Title: Dash 3000 Patient Monitor	Date: 11-22-2018
By: GE	**DISCLAIMER: THIS PROCEDURE PROVIDED "AS IS" AND WITH POSSIBLE FAULTS. USER MUST VERIFY BEFORE USE. NEITHER PROVIDER NOR WEBSITE ASSUMES ANY RESPONSIBILITY FOR ITS USE.**
File = Dash3000-draft.doc	
Note: Very preliminary but released due to no units available for future clarifications.	

1. General
   Applies to GE Marquette Dash 3000 Patient Monitor

2. Reference Documents
   Dash 3000/4000 Service Manual -- P/N 2000966-174
   Dash 3000/4000/5000 Operator's Manual
   P/N 2023896-026 or 2000966-338A

3. Tools / Accessories
   Digital Manometer, Blood Pressure Simulator,
   Temperature Calibration Key
   Temperature probe, SP02 probe, cuff with hose.
   ECG Simulator

4. Basic PM Procedure

   4.1. Physical Inspection
   If necessary, wipe down with a weak disinfectant or a 5% bleach solution (careful around the buttons).
   Check case, power cord, accessory cords, and hoses for integrity.

   4.2. Battery Quick Check:
   This may be done with power plugged in or not.
   Go to <MORE MENUS> , <BATTERY STATUS>. Note the charge level for A and B.

   4.3. Time and Date Check/Change
   Initiate the monitor's internal setup by using the selector (Trim) knob to choose <Main Menu>, <Monitor Setup>, <Service Mode>. The password is a function of the displayed date (in fine print on upper left hand corner of display). For example, if the date is Apr 27, enter 2 7 0 4. Again choose <Service Mode>. Check date and time and update if necessary.

   Use the TRIM KNOB to select <Time and Date>. When selected, the date item will flash. After making the desired date change, repeat the drill for time if necessary.

   4.4. ECG CHECK
   Connect the (usually 5) ECG leads to a simulator. If necessary enable QRS beep tones by: Use rotator selector to **not** choose MORE MENUS, but instead rotate until the "ECG" label next to the ECG waveforms highlights; select it and a new set of menus will appear below. Select MORE ECG and then QRS VOLUME. At this point various volume levels, including OFF, can be selected. Does the heart-rate display match the simulator? Removal of even one ECG lead will replace the regular beeps with an alarm tone.

4.5. Printer Check
With an ECG waveform on the display, simply push the Print button. The printer will deliver paper at the rate. If no lines occur, be sure paper roll is inserted properly.

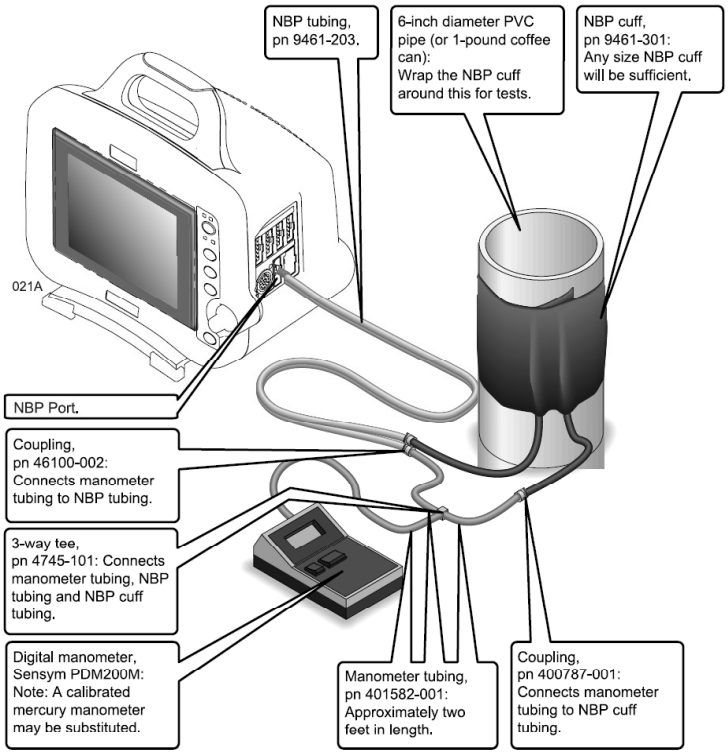
4.6. SpO2 Functional Check (if supplied). T
Use SpO2 simulator to check the SpO2 functionality (including heart rate). Otherwise, the average healthy person will normally measure in the high 90's as a reference. Also, note that the heart rate display section correctly indicates the subject's heart rate.

4.7. NIBP Quick Check
Connect the two pressure lines to an appropriate cuff including a blood pressure simulator. Check at normal, low, and high pressure settings.

Note: If first results are unsatisfactory, it may be necessary to swap the cuff hoses and repeat the test, especially at high pressure. Check for o-rings in hose connector.

Optional: Perform BP check on human subject.
If needed, the pressure calibration procedure follows below.

4.8. Pressure Accuracy (Zero Calibration)
Using the Trim Knob control, access the SERVICE MODE menu starting from the MAIN menu.
1. Select MORE MENUS-> MONITOR SETUP-> SERVICE MODE.
2. Enter password using the Trim Knob control to select the day and month from monitor screen with leading zeros. (e.g. July 4 = 0407 i.e., day first, month).
3. Select CALIBRATE-> CALIBRATE NBP-> CAL ZERO OFF->START.
4. The text on the menu item changes from CAL ZERO OFF to CAL ZERO IN PROGRESS. When the process is complete, the menu item shows that it is OFF again.
To proceed with the Gain Calibration Test, setup the monitor and test equipment following the guidelines illustrated in the NBP Checkout Procedure, Chapter 4, Maintenance.



4.9. Pressure Accuracy (Gain Calibration)
1. Attach the digital manometer, noninvasive blood pressure (NBP) cuff, tees and tubing, as shown in the illustration below, to the NBP connector of the monitor.
2. Set the digital manometer power switch to the on position.

3. Set the digital manometer range switch to 1000 mmHg. Using the Trim Knob control, access the SERVICE MODE menu starting from the MAIN menu.
4. Select MORE MENUS -> MONITOR SETUP -> SERVICE MODE ->
5 Enter password using the Trim Knob control to select the day and month from monitor screen with leading zeros. (e.g. July 4 = 0407).
6. Select CALIBRATE-> CALIBRATE NBP-> CHECK CAL OFF->START->.The text on the menu item changes from CHECK CAL OFF to CHECK CAL IN PROGRESS.
Verify the readings in the NBP parameter window on the monitor display and readings on the digital manometer are equal (± 1 mmHg) for at least one full minute. If the readings are not equal for at least one full minute, the NBP circuit requires calibration.
7. Select CHECK CAL IN PROGRESS-> STOP->. The pneumatic control circuit of the monitor vents air pressure in the pneumatic circuit of the monitor to atmosphere and causes the NBP cuff to deflate.
8. Remove the NBP test setup apparatus from the monitor. The NBP tests are complete.
will deliver paper at the rate. If no lines occur, be sure paper roll is inserted properly.

Note: If message "PREVENTIVE MAINTENANCE REQUIRED" appears, perform all of the maintenance procedures listed under, "Manufacturer Recommendations" on page 4-3 of Service Manual. See Appendix below. Do the calibration the service manual shows and then get out of the service menu and go back to patient monitoring mode. Now discharge the patient and then reboot (off / on) the monitor. The message should be gone. Also, to change a monitor setup at anytime, the "discharge patient and reboot" must first be performed.

To manually discharge a patient from the monitor, follow this procedure:
1. Disconnect all patient cables.
2. <More Menus>, <New Case Setup>, <New Case> This will cause a complete restart.

3. *Note – not verified:* To remove "PM is due" message, go into service mode and update time even if not needed. Then, MORE MENUS, NEW CASE SETUP. This will cause a power-off reset.

Note: To adjust the control settings for the patient admitted to the monitor, select MORE MENUS >ALARM CONTROLS

4.10. ECG Internal Voltage Check -- If needed, see Appendix or Service Manual

4.11. SpO2 Functional Check (if supplied). T
Use SpO2 simulator to check the SpO2 functionality (including heart rate). Otherwise, the average healthy person will normally measure in the high 90's as a reference. Also, note that the heart rate display section correctly indicates the subject's heart rate.

4.12. Temperature Calibration Check
Use the 9600 Plus Calibration Tester to check the SureTemp thermometer accuracy. If this calibrator is not available, you may use a subject of known body temperature as a check.

Another alternate reference is a glass of lukewarm water with a known temperature between 90 and 104 degrees. Monitor results can be checked in either the Normal mode or the Monitor mode. If the temperature is in Normal mode, the user may easily switch to Monitor mode without entering the Monitor's internal configuration mode. To do this, remove the probe from the probe holder, attach a new probe cover, and wait one minute (do not place probe anywhere at this time). After one minute the Monitor will automatically switch to temperature Monitor mode, and the green "Monitor Mode" display will be illuminated on the temperature display. After the probe is replaced in the holder, the Monitor will revert back to Normal temperature mode.

APPENDIX

• **Conditioning the Batteries:** Condition the batteries once every two months or as needed.
• **Calibrating the NBP, Analog Output BP, Analog Output ECG, and End-tidal CO2 Software:** Calibrate the NBP and End-tidal CO2 software upon receipt of the equipment, every 12 months thereafter, and each time the unit is opened for service. Calibrate the analog output BP and analog output ECG whenever these do NOT pass the analog output checkout procedure.
• **Electrical Safety Tests:** Perform safety tests upon receipt of the equipment, every 12 months thereafter, and each time the unit is serviced.
• **Checkout Procedures:** Perform the checkout procedures upon receipt of the equipment, every 12 months thereafter, and each time the unit is serviced.
• **Clearing the Stored Patient Data Memory:** Admit and discharge a test patient every 12 months to clear the monitor's stored patient data memory. To Discharge a Patient,

ECG Internal Voltage Check

Using the Trim Knob control, access the SERVICE MODE menu starting from the MAIN menu.
1. Select MORE MENUS-> MONITOR SETUP-> SERVICE MODE.
2. Enter password using the Trim Knob control to select the day and month from monitor screen with leading zeros. (e.g. July 4 = 0407).
3. Select CALIBRATE-> CAL ECG ANALOG OUT-> SET ECG LOW.
Adjust the count for –9.0 V ± 5 mV on the meter and press the Trim Knob control.
4. Select SET ECG HIGH.
Adjust the count for +9.0 V ± 5 mV on the meter and press the Trim Knob control.
5. Select SET ECG ZERO.
Adjust the count for 0.0 V ± 5 mV on the meter and press the Trim Knob control.
6. Select CONFIRM ECG CAL to confirm or abort the calibration BP Calibration Using the Trim Knob control, access the SERVICE MODE menu starting from the MAIN menu.
1. Select MORE MENUS-> MONITOR SETUP-> SERVICE MODE.
2. Enter password using the Trim Knob control to select the day and month from monitor screen with leading zeros. (e.g. July 4 = 0407).
3. Select CALIBRATE-> CAL BP ANALOG OUT-> SET BP LOW.
Adjust the count for –9.0 V ± 5