

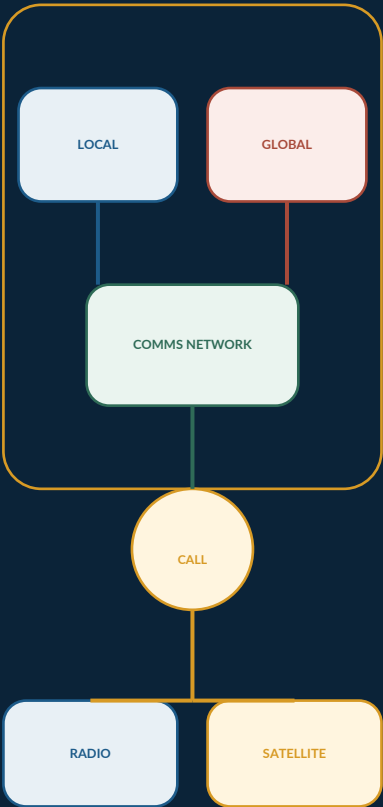
Understanding VHF, SSB and Satellite Communications

An owner's guide to local, long-range and satellite communications resilience

Communication range depends on more than the radio. Power, antenna, installation and service availability matter. Offshore resilience comes from several independent paths and a crew able to use them under pressure.

Absolute Marine

Commercial thinking for private cruising.



POWER | ANTENNA | SERVICE

GUIDE OVERVIEW

What VHF, SSB and satellite communications are designed to do

Marine communications combine local line-of-sight radio, long-range HF or SSB and satellite services to support routine traffic, weather, safety and distress contact.

SCOPE	This guide covers fixed and handheld VHF, DSC, HF or SSB, satellite voice and data, antennas, cabling, GNSS interfaces, subscriptions and independent power. Legal licensing and operator requirements vary by region.
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By the end of this guide, you should be able to:

- Trace the complete path from command or supply to the physical result.
- Identify the principal components, controls, protection and monitoring.
- Recognise common failure modes and early warning signs.
- Understand hidden dependencies and safe degraded operation.
- Ask better questions during purchase, survey, sea trial, refit and offshore preparation.

CORE PRINCIPLE	Different communication methods should not share every antenna, power source, subscription, network or vulnerable location.
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Safety

Radio transmitters can expose crew to RF energy and high voltage. HF antenna tuners may generate hazardous voltages; satellite and mast work require safe access. Use only authorised channels and procedures.

SYSTEM ARCHITECTURE

From the message to a usable remote contact

Communication requires a working operator interface, transceiver or terminal, antenna path, power source, addressing or service network and a receiving station.



Area	Why it matters	Owner focus
Operator and addressing	Correct channel, identity, number or destination is selected.	Keep call signs, MMSI and emergency contacts current.
Radio or terminal	Creates and decodes the signal.	Know modes, power settings, fault indication and local controls.
Antenna and feed line	Connects equipment to the outside radio path.	Inspect mounting, coax, grounding, tuner and water ingress.
External network	Coast stations, satellites or other vessels complete the path.	Understand coverage, propagation and service outages.
Power and time or position data	Supports transmission, DSC and satellite registration.	Provide essential supply and verify GNSS input.

CORE PRINCIPLE	A radio that lights up but cannot transmit through its antenna, reach a network or obtain position data is not a dependable communication path.
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MAIN COMPONENTS

What owners should be able to identify

The installation should be traceable from microphones and terminals through radios, tuners, splitters, antennas, GNSS data, network equipment and power supplies.



Area	Why it matters	Owner focus
Fixed and handheld VHF	Provides local marine voice and DSC where fitted.	Antenna, speaker, microphone, battery and waterproofing.
DSC and GNSS interface	Adds identity, position and digital distress or calling.	MMSI programming, position age and test procedure.
HF or SSB system	Provides long-range voice and data under suitable propagation.	Transceiver, tuner, backstay or whip, grounding and operator skill.
Satellite terminal	Provides network-based voice, text or data over covered areas.	Subscription, antenna view, firmware, SIM or account and emergency use.
Antennas and cabling	Determine range, signal quality and resilience.	Separation, connectors, coax loss, lightning and corrosion.
Independent power and contacts	Keeps selected equipment usable after blackout.	Battery condition, charger, portable units and printed contact information.

ACCESS AND LABELLING	An antenna or cable fault can make an expensive radio perform like a weak handheld. Installation quality is central to range.
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SYSTEM ARRANGEMENTS

Local, long-range and satellite communication paths

Each method has different coverage, latency, infrastructure and operator requirements. A resilient yacht uses them as complementary rather than interchangeable systems.



Area	Why it matters	Owner focus
Fixed VHF	Primary local bridge-to-bridge and coast communication.	Range depends strongly on antenna height and installation.
Handheld VHF	Portable local backup and tender or liferaft communication.	Limited range, battery and waterproofness.
HF or SSB	Long-range voice, weather and nets without satellite subscription.	Requires antenna system, propagation knowledge and practice.
Satellite voice or messaging	Wide-area contact through a commercial or safety network.	Coverage, account status, antenna view and network availability.
Internet-based applications	Convenient routine communication over satellite or cellular data.	Not a substitute for recognised marine distress methods.

PRACTICAL DISTINCTION	A phone application using the yacht satellite router is not independent of the terminal, router, subscription and ship power that support it.
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OPERATION AND CONTROL

Making routine, safety and distress calls correctly

The crew should understand channel selection, listening watch, DSC procedures, satellite addressing, microphone technique and how to change to an alternate path.



Area	Why it matters	Owner focus
VHF voice call	Listen first, call briefly and move to a working channel.	Use high or low power appropriately.
DSC calling	Select category and destination, then follow with voice traffic.	Verify MMSI and position data before reliance.
HF or SSB call	Choose frequency and time suited to range and propagation.	Tune correctly and avoid transmitting into a faulty antenna.
Satellite call or message	Confirm terminal registration, destination and account status.	Know emergency numbers and geographic restrictions.
Communications log	Record important safety, position and assistance traffic.	Preserve times, contacts and failed attempts.

OPERATOR FOCUS	The best communication method may change with distance, antenna damage, blackout, weather and the urgency of the message.
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DEPENDENCIES AND RESILIENCE

What can remove apparently independent capability

Several apparently separate devices can rely on one mast, GNSS source, router, DC bus, satellite subscription or bridge compartment.

SHARED ANTENNA

Splitter or mast failure

SHARED POWER

One bus or charger removes radios

SHARED GNSS

DSC and terminals lose position

SHARED SERVICE

Account or network outage

Area	Why it matters	Owner focus
Antenna location	Multiple radios may share mast structure, splitter or cable route.	Retain an independent emergency antenna or handheld.
DC power	VHF, SSB, satellite router and charging may share one board.	Trace emergency supply and battery endurance.
GNSS position	DSC and satellite systems may use one navigation source.	Provide internal or alternate position input.
Satellite service	Voice, messaging and internet may use one provider and account.	Keep a different-network or radio alternative.
Bridge access	Fire or flooding can make all fixed equipment unreachable.	Position portable units and grab-bag equipment elsewhere.

COMMON-MODE RISK

Diversity of device does not guarantee diversity of failure path. Follow the antenna, cable, power and commercial service dependencies.

MONITORING AND NORMAL VALUES

Recognising signal, antenna and service deterioration

Useful indicators include received signal, transmit power or standing-wave alarms, DSC position age, terminal registration, call quality and battery voltage under transmit load.

POWER

Voltage during transmission

ANTENNA

Signal and reflected power

NETWORK

Registration and coverage

MESSAGE

Clarity, latency and confirmation

Area	Why it matters	Owner focus
VHF receives but cannot transmit far	Low voltage, antenna, coax or power-output fault.	Test with a known station and inspect installation.
High SWR or tuner fault	Damaged antenna, connector, ground or tuning path.	Stop high-power transmission until corrected.
DSC position old or blank	GNSS source or network fault.	Enter or select a verified position source.
Satellite terminal searching	Blocked sky view, network, account, cable or antenna fault.	Change orientation or use alternate path.
Audio distorted or intermittent	Microphone, speaker, water ingress, voltage or connector issue.	Use another handset or radio and log the defect.
TREND, DO NOT GUESS	Routine successful calls to known stations are more useful than relying on a self-test that never exercises the antenna or external network.	

FAILURE AWARENESS

Common weaknesses and warning signs

Communication failures often appear as poor range, intermittent registration, noisy receive, no transmit, missing DSC position or an account that has quietly expired.

POWER FAULT

Low voltage or failed charger

ANTENNA FAULT

Coax, tuner or water ingress

DATA FAULT

Wrong identity or position

SERVICE FAULT

Coverage, account or network loss

Area	Why it matters	Owner focus
No receive or transmit	Power, fuse, antenna disconnect or radio failure.	Complete path may be unavailable without obvious alarm.
Poor VHF range	Low antenna, damaged coax, corrosion or low output.	Nearby tests may conceal offshore weakness.
HF will not tune	Antenna, ground, tuner or frequency fault.	Transmitter protection may limit output.
Satellite account inactive	Subscription, billing, SIM or authorisation problem.	Terminal can appear healthy but cannot place a call.
Handheld batteries depleted	Age, poor charging or cold storage.	Portable backup disappears during abandonment.

DO NOT NORMALISE CHANGE

Communication equipment should be tested through the real antenna and service network before departure, not only powered on at the dock.

FAILURE RESPONSE

Changing communication path during equipment or network failure

When a call fails, verify power and position, simplify the message, try another channel or frequency and move to a genuinely independent system.

VERIFY
Power, identity and position

RETRY SENSIBLY
Channel, frequency or antenna

CHANGE PATH
Handheld, HF or satellite

ESCALATE
Relay, visual signal or distress equipment

Area	Why it matters	Owner focus
Fixed VHF fails	Use handheld, second fixed set or emergency antenna.	Assuming the other fixed set is independent without checking.
Satellite service unavailable	Try alternate satellite network, HF or VHF relay.	Repeated app attempts while battery and time are lost.
HF antenna damaged	Stop transmitting and use satellite or VHF alternatives.	High-power operation into a known fault.
Blackout	Move to emergency-powered or battery portable equipment.	Using all handheld batteries for routine traffic.
Distress message not acknowledged	Repeat using another method and activate appropriate emergency beacons.	Relying on one unconfirmed transmission.

PROTECT THE WIDER YACHT

A concise position, nature of problem, assistance required and number of people is more useful than a long message on a weak link.

TESTING AND DEMONSTRATION

Testing radios, antennas, data and external services

Meaningful testing proves two-way communication, correct identity and position, usable audio, antenna condition, backup power and current commercial service.

INSPECT
Antennas, cables and power

SELF TEST
Approved radio or terminal checks

TWO-WAY CALL
Known station or service

BACKUP TEST
Portable and emergency power

Area	Why it matters	Owner focus
VHF radio check	Confirms transmit, receive and audio through the installed antenna.	Use approved local procedures and avoid distress channels.
DSC test call	Confirms identity, position and digital calling.	Use authorised test destination or procedure.
HF or SSB tune and contact	Confirms tuner, antenna, power and operator use.	Choose appropriate frequency and shore station or net.
Satellite voice or message test	Confirms registration, account and end-to-end delivery.	Test the emergency contact workflow as permitted.
Emergency-power test	Shows selected communications remain after normal supply loss.	Record runtime and charger condition.

MEANINGFUL EVIDENCE

A successful call proves far more than a green status lamp because it exercises power, antenna, network, addressing and operator procedure.

MAINTENANCE STRATEGY

Keeping radios, antennas and accounts ready

Maintenance should preserve dry connectors, low-loss antenna paths, clean power, current identity data, charged portable batteries and active subscriptions.



Area	Why it matters	Owner focus
Fixed radios and handsets	Clean controls, audio, cooling, connectors and software.	Maintains reliable operation and intelligibility.
Antennas and coax	Secure mounts, no cracks, corrosion or water ingress.	Preserves range and transmitter protection.
HF tuner and ground	Dry enclosure, sound bonding and correct antenna path.	Supports tuning and reduces RF faults.
Portable batteries	Capacity, charging, seals and spare packs.	Protects liferaft and blackout capability.
Satellite account and firmware	Active plan, contacts, SIM, software and test history.	Avoids administrative failure offshore.

WORK TO REFER

RF, mast, tuner, lightning-protection and high-current radio work should be completed by competent marine communications specialists.

RECORDS, SPARES AND SUPPORTABILITY

Keeping identities, contacts and backup procedures available

Critical information should exist outside the online system: vessel call sign, MMSI, satellite numbers, account details, emergency contacts, frequencies and test procedures.



Area	Why it matters	Owner focus
Communications plan	Primary and backup method by range and scenario.	Supports fast path selection.
Identity records	MMSI, call sign, licence and terminal identifiers.	Prevents wrong or unregistered distress data.
Contact sheet	Rescue, coast, medical, insurer and shore team numbers.	Works when internet or address book is unavailable.
System diagram	Radios, antennas, splitters, power and GNSS inputs.	Reveals common points and aids repair.
Selected spares	Handset, coax adapters, fuses, antenna lead and batteries as practical.	Supports simple recovery.

SUPPORTABILITY

Print essential numbers and procedures. A contact list stored only in the failed satellite terminal or cloud account is not a backup.

BUYER AND SURVEY PERSPECTIVE

Assessing real range and independence

A buyer should test every fixed and portable path, inspect antennas and verify account, licence, identity and emergency-power arrangements.



Area	Why it matters	Owner focus
VHF installation	Antenna height, coax, splitter and radio output.	Perform a known-station call.
HF or SSB system	Tuner, ground, antenna and operator capability.	Test a real contact and supportability.
Satellite service	Coverage, hardware, subscription and number portability.	Verify ownership transfer and live account.
Emergency power	Runtime and charging for fixed and handheld equipment.	Test after normal-power isolation.
Documentation	Licences, MMSI registration, contacts and diagrams.	Ensure information matches the yacht and new owner.

BUYER FOCUS	A shelf full of radios can still represent one fragile system when antennas, power and subscriptions have not been tested end to end.
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OFFSHORE READINESS

Questions before relying on communications offshore

A ready communications suite provides local, long-range and emergency paths with sound antennas, current accounts, independent power and practised operators.

Area	Question to resolve
Local contact	Which fixed and portable VHF paths remain after mast or bridge damage?
Long range	What HF or satellite method works outside coastal VHF coverage?
Identity and position	Are MMSI, call sign and GNSS data correct on every relevant device?
Power	How long will selected radios operate after blackout?
Service availability	Are subscriptions, coverage and emergency numbers current?
Crew use	Can more than one person make a safety or distress call on each path?

Quick readiness check

	Readiness statement
☐	Fixed and handheld VHF, HF or SSB and satellite equipment are identified.
☐	Antennas, coax, tuners and power paths have been inspected.
☐	Two-way calls and approved self-tests have been completed.
☐	MMSI, call sign, position input and satellite account details are correct.
☐	Portable batteries and emergency power have demonstrated capacity.
☐	At least two communication paths do not share every key dependency.
☐	Printed contacts, call formats and backup procedures are available.
☐	Selected spares and specialist support details are onboard.

KEY TAKEAWAY

Dependable offshore communications combine diverse radio and satellite paths, sound antenna installations, current services, independent power and crew practice.

Guidance to consult

Use current vessel communications, antenna, navigation-data and electrical drawings and the installed VHF, DSC, HF or SSB and satellite manufacturers' instructions, together with applicable radio licensing and operator requirements.

Understanding Yacht Systems

Practical guides for owners, buyers
and offshore cruising crews.

AMTG-044

Understanding VHF, SSB and Satellite Communications

RELATED GUIDES

AMTG-040 Understanding Marine Navigation Systems

AMTG-042 Understanding AIS

AMTG-045 Understanding Emergency Communications Equipment

AMTG-034 Understanding Emergency Power Systems

AMTG-026 Understanding Monitoring and Alarm Systems

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