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Technical characteristics and methods of measurement for equipment for generation, transmission and reception of Digital Selective Calling (DSC) in the maritime MF, MF/HF and/or VHF mobile service; Part 5: Handheld VHF Class H DSC

Reference
REN/ERM-TGMAR-603

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Foreword

This draft European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The present document is part 5 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.2].

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
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Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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1 Scope

The present document states the minimum requirements for general communication for handheld VHF radios using the handheld class H DSC for shipborne use.

Class H DSC may be used in the Very High Frequency (VHF) Maritime Mobile Service (MMS), for distress, urgency and safety communication and general communications using telephony for subsequent communications.

The present document is part 5 of a multi-part deliverable that covers the requirements to be fulfilled by equipment that is integrated with a handheld transceiver.

These requirements include the relevant provisions and the guidelines of the IMO as detailed in MSC/Circ.803 [i.1] for non-SOLAS vessels participating in the GMDSS.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] ITU Radio Regulations (2016).

[2] Recommendation ITU-R M.493-15 (01/2019): "Digital selective-calling system for use in the maritime mobile service".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] IMO Circular MSC/Circ-803: "Participation of non-SOLAS ships in the Global Maritime Distress and Safety System (GMDSS)".

[i.2] ETSI EN 300 338-1: "Technical characteristics and methods of measurement for equipment for generation, transmission and reception of Digital Selective Calling (DSC) in the maritime MF, MF/HF and/or VHF mobile service; Part 1: Common requirements".

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

acknowledged: automated procedure which indicates that the objective of the initial DSC message has been achieved

active: automated procedure which has control of the receiver and transmitter and is thus able to engage in subsequent communications and receive DSC messages

automated procedure: set of actions necessary to complete the objective of an initiating DSC message or non DSC communication event

NOTE 1: Four DSC automated procedures are designed to process these. They are the receiving of distress DSC messages, the receiving of non-distress DSC messages, the sending of distress DSC alert attempts and the sending of non-distress DSC messages. In addition a fifth procedure is designed to handle non DSC communication events.

NOTE 2: These automated procedures are called:

- Received distress automated procedure.
- Sending distress automated procedure.
- Received non-distress automated procedure.
- Sending non-distress automated procedure.
- Communications automated procedure.

class H: handheld class intended to provide minimum facilities for VHF DSC distress, urgency and safety as well as routine calling and reception, not necessarily in full accordance with IMO GMDSS carriage requirements for VHF installations

NOTE: For handheld Class H VHF a reduced functionality is permitted compared to a fixed VHF class D.

critical errors: set of information characters obtained from one or more received DSC messages is considered to have critical errors if the automated procedure needs information characters from that set in order to proceed or perform any task, but the required information characters are in error

EXAMPLE: An acknowledgement cannot be composed to an individual DSC message that has errors in the sender's MMSI.

default: value selected or an action taken by the equipment software in the absence of any operator input

distress alert: name given to the single distress DSC message with the format symbol 112

distress alert attempt: set of distress alerts sent by a vessel when in distress

NOTE: A distress alert DSC message by itself is never intentionally sent by a vessel in distress. For example, the single frequency distress alert attempt consists of five consecutive distress alerts with no break in between each distress alert.

distress DSC message: DSC message or acknowledgement containing the distress information

distress event: unique distress situation identified by two parameters of the distress information; the MMSI of the vessel in distress and the nature of distress

distress information: symbols within a DSC message describing a distress situation consisting of the MMSI of the vessel in distress, the nature of distress, the position of the vessel in distress, the UTC time of that position and the mode of subsequent communication

engaged: equipment that is busy handling an automated procedure

factory default: default value that is set by the manufacturer such that the field or behaviour is defined prior to any operator intervention

information characters: set of symbols in a DSC message that contains the items of interest for the recipient and is used to compute the ECC symbol that terminates the message

NOTE: These symbols are repeated in the DX/RX time diversity pattern.

initial DSC message: DSC message that starts an automated procedure

non-distress DSC message: DSC messages or acknowledgements that do not have the format specifier or category of "distress"

objective: intent of the DSC message either to establish subsequent communications or request information

operator options: any choices the operator can make while the automated procedure is engaged

pertinent to the automated procedure: DSC messages that have something to do with the procedure and are therefore 'handled' by the procedure

NOTE: A DSC message is pertinent to an automated procedure if the set of information characters in the DSC message has the correct values.

pertinent to the station: any DSC message that would start an automated procedure if the transceiver were in standby

self-terminating alarm: short alarm that stops by itself without operator intervention

NOTE: The purpose of this alarm is to inform the operator that a DSC message is received but it does not require his immediate attention.

standby: state of the operational unit when it is not in one of the procedures but is still able to receive DSC calls

symbol (as part of the DSC sentence): 7 binary bits of a 10 bit DSC word that have the information content

top level: items, buttons, or functions are present and visible without requiring any action by the operator (such as scrolling, opening up menus, or removing any obscuring covers, etc.)

two-tone alarm: alarm consisting of a repetition of the 2 200 Hz frequency for 250 ms followed by a 1 300 Hz frequency for 250 ms

NOTE: This alarm is used for the initiation of the received distress DSC automated procedure. The characteristics of this alarm are fixed.

urgency alarm: alarm consisting of a repetition of the 2 200 Hz frequency for 250 ms followed by 250 ms period of silence

NOTE: This alarm is used for the initiation of the received non-distress DSC automated procedure when the category of the initiating DSC message is "urgency". The characteristics of this alarm are fixed.

word (as part of the DSC sentence): 10 binary bits that make up the coded entities of a transmitted DSC message

NOTE: The 10 bits consist of a 7 bit "symbol" that gives the information content and 3 bit error check that gives the number of 0 binary bits in the 7 bit symbol.

3.2 Symbols

Void.

3.3 Abbreviations

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

ACK	ACKnowledgement
CH	Channel

DSC	Digital Selective Calling
ECC	Error Check Character
EPIRB	Emergency Position Indicating Radio Beacon
EUT	Equipment Under Test
GMDSS	Global Maritime Distress and Safety System
GNSS	Global Navigation Satellite System
HF	High Frequency
ITU	International Telecommunications Union
ITU-R	ITU - Radiocommunications Sector
MF	Medium Frequency
MMS	Maritime Mobile Service
MMSI	Maritime Mobile Service Identity
RT	Radio Telephony
TX	Transmit
UTC	Universal Time Co-ordinated
VHF	Very High Frequency

4 Controls and Indicators in handheld Class H DSC Equipment

4.1 Visual indication

4.1.0 General

Any visual display of the information content shall be clearly legible under all ambient light conditions.

4.1.1 Primary DSC alphanumeric display

4.1.1.0 General Requirements

The display characters shall have a minimum height of 2 mm, and a nominal character width/height ratio of 0,7.

The display shall have a minimum of 12 characters per line and a minimum of 32 characters total.

Any displayed information shall be static. Horizontal scrolling techniques are not permitted (see clause 4.1.2).

The display shall be capable of:

- prompting the operator if an incorrect operation is attempted;
- displaying error messages;
- displaying incoming and logged calls in plain language;
- displaying all the user programmable information content of a DSC call.

4.1.1.1 Additional display information

Additional display characters or symbols shall be capable of:

- showing the functions and options currently available;
- displaying that unread received DSC calls are present in memory;
- displaying other visual alarms;
- displaying whether the position and time information is automatically entered or manually entered.

There shall be additional display characters and symbols as required for displaying channel designator and other radio parameters.

Where logic flows and procedural guidance, expressed by graphical symbols, have an advantage over text, this shall be allowed. Any graphical symbols shall be clearly defined in the operation manual.

4.1.2 Handling visual information

In case all information, or user options, required for the active automated procedure, cannot be contained on a single screen, means shall be available to inform the user:

a) that more information is available;

b) how to select the relevant information not yet displayed, e.g. by means of a next button or info key.

5 Technical requirements

5.1 Facilities for DSC transmission and reception

5.1.1 GNSS receiver

A GNSS receiver shall be integrated into the equipment.

5.1.2 CH:70 receiver

The equipment shall be able to continuously monitor CH:70 at any time the transmitter is not active.

5.2 Facilities for coding and decoding of DSC

5.2.1 Call functions

The facilities for coding and composition of calls shall be so arranged that it is possible for the operator quickly and precisely to enter a call. The types of DSC calls provided in this equipment are specified in clause 5.2.4.

The CALL functions shall permit selection of the following functions:

- INDIVIDUAL: for making a call to a specific MMSI.
- GROUP: for making a call to a specific Group MMSI.
- ALL SHIPS: for making all ships calls where this option is available.
- RECEIVED CALLS: for retrieving stored incoming DSC calls.
- OTHER: for equipment housekeeping functions.

If INDIVIDUAL is selected, either a MANUAL call (see clause 5.2.2) or a DIRECTORY call shall be selected. The DIRECTORY list shall have a facility for at least 10 entries. Their MMSIs shall be programmable.

5.2.2 INDIVIDUAL calls

The INDIVIDUAL call facility shall permit either the MANUAL entry of a MMSI or the selection of a station from the DIRECTORY list. If the called station is a coast station (i.e. MMSI commencing 00) no further information shall be requested from the operator. If the called station is a ship station the equipment shall request input of a channel number. The equipment shall assist the operator by suggesting a suitable inter-ship channel as defined in appendix 18 of the Radio Regulations [1] (see also annex B).

5.2.3 ALL SHIPS calls

Where the option to transmit ALL SHIPS is available then it shall only be able to select ALL SHIPS calls by means of deliberate actions, such as two levels of menu instructions.

The operator shall be able to select either Urgency or Safety category and the equipment shall propose the default subsequent working channel of 16 (the operator shall have the option to change the working channel).

5.2.4 DSC call functionality

The following DSC calls shall be available in the equipment.

Table 1

CALL TYPE	Tx	Rx	Format specifier	Notes
Distress alert	Y	Y	112	TX: All natures of distress except "EPIRB"
Distress acknowledgement	#	Y	116	
Distress relay ACK DROBOSE to Group	#	Y	114	
All ships RT call	N	Y	116	Urgency (110) and Safety (108) only
All ships Duplex RT call	#	O	116	These are FULL duplex calls. Urgency (110) and Safety (108) only
Individual RT call	N	Y	120	Urgency (110) and Safety (108) only
Individual RT call acknowledgement	Y	N	120	Urgency (110) and Safety (108) only
Individual RT call acknowledgement "unable to comply"	Y	N	120	Urgency (110) and Safety (108) only
Individual test call	Y	Y	120	Safety (108) only
Individual test call acknowledgement	Y	Y	120	Safety (108) only
Routine group call RT	Y	Y	114	
Routine individual RT call	Y	Y	120	
Routine individual RT ACK	Y	Y	120	
Position request	N	Y	120	Safety (108) only
Position request ACK	Y	N	120	Safety (108) only
Distress Alert Cancel	Y	Y	112	This is the "self-addressed" distress ACK
NOTE: Handling of MoB Calls is not applicable to class H DSC equipment.				

If any other calls, not listed in table 1, are implemented in the device, they shall comply with tables 4.1 to 4.10.2 of Recommendation ITU-R M.493-15 [2]. Individual routine category polling and position calls from previous versions of Recommendation ITU-R M.493 may be implemented for the sake of reverse compatibility.

- Call types marked Y shall be available in the equipment.
- Call types marked N are not required.
- Call types marked # shall not be available in the equipment.
- Call types marked opt are optional.
- Call types marked o.1 are optional but if used then all calls marked o.1 shall be available.

6 Automated and Non-Automated Procedure Requirements in handheld Class H DSC Equipment

6.1 Introduction

This clause covers the minimum level of software automation, operational simplicity, and interface consistency requirements for handheld class H Digital Selective Calling equipment.

Where requirements in this clause are not fully aligned with those of ETSI EN 300 338-1 [i.2] then the requirement of the present document take precedence.

Perhaps the most important issue concerns an implied expectation for the use of the terminology "automated procedure" as used in the present document to appear in the user interface. The terminology "automated procedure" describes the set of algorithms that are used to encapsulate all the activities necessary to perform DSC, and non DSC communication events. The operator does not need to know anything about the existence of automated procedures in order to operate a radio that makes use of these algorithms. Though the present document refers to items such as the "Sending Distress Automated Procedure" such language shall not appear on the user interface of the equipment.

The primary purpose of DSC signalling is to provide the means to set-up subsequent communications between vessels and/or coast stations. A call may be considered as being the total duration from the start of the DSC signalling until the end of the subsequent communications, and the automated procedure is terminated.

The operational functionality described in the present document has the objective of not disturbing any ongoing call. Furthermore, the equipment shall assist the operator by providing simple audible indication of a received DSC call whilst the equipment is engaged and if that received DSC call is of a higher priority than the call in progress then the equipment shall be capable of displaying the information of this new call.

6.2 Non-automated features

6.2.1 DSC Message Composition

The equipment shall provide factory default values for all non-distress DSC messages as specified in Recommendation ITU-R M.493-15 [2], annex 3 and summarized in figure A.1 for all parameters where the operator has the option to select or enter more than one value and has not already done so.

The default values for the operator-composed distress alert shall be the default distress alert as specified in the sent distress automated procedure.

A destination MMSI that does not have at least 9 digits entered is invalid.

No DSC message shall be able to be sent that has an invalid parameter.

For simplicity of the user interface:

a) the DSC message composition interface shall be such that the operator needs no user manual to initiate the desired DSC message;

b) parameter descriptions and terms shall be provided in plain language;

c) all parameters of the DSC message that do not require an operator choice shall be entered automatically;

d) guidance and/or prompting shall be provided for the entry of any necessary parameters of the DSC message if these parameters and/or their values are not plainly visible from context or on the display.

For data entry:

a) the equipment shall only allow the operator to compose and send DSC messages that are compliant with clause 5.2.4;

b) acknowledgements shall be automatically composed by the equipment and user options for these acknowledgements are provided by the automated procedures;

c) the equipment shall provide an automatic determination of the channel and or frequencies of subsequent communication according to the algorithm given in Recommendation ITU-R M.493-15 [2], annex 3 and summarized in annex B.

The automated channel selection shall be able to be overridden.

It shall not be possible to select a distress channel for subsequent communications for DSC messages of priority routine.

The equipment shall automatically set the dot pattern length to 20 bits for all transmitted DSC messages.

6.2.2 Transmission of DSC messages and prioritized wait

If the channel is free the transmission shall begin immediately. If the channel is not free, and the DSC message is a distress alert, the alert shall be transmitted as soon as the channel becomes free or after 1 s, whichever occurs first. (The 1 s value is approximate average duration of a VHF DSC message). For all other DSC messages, the equipment shall wait for the channel to become free and then the equipment shall delay transmission of the DSC message for a specified wait time.

The specified wait time shall depend upon the message type and priority. Distress DSC messages (except for alerts), urgency, safety, routine and test DSC messages shall wait one, two, three, and four "fixed" units of time plus a random addition described below, respectively, before attempting to transmit. Transmission occurs if and only if the channel is still free after this wait time has elapsed, otherwise the process is repeated.

The fixed "unit" of time shall be 50 ms. The randomly generated component shall be some positive integer with resolution in milliseconds between zero and the fixed interval. The randomly generated part of the wait time shall be recomputed for every transmission attempt.

6.2.3 Alarms

Alarms shall have both a visual and aural component.

Any alarm that initiates for the purpose of getting the operator's attention shall provide the reason for and means to terminate the alarm.

Alarms shall be initiated for the reasons given in table C.1.

The means to terminate the alarms are given in table C.1.

The "two-tone" and "urgency-sound" alarms shall not be able to be disabled.

Those aural alarms are given by table C.2.

Alarms for other calls are specified in clause C.4.

6.3 Standby

NOTE: Standby is the state of the equipment when it is not engaged in a communications or DSC automated procedure.

The following functions and or information shall be available to the operator at top level while in standby:

a) the dedicated distress button;

b) a clearly labelled means to compose/send a non-distress DSC message.

The following functions and or information shall be accessible to the operator via a maximum of two menu layers:

a) the station MMSI;

b) the latest (enhanced) position of the vessel;

c) the UTC time of that position;

d) a clearly labelled means to compose a distress alert prior to sending.

The following configuration options for acknowledgements and timers shall be available with the following factory defaults:

a) the option to auto acknowledge test DSC messages: set to on;

b) the option to auto acknowledge individually addressed, non-distress DSC messages: set to off (see clause 6.7.7);

c) the option to set the no activity timeout to exit any non-automated procedure activity to some value that includes no timeout: set to 10 min;

d) the option to set the no activity timeout of non-distress DSC automated procedures to some value that includes no timeout: set to 15 min;

e) the option to set the no activity timeout of received distress DSC automated procedures to some value that includes no timeout: set to no timeout;

f) that there is no option to set any timeout of the unacknowledged sending distress automated procedure;

g) the option to set the no activity timeout of communications automated procedures to some value in the range [10 s to 10 min]: set 30 s;

h) the option to auto acknowledge position request DSC messages: set to off.

A record of the DSC activity shall be available containing the following information which shall be able to be displayed:

a) The UTC time of reception and date (if available).

b) The information content of the DSC message.

c) A minimum of the twenty most recently received DSC distress alert attempts and DSC messages with the category "distress". DSC alerts received within a period of 5 s shall be considered part of the same distress alert attempt. The information characters assimilated by the automated procedure handling the distress alerts shall be the recorded information characters. In other words, if any errors in the information characters of a received alert are corrected by the reception of other alerts within the attempt, only the corrected version shall be recorded.

d) A minimum of the twenty most recently sent DSC messages, where a distress alert attempt is recorded as a single message.

e) A minimum of the twenty most recently received non-distress DSC messages.

6.4 Sending distress automated procedure

6.4.1 Procedure

The sending distress automated procedure results when the operator presses the dedicated distress button to send a distress alert attempt. An informative schematic of the outline automated procedure is given in figure 1.

For handheld class H the equipment shall allow for the possibility that it has been placed in a position where a GNSS fix was not possible. For this reason, sending a distress alert will include the time necessary for a GNSS fix to be obtained.

If there is no current GNSS valid data when the distress alert is initiated then:

- The equipment shall display that it is waiting for a GNSS position (typically 15 s) and as soon as this new fix is obtained then the alert shall be transmitted.
- If no GNSS position fix is made then the equipment will check if the last GNSS data in memory is less than 4 hours old and the alert shall be transmitted with the position data from memory.
- If there is no position data in memory less than 4 hours old the distress alert shall be transmitted using the default values given in Recommendation ITU-R M.493-15 [2], clauses 8.1.2.4 and 8.1.3.3.

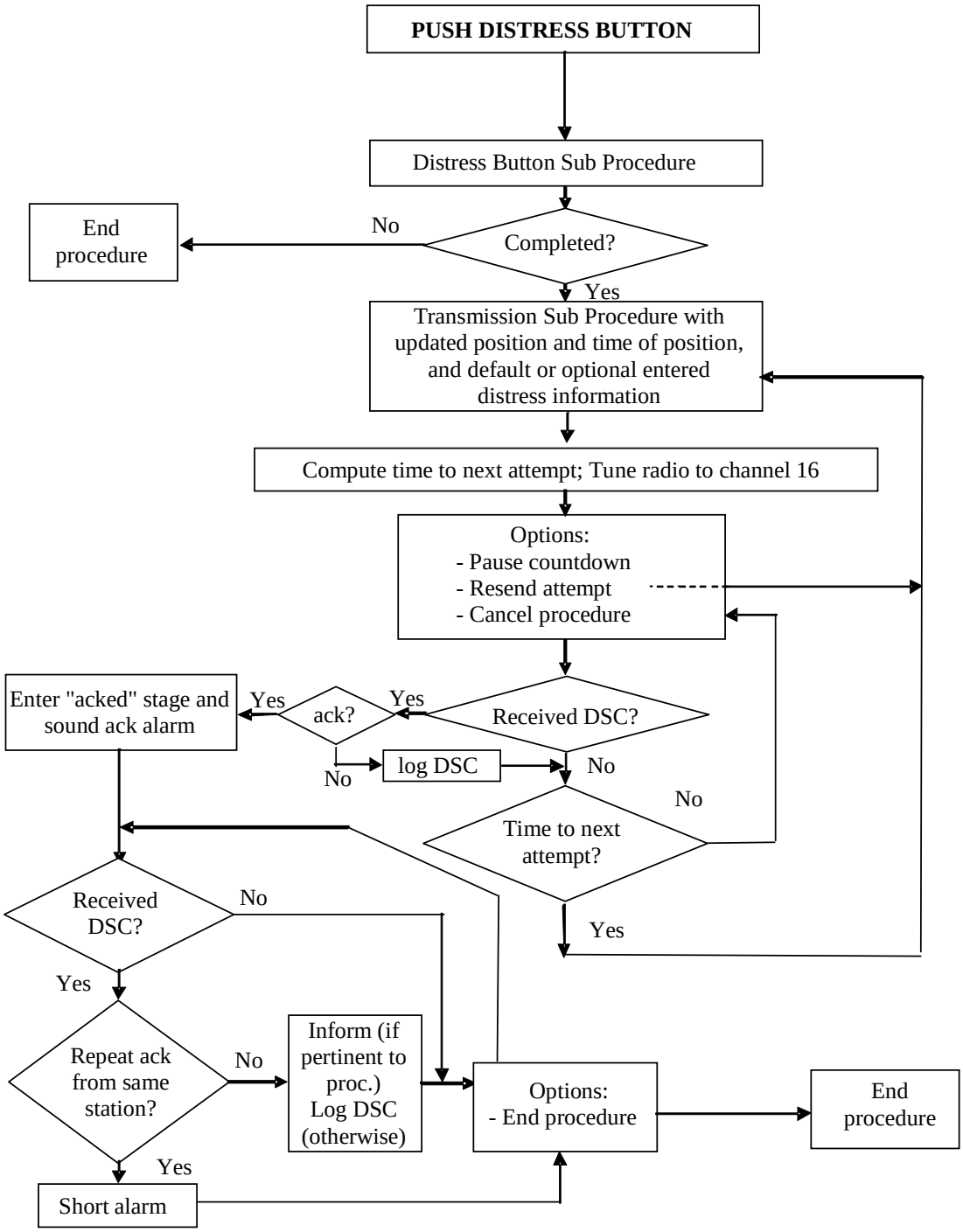


Figure 1: Sending distress procedure

6.4.2 Tasks

The radio shall follow the sending distress automated procedure as shown in figure 1.

The sending distress automated procedure shall handle the following events:

a) the distress button sub procedure;

b) prior to this procedure being acknowledged:

1) the transmission of the alert attempt;

2) calculating the time to an automated resending of the attempt (random, between 3,5 min and 4,5 min);

3) waiting for the reception of a distress alert acknowledgement;

4) logging all other received DSC messages assuring they do not disrupt the procedure;

5) retransmission of the alert attempt occurs after the calculated resend timer expires 2);

6) providing the valid operator options which are:

i) pausing the automatic re-transmission of alerts;

ii) resending the alert attempt, with the last entered other parameters, using the dedicated DISTRESS button;

iii) cancelling the alert attempt;

c) after reception of the acknowledgement:

1) stopping the automatic resending of the alert attempt;

2) log received DSC messages not pertinent to the procedure in the appropriate call log;

3) providing the valid operator options which are:

i) terminating the automated procedure.

6.4.3 Display

6.4.3.0 General Display Requirements

During the sending distress automated procedure the radio shall display the following items and/or information as appropriate at top level:

a) the fact one is engaged in sending a distress;

b) the distress information;

c) a warning before the automated resending of the attempt in case engaged in traffic;

d) the MMSI of the sender of the distress acknowledgement;

e) the sub-stages of the procedure:

1) transmitting;

2) waiting for acknowledgement;

3) alert acknowledged; and

f) the valid operator options.

During the sending distress automated procedure the radio shall make the following items and/or information accessible to the operator from top level:

a) the time remaining to the next automated resending of the attempt (prior to acknowledgement);

b) the elapsed time since receiving the distress alert acknowledgement (after acknowledgement).

6.4.3.1 Examples of sending distress procedure displays on handheld VHF equipment

In the following set of figures examples are shown of windows that could appear on a display screen during a sending distress automated procedure at various stages during the event. The first figure is what might appear after the operator holds down the dedicated distress button for 3 or more seconds. The second figure shows the window after the alert attempt has completed. The procedure is waiting for a distress alert acknowledgement and the radio is tuned for distress traffic on channel 16. The operator has several options; to cancel the alert, resend the alert before the auto-resend timeout, pause the countdown to the auto-resending, and to look at detailed information about the sent alert. The "info" shall contain, at minimum, the distress information. Note there is no option to "abort" the alert; the operator shall go through the cancel procedure. The third figure is 4 min later. There may have been voice traffic but no authority has acknowledged the alert. The next figure is 2 s later and now the EUT is warning the operator that the distress alert will be automatically resent in 9 s. The operator could press the pause button to stop the countdown (perhaps there is voice traffic) at which time the button would say "resume" or something like that. The fifth figure shows the retransmission of the alert and the sixth figure a short time later after the transmission has finished. Note the different time to the auto resend in the fifth figure. In the seventh figure the distress alert acknowledgement has been received. An alarm would sound that needs manual termination, and the text bar indicating the alarm information would likely flash or provide some other visual alarm signal. The eighth figure shows the acknowledged procedure. Note the operator options have changed and the procedure is still tuned for distress traffic. At this point, the DSC phase has accomplished its purpose and linked the vessel in distress to assistance/authorities. Until the procedure is terminated, the procedure remains.

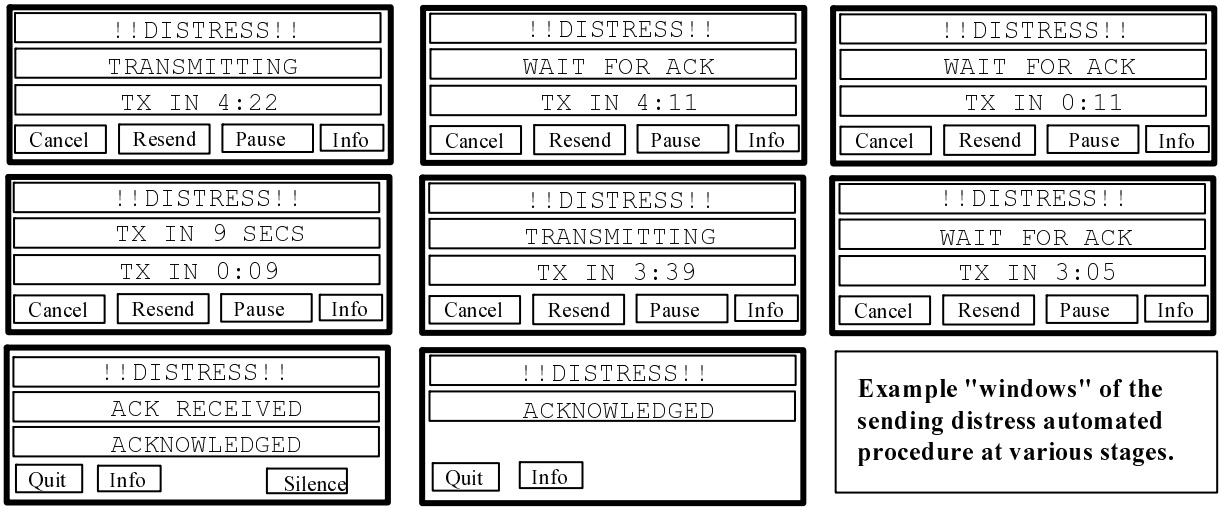


Figure 2

Note that the above examples are only examples. They show one means of providing the **minimum** required information. The layout, method, and choice of text are up to the manufacturer.

6.4.4 Dedicated distress button sub procedure

The dedicated distress button shall be used for the following purposes in the following manner:

a) Use of the dedicated distress button is required to initiate the sending distress automated procedure.

b) The dedicated distress button shall be used exclusively for initiating the sending distress automated procedure.

c) Use of the dedicated distress button after entering parameters of the alert attempt via a menu or equivalent shall initiate the sending distress automated procedure with the alert attempt as composed by the operator.

d) Use of the dedicated distress button without entering parameters of the alert attempt via a menu or equivalent shall initiate the sending distress automated procedure with the default alert attempt. The default alert attempt is given by the following:

   1) undesignated nature of a distress;

   2) the latest position of the vessel;

3) the UTC time of that position;

4) radio telephone for subsequent communication.

Use of the dedicated distress button without entering parameters of the alert attempt via a menu or equivalent shall initiate the sending distress automated procedure with the default alert attempt regardless of the state of the radio, except when the radio is already engaged in the sending distress automated procedure.

The distress button sub procedure of the sending distress automated procedure shall be as follows:

a) lifting of the spring loaded lid or cover, permanently attached to the equipment by, for example, hinges. This is ACTION 1;

b) pressing and holding the distress button (ACTION 2) while:

i) displaying the seconds remaining to transmission of the attempt starting at three; and

ii) invoking an intermittent audio and intermittent visual alarm once each second;

c) if the distress button is released before the 3 s have elapsed stop the procedure (when releasing the button the radio shall return to its previous state);

d) when the 3 s have elapsed regardless of whether the button is continued to be held down or released completes ACTION 2 and the alert attempt is started;

e) sounding a steady tone of two-second duration after ACTION 2 has completed and displaying a visual indication that the distress alert attempt has been sent.

6.4.5 Transmission of the alert attempt

The transmission sub procedure of the sending distress automated procedure shall be as follows:

a) the transmission frequency is always channel 70;

b) the transmission starts;

c) the countdown to the next automated resending of the attempt is started;

d) if a distress acknowledgement is received then automatic resending of the alert shall be cancelled;

e) five alerts shall be sent without a break between alerts;

f) the extended position information shall be sent only on completion of the 5^{th} alert.

6.4.6 Updating position

When a distress alert attempt is resent, it shall update the position and UTC time of position information.

6.4.7 Handling received DSC Messages

Prior to acknowledgement of the sending distress automated procedure only the distress acknowledgement describing the same distress event is pertinent to the procedure. However, after transmission of a distress alert, the position request acknowledgment of that particular radio should be activated automatically and then stay active until reset by the user. The Position Request Acknowledgement should be sent automatically by the equipment if requested. All other DSC messages shall be ignored and only recorded in the log.

After the sending distress automated procedure has been acknowledged all DSC messages describing the same distress event are pertinent to the procedure and may be ignored. DSC messages not pertinent to the procedure shall be logged.

6.4.8 Alarms

The reception of the first distress alert acknowledgement pertinent to the procedure shall sound a distress acknowledgement alarm. Any subsequent acknowledgement shall only sound the self-terminating alarm.

6.4.9 Determining Subsequent communications

Always channel 16.

6.4.10 Automated tuning

Automatic tuning to channel 16 shall occur after transmission of the first distress alert attempt.

6.4.11 Cancelling the Distress Alert

6.4.11.0 General Requirements

The distress cancel procedure consists of the cancel operation. The cancel operation consists of a DSC cancel (a self-addressed distress alert acknowledgement) followed by a voice cancel on channel 16.

Cancellation of a distress alert shall only be possible prior to acknowledgement.

Selection of the cancellation option during the sending of a distress alert attempt shall stop the transmission as soon as possible but only after any ongoing distress alert within the distress alert attempt is completed.

The radio shall prompt the operator to confirm that a distress cancel is requested.

Upon selection of a cancel, the self-addressed distress alert acknowledgement shall be sent on channel 70. After the transmission of the self-addressed distress alert acknowledgement, the receiver and transmitter shall be automatically tuned to channel 16, and the operator shall be prompted to make the voice cancellation.

Completion of the cancellation shall place the sending distress automated procedure in the acknowledged state.

6.4.11.1 Examples of cancel-distress displays on VHF equipment

In the following set of figures examples are shown of windows that could appear on a display screen during a sending distress automated procedure when the cancel operation is done. The first figure shows the sent distress procedure after the transmission. The operator presses the cancel button. The second figure shows the warning with the requirement to the operator to confirm the cancel operation. The operator chooses to continue. The third figure shows the start option which requires the operator to reconfirm the cancel operation. The operator selects start. The fourth figure shows the DSC phase of the cancel (the self-addressed distress acknowledgement) which lasts only about 0,7 s on VHF. The fifth figure shows the start of the voice cancel which provides a brief explanation to the operator. The only choice is to proceed, and in the sixth figure the EUT provides the text of the voice cancel message that the operator can read. Upon completion of the voice cancel, the operator returns to the distress procedure in its acknowledged state. Note that the operator does have the option to repeat the procedure (perhaps instructed to do so by a coast station). That action would bring the operator back to the fourth figure. However, once the finish option is selected, no further DSC cancels can be sent. The seventh figure shows the return to the sending distress procedure, now in its acknowledged state. Further communications may continue.

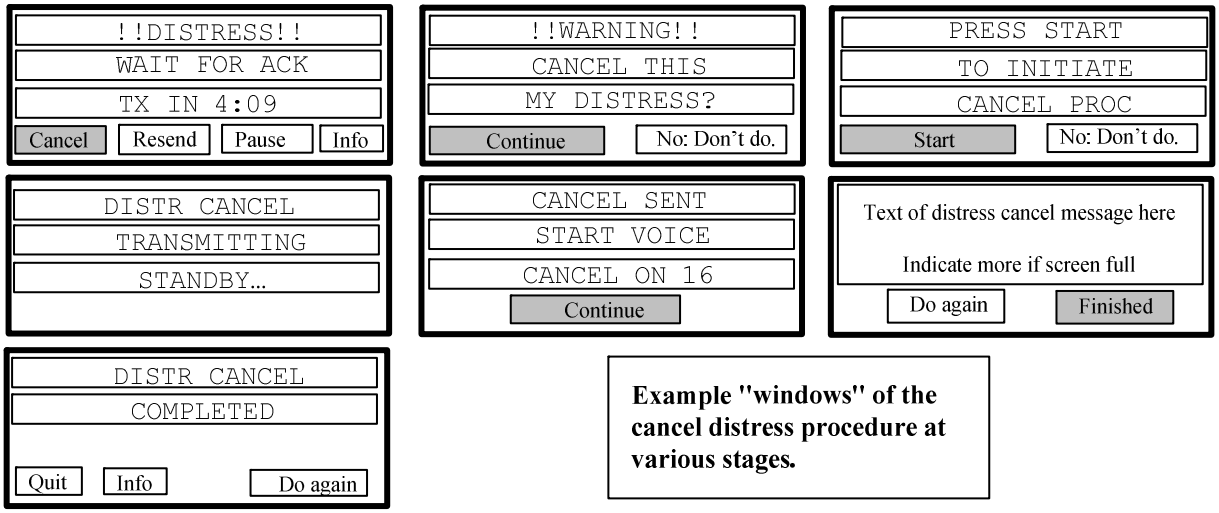


Figure 3

Note that the above examples are only examples. They show one means of providing the **minimum** required information. The layout, method, and choice of text are up to the manufacturer.

6.4.12 Acknowledgements

The procedure shall be considered acknowledged upon reception of the first distress alert acknowledgement concerning the same distress event.

6.4.13 Termination

Prior to acknowledgement the procedure cannot be terminated either by the operator or the equipment; it may only be cancelled as described in clause 6.4.11.

After acknowledgement, the procedure may only be terminated manually.

After a sending distress automated procedure the equipment should not automatically start displaying any new unread DSC messages from memory.

6.4.14 Warnings

The procedure shall provide warnings for incorrect entered parameters. The operator shall have the option to go back to the stage of the procedure where the action was taken that caused the warning.

6.5 Receiving distress automated procedure

6.5.1 Procedure

The receiving distress automated procedure is initiated by the reception of the first distress DSC message of a distress event. An informative schematic of the outline automated procedure is given in figure 4.

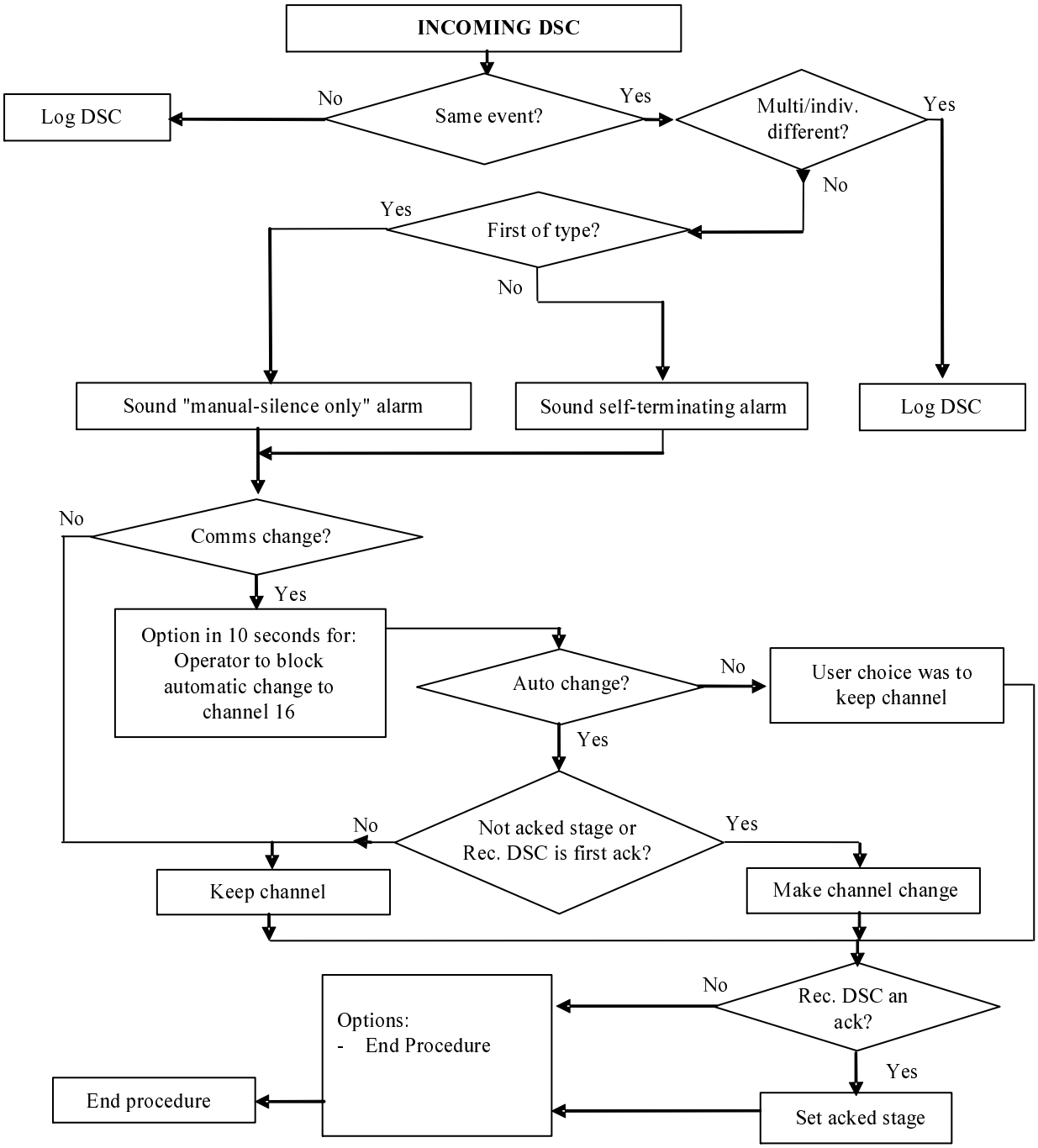


Figure 4: Receiving distress procedure

6.5.2 Tasks

The radio shall follow the received distress automated procedure as shown in figure 4.

The received distress automated procedure shall handle the following events:

a) the sounding of the appropriate alarms for DSC messages pertinent to the procedure;

b) logging all DSC messages pertinent to the station but not the procedure to the call log;

c) watching for the distress event acknowledgement or recognizing the self-cancel;

d) providing the operator with the option to end the procedure.

6.5.3 Display

6.5.3.0 General Display Requirements

During the received distress automated procedure the radio shall display or make available to the operator the following items and/or information:

a) the fact one is engaged in receiving a distress;

b) the elapsed time since the procedure started (prior to acknowledgement);

c) the elapsed time since acknowledgement (after acknowledgement);

d) the latest distress information (MMSI of vessel in distress, nature of distress, position, time of position);

e) the type (alert, relay, alert acknowledgement, relay acknowledgement), sender, and intended destination (individual, area, all ships) of the latest received DSC message;

f) at least a 10 s warning before any automated change in communications frequencies are invoked in case engaged in traffic;

g) displaying the valid user options;

h) the ability to display information about the history of at least the received DSC messages pertinent to the procedure;

i) and the sub-stages of the procedure which are:

   1) waiting for acknowledgement;

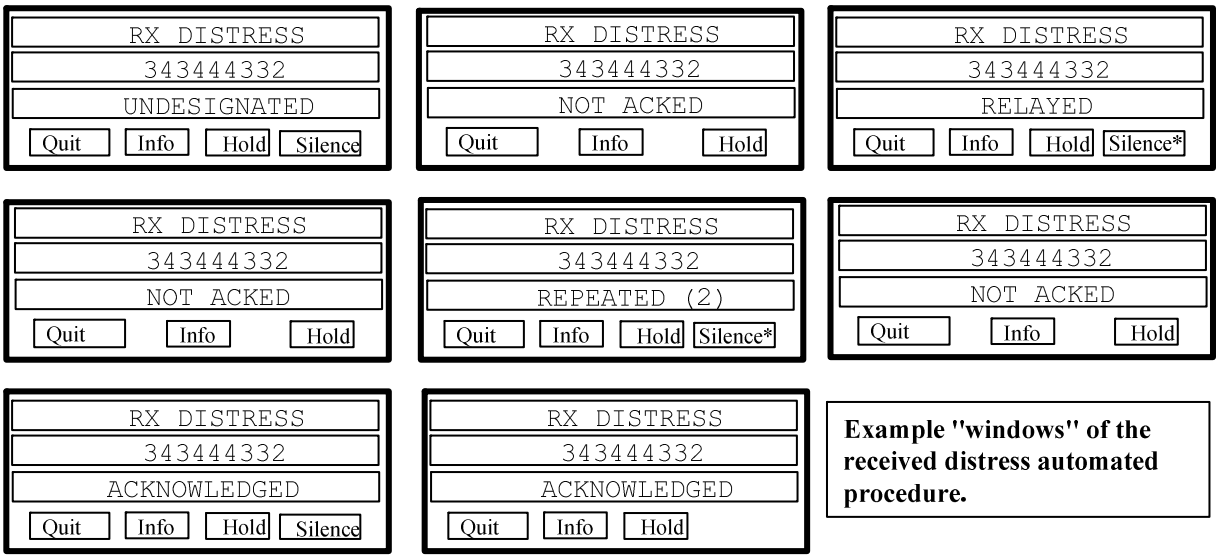
   2) cancelled;

   3) acknowledged.

At top level the elapsed time, the stage of the automated procedure, and operator options shall be displayed.

6.5.3.1 Examples of received distress procedure displays on VHF equipment

In the following set of figures examples are shown of windows that could appear on a display screen during a received distress automated procedure at various stages during the event. The first figure show the reception of the distress alert where the operator shall silence the two-tone alarm. The display concerning the alarm text should also be flashing or providing some type of visual alarm. The second figure shows the procedure after silencing the alarm. The radio is tuned to channel 16 (displayed on radio section of the display) and is open for traffic and the procedure is waiting for a distress alert acknowledgement. The third figure shows the reception of a distress relay concerning this distress event. An alarm sounds, but it is self-terminating. The message shall still provide a means to silence it and it shall flash or provide some type of visual alarm. The operator can press "info" to view the details of the latest received DSC message pertinent to this event. The fourth figure shows the procedure after the alarm terminates. The procedure is still waiting for the DSC acknowledgement and is still tuned to channel 16. The fifth figure shows the reception of a repeat distress alert attempt by the vessel in distress. This attempt could have happened automatically or been done by the operator on the vessel in distress. However, this time only the self-terminating alarm sounds. The sixth figure shows continuation of the procedure after the alarm terminates. The seventh figure shows the reception of the distress alert acknowledgement. This time the alarm shall be manually silenced. The eighth figure shows the received distress procedure upon silencing the alarm. The DSC phase is done. Note that the operator has the option to exit the procedure, place it on hold (optional), or get further information at any time during the event. The class H received distress procedure is much simpler than the class A/B equivalent by the fact that the class H operator has no DSC options.



NOTE: * This alarm self terminates in 1 s. After this the option shall disappear.

Figure 5

The above examples are only examples. They show one means of providing the **minimum** required information. The layout, method, and choice of text are up to the manufacturer.

6.5.4 Handling received DSC Messages

DSC messages pertinent to the station but not the procedure shall be automatically placed in the received call memory and is flagged as an "unread call in memory".

DSC messages that are pertinent to the procedure are all DSC messages concerning the same distress event. DSC messages from Class M (MoB) devices are always pertinent to the procedure. If the MMSI is unknown, DSC messages that are pertinent to the procedure are all DSC messages that have the same distress information (format specifier, nature of distress and subsequent communication - allow updated position and time). However, individually addressed DSC messages shall simply be logged if engaged in a received distress procedure handling multi-station (for example, all ships, area) addressed DSC messages or vice versa.

6.5.5 Alarms

In a given procedure, only the reception of the initial DSC message and the DSC message that first acknowledges the procedure shall sound an alarm unique to the DSC message type (with the two-tone sound reserved for the distress alert or relay if it initiates the procedure) which shall be manually silenced.

All subsequent examples of the DSC messages shall only sound the self-terminating alarm.

6.5.6 Determining Subsequent communications

Always channel 16.

6.5.7 Automated tuning

The tuning shall occur automatically upon reception of a distress DSC message in the following manner:

a) The operator shall have at least a 10 s warning before turning to channel 16.

b) The operator shall be able to pause the tuning in case engaged in traffic or accept the tuning.

c) Automatic tuning shall apply in the absence of any operator action.

d) If automatic channel change has been switched off, the radio shall remain on the current channel and prompt the user to accept the channel change. There shall be no change of channel until manually accepted.

6.5.8 Acknowledgements

The procedure handling all-ships distress DSC messages and distress alerts shall be considered acknowledged upon reception of the first distress alert acknowledgement or all ships distress relay acknowledgement.

A self-addressed distress alert acknowledgement sent by the vessel in distress shall be recognized as a self-cancel.

6.5.9 Termination

The procedure can be terminated manually or by the automated timeout. At least 10 s prior to automated termination, a visual and discrete aural warning shall be displayed with the option to stop the automatic termination.

Once the procedure is terminated either by the user or automatic timeout, the equipment will automatically display any unread messages in memory, starting with the message with the highest priority as indicated in clause 6.9.

If the procedure is terminated manually by the user then integrated equipment may revert to the channel that was previously selected before the DSC procedure.

6.5.10 Warnings

The procedure shall provide warnings for incorrect entered parameters. The operator shall have the option to go back to the stage of the procedure where the action was taken that caused the warning.

6.6 Sending non-distress automated procedure

6.6.1 Procedure

The sending non-distress automated procedure results when the operator selects to transmit a DSC message that does not contain the distress information. It also results when an acknowledgement to a sending non-distress automated procedure that has been prematurely terminated is received ("an acknowledgement one quit waiting for"). An informative schematic of the outline automated procedure is given in figure 6.

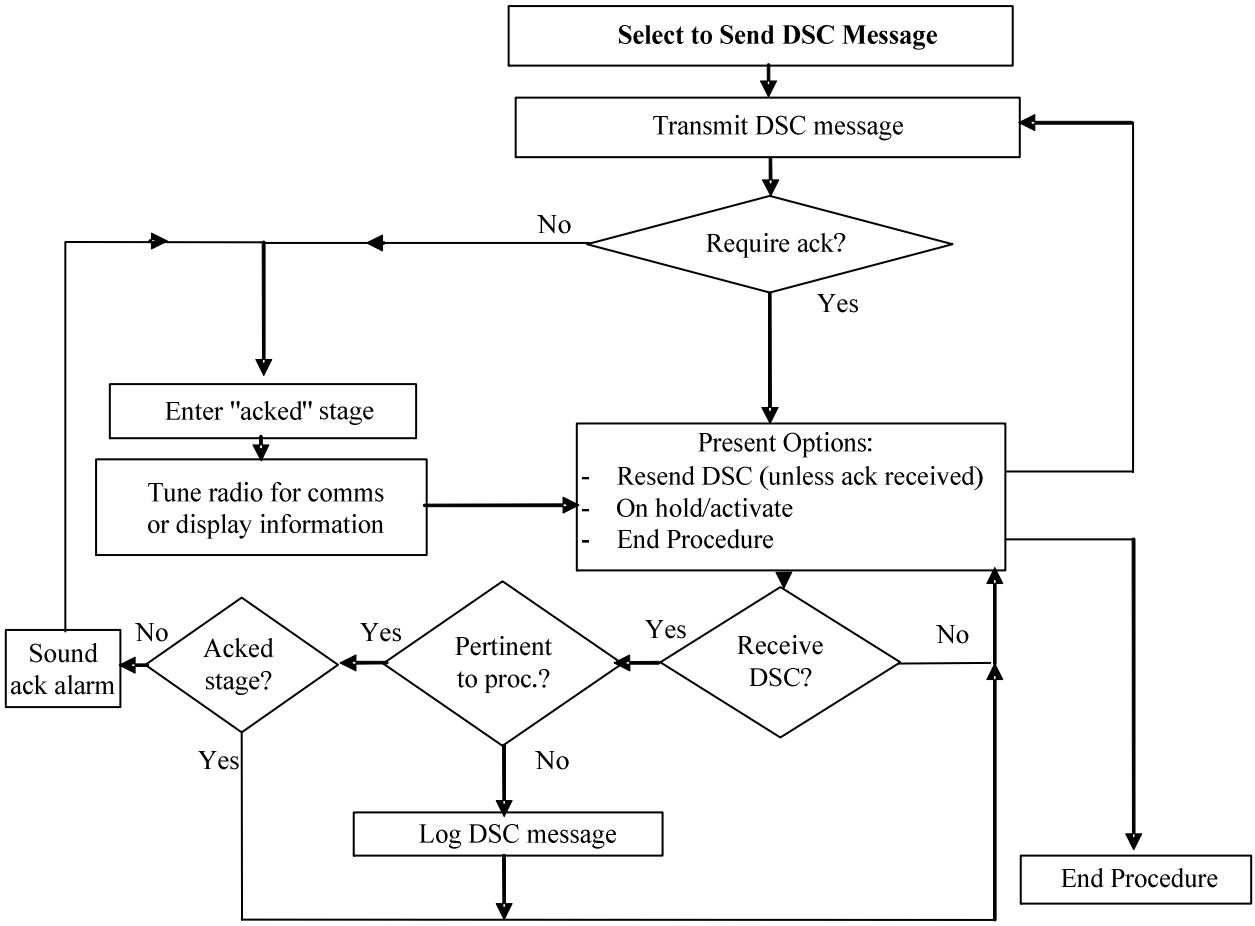


Figure 6: Sending non-distress automated procedure

6.6.2 Tasks

The radio shall follow the sending non-distress automated procedure as shown in figure 6.

The sending non-distress automated procedure shall handle the following events:

a) prior to acknowledgement:

1) the transmission of the composed/selected DSC message;

2) if the DSC message demands no acknowledgement setting the procedure to acknowledged;

3) if the DSC message demands an acknowledgement:

i) waiting for the acknowledgement and alarming when received;

ii) any received DSC message pertinent to the station but not the procedure shall be treated according to clauses 6.9.1 and 6.9.2;

iii) providing the valid operator options which are:

- resend the initial DSC message;

- terminate the procedure;

b) upon reception of an "able to comply" acknowledgement or being set to acknowledged:

1) tuning the receiver and transmitter to the frequency of subsequent communication or displaying the requested information;

2) ignoring any received DSC message pertinent to the procedure since it is a duplicate;

3) any received DSC message pertinent to the station but not pertinent to the procedure shall be treated according to clauses 6.9.1 and 6.9.2;

4) providing the valid operator options which are:

i) resend the initial DSC message if it requires no acknowledgement;

ii) terminate the procedure;

c) upon reception of an "Unable to comply" acknowledgement it shall display the reason given.

6.6.3 Display

6.6.3.0 General Display Requirements

During the sending non-distress automated procedure the radio shall display or make available to the operator the following items and/or information:

a) the fact one is engaged in sending a non-distress DSC message;

b) the elapsed time since sending the initial DSC message (prior to acknowledgement); or

c) the elapsed time since being acknowledged (once acknowledged or considered acknowledged);

d) the information content of the initial DSC message sent which is:

1) the type of DSC message (description);

2) the priority of the DSC message;

3) the destination;

4) the channel of subsequent communication if any;

5) whether or not the DSC message requires an acknowledgement;

e) if acknowledged, the information content of the acknowledgement which is:

1) the type of acknowledgement (description);

2) the priority of the DSC acknowledgement;

3) the sender;

4) to whom the DSC acknowledgement was sent;

5) the means of subsequent communication or the requested information;

6) if appropriate the frequency change or unable to comply and reason;

7) the frequencies of subsequent communication if any;

f) the valid operator options; and

g) the sub-stages of the procedure which are:

1) waiting for free channel;

2) transmitting;

3) waiting for acknowledgement;

4) linked for communications;

5) procedure done (no more to do).

At top level the elapsed time, the stage of the automated procedure, and operator options shall be displayed.

6.6.3.1 Examples of sending non-distress procedures displays on VHF equipment

In figure 7 is a set of example windows that could appear on a display screen during a sending non-distress procedure. The examples below show windows for a routine call, group call, and an urgency call.

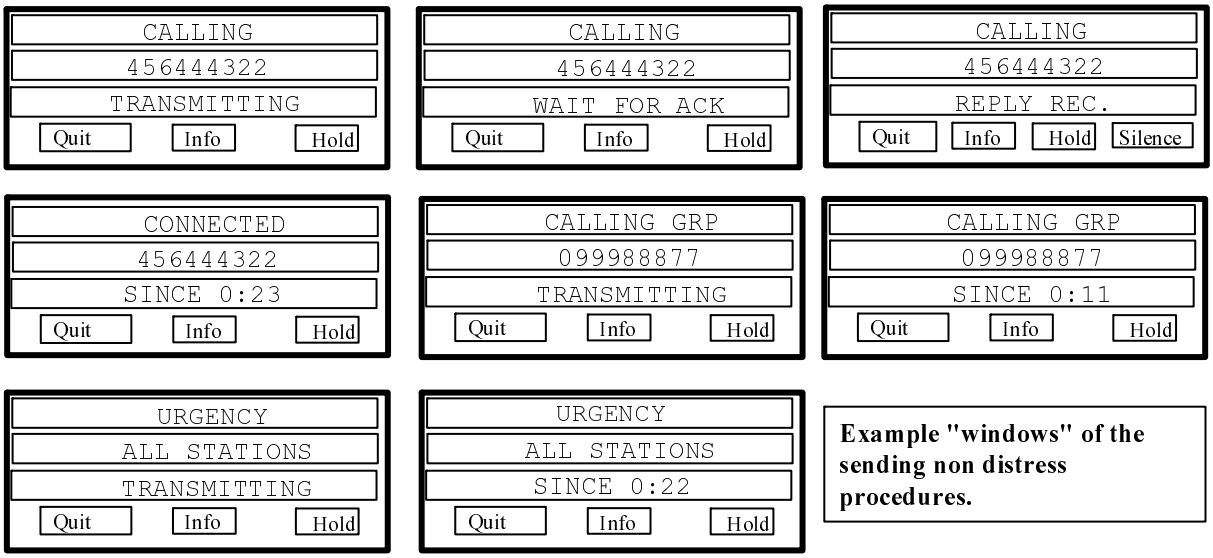


Figure 7

6.6.4 Handling received DSC Messages

Any received DSC message pertinent to the station but not pertinent to the procedure shall be treated according to clauses 6.9.1 and 6.9.2.

DSC messages that are pertinent to the procedure are acknowledgements to the initial DSC message.

6.6.5 Alarms

The reception of the first acknowledgement pertinent to the procedure shall sound the appropriate acknowledgement alarm as specified in tables C.1 and C.2.

Any subsequent acknowledgement may be ignored as only individually addressed non-distress DSC messages have acknowledgements.

6.6.6 Automated tuning

If the DSC message requires subsequent communications, the receiver and transmitter shall be tuned to the frequencies given in the acknowledgement upon reception of the "able to comply" acknowledgement.

If the acknowledgement received is "Unable to comply" the radio shall not tune to the originally proposed channel.

If the acknowledgement received is "able to comply" but proposes a new working channel that is not available the radio shall not tune to the proposed channel, but inform the operator that he has to make a new call request to the called station.

If no acknowledgement is required the transmitter shall be tuned to the frequency of subsequent communications given by the initial DSC message.

6.6.7 Delayed Acknowledgements

If an acknowledgement to a sending non-distress automated procedure is received after the procedure has been prematurely terminated, the automated procedure shall initiate itself recreating the initial DSC message based upon the acknowledgement. The procedure shall inform the operator that "an acknowledgement the equipment quit waiting for" has been received. If the acknowledging station responded with "Unable to comply" acknowledgement it shall display the reason given.

6.6.8 Termination

Termination is done manually or by the automated timeout. At least 10 s prior to automated termination, a visual and discrete aural warning shall be displayed with the option to stop the automatic termination.

Once the procedure is terminated either by the user or automatic timeout, the equipment will automatically display any unread messages in memory, starting with the message with the highest priority as indicated in clause 6.9.

If the procedure is terminated manually by the user then integrated equipment may revert to the channel that was previously selected before the DSC procedure.

6.6.9 Warnings

The procedure shall provide warnings for incorrect entered parameters. The operator shall have the option to go back to the stage of the procedure where the action was taken that caused the warning.

6.7 Receiving non-distress automated procedure

6.7.1 Procedure

The received non-distress automated procedure results when a DSC message is received that does not contain the distress information and is not an acknowledgement. An informative schematic of the outline automated procedure is given in figure 8.

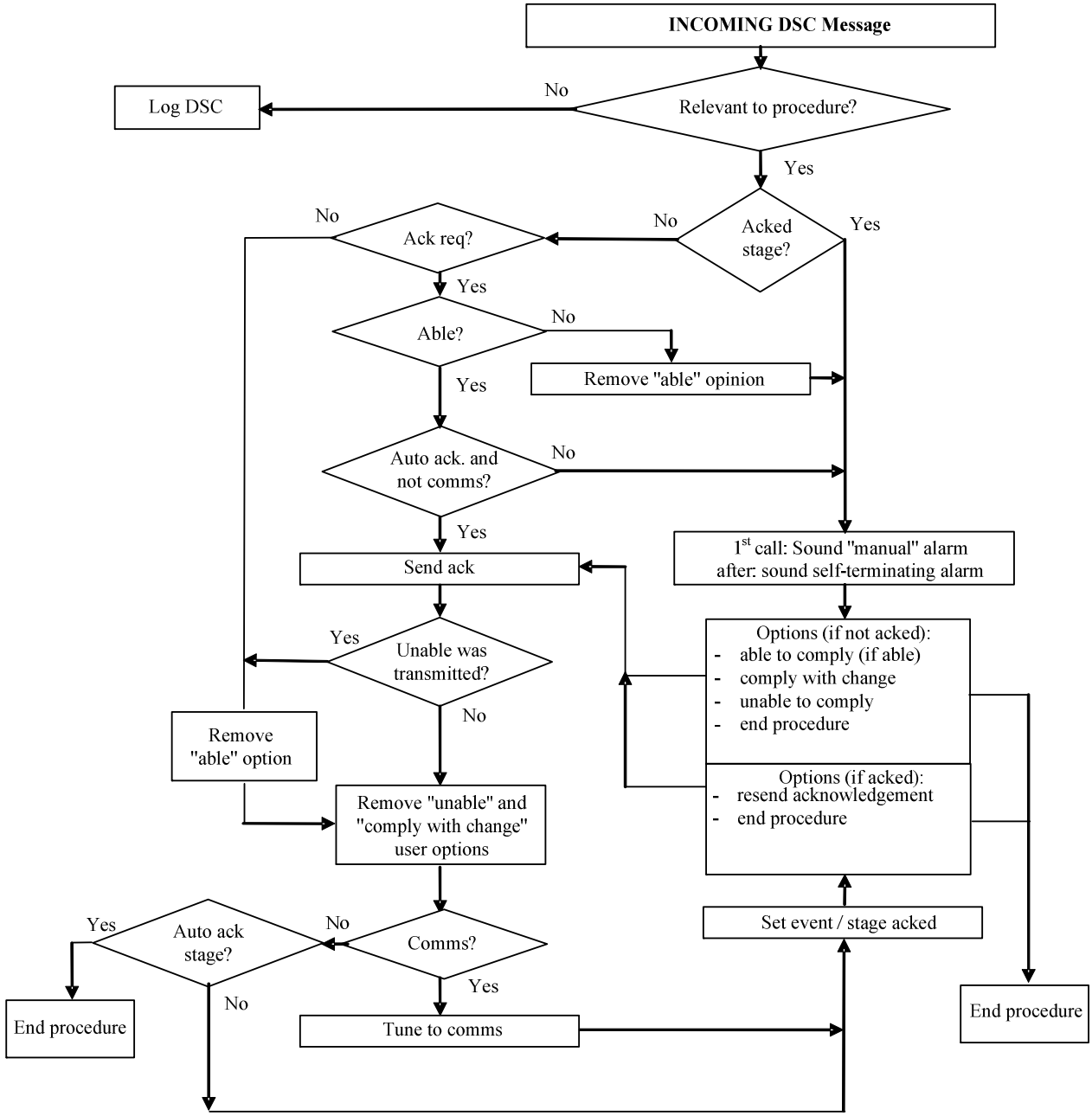


Figure 8: Receiving non-distress procedure

6.7.2 Tasks

The radio shall follow the received non-distress automated procedure as shown in figure 8.

The received non-distress automated procedure shall handle the following events:

a) sound the appropriate alarms at the appropriate times for DSC messages pertinent to the procedure;

b) received DSC messages pertinent to the station but not the procedure shall be treated according to clauses 6.9.1 and 6.9.2;

c) denote the procedure as acknowledged if the DSC message requires no acknowledgement;

d) provide and compose the acknowledgement options as dictated by the initial DSC message;

e) tune the receiver and transmitter to the frequencies of subsequent communications when and if required;

f) provide the operator with the option to:

1) prior to acknowledgement:

i) comply if able;

ii) comply with frequency change if there are communications;

iii) unable to comply;

iv) end the procedure;

2) after acknowledgement or being considered acknowledged:

i) resend the acknowledgement (after sending the first acknowledgement);

ii) end the procedure.

6.7.3 Display

6.7.3.0 General Display Requirements

During the received non-distress automated procedure the radio shall display or make available to the operator the following items and/or information:

a) the fact one is engaged in receiving a non-distress DSC message;

b) the elapsed time since the procedure started (prior to acknowledgement); or

c) the elapsed time since acknowledgement (after acknowledgement);

d) at least a 10 s warning before any automated change in communications frequencies are invoked in case engaged in traffic;

e) the information content of the received DSC message:

1) priority (category);

2) the sender;

3) to whom the DSC message was sent (format and MMSI);

4) means of subsequent communication or the requested or sent information;

5) frequencies of subsequent communication (if any);

6) whether or not the DSC message requires an acknowledgement;

f) the information content of any acknowledgement sent:

1) priority;

2) the destination;

3) the communication frequency, or unable to comply and reason; or info;

g) displaying the valid user options; and

h) the sub-stages of the procedure which are:

1) waiting to send acknowledgement;

2) transmitting;

3) acknowledged;

4) waiting for a free channel.

At top level the elapsed time, the stage of the automated procedure, and operator options shall be displayed.

6.7.3.1 Examples of receiving non-distress procedures displays on VHF equipment

In figure 9 is a set of example windows that could appear on a display screen during a received non-distress procedure. The examples below show windows for a received routine call, group call, and an urgency call.

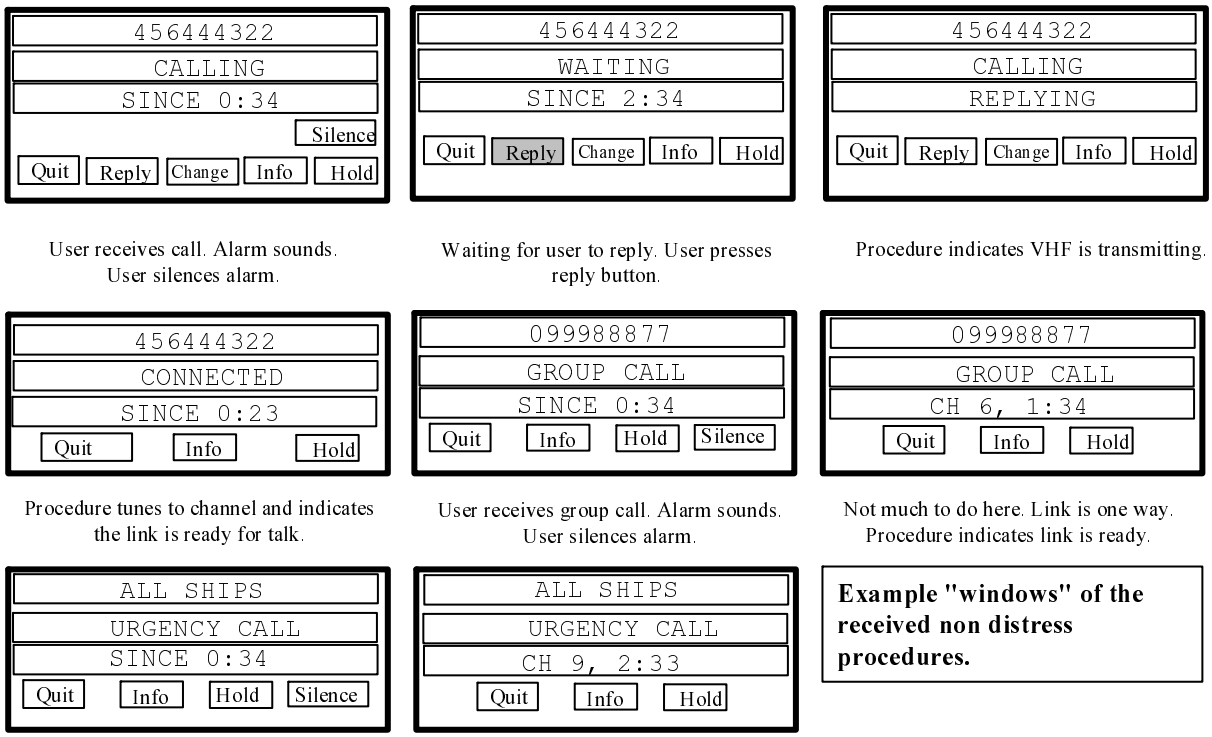


Figure 9

6.7.4 Handling received DSC messages

DSC messages pertinent to the station but not the procedure shall be treated according to clause 6.9.

DSC messages that are pertinent to the procedure are repeats of the initial DSC message.

6.7.5 Alarms

When auto acknowledging position, poll, and test DSC messages, no alarm shall sound.

When auto acknowledging is not involved, an alarm shall sound and be terminated as specified in tables C.1 and C.2.

All repeat initial DSC messages shall sound the self-terminating alarm.

6.7.6 Automated tuning

If the DSC message requires subsequent communications, the receiver and transmitter shall be tuned to the frequencies of the subsequent communications given in the acknowledgement if acknowledgements are requested. Otherwise the receiver shall be tuned to the frequency of subsequent communication given by the initial DSC message:

a) The operator shall have a 10 s warning prior to any tuning if the new subsequent frequency is different from the current.

b) The operator shall be able to pause the tuning in case engaged in traffic or accept the tuning.

c) If automatic channel change has been switched off, the radio shall remain on the current channel and prompt the user to accept the channel change. There shall be no change of channel until manually accepted.

6.7.7 Acknowledgements

Acknowledgement options shall only be provided if the initial DSC message requests an acknowledgement and the acknowledgement option is possible.

EXAMPLE: The "able to comply" option is not possible for an individually addressed DSC message requesting telephony but providing no subsequent communication frequency information.

Only the "comply with mode/frequency change" and "Unable to comply" options are possible.

In the case of a received individual call, the radio shall be capable of identifying if the requested working channel identified in the call is available in the equipment:

- If this channel is available the radio shall display the call details and compose an "able to comply" acknowledgement which shall only be transmitted manually. Switching to the channel identified shall only be performed after a manual "able to comply" acknowledgement has been transmitted.
- If this channel is not available the radio shall display the call details and compose an "unable to comply" acknowledgement with 104 as the first telecommand and 108 as the second telecommand. This acknowledgement may be automatic.

Any "unable to comply" acknowledgement other than that specified above shall be "no reason given".

The "able to comply" option shall only require a single action by the operator to respond. The operator shall not be required to compose any elements of this acknowledgement.

The "comply with channel change" option shall require that the operator be able to enter/select channels before sending. The operator shall not be required to compose any other elements of this acknowledgement.

If an acknowledgement is resent by the operator it shall be identical to the first acknowledgement. It shall not be possible to further edit the content.

6.7.8 Termination

When auto acknowledging position, poll, and test DSC messages, the procedure shall self-terminate after sending the acknowledgement.

When sending an "unable to comply" acknowledgement the procedure shall terminate after completing the transmission.

In all other cases, termination is done manually or by the automated timeout. At least 10 s prior to automated termination, a visual and discrete aural warning shall be displayed with the option to stop the automatic termination.

Once the procedure is terminated either by the user or automatic timeout, the equipment will automatically display any unread messages in memory, starting with the message with the highest priority as indicated in clause 6.9.

If the procedure is terminated manually by the user then integrated equipment may revert to the channel that was previously selected before the DSC procedure.

6.7.9 Warnings

The procedure shall provide warnings for incorrect entered parameters. The operator shall have the option to go back to the stage of the procedure where the action was taken that caused the warning.

6.8 Communications automated procedure

6.8.1 Procedure

The communications automated procedure results when the operator engages in communications established by non DSC means. The critical purpose of this simple procedure is to assure that received DSC messages do not interrupt ongoing communications in the same manner that they do not disrupt any of the ongoing automated procedures handling DSC messages.

The communications automated procedure results when:

i) the radio transmitter has been keyed from the standby condition;

ii) the receiver is activated by the reception of an appropriate signal; or

iii) a new receiver channel has been selected.

6.8.2 Tasks

The communications automated procedure shall handle the following events:

a) received DSC messages pertinent to the station shall be treated according to clauses 6.9.1 and 6.9.2;

b) tune the receiver and transmitter to the frequencies of communication;

c) provide the operator with the option to terminate the procedure.

6.8.3 Display

During the communications automated procedure the radio shall display or make available to the operator the following items and/or information:

a) the fact one is engaged in a communications procedure;

b) the VHF channel in use;

c) the operator options.

The following information shall be accessible to the operator via a maximum of two menu layers:

a) the station MMSI;

b) the latest position of the vessel;

c) the UTC time of that position.

6.8.4 Handling received DSC Messages

All received DSC messages pertinent to the station shall be treated according to clauses 6.9.1 and 6.9.2.

6.8.5 Tuning of the receiver and transmitter

The procedure shall automatically tune the receiver and transmitter to the frequencies of the selected channel.

6.8.6 Termination

The procedure may either be terminated manually or via an automatic timeout.

6.9 Handling incoming calls while the equipment is engaged

6.9.1 Procedure

This clause describes the handling of received DSC messages that are pertinent to the station while the radio is engaged.

6.9.2 Tasks

6.9.2.0 General

If the radio is engaged in handling an automated procedure, received DSC messages that are pertinent to the station but not the currently active automated procedure are handled as described in this clause.

The equipment may be designed with the option to handle a single background non-terminated automated procedure. Clauses 6.9.2.5 and 6.9.2.6 shall only apply to such equipment.

6.9.2.1 Higher priority calls

6.9.2.1.0 General

DSC calls are prioritized according to table 2.

Table 2: Priority of DSC calls

Priority	Call type
Highest	Own Distress Alert
	Other Distress message (most recent)
	Other Distress message (oldest)
	All Ship Distress Ack
	All Ship Distress Relay
	All Ship Distress category
	Individual Distress category
	All Ships Urgency
	Individual Urgency
	All Ships Safety
	Individual Safety
	Individual Routine
Lowest	Communication initiated by other means than DSC

If the equipment is engaged on a call and a DSC call is received with a higher priority than the current call the equipment will display the call information of the new call and present the operator with the following options:

a) accept the call; or

b) log the call.

A discrete audible alarm will sound. The radio will not change to any channel specified in the new call unless the operator manually accepts the new call.

6.9.2.1.1 Higher priority calls - acceptance

If the equipment is engaged, and the operator manually accepts this new higher priority call the equipment will:

a) abandon any current automated procedure, and engage in the new call; or

b) if the equipment is designed with the option to handle a background procedure, place the current automated procedure on hold and engage in the new call.

The equipment may then send any DSC response, or any acknowledgement, requested by this new call and select the channel for subsequent communications requested by this call.

6.9.2.1.2 Higher priority calls - non acceptance

If the equipment is engaged, and the operator does not manually accept this new higher priority call, then the new call is automatically placed in the received call memory and is flagged as an "unread call in memory" and the equipment shall not send any DSC response or acknowledgement requested by this new call.

6.9.2.2 Other calls

If the equipment is engaged, and a DSC call pertinent to the station is received with a lower or equal priority to the current call, then the equipment will not display the call information of the new call. The new call is automatically placed in the received call memory and is flagged as an "unread call in memory".

A discrete audible alarm will sound. A visual indicator for unread received calls is activated. The radio will not change to any channel specified in the new call.

If the equipment is designed with the option to handle a background procedure received calls that are pertinent to the background procedure may update the stage of that procedure without alerting the operator.

A discrete audible alarm will sound. A visual indicator is shown indicating the background procedure has been updated. The radio will not change to any channel specified by the procedures stage until the procedure is activated by the operator.

6.9.2.3 Termination of automated procedures

While the operator is engaged in an automated procedure (different from an unacknowledged sending distress procedure) he can chose to terminate the call. The mean shall be clearly identified (e.g. display guided button press).

6.9.2.4 Action after termination of an automated procedure

Once the operator has confirmed the termination of the current procedure as in clause 6.9.2.3 the equipment shall:

a) if no unread calls are stored in the memory, enter standby mode;

b) automatically display any unread calls in memory, starting with the call with the highest priority as indicated in table 2, thus initiating and activating the appropriate automated procedure from the stored information;

c) if the equipment is designed with the option to handle a background non-terminated automated procedure (optional), display the updated stage of the automated procedure:

   i) the operator shall now have the option to activate the displayed automated procedure; or

   ii) leave the displayed procedure in the list of non-terminated automated procedures on hold.

6.9.2.5 Putting automated procedures on hold (optional)

If the equipment is designed with the option to handle a background non-terminated automated procedure, it shall be possible for the operator to put the current active automated procedure on hold, by selecting e.g. "pause" or "hold". The user may also achieve this by accepting a higher priority call as described in clause 6.9.2.1.1.

6.9.2.6 Controlling non-terminated automated procedures (optional)

Only one automated procedure can be active at a time (since there is only one transmitter and receiver) thus any action to activate the background automated procedure on hold inactivates the currently active automated procedure - and vice versa.

A background automated procedure on hold shall not react to incoming calls unless accepted by the operator, either by accepting a higher priority call (clause 6.9.2.1.1) or terminate the current active procedure (clause 6.9.2.4) thus:

a) the only operator options which are available are those that do not require use of the transmitter or receiver such as to terminate or activate the automated procedure;

b) any subsequent tunings of the transmitter and receiver that would occur if the procedure were active upon reception of a DSC message appropriate to the procedure shall not occur until the procedure is activated by the operator;

c) the display of the background automated procedure on hold may be requested by a simple button press or selection, and may be represented by a labelled icon;

d) all other features, including handling of the alarms and full display of information at the request of the operator, remain.

The operator shall be able to activate the displayed background automated procedure on hold by a single action (a button press or selection) unless the currently active procedure is transmitting, thus recreating all information required for continuing the selected automated procedure (e.g. voice frequency).

If the only automated procedure present on the equipment is a background procedure on hold, and incoming or "unread calls" calls will initiate automated procedures handling test, polling, or position requests and these procedures are setup to auto acknowledge, the equipment shall successively perform the auto acknowledgement and terminate these procedures.

If the operator accepts a call that is not pertinent to the active procedure, and if the new call will initiate a new automated procedure, and if there is already a procedure in the background, the user shall be:given the following options:

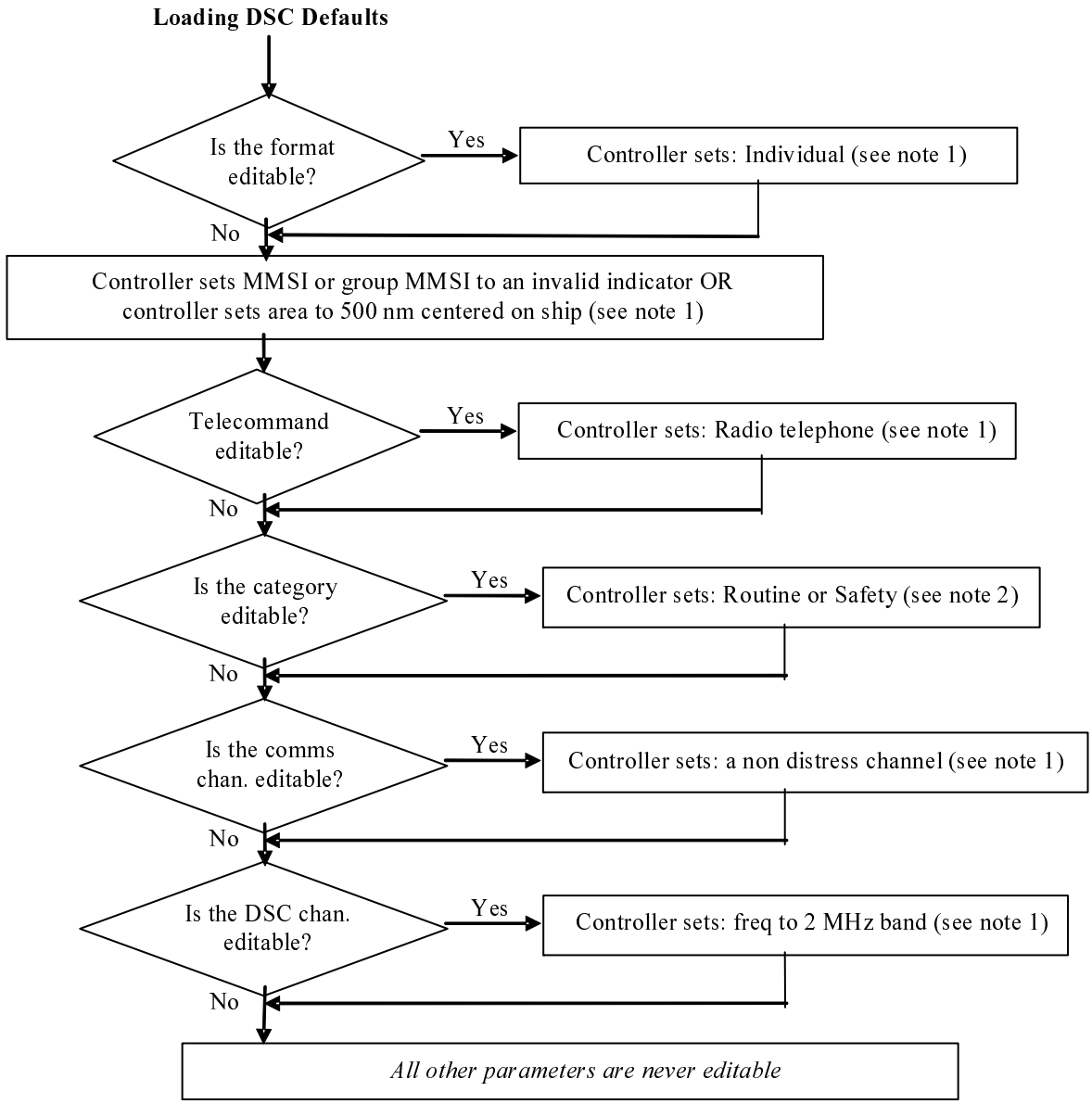
a) put the currently active procedure in the background and initiate the new automated procedure in foreground, hence ending the procedure currently parked in background;

b) cancel the acceptance and log the call as "unread call" in the call log.

Annex A (informative): DSC message composition

A.1 Default values

When default parameters are necessary, the factory default values may be as shown in figure A.1.



NOTE 1: Only if the parameter has not already been set by the operator.
NOTE 2: The default is "routine" if allowed (it is not allowed for area or all ships messages), otherwise the default is "safety". This default is to be reset (the most recently entered value will be overwritten) when the operator selects the option to compose a non-distress DSC message at some later time.

Figure A.1: Loading DSC defaults

Annex B (normative): Automated non-distress channel selection algorithm

Automated subsequent communications channel selection provides a default channel for the operator for non-distress DSC messages requiring subsequent communications based upon a simple algorithm. It shall be applied in the absence of any other specialized means of an automated communication setup:

a) Channel 16 shall not be used as a default for routine category DSC messages.

b) If the DSC message is directed toward a ship station, a simplex channel shall be used (for example channel 6).

c) DSC messages directed toward a coast station shall let the coast station decide (position or all 126's in the frequency parameters of the DSC message).

d) DSC messages directed to a group (area) or all ships shall use the broadcast mode (126's for the TX channel in the frequency parameters of the DSC message).

e) Due to the regional nature of VHF, the actual channel number for each vessel may be established as an operator set up option.

The automated channel/frequency selection shall be able to be overridden (which will be necessary to select a distress channel for subsequent communications).

Annex C (normative): Alarms

C.1 Alarm specifications

Table C.1 summarizes the alarm characteristics required by the radio. The "**Event**" is the reason for the alarm. The "**sound**" specifies the default audio character of the alarm whose detailed characteristics are specified in table C.2. The "**increase**" specifies whether or not the alarm shall increase in volume over the first 10 s. The "**shutdown**" specifies whether the alarm shall be terminated manually (man), may be silenced automatically (auto), or automatically if the situation causing the alarm is corrected (corr). Manual silencing of alarms is always an option. The "**when aural required**" column specifies the conditions under which the aural alarm is mandatory.

In the event that an alarm is not cancelled manually then automatic cancellation shall take place after 2 min. It is assumed in table C.1 that any references to received DSC messages refer only to messages implicitly or explicitly addressed to the station.

Table C.1: Alarm characteristics

Event	Sound	Increase	Shutdown	When aural is required
Initiating a received distress automated procedure (see note 1)	Two-tone	Yes	Man	Only if within 500 nm of the vessel in distress or if from north of 70ºN or south of 70ºS otherwise alarm self-terminates
Acknowledging a received distress automated procedure (see note 1)	Distress ack	No	Man	Only if within 500 nm of the vessel in distress or if from north of 70ºN or south of 70ºS otherwise alarm self-terminates
Acknowledging a sent distress automated procedure (see note 1)	Distress ack	No	Man	Always
rx DSC message not pertinent to unacknowledged sent distress automated procedure	Silence	Does Not Apply	Does Not Apply	DSC message is only logged, no alarm of any type is required
Initiating a received urgency non-distress automated procedure	Urgency alarm	Yes	Man	Always when the priority of the non-distress DSC message is (distress - see note 2) or urgency
Acknowledging a sent urgency non-distress automated procedure	Urgency ack alarm	No	Man	Always when the priority of the non-distress DSC message is (distress - see note 2) or urgency
Initiating all other priority non-distress automated procedures (see note 1)	Routine alarm	Yes	Auto	When the priority of the non-distress DSC message is safety, routine, ships business, or unknown
Acknowledging all other priority sent non-distress automated procedures	Routine ack alarm	No	Auto	When the priority of the non-distress DSC message is safety, routine, ships business, or unknown
rx DSC message pertinent to an ongoing automated procedure	Self-terminating alarm	No	Auto	Always
Auto termination of procedures; too many procedures	Discrete	No	Auto	Always
No own MMSI	Warning	No	Auto	Only on equipment power up
Automatic positioning ceases	Warning	No	Man / corr	Only if configured for auto position updating and info has not been received for 10 min
Position older than 4 hours	Warning	No	Man	At all times the situation is satisfied

Event	Sound	Increase	Shutdown	When aural is required
Position older than 23,5 hours	Warning	No	Man	Only if older than 4 hours alarm has been silenced
Pressing the dedicated distress button	Count	No	____	At all times the situation is satisfied
NOTE 1: Only when the event occurs due to the reception of a DSC message. NOTE 2: The "distress priority" has been a source of great confusion. It is not a distress alert but a non-distress DSC message with the priority "distress" which is no longer allowed in the latest version of Recommendation ITU-R M.493-15 [2]. The distress priority non-distress DSC message has no distress information, is sent as a single DSC message on a single frequency, and all subsequent communication information is given explicitly in the message. Like any other non-distress DSC message in the old recommendation, it could be addressed to an individual, a group, an area, or all ships and have one of several possible telecommands.				

C.2 Alarming with critical errors

If an automated procedure is initiated by a DSC message with critical errors (errors in the information symbols such that the procedure cannot take any action such as generating acknowledgements) the alarm shall self-terminate. The sound of the alarm shall be that it would have had if the DSC message were received without critical errors. The alarm specified in table C.1 (perhaps requiring manual termination) shall be delayed until that time the reception of subsequent or repeat DSC messages allows the procedure to correct the critical errors.

C.3 Default alarm sounds

The accuracy of the tones and durations specified in the table are not critical since they are for the human ear and not electronic detection. Nevertheless, the error shall not be more than 5 % in frequency and time. The waveforms may be sinusoidal, square, triangular, sawtooth, or any other form as long as the fundamental tone is clearly recognizable.

The two-tone and "urgency" alarms of table C.2 shall initially be of a power that is clearly distinguishable, but not interfere with, radiotelephone communications. If not manually cancelled within 10 s, the power shall start to rise to a level of at least 80 dB(A) within the next 10 s at a distance of 0,5 m from the equipment.

The "count" alarm of table C.2 shall have a power level of at least 80 dB(A) at a distance of 0,5 m from the equipment.

All other alarms (clause C.4) shall be of an audio level (or of a final level when appropriate) that is clearly distinguishable, but not interfere with, radiotelephone communications.

The operator shall be unable to neither customize the two-tone, distress acknowledgement, urgency and urgency acknowledgement alarms of table C.2 nor use these alarms for other purposes. Alarms for other purposes are specified in clause C.4.

Table C.2: Non-configurable alarm sounds

Fixed Alarm sounds	Frequency (Hz) Tone 1	Frequency (Hz) Tone 2	Duration (ms) Tone 1	Duration (ms) Tone 2
Two-tone (see note)	2 200	1 300	250	250
Distress ack (see note)	2 200	1 300	500	500
Urgency (see note)	2 200	Silence	250	250
Urgency ack (see note)	2 200	Silence	500	500
Count	2 000	Silence	500	500
NOTE: The two-tone, distress ack, urgency, and urgency ack alarms shall not be able to be customized. These alarms are continuously repeated until manually terminated.				

C.4 Recommended alarm sounds

The manufacturer may implement alarm sounds for the following events:

- Routine calls and routine acknowledgement calls.
- Safety calls and safety acknowledgement calls.
- Warnings.
- Discrete alarms.
- Self-terminating alarms.

Alarms may be repeated as long as it is pertinent to the procedure, and awaiting user interaction (unhandled).

It is recommended the alarms are selected within an audible frequency range of 300 Hz to 3 300 kHz.

The manufacturer is encouraged to implement an option to disable alarms, except from those defined in table C.2.

History

Document history		
V1.1.1	February 2011	Publication
V1.2.1	February 2017	Publication
V1.3.0	October 2019	EN Approval Procedure AP 20191231: 2019-10-02 to 2019-12-31