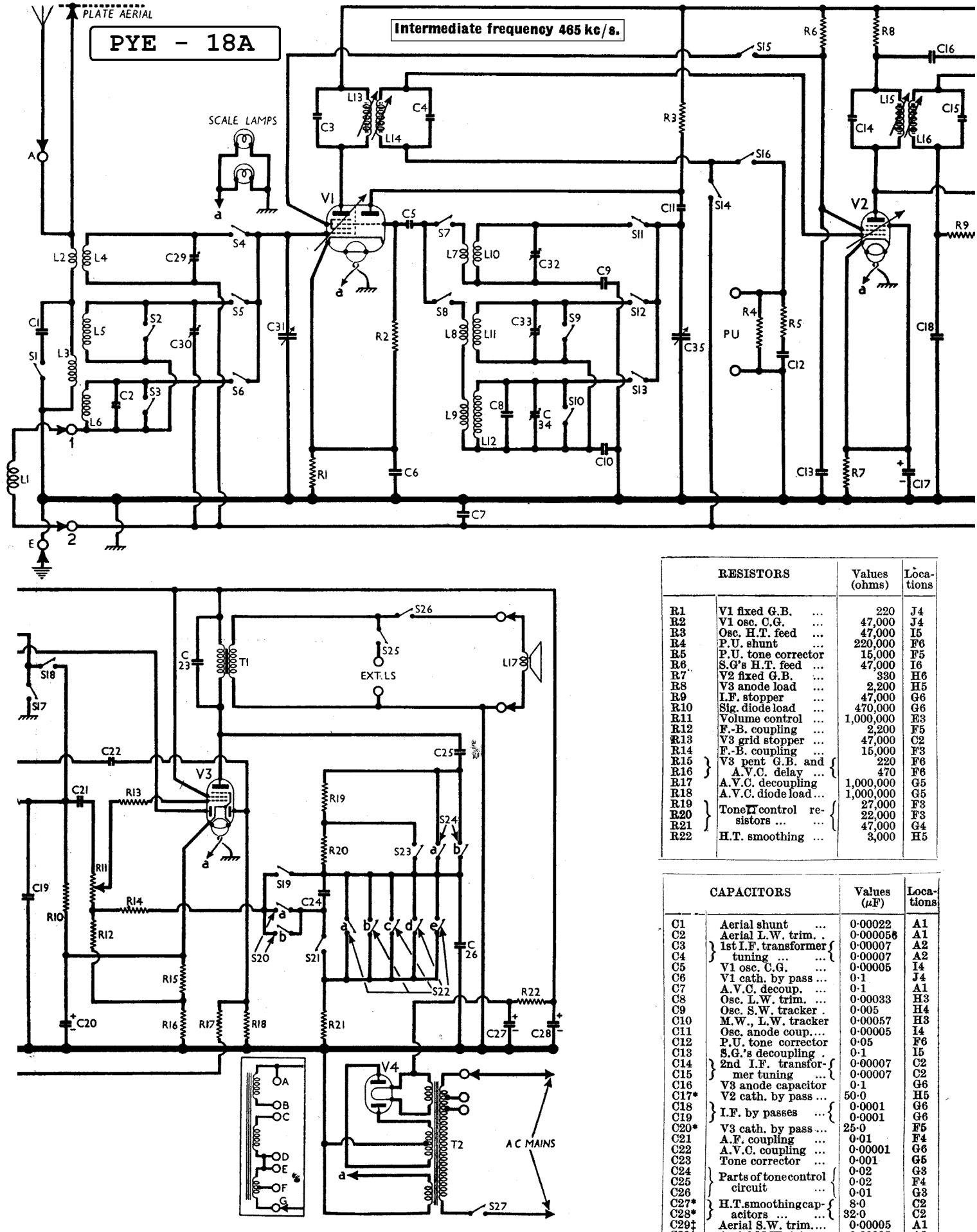
PYE - 18A



	RESISTORS	Values (ohms)	Locations
R1	V1 fixed G.B. ...	220	J4
R2	V1 osc. C.G. ...	47,000	J4
R3	Osc. H.T. feed ...	47,000	I5
R4	P.U. shunt ...	220,000	F6
R5	P.U. tone corrector	15,000	F5
R6	S.G's H.T. feed ...	47,000	I6
R7	V2 fixed G.B. ...	330	H6
R8	V3 anode load ...	2,200	H5
R9	I.F. stopper ...	47,000	G6
R10	Sig. diode load ...	470,000	G6
R11	Volume control ...	1,000,000	E3
R12	F.-B. coupling ...	2,200	F5
R13	V3 grid stopper ...	47,000	C2
R14	F.-B. coupling ...	15,000	F3
R15	V3 pent G.B. and	220	F6
R16	A.V.C. delay ...	470	F6
R17	A.V.C. decoupling	1,000,000	G5
R18	A.V.C. diode load ...	1,000,000	G5
R19	Tone control re-	27,000	F3
R20	sistors	22,000	F3
R21		47,000	G4
R22	H.T. smoothing ...	3,000	H5

	CAPACITORS	Values (μF)	Locations
C1	Aerial shunt ...	0·00022	A1
C2	Aerial L.W. trim. .	0·000056	A1
C3	1st I.F. transformer	0·00007	A2
C4	tuning	0·00007	A2
C5	V1 osc. C.G. ...	0·00005	I4
C6	V1 cath. by pass ...	0·1	J4
C7	A.V.C. decoup. ...	0·1	A1
C8	Osc. L.W. trim. ...	0·00033	H3
C9	Osc. S.W. tracker .	0·005	H4
C10	M.W., L.W. tracker	0·00057	H3
C11	Osc. anode coup....	0·00005	I4
C12	P.U. tone corrector	0·05	F6
C13	S.G.'s decoupling .	0·1	I5
C14	2nd I.F. transfor-	0·00007	C2
C15	mer tuning ...	0·00007	C2
C16	V3 anode capacitor	0·1	G6
C17*	V2 cath. by pass ...	50·0	H5
C18	I.F. by passes ...	0·0001	G6
C19		0·0001	G6
C20*	V3 cath. by pass	25·0	F5
C21	A.F. coupling ...	0·01	F4
C22	A.V.C. coupling ...	0·00001	G6
C23	Tone corrector ...	0·001	G5
C24	Parts of tone control	0·02	G3
C25	circuit ...	0·02	F4
C26		0·01	G3
C27*	H.T. smoothing cap-	8·0	C2
C28*	acitors	32·0	C2
C29‡	Aerial S.W. trim....	0·00005	A1
C30‡	Aerial M.W. trim. .	0·00005	A1
C31†	Aerial tuning ...	0·000532	B1
C32‡	Osc. S.W. trim. ...	0·00005	H4
C33‡	Osc. M.W. trim. ...	0·00005	H4
C34‡	Osc. L.W. trim. ...	0·00005	I4
C35†	Oscillator tuning .	0·000532	B1

* Electrolytic. † Variable. ‡ Pre set.

OTHER COMPONENTS		Approx. Values (ohms)	Location
L1	Frame aerial ...	0·7	A1
L2	Aerial coupling coils	0·3	A1
L3		54·0	A1
L4	Aerial tuning coils	Very low	A1
L5		1·5	A1
L6		13·5	A1
L7	Osc. S.W. reaction	21·0	I4
L8	Osc. M.W. and L.W. reaction, total ...	2·9	H4
L9			H3
L10	Oscillator tuning coils	Very low	I4
L11		3·4	H4
L12		4·2	H3
L13	1st I.F. trans. Pri.	8·5	A2
L14	1st I.F. trans. Sec.	8·5	A2
L15	2nd I.F. trans. Pri.	8·5	C2
L16	2nd I.F. trans. Sec.	8·5	C2
L17	Speech coil ...	1·5	—
T1	Output trans. Pri.	560·0	C1
	Output trans. Sec.	0·3	C1
T2	Mains trans. Pri., total	19·5	D2
	Mains trans. Heat. sec., Rect. heat. sec. ...	0·1	D2
	Mains trans. H.T. sec., total ...	370·0	D2
S1	External aerial sw.	—	J6
S2-S13	Waveband switches	—	I3
S14-S18	Radio-Gram switches	—	F4
S19-S24	Tone control switches	—	F3
S25	Ext. speaker sw. ...	—	F6
S26	Int. speaker sw. ...	—	F6
S27	Mains sw., g'd S14-S24	—	F4

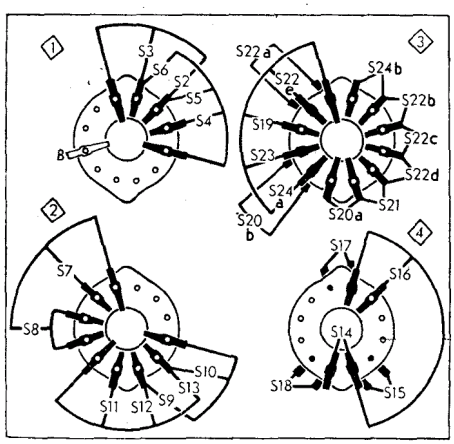
Waveband Switch Table

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

VALVE ANALYSIS

Valve		Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1	ECH35	241	2·6	80	2·1
		Oscillator			
		83	3·2		
V2	EF39	227	4·6	80	1·3
V3	EBL31	225	26·0	241	2·9
V4	AZ31	327†	—	—	—

† Each anode, A.C.



Diagrams of the Waveband (left) and "Tonemaster" (right) switch units as seen from the rear of an inverted chassis. The associated tables are at the head of cols. 1 and 3.

Tone Control Switch Table

Switch	RADIO				GRAM.	
	Fid.	Bri.	M1	M2	Fid.	Mel.
S14	C	C	C	C	—	—
S15	C	C	C	C	—	—
S16	—	—	—	—	C	C
S17	C	C	C	C	—	—
S18	—	—	—	—	C	C
S19	—	C	—	—	—	—
S20a	C	—	C	C	—	C
S20b	—	—	—	—	C	—
S21	—	C	—	—	—	—
S22a	—	—	—	—	—	C
S22b	—	—	—	—	C	—
S22c	—	—	—	C	—	—
S22d	—	—	C	—	—	—
S22e	C	—	—	—	—	—
S23	—	—	C	—	—	—
S24	—	—	—	C	—	—
S24b	—	—	—	—	—	C

Export Models.—The 38A is the export version of the 18A, and the G38K is the export version of the G18K. The only difference between the home and export versions lies in the provision of a universal voltage primary on the mains transformer in the export models.

There are two 100 V primaries, which may be connected in parallel or series, and the lower one has an additional section, beyond 100 V, tapped to permit adjustment to mains up to 50 V beyond the range of the large sections. The three tappings shown are rated for (E) 0-15 V, (F) 16-35V, (G) 36-50 V, which may be additional to the 100 V or 200 V arrangement of the main sections. A diagram is inset beneath the circuit overleaf.

RADIOGRAM MODIFICATIONS

Basically, the chassis of the radiogram versions G18K and G38K are the same as the table models, but a fairly large number of small changes are made, principally in component values.

The H.T. smoothing resistor **R22** is replaced by an iron-cored choke (D.C. resistance 200 Ω), which is fitted on the chassis-deck, near **T1.** This results in a rise in H.T. positive line potential to about 270 V, which is countered by the addition of a decoupling circuit (4,700 Ω and 2 μF) between **R8** and the H.T. positive line in **V2** anode circuit. Here also a 0.01 μF capacitor is added between **R8, C16** and chassis, and a 2 μF capacitor is shunted across **C13.**

The value of **R5** is changed to 4,700 Ω, **R6** is changed to 68,000 Ω, **R8** to 10,000 Ω, **R15** to 150 Ω, **R16** to 470 Ω, and **C12** to 0.25 μF. For drive cord, see below.

DRIVE CORD REPLACEMENT

Models 18A and 38A.—One yard of Nylon braided glass yarn is required for cord replacement, this length leaving a comfortable margin for tieing off. It is most conveniently fitted if made up first, with a loop tied at each end. The makers quote the length as 28¾ in between the centres of the two loops; the measured overall length of our sample, when stretched between two pins, was 29¼ in.

The right-hand sketch (col. 4) shows the course followed by the cord as it would be seen from the front if the scale backing plate did not obscure it; actually this plate must be in position to support the drive. Inset in the drawing is a sketch showing a suitable knot for making the loops in the material used for the cord. It should be so tied that the strain is taken in the direction of the arrow; the spare end should be pulled up tight and then left free, the surplus being snipped off.

Having made two turns of cord round the control spindle in the direction shown in our sketch, pass the right-hand (vertical) length of cord up round its two pulleys, bring the left-hand length up behind the scale backing plate to meet it, and loop the two ends on to one end of the tension spring, closing the hook on the spring so that the loops do not slip off. It is helpful if the scale lamps are removed.

Now anchor the other end of the spring to the tag inside the gang drum (on rear face) and strain the cord over the drum groove, crossing the cord in figure-eight fashion as shown in the sketch.

Finally, adjust drum so that the groove opening is at the top as shown in one sketch when the gang is at maximum, and slip on the pointer, weaving the cord between its tongues, and adjust as explained under "Circuit Alignment."

Models G18K and G38K.—In the radiogram versions, the method is generally the same as for the table models, but it is expedient to work from the rear of the scale assembly. Our sketch (on the left) therefore is drawn from the rear, and shows the position of the drum again when the gang is at maximum. The length of the cord between loop centres is given in this case as 26⅜ in.

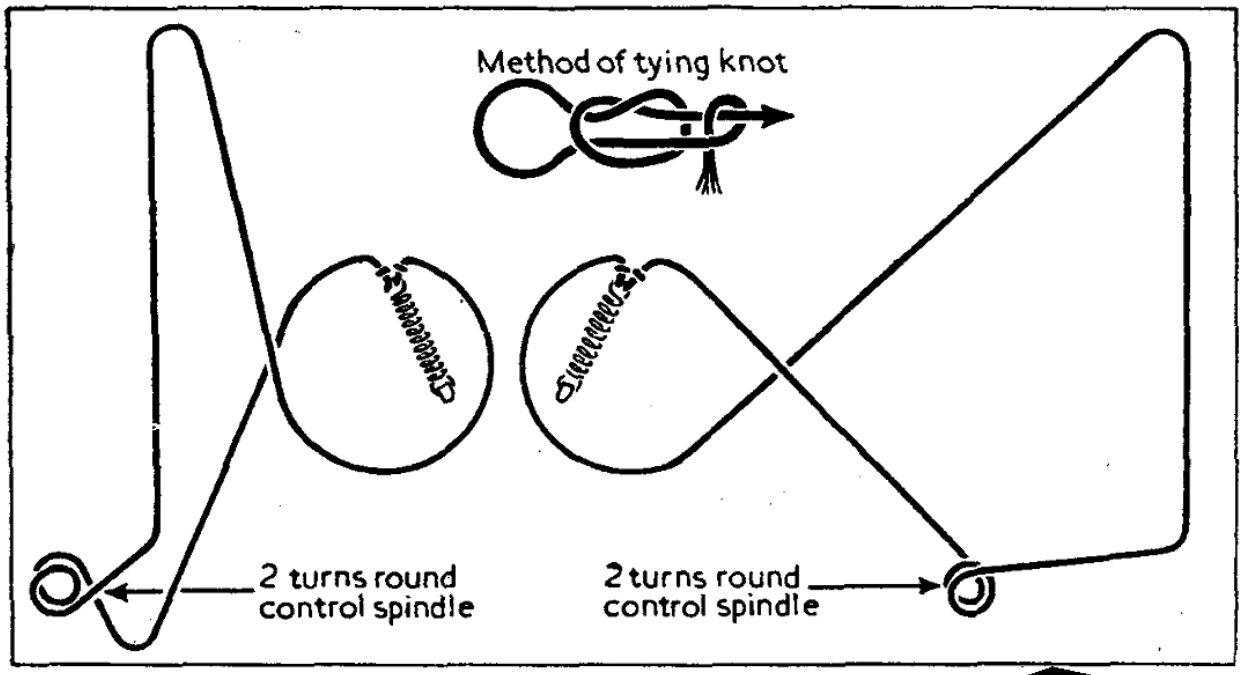
CIRCUIT ALIGNMENT

I.F. Stages.—Connect signal generator via an 0.1 μF capacitor in the "live" lead, to control grid (top cap) of **V1** and the **E** socket, removing the original top cap connector but connecting a 500,000 Ω resistor between the top cap of the valve and the A.V.C. line. A convenient point for this connection is the bare wire joining **C29, C30** on the aerial coil (location reference A1).

Switch set to M.W., turn gang and volume control to maximum, feed in a 465 kc/s (645.16 m) signal, and adjust the cores of **L13, L14, L15** and **L16** (I6, B2, H6, C2) for maximum output. Finally, remove the 500,000 Ω resistor and replace top cap connector.

R.F. and Oscillator Stages.—Since the calibrated glass scale is mounted in the cabinet and alignment adjustments must be carried out with the chassis on the bench, a substitute scale is printed on the rear of the scale backing plate. This scale has 100 divisions, and readings on it are taken against the upper edge of the top tongue of the three-tongued drive cord clamp on the cursor carriage.

Thus, with the gang at maximum capacitance, the reading on the substitute scale should be 98 degrees, and if



Drive cord sketches for the table models (right) as seen from the front, and auto-radiograms (left) as seen from the rear, when the gang is at maximum. A recommended knot is shown inset.

any adjustment is required the cursor carriage may be slid up or down the drive cord as necessary. Transfer the "live" signal generator lead to **A** socket via a suitable dummy aerial.

M.W.—With set still switched to M.W., tune to 6 deg on scale, feed in a 200 m (1,500 kc/s) signal, and adjust **C33** (H4) and **C30** (A1) for maximum output. Tune to 76 deg on scale, feed in a 500 m (600 kc/s) signal, and check calibration.

L.W.—Switch set to L.W., tune to 28 deg on scale feed in a 1,200 m (250 kc/s) signal, and adjust **C34** (I4) for maximum output. Tune to 72 deg on scale, feed in an 1,800 m (166.7 kc/s) signal, and check calibration.

S.W.—Switch set to S.W., using a 400 Ω dummy aerial, tune to 4 deg on scale, feed in a 17.5 m (17.14 Mc/s) signal, and adjust **C32** (H4) and **C29** (A1) for maximum output. Tune to 72 deg on scale, feed in a 43 m (6.98 Mc/s) signal, and check calibration. If any error exsits, the turns spacing of **L10** (I4) should be altered to correct it. Then adjust the turns spacing of **L4** (A1) for maximum output. Repeat the S.W. adjustments.