POST OFFICE TELECOMMUNICATIONS HEADQUARTERS

SPECIFICATION OF REQUIREMENTS

FOR

TELEPHONE SA 4258

TELEPHONE 2/SA 4258

TELEPHONE 4/SA 4258

CONTENTS

1. GENERAL

1.1 Specification D 1000 shall be taken as forming part of this Specification.

1.2 All components shall be to the relevant PO Specifications where appropriate or if no PO document exists the relevant BS 9000 Specification. All components shall be of the type approved by the Director of Telecommunications Development (TD7.1.1).

1.3 This Specification details the requirements for regulated MF push-button telephones with electrical characteristics suitable for connexion to certain types of large PABX.

2. DESCRIPTION

2.1 The telephones will be based on the Telephone 746/740 range except that a push-button unit will be fitted in place of the rotary dial, and a line powered oscillator unit will be incorporated. A recall switch is fitted as standard.

2.2 Telephone SA 4258. This is a table instrument based on the Telephone 746.

2.3 Telephone 2/SA 4258. This is a table instrument based on the Telephone 740.

2.4 Telephone 4/SA 4258. This is a wall instrument based on the Telephone 740.

2.5 All instruments shall be capable of connexion in the extension plan arrangements detailed in Diagram SA(L) 4258 using the same add-on parts.

3. CONSTRUCTION

3.1 The telephones shall be assembled in accordance with the relevant SM Specification.

3.2 Push-Button Unit. The push-button unit shall meet the requirements of Specification S 1161A paragraphs 3, 4 and 5.

3.3 Oscillator Unit. The line powered oscillator unit shall be mounted within the telephone case in such a position that it does not prevent the fitting of add-on units designed for the equivalent dial telephone. The wires leading from the oscillator board shall be terminated on the transmission board using Parts 13/SD 77.

3.4 It is a desirable feature that a single design of push-button unit and oscillator shall be capable of connexion in all models having the mark number.

3.5 The colours of the separate mouldings of the telephone shall match each other, where appropriate, to the satisfaction of the Purchasing and Supply Department of the Post Office.

3.6 Handset Cord

3.6.1 Telephones SA 4258 and 2/SA 4258. When viewed from the rear, the handset cord shall emerge from the right-hand cord outlet in such a way that the helix leads out naturally to the right-hand side of the telephone.

3.6.2 Telephone 4/SA 4258. When viewed from the rear, the handset cord shall emerge from the left-hand cord outlet in such a way that the helix leads out naturally to the left-hand side of the telephone.

3.7 Gravity Switch Mechanism

3.7.1 Handset Rest

3.7.1.1 Telephones SA 4258 and 2/SA 4258. The handset, when resting within the cradle of the completely assembled telephone, shall depress the plungers down to the full extent of their travel as defined by the lugs within the telephone, not by the cover.

3.7.1.2 Telephone 4/SA 4258. The handset, when placed within the handset cradle bracket of the completely assembled telephone, shall depress the plungers such that the gravity-switch is fully operated and perceptible movement of the plungers follows before the handset comes to rest.

3.7.2 The gravity switch plungers shall restore unaided, when the handset is removed, to the full height of their travel as defined by the lugs within the telephone, not by the cover.

3.7.3 A 50 gms ($1\frac{3}{4}$ oz) weight placed across the gravity switch plungers shall be insufficient to break contacts 4 and 5 of the gravity microswitch when tested electrically.

3.7.4 A 135 gms ($4\frac{3}{4}$ oz) weight placed across the gravity switch plungers shall fully depress them as in 3.7.1.

3.7.5 When the gravity switch plungers are full depressed as in 3.7.4 there shall be a perceptible amount of overtravel available on the gravity microswitch button.

3.7.6 When the gravity-switch latch is engaged with the gravity switch plunger, contacts 4 and 5 and 1 and 2 of the gravity microswitch shall be broken when tested electrically. The latch shall drop freely out of engagement when the gravity switch plungers are fully depressed.

3.7.7 With a 0.4 mm (0.015 inch) feeler gauge inserted between the gravity microswitch button and its operating lever, contact 1 and 2 of the microswitch shall make, when tested electrically, as the gravity switch plungers are restored to the upper limit of their travel as in 3.7.2.

Slight adjustment of such lugs, levers and brackets as may be required to achieve the above adjustments is permissible.

3.8 Latch Mechanism - Telephone 2/SA 4258 and 4/SA 4258

3.8.1 At least one of the latch plate stop lugs must bear against its mating face on the mounting bracket (Drawing DMO/141). The maximum deviation of the other stop lug shall be 0.1 mm (.004 inch). Pressure against the front face of the gravity switch plunger (Drawing DPL/1021) due to the latch plate assembly shall be not less than 0.3 N (30 gms) measured under the tip of the release latch bracket of the latch plate assembly (Drawing No. DLA/61).

3.8.2 There shall be perceptible clearance between the gravity switch latches and their mating faces on the gravity switch plunger.

3.8.3 The latch plate shall pivot freely over the working arc and shall latch and release when a .25 mm (.010 inch) flat gauge is placed between the stop lug and the appropriate mating face on the mounting bracket.

3.8.4 Apart from the latch used for Recall (see Clause 3.10) all latches shall be in the interlocking position ie the operation of any plunger (Drawing DPL/1022) shall release any other already operated.

3.8.5 A latched plunger shall not release when the gravity switch plungers are depressed slowly 1.6 mm ($\frac{1}{16}$ inch) but shall have released when the gravity switch plungers have completed $\frac{3}{4}$ of their travel, as judged by eye.

Slight adjustment of latches to meet the conditions in Clause 3.8.3 above is permissible.

3.9 Bell. When the armature is resting on either of the pole faces the clearance between the hammer and bell gongs shall be not less than 0.4 mm ($\frac{1}{64}$ inch) the gongs being adjusted to give optimum ringing under the limiting circuit condition stated in Specification S 81. The ball of the hammer shall strike the gong 1.6 mm ($\frac{1}{16}$ inch) above the bottom edge, this adjustment being obtained by setting the bell hammer rod.

3.10 Recall

3.10.1 Earth loop recall shall be provided as in Figure 3.

3.10.2 Telephone SA 4258. The recall switch parts shall be fitted in the central location on the switch-hook gantry.

3.10.3 Telephones 2/SA 4258 and 4/SA 4258. The recall switch parts shall be fitted in location D on the switch-hook gantry and the action of the latch shall be non-locking such that the operation of the plunger shall not affect the condition of any other plunger.

3.11 Wiring

3.11.1 The flexes from the push-button unit and the oscillator shall be neatly grouped and formed to the right side of the telephone when viewed from the front.

3.11.2 The push-button unit and bell connexions shall not foul the bell armature or damp the bell gongs.

4. PERFORMANCE

4.1 Insulation Resistance. The resistance measured between metallic points which are required to be electrically isolated shall be not less than 5 megohms when measured with 250 volts d.c.

4.2 Transmission Performance. The completely assembled telephone shall be capable of passing a simple transmission test to prove the correct connexion of components and freedom from gross component faults.

4.3 Signalling Performance

4.3.1 Test Circuit. The circuit shown in Figure 1 shall be used for all tests called for in this Section. The artificial cable shown in Figure 2 shall be constructed from discrete sections each representing no more than 1 km of line length.

4.3.2 The performance requirements in this Section shall be independent of line polarity and shall be met under all operating conditions as laid down in paragraph 5.

4.3.3 The d.c. resistance of the oscillator unit shall be such that when the telephone is connected as shown in Figure 1, with 6.0 km of artificial cable, a minimum line current of 25 mA shall flow when any push-button is operated and the handset is off the rest.

4.3.4 When any button is operated with the handset lifted, the telephone transmitter shall be rendered inoperative and the appropriate tones sent to line. A 'confidence' tone composed of the same frequencies as those sent to line shall be reproduced in the receiver. The level of this tone measured at the receiver terminals shall lie between -45 dB and -65 dB relative to 1 V with the Receiver 4T replaced by a 150- ohm resistor. This requirement shall be met with any length of artificial cable between zero and 6 km.

4.3.5 The oscillator unit shall, when the appropriate push-button is operated, give sinusoidal outputs at the levels stated in paragraph 4.3.7 and at the frequencies stated below:-

PUSH BUTTON	HIGH FREQUENCY (Hz)	LOW FREQUENCY (Hz)
1	1209	697
2	1336	697
3	1477	697
4	1209	770
5	1336	770
6	1477	770
7	1209	852
8	1336	852
9	1477	852
0	1336	941
11 (*) LEFT HAND	1209	941
12 (#) RIGHT HAND	1477	941

4.3.6 Any deviation from the nominal frequency shall not exceed 1.0 per cent of the nominal.

4.3.7 Signal Level. With any length of artificial cable between zero and 6 km the power for each signal component shall lie between the limits of -9 dBm and -16 dBm.

4.3.8 The maximum difference in level between the two component levels shall be 3 dB.

4.3.9 The power of the signal sent to line shall reach within 2 dB of its final value within 10 ms of the connexion of power to the oscillator unit.

4.3.10 The total power of distortion products shall be at least 20 dB below the power of both the component frequencies taken singly.

4.3.11 The impedance presented to line with the buttons operated and unoperated shall give a return loss against a 600 ohm non-reactive resistance no worse than that of the Telephone 746 transmission circuit.

4.4 Operating Conditions. The telephone shall meet the performance requirements above under all normal working conditions including:-

(a) exchange bus-bar voltages of 45 V to 52 V and

(b) temperature range of -10°C to +50°C.

6. APPROVAL

6.1 A manufacturer wishing to supply, for the first time, apparatus designed to meet this specification is normally required to submit two prototypes to the Telecommunications Development Department (TDD) for approval. (Definition:- A prototype is a model embodying the completed mechanical and electrical design from which design the manufacturer proposes to manufacture production items.) Comprehensive tests will be carried out on the prototypes to determine that all the specification requirements are met.

6.2 On any subsequent supply contract for approved items the requirement for submission of samples, as defined in Specification D 1000, will be determined by Purchasing and supply Department.

6.3 The prototypes, when submitted, must be accompanied by the following:-

6.3.1 A copy of the drawings, diagrams and specifications from which the prototypes were made and from which the manufacturer proposes to manufacture production items.

6.3.2 A certified copy of the test results taken by the manufacturer to satisfy himself that all specified requirements have been met.

6.3.3 A list of all electrical components used in the prototypes and any alternatives which may be used in subsequent production. Where codes are used, a conversion list to normal proprietary terms shall be supplied.

6.4 When tests have been satisfactorily concluded TDD will produce a specification for the approved item. This will include the prefix or suffix (as appropriate) to be used in the marking and will identify the item by reference to the relevant issues of the manufacturer's documents.

6.5 Following the approval of the prototypes, it will be the manufacturer's responsibility to ensure that subsequent production items correspond with the agreed documentation.

6.6 After approval has been granted by TD7.1.1, no design changes shall be made to the item, or alterations made to the documentations listed in the SM specification, without the prior agreement of TDD, TD7.1.1.

7. MARKING

The telephone shall be marked on the base with the PO abbreviated title, the approved letters identifying the manufacturer, and the last 2 figures of the year of manufacture followed by the mark number, eg: SA 4258 FHB 99/1. The letters FHB are typical and shall be replaced by the approved letters allocated to the manufacturer.

8. REFERENCES

Specifications	Diagrams	Drawings
BS 9000	SA(L) 4258	DLA/61
D 1000		DMO/141
S 81		DPL/1021
S 1161A		DPL/1022
		SD 77

9. HISTORY

Date	Issue	Details
May 1976	Open	
October 1976	A	Figure 3 added, 3.4.3.3 removed (already appears S 1009). 4.3 removed.
October 1977	B	3/SA 4258 removed. Clauses from S 1009 brought into this Specification.

END OF SPECIFICATION

October 1977
4673/DJH

Post Office Telecommunications Headquarters
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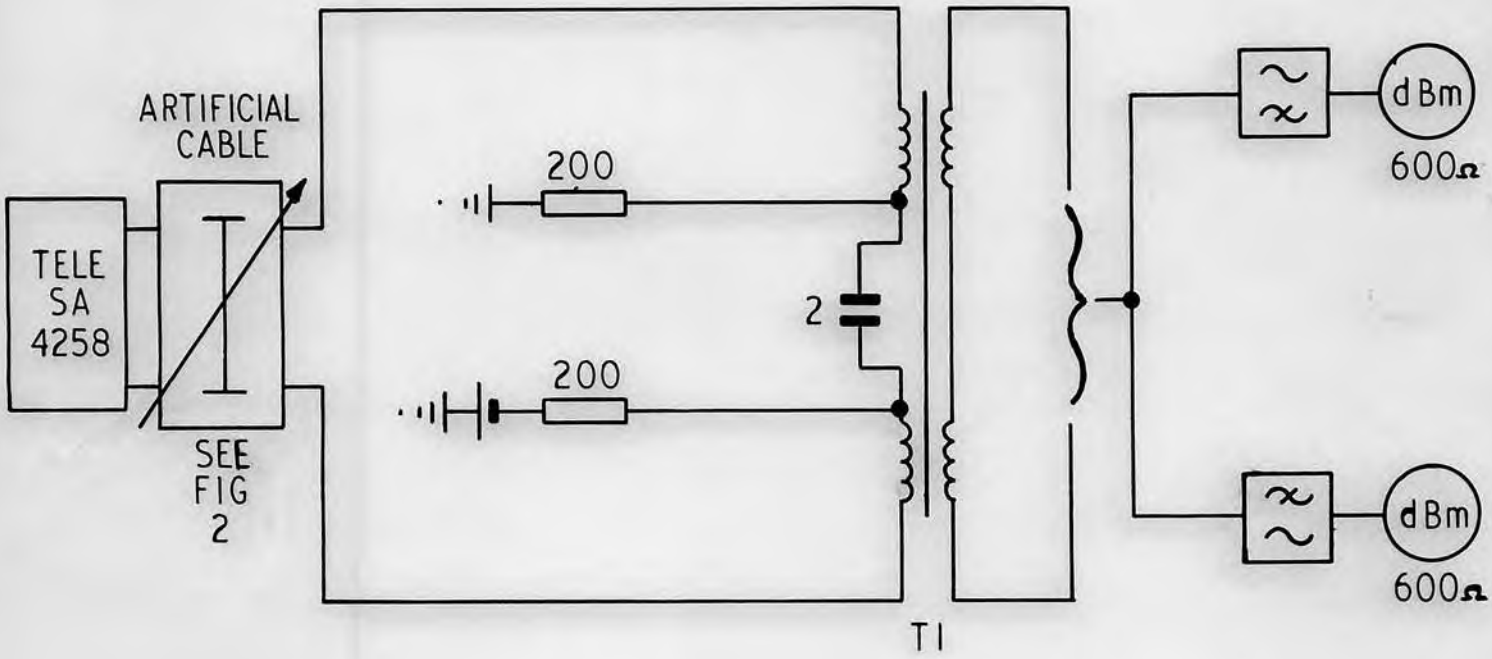
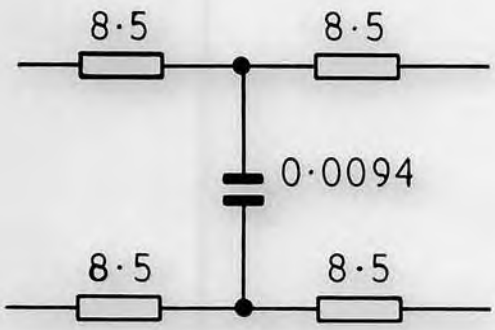
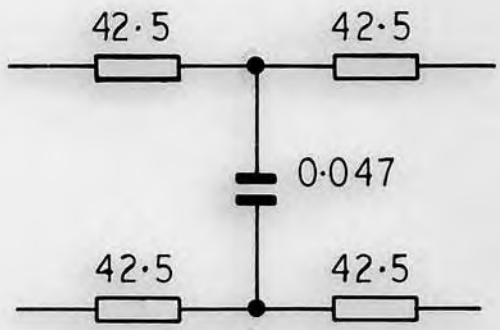


NOTE: T1.....PO TRANSFORMER No. 3/216A

Fig 1. TELEPHONE TEST CIRCUIT



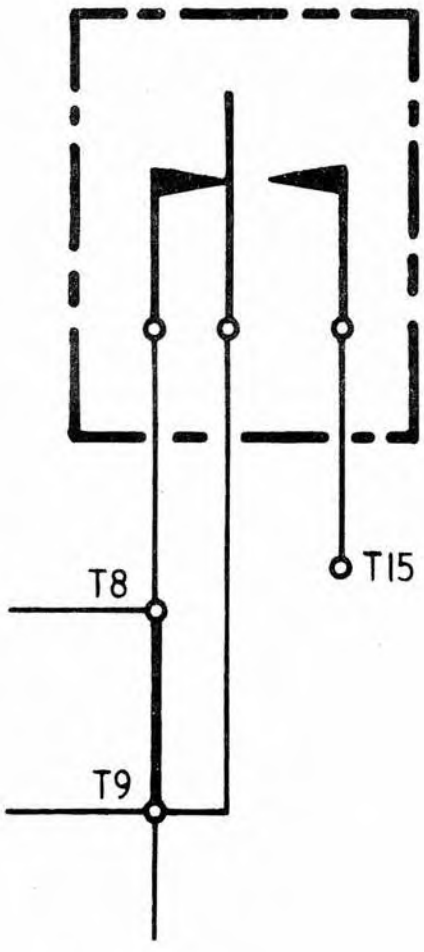
0·2 km section



1·0 km section

NOTE: All component values ± 1% tolerance

Fig 2. 0·5 mm ARTIFICIAL COPPER CABLE



Schematic :–

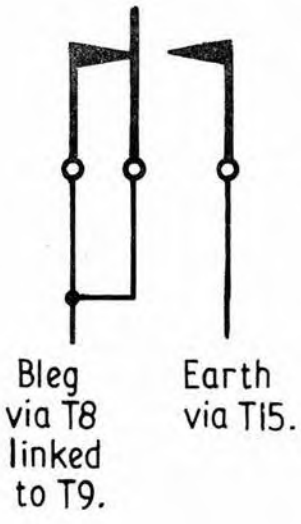


Fig 3. EARTH RECALL