLECTED READING	SWR
0	1 to 1
5	1.1 to 1
10	1.2 to 1
15	1.35 to 1
20	1.5 to 1
25	1.66 to 1
30	1.85 to 1
35	2.1 to 1
40	2.3 to 1
45	2.6 to 1
50	3.0 to 1
55	3.5 to 1
60	4.0 to 1
65	4.7 to 1
70	5.6 to 1
75	7.0 to 1
80	9.0 to 1
85	12.3 to 1
90	19.0 to 1

SECTION 6 (cont'd)

Any SWR less than 2 to 1 is good and any effort spent to reduce it will have little effect on efficiency. You will also find that the SWR of any antenna system is not the same on all channels.

With the many types of specially constructed antennae available you should consult the manufacturer of your particular antenna for information on matching the antenna to the feedline. Following the manufacturers recommendations and using the Eagle transmitter power meter will eliminate your purchasing expensive SWR meters.

SECTION 7

EAGLE RECEIVER CIRCUIT DESCRIPTION (refer to Schematic)

The Eagle Receiver is a deluxe communications type receiver utilizing a dual nuvistor cascode front end followed by a unique low noise mixer and high gain IF stages for that extra measure of sensitivity often needed on distant stations.

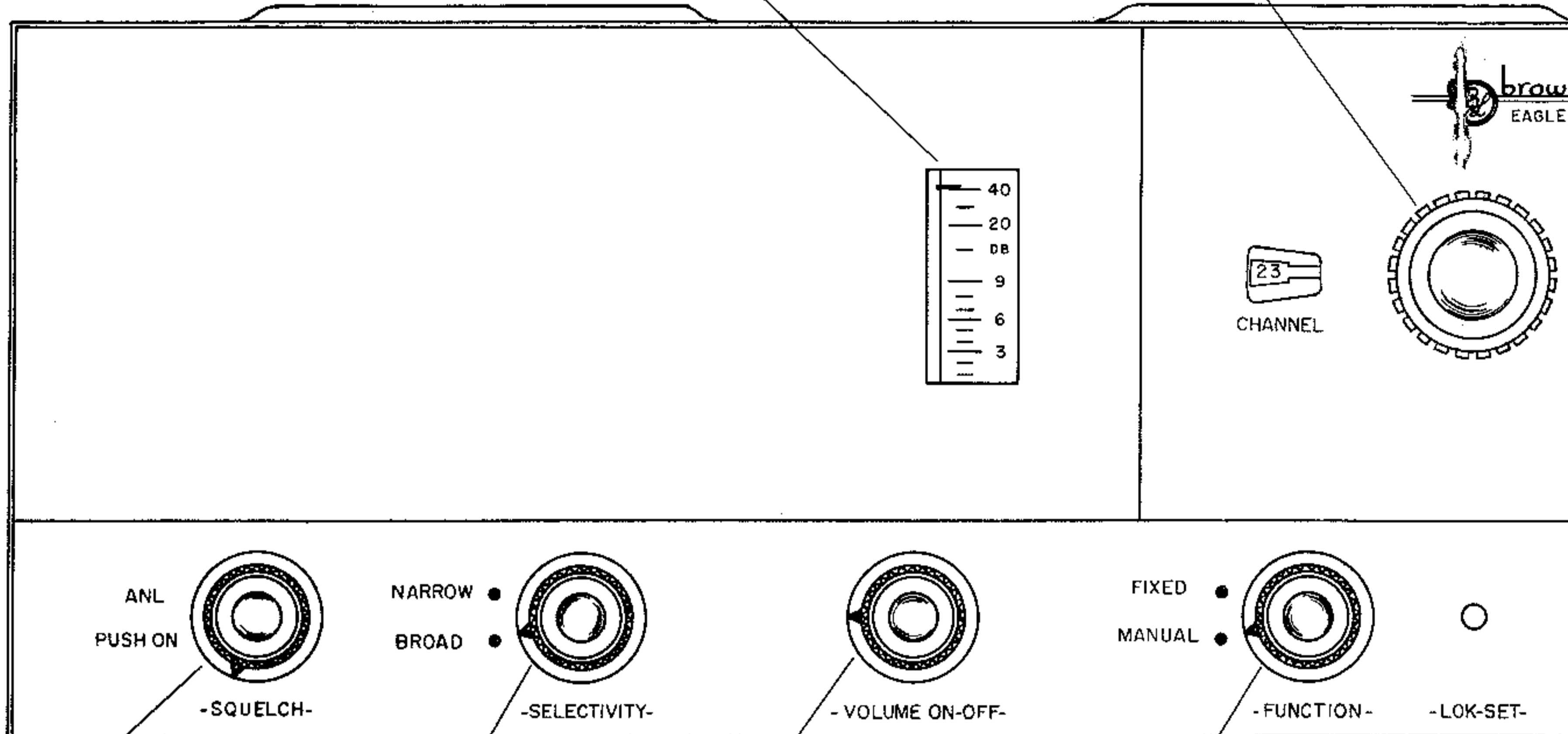
The circuit consists of 2 6DS4 nuvistors V1 and V2 as a cascode RF amplifier, followed by V3A, 1/2 12AT7, as a mixer. The mixer is fed by a conversion frequency from V3B, 1/2 12AT7 which mixes the output of the first and second oscillators. The first oscillator is V4A, 1/2 12AT7, the second oscillator V4B, 1/2 12AT7. The first 455 KC IF stage V5 6BA6 is fed by the first mixer. Two more 6BA6 IF stages follow V6 and V7. Extra 455 KC IF transformers are switched in between V3 and V5 and between V5 and V6 for extra selectivity. Delayed AVC from V8A, 1/2 6AL5, provides full audio output from the weakest signals and prevents overloading by strong signals. The "S" meter is in the plate circuit of the cascode RF amplifier.

The audio circuits V9 - 12AX7 and V10 6AQ5 incorporates a fully adjustable squelch which eliminates the hissing noise in the absence of a signal. V8B - 1/2 6AL5 is a series gated noise limiter. The rear illuminated dial calibrated in channel number and frequency quickly identifies EXACT channel and frequency being received. The second oscillator is voltage regulated by V11 the VR tube for utmost stability. Four watts of audio driving a built-in speaker or an optional external speaker assures a reserve of audio. Extra features which make the Eagle Receiver truly a communications receiver are an RF gain control and AVC defeat switch.

SIGNAL STRENGTH METER (S-METER) WILL NOT OPERATE UNLESS RF GAIN AND AVC SWITCH ARE SET FOR NORMAL OPERATION.

CHANNEL TUNING KNOB OPERATES ONLY WHEN FUNCTION SWITCH IS IN MANUAL POSITION.

AUDI
VARI
MOD

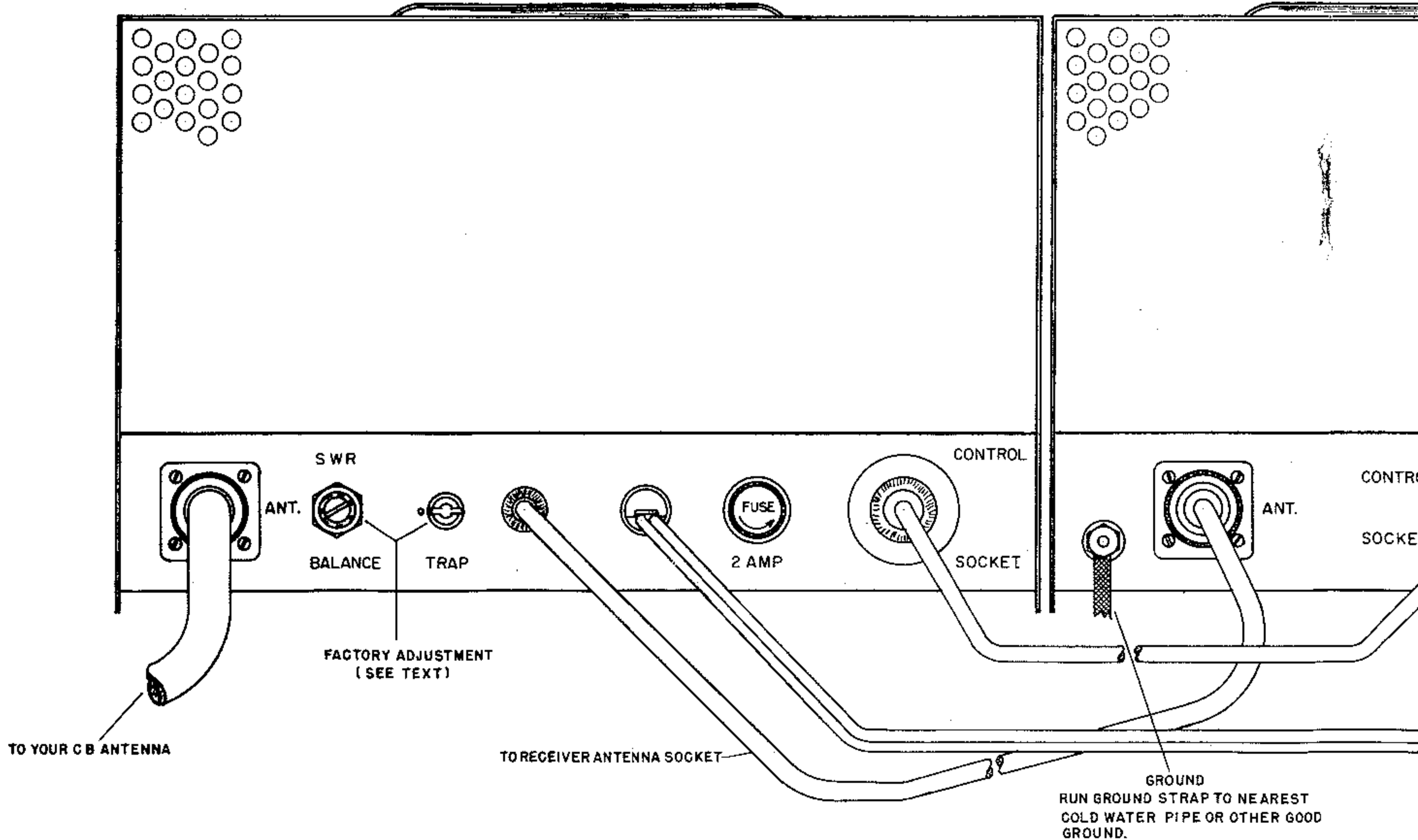


AUTOMATIC NOISE LIMITER (ANL) AND SQUELCH CONTROL. NOISE LIMITER SWITCH IS PULL-PUSH TYPE. PULL OUT TO TURN LIMITER OFF. ROTATE KNOB FOR SQUELCH ADJUSTMENT.

IF SELECTIVITY CONTROL SET FOR DESIRED BANDPASS

AC POWER SWITCH & VOLUME CONTROL. THIS SWITCH CONTROLS POWER TO RECEIVER AND UTILITY SOCKET. ROTATE KNOB FOR DESIRED AUDIO LEVEL.

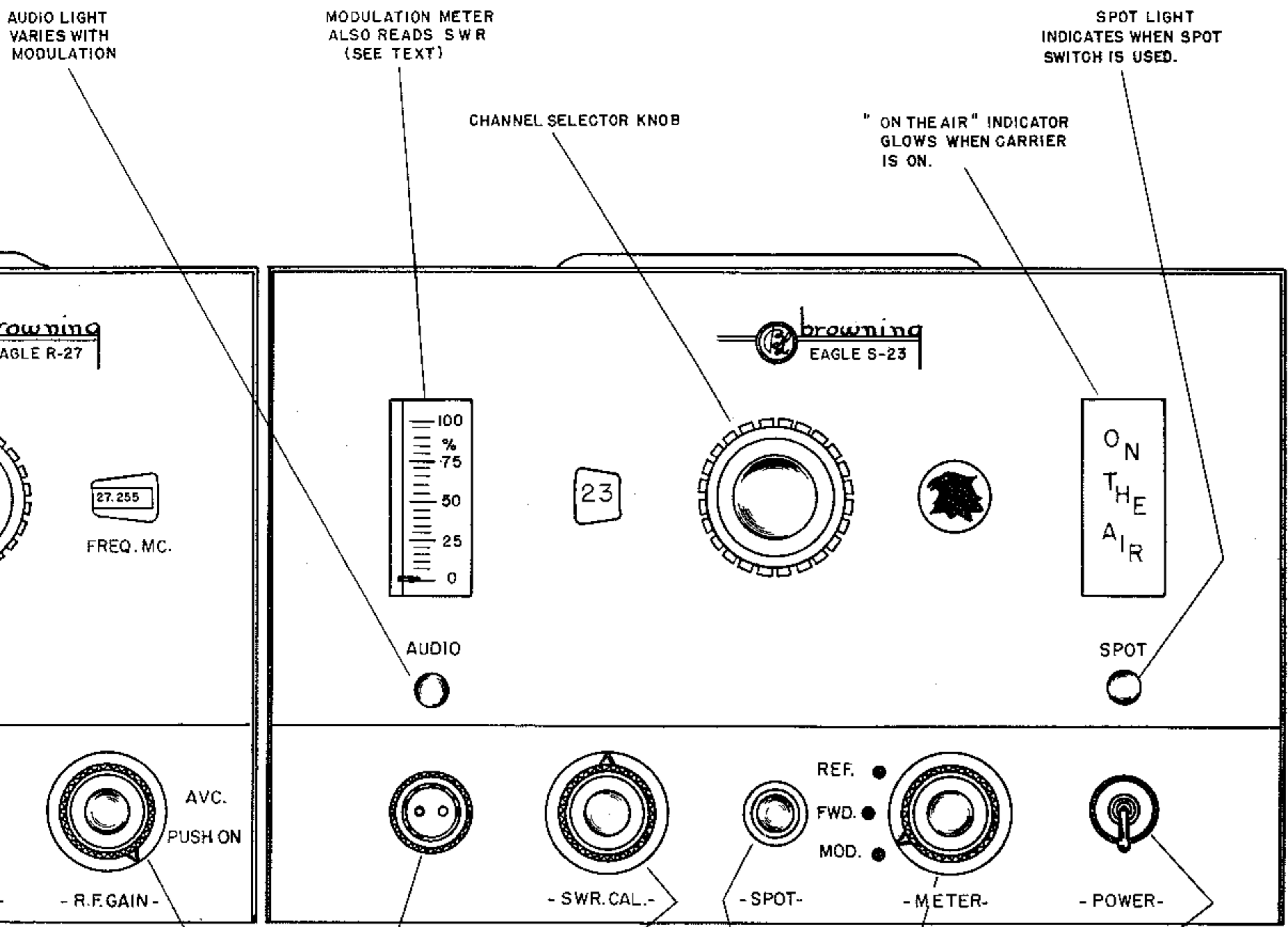
TUNING FUNCTION SWITCH, IN MANUAL POSITION THE LARGE KNOB IS USED FOR TUNING TO DESIRED CHANNEL. THE FIXED POSITION LOCKS THE RECEIVER TO A PRE-SET CHANNEL. (SEE TEXT FOR ADJUSTMENT INSTRUCTIONS)



TO YOUR C B ANTENNA

TO RECEIVER ANTENNA SOCKET

GROUND
RUN GROUND STRAP TO NEAREST
COLD WATER PIPE OR OTHER GOOD
GROUND.

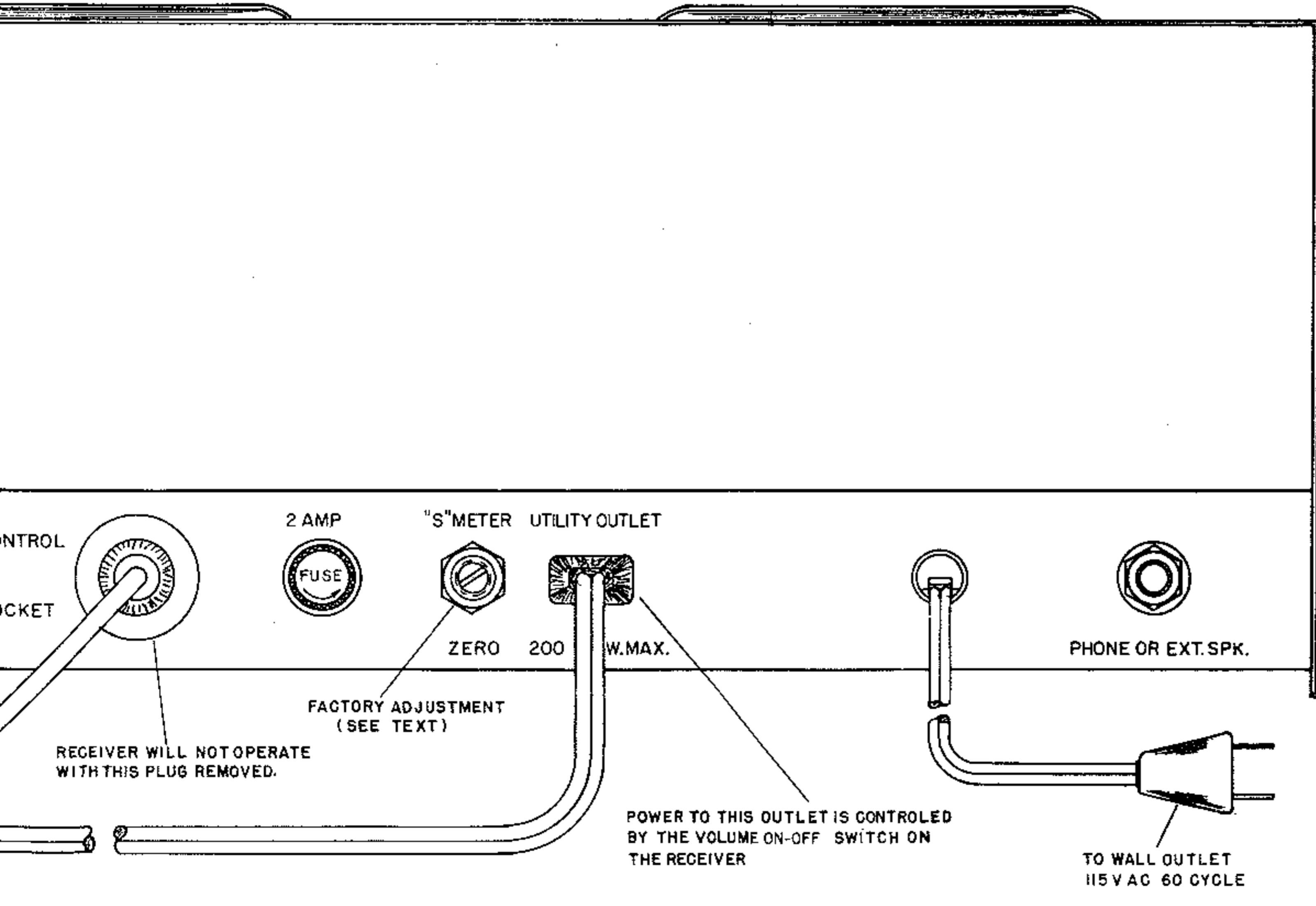


FOR NORMAL OPERATION - R.F. GAIN CONTROL SHOULD BE IN MAXIMUM CLOCKWISE POSITION & AVC SWITCH SHOULD BE ON (PUSH ON)

R.F. BRIDGE CALIBRATION CONTROL. (SEE TEXT)

SPOT SWITCH PRESS FOR TUNING IN TRANSMITTER SIGNAL ON RECEIVER. SPOT SIGNAL IS TONE MODULATED.

AC POWER SWITCH MAY BE LEFT ON IF TRANSMITTER A.C. LINE CORD IS PLUGGED INTO RECEIVER UTILITY OUTLET. RECEIVER A.C. SWITCH TURNS COMPLETE STATION ON AND OFF.



POWER TO THIS OUTLET IS CONTROLLED BY THE VOLUME ON-OFF SWITCH ON THE RECEIVER

SECTION 8

EAGLE TRANSMITTER CIRCUIT DESCRIPTION (Refer to Schematic)

The Eagle transmitter miniature crystals are mounted on a unique 23 channel selector assembly. The crystal oscillator is V1A (1/2 6GH8) with L1-C37 the tuned circuit. The oscillator signal is coupled through C-2 to the grid of the buffer V1B (1/2 6GH8). The tuned circuit C4-L2 tunes the plate of the buffer and is coupled through C6 to the grid of the final amplifier V2 (5763). The output of this class C RF amplifier is tuned with a Pi network consisting of C10, L4, and C11. The tuned circuit A-328 suppresses 2nd harmonics. The RF output is coupled to the SWR bridge through a pick up loop on the top of the chassis. Forward and reverse readings are switched to the meter with switch S-3.

Modulation is provided by V3A (1/2 12AX7) microphone amplifier, V3B (1/2 12AX7) audio amplifier, V4 audio clipper followed by C27, L5, C28, the audio filter. The filter shapes the audio response for communication. The audio passes through R27 and C29 to the modulator tube V5 (6BQ5) and plate modulation is accomplished with transformer T2.

Modulation readings come from a separate winding on the modulation transformer T-2.

Spotting is accomplished by applying a very low voltage from divider R11, R12 to the RF section and modulating it with the tone from tone generator through R13.

The power supply is a voltage doubler circuit using silicon rectifiers and capacitive input filter.

SECTION 9
SERVICING INSTRUCTIONS

9.1 EAGLE RECEIVER

The Browning Eagle receiver is a precision communications receiver utilizing high quality components throughout and should provide dependable service for years. Although the tubes and nuvistors will normally have a long life they should be checked first, if trouble develops. The tube tester does not always show up a bad tube, therefore, substitution of a known good tube is the best method for locating a bad tube. The dust cover can be removed from the Eagle Receiver by removing four screws, two at each end.

1. Check to see that the tubes and pilot lights light. If not, check the fuse.
2. Check tubes as above by replacing suspected defective ones with known good ones.
3. Be sure control cable is plugged into both receiver and transmitter or a jumper plug may be used in the receiver control socket.
4. With the volume control at full and the squelch maximum counter clockwise, there should be some noise from the speaker. If noise is heard but no signals are heard, disconnect the antenna lead and with a pointed instrument or screwdriver touch the antenna socket inner terminal. If there is a good increase in noise and if some local stations can be heard, look for trouble in the antenna or its cable connections.

Having checked the above thoroughly without locating the trouble, the following simplified method of isolating the defective stage may be used.

1. With squelch and volume set as above, remove V9 (12AX7), and listen for a loud click from the speaker. If there is a click, the output stage, 6AQ5, is working properly, if no click is heard, it is defective. Check screen and plate voltages.
2. Proceed with each previous stage, replacing the tube each time until a tube is pulled which causes no click in the speaker. Check the stage after this one for correct voltages and continuity.

This simple method of isolation will usually help to locate the trouble quickly. Do not tune transformers or coils, as the repair can usually be made without disturbing any of the alignment. Refer to the schematic for voltages.

SECTION 9 (cont'd)

9.2 Receiver Gain Measurements

Equipment Required

1. A signal generator calibrated in frequency and microvolts output to cover the range from 455 KC to 27 MC.
2. A vacuum tube volt meter.

Procedure

Connect the VTVM between ground and T7 Pin 2 (Pin 2 has connected to it 1 meg, 470K, 4.7 meg and 100 PF). Use a .01 MFD disc capacitor in series with the generator lead to prevent possible damage to the signal generator. Connect the generator to each of the points listed in the following table adjust the generator output for a -5 volt reference on the VTVM. Compare the output of the generator with the values in the table. Plus or minus 3DB from these values are normal.

<u>Signal Applied To</u>	<u>Frequency</u>	<u>Level for -5 Volts at Detector</u>	
		<u>Micro Volts</u>	<u>or DB above 1 UV</u>
Pin 1 of V7	455 KC	100,000	100 DB
Pin 1 of V6	455 KC	10,000	80 DB
Pin 1 of V5	455 KC	1,000	60 DB
Pin 2 of V3	455 KC	100	40 DB
Pin 2 of V1	27 MC	18	25 DB
ANT Input	27 MC	0.8	-2 DB

SECTION 9 (cont'd)

9.3 Receiver Alignment Procedure

Alignment of the Eagle Receiver should not be attempted unless suitable equipment is available.

1. Connect the VTVM across the detector, between T7 - Pin 2 and ground.
2. Apply a 455 KC signal to V3 Pin 2. Adjust the generator level for approximately -5 volts on the VTVM. Set the selectivity switch in narrow position and tune T2, T3, T4, T5, T6 and T7 for maximum on the VTVM.
3. Apply a 27 mc signal (near center of the band) to the antenna input. Tune L1 and T1 for maximum on the VTVM.
4. Calibrate the dial by applying a CB Channel signal to the antenna input, set the dial to the channel being used and adjust C36 (ceramic trimmer) for maximum reading on the VTVM.

SECTION 10
SERVICING INSTRUCTIONS

10.1 EAGLE TRANSMITTER

The Eagle transmitter has been designed to give you trouble free performance for many years. Although the tubes will normally have a long life they should be checked first, if trouble develops. The tube tester does not always show up a bad tube, therefore, substitution of a known good tube is the best method for locating a bad tube. If all tubes check good and trouble still persists, refer to a qualified technician for repairing and adjusting. DO NOT TAMPER WITH ANY OF THE INTERNAL ADJUSTMENTS OF THE EAGLE TRANSMITTER. TO DO SO COULD RESULT IN IMPROPER AND ILLEGAL OPERATION. Only a qualified technician with the proper test instruments should service this transmitter. Trouble-shooting by inexperienced persons should be limited to fuse, tube, and pilot light replacement.

The following operations according to FCC regulations can only be performed by a person holding a commercial radio telephone second class or higher license. Adjustment by unauthorized persons is illegal.

10.2 RF Tuning Procedure

1. Connect dummy load to antenna socket.
2. Turn on power switch and key transmitter after at least one minute warmup.
3. With VTVM measure the grid voltage on the buffer stage (Pin 2 of 6GH8). If necessary adjust L1 (oscillator coil) for a reading of -6.5 volts.
4. Measure the grid voltage of the final amplifier. Adjust L2 for peak reading. Should be 40 - 50 volts.

10.3 Modulation Adjustment

Modulation percentage is controlled by R27. This control should be adjusted while observing the modulation on an oscilloscope for not over 100% modulation on peaks.

The EAGLE Base Station has been designed to give utmost efficiency on the 11-meter band. For optimum base-to-mobile performance the Browning DRAKE M-523 is desirable for your automobile or boat. Time-proven, reliable Browning circuitry and maximum performance is the result of over a quarter of a century in electronics.

W A R R A N T Y

Browning Laboratories, Inc., warrants each new inter-communicating device manufactured by it to be free from defective material and workmanship and agrees to remedy 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 discloses such defect - provided the unit is delivered by the owner to us or to our authorized distributor or dealer from whom purchased within one (1) year from the date of sale to original purchaser, and provided that such examination discloses in our judgment that it is thus defective. Tubes and Labor are warranted for ninety (90) days.

This warranty does not extend to any of our products which have been subjected to misuse, neglect, accident, incorrect application, improper installation, or use in violation of instructions furnished by us.

This is not an all-encompassing or performance guarantee (see instructions) and 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 products.

Browning Laboratories, Inc., reserves the right to make any change in design, or to make additions and improvements in its products without imposing any obligation on itself to install them in its products previously manufactured.

BROWNING LABORATORIES, INC.

1269 UNION AVENUE

LACONIA, N. H. 03246

EAGLE RECEIVER

PARTS LIST

<u>Description</u>					<u>Schematic No.</u>
Resistor	Comp.	1/2 Watt	10%	68 ohms	R3, R7
"	"	"	"	270 "	R19
"	"	"	"	470 "	R9, R13
"	"	"	"	680 "	R58
"	"	"	"	1.8 K	R43
"	"	"	"	2.2 K	R6, R11, R15, R21, R36, R55
"	"	"	"	3.3 K	R22
"	"	"	"	10 K	R46
"	"	"	"	47 K	R10, R14, R34, R20
"	"	"	"	68 K	R32, R35
"	"	"	"	100 K	R1, R5, R12, R18, R31, R33, R44
"	"	"	"	220 K	R27
"	"	"	"	330 K	R41
"	"	"	"	470 K	R2, R24, R25, R39, R48
"	"	"	"	1 Meg	R23, R26, R28, R40
"	"	"	"	2.2 Meg	R29
"	"	"	"	4.7 Meg	R37
"	"	"	"	10 Meg	R42
"	"	"	"	10 ohms	R51
"	"	"	"	22 "	R50
"	"	"	"	270 "	R49
"	"	"	"	6.8 K	R4
"	"	"	"	33 K	R8
"	"	"	"	100 K	R45
"	"	2	"	100 K	R16
"	W.W.	4	"	3.3 ohms	R56, R57
"	W.W.	4	"	250 "	R52
"	"	10	"	1 K	R54
"	"	10	"	10 K	R53
Pot.	1/2 Watt	10K w/Pull-Push	Switch	A-325	R17, R47
Pot.	1/2 Watt	1 K S.D.	Shaft		R30
Pot.	1/2 Watt	500K w/ switch	A-318		R38
Capacitor	molded silver mica			39 pf	C37
"	"	"	"	430 pf	C39, C40
"	tubular ceramic			1.0 pf	C33
"	"	"	"	2.2 pf	C27
"	dipped mica			5 pf	C32
"	"	"	"	10 pf	C31
"	tubular	20 pf	N750		C38
"	dipped mica			20 pf	C1, C28
"	"	"	"	39 pf	C9, C13
"	"	"	"	100 pf	C21, C23
"	"	"	"	270 pf	C22

EAGLE RECEIVER

PARTS LIST

<u>Description</u>	<u>Schematic No.</u>
Capacitor disc. ceramic .001	C2, C4, C5, C6, C29 C30, C43, C48, C52, C53, C56, C57
Capacitor disc. ceramic .01 500V	C3, C7, C8, C10, C11, C12, C14, C15, C16, C18, C19, C20, C24, C26, C41, C42, C44, C47, C49
Capacitor disc. ceramic .01 1K	C25
" " " .02	C17, C45
" Tubular 0.1 100V	C46, C50
" electrolytic 5 mfd 50 V	C51
" " 8 mfd 450 V	C55
" " 40-40-40/450 V	C54
" " 40 mfd 250 V	C36
Trimmer Ceramic 3-12 pf	C35
Capacitor Air variable 25 pf APC-25	C34
Main Tuning Capacitor A-226	L2
Choke Molded 18 uh	L5
Choke 2.5 mh	L1
Antenna Coil A138	T1
27 mc Transformer A-139	L3, L4
Coil Slug tuned 1 uh A-140	L6
Coil 2nd oscillator A-142	T2, T3, T4, T5, T6, T7
Transformer IF, 455 KC	T8
Audio Output Transformer and Speaker A-146	T9
Power Transformer A-225	SR1, SR2
Silicon Rectifier 600 P.I.V. 50 ma	CR1
S-Meter A-290	SW1, SW2
Crystal 31.4 mc	I1, I2, I3
Switch 3 circuit 3 pos. A-423	CR2
Dial Light Socket 4544	V1, V2
Pilot Light #47	V3, V4
Detector Diode 1N67A	V5, V6, V7
Nuvistor 6DS4	V8
Tube 12AT7	V9
" 6BA6	V10
" 6AL5	V11
" 12AX7	
" 6AQ5	
" OB2	
Fuse Holder	
Fuse 2 Amp.	
Line Cord	
Phone Jack	

EAGLE RECEIVER

PARTS LIST

Description

Vernier Drive
Tuning Dial A-409
Bracket for fixed Tuning Capacitor A-403
Dial Shaft Bracket A-400
Front Panel IF Section A-401
Front Panel RF Section A-402
Trim Plate A-410
Front Panel Mask A-404
Speaker Bracket A-405
Dial Mask A-406
Dial Mask A-408
Mask Bracket A-424
Chassis A-407
Bottom Plate A-150-CR-2
Top Cover A-420
Rubber Feet Short
Rubber Feet Long
Coaxial Socket SO-239
Knob Small
Knob Large

EAGLE TRANSMITTER

PARTS LIST

<u>Description</u>						<u>Schematic No.</u>
Resistor	Comp.	1/2 Watt	10%	100 ohms		R9
"	"	"	"	"	1 K	R12
"	"	"	"	"	2.2 K	R21, R6
"	"	"	"	"	15 K	R7
"	"	"	"	"	22 K	R4
"	"	"	"	"	33 K	R3, R30, R5
"	"	"	"	"	47 K	R1, R19
"	"	"	"	"	270K	R22
"	"	"	"	"	470K	R17, R18, R23, R35, R28
"	"	"	"	"	1 meg	R20
"	"	"	"	"	10 meg	R10, R13
"	"	1	"	"	10 ohm	R31
"	"	"	"	"	1.5 K	R26
"	"	"	"	"	22 K	R2
"	"	"	"	"	33 K	R25
"	"	"	"	"	47 K	R8
"	"	2	"	"	270 ohm	R29
"	"	"	"	"	10 K	R14, R24
"	"	"	"	"	22 K	R34
"	"	"	"	"	220 K	R11
"	W.W.	4	"	"	250 ohm	R32
"	"	7	"	"	500 ohm	R33
Pot.	1/2 Watt	5K				R16 SWR CAL
"	"	100 ohm				R15 SWR Balance
"	"	500 K				R27 Modulation
Capacitor	Dip Mica	5 pf				C2
"	"	10 pf				C4, C6, C37
"	"	12 pf				C12
"	"	68 pf				C28
"	"	100 pf				C41, C27
"	"	270 pf				C15
"	"	470 pf				C14
"	Disc Ceramic	.001				C3, C1, C7, C8, C9, C18, C19, C21, C22, C24, C26, C29, C38, C34, C35
"	"	.01	500V			C5, C17, C16, C40, C42, C43, C39
"	"	.04				C31
"	Electrolytic	10-10/450V				C20, C25
"	"	40 mfd 250V				C36
"	"	40-40-40/450V				C33
"	"	25 mfd 25V				C30, C23

EAGLE TRANSMITTER

PARTS LIST

<u>Description</u>	<u>Schematic No.</u>
Plate Tuning Capacitor 25 pf APC 25	C10
Antenna Loading Capacitor 100-500 pf	C11
TVI Trap Coil - Browning A-328	
SWR Can and Pick Up Loop	
Choke 18 uh	L3
Slug Tuned Coil 1 uh A-140	L1, L2
Pi Network Coil	L4
Audio Choke 20 Hy. 15 ma	L5
Modulation Transformer A-171	T2
Power Transformer A-255	T1
23 Pos. Switch A-417	
Spot Switch	
Meter Switch	
AC ON-OFF Switch	
Silicon Rectifier 600V PIV 500 MA	SR1, SR2, SR3, SR4, SR5,
RF Rectifier 1N67A	
Relay 4 PDT 10K	
Tube 12AX7	V3
" 12AU7	V4
" 6GH8	V1
" 6BQ5	V5
" 5763	V2
GE #47 Bulb On the Air Light	I4
GE #47 Bulb Dial Light	I5
Neon Indicator Red	I3
Neon Indicator Yellow	I2
Neon Bulb NE-2	I1
Transmit Crystal 3rd Overtone Miniature	CR1 to CR 23
Fuse Holder	
Fuse 2 Amp	
AC Line Cord	
Coaxial Socket S0-239	
Coaxial Connector PL-259	
Octal Plug W/cover 86 PM 8	
Modulation Meter A-291	
On The Air Light Socket	
Mic Connector 80-PC2F	
Mic Plug 80-MC-2M	
Microphone	
Knob Small	
Knob Large	
Rubber Feet Small	
Rubber Feet Large	

EAGLE TRANSMITTER

PARTS LIST

Description

Schematic No.

Front Panel	A-411	
Trim Plate	A-412	
Switch Bracket	A-413	
Chassis	A-414	
Pi Network Bracket	A-418	
Dial	A-416	
On the Air Window	A-415	
Bottom Plate	A-219 R3	
Top Cover	A-421	
Dial Light Socket	A-339 R-2	

NOTES

Manufacturers of...

- **Citizens Band Communication Equipment**
- **FM-Multiplex Equipment**
- **Microwave Test Instruments**
- **Klystron Power Supplies**
- **SWR Amplifiers**
- **Specialized Test Instruments**
- **Frequency Modulation Monitors**
- **WWV Receivers**
- **FM Broadcast Monitor and Relay Receivers**
- **Various Special Purpose Receivers**