# B.R.1565(ADDM)

## ADDENDUM N° 2 TO B.R.1565

## HANDBOOK FOR TYPE 618 AND RECEIVER OUTFIT CAS

## HF TRANSMITTER (A.P. 100333A) AND MF TRANSMITTER (A.P. 100334A)

ANY SUGGESTIONS FOR AMENDMENTS OR ADDITIONS TO THIS BOOK SHOULD BE SUBMITTED TO THE CAPTAIN SUPERINTENDENT, ADMIRALTY SURFACE WEAPONS ESTABLISHMENT, THROUGH THE USUAL CHANNELS.

WEAPONS DEPARTMENT · ADMIRALTY
JAN., 1960 (W. 3889/59)

"CHANGES."

## ★ ~~AMENDMENTS~~ ★

When an amendment to this handbook is promulgated the brief details required below are to be filled in.

| ~~AMENDMENT~~ CHANGE No. | AUTHORITY (A.F.O. No. ETC.) | DATE OF INSERTION | INITIALS |
|---|---|---|---|
| ONE | P392/61 | 9-1-62 | Geo. Temperley LTD. |
| 2 | P90/64 | 23-7-64 | H.Goll RO1(G) |

Admiralty, S.W.1.

January, 1960

W.3889/59

B.R.1565 Addm. "Addendum No. 2 to B.R.1565 Handbook for Type 618 and Receiver Outfit CAS 1959" having been approved by My Lords Commissioners of the Admiralty is hereby promulgated.

By Command of Their Lordships

To:-

Flag Officers and
Commanding Officers of
H.M. Ships and
Vessels concerned.

# B.R.1565 ADDM.

# ADDENDUM NO. 2 TO B.R.1565

# HF TRANSMITTER (A.P.100333A)

# AND

# MF TRANSMITTER (A.P.100334A)

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## LIST OF FIGURES

# HF TRANSMITTER (A.P.100333A)

# AND

# MF TRANSMITTER (A.P.100334A)

## Introduction

1. As from the beginning of 1959, all future production of HF and MF transmitters of Type 618 will be of the 'A' pattern. A summary of the differences between the original transmitters and the 'A' pattern is listed below. Apart from the keying circuit changes, the differences are mainly confined to improvements to various components and mechanical features which have given trouble since the introduction of these transmitters.

2. HF Transmitter A.P.100333A

(a) Redesigned keying and muting circuits.

(b) Redisposition of components to avoid overheating of transformer TR2.

(c) Up-grading of capacitors C9 and C71.

(d) Geared tuning controls fitted in place of the friction type.

(e) All Mark 4 plugs and sockets are of the 'Red splash' type.

(f) Relays are of plug-in type for easy changeability.

(g) Wire-wound resistors of improved type fitted.

3. MF Transmitter A.P.100334A

(a) Redesigned keying and muting circuits.

(b) Redesigned variometer assembly.

(c) Resistor R4 ohmic value and wattage increased.

(d) Geared tuning controls fitted.

(e) All Mark 4 plugs and sockets are of 'Red splash' type.

(f) Relays are of plug-in type.

(g) Wire-wound resistors of improved type fitted.

4. Power Unit A.P.100336

Although not given an 'A' suffix letter, all future production of this unit will be fitted with 'Red splash' plugs and sockets and improved wire-wound resistors. The 400-volt and 300-volt d.c. outputs have been modified to provide a separate fuse in each line.

Keying Circuit Changes

5. Complaints of excessive key click interference from Type 618 transmitters have called for a complete redesign of the keying circuits. As a result of these changes, the keying is accomplished by the removal of a negative bias from the grids of the first (and second in the HF transmitter) stages by a high-speed relay. A second high-speed relay, operated in parallel with the keying relay, mutes the receiver by inserting an 100-ohm resistor across the telephone output of the receiver.

6. The Send-Receive relay now functions in a manner normal to this type of relay; one contact transferring the aerial from receiver to transmitter and the second contact earthing the input to the receiver when the relay is operated.

7. The modifications have resulted in some reduction of key clock interference when the transmitters are working Send-Receive operation and further reduction is possible when the transmitters are fitted without the associated Receiver Outfit CAS. In such installations, the link normally fitted between terminals L and T in the A.P.61164 Junction Box, 32-Way is now fitted between terminals L and H. When so linked, the Send-Receive relay is operated in the TRANSMIT position when the control switch on the Power Unit is set to the READY position and only the keying and muting relays are 'keyed'.

8. In the event of both MF and HF transmitters being fitted in one installation without the associated receivers, both units must be 'A' pattern before the facility described above can be used.

9. In all other installations, the 'A' pattern of either transmitter is a direct replacement for a non-'A' pattern and no change of wiring is necessary.

Circuit Changes

10. HF Transmitter (See Fig. 1)

(a) Pattern Z530040 Relay fitted as muting relay RLD and R87, 100 ohms fitted as a muting resistor.

(b) Keying Relay RLB Pattern Z530039 replaced by Pattern Z530040 and series resistor R73 removed. Capacitor C75 fitted across the relay contact.

(c) Valve V4 buffer stage grid resistor R83 disconnected from the -60 volt line and connected to the M.O. keying line.

(d) Wiring to RLC2 and SWEda disconnected and resistors R28 and R74 removed.

(e) 250-volt supply to V101 and V102 in the receiver is completed by cross-connecting PL9A and PL9B.

(f) Relay contacts RLC1 and RLC2 rewired so as to earth the receiver input when the relay is operated. Series resistor of relay increased to 270 ohms.

(g) The new components layout is shown in Fig. 2.

11. MF Transmitter (See Fig. 3)

(a) Pattern Z530040 Relay fitted as muting relay RLD and R49, 100 ohms fitted as a muting resistor.

(b) Resistor R48 100k fitted between M.O. grid resistor R6 and -60 volt line. Keying relay RLB fitted to connect R6 to earth and C38 fitted across the contact.

(c) Relay contact RLA2 disconnected and contacts RLA1 and RLA2 rewired to earth the receiver input when the relay is operated. Series resistor of RLA increased to 270 ohms.

(d) 250-volt supply to V101 and V102 in the receiver completed by cross-connecting PL14A and PL14B.

(e) Keying and muting relays connected between PL14F/P and PL13F.

(f) The new components layout is shown in Fig. 4.

COMPONENT CHANGES

12. HF Transmitter A.P.100333A

| | | | | | |
|---|---|---|---|---|---|
| C33 | Capacitor, fixed | Z115630 | 0.05 µF | 20% | 200V |
| C34 | Capacitor, fixed | Z115630 | 0.05 µF | 20% | 200V |
| C36 | Capacitor, fixed | Z115630 | 0.05 µF | 20% | 200V |
| C48 | Capacitor, fixed | Z115552 | 0.01 µF | 20% | 350V |
| C50 | Capacitor, Fixed | Z115551 | 0.002µF | 20% | 500V |
| C51 | Capacitor, fixed | Z115551 | 0.002µF | 20% | 500V |
| C52 | Capacitor, fixed | Z115551 | 0.002µF | 20% | 500V |
| C53 | Capacitor, fixed | Z115552 | 0.01 µF | 20% | 350V |
| C54 | Capacitor, fixed | Z115552 | 0.01 µF | 20% | 350V |
| C55 | Capacitor, fixed | Z115551 | 0.002µF | 20% | 500V |
| C56 | Capacitor, fixed | Z115551 | 0.002µF | 20% | 500V |
| C57 | Capacitor, fixed | Z115551 | 0.002µF | 20% | 500V |
| C58 | Capacitor, fixed | Z115551 | 0.002µF | 20% | 500V |
| C59 | Capacitor, fixed | Z115552 | 0.01 µF | 20% | 350V |
| C62 | Capacitor, fixed | Z115551 | 0.002µF | 20% | 500V |
| C71 | Capacitor, fixed | 911-5660 | 1000 pF | 10% | 750V |
| C75 | Capacitor, fixed | Z115631 | 0.1 µF | 20% | 200V |
| | | | | | |
| R3 | Resistor | Z117900 | 2.4k | 5% | 6W |
| R13 | Resistor | Z113518 | 12k | 5% | 4.5W |
| R14 | Resistor | Z113425 | 15k | 5% | 6W |
| R24 | Resistor | Z113411 | 3.9k | 5% | 6W |
| R28 | Resistor | Not fitted in 'A' pattern | | | |
| R70 | Resistor | Z113417 | 6.8k | 5% | 6W |
| R71 | Resistor | Z113417 | 6.8k | 5% | 6W |
| R72 | Resistor | Z113383 | 270 | 5% | 6W |
| R73 | Resistor | Not fitted in 'A' pattern | | | |
| R74 | Resistor | Not fitted in 'A' pattern | | | |
| R87 | Resistor | Z221110 | 100 | 10% | ¼W |
| | | | | | |
| RLB | Keying relay | ~~Z530040~~ 5945-99-012-8201 | | | |
| RLD | Muting relay | ~~Z530040~~ 5945-99-012-8201 | | | |
| - | Socket for relays RLB/RLD | 5935-Z539001 | | | |
| | | | | | |
| PL9 | Plug, 18-way, fixed | 5935-A.P.208676 | | | |
| PL10 | Plug, 12-way, fixed | 5935-A.P.208655 | | | |
| | FLEXIBLE COUPLING (EDDYSTONE TYPE 893) | 5999-99-580-0003 | | | |

13. MF Transmitter A.P.100334A

| | | | | | |
|---|---|---|---|---|---|
| R4A | Resistor | Z117901 | 5.1k | 5% | 6W |
| R4B | Resistor | Z117901 | 5.1k | 5% | 6W |
| R10 | Resistor | Z113494 | 2k | 5% | 4.5W |
| R21 | Resistor | Z113411 | 3.9k | 5% | 6W |
| R35 | Resistor | Z113383 | 270 | 5% | 6W |
| R41 | Resistor | Z113511 | 10k | 5% | 4.5W |
| R48 | Resistor | Z223038 | 100k | 10% | $\frac{1}{4}$W |
| R49 | Resistor | Z221110 | 100 | 10% | $\frac{1}{4}$W |
| C11 | Capacitor, fixed | Z115549 | 0.001 µF | 20% | 500V |
| C38 | Capacitor, fixed | Z115625 | 0.01 µF | 20% | 350V |
| L8 | Transformer, variable r.f. | A.P.102921A | | | |
| SWC | Switch, c.w., m.c.w. | Z510301 | | | |
| RLB | Keying relay | ~~Z530040~~ 5945-99-012-8201 | | | |
| RLD | Muting relay | ~~Z530040~~ 5945-99-012-8201 | | | |
| - | Socket for relays RLB/RLD | 5935-Z539001 | | | |
| PL13 | Plug, 12-way, fixed | 5935-A.P.208655 | | | |
| PL14 | Plug, 18-way, fixed | 5935-A.P.208676 | | | |

14. Power Unit A.P.100336

| | | | | | |
|---|---|---|---|---|---|
| R1 | Resistor | Z113431 | 27k | 5% | 6W |
| R5 | Resistor | Z113417 | 6.8k | 5% | 6W |
| R6 | Resistor | Z117900 | 2.4k | 5% | 6W |
| R7 | Resistor | Z113370 | 75 | 5% | 6W |
| R8 | Resistor | Z113370 | 75 | 5% | 6W |
| R11 | Resistor | Z113382 | 250 | 5% | 6W |
| R12 | Resistor | Z113388 | 430 | 5% | 6W |
| R13 | Resistor | Z113387 | 390 | 5% | 6W |
| R14 | Resistor | Z113397 | 1k | 5% | 6W |
| R15 | Resistor | Z113397 | 1k | 5% | 6W |
| C12 | Capacitor, fixed | Z145508 | 25 µF | -20 +100% | 50V |
| PL1 | Plug, 2-way, fixed | 5935-A.P.208600 | | | |
| PL4 | Plug, 25-way, fixed | 5935-A.P.208682 | | | |
| PL7 | Plug, 18-way, fixed | 5935-A.P.208676 | | | |
| PL8 | Plug, 18-way, free | 5935-A.P.208788 | | | |
| SK2 | Socket, 12-way fixed | 5935-A.P.208755 | | | |
| SK3 | Socket, 18-way fixed | 5935-A.P.208766 | | | |
| SK5 | Socket, 12-way, fixed | 5935-972-9114 | | | |
| SK7 | Socket, 18-way, free | 5935-A.P.208688 | | | |
| SK8 | Socket, 18-way, fixed | 5935-A.P.208776 | | | |

# APIOO333A TRANSMITTER H.F.

CIRCUIT DIAGRAM

| RELAY DESIGNATION. | |
|---|---|
| RELAY | FUNCTION |
| RLB | KEYING RELAY |
| RLC | AE CHANGEOVER |

| SW B FREQUENCY RANGE SWITCH | POS^N | BAND | M^C/s |
|---|---|---|---|
| | 1 | 1 | 1·5-3·5 |
| | 2 | 2 | 3·5-8 |
| | 3 | 3 | 8-16 |

| SWC AERIAL TUNING SWITCH | POS | DUMMY LOAD |
|---|---|---|
| | 1 | |
| | 2 | PAR. 1 |
| | 3 | PAR. 2 |
| | 4 | OFF |
| | 5 | SER.1 |
| | 6 | SER.2 |

| SWE SERVICE SELECTOR SWITCH | POS^N | |
|---|---|---|
| | 1 | C.W. |
| | 2 | M.C.W. |
| | 3 | VOICE |

V1 & V2 PRIMING ANODE

V3 & V12

V4

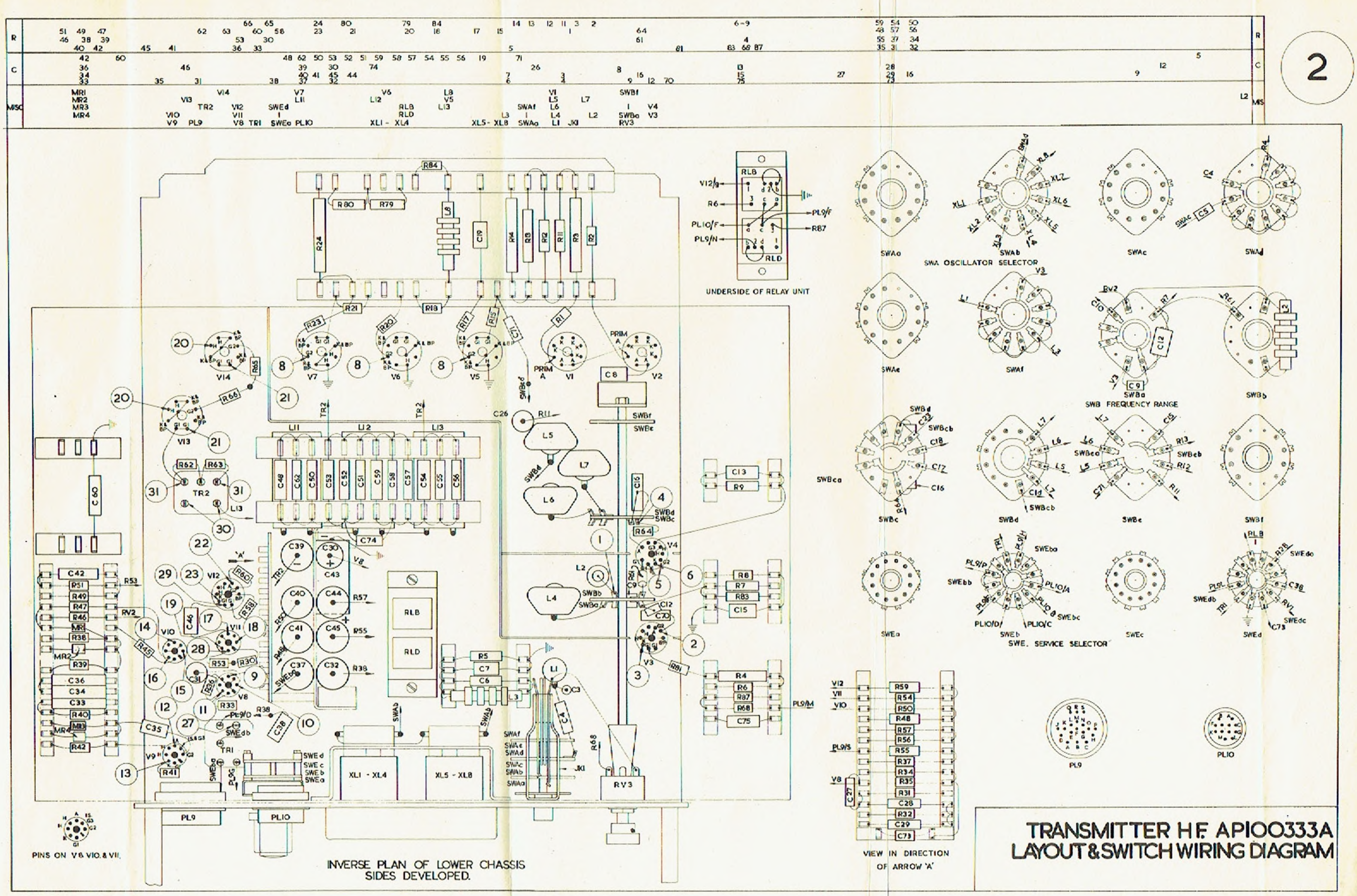
V5 V6 V7 V13 & V14

V8 V9 V10 & V11

PL9

SK3 P.U.

MIC EARTH MIC



INVERSE PLAN OF LOWER CHASSIS SIDES DEVELOPED.

## TRANSMITTER H.F. AP100333A
## LAYOUT & SWITCH WIRING DIAGRAM

| | |
|---|---|
| R | 30 1 4 2 28 35 6 40 48 5 39 3 8 21 41 22 43 45 38 12 11 10 42 12 36 23 37 9 24 13 31 7 25 26 15 46 27 14 19 18 32 16 17 33 44 20 47 |
| C | 1 32 31 33 2 28 36 5 3 6 17 37 26 10 13 27 4 8 11 9 29 23 24 25 30 12 14 15 16 21 19 18 20 17 22 35 34 36 |
| MISC. | RLB I RLD I SWC RLC 2 VI V2 RLA 2 RLBI LI RVI RLDI JKI L2 V3 L3 RLC2 L4 V4 V8 RLC1 TRI V5 V9 L5 M1 V6 L6 V7 SWBpb SWB kb SWBpa SWAa SWBma SWBmb SWAc SWBka L8 SWBg SWAe SWBfa SWAg M2 SWBda MRI SWBdb L7 SWBbb SWBfb SWBba RLA1 RLA2 |

SK3 IN PU — PL14 — (12)

+300V
+250V
-40V
KEY
EARTH
-60V
+400V
LISTEN THRO
EARTH

SK2 IN PU — PL13 — (11)

-40V
HEATERS 6·3V
EARTH

R4A 5·1K, R4B 5·1K, C10 ·01, R10 2K, C4 ·01, L4, R11 10K, R42 10K, R9 15K, C11 ·001, R36 27, R1 82K, V1 CV422, R2 470K, V2 CV395, C5 ·01, L2, R5 10K, C3 270p, R3 47K, C6 100p, C7 100p, SWC, RLC 2, R30 390, V3 CV416, V4 CV428, C28 100p, R40 100, R39 47, C13 470p, R38 27, R37 27, 3400, 3400, 500p, C1 18p, C32 3-33p, C31 C2 150p, L1, RLB I, RLD I, RLBI, C38 ·01, R48 100K, R6 47K, L3, R8 10K, C27 270p, C37 ·01, R12 470, C8 ·01, C9 ·01, R43 68K, OSCILLATOR

R.A. ANODE CURRENT.

C14 ·01, M1, R18 ·02, R14 7K, L6, V5 CV428, V6 CV428, V7 CV428, R31 27, R32 27, R33 27, C12 ·005, R13 27, R15 27, R19 27, R16 27, R17 27, R44 27, L5, R7 10K, POWER AMPLIFIER

A.E. LOADING SWITCH.

C15 ·04, SWAa, SWAc, SWAe, SWAg, RLA1, RLA2, SK15 R.X. AERIAL INPUT, A.E., DUMMY LOAD, C36, MR1, C34 750p, R47, C20 22K, C22 ·01, C35 ·001, L7, M2, C16 ·002, C21 ·002, C19 ·002, C18 500p, C20 ·001, C17 ·002, A.E. VOLTAGE

R.A. ANODE VARIOMETER

L8, SWBgb, SWBma, SWBda, SWBbb, SWBka, SWBfa, SWBkb, SWBmb, SWBfb, SWBpa, SWBg, SWBba

AERIAL REACTANCE SWITCH.

RLC1, TRI, RLC2, JK1, R28 1·2K, RV1 20K, R35 270, C33 25, 500, RLA 2, RLDI, R49 100, R21 3·9K, R45 27, C23 ·05, C24 ·04, C25 ·05, C29 ·05, C30 ·05, R46 27, V8 CV428, V9 CV428, R22 27, R23 27K, R25 27K, R27 27, C25 2, R41 10K, R24 47K, R26 47K, MODULATOR

| RELAY | DESIGNATION |
|---|---|
| RELAY | FUNCTION |
| RLA 2 | SEND-RECEIVE RELAY |
| RLC 2 | M C W |
| RLB 1 | KEYING |
| RLD 1 | MUTING |

PRIMING ANODE — V1&2 — V3 — V4,5,6,7,8&9. — T.C.

VALVE BASE CONNECTIONS.

SWITCHING SCHEMATIC FOR VARIOMETER L8.

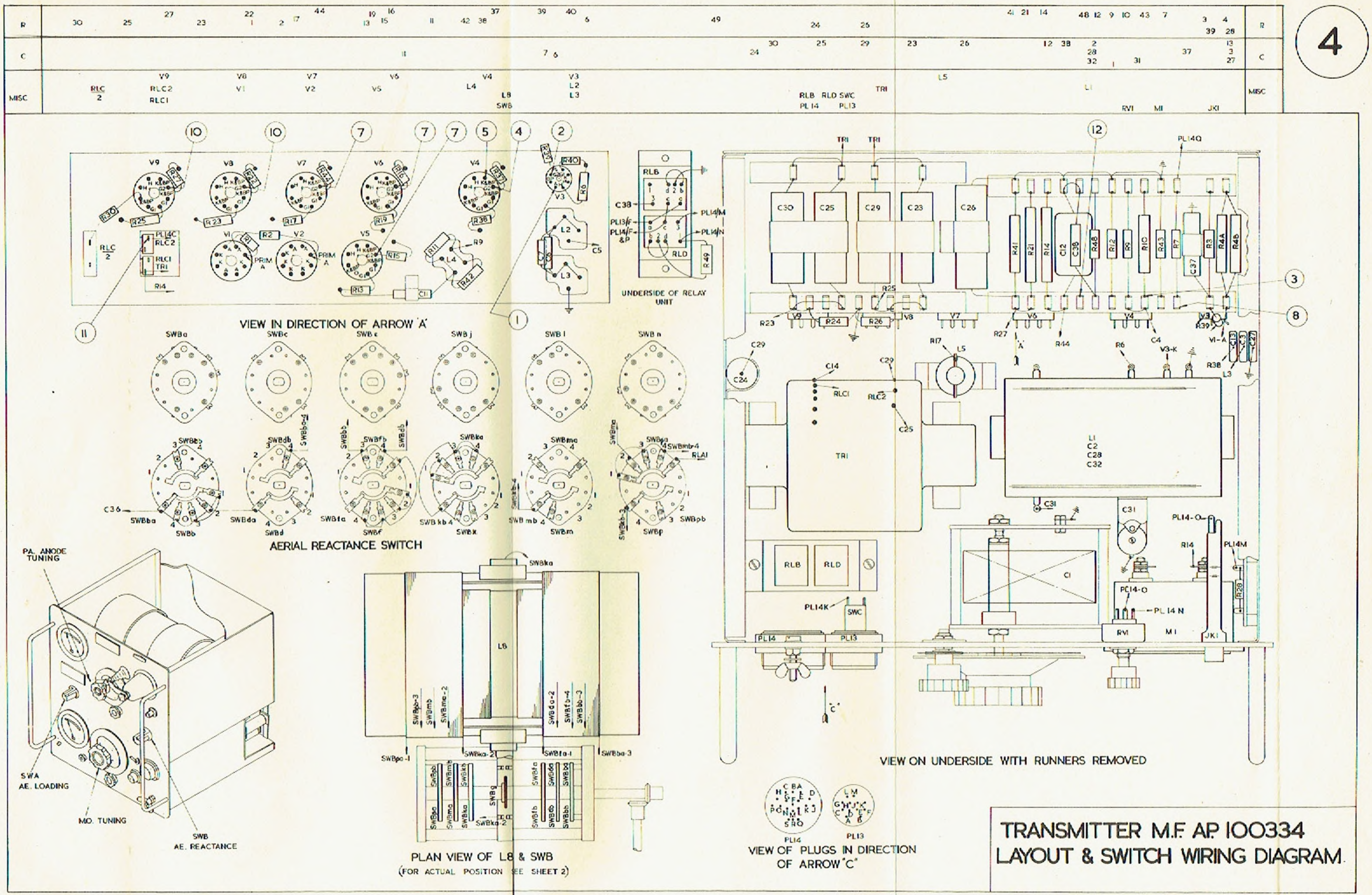
POS. 1 — POS. 2 — POS. 3 — POS. 4

SWA AERIAL LOADING SWITCH: POS. I-11 VARIABLE LOADING

SWB AERIAL REACTANCE SWITCH: POS. 1-4 VARIABLE REACTANCE

SWC CARRIER SELECTOR SWITCH: POS. 1 C.W., POS. 2 M.C.W.

# AP100334A TRANSMITTER M.F.
## CIRCUIT DIAGRAM.



# TRANSMITTER M.F. AP 100334
# LAYOUT & SWITCH WIRING DIAGRAM