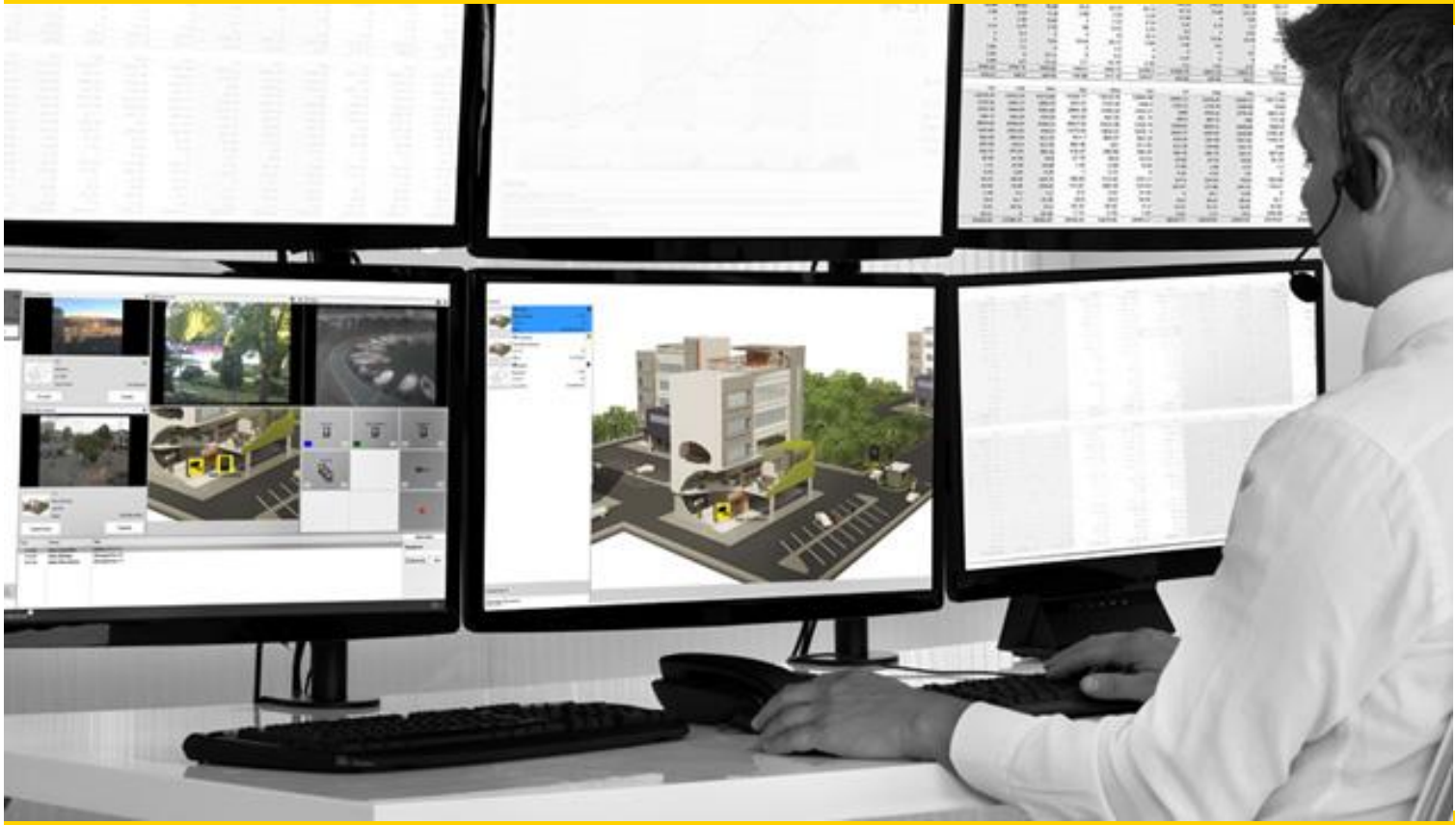
VINGTOR STENTOFON
by ZENITEL GROUP



CTB-10 & CTB-20 Command Talk-Back System

Installation & User Manual

Contents

1 Introduction

1.1 Document Scope

This manual supplies an engineer with the information required to install and commission a CTB system and the end-user with all necessary instructions for operating the CTB system.
Refer to Service Manual for maintenance and repair.
The manual can also be used as a guideline for designing and planning the system.

1.2 Related Documents

The following related documents are available:

- Single-line and connections drawing in AutoCAD format
- Declaration of Conformity doc. no. DC CTB 20040601 SH

1.3 Publication Log

Revision	Issued	Changes / Comments
00	2001.09.04	First issue, User & Technical Manual
01	2004.10.21	Second release, name changed to Installation & user manual
Draft II	2005.09.26	For approval
02	2006.06.12	Third release to meet requirement from Det Norske Veritas (DNV)
02.1	2006.12.20	Replaced drawing CTB_cc3 Rev.04 with CTB_cc3 Rev.05
A100K10865	2010.08.27	New front and back page. Doc. no. CTB_iu Rev.02.1 is replaced by this document no.
3	2018.10.16	Proofread and revised with Vingtor-Stentofon template

1.4 Requirements

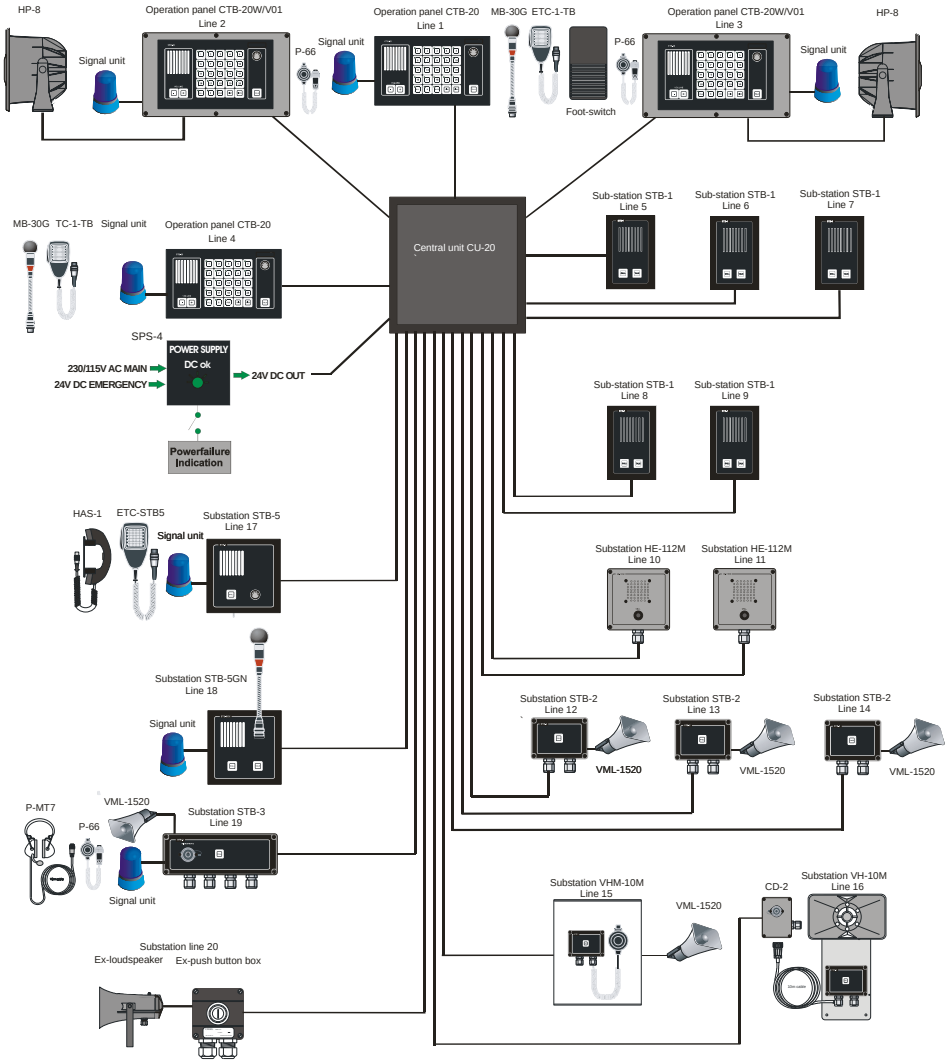
The CTB system and its components have been tested according to the following regulations:

- IEC 60533: Second edition, 1999; *«Electrical and electronic installation in ships – Electromagnetic compatibility».*
- IEC 60945: Fourth edition, 2002; *«Maritime navigation and radio communication equipment and systems - General requirements - Methods of testing and required test results».*
- IACS E10: Corr. 1 July 2003; *«Unified environmental test specification – Testing procedure for electric control and monitoring , safety and protection, on board computer based systems and peripherals, loading instruments, internal communication and other electrical equipment as considered appropriate».*
- Compliance with DNV ship requirements - Main Class Cargo Ship Vessels for two-way voice communication. Ref. B100 , 101, 102, 103 ,104.
  Ref. Section 2.4.19, Section 3.2.4 and 3.2.6, Section 3.4, 3.8.1 and 3.13 in this manual.
- Compliance with DNV ship requirements C500 Nautical safety for two-way voice communication, as a Talk-Back System.
  Ref. Section 2.4.13,and 2.4.19, Section 3.2.4 and 3.2.6, Section 3.4, 3.8.1 and 3.13 in this manual.

2 System Overview

2.1 Introduction

The Command Talk-Back System CTB is specially designed for use in rough marine environments, and is available in 10 and 20 line versions.
The CTB system consist of a central unit, CU-10 or CU-20, with up to 4 operation panels for use on bridge consoles, bridge wings, engine control room, etc. and a comprehensive range of substations and field equipment for use indoor, outdoor, and in noisy areas.
The system includes many features and can operate together with a PA system for increased functionality and fields of operation.



2.2 Features

- 10 or 20 line selection
- 4 Operation panels
- Gooseneck or handheld microphone.
- Parallel Communication.
- All Call / Group Call facility
- Access to external PA system
- AUX / Alarm input
- Signal oscillator
- Dimmable panel background light
- Step volume control
- Output for extra signal device for all substation lines
- Output for external loudspeaker
- Input for external microphone.
- Dimension panels H:144 x W: 240 x 100
- Power 22 - 32 V DC
- Cover requirement for DNV rule C500 Nautical Safety

2.3 Optional Equipment

Central Units & Microphones.

CU-10	Central unit 10 line 24V DC
CU-20	Central unit 20 line 24V DC
CTB-10	Operation panel, 10 lines
CTB-20	Operation panel, 20 lines
CTB-10W / V01	Operation panel, 10 lines, weatherproof. Bulkhead mounting only. Including external loudspeaker HP-8.
CTB-20W / V01	Operation panel, 20 lines, weatherproof. Bulkhead mounting only. Including external loudspeaker HP-8.
HP-8	Horn loudspeaker, part of CTB-10W V01 and CTB-20W V01
VMT-603	All Call station WT, for wall mounting
MB-30G	Gooseneck Microphone with plug for CTB-10 & 20
ETC-1-TB	Hand microphone with curled cord and plug for CTB-10 & 20
P-66	Hand microphone with curled cord and plug, WP
P-66/10	Hand microphone with 10mtr. Cable and plug, WP

Substations & Other Equipment

STB-1	Substation indoor wall mounted with call and answer button.
STB-2	Call box WP wall mounted for use together with VML-1520.
STB-3	WP Combined call-plug box w/ relay unit wall mount for headset, loudspeaker and extra signal device,
PMT-7	Portable headset w/10mtr. Cable and plug for STB-3
VML-1520	Horn loudspeaker 15W 20ohm IP-65
STB-5	Flush mounted substation w/ relay, for mic. or handset
STB-5GN	Flush mounted substation w/ relay, and gooseneck microphone
HAS-1	Handset for STB-5
ETC-STB5	Hand microphone with curled cord and plug for STB-5.
VH-10M	Portable deck loudspeaker with callbox and 10M cable and plug.
CD-2	Plugbox for VH-10M
VHM-10	Special deck unit with hand microphone mounted in cabinet.
HE-112M	Outdoor loudspeaker with call button WP IP-66
NEBB-42EX	Call box, Ex-approved

Bridge Wing Equipment & Microphones

STB-6	Flush mounted substation for handmic.
STB-6GN	Flush mounted substation w/gooseneck mic.
SB-4	WP Plug box for portable microphone, headset and loudspeaker, wall mounted.
P-66	Hand microphone with curled cord and plug, WP
P-66/10	Hand microphone with 10mtr. Cable and plug, WP

Additional Equipment

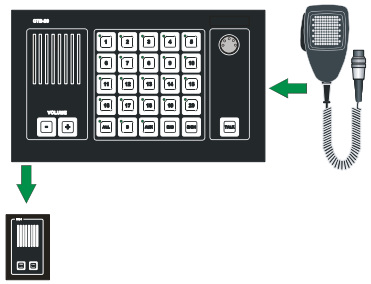
WBOKS	Wall mounted box for CTB-10/20
STBOKS5	Wall mounted box for STB-5 and STB-5GN
STBOKS	Wall mounted box for STB-6 ad STB-6GN
VML-1520	Horn loudspeaker 15W 20 ohm IP-66
SPS-4	Power supply 115/230V AC 24V DC w/ automatic switchover relay.
BLK5-24	Flash beacon 24V AC/DC 5 Joule IP65
EHS-24	Rotary light 24V DC IP54
A-100	Electronic alarm horn 24V DC – IP55 – 100dB
U2410	Footswitch for hands free operation

2.4 Functions & User Facilities

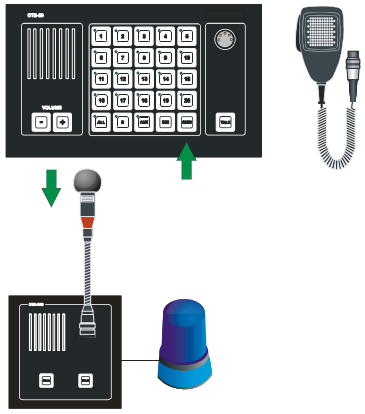
2.4.1 General

The CTB system consists of 1 central unit (CU-10 or CU-20), 1 to 4 operation panels and 1 to 20 substations. On systems with more than 1 operation panel, each panel takes up one substation line. The system has one speech channel and the use of one operation panel will be indicated in other operation panels. The operation panels follow a priority hierarchy of 1 to 4, meaning that operation panels with higher priority can override operation panels with lower priority. The functions of peration panels CTB-10 & CTB-10W_V01 with 10-line selection, and CTB-20 & CTB-20W_V01 with 20-line selection are described below. CTB-20 is used in the example.

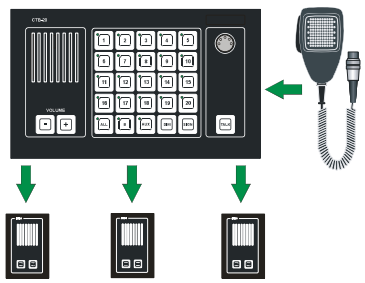
2.4.2 Line Selection / Single Call

	1 - 10 (20) substations or other operation panels can be selected from any operation panel by pressing respective line button. Indicated with steady green light in LED. (Light emitting diode)

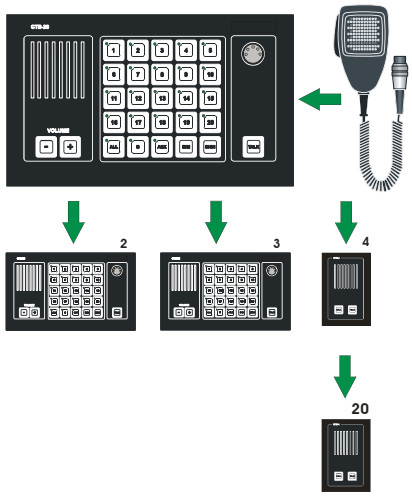
2.4.3 Signal and Extra Signal Device for Substations

	A call signal can be given to selected station. The function will also activate an 24VDC max 50mA to substation with relay or direct connected external signal device

2.4.4 Group Call

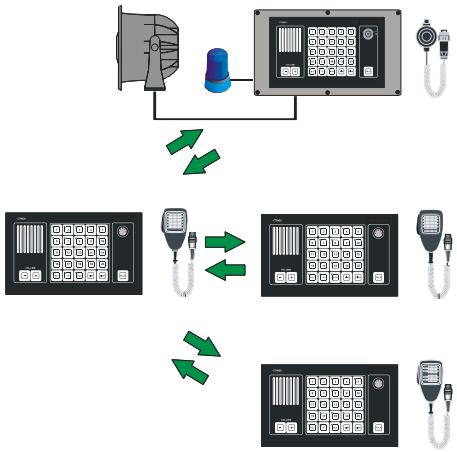
	Group of substations or other operation panels can be selected by pressing respective number of line buttons. Indicated with steady green LED.

2.4.5 All Call



All Call message can be distributed from any operation panel to all substations and other operation panels.
All Call message will also activate external Public Address System if connection is set up.
Indicated with steady green LED in the «ALL» push button.

2.4.6 Calls from and between Operation Panels

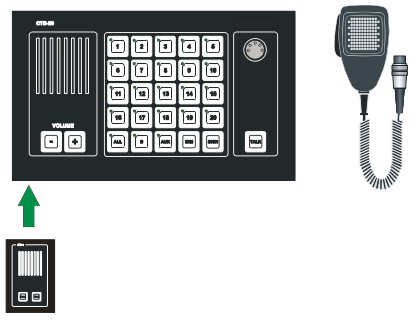


Up to 4 operation panels can be connected.
Calls can be made from any operation panel to substations.
Moreover, calls can be made from any operation panel to another by pressing respective line button.
At this stage, the called operation panel acts as a substation.
The system have one speech channel. Operation from one operation panel will be indicated in other operation panels.

Priority:
The operation panels follows a priority hierarchy 1 to 4, that means operation panels with higher priority can override operation panels with lower priority.
Operation panel 1 has highest priority.
It is a standard setting. Using DIP switches in the central unit the priority can be changed. (See section 3.5)

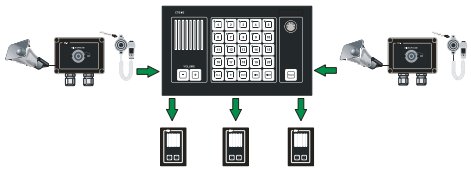
Type of panels:
CTB-10 Operation panel 10 line selection, indoor use.
CTB-10W/V01 Operation panel 10-line selection, WP.
CTB-20 Operation panel 20 line selection, indoor use.
CTB-20W/V01 Operation panel 20-line selection, WP.

2.4.7 Call from Substations



Calls from a substation can be received in operation panels that is set receive calls.
Indicated with flashing green light in LED in respective line.

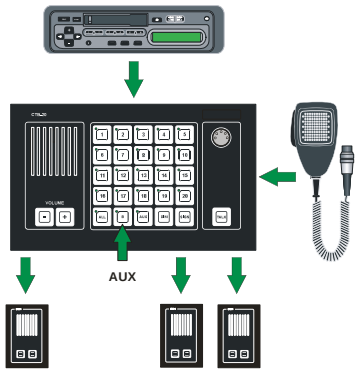
2.4.8 Parallel Communication



Function with operation from parallel microphone / loudspeaker located on bridge wings, or other locations where parallel microphone / loudspeaker needed.

Note! Line selection have to be set up from the operation panel.

2.4.9 AUX Function



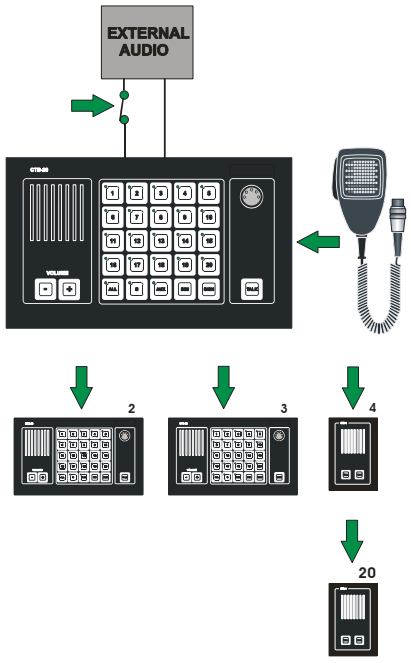
External entertainment, message or alarm can be distributed through the CTB system by using push button switch “AUX” together with line selection switches.
0dB signal from the external system connected to the CTB system will be addressed to selected substations.

The TALK button on operation panels or PTT button on hand microphone will override the AUX to giving an All Call message.

External system can be:

- VHF radio System
- Entertainment system.

2.4.10 Audio from External System



Alarm (or any audio) from external system can be distributed through the CTB system.
A potential free contact and 0dB signal from the external system activate the CTB and the message will be addressed to all substations and operation panels.

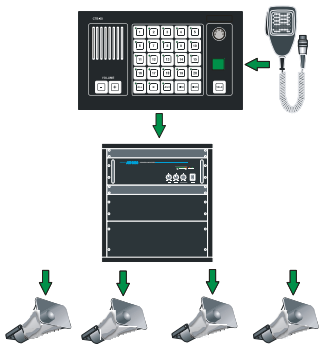
The talk button on the operation panel or PTT button on hand microphone will override the external audio.
Normal talk back functions cannot be used in this mode.

External system can be:

- Alarm system.
- External Public Address System.

Note! Only the operator of the external system can switch of the external audio.

2.4.11 Public Address Operation of External System

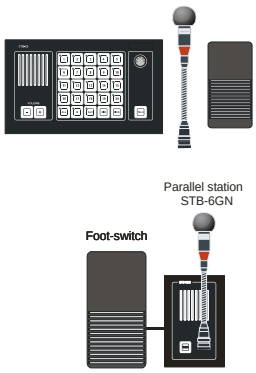


The four last line push buttons on the operation panels can be set to access external Public Address system. Up to 4 zones.

CTB-10 & CTB-10W_V01: Push button marked 7-8-9-10
CTB-20 & CTB-20W_V01: Push button marked 17-18-19-20

Note! Other operation panels with higher priority can override the PA-message.

2.4.12 Hands-free Operation

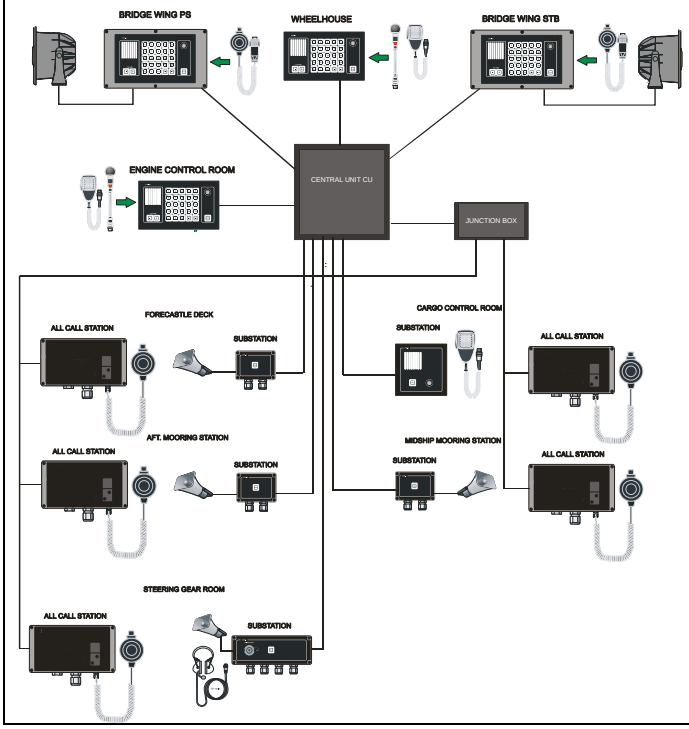


Hands free operation of operation panel or parallel station.

Option 1
Operation panel with gooseneck microphone MB-30G and footswitch U2410.

Option 2
Parallel station type STB-6GN with gooseneck microphone MB-30G and footswitch U2410.

2.4.13 Two-Way Voice Communication - Nautical Safety



Configuration to meet requirement for hands free two-way voice communication according to DNV rules for C500 Nautical Safety.

Following locations has operation panels with All Call:

- Bridge wings
- Wheelhouse
- Engine control room

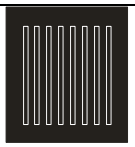
Following locations has substations and additional All Call stations:

- Forecastle deck (fore mooring station)
- Aft mooring station
- Midship mooring station
- Steering gear room
- Cargo control room

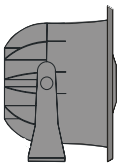
2.4.14 Privacy Function - Substation STB-1

	Substation STB-1 is designed for indoor use e.g. cabins, mess room etc., and prepared with privacy function. It means that listening is not possible in the central unit from STB-1. After a call is set up from the central unit, the operator of STB-1 have to use TALK button for communicate with the central unit. (STB-1 can also be set to normal talk back function, see section3.10)

2.4.15 Monitor Loudspeaker

	The monitor loudspeaker is located in front of the operation panels CTB-10 & CTB-20. CTB-10W_V01 & CTB-20W_V01 with external loudspeaker only. For distribution of audio message or alarm signals.

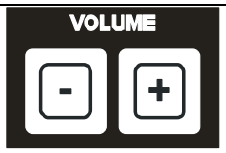
2.4.16 External Loudspeaker

	External loudspeaker for improved and higher sound level can be used. Connected in parallel with the monitor loudspeaker in CTB-10 and CTB-20. Located nearby the operation panel. **Note**: CTB-10W_V01 & CTB-20W_V01 operation panels only equipped with external loudspeaker.

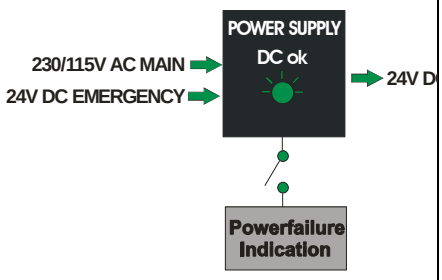
2.4.17 Call Light Dimmer

	Intensity of the push button light can be adjusted by pressing the **DIM** button. Switch between two steps max. and 1/3. Default is set to max. Dimmer can be set to on/off by DIP switch.

2.4.18 Volume Adjustment

	By pressing + or - buttons repeatedly, you can increase or decrease the listening volume in the central unit This will also affect the volume for an external speaker connected to the panel.

2.4.19 Power Supply SPS-4 (Option)

	The power supply SPS-4 is designed with power failure contact and automatic switch over relay. It means indication and automatic switch over to 24V DC emergency power supply when mains supply or power module fails.

3 Installation & Configuration Procedures

3.1 General

For proper installation and operation of the CTB system, we recommend reading this section thoroughly together with installation drawings in **section 6**.
Make sure that all mounting and cabling are correct before switching on the system.

3.2 Mounting & Terminal Configuration

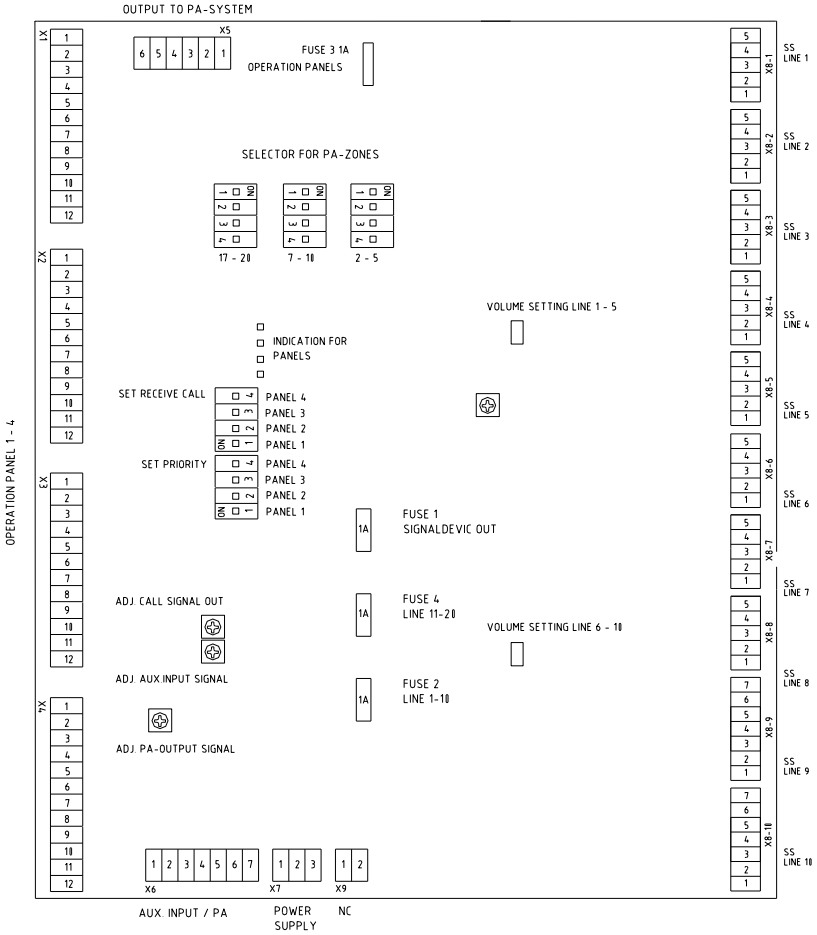
Note: Make sure that there is sufficient space for cables and maintenance.

3.2.1 Central Unit CU-10 & CU-20

The central unit is the basis of a system. It should be bulkhead mounted in a normal and ventilated indoor environment with a temperature of max. 55^0 C. See drawing CU_dd for mounting details.

It is equipped with pluggable screw terminals for cables max. $2.5mm^2$
See drawing CU-10_lo for terminal details.

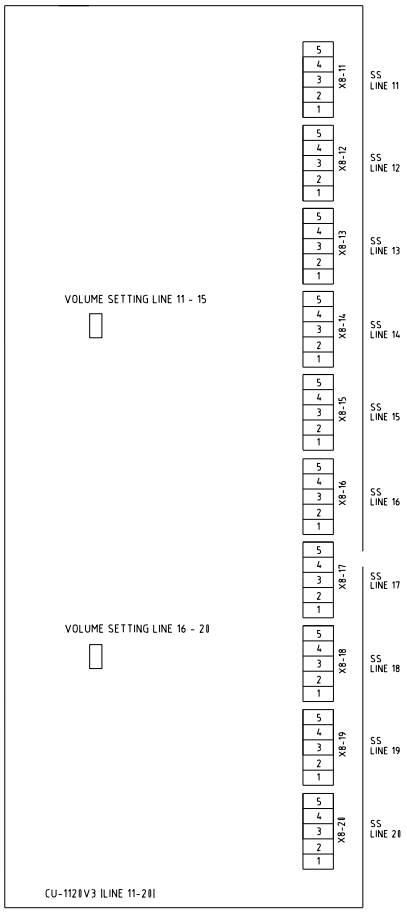
Main board CU-10 & 20



Terminal block X1-X4 Connection of operation panels.
Terminal block X5 Output to the PA-system.
Terminal block X6 AUX and PA input.
Terminal block X7 Power supply.

Terminal block X8 1-10 (main board) for substations 1-10
Terminal no.1 – 2 substation line.
Terminal no.3 – 4 24V DC to extra signal device.
Terminal no.5 is ground point for each substation screen.

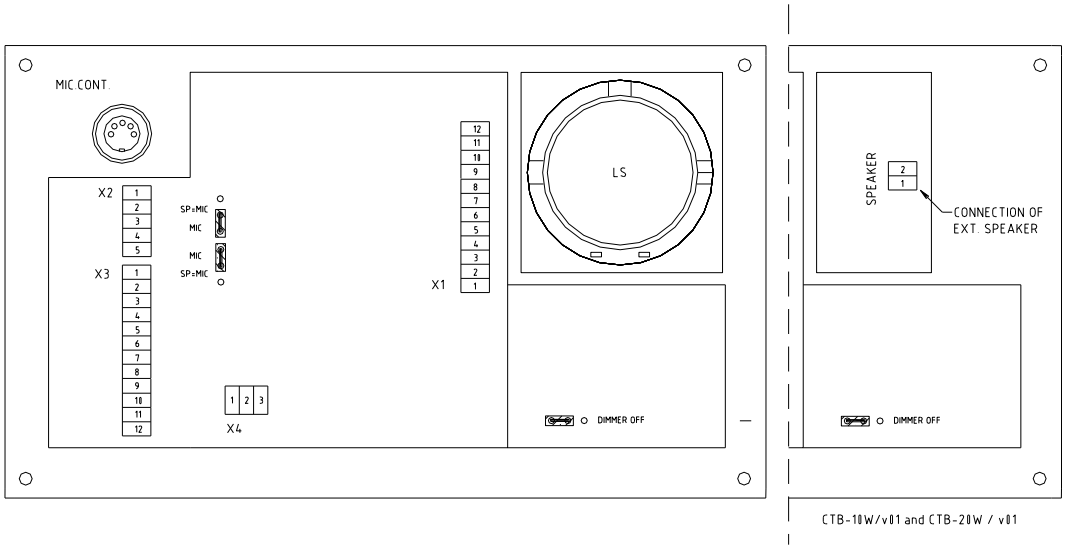
Additional board CU-20.



Terminal block X8 11-20
(additional board) for substations 11-20.
Terminal no.1 – 2 substation line.
Terminal no.3 – 4 24V DC to extra signal device.
Terminal no.5 is ground point for each substation screen.

3.2.2 Operation Panel CTB-10 & CTB-20

The operation panels indoor can be flush or bulkhead mounted in a normal and ventilated indoor environment with a temperature of 0 – 55 ^{0}C. See drawing CTB-1020_dd1 for mounting details.
It is equipped with 2x cable gland PG-16 and pluggable screw terminals for cables max. 2.5 mm^2.
See drawing CTB-1020_lo for terminals layout.



Terminal block X1: For connection to the central unit.
Terminal block X2: Not in use
Terminal block X3 For connection to external loudspeaker, microphone and parallel microphone.
Terminal block X4 Potential free contact for extra signal unit.
Terminal block SPEAKER 1-2 for external loudspeaker HP-8 (CTB-10W / V01, CTB-20W / V01)

3.2.3 CTB-10W / V01, CTB-20W / V01

This weatherproof operation panels IP-66 is for bulkhead mounting only. Including external loudspeaker HP-8 Ref. drawing CTB-1020W_dd for mounting details and datasheet for HP-8.
It is equipped with 2x cable gland PG-16 and pluggable screw terminals for cables max. 2.5 mm^2.
Ref. drawing CTB-1020_lo for lay out terminals drawing CTB-1020W_dd for mounting details and datasheet for HP-8.

3.2.4 Identification Sign Plate CTB Panels

A sign plate with directory / substation number for all substations has to be placed close to the CTB panels.

3.2.5 Substations and Other Equipment

Ref. datasheets for dimension, cut-out and mounting.

3.2.6 Identification Sign Plate Substation

A sign plate with each substation number has to be placed on or close to each substation.

3.3 Cable Requirements

All signal cables have to be approved ship-cable of type twisted pair with outer braided copper screen.
See cable connection drawings in section 6 for further details.
The screens must be interconnected in junction boxes and grounded in the central unit only.
Terminal block X8 1-20 terminal no.5 is ground point for each substation screen
Terminal block X1,2,3,4 / no.11 is ground point for each operation panel.
Power cable has to be approved ship cable min. 3 x 1,5mm^2
Note: The central unit has to be connected to the vessel's central ground.
Proper grounding is essential for reliable operation.

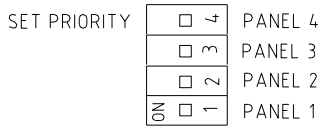
3.4 Power Supply Requirements

24VDC -10% + 33% (21.6 – 32VDC) Current consumption max. 4A
System power supply should be wired and fused independently from other systems.
1. 24V DC from ships 24V DC system.
2. 24V DC from power supply SPS-4 230V AC /.24V DC with automatic switch to 24V DC emergency power supply.

3.5 Set Priority in CU-10/CU-20

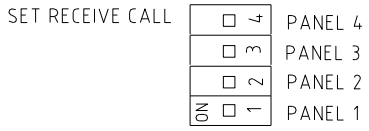
Ref. drawing CU-10_lo and CU-20_lo

DIP switches in the central unit.

	Priority is set by 4 DIP switches, corresponding to each operation panel 1 to 4. If all 4 DIP switches is set to off, the priority follows a hierarchy 1 to 4 giving panel 1 highest priority. This is standard factory setting. Whatever DIP switch set to 1 will have highest priority, still following the hierarchy as explained above. Example: If DIP switch 4 is set to ON, priority will be 4-1-2-3. If both DIP switch 1 and 4 is set to ON, priority will be 1-4-2-3.

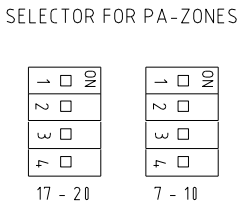
3.6 Set Receive Call from Substation

Ref. drawing CU-10_lo and CU-20_lo

	Receive call from substation is set by 4 DIP switches, corresponding to each operation panel 1 to 4. DIP switch set to ON, permits the panels to receive a call from substations. DIP switch 1 is set to ON for panel 1 is standard factory setting. Example: If both DIP switch 1 and 4 is set to ON, both panel 1 and 4 will receive a call.

3.7 Set Public Address Zones SPA

Ref. drawing CU-10_lo and CU-20_l

	Four line push buttons on the operation panel can be set to access 1 up to 4 public address zones. PA is set by 4 DIP switches corresponding to each push button. DIP switch marked 7-10 for line 7 – 10 (CTB-10 & CTB-10W_V01) DIP switch marked 17-20 for line 17 – 20 (CTB-20 & CTB-20W_V01) Standard factory setting is to OFF.

3.8 Volume and Signal Adjustment

Ref. drawing CU-10_lo and CU-20_lo for location.

3.8.1 Substations

System volume for substations can be adjusted by separate trim potential meter for each group of 5 lines.
Master volume line 1-5" "6-10" "11-15" "16-20"
Volume is factory adjusted and does not normally require any adjustment
If the installation on some locations requires another sound pressure level, this can be changed to satisfactory audibility and volume.

VOLUME SETTING LINE 1 - 5 	Volume adjustment for substation line 1 – 5 Trim potentiometer located on mainboard
VOLUME SETTING LINE 6 - 10 	Volume adjustment for substation line 6 – 10 Trim potentiometer located on mainboard
VOLUME SETTING LINE 11 - 15 	Volume adjustment for substation line 11 – 15 Trim potentiometer located on additional board CU-20.
VOLUME SETTING LINE 16 - 20 	Volume adjustment for substation line 16 – 20 Trim potentiometer located on additional board CU-20.

3.8.2 Auxiliary and Public Address

 ADJ. AUX.INPUT SIGNAL	Input signal for auxiliary can be adjusted by separate trim potentiometer marked "adj. aux. input signal". Required signal 0dB (0.775V)
 ADJ. PA-OUTPUT SIGNAL	Signal for Public address can be adjusted by separate trim potentiometer marked "adj. pa output signal". Signal is factory set to 0dB (0,775V) and does not normally require any adjustment.

3.8.3 Call Signal

Signal is factory adjusted and does not normally require any adjustment.

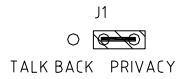
ADJ. CALL SIGNAL OUT 	Level of Call signal out all lines can be adjusted by trim potentiometer marked "adj. call signal out"

3.9 Dimmer On / Off in Operation Panel

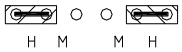
Ref. drawing CTB-1020_lo

	Dimmer can be set to on /off by DIP switch marked “dimmer off”

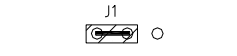
3.10 Substation STB-1

	Default setting is Privacy function, can be set to normal Talk Back Function. Talk Back Function; move the jumper J1 on PCB in STB-1

3.11 Substation STB-3

	Default setting is for headset, can be set for microphone. Microphone; move the two jumpers on PCB - STB-3in position M

3.12 Substation STB-5

	Default setting is for microphone or handset, loudspeaker can be set to both loudspeaker and microphone. (Re-entrant speaker) Re-entrant speaker; move the jumper J1 on PCB in STB-5.

3.13 Installation for C500 Nautical Safety

Installation has to follow strictly the requirements given in the following sections and drawing:

- Section 2.4.13
- Section 3.2.4 and 3.2.6
- Drawing: Cable connection diagram CTB_cc6

4 User Instructions

4.1 Using the Operation Panel

Up to 4 operation panels can be connected. Calls can be made from any operation panel to substations. In addition, calls can be made from any operation panel to another by pressing respective line button. At this stage the called operation panel acts as a substation. Calls from one operation panel will be indicated in other operation panels. One operation panel is always decided to be a master station with highest priority and can override operation panels with lower priority.

Figure 1 Operation panel CTB-10

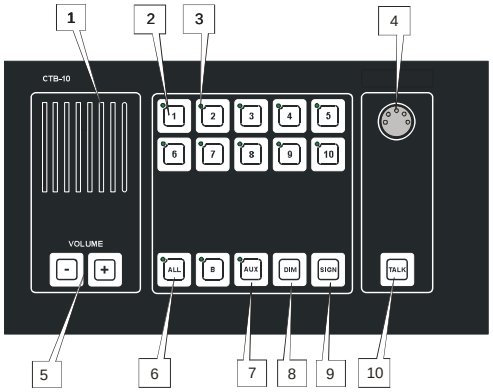


Figure 2 Operation panel CTB-20

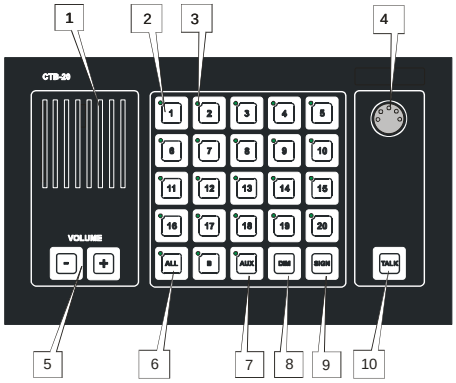


Figure 3 Operation panel CTB-10W_V01

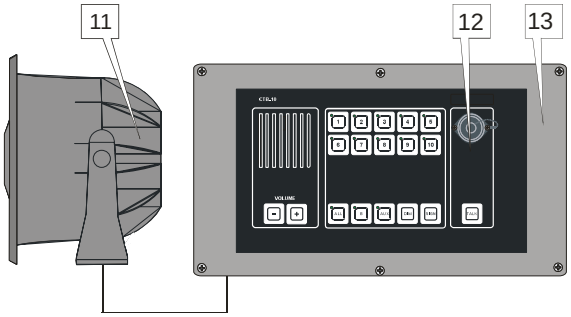


Figure 4 Operation panel CTB-20W_V01

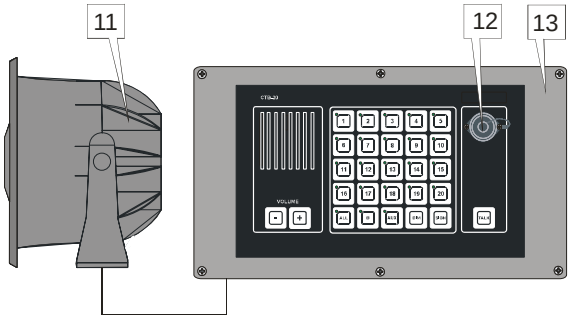


Figure 5
Gooseneck microphone MB-30G

Figure 6
Handheld Microphone with switch ETC-1-TB

Figure 7
Handheld Microphone WP with switch P-66

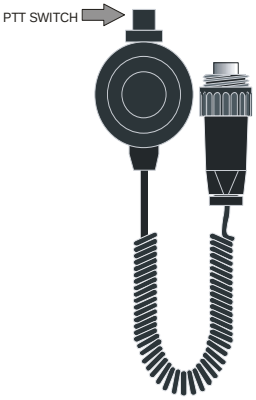


Figure 8
Footswitch U2410

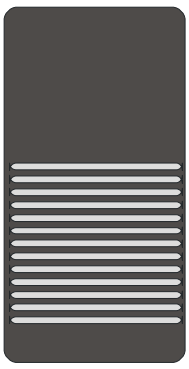


Figure 1 & 2 CTB-10 & CTB-20

1. .....**Monitor loudspeaker** ..For communication and alarm signals.
2. .....**Line Push Buttons** .....Line selection switch with indication light, 1 -10 for CTB-10
....1 – 20 for CTB-20
3. .....**Green Indication light** (LED) for each line push button.
4. .....**Microphone contact** ... For Gooseneck or hand microphone.
5. .....**VOLUME - +**: .....Increase or decrease of volume in monitor loudspeaker loudspeaker)
6. .....**ALL** .....Push button switch with indication light (LED)
7. .....AUX..... Push button switch for activating external signal to selected stations.
8. .....**DIM** .....Push button switch for adjust intensity of call light in indication light (LED)
9. .....**SIGN** .....Push button switch for signal and activating of extra signal device substations.
10. ...**TALK** .....PTT switch for gooseneck microphone MB-30G

Figure 3 & 4 CTB-10W_V01 & CTB-20W_V01

2-10..**Functions**.....Same as for CTB-10 & CTB-20
11. ....**External loudspeaker** .For communication and alarm signals. Flush or wall mounting.
....Monitor loudspeaker not installed.
12. ....**Microphone contact** ...For handheld microphone P-66
13. ....**Cabinet** .....WP cabinet, wall mounting only.

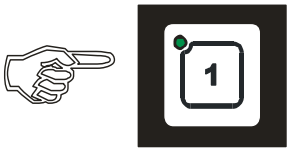
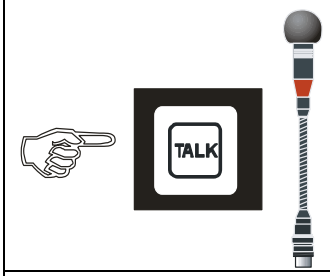
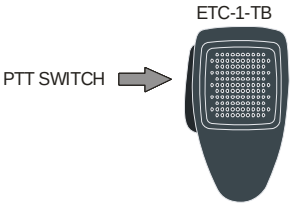
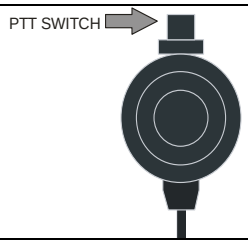
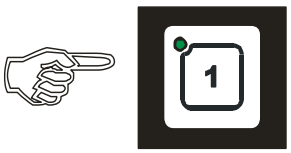
Figure 5.....Gooseneck microphone MB-30G for CTB-10 & CTB-20.
Figure 6.....Handheld microphones ETC-1-TB for CTB-10 & CTB-20.
Figure 7.....Handheld microphones P-66 for CTB-10W_V01 & CTB-20W_V01
Figure 8.....Footswitch U2410 for hands-free operation of microphone MB-30G

PTT switch = Push To Talk switch LED = Light emitting diode.

4.1.1 Make a Call to a Substation

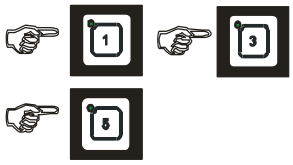
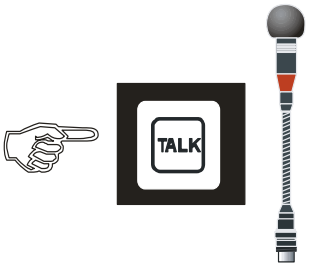
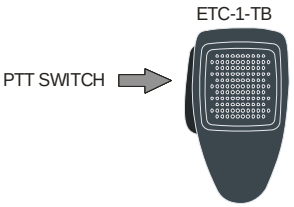
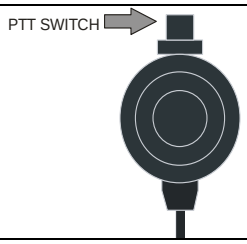
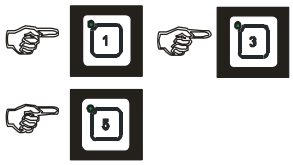
You can select the substation by pressing desired line push button.
Steady green LED will indicate activated selection.
If desired, the signal button **SIGN** may be pressed to give a tone signal to selected station. Talk from the Operation Panel is performed every time **TALK** button is pressed. The Operation Panel unit will be in listening mode as soon as a station is selected. When communication is finished, press again the selected station button to switch off. The LED will be switch off to indicate that selected line is turned off.

Operation Panel : CTB-10, CTB-20, CTB-10W_V01 or CTB-20W_V01

	• Press the **LINE** button, the call is set up. Indicated by steady green LED
	• Press the **SIGN** button A tone signal will be given to selected station as long as the **SIGN** button is kept pressed. This will also activate extra signal devices, if connected (Se section4.1.5)
	<u>Operation panel with gooseneck microphone MB-30G</u> • Press the **TALK** button. Speak clearly into the microphone. When the **TALK** button is released the operation panel will be in listening mode, and you will hear the communication from the selected station.
	<u>Operation panel with hand microphone ETC-1-TB</u> • Press the **PTT SWITCH**. Speak clearly into the microphone. When the **PTT SWITCH** button is released the operation panel will be in listening mode, and you will hear the communication from the selected station.
	<u>Operation panel with hand microphone P-66</u> • Press the **PTT SWITCH**. Speak clearly into the microphone. When the **PTT SWITCH** button is released the operation panel will be in listening mode, and you will hear the communication from the selected station.
	• Press the **LINE** button once more to end the call. The LED will be switch off.

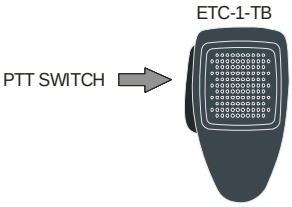
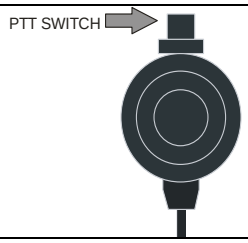
4.1.2 Make a Call to Group of Substations

You can select group of substations by pressing respective line buttons from one of the four Operation Panels. Only the Operation Panels can switch off and end the call

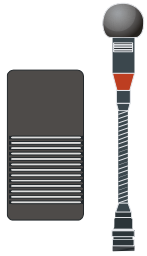
	• Press the required **LINE** buttons, the call is set up. Indicated by steady green LED in selected buttons.
	• Press the **SIGN** button A tone signal will be given to selected station as long as the **SIGN** button is kept pressed. This will also activate extra signal devices, if connected (Se section4.1.5)
	<u>Operation panel with gooseneck microphone MB-30G</u> • Press the **TALK** button. Speak clearly into the microphone. When the **TALK** button is released the operation panel will be in listening mode, and you will hear the communication from the selected stations.
	<u>Operation panel with hand microphone ETC-1-TB</u> • Press the **PTT SWITCH**. Speak clearly into the microphone. When the **PTT SWITCH** button is released the operation panel will be in listening mode, and you will hear the communication from the selected station.
	<u>Operation panel with hand microphone P-66</u> • Press the **PTT SWITCH**. Speak clearly into the microphone. When the **PTT SWITCH** button is released the operation panel will be in listening mode, and you will hear the communication from the selected stations.
	• Press all the **LINE** buttons once more to end the call. The LED will be switch off.

4.1.3 All Call

The message and signal from the operation panel will be given to all substations, as a one-way message. It will be indicated by steady green **LED** in the **ALL** button only. Talk back from substations is closed in this mode.

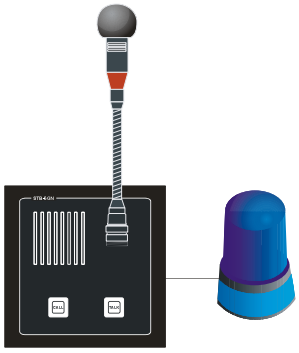
	• Press the **ALL** button, the call is set up. Indicated by steady green LED in the **ALL** button.
	• Press the **SIGN** button A tone signal will be given to selected station as long as the **SIGN** button is kept pressed. This will also activate extra signal devices, if connected (Se section4.1.5)
	<u>Operation Panel with gooseneck microphone MB-30G</u> • Press the **TALK** button. Speak clearly into the microphone.
	<u>Operation Panel with hand microphone ETC-1-TB</u> • Press the **PTT SWITCH**. Speak clearly into the microphone.
	<u>Operation panel with hand microphone P-66</u> • Press the **PTT SWITCH**. Speak clearly into the microphone.
	• Press the **ALL** button once more to end the call. The LED will be switch off.

4.1.4 Hands-free Operation

	Operation panel with gooseneck microphone MB-30G and footswitch • Press the **FOOTSWITCH** button. Speak clearly into the microphone. When the **TALK** button is released the operation panel will be in listening mode, and you will hear the communication from the selected station.

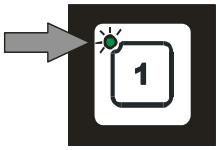
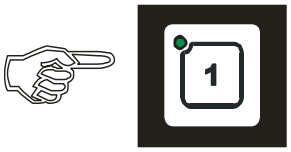
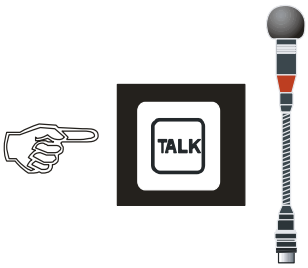
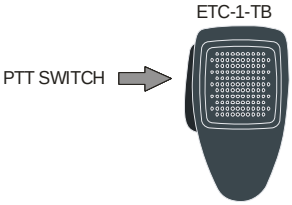
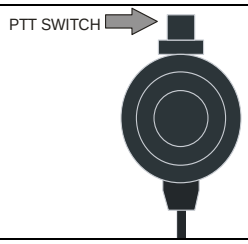
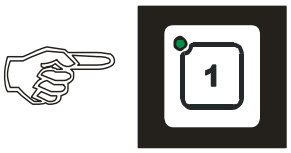
4.1.5 Give Signal to Substations with Extra Signal Device

Substations STB-3, STB-5 and STB-5GN are equipped with relays for activating extra signal devices. Extra signal devices can be flashing beacon, rotary light, alarm horn and bells.

Operation Panel		Substation
	• Press the **SIGN** button A tone signal will be given to the selected station as long as the **SIGN** button is kept pressed: ***Indication 1:*** ***A tone signal in the substation's monitor loudspeaker for STB-5 and STB-5GN or in horn-loudspeaker for STB-3.*** This will also activate extra signals for substations equipped with these devices. ***Indication 2:*** ***Signal in flashing beacon, rotary light, alarm horn or bells.*** ***(STB-5GN with Rotary light in illustration)***	

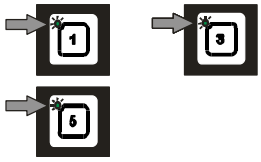
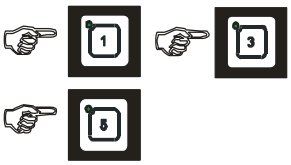
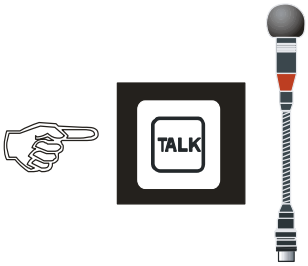
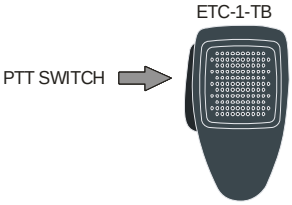
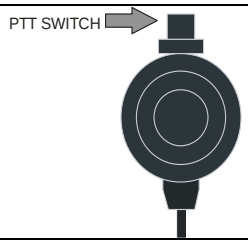
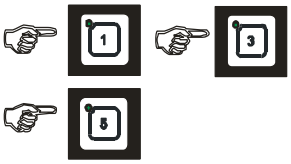
4.1.6 Receive a Call from a Substation

A call is indicated with a flashing green **LED** in the push button and a beep tone in the monitor loudspeaker or external loudspeaker. This will also activate an extra signal unit if installed. Only the operation panel can switch off and terminate the call.

	• A call is indicated with flashing green **LED** in for respective line button, and signal in the monitor loudspeaker. (and in extra signal unit if installed.)
	• Press the **LINE** button, the call is set up. Indicated by steady green LED
	<u>Operation panel with gooseneck microphone MB-30G</u> • Press the **TALK** button. Speak clearly into the microphone. When the **TALK** button is released the operation panel will be in listening mode, and you will hear the communication from the selected station.
	<u>Operation panel with hand microphone ETC-1-TB</u> • Press the **PTT SWITCH**. Speak clearly into the microphone. When the **PTT SWITCH** button is released the operation panel will be in listening mode, and you will hear the communication from the selected station.
	<u>Operation panel with hand microphone P-66</u> • Press the **PTT SWITCH**. Speak clearly into the microphone. When the **PTT SWITCH** button is released the operation panel will be in listening mode, and you will hear the communication from the selected station.
	• Press **LINE** button once more to end the call. The LED will be switch off.

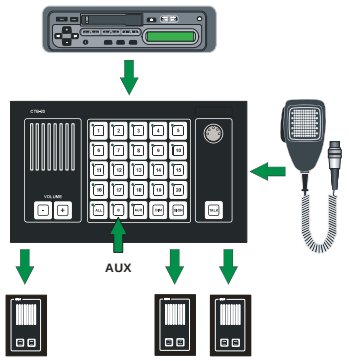
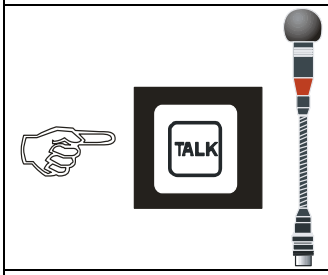
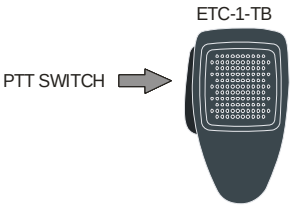
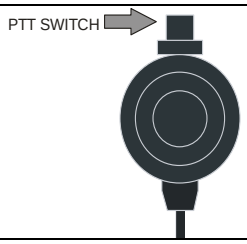
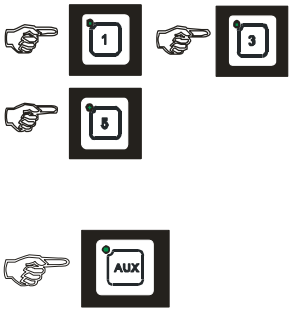
4.1.7 Receive a Call from Two or More Substations

Calls can be received from two or more substations at same time. The operation panel that is set to receive calls can select between calls from substations.
Calls are indicated with flashing green **LED** in the push buttons and a beep tone in the monitor loudspeaker Will also activate extra signal unit if installed. (Only for the first incoming call.)
.

	• Calls are indicated with flashing green **LED** for respective line button, and signal in monitor loudspeaker. (And in extra signal unit if installed, Note! only for the first call)
	• Press the **LINE** button, the call is set up. Indicated by steady green LED The operation panel can select between substation lines and cancel calls by pressing the respective LINE button once more.
	<u>Operation panel with gooseneck microphone MB-30G</u> • Press the **TALK** button. Speak clearly into the microphone. When the **TALK** button is released the operation panel will be in listening mode, and you will hear the communication from the selected station.
	<u>Operation panel with hand microphone ETC-1-TB</u> • Press the **PTT SWITCH**. Speak clearly into the microphone. When the **PTT SWITCH** button is released the operation panel will be in listening mode, and you will hear the communication from the selected station.
	<u>Operation panel with hand microphone P-66</u> • Press the **PTT SWITCH**. Speak clearly into the microphone. When the **PTT SWITCH** button is released the operation panel will be in listening mode, and you will hear the communication from the selected station.
	• Press the selected **LINE** buttons once more to end the call. The LED`s will be switch off.

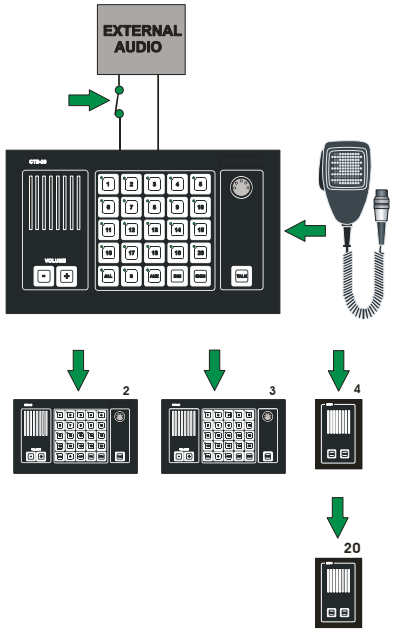
4.1.8 AUX Function

An external signal connected to the **AUX** input of the system, will be transferred to any selected station or group of stations if the **AUX** button is selected. (Example: Entertainment and VHF signal.)
Talk button in any operation panel will override this function.

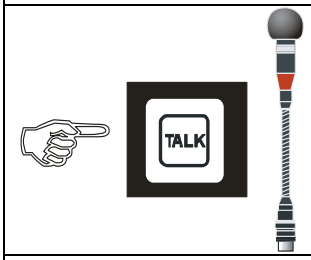
	• Press desired line push buttons • Press the **AUX** button The **AUX** transferring is set up. Indicated by steady green light.
	<u>To override this function with gooseneck microphone</u> • Press the **TALK** button on the operation panel. Speak clearly into the microphone. When the **TALK** button is released the system will be in AUX mode again.
	<u>To override this function with hand microphone ETC-1-TB</u> • Press the **PTT SWITCH** on hand microphone. Speak clearly into the microphone. When the **TALK** button is released, the system will be in AUX mode again.
	<u>To override this function with hand microphone P-66</u> • Press the **PTT SWITCH**. Speak clearly into the microphone. When the **PTT SWITCH** button is released, the operation panel will be in AUX mode again.
	<u>To end the function</u> • Press line buttons and **AUX** button once more to end the transferring.

4.1.9 Audio from External Audio to All

Alarm (or any audio) from external system can be distributed through the CTB system.
A potential free contact and 0dB signal from the external system activate the CTB and the message will be addressed to all substations and operation panels.
The talk button on the operation panel or PTT button on hand microphone will override the external audio.
Normal talk back functions cannot be used in this mode.

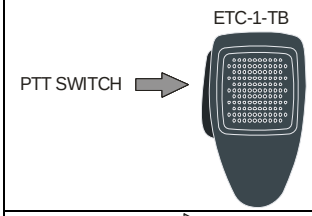
<table>
<tr><td> 
</td><td>

- Switch on the external audio.
  The audio transferring is set up. Indicated by steady green light in all line push buttons.

</td></tr>
<tr><td> 
</td><td>

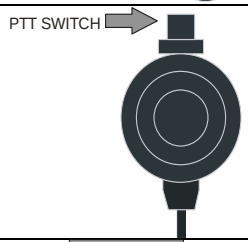
<u>To override this function with gooseneck microphone</u>

- Press the **TALK** button on the operation panel.
  Speak clearly into the microphone. When the **TALK** button is released, the system will be in “audio to all” mode again.

</td></tr>
<tr><td> 
</td><td>

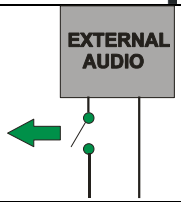
<u>To override this function with ETB-10A and hand microphone ETC-1-TB</u>

- Press the **PTT SWITCH** on hand microphone.
  Speak clearly into the microphone. When the **TALK** button is released, the system will be in “audio to all” mode again.

</td></tr>
<tr><td> 
</td><td>

<u>Operation Panel with hand microphone P-66</u>

- Press the **PTT SWITCH**.
  Speak clearly into the microphone. When the **PTT SWITCH** button is released, the operation panel will be in “audio to all” mode again.

</td></tr>
<tr><td> 
</td><td>

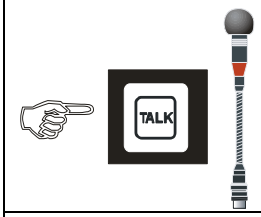
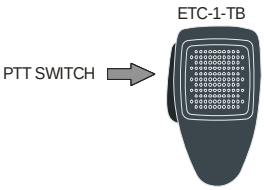
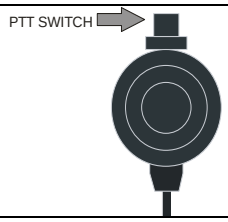
<u>To end the function</u>

- Switch off the external audio.

</td></tr>
</table>

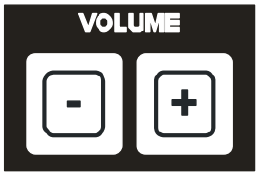
4.1.10 Public Address Operation of External System

The four last line push buttons on the operation panels can be set to access 1 to 4 public address zones on an external Public Address System.
CTB-10 & CTB-10W_V01: Push button marked 7-8-9-10
CTB-20 & CTB-20W_V01: Push button marked 17-18-19-20
ALL button will access all substations and external Public Address System.

CTB-10 & CTB-10W_V01  CTB-20 & CTB-20W_V01  	• Press desired **LINE** button (s), the Public Address call is set up. Indicated by steady green LED. Single or group of zones
 	• Press the **ALL** button, the call is set up. Indicated by steady green LED in the **ALL** button.
 	<u>Operation panel with gooseneck microphone MB-30G</u> • Press the **TALK** button. Speak clearly into the microphone for giving the message.
 	<u>Operation panel with hand microphone ETC-1-TB</u> • Press the **PTT SWITCH**. Speak clearly into the microphone for giving the message.
 	<u>Operation panel with hand microphone P-66</u> • Press the **PTT SWITCH**. Speak clearly into the microphone for giving the message. •
CTB-10 & CTB-10W_V01  CTB-20 & CTB-20W_V01   	<u>To end the function</u> • Press **line** button (s) or **ALL** once more to end the Public Address Operation

4.1.11 Volume

By pressing **+** or - buttons repeatedly, you can increase or decrease the listening volume in the ETB.
This will also affect the volume for a parallel speaker connected to the ETB

	• Press the + buttons repeatedly for increased volume • Press the - buttons repeatedly for decreased volume

4.1.12 Dimming of Call Light

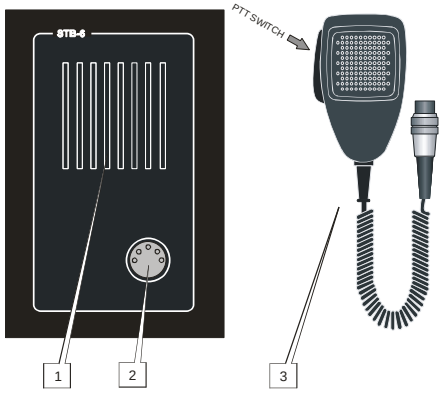
Intensity of light in push buttons can be adjusted by pressing **DIM** button.
Switch between two steps max. and 1/3. Default is set to max.
Dimmer can be set to on/off by DIP switch marked “dimmer off” (See section 3.10)

	• Press **DIM** button once for 1/3 intensity. • Press **DIM** button once more back to max. intensity.

4.2 Parallel Communication

Function with operation from parallel microphone / loudspeaker located on bridge wings, or other locations near the operation panel, where parallel microphone / loudspeaker needed.
Two parallel stations can be connected. Communication is set up by the Operation Panel.
Bridge wing unit will be in operation mode as soon as a station is selected on the Operation Panel.

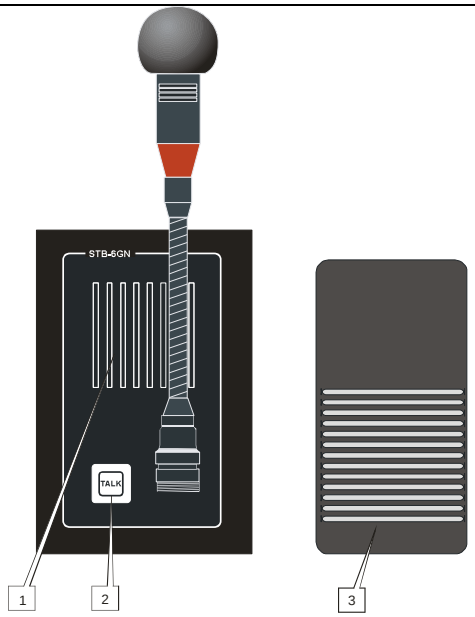
Figure 9 Parallel station STB-6



1. **Loudspeaker** (Parallel to the central unit)
2. **Contact** For microphone
3. **Microphone** ETC-1-TB with PTT switch

PTT switch = Push to talk button switch

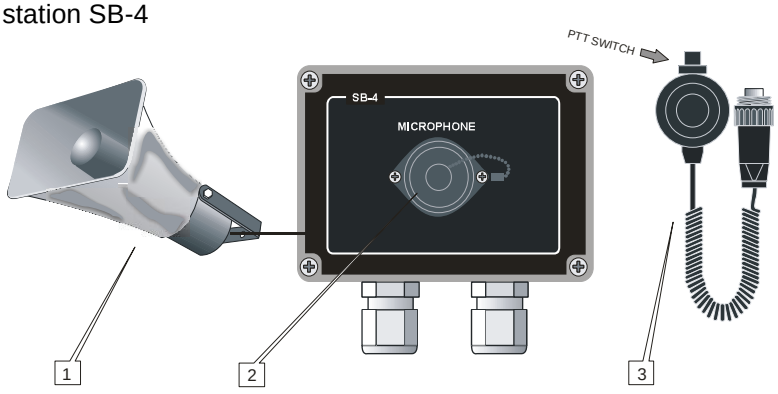
Figure 10 Parallel station STB-6GN



1. **Loudspeaker** (Parallel to the central unit)
2. **TALK** PTT switch for microphone (Parallel to the central unit)
3. **Footswitch** (Parallel to PTT switch)

PTT switch = Push to talk button switch

Figure 10 Parallel station SB-4

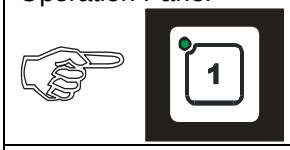
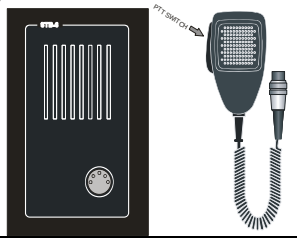
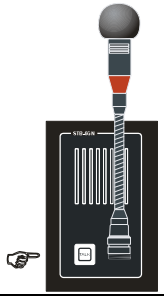
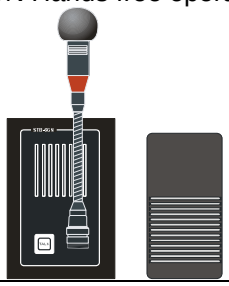
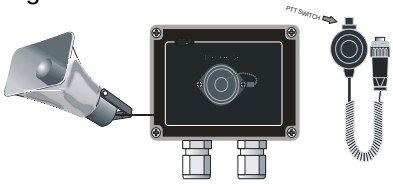
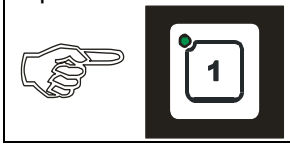


1. **Loudspeaker** (Parallel to the central unit)
2. **Contact** For microphone
3. **Microphone** Microphone P-66 with push to talk switch (parallel to microphone on the central unit

PTT switch = Push to talk button switch

4.2.1 Operation

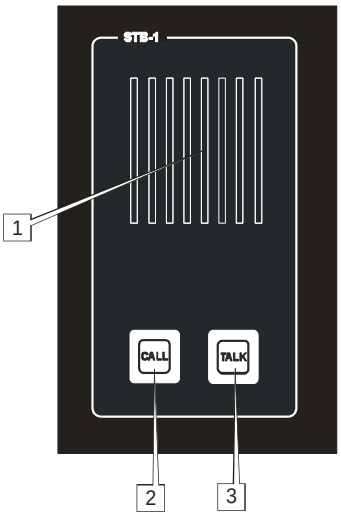
Note: Line selection and signal have to be set up from the central unit.

Operation Panel 	• Press the desired **LINE** button, the call is set up. Indicated by steady green LED
Operation Panel 	• Press the **SIGN** button. A tone signal will be given to selected station as long as the **SIGN** button is kept pressed. This will also activate extra signal to substations equipped with these devices.
Figure 7 Parallel station STB-6 	• Press **PTT SWITCH** on hand microphone ETC-1-TB Speak clearly into the microphone. When **PTT SWITCH** button is released the parallel equipment will be in listening mode, and you will hear the communication from the selected station in the monitor loudspeaker.
Figure 8 Parallel station STB-6GN 	• Press **TALK** on the STB-6GN Speak clearly into the microphone. When **TALK** button is released the parallel equipment will be in listening mode, and you will hear the communication from the selected station in the monitor loudspeaker.
STB-6GN Hands free operation 	• Press the **FOOTSWITCH** button. Speak clearly into the microphone. When the **TALK** button is released the parallel equipment will be in listening mode, and you will hear the communication from the selected station.
Figure 9 Parallel station SB-4 	SB-4 Plug box P-66 microphone. VML-1520 loudspeaker • Press **PTT SWITCH** on hand microphone P-66 Speak clearly into the microphone. When **PTT SWITCH** button is released the parallel equipment will be in listening mode, and you will hear the communication from the selected station.
Operation Panel 	• Press the desired **LINE** button on the Operation Panel once more to end the call. The LED will be switch off.

4.3 Operation from Substations

Calls can be made from substations to the operation panels by pressing the CALL push button. A call is indicated by a flashing green LED and a signal in the operation panel. The operation panel confirm the call by pressing respective line button. The communication is set up. Only the operation panel can switch off and end the call.

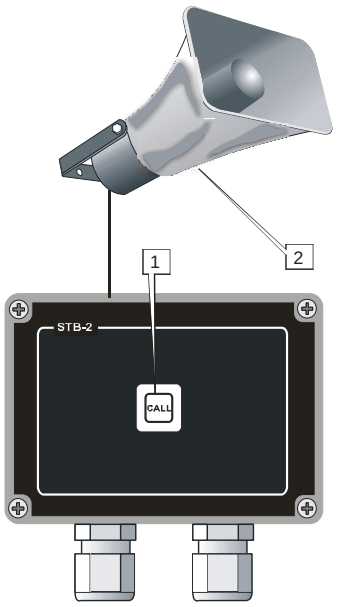
Figure 11 Substation STB-1



1. Re-entrant **Loudspeaker**
   For communication from the central unit.
   Microphone for communication to the central unit.
2. **CALL**
   Push button switch for call to central unit.
3. **TALK**
   PTT switch for talk to the central unit

PTT switch = Push to talk button switch

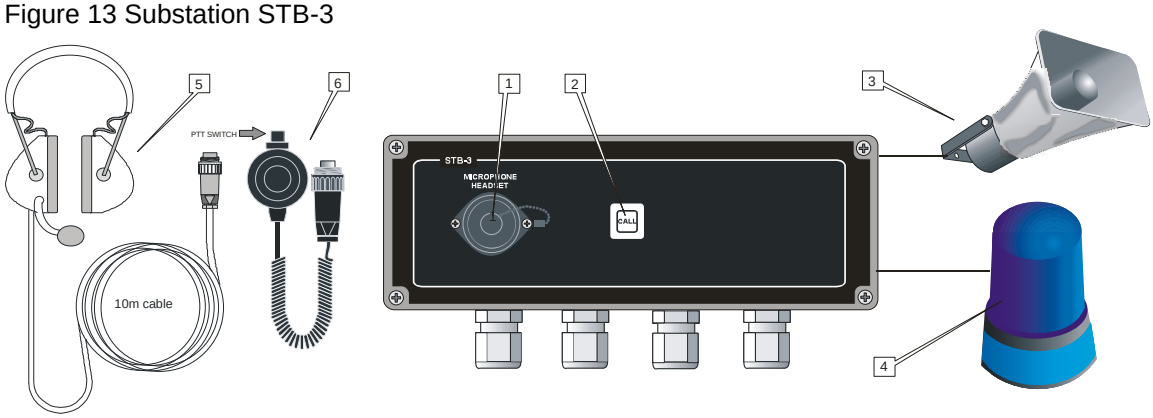
Figure 12 Substation STB-2



1. **CALL**
   Push button switch for call to central unit.

2. **Re-entrant Loudspeaker**
   For communication from the central unit.
   Microphone for communication to the central unit.

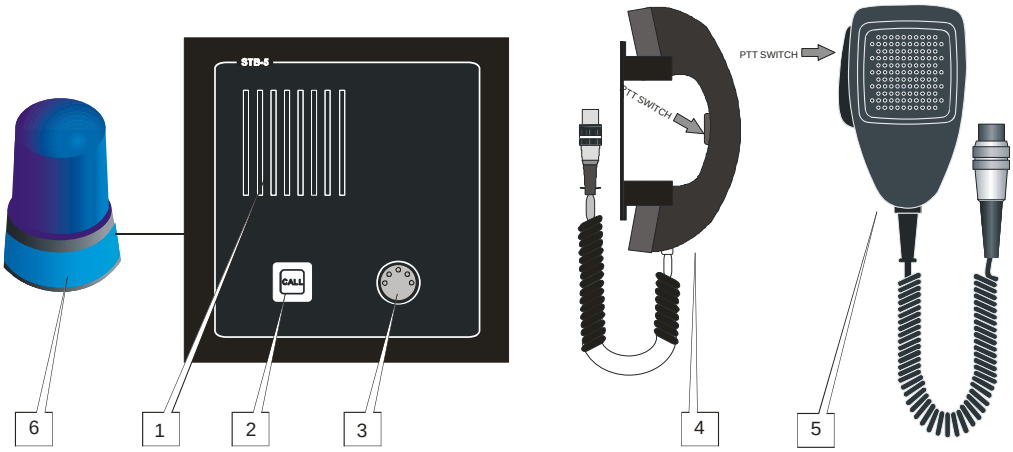
Figure 13 Substation STB-3



1. **Contact** For headset or Microphone.
2. **Call** Push button switch for call to central unit.
3. **Loudspeaker** For communication from the central unit.
4. **Signal device** Activated from the central unit.
5. **Headset** P-MT7 with boom microphone
6. **Microphone** P-66 with PTT switch

PTT switch = Push to talk button

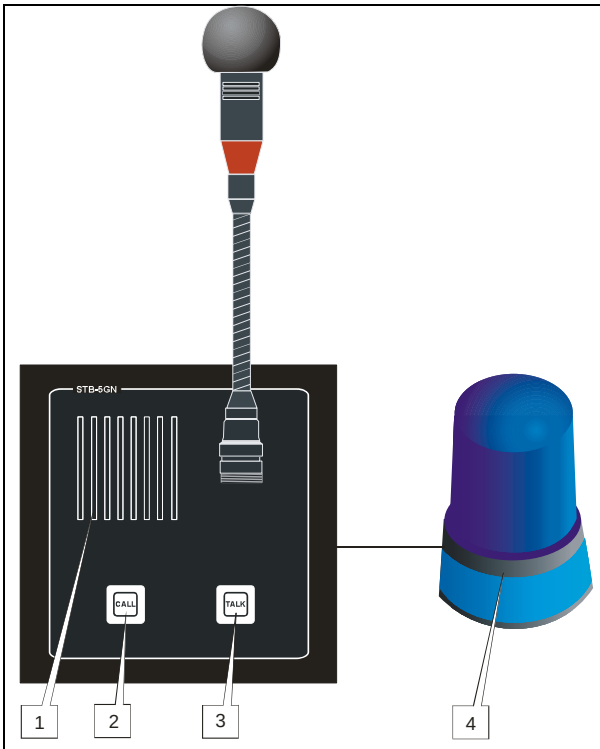
Figure 14 Substation STB-5



1. **Loudspeaker** For communication from the central unit.
2. **Call** Push button switch for call to central unit.
3. **Contact** For handset HAS-1 or handheld microphone ETC-STB5
4. **Handset** HAS-1 with push to talk switch (PTT)
5. **Microphone** ETC-STB5 with push to talk switch (PTT)
6. **Signal device** Activated from the central unit.

PTT switch = Push to talk button switch

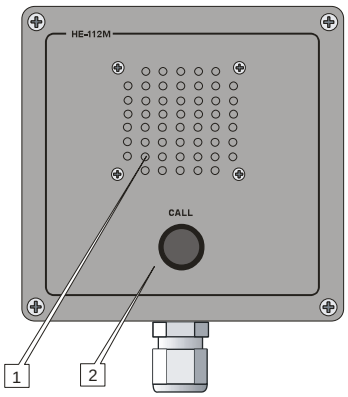
Figure 15 Substation STB-5GN



1. **Loudspeaker** For communication from the central unit.
2. **CALL** Push button switch for call to central unit.
3. **TALK** PTT switchfor talk to the central unit.
4. **Signal device** Activated from the central unit.

PTT switch = Push to talk button switch

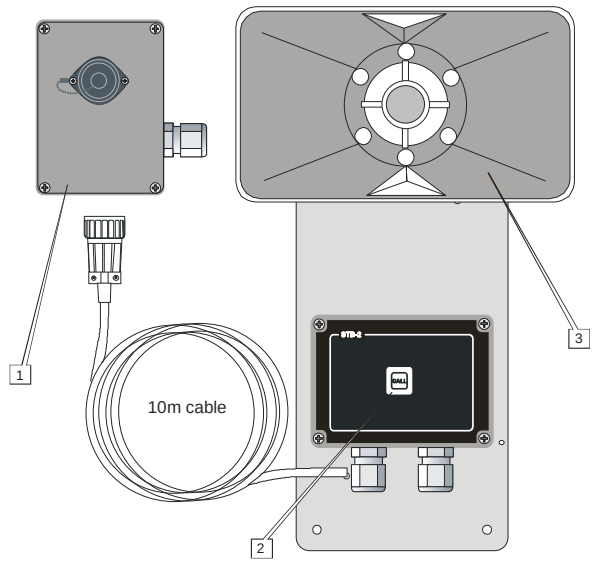
Figure 16 Substation HE-112M



1. **Re-entrant Loudspeaker**
   For communication from the central unit.
   Microphone for communication to the central unit.

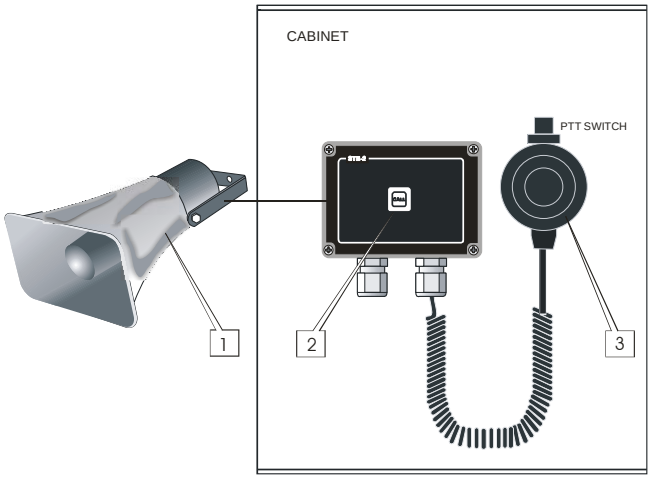
2. **CALL**
   Push button switch for call to central unit.

Figure 17 Substation VH-10M



1. **Plugbox**
   CD-2 for VH-10M
2. **CALL**
   Push button switch for call to the central unit
3. **Re-entrant Loudspeaker**
   For communication from the central unit
   Microphone for communication to the central unit.

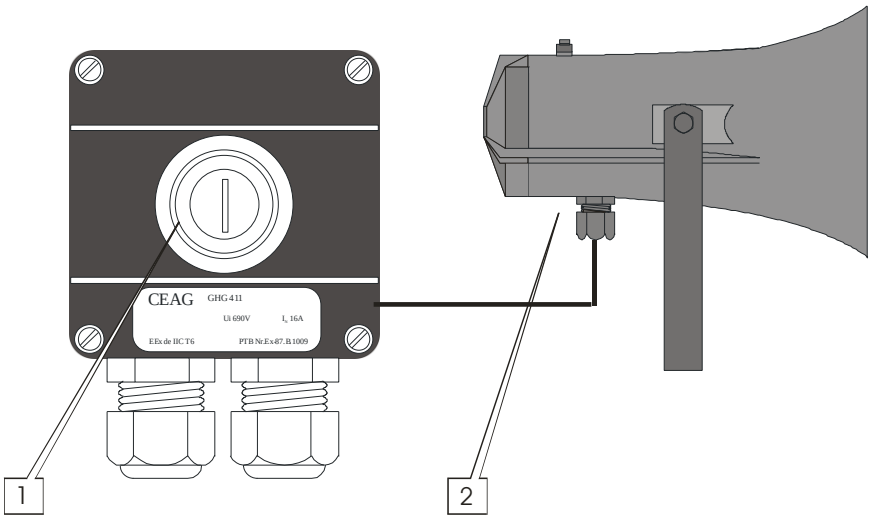
Figure 18 Substation VHM-10



1. **Loudspeaker** For communication from the central unit
2. **CALL** Push button switch for call to the central unit
3. **Microphone** P-66 fixed connected with PTT switch

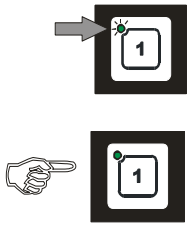
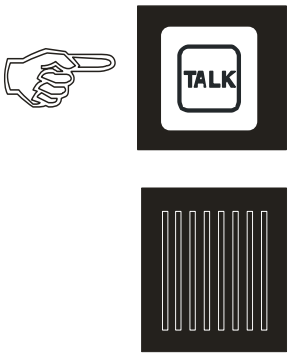
PTT switch = Push to talk button switch

Figure 19 Substation NEBB-42EX / EX Loudspeaker

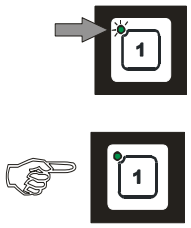
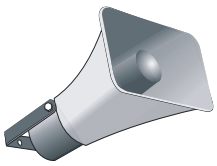
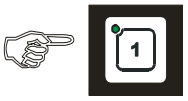


1. Push to call switch
2. Re-entrant Loudspeaker EX.

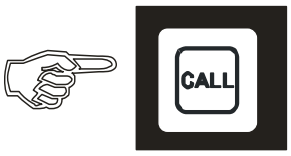
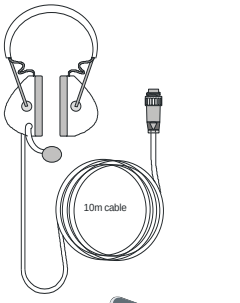
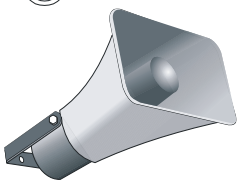
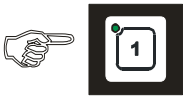
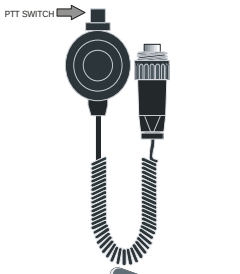
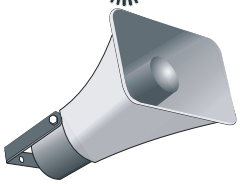
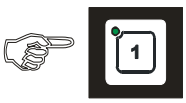
4.3.1 Operation from STB-1

Substation		Operation Panel
	• Press the **CALL** button. • ***Indicated with flashing green LED and a signal in the operation panel's speaker for selected line.*** • ***Operator of the operation panel press respective LINE button, the call is set up. Indicated by steady green light***,	
 Loudspeaker	• Press **TALK** button. • Speak clearly into the re-entrant loudspeaker. When **TALK** button is released the STB-1 will be in listening mode, and you will hear the communication from the operation panel. • ***Operator of the operation panel end the call by pressing the LINE button once more.***	

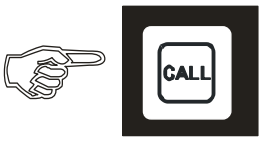
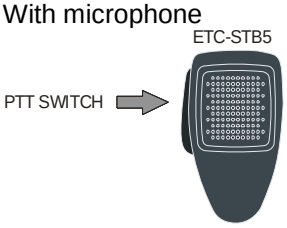
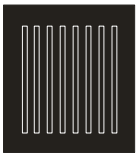
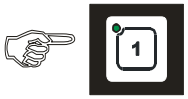
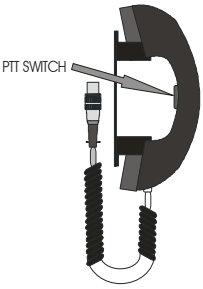
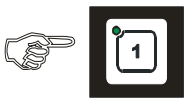
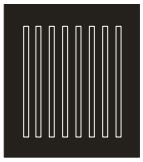
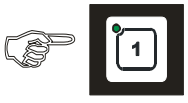
4.3.2 Operation from STB-2

Substation		Operation Panel
	• Press the **CALL** button. • ***Indicated with flashing green LED and a signal in the operation panels monitor loud speaker for selected line.*** • ***Operator of the operation panel press respective LINE button, the call is set up. Indicated by steady green light in the operation panel***	
	• Speak clearly into the re-entrant loudspeaker for communication to the operation panel, and receive communication in the same loudspeaker. • ***Operator of the operation panel end the call by pressing the LINE button once more.***	

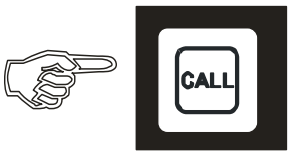
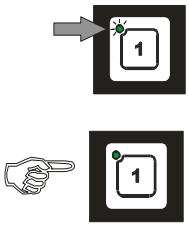
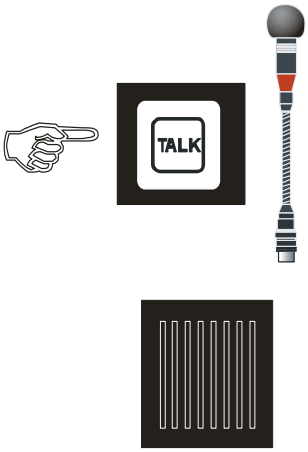
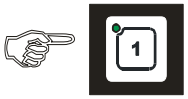
4.3.3 Operation from STB-3

Substation		Operation Panel
	• Press the **CALL** button. • ***Indicated with flashing green LED and a signal in the operation panel's speaker for selected line.*** • ***Operator of the operation panel press respective LINE button, the call is set up. Indicated by steady green light.***	
With headset P-MT7  	• Speak clearly into the Boom microphone on the headset • Receive communication from the operation panel in the headphones. (And in the loudspeaker if installed) • ***Operator of the operation panel end the call by pressing the LINE button once more.***	
With microphone P-66  	• Press the **PTT SWITCH** on the microphone. Speak clearly into the microphone. When **PTT SWITCH** button is released the microphone will be in listening mode, and you will hear the communication from the operation panel in the loudspeaker • ***Operator of the operation panel end the call by pressing the LINE button once more.***	

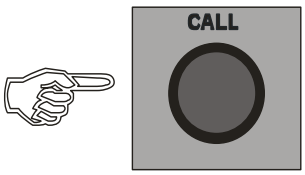
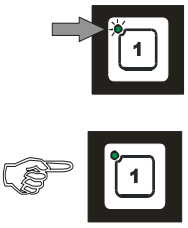
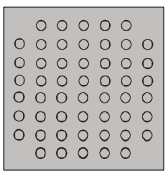
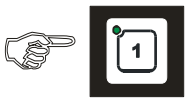
4.3.4 Operation from STB-5

Substation		Operation Panel
	• Press the **CALL** button. • ***Indicated with flashing green LED and a signal in the operation panels monitor loud speaker for selected line.*** • ***Operator of the operation panel press respective LINE button, the call is set up. Indicated by steady green light***,	
With microphone   Loudspeaker	• Press the **PTT SWITCH** on the microphone and speak clearly into the microphone. • When **PTT SWITCH** is released the STB-5 will be in listening mode, and you will hear the communication from the operation panel in the monitor loudspeaker. • ***Operator of the operation panel end the call by pressing the LINE button once more.***	
With handset HAS-1 	• Press the **PTT SWITCH** on the handset and speak clearly into the microphone. • When **PTT SWITCH** is released the STB-5 will be in listening mode, and you will hear the communication from the operation panel in the handsets loudspeaker • ***Operator of the operation panel end the call by pressing the LINE button once more.***	
With monitor speaker only  Loudspeaker	• Speak clearly into the Monitor loudspeaker for communication to the operation panel, and receive communication from it in the same loudspeaker. • ***Operator of the operation panel end the call by pressing the LINE button once more.***	

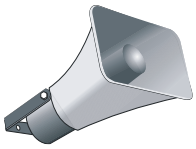
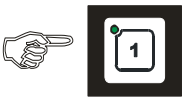
4.3.5 Operation from STB-5GN

Substation		Operation Panel
	• Press the **CALL** button. • ***Indicated with flashing green LED and a signal in the operation panel's speaker for selected line.*** • ***Operator of the operation panel press respective LINE button, the call is set up. Indicated by steady green light***,	
 Loudspeaker	• Press **TALK** button on the STB-5GN Speak clearly into the microphone. When **TALK** button is released the STB-5GN will be in listening mode, and you will hear the communication from the selected station in the monitor loudspeaker. • ***Operator of the operation panel end the call by pressing the LINE button once more.***	

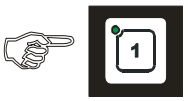
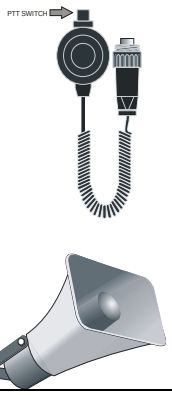
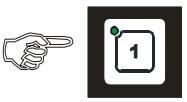
4.3.6 Operation from HE-112M

Substation		Operation panel
	• Press **CALL** button. • ***Indicated with flashing green LED and a signal in the operation panel's speaker for selected line.*** • ***Operator of the operation panel press respective LINE button, the call is set up. Indicated by steady green light.***	
 Loudspeaker	• Speak clearly into the Re-entrant loudspeaker for communication to the operation panel, and receive communication in the same loudspeaker. • ***Operator of the operation panel end the call by pressing the LINE button once more.***	

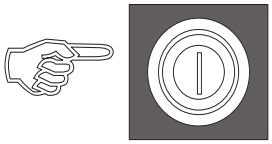
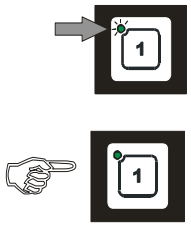
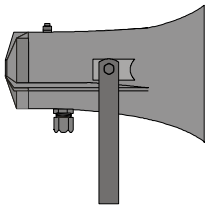
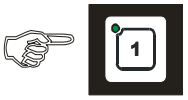
4.3.7 Operation from VH-10M

Substation		Operation Panel
	• Press **CALL** button. • ***Indicated with flashing green LED and a signal in the operation panel's speaker for selected line.*** • ***Operator of the operation panel press respective LINE button, the call is set up. Indicated by steady green light in the operation panel.***	 
	• Speak clearly into the Re-entrant loudspeaker for communication to the operation panel, and receive communication in the same loudspeaker. • ***Operator of the operation panel end the call by pressing the LINE button once more.***	

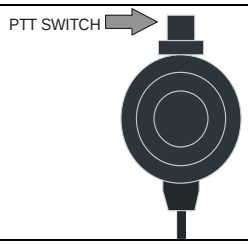
4.3.8 Operation from VHM-10

Substation		Operation Panel
	• Press the **CALL** button. • ***Indicated with flashing green LED and a signal in the operation panel's speaker for selected line.*** • ***Operator of the operation panel press respective LINE button, the call is set up. Indicated by steady green light***,	 
	• Press the **PTT SWITCH** on the microphone. Speak clearly into the microphone. When **PTT SWITCH** is released the **VHM-10** will be in listening mode, and you will hear the communication from the operation panel in the loudspeaker. • ***Operator of the operation panel end the call by pressing the LINE button once more.***	

4.3.9 Operation from NEBB-42EX / EX Loudspeaker

Substation		Operation Panel
	• Press the **CALL** button. • ***Indicated with flashing green LED and a signal in the operation panel's speaker for selected line.*** • ***Operator of the operation panel press respective LINE button, the call is set up. Indicated by steady green light in the central unit***	
	• Speak clearly into the re-entrant EX loudspeaker for communication to the operation panel, and receive communication from the central unit in the same loudspeaker. • ***Operator of the operation panel end the call by pressing the LINE button once more.***	

4.3.10 Operation from All Call Station VMT-603

	• Press the **PTT SWITCH**. Speak clearly into the microphone to give message. • When the **PTT SWITCH** button is released, the system will be in normal talk back mode again.

5 Commissioning

5.1 General

The CTB and CU units and all related equipment have been fully tested in our workshop before delivery. To ensure that everything is correct after installation and configuration of the system, do the following procedure before the system is ready for use.
Refer to sections 3. Installation & Configuration Procedures and 6. Installation Drawings.

5.2 Mechanical Inspection

- All equipment is well fastened in console or wall according to section 3.2
- All cable and cable glands are well tightened and fastened according to section 3.2

5.3 Cable Inspection

All cables are connected according to section 3.3 and dwg.no. CTB_sl, CTB_cc01, CTB_cc02, CTB_cc03, CTB_cc04, CTB_cc05 and CTB_cc06

- Use signal cables 0.5mm^2 approved ship-cable of type twisted-pair with outer braided copper screen. The screens are interconnected in junction boxes and grounded in the central unit only (CU-10,20)
  Common ground points:
  Terminal block X8-1-20 /no. 5 is ground point for each substation,
  Terminal block X1,2,3,4 / no.11 is ground point for each operation panel.
- Power cable are min. 0.75mm^2 and is connected to terminal block X7, + to terminal 1, - to terminal 2. The screen is grounded on terminal 3.
- Use cable 0.75mm^2 for power to signal units.
- Polarity for extra signal device is connected in according to dwg.CTB_cc04 and CTB_cc05

5.4 Check Configurations

Refer to section 3. Installation & Configuration Procedures

- Use power supply according to section 3.4
- Priority is set according to section 3.5
- Receive call from substation is set according to section 3.6
- Public address zones is set according to section 3.7
- Volume and signal adjustment is set according to section 3.8
- Dimmer is set according to section 3.10
- Substation is set according to 3.11, 3.12 and 3.13

5.5 C500 Nautical Safety

For compliance to DNV ship requirements, the following has been carried out:

- Configuration and connection are according to section 2.4.13 and cable connection drawing CTB_cc6
- Sound pressure level is set to satisfactory audibility and volume, ref. section 3.8.1
- A sign plate with directory / substation number for all substations has been placed close to the CTB panel
- A sign plate with each substation number has been placed on or close to each substation.

5.6 Starting Up the System

The system has no On/Off switch for main power. Power switching is done from external equipment.
The system is always powered and ready for use and it will only indicate when the system is in use.
The following procedure has to be completed before use. Do the test procedure for all equipment in the installation. ***Test functions according to User Instructions in Section 4*.**

Basic functions CTB, operation from all CTB-operation panels have to be done.

Pos.	Operation Requirement	Tested, ok
1	Commissioning according to section 5.2, 5,3, 5.4 and 5.5 is done.	☐
2	Power on. 24V DC measured on terminal X7 no.1-2 in central unit	☐
3	Make a call to each substation Ref. 4.1.1	☐
4	Make a call to group of substations Ref. 4.1.2	☐
5	All Call Ref. 4.1.3	☐
6	Give signal to substations with extra signal device. 4.1.5	☐
7	Receive a Call from an substation Ref. 4.1.6	☐
8	Receive a Call from two or more substations. Ref. 4.1.7	☐
9	Volume control of internal loudspeaker Ref. 4.1.11	☐
10	Dimmer for light in Line button Ref. 4.1.12	☐

Additional functions if installed

Pos.	Operation Requirement	Tested, ok
11	Make a call with footswitch, hands free. Ref. 4.1.4	☐
12	AUX function Ref. 4.1.8	☐
13	Audio from external system Ref. 4.1.9	☐
14	Public Address operation of external system Ref. 4.1.10	☐
15	Operation from All Call station VMT-603 Ref. 4.3.10	☐

Parallel communication / Bridge wing Ref. 4.2.1, if installed

Pos.	Operation Requirement	Tested, ok
16	Operation with STB-6	☐
17	Operation with STB-6GN	☐
18	Operation with STB-6GN hands free	☐
19	Operation with SB-4	☐
20	Call to two or more substations from parallel station	☐

Power supply SPS-4, if installed

Pos.	Operation Requirement	Tested, ok
21	Operating by 230V AC or 115v AC mains power supply. 24V DC on terminal 3 -4 Green light marked "DC ok"	☐
22	Operating with 24V DC emergency power supply. 1. Disconnect 230V AC or 115V AC mains power supply and check if the auto switch relay switch to emergency 24V DC. 24V DC on terminal 3 - 4 Check if power failure contact marked NC 6-7 is activated. 2. Disconnect cables to + and – on the power supply module, and check if the auto switch relay switch to emergency 24V DC. On terminal 3 - 4 Check if power failure contact marked NC 6-7 is activated.	☐ ☐

Substations

Pos.	Operation Requirement	Tested, ok
23	Operation from STB-1 Ref. 4.3.1	☐
24	Operation from STB-2 Ref. 4.3.2	☐
25	Operation from STB-3 Ref. 4.3.3	☐
26	Operation from STB-5 Ref. 4.3.4	☐
27	Operation from STB-5GN Ref. 4.3.5	☐
28	Operation from HE-112M Ref. 4.3.6	☐
29	Operation from VH-10M Ref. 4.3.7	☐
30	Operation from VHM-10 Ref. 4.3.8	☐
31	Operation from NEBB-42EX / EX Loudspeaker Ref. 4.3.9	☐

Volume Control

Pos.	Operation Requirement	Tested, ok
32	Adjust sound pressure level, to convenient level if necessary Master volume line 1-5, 6-10, 11-15, 16-20 **Ref. section 3.8 and dwg.CU-10:lo and CU-20_lo**	☐

5.7 Trouble Shooting

Most faults can be related to the following problems.
Important! Use this trouble shooting together with section 3 Installation and Configuration Procedures

Problems when operating from operation panels

Pos.	Failure event	Description / Indication	Recommended Action
1	The whole system is shut down. No light indication in CTB-panels.	No voltage measured on terminal block X7 no.1-2 in the CU-unit	1.Check 24V DC mains power supply or power supply SPS-4
		Correct voltage 24 – 32VDC measured on terminal block X7 no.1-2 in the CU-unit	2. Check fuse marked F3 1AT (Ref. dwg CU-10_lo)
2	SPS-4 power supply failure	Indication from failure contact X2 No.5-6(NO) or. X2 No.6-7 (NC) No light in “DC ok” Two possibilities 1. 230V AC or 115V AC failed and has been switched to 24V DC Emergency. 2. The power supply module has failed.	1. Check main power supply 2. Check fuse 5.0AT , terminal marked 3 2.1 If not success, the power module have to be repaired/ replaced.
3	Operation from CTB-panels failed **1.**	No audio message received in any substation no. 1-10 or 11-20.	Check fuse marked “fuse 2”1.0AT for line 1-10 and “fuse 4”1.0AT for line 11-20
3.1	Operation from CTB-panels failed **2**	One or more operation panels failed. One or more Indication light is active , one for each operation panel marked “indication for panels” on central unit.ref.dwg.CU-10_lo	Check all connection for actual panel(s) The panel operate correct when light is turned off. Try to replace the position, if current panels then work correct the fault must be in the central unit. The main board have to be replaced or repaired.
4	Priority do not fulfil requirement for actual operation panel		Check if DIP switches in the central unit marked “set priority” is set according to section 3.5
5	Receive call from substation do not fulfil requirement for actual station.		Check if DIP switches in the central unit marked “set receive call” is set according to section 3.6
6	Public address operation does not fulfil the requirement for operation of SPA public address system.		Check if DIP switches in the central unit marked “selector for PA-zones” is set according to section 3.7
7	Level for signal from auxiliary does not fulfil the requirement.		Adjust trim potentiometer in the central unit marked “adj. aux. input signal” to satisfactorily level. See section 3.8.2
7.1	Level for output PA-Signal does not fulfil the requirement.		Adjust trim potentiometer in the central unit marked “adj. PA-output signal” to satisfactorily level. See section 3.8.2

7.2	Level for call signal out to all lines does not fulfil the requirement.		Adjust trim potentiometer in the central unit marked “adj. call signal out” to satisfactorily level. See section 3.8.3
8	General operating problems occurred when operating several stations.	Instability.	Check cable and termination blocks in the CU unit for respective stations, especially cable and termination blocks in junction boxes, if used.
9	One substation cannot be operated	No contact between CTB panel and substation	Check cable and terminal block in the CU unit for current extension. Check cable and terminal block in the substation or plugbox. Move this terminal block to another ext. number. If operating is ok, current substation have to be repaired.
10	Operation problem from a substation.	Continuous rapping tone (pip..pip) in the CTB units.	Change polarity in substation terminal no1-2
11	No signal in substation when using the sign push button on the CTB- unit.	No audio 1Khz tone in the substation	Disconnect the substation. 1. If 7V AC is measured on terminal X8 1-2 in the CU unit, this unit is ok. 2. If no voltage measured, the CU unit have to be repaired 3. Connect the substation. If no voltage measured on terminal X8 1-2 in substation, fault must be in cable or the substation has to be repaired.
12	No signal in additional signal device when using the sign push button.	Signal in substation, but no signal in the additional signal device.	Disconnect the substation. 1. If no voltage measured on terminal X8 3-4 in the CU unit, check fuse F3 1A. 2. If fuse F3 is ok. Check automatic fuse by waiting 2 to 3 seconds. If 24V DC is measured, the load is too high. Max. 50mA.
13	Feedback problems	In one CTB unit	Move substation or parallel equipment to another position.
14	Problems with system generated noise **1**	Occurred both in central unit and substations if it used ships own 24V DC	Disconnect ships 24V DC and connect a separate power supply (SPS-4) or a DC 24V / 24V DC converter.
14.1	Problems with system generated noise **2**	Occurred both in CTB units and substation, (substations)	1. Check all cable connections, especially the screens. Important that connections is done according to requirements in section 3.4 and dwg. CTB_cc1, CTB _cc2 and CTB _cc3, CTB_cc4, CTB_cc5 and CTB_cc6 2. If still problems, try with an capacitor 1uF between terminal no.1-2 block X8-10 (20) If still problems, it will require service from Zenitel.

Problems when operating from substation or parallel station connected to an operation panel

Pos.	Failure event	Description / Indication	Recommended Action
15	Operation from an substation cannot be done	No flashing green LED and a signal in the CTB monitor loudspeaker for the selected line.	1. Check cable and terminal block in the substation or plug box. 2. Move this terminal block to another ext. number. If still problems, the substation have to be repaired If operating is OK, the CU unit have to be repaired
16	Problems with high background sound	Nearby the substation	Replace current substation with substation with headset or with external loudspeaker STB-2 Or adjust Master volume line 1-5 6-10, 11-15 or 16-20. (Ref. Document dwg.CU-10_lo and CU-20_lo)
17	Operation from an parallel station cannot be done	Normal operation from the CTB unit.	1. Check cable and connections between the parallel station and the central unit. 2. Check microphones If still problems, the parallel station have to be repaired

Problems when operating from All Call stations. Ref DNV C500 Nautical Safety

Pos.	Failure event	Description / Indication	Recommended Action
18	Operation from one All Call station cannot be done.	No audio in all other operation panels or substations.	1. Check connection between the unit and the junction box. 2. If 24V DC voltage is measured in the All Call station, the unit have to be repaired. Ref. dwg. CTB-cc6
19 20	Operation from All Call station cannot be done.	No audio in all other operation panels or substations.	1. Check connection between the junction box and the central unit, and specially the terminal block connected to X6. Ref. dwg. CTB-cc6 If still problems, the central unit have to be repaired.
	Sound pressure level does not fulfil the requirement.		Adjust trim potentiometer in the central unit marked “adj. aux. input signal” to satisfactorily level. See section 3.8.2

Note: If the recommended actions above do not succeed, further action has to be done in cooperation with or by Zenitel.

6 System & Dimension Drawings

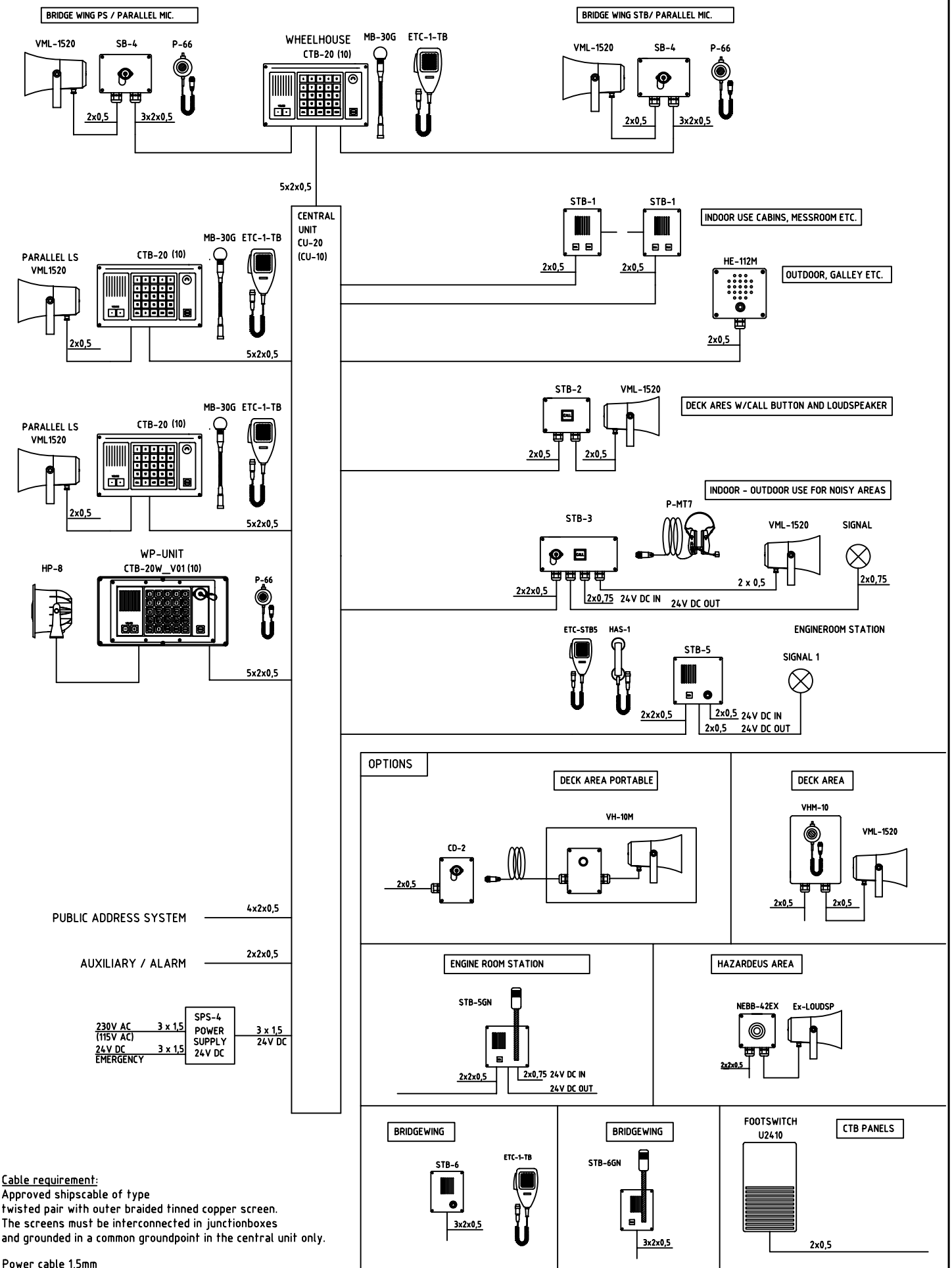
The system and dimension drawings can be found in the following pages in the order listed below.

System Drawings

Item	Description	Doc. No.
System drawing	Single line diagram	CTB-_sl
System drawing	System block diagram	CTB_bd
System drawing	Lay out terminals CTB-10, 20, CTB-10,20 W/01	CTB-1020_lo
System drawing	Lay out terminals CU-10	CU-10_lo
System drawing	Lay out terminals CU-20	CU-20_lo
System drawing	Connection substations, options	CTB-cc1
System drawing	Connection CU- / CTB with options	CTB-cc2
System drawing	Connection power, PA, alarm & Auxiliary	CTB-cc3
System drawing	Connection CU- substations, line 1-10	CTB-cc4
System drawing	Connection CU- substations, line 11-20	CTB-cc5
System drawing	Connection Nautical Safety	CTB-cc6
Wiring diagram	Power Supply SPS-4	SPS-4Ver.2.0_ddwd

Dimension Drawings

Item	Description	Doc. No.
CU-10 & CU-20	Central units	CU_dd
CTB-10, 20	Operator panel 10,20 lines	CTB-1020_dd1
WBOKS	Wall mounted box for CTB-10 and 20	WBOKS_dd
CTB-10,20 W V01	WP Operator panel 10,20 lines	CTB-1020W_dd
HP-8	Horn loudspeaker, part of CTB-10W V01 and CTB-20W V01	HP-8_dd



Cable requirement:
Approved shipscable of type
twisted pair with outer braided tinned copper screen.
The screens must be interconnected in junctionboxes
and grounded in a common groundpoint in the central unit only.

Power cable 1,5mm
JB is yard supply

Note!
Output for extra signal device made for all lines.
In case, use 2pair cable to each substation line.

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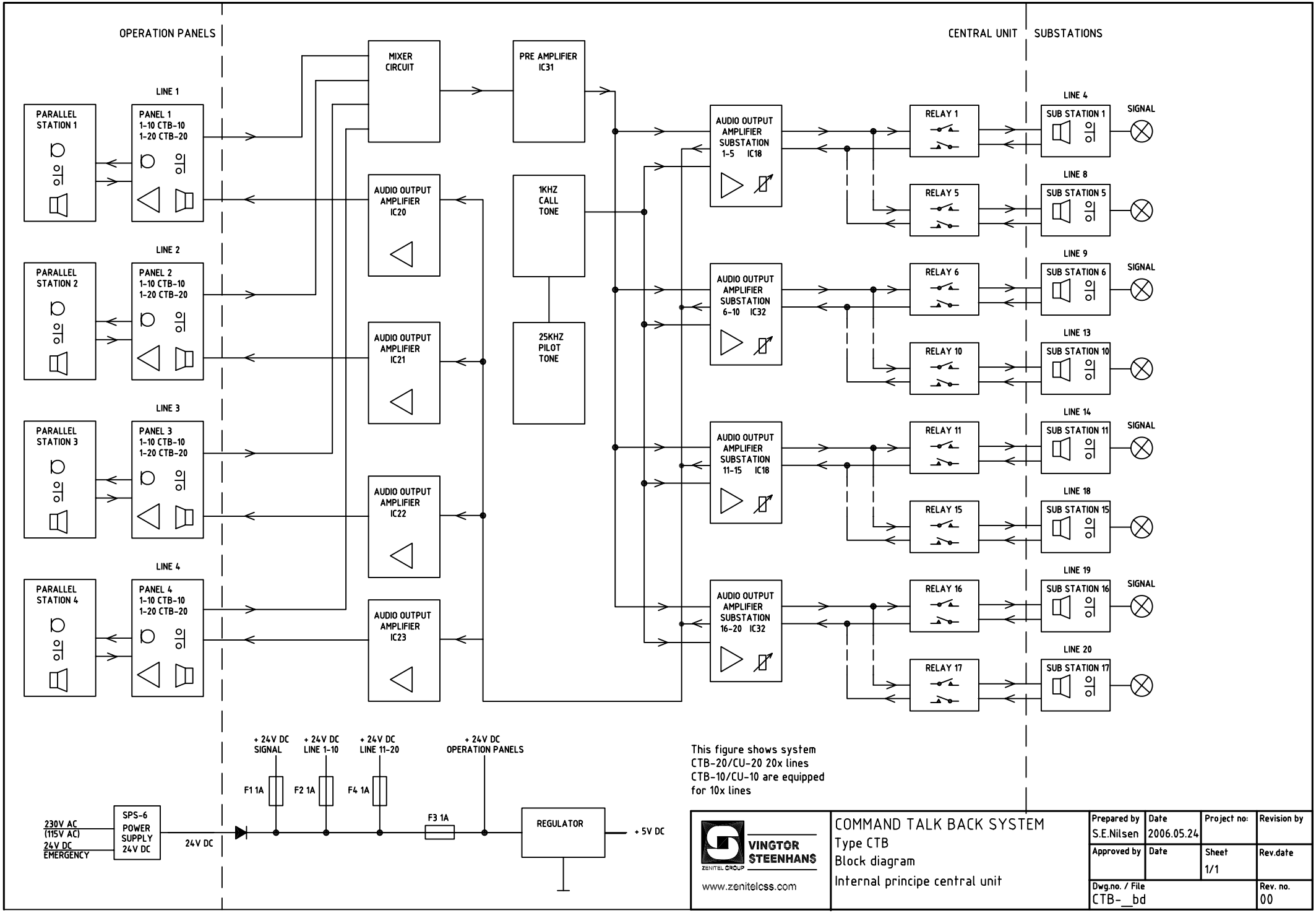
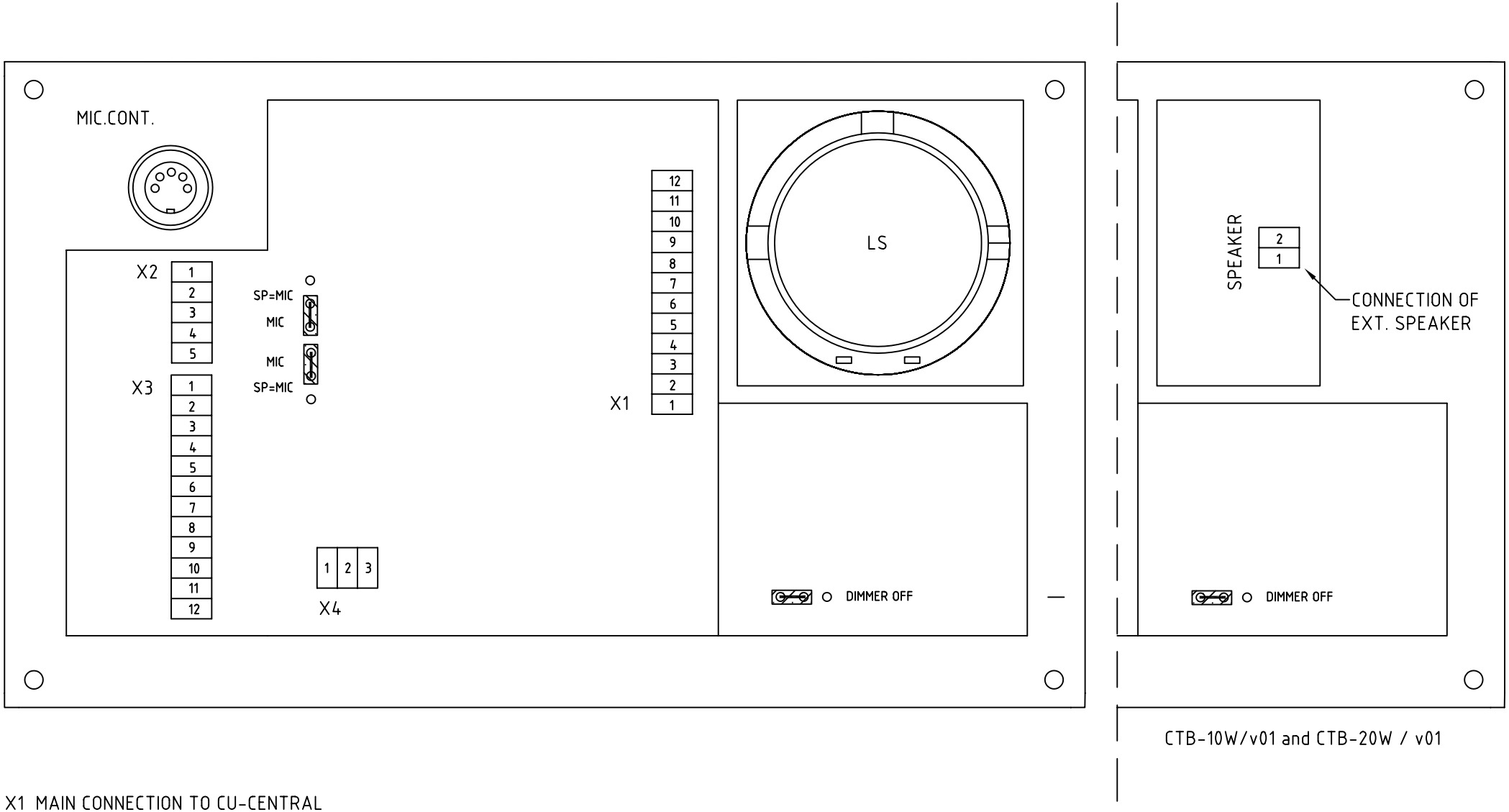
COMMAND TALK BACK SYSTEM
Type CTB
Single line diagram
Typical configuration / Options

Prepared by	Date	Project no:	Revision by
S.E.Nilsen	2001.08.30		S.E.Nilsen
Approved by	Date	Sheet	Rev.date
		1/1	2006.06.08
Dwg.no. / File			Rev. no.
CTB_sl			02


OPERATION PANELS
CENTRAL UNIT
SUBSTATIONS
PARALLEL STATION 1
PARALLEL STATION 2
PARALLEL STATION 3
PARALLEL STATION 4
LINE 1
LINE 2
LINE 3
LINE 4
PANEL 1 1-10 CTB-10 1-20 CTB-20
PANEL 2 1-10 CTB-10 1-20 CTB-20
PANEL 3 1-10 CTB-10 1-20 CTB-20
PANEL 4 1-10 CTB-10 1-20 CTB-20
MIXER CIRCUIT
PRE AMPLIFIER IC31
1KHZ CALL TONE
25KHZ PILOT TONE
AUDIO OUTPUT AMPLIFIER IC20
AUDIO OUTPUT AMPLIFIER IC21
AUDIO OUTPUT AMPLIFIER IC22
AUDIO OUTPUT AMPLIFIER IC23
AUDIO OUTPUT AMPLIFIER SUBSTATION 1-5 IC18
AUDIO OUTPUT AMPLIFIER SUBSTATION 6-10 IC32
AUDIO OUTPUT AMPLIFIER SUBSTATION 11-15 IC18
AUDIO OUTPUT AMPLIFIER SUBSTATION 16-20 IC32
RELAY 1
RELAY 5
RELAY 6
RELAY 10
RELAY 11
RELAY 15
RELAY 16
RELAY 17
LINE 4
SUB STATION 1
LINE 8
SUB STATION 5
LINE 9
SUB STATION 6
LINE 13
SUB STATION 10
LINE 14
SUB STATION 11
LINE 18
SUB STATION 15
LINE 19
SUB STATION 16
LINE 20
SUB STATION 17
SIGNAL
+ 24V DC SIGNAL
+ 24V DC LINE 1-10
+ 24V DC LINE 11-20
+ 24V DC OPERATION PANELS
F1 1A
F2 1A
F4 1A
F3 1A
230V AC (115V AC)
24V DC EMERGENCY
SPS-6 POWER SUPPLY 24V DC
24V DC
REGULATOR
+ 5V DC
This figure shows system
CTB-20/CU-20 20x lines
CTB-10/CU-10 are equipped
for 10x lines
VINGTOR STEENHANS
ZENITEL GROUP
www.zenitelcss.com
COMMAND TALK BACK SYSTEM
Type CTB
Block diagram
Internal principe central unit
Prepared by S.E.Nilsen
Date 2006.05.24
Project no:
Revision by
Approved by
Date
Sheet 1/1
Rev.date
Dwg.no. / File CTB-__bd
Rev. no. 00



CTB-10W/v01 and CTB-20W / v01

X1 MAIN CONNECTION TO CU-CENTRAL
X2 BRIDGE WING MICROPHONE
X3 PARALLEL MICROPHONES / PARALLEL SPEAKER
X4 CALL IN RELAY CONTACTS

CTB-10W / V01 and CTB-20W / V01
WITHOUT INTERNAL SPEAKER

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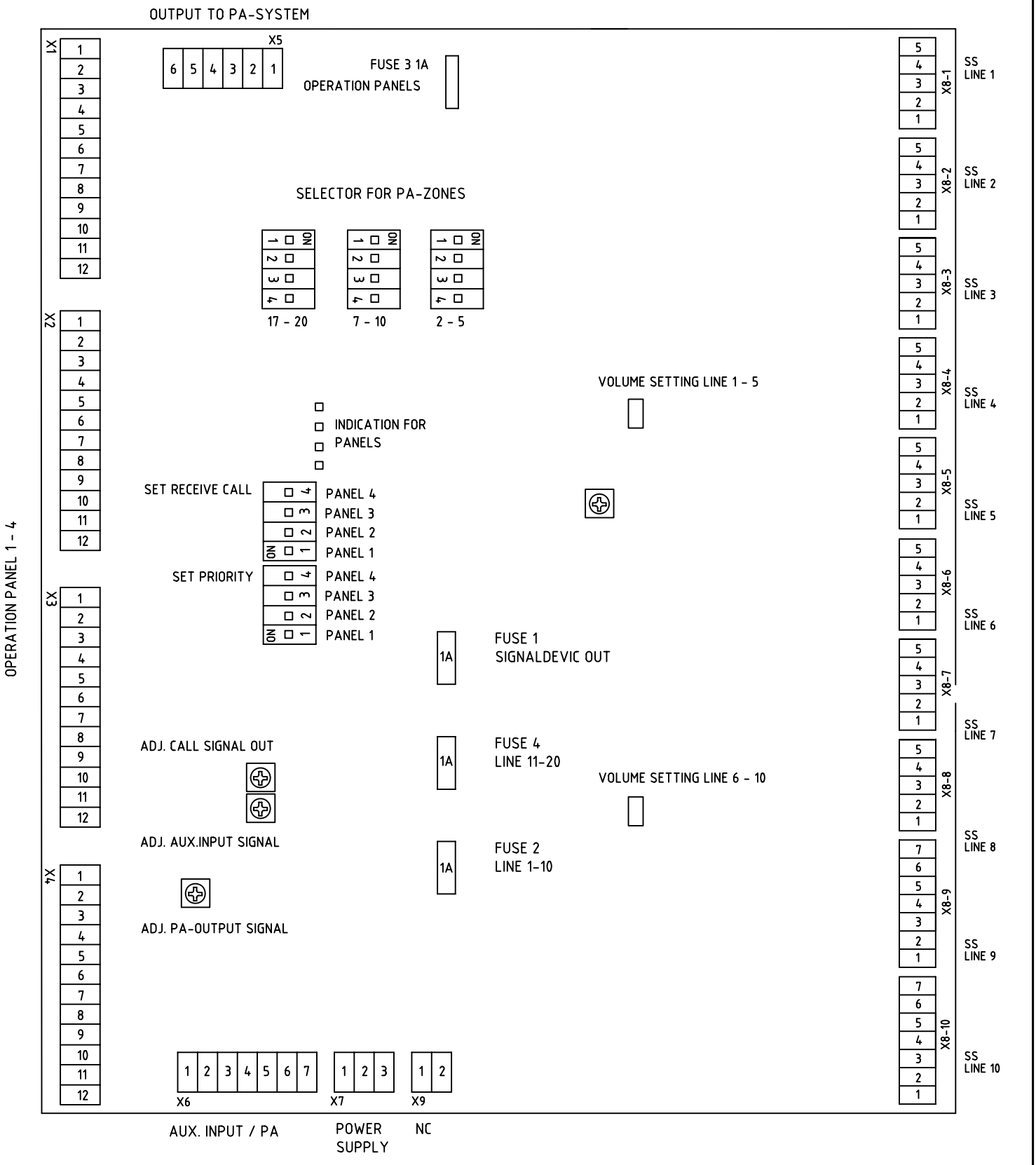
COMMAND TALK BACK SYSTEM
Type CTB & CTB-100
Operation panel CTB-10, CTB-20
CTB-10W/V01 & CTB-20W/V01
Lay out terminals and dipswitch

Prepared by: S.E.Nilsen	Date: 2001.08.29	Project no:	Revision by: S.E.Nilsen
Approved by: xxx	Date: xxx	Sheet: 1/1	Rev.date: 2004.12.16
Dwg.no. / File: CTB-1020__lo			Rev. no.: 01



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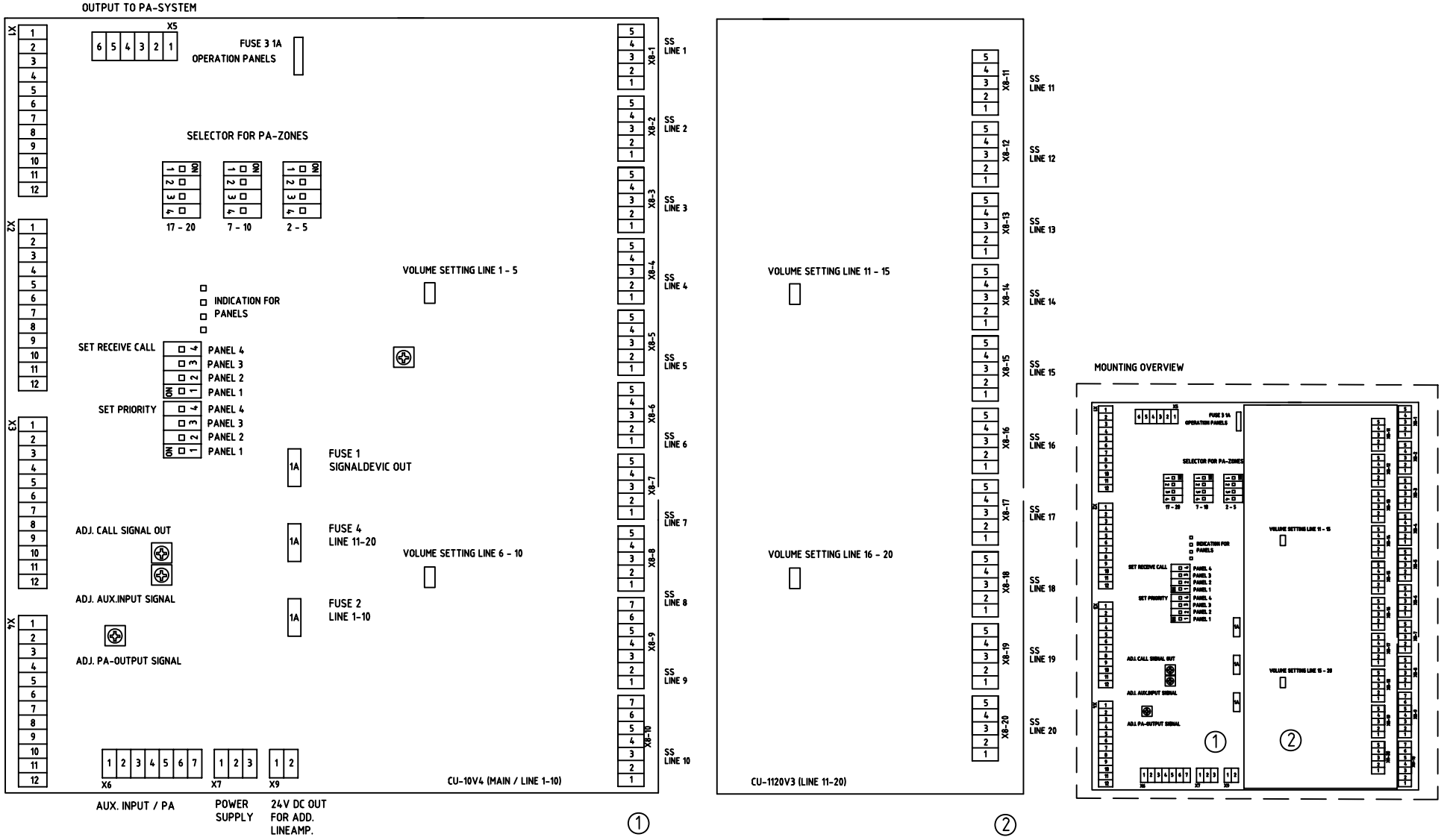
COMMAND TALK BACK SYSTEM

Type CTB

Lay out CU-10

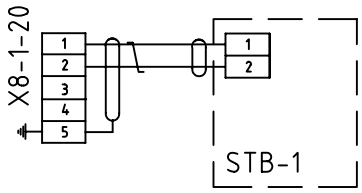
Terminals, selctors, fuses, jumpers & adjustments.

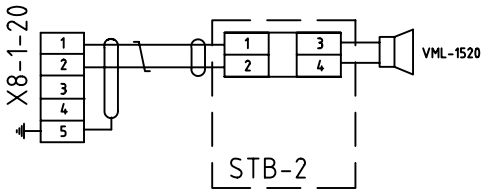
Prepared by	Date	Project no:	Revision by
S.E.Nilsen	2004.12.16		S.E.Nilsen
Approved by	Date	Sheet	Rev.date
		1/1	2006.06.08
Dwg.no. / File			Rev. no.
CU-10__lo			01

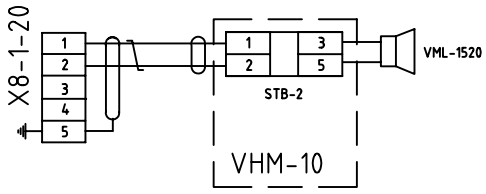


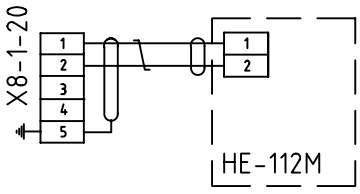
1 Main / line board 1-10
2 Line board 11-20

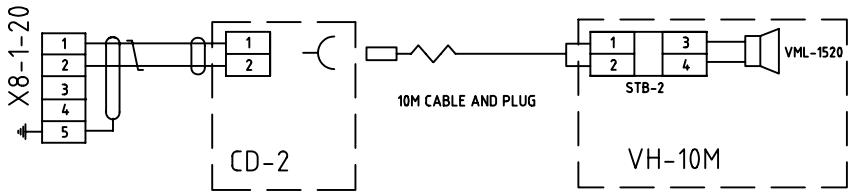
zenitel Zenitel Marine Norway	COMMAND TAK BACK SYSTEM Type CTB Lay out CU-20 Terminals, selectors, fuses, jumpers & adjustments.	Prepared by: S.E.Nilsen	Date: 2004.12.17	Project no:	Revision by: S.E.Nilsen
		Approved by:	Date:	Sheet: 1/1	Rev.date: 2006.06.14
		Dwg.no. / File: CU-20_lo			Rev. no.: 01

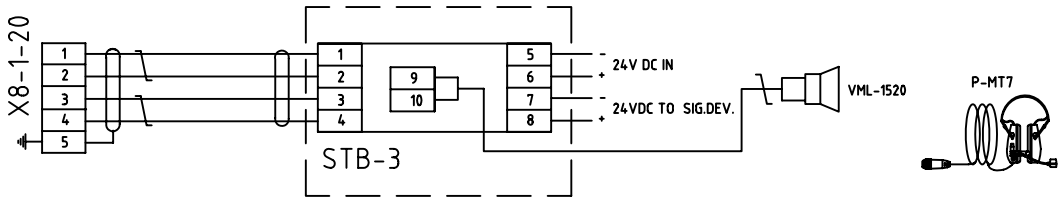


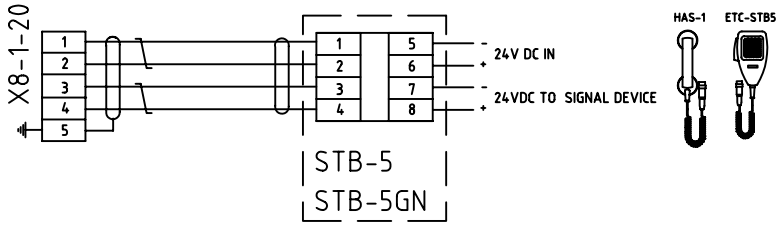




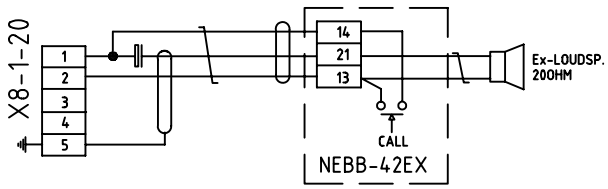


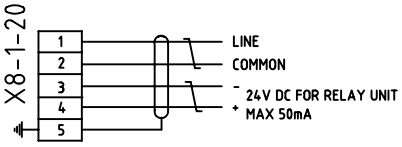






22uF/100V (MOUNTED IN CENTRAL)





ISOLATED SCREEN

Twisted pair

Cable requirement:
Approved shipscable of type
twisted pair with outer braided tinned copper screen.
The screens must be interconnected in junctionboxes
and grounded in a common groundpoint in the central unit only.

Power cable 1,5mm
JB is yard supply

Output for extra signal device for all lines.
We recommend to use 2pair cable to each substation line.

24V DC out from substation w/ relay unit to signal device max.2A

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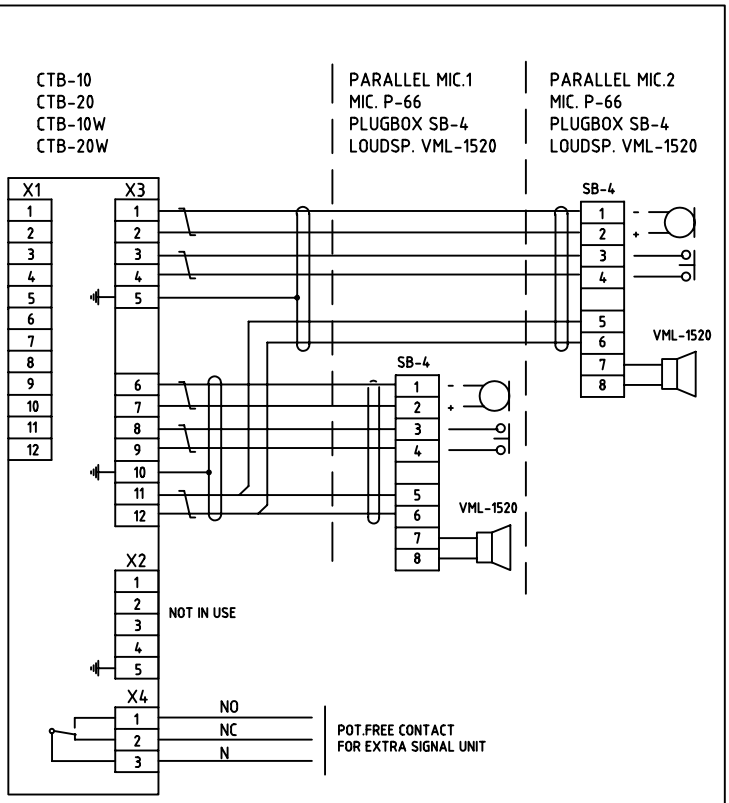
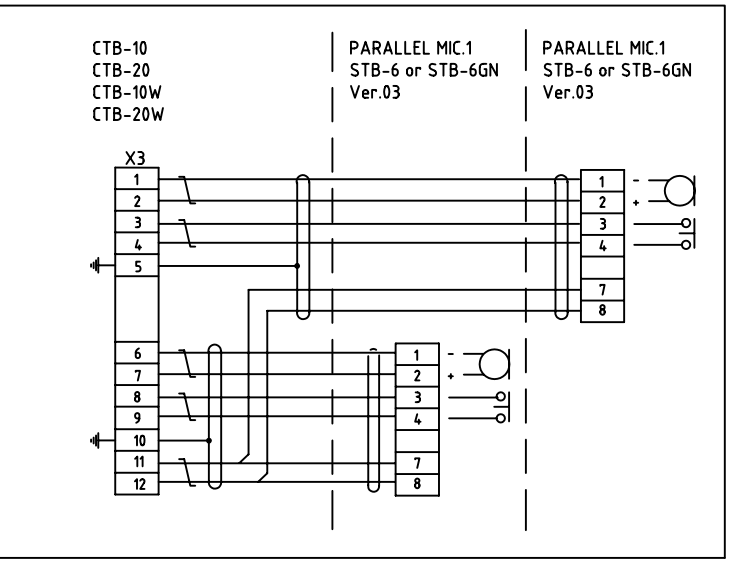
COMMAND TALK BACK SYSTEM
Type CTB
Connection substations
CU-10 & CU-20
Low impedance

Prepared by	Date	Project no:	Revision by
S.E.Nilsen	2001.08.29		Sen
Approved by	Date	Sheet	Rev.date
		1/1	2004.12.23
Dwg.no. / File			Rev. no.
CTB-__cc1			03

OPTION 1 PARALLEL MICROPHONE / LOUDSPEAKER

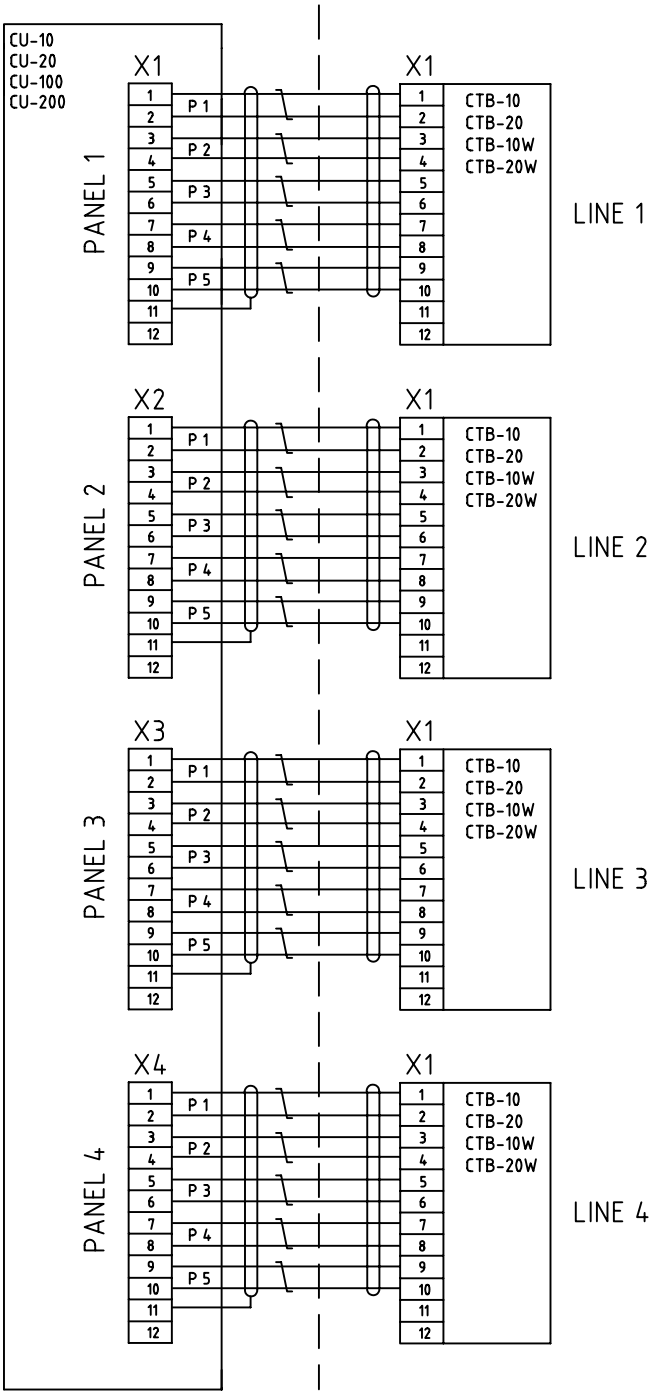


OPTION 2 PARALLEL MICROPHONE / LOUDSPEAKER



CENTRAL UNIT

OPERATION PANEL



Max. 4 operation panels
On system with more than
1 operation panel,
each panel take one
substation line.

CTB-10
CTB-20
CTB-10W
CTB-20W

X1

1	+ 24V DC
2	− 24V DC
3	CLK A
4	CLK B
5	RX TX A
6	RX TX B
7	F > MIC. LINE OUT
8	F > MIC. LINE OUT
9	F > SPEAKER LINE IN
10	F > SPEAKER LINE IN
11	SCREEN
12	

Output for extra signal device for all lines.
We recommend to use 2pair cable to each substation line.

Twisted pair

Isolated screen

Cable requirement:
Approved shipscable of type
twisted pair with outer braided tinned copper screen.
The screens must be interconnected in junctionboxes
and grounded in a common groundpoint in the central unit only.

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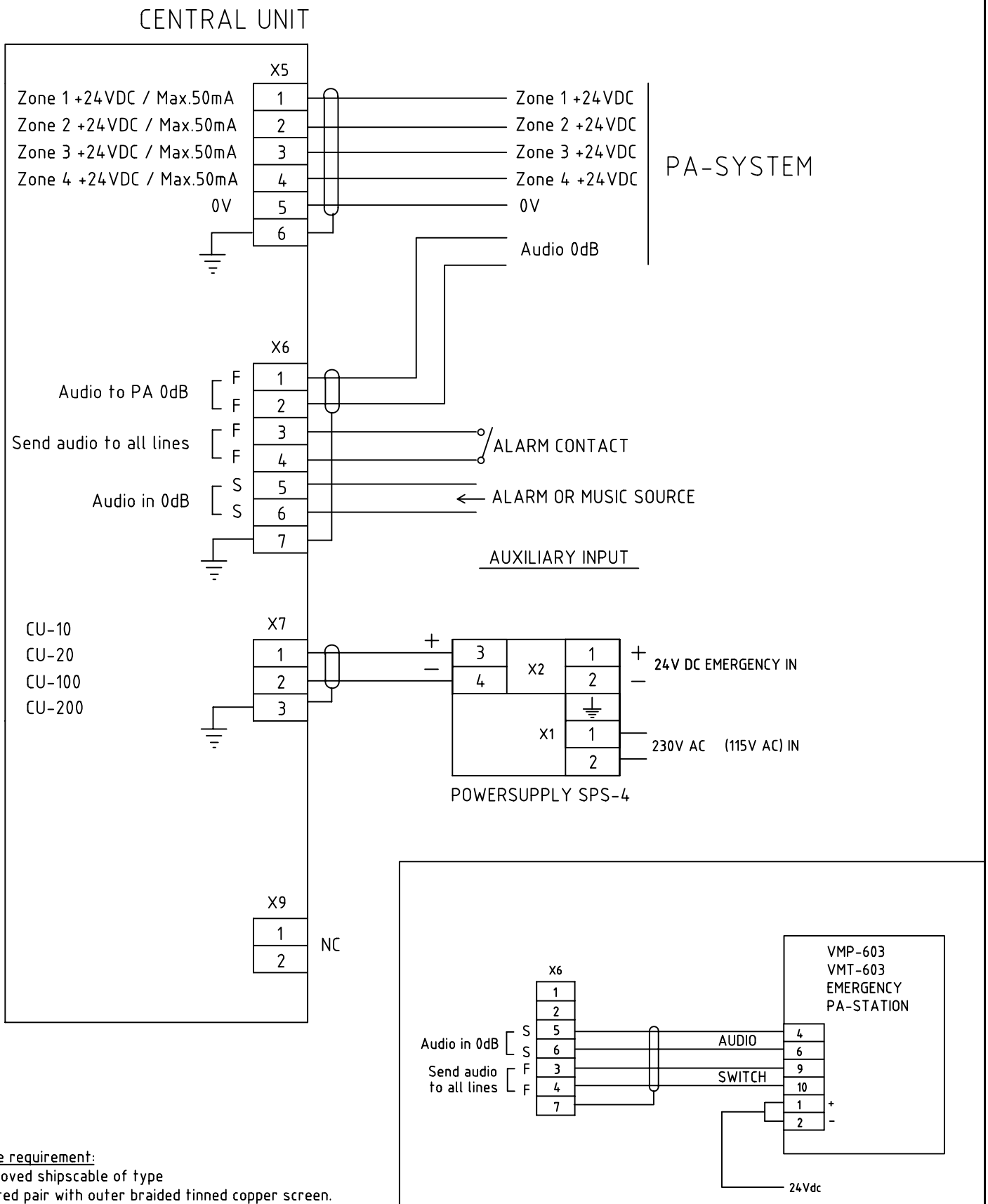
COMMAND TALK BACK SYSTEM
Type CTB & CTB-100V
Cable connection diagram
Central unit CU- / operation panels CTB-
Option operation panels.

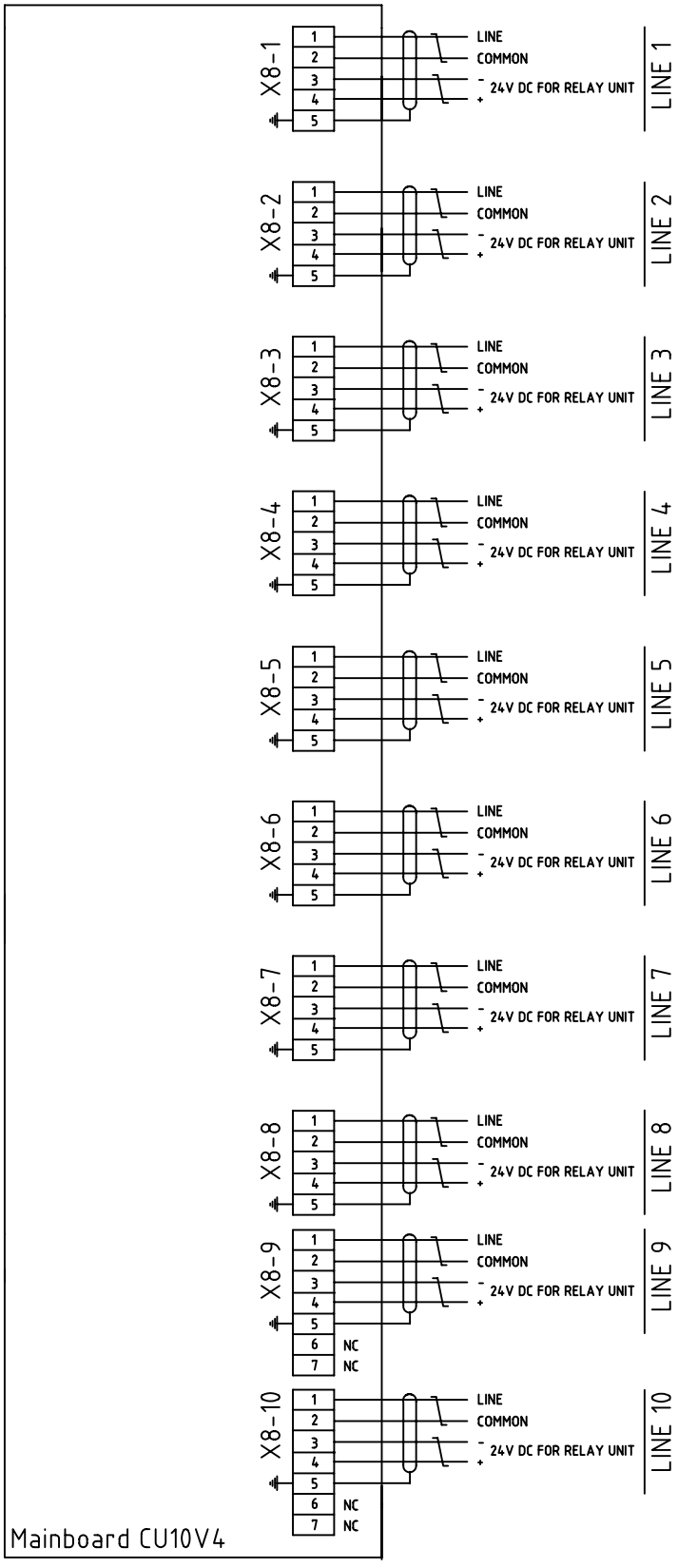
Prepared by	Date	Project no:	Revision by
S.E.Nilsen	2001.08.29		Sen
Approved by	Date	Sheet	Rev.date
		1/1	2004.07.04
Dwg.no. / File			Rev. no.
CTB__cc2			03



Cable requirement:
Approved shipscable of type
twisted pair with outer braided tinned copper screen.
The screens must be interconnected in junctionboxes
and grounded in a common groundpoint in the central unit only.

Powercable min 0,75mm

zenitel Zenitel Marine Norway	COMMAND TALK BACK SYSTEM Type CTB Cable connection diagram Power, PA, alarm & Auxiliary	Prepared by: 2001.09.03 / Date: S.E.Nilsen / Project no: / Revision by: S.E.Nilsen	
		Approved by / Date / Sheet: 1/1 / Rev.date: 2006.12.19	
		Dwg.no. / File: CTB_cc3	Rev. no.: 05



Cable requirement:
Approved shipscable of type
twisted pair with outer braided tinned copper screen.
The screens must be interconnected in junctionboxes
and grounded in a common groundpoint in the central unit only.

Power cable 1,5mm
JB is yard supply

24V DC out for substation w/ relay unit
or other relay units (max 50mA)
We recommend to use 2pair cable to each
substation line.

\ Twisted pair

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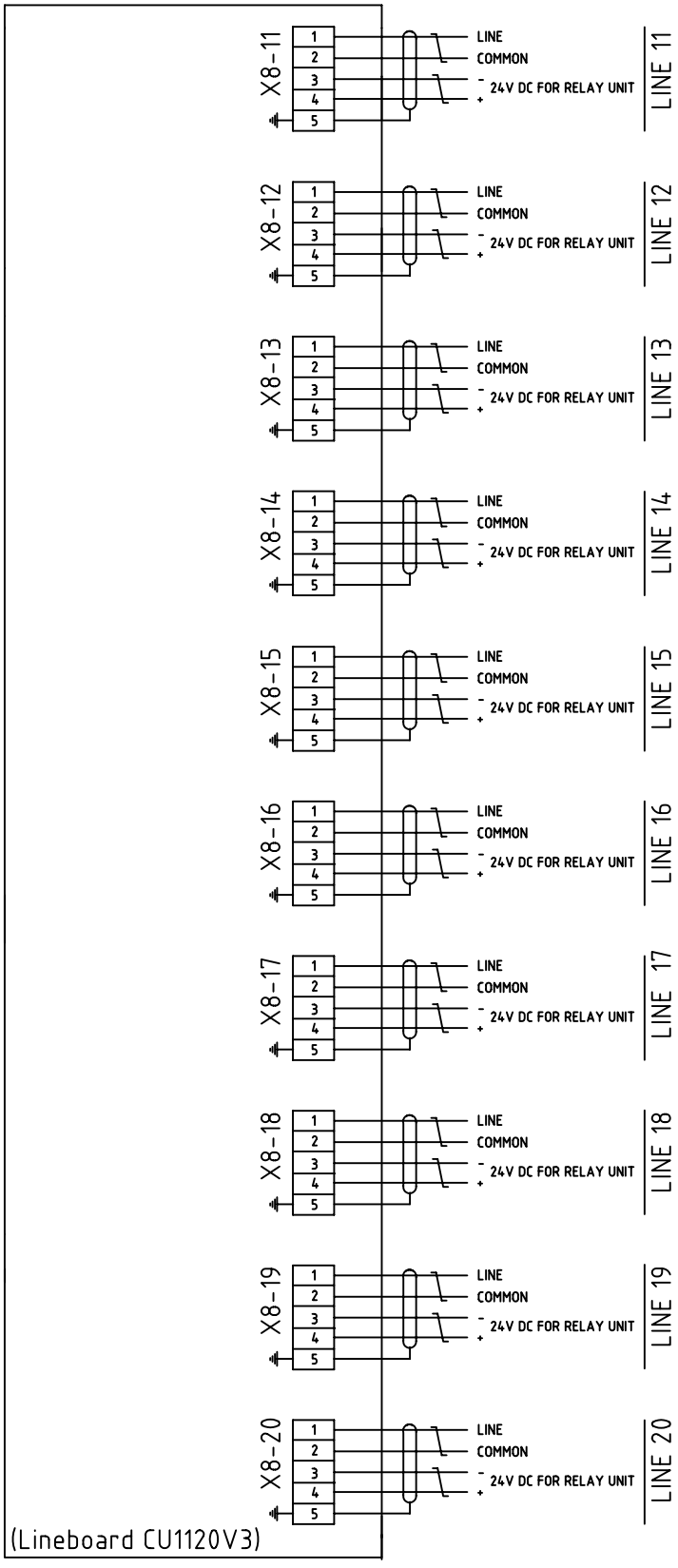
COMMAND TALK BACK SYSTEM
Type CTB
Cable connection diagram
Central unit CU-10 & CU-20
Substation line 1 - 10

Prepared by	Date	Project no:	Revision by
S.E.Nilsen	2002.09.12		S.E.Nilsen
Approved by	Date	Sheet	Rev.date
		1/1	2004.12.22
Dwg.no. / File			Rev. no.
CTB__cc4			01



Cable requirement:
Approved shipscable of type
twisted pair with outer braided tinned copper screen.
The screens must be interconnected in junctionboxes
and grounded in a common groundpoint in the central unit only.

Power cable 1,5mm
JB is yard supply

24V DC out for substation w/ relay unit
or other relay units (max 50mA)
We recommend to use 2pair cable to each
substation line.

\ Twisted pair

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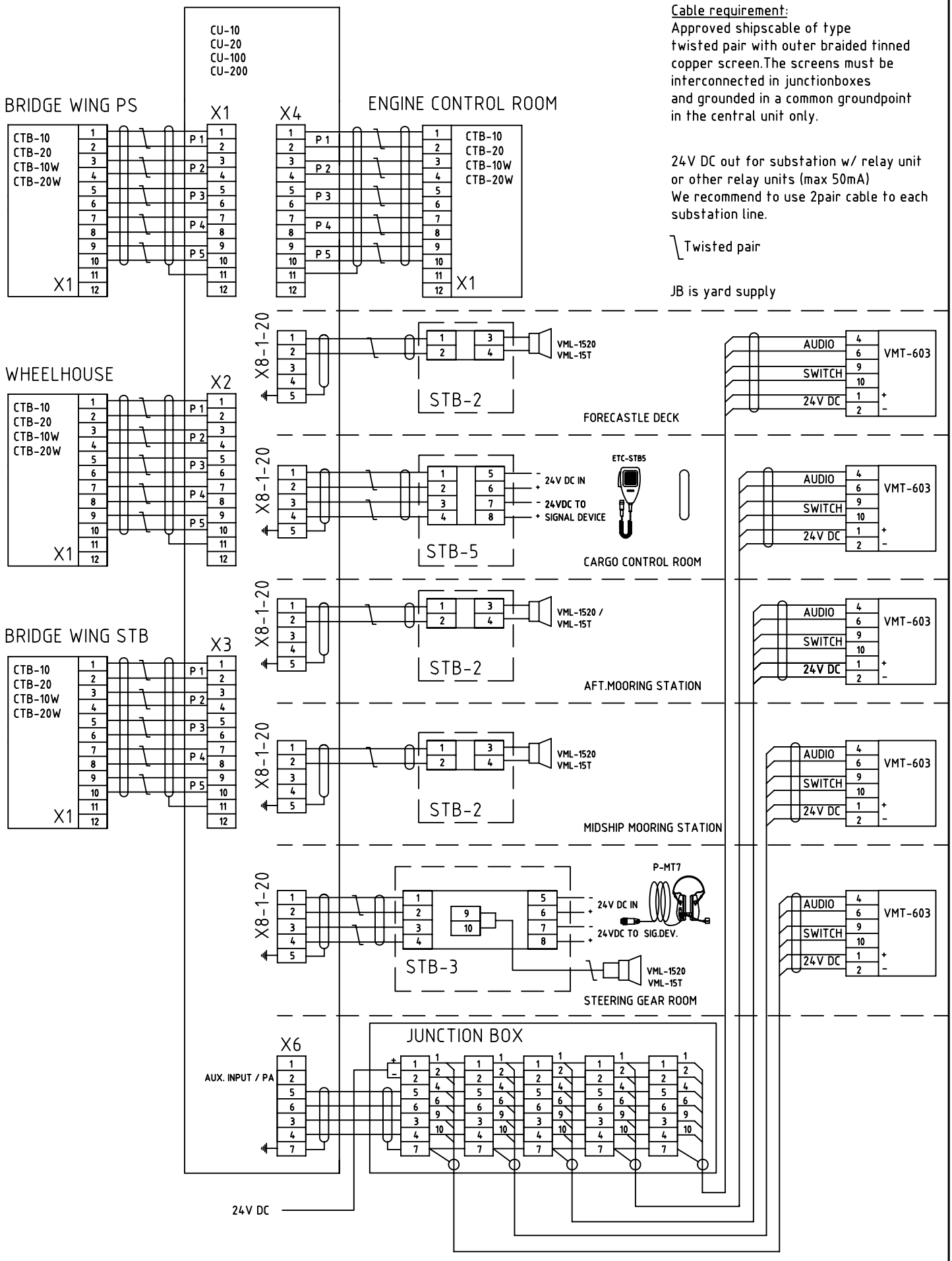
COMMAND TALK BACK SYSTEM
Type CTB
Cable connection diagram
Central unit CU-20
Substation line 11 - 20

Prepared by	Date	Project no:	Revision by
S.E.Nilsen	2002.09.12		S.E.Nilsen
Approved by	Date	Sheet	Rev.date
		1/1	2004.12.22
Dwg.no. / File			Rev. no.
CTB__cc5			01



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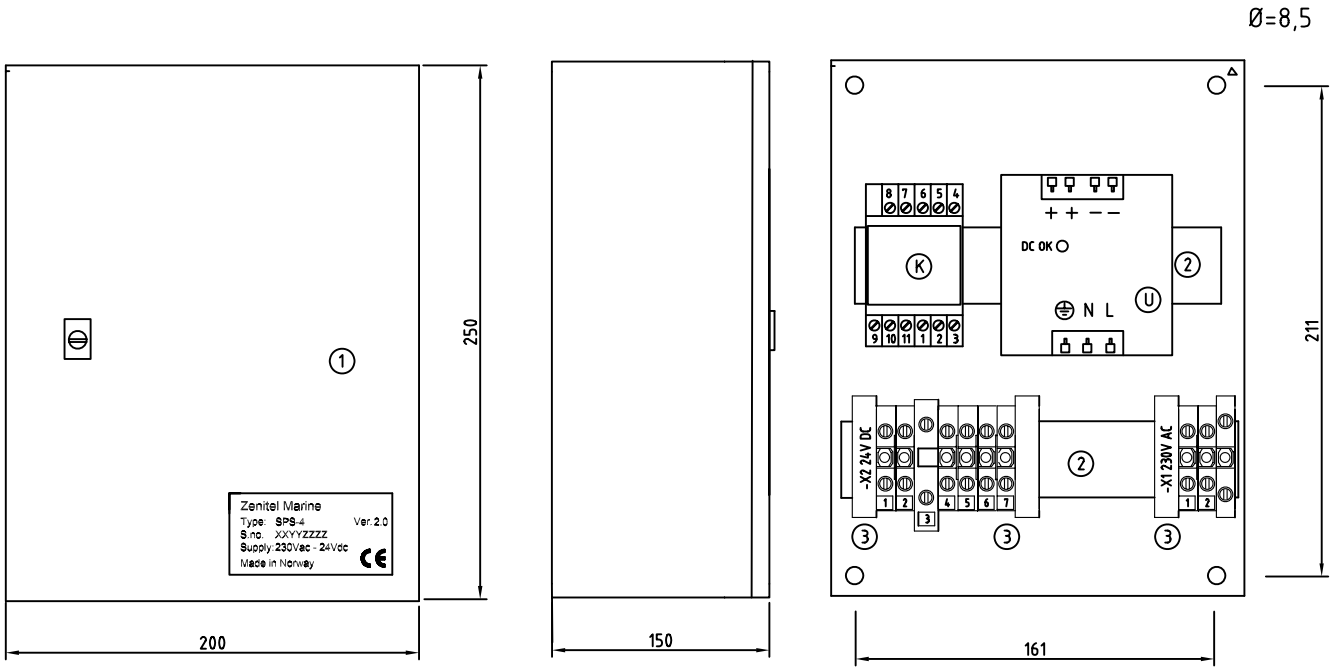
COMMAND TALK BACK SYSTEM
Type CTB & CTB-100
Cable connection diagram
when system is classified in
DNV C500 Nautical Safety

Prepared by	Date	Project no:	Revision by
S.E.Nilsen	2006.06.08		
Approved by	Date	Sheet	Rev.date
		1/1	
Dwg.no. / File			Rev. no.
CTB__cc6			00



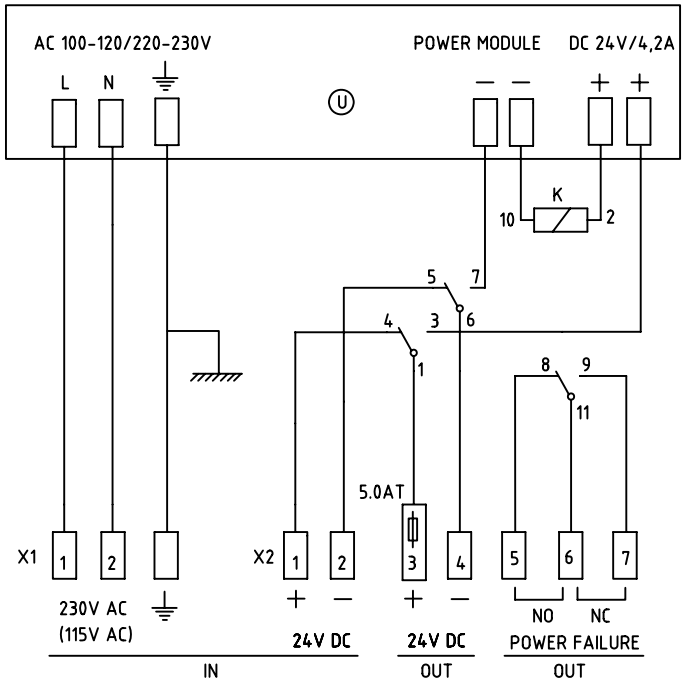
NORMAL OPERATING,
GREEN LIGHT IN "DC OK"
230V AC OR 115V AC MAIN POWERSUPPLY X1 No.1-2
24V DC OUT ON TERMINAL X2 No.3-4

OPERATING WITH 24V DC EMERGENCY POWERSUPPLY
WHEN POWERFAILURE FROM 230V AC OR 115V AC
NO GREEN LIGHT IN "DC OK"
24V DC IN ON TERMINAL X2 No.1-2
24V DC OUT ON TERMINAL X2 No.3-4

POWERFAILURE INDICATION
INDICATION ON X2 No.5-6 NO (=NORMAL OPEN)
OR ON X2 No.6-7 NC (=NORMAL CLOSED)
OR DEVICE CONNECTED TO THIS CONTACTS.
NO LIGHT IN LAMP MARKED "DC ok"

TWO POSSIBILITIES:
1. 230V AC OR 115V AC HAS FAILED AND HAVE BEEN
SWITCHED TO 24V DC EMERGENCY
RECOMMENDED ACTION: CHECK MAIN POWERSUPPLY.

2. THE POWER SUPPLY MODULE HAS FAILED
RECOMMENDED ACTION 1: CHECK FUSE 5.0AT TERMINAL X2 No.3
RECOMMENDED ACTION 2: THE POWERSUPPLY
HAVE TO BE REPAIRED/REPLACED



ID	Description 1	Description 2	Qty.
1	CABINET w/ MOUNTINGPLATE	MAS0252015 ELDON	1
2	DIN-RAIL	TS-30 (150MM)	2
U	POWERSUPPLY MODULE	ML100.100	1
K	RELAY 24V DC w/SOCKET	C3-A30X RELECO	1
X1: 1 2 X2: 1 2 4 5 6 7	TERMINAL w/MARKING	4MM	8
X2: 3	FUSE TERMINAL w/MARKING	4MM	1
X1: G/Y	GROUND TERMINAL	4MM	1
3	END LOCK w/ MARKING X1, X2		3
X2: 3	FUSE 5x20	5,0A T	1

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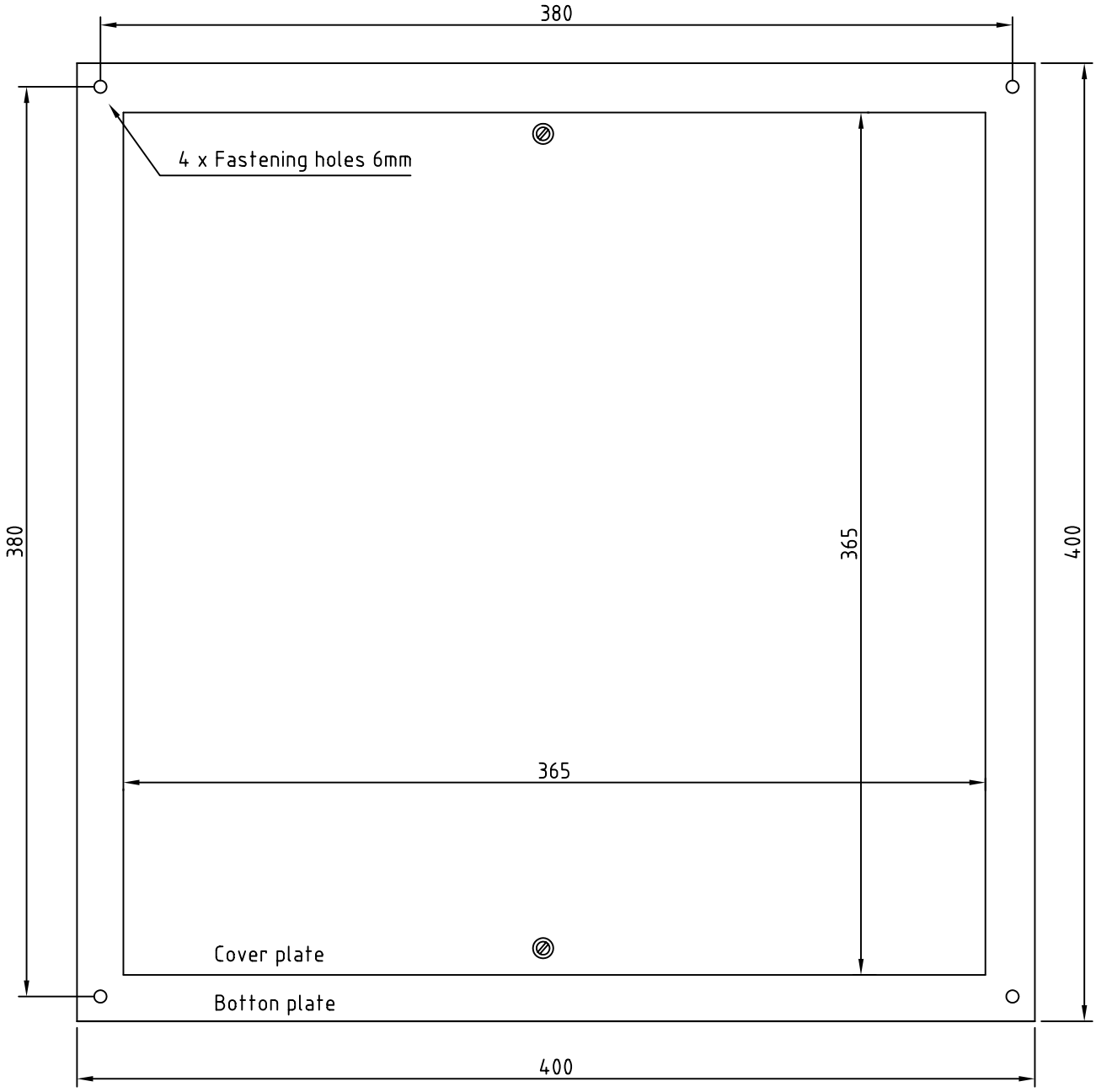
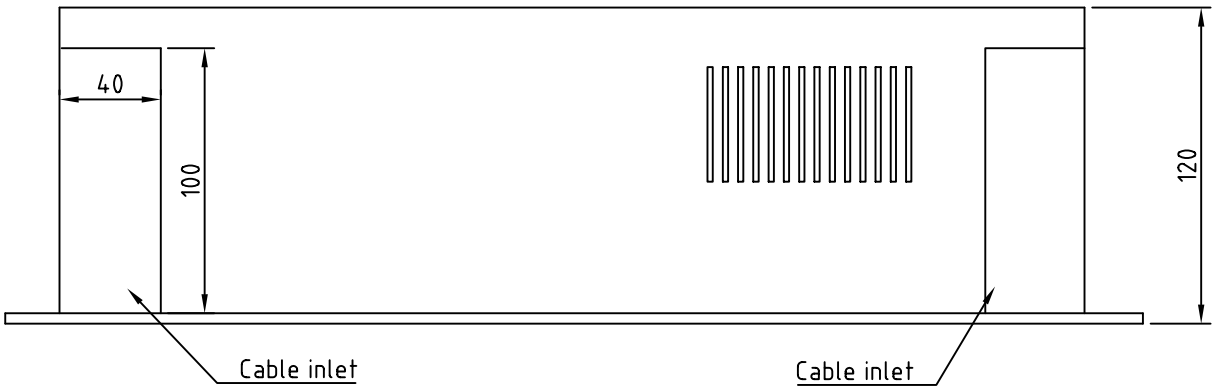
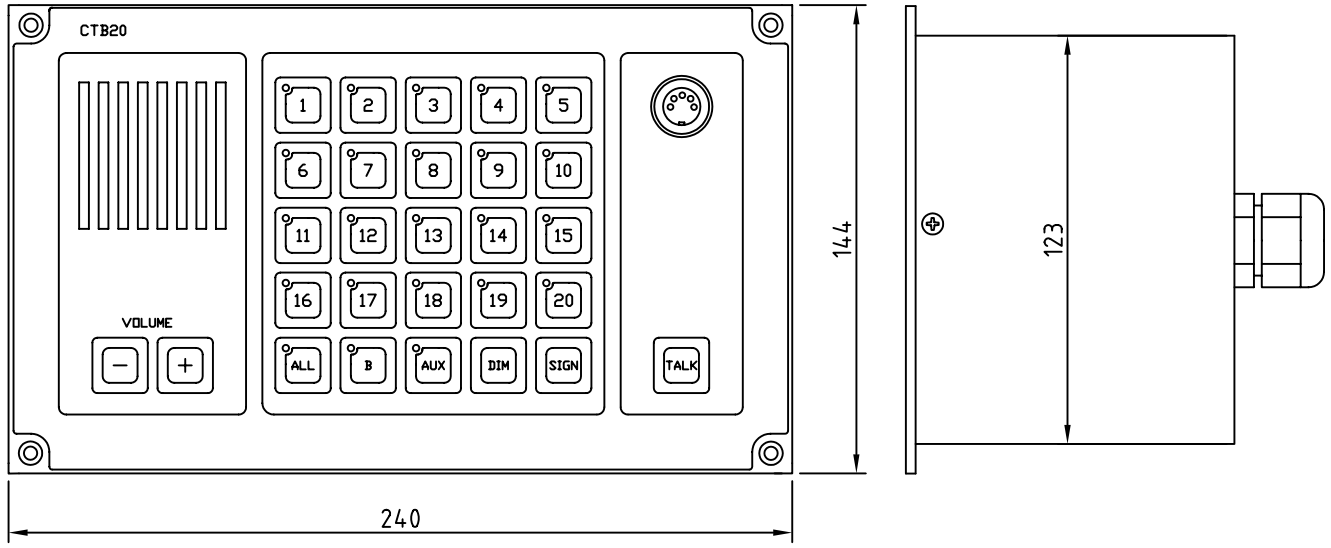
COMMON EQUIPMENT
Powersupply SPS-4
230V AC - 115V AC / 24V DC
w/relay and powerfailure contact
Ver.2.0

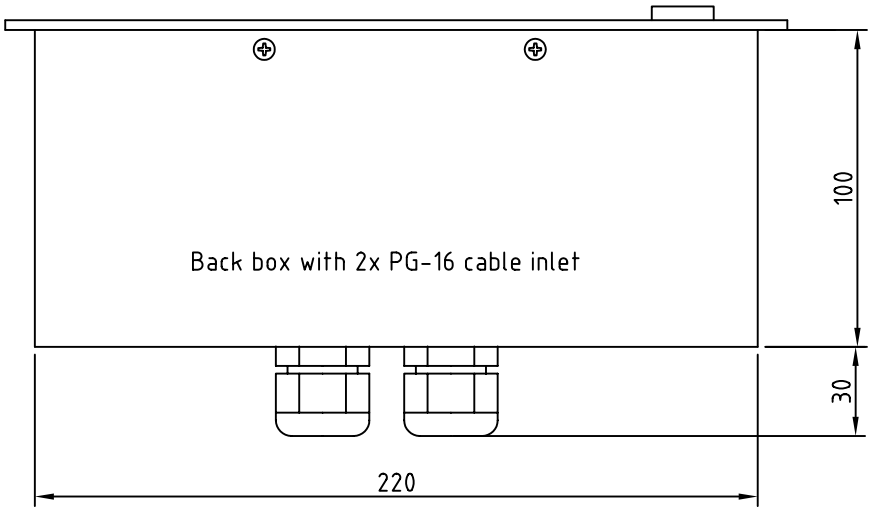
Prepared by	Date	Project no:	Revision by
S.E.Nilsen	2005.08.19		S.E.Nilsen
Approved by	Date	Sheet	Rev.date
xxx	xxx	1/1	2006.05.31
Dwg.no. / File			Rev. no.
SPS-4 Ver.2.0_ddwd			01

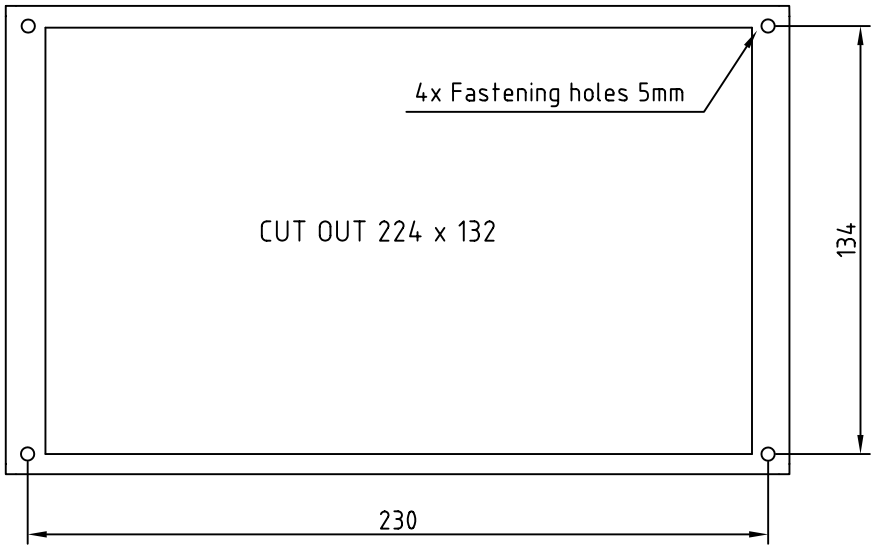




zenitel Zenitel Marine Norway	COMMAND TALK BACK SYSTEM CTB & CTB-100 Central unit CU-10, CU-20, CU-100,CU-200 Outline dwg.	Prepared by S.E.Nilsen	Date 2001.08.29	Project no:	Revision by S.E.Nilsen
		Approved by	Date	Sheet 1/1	Rev.date 2004.12.29
		Dwg.no. / File CU__dd			Rev. no. 01

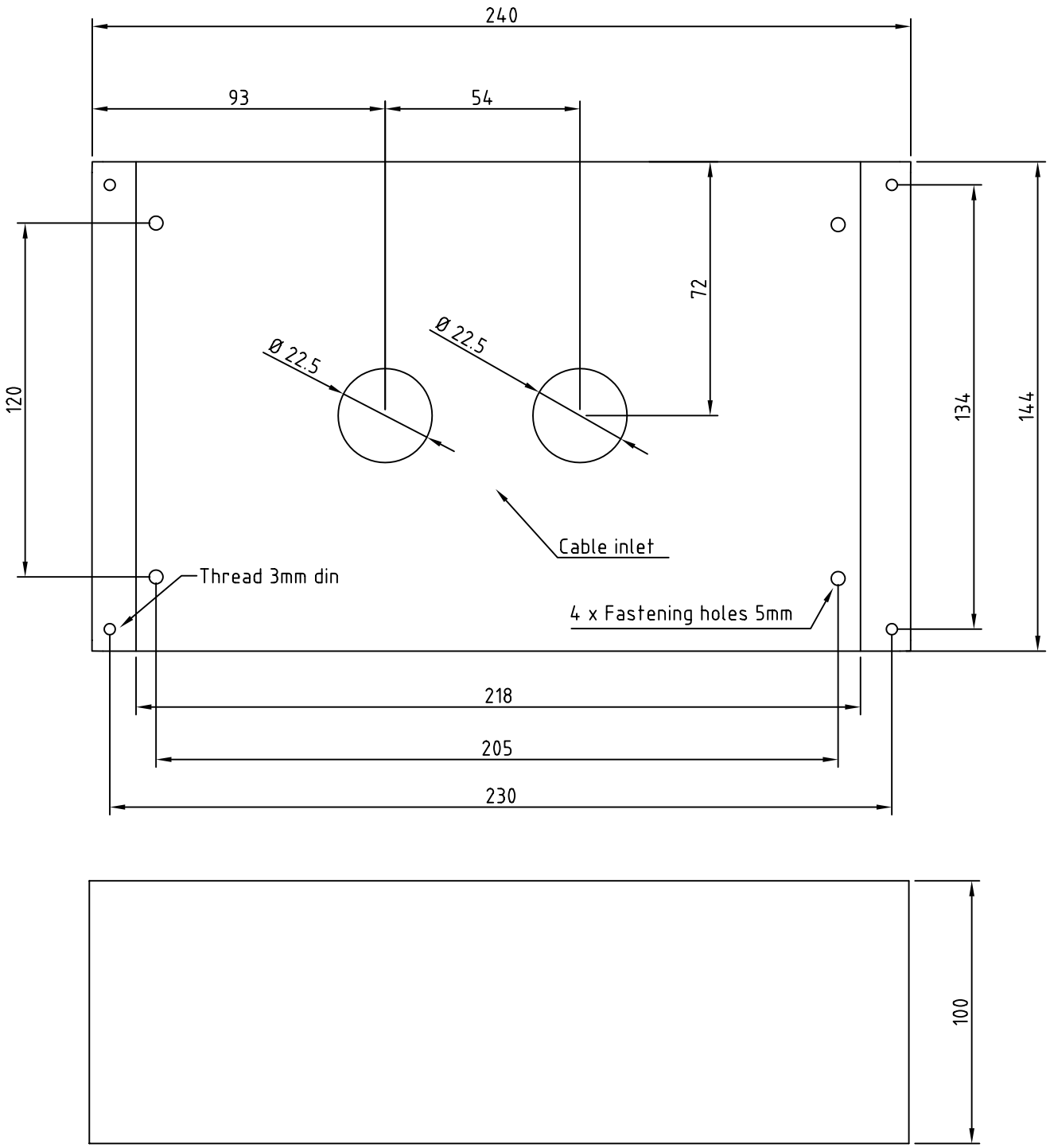




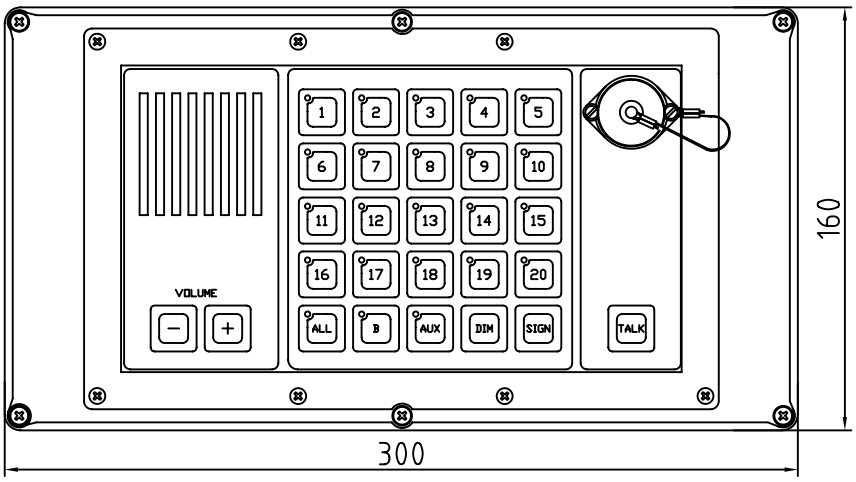


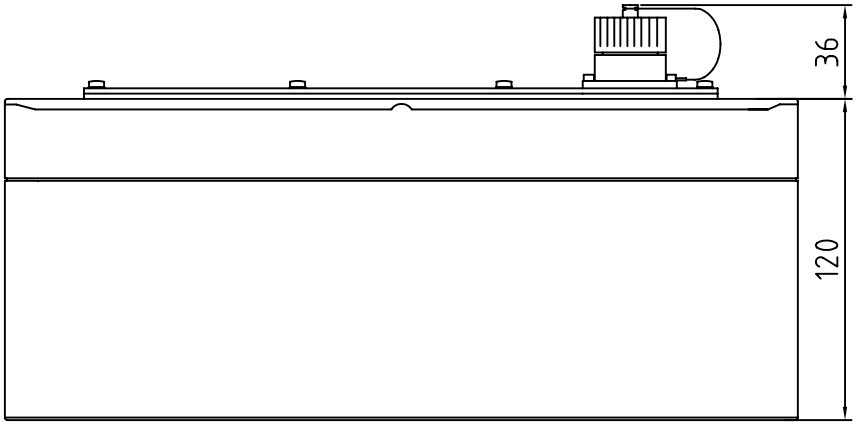
CTB-10 Equipped with 10 line push buttons
CTB-20 Equipped with 20 line push buttons

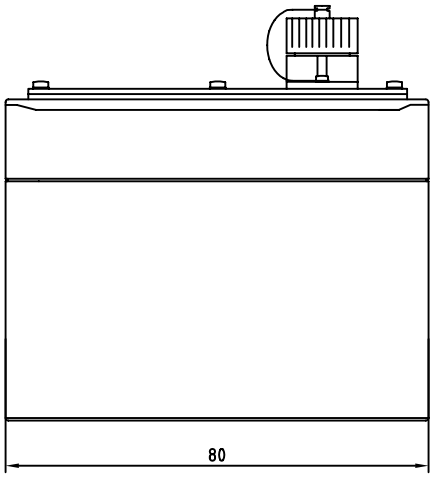
zenitel Zenitel Marine Norway	COMMAND TALK BACK SYSTEM Type CTB & CTB-100 Operator panel Type CTB-10 & CTB-20 Outline dwg.	Prepared by: S.E.Nilsen	Date: 2001.08.30	Project no:	Revision by: S.E.Nilsen
		Approved by:	Date:	Sheet: 1/1	Rev.date: 2004.12.29
		Dwg.no. / File: CTB-1020__dd1			Rev. no.: 01

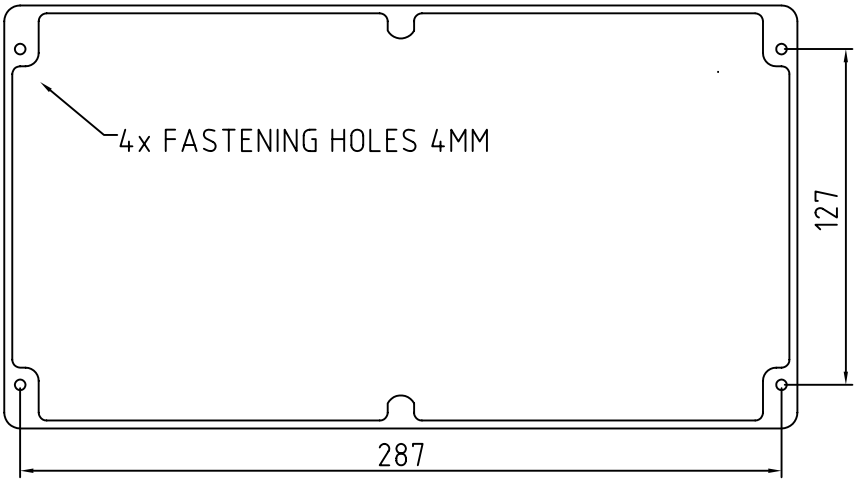


zenitel Zenitel Marine Norway	COMMAND TALK BACK SYSTEM Type CTB & CTB-100 Box for wall mounting CTB-10 & 20 ETB-5,10,100. Type WBOKS	Prepared by S.E.Nilsen	Date 2004.12.29	Project no:	Revision by
		Approved by	Date	Sheet 1/1	Rev.date
		Dwg.no. / File WBOKS__dd			Rev. no. 00









CTB-10 Equipped with 10 line push buttons

zenitel Zenitel Marine Norway	COMMAND TALK BACK SYSTEM Type CTB & CTB-100 Operator panel Type CTB-10W / V01 and CTB-20W / V01	Prepared by: S.E.Nilsen	Date: 2004.12.30	Project no:	Revision by
		Approved by	Date	Sheet: 1/1	Rev.date
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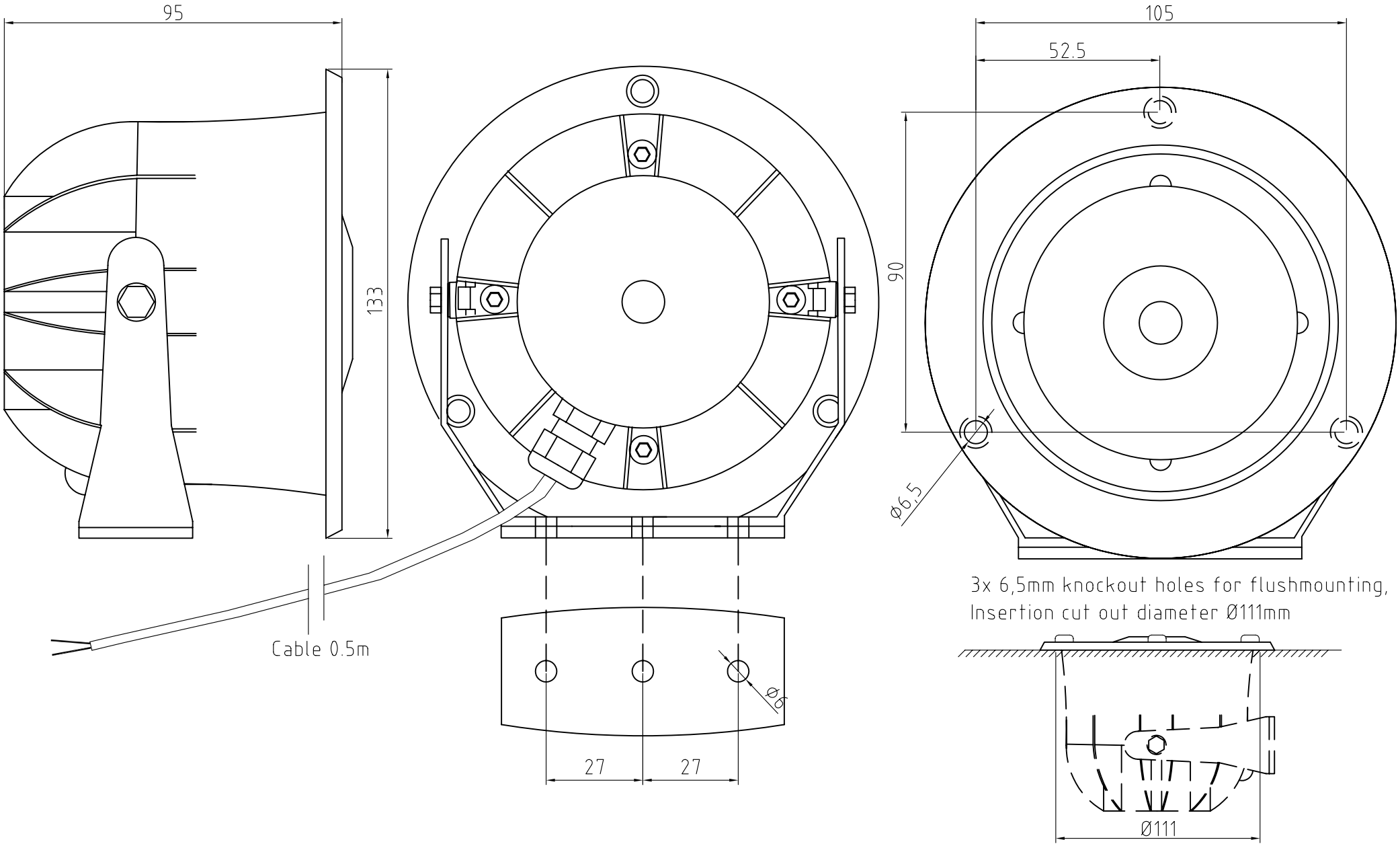

zenitel Zenitel Marine Norway	COMMON EQUIPMENT Loudspeaker Horn Type HP-8 & HP-8T Flush and bracket mounting	Prepared by S.E.Nilsen	Date 2005.03.15	Project no:	Revision by
		Approved by	Date	Sheet	Rev.date
		Dwg.no. / File HP-8__dd			Rev. no. 00

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The WEEE Directive does not legislate that Zenitel, as a 'producer', shall collect 'end of life' WEEE.

This 'end of life' WEEE should be recycled appropriately by the owner who should use proper treatment and recycling measures. It should not be disposed to landfill.

Many electrical items that we throw away can be repaired or recycled. Recycling items helps to save our natural finite resources and also reduces the environmental and health risks associated with sending electrical goods to landfill.

Under the WEEE Regulations, all new electrical goods should now be marked with the crossed-out wheeled bin symbol shown.

Goods are marked with this symbol to show that they were produced after 13th August 2005, and should be disposed of separately from normal household waste so that they can be recycled.

customer.service@zenitel.com