# PORTABLE ELECTRONIC TRAFFIC ANALYSER

## P.E.T.A.

*Type S350*

*T.3827*

*Marconi*

*Technical Manual*

**MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED**

*Chelmsford, Essex, England · Telephone: Chelmsford 3221 · Telex: 1953 · Telegrams: Expanse Chelmsford Telex*



*Printed in Great Britain*

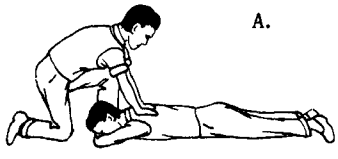
# FIRST AID IN CASE OF ELECTRIC SHOCK

**DO NOT TOUCH THE VICTIM WITH YOUR BARE HANDS until the circuit is broken. SWITCH OFF. If this is not possible, PROTECT YOURSELF with dry insulating material and pull the victim clear of the conductor.**

## HOLGER NIELSEN METHOD OF ARTIFICIAL RESPIRATION

*The instructions given below are approved by the Royal Life Saving Society.*

1. Lay patient face downwards, head on one side, with forehead resting on the hands, placed one above the other.
2. Remove FALSE TEETH, TOBACCO OR GUM, from patient's mouth; make sure the TONGUE IS FREE by firm blows between the shoulders with the flat of the hand.
3. Kneel on one knee at the patient's head, one foot by the patient's elbow.
4. Place the palms of your hands on the patient's shoulder blades (See A).
5. Rock forward until arms are vertical. The pressure should be light and without force (22-30 lbs is sufficient). This should take 2½ seconds (See B).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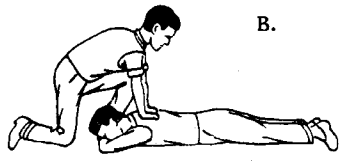
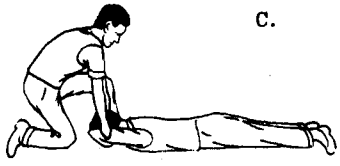

B.

6. Release the pressure by allowing the hands to slide down the arms to the patient's elbows (approx. 1 second) then raise the patient's arms and shoulders slightly, pulling at the same time by swinging backwards (approx. 2½ seconds) (See C). Lower the patient's arms (See D) and return your hands to the patient's shoulder blades.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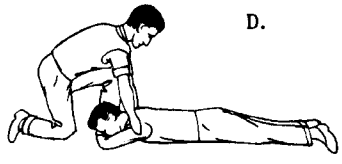
D.

7. Repeat the movements, taking 7 seconds for each complete respiration.
8. While artificial respiration is continued, have someone else:- (a) Loosen patient's clothing.
   (b) Send for a doctor.
   (c) Keep patient warm.
9. If patient stops breathing, continue artificial respiration. Four hours or more may be required.
10. DO NOT GIVE LIQUIDS UNTIL PATIENT IS CONSCIOUS.

## TREATMENT FOR BURNS

If, as a result of electric shock, the patient is suffering from burns, the following treatment should be given without hindrance to artificial respiration:-

(a) Remove clothing locally to enable the burn to be treated but do not break blisters.
(b) Saturate burns with warm solution of one desertspoonful of bi-carbonate of soda to a pint of warm water, or a teaspoonful of salt to a pint of warm water.
(c) Cover with lint soaked in a similar solution and bandage (lightly if blisters have formed).
(d) If the above solutions are not available, cover with a sterile dressing.
(e) Warm, weak, sweet tea may be given when the patient is able to swallow.

*Further details of charts and book on Artificial Respiration may be obtained from:- The Royal Life Saving Society, 14 Devonshire Street, London W.1.*

# PORTABLE ELECTRONIC TRAFFIC ANALYSER
# P.E.T.A.
# TYPE S.350

## Amendment No.1
## to
## Technical Manual
## T.3827

1. 'Remove' and 'destroy' existing contents pages (i) to (iv) (2 sheets) and 'replace' with new pages (i) to (iv) appended.

2. 'Remove' and 'destroy' existing page 3/4 (1 sheet) and 'replace' with new page 3/4 appended.

3. Page 8 paragraph 5.3.4 'amend' heading to read:-
'Hold Off Position Type 4127A, B or C Fig.9'

4. 'Remove' and 'destroy' existing pages 9 to 12 (2 sheets) and 'replace' with new pages 9 to 12 appended.

5. 'Remove' and 'destroy' existing pages 15 to 18 (2 sheets) and 'replace' with new pages 15 to 18 appended.

6. 'Remove' and 'destroy' existing pages 21 to 25 (3 sheets) and 'replace' with new pages 21 to 26 appended.

'Record' this amendment on the Amendment Record Sheet in the front of the Technical Manual T.3827.

## RECORD SHEET -

## AMENDMENT AND MODIFICATION LEAFLETS

The incorporation of an amendment in this publication should be recorded in the table below, when making the amendment.

In the case of pages or drawings to be replaced, the obsolete sheets should be removed and their replacements inserted in the appropriate places. To open the binding clip, press together the levers at the bottom. To close the clip, press together the levers at the top.

Upon receipt of Modification Leaflets, any relevant information can be noted in the spaces provided overleaf.

| Amendment No. | Amended by | Section, Chapter affected | Date |
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## Manual Amendment Procedure

This manual reflects the design state of the equipment, to which it refers, at the time of publication.

Amendments will be incorporated in this manual for the following reasons:-

1) To incorporate information on the latest state of the equipment design.

2) To include additional and revised information.

3) To correct typographical errors.

Items requiring amendment for reason 3) above, will only be revised when an amendment is issued for reasons 1) or 2), unless the error is likely to cause confusion.

Amendments to this manual will normally be by the issue of replacement pages and drawings. On these, changes in the text will be indicated by means of a heavy line in the margin alongside the amended material. Where an amendment results from a modification, the modification number will also be included in the margin.

NOTE: Where pages are re-issued because of a modification, the user should not replace the superseded pages or drawings, without first checking that the equipment incorporates the modifications listed in the Revised Modification State accompanying the amendment. If this is not done, the amended manual may not truly reflect the modification state of the particular equipment for which the manual is used. This checking is best done by comparing the modification record labels on the equipment, against the table.

Each amendment leaflet will include a list of pages and drawings replaced, together with a brief reason for their replacement. When the task of amendment is completed, the details of the amendment and the date on which it is carried out should be entered on the amendment record sheet which follows. It is recommended that the amendment leaflet be filed for future reference after the amendment task has been completed.

## MODIFICATION STATE OF THE EQUIPMENT

Modification Record Labels are fitted to the units of the equipment listed below. Embodiment of a modification is indicated by scoring through the relevant number on the appropriate label.

The amendment state of this manual is related to the modification state of the equipment. To ensure that this relationship may be determined at any time, the following table is re-issued with successive amendments to the manual.

T.3827

| UNIT No. | Unit or Sub-Unit Title | Modification State of Unit or Sub-Unit Related to Amendment State of Manual | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| - | Aerial Unit Type 4125 A & B | 2 | | | | | | | | | | | | |
| - | Meter Unit Type 4127 A, B & E | 1 | | | | | | | | | | | | |
| - | Meter Unit Type 4127 C & D | 2 | | | | | | | | | | | | |
| - | Power Unit Type 4126 A & B | 0 | | | | | | | | | | | | |
| - | Remote Meter Type 6656 A & B | 0 | | | | | | | | | | | | |
| Manual Amendment No. | | 3 | | | | | | | | | | | | |

## CONTENTS


| | | Page |
|---|---|---|
| 1 | INTRODUCTION ... ... ... ... ... ... ... | 1 |
| 2 | DATA SUMMARY ... ... ... ... ... ... ... | 1 |
| 3 | EQUIPMENT LIST ... ... ... ... ... ... ... | 3 |
| 4 | BRIEF DESCRIPTION ... ... ... ... ... ... | 4 |
| | 4.1 Aerial Unit Type 4125A or B ... ... ... ... | 4 |
| | 4.2 Meter Unit Type 4127A to E ... ... ... ... | 4 |
| | 4.3 Power Unit 4126A or B ... ... ... ... ... | 5 |
| | 4.4 Remote Meter Type 6656A or B ... ... ... | 5 |
| 5 | DETAILED DESCRIPTION ... ... ... ... ... ... | 5 |
| | 5.1 Aerial Unit Type 4125A or B ... ... ... ... | 5 |
| | 5.1.1 Aerial and Flare ... ... ... ... | 5 |
| | 5.1.2 Transmitter Valve ... ... ... ... | 5 |
| | 5.1.3 Waveguide and Micro-wave Circuitry ... | 6 |
| | 5.1.4 Crystal Current Monitoring Facility ... | 6 |
| | 5.1.5 AF Amplifier ... ... ... ... ... | 6 |
| | 5.1.6 The -9V and -6.3V Stabilisers ... ... | 6 |
| | 5.1.7 200V Stabiliser ... ... ... ... | 7 |
| | 5.2 Power Unit Type 4126A or B ... ... ... ... | 7 |
| | 5.3 Meter Unit Type 4127A, B, C, D or E ... ... | 8 |
| | 5.3.1 The 1st Multivibrator ... ... ... | 8 |
| | 5.3.2 The 2nd Multivibrator ... ... ... | 8 |
| | 5.3.3 Pulse Amplifier ... ... ... ... | 8 |
| | 5.3.4 HOLD OFF Position Type 4127A, B or E ... | 8 |
| | 5.3.5 HOLD OFF Position Type 4127C or D ... | 9 |
| | 5.3.6 HOLD ON Position Type 4127A, B or E ... | 9 |
| | 5.3.7 HOLD ON Position Type 4127C or D ... ... | 10 |
| | 5.3.8 Check Oscillator ... ... ... ... | 11 |
| 6 | INSTALLATION ... ... ... ... ... ... ... | 11 |
| 7 | OPERATION ... ... ... ... ... ... ... | 11 |
| | 7.1 General ... ... ... ... ... ... ... | 11 |
| | 7.1.1 Mode Switching Procedure ... ... ... | 12 |

CONTENTS (Contd.)


Page

7.2 Positioning ... ... ... ... ... ... ... 12
7.3 Interconnections ... ... ... ... ... ... 13
7.4 Calibration Check - Meter Unit ... ... ... ... 14
7.5 Movement of Meter Pointer ... ... ... ... ... 14

8 MAINTENANCE ... ... ... ... ... ... ... 14

8.1 Operators Maintenance ... ... ... ... ... 14

8.1.1 Battery ... ... ... ... ... ... 15
8.1.2 Adjustment of Meter Unit Type 4127A, B or E Calibration ... 15
8.1.3 Adjustment of Meter Unit Type 4127C or D Calibration ... 15
8.1.4 Adjustment of Remote Meter Unit Calibration 16
8.1.5 Crystal Current Check - Aerial Unit ... ... 16

8.2 Comprehensive Checks ... ... ... ... ... 16

8.2.1 Aerial Unit Type 4125A or B ... ... ... 17

8.2.1.1 Wavemeter Check ... ... ... ... 17
8.2.1.2 D.C. Checks ... ... ... ... 17
8.2.1.3 Noise Checks ... ... ... ... 18
8.2.1.4 AF Checks ... ... ... ... ... 18
8.2.1.5 Klystron Tuning ... ... ... ... 20
8.2.1.6 Klystron Replacement ... ... ... 20

8.2.2 Meter Unit Type 4127A to E ... ... ... 20

8.2.2.1 Oscillator Check ... ... ... 21
8.2.2.2 Multivibrator Checks ... ... ... 21
8.2.2.3 HOLD OFF Linearity Check Meter Unit Type 4127A, B or E ... ... 21
8.2.2.4 HOLD ON Linearity Check Meter Unit Type 4127A, B or E ... ... 22
8.2.2.5 Miller Circuit Adjustment Meter Unit Type 4127C or D ... ... ... 22
8.2.2.6 Hold Linearity Checks Meter Unit Type 4127C or D ... ... ... 22
8.2.2.7 HOLD Check Meter Unit Type 4127C or D 23
8.2.2.8 Signal Switch and Hold Operation ... 23
8.2.2.9 Remote Meter Test for Remote Meter Unit Type 4127B, C or D ... ... 23
8.2.2.10 Thermistor Check ... ... ... 23

## CONTENTS (Contd.)


| | | Page |
|---|---|---|
| 8.2.3 | Power Unit Type 4126A or B ... ... ... | 23 |
| 8.2.3.1 | Hum/Ripple Check ... ... ... | 24 |
| 8.2.4 | Setting Up the GAIN Control ... ... ... | 24 |
| 8.3 | Fault Finding ... ... ... ... ... ... ... | 24 |
| 8.4 | Table 1 ... ... ... ... ... ... ... | 25 |

APPENDIX 1

Recommended Methods of Servicing
Printed Wiring Boards.

## Illustrations


| | Fig. No. |
|---|---|
| Typical Site Position | 1 |
| P.E.T.A. General View | 2 |
| P.E.T.A. Assembled for Transportation | 3 |
| P.E.T.A. Drivers View | 4 |
| Analyser S350 (P.E.T.A.) Block Diagram | 5 |
| Type 4125 Aerial Unit Circuit Diagram | 6 |
| Type 4125 Aerial Unit Component Layout | 7 & 8 |
| Type 4126 Power Unit, Type 4127 Meter Unit Circuit Diagram | 9 |
| Type 4126B Power Unit Circuit Diagram | 10 |
| Type 4127C Meter Unit Circuit Diagram | 11 |
| Type 4126 A & B Power Unit Component Layout | 12 |
| Type 4127 Meter Unit Component Layout | 13 |
| Type 4127C Meter Unit Component Layout | 14 |
| F634 Main Printed Board | 15 |
| F635 Stabiliser Board | 16 |
| F641 Frequency Board | 17 |
| F642 Hold On Board | 18 |
| F752 Hold Off Board | 19 |
| F1417 Analyser Board | 20 |
| F1419 Frequency Meter Board | 21 |
| Typical Waveforms, Analyser S350 | 22 |
| Fault Finding Chart | 23 |
| Gain Setting Attenuator | 24 |


## Components List

Component schedules in this handbook are presented in the form of a master components list, which includes all components used in this equipment. Each component is identified by means of a spares reference number, column 1, in addition to the normal part identity in column 6.

Components shown on individual circuit diagrams may be identified in the master list by means of the cross-reference tables associated with each circuit diagram. The numbers given are the spares reference numbers.

Master Components List for Portable Electronic Traffic Analyser (P.E.T.A.) Type S350 Page A

This list will be found immediately after the text.

Cross Reference Lists:

These lists will be found adjacent to the circuit diagrams to which they refer.

# PORTABLE ELECTRONIC TRAFFIC ANALYSER

# (P.E.T.A.)

# TYPE S350

## 1 INTRODUCTION

The Portable Electronic Traffic Analyser, Type S.350, PETA, has been designed to give the operator comprehensive information on the movements of road traffic. This information of road speed is passed to the operator in the form of a meter reading, the meter having been calibrated in m.p.h. or k.p.h.

The equipment employs the 'Doppler' effect of frequency change in electro-magnetic waves reflected from moving objects. This principle allows simplicity of design, portability and high accuracy of measurement.

The equipment operates in the frequency band of 10,675 Mc/s to 10,699 Mc/s and its c.w. output provides a working range of 150 feet.

A remote meter is available as an optional extra and can be positioned up to a maximum of 450 feet from the equipment.

## 2 DATA SUMMARY

**NOTE:** *This is not a rigid specification, the performance figures given being typical only.*

| | |
|---|---|
| Frequency: | In the band 10,675 to 10,699 Mc/s. |
| Klystron Power Output: | 8 mW c.w. |
| Aerial: | Linear array with slotted waveguide feeding flare. |

| | |
|---|---|
| Horizontal Beamwidth: | $4^{\circ}$ |
| Vertical Beamwidth: | $20^{\circ}$ |
| Working Range: | 150 ft. (46 m). |
| Speed Range: | 10 - 80 m.p.h. (16 - 130 k.p.h.) |
| Discrimination: | Vehicles more than 8 ft. (2.5m) apart will give separate readings on HOLD OFF mode working. |
| Accuracy: | Better than ± 2 m.p.h. (±3.2 k.p.h.). |
| Meter: | Illuminated 4 in. (10 cm) rectangular. White figures on black background. Calibrated in either m.p.h. or k.p.h. |
| Power Supply: | $10\frac{1}{2}$V d.c. to 14V d.c. |
| Power Consumption: | $3\frac{1}{2}$A from a 12V car battery. |

Dimensions (Overall)

| | | | | | |
|---|---|---|---|---|---|
| Aerial Unit: | 9 in. (22.8 cm) | $27\frac{1}{2}$ in. (69.9 cm) | 9 in. (22.8 cm) | $17\frac{1}{2}$ lb. | (7.9 kg.) |
| Meter Unit: | 9 in. (22.8 cm) | $7\frac{1}{2}$ in. (19 cm) | $4\frac{1}{2}$ in. (11.4 cm) | $4\frac{1}{2}$ lb. | (2 kg.) |
| Power Unit: | 9 in. (22.8 cm) | 10 in. (25.4 cm) | $4\frac{1}{2}$ in. (11.4 cm) | $7\frac{1}{4}$ lb. | (3.3 kg.) |
| Cables & Connectors: ... ... ... ... ... | | | | $2\frac{1}{2}$ lb. | (1.1 kg.) |
| | | | Total: | $31\frac{3}{4}$ lb. | (14.3 kg.) |

## VALVES AND SEMI-CONDUCTOR DEVICES

| Quantity | British Commercial Type | CV No. | Remarks |
|---|---|---|---|
| 1 | QB309 or 12AT7WA | (CV 4024) | |
| 1 | QS 150/15 | (CV 287) | |
| 1 | E 182CC | (CV 2901) | Meter Unit Type 4127C only |
| 1 | EF 86 | - | |
| 11 | OC 71 | (CV 7005) | |
| 2 | V 15/20 IP | - | |
| 3 | OC 35 | (CV 7084) | |
| 5 | OC 44 | (CV 7003) | |
| 1 | OC 140 | - | |
| 1 | OC 201 | (CV 7044) | |
| 1 | OC 72 | (CV 7006) | |
| 1 | OC 73 | - | |
| 1 | OC 28 | (CV 7085) | |
| 1 | K 357 | - | transmitting klystron |
| 1 | Crystal | (CV 2154) | |

## 3 EQUIPMENT LIST

The Portable Electronic Traffic Analyser Type S.350 consists of the following equipment:

**S. 350**

| Main Units | Edn.A | Edn.B | Edn.C | Edn.D | Edn.E |
|---|---|---|---|---|---|
| Aerial Unit Type | 4125A | 4125A | 4125A | 4125B | 4125B |
| Power Unit Type | 4126A | 4126A | 4126A | 4126B | 4126B |
| Meter Unit | 4127A | 4127B | 4127E | 4127C | 4127D |

**Cables**

| Cable Assembly | Reference | S.350 Edition A | B | C | D | E |
|---|---|---|---|---|---|---|
| Power Unit to Battery | W.74004/B Sh.1 Edn.A | 1 | 1 | 1 | | |
| Aerial Unit to Meter Unit | W.74006/B Sh.1 Edn.A | 1 | 1 | 1 | | |
| Aerial Unit to Power Unit | W.74008/B Sh.1 Edn.A | 1 | 1 | 1 | | |
| Power Unit to Battery | W.74004/B Sh.1 Edn.B | | | | 1 | 1 |
| Aerial Unit to Meter Unit | W.74006/B Sh.1 Edn.B | | | | 1 | 1 |
| Aerial Unit to Power Unit | W.74008/B Sh.1 Edn.B | | | | 1 | 1 |

**Optional Extras**

| | S.350 Edition A | B | C | D | E |
|---|---|---|---|---|---|
| Remote Meter Type 6656A (m.p.h.) | | 1 | | 1 | 1 |
| Remote Meter Type 6656B (k.p.h.) | | 1 | | 1 | 1 |
| Graphical Recorder Type 6707A (m.p.h.) | | | 1 | 1 | 1 |
| Graphical Recorder Type 6707B (k.p.h.) | | | 1 | 1 | 1 |

# 4 BRIEF DESCRIPTION

The Portable Electronic Traffic Analyser Type S.350 consists of three main units:

(i) Aerial Unit
(ii) Power Unit
(iii) Meter Unit

When not in use these units clip together for transport and stowage. A locker is provided on the aerial unit for storing the interconnecting cables.

## 4.1 AERIAL UNIT TYPE 4125A OR B

This unit houses the transmitter, aerial, receiver, and the -9V, -6.3V and the +200V stabilisers.

The transmitter valve is an X band klystron giving an 8 mW, c.w. output. A wavemeter is built into the waveguide to permit checking of the transmitter frequency.

The aerial is common to both transmitter and receiver and consists of a linear array in a flare having a narrow beam width of approximately 4° which is directed at an angle of 20° across the road.

The receiver signal is mixed with a sample of the transmitter signal and the difference in frequency, dependent on the doppler effect from the moving vehicle, is applied to an a.f. amplifier and a shaping circuit. The output of the shaping amplifier is fed via SKP to the meter unit. The -9V stabiliser provides power for the transistorised circuits, the -6.3V stabiliser supplies the klystron and valve heaters and the 200V stabiliser supplies h.t. to the meter unit.

## 4.2 METER UNIT TYPE 4127A, B, C, D OR E

Meter Unit Type 4127A, B and E are fitted with close thread aluminium connectors whilst Types 4127C and D have brass connectors.

The meter unit comprises a check oscillator, a limiter stage, a 1st and 2nd Multivibrator, a pulse amplifier, a signal break detector circuit, a valve voltmeter and timing circuits.

The signal is passed through the limiter stage to the 1st multi-vibrator which, for every cycle, produces a square wave. There are two outputs, one to the 2nd multivibrator the other to the signal break detector circuit. The output from the 2nd multivibrator is applied to the pulse amplifier and then to the valve voltmeter which is calibrated in k.p.h. or m.p.h. When the HOLD switch is in the ON position, the timing and signal

break detector circuits prevent a slow-moving vehicle presenting a second reading.

The check oscillator provides a means of calibrating the meter at 40 m.p.h. (64 k.p.h.) and 70 m.p.h. (112 k.p.h.).

### 4.3 POWER UNIT TYPE 4126A OR B

The power unit provides stabilised supplies of +240V and -150V for the klystron and the valves in the meter and aerial units.

### 4.4 REMOTE METER TYPE 6656A OR B

This meter is identical to that fitted in the Meter Unit. The meter may be incorporated with the equipment if a remote speed indication is required. The remote meter is connected in series with the meter unit by means of a jack plug and socket, the socket being on the meter unit. The remote meter may be positioned up to 450 feet from the remainder of the equipment.

## 5 DETAILED DESCRIPTION

### 5.1 AERIAL UNIT TYPE 4125A OR B

Fig.6

#### 5.1.1 Aerial and Flare

The aerial comprises a linear, slotted array in a flare. The disposition of these slots gives a 'squint' angle of $20^{\circ}$ at a frequency of 10,687 Mc/s. The aerial has a horizontal beamwidth of $4^{\circ}$ and a vertical beamwidth of $20^{\circ}$. The front of the flare is covered by a fibreglass and hikar 'sandwich' $\lambda/4$ thick.

#### 5.1.2 Transmitter Valve

An X-band, pre-tuned reflex klystron, V4, is used as the transmitter valve. The klystron operates in the frequency range 10,675 Mc/s to 10,699 Mc/s and has a power output of approximately 8 mW, c.w.

The 240V supply is brought into the Aerial Unit on PLS/B and fed to the klystron resonator. This supply is decoupled by R47, C44. The reflector voltage is obtained from a potentiometer chain, R43, RV11 REFLECTOR VOLTS, R44, connected across the -150V supply. The resonator and reflector supplies may be monitored at SKH and SKG respectively. As the klystron body is at a potential of 240V, an insulated flange is provided between the klystron and the waveguide. The screws holding the klystron to the waveguide and those holding the waveguide sections together are unified thread. If replaced, the same type of screws must be used.

### 5.1.3 Waveguide and Micro-wave Circuitry

The klystron output is fed directly to a short slot hybrid which divides the power equally between the aerial and a variable mismatch. This mismatch is adjusted to reflect the requisite amount of power into the crystal, MR6, to produce a crystal current of 0.2 to 0.25 mA.

The received signal is again divided at the hybrid, one half passing to the transmitter and the other half to the crystal, MR6, to mix with the reflected sample from the mismatch. To prevent the detection of unwanted v.h.f. radiation, C15 and C25 are included.

A tuned cavity wavemeter is contained within the waveguide assembly. This enables the transmitter frequency to be checked.

### 5.1.4 Crystal Current Monitoring Facility

The crystal current and doppler signal are passed to a printed board F634, filtered by L9 and C5, to protect the crystal, and fed to the CRYSTAL CURRENT switch SWA. In the normal position of SWA the crystal current will be fed to the d.c. load, R46. When SWA is switched to the READ position the current if fed to the crystal current monitoring meter. On those models prior to serial number 054 this meter is not fitted and the current is fed to two test sockets where it may be monitored with an Avometer model 8 on the milliamp scale.

### 5.1.5 AF Amplifier

The audio input is applied to an m-derived low pass filter, C8, C9, C11, and L7, and then fed to the a.f. amplifier. The amplifier may be considered in two sections; that before, and that after, the threshold.

The first section consists of three stages of grounded emitter amplification, VT2, VT3, VT4, and an emitter follower, VT5. The overall gain of the section is controlled by RV3 and the maximum is 85 dB. The output of the emitter follower, which may be monitored at SKB, is applied to the threshold. The threshold, MR10 and MR11, only passes signals greater than 0.4V peak to peak in amplitude.

To obtain the correct operational frequency response it is necessary for the shaping amplifier, VT9, to have a falling response of 12 dB per octave, i.e. for every doubling of frequency, the signal level is divided by 4. This response is effected by R15, C35, R41 and C38. The output of the a.f. amplifier is then fed via SKP/B to the meter unit.

### 5.1.6 The -9V and -6.3V Stabilisers

The low voltage stabiliser supplies a -9V rail for the transistorised stages from the -12V input at PLS/C.

VT21 is the series regulator. VT23, which has its collector load, R54, directly coupled to V22 base, acts as a comparator between the voltage on the slider of RV1 and the reference voltage across the low voltage stabilisers, BY3 and BY4. VT22 is biased by BY1 and BY2 and feeds VT21 base via VT25, an emitter follower. R51 is the collector load for VT22. R53 and R56 provide a standing current in the low voltage stabilisers. The -9V output of the stabiliser is taken from the emitter of VT21.

The -9V output is also used as a reference for a simple emitter follower type of stabiliser supplying the klystron and meter unit valve heaters. R61, RV2, and R59 form a voltage divider network to drop the -9V to -6.3V which is applied to VT24 base. VT24 acts as an emitter follower driving VT26, another emitter follower. The -6.3V output is taken from the emitter of VT26. The 12V input is dropped to 10V across R62 to minimise dissipation in VT26.

### 5.1.7 200V Stabiliser

The 200V stabiliser supplies h.t. to the meter unit. The 200V rail is stabilised by V5, a double triode. The circuit is conventional, the 200V output being taken off the cathode of V5A. The output potential is determined by the bias on the grid of V5B, obtained via RV13.

## 5.2 POWER UNIT TYPE 4126A OR B

Figs. 9 & 10

The Power Unit Type 4126 supplies +240V and -150V to the klystron and the 200V stabiliser in the Aerial Unit.

The 12V d.c. supply to the Power Unit is fed to a series stabiliser through a filter network C91, C98, and L14. The filter network isolates the high peak currents, occuring in the power supply convertor, from the rest of the equipment. The series stabiliser, VT61, VT62, which obtains its reference voltage from the -9V stabilised supply in the Aerial Unit, supplies the input voltage to TR1 of the convertor.

The convertor is a ringing choke oscillator with TR1 the energy store, and power transistor VT63, the switch. RV31 controls the base current to VT63, thus governing the peak collector current which in turn governs the output voltage. The positive output of TR1 is rectified by MR22 and is filtered by C96, C97, and L13. The negative output of TR1 is rectified by MR21, MR23, and is filtered by C93, R167, and C94.

The negative 150V output is stabilised by V3, the ignition electrode voltage being supplied from the +240V line via R166. The +240V and -150V from outputs of the Power Unit are taken out on socket SKS, Pins B and D respectively.

## 5.3 METER UNIT TYPE 4127A, B, C, D OR E

Figs. 9 & 11

The a.f. signal is fed from the Aerial Unit to two limiting stages VT42 and VT43 via the CHECK switch SWB. VT42 and VT43 form a d.c. coupled limiting amplifier. R106, R107, and R111 are the bias components, and R109 the collector load for VT42. The emitter of VT43 is biased by BY6, and its collector load, R125, is coupled to the emitter of VT42 to give good d.c. stability. The output at the collector of VT43 is a series of 3V to 4V square waves, at the doppler frequency, which trigger the 1st multivibrator, VT47 and VT48.

### 5.3.1 The 1st Multivibrator

In the stable condition, VT48 is cut off and VT47 conducting. The base of VT48 is driven negative by the trigger pulse, and VT48 conducts. The base of VT47 is driven positive by the signal coupled from the collector of VT48 via C84 and R149, and the resulting negative swing of its collector is coupled to the base of VT48, via R150, R151; holding VT48 conducting for a period determined by the RC time constant R149, C84.

A 90 μs output pulse is taken from each collector. One is differentiated and applied to the 2nd multivibrator, the other is applied to the Signal Break Detector circuit.

### 5.3.2 The 2nd Multivibrator

In the stable condition, VT46 is cut off and VT44 conducting. The differentiated pulse fed to the base of VT46 causes it to conduct. The base of VT44 is driven positive by the signal coupled from the collector of VT46 via C72 and R119. The resulting negative swing of VT44 collector is coupled to the base of VT46 via R122, holding VT46 conducting for a period determined by the duration of the RC time constant of C72, R119.

The output from the 2nd Multivibrator is taken from the collector of VT46 and is a positive pulse, of 180 μs duration, for each received doppler cycle.

### 5.3.3 Pulse Amplifier

The output pulse from the 2nd multivibrator is fed directly to the grid of V2A, which is normally cut-off, producing at the anode a negative going pulse of approximately 100V peak amplitude. The pulse amplitude is stabilised by the network, MR12, R144, and R146. The application of this output pulse will depend on the position of the HOLD switch, SWC.

### 5.3.4 Hold Off Position Type 4127A, B or E

With SWC in the HOLD OFF position the series of pulses is applied to the network C76, RV23 and R132. RV23 is used to adjust the meter calibration in the HOLD OFF position of SWC. The resultant signal will be a mean voltage, developed across R132, proportional to the frequency of

the input pulses. This voltage is rectified by MR13 and fed to the filter network C81, R143 and R145.

The d.c. voltage across C81, which is directly proportional to the received doppler frequency, is applied to the grid of V2B. V2B, together with M1, R127, and R133 form a valve-voltmeter circuit to indicate the rectified mean voltage. RV25 provides a zero adjustment for the voltmeter.

The collector of VT52 is grounded by SWC4 thus preventing further application of the signal.

**5.3.5 Hold OFF POSITION Type 4127C or D** Fig.11

With SWC in the HOLD OFF position the series of pulses is applied to the network C76, RV23, RV22 and R132. RV22 is used to trim the meter calibration in the HOLD OFF position of SWC. The resultant signal will be a mean voltage, developed across R132, proportional to the frequency of the input pulses. This voltage is rectified by MR13 and fed to the filter network C77, R143 and R145.

The d.c. voltage across C77, which is directly proportional to the received doppler frequency, is applied to the grid of V2B. A valve-voltmeter circuit to indicate the rectified mean voltage is formed by V2B together with M1, R127 and R133. Zero adjustment for the voltmeter is provided by RV25.

V6 is rendered inoperative by SWC3 and the collector of VT52 is grounded by SWC4, thus preventing further application of the signal.

**5.3.6 Hold On Position, Type 4127A, B or E** Fig.9

When the HOLD ON position of SWC is selected, the series of pulses from the anode of V2A is applied to the network C76, RV23, R132, and RV22. The resultant signal is, again, a mean voltage proportional to the frequency of the input pulses. RV22 is used to trim the calibration in the HOLD ON position of SWC. The rectified mean voltage from MR13 is now applied to the grid of V2B across storage capacitor C77. The action of the valve-voltmeter circuit is the same as with SWC in the HOLD OFF position.

The signal at the cathode of V2B is a positive going step in voltage which is applied, via RV24, to the base of VT52. This cuts off the transistor, which normally operates at saturation, due to the bias applied via RV24. With VT52 cut-off, C78 and C79 charge towards -9V via R136, saturating VT54 in approximately 0.3 seconds from the beginning of the signal. When saturated VT54 offers a low impedance path to earth to the trigger pulses being fed to the 2nd multivibrator. The 2nd multivibrator, prevented from firing, ceases to feed information to the storage capacitor C77.

Meanwhile, the voltage across C78 continues to rise until it reaches approximately 1.6V, at which point VT53 will start conducting. VT53 conducts $1\frac{1}{2}$ to 2 seconds after the beginning of the signal and energizes relay RLA, shorting out C77 and ensuring the complete discharge of C78, C79.

When RLA energizes it connects VT50 and VT53 in parallel. If the 1st Multivibrator is still firing, due to a doppler signal being present, the action of the peak detector VT49 will develop a voltage at the base of VT50. VT50 will then conduct and keep RLA energized.

This prevents a slow moving vehicle from giving more than one reading since, if the vehicle is still giving a signal after $1\frac{1}{2}$ seconds display time, the signal break detector circuit will keep RLA energized until the signal has disappeared.

**5.3.7 Hold On Position, Type 4127C or D** Fig.11

The following description applies only to the Edition C meter unit. This edition incorporates a Miller amplifier to stabilize the action of the circuit in the HOLD ON position.

When the HOLD ON position of SWC is selected, the series of pulses from the anode of V2A is applied to the network C76, RV23 and R132. The resultant signal is, again, a mean voltage proportional to the frequency of the input pulses. RV23 is used to adjust the calibration in the HOLD ON position of SWC. The rectified mean voltage is then applied to the grid of V2B across a storage capacitor C77. The action of the valve voltmeter is the same as in editions A, B and E.

The signal at the cathode of V2B is a positive going step in voltage which is applied, via RV24, to the base of VT52 and also, via C101, to the grid of V6. The signal cuts off the transistor, which normally operates at saturation, due to the bias applied via RV24 and R135. With VT52 cut off, C78 and C79 charge towards -9.0V via R136, saturating VT54 in approximately 0.3 seconds from the commencement of the signal. When saturated VT54 offers a low impedance path to earth to the pulses being fed to the 2nd Multivibrator. The 2nd Multivibrator, prevented from firing, ceases to feed information to the grid of V2B. The valve V6, operating as a Miller amplifier, continues to conduct, due to the charge on C101, and in so doing maintains the charge on C77 until C101 discharges. This provides a compensating action prolonging the decay of the signal by the amount of the gain of the amplifier. RV26 is used to adjust the initial current flow in V6 to prevent fluctuations or droop in the meter indication at the commencement of a signal.

Meanwhile, the voltage across C78 continues to rise until it reaches approximately 1.6V, at which point VT53 will start conducting. VT53 conducts $1\frac{1}{2}$ - 2 seconds after the beginning of the signal and energizes relay RLA, and via contacts RLA1, relay RLB.

When RLA energizes it ensures the complete discharge of C78 and C79 and also connects VT50 and VT53 in parallel. If the 1st Multivibrator is still firing, due to a doppler signal being present, the action of the peak detector VT49 will develop a voltage at the base of VT50. VT50 will then conduct and keep RLA energized.

RLB, when energized, discharges C77 and shorts the grid of V6 to earth, thus discharging C101 and retuning the Miller amplifier to the original, pre-signal condition.

The action of VT50 maintaining relay RLA in the energized position prevents a slow moving vehicle from giving more than one reading, since, if the vehicle is still giving a reading after $1\frac{1}{2}$ seconds display time, the signal break detector circuit will keep RLA energized until the signal has disappeared.

### 5.3.8 Check Oscillator

The check oscillator operates at a frequency of 1.20 Kc/s or 2.10 Kc/s which corresponds to speeds of 40 m.p.h. (64 k.p.h.) and 70 m.p.h. (112 k.p.h.) respectively, providing a means of calibrating the meter.

The oscillator, VT41, is connected to the selected tuned collector oscillatory circuit by the 40-70 (64-112) switch SWD. Feedback is applied via a step down winding between base and earth, R103 and R110 acting as antisquegg resistors. R101, R102 and R104 are biassing components, decoupled by C61 and C62.

When the CHECK switch, SWB, on the front panel, is operated, -9V is applied to the oscillator circuit. The input of the limiter stage is switched to the oscillator output. Operation of the meter unit is then as described in 5.3.

## 6 INSTALLATION

The battery cable is supplied with the positive and negative leads unterminated. These leads may be fitted with crocodile clips with lug type connectors, or with a non-reversible 13 or 15A plug. The plug fitting is strongly recommended since this will prevent the battery connections being reversed and, once fitted, will enable the operator to set-up his equipment more quickly. Lug type connectors will prevent polarity reversal only if a battery with lugs of differing sizes is to be used.

## 7 OPERATION

### 7.1 GENERAL

The Portable Electronic Traffic Analyser (P.E.T.A.) may be used to check the speed of offending vehicles or to obtain information on the number and the average speed of vehicles.

Two modes of operation are provided. These are known as HOLD ON and HOLD OFF and can be selected by means of a two position switch situated inside the meter unit. Placed in this position, accidental mode switching

cannot occur.

HOLD ON. This operating mode is recommended for Police Operation as it provides a distinct indication of a vehicle's speed for a period of approximately 1½ seconds. During this period of time, any other vehicle entering the beam will not be registered.

HOLD OFF. This operating mode is recommended for traffic analysis work when vehicle counting or average speeds are required. All speeds will be registered on the meter unit for a period equal to the length of time the vehicle is in the beam. Two vehicles in the beam at the same time will not prevent the true speed of each being registered unless the vehicle furthest away from the radar is completely blanked by the nearer vehicle.

Before issuing the equipment to the operator it may be felt advisable to select the mode of operation according to the activities to be undertaken. This procedure may prevent difficulties arising in the case of an inexperienced operator.

### 7.1.1 Mode Switching Procedure

(a) Disconnect the battery.

(b) Unscrew the four captive screws attaching the instruction plate to the rear of the meter unit. Inside the meter unit, at the bottom centre, is a small metal plate through which the mode switch spindle protrudes. Marked on this metal plate are HOLD ON and OFF.

(c) Insert a screwdriver into the slot at the end of the spindle and turn either right or left, according to the operating mode required.

(d) Replace the instruction plate and reconnect battery.

(e) Allow five minutes for the equipment to warm up before accurate readings are taken.

## 7.2 POSITIONING

The equipment may be operated from the boot of a patrol car or placed on a small table, or similar support, approximately 18 to 30 inches high. After the operational site has been selected, remove the meter and power units by operating the two spring catches (Fig.2) to one side and sliding each unit vertically, clear of the aerial unit.

It will be observed that a RED arrow is marked on the upper and lower surfaces of the aerial unit. This arrow indicates the direction of the radar beam and with the unit correctly positioned, points across the line of traffic at the required angle of 20°.

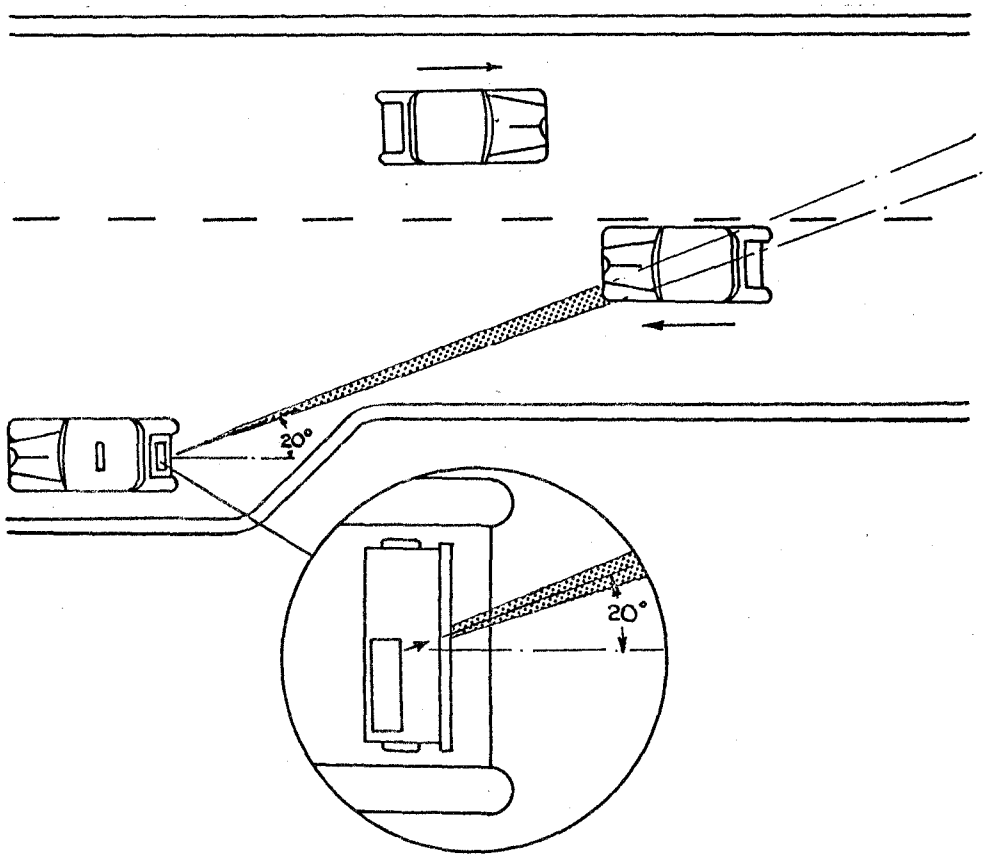


**FIG. 1 TYPICAL SITE POSITION**

Correct operation is achieved by positioning the aerial unit with its shorter sides parallel to the roadside. Rubber feet are provided on the upper and lower surfaces of the aerial unit to enable correct operation from either side of the road or from the centre of a dual-carriage-way.

### 7.3 INTERCONNECTIONS

Three colour-coded cables are provided inside the aerial unit cable locker (Fig. 2). Corresponding colours are marked on the individual units.

**NOTE:** *The battery connections MUST be made only after all other connections are completed. If crocodile clips or lug connectors are used, connect the RED lead to positive (+) terminal and the BLACK lead to the negative (-) terminal.*

After the interconnections have been made, a faint high pitched whistle should be heard from the power unit. A five minute stabilising period MUST be allowed before accurate readings are taken.

### 7.4 CALIBRATION CHECK - METER UNIT

Calibration signals corresponding to 40 m.p.h. (64 k.p.h.) and 70 m.p.h. (112 k.p.h.) are provided within the equipment. Calibration checks can be carried out at any interval, and in particular following the apprehension of each offender, by operating the CHECK switch. The readings obtained must lie between 38 and 42 m.p.h. (61 and 67 k.p.h.) for 40 m.p.h. (64 k.p.h.) and between 68 and 72 m.p.h. (109 and 115 k.p.h.) for 70 m.p.h. (112 k.p.h.).

As an additional accuracy check, a patrol car, fitted with a speedometer checked for accuracy against a stop watch over a measured mile, may be driven through the beam, at a selected speed before the commencement of operations. This check may also be carried out at the conclusion of operations.

### 7.5 MOVEMENT OF METER POINTER

The movement of the meter pointer on editions A, B and E of Meter Unit Type 4127 is that of a well-damped meter movement. On editions C and D the meter pointer behaves as though the movement is undamped with an overshoot of approximately 10% of the correct deflection. If, for example, the equipment is used to check a speed of 50 m.p.h. the following sequence of readings will be observed:

(a) a momentary reading of 55 m.p.h. (approximately) followed by

(b) a reading of 50 m.p.h. which during the 1.5 second HOLD ON period 'droops' by not more than $\frac{1}{4}$ m.p.h. and then returns to zero.

## 8 MAINTENANCE

Maintenance of the equipment is divided into two sections:-

Section 8.1 consists of checks that may be performed by the operator at his base.

Section 8.2 consists of comprehensive checks requiring the services of a skilled technician and special test gear.

The comprehensive checks in 8.2 should only be performed when satisfactory results cannot be obtained after carrying out the checks detailed in 8.1., or when a fault occurs. The fault finding chart, Fig.23, should be used as a guide as to which check to perform.

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## 8.1 OPERATOR'S MAINTENANCE

### 8.1.1 Battery

Care must be taken to keep the battery in a good state of charge. The frequency of recharging will be dependent upon the capacity of the battery in use.

### 8.1.2 Adjustment of Meter Unit Type 4127A, B or E Calibration

(a) Remove the back of the meter unit.

(b) Set the HOLD switch to OFF.

(c) Set the 40 - 70 (64 - 112) switch to 40 (64).

(d) Depress the CHECK switch.

(e) Adjust the NO HOLD CAL. control until the meter reads 40 m.p.h. (64 k.p.h.)

(f) Set the 40 - 70 (64 - 112) switch to 70 (112).

(g) Check that the meter reads 70 m.p.h. (112 k.p.h.).

(h) Set the HOLD switch to ON.

(i) Set the 40 - 70 (64 - 112) switch to 40 (64).

(j) Adjust the HOLD CAL. control until the meter reads 40 m.p.h. (64 k.p.h.).

(k) Release the CHECK switch.

(l) Set the 40 - 70 (64 - 112) switch to 70 (112).

(m) Depress the CHECK switch. The meter should now read 70 m.p.h. (112 k.p.h.).

(n) Replace the back of the meter unit.

### 8.1.3 Adjustment of Meter Unit Type 4127C or D Calibration

(a) Remove the back of the meter unit.

(b) Set the HOLD switch to ON.

(c) Set the CHECK 40 - 70 (64 - 112) switch to 40 (64).

(d) Depress the CHECK ON switch.

(e) Adjust the SET CAL. control, RV23, until the meter reads 40 m.p.h. (64 k.p.h.).

(f) Set the CHECK 40 - 70 (64 - 112) switch to 70 (112).

(g) Check that the meter reads 70 m.p.h. (112 k.p.h.).

(h) Set the HOLD switch to OFF.

(i) Set the CHECK 40 - 70 (64 - 112) switch to 40 (64).

(j) Check that the meter still reads 40 m.p.h. (64 k.p.h.). If not adjust RV22, on the main printed board, to give a meter

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reading of 40 m.p.h. (64 k.p.h.). Access to RV22 is obtained by releasing the board fastener and hingeing the board outwards from the meter unit.

(k) Set the CHECK 40 - 70 (64 - 112) switch to 70 (112).

(l) Check that the meter reads 70 m.p.h. (112 k.p.h.).

(m) Any excessive fluctuation in the meter indication before taking up a steady reading should be eliminated by adjusting RV26 to give a droop of $\frac{1}{4}$ m.p.h. (See 8.2.2.7.)

(n) Replace the back of the meter unit.

### 8.1.4 Adjustment of Remote Meter Unit Calibration

(a) Connect remote meter unit to the meter unit.

(b) Carry out 8.1.2 (a) to (d) and check that the reading on the meter unit does not differ by more than 0.5 m.p.h. (1 k.p.h.) from that previously obtained.

(c) Check that the reading at the remote meter unit does not differ by more than 0.5 m.p.h. (1 k.p.h.) from that at the meter unit.

### 8.1.5 Crystal Current Check - Aerial Unit

This check should be carried at 100 hour intervals after the first 200 hours. Ensure that the fibreglass front of the aerial unit does not point in the direction of large objects when carrying out this check.

(a) Switch on the equipment and allow a warming-up period of at least 15 minutes.

(b) Open the panel at the back of the aerial unit to expose the built-in meter.

(c) Press the XTAL CURRENT switch to READ and adjust the REFLECTOR VOLTAGE control for maximum deflection on the meter. This reading should be at least half full-scale.

On models prior to serial number 054 the built-in meter is not fitted.

(d) Connect an Avometer Model 8, set to the 1mA d.c. range, to the TEST sockets.

(e) Press the XTAL CURRENT switch to READ and adjust the REFLECTOR VOLTAGE control for maximum deflection on the Avometer. This reading should be between 0.2 and 0.25 mA.

## 8.2 COMPREHENSIVE CHECKS

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**NOTE:** *It is important that the battery voltage is maintained at 10.5V - 14V d.c.*

### 8.2.1 Aerial Unit Type 4125A or B

Test Equipment

Avometer Model 8.

Advance H1 signal generator, or similar
Solartron CD523 oscilloscope, or similar
Marconi Instruments TF338 variable attenuator,
or as Fig.24.

Tested Power Unit Type 4126.

#### 8.2.1.1 Wavemeter Check

(a) Switch on the equipment and allow a warming-up period of at least 15 minutes.

(b) Open the panel at the back of the aerial unit to expose the built-in meter.

(c) On models prior to serial number 054 connect an Avometer Model 8, set to the 1 mA d.c. range to the TEST sockets.

(d) Press the XTAL CURRENT switch to READ and adjust the wavemeter for minimum crystal current reading. This minimum reading should occur at the wavemeter setting where the mark on the barrel is adjacent to the centre mark on the thimble. The outer marks on the thimble indicate the operational limits.

(e) If the wavemeter setting marks are not adjacent, adjust the Klystron Tuning Screw by a SMALL amount and again tune the wavemeter for minimum reading.

(f) If the marks are now closer, continue to adjust the Klystron Tuning Screw in the same direction, and tune the wavemeter for minimum reading, until the marks are adjacent.

(g) If the marks are further apart, adjust the Klystron Tuning Screw in the other direction.

(h) Check the crystal current as in 8.1.5 then repeat (d) above.

(i) After checking the wavemeter setting, MISTUNE THE WAVEMETER BY AT LEAST TWO TURNS.

#### 8.2.1.2 D.C. Checks

(a) Remove the Aerial Unit from its case, but leave it connected.

(b) Switch on the equipment and allow a warming up period of at least 15 minutes.

(c) Connect an Avometer Model 8, set to the 10V d.c. range, between pin 2, on the stabiliser board, and earth.

(d) Adjust RV1, the set - 9V control, to give exactly - 9V d.c.

(e) Connect the Avometer, set to the 10V d.c. range, between pin 4 and earth and adjust RV2, the set -6.3V control, to give exactly -6.3V d.c.

(f) Connect the Avometer, set to the 2.5V d.c. range, across BY4 and BY2 in turn. Check that the voltage across each is 1.5V ± 0.05.

(g) Connect the Avometer, set to the 10V d.c. range, between the negative end of BY1 and earth and between the negative end of BY3 and earth. Check that the voltage in each case is 3V ± 0.1V.

(h) Connect the Avometer, set to the 250V d.c. range, between SKH (red), on the klystron control panel, and earth. Check that the voltage is 240V. Adjust RV31, on the power unit, if necessary.

(i) Connect the Avometer, set to the 250V d.c. range, between SKG (blue), on the klystron control, and earth. Check that the voltage is -150V ± 5V.

(j) Connect the Avometer, set to the 250V d.c. range, between SKW, on the Klystron Control Panel and earth. Check that the voltage is 200V. Adjust RV13 if necessary.

(k) If any voltage adjustments have been made, carry out a calibration check as detailed in 8.1.2 or 8.1.3 and a crystal current check as in 8.1.5.

**8.2.1.3 Noise Check**

**NOTE:** *This check should be performed in a location free from stray radiation and electrical interference.*

(a) Connect the oscilloscope to the positive end of C19 (on models after 042, SKB)

(b) Set the GAIN control, RV3, to maximum and measure the noise level on the oscilloscope. This must be less than 500 mV peak to peak.

(c) Check that low frequency oscillations are not present.

**8.2.1.4 A.F. Checks**

(a) Remove the crystal.

(b) Using the oscilloscope, adjust the signal generator output to give a 1 kc/s c.w. signal, 0.5V peak to peak amplitude.

(c) Connect the signal generator output to pin 11 (on models after 042, SKA) via a 65 dB attenuator.

(d) Set the gain control RV3, to give 65 dB ± 1 dB at the positive end of C19 (on models after 042, SKB).

(e) Connect a 1k ohm resistor in the output lead of the attenuator and increase the signal generator frequency to 2.4 kc/s. Check that the input filter reduces the gain by 3 dB ± 2 dB.

(f) Increase the signal generator frequency to 3.5 kc/s and check that the input filter reduces the gain by 13 dB ± 3 dB. Remove the 1 kohm resistor.

(g) Using the oscilloscope, adjust the signal generator output to give a 1 kc/s c.w. signal, 0.1V peak to peak amplitude.

(h) Connect the signal generator output to the positive end of C30 (on models after 042, SKC) via a 50μF capacitor.

(i) Connect the oscilloscope to pin 19 (on models after 042, SKD).

(j) Increase the signal generator frequency and check that the unity gain point of VT9 is between 1.3 kc/s and 3.0 kc/s. Note this frequency.

(k) Reduce the input frequency to one half of that obtained in (j) above and check that the gain has increased by 12 dB $^{+o}_{-2}$ dB.

(l) Increase the input frequency to twice that obtained in (j) and check that the gain has decreased by 12 dB $^{+o}_{-2}$ dB.

(m) Connect the signal generator to pin 11 (on models after 042, SKA) and the oscilloscope to the positive end of C19 (on models after 042, SKB).

(n) Adjust the signal generator output to give 0.2V peak to peak amplitude.

(o) Re-connect the oscilloscope to the positive end of C30 (on models after 042, SKC) and check that the output is less than 0.05V peak to peak amplitude.

(p) Re-connect the oscilloscope to C19 and increase the signal generator output to give 2V peak to peak amplitude.

(q) Re-connect the oscilloscope to C30 and check that the output is now greater than 1.5V peak to peak amplitude. N.B. Some distortion of the sinewave will occur at the positive end of C30 (on models after 042, SKC). See Fig.22 waveform k.

(r) Replace the crystal.

#### 8.2.1.5 Klystron Tuning

(a) Let the equipment warm up for at least 15 minutes.

(b) Check that the resonator voltage is at 240V.

(c) Tune the REFLECTOR VOLTAGE control for maximum crystal current (See 8.1.5).

(d) Tune the wavemeter for a dip in the crystal current reading.

(e) If the dip in current occurs at a wavemeter setting outside the marked limits, adjust the screw in the side of the klystron by half a turn.

(f) Retune the REFLECTOR VOLTAGE control for maximum crystal current.

(g) Retune the wavemeter for a dip in the crystal current reading. If this reading occurs at a wavemeter setting closer to the desired setting continue to adjust the klystron screw in the same direction and repeat step (f), until the wavemeter setting is within the set limits. If the wavemeter setting is further from the limits than before adjusting the screw, reverse direction of the adjustment and repeat until the desired wavemeter setting is obtained.

#### 8.2.1.6 Klystron Replacement

When replacing the klystron attention should be paid to the following:-

(a) Replacement of the polythene gasket.

(b) Replacement of the unified thread screw (do not use BA screws).

(c) That the top cap is replaced before switching on.

### 8.2.2 Meter Unit Type 4127A

Test Equipment.

Avometer Model 8.

HI Advance Signal Generator, or similar
Solartron CD523 Oscilloscope, or similar i.e. Serviscope.

M.I. TF338 Attenuator or as Fig.24.

Tested Power Unit 4126.

Remote Meter (for Ed.B, C or D meters only).

Set RV25 fully clockwise, the gain control RV21 to maximum and all other controls including RV24 to their mid position. Switch to the HOLD OFF position. Check that the voltages across BY5 and BY6 are 1.5V ± .05V. Check that the meter lamp is alight.

**8.2.2.1 Oscillator Check**

(a) Connect the oscilloscope to SWB pin 4.

(b) Operate the 40 - 70 (64 - 112) switch to 40 (64).

(c) Check that the oscillations are continuous and free from squegging.

(d) Repeat for 70 (112) position of the 40-70 (64 - 112) switch.

**8.2.2.2. Multivibrator Checks**

(a) Connect the signal generator output to SKL.

(b) Set the signal generator frequency to 1.5 kc/s c.w.

(c) Set the a.f. input level to give a good square wave out from the limiting amplifiers.

(d) Connect the oscilloscope to VT48 collector. Check for a positive going square wave of not less than 5.5V amplitude (see Fig.22,d). Connect the oscilloscope to VT47 collector. Check for a negative going square wave of not less than 5.5V amplitude (see Fig.22,c).

(e) Connect the oscilloscope to VT46 collector. Check for a positive going square wave of not less than 4.5V amplitude. (see Fig.22,f).

8.2.2.3 Hold Off Linearity Check Meter Unit Type 4127A, B or E.

(a) Set the HOLD switch to the HOLD OFF position.

(b) Set the gain control, RV21, to minimum.

(c) Adjust RV25 for a reading of 0 m.p.h. (0 k.p.h.).

(d) Operate the CHECK switch and adjust NO HOLD CAL. RV23, with the 40 - 70 (64 - 112) switch alternatively at 40 (64) and 70 (112), until the readings are as accurate as possible in both positions.

(e) Repeat (c) and (d) until the readings at 0, 40 and 70 m.p.h. (0, 64 and 112 k.p.h.) are accurate, i.e. the scale is perfectly linear.

**8.2.2.4 Hold On Linearity Check Meter Unit Type 4127A, B or E**

(a) Turn the gain control, RV21, up and inject a signal at SKL to give a reading of 10 m.p.h. (16 k.p.h.) on the meter.

(b) Switch to HOLD ON and adjust RV24 so that the reading on the meter just switches off.

(c) Check that the voltage at VT52 collector is between 0.1V and 0.2V.

(d) Adjust the HOLD CAL. RV22 for accurate readings at 40 and 70 m.p.h. (64 and 112 k.p.h.) using the 40 - 70 (64 - 112) switch.

(e) To give correct operation of the hold circuits, adjust the contacts of RLA to ensure that RLA3 makes first. This may not always be necessary.

**8.2.2.5 Miller Circuit Adjustment Meter Unit Type 4127C or D**

(a) Set the HOLD switch to the HOLD OFF position.

(b) Set the CHECK 40 - 70 (64 - 112) switch to 70 (112).

(c) Depress the CHECK ON switch and adjust the SET CAL. control RV23 for a reading of approximately 70 m.p.h. (112 k.p.h.) on the meter.

(d) Set the HOLD switch to the HOLD ON position.

(e) Depress the CHECK ON switch and note the droop on the meter reading.

(f) Adjust RV26 to give $\frac{1}{4}$ m.p.h. ($\frac{1}{2}$ k.p.h.) droop during the hold time. NOTE: Due to the timing circuits, the CHECK ON switch will have to be released after each reading and depressed again to obtain further readings.

**8.2.2.6 Hold Linearity Checks Meter Unit Type 4127C or D**

(a) Set the HOLD switch to the HOLD ON position and adjust RV25 until the meter reads 0 m.p.h. (k.p.h.).

(b) Adjust the SFT CAL. control RV23 until the meter readings obtained, using the check oscillators at 40 and 70 (64 and 112), are nearly linear.

(c) Alternately adjust RV25 further anti-clockwise and the SET CAL. control RV23 until the meter readings at 0, 40 and 70 m.p.h. (0, 64 and 112 k.p.g) are accurate, i.e. the scale is linear.

### 8.2.2.7 Hold Check Meter Unit Type 4127C or D

(a) Turn up the gain control RV21 and inject a signal to give a reading of 10 m.p.h. (16.5 k.p.h.).

(b) Set the HOLD Switch to the HOLD ON position and adjust RV24 until the reading just switches off.

(c) Check that the voltage at the collector of VT52 is between 0.1 and 0.2V.

(d) Set the HOLD switch to the HOLD OFF position.

(e) Adjust RV22 until the readings obtained when the CHECK 40 - 70 (64 - 112) and CHECK ON controls are operated, are as those in 8.2.2.8. It may be necessary to adjust the contacts of RLA to ensure that RLA4 makes first to give correct operation of the hold circuits.

### 8.2.2.8 Signal Switch and Hold Operation

(a) Connect the oscilloscope to VT46 collector.

(b) Inject a 1.5 kc/s c.w. signal at SKL and check that:-

(i) The signal switch operates at 0.3 ± 0.1 seconds from the start of the multivibrator chain.

(ii) The hold time is 1.5 ± 0.5 seconds (see Fig.22 (i)).

(c) Switch to HOLD OFF and check that no multivibrator waveforms are present when the signal input is switched off.

### 8.2.2.9 Remote Meter Test for Meter Unit Type 4127B, C or D

(a) Insert the Remote Meter Jack.

(b) Check that the readings at 40 and 70 m.p.h. (64 and 112 k.p.h.) are accurate within 1 m.p.h. (1.5 k.p.h.).

### 8.2.2.10 Thermistor Check

(a) Disconnect the Meter Unit from the remainder of the equipment.

(b) Connect the Avometer Model 8 across the thermistor R127.

(c) Set the Avometer to OHMS and check that at an ambient temperature between 15°C and 30°C the measured resistance is between 130Ω and 250Ω.

## 8.2.3 Power Unit Type 4126A or B

Test Equipment

Avometer Model 8.

Solartron CD523 or similar oscilloscope.

### 8.2.3.1 Hum/Ripple Check

(a) Carry out instructions 8.2.1.2 (c), (d), (e), (h) and (i).

(b) Connect the oscilloscope to SKH (red) on the klystron control panel and check that the hum/ripple level on the 240V line is less than 50 mV peak to peak.

(c) Connect the oscilloscope to SKG (blue) on the klystron control panel and check that the hum/ripple level on the -150V line is less than 150 mV peak to peak.

(d) Connect the oscilloscope to the collector of VT63 and check that the waveform is similar to that in Fig.22 (j) and is within the specified limits.

### 8.2.4 Setting Up the Gain Control

(a) Set up the equipment for operation at the side of the road (see 7.2).

(b) Set the HOLD switch to the HOLD OFF position.

(c) Turn the gain control, RV21 in the meter unit, to maximum.

(d) Adjust the GAIN control, RV3 in the aerial unit, so that the meter just commences to flicker from zero on noise.

(e) Re-adjust the GAIN control to a point midway between the setting, established in (d) and its minimum position.

(f) Check that large lorries do not cause an upward flick of the needle before the normal indication. If this does occur turn down the GAIN control until this effect ceases.

## 8.3 FAULT FINDING Fig.23

As an aid to fault finding, a chart showing the symptoms of possible faults is provided. This, together with Table 1, will facilitate the location of most faults.

It is advisable to check the condition of MR24 whenever a fault is discovered in the stabilizer circuit. MR24 is a safety device and should it become a short-circuit, the effect of incorrectly connecting the external 12V supply is to cause widespread damage in the stabilizer circuit.

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## TABLE 1

Variations of ± 5V on the 240V and -150V lines and ± 20% on the other readings may be expected.

### 1 POWER UNIT Type 4126A OR B

| | | |
|---|---|---|
| VT61 | e | -8.5V |
| | b | -9.0V |
| | c | -11.4V |
| VT62 | e | -9.1V |
| | b | -9.0V |
| | c | -11.4V |
| VT63 | e | -0 |
| | b | -.8V |
| | c | -8.25V |
| hum. | 240V | 35mV |
| hum. | 150V | 100mV |
| osc. | P.W. | 100µs |
| osc. | amp. | 30V |

### 2 AERIAL UNIT Type 4125A OR B With no signal input.

| | | | | | |
|---|---|---|---|---|---|
| VT2 | e | -1.3 | VT21 | e | -9.0 |
| | b | -1.3 | | b | -9.15 |
| | c | -5.9 | | c | -11.9 |
| VT3 | e | -1.24 | VT22 | e | -3.0 |
| | b | -1.34 | | b | -3.15 |
| | c | -6.3 | | c | -9.3 |
| VT4 | e | -1.0 | VT23 | e | -2.9 |
| | b | -1.1 | | b | -3.0 |
| | c | -4.3 | | c | -3.1 |
| VT5 | e | -3.7 | VT24 | e | -6.6 |
| | b | -3.6 | | b | -6.9 |
| | c | -9.0 | | c | -9.25 |
| VT9 | e | -1.3 | VT25 | e | -9.2 |
| | b | -1.5 | | b | -9.3 |
| | c | -4.7 | | c | -11.7 |
| | | | VT26 | e | -6.3 |
| | | | | b | -6.65 |
| | | | | c | -9.9 |

## METER UNIT Type 4127A to E

| | | | | | |
|---|---|---|---|---|---|
| VT42 | e | -0.46 | VT49 | e | -0.02 |
| | b | -0.56 | | b | -0.03 |
| | c | -6.1 | | c | -1.9 |
| VT43 | e | -6.25 | VT50 | e | 0 |
| | b | -6.0 | | b | -0.02 |
| | c | -2.45 | | c | -3.0 |
| VT44 | e | -0.63 | VT52 | e | -0.02 |
| | b | -0.86 | | b | -0.17 |
| | c | -0.70 | | c | -0.70 |
| VT46 | e | -0.65 | VT53 | e | -1.43 |
| | b | -0.18 | | b | -0.10 |
| | c | 6.3 | | c | -11.5 |
| VT47 | e | 0.83 | VT54 | e | -0.12 |
| | b | 1.05 | | b | -0.025 |
| | c | 0.9 | | c | -8.75 |
| VT48 | e | 0.83 | VT41 | e | -2.9 |
| | b | 0.22 | | b | -2.6 |
| | c | 9.0 | | c | -9.0 |

## APPENDIX 1

## RECOMMENDED METHODS OF SERVICING

## PRINTED WIRING BOARDS

Printed wiring boards are made of a laminated material with a thin sheet of copper bonded to one side. The conductor pattern is formed by an etching process. Component leads are threaded through holes punched in the boards and the ends of the leads are normally bent over against 'pads' on the copper conductors. The completed assembly is then soldered and a protective coating applied.

### *Tools and Materials Required for Servicing*

1. A small soldering iron with a bit diameter of approximately 3/16" and a working temperature rather above the normal 250°C. A suitable tool is the Precision Iron, Model C240, 230-240 volts, 15 watts, with the No.4 standard bit, made by A.N.T.E.X. Ltd., 3 Tower Hill, London EC3.
2. 22 SWG resin cored 60/40 solder, such as Multicore Type PC35. Additional flux must not be used.
3. A pair of small side-cutters, such as the 5½ inch Pointed Nose Diagonal Cutting Nipper, Cat.No. 21123, made by Wilkinsons Tools Ltd., Kerfoot Street, Warrington, England.
4. A pair of small snipe-nosed instrument pliers, such as the 5½ inch or 6 inch Long Snipe Nosed Pliers, Cat.No.23107, made by Wilkinsons Tools Ltd.
5. A small stiff-bristled brush such as the Post Office Type Brush, fitch, Paint, No.7, round.
6. A small-bladed knife, e.g. a penknife.
7. An epoxy resin repair kit, e.g. the Araldite Two-tube Pack.

### *Repair Procedure*

It is recommended that the board be removed from the equipment before servicing, in order to facilitate inspection of the underside after repair.

Care should be taken to avoid mechanical damage to the board. Where the protective coating has been applied to both the component and the copper side of the board, it will be necessary to apply a sideways force to the component, after freeing the leads, in order to release it from the coating lacquer.

Avoid excessive heating of the joint, as this will reduce the strength of the bonding adhesive and damage more than the necessary minimum area of protective varnish.

Mechanical damage to the copper foil is most likely to be caused by stress on the component leads from the component side of the board.

In those methods where the soldering iron is applied to the copper 'pad', the following points should be noted:-

(a) It is not necessary to remove the protective varnish beforehand.

(b) The iron should only be applied to the pad for the absolute minimum of time necessary to melt the solder.

(c) Local repair of the damaged protective coating must be carried out immediately after the final soldering and cleaning operations, to prevent the ingress of moisture.

There are three recommended methods for the replacement of defective components, the suitability of each being determined by the circumstances.

**Method 1**

This is the recommended method for axial lead components, and certain others, when it is possible to leave a sufficient length of wire attached to the board.

(a) Clip off the leads close to the component (Fig.1.1). In the case of certain non-axial lead components it may be necessary to break the component in the middle (Figs. 1.2 and 1.3). Remove the component.

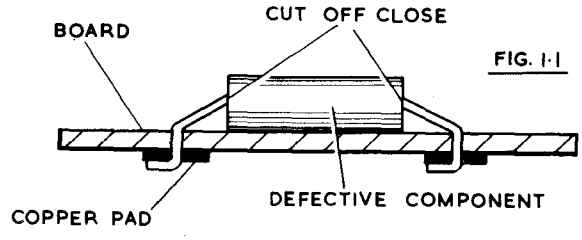


FIG. 1·1

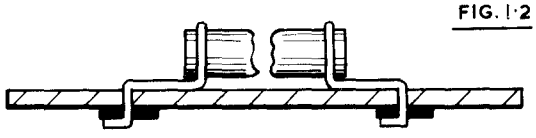


FIG. 1·2

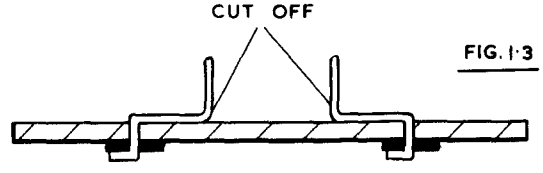


FIG. 1·3

(b) Straighten the wires left on the board, by bending away from the board, until they are perpendicular to it (Fig.1.4).

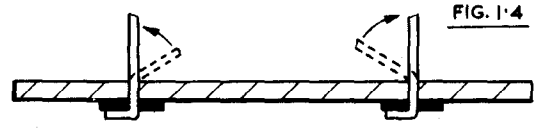


FIG. 1·4

(c) Bend semicircular hooks on the replacement component leads, to correspond with the spacing of the old component wires, slide on to the old leads and solder into position, ensuring that the component lies flat on the board

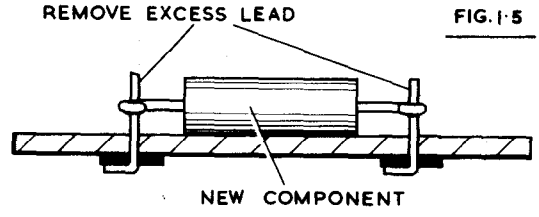
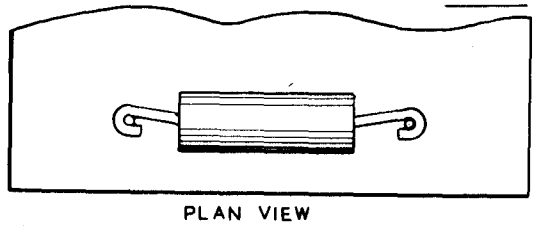


FIG. 1·5

App. 9575

FIG. 1·6


PLAN VIEW

(Figs.1.5 and 1.6). For radial lead components, form the leads as Fig.1.7 and attach as shown in Fig.1.8.

FIG.1·8

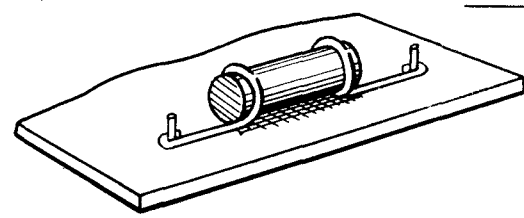
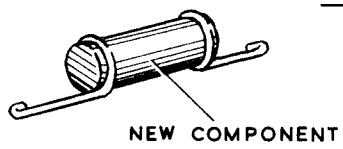
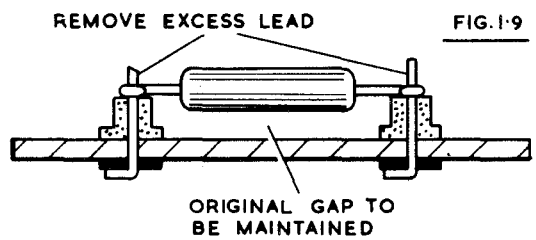


FIG.1·7




**NOTE:** *Where insulating spacers have been used to keep a component, such as a wirewound resistor, raised from the board, they should be retained as shown in Fig.1.9 to maintain adequate ventilation.*

FIG.1·9




**Method 2**

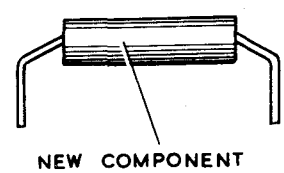
This is the recommended procedure when it is desired to retain, as far as possible, the original appearance of the board. It is preferable, however, that it should not be used unless the importance of appearance overrides the obvious advantage of avoiding application of heat direct to the copper pads.

(a) Proceed as in Method 1 until the old component leads are perpendicular to the boards.

(b) Clip off the leads close to the component side of the board.

(c) Melt the soldered connection by the brief application of a hot iron and flick the board rapidly so that the lead stub is ejected, together with the solder in the hole. Check that no solder remains in the hole. Care should be taken to avoid physical damage to the board when flicking.

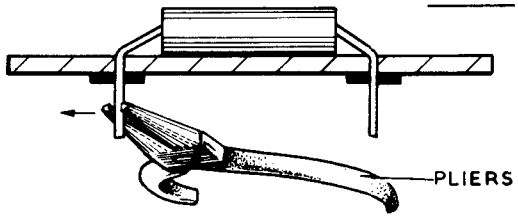
FIG.2·1




(d) Form the leads of the replacement components to the required shape (Fig.2.1).

(e) Fit the component and, after ensuring that it is lying flat on the board, clench the lead ends by gripping with the pliers, $\frac{1}{8}$ inch from the board, and pressing sideways, not allowing the pliers to twist, so that the sides of both jaws remain parallel to the board throughout the movement (fig.2.2).

FIG. 2·2




(f) Cut off leads at the edge of the pad between the two right-angle bends (Fig.2.3).

FIG. 2·3

(g) Resolder the joint using only resin-cored solder and a hot iron. The iron should be applied for the least possible time consistent with obtaining a good soldered joint.

(h) Remove the excess resin and any contaminant from around the joints by wiping with a degreasing solvent, e.g. trichlorethylene. Allow excess solvent to evaporate.

(i) Mix the components of the epoxy resin, according to the makers instructions and apply to the areas from which varnish has been removed during soldering, taking care to overlap the old varnish. The new resin will cure at room temperature but, if it is desired to achieve a 'tack free' state rapidly, the cure may be accelerated by raising the temperature of the board to 50°C.

*NOTE:*

*Operations (h) and (i) should follow (g) as rapidly as possible. If resealing is appreciably delayed, it is strongly recommended that the board be heated to 50°C and maintained at this temperature for one hour before resealing.*

**Method 3**

This method is recommended where access to the leads on the component side of the board is denied and where destruction of the component to gain access is impracticable.

(a) Apply a hot iron to the soldered connections, one at a time, and as soon as the solder has melted, remove as much excess as possible with the stiff brush.

(b) With the excess solder removed, apply the soldering iron to the clenched component lead end and, as the solder melts, introduce the blade of the small penknife under the clenched end, removing the soldering iron immediately this is achieved. Straighten the clenched end by twisting the knife in such a manner that the thin edge remains both on the board and touching the lead where it leaves the hole (Fig.3.1).

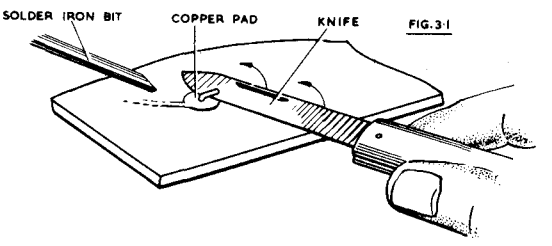


FIG.3·1

(c) After repeating operation (b) on all the leads of the component, carefully examine the leads where they enter the board, to ensure that they are not still attached to the pads. In those cases where they are attached they must be freed by re-applying the iron to the wire and, after the solder has melted, moving the wire to and fro in the hole until the solder has set.

(d) When all the leads are freed the component may be withdrawn and a new one inserted, pre-forming the leads where necessary.

(e) After insertion the ends are clenched, trimmed and soldered and the board resealed as in Method 2 (h) and (i).

**NOTE 1.** *Certain components, such as valve bases, may be fitted with tags which it is impracticable to clench over because of risk of damage to the board. Where these components have to be replaced, operation (b) is omitted during the removal and, correspondingly, the re-clenching operation is not carried out when fitting the new component.*

**NOTE 2.** *In operation (b) the knife must not be inserted without first melting the solder, or damage to the copper pad may result. Similarly in (d) the component must not be withdrawn until all the leads are freed as in (c).*

*Test and Inspection*

**NOTE:** *At no time, either while locating a faulty component or while testing following a repair, should any lead be attached to the copper side of the board.*

Repairs should be inspected for dry joints. When Methods 2 or 3 have been used the amount and shape of solder should be similar to the original connections on the board, and it should be possible to see the outline of the component leads.

Repairs should be inspected to ensure that all varnish displaced during the servicing operations has been made good and that a sufficient overlap of varnish has been allowed to effect a complete seal.

# MASTER COMPONENTS LIST

FOR

AERIAL UNIT TYPE 4125 AorB(W.74025 Ed.AorB)
FOR P.E.T.A. S350 (W.73995 Ed.AorB)

Technical Handbook Ref. T. 3827 List 1

NOTES:

1. Component schedules in this handbook are presented in the form of a master components list, which includes all components used in this equipment. Each component is identified by means of a spares reference number, column 1, in addition to the normal part identity in column 6.
2. Components shown on individual circuit diagrams may be identified in the master list by means of the cross-reference tables associated with each circuit diagram. The numbers given are the spares reference numbers.
3. For spares ordering purposes it is only necessary to quote the exact handbook reference at the top of this page together with the spares reference number. Individual part identities can be given as a cross check if desired, but are not necessary.
4. Prices are subject to change without notice.
5. The following abbreviations are used throughout this Master List:

| | | | |
|---|---|---|---|
| Cap. | Capacitor | Osc. | Oscillator |
| Carb. | Carbon | Pap. | Paper |
| Cer. | Ceramic | pF | Picofarad |
| C/O | Changeover | | Micro-Microfarad |
| Coef. | Coefficient | Psn. | Position |
| Comp. | Composition | Potr. | Potentiometer |
| DP | Double Pole | Prim. | Primary (winding) |
| DT | Double Throw | PVC | Polyvinyl Chloride Compound Insulated |
| En. | Enamelled | | |
| Elyc. | Electrolytic | Rect. | Rectifier |
| Fil. | Filament | Res. | Resistor |
| FSD | Full Scale Deflection | Sec. | Secondary (winding) |
| Gd. | Grade | Sil.Mica. | Silver Mica |
| HS | High Stability | Sil.Mica.Prot. | Silver Mica Protected |
| Indr. | Inductor | SP | Single Pole |
| Insd. | Insulated | Temp. | Temperature |
| Insr. | Insulator | Term. | Terminal |
| Lg. | Long | Transf. | Transformer |
| Lin. | Linear | Tub. | Tubular |
| Metd. | Metallised | Vble. | Variable |
| Mld. | Moulded | Vit. | Vitreous |
| Neg. | Negative | W/W | Wirewound |

| No. | Description and Identity | Qty. | Price † Each £. s. d. | Scale |
|---|---|---|---|---|
| 1 | Cap. Pap. 0.01uF ±20% 150V PC.19307-7 | 2 | 3 0 | 2S |
| 2 | Cap. Cer. 470pF ±20% 500V PC.18210-3 | 1 | 1 0 | 2S |
| 3 | Cap. Elyc. 8uF +100% -20% 6V WIS.5082-B-2-93 | 3 | 2 6 | 2S |
| 4 | Cap. Pap. 0.04uF ±20% 150V PC.19307-10 | 2 | 3 0 | 2S |
| 5 | Cap. Elyc. 10uF +100% -20% 12V PC.18467-92 | 5 | 2 6 | 3S |
| 6 | Cap. Elyc. 50uF +100% -20% 6V PC.18467-94 | 4 | 2 6 | 2S |
| 7 | Cap. Disc. Cer. 470pF +40% -20% 500V WIS.9392-B-1-6 | 2 | 3 6 | 2S |
| 8 | Cap. Elyc. 50uF +100% -20% 25V PC.148467-87 | 2 | 2 6 | 2S |
| 9 | Cap. Elyc. 100uF +100% -20% 12V WIS.8640-C-1-1A | 2 | 3 6 | 2S |
| 10 | Cap. Pap. (Type 4125B only) 0.5uF ±25% 150V PC.19301-3 | 2 | 3 0 | 2S |
| 11 | Cap. Pap. 0.01uF ±20% 500V PC.19308-7 | 1 | 3 0 | 2S |
| 12 | Cap. Elyc. 8uF +50% -20% 450V PC.18406-2 | 1 | 2 0 | 2S |
| 13 | Cap. Elyc. 100uF +50% -20% 350V PC.18407-4 | 1 | 6 0 | 2S |
| 14 | Cap. Pap. 0.1uF ±25% 150V PC.19301-1 | 1 | 2 6 | 2S |
| 15 | Cap. Cer. 47pF ±2% 750V PC.18223-9 | 9 | 1 0 | 3S |
| 16 | Cap. Tub. 0.5uF +50% -20% 50V WIS.7730-C-1-4 (For Type 4125A) | 1 | 18 0 | 1S |
| 17 | | | | |
| 18 | Cover, Spindle End PH.71103-1 | 1 | 1 0 | 1S |
| 19 | | | | |
| 20 | Indr. W.76968-C-1-A | 1 | 7 6 | 1S |
| 21 | Indr. WIS.5680-B-Sh.92 | 1 | 4 0 6 | 1S |
| 22 | Meter WIS.4595-B-1-2 (For Type 4125B) | 1 | 5 14 6 | 1S |
| 23 | | | | |
| 24 | Nut, Spindle Gripping PH.71101-1 | 1 | 1 0 | 1S |
| 25 | | | | |
| 26 | Plug, 6-pin (For Type 4125A only) WIS.4754-1-15P | 2 | 1 1 6 | 1S |
| 27 | Plug, 6-pin (For Type 4125B only) WIS.6499-1-32P | 2 | 1 9 0 | 1S |
| 28 | Plug, 6-pin (For Type 4125A only) WIS.4754-1-15 | 1 | 17 6 | 1S |
| 29 | Plug, 6-pin (For Type 4125B only) WIS.6499-1-32 | 1 | 1 9 0 | 1S |
| 30 | Plug, 6-pin (For Type 4125A only) WIS.4754-1-13 | 2 | 16 6 | 1S |
| 31 | Plug, 6-pin (For Type 4125B only) WIS.6499-2-42 | 2 | 1 3 6 | 1S |
| 32 | | | | |
| 33 | Printed Board Main F.634-1-A | 1 | 34 12 6 | 1B |
| 34 | Printed Board Stabiliser F.635-1-A | 1 | 11 16 6 | 1B |
| 35 | | | | |
| 36 | Rect. Microwave CV.2154 | 1 | 3 6 6 | 1S |
| 37 | Rect. Germanium OA.10 | 2 | 5 0 | 1S |
| 38 | | | | |
| 39 | Res. Comp. 10k ohms ±10% 0.25W PC.66609-31 | 3 | 1 0 | 2S |
| 40 | Res. Comp. 1.2k ohms ±10% 0.25W PC.66609-20 | 1 | 1 0 | 2S |
| 41 | Res. Comp. 2.2k ohms ±10% 0.25W PC.66609-23 | 3 | 1 0 | 2S |
| 42 | Res. Comp. 47k ohms ±10% 0.25W PC.66609-39 | 3 | 1 0 | 2S |
| 43 | Res. Comp. 220 ohms ±10% 0.25W PC.66609-11 | 2 | 1 0 | 2S |
| 44 | Res. Comp. 1k ohms ±10% 0.25W PC.66609-19 | 8 | 1 0 | 3S |

†

| No. | Description and Identity | Qty. | Price † Each £. s. d. | Scale |
|---|---|---|---|---|
| 45 | Res. Comp. 68 ohms ±10% 0.25W PC.66610-11 | 1 | 1 0 | 2S |
| 46 | Res. Comp. 68k ohms ±5% 0.125W PC.66601-35 | 1 | 1 0 | 2S |
| 47 | Res. Comp. 10k ohms ±5% 0.125W PC.66601-25 | 2 | 1 0 | 2S |
| 48 | Res. Comp. 2.2k ohms ±5% 0.125W PC.66601-17 | 1 | 1 0 | 2S |
| 49 | Res. Comp. 22k ohms ±10% 0.25W PC.66609-35 | 2 | 1 0 | 2S |
| 50 | Res. Comp. 15k ohms ±10% 0.25W PC.66609-33 | 1 | 1 0 | 2S |
| 51 | Res. Comp. 4.7k ohms ±10% 0.25W PC.66609-27 | 1 | 1 0 | 2S |
| 52 | Res. Comp. 470 ohms ±10% 0.25W PC.66609-15 | 4 | 1 0 | 2S |
| 53 | Res. Comp. 270 ohms ±10% 0.25W PC.66609-12 | 1 | 1 0 | 2S |
| 54 | Res. Comp. 22k ohms ±5% 0.25W PC.66602-36 | 1 | 1 0 | 2S |
| 55 | Res. Comp. 68k ohms ±5% 0.25W PC.66602-42 | 1 | 1 0 | 2S |
| 56 | Res. Comp. 150 ohms ±10% 0.25W PC.66609-9 | 1 | 1 0 | 2S |
| 57 | Res. Comp. 220k ohms ±5% 0.25W PC.66602-48 | 1 | 1 0 | 2S |
| 58 | Res. Comp. 330k ohms ±5% 0.25W PC.66602-50 | 1 | 1 0 | 2S |
| 59 | Res. Comp. 1.5k ohms ±10% 0.25W PC.66609-21 | 1 | 1 0 | 2S |
| 60 | Res. Comp. 470k ohms ±10% 0.25W PC.66609-51 | 1 | 1 0 | 2S |
| 61 | Res. Comp. 12k ohms ±10% 0.25W PC.66609-32 | 1 | 1 0 | 2S |
| 62 | Res. Comp. 560 ohms ±10% 0.25W PC.66609-16 | 1 | 1 0 | 2S |
| 63 | Res. Comp. 120 ohms ±10% 0.25W PC.66609-8 | 1 | 1 0 | 2S |
| 64 | Res. W/W 2.2 ohms ±5% 3W PC.67008-25 | 1 | 2 6 | 2S |
| 65 | Res. W/W 3.3 ohms ±5% 3W PC.67008-22 | 3 | 3 0 | 2S |
| 66 | | | | |
| 67 | | | | |
| 68 | Res. Comp. 150 ohms ±10% 0.25W PC.66610-15 | 1 | 1 0 | 1S |
| 69 | Res. Vble W/W 100 ohms ±10% 0.5W PC.67401-9 | 1 | 9 6 | 2S |
| 70 | Res. Vble. W/W 250 ohms ±10% 0.5W PC.67401-13 | 1 | 9 6 | 2S |
| 71 | Res. Vble. Comp. 2.5k ohms ±20% 0.1W PC.67201-5 | 1 | 7 0 | 2S |
| 72 | Res. Vble Comp. 50k ohms ±20% 0.25W PC.67202-21 | 0 | 5 6 | 0 |
| 73 | Res. Vble. 50k ohms ±20% 0.25W PC.67202-22 | 2 | 8 0 | 1S |
| 74 | Socket, 1-pin WIS.9456-C-1-1 | 1 | 1 0 | 1S |
| 75 | Socket, 1-pin WIS.9456-C-1-5 | 2 | 1 0 | 1S |
| 76 | Socket, 1-pin WIS.9456-C-1-3 | 0 | 1 0 | |
| 77 | Socket, 1-pin WIS.9456-C-1-2 | 1 | 5 6* | 1S |
| 78 | Socket, 1-pin WIS.10876-B-1-8 | 1 | 1 0 | 1S |
| 79 | Socket, 1-pin WIS.10786-B-1-1 | 2 | 1 0 | 1S |
| 80 | Socket, 6-pin (For Type 4125A only) WIS.4754-1-12P | 1 | 1 2 0 | 1S |
| 81 | Socket, 6-pin (For Type 4125B only) WIS.6499-1-25P | 1 | 1 4 6 | 1S |
| 82 | Socket, 6-pin (For Type 4125A only) WIS.4754-1-11P | 2 | 18 6 | 1S |
| 83 | Socket, 6-pin (For Type 4125B only) WIS.6499-1-41P | 2 | 1 4 6 | 1S |
| 84 | Socket, 6-pin (For Type 4125A only) WIS.4754-1-12 | 2 | 12 6 | 1S |
| 85 | Socket, 6-pin (For Type 4125B only) WIS.6499-1-25 | 2 | 1 9 6 | 1S |
| 86 | Socket, 1-pin WIS.7987-C-1-1 | 0 | 1 0 | |
| 87 | | | | |

†

| No. | Description and Identity | Qty. | Price † Each £. s. d. | Scale |
|---|---|---|---|---|
| 88 | Set, Mica, Washer and Bushes Part No.56201 (For Nos.94 & 95) | 2sets | | |
| 89 | Stabilizer Low Voltage 1.5V 20mA WIS.7825-C-1-1 | ※4 | 15 0 | 1S |
| 90 | | | | |
| 91 | Switch WIS.5103-C-1-16 | 1 | 10 0 | 1S |
| 92 | | | | |
| 93 | Transistor OC.71 | 8 | 4 0 | 3S |
| 94 | Transistor (For Type 4125A only) OC.16 | 2 | 1 14 0 | 2S |
| 95 | Transistor (For Type 4125B only) OC.35 | 2 | 13 6 | 2S |
| 96 | Transistor V15/20LP | 1 | 1 2 0 | 2S |
| 97 | | | | |
| 98 | Valve K357 | 1 | | 3S |
| 99 | Valve E182CC | 1 | | 3S |
| 100 | | | | |
| 101 | Valvebase PC.81830-1 | 1 | 3 0 | 1S |
| 102 | Valveholder B9A PC.81817-1 | 1 | 1 6 | |
| 103 | Valve Retainer PC.82501-1 | 1 | 1 0 | 1S |
| 104 | Cable (Aerial unit to Meter unit) for Type 4125A only W.74006-B-1-A. | 1 | 12 0 0 | 1B |
| 105 | Cable (Aerial unit to Meter unit) for Type 4125B only W.74006-B-1-B. | 1 | 14 0 0 | 1B |

† ※ Modified to W.101465-1-1

# MASTER COMPONENTS LIST
## FOR
## POWER UNIT TYPE 4126A or B(W.74010 Ed.A orB)
## FOR P.E.T.A. S350 (W.73995 Ed. A or B)
## Technical Handbook Ref. T. 3827 List 2

NOTES:

1. Component schedules in this handbook are presented in the form of a master components list, which includes all components used in this equipment. Each component is identified by means of a spares reference number, column 1, in addition to the normal part identity in column 6.
2. Components shown on individual circuit diagrams may be identified in the master list by means of the cross-reference tables associated with each circuit diagram. The numbers given are the spares reference numbers.
3. For spares ordering purposes it is only necessary to quote the exact handbook reference at the top of this page together with the spares reference number. Individual part identities can be given as a cross check if desired, but are not necessary.
4. Prices are subject to change without notice.
5. The following abbreviations are used throughout this Master List:

| | | | |
|---|---|---|---|
| Cap. | Capacitor | Osc. | Oscillator |
| Carb. | Carbon | Pap. | Paper |
| Cer. | Ceramic | pF | Picofarad |
| C/O | Changeover | | Micro-Microfarad |
| Coef. | Coefficient | Psn. | Position |
| Comp. | Composition | Potr. | Potentiometer |
| DP | Double Pole | Prim. | Primary (winding) |
| DT | Double Throw | PVC | Polyvinyl Chloride Compound Insulated |
| En. | Enamelled | Rect. | Rectifier |
| Elyc. | Electrolytic | Res. | Resistor |
| Fil. | Filament | Sec. | Secondary (winding) |
| FSD | Full Scale Deflection | Sil.Mica. | Silver Mica |
| Gd. | Grade | Sil.Mica.Prot. | Silver Mica Protected |
| HS | High Stability | SP | Single Pole |
| Indr. | Inductor | Temp. | Temperature |
| Insd. | Insulated | Term. | Terminal |
| Insr. | Insulator | Transf. | Transformer |
| Lg. | Long | Tub. | Tubular |
| Lin. | Linear | Vble. | Variable |
| Metd. | Metallised | Vit. | Vitreous |
| Mld. | Moulded | W/W | Wirewound |
| Neg. | Negative | | |

| No. | Description and Identity | Qty. | Price † Each £. s. d. | Scale |
|---|---|---|---|---|
| 1 | Cap. Elyc. 5000uF +100% -20% 25V PC.18407-8 | 2 | 14 6 | 2S |
| 2 | Cap. Elyc. 100uF +100% -20% 25V PC.18406-17 | 1 | 2 0 | 2S |
| 3 | Cap. Pap. 0.1uF ±20% 500V PC.19203-20 | 2 | 2 0 | 2S |
| 4 | Cap. Elyc. 8uF +50% -20% 450V PC.18406-2 | 2 | 2 0 | 2S |
| 5 | Cap. Elyc. 50uF +100% -20% 25V PC.18467-87 | 1 | 2 6 | 2S |
| 6 | | | | |
| 7 | | | | |
| 8 | Cover, Spindle End PH.71103-1 | 1 | 1 0 | 1S |
| 9 | | | | |
| 10 | Indr. WIS.5690-B-117 | 1 | 5 4 0 | 1S |
| 11 | Indr. W.27903-B-17 | 1 | 5 19 0 | 1S |
| 12 | Indr. W.44702-C-1-B | 1 | 14 0 | 1S |
| 13 | | | | |
| 14 | Nut, Spindle Gripping PH.71101-1 | 1 | 1 0 | 1S |
| 15 | | | | |
| 16 | Plug (For Type 4126B only) WIS.6499-2-74 | 1 | 1 2 6 | 1S |
| 17 | Plug (For Type 4126A only) WIS.4754-1-1 | 1 | 13 0 | 1S |
| 18 | Rect. WIS.7108-B-1-1 | 3 | 11 0 | 1S |
| 19 | Rect. GEX.541 G.E.C. | 1 | 18 0 | 1S |
| 20 | | | | |
| 21 | Res. Comp. 470k ohms ±10% 0.25W PC.66609-51 | 1 | 1 0 | 2S |
| 22 | Res. Comp. 10k ohms ±10% 0.25W PC.66609-31 | 1 | 1 0 | 2S |
| 23 | Res. Comp. 100 ohms ±10% 0.5W PC.66611-13 | 1 | 1 0 | 2S |
| 24 | Res. Comp. 4.7k ohms ±10% 0.25W PC.66609-27 | 1 | 1 0 | 2S |
| 25 | Res. W/W 10 ohms ±5% 4.5W PC.67009-1 | 2 | 2 6 | 2S |
| 26 | Res. Comp. 270 ohms ±10% 0.5W PC.66611-18 | 1 | 1 0 | 2S |
| 27 | | | | |
| 28 | | | | |
| 29 | Res. Vble. W/W 100 ohms ±10% 1W PC.67402-17 | 1 | 11 0 | 2S |
| 30 | Set Mica Washer and Bushes Part No.56201, (For Nos.39-40-41) | 3sets | | 3 |
| 31 | Socket, 6-pin (For Type 4126B only) WIS.6499-2-41 | 1 | 1 9 6 | 1S |
| 32 | Socket, 2-pin (For Type 4126B only) WIS.6499-2-73 | 1 | 1 8 6 | 1S |
| 33 | Socket, 6-pin (For Type 4126A only) WIS.4754-1-11 | 1 | 15 6 | 1S |
| 34 | Socket, 2-pin (For Type 4126A only) WIS.4754-1-2 | 1 | 12 6 | 1S |
| 35 | | | | |
| 36 | Transf. W.75727-1 | 1 | 12 10 0 | 1B |
| 37 | | | | |
| 38 | Transistor V15/201P | 1 | 1 2 0 | 2S |
| 39 | Transistor (For Type 4126B only) OC.35 | 1 | 13 6 | 2S |
| 40 | Transistor OC.28 | 1 | 17 6 | 2S |
| 41 | Transistor (For Type 4126A only) OC.16 | 1 | 1 14 0 | 2S |
| 42 | | | | |
| 43 | Valve QS.150/15 | 1 | | 3S |
| 44 | | | | |

†

| No. | Description and Identity | Qty. | Price † Each £. s. d. | Scale |
|---|---|---|---|---|
| 45 | Valveholder PC.81812-1 | 1 | 1 0 | 1S |
| 46 | | | | |
| 47 | Valve Retainer PC.82501-1 | 1 | 1 0 | 1S |
| 48 | Cable (Power Unit to Battery) for Type 4162A only W.74004-B-1-A | 1 | 5 13 0 | 1B |
| 49 | Cable (Power Unit to Battery) for Type 4162B only W.74004-B-1-B | 1 | 5 14 0 | 1B |
| 50 | Cable (Power Unit to Aerial Unit) for Type 4162A only W.74008-B-1-A | 1 | 10 0 0 | 1B |
| 51 | Cable (Power Unit to Aerial Unit) for Type 4162B only W.74008-B-1-B | 1 | 12 0 0 | 1B |

†

# MASTER COMPONENTS LIST

FOR

METER UNIT TYPE 4127A B or E (W.74026 Ed.A B or C)
FOR P.E.T.A. S350 (W.73995 Ed.A orB)

Technical Handbook Ref. T. 3827 List 3

NOTES:

1. Component schedules in this handbook are presented in the form of a master components list, which includes all components used in this equipment. Each component is identified by means of a spares reference number, column 1, in addition to the normal part identity in column 6.
2. Components shown on individual circuit diagrams may be identified in the master list by means of the cross-reference tables associated with each circuit diagram. The numbers given are the spares reference numbers.
3. For spares ordering purposes it is only necessary to quote the exact handbook reference at the top of this page together with the spares reference number. Individual part identities can be given as a cross check if desired, but are not necessary.
4. Prices are subject to change without notice.
5. The following abbreviations are used throughout this Master List:

| | | | |
|---|---|---|---|
| Cap. | Capacitor | Osc. | Oscillator |
| Carb. | Carbon | Pap. | Paper |
| Cer. | Ceramic | pF | Picofarad |
| C/O | Changeover | | Micro-Microfarad |
| Coef. | Coefficient | Psn. | Position |
| Comp. | Composition | Potr. | Potentiometer |
| DP | Double Pole | Prim. | Primary (winding) |
| DT | Double Throw | PVC | Polyvinyl Chloride Compound Insulated |
| En. | Enamelled | | |
| Elyc. | Electrolytic | Rect. | Rectifier |
| Fil. | Filament | Res. | Resistor |
| FSD | Full Scale Deflection | Sec. | Secondary (winding) |
| Gd. | Grade | Sil.Mica. | Silver Mica |
| HS | High Stability | Sil.Mica.Prot. | Silver Mica Protected |
| | | SP | Single Pole |
| Indr. | Inductor | Temp. | Temperature |
| Insd. | Insulated | Term. | Terminal |
| Insr. | Insulator | Transf. | Transformer |
| Lg. | Long | Tub. | Tubular |
| Lin. | Linear | Vble. | Variable |
| Metd. | Metallised | Vit. | Vitreous |
| Mld. | Moulded | W/W | Wirewound |
| Neg. | Negative | | |

| No. | Description and Identity | Qty. | Price † Each £. s. d. | Scale |
|---|---|---|---|---|
| 1 | Cap. Elyc. 50uF +100% -20% 25V PC.18467-87 | 2 | 2 6 | 2S |
| 2 | Cap. Elyc. 8uF +100% -20% 6V PC.18467-93 | 3 | 2 6 | 2S |
| 3 | Cap. Melinex 0.25uF ±20% 250V WIS.7850-C-1-1 | 2 | 19 6ø | 2S |
| 4 | Cap. Elyct. 10uF +100% -20% 12V PC.18467-92 | 1 | 2 6 | 2S |
| 5 | Cap. Elyc. 50uF +100% -20% 6V PC.18467-94 | 1 | 2 6 | 2S |
| 6 | Cap. Pap. Metd. 0.01uF ±20% 150V PC.19307-7 | 2 | 3 0 | 2S |
| 7 | Cap. Polystyrene 0.0047uF ±5% 350V WIS.7909-B-1-3 | 1 | 3 6 | 2S |
| 8 | Cap. Pap. Metd. 0.25uF ±25% 150V PC.19301-2 | 1 | 3 0 | 2S |
| 9 | Cap. Pap. Metd. 0.01uF ±20% 400V PC.19308-7 | 1 | 3 0 | 2S |
| 10 | Cap. Polystyrene 0.039uF ±10% 125V WIS.8996-B-1-5 | 1 | 3 6 | 2S |
| 11 | Cap. Elyc. 500uF ±20% 6V WIS.5082-B-3-138 | 2 | 2 6 | 2S |
| 12 | Cap. Elyc. Tub. 250uF +100% -20% 25V PC.18406-18 | 1 | 2 6 | 2S |
| 13 | Cap. Pap. 0.02uF ±20% 250V PC.19307-8 | 2 | 3 0 | 2S |
| 14 | Cap. Mica. Metd. 0.001uF ±2% 350V PC.18803-49 | 1 | 5 0 | 2S |
| 15 | Cap. Mica. Metd. 560pF ±2% 350V PC.18803-43 | 1 | 3 6 | 2S |
| 16 | Cap. Pap. Metd. 0.002uF ±20% 250V PC.19307-1 | 1 | 3 0 | 2S |
| 17 | Cap. Elyc. 200uF +100% -20% 6V 3/PC.18409-27 | 1 | 2 6 | 2S |
| 18 | Cap. Elyc. 2uF +100% -20% 25V PC.18467-98 | 1 | 2 6 | 2S |
| 19 | Cap. Elyc. 8uF -20% +100% 50V PC.18409-21 | 1 | 1 0 | 1S |
| 20 | | | | |
| 21 | Indr. WIS.7350-B-27 | 1 | 3 10 0 | 1B |
| 22 | Indr. WIS.7350-B-26 | 1 | 4 0 6 | 1B |
| 23 | | | | |
| 24 | Jack (For Type 4127B only) RP.15842 | 1 | 3 0 | 1S |
| 25 | | | | |
| 26 | Lamp 14V 0.2A PC.48704-4 | 1 | 1 0 | 12S |
| 27 | | | | |
| 28 | Meter WIS.4285-5-79 | 1 | 16 18 6 | 1B |
| 29 | | | | |
| 30 | Nut, Spindle Gripping PH.71101-1 | 3 | 1 0 | 1S |
| 31 | | | | |
| 32 | Plug WIS.4754-1-13P | 1 | 16 0 | 1S |
| 33 | | | | |
| 34 | Printed Board Frequency F.641-1-A | 1 | 23 9 0 | 1B |
| 35 | Printed Board 'Hold on' F.642-1-A | 1 | 23 11 6 | 1B |
| 36 | Printed Board F.752-1-A | 1 | 12 5 0 | 1B |
| 37 | Rect. 0A.202 Mullard | 2 | 4 0 | 1S |
| 38 | | | | |
| 39 | Relay WIS.6932-B-1-3 | 1 | 1 15 6 | 1S |
| 40 | Res. Thermistor PC.66380-10 | 1 | | 1 |
| 41 | Res. Comp. 10k ohms ±10% 0.25W PC.66609-31 | 5 | 1 0 | 3S |
| 42 | Res. Comp. 4.7k ohms ±10% 0.25W PC.66609-27 | 2 | 1 0 | 2S |
| 43 | Res. Comp. (For Type 4127B only) 1k ohms ±5% 0.125W PC.66601-13 | 1 | 1 0 | 2S |

† ø per pair

| No. | Description and Identity | Qty. | Price † Each £. s. d. | Scale |
|---|---|---|---|---|
| 44 | Res. Comp. (Value Determined on Test) ±10% 0.25W PC.66609 | 1 | 1 0 | 2 S |
| 45 | Res. Comp. 3.3k ohms ±10% 0.25W PC.66609-25 | 2 | 1 0 | 2 S |
| 46 | Res. Comp. 390 ohms ±10% 0.25W PC.66609-14 | 1 | 1 0 | 2 S |
| 47 | Res. Comp. 22k ohms ±5% 0.25W PC.66604-41 | 3 | 1 0 | 2 S |
| 48 | Res. Comp. 1.8k ohms ±5% 0.25W PC.66604-28 | 1 | 1 0 | 2 S |
| 49 | Res. Comp. (Value Determined on Test) ±10% 0.25W PC.66609 | 1 | 1 0 | 2 S |
| 50 | Res. Comp. 150 ohms ±10% 0.25W PC.66609-9 | 1 | 1 0 | 2 S |
| 51 | Res. Comp. 680 ohms ±10% 0.25W PC.66609-17 | 0 | 1 0 | 0 |
| 52 | Res. Comp. 2.2k ohms ±5% 0.25W PC.66604-29 | 3 | 1 0 | 2 S |
| 53 | Res. Comp. 220 ohms ±5% 0.25W PC.66604-17 | 2 | 1 0 | 2 S |
| 54 | Res. Comp. 56k ohms ±5% 0.25W PC.66604-46 | 2 | 1 0 | 2 S |
| 55 | Res. Comp. 47k ohms ±5% 0.25W PC.66604-45 | 2 | 1 0 | 2 S |
| 56 | Res. Comp. 820 ohms ±10% 0.25W PC.66609-18 | 2 | 1 0 | 2 S |
| 57 | Res. Thermistor WIS.5740-C-1-10 | 1 | 1 0 0 | 2 S |
| 58 | Res. W/W (For Type 4127E only) 20 ohms ±5% 1.5W PC.67007-29 | 1 | 3 0 | 2 S |
| 59 | Res. Comp. 47k ohms ±10% 0.5W PC.66611-45 | 1 | 1 0 | 2 S |
| 60 | Res. Comp. 100k ohms ±10% 0.25W PC.66609-43 | 1 | 1 0 | 2 S |
| 61 | Res. Comp. 18k ohms ±10% 0.25W PC.66609-34 | 1 | 1 0 | 2 S |
| 62 | Res. Comp. 150k ohms ±10% 0.25W PC.66609-45 | 1 | 1 0 | 2 S |
| 63 | Res. Comp. 10 ohms ±10% 0.25W PC.66610-1 | 1 | 1 0 | 2 S |
| 64 | Res. Comp. 1k ohms ±10% 0.25W PC.66609-19 | 2 | 1 0 | 2 S |
| 65 | Res. Comp. 6.8k ohms ±10% 0.25W PC.66609-29 | 1 | 1 0 | 2 S |
| 66 | Res. Comp. 2.2k ohms ±10% 0.25W PC.66609-23 | 2 | 1 0 | 2 S |
| 67 | Res. Comp. 10m ohms ±10% 0.25W PC.66610-73 | 2 | 1 0 | 2 S |
| 68 | Res. Comp. 68k ohms ±10% 0.25W PC.66609-41 | 2 | 1 0 | 2 S |
| 69 | Res. Comp. 15k ohms ±10% 0.25W PC.66609-33 | 1 | 1 0 | 2 S |
| 70 | Res. Comp. 1.5k ohms ±10% 0.25W PC.66609-21 | 1 | 1 0 | 2 S |
| 71 | Res. Comp. 330 ohms ±10% 0.25W PC.66609-13 | 1 | 1 0 | 2 S |
| 72 | Res. Comp. 68 ohms ±10% 0.25W PC.66610-11 | 1 | 1 0 | 2 S |
| 73 | Res. Comp. 3.9k ohms ±10% 0.25W PC.66609-26 | 1 | 1 0 | 2 S |
| 74 | | | | |
| 75 | | | | |
| 76 | | | | |
| 77 | | | | |
| 78 | | | | |
| 79 | Res. Vble. W/W 2.5k ohms ±10% 0.5W PC.67401-25 | 1 | 9 6 | 2 S |
| 80 | Res. Vble. Comp. 10k ohms ±10% 0.1W PC.67201-13 | 1 | 7 0 | 2 S |
| 81 | Res. Vble. Comp. 100k ohms ±20% 0.1W PC.67201-25 | 1 | 6 6 | 2 S |
| 82 | Res. Vble. Comp. 50k ohms ±20% 0.25W PC.67207-6 | 1 | 11 6 | 2 S |
| 83 | Res. Vble. Comp. 500k ohms ±20% 0.25W PC.67207-9 | 1 | 13 6 | 2 S |
| 84 | | | | |
| 85 | Socket, 1-pin WIS.9456-C-1-2 | 1 | 5 6* | 1 S |
| 86 | Socket, 1-pin WIS.10876-B-1-7 | 1 | 1 0 | 1 S |

†



* per doz

| No. | Description and Identity | Qty. | Price † Each £. s. d. | Scale |
|---|---|---|---|---|
| 87 | Socket 1-pin WIS.9456-C-1-4 | 1 | 5 6* | 1S |
| 88 | Socket 1-pin WIS.9456-C-1-3 | 1 | 5 6* | 1S |
| 89 | | | | |
| 90 | Stabilizer Low Voltage 1.5V 20mA WIS.7825-C-1-1 Mod. To W.101465-1-1 | 2 | 15 0 | 1S |
| 91 | | | | |
| 92 | Switch WIS.5103-C-1-16 | 1 | 10 0 | 1S |
| 93 | Switch WIS.5700-C-22-1 | 1 | 1 1 0 | 1S |
| 94 | Switch PC.71301-2 | 1 | 6 6 | 1S |
| 95 | | | | |
| 96 | Transistor OC.71 | 3 | 4 0 | 2S |
| 97 | Transistor OC.44 | 5 | 5 6 | 3S |
| 98 | Transistor OC.140 | 1 | 1 2 0 | 2S |
| 99 | Transistor OC.201 | 1 | 1 2 0 | 2S |
| 100 | Transistor OC.72 | 1 | 4 6 | 2S |
| 101 | Transistor OC.73 | 1 | 10 6 | 2S |
| 102 | | | | |
| 103 | Valve 12AT7WA | 1 | | 3S |
| 104 | | | | |
| 105 | Valveholder WIS.8579-C-1-1 | 1 | 1 0 | 1S |
| 106 | | | | |
| 107 | Valve Retainer PC.82501-1 | 1 | 1 0 | 1S |

†



* per doz

# MASTER COMPONENTS LIST

FOR

## METER UNIT TYPE 4127 C or D (W.93992 Ed. A & B)
## FOR P.E.T.A. S350 (W.73995 Ed.A or B)

Technical Handbook Ref. T. 3827 List 4

NOTES:

1. Component schedules in this handbook are presented in the form of a master components list, which includes all components used in this equipment. Each component is identified by means of a spares reference number, column 1, in addition to the normal part identity in column 6.
2. Components shown on individual circuit diagrams may be identified in the master list by means of the cross-reference tables associated with each circuit diagram. The numbers given are the spares reference numbers.
3. For spares ordering purposes it is only necessary to quote the exact handbook reference at the top of this page together with the spares reference number. Individual part identities can be given as a cross check if desired, but are not necessary.
4. Prices are subject to change without notice.
5. The following abbreviations are used throughout this Master List:

| | | | |
|---|---|---|---|
| Cap. | Capacitor | Osc. | Oscillator |
| Carb. | Carbon | Pap. | Paper |
| Cer. | Ceramic | pF | Picofarad |
| C/O | Changeover | | Micro-Microfarad |
| Coef. | Coefficient | Psn. | Position |
| Comp. | Composition | Potr. | Potentiometer |
| DP | Double Pole | Prim. | Primary (winding) |
| DT | Double Throw | PVC | Polyvinyl Chloride Compound Insulated |
| En. | Enamelled | | |
| Elyc. | Electrolytic | Rect. | Rectifier |
| Fil. | Filament | Res. | Resistor |
| FSD | Full Scale Deflection | Sec. | Secondary (winding) |
| Gd. | Grade | Sil.Mica. | Silver Mica |
| HS | High Stability | Sil.Mica.Prot. | Silver Mica Protected |
| Indr. | Inductor | SP | Single Pole |
| Insd. | Insulated | Temp. | Temperature |
| Insr. | Insulator | Term. | Terminal |
| Lg. | Long | Transf. | Transformer |
| Lin. | Linear | Tub. | Tubular |
| Metd. | Metallised | Vble. | Variable |
| Mld. | Moulded | Vit. | Vitreous |
| Neg. | Negative | W/W | Wirewound |

| No. | Description and Identity | Qty. | Price † Each £. s. d. | Scale |
|---|---|---|---|---|
| 1 | Cap. Elyc. 50uF +100% -20% 25V PC.18467-87 | 2 | 2 6 | 2S |
| 2 | Cap. Elyc. 8uF +100% -20% 6V PC.18467-93 | 3 | 2 6 | 2S |
| 3 | Cap. Melinex 0.25uF ±20% 250V WIS.7850-C-1-1 | 2 | 19 6ø | 2S |
| 4 | Cap. Elyc.10uF +100% -20% 12V PC.18467-92 | 1 | 2 6 | 2S |
| 5 | Cap. Elyc. 50uF +100% -20% 6V PC.18467-94 | 1 | 2 6 | 2S |
| 6 | Cap. Pap. 0.002uF ±20% 250V PC.19307-1 | 1 | 3 0 | 2S |
| 7 | Cap. Polystyrene 0.0047uF ±5% 350V WIS.7909-B-1-3 | 1 | 3 6 | 2S |
| 8 | Cap. Pap. 0.25uF ±25% 150V PC.19301-2 | 1 | 3 0 | 2S |
| 9 | Cap. Pap. 0.01uF ±20% 400V PC.19308-7 | 1 | 3 0 | 2S |
| 10 | Cap. Polystyrene 0.039uF ±10% 125V WIS.8996-B-1-5 | 1 | 3 6 | 2S |
| 11 | Cap. Elyc. 500uF ±20% 6V WIS.5082-B-3-138 | 2 | 2 6 | 2S |
| 12 | Cap. Elyc. 250uF +100% -20% 25V PC.18406-18 | 1 | 2 6 | 2S |
| 13 | Cap. Mica. 0.001uF ±2% 350V PC.18803-49 | 1 | 5 0 | 2S |
| 14 | Cap. Mica. 560pF ±2% 350V PC.18803-43 | 1 | 3 6 | 2S |
| 15 | Cap. Pap. 0.02uF ±20% 250V PC.19307-8 | 1 | 3 0 | 2S |
| 16 | Cap. Elyc. 200uF +100% -20% 6V 3/PC.18409-27 | 1 | 2 6 | 2S |
| 17 | Cap. Elyc. 2uF +100% -20% 25V PC.18467-98 | 1 | 2 6 | 2S |
| 18 | Cap. Pap. 0.5uF ±25% 250V PC.19302-4 | 1 | 3 6 | 2S |
| 19 | Cap. Melinex 2uF ±20% 250V WIS.7190-1-3 | 1 | 8 0 | 2S |
| 20 | Cap. Pap. 0.01uF ±20% 150V PC.19307-7 | 1 | 3 0 | 1S |
| 21 | Cap. Pap. (Value Determined on Test) ±20% 250V PC.19301 | 1 | | |
| 22 | Indr. WIS.9111-C-26 | 1 | 3 14 6 | 1B |
| 23 | Indr. WIS.9111-C-27 | 1 | 3 14 6 | 1B |
| 24 | Cap. Elyc. 8uF -20% +100% 50V PC.18409-21 | 1 | 1 0 | |
| 25 | Jack RP.15842 | 1 | 3 0 | 1S |
| 26 | | | | |
| 27 | Lamp 14V 0.2A PC.48704-4 | 1 | 1 0 | 12S |
| 28 | | | | |
| 29 | Meter (For Type 4127C only)(M.P.H. Calibration) WIS.4285-5-79 | 1 | 16 18 6 | 1B |
| 30 | Meter (For Type 4127D only)(K.P.H. Calibration) WIS.4285-5-80 | 1 | 16 18 6 | OR 1B |
| 31 | | | | |
| 32 | Nut, Spindle Gripping PH.71101-1 | 3 | 1 0 | 1S |
| 33 | | | | |
| 34 | Plug, 6-pin WIS.6499-2-42P | 1 | 1 3 6 | 1S |
| 35 | | | | |
| 36 | Printed Board 'Analyser' F.1417-1-A | 1 | 30 18 6 | 1B |
| 37 | Printed Board 'Frequency Meter' F.1419-1-A | 1 | 23 6 0 | 1B |
| 38 | | | | |
| 39 | Rect. OA.202 Mullard | 2 | 4 0 | 1S |
| 40 | Relay WIS.6932-B-Sh.1-Ref.8 | 1 | 4 15 0 | |
| 41 | Relay, WIS.6932-B-1-3 | 0 | 1 15 6 | 1S |
| 42 | Relay, PC.65408-3 | 1 | 2 1 6 | 1S |

† ø per pair

| No. | Description and Identity | Qty. | Price Each † £. s. d. | Scale |
|---|---|---|---|---|
| 43 | | | | |
| 44 | Res. Comp. 10k ohms ±10% 0.25W PC.66609-31 | 5 | 1 0 | 3S |
| 45 | Res. Comp. 4.7k ohms ±10% 0.25W PC.66609-27 | 2 | 1 0 | 2S |
| 46 | Res. Comp. (Value Determined on Test) ±10% 0.25W PC.66609 | 1 | 1 0 | 2S |
| 47 | Res. Comp. 3.3k ohms ±10% 0.25W PC.66609-25 | 2 | 1 0 | 2S |
| 48 | Res. Comp. 390 ohms ±10% 0.25W PC.66609-14 | 1 | 1 0 | 2S |
| 49 | Res. Comp. 22k ohms ±5% 0.25W PC.66604-41 | 3 | 1 0 | 2S |
| 50 | Res. Comp. 1.8k ohms ±5% 0.25W PC.66604-28 | 1 | 1 0 | 2S |
| 51 | Res. Comp. (Value Determined on Test) ±10% 0.25W PC.66609 | 1 | 1 0 | 2S |
| 52 | Res. Comp. 150 ohms ±10% 0.25W PC.66609-9 | 1 | 1 0 | 2S |
| 53 | Res. Comp. 680 ohms ±10% 0.25W PC.66609-17 | 1 | 1 0 | 2S |
| 54 | Res. Comp. 2.2k ohms ±5% 0.25W PC.66604-29 | 3 | 1 0 | 2S |
| 55 | Res. Comp. 220 ohms ±5% 0.25W PC.66604-17 | 2 | 1 0 | 2S |
| 56 | Res. Comp. 56k ohms ±5% 0.25W PC.66604-46 | 2 | 1 0 | 2S |
| 57 | Res. Comp. 10k ohms ±5% 0.25W PC.66604-37 | 2 | 1 0 | 2S |
| 58 | Res. Comp. 820 ohms ±10% 0.25W PC. 66609-18 | 2 | 1 0 | 2S |
| 59 | Res. Thermistor PC.66380-10 | 1 | 1 0 0 | 2S |
| 60 | Res. Comp. 4.7m ohms ±5% 0.25W PC.66604-69 | 1 | 1 6 | 2S |
| 61 | Res. Comp. 47k ohms ±10% 0.5W PC.66611-45 | 1 | 1 0 | 2S |
| 62 | Res. Comp. 100k ohms ±10% 0.25W PC.66609-43 | 1 | 1 0 | 2S |
| 63 | Res. Comp. 18k ohms ±10% 0.25W PC.66609-34 | 1 | 1 0 | 2S |
| 64 | Res. Comp. 150k ohms ±10% 0.25W PC.66609-45 | 1 | 1 0 | 2S |
| 65 | Res. Comp. 10 ohms ±10% 0.25W PC.66610-1 | 1 | 1 0 | 2S |
| 66 | Res. Comp. 1k ohms ±10% 0.25W PC.66609-19 | 2 | 1 0 | 2S |
| 67 | Res. Comp. 6.8k ohms ±10% 0.25W PC.66609-29 | 1 | 1 0 | 2S |
| 68 | Res. Comp. 2.2k ohms ±10% 0.25W PC.66609-23 | 2 | 1 0 | 2S |
| 69 | Res. Comp. 10m ohms ±10% 0.25W PC.66610-73 | 3 | 1 0 | 2S |
| 70 | Res. Comp. 68k ohms ±10% 0.25W PC.66609-41 | 2 | 1 0 | 2S |
| 71 | Res. Comp. 15k ohms ±10% 0.25W PC.66609-33 | 1 | 1 0 | 2S |
| 72 | Res. Comp. 1.5k ohms ±10% 0.25W PC.66609-21 | 1 | 1 0 | 2S |
| 73 | Res. Comp. 330 ohms ±10% 0.25W PC.66609-13 | 1 | 1 0 | 2S |
| 74 | Res. Comp. 68 ohms ±10% 0.25% PC.66610-11 | 1 | 1 0 | 2S |
| 75 | Res. Comp. 3.9k ohms ±10% 0.25W PC.66609-26 | 1 | 1 0 | 2S |
| 76 | Res. Comp. 1k ohms ±5% 0.125W PC.66601-13 | 1 | 1 0 | 2S |
| 77 | | | | |
| 78 | | | | |
| 79 | | | | |
| 80 | | | | |
| 81 | | | | |
| 82 | Res. Vble. W/W 2.5k ohms ±20% 0.25W PC.67207-2 | 1 | 11 6 | 2S |
| 83 | Res. Vble. Comp. 10k ohms ±20% 0.25W PC.67207-4 | 1 | 11 6 | 2S |
| 84 | Res. Vble. Comp. 100k ohms ±20% 0.25W PC.67208-25 | 1 | 9 0 | 2S |
| 85 | Res. Vble. Comp. 50k ohms ±20% 0.25W PC.67207-6 | 1 | 11 6 | 2S |

†

| No. | Description and Identity | Qty. | Price † Each £. s. d. | Scale |
|---|---|---|---|---|
| 86 | Res. Vble. Comp. 500k ohms ±20% 0.25W PC.67207-9 | 1 | 13 6 | 2S |
| 87 | Res. Vble. Comp. 1m ohms ±20% 0.25W PC.67207-10 | 1 | 13 6 | 2S |
| 88 | | | | |
| 89 | Socket WIS.9456-C-1-2 | 1 | 5 6* | 1S |
| 90 | Socket WIS.9456-C-1-4 | 1 | 5 6* | 1S |
| 91 | Socket WIS.9456-C-1-3 | 1 | 5 6* | 1S |
| 92 | | | | |
| 93 | Stabilizer Low Voltage 1.5V 20mA WIS.7825-C-1-1 | *2 | 15 0 | 2S |
| 94 | | | | |
| 95 | Switch WIS.5103-C-1-16 | 1 | 10 0 | 1S |
| 96 | Switch WIS.5700-C-22 | 1 | 1 1 0 | 1S |
| 97 | Switch PC.71301-2 | 1 | 6 6 | 1S |
| 98 | | | | |
| 99 | Transistor OC.71 | 3 | 4 0 | 2S |
| 100 | Transistor OC.44 | 5 | 5 6 | 3S |
| 101 | Transistor OC.140 | 1 | 1 2 0 | 2S |
| 102 | Transistor OC.201 | 1 | 1 2 0 | 2S |
| 103 | Transistor OC.72 | 1 | 4 6 | 2S |
| 104 | Transistor OC.73 | 1 | 10 6 | 2S |
| 105 | | | | |
| 106 | Valve 12AT7WA | 1 | | 3S |
| 107 | Valve EF86 | 1 | | 3S |
| 108 | | | | |
| 109 | Valveholder PC.81827-1 | 2 | 7 6 | 1S |
| 110 | | | | |
| 111 | Valve Retainer PC.82501-1 | 2 | 1 0 | 1S |

† * per doz

* Modified to W.101465-1-1

MCL T.3827 List 5
ISSUE: 1
DATE: 29.1.63

# MASTER COMPONENTS LIST

FOR

REMOTE METER TYPE 6656A or B(W.92853 Ed.A or B)
CABLE ASSEMBLY (w.92843B Ed.A)
FOR P.E.T.A. S350 (W.73995 Ed.A & B)
Technical Handbook Ref. T. 3827 List 5

NOTES:

1. Component schedules in this handbook are presented in the form of a master components list, which includes all components used in this equipment. Each component is identified by means of a spares reference number, column 1, in addition to the normal part identity in column 6.
2. Components shown on individual circuit diagrams may be identified in the master list by means of the cross-reference tables associated with each circuit diagram. The numbers given are the spares reference numbers.
3. For spares ordering purposes it is only necessary to quote the exact handbook reference at the top of this page together with the spares reference number. Individual part identities can be given as a cross check if desired, but are not necessary.
4. Prices are subject to change without notice.
5. The following abbreviations are used throughout this Master List:

| | | | |
|---|---|---|---|
| Cap. | Capacitor | Osc. | Oscillator |
| Carb. | Carbon | Pap. | Paper |
| Cer. | Ceramic | pF | Picofarad |
| C/O | Changeover | | Micro-Microfarad |
| Coef. | Coefficient | Psn. | Position |
| Comp. | Composition | Potr. | Potentiometer |
| DP | Double Pole | Prim. | Primary (winding) |
| DT | Double Throw | PVC | Polyvinyl Chloride Compound Insulated |
| En. | Enamelled | | |
| Elyc. | Electrolytic | Rect. | Rectifier |
| Fil. | Filament | Res. | Resistor |
| FSD | Full Scale Deflection | Sec. | Secondary (winding) |
| Gd. | Grade | Sil.Mica. | Silver Mica |
| HS | High Stability | Sil.Mica.Prot. | Silver Mica Protected |
| | | SP | Single Pole |
| Indr. | Inductor | Temp. | Temperature |
| Insd. | Insulated | Term. | Terminal |
| Insr. | Insulator | Transf. | Transformer |
| Lg. | Long | Tub. | Tubular |
| Lin. | Linear | Vble. | Variable |
| Metd. | Metallised | Vit. | Vitreous |
| Mld. | Moulded | W/W | Wirewound |
| Neg. | Negative | | |

| No. | Description and Identity | Qty. | Price † Each £. s. d. | Scale |
|---|---|---|---|---|
| 1 | Cable Twin DEF 10 2A | 450 ft. | 1 3 0ø | - |
| 2 | | | | |
| 3 | Meter (For Type 6656A only)(M.P.H. Calibration) WIS.4285-5-79 | 1 | 16 18 6 | 1B OR |
| 4 | Meter (For Type 6656B only)(K.P.H. Calibration) WIS.4285-5-80 | 1 | 16 18 6 | 1B |
| 5 | | | | |
| 6 | Plug, Telephone Jack WIS.121 | 2 | 6 0 | 1S |
| 7 | | | | |
| 8 | Res. Comp. 1k ohms ±5% 0.125W PC.66601-13 | 1 | 1 0 | 2S |
| 9 | | | | |
| 10 | Socket, Jack WIS.3150-C-1-1 | 1 | 10 6 | 1S |

† ø per 100 feet.

MCL:- T3827-6
Issue:- 1
Date:- 30.6.65

# MASTER COMPONENTS LIST
## FOR
## 65dB GAIN SETTING ATTENUATOR

| No. | Description and Identity | Qty. | Price Each † £. s. d. |
|---|---|---|---|
| 1 | Res. w.w. 47k ohms ±5% 6W PC.67010-23 | 1 | 3 6 |
| 2 | Res. w.w. 4.7k ohms ±5% 1.5W PC.67007-17 | 1 | 3 6 |
| 3 | Res. w.w. 33 ohms ±5% 1.5W PC.67007-4 | 1 | 3 0 |

1586

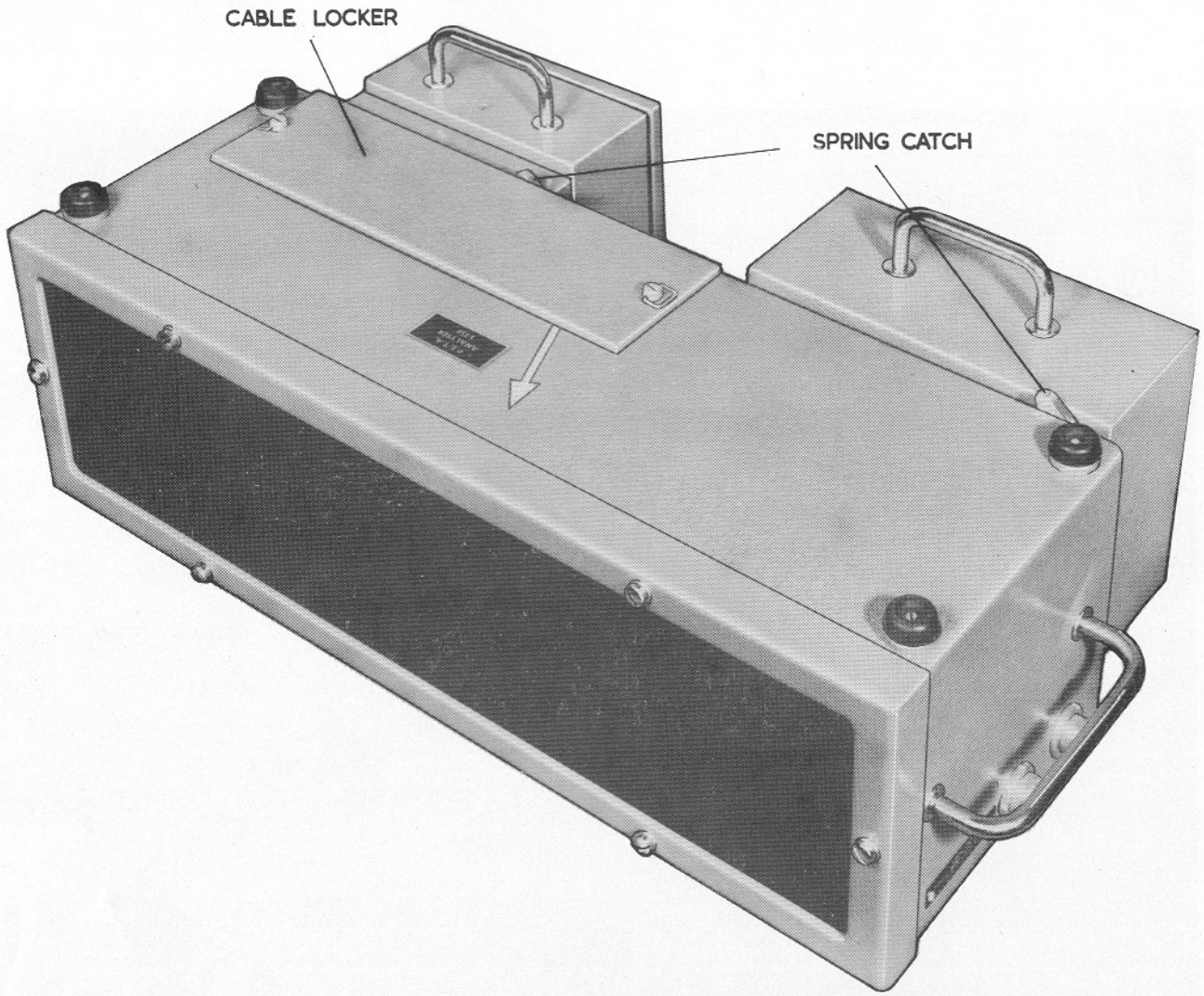



FIG. 3 P.E.T.A. Assembled for Transportation

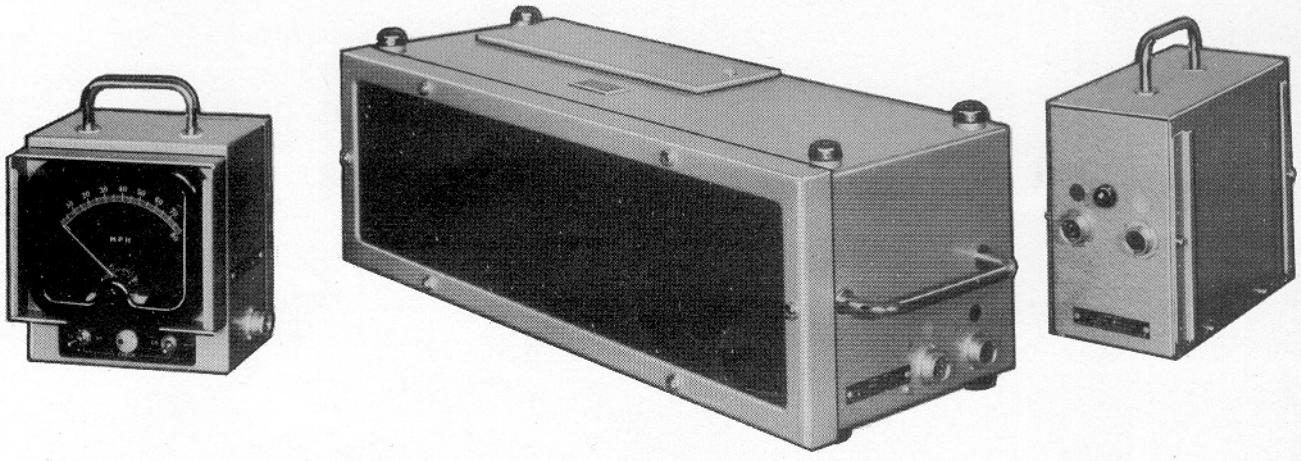



FIG. 2 P.E.T.A. General View

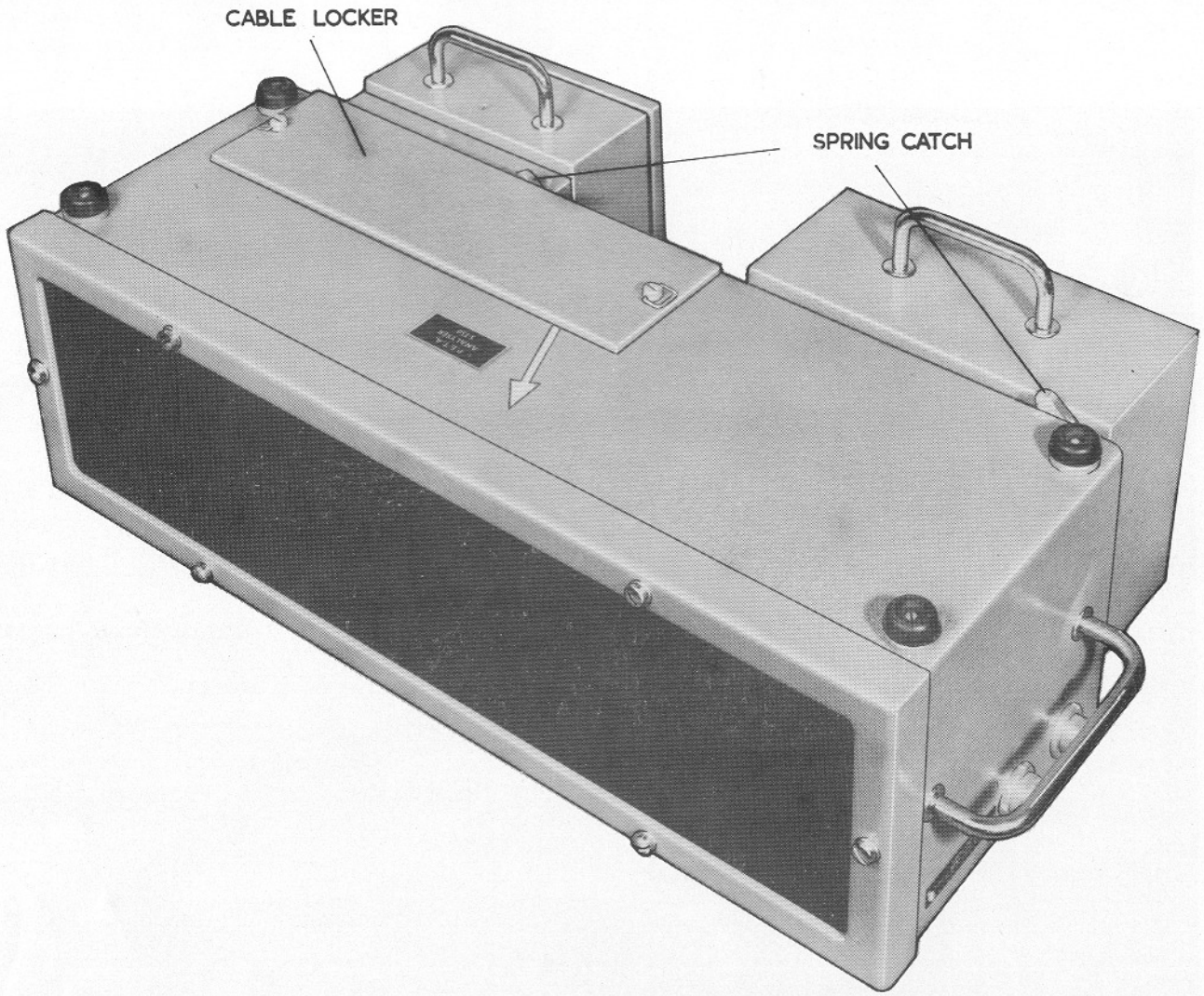
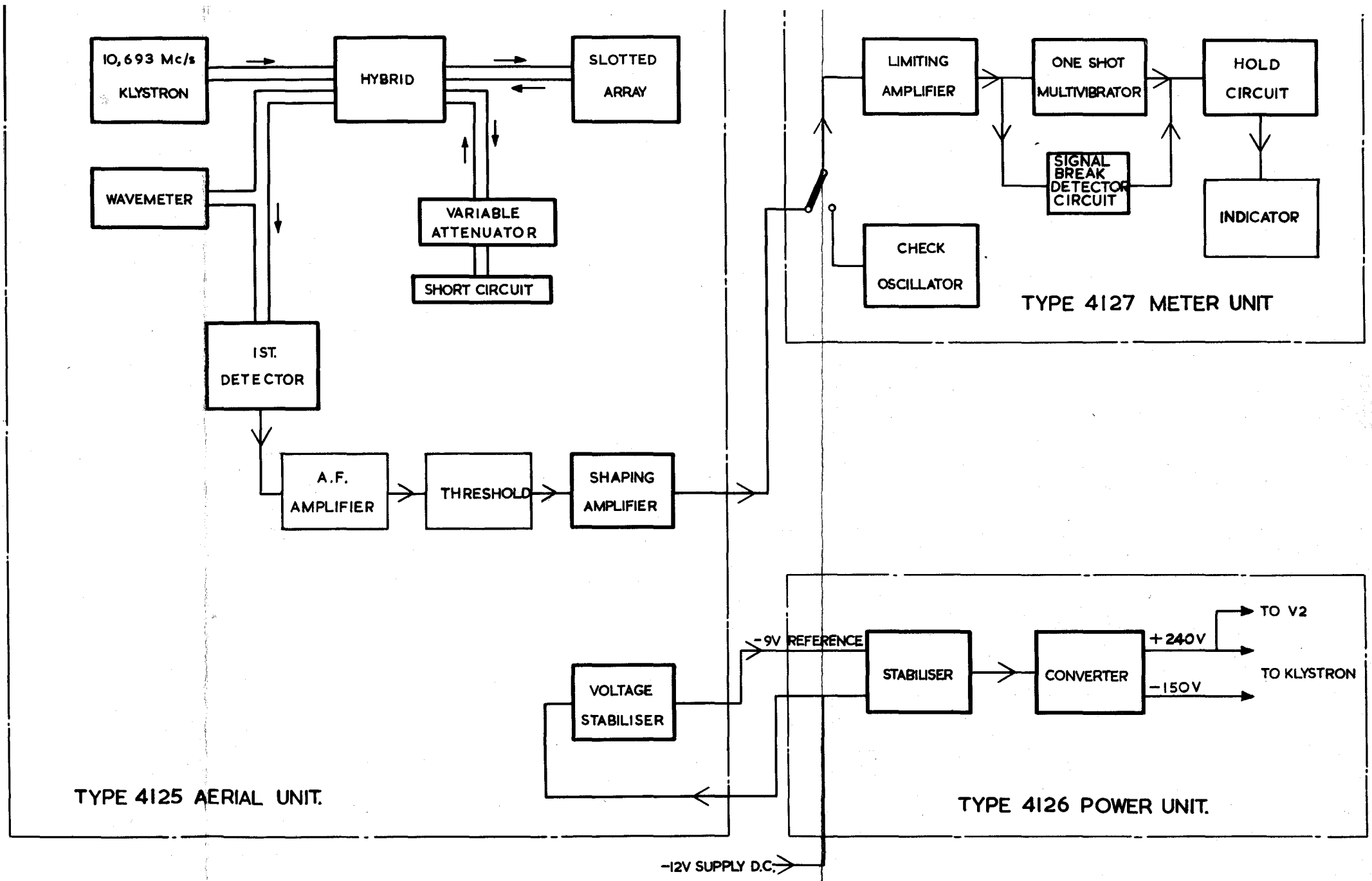


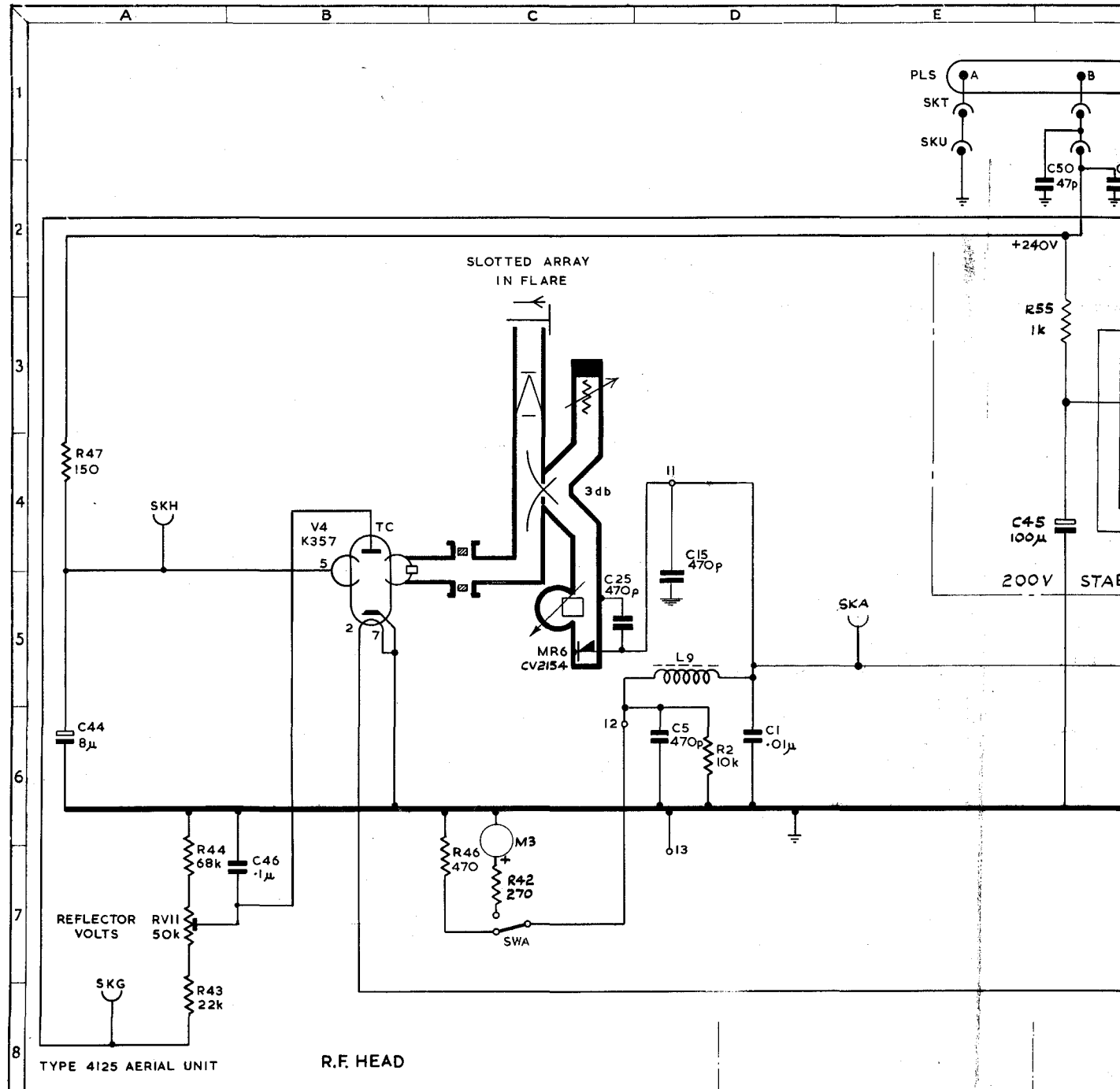

FIG. 3 P.E.T.A. Assembled for Transportation

FIG.4 P.E.T.A. Drivers View



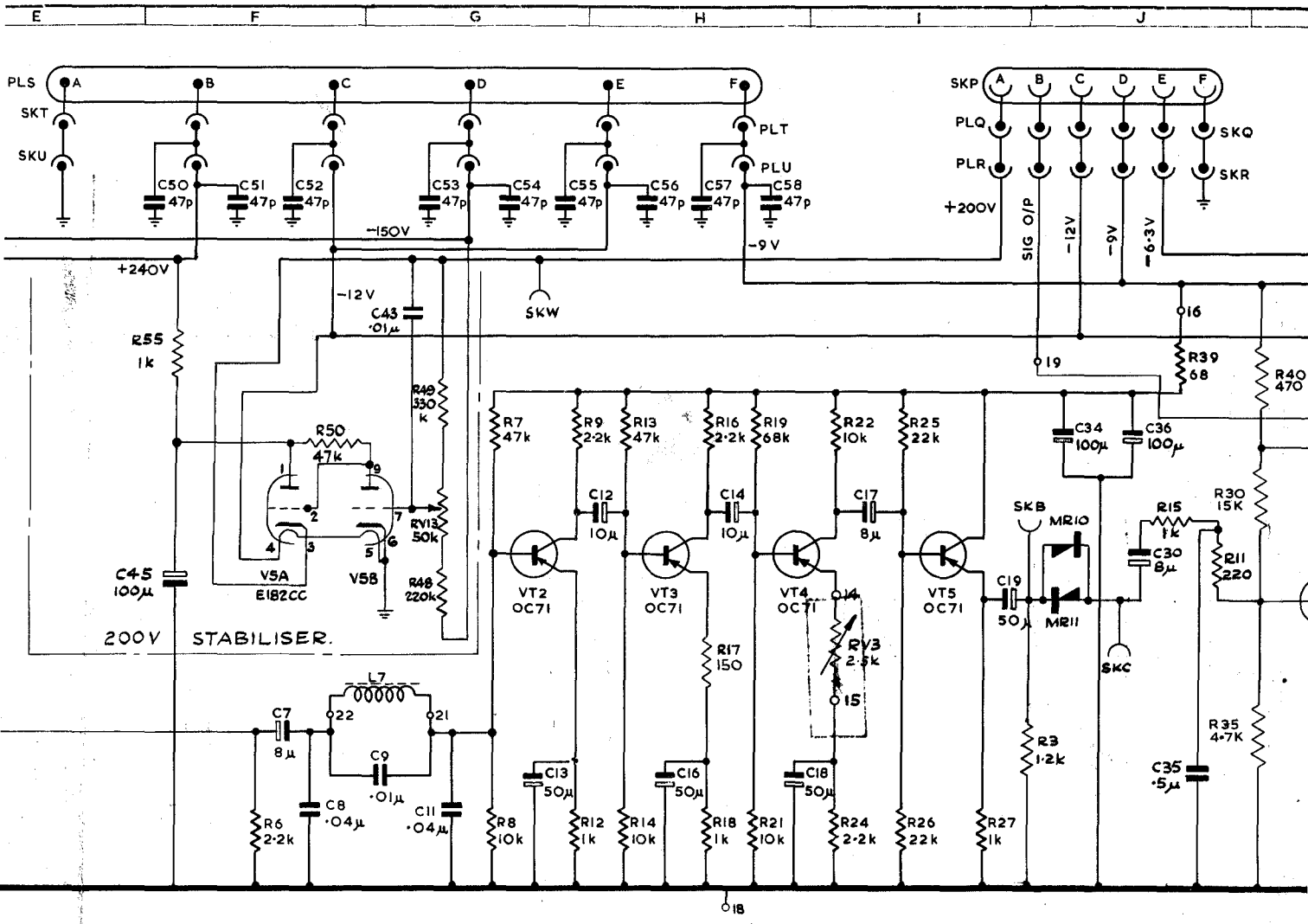

**BLOCK DIAGRAM**
**ANALYSER S350 (P.E.T.A.)**
**WZ.19903/B Sh.1. Iss.4**

**FIG. 5**




## NOTES

1. SKG & SKH ARE FOR MONITORING.




A.F. AMPLIFIER

THRESHOLD

# CIRCUIT DIAGRAM
# TYPE 4125 AERIAL UNIT
# WZ. 19884/D Sh.1 Iss. 5

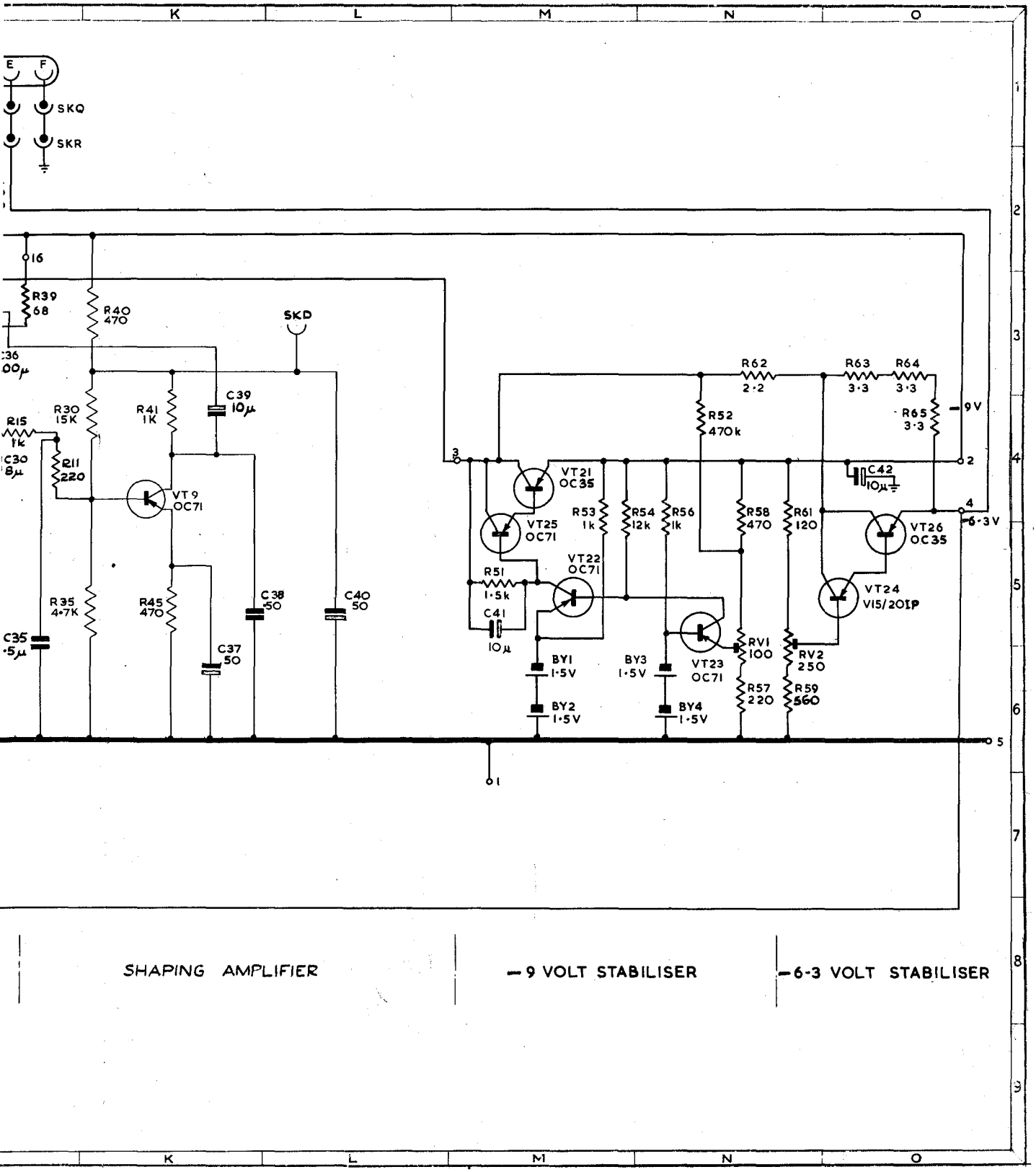

K
L
M
N
O
E
F
SKQ
SKR
16
R39
68
R40
470
SKD
C39
10μ
R30
15K
R41
1K
R15
1k
R11
220
VT9
OC71
R35
4·7K
R45
470
C38
50
C37
50
C40
50
C35
·5μ
R62
2·2
R63
3·3
R64
3·3
R52
470k
R65
3·3
9V
3
2
C42
10μ
4
6·3V
VT21
OC35
VT25
OC71
R53
1k
R54
12k
R56
1k
R58
470
R61
120
VT26
OC35
VT22
OC71
R51
1·5k
C41
10μ
VT24
VI5/201P
BY1
1·5V
BY2
1·5V
BY3
1·5V
BY4
1·5V
VT23
OC71
RV1
100
RV2
250
R57
220
R59
560
5
1
SHAPING AMPLIFIER
—9 VOLT STABILISER
—6·3 VOLT STABILISER

FIG. 6

# AERIAL UNIT TYPE 4125A&B FOR P.E.T.A. S350

(Refer to Master Components List T3827)

Cross Reference List

for WZ.19884/D Sh.1

Refer to Master Components List T.3827 List No.1

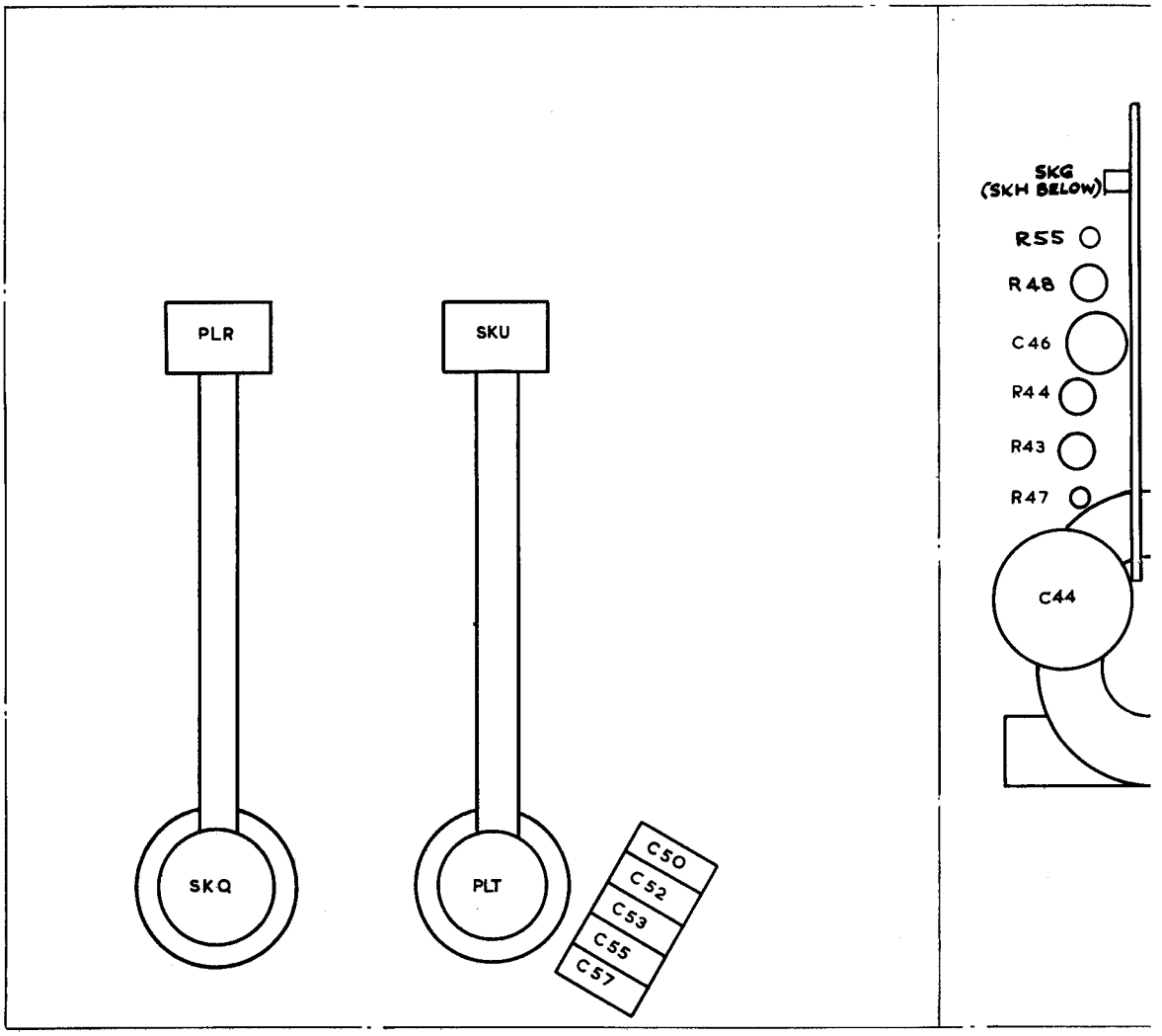
| Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BY1 | 89 | C30 | 3 | C57 | 15 | PLT | ø30 *31 | R24 | 48 | R54 | 61 | RV13 | 73 | V4 | 98 |
| BY2 | 89 | C34 | 9 | C58 | 15 | PLU | ø30 *31 | R25 | 49 | R55 | 44 | | | V5 | 99 |
| BY3 | 89 | C35* | 10 | | | | | R26 | 49 | R56 | 44 | SKA | 74 | | |
| BY4 | 89 | C36 | 9 | | | | | R27 | 44 | R57 | 43 | SKB | 75 | | |
| | | C37 | 6 | | | R2 | 39 | R30 | 50 | R58 | 52 | SKC | 75 | VT2 | 93 |
| | | C38 | 10 | L7 | 21 | R3 | 40 | R35 | 51 | R59 | 62 | SKD | 77 | VT3 | 93 |
| C1 | 1 | C39 | 5 | | | R6 | 41 | R39 | 45 | R61 | 63 | SKG | 78 | VT4 | 93 |
| C5 | 2 | C40 | 8 | L9 | 20 | R7 | 42 | R40 | 52 | R62 | 64 | SKH | 79 | VT5 | 93 |
| C7 | 3 | C41 | 5 | | | R8 | 39 | R41 | 44 | R63 | 65 | SKP | ø80 *81 | VT9 | 93 |
| C8 | 4 | C42 | 5 | | | R9 | 41 | R42 | 53 | R64 | 65 | SKQ | ø82 *83 | VT21 | ø94 *95 |
| C9 | 1 | C43 | 11 | M3* | 22 | R11 | 43 | R43 | 54 | R65 | 65 | SKR | ø82 *83 | VT22 | 93 |
| C10ø | 16 | | | | | | | | | | | | | | |
| C11 | 4 | C44 | 12 | | | R12 | 44 | R44 | 55 | | | SKT | ø84 *85 | VT23 | 93 |
| C12 | 5 | C45 | 13 | | | R13 | 42 | R45 | 52 | | | SKU | ø84 *85 | VT24 | 96 |
| C13 | 6 | C46 | 14 | MR6 | 36 | R14 | 39 | R46 | 52 | | | SKW | 79 | VT25 | 93 |
| C14 | 5 | C50 | 15 | MR10 | 37 | R15 | 44 | R47 | 56 | | | | | VT26 | ø94 *95 |
| C15 | 7 | C51 | 15 | MR11 | 37 | R16 | 41 | R48 | 57 | | | | | | |
| C16 | 6 | C52 | 15 | | | R17 | 68 | R49 | 58 | | | | | | |
| C17 | 3 | C53 | 15 | | | R18 | 44 | R50 | 42 | RV1 | 69 | | | | |
| C18 | 6 | C54 | 15 | PLQ | ø26 *27 | R19 | 46 | R51 | 59 | RV2 | 70 | SWA | 91 | | |
| C19 | 8 | C55 | 15 | PLR | ø26 *27 | R21 | 47 | R52 | 60 | RV3 | 71 | | | | |
| C25 | 7 | C56 | 15 | PLS | ø28 *29 | R22 | 47 | R53 | 44 | RV11 | 73 | | | | |

## MISCELLANEOUS MECHANICAL ITEMS

| | | |
|---|---|---|
| Ref. 5 | Valve Base for V4 | No.101 |
| Ref. 6 | Nut Spindle Gripping for RV1,RV2, RV3,RV11 & RV13 | No. 24 |
| Ref. 7 | Cover Spindle End for RV3,RV11, RV13 | No. 18 |
| Ref. 8 | Main Printed Board F.634-1-A | No. 33 |
| Ref. 9 | Stabiliser Board F.635-1-A | No. 34 |
| Ref.13 | Valve Retainer for V5 | No.103 |
| Ref.14 | Valveholder B9A (For V5) | No.102 |
| | Set, Mica Washer and Bushes, Part No.56201 (For VT21 & VT26) | No. 88 |

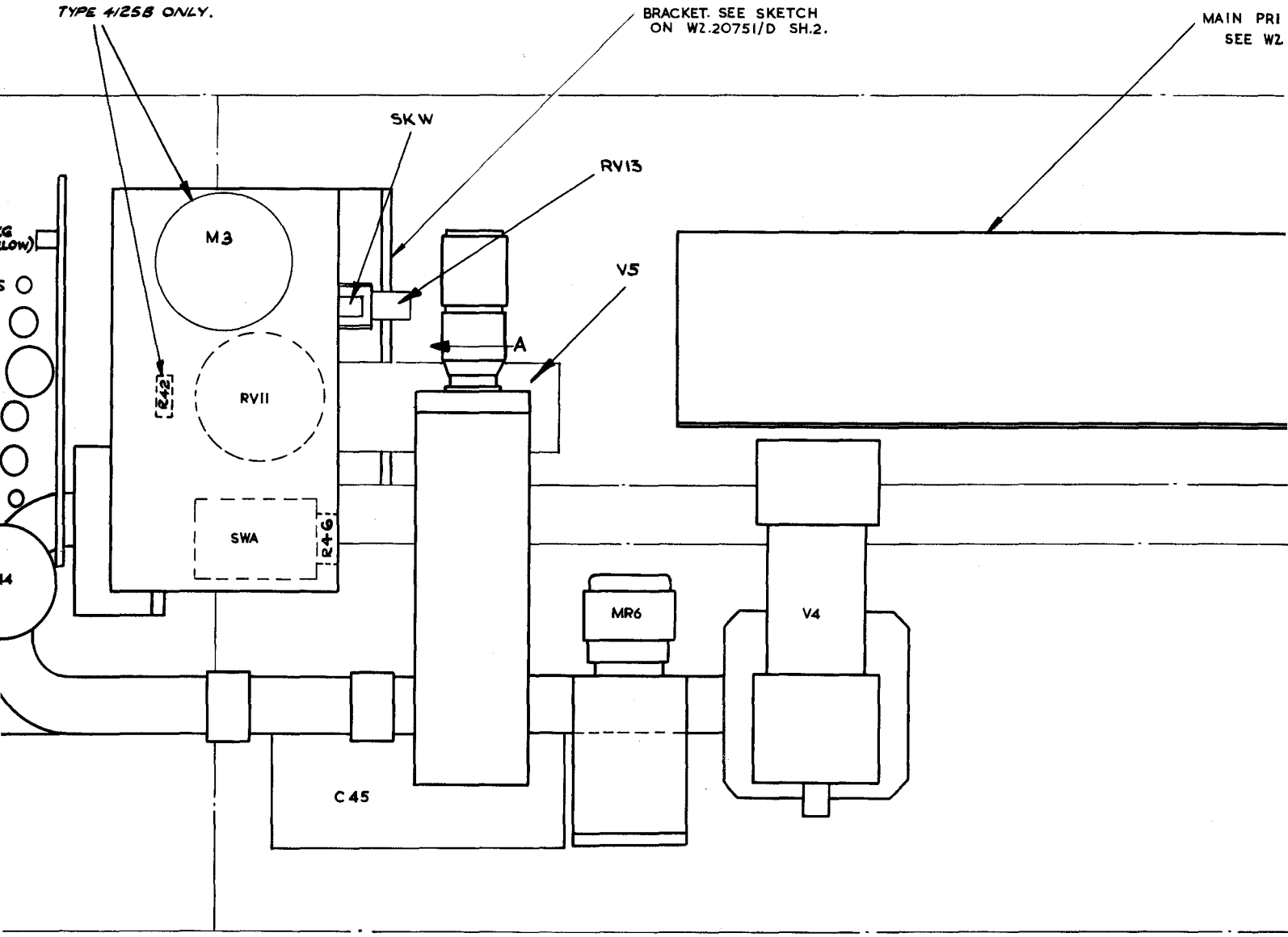
* For Type 4125B only

ø For Type 4125A only




NOTES

1. FOR COMPONENT SCHEDULE SEE WZ.19884A.
2. PLQ, PLS, SKP, SKT, SKV } ARE SITUATED ON LEADS IN CABLE LOCKER.




VIEW WITH BACK OF CASE REMOVED
AND ONE SIDE OPENED OUT.

**COMPONENT LAYOUT**
**TYPE 4125 AERIAL UNIT**
**WZ.20751/D Sh.1. Iss.2**

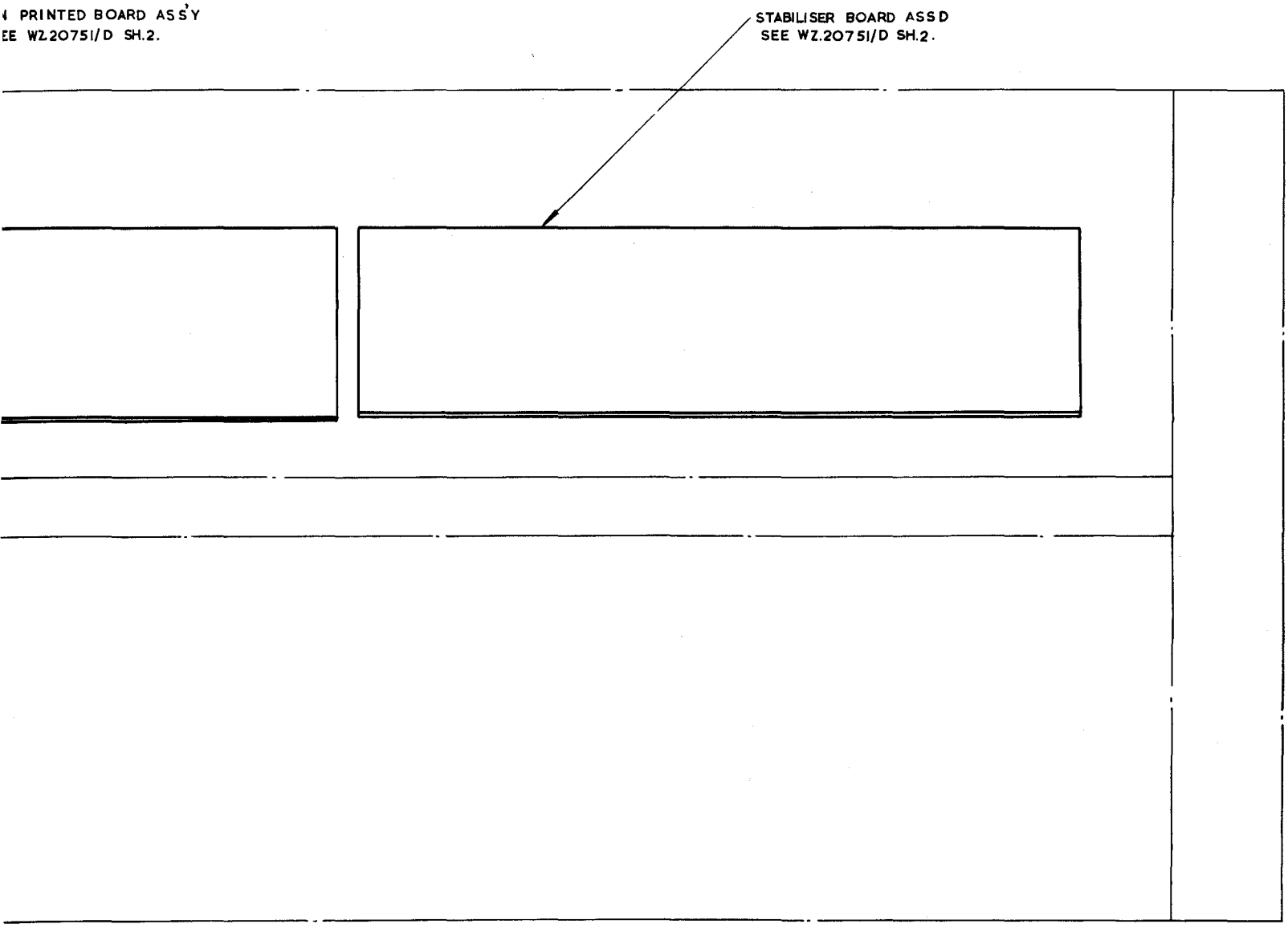
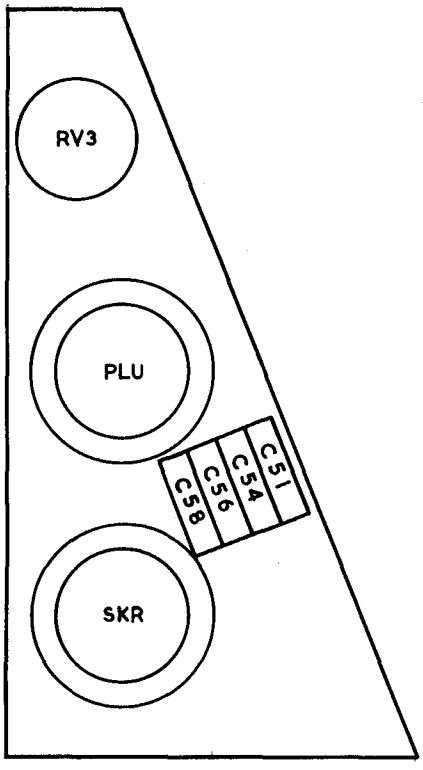
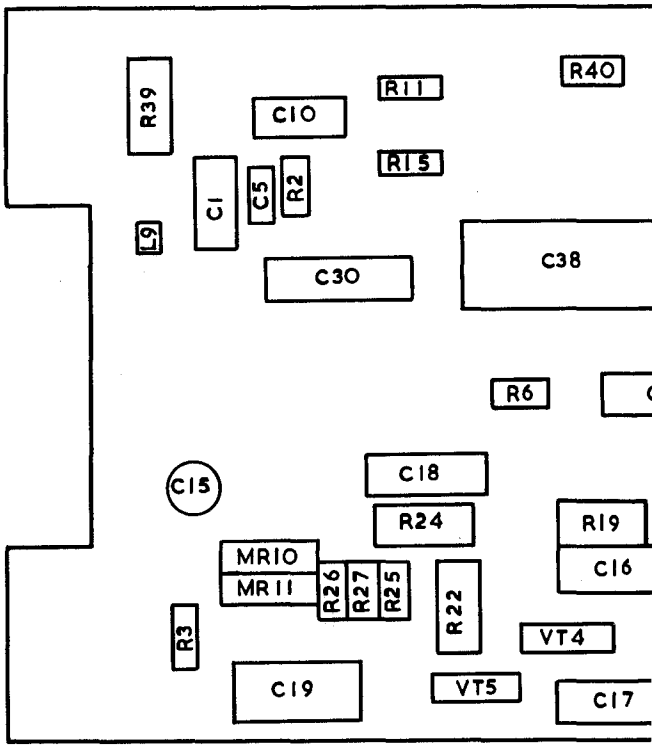

PRINTED BOARD ASS'Y
EE WZ.20751/D SH.2.
STABILISER BOARD ASS'D
SEE WZ.20751/D SH.2.

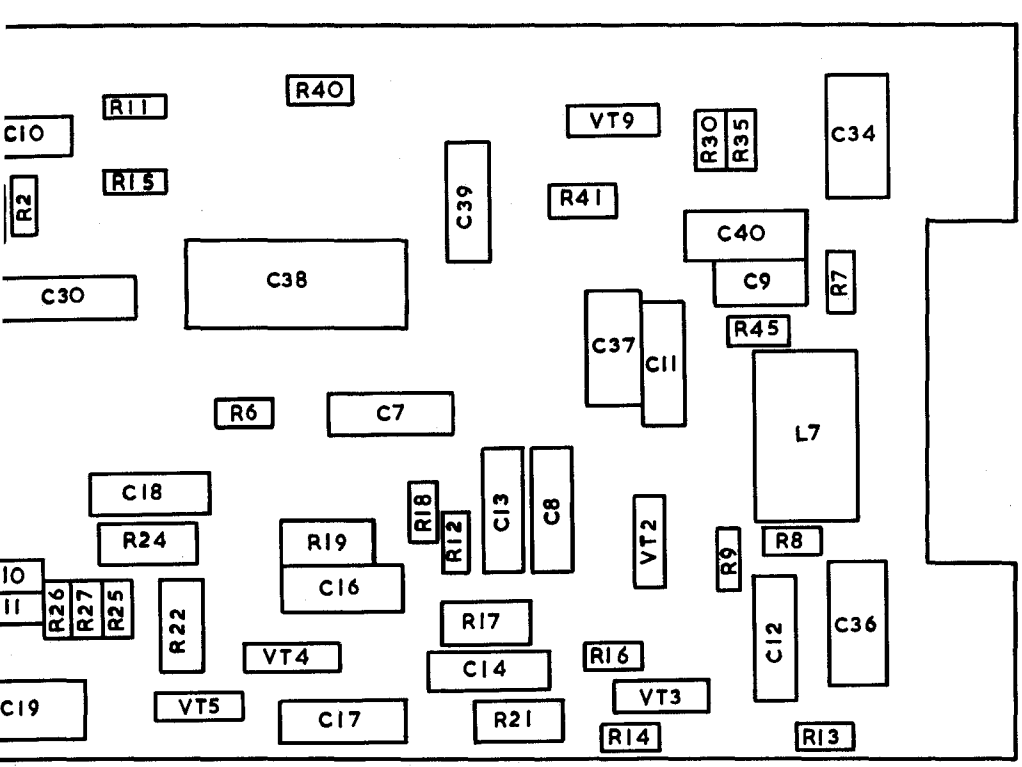
FIG. 7

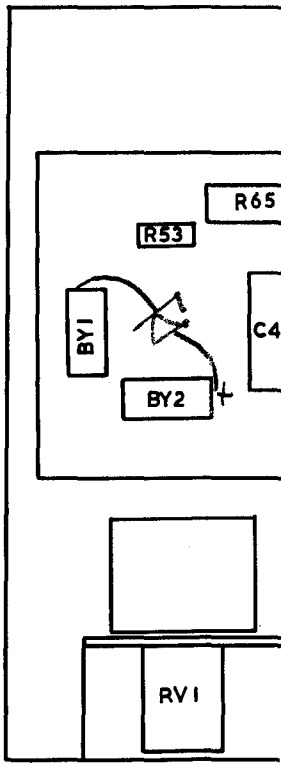



BRACKET VIEWED IN
DIRECTION OF ARROW 'A'. (ON SH. 1.)



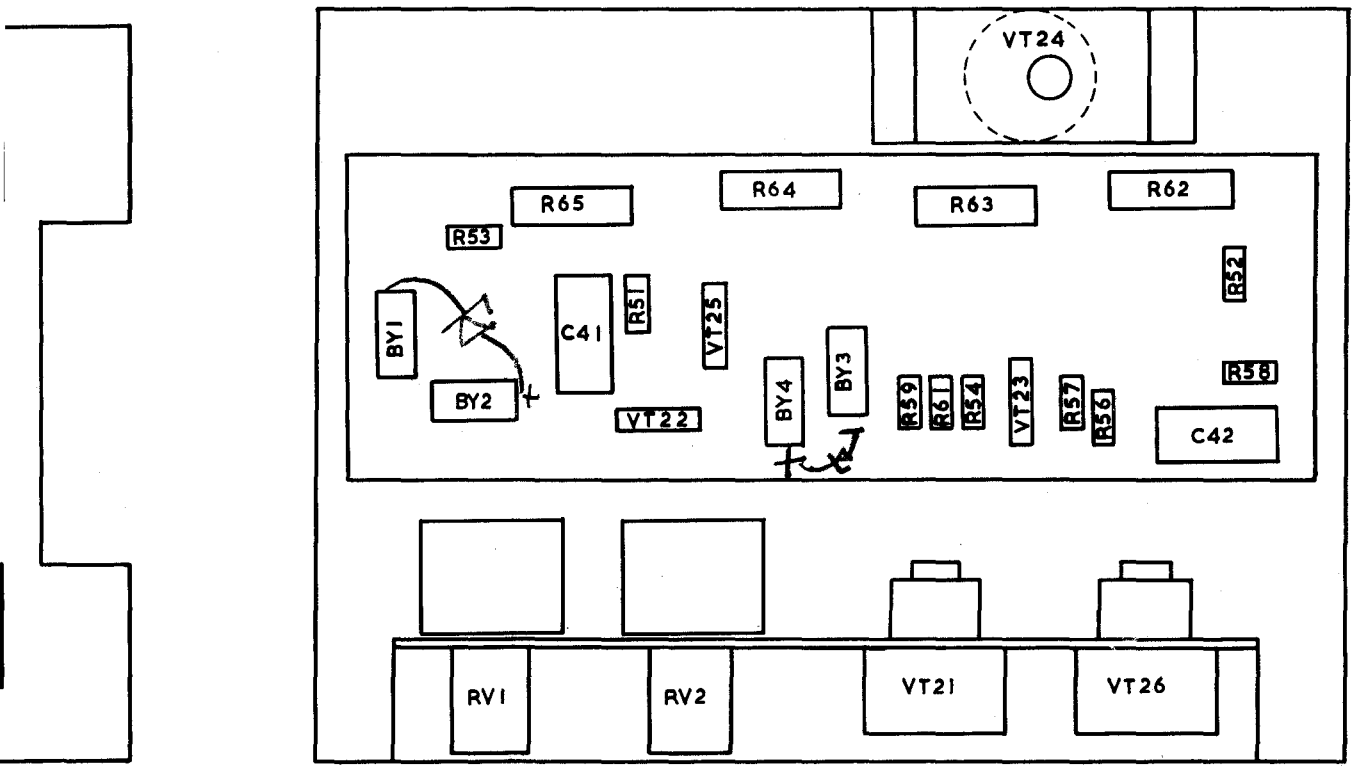

MAIN PRINTE




MAIN PRINTED BOARD ASS'Y.

**COMPONENT LAYOUT**
**TYPE 4125 AERIAL UNIT**
**WZ. 20751/D Sh. 2 Iss. 2**




STABILISER BOARD ASS'D.

FIG. 8

METER UNIT TYPE 4127A,B OR E, POWER UNIT TYPE 4126A
REMOTE METER TYPE 4138 AND CABLE ASSEMBLY
W.92843/B Sh.1 Ed.A for P.E.T.A. S350

Cross Reference List
for WZ.19884/D Sh.2

| Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | METER UNIT TYPE 4127A,B OR E | | | | | | | | | |
| | | Refer to Master Components List T.3827 List No.3 | | | | | | | | | | | | | |
| BY5 | 90 | C79 | 11 | | | R105 | 46 | R135 | 42 | R155 | 64 | RV24 | 82 | VT43 | 98 |
| BY6 | 90 | C80 | 12 | | | R106 | 47 | R136 | 41 | R156 | 71 | RV25 | 83 | VT44 | 97 |
| | | C81 | 13 | | | R107 | 48 | R137 | 63 | R157 | 41 | | | VT46 | 97 |
| | | C82 | 14 | LP1 | 26 | R108 | 41 | R138 | 56 | R158 | 72 | | | VT47 | 97 |
| C60 | 1 | C83 | 15 | | | R109 | 45 | R139 | 41 | R159 | 73 | SKJ | 85 | VT48 | 97 |
| C61 | 2 | C84 | 16 | | | R110 | 49 | R140 | 64 | R160 | 66 | SKL | 86 | VT49 | 99 |
| C62 | 2 | C85 | 13 | M1 | 28 | R111 | 50 | R141 | 65 | R170 | 43 | SKM | 87 | VT50 | 100 |
| C63 | 3 | C86 | 17 | | | R115 | 51 | R142 | 66 | | | SKN | 88 | VT52 | 101 |
| C64 | 4 | C87 | 18 | | | R117 | 52 | R143 | 67 | | | | | VT53 | 96 |
| C65 | 3 | | | MR12 | 37 | R118 | 53 | R144 | 68 | | | | | VT54 | 96 |
| C67 | 5 | | | MR13 | 37 | R119 | 54 | R145 | 67 | | | SWB | 92 | | |
| C70 | 1 | C102 | 19 | | | R121 | 47 | R146 | 68 | | | SWC | 93 | | |
| C71 | 6 | | | | | R122 | 55 | R147 | 52 | | | SWD | 94 | | |
| C72 | 7 | JKA | 24 | PLP | 32 | R125 | 56 | R148 | 53 | | | | | | |
| C73 | 6 | | | | | R127 | 40 | R149 | 54 | RLA | | | | | |
| C74 | 2 | | | | | R128 | 58 | R150 | 55 | | | V2 | 103 | | |
| C75 | 8 | L10 | 21 | R101 | 41 | R131 | 59 | R151 | 47 | | | | | | |
| C76 | 9 | L12 | 22 | R102 | 42 | R132 | 60 | R152 | 52 | RV21 | 79 | | | | |
| C77 | 10 | | | R103 | 44 | R133 | 61 | R153 | 69 | RV22 | 80 | VT41 | 96 | | |
| C78 | 11 | | | R104 | 45 | R134 | 62 | R154 | 70 | RV23 | 81 | VT42 | 97 | | |

MISCELLANEOUS MECHANICAL ITEMS

| | | |
|---|---|---|
| Ref. 6 | Nut Spindle Gripping for RV21-RV23 | No. 30 |
| Ref.10 | Frequency Board F.641-1-A | No. 34 |
| Ref.11 | Hold On Board F.642-1-A | No. 35 |
| Ref.12 | Valveholder for V2 | No.105 |
| Ref.13 | Valve Retainer for V2 | No.107 |
| | Printed Board F.752-1-A | No. 36 |

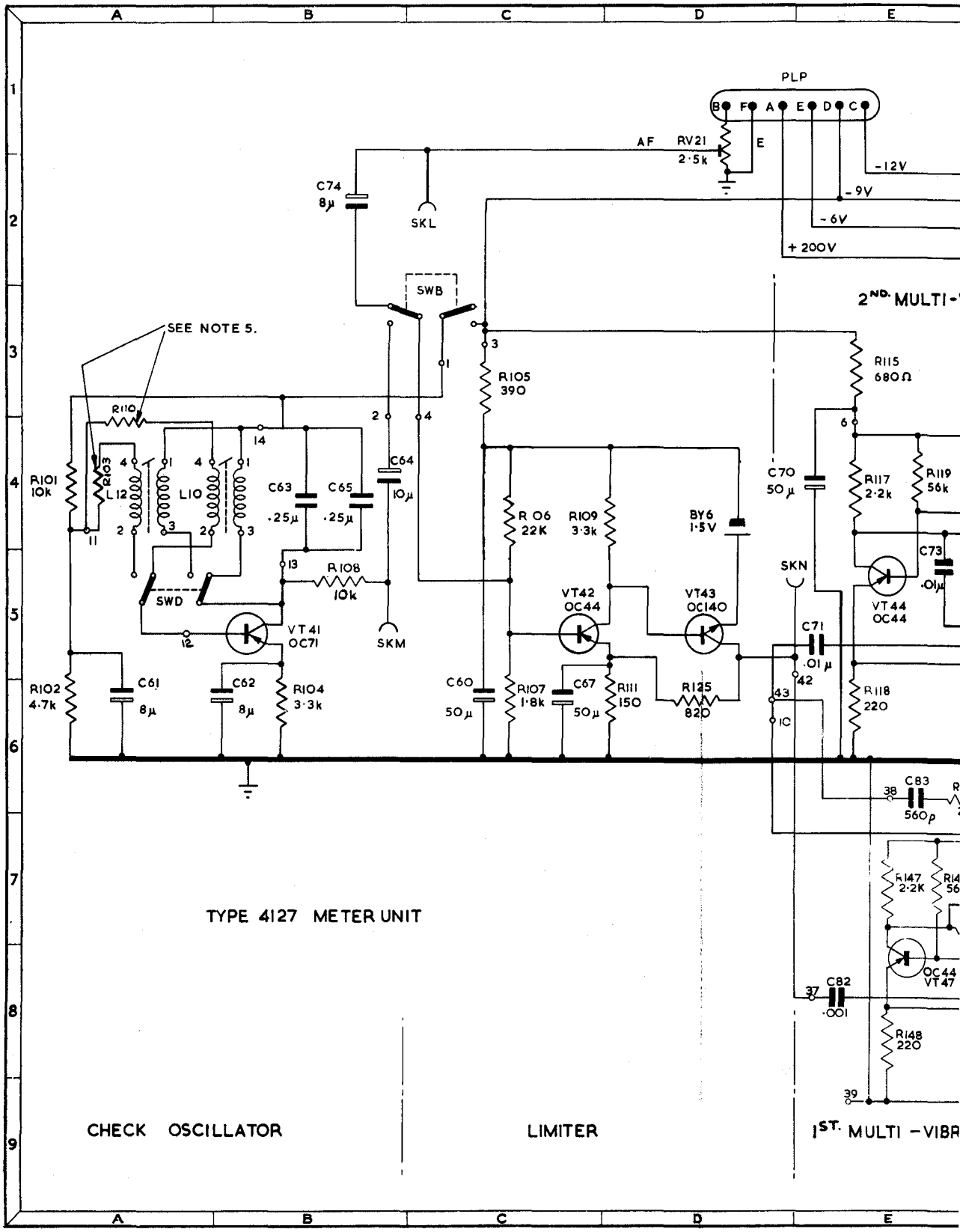
NOTES:
1. C63 & C65 are paired to give 0.5uF ±5%
2. JKA on Type 4127B only
3. R103 & R110 Value determined on Test.

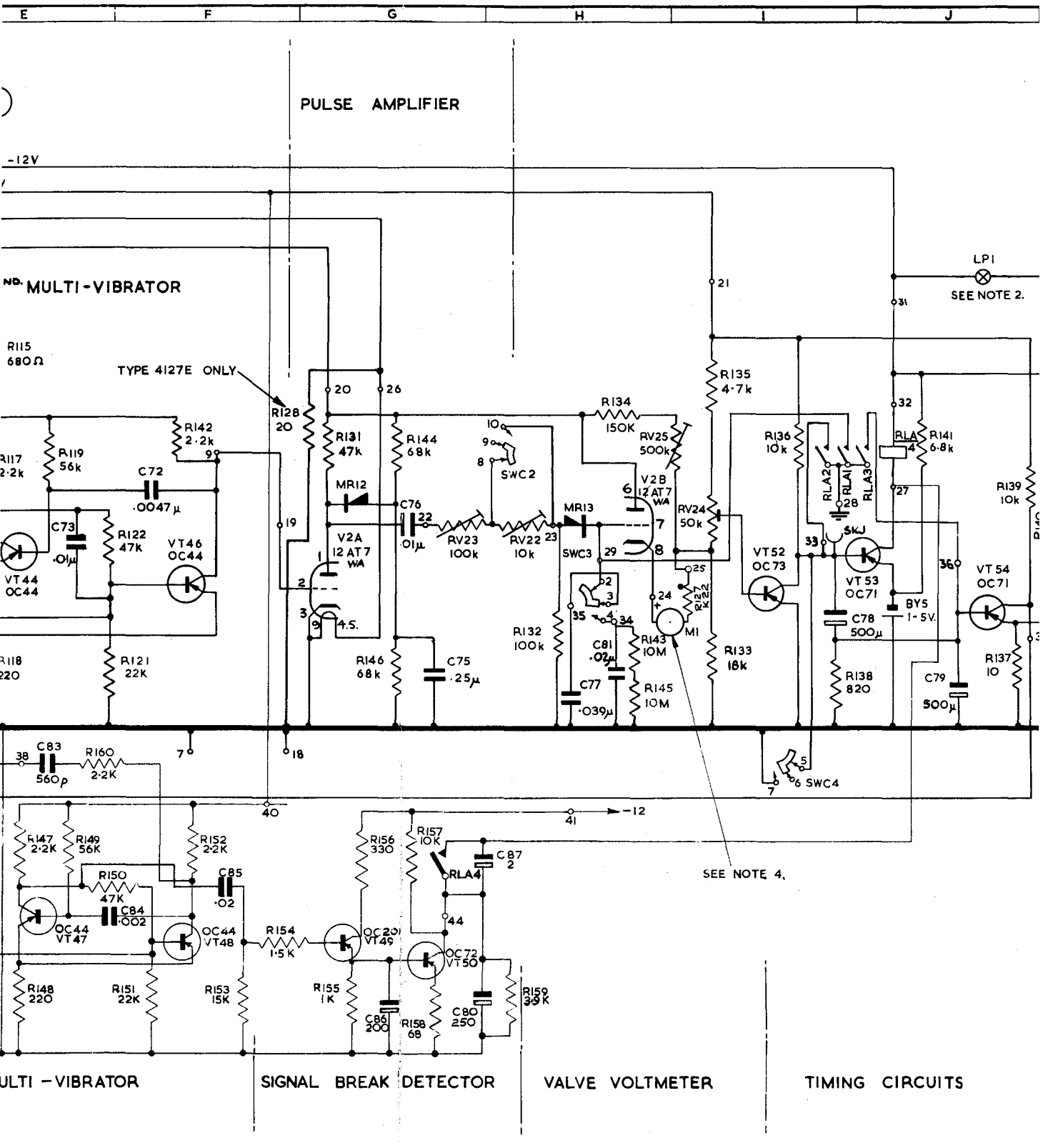
# METER UNIT TYPE 4127A,B OR E, POWER UNIT TYPE 4126A, REMOTE METER TYPE 4138 AND CABLE ASSEMBLY W.92843/B Sh.1 Ed.A for P.E.T.A. S350

## Cross Reference List for WZ.19884/D Sh.2

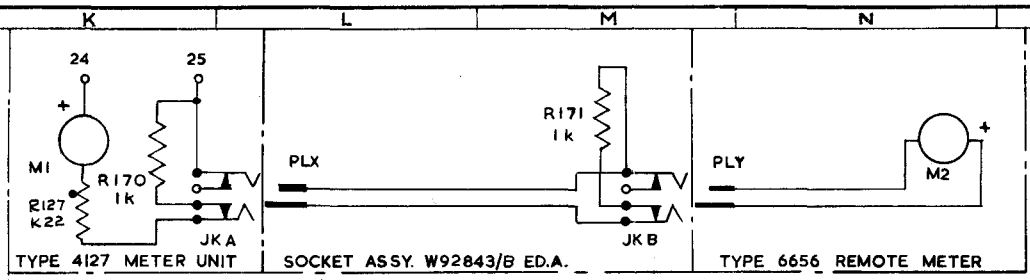
| Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | POWER UNIT TYPE 4126A | | | | | | | | | |
| | | Refer to Master Components List T.3827 List No.2 | | | | | | | | | | | | | |
| C91 | 1 | C98 | 1 | | | | | R166 | 21 | | | | | VT63 | 40 |
| C92 | 2 | C99 | 5 | | | PLV | 17 | R167 | 22 | | | | | | |
| C93 | 3 | | | MR21 | 18 | | | R168 | 23 | SKS | 33 | V3 | 43 | | |
| C94 | 4 | | | MR22 | 18 | | | R169 | 24 | SKV | 34 | | | | |
| C95 | | L13 | 10 | MR23 | 18 | R161 | 25 | | | | | | | | |
| C96 | 3 | L14 | 11 | MR24 | 19 | R162 | 26 | | | | | VT61 | 38 | | |
| C97 | 4 | L15 | 12 | | | R163 | 25 | RV31 | 29 | TR1 | 36 | VT62 | 41 | | |
| | | | | | | MISCELLANEOUS MECHANICAL ITEMS | | | | | | | | | |
| | | | | Ref.3 Valveholder for V3 No.45 | | | | | | | | | | | |
| | | | | Ref.4 Valve Retainer for V3 No.47 | | | | | | | | | | | |
| | | | | Ref.6 Nut Spindle Gripping for RV31 No.14 | | | | | | | | | | | |
| | | | | Ref.7 Cover Spindle End for RV31 No. 8 | | | | | | | | | | | |
| | | | | Set, Mica Washer and Bushes Part No.56201 (For VT62 & VT63) No.30 | | | | | | | | | | | |
| | | REMOTE METER TYPE 6656A OR B (W.92853 Ed.A OR B) AND CABLE ASSEMBLY (W.92843/B ED.A) | | | | | | | | | | | | | |
| | | Refer to Master Components List T.3827 List No.5 | | | | | | | | | | | | | |
| JKB | 10 | | | M2ø | 4 | | | PLY | 6 | | | | | | |
| | | M2* | 3 | | | PLX | 6 | | | R171 | 8 | | | | |
| | | | | MISCELLANEOUS MECHANICAL ITEMS | | | | | | | | | | | |
| | | | | Cable (450 ft.) No.1 | | | | | | | | | | | |

* Type 6656A only
ø Type 6656B only


PLP
B F A E D C
AF RV21 2·5k
E
-12V
-9V
-6V
+200V
C74 8μ
SKL
SWB
SEE NOTE 5.
R110
R101 10k
Q103
L12
L10
C63 .25μ
C65 .25μ
C64 10μ
R108 10k
SWD
VT41 OC71
SKM
R102 4·7k
C61 8μ
C62 8μ
R104 3·3k
R105 390
R106 22K
R109 3·3k
BY6 1·5V
VT42 OC44
VT43 OC140
C60 50μ
R107 1·8k
C67 50μ
R111 150
R125 820
2ND. MULTI-
R115 680Ω
C70 50μ
R117 2·2k
R119 56k
SKN
C73 .01μ
VT44 OC44
C71 .01μ
R118 220
C83 560p
R147 2·2K
OC44 VT47
C82 .001
R148 220
TYPE 4127 METER UNIT
CHECK OSCILLATOR
LIMITER
1ST. MULTI-VIBR

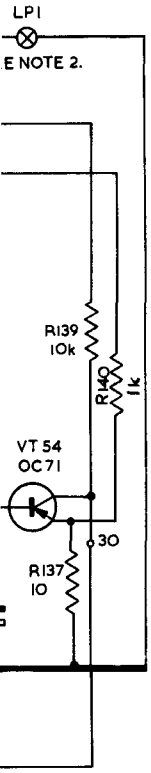


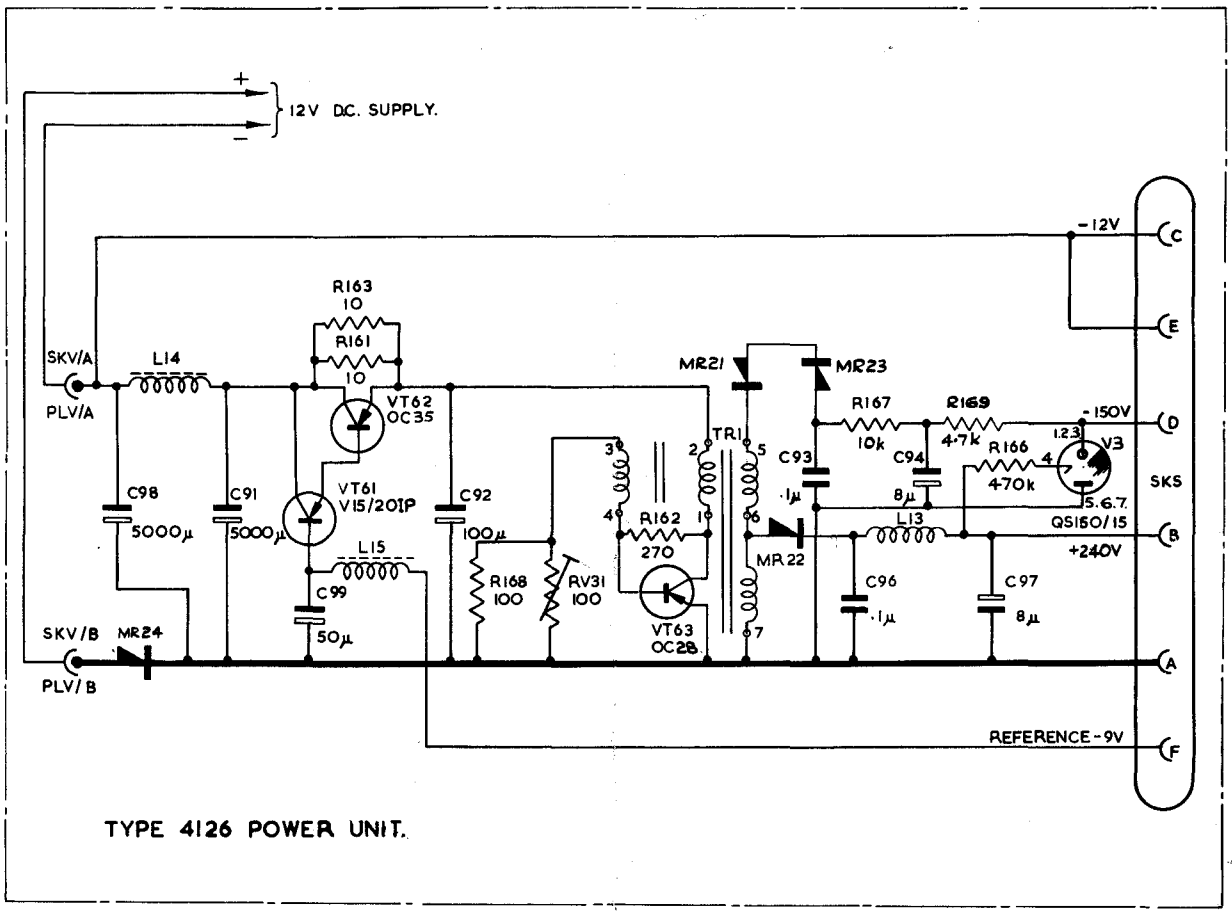

**CIRCUIT DIAGRAM**
**TYPE 4126 POWER UNIT, TYPE 4127 METER UNIT**
**WZ.19884/D Sh. 2. Iss.5**




CIRCUIT ARRANGEMENT FOR REMOTE METER WORKING

FIG. 1.




NOTES.

1. SKM & SKN ARE FOR MONITORING.
2. LAMP LP.I IS SITUATED IN METER MI.
3. SWC. IS SHOWN IN THE HOLD POSITION
4. FOR CIRCUIT ARRANGEMENT FOR REMOTE METER WORKING SEE FIG.I.
5. ANTI-SQUEGG RESISTORS, RIO3 & RIIO, TO BE ADDED ON TEST.

FILTER AND STABILISER

CONVERTER

FIG. 9

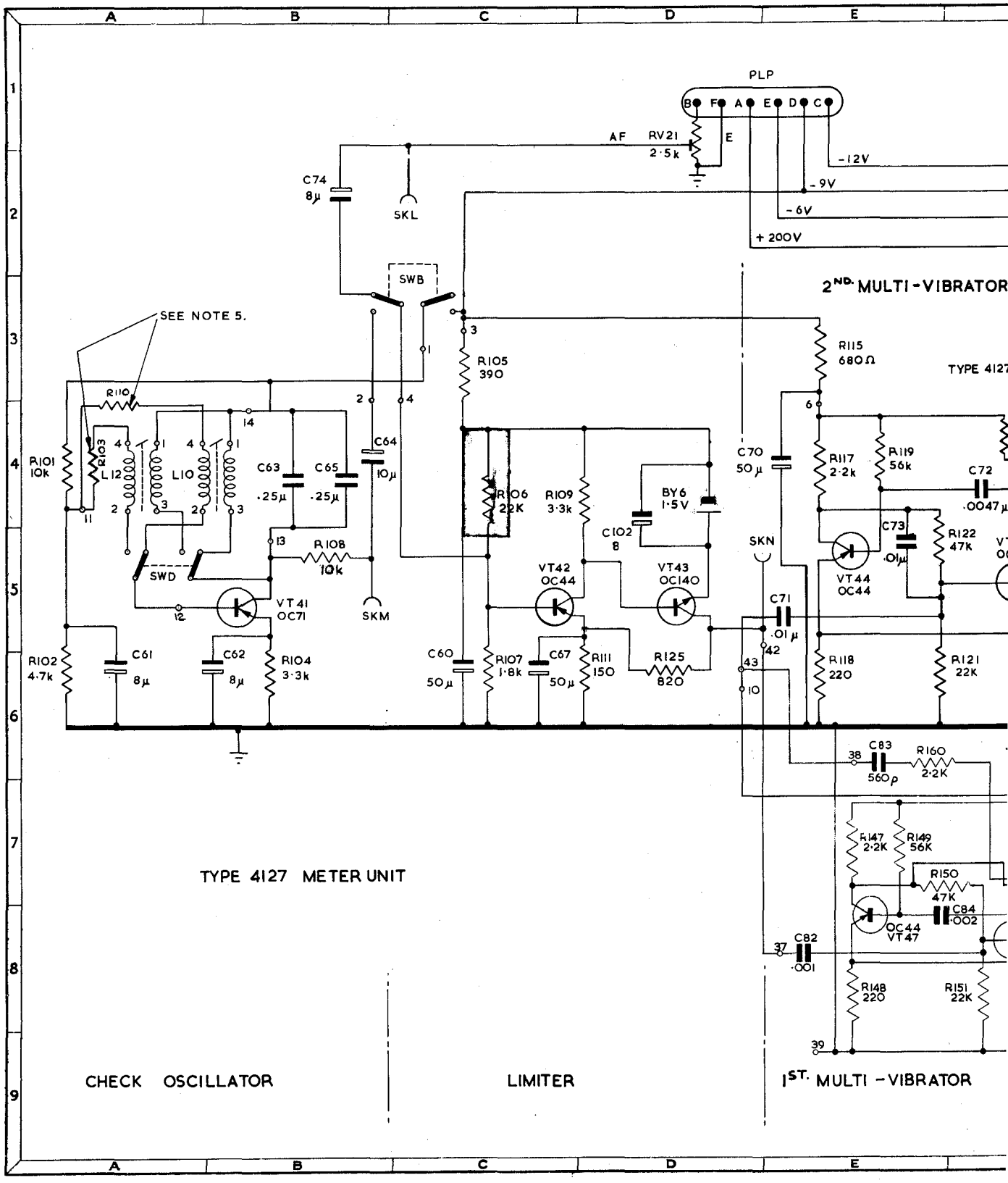
POWER UNIT TYPE 4126B FOR P.E.T.A. S350

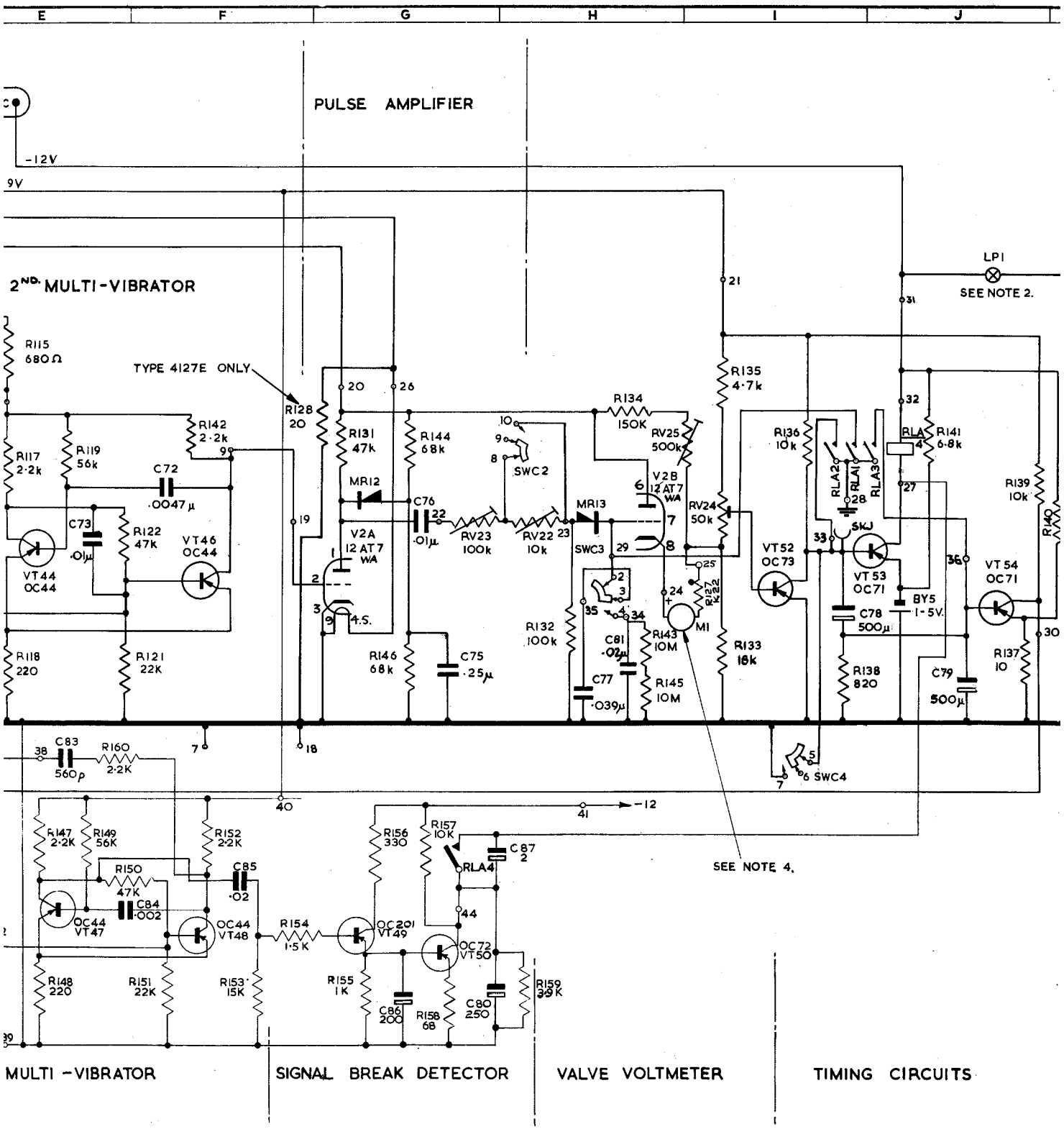
Cross Reference List
for WZ.19884/B Sh.3
Refer to Master Components List T.3827 List No.2

| Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C91 | 1 | C98 | 1 | | | | | R164 | | | | | | | |
| C92 | 2 | C99 | 5 | | | PLV | 16 | R165 | | | | | | | |
| C93 | 3 | | | MR21 | 18 | | | R166 | 21 | RV31 | 29 | | | VT61 | 38 |
| C94 | 4 | | | MR22 | 18 | | | R167 | 22 | | | TR1 | 36 | VT62 | 39 |
| C95 | | L13 | 10 | MR23 | 18 | R161 | 25 | R168 | 23 | | | | | VT63 | 40 |
| C96 | 3 | L14 | 11 | MR24 | 19 | R162 | 26 | R169 | 24 | SKS | 31 | | | | |
| C97 | 4 | L15 | 12 | | | R163 | 25 | | | SKV | 32 | V3 | 43 | | |

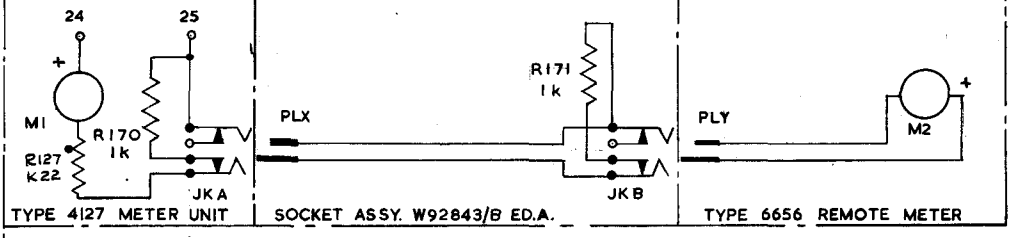
MISCELLANEOUS MECHANICAL ITEMS

| | | |
|---|---|---|
| Ref.3 | Valveholder for V3 | No.45 |
| Ref.4 | Valve Retainer for V3 | No.47 |
| Ref.6 | Nut Spindle Gripping for RV31 | No.14 |
| Ref.7 | Cover Spindle Gripping for RV31 | No. 8 |


PLP
B F A E D C
AF
RV21
2·5k
E
-12V
-9V
-6V
+200V
C74
8μ
SKL
SWB
SEE NOTE 5.
2ND. MULTI-VIBRATOR
TYPE 4127
R115
680Ω
R105
390
R110
R101
10k
R103
L12
L10
C63
·25μ
C65
·25μ
C64
10μ
R106
22K
R109
3·3k
BY6
1·5V
C102
8
C70
50μ
R117
2·2k
R119
56k
C72
·0047μ
C73
·01μ
R122
47k
SKN
VT44
OC44
SWD
R108
10k
VT42
OC44
VT43
OC140
VT41
OC71
SKM
C71
·01μ
R102
4·7k
C61
8μ
C62
8μ
R104
3·3k
C60
50μ
R107
1·8k
C67
50μ
R111
150
R125
820
R118
220
R121
22K
C83
560p
R160
2·2k
R147
2·2k
R149
56K
R150
47K
C84
·002
OC44
VT47
C82
·001
R148
220
R151
22K
TYPE 4127 METER UNIT
CHECK OSCILLATOR
LIMITER
1ST. MULTI-VIBRATOR

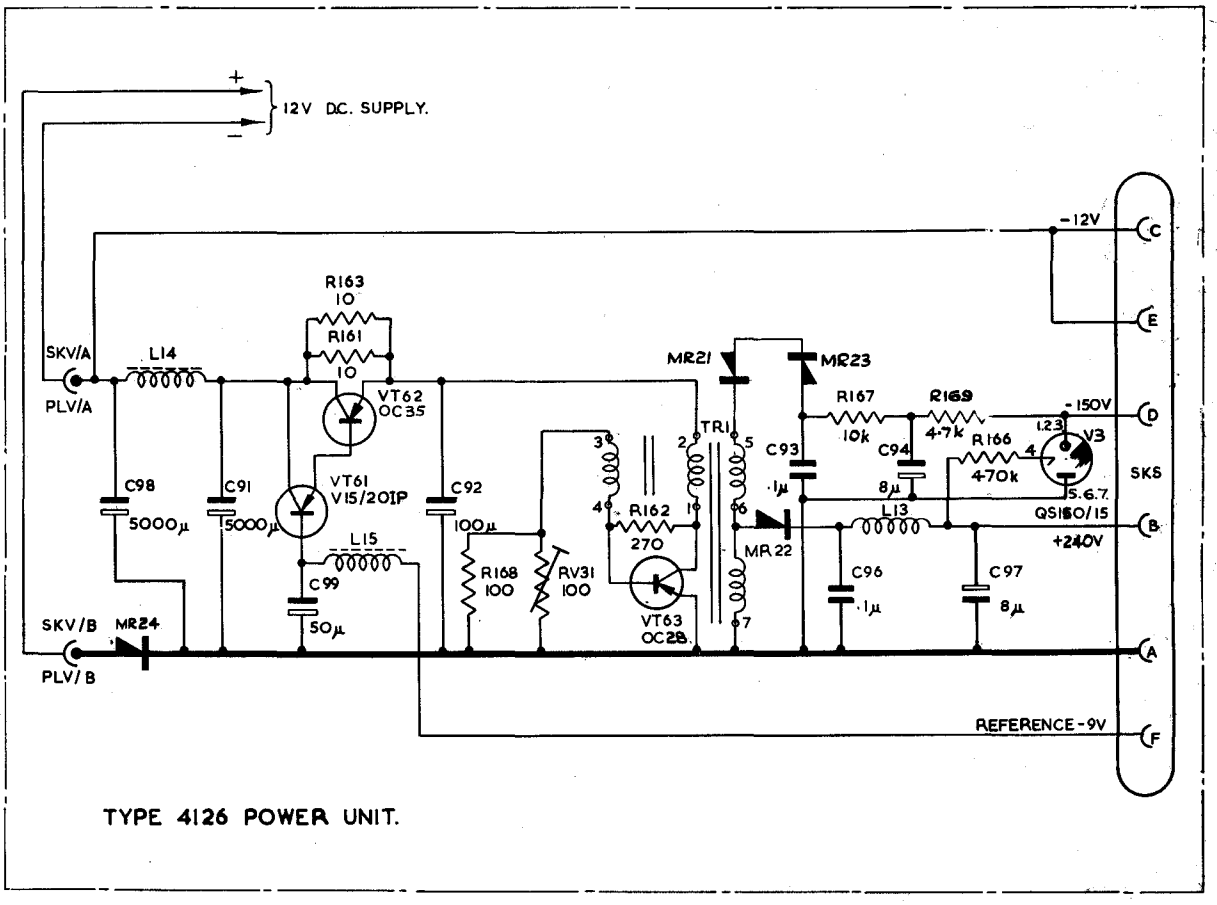



# CIRCUIT DIAGRAM
## TYPE 4126A POWER UNIT, TYPE 4127A, B & E METER UNIT
## WZ.19884/D Sh.2 Iss.7




CIRCUIT ARRANGEMENT FOR REMOTE METER WORKING

FIG. 1.




TYPE 4126 POWER UNIT.

NOTES.

1. SKM & SKN ARE FOR MONITORING.
2. LAMP LP1 IS SITUATED IN METER M1.
3. SWC. IS SHOWN IN THE HOLD POSITION
4. FOR CIRCUIT ARRANGEMENT FOR REMOTE METER WORKING SEE FIG.1.
5. ANTI-SQUEGG RESISTORS, R103 & R110, TO BE ADDED ON TEST.

FILTER AND STABILISER

CONVERTER

FIG. 9

METER UNIT TYPE 4127C OR D
AND REMOTE METER WITH CABLE ASSEMBLY FOR P.E.T.A. S350

Cross Reference List
for WZ.19884/D Sh.4

| Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | METER UNIT TYPE 4127C OR D | | | | | | | | | |
| | | | Refer | to Ma | ster | Components | List T. | 3827 | List | No.4 | | | | | |
| BY5 | 93 | C79 | 11 | LP1 | 27 | R108 | 44 | R131 | 61 | R154 | 72 | | | VT41 | 99 |
| BY6 | 93 | C80 | 12 | | | R109 | 47 | R132 | 62 | R155 | 66 | RV21 | 82 | VT42 | 100 |
| | | C81 | | M1* | 29 | R110 | 51 | R133 | 63 | R156 | 73 | RV22 | 83 | VT43 | 101 |
| | | C82 | 13 | M1ø | 30 | R111 | 52 | R134 | 64 | R157 | 44 | RV23 | 84 | VT44 | 100 |
| C60 | 1 | C83 | 14 | | | R112 | | R135 | 45 | R158 | 74 | RV24 | 85 | VT45 | |
| C61 | 2 | C84 | 6 | | | R113 | | R136 | 44 | R159 | 75 | RV25 | 86 | VT46 | 100 |
| C62 | 2 | C85 | 15 | | | R114 | | R137 | 65 | R160 | 68 | RV26 | 87 | VT47 | 100 |
| C63 | 3 | C86 | 16 | MR12 | 39 | R115 | 53 | R138 | 58 | R170 | 76 | | | VT48 | 100 |
| C64 | 4 | C87 | 17 | MR13 | 39 | R116 | | R139 | 44 | R171 | | | | VT49 | 102 |
| C65 | 3 | C88 | 21 | | | R117 | 54 | R140 | 66 | R172 | | SKJ | 89 | VT50 | 103 |
| C66 | | C100 | 18 | | | R118 | 55 | R141 | 67 | R173 | 60 | SKM | 90 | VT51 | |
| C67 | 5 | C101 | 19 | PLP | 34 | R119 | 56 | R142 | 68 | R174 | 69 | SKN | 91 | VT52 | 104 |
| C68 | | C102 | 24 | | | R120 | | R143 | 69 | | | | | VT53 | 99 |
| C69 | | | | | | R121 | 57 | R144 | 70 | | | | | VT54 | 99 |
| C70 | 1 | | | | | R122 | 49 | R145 | 69 | | | SWB | 95 | | |
| C71 | 20 | JKA | 25 | | | R123 | | R146 | 70 | | | SWC | 96 | | |
| C72 | 7 | | | R101 | 44 | R124 | | R147 | 54 | | | SWD | 97 | | |
| C73 | | | | R102 | 45 | R125 | 58 | R148 | 55 | | | | | | |
| C74 | 2 | | | R103 | 46 | R126 | | R149 | 56 | | | | | | |
| C75 | 8 | L10 | 22 | R104 | 47 | R127 | 59 | R150 | 49 | | | V2 | 106 | | |
| C76 | 9 | L12 | 23 | R105 | 48 | R128 | | R151 | 57 | RLA | 40 | V6 | 107 | | |
| C77 | 10 | | | R106 | 49 | R129 | | R152 | 54 | RLB | 42 | | | | |
| C78 | 11 | | | R107 | 50 | R130 | | R153 | 71 | | | | | | |

MISCELLANEOUS MECHANICAL ITEMS

| | | |
|---|---|---|
| Ref. 6 | Nut Spindle Gripping for RV21,RV22,RV23 | No. 32 |
| Ref.15 | Valveholder for V2,V6 | No.109 |
| Ref.16 | Valve Retainer for V2,V6 | No.111 |
| Ref.17 | Analyser Board F.1417-1-A | No.36 |
| Ref.18 | Frequency Meter Board F.1419-1-A | No.37 |

* For Type 4127C only
ø For Type 4127D only

C63 & C65 are paired to give 0.5uF ±5%

R103 & R110 Value determined by Test.

METER UNIT TYPE 4127C OR D
AND REMOTE METER WITH CABLE ASSEMBLY FOR P.E.T.A. S350

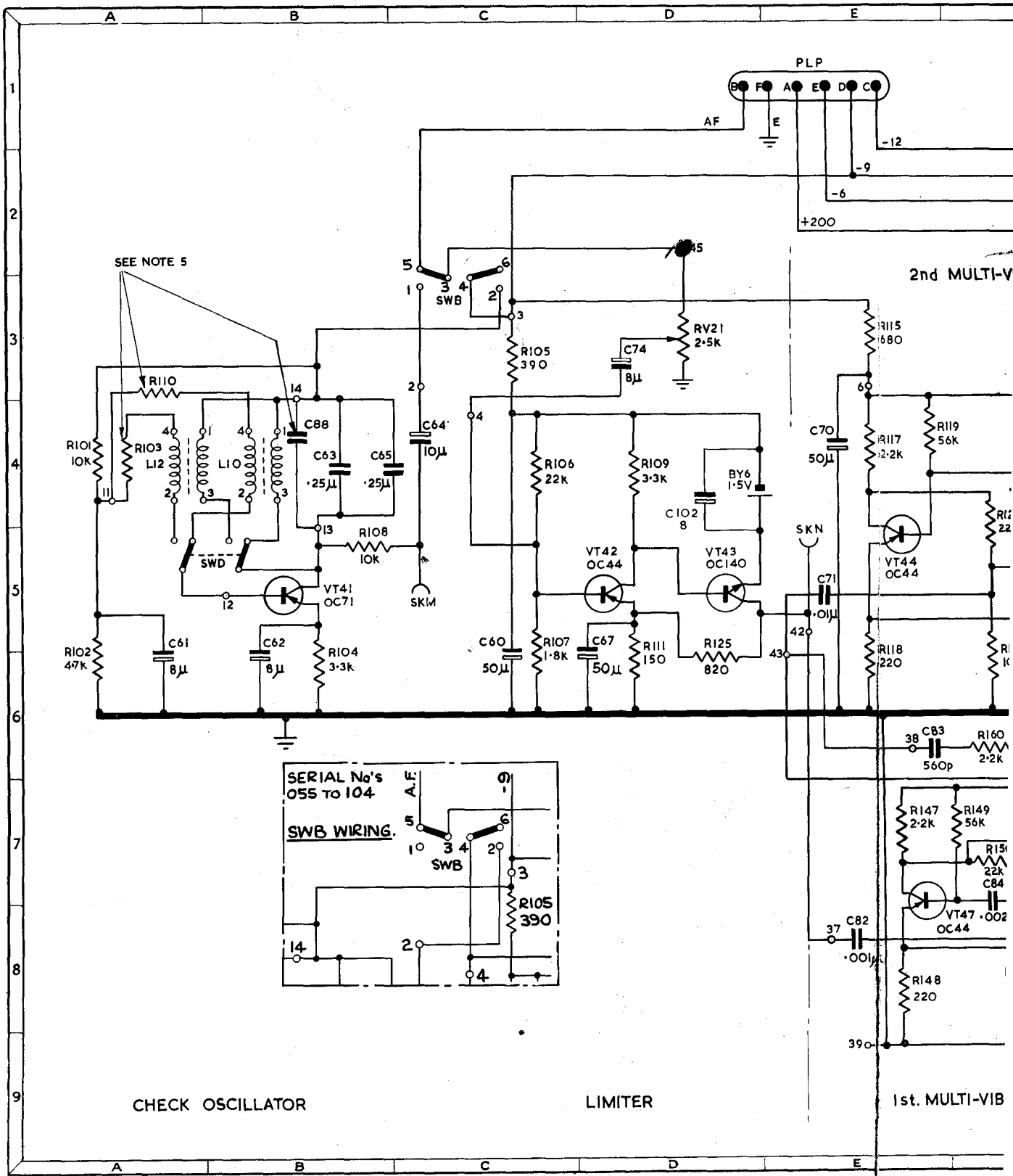
Cross Reference List
for WZ.19884/D Sh.4

| Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | REMOTE METER TYPE 6656A OR B (W.92853 Ed.A or B) AND CABLE ASSEMBLY W.92843/B ED.A | | | | | | | | | |
| | | | Refers to Master Components List T.3827 List No.5 | | | | | | | | | | | | |
| JKB | 10 | M2* | 3 | M2ø | 4 | PLX | 6 | PLY | 6 | R171 | 8 | | | | |

MISCELLANEOUS MECHANICAL ITEMS

Cable (450 ft.) No.1

* Type 6656A only
ø Type 6656B only


PLP
AF
E
-12
-9
-6
+200
SEE NOTE 5
SWB
RV21 2·5K
RI05 390
C74 8µ
RI15 680
2nd MULTI-V
RI10
RI01 10K
RI03 LI2
LI0
C88
C63 ·25µ
C65 ·25µ
C64 10µ
RI08 10K
SWD
VT41 OC71
SKM
RI06 22K
RI09 3·3K
BY6 1·5V
C102 8
VT42 OC44
VT43 OC140
SKN
C70 50µ
RI17 2·2K
RI19 56K
VT44 OC44
C71 ·01µ
RI02 4·7K
C61 8µ
C62 8µ
RI04 3·3K
C60 50µ
RI07 1·8K
C67 50µ
RI11 150
RI25 820
RI18 220
C83 560p
RI60 2·2K
SERIAL No's 055 TO 104
SWB WIRING.
A.F.
R147 2·2K
R149 56K
VT47 OC44
C84 ·002
C82 ·001µ
RI48 220
CHECK OSCILLATOR
LIMITER
1st. MULTI-VIB

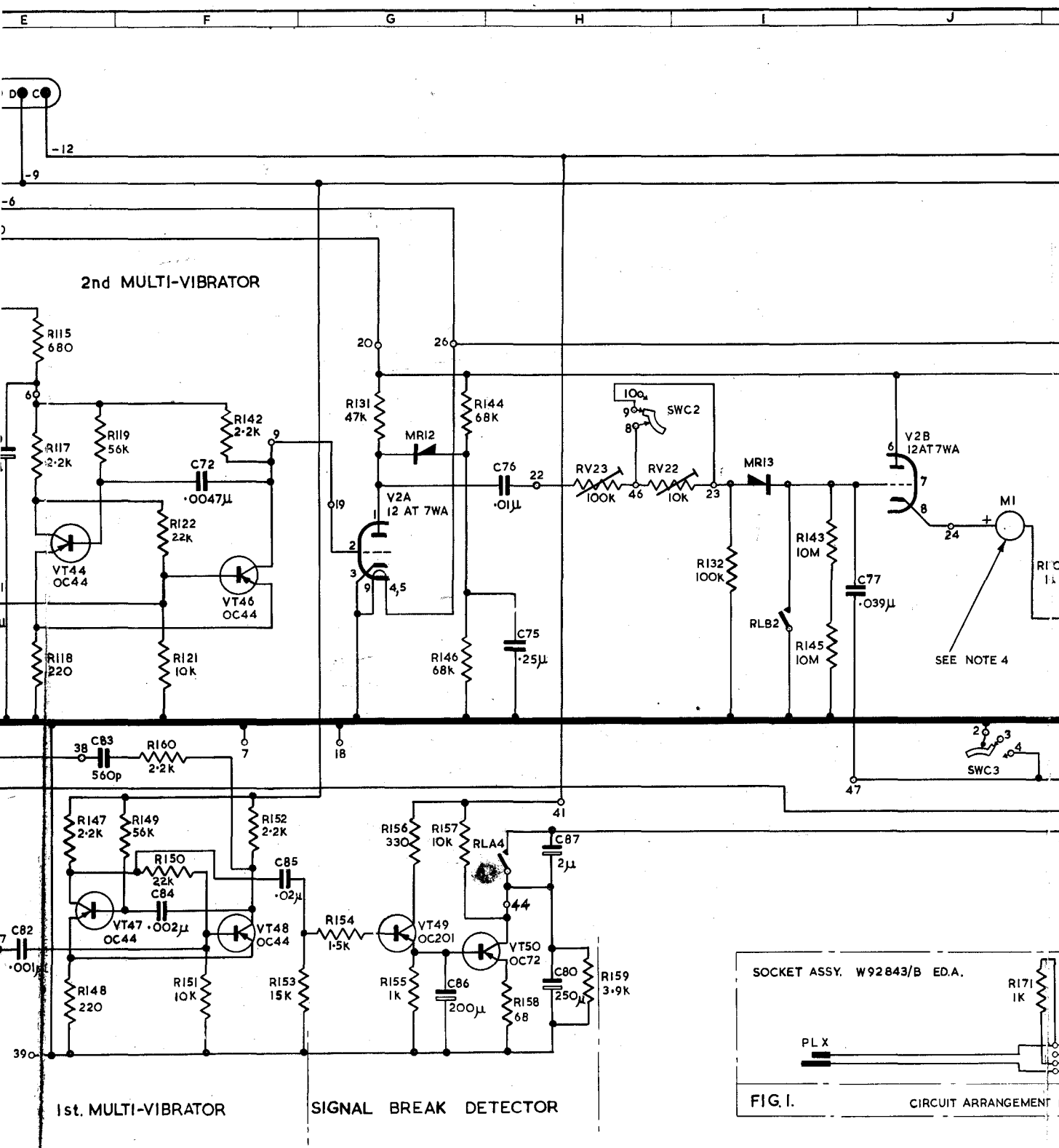
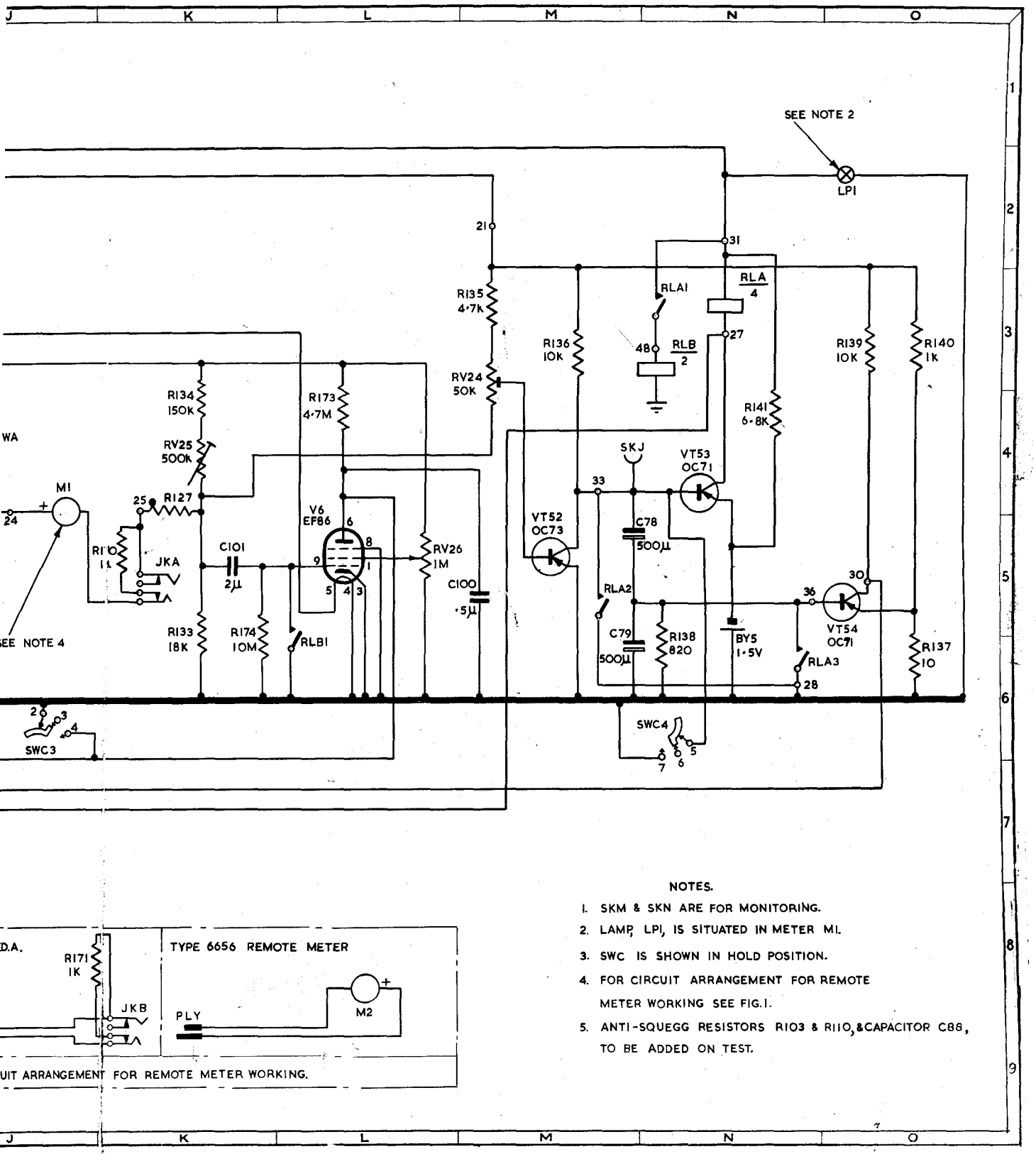



FIG. 1. CIRCUIT ARRANGEMENT FC

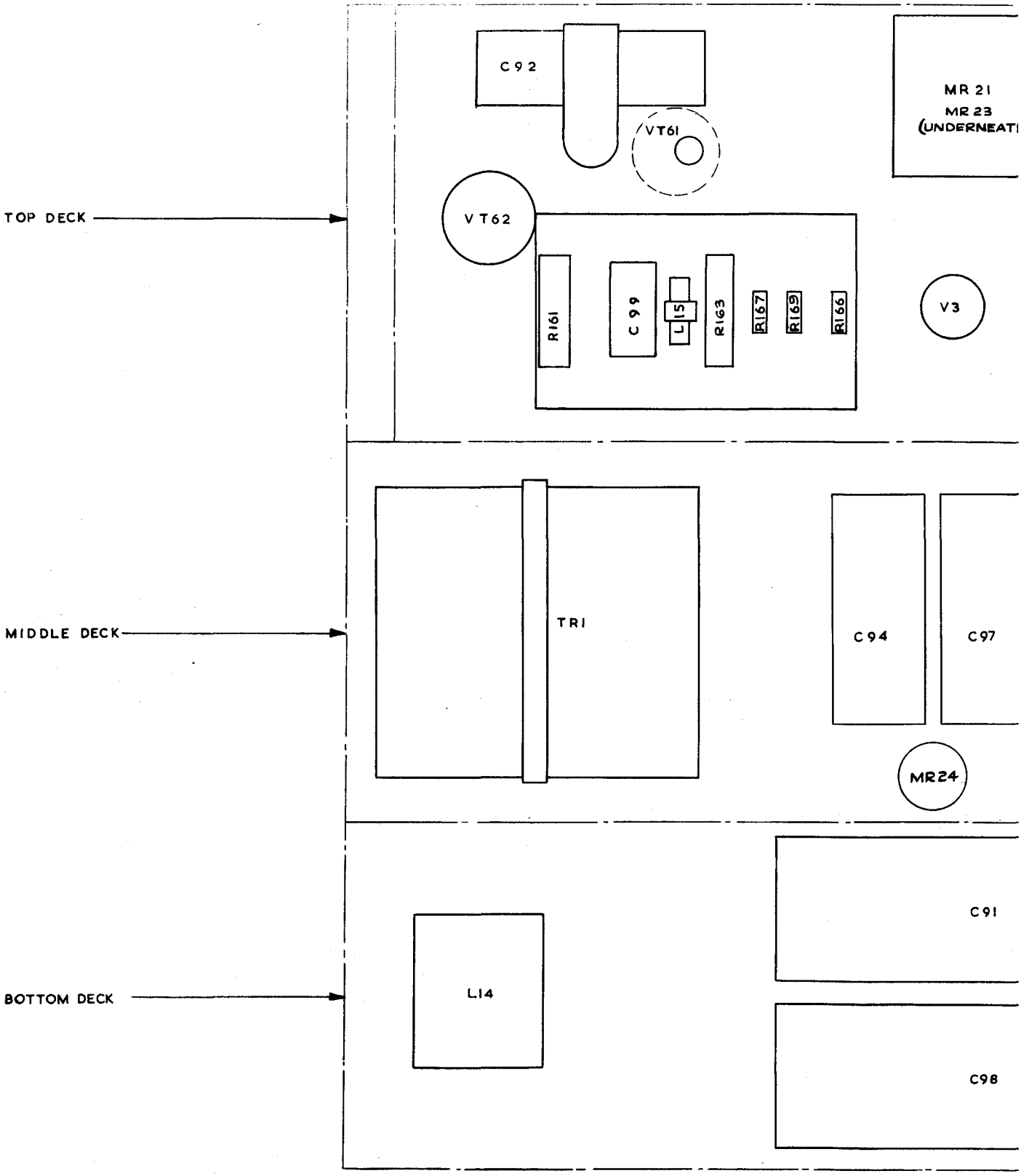
# CIRCUIT DIAGRAM. TYPE 4127C & D METRE UNIT WZ. 19884/D Sh. 4 Iss. 6



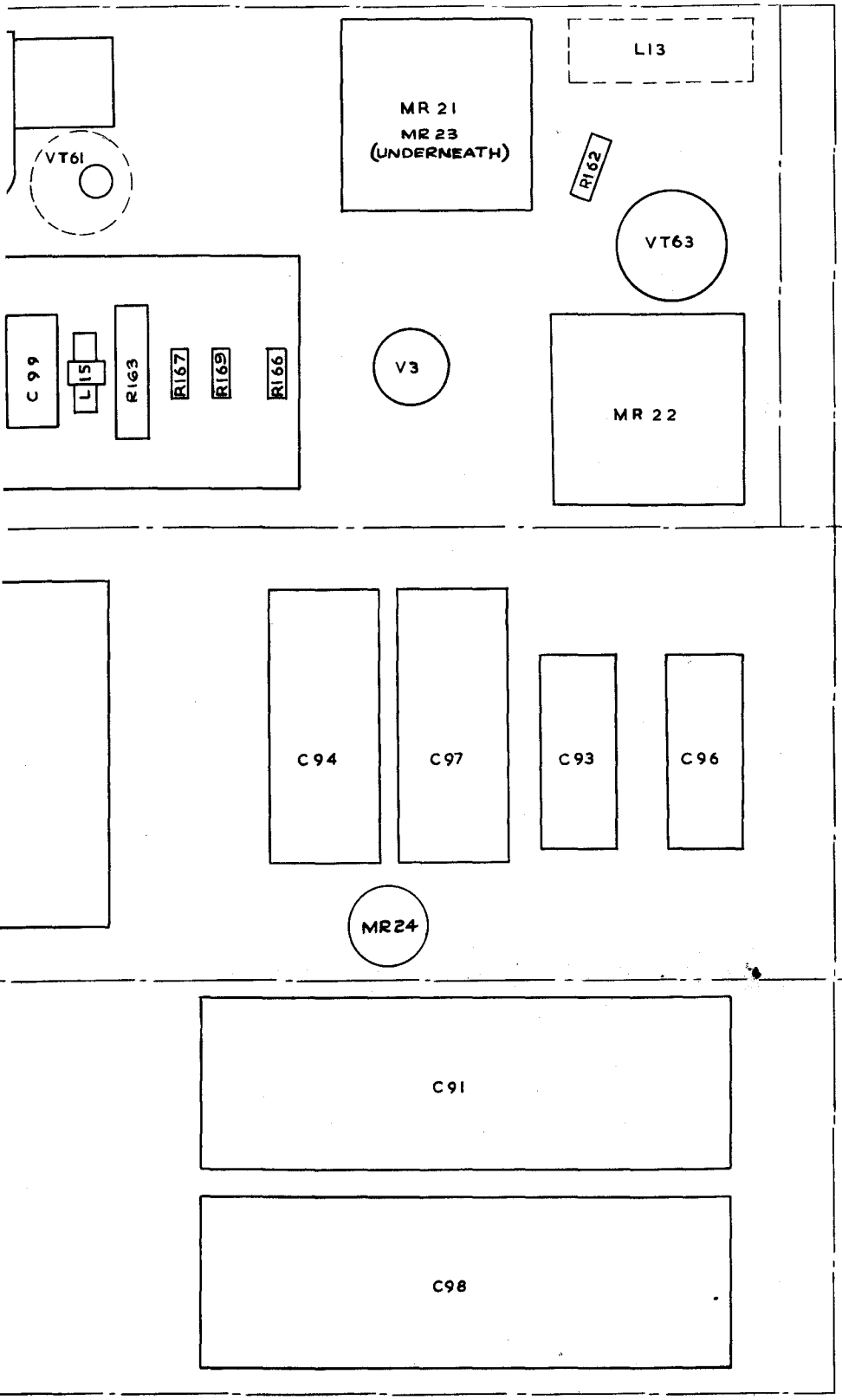

NOTES.

1. SKM & SKN ARE FOR MONITORING.
2. LAMP, LP1, IS SITUATED IN METER M1.
3. SWC IS SHOWN IN HOLD POSITION.
4. FOR CIRCUIT ARRANGEMENT FOR REMOTE METER WORKING SEE FIG.1.
5. ANTI-SQUEGG RESISTORS R103 & R110, &CAPACITOR C88, TO BE ADDED ON TEST.

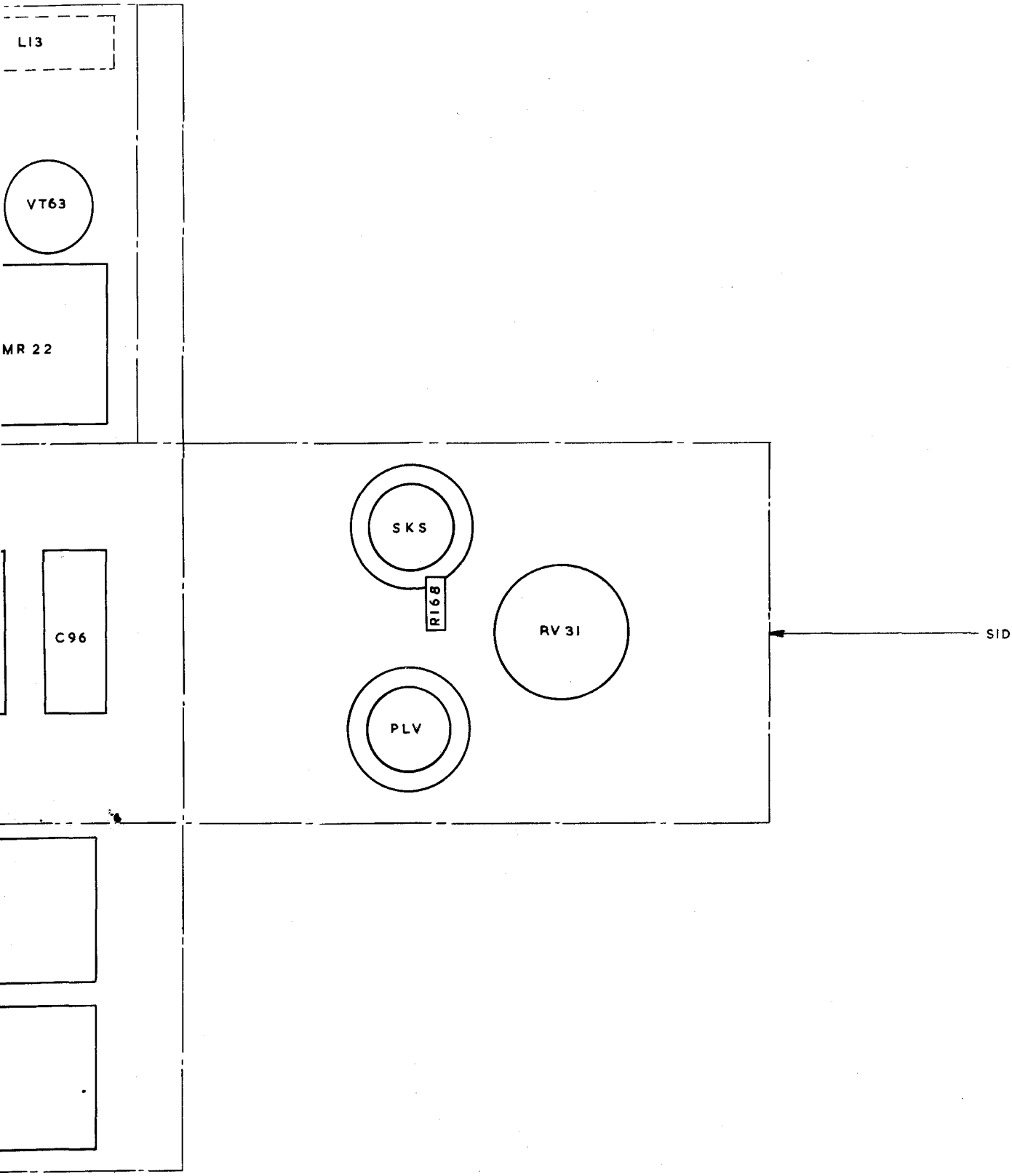
FIG.11




COMPO
TYPE 412
WZ. 207

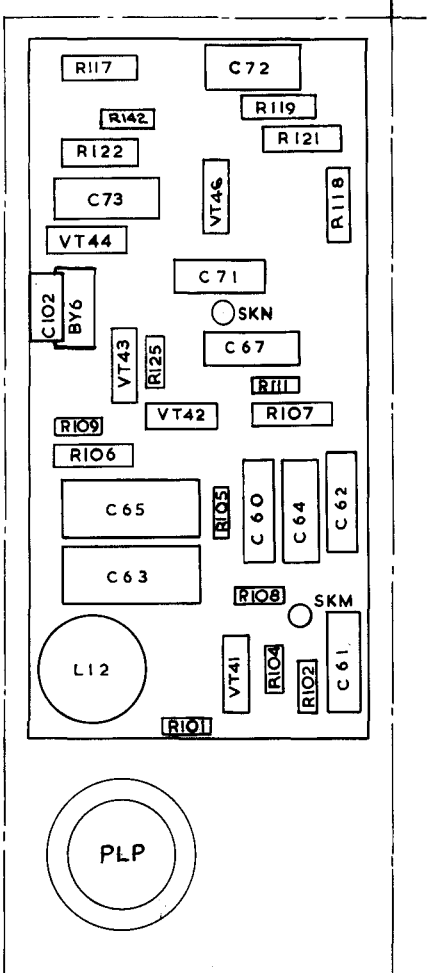



**COMPONENT LAYOUT**
**TYPE 4126A & B POWER UNIT**
**WZ.20750/D Sh.1. Iss.3**




**OUT**
**OWER UNIT**
**l. Iss. 3**

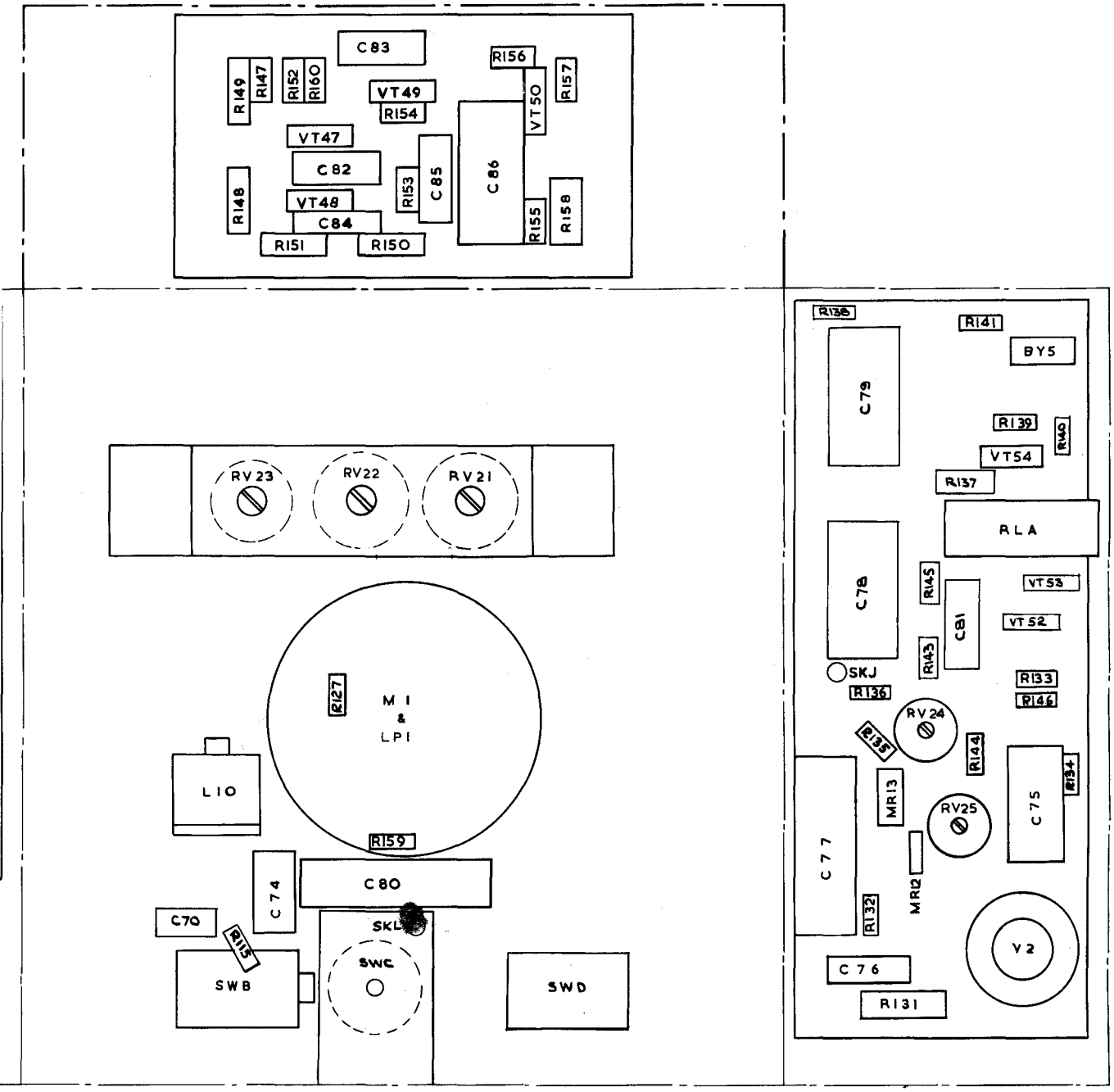
FIG. 12




NOTES.

1. FOR COMPONENT SCHEDULE SEE WZ.19884/A

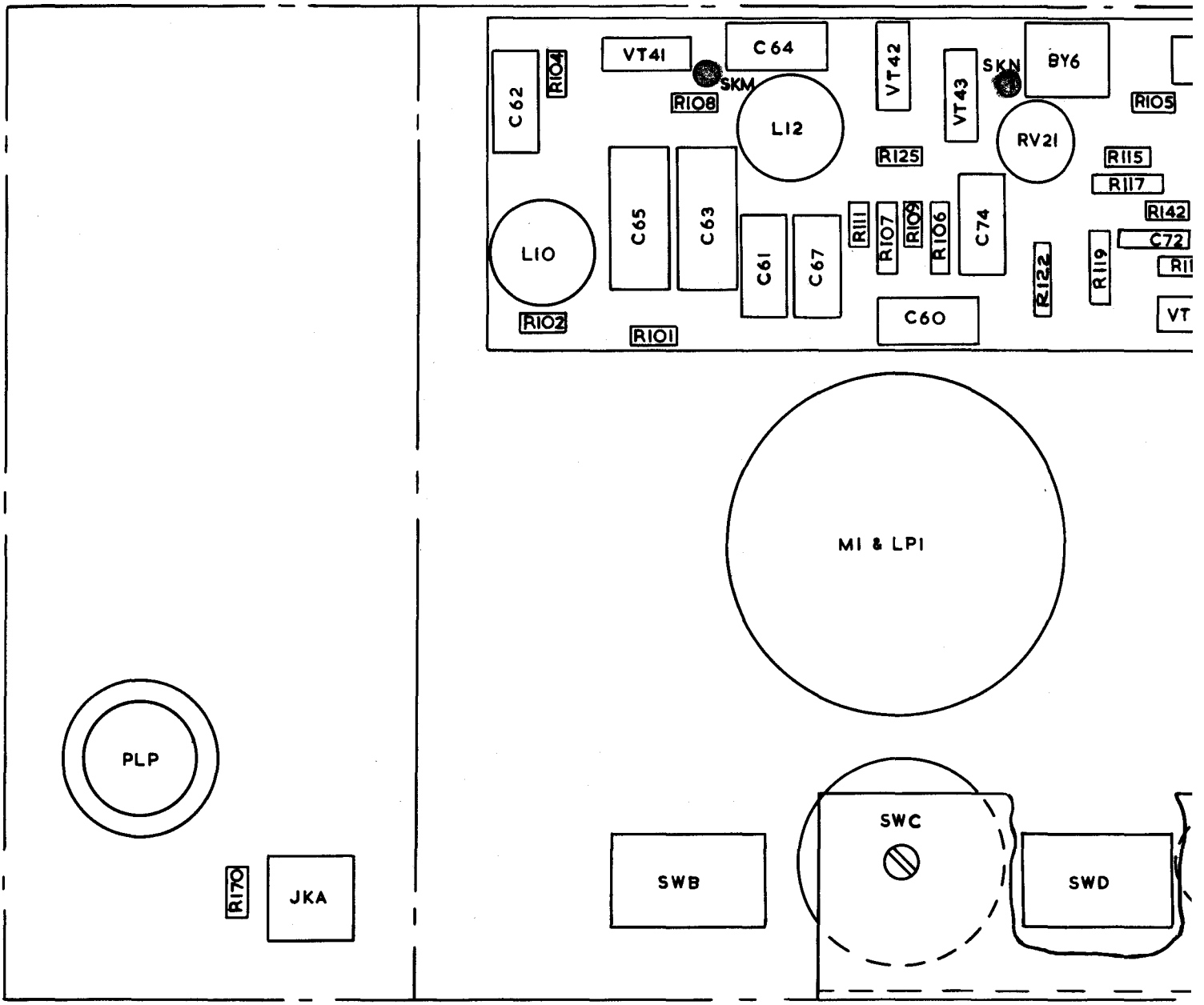
COMPONENT I
TYPE 4127A, B & E
WZ. 20749/D S




UNIT VIEWED FROM REAR
WITH 3 SIDES OPENED OUT.

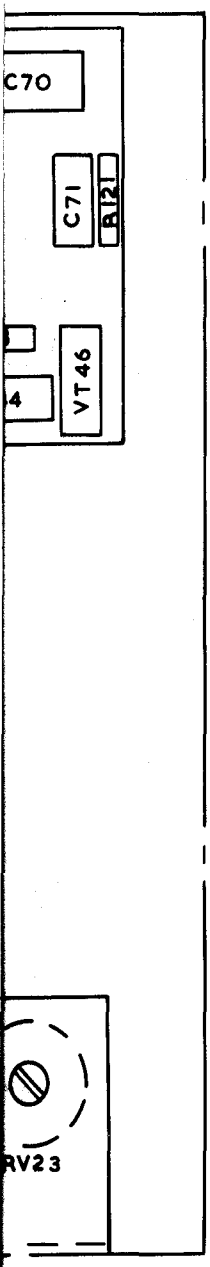
NT LAYOUT
& E METRE UNIT
D Sh.1 Iss.4

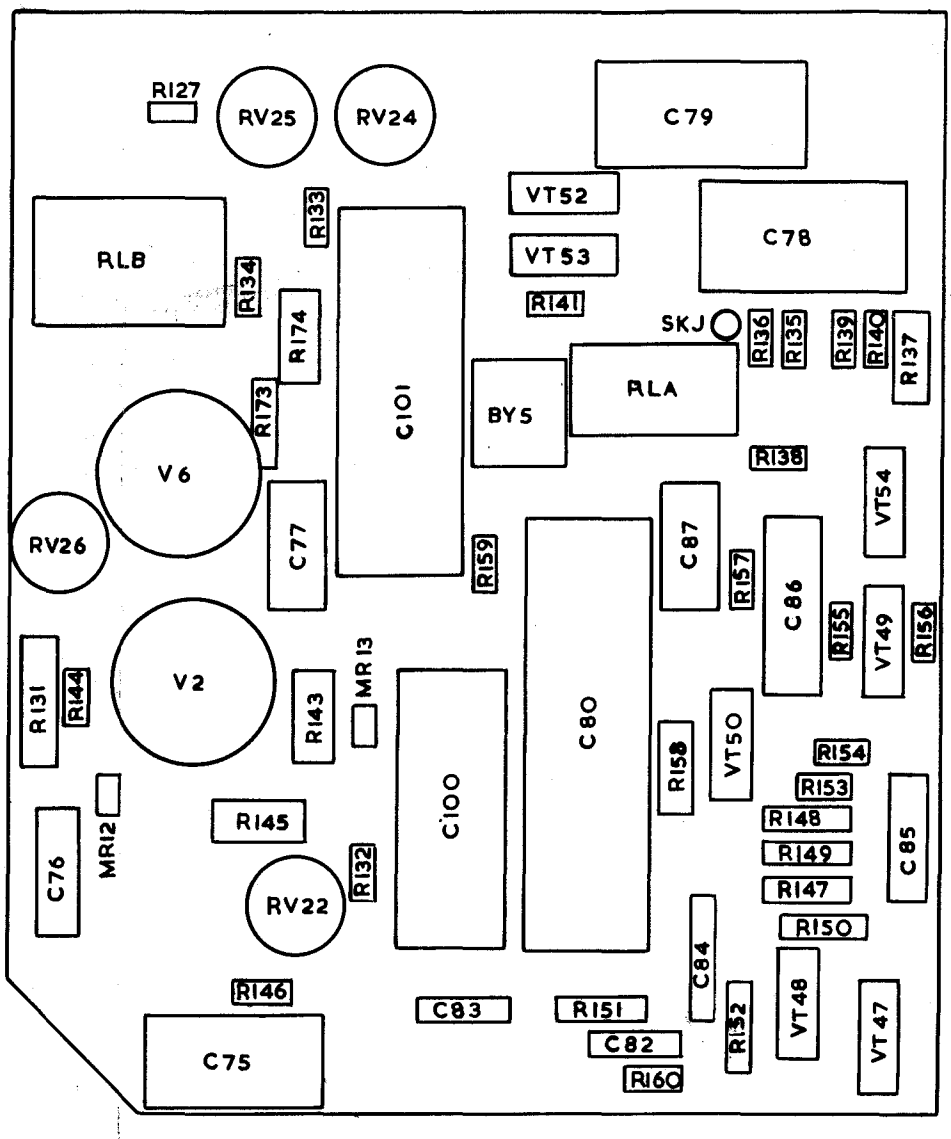
FIG. 13




UNIT VIEWED FROM REAR
WITH 1 SIDE OPENED OUT,
AND PRINTED BOARD,
SHOWN ON RIGHT, REMOVED.

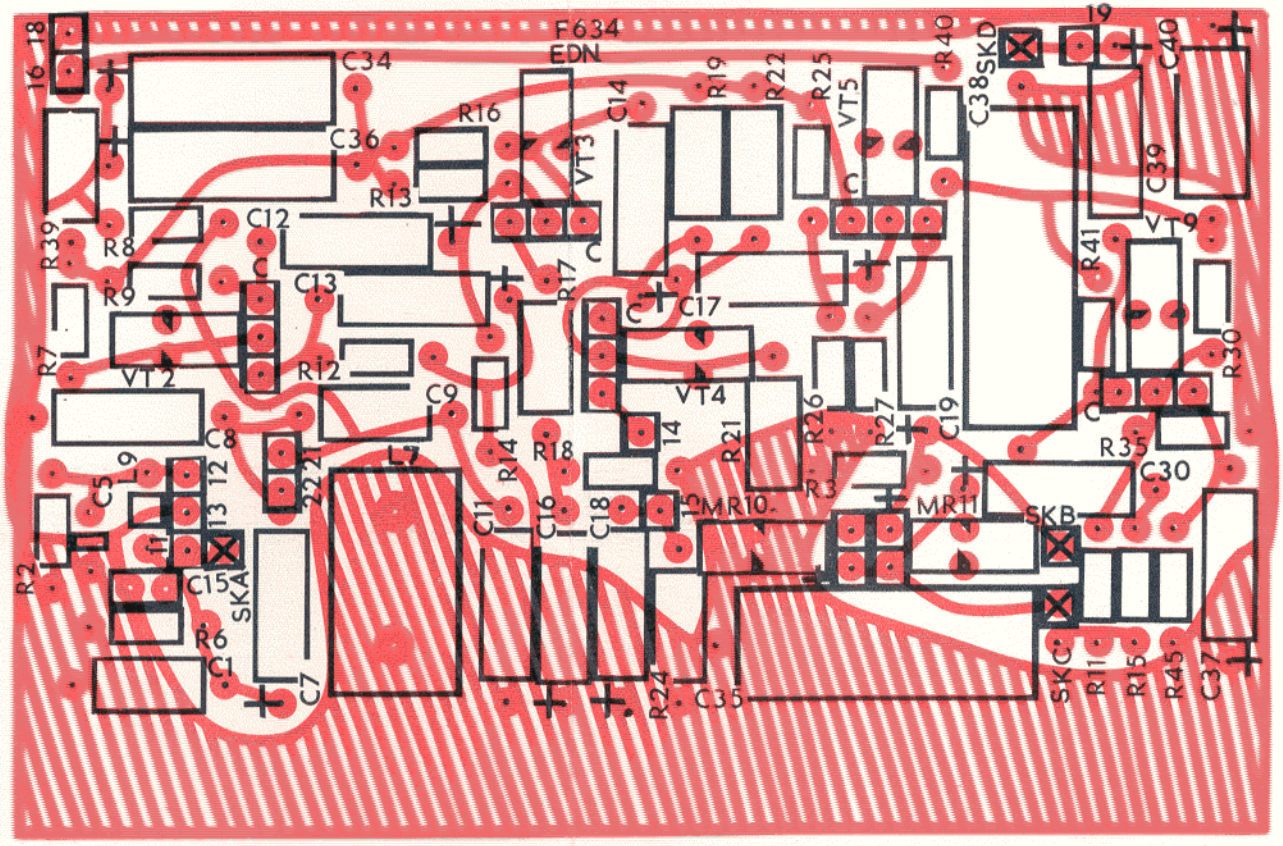
COMPONE
TYPE 412
WZ. 20




NT LAYOUT
C METER UNIT
749/D Sh.2. Iss.1

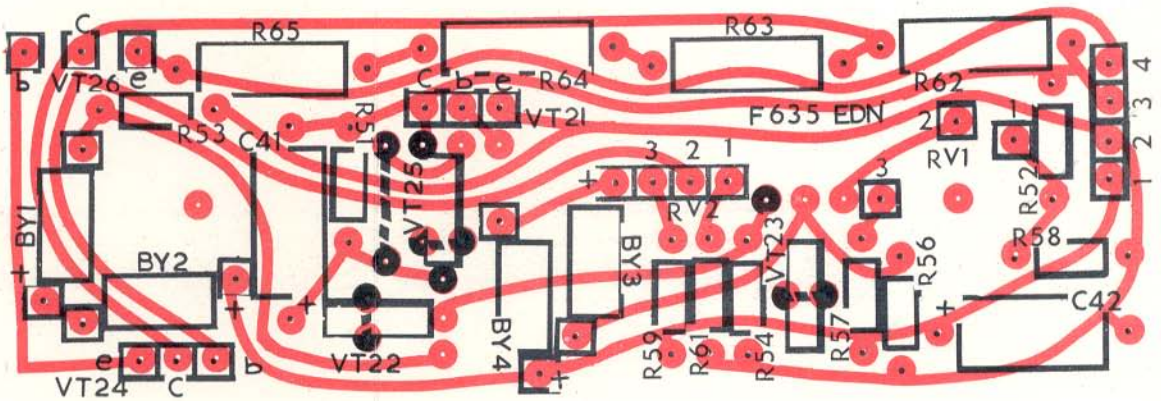
FIG. 14




PRINTED BOARD

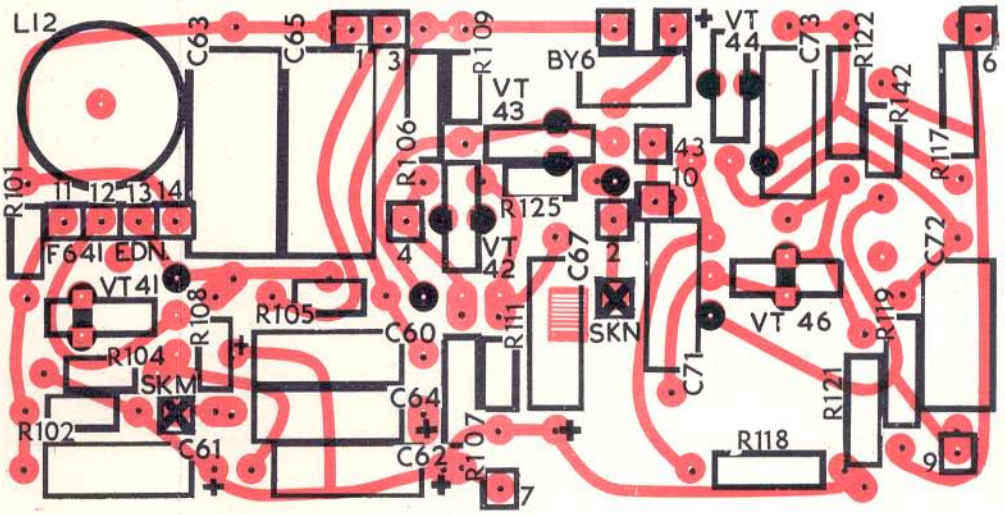
F634 MAIN PRINTED BOARD

FIG. 15



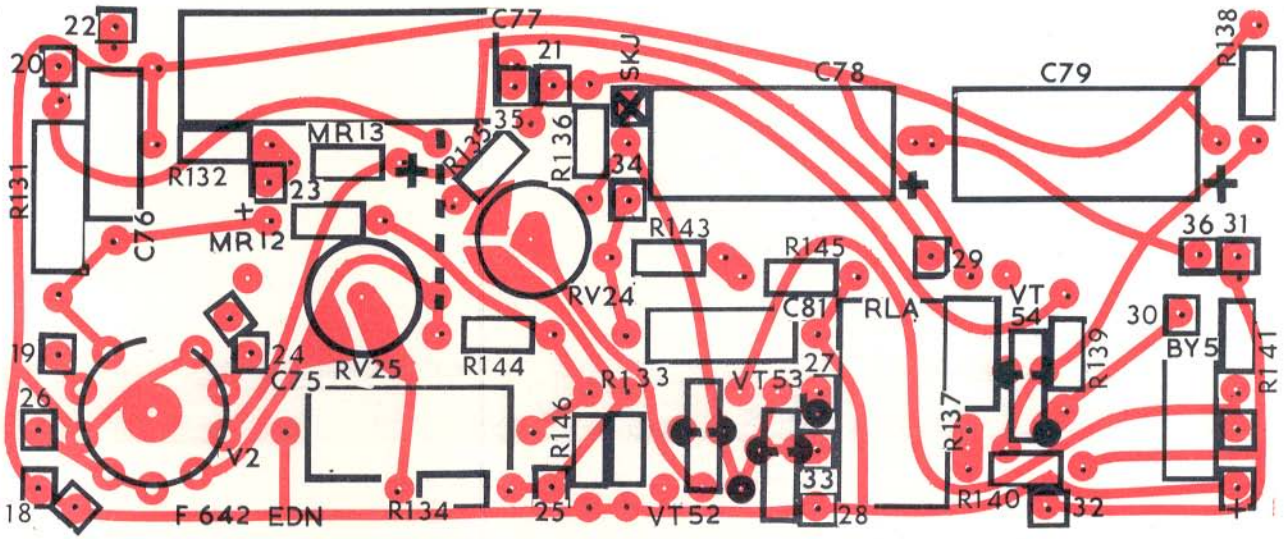

PRINTED BOARD
F635 STABILISER BOARD

FIG. 16



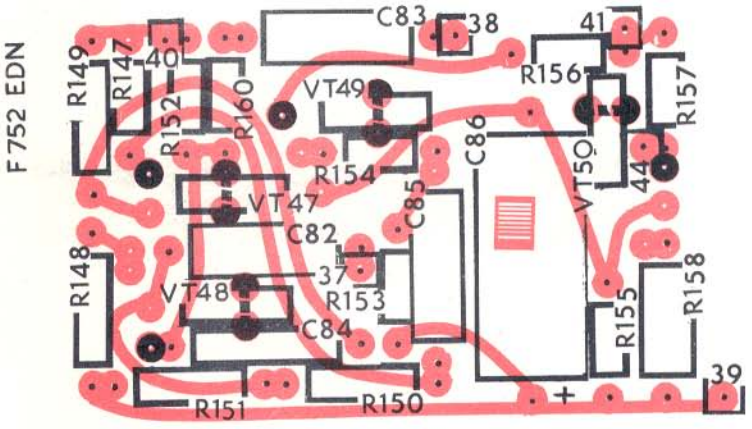

PRINTED BOARD
F641 FREQUENCY BOARD

FIG. 17



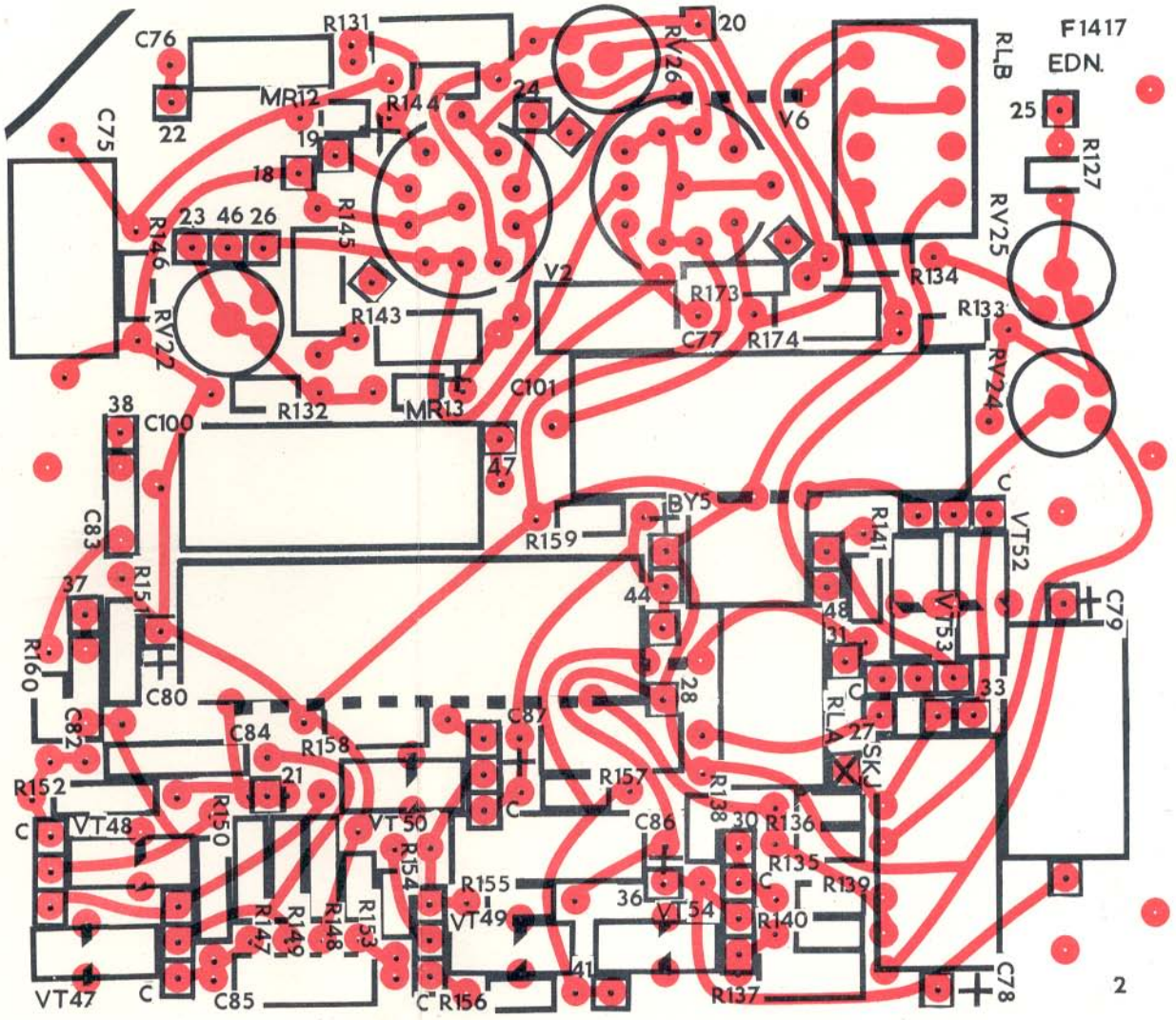

PRINTED BOARD
F642 HOLD ON BOARD

FIG. 18



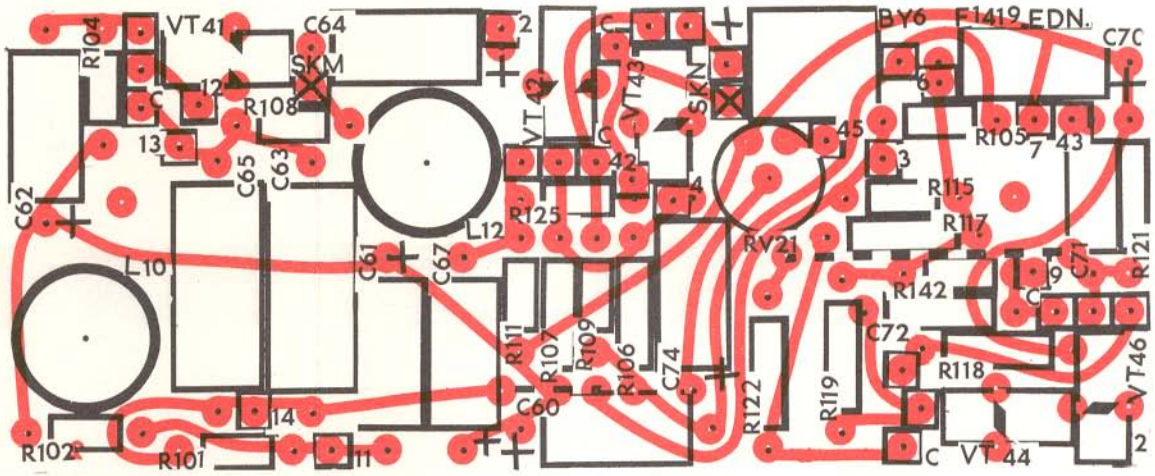

PRINTED BOARD
F752 HOLD OFF BOARD

FIG. 19



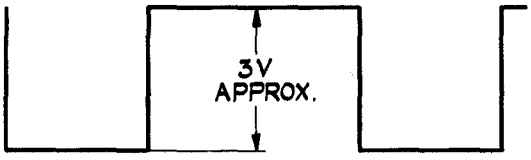

PRINTED BOARD
F1417 ANALYSER BOARD

FIG. 20



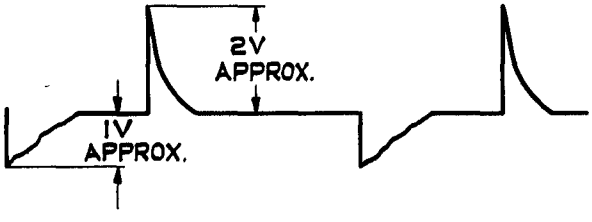

PRINTED BOARD
F1419 FREQUENCY METER BOARD

FIG. 21



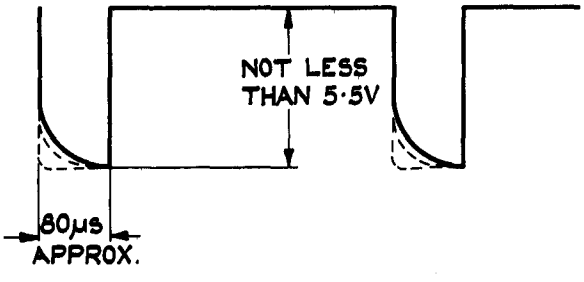

a

METER UNIT. F752 TAG 37
OUTPUT FROM LIMITING
AMPLIFIERS.



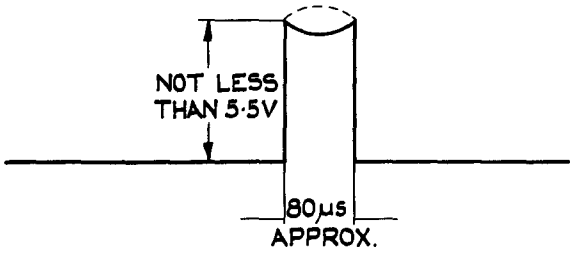

b

METER UNIT. F752
JUNCTION OF C82/R151



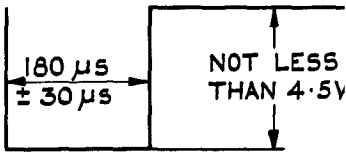

c

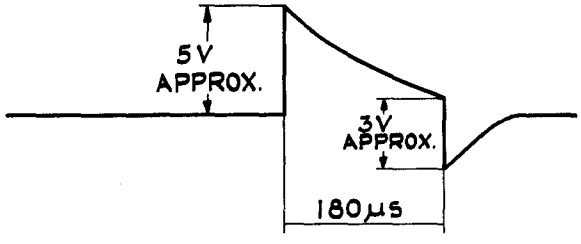
METER UNIT. F752
FIRST MULTIVIBRATOR
COLLECTOR VT. 47.




d

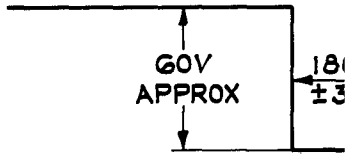
METER UNIT. F752
FIRST MULTIVIBRATOR
COLLECTOR VT.48.

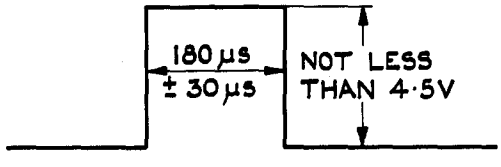



e

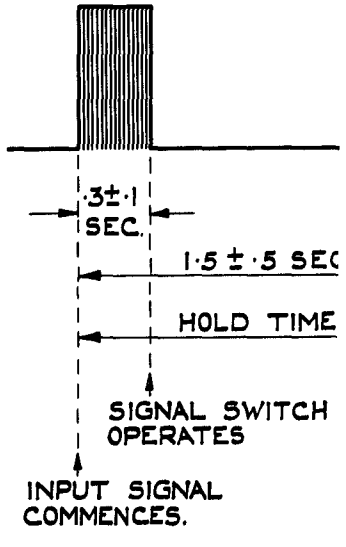
METER UNIT. F752
OUTPUT TO SECOND
MULTIVIBRATOR.



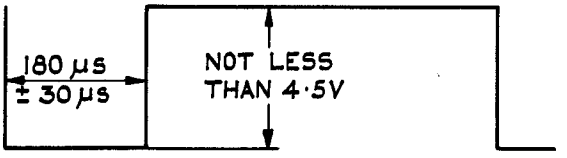

f

METER UNIT. FG41
SECOND MULTIVIBRATOR
COLLECTOR VT. 46.

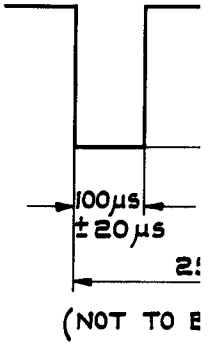



**TYPICAL WAVEFORMS**
**ANALYSER S350**
**WZ.25724/D Sh.1. Iss.1**

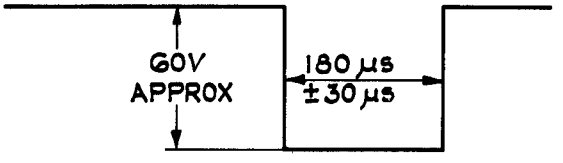
g



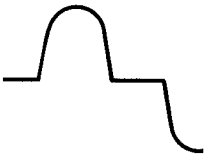

METER UNIT. FG41
SECOND MULTIVIBRATOR
COLLECTOR VT. 44.



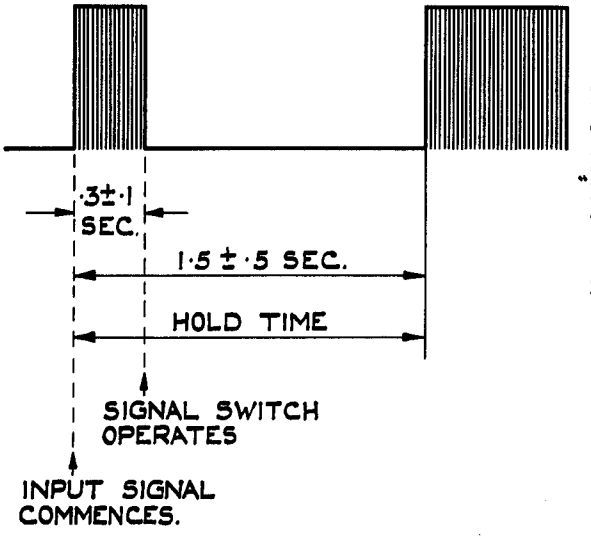

h




METER UNIT. FG42
PULSE AMPLIFIER
V2A ANODE.



i

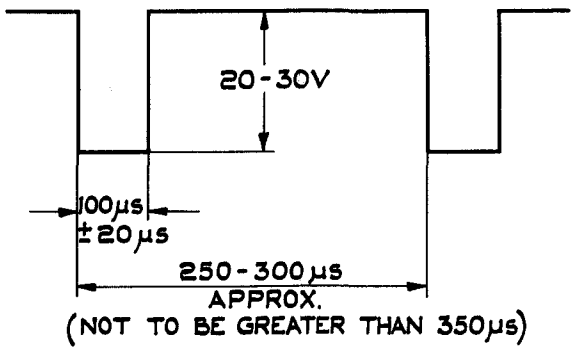



METER UNIT. FG41
OUTPUT OF SECOND
MULTIVIBRATOR ON THE
"HOLD ON" POSITION
WITH CONTINUOUS SIGNAL
INPUT AS VIEWED ON A
SLOW SPEED OSCILLOSCOPE.

**AL WAVEFORMS**
**LYSER S350**
**4/D Sh. 1. Iss. 1**

g

UNIT. FG41
) MULTIVIBRATOR
:TOR VT. 44.

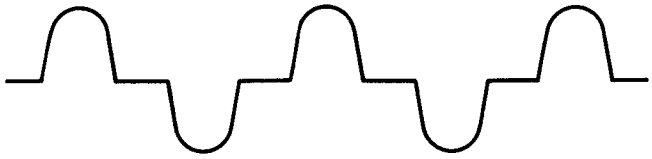



j

POWER UNIT. OUTPUT
OF RINGING CHOKE
OSCILLATOR (VT 63C)

h

UNIT. FG42
AMPLIFIER
ANODE.



k

AERIAL UNIT.
TYPICAL THRESHOLD
OUTPUT WAVEFORM
WITH NON-LIMITING
OUTPUT FROM VT.5

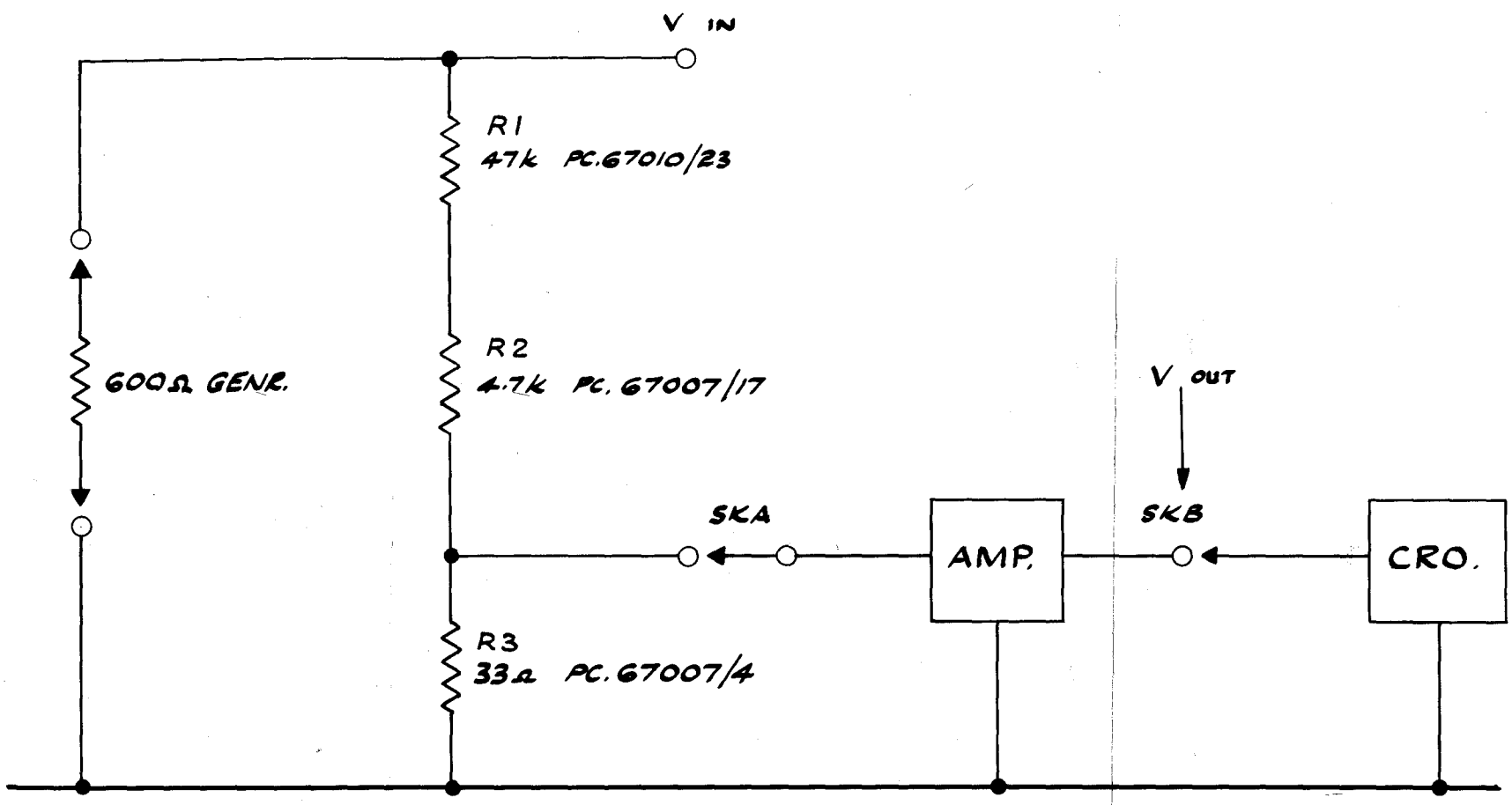
i

R UNIT. FG41
T OF SECOND
VIBRATOR ON THE
ON" POSITION
CONTINUOUS SIGNAL
AS VIEWED ON A
SPEED OSCILLOSCOPE.

FIG. 22

65dB GAIN SETTING ATTENUATOR
(Refer to Master Components List T3827-6)
Cross Reference List
for WZ.25656-B Sh.1

| Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. | Ref. | No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | R1 | 1 | R2 | 2 | R3 | 3 | | | | |




TEST FREQUENCY :- 1K cs

GAIN SETTING :- 65 dB's.

IMPORTANT :- REMOVE XTAL MRG BEFORE ADDING ATTENUATOR.

GAIN SETTING ATTENUATOR
WZ. 25656/B Sh.1 Iss.2

FIG. 24