



# Specifications of the Infrastructure in a PLMN to Allow Automatic Testing

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*This is a Non-binding Permanent Reference Document of the GSMA*

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## 1 Scope

Due to the high number of GSM operators all over the world, it is increasingly difficult:

- to find a schedule for the periodical bilateral retesting with each and every operator according to the roaming agreements
- to have staff enough to perform the tests

This document specifies the requirements a PLMN(a) has to fulfil in order to allow other PLMN operators to perform end-to-end functional capability tests in order to proof the interoperability without the need for staff assistance in PLMN(a). In comparison with GSM MoU PRD IR.24, GSM MoU PRD IR.26 and GSM MoU PRD IR.27, where all functions and configurations are tested in a more profound way, GSM MoU PRD IR.28 intends to make it possible to retest all functions basically only. A negative test result shall induce the operator in PLMN(b) - the one who originates the tests - to start more sophisticated tests such as the manual tests according to GSM MoU PRD IR.24, GSM MoU PRD IR.26 and GSM MoU PRD IR.27.

As there is no need for staff in PLMN(a) for this basic retesting, the tests can be executed by an automatic test equipment in PLMN(b). Test scenarios that comply with the infrastructure as specified within this paper are found in GSM MoU PRD IR.29 as well as the requirements for such an automatic test generator.

Every operator provides three (or more) subscriber-numbers to GSM MoU PRD IR.21. On these numbers the tests will be performed. The first number is for the AAC. This number must be a MSISDN-number of PLMN(a). The second number is for the DAAC for data services and the third is for the DAAC for FAX Gr.3 service. These two numbers may be of the MSISDN-range of PLMN(a), which is preferred, or of the PSTN(a)-range. If a password is required for the DAAC, this information must be given in GSM MoU PRD IR.21 too.

## 2 Abbreviations

Abbreviations according to the GSM specification ETR 100:1993 (GSM 01.04 Version 4.0.2).

Term	Description
AAC	Automatic Answering Circuit (Voice)
DAA	Data Automatic Answering Circuit
PLMN	Public Land Mobile Number
MoU	Memorandum of Understanding
CC	Country Code
NDC	National Destination Code
SN	Subscriber Number

## 3 Test Equipment

- AAC: Automatic Answering Circuit (Voice)
- DAAC: Data Automatic Answering Circuit (incl. Fax Gr. 3)

### 3.1 AAC

The AAC is able to answer basic test calls from a PLMN or a PSTN. It has the ability to handle at least 2 calls in parallel; in case of a implementation of the AAC with (2 or more) independant answering machines with individual MSISDNs, these MSISDNs must all be given in GSM MoU PRD IR.21.

The AAC answers in the following way:

- Sends the answer signal.
- Waits 2 sec and sends the called number (CC+NDC+ SN) by DTMF frequencies: according to CCITT Rec. Q23
- level: -8 dBm  $\pm$  2dBm
- signal and pulse duration: min 65 ms
- Waits 2 seconds
- Announces the name of the operator in English and in the local language, if not English.
- Waits 2 seconds.
- Total length of the cycle: 10-30 sec.
- Repeats the cycle between 2 and 10 times.
- Sends the clear backward signal.

### 3.2 DAAC

The DAAC is an answering circuit which is used for test Calls for data services and FAX Gr.3. It provides the following functions:

- Delivers the answer signal.
- Auto-answer MODEM with auto-baudrate selection for 1200, 2400, 4800 and 9600 Bits/s in a configuration of 8 bits, no parity and 1 stop bit.
- A previously uploaded file can be downloaded after the upload without the indication of a new path.
- A new upload of a file with the same name as a file that has been uploaded before will overwrite the old file without notice (overwrite mode).
- If the operator requires a password, then this password is the MCC + MNC (GSM MoU PRD IR.21)

The DAAC can be built up with a MODEM and a PC with commonly used telecommunication software supporting the Z-MODEM-protocol (in the overwrite mode) such as Procomm or Telemate. The up- and the download-directories must be the same directory. I.e. there is only one directory for up- and downloads. The Z-MODEM protocol must be set to the overwrite mode.

In order to test FAX calls, the PC must be equipped with a FAX MODEM and appropriate software, or a separate FAX machine is installed.

## 4 Implementation Costs

Every operator has the choice to realize an infrastructure that reacts as described above in his own manner. This could be (probably in the most expensive way) an automatic test equipment.

Low cost solutions for the AAC may consist of one (ore more) answering machines, that are customary in trade or are realized by using the answering machines, that are already available in many systems at no additional hardware costs.

Low cost solutions for the DAAC may consist of one (ore more) PCs with a FAX MODEM and appropriate software. The requirements on the PC and the MODEM are rather low. The highest bit rate the MODEM must support is 9600 kbps (for fax and data). A PC of the AT-class (286 Processor) with only a monochrome display and appropriate DOS-Software (one for data services and one for the fax service) do well.

## Annex A Document Management

### A.1 Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
3.0.0	10 October 2005	Specifies the requirements a PLMN(a) has to fulfil in order to allow other PLMN operators to perform end-to-end functional capability tests in order to proof the interoperability without the need for staff assistance	Networks Group	Javier Sendin GSMA

### A.2 Other Information

Type	Description
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