

| | | | |
|--|---|------------------------------|---|
|  WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | |
| | | Page 1 of 36 | Status: IFR |

TELECOM SYSTEM IOM – VHF AM SYSTEM

| B | IFR | Re-Issued for Review | 12/01/2026 | JH | HS | TS |
|-------------------------|--------|----------------------|---------------|------------|-------------|-------------|
| A | IFR | Issued for Review | 27/11/2025 | LC | HS | TS |
| Rev | Status | Reason for Issue | Revision Date | Written by | Reviewed by | Approved by |
| Revision History | | | | | | |

| | | | |
|--|---|------------------------------|------------------|
|  WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 2 of 36 | Status: IFR |

REVISION RECORD

| <i>Revision. No.</i> | <i>Date</i> | <i>Reason for Issue</i> | <i>Prepared</i> | <i>Checked</i> | <i>Approved</i> |
|----------------------|-------------|-------------------------|-----------------|----------------|-----------------|
| A | 27-NOV-2025 | Issued for Review | LC | HS | TS |
| B | 12-JAN-2026 | Issued for Review | LC | HS | TS |
| | | | | | |
| | | | | | |

| | | | |
|--|---|---|---|
|  HBA Offshore <i>(Int) Pte. Ltd</i>  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL DKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B Date: 12.01.2026 Page 3 of 36 Status: IFR | |

TABLE OF CONTENTS

| | |
|---|-----------|
| 1 PURPOSE AND SCOPE..... | 4 |
| 1.1 SCOPE OF DOCUMENT..... | 4 |
| 1.2 SYSTEM DESCRIPTION..... | 4 |
| 1.3 EQUIPMENT DESCRIPTION..... | 4 |
| 1.3.1 VHF/AM TRANSCEIVER ICOM IC-A220B..... | 4 |
| 1.3.2 VHF/AM TRANSCEIVER JOTRON TR-910 OF..... | 5 |
| 1.3.3 VHF AM PORTABLE RADIO WITH HEADSET | 5 |
| 1.3.4 VHF AM RADIO ANTENNA – PROCOM CXL3-1LW..... | 6 |
| 1.3.5 LIGHTNING ARRESTOR – POLYPHASER IS-B50HN-C0..... | 6 |
| 2 REFERENCE DRAWINGS | 7 |
| 3 MANUFACTURERS' MANUALS..... | 8 |
| 3.1 INSTALLATION INSTRUCTIONS..... | 8 |
| 3.1.1 INSTALLATION INSTRUCTIONS OF VHF/AM TRANSCEIVER ICOM IC-A220B | 8 |
| 3.1.2 INSTALLATION INSTRUCTIONS OF VHF/AM TRANSCEIVER JOTRON TR-910..... | 14 |
| 3.1.3 INSTALLATION INSTRUCTIONS OF AMPHENOL PROCOM CXL 3-1LW..... | 18 |
| 3.1.4 INSTALLATION INSTRUCTIONS ICOM IA16..... | 22 |
| 3.2 OVERALL SYSTEM ARCHITECTURE | 26 |
| 3.2.1 MAIN VHF-AM SYSTEM (WHEELHOUSE – PORT SIDE)..... | 27 |
| 3.2.2 BACKUP VHF-AM SYSTEM (MCR – A DECK) | 27 |
| 3.3 OPERATION – VHF-AM COMMUNICATION SYSTEM | 28 |
| 3.3.1 NORMAL OPERATION | 28 |
| 3.3.2 BACKUP OPERATION..... | 30 |
| 3.3.3 PORTABLE VHF-AM RADIO OPERATION..... | 32 |
| 3.3.4 ANTENNA AND RF PATH CONSIDERATIONS..... | 33 |
| 3.3.5 OPERATIONAL PRECAUTIONS | 33 |
| 3.4 MAINTENANCE..... | 34 |
| 3.4.1 ROUTINE INSPECTION | 34 |
| 3.4.2 FUNCTIONAL TESTING..... | 34 |
| 3.4.3 ANTENNA AND RF PATH MAINTENANCE..... | 34 |
| 3.4.4 CLEANING..... | 34 |
| 3.4.5 SOFTWARE / CONFIGURATION CHECKS..... | 34 |
| 3.4.6 FAULT HANDLING..... | 35 |
| 4 PROJECT SPECIFIC DRAWINGS..... | 36 |

| | | | |
|--|---|------------------------------|------------------|
|    | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |

1 PURPOSE AND SCOPE

1.1 SCOPE OF DOCUMENT

This Installation, Operation, and Maintenance (IOM) Manual provides guidelines for the safe installation, configuration, operation, and maintenance of the VHF-AM Radio Communication System installed onboard. The document is intended for use by commissioning engineers, operations personnel, and maintenance technicians.

The VHF-AM radio system operates in the Very High Frequency – Amplitude Modulation (VHF-AM) band and is primarily used for aircraft-to-vessel and helicopter communication. The system consists of a VHF-AM transceiver, antenna system, power supply, cabling, and associated accessories.

The system provides clear and reliable voice communication to support aviation coordination, emergency response, and operational safety.

1.2 SYSTEM DESCRIPTION

The system comprises the following main items of equipment:

| ITEM | EQUIPMENT DESCRIPTION | MAKE | MODEL | NOS |
|------|------------------------------------|------------|-------------|-----|
| 01 | VHF/AM TRANSCEIVER | ICOM | IC-A220B | 1 |
| 02 | VHF/AM TRANSCEIVER | JOTRON | TR-910 OF | 1 |
| 03 | LIGHTNING ARRESTOR | POLYPHASER | IS-B50HN-C0 | 2 |
| 04 | VHF AM PORTABLE RADIO WITH HEADSET | ICOM | IC-A16 | 2 |
| 05 | VHF AM RADIO ANTENNA | PROCOM | CXL3-1LW | 2 |
| 06 | VHF AM PORTABLE RADIO CHARGER | ICOM | N/A | 2 |

Each of the main components of the system is described in more detail below.

1.3 EQUIPMENT DESCRIPTION

1.3.1 VHF/AM TRANSCEIVER ICOM IC-A220B

The ICOM IC-A220B VHF/AM Transceiver is a rugged, marine and aviation-grade communication radio designed for reliable voice communication in demanding environments such as offshore vessels, Helidecks, and marine installations. Operating in the VHF frequency 118.000 – 136.975 MHz range, the IC-A220B supports AM modulation and is optimized for clear and stable communication with aircraft and ground stations, enabling safe and efficient aviation operations.

Constructed for durability and long-term offshore use, the IC-A220B features a compact, lightweight design with robust build quality to withstand vibration, temperature variations, and other environmental stresses typical of marine and offshore applications. The transceiver includes an easy-to-read display, intuitive user interface, and tactical controls for channel selection, volume, and squelch adjustment, ensuring straightforward operation by trained personnel.

The IC-A220B supports a wide range of marine and aeronautical channels and includes features such as dual-watch, priority channel monitoring, emergency channel presets, and programmable functions to meet operational requirements. Built-in audio circuitry provides clear transmit and receive performance, even in high-noise environments.

ICOM IC-A220B VHF/AM Transceiver installed at the following location:

| | | | |
|--|---|------------------------------|------------------|
|  HCC WORLD CARRIER CORPORATION  HBA OFFSHORE (INT) PTE. LTD  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |

- Port side -Wheelhouse (86-RU-121)

1.3.2 VHF/AM TRANSCEIVER JOTRON TR-910 OF

The JOTRON TR-910 VHF/AM Transceiver is a marine and offshore grade radio communication unit designed for Airband (VHF/AM) voice communications, ensuring reliable and clear contact between the vessel and aircraft, Helidecks, and other aviation assets. The TR-910 is built to meet demanding offshore operational requirements and supports continuous operation in harsh marine environments.

Constructed with robust hardware and marine-rated components, the TR-910 provides dependable transmit and receive performance across the designated VHF-AM aviation frequency band. The unit features a clear user interface with an LCD display, intuitive keypad controls, and audible alerts, allowing operators to select and monitor aviation channels, adjust volume and squelch settings, and quickly access priority or emergency channels.

The TR-910 incorporates advanced RF circuitry to deliver stable modulation characteristics, excellent audio clarity, and effective rejection of interference. Its rugged design enables the transceiver to withstand vibration, shock, temperature variations, and salt-laden environments typical of offshore installations.

The transceiver is typically installed in a dedicated communications console or equipment rack and is interfaced with a dedicated VHF-AM antenna system, power supply, and earthing system in accordance with approved drawings and safety requirements. Detailed electrical and environmental specifications are available in the manufacturer's technical documentation.

JOTRON TR-910 VHF/AM Transceiver installed at the following location:

- A DECK-MCR _BACKUP GMDSS CONSOLE (86-RU-122)

1.3.3 VHF AM PORTABLE RADIO WITH HEADSET

The ICOM IC-A16 is a rugged, compact VHF AM portable aviation radio designed for reliable voice communication in marine and offshore operations, including helicopter deck coordination, aircraft approach control, and personnel communication. The IC-A16 supports the Aeronautical VHF AM band, delivering clear transmit and receive performance for critical aviation communication tasks.

The unit features a lightweight, ergonomic design with user-friendly controls and a bright, easy-to-read display for channel selection and status monitoring. The portable radio includes a headset interface that allows connection of an aviation-grade headset for enhanced audio clarity in noisy environments.

Built to withstand demanding operational conditions, the IC-A16 is water-resistant and constructed to endure vibration, shock, and salt-laden offshore air. Its internal circuitry ensures stable frequency performance and effective audio quality even in high-noise surroundings.

The portable radio is supplied with a matched headset that provides comfortable wear and reliable communication, with noise-rejecting microphone characteristics suitable for aviation and marine operations

Key Features

- VHF AM aviation band transmit/receive capability
- Lightweight and rugged portable design
- Headset compatible for hands-free operation

| | | | |
|--|---|------------------------------|------------------|
|  HCC WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |

Page 6 of 36

Status: IFR



- Clear LCD display and intuitive interface
- Water-resistant construction for marine environments
- Designed for personnel and Heli-deck communication use

1.3.4 VHF AM RADIO ANTENNA – PROCOM CXL3-1LW

The PROCOM CXL3-1LW is a high-performance VHF AM communication antenna designed for reliable aeronautical and marine voice communications in demanding offshore and maritime environments. Engineered for robustness and durability, the CXL3-1LW supports VHF AM frequency bands commonly used for helicopter, aviation, and marine communication systems, ensuring excellent signal transmission and reception.

Constructed with quality materials and precision engineering, this antenna features low-loss performance and wide bandwidth, providing effective radiation efficiency and minimal signal distortion. The design is optimized to deliver stable VSWR (Voltage Standing Wave Ratio) characteristics across the intended frequency range, contributing to reliable long-range communication with minimal interference.

The CXL3-1LW antenna is suitable for permanent installation on vessels, offshore platforms, and Helidecks, and is engineered to withstand the rigors of marine environments, including exposure to salt spray, wind loads, and UV radiation. Its rugged design and mounting flexibility make it ideal for integration with VHF/AM transceivers such as the JOTRON TR-910 and other aviation band radios.

The antenna is typically installed on designated support structures on Vessel Navigation Deck. with proper grounding and bonding to the vessel or platform earthing system to ensure lightning protection and reduce RF interference. Detailed electrical and mechanical specifications, including frequency range, gain, and mounting requirements, are available in the manufacturer's manual.

Two PROCOM CXL3-1LW antennas are installed at the following locations:

- Port side -Navigation Deck- (86-RU-101)
- Port side -Navigation Deck- (86-RU-102)

1.3.5 LIGHTNING ARRESTOR – POLYPHASER IS-B50HN-C0

The PolyPhaser IS-B50HN-C0 is a high-performance coaxial RF lightning arrestor designed to protect VHF radio communication systems and antennas from transient surges caused by lightning strikes and electromagnetic events. It is engineered to safeguard delicate radio frequency (RF) equipment by diverting high-energy surges to ground before they can damage connected devices.

The IS-B50HN-C0 features a blocking capacitor combined with a gas discharge tube (GDT) in a robust coaxial design, offering multi-strike surge capability and extremely low insertion loss across its operating frequency range. This ensures minimal impact on normal RF signal transmission while providing effective surge suppression.

This model is specified with Type-N female to Type-N female bulkhead connectors and supports a wide frequency range from 1.5 MHz to 700 MHz, making it suitable for HF, VHF, and UHF radio systems including VHF-AM aviation and marine communication installations. It has a maximum RF power handling capability of up to 3 kW and can safely conduct surge currents of up to 50 kA. The device is mounted inside A DECK Backup GMDSS console connecting 86-RU-102 antenna feed point F86-RU-102 providing a secure and weather-tolerant installation.

| | | | |
|--|---|------------------------------|------------------|
|    | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 7 of 36 | Status: IFR |

PolyPhaser IS-B50HN-C0 installed at the following locations:

- A DECK - Backup GMDSS console - (86-RU-101)

2 REFERENCE DRAWINGS

The following reference drawings shall be consulted prior to installation, operation, or maintenance of the equipment.

| No | Document No. | Rev | Title or Description |
|----|------------------------------|-----|---|
| 1 | WCPOKWTP-450-TE-(VAE) DS-022 | 0 | Telecom System Data Sheet-VHF AM System |
| 2 | WCPOKWTP-450-TE-(VAE) BF-022 | 1 | Telecom Cable Block Diagram-VHF AM System |
| 3 | WCPOKWTP-450-TE-(VAE) LY-022 | 0 | Telecom Device Location Layout Drawing- VHF AM System |
| 4 | WCPOKWTP-450-TE (VAE) GA-003 | 0 | Telecom GA Drawing - GMDSS System |
| 5 | WCPOKWTP-450-TE-(VAE) DG-003 | 0 | Telecom Internal Wiring Drawing - GMDSS System |
| 1 | WCPOKWTP-450-TE-(VAE) DS-022 | 0 | Telecom System Data Sheet-VHF AM System |

| | | | |
|--|------------------|------------------------------|---|
|  HCC WORLD CARRIER CORPORATION | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |  ORIENTAL DKWOK |
| | Page 8 of 36 | Status: IFR | |

3 MANUFACTURERS' MANUALS

This section includes the manufacturers' manuals for the installation, operation, and maintenance of the equipment.

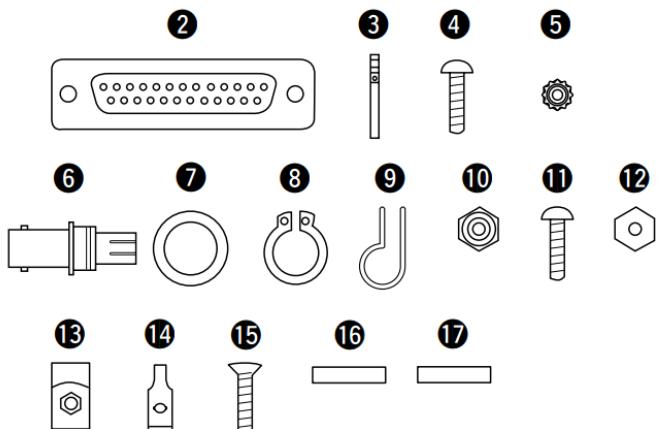
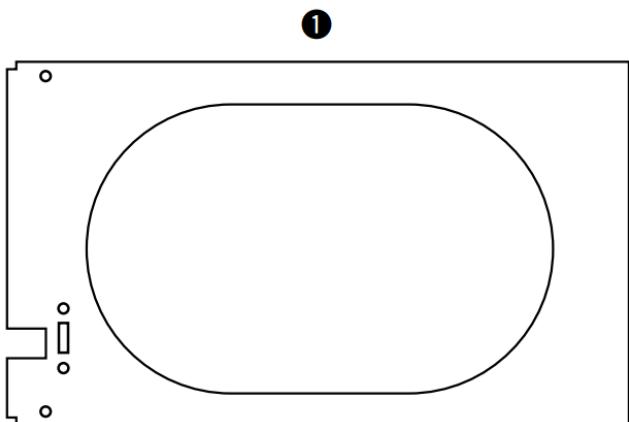
3.1 INSTALLATION INSTRUCTIONS

3.1.1 INSTALLATION INSTRUCTIONS OF VHF/AM TRANSCEIVER ICOM IC-A220B



- WHAT'S IN THE BOX

The following accessories are supplied with the transceiver

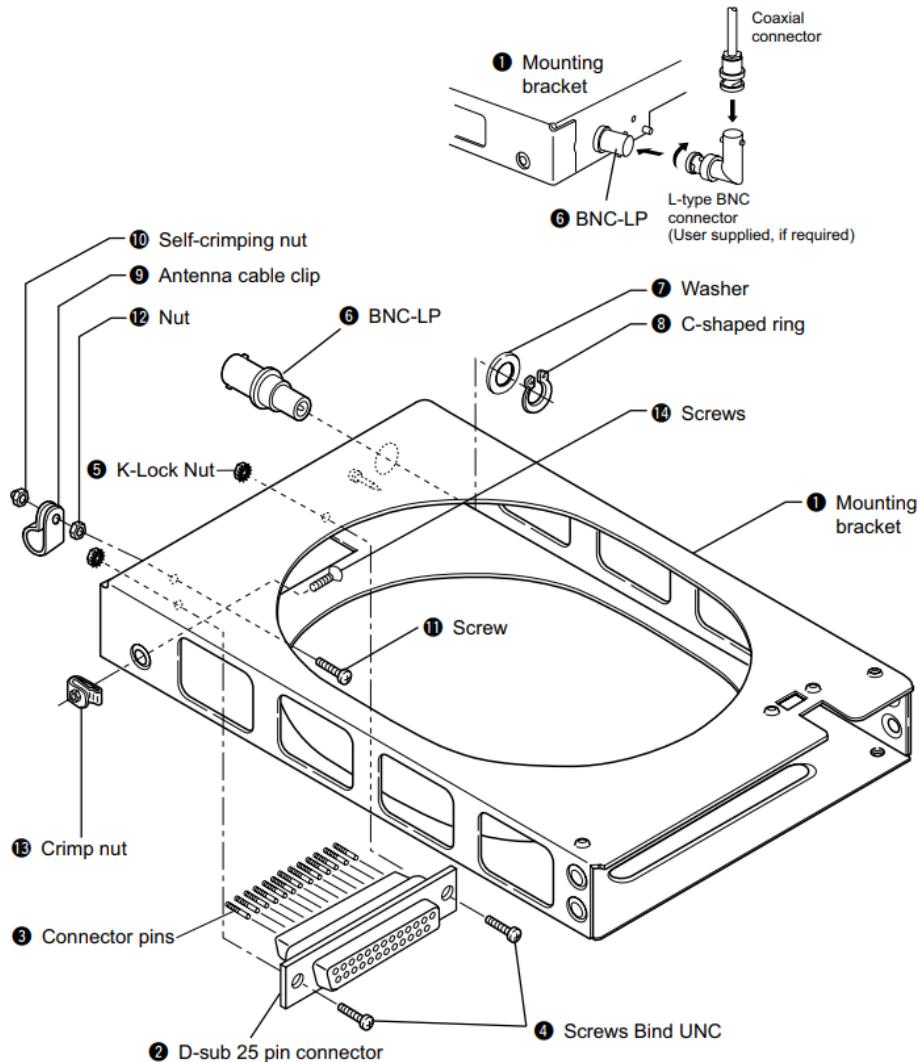


| | |
|---------------------------------------|----|
| ① Mounting bracket..... | 1 |
| ② D-Sub 25 pin connector | 1 |
| ③ Connector pins (M39029/63-368)..... | 25 |
| ④ Screws Bind UNC (No. 4 × 3/8) | 2 |
| ⑤ K-Lock Nut (No. 4) | 2 |
| ⑥ BNC-LP | 1 |
| ⑦ Washer (Icom washer V) | 1 |
| ⑧ C-shaped ring | 1 |
| ⑨ Antenna cable clip | 1 |
| ⑩ Self crimping nut (No. 6) | 1 |

| | |
|-------------------------------|---|
| ⑪ Screw (No. 6 × 1/2)..... | 1 |
| ⑫ Nut (No. 6) | 1 |
| ⑬ Crimp nuts (No. 6) | 6 |
| ⑭ Speed nut UNC (No. 6) | 4 |
| ⑮ Screws (No. 6 × 1/2) | 6 |
| ⑯ COMM1 sticker | 1 |
| ⑰ COMM2 sticker | 1 |

| | | | |
|--|---|------------------------------|---|
|  WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 9 of 36 | Status: IFR |

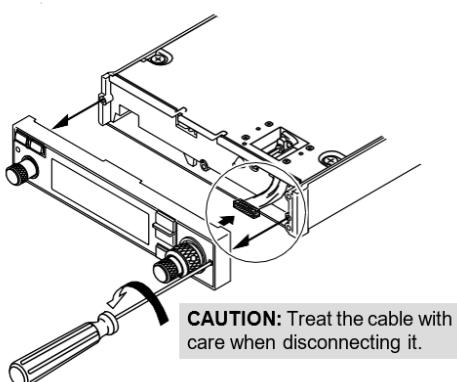
- MOUNTING BRACKET ASSEMBLY



- Remove the front panel from the transceiver's main unit.

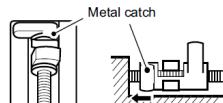
Use a 3/32" allen driver.

Carefully disconnect the cable from the front panel.

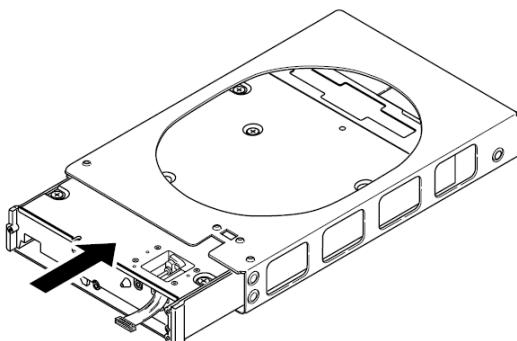


| | | | |
|---|---|------------------------------|---|
|    VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 10 of 36 | Status: IFR |

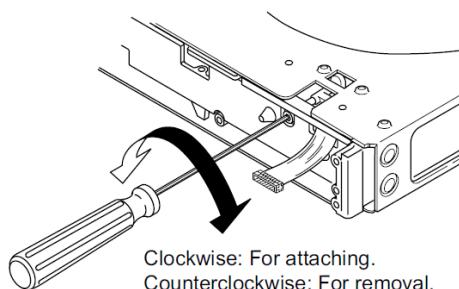
- Insert a 3/32" allen driver into the lock screw and rotate the driver counterclockwise until the metal catch touches the back of the lock chassis.



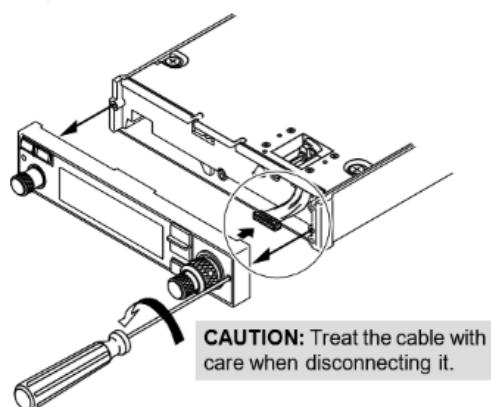
- Insert the transceiver into the mounting bracket.



- Turn the lock screw clockwise until transceiver is fixed to the bracket.

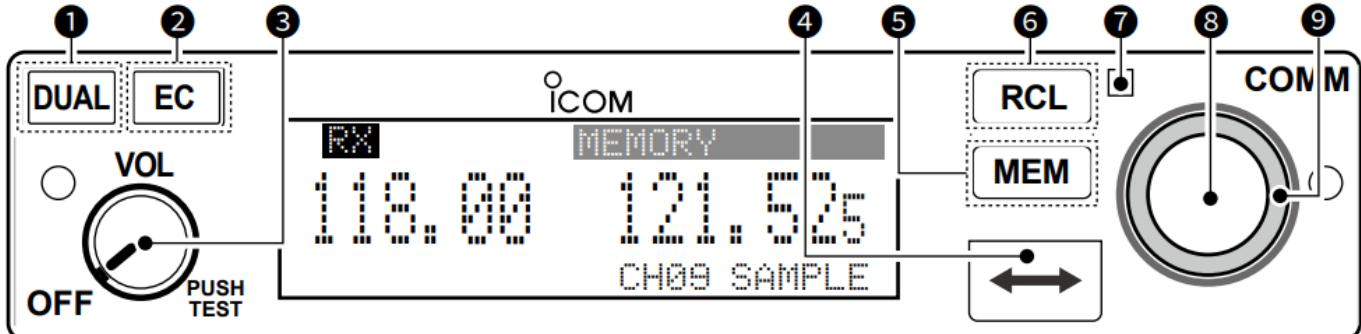


- Connect the cable and attach the front panel and tighten the allen screws.

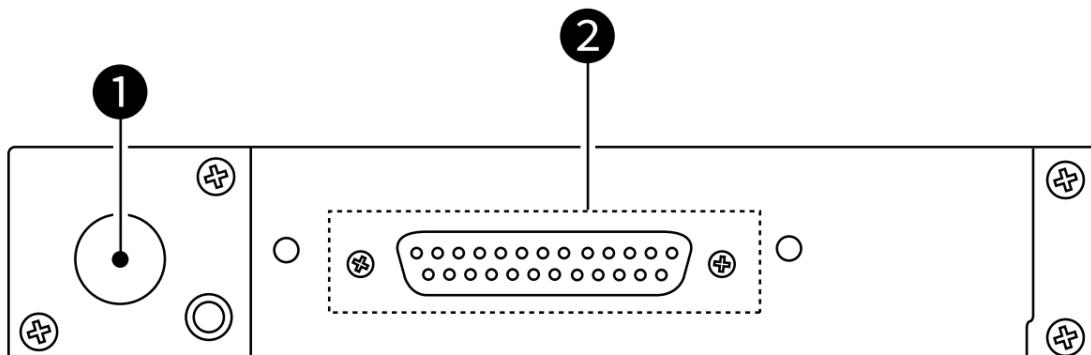


| | | | |
|--|------------------|------------------------------|---|
|  HCC WORLD CARRIER CORPORATION | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |  ADDAX PETROLEUM |
| | Page 11 of 36 | Status: IFR | |

- PANEL DESCRIPTION



1. DUAL SWITCH [DUAL]
2. EMERGENCY CHANNEL SWITCH [EC]
3. VOLUME/POWER SWITCH [VOL]
4. FREQUENCY EXCHANGE (FLIP-FLOP) SWITCH
5. MEMORY SWITCH [MEM]
6. RECALL SWITCH [RCL]
7. LIGHT-SENSITIVE DETECTOR
8. INNER (Small) TUNING DIAL [DIAL]
9. OUTER (Large) TUNING DIAL [O-DIAL]



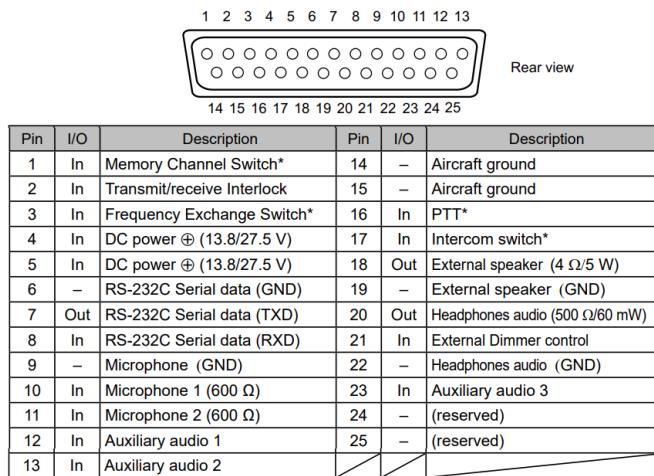
1. ANTENNA CONNECTOR
2. D-SUB 25 PIN CONNECTOR

| | | | |
|--|---|------------------------------|---|
|    | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 12 of 36 | Status: IFR |

- CONNECTION OF HAND MICROPHONE (HM-176) TO IC-A220B



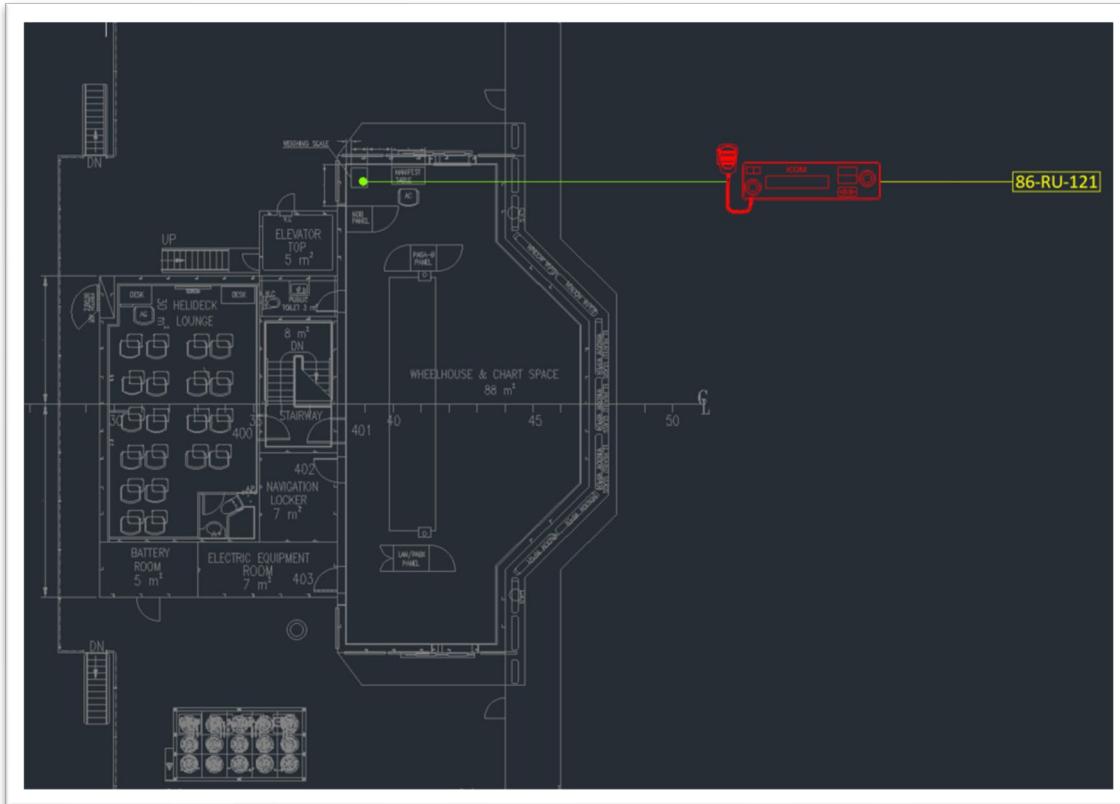
The HM-176 hand microphone shall be connected to the IC-A220B VHF/AM transceiver via the rear 25-pin D-Sub accessory connector.



| IC-A220B Pin No. | Signal Description | Connection |
|------------------|------------------------------|-----------------------------|
| Pin 10 | Microphone 1 (600 Ω) | Microphone audio |
| Pin 11 | Microphone 2 (600 Ω) | Microphone audio (balanced) |
| Pin 9 | Microphone Ground | Mic ground / shield |
| Pin 16 | PTT (Ground to activate) | PTT switch |
| Pin 9 | Ground | PTT return |

| | | | |
|--|---|------------------------------|------------------|
|  WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 13 of 36 | Status: IFR |

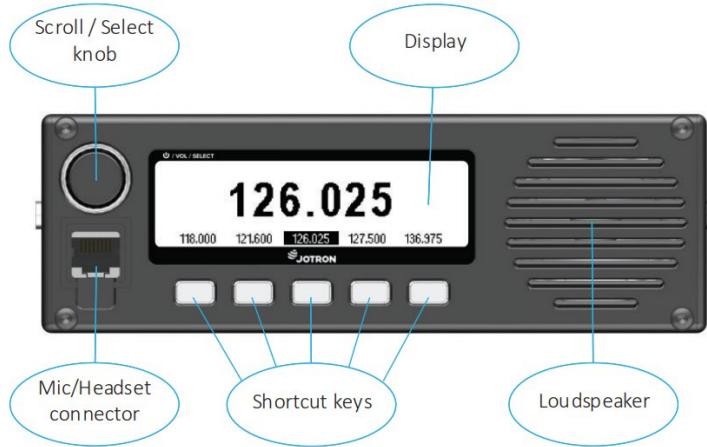
- MOUNTING LOCATION



The VHF/AM transceiver (ICOM IC-A220B) is installed at the navigation wheelhouse, port side, in accordance with the approved equipment layout drawing.

| | | | |
|--|------------------|------------------------------|---|
|  HCC WORLD CARRIER CORPORATION | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |  ADDAX PETROLEUM |
| | Page 14 of 36 | Status: IFR | |

3.1.2 INSTALLATION INSTRUCTIONS OF VHF/AM TRANSCEIVER JOTRON TR-910



- **WHAT'S IN THE BOX**

The following accessories are supplied with the transceiver

- Handheld microphone
- Connection cables
- External AC/DC adaptor

- **DISPLAY FUNCTION**

The display shows the most important operational parameters such as selected channel/frequency, Modula on and indicator icons. The display will show various menus and submenus which can be navigated using the scroll/select knob and shortcut keys on the front panel. The indicator icons appear at the left and right side of the display during operation. Some icons share position on in the display and are with descending priority listed in the table below.

| Icon | Description |
|---|---|
| Left side area: | |
|  | Indicates that the transceiver is keyed, and the radio is transmitting. |
|  | Indicates that the SWR on the antenna is above the threshold value. The transmitter will reduce the output power to the predefined low power level in order to protect the output stage. |
|  | Indicates that the radio transmitter is operating in low power mode (1 W / 30 dBm). The reason for switching to low power will be due to one of the following: <ul style="list-style-type: none"> • The BITE system, as a safety feature, has switched the radio to the low power setting due to a failure normally caused by high SWR, high temperature, or a low DC input voltage. • A signal to the radio, using the GPIO pin, is forcing the radio to the low power setting • The radio has been configured (forced) to low power |

| | | | |
|---|---|------------------------------|---|
|    VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 15 of 36 | Status: IFR |

| | |
|--|---|
|       | Indicates the received signal strength level RSSI (dBμV): |
| | > 34 |
| | 23 to 34 |
| | 12 to 23 |
| | 1 to 12 |
| | -10 to 1 |
| | < -10 |
| Right side area: | |
|  | Indicates an Alarm condition. The BITE system in the radio has discovered an internal value outside the normal operating range. See Failures and Corrective Actions chapter for details on BITE system alarms. |
|  | Indicates that the transceiver is kept in standby, either by user input or because an alarm condition has been detected, and the transceiver is set up as a MAIN transceiver. In standby the transceiver will be disabled (not able to transmit nor receive). This condition normally requires that there is another (spare) transceiver that can take over the functionality of the transceiver. |
|  | Indicates the battery status if used with BU-872. See TR-910 Battery indicator chapter for details on battery icons. |

- SCROLL/SELECT KNOB

The Scroll>Select knob is used for multiple purposes on the radio and has the following actions listed below: It can be rotated or momentarily pressed.

In general, the use of the Scroll/Select knob is:

- Power - Press and hold to turn the device on or off.
- Volume control
- Menu navigation
- Value and parameter setting

| | | | | |
|--|---|------------------------------|-----------------------|---|
|  HCC WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | 2024-VIVO-EMEM-TR-167 |  ORIENTAL DKWOK |
| | | | | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |  ADDAX PETROLEUM |
| | | Page 16 of 36 | Status: IFR | |

- **SHORTCUT KEYS**

In the home screen, the shortcut key functions are shortcuts to pre-stored frequencies. Otherwise, the function of the shortcut keys will change depending on active sub menu. The display will indicate the function of each shortcut key, using text or icons.

- **CONNECTION OF MIC/HEADSET**

The Mic/Headset connector is an RJ45 type connector and is used for connecting a Speaker Mic with PTT switch, or a headset with earpieces, microphone and PTT switch. TR-910 supports both dynamic and electret microphones, and this is configurable through the advanced settings/configuration/audio menu.

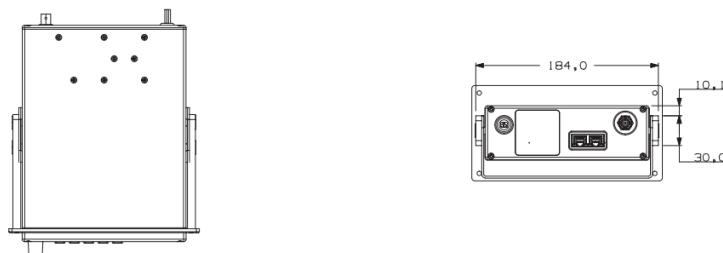
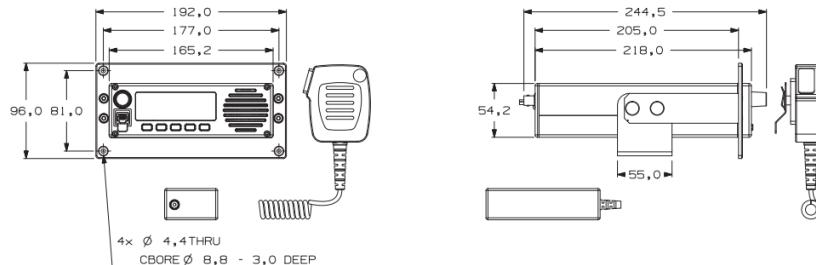
| Mic/Headset connector | | |
|-----------------------|-----|---|
| Name | Pin | Function |
| Mic input | 1 | Microphone input. Support dynamic and electret types with adjustable sensitivity. Mic Bias is selectable (8 V via 2k2). |
| Mic GND | 2 | Microphone ground |
| Headset | 3 | Headset output, contains side-tone and received audio. |
| USB (+) | 4 | USB Data + |
| USB (-) | 5 | USB Data - |
| PTT | 6 | PTT input. Grounding this pin will key the transmitter |
| +5 VDC | 7 | +5 V supply for USB devices. Max 100 mA. |
| GND | 8 | Common ground |

- **ANTENNA CONNECTOR**

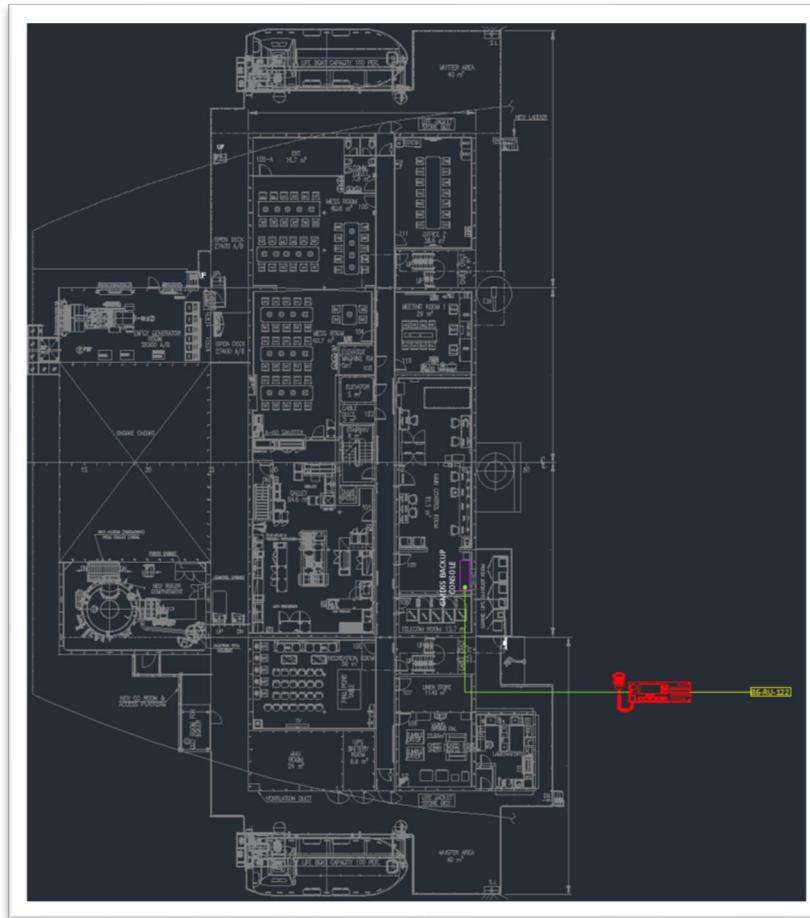


The IC-A220B antenna interface is provided via a BNC-type connector and shall be connected to a 50Ω VHF Airband antenna (PROCOM CXL3-1LW) suitable for operation within the specified frequency range. The antenna feeder cable shall be routed through a POLYPHASER IS-B50HN-C0 lightning arrestor, installed in line with the coaxial feed, to provide effective protection of the transceiver against lightning-induced surges. Where connector type conversion is required, approved adapters may be used to interface BNC, N-type, or TNC connectors without degrading RF performance.

| | | | | |
|---|---|------------------------------|--|--|
|  HBA Offshore <i>(Int) Pte. Ltd</i>  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | | |
| | Telecom System IOM – VHF AM SYSTEM | 2024-VIVO-EMEM-TR-167 | | |
| | Rev: B | Date: 12.01.2026 | | |
| | Page 17 of 36 | Status: IFR | | |



- MOUNTING LOCATION



The JOTRON TR-910 VHF/AM transceiver is located in the Main Control Room (MCR), A Deck, at the GMDSS backup console, in accordance with the approved layout drawings.

| | | | |
|--|---|------------------------------|------------------|
|  HBA Offshore <i>(Int) Pte. Ltd</i>  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 18 of 36 | Status: IFR |

3.1.3 INSTALLATION INSTRUCTIONS OF AMPHENOL PROCOM CXL 3-1LW



- **DESCRIPTION**

- CXL 3-1LW is a 0 dBd, vertically polarized, omnidirectional base station antenna for the 118 - 137MHz civil aircraft band.
- The antenna is a broad-banded $\frac{1}{2} \lambda$ dipole design, and it is equipped with our type "LW" mast mount, which is a lightweight, multi-purpose, epoxy-coated aluminum mounting bracket with stainless steel fittings.
- The antenna can be mounted on vertical or horizontal mast tubes, 16 to 54 mm in outer diameter. Further, the construction of the mount makes it possible to lead the cable either along the inside or on the outside of the mast tube.
- A conical glass fiber tube with very low wind-loading completely encloses the carefully designed radiating element to ensure long dependable service in all climates.
- To substantially reduce noise caused by atmospheric discharges, all metal parts in the antenna are DC-grounded. Consequently, the antenna shows a DC-short across the coaxial cable.
- CXL 3-1LW is a vibration-proof, lightweight, slim-line, corrosion-resistant, modern style base station antenna.

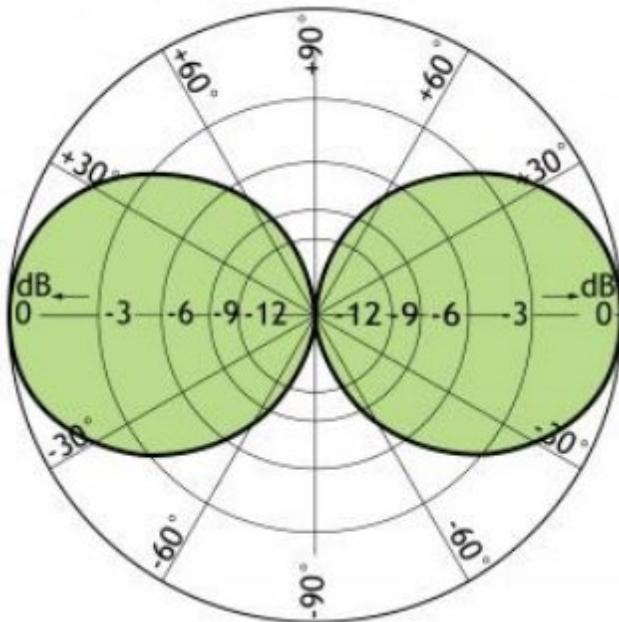
- **SPECIFICATIONS**

| Electrical | |
|-------------------------|---|
| Model | CXL 3-1LW |
| Frequency | Covering : 118 - 137 MHz |
| Antenna Type | Coaxial dipole, broad-banded |
| Max. Input Power | 150 W |
| Polarisation | Vertical |
| Pattern Type | Omnidirectional |
| 3 dB Beamwidth, E-Plane | 66 ° |
| 3 dB Beamwidth, H-Plane | Omnidirectional |
| Impedance | 50 Ω |
| Gain | 0 dBd (2.2 dBi) |
| VSWR | < 1.75:1 |
| Bandwidth | 19 MHz |
| Antistatic Protection | All metal parts DC-grounded (Connector shows a DC-short) |
| HCM Code(s) | HCM000ND00, 030DE00 |

| | | | |
|--|---|------------------------------|---|
|  WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B Page 19 of 36 | Date: 12.01.2026 Status: IFR |

| Mechanical | |
|---------------|---|
| Connection(s) | N(f) |
| Materials | Radome : Polyurethane-coated glass fibre Mounting bracket : Seawater resistant aluminium, epoxy-coated |
| Colour | White (RAL 9003) |
| Wind Area | 0.0162 sq. m / 0.17 sq. ft. |
| Wind Load | 25 N (160 km/h) |
| Height | Approx. 1500 mm / 59.06 in. |
| Weight | Approx. 0.80 kg / 1.76 lb. |
| Mounting | On 27 - 65 mm / 1.02 - 2.56 in. dia. mast tube |

TYPICAL RADIATION PATTERN (E-PLANE)

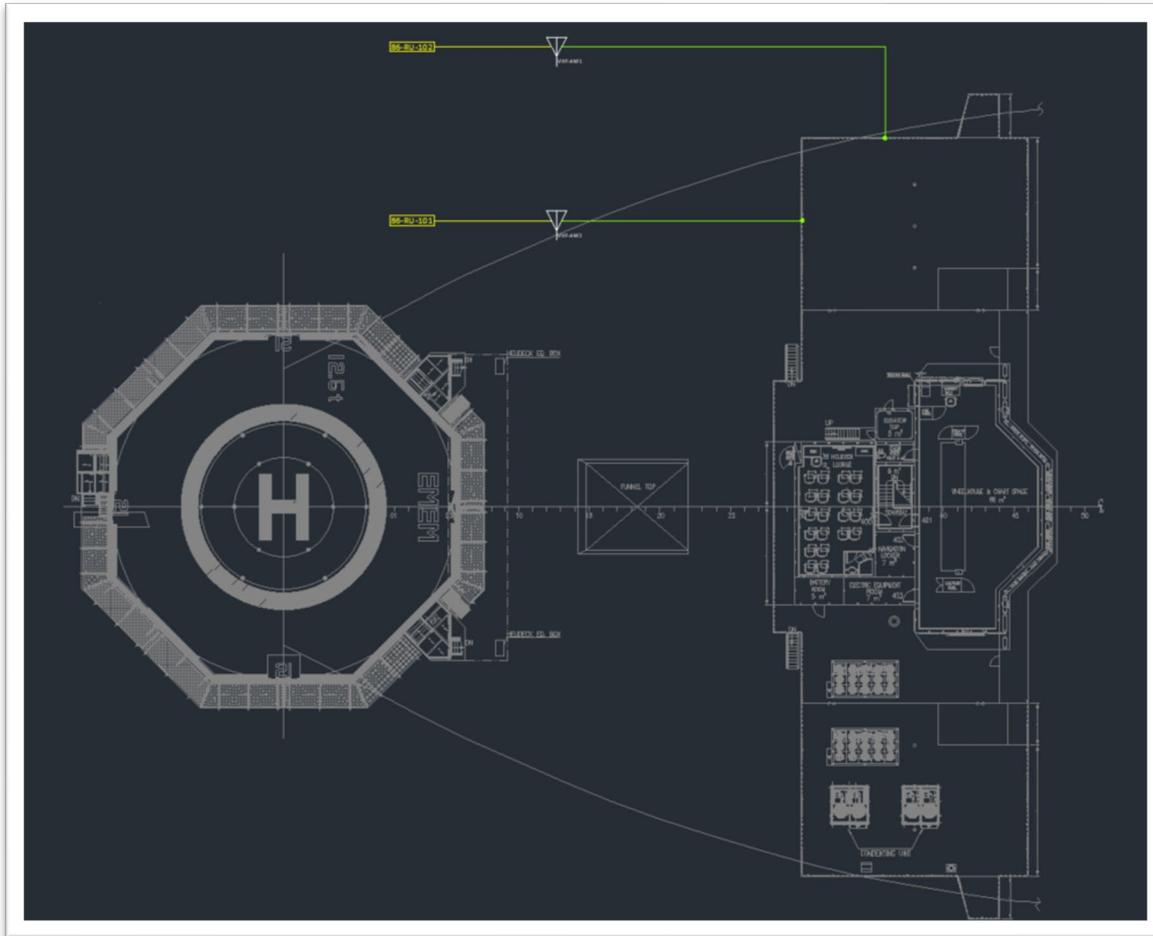


TYPICAL RADIATION PATTERN (H-PLANE)



| | | | |
|--|---|------------------------------|--|
|  WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 20 of 36 | Status: IFR |

- MOUNTING LOCATION



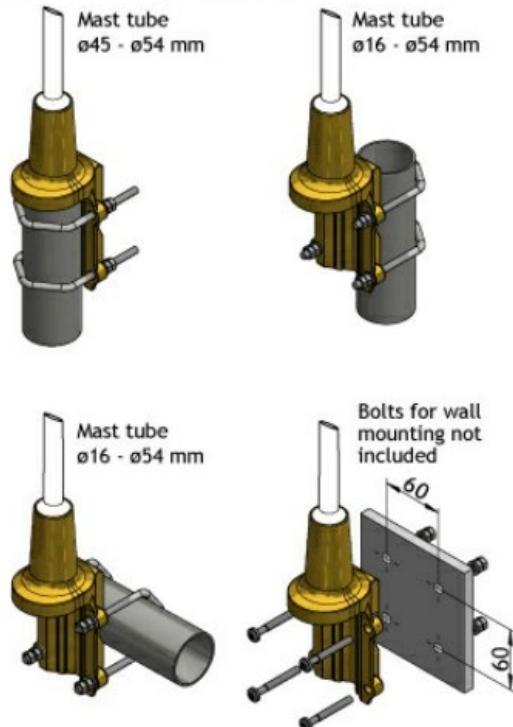
- The antenna shall be installed on the navigation deck, port side, at a position providing maximum clearance and unobstructed 360° coverage.
- The selected location shall maintain adequate separation from radar scanners, satellite antennas, and other RF equipment.
- The mounting structure shall be structurally sound and electrically bonded to the vessel earthing system.

- MAST / POLE REQUIREMENTS AND ANTENNA MOUNTING

- Install the antenna on a vertical mast or mounting pole with an outer diameter of 16 to 54 mm.
- The mast shall be marine-grade, corrosion-resistant, and securely fixed to the deck structure.
- Installation shall comply with vessel safety and navigation requirements.

| | | | | |
|--|---|------------------------------|-----------------------|---|
|  HBA Offshore <i>(Int) Pte. Ltd</i>  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | 2024-VIVO-EMEM-TR-167 |  ORIENTAL OKWOK |
| | | Rev: B | | |
| | Telecom System IOM – VHF AM SYSTEM | Date: 12.01.2026 | | |
| | | Page 21 of 36 | Status: IFR | |

MULTI-PURPOSE MOUNTING BRACKET



- Attach the antenna to the mast using the manufacturer-supplied LW mounting bracket.
- Ensure the antenna is installed in a vertical orientation to maintain correct polarization.
- Secure the antenna using the supplied stainless-steel fasteners.
- Tighten fasteners evenly to achieve a vibration-resistant and stable installation.
- Avoid overtightening to prevent mechanical damage.

- **CABLE ROUTING**

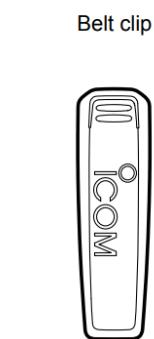
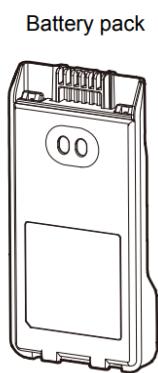
- Route the coaxial cable downward along the mast with a drip loop formed below the antenna.
- Secure the cable using UV-resistant and marine-grade cable ties or clamps.
- Ensure the cable is protected from sharp edges, mechanical stress, and heat sources.

| | | | |
|---|---|------------------------------|---|
|  HCC WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 22 of 36 | Status: IFR |

3.1.4 INSTALLATION INSTRUCTIONS ICOM IA16



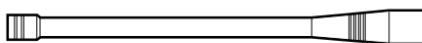
- WHAT'S IN THE BOX



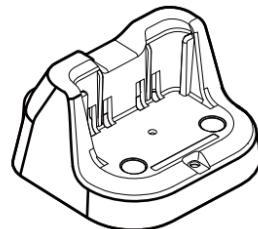
Handstrap



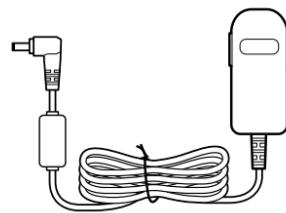
Antenna



Battery charger*



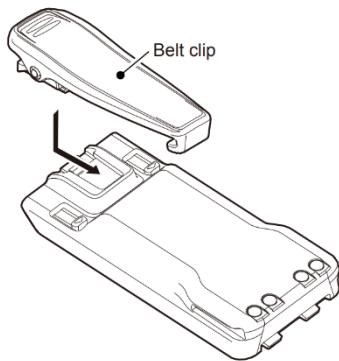
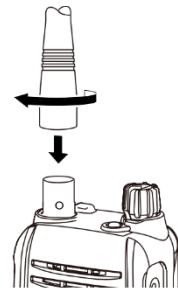
Power adapter*



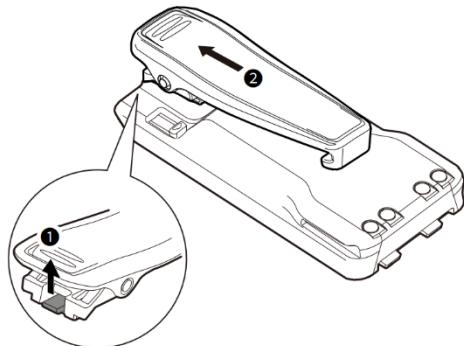
| | | | |
|--|---|------------------------------|---|
|    | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B Date: 12.01.2026 |  ADDAX PETROLEUM |
| | | Page 23 of 36 Status: IFR | |

- Attaching accessories

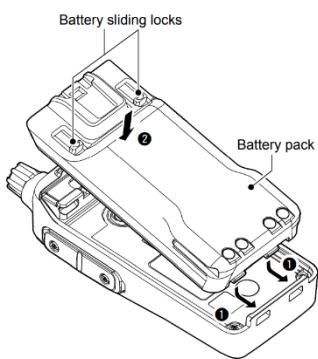
- Connect the supplied antenna to the antenna connector.



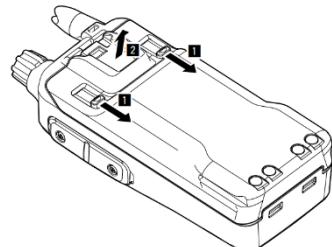
- Slide the belt clip in the direction of the arrow until the belt clip is locked and makes a 'click' sound



- Lift the tab up, and slide the belt clip in the direction of the arrow



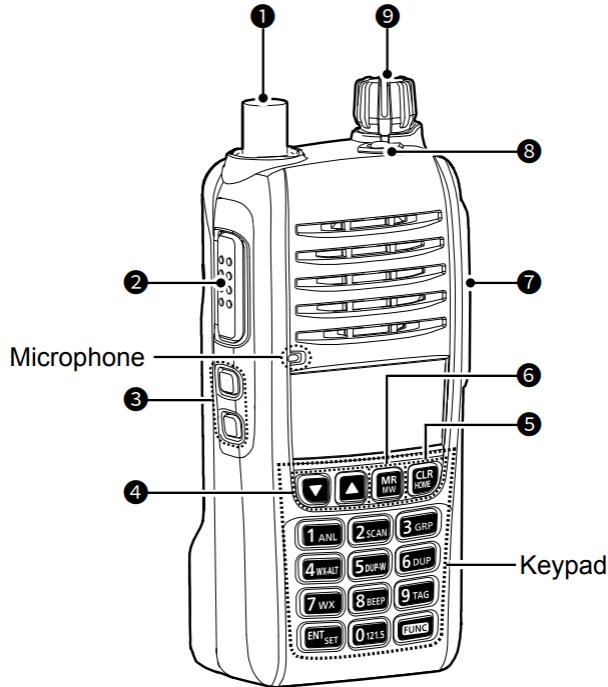
- Slide the battery pack in the direction of the arrow
- Push the battery pack until the battery sliding locks make a 'click' sound



- For Detach-Pull both battery sliding locks in the direction of the arrow
- Lift up to detach the battery pack

| | | | |
|--|---|------------------------------|---|
|    <p>WORLD CARRIER CORPORATION HBA Offshore (Int) Pte. Ltd VIVO ASIA ENGINEERING & TRADING</p> | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 24 of 36 | Status: IFR |

- PANEL DESCRIPTION



1. ANTENNA CONNECTOR
 - Connect the supplied antenna.
2. PTT SWITCH
 - Hold down to transmit, release to receive.
3. SQUELCH ADJUSTMENT KEYS
 - Push to adjust the squelch level.
4. UP/DOWN KEYS
 - Push to change or select the frequency, Memory channel, Set mode settings, and so on. While scanning, push to change the scanning direction.
5. CLEAR/HOME KEY
 - Push to return to the VFO mode. Hold down for 2 seconds to reset the Set mode settings to default.
6. MEMORY/MEMORY WRITE KEY
 - Push to enter the Memory Channel Selection mode. Push [FUNC] and then push this key to enter the Memory Write mode.
7. HEADSET JACK
 - Connect a third-party headset through the optional headset adapter.

| | | | |
|--|---|------------------------------|--|
|  WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 25 of 36 | Status: IFR |

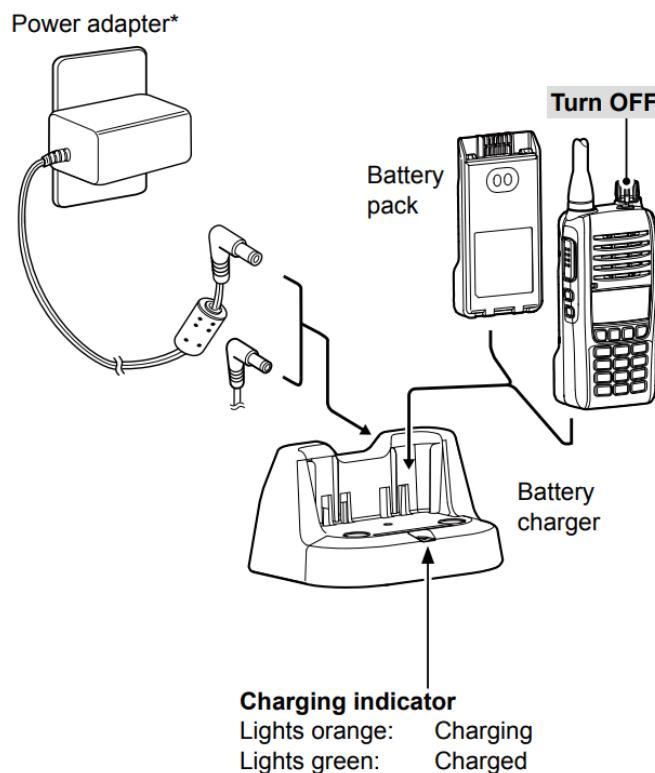
8. LOCK KEY

- Push to lock the keypad. Hold down for 2 seconds to unlock the keypad.

9. VOLUME/POWER SWITCH

- Rotate to turn the transceiver ON or OFF. Rotate to adjust the audio output level.

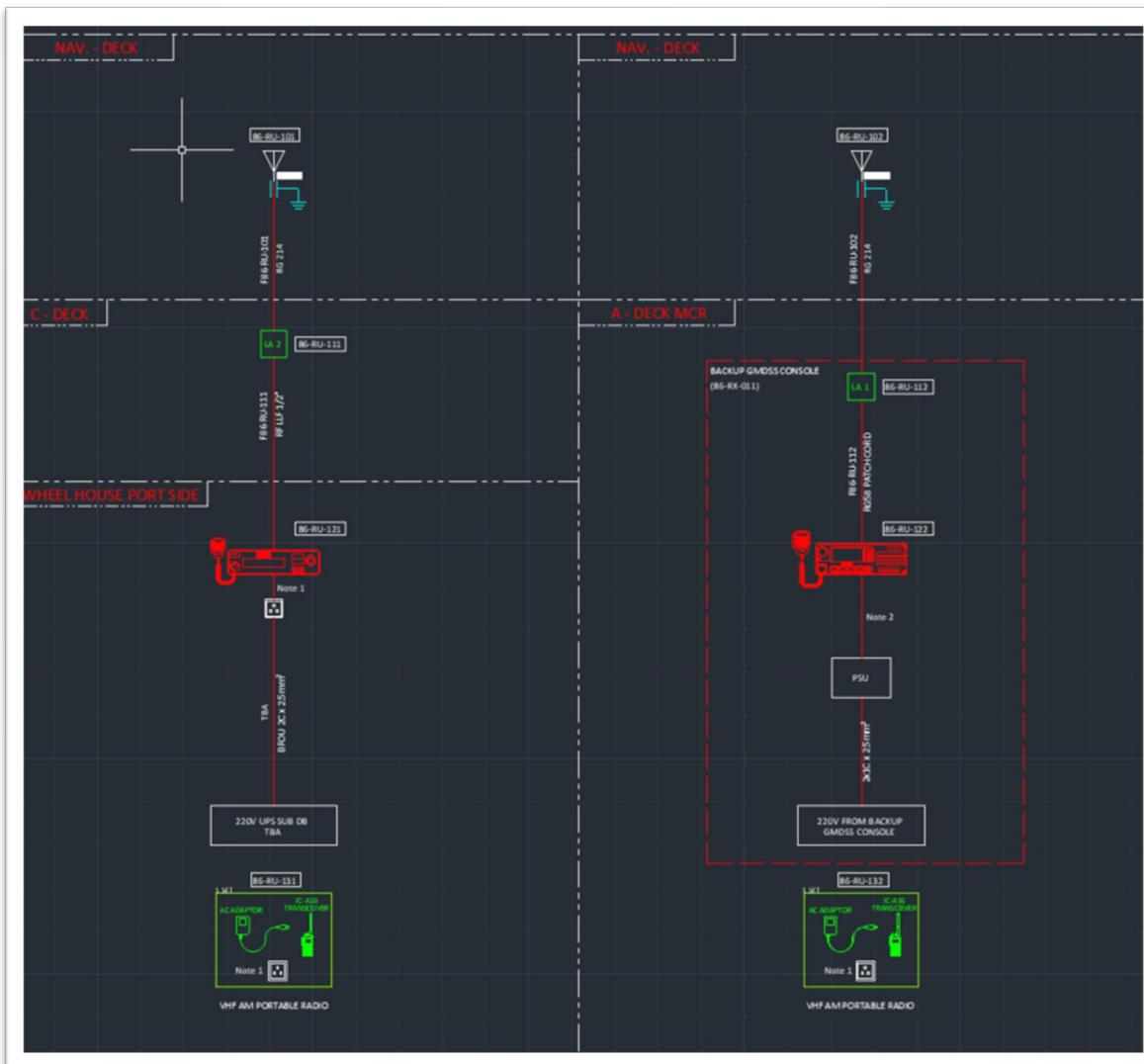
- Battery charger



| | | | | |
|--|---|------------------------------|------------------|--|
|  HBA Offshore <i>(Int) Pte. Ltd</i>  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | | |
| | Telecom System IOM – VHF AM SYSTEM | 2024-VIVO-EMEM-TR-167 | | |
| | | Rev: B | Date: 12.01.2026 | |
| | | Page 26 of 36 | Status: IFR | |

3.2 OVERALL SYSTEM ARCHITECTURE

The VHF-AM communication system is designed to provide reliable aeronautical and helicopter communication coverage for vessel operations. The system consists of two independent VHF-AM transceiver chains, installed on different decks to ensure operational redundancy and compliance with marine and offshore communication requirements.



The system comprises the following major elements:

- Fixed VHF-AM transceivers
- Dedicated VHF-AM antennas with lightning protection
- Power supply sources
- Portable VHF-AM radios for local and emergency use
- Interconnecting RF, power, and earthing networks

| | | | |
|--|---|------------------------------|------------------|
|  HCC WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 27 of 36 | Status: IFR |

3.2.1 MAIN VHF-AM SYSTEM (WHEELHOUSE – PORT SIDE)

- The primary VHF-AM transceiver (ICOM IC-A220B) is installed in the Navigation Deck, Wheelhouse – Port Side.
- The transceiver is connected to a dedicated VHF-AM antenna installed on the Navigation Deck, providing omnidirectional coverage in the 118–137 MHz aeronautical band.
- A lightning arrestor is installed in-line between the antenna and the transceiver to protect the equipment from lightning-induced surges.
- Power is supplied from the 220 V AC UPS distribution board, ensuring continuous operation during short-term power interruptions.
- A VHF-AM portable radio with AC adapter/charger is provided in the vicinity for operational flexibility and contingency use.

3.2.2 BACKUP VHF-AM SYSTEM (MCR – A DECK)

- The backup VHF-AM transceiver (JOTRON TR-910) is installed at the Main Control Room (MCR), A Deck – GMDSS Backup Console.
- This transceiver is connected to an independent VHF-AM antenna mounted on the Navigation Deck, with a dedicated RF feeder and lightning arrestor.
- The backup system is powered from the 220 V AC supply derived from the GMDSS backup console, ensuring availability during emergency and blackout conditions.
- A separate VHF-AM portable radio with AC adapter/charger is provided for redundancy and emergency communication.

The system architecture ensures physical separation of main and backup equipment across different decks. Independent power sources, antennas, and RF paths are provided to eliminate single points of failure. Portable radios further enhance operational continuity during maintenance or emergency scenarios.



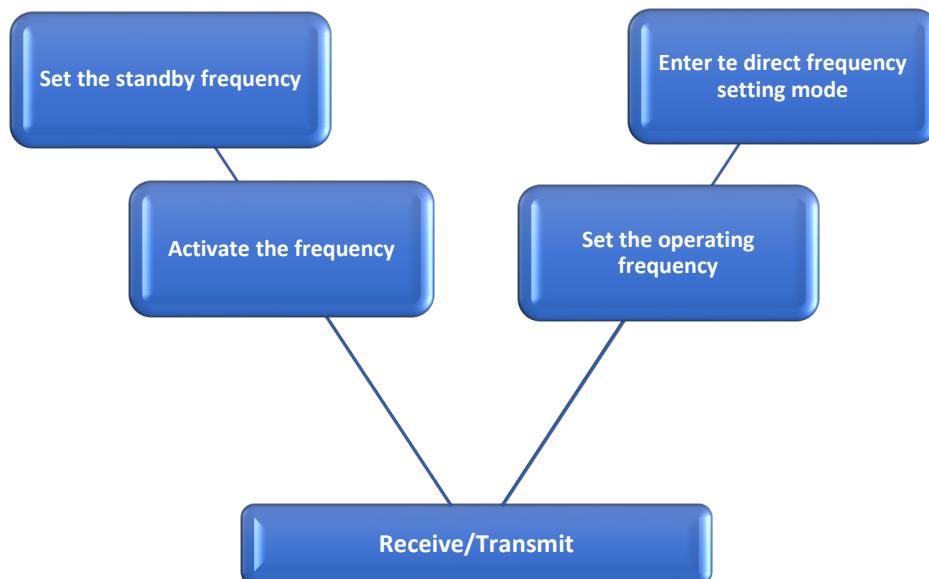
| | | | |
|---|------------------|------------------------------|---|
|  HCC WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 |  ORIENTAL OKWOK |
| | | 2024-VIVO-EMEM-TR-167 | |
| Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |  ADDAX PETROLEUM |
| | Page 28 of 36 | Status: IFR | |

3.3 OPERATION – VHF-AM COMMUNICATION SYSTEM

The VHF-AM communication system is intended for aeronautical and helicopter communication within the frequency range 118–137 MHz. The system supports normal and emergency operations through main and backup fixed transceivers, supplemented by portable VHF-AM radios. Only trained and authorized personnel should operate the equipment.

3.3.1 NORMAL OPERATION

- The primary VHF-AM transceiver (ICOM IC-A220B) located at the Navigation Deck, Wheelhouse – Port Side shall be used for routine operations.
- Ensure the transceiver is powered ON from the UPS-backed AC supply.
- Verify the following before operation:
 - Correct channel or frequency selection
 - Volume and squelch adjusted to suitable levels
 - Antenna and RF connections are intact
- Transmit and receive audio is handled via the hand microphone and external speaker connected to the transceiver. The flow chart below shows the basic operating procedures. You need to set the frequency, activate the frequency, and receive or transmit



- Receiving and transmitting

Setting the standby frequency

Rotate [DIAL] and [O-DIAL] to select the standby frequency.

- Rotate [O-DIAL] to set above 1 MHz digit.
- Rotate [DIAL] to set below 100 kHz digit.

134.89 126.40

| | | | |
|--|---|------------------------------|------------------|
|  HCC WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 29 of 36 | Status: IFR |

Exchanging the frequency

After setting the standby frequency, push [\leftrightarrow] to exchange it with the active frequency

126.40 134.80

When receiving a signal, “RX” is displayed and audio is heard.

- Rotate [VOL] to adjust the audio level.
- Adjust the squelch if necessary. See ‘Squelch settings for details’

RX
126.40 134.80

Hold down PTT switch and then speak at your normal voice level.

- “TX” is displayed.

TX
126.40 134.80

Directly setting the frequency

Hold down [\leftrightarrow] for 2 seconds to enter the direct frequency setting mode.

- Only active frequency is displayed.

Set an operating frequency.

- Rotate [O-DIAL] to set above 1 MHz digit.
- Rotate [DIAL] to set below 100 kHz digit.

121.80

When receiving a signal, “RX” is displayed and audio is heard.

- Rotate [VOL] to adjust the audio level.

RX
121.80

Hold down PTT switch and then speak at your normal voice level.

- “TX” is displayed

TX
121.80

Release the PTT switch to receive.

Push [RCL] or [\leftrightarrow] to exit the direct frequency setting mode.

| | | | |
|---|---|------------------------------|------------------|
|    VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 30 of 36 | Status: IFR |

3.3.2 BACKUP OPERATION

- In the event of failure or unavailability of the main system, the backup VHF-AM transceiver (JOTRON TR-910) installed at the MCR, A Deck – GMDSS Backup Console shall be used.
- The backup transceiver is powered from the GMDSS backup power supply, ensuring availability during emergency or blackout conditions.
- Operation of the backup unit follows the same basic procedure as the main system:
 - Power ON the unit
 - Select the required frequency or channel
 - Adjust volume and squelch as required
 - Perform a radio check prior to operational use

Turning the unit ON/OFF

- Turn ON:**
- Press and hold the Scroll/Select knob for approximately 1 second. The unit starts up and the Home Screen is displayed.
- Turn OFF:**
- Press and hold Scroll/Select for 3 seconds, select Shutdown, and confirm Yes.
- Restart:
- Press and hold Scroll/Select for 3 seconds, select Restart, and confirm Yes.
- Forced Shutdown (if unresponsive): Press and hold Scroll/Select for more than 10 seconds.

Home Screen – Channel Selection

- The **Home Screen** is the main operating screen.
- Displays:
 - Current operating frequency
 - Shortcut channels (Channel 1–5)
 - Status and indicator icons
- Select a shortcut channel by pressing the corresponding shortcut key.



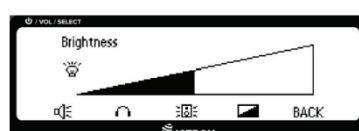
Volume Adjustment

- Rotate the Scroll/Select knob to open the Volume Screen.
- Rotate Scroll/Select to increase or decrease volume.
- Press the shortcut key to enable or disable the selected audio output.
- The screen returns automatically after a few seconds of inactivity.



Display Brightness and Contrast

- Access from the Volume Screen.
- Press the Brightness shortcut to toggle between brightness and contrast.
- Rotate Scroll/Select to adjust the selected setting.



| | | | |
|---|---|------------------------------|------------------|
|  HCC WORLD CARRIER CORPORATION  HBA Offshore <i>(Int) Pte. Ltd.</i>  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 31 of 36 | Status: IFR |

Channel Recall

- Press Scroll>Select to open the Function Screen.
- Rotate Scroll>Select to browse stored channels.
- Press Scroll>Select or RCL to select the channel and return to the Home Screen.



Squelch Adjustment

- The TR-910 uses automatic S/N squelch (default: 12 dB).
- Manual adjustment is normally not required.
- To adjust:
 - Open the Function Screen
 - Select SQL
 - Rotate Scroll>Select to adjust squelch level
 - Enable or disable squelch as required



Frequency Selection and Channel Storage

- Open the **Function Screen** and select **FREQ**.
- Rotate **Scroll>Select** to change frequency.
- Confirm by pressing **SELECT**.

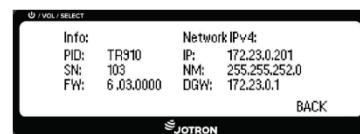


To store a frequency:

- Select **STORE**
- Choose a channel number (1–100)
- Press **STORE** to save or overwrite the channel

Function screen - Show radio information

- Press scroll/select to open the function screen.
- Press the INFO shortcut to open the info screen.



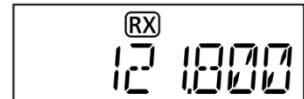
| | | | |
|--|---|------------------------------|------------------|
|  HCC WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 32 of 36 | Status: IFR |

3.3.3 PORTABLE VHF-AM RADIO OPERATION

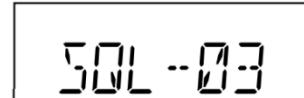
- Portable VHF-AM radios are provided for direct air-to-ground communication between helideck personnel and helicopters during helideck operations.
- Ensure the portable radio battery is adequately charged using the supplied AC adapter/charger.
- Switch ON the portable radio and select the required frequency.
- Use the portable radio when:
 - Fixed transceivers are unavailable
 - Personnel are required to communicate away from fixed operating positions
 - During maintenance or emergency scenarios

Receiving and transmitting

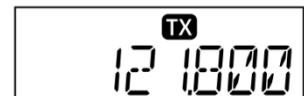
- Setting the frequency
 - If the transceiver is in Memory mode, push [CLR]/[HOME] to exit the Memory mode.
 - Use the keypad to set the frequency.
- Selecting a Memory channel
 - Push [MR]/[MW] to enter the Memory mode.
“M_{CH}” is displayed.
The memory channel’s frequency or name is displayed, if it is entered.
 - Push [^Y] or [_Y] to select a channel.
- When receiving a signal, “RX” is displayed and audio should be heard. Rotate [VOL] to adjust the audio output level.



- Adjusting the squelch level
 - Push [SQL ^Y]/ [SQL _Y] to adjust the squelch level until the noise just disappears when no signal is received.



- Using the Automatic Noise Limiter (ANL) function
 - The function reduces noise components in the received signal, such as those caused by engine ignition systems.
 - Push [FUNC] and then push [ANL] to turn the function ON or OFF.
- When transmitting a signal Hold down [PTT] and then speak at your normal voice level.
 - “TX” is displayed.



| | | | |
|--|---|---|------------------|
|  HCC WORLD CARRIER CORPORATION | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
|  VIVO ASIA ENGINEERING & TRADING | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 33 of 36 | Status: IFR |
|  ORIENTAL DKWOK | |  ADDAX PETROLEUM | |

- Programming a Channel with a Specific Frequency

The transceiver has 200 memory channels to save often-used frequencies. The frequency and channel name can be saved into each memory channel. Follow the steps below to set and store the desired frequency into a channel

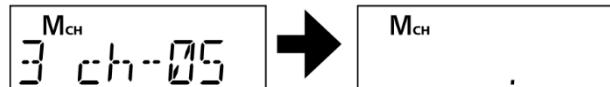
Set the Required Frequency

- Ensure the radio is in VFO mode.
- Use the keypad or press [▲] / [▼] to select the required operating frequency.
- Confirm the correct frequency is displayed.



Select a Memory Channel

- Press [FUNC], then press [MR/MW] to enter Memory Write mode.
- “MCH” will blink on the display.
- Press [▲] / [▼] to select the desired memory channel number.



Store the Frequency

- Press [ENT] to store the selected frequency into the chosen memory channel.
- The radio will automatically return to VFO mode.

Selecting a Stored Memory Channe

- Press the “MR” (Memory Recall) button.
- The display will show the memory channel number instead of the frequency.

3.3.4 ANTENNA AND RF PATH CONSIDERATIONS

- Each transceiver operates with a dedicated antenna through a 50 Ω coaxial feeder and lightning arrestor.
- Operators are not required to perform any manual antenna switching during normal or backup operation.
- Any abnormal transmission performance shall be reported to maintenance personnel for inspection of antenna, RF cable, and lightning arrestor connections.

3.3.5 OPERATIONAL PRECAUTIONS

- Do not transmit without a properly connected antenna.
- Ensure transmission power and frequency selection comply with applicable aviation and marine regulations.
- Avoid continuous transmission beyond recommended duty cycles.
- Any alarms, abnormal audio, or transmission failures shall be logged and reported

| | | | |
|--|---|------------------------------|------------------|
|  HCC WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 34 of 36 | Status: IFR |

3.4 MAINTENANCE

The VHF/AM radio system is designed for continuous operation with minimal maintenance. Routine inspections and preventive maintenance shall be carried out to ensure reliable performance and compliance with operational requirements. All maintenance activities shall be performed by qualified personnel.

3.4.1 ROUTINE INSPECTION

The following checks shall be performed at regular intervals:

- Verify the transceiver is securely mounted and free from physical damage.
- Check power supply connections for tightness and signs of corrosion.
- Inspect antenna, antenna mount, and coaxial cable for mechanical damage.
- Confirm lightning arrestor connections are secure and properly grounded.
- Ensure ventilation openings are free from obstruction.
- Verify display, keypad, and control knobs are functioning correctly.

3.4.2 FUNCTIONAL TESTING

- Power ON the radio and confirm normal startup.
- Verify transmission and reception on an assigned test frequency.
- Check audio clarity via internal speaker, external speaker, or headset.
- Confirm Push-To-Talk (PTT) operation.
- Verify squelch operation and noise suppression.
- Confirm channel recall and frequency selection functions

3.4.3 ANTENNA AND RF PATH MAINTENANCE

- Inspect antenna mounting hardware for tightness and corrosion.
- Verify the coaxial cable is properly routed and protected from mechanical stress.
- Confirm lightning arrestor is installed inline between antenna and transceiver.
- Ensure grounding of antenna and lightning arrestor is intact and continuous.
- Measure VSWR if required during periodic inspections.

3.4.4 CLEANING

- Clean the front panel, display, and controls using a dry or slightly damp lint-free cloth.
- Do not use solvents, abrasive cleaners, or pressurized air.
- Ensure the unit is powered OFF before cleaning.

3.4.5 SOFTWARE / CONFIGURATION CHECKS

- Verify stored channels and frequencies remain correct.
- Check system information and firmware version during scheduled inspections.
- Configuration changes shall only be performed by authorized personnel



| | | | |
|--|---|------------------------------|------------------|
|  WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | Rev: B | Date: 12.01.2026 |
| | | Page 35 of 36 | Status: IFR |

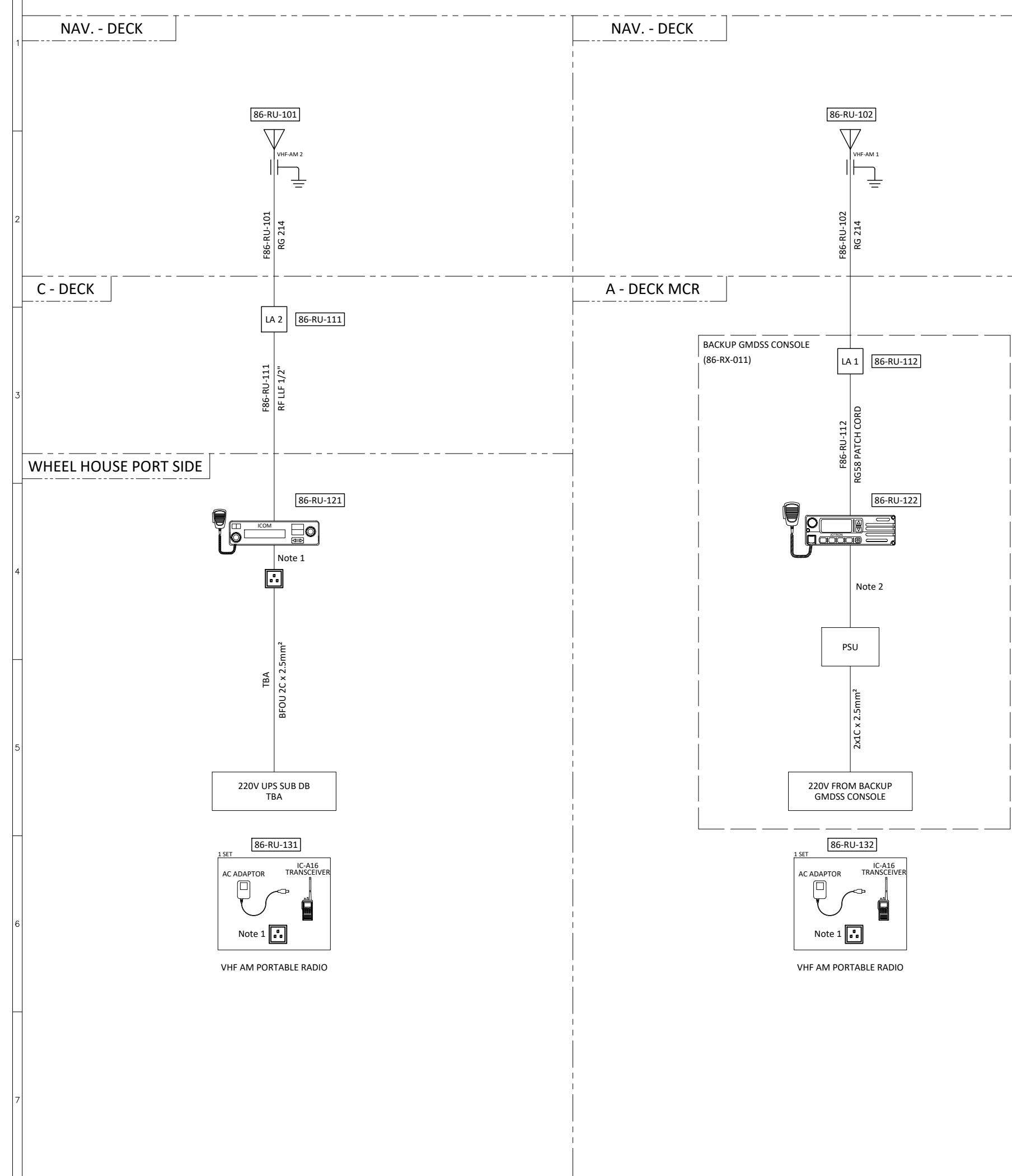
3.4.6 FAULT HANDLING

| No. | Fault Condition | Equipment | Possible Cause | Action |
|-----|--|------------|------------------------------------|--|
| 1 | Radio does not power ON | All models | No power supply available | Verify power source availability |
| | | | Loose or damaged power cable | Check and secure power connections |
| 2 | Radio does not power ON | IC-A16 | Battery discharged | Recharge or replace battery |
| | | | Battery not seated correctly | Refit battery pack securely |
| | | | Dirty or corroded battery contacts | Clean contacts |
| 3 | Radio does not power ON | IC-A220B | Power supply not operational | Check PSU status and output |
| | | | Poor grounding | Verify grounding |
| 4 | Radio does not power ON | TR-910 | DC supply not available | Verify supply from UPS / GMDSS backup |
| | | | Rear connector not secured | Reset and secure connectors |
| 5 | Radio powers ON but no audio | All models | Volume set too low | Increase volume level |
| | | | Squelch set too high | Reduce squelch level |
| | | | External speaker/headset fault | Check audio accessories |
| 6 | No transmission or low RF output | All models | PTT not functioning | Verify PTT operation |
| | | | Antenna not connected | Secure antenna connection |
| | | | Coaxial cable damaged | Inspect and replace if required |
| | | | Lightning arrestor faulty | Inspect and ensure proper grounding |
| 7 | Poor communication quality | All models | Antenna obstruction | Check antenna |
| | | | Improper grounding | Verify grounding |
| | | | Electrical interference | Identify and remove interference source |
| | | | Antenna damaged or misaligned | Inspect and realign/replace antenna |
| 8 | Equipment unresponsive or abnormal operation | All models | Temporary system fault | perform a system restart |
| | | | Persistent fault | Refer to manufacturer's service Manu / service agent |

| | | | |
|--|---|------------------------------|------------------------------|
|  WORLD CARRIER CORPORATION  HBA Offshore (Int) Pte. Ltd  VIVO ASIA ENGINEERING & TRADING | EMEM FPSO | WCPOKWTP-450-TE-(VAE) MN-022 | |
| | | 2024-VIVO-EMEM-TR-167 | |
| | Telecom System IOM – VHF AM SYSTEM | | Rev: B Date: 12.01.2026 |
| | | Page 36 of 36 | Status: IFR |

4 PROJECT SPECIFIC DRAWINGS

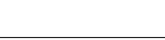
VHF AM SYSTEM CABLE BLOCK DIAGRAM

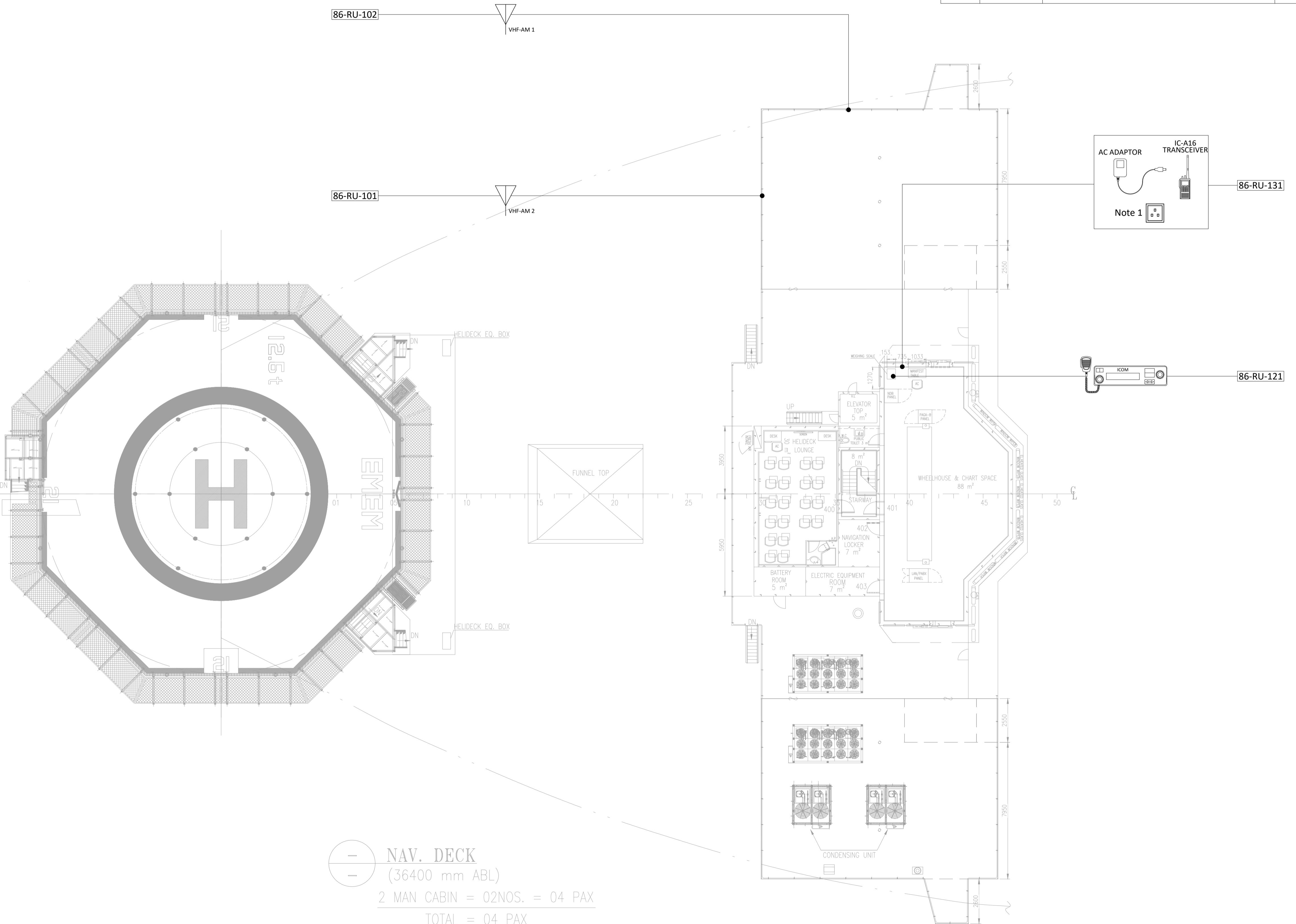


REVISIONS

| REV. | DATE | DESCRIPTION | DRWN | CHKD | APPD | CLIENT |
|-------------|--------------------------|---|--|--|--------------------|--------------------------------|
| 0 | 18.04.2025 | ISSUED FOR CONSTRUCTION | TT | KK | TS | |
| COMPANY: | | | | | | |
| | |  ORIENTAL OKWOK | |  ADDAX PETROLEUM | | |
| CONTRACTOR: | | | | | | |
| | |  WORLD CARRIER CORPORATION | |  HBA Offshore | | |
| VENDOR: | | | | | | |
| | |  VIVO ASIA ENGINEERING & TRADING | TP : +65 6826 2525 | Head Office : 21 Toh Guan Rd E, #06-06A, Singapore 608609 | Web : vivoasia.com | E-mail : contract@vivoasia.com |
| PROJECT: | | | | | | |
| | | | OKWOK-FPSO | | | |
| | | | TOPSIDES PRODUCTION FACILITIES | | | |
| LOCATION: | | | | | | |
| | | | OKWOK FIELD OFFSHORE NIGERIA-OML 67 | | | |
| TITLE: | | | | | | |
| | | | TELECOM CABLE BLOCK DIAGRAM -VHF AM SYSTEM | | | |
| SCALE: | DRAWING NO. | | WCP DRAWING NO. | | | REV. |
| N TS | 2024-VIVO-EMEM-TS-BD-024 | | WCPOKWT-P-450-TE-(VAE)BF-022 | | | 0 |
| SHEET: | 03 | of 03 | | | | |

VHF AM SYSTEM - NAV. DECK

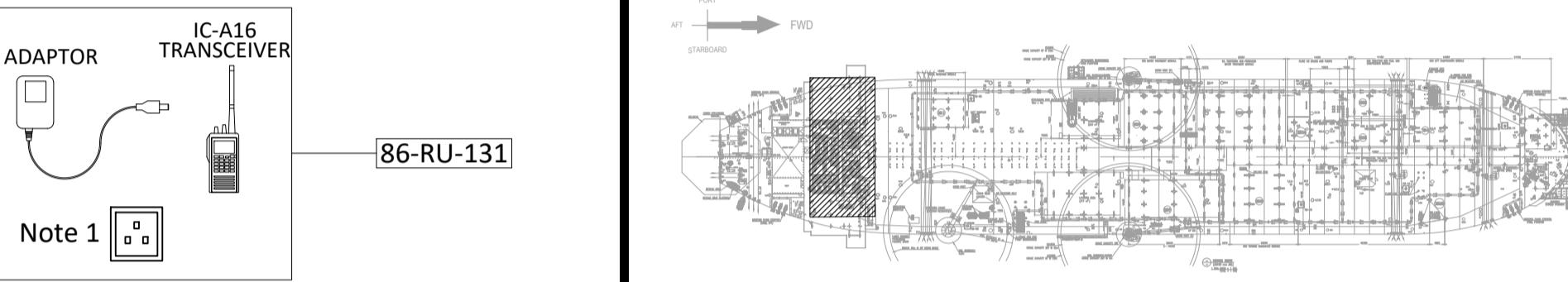
| BILL OF MATERIAL | | | |
|------------------|---|---|------|
| S/N | SYMBOL | DESCRIPTION | QTY. |
| 1 |  | VHF/FM TRANSCEIVER MODEL : IC-A220B MANUFACTURER : ICOM | 01 |
| 2 |  | VHF AM PORTABLE RADIO WITH HEADSET MODEL : IC-A16 MANUFACTURER : ICOM | 01 |
| 3 |  | VHF AM PORTABLE RADIO CHARGER MODEL : TBA MANUFACTURER : ICOM | 01 |
| 4 |  VHF-AM 1 | VHF AM RADIO ANTENNA MODEL : CXL3-1LW MANUFACTURER : PROCOM | 01 |
| 5 |  VHF-AM 2 | VHF AM RADIO ANTENNA MODEL : TBA MANUFACTURER : TBA | 01 |



NOTES

HOLD LIST

KEYPLAN



REFERENCES



ORIENTAL
OKWOK



 WORLD CARRIER CORPORATION



VIVO ASIA
ENGINEERING & TRADING

TP : +65 6826 2525
Head Office : 21 Toh Guan Rd E,#06-06A, Singapore 608609
Web : vivoasia.com
E-mail : contract@vivoasia.com

JECT:
OKWOK-FPSO
TOPSIDES PRODUCTION FACILITIES

CATION:
OKWOK FIELD OFFSHORE NIGERIA-OML 67

LE:
TELECOM DEVICE LOCATION LAYOUT DRAWING-
VHF AM SYSTEM

VHF AM SYSTEM - C DECK

BILL OF MATERIAL

| S/N | SYMBOL | DESCRIPTION | QTY. |
|-----|--------|---|------|
| 1 | LA 2 | LIGHTNING ARRESTOR MODEL : TBA MANUFACTURER : TBA | 01 |

NOTES

HOLD LIST

KEYPLAN

REFERENCES

| DOCUMENT NO. | DESCRIPTION |
|--------------|-------------|
| | |

REVISIONS

| | | | | | |
|------|------------|-------------------------|------|------|------|
| 0 | 23.04.2025 | ISSUED FOR CONSTRUCTION | TT | KK | TS |
| REV. | DATE | DESCRIPTION | DRWN | CHKD | APPD |

COMPANY:



ORIENTAL
OKWOK

ADDAX
PETROLEUM

CONTRACTOR:



WORLD
CARRIER
CORPORATION

HBA Offshore

VENDOR:



VIVO
ASIA
ENGINEERING & TRADING
TP : +65 6826 2525
Head Office : 21 Toh Guan Rd E,#06-06A, Singapore 608609
Web : vivoasia.com
E-mail : contact@vivoasia.com

PROJECT:

OKWOK-FPSO
TOPSIDES PRODUCTION FACILITIES

HBA Offshore

LOCATION:

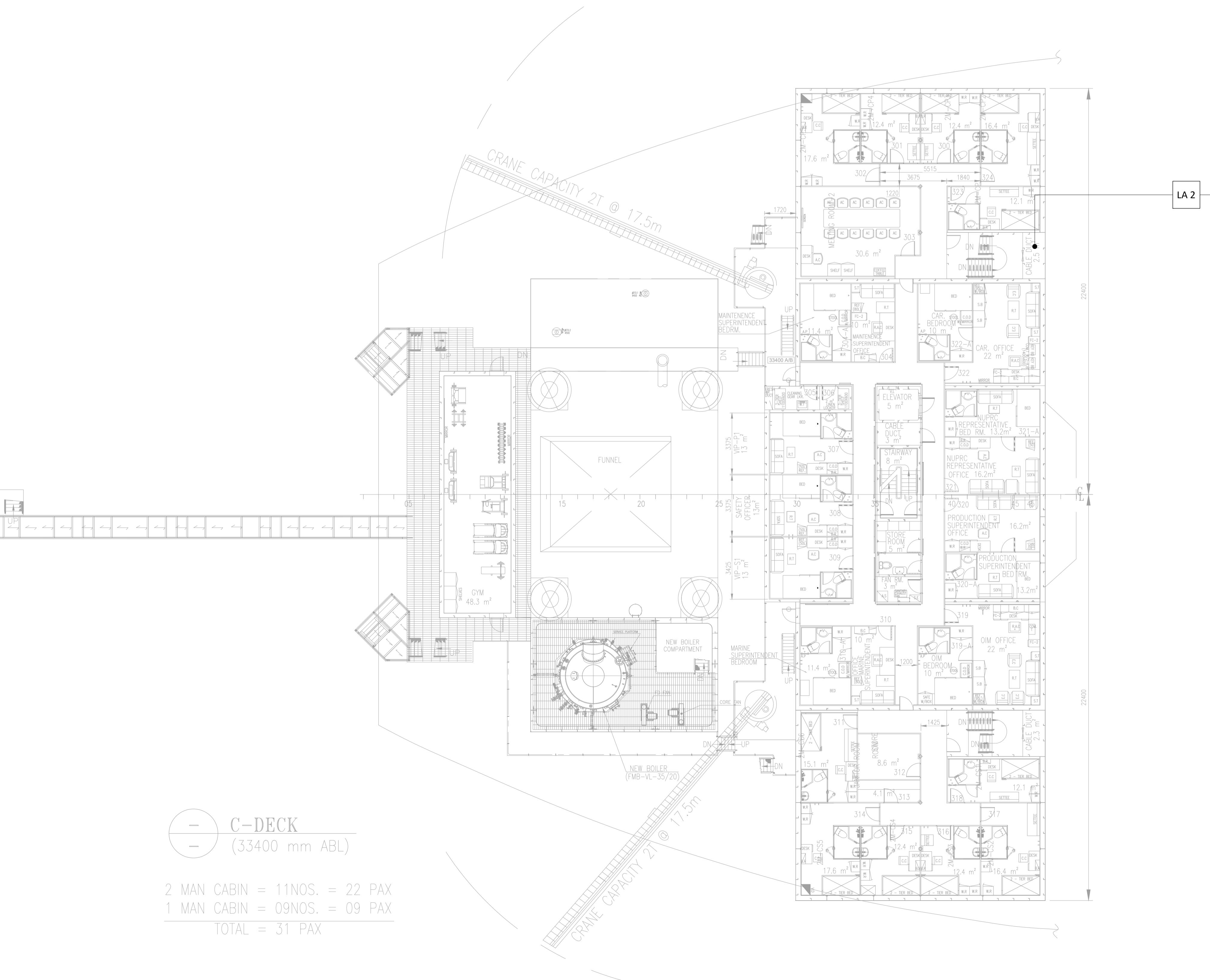
OKWOK FIELD OFFSHORE NIGERIA-OML 67

TITLE:

TELECOM DEVICE LOCATION LAYOUT DRAWING-
VHF AM SYSTEM

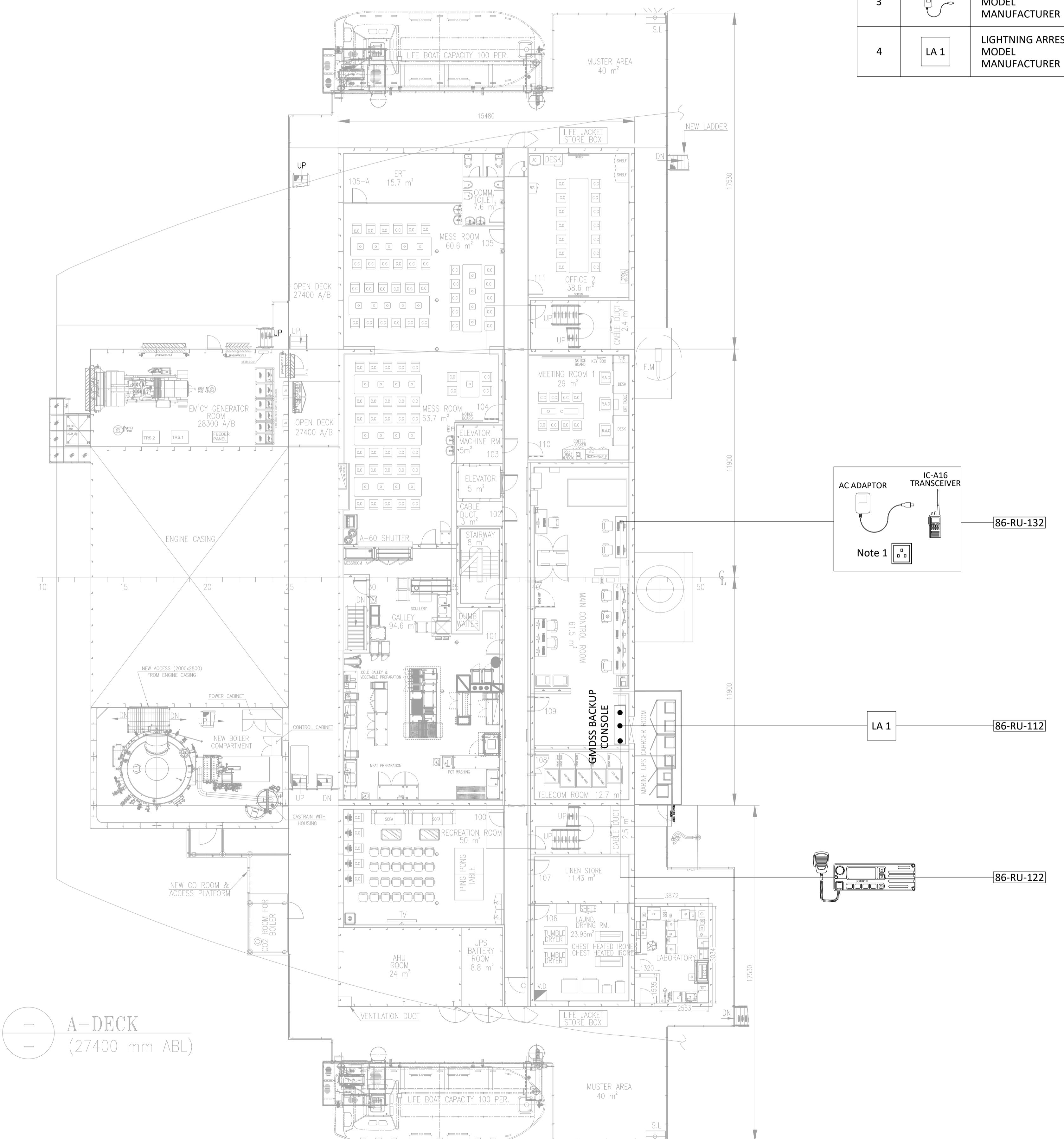
SCALE: 1:125 DRAWING NO. 2024-VIVO-EMEM-TS-LD-024 WCP DRAWING NO. WCPOKWTP-450-TE-(VAE)LY-022 REV. 0

SHEET: 04 of 05



VHF AM SYSTEM - A DECK

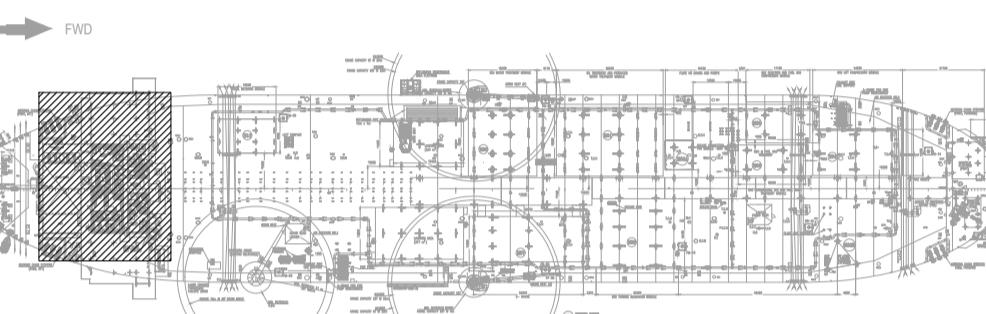
| BILL OF MATERIAL | | | |
|------------------|---|---|------|
| N | SYMBOL | DESCRIPTION | QTY. |
| |  | VHF/FM TRANSCEIVER MODEL : TR-910 OF MANUFACTURER : JOTRON | 01 |
| |  | VHF AM PORTABLE RADIO WITH HEADSET MODEL : IC-A16 MANUFACTURER : ICOM | 01 |
| |  | VHF AM PORTABLE RADIO CHARGER MODEL : TBA MANUFACTURER : ICOM | 01 |
| | LA 1 | LIGHTNING ARRESTOR MODEL : IS-B50HN-C0 MANUFACTURER : POLYPHASER | 01 |



NOTES

HOLD LIST

KEYPLAN



REFERENCES

REVISIONS



ORIENTAL
OKWOK



 **VIVO
ASIA**
ENGINEERING & TRADING

TP : +65 6826 2525
Head Office : 21 Toh Guan Rd E,#06-06A, Singapore 608609
Web : vivoasia.com
E-mail : contract@vivoasia.com

OKWOK-FPSO TOPSIDES PRODUCTION FACILITIES

OKWOK FIELD OFFSHORE NIGERIA-OML 67

| | | |
|---|--|------|
| DRAWING NO. 2024-VIVO-EMEM-TS-LD-024 | WCP DRAWING NO. WCPOKWTP-450-TE-(VAE)LY-022 | REV. |
| SHEET: 05 of 05 | | 0 |