

Resistors

R1	22kΩ
R2	1MΩ
R3	10MΩ
R4	220kΩ
R5	1MΩ
R6	2.2kΩ
R7	220kΩ
R8	10MΩ
R9	68kΩ
R10	100kΩ
R11	47kΩ
R12	100kΩ
R13	100kΩ
R14	220kΩ
R15	220kΩ
R16	22kΩ
R17	220kΩ
R18	1MΩ
R19	10kΩ
R20	1MΩ
R21	140Ω
R22	100kΩ
R23	10MΩ
R24	100kΩ
R25	5.6kΩ
R26	200Ω
R27	220kΩ
R28	220kΩ
R29	10Ω
R30	75Ω
R31	10Ω
R32	820Ω
R33	2.2MΩ
R34	500Ω

Capacitors

C1	0.04μF
C3	5,000pF
C4	5,000pF
C5	8μF
C6	100pF
C7	100pF
C8	220pF
C9	820pF
C10	0.05μF
C11	0.04μF
C12	220pF
C13	50pF
C14	4,700pF
C15	3,900pF
C16	3,000pF
C17	50μF
C18	100pF
C19	0.01μF
C20	50μF
C21	50μF
C22	50pF
C23	820pF
C24	0.1μF
C25	450μF
C26	0.1μF
C27	450μF
C28	0.01μF
C29	0.01μF

Coils and Transformers

L1	8-3
L2	—
T1	{ a 400-0 b — c 150-0 }
T2	{ a — b 8-0 c 90-0 }

VALVE ANALYSIS

Valve voltages given in the table were taken from information supplied by the manufacturers. They were measured on a 20,000Ω/V meter with the recorder switched as indicated. H.t. line voltage measured at the junction W2/R25 was 288V (record), 273V (play) and the voltage at the junction W3/R32 pin 3 of skt 6 was -32.5V. All readings were taken with respect to chassis.

Recording Head Voltages.—The bias voltage measured at tag 2 of L2 using a valve voltmeter should be 80V a.c. and the erase voltage at tag 1 should be 15V a.c. with the recorder switched to record.

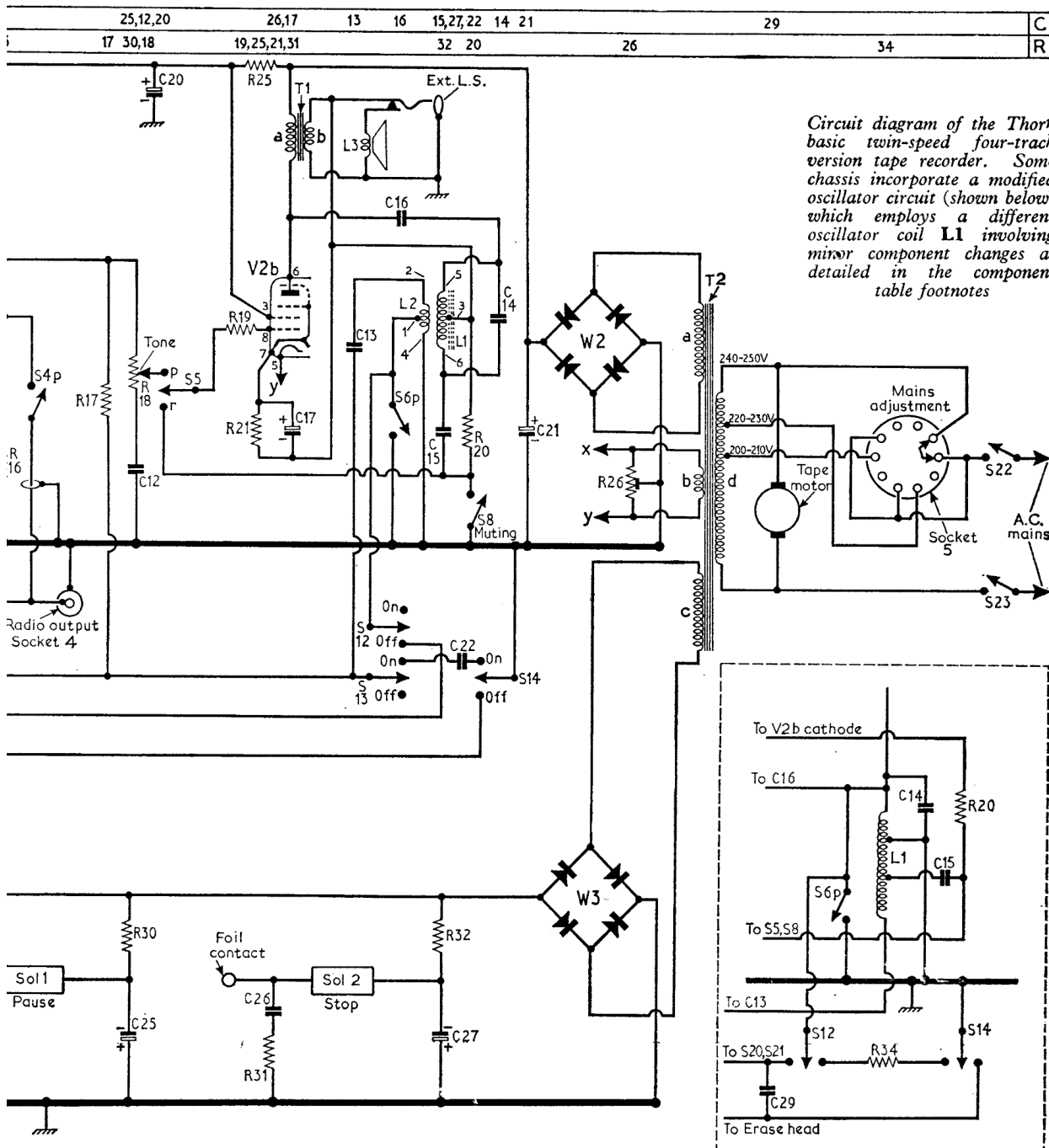
VALVE TABLE

Valve	Anode (V)	Screen (V)	Cathode (V)
V1a ECC83	83	—	—
V1b ECC83	81	—	—
V2a ECL86	90	—	0.7
V2b ECL86	90	—	0.7
V3 EM87	133	—	—
	128	—	—
	280	220	3.4
	275	220	5.2
	50	—	—
	50	—	—

*Receiver switched to record.
 †Receiver switched to play.

FERGUSON - 3204
H.M.V. - 2204 B

MARCONIPHONE - 4204
ULTRA - 6202



HEAD ADJUSTMENT

Provision is made on the head mounting for both vertical (height) and horizontal (azimuth) adjustment. Adjustment only becomes necessary where the manufacturing settings have been disturbed. The height adjustment is made by turning the mounting screws to compress the leaf spring on which the head is mounted; the azimuth adjustment is achieved by complementary adjustments to the mounting screws.

Record/Play Head Height Setting.—

The height of the record/play head may be set visually so that the upper edge of the top track head gap is level with the upper edge of the tape; with the tape motion keys at neutral, thread the tape so that it runs behind the tape guide (on the right of the record/play head) to give sufficient tape contact on the head for observing the height setting. While making the adjustments, ensure that the tape is taut by turning the take-up spool by hand. Finally, return the tape to its normal "run" before operating the mechanism. The track positioning should then be checked by making recordings at peak level and "developing" the tape with "Indicord" magnetic ink.

Azimuth Adjustment.—To readjust, play back a standard four-track azimuth tape with an output meter connected. Adjust the record/play head for maximum output, using the volume control to keep the output level as low as possible.

Erase Head.—Ensure that the gap is visually at right-angles to the tape motion and make final adjustments to obtain complete erasure on a tape recording previously made on the same machine.

The lateral position of the heads may also be adjusted to bring them into correct contact with the tape. This adjustment, however, should be necessary only when replacement heads are fitted. When the correct position has been found, the brass clamp screws should be tightened to lock the head on the clamp before re-assembly on to the head plate. The correct settings are as follows:—

Record/Play Head.—Adjust for 0.1in between head face and front edge of head clamp.

Erase Head.—The head face should protrude 0.035in from front edge of head clamp.

FERGUSON - 3204 MARCONIPHONE - 4204
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