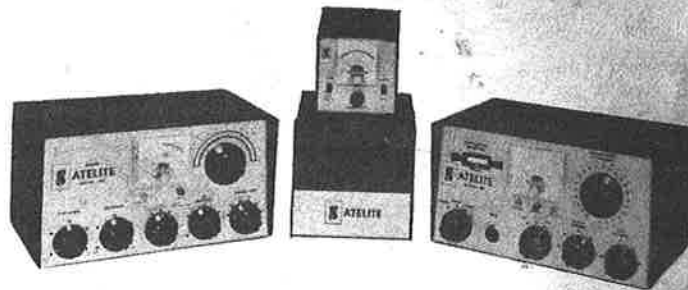


# SATELITE

## CB TWO WAY RADIO



### INSTRUCTION BOOK

**DEMCO ELECTRONICS, INC.**  
BRISTOL, INDIANA  
DEPT. 3 - A

December 24, 1965

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## STATION HOOK-UP INSTRUCTIONS

### DEMCO MODEL CB-1A

consists of:

1	T-110A	Transmitter
1	R-101A	Receiver
1	R-102A	Speaker
1	M-10A	S. W. R. Meter

These step-by-step instructions should be adhered to closely to assure best performance of your **Demco** Base Station (CB-1A).

**I.** Interconnect the receiver and the transmitter for operation from microphone press-to-talk switch.

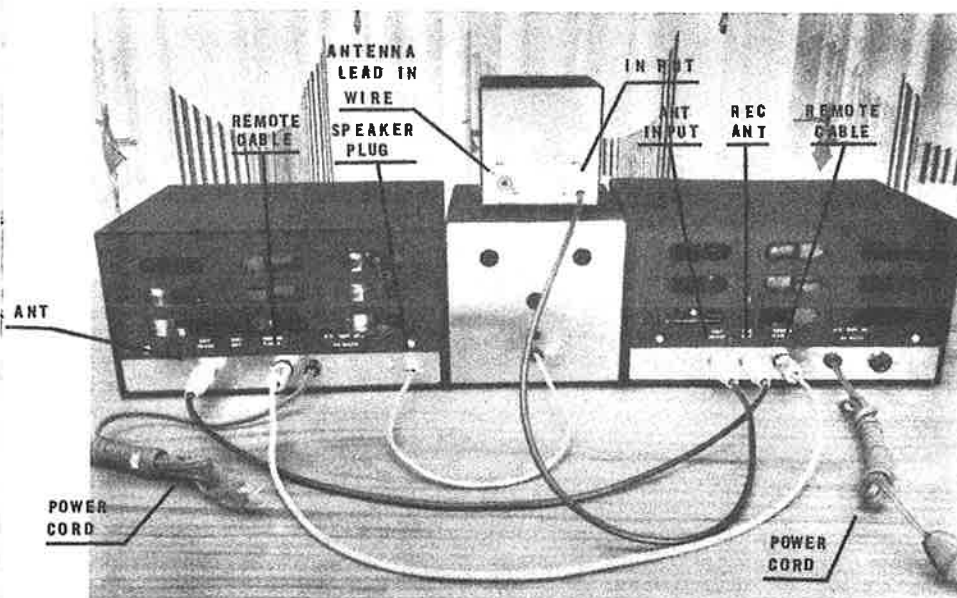
Wire microphone to microphone plug supplied (Amphenol #91-MC3M or equivalent).

1. Connect shield of microphone cable to pin #1 of #91-MC3M (if 4-conductor mike is used connect shield and one switch lead to pin #1).
2. Connect center conductor of shielded lead to pin #2.
3. Connect remaining switch lead to pin #3.
4. Insert microphone plug into mike receptacle on front panel of transmitter
  - a. If microphone has only one shielded lead see your **Demco** dealer for instructions. He will be able to supply instructions or appropriate microphone for your use.
  - b. If power modulator accessory is purchased, see page 13.

**II.** Cable connections - two cables are supplied with receiver.

1. Remote cable (gray). Plug one end into remote cable socket of receiver and the other end into remote cable socket of transmitter. These sockets are located on the rear of the units and labeled as in layout Photo #1.
2. Antenna Jumper Cable (Black). Connect cable to jack labeled REC Ant on transmitter to jack labeled ANT on receiver with this cable.

(See Hook-Up Photo #1 on next page)



- III. Speaker (Demco R-102A). Connect speaker lead to jack marked SPEAKER PLUG on receiver.
- IV. SWR Meter (Demco M-10A). Additional antenna jumper cable is supplied in carton with meter. Insert one end of jumper into jack labeled ANT on transmitter, the other plug into jack labeled IN-PUT on SWR meter.
- V. Antenna connections. After installing your C. B. antenna connect coaxial lead to PL-259 (Amphenol series 83) connector and insert into ANT socket on SWR Meter (Demco M-10A).

You are now ready to go on the air with the finest Citizens Band Equipment available at any price.

### MODEL T-110A

#### C. B. TRANSMITTER

Your new Demco Model T 110A is an advanced design, self contained transmitter for Class "D" 27 megacycle Citizens Band Service.

1. 23-channel switching—Channel 9 crystal supplied.
2. Convenient external crystal test socket.
3. Front-panel Pi network antenna tuning—assures maximum transferred efficiency.

4. 2½" plate meter—measures plate current and voltage.
5. Cathode-ray modulation indicator.
6. "Calibrate" switch position for simplified precision receiver tuning.
7. Remote receiver-control jack.
8. Second overtone crystals for maximum efficiency.
9. 5 tubes plus 2 silicon diodes.
10. 5-watt input—100% Heizing negative modulation—more "talk-power" for best readability

**SIZE:** 11" wide x 6" high x 7¼" deep.

All that is required for operation is: (1) completion of an FCC application and assignment of call letters. (2) appropriate antenna system and (3) 115V AC house current.

#### **OPERATING CONTROLS**

There are five (5) operating controls on the front of the T-110. Facing the transmitter from upper right, clockwise to lower left, they are (1) CHANNEL SELECTOR SWITCH, (2) ANTENNA TUNING, (3) PLATE TUNING, (4) "OFF-ON" METER SWITCH, and (5) TRANSMITTER MODE SWITCH.

The CHANNEL SELECTOR SWITCH has 23 positions. The position of the switch will indicate the transmitting channel. Channel 23 connects to external socket for crystal test or channel 23 crystal.

The ANTENNA TUNING control matches the pi network to the antenna.

The PLATE TUNING control tunes the plate of the output tube.

The "ON-OFF" METER SWITCH turns on the unit and permits reading of the plate voltage and plate current.

The TRANSMITTER MODE SWITCH is used in tuning the transmitter and spot tuning the receiver.

#### **OPERATING INSTRUCTIONS**

1. Connect microphone to "MIC" jack. (See station hook-up instructions).
2. Set transmitter mode switch to "XMIT".

3. Set PLATE TUNING and ANT TUNING controls on center or top dots.
4. Set CHANNEL SELECTOR SWITCH on channel 9 or any other position that contains a crystal. Transmitters come equipped with channel 9 crystals only. The T-110A transmitter uses James S. Knights type C32S one-half frequency crystal or equivalent. (additional crystals may be ordered from your dealer). See chart of crystal frequencies page 8.
5. Connect line cord to 110V AC outlet.
6. Set ON-OFF METER switch to MILS position. Power light will come on.
7. Tuning the transmitter:
  - A. Set SWR METER switch to R. F. watts.
  - B. Set position channel selector switch to highest channel which contains a crystal.
  - C. Set meter switch to MILS.
  - D. Set transmitter MODE CONTROL to TUNE.
  - E. Press and hold PUSH TO TALK button on mike.
  - F. Rock plate tuning control to position where meter needle dips to minimum reading.
  - G. Rock antenna tuning control to position where meter needle dips to minimum position.
  - H. Switch SWR METER to SWR and MODE control to XMIT and repeat steps "F" and "G" for maximum reading on SWR meter.

**WARNING! You are on the AIR in Step "H". Work quickly and silently.**

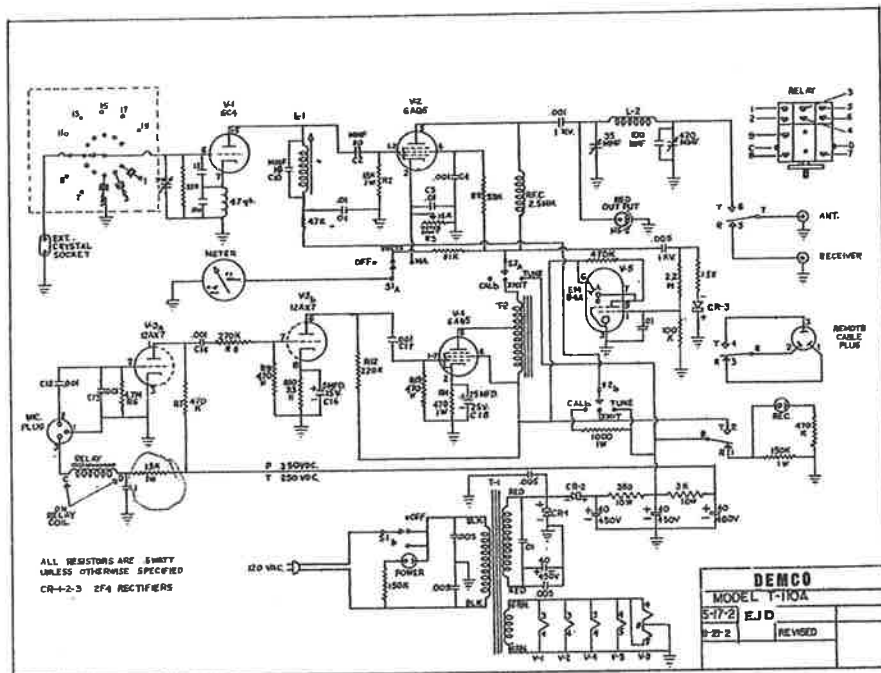
The above procedure should only be repeated occasionally or if antenna is changed.

8. Meter may be left in either VOLTS or MILS position when station is operated.
9. CALIB position on TRANSMITTER MODE control enables spot tuning of receiver with any Transmitter channel. Set channel selector of Transmitter on desired channel with crystal in position and turn MODE control into calibrate position. Then tune variable tuner of receiver on station to highest reading on "S" meter.
10. Modulation monitor eye gives indication of your output modulation and lights up when the microphone button is depressed. Fluctuation of the eye indicates Transmitter is modulating the carrier.

11. Transmitter may be used with any receiver. Transmitter includes Antenna change over relay and remote plug on back may be used to break or make any part of circuit as desired.
12. Any internal adjustments and/or repairs must be performed by personnel holding appropriate F.C.C. License.
13. Crystal Frequencies for **DEMCO T-110A** Transmitter:

CHANNELS	CRYSTAL FREQUENCY	CHANNELS	CRYSTAL FREQUENCY
1.	13482.5 KC	13.	13557.5 KC
2.	13487.5 KC	14.	13562.5 KC
3.	13492.5 KC	15.	13567.5 KC
4.	13502.5 KC	16.	13577.5 KC
5.	13507.5 KC	17.	13582.5 KC
6.	13512.5 KC	18.	13587.5 KC
7.	13517.5 KC	19.	13592.5 KC
8.	13527.5 KC	20.	13602.5 KC
9.	13532.5 KC	21.	13607.5 KC
10.	13537.5 KC	22.	13612.5 KC
11.	13542.5 KC	23.	13627.5 KC
12.	13552.5 KC		

If additional information is required contact **YOUR DEMCO DEALER.**



### Dial Scale Calibration

(Continued)

6. Tune R101A tuning knob for maximum reading on "S" meter (marker on knob should point to 1 on dial).
  - A. If knob reads high on dial (toward 21) turn trimmer condenser marked "Tune" inward (clockwise) a few turns. Repeat steps 2 thru 6.
  - B. If knob reads low on dial, turn trimmer marked "Tune" outward (counter clockwise) a few turns. Repeat steps 2 thru 6.

This completes dial calibration.

### Fixed Channel Alignment

Receiver R101A has 5 fixed channels marked A, B, C, D, and E on the channel selector. These 5 positions may be set to any of the 23 channels available. However, it is best to set the high numbered channels on positions D or E.

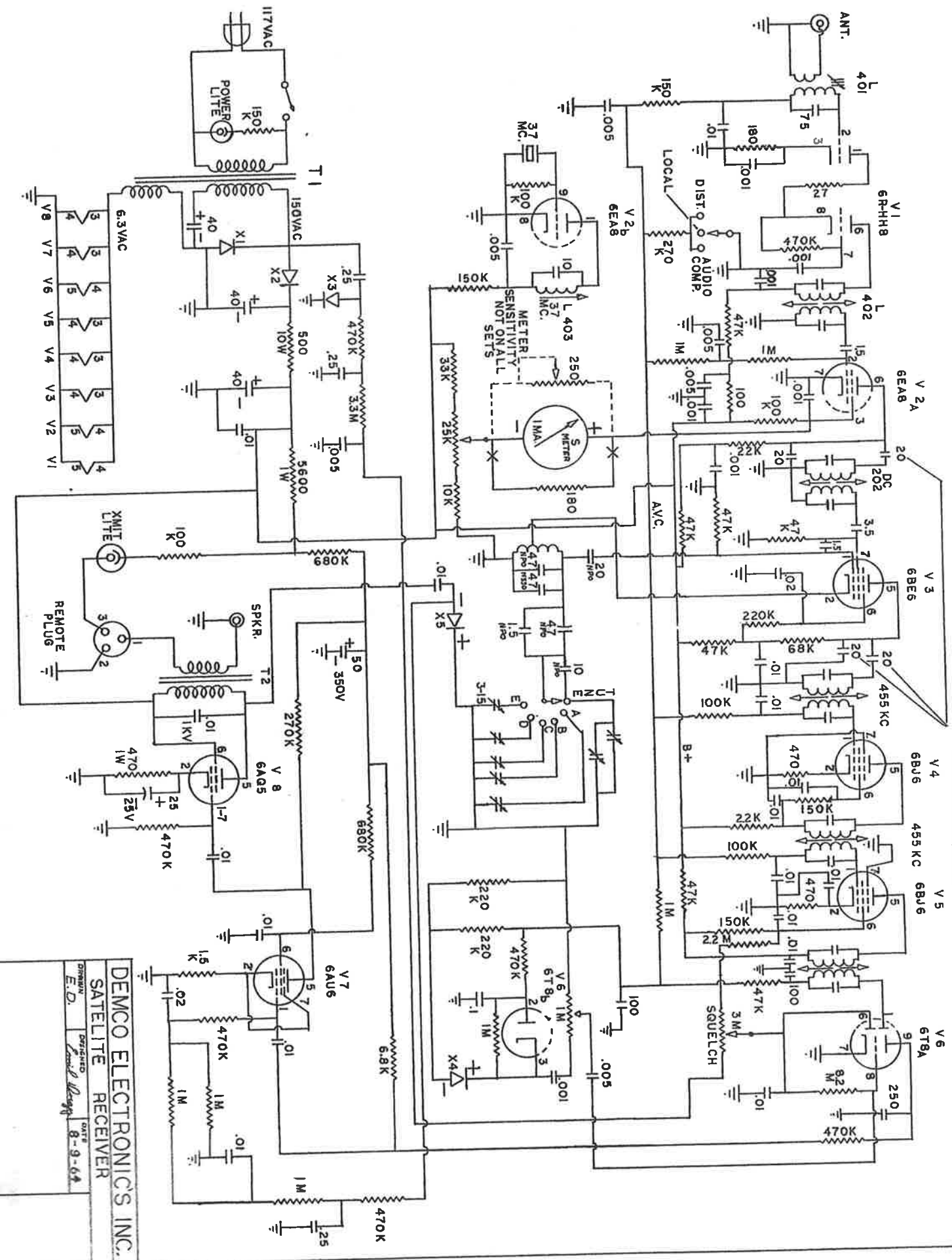
1. Connect signal generator to R101A antenna. (See Note 2.)
2. Set R101A selector switch to position to be adjusted.
3. Set signal generator (See Note 2) to channel desired.
4. Set R101A tuning knob to "Set".
5. Tune corresponding trimmer condenser (See parts placement) for maximum reading on R101A "S" meter.
6. Repeat steps 2 thru 5 for remaining fixed channel positions.

Note 1. Maintain a 2 to 3 volt reading on V.T.V.M. by adjusting signal generator output. This prevents overloading.

Note 2. Transmitter T101A may be used for a signal generator by placing it in calibrate position.



SOME MODELS HAVE 18 MMF



**DEMCO ELECTRONICS INC.**

**SATELLITE RECEIVER**

DESIGNED DATE 8-9-64  
 E.D. Lowell Design

### Alignment Procedure

Alignment of the R101A should not be attempted unless suitable equipment is available. Before attempting alignment, be sure the tuning knob is tight on the shaft.

### Simplified Procedure

1. Connect a VTVM between the diode load resistor (A.V.C. line) and ground. Reading should be -DC.
2. Connect a channel 12 signal to the receiver antenna.
3. Set the R101A channel selector to tune position, and tuning knob to channel 12.
4. Tune top and bottom slugs of DC-202 (10 mc coil) for maximum V.T.V.M. reading. (See Note 1.)
5. Tune top and bottom slugs of L-402 (band pass coil) for maximum reading on V.T.V.M. (See note 1.)
6. Tune slug in L-401 (antenna coil) for maximum reading on V.T.V.M. (See note 1.)
7. Tune top and bottom slugs of all three DC-201 coils (1st, 2nd, and 3rd 455 kc IF's) for maximum V.T.V.M. reading.

This completes RF and IF alignment.

### Dial Scale Calibration

1. Connect a signal generator (See Note 2.) to receiver R101A antenna.
2. Set R101A tuning knob to channel 21.
3. Set signal generator (See Note 2) to channel 21.
4. Adjust coil L-405 for maximum reading on receiver "S" meter. (This is a very sensitive adjustment and should not require much movement.)
5. Set signal generator to channel 1. (See Note 2.)

## MODEL R-101A

### C. B. RECEIVER

Your new **Demco Model R-101A** has more features than any comparable receiver for Class "D", 27 megacycles Citizens Band Service.

The features listed below will give you maximum sensitivity and selectivity resulting in performance of highest efficiency.

#### SPECIFICATIONS:

1. .1 microvolt sensitivity cascode amplifier with 6R-HH8 (improved version of 6DJ8) receiving tube.
2. Dual conversion IF, 10 mc. and 455 kc.
3. Automatic Volume Control (AVC) for fast-acting, positive control.
4. Highly readable 2-1/2" square "S" meter with front-panel zeroing control.
5. Exclusive local distance switch with audio-compressor position to prevent overload from nearby stations.
6. Series-gated noise limiter.
7. Squelch opens at under 1 microvolt signal.
8. 3-watt audio output, with acceptable distortion.
9. 5 fixed "receive" channels with band-spread tuning and overall 23-channel continuous tuning.
10. Remote control jack for use by any type Citizens Band Transmitter.
11. 8-tubes and 5-diodes giving 14-tube function performance.
12. Size: 11" wide x 6" high x 7-1/4" deep.

#### OPERATING CONTROLS

There are six (6) operating controls on the front of the R-101A. Facing the receiver from upper right, clockwise to lower left, they are (1) TUNING CONTROL, (2) MODE SELECTOR, (3) "S" METER (4) SENSITIVITY SWITCH, (5) SQUELCH CONTROL, (6) "OFF-ON" VOLUME CONTROL.

TUNING CONTROL tunes receiver continuously through the complete

27 megacycle Citizens Band, and on preset channels, permits the fine tuning of incoming signals which may be off frequency.

MODE SELECTOR control permits the following functions. In TUNE position the receiver is tunable through all 23 channels. Positions A, B, C, D, or E, are preset channels. Each of the channels may be tuned as desired.

"S" METER control permits calibration of the "S" meter.

SENSITIVITY SWITCH allows you to switch from LOCAL TO DISTANT to AUDIO COMPRESSOR.

SQUELCH CONTROL permits the elimination of unwanted noise.

VOLUME CONTROL controls levels of volume and switches "on" and "off".

#### OPERATING INSTRUCTIONS

After completing station hook-up instructions, the following procedure should be used:

1. Connect receiver to 110V AC.
2. Set SELECTOR control to TUNE.
3. Set SENSITIVITY switch to LOCAL.
4. Turn VOLUME switch to ON and continue to first dot. Power light will come on.
5. Turn SQUELCH to mid position, where background noise is just noticeable.
6. Select station with TUNING control using lower scale and set VOLUME for best reception.
7. SENSITIVITY control has three (3) positions . . . LOCAL . . . DISTANT . . . AUDIO COMPRESSOR. LOCAL position is used for normal operation and will receive a maximum signal and block most background noise.

DISTANT position increases sensitivity to receive weak signals but will increase background noise.

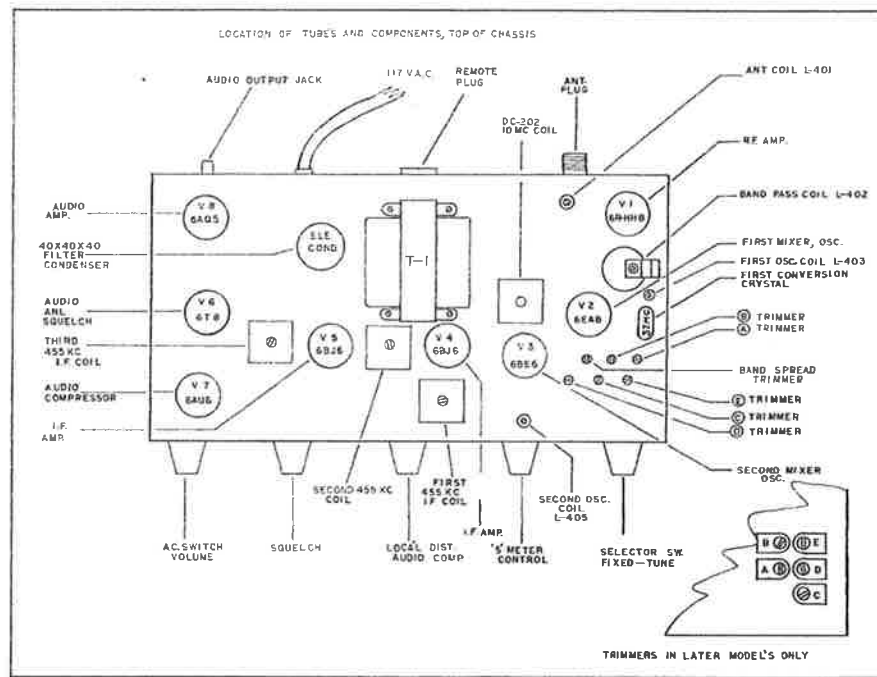
AUDIO COMPRESSOR position is a new feature, designed to equalize weak and strong signals and avoids damage to the

speaker and overloading if a local C. B. station should interrupt your reception. It should be noted that in the AUDIO COMPRESSOR position you have comparable sensitivity to the DISTANT position but will not overload your audio system.

8. The "S" METER control should be used to calibrate the meter to zero when no signal is being received so that interference will not add to your "S" readings of received signals. Calibrate by setting SWR METER to RF WATTS position which replaces antenna with dummy load built into the meter. Then adjust "S" METER control so that meter reads zero. Do Not Forget to return SWR METER switch to SWR position.
9. THE SQUELCH control increases its effectiveness when rotated in a counter-clockwise direction and should be set to a position to just cut off background noise. When receiving weak signals from distant stations this control should be turned clockwise a small amount from cut-off for best reception.
10. The MODE SELECTOR control has six (6) positions. In TUNE position the TUNING control covers all channels as indicated on its lowest scale. Fixed tune positions are pre-set at the factory as follows:  

"A" is Channel 5; "B" is Channel 7; "C" is Channel 9;  
"D" is Channel 12; "E" is Channel 21, but may be changed to your preferences by adjusting the appropriate trimmer marked "A", "B", "C", "D" or "E" on the chassis of the set. When adjusting these trimmers the switch should be set to the appropriate position and the tuning control left in middle position marked "set". After adjusting this will permit the use of the tuning knob as a band spread tuning device on that channel.
11. When the RECEIVER is used without transmitter, as monitor only, a jumper must be placed across points 1 & 2 of remote socket to activate the speaker jack.
12. When your Demco receiver is used with other than a Demco transmitter, remote cable must be modified to fit the requirements of your individual transmitter.

(See Diagram on next page)



## SWR-POWER METER

M-10A

Your **Demco SWR POWER METER** is a highly accurate meter for measurement of total power available at the antenna and for measurement of standing wave ratio (SWR) for antenna matching. The meter consumes no power and may be left in circuit at all times.

The **SWR - RF WATTS SWITCH** is located on front panel at lower left. The RF Watts position places dummy load in the circuit and gives a direct reading of total power available to the antenna. Read upper scale of meter. The dummy load dissipates the power and none is radiated.

In **SWR** position the relative forward to reverse standing wave ratio may be measured. To perform this measurement, set switch to SWR and press microphone switch. Adjust knob at center of panel marked "sensitivity" so that meter reads 5 on lower scale. Then press right-hand switch to reverse. The reading on the low scale will indicate the standing wave ratio. The ideal reading is one (1), which indicates maximum radiated power. If ratio is over two (2) the antenna must be checked.

## POWER MODULATOR

VM-12-120

The **Demco Power Modulator VM-12-120** is an audio compressor amplifier which more than doubles your talk power without increasing the wattage output of your transmitter. No internal connections are required - merely plug into your transmitter microphone socket, plug your microphone into the power modulator and your signal immediately becomes more than twice as readable. The VM-12-120 will operate with any transmitter up to 1 kw in power and with any microphone.

### OPERATING CONTROLS

**AMPLIFIER GAIN** - adjusts to match your microphone and transmitter to the output of the power modulator.

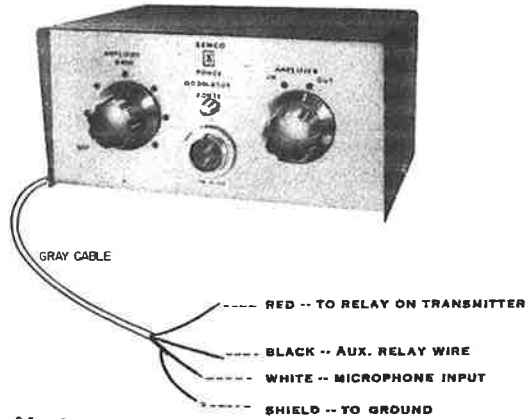
**AMPLIFIER "IN-OUT"** - switches the VM-12-120 **Demco POWER MODULATOR** in and out of the circuit. In the "out" position, the microphone output by-passes the power modulator and goes directly into the transmitter.

### OPERATING INSTRUCTIONS

1. Remove microphone connector from your microphone cord and install on grey output cable on power modulator (see diagram).
2. Install Amphenol 91MC4M (supplied) four pin microphone connector on your microphone cord (see diagram).
3. Connect microphone plug to microphone jack on the **Demco POWER MODULATOR**.
4. Connect grey output cable on the **Demco POWER MODULATOR** to the microphone jack on your transmitter.
5. Connect power cord to power jack on rear of power modulator. AC cord is supplied with VM-12-120; 12 volt DC cord is available as accessory. Attach to power source.
6. Set Amplifier Gain control to mid position for normal use. It may be necessary to experiment with different settings to match your transmitter and microphone.
7. Amplifier "IN-OUT" switch allows straight-thru operation of microphone without disconnecting.
8. When used for mobile operation, **Demco Power Modulator** must be properly grounded with Belden Bonding Cable (8663) or equal be-

tween power modulator back and your transceiver to prevent noise pick-up.

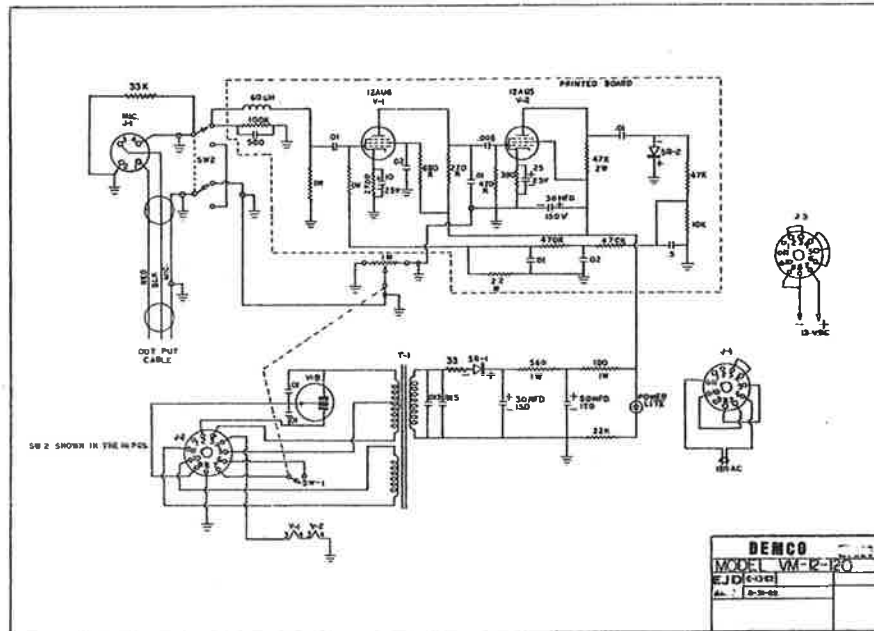
9. If at any time a whistle or howl is heard in transmission, antenna lead and ground connections should be checked. This noise is caused by RF feed-back through microphone cable.



**A**  
 MICROPHONE PLUG, "C" TO POWER MODULATOR SOCKET, "B"  
Part of 584C-4M AMMVENOL

SOLDER MICROPHONE AS FOLLOWS:

Pin No.	GENERAL DESCRIPTION
1	RELAY LEAD
2	SHOULDER
3	AUXILIARY OR ON RELAY LEAD
4	MICROPHONE INPUT



<b>DEMCO</b>	
MODEL VM-R-10	
EJD (C-10)	
Rev. 1 10-20-52	



# Electro-Voice Specifications / Model 729 and 729SR Microphones

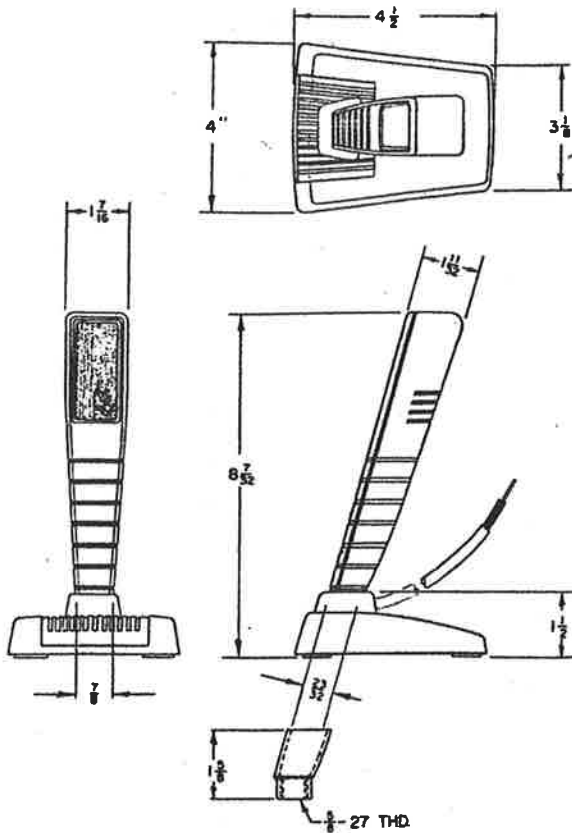


Fig. 3 — Dimensions

**Cable, 729:** 8½ foot single conductor shielded. Additional cable reduces the output level, but does not distort frequency response.

**729SR:** 8½ foot three conductor (one shielded).

**Stand Coupler:** ¼" —27 thread.

**Temperature:** May be used in any climate. Will withstand 200° F.

**Warranty:** The Model 729 is guaranteed against defects in workmanship and materials.

## Architects' and Engineers' Specifications

(The following specifications may be used when Model 729SR is required by substituting Model 729SR for model number 729.)

The microphone shall be an Electro-Voice Model 729 or equivalent. The microphone shall be an unidirectional, ceramic type, with uniform response from 60 to 8,000 cps. The microphone shall have a high impedance output that shall work into a standard grid resistance of from .5 to 2 megohms. The high impedance output level shall be —60 db with 0 db equaling 1 volt/dyne/cm<sup>2</sup>. The EIA sensitivity rating shall be —158 db rising response. The case shall be of pressure diecast front and gray plastic back. The microphone shall have a maximum net weight of 1 lb. with cable. An 8½' single conductor, shielded cable shall be provided on the 729. The Model 729SR microphone or equivalent shall have an ON-OFF switch that removes short circuits in the "ON" position and closes from microphone relay circuit. Cable shall be three conductor, one shielded.

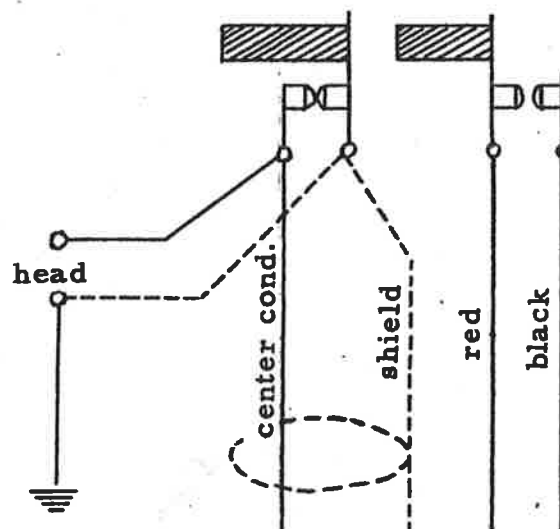


Fig. 4 — 729SR Wiring Diagram

