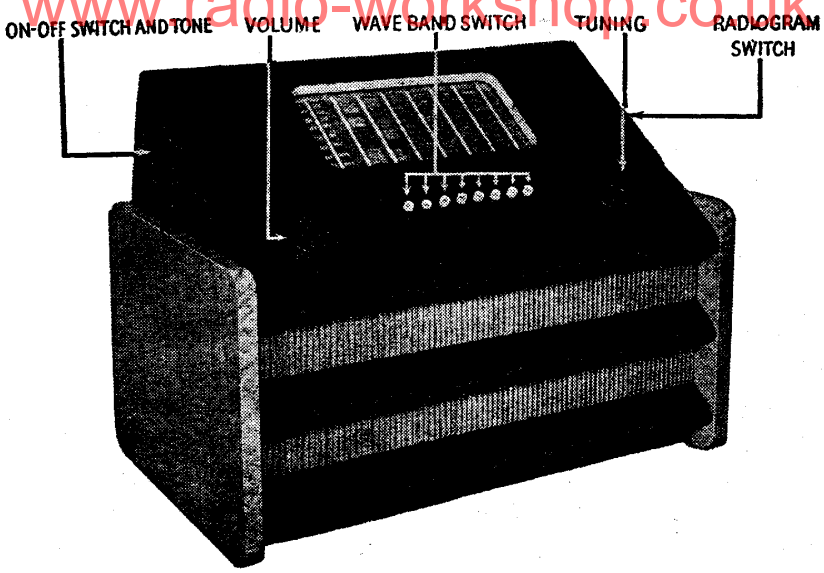
AI28 & UI28

MURPHY SERVICE INSTRUCTIONS

Issued by

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

A128 & U128



MAINS SUPPLIES:	A128:	105-150 volts, 210-260 volts A.C., 50-100 cycles
	U128:	200-250 volts D.C. 200-250 volts A.C. 25-100 cycles
WAVE RANGES:		Long Wave Band: 1000–2050 Metres Medium Wave Band: 200–550 Metres Short Wave Band: 75–200 Metres 41/49 Metre Band: 40–50·5 Metres 31 Metre Band: 30·1–32·1 Metres 25 Metre Band: 24·5–26 Metres 19 Metre Band: 19·1–20·2 Metres 16 Metre Band: 16·5–17·3 Metres
INTERMEDIATE FREQUENCY:		465 Kc/s
VALVES:	A128:	Mazda SP41, TH41, VP41, HL41DD, PEN45, UU6
	U128:	Mazda SP181, TH233, VP133, HL133DD, PEN383, U403
PILOT LAMPS:	A128:	Four 6·2 volt, 0·3 amp. (Miniature Screw)
	U128:	One 250 volt, 15 watt B.C. Sign Type Pigmy
SPEECH COIL IMPEDANCE:		2·5 ohms
EXTENSION LOUDSPEAKER:		3 to 7 ohms
PICK-UP SOCKETS:		High Impedance Input
CABINET DIMENSIONS:		21 in. by 13 in. by 16½ in. high
TOTAL WEIGHT:	A128:	36 lb.
	U128:	32 lb.
CONSUMPTION:	A128:	65 watts approx.
	U128:	85 watts approx.

www.radio-workshop.co.uk

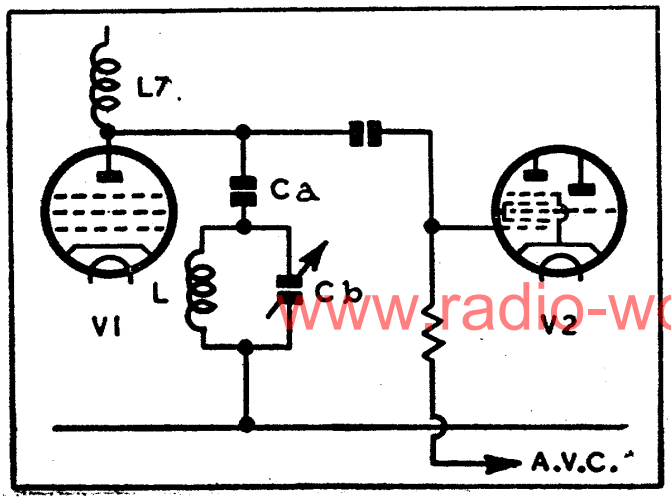
INTRODUCTION

THE "128" receivers have been designed to provide a high standard of reception, particularly on short-waves. The high sensitivity and signal to noise ratio are largely due to the use of an R.F. Amplifier with a mutual conductance of over 8mA. per volt. The performance is, of course, dependent on accurate alignment, and in cases where re-alignment is necessary the instructions given on page 8 must be carefully followed. When adjusting the oscillator circuits, it should be realized that a small calibration error will be very apparent on the tuning scale. Thus a 3 per cent error when adjusting the 16 m. band will take the stations marked, right off the scale. If the calibration on short-waves is adjusted, it should be checked by known stations on each band.

The aerial input passes through a rejector circuit tuned to 465 kc/s (the Intermediate Frequency). On the five short-wave bands the input circuits are broadly tuned to the mid-points of the bands, and all are tuned by C6. It will be seen that the R.F. Amplifier V1 is in circuit only on the five short-wave bands; on these bands, the aerial is connected to the junction of C2 and C3, which form a capacitative tap across the S.W. aerial coils.

The coupling between V1 and V2 (the frequency changer) may appear somewhat complex. The basic arrangement, however, is as shown in the diagram below.

The value of Ca is chosen so that when L-Cb are tuned to the required signal frequency, Ca-LCb



are tuned as a series resonant circuit to the image frequency. The result is that while the wanted station is selected for further amplification, stations on or near the image frequency are rejected. In practice the rejection obtained varies somewhat, but averages 100 : 1 (or 40 db) for all bands.

Bandspreading is effected by connecting suitable condensers in series and in parallel with each section of the gang condenser, thus decreasing the frequency range covered on the band.

On the 16 metre and 19 metre bands, R4 is short-circuited, to decrease the standing bias on the R.F. valve, and increase the stage gain on these bands. The anode current is increased, and therefore some change of voltages occur throughout the receiver.

On the three lower frequency bands (S, M, and L) the signal is passed to the single preselector preceding the frequency changer.

Automatic volume control bias is applied to the frequency changer and I.F. valves, and is undelayed.

The U128 receiver is very similar in general arrangement to the A128 (the A.C. model), except for the power supply circuits. It will be noted that the chassis of the U128 is connected to one side of the mains, and for this reason the pick-up sockets are isolated by means of two ·01 μF. condensers rated at 1000 v.w.

The Waverange Switching arrangements are worthy of special attention. It should be noted that the aerial connection to the 16, 19, 25, 31, and 41 metre bands is via the aerial switching sections of the S, M, and L switches. Thus an open circuit in one of the latter sections, whilst not affecting the band associated with it, may produce a considerable reduction of gain or even no signals, on the higher frequency bands (e.g. low gain or no signals on all bands but the L.W. band may be due to an open circuit in the L.W. aerial switching section when the L.W. button is out).

Similar results may be caused by the V2 control grid circuit switching on S, M, and L bands. The connection between V2 control grid and the 16 to 41 metre band tuned circuits is by way of the S, M, and L switches.

In addition it will be seen that the oscillator coils,

and the 16 to 41 metre R.F. coils are short-circuited when not in use. If a switch develops an open circuit, the coil may resonate (with its self capacity) in some higher frequency band, causing a sharp drop in gain, or even no signals, at one point. The simplest way to check this is to short circuit each of the lower frequency coils in turn.

The Diagrams. The diagrams on pages 10 to 17 contain most of the information required for carrying out normal service work. To make full use of these pages, it should be noted that the circuit diagrams are numbered at each "junction point" so that every component has a number at each terminal. These "test point numbers" are marked at the ends of the components in the underside and top views of the chassis, so that the respective terminals may easily be identified with those on the circuit diagram. Separate sets of drawings are given for the A128 and U128 receivers. To locate any required component on the layout diagrams, the indicating panel given above the drawing will be useful.

MECHANICAL NOTES

Chassis Mounting. The chassis is mounted in the cabinet on rubber supports, in order to reduce microphonic feed-back. During transit, however, it is fixed securely; before the receiver is put into use the four chassis fixing bolts should be unscrewed until the rubber is only just compressed. If it is necessary to pack a receiver for subsequent transport, the bolts should be screwed tight.

To remove the Chassis take off the four control knobs and release the tone control and radio-gram switch from the cabinet brackets. After removing the loudspeaker plugs, and the chassis bolts, the chassis can be lifted clear of the cabinet. The loudspeaker leads are of sufficient length to allow for reconnection when the chassis has been withdrawn from the cabinet.

Temporary mountings for the tone control and the radio-gram switch are available on the chassis. The tone control may be fixed in the hole near the mains transformer, as shown in the top and underneath views, and the radio-gram switch may be fixed in the hole in the rear of the chassis near the P.U. sockets, with the control spindle under the chassis. (It may be necessary to remove the clamp on the reflector bracket so that no undue strain is placed on the leads.)

Note that in this position the radio-gram switch contacts are exposed and some are "live". It may therefore be secured to the reflector bracket by a small bolt and nut, if the switch has not to be operated.

To replace the press-button unit, remove the paxolin cover-plate, and the metal screen beneath the switch. Unsolder the 17 connecting wires and remove the four fixing bolts. The A128 and U128 tuning units are identical, except for R13, which is 15 KΩ ½W. in the U128, and 39 KΩ 1W. in the A128, and also R16 which is left out of the U128.

When wiring a new switch or complete tuning unit, it is vital that the earthing connections should be correctly positioned. As it is also important that certain of the R.F. connections should be accurately placed, it is recommended that a sketch should be made of the original wiring before it is disturbed. This can then be used as a guide when re-wiring. Always replace the paxolin plate after removal to exclude dust, which is very harmful to the switch.

The Tuning Drive. The flywheel and tuning spindle are supported by the drive bracket, and the flywheel is held in place by the "C" clip which fits into a groove on the spindle. This clip can be removed by means of a fine screwdriver, and replaced with a pair of pliers. The drive bracket also supports the die-cast drum (D) the short spindle being secured in place by two grub-screws.

The drum (D) is fitted with a stop (H) which allows a rotation of rather more than 360°, and it should stop the drive (B) when the gang condenser is at maximum and minimum capacity. This drive drum has a polished edge, which should be lightly greased, in order that the spring can take up any slack which may develop when turning the tuning control. If there is too much friction on its drive (drive "A" in diagram) there is a possibility that the cord may fall off the tuning control spindle, due to

the sloping position of the chassis in the cabinet.

The bakelite drive drum (E) should be secured to the gang condenser so that the holes in the rim will correspond with the diagrams. It should also be set so that it clears the screws for the scale support, and the groove on the drum is in line with the metal die-cast drum (D). To remove the drum (E) it is necessary to move either the gang condenser or the drive bracket.

The Cord Drives. The tuning drive on these receivers employs three separate cord drives, *i.e.*, the flywheel drive "A", the gang condenser drive "B", and the cursor drive "C". A fairly thick cord (plaited and waxed hemp cord, Spec. 935, as supplied by Murphy Radio Ltd) is used for the cord drives "A" and "B", while a thinner cord is used for the cursor drive. Three different sizes of tension spring are used for the drives, the strongest being used on the flywheel drive, and the lightest on the cursor drive. As a general rule, when fitting the springs they should be tied to the cord as near as possible to the inside edge of the respective drive drums. Then when the other end of the spring is hooked into the appropriate fixing hole, the spring should be within the small permissible tolerance of the quoted dimensions.

The diagrams show the general arrangements, and the following notes may be of assistance when refitting the cord drives.

To replace the cord drives "B" and "C" the flywheel and the spindle should first be removed together with drive "A", by releasing the "C" clip on the tuning shaft. The tuning scale should be removed when replacing drive "C". It is not necessary of course to remove the scale or the flywheel when replacing the drive "A".

When re-assembling the complete drive, it is advisable to proceed in the following order: drive "B", drive "C", then drive "A". First set the gang condenser to maximum capacity, and the drive drums as shown in the diagrams. Pieces of adhesive tape may be useful, to prevent the cord from slipping off the drive drums.

Drive "B". Pass the centre of a 36" length of drive cord (Spec. 935) round the boss of the die cast drive drum "D". After knotting the cord round the boss, pass the two ends through the hole and round the drum and the rear groove of the bakelite drive drum "E" as shown in the diagrams, and then through the lower hole in the drive drum. Tie the medium strength spring as close to the inside edge of the drum as possible, and hook the other end of the spring into the fixing hole as shown.

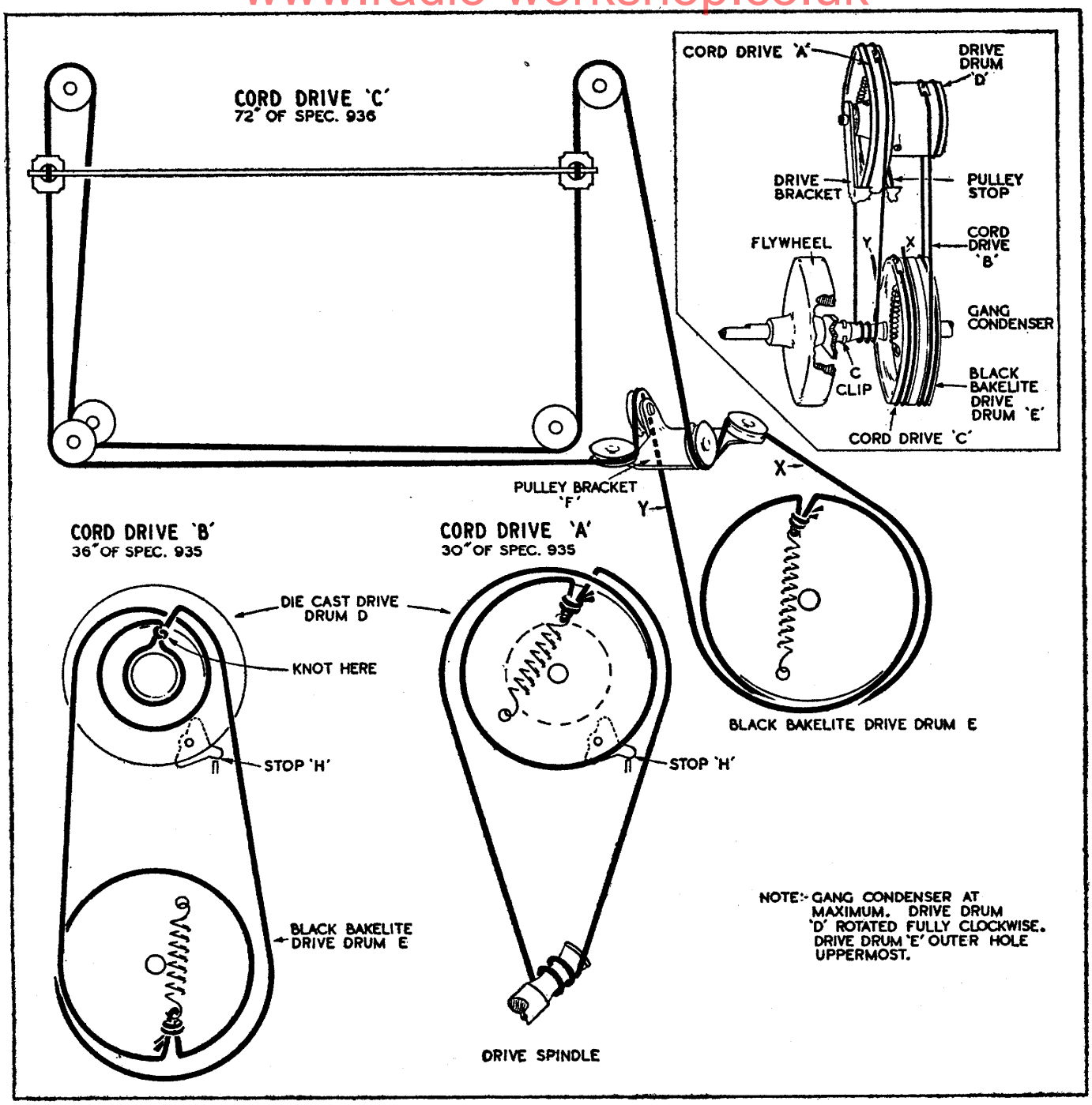
Drive "C". Tie one end of a 72" length of drive cord (Spec. 936) to the looped end of the weakest spring, and thread the other end from the inside, through the upper hole in the bakelite drive drum "E", round the front groove in a clockwise direction, to the pulley bracket "F" (cord Y on diagram). Continue round the reflector pulleys, back to the pulley bracket "F" and nearly a complete turn round the drive drum "E" again, to the hole. Knot this end also on to the spring, as near to the inside edge as possible, and hook the other end of the spring into the securing hole. A piece of adhesive tape may be useful in preventing the cord from slipping off the flat edge of the drive drum "E".

Drive "A". First, replace the flywheel and spindle in the drive bracket, and fix the "C" clip on to the shaft, with a pair of pliers, so that the flywheel spins easily, but has not an excessive amount of end play.

Tie one end of a 30" length of drive cord (Spec. 935) on to the loop of the strongest spring, and pass the other end from the inside, through the hole in the die cast drum "D", then round the drive spindle, back round the drum and through the hole. Tie the end on to the spring, as near the inside edge as possible, and hook the other end of the spring into the fixing hole.

Spin the flywheel, and see that the operation of the drive is satisfactory. Set the gang condenser again to maximum capacity and see that the drum assembly stop "H" has stopped against the drive bracket, then fix the cursor in its approximate position near the top of the reflector. Refit the scale, and line up the cursor by moving it up or down as required, so that the centre of the cursor is in alignment with the top edges of the scale apertures.

The Oscillator and R.F. Coupling Coils are held in position by speed nuts. They can be removed by lifting one of the lips of the nut with a small screwdriver. To fit a new coil, place it in position with the spigot correctly located; put the speed nut on the spigot, and then a hollow tool, such as a



128 TUNING DRIVE

box spanner, over it. If the spanner is now given a sharp blow it will push the speed nut against the panel, and cause it to grip the coil former.

The iron-dust cores are fitted with threaded studs, which screw into the bakelite formers. The cores are held in position by the anti-backlash wires which are passed above and below alternate core studs.

Tuning Drift. To reduce changes in calibration on the Short Wave Bandspread Bands due to warming up or other temperature changes, the condenser C27 in the oscillator circuit is of a special type having a negative temperature coefficient. If it becomes necessary to change this component, an exact replacement must be used.

The Press Buttons are fixed to their shafts by an adhesive known as "Bostik". To remove a button, it is only necessary to heat the shaft

slightly with a soldering iron; this will warm the "Bostik" sufficiently to allow the button to be pulled off. The same process can be used when refixing a button. If "Bostick" is not available a rubber based, non-hardening cement may be used.

The I.F. Transformers. If access is required to the components of the I.F. transformers, the screening cans may be removed in the following way: unscrew the two self-tapping screws, and bend back the securing tabs, which can be seen through the holes in the chassis, using a small screwdriver. The piece of insulating material should be wrapped round the coil assembly before replacing the can.

The iron-dust cores are threaded on the outside, and U-shaped pieces of paxolin, fitting into slots in the coil former, hold them in position. If the cores are screwed in too far, they will become disengaged from the U-shaped pieces. If this occurs the opposite core must be removed, in order to start the loose core in its thread. When retrimming I.F. circuits, the cores should be unscrewed fully and then screwed in until the circuit peaks. A non-metallic screwdriver must be used to turn these cores.

The Dial Lamps. The U128 uses a pigmy, or sign, type of 250 volt 15 watt lamp, with a standard bayonet type of mounting. To remove the scale lamp bracket the nuts at the end should be unscrewed.

The A128 uses four clear 6·2 volt 0·3 amp. lamps, with a miniature Ediswan screw base. The bracket may be removed as described above.

Both the U128 and A128 receivers are fitted with a diffuser, which is clamped under the reflector bracket screws.

AERIAL FILTERS

When the A128 or U128 receiver is operated within three or four miles of a powerful transmitter the reception of some other stations may be spoiled by whistles. This is due to the overloading of the frequency changer valve. In order to eliminate this form of interference, suitable filters can be supplied by Murphy Radio, and are in the form of single or double units according to the number of stations causing trouble. The arrangement decided upon will be determined by local conditions.

There are three standard filters covering wave-ranges as under:

A: 200–300 metres (1500–1000 Kc/s)
B: 300–428 metres (1000– 700 Kc/s)
C: 428–600 metres (700– 500 Kc/s)

The filter is adjusted by connecting an output meter to the Ext. L.S. sockets and a service signal generator through a dummy aerial to the aerial socket. Set the signal generator to the frequency of the local transmitter and turn the filter core for minimum output. When a double unit is used the same procedure is followed for each section.

It is an easy matter to mount the filter unit in position upon the left-hand side of the wooden rail at the back of the cabinet; a bracket (Dwg. No. 50081) is supplied for this purpose. When secured the unit should be flush with the rear edge of the rail and the adjusting screw or screws should be uppermost.

NOTE: The chassis cannot be taken out of the cabinet without first removing the filter unit from its mounting.

"MURPHY NEWS"

Topical articles on Service matters, as well as technical information on new models, are frequently printed in the MURPHY NEWS which is dispatched each month to all Murphy Dealers throughout Great Britain and Northern Ireland.

NOTES AND MODIFICATIONS

Details of any modifications to the A128 and U128 receivers should be noted in the space below. It is also suggested that information regarding elusive faults which may have been experienced should be added for future reference.

CIRCUIT ALIGNMENT

THE chassis must be removed from the cabinet before any circuit adjustments can be made.

All adjustments should be made for maximum output on a meter connected to the L.S. sockets, with the volume control turned to maximum, and the tone control turned fully clockwise. The Service Signal Generator output should always be set so that the receiver output is less than 0·5 watts (or about 1 volt across the L.S. sockets with the internal speaker in circuit).

Before starting any adjustments check the following: The centre of the indicator should be parallel to, and coincide with, the top edges of all the scale apertures when the drive stop operates. At this point the gang condenser must be at maximum capacity.

The iron-dust cores of the A128 and U128 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 them 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 tuned 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.

A non-metallic screwdriver is required when adjusting the I.F. cores.

The table gives the trimming instructions for the L, M, and S bands; the trimming of the bandspread bands, which is very critical, follows it.

ALIGNMENT TABLE

L, M, AND S BANDS

CIRCUIT	NOTES	SIG. GEN. FREQUENCY	SIG. GEN. TERMINATION	CONNECT SIG. GEN. TO	RECEIVER SETTING	RECEIVER RANGE	ADJUSTMENTS
I.F.	Unscrew all cores to fullest extent	465 Kc/s	Via 0·1 mfd. Condenser	V3 control grid	550 Metres	M	2nd I.F. Pri. (L36) under chassis. 2nd I.F. Sec. (L37) top of chassis. DO NOT READJUST
		465 Kc/s	Via 0·1 mfd. condenser	V2 control grid	550 Metres	M	1st I.F. Pri. (L34) under chassis. 1st I.F. Sec. (L35) top of chassis. DO NOT READJUST
I.F. Rejector	Adjust for minimum output	465 Kc/s	Via dummy aerial	Aerial socket	550 Metres	M	L1 (under chassis) for minimum signal
L	Repeat these adjustments until there is no further improvement	158 Kc/s (1900 m.)	Via dummy aerial	Aerial socket	1900 Metres	L	L. Osc. coil (L32) L. Aerial coil (L9) (on switch panel)
		300 Kc/s (1000 m.)	Via dummy aerial	Aerial socket	1000 Metres	L	L. Osc. trimmer (C38) (on switch panel)
M	Repeat these adjustments until there is no further improvement	600 Kc/s (500 m.)	Via dummy aerial	Aerial socket	500 Metres	M	M. Osc. coil (L31) M. Aerial coil (L11) (on switch panel)
		1363 Kc/s (220 m.)	Via dummy aerial	Aerial socket	220 Metres	M	M. Osc. trimmer (C36) (on switch panel) M. Aerial trimmer (C7) (under chassis end trimmer)
S	Repeat these adjustments until there is no further improvement	1·666Mc/s (180 m.)	Via dummy aerial	Aerial socket	180 Metres	S	S. Osc. coil (L29) S. Aerial coil (L13) (on switch panel)
		3.75 Mc/s (80 m.)	Via dummy aerial	Aerial socket	80 Metres	S	S. Osc. trimmer (C33) (on switch panel) S. Aerial trimmer (C8) (under chassis centre trimmer)

Note that the oscillator frequency is below the signal frequency on the five short-wave band spread bands, but it is above the signal frequency on the L, M, and S bands.

TRIMMING THE 16, 19, 25, 31, and 41 m. BANDS

Trimming on all bandspread bands is extremely critical, and is carried out in the factory with the aid of crystal controlled oscillators. The type of Service Signal Generator generally available will not give the required order of accuracy, and the following procedure is recommended.

1. For receivers requiring only minor trimming adjustments.

(*a*) Check the calibration of the receiver by tuning to stations of known frequency near the centre of the bands. If there are any calibration errors, make *small* adjustments to the appropriate oscillator coil to correct them.

(*b*) Set the receiver scale in turn to each of the frequencies or wavelengths or other settings given in the S.W. trimming table.

(*c*) Connect the Service Signal Generator to the receiver through a dummy aerial and tune it to produce maximum output at each setting of the receiver.

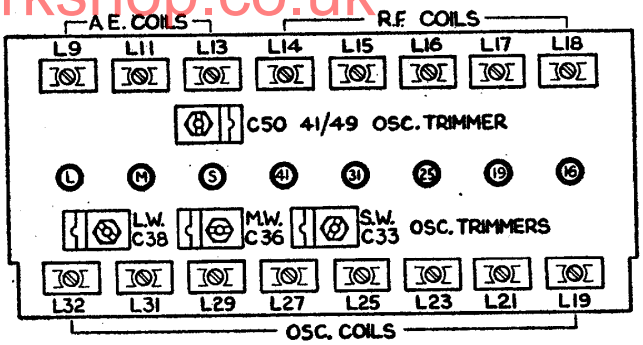
(*d*) Adjust the appropriate R.F. coil (and the aerial trimmer on the 31 metre band) for maximum gain; the tuning control should be rocked to overcome the effect of "oscillator pulling".

2. For receivers where major trimming adjustment is required; e.g.

Receivers in which the tuned circuits have been maladjusted, or in which tuning components have been replaced.

(*a*) Connect the Service Signal Generator to the frequency changer grid cap through a 0·1 mfd. condenser.

(*b*) Press the appropriate switch button and set the scale to the trimming frequency given in the S.W. trimming table.



NOTE:-MW. SW. AND 31 M. AE. TRIMMERS UNDER CHASSIS (31 M. TRIMMER ADJACENT TO L6) I.F.T. PRIMARIES UNDER CHASSIS. I.F.T. SECONDARIES ABOVE CHASSIS.

TRIMMING DIAGRAM
SHOWING TRIMMER AND COIL POSITIONS

This diagram of the front panel, showing the trimmer and coil positions will assist when re-aligning

(*c*) Unscrew the Osc. and R.F. coil cores to their fullest extent.

(*d*) Screw in the Osc. coil core to obtain a peak, then screw it in further to obtain a second peak.

(*e*) Connect the Service Signal Generator to the aerial socket through a dummy aerial.

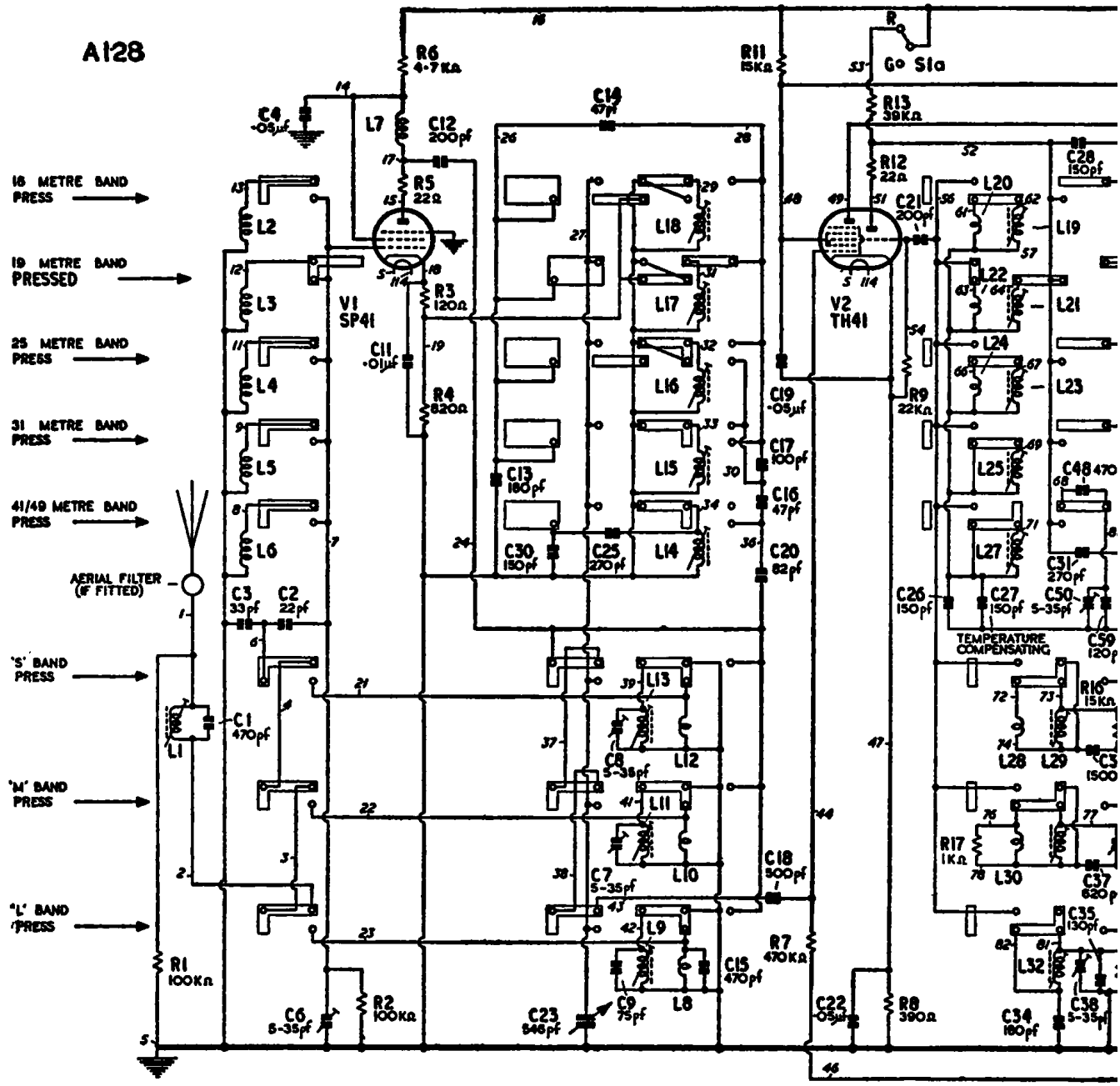
(*f*) Adjust the R.F. coil for maximum output; rock the tuning control for maximum output after each R.F. adjustment, and repeat, to reduce the effect of oscillator pulling. (Adjust the aerial trimmer if trimming the 31 metre band.)

The above procedure will give an approximate adjustment for the tuned circuits. **Then proceed as in Section 1 above—i.e. receivers requiring only minor trimming adjustments.**

S.W. ADJUSTMENT TABLE

Note. For general procedure, see notes above. The dummy aerial may consist of a 400 ohm resistor connected in series with the Signal Generator lead. The aerial coils are not adjustable.

BAND	TRIMMING FREQUENCY AND RECEIVER SETTING	ADJUSTMENT	NOTES
41/49 Metres	6 Mc/s (50 Metres) 7·25 Mc/s (41·4 Metres) 6 Mc/s (50 Metres)	Osc. coil (L27) Osc. trim (C50) R.F. coil (L14)	On switch panel
31 Metres	9·6 Mc/s	Osc. coil (L25) R.F. coil (L15) Aerial trim (C6)	On switch panel " " " Under chassis (3rd trim)
25 Metres	11·8 Mc/s	Osc. coil (L23) R.F. coil (L16)	On switch panel
19 Metres	15·2 Mc/s	Osc. coil (L21) R.F. coil (L17)	On switch panel
16 Metres	17·8 Mc/s	Osc. coil (L19) R.F. coil (L18)	On switch panel

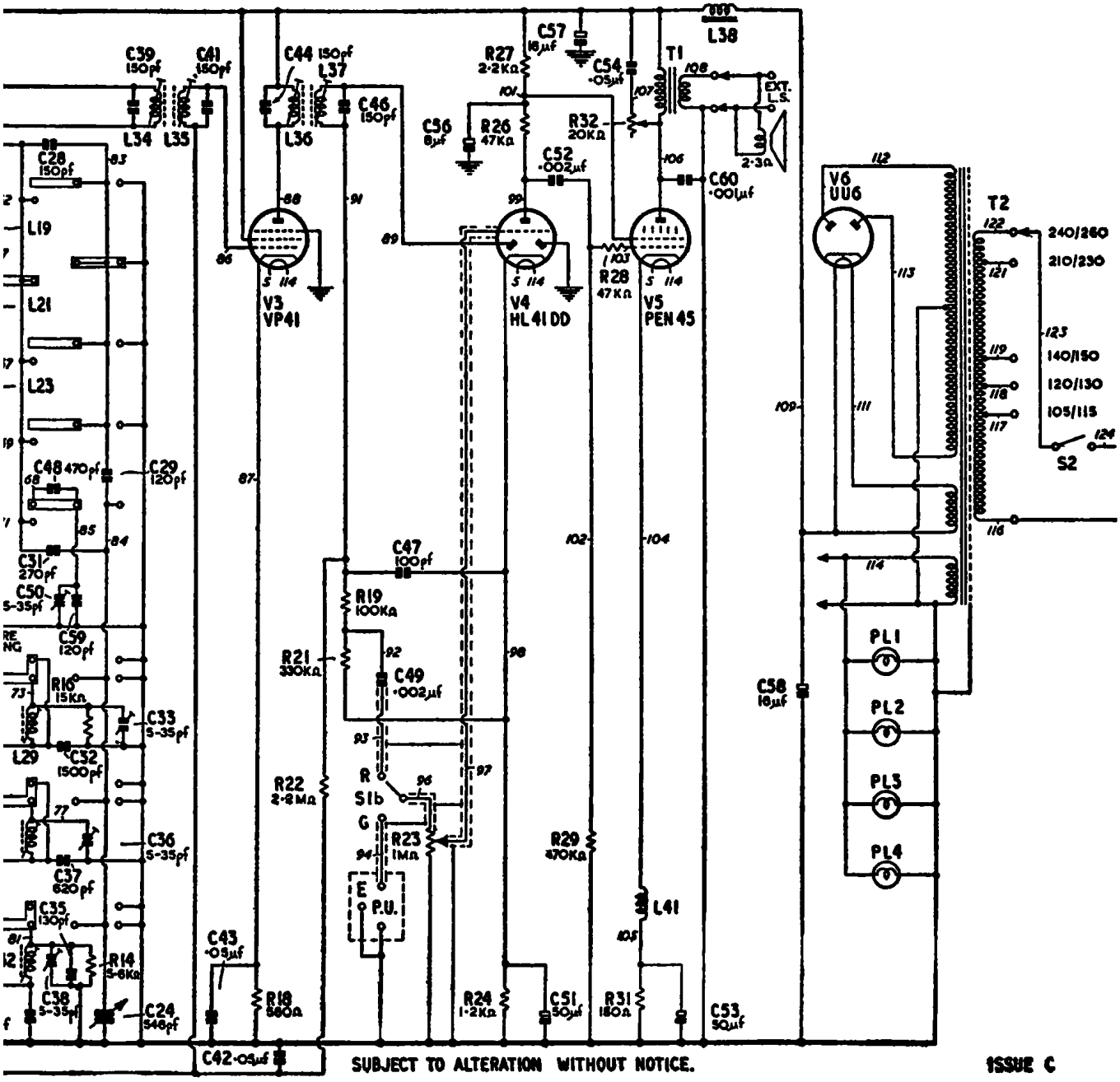


COIL RESISTANCES

Average values. Any coil not shown has a resistance of less than 1 ohm.

Coil	L1	L7	L8	L9	L11	L31	L32	L34
Ohms	3	7·5	21	16	2·5	2	4	6

Coil	L35	L36	L37	L38	L41	T1 Pri.	T2 Pri.	T2 H.T.
Ohms	6	6	6	265	24·5	320	20	110 + 110



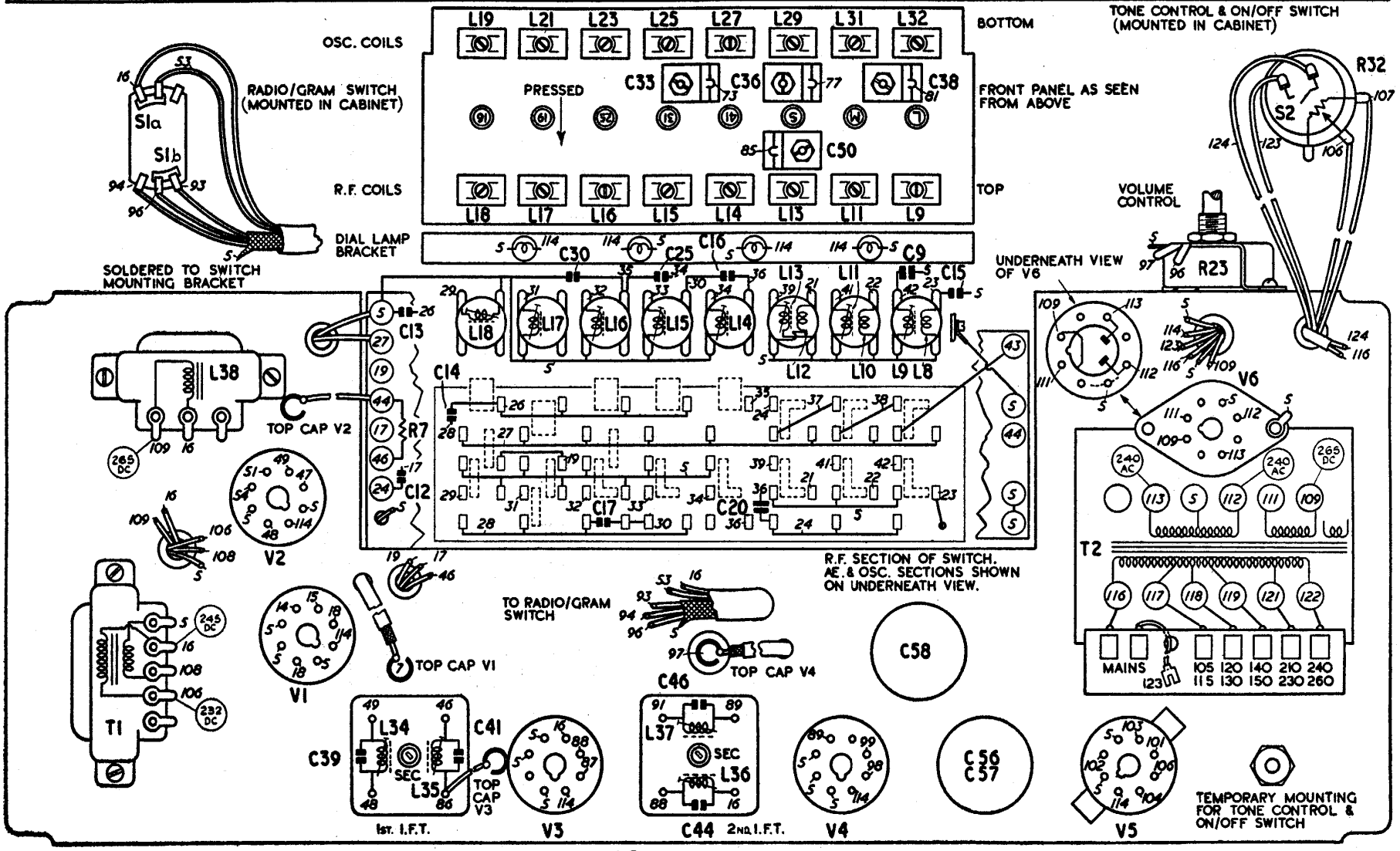
SUBJECT TO ALTERATION WITHOUT NOTICE. ISSUE C

VOLTAGE MEASUREMENTS

Voltages measured with Avometer Model 7. ("M" waveband, no signal conditions.)

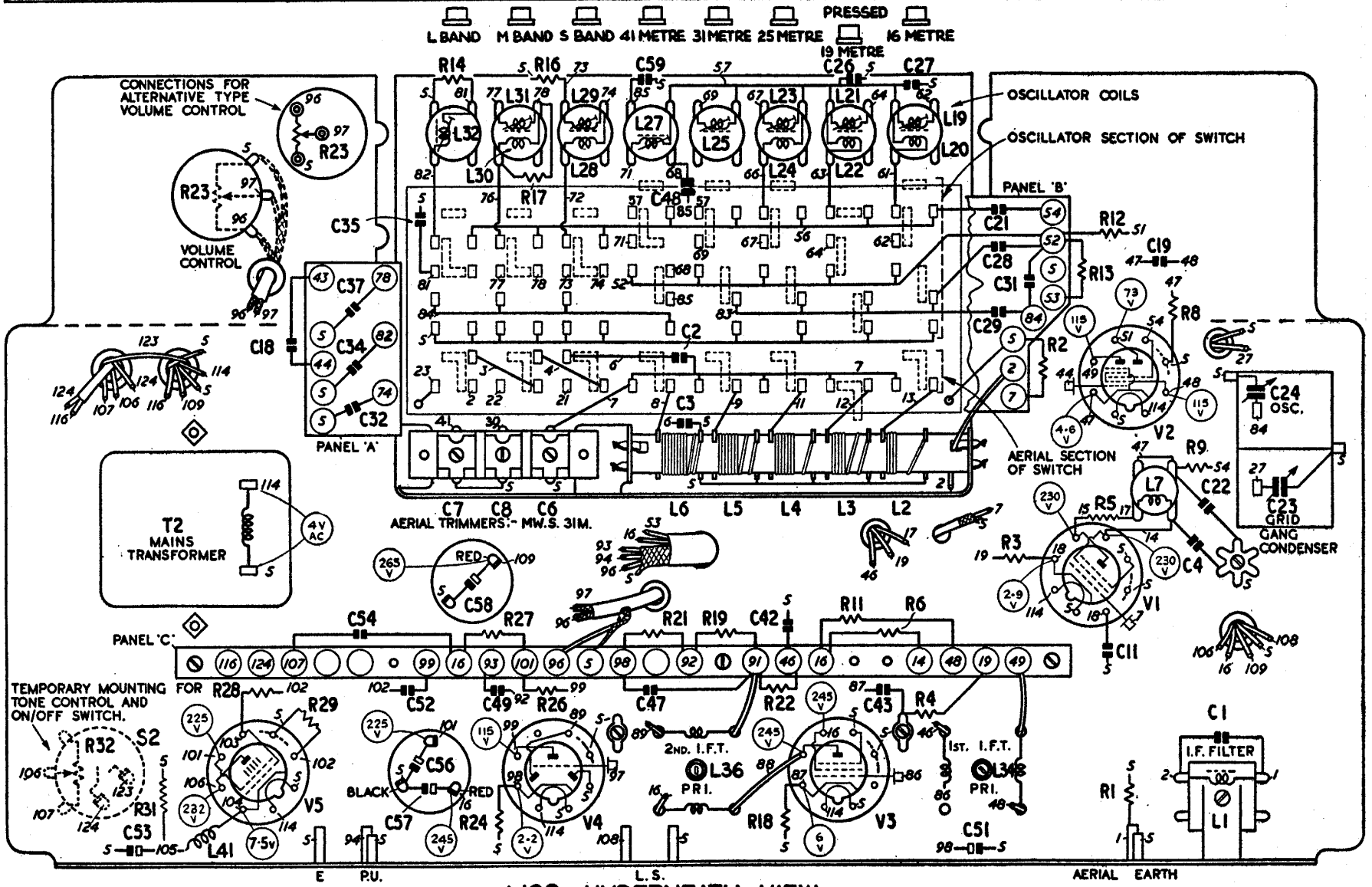
Electrode	V1	V2	V3	V4	V5	V6
Cathode	2·9	4·6	6	2·2	7·5	265 D.C.
Anode	230	115	245	115	232	240/240 A.C.
Screen	230	115	245	—	225	—
Osc. Anode	—	73	—	—	—	—

R								7																	23		32		
C							39	13 12	14 41			30 17	25	33 46 44	16 20	36 30		38	15 9 58	56 57									
L			38					34	35	19 18	21 17	23 16	25 15	37 36	27 14	29 13 12	31 11	10	33 9 8										
MISC		T1	S1a S1b		V2	V1		I.F.T.1.			V3			I.F.T.2.			V4					T2	V5		V6		S2	



A128 TOP VIEW

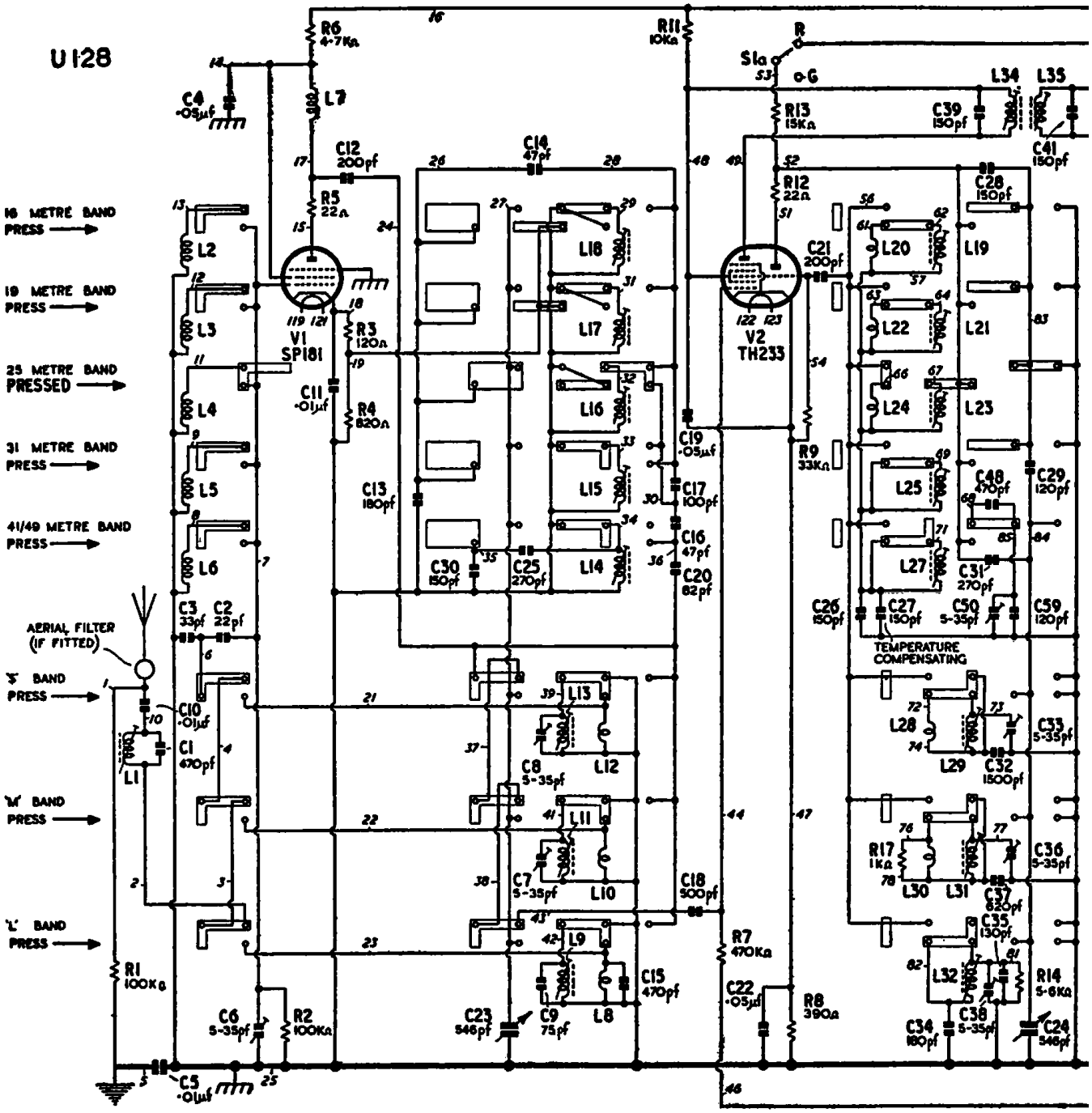
R	32			23 31	28	29 18		37 34 32 54	35 52	14 7 56 57	8 58 49	27 24	16 17 26 6			21 59	48 2 3 47	19	22 18 42		11 26 43	6 4 27		3 21 28 31 29	2	12 15 5 11	1 19	8 9 22 4	24 1	23	
C		53																					51							
L				41						32		31 30	29 28	27	6	25 5	23 24 4		21 22 3	19 20 2					7		1		
MISC		S2		T2	V5							V4			IFT 2				V3		IFT 1			VI	V2				



A128 UNDERNEATH VIEW

Voltages shown on these layout diagrams were measured between the test points and chassis (except where shown otherwise) using an Avometer Model 7. The receiver was switched to M.W. and working on 245 volts mains supply, connected to the 240-260 volt tap, under no signal conditions. Variations may however occur without affecting the performance of the receiver.

Note that the tag arrangement on the waverange switch corresponds with the circuit diagram on pages 10 and 11.

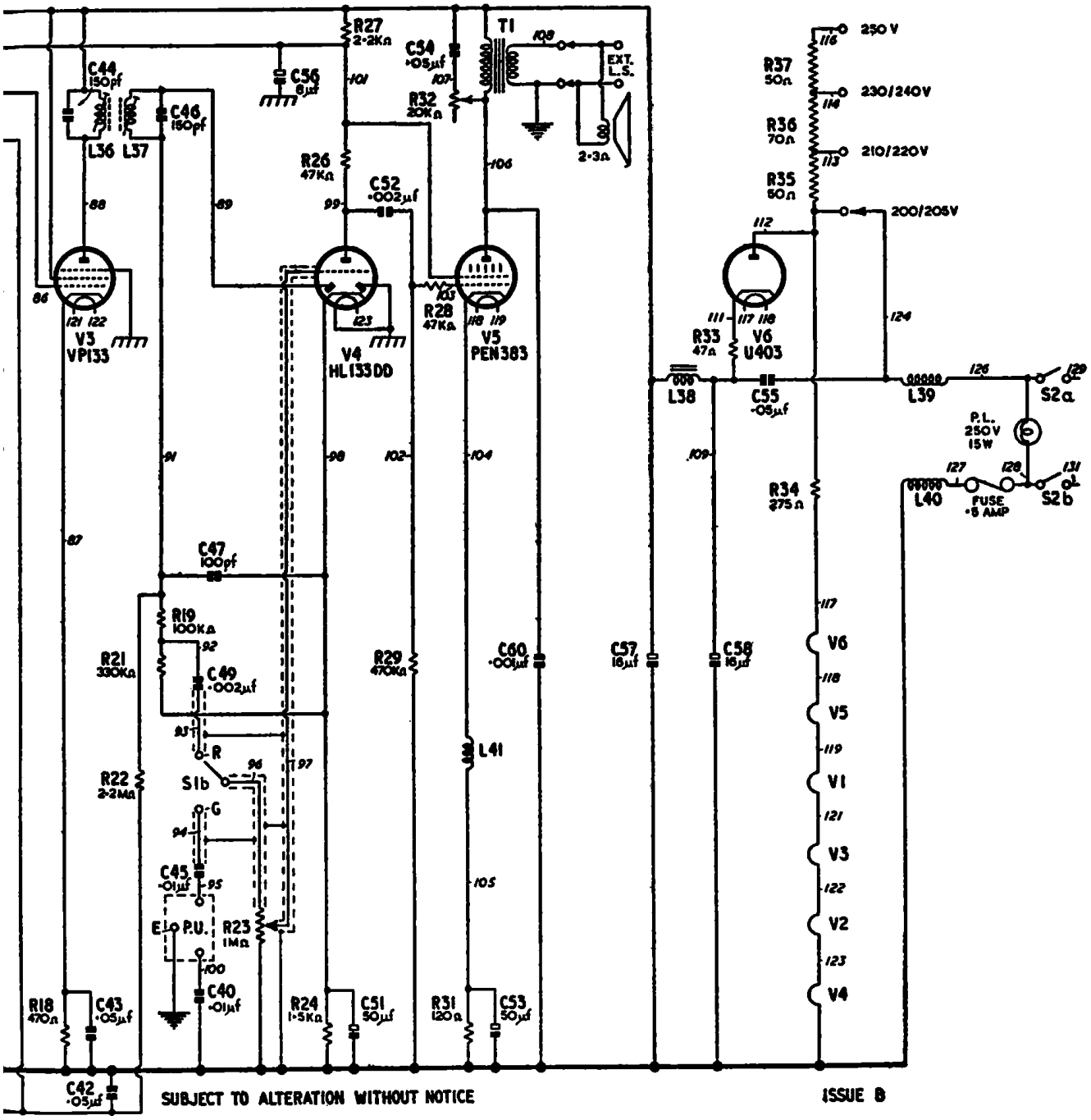


COIL RESISTANCES

Average values. Any coil not shown has a resistance of less than 1 ohm.

Coil	L1	L7	L8	L9	L11	L31	L32	L34
Ohms	3	7·5	21	16	2·5	2	4	6

Coil	L35	L36	L37	L38	L39	L40	L41	T1 Pri.
Ohms	6	6	6	300	5·7	5·7	24·5	160



SUBJECT TO ALTERATION WITHOUT NOTICE

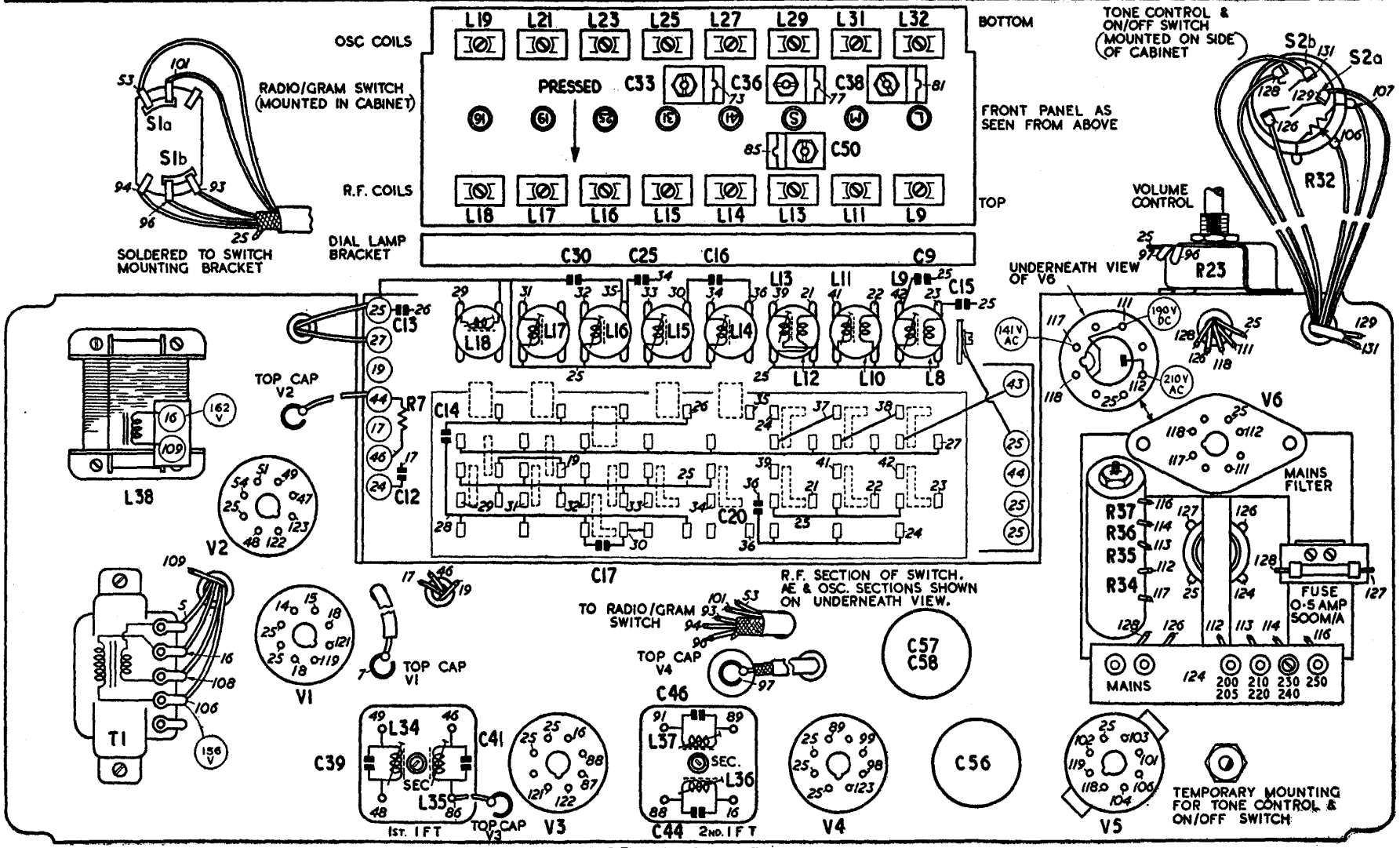
ISSUE B

VOLTAGE MEASUREMENTS

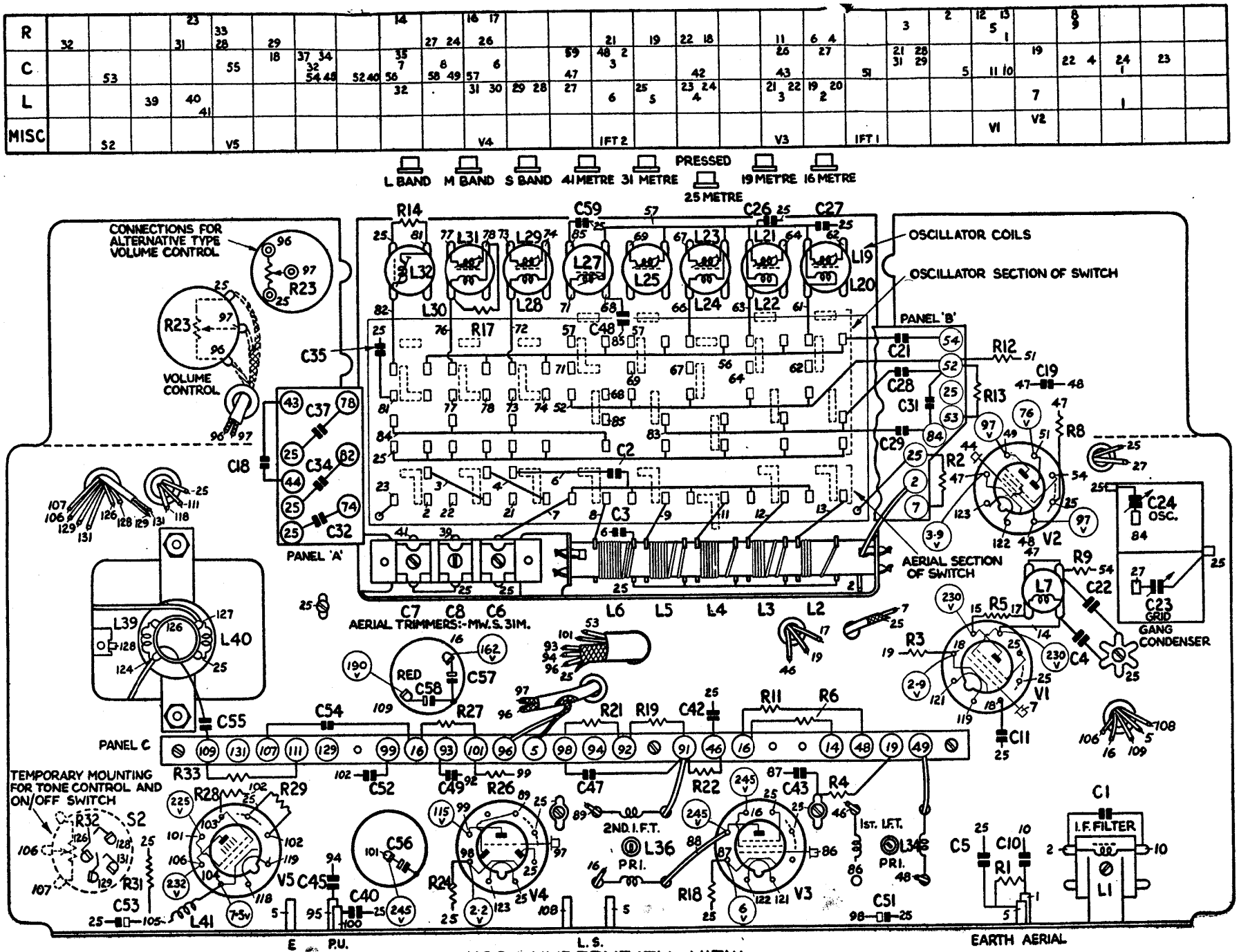
Voltages measured with Avometer Model 7. ("M" waveband, no signal conditions.)

Electrode	V1	V2	V3	V4	V5	V6
Cathode	2	3·9	4·4	1·5	7·6	190
Anode	151	97	162	72	156	210 A.C.
Screen	151	97	162	—	137	—
Osc. Anode	—	76	—	—	—	—

R								7															37 36 35 34		23		32		
C							39	13 12	14 41		30	17	25	33 16 46 44	20	36 50		38	15 57 58	56									
L		38						34 35	19 18		21 17	23 16	25 15	37 36	27 14	29 13 12	31 11 10	33 9	8											
MISC		T1	S1a S1b		V2	V1					V3						V4						V5		V6	S2b	S2a		



U128 TOP VIEW



U128 UNDERNEATH VIEW

Voltages shown on these diagrams were measured between test points and chassis, using an Avometer, Model 7. The receiver was switched to M.W. and was working on 245 volt A.C. mains supply, connected to the 250 volt tap, under no signal conditions. Variations may however occur without affecting the performance of the receiver. Note that the tag arrangement on the waverange switch corresponds with the circuit diagram on pages 14 and 15.

PARTS LIST

ABBREVIATIONS: M.M.: moulded mica. P.S.M.: protected silvered mica.
Tub: tubular paper type. El: electrolytic.
Resistors are ¼-watt, unless otherwise stated.
In some cases an approved alternative may be available, but one part number only is given.

CIRCUIT NO.	VALUE	REMARKS	PART NO.
C1	470 pf.	5% P.S.M.	28173
C2	22 pf.	10% P.S.M.	23603
C3	33 pf.	5% P.S.M.	28246
C4	·05 µf.	20% Tub. 350 v.	41403
C5	·01 µf.	25% Tub. 1000 v. (U128)	41419
C6	5–35 pf.	Triple trimmer	48563
C7	5–35 pf.		
C8	5–35 pf.		
C9	75 pf.	5% P.S.M.	28251
C10	·01 µf.	25% Tub. 1000 v. (U128)	41419
C11	·01 µf.	25% Tub. 350 v.	41401
C12	200 pf.	20% M.M.	23900/1
C13	180 pf.	5% P.S.M.	28161
C14	47 pf.	5% P.S.M.	28162
C15	470 pf.	5% P.S.M.	28173
C16	47 pf.	5% P.S.M.	28162
C17	100 pf.	5% P.S.M.	28156
C18	500 pf.	20% M.M.	23966/7
C19	·05 µf.	20% Tub. 350 v.	41403
C20	82 pf.	5% P.S.M.	28179
C21	200 pf.	20% M.M.	23900/1
C22	·05 µf.	20% Tub. 350 v.	41403
C23	546 pf.	Gang Condenser	49023
C24	546 pf.		
C25	270 pf.	3% P.S.M.	28225
C26	150 pf.	5% P.S.M.	28169
C27	150 pf.	5% Temperature compensating	40738
C28	150 pf.	5% P.S.M.	28169
C29	120 pf.	5% P.S.M.	28195
C30	150 pf.	5% P.S.M.	28169
C31	270 pf.	3% P.S.M.	28225
C32	1500 pf.	10% P.S.M.	23710
C33	5–35 pf.	Trimmer	37480
C34	180 pf.	1% P.S.M.	28242
C35	130 pf.	5% P.S.M.	28252
C36	5–35 pf.	Trimmer	37480
C37	620 pf.	5% P.S.M.	28196
C38	5–35 pf.	Trimmer	37480
C39	150 pf.	5% P.S.M.	28169
C40	·01 µf.	25% Tub. 1000 v. (U128)	41419
C41	150 pf.	5% P.S.M.	28169
C42	·05 µf.	20% Tub. 350 v.	41403
C43	·05 µf.	20% Tub. 350 v.	41403
C44	150 pf.	5% P.S.M.	28169
C45	·01 µf.	25% Tub. 1000 v. (U128)	41419
C46	150 pf.	5% P.S.M.	28169
C47	100 pf.	20% M.M.	23867/8
C48	470 pf.	5% P.S.M.	28173
C49	·002 µf.	25% Tub. 500 v.	41408
C50	5–35 pf.	Trimmer	37480
C51	50 µf.	−20% + 100% 12 v. El.	31315
C52	·002 µf.	25% Tub. 500 v.	48287
C53	50 µf.	−20% + 100% 12 v. El.	31315
C54	·05 µf.	20% Tub. 1000 v.	41421
C55	·05 µf.	20% Tub. 1000 v. (U128)	41421
C56	8 µf.	−20% + 50% El. 350 v. (U128)	46515
C57	16 µf.	−20% + 50% El. 350 v. (U128)	46514
C58	16 µf.		
C56	8 µf.	−20% + 50% E. 450 v. (A128)	46512
C57	16 µf.		
C58	16 µf.	−20% + 50% El. 450 v. (A128)	46503
C59	120 pf.	5% P.S.M.	28195
C60	·001 µf.	25% Tub. 1000 v.	41416
R1	100 KΩ	20%	27269
R2	100 KΩ	20%	27269
R3	120 Ω	10%	24581
R4	820 Ω	10%	24901
R5	22 Ω	20%	26565
R6	4·7 KΩ	20% ½ w.	27021
R7	470 KΩ	20%	27397
R8	390 Ω	10%	24773
R9	22 KΩ	20% (A128)	27141
R9	33 KΩ	20% (U128)	27173
R10			
R11	15 KΩ	10% 1½ w. (A128)	29984/5
R11	10 KΩ	10% 1 w. (U128)	25340
R12	22	20%	26565
R13	39 KΩ	10% 1 w. (A128)	25564/5
R13	15 KΩ	10% ½ w. (U128)	25389
R14	5·6 KΩ	10%	25221
R15			
R16	15 KΩ	20% (A128)	27109
R17	1 KΩ	20%	26885
R18	560Ω	10% (A128)	24837
R18	470Ω	10% (U128)	24805
R19	100 KΩ	20%	27269
R20			
R21	330 KΩ	20%	27365
R22	2·2 MΩ	20%	27525
R23	1·0 MΩ	Volume Control	48577
R24	1·2 KΩ	10% (A128)	24965
R24	1·5 KΩ	10% (U128)	24997
R25			
R26	47 KΩ	20%	27205
R27	2·2 KΩ	20% ½ w.	26957
R28	47 KΩ	20%	27205
R29	470 KΩ	20%	27397
R30			
R31	150 Ω	10% ½ w. (A128)	24621
R31	120 Ω	10% ½ w. (U128)	24589
R32	20 KΩ	Tone Control (A128)	49208
R32	20 KΩ	Tone Control (U128)	49209
R33	47 Ω	20% 1 w. (U128)	26652
R34	275 Ω		
R35	50 Ω	5% Mains Resistor (U128)	46677
R36	70 Ω		
R37	50 Ω		

CIRCUIT NO.	D.C. RESISTANCE	REMARKS	PART NO.
L1	3 Ω	I.F. Rejector Coil	37584
L2	—	16 M. Aerial Coil	
L3	—	19 M. Aerial Coil	
L4	—	25 M. Aerial Coil	49659
L5	—	31 M. Aerial Coil	
L6	—	41 M. Aerial Coil	
L7	7·5 Ω	S.W. Anode Choke	48725
L8	21 Ω	L.W. Aerial Coil	49664
L9	16 Ω	L.W. Grid Coil	
L10	—	M.W. Aerial Coil	48986
L11	2·5 Ω	M.W. Grid Coil	
L12	—	"S" Aerial Coil	49662
L13	—	"S" Grid Coil	
L14	—	41 M. R.F. Coil	49660
L15	—	31 M. R.F. Coil	48731
L16	—	25 M. R.F. Coil	48733
L17	—	19 M. R.F. Coil	48735
L18	—	16 M. R.F. Coil	48737
L19	—	16 M. Osc. Coil	48736
L20	—	16 M. Osc. Coil	
L21	—	19 M. Osc. Coil	48734
L22	—	19 M. Osc. Coil	
L23	—	25 M. Osc. Coil	48732
L24	—	25 M. Osc. Coil	
L25	—	31 M. Osc. Coil	48730
L26			
L27	—	41 M. Osc. Coil	49661
L28	—	S. Osc. Grid Coil	49663
L29	—	S. Osc. Anode Coil	
L30	—	M. Osc. Grid Coil	48985
L31	2 Ω	M. Osc. Anode Coil	
L32	4 Ω	L. Osc. Coil	49665
L33			
L34	6 Ω	1st I.F.T. Pri.	48467
L35	6 Ω	1st I.F.T. Sec.	

CIRCUIT NO.	D.C. RESISTANCE	REMARKS	PART NO.
L36	6 Ω	2nd I.F.T. Pri.	48467
L37	6 Ω	2nd I.F.T. Sec.	
L38	300 Ω	Smoothing Choke (U128)	46177
L38	265 Ω	Smoothing Choke (A128)	39276
L39	5·7 Ω	Mains Filter (U128)	49044
L40	5·7 Ω		
L41	24·5 Ω	R.F. Choke	49666
T1 Pri.	320 Ω	Output Transformer (A128)	48766
T1 Pri.	160 Ω	Output Transformer (U128)	49043
T2 Pri.	20 Ω	Mains Transformer (A128)	50158
H.T. Sec.	110+110		

VALVES

NO.	REMARKS	TYPE	
V1	Valve Types, Mazda	SP41	A128
V2		TH41	
V3		VP41	
V4		HL41DD	
V5		PEN45	
V6		UU6	
V1	Valves should be obtained direct from the valve manufacturers or distributors	SP181	U128
V2		TH233	
V3		VP133	
V4		HL133DD	
V5		PEN383	
V6		U403	

ALPHABETICAL LIST

Excluding fixed condensers, resistors and those components unlikely to be required under normal circumstances. Nuts and bolts, grub screws, and self-tapping screws etc. can also be supplied if required.

DESCRIPTION	REMARKS	CIRCUIT NO.	PART NO.
B Back for Cabinet			49032
Bolts	Chassis Fixing 2¼" Whit.		37607
Bracket with four Pulleys			49615
Bracket for Tuning Spindle	The Drive Bracket		49429
C Cabinet			49026
Cabinet Back	Without A128 or U128 label		49032
Cap for V4			49501
Carrier for Indicator			49012
Choke, Anode R.F.		L7	48725
Choke R.F.		L41	49666
Clip for Flywheel	"C" Clip		48998
Clip for V1, V2, V3	Top Cap Connector		6678
Cord for Tuning Drive	A (30"), B (36") and C (72")		Spec. 935 Spec. 936
Cores, Iron Dust	For I.F. Transformers		46911
	For S.W. Coils (¼")		10696
	For L, M, and S Coils (½")		10694
D Diffuser			49762
Drive Drum	Bakelite ("E")		48999
Drive Drum	Die Cast, with Stop ("D")		49761

	DESCRIPTION	REMARKS	CIRCUIT NO.	PART NO.
E	Escutcheon	For Press-buttons		49030
F	Filter, Mains	For U128	L39/L40	49044
	Flywheel			48993
	Flywheel with Spindle			49513
	Fuse .5 amp.	For U128		33207
	Fuseholder	For U128		48701
G	Gang Condenser		C23/C24	49023
	Gramophone Switch		S1	49420
H	Holder—fuse	For U128		48701
I	Indicator	Tuning Pointer		43274
	I.F. Rejector	Assembly	L1/C1	49692
	I.F. Transformer	Complete in can		48467
K	Knob-Key Type	For On-Off/Tone or Radio Gram		49031
	Knob—Large Round	For Tuning or Volume		49038
L	Label	For A128 } Cabinet Back		49824
	Label	For U128 }		49825
	Lamp—Pilot	For A128 6·2 v., 0·3 amp.	PL 1–4	16880
	Lamp—Pilot	For U128 250 v. 15 watt		45288
	Lampholder	For A128		42007
	Lampholder	For U128		45289
	Loudspeaker	8" P.M.		45388
M	Mains Filter	For U128	L39/L40	49044
	Mains Resistor	For U128	R34/35/36/37	46677
	Mains Transformer	For A128	T2	50158
O	Output Transformer	For A128	T1	48766
	Output Transformer	For U128	T1	49043
P	Panel, Mains Adjustment	For U128		45242
	Panel, with sockets	Aerial and Earth		37497
	Panel, with sockets	Loudspeaker		49011
	Panel, with sockets	Pick-up		37381
	Plug—Aerial			37974
	Plug—Earth			37975
	Plug—Loudspeaker			45974
	Press Buttons	State waverange required		—
	Press Button Unit	Wired for A128 and U128		49658
	Press Button Switch	Unwired		49015
R	Reflector and Pulleys	For back of tuning scale		38701
	Rejector I.F.		L1/C1	49692
	R.F. Choke	For V5 Cathode	L41	49666
	Rubber, Chassis Mounting			8608
	Rubber, Scale Packing			37494
S	Scale, Tuning	A128 and U128		49667
	Screw and Washer	For securing cabinet back		50735
	Smoothing Choke	For A128	L38	39276
	Smoothing Choke	For U128	L38	46177
	Speed Nuts	For coil fixing		15264
	Spindle, Tuning	Less Flywheel		48990
	Springs for Cord Drives	Primary Drive "A"		19456
		Secondary Drive "B"		19448
		Cursor Drive "C"		19455
	Stud (4BA)	U128 Mains Resistor Fixing		22540
	Switch, Radio-Gramophone		S1	49420
	Switch, Press-Button			49015
	Switch, On-off and Tone	For A128 with Tone Control	S2/R32	49208
	Switch, On-off and Tone	For U128 with Tone Control	S2/R32	49209
T	Transformer, I.F.			48467
	Tuning Unit, Wired	For A128 and U128		49658
	Tuning Spindle	Less Flywheel		48990
	Traveller (Carrier)	To secure Indicator to Cord		49012
	Tone Control and Switch	For A128	S2/R32	49208
	Tone Control and Switch	For U128	S2/R32	49209
V	Valve Top Connector	V1, V2, V3		6678
	Valve Screened Connector	V4		49501
	Valveholder, British Octal			3975
	Volume Control		R23	48577
W	Washer, Felt, for Knobs			47912
	Washer, Felt, for Press-button			34594
	Washer, steel	For chassis fixing bolts		491481