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The attached document is a proposed revision to the draft report on Terminal Capability requirements, submitted to the last TSG T WG2 meeting as document 275. This latest version seeks to refine the description of the required terminal baseline capabilities, to more closely reflect the definition that was agreed in document T2-99282. Delegates are invited to consider the attached draft and agree the baseline capabilities contained therein.

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*Technical Specification*

**3<sup>rd</sup> Generation Partnership Project (3GPP);  
Technical Specification Group (TSG) Terminals;  
Terminal Capability Requirements**

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**3GPP**

Postal address

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Office address

---

Internet

---

secretariat@3gpp.org

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# Intellectual Property Rights

## Foreword

This Technical Specification has been produced by the 3<sup>rd</sup> Generation Partnership Project, Technical Specification Group Terminals.

The contents of this TS may be subject to continuing work within the 3GPP and may change following formal TSG approval. Should the TSG modify the contents of this TS, 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.

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## Introduction

The 3GPP System consists of terminals and Network Infrastructure. The System is designed to support a wide variety of services and terminal types. Due to this diversity of applications there are many options within the 3GPP specifications. This document defines the requirements for the sub-set of options (referred to as **baseline capabilities**) that are mandatory in all 3GPP terminals to allow world-wide roaming of terminals within all 3GPP networks.

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# 1 Scope

This ~~e-present~~ document defines a baseline set of capability requirements that ~~enable~~ ~~allow~~ all terminals to ~~attempt~~ ~~“registration”~~ ~~“register”~~ with all applicable 3GPP networks (~~depending on the availability of an appropriate subscription~~). It describes all the functions that a terminal must perform in order to “exist” within a 3GPP network. These functions are used to derive requirements ~~for~~ all aspects of terminal capability. The actual capabilities that a terminal must possess to meet these requirements are ~~then~~ described in the ~~referenced~~ implementation documents. ~~referenced later in this document.~~

This document introduces the concept of “**service-less terminal**” which can exist in the network but provides no user service. Although this is not a marketable terminal type it describes from the standardisation viewpoint a baseline set of capabilities to which specific service-related terminal capabilities can then be added.

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## 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.

[1]

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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

**Baseline capabilities:** ~~capabilities that are required for a service-less terminal to operate within a network. The baseline capabilities for a terminal include the capabilities to search for, synchronise with and register (with authentication) to a network. The negotiation of the terminal and the network capabilities, as well as the maintenance and termination of the registration are also part of the required baseline capabilities.~~

**Baseline implementation capabilities:** ~~set of Implementation capabilities, in each technical domain, required to enable a terminal to support the required Baseline capabilities.~~

**Implementation capability:** ~~a capability that relates to a particular technical domain. Example (in the domain of the physical layer): a spreading factor of 128; Examples (in the domain of security): the A5 algorithm; a 64 bit key length; Example (in the domain of transmitter performance): a power output of 21 dBm; Example (in the domain of the Codec): support of AMR Codec; Example (in the domain of the USIM): support of CHV1;~~

**Service capabilities:** capabilities that can be used either singly or in combination to deliver services to the user. The characteristic of service capabilities is that their logical function can be defined in a way that is independent of the implementation of the UMTS system (although all service capabilities are of course constrained by the implementation of UMTS). Examples: a data bearer of 144 kbps; a high quality speech teleservice; an IP teleservice; a capability to forward a speech call.

~~**Baseline capabilities:** capabilities that are required for a service-less terminal to operate within a network. The baseline capabilities for a terminal include the capabilities to search for, synchronise with and register (with~~

authentication) to a network. The negotiation of the terminal and the network capabilities, as well as the maintenance and termination of the registration are also part of the required baseline capabilities.

**Implementation capability:** a capability that relates to a particular technical domain. Example (in the domain of the physical layer): a spreading factor of 128; Examples (in the domain of security): the A5 algorithm; a 64 bit key length; Example (in the domain of transmitter performance): a power output of 21 dBm; Example (in the domain of the Codec): support of AMR Codec; Example (in the domain of the USIM): support of CHV1;

**Baseline implementation capabilities:** set of Implementation capabilities, in each technical domain, required to enable a terminal to support the required Baseline capabilities.

**Service implementation capabilities:** set of Implementation capabilities, in each technical domain, required to enable a terminal to support a set of Service capabilities.

**Service-less terminal:** a terminal that has only the Baseline capabilities.

[Editor's note: other definitions to consider? Perhaps Terminal, UE, USIM, etc]be added as required]

## 3.2 Symbols

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

<symbol> — <Explanation>

### 3.2.3 Abbreviations

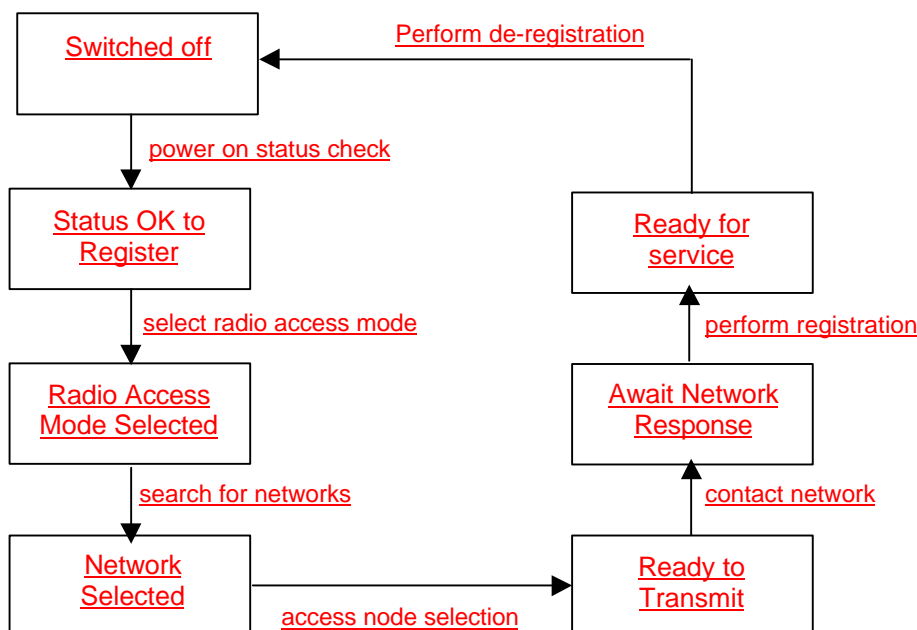
For the purposes of the present document, the following abbreviations apply:

<ACRONYM> <Explanation>

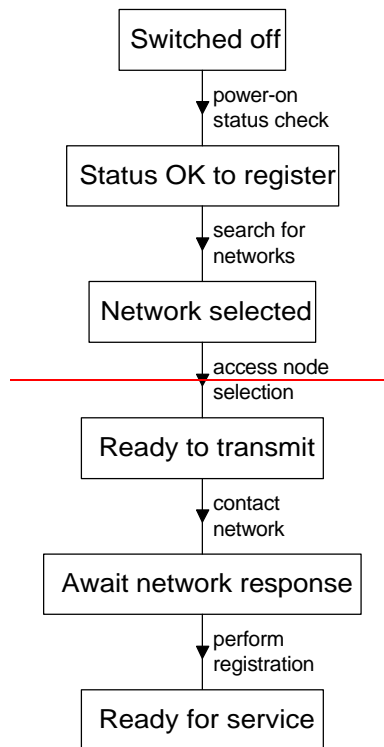
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## 4 Baseline Definition

The requirements for the baseline implementation capabilities can be defined by the functions required of a terminal to power on and attempt registration with a network. Note that successful completion of the registration procedure depends on the subscription and service capabilities of the terminal and user and is therefore outside the scope of the baseline requirements. The attempted registration can be illustrated by the in the following state diagram of figure 1.







**Figure 1 - states required for baseline capability**

The actions and states given above are defined below.

[Editor's note: these sections are a first indication of what each state and action means and do not yet contain the requirements]

## 4.1 Switched off

The state “switched off” describes the terminal when no 3GPP system functions are operational.

[Editor's note: any requirements here for not doing anything?!]

## 4.2 Power-on status check

The action “power-on status check” describes starting the 3GPP functions within the terminal and checking that the terminal meets the 3GPP system requirements needed to start the registration procedure (e.g. an appropriate subscription). If no subscription is available, the terminal may still select an access node and enter an limited service state in which only emergency calls can be attempted.

[Editor's note: any requirements here for response to power on stimulus?]

## 4.3 Status OK to register

The state “status OK to register” describes the terminal when all checks have been performed and the terminal is ready to start 3GPP reception.

## 4.4 Select radio access mode

The action “select radio access mode” describes the terminal’s selection of an available radio access mode e.g. UTRA FDD/TDD mode or GSM/GPRS. The decision may be made manually or automatically.

## 4.5 Radio access mode selected

The state “radio access mode” describes the terminal when it has selected a radio access mode to use it its search for networks.

## 4.64 Search for networks

The action “search for networks” describes the terminal’s attempt to detect and decode the information for all 3GPP networks in its immediate environment. The result of this attempt shall produce a list of available networks from which one is selected for requesting registration. If no networks can be found, the terminal can revert to its “OK to register” and select another radio access mode if it has one available.

[Editor’s note: requirements include automatic and manual selection among others]

## 4.57 Network selected

The state “network selected” describes the terminal when a 3GPP network has been selected for a registration attempt. The particular network to be selected may be chosen either manually or automatically.

## 4.86 Access node selection

The action “access node selection” describes the terminal’s selection of one cell in which to attempt registration. This is also known as “camping on a cell” and enables the terminal to receive system information.

[Editor’s note: is cell the correct word here?]

## 4.97 Ready to Transmit

The state “ready to transmit” describes the condition in which the terminal has regulatory permission to start transmitting at the 3GPP frequencies.

[Editor’s note: is this true for all regulatory regimes?]

## 4.108 Contact network

The action “contact network” describes the terminal’s act of transmitting a first signal to the network to indicate its ~~presence~~. desire to register.

[Editor’s note: is this all this signal does?]

## 4.119 Await network response

The state “await network response” describes the condition in which the terminal is waiting for the network to respond to its first contact signal.

## 4.120 Perform registration

The action “perform registration” describes the procedures for ~~location updating~~, authentication, ~~and~~ capability negotiation and location registration.

[Editor’s note: are all the correct procedures listed here or alternatively should the requirements be stated in a non-procedural way?]

## 4.131 Ready for service

The state “Ready for service” describes the condition in which the terminal has successfully completed the registration procedures. ~~Note that~~ if registration is unsuccessful the mobile can revert to the “status OK to register” state and try selecting another network. At this point the terminal is ready to initiate or receive data for a specific service. Note that in order to maintain the “ready for service” state, the terminal will have to perform location registration regularly and when entering a new registration area.

## 4.14 Perform De-registration

The action “perform de-registration” describes the procedures for de-registering the terminal prior to power-off. After de-registration the terminal returns to the power-off state.

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## 5 Terminal Implementation Types

Although the baseline capability requirements define what is needed for service-less terminals there are a few basic service-less terminal types can be used to meet these requirements. These are as follows:

- single-mode FDD
- single-mode TDD
- dual-mode FDD/TDD
- dual-mode FDD/GSM
- dual-mode TDD/GSM
- tri-mode FDD/TDD/GSM

[Editor's note: is this all the types or should, for example, 3GPP/2G or licensed and/or unlicensed terminals be considered?]

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## 6 Baseline Implementation Capabilities

The

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Annex A (~~normative~~):

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## Bibliography

The following material, though not specifically referenced in the body of the present document (or not publicly available), gives supporting information.

<Publication>: "<Title>"

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## History

<b>Document history</b>		
V 0.0.1	1999-03	First draft (introduction, scope, TOCs) proposed by editor
V 0.0.2	1999-04	Update based on discussions at T2 SWG6#2? (proposed by editor)