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Trader
Service
Sheet

Dynatron 'Elan' TP38 & TP39

1958

Battery operated portable radio receiver

Introduction

Dynatron 'Elan' (models TP38 and TP39,) is an a.m./f.m. battery operated portable radio receiver incorporating 13 transistors. Principal features are separate a.m. and f.m. circuits right through to the post demodulator stages, switched a.f.c. on v.h.f., and separate switched aerial matching sections when reception is via a car aerial.
Press-button operated waveband selection is used, and wavebands covered are: v.h.f./f.m. 87-108MHz, reception via telescopic aerial; m.w. 185-570m (1620-525kHz) and l.w. 1,100-2,000m (270-150kHz), reception via an 8in ferrite rod aerial assembly. An external aerial socket is fitted which serves all wavebands.
Separate bass and treble tone controls are fitted, and the volume control circuit has tone compensation.
An audio output power of 1W is handled with a 25Ω, 7 x 4in elliptical loudspeaker and operating power is supplied from an 18V supply provided by two 9V batteries type PP9 or their equivalent.

Circuit alignment

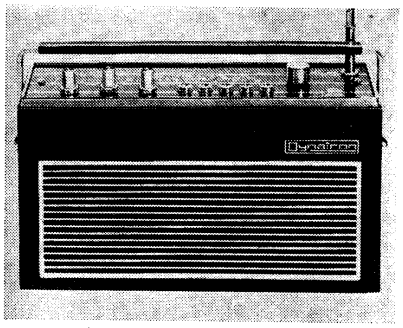
Equipment required. – An a.m./f.m. signal generator, r.f. coupling coil, dummy car aerial – see inset on circuit diagram, a wobbulator, an oscilloscope (c.r.o.) and an Avo model 8.
The mixer and i.f. amplifier for the a.m. section are contained in a pre-tuned module which will not require adjustment. In the event of a component failure, including transistors, the module should be returned to Dynatron spares department for replacement. When a replacement is fitted to a receiver the first i.f. should be peaked for maximum gain at 470kHz. *Only this adjustment should be made.*

A.m. r.f. section

Check that with tuning gang at maximum capacitance, the cursor coincides with end of scale aperture. Correct if necessary.
With the r.f. coupling coil, loosely couple signal generator to ferrite rod aerial assembly. Rotate volume control to maximum.
1. – Switch receiver to m.w., rotate tuning gang to maximum capacitance and feed in a 525kHz a.m. signal. Adjust **L5** for maximum output.
2. – Rotate tuning gang to minimum capacitance and feed in a 1630kHz a.m. signal. Adjust **C9** for maximum output.
3. – Feed in a 560kHz a.m. signal then tune receiver to this signal. Adjust position of **L2** on ferrite rod for maximum output.
4. – Feed in a 1500kHz a.m. signal then tune receiver to this signal. Adjust **C2** for maximum output.
5. – Repeat operations 3 and 4 for optimum.
6. – Switch receiver to l.w., tune to 1600m and feed in a 187kHz a.m. signal. Adjust **C11** and position of **L1** on ferrite rod for maximum output.
7. – Check calibration and tracking on both m.w. and l.w. using known broadcast transmissions.
Car aerial circuits. – Connect dummy aerial to car aerial socket and feed in signals, required for the following adjustments, via the dummy aerial. Depress 'Car' press-button.
8. – Switch receiver to m.w., feed in a 560kHz a.m. signal then tune receiver to this signal. Adjust **L4** for maximum output.
9. – Feed in a 1500kHz a.m. signal then tune receiver to this signal. Adjust **C5** for maximum output.
10. – Repeat operations 8 and 9 for optimum.
11. – Switch receiver to l.w., feed in a 187kHz a.m. signal then tune receiver to this signal. Adjust **L3** for maximum output.
Note: For optimum performance on a particular car aerial installation, if cable capacitance is high. Switch receiver to m.w. and car then tune to a weak signal at high frequency end of band. Adjust **C5** *for maximum output.*

V.h.f./f.m. section

Connect wobbulator to junction **C1/TR1** base and c.r.o. input to junction **C12/R16.** Feed in a 10·7MHz signal, deviation ±150kHz.
1. – Adjust **T3** for maximum amplitude and **T4** for correctly centred 'S' curve.
2. – Adjust **T2** for maximum amplitude, reducing input so that only a small curve is displayed to give greater accuracy in setting.
3. – Adjust **T1** for maximum sensitivity.
4. – Repeat operations 1-3 for maximum sensitivity and correctly centred 'S' curve with a ±100kHz band width.
5. – Transfer wobbulator output to v.h.f. aerial input and remove core from filter coil **L6.**
6. – Adjust **L3** and **L4** – located in v.h.f. tuner – for maximum sensitivity with good 'S' curve. Note that **T1** may need slight adjustment.
7. – Set core of **L1** (v.h.f. tuner) level with top of former and adjust **C7** for maximum amplitude.
8. – Insert core into filter coil **L6** and adjust for minimum output.
V.h.f. calibration. – Disconnect wobbulator and connect a.m./f.m. signal generator to aerial socket. Ensure that a.f.c. press-button is 'out' – a.f.c. off.
1. – Tune receiver to 88MHz and feed in an 88MHz f.m. signal (with 22·5kHz deviation). Adjust **L5** for maximum output.
2. – Tune receiver to 108MHz, feed in a 108MHz f.m. signal and adjust **C16** for maximum output.
3. – Repeat operations 1 and 2 for optimum calibration and output.
4. – Disconnect c.r.o. and connect an Avometer model 8 – set to 10V d.c. range – between tuning gang frame and junction **D1/RV1.** Feed in a 90MHz f.m. signal and tune receiver to this signal for maximum voltage reading on meter. Reduce input signal level until output voltage falls to 0·75V. Adjust **C7** for maximum output voltage.
5. – With the meter connected as in operation 4 and using it as a tuning meter, tune as accurately as possible to signal generator test frequency. Disconnect meter and switch signal generator to a.m. Adjust **RV1** for minimum audio output. Seal **RV1.**



Appearance of Dynatron TP38.

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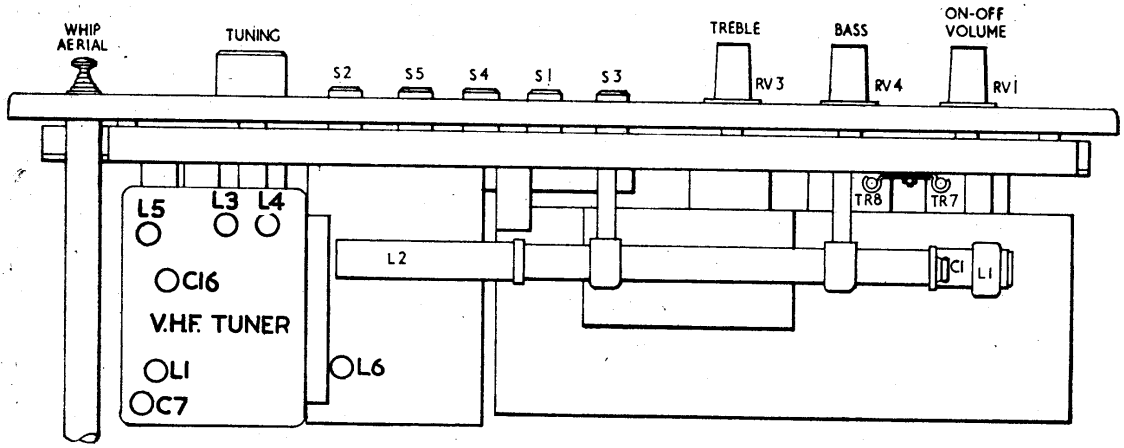

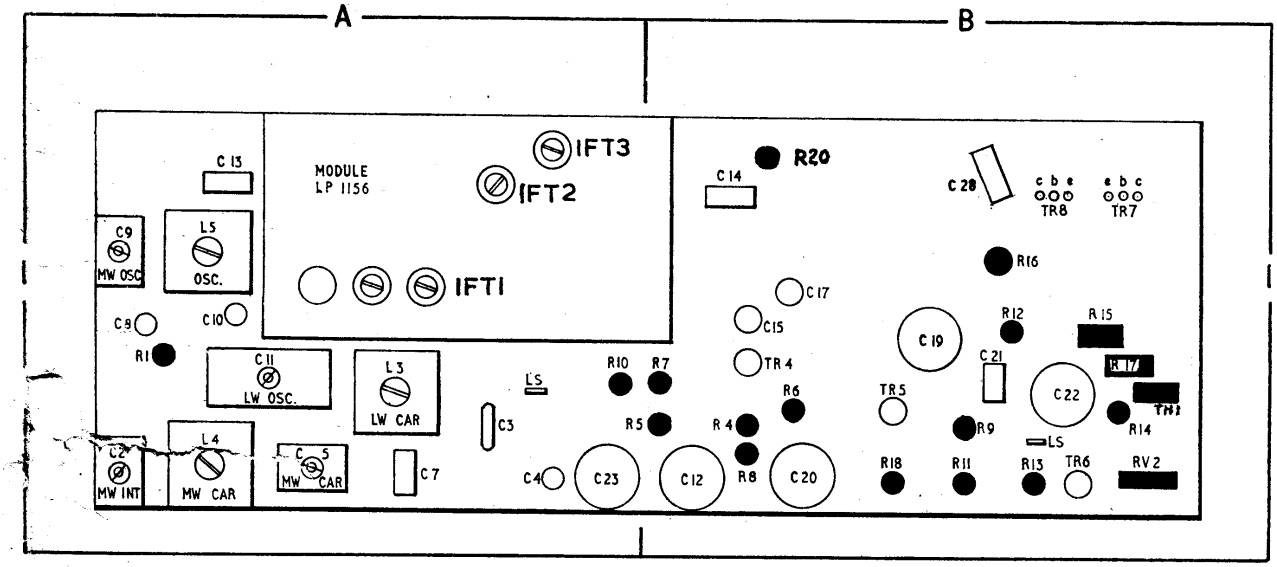

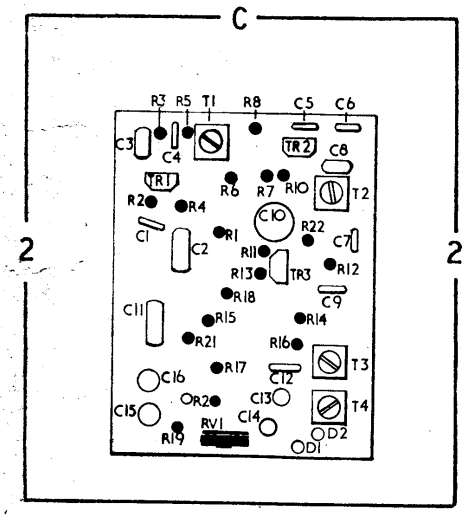

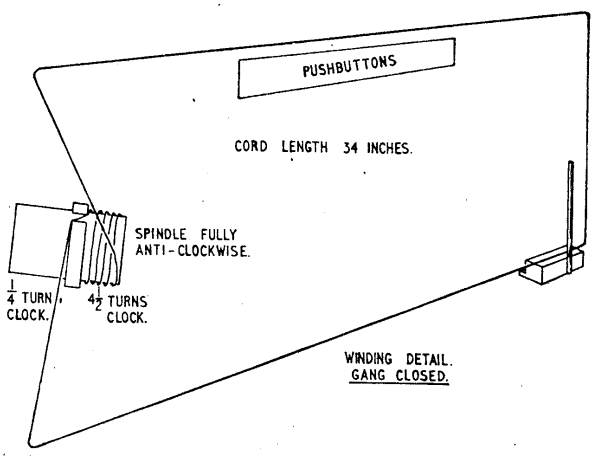

General notes

Dismantling. – Disconnect and remove batteries, then disconnect leads to earphone and external aerial sockets. Unscrew and remove cross-head screws from each end of tuning scale. The chassis may now be withdrawn through top of case.

Output stage quiescent current. – Check that batteries are in good condition, and with receiver tuned to a quiet point in any waveband, the terminal p.d. is 18V. Insert a 0-10mA milliammeter in **TR7** collector circuit. With volume at minimum adjust **RV2** to produce 4mA meter indication. Remove meter, reconnect **TR7** collector and seal **RV2.** Check that mid-point volts at **TR7** emitter is 9V.

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Resistors		
R1	150kΩ	A1
R4	330kΩ	B1
R5	33kΩ	B1
R6	22kΩ	B1
R7	4·7kΩ	B1
R8	1·5kΩ	B1
R9	22kΩ	B1
R10	820Ω	A1
R11	10Ω	B1
R12	1kΩ	B1
R13	470Ω	B1
R14	2·2kΩ	B1
R15	4·7Ω	B1
R17	4·7Ω	B1
R18	15kΩ	—
R19	10kΩ	—
R20	5·6kΩ	B1
R21	47kΩ	—
R22	2·2kΩ	—
R23	470kΩ	—
R24	1kΩ	—
R25	47kΩ	—
RV1	50kΩ	—
RV2	500Ω	B1
RV3	250kΩ	—
RV4	250kΩ	—

F.m. i.f. module

R1	1kΩ	C2
R2	10kΩ	C2
R3	27kΩ	C2
R4	1·5kΩ	C2
R5	1kΩ	C2
R6	100Ω	C2
R7	15kΩ	C2
R8	39kΩ	C2
R10	2·2kΩ	C2
R11	27kΩ	C2
R12	22kΩ	C2
R13	2·7kΩ	C2
R14	220Ω	C2
R15	470kΩ	C2
R16	470Ω	C2
R17	1kΩ	C2
R18	220Ω	C2
R19	10kΩ	C2
R20	10kΩ	C2
R21	27kΩ	C2
R22	100Ω	C2
RV1	2kΩ	C2

Capacitors		
C1	130pF	—
C2	40pF	A1
C3	150pF	A1
C4	290pF	A1
C5	40pF	A1
C6 a/b	—	—
C7	33pF	A1
C8	390pF	A1
C9	40pF	A1
C10	250pF	A1
C11	80pF	A1
C12	200μF	B1
C13	0·02μF	A1
C14	0·01μF	B1
C15	4μF	B1
C17	4μF	B1
C19	125μF	B1
C20	80μF	B1
C21	1,000pF	B1
C22	125μF	B1
C23	80μF	A1
C24	0·1μF	—
C26	6,800pF	—
C27	5,000pF	—
C28	0·2μF	B1
C29	0·1μF	—
C30	100μF	—
C31	5,000pF	—
C32	200pF	—

F.m. i.f. module

C1	1,000pF	C2
C2	0·1μF	C2
C3	0·1μF	C2
C4	5,000pF	C2
C5	5,000pF	C2
C6	5,000pF	C2
C7	5,000pF	C2
C8	0·1μF	C2
C9	5,000pF	C2
C10	125μF	C2
C11	0·1μF	C2
C12	0·01μF	C2
C13	390pF	C2
C14	390pF	C2
C15	4μF	C2
C16	4μF	C2

Inductors

L1	—	—
L1b	—	—
L2	—	—
L2b	—	—
L3	—	A1
L4	—	A1
L5	—	A1
L6	—	—
LS	25Ω	—
T1	—	—
T2	—	—
T3	—	—
T4	—	—

Semiconductors

V.h.f. tuner

TR1	AF78	r.f. amplifier
TR2	AF115	mixer/oscillator
D1	BA102	a.f.c.

F.m. i.f. module

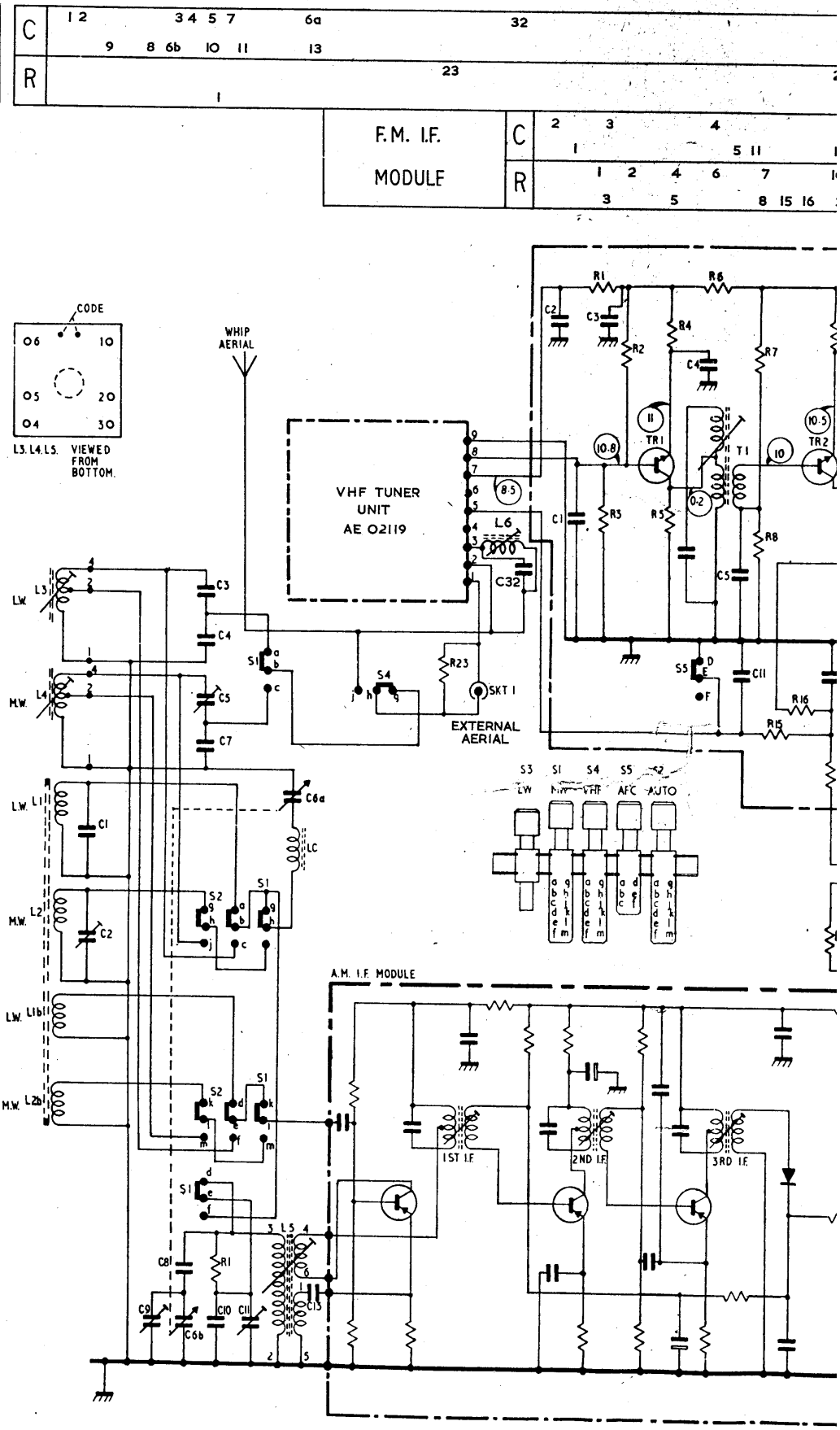
TR1	BF194	i.f. amplifier
TR2	BF195	i.f. amplifier
TR3	BF195	i.f. amplifier
D1	AA119	detector
D2	AA119	detector

A.m. i.f. module

TR1	AF115	mixer/oscillator
TR2	AF117	i.f. amplifier
TR3	AF117	i.f. amplifier
D1	OA90	detector

A.f. amplifier

TR4	NKT275P	a.f. amplifier
TR5	NKT775	a.f. amplifier
TR6	NKT272A	driver
TR7	NKT773	complementary output pair.
TR8	NKT271A	



Transistor analysis
Voltages shown on the circuit were obtained from data supplied by the manufacturer. They are all negative with respect to chassis and were measured with a model 8 Avometer.

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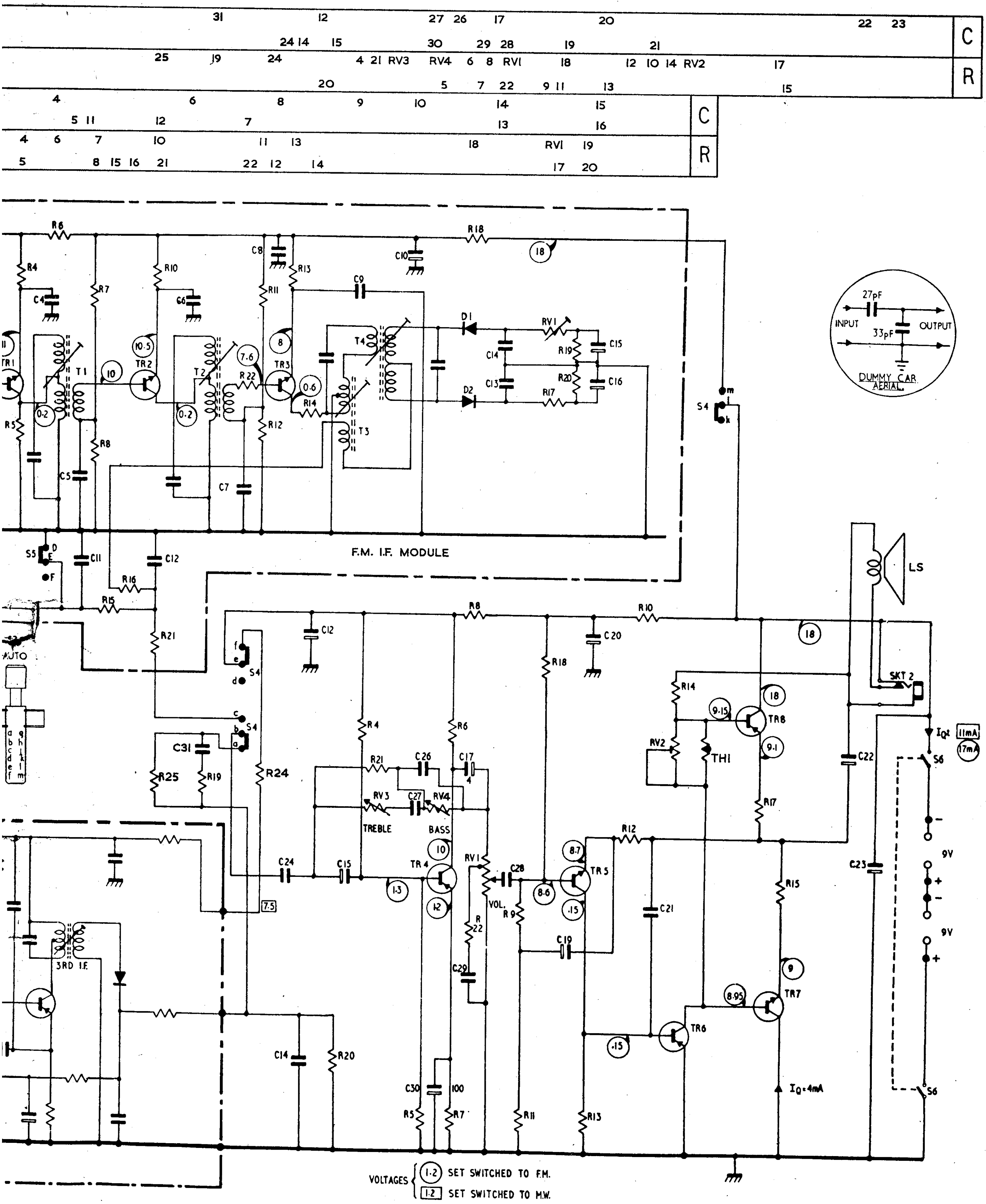

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