

THE "RANGER-3"

Medium Wave and Amateur Top Band

Personal Pocket Radio

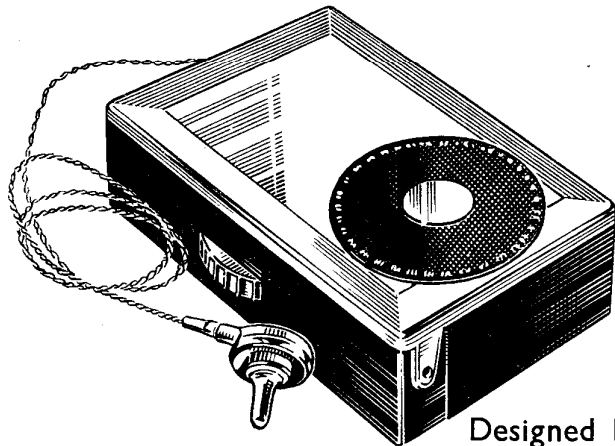
- Complete Station Separation
- Fully Tunable 120 to 500 metres
- No External Aerial or Earth Required
- Quality Output on Personal Earphone
- Three Top Grade Transistors, Two Diodes
- Calibrated Tuning Dial — Full Volume Control
- Up to 6 Months Battery Life
- Guaranteed Results anywhere
- Simple to Build—Easy to Use

**WILL DRIVE A
LOUDSPEAKER!**



**RECEPTION OF RADIO
LUXEMBOURG GUARANTEED.**
—WHERE NORMALLY RECEIVED.

★ Can be Built
for 79/6 P/P. 1/6
SEE BACK PAGE



Size $4\frac{3}{8} \times 3 \times 1\frac{1}{4}$ in.

Designed by
D. J. FRENCH,
Grad.I.E.E.

Available Cash With Order or C.O.D. From

HENRY'S RADIO LTD.

5 HARROW ROAD, LONDON, W.2

(At the junction of Edgware Road and Harrow Road, Paddington, W.2)

Shop Hours: 9 a.m. to 6 p.m. Monday to Saturday. Thursday 1 p.m.

Telephone: PADdington 1008/9

THE RANGER-3

★ 5-STAGE REFLEX RECEIVER ★

THE RANGER-3 is a Three Transistor and Two Diode Personal Pocket Radio of the very latest design and using the latest type Transistors. Tunable over ALL the Medium Waveband, Short Wave Amateur Top Band and part of the Shipping Band. Outstanding results are obtainable, depending upon locality, on local and continental stations as well as Radio Luxembourg without external aerial or earth. The dial plate is calibrated in metres for easy station selection. A miniature volume control is provided combined with

the On/Off switch. A 9-volt battery provides up to 6 months listening without replacement. The first transistor is an RF amplifier which is used as an audio amplifier after the Diodes to provide extra output. The effect is of four transistors. Good quality and volume is given by the miniature earphone provided. Alternatively an output transformer and speaker may be used. All necessary brackets, holes and clips are pre-mounted on the chassis and the plastic cabinet ready drilled. Transistor holders are provided making heat damage to the transistors impossible.

ASSEMBLY

- For best results strict attention must be paid to the Layout Diagram and Assembly Instructions.
 - Read through the instructions before commencing.
 - The chassis is wired up and tested out of the cabinet.
 - Make sure that all soldered joints are properly made. A good joint will not come undone if pulled or pushed harshly. All leads must be as short as possible unless otherwise mentioned below.
1. Solder the bare lengths of wire forming the positive bar and the negative bar.
 2. Connect the following components to their appropriate solder tags in the order listed: 25mfd (Red end to positive bar; both 0.04mfd; D1 and D2; both 4.7k ohm (Yellow/Mauve/Red); 10k ohm (Brown/Black/Orange) (shown unmarked above TR3 Holder); 47k ohm (Yellow/Mauve/Orange); 1k ohm (Brown/Black/Red).
 3. Bolt on the volume control, solder one switch tag to positive bar as shown.
 4. Solder TR2 and TR3 transistor holders to the tags provided. Solder 0.01mfd to 'B' on TR2 holder and positive bar.
 5. Solder TR1 transistor holder to the tags provided and connect the following components onto the tags as shown: 500pf (Green/Black/Brown/Black); 100k ohm (Brown/Black/Yellow); 220k ohm (Red/Red/Yellow) and RFC.
 6. From the tag joining the RFC and the 4.7k ohm connect one lead of 0.1mfd condenser, the other lead passing through the hole in the chassis and connecting to the centre pin of the volume control. The left hand pin as view on the diagram is connected to the positive bar as illustrated.

7. Join a wire from the right hand pin of the volume control through the hole in the chassis to 'B' on TR2 transistor holder.
8. Join the second 0.1mfd from 'C' on TR2 transistor holder to the junction of the 10k ohm, 47k ohm and 0.04mfd as shown also making the connection to 'B' on TR3 transistor holder.
9. Connect a 4-inch piece of covered wire to tag 'A' and the other end to the negative (-VE) part of the battery clip. Solder another 4-inch length to the free switch tag 'X' on the volume control, the other end to the positive (+VE) battery clip. **Make sure that these are the right way round.** Check this with the actual battery.
10. Two nuts are provided for the 100pf preset, put one on first then fix the preset to the board as shown with the remaining nut. Solder a wire from one tag of the preset to 'C' on TR1 holder.
11. Bolt on the tuning condenser. Solder a wire from the positive bar to the frame of the tuning condenser as illustrated.
12. Solder the ferrite aerial wires to the tags indicated paying attention to the lead colours, keeping the wires as short as possible. Fix this aerial into its clips. Connect the earphone leads as shown, passing them through the hole in the chassis.
13. Starting with number 1 above thoroughly check each step **before** continuing.
14. Cut the leads of the transistors to about $\frac{1}{2}$ inch length: plug them into the transistor holders. TR1 = SB078; TR2 = XB102; TR3 = XB102; make sure they are the right way round and in the right place by referring to the transistor diagrams.
15. Check the layout again and then connect the battery and switch on. Rotating the tuning condenser should produce local stations.

The SBO78 Transistor is specially tested before despatch. We regret that we cannot replace these for short circuit or open circuit faults which only occur due to mishandling.

For the best selectivity and sensitivity the following should be observed.

Set the tuning condenser to a station such that the vanes are almost fully open, i.e. around Radio Luxembourg with the volume control set to a reasonable listening level, adjust the preset control until the whistling sound is very faintly audible or just stops. This preset control should be adjusted such that required stations are heard without undue whistling. Once set this preset control should not require further adjustment. The actual stations heard may vary from district to district. The receiver is then ready for use.

If the output is low or the whistling too fierce, then the 100k ohm resistor may have to be changed to a minimum

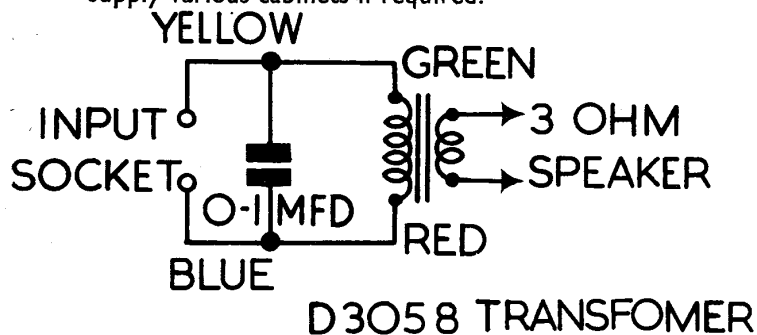
value of 47k ohm or a maximum value of 220k ohm. Always remove the transistors from their holders before doing any soldering. After any alteration the preset control must be re-adjusted.

Fit the chassis into the cabinet locating the volume control in the slot provided and screw on the dial plate.

The tuning is very sharp so that if the tuning condenser is turned quickly the stations may be passed without being heard. Tune slowly. Due to the built-in ferrite aerial the receiver is directional. Maximum volume and separation of the stations will be obtained by rotating the radio.

TO USE THE "RANGER-3" WITH A LOUD SPEAKER.

1. For low level or private listening where outside noises are not too disturbing, use the components shown on the diagram. Unclip the earphone from its leads and simply plug it into the input socket. No cabinet is provided as this will depend upon the size of speaker used, we can supply various cabinets if required.



Special Input Socket	...	...	...	s. d.
D3058 Transformer	...	...	...	3 6
0.1mfd Condenser	...	...	...	1 0

SUITABLE SPEAKERS

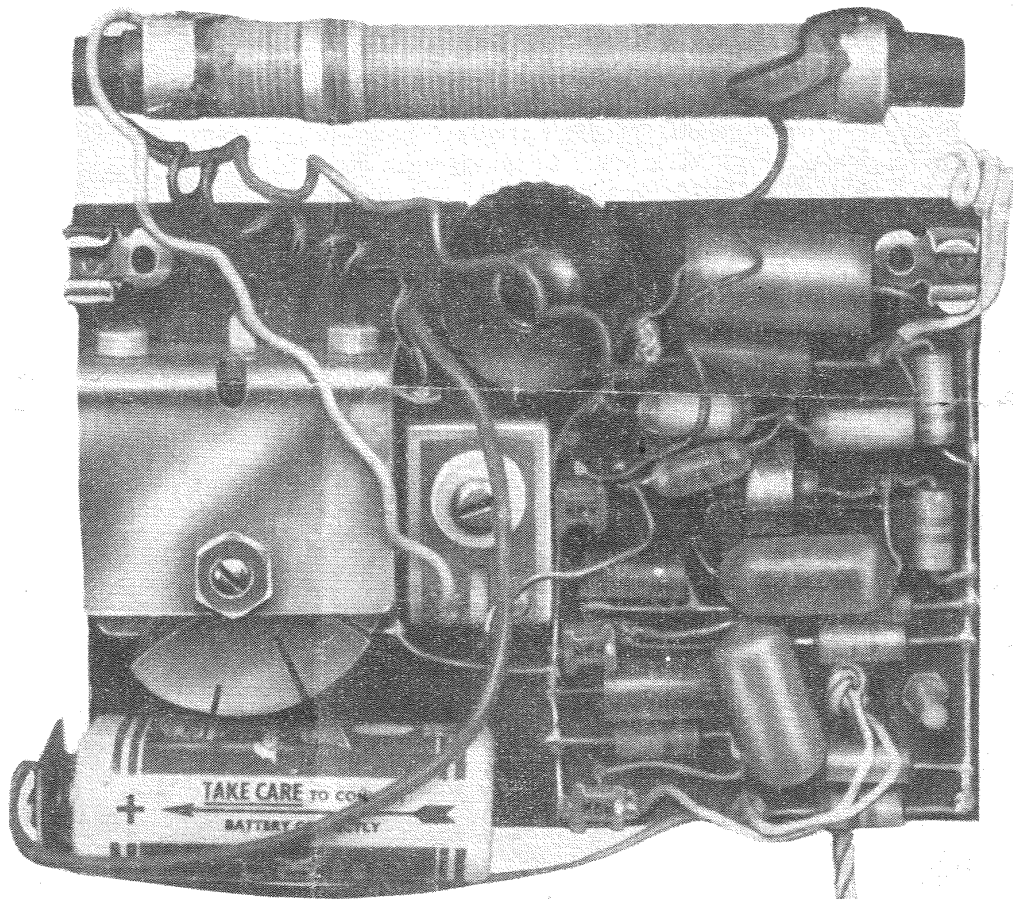
1 3/4 inch TSL	...	...	...	s. d.
3 inch Elac	...	...	...	25 0
4 1/2 x 1 1/2 inch TSL	...	...	...	18 6
5 inch RA or Similar	...	...	...	24 0
7 x 4 inch Elac	...	...	...	15 0
2 1/2 inch E.M.I.	...	...	...	20 0
				19 6

2. For good loudspeaker strength up to 250mW the 'Addon' push-pull output stage should be used. All components including a 3-inch speaker, transistors and portable cabinet are available at 59/6d. p.p. 1/6d. An input socket is provided as above.

FAULT FINDING

In most cases lack of reception is due to wrong connection or dry solder joints. A click should be heard in the earpiece on touching each solder tag or soldered joint (other than positive bar), with the blade of a screwdriver. To determine where a fault lies, start at TR3 transistor and work back to the tuning condenser. Maximum current consumption is 5 mA, minimum 3 mA. If a component is suspect please return it for test with a covering letter.

NOTE.—If necessary the Battery may be fixed to the Chassis with some sort of adhesive to prevent movement.



COMPONENTS LIST:—All parts sold separately

TR1 SB078 Transistors	...	...	...	7/6	Set of 3	19 6	Resistors:				s. d.	s. d.
TR2 and 3, XB102 Transistors	...	...	each	7/6		9	2—4.7k ohm (Yellow/Mauve/Red)	...	each	3		
3—Transistor Holders	...	...	each			0	1—100k ohm (Brown/Black/Yellow)	...	each	3		
2—'Top Quality' Diodes	...	...	each			2	1—47k ohm (Yellow/Mauve/Orange)	...	each	3		
1—RF Choke (RFC)	...	...				6	1—10k ohm (Brown/Black/Orange)	...	each	3		
10k ohm Volume Control with 2-10BA nuts and bolts	...	...				7	1—220k ohm (Red/Red/Yellow)	...	each	3	5 3	
365pf Tuner, Tapped Spindle with 3-4BA bolts	...	...				8	1—1k ohm (Brown/Black/Red)	...	each	3		Set
PP3 9-volt Battery (or equiv.)	...	...				2	1—0.01 mfd: 1-500pf (Green/Black/Brown/Black)	...	each	6		
Battery Clips	...	...				1	2—0.04mfd or 0.047mfd	...	each	9		
100pf Pre-Set Control with 2-2BA nuts	...	...				1	2—0.1mfd Miniature	...	each	1 0		
M4 Ferrite Assembly	...	...				6	1—25mfd Electrolytic	...	each	1 6		
Drilled Chassis with tags and clips	...	...				3	6-inch length of Buss-Bar Wire	...	each	6		
Drilled Cabinet	...	...				3	12 inch Hook-up Wire	...	each	6		
Engraved Tuning Dial and Bolt	...	...				1	Personal Earphone and Leads	...			12 6	

● TOTAL COST OF ALL COMPONENTS — NO EXTRAS TO BUY ●

With Batteries, Transistors, Personal Earphone, Etc. **79/6** P/P. 1/6d

THE PERSONAL EARPHONE SUPPLIED IS CORRECTLY MATCHED TO THIS RADIO. OTHER TYPES SHOULD NOT BE USED IF GOOD RESULTS ARE TO BE OBTAINED.