



ITS 1

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Interface Technical Specifications
for the France Telecom's network

Directive 1999/5/EC

Analogue subscriber interface characteristics

Summary: This document describes the analogue subscriber interface characteristics, interface Z, for the France Telecom network

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1. timer values are indicative and can be subject to modification,
2. due to various technical constraints, some services or service options may not be available on some interfaces,
3. the fact that a service not yet commercially open is described in this document can in no case be considered as a binding commitment on France Telecom part to actually open this service.

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1. General comments

1.1 Introduction

This document describes the characteristics related to the physical interface of the network, except for supplementary services information which is described in a separate document (Cf document [5]).

The document is divided into two technical parts. The first part, entitled "Basic characteristics", describes the characteristics of the network relating to the basic service according to ETSI TBR 21 approach [2]. The second part, entitled "Additional characteristics" describes the physical characteristics of the network not covered by TBR 21[2].

This document refers as far as possible to the relevant published standards, and only describes the used options and particularities of these standards.

The characteristics are defined at the network termination point (NTP). To design terminal equipment to be connected in parallel or series on a single subscriber line, it is appropriate to refer to ETSI Guide EG 201 120[4], taking into account that the network can support 100 Loading Units (LU).

1.2 Definitions and abbreviations

1.2.1 Definitions

In addition to definitions and abbreviations used in TBR 21[2], this document uses the following :

- | | |
|----|---|
| LF | Loading Factor – Loading Factor corresponding to the part of the network resources used by terminal equipment or group of terminal equipment (terminal installation) when connected to the network termination point (NTP). Cf guide EG 201 120[4]. |
| LU | Loading Unit – Arbitrary Loading Unit to measure (or evaluate) the loading factor (LF). Cf guide EG 201 120[4]. |

1.2.2 Abbreviations

See § 4 "Glossary".

1.3 Reference documents

- [1] Directive 1999/5/EC of the European Parliament and Council dated 9 March 1999 – concerning hertzian equipment and telecommunications terminal equipment and mutual recognition of its conformity (published in the OFEC on 7.4.1999)
- [2] TBR 21 (January 1998 Edition) - Terminal equipment (TE); Connection 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.
French version: Document referenced AFNOR FD Z81-021.
- [3] TBR 38 (May 1998 Edition) - Public Switched Telephone Network (PSTN) ; Connection 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] 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)
- [5] STI 2 – Additional services that can be accessed from France Telecom network analogue lines.
- [6] EN 301 437 - Terminal equipment (TE); Attachement 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
- [7] STI 3 – Connection interface to the France Telecom-Ringing-Dial Tone network
- [8] ETS 300 001 - Attachments to the Public Switched Telephone Network (PSTN); General technical requirements for equipment connected to an analogue subscriber interface in the PSTN (Chapter 5: Calling function)
French transposition: Document referenced AFNOR FD Z81-123.
- [9] IEC 60603-7-1 – Connectors for electronic equipment - Part 7-1: Special specification for armoured, 8-channel connectors comprising plugs and bases with common coupling characteristics, with quality assurance.

- [10] IEC 60603-7-3 – Connectors for electronic equipment - Part 7-3: Special specification for armoured, 8-channel connectors comprising plugs and bases, for data transmission at frequencies of up to 100 MHz
- [11] UTE C 90-483 5 – Residential wiring for communication networks
- [12] UTE C 93-531-11 – Unshielded cables for Grade 1 interior telecommunications installations – Special specification for series 298 cables
- [13] UTE C 93-531-12 – Shielded cables for Grade 1 residential cables
- [14] TR 103 000-4-1 - Access and Terminals;
Analogue Access to Public Telephone Network
Advisory Notes to Standards harmonising terminal interface
Part 04: Information arising from CEC decisions;
Sub-part 1: General loop steady state requirements

Note: Standards [4] and [6] are not quoted in the following text. They are indicated in paragraph 1.3 as bibliography.

2. Basic characteristics

2.1 Introduction

The analogue subscriber interface to the France Telecom switched telephone network **is compatible with terminal equipment that complies with ETSI European Standard TBR 21[2]** (January 1998 edition).

The following clauses precise or complement points described in TBR21, in order to allow manufacturers to optimise the adequation of their terminal equipment to France Telecom network.

2.2 Connecting mode to the network

2.2.1 Line termination point (LTP)

The line termination point is the first physical network access point installed by France Telecom and, in general, located into the subscriber's premises. It is intended to separate the local loop line from the wiring customer (ie installation wiring in the customer premises), in order to allow the subscriber to test the local loop line.

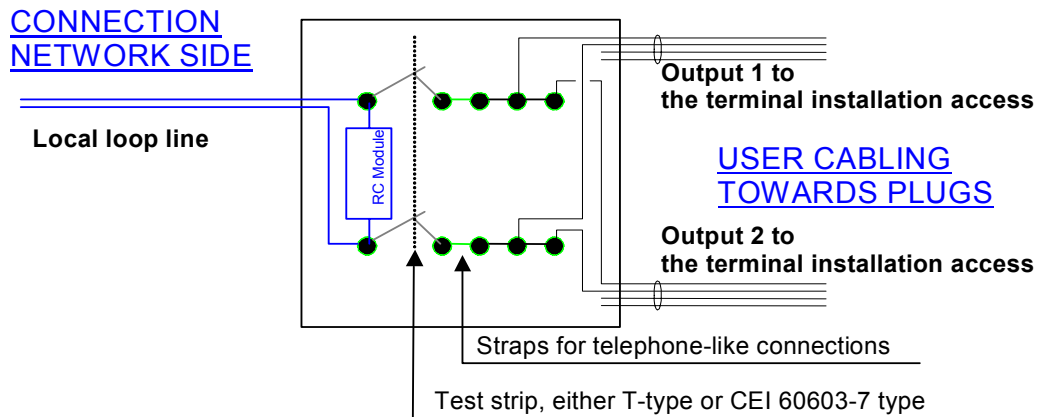
This point is materialised in the following way:

- by a device called the Indoor Termination Device (ITD):
 - . equipped with a RC module ($R = 20\text{ K}\Omega$ and $C = 2.2\ \mu\text{F}$) called the "testing module",
 - . allowing the terminal equipment plug to be plugged related to the type of connector used for wiring the subscriber's installation, either into T-connector, or into "CEI 60603-7 connector" (see § 2.2.2.1), while isolating the subscriber's installation wiring, in order to test the local loop line (in normal service, no terminal equipment should be plugged into the ITD), (*)
 - . if necessary, equipped with a module to protect against electrical surges.

A diagram of the ITD is given in Figure 2.2.1.

- . by a 12-pole strip equipped with an RC module ($R = 20\text{ K}\Omega$ and $C = 2.2\ \mu\text{F}$) called the "testing module",
- by the first telephone socket of the subscriber's installation equipped with an RC module ($R = 20\text{ K}\Omega$ and $C = 2.2\ \mu\text{F}$) that can be used to test the line,
- or by a device composed of an interface strip and test points.

(*) : The RC "testing module" is necessary for line tests made from the network when the installation terminals are unplugged.



Note: The test socket allows the terminal equipment plug to be plugged in, at the same time isolating the customer's wiring, in order to test the local loop line (in normal service, no terminal equipment should be plugged into the ITD).

Figure 2.2.1 – Diagram of the ITD with test socket to connect a terminal

2.2.2 Network termination points (NTPs) and connecting terminal equipment to the network

2.2.2.1 The two types of NTP connection

Except for some types of terminals (eg meter pulse detectors), a terminal is connected using a standard male plug to be plugged into a female socket fixed to the wall and connected, on the network side, to one or more analogue subscriber access lines. **The female socket constitutes the Network Terminal Point (NTP).**

Since the end of 2003, France Telecom has only used plugs with IEC 60603-7 bases for new terminal installations. In addition, the technical reference documentation enclosed with agreements between France Telecom and property developers specifies this type of telephone socket.

Before the end of 2003, France Telecom used T-sockets for terminal installations.

As a result, two types of female sockets can be found at the NTPs of France Telecom public network analogue lines:

- T-plugs with 3, 6 or 8 poles (contacts),
- sockets with an IEC 60603-7 base. In this document, this type of socket will generally be referred to as an IEC60603-7 socket.

A terminal installation is set up using only one type of socket. An extension to a terminal installation where T-sockets were used is made using a T-socket.

2.2.2.2 NTP with a T socket

2.2.2.2.1 Description of the T-socket

The T-socket may have 3, 6 or 8 poles. The numbering of the poles is described in Appendices 3 and 5 with drawings of the plug:

- Appendix 3 contains the drawings for 6-pole plugs. The 3-pole plug has the same body without metal poles 4, 5 and 6 inserted.
- Appendix 5 contains the drawings for 8-pole plugs.

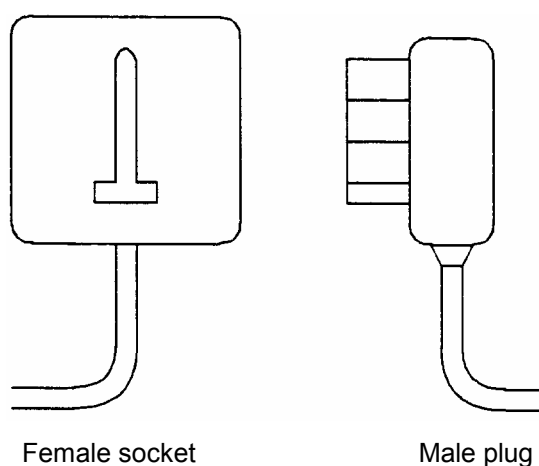
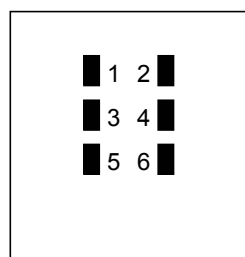
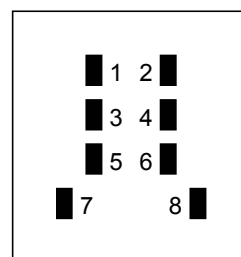


Figure 2.2.2.1.a – Front of the female socket and side view of the mal plug with 3 or 6 poles

The numbering of the poles in the socket corresponds to the numbering of the poles in the plug. The diagram below indicates the numbering of the poles in the socket.



3 or 6-pole female socket



8-pole female socket

Figure 2.2.2.1.b – Numbering of the poles in a female socket

2.2.2.2.2 Connection of one or several simple terminals in the same subscriber terminal installation, on the same outgoing LTP (cf. § 2.2.1)

Subscriber terminal installation with one socket for an LTP (cf. § 2.2.1)

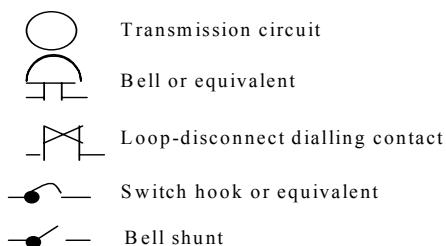
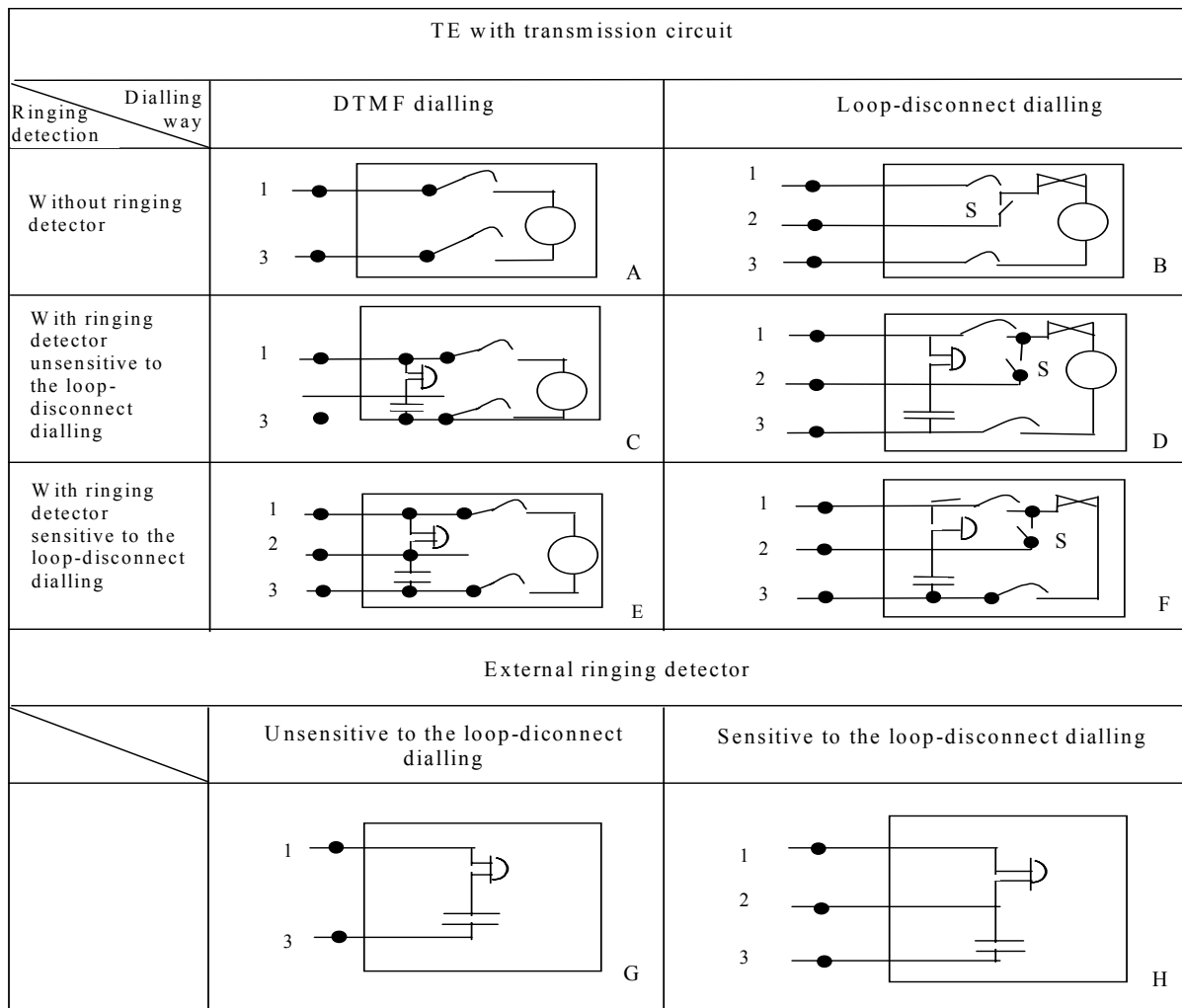


Figure 2.2.2.2.a – Wiring diagram for the female socket for a subscriber terminal installation

The female socket pole allocation is as follows:

Pole N°	8-pole female socket allocation
1	"a" wire on line 1
2	Anti-tinkling line 1
3	"b" wire on line 1
4	not used
5	not used
6	"a" wire on line 2
7	Anti-tinkling line 2
8	"b" wire on line 2

The male plug pole allocation is as follows:

Pole N°	Asssignment		
	3-pole male plug	6-pole male plug	8-pole male plug
1	"a" wire	"a" wire	"a" wire on line 1
2	shunt wire (*)	shunt wire (*)	shunt wire (*) on line 1
3	"b" wire	"b" wire	"b" wire on line 1
4		not used	not used
5		not used	not used
6		not used	"a" wire on line 2
7			shunt wire (*) on line 2
8			"b" wire on line 2

(*): The purpose of the shunt wire is to prevent the bell of a telephone terminal from tinkling due to loop-disconnected dialling on parallel terminal equipment. Use of pole 2 is obsolete since multi-frequency dialling and electronic bells not affected by parallel decimal dialling has come into widespread use.

Implementation of the RC circuit ($R = 20 \text{ K}\Omega$ and $C = 2.2 \text{ }\mu\text{F}$) called the "testing module": If T-sockets are used for the terminal installation, the RC circuit (test module) is located in the LTP equipment (cf. § 2.2.1) or, failing this, in the first socket of the terminal installation as per Figure 2.2.2.2.b.

Connection of additional terminal equipment in a subscriber terminal installation

An additional single terminal for a switched telephone network line in a subscriber terminal installation is connected by installing an additional female socket wired in parallel mode (see the socket wiring diagram at the figure 2.2.3.2.b).

Reminder of last section of § 1.1: “The characteristics are defined at the network terminal point (NTP). To design terminal equipment to be connected in parallel or series on the same subscriber line, please refer to ETSI Guide EG 201 120[4], taking into account that the network can support 100 Loading Units (LU).”

2.2.2.3 NTP with an IEC 60603-7 socket

2.2.2.3.1 Description of the IEC 60603-7 socket

Since the end of 2003, France Telecom has only used sockets with IEC 60603-7 bases for new terminal installations. In addition, the technical reference documentation enclosed with agreements between France Telecom and property developers specifies this type of telephone socket.

The wiring for installations with this type of socket is termed “multimedia” and can be used up to a frequency of 100 Mhz. It complies with the Grade 1 specifications defined in the UTE C 90-483 5[11] guide. The sockets used are sockets with an IEC 60603-7 base. The characteristics of these bases comply with IEC 60603-7-1[9] and IEC 60603-7-3[10] standards.

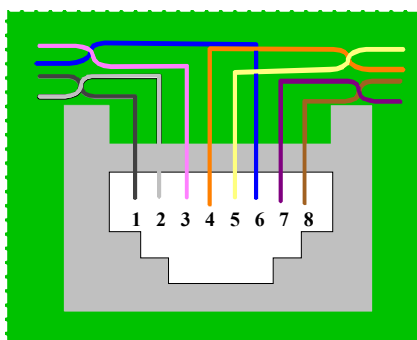


Figure 2.2.2.3.1.a – Base of the IEC 60603-7 socket

The 8 contacts of the IEC 60603-7 socket base connectors are allocated in line with the recommendations of the UTE C 90-483 5[11] guide.

N° of the pair in the network side cable		Contact N° in the RJ45 base	(Main) functions
Pair 3	a wire	1	Ethernet (10 and 100 T base)
	b wire	2	
Pair 2	a wire	3	Ethernet (10 and 100 T base) S bus send of an ISDN terminal connected to a basic access
	b wire	6	
Pair 1	a wire	4	S bus receive of an ISDN terminal connected to a basic access Line 1 (analogue line or ISDN basic access)
	b wire	5	
Pair 4	a wire	7	Line 2 (analogue line or ISDN basic access)
	b wire	8	

Table 2.2.2.3.1.b – Allocation of the pairs of the cable on the network side to the IEC 60603-7 socket contacts

2.2.2.3.2 Connection of one or more simple terminals in the same subscriber terminal installation

The terminal installations are star-connected from the customer distribution frame, using the following rule: each branch, a maximum of 45m long, serves one socket constituting a NTP (cf. § 2.2.2). There are therefore as many branches as there are NTPs.

In general, the customer distribution frame has two interfaces:

one interface on the network side which is connected to the ITD (see § 2.2.1) and equipped with a set of IEC 60603-7 sockets connected via a patch panel to the distribution frame interface IEC 60603-7 sockets on the terminal installation side,

- one interface on the terminal installation side equipped with a set of IEC 60603-7 sockets. The far ends of the wires of all the branches of the terminal installation are connected to this interface so as to be respectively connected to the above-mentioned sockets.

The terminal installation is wired using a:

- shielded cable (UTE C 93-531-12[13] standard) or unshielded cable (UTE C 93-531-11[12] standard),
- with 4 twisted pairs for each branch,
- with 0.5 mm diameter copper conductors,

the far ends of which are connected to the customer distribution frame socket on the terminal installation side and to the NTP socket on the other.

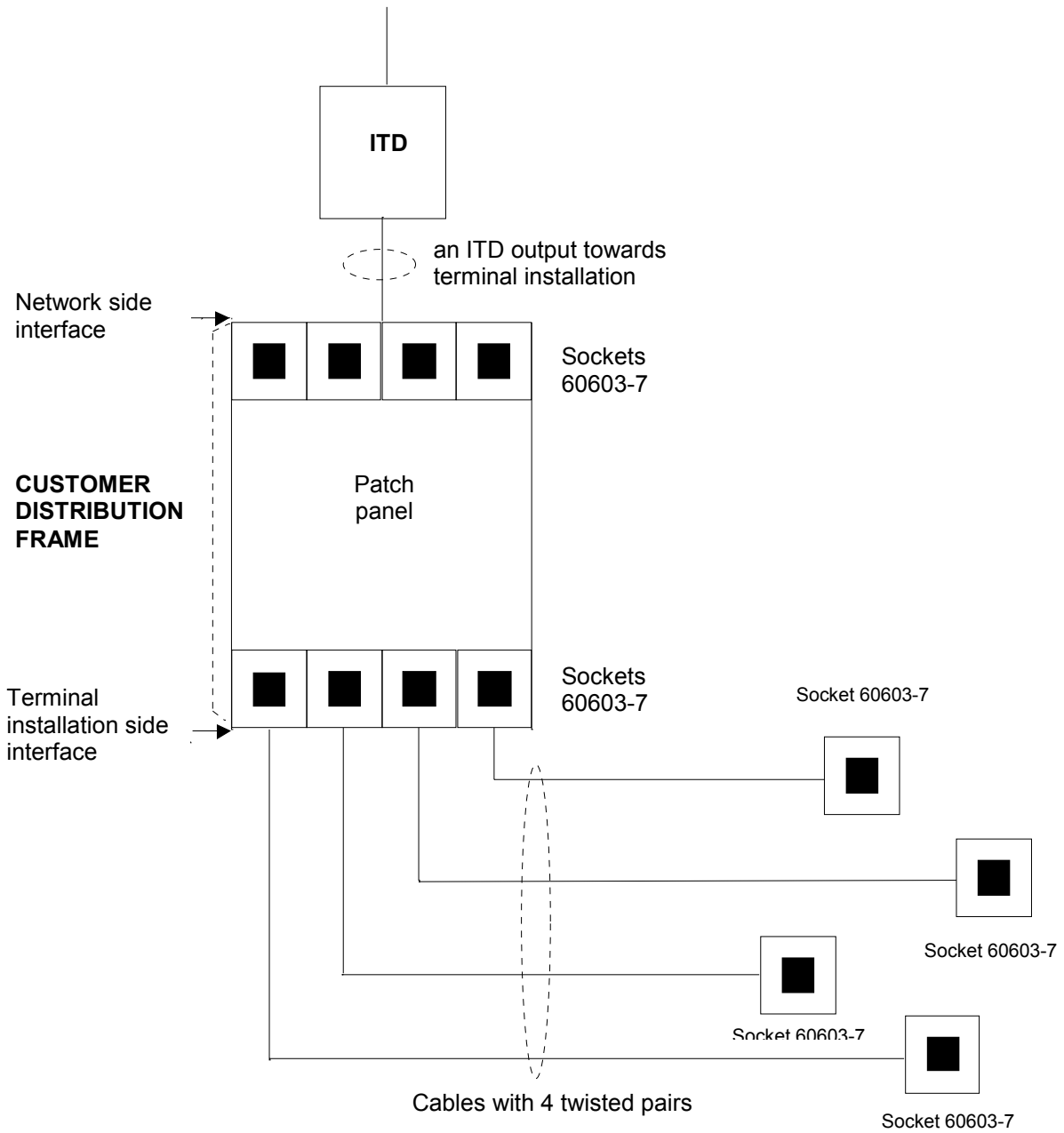


Figure 2.2.2.3.2 – Diagram of a terminal installation with IEC 60603-7 sockets.

2.3 Power supply polarity

Cf § 4.3.1 TBR 21 (January 1998 Edition)

Compliance with the characteristics specified below must be independent of the power supply polarity. Since this polarity inversion is not systematic, it cannot be used by the terminals.

2.4 Conditions in quiescent state

Quiescent conditions cover states where the line is not engaged or is in a ringing phase.

The subscriber's terminal installation is powered by direct voltage of between 45 V and 54 V.

2.4.1 Resistance between wires

Cf § 4.4.1 TBR 21 (January 1998 Edition)

2.4.2 Conditions at 50 Hz

2.4.2.1 Impedance

Cf § 4.4.2.1 TBR 21 (January 1998 Edition)

2.4.2.2 Transient response

Cf § 4.4.2.2 TBR 21 (January 1998 Edition)

2.4.2.3 Direct current

Cf § 4.4.2.3 TBR 21 (January 1998 Edition)

2.4.3 Impedance unbalance about earth

Cf § 4.4.3 TBR 21 (January 1998 Edition)

2.4.4 Resistance to earth

Cf § 4.4.4 TBR 21 (January 1998 Edition)

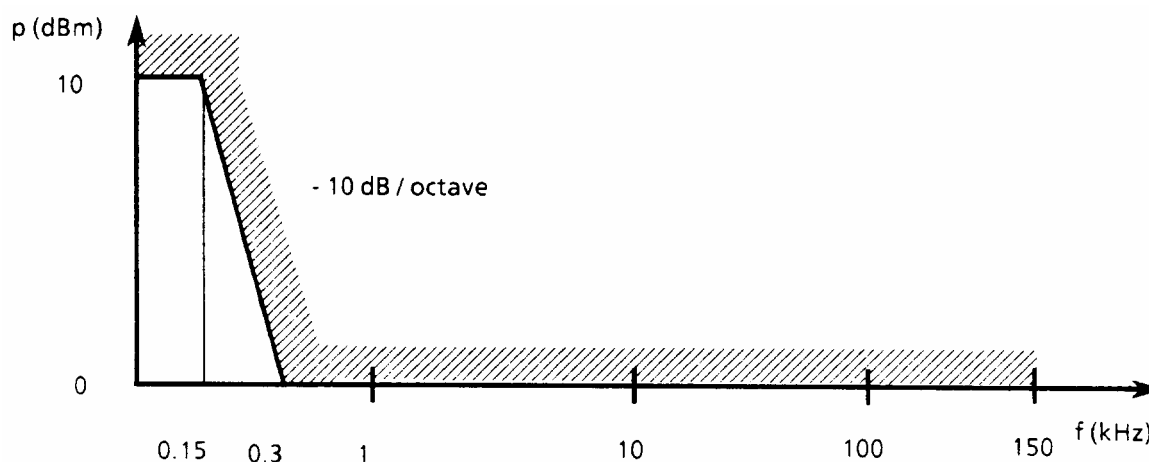
2.5 Ringing detection conditions

Cf § 4.5 TBR 21 (January 1998 Edition)

NOTE: However, as indicated in Note 2, § 4.5 of TBR 21 (January 1998 Edition), it is advisable to refer to document [7] relating to the characteristics of ringing and tones transmitted by the network to ensure proper detection on the France Telecom network.

2.5.1 Ringing signal linearity

In order to prevent the call signal from generating interference on neighbouring lines by cross-talk, any individual frequency component due to possible distortion of the call signal applied to the call receiving terminal, should not exceed the limits indicated by the following mask. This is for a 80 V eff call signal level, a 54 V DC power supply voltage and a line resistance of 230 Ω .



2.6 Establishment of loop state

2.6.1 Breaks in the loop

Cf § 4.6.1 TBR 21 (January 1998 Edition)

2.6.2 Loop current establishment

Cf § 4.6.2 TBR21 (January 1998 edition) modified by ETSI TR 103 000-4-1(V 1.1.1-june 2003)[14]

2.7 Conversation state

2.7.1 Loop characteristics

Cf § 4.7.1 TBR21 (January 1998 edition) modified by ETSI TR 103 000-4-1(V 1.1.1-june 2003)[14]

For a terminal compliant with the mask $U=f(I)$ of TBR 21 modified by ETSI TR 103 000-4-1(V 1.1.1-june 2003), in all stable phases of operation (dialling, conversation, on, conversation, waiting and false call) the loop current provided by the network is equal to 15 mA or above.

2.7.2 Impedance

Cf § 4.7.2 TBR21 [2] (January 1998 Edition)

Note: The France Telecom network accepts terminals with complex impedance, compliant with the one described in TBR 21. However, in the event of a short line connection, the network impedance is 600 Ω , with a return loss of at least 14 dB between 300 and 3400 Hz. However, a limited number of analogue subscriber cards are adapted for complex impedance.

2.7.3 Sending level limitation

2.7.3.1 Mean sending level

Cf § 4.7.3.1 TBR 21 (January 1998 Edition)

2.7.3.2 Instantaneous voltage

Cf § 4.7.3.2 TBR 21 (January 1998 Edition)

2.7.3.3 Sending level in a 10 Hz bandwidth

Cf § 4.7.3.3 TBR 21 (January 1998 Edition)

2.7.3.4 Sending level above 4.3 kHz

Cf § 4.7.3.4 TBR 21 (January 1998 Edition)

2.7.4 Impedance unbalance about earth

2.7.4.1 Longitudinal conversion loss

Cf § 4.7.4.1 TBR 21 (January 1998 Edition)

2.7.4.2 Output signal balance

Cf § 4.7.4.2 TBR 21 (January 1998 Edition)

2.7.5 Noise

This parameter is not specified in TBR 21: please refer to Chapter 4.2.6 of TBR 38 (May 1998 Edition)[3].

2.8 Dialling conditions

2.8.1 Automatic dialling

2.8.1.1 Dialling without dial tone detection

Cf § 4.8.1.1 TBR 21 (January 1998 Edition)

Note: The network accepts information via the automatic dialling of a terminal installation without dial tone detection if a timeout has elapsed.

2.8.1.2 Dialling with dial tone detection

Cf § 4.8.1.1 TBR 21 (January 1998 Edition)

2.8.2 DTMF signalling

2.8.2.1 Frequency combinations

Cf § 4.8.2.2 TBR 21 (January 1998 Edition)

2.8.2.2 Signalling level

Cf § 4.8.2.2 TBR 21 (January 1998 Edition)

2.8.2.3 Unwanted frequency components

Cf § 4.8.2.3 TBR 21 (January 1998 Edition)

2.8.2.4 Tone duration

Cf § 4.8.2.4 TBR 21 (January 1998 Edition)

2.8.2.5 Pause duration

Cf § 4.8.2.5 TBR 21 (January 1998 Edition)

2.8.3 Decadic dialling (loop pulsing)

The implementation of this function is no longer necessary for terminal operation on the France Telecom network. However, decadic dialling is still accepted, as per Chapter 5 of ETS 300 001[8].

2.8.4 Automatically repeated call attempts

Cf § 4.8.3 TBR 21 (January 1998 Edition)

2.9 End of loop condition

Transition from a loop condition to quiescent state is taken into account by the network when the value of the loop current stays below 5 mA for more than 500 ms.

3. Additional characteristics

3.1 Register recall

Register recall is the opening of a dc loop for a calibrated period of time, presented to the network by the terminal to enable the network to offer certain additional services. The register recall calibrated time opening pulse can be transmitted to the network by manual activation on the terminal or automatically by the terminal itself. In the event of manual action, the opening impulse time must be independent from the length of time the corresponding button is pressed.

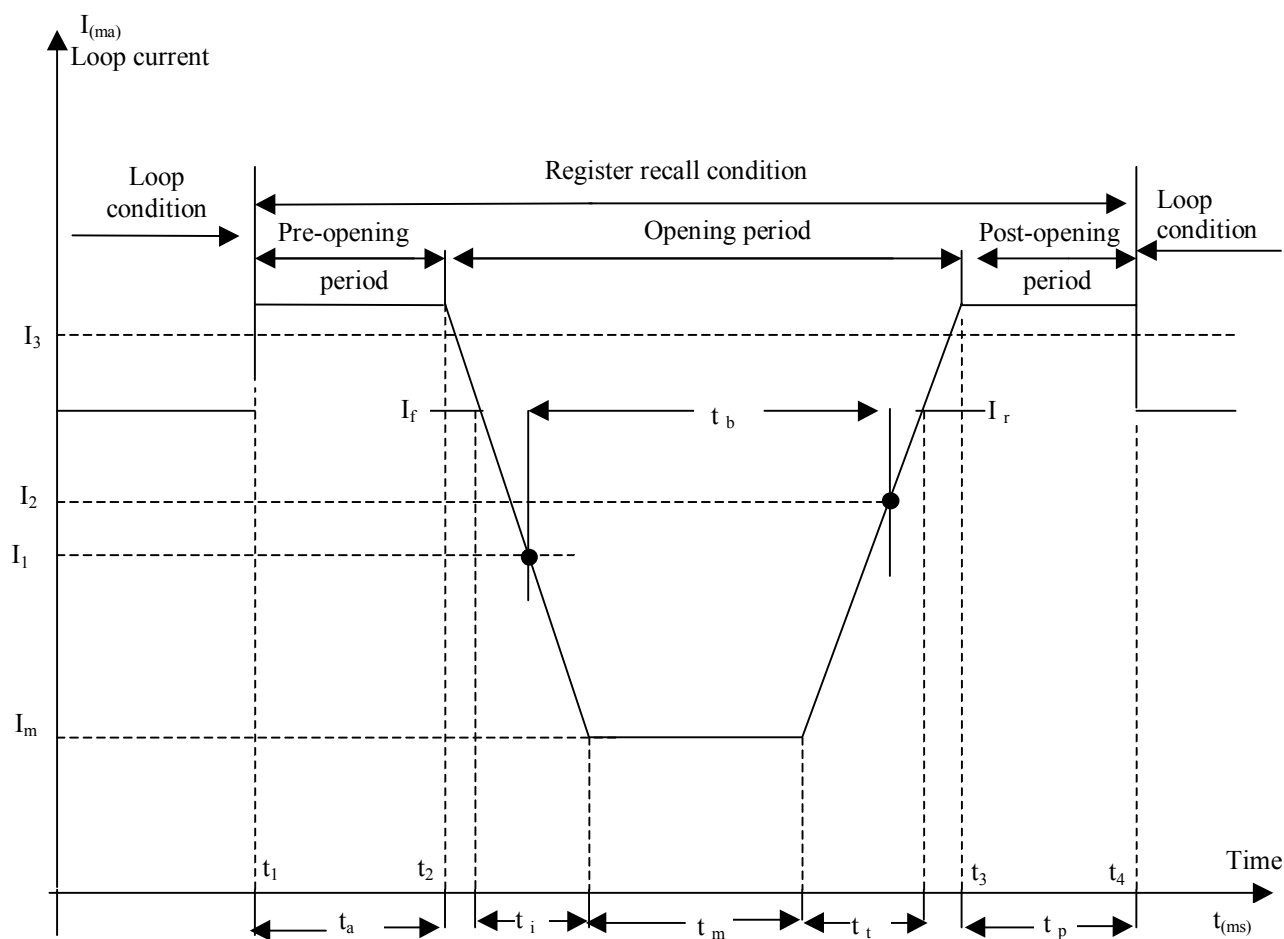


Figure 3.1 – Register recall

PARAMETERS					
t_m (ms)	t_b (ms)	Δt_b (ms)	I_m (mA)	I_1 (mA)	I_2 (mA)
40	270	± 50	≤ 1	5	5

3.2 Transmission of meter pulses

When the function of charging information is applied by the network at the NTP, the network sends to the terminal installation meter pulses. These pulses consist of a 12kHz-rated transversal signal.

Characteristics of meter pulses at NTP poles are indicated in the table below.

PARAMETERS			
f_{\min} (kHz)	f_{\max} (kHz)	e_{\min} (mV)	e_{\max} (mV)
11.880	12.120	105	4000

Whatever in the presence or absence of loop current, meter pulses are transmitted during a period of 75ms, as a minimum and 150ms at the maximum, with intervals between them of at least 75ms.

In quiescent condition, one or several meter pulse(s) may be transmitted within 2 secs following the line release.

3.3 Polarity inversion

Some France Telecom equipment allows inversion of the power supply to the requester's line when the called party picks up the call or on receipt of the answering signal. Since this information is not available throughout the network, it cannot be used by terminals.

3.4 Neutralisation of echo treatment devices

3.4.1 Introduction

Echo suppressors or cancellers have a tone neutralisation device to ensure that signals crossing it in either direction are no longer modified on receipt of the signals defined below, which are transmitted by some terminals.

3.4.2 Signal characteristics

Echo suppressors or cancellers are neutralised by the terminal equipment in loop condition, transmitting a $2100 \text{ Hz} \pm 15 \text{ Hz}$ tone during a period of 3.3 ± 0.7 secs, at a level between $p1$ (dBm) and $p2$ (dBm) measured on a load impedance of Zl (Ω), for V_f and R_f DC voltages as specified in Table 3.4.2.

For automatic answering, the tone must be preceded by a period of silence between 1.8 and 2.5 secs after a dc loop condition has been established, followed by a period of silence of 75 ± 20 msecs, after which power must be maintained with no signal spacing above 100 msecs, in order to maintain the neutralisation of echo treatment devices.

If the terminal equipment has echo cancellers or suppressors to be neutralised at the same time as those on the network, the terminal must then reverse the tone phase at intervals of between 425 and 475 msecs, in order to obtain a phase angle of over 180 ± 10 degrees in less than 1 msec and a 2100 Hz tone amplitude no more than 3 dB lower than its stable state value for a maximum of 400 μs .

The transmission period must be:

- less than 2.6 msec if an answer is received from the calling station. In this case, the 2100 Hz tone may be stopped once an answer has been detected from the calling station during a continuous period of 100 msec.
- over 4 secs but less than 10 secs, in applications where an automatic answering TEUT is permanently assigned to receiving calls transmitted only by acoustic coupling stations, in order to take the reaction time required by the operator to put the telephone handset into contact with the acoustic coupler.

Table 3.4.2 - Neutralisation of echo treatment devices

PARAMETERS						
Value required	Value required	Test value	Test value	Test value	Test value	Test value
p1 (dBm)	p2 (dBm)	Zl (Ω)	Vf (V)	Rf (Ω)	If (mA)	Comment
-15	0	600	49 - 54	1400 - 300	17	yes

Note: The maximum level of the echo canceller neutralisation tone is 3V.

3.5 Monitoring signals

The characteristics of ringtones and other tones transmitted by the network are described in document [7].

3.6 Overvoltage on line

Mains electricity in France:

The "neutral" conductor of electrical installations is earthed via the EDF (*Electricity Board*) transformer located at a varying distance, the potential of which may vary considerably irrespective of the variations supported by the earths of the telecommunications terminal installation and the associated telephone switch sites.

The lower limit of voltage taken into consideration by France Telecom for the protection of telecommunications equipment:

The value of 10 KV has been adopted as this limit in France Telecom approval specifications for telecommunications terminals. Experimentation has proved this value sufficient.

4. Glossary

IEC	International Electrotechnical Commission
ITD	Indoor Termination Device
DTMF	Dual Tone Multi Frequency signalling
LF	Loading Factor
LU	Loading Unit
TEUT	Terminal Equipment Under Test
NTP	Network Termination Point
PSTN	Public Switched Telephone Network
LTP	Line Termination Point
NTP	Network Termination Point
PSTN	Public Switched Telephone Network
TE	Terminal Equipment
UTE C	Union Technique de l'Electricité et de la Communication (<i>Technical Electricity and Communication Union</i>)

5. History

Edition	Date	Comments
1	March 2000	Initial version.
2	October 2000	Correction of errors in the wiring diagram and format.
3	December 2001	Modification of § 2.2.2 (Line Terminal Point) with specific addition of the ITD, addition of the reference [8] and modification of § 2.8.3.
4	September 2002	Addition of appendices for §6 containing drawings of the NTP component, the T-socket, and corresponding terminal plug.
5	April 2004	Introduction of a second type of NTP for the France Telecom network analogue subscriber interface. This new type of NTP is based on an IEC 60603-7 socket.
6	December 2005	Modifications to § 1.3 (Reference documents), § 2.7.1 (Loop characteristics) and § 3.2 (Retransmission of metering).
7	June 2006	Modifications to § 3.2 (Transmission of meter pulses).
8	May 2007	Modifications to § 2.2.1 (Line termination point (LTP)). Purpose of modifications: Introduction of the DTI with "CEI 60603-7 socket". - Modification to § 2.2.2.3.2 (Connection of one or more simple terminals in the same subscriber terminal installation). Purpose of modification: In the 1 st paragraph, replacement of «90m» by «45m».

Line termination point (LTP)

6. Appendices

The following 7 appendices contain descriptive drawings of the T-socket and corresponding plug. The T-socket is one of two types of sockets used for the NTPs of analogue user accesses in terminal installations (cf. § 2.2.2.2).

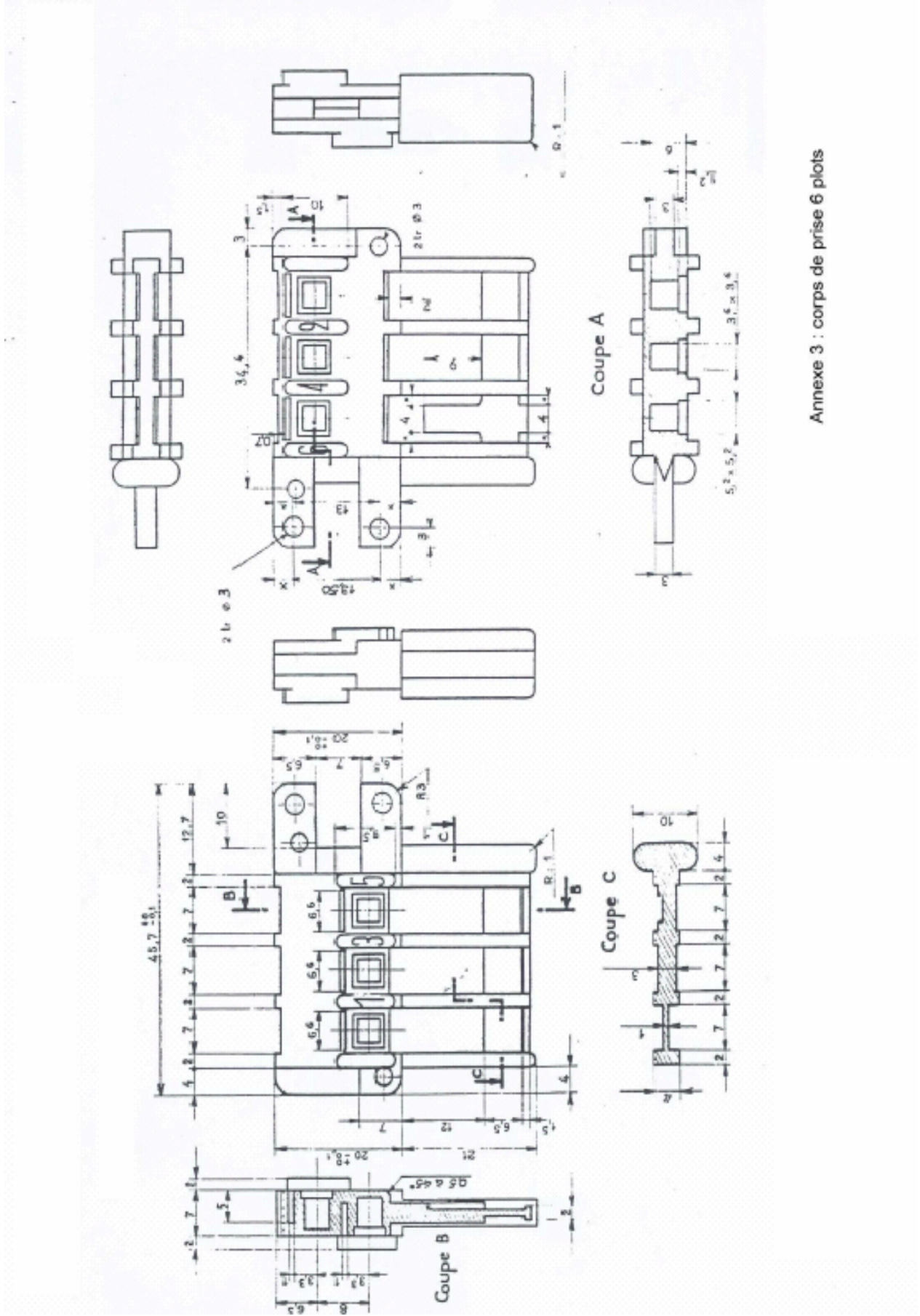
The drawings in the following appendices are for **information purposes only**.

List of appendices:

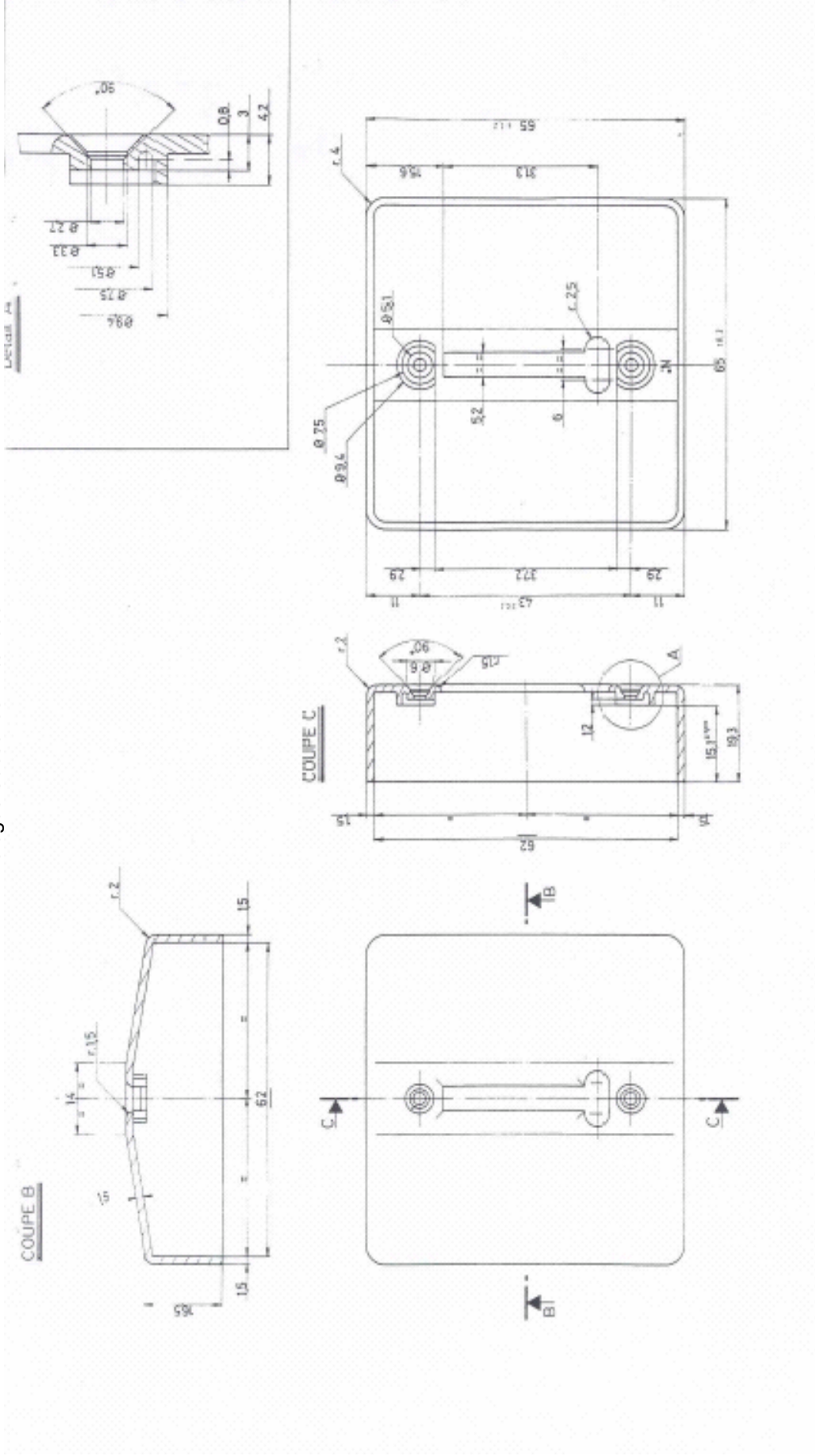
Appendix 1	6-pole connector plug, left half-cover
Appendix 2	6-pole connector plug, right half-cover
Appendix 3	6-pole connector plug, main part
Appendix 4	6-pole embeddable connector socket module
Appendix 5	8-pole connector plug, main part
Appendix 6	Standing 8-pole connector socket, cover
Appendix 7	Standing 8-pole connector socket, cover

Note:

- The force required to plug in and unplug the two component parts (plug and socket) must be between 20 and 30 Newtons.
- Since the plug is plugged into the connector socket, the resistance of each contact must be less than or equal to 30 mΩ.
- 1000-V eff voltage at a frequency of 50 Hz applied for one minute between isolated metal parts will not cause arcing or overheating.



Annexe 3 : corps de prise 6 plots



Annexe B : capot
 prise 6 plots

