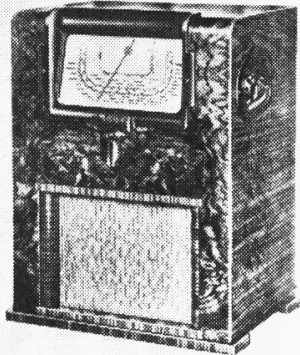


"TRADER" SERVICE SHEET

377

COSSOR 485

3-BAND BATTERY SUPERHET



The Coszor 485 3-band battery superhet. Early models had battery bias, but automatic bias was substituted later.

COVERING a short-wave range of 19-57.5 m, the Coszor 485 is a 4-valve battery 3-band superhet with a valve arrangement comprising a heptode frequency changer, a variable-mu pentode IF amplifier, a double-diode triode and a double pentode QPP output valve. Provision is made for the connection of an extension speaker.

Early models, those issued before February, 1938, required a separate bias battery but later models, such as that on which this *Service Sheet* was prepared, have automatic bias.

Release date : July, 1937.

CIRCUIT DESCRIPTION

Aerial input via series condenser **C1** and, on SW, further series condenser **C2** and coupling coil **L1**; on MW, coupling coil **L2**; on LW, coupling coil **L3**, to single tuned circuits **L4**, **C29** (SW), **L5**, **C29** (MW) and **L6**, **C29** (LW) which precede a heptode valve (**V1**, **Coszor metallised 210PG**) operating as frequency changer with electron coupling. Oscillator grid coils **L7** (SW), **L8** (MW) and **L9** (LW) are tuned by **C30**; parallel trimming by **C31** (SW), **C32** (MW) and **C8**, **C33** (LW); series tracking by **C34** (MW) and **C35** (LW). Reaction by coils **L10** (SW), **L11** via coupling condenser **C9** (MW) and **L12** via coupling condenser **C10** (LW). On SW, the reaction coil is connected across the anode feed resistance **R5**, thus raising the anode volts.

Second valve (**V2**, **Coszor metallised 210VPT**) is a variable-mu RF pentode operating as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings **C5**, **L13**, **L14**, **C6** and **C15**, **L15**, **L16**, **C16**. The tuning condensers are fixed and tuning is effected by adjusting the iron cores.

Intermediate frequency 465 KC/S.

Diode second detector is part of double-diode triode valve (**V3**, **Coszor metallised 210DDT**). Audio frequency component in rectified output is developed across load resistances **R9** and **R10**, the latter of which also operates as manual volume control, and passed via AF coupling

condenser **C19** to CG of triode section, which operates as AF amplifier. IF filtering by **C17** and **C20**.

Second diode of **V3**, fed from **V2** anode via **C18**, provides DC potentials which are developed across load resistance **R13** and passed back through decoupling circuits as GB to FC (except on SW) and IF valves, giving AVC.

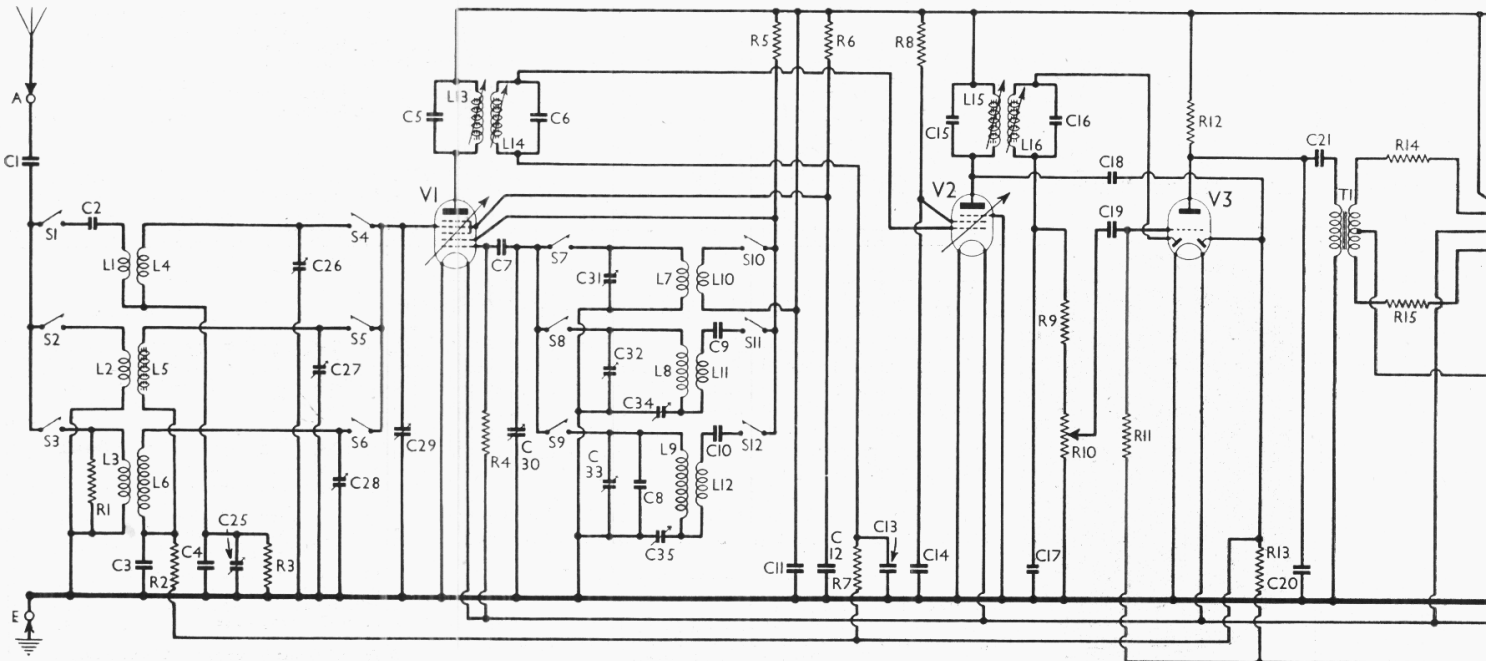
Parallel-fed transformer coupling by **R12**, **C21** and **T1**, via grid stoppers **R14**, **R15**, between **V3** triode and quiescent push-pull double-pentode output valve (**V4**, **Coszor 240QP**). Fixed tone correction by **R16**, **C22** between the two anodes.

Fixed GB potential for **V1** and **V2**, GB for **V3** triode and AVC delay potential are obtained from junction of resistances **R17** and **R18**, which form a potential divider in the negative HT lead to chassis. Total potential developed across **R17** and **R18** is applied as GB to control grids circuit of **V4**.

DISMANTLING THE SET

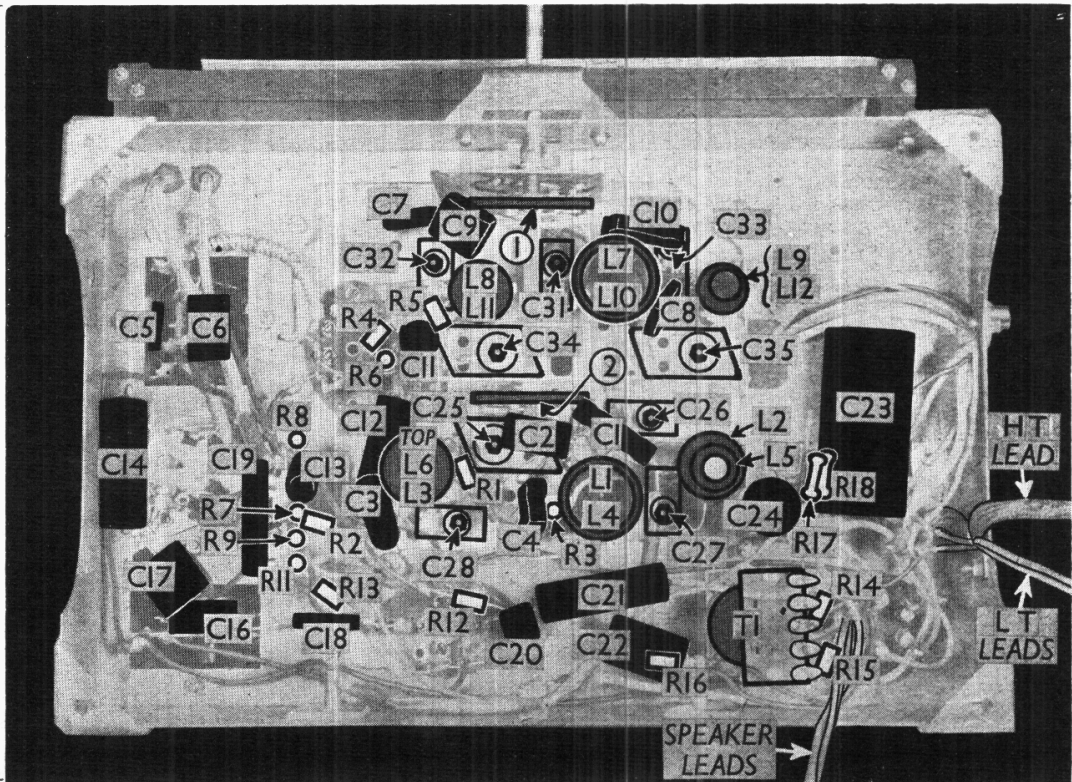
Removing Chassis.—A steel transit bar is fitted to the inside of the top of the cabinet and if this has not been taken out, remove the round-head wood screw at the back and push the bar away from you and to the left until the bar is free. Now remove the control knob at the front of the set (recessed grub screw) and the three knobs at the sides with their extensions (screws accessible from the inside of the cabinet).

Then remove the four bolts (with



Circuit diagram of the latest version of the Coszor 485. The divergencies in early models are in cols. 2 and 3 of

Under - chassis view. Diagrams of the two switch units are in col. 3 overleaf. All the trimmers are built on to the chassis. In early models R17, R18 and C24 were omitted, as battery bias was used.



washers and lock washers) holding the chassis to the platform and disconnect the speaker leads (screw terminals) when by lifting the back upwards, the chassis can be withdrawn from the cabinet. When replacing, connect the speaker leads as follows, numbering the terminals from bottom to top:—1, black; 2, red; 3, black. If the valves have been removed note that the screening cap goes on V2.

Removing Speaker.—To remove the speaker from the cabinet, disconnect the leads (screw terminals) and slacken the four clamps holding the speaker to the sub-baffle. When replacing, see that the transformer is on the right and connect the leads as follows, numbering the terminals from bottom to top:—1, black; 2, red; 3, black.

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	V1 osc. CG condenser ..	0.00016
C7	V1 osc. CG fixed trimmer	0.0002
C8	V1 osc. anode MW coupling	0.00005
C9	V1 osc. anode LW coupling ..	0.0003
C10	HT circuit RF by-pass ..	0.0005
C11	V1 SG decoupling ..	0.01
C12	V2 CG decoupling ..	0.01
C13	V2 SG decoupling ..	0.01
C14	2nd IF transformer fixed tuning condensers ..	0.00005
C15	IF by-pass ..	0.00007
C16	Coupling to V3 AVC diode ..	0.00005
C17	AF coupling to V3 triode ..	0.00005
C18	IF by-pass ..	0.01
C19	Part of fixed tone corrector ..	0.0002
C20	HT reservoir condenser ..	0.1
C21	Auto GB by-pass ..	50.0
C22	Aerial circuit SW tracker ..	0.00021
C23	Aerial circuit MW trimmer ..	—
C24	Aerial circuit LW trimmer ..	—
C25	Aerial circuit tuning ..	—
C26	Oscillator circuit tuning ..	—
C27	Osc. circuit SW trimmer ..	—
C28	Osc. circuit MW trimmer ..	—
C29	Osc. circuit LW trimmer ..	—
C30	Osc. circuit MW tracker ..	0.00075
C31	Osc. circuit LW tracker ..	0.0003

RESISTANCES		Values (ohms)
R1	Aerial circuit LW damping ..	50,000
R2	V1 tetrode CG MW and LW decoupling ..	10,000
R3	Aerial SW trackers shunt ..	3,000,000
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	Part of fixed tone corrector ..	100,000
R16	V1 and V2 fixed, V3 and V4 automatic GB resistances ..	10,000
R17		500
R18		150

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 ..	3.0
L13	1st IF trans. Pri. ..	4.0
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
T2	Speaker input trans. Sec., total ..	2,100.0
St-S12	Waveband switches ..	0.17
S13	HT circuit switch ..	—
S14	LT circuit switch ..	—
F1	HT circuit fuse ..	—

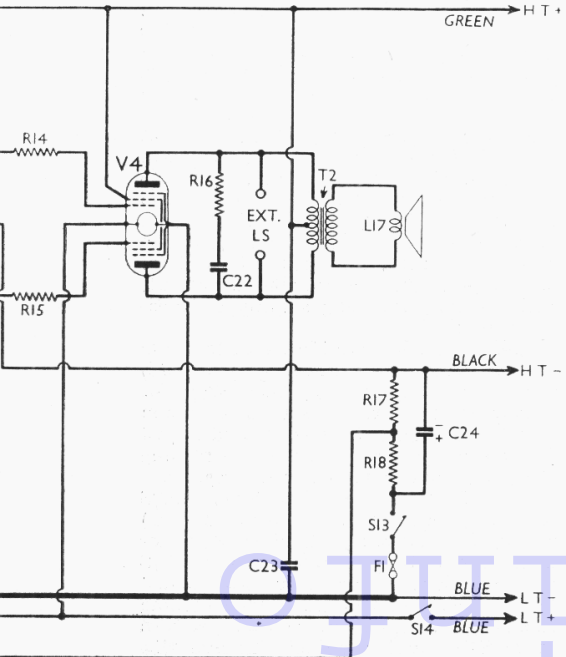


Fig. 2 and 3 overleaf.

* Electrolytic. † Variable. ‡ Pre-set.

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 Oscillator	0.1	33	0.7
V2 210VPT	78 1.0	1.0	56	0.5
V3 210DDT	113 68	2.0 0.3	—	—
V4 210QP	112† 2.3†	2.3†	113	0.9

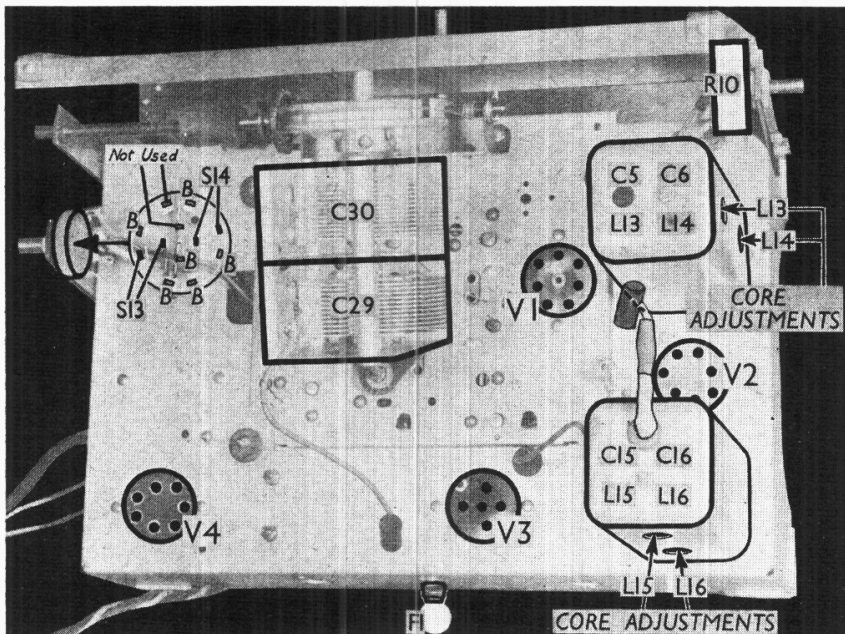
† Each anode.

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.



Plan view of the chassis. The S13, S14 switch diagram is inset.

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

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.

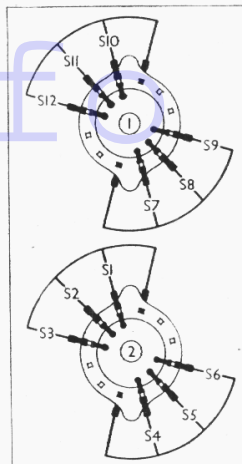
External Speaker.—Two sockets are provided at the rear of the chassis for a high impedance (24,000 O) external speaker.

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.

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



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

C4 may be 0.0015 µF, not 0.00175 µF. The makers' diagram shows the positive side of C24 to 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.