

## Telecommunications equipment – Private Branch Exchanges (PBXs) – Common technical requirements

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### 1 Introduction

This edition results from a general review of Swedish Standards for attachment to a PSTN in order to align their mandatory content with the requirements of the teleterminal directive (91/263/EEC). A number of provisions have been deleted, some provisions have been transferred to informative parts of the standard and some other modifications have been made.

By this edition the Swedish language version of SS 63 63 27 is withdrawn. From now on the Swedish language version of standards for attachment to a PSTN will not be maintained.

### 2 Scope

This standard covers common technical requirements in a number of aspects not covered by other standards for PBXs. This concerns requirements imposed on e.g. tone messages, the sending of signals to lines in the public switched telephone network, traffic functions in PBXs and PBX networks.

### 3 References

The following standards contain requirements, which through reference, constitute requirements of this standard. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below.

- |             |  |
|-------------|--|
| SS 63 63 22 | Telecommunications equipment – Private Branch Exchanges (PBXs) – Transmission requirements for analogue PBXs   |
| SS 63 63 23 | Telecommunications equipment – Private Branch Exchanges (PBXs) – Transmission requirements for digital PBXs (A-law) having analogue interfaces with exchange lines |
| SS 63 63 24 | Telecommunications equipment – Private Branch Exchanges (PBXs) – Signalling requirements in analogue interface for outgoing exchange line                          |
| SS 63 63 28 | Telecommunications equipment – Private Branch Exchanges (PBXs) – Transmission requirements for digital PBXs (A-law) having digital interfaces with exchange lines  |
| SS 63 63 30 | Telecommunications equipment – Private Branch Exchanges (PBXs) – Transmission requirements for digital PBXs not using 8 bits PCM with A-law                        |
| SS 63 63 31 | Telecommunications equipment – Private Branch Exchanges (PBXs) – Signalling requirements in digital interface for outgoing exchange line                           |
| SS 63 63 40 | Telecommunications equipment – Subscriber equipment – Connection of equipment to leased circuit  |
| ETS 300 001 | Attachments to Public Switched Telephone Network (PSTN); General technical requirements for equipment connected to an analogue subscriber interface in the PSTN    |

### 4 Tone messages sent to a public switched telephone network

#### 4.1 General

The requirements set forth in clauses 4.2 and 4.3 refer to sending of tone messages to a public switched telephone network. As used here, this means sending tone messages to an exchange line connected to or seized for a call to a public switched telephone network.

The levels indicated in the descriptions of the tone messages refer to

- levels in an analogue interface towards the line, as regards values expressed in dBm;
- levels in a digital interface towards the line, as regards values expressed in dBm0.

The ringing tone shall be sent in accordance with clause 4.2. The sending of a ringing tone is mandatory only in connection with calls over an exchange line with digital interface or over a direct dialling-in line, before receiving an answer.

The busy tone shall be sent in accordance with clause 4.3. The sending of a busy tone is mandatory only in connection with calls over a direct dialling-in line, before receiving an answer.

**Note:** The ringing tone/busy tone may also be sent after receiving an answer, e.g. in connection with transfer of calls between extensions.

Other types of tone messages than those indicated in clause 4.2 and 4.3 shall not be sent to a public switched telephone network during the establishing of a call.

## 4.2 Ringing tone

**Meaning:** A ringing signal or a call waiting tone is sent to the called extension (or equivalent).

**Character:** First ringing tone: 300–600 ms

Intermittent tone: a  $1000 \pm 100$  ms tone, a  $5000 \pm 500$  ms pause

A ringing tone shall be sent directly in connection with the ringing signal.

**Note:** This may be accomplished as follows:

- an intermittent tone is initiated simultaneously with the ringing signal, or
- a separate first ringing tone as above is sent directly and after that an intermittent tone is sent with an arbitrary phase step; in this case a first ringing tone may coincide with an intermittent tone, resulting in a tone lasting about 1600 ms.

**Frequency:**  $425 \pm 15$  Hz

**Harmonics:**  $< 5\%$

**Level:**  $-10$  dBm  $\pm 5$  dB and  $-10$  dBm0  $\pm 5$  dB, respectively

## 4.3 Busy tone

**Meaning:** A called extension (or equivalent) is busy or not obtainable due to congestion.

**Character:** Intermittent tone: a  $250 \pm 25$  ms tone, a  $250 \pm 25$  ms pause

**Frequency:**  $425 \pm 15$  Hz

**Harmonics:**  $< 5\%$

**Level:**  $-10$  dBm  $\pm 5$  dB and  $-10$  dBm0  $\pm 5$  dB, respectively

**Note:** The characteristics of the busy tone according to this standard are equivalent to the congestion tone set forth in ITU-T recommendations.

## 5 Transmission of multifrequency tone signals

Standards SS 63 63 24 and SS 63 63 31 set forth the requirements for sending multifrequency tone signals in connection with signalling on an exchange line for outgoing traffic to a public switched telephone network.

In other cases of sending multifrequency tone signals to a public switched telephone network, the requirements set forth in ETS 300 001, clause 4.4, shall apply.

## 6 Transmission of other signals

### 6.1 General

Transmission of signals, as used here, refers to e.g. recorded announcements, music or a modem signal for data transmission in those cases where the signal is generated within an interface as defined in one of the standards SS 63 63 22, SS 63 63 23, SS 63 63 28 or SS 63 63 30.

Therefore, this clause does not apply to cases where the signal is generated in or beyond equipment connected to an interface as covered by the standards mentioned above. An example of such a case is when an approved modem or an announcement machine is connected to an extension intended for connection of approved plug-in equipment.

No transmission of e.g. recorded announcements, music or a modem signal for data transmission is allowed until an answer signal has been sent to the line in connection with incoming traffic.

Where easily accessible control/adjustment devices can be actuated by the user, the manufacturer or supplier of the terminal equipment shall provide information regarding the conditions that need to be met to enable the user to ensure that their use does not cause the terminal equipment to fail to meet the essential requirements.

### **6.2 Sending in analogue interface to exchange line in the public switched telephone network**

In this case, the requirements set forth in standard ETS 300 001, clause 4.4, shall apply, where applicable, under normal operating conditions of the PBX, including appropriate current feed on a short supply lead (0 ohms).

### **6.3 Sending in digital interface to exchange line in the public switched telephone network**

In this case, the requirements set forth in standard ETS 300 001, clause 4.4, shall be met, where applicable, with each absolute level (in dBm) indicated there being replaced by the same level in dBm0.

### **6.4 Sending in analogue interface to leased telephone circuit in the public telecommunications network**

In this case, the requirements set forth in SS 63 63 40, clause 5.3.2, shall be met, where applicable. The value 25 mA in clause 5.3.2.1 shall, however, be changed to 40 mA.

### **6.5 Sending in digital interface to leased telephone circuit in the public telecommunications network**

In this case, the requirements set forth in standard SS 63 63 40, clause 5.3.2, shall be met, where applicable, with each absolute level in dBm being replaced by the same level in dBm0.

## **7 Switching external calls**

### **7.1 Transfer of external calls**

External call transfer may be performed in a PBX or in a PBX network if the incoming exchange line is connected to a digital exchange, and if clearing signals from the incoming to the outgoing exchange line, or vice versa, are forwarded within 3 s, and if the attenuation is  $\geq 0$  dB.

### **7.2 Establishment of conference calls**

Conference calls that incorporate external connections to a PBX are normally permitted only for one external party and two internal parties. Digital PBXs which are only connected digitally via digital exchange lines to digital local exchanges may in addition support conference calls for two external parties and one internal party.

As regards transmission characteristics in connection with conference calls, the following requirements are set forth :

Requirements imposed for the purpose of protecting the telephone network shall, in the interface towards the exchange line and where applicable, correspond to the requirements set forth in the following clauses of standards SS 63 63 22, SS 63 63 23 and SS 63 63 28:

- SS 63 63 22:
  - \* 6.2 Impedance
  - \* 6.3 Unbalance about earth
  - \* 6.5.2 Individual frequency components
  - \* 7.5, 8.2.9 Crosstalk
  - \* 8.2.10 Level limitation
- SS 63 63 23:
  - \* 6.2 Impedance
  - \* 6.3 Unbalance about earth
  - \* 6.5.2 Individual frequency components
  - \* 7.5, 8.2.11 Crosstalk
  - \* 8.2.12 Acoustic level limitation
- SS 63 63 28
  - \* 6.2 Impedance
  - \* 6.3 Unbalance about earth
  - \* 6.5.2 Individual frequency components
  - \* 7.5, 8.2.12 Crosstalk
  - \* 8.2.13 Acoustic level limitation

## Annex A (informative)

### Internal tone messages

#### A.1 General

Clauses A.2.1 – A.2.9 below provide descriptions of the meaning and composition of tone messages within PBXs. Only nominal values are indicated for the parameters used to define the characteristics of the tone message.

#### A.2 Tone messages

##### A.2.1 Dial tone

Meaning: Dialling may be initiated or continued.

Character: Continuous tone

Frequency: 425 Hz

##### A.2.2 Ringing tone

Meaning: A ringing signal or a call waiting tone is sent to the called extension (or equivalent).

Character: Intermittent tone: a 1000 ms tone, a 5000 ms pause

Frequency: 425 Hz

##### A.2.3 Busy tone

Meaning: A called extension (or equivalent) is busy or not obtainable due to congestion.

Character: Intermittent tone: a 250 ms tone, a 250 ms pause

Frequency: 425 Hz

**Note:** The characteristics of the busy tone according to this standard are opposite from those set forth in ITU-T recommendations.

##### A.2.4 Congestion tone

Meaning: A requested connection cannot or must not be established.  
A request service is not accepted.

Character: Intermittent tone: a 250 ms tone, a 750 ms pause

Frequency: 425 Hz

**Note:** The characteristics of the congestion tone according to this standard are opposite from those set forth in ITU-T recommendations.

##### A.2.5 Special information tone

Meaning: The called number is connected to a recorded announcement for information on vacant numbers or for other information.

Character: Three consecutive tones with different frequencies, each tone being 330 ms long. The tone combinations are separated by a pause lasting 1000 ms.

Frequency: 950 Hz, 1400 Hz, 1800 Hz

**A.2.6 Warning tone in connection with speech recording**

Meaning: A speech recording machine is switched in during the call.

Character: Intermittent tone: a 400 ms tone every 15 s.

Frequency: 1400 Hz

**A.2.7 Warning tone in connection with switching-in of the operator**

Meaning: An operator is switched in during the call.

Character: Intermittent tone: a 100 ms tone, a 1500 ms pause

Frequency: 1400 Hz

**A.2.8 Special dial tone**

Meaning: The extension number is transferred and dialling may be initiated.

Character: Intermittent dial tone: a 320 ms tone, a 25 ms pause

Frequency: 425 Hz

**A.2.9 Call waiting tone**

Meaning: A tone advising a busy subscriber that someone is attempting to call his number.

Character: Non-repetitive tone sequence consisting of two tones arranged as follows: a 200 ms tone, a 500 ms pause, a 200 ms tone.

Frequency: 425 Hz

