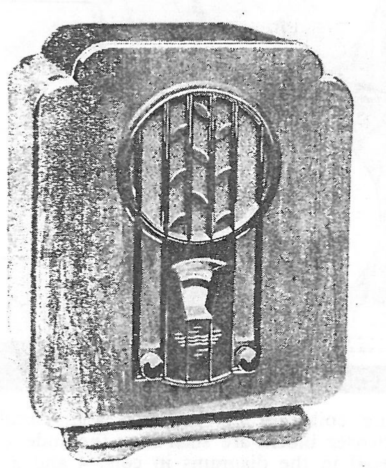
"TRADER" SERVICE SHEET

584

PHILIPS 630A

SUPERINDUCTANCE AC RECEIVER



TWO band-pass filter circuits, both tuned to signal frequency, are employed in the Philips 630A. The receiver is a 5-valve (plus rectifier) 2-band TRF "Superinductance" model, and a special type of adjustment provides for AC mains of 100-250 V, 40-100 C/S.

Generally speaking, the Continental Philips models 620A, 545, 546 and 600A employ the same chassis, although there are small differences in these models.

Release date : 1932.

CIRCUIT DESCRIPTION

Aerial input via impedance matching circuit **C1, C2** to capacity coupled band-pass filter. Primary coils **L1, L2** are tuned by **C37**; secondary coils **L3, L4** by **C40**. Bottom coupling by **C5** (MW) and **C4, C5** (LW), with top coupling by very small capacity **C3**. Two alternative aerial input sockets, **A1** and **A2**, are provided. Input from **A2** is direct, while input from **A1** is capacity coupled to **A2**. The coupling between the two sockets consists only of their mutual capacity.

First valve **(V1, Mullard metallised S4VB)** is a variable-mu RF tetrode operating as signal frequency amplifier with gain control by potentiometer **R4**, which varies applied GB. The earthy end of the band-pass filter is returned to **V1** cathode, and to chassis via **C7**, and the GB, which is developed across the fixed resistance **R5** and part of the potentiometer **R4**, is applied via **R1** and the band-pass secondary coils. **R1** is included to avoid short-circuiting **C4, C5**.

Tuned-anode RF coupling, in which a second capacity coupled band-bass filter is employed, couples **V1** to second valve **(V2, Mullard metallised VMS4B)**, another RF tetrode operating as signal frequency amplifier, but this time with fixed bias.

Band-pass primary coils **L5, L6** are tuned by **C43**; secondaries **L7, L8** by **C46**. Bottom coupling by **C11** (MW) and **C10, C11** (LW), with top coupling by **C9**, and the filter is a replica of the aerial filter circuit, and is returned to chassis via **C8**, while H1 is fed via **R6, R7** and the band-pass primary coils to **V1** anode, **R7** being inserted to avoid shorting **C10, C11**.

Screen grid potential for **V1** is obtained from a potential divider **R2, R3**, and that for **V2** is obtained from a second potential divider **R9, R10**. The two potential dividers are connected in parallel, and their combined current, together with screen and anode currents of **V1**, provide the current which flows through **R4**.

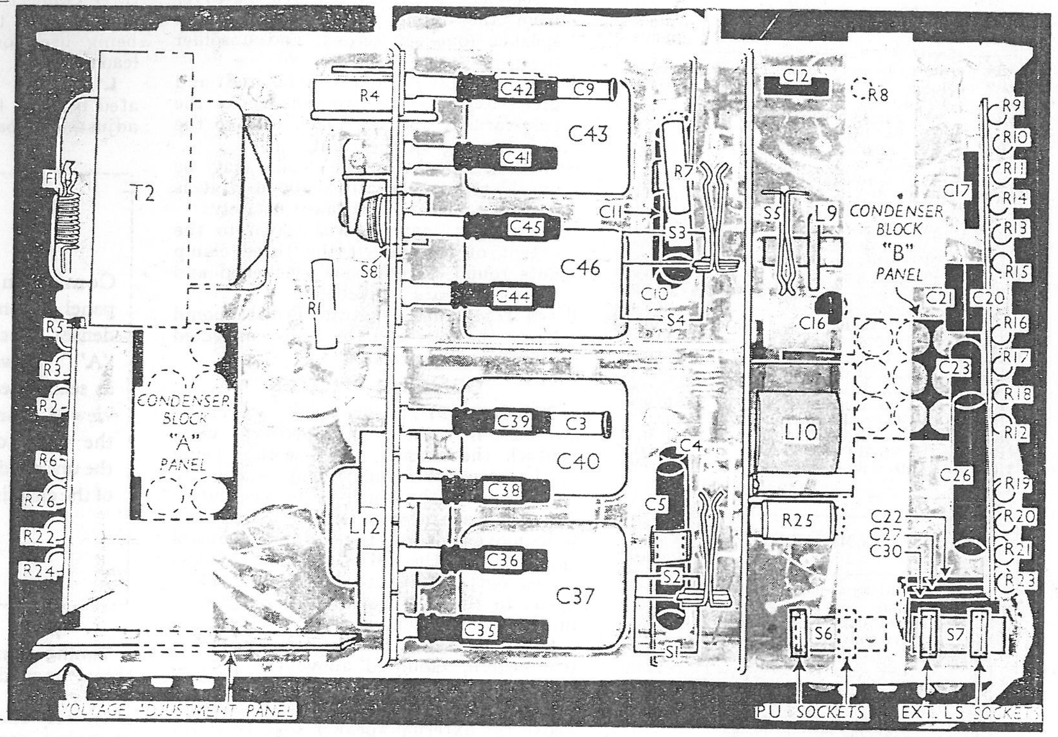
Choke-capacity RF coupling by **L9, C17** and **R14** between **V2** and triode valve **(V3, Mullard metallised 244V)**, which operates as leaky grid detector with **C17, R14**. On LW, **C16** is connected via **S5** and **C14** across **L9**. Provision for connection of gramophone pick-up, via voltage-limiting resistance **R13**, across **R14**.

Resistance-capacity coupling by **R17, C23** and **R19**, via RF filter **C20, R18, C21**, between **V3** and a second triode valve **(V4, Mullard 244V)**, which operates as AF amplifier. Two-position tone control by **C22** and **S6**. Rigid decoupling in **V3** anode circuit by **R15, C18** and **R16, C19**.

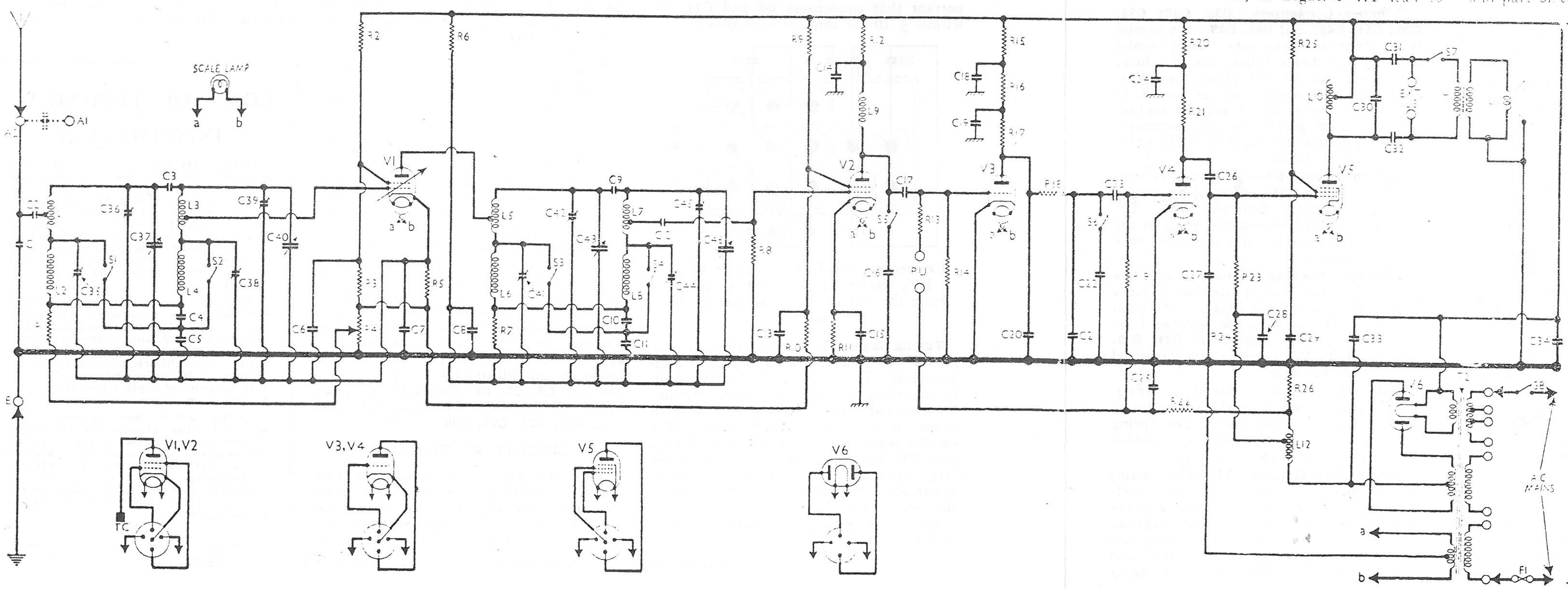
Resistance-capacity coupling by **R21, C26** and **R23** between **V4** and pentode output valve **(V5, Mullard PM24A)**, with directly heated cathode. Choke-capacity coupled output by **L10, C31, C32** to transformer-coupled low impedance moving coil speaker. Provision for connection of high impedance external speaker by sockets across the output at **C31, C32**, while switch **S7** permits internal speaker to be muted if desired. Fixed tone correction by **C30**. Only part of **L10** is used.

HT current is supplied by full-wave rectifying valve **(V6, Philips 1821)**. Smoothing by iron-cored choke **L12** and resistance **R26**, in negative HT lead to chassis, and condensers **C33, C34**. Fuse **F1** protects the mains input circuit in case of accidental short-circuit.

GB potential for **V3** (when used with gramophone pick-up only) and **V4** is obtained from drop along **R26**, while GB for **V5** is obtained from a tapping on **L12** and comprises the drop across **R26** and part of that across **L12**.



Under-chassis view. The undersides of the two condenser blocks are indicated and marked "A" and "B." It is in the position shown here that they are viewed in the drawings showing the connecting panels in cols. 3 and 4 overleaf. The construction of the special tuning and trimming condensers C35-C46 is described under "General Notes." Resistances R25 and R26 are wire wound.



Circuit diagram of the Philips 630A Superinductance receiver. The tuned circuits associated with the aerial input and RF amplifier are both band-pass filters. It should be noted that, although the earthy ends of these circuits are returned to chassis via condensers C7 and C8, they are not at chassis potential to DC, and this applies to the screens of the gang condensers. R4 is the gain control, and R5 is V1 fixed GB resistance. Note that R2, R3 and R9 R10 are two potential dividers connected in parallel, and are returned to chassis via R4. The output from V5 is choke-capacity coupled to speaker transformer.

COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	Aerial coupling condensers ...	0·00008
C2		0·00004
C3	"Top" coupling condenser ...	0·00[illegible]
C4	Band-pass "bottom" coupling condensers ...	0·05
C5		0·05
C6*	V1 SG decoupling ...	1·5
C7*	V1 cathode by-pass ...	0·5
C8*	V1 anode decoupling ...	0·5
C9	"Top" coupling condenser ...	0·00[illegible]
C10	Band-pass "bottom" coupling condensers ...	0·05
C11		0·05
C12	V2 CG condenser ...	0·00[illegible]
C13§	V2 SG decoupling ...	0·5
C14§	V2 anode decoupling ...	0·5
C15§	V2 cathode by-pass ...	0·5
C16	V2 anode LW trimmer ...	[illegible]
C17	V3 CG condenser ...	0·0001
C18§	V3 anode decoupling ...	1·0
C19§		1·0
C20	RF by-pass condensers...	0·002
C21		0·0002
C22	Tone control condenser ...	[illegible]
C23	V3 to V4 AF coupling ...	[illegible]
C24	V4 anode decoupling ...	0·5
C25§	V4 CG decoupling ...	0·5
C26	V4 to V5 AF coupling ...	0·05
C27	RF by-pass ...	0·001
C28§	V5 CG decoupling ...	0·5
C29§	V5 SG decoupling ...	0·5
C30	Tone filter condenser ...	[illegible]
C31	Speaker isolating condensers ...	[illegible]
C32*		[illegible]
C33*	HT smoothing condensers ...	3·0
C34*		4·0
C35‡	B-P pri. LW trimmer ...	0·000027
C36‡	B-P pri. MW trimmer ...	[illegible]
C37†	Band-pass pri. tuning ...	0·00043
C38‡	B-P sec. LW trimmer ...	[illegible]
C39‡	B-P sec. MW trimmer ...	[illegible]
C40†	Band-pass sec. tuning ...	0·00043
C41‡	RF B-P pri. LW trimmer	0·000027
C42‡	RF B-P pri. MW trimmer	[illegible]
C43†	RF B-P pri. tuning ...	0·00043
C44‡	RF B-P sec. LW trimmer	0·000027
C45‡	RF B-P sec. MW trimmer	[illegible]
C46†	RF B-P sec. tuning ...	0·0004

† Variable. ‡ Pre-set.
* In condenser block "A."
§ In condenser block "B."

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RESISTANCES		Values (ohms)
R1	V1 CG decoupling ...	1,000,000
R2	V1 SG HT potential divider	50,000
R3		40,000
R4	V1 gain control	6,200
R5	V1 fixed GB	400
R6	V1 anode HT feed resistances	16,000
R7		2,000
R8	V2 CG resistance... ...	1,000,000
R9	V2 SG HT potential divider	50,000
R10		64,000
R11	V2 GB resistance... ...	400
R12	V2 anode decoupling ...	20,000
R13	PU series resistance ...	320,000
R14	V3 grid leak	200,000
R15	V3 anode decoupling resistances	16,000
R16		10,000
R17	V3 anode load	32,000
R18	RF stopper	100,000
R19	V4 CG resistance... ...	640,000
R20	V4 anode decoupling ...	25,000
R21	V4 anode load	32,000
R22	V4 CG decoupling ...	640,000
R23	V5 CG resistance... ...	100,000
R24	V5 CG decoupling ...	100,000
R25	V5 SG HT feed	15,000
R26	Auto GB resistance ...	100

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial band-pass primary coils	3·0
L2		23·0
L3	Aerial band-pass secondary coils	3·0
L4		23·0
L5	RF band-pass primary coils	3·0
L6		23·0
L7	RF band-pass secondary coils	3·0
L8		23·0
L9	V2 anode RF choke ...	30·0
L10	V5 anode output choke, total	1,000·0
L11	Speaker speech coil ...	6·5
L12	HT smoothing choke, total	1,200·0
T1	Speaker input trans. Pri. ...	500·0
	Speaker input trans. Sec. ...	0·8
T2	Mains trans. Pri., total ...	33·0
	Mains trans. Heater sec. ...	0·05
	Mains trans. Rect. heat. sec....	0·15
	Mains trans. HT sec., total ...	340·0
S1-S5	Waveband switches ...	—
S6	Tone control switch ...	—
S7	Internal speaker switch ...	—
S8	Mains switch	—
F1	Mains circuit fuse ...	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted for an average receiver by the makers. Measurements should be made with the volume control at maximum, with no signal input.

Voltages should be measured with a high-resistance voltmeter whose negative lead is connected to chassis.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 S4VB	185	2·5	100	0·8
V2 S4VB	165	4·0	110	1·3
V3 244V	57	3·5	—	—
V4 244V	110	2·8	—	—
V5 PM24A	240	14·0	170	5·0
V6 1821	255†	—	—	—

† Cathode to chassis, DC.

DISMANTLING THE SET

Removing Chassis.—Remove the two control knobs (recessed grub screws) from the front of the cabinet;

remove the four bolts with metal washers, rubber washers and brass sleeves holding the chassis to the bottom of the cabinet.

The chassis may now be withdrawn to the extent of the speaker lead, which is sufficient for normal purposes.

To free chassis entirely, remove the cover from the input transformer on the speaker (one set screw), and unsolder the three leads from it.

When replacing, connect the red and green leads to the two tags above the transformer, and the black lead to the earthing tag on the right.

Removing Speaker.—The leads may be unsoldered as described above if it is desired to free the speaker entirely.

Otherwise, it may be withdrawn to the extent of its lead if the three clamp nuts round its edge are slackened and the clamps are swivelled.

When replacing, the transformer should be on the left, and the leads connected as previously described.

GENERAL NOTES

Switches.—S1-S5 are the waveband switches, in three ganged leaf-type units beneath the chassis, each section being in the screened compartment relative to the circuit with which it is associated. The units are lever operated by a push-pull movement of the tuning control spindle. In the MW position (knob pulled out), **S1-S4** are closed, and **S5** is open; in the LW position (knob pushed in) **S1-S4** are open, and **S5** is closed.

S6 is the QMB two-position tone control switch, mounted above the pick-up sockets at the rear of the chassis.

S7 is the QMB speaker switch, mounted above the external speaker sockets at the rear of the chassis.

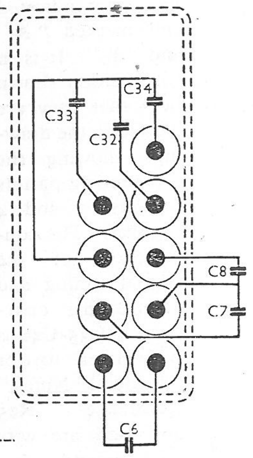
S8 is the QMB mains switch, operated by an extension of the volume control **R4** spindle.

Coils.—The four band-pass circuit coil units are of the Philips "Superinductance" type, consisting of Litzendraht wire wound on glass formers. They are contained in large diameter metal screens mounted on the chassis deck, and are of very low loss and carefully matched. Great care should be exercised if work becomes necessary on the coil units themselves. Unless it is absolutely necessary, the cans should not be disturbed at all.

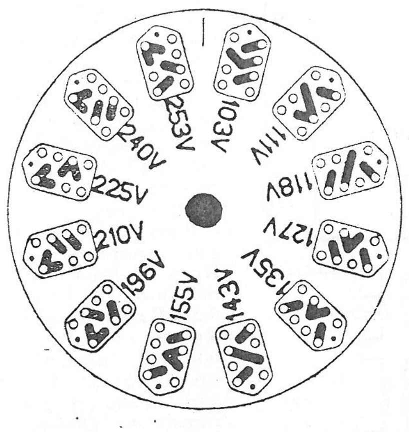
L9 is a small unscreened coupling choke, mounted just below **V2** holder in the under-chassis compartment.

L10 is the output choke, mounted close to **V5** holder beneath the chassis. Of the three connecting tags on it, only two are connected to the winding, the centre tag being used only as a bearer for other leads.

L12 is the HT smoothing choke, situated beneath the chassis near the voltage adjustment panel.



Connecting panel of condenser block "A", drawn as seen when viewed from the rear of the underside of the chassis.



Actual size reproduction of the voltage adjustment indicator disc. On the reverse is printed the range of each setting.

Tuning Condensers.—There are four of these, ganged together across the centre compartment beneath the chassis. Each is entirely encased in its own sealed metal screening can, and is unlikely ever to give trouble. The cans should not be opened if this can be avoided. In no case is the can connected directly to chassis, although all are returned there via condensers. The aerial circuit cans are connected to **V1** cathode, and the RF amplifier condenser cans are actually at HT potential, so that short-circuits to chassis must be avoided.

Trimmer Condensers.—C35, C36; C38, C39; C41, C42; and **C44, C45** are a special type of trimmer condenser. They consist of concentric brass tubes, one of which, the outer, can be slid along the other. Normally, the outer tube is sealed in position by paint, but it may be moved, if it is eased gently, for readjustment. After adjustment it should be sealed again with a dab of paint.

Condensers C3, C9.—These are of very small capacity, and consist of an extension on trimmers **C39** and **C42**. The capacity is that between the metal at the end of the extension and the inner tube of each trimmer.

External Speaker.—Two sockets are provided at the rear of the chassis for a high impedance (about 10,000 O) external speaker. The sockets are isolated from the HT circuit by condensers **C31, C32.** The switch **S7** permits the internal speaker to be muted.

Fuse F1.—This consists of a spring-loaded loop mounted on the mains transformer. If the fuse melts, the spring opens the gap rapidly ensuring a sudden break and an absence of arcing.

Mains Transformer T2.—The mains transformer has a special universal voltage primary winding, wound in three sections as shown in our circuit diagram. The two lower sections in the diagram are each wound for approximately 100 V, and the top section for about 50 V. Roughly speaking, the two untapped sections are connected in series for, say, 200 V, and in parallel for 100 V. The tapped winding is then added in various ways to suit odd voltages.

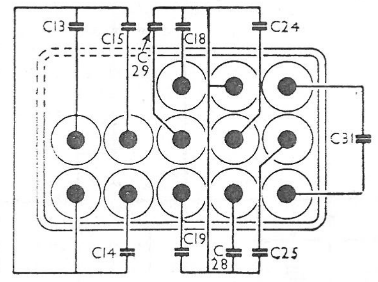
The adjustment of the winding for the required mains voltage is carried out by positioning four metal links on the voltage adjustment panel according to a code diagram supplied with the receiver and attached to the panel cover. The voltage settings available are : 103, 111, 118, 127, 135, 143, 155, 196, 210, 225, 240 and 253.

The code diagram is a pink circular disc which can be swivelled round on its central fixing rivet. On the face are twelve patterns showing the link positions between the eleven fixed terminals on the adjusting panel, with the corresponding mean voltage ratings marked beside each.

The disc is reproduced in actual size in the diagram in col. 2. Each pattern is marked at its pointed end with a key in the form of a dot, which should be on the *left* of the operator when setting the adjustment, as it is on the actual panel.

On the reverse of the disc, the voltage range of each setting is printed, and after adjustment, the disc should be rotated until the appropriate range registers with a hole provided for it in the panel cover, so that the indication is visible from the rear of the receiver.

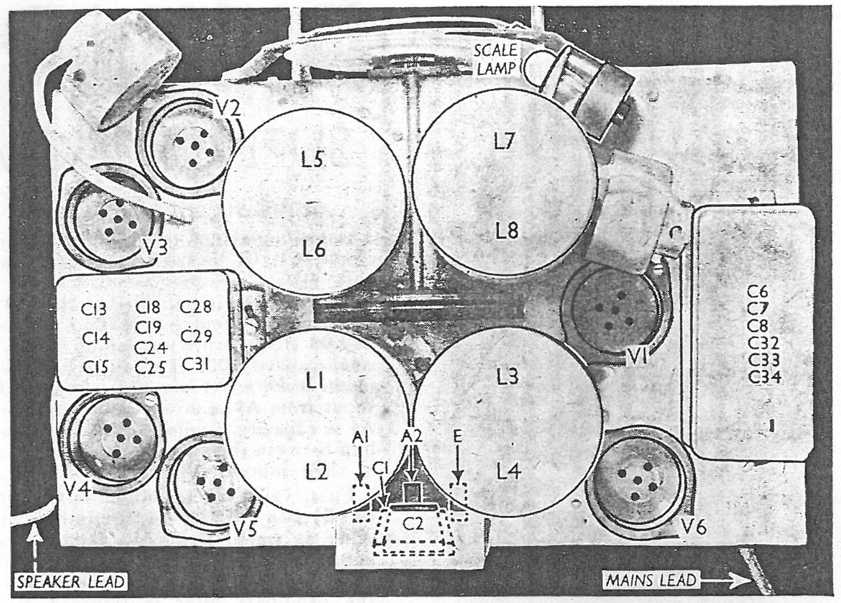
Chassis Divergencies. — The values quoted in our component tables are those found in our chassis, but the makers give the following alternative values : **R15,** 16,000 or 20,000 O; **R16,** 10,000 or 12,500 O; **R20,** 20,000 or 25,000 O; **R19,** 500,000 or 640,000 O; **R23,** 80,0000 or 100,000 O; **R24,** 100,000, 125,000 or 160,000 O; **R1,** 1,000,000 or 1,250,000 O; **R18,** 100,000 or 125,000 O; **R22,** 500,000 or 640,000 O; **C12,** 0.000064 or 0.00008 μF; **C30,** 0.0016 or 0.002 μF. Also, it is important that condensers **C5** and **C11** are within ± 10 per cent. of each other.



Connecting panel of condenser block "B", drawn as seen when viewed from the rear of the underside of the chassis.

Tuning Scale.—The tuning register consists of two rotary scales and a fixed indicator line. The larger scale is marked off in wavelengths near its outer circumference, and divided into twelve lettered zones on its inner circumference. The smaller scale is a vernier, and is divided into 100 divisions. It is geared to the larger scale by a 12 : 1 ratio, and makes a complete revolution to each zone on the large scale.

By this means, very accurate calibration is possible. The wavelength markings are only a rough indication, but once a known wavelength has been recorded with a letter/number, the setting can easily be repeated. An example can be seen in our "Circuit Alignment," where 225 m is given as B/45.



Plan view of the chassis. The tuning coils are in the four large circular cans. The connections to the two condenser blocks are seen from the underside of the chassis, and are shown in detail in the diagrams in cols. 3 and 4.

Wavechange Switch Seizure. — On switching over from one band to the other, a shutter obscures the wavelength markings of the unused band. The shutter is lever operated from the control spindle, and a short arm projecting from the upper edge runs in a guide formed of a slotted plate. The slot is closed at its ends, which form a stop to the excursion of the shutter.

These receivers are now fairly old, and in some cases, as in our sample, the short arm may have become bent with constant use, so that the shutter excursion exceeds its allotted range, and jams the wavechange switch movement. The remedy would appear to lie in removing the existing arm, which will break off if it is bent too often, and riveting on another in its place; otherwise the shutter must be removed altogether.

Condenser Blocks.—There are two of these, and in order to distinguish one from the other they have been designated "A" and "B." They are indicated in our chassis illustrations, and their connecting panels are shown in detail in the diagrams in cols. 3 and 4, where they are viewed in the position seen in our under-chassis illustration. Block "A" contains **C6, C7, C8, C32, C33** and **C34;** block "B" contains **C13, C14, C15, C18, C19, C24, C25, C28, C29** and **C31.**

CIRCUIT ALIGNMENT

With the gang at minimum, the line marking the left-hand edge of zone A on the main scale and the zero line on the vernier scale should register with the pointer line in the tuning aperture. Connect the signal generator leads to **A1** and **E** sockets and turn the gain control to maximum. If the signal is not audible when fed in via socket **A1,** transfer the lead to **A2.**

MW.—Switch set to MW (knob out), tune to 225 m (B/45 on scale), feed in a 225 m (1,330 KC/S) signal, and adjust **C45, C42, C39** and **C36** as described in "General Notes" for maximum output.

LW.—Switch set to LW (knob in), tune to 1,000 m (C/0 on scale), feed in a 1,000 m (300 KC/S) signal, and adjust **C44, C41, C38** and **C35** for maximum output.

LOAN OF TECHNICAL INFORMATION

Dealers are requested to note when applying for the loan of technical information on receivers for which we have not published a *Service Sheet*, or for the loan of our file copies of *Service Sheets* which are out of print, that such applications must be accompanied by a written undertaking promising to return the material loaned within three working days of receipt.

This was explained in our notice of the conditions associated with such loans on *Service Sheet* 562, published March 28, 1942, and in another notice on page 253 of the same issue. For some reason this requirement does not appear to be fully understood, as in fifty per cent. of applications the undertaking is not given.

In the past we have in many cases forwarded the information without it, in order to avoid delay, but in future we shall be obliged in such cases to write back and ask for the required undertaking before forwarding the material, as some of it cannot be replaced and we cannot take the risk of its being lost.

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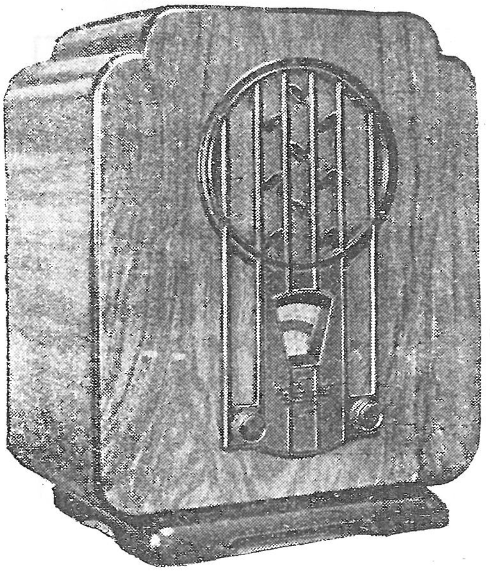


Philips "SUPER-INDUCTANCE" RECEIVER

TYPE 630A.

Description and Test Report of a Much-discussed New Set.

DESIGNERS of manufactured sets generally contend that many of the refinements which appeal to the knowledgeable enthusiast are quite out of place in their products or, at any rate, that their inclusion would be commercially impracticable. The set which forms the subject of the present review tends to refute this argument, as it may fairly be described as a commercial version of an enthusiast's receiver. Its undoubtedly exceptional performance is due mainly to the inclusion of tuned circuits of an efficiency that is probably not to be found in any other set on the market. The makers have proved that it is possible to attain this high standard in a "production" set and, moreover, that it can be done at a reasonable price.

It would take much more space than is available to discuss all the finer points of the circuit arrangement, and so the interested reader must be referred to the accompanying diagram, and our comments must be confined to those details which are especially unconventional.

The H.F. amplifier as a whole is unique. Double-capacity-coupled filters and a total of four tuned circuits in a "two-H.F." set are common enough, but the arrangement of this number of circuits as two filters, the first acting as an input tuner and the other as an intervalve coupling, certainly breaks new ground. Avoidance of losses is the keynote in the radio-frequency section of the set; to this end, exceptionally efficient coils, wound on glass formers with Litz wire and of appreciably larger dimensions than is fashionable nowadays, are used throughout; in order that these coils may work under the most favourable conditions, meticulous care has been taken to restrict the external damping applied to them. For instance, the grids of both H.F. valves are tapped down, and the inevitable loading effect of a power grid detector is avoided altogether by the bold step of fitting a semi-aperiodic coupling between the second H.F. valve and the detector.

A Constant-sensitivity Device.

The aperiodic coupling device is arranged to resonate at 600 metres on the medium band, and, by the inclusion of a condenser which is automatically thrown into position by the operation of the change-over switch (S in the diagram), at about 2,000 metres on the long-wave band. The efficiency of all conventional tuned circuits tends to fall as wavelength is increased, but the aperiodic coupling introduces compensation, with the result that sensitivity is more or less equal at all wavelengths.

There is nothing particularly unconventional in the resistance-capacity coupled L.F. amplifier, but the arrangement of the H.F. filter, which is also a resistance-capacity combination, in the detector anode circuit should be noted.

The tone control, which consists of a fixed condenser, is thrown into action at will by the operation of switch S_1, and is intended for using only in cases where heterodyne interference is encountered.

The high efficiency of the tuning coils would be a handicap rather than a help if all windings were not accurately matched. The ganged tuning condensers must also be in exceptionally accurate alignment. We have had an opportunity of seeing these sets in course of construction at the Philips' factory at Mitcham, and were greatly impressed by the measures taken to ensure accurate matching and "ganging." The tuning condensers are of exceptionally small size and beautifully made; each unit is fully screened and, contrary to the usual practice, is insulated from its neighbour. As a result, circuit alignment seems to be as perfect as is humanly possible; the tradition that "good" circuits cannot be effectively ganged has been finally disposed of.

FEATURES.

General.—*A self-contained 5-valve table-model receiver with built-in moving-coil loud speaker of the permanent-magnet type. For operation on A.C. mains and with an external aerial. Provision for extra loud speaker and gramophone pick-up.*

Circuit.—*Input filter, double-capacity coupled; 1st H.F. stage coupled by a similar filter to a second H.F. valve, which is linked to a power grid detector by a semi-aperiodic system. Two-stage resistance-coupled L.F. amplifier and pentode output valve, which feeds the loud speaker through a choke-fed transformer. Full-wave power rectifying valve.*

Controls.—*(1) Combined tuning control and wave-range switch (2) Combined volume control and on-off switch. (3) Tone control switch.*

Price.—*23 guineas.*

Makers.—*Philips Lamps Ltd., Philips House, Charing Cross Road, London, W.C.2.*

Low-loss construction is everywhere in evidence. Bakelite is used comparatively sparingly, the material used for insulation at high-potential points in the H.F. circuits being Isolantite, which has exceptionally good dielectric properties.

Possibly one of the most interesting—and controversial—points in construction is the tuning dial. Instead of the conventional scale, roughly calibrated either in station settings or wavelengths, the 630A has a double indicating dial, the object of which is to allow of the accurate recording of station settings. In addition, there is a third dial which gives a rough indication of the wavelengths to which the set is tuned.

For the accurate "logging" of stations, a "letter" scale is used in conjunction with a micrometer dial which is geared up from the main condenser drive, and by this simple scheme has an effective diameter that would otherwise be impossible of attainment. It may be said that an arrangement of this sort is too complicated for the non-technical user, but with this opinion we can hardly agree; surely it is no more difficult to memorise the adjustment of a station as "E50" than as 60.5 on a dial calibrated into degrees, and it is certainly much more definite than "about 370 metres," as the same station might be recorded on a wavelength dial.

Results of Comparative Tests.

Even before testing the set, it was fairly obvious from the specification that selectivity should be of a high order, but it was hardly expected that it would rival the superheterodyne in this respect. But it actually does so, and is certainly the most selective commercial "straight" set that *The Wireless World* has tested officially.

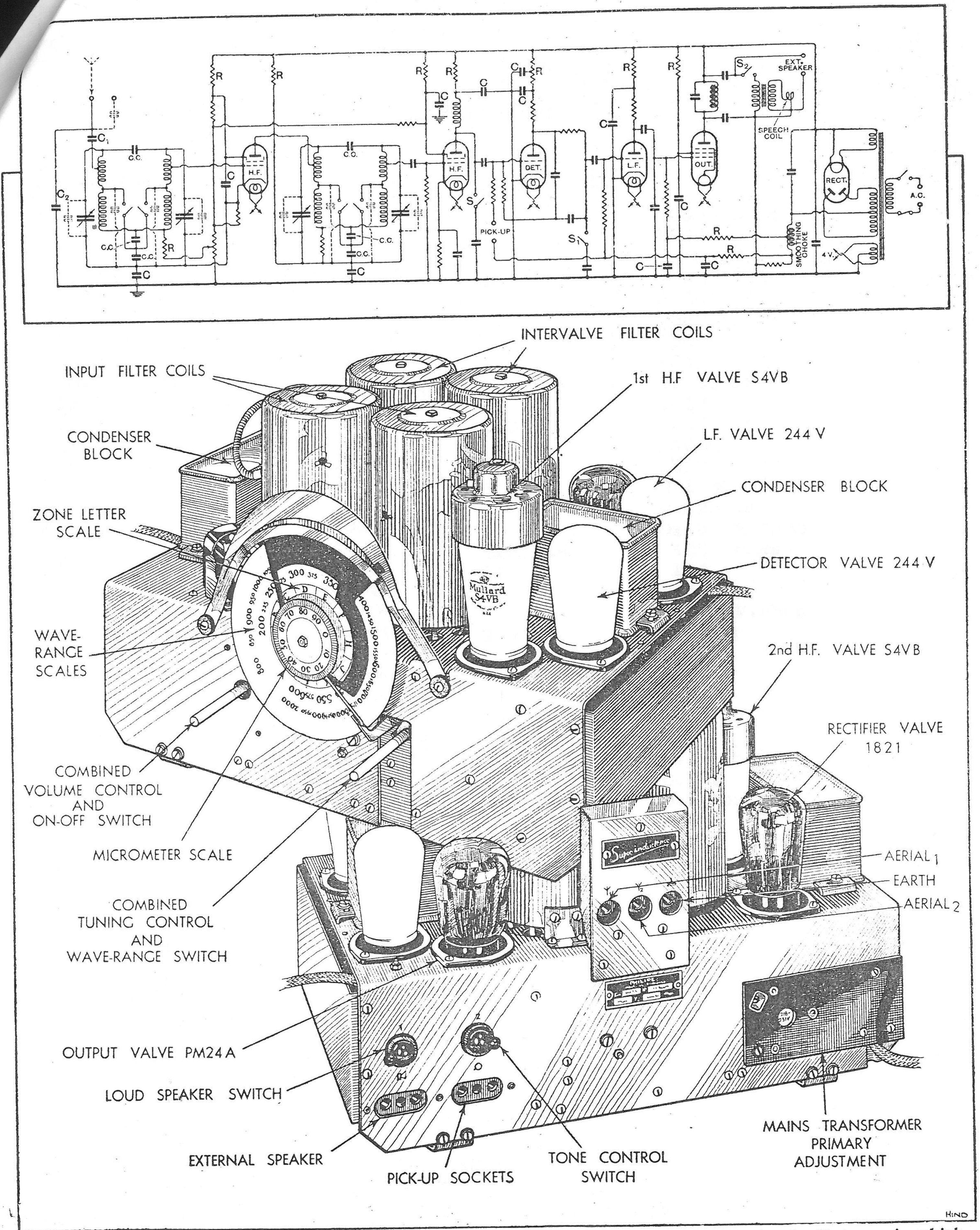
At five miles from the Brookmans Park station, and literally within sight of the aerials, only four transmission channels—those immediately adjacent to the twin local stations—are lost, and in each case the transmissions in the next-but-one channel were definitely receivable, although two of them were subjected to slight interference. A more conventional four-circuit receiver, itself no mean performer, made a very bad showing in this respect when subjected to a comparative test.

Selectivity should properly be judged in terms of sensitivity, and with regard to the latter quality the 630A was appreciably "down" on the other set, but not as much as might have been expected, in view of the fact that one of its H.F. stages is semi-aperiodic. The "standard" set, with its sensitivity artificially reduced to that of the Philips receiver, was still vastly inferior in selectivity.

On the long waves, all-round performance was found to be even better than on the medium band, probably because the aperiodic stage provides more amplification. Daventry, Königswusterhausen, and Radio Paris were separated perfectly, and as there is no reaction, operating skill does not come into the picture.

Quality of reproduction is eminently satisfactory, and is surprisingly brilliant in view of the undoubtedly high selectivity. The fact that frequencies up to 4,500 or 5,000 cycles are reproduced can only be accounted for by a system of tone correction in the output stage in which the pentode, the output coupling, and the loud speaker itself all play a part. Speech is crisp and intelligible, and bass is sufficient without any obtrusive resonances. Volume, without being overpowering, is satisfying.

A "STRAIGHT" SET WITH SUPERHETERODYNE SELECTIVITY.



Chassis of the Philips Type 630A as seen from front and rear. Inset is the complete circuit diagram, in which resistances which are essentially for decoupling or voltage-absorbing are marked R; the associated by-pass condensers are indicated by C. The aerial is fed through a form of capacity potentiometer consisting of C_1 and C_2. S_1, Tone corrector switch; S_2, loud speaker isolating switch. CC, filter coupling condensers.

670A

SPARES FOR 630A RECEIVER.

CONDENSERS.

C1	3 uF
C2	4 uF
C4	1.5 "
C3,C5,C6,	0.5 "
C7,C8,	1 "
C9,C10,C11,	0.5 "
C12,C13,C14,	0.5 "
C15	2000 uuF
C16,C20,C21,C22	430 "
C17,C23,C24,C25	10 "
C18,C26,C27,C28	27 "
C19	40 "
C29	50000 "
C30	50000 "
C31	50000 "
C32	50000 "
C33	64 or 80 "
C34	64OS "
C35	1600 "
C36	100 "
C37	2000 "
C38	250 "
C39	8000 "
C40	50000 "
C41	1600 or 2000 of 2500 uuF
C42,C43.	0.5 "
C44	0.2 uF
C45	80 uuF
C46	0.2 uF

RESISTANCES.

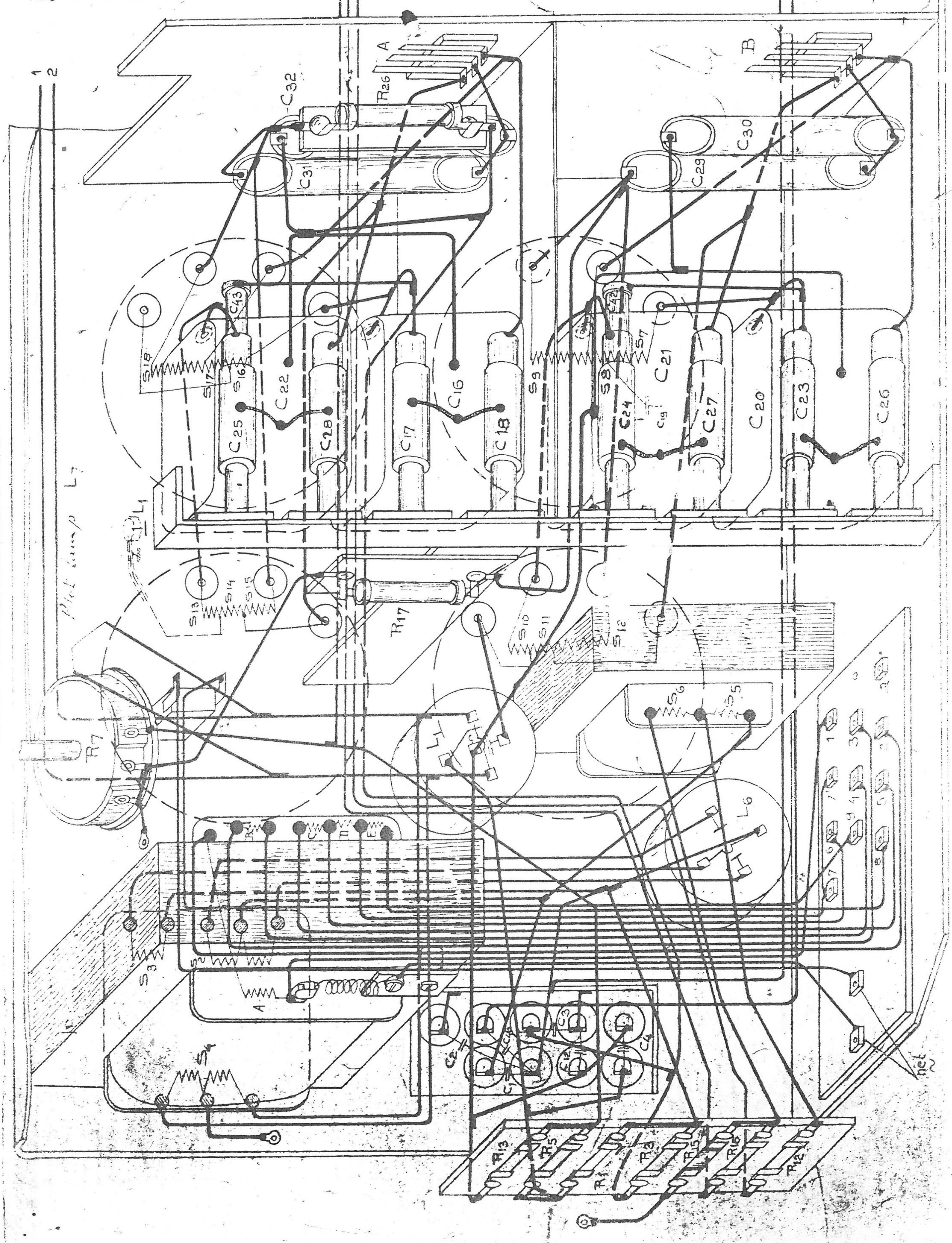
R1,R2	50000 ohms
R3	16000 "
R4	20000 "
R5	40000 "
R6	64000 "
R7	6200 "
R8	10000 or 12500 "
R9	16000 or 20000 "
R10	20000 or 25000 "
R11	15000 "
R12	0.1 or 0.125 or 0.16 M.ohms
R13,R14	400 ohms.
R15	100 "
R16	0.5 or 0.64 M.ohms
R17	1 or 1.25 "
R18	1 "
R19	0.32 "
R20	0.2 "
R21	0.1 "
R22	0.1 or 0.125 "
R23	0.5 or 0.64 "
R24	32000 ohms
R25	0.08 or 0.1 M.ohms
R26	2000 ohms.

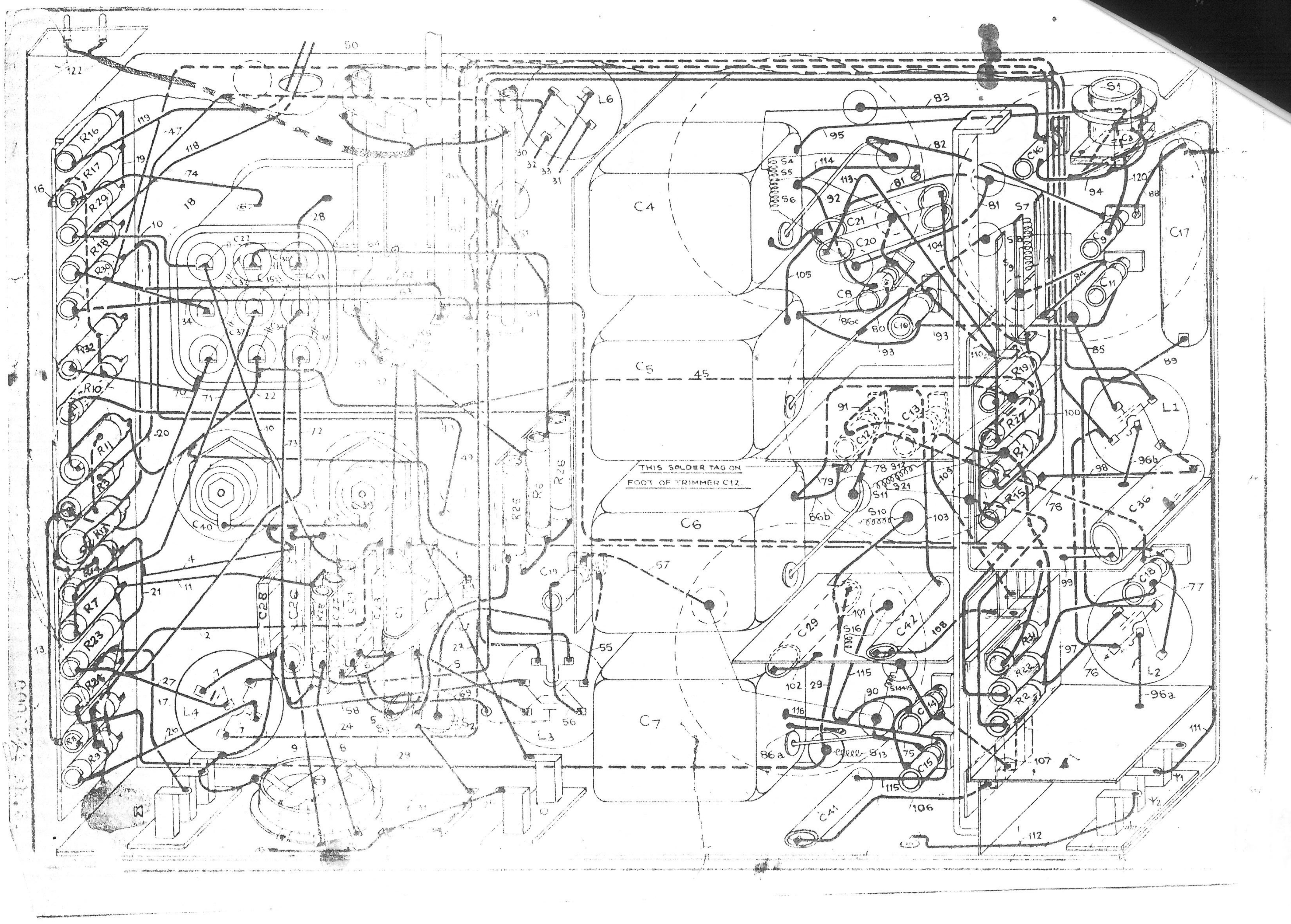
VALVES.

L1 -	S4VB/B
L2 -	S4VB/B
[illegible] -	244V
L[illegible] -	244V
L5 -	PM24A
L6 -	1821
L7 -	8046

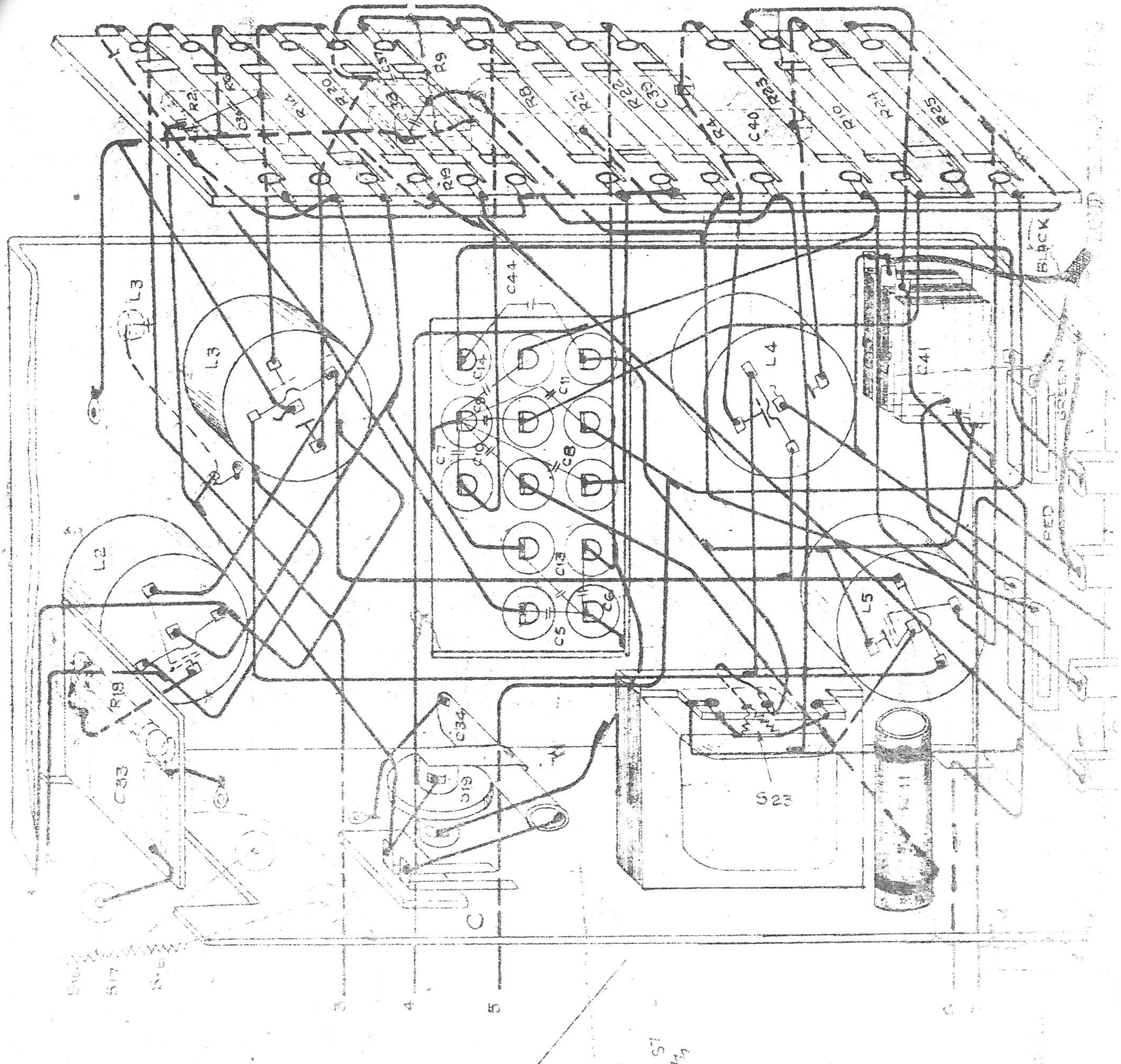
RECEIVER 620A, 630A	Also applies to: S000630A	CIRCUIT.
		S 000620A Sh.3
WIRING DIAGRAM L.H. SECTION		Dat.

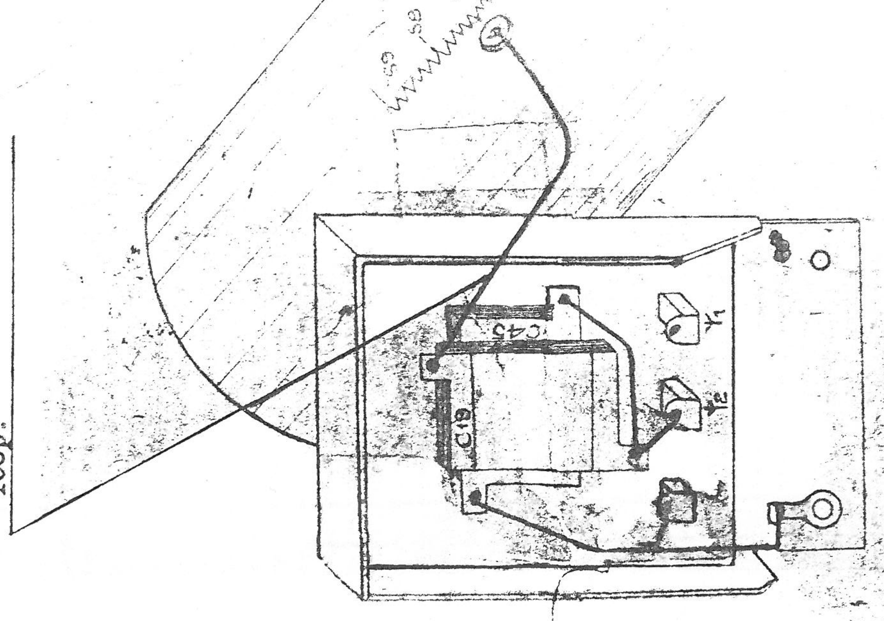
Points 1-7 strapped to corresponding points on Sh. 2 or 4.




THIS SOLDER TAG ON
FOOT OF TRIMMER C12.
C4
C5
C6
C7
C17
C36
L1
L2
L3
L4
L6
C40
C28
C26
R26
R16
R17
R29
R18
R11
R7
R23
R19
R27
R1
R15
R2
C41
C42
C29
C14
C15
C18
C21
C20
C8
C13
S1
S7

GENERAL ARRANGEMENT.



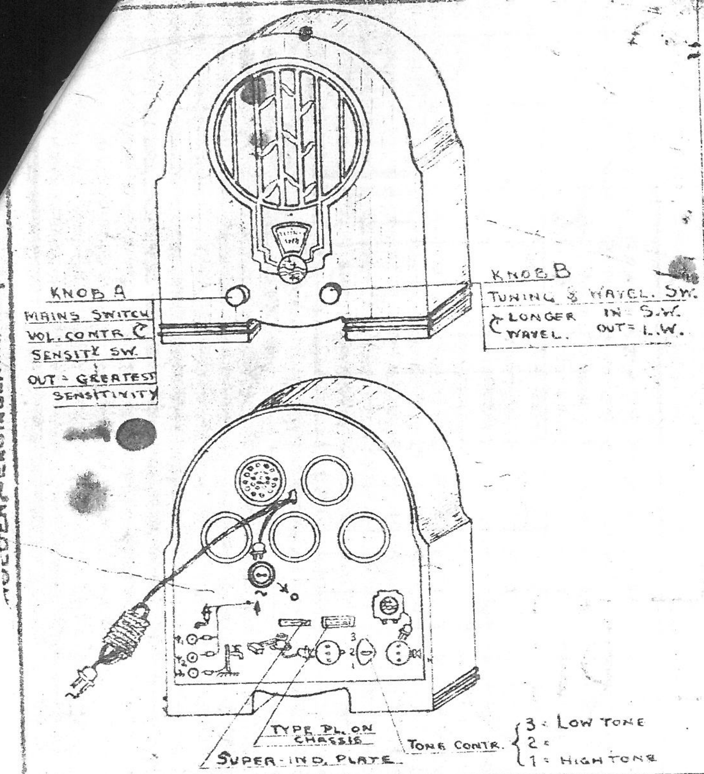


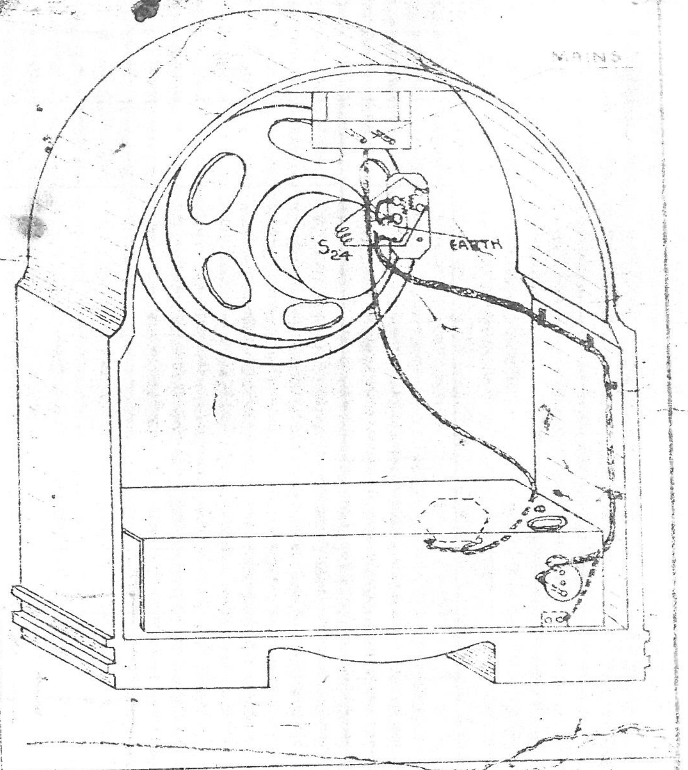
In Medium Wave position Switch C-1 is open

To prevent breaking of the lead, assemble in a loop.

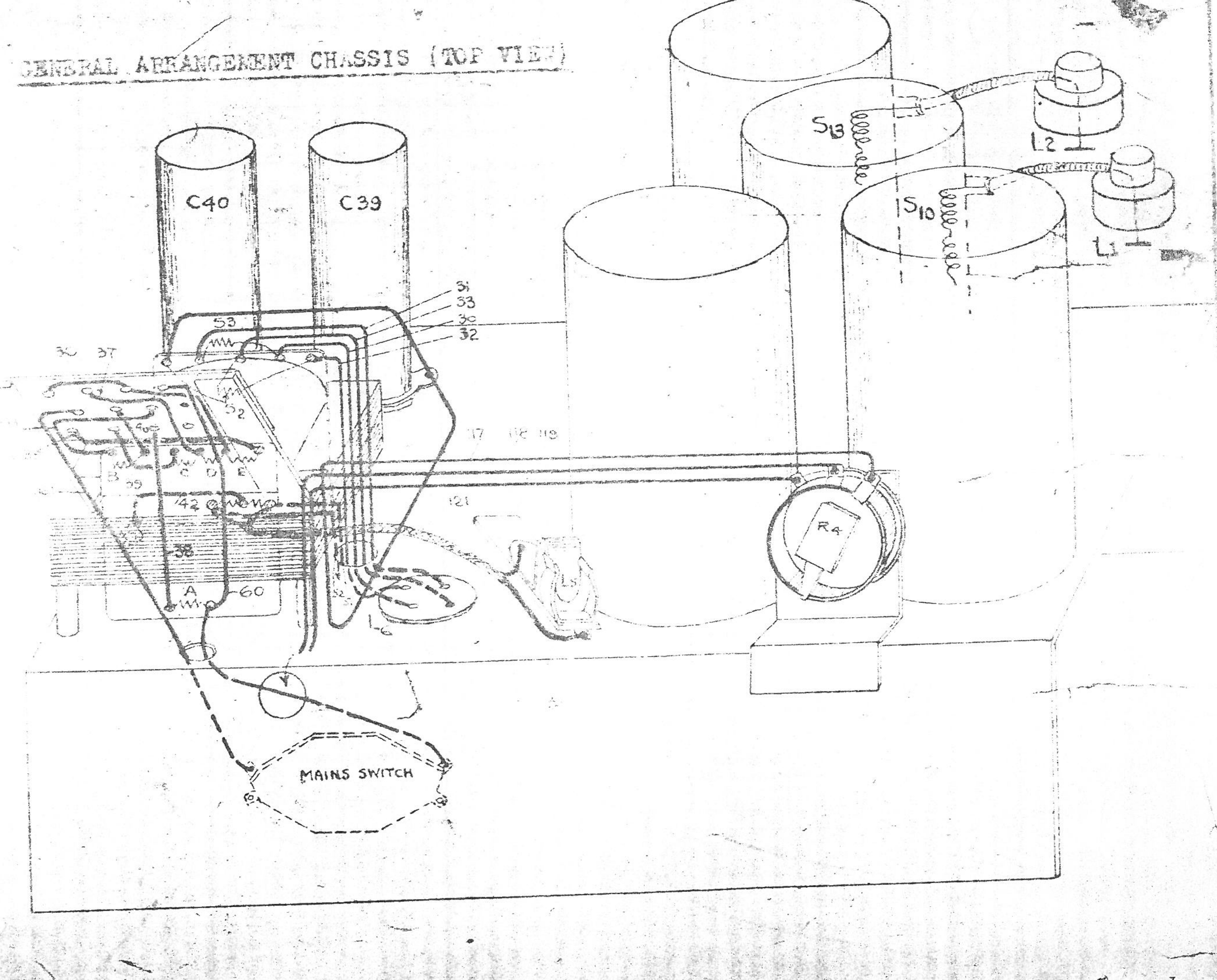
Connect 1 - 9 to [illegible] points on sheet 5.

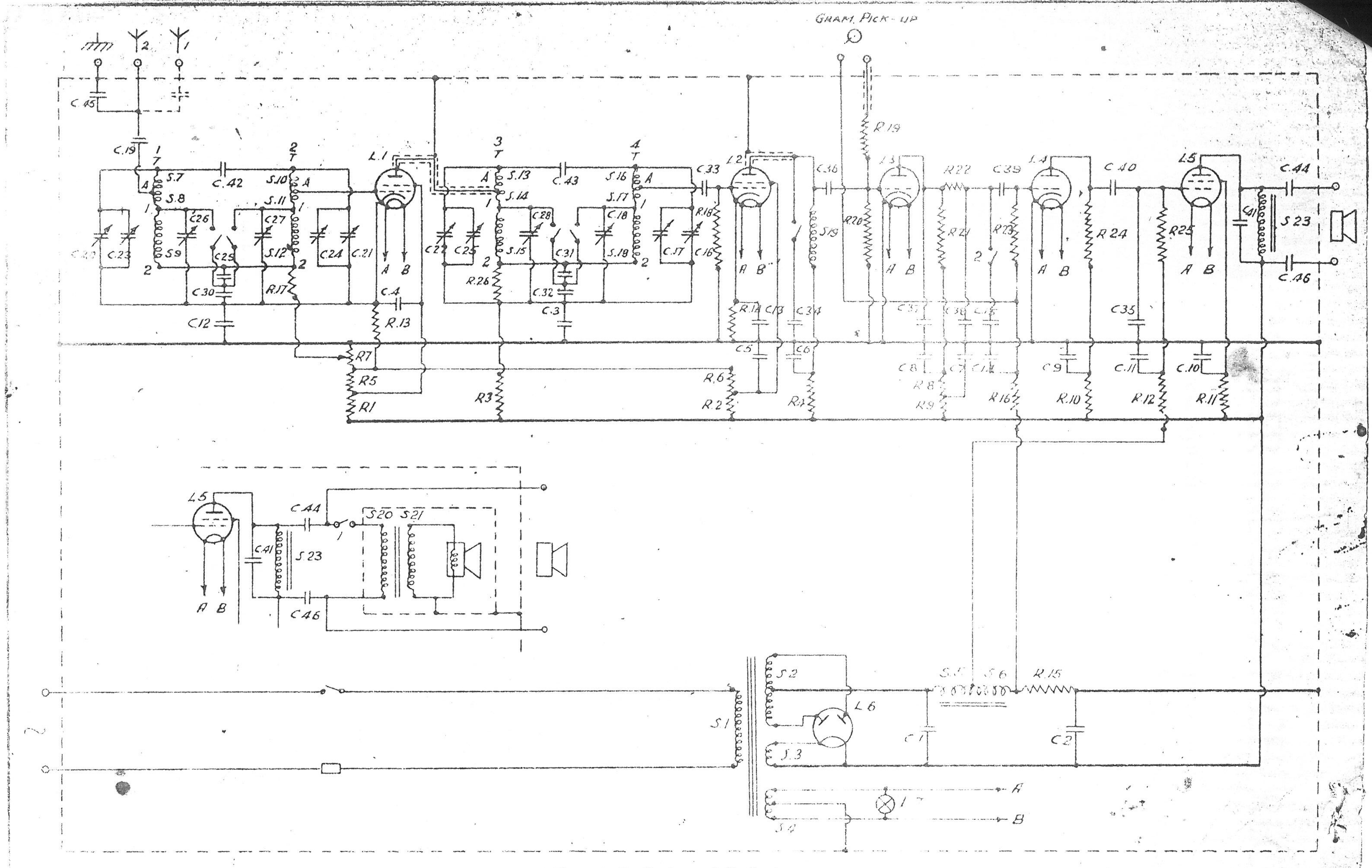
...RRANGEMENT CASE.





GENERAL ARRANGEMENT CHASSIS (TOP VIEW)





620A. 630A.