"TRADER" SERVICE SHEET
966

SOBELL 719C

Covering the whole of the 717 Series

THIS series comprises four models, the 719C console from which this technical information was prepared; the 717, a table model employing a similar chassis; and two autoradiograms 717G and 717AG, which employ a slightly modified 719C chassis. The 717AG has a cathode-ray tuning indicator.

The chassis in all models is a 6-valve, 4-band superhet, with two I.F. stages and push-pull output, designed to operate from A.C. mains of 200-250 V, 40-100 c/s., although export versions are tapped for 100-120 V. Waveband ranges are 13.5-25 m (S.W.1), 25-50 m (S.W.2.), 200-550 m and 900-2,000 m.

Release dates and original prices: 717, *May* 1947, £34 13*s*, *reduced March* 1949, *to* £25 10*s*; 719*C*, *April* 1948, £38 17*s*, *reduced June* 1949, *to* £30 5*s* 6*d*; 717*G*, *July* 1947, £88, *reduced May* 1949, *to* £63; 717*AG*, *July* 1947, £135 10*s*, *reduced December* 1948, *to* £126, *and June* 1949, *to* £69 6*s*.

CIRCUIT DESCRIPTION

Aerial input via coupling coils **L1, L2** and **L4** to single-tuned circuits **L5, C47** (S.W.1), **L6, C47** (S.W.2) and **L8, C47** (L.W.). On M.W., aerial input is via coupling coil **L3** to tuned band-pass circuits **L7, C41** and **L9, C47**; **C41** being a section of the gang. Coupling between **L7** and **L9** by mutual inductance. Tracking on the S.W. bands by **C2** (S.W.1) and **C4** (S.W.2.).

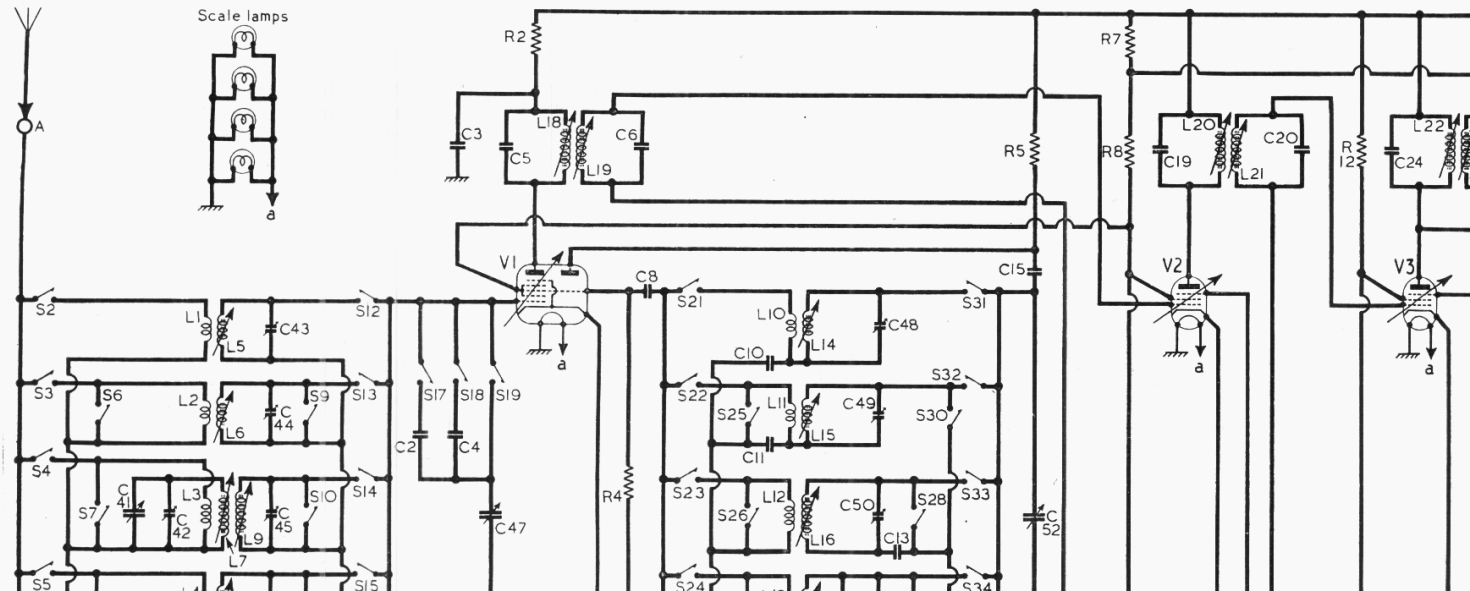
First valve **(V1, Mazda metallized TH41)** is a triode-heptode operating as frequency changer with internal coupling. Oscillator anode coils **L14** (S.W.1), **L15** (S.W.2), **L16** (M.W.) and **L17** (L.W.) are tuned by **C52.** Parallel trimming by **C48** (S.W.1), **C49** (S.W.2), **C50** (M.W.) and **C12, C51** (L.W.); series tracking by **C10** (S.W.1), **C11** (S.W.2), **C13** (M.W.) and **C14** (L.W.). Reaction coupling from grid is provided by coils **L10** (S.W.1), **L11** (S.W.2) **L12** (M.W.) and **L13** (L.W.), with additional coupling across the common impedance of trackers **C10** (S.W.1) and **C11** (S.W.2).

Intermediate frequency amplifiers **(V2, V3, Mazda metallized VP41)** are variable-mu R.F. pentodes with tuned transformer couplings **C5, L18, L19, C6**; **C19, L20, L21, C20** and **C24, L22, L23, C25.**

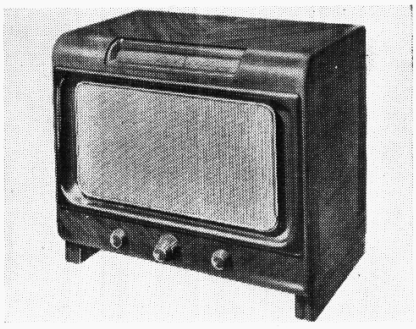
Intermediate frequency 465 kc/s.

Diode signal detector is part of double diode triode valve **(V4, Mazda metallized HL41DD).** Audio frequency component in rectified output is developed across load resistors **R14, R15,** and that across **R15** is passed via I.F. stoppers **R17, R18,** radio switch **S36,** coupling capacitor **C31** and manual volume control **R19** to grid of triode section, which operates as A.F. amplifier.

I.F. filtering by **C26, C29** and **C30** in diode circuit. Provision for the connection of a gramophone pick-up across **R19** via **S37,** which closes on Gram. Switches **S1, S16, S20** and **S35** close, and **S36** opens, on Gram to prevent radio break-through.



Circuit diagram of the Sobell 719C console receiver, w
table model and the 717G autoradiogram, except for the p
features are the tracking capacitors **C2** and **C4** which are sw
the use of two I.F. amplifying stages, **V2** and **V3**, and
push-pull output circ



The Sobell 717 table model. An illustration of the 719C appears in col. 6 overleaf.

Second diode of **V4,** fed from **V3** anode via **C28,** provides D.C. potentials which are developed across load resistors **R23, R24.** The total potential is fed back to the F.C. and 1st I.F. valves, and a proportion of it, developed across **R24,** is fed back to the 2nd I.F. valve, giving automatic gain control. Delay voltage, together with G.B. for triode section, is obtained from the drop across **R20, R21** in the cathode lead to chassis.

Parallel-fed choke coupling by **R22, C33** and **L24,** between **V4** triode and push-pull output stage comprising two beam tetrode

COMPONENTS AND VALUES

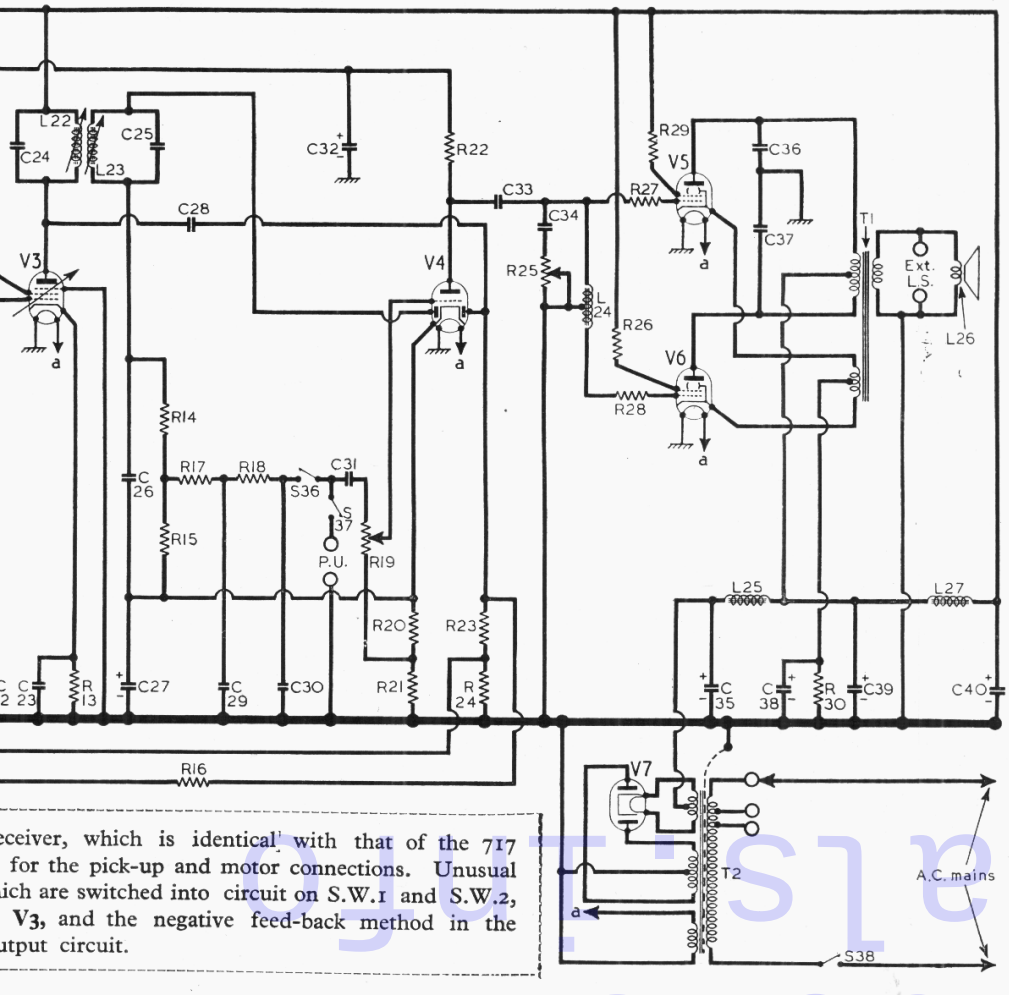
	RESISTORS	Values	Locations
R1	A.G.C. decoupling	330kΩ	H4
R2	V1 H.T. decoupling	3·3kΩ	H4
R3	V1 G.B.	330Ω	G4
R4	V1 osc. C.G. ...	47kΩ	G4
R5	Osc. H.T. feed ...	47kΩ	H4
R6	A.G.C. decoupling	330kΩ	H4
R7	H.T. potential divider	3·3kΩ	E4
R8		3·3kΩ	E3
R9		6·8kΩ	D3
R10	V2 G.B.	270Ω	H4
R11	A.G.C. decoupling	470kΩ	F5
R12	V3 S.G. H.T. feed	27kΩ	H5
R13	V3 G.B.	270Ω	H5
R14	Signal diode load ...	150kΩ	G5
R15		150kΩ	G5
R16	A.G.C. decoupling	470kΩ	G5
R17	I.F. Stoppers ...	100kΩ	G5
R18		100kΩ	G5
R19	Volume control ...	1MΩ	G3
R20	V4 G.B.	1·5kΩ	G5
R21	A.G.C. delay ...	1·5kΩ	G5
R22	Triode anode load	47kΩ	H4
R23	A.G.C. diode load	470kΩ	G5
R24		470kΩ	F5
R25	Tone control ...	100kΩ	F3
R26	V6 S.G. stopper ...	100Ω	E5
R27	V5 C.G. stopper ...	1·5kΩ	F5
R28	V6 C.G. stopper ...	1·5kΩ	E5
R29	V5 S.G. stopper ...	100Ω	F5
R30	V5, V6 G.B. ...	150Ω	C1

	CAPACITORS	Values	Locations
C1	A.G.C. decoupling	0·01μF	F3
C2	S.W.1 tracker ...	365pF	G3
C3	V1 H.T. decoupling	0·05μF	H4
C4	S.W.2 tracker ...	550pF	G4
C5	1st I.F. trans. ...	400pF	A1
C6	tuning	400pF	A1
C7	V1 cath. by-pass	0·1μF	G4
C8	V1 osc. C.G. ...	100pF	G4
C9	A.G.C. decoupling	0·25μF	G5
C10	S.W.1 osc. tracker	365pF	F4
C11	S.W.2 osc. tracker	465pF	F4
C12	L.W. fixed trim ...	100pF	G4
C13	M.W. osc. tracker	540pF	G4
C14	L.W. osc. tracker	270pF	G5
C15	Osc. anode coup.	100pF	G4
C16	A.G.C. decoupling	0·05pF	H4
C17	V2 S.G. decoup.	0·1μF	G4
C18	V2 cath. by-pass	0·1μF	H4
C19	2nd I.F. trans.	400pF	A2
C20	tuning	400pF	A2
C21	A.G.C. decoupling	0·25μF	H5
C22	V3 S.G. decoup.	0·01μF	H5
C23	V3 cath. by-pass	0·1μF	H5
C24	3rd I.F. trans.	400pF	A2
C25	tuning	400pF	A2
C26	I.F. by-pass ...	100pF	G5
C27*	V4 cath. by-pass	50μF	G5
C28	A.G.C. coupling ...	100pF	G5
C29	I.F. by-passes ...	50pF	G5
C30		50pF	G5
C31	A.F. coupling ...	0·05μF	F3
C32*	V4 H.T. decoup.	8μF	C1
C33	A.F. coupling ...	0·1μF	F5
C34	Part tone control	0·05μF	E5
C35*	H.T. smoothing ...	8μF	C1
C36	Tone correctors	0·005μF	F5
C37		0·005μF	E5
C38*	V5, V6 cath. by-pass	50μF	C1
C39*	H.T. smoothing ...	16μF	C1
C40*		16μF	C1
C41†	M.W. aerial tune		B1
C42‡	M.W. aerial trim	40pF	G3
C43‡	S.W.1 aerial trim	80pF	F3
C44‡	S.W.2 aerial trim	40pF	F4
C45‡	M.W. aerial trim	40pF	G4
C46‡	L.W. aerial trim ...	80pF	F3
C47†	Aerial tuning ...		B1
C48‡	S.W.1 osc. trim	40pF	F4
C49‡	S.W.2 osc. trim	40pF	F4
C50‡	M.W. osc. trim ...	40pF	G4
C51‡	L.W. osc. trim ...	100pF	G4
C52†	Oscillator tuning		B2

* Electrolytic. † Variable. ‡ Pre-set.

If the component numbers given in the accompanying tables are used when ordering spares, dealers are requested to say so, as these usually differ from those used in the manufacturers' diagram.

	OTHER COMPONENTS	Approx. Values (ohms)	Locations
L1	Aerial coupling ...	0·2	F3
L2		0·4	F4
L3	coils	21·5	G3
L4		200·0	F3
L5	S.W.1 aerial tune	Very low	F3
L6	S.W.2 aerial tune	Very low	F4
L7	M.W. aerial tuning	3·5	G3
L8	L.W. aerial tuning	27·0	F3
L9	M.W. aerial tuning	3·0	G4
L10	Oscillator reaction coils	Very low	F4
L11		0·3	F4
L12		1·5	G4
L13		2·6	G4
L14	S.W.1 osc. tuning	Very low	F4
L15	S.W.2 osc. tuning	Very low	F4
L16	M.W. osc. tuning	3·5	G4
L17	L.W. osc. tuning	5·6	G4
L18	1st I.F. trans. Pri.	7·0	A1
L19	Sec.	7·5	A1
L20	2nd I.F. trans. Pri.	7·0	A2
L21	Sec.	7·5	A2
L22	3rd I.F. trans. Pri.	7·0	A2
L23	Sec.	7·5	A2
L24	A.F. choke, total ...	800·0	F5
L25	Smoothing choke ...	135·0	D4
L26	Speech coil ...	2·2	—
L27	Smoothing choke ...	270·0	C2
T1	O.P. trans. Pri., total	230·0	C1
		0·2	
		13·0	
T2	Sec. F.-B. Sec.	19·0	C2
	Primary, total ...	260·0	
	H.T. sec., total ...	Very low	
	4V heater ...	Very low	
	Rect. heater ...	—	F4
S1-S37	W/band switches	—	F3
S38	Mains sw., g'd R25		



eceiver, which is identical with that of the 717 for the pick-up and motor connections. Unusual ich are switched into circuit on S.W.1 and S.W.2, **V3,** and the negative feed-back method in the utput circuit.

Circuit Description—*continued*

output valves **(V5, V6, Mazda metallized Pen 45's).** Variable tone control in coupling circuit by **C34, R25,** and fixed tone correction between anodes by **C36, C37.** The cathodes of **V5, V6** are returned via a third winding on **T1,** in series with **R30, C38,** to chassis, the drop across **R30** supplying G.B., and the cathode winding on **T1** providing negative feedback. Provision is made for the connection of a low-impedance speaker across **T1** secondary winding.

H.T. current is supplied by I.H.C. full-wave rectifying valve **(V7, Mazda metallized UU6).** Smoothing by chokes **L25, L27** and electrolytic capacitors **C35, C39** and **C40.**

VALVE ANALYSIS

Valve voltages and currents given in the table below are those quoted in the manufacturers' manual. Their receiver was operating on A.C. mains of 230 V, using the 220-230 V adjustment tapping, and was tuned to the highest wavelength on M.W. The volume control was at maximum, but there was no signal input. Voltages, with the exception of cathode readings, were measured on the 1,200 V range of a Model 40 Avometer, chassis being the negative connection.

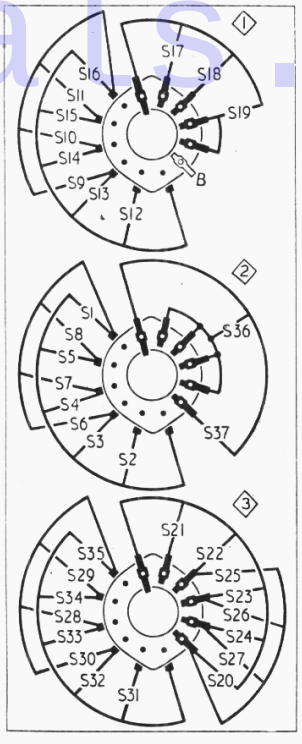
Valve	Anode		Screen		Cath.
	V	mA	V	mA	V
V1 TH41	300	2·3	140	4·8	4·0
	Oscillator				
	100	4·3			
V2 VP41	310	5·0	140	1·15	2·0
V3 VP41	310	9·3	212	2·3	3·0
V4 HL41DD	110	1·75	—	—	5·0
V5 Pen45	310	26·0	295	4·5	10·5
V6 Pen45	310	26·0	295	4·5	10·5
V7 UU6	320‡	—	—	—	335·0

‡ Each anode, A.C.

GENERAL NOTES

Switches.—S1-S37 are the waveband and radio/gram change-over switches, ganged in three rotary units beneath the chassis. These are indicated in our under-chassis view, and shown in detail in the diagrams (Col. 2), where they are drawn as seen from the rear of an inverted chassis.

Switch Diagrams and Table



Diagrams of the waveband switch units drawn as seen from the rear of an inverted chassis. On the right of the diagrams is the associated switch table.

Switch	Gram	L.W.	M.W.	S.W.2	S.W.1
S1 ...	C	—	—	—	—
S2 ...	—	—	—	—	C
S3 ...	—	—	—	C	—
S4 ...	—	—	C	—	—
S5 ...	—	C	—	—	—
S6 ...	—	—	—	—	C
S7 ...	—	—	—	C	C
S8 ...	—	—	C	C	C
S9 ...	—	—	—	C	C
S10 ...	—	—	—	C	C
S11 ...	—	—	C	C	C
S12 ...	—	—	—	—	C
S13 ...	—	—	—	C	—
S14 ...	—	—	C	—	—
S15 ...	—	C	—	—	—
S16 ...	C	—	—	—	—
S17 ...	—	—	—	—	C
S18 ...	—	—	—	C	—
S19 ...	—	C	C	—	—
S20 ...	C	—	—	—	—
S21 ...	—	—	—	—	C
S22 ...	—	—	—	C	—
S23 ...	—	—	C	—	—
S24 ...	—	C	—	—	—
S25 ...	—	—	—	—	C
S26 ...	—	—	—	C	C
S27 ...	—	—	C	C	C
S28 ...	—	—	—	C	C
S29 ...	—	—	C	—	C
S30 ...	—	—	—	—	C
S31 ...	—	—	—	C	—
S32 ...	—	—	—	—	—
S33 ...	—	—	C	—	—
S34 ...	—	C	—	—	—
S35 ...	C	—	—	—	—
S36 ...	—	C	C	C	C
S37 ...	C	—	—	—	—

The table in col. 3 gives the switch positions for the five control settings, starting from the fully anti-clockwise position of the control spindle. A dash indicates open, and **C,** closed.

S38 is the Q.M.B. mains switch, ganged with the variable tone control **R25.**

Scale Lamps.—These are four Osram lamps, with M.E.S. bases and small clear spherical bulbs, rated at 6.5 V, 0.3 A.

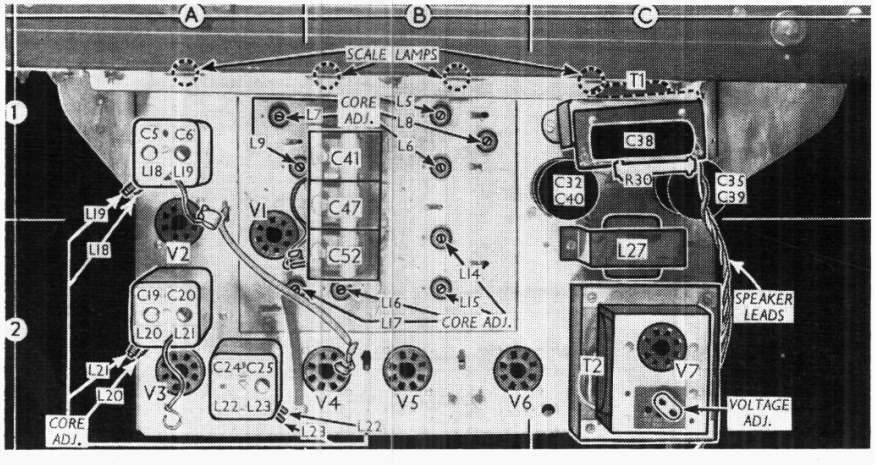
I.F. Transformers.—Although we show the I.F. transformers in our circuit diagram as simple 2-coil units, actually there is a coupling winding on the primary coil former, connected in series with the earthy end of the secondary winding. Between the two windings is an electrostatic screen.

External Speaker.—Two sockets are provided at the rear of the chassis for the connection of a low impedance (about 2.5Ω) external speaker.

Chassis Divergencies.—In our chassis, **C2** and **C10** were each 365 pF, whereas the value given in the makers' manual was 360 pF. Replacements should be of the same value as was used originally in a given chassis.

Associated Models.—Our receiver was a 719 console, but a similar chassis is employed in the 717 table model and, excepting the tuning drive, in the 717G autoradiogram. In the 717AG autoradiogram, a tuning indicator is fitted and the speaker is a 12-in model with a speech coil of 15Ω impedance, while the output transformer is tapped at 2.5Ω for the external speaker sockets.

The tuning indicator is a Mazda ME41, its control grid being connected to the A.G.C. line at the junction of **R1, R6, R16,** and its cathode going to chassis. Its target is connected via a 22kΩ resistor to H.T. positive, and a 680Ω resistor is connected between its target and anode. The pick-up in the 717AG is shunted by a 100kΩ resistor. In the 717G it is shunted by a 47kΩ resistor. The differences in the drive systems are shown under "Drive Wire Replacement."



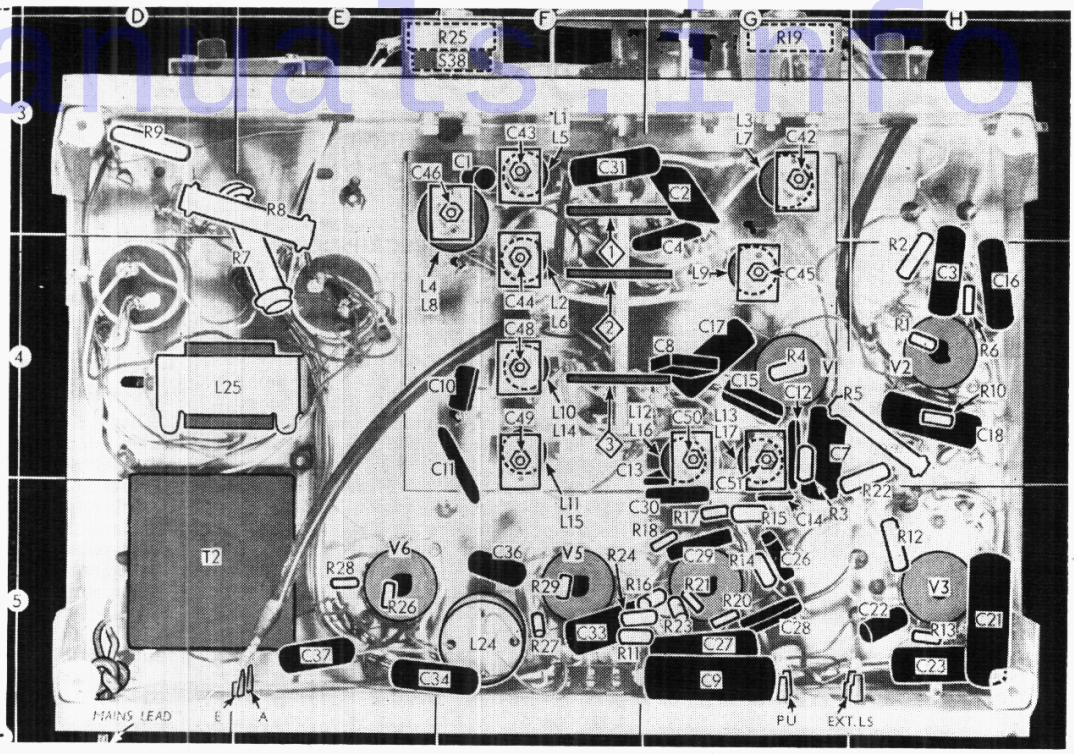
Plan view of the chassis. The outlined square in the centre is a panel carrying the entire variable tuning assembly. The rectifier **V7** is mounted on the mains transformer.

DRIVE WIRE REPLACEMENT

Altogether there are four different cursor drive systems in the 717/719 series of receivers. The gang drive is direct. Our sample 719C and practically all the 717 table models used the same system, which is shown in the left-hand sketch in col. 4. A replacement wire for this is code 712, available from the makers, and is 5ft 11¼in long.

In the first 5,000 of the table model chassis, the drive system comprised two separate drive wires: a primary drive, and a secondary drive, giving a step-up ratio to the cursor drive. The complete system is shown in the right-hand sketch in col. 4. The primary wire replacement is code 402, 3ft 4¼in long, and the secondary is code 610, 5ft 1in long.

The third system is that used in the two radiograms, 717G and 717AG. This in general is like the one in our left-hand sketch, but the superstructure is inclined forward at about 45 deg. This angular change is accommodated by the lower pair of pulleys, which are set one behind the other, instead of side by side, and tilted forward. The drive wire is code 610, 5ft 1in long.



Under-chassis view. The waveband switch units are indicated by numbers **1, 2, 3** in diamonds and arrows which show the direction in which they are viewed in the diagrams in col. 2, where they are shown in detail. The two controls at the front, **R19** and **R25**, are mounted on brackets outside the chassis.

In the radiograms, another wire drive system, making the fourth, is used to turn the scale drum in synchrony with the waveband control. This is very straightforward, and does not require illustrating. Its drive wire is code 327, 2ft 8¾in long. In the table and console models bevelled gear wheels are used to turn the drum.

DISMANTLING THE SET

Removing Chassis.—Remove the two knobs (pull off), the waveband knob (recessed screw) and the (larger) concentric tuning knob (pull off); slide off felt washers and celluloid escutcheon from control spindles;
remove four 2BA cheese head chassis bolts, with washers and grommets, holding chassis to cabinet shelf;
unsolder leads from tags on speaker in bottom of cabinet and withdraw chassis, lifting it up slightly to clear the rubber mounting strips glued to shelf.
When replacing, the blue speaker lead should be connected to the right-hand speech coil tag.
Removing Speaker.—Remove four 4BA nuts securing speaker to metal baffle.
When replacing, the speech coil tags should be at the top right-hand corner.

CIRCUIT ALIGNMENT

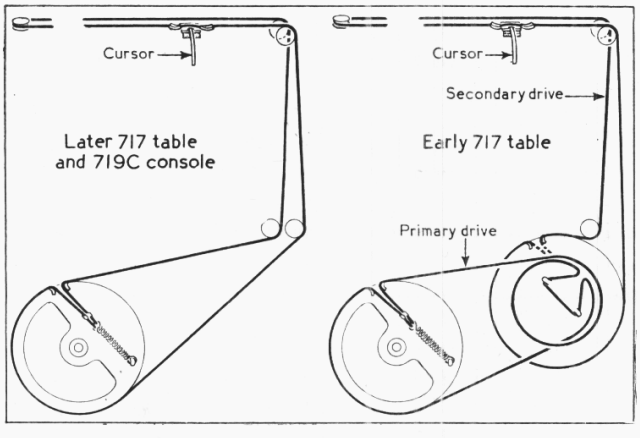
The I.F. adjustments may be made with the chassis in its cabinet, but to gain access to the R.F. and oscillator trimmers the chassis should be withdrawn and placed, standing on its transformer end, on the bench.

I.F. Stages.—Switch to M.W., turn gang and volume control to maximum, and tone control fully clockwise. Connect signal generator, via a 0.01 μF capacitor in the "live" lead, to control grid (top cap) of **V1** and chassis. Feed in a 465 kc/s (645.16 m) signal and adjust the cores of **L23, L22, L21, L20, L19** and **L18** (location references A1, A2), in that order, for maximum output, reducing the input as the circuits come into line to avoid A.G.C. action. Repeat these adjustments.

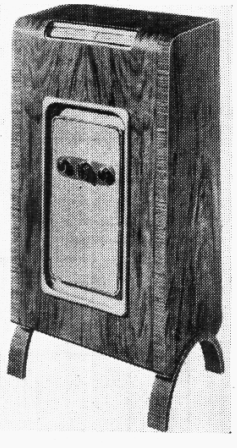
R.F. and Oscillator Stages.—Remove chassis from cabinet and check that, with the gang at maximum capacitance, the cursor coincides with the ends of the thick black scale lines. Transfer signal generator leads to **A** and **E** sockets, using a dummy aerial.

L.W.—Switch set to L.W., tune to 900 m on scale, feed in a 900 m (334 kc/s) signal and adjust **C51** (G4), **C46** (F3) for maximum output. Tune to 2,000 m on scale, feed in a 2,000 m (150 kc/s) signal and adjust the cores of **L17** (B2) and **L8** (B1) for maximum output. Repeat these adjustments.

M.W.—Switch set to M.W., tune to 214 m on scale, feed in a 214 m (1,400 kc/s) signal and adjust **C50** (G4), **C45** (G4) and **C42** (G3) for maximum output. Tune to 500 m on scale, feed in a 500 m (600 kc/s) signal and adjust the cores of **L16** (B2), **L9** (A1) and **L7** (A1) for maximum output. Repeat these adjustments.



Sketches showing the tuning drive systems used in almost the whole 717 series (left) and that used in the first 5,000 717 table models (right). In each case the system is drawn as seen from the front with the gang at maximum capacitance.



The appearance of the 719C console, on a sample of which this Service Sheet was prepared.

S.W.2.—Switch set to S.W.2, tune to 25 m on scale, feed in a 25 m (12 Mc/s) signal and adjust **C49** (F4) and **C44** (F4) for maximum output. Tune to 47.2 m on scale, feed in a 47.2 m (6.35 Mc/s) signal, and adjust the cores of **L15** (B2) and **L6** (B1) for maximum output. Repeat these adjustments.

S.W.1.—Switch set to S.W.1. tune to 13.6 m on scale, feed in a 13.6 m (22 Mc/s) signal and adjust **C48** (F4) and **C43** (F3) for maximum output. Tune to 23.1 m on scale, feed in a 23.1 m (13 Mc/s) signal and adjust the cores of **L14** (B2) and **L5** (B1) for maximum output. Repeat these adjustments.

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