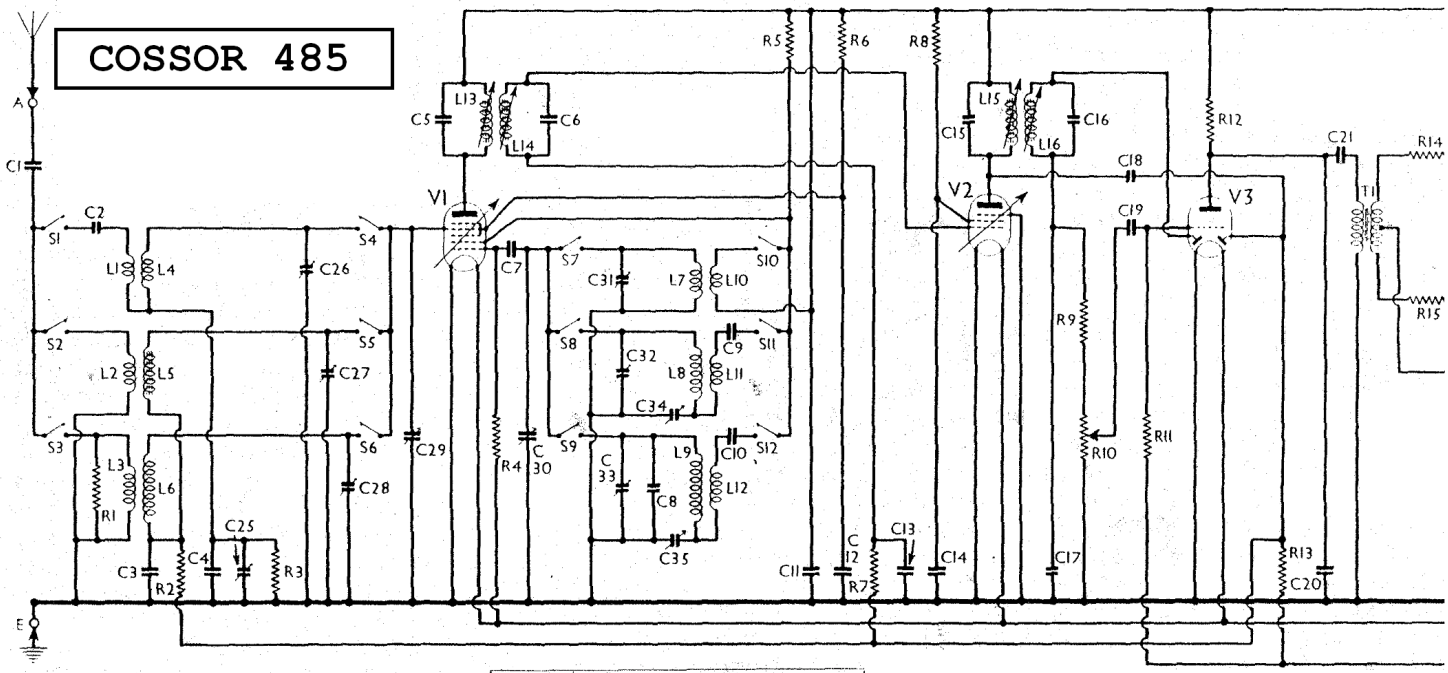
COSSOR 485



COMPONENTS AND VALUES

	CONDENSERS	Values (μF)
C1	Aerial series condenser	0·0005
C2	Aerial SW series condenser	0·00005
C3	V1 tetrode CG MW and LW decoupling	0·05
C4	Aerial circ. SW fixed tracker	0·00175
C5	1st IF transformer fixed tuning condensers	0·00015
C6		0·00016
C7	V1 osc. CG condenser	0·0002
C8	Osc. circuit LW fixed trimmer	0·00005
C9	V1 osc. anode MW coupling	0·0003
C10	V1 osc. anode LW coupling	0·0005
C11	HT circuit RF by-pass	0·01
C12	V1 SG decoupling	0·1
C13	V2 CG decoupling	0·01
C14	V2 SG decoupling	0·1
C15	2nd IF transformer fixed tuning condensers	0·00005
C16		0·00007
C17	HF by-pass	0·00005
C18	Coupling to V3 AVC diode	0·00005
C19	AF coupling to V3 triode	0·01
C20	HF by-pass	0·0002
C21	AF coupling to T1	0·1
C22	Part of fixed tone corrector	0·001
C23	HT reservoir condenser	2·0
C24*	Auto GB by-pass	50·0
C25‡	Aerial circuit SW tracker	0·0021
C26‡	Aerial circuit SW trimmer	
C27‡	Aerial circuit MW trimmer	
C28‡	Aerial circuit LW trimmer	
C29†	Aerial circuit tuning	
C30†	Oscillator circuit tuning	
C31‡	Osc. circuit SW trimmer	
C32‡	Osc. circuit MW trimmer	
C33‡	Osc. circuit LW trimmer	
C34‡	Osc. circuit MW tracker	0·00075
C35‡	Osc. circuit LW tracker	0·0003

* Electrolytic. † Variable. ‡ Pre-set.

	RESISTANCES	Values (ohms)
R1	Aerial circuit LW damping	50,000
R2	V1 tetrode CG MW and LW decoupling	3,000,000
R3	Aerial SW trackers shunt	10,000
R4	V1 osc. CG resistance	100,000
R5	V1 osc. anode HT feed	25,000
R6	V1 SG HT feed	100,000
R7	V2 CG decoupling	3,000,000
R8	V2 SG HT feed	100,000
R9	Part of V3 signal diode load	100,000
R10	Part of V3 signal diode load; manual volume control	500,000
R11	V3 triode CG resistance	2,000,000
R12	V3 triode anode load	100,000
R13	V3 AVC diode load	2,000,000
R14	V4 grids stopper resistances	100,000
R15		100,000
R16	Part of fixed tone corrector	10,000
R17	V1 and V2 fixed, V3 and V4 automatic GB resistances	500
R18		150

Battery GB, instead of automatic GB, was used. **R17, R18** and **C24** were not used. The top of **S13** was connected to HT negative. The GB positive connection went, via an extra battery switch in the **S13, S14** unit, to the top of **F1.** The lead at present connected to the junction of **R17, R18** was the GB negative 1 (—1·5 V) lead, while the lead from the centre tap of the secondary of **T1** was the GB negative 2 (—9 V) lead.

	OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial SW coupling coil		0·2
L2	Aerial MW coupling coil		6·5
L3	Aerial LW coupling coil		43·0
L4	Aerial SW tuning coil		Very low
L5	Aerial MW tuning coil		1·5
L6	Aerial LW tuning coil		17·0
L7	Osc. circuit SW tuning coil		0·05
L8	Osc. circuit MW tuning coil		1·0
L9	Osc. circuit LW tuning coil		9·0
L10	Oscillator SW reaction		1·0
L11	Oscillator MW reaction		0·4
L12	Oscillator LW reaction		4·0
L13	1st IF trans.	Pri.	3·0
L14		Sec.	3·0
L15	2nd IF trans.	Pri.	5·5
L16		Sec.	5·5
L17	Speaker speech coil		1·8
T1	Intervalve trans.	Pri.	900·0
		Sec., total	2,100·0
T2	Speaker input trans.	Pri., total	1,100·0
		Sec.	0·17
S1-S12	Waveband switches		—
S13	HT circuit switch		—
S14	LT circuit switch		—
F1	HT circuit fuse		—

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating with a new HT battery reading 120 V on load. 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.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 210PG	113	0·1	33	0·7
	Oscillator 78	1·0		
V2 210VPT	113	2·0	56	0·5
V3 210DDT	68	0·3	—	—
V4 210QP	112†	2·3†	113	0·9

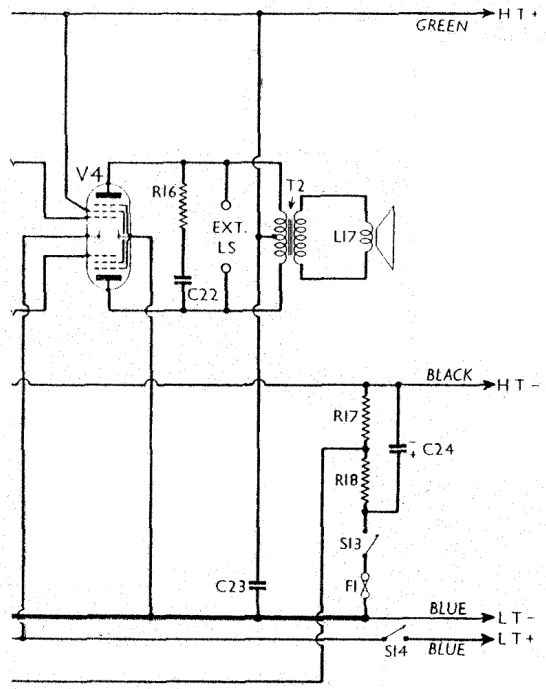
† Each anode.

GENERAL NOTES

Switches.—**S1-S12** are the waveband switches, in two rotary units beneath the chassis. These are indicated in our under-chassis view, and shown in detail in the diagrams in col. 3. The table (col. 2) gives the switch positions for the three settings, starting from fully anti-clockwise.

S13 and **S14** are the HT and LT circuit switches, in a rotary unit, mounted on a raised bracket at one side of the chassis deck. The diagram of this unit is inset on the plan chassis view, and shows the contacts, looking towards the back of the unit from the gang condenser. It will be noted that there are several blank tags (B), while two others are marked "Not Used."

These two tags are connected up, in our chassis, to two leads, one of which enters the HT cable, but is cut off at the far end. In early models, the two tags were the connections of an extra GB switch from the top of **F1** to GB+. In later models this switch is not required as GB is automatic.



S13 and **S14** are closed when the switch spindle is rotated clockwise.

Coils.—**L1, L4 ; L2, L5 ; L3, L6 ; L7, L10 ; L8, L11** and **L9, L12** are in six unscreened units beneath the chassis.

The IF transformers **L13, L14** and **L15, L16** are in two screened units on the chassis deck. Their core adjustments are reached through holes in the sides of the cans.

Fuse F1.—This is an Osram MES bulb, rated at 3·5 V, 0·15 A. It screws into a holder at the rear of the chassis.

External Speaker.—Two sockets are provided at the rear of the chassis for a high impedance (24,000 Ω) external speaker.

Batteries.—LT, 2V 70 AH accumulator cell, such as Cossor type E370. HT, 120 V HT dry battery, such as Cossor Double Capacity Type 2120. GB is automatic in late models. In early models a 9 V GB battery is necessary.

Battery Leads and Voltages.—Blue lead, black spade tag, LT negative; blue lead, red spade tag, LT positive 2 V; black lead and plug, HT negative; green lead and plug, HT positive 120 V. In early models, there were GB positive, GB negative 1 (—1·5 V) and GB negative 2 (—9 V) plugs.

Chassis Divergencies.—The main divergencies likely to be found will be in sets issued prior to February, 1938, where the GB arrangements were different.

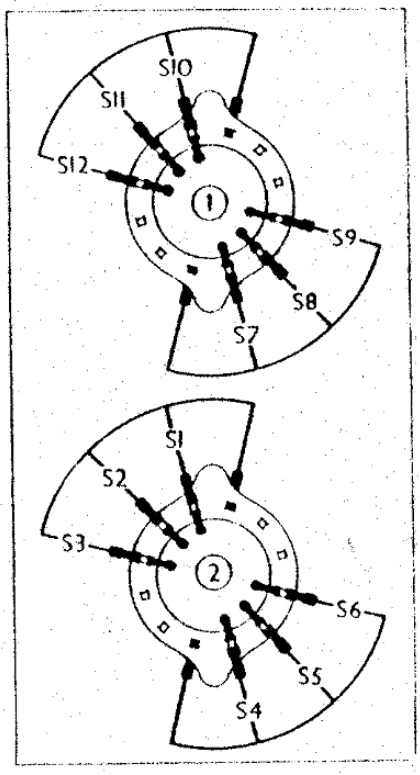
TABLE AND DIAGRAMS OF THE SWITCH UNITS

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

Other possible divergencies are as follows. In our chassis **C35** is a single 300 $\mu\mu$F maximum pre-set condenser, but in other models there may be a pre-set 800 $\mu\mu$F maximum type, in series with a 270 $\mu\mu$F fixed condenser.

C4 may be 0·0015 μF, not 0·00175 μF. The makers' diagram shows the positive side of **C24** to chassis.

Diagrams of the two switch units, as seen from the rear of the underside of the chassis.



CIRCUIT ALIGNMENT

IF Stages.—Connect signal generator to control grid (top cap) of **V1** and chassis. Short-circuit **C30** to stop **V1** oscillating, then feed in a 465 KC/S signal. Adjust the cores of **L13, L14, L15** and **L16** for maximum output, by screwing them in or out. Re-check, and then remove the short from **C30.**

RF and Oscillator Stages.—Connect signal generator to **A** and **E** sockets.

LW.—Switch set to LW, tune to 1,000 m on scale, feed in a 1,000 m (300 KC/S) signal, and adjust **C33,** then **C28** for maximum output. Feed in a 1,875 m (160 KC/S) signal, tune it in, and adjust **C35** for maximum output, while rocking the gang slightly for optimum results.

MW.—Switch set to MW, tune to 214 m on scale, feed in a 214 m (1,400 KC/S) signal, and adjust **C32,** then **C27,** for maximum output. Feed in a 522 m (575 KC/S) signal, tune it in, and adjust **C34** for maximum output, while rocking the gang slightly for optimum results.

SW.—Switch set to SW, tune to 14 MC/S on scale, feed in a 14 MC/S (21·4 m) signal, and adjust **C31,** then **C26,** for maximum output. Feed in a 7 MC/S (42·9 m) signal, tune it in, and adjust **C25** for maximum output, while rocking the gang for optimum results. Return to 14 MC/S, and re-adjust **C31** and **C26** if necessary.