

# Maintenance



## Maintenance Activities

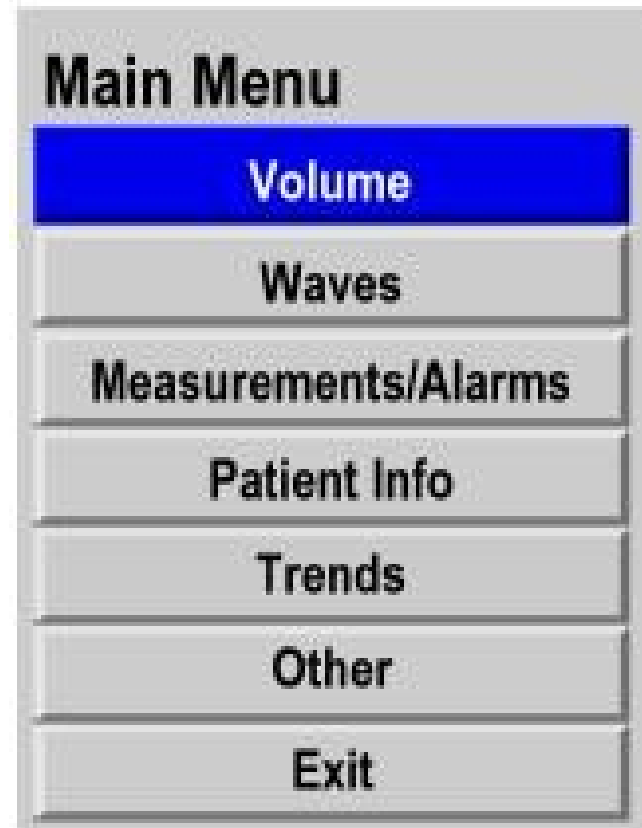
- Observe Ready for Use indicator.
- Perform Operational Checks.
- Care for batteries.
- Clean MRx and order supplies and accessories.
- Call service for calibration of CO<sub>2</sub> and NBP.

## Automated Tests

Test Name	Description:	Frequency
Hourly	Tests batteries &/or internal power supplies.	Hourly.
Daily	Hourly plus defib (low energy internal discharge), pacing, ECG SpO <sub>2</sub> , CO <sub>2</sub> , NBP and printer. ECG cable, if attached.	Daily, at midnight.
Weekly	Daily plus delivers a high energy internal discharge.	Weekly on Sunday, at midnight.

## Automated Test Summary

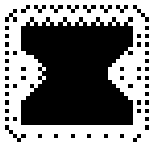
- Can print automatically at completion of tests.
- Print at other times by selecting **Other** from the main menu, then **Operational Check**, then **Automated Test Summary**.



# Automated Test Summary Results

Result	Definition	Required Action
Pass	All tests passed.	None
CF	A critical failure was detected. Critical failures impact lifesaving functionality (defibrillation, pacing, ECG acquisition). RFU displays a solid red “X” and chirps.	Respond to the RFU indicator.
NCF	A non-critical failure was detected. Non-critical failures do not impact life-saving functions.	Turn the MRx to Monitor and observe the inop statement(s).

## Ready For Use Indicator



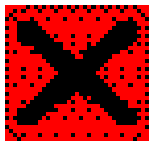
**Blinking Black Hourglass** – shock, pacing, and ECG are ready for use and sufficient battery power is available.



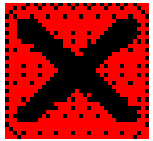
**Blinking Red X with a periodic chirp** – low battery that is not being charged.



**Blinking Red X without a periodic chirp** – low battery that is being charged.



**Solid Red X with a chirp** – a failure has been detected that prevents delivery of a shock, pacing, or ECG acquisition.



**Solid Red X without a chirp** – No power or device failure.

# Operational Check

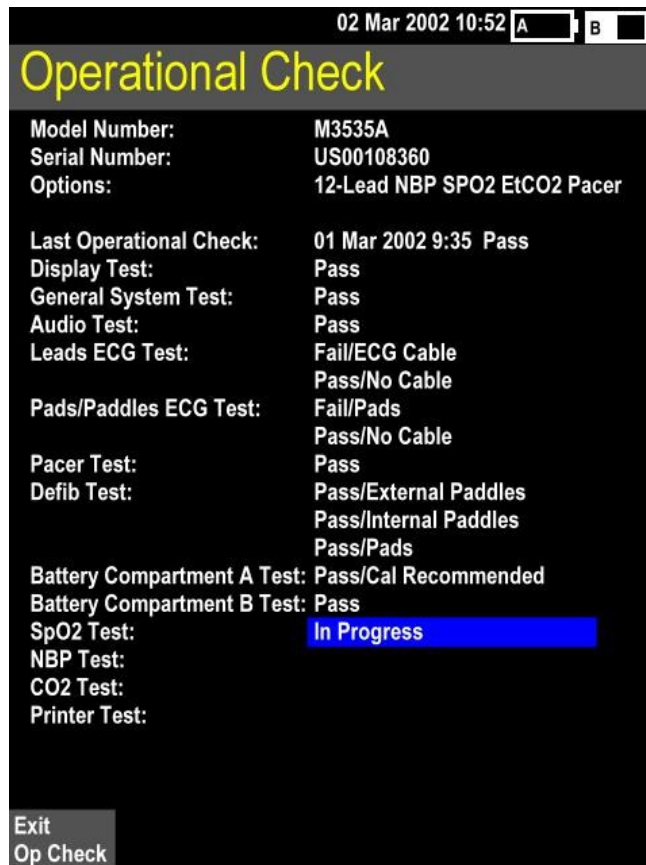
1. Performs a Weekly test plus verifies:
  - Therapy cables
  - ECG cables
  - Paddles
  - Buttons
  - Audio
  - Display
2. Prompts for check of supplies and accessories.
3. Notifies you if NBP or CO2 calibration is due.
4. Should be performed at least daily.

## Performing an Operational Check

1. Disconnect from AC/DC power.
2. Attach pads or paddles.
3. Attach an ECG cable.
4. Turn the Therapy Knob to Monitor.
5. Select **Other** from the Main menu.
6. Select **Run Operational Check**.
7. Respond to the prompts.



## Operational Check (cont.)



- Tests are displayed as they run.
- Be sure to test all therapy cables used.
- Rerun the check if additional ECG cables need to be tested.
- Refer to the Instructions for Use on actions to take for failed tests.
- Batteries pass if  $\geq 20\%$  capacity.

# Operational Check Report

Operational Check Report	Current Test Results:	
Model Number: M3535A	Display Test: Pass	NBP Test: Pass
Serial Number: USD00123456	General System Test: Pass	CO2 Test: Pass
Options: 12-Lead NBP SpO2 EtCO2 Pacer	Audio Test: Pass	Printer Test: Pass
SW: A.00.00	Leads ECG Test: Pass/ECG Cable	
	Pads/Paddles ECG Test: Pass/Pads	
Current Operational Check:	Pacer Test: Pass	
DD Mon YYYY HH:MM:SS	Defib Test: Pass/External Paddles	
	Battery Compartment A Test: Pass	
Last Checked On:	Battery Compartment B Test: Pass	
DD Mon YYYY HH:MM:SS:Pass/Fail	SpO2 Test: Pass	

Qty/Check List	___ CO2 FilterLine	Comments:
___ Defibrillator Inspection		<div style="border: 1px solid black; height: 150px; width: 100%;"></div>
___ Cables/Connectors		
___ Paddles/Pads		
___ Monitoring Electrodes		
___ Charged Batteries		
___ AC/DC Power & Cord		
___ Printer Paper		
___ Data Card		
___ SpO2 Sensor		
___ NBP Cuffs & Tubing		
Inspected by: _____		

## User Checks

- **Defibrillator** – clean, no damage.
- **Cables/connectors/paddles/electrodes** – no cracks, broken wires, damage; good connections; not expired.
- **Batteries** – charged and spare available.
- **AC Power** – indicator lights when no battery.
- **Printer paper** – sufficient paper and acceptable print quality.
- **Data card** – inserted, if needed.
- **SpO2 sensor/cable** – no damage.
- **NBP cuff and tubing** – no damage
- **CO2 FilterLine** – unopened, sterile package available.

# Operational Check Summary

Shows results of the last 60 Operational Checks.

To print:

1. Select **Other** from the Main menu.
2. Select **Op Check Summary**.
3. Press the **[Print]** soft key.

# Battery Maintenance

## Activity

## When to Perform

Perform a visual inspection.

As part of the Operational Check.

Charge the battery.

Upon receipt, after use, or if the message Batteries Low is displayed.

Perform a calibration.

When the Operational Check test results state Calibration recommended, or every 6 months.

Store batteries in a state of charge in the range of 20% - 30%.

When not in use for an extended period of time

Discard the battery.

When there are visual signs of damage or calibration reports less than 70% capacity.

## Charging Batteries

- Charge in either the MRx or a Philips approved battery support system.
- When charging in the MRx, use either AC or DC power.
- The External Power indicator is lit when the MRx is charging.
- It takes approximately 2 hours to charge a fully discharged battery to 80% of its capacity in the MRx; 3 hours to 100%.

## Charge Status

Check the batteries charge by:

- Pushing the battery fuel gauge button. Each LED represents a charge of approximately 20% capacity.
- Turning the Therapy Knob to any mode of operation and observing the battery power indicators displayed in the General Status area.

## Battery Calibration

- Checks to see if the battery is nearing its useful end of life and should be discarded.
- Ensures the fuel gauge is accurate, based on the total capacity.
- Performed by selecting Other from the Main menu, then Battery Calibration.
- Takes approximately 11 hours in the MRx, significantly less in a battery a battery support system.
- Discard the battery if the capacity is < 70%.