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Presentation of Specification to TSG or WG

Presentation to:	**TSG T Meeting #6**
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Abstract of document:

The present document discusses external and internal interfaces of a terminal, with the exception of the radio and USIM interfaces. The focus of the study has been on external interfaces, to identify where existing industry standards can be used and whether there would be a need for specifications to be produced within 3GPP.

Changes since last presentation to TSG T Meeting #5:

MCC has made editorial changes and cleaning up. Furthermore, the editor has merged 3.1 Definitions and 3.2 Abbreviations to the new chapter 3.1 Abbreviations.

Outstanding Issues:

This document is stable and no significant changes are expected following approval, although it is foreseen that due to decisions at TSG-SA#5, some editorial changes to the terminology may be required following TSG-T#6.

Contentious Issues:

None.

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Contents

Foreword

This Technical Report has been produced by the 3rd Generation Partnership Project, Technical Specification Group Terminals (TSG-T)

The contents of the present document may be subject to continuing work within the 3GPP and may change following formal TSG-T approval. Should the TSG modify the contents of the present document, it will be re-released with an identifying change of release date and an increase in version number as follows:

Version m.t.e

where:

m   indicates [major version number]

x   the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

y   the third digit is incremented when editorial only changes have been incorporated into the specification.

1   Scope

The present document discusses external and internal interfaces of a terminal, with the exception of the radio and USIM interfaces. The focus of the study has been on external interfaces, to identify where existing industry standards can be used and whether there would be a need for specifications to be produced within 3GPP.

2   References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

    No references were identified.

3   Definitions and abbreviations

3.1   Abbreviations

For the purposes of the present document, the following abbreviations apply:

AT Commands	ATtention Commands
EIA	Electronics Industry Association
FCC	Federal Communications Commission
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IR	Infrared
IrDA	Infrared Data Association
ISDN	Integrated Services Digital Network
ISO	International Standardisation Organization
ITU-T	International Telecommunications Union – Telecom sector
ME	Mobile Equipment
MT	Mobile Termination
RF	Radio Frequency
TA	Terminal Adaptation
TE	Terminal Equipment
TIA	Telecommunication Industry Association
UART	Universal Asynchronous Receiver and Transmitter
USB	Universal Serial Bus
USIM	Universal Subscriber Identity Module

4 Assumptions of the technical specification work for terminal interfaces

4.1 General

4.1.1 The 3GPP terminal model

The area of external and internal interfaces for 3GPP MEs have been studied and Figure 1 shows the model that has been used. The external interface, other than the radio and USIM interfaces, is the TE-ME interface. An example of an internal interface is the TA-MT interface, as illustrated.
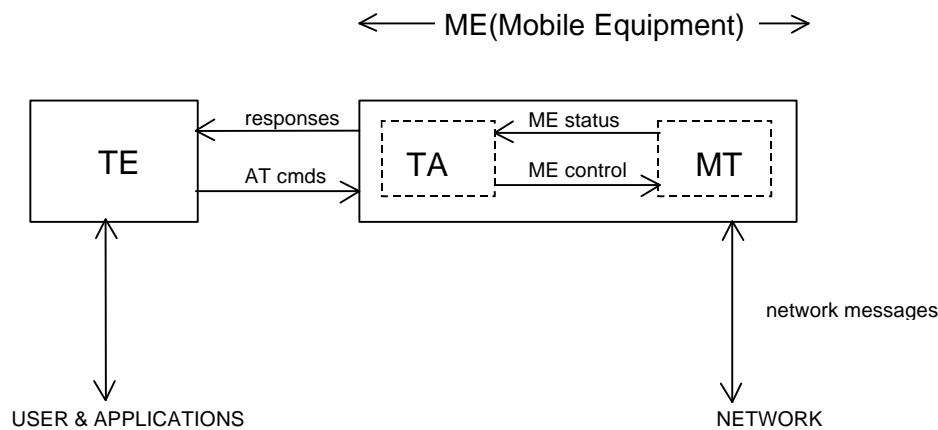

Figure 1: The 3GPP terminal model

4.1.2 Requirements

There is a vast variety of market expectations, depending on end-users' and operators' demands and needs, and the 3GPP terminal design choice must be made under full influence from these market requirements.

The goal is to find a way to minimize the time-to-market of new, evolved interface solutions, at the same time allowing for the widest possible service diversity, that can be provided by a variety of terminal designs.

The success of 3GPP requires that an efficient and flexible approach is found to give a timely and dynamic development of many kinds of terminals, each type optimized relative to its own specific target of market requirements, while at the same time not imposing restrictions on the global circulation of terminals.

4.2 Conclusions

It has been concluded that 3GPP should not produce any technical specifications for terminal interfaces (neither external, i.e. ME-TE, nor internal, e.g. MT-TA) other than the radio interface and the USIM interface. This includes optional as well as mandatory mechanical, electrical and logical specifications for interfaces. As an exception, optional protocols that are necessary for 3GPP terminals and that are *not defined elsewhere* could be standardized. One agreed example is AT commands.

Instead of specifying external interfaces in 3GPP, appropriate open standards should be used for external interfaces for 3GPP terminals. A list of potential examples of such interfaces is shown in Table 1. It should be noted that the list of interfaces in Table 1 is not exhaustive and that new examples are likely to be added in the future as technical development advances. It should also be noted that proprietary external interfaces may be used in the 3GPP terminals. It is then up to the manufacturer to handle the adoption to standard interfaces.

Since the terminal external interfaces (other than the radio interface, the USIM interface and AT commands), are out of scope of 3GPP, the SDOs can develop their own physical connector specification based on their market requirements. Such specifications should be optional to allow for other terminal interface options to exist on those markets.

4.2.1   AT-commands

One important aspect for 3GPP terminals is not being specified in any other specification forum, namely the AT commands. The AT commands are necessary for 3GPP terminals and should therefore be specified in 3GPP. AT commands can be commonly used as a common protocol specification, regardless of whether a wired or wireless connection (IR or RF) is used.

Most of the AT commands will be needed both in GSM and 3GPP. For this reason there is a need to have full access in 3GPP to the GSM defined AT commands.

5   Examples of external interfaces

Below some potential examples of external interface specifications are given.

Table 1: Examples of terminal external interfaces

Interface Standard	Physical Media (connector)	Data Rate	Network Topology	Standard
EIA-232F	Nine wires	Up to 115 kbps	Point to point	TIA/EIA-232-F UART (Intel 8251A Industry Standard)
EPP Enhanced Parallel Port	IEEE 1284 –connector with 25 or 36 wires	Up to 1,5 Mbps	Point to point	IEEE Std 1284-1994
ISDN S-Interface	Eight wires	2X64 kbps + 16 kbps	Point to point	ISO/IEC 8877:1992. ITU-T Recommendation I.430
IEEE 802.3 Ethernet	Four wires	10 Mbps	Multimaster	ISO/IEC 8877:1992. IEEE Std. 802.3 1998 Edition
USB	Four wires (USB Connector)	Up to 12 Mbps	Master to slave devices	USB Specification 1.1
IEEE 1394	Four wires (iLink connector)	100 Mbps – 400 Mbps	Multimaster	IEEE Std. 1394 - 1995
IrDA-SIR	Infra red transceiver (line of sight)	Up to 115 kbps	Point to point(s)	Infrared Data Association Serial Infrared Physical Layer Specification v1.3
IrDA-MIR	Infra red transceiver (line of sight)	Up to 1 Mbps	Point to point(s)	Infrared Data Association Serial Infrared Physical Layer Specification v1.3
IrDA-FIR	Infra red transceiver (line of sight)	Up to 4 Mbps	Point to point(s)	Infrared Data Association Serial Infrared Physical Layer Specification v1.3
802.11 – IR	Infra red transceiver (diffused IR)	Up to 2 Mbps	Multimaster	IEEE Std 802.11-1997
802.11-FHSS	Frequency-Hopping Spread Spectrum RF	Up to 2 Mbps	Multimaster	IEEE Std 802.11-1997
802.11- DSSS	Direct Sequence Spread Spectrum RF	Up to 2 Mbps	Multimaster	IEEE Std 802.11-1997
Bluetooth	Frequency-Hopping Spread Spectrum RF	721 kbs + 57,6 kbs or 2x432,6 kbs	Point to point(s)	Bluetooth Specification 1.0

History

Document history		
V 2.0.0	December 1999	Presented for approval to TSG-T#6