

# CU's Emergency Responder 1 Training Kit

# CU-ERT

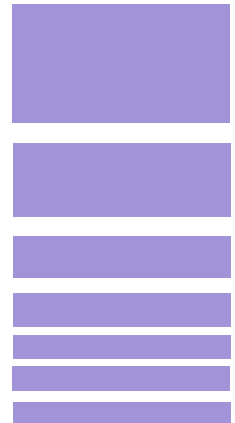
# Operator's Manual

*Paramedic Series AED*



**CU Medical Systems, Inc.**

Medical Systems, Inc.



# **Operator's Manual**

**Semi-automated External  
Defibrillator Trainer  
CU-ERT ver 1.10**



**Medical Systems, Inc.**

**Specifications and information** contained in this Operator's Manual are subject to change without prior notice.

**The operation protocol of the Semi-automated External Defibrillator Trainer CU-ERT has been upgraded to comply with the American Heart Association 2005 Guidelines for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiovascular Care (ECC).**

**NOTICE**

**2005 CPR Guidelines are applied to the ERT after software version 1.10**

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## ● General

Thank you for acquiring the Paramedic CU-ERT. Please read this Operator's Manual carefully and thoroughly before using it. This Manual contains instructions on how to operate and maintain the Paramedic CU-ERT.

CU Medical Systems, Inc. designs and manufactures all of its products in accordance with international standards (NS-EN ISO9001:2000/ ISO13485:1996-MDD 93/42/EEC). This ensures that CU Medical Systems, Inc. provides products of high quality and reliability.

In this regard:

- Only persons authorized by CU Medical Systems, Inc. should do all servicing of the device. There are no user serviceable parts in this device.
- You should ensure that all power sources are properly installed or connected before using this device.
- You should operate this device in accordance with the instructions specified in this manual.

This device is intended for use during trainings such as CPR training, Basic Cardiac Life Support (BCLS) training, or Advanced Cardiac Life Support training.

This device is not intended for use during sudden cardiac arrest resuscitation operations as it can not deliver a defibrillating shock.

To ensure safety and reliability, use only parts and accessories recommended by CU Medical Systems, Inc.

If you intend to use this device in conjunction with other devices not specified in this manual, please notify the manufacturer.

## ● WARRANTY

- The products of CU Medical Systems, Inc. are designed and manufactured according to international standards (NS-EN ISO9001:2000/ ISO13485:1996-MDD 93/42/EEC). Every device that goes out of the assembly line passes through a battery of reliability tests. In case of problems, our maintenance and exchange policies are in accordance with the relevant consumer protection laws and regulations in the particular country where the device is sold.
- The warranty period of this device is within two years after the date of purchase.
- When the device malfunctions during the warranty period, it will be repaired free of charge at our service centers.
- When you submit the device for maintenance, please specify the details as listed below :  
The name of model, product serial number, date of purchase, name of sales representative, information of customer and a brief description of the problems.

Name of Product	<b>AED (semi Automated External Defibrillator) Trainer</b>		
Name of Model	<b>CU-ERT</b>	Serial No.	
Date of Purchase		Sales Representative	
Customer Information	Address		
	Name		
	Contact No.		
Brief Description of Problems			

## ● Service

Only CU Medical Systems, Inc. or its authorized representatives should service the device. If unauthorized personnel service the device during the warranty period, the warranty will become null and void.

CU Medical Systems, Inc. or its authorized representatives are obliged to service the device free of charge during the warranty period.

When the device is not functioning properly, it has to be submitted for maintenance immediately.

When any abnormalities are found in the device or when a danger to bodily harm exists, the device has to be repaired fast and adequately by authorized personnel.

When the need for maintenance arises:

- Please contact CU Medical Systems, Inc. or its authorized representatives immediately. Prepare a summary of the problems. Also include the name of model, product serial number, date of purchase, name of sales representative, information of customer.
- There are no user-serviceable parts in the Paramedic CU-ERT. The user should not attempt any repair beyond what we recommend in the maintenance section of this manual.



## CONTACT US

You can contact us at the following address and telephone number for services and supplies.

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## 1. How to Use This Manual

### 1.1 Contents of This Manual

- This Operator's Manual contains all the information a user needs to operate the Paramedic CU-ERT properly.
- In case you have any problems regarding the operation of the device, please don't hesitate to contact us.
- This Operator's Manual contains information on a device that is subject to upgrades to incorporate additional features. Specifications and information herein are subject to change without prior notice.

### 1.2 Safety Messages

The following safety messages are used to emphasize the safety practices that must be observed and followed during the operation of the Paramedic CU-ERT. The operator must follow the instructions in all the Warnings, Cautions, and Notices found throughout this Operator's Manual

In the event that the product is damaged due to misuse or negligence by a user, the manufacturer or the authorized representatives shall not be responsible for the damage or loss to the product.

#### **⚠ WARNING**

**Conditions, hazards, or unsafe practices that can result in serious personal injury or death.**

#### **⚠ CAUTION**

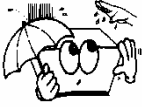
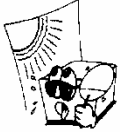
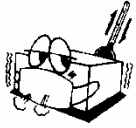
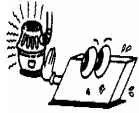
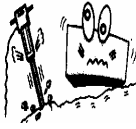



**Conditions, hazards, or unsafe practices that can result in minor personal injury, damage to the Paramedic CU-ERT, or loss of data stored in the device.**

#### **NOTICE**

**Used to denote items that are important during installation, operation, or maintenance of the device.**

## 2. Device Operation Guidelines

### 2.1 General Guidelines

	<p>Do not operate or store the device in conditions that are beyond the following specified limits.</p> <p>Operating Conditions</p> <p>Temperature 0 °C to 50 °C</p> <p>Humidity 5 % to 95 % (non-condensing)</p> <p>Storage Conditions</p> <p>Temperature -20 °C to 70 °C</p> <p>Humidity 5 % to 95 % (non-condensing)</p>
	<p>Do not store the device in areas that are directly exposed to sunlight</p>
	<p>Do not store the device in areas with highly fluctuating temperatures</p>
	<p>Do not store the device near heating equipment</p>
	<p>Do not store the device in areas where there is high vibration (in excess of Category 10 of MIL-STD-810E)</p>
	<p>Do not operate or store the device in environments with high concentration of flammable gas or anesthetics.</p>
	<p>Do not operate or store the device in areas with high concentration of dust</p>
	<p>Only personnel authorized by the manufacturer shall open the device for servicing. There are no user serviceable components inside the device.</p>

## 2.2 Storage and Operating Environment Guidelines

- Avoid damp locations. Do not operate and store the device beyond the specified limits. Do not operate the device with wet hands. Do not conduct rescue operations with patients on wet surfaces.
- Do not expose the device to direct sunlight during storage.
- Do not store the device in areas with highly fluctuating temperatures.
- Do not store the device close to heating equipment and appliances.
- Do not store the device near sources of vibration.
- Do not store and operate the device in locations that are exposed to chemicals, explosive gas and solvents.
- Keep the device away from dusty environments.
- There are no user serviceable parts inside the Paramedic CU-ERT. Only authorized service personnel should open the device for repairs.
- During recharging, when the device is connected and disconnected from the mains power connector, hold the plug and not the electrical cord.

### Operating environmental condition limits:

- **Temperature: 0 °C to 50 °C**
- **Relative Humidity: 5 % to 95 % (non-condensing)**

### Storage environmental condition limits:

- **Temperature: -20 °C to 70 °C**
- **Relative Humidity: 5 % to 95 % (non-condensing)**

** WARNING**

**Do not use the Paramedic CU-ERT if it has been submerged in water. Call immediately for service assistance.**

## 2.3 Cleaning and Maintenance

After each use, clean the Paramedic CU-ERT using a soft, damp cloth moistened with any of the following solvents:

Soap and water

70% solution isopropyl alcohol

Chlorine bleach and water mixture (30 ml bleach/liter of water)

Ammonia-based cleaners

Hydrogen peroxide

### CAUTION

**Do not immerse any part of the Paramedic CU-ERT in fluids.**

**Do not let any fluid enter the case of the device.**

Do not spill liquids on the case of the device.

**Do not use strong, acetone-based cleaners in cleaning the device.**

**Do not use abrasive materials in cleaning the unit, especially on the LCD display and the infrared filter on the IrDA port.**

**Do not sterilize the Paramedic CU-ERT.**

Although there are no user serviceable parts inside the Paramedic CU-ERT, the operator can do maintenance checks that will help ensure that the device stays in mint condition.

- Check the case of the device for any apparent damage.
- Check the ports (defibrillator lead port, UART port, adapter power port) to see that they are tightly in place.
- Check the accessories, especially the defibrillation pads, to see that they are in good condition and that they have not yet reached their expiration dates.

## 3 Introduction

### 3.1 Product Description

The Paramedic CU-ERT is a defibrillator simulator designed to mimic the operations of the Paramedic CU-ERT. It can simulate all the functions of the Paramedic CU-ERT including charging and shock delivery.

**NOTICE**

**The charging and shock delivery operations of the Paramedic CU-ERT are simulated only. The device does not contain any defibrillating capacitor and thus can not charge itself.**

It has preprogrammed rescue scenarios that were generated in accordance with the recommended rescue protocol of international rescue policy making bodies such as the American Heart Association, the European Resuscitation Council, and the American Red Cross.

It is to be used in conjunction with the resuscitation mannequin from CU Medical Systems, Inc.

It has a standard infrared remote control accessory which renders it operable by an instructor from a distance.

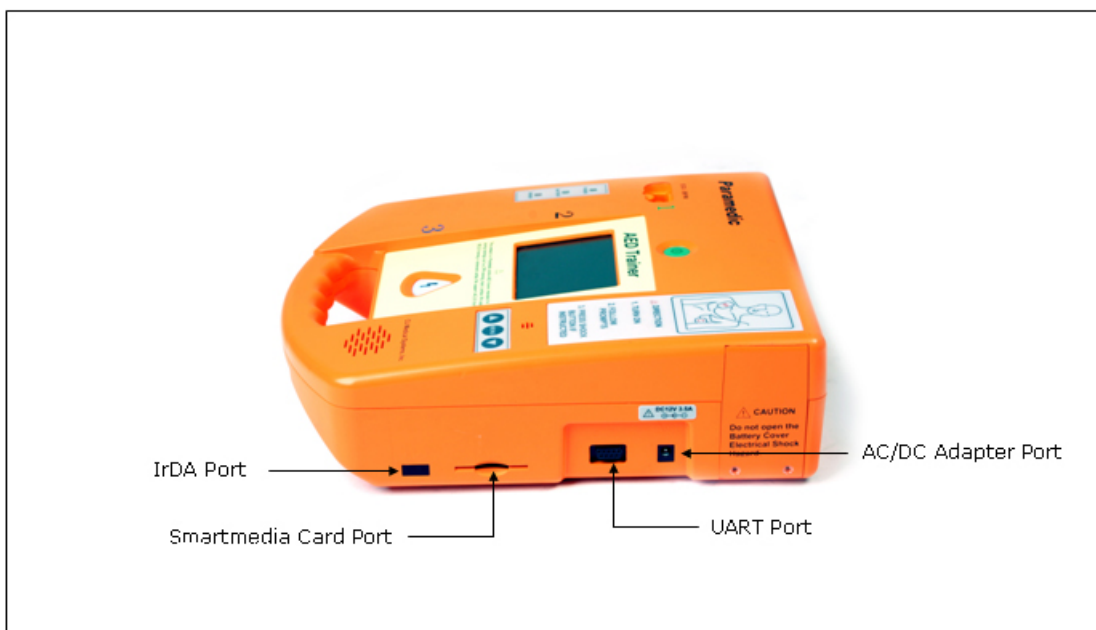
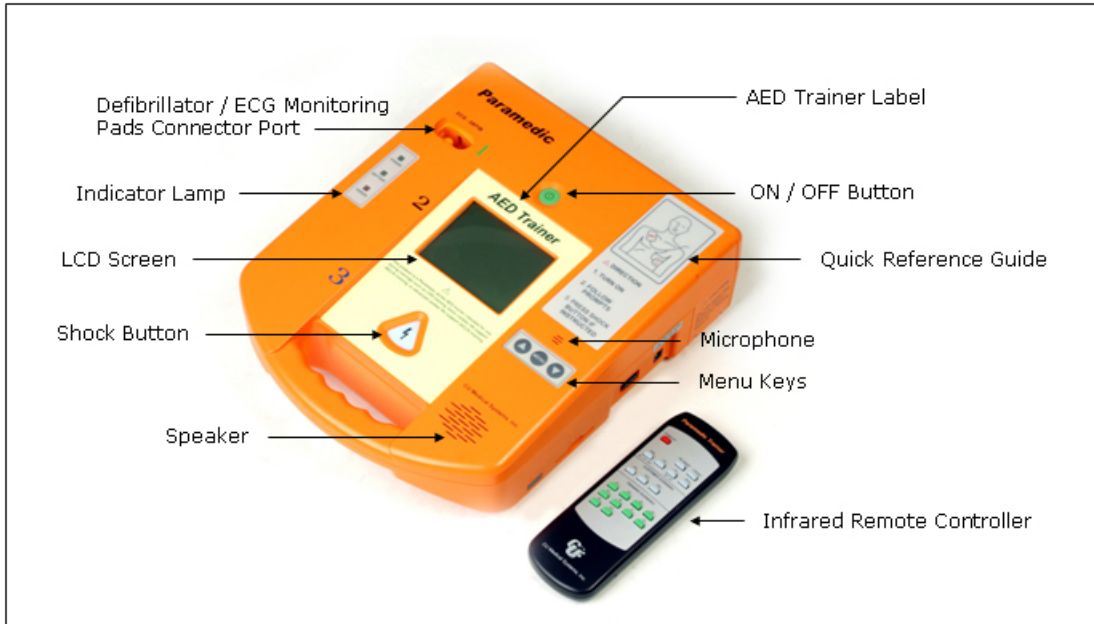
### 3.2 Intended Use

The Paramedic CU-ERT is intended for use during Advanced Cardiac Life Support training, Basic Life Support training, or any other physician approved trainings that deal with the operation of an automated external defibrillator.




The Paramedic CU-ERT is not intended for use during actual rescue operations as it can not deliver a defibrillating shock.

## 4 Basic Orientation

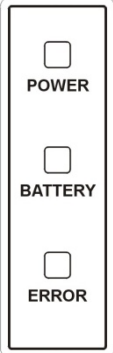
### 4.1 Controls, Indicators, and Ports



## 4.2 Operating Controls

 <p>ON/OFF button</p>	<p>Turns the power of the <b>Paramedic CU-ERT</b> ON or OFF.</p>
 <p>SHOCK button</p>	<p>Flashes its red backlight when the <b>Paramedic CU-ERT</b> is ready to deliver a simulated shock. Delivers the simulated shock when pressed (while the backlight is flashing).</p>
 <p>MENU keys</p>	<p>Control special functions such as device setup and data management and review.</p>

## 4.3 Indicator Lamps

	<p><b>POWER</b></p>	<p>Indicates that the source of power is the AC adapter.</p>
	<p><b>BATTERY</b></p>	<p>This indicator is not used (no function) in the Paramedic CU-ERT</p>
	<p><b>ERROR</b></p>	<p>Indicates that a system error occurred. If error lamp is on, contact the service representatives.</p>



#### 4.4 Parts and Accessories

Infrared remote controller	Used to control the training functions of the Paramedic CU-ERT
AED Pads	Used to connect the Paramedic CU-ERT to the resuscitation mannequin. For simulation only. No signal acquisition and shock deliveries are involved.
Quick Reference Card	Quick reference for the steps involved in a rescue operation
AC/DC Adapter	Used to provide power to the trainer using power from the mains
Power Cord	Used to connect the AC/DC Adapter to the power mains
SmartMedia Card	Used to store resuscitation data.
Thermal Printer	Used to print data
UART Cable	Used to connect the trainer to a personal computer for data transmission
Car Cigar Lighter Jack Power Cord	Used to connect the trainer to a car cigar lighter jack for power supply
Carrying Case	Used to contain the trainer and all its accessories
External Disposable Battery Pack	Used to power the trainer
Resuscitation Mannequin	Used to simulate connection with a patient
IrDA COM Port Serial Adapter	Used to transmit data to a personal computer

#### 4.5 Input / Output Ports

ECG-DEFIB port	Used to connect the defibrillator pad assembly to the device. Also used to connect the custom made ECG MONITORING CABLE AND CONNECTOR ASSEMBLY to the Paramedic CU-ERT.
SmartMedia Card port	Receptacle for the SmartMedia card, which is used for storage of incident information. (ECG waveform, voice record, and rescue events)
IrDA port	Used for transfer of data between the <b>Paramedic CU-ERT</b> and other devices. (personal computer or thermal printer)
UART port	Used to transfer data between the <b>Paramedic CU-ERT</b> and a personal computer (PC). Also used to download data for printing to the thermal printer. <b>Use only the UART cable that is supplied by the manufacturer. Using others may cause damage to the device.</b>
AC/DC Adapter port	Receptacle for the 12V DC power supply from an AC adapter unit or a car cigar lighter jack.

## 4.6 Voice and Text Prompts

ATTACH PADS	Indicates that the operator has to attach the defibrillation pads to the bare chest wall of the patient. In the trainer, the instructor operator should press the PAD ON/OFF button on the infrared remote controller.
CHECK PADS	Indicates that the operator has to check the attachment of the pads to the bare chest wall of the patient. In the trainer, the instructor operator should press the PAD ON/OFF button on the infrared remote controller.
ANALYZING ECG	Indicates that the Paramedic CU-ERT is doing an analysis of the patient's ECG signal.
SHOCK ADVISED	Indicates that the patient has a shockable ECG rhythm such as VF or VT with rates greater than 150 bpm.
DO NOT TOUCH THE PATIENT	Indicates that the Paramedic CU-ERT is analyzing the ECG signal acquired from the patient. The operator should not touch the patient to minimize artifacts. Motion during ECG acquisition will introduce artifacts.
STAND CLEAR	Indicates that everybody in the vicinity of the patient should stand clear and not touch the patient.
NO SHOCK ADVISED	Indicates that the patient has a non-shockable ECG rhythm.
CHARGING	Indicates that the Paramedic CU-ERT is charging its capacitor for a subsequent shock delivery.
CHARGING COMPLETE	Indicates that the Paramedic CU-ERT has finished charging its capacitor for a subsequent shock delivery.
PRESS THE SHOCK BUTTON	Indicates that the user has to press the SHOCK button for the delivery of a defibrillation shock. At this time, SHOCK button is flashing and the beeper is beeping.
SHOCK BUTTON NOT PRESSED	Indicates that a shockable rhythm has been detected and a prompt to press the SHOCK button has been given but the SHOCK button is not pressed within 15 seconds. The device will discharge through its internal discharge circuit. The device will then re-analyze the ECG of the patient.
SHOCK DELIVERED	Indicates that a defibrillation shock has been delivered.
CHECK PATIENT, IF NO PULSE, DO CPR	Tells the operator to check the patient and do cardiopulmonary resuscitation (CPR) if the patient has no pulse.
PAUSED FOR CPR	Indicates that the analysis of the patient's ECG signal has been stopped so that a CPR could be done on the patient for one minute. Do a CPR to the patient.
STOP CPR	This tells the operator to stop administering CPR.

## 4.7 User Interface

The Paramedic CU-ERT has exactly the same user interface as the Paramedic CU-ERT except for the infrared remote controller that is not available on the Paramedic CU-ERT.

### 4.7.1 LCD Display

#### Splash Screen

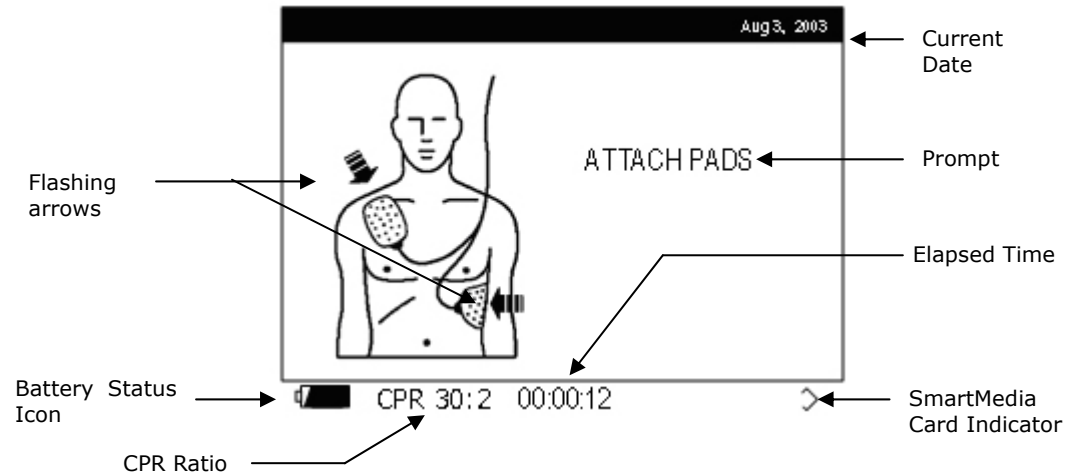
When the power is turned ON, the following splash screen is displayed on the LCD of the Paramedic CU-ERT.

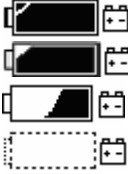



Splash Screen

**Initial Screen**

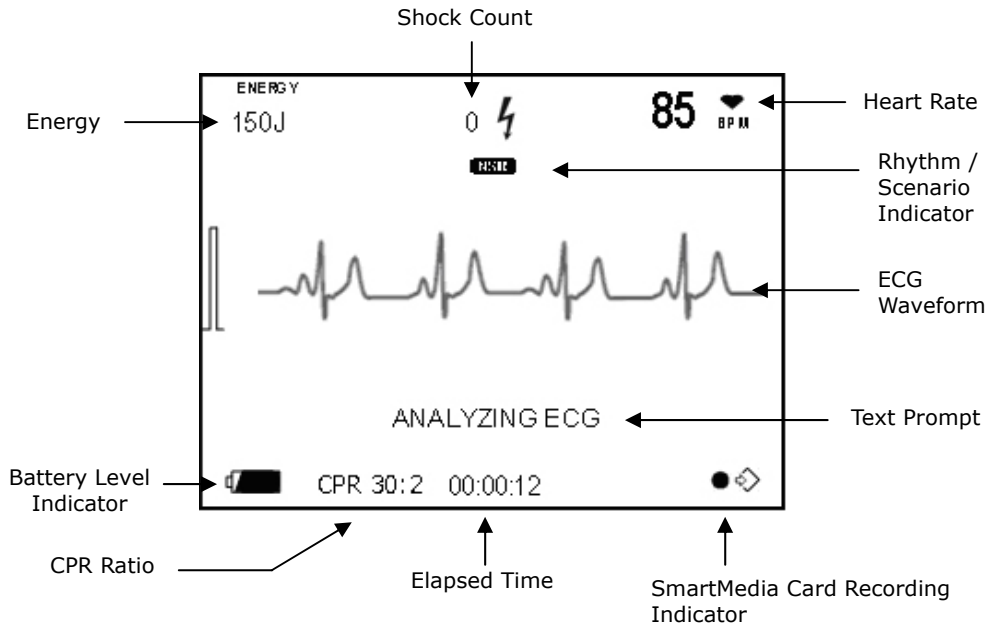
After a second or two, the Splash Screen is replaced by the Initial Screen shown in the following figure.

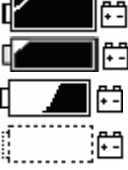









Flashing Arrows	Point to the location where the pads should be placed
Battery Status Icon When the External Battery Pack (LiMnO <sub>2</sub> ) is on Use	Shows the power level of the external battery pack of the Paramedic CU-ERT. It also indicates when the Paramedic CU-ERT is powered by an AC adapter or a Car cigar lighter jack.  <ul style="list-style-type: none"> <li>Battery level &gt; 90% of full level.</li> <li>90% &gt; Battery level &gt; 40% of full level.</li> <li>40% &gt; Battery level &gt; 10% of full level.</li> <li>Battery level &lt; 10% of full level. At this level, the device can still deliver ten 150J shocks. When this is displayed, the battery pack should be replaced. Do not wait for the battery pack to be drained below the level where the Paramedic CU-ERT could not operate anymore.</li> </ul>
Battery Status Icon When the AC/DC Adapter is on Use	 the device is powered by an AC adapter or a Car cigar lighter jack
Prompt	Displays the action that needs to be done by the operator
Elapsed Time	The time that elapsed since the Paramedic CU-ER2 was turned ON
SmartMedia Card Indicator	This icon is displayed when the SmartMedia Card is inserted in its port before the Paramedic CU-ERT is turned ON
Current Date	Displays the present date.
CPR Ratio	Displays the status of setting for CPR Ratio (30:2, 15:2)

**Rescue Operation Screen**

When the Paramedic CU-ERT simulates the acquisition and analysis of ECG signal, the following screen is displayed:



Energy	indicates the amount of energy to be delivered to the patient
Shock Count	indicates the number of shocks that have been delivered during the rescue session.
Heart Rate	indicates the heart rate of the acquired ECG in beats per minute (BPM)
ECG Waveform	displays the ECG waveform acquired from the patient
BATTERY LEVEL INDICATOR; External Battery Pack is Used	Shows the power level of the external battery pack of the Paramedic CU-ERT. It also indicates when the Paramedic CU-ERT is powered by an AC adapter or a Car cigar lighter jack.  <ul style="list-style-type: none"> <li> Battery level &gt; 90% of full level.</li> <li> 90% &gt; Battery level &gt; 40% of full level.</li> <li> 40% &gt; Battery level &gt; 10% of full level.</li> <li> Battery level &lt; 10% of full level. At this level, the device can still deliver ten 150J shocks. When this is displayed, the battery pack should be replaced. Do not wait for the battery pack to be drained below the level where the Paramedic CU-ERT could not operate anymore.</li> </ul>
Battery Status Icon When the AC/DC Adapter is on Use	 the device is powered by an AC adapter or a Car cigar lighter jack
Rhythm / Scenario Indicator	Indicates the rhythm being displayed on the screen or the rescue scenario being run
Text Prompt	the commands issued by the device that guides the user throughout the rescue process.
Elapsed Time	indicates the time that elapsed since the device was turned on during the current rescue process.
SmartMedia Card Recording Indicator	Indicates that the SmartMedia card is in its port and recording of ECG waveform, voice, and event data is being done. When  is displayed, the voice recording option is ON and audio signals in the vicinity of the rescue operation are being recorded. When  is displayed, the voice recording option is OFF and the voice signals in the vicinity of the rescue operation are not recorded. All the other rescue data are still being recorded.
CPR Ratio	Displays the status of setting for CPR Ratio (30:2, 15:2)

#### 4.7.2 Power Switch and SHOCK Button

Power is turned ON and SHOCK is delivered by activating the Power switch and the SHOCK buttons, respectively.

#### 4.7.3 Menu Buttons

The menu is activated and navigated using the Menu Buttons




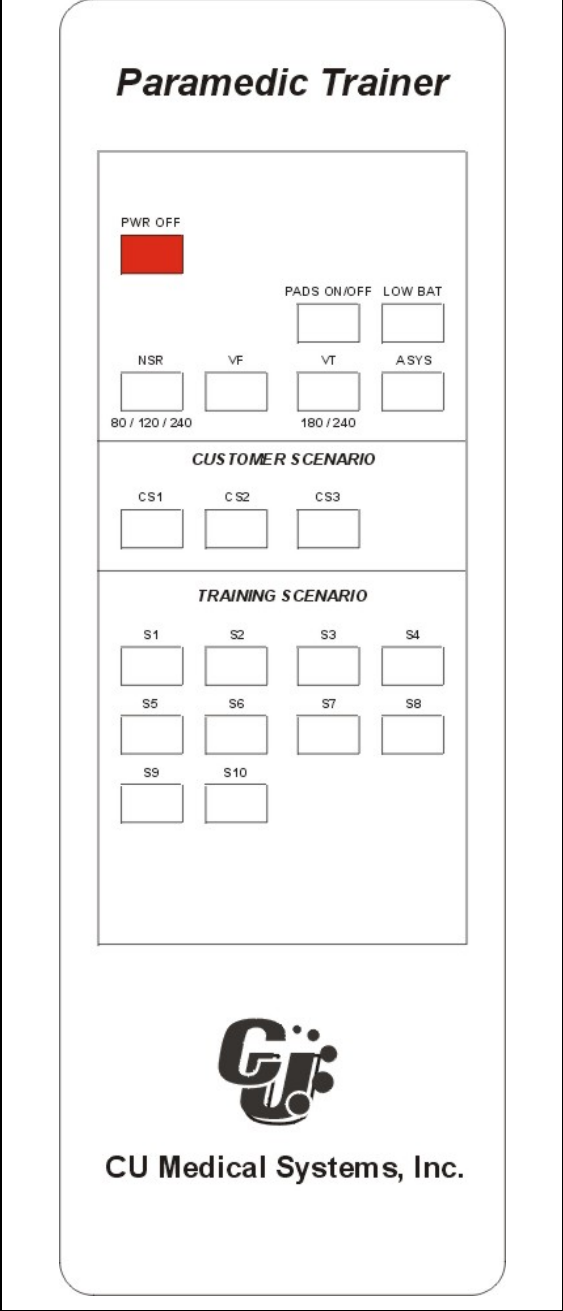
The UP Button scrolls the highlighter up during Menu operation.

The DOWN Button scrolls the highlighter down during Menu operation.

The MENU Button, when pressed, selects the option highlighted by the highlighter bar.

4.7.4 Infrared Remote Controller

This enables an instructor to control the Paramedic CU-ERT from a distance.

Infrared Remote Controller	
Actual Shape	Key Button Markings
	<p><b>Paramedic Trainer</b></p> 

Infrared Remote Controller Functions	
Key	Function
POWER OFF	Turns the power of the Paramedic CU-ERT when pressed while the Paramedic CU-ERT is ON.
PAD ON/OFF	Simulates pads ON and pads OFF conditions. Toggles between the said two conditions when pressed (i.e. if the pads are ON, turns OFF the pads when pressed; if the pads are OFF, turns ON the pads when pressed).
LOW BAT	Simulates a low battery condition when pressed.
NSR 80/120/240	Simulates the acquisition and display of a normal sinus rhythm ECG. Default rate is 80 bpm. The rate is cycled through the 80/120/240 bpm loop when the key is pressed repeatedly.
VF	Simulates the acquisition and display of a ventricular fibrillation ECG rhythm.
VT 180/240	Simulates the acquisition and display of a ventricular tachycardia ECG rhythm. The rate is cycled through the 1800/240 bpm loop when the key is pressed repeatedly.
ASYS	Simulates the acquisition and display of an asystole ECG rhythm.
CS1	Customer defined rescue scenario. Not implemented on this version of Paramedic CU-ERT.
CS2	Customer defined rescue scenario. Not implemented on this version of Paramedic CU
CS3	Customer defined rescue scenario. Not implemented on this version of Paramedic CU
S1 to S10	Rescue scenarios 1 to 10. The rescue scenarios simulate rescue conditions in the field. The trainee may react to the scenarios by doing the appropriate actions.



#### **4.7.5 Light indicators**

The following light indicators indicate the state of the Paramedic CU-ERT during operation.

Power – indicates that the Paramedic CU-ERT is ON.

Battery – not used in this version of the Paramedic CU-ERT.

Error – indicates that an error has occurred.

Power Switch Button Backlight – when ON, indicates that the Paramedic CU-ERT is ON.

SHOCK Button Switch Backlight – flashes when the SHOCK Button needs to be pressed to simulate the prompt for a SHOCK delivery.

#### **4.7.6 Speaker and beeper**

Speaker – plays back the appropriate recorded prompts during operation.

Beeper – beeps during charging completion simulation and during CPR pause simulation.

## 4.8 Menu Operation

The simulation of the Paramedic CU-ERT menu is activated when the MENU button on the keypad is pressed.

MENU button – used to activate the MENU. When the Menu is active, used to select the highlighted option of the Menu.

UP button – used to scroll UP the highlighter in the Menu.

DOWN button – used to scroll DOWN the highlighter in the Menu.

The MENU will be activated upon pressing the MENU button while the ECG connector is not connected with the ECG-DEFIB port of the Paramedic CU-ERT. Menu operation will be possible only when the MENU button is pressed right after the power switch is turned ON. Once the device had started acquiring ECG data, menu operation can no longer be done. The device had to be turned OFF then ON again if the operator wants to enter menu operation.

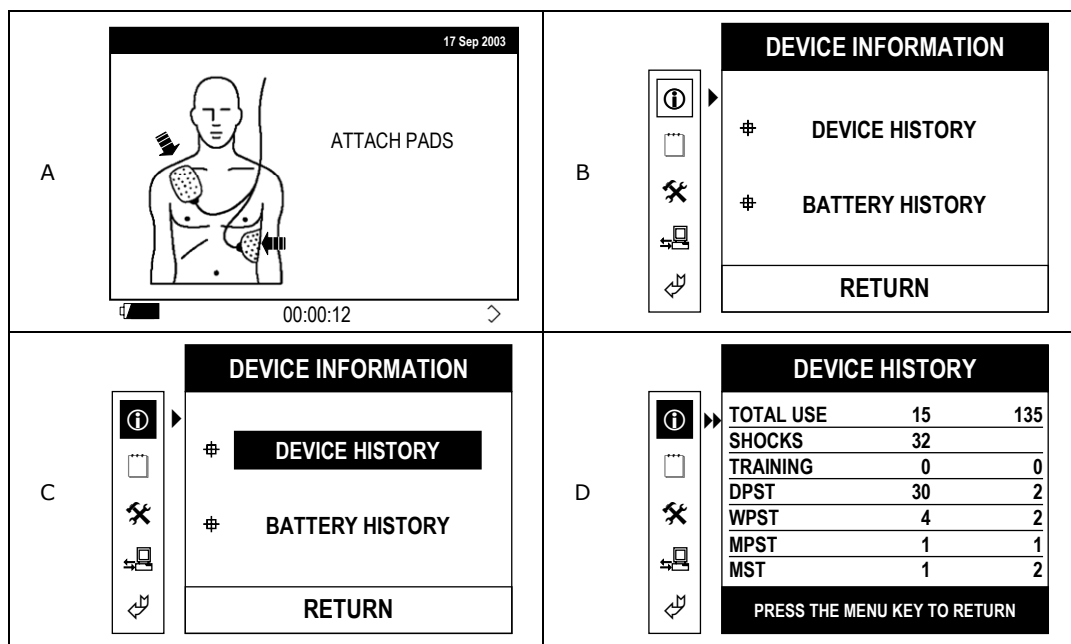
### 4.8.1 Device History

Device History contains the history of the device during its lifetime. Displayed on the LCD are data on parameters such as:

- the number and total elapsed time of device usage
- the number of shocks delivered
- the number and total elapsed time of trainings conducted using the device
- the number and total elapsed time of the different tests (daily, weekly, monthly, and manual tests)

To go to device history, press the following keys

Turn ON the device. Press MENU key three times. The following screens will be displayed



Total Use:

First column- number of times the Paramedic CU-ERT had been used in RESCUE operations.

Second column: total elapsed time, in minutes that the device had been in use in RESCUE operations.

Total use values are cumulative since the device was first used.

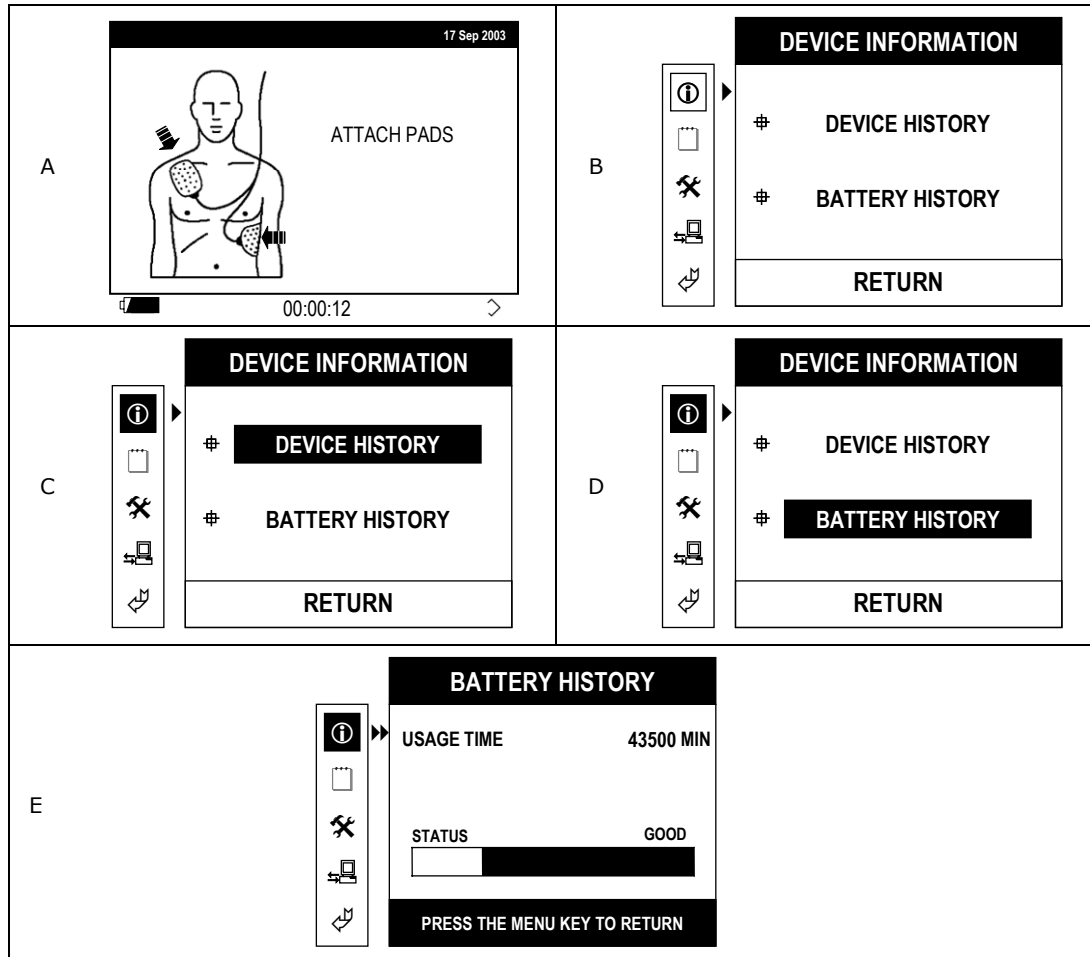
Shocks: total number of shocks delivered since the device had been put into use.

TRAINING/DPST/WPST/MPST/MST: number (first column) and total elapsed time (second column) of training sessions, Self-tests (Power-ON, Daily, Weekly, Monthly) and manual tests.

### 4.8.2 Battery History

The battery history indicates the number of minutes that the battery had been in use and the current state of the battery (GOOD or LOW). This indicates the history and status of the internal battery pack only. It does not indicate the history and status of the external battery pack.

To go to BATTERY HISTORY press ON – MENU – MENU – DOWN – MENU. The following screens will be displayed:



**USAGE TIME** - Total time that the internal battery pack is used as power supply of the Paramedic CU-ERT. This time is counted since the time when the Paramedic CU-ERT is first used. Only the time when the Paramedic CU-ERT is turned ON will be counted

**STATUS** - Battery charging state: indicates the power level of the internal battery pack. When the Status indicates LOW, recharge the battery pack.

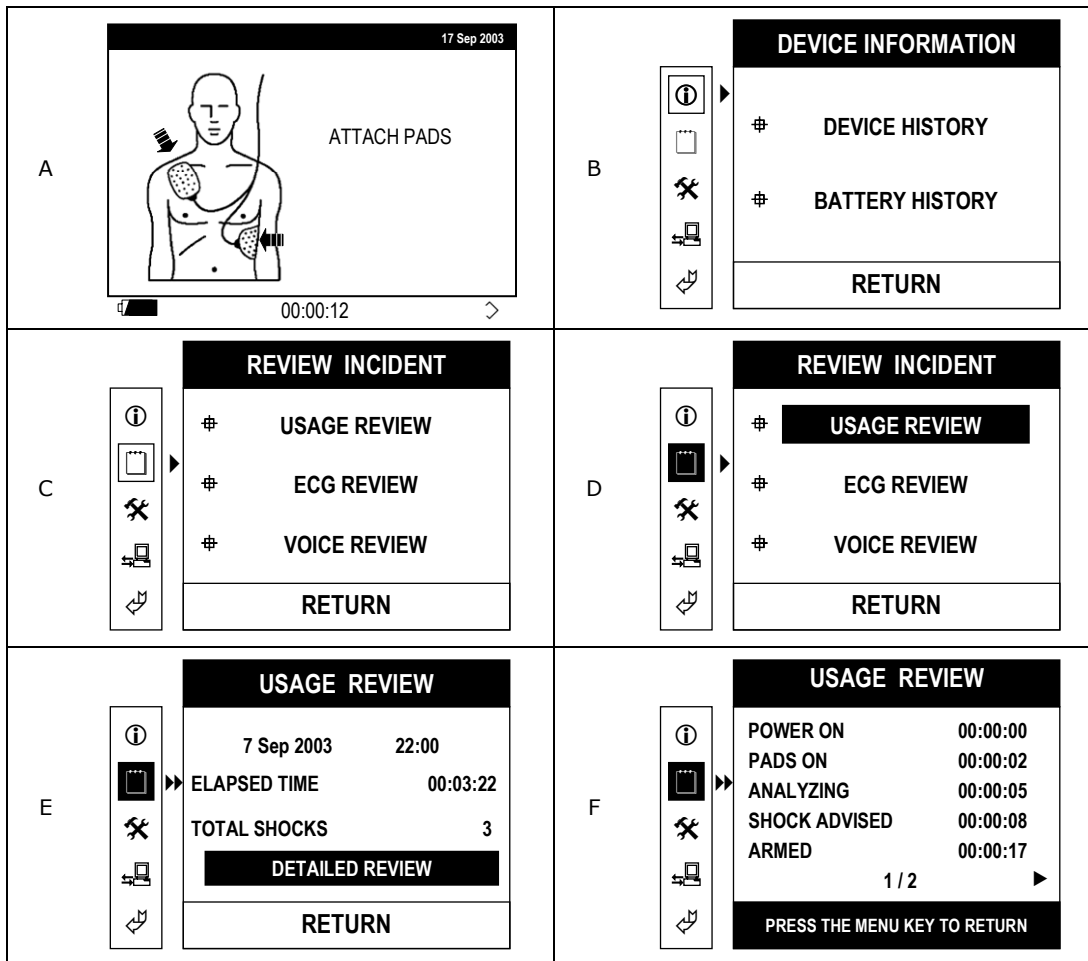
### 4.8.3 Usage Review

USAGE REVIEW will display the list of Rescue Events recorded together with their time stamp. The list of Rescue Events is given in the following table.

Name of Event	Event
Power ON	Indicates the time when the Paramedic CU-ERT is turned ON.
Power OFF	Indicates the time when the Paramedic CU-ERT is turned OFF
Pads ON	Indicates the time when the multifunction rescue pads are connected to the Paramedic CU-ERT
Pads OFF	Indicates the time when the multifunction rescue pads are disconnected from the Paramedic CU-ERT
Armed	Indicates the time when the defibrillating capacitor of the Paramedic CU-ERT is fully charged.
Disarmed	Indicates the time when the charge in the defibrillating capacitor is dumped on the internal dump resistance of the Paramedic CU-ERT. The charge in the defibrillating capacitor is automatically dumped when the SHOCK button is not pressed within 15 seconds after the prompt to press the SHOCK button is given.
Shock # X	Indicates the time when the X'th shock is delivered by the Paramedic CU-ERT.
Analyzing	Indicates the time when the Paramedic CU-ERT is analyzing the ECG of the patient.
No Shock Advised	Indicates the time when the Paramedic CU-ERT issues the "NO SHOCK ADVISED" prompt.
Shock Advised	Indicates the time when the Paramedic CU-ERT issues the "SHOCK ADVISED" prompt.
Paused for CPR	Indicates the time when the Paramedic CU-ERT pauses to give way to CPR administration
ECG Pads On	Indicates the time when the ECG monitoring cable and connector assembly is connected to the Paramedic CU-ERT
ECG Pads Off	Indicates the time when the ECG monitoring cable and connector assembly is disconnected from the Paramedic CU-ERT

To go to USAGE REVIEW press ON – MENU – DOWN – MENU – MENU – MENU

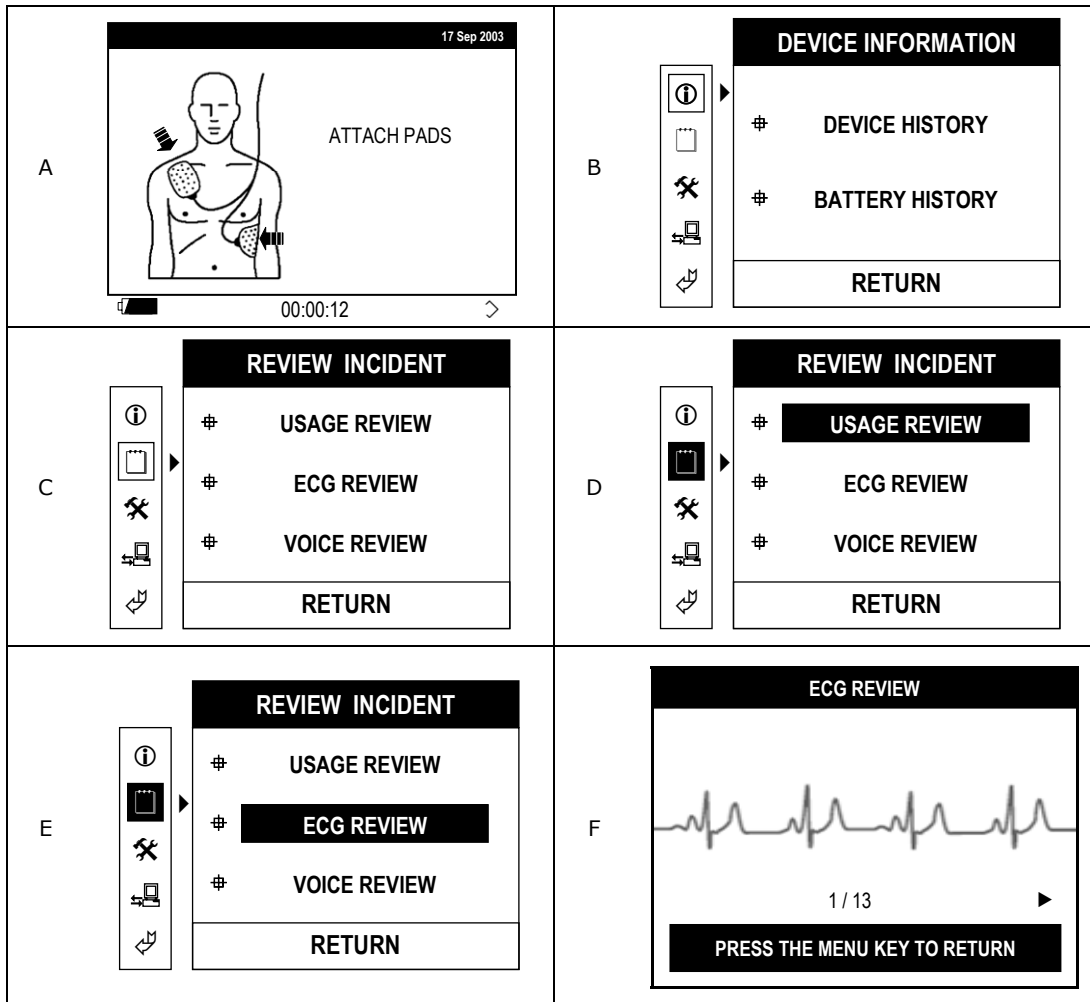
The following screens will be displayed:



**4.8.4. ECG Review**

ECG REVIEW will display the ECG record stored in the internal memory or the SmartMedia Card memory. The ECG data from the latest rescue operation can be scrolled to the right or to the left (earlier or later part of the recording, respectively). Scroll the data by pushing the UP or DOWN arrow button.

To go to ECG REVIEW, press ON – MENU – DOWN – MENU – DOWN – MENU.  
The following screens will be displayed:



### 4.8.5 Voice Review

In VOICE REVIEW, the voice recorded during a rescue operation is played back. Voice can be stored only in the SmartMedia Card. Therefore, this will work only if the SmartMedia Card is inserted.

To do a VOICE REVIEW:

Insert the SmartMedia Card

Press ON – MENU – DOWN – MENU –DOWN – DOWN –MENU

The following screens will be displayed

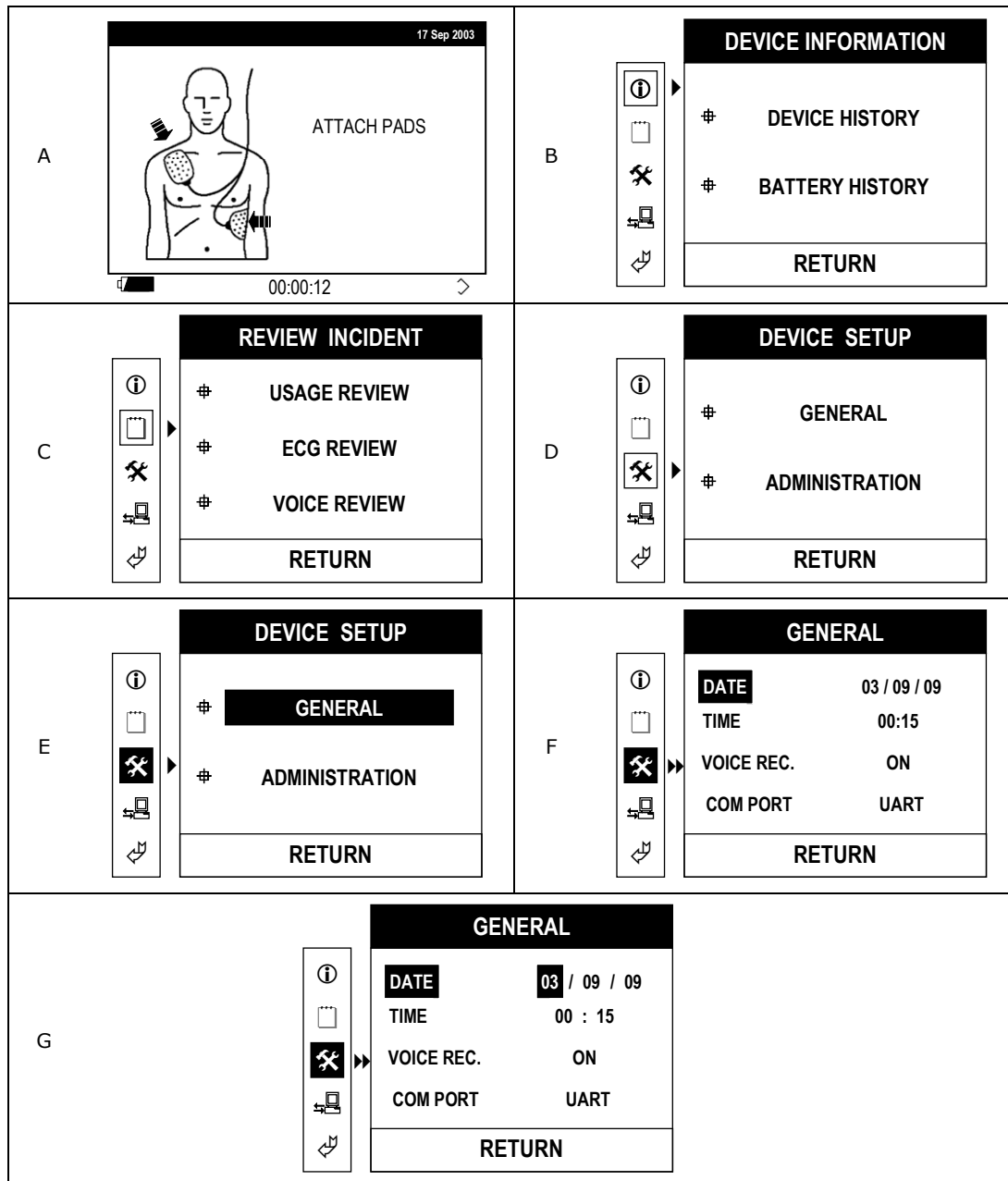
<p>A</p>	<p>B</p>
<p>C</p>	<p>D</p>
<p>E</p>	<p>F</p>
<p>G</p>	<p>H</p> <p>If the SmartMedia Card is not inserted, going to VOICE REVIEW will display the this screen:</p>

### 4.8.6 General Device Setup

In the GENERAL DEVICE SETUP, operating parameters such as date, time, voice recording, and printer option can be changed or adjusted by the user.

To go to GENERAL DEVICE SETUP, press, ON – MENU – DOWN –DOWN –MENU – MENU – MENU.

The following screens are displayed:



The variable parameters are highlighted one by one by pressing the MENU button while the variable is highlighted. For example, when DATE is highlighted, the day, month, or year can be highlighted by pressing the MENU button.

When a variable parameter (such as day for DATE) is highlighted, its value can be changed by pressing the UP or DOWN button. UP will increase the value, DOWN will decrease the value. When the boundary of the value is reached the value will wrap around. For example for the MONTH variable of DATE, when 12 is reached, one more press of the UP button will wrap the value to 01



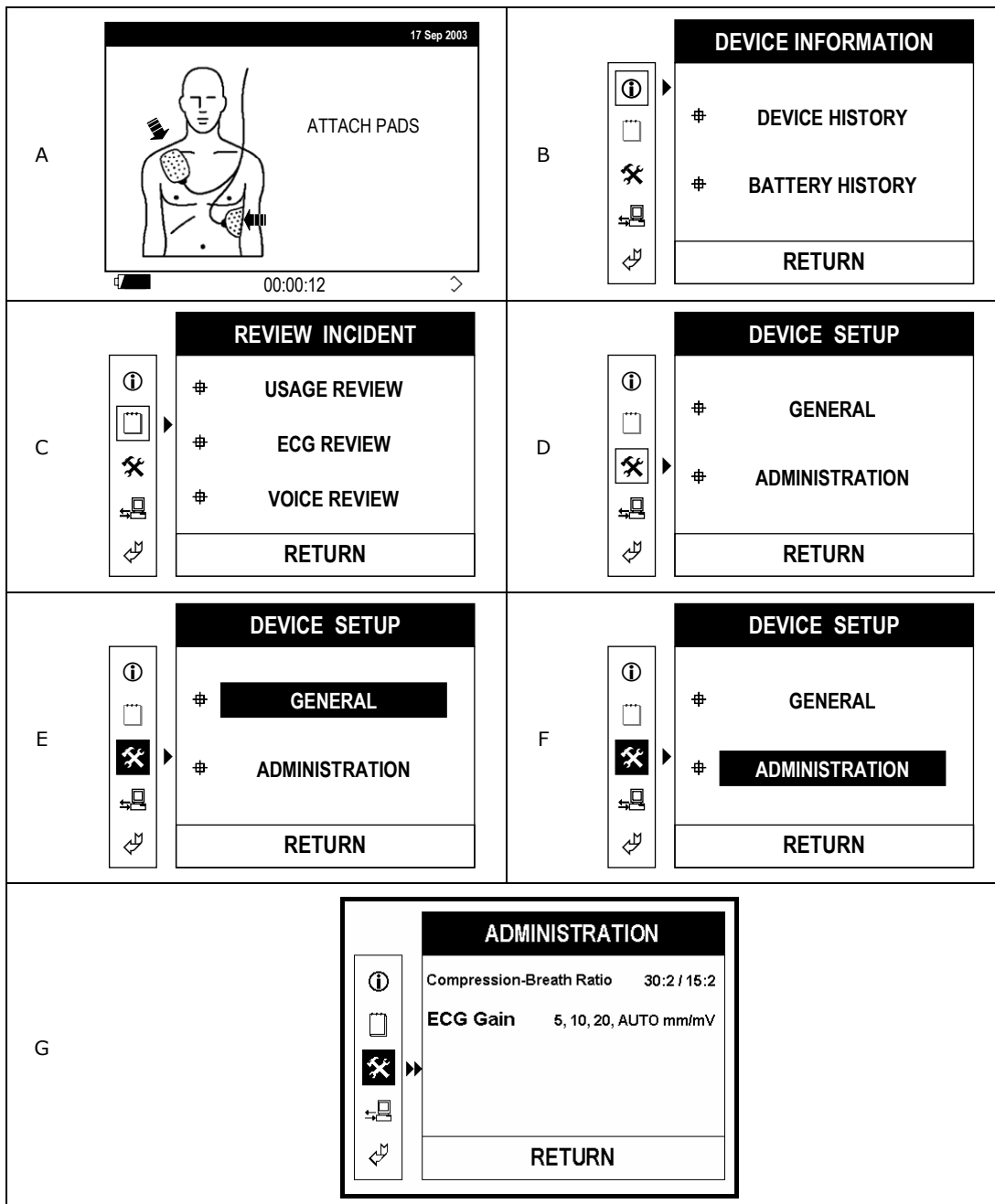
### 4.8.7 Administration Device Setup

In the ADMINISTRATION DEVICE SETUP menu, you can set the “**Compression-Breath Ratio**” and “**ECG Gain**”, as follows.

To go to ADMINISTRATION DEVICE SETUP, press, ON – MENU – DOWN – DOWN – MENU – DOWN – MENU

- **Compression-Breath Ratio** : 30:2, 15:2 (You can select one between the 2 options.)
- **ECG Gain** : 5, 10, 20, AUTO mm/mV (You can select one among, the 4 options.)

The following screens are displayed



Scroll through the choices by pushing the UP or DOWN button. Highlight your choice and then press the MENU button.

### 4.8.8 Printing Data

The ECG data stored in the internal flash memory or the SmartMedia Card can be printed using the optional thermal printer. If the SmartMedia Card is not inserted, the data stored in the internal flash memory is printed. If the SmartMedia Card is inserted, the ECG data stored in it will be printed.

To print ECG data, press ON – MENU – DOWN – DOWN – DOWN – MENU – DOWN – DOWN – MENU

The following screens will be displayed:

<p>A</p>	<p>B</p>
<p>C</p>	<p>D</p>
<p>E</p>	<p>F</p>
<p>G</p>	<p>H</p>

#### **4.8.9 Return**

To return to a higher level in the MENU system during menu operation, highlight the RETURN option or icon then press the MENU button. You will then be taken to the next higher level in the system. If you are in the highest sublevel, highlighting the RETURN icon and then pressing the MENU button will take you back to RESCUE mode and the Paramedic CU-ERT will prompt you to ATTACH PADS.

## 5 Device Preparation/Set Up

### 5.1 Unpacking

- a) Carefully inspect the packing container for damage.
- b) Inspect the unit for apparent damage that the device might have sustained during shipping.
- c) Check the shipping list to ensure that the unit comes with the complete accessories.

### 5.2 Power Connection

Connect the preferred Power Source to the Paramedic CU-ERT. This is discussed in detail on the Chapter on Power Supply.

### 5.3 Rescue Setup

- a. Connect the plug of the AED pads to the ECG-DEFIB Port of the Paramedic CU-ERT.
- b. Attach the pads to the resuscitation mannequin at the locations shown on the graphic guide at the back of the pads.

## 6. Operation

### 6.1 Operation Scenario Groups

The operation scenarios of the Paramedic CU-ERT can be grouped into three.

- a. Continuous single type ECG rhythm – this refers to the simulation wherein the chosen ECG rhythm is continuously acquired by the Paramedic CU-ERT. The ECG rhythm does not change throughout the operation unless changed by the user.
- b. Customer Scenario – this refers to the scenario that is programmed by the user. This is not available for this version of the Paramedic CU-ERT.
- c. Training Scenario – this refers to the rescue scenarios that are programmed into the Paramedic CU-ERT at the factory.

### 6.2 Paramedic CU-ERT Operation

To use the Paramedic CU-ERT, do the following steps:

- a. Turn the Paramedic CU-ERT by pressing the Power Switch.
- b. Simulate the attachment of the pads by pressing the PAD ON/OFF key of the Remote Controller. The infrared output of the Remote Controller should be directed towards the LCD screen of the Paramedic CU-ERT.
- c. Choose the single ECG rhythm to simulate or choose an available Customer Scenario or Training Scenario. The default simulated rhythm is Normal Sinus Rhythm, 80 bpm.
- d. Follow the voice and text prompts issued by the Paramedic CU-ERT.

## 6.3 Scenarios

### 6.3.1 PAD ON/OFF

- a. This simulates a Pads On or Pads Off scenario. It is initiated by pressing the PAD ON/PAD OFF key on the Remote Controller.
- b. The PAD ON/PAD OFF key on the Remote Controller toggles the simulated condition of the pads. When the pads are currently ON, pressing the PAD ON/PAD OFF key will turn the pads OFF. When the pads are currently OFF, pressing the PAD ON/PAD OFF key will turn the pads ON.
- c. Upon turning the pads ON, the default simulated ECG rhythm is Normal Sinus Rhythm 80 bpm.
- d. Upon turning the pads OFF, the device will issue the "CHECK PADS" voice and text prompts.

### 6.3.2 LOW BAT

- a. This simulates a low battery condition. The scenario is entered by pressing the LOW BAT key on the Remote Controller.
- b. When the LOW BAT key is pressed, the device does the following:
  - i. Displays the text prompt "LOW BATTERY CODE:0001"
  - ii. Emits short beeps in quick succession
  - iii. Turns the ERROR light indicator ON
  - iv. Turns OFF after approximately 5 seconds

### 6.3.3 NSR

- a. This is the default simulated ECG (80 bpm)
- b. There are three available beat rates, 80 bpm, 120 bpm, and 240 bpm.
- c. The heart beat rates are cycled through by pressing the NSR button repeatedly.
- d. The name of the ECG rhythm and the beat rate will be shown on the LCD before the said ECG rhythm is displayed on the LCD screen and while the same ECG rhythm is running.

### 6.3.4 VF

- a. This is initiated by pressing the VF key on the Remote Controller.
- b. A Ventricular Fibrillation ECG rhythm will be simulated and fed to the Paramedic CU-ERT.
- c. The name of the ECG rhythm and the beat rate will be shown on the LCD before the said ECG rhythm is displayed on the LCD screen and while the same ECG rhythm is running.

### 6.3.5 VT

- a. This is initiated by pressing the VT key on the Remote Controller
- b. A Ventricular Tachycardia ECG Rhythm will be simulated and fed to the Paramedic CU-ERT.
- c. There are two available beat rates for this ECG rhythm, 180 bpm and 240 bpm. The 180 bpm monomorphic VT is non shockable while the 240 bpm monomorphic VT is shockable.
- d. The heart beat rates are cycled through by pressing the NSR button repeatedly.
- e. The name of the ECG rhythm and the beat rate will be shown on the LCD before the said ECG rhythm is displayed on the LCD screen and while the same ECG rhythm is running.

### 6.3.6 Asystole

- a. This is initiated by pressing the ASYS key on the Remote Controller
- b. An Asystole ECG Rhythm will be simulated and fed to the Paramedic CU-ERT.
- c. The name of the ECG rhythm and the beat rate will be shown on the LCD before the said ECG rhythm is displayed on the LCD screen.

**6.3.7 S1, Training Scenario 1**

- a. This is initiated by pressing the S1 key on the Remote Controller
- b. Ventricular Fibrillation with multiple shocks required for conversion.
- c. The following will be simulated:
  - i. Shockable rhythm
  - ii. 1<sup>st</sup> shock
  - iii. CPR countdown (30:2, 15:2)
  - iv. 2<sup>nd</sup> shock
  - v. CPR countdown (30:2, 15:2)
  - vi. 3<sup>rd</sup> shock
  - vii. CPR countdown (30:2, 15:2)
  - viii. 4<sup>th</sup> shock
  - ix. CPR countdown (30:2, 15:2)
  - x. Rhythm converted to non shockable Normal Sinus Rhythm.
- d. The name of the Training Scenario will be shown on the LCD before the said scenario is displayed on the LCD screen and while the scenario is running.

**6.3.8 S2, Training Scenario 2**

- a. This is initiated by pressing the S2 key on the Remote Controller
- b. Ventricular Fibrillation with two shocks required for conversion.
- c. The following will be simulated:
  - i. Shockable rhythm
  - ii. 1<sup>st</sup> shock
  - iii. CPR countdown (30:2, 15:2)
  - iv. 2<sup>nd</sup> shock
  - v. CPR countdown (30:2, 15:2)
  - vi. Rhythm converted to non shockable Normal Sinus Rhythm.
- d. The name of the Training Scenario will be shown on the LCD before the said scenario is displayed on the LCD screen and while the scenario is running.

**6.3.9 S3, Training Scenario 3**

- a. This is initiated by pressing the S3 key on the Remote Controller
- b. 80 bpm Normal Sinus Rhythm all throughout.
- c. The name of the Training Scenario will be shown on the LCD before the said scenario is displayed on the LCD screen and while the scenario is running.

**6.3.10 S4, Training Scenario 4**

- a. This is initiated by pressing the S4 key on the Remote Controller
- b. Ventricular Fibrillation with two shocks required for conversion followed by refibrillation.
- c. The following will be simulated:
  - i. Shockable rhythm
  - ii. 1<sup>st</sup> shock
  - iii. CPR countdown (30:2, 15:2)
  - iv. 2<sup>nd</sup> shock
  - v. CPR countdown (30:2, 15:2)
  - vi. Rhythm converted to non shockable Normal Sinus Rhythm.
  - vii. Refibrillation to Ventricular Fibrillation after 50 seconds.
  - viii. 3<sup>rd</sup> shock
  - ix. CPR countdown (30:2, 15:2)
  - x. Rhythm converted to non shockable Normal Sinus Rhythm.
- d. The name of the Training Scenario will be shown on the LCD before the said scenario is displayed

on the LCD screen and while the scenario is running.

#### **6.3.11 S5, Training Scenario 5**

- a. This is initiated by pressing the S5 key on the Remote Controller
- b. Ventricular Fibrillation with one shock required for conversion followed by refribrillation and then another shock then conversion to non shockable rhythm.
- c. The following will be simulated:
  - i. Shockable rhythm
  - ii. 1<sup>st</sup> shock
  - iii. CPR countdown (30:2, 15:2)
  - iv. Rhythm converted to non shockable Normal Sinus Rhythm.
  - v. Refibrillation to Ventricular Fibrillation after 10 seconds.
  - vi. 2<sup>nd</sup> shock
  - vii. CPR countdown (30:2, 15:2)
  - viii. Rhythm converted to non shockable Normal Sinus Rhythm.
- d. The name of the Training Scenario will be shown on the LCD before the said scenario is displayed on the LCD screen and while the scenario is running.

#### **6.3.12 S6, Training Scenario 6**

- a. This is initiated by pressing the S6 key on the Remote Controller
- b. Ventricular Fibrillation with one shock required for conversion to non shockable rhythm.
- c. The following will be simulated:
  - i. Shockable rhythm
  - ii. 1<sup>st</sup> shock
  - iii. CPR countdown (30:2, 15:2)
  - iv. Rhythm converted to non shockable Normal Sinus Rhythm.
- d. The name of the Training Scenario will be shown on the LCD before the said scenario is displayed on the LCD screen and while the scenario is running.

#### **6.3.13 S7, Training Scenario 7**

- a. This is initiated by pressing the S7 key on the Remote Controller
- b. Ventricular Fibrillation with one shock required for conversion to non shockable rhythm.
- c. The following will be simulated:
  - i. Shockable rhythm
  - ii. 1<sup>st</sup> shock
  - iii. CPR countdown (30:2, 15:2)
  - iv. Rhythm converted to non shockable Normal Sinus Rhythm.
  - v. Device error condition (Error code : 0128)
- d. The name of the Training Scenario will be shown on the LCD before the said scenario is displayed on the LCD screen and while the scenario is running.

#### **6.3.14 S8, Training Scenario 8**

- a. This is initiated by pressing the S8 key on the Remote Controller
- b. Ventricular Fibrillation with one shock required for conversion followed by refribrillation and then another shock then conversion to non shockable rhythm.
- c. The following will be simulated:
  - i. Shockable rhythm
  - ii. 1<sup>st</sup> shock
  - iii. CPR countdown (30:2, 15:2)

- iv. Rhythm converted to non shockable Normal Sinus Rhythm.
  - v. Refibrillation to Ventricular Fibrillation after 20 seconds.
  - vi. 2<sup>nd</sup> shock
  - vii. CPR countdown (30:2, 15:2)
  - viii. Rhythm converted to non shockable Normal Sinus Rhythm.
- d. The name of the Training Scenario will be shown on the LCD before the said scenario is displayed on the LCD screen and while the scenario is running.

#### **6.3.15 S9, Training Scenario 9**

- a. This is initiated by pressing the S9 key on the Remote Controller
- b. Ventricular Fibrillation all throughout, no conversion to Normal Sinus Rhythm
- c. The name of the Training Scenario will be shown on the LCD before the said scenario is displayed on the LCD screen and while the scenario is running.

#### **6.3.16 S10, Training Scenario 10**

- a. This is initiated by pressing the S10 key on the Remote Controller
- b. Ventricular Fibrillation with one shock required for conversion followed by a low battery condition.
- c. The following will be simulated:
  - i. Shockable rhythm
  - ii. 1<sup>st</sup> shock
  - iii. CPR countdown (30:2, 15:2)
  - iv. Rhythm converted to non shockable Normal Sinus Rhythm.
  - v. Low battery condition
- d. The name of the Training Scenario will be shown on the LCD before the said scenario is displayed on the LCD screen and while the scenario is running.



## 7. Power Supply

The Paramedic CU-ERT can be powered by any of the following:

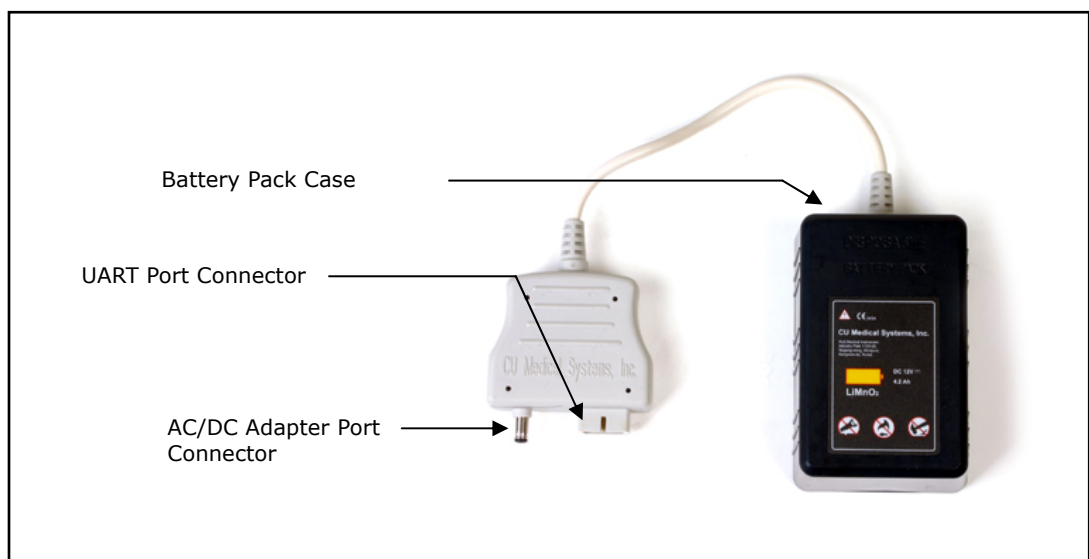
- a. External Disposable Battery Pack
- b. AC/DC Adapter

### 7.1 External Disposable Battery Pack

#### Description

The external disposable battery pack of the Paramedic CU-ERT is a LiMnO<sub>2</sub> battery pack. It is nonrechargeable.

The battery pack has a capacity of 10 hours of continuous operation.



The External LiMnO<sub>2</sub> Battery Pack

#### Connecting the Battery Pack

The battery pack is connected to the Paramedic CU-ERT through the AC/DC adapter port and the UART Port. The connector of the battery pack is embedded with connectors that match the AC/DC and UART Port connectors.

To connect the external battery pack, do the following:

- a. Plug in the connector of the external battery pack to the UART port and the AC/DC Adapter port simultaneously. The UART port and AC/DC port connectors on the battery pack are integrated into one connector.

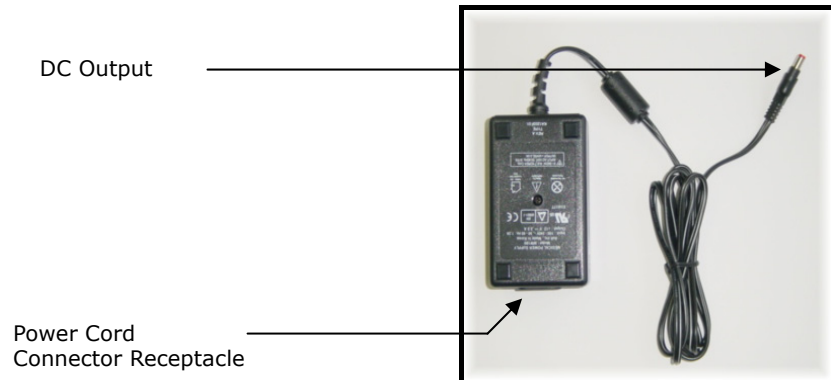
It is recommended that the external battery pack should be disconnected when the Paramedic CU-ERT is in storage.

## 7.2 AC/DC Adapter

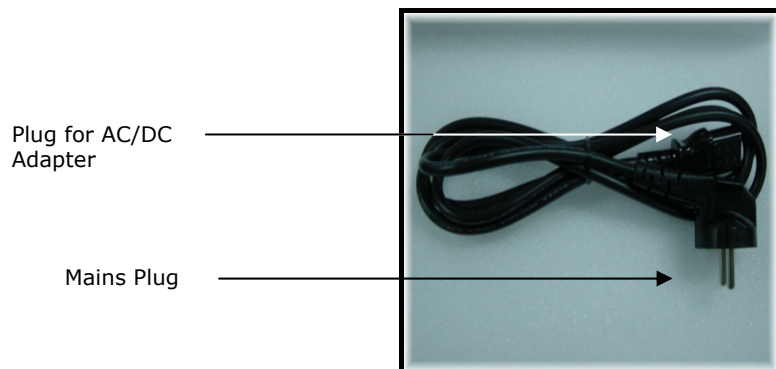
### Description

The AC/DC Adapter runs off the power mains with the following specifications:

- a. 100V to 240V AC
- b. 50/60 Hz line frequency



The AC/DC Adapter



Power cord

### Connecting the AC/DC Adapter

- a. connect the power cord to the power mains outlet and to the AC/DC adapter.
- b. connect the output of the AC/DC Adapter to the AC/DC Adapter port on the Paramedic CU-ERT.

## 8. Data Management

The Paramedic CU-ERT can simulate all of the Data Management functions of the Paramedic CU-ERT.

### 8.1 Overview

The Paramedic CU-ERT stores the following rescue operation data

- a. ECG data – the ECG signal acquired from the patient during an entire rescue operation.
- b. Rescue Events Data – the significant events during a rescue operation. These include events such as POWER ON, PADS ON, etc. These events are recommended for recording by the AAMI DF39 Standard.
- c. Audio Signal Data – this is a recording of the audio signals in the vicinity of the rescue operation. These include the voice prompts given by the device and the audio signals generated by sources close to the rescue operation (e.g. voice of the rescue administrator)

The Paramedic CU-ERT stores the rescue operation data in the following locations.

- a. Internal Data Flash Memory – this is the nonvolatile, default data storage location of the Paramedic CU-ERT. Audio signal data can not be recorded here. It is nonvolatile, thus, the stored data is not erased when the device is turned OFF.

The Internal Data Flash Memory has a capacity of 12 hours of ECG and Event data recording. The whole memory location is erased at the beginning of a rescue operation, thus, data stored from a previous rescue operation is overwritten. To keep previously recorded data from being lost, these must be transferred to a personal computer using the CU Expert ECG Data Management software.

- b. SmartMedia Flash Memory Card – this is the optional, removable, nonvolatile memory card available from CU Medical Systems, Inc. Audio signals may be stored here. This card is also erased during the start of a rescue operation. The data has to be transferred to a PC the same way as described above.

The SmartMedia card has a recording capacity of 48 hours of ECG and Events data or 1 hour of ECG, Event data, and Audio Signal Data.

When used, the SmartMedia card has to be installed in its port before the Paramedic CU-ERT is turned ON. The device has to be turned OFF before removing the SmartMedia card from its port.

## 8.2 Data Review

### 8.2.1 Internal Flash Memory

Data from the latest rescue operation is stored in the internal flash memory of the **Paramedic CU-ERT** if the SmartMedia Card is not present in its port. The data stored in the internal flash memory can be displayed and reviewed on the LCD screen of the device.

To review the stored data, perform the following steps:

- a. Turn the Paramedic CU-ERT ON without inserting the SmartMedia Card and without connecting any ECG/Defibrillation pads connector assembly to the ECG-DEFIB port.
- b. Activate the menu by pressing the MENU button and go to REVIEW INCIDENT-USAGE REVIEW or REVIEW INCIDENT-ECG REVIEW.

### 8.2.2 SmartMedia Card

Data from the latest rescue operation is stored in the SmartMedia flash memory card if it is installed in its port before the Paramedic CU-ERT is turned ON.

#### 8.2.2.1 Installation of a SmartMedia Card

- a) Ensure that the SmartMedia Card is clean and dry.
- b) Turn the **Paramedic CU-ERT** OFF.
- c) Load the SmartMedia Card with the metallic strip facing down and the notched end going in first. Push the card all the way in until the card hits a stop. The SmartMedia Card is ready to record data when the **Paramedic CU-ERT** is turned on for use.
- d) When the device is turned on with the SmartMedia Card inserted, the SmartMedia card data recording symbol is displayed on the bottom right side of the LCD display.



is displayed when the Voice Recording option is ON.



is displayed when the Voice Recording option is OFF

- e) Only SmartMedia Cards supplied by the manufacturer are compatible with the Paramedic CU-ERT. Do not use any other kind of flash memory card.

#### 8.2.2.2 Removal of a SmartMedia Card

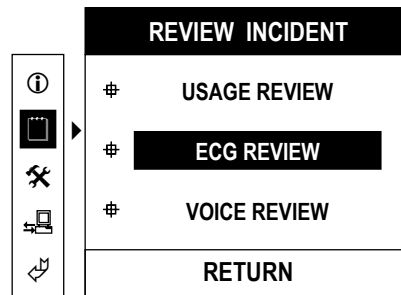
- a) Turn the **Paramedic CU-ERT** OFF
- b) Pull out the SmartMedia Card from the SmartMedia Card port.

#### NOTICE

**Make sure that the SmartMedia Card is loaded before turning ON the device. Do not pull out the SmartMedia Card before turning OFF the device. Loading or pulling out the SmartMedia Card while the power is ON will cause data error and may damage the SmartMedia card**

### 8.2.2.3 Reviewing Data Using A SmartMedia Card

After installing the SmartMedia Card, turn ON the Paramedic CU-ERT. Activate the menu by pressing the MENU button. Go to REVIEW INCIDENT. The following screen will be displayed



3 submenu listings (Usage Review, ECG Review, Voice Review) of the recorded incident data is then shown. Scroll the highlighter bar through the choices (Usage Review, ECG Review, Voice Review). Press the MENU key to enter the chosen sublevel. The data (Usage, ECG waveform, voice) will be displayed on the LCD or played back on the speaker. The user can scroll through the ECG data by pressing the UP(▲) or DOWN(▼) key

#### NOTICE

**When the SmartMedia Card is inserted to the Paramedic CU-ERT for recording of rescue data, all the data present in the SmartMedia Card will be overwritten with data from the current rescue operation. The previous data will no longer be retrievable. To preserve data through a series of rescue operations, the data must be transferred to a personal computer before using the SmartMedia card again.**

**The same is true with the internal flash memory. Previously recorded data will be overwritten every time new data are recorded in the internal flash memory during a rescue operation.**

**Stored data in the internal flash memory will not be overwritten if the data in a current rescue operation is stored in a SmartMedia Card. Thus, the data in the internal flash memory is still available for review when the Paramedic CU-ERT is turned ON without the SmartMedia Card inserted.**

### 8.3 DATA TRANSFER TO PERSONAL COMPUTER

The data from the previous rescue operation stored in the internal flash memory or the SmartMedia card is overwritten every time the Paramedic CU-ERT is used in a rescue operation.

To keep data permanently, it must be transferred to a computer that is running the CU Expert ECG Data Management Software. The CU Expert is an optional data management software available from CU Medical Systems, Inc.

Data transfer can be done through the IrDA port or the UART port of the Paramedic CU-ERT.

#### 8.3.1 IrDA

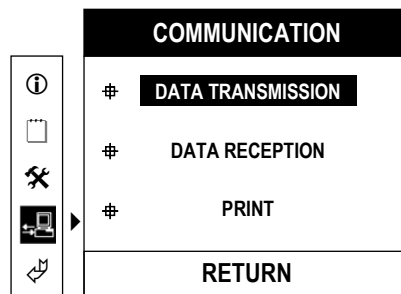
Connect the IrDA transceiver to the COM1 or COM2 serial port of the PC hosting the CU Expert ECG Data Management Software.

Align the IrDA transceiver with the IrDA port of the Paramedic CU-ERT. Insert the SmartMedia Card if the data to be transferred is in the SmartMedia Card. See the illustrations on the CU Expert User's Manual

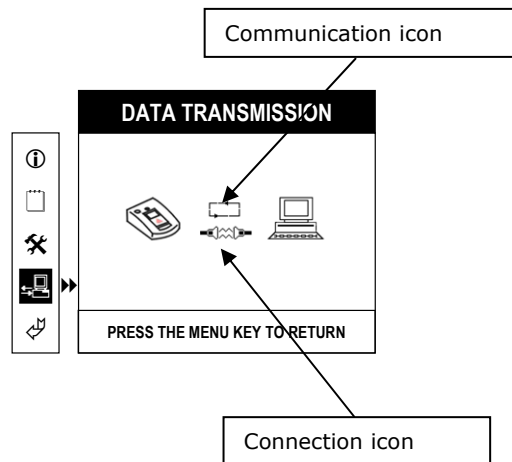
The Paramedic CU-ERT must be set to communicate through its IrDA port by setting the COM PORT to IrDA as outlined in the GENERAL DEVICE SETUP of the section on MENU OPERATION.

Transmit the data from the Paramedic CU-ERT through the following steps:

- a. Open the CU Expert ECG Data Management Software.
- b. Turn the Paramedic CU-ERT ON. Do not connect any cable connector to the ECG-DEFIB port (AED pads assembly or ECG Monitoring Cable Connector assembly.)
- c. Go to the CU Expert and begin data reception by executing the instructions spelled out in its User's Manual.
- d. Go back to the Paramedic CU-ERT. Activate the MENU by pressing the MENU button. Go to COMMUNICATION-DATA TRANSMISSION. The following screen should be displayed.



Push the MENU button. The data transmission screen will be displayed



When the Paramedic CU-ERT is communicating, the Communication icon will show moving arrow tips.

The Connection icon will show the status of the connection of the Paramedic CU-ERT with the PC during data transmission



- signifies that connection has not been made yet. This is also shown at the end of the data transfer process.



- signifies that a connection has been established and that communication is ongoing. When this icon is shown, a progress bar will also be shown underneath the Paramedic CU-ERT icon.



- signifies that the attempt to make a connection has failed. When this icon is shown, the Communication icon will also stop moving the arrow tips. Attempts to establish a connection will be stopped if no connection is made in 1 minute. This icon is also shown if data transfer is cancelled due to interference

- e. The progress of the data transmission will be tracked by a progress bar in the LCD display of the Paramedic CU-ERT.
- f. The order of device activation can also be reversed. It is possible to set the Paramedic CU-ERT first to transmit data and then set the CU Expert to receive data.
- g. When the data transmission is completed, the CU Expert ECG Data Management Software will prompt the user about the completion of the transmission. The completion of the data transmission is also shown by a full progress bar in the LCD display of the Paramedic CU-ERT.
- h. When the transmission is finished, the Paramedic CU-ERT may be turned OFF. It is also possible to do other tasks that are accessible through the menu operation.

### 8.3.2 UART Port

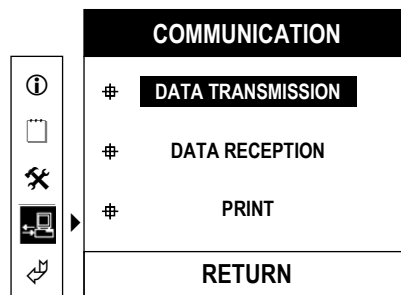
The UART port can be used to transmit data to a PC running the CU Expert ECG Data Management Software.

Connect the Paramedic CU-ERT to the PC as specified in the User's Manual of the CU Expert Data Management Software. Insert the SmartMedia Card if the data to be transferred is in the SmartMedia Card

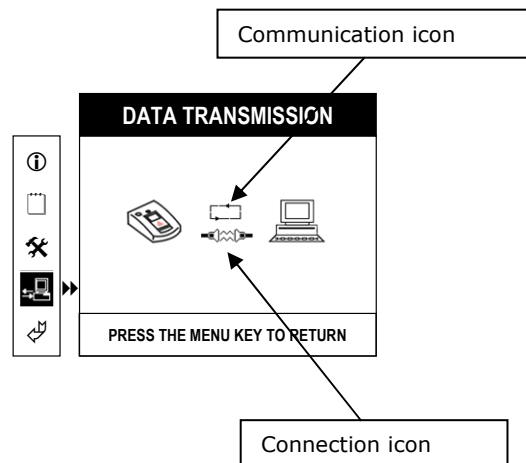
The Paramedic CU-ERT must be set to communicate through its UART port by setting the COM PORT to UART as outlined in the GENERAL DEVICE SETUP of the section on MENU OPERATION

Data Transmission Using the UART Port is done through the following steps:

- a. Open the CU Expert ECG Data Management Software.
- b. Turn the Paramedic CU-ERT ON. Do not connect any cable connector to the ECG-DEFIB port (AED pads assembly or ECG Monitoring Cable Connector assembly.)
- c. Go to the CU Expert and begin data reception by executing the instructions spelled out in its User's Manual.
- d. Go back to the Paramedic CU-ERT. Activate the MENU by pressing the MENU button. Go to COMMUNICATION-DATA TRANSMISSION. The following screen should be displayed.



- e. Push the MENU button. The data transmission screen will be displayed



When the Paramedic CU-ERT is communicating, the Communication icon will show moving arrow tips.

The Connection icon will show the status of the connection of the Paramedic CU-ERT with the PC during data transmission



- signifies that connection has not been made yet. This is also shown at the end of the data transfer process.



- signifies that a connection has been established and that communication is ongoing. When this icon is shown, a progress bar will also be shown underneath the Paramedic CU-ERT icon.



- signifies that the attempt to make a connection has failed. When this icon is shown, the Communication icon will also stop moving the arrow tips. Attempts to establish a connection will be stopped if no connection is made in 1 minute. This icon is also shown if data transfer is cancelled due to interference.



- f. The progress of the data transmission will be tracked by a progress bar in the LCD display of the Paramedic CU-ERT.
- g. The order of device activation can also be reversed. It is possible to set the Paramedic CU-ERT first to transmit data and then set the CU Expert to receive data.
- h. When the data transmission is completed, the CU Expert ECG Data Management Software will prompt the user about the completion of the transmission. The completion of the data transmission is also shown by a full progress bar in the LCD display of the Paramedic CU-ERT.
- i. When the transmission is finished, the Paramedic CU-ERT may be turned OFF. It is also possible to do other tasks that are accessible through the menu operation.

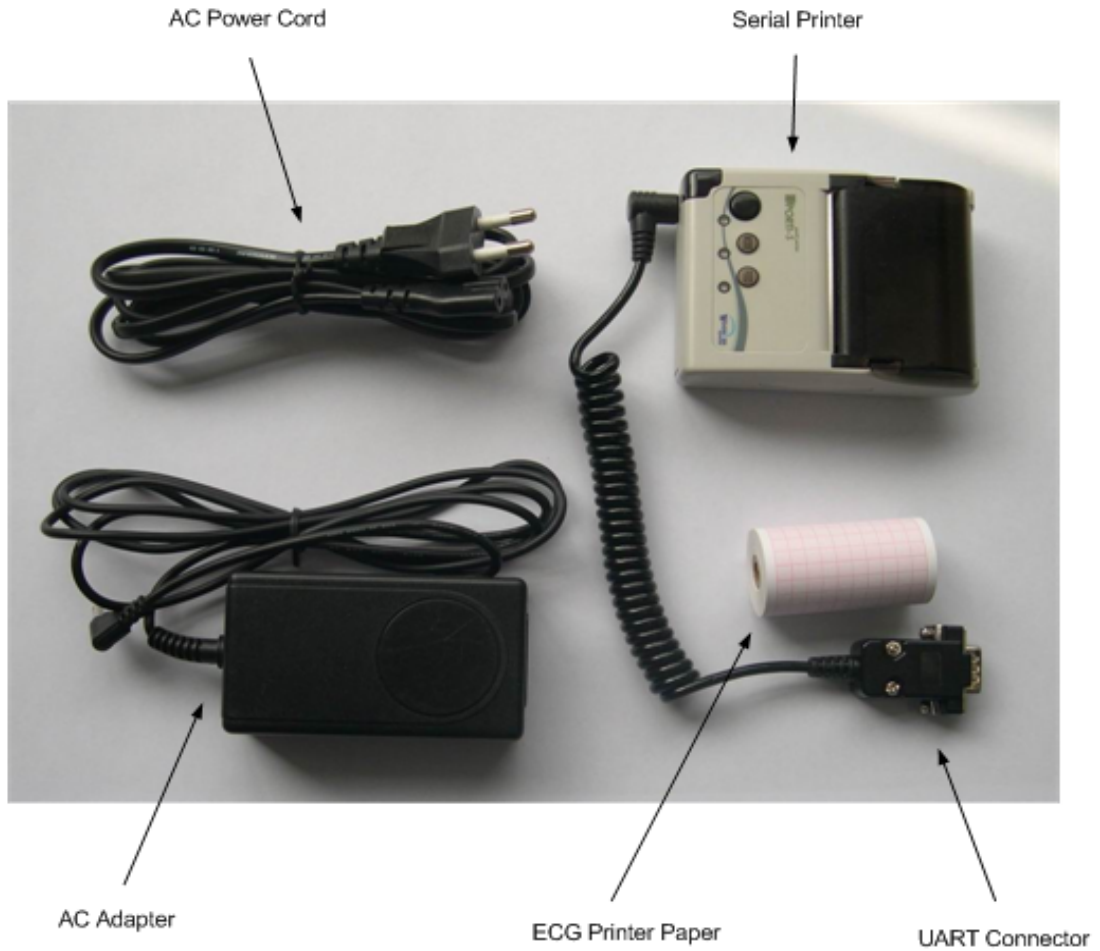
## 8.4 Printing Using a Stand-alone Serial Printer

The UART port can also be used to transmit data to a stand-alone serial printer.

### Stand-alone Serial Printer

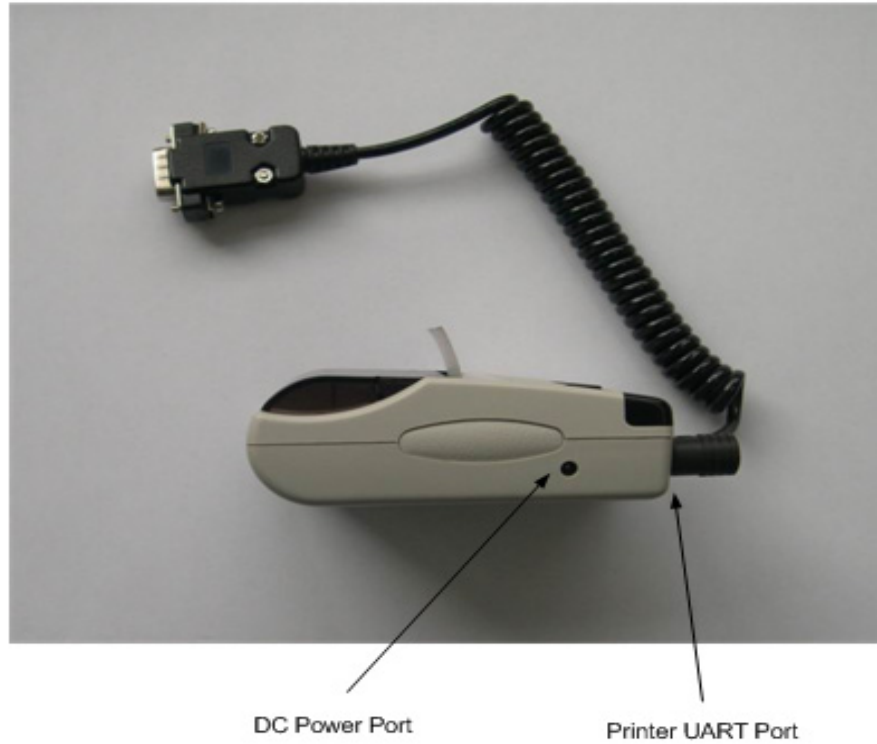
The optional stand-alone printer is a serial printer configured to receive data using RS232C protocol.

The stand-alone printer set that comes with the Paramedic CU-ERT (optional) is composed of the printer, UART cable, AC adapter, AC power cable, ECG printer paper. These are shown in the figure below:

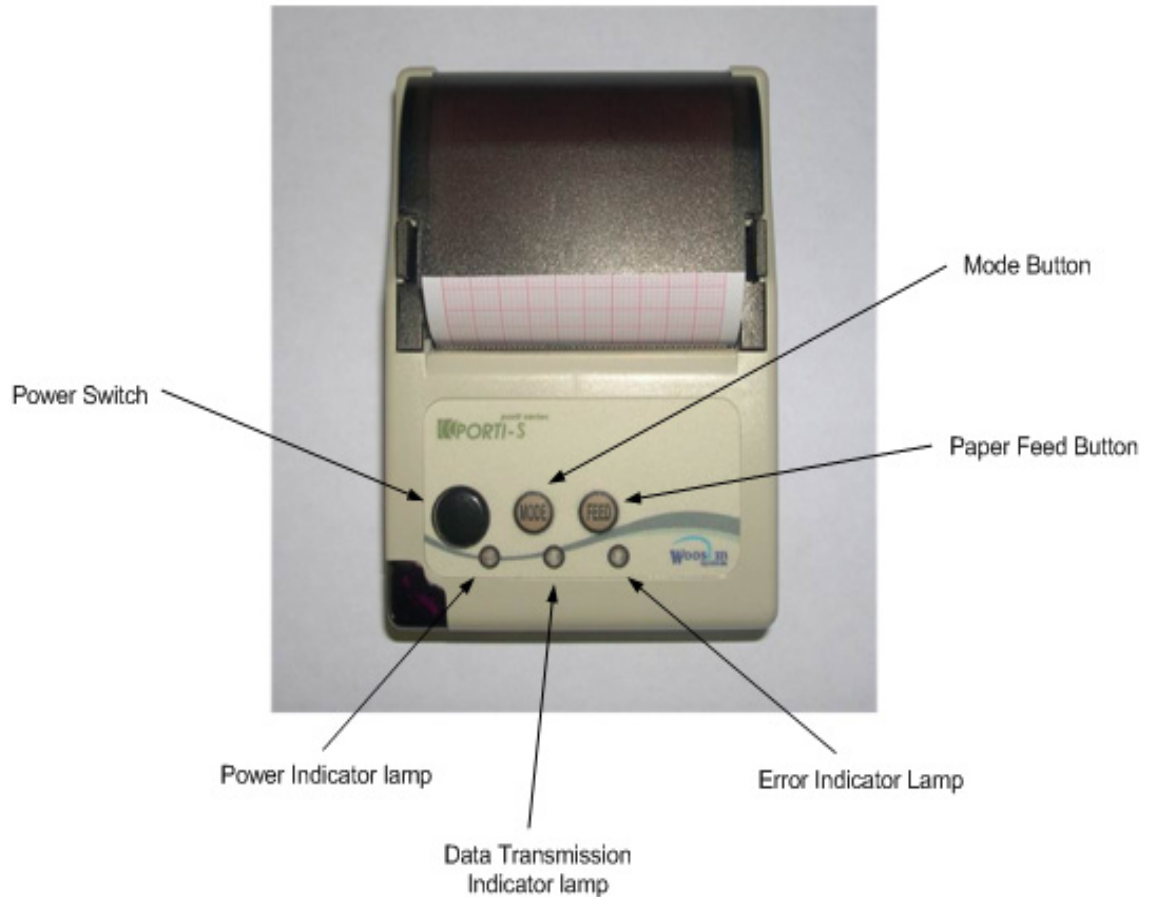


There are two ways to provide power to the stand-alone printer

- a. Connect the printer to the Paramedic CU-ERT without connecting the AC adapter. In this mode, the printer is powered by the Paramedic CU-ERT through the UART port.
- b. Connect the printer to the Paramedic CU-ERT and at the same time connect the DC output of the AC adapter to the printer power port. In this mode, the AC Adapter is supplying power to the printer. The printer is not drawing power off the Paramedic CU-ERT. The printer power port is shown in the next figure.



### Printer Control Buttons and LED Indicators



**Power Switch** – used to turn the power of the printer ON or OFF

**Mode button** – used to change the transmission parameters of the printer

**Paper Feed Button** – used to advance the printing paper. When the button is pressed and then released, the printer paper advances one line. When the button is pressed continuously, the printer paper advances continuously until the button is released.

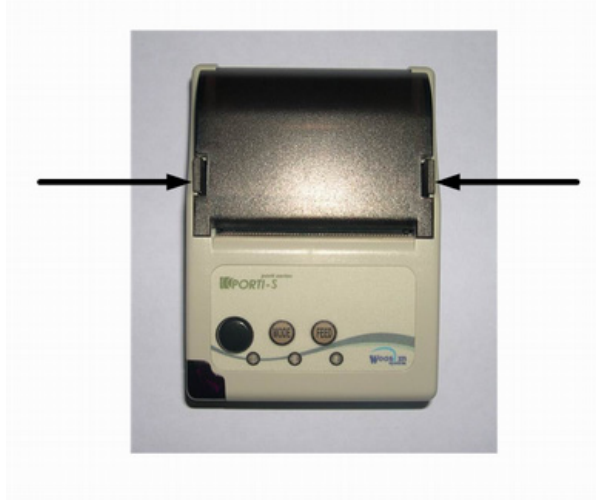
**Power Indicator Lamp** – this indicator lamp is ON when the printer is ON.

**Data Transmission Indicator Lamp** – this indicator lamp turns ON when the device is receiving data.

**Error Indicator** – this indicator lamp is ON when there is an error in the operation of the device.

### Loading Paper into the Printer

1. Open the paper compartment of the printer by pushing the locks inward simultaneously. When the locks are disengaged, pull the paper compartment lid upward. This is shown in the following figure.



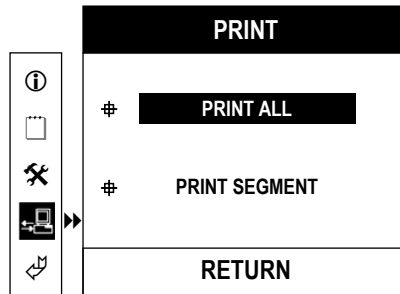
2. Place a roll of printer paper as shown in the following figure. The printing surface must face the paper cutter of the printer.



3. Close down the lid of the printing paper compartment. Allow around ¼ inch of printer paper to go past the paper cutter to ensure that the paper will feed properly during printing.

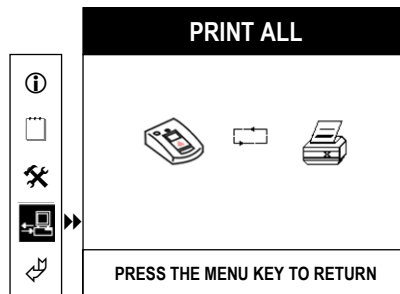
**Printing Data From the Paramedic CU-ERT**

- a. Connect the printer UART cable to the Paramedic CU-ERT's UART port.
- b. If it is desired to operate the printer using power from the AC adapter, connect the AC adapter power cord to the power mains and the AC adapter output to the printer power port. If it is desired to run the printer using power from the Paramedic CU-ERT, do not connect the AC adapter.
- c. Do not connect any connector (AED or ECG monitoring pads connector) to the ECG-DEFIB port of the Paramedic CU-ERT.
- d. If it is desired to print data contained in the SmartMedia card, insert the SmartMedia card into its port in the Paramedic CU-ERT, otherwise, do not insert the SmartMedia card and the data in the internal flash memory will be printed.
- e. Turn the Paramedic CU-ERT ON. Activate the menu. Go to COMMUNICATION, highlight PRINT then press the MENU button. The following screen will be displayed

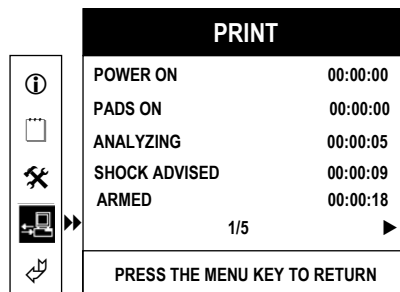


Pressing the MENU button will print all ECG and Event data stored in the active data memory storage (internal data flash memory if no SmartMedia card is present, SmartMedia card if it is present in its port)

The following figure will be displayed during printing

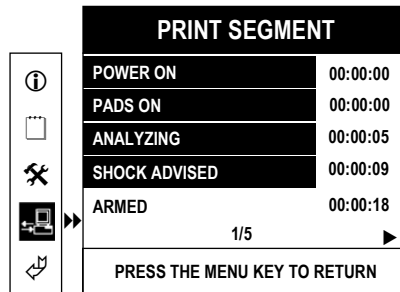


- f. If it is desired to print only a segment of the stored ECG data, highlight PRINT SEGMENT, then press the MENU button. The following screen will be displayed

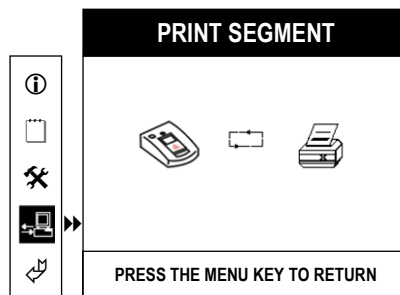


The event highlights are displayed. Choose the starting point of the segment to be printed by pressing the UP or DOWN buttons. A highlighter bar will appear and scroll UP or DOWN. Mark the starting Event point by highlighting it with the highlighter bar and pressing the MENU button.

Choose the ending Event point by pressing the DOWN button. As the DOWN button is pressed, the Events included in the segment to be printed are highlighted. The ending point will be the last highlighted event. After choosing the range to be printed, the screen display will look like this:



To print the chosen segment, press the MENU button. While the segment is being printed, the PRINT SEGMENT screen will be displayed



## 9. Maintenance

Although there are no user-serviceable parts inside the **Paramedic CU-ERT**, the user can perform simple maintenance tasks to help prolong the life of the device and to help ensure that the device is in mint condition. The following are the activities, together with frequency, that can be performed by the user.

Used consumables should be disposed of in accordance with local regulations. Care should be taken in disposing of spent external battery packs so as not to contribute to the pollution of the environment.

### Maintenance Activities

Frequency	Activity	Actions to be Taken
Monthly and after each use	Check supplies, accessories, and spare parts for damage and expiration.	If any supplies have expired, replace them immediately.
	<p>Check the case of the <b>Paramedic CU-ERT</b> and the accessories for any sign of apparent damage.</p> <p>Check for dirt Contamination.</p>	<p>If there is any apparent damage to the case of the device, consult the manufacturer.</p> <p>If there is dirt contamination, clean the case as suggested in Chapter 6 of this Manual.</p>
After each use.	Ensure that the connector of the defibrillator pad assembly is disconnected from the socket on the <b>Paramedic CU-ERT</b> .	Disconnect the pad assembly from the ECG-DEFIB port



## MAINTENANCE CHECKLIST

**Paramedic CU-ERT**

Serial Number: \_\_\_\_\_ Location/Vehicle ID: \_\_\_\_\_

Date			
Scheduled Frequency			
<p>Paramedic CU-ERT Clean, no signs of damage, free of excessive wear</p>			
<p><b>Supplies Available</b> -2 sets of pads, undamaged, sealed, within expiration date -supplementary supplies (razor, scissors, gloves, gauze)</p>			
<p><b>Remarks, Problems, Corrective Actions</b></p>			
<p><b>Inspected by</b> Signature of operator doing the inspection</p>			

## 9.1 Cleaning the Paramedic CU-ERT

After each use, clean the **Paramedic CU-ERT** using a soft, damp cloth moistened with any of the following solvents:

Soap and water  
70% solution isopropyl alcohol  
Chlorine bleach and water mixture (30 ml bleach/liter of water)  
Ammonia-based cleaners  
Hydrogen peroxide

### **⚠ CAUTION**

**Do not immerse any part of the Paramedic CU-ERT in fluids**  
**Do not let any fluid enter the case of the device.**  
**Do not spill liquids on the case of the device.**  
**Do not use strong, acetone-based cleaners in cleaning the device.**  
**Do not use abrasive materials in cleaning the unit, especially on the LCD display and the infrared filter on the IrDA port.**  
**Do not sterilize the Paramedic CU-ERT.**

## 9.2 Troubleshooting Guide

There are no user serviceable parts in the Paramedic CU-ERT.

Replace the external batteries if the "**LOW BATTERY CODE:0001**" prompt is issued when the Paramedic CU-ERT is turned ON with the external battery pack connected or if the empty battery icon is displayed when the Paramedic CU-ERT is ON.

### Prompts

PROMPT	POSSIBLE CAUSES	ACTION(S) TO BE TAKEN
<b>SHOCK BUTTON NOT PRESSED</b>	The Paramedic CU-ERT detected a shockable rhythm, made the prompt of "PRESS THE SHOCK BUTTON" but the operator did not press the SHOCK BUTTON within 15 seconds from the time the prompt was issued.	The device will dump the charge internally and will acquire the ECG signal and do analysis again. Press the SHOCK button when the device issues the prompt "PRESS THE SHOCK BUTTON"
<b>ATTACH PADS</b>	The defibrillation pads are not attached to the patient's bare chest.	Attach the defibrillation pads on the bare chest of the patient. Follow the graphic direction provided at the back of each defibrillation pad
	The defibrillation pad assembly is not connected to the ECG-DEFIB port of the Paramedic CU-ERT.	Attach the connector of the defibrillation pad assembly to the ECG-DEFIB port of the Paramedic CU-ERT
<b>CHECK PADS</b>	The defibrillation pads are not attached well to the patient's chest.	Make sure that the area where the pads are to be attached is clean and free of moisture. Shave excessive hair and wipe off moisture.
	The defibrillation pads are in contact with each other.	Attach the pads firmly to the patient's skin. The sticky side should be in contact with the patient's skin.
		Make sure that the pads are not touching each other.

## 9.3 Safety Considerations

The operators should be aware of the following safety considerations:

- a. The Paramedic CU-ERT does not deliver any defibrillating shock. However, the operator must treat the trainer as if it is the real thing so that safety habits will be second nature during operations using the real defibrillator.

## APPENDIX A

### <TECHNICAL SPECIFICATIONS>

<b>ECG Monitor (Simulated)</b>	
• Patient connection:	Defibrillation Pads, ECG Electrodes
• Bandwidth:	Monitoring Mode: 0.3 to 40 Hz (-3 dB) AED mode (EMS): 1 Hz to 30 Hz
• ECG size:	Auto-scaled (0.3 to 1 mV signals are displayed with 10mm/mV gain, outside of that range, the peak to peak value is displayed as 10 mm on the LCD display)
• Heart rate:	Digital readout on LCD display, 30 to 300 bpm ( $\pm$ 2%)
<b>Defibrillator (Simulated)</b>	
• Operating modes:	Semi automatic
• Waveform:	<i>e-cube</i> biphasic (Truncated exponential type)
• Energy:	
• AED mode	150J into a 50 $\Omega$ load
• Charging time:	Less than 10 seconds
• Sensitivity & Specificity:	Meets AAMI DF39 guidelines
• Detection Level	> 0.1 mV
• Defibrillation Electrodes:	Multifunction, self-adhesive, adult electrodes (Disposable, Pre-gelled)
<b>Voice &amp; Text Prompts</b>	
• Voice & text prompts guide the user through the rescue protocol	
• All the user interfaces are supported in local language for easy use and access	
<b>Data Storage &amp; Management</b>	
• Internal flash memory:	12 hours of event and ECG recording
• SmartMedia Card (32M):	48 hours of event and ECG recording or 1 hour recording if voice recording is enabled
• Review of the patient's ECG, incident details and device information	
• Data management software for storage, review, and printing of multiple patient rescue data using a PC running on Windows OS.	
<b>Display</b>	
• Screen Type:	High resolution graphic Liquid Crystal Display
• Screen size:	4 inches (10.16 cm) diagonal, 320X240 pixels
• Sweep speed:	25mm/sec, nominal
• Viewing time:	3.2 seconds
<b>Physical</b>	
• Size:	305 mm X 250 mm X 95 mm (L X W X H)
• Weight	Approximately 1.4 kg; without the external battery pack
<b>AC Adapter</b>	
• Input:	100 to 240V AC 50/60Hz 1.2A
• Output:	12V DC, 3.5A
<b>External Battery Pack</b>	
• 12V LiMnO <sub>2</sub> disposable battery pack	
• Capacity	when new, 10 hours of continuous operation
<b>External Link</b>	
• UART port	
• IrDA port	

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Medical Systems, Inc.