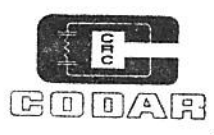


16m - 125

13m 15-25

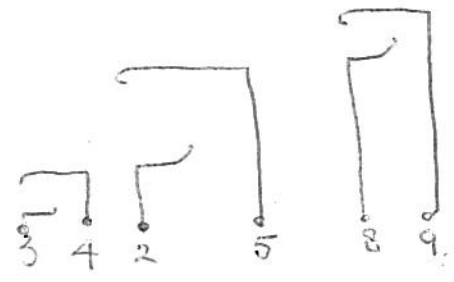
6m - 28



2 1/2 3 A

3 1/2 7 T

3 4 R



# MULTIBAND 6

## INSTRUCTION MANUAL

**CODAR RADIO COMPANY**

## CODAR KITS

### INTRODUCTION

The construction of your MULTIBAND 6 KIT is quite straightforward. All the components are of top quality and if the instructions are followed correctly it will give you long and reliable service.

Before commencing, check all parts with the Parts List and familiarise yourself with the various components which can be indentified from the drawings.

As each step is completed, tick it off in the circle provided at the end of each section, This will ensure that no wires are omitted. The drawings are sepearte to allow for easier reference whilst the instructions are being followed.

### Soldering Notes.

Without good soldering, electronic equipment will not function correctly. The following notes have been compiled to assist the newcomer to soldering, to obtain correct results.

The soldering iron must be clean and bright with a tinned tip. If the iron requires tinning, carefully clean the tip with a fine file or steel wool until the bright copper surface is exposed.

NOTE. Some soldering irons may employ a special bit with a long-life plated tip. This should not be filed or scraped as it has a semi-permanent surface that does not require tinning.

Heat the iron and apply solder to completely cover the tip. Remove excess solder with a clean cloth or cleaning tissue. If after some use the tip becomes covered with a dull oxide film, wipe off all solder and re-tin.

Apply the iron to the joint together with the solder. It is most important that sufficient heat is conducted to the parts being soldered to ensure that the solder flows and joins the parts. A common failing is to just allow the solder to melt and then remove the iron before the parts have attained sufficient heat. If the parts are not hot enough, the solder will cool down without amalgamating the parts, causing what is known as a "dry" joint.

Another cause of dry joints occurs when having removed

the iron for the joint to cool, the wires are moved before the solder has hardened. If you accidentally move the wires before the solder has set, re-apply iron...

Check all joints to see if the solder has flowed over the wire and tag surfaces and appears bright and smooth. Where more than one wire is connected to the same point make certain that all wires are soldered. Try lifting the joint to check that the joints are sound.

An ample quantity of the correct type of resin-cored solder has been included in your Kit. Do not use solder pastes, flux or soldering fluids which can damage components and will make your Guarantee void.

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#### WIRING NOTES

The Printed Circuit Board used in the construction of your MULTIBAND -6 Receiver is of top quality material with etched copper segments with all component holes pre-punched and ready for use.

Do not use more solder than is necessary for a good joint otherwise bridging of the copper segments can occur. Repeated overheating can cause lifting of the copper segments, although only excessive overheating would cause this.

"Dry" joints can occur where the component wire ends go through the board and although the solder has flowed correctly on the copper segment, it has not taken to the wire. This is caused by the soldering iron being applied only to the board, the wire not attaining sufficient heat.

Push each component down on to the plain side of the board with the wire ends through the correct holes as shown. Cut the wire ends about a sixteenth of an inch above the copper surface. Apply the iron to the side of the wire and the board and then apply just sufficient solder for a good joint.

The resistors are colour coded with coloured bands and the electrolytic capacitors C4 - C6 - C7 and C8 are polarised types and must be fitted the correct way round. According to the types supplied, the capacitors will have a black ring and/or negative sign - at the negative, whilst the positive end may be red and/or marked with a positive sign.

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The MULTIBAND -6 requires a 9 volt battery, and dependent on use, will last 2/3 months or more. The louder the output from the speaker the higher the battery current. Type Every Ready PP6 or equivalent is suitable.

MB6.

STEP 1. FIG.1

WIRING PRINTED CIRCUIT BOARD. (Viewed from plain side.)

---

Fit all the components to the board, starting with resistors and leaving the transistors until last.  
See parts list for resistor coding values.

Note the large capacitor C8 is mounted vertically, the negative wire end through the board, the correct hole being central between the two holes marked L51 and - negative sign. The positive end + wire is taken down the side of the capacitor and inserted through the board, the correct hole being at the end of the copper segment marked with the positive sign +.

Handle the R.F.C. (Radio Frequency Choke) carefully, do not bend its wires at a sharp angle but bend them gently round until they fit into the board (either way round).

Bend the AF Module tags down and insert them into the matching holes as shown. The four corner lugs fit in the four larger holes. Solder all the spills including the four lugs.

Now fit the two transistors, pushing wire ends through the holes with just sufficient to solder to. Do not push them down on to the board and do not cut the wires.

Make certain the correct transistors are in the right position. T.1. is FET PN3819E OR 2N3823E  
T.2. is PN2904 OR 2N4964 \*\*\*\*

Also make sure the wires are inserted in the correct holes. The drawings show the transistors viewed from the wire ends. (FIG.2) Incorrect fitting will damage the transistors. Do not overheat these joints. Directly the solder has flowed, remove the iron and blow on the joint to cool it.

Note the correct way round for C4-6-7.

COMPLETION OF STEP 1.

Check all components and joints and tick.

\*\*\*\* Alternative types as supplied.  
T.1. PN3819  
T.2. 2N2904

## STEP 2. ASSEMBLY

Fit the two terminal panels and the Coilholder on the rear chassis runner, using two short 6 BA bolts and nuts. Note the solder tags under the left hand fixing nuts, FIG.3. These nuts must be really tight.

Note correct way round for Coilholder, the gap between Tags 1 and 9 (viewed from tags side) at the bottom.

Fit rubber grommet as shown.

Fit both chassis runners to the Printed Circuit Board using the 5  $\frac{1}{4}$ " Pozidrive self tapping screws. Only use the  $\frac{1}{4}$ " screws for this.

Fit VC1 and VC2 to the board using the two short 4 BA screws supplied. Longer screws must not be used. The VC1 capacitor has the most plates.

Fit the Drive Unit Bracket using two short 6 BA bolts and nuts. Note the two solder tags under each fixing nut.

Fit the Drive Unit, slackening off its two set screws and pushing it on to VC1 shaft. The two "ears" of the unit are bolted to the front of the bracket using two short 6 BA bolts and nuts as shown FIG.1.

Fit the Dial on to the front of the Drive Unit, using the two 8BA dial screws supplied. The Dial is tilted down into the slot in the front runner and then placed on to the Drive Unit shaft.


Fit the Front Panel (take care not to scratch the back surface) as follows :-

Insert A.F. Gain control through the right hand chassis runner (viewed from underneath) with its three side tags pointing inwards.

Place Panel in position and fit front nut on the control bush. Do not fully tighten yet.

Fit VC3 in left hand hole with its fixed vanes inwards. Check that Panel is square with the bottom of the runner and fully tighten both nuts.

### COMPLETION OF STEP 2.

Check and tick 

NOTE:- VC3 is now supplied with two fixing nuts. Remove one only, leaving the other nut tight at the back of the bush to act as spacer nut.

FINAL WIRING STEP 3 Under chassis view

Use bare copper wire and sleeving.

Connect the A.F.Gain control as shown FIG.2.

Solder the earthing tags of VC1 and VC2. Fit the link between the two solder tags and the front earthing tag of VC1 as shown. Keep this wire direct and short, cover with sleeving.

Connect the loudspeaker terminals as shown. Note the right hand tag must be connected to the LS1 hole and the left hand tag to the LS2 hole.

Connect C10 (.01 mfd) across the terminals and C9 (.01 mfd) from the left hand tag and to the solder tag as shown.

Do not overlook the wire connecting one of the switch tags on the rear of the A.F.Gain control (either Red spot) to the hole marked with a positive sign +.

Connect Coilholder as shown. The centre spigot is not used. Note that the left hand terminal tag (EARTH) is connected to the solder tag under the left hand fixing nut and on to link Tags 2 and 9 of the Coilholder. Sleeving is not required use one continuous length of copper wire.

Note the connection from Tag 4 of the Coilholder to the fixed plates of VC3 (using either of the two projecting spalls) as shown marked X. This joint will require a little extra heating for a good joint. Cover this wire with sleeving and keep it short and direct.

Connect Tag 3 to P3 on board.

Connect Tag 5 to P5 " "

Connect Tag 8 to right hand terminal tag (AERIAL).

Connect Battery lead, inserting the wires through the rear grommet, soldering the BLACK wire to the top right hand hole marked with a negative sign -, and the RED wire to the remaining RED spot tag on the A.F.Gain control.

ABOVE CHASSIS.

Connect the link between VC1 and VC2 as shown using copper wire and sleeving. For clarity the wire is shown running close to the front panel. It should be taken diagonally and kept back away from the front panel. Keep it short and direct between the two points.

COMPLETION OF STEP 3.

Check all components and joints carefully.

Check and tick

#### STEP 4. FINAL ASSEMBLY

Fit the large knobs on VC1 and VC2 shafts. The knob with the white line is fitted to VC2 Bandspread. Fully close the vanes of VC2 and line up the knob white line on the 100 degree mark.

Close the vanes of VC3 fully meshed and set the knob white line (one of the small knobs) on the MAX mark. Turn the A.F. Gain control fully anti-clockwise to operate its switch, and set the white line of the other small knob on the OFF mark.

#### DIAL ALIGNMENT

Fully close the vanes of VC1. Rotate the tuning knob clockwise only until the vertical black line at the low frequency end of the scales (left of the name CODAR) is in line with the white indexing line in the dial window.

Fully tighten both screws in the Drive Unit, as it has a powerful drive and will slip at the stop ends otherwise.

Check that the dial rotates correctly. A slight overrun at the H.F. end of the scales is normal, but the L.F. end must stop with the black line exactly on the white window line.

Fit the self adhesive labels A.E. and L.S. either on the rear chassis runner or on the board over the terminal panels. Peel off the backing paper and press into position.

#### COMPLETION OF STEP 4.

#### YOUR MULTIBAND 6 IS NOW READY FOR TESTING

NOTE. The Receiver must not be switched on without either loudspeaker or headphones connected or damage to the A.F. Module can occur.

Connect a 2/3 ohm speaker to the L.S. terminals. To obtain correct output and quality, the speaker unit should be housed in a suitable cabinet. Without this, output and quality will be adversely affected.

Plug in the Coil for the required range. For initial test use Coil No. 2. Avoid handling the coil windings, and do not disturb the top core fixing nut which would cause mis-alignment.

Set Regen. control at MIN before switching on.

Connect aerial and earth to correct terminals.

(See Section on AERIALS, Page 9)

## GENERAL NOTES

The Main tuning control tunes the Coil over its entire range. The BANDSPREAD control tunes over a small section of the band selected by the main tuning control, expanding the section over a wider tuning range for easier tuning.

On the lower frequencies where the tuning can be carried out directly by the main tuning control, the BANDSPREAD control will have less effect where its facility is not required.

### REGENERATION CONTROL.

This control is very important and determines the high sensitivity of the receiver. Advancing clockwise increases the feed back until oscillation occurs, raising the gain of the detector stage considerably. For the highest gain and selectivity the control must be kept just below the oscillation point. The actual position of the control will vary according to the frequency and coil in use.

With the control advanced to the oscillation point, each transmission will be heard with a carrier whistle and the control should be turned back to the point where the whistle just disappears. When tuning in a weak signal, particularly on the higher frequencies, use the Regen. and Bandsread controls together. Slowly advance the Regen. control towards oscillation point and using the Bandsread to maintain the correct tuning point.

Do not use the Regen. control as a volume control, except on very strong signals. Always keep it near oscillation point and regulate the output to the required level with the A.F. Gain control.

Note that the Regen. control can be rotated either way, but it is best to use it as the panel markings i.e. increase feedback by clockwise rotation. Too much feedback will lower sensitivity and produce excessive oscillation. Handle the control slowly first of all, until you get used to its action.

### SINGLE SIDEBAND AND CW (MORSE) SIGNALS.

For reception of Single Sideband transmissions (SSB), a different method of tuning is required. This mode of transmission is used by some commercial stations and by many "hams". The transmission sounds quite different to the usual voice broadcast signals and is quite un-intelligible on an ordinary receiver. However your MULTIBAND -6 can resolve these signals, but a little practice will be necessary to obtain good results.



The voice sounds like scrambled speech and it is suggested that a check round 3.5 - 3.8 MHz (the 80 metre amateur band) Coil 3 will nearly always have some SSB transmissions, particularly at week-ends, and is good band to practice on.

Advance the Regen. control slowly until oscillation just occurs and adjust the BANDSPREAD control very slowly until the speech becomes intelligible. It is essential that the tuning is carried out very slowly as the correct tuning point is very narrow. On very strong local signals advance the Regen. control a little further, but on weak signals it should be just past the oscillation point.

For reception of CW (Morse) signals, advance the Regen. control to the just oscillating point and adjust the BANDSPREAD control for the required beat note.

Short Wave reception varies on the different bands, time of day, period of the year and prevailing atmospheric conditions. It will be found that reception on one band may be excellent in the morning or afternoon and fades out as darkness approaches. At the same time, reception on another band will steadily improve.

Generally in this part of the world, the first half of the day is best for the higher frequencies and the hours of darkness best for the lower frequencies. This is subject to considerable variation according to the time of year, and sunspots and electrical storms can affect reception.

1.9 - 3.5 - 7 - 14 - 21 - 28 MHz Amateur Bands  
throughout the World.

12 - 15 - 17 - 22 - 25 MHz Commercial Broadcast Bands,  
North/South America, Far East,  
Russia, Australia, Africa, Europe.

1.7 - 3.0 MHz. Shipping, Trawlers, Ship to Shore Telephone,  
Lifeboat, Coastal stations.

1.6 - .54 MHz. Medium waves Local and Continental stations.

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#### FITTING CABINET.

Fit the completed chassis to the baseplate, noting that sloping edge is the front. Use 4 -  $\frac{1}{4}$ " Pozidrive self tapping screws which tap directly into the runners. Turn Cabinet upside down, place baseplate into position on the side flanges and fix with 4 -  $\frac{3}{8}$ " Pozidrive screws, which are first inserted in the cabinet feet. Do not over-tighten.

Cut the chrome trim to length and fit on each vertical side.

## AERIALS

Your MULTIBAND - 6 is capable of giving excellent results under adverse conditions and good reception can be obtained on simple indoor aerials. However for consistent long distance reception an outside aerial is far superior. The actual length is not critical but where possible it should be clear of buildings and as high as possible.

Space limitations determine the total length possible, but where available an aerial up to 30 feet long will give excellent results. Avoid making joints in the wire unless they can be soldered as eventual corrosion will cause crackling and intermittent signals.

Where space is a limiting factor, vertical aerials can give good results. The vertical wire can be installed from upper and lower windows, spaced away from the wall with stand-off pieces of wood or plastic. One advantage of vertical aerials is that they are less directional than horizontal types, although the pick-up pattern can be affected by local buildings.

With either indoor or outdoor aerials, an earth is essential. A water pipe or earth stake is satisfactory but not always easy to install. An alternative can be the third pin of a mains plug (Earth pin) but usually the connection of the mains earth to ground can be an appreciable distance. If you do try this, make absolutely certain you connect to the Earth pin and not to either of the mains supply pins.

In all cases, keep the lead as short as possible and direct to the earth terminal.

If a very long aerial is used, it may be necessary to use a series aerial capacitor and a spare 100 pfd. capacitor is included for use if required. It is connected as follows :-

Disconnect the wire from the aerial tag and connect it to the left hand hole of the pair marked A2 on the board. Connect the 100 pfd. to the right hand hole of the pair and the other end to the aerial tag.

Alternatively the capacitor can be fitted externally to the aerial terminal if preferred.

HEADPHONE JACK SOCKET. (See drawing.)

Provision is made to add a headphone jack socket for using headphones for private and late night listening. The socket hole is provided on the rear chassis runner. Inserting the headphone jack automatically switches off the speaker.

NOTE. WARNING.

Only an insulated socket must be used or the transistors will be damaged. A STETHOSET is also available, please see price list. ONLY LOW IMPEDANCE HEADPHONES 5-40 ohms MUST BE USED.

MULTIBAND 6 PARTS LIST

R1. 1 Meg. Brown black green OR 1MON  
R2. 2.2K Red red red OR 2K2N  
R3. 1K Brown black red OR 1KON  
R4. 100K Brown black yellow OR M10N  
R5. 10 ohms Brown black black

✓ C1. 100pfd capacitor square or tubular  
5 C2/C3/C5/C9/C10. .01 Disc. square or tubular. May be marked 10K or 10H or .01 ✓  
2 C4/C6 1uf. Electrolytic or Polycap type tubular.  
1 C7 10uf or 12.5uf. Electrolytic  
1 C8 250 uf or 220 uf.  
VC1 ✓ 300 pfd. Main tuning variable capacitor  
VC2 ✓ 17 pfd. Bandsread tuning variable capacitor  
VC3 ✓ 60 pfd. Regeneration variable capacitor

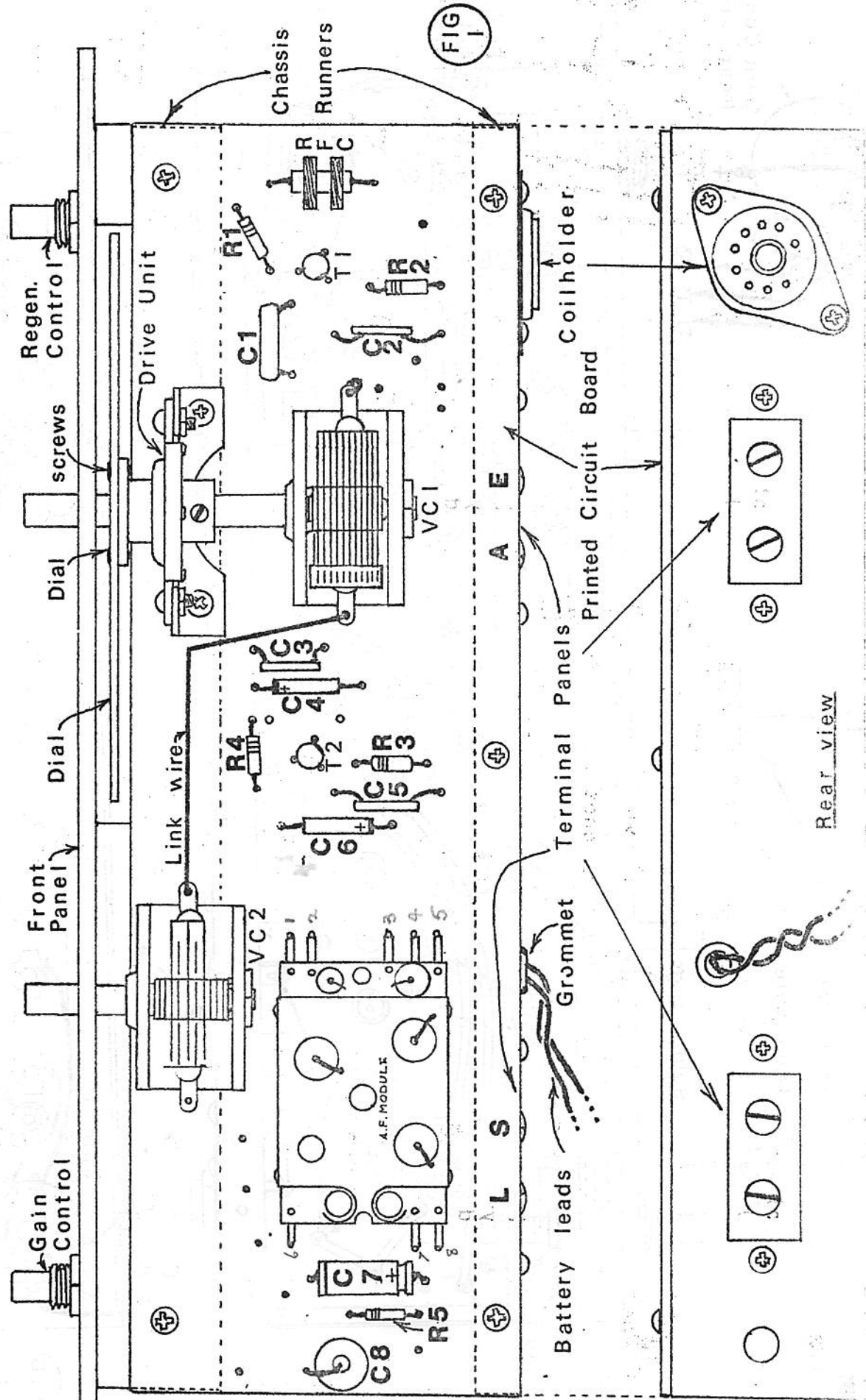
PRINTED CIRCUIT BOARD. ✓

AF Gain Control 5K ohms with DPDT Switch ✓  
Multiband RF Choke ✓  
Multiband A.F. Module. Complete, tested. ✓  
Slow motion Drive Unit and mounting bracket ✓  
Calibrated Dial  
9 Pin Coil Holder ✓  
Coils. (4) No: 1, 2, 3, 4.  
FRONT PANEL MULTIBAND 6 ✓  
Phone Jack Socket ✓  
2 Large Control Knobs ✓  
2 Small Control Knobs ✓  
FET TRANSISTOR TYPE 2N3823B / OR PN3819 ✓  
PNP TRANSISTOR TYPE 2N4964 / OR PN2904 ✓  
CABINET/BASE PLATE/4 FEET AND LENGTH CHROME TRIM. ✓  
2/ 2way terminal panels, 1 Battery lead, 1 Rubber Grommet  
4 Solder Tags, 4 x  $\frac{3}{8}$ " pozidrive screws, 9 x  $\frac{1}{4}$ " Pozidrive screws, 10 6BA bolts, 10 x 6BA nuts, 2 x 4BA bolts, 2 x 8BA dial screws, 1 x AE label, 1 x LS label.  
Connecting wire, insulating sleeving, Resin cored solder.  
Instruction Manual, parts list, guarantee card

N<sup>o</sup> PACK 5. (CAL DIAL)

# CODAR MULTIBAND-6

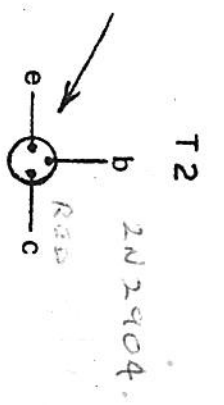
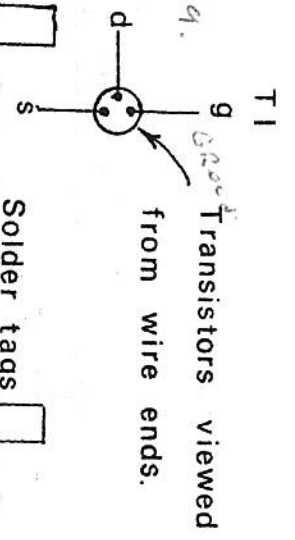
Top View - Plain side of P.C. Board



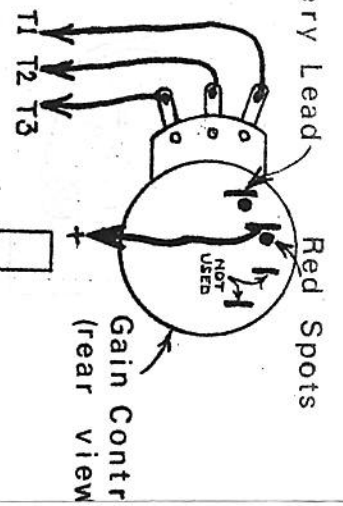
Underneath View — Copper side of P.C. Board



2N3819



RED Battery Lead



7.6-  
R1 1m  
R2 2.2K

FIG 2

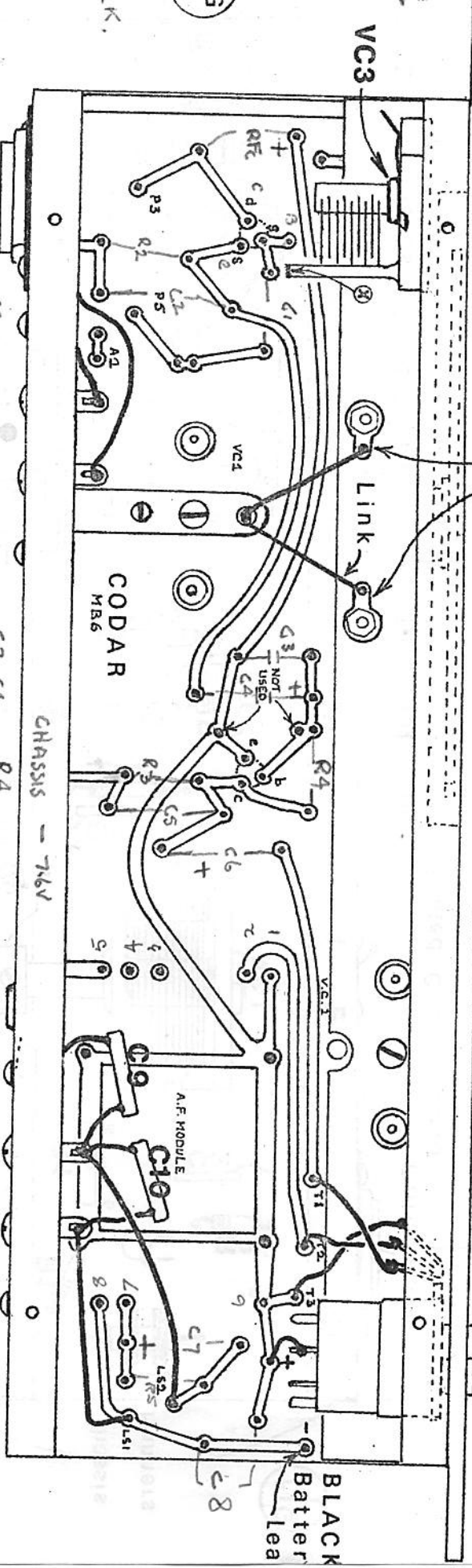
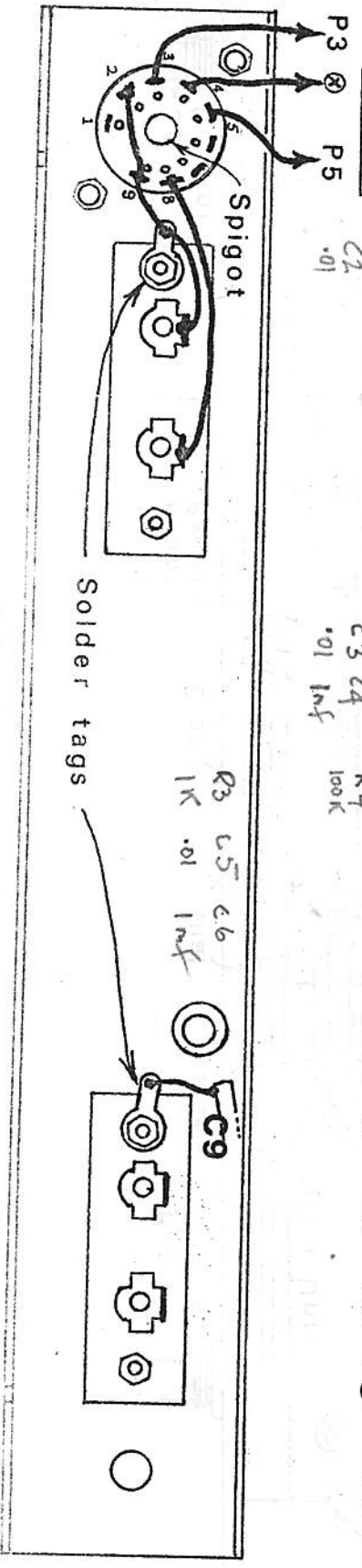
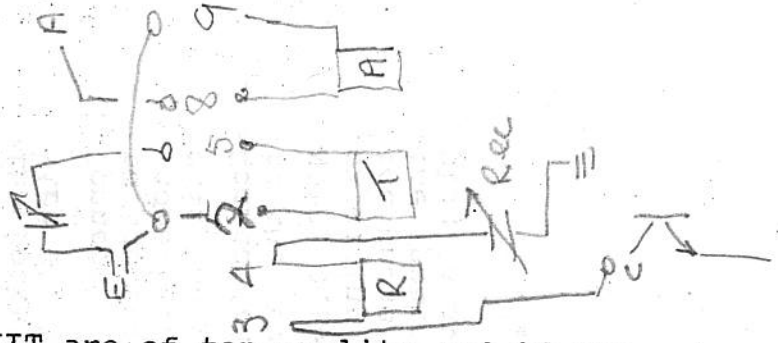


FIG 3



CODAR MULTIBAND-6

SERVICE FACILITIES



The components in your CODARKIT are of top quality and if the Instruction Manual has been correctly followed, it will give you long and reliable service.

If you need any assistance, write first to the SERVICE DEPARTMENT., who may be able to help you and avoid having to return the receiver to us. Our records show that the failure of a KIT to function correctly is invariably due to a wiring error or bad joint, a component failure being rare. For a quick reply, you can ring the SERVICE DEPARTMENT, stating date of purchase, and the Invoice number.

If the cause of failure is due to a component, it will be replaced free of charge under the terms of the Guarantee.

If the cause of the failure is due to the KIT not being constructed exactly to the Instruction Manual, a reasonable Service charge will be made, but this will be quoted first before any work is carried out. Equipment that has been modified in any way, or uses components not specified will render the Guarantee void.

The Guarantee Card must be completed and returned to us within 10 days of purchase.

MULTIBAND 6 KIT. PAGE 11

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SERVICE DEPT. 090-63-61901. STD. LANCING 61901  
CODAR.  
BURRELL BUILDINGS. CHURCHILL INDUSTRIAL ESTATE. LANCING. BN15 8TZ

Invoice Number.....  
Date purchased.....  
Fault.....  
MULTIBAND 6 KIT

MULTIBAND 6 RECEIVER

PHONE SOCKET FITTING INSTRUCTIONS

Use bare copper wire and sleeving supplied.

Fit the Phone socket in hole provided on right hand side of rear chassis runner, FIG.3 Instruction Manual. Keep the tags pointing away from the Printed Circuit Board and make sure that the socket bush is central in the runner hole. Do not omit the insulating washer which must be under the fixing nut. The metal bush must not make contact with the runner.

Disconnect the end of the wire (between LS1 and the Right hand speaker terminal) from the speaker terminal and re-connect this end to the rear left hand tag on the socket. Leave the other end of this wire still connected as before.

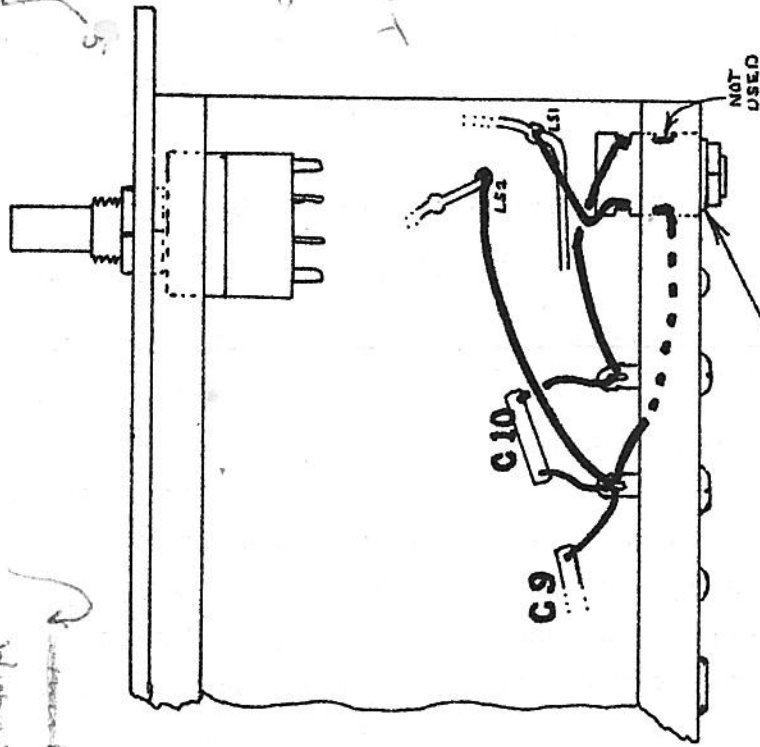
Connect the left hand speaker terminal to the front left hand socket tag as shown. Do not disconnect any of the existing connections.

Connect the Right hand speaker terminal to the front right hand socket tag.

NOTE: Only low impedance phones not exceeding 16 ohms must be used. Inserting the phone jack automatically switches off the speaker. A Stethoset headset with jack plug is available. See separate Price List.

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Under chassis view  
See also FIG.2 Instruction Manual



Insulating washer

47 d o  
Y M R R B L K

