GMR 420/620/1220/2520 xHD2 Series Field Service Manual

⚠ WARNING

The GMR 420/620/1220/2520 xHD2 series radar generates and transmits non-ionizing radiation. The radar must be turned off before approaching the scanner for service. Avoid looking directly at the scanner while it is transmitting, as the eyes are the most sensitive part of the body to electromagnetic radiation. **Before performing any bench test procedure, remove the antenna and install the antenna terminator provided in the Garmin Radar Service Kit (T10-00114-00).** Failure to install the antenna terminator will expose the service technician to harmful electromagnetic radiation that can result in personal injury or death.

The GMR 420/620/1220/2520 xHD2 series radar contains high voltages. The scanner must be turned off before the covers are removed. While servicing the unit, be aware high voltages are present and take the necessary precautions. The high voltages in the scanner can take some time to decay. Failure to adhere to this warning can result in personal injury or death.

DO NOT place the GMR 420/620/1220/2520 xHD2 series radar into a test mode for display purposes. When the antenna is attached, there is a danger of non-ionizing radiation. The test modes should only be used for troubleshooting purposes with the antenna removed and the antenna terminator in place.

The GMR 420/620/1220/2520 xHD2 series radar contains a magnetron. Persons with a cardiac pacemaker should not perform any service to the radar that may place them in close proximity to the magnetron. If a person with a cardiac pacemaker fails to adhere to the warning, there is a danger that the pacemaker may experience abnormal operation or failure.

Repairing and performing maintenance on Garmin electronics is complex work that can result in serious personal injury or product damage if not done correctly.

NOTICE

Use care when working near a magnetron with ferrous instruments. The strong magnetic force of the magnetron will attract ferrous instruments, and any contact with the magnetron could damage the magnetron. If possible, use stainless steel or titanium instruments when working near the magnetron. If specialty instruments are not available, use cardboard or a similar material to act as a shield between the magnetron and a ferrous instrument.

Garmin is not responsible for, and does not warrant, the work that you or a non-authorized repair provider perform on your product.

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Getting Started

Radar Software Update

Before using this manual to troubleshoot a problem, ensure all Garmin devices on the boat, including the chartplotter and the GMR 420/620/1220/2520 xHD2 radar, are operating on the latest-released software version. Software updates may resolve the problem.

Checking the Radar Software on a GPSMAP® 4000/5000/6000/7000 Series Chartplotter

1. Turn on the chartplotter.
2. Select **Configure** > **Communications** > **Marine Network**, and note the software version listed for the radar.
3. Go to www.garmin.com/support/software/marine.html.
4. Click on **See All Devices in this Bundle** under **Garmin Marine Network with SD Card** to see if your firmware is up-to-date.

Checking the Radar Software on a GPSMAP 7400/7600/8000 Series Chartplotter

1. Turn on the chartplotter.
2. Select **Settings** > **Communications** > **Marine Network**, and note the software version listed for the radar.
3. Go to www.garmin.com/support/software/marine.html.
4. Click on **See All Devices in this Bundle** under **Garmin Marine Network with SD Card** to see if your firmware is up-to-date.

Checking the Radar Software on a GPSMAP 700 Series Chartplotter

1. Turn on the chartplotter.
2. Select **Configure** > **System** > **System Information** > **Garmin Devices**, and note the software version listed for the radar.
3. Go to www.garmin.com/support/software/marine.html.
4. Click on **See All Devices in this Bundle** under **Garmin Marine Network with SD Card** to see if your firmware is up-to-date.

Updating the Radar Software

1. Download the latest update.
2. Using an SD Card Programmer and a appropriately-sized SD card, run the update file downloaded from the Web site.
3. Turn on the chartplotter.
4. Insert the SD card in the chartplotter, and agree to the update.

Radar Diagnostics Page

Opening the Radar Diagnostics Page on a 4000/6000 Series Chartplotter

1. From the Home screen, select **Configure** > **System**.
2. Hold **Menu** for four seconds.

   A menu item for **Radar** appears at the bottom of the list.
3. Select **Radar** to open the Radar Diagnostics page.

Opening the Radar Diagnostics Page on a 5000/7000 Series Chartplotter

1. From the Home screen, select **Configure** > **System**.
2. Hold the free space immediately to the left of **Simulator** for at least four seconds.

   A menu item for **Radar** appears at the bottom of the list.
3. Select **Radar** to open the Radar Diagnostics page.

Opening the Radar Diagnostics Page on a 7400/7600/8000 Series Chartplotter

1. From the Home screen, select **Settings** > **System** > **System Information**.
2. Hold the upper left corner of the system information box (where it shows the software version) for about three seconds.

   The **Field Diagnostics** menu appears in the list on the right.
3. Select **Field Diagnostics** > **Radar.**

Viewing a Detailed Error Log on a 7400/7600/8000 Series Chartplotter

The GMR 420/620/1220/2520 xHD2 keeps a log of reported errors, and this log can be opened using a 7400/7600/8000 series chartplotter. The error log contains the last 20 errors reported by the radar. If possible, it is recommened to view the error log while the radar is installed on the boat where the problem is encountered.

1. On a 7400/7600/8000 series chartplotter, open the radar diagnostics page.
2. Select **Radar** > **Error Log**.

Tools Needed

- Screwdrivers
  - Number 1 Phillips
  - Number 2 Phillips
  - 6 mm hex
  - 3 mm hex (preferably stainless steel or titanium to avoid damaging the magnetron)
- Sockets
  - 29 mm (remove network connector)
  - 13/16 in. (remove power connector)
- Digital Voltmeter (DVM)
- GPSMAP 4000/5000/6000/7000/8000 series chartplotter
- 12 Vdc power supply
- Radar service kit (T10-00114-00)

Troubleshooting

Errors on the GMR 420/620/1220/2520 xHD2 are reported on the chartplotter as an error message. When the radar reports an error, it may stop, go into standby mode, or continue operating, depending on the severity of the error. When an error is encountered, note the error message and perform the universal troubleshooting steps before proceeding with error-specific troubleshooting.

Universal Troubleshooting Steps

You must perform these troubleshooting steps prior to performing error-specific troubleshooting. You should perform these steps in order, and check to see if the error remains after performing each step. If the error remains after completing all of these steps, you should see the topic that corresponds to the error message you received.

1. Update the Garmin Network software (page 8).
2. Examine the radar power cable, the voltage regulator, if applicable, and connections on the radar and on the battery or fuse block.
3. Select an option:
   - If the cable is damaged or a connection is corroded, replace the cable or clean the connection.
   - If the cable is undamaged and the connections are clean, test the radar with a working power cable or voltage regulator.
4. Examine the Garmin Marine Network cable and connections on the radar and the chartplotter or GMS™ 10.
5. Select an option:
   - If the cable is damaged or a connection is corroded, replace the cable or clean the connection.
   - If the cable is undamaged and the connections are clean, test the radar with a working Garmin Marine Network cable.

Radar Satus LED

A status LED is located on the product label and it can help you troubleshoot installation issues.

Status LED Color and Activity	Radar Status
Solid red	The radar is getting ready for use. The LED is solid red briefly and changes to flashing green.
Flashing green	The radar is operating properly.
Flashing orange	The radar software is being updated.
Flashing red	The radar has encountered an error. Check a connected chartplotter to see if an error message is shown.

Error Codes and Messages

Major warning and severe error codes for the GMR 420/620/1220/2520 xHD2 radar appear on the chartplotter screen. These codes and messages can be helpful when troubleshooting the radar. In addition to the major warning and severe error codes, all error and diagnostic codes are also stored in an error log. You can view the log on a 7400/7600/8000 series chartplotter (page 2).

1002 - Hardware FPGA Interface Fault
1003 - Hardware FPGA Program Fault

1. Perform the universal troubleshooting steps (page 3).
2. If the problem persists, replace the processor PCB (page 11).

1004 - Input Voltage Low

1. Perform the universal troubleshooting steps (page 3).
2. Check the input voltage level, and make sure it meets the specification for the radar.

   NOTE: The voltage specification for the GMR 420/620/1220/2520 xHD2 is from 10 to 32 Vdc.
3. If a correction is made to the input voltage and the problem persists, perform the universal troubleshooting steps (page 3) again.
4. If the problem persists, replace the modulator PCB and magnetron (page 11).
5. If the problem persists, replace the processor PCB (page 11).

1005 - Input Voltage High

1. Perform the universal troubleshooting steps (page 3).
2. Check the input voltage level, and make sure it meets the specification for the radar.

   NOTE: The voltage specification for the GMR 420/620/1220/2520 xHD2 is from 10 to 32 Vdc.
3. If a correction is made to the input voltage and the problem persists, perform the universal troubleshooting steps (page 3) again.
4. If the problem persists, replace the processor PCB (page 11).

1006 - Heater Voltage Low
1007 - Heater Voltage High
1009 - High Voltage High
1011 - Transmit Current High

1. Perform the universal troubleshooting steps (page 3).
2. If the problem persists, replace the modulator PCB and magnetron (page 11).

1013 - System Temperature High

1. Perform the universal troubleshooting steps (page 3).
2. Check the temperature in the installed location, and make sure it meets the specification for the radar.

   NOTE: The temperature specification for the GMR 420/620/1220/2520 xHD2 is from -15 to 70°C (from 5 to 158°F).
3. If a correction is made to the temperature in the installed location and the problem persists, perform the universal troubleshooting steps (page 3) again.
4. If the problem persists, replace the processor PCB (page 11).

1015 - Modulator Temperature High

1. Perform the universal troubleshooting steps (page 3).
2. Check the temperature in the installed location, and make sure it meets the specification for the radar.

   NOTE: The temperature specification for the GMR 420/620/1220/2520 xHD2 is from -15 to 70°C (from 5 to 158°F).
3. If a correction is made to the temperature in the installed location and the problem persists, perform the universal troubleshooting steps (page 3) again.
4. If the problem persists, replace the modulator PCB and megnetron (page 11).

1017 - Modulator Status Fault, Modulator is Not Responding
1026 - Modulator Power Fault, Could Not Power Up the Modulator

1. Perform the universal troubleshooting steps (page 3).
2. Remove the electronics box (page 9).
3. Remove the procesor PCB (page 11).
4. Examine the connection between the modulator PCB and the connector on the bottom of the processor PCB.
7. Select an option:
   - If damage is present on the pins or connector, replace the damaged PCB.
   - If no damage is present, replace the modulator PCB and magnetron (page 11).

1018 - Heater Status Fault, Heater Current Low

NOTE: This message may not appear on the chartplotter, and may be included in the error log instead (page 2).

1. Perform the universal troubleshooting steps (page 3).
2. Open the pedestal housing (page 8).
3. Disconnect the magnetron cable from the MAGNETRON 2-WIRE port on the front of the electronics box.
4. Examine the magnetron cable.
5. Select an option:
   - If the magnetron cable is not connected securely to the MAGNETRON 2-WIRE port on the electronics box, secure the cable.
   - If the magnetron cable is damaged, replace the magnetron and modulator PCB (page 11).
   - If the cable is undamaged and was connected securely, disconnect the magnetron ground cable from the magnetron (page 9).
6. Remove the electronics box (page 9).
7. Remove the processor PCB from the electronics box (page 11) and examine the magnetron ground cable and modulator PCB.
8. Select an option:
   - If the magnetron ground cable is not connected securely to the modulator PCB and to the magnetron, secure the cable.
   - If the magnetron ground cable is damaged, replace the cable.
   - If the cable is undamaged, replace the modulator PCB and magnetron (page 11).

1023 - AFC Calibrate Time Out, Did Not Complete AFC Calibration
1024 - AFC Calibrate Failed, Could Not Complete AFC System

1. Perform the universal troubleshooting steps (page 3).
2. Open the pedestal housing (page 8).
3. Disconnect the magnetron cable from the MAGNETRON 2-WIRE port on the front of the electronics box.
4. Examine the magnetron cable.
5. Select an option:
   - If the magnetron cable is not connected securely to the MAGNETRON 2-WIRE port on the electronics box, secure the cable.
   - If the magnetron cable is damaged, replace the magnetron and modulator PCB (page 11).
   - If the cable is undamaged and was connected securely, disconnect the magnetron ground cable from the magnetron (page 9).
6. Remove the electronics box (page 9).
7. Remove the processor PCB from the electronics box (page 11) and examine the magnetron ground cable and modulator PCB.
8. Select an option:
   - If the magnetron ground cable is not connected securely to the modulator PCB and to the magnetron, secure the cable.
   - If the magnetron ground cable is damaged, replace the cable.
   - If the cable is undamaged, replace the modulator PCB and magnetron (page 11).
9. If the problem persists, replace the processor PCB (page 11).

1019 - Spin Up Time Out, Speed Did Not Reach Specified RPMs
1025 - Transmit Speed Lost, Could Not Maintain Rotation Speed

1. Perform the universal troubleshooting steps (page 3).
2. If the problem persists, with the radar still installed on the boat, turn on the radar, and begin transmitting.
3. Observe the antenna.
4. Select an option:
   - If the antenna rotates and you receive this error, proceed to the Antenna Rotates flowchart for further troubleshooting.
   - If the antenna does not rotate and you receive this error, proceed to the Antenna Does Not Rotate flowchart for further troubleshooting.

Antenna Rotates

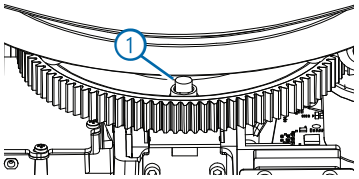
1. *Remove the antenna and install the antenna terminator (page 8).*
2. *Turn off the radar and open the pedestal housing (page 8).*
3. *Disconnect the cable from the MOTOR 12-PIN port on the electronics box.*
4. *Disconnect the other connectors on the cable from the motor controller PCB and the antenna position sensor PCB.*
5. *Examine the cable, connectors, and ports for damage.*
4. *Check the continuity of the cable with a volt/ohm meter.*

Is the cable or a port on a PCB damaged?

yes → *Replace the damaged cable, motor assembly (page 11), or the processor PCB (page 14).*

no

Use a ferrous instrument to verify that the hall-effect magnet ① is installed in the rotary joint drive gear.



Is the hall-effect magnet missing?

yes → *Install a replacement magnet (page 7) using a fast-acting adhesive. Make sure the north pole of the magnet faces up.*

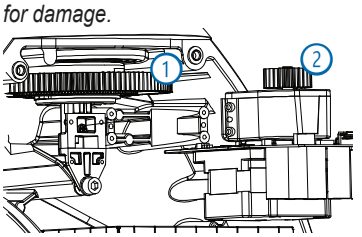
no

Replace the antenna position sensor PCB (page 10).

error unresolved → *Replace the processor PCB (page 11).*

Antenna Does not Rotate

1. *Turn off the radar, remove the antenna and install the antenna terminator (page 8).*
2. *Open the pedestal housing (page 8).*
3. *Inspect the antenna drive gear ① and the motor drive gear ② for damage.*



Is the motor drive gear damaged?

yes → *Replace the motor assembly (page 11).*

no

Is the antenna drive gear damaged?

yes → *Replace the pedestal housing (page 7).*

no

Rotate the antenna arm by hand and observe the motor drive gear.

Does the motor drive gear move smoothly and easily?

no → *Replace the motor assembly (page 11)*

yes

1. *Disconnect the cable from the MOTOR 12-PIN port on the electronics box.*
2. *Disconnect the other connectors on the cable from the motor controller PCB and the antenna position sensor PCB.*
3. *Examine the cable, connectors, and ports for damage.*
4. *Check the continuity of the cable with a volt/ohm meter.*

Is the cable or a port on a PCB damaged?

yes → *Replace the damaged cable, motor assembly (page 11), or the processor PCB (page 11).*

no

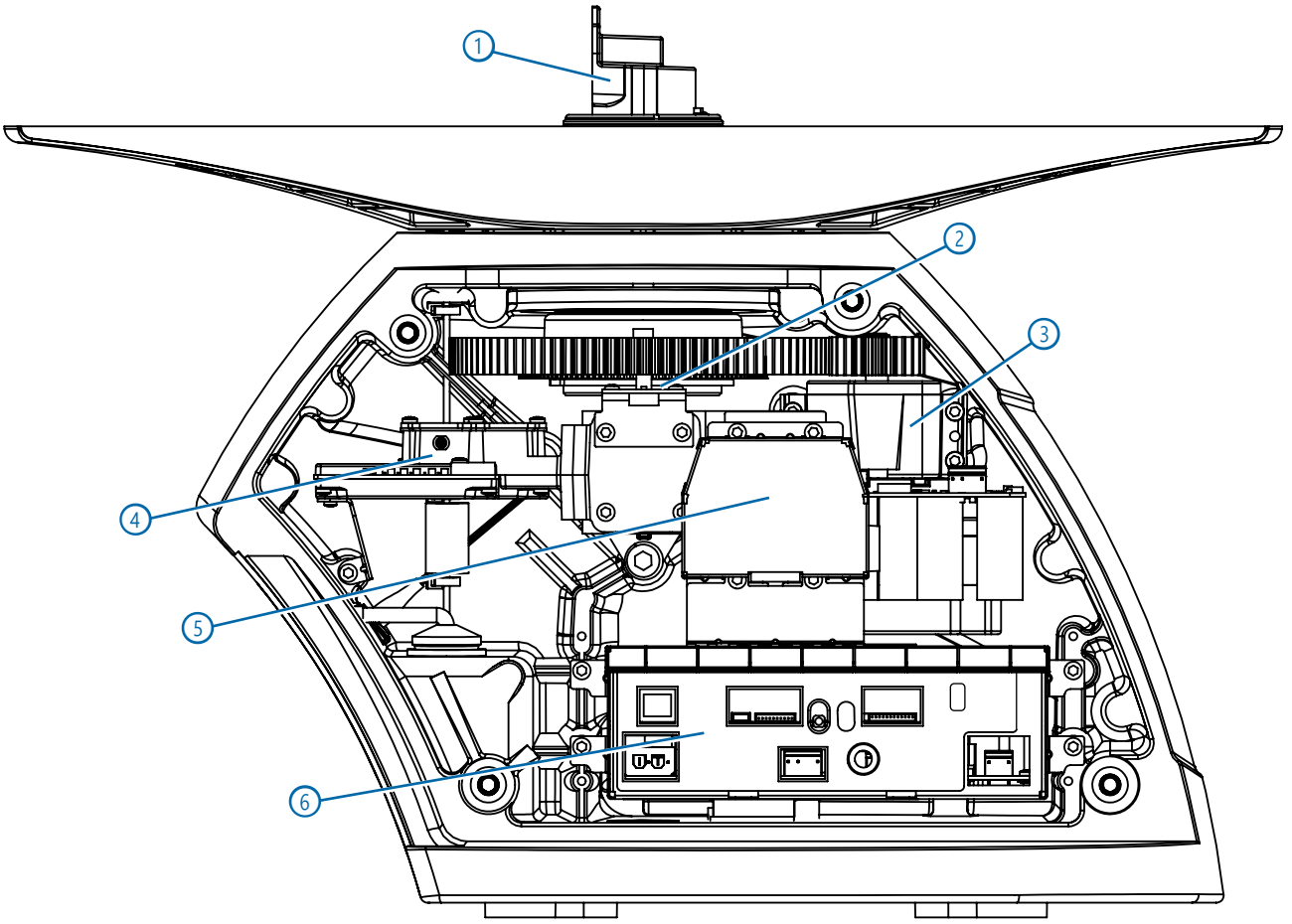
Replace the motor assembly (page 11).

error unresolved → *Replace the processor PCB (page 11)).*

Failure With No Error Code

Symptom	Possible Cause	Determination
The radar does not appear on the network-device list.	1. Network connection	1. Inspect the radar network cable for damage at both ends. • If possible, check the cable for continuity. • If the cable is damaged, repair or replace it. 2. If a GMS 10 is installed, check the LEDs for activity: • If there is no activity, check the network cable from the chartplotter to the GMS 10. • Repair or replace the GMS 10 or cable, if needed. 3. Inspect the internal network cable and connectors on the radar. 4. Repair or replace any cables, if needed.
	2. Power connection	1. With the Radar off, check the fuse in the system cable. 2. If the fuse is blown, replace it: • 420/620 xHD2 = 15A slow blow • 1220/2520 xHD2 = 10A slow blow 3. Check the power cable and connectors. 4. Repair, replace, or tighten the cable, if needed. 5. Verify that voltage (10 to 32 Vdc) is present at input to the External Voltage Converter or to the pedestal if no voltage converter is present. 6. Verify that voltage (10 to 32 Vdc) is present at the internal power cable. • Check connector and internal cable for damage and for continuity. • If no voltage is present, repair or replace the harness, if needed.
	3. External voltage converter	1. Verify that voltage (10 to 32Vdc) is present at the input to the external voltage converter. 2. If no voltage is present at the input to the external converter, make sure it is correctly wired to the boat battery according to the *GMR 420/620/1220/2520 xHD2 Series Installation Instructions*. 3. Measure the voltage on the power cable at the radar. 4. If no voltage is present, replace the converter.
	4. Processor PCB	1. Connect the radar to a working chartplotter, and turn it on. 2. If the radar does not appear on the network list, replace the processor PCB.
	5. Modulator PCB	Replace the modulator PCB if replacing the processor PCB does not resolve the issue.
There is no radar picture but no error messages are displayed.	1. Setup or configuration settings	Return the radar to factory default settings on the chartplotter.
	2. Antenna	Install a replacement antenna.
"Radar Service Lost" reported by chartplotter.	1. Power and network connections	Verify that all connections are tight on the radar, the network, and the battery.
	2. Main supply voltage	1. If the power wires are extended, make sure the wire gauge is correct for the extended distance, according to the *GMR 420/620/1220/2520 xHD2 Series Installation Instructions*. • If the wire gauge is too small, it may result in a large voltage drop. • Replace the extended wires with the correct gauge, if necessary.
	3. Processor PCB intermittent	1. Make sure the network and power cables both inside the pedestal and out are working. 2. If all of the cables and connections are working, replace the processor PCB.
The radar returns have poor sensitivity and sensitivity differences between ranges.	1. Setup or configuration settings	1. Return radar to factory default settings on the MFD.
	2. Antenna	1. Install a working antenna. 2. If the working antenna fixes the problem, replace the antenna.
	3. Magnetron	1. Install a working magnetron (and paired modulator PCB). 2. If the working magnetron fixes the problem, replace the magnetron (and paired modulator PCB).
	4. LNC	1. Install a working LNC. 2. If the working LNC fixes the problem, replace the LNC.

Major Component Locations



Item	Description	Note
1	Rotary joint	
2	Antenna position sensor PCB	
3	Motor/gearbox assembly	The motor controller PCB is in the center of the motor/gearbox assembly.
4	LNC	To remove the LNC, you must remove the magnetron/LNC/circulator assembly.
5	Magnetron	The magnetron can be removed without removing the magnetron/LNC/circulator assembly.
6	Electronics box	The electronics box contains the processor PCB and the modulator PCB.

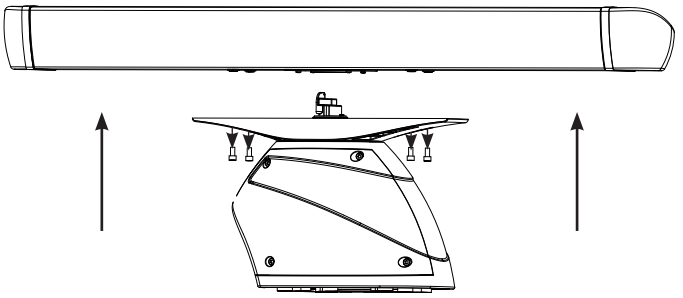
Radar Disassembly

Removing the Antenna

⚠ WARNING

Before you perform any service on the radar, you must remove the antenna to avoid potentially dangerous radiation.

1. Remove the four M8 screws and four split washers from under the antenna arm.
2. Lift up by applying pressure evenly on both sides of the antenna.



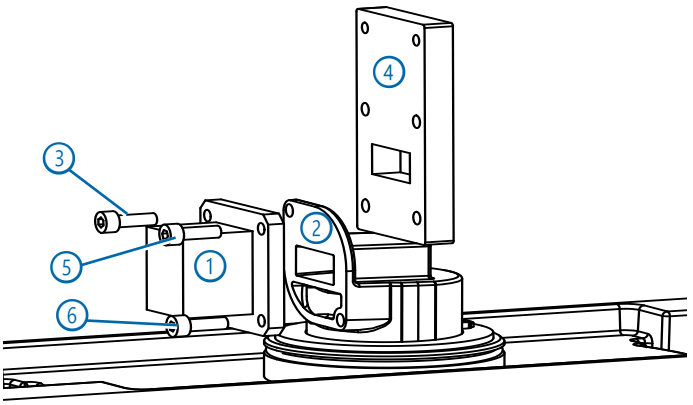
It should pull free easily.

Installing the Antenna Terminator

After removing the antenna, you must install the antenna terminator

The Garmin Radar Service Kit (T10-00114-00) contains the antenna terminator, a bracket, and three screws to hold it in place.

1. Hold the antenna terminator ① against the flat portion of the rotary joint ②.



2. Place one screw ③ through the hole in the top of the antenna terminator and the rotary joint, and fasten it to the threaded hole in the bracket ④ on the other side of the rotary joint.
3. Place another screw ⑤ through the hole in the top of the antenna terminator, and fasten it to the other threaded hole in the bracket on the other side of the rotary joint.
4. Place another screw ⑥ through the hole in the bottom of the antenna terminator into the smooth hole on the bottom of the rotary joint.

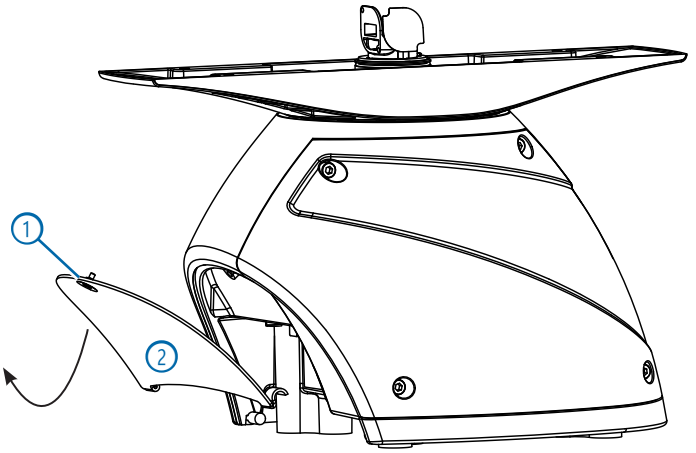
   Because the bottom hole on the rotary joint is not threaded, this screw does not fasten in place. It rests in the hole to prevent the antenna terminator or bracket assembly from shifting.

Opening the Pedestal Housing

You can open two doors on the pedestal housing, a small one on the front, and a large one on the side. The small door on the front allows you to reach the power and data connections going into the pedestal housing. The large door on the side allows you to reach the internal parts of the radar.

Removing the Front Door

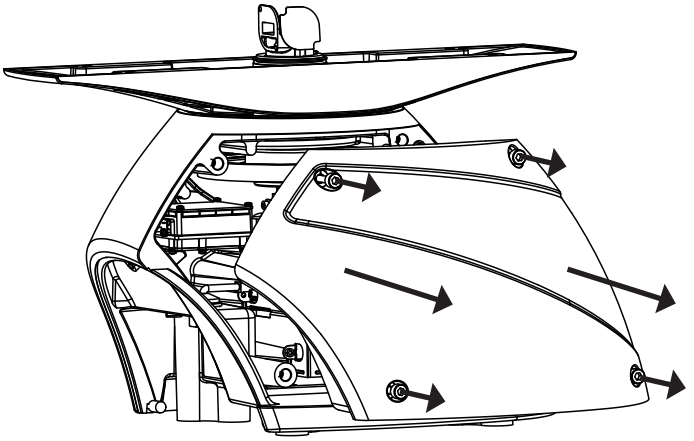
1. Remove the M4 screw ① from the top of the small door on the front of the pedestal housing.



2. Lift up on the small door ② as it opens to remove it.

Removing the Pedestal Door

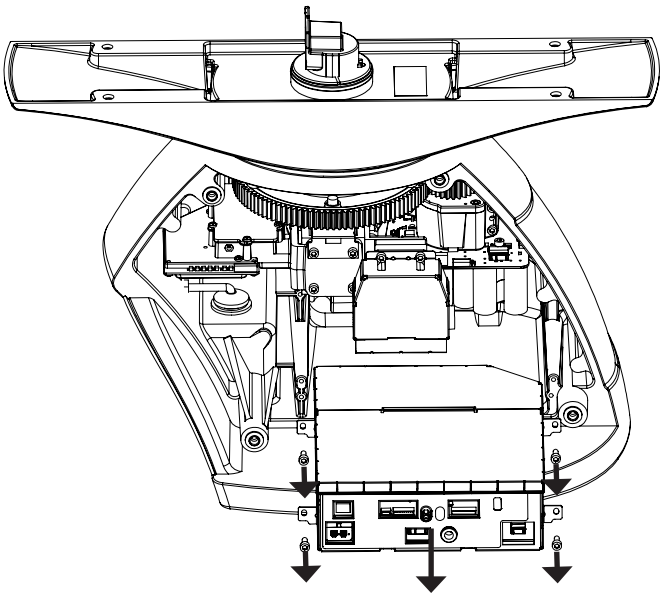
1. Remove the four M8 screws from the large door.
2. Pull the door away from the radar to remove it.



Removing the Electronics Box

The electronics box contains the processor PCB and the modulator PCB. You must remove the electronics box to reach these PCBs.

1. Disconnect the power from the radar.
2. Open the pedestal housing (page 8).
3. Disconnect all of the connectors from the ports on the front of the electronics box.
4. Disconnect the magnetron ground cable from the magnetron (page 9).
5. On a GMR 2520 xHD2, remove the magnetron and spacer (page 9).
5. Remove the four M4 screws from the corners of the electronics box.
6. Remove the electronics box from the pedestal housing.



Magnetron Considerations

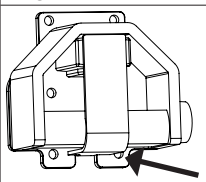
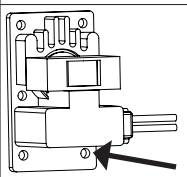
Different radar models use different magnetrons. When removing or replacing a magnetron, make sure you follow the correct instructions and order the correct magentron for your model of radar.

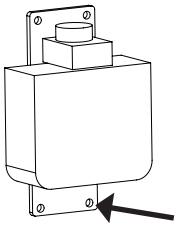
Because the magnetron and modulator PCB are tuned at the factory, a replacement magentron is paired with a tuned modulator PCB, and both must be installed when replacing one or the other.

Magnetron Ground Location

The MAGNETRON GND cable from the modulator PCB is connected to the magnetron a specific location to ensure proper grounding. The ground cable is secured to the magnetron using one of the screws that secures the magnetron to the magnetron/LNC/circulator assembly.

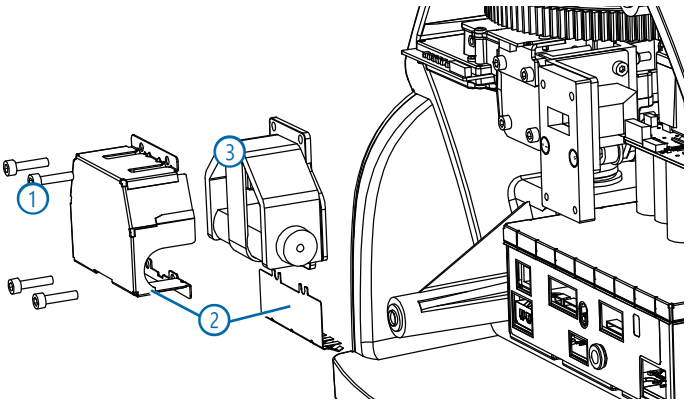
When disconnecting this cable from the magnetron, you must reconnect it at the proper location.

Model	Magnetron Ground Location
GMR 420 xHD2	
GMR 620/1220 xHD2	

GMR 2520 xHD2	

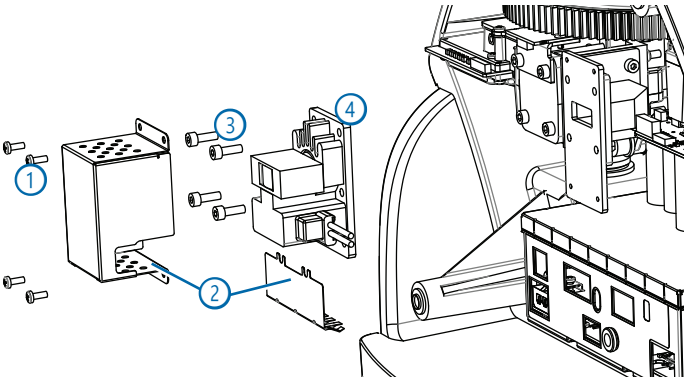
Removing the Magnetron from a GMR 420 xHD2

1. Disconnect the power from the radar.
2. Open the pedestal housing (page 8).
3. Disconnect the magnetron cable from the MAGNETRON 2-WIRE port on the front of the electronics box.
4. Remove the four screws ① that secure the magnetron cover ② and magnetron ③.



Removing the Magnetron from a GMR 620/1220 xHD2

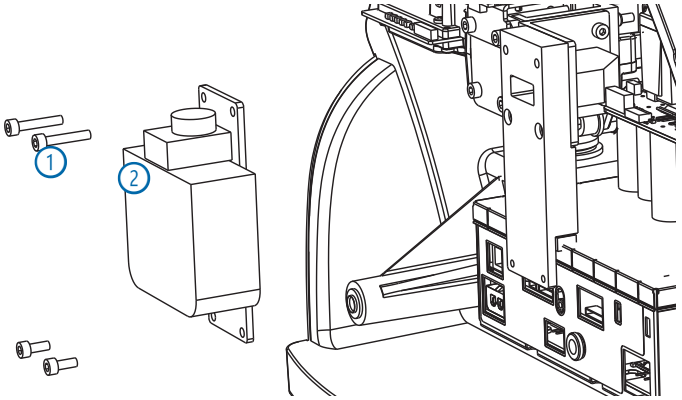
1. Disconnect the power from the radar.
2. Open the pedestal housing (page 8).
3. Disconnect the magnetron cable from the MAGNETRON 2-WIRE port on the front of the electronics box.
4. Remove the four screws ① that secure the magnetron cover ②.



5. Remove the four screws ③ that secure the magnetron ④.

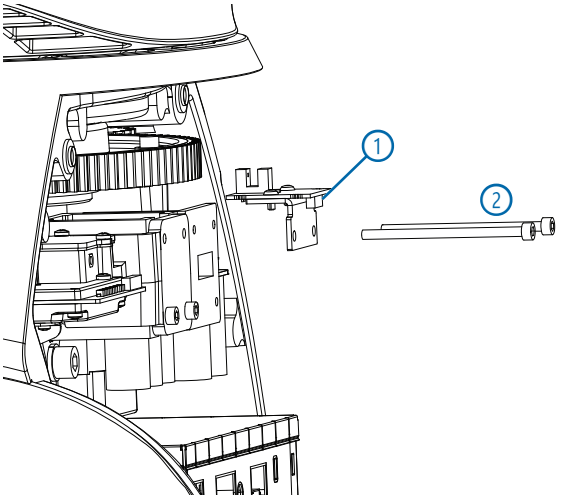
Removing the Magnetron from a GMR 2520 xHD2

1. Disconnect the power from the radar.
2. Open the pedestal housing (page 8).
3. Disconnect the magnetron cable from the MAGNETRON 2-WIRE port on the front of the electronics box.
4. Remove the four screws ① that secure the magnetron ②.



Removing the Antenna Position Sensor PCB

1 Disconnect the power from the radar.
2 Open the pedestal housing (page 8).
3 Disconnect the cable from the antenna position sensor PCB ①.



4 Remove the top two M4×60 screws that secure the antenna position sensor bracket to the magnetron/LNC/circulator assembly ②.
5 Remove the antenna position sensor bracket.

The Magnetron/LNC/Circulator Assembly

The magnetron, LNC, and circulator are connected, so you may need to remove the assembly to reach the individual parts.

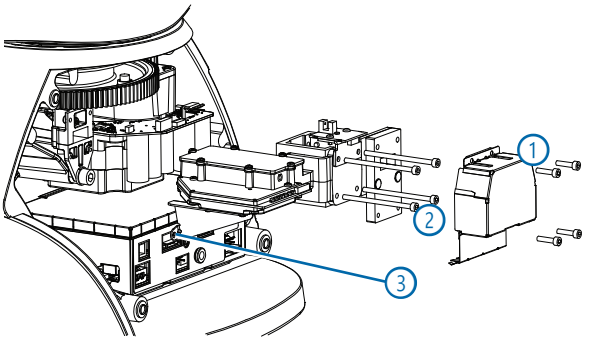
This assembly to must be removed to reach the motor assembly.

Depending on the model of radar, the removal procedures are different, due to the type of magentron.

NOTE: The magnetron can be removed from the housing without removing the entire manetron/LNC/circulator assembly (page 9).

Removing the Magnetron/LNC/Circulator Assembly from a GMR 420 xHD2 radar

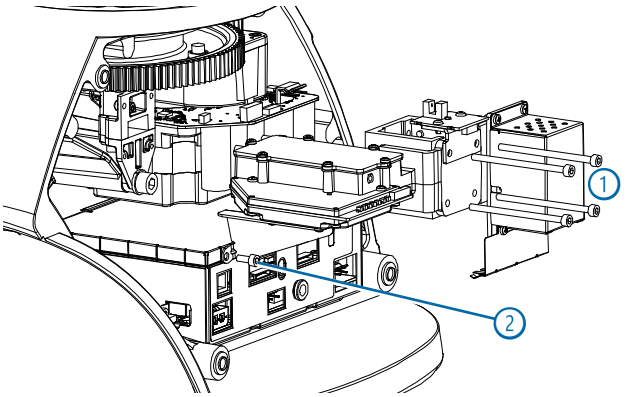
1 Disconnect the power from the radar.
2 Open the pedestal housing (page 8).
3 Disconnect the cable from the antenna position sensor PCB
4 Disconnect the cables from the LNC 10-PIN, LNC COAX, and MAGNETRON 2-WIRE ports on the front of the electronics box.
5 Remove the magnetron cover and magnetron by removing the four screws connecting it to the LNC/circulator assembly ①.
6 Remove the five screws connecting the assembly to the pedestal housing.
   - Four of the screws ② are located in the center of the assembly.
   - One of the screws ③ is recessed on the LNC.



7 Pull out the assembly.

Removing the Magnetron/LNC/Circulator Assembly from a GMR 620/1220 xHD2 Radar

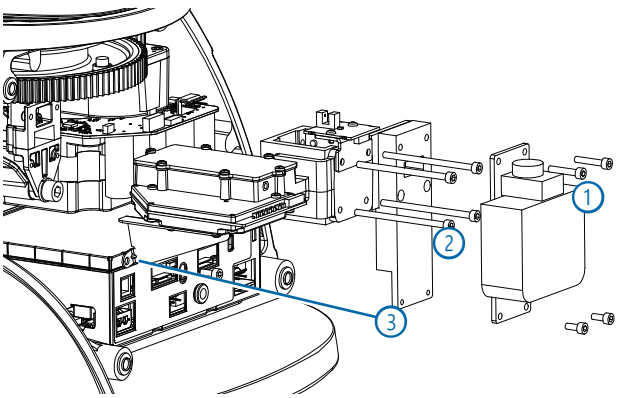
1 Disconnect the power from the radar.
2 Open the pedestal housing (page 8).
3 Disconnect the cable from the antenna position sensor PCB
4 Disconnect the cables from the LNC 10-PIN, LNC COAX, and MAGNETRON 2-WIRE ports on the front of the electronics box.
5 Disconnect the ground wire from the magnetron (page 9).



6 Remove the five screws connecting the assembly to the pedestal housing.
   - Four of the screws ① are located in the center of the assembly.
   - One of the screws ② is recessed on the LNC.
7 Pull out the assembly.

Removing the Magnetron/LNC/Circulator Assembly from a GMR 2520 xHD2 Radar

1 Disconnect the power from the radar.
2 Open the pedestal housing (page 8).
3 Disconnect the cable from the antenna position sensor PCB
4 Disconnect the cables from the LNC 10-PIN, LNC COAX, and MAGNETRON 2-WIRE ports on the front of the electronics box.
5 Remove the magnetron by removing the four screws connecting it to the LNC/circulator assembly ①.

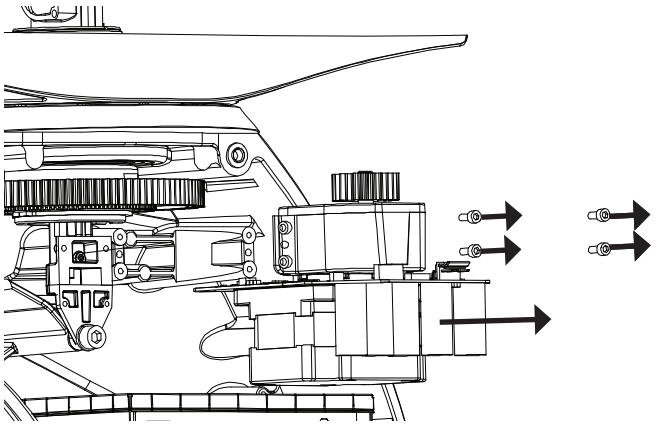


6 Remove the five screws connecting the assembly to the pedestal housing.
   - Four of the screws ② are located in the center of the assembly.
   - One of the screws ③ is recessed on the LNC.
7 Pull out the assembly.

Removing the Motor Assembly

You must remove the magnetron/LNC/circulator assembly to reach the motor assembly (page 10).

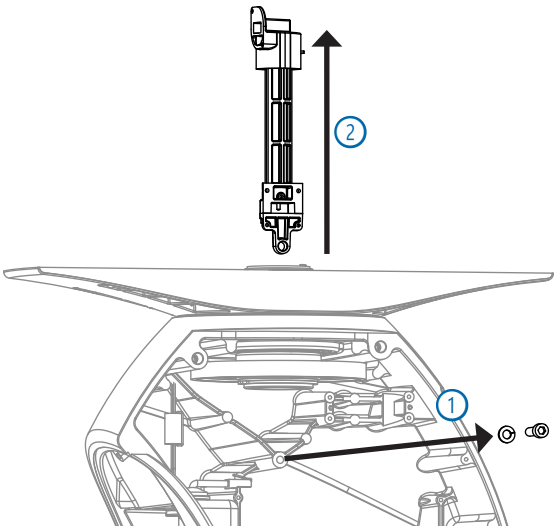
1 Remove the four screws from the corners of the gearbox.
2 Pull out the assembly.



Removing the Rotary Joint

Before you can remove the rotary joint, you must remove the magnetron/LNC/circulator assembly (page 10).

1 Remove the screw and lock washer ① at the base of the rotary joint.



2 Lift up on the rotary joint ② to remove it from the pedestal housing.

Removing the Internal Power and Network Cables

1 Open the pedestal housing.
2 Select an option:
   - Disconnect the power cable from the POWER IN port on the front of the electronics box.
   - Disconnect the network cable from the NETWORK port on the front of the electronics box.
3 Select an option.
   - To disconnect the power cable the power cable, use a 13/16 in. socket.
   - To disconnect the network cable, use a 29 mm socket.
4 Use the appropriate socket to loosen the connector on the outside of the pedestal housing
5 Remove the plastic nut from the connector on outside of the pedestal housing.

   The cable pulls free on the inside of the housing.

Disassembling the Electronics Box

After you remove the electronics box from the pedestal housing (page 9), you can reach the processor PCB and the modulator PCB.

You must remove the processor PCB before you can reach the modulator PCB.

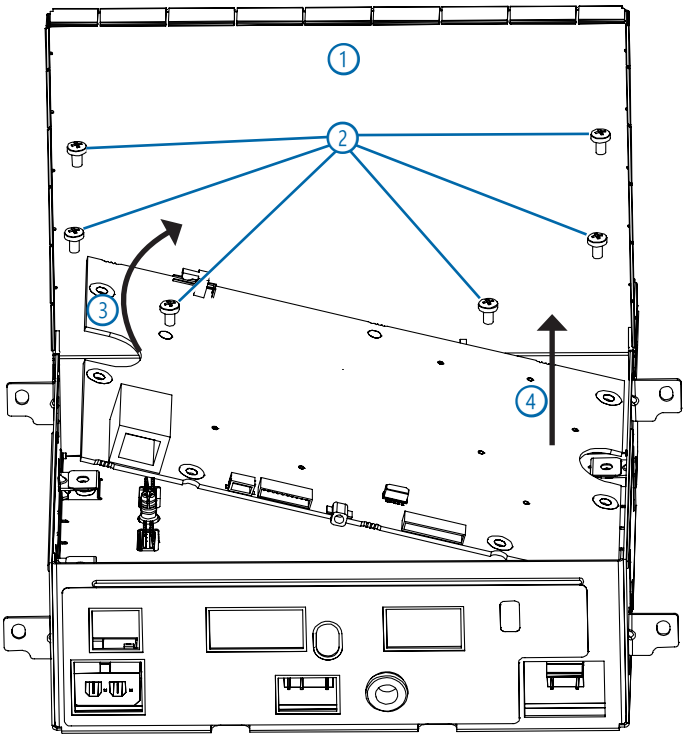
⚠ WARNING

The modulator PCB contains high voltages. While servicing the electronics box, be aware high voltages are present and take the necessary precautions. The high voltages can take some time to decay. Failure to adhere to this warning can result in personal injury or death.

Removing the Processor PCB

Before you can remove the processor PCB from the electronics box, you must disconnect all cables except the MAGNETRON GND cable from the ports on the front of the electronics box, if necessary.

1 Open the lid of the electronics box ①.

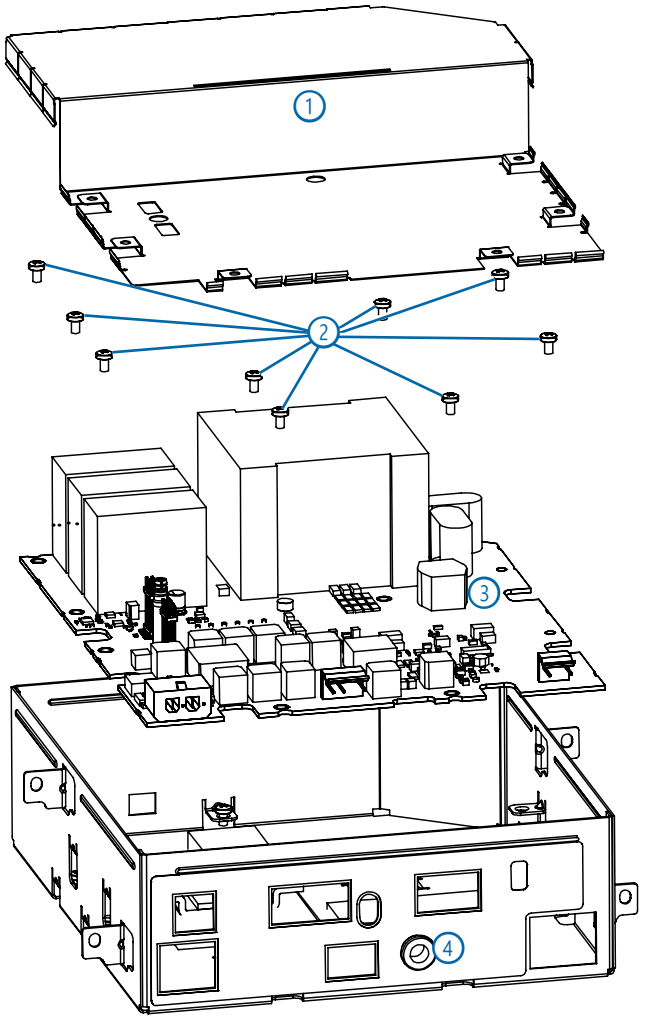


2 Remove the four M3 screws ② that fasten the processor PCB to the electronics box.
3 Pull up on the left side of the processor PCB ③ to disconnect it from the modulator PCB below.
4 Remove the processor PCB from the electronics box ④.

Removing the Modulator PCB

Before you can remove the modulator PCB, you must remove the processor PCB.

1 Remove the divider/lid ① from the the electronics box.



2 Remove the nine M3 screws (2) that connect the modulator PCB to the electronics box.

3 Remove the M3 screw that connects the magnetron ground cable to the modulator PCB (3).

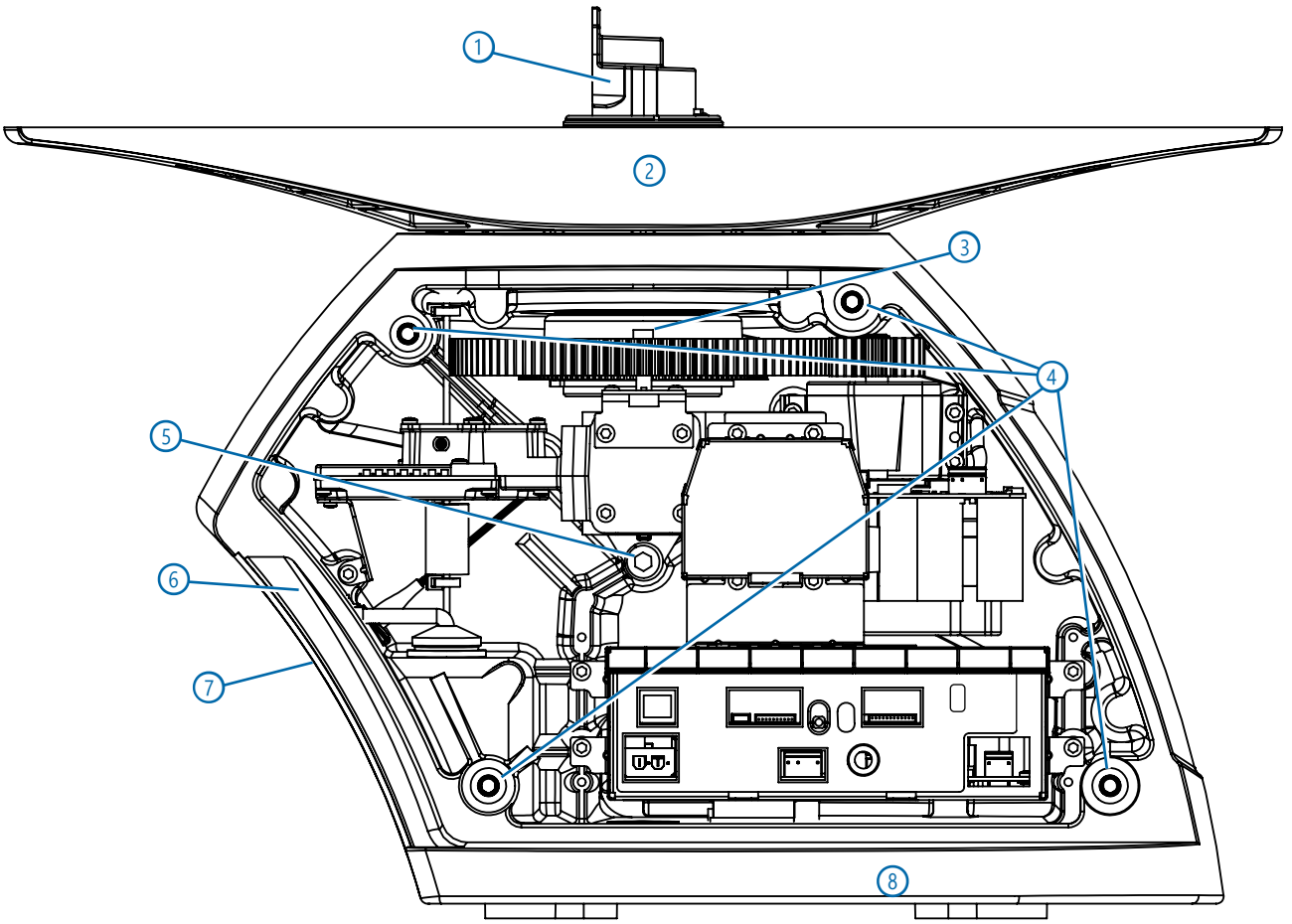
4 Pull the magnetron ground cable through the MAGNETRON GND port on the electronics box.

5 Lift the modulator PCB from the electronics box.

NOTE: Because the modulator PCB and magnetron are tuned at the factory, a replacement tuned modulator PCB is paired with magentron, and both must be installed when replacing one or the other.

Service Parts

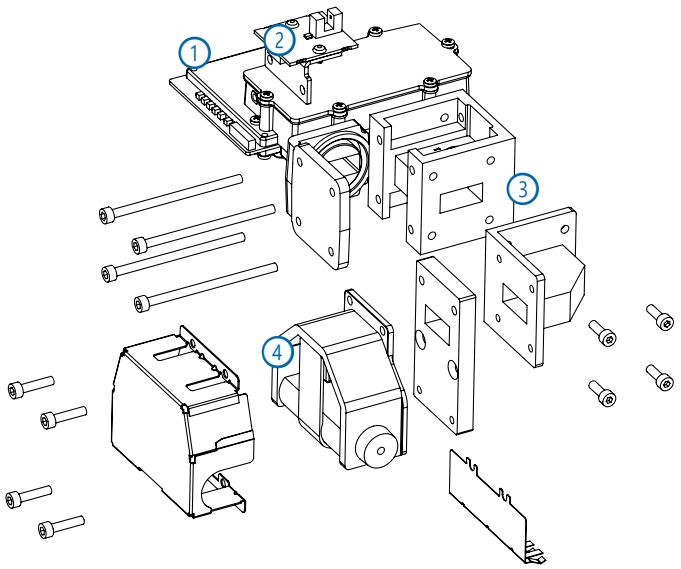
Pedestal Housing



Number	Description	Kit Number
1	Rotary joint	S00-00600-07
2	External antenna rotor	(Part of pedestal housing)
3	Hall effect magnet	S00-00600-11
4	Side panel securing hardware • Screw (M8) • Split washer (M8) • Flat washer (M8)	Included in side panel replacement kit
5	Rotary joint securing hardware • Screw (M8) • Split washer (M8)	Included with replacement rotary joint.
6	Pedestal grounding hardware Depending on the version of the pedestal, you may need to use either M3 or M4 grounding hardware. A set of each is included in the kit. • Screw (M3 and M4) • Washer (M3 and M4) • Locking washer (M3 and M4)	S00-00600-05
7	Front access panel	S00-00382-00
8	Pedestal housing	S00-00600-08
	Side panel (not shown)	S00-00600-04

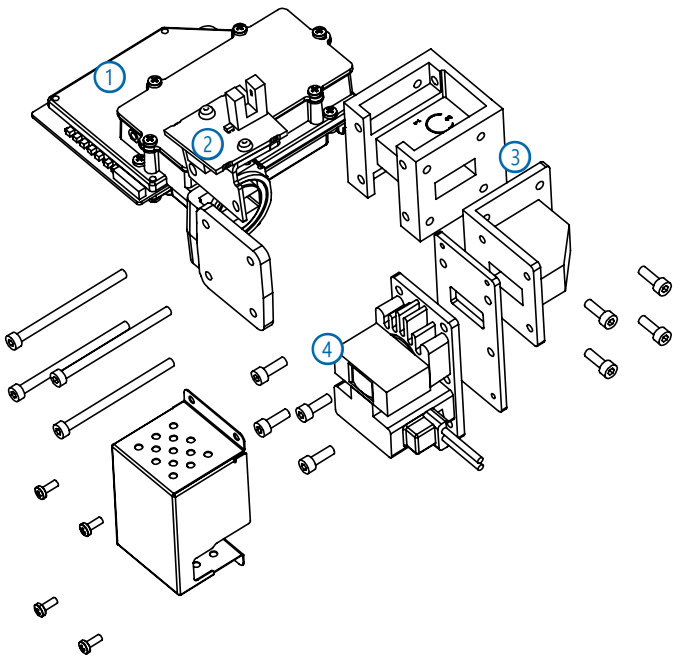
Magnetron, LNC, and Circulator

GMR 420 xHD2



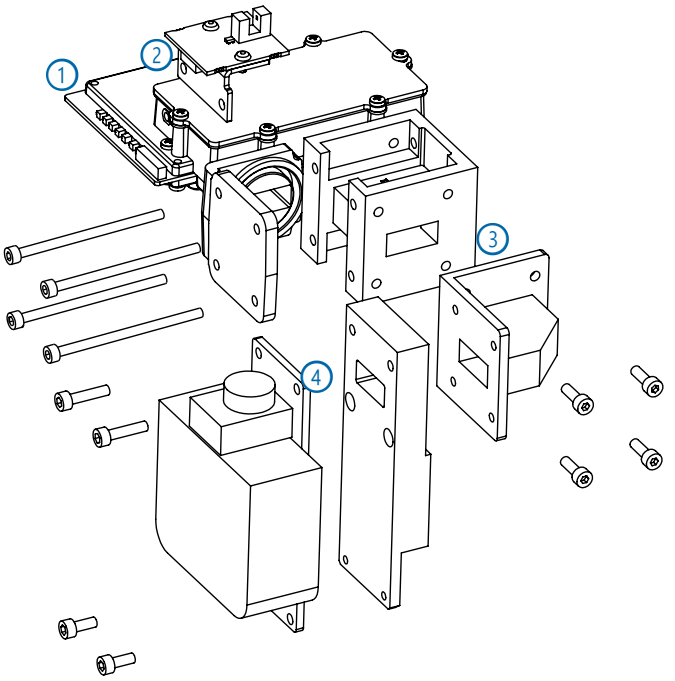
Item	Description	Kit Number
1	LNC	S00-00312-00
2	Antenna position sensor bracket and PCB	S00-00600-09
3	Circulator assembly: GMR 420 xHD2	S00-00600-13
4	Magnetron and paired modulator PCB: GMR 420 xHD2 Magnetron and paired electronics box: GMR 420 xHD2	S00-00600-01 S00-00600-17

GMR 620/1220 xHD2



Item	Description	Kit Number
1	LNC	S00-00312-00
2	Antenna position sensor bracket and PCB	S00-00600-09
3	Circulator assembly	S00-00600-14
4	Magnetron and paired modulator PCB: GMR 620 xHD2 Magnetron and paired modulator PCB: GMR 1220 xHD2 Magnetron and paired electronics box: GMR 620 xHD2 Magnetron and paired electronics box: GMR 1220 xHD2	S00-00600-02 S00-00600-03 S00-00600-18 S00-00600-19

GMR 2520 xHD2



Item	Description	Kit Number
1	LNC	S00-00312-00
2	Antenna position sensor bracket and PCB	S00-00600-09
3	Circulator assembly	S00-00600-14
4	Magnetron and paired modulator PCB Magnetron and paired electronics box	S00-00600-15 S00-00600-20

Motor Assembly

The motor assembly kit includes the mounting screws.

Description	Kit Number
GMR 420/620/1220/2520 xHD2 motor assembly kit	S00-00600-16

Electronics

Processor PCB

The same processor PCB is used across all GMR 420/620/1220/2520 xHD2 radar units. The screws are not included in the processor PCB kit.

Description	Kit Number
GMR 420/620/1220/2520 xHD2 processor PCB	S00-00600-00

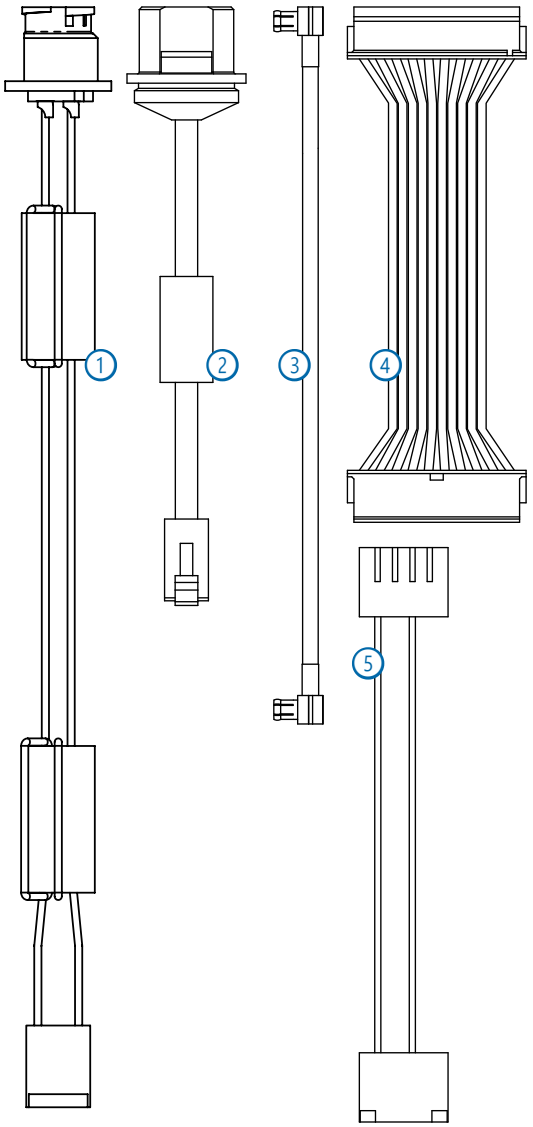
Modulator PCB

Because the modulator PCB and magnetron are tuned at the factory, a replacement tuned modulator PCB is paired with magentron, and both must be installed when replacing one or the other.

All of the screws and thermal pads are included in the modulator PCB kit, along with the paired magnetron.

Description	Kit Number
GMR 420 xHD2 Modulator PCB and paired magnetron	S00-00600-01
GMR 620 xHD2 Modulator PCB and paired magnetron	S00-00600-02
GMR 1220 xHD2 Modulator PCB and paired magnetron	S00-00600-03
GMR 2520 xHD2 Modulator PCB and paired magnetron	S00-00600-15

Cables



Item	Description	Kit Number
1	Internal power cable	S00-00600-10
2	Internal network cable	S00-00319-00
3	LNC coaxial cable	S00-00322-00 (cables kit)
4	LNC data cable	S00-00322-00 (cables kit)
5	Motor power cable	S00-00322-00 (cables kit)

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