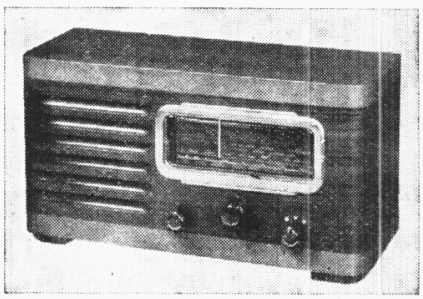
Supplement to The Wireless & Electrical Trader, Jan. 6, 1940.

"TRADER" SERVICE SHEET **443**

SELMER TRUVOICE

MODEL 139 AC/DC SUPERHET



The Selmer Truvoice 139 receiver

THE Selmer Truvoice Five (Model 139) is a four-valve plus valve rectifier AC/DC 3-band superhet, fitted in a small table cabinet. It has a permanently attached aerial lead, but no earth is used. The SW range is 16.5-52 m, and the receiver is suitable for use on 200-250 V AC or DC mains (40-100 C/S in the case of AC).

Release date: August, 1939.

CIRCUIT DESCRIPTION

Aerial input via coupling coils **L2** (SW), **L3** (MW) and **L4** (LW) to single tuned circuits **L5, C28** (SW), **L6, C28** (MW) and **L7, C28** (LW). IF filtering by **L1, C24** across aerial circuit.

First valve **(V1, Osram X63)** is a heptode operating as frequency changer with electron coupling. Oscillator grid coils **L8** (SW), **L9** (MW) and **L10** (LW) are tuned by **C29**; parallel trimming by **C32** (SW), **C33** (MW) and **C5, C34** (LW); series tracking by **C30** (MW) and **C31** (LW). Reaction coupling by **L11** (SW), **L12** and common impedance of **C30** (MW) and common impedance of **C31** (LW). **C30** and **C31** are included in both grid and anode circuits in their respective wavebands.

Second valve **(V2, Osram KTW61)** is a variable-mu RF tetrode operating as intermediate frequency amplifier with tuned-primary, tuned-secondary transformer couplings **C35, L13, L14, C36** and **C37, L15, L16, C38.**

Intermediate frequency 450 KC/S.

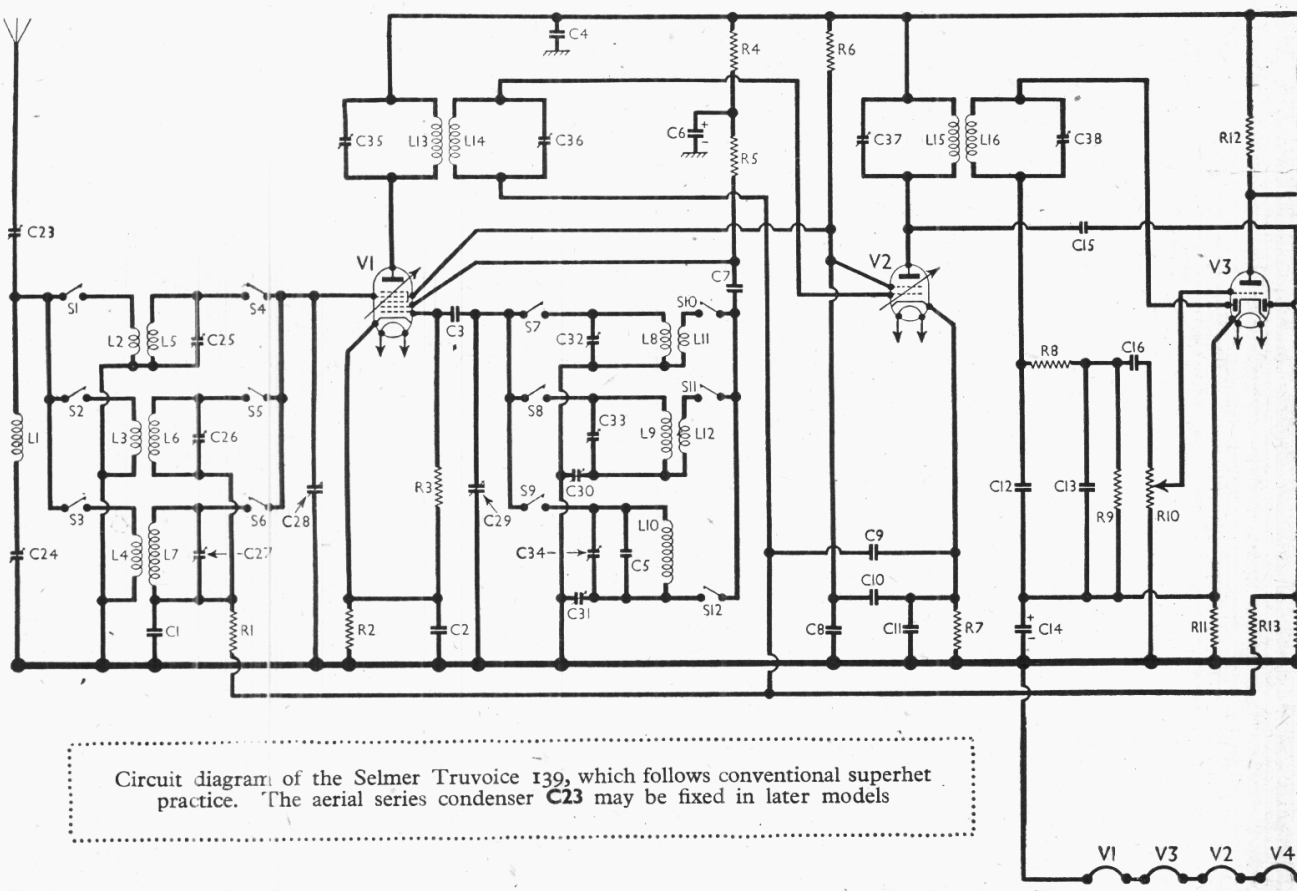
Diode second detector is part of double diode triode valve **(V3, Osram DL63).** Audio frequency component in rectified output is developed load resistance **R9** and passed via AF coupling condenser **C16** and manual volume control **R10** to CG of triode section, which operates as AF amplifier. IF filtering by **C12, R8** and **C13.**

Second diode of **V3,** fed from **V2** anode via **C15,** provides DC potential which is developed across load resistance **R14** and fed back through decoupling circuits as GB to FC (except on SW) and IF valves, giving automatic volume control. Delay voltage, together with GB for triode section, is obtained from drop along **R11** in cathode lead to chassis.

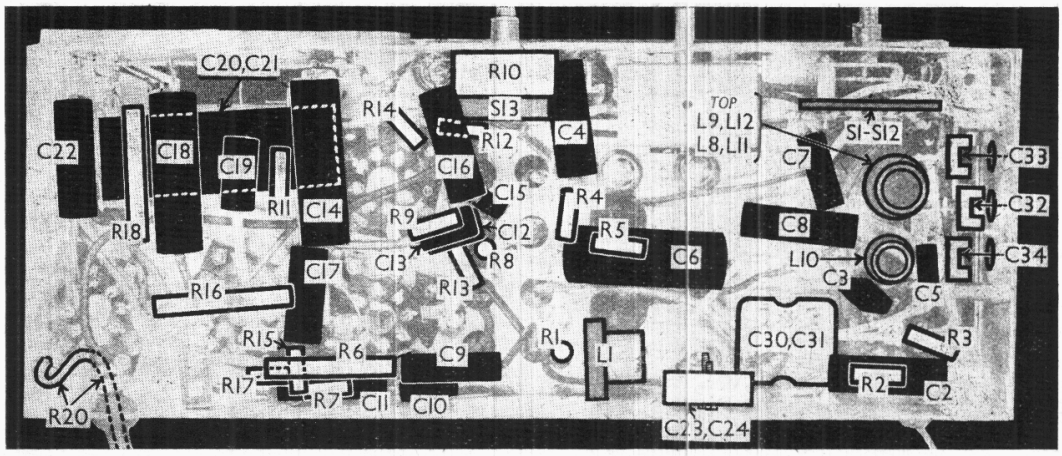
Resistance-capacity coupling by **R12, C17** and **R15,** via grid stopper **R17,** between **V3** triode and tetrode output valve **(V4, Osram KT33C).** Fixed tone correction by **C19** in anode circuit. Provision for connection of low impedance external speaker by tags across secondary of internal speaker input transformer **T1.**

When the receiver is used with AC mains, H.T. current is supplied by IHC half-wave rectifying valve **(V5, Osram U31)** which on DC mains behaves as a low resistance. Smoothing is effected by speaker field **L18** and dry electrolytic condensers **C20** and **C21.**

Valve heaters, together with line cord ballast resistance **R20,** are connected in series between one side of the mains and chassis. Scale lamps, which are shunted



Circuit diagram of the Selmer Truvoice 139, which follows conventional superhet practice. The aerial series condenser **C23** may be fixed in later models



Under - chassis view. **R20** is incorporated in the mains lead, but the chassis end of it is indicated. A diagram of the **S1-S12** unit is overleaf. **C32-C34** are reached through holes in the chassis side-plate.

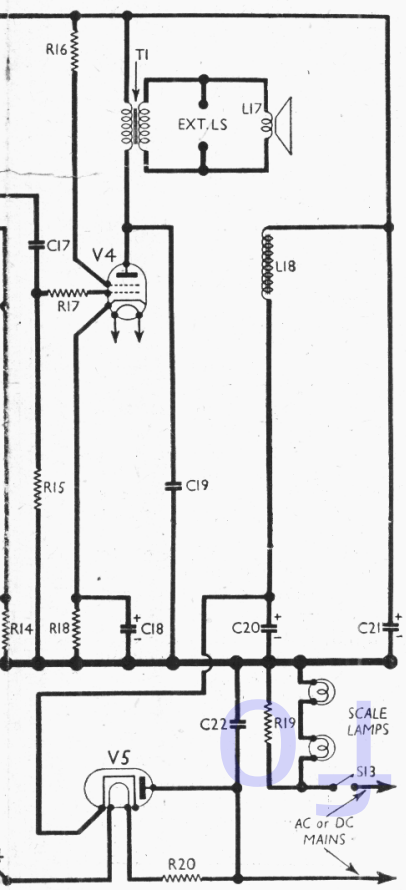
by **R19**, are connected between chassis and the other side of the mains.

Mains circuit RF filtering by by-pass condenser **C22.**

DISMANTLING THE SET

Removing Chassis.—Remove the three control knobs (recessed grub screws) and the four screws (with washers) holding the chassis to the bottom of the cabinet, when the complete receiver can be withdrawn as a single unit.

When replacing, a cardboard strip should be clamped across each end of the chassis, between the chassis and the bottom of the cabinet.



COMPONENTS AND VALUES

	RESISTANCES	Values (ohms)
R1	V1 pentode CG decoupling ...	100,000
R2	V1 fixed GB resistance	350
R3	V1 osc. CG resistance	50,000
R4	V1 osc. anode decoupling ...	10,000
R5	V1 osc. anode HT feed	15,000
R6	V1, V2 SG's HT feed	25,000
R7	V2 fixed GB resistance	350
R8	IF stopper	100,000
R9	V3 signal diode load	500,000
R10	Manual volume control	1,000,000
R11	V3 triode GB; AVC delay ...	1,500
R12	V3 triode anode load	100,000
R13	AVC line decoupling	1,000,000
R14	V3 AVC diode load	1,000,000
R15	V4 CG resistance	250,000
R16	V4 SG HT feed	3,000
R17	V4 grid stopper	50,000
R18	V4 GB resistance	250
R19	Scale lamps shunt	100
R20	Heater circuit ballast	460

	CONDENSERS	Values (μF)
C1	V1 pentode CG decoupling...	0·05
C2	V1 cathode by-pass	0·05
C3	V1 osc. CG condenser ...	0·0001
C4	HT line RF by-pass	0·1
C5	Osc. circ. LW fixed trimmer	0·00003
C6*	V1 osc. anode decoupling ...	4·0
C7	V1 osc. anode coupling ...	0·001
C8	V1, V2 SG's decoupling ...	0·05
C9	V2 CG decoupling	0·05
C10	V1, V2 SG's RF by-pass ...	0·0003
C11	V2 cathode by-pass	0·05
C12	IF by-pass condensers ...	0·0001
C13		0·0005
C14*	V3 cathode by-pass	5·0
C15	Coupling to V3 AVC diode...	0·00003
C16	AF coupling to V3 triode ...	0·05
C17	V3 triode to V4 AF coupling	0·05
C18*	V4 cathode by-pass	25·0
C19	Fixed tone corrector	0·003
C20*	HT smoothing condensers ...	16·0
C21*		8·0
C22	Mains RF by-pass	0·05
C23‡	Aerial series	0·0007
C24‡	Aerial IF filter tuning ...	—
C25‡	Aerial circuit SW trimmer ...	—
C26‡	Aerial circuit MW trimmer	—
C27‡	Aerial circuit LW trimmer...	—
C28†	Aerial circuit tuning	—
C29†	Oscillator circuit tuning ...	—
C30‡	Osc. circuit MW tracker ...	0·0006
C31‡	Osc. circuit LW tracker ...	0·0003
C32‡	Osc. circuit SW trimmer ...	—
C33‡	Osc. circuit MW trimmer ...	—
C34‡	Osc. circuit LW trimmer ...	—
C35‡	1st IF trans. pri. tuning ...	—
C36‡	1st IF trans. sec. tuning ...	—
C37‡	2nd IF trans. pri. tuning ...	—
C38‡	2nd IF trans. sec. tuning ...	—

* Electrolytic † Variable. ‡ Pre-set.

	OTHER COMPONENTS	Approx. Values (ohms)
L1	Aerial IF filter coil	27·0
L2	Aerial SW coupling coil ...	0·25
L3	Aerial MW coupling coil ...	20·0
L4	Aerial LW coupling coil ...	100·0
L5	Aerial SW tuning coil ...	0·05
L6	Aerial MW tuning coil ...	4·3
L7	Aerial LW tuning coil ...	23·0
L8	Osc. circuit SW tuning ...	0·05
L9	Osc. circuit MW tuning ...	5·75
L10	Osc. circuit LW tuning ...	14·0
L11	Oscillator SW reaction ...	0·4
L12	Oscillator MW reaction ...	0·5
L13	1st IF trans. Pri. ...	8·5
L14	1st IF trans. Sec. ...	13·0
L15	2nd IF trans. Pri. ...	17·0
L16	2nd IF trans. Sec. ...	17·0
L17	Speaker speech coil	1·8
L18	Speaker field coil	600·0
T1	Speaker input trans. Pri....	320·0
	Sec...	0·3
S1-S12	Waveband switches... ...	—
S13	Mains switch, ganged R10	—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on AC mains of 232 V. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

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

If, as in our case, **V2** should become unstable when its screen current is being measured, it can be stabilised by connecting a non-inductive condenser of about 0.1 μF from grid (top cap) to chassis.

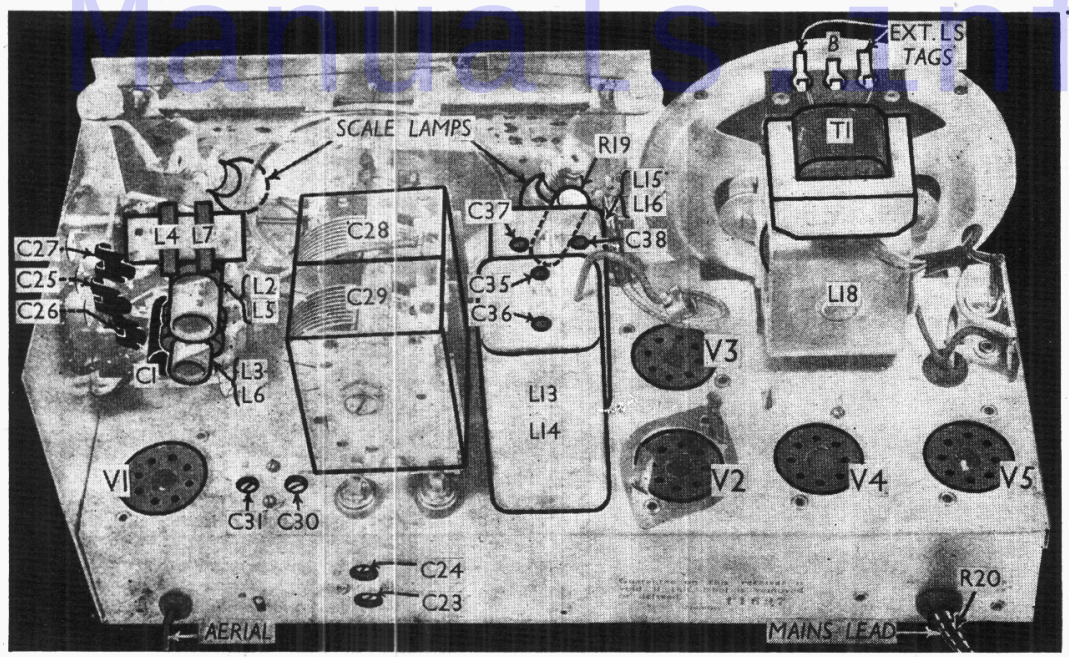
Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 X63	195	2·5	82	2·9
	Oscillator			
	93	3·8		
V2 KTW61	195	7·3	82	2·1
V3 DL63	75	1·1	—	—
V4 KT33C	181	38·0	173	6·6
V5 U31†	—	—	—	—

† Cathode to chassis, 235 V. DC

GENERAL NOTES

Switches.—S1—S12 are the waveband switches, in a single rotary unit beneath the chassis. This is indicated in our

Supplement to The Wireless & Electrical Trader, Jan. 6, 1940.



Half-plan view of the chassis. The positions of most of the trimmers in the set are shown. **C25-C27** are reached through holes in the side-plate. An external speaker can be connected to the tags indicated.

under-chassis view, and shown in detail in the diagram below, where it is drawn as seen looking from the rear of the underside of the chassis. The table below gives the switch positions for the three control settings, starting from fully anti-clockwise. A dash indicates open, and **C**, closed.

S13 is the QMB mains switch, ganged with the volume control **R10.**

Coils.—L2, L5; L3, L6 and **L4, L7** are in three unscreened tubular units on the chassis deck. The IF transformers **L13, L14** and **L15, L16** are in two screened units on the chassis deck. Beneath the chassis are the coils **L1; L8, L9, L11, L12;** and **L10,** in three unscreened units.

SWITCH TABLE

Switch	SW	MW	LW
S1	C	—	—
S2	—	C	—
S3	—	—	C
S4	C	—	—
S5	—	C	—
S6	—	—	C
S7	C	—	—
S8	—	C	—
S9	—	—	C
S10	C	—	—
S11	—	C	—
S12	—	—	C

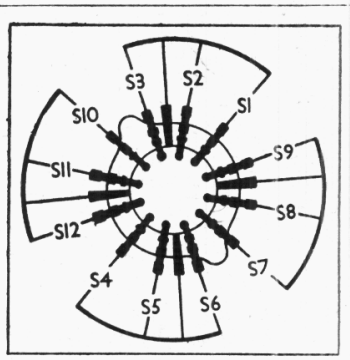


Diagram of the switch unit, as seen from the rear of the underside of the chassis.

Trimmers.—Six of the trimmers are reached through holes in the vertical chassis side plate. The aerial trimmers are above, and the oscillator trimmers below the level of the chassis deck. The holes are colour coded by dots of paint, yellow for SW, green for MW, and red for LW. **C23** and **C24** are reached through holes in the rear of the chassis. In some models **C23** is replaced by a fixed 0.0005μF condenser. **C30** and **C31** are reached through holes in the chassis deck, while the IF trimmers are reached through holes in the tops of their respective cans.

Scale Lamps.—These are two Osram MES types, rated at 6.2V, 0.3A. They are in series, and shunted by **R19,** a wire-wound resistor above the chassis.

External Speaker.—A low resistance (about 20) external speaker could be connected to the two outer tags on **T1,** to which the internal speaker speech coil is connected.

Condensers C20, C21.—These are two dry electrolytics in a single metal-cased tubular unit beneath the chassis. It is a Dubilier Drilitic type 3352, and has one positive connection at each end. The case is negative; the connection at the red end (to **V5** holder) is the positive of **C20** (16μF), while the connection at the black end (to **R16**) is the positive of **C21** (8μF).

Resistance R20. — The heater circuit ballast resistor is of the wire-wound type, incorporated in the mains lead. It is asbestos covered, and emerges separately from the two mains leads at the chassis end. At the plug end it is joined to the red mains lead.

Chassis Divergencies. — Some chassis may have a 500,000 Ω resistance across **L7,** and a 0.0001μF condenser between the bottom of **L7** and **C27. C9** and **C13** may not occur in some chassis; **R8** may be 50,000 Ω in some models. In later models **C23** becomes a 0.0005μF fixed condenser.

CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator, via a 0.1 μF condenser to control grid (top cap) of **V1,** and via another 0.1 μF condenser to chassis. Switch set to MW, and turn gang to minimum. Feed in a 450 KC/S signal, and adjust **C38, C37, C36** and **C35** in turn for maximum output. Repeat these adjustments.

IF Filter.—Transfer "live" lead of signal generator to aerial connection (top of **C23),** unsolder aerial wire from **C23,** and leave earthed generator lead connected, via a 0.1 μF condenser, to chassis. Leave set tuned to bottom of MW band (about 200 m), feed in a strong 450 KC/S signal, and adjust **C24** for *minimum* output.

RF and Oscillator Stages.—With gang at maximum, pointer should cover dots at left-hand ends of wavelength scales. Leave signal generator connected to input of set as for IF filter adjustment, but via a suitable dummy aerial.

SW.—Switch set to SW, tune to 19 m on scale, feed in a 19 m (15.8 MC/S) signal, and adjust **C32,** then **C25,** for maximum output. Check sensitivity at 50 m.

MW. — Switch set to MW, tune to 200 m on scale, feed in a 200 m (1,500 KC/S) signal, and adjust **C33,** then **C26,** for maximum output. Feed in a 500 m (600 KC/S) signal, tune it in, and adjust **C30** for maximum output, while rocking the gang for optimum results.

LW.—Switch set to LW, tune to 1,200 m on scale, feed in a 1,200 m (250 KC/S) signal, and adjust **C34,** then **C27,** for maximum output. Feed in an 1,800 m (166.7 KC/S) signal, tune it in, and adjust **C31** for maximum output, while rocking the gang for optimum results.

Printed in Great Britain by The Cornwall Press Ltd., Paris Garden, London, S.E.1