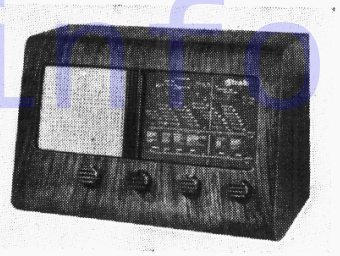
"TRADER" SERVICE SHEET

903

STRAD

492 & 492E



FOUR valves (plus rectifier) are employed in the R.M. Electric Strad 492 receiver, a 3-band superhet for operation from A.C. mains of 200-250V, 40-100 c/s. The wave-band ranges are: 15-50 m, 200-550 m and 750-2,000 m. The only difference in the export model 492E is the provision of mains voltage tappings at 120 V, 220 V and 230 V.

Release date and original price: September 1948; £15 15s, plus purchase tax.

CIRCUIT DESCRIPTION

Aerial input is inductively coupled, via I.F. rejector **L1, C1** and coupling coils **L2** (S.W.), **L3** (M.W. and L.W.), to single-tuned circuits **L4, C25** (S.W.), **L5, C25** (M.W.) and **L6, C25** (L.W.), which precede a triode heptode valve **(V1, Mazda metallized TH41)** operating as frequency changer with internal coupling.

Triode oscillator anode coils **L8** (S.W.), **L9** (M.W.) and **L10** (L.W.) are tuned by **C31**, with parallel trimming by **C28** (S.W.), **C29** (M.W.), **C7, C30** (L.W.) and series tracking by **C6** (S.W.), **C26** (M.W.) and **C27** (L.W.). Capacitative reaction coupling is employed on all bands, due to the common impedance of the trackers in grid and anode circuits, with additional inductive coupling on S.W. by **L7.**

Second valve **(V2, Mazda metallized VP41)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings **C3, L11, L12, C4** and **C11, L13, L14, C12** in which the tuning capacitors are fixed and alignment is effected by varying the positions of the iron-dust cores.

Intermediate frequency 465kc/s.

Diode detector is part of double diode triode valve **(V3, Mazda metallized HL42DD),** the second diode of which is unused and wired to chassis. Audio frequency component in rectified output is developed across diode load resistors **R9, R10** and passed, via A.F. coupling capacitor **C16** and manual volume control **R11,** to grid of triode section, which operates as A.F. amplifier. I.F. filtering by **C13, R8, C14** in diode circuit, and provision for the connection of a gramophone pick-up across **R11.**

The D.C. component developed across **R9, R10** is tapped off and fed back through decoupling circuits as G.B. to F.C. and I.F. valves, giving automatic gain control.

Resistance-capacitance coupling by **R13, C17, R14** between **V3** triode and beam tetrode output valve **(V4, Mazda metallized PEN45).** Variable tone control by **R15, C18** in anode circuit, and provision for the connection of a low impedance external speaker across **T1** secondary winding.

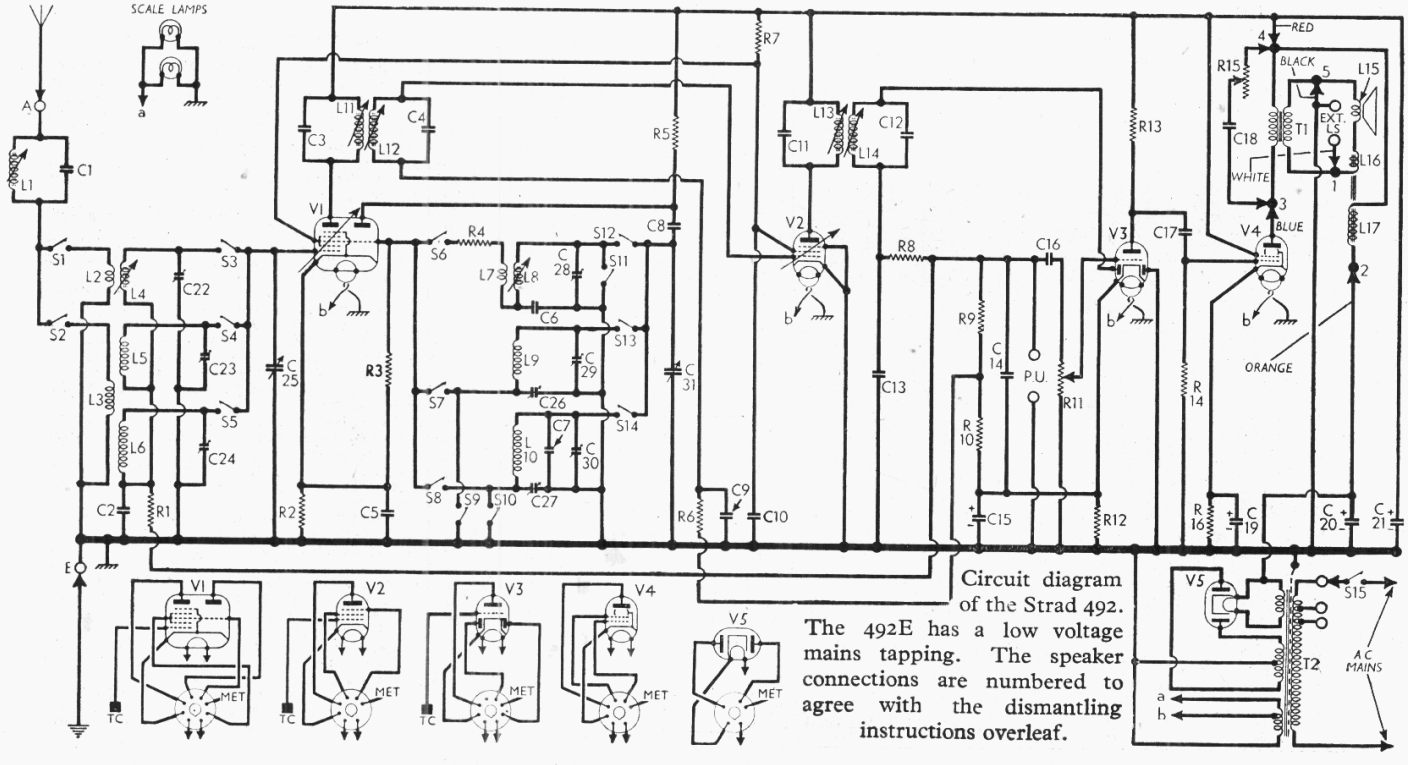
H.T. current is supplied by I.H.C. full-wave rectifying valve **(V5, Mazda metallized UU6).** Smoothing by speaker field **L17** and electrolytic capacitors **C20, C21.**

COMPONENTS AND VALUES

	RESISTORS	Values (ohms)	Locations
R1	V1 A.G.C. decoup.	1,000,000	G5
R2	V1 fixed G.B. ...	220	K4
R3	V1 osc. C.G. ...	47,000	K3
R4	S.W. stabilizer ...	100	H3
R5	Osc. anode load ...	33,000	K4
R6	V2 A.G.C. decoup.	2,200,000	J4
R7	S.G.'s H.T. feed ...	33,000	K5
R8	I.F. stopper ...	100,000	H5
R9	A.G.C. potential	220,000	H4
R10	divider network	220,000	H4
R11	Volume control ...	500,000	E3
R12	V3 G.B., A.G.C. delay	470	G5
R13	V3 triode load ...	47,000	H5
R14	V4 C.G. resistor ...	680,000	F5
R15	Tone control ...	50,000	—
R16	V4 G.B. resistor ...	180	F5

	CAPACITORS	Values (μF)	Locations
C1	I.F. rejector tune	0·00056	G3
C2	V1 hex. C.G. decoup.	0·01	G4
C3	1st I.F. trans. tun.	0·00015	A2
C4	1st I.F. trans. tun.	0·00015	A2
C5	V1 cath. by-pass ...	0·01	J3
C6	Osc. S.W. tracker...	0·005	K3
C7	Osc. L.W. trimmer	0·000047	H3
C8	Osc. anode coup. ...	0·00047	J3
C9	V2 C.G. decoup. ...	0·01	J4
C10	S.G's decoupling ...	0·01	K5
C11	2nd I.F. trans. tun	0·00015	B2
C12	2nd I.F. trans. tun	0·00015	B2
C13	I.F. by-passes ...	0·0001	J5
C14	I.F. by-passes ...	0·0001	H5
C15*	V3 cath. by-pass	30·0	H4
C16	A.F. coupling ...	0·01	G5
C17	A.F. coupling ...	0·01	G5
C18	Part. tone control	0·05	—
C19*	V4 cath. by-pass ...	25·0	F4
C20*	H.T. smoothing ...	16·0	C2
C21*	H.T. smoothing ...	16·0	E4
C22‡	Aerial S.W. trim....	0·000055	F3
C23‡	Aerial M.W. trim.	0·000055	F3
C24‡	Aerial L.W. trim....	0·000055	F3
C25†	Aerial tuning ...	0·00045§	B2
C26‡	Osc. M.W. tracker	0·00035	H3
C27‡	Osc. L.W. tracker	0·00015	G3
C28‡	Osc. S.W. trim. ...	0·000055	H3
C29‡	Osc. M.W. trim. ...	0·000055	H3
C30‡	Osc. L.W. trim. ...	0·000055	H3
C31†	Oscillator tuning...	0·00045§	B1

*Electrolytic. †Variable ‡Pre-set
§"Swing" value, min. to max.



Circuit diagram of the Strad 492. The 492E has a low voltage mains tapping. The speaker connections are numbered to agree with the dismantling instructions overleaf.

OTHER COMPONENTS		Approx. Values (ohms)	Locations
L1	I.F. rejector coil	3·5	G3
L2	Aerial coupling coils	8·6	E3
L3		14·0	F3
L4	Aerial tuning coils	Very low	E3
L5		3·5	F3
L6		16·5	F3
L7	S.W. reaction coil	8·5	J3
L8	Oscillator tuning coils	Very low	J3
L9		2·6	J3
L10		6·5	J3
L11	1st I.F.trans. Pri.	8·0	A2
L12	1st I.F.trans. Sec.	8·0	A2
L13	2nd I.F.trans. Pri.	8·0	B2
L14	2nd I.F.trans. Sec.	8·0	B2
L15	Speech coil	2·5	—
L16	Hum neut. coil	Very low	—
L17	Field coil	1,500·0	—
S1-S14	W/band switches	—	H3
S15	Mains sw., g'd R11	—	E3
T1	Speaker trans. Pri.	200·0	—
	Speaker trans. Sec.	0·1	—
T2	Mains trans. Pri., total	37·0	D1
	Mains trans. Heat sec., total	Very low	D1
	Mains trans. Rect. heat sec.	Very low	D1
	Mains trans. H.T. sec., total	320·0	D1

VALVE ANALYSIS

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

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TH41	204	0·9	53	3·85
	Oscillator			
	85	3·0		
V2 VP41	204	2·4	53	0.55
V3 HL42DD	72	2·7	—	—
V4 IFN45	198	34·0	204	7·0
V5 UU6	254†	—	—	—

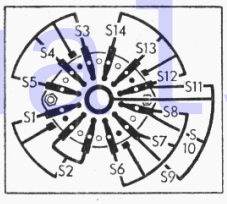
† Each anode, A.C.

DISMANTLING THE SET

Removing Speaker and Chassis.—Pull off the four control knobs, unsolder the speaker leads and remove the fixing bolts.

When replacing, the chassis must be fitted in the cabinet first, and then the speaker, with its transformer at the bottom.

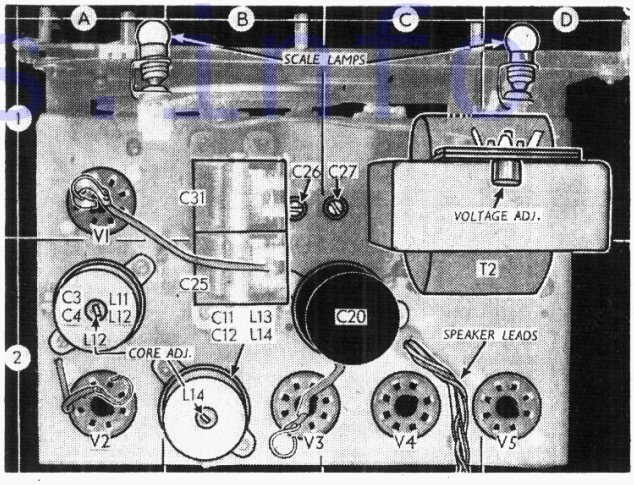
The speaker leads should be resoldered as follows, numbering the tags on the transformer from left to right; 1, white; 2, orange; 3, blue (and wire from **C18**); 4, red (and wire from **R15**); 5, black.



Above : Diagram of the switch unit, as seen from the rear, with (below) the switch table.

Right : Plan view of the chassis.

Switch	S.W.	M.W.	L.W.
S1	C	—	—
S2	—	C	C
S3	C	—	—
S4	—	C	—
S5	—	—	C
S6	C	—	—
S7	—	C	—
S8	—	—	C
S9	C	—	—
S10	—	C	—
S11	—	—	C
S12	C	—	—
S13	—	C	—
S14	—	—	C



GENERAL NOTES

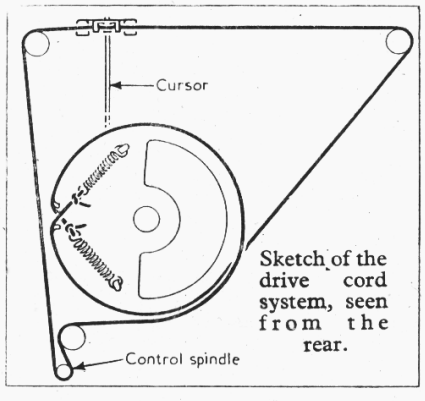
Switches.—**S1-S14** are the waveband switches in a rotary unit beneath the chassis. The unit is shown in detail in the diagram above where it is drawn as seen from the rear of an inverted chassis. The table below gives the switch positions for the three control settings, starting from the fully anti-clockwise position of the control knob.

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

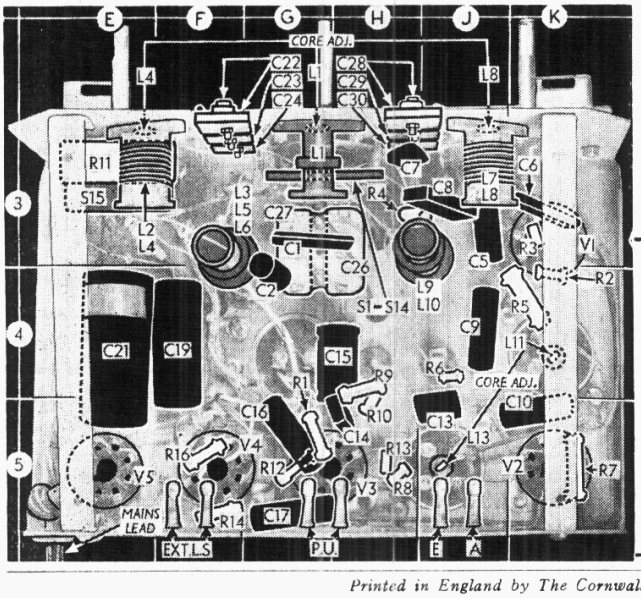
External Speaker.—Two sockets are provided at the rear of the chassis for the connection of a low impedance (2-3 Ω) external speaker.

Drive Cord Replacement.—Four feet of cord, which should be of superior quality fishing line, is sufficient for the drive, leaving ample for tying off. The cord should be run as shown in the sketch (next col.), where it is viewed from the rear. Considerable tension is necessary, and in our sample the ½-in tension springs were extended to between 2 and 3 inches

Chassis Divergencies.—**C21** may be 16 μF, and **S9**, **S10** and **S11** may sometimes be omitted. Many small divergencies in component values were found in our chassis, but they were due to availability of materials, and had a negligible effect on performance. Replacements should be of the prescribed value, in any case, so we have quoted the designer's value in our tables.



Sketch of the drive cord system, seen from the rear.



Under-chassis view. The arrow indicating the **S1-S14** switch unit shows the direction in which it is viewed in the diagram inset beside the plan view at the top of the page.

CIRCUIT ALIGNMENT

I.F. Stages.—Switch set to M.W., turn gang to minimum and volume control to maximum, connect signal generator, via an 0.01 μF capacitor in the "live" lead, to the control grid (top cap) of **V1** and the **E** socket, after removing the original top cap connector and joining a 500,000 Ω resistor between the top cap of the valve and chassis, and short-circuit **C31** (location reference B1).

Feed in a 465 kc/s (645 m) signal and adjust the cores of **L14, L13, L12** and **L11** (B2, J5, A2, K4) for maximum output. Finally, remove short-circuit from **C31** and replace original top cap connector on **V1.**

I.F. Filter.—Transfer "live" signal generator lead to **A** socket, via a suitable dummy aerial, feed in a strong 465 kc/s signal, and adjust the core of **L1** (G3) for minimum output.

M.W.—With set still switched to M.W., feed in a 500 m (600 kc/s) signal, tune it in and adjust **C26** (B1), while rocking the gang, for maximum output. Slide the cursor carriage along the drive cord until the cursor coincides with the 500 m calibration point on the scale. Tune to 250 m on scale, feed in a 250 m (1,200 kc/s) signal, and adjust **C29** (H3) and **C23** (F3) for maximum output. Repeat these operations if necessary.

L.W.—Switch set to L.W., tune to 2,000 m on scale, feed in a 2,000 m (150 kc/s) signal, and adjust **C27** (C1) for maximum output. Tune to 1,000 m on scale, feed in a 1,000 m (300 kc/s) signal, and adjust **C30** (H3) and **C24** (F3) for maximum output. Repeat these operations until no improvement results.

S.W.—Switch set to S.W., tune to 50 m on scale, feed in a 50 m (6 Mc/s) signal, and adjust the cores of **L8** (J3) and **L4** (E3) for maximum output. Tune to 20 m on scale, feed in a 20 m (15 Mc/s) signal, and adjust **C28** (H3) and **C22** (F3) for maximum output. Repeat these operations until no improvement results.

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