

## "TRADER" SERVICE SHEET

1819

## EKCO A455: FERRANTI A1149

Mains Operated Transistored Table  
Radio Receivers

## 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)

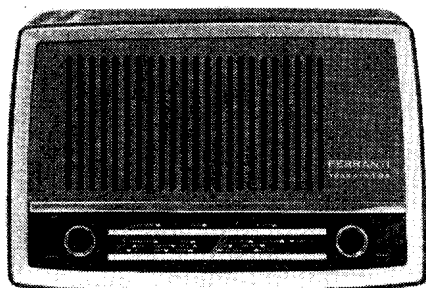
EKCO A455 and Ferranti A1149 are mains operated transistor table radio receivers covering medium (182-580m) and long (1,100-2,000m) wavebands.

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	—

## 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	† C1
T1	—	—

## Miscellaneous

LP1	24V 2.8W	B2
MR1	HO29/	—
	PEO1B	B1
S1-S3	—	B2
S4	—	C2

## MODULE LP1156

## Resistors

MR1	33kΩ	—
MR2	6.8kΩ	—
MR3	820Ω	—
MR4	100Ω	—
MR5	56kΩ	—
MR6	680Ω	—

MR7	22kΩ	—
MR8	4.7kΩ	—
MR9*	1kΩ	—
MR10	8.2kΩ	—
MR11	470Ω	—

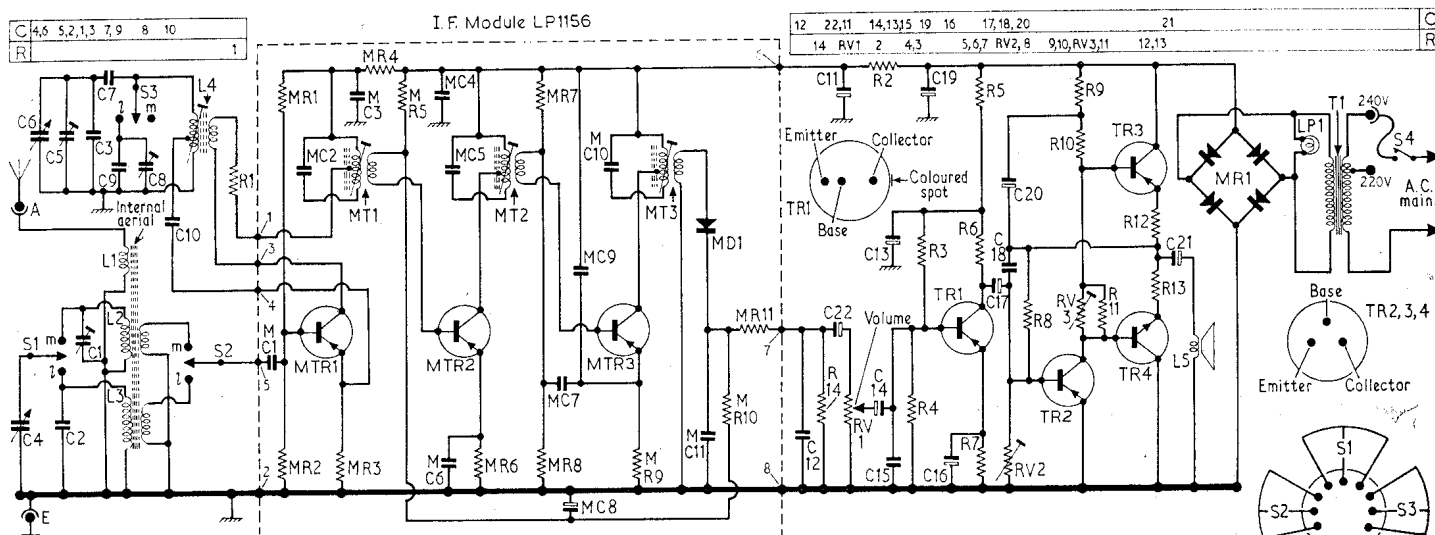
## Capacitors

MC1	0.047μF	—
MC2	—	—
MC3	0.047μF	—
MC4	0.047μF	—
MC5	—	—
MC6	0.047μF	—
MC7	0.047μF	—
MC8	10μF	—
MC9	0.047μF	—
MC10	—	—
MC11	0.01μF	—

## Miscellaneous

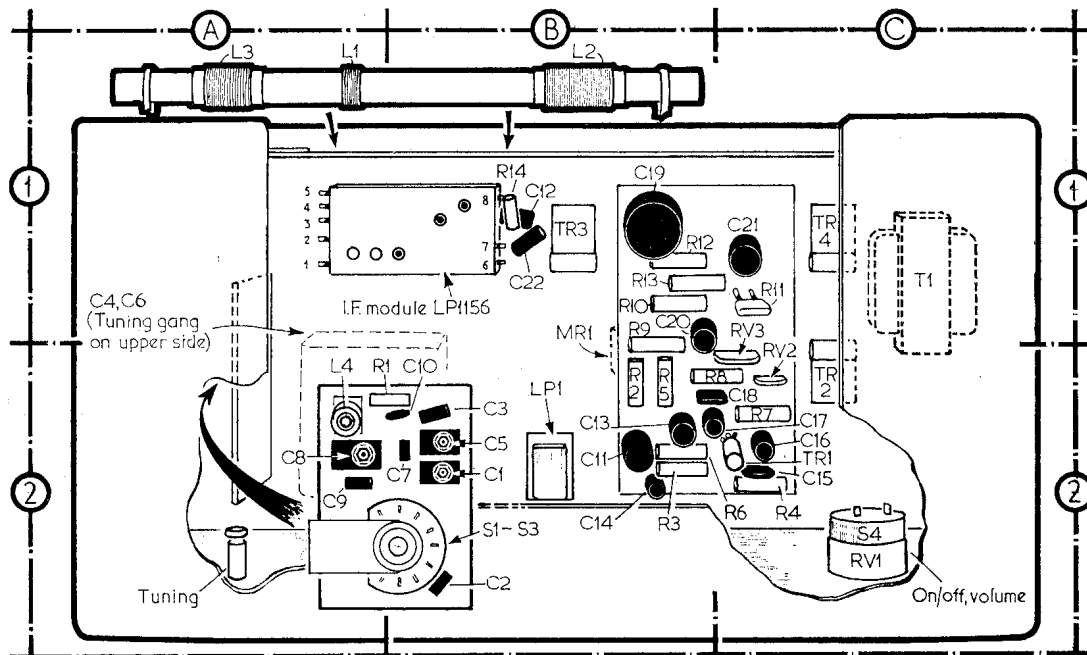
MT1	—	—
MT2	—	—
MT3	—	—
MD1	OA90	—
MTR1	AF115	—
MTR2	AF117	—
MTR3	AF117	—

\* Value adjusted for standard  
i.f. performance.  
† Speaker.



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

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EKCO A455  
FERRANTI A1149Supplement to *Electrical and  
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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 i.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

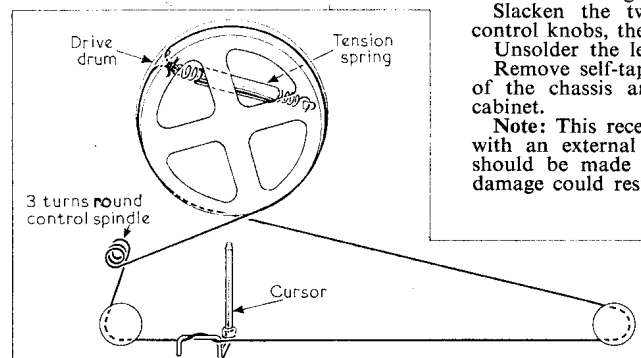
To remove the chassis from the cabinet, first remove the back cover.

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.