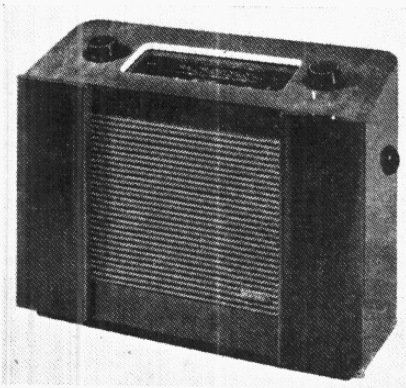
| CAPACITORS (cont.) | | Values | Locations |
|---|---|---|---|
| C35‡ | M.W. osc. trim. ... | 35pF | D3 |
| C36† | Oscillator tuning ... | 528pF | B1 |
| C37 | Tone corrector ... | 0·005μF | — |
| C38* | V3 anode decoup.... | 8μF | — |
| C39 | A.F. coupling ... | 0·01μF | — |
| C40* | V4 cath. by-pass ... | 50μF | — |

* Electrolytic. † Variable. ‡ Pre-set.

| RESISTORS | | Values | Locations |
|---|---|---|---|
| R1 | Anti-static shunt ... | 1MΩ | E4 |
| R2 | V1 C.G. ... ... | 470kΩ | D3 |
| R3 | V1 osc. C.G. ... | 27kΩ | D3 |
| R4 | Osc. stabilizers ... | 100Ω | D3 |
| R5 | | 680Ω | A1 |
| R6 | Osc. anode load ... | 22kΩ | D3 |
| R7 | S.G. H.T. feed ... | 22kΩ | E4 |
| R8 | I.F. stopper ... | 180kΩ | F3 |
| R9 | A.G.C. decoupling | 1MΩ | F3 |
| R10 | Diode load ... | 330kΩ | F3 |
| R11 | P.U. shunt ... | 220kΩ | F4 |
| R12 | Volume control ... | 1MΩ | G4 |
| R13 | V3 C.G. ... ... | 10MΩ | F3 |
| R14 | V3 anode load ... | 56kΩ | F3 |
| R15 | V4 C.G. ... ... | 470kΩ | F3 |
| R16 | V4 C.G. stopper ... | 47kΩ | F3 |
| R17 | H.T. smoothing ... | 1·95kΩ* | F3 |
| R18 | Tone control ... | 20kΩ | C1 |
| R19 | V4 G.B. ... ... | 180Ω | G3 |
| R20 | Thermistor CZ3 ... | — | F3 |
| R21 | Thermistor CZ3 ... | — | G3 |
| R22 | MR1 surge limiter | 47Ω | G4 |
| R23 | Heater ballast ... | 950Ω | G3 |
| R24 | | 125Ω | G4 |
| R25 | | 125Ω | G3 |
| R26 | Tone correctors ... | 6·8Ω | — |
| R27 | | 47kΩ | — |
| R28 | H.T. decoupling ... | 2·2kΩ | — |
| R29 | V3 anode load ... | 100kΩ | — |
| R30 | V4 C.G. ... ... | 220kΩ | — |
| R31 | V4 anode stopper | 33Ω | — |
| R32 | Gram motor volt- | 200Ω | — |
| R33 | age adj.... ... | 700Ω | — |

* Made up of two 3·9kΩ in parallel.

| OTHER COMPONENTS | | Approx. Values (ohms) | Locations |
|---|---|---|---|
| L1 | I.F. filter ... ... | 17·0 | B1 |
| L2 | Aerial coupling | — | A1 |
| L3 | coils ... ... | 39·0 | A1 |
| L4 | Aerial tuning coils | — | A1 |
| L5 | | 7·0 | A1 |
| L6 | | 29·0 | A1 |
| L7 | Oscillator reaction | — | D4 |
| L8 | coils ... ... | — | A2 |
| L9 | Oscillator tuning | — | D4 |
| L10 | coils ... ... | 4·5 | A2 |
| L11 | | 10·0 | A2 |
| L12 | 1st I.F. Pri. ... | 6·2 | B2 |
| L13 | trans. Sec. ... | 6·2 | B2 |
| L14 | 2nd I.F. Pri. ... | 6·2 | B2 |
| L15 | trans. Sec. ... | 6·2 | B2 |
| L16 | Speech coil ... | 2·5 | — |
| L17 | Mains filter chokes | 7·0 | C1 |
| L18 | | 7·0 | C1 |
| L19 | 78 r.p.m. P.U. ... | 22·0 | — |
| L20 | 33⅓, 45 r.p.m. P.U. | 22·0 | — |
| T1 | O.P. trans. a ... | 25·0 | |
| | b ... | 405·0 | B1 |
| | c ... | — | |
| T2 | P.U. trans. a ... | 4·0 | — |
| | b ... | 840·0 | |
| S1–S15 | Waveband switches | — | A1 |
| S16, S17 | Mains sw, g'd R12... | — | G4 |
| S18 | Motor switch ... | — | — |



Appearance of the Murphy U182.

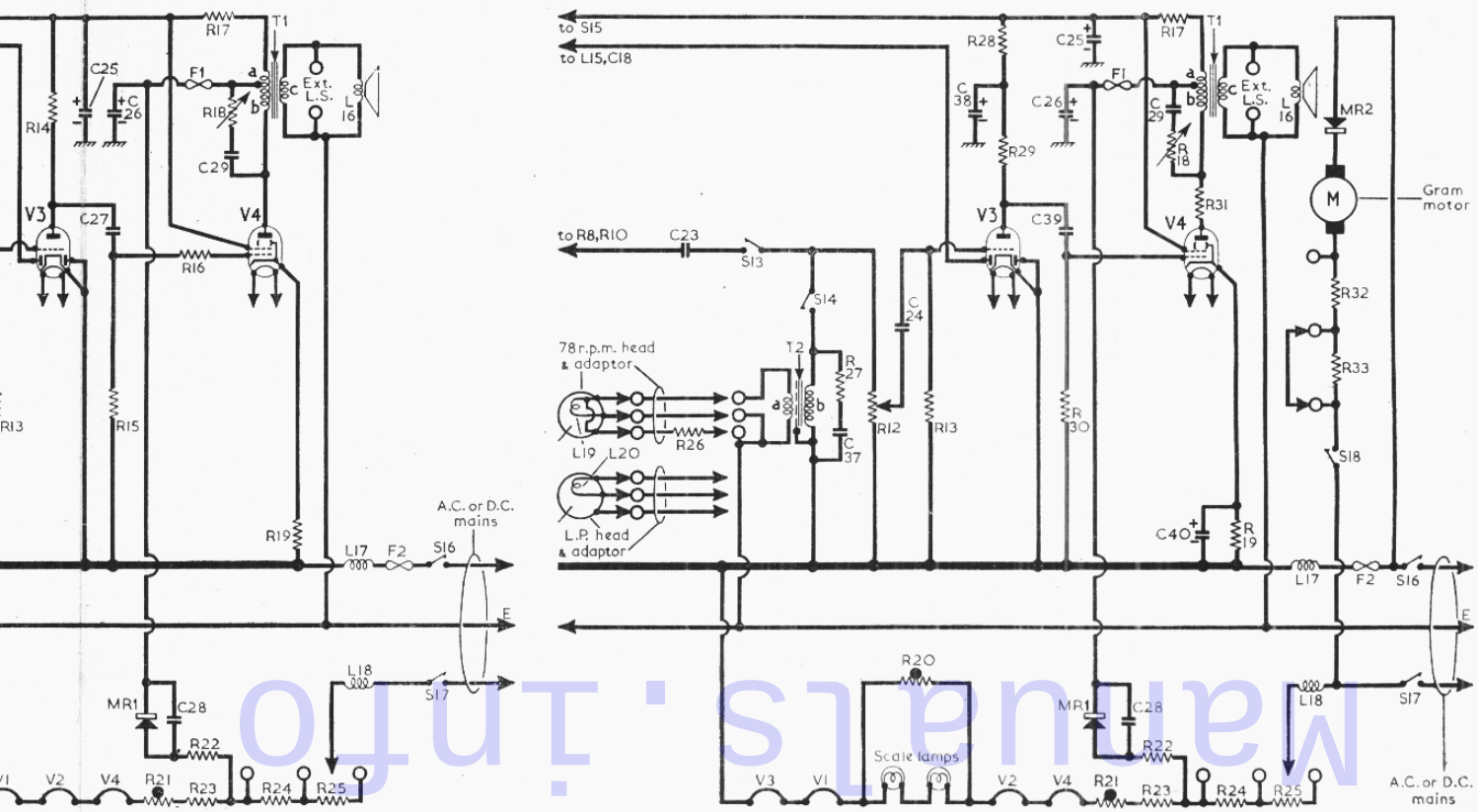
**Circuit Description**—*continued*

vent radio break-through. The pick-up sockets are isolated from chassis by **C21** and **C22.** In the gram model the low-impedance 78 r.p.m. and L.P. pick-up heads are coupled to the volume control circuit by matching transformer **T2,** which also isolates the pick-up from chassis.

Resistance-capacitance coupling via **R14, C27** and **R15** between **V3** and pentode output valve **(V4, Mazda 10P14).** Variable tone control in anode circuit by **C29** and **R18.** The normal by-pass capacitor is omitted from **V4** cathode circuit in the table model, giving a degree of negative feed-back tone correction.

H.T. current is supplied by metal rectifier **(MR1, Westinghouse 15B35).** Smoothing by **R17** and electrolytic capacitors **C25** and **C26,** residual hum being neutralized by passing H.T. current through section **a** of **T1** primary winding.

The gram model employs an A.C./D.C. motor **(Garrard RC75A/U)** which incorporates its own voltage adjustment resistors **R32, R33** and a metal rectifier **MR2,** the latter operating as a resistor when operating from D.C. mains.



"TRADER" SERVICE SHEET
1167

# MURPHY U182 & U182R

## *A.C./D.C. Table and 3-speed Autoradiogram Models*

FITTED with an internal plate aerial, the Murphy U182 is a 4-valve (plus metal rectifier) 3-band superhet, designed to operate from A.C. or D.C. mains of 200-250 V, 25-60 c/s in the case of A.C. The waveband ranges are 16.8-50.4 m, 187-540 m and 1,000-2,000 m.

Model U182R is a 3-speed autoradiogram version of the U182 and is covered by a separate section of circuit diagram to the right of the main diagram. Details of this receiver are given in "General Notes" overleaf.

*Release dates and original prices: Model U182, August 1952, £18 1s; Model U182R, November 1953, £59 12s 6d. Purchase tax extra.*

### CIRCUIT DESCRIPTION

Aerial input via coupling coils **L2** (S.W.) and **L3** (M.W. and L.W.) to single tuned circuits **L4, C32** (S.W.), **L5, C32** (M.W.) and **L6, C32** (L.W.) which precede triode heptode valve **(V1, Mazda 10C1)** operating as frequency changer with internal coupling. Additional coupling on M.W. by **C4.** The aerial and earth sockets are isolated from chassis by **C1, C2** and **C5.**

Oscillator anode coils **L9** (S.W.), **L10** (M.W.) and **L11** (L.W.) are tuned by **C36.** Parallel trimming by **C33** (S.W.), **C35** (M.W.) and **C13, C34** (L.W.); series tracking by **C12** (M.W.) and **C11, C12** (L.W.). Reaction coupling from grid circuit via **L7** (S.W.) and **L8** (M.W. and L.W.), with additional coupling across **C12.** Oscillator stabilization by **R4** and **R5.**

Second valve **(V2, Mazda 10F9)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with transformer couplings **C8, L12, L13, C9** and **C17, L14, L15, C18.**

**Intermediate frequency 470 kc/s.**

Diode signal detector is part of double diode triode valve **(V3, Mazda 10LD11** (table model) or **10LD3** (gram model)**).** A.F. component in rectified output is developed across **R10,** and passed via **S13, C23,** volume control **R12** and **C24** to grid of triode section.

D.C. potential developed across **R10** is fed back as bias to **V1** and **V2** giving automatic gain control.

In the table model provision is made for the connection of a gramophone pick-up across **R12** via **S14,** which closes in the gram position of the waveband control. **S13** and **S15** open in this position to pre-

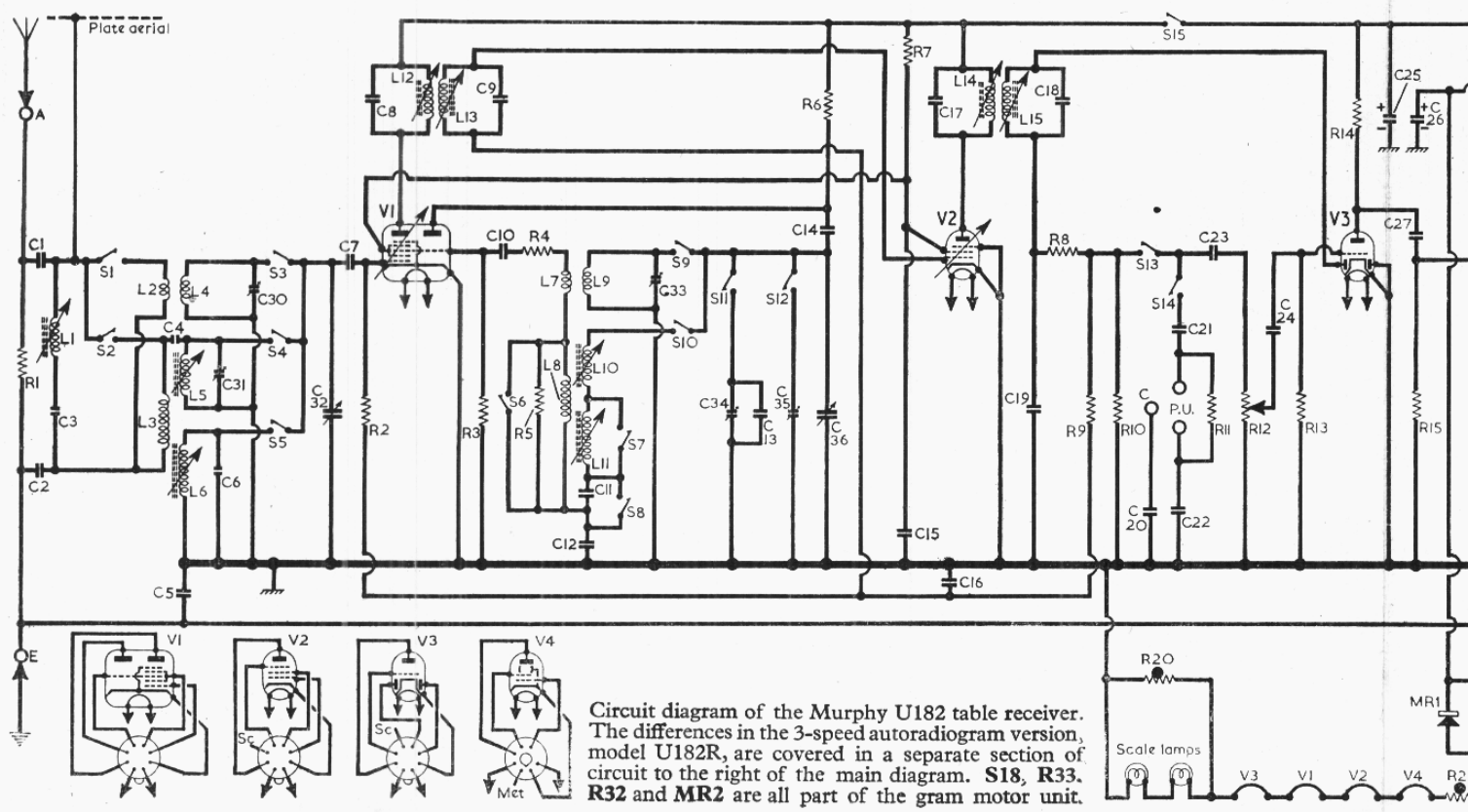
*(continued in col. 5 on this page)*

### COMPONENTS AND VALUES

| | CAPACITORS | Values | Locations |
|---|---|---|---|
| C1 | Aerial couplers | 470pF | E4 |
| C2 | Aerial couplers | 470pF | E4 |
| C3 | Part I.F. filter | 33pF | E4 |
| C4 | "Top" coupling | 2·7pF | D4 |
| C5 | Earth isolator | 0·01μF | E4 |
| C6 | L.W. aerial trim. | 68pF | D4 |
| C7 | V1 C.G. | 470pF | A1 |
| C8 | 1st I.F. trans tuning | 150pF | B2 |
| C9 | 1st I.F. trans tuning | 150pF | B2 |
| C10 | V1 osc. C.G. | 100pF | D3 |
| C11 | L.W. osc. tracker | 390pF | A1 |
| C12 | M.W. osc. tracker | 560pF | A1 |
| C13 | L.W. osc. trimmer | 150pF | A2 |
| C14 | Osc. anode coup. | 100pF | D3 |
| C15 | S.G. decoupling | 0·05μF | D3 |
| C16 | A.G.C. decoupling | 0·04μF | F4 |
| C17 | 2nd I.F. trans. tuning | 150pF | B2 |
| C18 | 2nd I.F. trans. tuning | 150pF | B2 |
| C19 | I.F. by-pass | 100pF | F3 |
| C20 | P.U. isolators | 0·001μF | E4 |
| C21 | P.U. isolators | 0·005μF | F4 |
| C22 | P.U. isolators | 0·005μF | F4 |
| C23 | A.F. couplers | 0·005μF | F3 |
| C24 | A.F. couplers | 0·04μF | F3 |
| C25* | H.T. smoothing | 50μF | B1 |
| C26* | H.T. smoothing | 50μF | B1 |
| C27 | A.F. coupling | 0·005μF | F3 |
| C28 | Mains R.F. by-pass | 0·05μF | G3 |
| C29 | Part tone control | 0·05μF | B1 |
| C30‡ | S.W. aerial trim. | 35pF | A1 |
| C31‡ | M.W. aerial trim. | 35pF | A1 |
| C32† | Aerial tuning | 528pF | B1 |
| C33‡ | S.W. osc. trim. | 35pF | D4 |
| C34‡ | L.W. osc. trim. | 35pF | A2 |

*(continued next col.)*

* Electrolytic. † Variable. ‡ Pre-set.




Circuit diagram of the Murphy U182 table receiver. The differences in the 3-speed autoradiogram version, model U182R, are covered in a separate section of circuit to the right of the main diagram. **S18, R33, R32** and **MR2** are all part of the gram motor unit.

following instructions. Check that with the gang at maximum capacitance (this occurs just short of the fully clockwise setting of the gang) the left-hand edge of the cursor coincides with 0.6 on the substitute tuning scale. When the chassis is finally replaced in its cabinet, check that with the gang at maximum capacitance the cursor coincides with the vertical datum lines at the highest wavelength ends of the tuning scales. Transfer signal generator leads, with isolating capacitors, to **A** and **E** sockets.

**M.W.**—Switch receiver to M.W., tune to 500 m (2.25 on substitute scale), feed in a 500 m (600 kc/s) signal and adjust the cores of **L10** (A2) and **L5** (A1) for maximum output. Tune receiver to 220 m (11.45), feed in a 220 m (1,363 kc/s) signal and adjust **C35** (D3) and **C31** (A1) for maximum output. Repeat these adjustments until no further improvement results.

**L.W.**—Switch receiver to L.W., tune to 1,700 m (4.1), feed in a 1,700 m (176.5 kc/s) signal and adjust the cores of **L11** (D3) and **L6** (D4) for maximum output. Tune receiver to 1,000 m (12.75), feed in a 1,000 m (300 kc/s) signal and adjust **C34** (A2) for maximum output.

**S.W.**—Switch receiver to S.W., tune to 16.86 m (13.9), feed in a 16.86 m (17.8 Mc/s) signal and adjust **C33** (D4) and **C30** (A1) for maximum output, rocking the gang for optimum results while adjusting **C30. C33** should be set to the lower capacitance peak. Feed in a 44.8 m (6.7 Mc/s) signal and tune receiver to it. Check that the substitute scale reading is between 2.35 and 2.65. If the calibration falls outside these limits, the spacing of the top turns of **L4** and **L9** should be adjusted. Repeat these adjustments until no further improvement results.

If it is found necessary to replace the short wave coils **L2, L4** and **L7, L9,** the spacing of their top turns will have to be adjusted as described above to obtain correct tracking.

## DISMANTLING THE SET

**Removing Chassis.**—Remove two top and two side control knobs (pull off);

unsolder leads from speech coil tags on speaker;

disconnect white lead from metal foil plate aerial in base of cabinet;

lay cabinet flat on bench with speaker facing downwards;

remove four Phillips head bolts securing end flanges of chassis to cabinet and withdraw chassis.

To make the under-chassis components accessible, remove the scale backing plate (four self-tapping Phillips head screws).

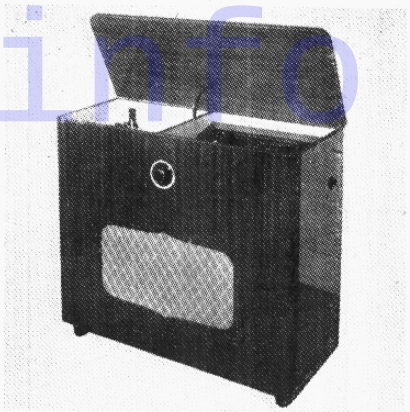
## VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from 230 V A.C. mains. The receiver was tuned to the high wavelength end of M.W.

Voltages were measured with an Avo Electronic TestMeter, and as this instrument has a high internal resistance allowance should be made for the current drawn by other types of meter. Chassis was the negative connection in every case. The voltage measured across **R19** was 7.5 V, and that across **C26** was 185 V. The total H.T. current was 66 mA.

| Valve | | Anode | | Screen | |
|---|---|---|---|---|---|
| | | V | mA | V | mA |
| V1 | 10C1 | 152 (Oscillator 68) | 2·0 (4·0) | 42 | 3·6 |
| V2 | 10F9 | 152 | 5·0 | 42 | 1·4 |
| V3 | 10LD11* | 55 | 1·7 | — | — |
| V4 | 10P14 | 168 | 43·0 | 152 | 6·0 |

* 10LD3 in Gram model.

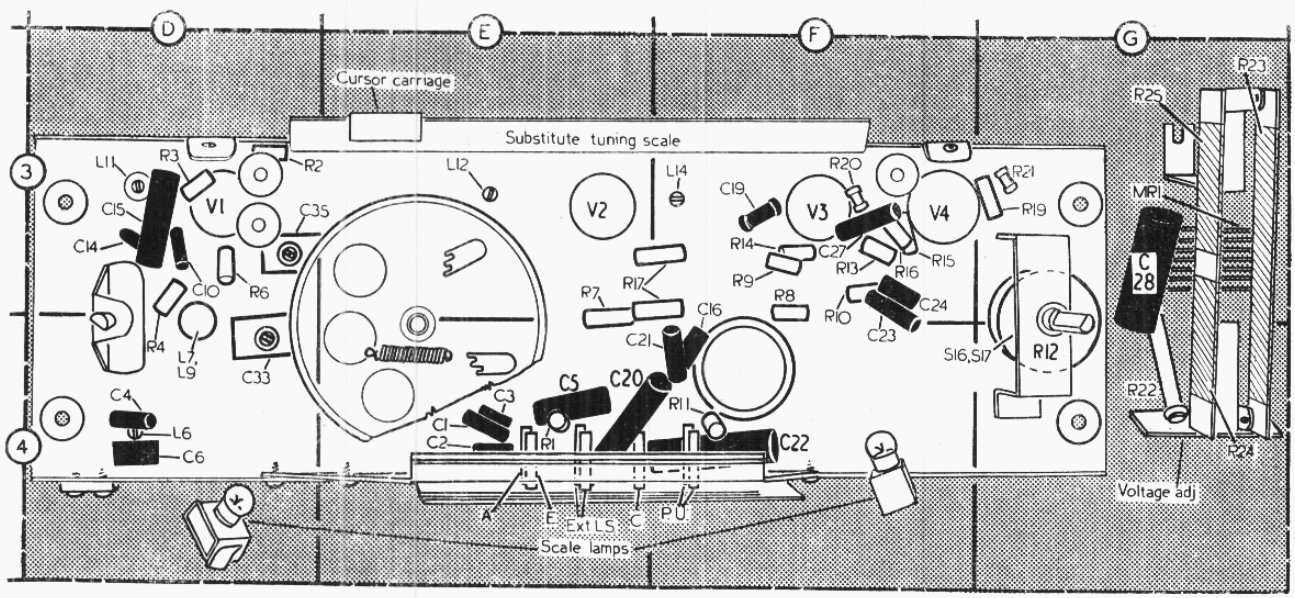


Appearance of the Murphy U182R.

## Service Sheet Correction

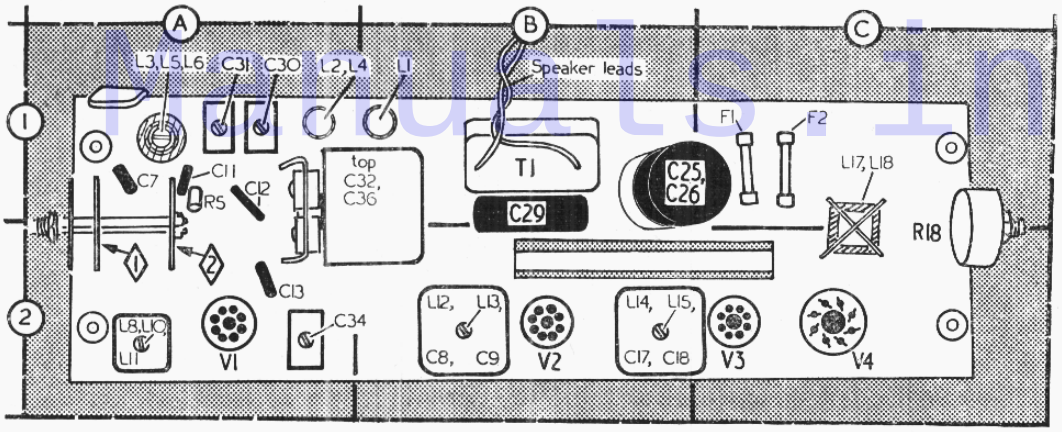
Owing to an error made when compiling and checking the component tables of the H.M.V. "Highlight" television receiver in *Service Sheet* 1061/T30, the resistance values of the windings for transformers **T1** and **T4** were transposed.

It will be appreciated as a favour if users will insert the following corrections. Windings **a** and **b** on **T1** should read 5.2Ω and 7.5Ω respectively. Windings **a** and **b** on **T4** should read 310Ω and 280Ω respectively.




Underside illustration of the U182 chassis with the scale backing plate removed. The rectifier and heater ballast unit in location G3 is normally bolted to the base of the cabinet.

*Printed in England by Cornwall Press Ltd., Paris Garden, London, S.E.1.*




Plan view of the U182 chassis. The numbered arrows in location A2 show the direction in which the switch diagrams are viewed.

## GENERAL NOTES

**Switches.**—**S1-S15** are the waveband and radio/gram change-over switches, ganged in two rotary units on the top of the chassis. These units are indicated in our plan chassis illustration, and shown in detail in the diagrams below, where they are drawn as seen from the tone control end of the chassis. The associated switch table shows the switch operations in the four control settings, starting with the control fully anti-clockwise. A dash indicates open, and **C,** closed.

**S16, S17** are the Q.M.B. mains switches ganged with the volume control **R12.**

**Scale lamps.**—These are rated at 6.3 V, 0.11 A and have small clear spherical bulbs and M.E.S. bases.

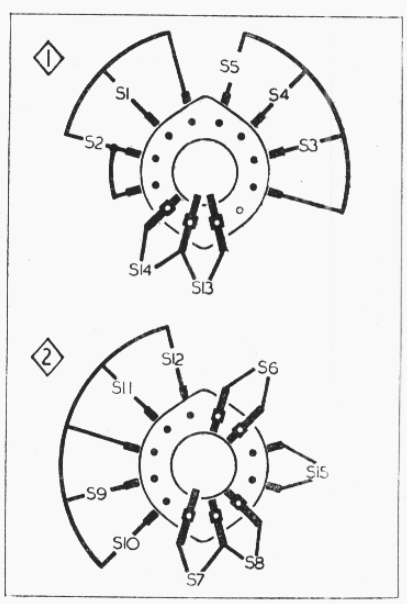
**Drive Cord Replacement.**—Approximately 50 inches of nylon-braided glass yarn is required for a new drive, which should be run as indicated in the sketch of the tuning drive system (at foot of cols. 2 and 3), starting with the gang at minimum capacitance and running the cord anti-clockwise round the drum. The cord tension should be adjusted so that the spring is extended to one inch (± 1/16 inch).

**Model U182R.**—This is the 3-speed auto-radiogram version of the U182 and employs a Garrard RC75A/U A.C./D.C. gram motor. Two pick-up heads are used, one for 78 r.p.m. operation (brown) and the other for 33⅓ and 45 r.p.m. operation (red).

**Instability.**—If "squegging" occurs in the gram model, particularly when fitting a new frequency changer, a 39Ω resistor (normally short-circuited) should be brought into circuit by cutting its shorting link. In the table model this resistor is not fitted and should be added in series with C33 if instability occurs. **C10** should also be reduced to 82 pF.

### Waveband Switch Table

| Switches | Gram | S.W. | M.W. | L.W. |
|---|---|---|---|---|
| S1 | — | C | — | — |
| S2 | — | — | C | C |
| S3 | — | C | — | — |
| S4 | — | — | C | — |
| S5 | — | — | — | C |
| S6 | — | C | — | — |
| S7 | — | — | C | — |
| S8 | — | — | C | — |
| S9 | — | C | — | — |
| S10 | — | — | C | C |
| S11 | — | — | — | C |
| S12 | — | — | C | — |
| S13 | — | C | C | C |
| S14 | C | — | — | — |
| S15 | — | C | C | C |




Diagrams of the waveband switch units, drawn as seen from the tone control end of an upright chassis.

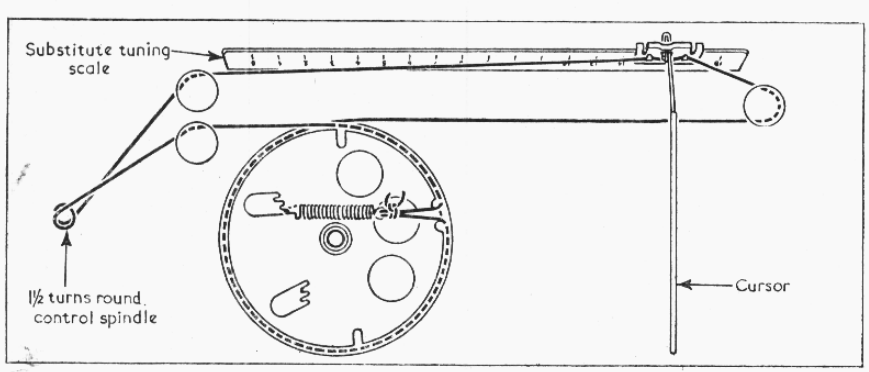
## CIRCUIT ALIGNMENT

The chassis should be removed from its cabinet for the following alignment adjustments.

**I.F. Stages.**—Switch receiver to M.W. and turn gang to maximum capacitance. Screw the cores of **L13** and **L15** half-way out of their formers. Connect output of signal generator, via an 0.01 μF capacitor in each lead, to control grid (pin 6) of **V2** and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust the cores of **L14** (location reference F3) and **L15** (B2) for maximum output. Do not re-adjust the core of **L14.** Transfer signal generator "live" lead to control grid (pin 6) of **V1.** Feeding in a 470 kc/s signal, adjust the cores of **L12** (E3) and **L13** (B2) for maximum output. Do not re-adjust the core of **L12.**

**I.F. Rejector.**—With the receiver switched to M.W. and the gang turned to maximum capacitance, fed in a 470 kc/s signal and adjust the core of **L1** (B1) for minimum output.

**R.F. and Oscillator Stages.**—As the tuning scale remains fixed in the cabinet when the chassis is withdrawn, reference is made during alignment of the substitute tuning scale printed along the edge of the cursor carriage rail. Readings on this scale are taken against the left-hand edge (as viewed in our under-chassis illustration) of the cursor carriage. The substitute scale readings are given in brackets after each alignment wavelength in the




Sketch of the tuning drive system drawn as seen in the under-chassis illustration with the gang at minimum capacitance and with the scale backing plate removed.