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## Foreword

This document is the Publicly Available Specification (PAS) of the TETRAPOL land mobile radio system, which shall provide digital narrow band voice, messaging, and data services. Its main objective is to provide specifications dedicated to the more demanding PMR segment: the public safety. These specifications are also applicable to most PMR networks.

This PAS is a multipart document which consists of:

- Part 1      General Network Design
- Part 2      Radio Air interface
- Part 3      Air Interface Protocol
- Part 4      Gateway to X.400 MTA
- Part 5      Interface to dispatch centre**
- Part 6      Line Connected Terminal interface
- Part 7      Codec
- Part 8      Radio conformance tests
- Part 9      Air interface protocol conformance tests
- Part 10     Inter System Interface
- Part 11     Gateway to PABX, ISDN, PDN
- Part 12     Network Management Centre interface
- Part 13     User Data Terminal to System Terminal interface
- Part 14     System Simulator
- Part 15     Gateway to External Data Terminal
- Part 16     Security
- TTR 1      Guide to TETRAPOL features
- Part 18     Base station to Radioswitch interface
- Part 19     Stand Alone Dispatch Position interface



## 1. Scope

The TETRAPOL interface to a dispatch centre is a network-to-network interface between one TETRAPOL switching and management infrastructure (SwMI) and one dispatch centre (DC).

This document corresponds to sub-part 5.3 of the TETRAPOL specification of the interface to a dispatch centre, which is divided into four sub-parts:

- Part 5.1 Technical requirements;
- Part 5.2 Call related protocol design;
- Part 5.3 SDL model of the call related protocol;
- Part 5.4 Service control protocol design.

This informative sub-part will provide the SDL model of the network layer protocol at R6-I1 interface.

## 2. Normative references

This PAS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter.

- [1] PAS 0001-1-1: "TETRAPOL Specifications; General Network Design; Reference Model".
- [2] PAS 0001-5-1: "TETRAPOL Specifications; Interface to dispatch centre; technical requirements Specifications".
- [3] PAS 0001-10-1: "TETRAPOL Specifications; Inter System interface; ISI Technical Requirements".
- [4] ETS 300 172 (1995): "Private integrated services network (PISN); Inter-exchange signalling protocol; Circuit mode basic services".
- [5] ETS 300 239 (1995): "Private integrated services network (PISN) Inter-exchange signalling protocol; generic functional protocol for the support of supplementary services".
- [6] ETS 300 170 "Private Telecommunication network (PTN) Data link layer protocol at the Q reference point for signalling channel between two private telecommunication network exchanges".
- [7] ITU-T Recommendation T.50 "International Alphabet n°5".
- [8] ITU-T Recommendation X.219 "Remote Operation Model, Notation and Service".
- [9] ITU-T Recommendation Q.931 "ISDN user-network interface layer 3 specification for basic call control".
- [10] ITU-T Recommendation I.430 "Basic user-network interface; layer 1 specification".

- [11] ITU-T Recommendation X.208 "Specification of Abstract Syntax Notation One (ASN.1)".
- [12] ITU-T Recommendation X.209 "Specification of basic encoding rules for Abstract Syntax Notation One (ASN.1)".
- [13] ETR 060 "Signalling Protocol and Switching (SPS); Guidelines for using Abstract Syntax Notation One (ASN.1) in telecommunication application protocols".
- [14] ITU-T Recommendation Q.921 "ISDN user-network interface layer 2 specification for basic call control".
- [15] ITU-T Recommendation X.224 "Open systems interconnection; Transport protocol specification".
- [16] ITU-T Recommendation Z.100 "Specification and description language (SDL)".
- [17] ITU-T Recommendation Z.120: "Message sequence charts (MSC)".
- [18] ETS 300 414: "Methods for Testing and Specification (MTS) Use of SDL in European Telecommunication Standards; Rules for testability and facilitating validation".
- [19] ETS 300 406: "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardisation methodology".
- [20] ISO/IEC 9646: "Information technology - Open systems interconnection - Conformance testing methodology and framework".
- [21] ETS 300 238: "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Name identification supplementary services".
- [22] ISO-8859-1: "Information Processing - 8-bit single byte coded graphic character sets - Part 1: Latin alphabet n°1".

### 3. Definitions, symbols and abbreviations

#### 3.1. Definitions

The definitions from the dispatch centre technical requirements [2] apply, including the following definitions:

**Access gate (AG):** Functional entity in the TETRAPOL SwMI, featuring a radio connected or line connected access gate to a QSIG link, that handles voice call control over the interface to the dispatch centre. In the subsequent specification, access gate may either refer to the access gate functional entity or refer to one access gate instance that is dedicated to a call.

**Access handler (AH):** Functional entity in the TETRAPOL SwMI, handling a set of access gates that are collocated and connected to the same QSIG link.

**Additional Network Feature (ANF):** A capability provided by a private services network exchange, not generally directly to a user, over and above that of the basic call. In this specification, the additional network features refer to the extra-capabilities provided above QSIG basic call in order to handle TETRAPOL services over the interface to the dispatch centre, embodied by the access gate in the SwMI and by the dispatch centre switch.

**Base station (BS):** Interface unit containing a set of radio transmitters/receivers providing access to communications with radio terminals and radio connected access gates.



**Dispatch Access Controller (DAC):** Functional entity within the TETRAPOL system that acts as an information Service Control Point (SCP) for the dispatch centre.

**Dispatch Centre (DC):** The dispatch centre may include a dispatch control server (DCS) and shall include a dispatch position switch (DPS) which connects a number of dispatch positions (DPs) to the TETRAPOL network.

**Dispatch control server (DCS):** Functional entity within the dispatch centre that intermediates between the DAC and the DPS for non call related operations and interface related information. The DCS shall handle queries from the dispatch positions.

**Dispatch Position Switch (DPS):** Call control functional entity within the dispatch centre that handles voice calls over the QSIG interface to the TETRAPOL SwMI.

**Dispatch Position (DP):** Work position connected to the DPS where the dispatchers operate.

**Dispatcher:** A subscriber of the dispatch centre that uses a dispatch position.

**ICS proforma:** A document, in the form of a questionnaire, which when completed for an implementation or system becomes an ICS. This specification contains a protocol ICS proforma.

**Implementation Conformance Statement (ICS):** A statement made by the supplier of an implementation or system claimed to conform to a given specification, stating which capabilities have been implemented.

**Line connected interface unit:** Interface unit of a SwMI connecting several line connected access gates.

**Message Trunking:** A method of traffic channel organisation where each traffic channel is permanently allocated for the complete duration of the call.

**Operational group:** Group of subscribers that share a certain right to participate in a group communication

**Private integrated signalling system number 1 (PSS1):** Set of standards defining the signalling procedures and protocol for the purpose of circuit-switched call control at the Q reference point between private integrated services network exchanges connected together within a private integrated services network. PSS1 protocol is also referred to as QSIG.

**Protocol ICS (PICS):** An ICS for an implementation or system claimed to conform to a given protocol specification.

**QSIG:** PSS1 protocol at the Q reference point.

**Supplementary Service:** Service which modifies or supplements a bearer service or a teleservice. A supplementary service cannot be offered as a stand alone service. It should be offered in combination with a bearer service or a teleservice.

**System Terminal:** Service access reference point provided to the user by the system. System terminals (STs) are radio terminals (RTs), line connected terminals (LCTs).

**System:** The TETRAPOL system is composed of the large area fixed infrastructure (SwMI) called network and of the system terminals allowing user access to the available services.

**Switching and Management Infrastructure (SwMI):** The SwMI shall be a subsystem of the TETRAPOL network. It includes two subsystems: the base station (BS) and the radioswitch network (the radioswitch or RSW may include one or several switches organised or not with several hierarchical levels, as a manufacturer option). The SwMI also includes the operation and maintenance centre (OMC) and the key management centre (KMC). OMC and KMC are outside the scope of the present specification.

**Stand Alone Dispatch Position (SADP):** The stand alone dispatch position shall be an isolated operator position providing dispatching and management functions.

**Trunk:** A set of access gate instances and related traffic channels over R6-I1 that are dedicated to an administrative service entity. All AG from a trunk have the same characteristics. A trunk is embodied by one or several physical links.

### 3.2. Symbols

Not applicable.

### 3.3. Abbreviations

The abbreviations from document [2] apply, including the following abbreviations:

AG	QSIG access gate at SwMI side of the R6-I1 interface
AH	Access handler
DAC	Dispatch access control functional entity in the SwMI
DC	Dispatch centre
DCS	Dispatch centre server functional entity in the DC
DPS	Dispatch position switch functional entity in the DC
ETS	European Telecommunication Standard
ICS	Implementation Conformance Statement
IE	Information Element in a message
IUT	Implementation Under Test
PAS	Publicly Available Specification
PAS	Publicly available specification
PDU	Protocol data unit
PICS	Protocol implementation conformance statement
PINX	Private integrated services network exchange, i.e node in a QSIG network
PISN	Private integrated services network, i.e. a QSIG network
PMR	Private Mobile Radiocommunications
PSS1	Private integrated signalling system number 1
PSTN	Public switched telephone network
PTT	Push to talk service
Q	Reference point between AG and DPS at network layer over R6-I1 interface
Qbis	Reference point between DAC and DCS over R6-I3 interface
QSIG	PSS1 protocol at the Q reference point between SwMI and DC over R6-I1 interface
R6	Reference point for the TETRAPOL SwMI-Dispatch centre interface
RD	Speech receive detection in the PTT service
SCF	Service control functional entity
SCS	System Conformance Statement
SDU	Service data unit
SP	Service Primitive
SUT	System Under Test
SwMI	TETRAPOL Switching and management infrastructure
TI	Speech transmit indication in the PTT service
TPI	Talking party identification

#### **4. Introduction to the SDL description**

This clause will contain an SDL model which provides an example of the protocol procedures, the behaviour of the functional entities and their actions as described in this specification. The procedure illustrated are not intended to be exhaustive and several potential situations that may occur may be omitted from the SDL.

This SDL model will describe those aspects of the additional network features provided to call control which are necessary for the SwMI and the DC to cooperate in the control of calls over the R6 interface.

This SDL will be an addition to the protocol control of QSIG model.

History

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