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STATION, RADIO, A13
TECHNICAL HANDBOOK - UNIT REPAIRS

Note: This Issue 2, Pages 1-4 and 1001-1011, supersedes Issue 1, Pages 0-01, dated 28Apr 65, 02 dated 21 Oct 68, 1-6 and 1001-1011, dated 29 Jan 65. The regulation has been revised throughout.

General

1. The station comprises some of each or all of the following sealed units:

Z1/5820-99-949-6353	Transmitter-receiver, radio, A13
Z1/5820-99-949-6154	Tuner, radio frequency, antennae
Z1/5820-99-949-6111	Stabilizer, voltage, transistor type
Z1/6115-99-949-8134	Generator, d.c., hand
Z1/5820-99-949-6108	Harness adaptor unit
Z1/5820-99-949-6365	Control, transmitter-receiver, remote
Z1/5820-99-949-6158	Amplifier, r.f. No 12 Mk 1
Z1/5820-99-105-3158	Amplifier, r.f. No 12 Mk 2
Z1/6130-99-103-2895	Charger, battery resistance

2. The fault-finding tables in the User Handbook (Army Code No 13120) give a step-by-step drill for diagnosing the faulty unit in a station. These tables are repeated in this regulation, (Table 3001).

3. In addition to the sealed units detailed in para 1 the station contains a number of ancillary units such as handsets, headsets, key etc.

4. In view of the complexity of this equipment, unit repairs are to be confined to:

a. The exchange of loose CES items.

b. The replacement of the parts listed in Table 1.

Precautions

5. Opening of sealed units, their repair and adjustment, is only to be carried out in workshops authorized to carry out repairs to SRA13 and which are in possession of the special test equipment listed in Tels F 144.

6. Under no circumstances are any 'ad hoc' voltage supply arrangements to be made. The only supplies to be used are those provided by the station, viz:

a. The SRA13 battery.

b. A 24V vehicle battery via the harness adaptor unit.

c. An external 12V battery (which must not be on any form of float charge) using the connector provided and entering the TRA13 via the socket adjacent to the headset sockets. This socket contains reverse polarity protection but no overvoltage protection.

7. The SRA13 uses a large number of transistors and the momentary connection of either an overvoltage or a correct voltage with reversed polarity to the set via the battery plug or the 6-pin sockets SKB and SKC, will have catastrophic results. The repair costs for a set so damaged might be in the order of £100. Care has been taken in the design of the station and the test equipment to prevent any such damage occurring if the authorized leads etc are used.

Repairs

8. Fig 3001-3006 detail the procedure to be adopted when replacing cords etc on the headsets, handsets, key and cable assemblies.

9. These cords are tinsel and are crimped onto the plug pins using a special tool; they are not repairable. When necessary they will be replaced by new cords which are supplied ready fitted with new plug pins, loops etc; Fig 3001 and 3002 show the correct method of dismantling and assembling. The special extraction and insertion tools together with the rubber lubricant (RELEASIL 7) and locking compound are provided to units authorized to carry out unit repairs.

Table 1 - SRA13 spare parts authorized for unit repair or replacement

Cat No	Designation
Station items	
Z1/5820-99-102-0575	Adaptor, antenna to antenna base, 11.3/4 in.
Z1/5820-99-949-6861	Antenna counterpoise, 30 ft
Z1/5820-99-101-9312	Antenna and frame assembly (150 ft braid antenna)
Z1/5820-99-104-1523	Antenna, whip type, collapsible
Z1/8105-99-949-6530	Bag, cotton duck, 10.1/2 in. x 6 in. dia
Z1/5995-99-949-6770	Cable assembly, radio frequency, UN 95, 2 ft
Z1/5995-99-949-7148	Cable assembly, special, 2-conductor, 6 ft
Z1/5820-99-949-6873	Case, antenna, cotton duck, 15.1/2 in. x 3.1/2 in.
Z1/5820-99-949-6925	Cord, antenna erection, plastic, 80 ft
Z1/5820-99-949-8945	Cover, transmitter-receiver, canvas
Z1/5820-99-101-9311	Carrying frame, electrical equipment
Z1/5820-99-949-6876	Spike, supporting, antenna, 8 in. x 19/32 in.
Cable assemblies - breakdown	
Z9/5940-99-940-0859	Clip, electrical, battery charging, 50A
Z1/5935-99-102-7111	Plug, electrical, free, plastic
Z32/5935-99-106-0215	Plug, electrical, free, brass, co-axial, 50Ω and pre-shrunk sleeve

Table 1 - (Cont)

Cat No	Designation
Handset, SI type	
Y1/5965-99-901-1184	Microphone element
Y1/5965-99-940-2368	Inset, earphone
Z42/5995-99-101-4823	Cord assembly, electrical, with plug, 6 pt, 5 ft 9 in.
Y1/5995-99-101-9824	Cord assembly, electrical, processed ends, 5 ft 9 in.
Y1/5975-99-100-1947	Protector, electric cable, rubber
Z42/5975-99-901-2988	Packing nut, cable gland
Y1/5310-99-901-2989	Washer, finishing, aluminium
Z1/5820-99-102-2821	Plug, electrical, 6 pt
Z32/5930-99-109-2208	Switch and actuator assembly
Y1/5965-99-101-9826	Cover, electrical switch
Y1/5965-99-101-9827	Gasket, rubber
Y1/5965-99-101-9713	Bar, actuator, electrical switch
Y1/5930-99-901-0419	Cap, electrical, nylon
Z1/5820-99-102-3724	Outlet set, electrical, plug-socket
Headset microphone, SI type	
Y1/5965-99-100-1940	Neckband, single wire style
Y1/5965-99-949-2572	Cushion, earphone, rubber, single entry
Y1/5965-99-100-1941	Cushion, earphone, rubber
Y1/5965-99-100-1942	Boom, microphone, steel
Y1/5965-99-901-1184	Microphone element
Y1/5965-99-940-2368	Inset, earphone
Y1/5965-99-901-2377	Clip, clothing, steel
Y1/5995-99-102-0173	Cord assembly, electrical, 2-conductor, 17 in.
Z42/5965-99-102-0174	Junction box, plastic
Y1/5965-99-102-0175	Plate, retaining, gasket
Y1/5965-99-102-0176	Pushbutton, brass
Y1/5965-99-101-9830	Gasket, rubber
Y1/5965-99-100-1939	Headband, single, flat band
Y1/5965-99-100-1943	Shell, microphone, rubber
Z1/5820-99-102-2821	Plug, electrical, 6 pt
Y1/5995-99-101-9828	Cord assembly, electrical, 4-conductor, with plug, 6 pt, 4 ft 9 in.
Y1/5975-99-102-0172	Protector, electrical cable, rubber
Y1/5995-99-102-0173	Cord assembly, electrical, 4-conductor, processed ends, 4 ft 8 in.
Y1/5940-99-949-2571	Cover, terminal box, plastic
Y1/5330-99-949-2593	Gasket, rubber
Z1/5390-99-900-9260	Switch, sensitive, S.P.4 circuit
Z1/5820-99-102-3724	Outlet set, electrical, plug-socket
TRA13	
Z1/5340-99-102-3158	Strap, webbing
Z1/5820-99-949-8852	Crank, hand
Z1/5355-99-949-9032	Knob
Z1/5355-99-949-6085	Knob
Z1/5355-99-949-5986	Knob
Z1/5355-99-949-5747	Knob

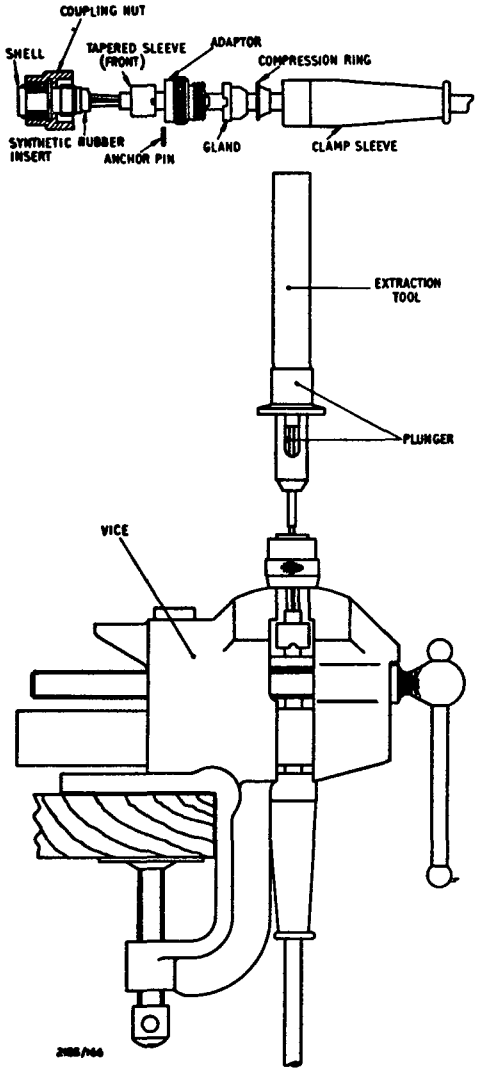
Table 1 - (Cont)

Cat No	Designation
Tuner, r.f., antennae	
Z1/5820-99-101-9880	Catch, electronic equipment
Z1/5355-99-949-9032	Knob, aluminium
Z1/5355-99-949-9024	Knob, aluminium
Z1/5355-99-949-9151	Knob, aluminium
Stabilizer, voltage	
Z1/5820-99-102-8366	Strap, latched, 11.1/2 in.
Z1/5820-99-102-8372	Strap, buckled, 3 ft 8 in.
Z1/5820-99-102-8374	Strap, buckled, 9.1/2 in.
CN 5340-99-973-6841	Buckle, lightweight
Z/6210-99-012-0914	Lens, indicator light, red
X5/6240-99-995-9120	Lamp, filament, 12V, 1.2W
Harness adaptor unit	
Z/6210-99-012-0914	Lens, indicator light, red
X2/5920-99-059-0113	Fuse link, ceramic, 7A
X5/6240-99-995-9120	Lamp, filament, 12V, 1.2W
X2/5920-99-012-0232	Carrier, fuse link, 250V, 7A
Z1/5340-99-949-5123	Mount, resilient
Generator, d.c., hand	
Z/6210-99-012-0914	Lens, indicator light, red
X5/6240-99-995-9120	Lamp, filament, 12V, 1.2W
Z1/6115-99-102-2344	Crank, handle
Z1/6115-99-102-2345	Arm, handcrank
Z1/6115-99-102-2346	Handle, handcrank
Z1/5820-99-102-0576	Screw, mounting, generator
Key, telegraph	
Y2/5805-99-102-0917	Strap, webbing
Y2/5805-99-102-0918	Arm assembly, key, telegraph
Y2/5805-99-102-0921	Knob, plastic
Y2/5805-99-102-0925	Diaphragm, key, telegraph
Y2/5805-99-102-0926	Spring, helical, compression
Y2/5805-99-102-0928	Gasket
Y2/5805-99-102-1101	Cable assembly, electrical, 48 in. with 6 pt plug
Thorn	
Z1/9535-99-102-2821	Plug, electrical
Z1/5820-99-102-1960	Outlet set, electrical, plug-socket

10. This regulation includes references to various special extraction tools for use with pygmy plugs and sockets. These tools are catalogued as follows:

F1/5120-99-120-7735	Inserter - electrical contact, size 20
F1/5120-99-120-7736	Extractor - electrical contact, size 20

Note: The next page is Page 1001



1. Dis-assemble plug as shown.

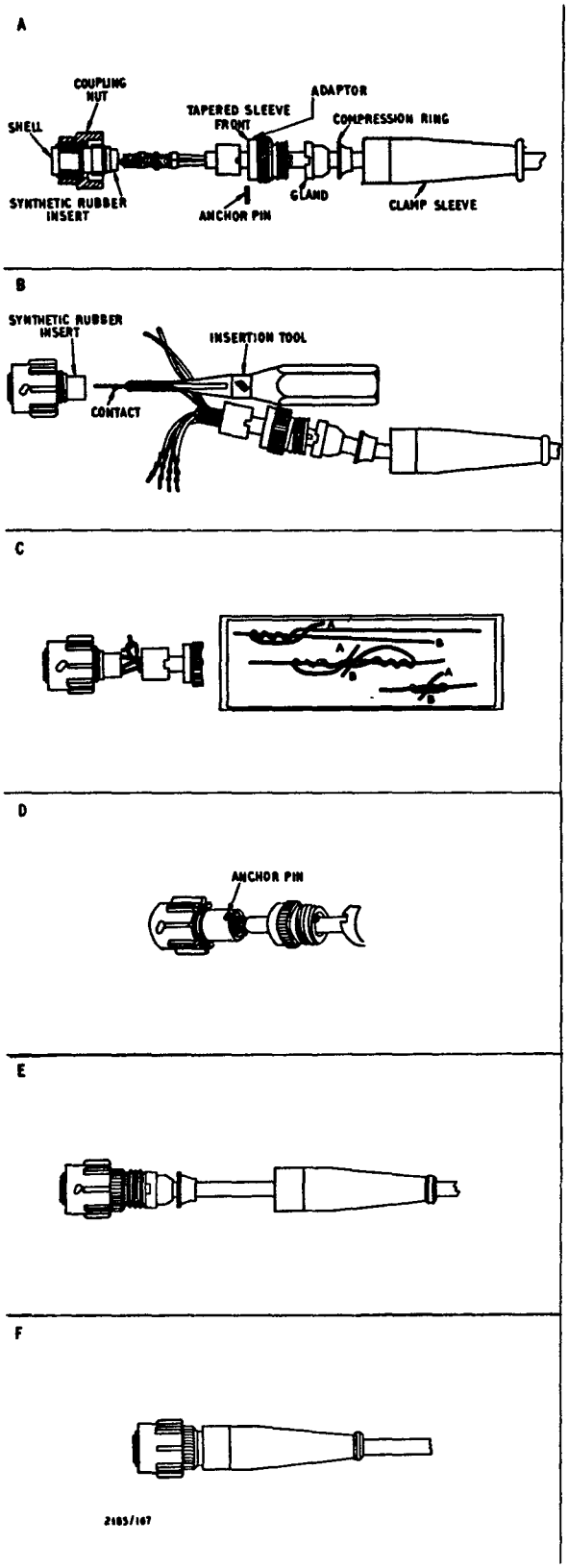
2. Place plug in vice with rear of coupling nut resting on the jaws.

3. Place the tube of the extraction tool over one of the pins of the plug.

4. Slowly and steadily depress the plunger of the tool, the pin will then be ejected from the rubber insert.

5. Repeat 3 and 4 until all pins are removed.

Fig 3001 - SRA13, method of dismantling and removing pins from pygmy type plugs



A Thread clamp sleeve, compression ring, gland, adaptor and tapered sleeve over cable in that order. Use rubber lubricant if necessary.

B Insert contacts into the relevant holes in the rear of the insert using special tool. N.B. If the lay of the cable differs from the location of contact positions the individual cables must follow the shortest route, eg, plait them if necessary.

C Tie special knot to form loop in strain cords as shown, ends of knot to be heat-sealed, knot to be positioned so that when assembled as shown in section D below, no strain is imposed on the conductors.

D Bring up the tapered sleeve to butt against the rear of the connector shell, pass the anchor pin between an equally divided number of connectors and also through the nylon loop and locate the ends of the pin in the slots provided. After strain cord has been secured cable must be capable of withstanding a steady pull of 10 lb without imposing any strain on the conductors.

E Apply 'Loctite' Grade A to the external thread on the connector shell. Bring the adaptor over the tapered sleeve to engage with the thread on the rear of the connector (shell) screw on firmly whilst ensuring that the anchor pin remains in position, bring up the gland and locate the adaptor key as shown.

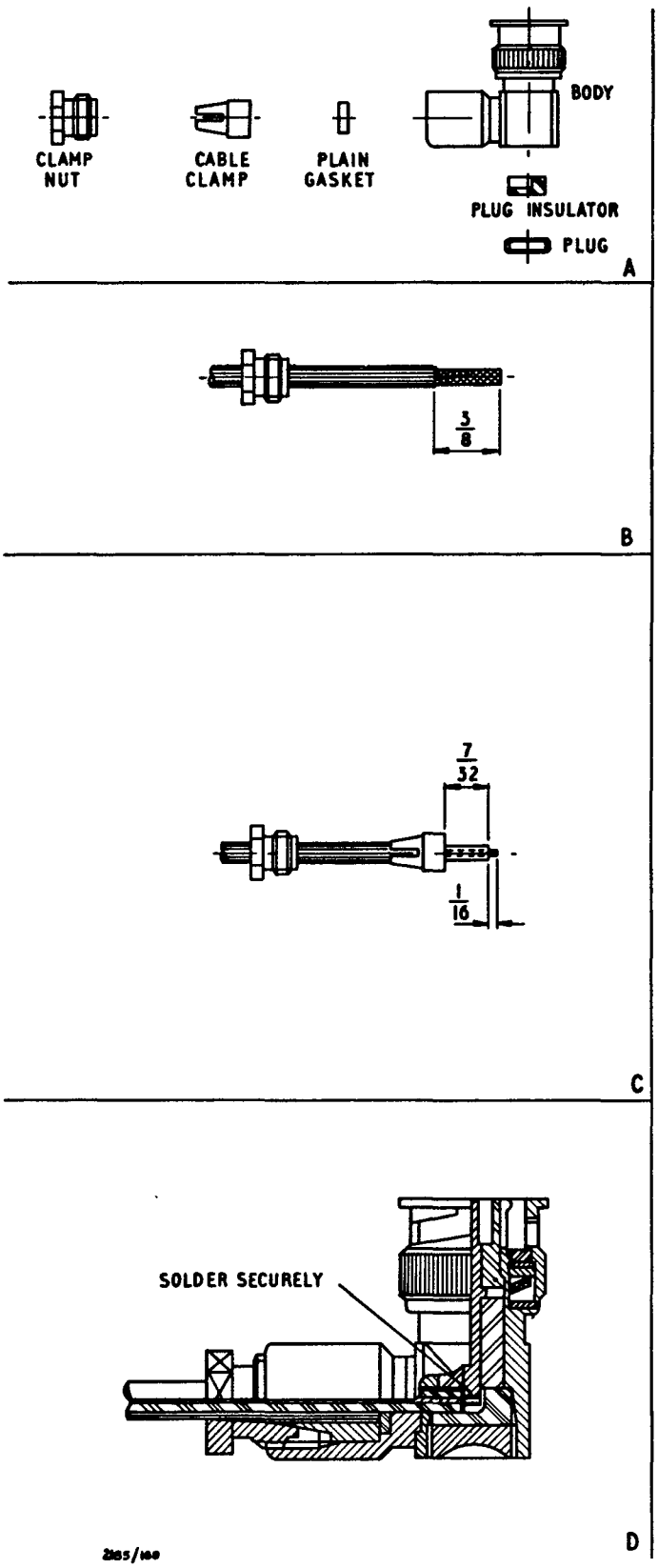
F Apply 'Loctite' Grade A to the external thread on the adaptor. Bring up the compression ring to the rear of the gland, bring up the clamp sleeve over the compression ring and gland, then screw up firmly.

Note: Loctite Grade A available in

10 cc tubes H1/8030-99-220-2387
50 cc tubes H1/8030-99-220-2874

Silicone compound, Releasil 7
H1/HA 6850-99-943-3472

Fig 3002 - Plug assembly detail



A Dis-assemble plug as shown.

B Remove all piece parts shown above. Cut off outer sheath square to 3/8 in. from end of cable.
Care must be taken to avoid damaging the braid.
Slide 'clamp nut' over outer sheath.

C Screw 'cable clamp' over outer sheath until rear face is flush with cut end of outer sheath. Comb out the braid and fold back to lay against rear face of 'cable clamp'. Trim off surplus braid flush with O/Dia of 'cable clamp'.
Cut off dielectric to 7/32 in. from braid, care being taken to avoid damaging the centre conductor. Cut off centre conductor to 1/16 in. from end of dielectric. Tin dip centre conductor. Avoid excessive heat.
Slide 'plain gasket' over the dielectric to butt against the braid.

D Turn the 'male contact' in the 'body' so that the slot is in the line to receive the centre conductor of the cable. Push the sub-assembled cable into the 'body' as far as it will go. Engage the 'clamp nut' in the thread and tighten fully home.
Solder the centre conductor securely into the slot in the 'male contact'. Avoid excessive heat.
Replace the 'plug insulator' with slot leading and in line with the cable. Locate the 'plug' and tighten up.

Fig 3003 - Co-axial connectors, method of assembly

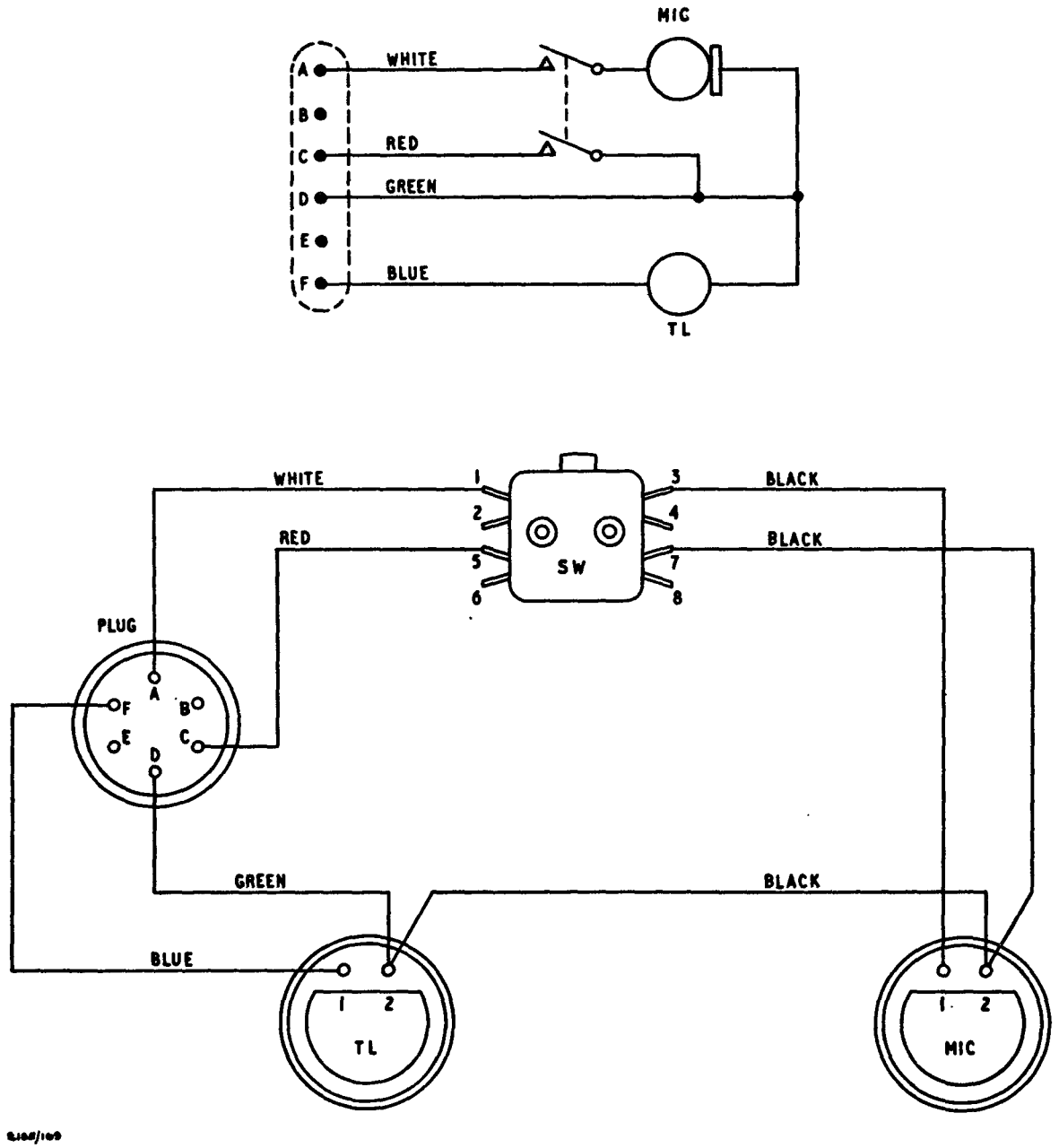


Fig 3004 - Handset, SI type, wiring and circuit diagrams

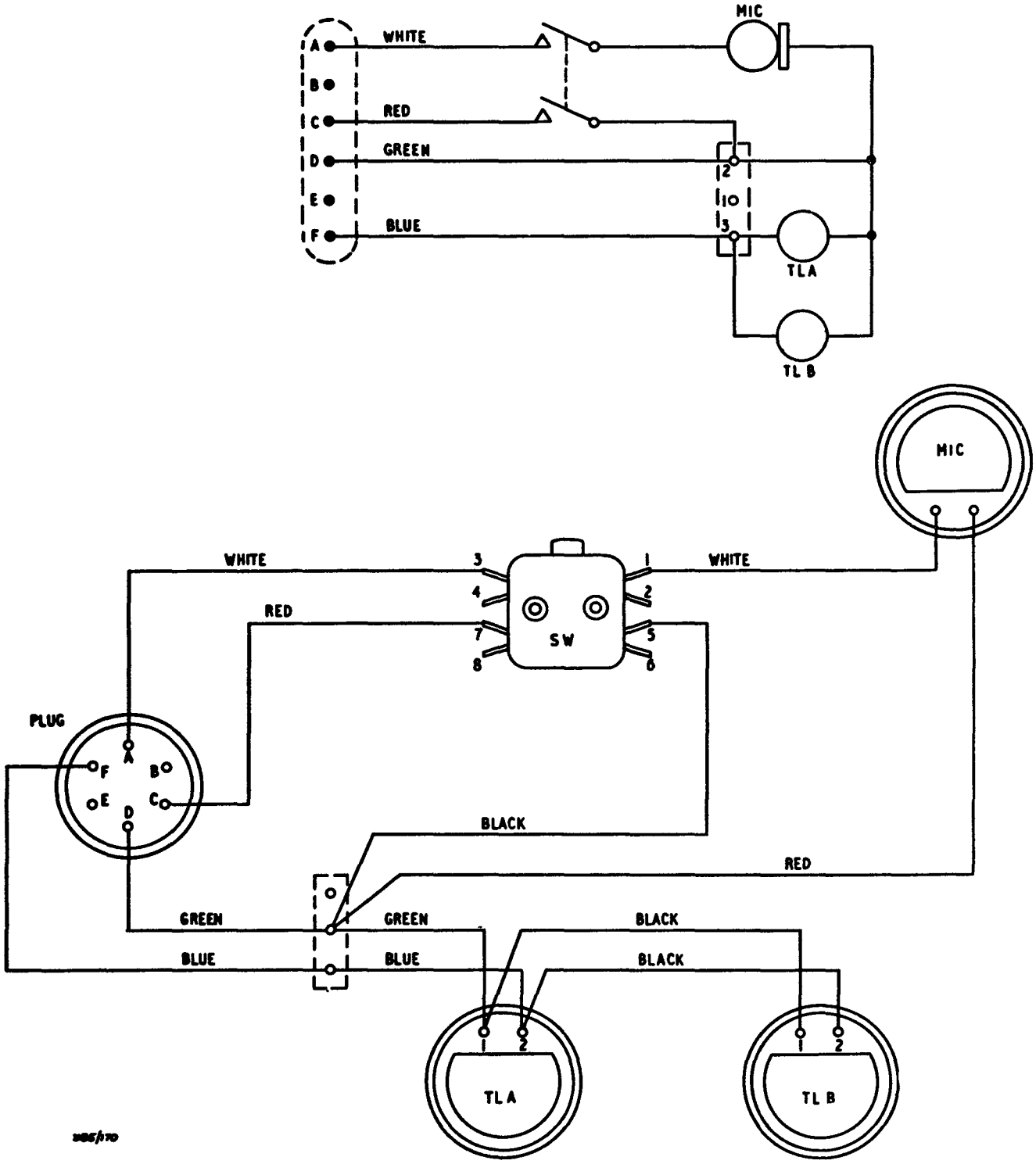
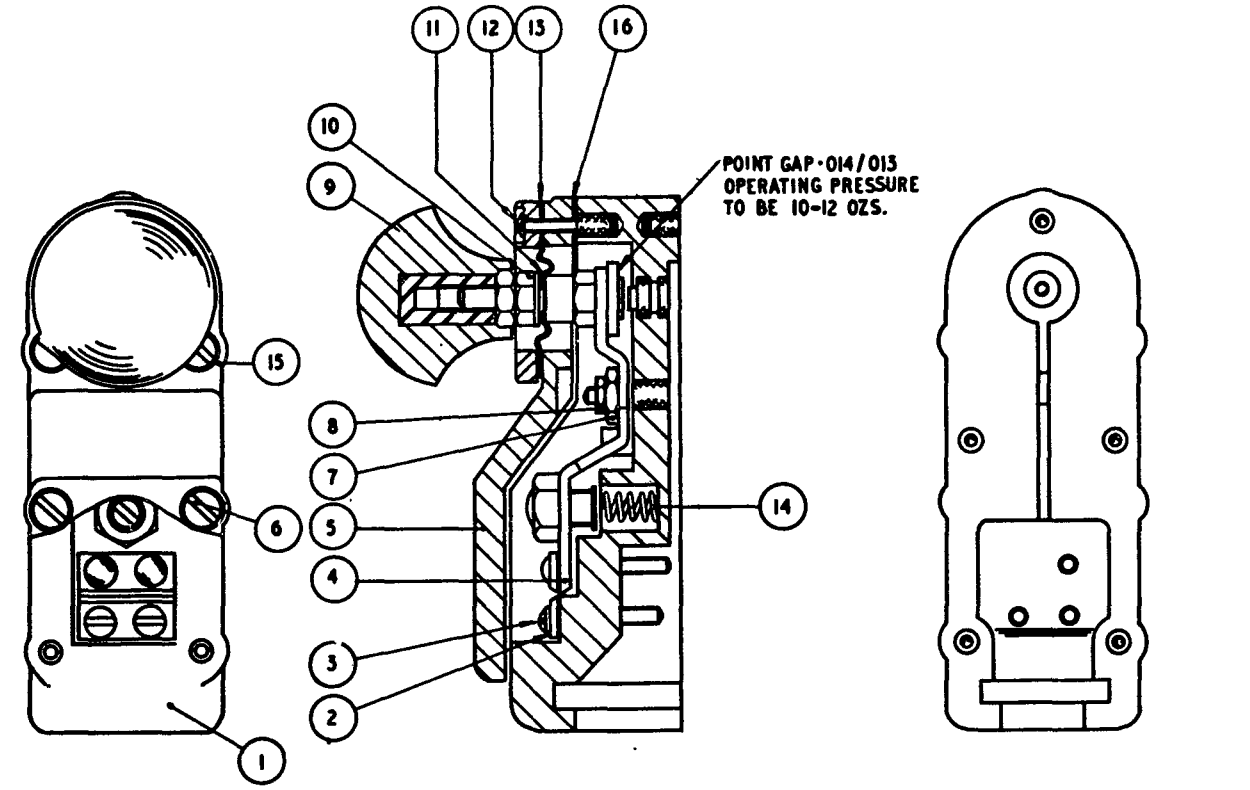


Fig 3005 - Headset microphone, SI type, wiring and circuit diagrams



ITEM	NAME	ITEM	NAME
1	BODY, KEY, TELEGRAPH	9	KNOB
2	PLATE, WASHER, PLAIN	10	NUT, HEX, THIN
3	SCREW, MACHINE	11	WASHER, FLAT
4	ARM ASSEMBLY, KEY TELEGRAPH	12	SCREW, MACHINE
5	COVER, TELEGRAPH KEY	13	DIAPHRAGM, KEY TELEGRAPH
6	SCREW, MACHINE	14	SPRING, HELICAL, COMPRESSION
7	NUT, PLAIN, HEXAGON	15	CLAMP, RIM, CLENCHING
8	NUT, HEX, FULL	16	GASKET

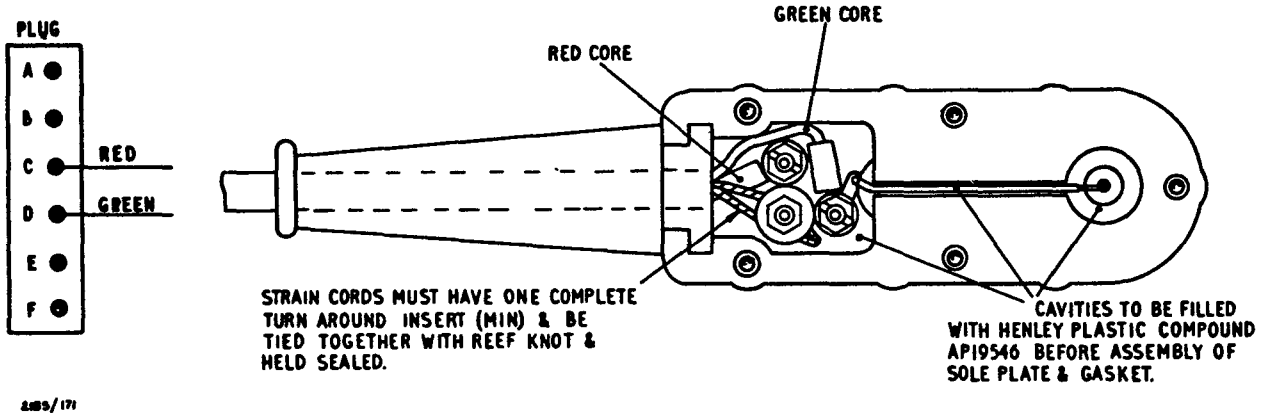
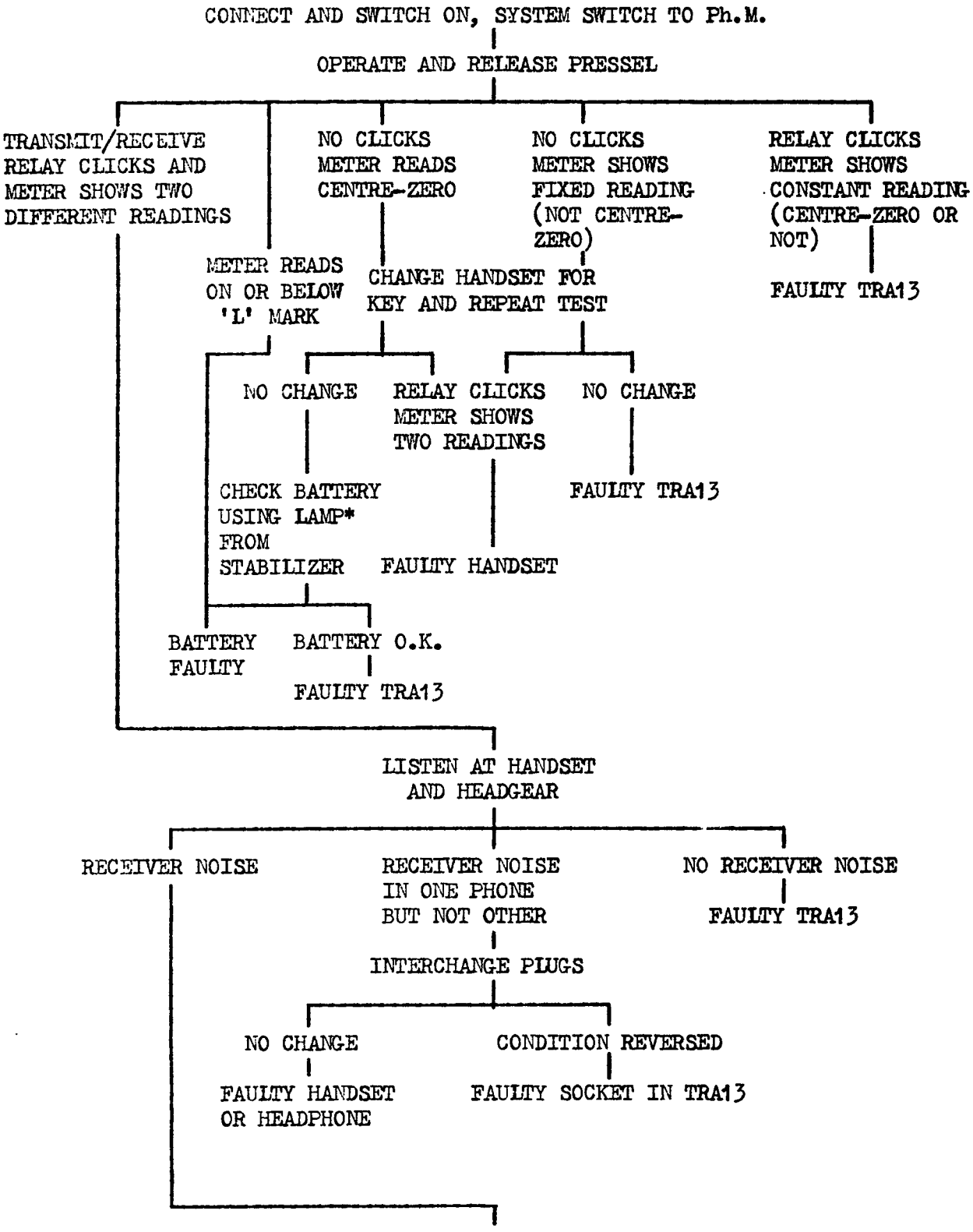


Fig 3006 - SRA13, key, telegraph, assembly detail

Table 3001 - Fault finding table for SRA13
(reprinted from User Handbook Army Code 13120)

TEST No 1

TRA13 WITH BATTERY, HANDSET, HEADGEAR, TUNER RF AND 8-FT ANTENNA

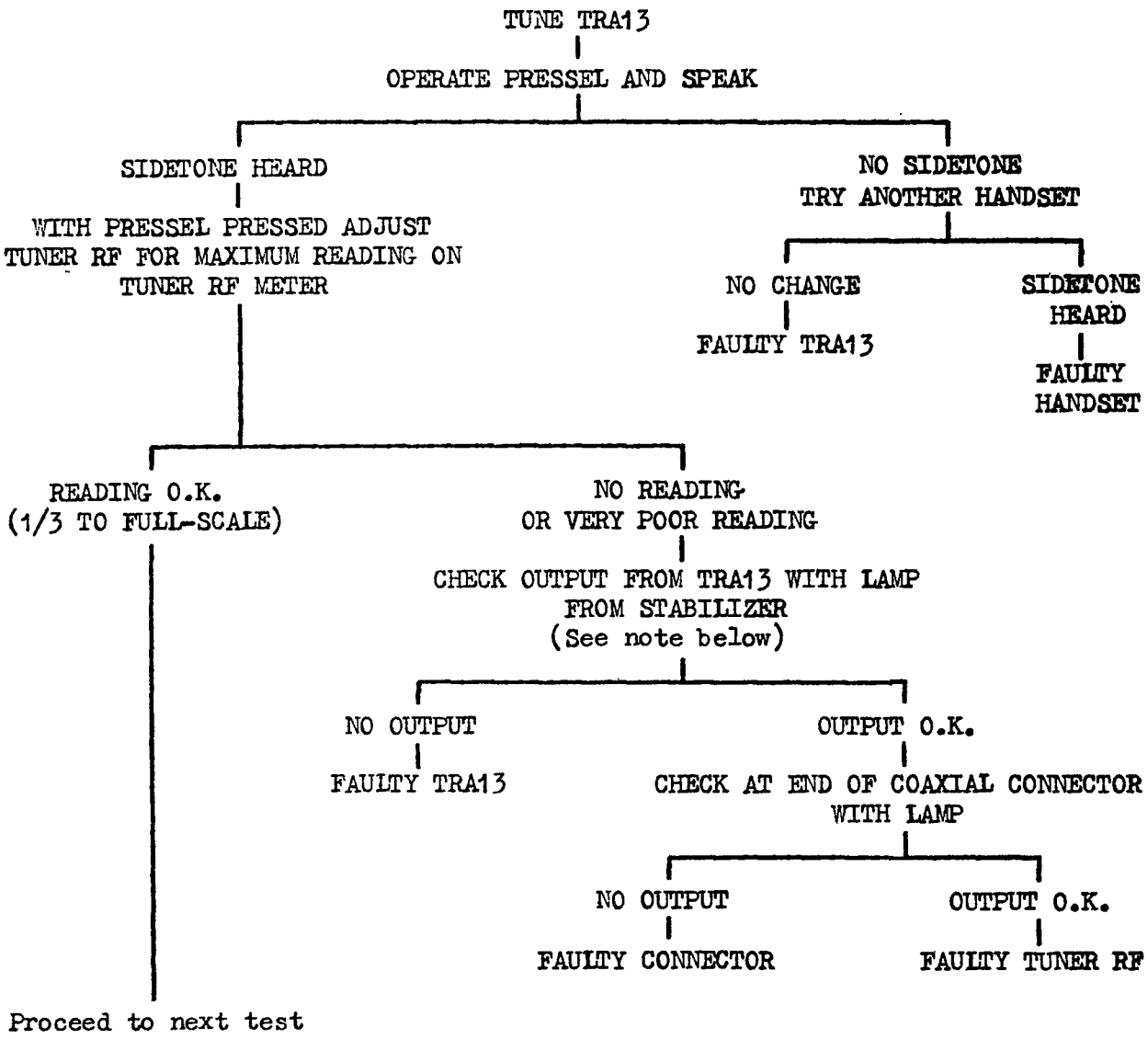


Test No 1 continued on next page

* See note on next page

Table 3001 - (Cont)

TEST No 1 - (Cont)



Proceed to next test

Note: (1) To remove lamp cover, unscrew it at the black base ring. The 12V lamp can then be slipped out of the cover. The red cover is a dimming device and revolves freely.

(2) To check the A13 output, insert a short piece of wire into the co-axial centre socket and hold the lamp contacts between this and the co-axial outer ring. Press the pressel. The lamp should light.

Table 3001 - (Cont)

TEST No 2

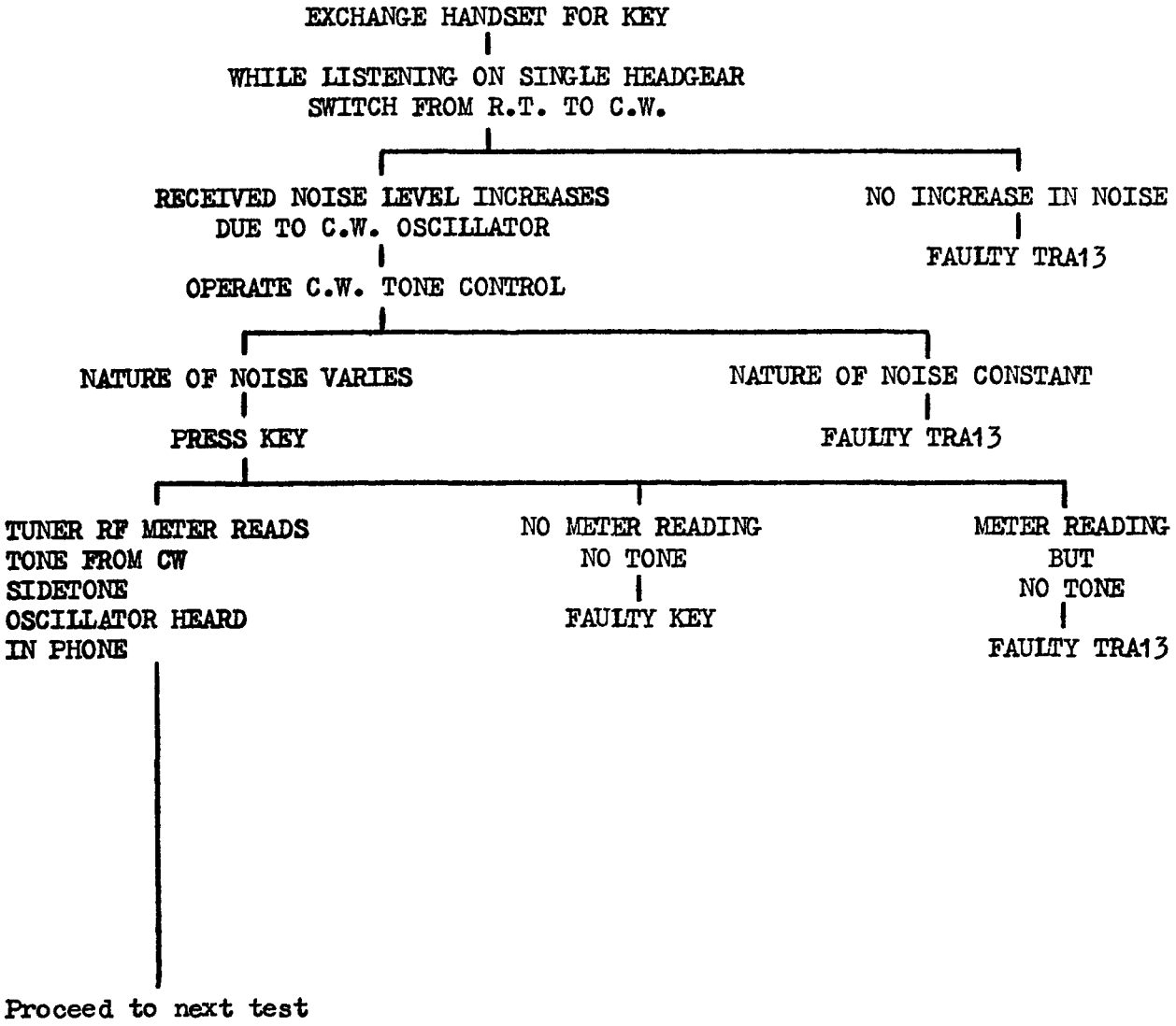


Table 3001 - (Cont)

TEST No 3

SWITCH TRA13 TO "CURSOR ADJ"

- *SCALE AND METER LAMPS LIGHT
  - TUNE CHANNEL SCALE TO ANY 100kHz POINT, RF SCALE BEING SET TO APPROX CORRECT FREQUENCY
    - METER SWINGS TO APPROX FULL SCALE EITHER WAY WITH SAME "HAND" AS SCALE AND KNOB
      - ESTABLISH THIS POINT AND THE NEXT 100kHz POINT UP OR DOWN (MAKING USE OF THE CURSOR). SWITCH TO "CHAN ADJ" AND TUNE SLOWLY FROM ONE OF THE 100kHz POINTS TO THE OTHER OBSERVING THE SWINGS OF THE METER
        - 10 SWINGS (ONE AT EACH 10kHz POINT ON THE SCALE)
          - SWITCH TO "TUNE RF" AND TUNE R.F. CIRCUIT
            - METER SWINGS TO APPROX FULL SCALE EITHER WAY
              - Proceed to next test
            - METER FAILS TO DO THIS
              - FAULTY TRA13
        - OTHER THAN 10 SWINGS
          - FAULTY TRA13
    - METER FAILS TO DO THIS
      - FAULTY TRA13
- NO LAMPS LIGHT*
  - FAULTY TRA13

*Note: In bright sunlight shield windows when checking scale lamps

Table 3001 - (Cont)

TEST No 4

CONNECT R.F. AMPLIFIER TO TRA13, CONNECT HANDSET AND TUNER RF WITH 8-FT WHIP TO R.F. AMPLIFIER
SWITCH ON, SWITCH TRA13 TO Ph.M. RF AMPLIFIER TO "TUNE PA" AND TO THE FREQUENCY RANGE APPROPRIATE TO THE FREQUENCY TO WHICH TRA13 IS TUNED.
OPERATE "TUNE" CONTROL ON RF AMPLIFIER

- METER ON RF AMPLIFIER TUNES TO PEAK
  - SWITCH RF AMPLIFIER TO "OPERATE". OPERATE PRESSEL. CHECK TUNING OF TUNER RF BY TUNER METER.
    - METER READING 1/3 TO FULL-SCALE
      - TEST CONCLUDED
    - NO READING OR VERY POOR READING
      - FAULTY RF AMPLIFIER
- METER FAILS TO TUNE OR FAILS TO READ
  - FAULTY RF AMPLIFIER

EME8c/2185/Tels

END