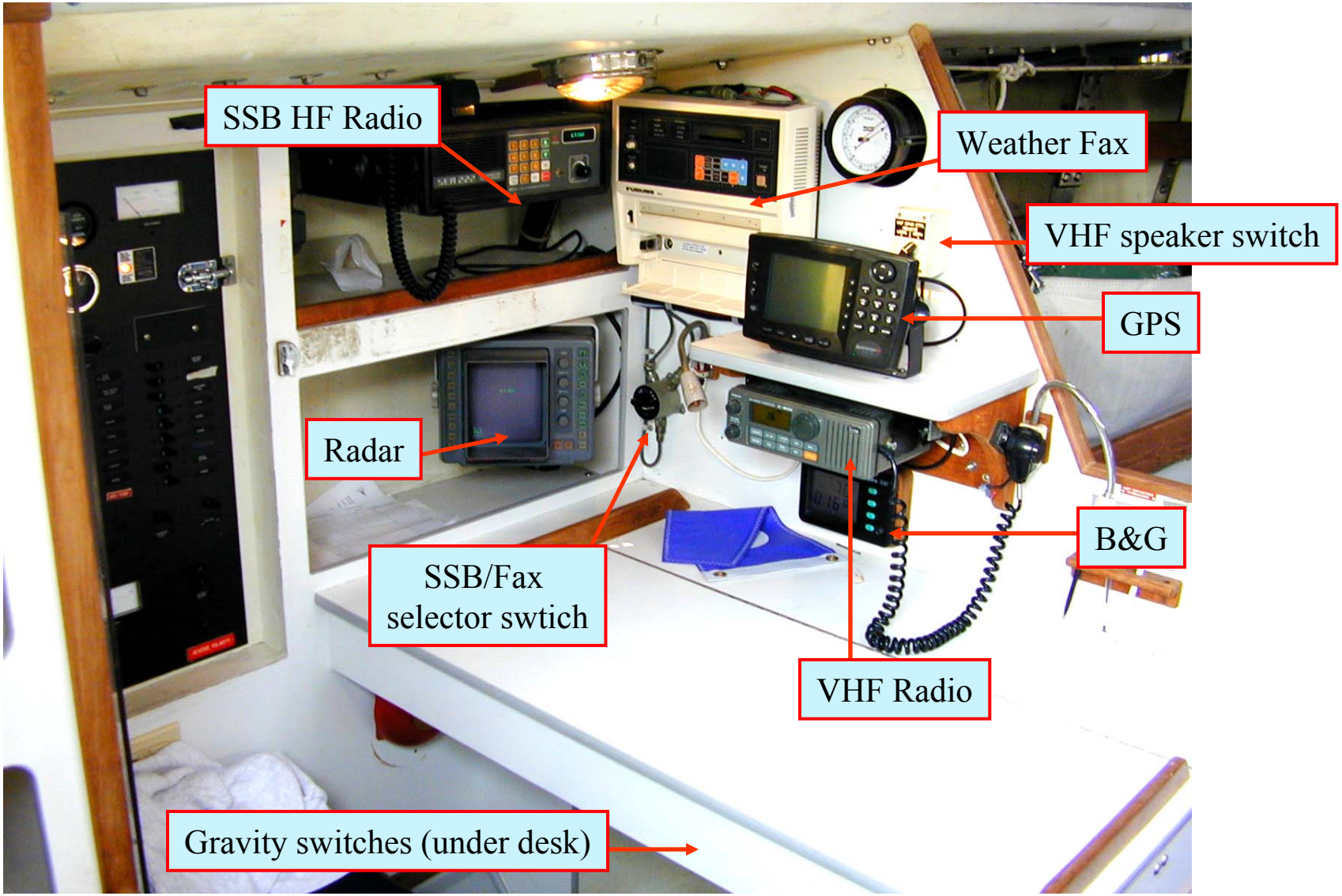
Electronic Equipment

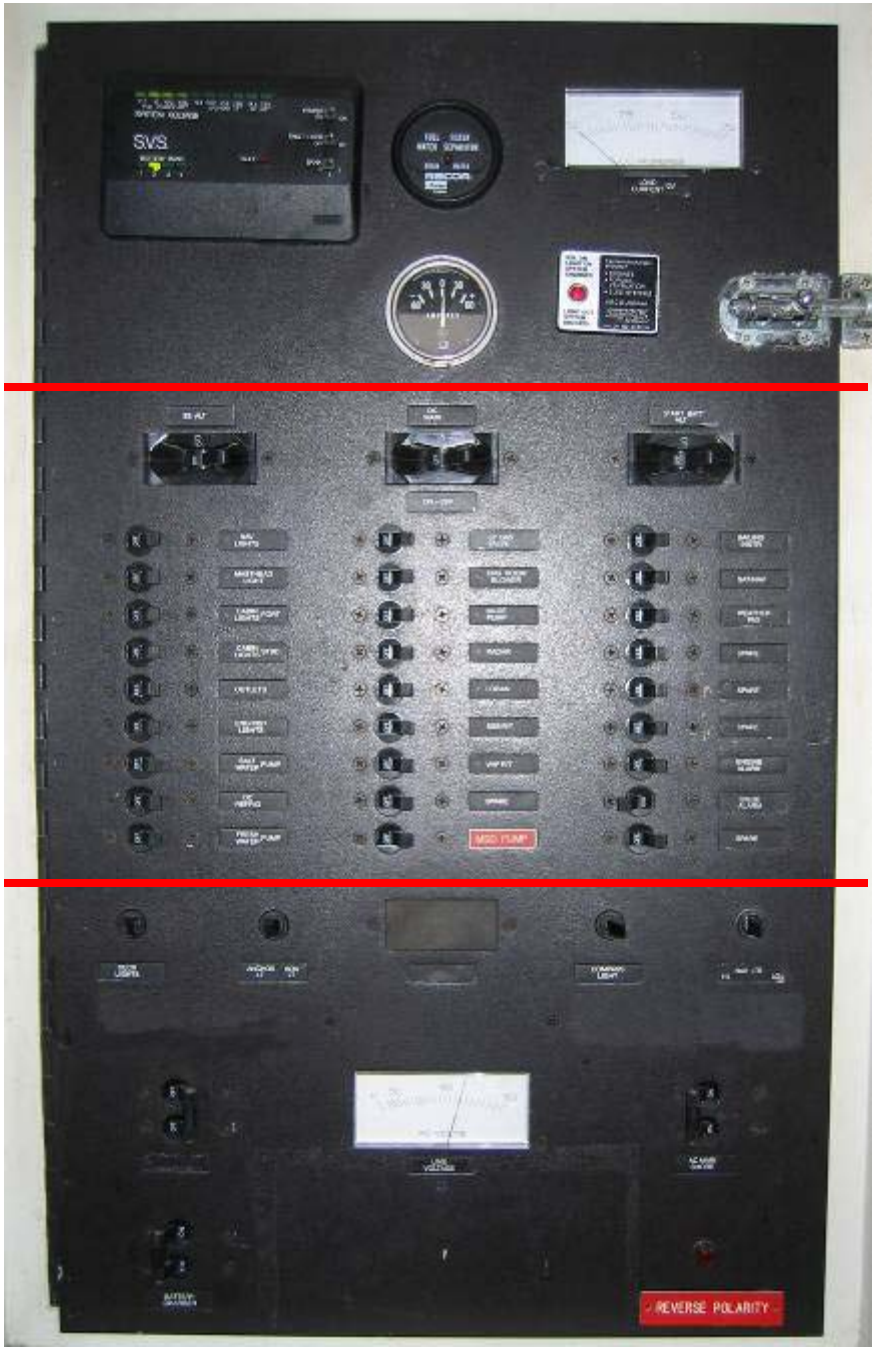
Skipper/XO Training

2005

Nav Station


SSB HF Radio
Weather Fax
VHF speaker switch
GPS
Radar
B&G
SSB/Fax
selector swtich
VHF Radio
Gravity switches (under desk)

Breaker panel



Monitoring section

DC section

AC section

ICOM VHF Radio

ICOM M100 & M120

ICOM VHF

- VHF Radios are used to communicate
  - Line of Sight (LOS) 10-20 Miles
  - Ship to Ship when close to one another
  - Shore stations LOS
    - Some Coast Guard Stations can communicate up to 120 miles.

Prior to turning on radio

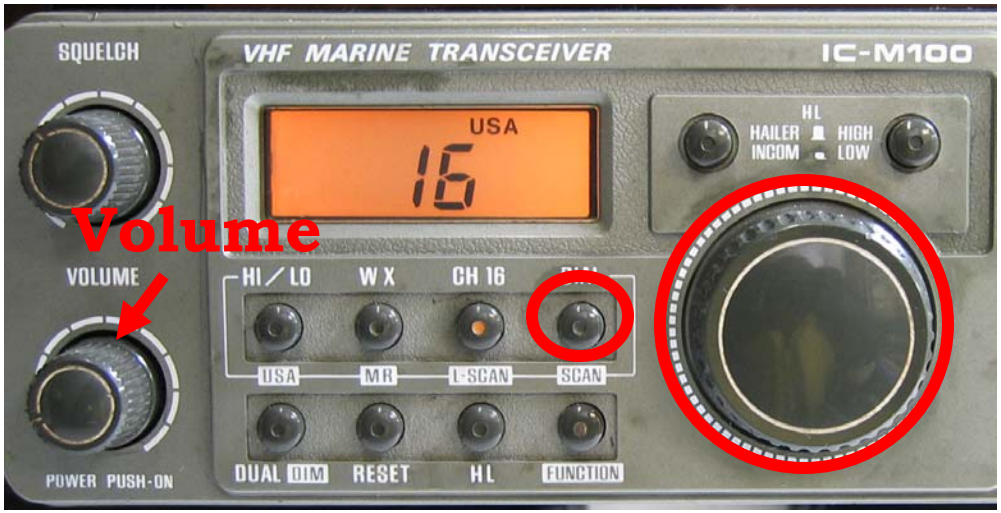
- Verify the **SPEAKER** switch is in the **BOTH** position.
- Set **SQUELCH** at 10 o'clock.
- Set **VOLUME** in mid position

ICOM VHF

- The radio is turned on/off by momentarily depressing pressing the V**olume** **Control**.
- The radio **WILL** turn on on channel 16
  - If the radio does not display 16 in the display check the breaker panel.

ICOM VHF

- To use the radio on **ANY** frequency other than **CHANNEL 16** press the DIAL button
  - The radio will display the channel last used.
  - Use the **Channel Knob** to select the channel you want.
  - If you call Santee Basin Control and do not hear an answer verify the radio is set in the US frequency mode.



ICOM VHF

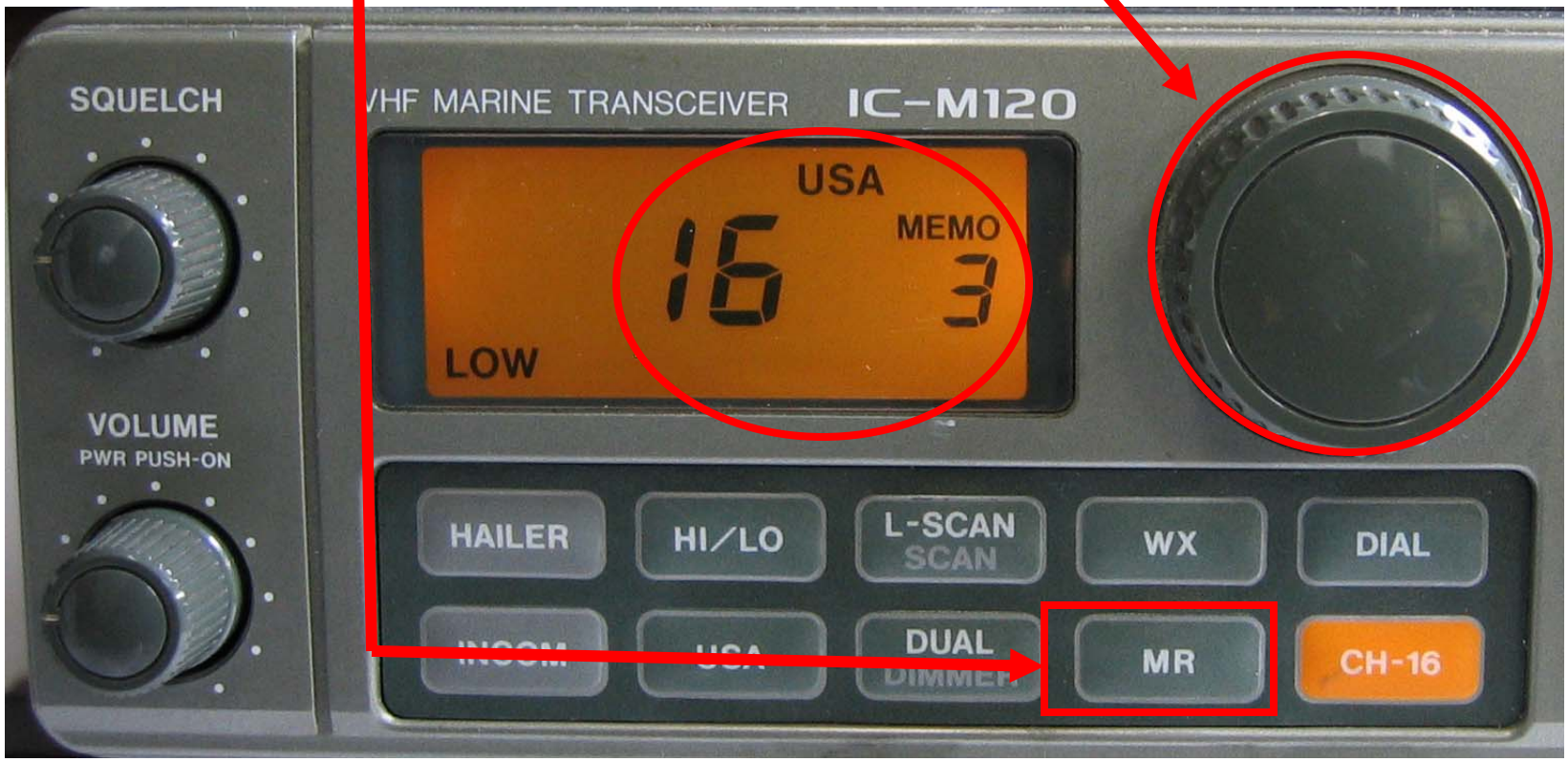
- Since the majority of Navy 44s have Icom 120, this radio will be used for demonstration
- Vessels equipped with Icom M100 consult your manual

Programming ICOM VHF

- Once the radio is properly programmed it should not need reprogramming unless someone has made a change.
- The first three channels should be programmed for:
  - Channel **13**
  - Channel **16**
  - Channel **82A**
- The remaining channels should be empty

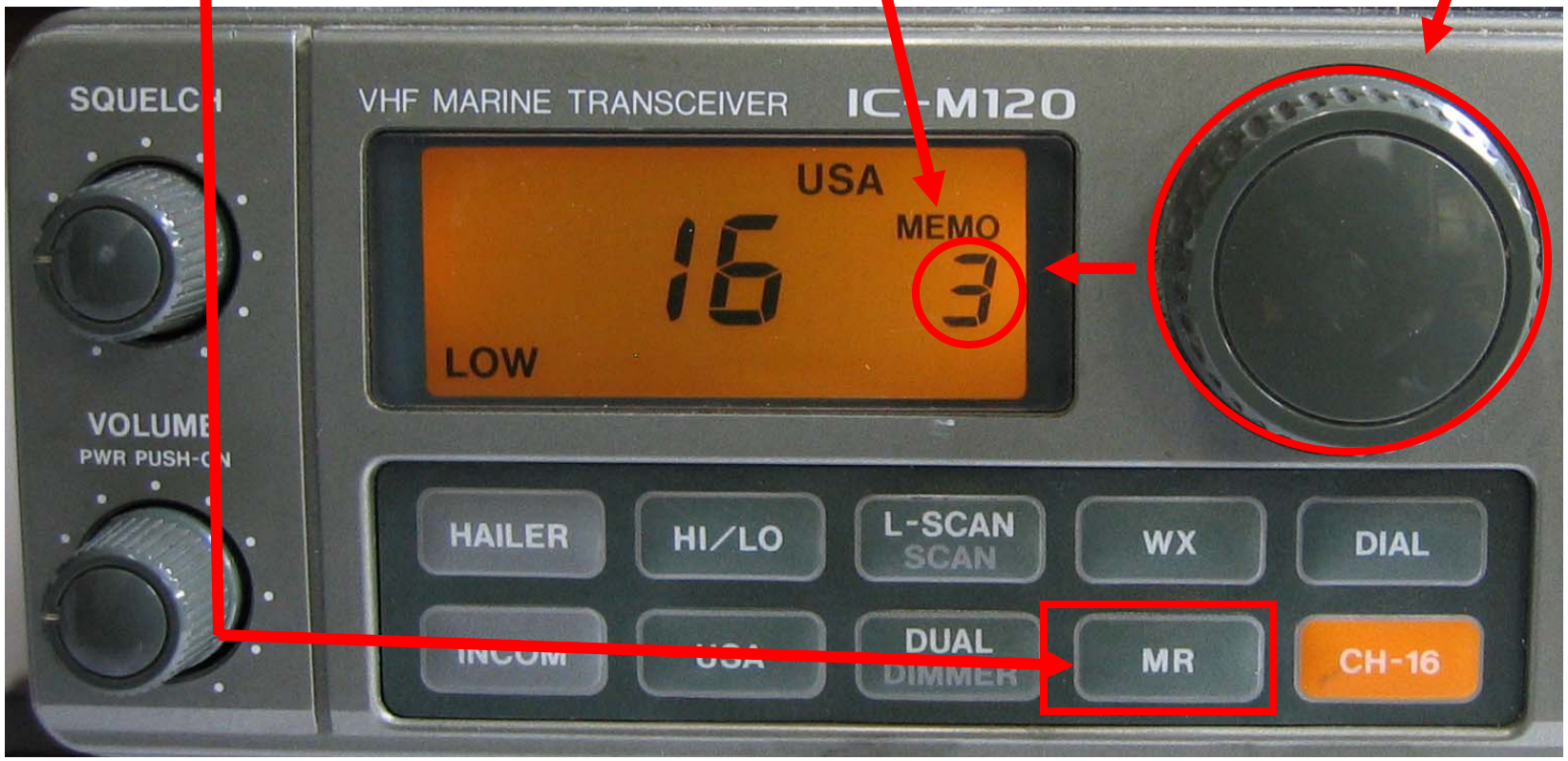
Verifying Memory Channels

- Press MR and turn the **DIAL** to verify the contents of each channel.



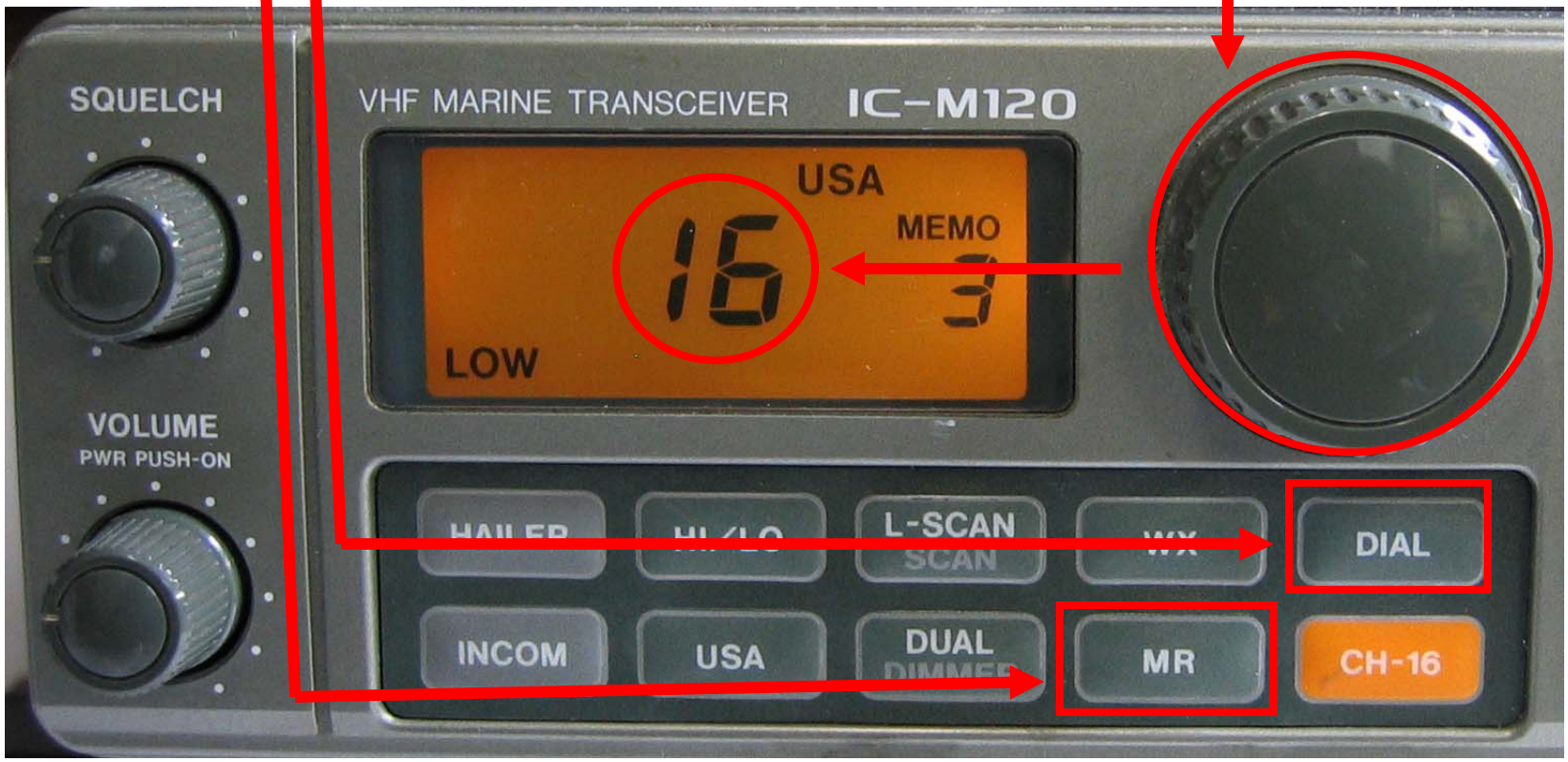
Writing a Memory Channels

- Press MR and hold until ***MEMO*** flashes,turn the **DIAL** to Memory channel you want to program.



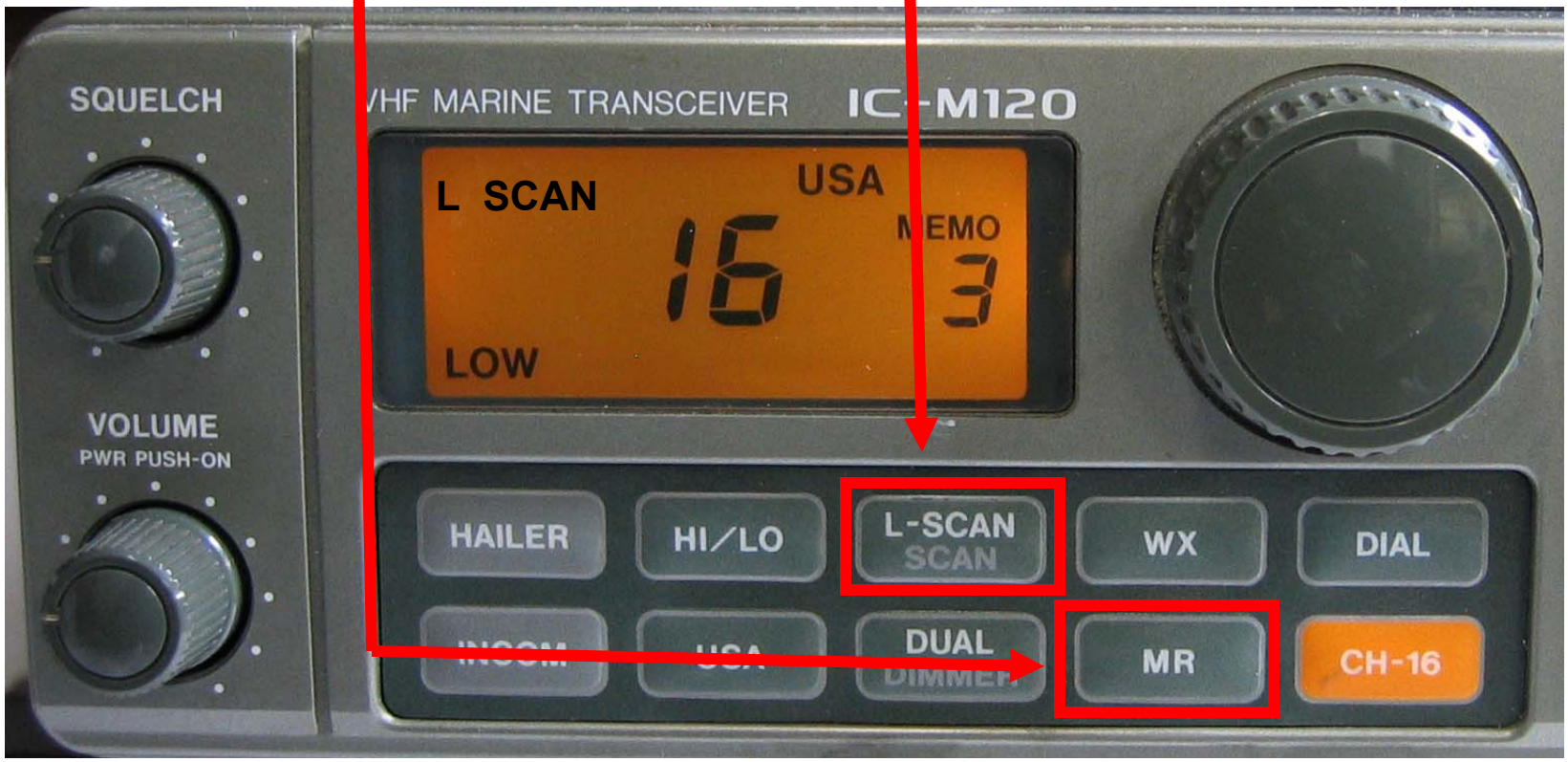
Writing a Memory Channels

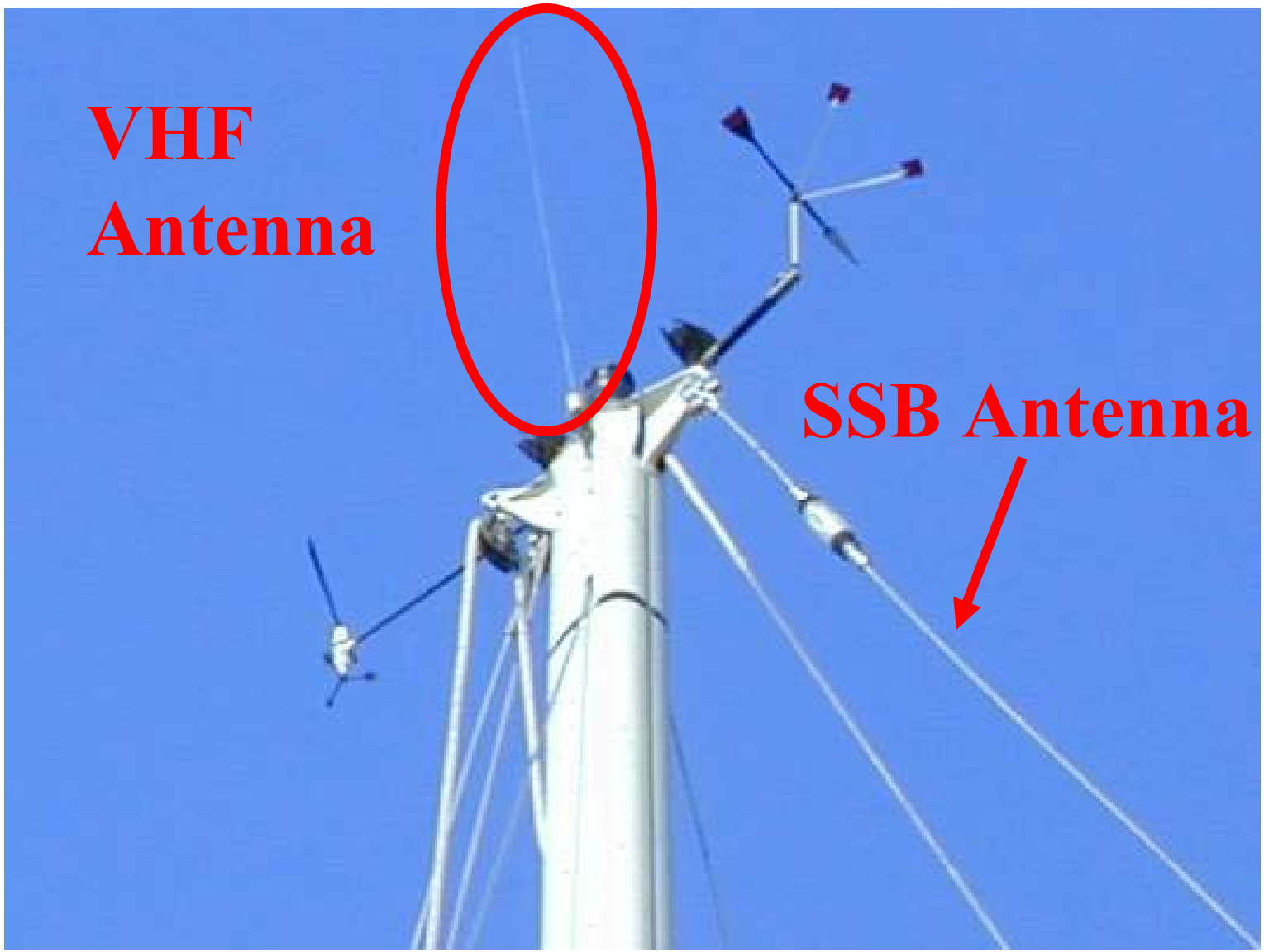
- Press DIAL and select the desired **channel** , push MR to complete programming.



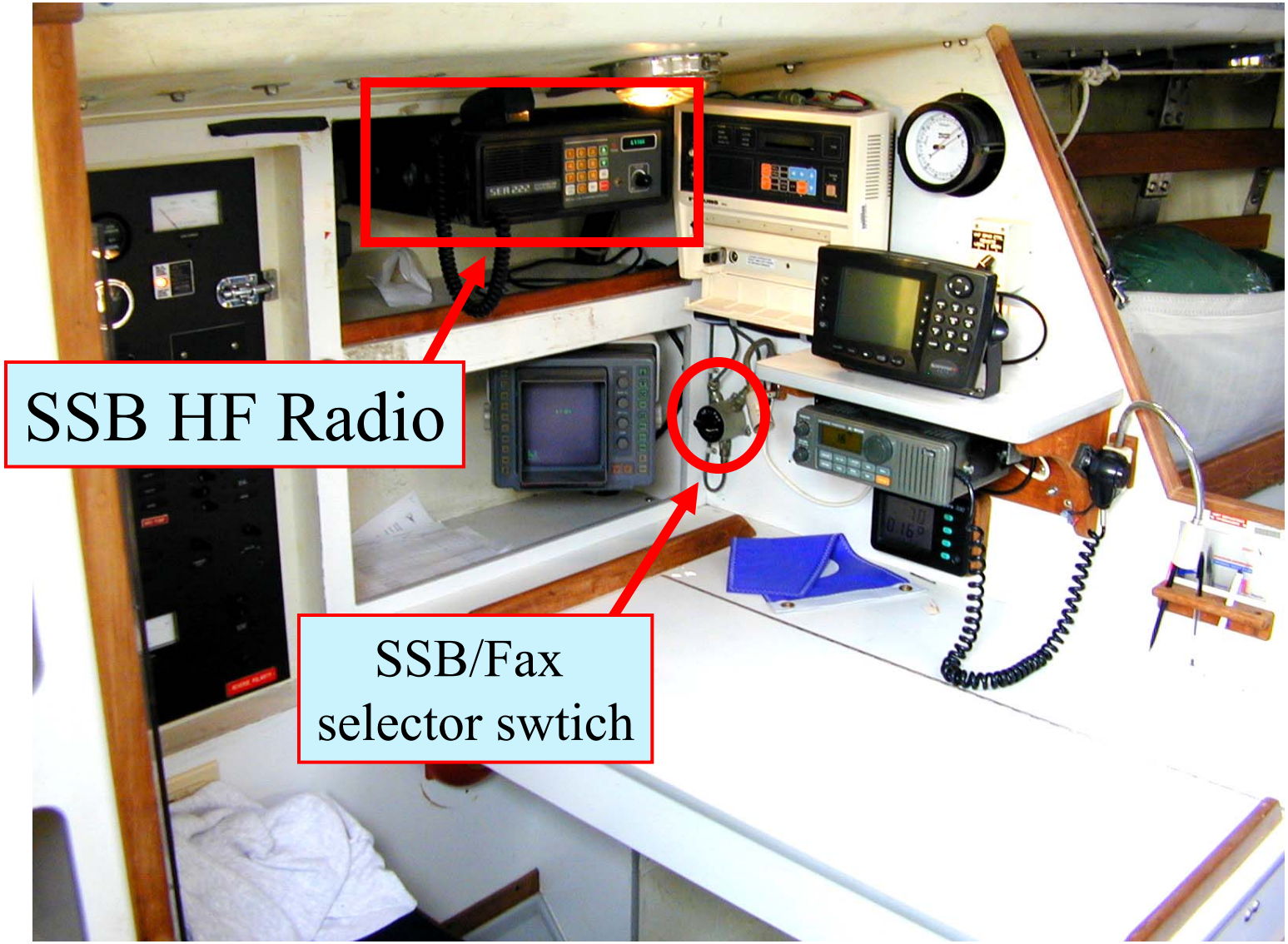
Scanning Memory Channels

- Press MR and press L-SCAN SCAN
- The radio will scan occupied memory channels




VHF
Antenna
SSB Antenna

SEA 222 Single Side Band



HF COMMS

- How do you select a frequency in the radio?
  - Frequencies are stored by pairs (xmt/rcv) in bins (programmed by user) or ITU channels (preprogrammed in ROM at factory).
  - To use radio, you must enter bin or channel number, not the frequency. If you enter a frequency, the radio will be *receive only*.

HF COMMS

- Channel vs. BIN
  - Channels are preset by the factory for transmit/receive frequencies.
    - List of stations/channels/frequencies are found in owner's manual for radio
    - When contacting another station, they may ask you to communicate on a specific frequency – you must know the channel number (from table in Owner's Manual) to be able to communicate on that specific frequency.

HF COMMS

- BINs are “scratch pad” memory locations that allow the user to store specific frequencies.
  - Separate transmit and receive frequencies are stored for each BIN number (10-99)
  - Once programmed the user simply has to enter the two digit bin number to use the frequency.
  - Programmed bin numbers should be posted next to the radio

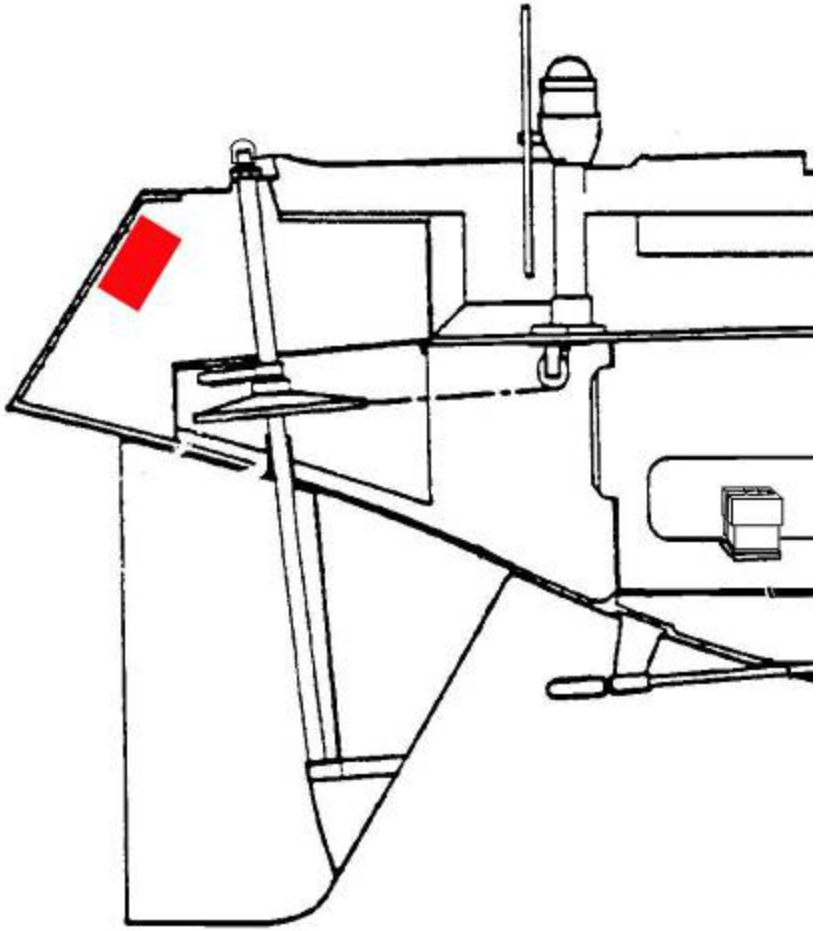
HF COMMS

- To transmit on radio:
  - Ensure the antenna coupler switch is selected to HF
  - Enter the bin or channel number for the proper frequency.
  - Tune the antenna coupler – key the microphone and whistle in the microphone. The coupler will automatically adjust and an * will appear on the display when the coupler is tuned.
  - You are ready to make your call.

HF COMMS

- What does the antenna coupler do?
  - Antenna transmits most efficiently when it is tuned to the frequency being transmitted

Antenna Coupler



Antenna Coupler

– What frequency is the antenna on the Navy 44 most efficient?

Length of antenna (L) = 50’ = 16.67m

$\lambda = L*2 = 33.34m$

$$\text{Freq} = \frac{c}{\lambda} = \frac{3 \times 10^8 \text{ m/s}}{33.34\text{m}} = 9.0 \text{ MHz}$$

HF COMMS

- The antenna coupler uses an RLC circuit to “electrically change” the length of the antenna to match the frequency (wavelength) of the radio to the antenna.
  - This allows the radio to use multiple frequencies with the same antenna and maximize transmission efficiency of the antenna.

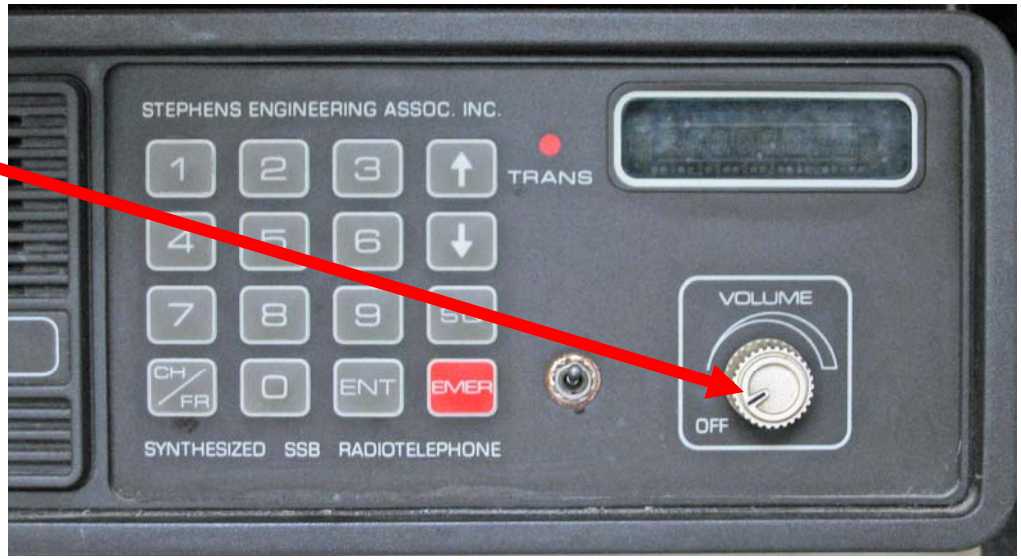
SEA 222 SSB

1
2
3
FREQ
TRANS
4
5
6
FREQ
7
8
9
SQL
CHAN
FREQ
0
ENT
EMER
VOLUME
OFF
SEA Inc. A UNIT OF DATAMARINE INTERNATIONAL

SSB POWER ON

- Verify the antenna switch is set to HF

- Turn the radio VOLUME CONTROL clockwise to mid range.



SEA 222 SSB

- When the radio comes on it will be on 2182 KHz. If no display check CB.

To recall an ITU Channel

To select an ITU channel enter the three or four digit channel number via the key pad

Press ENT to activate frequency

To recall BIN

To select BIN - enter the two digit BIN number via the key pad

Press ENT to activate frequency

Programming a BIN

- Determine the transmit and receive frequencies in KHz's
- Determine the BIN in which the frequency pairs will be stored.
- Add the BIN and frequency to the recall list.

Programming a BIN

- Press 7

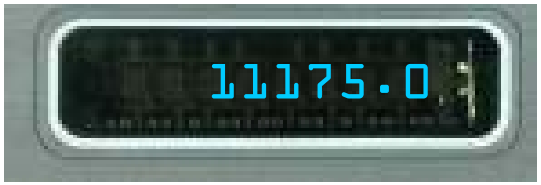
s
- Display will show

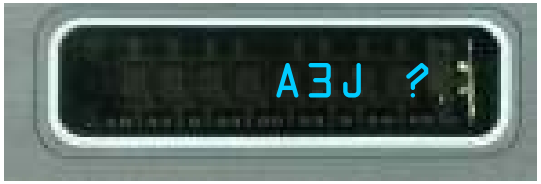
then

- Key in predetermined BIN # **XX**
- Press

Programming a BIN

- Radio will display
- KEY TX FREQ in Hertz 111750
  - Press ENT
- Radio will display
- Press ENT





Programming a BIN

- Radio will display

- KEY RX FREQ in Hertz

111750

  – Press ENT

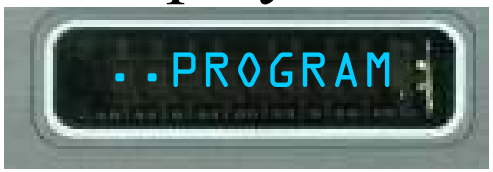
- Radio will display

- **Wait 10 seconds and the radio will leave the programming mode**

Reprogramming a full BIN

- Press 7

s
- Display will show



then

- Key in predetermined BIN # **XX**
- Press

Reprogramming a full BIN

- Radio will display

- KEY any digit **1**
  - Press

- Radio will display

- **Proceed as in regular programming mode**

RADIO HAS TO BE PROGRAMMED CORRECTLY ONLY ONCE

Raytheon Radar

Purpose

- The purpose of Radar installation on a Navy 44
  - Provide a method of detection and determining the range of another vessel
  - Provide a method of detection and determining the range of a land mark for navigation.

The differences

- When the Radar is used for vessel detection it is tuned for maximum target acquisition.
- When the Radar is used for navigation it is optimized for target definition.

Power ON

- Before powering on the Radar set
  - ***TUNE*** to mid range
  - ***RAIN CL*** full counter clockwise
  - ***SEA CL*** full counter clockwise
  - ***GAIN*** to mid range
- Press the ***ST-BY/OFF*** key
  - It takes 90 seconds to warm up
  - When the Radar is ready it will display *ST-BY*
- Press the ***X-MIT/OFF*** to operate.

TUNE CONTROL

- The TUNE CONTROL is used to tune the receiver in the antenna for maximum targets on the display
- Tune for peak indicator bars on screen
- Re tune for each range change.

GAIN CONTROL

- The GAIN CONTROL adjusts the strength of the incoming video and noise.
- The GAIN CONTROL is usually set for the best target presentation on the range scale selected with noise speckles in the background.
- Caution must be used when setting the GAIN CONTROL, if set too low targets will be missed.

SEA CLUTTER (SC)

- The SC CONTROL is used on short ranges to suppress the effects of sea clutter near the boat.
- SC should be set to the point where nearby clutter is reduced to small noise dots and **small targets can still be distinguished.**

RAIN CLUTTER (RC)

- RC is used to reduce echoes from events such as rain and snow.
- RC when adjusted properly will improve detection of targets inside the area of obscuration.
- **If set too high small targets will be missed**.

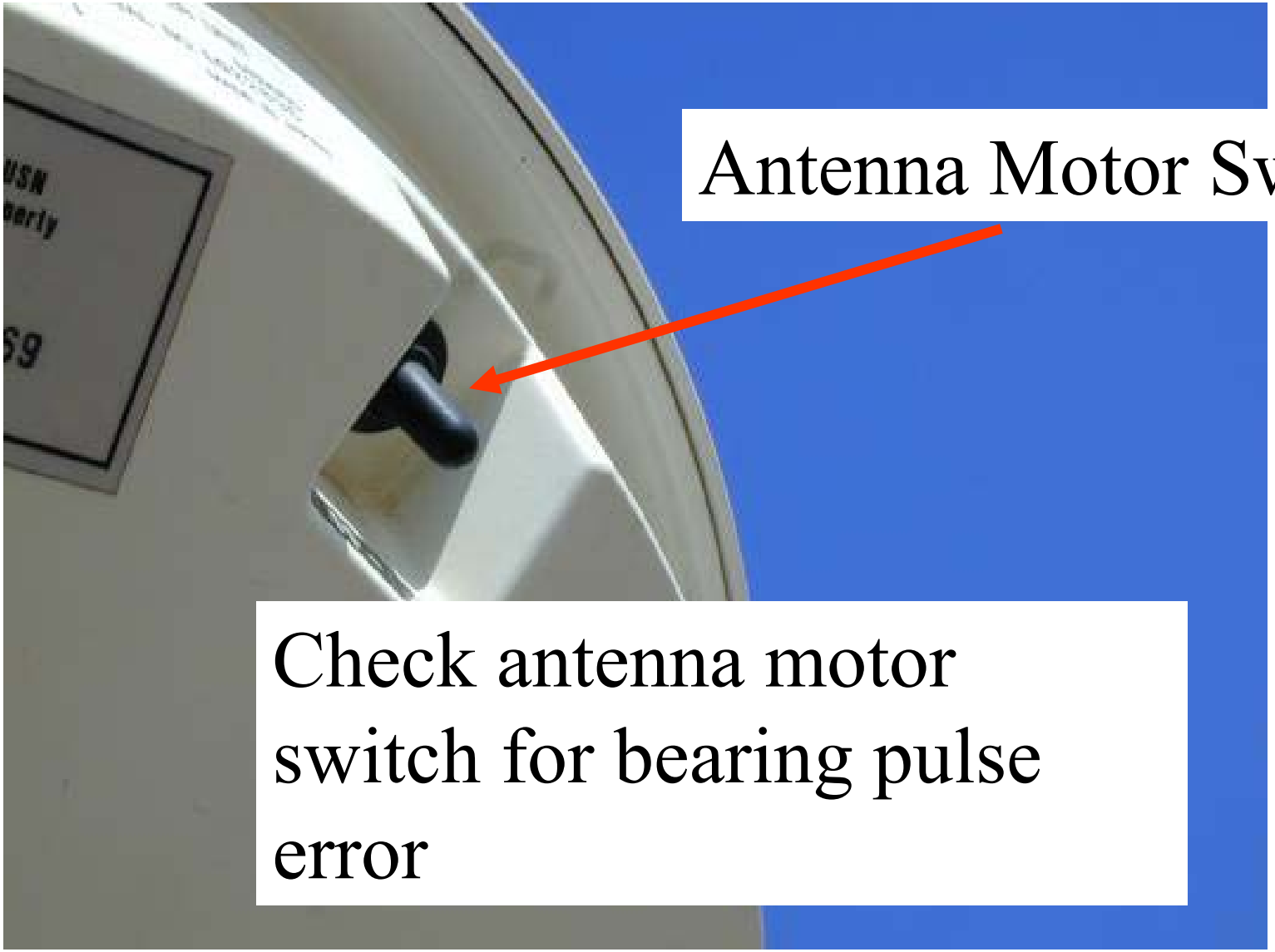
MODE
LL/TD
WPT
ALM
EXP
IR
SHM
RR
TIME
DIM/BRL
EBL1
VRM1
ST-BY
TUNE
RANGE
RANGE
VRM
GAIN
EBL
OFF CENT
ZOOM
ST-BY OFF
E-MIT OFF
Power on Radar

CRT Brilliance
Controls
MODE
LL/TD
WPT
ALM
EXP
IR
SHM
RR
TIME
DIM/BRL
EBL1
VRM1
TUNE
RAIN CL
SEA CL
GAIN
RANGE
RANGE
VRM
EBL
OFF CENT
ZOOM
ST-BY OFF
E-MIT OFF
RASTER SCAN

Range Setting

- It is recommended that the Radar be set at a range of 6 Miles for initial target acquisition .
- The range will change based on actual needs.
- Range is changed by using the key

EBL1
VRM1
BEARING PULSE ERROR
R 3



Check antenna motor switch for bearing pulse error

When all goes well

Tune Indicator

Targets

Land

Range

Range ring
Distance

RAIN CL
SEA CL
GAIN
R 12
RR 2
Gain too High

Variable Range Marker

On - Off Switch

Marker movement

Out

In

Distance

Variable Range Marker

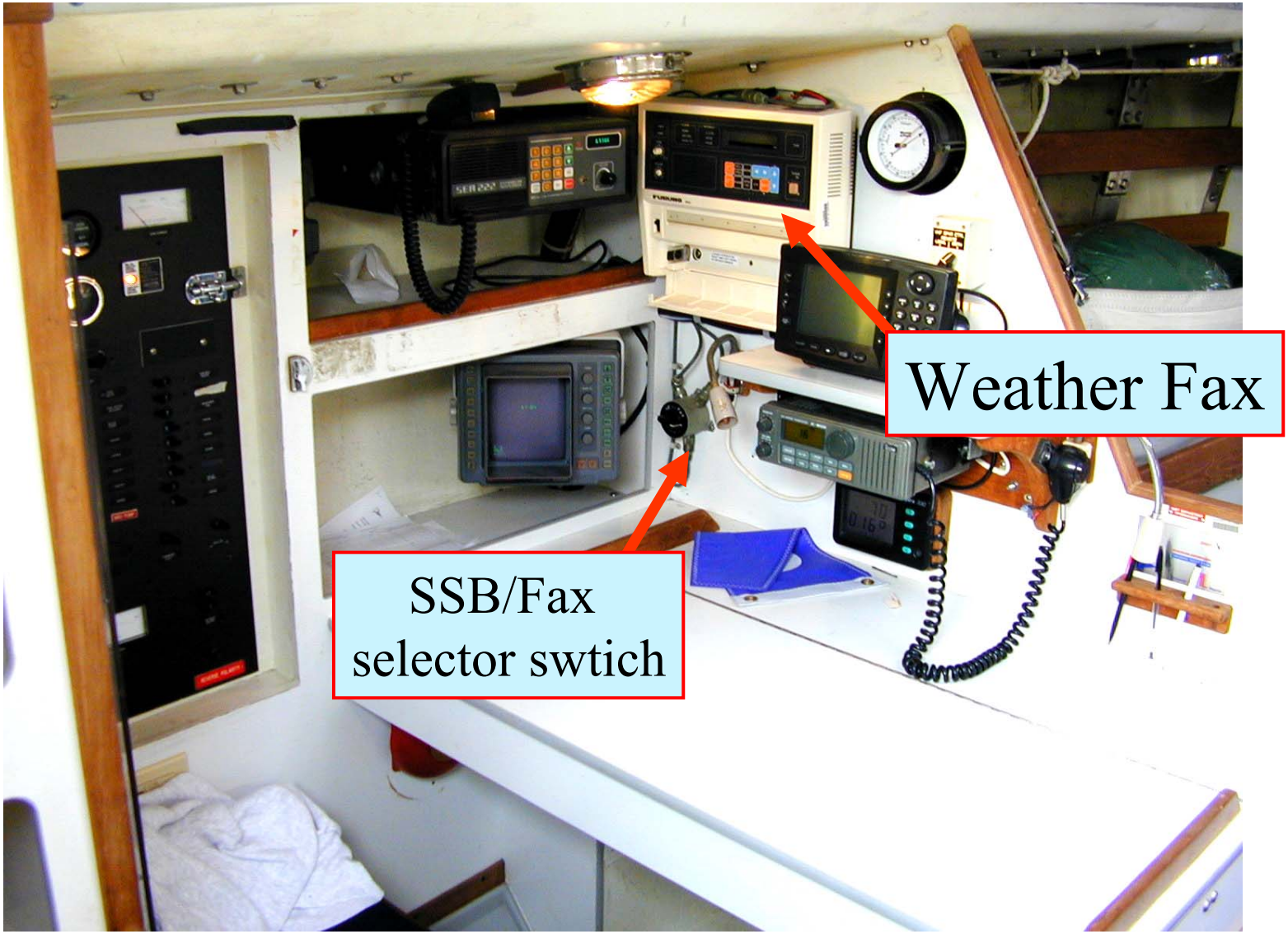
Stand By Mode

- To return the unit to the Stand By mode
  - Press the X-MIT/Off key

Turning Power Off

- Press both X-MIT/OFF and ST-BY/OFF keys simultaneously

Furuno Weather Fax



Furuno WEFAX

- The Furuno DFAX 208 is a receiver printer.
- Charts are received by selecting a station by **call sign, not by frequency**.
- This presentation is about how to setup the WeFax to receive a weather map from a station already setup. (for additional information see “Furuno Owner’s Manual”

Furuno WEFAX

- Power on button
  - The LCD display will show time, station tuned.
  - If garbled data is present consult manual.
  - If no display check breaker on power panel.
- Check Antenna Switch is in FAX position.

Furuno WEFAX

- Press and pop out Volume control
- Turn to mid position and verify presence of a signal. Adjust to acceptable level.

Furuno WEFAX

- Select station (NMF{56X}, CFH{57X})
  - Press CH key
  - Use the ◀ key to have the cursor underscore the second digit. (cursor starts on far right)
  - Use the ▲▼ to select either NMF or CFH

Furuno WEFAX

- Select frequency (NMF{56X}, CFH{57X})
  - Press CH key
  - Use the ◄ ► key to underscore the third digit.
  - Use the ▲ ▼ to select the frequency
  - Then press ENT to receive frequency

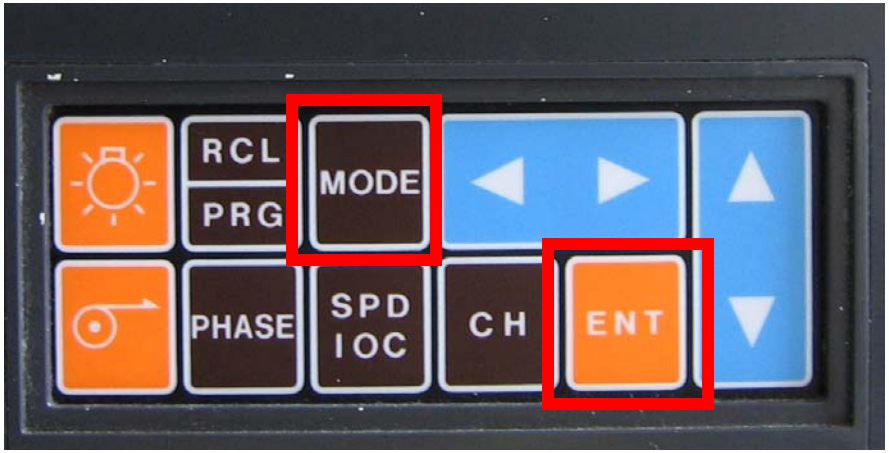
Station **Frequency**

Furuno WEFAX

- If a chart is being transmitted you will hear the sound, and the WeFax should start automatically at the beginning of the next chart.
- NOTE: CFH (57X) transmits RTTY half of the time.
- If a * is selected for the third digit the WeFax will search for the best frequency.

Furuno WEFAX

- To manually begin receiving a fax
  - MODE — Manual Start: ?
  - ENT — SPD/IOC: 120/576
  - ENT
- To manually stop receiving a fax
  - MODE — Manual Stop: ?
  - ENT



Furuno WEFAX

- When done POWER DOWN the unit
- Change the Antenna Switch back to SSB

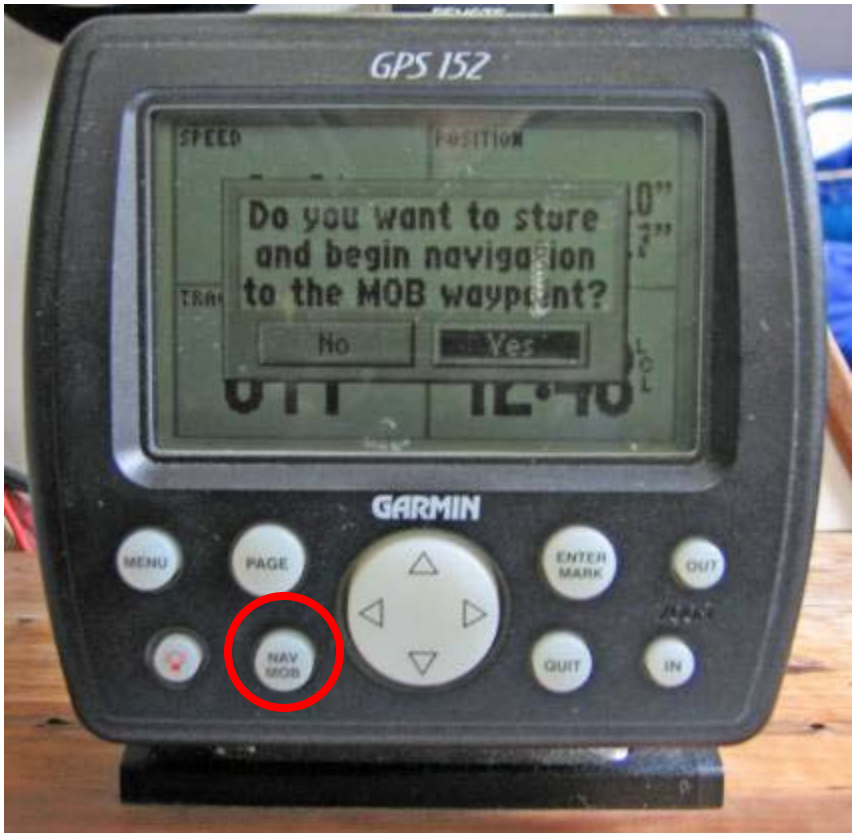
Furuno WEFAX

- Changing paper
  - Consult manual.
    - Verify paper feels damp
    - If the paper is dry and brittle it is BAD
  - **SAVE END CAPS**

GPS Navigators

Garmin & Northstar

MOB mode on GPS units

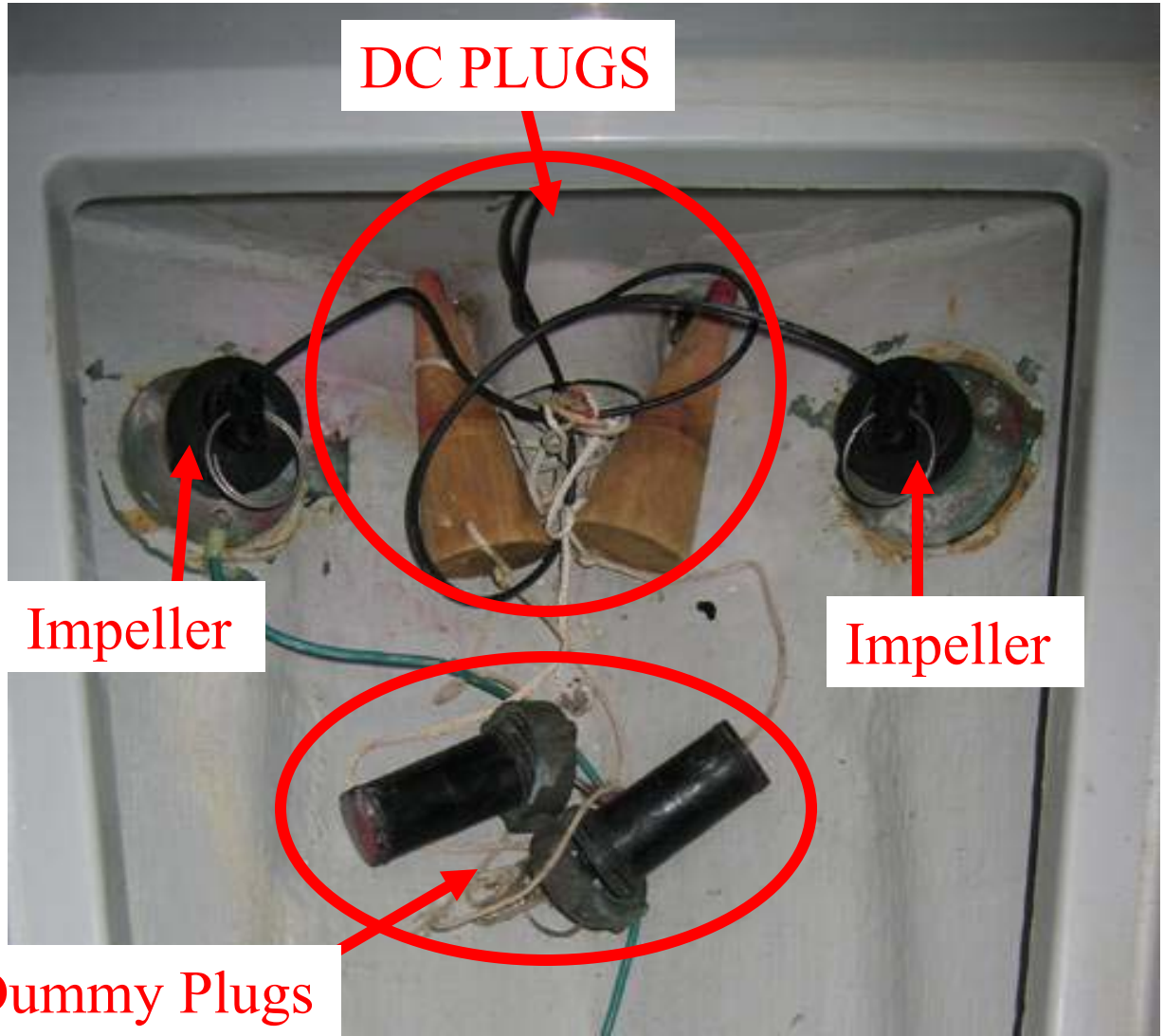


Brooks and Gatehouse (B&G) Sailing Instruments

B&G (NA1-8)

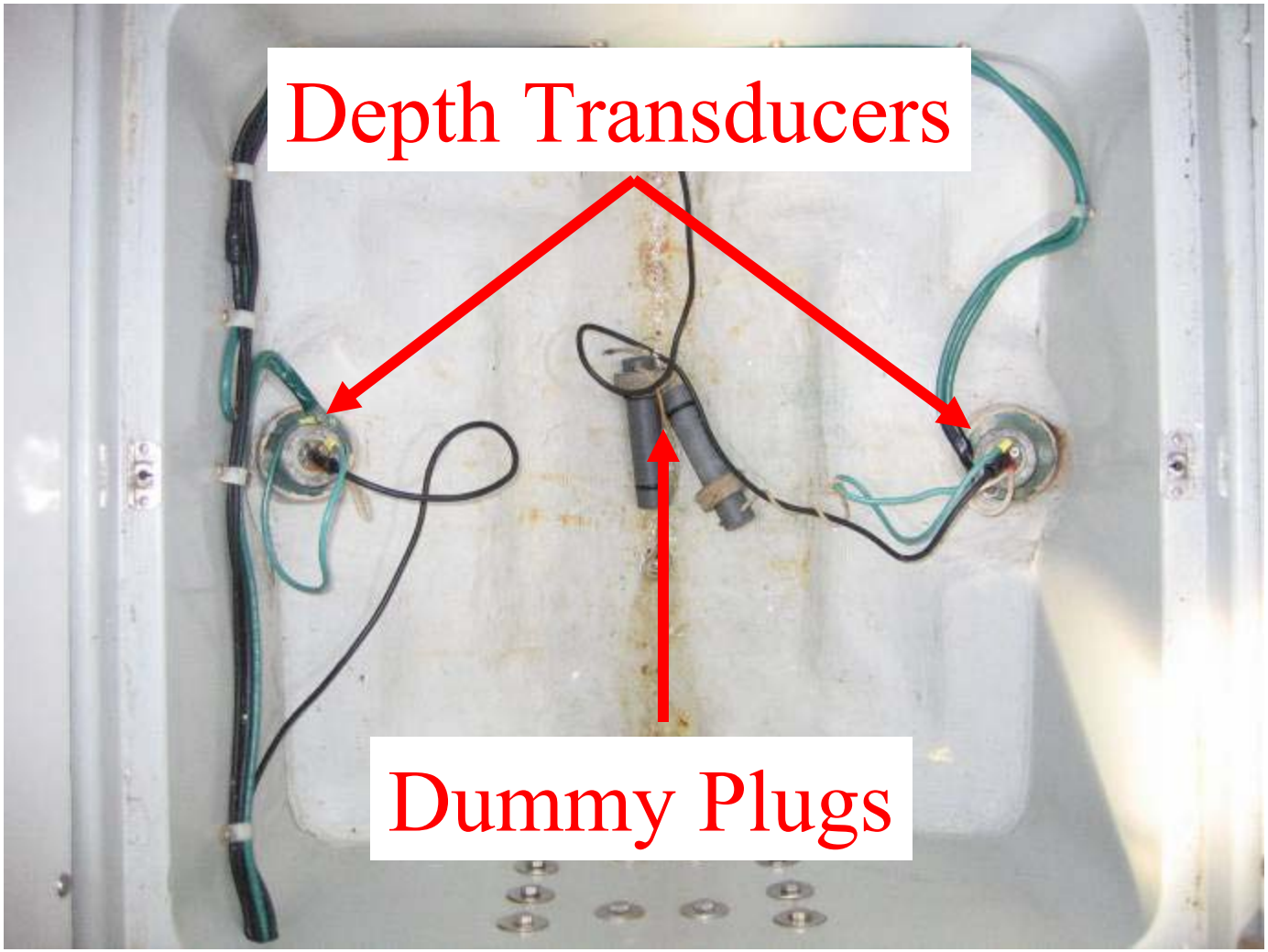
Hornet4
SAILING MONITOR
SHIFT
ALARM On/Off
LOG BOAT SPEED
WIND ANGLE WIND SPEED
TIMER RESET LOG
START
ADJUST
RESET
VALUE
LOW ALARM
HIGH ALARM
CAL
Hecta
HORNET DEPTH MONITOR
SHIFT
ALARM On/Off
DEPTH
SHALLOW ALARM
DEEP ALARM
ADJUST
VALUE
FT/FMS/M
DATUM

Speed Impellers



Speed Impeller

Depth Transducers



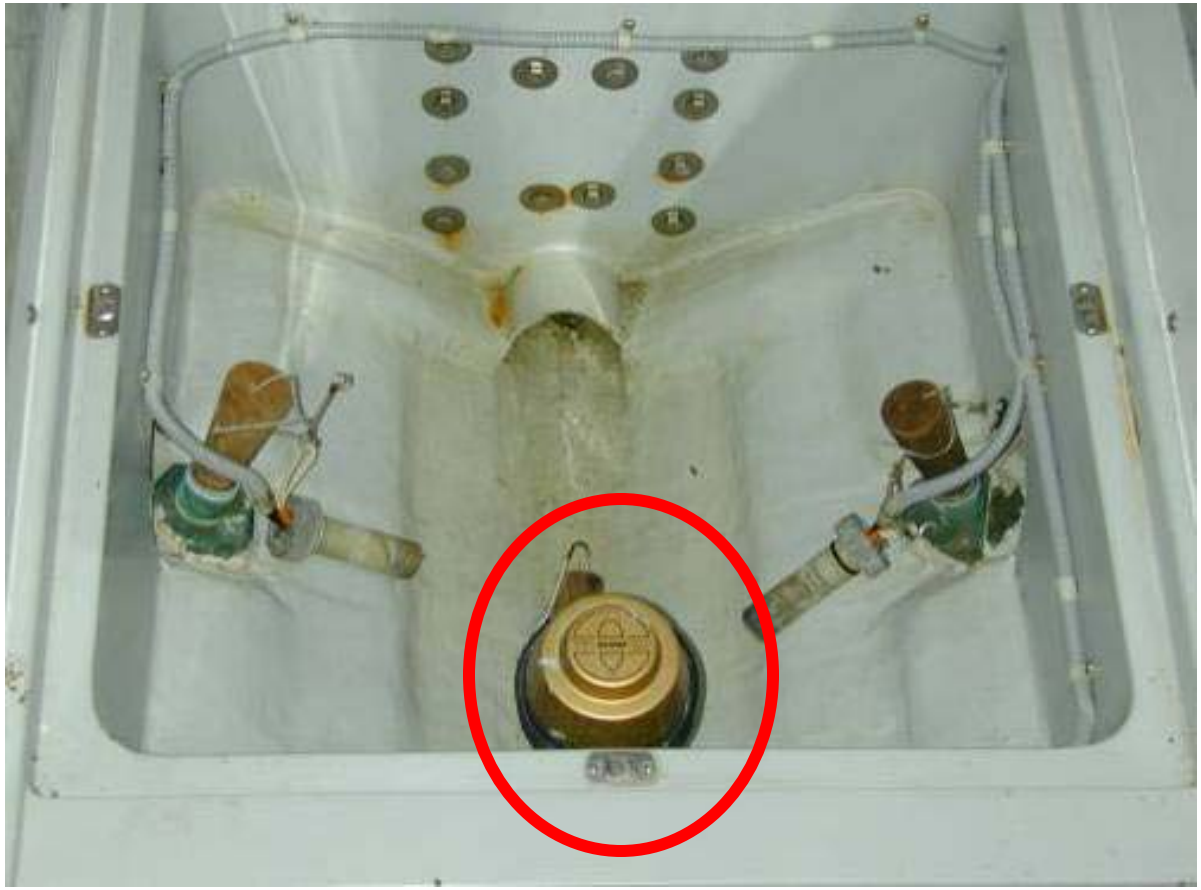
Depth Transducer

Fatho & Speedo switches

Wind instruments

Fluxgate compass

- NA9-20



Trouble Shooting

General Electrical Systems

- No Power to multiple Systems
  - Verify DC Breakers are ON.
  - Verify Perko Switches are properly set.
  - Verify Status of Battery Bank

DC Breaker

SS ALT
DC MAIN
START BATT ALT
ON - OFF
NAV LIGHTS
MASTHEAD LIGHT
CABIN LIGHTS PORT
CABIN LIGHTS STBD
OUTLETS
INSTR LIGHTS
SALT WATER PUMP
DC REFRIG
FRESH WATER PUMP
LP GAS VALVE
BILGE PUMP
RADAR
SEA 222
VHF R/T
MSD PUMP
SAILING INSTR
WEATHER FAX
SAT PHONE
ENGINE ALARM
BILGE ALARM

Nav Station Seat

Battery Switch

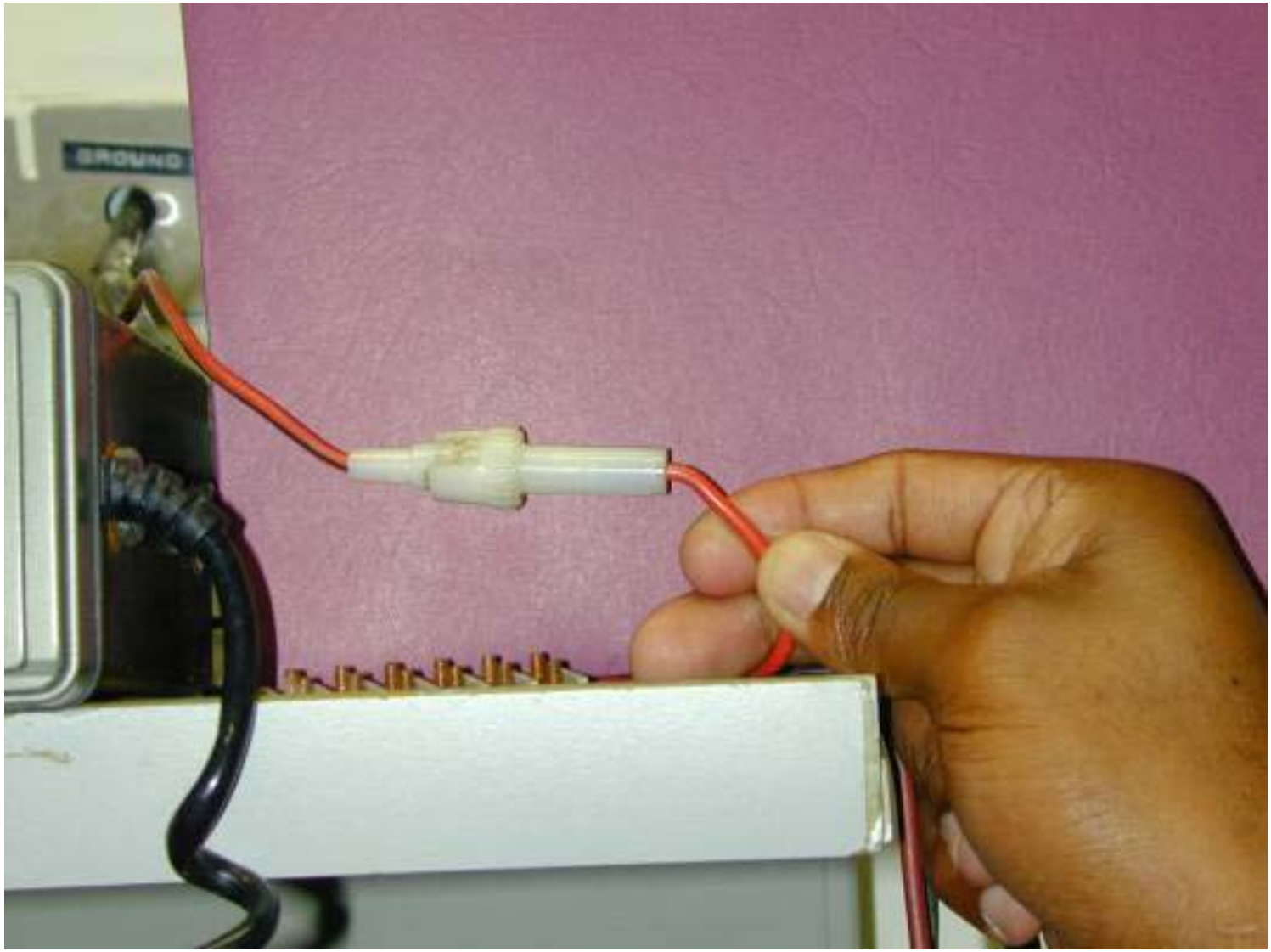
SHIPS SERVICE
Both
MADE IN U.S.A.
GUEST
1
2
Off
On
MADE IN U.S.A.
GUEST
CAUTION
Off
ENGINE SERVICE

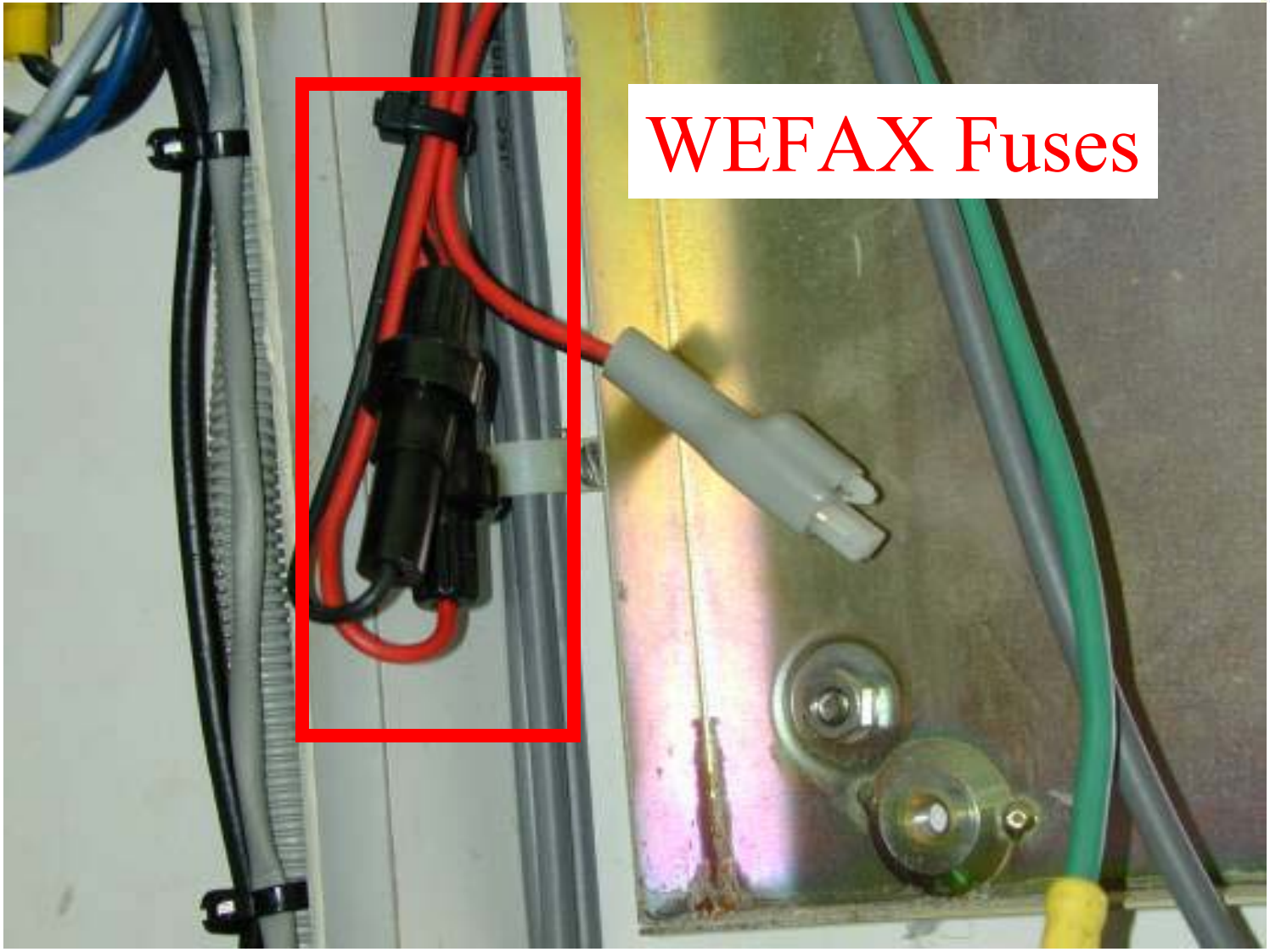
Battery Status

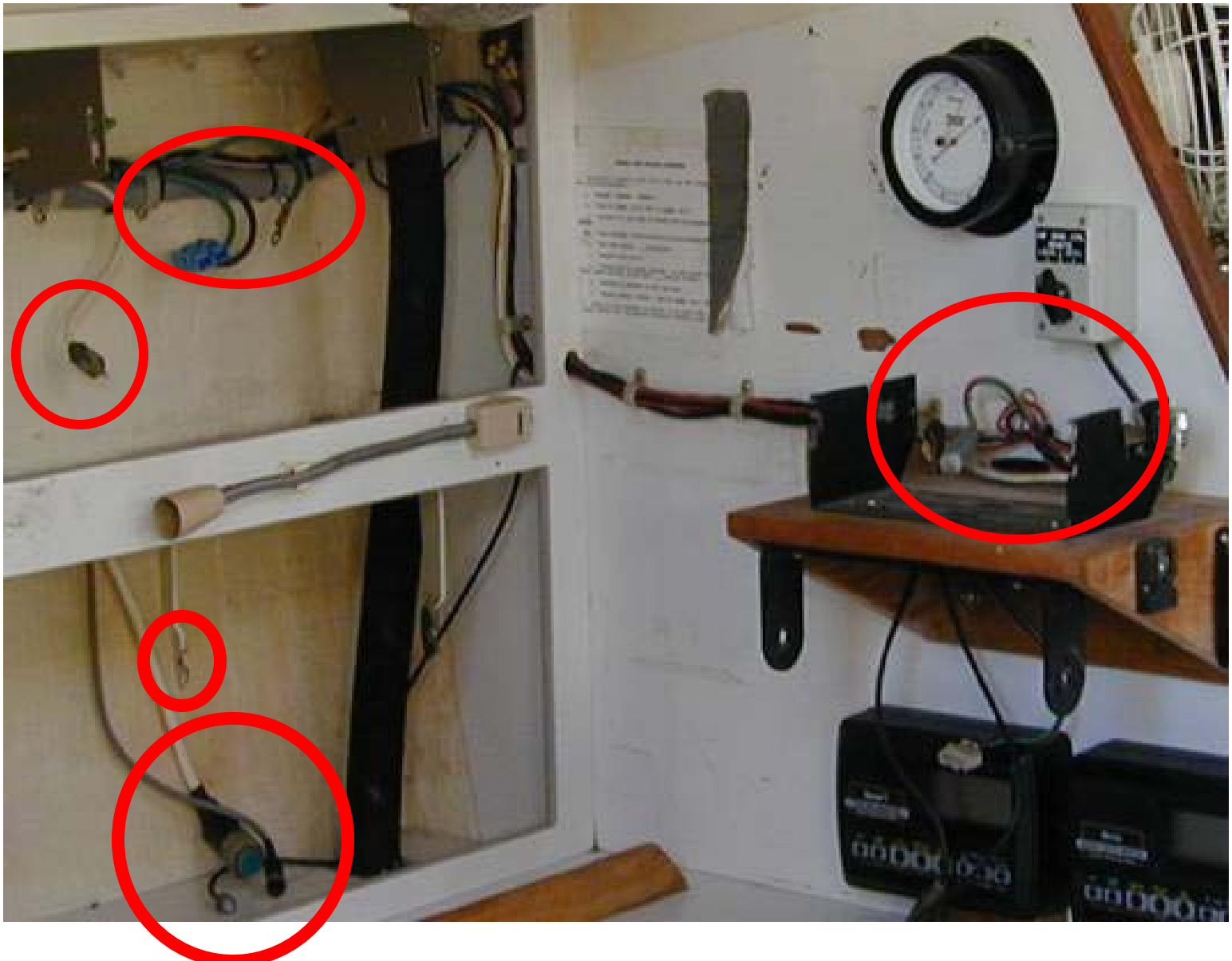
Single System does not power up

- Check **Power Switch** at Equipment
- Check **Circuit Breaker** at Power Panel
- Check to make sure equipment is **not wet**.
- Verify **Connectors Seating** for the equipment.
- Verify Status of **Power Lead Fuse**

SS ALT
DC MAIN
START BATT ALT
ON - OFF
NAV LIGHTS
MASTHEAD LIGHT
CABIN LIGHTS PORT
CABIN LIGHTS STBD
OUTLETS
INSTR LIGHTS
SALT WATER PUMP
DC REFRIG
FRESH WATER PUMP
LP GAS VALVE
BILGE PUMP
RADAR
SEA 222
VHF R/T
MSD PUMP
SAILING INSTR
WEATHER FAX
SAT PHONE
ENGINE ALARM
BILGE ALARM


GROUND


WEFAX Fuses



Instruments Power On But Do Not Display Data

- Speedo or Depth
  - Verify Speed impeller is clean
  - Depth Transducer is clean
  - Check Gravity Switch

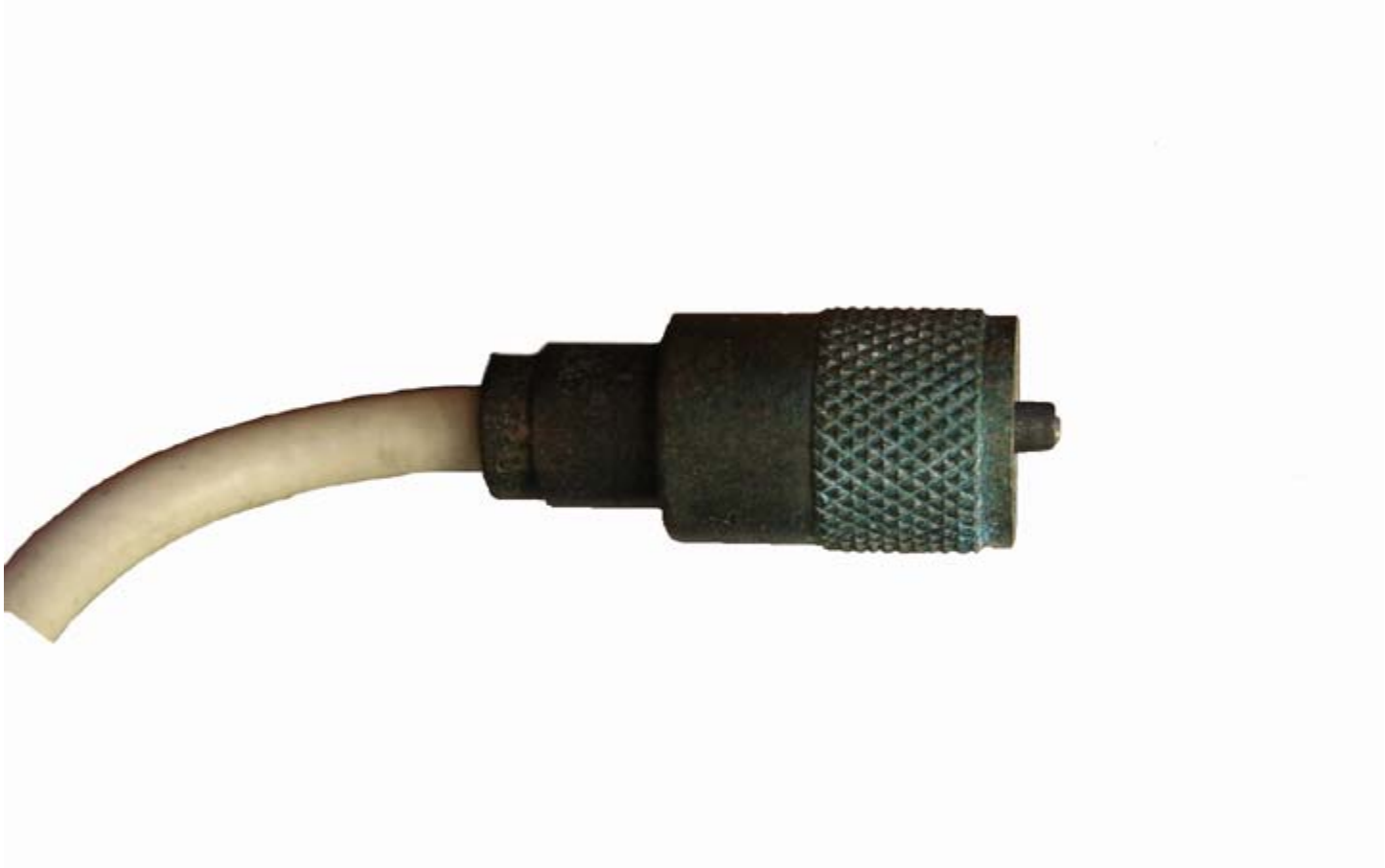
Unable to make contact on a Radio System

- Verify Correct Frequency
- Verify Transmitter Indicator is lit
- Call another Station
- Verify Antenna Connectors
- Change Radio System.
  - VHF
  - SSB

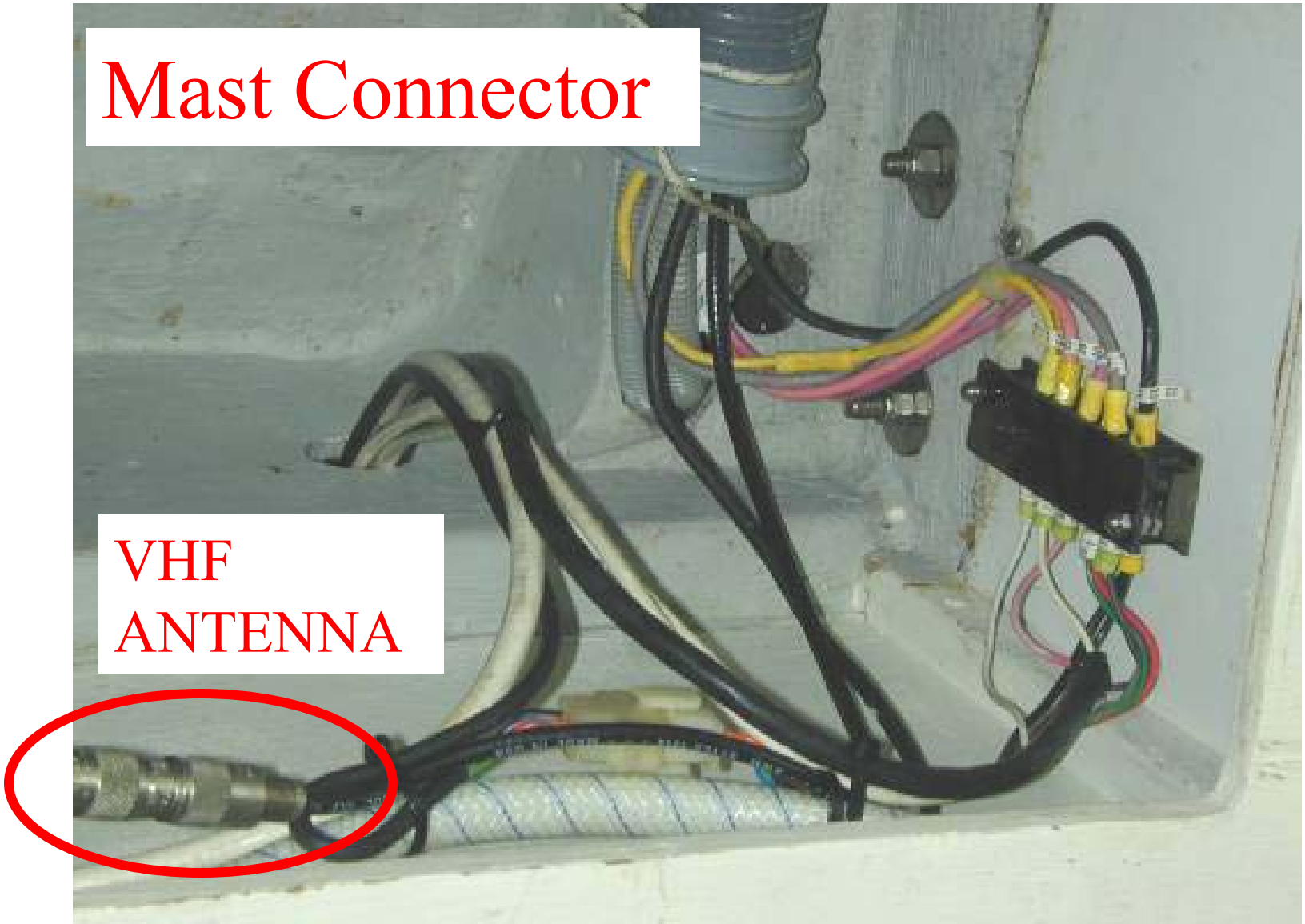
Unable to make contact on a Radio System

- Verify Antenna
  - Visually inspect Coax Cable and Connectors
  - Visually inspect Antenna
  - Inspect Antenna Wire to Back Stay
- For SSB determining Functioning of Antenna Coupler
  - Power
  - Switching

VHF & SSB PL 259 Antenna Connector

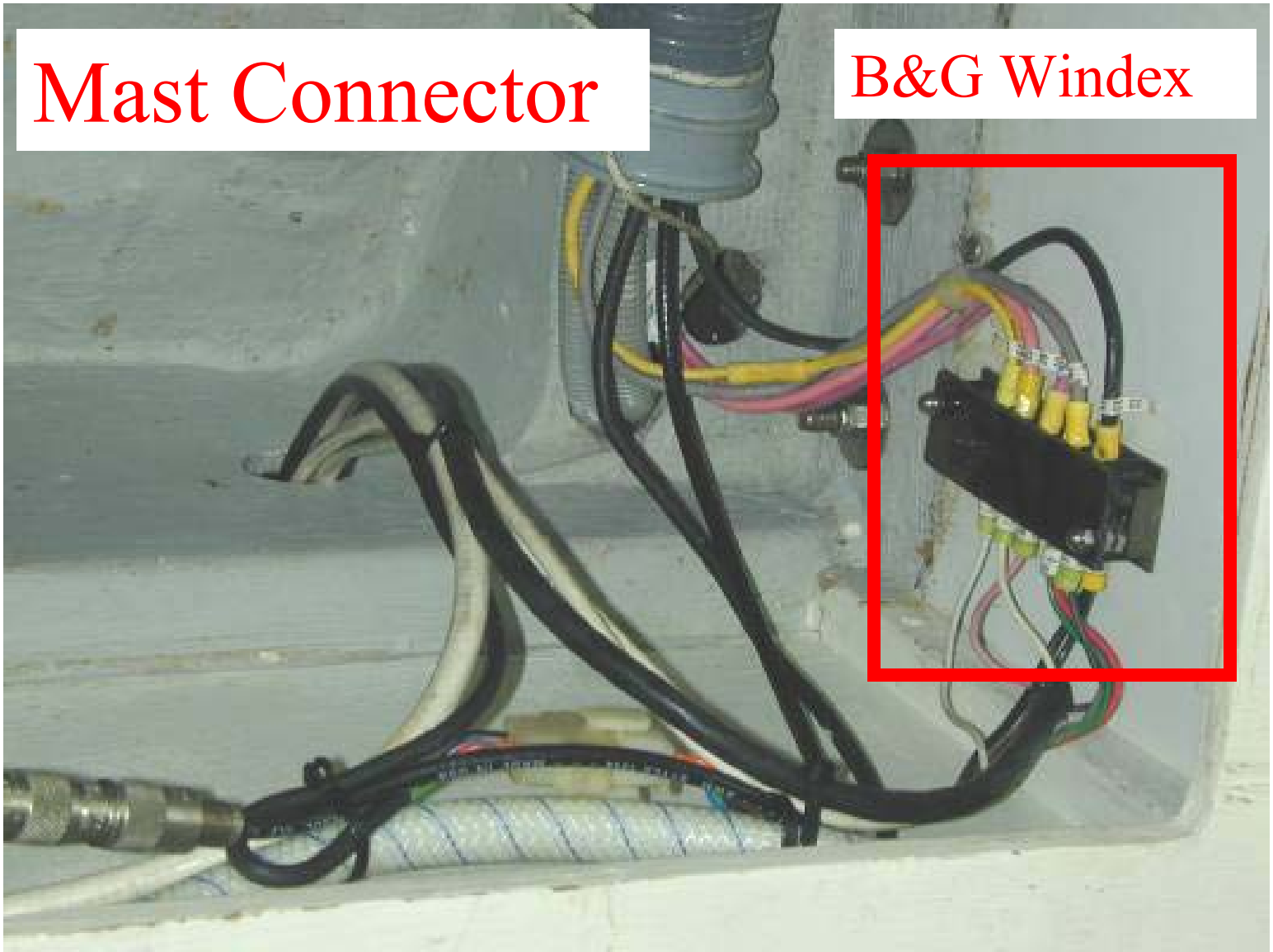


RADAR BNC Connector


Mast Connector
VHF
ANTENNA

No Wind Readings

- Verify Page selection
- Verify Mast Head
  - Anemometer is Turning
  - Windex is Turning
- If they are not turning this is the problem.
- Verify Mast Junction.


Mast Connector
B&G Windex

Questions?