

Report on the application of TBR 21



Reference

DTR/ATA-005075 (anc00ics.PDF)

Keywords

PSTN, TE, analogue, 2 wires

ETSI

Postal address

F-06921 Sophia Antipolis Cedex - FRANCE

Office address

650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16
Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Internet

secretariat@etsi.fr
<http://www.etsi.fr>
<http://www.etsi.org>

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 1998.
All rights reserved.

Contents

Intellectual Property Rights	4
Foreword	4
Introduction	4
1 Scope	5
2 References	5
3.1 Abbreviations	6
4 Countries applying (pr)TBR 21	6
5 Scope interpretation issues	8
6 Possible extensions of the application of TBR 21	9
6.1 Voice telephony justified case TE	9
6.2 Loop Disconnect dialling function	9
6.3 Multi-line TE	9
6.4 Series/parallel connection	9
7 Impact upon non-PSTN TE	10
8 Conclusions	10
8.1 TBR 21/37 scope issues	10
8.2 Introduction of TBR 38	10
8.3 Progression of prTBR 37	10
8.4 Testing detail	10
8.5 Functions outside the scope of TBR 21	11
8.5.1 Loop disconnect dialling	11
8.5.2 Multi-line TE	11
8.5.3 Series/parallel connection	11
8.6 Non-PSTN TE	11
8.7 New activities required to implement the conclusions of the present document	11
Annex A: Possible additional test detail for voice TE	12
A.1 Introduction	12
A.2 Normative references	12
A.3 Voice signal to be used during tests	12
A.3.1 Type	12
A.3.2 Levels	13
A.4 Electro-acoustic interfaces	14
A.4.1 Handset	14
A.4.2 Hands-free	14
A.4.3 Headset	14
A.4.4 Other interfaces	14
A.5 Electrical interfaces simulations	14
A.5.1 Analogue 2-wire NTP (Network Termination Points)	14
A.5.2 Analogue 2-wire TCP (TCP of TE behind TCE)	14
A.5.3 Other harmonized interfaces	14
A.5.4 Non harmonized interfaces	14
A.6 Requirements Table (TBR-RT)	14
History	15

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETR 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available **free of charge** from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://www.etsi.fr/ipr>).

Pursuant to the ETSI Interim IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETR 314 (or the updates on <http://www.etsi.fr/ipr>) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Report (TR) has been produced by ETSI Project Analogue Terminals and Access (ATA).

Introduction

The present document studies the application of prTBR 21 and the published TBR 21 [1] at a national level and considers opportunities to build upon the experience gained. Topics taken into account include the scope of actual implementations, problems encountered or foreseen in practical application, interpretation of the Scope of TBR 21, the relationship with TBR 37 [9] and TBR 38 [3] (including the opportunities for convergence towards a single access CTR for the analogue PSTN), and possible extensions to the applicability of TBR 21.

It was considered by some ATA members, including some regulatory authority representatives, that studying the experience of early applications of (pr)TBR 21 could give confidence to other countries' representatives that a pan-European regime based upon TBR 21 will operate successfully and will quickly lead to the creation of a single market of analogue interfacing TE. This is particularly relevant considering that it is increasingly the case that there is more than one analogue PSTN telecommunications operator in a particular country and that PSTN interfaces represent the vast majority of consumer telecommunication interfaces (in Europe and in the world), and that this situation will persist for some time.

It was felt that such an exercise could also help to minimize or to prevent future difficulties resulting from possible different interpretations of TBR 21.

Some countries are already applying versions of (pr)TBR 21, or national standards based upon (pr)TBR 21, for national type approval. Some of these applications add to or subtract from the requirements stated in (pr)TBR 21 itself, and some cover types of terminal equipment, e.g. handset telephones participating in the Article 4(g) justified case service of voice telephony, that are outside the scope of TBR 21. In support of this activity, there are already ad-hoc arrangements existing between Notified Bodies in some Member States of the EU for mutual recognition of the results of tests carried out against (pr)TBR 21.

The intended implementation of CTR 21 envisages TBR 21 being applied in conjunction with Advisory Notes providing information on important technical considerations relating to differences between national networks and additional guidance on the interpretation or implementation of the requirements and tests. These Advisory Notes are handled by the Analogue Type Approval Advisory Board (ATAAB). The arrangements are described in ETSI Guide EG 201 121 [8].

1 Scope

The present document studies the application of prTBR 21 and the published TBR 21[1] at a national level and considers opportunities to build upon the experience gained. Topics taken into account include:

- a) the scope of actual implementations;
- b) problems encountered or foreseen in practical application;
- c) interpretation of the Scope of TBR 21;
- d) the relationship with TBR 37 [9] and TBR 38 [3] (including the opportunities for convergence towards a single access CTR for the analogue PSTN);
- e) possible extensions to the applicability of TBR 21 (including the opportunity for an early application of TBR 38);
- f) relationships with other related areas, e.g. analogue leased line TBRs.

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, subsequent revisions do apply.
- 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] TBR 21: "Terminal Equipment (TE); Attachment requirements for pan-European approval for connection to the analogue Public Switched Telephone Networks (PSTNs) of TE (excluding TE supporting the voice telephony service) in which network addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signalling".
- [2] TBR 10: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements: Telephony applications".
- [3] TBR 38: "Public Switched Telephone Network (PSTN); Attachment requirements for a terminal equipment incorporating an analogue handset function capable of supporting the justified case service when connected to the analogue interface of the PSTN in Europe".
- [4] TBR 15: "Business Telecommunications (BTC); Ordinary and Special quality voice bandwidth 2-wire analogue leased lines (A20 and A2S); Attachment requirements for terminal equipment interface".
- [5] TBR 17: "Business Telecommunications (BTC); Ordinary and Special voice bandwidth 4 wire analogue leased lines (A40 and A4S); Attachment requirements for terminal equipment interface".
- [6] TR 101 149: "2 wire analogue voice band interfaces; TE transmitting voice signals; Test simulation for level limitation requirements".
- [7] EG 201 120: "Public Switched Telephone Network (PSTN); Method of rating terminal equipment so that it can be connected in series and/or in parallel to a Network Termination Point (NTP)".
- [8] EG 201 121: "A guide to the application of TBR 21".

- [9] TBR 37: "Terminal Equipment (TE); Attachment requirements for pan-European approval for connection to the analogue Public Switched Telephone Networks (PSTNs) of TE supporting the voice telephony service in which network addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signalling".

3 Definitions, symbols and abbreviations

TBR 21 [1] definitions, symbols and abbreviations apply. Additionally following abbreviations are to be considered.

3.1 Abbreviations

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

ACTE	Advisory Committee for Terminal Equipment
AN	Advisory Note
ATA	Analogue Terminals and Access
ATAAB	TRAC Analogue Type Approval Advisory Board
CLI	Calling Line Identity
CTR	Common Technical Regulation
dB	decibel
d.c.	direct current
e.m.f.	electromotive force
LD	Loop Disconnect (decadic)
NTP	Network Termination Point
PABX	Private Automatic Branch eXchange
PBX	Private Branch eXchange
PSTN	Public Switched Telephone Network
RT	Requirements Table
TBR	Technical Basis for Regulation
TE	Terminal Equipment
TRAC	Technical Regulations Applications Committee

4 Countries applying (pr)TBR 21

A number of countries have already implemented national regimes based upon (pr)TBR 21. This number is increasing. However inconsistencies in application have arisen, in particular, because of the ambiguities over the definitions of "voice equipment" and of the extent of the justified case service of voice telephony covered by Article 4(g) of Directive 91/263/EEC.

Also, where requirements in (pr)TBR 21 have arisen primarily from the needs of a single network, or a small number of networks, certain requirements have not always been applied mandatorily (e.g. the d.c. characteristic requirements relating to the 60mA limit and operation at very low line currents). These relaxations have been applied so as to avoid unnecessary demands on TE not intended to be used on the networks in question. In a few cases, it would be useful to investigate the future need for retaining such requirements in the common text. In the case of operation at very low line currents, proposals for relaxations in the requirements have already been tabled in the course of work on prTBR 37 and prTBR 38.

There are examples of requirements being introduced that are more onerous than (pr)TBR 21. Where such requirements have not been pressed for incorporation in (pr)TBR 21 it is assumed that they will disappear once TBR 21 comes formally into use.

Although not covered by the Scope of TBR 21, several countries have included coverage of loop disconnect dialling. In one case this consists of including the use of loop disconnect dialling within the approval granted but stating specifically that there are NO mandatory requirements to be met.

Some countries have taken the opportunity to use (pr)TBR 21 as the basis for type approval of all PSTN TE, including TE covered by Article 4(g) of Directive 91/263/EEC.

In some countries, older, national, standards have been retained in whole or in part to serve as voluntary design guides. These can assist manufacturers in dealing with parameters relating to network behaviour which it is useful to take account of in designing TE for best performance, even though these parameters may be outside the scope of the essential requirements of Directive 91/263/EEC and consequently outside of the scope of TBR 21. There could be merit in collecting such useful, network specific, advice and making its existence more visible.

Where regimes based upon (pr)TBR 21 have been introduced, practical experience has shown that they are very popular with TE manufacturers who generally prefer them to previous systems. There is no evidence of significant problems arising from the application of (pr)TBR 21 in this fashion, from either the TE manufacturers, the network operators, or the notified bodies. However, it should be noted that most countries implementing these regimes have disappplied some of the requirements contained in (pr)TBR 21, in particular, the 60 mA line current limit and the extreme low line current requirements which can cause difficulties for terminal designers.

Some information on such schemes is given below.

Table 1: Countries applying or contemplating applying (pr)TBR 21 versions and field of application

Country	TBR 38 Telephones	Other acoustic Transducers	Answering Machines	Modem Fax	PABX	LD dial	Multiline
CH	X	X	X	X	X	X	X
DK			X	X	X		X
IRL	X	X	X	X	X	X	X
Lx	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
NL	X	X	X	X	X	X	X
S	X	X	X	X	X	X	X
SF	X	X	X	X		Unknown	
UK		X	X	X		X	X
Iceland	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

NOTE: In the above table an "X" signifies that (pr)TBR21 is being applied for that combination of country and field of application.

Table 2: Countries applying or contemplating applying (pr)TBR 21 versions. Deviations to the requirements resulting from application within the scope of TBR 21

Country	Additional requirements (+ req)	Relaxed or deleted requirements (- req)
CH	Ring sensitivity	60mA-limit, min. loop current
DK	None	None
IRL	Reduced time to dial first digit, ring detect cadence, call progress tone monitoring (special circumstances), 14dB return loss for voice terminals	60mA-limit, min. loop current, output Signal Balance, dial tone detect range, Transition between quiescent and loop
Lx	Unknown	Unknown
NL	None	60mA-limit, min loop current, d.c. characteristics
S	None	60mA-limit, transition between quiescent and loop
SF	None	None
UK	None	60mA-limit, min. loop current, transition between quiescent and loop
Iceland	Unknown	Unknown

Table 3: Countries applying or contemplating applying (pr)TBR 21 versions. Deviations to the requirements resulting from application beyond the scope of TBR 21

Country	Additional requirements (+ req)	Relaxed or deleted requirements (- req)
CH	LD. multi-line	None
DK	None	None
IRL	LD, Series & parallel, connection arrangements, DTMF outbands for voice, 14dB return loss for voice terminals	None
Lx	Unknown	Unknown
NL	LD, Series connection, PBX signalling, CLI access	None
S	PABX, loudness rating	None
SF	None	Unknown
UK	None	LD (included but with no mandatory requirements)
Iceland	Unknown	Unknown

5 Scope interpretation issues

Although the scope of TBR 21 covers voice equipment except that covered by the justified case service of voice telephony referenced by Article 4(g) of Directive 91/263/EEC, inconsistencies have arisen because of the ambiguities over the definitions of "voice equipment" and of the extent of the of the justified case service of voice telephony covered by Article 4(g) of Directive 91/263/EEC, and because of the overlap of the Scopes of TBR 21 and TBR 37.

The scope of TBR 38 describes the voice telephony justified case service, when applied to analogue PSTN non-cordless TE, as applying only to TEs supporting a handset telephony function without any further features (but not applicable to TE specially designed for the disabled or for hostile environments, cordless telephones, handsfree or loudspeaking voice telephony functions, or handset telephony functions employing non-linear or time variant techniques for the processing of the signal)

In the case of cordless telephony, DECT, covered by TBR 10 is defined as a voice telephony justified case application.

From the above it could be concluded that every TE intended to be connected to the analogue PSTN, excluding TE within the scope of TBR 10 or TBR 38, could be considered within the scope of TBR 21. This includes:

- a) handset telephones employing non-linear or time variant techniques for the processing of the signal;
- b) telephones specially designed for disabled people;
- c) TE providing a handsfree or loudspeaking voice telephony function;
- d) answering machines;
- e) voice-mail systems;
- f) through connecting TE (including PABX).

The fact that the scope of TBR 37 includes "any voice telephony service" causes confusion because it makes it possible to consider most of the above examples as within the scope of both TBR 21 and TBR 37. As a result, some countries have been hesitant to apply (pr)TBR 21 to "voice equipment" which appears to fall within the scope of both TBRs.

To avoid such confusion it seems essential that action should be taken to converge the applicability of TBR 21 and TBR 37 into a single access TBR for all analogue PSTN applications (e.g. in a future edition of TBR 21 by implementing the extension referred to in subclause 6.1).

It seems most likely that any "scope matching" exercises would be very long and unsuccessful and would still result in disputes about what was or was not covered by each TBR.

However, the interpretation of the Scopes of TBRs is a matter for ACTE/TRAC and cannot be determined by ETSI.

NOTE: Although TBR 21 does not explicitly specify the detail of test methods for the all types of TE mentioned above, studies carried out in connection with TBR 37 (e.g. TR 101 149) have resulted in detailed definitions of test methods suitable for such applications. An example of the technical contents of a possible ATAAAB Advisory Note based upon these methods, and which could enhance the reproducibility of test results obtained against (pr)TBR 21, is given in annex A.

6 Possible extensions of the application of TBR 21

In this clause a number of possible extensions of the application of TBR 21 are presented. However, it is noted that the implementation of such possibilities by means of a change to the scope of TBR 21 would need a formal EU mandate and would be likely to be time consuming.

Examples are provided of possible extensions that would extend the single market to be created by TBR/CTR 21 to a much larger range of TE, by creating harmonized specifications for the most common PSTN features not currently covered by TBR/CTR 21 and therefore still subject to national regulations. Such harmonized specifications could be used even in the absence of a revised TBR/CTR 21, e.g. at a national level.

It also covers the suggestion to combine, into a single TBR, all applicable analogue PSTN access requirements.

6.1 Voice telephony justified case TE

In the light of the problems highlighted in clause 5 of the present document, and taking into account the technical content of the present prTBR 37, it seems a straightforward task to extend the application of TBR 21 to support voice telephony justified case service TEs covered by TBR 38. Apart from the level of testing detail contained in prTBR 37, there are minimal technical differences between it and TBR 21.

6.2 Loop Disconnect dialling function

Loop disconnect dialling, although a decreasingly important signalling method, is still employed on a significant number of lines. Whilst on some networks 100% of customers have access to DTMF dialling, on others a high proportion of customers still have to use loop disconnect. It is recognized that major differences in the TE requirements specified by different countries have impeded achieving a harmonized solution for this market segment.

However, it is a fact that the differences in the technical characteristics of the TEs themselves that meet all of these differently stated requirements are relatively minor. Also, with modernization of the network switching equipment some of the strict parameters required for interworking with electro-mechanical switches are no longer important on many networks. It could therefore now be possible to produce a simple specification for TEs which contained either no country variations or contained very few, enabling customers without access to DTMF dialling to enjoy the full benefit of the market in TBR 21 terminals, either by eliminating the need for additional national approvals of the loop disconnect dialling function, or by providing a common specification which could be used at a national level.

6.3 Multi-line TE

Although the decreasing price of ISDN TE brought about by technology and the availability of harmonized standards has resulted in a reduction of the analogue PSTN market share of some types multi-line TE, the harmonization of analogue PSTN access requirements could be of particular benefit in the market place for consumers and small businesses. It should be noted that the current scope does not exclude TE with multiple PSTN line connections per se. However, there could be physical or functional issues to be addressed in respect of certain types of application.

Such an extension might introduce additional or changed requirements, e.g. the method of connection to line.

6.4 Series/parallel connection

Currently the scope of TBR 21 is restricted to the case of a PSTN line with a single TE attached to it. The connection of a number of TE to a single line, in series or parallel combination has become very common. ETSI has published EG 201 120 [7] on this subject which explains how such connections could be achieved. There needs to be a formalized method of using the Guide in conjunction with TBR/CTR 21.

7 Impact upon non-PSTN TE

The most direct implication of the findings of the present document in other areas is the possible application of some of its conclusions to voice equipment TE within the scope of TBR 15 and TBR 17. Since analogue leased line TEs are, technically, closely related to analogue PSTN TEs, and sometimes the same, there is clear merit in the test methods having a high degree of commonality with TBR 21. In particular, the proposals for additional testing detail in respect of voice terminals could be usefully employed in conjunction with these TBRs.

8 Conclusions

8.1 TBR 21/37 scope issues

The current overlap between the Scopes of TBR 21 and TBR 37, where voice TEs NOT providing services subject to Article 4(g) of Directive 91/263/EEC appear to be within the Scope of both Directives simultaneously, could cause significant problems were the both TBRs to coexist.

It could prove very difficult successfully to eliminate the overlap between the Scopes of TBR 21 and TBR 37.

It would almost certainly be simpler to remove the exclusion in respect of Article 4(g) telephony terminals that currently exists in TBR 21, and to incorporate whatever other changes to the text of TBR 21 might be essential in order to address the extended range of equipment to be covered, so as to bring all type of analogue PSTN TE under a single access TBR.

Some European countries have already introduced national regulations based upon (pr)TBR 21 which cover voice terminals, including those subject to Article 4(g) of Directive 91/263/EEC. This supports the view that a single access standard is a practical and desirable proposition.

8.2 Introduction of TBR 38

TE manufacturers, in particular, would like an early opportunity to exploit TBR 38 without being forced to submit their equipment to additional national specific approval. Considering the long timeframe for the possible adoption of a TBR 37, there should be a mechanism for exploiting TBR 38 in conjunction with other access requirements, e.g. those in TBR 21, supplemented as necessary by additional testing detail.

8.3 Progression of prTBR 37

Until the issues referred to in 8.1 have been addressed it is premature to consider releasing prTBR 37 for public enquiry.

8.4 Testing detail

TBR 21 does contain requirements relating to all the access requirements specified in prTBR 37. However, TBR 21 (in common with other analogue access TBRs such as TBR 15 and TBR 17) does not provide the detail of testing methods for voice equipment, but leaves this to the expertise of the accredited laboratories.

It would be useful to provide additional guidance on testing methods for voice equipment to aid reproducibility. prTBR 37 contains text which appears to be suitable for this purpose. This text could potentially be made available for use with TBR 21, e.g. via ATAAB ANs.

8.5 Functions outside the scope of TBR 21

8.5.1 Loop disconnect dialling

It would be useful and it should be possible to produce harmonized requirements and tests for loop disconnect dialling which could be used to supplement TBR 21 for the national purposes.

It could be useful to incorporate in the future harmonized requirements relating to loop disconnect dialling in a future edition of TBR 21, although this would necessitate a change in its scope.

8.5.2 Multi-line TE

It would be useful to investigate whether any additional requirements are essential for the application of TBR 21 to any multi-line facility which might not fall under the present scope of TBR 21, and for requirements so identified to be available in a harmonized form to aid their application for national purposes or to support any extension to the applicability of TBR 21 which might be agreed in the future.

8.5.3 Series/parallel connection

A formal mechanism should be provided whereby TBR/CTR 21 TE can be applied in the case where TE is configured in accordance with the scheme described in EG 201 120 [7].

8.6 Non-PSTN TE

It could improve the effectiveness of the use of TBR 15 and TBR 17 for voice equipment if the test details suggested to be employed for TBR 21 were also available for use with these TBRs. A possible mechanism for achieving this might be by means of ATAAB ANs.

8.7 New activities required to implement the conclusions of the present document

The following activities would be required to implement the conclusions of the present document:

- a) addition of detailed guidance on test methods to be used when applying TBR 21 to voice terminals;
- b) possible extension to TBR 21 scope to cover Article 4(g) voice telephony terminals;
- c) possible extension to TBR 21 scope, or TBR 21 add-on, to cover Loop Disconnect dialling;
- d) possible extension to TBR 21 scope, or TBR 21 add-on, to cover certain Multi-Line facilities;
- e) possible extension to TBR 21 scope, or TBR 21 add-on, to cover series/parallel connection;
- f) addition of detailed guidance on test methods to be used when applying TBR 15 and TBR 17 to voice terminals.

Annex A: Possible additional test detail for voice TE

This annex contains examples of relevant test methods derived from existing ATA documents, including TBR 37, that provide additional details to support testing of voice equipment against access requirements, e.g. TBR 21.

A.1 Introduction

There is a risk that Voice Terminal Equipment to be approved to TBR 21 could yield different test results from test house to test house if some more detailed guidance is not provided in respect of certain tests. This annex specifies additional test method details which, if used, should minimize this risk.

The present document is based on technical studies being carried out by ETSI project ATA. The present annex contains examples of relevant test methods taken from existing ATA documents, including prTBR 37, that provide additional details to support testing of voice equipment against the access requirements of TBR 21.

A.2 Normative references

- [1] TBR 21: "Attachment requirements for pan-European approval for connection to the analogue Public Switched Telephone Networks (PSTNs) of TE (excluding TE supporting the voice telephony service) in which network addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signalling".
-

A.3 Voice signal to be used during tests

A.3.1 Type

Pink noise: for the purpose of the present document the pink noise test signal, adjusted at the relevant Reference Point, shall be band limited to the frequency range 200 Hz to 3 800 Hz.

There are two recommended methods of achieving this, the choice of which depends upon the filtering technique used.

- a) Where analogue filters are used the slopes of the band limiting filter shall be at least 24 dB/ octave and the out-of-band attenuation shall be at least 25 dB (see figure 1). The third octave spectrum of electrically generated pink noise shall be equalized to within ± 1 dB, while acoustically generated pink noise shall be equalized (in free field) to within ± 3 dB.

NOTE 1: When measured with 1/3 octave bandwidth at standard frequencies, an ideal filtered pink noise signal will be attenuated 1,1 dB at 200 Hz and 0,9 dB at 4 kHz compared to a non-filtered pink noise signal.

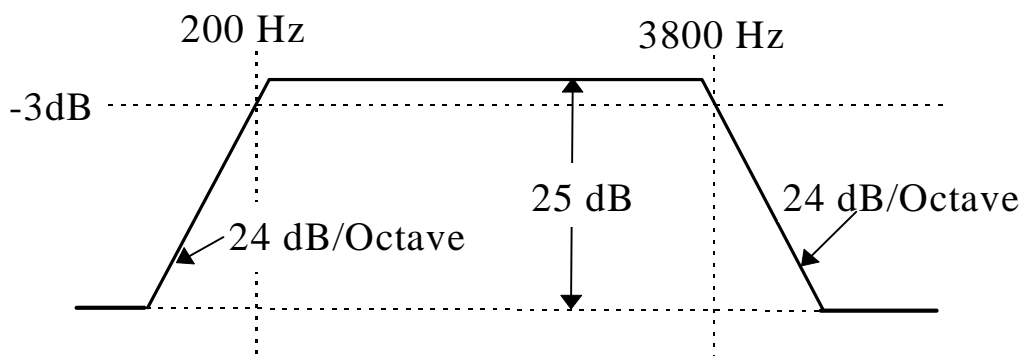


Figure A.1: Response for the band-limiting filter

- b) Where digital filters are used the detail of a) above applies, but with the 3dB attenuation points set at 225 Hz and 3 563 Hz instead of 200 Hz and 3 800 Hz.

Speech test signal: this shall be band-limited pink noise (see definition above) that is continuously modulated to be ON for a period of $250 \text{ ms} \pm 5 \text{ ms}$ and OFF for a period of $150 \text{ ms} \pm 5 \text{ ms}$. The signal level specified refers to the level of the signal during the ON period.

Pseudo speech signal: this shall be a speech test signal (see definition above) with 11 cycles and then followed by a period of $5,6 \text{ seconds} \pm 20 \text{ ms}$ OFF giving an activity ratio of approximately 28 %.

NOTE 2: The total OFF time after the 11th ON burst will be 5,75 seconds.

NOTE 3: The timing tolerances given above will result in a tolerance for the r.m.s. level of $\pm 0,1 \text{ dB}$.

This pseudo speech signal is repeated for as long as is necessary for any measurements to be made.

Where the Supplier declares that the pseudo speech signal is not appropriate for the intended use of the TE, an alternative test signal may be specified by the Supplier providing that the overall activity ratio during a one minute period shall be within the range of 23 % to 33 %. Any alternative signal shall be adjusted to give the same r.m.s. level over a one minute period as the level for the pseudo speech signal.

A.3.2 Levels

Table A.1: Input signal levels (ON)

		except for A.4.7.3.2	A.4.7.3.2 only
Stimulating point:	Stimulated point:	nominal	5 Vpp
analogue NTP simulator	TCP	-12 dBV e.m.f.	-7 dBV e.m.f.
digital (NTP or TCP or other)	TCP or ICP or other	-12,5 dBm0	-7,5 dBm0
analogue TCP simulator	ICP	-4 dBV e.m.f.	+1 dBV e.m.f.
MRP of a handset or headset	microphone	-4,7 dBPa	+0 dBPa
HFRP of a handsfree	microphone	-28,7 dBPa	-24 dBPa

NOTE: Analogue interfaces (PSTN-TCP and ICP) shall be stimulated with generators presenting a source impedance of Z_{ref} defined in TBR 21. Equalization and level calibration of the pink noise signal shall be done with the generator disconnected from the load.

A.4 Electro-acoustic interfaces

A.4.1 Handset

Mouth Reference Point (MRP): generally the appropriate Mouth Reference Point from ITU-T Recommendations P.34, P.56 etc., shall be used. Where a supplier has declared that the ITU MRP would be inappropriate for the intended use of the TE, then the microphone positioning described by the supplier shall be applied.

A.4.2 Hands-free

Hands-Free Reference Point (HFRP): a point located on the axis of the artificial mouth, at 50 cm from the lip ring, where the level calibration is made in free field. It corresponds to the measurement point n° 11, as defined in ITU-T Recommendation P.51.

A.4.3 Headset

For headsets the same measuring methods apply as for handsets. If the microphone positioning for testing is not defined by the manufacturer, it will correspond to the "corner of the mouth" position as defined in the ITU-T Recommendation P.38, clause 1, note.

A.4.4 Other interfaces

TE with other transducers arrangements will be tested in accordance with the manufacturer's instructions.

A.5 Electrical interfaces simulations

A.5.1 Analogue 2-wire NTP (Network Termination Points)

The analogue 2-wire NTP simulation is the one used for the tests in TBR 21.

A.5.2 Analogue 2-wire TCP (TCP of TE behind TCE)

The analogue 2-wire TCP simulation is derived from TBR 21. For test purposes it will have an equivalent d.c.-resistance of 400 Ω and an impedance of Z_{ref} as defined in TBR 21 (270 Ω + [750 Ω // 150 nF]).

A.5.3 Other harmonized interfaces

Should be simulated according the corresponding standards.

A.5.4 Non harmonized interfaces

Should be simulated according the manufacturers instructions.

A.6 Requirements Table (TBR-RT)

The requirements table of TBR 21, annex B is still applicable.

History

Document history		
V1.1.1	May 1998	Publication