

UI02 & UI02C

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MURPHY RADIO SERVICE INSTRUCTIONS



MAINS SUPPLY:	200-250 volts A.C. or D.C.
WAVE RANGES:	16·7-50 metres 190-550 metres 970-2,000 metres
INTERMEDIATE FREQUENCY:	465 Kc/s
VALVES:	Mazda TH233, VP133, HL133DD, PEN383, U403
PILOT LAMP:	6·2 volt, 0·3 amp. M.E.S.
SPEECH COIL IMPEDANCE:	3 ohms
TOTAL WEIGHT:	Moulded Cabinet: 17 lb. Wooden Cabinet: 18 lb. Console: 42 lb.
CABINET DIMENSIONS:	Moulded Cabinet: 17" × 7" × 10" Wooden Cabinet: 20" × 8½" × 11" Console Cabinet: 34" × 22" × 13"
CONSUMPTION:	65 watts on 230 volts

Issued by

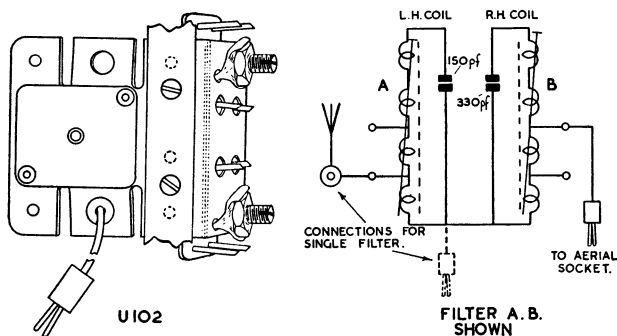
**MURPHY RADIO LTD · WELWYN GARDEN CITY
HERTS · ENGLAND**

TEL: WELWYN GARDEN 800

AERIAL FILTERS

In receivers operating close to transmitters, an aerial filter for this receiver, as supplied by Murphy Radio, may be necessary if tuneable whistles occur on stations. The actual area affected is usually within a radius of three to four miles of the transmitter, though it may be modified by such local conditions as the nature of the country, the transmitter aerial power, and the type of receiving aerial in use. The object of the filter is to reduce the interfering signal to the receiver and it may be a single or double unit according to the number of local stations.

Remove the back of the receiver and then remove the screws holding the small paxolin plate to the left-hand side chassis strap, and fix the filter unit as shown, in its place, using the same screws.



Note that when in the correct position, both adjusting screws (if a twin filter is being used) can be easily adjusted with a screwdriver.

Insert the plug from the filter unit into the aerial socket, and connect the aerial to the socket on the filter.

There are three standard filter coils, each tuning through a different range of frequencies, and the units can be provided as desired with a suitable arrangement to suit local conditions.

Filter A	Wavelength Range	200-300 metres
		(1500-1000 Kc/s)
„ B	„ „	300-428 metres
		(1000-700 Kc/s)
„ C	„ „	428-600 metres
		(700-500 Kc/s)

In order to adjust the filter when fitted, connect an output meter to the Ext. L.S. sockets, and a Service Signal Generator through “dummy aerial”, to the Aerial Socket. Set the Signal Generator carefully to the same frequency as the local transmitter and adjust the coil core for minimum output. If the filter is a double unit the same procedure must be followed for each section.

THE CORD DRIVES

In order to reduce wear, thicker drive cord is now used on the main drive, whilst the original thin cord is used on the pointer drive. The following notes will help when replacing these cords. If both cord drives are faulty, first replace the main drive and then the pointer drive.

MAIN DRIVE

If the main drive only is being replaced, unhook the pointer drive spring, and remove pointer cord out of the way.

1. Place chassis on a bench, dial uppermost, with gang capacitor at maximum, and drive drum as shown in diagram.

2. Obtain length of about 30 in. of thick woven and waxed Italian hemp cord (as supplied by Murphy Radio Ltd).

3. Pass end of cord twice round control spindle, as shown in diagram.

4. Hold rear (underneath) cord in left hand near drive drum slot.

5. Pass front (upper) cord round lower pulley, then round drive drum to meet other end near drive drum slot.

6. Hold both cords tightly to drum and pass ends through slot until they show behind hole on the inside edge of drive drum.

7. Hook the ends through to the front of the drive drum, with small screwdriver or pliers.

8. Knot the ends about $\frac{1}{2}$ in. from inside edge of drive drum.

9. Hook spring into position behind knot, and ease other end of spring into fixing hole with small pair of pliers or screwdriver.

10. Check that the spring is extended approximately $1\frac{1}{16}$ in., and see that there is no tendency to slip.

REFITTING POINTER DRIVE CORD

1. Set gang capacitor to maximum and drive drum as shown in diagram.

2. Slide pointer under dial, with felt pad towards dial, and place cord on pulleys so that the pointer is in line with the top of the dial aperture.

3. Hold lower cord in left hand near drive drum and pass upper cord $1\frac{1}{2}$ times round pointer drum in direction shown. It will be found that the spring takes up a position near to the slot in the drive drum.

4. Bring knot with spring over to the slot, using left hand to keep the cords in the groove.

5. Place cords in slot, and ease spring into fixing hole with pliers.

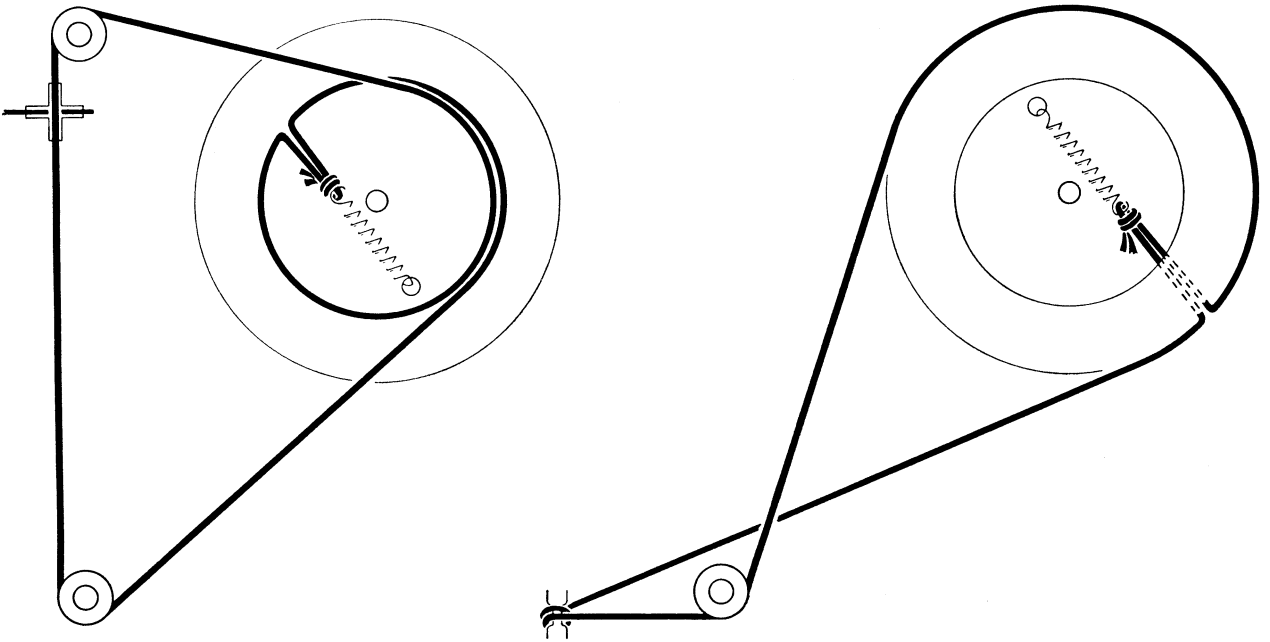
6. Check that the pointer is still in line with edge of scale; if not, slacken locking screws on drive drum, and rotate slightly to correct any error, then tighten screws.

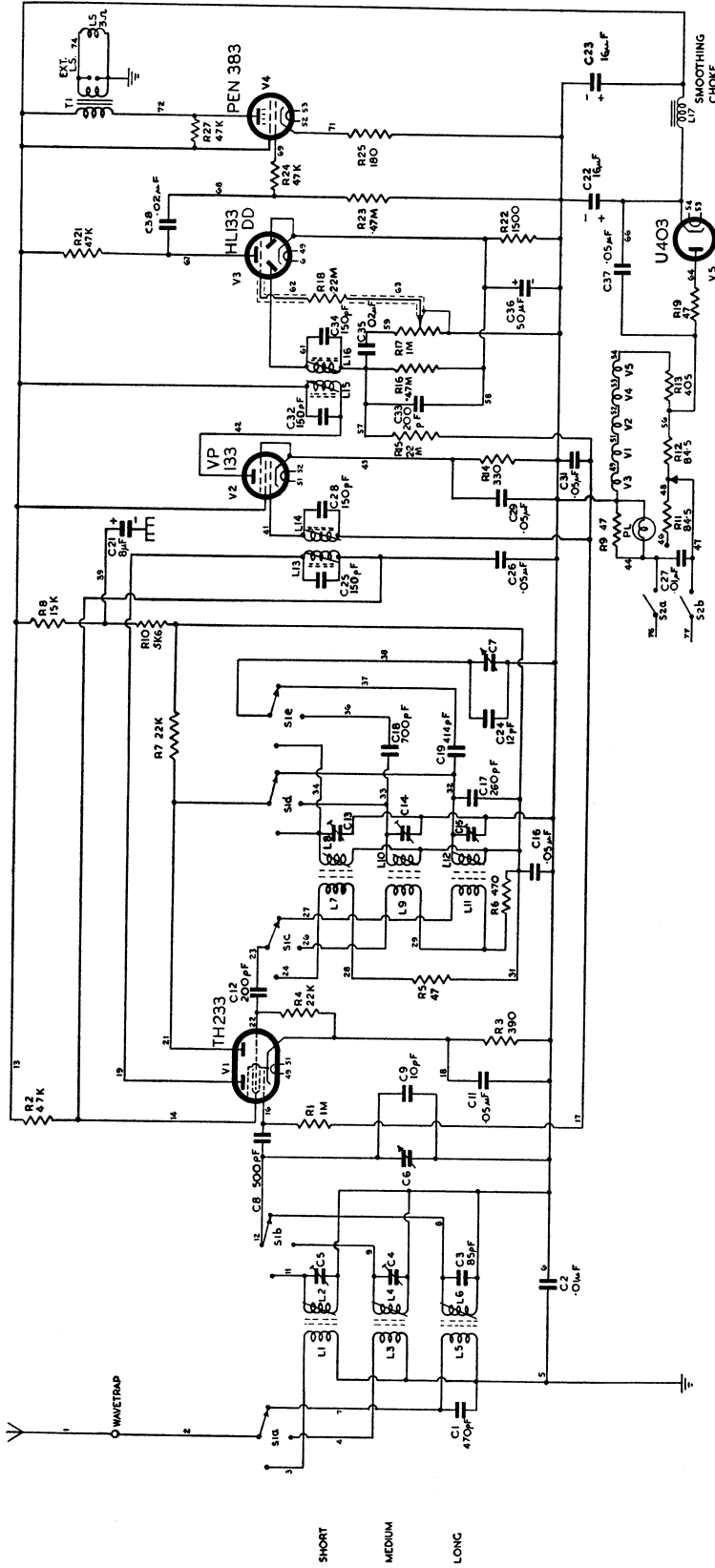
FITTING NEW POINTER DRIVE CORD

1. Place chassis on bench, dial uppermost.
2. Remove dial by releasing clamp as shown in picture elsewhere (page 5).
3. Set gang capacitor to maximum, with drive drum as shown in diagram.
4. Obtain length of about 30 in. of thin woven and waxed Italian hemp cord (as supplied by Murphy Radio Ltd), also pointer and felt pad.
5. Place centre of cord over the two pointer pulleys, and pass the ends round the pointer drive drum, as shown in diagram, so that the two ends meet near the slot in the drum.
6. Knot the ends together so that the knot will lie about $\frac{3}{4}$ in. from the inside edge.
7. Hook the spring through the knot and ease other end of spring into fixing hole with small pliers. Check that the spring is extended $\frac{1}{16}$ in., if necessary, adjust the position of the knot.
8. Place pointer on cord, so that at maximum gang capacity it will be aligned with the end of the scale, and clamp into position. Glue the felt pad onto the pointer so that it will rest against the dial.
9. Replace dial in dial clamp, and finally check that the pointer is in alignment with the top end of the scale; if not, slacken fixing screws on drive drum and rotate slightly to correct any error, then tighten screws.

MODIFICATIONS

- In some receivers, R27 is replaced by a .02 capacitor.
- ” ” ” some of the variable inductances have slots for use with a screwdriver for adjusting, instead of the standard 7 B.A. hexagonal end.
- ” ” ” the 10 p.f. and 12 p.f. capacitors on the gang capacitor are interchanged.
- ” ” ” C17 is 270 p.f.
- ” ” ” R10 is 1000 Ω .
- ” ” ” R26 (620 Ω , 4 W.) was connected between test points 66 on V5 and 73 on L17, and is now deleted.
- ” ” ” A toggle mains switch was fitted due to a temporary inability to obtain volume controls with switches.
- ” ” ” R16 and R23 may be .39 M Ω
- ” ” ” R15 may be 1.8 M Ω
- ” ” ” R5 may be 51 Ω .
- ” ” ” C9 may be 7 p.f.
- ” ” ” C22 may be a separate 16 mfd. capacitor clamped on to C21/23.
- ” ” ” R9 and R19 are interchanged so that R19 is now wire-wound.





COIL RESISTANCES

COILS	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
OHMS	1	—	6	2.3	26	15	1	0.5	6	13

COILS	L11	L12	L13	L16	L17	T1 Prim.	T1 Sec.
OHMS	7	18	6.3	5.5	250	120	1

OSCILLATOR GRID CURRENT

(Measurements taken between R4 and test point r8)

- L. W. ·195 mA at 2000 metres
- 210 " " 1000 "
- M. W. ·255 " " 500 "
- 315 " " 200 "
- S. W. ·020 " " 50 "
- 170 " " 23 "

The above readings should be taken as a guide only, as variations may occur from set to set.

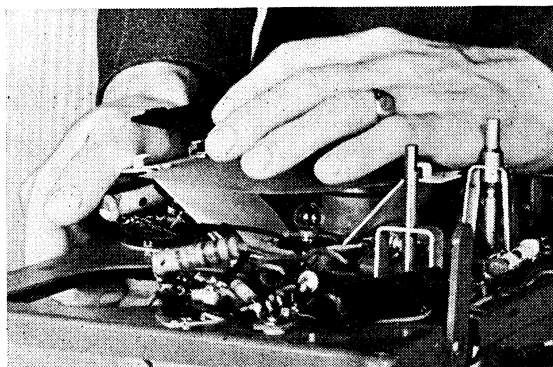
CONNECTIONS FOR MAJOR COMPONENTS

COMPONENT	LEAD	TEST POINT	CONNECTION TO
Capacitor Bank, C21, C22, C23	Red (C22)	66	V5 cathode R26 on L17
	Yellow (C23)	13	L17 Screen of V2
Wave Range Switch	Green (C21)	39	Short R/C strip (R21)
	Black	6	Long R/C strip (R10)
	S1a	2 3 4 7	Earth tag
			Aerial socket
			L1
			L3
			L5
	S1b	12 11 9	C8; Gang; and C8 to *16
			C5
			C4
	* (not used)	8 16 17	L6
			V1 grid; C8 to S1b; R1 to *17
R1 to *16; long R/C strip (C31)			
S1c	36 23 24 26 27	C18 to S1d; lead to S1e	
		Long R/C strip (C12)	
		L7	
		L9	
		L11	
S1d	21 34 33 32	V1, Osc. Anode	
		L8; Link to S1e	
		L10; C18 to upper wafer (*36)	
		L12; C19 to S1e (37)	
S1e	38 34 36 37	Osc. section, gang capacitor	
		Link to S1d	
		Link to upper wafer (*36)	
		C19 to S1d (32)	
Volume Control and On/Off switch	Case	6	Screened lead to V3; end tag; chassis tag on OPT
		63	Screened lead to R18 and cap of V3
	S2a	59 44 76	Long R/C strip (C35)
			Long R/C strip (R9); C27 to S2b
			Mains input
			Variable lead for R11/I2/I3; C27 to S2a
S2b	47 77	Mains input	

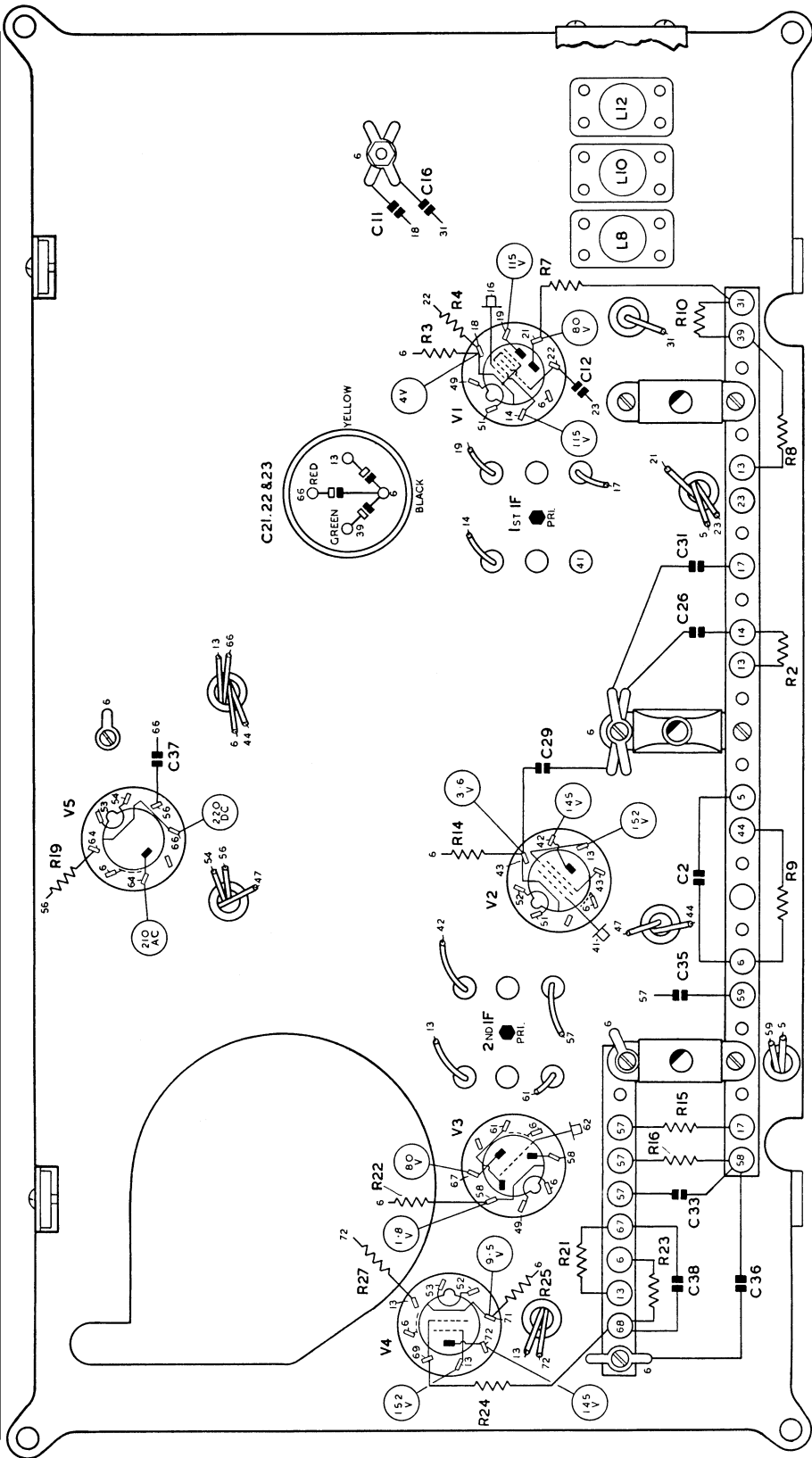
* Used as anchoring points only.

REMOVING THE TUNING CHART

The Uro2 chart is held in place by a sheet metal clamp, and it may easily be removed by pressing the top and bottom of the clamp and lifting it out, as shown in the photograph in the next column.



R	24	25	27	22	16	15	19	14	9	37	2	3	4	10	7
C		23	21				14			29		8			
L		38	36	33			2			31	26	12			11
MISC												V1			6
															10
															7
															4
															3
															10
															7
															12
															6
															10
															12



UIO2 UNDERNEATH VIEW

Voltages are average figures measured between test points and chassis, using an AVO meter type 7, with receiver switched to M.W. and working on 230 volt mains, under no signal conditions.

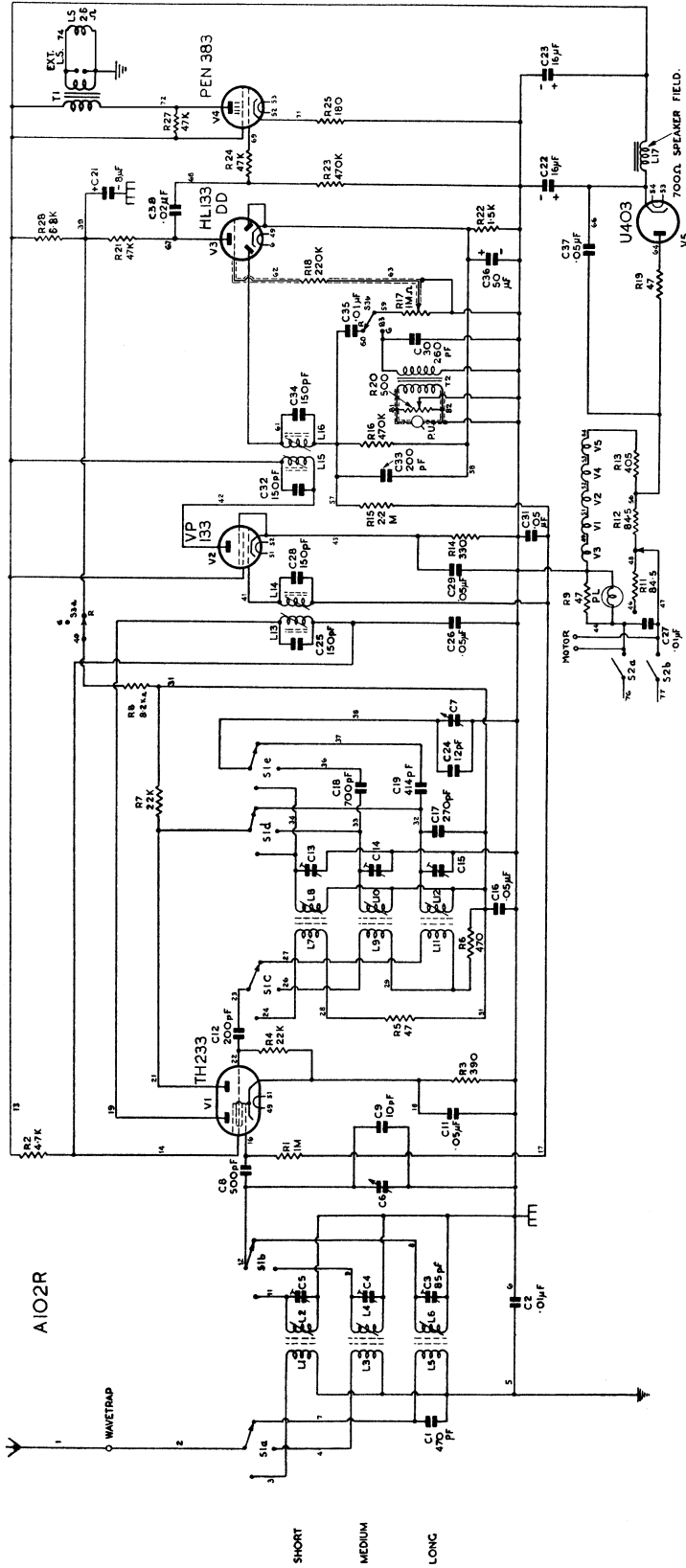
TRIMMING INSTRUCTIONS

All adjustments are made for maximum reading on an output meter connected to L.S. sockets, with V/C at maximum and the Service Signal Generator output adjusted to produce the lowest convenient meter reading. Before starting R.F. adjustments, see that the tuning pointer is just under the end of the dial at the L.F. ends of the bands when the ganged capacitor is at maximum capacity.

NOTES. To trim the I.F. transformers it will be necessary to remove the dial, by springing the dial frame. A 7 B.A. box spanner must be used to adjust the variable inductances, although some receivers have been released with screw-driver slots instead.

CIRCUIT	NOTES	SERVICE SIG. GEN. SETTING	SERVICE SIG. GEN. TERMIN'TN	CONNECT SIG. GEN. TO	RECEIVER DIAL SETTING	RECEIVER RANGE	ADJUSTMENTS
I.F.	Unscrew 2nd I.F. Pri. and Sec. cores to fullest extent	465 Kc/s	Direct via ·1 mfd.	V2 Control Grid	550 m	M.W.	2nd I.F. Pri. (L15) front of chassis 2nd I.F. Sec. (L16) back of chassis. Do NOT READJUST
	Unscrew 1st I.F. Pri. and Sec. cores to fullest extent	465 Kc/s	Direct via ·1 mfd.	V1 Control Grid	550 m	M.W.	1st I.F. Pri. (L13) front of chassis 1st I.F. Sec. (L14) back of chassis. Do NOT READJUST
S.W.	Repeat these adjustments until there is no further improvement	7·14 Mc/s (42 m)	Dummy Aerial	Aerial Socket	42 m	S.W.	S.W. Osc. coil (L8) S.W. Grid coil (L2)
		15·25 Mc/s (19·7 m)	Dummy Aerial	Aerial Socket	19·7 m	S.W.	S.W. Osc. trimmer (C13) S.W. Grid trimmer (C5)
M.W.	Repeat these adjustments until there is no further improvement	600 Kc/s (500 m)	Dummy Aerial	Aerial Socket	500 m	M.W.	M.W. Osc. coil (L10) M.W. Grid coil (L4)
		1363 Kc/s (220 m)	Dummy Aerial	Aerial Socket	220 m	M.W.	M.W. Osc. trimmer (C14) M.W. Grid trimmer (C4)
L.W.	Repeat these adjustments until there is no further improvement	158 Kc/s (1900 m)	Dummy Aerial	Aerial Socket	1900 m	L.W.	L.W. Osc. coil (L12) L.W. Grid coil (L6)
		300 Kc/s (1000 m)	Dummy Aerial	Aerial Socket	1000 m	L.W.	L.W. Osc. trimmer (C15)

CIRCUIT DIAGRAM



A102R RECEIVER SUPPLEMENTARY SERVICE INSTRUCTIONS

For use in conjunction with UI02 and UI02C Service Instructions.

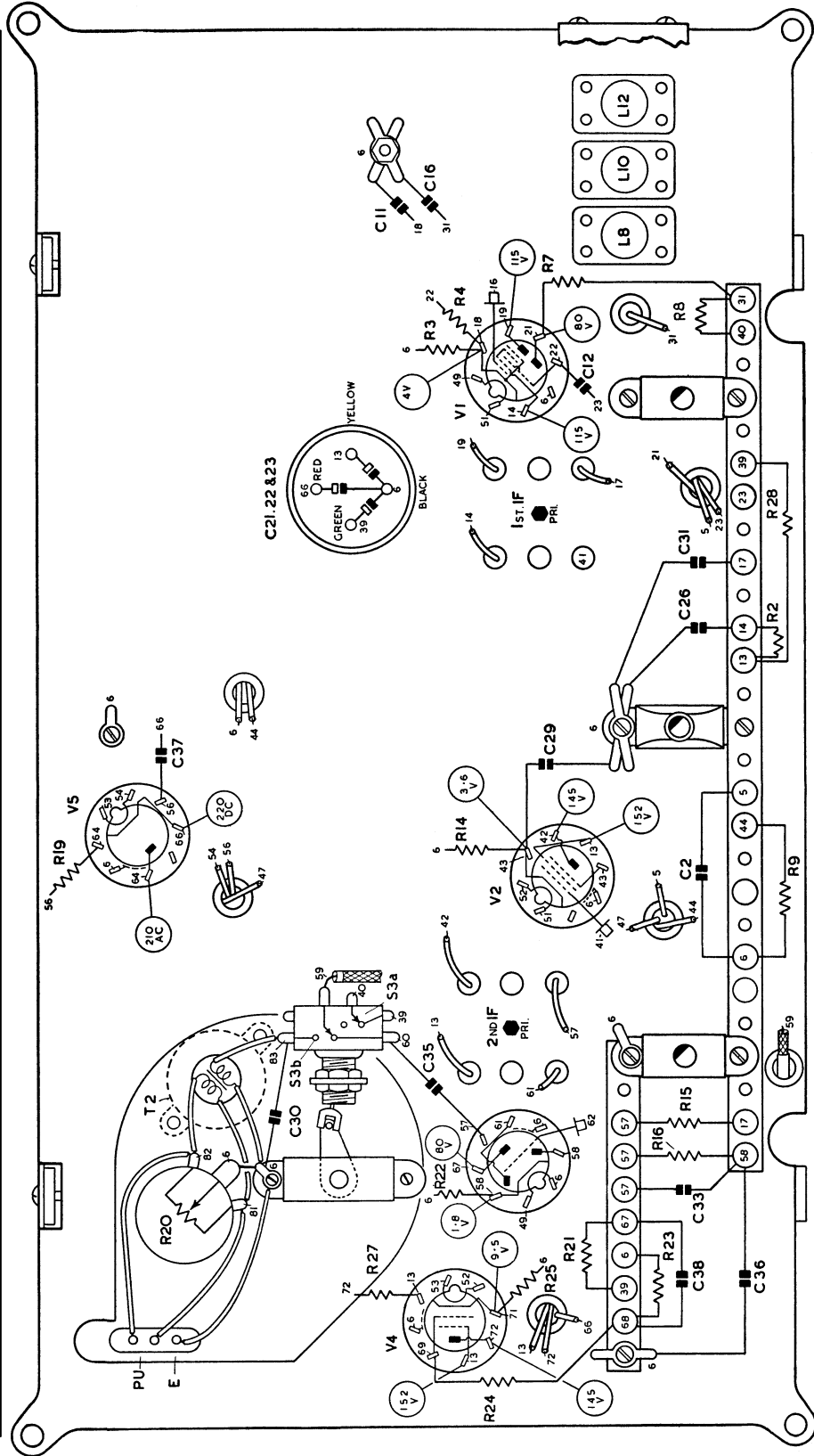
Early receivers incorporating a 220K Ω resistor in T2 secondary circuit, and 100p.f. capacitor(C30) across this circuit should be modified to conform with the above circuit diagram.

T2 primary resistance is approximately 1.7 ohms, and secondary resistance 780 ohms. For layout of components on chassis, see back of sheet.

This receiver is for use on A.C mains 200 - 250 volt, 40 - 60 cps., only.

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MURPHY RADIO LTD, WELWYN GARDEN CITY, HERTS, ENGLAND

R	24	25	27	22	20	19	14	9	2	28	3	4	7
C	23	21	30	35	37	29	26	31	12	11	16	8	10
L	38	36	33									6	10
MISC	V4	V3	T2 S3b	S3a	V5	V2	V1						12



AIO2R UNDERNEATH VIEW

Voltages are typical figures, measured between test points and chassis, using an Avometer type 7, with the receiver switched to M.W. under no signal conditions.

MURPHY RADIO

102 Series—SERVICE INSTRUCTIONS

Modifications and Corrections

The U102 Service Instructions booklet, and the Supplementary sheet dealing with the A102R, should be corrected as follows:

Page 4. COIL RESISTANCES—tolerance approximately 20 per cent—amended list

COIL	1	2	3	4	5	6	7	8	9	10	11
OHMS	—	—	0·5	2·2	24	14·5	—	—	0·5	1·2	0·7
COIL	12	13	14	15	16	17	T1 Pri.	Sec.	102R T2 Pri.	Sec.	
OHMS	1·7	5·5	5·5	5·5	5·5	250	120	—	1·7	780	

Page 3. MODIFICATIONS—R9 and R19 are interchanged so that R9 is now wire-wound.

The modification notes below may be stuck into the U102 Service Instructions.

Later console and radiogramophone receivers incorporate a tone control, consisting of a variable resistance (50 K Ω) and a fixed condenser (0·05 μ F), connected across the primary of the output transformer. Due to supply difficulties, a 15 K Ω variable resistance has been fitted in some receivers.

Following the introduction of the tone control circuit, a 10-inch P.M. loudspeaker is being substituted for the 8-inch model in the radiogramophones and consoles; the original field coil (in the A102R) is replaced by a choke L17, the D.C. resistance of which is approximately 250 ohms. These changes are not retrospective.

A new type of lightweight pick-up, of Murphy manufacture, is being fitted in the radiogramophones. It is oil damped, and magnetized with the magnet in position; no attempt should therefore be made to repair or adjust it without proper service facilities. If the magnet is moved, the sensitivity will be affected. The pick-up is designed for use with miniature type needles, which drop into the socket freely, but are held firmly in position when in contact with a record. In order to correct the characteristics of the amplifier, the value of C30 is changed to 680 pf. (or 630 pf.). A new connecting lead is also used, to reduce the drag on the pick-up arm.

Owing to the light weight of the Murphy pick-up, the auto-stop mechanism should be adjusted to the lightest possible setting.

Since the publication of the A102R Instructions, a Universal model, the U102R, has been introduced; this is identical in all respects, except for the use of an A.C./D.C. Motor unit, the U5A, in place of the AC7 used in the A.C. model. The U5A requires to be adjusted according to whether it is used on A.C. or D.C. mains.

The voltage measurements given in the supplementary sheet for the A102R are those applicable to the receivers fitted with P.M. loudspeakers. The following measurements were taken on an Avometer type 7 on a typical A102R receiver fitted with an energized loudspeaker, and the underneath view of the receiver should be appropriately marked.

VALVE	Anode	Osc. Anode	Screen	Cathode
1	87	56	87	3·8
2	122	—	122	2·7
3	44	—	—	1·0
4	115	—	122	6·5
5	205v. A.C.	—	—	232