

# 1 Radar calibration at first installation

At first installation is necessary to properly calibrate the radar. This includes:

- Heading Line
- Transmission Trigger Delay
- Antenna Parking Position (only MDS 9 and 10)
- Sector transmission off (only MDS 9 and 10)

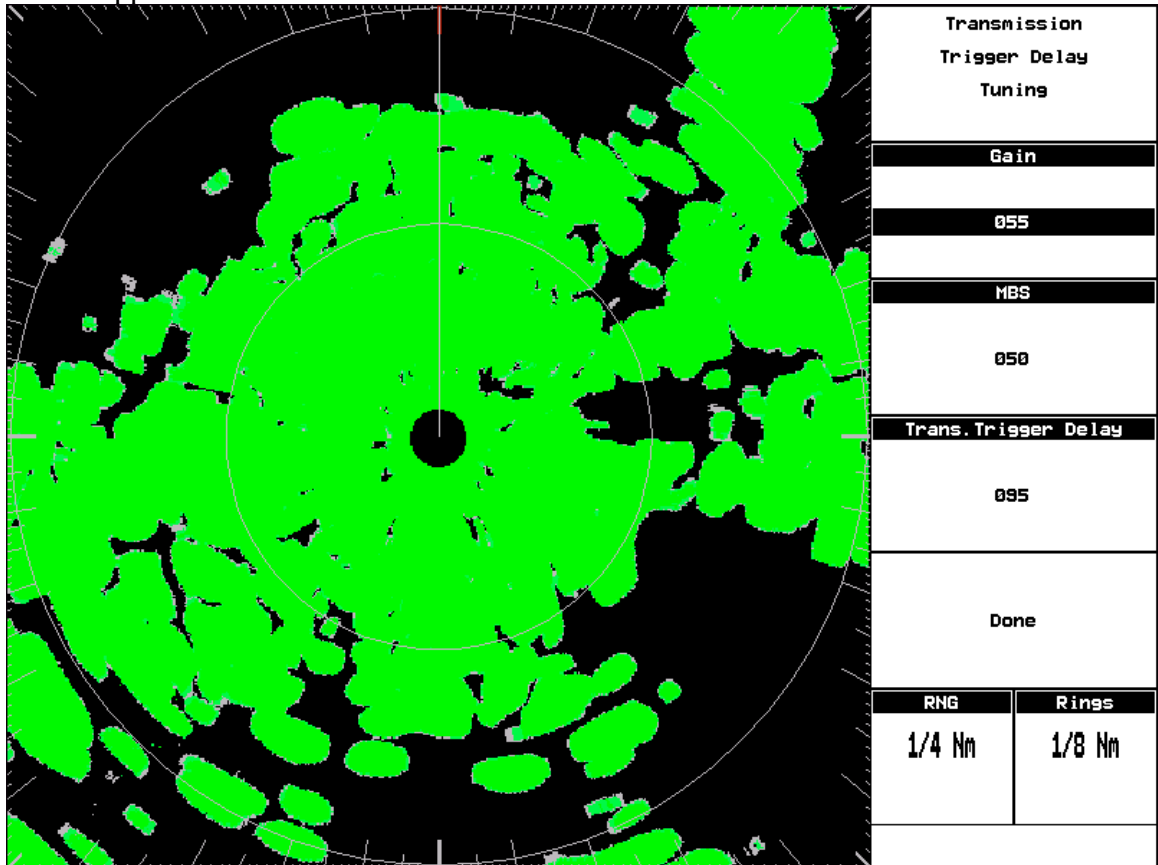
## 1.1 Transmission Trigger Delay

Tuning the transmission Trigger Delay allows making accurate distance measurement. In practice, you need to align the start of the sweep with the leading edge of the transmission pulse.

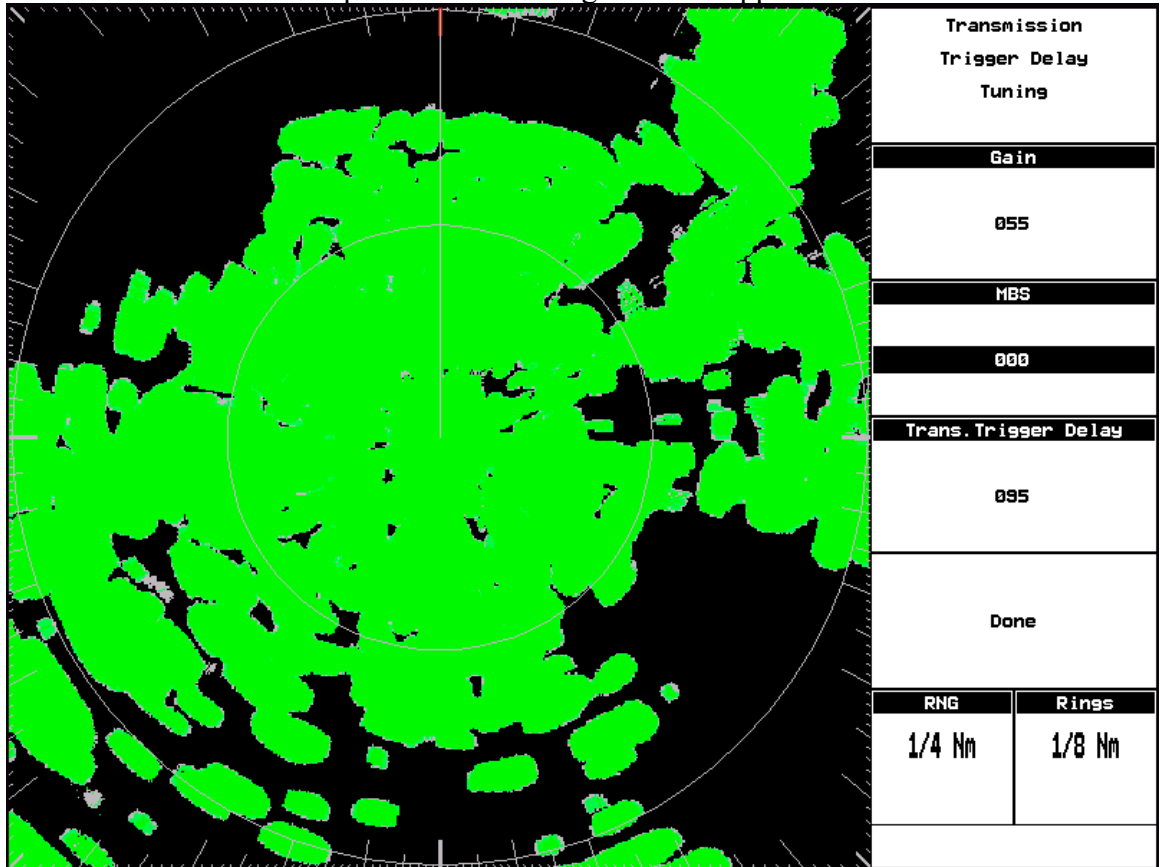
**IMPORTANT:** The unit comes with a default tuning value already setup by the factory but to obtain maximum precision you should finely adjust this value.

Use the following procedure

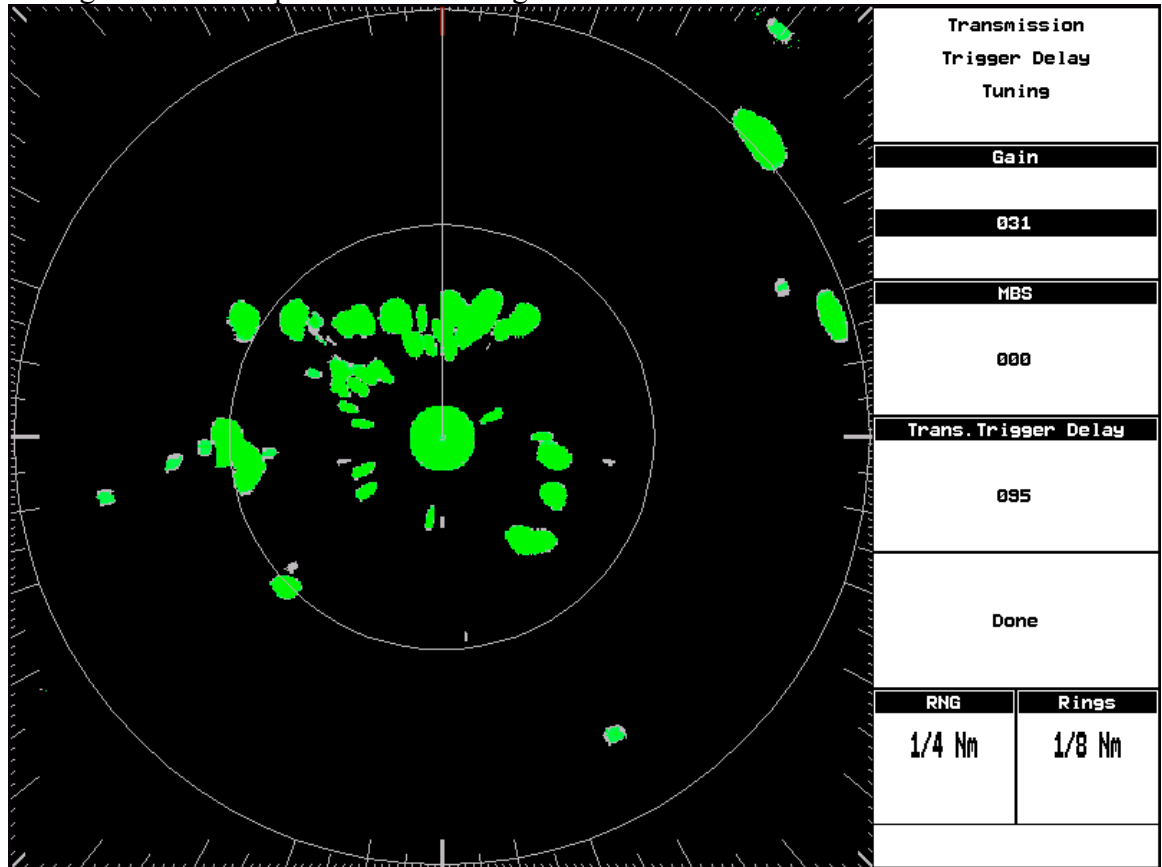
- Enter the Transmission Trigger Delay page. Since the STC is automatically turned off when entering this page, the screen appear completely covered with clutter, this is a mandatory condition to allow properly setting the TTD. The screen should appear as follows:



- Set MBS to 0. The black spot in the radar origin will disappear.

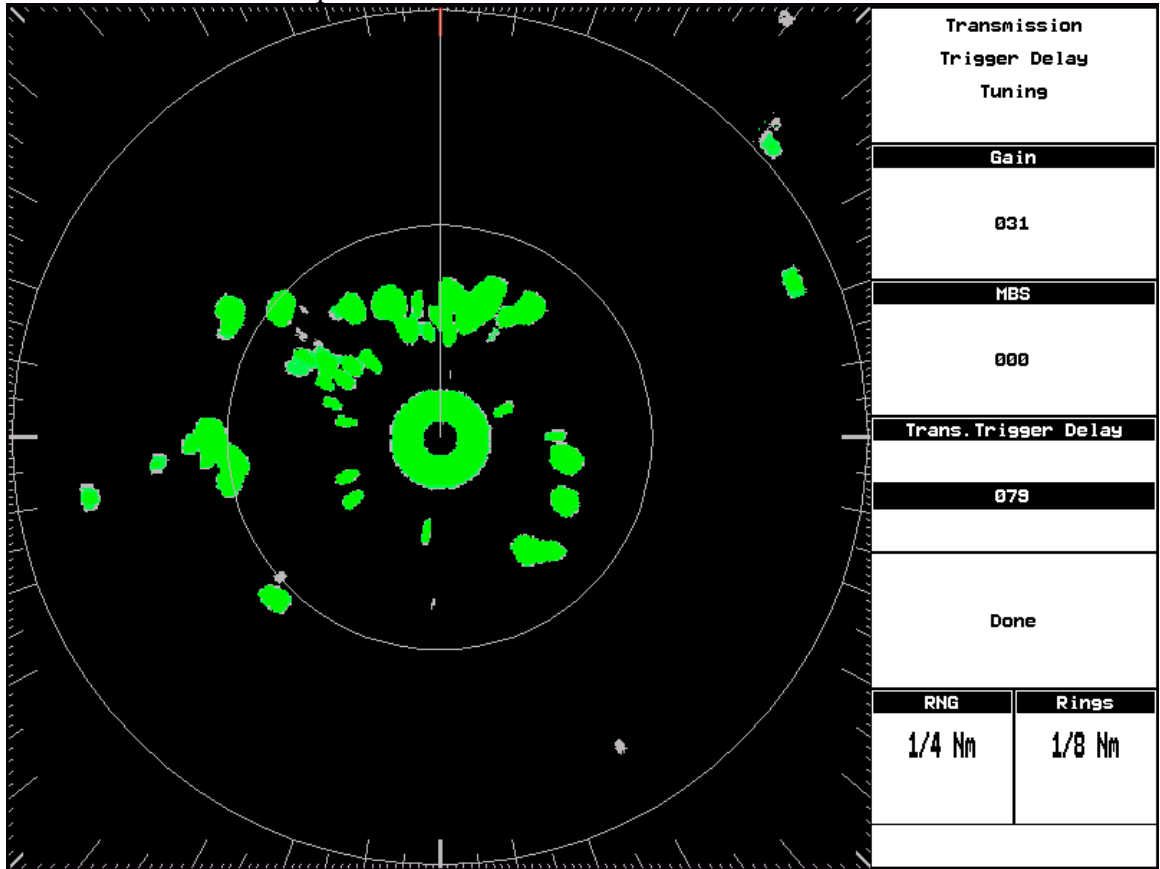


- Slowly decrease the GAIN value until the clutter clears out and you can clearly distinguish a round spot in the radar origin:



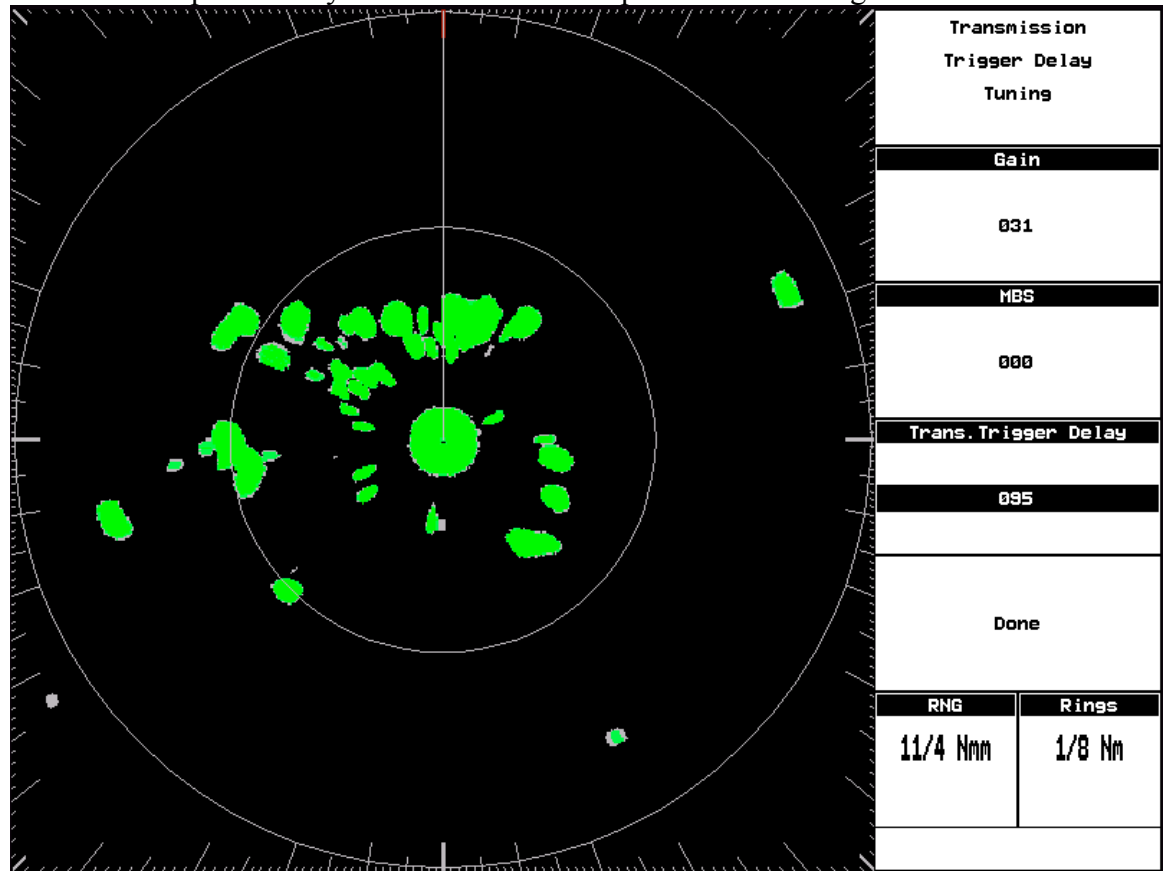
- If the Transmission Trigger Delay is properly tuned the spot in the radar origin should appear as in the picture above. In any case to be sure your TTD is properly tuned try to decrease the Transmission Trigger Delay until a hole start forming in

the center of the round spot:



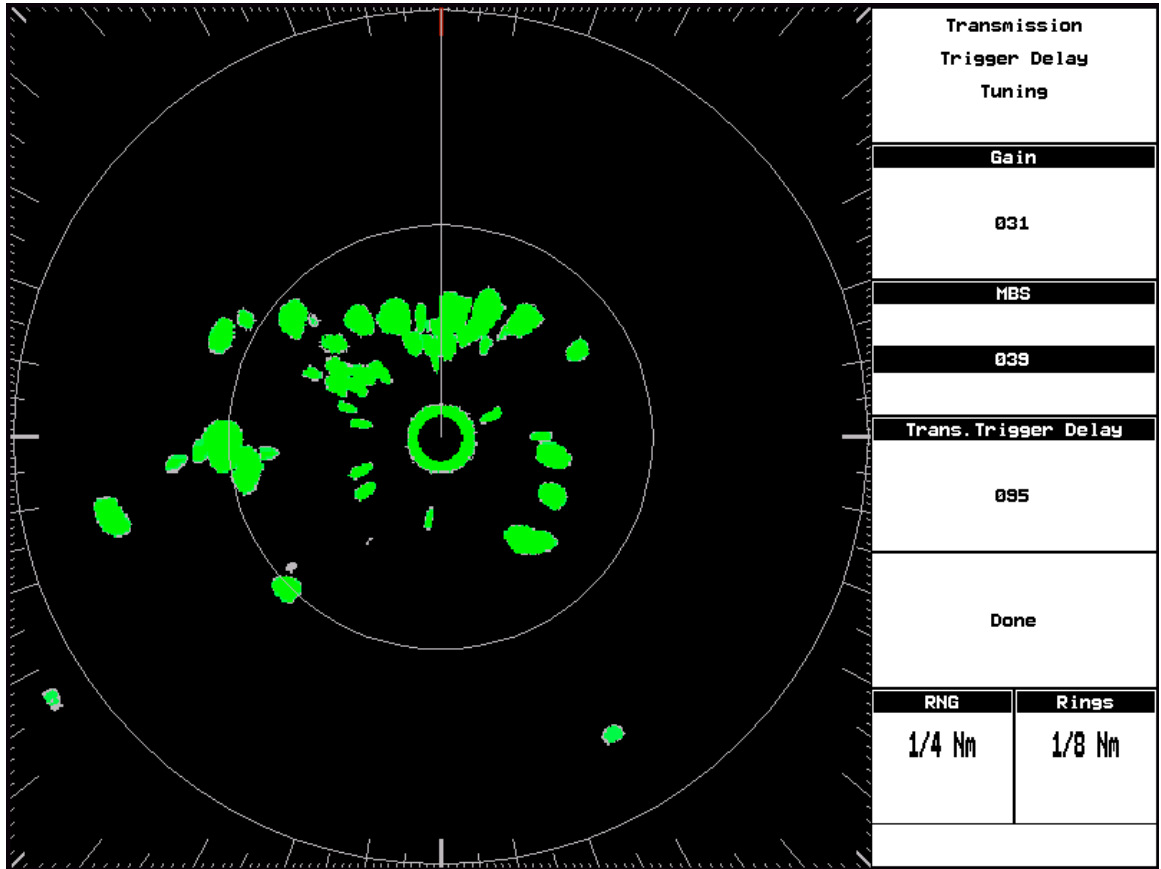
- Now increase the TTD until the hole closes (not more than just the value to make it close). The increase rate should be very slow: just increase by a single step at the time and wait until you see the effect on the screen. When the hole in the

center of the spot closes you have reached the optimal TTD setting.

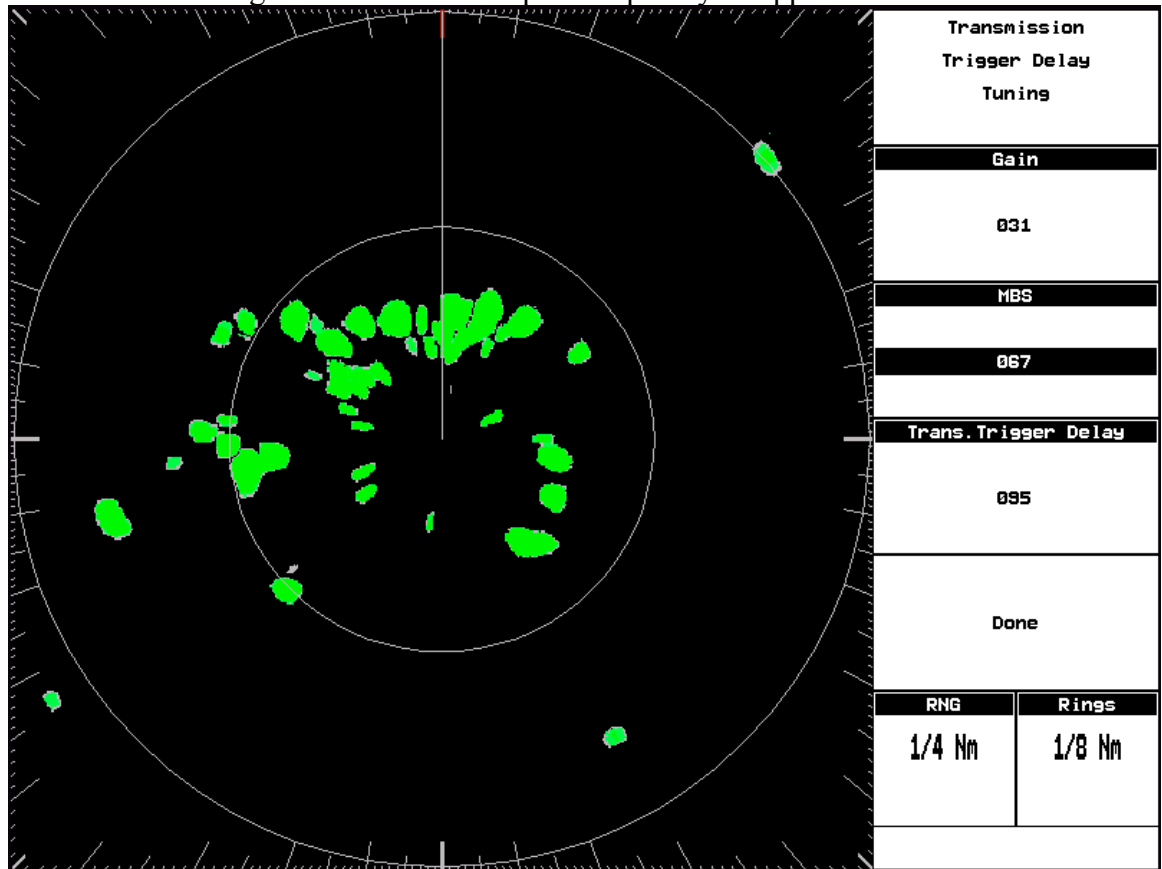


- The green spot in the radar origin is the transmission pulse itself. Targets within such range are not detectable because their echoes are completely overwritten by the radar still transmitting. Such spot is called Main Bang. To remove it from the screen it is necessary to properly set the MBS (Main Bang Suppression) control. To do this, increase slowly the MBS. The spot is progressively deleted from the inside toward the

outside:

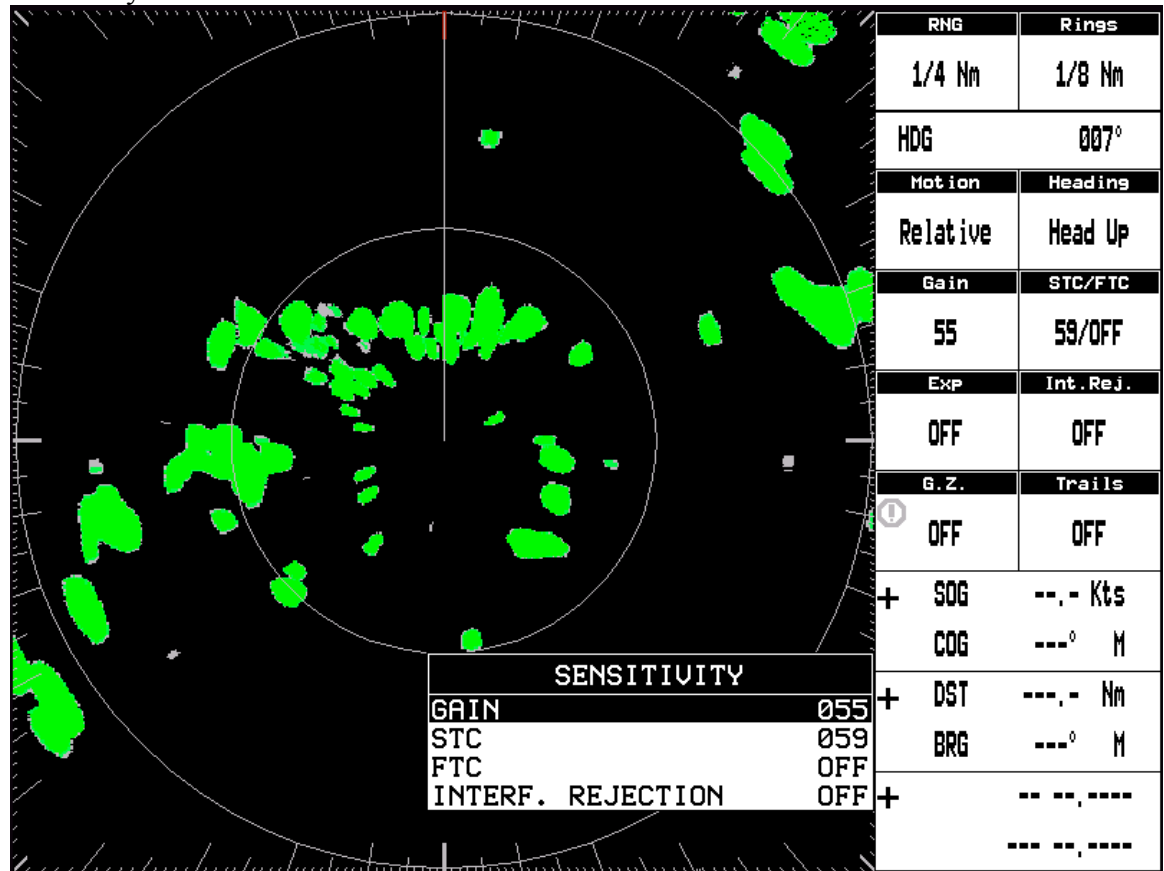


- Continue increasing the MBS until the spot completely disappear:



- Select DONE to exit the TTD tuning menu saving your settings
- The main radar page is displayed. Please note that since initially Gain was decreased, now it's necessary to increase it back in order to achieve maximum

sensitivity:



Once the calibration has been performed, the calibration data is retained. However if a Clear RAM operation is performed it may be necessary to repeat the calibration.



## 2 Automatic and Manual Tune (non necessary at first installation)

The Tune control is used to tune the receiver in the Radar antenna for maximum target returns on the display. The radar comes from the factory already tuned so this operation is not necessary at first installation. In general radar tuning may be necessary if any component of the radar is replaced for maintenance.

The Radar receiver can be tuned in Automatic or Manual mode. In Automatic Tune mode, the Radar tunes itself automatically on all range scales. It is recommended to execute the Tune function in Automatic mode. This generally ensures that the Radar receiver is always tuned to receive the maximum signal.

If you choose the Manual Tune, you will need to adjust it again after 10 minutes, after you have turned on the Radar, since the required setting will change after the magnetron has warmed

### 2.1 Manual Tuning

To execute manual tuning follow the procedure:

- [MENU] + "TUNING" + [ENTER] + "MANUAL TUNE" + [ENTER]

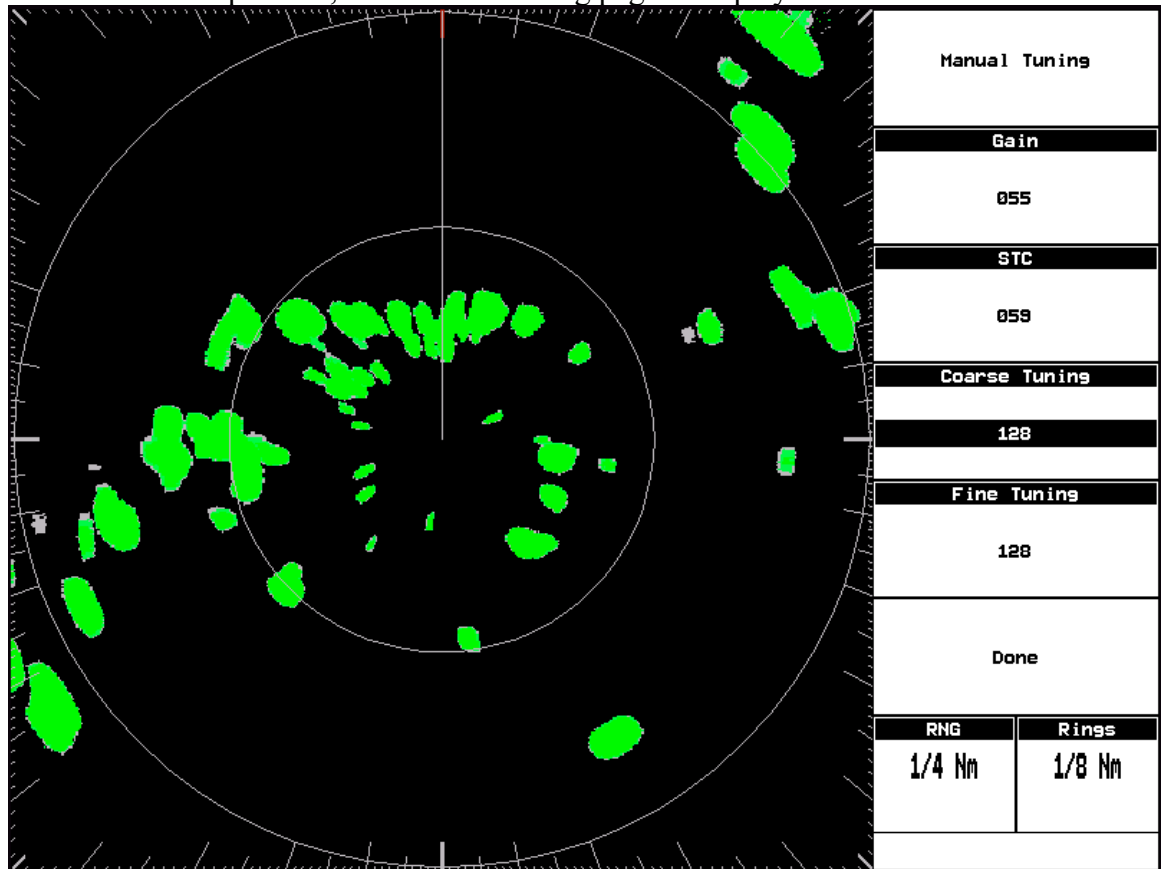
The following Warning message is displayed:

The screenshot shows the radar's menu system. On the left, the 'RADAR SETUP' menu is visible with options like CHART OVERLAY, TRANSMISSION, RANGE (24 Nm), and ORIENTATION (Head Up/Relative). A 'WARNING' box is overlaid on the radar display, stating: 'The Manual Tuning operation may reduce the radar sensitivity if not performed correctly. Please read carefully the manual before proceeding.' Below this, the 'TUNING' menu is shown with options: HEADING LINE, ANTENNA PARKI, SECTOR TRANSM, TRANSMISSION, AUTOMATIC TUNE, MANUAL TUNE, LOAD TUNING FROM USER CARTRIDGE, and SAVE TUNING TO USER C-CARD. On the right side of the screen, a data panel displays various parameters:

RNG	Rings
24 Nm	4 Nm
HDG 007°	
Motion	Heading
Relative	Head Up
Gain	STC/FTC
82	67/OFF
Exp	Int. Rej.
OFF	OFF
G.Z.	Trails
OFF	OFF
+ SOG	--.- Kts
COG	---° M
+ DST	---.- Nm
BRG	---° M
+	-- --,----
	--- --,----

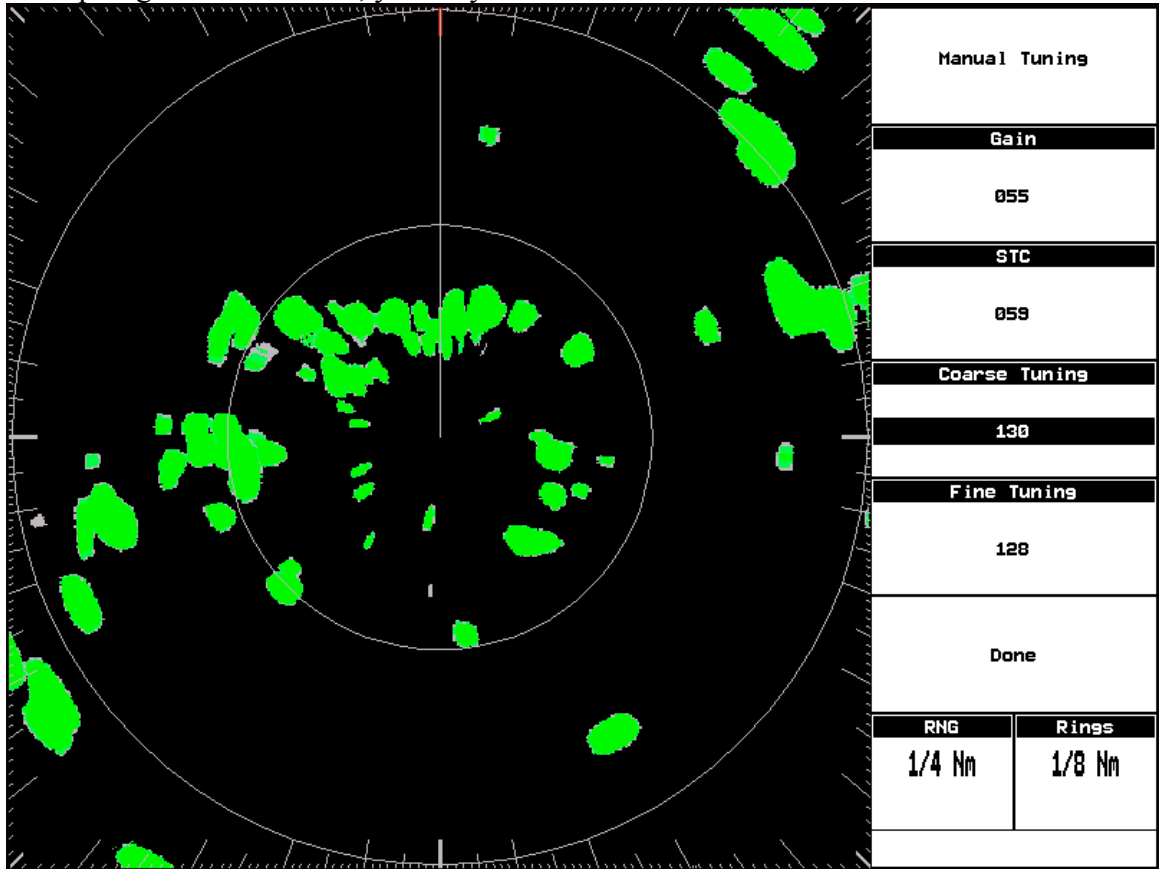
An 'OK' button is visible at the bottom left of the radar display area.

- Press ENTER to proceed, the Manual Tuning page is displayed:

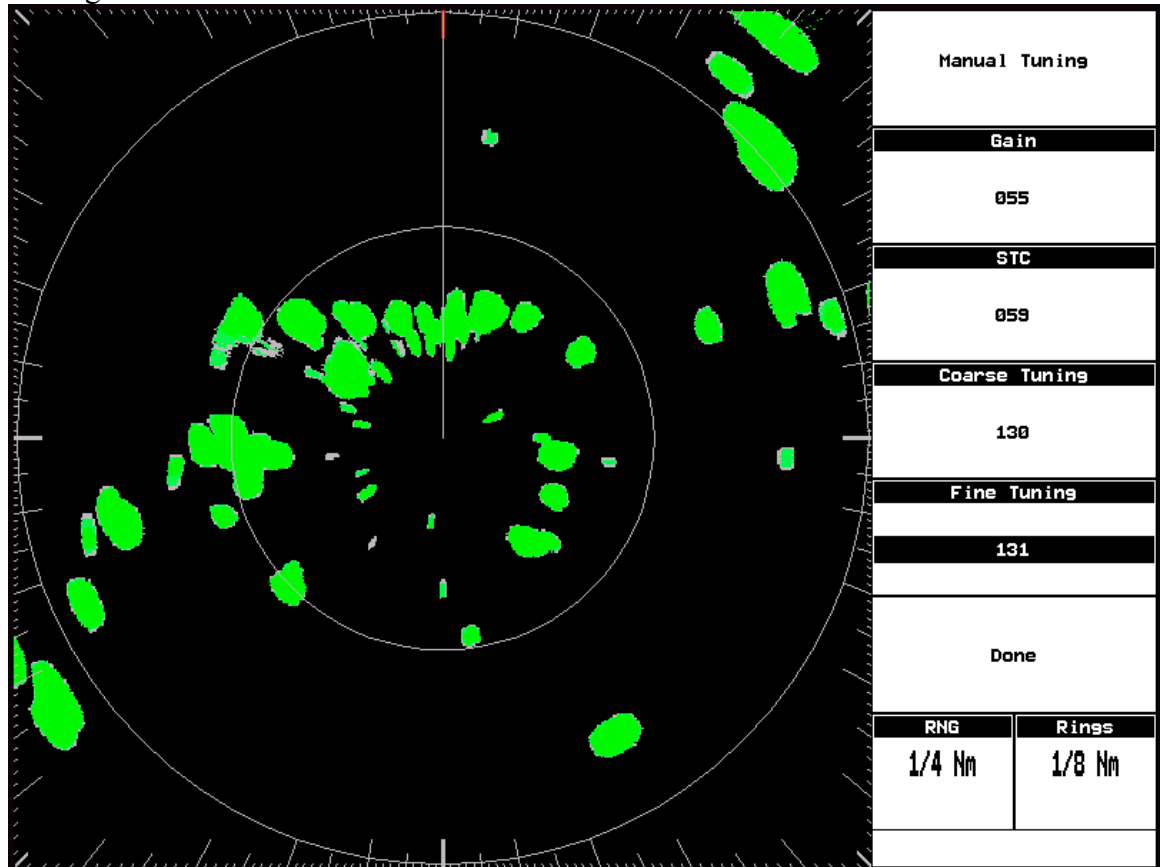


- Try increasing or decreasing the Coarse tuning very slowly and in small steps from its middle value (128) until you obtain the maximum echo returns. If no land

or ship targets are available, you may tune for maximum sea clutter.



- Once the Coarse Tuning has been set, repeat the same procedure with the Fine Tuning:



- Select DONE to exit the manual tuning page saving your settings

## 2.2 Automatic Tuning

To execute manual tuning follow the procedure:

- [MENU] + "TUNING" + [ENTER] + "AUTOMATIC TUNE" + [ENTER]  
The following Warning message is displayed to alert the user that the Auto Tuning procedure may require up to ten minutes. Please note that during AUTO

Tuning all the radar functionalities are disabled.

The image shows a radar display interface. On the left, a 'RADAR SETUP' menu lists various settings. A 'WARNING' dialog box is centered, asking for confirmation to proceed with auto-tuning. On the right, a data table displays radar parameters. At the bottom, 'YES' and 'NO' buttons are visible.

RADAR SETUP	
CHART OVERLAY	OFF
TRANSMISSION	ON
RANGE	24 Nm
ORIENTATION	Head Up
MOTION MODE	Relative
ECHO TRAILS	OFF
TARGET EXPANSION	OFF
POWER	OFF
SENSITIVITY	▶
GUARD ZONES	▶
RADAR FEATURES	▶
CHART FEATURES	

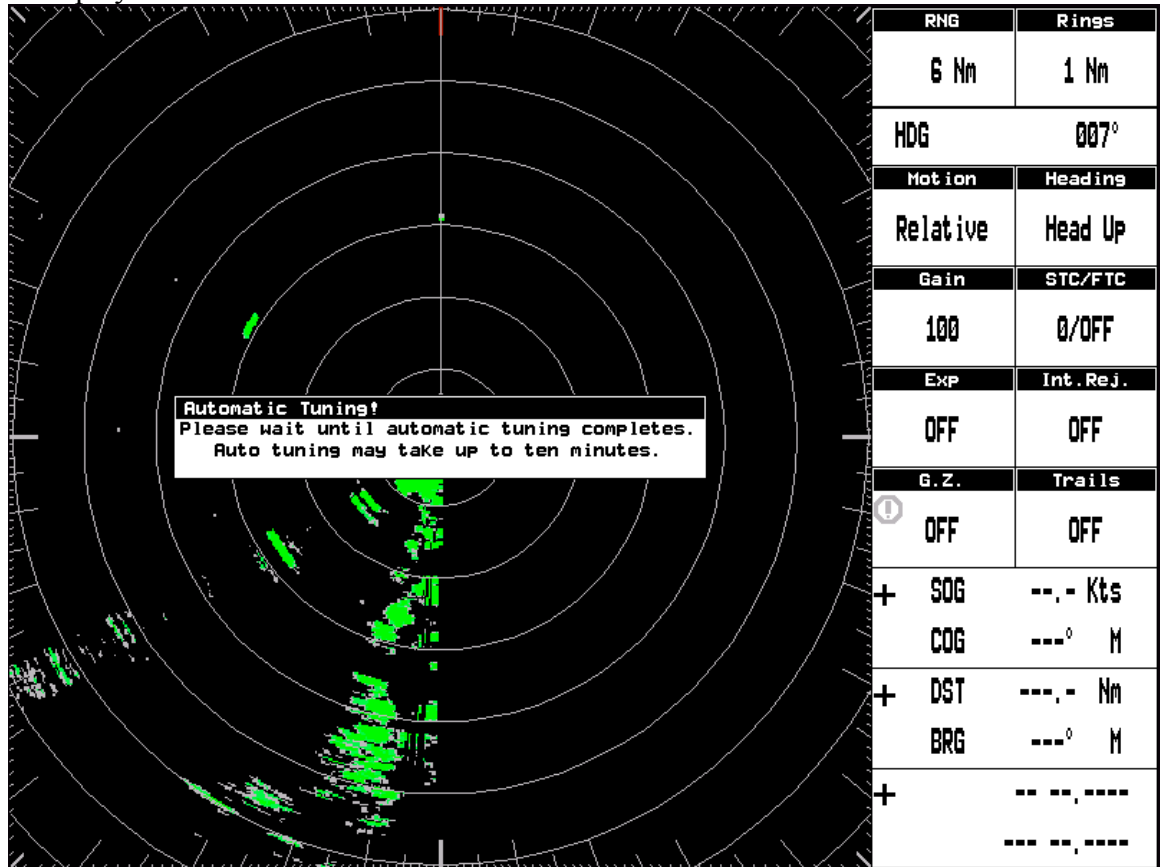
**WARNING**

Auto tuning may take up to ten minutes.  
Are you sure you want to continue?

RNG	Rings
24 Nm	4 Nm
<b>HDG</b> 007°	
Motion	Heading
Relative	Head Up
Gain	STC/FTC
82	67/OFF
Exp	Int. Rej.
OFF	OFF
G.Z.	Trails
OFF	OFF
+ SOG	--.- Kts
COG	---° M
+ DST	---.- Nm
BRG	---° M
+	-- --,----
	--- --,----

YES
NO

- Press ENTER to proceed, the Automatic Tuning starts and the following Window is displayed on the screen:



- When the auto Tuning completes the Warning Message is hidden and all radar functionalities return to be available.