



## **CODAR RADIO COMPANY**

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CANADA CODAR RADIO COMPANY OF CANADA TWEED ONTARIO

### ★ **CODAR AT5 12 WATT MINIATURE TRANSMITTER** ★

#### INSTRUCTION MANUAL

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The CODAR AT5 Transmitter covers the two amateur bands 1.8 - 2.0 and 3.5 - 4.0 Mc/s with facilities for both A.M. (Telephony) and C.W. (Telegraphy) at a power input rating of 10 watts A.M., 14 watts C.W.

The V.F.O. is a new type of modified Vackar circuit developed by CODAR and is extremely stable. Temperature compensating capacitors are used to obviate frequency drift. The dial is calibrated every 20 kc/s from 1.8 - 2.0 Mc/s and every 50 kc/s from 3.5 - 3.8 Mc/s. For export use, calibration at 3.9 and 4.0 Mc/s is included.

The second stage functions as a buffer on the 1.8 - 2.0 Mc/s range, and as a doubler on the 3.5 - 4.0 Mc/s range, with a fixed series tuned wideband anode coil switched into circuit by the bandswitch.

The P.A. final stage functions straight through on each range with a Pi-network air-spaced low loss inductor output for matching into a wide range of different aerial impedances.

On A.M. the plate and screen of the P.A. stage are both modulated by a tapped auto-transformer to provide the correct impedance matching. The modulator consists of a high gain twin triode driving the modulator output stage. The input is high impedance suitable for a crystal microphone and a pre-set gain control is provided on the rear panel of the chassis. Adjustment of this control is made with a small key provided and a socket to retain the key to prevent it being mislaid is fitted to the right of the microphone input socket. Indication of modulation peaks is given by the neon indicator fitted below the current meter and is a useful feature in maintaining correct modulation level.

On C.W. the H.T. to the modulator is removed by the AM/CW function switch and transferred direct to the P.A. stage. The P.A. stage is cathode keyed via the morse key jack socket on the front panel and a key click suppressor ensures a clean C.W. note.

The total P.A. cathode current is monitored by the 100 Ma panel meter and reference to the current readings is made under the section headed TUNING.

## POWER SUPPLIES.

The power supplies required are as follows:

250-280 volts 100 mA. H.T. / 150 volts stabilised.

6.3 volts 1.8 amps L.T. (Or 12 volts 0.9 amp.)

The power supply input socket is fitted on the rear of the chassis.

Automatic changeover from 6 volt to 12 volt heater supply is achieved by inserting the appropriate power supply plug. A 6 volt power supply lead assembly is supplied with the transmitter. This is fitted with 9 pin plugs at each end marked 6v. for use with the companion mains power supply unit TYPE 250/S. For use with other power supply units, the plug on one end can be removed if required. These plugs are linked internally to provide necessary heater connections for 6 volt supply. A 12 volt power supply lead assembly with plugs is supplied with the 12 volt Transistor supply unit Type 12/MS, but can be supplied separately if required.

(See Accessories.)

The colour coding for the power supply leads is as follows:

H.T. +2 250 - 280 volts RED.

H.T. +1 150 volts stabilised BLUE.

H.T. - Negative, chassis. )  
L.T. Common, chassis ) BLACK

L.T. LIVE , YELLOW.

NOTE: One side of the heater supply is earthed internally to the chassis, which should be borne in mind where the transmitter is installed in a car for mobile use. The chassis/cabinet will probably be in direct contact with the metalwork of the car which is one side of the battery, usually positive.

PLEASE NOTE. METER NOW WIRED IN SERIES WITH RFC1 AND NOT IN CATHODE AS SHOWN IN SCHEMATIC.

MAINS POWER SUPPLY UNIT TYPE 250/S. 200-250 volts A.C.

This unit provides all the power supplies for the Transmitter together with STANDBY/NET/TRANSMIT and aerial changeover switching. A neon H.T. indicator monitors the switching by flashing continuously in the Standby position, and with a steady glow on the Net and Transmit positions. Depending upon raw material supply the mains transformer may be fitted with either mains voltage selector panel or terminating tags. The unit is set for 225/230 volts supply when it leaves the factory, and if the local mains voltage differs from this, the appropriate adjustment should be made. A bulb H.T. fuse is fitted and replacement must be 6.3V 0.3 amp rating standard pilot bulb. The bulb will glow slightly on full H.T. load. Disconnect unit when replacing this fuse. For connections to the three co-axial sockets on the rear of the unit see Diagram on Page 5.

## INSTALLATION AND TUNING

Insert the power supply cable plugs in the transmitter and power supply Unit and connect aerial and microphone to the appropriate sockets.

Check that the power supply function switch is in the STANDBY position. Switch power supply switch to ON. After a few seconds the neon indicator will flash continuously.

Set function switch on rear of Transmitter to AM or CW as required. For AM check that the pre-set gain control is at maximum, fully clockwise looking at rear.

Set Bandswitch to Band required and tune VFO dial to the correct Band. To zero beat the transmitter frequency to another station switch the power supply Unit to NET position and tune the VFO to zero beat with the station being received. Return the switch to the STANDBY position.

Turn the P.A. LOADING control to maximum capacity dial setting 100. Switch power supply Unit to TRANSMIT and tune the P.A. TUNE control for minimum current reading on the meter. This tuning must be carried out quickly to prevent excessive P.A. current in the off tune condition.

On the 1.8 - 2.0 Mc/s Band resonance and minimum current dip will occur approx. between 50 and 100 on the P.A. Tune dial, and on 3.5 - 4.0 Mc/s between 0 and 50.

Now adjust the P.A. LOAD control for a higher current reading and re-tune the P.A. TUNE control for minimum current dip. Repeat this until the current dip reads approx. 45 mA. On C.W. the current can be increased to 60 mA, which represents approx. 14 watts input.

It is important that on AM the current does not exceed 50 mA.

For obtaining maximum R.F. output efficiency an aerial ammeter or or field strength meter is extremely useful in tuning up, as due to the characteristics of Pi-network output circuits, maximum R.F. does not always occur at plate resonance.

## VENTILATION

Due to the compact size of the Transmitter, it is essential that the ventilation grilles on the top and rear of the cabinet are not obstructed in any way.

## GENERAL NOTES

Always switch to STANDBY before switching AM/CW. The Morse key jack plug must be withdrawn from the panel socket on AM as the P.A. stage will remain in the key up condition. For tune-up in the C.W position the Morse key can be withdrawn temporarily or depressed.

On AM, speak into the microphone at a distance of 3" to 4" at a normal voice level with the preset gain control at or near maximum.

## GENERAL NOTES continued.

Always check that the VFO and P.A. are tuned to the correct Band as selected by the Bandswitch.

On the NET and TRANSMIT positions, the glow in the neon H.T. indicator may move slowly across the electrodes. This is quite normal, being a characteristic of certain types of neon when used on D.C.

Do not leave the P.A. tuned off resonance or too lightly loaded with low current reading.

The function switch should not be left in the NET position for long periods.

Some types of aerial including low impedance mobile whips may present difficulty in loading. Satisfactory loading in some cases may be obtained by increasing the capacity across the output loading capacitor. This can be fitted externally across the aerial output socket. A capacitor having a value between 500-1000pF at 250 volts working being suitable.

Access to the temperature compensation VFO trimmer is provided in the base plate. The rubber plug in this access hole must be refitted to prevent direct air currents coming into contact with the trimmer.

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## VOLTAGE READINGS

Frequency 3.7 Mc/s. Function A.M. Gain Control at zero.

P.A. load 75 ohms. Readings refer to Power Supply Unit 250/S.

Full H.T. Line 270 volts.

TESTMETER 50,000 O.P.V.

P.A. current 48 mA. V.3.

P.A. Screen 180 volts.

Grid current 2.4 mA.

Buffer/Doubler 200 volts. V.2. Screen.

V.F.O. H.T. Line Stabilised 150 volts.

Modulator anode 265 volts. V.5.

Modulator cathode 14 volts.

12AX7 1st. Anode 120 volts. V.4a.

12AX7 2nd. Anode 185 volts. V.4b.

12AX7 2nd. Cathode 1.4 volts. V.4b.

Voltages shown are not critical and other than the 150 volts stabilised line may vary according to the local mains voltage.

## ACCESSORIES.

ACOS CRYSTAL MICROPHONE TYPE 40

22/6 Post 1/6

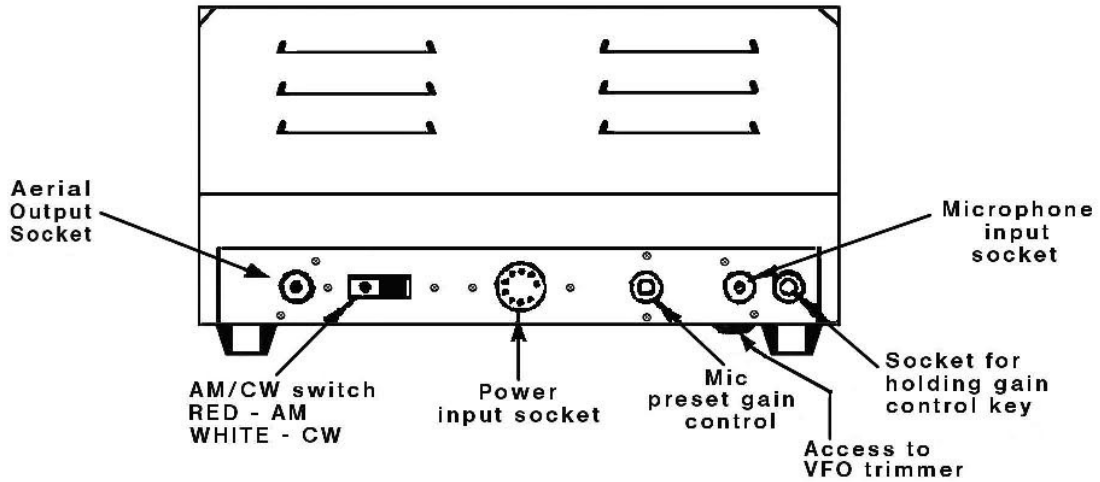
MORSE KEY

8/6 Post 1/6

SPARE 12 VOLT POWER SUPPLY LEAD 2' 6" LONG, FITTED PLUGS 8/- Post 1/-

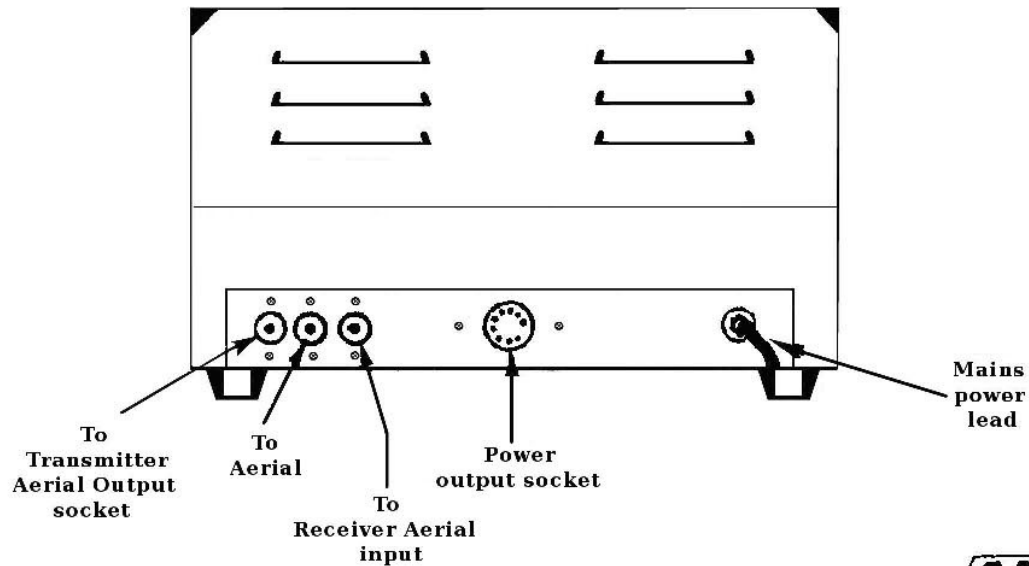
## CODAR A.T.5. TRANSMITTER

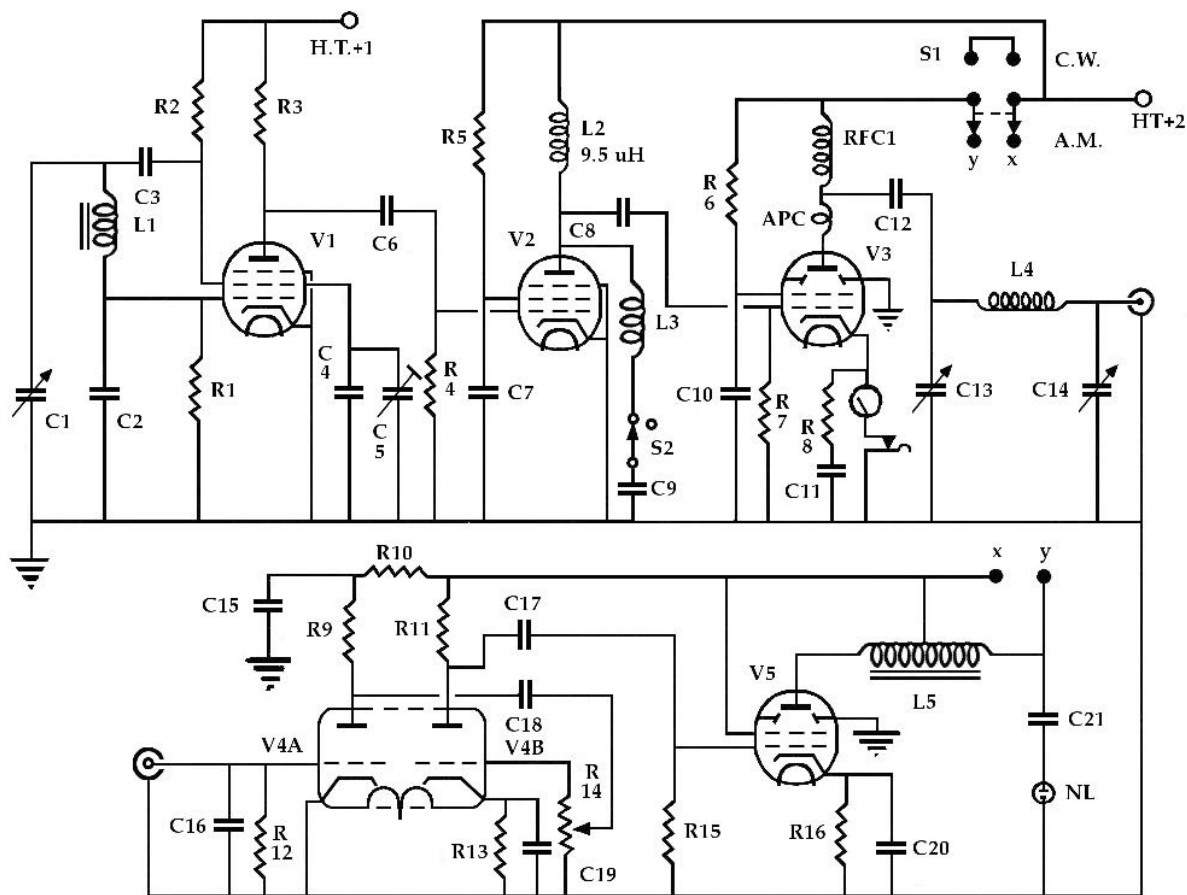
Rear view



## Mains Power Supply Unit Type 250/S

Rear view





Schematic Drawing

C1. 60 pfd. var.  
 C2. 2000 pfd. polycap. 2%  
 C3. 270 pfd. polycap. 2%  
 C4. 270 pfd. polycap. 2%  
 C5. 10/40 pfd. Temp Comp.  
 C6. 100 pfd. ceramic  
 C7. 0.01 mfd  
 C8. 100 pfd. ceramic  
 C9. 22 pfd. ceramic 2%  
 C10. 1000 pfd. ceramic  
 C11. 0.01 mfd  
 C12. 1000 pfd. ceramic  
 C13. 365 pfd var.  
 C14. 900 pfd. var.  
 C15. 8 mfd. elect.  
 C16. 100 pfd. ceramic  
 C17. 1000 pfd. ceramic  
 C18. 0.01 mfd. ceramic/disk

C19. 10/25 elec.  
 C20. 10/25 elec.  
 R1. 100k.  
 R2. 100k.  
 R3. 22k.  
 R4. 56k.  
 R5. 22k.  
 R6. 12k 2 watt.  
 R7. 22k.  
 R8. 1k.  
 R9. 100k.  
 R10. 10k.  
 R11. 100k.  
 R12. 1 meg.  
 R13. 1k.  
 R14. 500k. var.  
 R15. 470k.

C21. 1000 pfd. ceramic

R16. 270 ohm. 2 watt

All resistors 1/2 watt  
 other than R6/R16.

R1/C3/C4/L1 are in  
 VFO can assembly.

L2. R.F.C. 2.5 mH.  
 L3. 3.5 Mc/s Doubler coil.  
 L4. CODARQOIL &422S.  
 L5. Auto-Trans. Type TL10.  
 NL. Neon indicator.  
 APC. Anti-parasitic choke

