

"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 G33 (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-

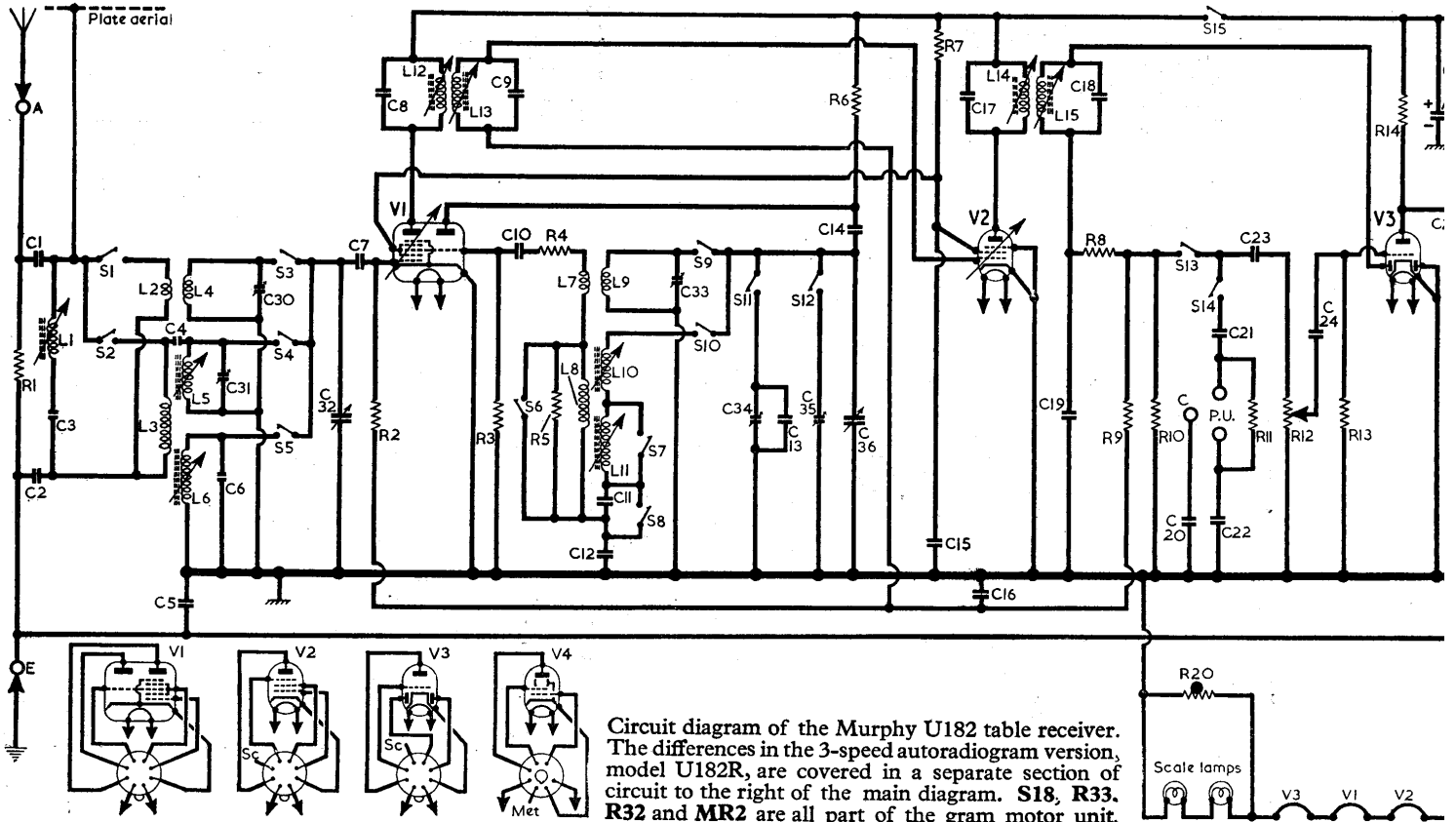
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COMPONENTS AND VALUES

CAPACITORS		Values	Locations
C1	Aerial couplers ...	470pF	E4
C2		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		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		150pF	B2
C19	I.F. by-pass ...	100pF	F3
C20	P.U. isolators ...	0.001μF	E4
C21		0.005μF	F4
C22		0.005μF	F4
C23	A.F. couplers ...	0.005μF	F3
C24		0.04μF	F3
C25*	H.T. smoothing ...	50μF	B1
C26*		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.

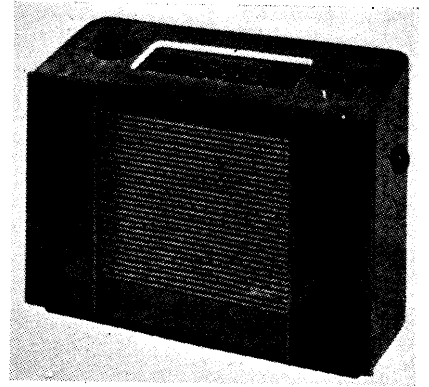
CAPACITORS (cont.)		Values	Locations
C35†	M.W. osc. trim ...	35pF	D3
C36†	Oscillator tuning ...	528pF	B1
C37	Tone corrector ...	0.005μF	—
C38*	V3 anode decoup.	8μF	—
C39	A.F. coupling ...	0.01μF	—
C40*	V4 cath. by-pass ...	50μF	—

* 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 coils ...	—	A1
L3		—	A1
L4		—	A1
L5	Aerial tuning coils	7.0	A1
L6		29.0	A1
L7	Oscillator reaction coils ...	—	D4
L8		—	A2
L9	Oscillator tuning coils ...	—	D4
L10		—	A2
L11	—	A2	
L12	1st I.F. trans. { Pri. ...	4.5	B2
L13		Sec. ...	6.2
L14	2nd I.F. trans. { Pri. ...	6.2	B2
L15		Sec. ...	6.2
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	33½, 45 r.p.m. P.U. ...	22.0	—
T1	O.P. trans. { a ...	25.0	B1
		b ...	
		c ...	
T2	P.U. trans. { a ...	4.0	—
		b ...	
S1-	Waveband switches	—	A1
S15		—	
S16		—	
S17		—	
S18	Mains sw, g'd R12...	—	G4
S18	Motor switch ...	—	—



Appearance of the Murphy U182.

tode 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.

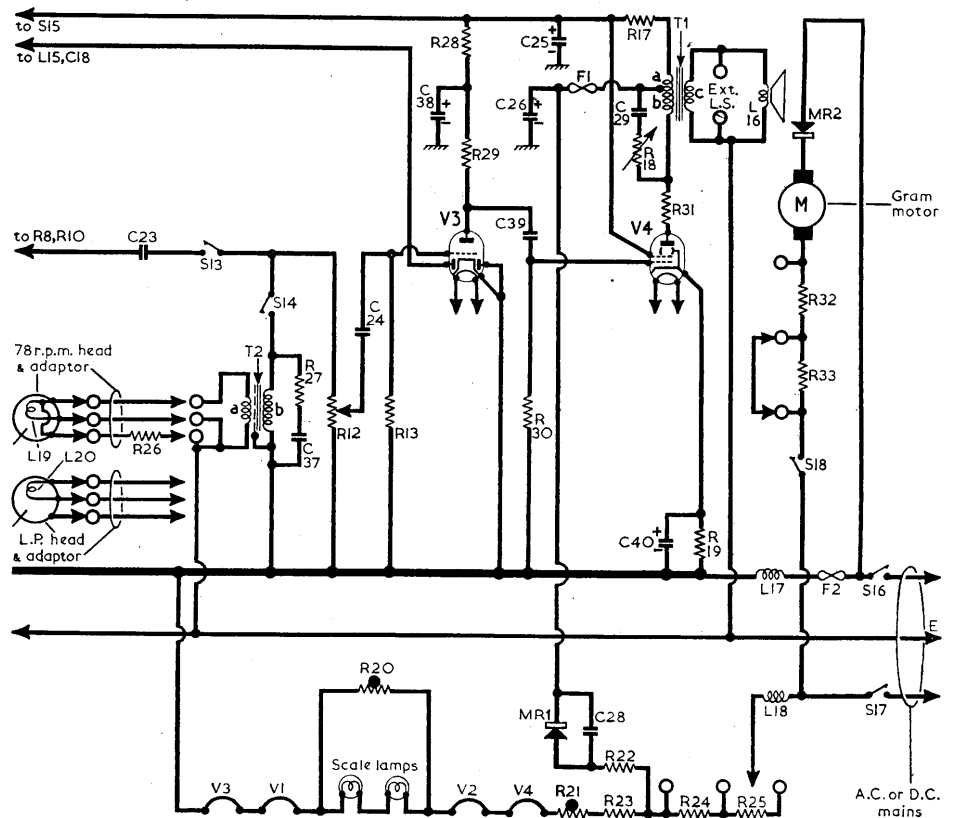
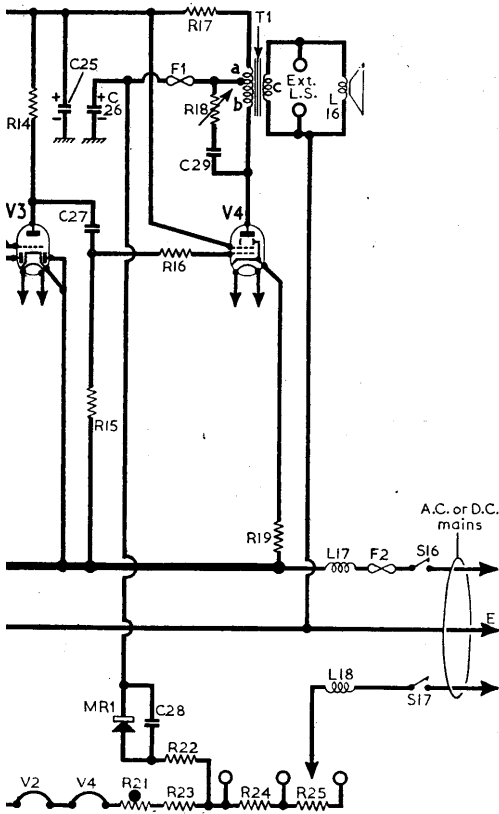
H.T. current is supplied by metal rectifier (MR1, Westinghouse 15B35). Smoothing by R17 and electrolytic capacitors C25 and C26, residual hum being neutralized by passing H.T. current through section a of T1 primary winding.

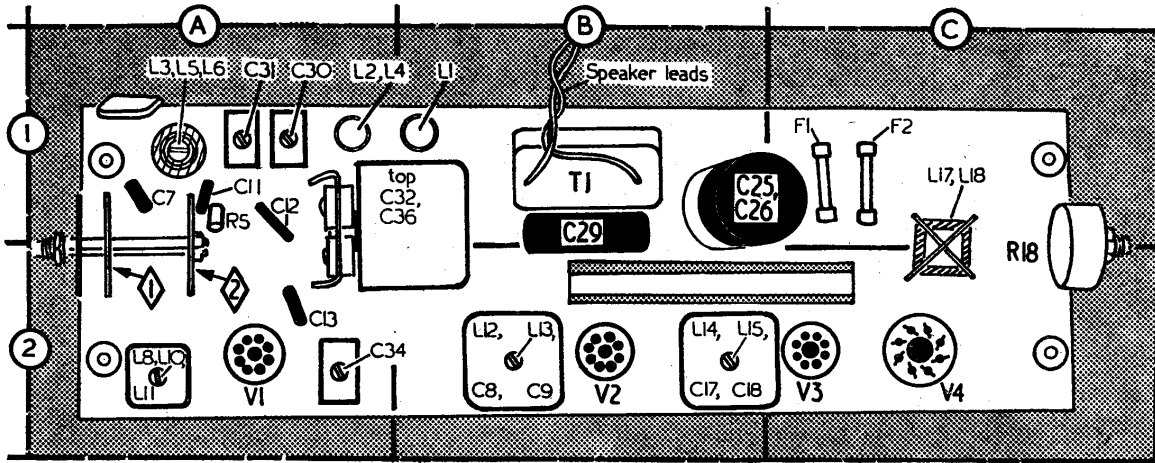
The gram model employs an A.C./D.C. motor (Garrard RC75A/U) which incorporates its own voltage adjustment resistors R32, R33 and a metal rectifier MR2, the latter operating as a resistor when operating from D.C. mains.

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 pen-





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 ($\pm \frac{1}{8}$ 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 33½ 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.

CIRCUIT ALIGNMENT

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

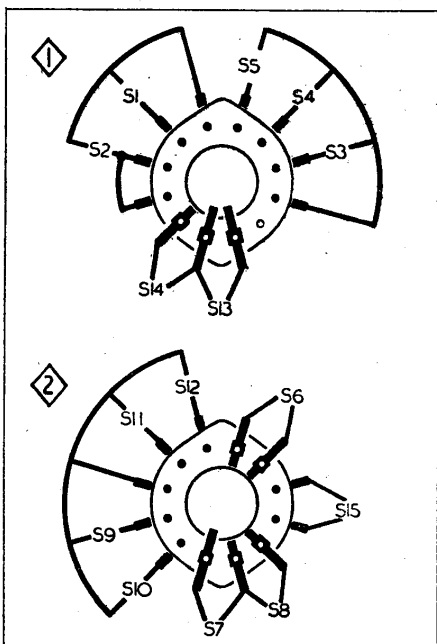
I.F. Stages.—Switch receiver to M.W. and turn gang to maximum capacitance. Screw the cores of L13 and L15 half-way out of their formers. Connect output of signal generator, via an 0.01 μF capacitor in each lead, to control grid (pin 6) of V2 and chassis. Feed in a 470 kc/s (638.3 m) signal and adjust 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, feed in a 470 kc/s signal and adjust the core of L1 (B1) for minimum output.

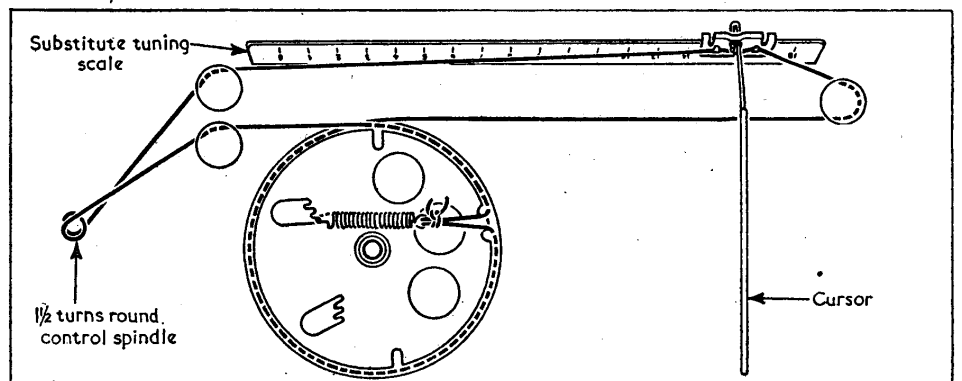
R.F. and Oscillator Stages.—As the tuning scale remains fixed in the cabinet when the chassis is withdrawn, reference is made during alignment of the substitute tuning scale printed along the edge of the cursor carriage rail. Readings on this scale are taken against the left-hand edge (as viewed in our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

Waveband Switch Table

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



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



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.

