

UI02A & TUI02A _____ UI02A & TUI02A

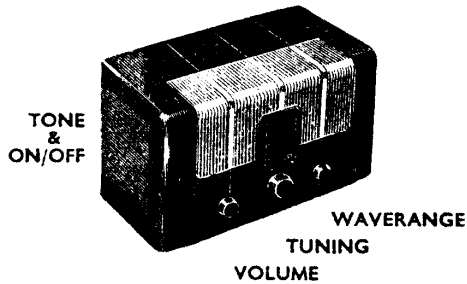
MURPHY SERVICE INSTRUCTIONS

Issued by

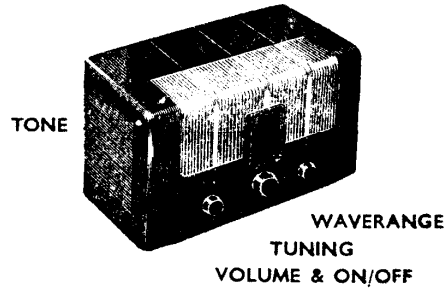
**MURPHY RADIO LTD · WELWYN GARDEN CITY
HERTS · ENGLAND PHONE: WELWYN GARDEN 800**

FOREIGN TELEGRAMS AND CABLES: RADMURPHY, LONDON

UI02A



TUI02A

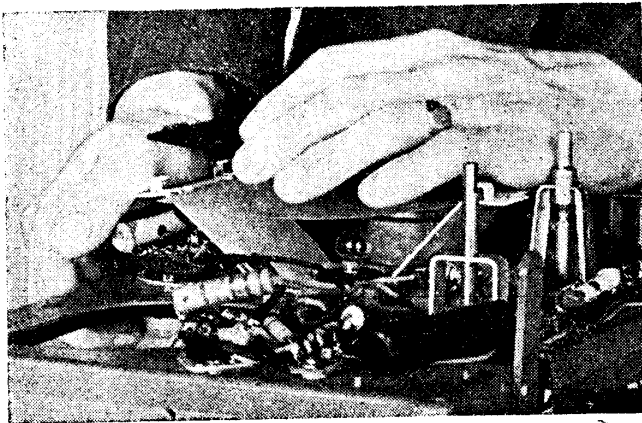


MAINS SUPPLY:	UI02A: 200-250 volts D.C. or A.C., 25-100 cps.
	TUI02A: 105-130, 200-250 volts D.C. or A.C., 25-100 cps.
WAVE RANGES:	S. 16.7 to 50 metres
	M. 190 to 550 metres
	L. 970 to 2000 metres
INTERMEDIATE FREQUENCY:	465 kc/s
VALVES:	UI02A: Mazda: TH233, VP133, HL133DD, PEN383, and U403
	TUI02A: Mazda: TH233, VP133, HL133DD, PEN384, and U201
PILOT LAMP:	3.5 volts, 0.15 amp. (miniature screw)
SPEECH COIL IMPEDANCE:	3 ohms
CABINET DIMENSIONS:	17" wide, 7" deep, 10" high
TOTAL WEIGHT:	17 lb.
CONSUMPTION:	65 watts approximately

MECHANICAL NOTES

THE U102A and TU102A receivers are of basically similar design. The circuit and layout diagrams refer to the U102A and the differences of the TU102A are fully described on page 4. Both receivers are developed from the U102, and they may be distinguished from it by the fact that both have a tone control at the back of the cabinet.

The Thermatrol. The pilot lamp is protected by a thermal delay switch which shorts it out until the valves have warmed up. The switch is adjusted in the factory for a delay between 8 and 18 seconds. If the operation is faulty, the switch can be readjusted, but in general we suggest that faulty switches should be replaced. If readjustment is attempted, the screw should be turned in a clockwise direction to increase the delay, or in an anti-clockwise direction to reduce it. The adjustment should be checked with the receiver quite cold, and this means waiting for at least 30 minutes after switching off. The adjustment of the screw is fairly critical.



The Tuning Scale. The tuning scale is held in place by a sheet metal clamp, and it may be removed or replaced by pressing the top and bottom edges of the clamp. The scale can then be lifted out, as shown in the photograph.

The scale is marked at the edge for locating the four rubber buffers which fit into the clamp.

The R.F. and Oscillator Coils. The tuning coils are secured to the chassis by means of an

O.B.A. lock nut and a special anti-backlash spring washer. To remove the coils, unsolder the connections and unscrew the nut. Then lift the coil out, complete with iron dust core. When replacing a coil, screw the iron dust core partly into the coil, place the coil so that it fits into the hole in the chassis, slip the spring into position with the ends in the two holes in the chassis, then screw on the nut until the spring is compressed and the coil is secure.

The I.F. Transformers. The I.F. assemblies used on the U102A receiver cannot be opened for inspection without being first removed from the chassis; this is accomplished by removing the self-tapping screws and unsoldering the connections to the tags under the chassis. The tabs on the coil can should then be bent back, and the coil assembly removed. The cores screw into "U"-shaped pieces of paxolin inside the coil former. These cores are rather fragile, and may chip or break if carelessly handled; **a non-metallic screwdriver should always be used to adjust them.** When re-assembling, the piece of insulating material should be wrapped round the assembly before replacing the can.

The I.F. assemblies used in the TU102A receiver use the same type of iron dust core as those used for the R.F. and Oscillator circuits. The I.F. cans may be removed by unscrewing the two self-tapping screws; the coil assemblies are then exposed for servicing, and they can be removed from the chassis in the same way as the R.F. and Oscillator coils.

Sometimes, due to the supply position, certain iron dust cores may be fitted with brass stems. These cores should never be used in the S.W. Aerial or the I.F. circuits.

Additional notes on the TU102A receiver will be found on page 4.

The Cord Drives. Two types of drive cord are used, the thicker cord being used for the main drive, and the thinner cord for the pointer drive. The diagram shows the arrangement of the cords when the

gang condenser is at maximum capacity, and little difficulty should be experienced in replacing either drive; the following instructions, however, give the simplest methods.

The Main Drive. If the main drive only is being replaced, unhook the pointer drive spring, and move the pointer cord out of the way. Place the chassis on the bench so that the dial is uppermost, and set the gang condenser to maximum capacity, and the drive drum as shown in the diagram.

1. Pass the end of a 33-inch length of thick woven and waxed Italian hemp cord (as supplied by Murphy Radio Ltd, Spec. No. 935) round the control spindle twice, as shown in the diagram.
2. While holding the rear (underneath) cord in the left hand near the drive drum slot, pass the front (upper) cord round the lower pulley, and then round the drive drum to meet the other end near the drive drum slot.
3. Hold both cords tightly to the drum and pass the ends through the slot until they show behind the hole on the inside edge of the drum, then hook

the ends through the hole to the front, using a small screwdriver or pair of pliers.

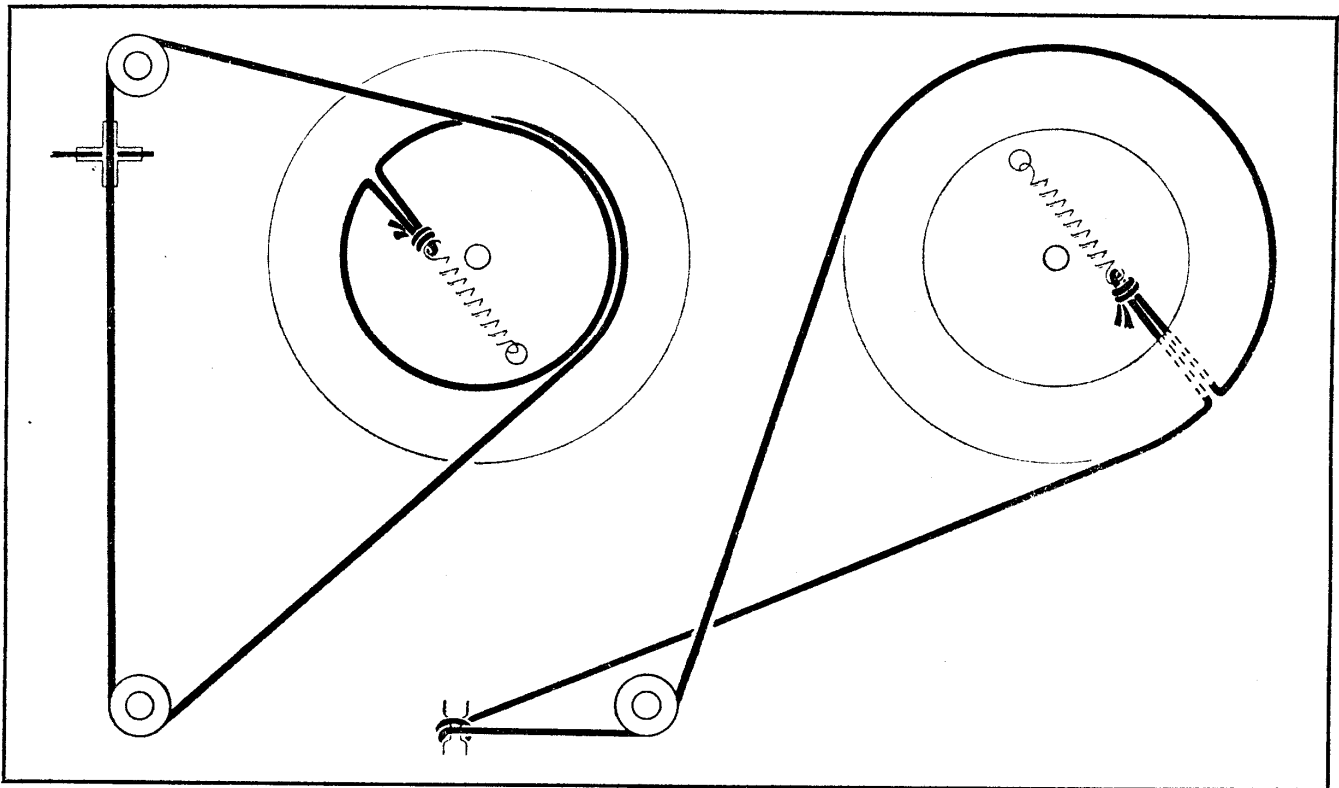
4. Knot the ends about half an inch from the inside edge of the drum, then hook the spring behind the knot and ease the other end of the spring into the fixing hole with a small pair of pliers or a screwdriver.

5. The extended spring should be between 1 in. and 1½ in. in length, and there should be no tendency to slip.

Refitting the Pointer Cord Drive. After the main cord drive has been replaced as described above, the pointer cord, which had been moved out of the way, may be refitted. First set the gang condenser to maximum capacity, with the drive drum as shown in the diagram.

1. Slide the pointer under the scale, with the felt pad towards the scale, and place the cord on the pulleys so that the pointer is in line with the L.F. end of the scale apertures.
2. Hold the lower cord in the left hand near the

(continued on next page)



(DIAGRAM OF UI02A & TUI02A CORD DRIVE)

drive drum, and pass the upper cord $1\frac{1}{2}$ times round the smaller part of the drum in the direction shown in the diagram. It will be found that the spring takes up a position near to the slot in the drive drum.

3. Bring the knot and spring over to the slot, using the left hand to keep the cords in the groove, then place the cords in the slot, and ease the end of the spring into the fixing hole with a small pair of pliers or a screwdriver.

4. Check that the pointer is still in alignment with the end of the scale; if not, slacken the locking screws on the drive drum, and rotate it slightly to correct any error, then retighten the screws.

If it is necessary to replace the Pointer Drive completely. First remove the scale as shown in the photograph on page 2. Then set the gang condenser to maximum, with the drive drum as shown in the diagram. Obtain cord, pointer, felt pad, and carrier before commencing replacement. The cord used is thin woven and waxed Italian hemp, supplied by Murphy Radio as Spec. No. 936. A length of 33 inches is required.

1. Place the centre of the cord over the two pointer pulleys, and pass the ends round the pointer drive drum as shown in the diagram, and pass the two ends through the slot in the drum.

2. Knot the ends together so that the knot will lie about $\frac{3}{4}$ in. from the inside edge of the pointer drive drum, hook one end of the spring into the knot, and ease the other end into the fixing hole,

using a small pair of pliers or a screwdriver. The extended spring should measure between $\frac{7}{8}$ in. and 1 in., and the position of the knot should be adjusted if necessary.

3. Place the carrier, with pointer attached, on the cord so that at maximum gang capacity, the pointer is in alignment with the L.F. end of the scale, then clamp it in position. Glue the felt pad on to the pointer carrier so that it will rest against the back of the scale.

4. Replace the scale in the clamp, and finally check that the pointer is in alignment with the L.F. end of the scale, if necessary rotating the drive drum slightly on the gang spindle to correct any errors.

The Parts List. On pages 10 to 12 a list of component parts will be found. This is in two parts; in the first section the electrical components are listed, under their circuit numbers, with values, tolerances, and part numbers. In the second section an alphabetical list is given, containing those other parts which may require replacement.

It will be of considerable assistance if orders for spare parts contain the Part Number, in addition to the description, type, and serial number of the receiver, and component numbers, if any.

Certain components have several alternatives, but part numbers are quoted for the sake of completeness. The different components used in the U102A and TU102A are listed separately, although they are interchangeable in several cases.

THE TU102A RECEIVER

Differences from the U102A receiver are as follows:

(a) It is suitable for mains supplies from 105–130 volts, in addition to 200–250 volts.

(b) The mains voltage adjustment is different.

(c) The output and rectifier valves are of different types (Pen384 and U201).

(d) Gramophone pick-up sockets are fitted.

(e) The on-off switch is fitted to the volume control, instead of on the tone control.

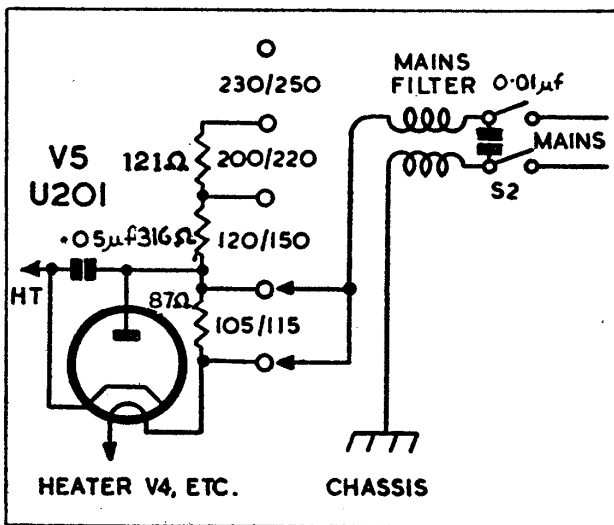
(f) The colour of the cabinet will normally be different.

(g) Small differences in components and wiring (I.F. assemblies etc.).

The mains rectifier is a U201 valve, which has an international octal valve base. The connections differ slightly from the British octal holder shown in the diagram on page 9 (for the U403 valve), and the following list gives the pin connections as seen from the base of the valve, numbering from the

spigot in a clockwise direction, together with typical voltage readings.

- Pin 1. Blank.
- Pin 2. Heater, 105v A.C. (with a supply of 240 volts on the 240-250 tap).
- Pin 3. Blank.
- Pin 4. Connected to pin 5.
- Pin 5. Anode, 120v A.C. (with a supply of 240 volts).
- Pin 6. Blank.



(TUI02A RECTIFIER CIRCUIT)

Pin 7. Heater.

Pin 8. Cathode, 100v D.C. (with a supply of 240 volts).

The mains adjustment is carried out by plugging the two-pin plug into the sockets on either side of the engraved voltage indication corresponding to the mains supply. The diagram shows the connections of the mains resistor.

The on/off switch is a toggle switch, operated by a lever on the volume control shaft.

An 0.01 mfd. 1000v fixed condenser (C27) is connected across the mains switch.

The output valve is a Pen384, which has slightly different characteristics from the Pen383 used in the U102A, and uses a bias resistor of 100 ohms. The base connections are the same as those shown in the diagrams.

Pick-up sockets are fitted, and any high impedance pick-up may be connected to the "P" and "U" sockets. The pick-up lead screening, and the motor board assembly should be connected to the socket "E". The circuit is as follows:

Socket "P"; via 0.01 mfd. (C41) (1000v wkg.) to volume control (test point 59).

Socket "U"; via 0.01 mfd. (C42) (1000v wkg.) to chassis (test point 6).

Socket "E"; direct to the Earth socket (test point 5).

TRIMMING INSTRUCTIONS

BEFORE trimming, see that the pointer is in alignment with the L.F. end of the scale when the gang condenser is at maximum capacity.

All adjustments are made for maximum reading on an output meter connected to the L.S. sockets, with the volume control at maximum, and the tone control turned fully clockwise. The Service Signal Generator output should always be adjusted to produce the lowest convenient meter reading which should not exceed 0.5 watts, or about 1 volt across the speech coil.

When trimming the I.F. transformers, it is necessary to remove the scale by releasing the scale clamp, as shown on page 2. **A non-metallic screwdriver is required when adjusting the U102A I.F. cores, and a 7 B.A. box spanner, or a screwdriver (depending on the type of stem which is fitted to the iron dust cores)**

will be required for adjusting the R.F. and Oscillator coils, and the TU102A I.F. transformers.

The iron dust cores of the U102A I.F. transformers are fragile, and care must be taken when adjusting them to avoid damage. It is advisable to unscrew the cores fully, and then to screw in for the peak reading on the meter. This avoids the possibility of screwing the core in too far, when it may become disengaged from the paxolin retaining piece in the coil former; it also ensures that the coil is trimmed correctly. If the core does fall into the coil former, the opposite core must be removed and the loose core can then be re-started in its thread. In some receivers it may be necessary to remove the complete assembly to do this.

The oscillator frequency is higher than the signal frequency on all bands.

TRIMMING TABLE

General notes and instructions are given on the previous page.

CIRCUIT	NOTES	SERVICE SIG. GEN. FREQUENCY	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 before adjusting	465 Kc/s	Via 0·1 mfd. Condenser	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 before adjusting	465 Kc/s	Via 0·1 mfd. Condenser	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.)	Via Dummy Aerial	Aerial Socket	42 m.	S.W.	S.W. Osc. coil (L10) S.W. Grid coil (L2)
		15·25 Mc/s (19·7 m.)	Via Dummy Aerial	Aerial Socket	19·7 m.	S.W.	S.W. Osc. trimmer (C13)
M.W.	Repeat these adjustments until there is no further improvement	600 Kc/s (500 m.)	Via Dummy Aerial	Aerial Socket	500 m.	M.W.	M.W. Osc. coil (L10) M.W. Grid coil (L4)
		1363 Kc/s (220 m.)	Via 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.)	Via Dummy Aerial	Aerial Socket	1900 m.	L.W.	L.W. Osc. coil (L12) L.W. Grid coil (L6)
		300 Kc/s (1000 m.)	Via Dummy Aerial	Aerial Socket	1000 m.	L.W.	L.W. Osc. trimmer (C15)

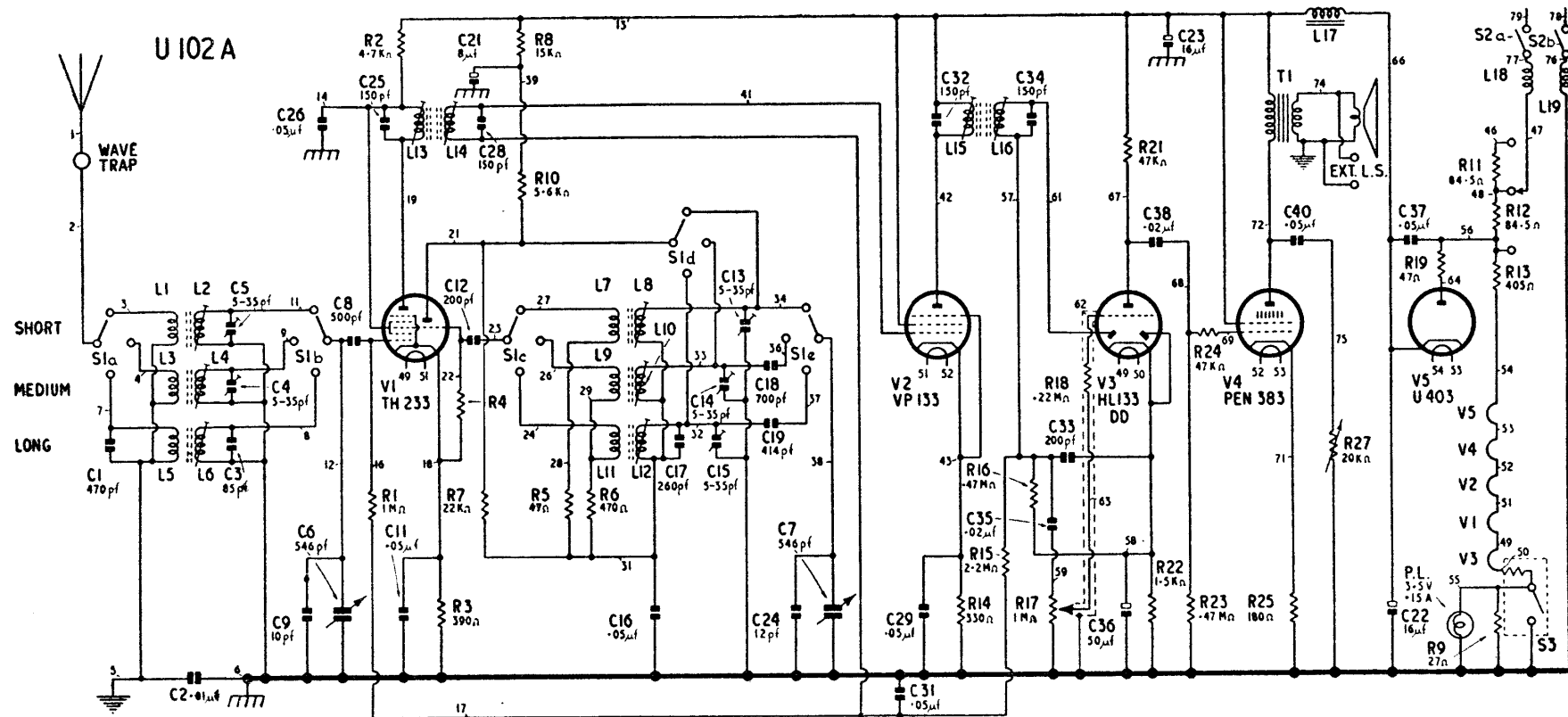
AERIAL FILTERS

Provision is made for the addition of an aerial filter, which may be required if M.W. reception is spoiled by tunable whistles, due to a local station overloading the frequency changer.

When an aerial filter is fitted this should be tuned for minimum signal on the local broadcast station. Connect an 0-10 voltmeter between V2 cathode and chassis, tune exactly to the local station, and then adjust the filter for maximum voltage reading.

The aerial filter should be mounted on to the left-hand chassis strap with the socket and coils facing towards the left. In this position the coils are easily adjusted and the socket is directly behind the hole in the cabinet back.

When ordering aerial filters, please state the frequencies required.



COIL RESISTANCES

Measured with Avometer type 7

COIL	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13
OHMS	—	—	0.5	2.2	24	14.5	—	—	0.5	1.2	0.7	1.7	5.5

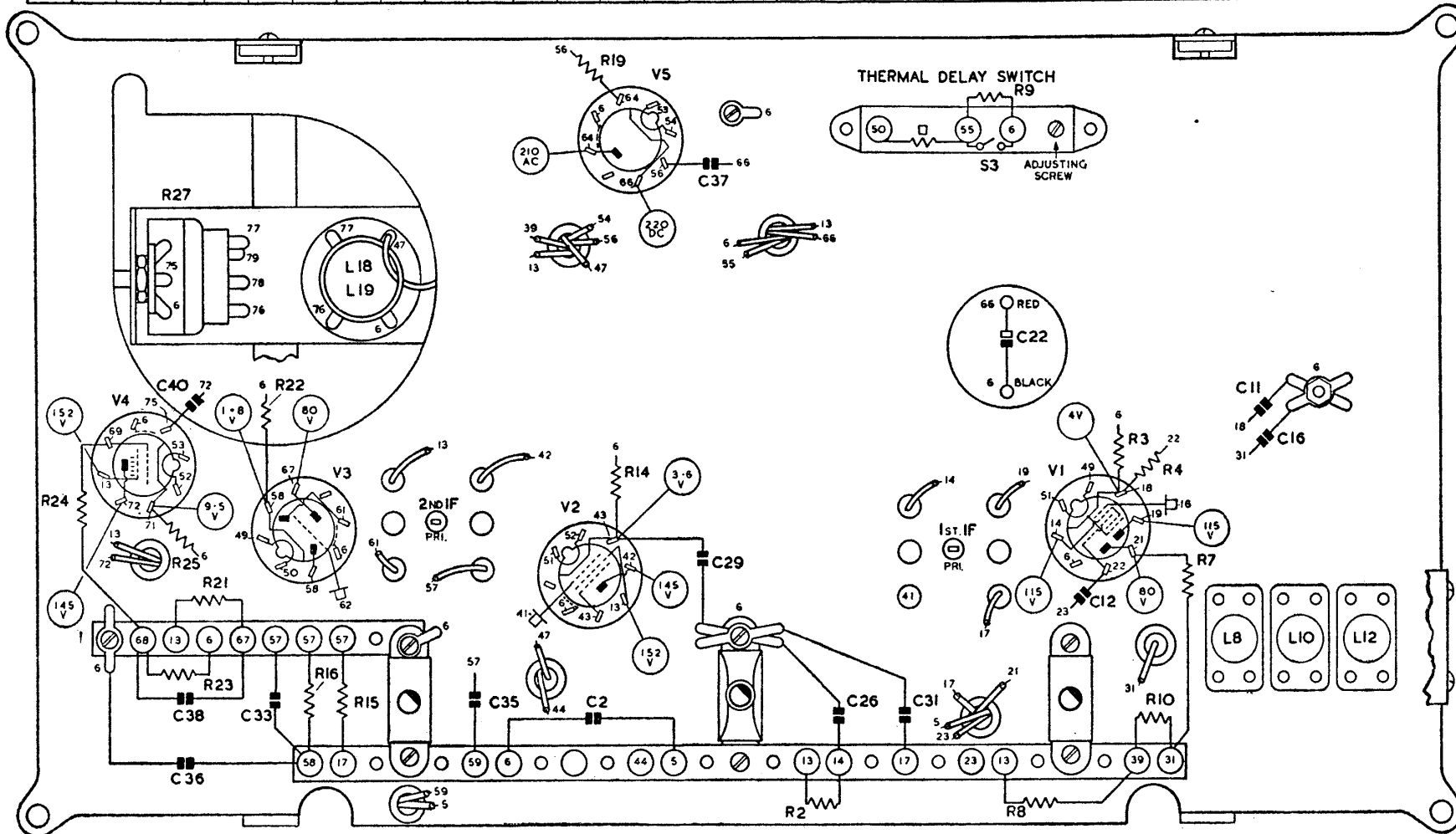
COIL	L14	L15	L16	L17 (U102A)	L17 (TU102A)	L18	L19	T1 Pri. (U102A)	T1 Pri. (TU102A)
OHMS	5.5	5.5	5.5	250	120	5.7	5.7	110	75

VOLTAGE TABLE

Measured with Avometer type 7 (no signal conditions)

ELECTRODE	V1	V2	V3	V4	V5
Cathode	4	3.6	1.8	9.5	220
Anode	115	151	80	145	210
Screen	115	152	—	152	—
Osc. Anode	80	—	—	—	—

R	24	27 25 23	21	22	16	15				19 14					9	8	3	4 10	7					
C		40 38 36		33				35		2				37 29		22		12						11 16
L						18 19																8	10	12
MISC	V4				V3					V2	V5				S3			V1						



UI02A UNDERNEATH VIEW

Voltages are measured between test points and chassis, using an Avometer type 7, with the receiver switched to M.W. and working on 230 volt mains, under no signal conditions. All figures are approximate and variations may occur without affecting the performance of the receiver.

PARTS LIST

Components marked with an asterisk (*) should normally be returned to Murphy Radio Ltd Service Department by dealers in the United Kingdom.

CIRCUIT NO.	VALUE	PART NO.	REMARKS	CIRCUIT NO.	VALUE	PART NO.	REMARKS	
C1	470 pf.	23639	10% P.S.M.	C42	0.01 mfd.	41419	TU102A only, P.U. circuit 1000 v.w.	
C2	0.01 mfd.	41419	25% 1000 v.w.	R1	1 MΩ	27461	20% Y9	
C3	85 pf.	28177	3% P.S.M.	R2	4.7 KΩ	25189	10% Y9	
C4	5/35 pf.	37480	Trimmer	R3	390 Ω	24773	10% Y9	
C5	5/35 pf.	37480	Trimmer	R4	15 KΩ	27109	20% Y9	
C6/C7	546 pf.	48504	Gang Condenser (for U102A)	R5	47 Ω	24421	10% Y9	
	546 pf.	42036	Gang Condenser (for TU102A)	R6	470 Ω	24805	10% Y9	
C8	500 pf.	23966	20% M.M.	R7	22 KΩ	25445	10% Y9	
C9	10 pf.	23601	10% P.S.M.	R8	15 KΩ	25389	10% Y8	
C11	0.05 mfd.	41403	20% 350 v.w.	R9	27 Ω	24348	10% Z2	
C12	200 pf.	23900/1	20% M.M.	R10	5.6 kΩ	25221	10% Y9 U102A	
C13	5/35 pf.	37480	Trimmer	R10	1 KΩ	26885	20% Y9 TU102A	
C14	5/25 pf.	37480	Trimmer	R11	84.5 Ω	42431	Mains Resistor for U102A only	
C15	5/35 pf.	37480	Trimmer	R12	84.5 Ω			
C16	0.05 mfd.	41403	20% 350 v.w.	R13	405 Ω	47740	Mains Resistor for TU102A only	
C17	260 pf.	28170	3% P.S.M.	R11	121 Ω			
C18	700 pf.	28175	5% P.S.M.	R12	316 Ω			
C19	414 pf.	28176	5% P.S.M.	R13	87 Ω			
C21	8 mfd. }	46507	Dry Electrolytic	R14	330 Ω	24741	10% Y9	
C22	16 mfd. }	46503	350 v.w.	R15	2.2 MΩ	27525	20% Y9	
C23	16 mfd.		Dry Electrolytic	R16	0.47 MΩ	27397	20% Y9	
			350 v.w.	R17	1 MΩ	48042	Volume Control	
C21	8 mfd. }	46505	For TU102A. When available	R18	0.22 MΩ	27333	20% Y9	
C22	16 mfd.				R19	47 Ω	26652	20% Z2
C23	16 mfd.				R21	47 kΩ	27205	20% Y9
C24	12 pf.			23607	10% P.S.M.	R22	1.5 KΩ	24997
C25	150 pf.	28169	5% P.S.M.	R23	0.47 MΩ	27397	20% Y9	
C26	0.05 mfd.	41403	20% 350 v.w.	R24	47 KΩ	27205	20% Y9	
C27	0.01 mfd.	41419	TU102A 20% 1000 v.w.	R25	180 Ω	24653	10% Y8 U102A	
				R25	100 Ω	24557	10% Y8 TU102A	
C28	150 pf.	28169	5% P.S.M.	R27	20 KΩ	49213	Tone Control with Switch (U102A)	
C29	0.05 mfd.	41403	20% 350 v.w.			49214	Tone Control without Switch (TU102A)	
C31	0.05 mfd.	41403	20% 350 v.w.					
C32	150 pf.	28169	5% P.S.M.	S1	—	42069	Waverange switch	
C33	200 pf.	23900/1	20% M.M.	S2	—	49213	With tone control for U102A	
C34	150 pf.	28169	5% P.S.M.			47820	Toggle switch for TU102A	
C35	0.02 mfd.	41402	20% 350 v.w.	S3	—	49637	Thermatrol	
C36	50 mfd.	31315	Tubular Electrolytic 12 v.w.			16881	3.5 volt, 0.15 amp. miniature screw	
C37	0.05 mfd.	41421	20% 1000 v.w.					
C38	0.02 mfd.	41451	20% Neoprene sleeved					
C40	0.05 mfd.	41421	20% 1000 v.w.					
C41	0.01 mfd.	41419	TU102A only, P.U. circuit 1000 v.w.					

COIL NO.	PART NO.	D.C. RESISTANCE	REMARKS	COIL NO.	PART NO.	D.C. RESISTANCE	REMARKS
L1 } L2 }	42387	—	S.W. Aerial	T1	46576	110 Ω	U102A O.P.T. (sec. less than 0.5 Ω)
L3 } L4 }	42391	0.5 Ω 2.2 Ω	M.W. Aerial	T1	39253	75 Ω	TU102A O.P.T. (sec. less than 0.5 Ω)
L5 } L6 }	42388	24 Ω 14.5 Ω	L.W. Aerial	VALVES			
L7 } L8 }	42386	—	S.W. Oscillator				
L9 } L10 }	42390	0.5 Ω 1.2 Ω	M.W. Oscillator	NO.	REMARKS	TYPE	
L11 } L12 }	42389	0.7 Ω 1.7 Ω	L.W. Oscillator	V1	Valves should be obtained direct from the valve manufacturers or distributors	TH233	} For TU102A
L13 } L14 }	48467 (42070)	5.5 Ω 5.5 Ω	1st I.F.T. U102A (TU102A)	V2		VP133	
L15 } L16 }	48467 (42070)	5.5 Ω 5.5 Ω	2nd I.F.T. (U102A) (TU102A)	V3		HL133DD	
L17 }	39276	250 Ω	Smoothing choke U102A	V4		PEN384	
				V5		U201	
L17 }	39262	120 Ω	Smoothing choke TU102A	V1	Valves should be obtained direct from the valve manufacturers or distributors	TH233	} For U102A
L18 } L19 }	49044	5.7 Ω 5.7 Ω	Mains filter	V2		TP133	
				V3		HL133DD	
				V4		PEN383	
				V5		U403	

ALPHABETICAL PARTS LIST

(Excluding fixed resistors and condensers)

DESCRIPTION	REMARKS	CIRCUIT NO.	PART NO.
B Back, Cabinet	For U102A receiver	—	49597
	For TU102A Receiver	—	49682
Bracket	For Tone Control (TU102A)	—	49683
	For Tone Control and Filter (U102A)	—	49594
	For Mains Socket Panel (TU102A)	—	47715
	For Oscillator Coils	—	42042
Buffers, Rubber	For Supporting Scale	—	37494
C Cabinet	For TU102A	—	42067
	For U102A	—	49604
Cap, Screening	For V3 Grid Cap, complete with lead	—	46099
Carrier	For Scale Pointer	—	42037
Choke	Smoothing	L17	39276
	Mains Filter	L18, L19	49044
Clamp	For Tuning Scale (Reflector)	—	42774
	For Two Electrolytic Condensers	—	48275
	For One Electrolytic Condenser (TU102A)	—	43009
	Bar Nut Type, for Mains Filter (TU102A)	—	49596
	Hook Type, for Mains Filter (U102A)	—	48193
Condenser	Gang	C6, C7	48504
Cord Drive	33" for Tuning Drive	—	Spec. 935
	33" for Pointer Drive	—	Spec. 936
Cores, Iron Dust	For R.F., Osc., and TU102A I.F. (with stem)	—	44394
	For U102A I.F.s only	—	46911

DESCRIPTION	REMARKS	CIRCUIT NO.	PART NO.
C "C" Clip	For Tuning Control Spindle	—	42580
Clip Valve	For Valve Grid Top Caps	—	6678
*Coils	S.W. Aerial and Grid	L1, L2	42387
*	M.W. Aerial and Grid	L3, L4	42391
*	L.W. Aerial and Grid	L5, L6	42388
*	S.W. Oscillator	L7, L8	42386
*	M.W. Oscillator	L9, L10	42390
*	L.W. Oscillator	L11, L12	42389
*	I.F.T. (Complete Assembly) U102A	L13/14, L15/16	48467
*	I.F.T. (Complete Assembly) TU102A	L13/14, L15/16	42070
D Drive Drum	Black Bakelite (Pulley)	—	42044
Diffuser	For Reflector	—	42025
F Flywheel	Complete with spindle	—	42648
Filter	Mains	L18, L19	49044
G Gang Condenser	—	C6, C7	48504
H Holder	For Pointer	—	42037
	For Scale Lamp	—	42040
I *I.F. Transformer	Complete Assembly (U102A)	L13/14, L15/16	48467
*	Complete Assembly (TU102A)	L13/14, L15/16	42070
Indicator	Pointer Wire	—	43271
Insulating Panel	For Tone Control Bracket	—	49684
K Knob, Plain	For Volume Control (U102A)	—	49650
	(TU102A)	—	37553
Knob, Large	For Tuning Control (U102A)	—	49651
	(TU102A)	—	42394
Knob, L.M.S.	For Waverange Control (U102A)	—	49607
	(TU102A)	—	42773
Knob, Tone	(U102A)	—	49595
	(TU102A)	—	49691
L Lamp Holder	—	—	44117
Lamp, Pilot	3.5 volt, 0.15 amp.	—	16881
Loudspeaker	(U102A)	—	46471
	(TU102A)	—	46646
M*Mains Filter	—	L18, L19	49044
Mains Resistor	(U102A)	R11, R12, R13	42431
Mains Resistor	(TU102A)	R11, R12, R13	47740
Mounting Rubbers	For Scale	—	37494
N Nut, Bar	For Fixing Mains Filter	—	49596
O *Output Transformer	(U102A)	T1	46576
	(TU102A)	T1	39253
P Panel, Mains	For TU102A with Sockets	—	47803
Panel, Socket	A and E	—	44234
	L.S.	—	44237
	P.U. and L.S. for TU102A	—	48004
Pilot Lamp	3.5 volt, 0.15 amp.	—	16881
Pointer	Tuning	—	43271
Plugs, Aerial	—	—	37974
Plugs, Earth	—	—	37975
T Tone Control	With Switch for U102A	R27/S2	49213
	Without Switch for TU102A	R27	49214
V Valve Holder	British Octal (for all Valves except U201 in TU102A)	—	3975
Valve Holder	International Octal (for U201)	—	5687
Volume Control	—	R17	48042
Valve Clip	For Top Cap Grid Connection	—	6678
Valve Screen	For V3 Grid, complete with lead	—	46099
W Wave range Switch	Complete	S1a-S1e	42069