TABLE OF CONTENTS

SPECIFICATION DPT-SWS-009

FUNCTIONAL REQUIREMENTS FOR MULTI-LINE CORDLESS TELEPHONE SWITCHING SYSTEMS (CT2/CAI)

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FUNCTIONAL REQUIREMENTS FOR MULTI-LINE CORDLESS TELEPHONE SWITCHING SYSTEMS (CT2/CAI)

1. INTRODUCTION

1.1 This specification states the requirements and properties for low power, digital, multi-line cordless telephone switching systems (CT2/CAI), operating in the frequency band **864.100 MHz to 868.100 MHz,** intended for connection to the PSTN.

1.2 In addition to this specification, the line interface and switching control of the equipment shall meet all relevant aspects of Specifications **DPT-SWS-001** and **DPT-TE-001**.

2. APPLICABLE DOCUMENTS

2.1 The Radio Regulations
2.2 Specification **DPT-SWS-001**
2.3 Specification **DPT-TE-001**
2.4 Common Air Interface (CAI) Specification MPT 1375:1989
2.5 Specification MPT 1334:1987
2.6 Specification BS 6833:1987 part 2, sections 17, 18 and 19.

3. APPROVAL

3.1 Approval of cordless telephones are subject to the Radio Regulations: Regulation R2862 as published in the Government Gazette no 6794 of 28 December 1979

3.2 Cordless telephones shall comply with the technical requirements of the Radio Regulations and CEPT Specification T/R 24-03.

4. DEFINITION

4.1 A multi-line cordless telephone switching system is connected to a public exchange, or behind an existing PABX. In its simplest form it consists of a central unit or base station, which provides for physical connection to two or more exchange lines and a number of extensions (mobiles), connected to the central unit by means of a radio link, providing the same basic functions as a standard telephone within a limited area around the base station, typically up to 200 m.

4.2 The base station will allow multiple handsets to be registered for operation with the system, and will allow as many calls in progress at any one time as the number of incoming exchange lines connected to it. It further allows for calls between extensions and the transfer of calls between exchange and extensions. Either a proprietary protocol, which is specific to a particular manufacturer, or the CAI protocol may be used between the fixed and the mobile stations, as long as it complies with the standards set in Specification MPT 1334:1987 and MPT 1375:1989.

4.3 In more complex configurations, it may consist of more than one base station controlled by a base station controller, to form a cellular network which allows roaming of the mobile units between cells with handover from one cell to another.

5. PRINCIPLE OF OPERATION: RADIO CONNECTION

5.1 Occupancy of a radio frequency channel may be initiated by either the fixed or the mobile unit. Two-way communication on one radio channel is achieved by encoding speech at 32 kb/s using adaptive pulse code modulation (ADPCM) and transmitting the digitised speech in 1 ms bursts at 72 kb/s using a time-division duplex (TDD) technique to interleave bursts from either end. The 72 kb/s data rate consists of two way encoded speech at 64 kb/s, plus two way signaling data at 4 kb/s, with a guard band between the transmit/receive time slots equivalent to a further 4 kb/s. The resultant data stream is then applied to the RF carrier by using Gaussian filtered, Minimum Shift Keying (GMSK) modulation process. Within the frequency band of **864.100 MHz to 868.100 MHz**, 40 channels has been allocated, spaced 100 kHz apart.

5.2 The channel carrier frequencies shall be 864.05 + (0,1 x n) MHz where n is from 1 to 40. The same carrier frequency shall be used for transmission in both directions between fixed and mobile parts. Dynamic channel allocation shall be used.

5.3 When a call is initiated the initiating unit will choose a free channel over which to signal its handshake protocol to the other part. If the handshaking procedure is accomplished, a communication link is established

5.4 If channel acquisition is unsuccessful, the initiating part may make re-attempts sequentially, on subsequent free channels. These re-attempts shall be restricted to using a maximum of five free channels and shall be constrained by the requirements of the Specification BS 6833:1987 part 2, sections 17.4 and 18.3.

5.5 The handshake code shall be transmitted both ways between the fixed and mobile part at least once per second during communication. If RF link conditions are such that the receiving part fails to detect a handshake code for 3 s, the call is suspended and an attempt is made to re-establish communication on a different channel. If this is not achieved within 10 s, communication will be terminated.

5.6 A free channel is defined as:

5.6.1 any channel with a local field strength below an absolute maximum of 40 dB relative to 1 µV/m; or

5.6.2 where all channels are above 40 dB relative to 1 µV/m, then that channel having the lowest field strength of all available channels, as measured by intermittent or continuous monitoring, to a resolution of 6 dB. Any channels on which an unsuccessful attempt has been made previously may be excluded.

6. TECHNICAL REQUIREMENTS

6.1 The technical requirements of the base station interface to the public network shall be in accordance with **Chapter 2** of Specification **DPT-SWS-001** and Specification **DPT-TE-001**.

6.2 The technical requirements with which the radio portion of a cordless telephone must comply can be found in the Radio Regulations, Specification MPT 1334:1987 and the Common Air Interface Specification (CAI) MPT 1375:1989 and Specification BS 6833:1987.

6.3 The RF output of the mobile units shall be limited to 10 mW/channel.

7. APPROVAL PROCEDURE

7.1 Cordless telephone approval testing will be conducted in two phases;

7.1.1 Testing of the switching, line interface and transmission parameters for compliance to the Specifications **DPT-SWS-001** and **DPT-TE-001**, by the TCL

7.1.2 Testing of the radio portion for compliance with both the Radio Regulations, Specification MPT 1334:1987 and/or the Common Air Interface Specification (CAI) MPT 1375:1989, by the SABS.

7.2 The Department will remain the approval authority and no reports or documentation issued by any testing laboratory shall indicate any form of approval for use in South Africa.

7.3 This process will require that two separate submissions be made to the two testing authorities in terms of the following procedure. Each testing authority shall be entitled to charge its prescribed evaluation and test fees.

7.5 The licensee will also have to obtain a radio dealers registration certificate in terms of the Radio Act of 1952, before cordless telephones may be marketed. Such a certificate can be obtained from Post Offices.

7.6 No modifications or alterations may be introduced to the equipment without the prior approval of the Department.

8. MARKING OF EQUIPMENT

8.1 In order that approved cordless telephones may be readily identified, the base station shall be marked with the licence number, issued by the Department, indicating the approval of the equipment.

8.2 Marking shall take the form of a label as stipulated in **DPT-SG-001**: Suppliers Guide to Approval and Licensing of Telecommunication-Line Terminal Equipment.

8.3 The distributors details shall also be clearly displayed on the unit.

WARNING

The distribution of cordless telephones not approved and licensed by the Department of Communications and which are not properly labeled or are labeled with incorrect information e.g. the licence number does not correspond to the equipment or the equipment has been modified from that approved by the Department, will lead to prosecution in terms of the Radio Act.

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