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Ships and marine technology — Navigation and ship operations — Guidelines for onboard telephone equipment

Navires et technologie maritime — Navigation et opérations maritimes — Lignes directrices concernant le matériel téléphonique embarqué

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Foreword

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This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 6, *Navigation and ship operations*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Onboard telephone equipment generally includes automatic telephones, common battery telephones, battery-less telephones and sound-powered telephones.

Until now, there have been no comprehensive standards for onboard telephone equipment provided by different manufacturers, and this has impeded the equipment improvements of reliability.

This document will promote sharing common understanding among all parties involved, including the manufacturers, engineering companies, shipbuilders and ship owners.

Ships and marine technology — Navigation and ship operations — Guidelines for onboard telephone equipment

1 Scope

This document provides general and specific recommendations related to the quality of communication, connectivity, installation, performance and maintenance of onboard telephone equipment, including automatic telephones, common battery telephones, battery-less telephones and sound-powered telephones.

It also specifies requirements for the related performance tests (shop tests and onsite tests) and for the maintenance tests.

It is not applicable to digital telephones, LAN (VoIP) telephones, and wireless telephones.

NOTE These telephones are excluded because they were under development during the elaboration of this document so that their specifications remained to be determined.

Table 1 further illustrates the applicability of this document.

Table 1 — Applicability of this document

Type of connection	Signal	
	Analog	Digital
Wired	X	n.a.
Wireless	n.a.	n.a.
X: covered in this document.		
n.a.: not applicable.		

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1 Types of telephones

3.1.1
automatic telephone
telephone commanded under an *automatic telephone exchanger* (3.3)

Note 1 to entry: Automatic telephones can be classified into four types — desk, wall-mounted, flush-mounted and portable — based on their structural appearance.

Note 2 to entry: Automatic analog telephones are called "automatic telephones" in this document.

3.1.2
common battery telephone
telephone powered by a DC power supply (DC24V)

Note 1 to entry: Common battery telephones are classified into two types — "selective" and "direct" — based on their connectivity.

Note 2 to entry: Common battery telephones can be classified into four types — desk, wall-mounted, flush-mounted, and portable — based on their structural appearance.

3.1.3
battery-less telephone
telephone fitted with a hand crank generator for communicating by voice, amplified by self-generated power

Note 1 to entry: Battery-less telephones are classified into two types — "selective" and "direct" — based on their connectivity.

Note 2 to entry: Battery-less telephones can be classified into four types — desk, wall-mounted, flush-mounted, and portable — based on their structural appearance.

3.1.4
sound-powered telephone
battery-less telephone (3.1.3) not requiring an external power source for conversation (talk circuit)

Note 1 to entry: A hand crank generator is only used for signalling actions.

Note 2 to entry: Sound-powered telephones can be classified into four types — desk, wall-mounted, flush-mounted, and portable — based on their structural appearance.

3.2
automatic telephone equipment
system that connects *automatic telephones* (3.1.1) to an *automatic telephone exchanger* (3.3), thereby enabling telephonic ringing and telephonic conversation between any two automatic telephones through selection signals (such as push button or dial pulse dialling)

3.3
automatic telephone exchanger
telephone exchanger that uses *automatic telephones* (3.1.1), made durable to withstand typical shipboard vibration and environments

Note 1 to entry: This is also available for public announcements by way of a PA system. Through this, the automatic telephone is able to communicate with land telephones via SATCOM or INMARSAT, etc.

3.4
howling
unpleasant noise caused by audio feedback due to repeated amplification by the amplifier of the voice input, that impedes intelligible conversation

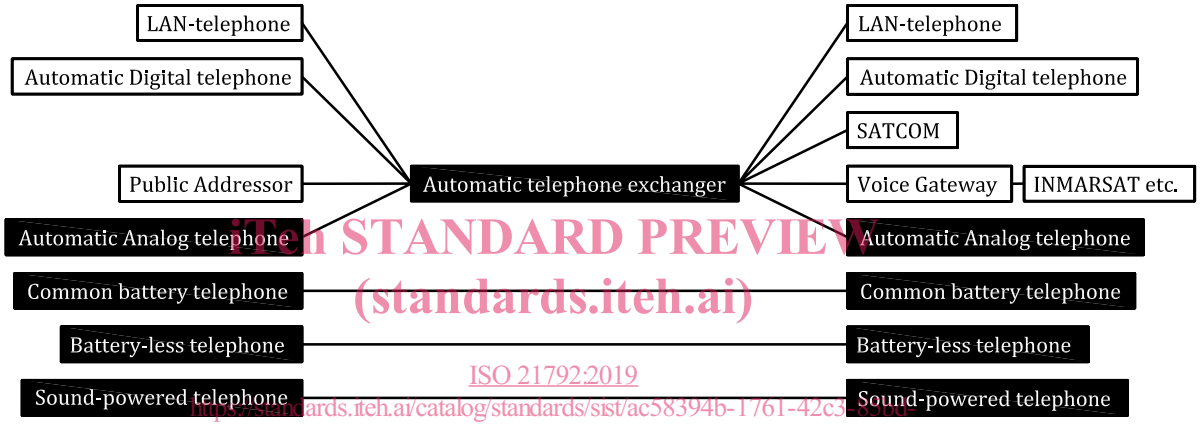
4 General characteristics

4.1 General

The classification and connection of telephones are shown in Table 2 and Figure 1.

Table 2 — Classification of telephones

Type of telephone	Connection	Amplified	DC power supply
Automatic telephone	Multiple	X	X
Common battery telephone	Direct/Selective	X	X
Battery-less telephone		X	n.a.
Sound-powered telephone		n.a.	n.a.
X: existing configuration. n.a: not applicable.			



NOTE The telephones covered in this document are written in white letters on black.

Figure 1 — Connection of telephones

The onboard telephone equipment includes automatic telephones, automatic telephone exchanger, common battery telephones, battery-less telephones and sound-powered telephones.

The equipment should ensure accurate transmission and reproduction of the caller voice signals.

4.2 Automatic telephones

The automatic telephone equipment enables calling between onboard and outboard telephone equipment by connecting to outboard communication systems (such as INMARSAT, VSAT, cellular phones, and landline telephones). It also enables paging broadcasts from the telephone equipment by coupling with a public addresser.

The automatic telephone exchanger should be able to withstand typical vibration and swinging motions (pitch and roll) for use in a shipboard environment.

The automatic telephone exchanger should comply with ISO 19847 and ISO 16425.

Electric source for the automatic telephones should be supplied by both AC power and DC power (DC24V). In case the AC power is lost, the telephones can switch to the DC power supply automatically.

4.3 Common battery telephones

Selective common battery telephones permit telephonic ringing and telephonic conversation between any two devices.

Direct common battery telephones only permit telephonic ringing and telephonic conversation between parent and child telephones (such as 1:1, 1:2, and 1:3 configurations).

A DC power supply (DC24V) is required for common battery telephones.

4.4 Battery-less telephones

Battery-less telephones are able to use their built-in generator to call other telephones, even if power is not supplied from an external source.

If a complete power failure occurs on a ship, the battery-less telephone (or sound-powered telephone) may be the only emergency system available for communication.

4.5 Sound-powered telephones

In high noise environments, the hand crank generator may also power a latching circuit at a remote station that augments the hand crank generator powered signalling circuit with an externally powered audible or visual signalling device.

The hand crank generator powers the signaling circuit to notify another station. Sound-powered telephones use "common talk" (everyone hears the conversation) for all stations on the circuit.

Sound-powered telephones are classified as direct call and selective call.

If a complete power failure occurs on a ship, the sound-powered telephone (or the battery-less telephone) may be the only emergency system available for communication.

5 Quality

5.1 General

When dealing with onboard telephone equipment, the measures given in 5.2 and 5.3 should be taken to ensure the accurate transmission of caller voice information.

5.2 Measures to prevent howling

Howling may occur due to the position and directivity of handsets and speakers of the onboard telephone equipment.

The following measures should be taken to prevent howling.

a) The microphones and speakers should be kept sufficiently far away from each other with their amplification loop broken to prevent howling.

b) In the case of paging broadcasts from the automatic telephone, the telephones and speakers should be kept sufficiently far away from each other, and a handset designed to prevent howling should be used.

5.3 Measures to suppress noise

Noise may increase if the voice signal of the telephone receives interference from other electrical circuits (such as power lines). The following measures should be taken to suppress the generation of the noise.

a) For voice signal cables such as the microphone, shielded cables that can prevent the noise due to electromagnetic induction from other lines should be used.

b) The telephones should be kept sufficiently away from the source of the noise in order to avoid its adverse impact.

c) Automatic telephone may use twisted-pair cables rather than multicore cables for preventing the noise due to electromagnetic induction.

d) If a DC power source is used for common battery telephones, the ripple component from the full-wave rectification of the built-in AC power supply presents in the charging and discharging board, and the high frequency component generated by the switching-device power controller, may cause electrical noise. Common battery telephones are adversely affected by the noise from the DC power source. In order to prevent the noise, an isolated DC/DC converter should be used to power the common battery telephone.

e) Attention should be paid to the wiring of cables (refer to 7.4).

f) Particular attention should be paid to the routing of sound-powered telephone cabling. Sound-powered telephones cabling should be routed away from equipment that may generate large electromagnetic signals, and/or cabling that carries large power currents. Examples of such equipment include: electrical motors, switchboards, spark-ignition engines, power lines.

g) When installed in spaces with high levels of background noise that severely impact the ability of an operator to maintain audible telephonic conversation, a sound absorbing chamber large enough to place the operators head inside or an appropriate headset unit should be provided.

6 Data recommendations — Automatic telephones

6.1 General

Connection between automatic telephones and onboard communication systems should be in accordance with the data recommendations given in 6.2 to 6.4. They are applicable only to automatic telephones.

6.2 Multifunction telephones

6.2.1 Signal condition

Multifunction telephones should meet the requirements mentioned in the exchanger specifications.

Products from the same manufacturer as that of the exchanger should be used, otherwise compatibility should be confirmed.

6.3 Analog telephone

6.3.1 Signal condition

The open-circuit voltage should be DC 24 V/48 V.

The open-circuit voltage should be compatible with loop-start signaling.

6.3.2 Output signal

The selection signal should be a PB signal.

The selection signal should comply with ITU-T Q.23/Q.24.

The selection signal should also be compatible with DP signals.

NOTE PB signal (push button dial signal), DP signal (dial pulse signal).