
MARINE ELECTRICAL INSPECTION REPORT

Cockpit Instrument Power — Investigation & Findings

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Prepared By	Jeremyn Horsley - Sure Shot Marine (510) 930-1239 www.sureshotmarine.com
Scope	Targeted investigation of intermittent power loss to cockpit sailing instruments. Battery voltages measured. Safety systems, shore power, and battery load/capacity testing were NOT within scope of this inspection.

1. Executive Summary

A targeted visual inspection of the ██████████ cockpit instrument system was conducted to identify the root cause of intermittent instrument power loss. The investigation was limited to the instrument network, associated power distribution, and direct power connections. Safety systems, shore power, and battery load/capacity testing were not evaluated.

The root cause of the intermittent power issue was identified: a bent DC positive (Pin 1) in the SeaTalk connector on the starboard cockpit ST70 display. Evidence of heat damage was found at the Pin 1 spur cable connector, indicating a prior high-resistance or overcurrent event at that pin. Additional issues were found including corrosion inside the connector (origin unknown, as the connector should be watertight), a failed crimped butt connector on the house battery VHF power feed, and a second ST70 (port side) that requires further investigation due to moisture behind the screen and a failure to power on.

2. Scope & Limitations

This inspection was limited to the following:

- Visual inspection of cockpit sailing instruments (port and starboard sides)
- Tracing of SeaTalk instrument network connections to the Autohelm junction box
- Inspection of instrument power feeds and associated wiring at the battery and distribution level
- Battery voltage measurements only (no load or capacity testing performed)

The following were NOT within scope:

- Safety equipment inspection (flares, EPIRBs, fire extinguishers, etc.)
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- ██████████

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- Shore power / AC system
 - Battery load testing or capacity assessment
 - Full vessel wiring audit
 - Interior of the Autohelm junction box (not opened)
 - Full function/purpose of the Raymarine white module in the forward berth

3. System Inventory (Inspected Items)

3.1 Starboard Cockpit Instruments

- TOP — Raymarine ST60+ Wind Display: powered on successfully when SeaTalk spur cable was temporarily relocated from the ST70. Speed data not displayed (possible sensor or network issue to investigate further).
- BOTTOM — Raymarine ST70 Multi-Function Display: broken/bent Pin 1 (DC+) in SeaTalk connector; corrosion present inside connector. This is the confirmed root cause of instrument power loss. Unit requires connector replacement or instrument replacement.

3.2 Port Cockpit Instruments

- TOP — Raymarine ST60+ Wind Display: not fully verified during inspection; the temporary SeaTalk spur cable did not reach the port side for testing. Requires follow-up verification.
- BOTTOM — Raymarine ST70 Multi-Function Display: would not power on during inspection; moisture observed behind the screen. Requires further investigation — possible water ingress or internal failure.

3.3 Port Cockpit Bulkhead Connector

- A panel-mount multi-pin plug connector is located on the port side cockpit bulkhead, below what appears to be a tiller autopilot arm. This is likely an Autohelm tiller pilot connection point. A SeaTalk cable runs from this location to an ST60+ instrument. Functionality not tested.

3.4 SeaTalk Network / Autohelm Junction Box

- Autohelm junction/distribution box: located in the forward berth, mounted on the bulkhead. The SeaTalk network cable from this box connects to the starboard ST60+. The box was not opened; internal configuration and exact function are unknown.
- Raymarine white module: also located in the forward berth, mounted on the bulkhead. Function not determined during this inspection.

3.5 Sensor Network (Forward Berth, Starboard Bulkhead)

- Raymarine depth transducer converter
 - Raymarine speed transducer converter
 - Raymarine wind transducer converter (or similar third converter)
 - All three units mounted on the forward berth starboard bulkhead and interconnected via SeaTalk cabling.
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3.6 em-trak AIS Transponder

- Located on the forward berth starboard bulkhead, just below the sensor network. All three RF connectors (Antenna, VHF Radio, GNSS) show significant green corrosion on the connector bodies.

3.7 VHF Radio

- Located at the nav station / starboard side table in the cabin. During inspection, the VHF was heard cutting in and out when the house battery butt connector was disturbed — confirming that connector as the VHF power feed (see Finding #3).

3.8 Power Distribution

- Blue Sea Systems DC distribution panel — companionway starboard bulkhead; 8-circuit breaker panel with labeled circuits including Sailing Instruments, VHF, and Electronics.
- Legacy distribution block — located in the engine space, normally covered by a black plastic cover. Wiring is heavily corroded and disorganized; this block was not the focus of this inspection but is noted as a concern.
- Guest battery selector switch (1/2/BOTH/OFF) — adjacent to the Blue Sea panel.

3.9 Batteries

- House Battery — West Marine, MCA 705A, RC 90 min; located in the starboard cockpit locker. Labeled HOUSE. Dated November 2025. An inline fuse holder on the positive feed cable was coming loose; electrical tape was applied as a temporary fix. A yellow butt connector on the VHF power feed was found un-crimped (causing intermittent VHF power loss). The butt connector was crimped as a temporary repair to allow the vessel to get underway. The wiring at this connection is corroding and should be replaced.
- Starting Battery — West Marine, MCA 1000A, RC 130 min; located in the starboard cockpit locker. Dated March 2026.

4. Findings

#	Location	Finding	Severity	Recommendation
1	Starboard cockpit — ST70 SeaTalk connector	Bent/broken Pin 1 (DC+) in SeaTalk connector. Melted insulation on the spur cable at Pin 1 indicates prior heat damage from a high-resistance connection at this pin. Corrosion also present inside the connector (origin unknown; connector should be watertight).	CRITICAL	Replace the ST70 and spur cables

2	Port cockpit — ST70	ST70 would not power on. Moisture observed behind the screen, indicating water ingress. Root cause not determined during this inspection.	HIGH	Further investigation required. Attempt to power the unit via a known-good SeaTalk spur. If unresponsive, the instrument likely requires replacement. Source of moisture ingress should be identified and sealed.
3	House battery — VHF power feed butt connector	Yellow butt connector on VHF radio power feed was un-crimped, causing intermittent VHF power loss (confirmed audibly during inspection). Inline fuse holder also loose. Wiring at this connection is corroding. Butt connector was crimped as a temporary field repair.	HIGH	Temporary repair in place. Remove and replace the butt connector with a proper tinned marine-grade crimp splice or terminal block connection. Replace corroding wiring back to its source. Properly secure the inline fuse holder or replace it.
4	em-trak AIS — RF connectors	All three RF connectors (Antenna, VHF Radio, GNSS) show heavy green corrosion on the connector bodies and mating threads.	HIGH	Remove connectors, clean with electrical contact cleaner, and apply corrosion inhibitor. Inspect coax cables for moisture ingress. Replace connectors if pitting is severe.
5	Port cockpit — ST60+	Instrument not verified due to temporary SeaTalk spur cable not reaching the port side during this inspection.	MODERATE	Return visit required with appropriate cable length to verify instrument powers on and reads correctly.
6	Starboard cockpit — ST60+ speed display	ST60+ powered on when connected via temporary spur, but did not display speed data.	MODERATE	Investigate speed transducer network path. Verify the speed transducer converter in the forward berth is correctly connected and functioning. Check SeaTalk data bus for speed data.
7	Engine space — legacy distribution block	Observed during inspection: distribution block wiring is heavily corroded and disorganized. Not the focus of this inspection but presents a reliability and safety concern.	MODERATE	A dedicated audit of the engine space distribution block is recommended as a separate work item.

5. Root Cause Analysis

The root cause of the intermittent cockpit instrument power loss was confirmed to be a bent/broken Pin 1 (DC positive) in the SeaTalk connector on the starboard cockpit ST70 display. Pin 1 carries the 12V supply that powers all instruments on the SeaTalk spur; a compromised pin at this point would cause intermittent or total loss of power to the connected instruments.

Physical evidence of heat damage was found on the SeaTalk spur cable at the Pin 1 connector — the insulation showed signs of melting. This indicates the pin had been creating a high-resistance connection for some time, generating heat under load before ultimately failing. A high-resistance DC positive connection causes exactly the kind of intermittent behavior described by the owner: instruments that flicker, drop out, or fail to start under varying conditions.

The presence of corrosion inside the connector is a secondary finding. The origin of the corrosion is unknown, as the SeaTalk connector is rated as watertight in normal conditions. Possible causes include: a prior improperly seated connector allowing water ingress over time, condensation accumulation, or contamination introduced during a previous service. The corrosion compounds the contact resistance issue but the bent pin is the primary failure mechanism.

6. Recommended Work Scope

6.1 Immediate Priority

- Replace the starboard ST70 and spur cables.
- Inspect the repaired butt connector on the house battery VHF power feed; schedule full replacement of the corroding wiring run at the earliest opportunity. [FINDING #3]

6.2 Short-Term (Schedule Within 30 Days)

- Return visit to verify the port ST60+ with an appropriate-length SeaTalk spur cable. [FINDING #5]
- Investigate port ST70 — attempt to power via known-good spur; assess moisture ingress and determine whether repair or replacement is needed. [FINDING #2]
- Investigate the starboard ST60+ speed data issue — trace the speed transducer path and verify the converter in the forward berth. [FINDING #6]
- Service the em-trak AIS RF connectors. [FINDING #4]

6.3 Long-Term (Schedule Within 90 Days)

- Commission a dedicated audit and rewire of the engine space legacy distribution block. [FINDING #7]
- Investigate the source of moisture ingress into the starboard ST70 SeaTalk connector to prevent recurrence.
- Determine the function of the Raymarine white module and the Autohelm junction box (open and inspect), and document the SeaTalk network topology.

7. Additional Notes

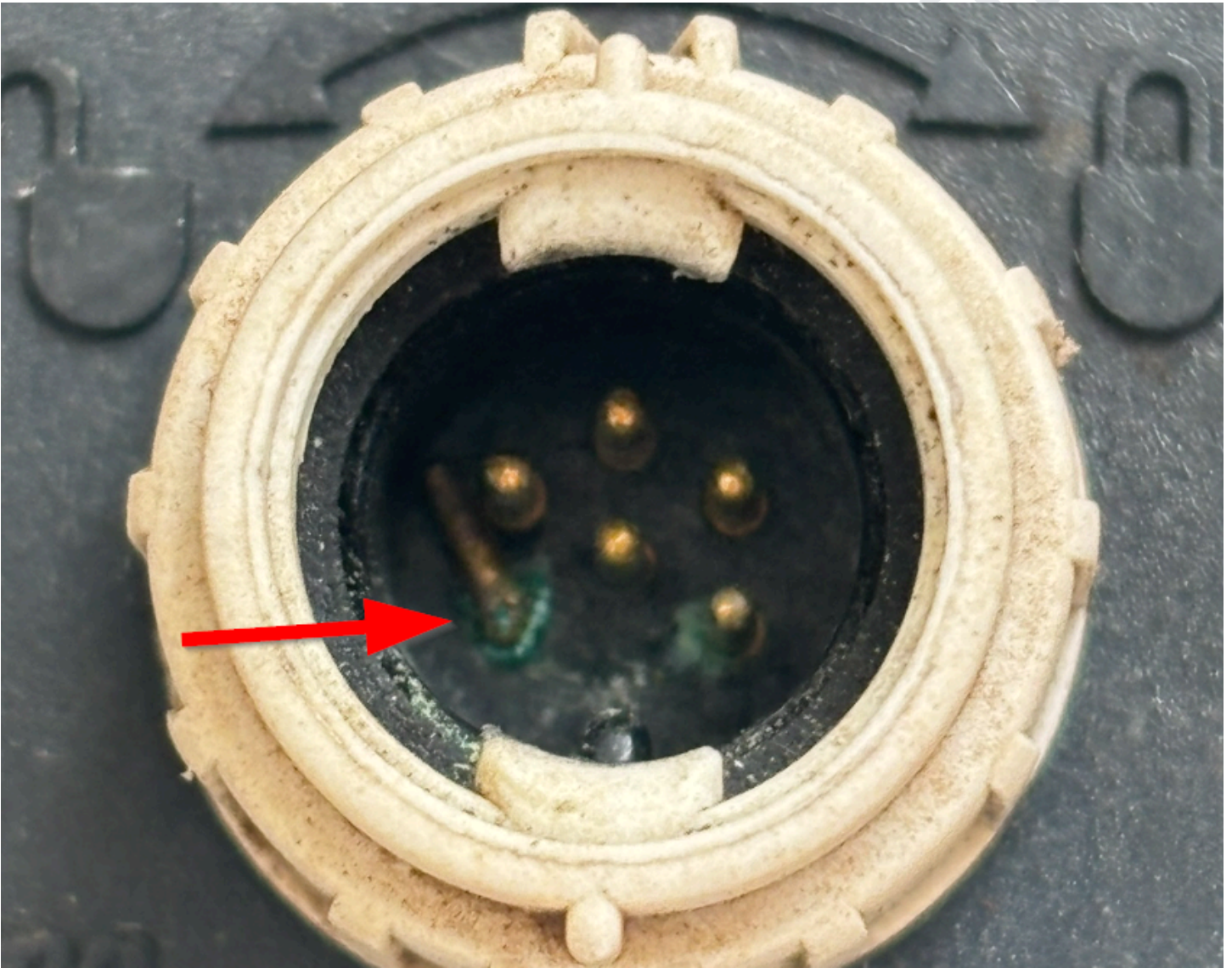
Battery voltages were measured - House: 12.54, Starter 12.67. Both West Marine batteries are relatively recent (house: November 2025; starting: March 2026) and are in appropriate battery boxes with hold-down straps.

The Blue Sea Systems DC distribution panel appeared to be in satisfactory condition with clearly labeled breakers. Its internal wiring was not inspected during this visit.

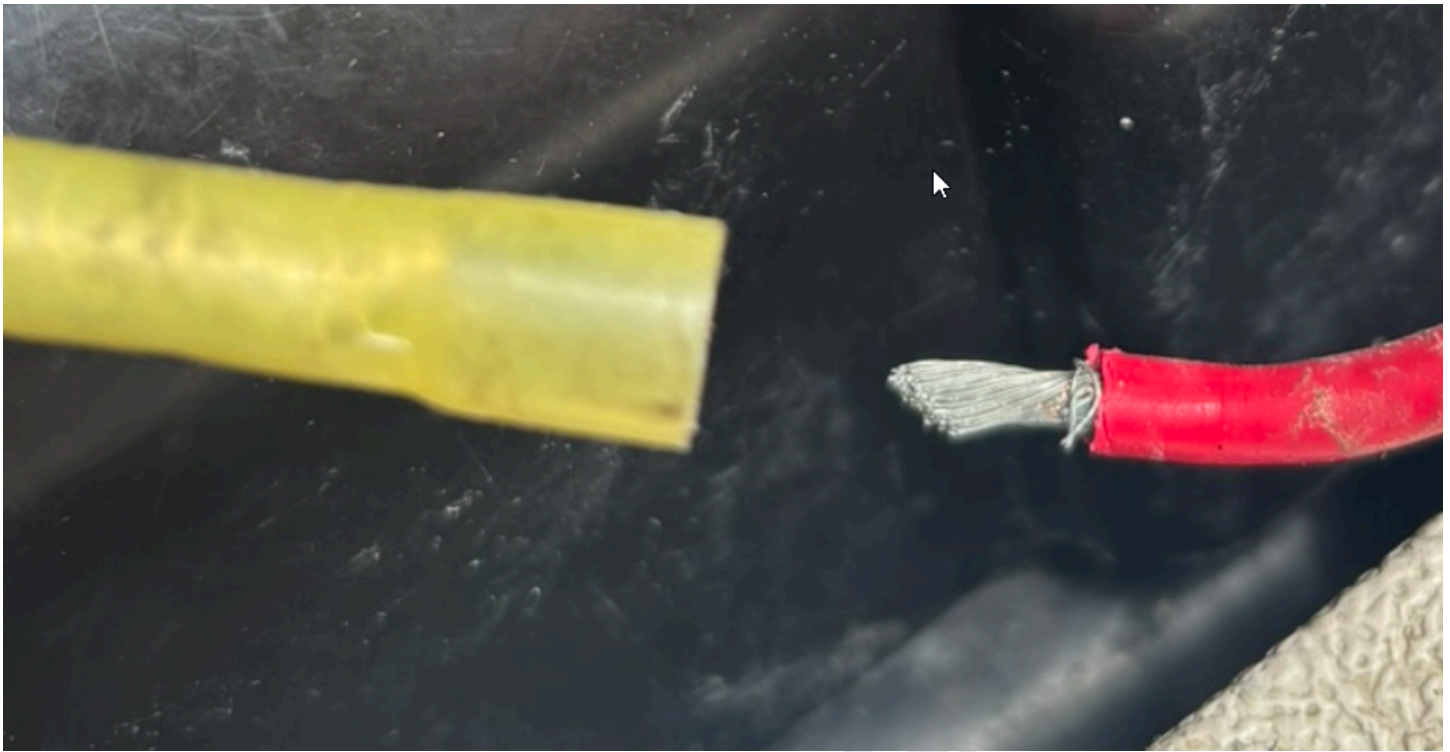
The starboard ST60+ face glass shows a crack or crazing in the lower-left quadrant. While not directly related to the power issue, this allows moisture ingress and should be addressed to prevent further damage to the instrument.

An Autohelm tiller pilot connection point was noted on the port cockpit bulkhead. Its functionality was not tested and is outside the scope of this inspection.

8. Photos



ST70 connection bent pin.



Uncrimped butt connector - corrosion in wire.



AIS connectors corroded.

DISCLAIMER

This report reflects the findings of a targeted visual inspection conducted on the date noted above. It does not constitute a full vessel survey or safety certification. Battery load/capacity testing, safety systems, and shore power were not evaluated. All electrical work should be performed by a qualified marine electrician. The owner is solely responsible for ensuring the vessel is safe before operation.
