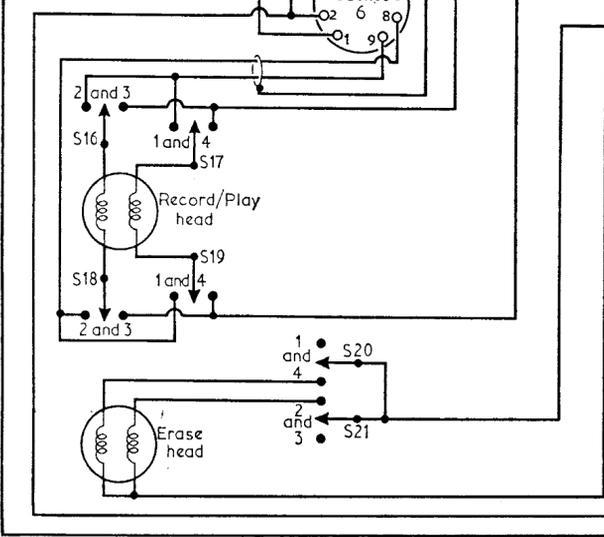
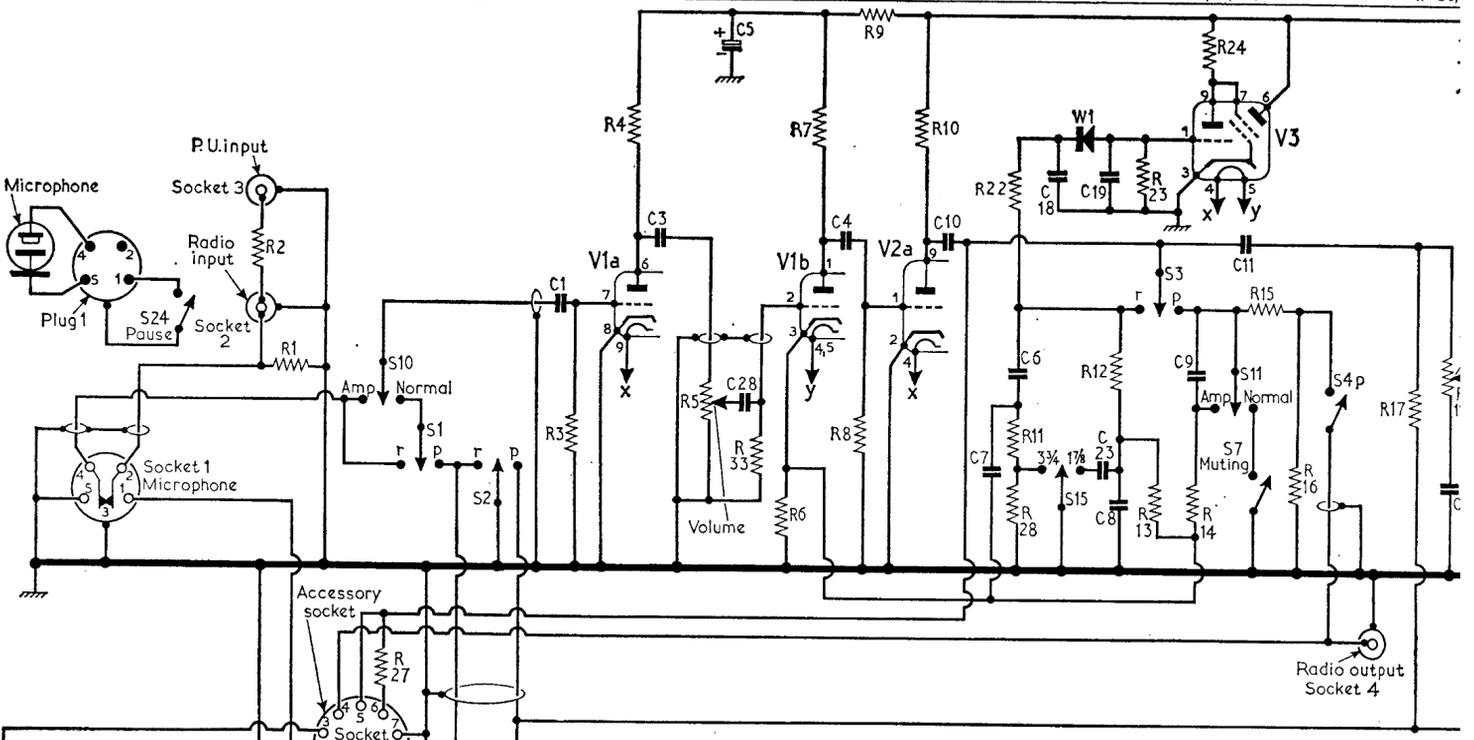
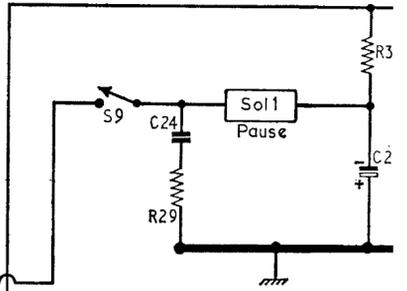


C		1	3	5	28	4	10	7	6	18	19,23,8	9	11,24	25,1			
R	1	27	3	4	5	33	6	7	8,9	10	22,11,28	12	23,13	14,24,29,15	16	17	30,



SWITCH CODING
 Record button operates switches S1-S6
 Play button operates switches S7-S9
 Amp/Sup button operates switches S10-S14
 Speed control operates switch S15
 Track buttons operate switches S16-S21
 Tone control operates on/off switches S22-S23
 Pause switch S24 is located on microphone



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 — }
- T2 { a 150-0 }
 { b — }
 { c 8-0 }
 { d 90-0 }

VALVE ANALYSIS

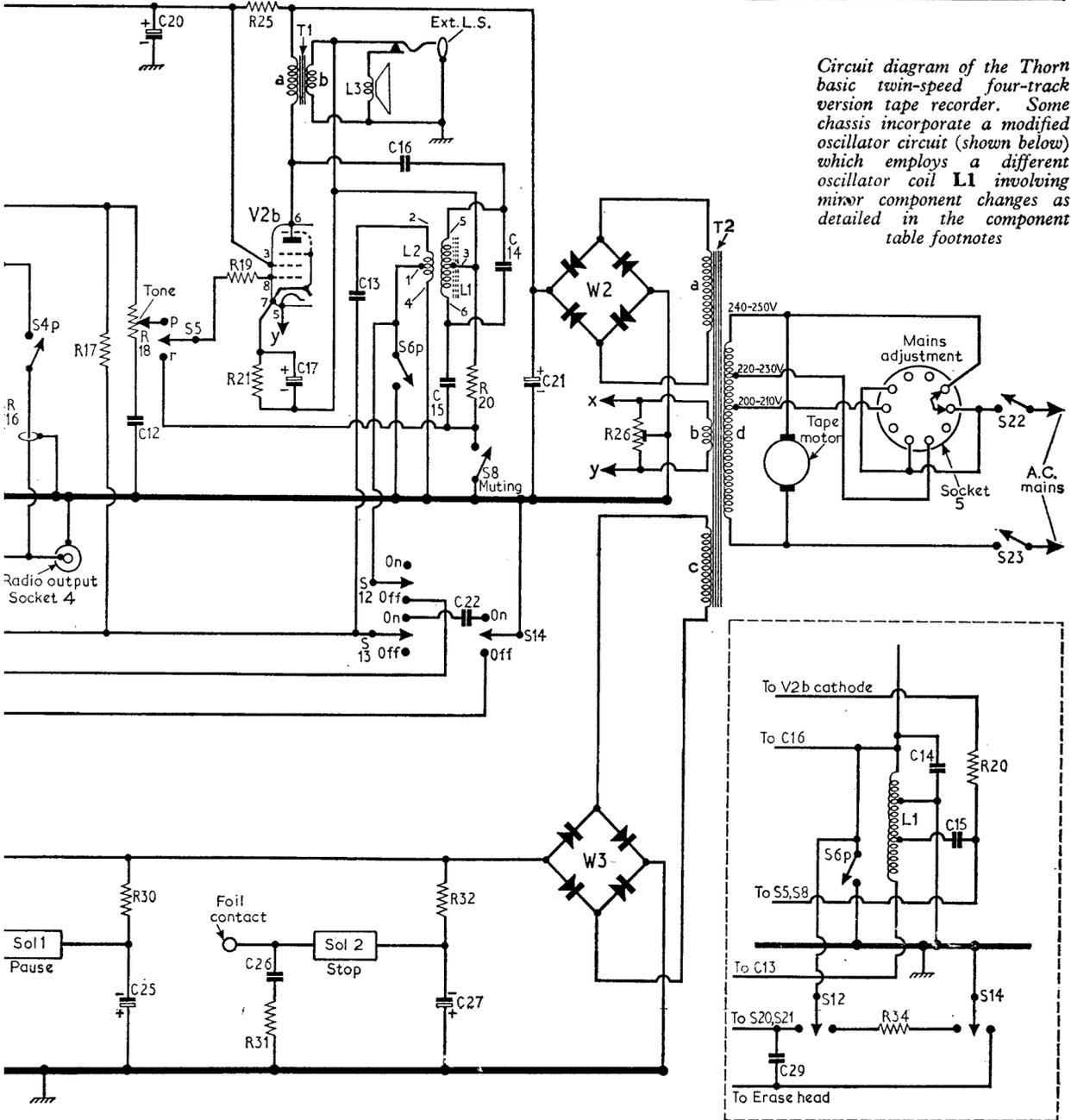
Valve voltages given in the table were taken from information supplied by the manufacturers. They were measured on a 20,000Ω/V meter with the recorder switched as indicated. H.t. line voltage measured at the junction W2/R25 was 288V (record), 273V (play) and the voltage at the junction W3/R32 pin 3 of 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	133	—	—
	128	—	—
	280	220	3.4
	275	220	5.2
V3 EM87	50	—	—
	50	—	—

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

FERGUSON - 3204 H.M.V. - 2204 B **MARCONIPHONE - 4204 ULTRA - 6202**



Circuit diagram of the Thorn basic twin-speed four-track version tape recorder. Some chassis incorporate a modified oscillator circuit (shown below) which employs a different oscillator coil L1 involving mirror component changes as detailed in the component table footnotes

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.

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