A

Maintenance

Regular maintenance, irrespective of usage, is essential to ensure that the equipment will be functional when required. For the MAC system, regular maintenance includes the following:

- Equipment Inspection and Cleaning
- Paper Maintenance
- Battery Maintenance
- Leadwire Adapter Replacement

For the maintenance procedures for your peripheral equipment, refer to the documentation provided with that equipment.

WARNING:

MAINTENANCE — Failure on the part of all responsible individuals, hospitals, or institutions employing the use of this device to implement the recommended maintenance schedule may cause equipment failure and possible health hazards. The manufacturer does not in any manner, assume the responsibility for performing the recommended maintenance schedule, unless an Equipment Maintenance Agreement exists. The sole responsibility rests with the individuals, hospitals, or institutions utilizing the device.

Inspecting and Cleaning the MAC System

When inspecting and cleaning your system, take the following precautions:

- Turn off the system.
- Do NOT immerse any part of the equipment in liquid.
- Do NOT use organic solvents, ammonia based solutions, or abrasive cleaning agents. These may damage the equipment surfaces.

Inspecting the MAC System

Perform a visual inspection of all equipment and peripheral devices daily. If you notice any items that need repair, do not use the equipment until an authorized service person has completed the repairs.

- Check the case and display screen for cracks or other damage.
- Inspect all plugs, cords, cables, and connectors for fraying or other damage.

- Verify that all cords and connectors are securely seated.
- Inspect keys and controls for proper operation:
  - Toggle keys should not stick in one position.
  - Knobs should rotate fully in both directions.

Cleaning and Disinfecting Exterior Surfaces

Clean and disinfect the exterior surfaces of all equipment and peripheral devices monthly, or more frequently if needed.

Cleaning and Disinfecting the Surfaces

Proper cleaning and disinfecting prolongs the life of the product. Failure to use the proper cleaning solutions or to follow proper procedures can result in the following:

- Damage or corrosion
- Product discoloration
- Metal part corrosion
- Unit malfunction
- Voided warranty

Use the following procedure to clean the equipment's exterior surfaces. Be sure to observe all cautions when cleaning the device.

1. To clean, wipe with a lightly moistened cloth.

   Use a mild soap and water solution to moisten the cloth.

   Do NOT use any of the following cleaning products, or products that contain the same active ingredients and solutions, which are known to cause the problems previously listed:

   - Sani-Cloth® Wipes
   - Ascepti® Wipes
   - HB Quat®
   - Clorox® Wipes (they do not contain bleach)
   - Over-the-counter detergents (such as Fantastic®, Tilex®, and so on)

2. To disinfect, wipe with a soft, lint-free cloth moistened with an appropriate disinfectant.

   Use the following solutions, as recommended in the APIC Guidelines for Selection and Use of Disinfectants (1996):

   - Sodium hypochlorite (5.2% household bleach) minimum 1:500 dilution (minimum 100 ppm free chlorine) and maximum 1:10 dilution.
   - Any sodium hypochlorite wipe product that meets the previous guidelines can be used.

3. Dry with a clean cloth or paper towel.

Cautions

- Follow the cleaning instructions exactly.
- Wring excess disinfectant from wipe before using.
- Never immerse the device, cables, or leadwires in any liquid, as this may corrode metal contacts and affect signal quality.
- Do not allow fluid to pool around connection pins. If this happens, blot dry with a soft, lint-free cloth.
- Never use conductive solutions or solutions that contain chlorides, wax, or wax compounds to clean the device, cables, or leadwires.
- Never use solutions or products that contain any type of Ammonium Chloride such as, but not limited to:
  - Dimethyl Benzyl Ammonium Chloride
  - Quaternary Ammonium Chloride solutions
  - Abrasive cleaners or solvents of any kind
  - Acetone
  - Ketone
  - Betadine
  - Alcohol-based cleaning agents
  - Sodium salts
- Never autoclave or steam clean the device, cables, or leadwires.
- Do not use until thoroughly dry.

Cleaning, Disinfecting, and Storing ECG Cables and Leadwires

In addition to keeping the MAC system clean and in good repair, it is important to keep the leadwires clean and disinfected. This section provides instructions for cleaning, disinfecting, and storing ECG cables and leadwires to extend their life and protect patients.

NOTE:
This information applies to the Multi-Link cable and leadwires. For systems with the optional KISS system, see the KISS operator's manual for cleaning and disinfecting information.

Cleaning and Disinfecting Leadwires

Proper cleaning and disinfecting prolongs the life of cables and leadwires. Failure to use the proper cleaning solutions or to follow proper procedures can result in the following:

- Damage or corrosion
- Diminished signal quality
- Product discoloration
- Metal part corrosion
- Brittle wires and connectors
- Reduced cables and leadwires life

- Unit malfunction
- Voided warranty

Use the following procedure to clean and disinfect the cables and leadwires.

1. Remove cables and leadwires from the device or system before cleaning.
2. Use care in cleaning leadwires to prevent pulling the long wires from the connector ends. Metal connections can be pulled away from the connectors.
3. To clean, wipe with a lightly moistened cloth.

   Use a mild soap and water solution to moisten the cloth.

   Do NOT use any of the following cleaning products, or products that contain the same active ingredients and solutions, which are known to cause the problems previously listed:

   - Sani-Cloth® Wipes
   - Ascepti® Wipes
   - HB Quat®
   - Clorox® Wipes (they do not contain bleach)
   - Over-the-counter detergents (such as Fantastic®, Tilex®, and so on)
4. To disinfect, wipe with a soft, lint-free cloth moistened with an appropriate disinfectant.

   Use the following solutions, as recommended in the APIC Guidelines for Selection and Use of Disinfectants (1996):

   - Sodium hypochlorite (5.2% household bleach) minimum 1:500 dilution (minimum 100 ppm free chlorine) and maximum 1:10 dilution.
   - Any sodium hypochlorite wipe product that meets the previous guidelines can be used.
5. Observe the following guidelines when cleaning and disinfecting cables and leadwires.

   - Do NOT immerse either end of a cable or leadwire connector.
     Immersing or “soaking” the connector ends may corrode metal contact ends and affect signal quality.
   - Do NOT let fluid “pool” around connection pins.
     If this happens, blot dry with a soft, lint-free cloth.
6. Dry the cable and leadwires thoroughly with a dry lint-free cloth and let air dry for at least 30 minutes.

   DO NOT use excessive drying techniques, such as oven, forced heat, or sun drying.

   NOTE:
   Drying times may vary based on the environmental conditions.

Cautions

- Follow the cleaning instructions exactly.
- Wring excess disinfectant from wipe before using.

- Never immerse the device, cables, or leadwires in any liquid, as this may corrode metal contacts and affect signal quality.
- Do not allow fluid to pool around connection pins. If this happens, blot dry with a soft, lint-free cloth.
- Never use conductive solutions or solutions that contain chlorides, wax, or wax compounds to clean the device, cables, or leadwires.
- Never use solutions or products that contain any type of Ammonium Chloride such as, but not limited to:
  - Dimethyl Benzyl Ammonium Chloride
  - Quaternary Ammonium Chloride solutions
  - Abrasive cleaners or solvents of any kind
  - Acetone
  - Ketone
  - Betadine
  - Alcohol-based cleaning agents
  - Sodium salts
- Never autoclave or steam clean the device, cables, or leadwires.
- Do not use until thoroughly dry.

Storage

Store cables and leadwires by hanging them vertically in a dry, well-ventilated area. Do NOT coil leadwires or cables around the device.

Cleaning, Disinfecting, and Storing Handheld Devices

In addition to keeping the MAC system, leadwires, and cables clean and in good repair, it is important to keep the associated acquisition modules clean and disinfected as well. This section provides instructions for cleaning, disinfecting, and storing the acquisition modules to extend their life and protect patients.

Cleaning and Disinfecting Acquisition Modules

Proper cleaning and disinfecting prolongs the life of acquisition devices. Failure to use the proper cleaning solutions or to follow proper procedures can result in the following:

- Appearance of waveforms when not connected to a patient, resulting in false alarms instead of lead failure alarms
- Brittle and cracked device case
- Melting, dulling, or distortion of the case
- Total device failure, requiring replacement
- Unit malfunction
- Voided warranty

Use the following procedure to clean and disinfect the cables and leadwires.

1. Remove cables, leadwires, and batteries from the device before cleaning.

   Make sure to firmly close the battery door after removing the batteries.

2. To clean, wipe with a lightly moistened cloth.

   Use a mild soap and water solution to moisten the cloth.

   Do NOT use any of the following cleaning products, or products that contain the same active ingredients and solutions, which are known to cause the problems previously listed:

   - Sani-Cloth® Wipes
   - Ascepti® Wipes
   - HB Quat®
   - Clorox® Wipes (they do not contain bleach)
   - Over-the-counter detergents (such as Fantastic®, Tilex®, and so on)

3. To disinfect, wipe with a soft, lint-free cloth moistened with an appropriate disinfectant.

   Use the following solutions, as recommended in the APIC Guidelines for Selection and Use of Disinfectants (1996):

   - Sodium hypochlorite (5.2% household bleach) minimum 1:500 dilution (minimum 100 ppm free chlorine) and maximum 1:10 dilution.
   - Any sodium hypochlorite wipe product that meets the previous guidelines can be used.

4. Allow the cleaning solution/disinfectant to remain on the device for a minimum of one minute, or per hospital guidelines.
5. Wipe off the cleaning solution/disinfectant with a clean, moistened cloth.
6. Dry thoroughly with a dry, lint-free cloth and let air dry for a minimum of 30 minutes before use.

   DO NOT use excessive drying techniques, such as oven, forced heat, or sun drying.

   NOTE:
   Drying times may vary based on the environmental conditions.

Cautions

- Follow the cleaning instructions exactly.
- Wring excess disinfectant from wipe before using.
- Never immerse the device, cables, or leadwires in any liquid, as this may corrode metal contacts and affect signal quality.
- Do not allow fluid to pool around connection pins. If this happens, blot dry with a soft, lint-free cloth.
- Never use conductive solutions or solutions that contain chlorides, wax, or wax compounds to clean the device, cables, or leadwires.

- Never use solutions or products that contain any type of Ammonium Chloride such as, but not limited to:
  - Dimethyl Benzyl Ammonium Chloride
  - Quaternary Ammonium Chloride solutions
  - Abrasive cleaners or solvents of any kind
  - Acetone
  - Ketone
  - Betadine
  - Alcohol-based cleaning agents
  - Sodium salts
- Never autoclave or steam clean the device, cables, or leadwires.
- Do not use until thoroughly dry.

Storage

Use the following guidelines when storing acquisition modules:

- Always remove the batteries when the device is not in use, even for short periods of time.
- Store in a dry, well-ventilated area.
- Hang the device, using a holder if available.
- If leadwires are attached, they should hang straight.
- Do not coil leadwires or cables around the device.

Battery Compartment Cleaning

NOTE:

This procedure applies only for frequency hopping telemetry transceivers. It should not be used for other devices.

Under normal operation, the battery compartment should not require cleaning. If the battery compartment should require cleaning, use the following instructions.

CAUTION:

DEVICE MALFUNCTION — Cleaning the battery compartment in a manner other than that described in the following procedure may cause the unit to malfunction and void the warranty.

The battery compartment is not waterproof. Make certain fluids do not enter the electronics through the air holes in the battery compartment floor.

1. Remove the battery from the battery compartment.
2. Clean the device with a gauze pad or cloth lightly moistened with one of the following agents:
   - Water
   - Soap

3. Use a cloth lightly moistened with distilled water to rinse away the cleaning solution. Make certain that moisture does not enter the electronics area below the battery compartment floor.
4. Dry thoroughly with a lint-free cloth and allow the battery compartment to air dry completely prior to closing the compartment door.

Paper Maintenance

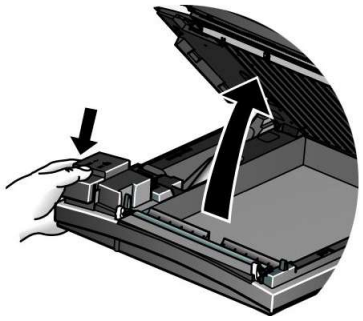
Proper paper maintenance ensures optimum ECG printouts. Paper maintenance includes:

- Setting the correct paper size
- Loading the paper

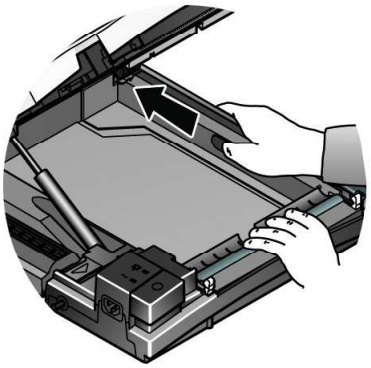
Setting the Correct Paper Size

The MAC system can accommodate standard (US Letter) and A4 fanfold thermal ECG paper. To ensure that the paper feeds correctly, you must adjust the paper guide

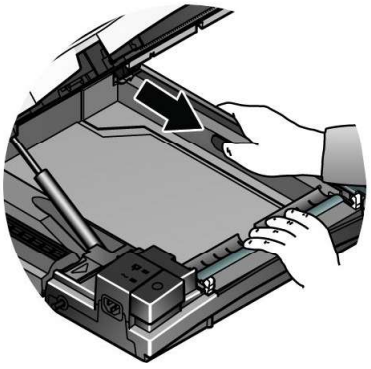
1. Open the MAC writer drawer.



2. To set the tray for A4 paper, slide the paper guide toward the rear of the device.



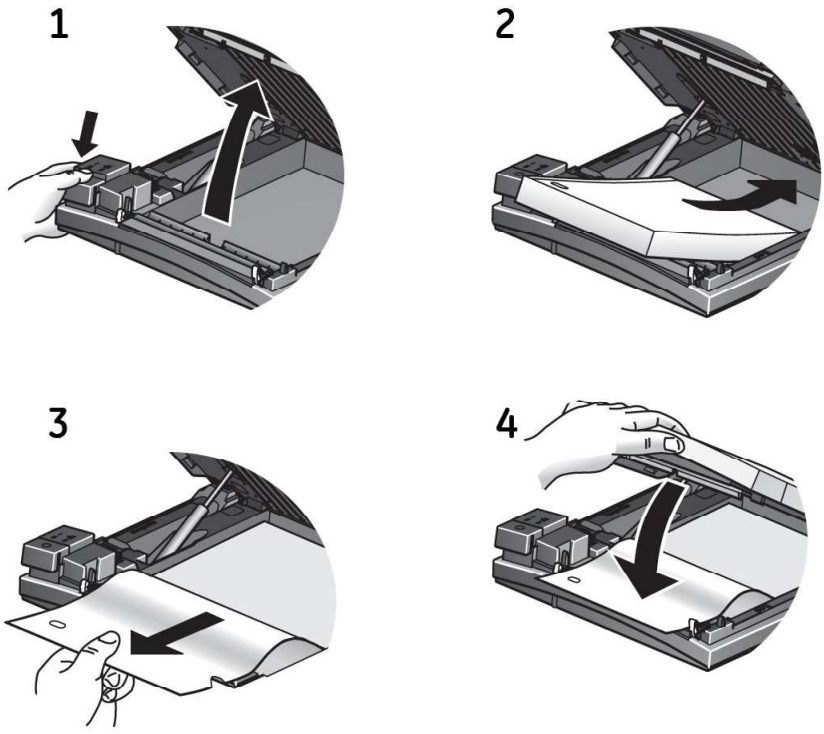
3. To set the tray for standard (US Letter) paper, slide the guide toward the front of the device.



4. You are now ready to load your paper.

Loading the Paper

Use the following instructions to load paper into the MAC system. Refer to the following illustration.



1. Open the writer drawer.
2. Place the pad of paper with the holes on the left.

3. Advance the first sheet of paper.
4. Close the writer drawer securely.

Battery Maintenance

Proper battery maintenance prolongs the battery life and ensures that the MAC system will operate when needed. Proper maintenance consists of the following:

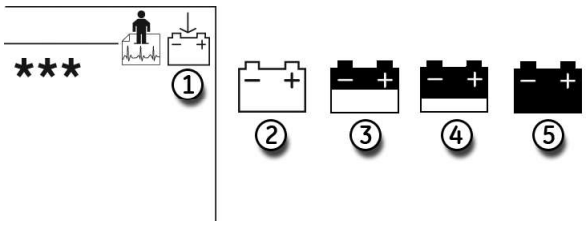
- Charging the battery
- Conditioning the battery
- Replacing the battery

Charging the Battery

A fully charged battery ensures that the MAC system will operate without being connected to an AC outlet. The MAC system's battery should be charged at the following times:

- Before initial use
- Between acquisitions
- When the battery is low
- When the battery is completely discharged

To determine when the battery is low, use the battery gauge icon that appears in the upper right corner of the system screen.



Item	Description
1	Battery gauge icon position.
2	Battery fully charged.
3	Battery 1/2 charged.
4	Battery 1/4 charged.
5	Battery fully discharged.

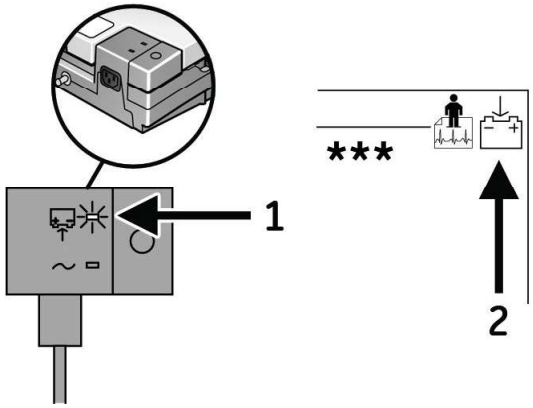
NOTE:

The system may run for a long time after the fully-discharged icon appears. When the battery is fully discharged, the system will power off. To operate your system at that time, you must connect the system to an AC wall outlet.

Use the following procedure to charge the battery:

1. Power off the system.
2. Connect the system to an AC wall outlet.

   To indicate the battery is charging, the amber battery light glows (1) and the charging battery icon is displayed on the screen (2).



3. Charge the system for 4–5 hours or until the battery gauge icon indicates a full charge.

   NOTE:
   If the battery is fully charged or exceeds safe charging temperature, the system will not charge the battery.

Conditioning the Battery

In addition to normal system use, periodic deep discharge cycles may be required to ensure consistent battery performance. A deep discharge cycle occurs when the battery is discharged until the system shuts down and then recharged until it is full.

GE Healthcare recommends one deep discharge cycle once every three months, but does not recommend over-exercising the battery with multiple deep discharge cycles.

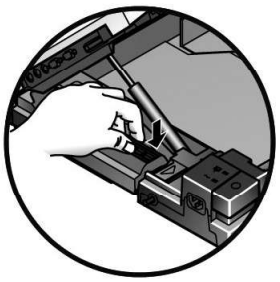
Replacing the Battery

No matter how well you maintain your battery, you will eventually need to replace it. Refer to the following illustration for instructions on how to replace the battery.

1

2

3



WARNING:

BATTERY PACK DISPOSAL — Do NOT dispose of the battery pack by fire or burning.

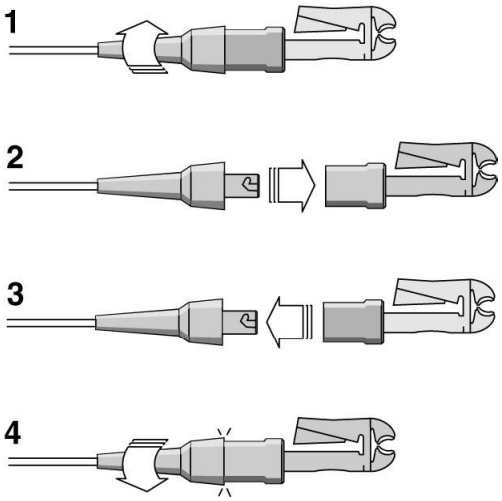
Follow local environmental guidelines concerning disposal and recycling.

WARNING:

CHEMICAL BURN — If battery fluid contacts your skin, eyes, or clothing, immediately wash the area with clean water and see a doctor.

Replacing Leadwire Adapters

The following diagram shows how to replace the acquisition leadwire adapters:


1
2
3
4