

# COSSOR 33

Four valve, three waveband, table model superhet for battery operation, with push-button tuning by a mechanical system. Made by A. C. Coscor, Ltd., Highbury Grove, London, N.5.

**Circuit.**—The aerial circuit contains an I.F. filter L1, C1. H.F. transformers, with iron-core primaries on M. and L.W., couple the aerial to V1, the frequency-changer. Each grid circuit has its trimmer and A.V.C. is applied on M. and L.W. only.

In the oscillator section, anode reaction coils are used on each band. The anode voltage is increased on S.W.

The I.F. transformers linking V1, V2 and V3 have iron-cores and are permeability tuned.

A.V.C. is obtained from a diode of V3, energised from V2 anode via C26, and delay biased via R17, R18. The volume control, R9, forms the signal diode load, R8 forming an H.F. filter in conjunction with C27, C28.

The triode section of V3, also biased from R17, R18, is resistance-capacity coupled to V4, an output tetrode. The grid circuit contains a stabiliser, R14, and a tone control, R13, C32.

The grid of V4 is returned to H.T.—via R15, and is biased because the filament is positive by the voltage drop across R17, R18. There is a shunt anode tone circuit, and C35 decouples the H.T. battery.

**BATTERIES.**—120 volt H.T. 2 volt L.T.  
**WAVEBANDS.**—16.48-50, 190-545, 820-2,200 metres.

**EXTENSION SPEAKER.**—Provision is made for a P.M. speaker of about 20,000 ohms impedance.

**PICK-UP.**—A pick-up can be connected between the junction of R8-R9 and chassis.

**SWITCHING.**—On the three wavebands, the contacts closed are: S.W., 1, 4, 7, 10, 13, 16;

M.W., 2, 5, 8, 11, 14, 17; L.W., 3, 6, 9, 12, 15, 18.

## GANGING

**I.F. CIRCUITS.**—Remove paper discs on I.F. transformers and soften wax covering iron cores with warm screwdriver. Inject 465 kc. to V1 grid and adjust cores for maximum using lowest possible input.

To avoid all possibility of error, the oscillator section of the gang can be shorted and the A.V.C. put out of action by disconnecting at point X in circuit and earthing lead to R5, R6.

**M.W. BAND.**—Tune set to 214 m., inject 1,400 kc. to aerial and adjust T1 and T2 for maximum. Padding is fixed.

**L.W. BAND.**—Tune to 1,200m., inject 250kc. and adjust T3 and T4 for maximum.

Tune to 1,875m., inject 160kc., and pad with T5 while rocking the gang.

**S.W. BAND.**—Tune and inject 18mc. Adjust T6 and T7 while slightly rocking the gang. There is no padding, tracking being obtained by shaped vanes on the gang.

**I.F. FILTER.**—Inject 465kc. to aerial and adjust L1 for minimum.

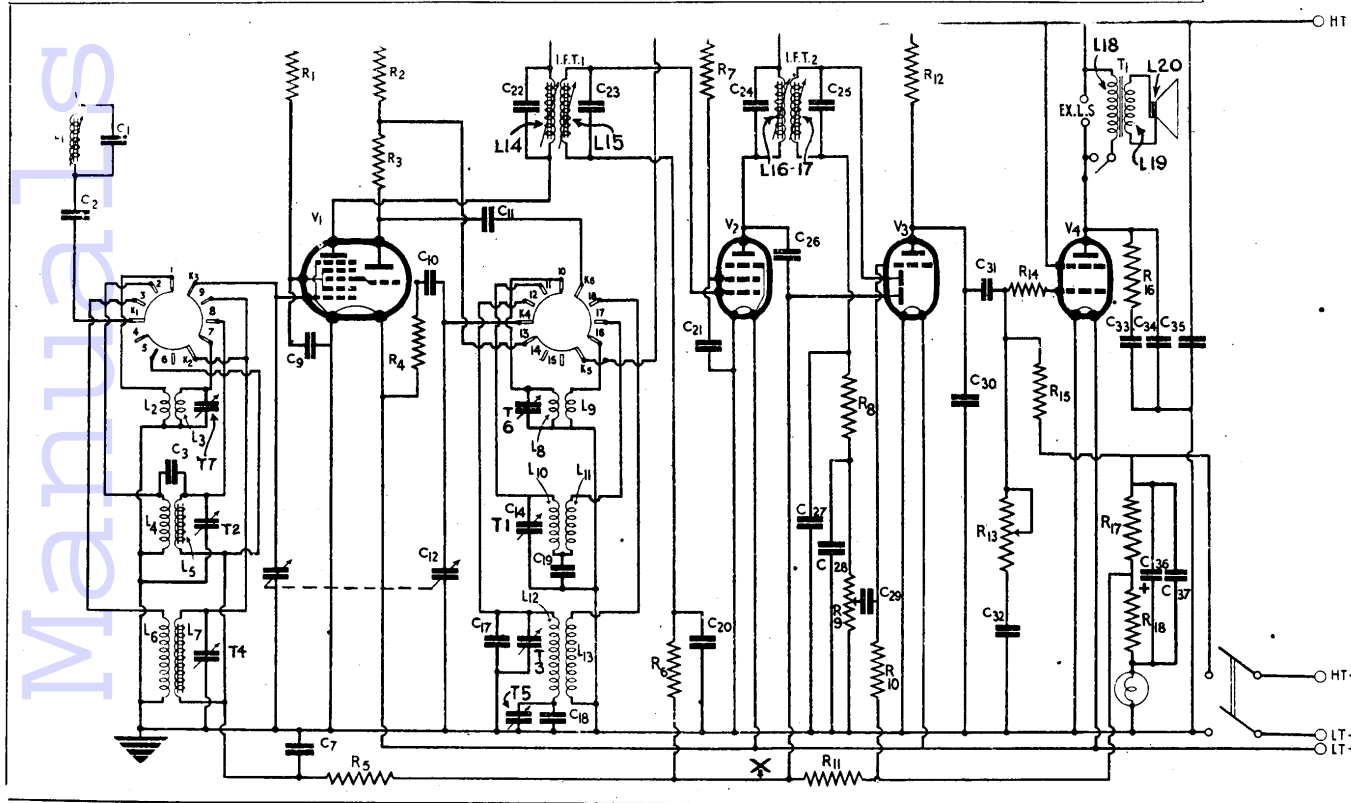
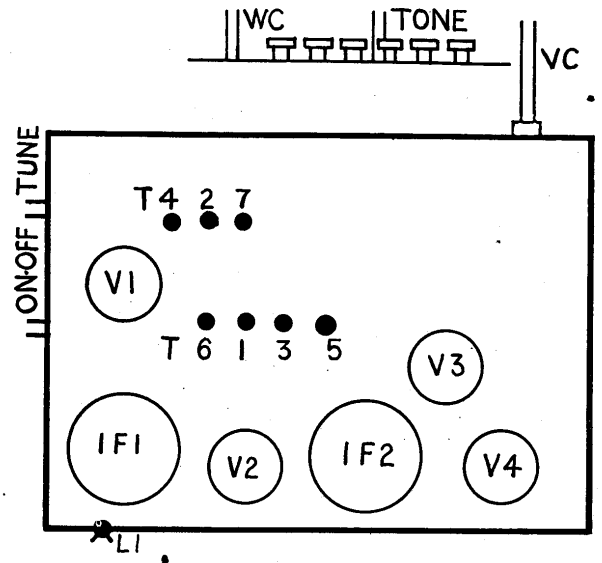
## PUSH-BUTTONS

The P.B. system is solely mechanical and involves no circuit features.

To set a button, unscrew it one full turn anticlockwise. Tune manually to required station. Depress button fully and screw up reasonably tight. Check the setting.

The system should not be used on S.W.

A popular all-wave battery superhet, the 33 is a good example of a straightforward design in both circuit and chassis. The trimmers, while in the order shown, are actually below deck.



## VALVE READINGS

| V | Type   | Electrode  | Volts | Ma. |
|---|--------|------------|-------|-----|
| 1 | 220TH  | Anode      | 115   | .2  |
|   |        | Screen     | 54    | .8  |
| 2 | 210VPA | Os. anode— | 24    | 1.3 |
|   |        | L. & M.W.  | 46    | 2.9 |
| 3 | 210DDT | Anode      | 115   | 1.4 |
|   |        | Screen     | 50    | .6  |
| 4 | 220OT  | Anode      | 68    | .35 |
|   |        | Screen     | 107   | 4.8 |
|   |        |            | 115   | 1.1 |

Pilot lamp, 3.5 v., .15 amp., M.F.S.

## CONDENSERS

| C  | Mfds.      | C  | Mfds.      |
|----|------------|----|------------|
| 1  | 225 mmfds. | 24 | 43 mmfds.  |
| 2  | .005       | 25 | 65 mmfds.  |
| 3  | 9 mmfds.   | 26 | 50 mmfds.  |
| 7  | .05        | 27 | 50 mmfds.  |
| 9  | .05        | 28 | 50 mmfds.  |
| 10 | 50 mmfds.  | 29 | .05        |
| 11 | 500 mmfds. | 30 | 200 mmfds. |
| 17 | 50 mmfds.  | 31 | .01        |
| 18 | 140 mmfds. | 32 | .01        |
| 19 | 468 mmfds. | 33 | .002       |
| 20 | .05        | 34 | .001       |
| 21 | .1         | 35 | 2          |
| 22 | 53 mmfds.  | 36 | 20         |
| 23 | 58 mmfds.  | 37 | .1         |

## WINDINGS

| L      | Ohms.  |
|--------|--------|
| 1      | 4.2    |
| 2      | .6     |
| 3      | V. low |
| 4      | 25     |
| 5      | 2.2    |
| 6      | 148    |
| 7      | 16     |
| 8      | V. low |
| 9      | .2     |
| 10     | 6.2    |
| 11     | 2.4    |
| 12     | 14.5   |
| 13     | 6.2    |
| 14, 15 | 7.8    |
| 16, 17 | 18.5   |
| 18     | 1.190  |
| 19     | .17    |
| 20     | 2      |

## RESISTANCES

| R | Ohms.   | R  | Ohms.    |
|---|---------|----|----------|
| 1 | 70,000  | 10 | 2 meg.   |
| 2 | 50,000  | 11 | 2 meg.   |
| 3 | 20,000  | 12 | .1 meg.  |
| 4 | 25,000  | 13 | .25 meg. |
| 5 | 3 meg.  | 14 | .1 meg.  |
| 6 | 3 meg.  | 15 | 1 meg.   |
| 7 | .1 meg. | 16 | 25,000   |
| 8 | 50,000  | 17 | 250      |
| 9 | .5 meg. | 18 | 150      |

A mechanical push-button pre-set tuning system does not involve any electrical circuit features. Note the extra resistance for decreasing oscillator anode volts on M. and L.W.