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"TRADER" SERVICE SHEET

1819

EKCO A455: FERRANTI A1149

Mains Operated Transistored Table Radio Receivers

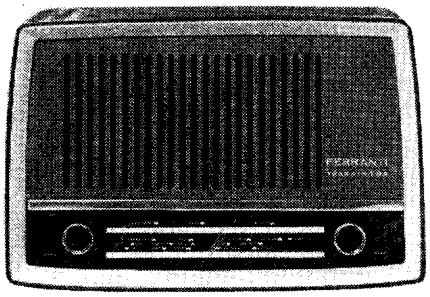
EKCO A455 and Ferranti A1149 are mains operated transistor table radio receivers covering medium (182-580m) and long (1,100-2,000m) wavebands.

The receivers are fitted with a Mullard i.f. module type LP1156 and apart from the cabinet styling they are identical.

Seven transistors are used (three contained in the module), the driver and output stages being arranged in a d.c. stabilized complementary push-pull circuit.

Reception is by means of a ferrite rod aerial; a socket is provided for the connection of an external aerial if desired.

Operating current is derived from a.c. mains via a step-down isolating transformer and full wave bridge rectifier. Power consumption is 5-10W.



Appearance of Ferranti A1149 (later version). The Ekco A455 is similar.

Transistor Table

Transistor		Emitter (V)	Base (V)	Collector (V)
TR1	OC75	0·35	0·5	7·0
TR2	AC128	—	0·2	10·2
TR3	AC128	10·4	10·6	24·0
TR4	AC176	10·4	10·2	—

TRANSISTOR ANALYSIS

Transistor voltages quoted in the table in col. 1 were taken from information supplied by the manufacturer. They were measured on a model 8 Avometer switched to the 25V range and are negative with respect to chassis. The volume control was turned to minimum.

CIRCUIT DESCRIPTION

S1-S3 are two-way waveband switches which select the appropriate circuits for r.f. and oscillator tuning. On m.w., the ferrite rod aerial is tuned by **L2, C1** and the gang capacitor **C4,** and m.w. signals are inductively coupled to the base of the mixer/oscillator **MTR1** via the isolating capacitor **MC1.**

Local oscillator frequency is determined by the tuned circuit **L4, C7, C3, C5** and gang capacitor **C6.** A coupling winding in series with **MTR1** collector provides oscillator feedback via **C10** through the tuned circuit.

On l.w., the aerial tuning circuits comprise **L3, C2** and **C4.** The common oscillator coil **L4** is shunted by **C8** and **C9** which modifies the circuit for l.w. coverage. Forward base bias for **MTR1** is derived from the d.c. potential divider **MR1** and **MR2** in conjunction with emitter resistor **MR3.**

(Continued overleaf col. 1)

Resistors

R1	330Ω	A2
R2	4·7kΩ	B2
R3	47kΩ	B2
R4	2·2kΩ	C2
R5	4·7kΩ	B2
R6	2·2kΩ	C2
R7	150Ω	C2
R8	18kΩ	C2
R9	180Ω	B1
R10	470Ω	B1
R11	VA1077	C1
R12	2·2Ω	B1
R13	2·2Ω	B1
R14	10kΩ	B1
RV1	10kΩ	C2
RV2	1kΩ	C2
RV3	50Ω	C1

Capacitors

C1	25pF	B2
C2	140pF	B2
C3	20pF	B2
C4	—	A1
C5	25pF	B2
C6	—	A1
C7	560pF	B2
C8	80pF	A2
C9	440pF	A2
C10	0·01μF	B2
C11	125μF	B2
C12	0·01μF	B1
C13	125μF	B2
C14	16μF	B2
C15	0·03μF	C2
C16	125μF	C2
C17	16μF	C2
C18	5,000pF	C2
C19	500μF	B1
C20	40μF	B1
C21	250μF	C1
C22	16μF	B1

Coils and Transformers

L1	—	A1
L2	—	B1
L3	—	A1
L4	—	A2
L5	15Ω	†
T1	—	C1

Miscellaneous

LP1	24V 2·8W	B2
MR1	HO29/ PEO1B	B1
S1–S3	—	B2
S4	—	C2

MODULE LP1156

Resistors

MR1	33kΩ	B1
MR2	6·8kΩ	B1
MR3	820Ω	B1
MR4	100Ω	B1
MR5	56kΩ	B1
MR6	680Ω	B1
MR7	22kΩ	B1
MR8	4·7kΩ	B1
MR9*	1kΩ	B1
MR10	8·2kΩ	B1
MR11	470Ω	B1

Capacitors

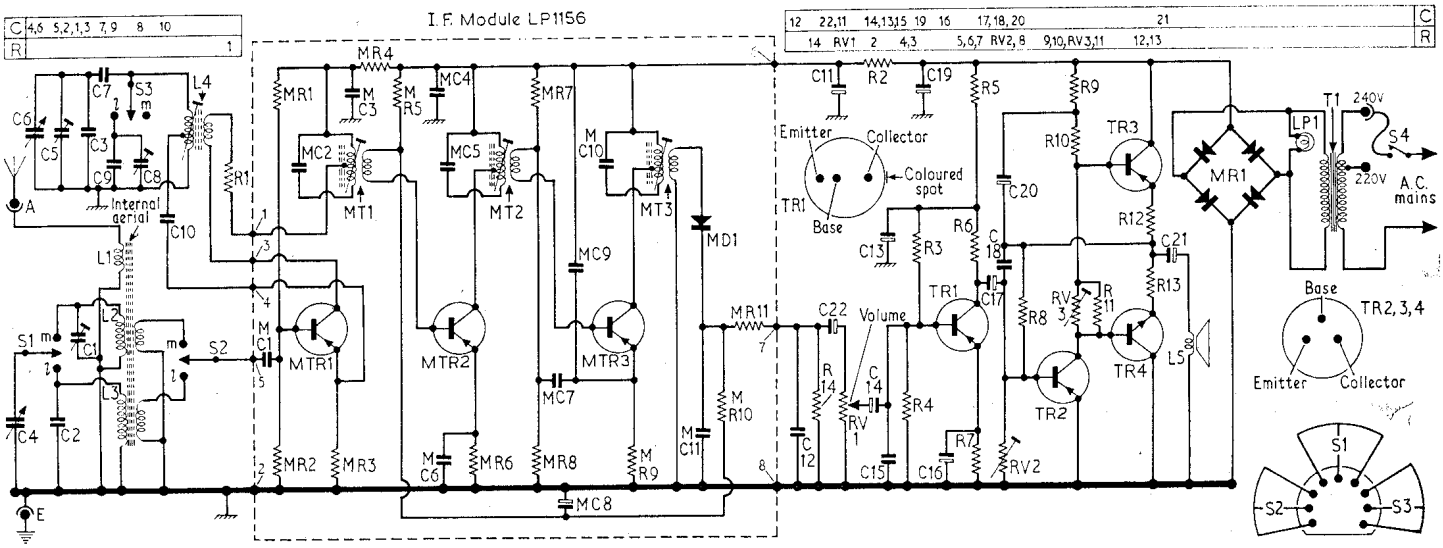
MC1	0·047μF	B1
MC2	—	B1
MC3	0·047μF	B1
MC4	0·047μF	B1
MC5	—	B1
MC6	0·047μF	B1
MC7	0·047μF	B1
MC8	10μF	B1
MC9	0·047μF	B1
MC10	—	B1
MC11	0·01μF	B1

Miscellaneous

MT1	—	B1
MT2	—	B1
MT3	—	B1
MD1	OA90	B1
MTR1	AF115	B1
MTR2	AF117	B1
MTR3	AF117	B1

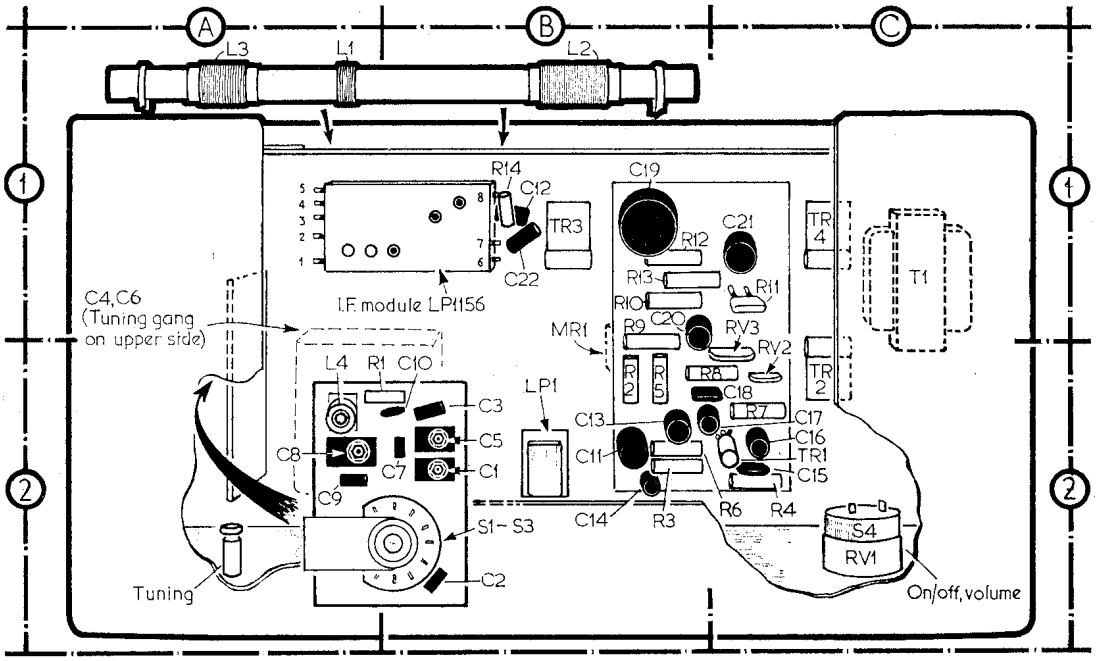
* *Value adjusted for standard i.f. performance.*

† *Speaker.*



Circuit and switch diagram of the Ekco A455 and Ferranti A1149. **Note: R11** *is a thermistor.*

Supplement to Electrical and Electronic Trader, 1 September 1967



Underside view of the chassis with the cabinet shown face downwards. **Note:** *In some earlier receivers the printed panel coding for* **C11** *and* **C13** *is incorrect.*

Circuit Description—*continued*

Signals at i.f. in **MTR1** collector are selected by the tuned i.f. primary **MT1** and **MC2** and inductively coupled to the base of the first i.f. amplifier **MTR2.** After amplification they are applied via similar coupling components, to the base of the second i.f. amplifier **MTR3,** and from the output of **MTR3** to the detector diode **MD1.**

MD1 is forward biased slightly to improve its sensitivity at low signal level. Bias applied to its cathode is derived from the potential across **MR11** and **R14** due to current passing through the network **MR5, MR10, MR11** and **R14.** This network also supplies bias to the base of **MTR2** via the junction **MR5** and **MR10.**

When a signal is received the carrier is rectified and a positive d.c. voltage is developed across **MR11** and **R14** which is fed back by **MR10** to reduce the forward bias on **MTR2.** This has the effect of providing a.g.c. by reducing the i.f. gain according to signal strength.

Rectified audio component present across **R14** is passed via **C22** to the volume control **RV1** and from the slider of **RV1** to the base of a conventional audio preamplifier **TR1.** R/C coupling (**R6** and **C17**) is employed between **TR1** and the driver **TR2.**

Output from **TR2** is applied simultaneously to the bases of **TR3** and **TR4** which are connected in series across the supply voltage. **TR3** p.n.p. type conducts on negative half-cycles of the signal, and **TR4** n.p.n. type conducts on positive half-cycles. The variation in voltage produced at their emitter junction is a function of the audio modulation and is passed via **C21** to the loudspeaker **L5.**

Output stage bias is adjusted by **RV3** and is stabilized against temperature changes by thermistor **R11.** Output stage balance is set by **RV2. TR2** base is fed from the junction **R12** and **R13** to provide d.c. stabilizing of the audio section. A change in d.c. conditions at the junction **R12, R13** will produce a change in **TR2** collector current in the correct sense to have a compensating effect.

CIRCUIT ALIGNMENT

Equipment Required.—An a.m. signal generator; an audio output meter with an impedance of 15Ω. (If less than 15Ω impedance is used, **TR3** and **TR4** will become damaged); a model 8 Avometer; an oscilloscope and suitable trimming tools.

1.—Fully mesh the tuning gang and check that the cursor coincides with the datum mark at the l.f. end of the tuning scale. Couple the signal generator to the receiver via an r.f. coupling coil placed about 11in. from the ferrite rod centre. Connect the audio output meter in place of the loudspeaker.

2.—Switch receiver to m.w. and tune to 500m. Feed in a 600kc/s signal and adjust the core **L4** and the position of **L2** on the ferrite rod for maximum output.

3.—Tune receiver to 214m. Feed in a 1,400 kc/s signal and adjust **C5** and **C1** for maximum output. Check tracking and calibration, then seal **L2** on the ferrite rod.

4.—Switch receiver to l.w. and tune to 1,400m. Feed in a 214.3kc/s signal and adjust **C8** and **L3** for maximum output. Check tracking and calibration then seal **L3** on the ferrite rod.

Note: Module LP1156 is pre-tuned and will not normally require adjustment. In the event of any component failure within the module it should be removed and returned to Radio and Television Services Ltd., Cambridge, for replacement.

Audio Adjustments.—Switch the Avometer to the 100mA range and insert it in the collector lead of **TR4.**

Set **RV3** to give a reading of 10mA on the meter.

Connect the oscilloscope to the output across a 15Ω load. Switch the Avometer to its 10A range and turn the volume control to maximum.

Apply an audio signal to the top of the volume control and increase the input until "clipping" is apparent.

Adjust **RV2** until both peaks "clip" at similar amplitudes.

Reduce the input to zero and repeat the operations to **RV3.**

Remove the Avometer and resolder **TR4** lead.

DISMANTLING

To remove the chassis from the cabinet, first remove the back cover.

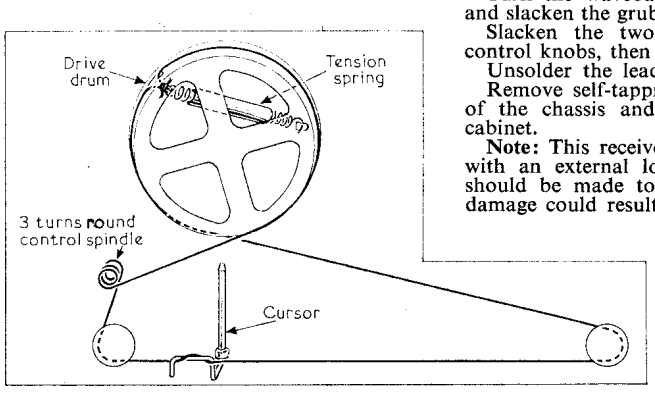
Turn the waveband switch to "Medium" and slacken the grub screw.

Slacken the two grub screws on front control knobs, then pull off all knobs.

Unsolder the leads from the loudspeaker.

Remove self-tapping screws on either side of the chassis and withdraw chassis from cabinet.

Note: This receiver is not suitable for use with an external loudspeaker. No attempt should be made to connect one as serious damage could result.



Left : Sketch of the scale drive assembly with the gang at maximum.

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