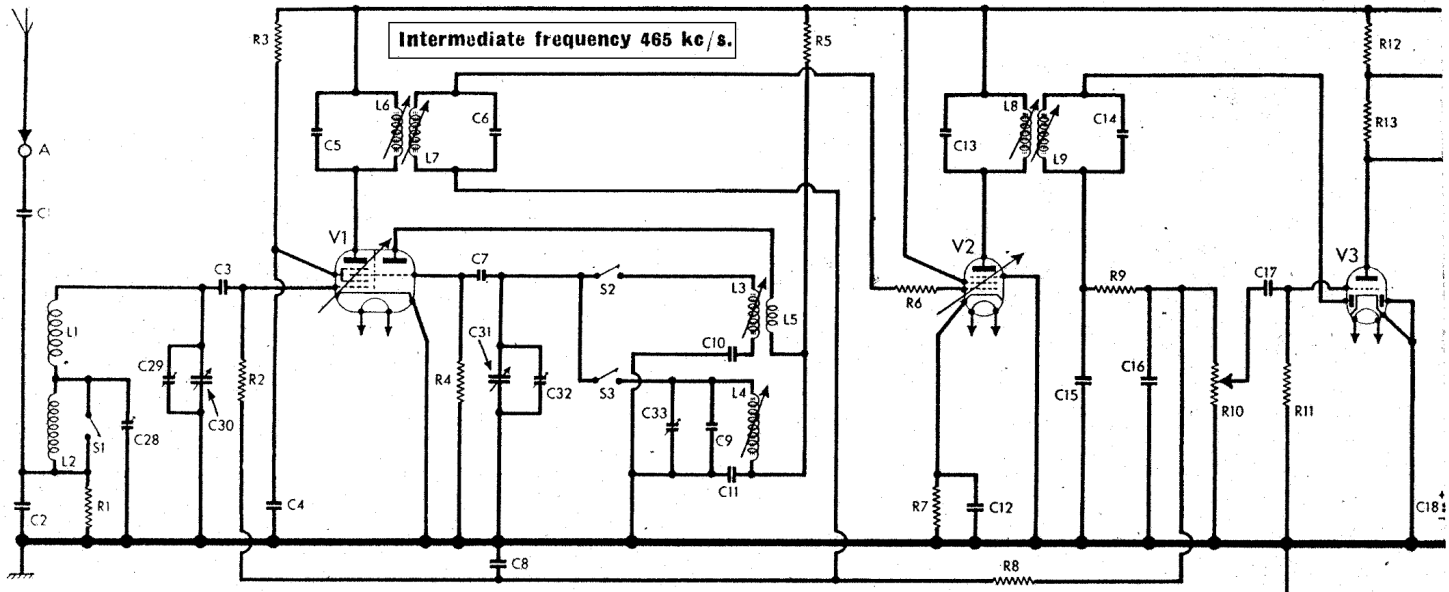
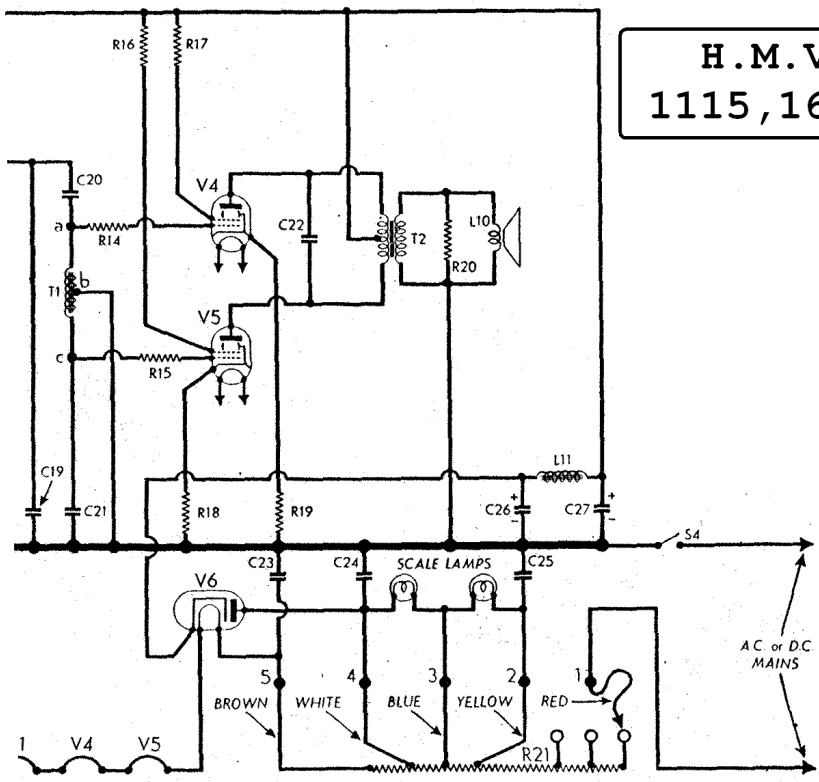
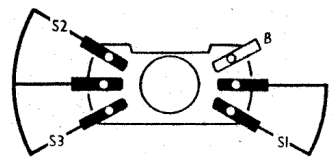




H.M.V. 1115, 1604



V3 V2

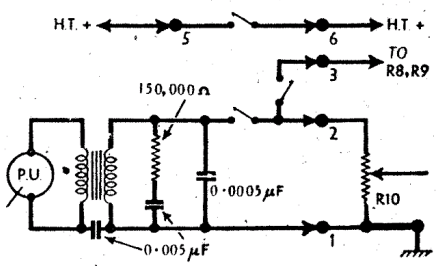


Diagram of the pick-up input circuit in the 1604 autoradiogram. The two lower switches effect the radio/gram change-over, while the upper one cuts off the H.T. supply to **V1** and **V2**.

RESISTORS		Values (ohms)
R1	Part aerial coupling ...	22,000
R2	V1 hex. C.G. resistor ...	470,000
R3	V1 S.G. H.T. feed ...	10,000
R4	V1 osc. C.G. resistor ...	100,000
R5	V1 osc. anode H.T. feed...	10,000
R6	V2 C.G. stopper	10,000
R7	V2 fixed G.B. resistor ...	100
R8	A.V.C. line decoupling ...	1,500,000
R9	I.F. stopper	100,000
R10	Manual volume control ...	500,000
R11	V3 triode C.G. resistor ...	10,000,000
R12	V3 triode H.T. decoupling	10,000
R13	V3 triode anode load ...	100,000
R14	V4 C.G. stopper	10,000
R15	V5 C.G. stopper	10,000
R16	V5 S.G. stopper	100
R17	V4 S.G. stopper	100
R18	V5 G.B. resistor	160
R19	V4 G.B. resistor	160
R20	Safety load resistor ...	47
R21	Heater ballast resistor ...	415*

* Tapped at 65Ω + 35Ω + 35Ω + 160Ω + 60Ω + 60Ω from V6 heater.

CAPACITORS		Values (μF)
C1	Aerial coupling capacitors	0·0035
C2	Aerial coupling capacitors	0·0035
C3	V1 hex. C.G. capacitor ...	0·0001
C4	V1 S.G. decoupling ...	0·1
C5	1st I.F. transformer fixed tuning capacitors ...	0·00008
C6	1st I.F. transformer fixed tuning capacitors ...	0·00008
C7	V1 osc. C.G. capacitor ...	0·000075
C8	A.V.C. line decoupling ...	0·047
C9	Osc. L.W. fixed trimmer...	0·000075
C10	Osc. circ. M.W. tracker ...	0·00035
C11	Osc. circ. L.W. tracker ...	0·0002
C12	V2 cathode by-pass ...	0·047
C13	2nd I.F. transformer fixed tuning capacitors ...	0·00008
C14	2nd I.F. transformer fixed tuning capacitors ...	0·00008
C15	I.F. by-pass capacitors ...	0·0001
C16	I.F. by-pass capacitors ...	0·0001
C17	A.F. coupling to V3 C.G....	0·0023
C18*	V3 triode H.T. decoupling	8·0
C19	I.F. by-pass capacitor ...	0·00023
C20	A.F. coupling to T1 ...	0·05
C21	Anti-parasitic capacitor...	0·00015
C22	Fixed tone corrector ...	0·01
C23	Heater circuit R.F. by-pass	0·0023
C24	Mains R.F. by-pass capacitors	0·0023
C25	Mains R.F. by-pass capacitors	0·0023
C26*	H.T. smoothing capacitors	32·0
C27*	H.T. smoothing capacitors	32·0
C28‡	Aerial circ. L.W. trimmer	0·00003
C29‡	Aerial circ. M.W. trimmer	—
C30†	Aerial circuit tuning ...	—
C31†	Oscillator circuit tuning...	—
C32‡	Osc. circ. M.W. trimmer...	—
C33‡	Osc. circ. L.W. trimmer...	0·00003

* Electrolytic. † Variable. ‡ Pre-set.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Frame aerial winding ...	1·5
L2	Aerial L.W. loading coil	9·2
L3	Osc. M.W. tuning coil ...	4·2
L4	Osc. L.W. tuning coil ...	7·5
L5	Osc. M.W. reaction coil...	3·5
L6	1st I.F. trans. Pri. ...	6·5
L7	1st I.F. trans. Sec. ...	6·5
L8	2nd I.F. trans. Pri. ...	6·5
L9	2nd I.F. trans. Sec. ...	6·5
L10	Speaker speech coil ...	3·5
L11	H.T. smoothing choke ...	180·0
T1	Intervalve trans. a,b	290·0
	Intervalve trans. b,c	290·0
T2	Output trans. Pri., total	360·0
	Output trans. Sec. ...	1·2
S1-S3	Waveband switches ...	—
S4	Mains switch, ganged R10	—

Valve		Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1	X76M	110	2·1	65	4·0
		Oscillator			
		77	2·1		
V2	W76	110	11·6	110	2·9
V3	DH76	50	0·4	—	—
V4	KT71	98	29·0	102	5·0
V5	KT71	98	29·0	102	5·0
V6	U76†	—	—	—	—

† Cathode to chassis, 125 V, D.C.

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Chassis Divergencies.—In addition to the note under "Coils" concerning the *frame winding*, in some early models also **R7** and **C12** were omitted. Dealers are advised by the makers to introduce these components where they are missing when replacing **V2.** Their values are 100 Ω and 0.047 μF respectively, and they can be obtained from the makers, whose part numbers for them are 33362DG and 36700F respectively.

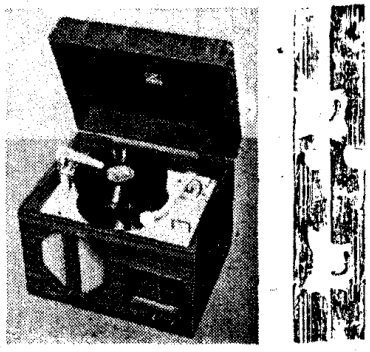
At one time also, **R9** was 47,000 Ω, which should be changed to 100,000 Ω if instability is experienced. **C21** was omitted when an early type of transformer (without soldering tags) was used. It should be added if one of these transformers is replaced by one of the later type (with tags).

The early cabinet of the 1115 had four plastic covers to protect the heads of the fixing screws. Later, two of them were rendered unnecessary by sinking the screw heads into the batten near the front edge of the cabinet.

Valve Range.—The "76" range of valves used in this receiver have international octal bases with standard connections. Their heater current is 0.16 A, and their approximate heater voltages are as follows: X76M, 13 V; W76, 13 V; DH76, 13 V; KT71, 48 V; U76, 30 V. The KT71 is not strictly one of the "76" series, of course, but it has a larger output than the KT76. **V2** is fitted with a close-fitting shield.

RADIOGRAM MODIFICATIONS

The H.M.V. 1604 is a radiogram employing a slightly modified 1115 chassis fitted in a table cabinet with a lid and equipped with a new style of record-changer, type 35000T. This has a



The 1604 table autoradiogram.

hysteresis motor, and a new type lightweight pick-up in which the needle feels loose when correctly inserted. Users should be warned of this, and instructed to use only "Silent Stylus" needles. The 1604 is restricted by reason of its motor to 50 c/s A.C. mains.

The pick-up is coupled to the receiver via a matching transformer whose winding resistances are 0.1 Ω and 2,500 Ω. The method of connection and the values of added components are shown in the diagram in col. 3, where the switch in the H.T.+ line mutes radio by cutting off the H.T. supply to **V1** and **V2.** Physically, these parts are all mounted on the record-changer assembly, and connected via the connecting strip at the rear of the chassis, which, in the 1115, carries only the ballast resistor connections. In the 1604 the number of tags is increased to eleven.

These tags are numbered 1 to 11, counting from left to right when viewed from the rear of the set, and should not be confused with the tags 1 to 5 shown in our illustrations of the 1115. They are in the same position, but these latter now become **7, 8, 9, 10** and **11.** Tag No. 4 is blank.

Other differences in the 1604 include a variable tone control, which is mounted on the side of the cabinet. It comprises a 500,000 Ω variable resistor and a 0.005 μF capacitor connected in series between tag **a** on the intervalve transformer **T1** and chassis. Also, **C21** may be connected between tags **a** and **b** on **T1,** in which case its value would be 0.00023 μF. If it is where we show it, between tag **c** and chassis, its value becomes 0.0005 μF. The speaker, which is a 5in type in the 1115, becomes a 6½in model, and **C22** is changed to 0.0023 μF.

CIRCUIT ALIGNMENT

I.F. Stages.—Connect signal generator, via an 0.005 μF capacitor in each lead, to control grid (top cap) of **V1** and chassis, leaving existing top cap connector in position. Switch set to M.W., and turn volume control and gang to maximum. Feed in a 465 kc/s (645.16 m) signal, and adjust the cores of **L9, L8, L7** and **L6,** in that order, for maximum output. Repeat these adjustments.

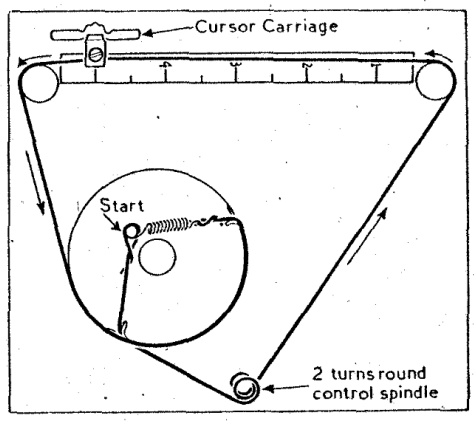
R.F. and Oscillator Stages.—Since the calibrated glass scale is mounted on the cabinet, and the alignment adjustments are carried out with the chassis on the bench, a substitute scale is fixed to the rear of the scale backing plate. This is divided into inches and sixteenths of an inch, and linear measurements on this scale correspond to frequencies given in the alignment instructions, which are read against the centre of the cursor carriage.

With the gang at maximum capacitance, the centre of the cursor carriage should cover the 5 ins. mark on the scale. If any adjustment is necessary, slacken the screw clamping the cursor carriage to the drive cord, adjust the carriage, and tighten the clamping screw.

Connect signal generator leads, via a suitable dummy aerial, to **A** socket, and via an 0.005 μF series capacitor, to chassis.

M.W.—Switch set to M.W., turn gang to minimum capacitance, feed in a 180 m (1,667 kc/s) signal, and adjust **C32** for maximum output. Set cursor carriage to 1$\frac{29}{32}$ ins., feed in a 210 m (1,429 kc/s) signal, and adjust **C29** for maximum output. Set cursor carriage to 4$\frac{13}{32}$ ins., feed in a 510 m (588 kc/s) signal, and adjust the core of **L3** for maximum output, while rocking the gang. Repeat these adjustments.

L.W.—Switch set to L.W., turn gang to minimum capacitance, feed in a 900 m (333.3 kc/s) signal, and adjust **C33** for



The tuning drive system as seen from the rear of the scale backing plate. Both ends of the cord are anchored to the single pin marked "Start."

maximum output. Set cursor carriage to 2⅛ ins., feed in a 1,000 m (300 kc/s) signal, and adjust **C28** for maximum output. Set cursor carriage to 4$\frac{13}{32}$ ins., feed in an 1,850 m (162.2 kc/s) signal, and adjust the core of **L4** for maximum output, while rocking the gang. Repeat these adjustments.

Finally, replace chassis in cabinet and check calibration, at about the middle of the tuning scale, on a station of known wavelength. Adjust cursor to give the best compromise on both wavebands, if necessary.

DRIVE CORD REPLACEMENT

The general scheme of the tuning drive system can be seen in the sketch above, where it is drawn as it would be seen from the rear of the receiver, if there were no obstructions, with the gang at maximum capacitance.

The makers emphasize that only the correct high grade of flax fishing line must be used for replacement, supplies of which can be obtained from E.M.I. Sales and Service, Ltd., Sheraton Works, Hayes, Middlesex. A 30in length is ample for the job.

Tie a small loop (about ⅛in diameter) at one end, pass it into the drum through the appropriate slot in the drum groove, and slip it over the anchor pin marked "Start" in the sketch. A drop of shellac will render the knot non-slipping. Follow the course indicated in the sketch, and finish by passing the other end of the cord through the second slot into the drum, then tie it off on to the spring, which should be sufficiently extended to open the turns well when its far end is hooked to the "Start" anchor pin. Finally, cut off surplus cord.