

One sheet

(T/37)

A.R.I. 5506, 5543

Transmitter Receiver, Type T.R. 3173A (Stores Ref. 10DB/6022).—Replacement of Switch Unit, Type 208 (Stores Ref. 10FB/6007), by Switch Unit, Type 115 (Stores Ref. 10FB/556).

(S.B. 49879.—24.1.1945.)

1. Models of Rebecca, Mk. II, transmitter receiver, type T.R. 3173A (Stores Ref. 10DB/6022), having serial numbers between 201 and 400, may employ switch unit, type 208 (Stores Ref. 10FB/6007), which has given rise to a certain amount of interference. Bulk production models of transmitter receiver, type T.R. 3173A (Stores Ref. 10DB/6022), include switch unit, type 115 (Stores Ref. 10FB/556), which, though similar in operation, employs greater screening and more efficient filter circuits.

2. Units holding any transmitter receiver, type T.R. 3173A (Stores Ref. 10DB/6022), of the above serial numbers, should therefore determine which switch unit is fitted, and if it is switch unit, type 208 (Stores Ref. 10FB/6007), should arrange to replace it by switch unit, type 115 (Stores Ref. 10FB/556).

3. The item required for this modification is as shown below, and is to be demanded from the appropriate maintenance unit :—

<i>Stores Ref.</i>	<i>Nomenclature</i>	<i>Quantity</i>
10FB/556	Switch unit, type 115	1

4. The procedure for effecting the modification is as detailed in this paragraph :—

- (i) Locate the feeder carrying the switch input to the receiving unit, type 61A (Stores Ref. 10PB/6004). Unscrew the clamp securing this to the rear of the front panel, and disconnect the feeder at the end remote from the switch unit, type 208 (Stores Ref. 10FB/6007).
- (ii) Unscrew the four screws securing the switch unit, type 208 (Stores Ref. 10FB/6007), to the front panel of the equipment and remove the switch unit, type 208 (Stores Ref. 10FB/6007), bodily from the chassis assembly, ensuring not to damage the OFF—ON relay.

Note.—It is desirable that the transmitter unit be unscrewed from the chassis before attempting to remove the switch unit, type 208 (Stores Ref. 10FB/6007).

- (iii) Remove the screening cover from the switch unit, type 208 (Stores Ref. 10FB/6007). Unsolder the inner conductor of the cable from the centre contact and unscrew the clamping ring. The length of feeder may then be withdrawn.

Note.—Care should be taken in the unsoldering operation, as much time will be saved by retaining the full length of the inner conductor.

- (iv) Remove the screening cover from the switch unit, type 115 (Stores Ref. 10FB/556), and ensuring to avoid damaging the spring contacts on the unit, connect the feeder to the centre contact in a manner similar to that in which it was connected to the switch unit, type 208 (Stores Ref. 10FB/6007). Screw up the clamping ring as tightly as possible and replace the screening cover on the switch unit, type 115 (Stores Ref. 10FB/556).
- (v) Lay the feeder along the same path as before, and position the switch unit, type 115 (Stores Ref. 10FB/556), by the terminal block mounted at the bottom of the front panel.
- (vi) Arrange that the spring clips on the switch unit, type 115 (Stores Ref. 10FB/556), are firmly positioned over the appropriate parts on the terminal block, and when this has been done screw the switch unit, type 115 (Stores Ref. 10FB/556), to the front panels.
- (vii) Clamp the feeder in position, using the clamp previously removed, and connect the feeder to the appropriate plug in the receiving unit, type 61A (Stores Ref. 10PB/6004).
- (viii) Action is required to be taken as indicated in A.M.O. A.328/44, the modification No. C.D. 0338B, Leaflet 1 being inserted on the modification label.

CONFIDENTIAL

CD.0338 B. Leaflet 2

CD.0338 G. Leaflet 2

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A.R.I.5506, A.R.I.5543, A.R.I.5594.

Amplifying Unit, Type 178, (Stores Ref. 10UB/185).

**Modification to Improve Gain Control and Output
Pulse Shape**

(S.B.49910.—3.2.45.)

1. It has been found in service that the gain control circuit as originally embodied in the Amplifying Unit, Typ 178, used in Transmitter Receiver, type T.R.3173A, (Stores Ref. 10DB/6022) bearing serial numbers 201 to 400 (inclusive) does not provide a smooth enough action at its lower end, and that the maximum gain available is greater than is operationally necessary. This modification has the twofold purpose of decreasing the maximum over-all gain, and providing a smoother action at low values of gain. The alterations described in paras. 4(i)-4(iii) improve the gain control, while those described in paras. 4(iv)-4(vi) improve the output pulse shape.

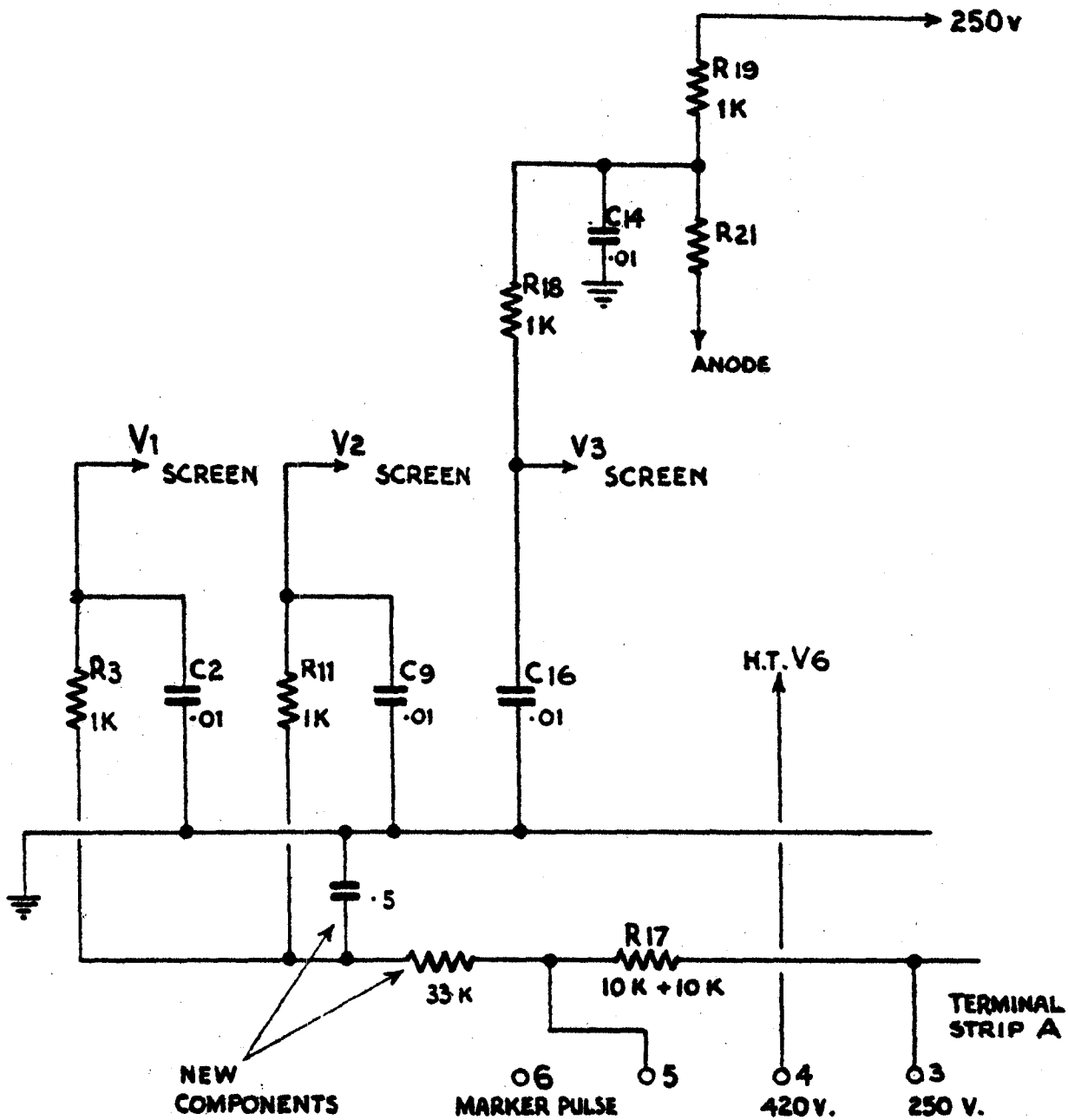
2. All Units holding Transmitter Receiver T.R.3173A bearing the above serial numbers in use or in store are to modify the Amplifying Unit, type 178, in accordance with this leaflet. All other transmitter receivers will be modified before reaching the Service.

3. The following components are required for the modification and should be demanded from the appropriate maintenance units :—

<i>Stores Ref.</i>	<i>Nomenclature</i>	<i>Quantity</i>
10W/300	Resistance, Type 726, (33K $\frac{1}{2}$ watt +10 % in)	1
10C/11131	Condenser, Type 3367, (0.5 η F, 450 V. wkg.)	1

4. Circuit references are to S.D.0338, Chapter 2, Fig. 8, and Drg. No. 0338, Ch.1, Leaflet 2, shows modified parts of the circuit. The modification is effected as follows :—

- (i) Locate the lead from R.17/10K +10K in series) to the 420V. H.T. line (tag 4 on the terminal Strip A). Disconnect this lead from the 420V. line and connect it instead to the 250V. line (tag 3 on the terminal Strip A).
- (ii) Locate the common junction point of R.3, R.11, R.17, which is connected by a lead to tag 5 on the terminal strip A. Disconnect R.17 and this lead from the junction. Connect one end of the 33K Resistance (Type 726 or 1799) to the junction of R.3 and R.11, and the other end to the: junction of R.17 and the lead which goes to tag 5.
- (iii) Connect the Condenser, Type 3367 (0.5 η F.), between earth and the junction of R.3, R.11 and the 33K resistor.
- (iv) Remove the 0.01 ν F. condenser C.38 connected between the cathode of V.6 and earth.
- (v) Remove the lead which connects the junction of R.32, R.45 to tag 6 on the terminal strip A.
- (vi) Remove the connection between terminals A6 and M7 on the base plate.
- (vii) After modification a label should be affixed in accordance with A.M.O. A.328/44.



DRG.N^o.C.D.0338/B Leaflet 2/44

**A.R.I.5506 and A.R.I.5594—Indicating Unit, type 6E (Stores Ref. 10QB/141)
—Modification to improve the Calibration Setting up Procedure**

(Establishment Ref. No. T/536.)

(Mod. No. 1059/1.)

(Class 3A.)

(Research Mods. 20232.—6.12.45.)

1. The modification detailed in this leaflet to indicating unit, type 6E (Stores Ref. 10QB/141), eases and improves the calibration setting up procedure. A 1.2 megohm resistor is also inserted between earth and the junction of R7 and R8, as a precautionary measure to avoid RF jitter.

2. All units holding indicating units, type 6E (Stores Ref. 10QB/141), in use and in store, are to ensure that they are modified in accordance with the instructions contained in this leaflet, and that the modification labels are properly annotated.

3. The following items are required for the modification and are to be demanded as necessary from the appropriate maintenance unit:—

Item.	Stores Ref.	Nomenclature.	Quantity.
1	10W/8687	Resistance, type 2161 (1.2 M, $\frac{1}{2}$ watt, 10%)	1
2	10W/11667	Resistance, type 500 (1 K, 10%, $\frac{1}{4}$ watt)	1

4. The following is the sequence of operations:—

(Refer to fig. 14, CD.0338-B, and to Drg. No. A.P.2914B/6/45.)

(i) Remove VR2 and correct R5(27K) to earth. (It should be noted that the input circuit in CD.0338B, fig. 14 is incorrect and reference should be made to the drawing.)

(ii) Remove R9 and replace it by VR2 connected as a variable resistor.

(iii) Disconnect the contact "b" on switch S5 from contact "a" and reconnect it to contact "c" on the same switch. (Contact "a" is now connected to R15 and contacts "b" and "c" to C20.)

(iv) Insert between contact "a" of S1 and C2 a resistance, type 500 (Stores Ref. 10W/11667).

(v) Remove the switch S2 in parallel with R36 and re-connect it in parallel with the resistance, type 500 (Stores Ref. 10W/11667) referred to in operation (iv).

(vi) Insert a resistance, type 2161 (Stores Ref. 10W/8687), between earth and the junction of R7 and R8.

(vii) Take action as indicated in A.M.O. A.328/44 and subsequent amendments.

5. *Range Calibration.*

The setting up instructions given in CD.0338-B, para. 136, are to be modified as follows:—

(i) Re-write para. 136 (vi) as "Set VR3, VR4 and VR5 at their mid positions."

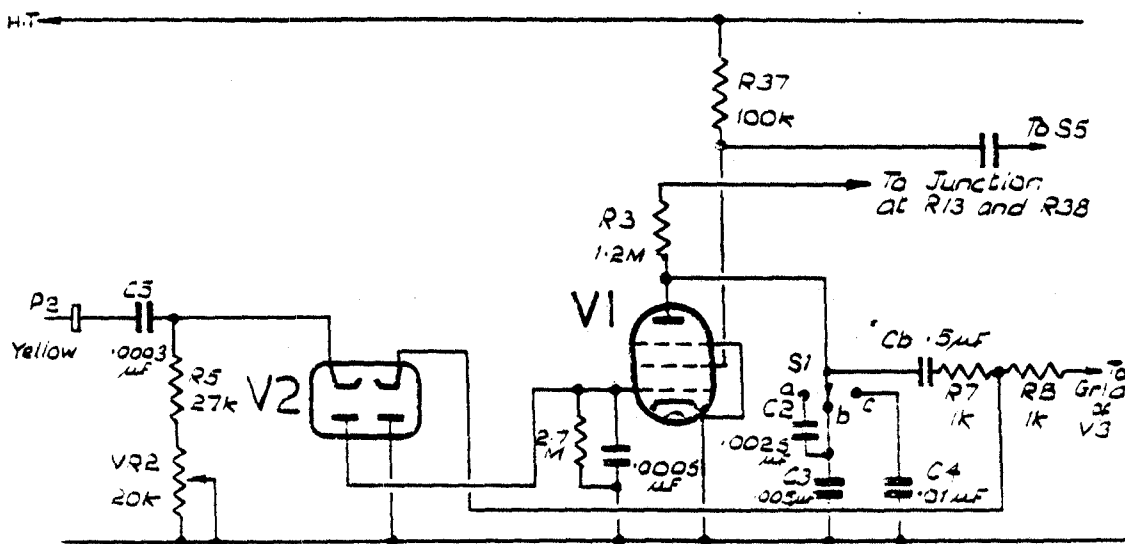
(ii) Re-write para. 136 (vii) as "Set VR9 so that the first mile mark is opposite 1 on the scale. If the trace does not start almost at zero, operate the switch S2."

(iii) Re-write para. 136 (x) as "If the indication cannot be adjusted to the 9 mile mark, adjust the Amplitude Control VR2."

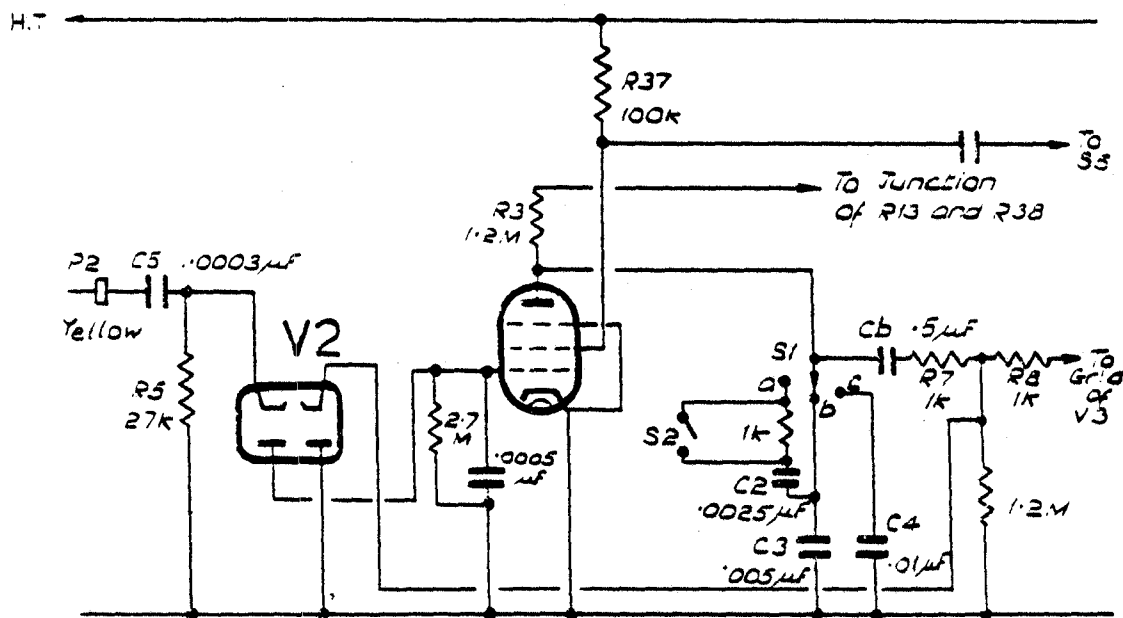
6. The following item rendered surplus as a result of this modification is to be disposed of in accordance with A.M.O. A.736/43 and subsequent amendments:—

Stores Ref.	Nomenclature.	Quantity.
10W/1803	Resistance, type 1803 (R.9, 18K, $\pm 10\%$, 1w)	1

P.T.O.



(a) BEFORE MODIFICATION



(b) AFTER MODIFICATION.

INPUT CIRCUIT OF INDICATING UNIT
TYPE 6E.

MODIFICATION TO INDICATING UNIT
TYPE 6E

FIG. I.

DRG. NO. A.P.2914 B / 6 / 45

LP16442 12/45 900 C & P Gp. 959 (4)

A.R.I. 5002, A.R.I. 5008, A.R.I. 5077, A.R.I. 5136, A.R.I. 5184,
A.R.I. 5506 and A.R.I. 5642—Indicating Units, type 96 (Stores Ref.
10QB/198) and type 260 (Stores Ref. 10QB/6374)—Replacement
of Condenser C2

(Establishment Ref. No. T/673.)

(Mod. No. 428/1.)

(Class 3A.)

(Research Mods. 24641.—19.2.46.)

1. Failures have occurred in indicating unit, type 96 (Stores Ref. 10QB/198), and indicating unit, type 260 (Stores Ref. 10QB/6374), due to surge voltages breaking down the H.T. smoothing condenser C2 ($4\mu\text{F}$, 450v.). This leaflet details the modification to replace the condenser.

2. All units holding indicating units, type 96 (Stores Ref. 10QB/198) and type 260 (Stores Ref. 10QB/6374), in use and in store, are to ensure that they are modified in accordance with the instructions contained in this leaflet, and that the modification labels are properly annotated.

3. The following item is required for the modification and is to be demanded as necessary from the appropriate maintenance unit :—

Item	Stores Ref.	Nomenclature	Quantity
1	10C/4780	Condenser, type 2512 ($4\mu\text{F}$, $\pm 20\%$, 500v. D.C. wkq.)	1

4. The following is the sequence of operations :—

(Refer to Air Publication 2544A, Vol. 1, Section 3, Chapter 4, fig. 1, and to CD 0338-R, fig. 4.)

P.T.O.

- (i) Remove the dust cover from the indicating unit.
- (ii) Locate condenser C2 ($4\mu\text{F}$, 450v. D.C. wkg.) and remove it.
- (iii) Replace the condenser removed in operation (ii) by the condenser, type 2512 ($4\mu\text{F}$, 500v. D.C. wkg.).
- (iv) Replace the dust cover.
- (v) Take action as indicated in A.M.O. A.328/44 and subsequent amendments, inscribing the modification label with the modification number quoted beneath the title of this leaflet.

5. The item rendered surplus as a result of this modification is to be disposed of in accordance with A.M.O. A.736/43 and subsequent amendments:—

<i>Stores Ref.</i>	<i>Nomenclature</i>	<i>Quantity</i>
10C/11482	Condenser, type 3503 ($4\mu\text{F}$, +50% -20%, 450v. D.C. wkg.)	1

SECRET

APPENDIX 3

MODIFIED INDICATOR, TYPE 6E

1. The operation and circuit of indicator 6E has been modified from that given in S.D.0338, Chapter 2 (Provisional Issue) and will be retrospective on all 6E units in service.

2. The main alteration consists of a modification to the input circuit. Explanatory notes paras.49-51 should be omitted and the following substituted.

- (1) Para.49 The grid of valve V_1 is normally held at earth potential, the valve passing a relatively high anode current such that the voltage across C_4 is small. If the grid is suddenly driven negative and maintained cut off, the condenser C_4 commences to charge up towards H.T. potential through R_3 . So long as C_4 is allowed to charge up to about only one-tenth of the H.T. voltage, the curve of volts across C_4 against time is approximately linear. At the end of 2 milli-seconds the grid of V_1 is returned to earth potential and C_4 is discharged through valve V_1 to its original potential.
- (2) Para.50 The positive pulse from the modulator unit, type 66, is differentiated by the short time constant of the input circuit, C_1, R_1, VR_2 . The resultant negative pulse of some 60 volts amplitude occurring at the end of the positive input pulse charges C_2 negatively through the right-hand half of the diode V_2 . V_1 is now cut off and the condenser C_4 commences to charge up towards H.T. voltage. This instant, i.e., the end of the synchronising pulse corresponds to the start of the time base sweep and to the start of the pulse from the transmitter. The charge on C_2 discharges through R_3 until the grid of V_1 is no longer cut off and the condenser C_4 is then discharged ready for another scan. The time base speed is controlled by the capacitance of condenser C_4 and the range switch S_1 selects the appropriate capacitance for the range required.
- (3) Para.51 The time for which C_4 charges must be adjusted to be not less than 1,000 microseconds after the start of the transmitter pulse as otherwise the scan on the 90 mile range would be shortened. Furthermore since the duration between pulses is 3300 microseconds, the time at which C_4 discharges must not be greater than 2500 microseconds. This charging time of C_4 is determined by the time constant C_2 and R_3 and is of the order of 2000 microseconds.

Range Calibration of Indicating Unit

3. The setting up instructions are slightly modified as a result of the input circuit changes as follows:-

- (1) Para.136(vi) Delete "VR₂". For "until trace" substitute "fully clockwise".
- (2) (vii) Set VR₉ so that the first mark on the trace is opposite 1 on the scale. N.B. In general, this means that the trace will not commence at zero.
- (3) (xiii) Delete "If adjusted"
- (4) Note that these alterations to the relevant paras. in S.D.0338, Chapter 2 are only applicable to those indicating units in which the input circuit has been modified, though all Type 6E units at present in service will receive retrospective modification at a future date. This appendix will be cancelled and the relevant paragraphs and diagrams of the provisional chapter amended, in due course.

