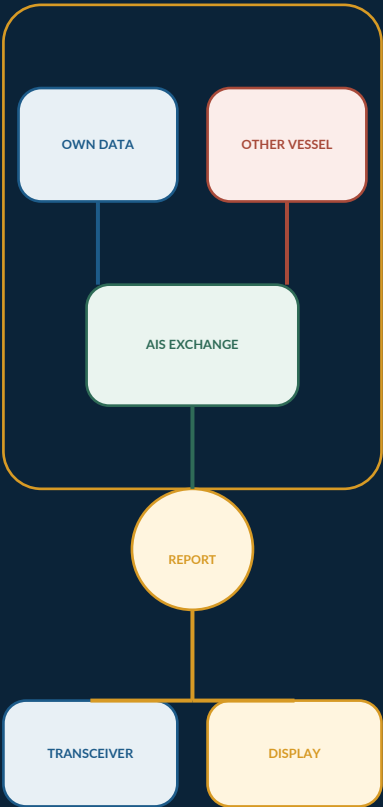


Understanding AIS

An owner's guide to transmitted vessel data,
target information, antennas and system limitations



IDENTIFY | TRANSMIT | CROSS-CHECK

AIS exchanges reported information; it does not detect every vessel. Its accuracy depends on antennas, GNSS, programmed data and what another vessel chooses or is required to transmit. Collision avoidance still depends on lookout and judgement.

GUIDE OVERVIEW

What understanding ais are designed to do

AIS uses VHF radio channels to exchange vessel identity, position, course, speed and other reported information between equipped vessels and shore stations.

SCOPE	This guide covers common Class A and Class B AIS installations, including transceivers, GNSS inputs, VHF antennas, splitters, static and voyage data, displays, networks, alarms and silent modes. It does not replace collision-avoidance training or a proper lookout.
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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	AIS should be treated as supporting information and continuously cross-checked with radar, visual lookout and other navigation evidence.
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Safety

AIS equipment transmits on marine VHF frequencies and may share antennas through an active splitter. Avoid transmitting into disconnected or damaged antenna systems, and do not alter identity data, silent mode or distress-related settings without understanding legal and operational consequences.

SYSTEM ARCHITECTURE

How own-ship data becomes an AIS report

The transceiver combines programmed identity with live GNSS and navigation data, schedules a VHF transmission and receives reports from other stations for display.



Area	Why it matters	Owner focus
Static vessel data	Identifies the yacht and describes type and dimensions.	Verify MMSI, name, call sign, ship type and antenna-reference dimensions.
Dynamic navigation data	Provides position, course, speed and sometimes heading or rate of turn.	Know source identity, validity and what happens after sensor loss.
AIS transceiver	Creates and receives digital reports on allocated VHF channels.	Confirm class, transmit status, alarms, software and internal GNSS.
VHF antenna system	Radiates own reports and receives other stations.	Inspect antenna, coax, connectors, splitter and mounting height.
Display and network	Shows targets on a dedicated screen or navigation display.	Understand filters, symbols, target age, alarms and network dependencies.

CORE PRINCIPLE	AIS information is self-reported by equipment on another station. A target can be absent, delayed, wrongly programmed or based on faulty sensors.
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MAIN COMPONENTS

What owners should be able to identify

The installation should be traceable from AIS transceiver and GNSS antenna to VHF antenna or splitter, heading input, display, network, breaker and any independent receiver.



Area	Why it matters	Owner focus
AIS transceiver	Transmits own data and receives reports from other stations.	Class, approvals, alarms, software, ventilation and transmit status.
GNSS antenna or input	Provides position and accurate timing for transmissions.	Antenna view, cable, internal versus external source and validity alarms.
VHF antenna and coax	Determines radio range and signal quality.	Height, connector corrosion, cable loss, water ingress and separation.
Antenna splitter	Allows AIS and voice VHF to share one antenna when correctly designed.	Active power, fail-safe path, status lights and effect on both radios.
Display or chart integration	Presents identity, vectors, CPA/TCPA and messages.	Filters, scale, target age, alarm settings and source selection.

ACCESS AND LABELLING	A failed or unpowered splitter can affect both AIS and voice VHF. Shared antennas should be treated as a common dependency.
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SYSTEM ARRANGEMENTS

Class A, Class B, receive-only and satellite reception

AIS classes differ in reporting rate, transmit power, channel access and required data. The practical result is different visibility and update performance in busy or fast-moving situations.

CLASS A
Higher priority and more frequent reporting

CLASS B
Lower power and different reporting behaviour

RECEIVE ONLY
Displays others but does not transmit own yacht

SATELLITE AIS
Shore service receives some reports from space

Area	Why it matters	Owner focus
Class A transceiver	Typically transmits more data, at higher power and with faster reporting under way.	Correct voyage data, pilot-plug or sensor inputs and service requirements.
Class B transceiver	Common on private yachts with lower power and class-dependent access methods.	Understand expected range, reporting interval and crowded-channel behaviour.
Receive-only AIS	Shows other transmitting stations but provides no own-ship report.	Do not assume nearby vessels can see the yacht electronically.
Dedicated versus shared antenna	Dedicated antenna avoids splitter dependency; shared installation reduces mast hardware.	Evaluate cable loss, height, splitter condition and voice-radio interaction.
Satellite AIS reception	Can support shore monitoring beyond local VHF range.	It is not a guaranteed onboard distress or collision-avoidance path.

PRACTICAL DISTINCTION	Class A and Class B labels do not make AIS a detection system. Vessels without working transmitters, small craft and many hazards remain invisible.
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OPERATION AND CONTROL

Managing static data, voyage data, filters and silent mode

Normal operation is largely automatic, but owners should verify transmitted data, understand display filtering and know the consequences of disabling transmission.

VERIFY OWN DATA
Identity, dimensions,
position and movement

CONFIRM TRANSMIT
No silent mode or
unresolved alarm

SET DISPLAY
Useful target filters,
CPA and TCPA alarms

CROSS-CHECK
Radar, visual lookout
and VHF communication

Area	Why it matters	Owner focus
Static data entry	MMSI and identity should match registration and radio licensing.	Changes may require authorised programming rather than menu entry.
Dimensions and reference point	Describe bow, stern, port and starboard distance from the GNSS antenna.	Incorrect values distort displayed vessel position and closest approach.
Voyage data	Destination, draught, navigation status and ETA may be entered where applicable.	Keep relevant fields current and avoid misleading default information.
Target filters and alarms	Control display workload and highlight selected CPA/TCPA conditions.	Hidden or sleeping targets may still matter; review filters in dense traffic.
Silent or transmit-off mode	Stops own AIS transmission while reception may continue.	Use only when lawful and operationally justified; make status unmistakable.

OPERATOR FOCUS	The owner should periodically confirm what another receiver actually sees, not rely only on the local display showing correct own-ship data.
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DEPENDENCIES AND RESILIENCE

What can remove apparently independent capability

AIS can appear healthy while sharing one GNSS antenna, VHF splitter, navigation network, heading source, power converter or display with other critical equipment.

SHARED GNSS

One position or time fault affects several systems

SHARED VHF

One antenna or splitter affects AIS and voice

SHARED NETWORK

One gateway removes targets from every display

SHARED POWER

One DC bus or converter stops transmission

Area	Why it matters	Owner focus
GNSS and time	AIS transmission scheduling and position depend on a valid solution.	Know internal backup receiver and antenna arrangement.
VHF antenna or splitter	Poor RF path reduces both transmit and receive range.	Inspect dedicated or shared antenna and verify voice-radio interaction.
Heading and other sensor data	Some displays and target calculations use external heading or rate data.	Treat invalid inputs as faults and avoid false precision.
Navigation network	Targets may reach all displays through one gateway or switch.	Retain local AIS status or dedicated display where practical.
Electrical supply	Transceiver, splitter, display and GNSS may share one breaker or converter.	Trace essential power, fuse and low-voltage behaviour.

COMMON-MODE RISK

A target list on the chartplotter does not prove the transceiver is transmitting. Reception, transmission and display are separate functions.

MONITORING AND NORMAL VALUES

Confirming transmission, reception and data quality

Useful evidence includes own-ship transmit status, GNSS validity, antenna diagnostics, received-target range, message age and comparison with another receiver or shore station.

OWN STATUS
Transmit, MMSI, GNSS
and alarm state

RF PATH
Antenna, splitter,
VSWR and range

TARGET QUALITY
Age, position, course,
speed and class

DISPLAY LOGIC
Filters, alarm limits
and network delivery

Area	Why it matters	Owner focus
Own target not seen by another receiver	Silent mode, antenna, splitter, transmitter, GNSS or programming fault.	Confirm status and test with known nearby receiver.
Reception range is unusually short	Low antenna height, cable loss, corrosion, splitter or receiver problem.	Compare with voice VHF and known stations.
Targets freeze or age increases	Network, display, radio congestion or remote target problem.	Use radar and visual trend rather than stale AIS vectors.
Own position or course is wrong	GNSS source, antenna offset, heading or network configuration issue.	Correct the source before continued transmission.
Frequent antenna or transmit alarm	High VSWR, disconnected coax, water ingress or splitter fault.	Avoid repeated transmission into a damaged RF path.
TREND, DO NOT GUESS	AIS performance is best checked by reciprocal observation: confirm both that the yacht receives expected stations and that a separate receiver sees the yacht correctly.	

FAILURE AWARENESS

Common weaknesses and warning signs

AIS faults often begin with short reception range, intermittent antenna alarms, stale targets, wrong identity data, GNSS loss or a chart display that silently filters relevant vessels.

NO TRANSMIT
Silent mode, RF, power or transceiver fault

NO RECEIVE
Antenna, splitter, receiver or display fault

WRONG DATA
Programming, GNSS or sensor problem

MISINTERPRETATION
Filtering, stale target or CPA/TCPA error

Area	Why it matters	Owner focus
AIS is receiving but not transmitting	Silent mode, transmitter fault, antenna issue, invalid MMSI or GNSS alarm.	Other vessels may not receive the yacht's report.
No or few targets appear	Antenna, splitter, coax, receiver, display filter or network fault.	Electronic traffic awareness is reduced.
Incorrect static data	Ownership change, programming error or wrong antenna dimensions.	Other vessels receive misleading identity and geometry.
CPA/TCPA is implausible	Stale target, own heading or speed fault, target manoeuvre or display logic.	Collision decisions may be based on false precision.
AIS and voice VHF both degrade	Shared antenna, splitter, coax or power problem.	Routine and safety communication capability may be affected together.

DO NOT NORMALISE CHANGE	An AIS target can vanish because the other vessel stopped transmitting, moved behind terrain, suffered a fault or was filtered from view. Absence is not proof of clear water.
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FAILURE RESPONSE

Continuing safely after AIS degradation or loss

Loss of AIS should increase reliance on radar, visual lookout, sound signals and voice communication rather than trigger hurried attempts to make collision decisions from incomplete data.

CONFIRM FAILURE

Transmit, receive, GNSS,
filter or display issue

INCREASE LOOKOUT

Radar, visual and
sound awareness

USE VOICE

VHF communication when
appropriate and clear

REDUCE RISK

Slow, create sea room
and reassess passage

Area	Why it matters	Owner focus
Own transmission fails	Continue lookout and radar, advise relevant traffic by VHF where necessary and arrange repair.	Assuming others can still see the yacht electronically.
Reception fails	Use radar, visual lookout and voice VHF; inspect safe power and antenna indications.	Treating an empty AIS display as an empty sea.
GNSS or own data is wrong	Disable misleading transmission only according to lawful procedure and restore a valid source.	Broadcasting knowingly incorrect position or identity.
CPA/TCPA is unstable	Use radar plotting, relative bearing and visual assessment.	Making abrupt manoeuvres solely from one fluctuating number.
Splitter fault affects VHF	Select documented bypass or independent handheld/fixed radio and antenna.	Continuing to transmit repeatedly into an unknown antenna fault.
PROTECT THE WIDER YACHT	AIS failure is usually manageable when radar, lookout and communications remain strong. The operating plan should change if those alternatives are also degraded.	

TESTING AND DEMONSTRATION

Testing transmitted data, antenna performance and target display

A meaningful test confirms own reports on an independent receiver, checks static and dynamic values, verifies receive range and demonstrates alarms and display behaviour.

CHECK OWN DATA

MMSI, name, dimensions,
position and movement

INDEPENDENT RECEIVE

Another vessel, portable
receiver or shore service

TARGET TEST

Known nearby stations,
filters and alarms

FAIL / RECOVER

GNSS, splitter, network
and power behaviour

Area	Why it matters	Owner focus
Own-report verification	Shows what another receiver actually sees.	Use a known independent receiver and compare every important field.
Static-data audit	Confirms MMSI, name, call sign, type and dimensions.	Some changes require authorised programming.
Reception-range check	Shows practical antenna and receiver performance.	Compare with known stations and account for antenna height and terrain.
Alarm and filter test	Confirms GNSS, antenna, transmission and CPA/TCPA warnings.	Review target hiding, acknowledgement and alarm reset.
Shared-antenna or power test	Shows splitter fail-safe behaviour and what remains after one supply is lost.	Protect voice communications and avoid unsafe RF disconnection.

MEANINGFUL EVIDENCE

Seeing the yacht's name on its own chartplotter is not a transmission test. Use a separate receiving system.

MAINTENANCE STRATEGY

Keeping the transceiver, antenna and programmed data dependable

Maintenance should preserve clean DC power, a sound RF path, valid GNSS, current identity data, secure networks and software that remains supported.

TRANSCEIVER

Cooling, alarms,
software and connectors

ANTENNA

Mounting, coax,
connectors and splitter

DATA SOURCES

GNSS, heading and
network validity

PROGRAMMING

MMSI, dimensions,
licensing and records

Area	Why it matters	Owner focus
Transceiver	Dry and ventilated mounting, secure connectors, current software and no unresolved alarms.	Maintains reliable transmit and receive operation.
VHF antenna and coax	Secure masthead, clean connectors, low-loss cable and no water ingress.	Protects range and transmitter output stage.
Active splitter	Correct power, fail-safe path, status and approved compatibility.	Prevents one fault degrading AIS and voice VHF.
GNSS and sensor inputs	Valid position, time, heading and source priority.	Prevents incorrect or missing dynamic reports.
Static and voyage data	Registration, ownership, dimensions and operational status reviewed.	Avoids transmitting misleading identity or geometry.
WORK TO REFER	MMSI programming, RF power and antenna testing, splitter diagnosis and internal transceiver repair should be completed by authorised or competent marine radio specialists.	

RECORDS, SPARES AND SUPPORTABILITY

Preserving identity, licensing, configuration and supportability

Useful records show the programmed identity, antenna geometry, radio licence, system diagram, software version, test history and who can legally reprogram or service the unit.

IDENTITY

MMSI, name, call sign, type and dimensions

SYSTEM DRAWING

Power, GNSS, VHF, splitter and network

TEST RECORD

Independent reports, range and alarms

SUPPORT

Authorised dealer, software and parts

Area	Why it matters	Owner focus
Programmed-data record	MMSI, call sign, vessel name, ship type and antenna offsets.	Supports audit after ownership or equipment change.
Radio licence and registration	Links identity and equipment to the lawful operator.	Avoids mismatched or duplicated identifiers.
System diagram	Shows transceiver, antennas, splitter, GNSS, network and power.	Makes common dependencies visible.
Independent test results	Records transmitted fields, reception range, alarms and target age.	Provides evidence when performance changes.
Software and supplier details	Firmware, configuration backup and authorised service contact.	Protects supportability and lawful reprogramming.

SUPPORTABILITY

When buying a yacht, confirm that MMSI and radio licensing can be transferred or changed correctly before assuming the existing programming can remain.

BUYER AND SURVEY PERSPECTIVE

Assessing identity accuracy, antenna quality and real transmission

A buyer should verify the transmitted report independently, inspect the RF installation and understand whether AIS shares antennas, power or displays with voice communications and navigation systems.

IDENTITY

MMSI, name, type and dimensions

RF INSTALLATION

Antenna, coax, splitter and mounting height

DATA / DISPLAY

GNSS, targets, filters and network

COMPLIANCE

Class, licence, service and change procedure

Area	Why it matters	Owner focus
Programmed identity	Does an independent receiver show correct MMSI, name, call sign, type and dimensions?	Resolve ownership and registration changes before use.
Class and performance	Is Class A, Class B or receive-only suitable for intended cruising?	Understand update rate, power and operating limitations.
Antenna installation	Is the antenna dedicated or shared, high enough and free from water-damaged coax?	Inspect splitter and voice-VHF interaction.
Data integration	Are GNSS, heading, target display and alarms valid without hidden filters?	Test after network or display source changes.
Supportability and licensing	Can the unit be reprogrammed, serviced and legally operated in the new ownership?	Include replacement and mast work if support is limited.

BUYER FOCUS

A list of targets on the chartplotter does not demonstrate correct own-ship transmission, identity or antenna performance.

OFFSHORE READINESS

Questions before relying on AIS offshore

A ready AIS installation transmits accurate own-ship information, receives expected stations, survives reasonable single failures and is used as supporting information rather than a substitute for lookout or radar.

Area	Question to resolve
Own transmission	Has a separate receiver confirmed the yacht's current identity, position, course and speed?
Antenna path	Is AIS using a dedicated antenna or an approved splitter, and what else fails with it?
Class and limitations	Do watchkeepers understand the installed AIS class and expected reporting behaviour?
Display and filters	Which targets can be hidden, slept or removed by current settings?
Power and GNSS	What happens after low voltage, GNSS loss or network failure?
Collision avoidance	How will radar, visual lookout and VHF replace AIS if it becomes unavailable?

Quick readiness check

	Readiness statement
☐	Transceiver, GNSS, antenna, splitter, display, network and breakers are identified.
☐	MMSI, name, call sign, vessel type and antenna dimensions are correct.
☐	An independent receiver has verified actual own-ship transmission.
☐	Reception range and target age are reasonable for the installation.
☐	There are no unresolved antenna, GNSS, transmit, network or stale-target alarms.
☐	Target filters, CPA/TCPA settings, silent mode and class limitations are understood.
☐	Radar, visual lookout and voice communication remain the primary alternatives.
☐	Licensing, diagrams, test records and specialist contacts are available.

KEY TAKEAWAY

Dependable AIS operation combines correct programmed identity, valid navigation data, a sound VHF antenna path, clear transmission status and watchkeepers who understand that AIS reports rather than detects.

Guidance to consult

Use the current vessel radio, navigation, mast, electrical and network drawings and the installed AIS, GNSS, antenna and splitter manufacturers' instructions, together with applicable radio licensing, carriage requirements, collision regulations and operator guidance.

Understanding Yacht Systems

Practical guides for owners, buyers
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