

BRITISH TELECOMMUNICATIONS ENTERPRISES

SPECIFICATION OF REQUIREMENTS

FOR

(i) 8782 - 8786 MF4 PUSH BUTTON TELEPHONES

WITH REGISTER RECALL FACILITY

(ii) KIT CP100 FOR CONVERSION OF TELE 8782R - 8786R to

8782RR - 8786RR

(iii) CONVERSION OF TELE 8782R - 8786R TO TELE 8782RR -

8786RR

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1. GENERAL

1.1 This specification gives the requirements for a Register Recall circuit fitted in 700 style Push Button Telephone, where recall of the local exchange register is required.

1.2 The Register Recall Circuit is required to generate a timed break in the line circuit, which will be detected at the local exchange by a current monitoring device in the A and B legs of the line.

1.3 The telephone is required in table and wall mounted versions, designated 8782RR, 8783RR, 8784RR, 8785RR and 8786RR.

1.4 The conversion kit is required to fit into all makes and mark numbers of telephones 8782R to 8786R to convert them into telephones 8782RR to 8786RR.

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1.5 The completed telephone, MF4 with Register Recall circuit (not operated), shall meet the requirements of Specification S 1298D as ammended by Specifications S 1486 and S 1487.

1.6 Specification D 1000 shall form part of this specification.

2. CIRCUIT CONNECTIONS

2.1 Complete Instrument

2.1.1 The Register Recall circuit shall be securely mounted within the telephone such that it does not interfere with fitting or operation of the telephone and the Extension Plan arrangements detailed in 2.1.2.

2.1.2 Plan Arrangements. Register Recall will be required on the main and/or extensions of:-

1 and 1A,
Plan 105 and 107, Internal and External only.

2.1.3 Circuit Wiring. The Register Recall circuit shall be connected to the telephone 22 terminal board by two red wires only, fitted with ring tags and routed such as not to interfere with the operation of the bell mechanism or gravity switch etc. The telephone shall be supplied to BT with the Register Recall circuit connected to terminals T8 and T9 as shown in Fig 1.

The instrument cord red wire should be connected to T9.

2.1.4 Press Button and Switch. The Press Button, marked R, will be free issued by BT and shall be fitted, with the 5A-4 switch (to S 1226), in the centre position of tele's 8782RR and 8783RR and in the 'D' position of tele's 8784RR and 8785RR. A switch 13A-2 (SA) shall be used for tele 8786.

The brown, blue and grey wires from the switch shall be connected as shown in Fig 1.

2.2 Conversion Kit CP100

2.2.1 The Register Recall module, in conversion kit form, shall be insulated with a suitable material such that it can be positioned anywhere convenient within a telephone in the 8782-8786 range without making electrical contact with any other circuitry.

The insulation material shall afford sufficient mechanical protection to allow the module to rest in the telephone, restrained only by its electrical connections, and to prevent sharp items or component wires in the rest of the telephone making electrical contact with any part of the module circuit when the telephone is subject to a drop test as specified in S 1289D.

2.2.2 The dimensions of the module shall not exceed 27 mm x 65 mm x 18 mm high. The connection wires shall lead from the 27 mm side and shall be 150 mm in length.

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2.2.3 The colour coding of the wires shall conform to Fig 1.

2.3 Conversion of Tele 8782R - 8786R to 8782RR - 8786RR

2.3.1 The conversion kit CP100 is insulated such that it can be placed anywhere Convenient within the body of the telephone, but care should be taken not to foul any moving part of the instrument.

2.3.2 The recall button shall be re-connected in accordance with Fig 1.

2.3.3 The Register Recall module shall be connected in accordance with Fig 1.

3. CIRCUIT OPERATION

3.1 Duration of Timed Break. The following limits of timed break-duration shall apply to telephones or conversion kits, submitted for approval against this specification.

Production Test (Ambient)	60 ms to 96 ms (78 ms +/- 18 ms)
Temperature Testing (-10°C, +50°C)	55 ms to 101 ms (78 ms +/- 23 ms)
Absolute Maximum, allowing for ageing	53 ms to 103 ms (78 ms +/- 25 ms)

The above limits should be measured at Terminals T9 and T18 of the telephone for all line lengths zero and 6 km and battery voltages 45 V and 52 V. See 4.1 and Fig 2.

3.2 Operating Current. Since the circuit must remain active during the break period to perform the timing function, a small line current will be allowed to flow. This current shall not exceed 2.5 mA which is equivalent to a total circuit resistance of approximately 20 kilohms.

3.3 Voltage Drop. The voltage across the Register Recall circuit measured at X, Y shall not exceed 2.5 volts at 6 km or 3 V at 0 km with the button remaining depressed and the circuit active, following the timed break period.

3.4 Distortion. Detection of the timed break at the local exchange will not depend on the release of a conventional electro-mechanical relay and for this reason it will be permissible for the break duration, voltage overshoot and rate of change of current to be different from that produced by a dial and RC spark quench circuit.

A low rate of change of current has been demonstrated to reduce acoustic shock and produce smaller induced emfs which may allow the use of lower voltage rated components and improve the timing tolerance of the break period. See also 3.8.

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3.5 Acoustic Shock. Operation of the Register Recall button shall, under subjective test, produce an acceptable level of noise in the telephone receiver and shall be less than that produced by a gravity switch 'flash' under the same line conditions.

3.6 Spark Quench. The Register Recall circuit, bell capacitor, bell shunt circuit and the circuit components of the telephone shall together provide an effective spark quench circuit to limit the induced emf and protect the contacts of the recall switch under worst case conditions, ie zero line, 52 volt supply.

3.7 Signal Attenuation. On completion of the timed break and with the R button remaining depressed, it shall be possible for incoming signals, eg dial tone, recorded announcements etc, to be recognised by the customer.

3.8 Over-Voltage Protection

3.8.1 The components of the Register Recall circuit shall be able to withstand or be protected against voltages produced as a result of the timed break or by other system induced voltages.

3.8.2 The application of zener diode type components may prove to be an acceptable method of limiting the induced voltages, providing that the current during the break is limited to 2.5 mA for at least 60 ms, in keeping with the requirement of 3.1 and 3.2.

3.8.3 The Register Recall circuit will only be required to withstand the specified test voltages applied to the MF telephone, when in the non-operated state, ie short circuited by the recall switch contacts.

3.9 Polarity Protection. Components shall be able to withstand or be protected against changes of line polarity, and the circuit shall function correctly, without adjustment, on lines of either polarity.

3.10 Button Operation. It is accepted that a rapid button operation may, in the proposed circuit configuration, produce a 'break' that is of shorter duration than that which the electronic timing would have given. This is not regarded as a serious problem since a 'break' of less than 50 ms is unlikely to be produced by a micro-switch and button mechanism.

The Register Recall circuit shall respond to Button operation as follows:-

3.10.1 The timed break shall commence within 5 ms of the circuit being activated, ie from the opening of the recall switch contacts.

3.10.2 Only one timed break signal shall be generated for each button depression.

3.10.3 Following a button operation with a duration of between 40 ms and 200 ms, the RR circuit shall reset such that a subsequent button operation, 2.5 seconds (or more) after the first, shall produce a valid timed break signal.

3.11 Non-Operated State (Idle Condition) The contacts of the recall switch shall disable the Register Recall circuit such that it does not in any way degrade signalling or transmission performance or reduce the line current.

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3.12 Bell Shunt Circuit. To prevent bell tinkle on the RR telephone and other telephones on the same plan arrangement, a bell shunt circuit shall be provided.

This shall take the form of a pair of 3.3 volt or 3.6 volt zener diodes (or equivalent) connected back-to-back, in series with a low value resistor between terminals T2A and T19A, ie, across the bell(s) when the telephone is off-hook (Fig 1).

3.12.1 These components shall be mounted on the Register Recall PCB.

3.12.2 The zener diodes and resistor shall be able to withstand transient conditions produced by the operation of the Register Recall circuit and over-voltages produced by off-hook tests applied to the MF Telephones.

4. TEST PROCEDURES

The following tests will be carried out at Ambient temperature; -10°C and $+50^{\circ}\text{C}$ tests may be conducted by British Telecom.

4.1 The Register Recall circuit will be connected in the circuit shown in Fig 2 for functional testing and measurement of the break duration. The circuit will be tested for all line lengths between 0 and 6.0 km ($0.5 \text{ mm}^2 \text{ Cu}$), battery voltages 45 V and 52 V and terminating resistance between 0 and 2300 ohms.

4.2 The Register Recall circuit will be connected in the circuit shown in Fig 3 for measurement of the current flow during the break period (see also 4.3) and the voltage drop across the circuit after the break period.

4.2.1 The current taken by the circuit shall not exceed 2.5 mA during the break.

4.2.2 With the Link (U, V) replaced by a 1000 ohm resistor and the resistor (A, B) replaced by a 200 ohm resistor, the voltage across the circuit after the break period, measured at (X, Y) shall not be greater than 2.5 volts.

4.3 Register Recall circuits employing zener diodes or similar components for voltage limiting will, additionally, be connected in the circuit shown in Fig 2 with 0 line and 52 V battery to demonstrate that the requirements of 3.8.2 are satisfied.

5. COMPONENT AND CIRCUIT APPROVAL

5.1 Two samples of complete telephones or conversion kit for evaluation against this specification shall be submitted to BTE/Merlin/SE1.1.2.

5.2 Component choice shall be at the discretion of the manufacturer, whose responsibility it shall be to ensure that their specification and the results of the circuit tests, show they are suitable for the particular application.

5.3 The prototypes must be accompanied by:-

5.3.1 Drawings, diagrams and specifications from which the prototypes were made and from which the manufacturer proposes to make the production items.

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

5.3.3 A list of all components used in the prototype and any alternatives which might be used in production.

5.3.4 A circuit description stating the function of each component and showing how their values, tolerances and ratings etc are determined.

6. MARKING

6.1 The Register Recall circuit shall be marked with the manufacturers identification code, as shown on the manufacturer's PC board assembly drawing.

6.2 The telephone shall be marked on the base with the BT title, the approved letters identifying the manufacturer and the last two figures of year of manufacture followed by the mark number, eg 784RR FHB 99/1.

6.3 The conversion kit shall be similarly marked, eg.

"Kit FHB 99/1" or "Kit CP100 FHB 99/1"

7. REFERENCES

Specification S 1289D

S 1226 S 1486

D 1000 S 1487

8. HISTORY

DATE	ISSUE	DETAILS
November 1978 April 1983	Open A	Group reference changed, Conversion kit added. Reference to Plans 1, 1A, 2 2A and 4 deleted. Telephone range changed from 782 - 785 to 8782 - 8786

END OF SPECIFICATION

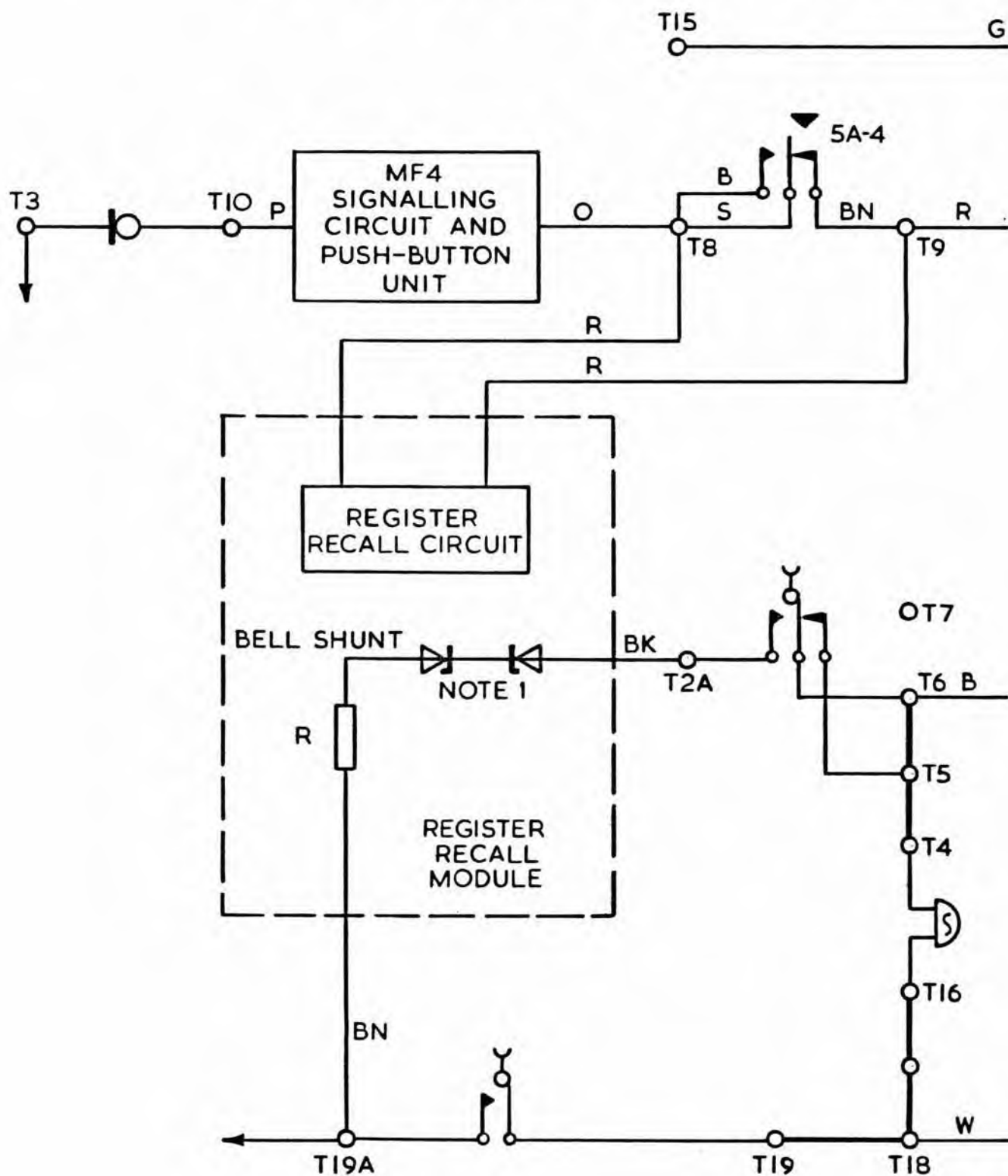
April 1983
SE1.1.2/PJM/4671/4

British Telecom
Merlin SE1.1.2
Anzani House
Trinity Avenue
Felixstowe
Suffolk
IP11 8XB

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FIG.1 CONNEXION OF REGISTER RECALL CIRCUIT
IN TELEPHONE USING T8—T9



NOTE 1: ZENER DIODES MAY BE 3.3 VOLTS OR 3.6 VOLTS

FIG.2 FUNCTIONAL TEST CIRCUIT

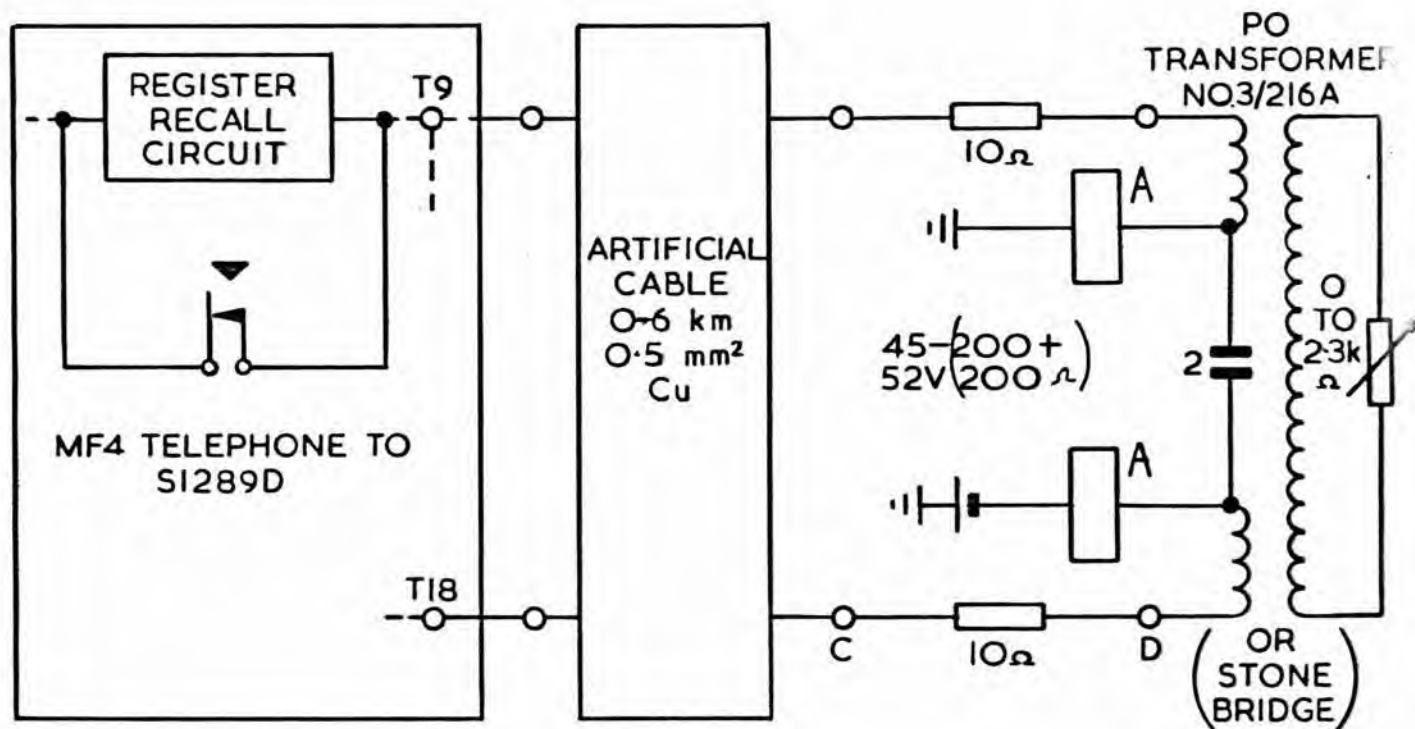


FIG.3 OPERATE CURRENT AND VOLT DROP TEST CIRCUIT

