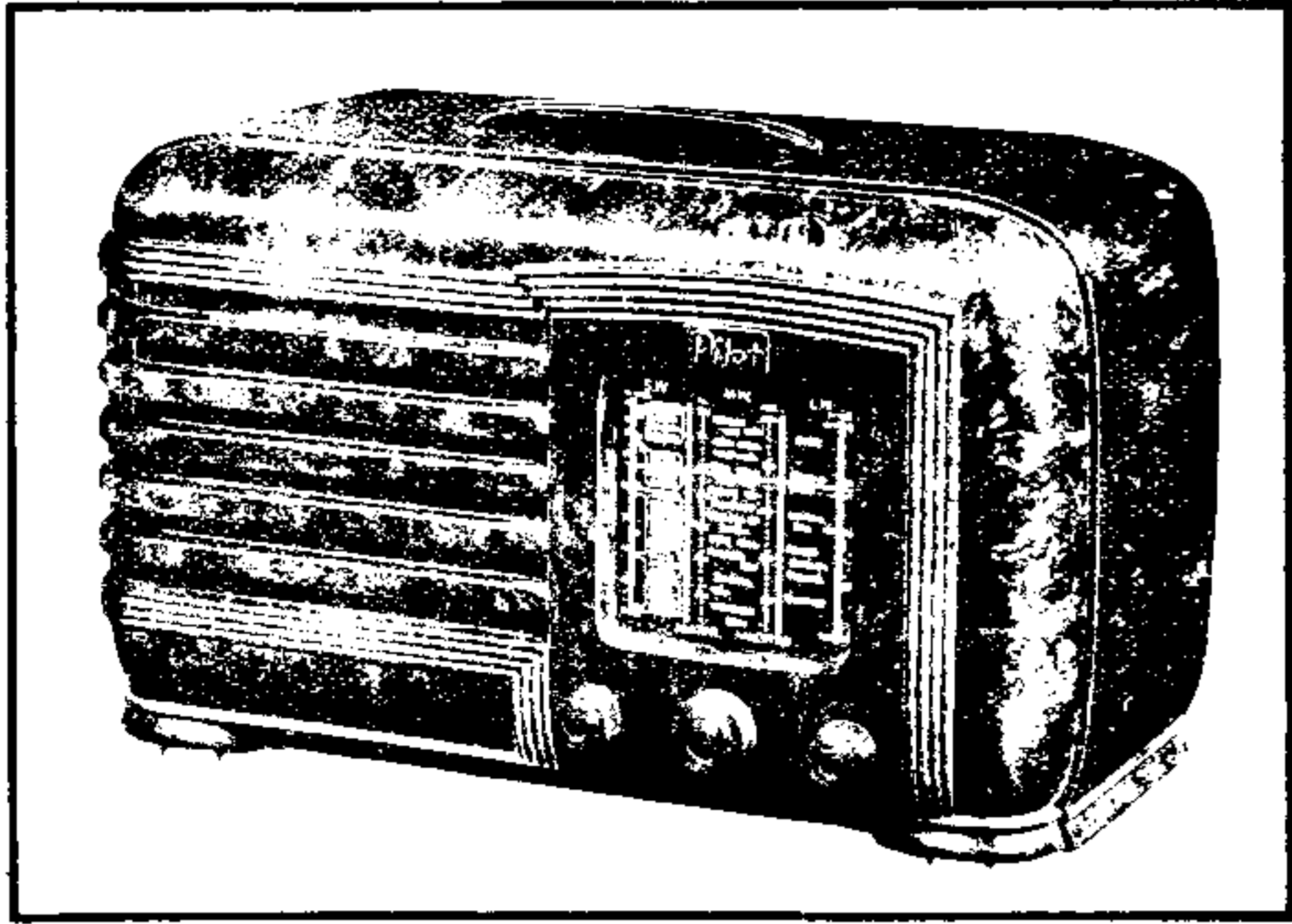


Inlichtingen voor de **MEGA** Service-Man



# Pilot Radio

## Major Maestro AC/DC



Afmetingen van het meubel: hoogte 23 cm, breedte 38 cm, diepte 17 cm.

**BIJZONDERSTE KENMERKEN:**

Bakelite meubel imitatie notelaar.

Superheterodyne schakeling met 5 Amerikaanse loctalbuizen: 6K8G of 6K8GT - 6K7G - 6Q7G - 25 A6G - 25 Z4G.

Spanningen: 200/225 V of 230/250 V. De inschakeling op de vereiste spanning, gebeurt door het verplaatsen van een losse draad op de voedingsweerstand.

Golfbereiken: 13.50 m, 200-570 m, 1000-2000 meter.

Eindvermogen: 2.5 Watt.

Luidspreker: 17 cm doormeter, permanent magnetisch type.

**Bij het schema:** één kant van het net is rechtstreeks verbonden met het chassis dat dus stroom voert. Er mag dus geen aardverbinding aan het toestel gelegd worden. De andere kant van het net ligt over een balastweerstand aan de plaat van de gelijkrichterlamp V5. De gelijkgerichte stroom wordt gefilterd door twee cellen, R 14 - C 29 - C 30 en R 13 - C 26 - C 29.

Bemerk de zorg aan de aflakking besteed in de andere ketens van het toestel, zo bv. C 22 - R 7 - C 19 - C 20, enz.

In de keten van de gloeidraden zijn de schaalverlichtinglampjes D 1 en D 2 in serie gemonteerd, en beschermd door de weerstand R 15 bij het inschakelen. Niettegenstaande het chassis stroom voert, is de pick-up aansluiting zonder gevaar, gezien deze beschermd is door de condensator C 31.

**Spoolenblok:** de primaire van L1 (UKG) bestaat in serie met L2 antennespoel voor midden- en lange golven. De middengolfspoel is voorzien van één trimmer C 2 en de lange golfspoel met een trimmer C 4. Op het schema staat naast de pijl van de verschillende schijven van de golfbandschakelaar een soort vlag getekend. Dit is een metalen stuk dat niet de beweegbare vinger mededraait en de

niet gebruikte spoelen kortsluit. Daardoor is alle invloed van de niet werkende spoelen op deze die in bedrijf zijn uitgesloten.

De auto-transfo schakeling van de ultra-korte golven oscillatorspoelen, alsmede de middengolf oscillatorspoel L3 verdienen bijzondere aandacht.

De afregeling van het toestel gebeurt volgens de klassieke methode, dwz. door het afregelen van de middengolven, lange golven en ultra-korte golven. Voor elke band worden twee ijkingspunten gebezigd, aangegeven in de tabel der ijkingsfrequenties.

Men begint eerst onderaan de band te regelen door het instellen van de trimmers en bovenaan de band door het instellen van de padders, na voorafgaandelijk de twee middenfrequent transformatorren P1 en P2 afgeregeld te hebben op 451 kc.

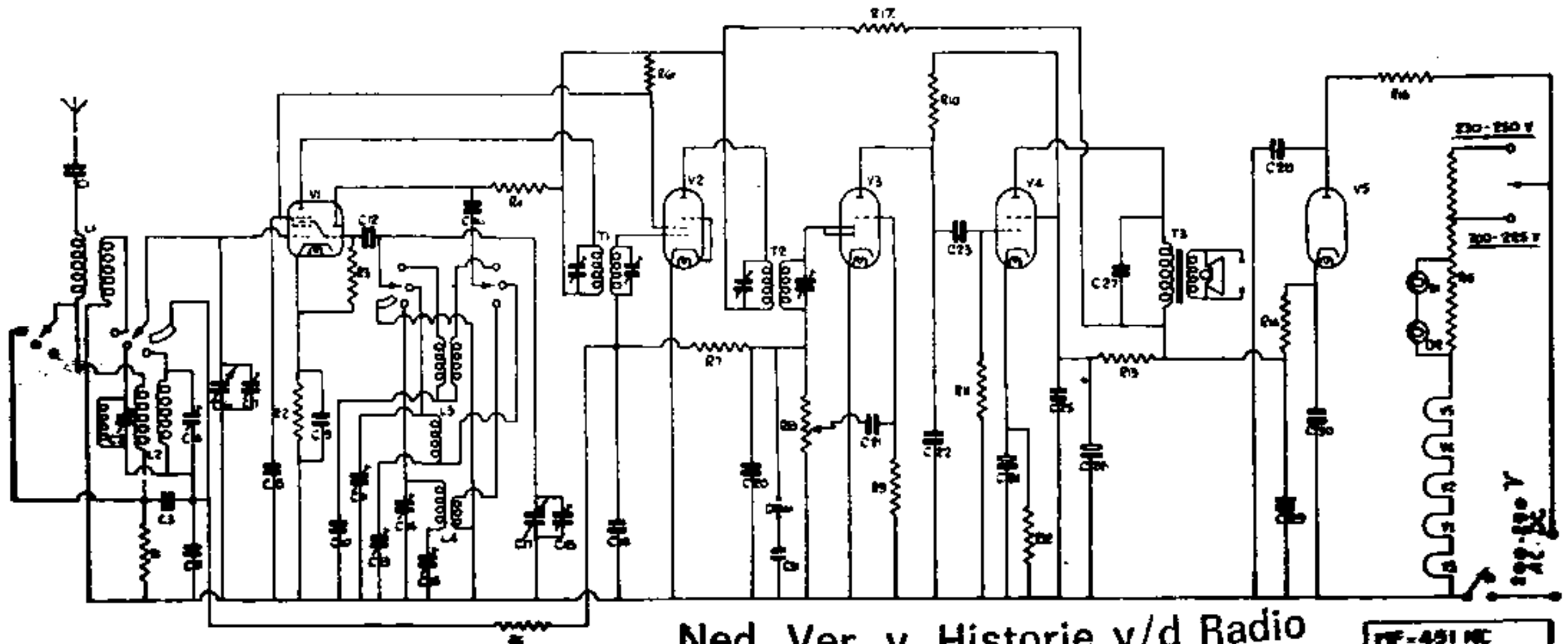
Tooncontrole is vast, en wordt bepaald door C 27.

Het toestel is voorzien met een antenne die op een karton gerold is.

Het toestel speelt op die manier, maar geeft natuurlijk beter resultaat wanneer de antenne ontrollt wordt.

De afstemknop heeft twee snelheden.

**Principe schema van PILOT Radio Major Maestro AC/DC.**



Ned. Ver. v. Historie v/d Radio

RF-451 MC

# Codenummers en waarden van de gebruikte onderdelen

## WEERSTANDEN

R 1 - 17	1.000 ohm - 1/4 watt	± 20%
R 2	220 ohm - 1/4 watt	± 20%
R 3	47.000 ohm - 1/4 watt	± 20%
R 4 - 13	22.000 ohm - 1/4 watt	± 20%
R 5	100 kiloohm - 1/4 watt	± 20%
R 6	6.800 ohm - 1/4 watt	± 20%
R 7	1 megohm - 1/4 watt	± 20%
R 8	1/2 megohm - verstelbaar	
R 9	10 megohm - 1/4 watt	± 20%
R 10 - 11	270.000 ohm - 1/4 watt	± 20%
R 12	470 ohm - 1 watt	± 20%
R 14	1.000 ohm - 2 watt	± 20%
R 15	600 ohm - 60 watt draaggewonden met aftakk.	
R 16	100 ohm - 1/4 watt	± 20%

## KONDENSATOREN

C 1	0,001 µF	papier 350 V =
C 2	50 pF	M.G. Ant. trimmer (is een deel van de dubbele trim. 50/100 pF C2-C4 geplaatst in L 2)
C 3 - 31	0,02 µF	papier 450 V =

## KONDENSATOREN (vervolg)

C 4	100 pF	L.G. Ant. trimmer (zie C 2)
C 5 - 21	0,002 µF	papier 450 V =
C 6 - 17	0,000528	afstemkondensator
C 7 - 18	30 pF	trimmers op afstemkondensator
C 8 - 19 - 25	0,1 µF	papier
C 9 - 28	0,05 µF	papier 500 V =
C 10	0,006 µF	zilver mica ± 2%
C 11	50 pF	M.G. Oscil. trimmer (is een deel van de dubbele padder 50-700 pF C 11 - C 13)
C 12	60 pF	mica
C 13	700 pF	M.G. padder (zie C 11)
C 14	100 pF	L.G. oscil. trimmer (is een deel van de dubbele padder 100-300 pF C 14 - C 15)
C 15	300 pF	L.G. padder (zie C 14)
C 16 - 20	100 pF	mica
C 22	0,0003 µF	mica
C 23 - 27	0,01 µF	papier 350 V =
C 24	25 µF	electrolyt. 25 V =
C 26	8 µF	electrolyt. 200 V =
C 29 - 30	16 + 16 µF	electrolyt. 350 V =

## SPOELENGROEPEN

L 1	K.G. Antenne
L 2	M.G. en L.G. Antenne
L 3	K.G. en M.G. Oscillator
L 4	L.G. Oscillator.

## BUIZEN

V 1	6 K 8 G of 6 K 8 G T
V 2	6 K 7 G
V 3	6 Q 7 G
V 4	25 A 6 G
V 5	25 Z 4 G

## SCHAALVERLICHTINGS-LAMPJES

D 1 - 2	6,2 V - 0,3 A.
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## TRANSFORMATOREN

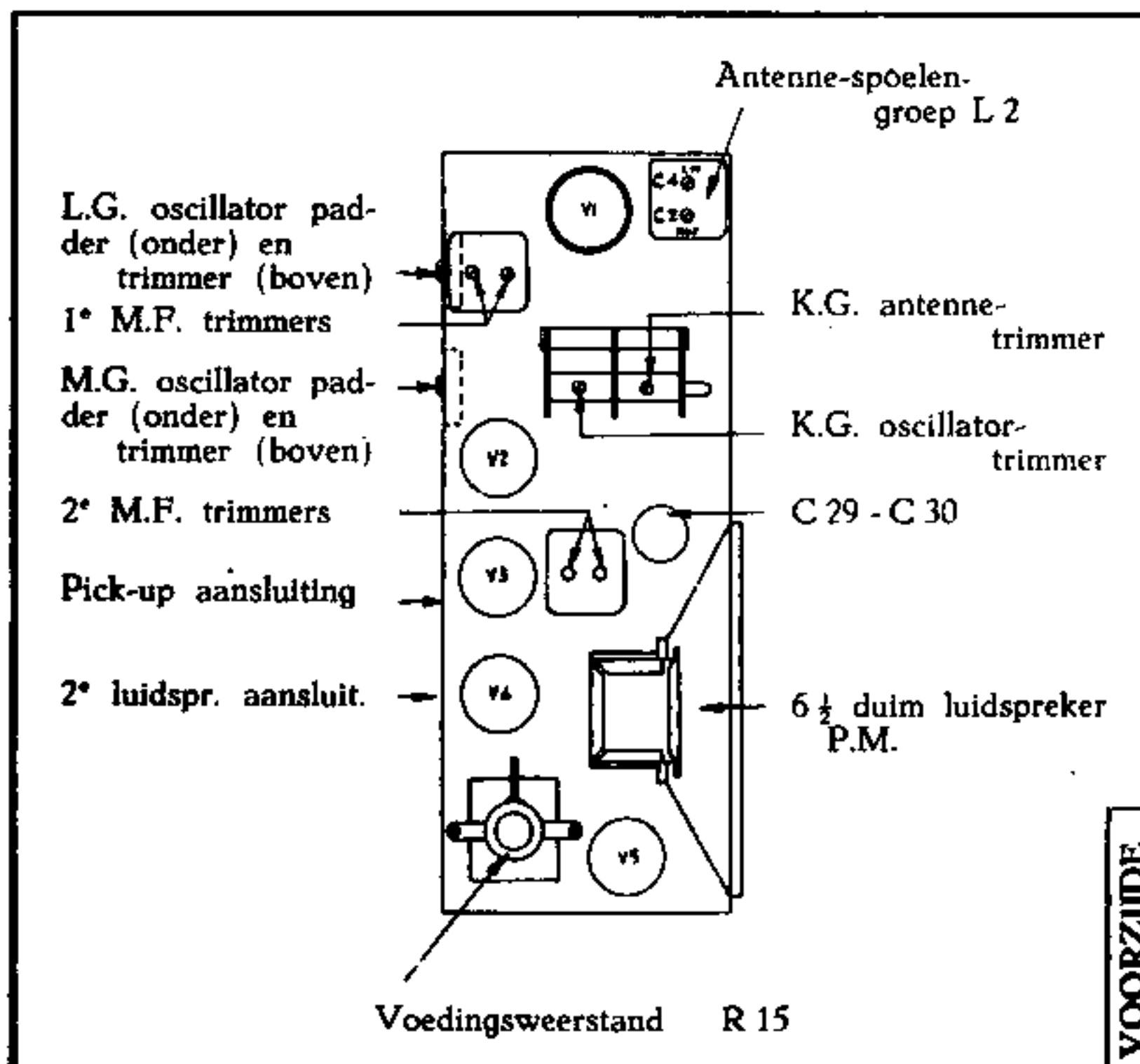
T 1	1ste M.F.
T 2	2de M.F.
T 3	Output

## IJKINGSFREQUENTIES

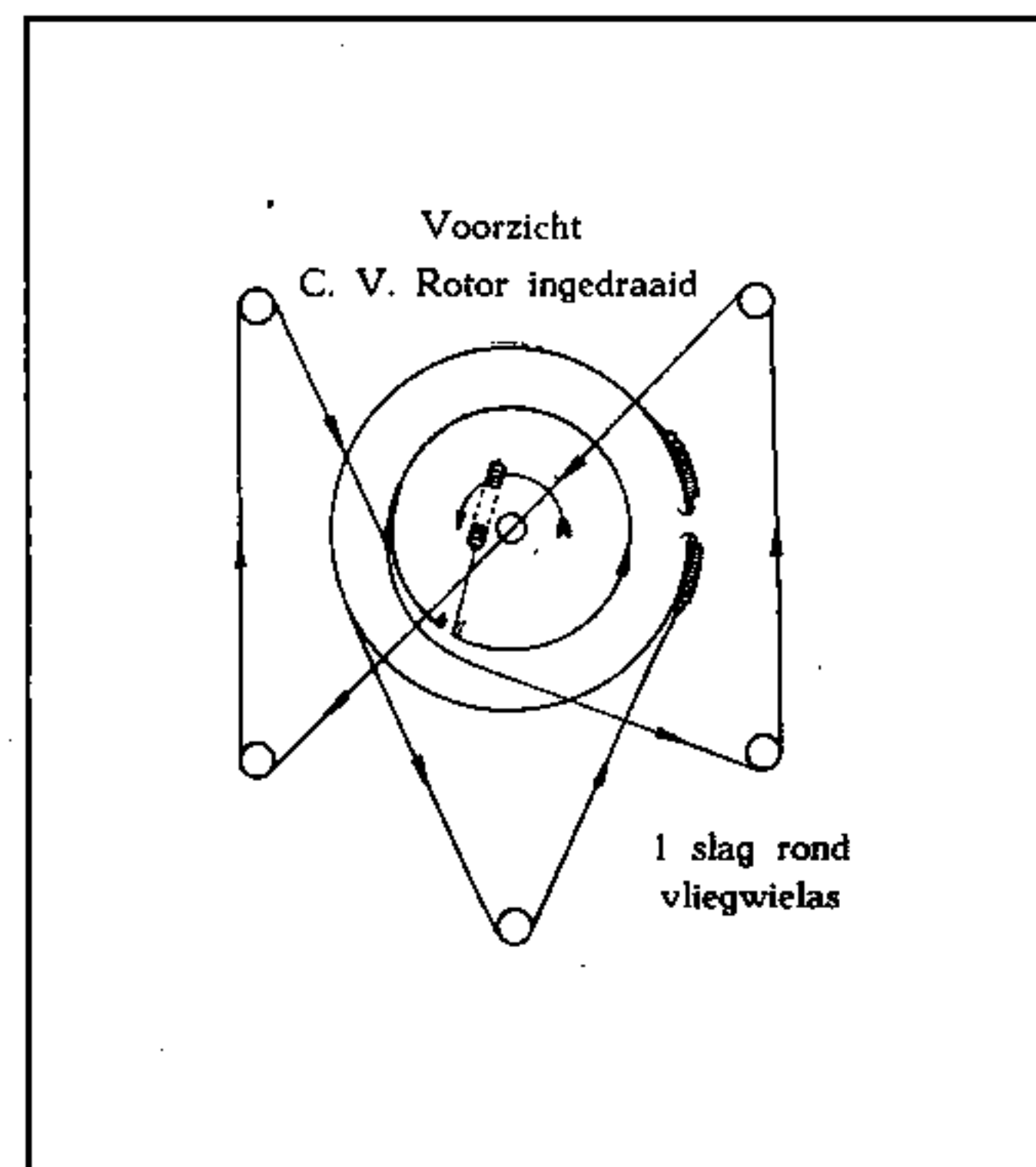
M.F.	451 KC
L.G.	300 KC en 150 KC
M.G.	1400 KC en 600 KC
K.G.	20 MC

Gebruik de bovenstaande codenummers der onderdelen bij eventuele bestellingen.

Bovenzicht van het chassis



Koordverbinding der schaal aandrijving



De bovenstaande figuur van het chassis geeft duidelijk de plaats aan waar de verschillende regelvijzen en kernen zich bevinden

Het eventueel vervangen van de koord der schaal aandrijving moet gebeuren volgens bovenstaande figuur.

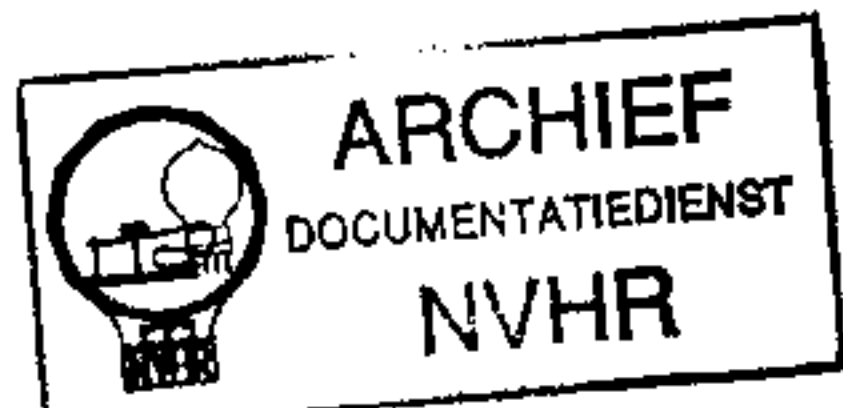
## INLICHTINGEN BIJ HET PILOT TOESTEL SH 545 AC.

afgedrukt in N° 3-1947, blz. 56/57.

Wij wijzen: bij de Kondensatoren { C 3 - 5 - 13 0,1 µF-papier in plaats van 1 µF.  
C 4 - 7 0,000532 µF-afstemband. in pl. v. 532 cm.

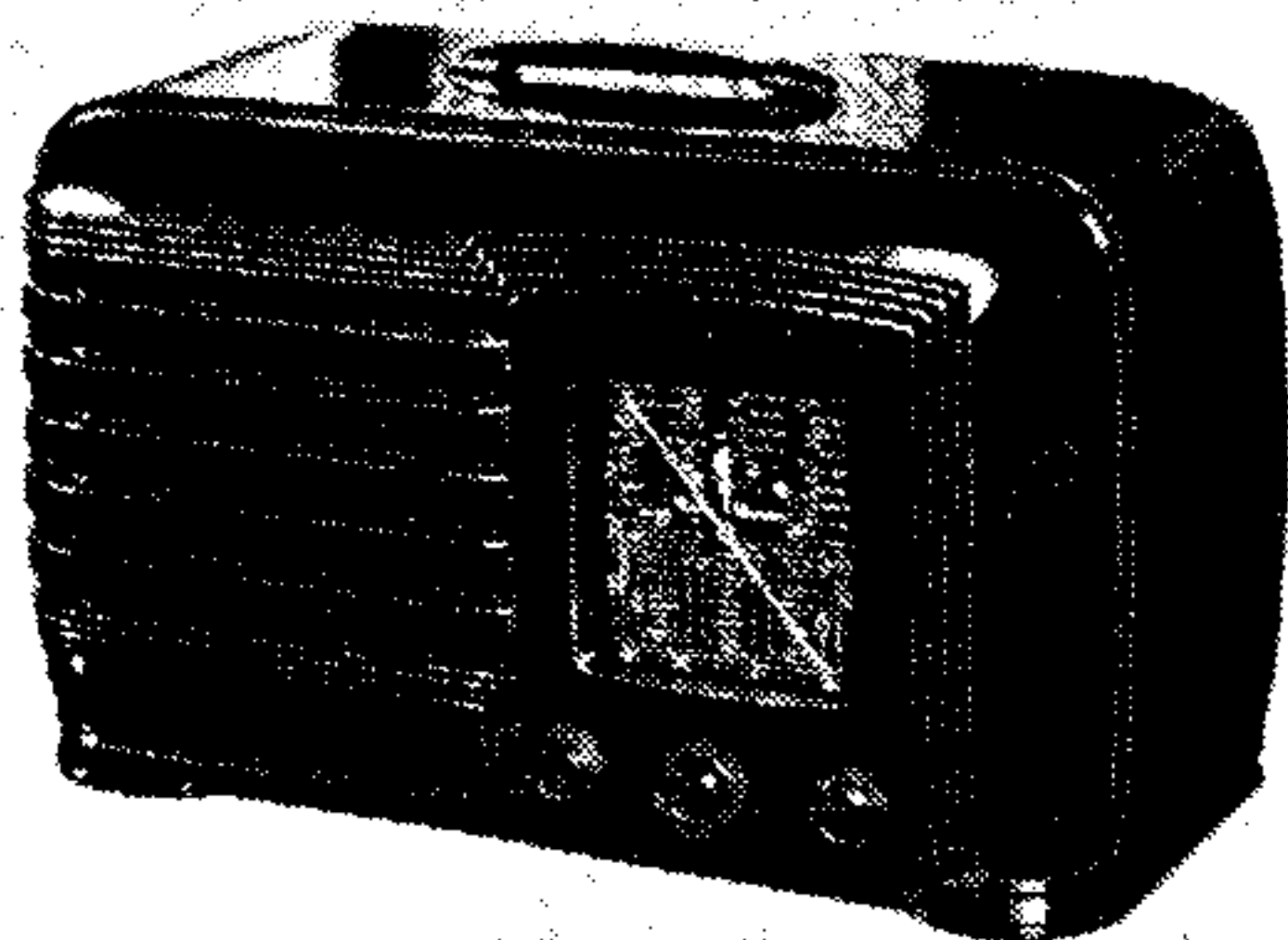
Spoelen: Morse-filter in plaats van Morse-filter.  
L 1 - 2 - 3 en 4 zijn te groeperen onder: Antenne-spoel.  
L 5 - 6 en 7 onder: Oscillator-spoel.

Ned. Ver. v. Historie v/d Radio



# PILOT MAJOR MAESTRO

## 2-BAND AC/DC SUPERHET



### COMPONENTS AND VALUES

RESISTANCES		Values (ohms)
R1	V1 fixed GB resistance ...	220
R2	V1 osc. CG resistance ...	39,000
R3	Part V1 osc. anode HT feed	22,000
R4	V1, V2 SG's HT feed ...	22,000
R5	IF stopper ...	33,000
R6	AVC line feed resistance ...	1,000,000
R7	Manual volume control; V3 signal diode load ...	1,000,000
R8	V3 triode CG resistance ...	9,500,000
R9	V3 triode anode load... ..	100,000
R10	V4 CG resistance ...	270,000
R11	V4 GB resistance ...	470
R12	Part V1 osc. anode HT feed	10,000
R13	Heater circuit ballast ...	660*

\*Tapped at 150 O + 360 O + 120 O + 30 O from V5 heater end.

Second valve (V2, Brimar 6K7G) is a variable-mu RF pentode operating as IF amplifier with tuned-primary, tuned secondary transformer couplings C26, L9, L10, C27 and C28, L11, L12, C29.

Intermediate frequency 451 KC/S.

Diode second detector is part of double diode triode valve (V3, Brimar 6Q7G). Audio frequency component is developed across manual volume control R7 and passed via AF coupling condenser C11 to CG of triode section. IF filtering by C9, R5 and C10.

DC potential across R5, R7 is fed via R6 and V3 AVC diode back as GB to FC and IF valves, giving AVC.

Resistance-capacity coupling by R9, C12 and R10 between V3 triode and pentode output valve (V4, Brimar 25A6G). Fixed tone correction by C14 in anode circuit.

When the receiver is used with AC mains, HT current is supplied by rectifying valve (V5, Brimar 25Z6G), which with DC mains behaves as a low resistance. Smoothing by speaker field L15, electrolytic condensers C15, C16 and C17 and R12.

Valve heaters, together with ballast resistance R13 and scale lamps, are connected in series across mains input.

### DISMANTLING THE SET

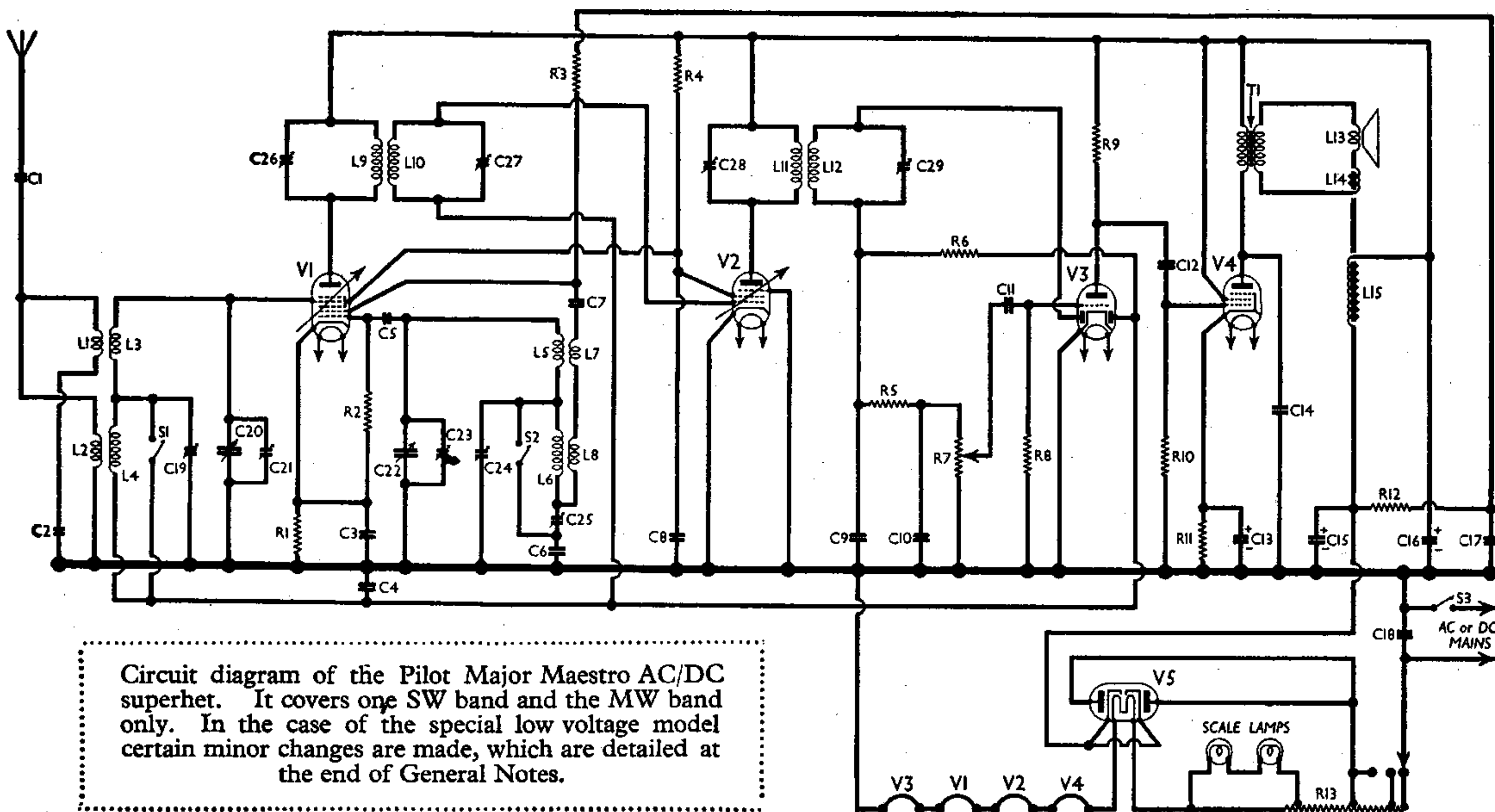
**Removing Chassis.**—Remove the three control knobs (pull-off); remove the three screws (with washers) holding the chassis to the bottom of the cabinet.

CONDENSERS		Values (μF)
C1	Aerial isolating condenser...	0-00006
C2	Aerial SW coupling condenser ...	0-00006
C3	V1 cathode by-pass ...	0-025
C4	AVC line decoupling ...	0-04
C5	V1 osc. CG condenser ...	0-00006
C6	Osc. circuit SW tracker ...	0-006
C7	V1 osc. anode coupling ...	0-00015
C8	V1, V2 SG's decoupling ...	0-05
C9	IF by-pass condensers ...	0-00015
C10		0-00015
C11	AF coupling to V3 triode ...	0-004
C12	V3 triode to V4 AF coupling	0-025
C13*	V4 cathode by-pass ...	25-0
C14	Fixed tone corrector ...	0-01
C15*	HT smoothing condensers...	20-0
C16*		20-0
C17*		8-0

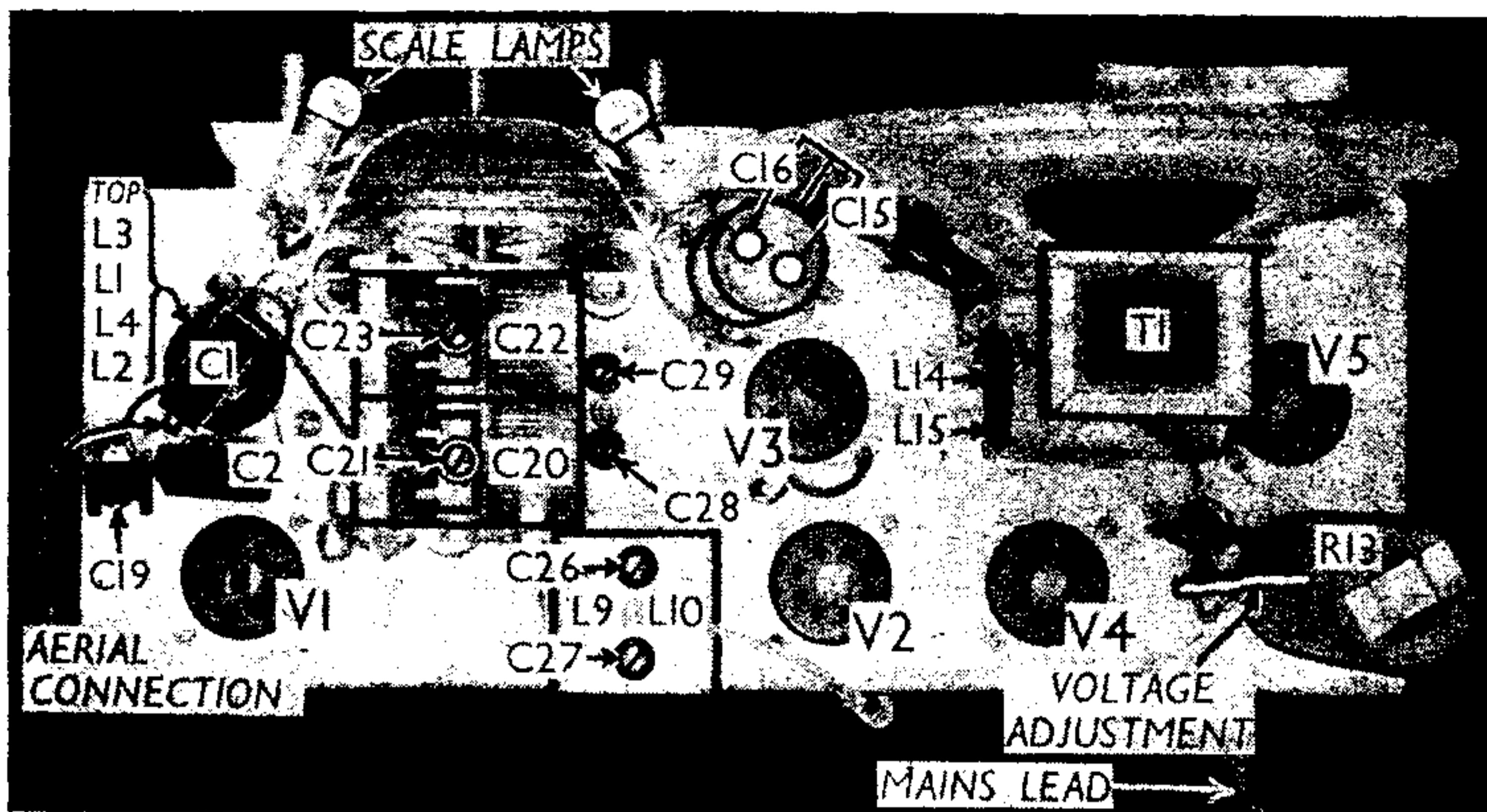
### CIRCUIT DESCRIPTION

Aerial input via coupling coils L1 (SW), L2 (MW) and C2 to single tuned circuits L3, C20 (SW) and L4, C20 (MW), which precede heptode valve (V1, Brimar 6A8G) operating as frequency changer with electron coupling.

Oscillator grid coils L5 (SW) and L6 (MW) are tuned by C22; parallel trimming by C23 (SW) and C24 (MW); series tracking by C6 (SW) and C25 (MW). Reaction by coils L7 (SW) and L8 (MW).



Circuit diagram of the Pilot Major Maestro AC/DC superhet. It covers one SW band and the MW band only. In the case of the special low voltage model certain minor changes are made, which are detailed at the end of General Notes.



Plan view of the chassis. Note the double condenser C15, C16. Its negative connection is beneath the chassis. R13 is the tapped ballast resistor. The aerial is connected to one side of C1.

**Condensers C15, C16.**—These are two 20 $\mu$ F, 250V DC working dry electrolytics in a tubular carton mounted vertically in a clip on the chassis deck. The common negative connection is a tag reached from beneath the chassis. The positive tags are indicated in our plan chassis view.

**Resistance R13.**—This is the wire-wound ballast resistance mounted on the chassis deck. The tags from the lowest upwards are the connections from left to right on R13 in our circuit diagram.

**Chassis Divergencies.**—R1 is 2200, not 2000 as shown by the makers; C4 is 0.04 $\mu$ F, not 0.05 $\mu$ F; C11 is 0.004 $\mu$ F, not 0.005 $\mu$ F. C18 is from the unswitched side of the mains to chassis; in the maker's diagram it is from the anodes of V5 to chassis.

**110V Model.**—In the 110V model the place of the speaker field is taken by an iron-cored choke; the speaker field is then connected from the cathode of V5 to chassis. The resistance of the field in this model is 2,500 O. R3 and R4 both become 10,000 O instead of 22,000 O; C7 becomes 0.0004 $\mu$ F instead of 0.00015 $\mu$ F; C17 becomes 40 $\mu$ F instead of 8 $\mu$ F, and R13 has a total resistance of 215 O instead of 660 O.

CONDENSERS (continued)		Values ( $\mu$ F)
C18	Mains RF by-pass ...	0.1
C19†	Aerial circuit MW trimmer ...	0.00003
C20†	Aerial circuit tuning ...	—
C21†	Aerial circuit SW trimmer ...	0.00003
C22†	Oscillator circuit tuning ...	—
C23†	Osc. circuit SW trimmer ...	0.00003
C24†	Osc. circuit MW trimmer ...	0.000025
C25†	Osc. circuit MW tracker ...	0.00065
C26†	1st IF trans. pri. tuning ...	—
C27†	1st IF trans. sec. tuning ...	—
C28†	2nd IF trans. pri. tuning ...	—
C29†	2nd IF trans. sec. tuning ...	—

\*Electrolytic. †Variable. ‡Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW coupling coil ...	2.2
L2	Aerial MW coupling coil ...	16.0
L3	Aerial SW tuning coil ...	Very low
L4	Aerial MW tuning coil ...	2.7
L5	Osc. circuit SW tuning coil ...	Very low
L6	Osc. circuit MW tuning coil ...	2.5
L7	Oscillator SW reaction ...	0.2
L8	Oscillator MW reaction ...	0.2
L9	1st IF trans. { Pri. ...	9.0
L10		Sec. ...
L11	2nd IF trans. { Pri. ...	30.0
L12		Sec. ...
L13	Speaker speech coil ...	2.5
L14	Hum neutralising coil ...	0.1
L15	Speaker field coil ...	1,000.0
T1	Speaker input trans. { Pri. ...	450.0
	{ Sec. ...	0.5
S1, S2	Waveband switches ...	—
S3	Mains switch, ganged R7 ...	—

**VALVE ANALYSIS**

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on our AC mains of 235V, using the top tapping on the mains resistance. The receiver was tuned to the lowest wavelength on the MW band and the volume

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 6A8G	130	2.0	51	2.6
	Oscillator	3.2		
V2 6K7G	130	3.8	51	0.9
V3 6Q7G	55	0.6	—	—
V4 25A6G	115	34.0	130	7.8
V5 25Z6G	185†	—	—	—

† Cathode to chassis, DC.

control was at maximum, but there was signal input.

Voltages were measured on the 400V scale of a model 7 Universal Avometer, chassis being negative.

**GENERAL NOTES**

**Switches.**—S1, S2 are the waveband switches, in a rotary unit beneath the chassis. This is indicated in our under-chassis view, and a drawing is also inset in this view showing the tags of the two switches. Both are closed on SW, and open on MW.

S3 is the QMB mains switch, ganged with the volume control R7.

**Coils.**—L1-L4 are in an unshielded unit on the chassis deck; L5, L7 and L6, L8 are in two unshielded units beneath the chassis, while the second IF transformer L11, L12 is also unshielded, and beneath the chassis. The first IF transformer L9, L10 is in a screened unit on the chassis deck.

**External Speaker.**—No provision is made for this, but a low resistance (about 30) type could be connected across the speech coil of the internal speaker.

**Scale Lamps.**—These are two Ever Ready types with miniature bayonet cap bases, rated at 7.3V, 0.25A.

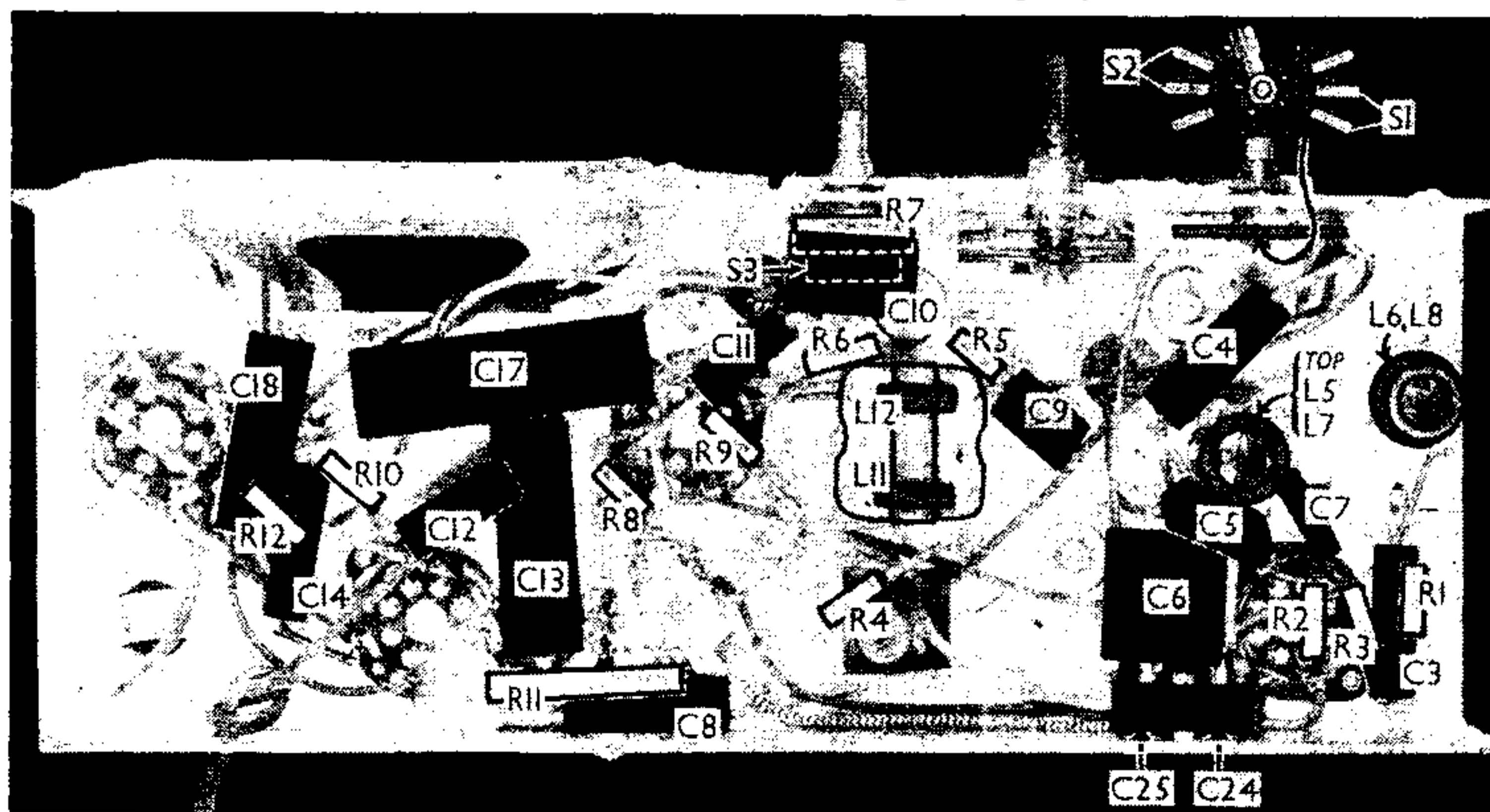
**CIRCUIT ALIGNMENT**

**IF Stages.**—Connect signal generator, via a 0.1 $\mu$ F condenser, to control grid (top cap) of V1, and, via another 0.1 $\mu$ F condenser, to chassis. Feed in a 451 KC/S signal, and adjust C29, C28, C27 and C26 in turn for maximum output. Repeat these adjustments.

**RF and Oscillator Stages.**—With gang at maximum, pointer should be horizontal. Connect signal generator to aerial side of C1 and, via a 0.1 $\mu$ F condenser, to chassis.

**SW.**—Switch set to SW, tune to 17 m on scale, feed in a 17 m (17.6 MC/S) signal, and adjust C23, then C21, for maximum output. C23 should be set to the peak involving the lesser trimmer capacity.

**MW.**—Switch set to MW, tune to 200 m on scale, feed in a 200 m (1,500 KC/S) signal, and adjust C24, then C19, for maximum output. Feed in a 500 m (600 KC/S) signal, tune it in, and adjust C25 for maximum output, while rocking the gang for optimum results.



Under-chassis view. A drawing of the switch unit is inset at the top right hand corner. C24 and C25 are adjustable through holes in the rear chassis member.