

Admitting Under Special Conditions

Circumstance	Effect on Admit Function
Bedside monitor is powering up.	Patient admission is not possible.
CPU/receiver is offline.	Patient admission is not possible.
Bedside monitor/bedside CPS/transmitter cannot communicate with the network.	The MULTIVIEW WORKSTATION exits the Admit screen without accepting any changes, displays a blank BEDVIEW screen, and generates a serious alarm. Patient admission is not possible.
The patient either goes into or comes out of standby.	No effect; the demographic information can be viewed and edited.
The bedside monitor is removed for transport (PICK AND GO).	The MULTIVIEW WORKSTATION exits the Admit screen without accepting changes and displays a blank BEDVIEW screen banner BED DISCONNECTED appears in BEDVIEW and in CLUSTERVIEW. Patient admission is not possible.
The bedside monitor returns from transport.	You can view, enter and/or edit the patient's demographic information immediately.

Discharging a Patient

Discharging a patient varies for different patient groups:

- *all non-telemetry patients* must be discharged at the bedside monitor.
- *local telemetry patients* are discharged at the MULTIVIEW WORKSTATION.
- *remote telemetry patients* are discharged at their respective MULTIVIEW WORKSTATION. Remote discharge is not possible.

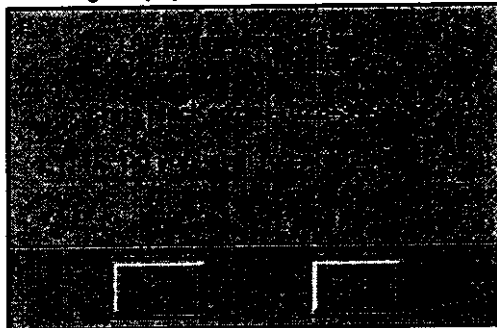
When you discharge a patient

- demographics are replaced by system defaults.
- all patient setup data such as alarm limits, arrhythmia setup etc. is replaced by system defaults.
- trends are deleted.
- all pending and active recordings are cancelled.
- the patient's channel is put into standby.

Steps: Discharging a Telemetry Patient

1. Access the patient's BEDVIEW screen.
2. Click on the **Admit** button in the BEDVIEW menu bar.
3. Click on the **Discharge...** menu selection. This activates the Admit screen with the discharge popup window.

Discharge Popup



4. Click on the **Yes** button inside the popup to discharge patient or on the **No** button to cancel the discharge and miss the window.



8 Arrhythmia/ECG Monitoring

This chapter describes how to customize the arrhythmia settings for an individual patient. For non-telemetry patients, these settings supersede the defaults of the bedside monitors. For telemetry patients, these settings replace the defaults defined under the Arrhythmia Defaults menu (see chapter 4, *Telemetry System Setup*). In both cases, the original defaults are restored automatically once you discharge the patient. At the end of this chapter are the messages associated with arrhythmia/ECG monitoring tasks.

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Overview

For telemetry patients, the MULTIVIEW WORKSTATION performs arrhythmia analysis in parallel to QRS processing, and on the same leads. For non-telemetry patients, these functions are executed by the monitors.

After each QRS complex, the monitor computes the heart rate using the last eight R-R intervals. The two longest and two shortest R-R intervals are disregarded. The remaining R-R intervals are averaged, and converted into the heart rate.

A learning period begins when arrhythmia monitoring is first enabled in order to form the beat classification template. After the learning period is completed, the algorithm determines whether or not a QRS complex is a paced beat and if it compares to the learned beat, in which case it is classified as normal. If the previous conditions are not met, the QRS complex is classified as a ventricular beat.

The system maintains one dominant normal template per monitored lead against which it compares each detected beat for classification.

Because beat classification is difficult in the presence of excessive baseline shift, the system examines the baseline continuously and considers each beat questionable if it exceeds a certain limit. Arrhythmia monitoring resumes within 35 seconds after the last appearance of a baseline shift.

Because needs differ from patient to patient, you can configure each individual patient's arrhythmia setup separately. For example, you can adjust the alarm grade, count and rate, as well as event storage and recording functions.

Relearning the Template

The purpose of the relearning process is to establish a beat classification template against which each detected beat is compared and classified.

An automatic relearning is initiated under the following circumstances:

- arrhythmia monitoring is enabled for the first time.
- a patient comes out of standby.
- you change the processing mode (ECG1 or ECG 1&2).
- you assign a different lead to a channel.

During the learning process no arrhythmia events are reported and the parameter area displays the abbreviation *LRN*.



NOTE: The algorithm only 'learns' the leads that are available. For example, if you assign more than one lead and if only one of these leads is available, the algorithm will learn that lead.

We recommend that you initiate a relearning of the patient's normal template manually under the following circumstances:

- 8 hours after the last relearning occurred
- after the patient's electrodes have been repositioned, removed, or disturbed
- if the message *CANNOT LEARN* <lead> or *CANNOT LEARN* is displayed



Steps: Initiating a Relearning

Initiate a manual relearning of the patient's template as follow

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Relearn** button.
3. Click on the **Relearn ECG** button.

Once the learning phase is completed successfully, the assigned leads do not require a new relearn if they fall off and are reconnected.

If the message *CANNOT LEARN* is displayed in the patient's waveform channel, try to relearn once more and confirm the quality of the signal. If the message persists, reposition or replace the electrodes after cleaning the skin site thoroughly, then try to relearn again.

➤ **NOTE:** Whenever you click on **Relearn ECG**, a relearning of the arrhythmia template is initiated. If the ST option is unlocked, the ST algorithm also performs a relearn of the ST template. During the ST relearn, the ST parameter box appears blank (there is no *LRN* message).

Restoring Arrhythmia System Defau

For Telemetry patients the arrhythmia system defaults are and setup at the MULTIVIEW WORKSTATION (see chapter *Telemetry System Setup*, for detailed information). For non-telemetry patients these system defaults are stored at the bedside monitor (see the operating instructions of the bedside monitor for information on default settings).

Although system defaults are restored automatically when you discharge a patient, you can restore them manually at any time. For non-telemetry patients you must reactivate the default bedside monitor (consult the appropriate User's Guide). For telemetry patients, you can restore the defaults directly at the MULTIVIEW WORKSTATION.

Steps:

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button.
3. Click on the **Arrhythmia...** menu selection to display the arrhythmia setup table.
4. Click on the **Restore System Defaults** button.

The Setup Arrhythmia Table allows you to setup arrhythmia functions for telemetry and non-telemetry patients alike. Depending on whether or not you are dealing with an SC 6000 or an SC 9000 bedside monitor, the last column in the Arrhythmia Setup table varies slightly (see illustrations below). If a telemetry patient is admitted to Event Disclosure, the arrhythmia setup table with the 'Alarm Archive' column appears. If the telemetry patient is *not* admitted to Event Disclosure, the arrhythmia setup table resembles the SC 6000 table, which does not have the STORE and REC/STORE setting. The first column of the table lists the events that the bed can detect. The remaining columns are for modifying the attributes of each event. Fields that are not applicable for a certain event category are blank, while those that cannot be modified are ghosted. Once you are finished with your setup of a parameter, click on the OK button within the selected row to store your selection and dismiss the configuration buttons.

Arrhythmia Setup Table (SC 9000)

RUN		SER	REC-STORE
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100

NOTE: For SC 6000 series monitors the setup arrhythmia table only contains information for VT parameters and the only available alarm grade setting is life-threatening (LT).

Arrhythmia/ECG Moni

Selecting the Arrhythmia Mode

The MULTIVIEW WORKSTATION has three different arrhythmia modes. The selected mode determines the amount of parameters that are included in arrhythmia processing. The choices and available parameters are listed in the following table.

Setting	Available Event Categories
Basic	ASY, VF, VT (Ventricular Tachycardia), ARTF Note: For this setting, SC 6000 series monitors report only VT events.
Full	ASY, FIB, VT, RUN, AIVR, CPT, BGM, ARTF
OFF	No arrhythmia monitoring is performed.

Note: Bedside monitors: the 'Full' arrhythmia capability at the MULTIVIEW WORKSTATION is only active if the bedside monitor has the full arrhythmia capability also. If you select 'OFF', the arrhythmia setup table and the arrhythmia field within the patient parameter area appear blank.



CAUTION: If arrhythmia monitoring is turned off, arrhythmia event alarms are also automatically turned off. The only exceptions are asystole and ventricular fibrillation events, which always generate an alarm since they are part of the ECG monitoring. However, these two events will not cause an alarm. The HR alarm function is also turned off. It is therefore recommended that HR alarms are always turned on (see chapter: MultiView WorkStation Setup) to ensure an audible alarm for asystole and ventricular fibrillation events.

Steps: Selecting the Arrhythmia Mode

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button.
3. Click on the **Arrhythmia...** menu selection.
4. Click on the desired **Arrhythmia** radio button below the arrhythmia setup table.



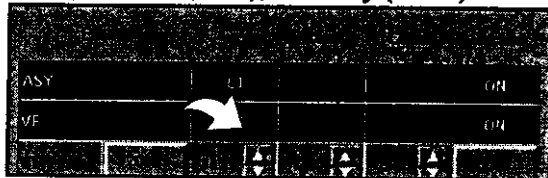
Assigning an Alarm Grade to an Event

The alarm grade determines how an event is reported visually and audibly at the MULTIVIEW WORKSTATION. Please see chapter 11, *Alarms* for more information on the various alarm grades.

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button.
3. Click on the **Arrhythmia...** menu selection.
4. Click on the table row of the event category for which you wish to select an alarm grade (the up/down arrows for that row are activated).

NOTE: For SC6000 Series monitors, the Setup Arrhythmia Table only contains information for VT parameters and the only available alarm grade setting is life-threatening (LT).

5. Click on the up/down arrows in the "Alarm Grade" column and scroll to one of the available settings: life threatening (L-T), serious (SER), advisory (ADV) or OFF (no alarms)



NOTE: The above illustration shows the arrhythmia setup table for an SC 6000 monitor or a Telemetry patient who has not yet been admitted to Event Disclosure. The columns in the Alarm Limits table for SC 9000 monitors (VC0) or a telemetry patient who has been admitted to Event Disclosure/Full Disclosure are identical except for the last column, labeled 'Alarm Archive' (with the settings STORE and REC/STORE) instead of Record

Once you have selected an alarm grade, the list disappears and the corresponding field in the table displays the new selection.

6. Click on the **OK** button next to the parameter label to confirm your change and transmit it to the bedside monitor.
7. Repeat steps 4 and 5 for additional events.

Setting the Rate and the Count

The ranges for event rates and counts are listed in the following table. The shaded table cells designate settings that cannot be modified.

Event	Count (in beats)	Rate (in beats)
ASY		
VF		
VT	5 - 15 (increments of 1) Default: ≥10	100 - 200 (increments of 1) Default: ≥ 120
ARTF		
RUN	Not adjustable; upper value is VT count - 1. Default: 3 - 9	Not adjustable; same as VT rate. Default: ≥ 120
AIVR	Not adjustable Default: ≥ 3	Not adjustable, upper value is VT rate - 1. Default: ≥ 119
CPT		
BGM		



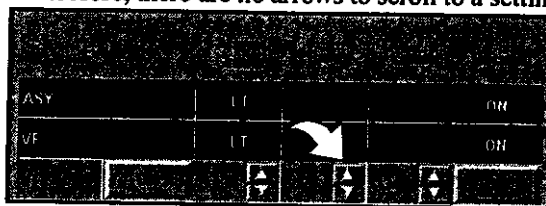
NOTE: Some arrhythmia settings are based on the Rate and Count settings for other calls (e.g. RUN is dependent on the VT settings).

Setting the Rate

The rate setting determines at what point an event call is triggered (in coordination with the count, if appropriate).

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button.
3. Click on the **Arrhythmia...** menu selection.
4. Click on the table row of the event category for which you wish to select a rate setting. The up/down arrows for that row are thus activated.
5. Click on the up/down arrows in the "Rate" column that become available to scroll to the desired setting (see table on page 8-9 for available settings).

NOTE: Some arrhythmia settings are based on the Rate and Count settings for other calls (e.g. RUN is dependent on the VT setting). Therefore, there are no arrows to scroll to a setting.



ASY	LT	ON
VF	LT	ON

NOTE: The above illustration shows the arrhythmia setup table for an SC 6000 monitor or a Telemetry patient who has not yet been admitted to Event Disclosure. The columns in the Alarm Limits table for SC 9000 monitors (VC0) or a telemetry patient who has been admitted to Event Disclosure/Full Disclosure are identical except for the last column which is labeled 'Alarm Archive' (with the settings STORE and REC/STORE) instead of Record.

6. Click on the **OK** button next to the parameter label to confirm your change.
7. Repeat steps 4 and 5 if you wish to configure additional events.

Arrhythmia/ECG Monitor

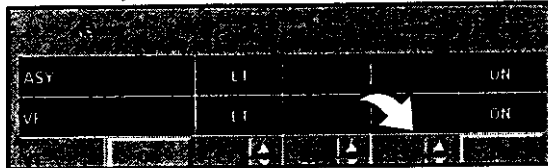
Setting the Count

The count indicates at what point an event call is triggered (in coordination with the rate, if appropriate).

Steps:

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button.
3. Click on the **Arrhythmia...** menu selection.
4. Click on the table row of the event category for which you wish to select a count setting (the up/down arrows for the row are activated).
5. Click on the up/down arrows in the "Count" column to become available to scroll to the desired setting (see page for available settings). Event-specific increments are

NOTE: Some arrhythmia settings are based on the Rate and settings for other calls (e.g. RUN is dependent on the VT settings). Therefore, there are no arrows to scroll to a setting.



NOTE: The above illustration shows the arrhythmia setup for an SC 6000 monitor or a Telemetry patient who has not been admitted to Event Disclosure. The columns in the Alarm Limits table for SC 9000 monitors (VC0) or a telemetry patient who has been admitted to Event Disclosure/Full Disclosure are identical except for the last column which is labeled 'Alarm Archive' (with the additional settings STORE and REC/ST instead of Record).

6. Click on the **OK** button next to the parameter label to save your change.
7. Repeat steps 4 and 5 if you wish to configure additional events.



Turning Event Recordings On or Off

When an event's alarm recording function is turned on, a time recording is generated automatically for each validated alarm condition.

A timed recording consists of pre-event and post-event data. The recording duration and the ratio of pre-event and post-event data is configurable in the Setup Recorders menu (see page 3-10 for detailed information).

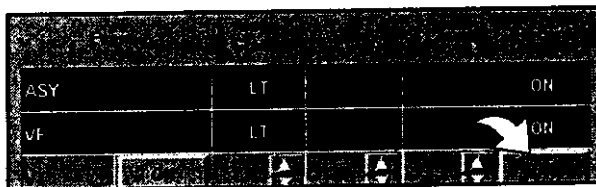
Activating the alarm recording feature differs slightly depending on whether you are dealing with an SC 6000 (see page 8-13), an SC 9000 monitor (see page 8-14) or a telemetry patient (see page 8-15 and page 8-16).

Arrhythmia/ECG Monitor

SC 6000 Monitors

Steps: Turning the event recording function on/off

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button.
3. Click on the **Arrhythmia...** menu selection.
4. Click on the table row of the event category whose recording setting you wish to change. The up/down arrows for that row are thus activated.
5. Click on the **ON/OFF** button in the "Record" column to toggle the button to the opposite state.



6. Click on the **OK** button next to the parameter label to save your change.
7. Repeat steps 4 and 5 if you wish to configure additional events.

SC 9000 Monitor

Steps: Turning the Event Recording Function On/Off

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button.
3. Click on the **Arrhythmia...** menu selection.
4. Click on the table row of the event category whose record setting you wish to change. The up/down arrows for that row are thus activated.
5. Click on the up/down arrow buttons in the "Alarm Archiv" column and scroll to the setting 'REC'.



➤ **NOTE:** On SC 9000 monitors prior to VC0, the event storage function was optional and has to be activated separately. The above illustration shows an SC 9000 with software version VC0 or one with an earlier version whose event storage function is enabled. If event storage is not enabled on a software prior to VC0, the last column is labeled RECORD and the available settings are 'On' and 'Off'.

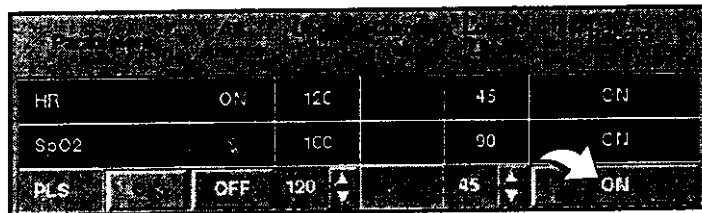
6. Click on the **OK** button next to the parameter label to confirm your change.
7. Repeat steps 4 and 5 if you wish to configure additional events.

Arrhythmia/ECG Monitor

Telemetry Patient (NOT admitted to Event Disclosure)

Steps: Turning the Event Recording Function On

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button.
3. Click on the **Arrhythmia...** menu selection.
4. Click on the table row of the parameter whose alarming function you wish to change. This activates the parameter's alarm setup mode.
5. Click on the **ON/OFF** button in the 'Record' column. The button toggles to its opposite state.



HR	ON	120	45	ON
SpO2	ON	100	90	OFF
PLS	OFF	120	45	ON

6. Click on the **OK** button next to the parameter label to confirm your change and transmit it to the bedside monitor.
7. Repeat steps 4 and 5 to modify additional parameters.

Telemetry Patient (admitted to Event Disclosure)

Steps: Turning the Event Recording Function On/Off

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button
3. Click on the **Arrhythmia...** menu selection.
4. Click on the table row of the parameter whose alarm recording function you wish to change. This activates the parameter's alarm setup mode.
5. Click on the up/down arrow buttons in the "Alarm Archive" column and scroll to the setting REC.



6. Click on the **OK** button next to the parameter label to confirm your change and transmit it to the bedside monitor.
7. Repeat steps 4 and 5 to modify additional parameters.

Arrhythmia/ECG Monitor

Turning Event Storage On or Off



NOTE: This function is only available for SC 9000 monitor software VC0 or earlier versions with event storage enabled. Telemetry patients who are admitted to Event Disclosure.

When an event's storage function is turned on, waveform is stored automatically for each occurrence of the event (the function does *not* have to be turned on for events to be stored).

This function allows you to significantly reduce the amount of alarm strip recordings by enabling you to *store* instead of *print* clinically relevant events for a patient. Later you can review stored recordings and either print or delete them provided the patient is admitted to the Event Disclosure system. Refer to the *Event Disclosure (Option)* section for detailed information on accessing stored events at the MULTIVIEW WORKSTATION.

Each stored event is 18 seconds long, the first 9 seconds having been collected before the event and the last 9 seconds after.

At the MULTIVIEW WORKSTATION you can only enable or disable the event storage function for telemetry patients and SC 9000 monitors. You cannot turn event storage on or off for SC 6000 monitors because there is no local event storage option. However, if an SC 6000 monitor is admitted to the Event Disclosure application, *all* alarm conditions are sent to Event Disclosure.

SC 9000 Monitors/Telemetry

➤ **NOTE:** This function is only available for SC 9000 monitors w software VC0 or earlier versions with event storage enabled and Telemetry patients who are admitted to Event Disclosure.

Steps: Turning the Event Storage Function On/Off

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button.
3. Click on the **Arrhythmia...** menu selection.
4. Click on the table row of the event category whose record setting you wish to change (the up/down arrows for that row are activated).
5. Click on the up/down arrow buttons in the 'Alarm Archive' column and scroll to the setting 'REC'.



6. Click on the **OK** button next to the parameter label to confirm your change.
7. Repeat steps 4 and 5 if you wish to configure additional events.

Arrhythmia Beat Classification

The following table lists the available beat classifications in order of their priority. These abbreviations appear in the patient area and identify a certain event. If two or more different events occur simultaneously, the MULTIVIEW WORKSTATION reports the one with the highest priority.

Abbreviation	Definition
LRN	Learning is in progress
ASY	Asystole
VF	Ventricular fibrillation
VT	Ventricular tachycardia
RUN	Ventricular run
AIVR	Accelerated idioventricular rhythm
CPT	Ventricular couplet
BGM	Bigeminy
ARTF	Artifact

Alarm Setup

Event/HR alarms are reported when set alarm limits are violated. Please refer to chapter 11, *Alarms* for detailed information on setting up the various alarm functions outlined in the following table. For a detailed list of arrhythmia/ECG messages that identify the alarm cause and contain suggestions for troubleshooting, refer to page 8-21.

Setup function	Location of Instruction
Turning all alarms on/off	Chapter 11, page 11-16
Setting alarm limits	Chapter 11, page 11-18
Automatic alarm limit calculation for all patients	Chapter 11, page 11-20
Turning the alarm recording function on/off	Chapter 11, page 11-21
Turning alarm storage function on/off	Chapter 11, page 11-26

Arrhythmia/ECG Monitor

Arrhythmia Messages

The arrhythmia program produces numerous messages that notify alarms or technical conditions that warrant your attention.

Status Messages

Message		Description	Action?
Parameter Value	Status Area		
ARR:<blank>		- Regular rhythm is detected. - Paced rhythm is detected. - Arrhythmia monitoring is turned off.	
ARR:LRN	ECG Relearning	Arrhythmia is 'learning' the patient's QRS morphology to build a reference template.	Wait until the learning period ends.
ARR:<blank>	Cannot learn <lead label>	Unable to relearn on the indicated lead. Note: An attention tone sounds at the MULTIVIEW WORKSTATION.	Try to initiate the learning phase manually (see page 8-4) if it fails again, reposition or replace the electrodes after checking the skin site thoroughly.
ARR:<blank>	Cannot learn	Unable to learn on any lead. Note: An attention tone sounds at the MULTIVIEW WORKSTATION.	

Arrhythmia Alarm Messages

The alarm messages listed in the following table pertain to the arrhythmia parameters. These alarm messages are displayed in the status area in CLUSTERVIEW and in the top waveform channel in BEDVIEW. In addition, the parameter areas display an abbreviated message in the appropriate parameter field.

Alarm Message		Default Alarm Grade	Description	Action
Parameter Area	Status/Information Area			
ARR:ASY	Asystole	L-T	An asystole has been detected.	Check the patient and treat appropriately.
ARR:VF	Ventricular Fibrillation	L-T	A ventricular fibrillation has been detected.	Check the patient and treat appropriately.
ARR:VT	ARR: Ventricular Tachycardia	L-T	A ventricular tachycardia has been detected.	Check the patient and treat appropriately.
ARR:RUN *	ARR: Run	selectable	A ventricular run has been detected.	Check the patient and treat appropriately.
ARR:AIVR *	ARR: Accelerated Idioventricular	selectable	An Accelerated idioventricular rhythm has been detected.	Check the patient and treat appropriately.
ARR:CPT *	ARR: Couplet	selectable	A ventricular couplet has been detected.	Check the patient and treat appropriately.
ARR:BGM *	ARR: Bigeminy	selectable	A ventricular bigeminy has been detected.	Check the patient and treat appropriately.
ARR:ARTF *	ARR: Baseline Artifact	selectable	Baseline artifact has been detected (too many questionable beats).	Make sure you have observed proper ECG preparation.

* For all of these event categories you can choose the alarm grade chapter 11, Alarms

Arrhythmia/ECG Moni

ECG Alarm Messages

The alarm messages listed in the following table pertain to the HR parameter. These alarm messages are displayed in the status area in CLUSTERVIEW and in the top waveform channel in BEDVIEW. In addition, the parameter areas display an abbreviated message in the appropriate parameter field.

Alarm Message		Default Alarm Grade	Description	Action
Parameter Area	Status/Information Area			
HR: ASY	Asystole	L-T	Asystole	Check the patient; treat appropriately.
HR: VF	Ventricular Fibrillation	L-T	Ventricular fibrillation	Check the patient; treat appropriately.
HR <value>	HR > UL	SER	HR value exceeds upper alarm limit.	-Check the patient -Change the limit
HR <value>	HR < LL	SER	HR value is below the lower alarm limit.	-Check the patient -Change the limit
HR +++	HR Out of Range (High)	SER	Parameter value is outside the device's measuring range.	Hardware condition; contact your Biomed or Siemens service.
HR: --- ARR: blank PVC/min: blank	ECG Leads Invalid	ADV	QRS processing leads are invalid for 10 seconds or more or the ECG signal is not available.	Make note of occurrences and determine cause of the alarm signal.
HR: *A* ARR: blank PVC/min: blank STx: blank	ECG Artifact	ADV	Persistent artifact.	Reapply electrodes; proper preparation technique.
HR: *L* ARR: *L* PVC/min: *L* STx: *L*	LA Lead OFF ¹ RA Lead OFF ¹ LL Lead OFF ¹ RL Lead OFF ¹ Chest Lead OFF ¹	ADV	Indicated electrode is disconnected.	Check the respiratory electrode connection.

¹ These are one-shot alarms. Once you acknowledge them, they clear even though the condition remains valid.



9 MICRO₂ Monitoring

This chapter describes how to setup a Telemetry patient for monitoring using a MICRO₂ oximeter. For non-telemetry, these functions are configured at the bedside monitors.

Overview	
Signal Acquisition	
Turning Micro ₂ Monitoring On/Off	
Display of Micro ₂	
Micro ₂ Alarm Functions	
Micro ₂ Alarm Messages	

Overview



NOTE: Before you start your MICRO₂ monitoring session, read precautions listed in the front of this User's Guide on page viii.

MICRO₂ monitoring consists of determining the percentage of functional hemoglobin saturated with oxygen (% SpO₂) in the patient's arterial blood.

A light sensor on the patient's finger measures the absorption levels of red and infrared light. Since oxyhemoglobin and deoxyhemoglobin absorb different amounts of red light, but nearly the same amount of infrared light, the monitor uses the difference between the two measurements to calculate the percentage of saturated hemoglobin. Because light absorption varies with blood volume and blood volume varies with the pulse rate, a pulse rate can also be derived.

Screen icons and acoustic alarms alert you to limit violations, low battery conditions and sensor malfunctioning. The MULTIVIEW WORKSTATION displays SpO₂ values and the pulse rate in blue (there is no waveform data transmitted at the MICRO₂).



NOTE: Recycle and dispose of all batteries properly according to EC Directive 91/156/EEG or equivalent, country-specific regulation.

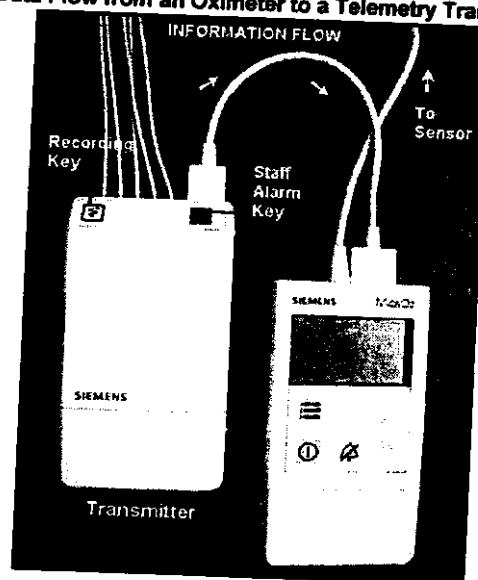


WARNING: To avoid explosion, do not recharge or disassemble a battery or dispose of it in fire.

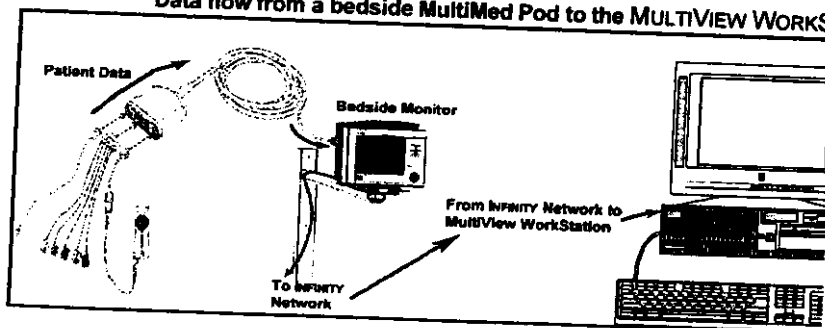
Signal Acquisition

For telemetry patients, the detected values are sent direct to a transmitter, which relays them to the MULTIVIEW WORKSTATION for display (for non-telemetry patients, the signals are sent to the MULTIMED pod before being transmitted to the MULTIVIEW WORKSTATION).

Data Flow from an Oximeter to a Telemetry Transmitter



Data flow from a bedside MultiMed Pod to the MULTIVIEW WORKSTATION



Turning MICRO₂ Monitoring On/Off

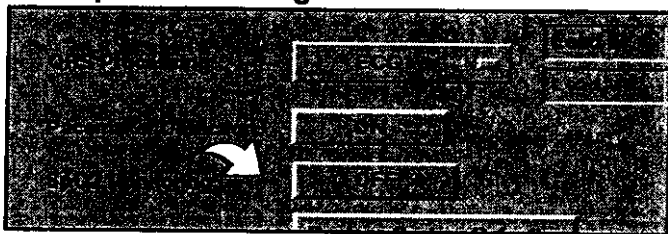
If MICRO₂ monitoring has been enabled as a system default (see page 4-10), you can turn it on or off for an individual telemetry patient as follows:



WARNING: Please refer to the information entitled *Micro2 Precautions* in the front of this User's Guide.

Steps:

1. Access the patient's **BEDVIEW**.
2. Click on the **Setup** button.
3. Click on the **Telemetry ►** button (if this button is not visible, the Telemetry option must first be unlocked by your Biomed).
4. Click on the **Patient View** menu selection.
5. Click on the **ON/OFF** button next to the menu selection **SpO₂ Monitoring**.



NOTE: If the button appears ghosted, the SpO₂ monitoring is disabled as a system default.

6. Click on the **Accept** button to confirm your selection or on the **Undo** button to retain the previous selection and exit the menu.

If SpO₂ monitoring is enabled as a system default, but turned off for an individual patient, the SpO₂ field within the parameter block appears blank.

For non-telemetry patients, refer to the respective User's Guide for detailed information on how to enable/disable this function.

Display of MICRO₂

When MICRO₂ monitoring is turned on, the parameter are plays the following additional information:

- SpO₂ value and alarm limits (or crossed bells if alarms are turned off)
- Pulse rate (PLS) and alarm limits (or crossed bells if alarms are turned off)



MICRO₂ Alarm Functions

The MULTIVIEW WORKSTATION controls all SpO₂ and pulse rate alarms. Therefore, all alarm setup functions must be performed at the MULTIVIEW WORKSTATION. Refer to the sections outlined in the following table for specific setup instructions of the various alarm functions.

Setup function	Location of instruction
Turning all alarms on/off	Chapter 11, page 11-16
Setting alarm limits	Chapter 11, page 11-18
Automatic alarm limit calculation for all patients	Chapter 11, page 11-20
Turning the alarm recording function on/off	Chapter 11, page 11-21
Turning alarm storage function on/off	Chapter 11, page 11-26

In the event of an SpO₂/pulse limit violation or a technical condition such as a weak signal at the sensor, the MULTIVIEW WORKSTATION initiates an audible alarm and displays a corresponding message. In addition, the display area on the oximeter identifies the alarm cause with a code. For example, the alarm message MICRO₂ *Weak Signal* at the MULTIVIEW WORKSTATION is identified at the oximeter with the code *P6*.

For a detailed list of MICRO₂ messages that identify the alarm cause and contain suggestions for troubleshooting, refer to page 9-7.

MICRO₂ Alarm Messages

The alarm messages listed in the following table pertain to MICRO₂ parameters. These alarm messages are displayed in the status area in CLUSTERVIEW and in the top waveform channel in BEDVIEW. In addition, the parameter areas display an alarm message in the appropriate parameter field. At the MICRO₂ oximeter an additional code such as P1 identifies the alarm. Please refer to the MICRO₂ operating instructions for further details.

Alarm Message		Alarm Grade	Description	Action
Parameter Area	Status/Information Area			
PLS: <value>	PLS > UL	SER	Parameter value exceeds the upper alarm limit.	•Check the patient •Reset the alarm
PLS: <value>	PLS < LL	SER	Parameter value is below the lower alarm limit.	•Check the patient •Reset the alarm
PLS: +++	Pulse rate out of range	SER	The pulse rate is outside the measurement range.	•Check the patient •Reset the alarm
SpO ₂ : <value>	SpO ₂ > UL	SER	Parameter value exceeds the upper alarm limit.	•Check the patient •Reset the alarm
SpO ₂ : <value>	SpO ₂ < LL	SER	Parameter value is below the lower alarm limit.	•Check the patient •Reset the alarm
SpO ₂ : "U" PLS: "U" P1 (at oximeter)	MICRO ₂ sensor unplugged	ADV	Sensor is disconnected from the oximeter.	•Check all cable connections. •Replace sensor if necessary.
SpO ₂ : "A" PLS: "A" P2 (at oximeter)	MICRO ₂ transparent	ADV	Sensor cannot detect any signals.	•Check the patient •Check sensor assembly or replace it if necessary.
SpO ₂ : "A" PLS: "A" P3 (at oximeter)	MICRO ₂ Opaque	ADV	Sensor does not detect any light.	Make sure the MICRO ₂ oximeter is not blocked.



Alarm Message		Alarm Grade	Description	Action
Parameter Area	Status/Information Area			
SpO ₂ : "A" PLS: "A" P4 (at oximeter)	MicrO ₂ Artifact	ADV	Motion artifact	•Make sure the patient remains as still as possible. •Check the sensor; reapply or replace it if necessary.
SpO ₂ : "A" PLS: "A" P5 (at oximeter)	MicrO ₂ regulation error	ADV	Too much ambient light	Cover the sensor with an opaque material.
SpO ₂ : "A" PLS: "A" P6 (at oximeter)	MicrO ₂ Weak Signal *	ADV/ SER *	Pulse is weak or nonexistent.	•Check the patient. •Check sensor/oximeter and reapply or replace if necessary.
SpO ₂ : "N" PLS: "N"	MicrO ₂ No Signal	ADV	No signal is available from the oximeter.	Check connections and the MicrO ₂ battery.
* Note: After the 30-second advisory alarm, this alarm condition is upgraded to serious (to insure that conditions like shock do not go unnoticed).				

10 ST Segment Analysis (Opti

This chapter describes the ST analysis option of the MULTI WORKSTATION and the corresponding setup functions. For segment analysis to become available, the option has to be unlocked in the Biomed menu. The ST setup functions described in this chapter are only applicable for telemetry patients (for setup of non-telemetry patients, consult the User's Guide for the corresponding bedside monitor).

At the end of the chapter is a list of alarm messages that pertain exclusively to the ST segment analysis.

Overview	
ST Segment Morphology	
Parameter Display	
Relearning ST	
Setup ST Points Menu	
Accessing the Setup ST Points Menu	
Display Order of ST Complexes	
Zoom Mode	
Changing the ST Deviation Measurement Point	
Changing the Isoelectric Point	
Selecting the Display Size	
Updating Reference Complexes	
Displaying the Reference Complexes	
The Telemetry ST menu	
Accessing the Setup Telemetry ST menu	
Selecting ST Leads 1 through 7	
Selecting the ST Event Duration	
Restoring ST System Defaults	
Special Conditions	
ST Alarms	
ST Alarm Messages	



Overview

ST deviation measurements are performed on averaged ECG segments. An averaged ECG segment is 900 ms long (to include the entire QRS complex and the ST segment) and is calculated from a minimum of 4 normal QRS complexes that occurred during the previous 15 seconds.

To eliminate the effects of artifact, only normal beats are included in the average (if no normal beats are available, the corresponding ST field in the parameter box appears blank and no complex is displayed). As soon as a new averaged complex is available, the existing complex is replaced.

ST monitoring is available as a locked option and must be enabled by your Biomed.

ST parameters are included in the trend function, and you can configure the ST setup functions as for any other parameter (see chapter 11, *Alarms*).

Depending on the system default setting, the ST units of measurement appear either in mm or in uV.

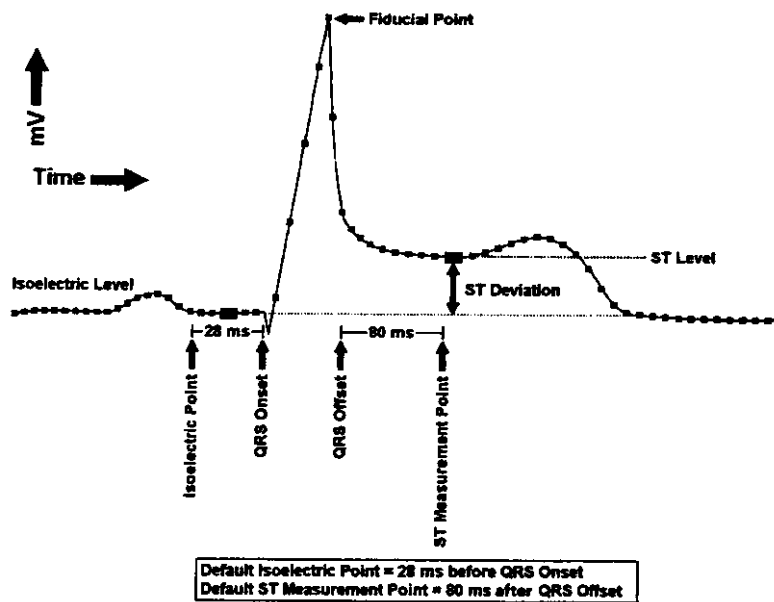
ST Segment Analysis (O

ST Segment Morphology

ST segment deviations are defined in terms of displacement (mm) above or below the isoelectric level. The measurement compares the *isoelectric point* to the ST deviation measurement point.

The isoelectric point defines the point of zero voltage (no electrical activity, 0 mm) with a default position of 28 ms before onset of the QRS complex on the horizontal (time) axis. The deviation point occurs in the ST segment between the QR (J point) and the T-wave, at a default position of 80 milliseconds after the QRS offset.

The value of the ST measurement point (in mm) is compared to the isoelectric point value, and the difference between the two is the ST deviation. The onset and offset points for the QRS complex are determined by the QRS detection algorithm.



Parameter Display

As soon as the ST option is unlocked, the size of the parameter area is enlarged to accommodate the ST parameters. It lists the ECG leads (up to a maximum of seven) that have been selected by the user as sources for ST analysis (see page 10-17).



If the transmitter is configured for 3-lead mode, the ST values for lead II are displayed. In 5-lead mode, all seven ST deviation measurements are displayed.

As is true for any other parameter, either the selected alarm limit or crossed bells (if alarms are turned off) are displayed.

ST Segment Analysis (O

Relearning ST

The monitor initiates a relearn automatically under the following circumstances:

- whenever you enable ST for the first time
- after you change leads
- when the patient comes out of standby
- after a device restart

You can also initiate a relearn manually at any time.

Steps: Initiating a relearn

1. Access the patient's **BEDVIEW** screen.
2. Click on the **Relearn** button, located in the upper portion of the screen.
3. Click on the **Relearn ECG** button.

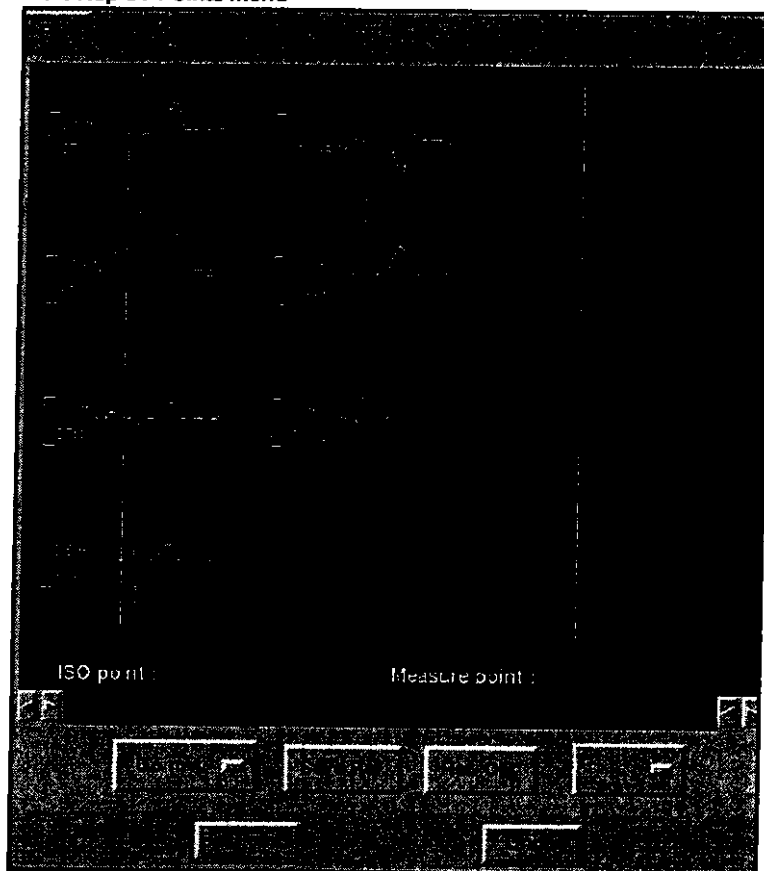
While the relearning is in progress, the ST fields within the parameter area appear blank. In addition, the message **AF RELEARNING** appears in the information area of the **BEDVIEW** screen.

A vertical tic mark in the ST trend graphs marks the time of relearn, and the letter 'R' is displayed if you move the trend cursor on the tic mark. Also, for each relearn an entry is made in the clinical events log.

Setup ST Points Menu

The Setup ST Points menu displays the current averaged comp. for each lead with the corresponding ST deviation measureme values and time stamps. In addition, you can customize an individual patient's ST functions and temporarily supersede the system defaults until the patient is discharged or you restore the defaults manually.

The Setup ST Points menu



➤ **NOTE:** If any of the buttons appear ghosted, remote control for that patient is disabled.

ST Segment Analysis (O

Accessing the Setup ST Points Menu

1. Access the patient's **BEDVIEW**.
2. Click on the **Setup** button.
3. Click on the **ST Points** button to activate the menu.

The following sections discuss the available functions of Setup ST Points menu.

Display Order of ST Complexes

As the following table illustrates, the averaged ST complex displayed in a fixed matrix in the Setup ST Points menu, can accommodate up to 12 leads.

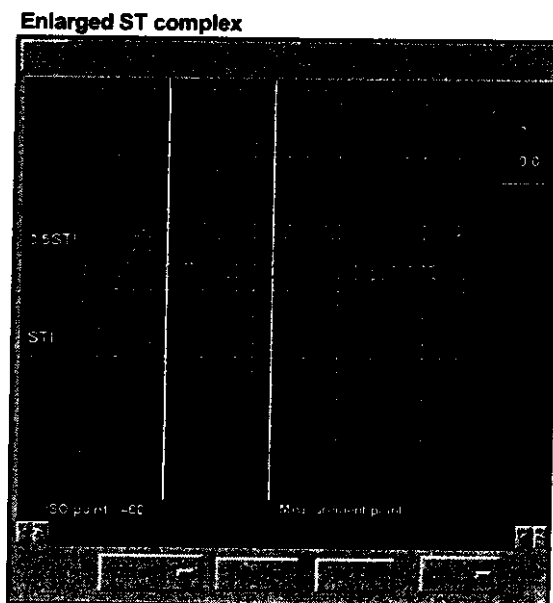
I	aVF	(blank)	I	aVF	V ₆
II	aVL	(blank)	II	aVL	V ₄
III	V	(blank)	III	V ₁	V ₅
aVR	(blank)	(blank)	aVR	V ₂	V ₃

The averaged complexes and corresponding ST deviation measurements and time stamps are updated as each new complex is computed. If an averaged complex is not available, the corresponding display area appears blank. You can change the gain of the complexes and adjust the measurement points (see page 10-6).

The current ST measurement point, the QRS offset (J point), and the isoelectric point are labeled and identified by vertical lines. When you make any adjustments to the measurement point, the ST deviation is recomputed and displayed below the current

Zoom Mode

To examine an individual ST complex in greater detail and view the current ST measurement point selections, click on the desired complex in the Setup ST Points menu to enlarge it.



The expanded complex is labeled with a lead label, ST deviation measurements, a scale bar and a display gain. The screen becomes blank if you select a gain that doesn't allow the whole complex to fit on the screen.

ST Segment Analysis (O)

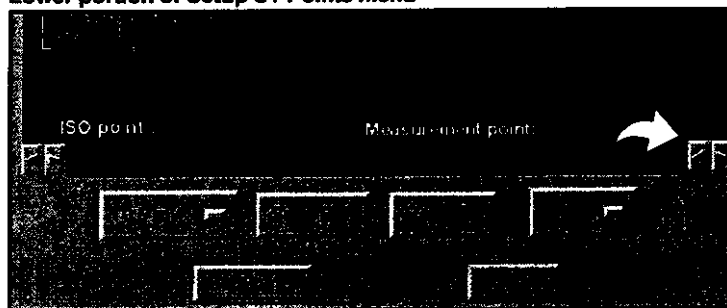
Changing the ST Deviation Measurement Point

The ST deviation point is set from the QRS offset (or fiducial point) to the end of the displayed ECG complex (including wave). The default setting is 60/80 ms.

Steps:

1. Access the patient's Setup ST Points menu (see page
2. Click on the left/right arrow buttons (see illustration) lower right corner of the Setup ST Points menu to select the desired setting. The setting changes in 4 ms increments each time you click on the arrows.

Lower portion of Setup ST Points menu



3. Click on the **Set Points** button to activate your selection or the **Undo** button to retain the previous selection.



NOTE: Changing measuring points does not affect previous segment analysis.

As you change the measurement points, the ST deviation is recomputed and the current value is displayed next to the *Measurement point*. A vertical marker is inserted into the trend graphs and a corresponding entry is stored in the clinical events log. If you move the trend cursor over the marker, the 'M' becomes visible.

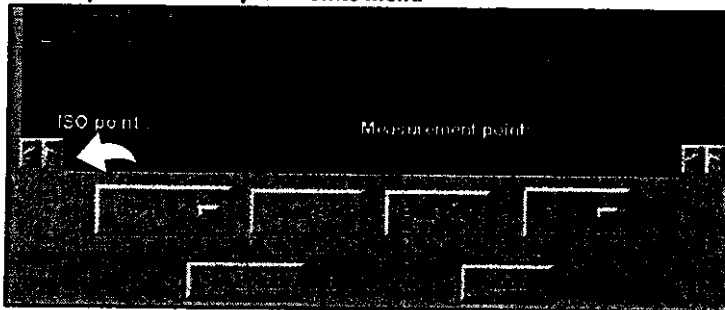
Changing the Isoelectric Point

You can define the *isoelectric measuring point* on the waveform from the beginning of the complex to the fiducial point. The default is set at -28 ms.

Steps:

1. Access the patient's Setup ST Points menu (see page 10-7)
2. Click on the left/right arrow buttons (see illustration) in the lower left corner of the Setup ST Points menu to scroll to the desired setting. The setting changes in 4 ms increments each time you click on the arrows.

Lower portion of Setup ST Points menu



3. Click on the **Set Points** button to confirm your selection on the **Undo** button to retain the previous selection.

➤ **NOTE:** Changing the isoelectric point does not affect previous segment analysis.

The number displayed next to the label *ISO point* indicates the selected time in milliseconds before QRS onset. The point at which the isoelectric measuring point intersects the ECG waveform is indicated by a green vertical line. A vertical marker is inserted into the ST trend graphs and a corresponding entry is stored in the clinical events log. If you move the trend cursor over the marker, the label 'CHG' becomes visible.

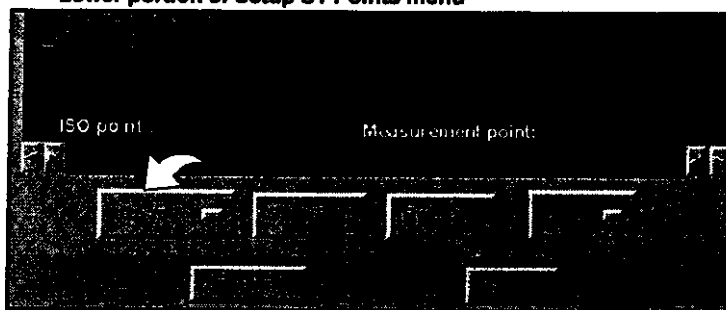
ST Segment Analysis (O

Selecting the Display Size

You can adjust the gain of the averaged complexes as fol

1. Access the patient's Setup ST Points menu (see page
2. Click on the size option button (see arrow) to scroll to desired setting. Available choices are: 0.25, 0.5, 1, 2, mV/cm).

Lower portion of Setup ST Points menu



3. Click on the **Set Points** button to confirm your selection or the **Undo** button to retain the previous selection.

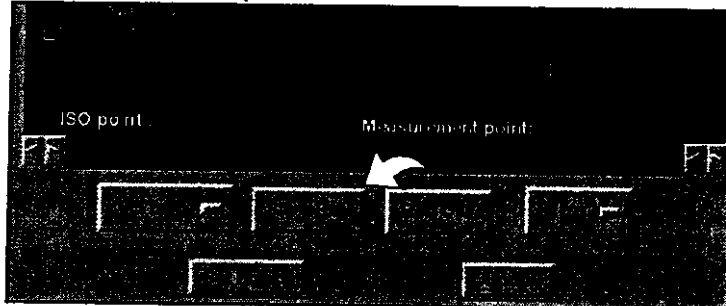
Updating Reference Complexes

In many clinical situations it is desirable to compare a reference ST complex with another, more recent ST complex (e.g. before and after drug administration) to evaluate therapeutic interventions.

Steps:

1. Access the patient's Setup ST Points menu (see page 10-7)
2. Click on the **Save Ref.** button.

Lower portion of Setup ST Points menu



3. Click on the **Set Points** button to confirm your selection on the **Undo** button to retain the previous selection.

The old reference complexes are replaced with the updated reference complexes, which are labeled with the new time and date

ST Segment Analysis (On)

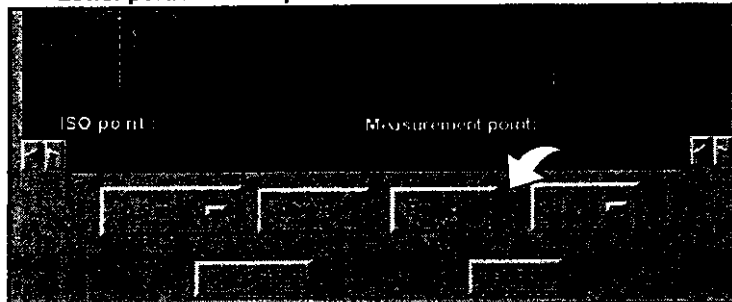
Displaying the Reference Complexes

You can superimpose a stored reference QRS complex on current complex for visual comparison as follows:

Steps:

1. Access the patient's Setup ST Points menu (see page
2. Click on the **Ref. On/Off** button (the button changes opposite value whenever you click on it).

Lower portion of Setup ST Points menu



3. Click on the **Set Points** button to confirm your selection or on the **Undo** button to retain the previous selection.

When the reference complex is selected for display, it is distinguished from the averaged complex by color (current complex appears green, and the reference complex appears purple).



The Telemetry ST menu

The Telemetry ST menu allows you to customize a telemetry patient's ST setup. For non-telemetry patients, please consult user's guide of the corresponding bedside monitor for relative information.

Accessing the Setup Telemetry ST menu

1. Access the patient's **BEDVIEW**.
2. Click on the **Setup** button.
3. Click on the **Telemetry ►** menu selection.
4. Click on the **ST** button.

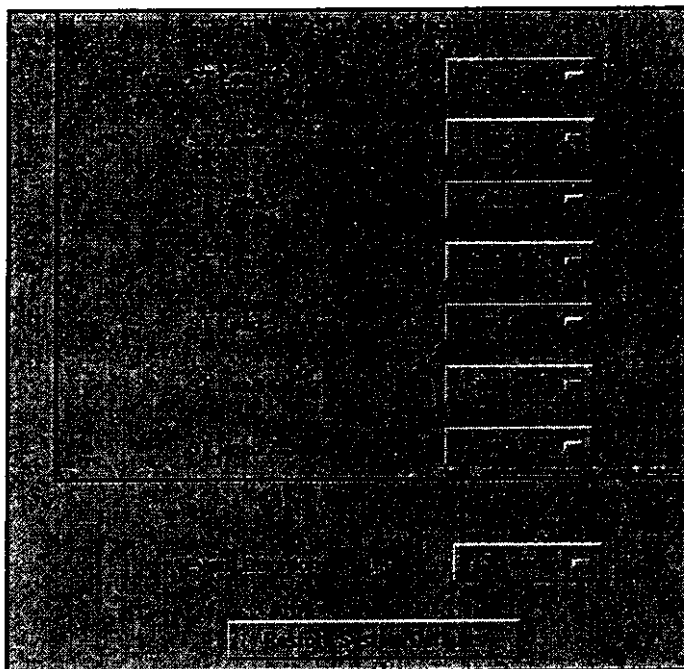
ST Segment Analysis (O

Selecting ST Leads 1 through 7

You can select the order in which ST leads are displayed parameter area in the Setup ST Points menu as follows:

Steps:

1. Access the patient's Setup Telemetry ST menu (see p 14).
2. Click on the desired **ST Lead x** stepper button(s) to the desired lead (**None, I, II, III, aVR, aVL, aVF, aI**



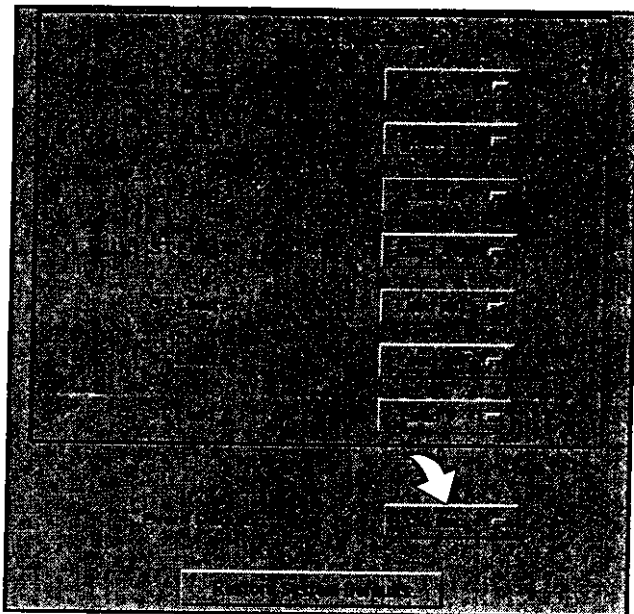
NOTE: When you set a transmitter to 3-lead mode, the selected **Lead II** is automatically assigned to the ST Lead 1 slot and **Lead I** is assigned to the ST Lead 2 - 7 slots.

Selecting the ST Event Duration

The event duration specifies the time that an ST alarm condition must persist before it is classified as a valid alarm. This feature minimizes the occurrence of distracting false alarms caused by artifact and non-clinical events.

Steps:

1. Access the patient's Setup Telemetry ST menu (see page 114).
2. Click on the **Event Duration** stepper button and select one of the available settings (OFF, 15, 30, 45, 60, 75, 90, 105, and 120 seconds).



3. Click on the **Accept** button to confirm your selection or on the **Undo** button to retain the previous selection.

➤ **NOTE:** If you select 'Off', all ST events are reported.

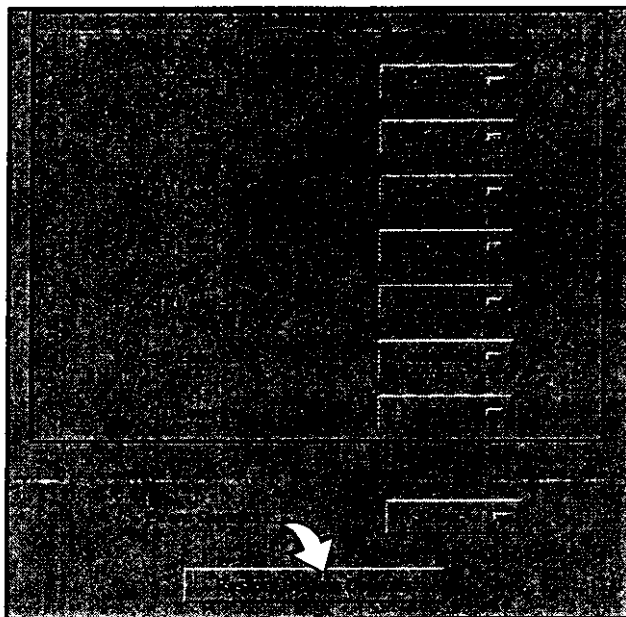
ST Segment Analysis (O

Restoring ST System Defaults

ST system defaults are restored automatically when a patient is discharged. However, you can restore the ST system for a patient at any time manually.

Steps: Restoring defaults

1. Access the patient's Setup Telemetry ST menu (see page 14).
2. Click on the **Restore System Defaults** button.



3. Click on the **Accept** button to confirm your selection or the **Undo** button to retain the previous selection.

For more detailed information on ST defaults refer to chapter 14, *Telemetry System Setup*.

Special Conditions

The following table lists some of the most common non-alarm conditions that may occur during ST segment analysis. These related messages appear in the information area of the patient's BEDVIEW screen.

Message in information area	Parameter area	Description	Action
<x> Cannot analyze	STx: blank	Due to artifact or abnormal beats, the algorithm cannot determine the ST value for lead <x>	• Initiate a relearning (see page 105). • Reprep the ECG electrodes.
ECG Signal Saturated		The ECG signal is saturated	Reprep the ECG electrodes.
ARR/ST Relearning		The reference complex is being established by the algorithm	Wait until the relearning is finished.

ST Segment Analysis (O

ST Alarms

An ST alarm occurs when the ST deviation measurement lead violates the set alarm limits for the user-selected duration (see page 10-16). An ST alarm is cleared if the majority of values following the alarm are within the specified limits.

ST alarms are subject to the same alarm guidelines as any parameters. Refer to chapter 11, *Alarms* for detailed information on setting up the various alarm functions outlined in the following table.

Setup function	Location of Instruction
Turning all alarms on/off	Chapter 11, page 11-16
Setting alarm limits	Chapter 11, page 11-18
Automatic alarm limit calculation for all patients	Chapter 11, page 11-20
Turning the alarm recording function on/off	Chapter 11, page 11-21
Turning alarm storage function on/off	Chapter 11, page 11-26

ST Alarm Messages

The alarm messages listed in the following table pertain specifically to the ST parameters. ST alarm messages are displayed in the status area in CLUSTERVIEW and in the top waveform channel in BEDVIEW. In addition, the parameter areas display an abbreviated message in the appropriate parameter field. Please note that the 'x' next to the ST label (e.g. in the message *STx: ****) is a placeholder for the actual ST lead.

Alarm Message/ Condition Message		Alarm Grade	Description	Action
Parameter Area	Status/Information Area			
<i>STx: <value></i>	<i>STx > UL</i>	SER	Parameter value exceeds the upper alarm limit.	•Check the patient. •Reset the alarm limits.
<i>STx: <value></i>	<i>STx < LL</i>	SER	Parameter value is below the lower alarm limit.	•Check the patient. •Reset the alarm limits.
<i>STx: +++</i>	<i>STx out of range (high)</i>	SER	Parameter value exceeds the upper measuring range.	•Check the patient. •Reset the alarm limits.
<i>STx: ---</i>	<i>STx out of range (low)</i>	SER	Parameter value is below the measuring range.	•Check the patient. •Reset the alarm limits.
<i>STx: <blank></i>	<i>STx Cannot Analyze</i>		The algorithm cannot determine the ST values.	•Check electrodes •relearn
	<i>ECG Relearning</i>		The ARR/ST morphologies are being relearned.	•Wait until relearning process is finished.

11 Alarms

This chapter describes how the MULTIVIEW WORKSTATION indicates alarms for telemetry and non-telemetry patients how it identifies technical alarm conditions for devices connected to the INFINITY NETWORK network. It also contains instructions on how to customize the alarm setup for an individual patient.



NOTE: The VIEWSTATION displays alarm messages only (audible alarms, flashing parameter areas etc.)

Overview	
Alarm Validation	
Alarm Grades	
Latching alarms	
Non-latching Alarms	
Visual and audible Alarm Signals	
The Surveillance Feature	
Display Features of Surveillance Alarms	
Audible Alarm Signals	
Special Surveillance Alarm Conditions	
Silencing Alarms	
Local Alarm Silence	
Remote Alarm Silence (Bed Silence)	
Silencing Surveillance Alarms	
Configuring a Patient's Alarm Setup	
Turning All Alarms ON/OFF	
Changing Alarm Limits	
Automatic Alarm Limits Selection (Auto Set)	
Turning Alarm Recordings ON/OFF	
Turning Alarm Storage On/Off	
Adjusting the Volume of the Alarm Tone	
Technical Communication Alarms	
Telemetry Communication	
Alarm Messages	
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Overview

The MULTIVIEW WORKSTATION continuously monitors and displays the alarm status of each parameter. Furthermore, it reports any technical condition such as, for example, a network communication error. Once the MULTIVIEW WORKSTATION detects an alarm condition, it classifies it according to three different alarm grades (life-threatening, serious, and advisory) and uses unique audible and visual signals to identify the alarm cause. When enabled, alarms are annunciated within ten seconds after the event has been recognized.

Whenever more than one alarm condition exists for a parameter, the MULTIVIEW WORKSTATION always reports the most recent one with the highest alarm grade. Each alarm condition triggers a new alarm. For example, if a serious alarm condition transitions into a life-threatening one, a new alarm with corresponding audible and visual alarm signals is reported.

All alarm tones are repetitive, except those associated with communication errors or failure conditions (see page 11-28, *Technical Communication Alarms*).

For telemetry patients the MULTIVIEW WORKSTATION is the primary alarm annunciator as opposed to bedside patients, for whom the bedside monitor is the primary alarm annunciator.

The MULTIVIEW WORKSTATION indicates alarms for the following:

- any telemetry patient that is assigned to the MULTIVIEW WORKSTATION
- any bedside CPS that is connected to the network and assigned to the MULTIVIEW WORKSTATION for monitoring
- network recorders and recorder CPSs

When the surveillance feature is enabled, alarm messages appear in the status area of the MULTIVIEW WORKSTATION for life-threatening and active serious alarms of any bedside monitor that experiences such an alarm condition even though it is not assigned to any CLUSTERVIEW.

The MULTIVIEW WORKSTATION issues visual and audible alarm signals for the following physiological and technical conditions:

- HR, SpO₂, PLS, ST, and arrhythmia event parameters exceed user-defined alarm limits
- technical conditions associated with the above-mentioned parameters (e.g. a defective SpO₂ sensor)
- technical network events
- error conditions that occur at the MULTIVIEW WORKSTATION or within the telemetry system (transmitters receivers etc.)

Any connected *remote display* mirrors only the visual alarm indications of the MULTIVIEW WORKSTATION to which it is linked. A remote display has no audio capabilities, nor does it allow user interaction.



CAUTION: For non-telemetry patients, the bedside monitor should be used for primary monitoring and diagnosis and the MULTIVIEW WORKSTATION only for remote assessment of a patient's status.

Alarm Validation

The alarm validation timer is designed to avoid frequent alarms for events that only briefly violate alarm limits. Therefore, the MULTIVIEW WORKSTATION issues visual and audible alarm signals *only* if the parameter remains outside the alarm limits longer than the assigned delay time (see the following table).

Parameter	Upper Limit Alarm Delay	Lower Limit Alarm Delay
HR	2 seconds	0 seconds (no delay)
ST ¹	user-selectable (see chapter 10, page 10-16)	user-selectable (see chapter 10, page 10-16)
SpO ₂	4 seconds	4 seconds
PLS	4 seconds	0 seconds (no delay)

¹ For telemetry patients only.

If the parameter returns to its assigned alarm limits before the delay timer expires, no alarm is triggered and the timer stops, ready to validate the next alarm condition.



Alarm Grades

The MULTIVIEW WORKSTATION reports the status of the assigned patients and the associated devices such as network recorders and transmitters. If a physiological event such as a violation of set alarm limits or a technical condition such as transmitter failure is sent to the MULTIVIEW WORKSTATION, it annunciates it accordingly.

All alarms are classified according to three alarm grades, with its own unique tone and color scheme (see table on page 16 for more detailed information). Depending on the severity of the alarm condition, alarms are either latching or non-latching.



NOTE: If several alarms are simultaneously active for a patient bed in CLUSTERVIEW, the MULTIVIEW WORKSTATION reports the most recent alarm with the highest alarm grade.

Latching alarms

Latching alarms indicate either life-threatening or serious conditions such as an asystole or a ventricular fibrillation. For life-threatening alarms, the audible *and* visual alarm indicators persist even if the alarm condition is no longer valid until you acknowledge the alarm manually (e.g. by clicking on the **Alarm Silence** button). Serious alarms behave similarly except that only the visual alarm indicators persist until you acknowledge the alarm. This ensures that a life-threatening or a very serious condition does not go unnoticed.



NOTE: A latching life-threatening alarm is cleared if another life-threatening alarm occurs for the same parameter. A latching serious alarm message is cleared if a new alarm condition is annunciated for the same parameter.

Non-latching Alarms

Non-latching (advisory) alarms, such as those for technical conditions, continue only for as long as the event exists. The visual and audible alarm signals end automatically as soon as the alarm condition ceases. You can also silence such alarms manually (see page 11-11).

Visual and audible Alarm Signals

The MULTIVIEW WORKSTATION uses unique visual and audible signals to identify the different alarm grades.

Life-threatening (e.g. asystole, ventricular fibrillation) first or highest priority	Entire parameter area flashes red.	Only parameter area of respective parameter flashes red.	Two-tone, high pitched, rapid tone	Message is displayed in red in the top waveform channel.	Message is displayed in red in the information area.	The alarm message is displayed the parameter area and the tone persists until you acknowledge the alarm.
Serious (limit violation) second priority	Entire parameter area flashes yellow.	Only parameter area of respective parameter flashes yellow.	Two short tones of medium pitch followed by a pause	Message is displayed in yellow in the top waveform channel.	Message is displayed in yellow in the information area.	The message persists in the waveform until you acknowledge the alarm.
Advisory (e.g. network events, bedside events such as lead-off) third or lowest priority	Entire parameter area flashes white.	Only parameter area of respective parameter flashes white.	Single, short tone of low pitch	Message is displayed in white in the top waveform channel.	Message is displayed in white in the information area.	

The Surveillance Feature

This feature extends alarm annunciation for life-threatening and serious alarms to bedside monitors of selected care units that are not displayed in any CLUSTERVIEW. Alarms that generated under the surveillance feature must meet the following criteria:

- the alarm must either be an active or a latched (not yet acknowledged) life-threatening alarm.
- the alarm must be an active serious alarm (no latched serious alarms are reported).

Multiple Alarm Situations/Priorities

If several bedside monitors issue surveillance alarms, the messages are displayed alternately for three seconds each. Surveillance alarm messages are displayed over the time/date in the status area along the bottom of the screen.

Silencing Surveillance Alarms

A surveillance alarm is reported until it is either acknowledged, or, in case of serious alarms, the alarm condition ceases. You can silence the audible alarm signal of a surveillance alarm locally like any other alarm by either clicking on the **Alarm Silence** button in the CLUSTERVIEW menu bar or by pressing the **F1** fixed key (see page 11-12 for more details).

Requesting a Timed Recording

You can request timed recordings manually in several ways:

- from CLUSTERVIEW
- from BEDVIEW
- from the transmitter



NOTE: For information on how to setup the MULTIVIEW WORKSTATION to generate recordings automatically (e.g. response to limit violations), refer to (see chapter 11, Alarm Response).

Steps: From CLUSTERVIEW (for an individual patient)

- Click on the **REC** button in the patient's parameter area. The **REC** button remains selected until the timed recording is finished. As soon as the recording starts printing, the text inside the button appears white until the recording is finished.



NOTE: If the patient has been discharged, the monitor is in standby or waveforms are stopped, the **REC** button for that patient is ghosted and you cannot request a timed recording. If waveforms are stopped, first click inside the waveform area to release the waveforms, then request the recording again. When the waveforms are stopped, you can request a print screen if the laser printer is configured and connected to the MULTIVIEW WORKSTATION. For further information, please refer to chapter 12-23.

Special Surveillance Alarm Conditions

The following table outlines the behavior of surveillance alarms under special circumstances.

Circumstance	Effect on surveillance alarm
A bedside CPS goes offline or fails while a surveillance alarm for that bed is reported at the MULTIVIEW WORKSTATION.	The surveillance alarm is canceled.
A bedside monitor goes offline or fails while a surveillance alarm for that bed is reported at the MULTIVIEW WORKSTATION.	
The bedside CPS or the monitor transitions into stand-alone mode.	
The bedside CPS or the monitor detects that it has the same IP address as another device on the network.	
The monitor is removed from the network for transport.	Any existing surveillance alarm is canceled.

Header Information

Like timed recordings, continuous recordings contain a header which appears along the top of the strip recordings (see page 17). Headers for continuous recordings contain the same information as those for timed recordings, except for the recording mode, CENT. CONT and the delay time, which are not part of continuous recordings.

The parameter values, patient name, ID #, date, and time are updated and displayed on continuous recordings at regular intervals.



Local Alarm Silence

You can silence *all* active alarms at the MULTIVIEW WORKSTATION for 60 seconds as follows:

Click on the **Alarm Silence** button in the CLUSTERVIEW menu bar.



or

Press the **Alarm Silence (F1)** key on the keyboard.

A local alarm silence has the following consequences:

- the alarm tone stops for all active alarms at the MULTIVIEW WORKSTATION for 1 minute.
- the affected parameter area continues to flash in the center of the highest grade alarm.
- alarm messages and the **Bed Silence** icon  remain displayed.
- the **Alarm Silence** button remains selected.



NOTE: The MULTIVIEW WORKSTATION maintains one common timer for all silenced alarms of a patient. When the timer expires, the MULTIVIEW WORKSTATION visually announces all alarm conditions whose conditions are still valid but only emits an alarm tone for the highest grade active alarm.

Diagnostic Code

The following table describes what each letter/number represents in the diagnostic string which appears in the header strip recording and provides important monitoring information.

Digit	Description	Possible Values	Definition
1	Lead processed for VF	1 2 3 L R F V X	Lead I Lead II Lead III Lead avL Lead avR Lead avF Chest lead None
2	ECG filter	M	Monitor
3	Pacemaker detection	P N	On Off
4	QRS processing mode	1 2	ECG1 ECG1 + ECG2
5	Beat classification lead(s)	1 2 B	First lead Second lead Both leads
6	Leads functional and available for processing	0 1 2 3	No valid processing lead ECG1 is valid ECG2 is valid ECG1 + ECG2 are valid
7	VT count	5-F	Value = VT count (where A to F = 10)
8	VT rate	0-A	Value = (VT rate - 100)/10 (where A = 10)
9-20	Space	Blank space or _	n/a
21	Monitor model	T	Infinity telemetry system processor n
22-27	Software version	xxxxx x	First six characters of base software sample, VA1.1W)

Remote alarm silence can either be accomplished from CLUSTERVIEW or BEDVIEW as follows:

Steps: Bed Silence from CLUSTERVIEW

1. Click on the yellow **Bed Silence** icon , which appears in response to an alarm to the right of a patient's wave area in CLUSTERVIEW.



NOTE: For telemetry patients the bed silence icon is only available if *remote silence* is activated (see chapter 4, page

Steps: Bed Silence from BEDVIEW

1. Click on the patient's parameter area to access that patient's BEDVIEW.
2. Click on the **Bed Silence** button in the upper right corner.



Manual vs. Automatic Event Recordings

Timed recordings are either requested manually or are generated automatically when a parameter or arrhythmia event occurs whose recording function is enabled.

The following table summarizes the three different types of timed recordings.

Timed Recording Type	Description
<i>Timed manual recording</i>	The user requests this recording by clicking the REC button either in BEDVIEW or in CLINICAL INTERVIEW.
<i>Automatic event recording</i>	This type of recording is generated automatically either • in response to an event whose recording function is activated or • in response to a limit violation for a parameter whose recording function is activated.
<i>Automatic alarm recording</i>	A strip recording that is generated in response to an alarm condition for an event/parameter whose recording and alarm functions are turned on.

An alarm strip recording is identical to a manually requested one except for the alarm code (such as *ASY*), which is printed in the header and identifies the alarm cause.

Recording Types

The MULTIVIEW WORKSTATION offers the following types of recordings, which have their own unique properties. If several requests are present, the one with the highest priority is honored.

Recording Type	Priority	Description
<i>Continuous recording</i>	1	A strip recording that runs continuously unless it is manually interrupted. Continuous recording can either be generated from the transmitter or the MULTIVIEW WORKSTATION.
<i>Alarm recording</i>	2	A timed recording that is automatically generated in response to a limit violation of a parameter whose recording function is enabled.
<i>Manual timed recording</i>	3	A strip recording that consists of a delay and a real-time display. It runs for a specified amount of time. A timed recording can be manually requested either from the transmitter or the MULTIVIEW WORKSTATION.
<i>Event recording</i>	4	A timed recording that is automatically generated in response to an occurrence of an arrhythmia event when the recording function is enabled.

The following sections describe each recording type in detail.

Optional Reports

Depending on the configuration of your MULTIVIEW WORKSTATION and the unlocked options that were purchased, the following reports may also be available (please refer to the specific sections of this User's Guide for detailed information).

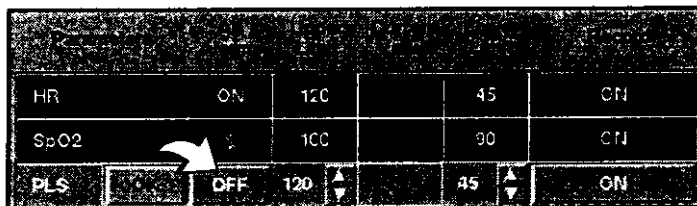
- Full Disclosure reports (strip report and one-hour report)
- Event Disclosure reports (strip report)

Non-Telemetry Patients

Non-Telemetry patients do not have an **All Alarms Off** button in the **BEDVIEW** main screen. However, you can suppress alarms by deactivating the alarm function individually for each parameter in the Alarm Limits table.

Steps: Turning all alarms on/off

1. Access the patient's **BEDVIEW**.
2. Click on the **Setup** button.
3. Click on the **Alarm Limits** button.
4. Click on the **All Alarms On/Off** button in the corresponding parameter row. This activates the parameter's alarm setup mode.



HR	ON	120	45	ON
SpO2		100	90	ON
PLS	OFF	120	45	ON

➤ **NOTE:** The above illustration shows the Alarm Limits table for an SC 6000 monitor. The columns in the Alarm Limits table for SC 9000 monitors are identical except for the last column, which is labeled 'Alarm Archive' instead of 'Record'.

5. Click on the **OK** button to confirm your selection.
6. Repeat steps 4 through 6 to modify additional parameters.

➤ **NOTE:** When the alarms for a parameter are turned OFF, entries in that row of the setup table are displayed in yellow. A crossed bell symbol (n) appears in the 'All Alarms' column. Otherwise, the entries are displayed in white.

Replacing the Recorder Paper

1. Open the paper door.
2. Pull out the paper roll from the spool holder and remove any paper remaining in the printing mechanism.
3. Place the new paper roll into the spool holder. Unroll inches of paper from the bottom. The printed side should be facing up.
4. Align the paper roll with the paper guides. If not aligned properly, the paper could jam.
5. Close the door.
6. Generate a timed recording to verify that the recorder connected properly and the paper is loaded correctly.

Laser Printer

The laser printer is used for print screens, trend reports, Failure Disclosure and/or Event Disclosure reports. Refer to the manufacturer's operating instructions for specific information regarding your particular type of laser printer.



7. Repeat steps 4 through 6 to modify additional param

Active Recordings

If a recorder is available and no pending recordings of higher priority are present, the recording starts printing on the assigned recorder.

If the recorder becomes unavailable (e.g. the paper runs out) while a recording is printing, it is interrupted. If another recorder is available, the recording is rerouted and printed there in its entirety. If no recorder is available, it becomes a *pending* recording, and it is added at the top of the *pending* recording list. This ensures that it is the first to be printed soon as a recorder becomes available.

Pending Recordings

If no recorder is available to process the print request it is stored (pending) until it can be printed.



NOTE: If a timed recording is stored, the actual parameters of the waveform, patient and configuration data are stored. For continuous recording only the request itself is stored (the time that is printed reflects therefore the time the recording is printed, not the time of the request).

Pending recordings are stored on a first-in first-out basis. As soon as the buffer is full, the oldest request is deleted. The buffer can store the following number of recordings for each patient:

- 2 manual timed recordings
- 1 continuous recording
- 1 automatic recording (alarm or event recording)

Remote Recording Requests

Remote devices such as other central stations or other bedside monitors can request recordings of local patients. Such requests are processed according to the recording attributes of the remote device. Status messages notify the remote device of the recording's status.

Turning Alarm Recordings ON/OFF

When a parameter's alarm recording function is turned on, timed recording is generated automatically for each valid alarm condition.

A timed recording consists of pre-event and post-event data. The recording duration and the ratio of pre-event and post-event data is configurable in the Setup Recorders menu (see page 3-10 for detailed information).

Activating the alarm recording feature differs slightly depending on whether you are dealing with an SC 6000 (see page 22), an SC 9000 monitor (see page 11-23) or a telemetry (see page 11-24 and page 11-25).

Special Conditions

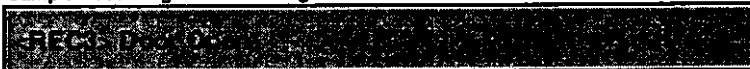
What happens if...	Effect on alarm recording function
an alarm is reactivated (as is the case when an alarm condition is valid beyond the alarm silence state)	A new alarm recording is not generated.
you silence an alarm while an alarm recording is in progress or is waiting to be printed (pending)	All alarm recordings in progress and any pending alarm recordings are still printed completely.
a parameter's alarm function is turned off	An alarm recording is still generated if the alarm recording function is turned on.
the <i>alarm waveform</i> is activated in the Telemetry Recording Setup menu (see page 4-16) ¹	The waveform associated with the alarm parameter is printed in the bottom channel of the strip recording (instead of the waveform assigned to that channel).
¹ This function only pertains to telemetry patients.	

Record

Timed and continuous recordings requested from CLUSTERVIEW or BEDVIEW print waveforms and parameters in the order in which they appear on the respective screens. If the Disclosure and/or Event Disclosure option is enabled, you also request Full Disclosure and/or Event Disclosure reports from a laser printer.

Status messages in the CLUSTERVIEW status area indicate when a request is accepted, canceled or rejected because the queue is full, and when the recording has started and finished. These messages also alert you to certain problems that may be present during recordings. For a list of messages, see chapter 5-28.

Sample Recording Status Message in the Status Area



SC 9000 Monitor

Steps: Turning the Alarm Recording Function On

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button
3. Click on the **Alarm Limits...** menu selection.
4. Click on the table row of the parameter whose alarm recording function you wish to change. This activates the parameter's alarm setup mode.
5. Click on the up/down arrow buttons in the 'Alarm Archive' column and scroll to the setting REC.



NOTE: On SC 9000 monitors prior to VC0, the event storage function was optional and had to be activated separately. The above illustration shows an SC 9000 with software version VC0 or one with an earlier version whose event storage function is enabled. If event storage is not enabled on a software prior to VC0, the last column is labeled 'Record' and the available settings are ON and OFF.

6. Click on the **OK** button next to the parameter label to confirm your change and transmit it to the bedside monitor.
7. Repeat steps 4 through 6 to modify additional parameters.

12 Recordings

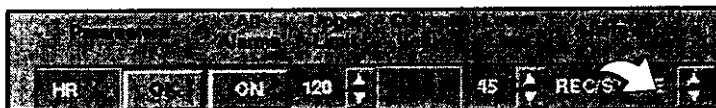
This chapter describes the various types of recordings that can be generated from the MULTIVIEW WORKSTATION.

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Telemetry Patient (admitted to Event Disclosure)

Steps: Turning the Alarm Recording Function On

1. Click on the patient's parameter area in CLUSTERVIEW access the BEDVIEW window.
2. Click on the **Setup** button
3. Click on the **Alarm Limits...** menu selection.
4. Click on the table row of the parameter whose alarm recording function you wish to change. This activates parameter's alarm setup mode.
5. Click on the up/down arrow buttons in the 'Alarm Archive' column and scroll to the setting REC.

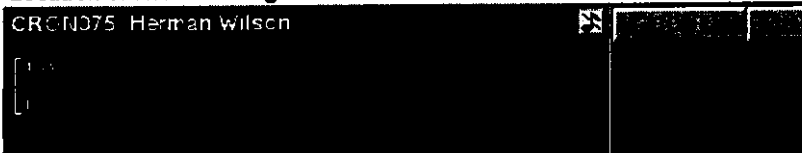


6. Click on the **OK** button next to the parameter label to firm your change and transmit it to the bedside monitor.
7. Repeat steps 4 through 6 to modify additional parameters.

Display Location of Alarm Messages

Alarm messages that pertain to the MULTIVIEW WORKSTATION are displayed as black text in the status area at the bottom of the CLUSTERVIEW screen. Alarm messages that originate from the bedside monitor or the telemetry transmitter are played in the color corresponding to the alarm grade in the patient's top waveform channel in CLUSTERVIEW and in the information area in BEDVIEW.

Location of alarm message in CLUSTERVIEW



Location of alarm message in BEDVIEW



SC 9000 Monitors/Telemetry



NOTE: This function is only available for SC 9000 monitor with software VC0 or earlier versions with event storage enabled and Telemetry patients who are admitted to Event Disclosure.

Steps: Turning the Alarm Storage Function On/Off

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button
3. Click on the **Alarm Limits...** menu selection.
4. Click on the table row of the parameter whose alarm recording function you wish to change. This activates alarm setup mode for that parameter.
5. Click on the up/down arrow buttons in the 'Alarm Archive' column and scroll to the setting STORE.



6. Click on the **OK** button next to the parameter label to confirm your change and transmit it to the bedside monitor.
7. Repeat steps 4 through 6 to modify additional parameters.

MULTIVIEW WORKSTATION Communication

If the network configuration information of the MULTIVIEW WORKSTATION is incorrect, it

- stops monitoring all beds.
- emits a serious alarm tone until the alarm is acknowledged by clicking on the **Alarm Silence** button.
- displays the alarm message **CENTRAL OFFLINE** in the status area of the **CLUSTERVIEW** for as long as the condition exists.
- records the event in the diagnostic log.



Telemetry Communication

If a telemetry transmitter or a receiver that is assigned to displayed CLUSTERVIEW stops communicating with the work, the MULTIVIEW WORKSTATION

- displays the message RECEIVER OFFLINE in the BED information area of the corresponding patient if the receiver goes offline.
- displays the serious alarm message DUPLICATE RECEIVER ADDRESS in the BEDVIEW information area of the corresponding patient if the receiver has a duplicate IP address.
- displays the serious alarm message OFFLINE if the MULTIVIEW WORKSTATION stops advertising the telemetry.
- displays the message XXX DATA NOT SAVED in the CLUSTERVIEW status area when a setup change for a telemetry patient cannot be processed (and emits a serious one-time alarm).



Telemetry Communication

If a telemetry transmitter or a receiver that is assigned to displayed CLUSTERVIEW stops communicating with the work, the MULTIVIEW WORKSTATION

- displays the message RECEIVER OFFLINE in the BED information area of the corresponding patient if the receiver goes offline.
- displays the serious alarm message DUPLICATE RECEIVER ADDRESS in the BEDVIEW information area of the corresponding patient if the receiver has a duplicate IP address.
- displays the serious alarm message OFFLINE if the MULTIVIEW WORKSTATION stops advertising the telemetry.
- displays the message XXX DATA NOT SAVED in the CLUSTERVIEW status area when a setup change for a telemetry patient cannot be processed (and emits a serious one-time alarm).

MULTIVIEW WORKSTATION Communication

If the network configuration information of the MULTIVIEW WORKSTATION is incorrect, it

- stops monitoring all beds.
- emits a serious alarm tone until the alarm is acknowledged by clicking on the **Alarm Silence** button.
- displays the alarm message **CENTRAL OFFLINE** in the status area of the **CLUSTERVIEW** for as long as the condition exists.
- records the event in the diagnostic log.

SC 9000 Monitors/Telemetry



NOTE: This function is only available for SC 9000 monitor with software VC0 or earlier versions with event storage enabled and Telemetry patients who are admitted to Event Disclosure.

Steps: Turning the Alarm Storage Function On/Off

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button
3. Click on the **Alarm Limits...** menu selection.
4. Click on the table row of the parameter whose alarm recording function you wish to change. This activates alarm setup mode for that parameter.
5. Click on the up/down arrow buttons in the 'Alarm Archive' column and scroll to the setting **STORE**.

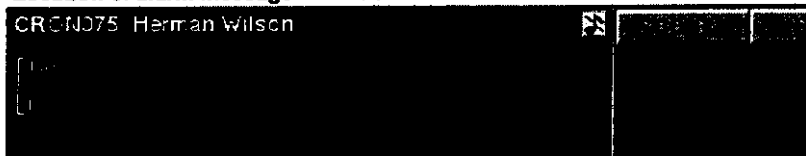


6. Click on the **OK** button next to the parameter label to firm your change and transmit it to the bedside monitor.
7. Repeat steps 4 through 6 to modify additional parameters.

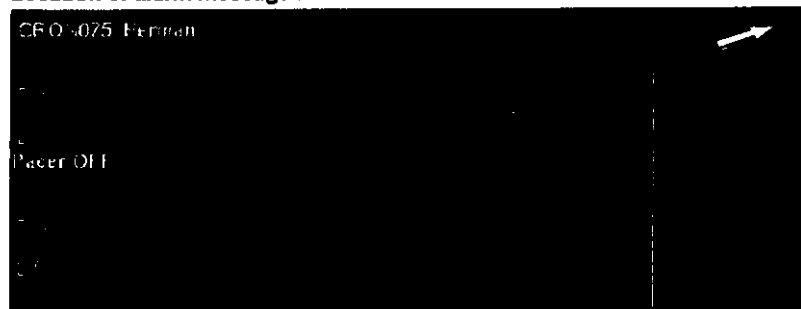
Display Location of Alarm Messages

Alarm messages that pertain to the MULTIVIEW WORKSTATION are displayed as black text in the status area at the bottom of the CLUSTERVIEW screen. Alarm messages that originate from the bedside monitor or the telemetry transmitter are played in the color corresponding to the alarm grade in the patient's top waveform channel in CLUSTERVIEW and in the information area in BEDVIEW.

Location of alarm message in CLUSTERVIEW



Location of alarm message in BEDVIEW



Telemetry Patient (admitted to Event Disclosure)

Steps: Turning the Alarm Recording Function On

1. Click on the patient's parameter area in CLUSTERVIEW access the BEDVIEW window.
2. Click on the **Setup** button
3. Click on the **Alarm Limits...** menu selection.
4. Click on the table row of the parameter whose alarm recording function you wish to change. This activates parameter's alarm setup mode.
5. Click on the up/down arrow buttons in the 'Alarm Archive' column and scroll to the setting REC.



6. Click on the **OK** button next to the parameter label to firm your change and transmit it to the bedside monitor.
7. Repeat steps 4 through 6 to modify additional parameters.

12 Recordings

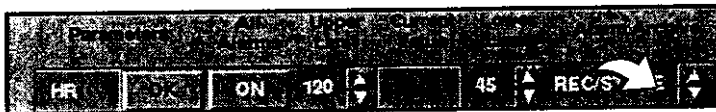
This chapter describes the various types of recordings that can be generated from the MULTIVIEW WORKSTATION.

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SC 9000 Monitor

Steps: Turning the Alarm Recording Function On

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Setup** button
3. Click on the **Alarm Limits...** menu selection.
4. Click on the table row of the parameter whose alarm recording function you wish to change. This activates the parameter's alarm setup mode.
5. Click on the up/down arrow buttons in the 'Alarm Archive' column and scroll to the setting REC.



NOTE: On SC 9000 monitors prior to VC0, the event storage function was optional and had to be activated separately. The above illustration shows an SC 9000 with software version or one with an earlier version whose event storage function is enabled. If event storage is not enabled on a software prior to VC0, the last column is labeled 'Record' and the available settings are ON and OFF.

6. Click on the **OK** button next to the parameter label to confirm your change and transmit it to the bedside monitor.
7. Repeat steps 4 through 6 to modify additional parameters.

Record

Timed and continuous recordings requested from CLUSTERVIEW or BEDVIEW print waveforms and parameters in the order in which they appear on the respective screens. If the Disclosure and/or Event Disclosure option is enabled, you also request Full Disclosure and/or Event Disclosure reports from a laser printer.

Status messages in the CLUSTERVIEW status area indicate when a request is accepted, canceled or rejected because the queue is full, and when the recording has started and finished. These messages also alert you to certain problems that may be present during recordings. For a list of messages, see chapter 5-28.

Sample Recording Status Message in the Status Area



Turning Alarm Recordings ON/OFF

When a parameter's alarm recording function is turned on, a timed recording is generated automatically for each valid alarm condition.

A timed recording consists of pre-event and post-event data. The recording duration and the ratio of pre-event and post-event data is configurable in the Setup Recorders menu (see page 3-10 for detailed information).

Activating the alarm recording feature differs slightly depending on whether you are dealing with an SC 6000 (see page 22), an SC 9000 monitor (see page 11-23) or a telemetry (see page 11-24 and page 11-25).

Special Conditions

What happens if...	Effect on alarm recording function
an alarm is reactivated(as is the case when an alarm condition is valid beyond the alarm silence state)	A new alarm recording is not generated.
you silence an alarm while an alarm recording is in progress or is waiting to be printed (pending)	All alarm recordings in progress and any pending alarm recordings are still printed completely.
a parameter's alarm function is turned off	An alarm recording is still generated if the alarm recording function is turned on.
the <i>alarm waveform</i> is activated in the Telemetry Recording Setup menu (see page 4-16) ¹	The waveform associated with the alarm parameter is printed in the bottom channel of the strip recording (instead of the waveform assigned to that channel).
¹ This function only pertains to telemetry patients.	

Active Recordings

If a recorder is available and no pending recordings of higher priority are present, the recording starts printing on the assigned recorder.

If the recorder becomes unavailable (e.g. the paper runs out) while a recording is printing, it is interrupted. If another recorder is available, the recording is rerouted and printed there in its entirety. If no recorder is available, it becomes a *pending* recording, and it is added at the top of the *pending* recording list. This ensures that it is the first to be printed soon as a recorder becomes available.

Pending Recordings

If no recorder is available to process the print request it is stored (pending) until it can be printed.



NOTE: If a timed recording is stored, the actual parameters of the waveform, patient and configuration data are stored. For continuous recording only the request itself is stored (the time that is printed reflects therefore the time the recording is printed, not the time of the request).

Pending recordings are stored on a first-in first-out basis. As soon as the buffer is full, the oldest request is deleted. The buffer can store the following number of recordings for each patient:

- 2 manual timed recordings
- 1 continuous recording
- 1 automatic recording (alarm or event recording)

Remote Recording Requests

Remote devices such as other central stations or other bedside monitors can request recordings of local patients. Such requests are processed according to the recording attributes of the remote device. Status messages notify the remote device of the recording's status.

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7. Repeat steps 4 through 6 to modify additional param

Replacing the Recorder Paper

1. Open the paper door.
2. Pull out the paper roll from the spool holder and remove any paper remaining in the printing mechanism.
3. Place the new paper roll into the spool holder. Unroll inches of paper from the bottom. The printed side should be facing up.
4. Align the paper roll with the paper guides. If not aligned properly, the paper could jam.
5. Close the door.
6. Generate a timed recording to verify that the recorder connected properly and the paper is loaded correctly.

Laser Printer

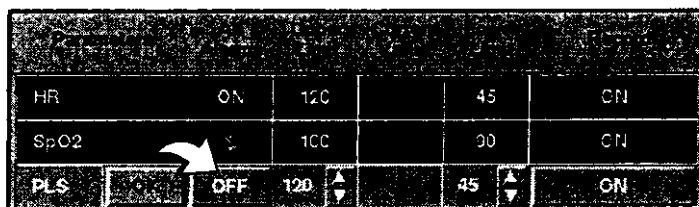
The laser printer is used for print screens, trend reports, Fault Disclosure and/or Event Disclosure reports. Refer to the manufacturer's operating instructions for specific information regarding your particular type of laser printer.

Non-Telemetry Patients

Non-Telemetry patients do not have an **All Alarms Off** button in the BEDVIEW main screen. However, you can suppress alarms by deactivating the alarm function individually for each parameter in the Alarm Limits table.

Steps: Turning all alarms on/off

1. Access the patient's BEDVIEW.
2. Click on the **Setup** button.
3. Click on the **Alarm Limits** button.
4. Click on the **All Alarms On/Off** button in the corresponding parameter row. This activates the parameter's alarm setup mode.



HR	ON	120		45	ON
SpO2	ON	100		90	ON
PLS	OFF	120		45	ON



NOTE: The above illustration shows the Alarm Limits table on an SC 6000 monitor. The columns in the Alarm Limits table on SC 9000 monitors are identical except for the last column, which is labeled 'Alarm Archive' instead of 'Record'.

5. Click on the **OK** button to confirm your selection.
6. Repeat steps 4 through 6 to modify additional parameters.



NOTE: When the alarms for a parameter are turned OFF, entries in that row of the setup table are displayed in yellow. A crossed bell symbol (n) appears in the 'All Alarms' column. Otherwise, the entries are displayed in white.

Recording Types

The MULTIVIEW WORKSTATION offers the following types of recordings, which have their own unique properties. If several requests are present, the one with the highest priority is honored.

Recording Type	Priority	Description
<i>Continuous recording</i>	1	A strip recording that runs continuously unless it is manually interrupted. Continuous recording can either be generated from the transmitter or the MULTIVIEW WORKSTATION.
<i>Alarm recording</i>	2	A timed recording that is automatically generated in response to a limit violation of a parameter whose recording function is enabled.
<i>Manual timed recording</i>	3	A strip recording that can be of delay and real-time duration. It runs for a specified amount of time. A timed recording can be manually requested either from the transmitter or the MULTIVIEW WORKSTATION.
<i>Event recording</i>	4	A timed recording that is automatically generated in response to an occurrence of an arrhythmia event when the recording function is enabled.

The following sections describe each recording type in detail.

Optional Reports

Depending on the configuration of your MULTIVIEW WORKSTATION and the unlocked options that were purchased, the following reports may also be available (please refer to the specific sections of this User's Guide for detailed information):

- Full Disclosure reports (strip report and one-hour report)
- Event Disclosure reports (strip report)

A

SC 9000 - Alarm Table

[illegible]

For non-telemetry patients any changes in alarm settings at the **MULTIVIEW WORKSTATION** are transmitted to the bedside monitor as soon as you click on the **OK** button in the selected parameter's table row (see instructions on the following page). As soon as the Telemetry option is unlocked, you can correct the parameters SpO₂, PLS, and ST for telemetry patients at the **MULTIVIEW WORKSTATION**.

Manual vs. Automatic Event Recordings

Timed recordings are either requested manually or are generated automatically when a parameter or arrhythmia event occurs whose recording function is enabled.

The following table summarizes the three different types of timed recordings.

Timed Recording Type	Description
<i>Timed manual recording</i>	The user requests this recording by clicking the REC button either in BEDVIEW or in CLINICAL INTERVIEW.
<i>Automatic event recording</i>	This type of recording is generated automatically either • in response to an event whose recording function is activated or • in response to a limit violation for a parameter whose recording function is activated.
<i>Automatic alarm recording</i>	A strip recording that is generated in response to an alarm condition for an event/parameter whose recording and alarm functions are turned on.

An alarm strip recording is identical to a manually requested one except for the alarm code (such as *ASY*), which is present in the header and identifies the alarm cause.

Remote alarm silence can either be accomplished from CLUSTERVIEW or BEDVIEW as follows:

Steps: Bed Silence from CLUSTERVIEW

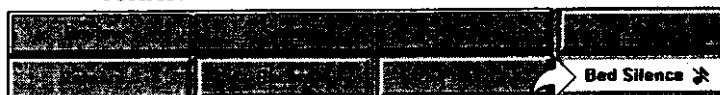
1. Click on the yellow **Bed Silence** icon , which appears in response to an alarm to the right of a patient's wave area in CLUSTERVIEW.



NOTE: For telemetry patients the bed silence icon is only available if *remote silence* is activated (see chapter 4, page

Steps: Bed Silence from BEDVIEW

1. Click on the patient's parameter area to access that patient's BEDVIEW.
2. Click on the **Bed Silence** button in the upper right corner.



Diagnostic Code

The following table describes what each letter/number represents in the diagnostic string which appears in the header strip recording and provides important monitoring information.

Digit	Description	Possible Values	Definition
1	Lead processed for VF	1 2 3 L R F V X	Lead I Lead II Lead III Lead avL Lead avR Lead avF Chest lead None
2	ECG filter	M	Monitor
3	Pacemaker detection	P N	On Off
4	QRS processing mode	1 2	ECG1 ECG1 + ECG2
5	Beat classification lead(s)	1 2 B	First lead Second lead Both leads
6	Leads functional and available for processing	0 1 2 3	No valid processing lead ECG1 is valid ECG2 is valid ECG1 + ECG2 are valid
7	VT count	5-F	Value = VT count (where A to F = 10)
8	VT rate	0-A	Value = (VT rate - 100)/10 (where A = 10)
9-20	Space	Blank space or _	n/a
21	Monitor model	T	Infinity telemetry system processor n
22-27	Software version	xxxxx x	First six characters of base software sample, VA1.1W)



Local Alarm Silence

You can silence *all* active alarms at the MULTIVIEW WORKSTATION for 60 seconds as follows:

Click on the **Alarm Silence** button in the CLUSTERVIEW menu bar.



or

Press the **Alarm Silence (F1)** key on the keyboard.

A local alarm silence has the following consequences:

- the alarm tone stops for all active alarms at the MULTIVIEW WORKSTATION for 1 minute.
- the affected parameter area continues to flash in the color of the highest grade alarm.
- alarm messages and the **Bed Silence** icon  remain displayed.
- the **Alarm Silence** button remains selected.



NOTE: The MULTIVIEW WORKSTATION maintains one common timer for all silenced alarms of a patient. When the timer expires, the MULTIVIEW WORKSTATION visually announces all alarm conditions whose conditions are still valid but only emits an alarm tone for the highest grade active alarm.

Header Information

Like timed recordings, continuous recordings contain a header which appears along the top of the strip recordings (see page 17). Headers for continuous recordings contain the same information as those for timed recordings, except for the recording rate, CENT. CONT and the delay time, which are not part of continuous recordings.

The parameter values, patient name, ID #, date, and time are updated and displayed on continuous recordings at regular intervals.

Special Surveillance Alarm Conditions

The following table outlines the behavior of surveillance alarms under special circumstances.

Circumstance	Effect on surveillance alarm
A bedside CPS goes offline or fails while a surveillance alarm for that bed is reported at the MULTIVIEW WORKSTATION.	The surveillance alarm is canceled.
A bedside monitor goes offline or fails while a surveillance alarm for that bed is reported at the MULTIVIEW WORKSTATION.	
The bedside CPS or the monitor transitions into stand-alone mode.	
The bedside CPS or the monitor detects that it has the same IP address as another device on the network.	
The monitor is removed from the network for transport.	Any existing surveillance alarm is canceled.

Requesting a Timed Recording

You can request timed recordings manually in several ways:

- from CLUSTERVIEW
- from BEDVIEW
- from the transmitter



NOTE: For information on how to setup the MULTIVIEW WORKSTATION to generate recordings automatically (e.g. response to limit violations), refer to (see chapter 11, Alarm Response).

Steps: From CLUSTERVIEW (for an individual patient)

- Click on the **REC** button in the patient's parameter area. The **REC** button remains selected until the timed recording is finished. As soon as the recording starts printing, the text inside the button appears white until the recording is finished.



NOTE: If the patient has been discharged, the monitor is in standby or waveforms are stopped, the **REC** button for that patient is ghosted and you cannot request a timed recording. If waveforms are stopped, first click inside the waveform area to release the waveforms, then request the recording again. When the waveforms are stopped, you can request a print screen if the laser printer is configured and connected to the MULTIVIEW WORKSTATION. For further information, please refer to 12-23.

The Surveillance Feature

This feature extends alarm annunciation for life-threatening and serious alarms to bedside monitors of selected care units that are not displayed in any CLUSTERVIEW. Alarms that generated under the surveillance feature must meet the following criteria:

- the alarm must either be an active or a latched (not yet acknowledged) life-threatening alarm.
- the alarm must be an active serious alarm (no latched serious alarms are reported).

Multiple Alarm Situations/Priorities

If several bedside monitors issue surveillance alarms, the messages are displayed alternately for three seconds each. Surveillance alarm messages are displayed over the time/date in the status area along the bottom of the screen.

Silencing Surveillance Alarms

A surveillance alarm is reported until it is either acknowledged, or, in case of serious alarms, the alarm condition ceases. You can silence the audible alarm signal of a surveillance alarm locally like any other alarm by either clicking on the **Alarm Silence** button in the CLUSTERVIEW menu bar or by pressing the **F1** fixed key (see page 11-12 for more details).

Steps: From **BEDVIEW**

You can also request timed recordings from a patient's **BEDVIEW**, provided the patient is not in standby, has not been charged and is not disconnected from the network.

1. Click in the parameter area in **CLUSTERVIEW** to access patient's **BEDVIEW**.
2. Click on the **Record** button.

Record button in the **BEDVIEW** menu bar



The **Record** button remains highlighted until the timed recording is finished. As soon as the recordings starts prior the text inside the button appears white until the recording finished.



NOTE: If waveforms are stopped, the **Record** button is gray and you cannot request a timed recording. In this case, first in the waveform area to release the waveforms, then request recording again. While waveforms are stopped, you can request a print screen provided the laser printer is configured and connected to the **MULTIVIEW WORKSTATION**. For further information refer to page 12-23.

The waveforms are printed in the order in which they appear in **BEDVIEW**.

Steps: From the Transmitter

You can also request a timed recording for a telemetry patient directly from the transmitter as follows:

- Press the transmitter's recording button for *less* than 3 seconds.

Transmitter recording key



Requesting a Continuous Recording

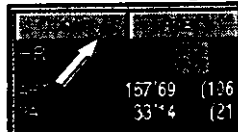
You can request a continuous recording either at the MULTIVIEW WORKSTATION or, in case of telemetry patients, from the transmitter.

At the MULTIVIEW WORKSTATION, continuous recording only be generated from the CLUSTERVIEW.

Steps: Requesting a continuous recording

1. Click on the **CONT** button in the patient's parameter

Continuous recording button



The recording buttons **CONT** and **REC** merge into one combined button, **CONTREC**. As soon as the recording starts printing, the text inside the button appears white until the recording is finished.



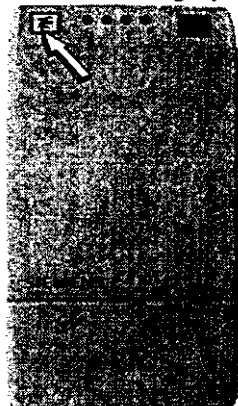
NOTE: If the patient has been discharged, the monitor is standby, or the waveforms are stopped, the **CONT** and **REC** buttons are ghosted and you cannot request a continuous recording. If the waveforms are stopped, first click inside the waveform area to release them, then request the recording again. When waveforms are stopped, you can request a print screen provided the laser printer is configured and connected to the MULTIVIEW WORKSTATION.

Steps: From the Transmitter

You can also request a continuous recording for a telemetry patient from the transmitter as follows:

- Press the transmitter's recording button longer than 3 seconds.

Transmitter recording key



Requesting a Print Screen Recording

Print screens are an exact representation of the screen at the time of the print screen request.

You can request a print screen of the CLUSTERVIEW and BEDVIEW provided the optional laser printer is configured in the MULTIVIEW WORKSTATION. If you request a print screen and the printer is not configured, the message Printer Not Configured is displayed in the MULTIVIEW WORKSTATION status area.



NOTE: If your setup includes two displays, the print screen reflects the contents of the display to which the mouse arrow is pointing at the time of the print request.

Steps: Generating a CLUSTERVIEW print screen

- 1. Press the **Print Screen** key on the keyboard while the CLUSTERVIEW is displayed.

Steps: Generating a BEDVIEW print screen

To print the contents of the BEDVIEW window, proceed as follows:

1. Access the patient's BEDVIEW.
2. Click on the **Print** button in the BEDVIEW window.

Print button in BEDVIEW



NOTE: If the Print button appears ghosted, the printer configuration was set to Off in the Configure Central menu (see chapter Biomed Functions).

Requesting a Trend Report

To print out the currently displayed trend window on a connected laser printer.

Steps:

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Review** button.
3. Click on one of the following menu selections:

Trend Graphs... to view the trend graphs

Trend Table... to view the trend table.

4. Click on the **BEDVIEW Print** button.

Print button in BEDVIEW



NOTE: If the Print button appears ghosted, the printer connection was set to Off in the Configure Central menu (see chapter 1 *Biomed Functions*).

Full Disclosure/Event Disclosure Rep

If the Full Disclosure and the Event Disclosure options are activated at your MULTIVIEW WORKSTATION, additional reports are available. Please refer to the sections in this User Guide entitled *Full Disclosure (Option)* and/or *Event Disclosure (Option)* for detailed information on the respective reports.

Recording Status Messages

The MULTIVIEW WORKSTATION alerts you to the status of the recorder or the recording request(s) with status messages that are displayed in the CLUSTERVIEW status area (along the bottom of the screen).

Recorder Status Messages			
Status Message	Tone	Description	Action
• <i>Timed Recording Request Accepted <xxx></i> • <i>Cont. Recording Request Accepted <xxx></i> • <i>Cont. Recording Now Timed</i> (for SC 6000 Series monitors only)		The recording request has been accepted, but the recorder is currently unavailable to print it. The recording is pending or stored until a recorder becomes available.	None
• <i>Timed Recording Started <xxx></i> • <i>Cont. Recording Started <xxx></i>		The requested recording is being printed.	None
• <i>Timed Recording Finished <xxx></i>		The recording has finished printing or has finished being stored.	None
• <i>Timed Recording Canceled <xxx></i> • <i>Cont. Recording Canceled <xxx></i>		The recording might have been canceled due to a special condition (see page 12-27).	None
• <i>Timed Recording Interrupted <xxx></i> • <i>Cont. Recording Interrupted <xxx></i>		The recording was interrupted because the recorder is out of paper, the door is open, the recorder is disconnected from the CPS or an error occurred during data transmission.	Contact your Biomed to check the recorder's status in the Show Devices screen. The recording will start printing again when the recorder is operating properly.
Note: <xxx> stands for the device/host label.			

Recorder

Recorder Status Messages (continued)

Status Message	Tone	Description	Action
• Excessive Artifact - Timed Recording Canceled <xxx> • Excessive Artifact - Cont. Recording Canceled <xxx>		Recording was canceled due to excessive artifact.	Check the patient connections to correct the source of artifact.
<xxx> Disconnected	Advisory	The recorder(s) is not connected to the network.	Connect the recorder.
<xxx> Door Open	Advisory	The recorder door is open.	Close the recorder door.
<xxx> Out Of Paper	Advisory	The recorder is out of paper.	Replace the recorder paper.
<xxx> Failure	Serious	Recorder failed.	Take the recorder out of service and contact the service personnel.
<xxx> Offline	Serious	The recorder CPS is offline. The recorder communication with the network has failed.	Contact your Biomed to check the network connection to the recorder.
<xxx> Duplicate Address	Serious	The recorder CPS has detected a duplicate address.	Contact your Biomed.
Recording Request Not Accepted	Attention	The manual recording request was rejected because the bedside monitor's print queue is full. For telemetry patients this message appears when a recording is requested within 5 seconds of requesting a recording of a higher priority.	Wait until some of the pending recordings are required before you request another recording.

Note: <xxx> stands for the device/host label.

**Recorder Status Messages (continued)**

Status Message	Tone	Description	Action
Recording Status Unknown - Connection Failed	Attention	The recording status is unknown due to a connection error to the bed (telemetry and non-telemetry patients).	Contact your Biomed.

Note: <xxx> stands for the device/host label.

Printer Status Messages

Status Message	Tone	Description	Action
Print Request Finished		The requested print screen is finished.	None
Printer Not Configured	Attention	A print screen was requested; however, no printer is configured for this MULTIVIEW WORKSTATION.	Configure the printer (see chapter 17, page 17).
Print Request Not Accepted - Queue Full	Attention	The print screen request was rejected because the print queue can only accommodate one print screen request at a time.	Wait until the previous print screen requests are completed before you request another.

13 Trends

This chapter describes the function of the MULTIVIEW WORKSTATION and the available display features of the trend graphs and the trend table.

Overview	
Trend Graphs	
Accessing a Patient's Trend Graphs	
Display Order	
Trend Graph Scales	
Layout of the Trend Graph	
Choosing a Different Time Base	
Trend Table	
Accessing a Patient's Trend Table	
The Trend Table Layout	
Changing the Time Interval	
Trend Cursor	
Displaying the Trend Cursor	
Representation of Special Conditions	
Requesting a Trend Report	



Overview

The MULTIVIEW WORKSTATION offers trend graphs and a trend table that display trend data for up to 28 hours for telemetry at SC 6000 patients and up to 24 hours of data for SC 9000 patients. If a patient is monitored longer than the allotted time, the oldest trend data is deleted and replaced with the most current. Trend data is sampled every 30 seconds except for ST parameters, which are sampled at every 15-second averaged ECG complex.

For non-telemetry patients, the *bedside monitors* process and store all of their own trend data and transmit it to the MULTIVIEW WORKSTATION for display. For telemetry patients, however, a trend information is processed and stored at the MULTIVIEW WORKSTATION. For all patients, the trend information is made available for remote viewing by network client devices.

As soon as you access a Trend application, the patient's BEDVIEW main screen is replaced by the trend data except for the information area, the top waveform channel, the BEDVIEW menu bar, and the BEDVIEW buttons, which always remain visible. In this way you can still observe the primary waveform and any alarm messages and banners as well as access other BEDVIEW menus while you are viewing the trend data.

Scroll bars located along the left edge or the bottom of the trend screen allow you to navigate through stored trend data. In addition, you can select different time intervals for the displayed data.

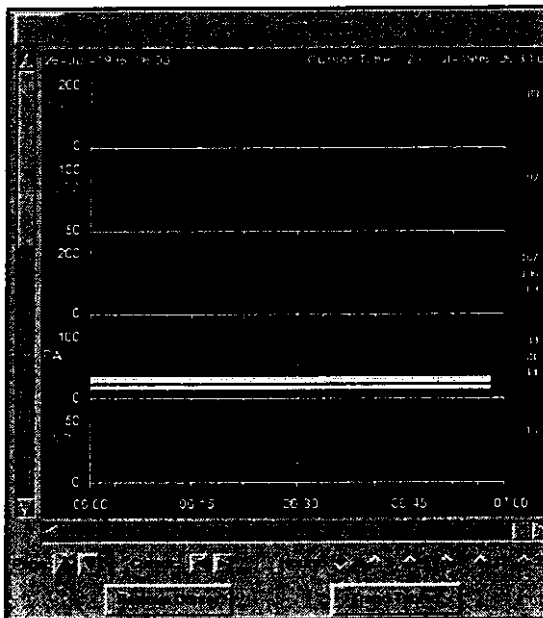
Special events such as an asystole or a technical occurrence such as a lead-off condition have special representation on a trend table or a trend graph.

Trend Graphs

Trend graphs display stored trend data in the form of individual graphs for each parameter (see illustration below). These show the behavior of the different parameters over a significant time period. One page in a trend graph screen can accommodate up to five individual graphs. If no parameter is assigned to a given slot in the trend graphs display, it appears blank.

The trend graphs and parameter labels are displayed in the top of the trends at the bed. Scale bars and scale labels appear on the right side of each graph.

Trends are updated automatically, with the most recent data entering continuously at the right side.



Accessing a Patient's Trend Graphs

1. Click on the patient's parameter area in **CLUSTERVIEW** to access the **BEDVIEW** window.
2. Click on the **Review** button.
3. Click on the **Trend Graphs...** menu selection.



NOTE: If you are in the trend table window, click on the **Trend Graphs...** button at the bottom of the window to access the trend graphs window.

The displayed trend data portion depends on the cursor's status when you access the trend graphs.

Cursor is active Yes/No?	Then the Trend Graph displays...
No	The most recent trend data.
Yes	Data is centered around the cursor time Note: If centering the data around the cursor would leave part of the Trend Graph blank, the trend display shifts so the available data fills the trend window.

The following table lists the available gain settings for each parameter.

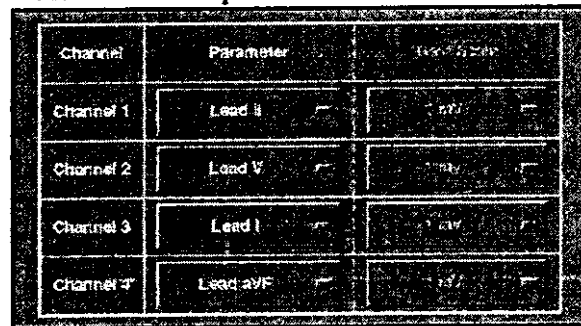
Full Disclosure (Option)

cting Waveforms for Storage

You can determine which waveforms or parameters will be 'captured' in the Full Disclosure database for each patient. These waveforms are initially selected at the time of admission; however, you can change them at any time. The defaults for each channel are outlined in the following table.

Channel 1	Lead II
Channel 2	Lead V
Channel 3	ART
Channel 4	SpO ₂

1. Access the Full Disclosure Review screen (see page 14-15).
2. Click on the **Options** button in the upper menu bar.
3. Click on the **Storage Options...** menu selection to activate the Patient Setup window.



Channel	Parameter	
Channel 1	Lead II	...
Channel 2	Lead V	...
Channel 3	Lead I	...
Channel 4	Lead aVF	...

4. Click on the option button for the channel you wish to configure under the 'Parameter' heading. This activates a popup with a list of all available waveforms from the bedside monitor.
5. Click on the desired selection.
6. Repeat steps 4 and 5 for the other channels.
7. Click on the **Accept** button to confirm your selection, the **Defaults** button to return to the factory defaults (see table above) or on the **Cancel** button to cancel the procedure.

Turning the Display of Pacer Markers On/Off

You can turn the display of pacer markers (spikes) in the ECG waveforms on or off.

Steps:

1. Access the Full Disclosure Review screen (see page 14-15).
2. Click on the **Options** button in the upper menu bar.
3. Click on the **Display Options...** menu selection to display the Patient Setup window.
4. Click on the **P.M.** button (Pacer Mark On/Off), which is located directly below the waveform selection table.



5. Click on the **Accept** button to confirm your selection, the **Undo** button to return the settings to the previously saved settings or on the **Cancel** button to cancel the procedure.

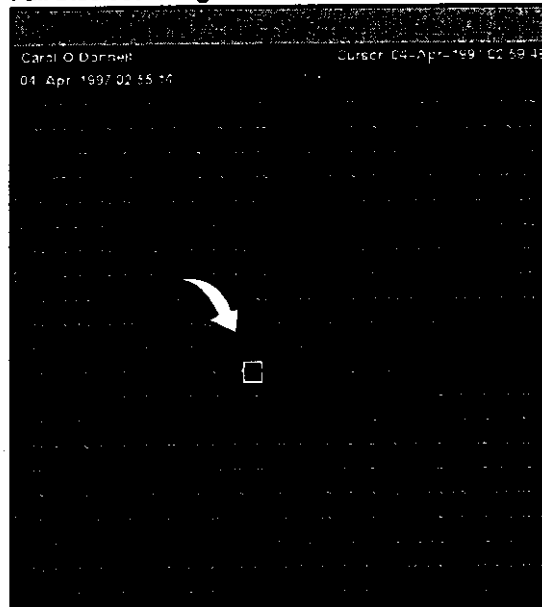


NOTE: Pacer marks are only displayed at the MULTIVIEW WORKSTATION if available from the bedside monitor.

Full Disclosure (Option)

In Full Disclosure, the cursor appears as a box on the waveform (see illustration below). The cursor is a useful tool that highlights a point in time on a waveform. It also allows you to 'capture' a certain segment of a waveform and the corresponding data in order to view it in different applications (e.g. you can move from Full Disclosure to Trends and view the trend data at the same time). If the cursor is active when you enter the Full Disclosure application, the displayed data is centered around the cursor's time. When the cursor is not active, the screen displays the most recent waveforms. When the cursor is active, the corresponding cursor time is displayed in the upper right corner. If the cursor is not active, that field appears blank.

Full Disclosure segment with cursor

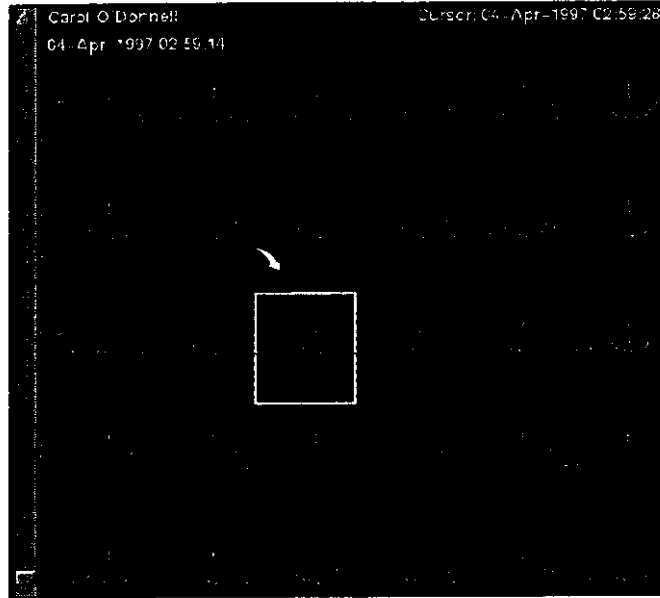


You can move the cursor on the screen by pointing and clicking the mouse on the displayed waveforms.

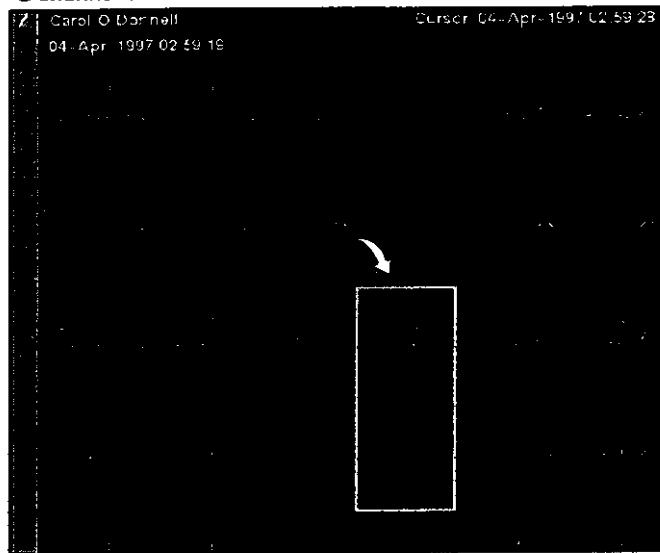
NOTE: The cursor's time does not change when you scroll through the data with the scroll bar or select a time on the time line. The cursor time only changes when you point and click on the actual waveform.

The height of the cursor is relative to how many channels you have selected for review.

1-channel cursor



2-channel cursor



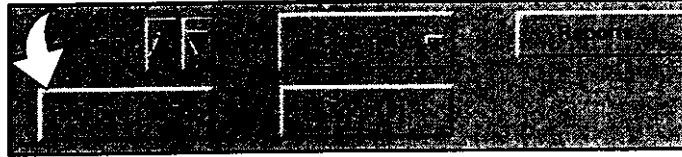
Full Disclosure (Option)

Adding/Removing the Cursor

You can either display or remove the cursor.

Steps:

1. Access the Full Disclosure Review screen (see page 14-15).



2. Click on the **Remove Cursor** button to hide the cursor or on the **Show Cursor** button to display it. Whenever you click on the button, it toggles to its opposite.

Full Disclosure Reports

The Full Disclosure application generates the following reports:

- Strip Report
- One-Hour Report

► **NOTE:** You can request Full Disclosure reports from a server as well as a client.

The cursor is necessary to select a report since the cursor time marks the “request time” for the report. If the cursor is not active, the **Report** button is ghosted.

A message in the status area of CLUSTERVIEW indicates when a report is requested or rejected.

Depending on the printer setting, all Full Disclosure reports are either printed on a network laser printer or on a laser printer that is connected directly to the MULTIVIEW WORKSTATION. Full Disclosure report requests are processed even if you exit the Full Disclosure application.

Pacer marks and time change indicators are printed where applicable.

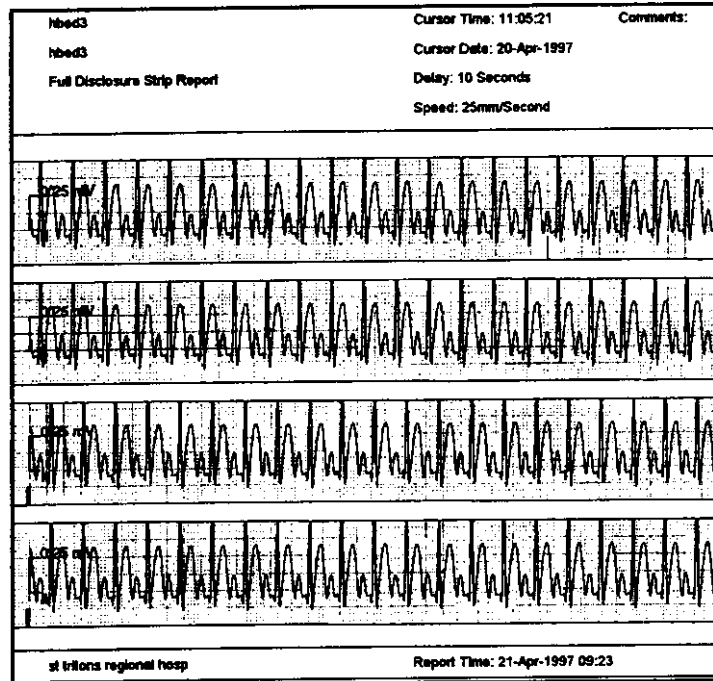
► **NOTE:** You cannot cancel Full Disclosure strip recordings or One-Hour reports.

Full Disclosure (Option)

Disclosure Strip Report

The following illustration depicts a Full Disclosure strip report. The waveforms that are displayed at the time of the recording request are the ones that are printed.

The report shows 10 seconds of waveforms before and 10 seconds after the cursor, which marks the center of the report. Each waveform is identified by the waveform label and the display gain. Each landscape-oriented page can contain a two-channel strip, each 20 seconds long. The one and two channel reports are one page long and the three channel report is two pages long.



The header of the Full Disclosure Strip report contains the following information:

- patient's name and ID#
- Print time of the report
- the report type (e.g. Full Disclosure Strip Report)
- the page number (x of y)
- the time and date corresponding to the cursor position
- the recording delay (10 seconds)
- the recording speed (25 mm/s)
- the hospital's name (defined at system setup)



NOTE: You cannot cancel Full Disclosure strip reports or One-Hour reports.

Full Disclosure (Option)

Testing a Full Disclosure Strip Report

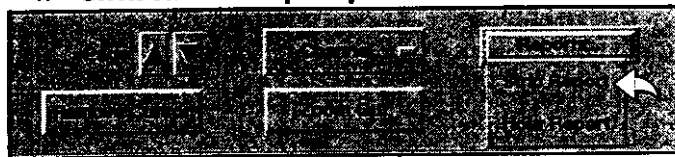
You can request a Full Disclosure Strip report from the Review screen.

Steps:

1. Access the Full Disclosure Review screen (see page 14-15).
2. Click on the **Show Cursor** button if the cursor is not already activated, and select the correct time frame by clicking directly on the waveform.

NOTE: Because the cursor is the time reference point, you must activate it before you can request a Full Disclosure strip report.

3. Click on the **Reports...** button.
4. Click on the **Strip Report** selection.



Full Disclosure One-Hour Report

The Full Disclosure One-Hour report is illustrated on page 14-34.
The cursor time marks the center of the report

The header of the One-Hour report contains the following information:

- patient name and ID#
- one-hour report label
- cursor date and time
- resolution
- channel labels
- gain

The footer identifies the hospital name, report time and page number.

The One-Hour report prints one minute of data per line or sixty minutes per page (sixty lines per page). A One-Hour report for one channel is one page long, for two channels it is two pages long, and for three channels it is three pages long. The channels are represented the same way they are viewed on the display screen and are labeled as such at the left of each line of data.

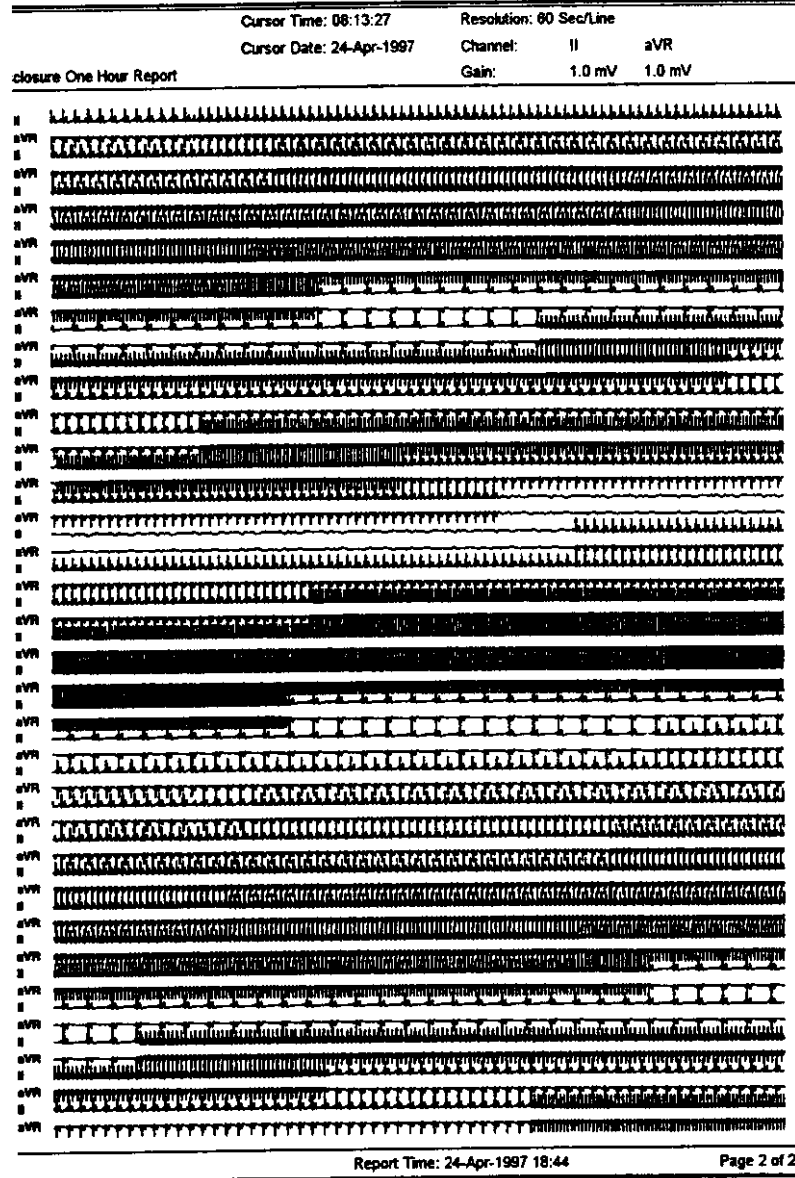
Data is captured 30 minutes before the cursor time. The waveforms are printed by channel groups as displayed on the review screen.



NOTE: You cannot cancel Full Disclosure strip recordings or One-Hour reports.

Full Disclosure (Option)

ne-Hour Report



requesting a Full Disclosure One-Hour Report

You can request a Full Disclosure One-Hour report from the Review screen as follows.

Steps:

1. Access the Full Disclosure Review screen (see page 14-15).
2. Click on the **Show Cursor** button if the cursor is not already activated, and select the correct time frame by clicking on a waveform.



NOTE: Because the cursor is the time reference point, you must activate it before you can request a Full Disclosure strip report.

3. Click on the **Reports...** button.
4. Click on the **Hour Report** menu selection.



Full Disclosure (Option)

Special Conditions

Different circumstances during patient monitoring may affect the collection of Full Disclosure data as indicated in this table.

Condition	Effect
Monitoring device is powered up.	Full disclosure data storage resumes accordingly.
Monitoring device is powered down.	The Full Disclosure data is preserved.
bedside monitor is has failed or is powered down.	Blank spaces appear for the duration of the interruption.
Patient is put in standby.	Blank spaces appear for the duration of the standby.
Monitoring is canceled.	Storage of full disclosure data resumes.
System is discharged at the end of the shift.	Full disclosure data remains until manually deleted at the MULTIVIEW WORKSTATION.
Demographics are edited.	Full disclosure data is stored under the edited demographics.
bedside monitor is disconnected.	The full disclosure data base shows blanks for the duration of the interruption. A message describes the absence of data.
Bridge or a signal such as a transducer is reconnected.	Full disclosure data collection begins for any displayed parameter that was selected for the Full Disclosure application.
Bridge or a signal such as a transducer is disconnected.	For the duration of the interruption blanks will appear in the Full Disclosure display, provided the parameter was displayed and selected for Full Disclosure.
System date and/or time is changed.	Up to 20 system time changes are stored. The time stamps on the waveforms mark the time the data was actually stored.

5 Event Disclosure (Option)

This chapter describes the Event Disclosure option of the MULTI-VIEW WORKSTATION, which allows you to view a patient's stored events. This option is purchased separately and must be unlocked in the Biomed menu.

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review

With the Event Disclosure option you can track and analyze a patient's clinically significant events over a period of 28 hours.

The Event Disclosure application is only accessible on MULTIVIEW WORKSTATIONS operating with enhanced level software. As soon as the option is unlocked (see Biomed chapter for details), the Event Disclosure application is available. The option is packaged in groups of eight patients (8 or 16 per MULTIVIEW WORKSTATION).

NOTE: If you unlock the Full Disclosure and the Event Disclosure application at the same time but select the 1-8 Patient option for one application and the 9-16 Patient option for the other, the MULTIVIEW WORKSTATION defaults to the lower patient number for both options. In addition, if both options are unlocked and you admit a patient to Full Disclosure, he or she is automatically admitted to Event Disclosure as well (and vice versa).

Depending on whether you purchase the Event Disclosure Server option or the Client option, the availability of functions varies (see the following table).

With the Event Disclosure Server option you can...	With the Client Option you can...
Admit/discharge patients to the Event Disclosure application	•view event disclosure data from any event disclosure server on the network
Send event disclosure data	•request event strip recordings
Retrieve events for the selected patients	
Select waveforms for storage	
Download stored events from its own database	
Request event strip recordings	

For each patient the MULTIVIEW WORKSTATION can store a maximum of 1000 events over 28 hours. Once the maximum storage capacity is reached, the oldest events are replaced by current ones.

You can view, delete and print these stored events selectively at any time.



NOTE: On a MULTIVIEW WORKSTATION with the Event Disclosure Server option enabled, you can only view Event Disclosure data for 'its own' patients (e.g. patients that are admitted to the Event Disclosure application of that MULTIVIEW WORKSTATION). However, if you have the Client option enabled in addition to the Event Disclosure Server option, you can view patients of other Event Disclosure servers.

Event Disclosure Census Window

Event Disclosure Census operations include:

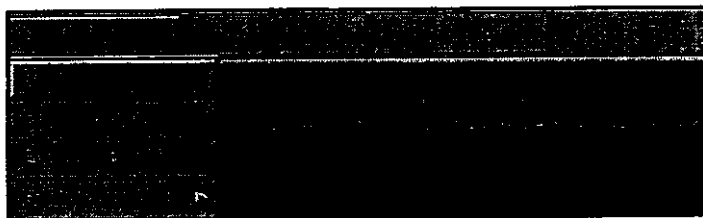
- **Admitting** a patient to the Event Disclosure application (only from a server)
- **Appending** a patient to an existing data set (only from a server)
- **Discharging** a patient from the Event Disclosure application (only from a server)
- **Viewing** a patient's stored events

Using the Census Screen

NOTE: The **Event Disclosure...** button is only visible if the Event Disclosure option has been unlocked. You may also see a **Full Disclosure...** button if the Full Disclosure option has been unlocked (as is illustrated below).

From CLUSTERVIEW:

1. Click on the **View** button in CLUSTERVIEW.
2. Click on the **Event Disclosure...** button to activate the Census window.



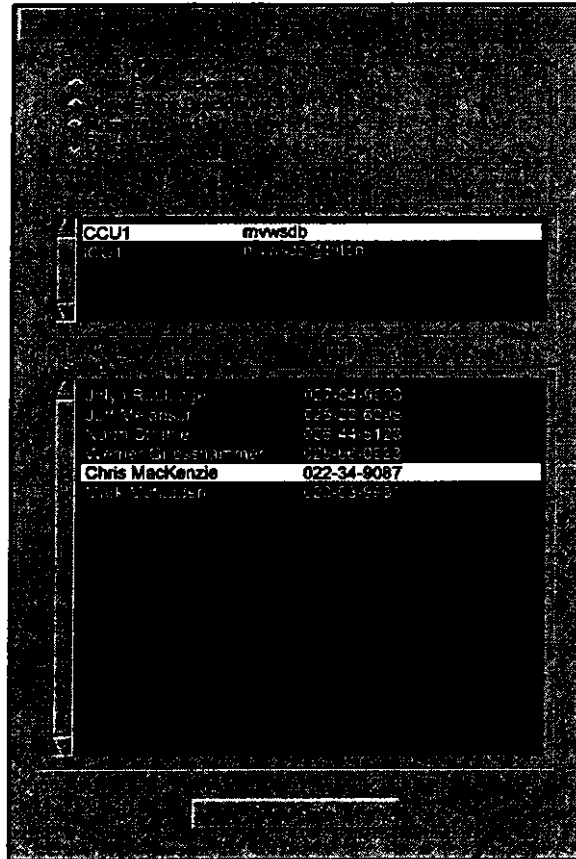
From BedView:

1. Click on the **Review** button.
2. Click on the **Event Disclosure...** button (this activates the Event Review screen).
3. Click on the **Census** button.



NOTE: The **Event Disclosure...** button *and* the **Full Disclosure...** button are only visible if both the Event Disclosure and the Full Disclosure options have been unlocked.

The Census window

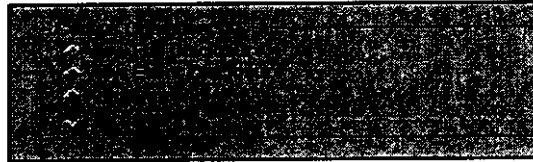


Event Disclosure (Option)

It of the Census Screen

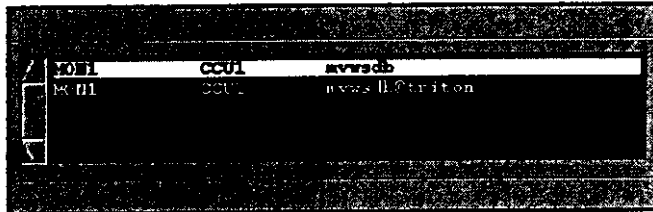
The Census screen is divided into three sections:

The upper portion contains the radio buttons for **Census Operation(s)**: **View Full Disclosure** (if option is unlocked), **View Event Disclosure**, **Admit/Append** and **Discharge**. These buttons determine the mode of the Census screen (e.g. View mode or Discharge mode). Depending on which of these buttons you select, the layout and the configuration of the screen varies.

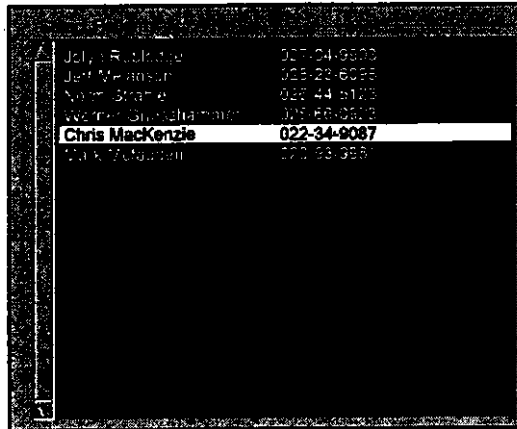


NOTE: If your MULTIVIEW WORKSTATION is only equipped with the *client* version, the **Admit/Append** and **Discharge** buttons are ghosted. Furthermore, the **View Event Disclosure** button *and* the **View Full Disclosure** button are visible only if both options have been unlocked. Otherwise only the button corresponding to the unlocked option is visible.

The middle section shows the Select Unit list with all available Event Disclosure servers. The server listed as... mvwsdb... is the local server on which you are working. Servers listed as...mvws@xxxx... are the names of other servers on the network. This list is displayed in View mode only.



The lower portion shows the Select Patient list, which contains all the patients with their ID numbers and current Event Disclosure status.



The patient list changes depending on whether you are in **View Event Disclosure**, **Admit/Append** or **Discharge** mode (see the following table).

Display mode of the Census screen	List label	Status
View Event Disclosure	No label	Patients who are admitted to the selected Event Disclosure server
Admit/Append	<i>Inactive</i> or Not Admitted	Patients admitted to this server but no longer available on the network; or, Patients not admitted to this server
Discharge	<i>Admitted</i> or <i>Inactive</i>	Patients who are admitted to this server

Event Disclosure (Option)

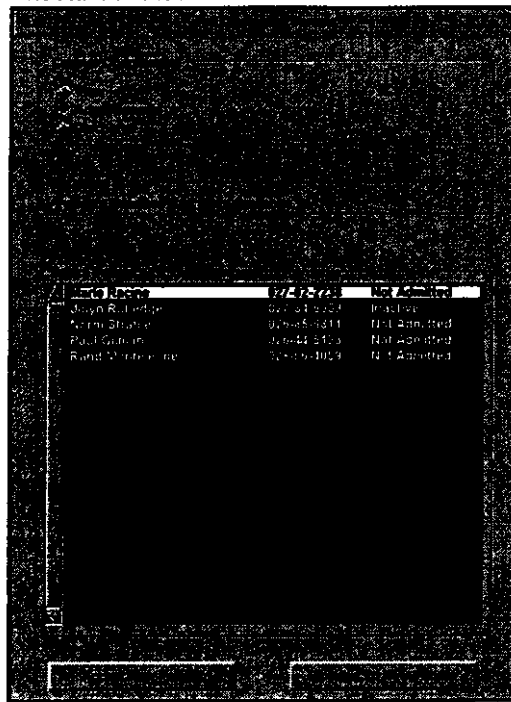
Admitting/Discharging a Patient

You must *admit* a patient to the Event Disclosure server to begin storing events. Only patients who are admitted at the bedside monitor (or in the case of telemetry patients at a MULTIVIEW WORKSTATION) with a name and ID number can be admitted to the Event Disclosure server of the MULTIVIEW WORKSTATION.

NOTE: You can only admit patients from within the monitoring unit of the MULTIVIEW WORKSTATION that is equipped with the Event Disclosure *Server* version. The *Client* version does not allow patient admission (the **Admit/Append** buttons appear ghosted). If both the Event Disclosure and the Full Disclosure server options are unlocked, patients are also automatically admitted to Full Disclosure when they are admitted to Event Disclosure (and vice versa).

The Admit window (see illustration on the following page) displays a list of patients who are either currently not admitted to the Event Disclosure (status: *Not Admitted*) or whose data collection has been interrupted (status: *Inactive*). The *inactive* status occurs during PICK AND GO applications (e.g., transfers for procedures, O.R., bed transfer, etc.). As long as the patient remains on the same monitor, the waveform data collection resumes when the patient is reconnected to the monitoring unit of his MULTIVIEW WORKSTATION.

The Admit window



The screenshot shows a window titled 'Admit' with a table of patient data. The table has three columns: 'Name', 'Room', and 'Status'. The data is as follows:

Name	Room	Status
John R. Smith	001-01-0001	Admitted
John R. Smith	001-01-0011	Not Admitted
Paul G. Smith	001-01-0012	Not Admitted
Paul G. Smith	001-01-0013	Admitted

The patient list in the Admit window shows only those patients and their Event Disclosure status who are in the monitoring unit of the MULTIVIEW WORKSTATION.

The Admit window also indicates the number of filled and available slots. Once the maximum capacity is reached (8 or 16 patients depending on the server option), new patients are admitted as slots become available as a result of discharges.

Event Disclosure (Option)

Admitting a New Patient

You admit a patient to the Event Disclosure application as follows:

1. Access the Census window (see page 15-4).
2. Click on the **Admit/Append** button to access the Admit window with the list of all patients within the monitoring unit who are not admitted to the Event Disclosure server.
3. Click on the patient you wish to admit (as soon as you make the selection, the **Accept New Patient** button is no longer ghosted).
4. Click on the **Accept New Patient** button. This activates the waveform storage selection table which allows to choose the waveforms to be included in that patient's Event Disclosure data storage. These waveforms may be changed at any time (see page 15-23) for details).
5. Click on the field in the table's *Parameter* column for the channel you wish to configure (this activates a popup with available settings).

Channel	Parameter	Gain/Scale
Channel 1	Lead I	1 mV
Channel 2	Lead V	5 mV
Channel 3	Lead I	1 mV
Channel 4	Lead aVF	1 mV

6. Click on the parameter you wish to assign to that channel.
7. Repeat steps 5 and 6 for additional channels.
8. Click on the **Admit** button to complete the admission and start the data collection for that patient or on the **Cancel** button to dismiss the popup and return to the Admit window.

Event Disclosure (O

You may also click on the **Defaults** button to restore channel to the server's default settings (see the following table).

Channel 1	Lead II
Channel 2	Lead V
Channel 3	ART
Channel 4	SpO ₂

As soon as the patient is admitted, the name appears in the Disclosure Census list.

Interruption in Data Collection

The patient remains admitted to the server and the Event Disclosure data storage continues for as long as the patient remains on the same monitor on the network and within the monitoring unit. The same holds true for telemetry patients; as long as they remain admitted to the same MULTIVIEW WORKSTATION, data storage continues.

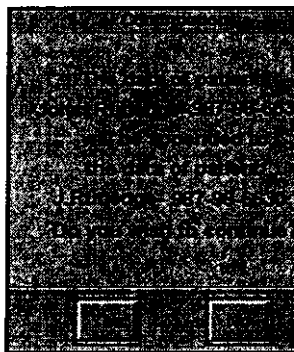
If the patient leaves the monitoring unit and returns with the bedside monitor or, in case of telemetry patients, returns to the same MULTIVIEW WORKSTATION, Event Disclosure data storage resumes automatically when reconnected to the HOSPITAL NETWORK even if the patient name and the ID have been changed.

Appending Event Disclosure Data

The append feature of the Event Disclosure application allows you to 'combine' two sets of data. This may be necessary when a patient's demographics have changed or the patient is being monitored by a different monitor or, in the case of a telemetry patient, by a different MULTIVIEW WORKSTATION and thus two sets of data are generated for the same patient.

Steps: Appending Data

1. Access the Census window (see page 15-4).
2. Click on the **Admit/Append** button to access the Admit window, which displays a list of all patients in the monitoring unit who are not admitted to the Event Disclosure server and whose data collection status is 'inactive'.
3. Select and click on the 'inactive' patient whose data you want to append. When you click on the patient name, the **Append To New Patient** button is unghosted.
4. Click on the **Append to New Patient** button. A list of patients in the monitoring unit who have not been admitted to the Event Disclosure server appears.
5. Click on the patient for whom continued Event Disclosure storage is desired.
6. Click on the **Append Data** button. A popup displays the name and ID# of both selected patients.
7. Click on **Yes** within the popup to confirm that the correct patients have been selected or **No** to cancel the selection.



The existing waveform data is relabeled with the name/ID of the patient and appended to the end of the stored data. As soon as the data is appended, the new name is removed from the Admit/Append list and moved to the Census list and Event Disclosure data collection resumes.

Event Disclosure (O

Discharging a Patient from Event Disclosure

Event Disclosure data collection is stopped by *discharging* a patient from the Event Disclosure server (you cannot discharge a patient from a client device).



NOTE: If both the Event Disclosure and the Full Disclosure options are unlocked, patients are also automatically discharged from Full Disclosure when they are discharged from Event Disclosure (and vice versa).

You can only discharge a patient from the Event Disclosure server of the MULTIVIEW WORKSTATION at which the patient was originally admitted.

When you discharge a patient from the Event Disclosure the patient is *not* discharged from the bedside monitor. In the same way a patient who is discharged from the bedside monitor is still admitted to the Event Disclosure server and all of his/her data is still stored at the MULTIVIEW WORKSTATION.

When you discharge a patient from the Event Disclosure real-time monitoring or the display of real-time data at the MULTIVIEW WORKSTATION is not affected.

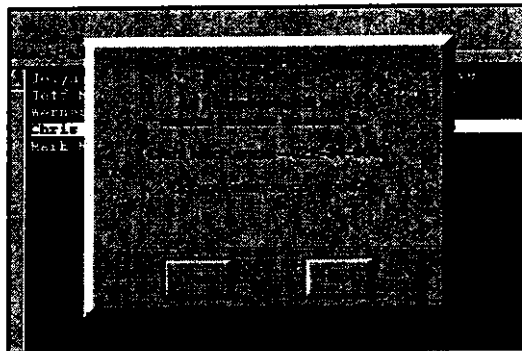


CAUTION: When you discharge a patient from the Event Disclosure application, all Event Disclosure data as well as any Event Disclosure reports are deleted for that patient. Therefore, it is important to generate Event Disclosure reports periodically if you wish to maintain a history of the patient's Event Disclosure session.

Steps: Discharging a Patient

You discharge a patient from the Census window as follows:

1. Access the Census window (see page 15-4).
2. Click on the **Discharge** button (located in the top portion the screen). The Census list with all of the patients current admitted to the Event Disclosure application is displayed.
3. Click on the desired patient (this activates the **Discharge Data** button).
4. Click on the **Discharge Data** button (this activates the following confirmation popup).



5. Click on the **Yes** button within the popup to discharge the patient from the Event Disclosure server or on the **No** button to cancel the discharge and continue the data collection for that patient.

If you click on **Yes**, the patient's name is removed from the census list.

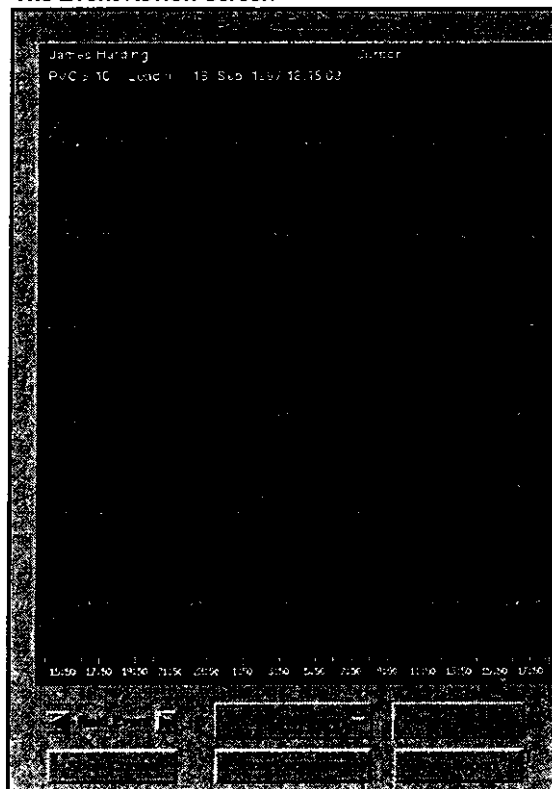
NOTE: When a client device is viewing data of a patient who has been discharged from the server, the screen appears blank except for the message DATA DISCHARGED.

Event Disclosure (C)

The Event Review Screen

The Event Disclosure application stores up to 1000 events per patient over the past 28 hours. All of these events originate from the bedside monitor or, in the case of telemetry patients, the transmitter. Once the maximum capacity is reached or events older than 28 hours, they are deleted on a first-in first-out basis. Whenever you access the Event Review menu, the most recent event is displayed unless the cursor is activated, in which case data is centered around the cursor time.

The Event Review screen





Accessing the Event Review Screen

On the Event Review screen you can perform numerous functions such as viewing events, generating reports, customizing the patient's waveform storage, etc.

You can access a patient's Event Review screen either from CLUSTERVIEW or from BEDVIEW.

From CLUSTERVIEW:

1. Click on the **View** button.
2. Click on the **Event Disclosure...** button.
3. Click on the desired unit from the list of servers.
4. Click on the desired patient to activate the **View Data** button.
5. Click on the **View Data** button which activates the Event Review screen.

From BEDVIEW:

1. Click on the **Review** button.
2. Click on the **Event Disclosure...** button (this activates the Event Review screen).

Whenever you access the Event Review screen, the most recent event is shown, or the event closest to the cursor (if it is activated). The event display consists of two waveforms, each 18 seconds long. Of these 18 seconds, the first 9 seconds represent data *before* the occurrence of the event and the other 9 seconds consists of waveform data that occurred *after* the event.

Event Disclosure (O

Layout of the Event Review Screen

The Event Review screen consists of the following comp

Header

The header spans across the top of the Event Review screen. In the left corner it displays the patient's name. The cause of the currently displayed event and the time and date it occurred are displayed directly below the patient's name. In addition, if the cursor is activated, the time and date corresponding to the cursor position are indicated to the right of the header. If the cursor is not activated, that portion of the header appears blank.

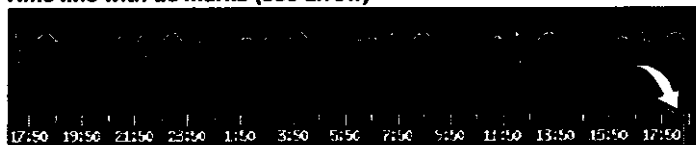
Time and date header

James Harding	Cursor:
PVC > 10 Lead II 13-Sep-1997 18:45:03	

28-hour time line

This time line contains tic marks for all stored events in the selected class. The prominent tic mark identifies the currently displayed event. Clicking inside the time line activates the event closest to the selected time within the selected event class.

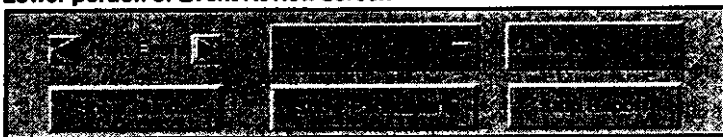
Time line with tic marks (see arrow)



Buttons

The lower portion of the Event Review screen contains the following buttons:

Lower portion of Event Review screen



- The **◀ Next event ▶** buttons enable you to scroll to the next/previous event on the time line.
- The event class button displays the label corresponding to currently selected event class as well as the total number of stored events for that class. Click on it to activate a list of available event categories for which events were stored.

You can click on any of these event class buttons to 'filter out' individual categories. This is especially helpful when you are only interested in events of a certain category.
- The **Delete...** button allows you to either delete an individual event or an entire event class (see page 15-21).
- The **Remove Cursor/Show Cursor** toggle button enables you to activate/deactivate a cursor which acts as a 'time anchor' among different applications (e.g. when you move between the trends and review events screens). As soon as you click on the **Show Cursor** button, it toggles to **Remove Cursor** and vice versa.
- The **Show Parameters/Remove Parameters** toggle button activates a snapshot view of all parameter values at the bedside monitor corresponding to the time of the event. As soon as you click on the **Show Parameters** button, it toggles to **Remove Parameters** and vice versa.
- The **Strip Report** button allows you to request a strip report on a laser printer.

Available Functions on the Event Review Screen

From the Event Review screen you can:

- view individual events (see page 15-19)
- view parameter values (see page 15-20)
- delete unwanted events, individual events or entire event classes (see page 15-21)
- customize event storage (see page 15-23)
- request strip recordings (see page 15-27)

The following sections describe each function in detail.

Viewing Events

You can view and navigate through stored events as follows:

- by clicking on the time line of the Event Review screen using the ◀ **Next event** ▶ arrow buttons to fine-tune selection

or

- by first selecting the event class to narrow your search, 'filter out' unwanted event categories and then proceeding as described above.

Steps: Viewing an Event

1. Access the Event Review screen (see page 15-19).
2. Click on the event class button (see arrow) to activate a list of available event classes as well as the total number of stored events for each class.



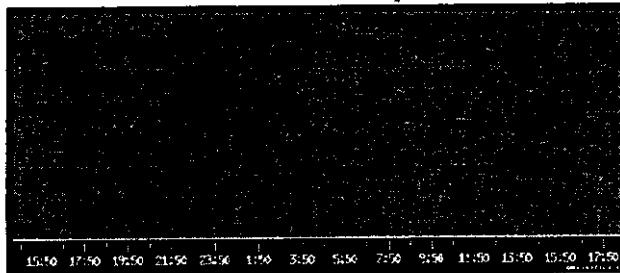
➤ **NOTE:** Only event classes for which at least one event has been stored during the last 28 hours are included in the event class list.

3. Click on the desired event category. This allows you to narrow your search by 'filtering out' tick marks of unwanted event categories on the time line. If you click on the **All** button (default selection when you first enter the Event Review screen), all event categories with stored events are displayed.

Viewing Parameter Values

You can request a snapshot view of all available parameter values at the bedside at the time of the event as follows:

1. Access the Event Review screen (see page 15-19).
2. Click on the **Show Parameters** button to activate a window with all of the available parameters of the selected event.



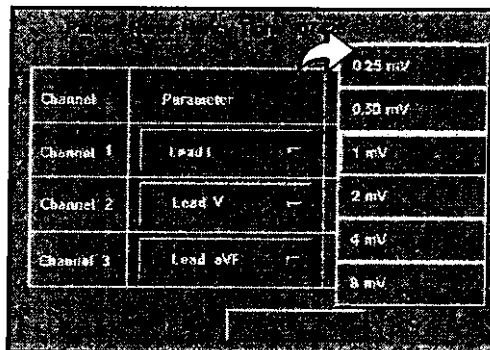
3. Use the arrow buttons on either side of the window to scroll through the parameter list (the arrow buttons appear only if the number of parameters exceeds the display area of the Show Parameters window).

Selecting the Display Gain

You can select the gain of each channel. The available gain settings for each parameter are listed in a table on the next page.

Steps:

1. Access the Full Disclosure Review screen (see page 14-15)
2. Click on the **Options** button in the upper menu bar.
3. Click on the **Display Options...** menu selection to open the Patient Setup window.
4. Click on the option button for the channel you wish to configure under the 'Gain/Scale' heading to activate a popup with available settings.
5. Click on the desired size in the popup.
6. Repeat steps 4 and 5 for the other channels.
7. Click on the **Accept** button to confirm your selection, the **Undo** button to return the settings to last saved setting or the **Cancel** button to cancel the procedure



Channel	Parameter	Gain/Scale
Channel 1	Lead I	0.25 mV 0.50 mV 1 mV
Channel 2	Lead V	2 mV 4 mV 8 mV
Channel 3	Lead aVF	8 mV

➤ **NOTE:** If you select different waveforms for display, the gain changes to the default setting for the new waveform.

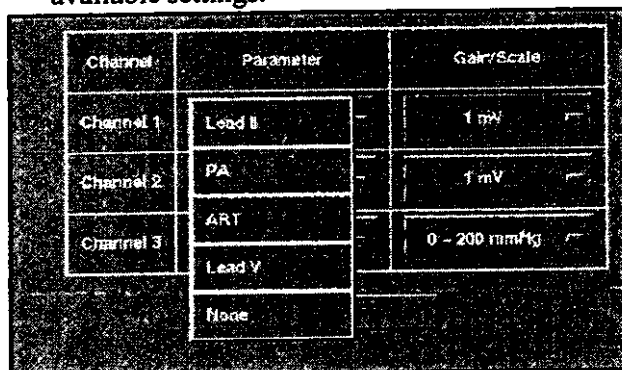
Full Disclosure (O

Selecting Waveforms for Display

During the Full Disclosure Admit process you choose forms for storage in the Full Disclosure database. At any you can select three of these waveforms for display in the channels and assign the order in which they are displayed function is available at server and client devices.

Steps: Selecting waveforms for display

1. Access the Full Disclosure Review screen (see page
2. Click on the **Options** button in the upper menu bar.
3. Click on **Display Options...** to activate the Patient window.
4. Click on the option button for the channel you wish to under the 'Parameter' heading to activate a popup available settings.

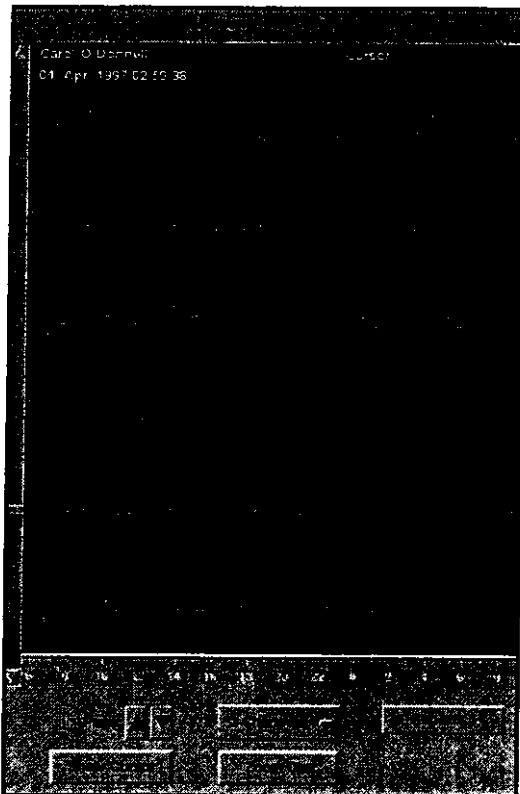


Channel	Parameter	Gain/Scale
Channel 1	Lead II	1 mV
Channel 2	PA	1 mV
Channel 3	ART	0 - 200 mm/1g
	Lead V	
	None	

5. Click on the desired setting in the popup to assign a waveform for that channel.
6. Repeat steps 4 and 5 for other channels.
7. Click on the **Accept** button to confirm your selection. Click on the **Undo** button to return the settings to last saved settings. Click on the **Cancel** button to cancel the procedure.

The Expanded Waveform Display Zoom In)

In this display mode you can view waveforms in more detail. You may view as much as 36 seconds of waveforms for a single channel on one screen page. Vertical grid lines divide the screen in one-second intervals. When two and three channels are displayed the amount of available data is decreased. At the beginning of each line of waveform data is a scale bar, a waveform label and the display gain with units of measure. The background of the expanded display screen is divided into one-second intervals.

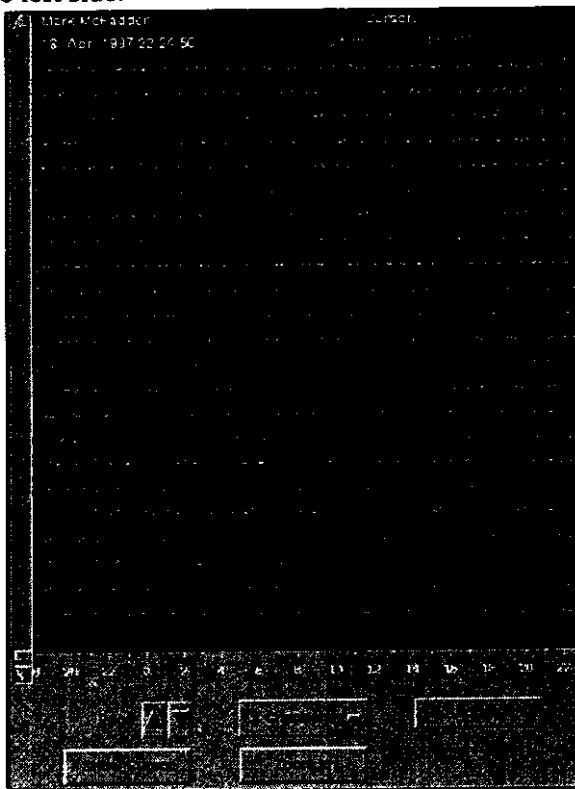


NOTE: If the cursor is active the displayed data is centered around the cursor's time. When the cursor is not activated, the screen displays the most recent waveforms.

Full Disclosure (O

The Compressed Display Format (Zoom Out)

This display allows you to review more information in on and enables you to quickly identify waveforms needing examination. When you are viewing one channel you will to see approximately nine and a half minutes of waveform screen page. With two and three channels displayed, the of data visible on the screen is correspondingly less. To s through compressed data, use the page keys or the scroll the left side.



NOTE: If the cursor is active the displayed data is centered the cursor's time. When the cursor is not activated, the screen plays the most recent waveforms.



The Full Disclosure Screen Formats

You can view a patient's Full Disclosure data in two display modes:

- the **ZOOM OUT** compressed format
- the **ZOOM IN** expanded format

In both display formats you can:

- navigate through the stored Full Disclosure data
- select how many channels of data you wish to view and select gain settings
- select the order of the waveform display
- generate Full Disclosure reports
- activate or deactivate a cursor which acts as a reference point among different applications (e.g. when you move from Full Disclosure to Trends etc.)
- zoom in or out of waveforms
- access the Census window and its applications via the Full Disclosure menu bar
- select waveforms for storage via the Full Disclosure menu bar
- move between Full Disclosure and bedside applications

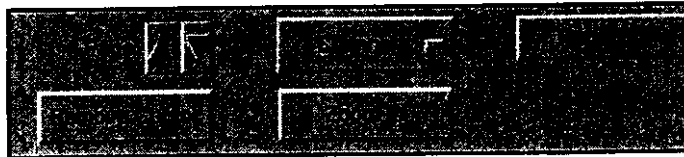


NOTE: A small gap in the Full Disclosure waveforms may appear when a patient is added/removed from the CLUSTERVIEW layout of the Full Disclosure application.

Full Disclosure (O

Buttons

The following buttons are located at the bottom of the Full Disclosure screen:



- the **Page: arrow keys** buttons allow you to navigate through the Full Disclosure screen page by page.
- the **1, 2, 3 Channel(s)** button allows you to select how many channels of stored data you wish to view at one time on the Full Disclosure screen. You can view a maximum of three channels simultaneously. You can assign the waveform displayed in each channel and the order in which the channels appear (see page 14-21).
- the **Remove Cursor/Show Cursor** button activates a cursor that identifies a point in time on a waveform and functions as a reference point for navigating among various applications (e.g. from Full Disclosure to the Trend screen).
- the **Zoom In/Zoom Out** button allows you to view waveforms in greater or lesser detail.
- the **Reports** button allows you to request Full Disclosure reports.



Features of the Full Disclosure Review Screen

At the top of the waveform display you will find the following information.

- the patient's name
- the patient's ID #
- the date and time corresponding to the oldest displayed data (upper left)
- the date and time corresponding to the cursor's position in the upper right corner (provided the cursor is activated)
- waveform labels and gain settings to the left of each displayed waveform in the compressed screen (zoom out).
- waveform labels and gain settings above the displayed waveforms in the expanded screen (zoom in).

All time changes that occur at the **MULTIVIEW WORKSTATION** are identified on the waveform by a yellow tic mark.

Appended data is marked with a flashing white tic mark which represents the time the data was appended.



NOTE: When moving between Full Disclosure and other screens such as Trends, near a time change, you may find that the time-stamps are slightly different on the two screens. This occurs because the **MULTIVIEW WORKSTATION** and the bedside monitors have different methods of annotating the time. However, these time differences do not affect the displayed data which *correlates exactly in both applications* to an internal time stamp.

Accessing the Full Disclosure Review Screen

On the Full Disclosure Review screen you can perform many functions such as zooming in and out of waveforms, generate reports, customizing the patient's waveform storage, etc.

You can access a patient's Full Disclosure Review screen from CLUSTERVIEW or from BEDVIEW.

Steps: From CLUSTERVIEW:

1. Click on the **View** button.
2. Click on the **Full Disclosure...** button.
3. Click on the desired unit from the list of servers.
4. Click on the desired patient to activate the **View Data** button.
5. Click on the **View Data** button, which activates the Full Disclosure waveform screen.

Steps: From BEDVIEW:

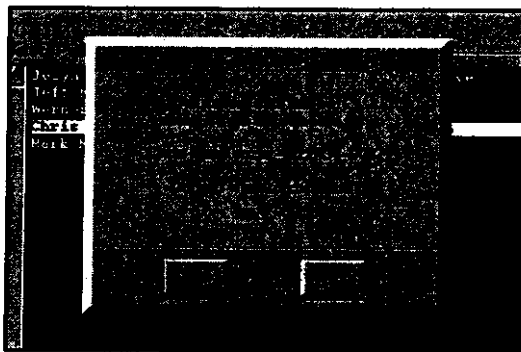
1. Click on the **Review** button.
2. Click on the **Full Disclosure...** button.

You are now viewing the patient's Full Disclosure data in the compressed screen (zoom out) format.

The following section describes the information and displays that appear on the Full Disclosure Review screen.

Steps: Discharging a Patient

1. Access the Census window (see page 14-4).
2. Click on the **Discharge** button. The Census list with all of the patients currently admitted to the Full Disclosure application is displayed.
3. Click on the desired patient (this activates the **Discharge Data** button).
4. Click on the **Discharge Data** button (this activates the following confirmation popup).



5. Click on the **Yes** button within the popup to discharge the patient from Full Disclosure or on the **No** button to cancel the discharge and continue data collection for that patient.

If you click on **Yes**, the patient's name is removed from the census list.



NOTE: When a client device is viewing data of a patient who has been discharged from the server, the screen appears blank except for the message DATA DISCHARGED.

Full Disclosure (O

Discharging a Patient from Full Disclo

Full Disclosure data collection is stopped by *discharging* patient from Full Disclosure.

You can only discharge a patient from the Full Disclosure of the MULTIVIEW WORKSTATION at which the patient was initially admitted.



NOTE: If both the Event Disclosure and the Full Disclosure options are unlocked, patients are also automatically discharged from Event Disclosure when they are discharged from Full Disclosure (and vice versa).

When you discharge a patient from the Full Disclosure server, the patient is *not* discharged from the bedside monitor, or in the case of a telemetry patient, from the MULTIVIEW WORKSTATION. In the same way a patient who is discharged from the bedside monitor is still admitted to the Full Disclosure server and all of his/her data is still stored at the MULTIVIEW WORKSTATION.

Discharge from Full Disclosure does not affect real-time monitoring or the display of real-time data at the MULTIVIEW WORKSTATION.



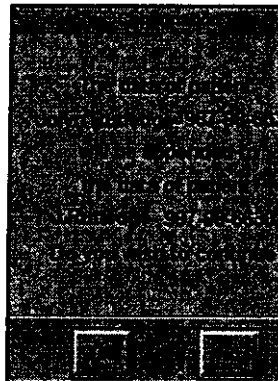
CAUTION: When you discharge a patient from Full Disclosure, all Full Disclosure data as well as any pending Full Disclosure reports are deleted for that patient. Therefore, it is important to generate Full Disclosure reports periodically if you wish to maintain a history of the patient's Full Disclosure session.

Appending Full Disclosure Data

The append feature of the Full Disclosure application allows you to 'combine' two sets of data. This may be necessary when a patient has been moved to a different monitor or, in the case of a telemetry patient, to a different MULTIVIEW WORKSTATION, as two sets of data are generated for the same patient.

Steps: Appending data

1. Access the Census window (see page 14-4).
2. Click on the **Admit/Append** button to access the Admit window, which displays a list of all patients in the monitoring unit who are not admitted to Full Disclosure and whose data collection status is 'inactive'.
3. Select and click on the 'inactive' patient whose data you want to append. When you click on the patient name, the **Append To New Patient** button is unghosted.
4. Click on the **Append to New Patient** button. A list of patients in the monitoring unit who have not been admitted to this Full Disclosure server appears.
5. Click on the patient for whom continued Full Disclosure storage is desired.
6. Click on the **Append Data** button. The following popup appears.
7. Click on the **Yes** button within the popup to confirm that the correct patients and data have been selected or **No** to cancel the selection.



The waveform data is relabeled with the new name/ID and appended to the end of the stored data. As soon as the data is appended, the name is removed from the Admit/Append list and moved to the Census list, and Full Disclosure data collection resumes.

Full Disclosure (O

You may also click on the **Defaults** button to restore channel to the server's default settings (see the following table).

Channel 1	Lead II
Channel 2	Lead V
Channel 3	ART
Channel 4	SpO ₂

As soon as the patient is admitted, the name appears in the Disclosure Census list.

Interruption in Data Collection

The patient remains admitted to the server and the Full Disclosure data storage continues for as long as the patient remains on the same monitor on the network and within the monitoring unit. This same holds true for telemetry patients; as long as they remain admitted to the same MULTIVIEW WORKSTATION, data storage continues.

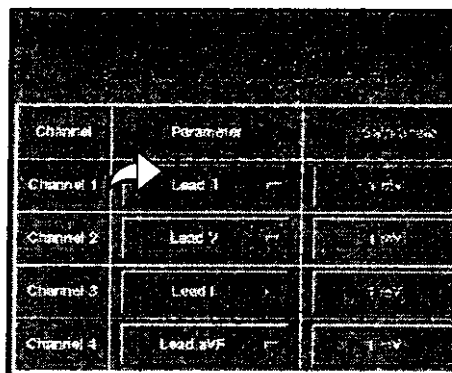
If the patient leaves the monitoring unit and returns with the bedside monitor or, in the case of telemetry patients, returns to the same MULTIVIEW WORKSTATION, Full Disclosure data storage resumes automatically when reconnected to the HOSPITAL NETWORK even if the patient name and the ID have been changed.

Admitting a New Patient

You admit a patient to the Full Disclosure application as follows:

Steps:

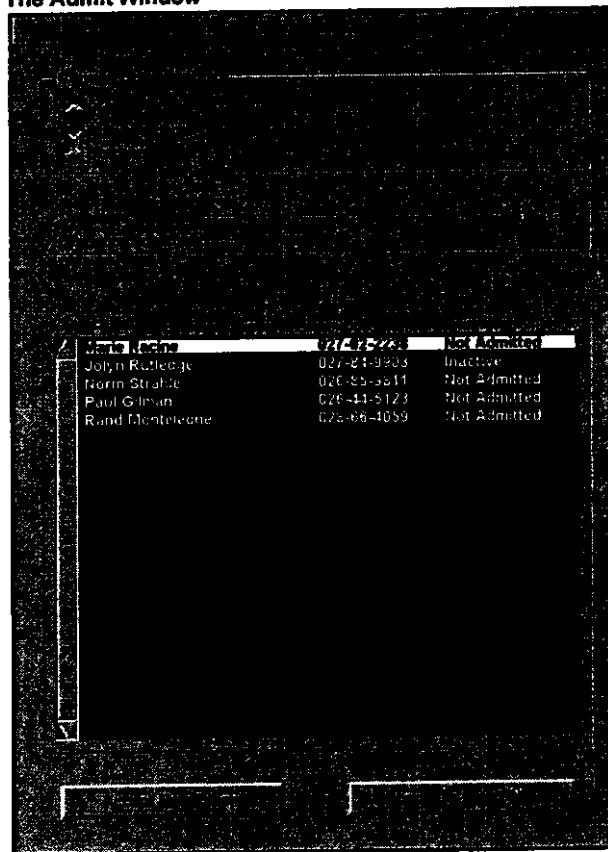
1. Access the Census window (see page 14-4).
2. Click on the **Admit/Append** button to access the Admit window with the list of all patients within the monitoring unit who are not yet admitted to Full Disclosure.
3. Click on the patient you wish to admit (as soon as you make the selection, the **Accept New Patient** button is no longer ghosted).
4. Click on the **Accept New Patient** button. This activates waveform storage selection table, which allows you to choose the waveforms to be included in that patient's Full Disclosure data storage. These waveforms may be changed any time (see page 24, *Selecting Waveforms for Storage for details*).
5. Click on the field in the table's *Parameter* column for the channel you wish to configure (this activates a popup with available settings).
6. Click on the lead you wish to assign to that channel.
7. Repeat steps 5 and 6 for additional channels.
8. Click on the **Admit** button to complete the admission and start the data collection for that patient or on the **Cancel** button to dismiss the popup and return to the Admit window.



Channel	Parameter	Settings
Channel 1	Lead I	1 mV
Channel 2	Lead II	1 mV
Channel 3	Lead III	1 mV
Channel 4	Lead aVR	1 mV

Full Disclosure (O

The Admit Window



The screenshot shows a window titled 'The Admit Window'. It contains a table with three columns: 'Name', 'Phone', and 'Status'. The table lists four patients: Jolyn Rutledge, Karin Strahle, Paul Gilman, and Rand Montecione. The 'Status' column indicates that Jolyn Rutledge is 'Inactive' and the others are 'Not Admitted'. There are also some checkboxes and a scroll bar visible in the window.

Name	Phone	Status
Jolyn Rutledge	027-24-9903	Inactive
Karin Strahle	020-25-3511	Not Admitted
Paul Gilman	026-44-5123	Not Admitted
Rand Montecione	026-66-4059	Not Admitted

The Admit window also indicates the number of filled and available Full Disclosure slots. Once the Full Disclosure capacity is reached (8 or 16 patients, depending on the server option), patients are admitted as slots become available as a result of discharges.



Admitting a Patient to Full Disclosure

You must *admit* a patient to Full Disclosure to begin collecting Full Disclosure waveform data. Only patients who are admitted to the bedside monitor (or in the case of telemetry patients at the MULTIVIEW WORKSTATION) with a name and ID number can be admitted to Full Disclosure.



NOTE: You can only admit patients from within the monitoring unit of the MULTIVIEW WORKSTATION that is equipped with the Full Disclosure *Server* version. The *Client* version does not allow patient admission. If both the Event Disclosure and the Full Disclosure server options are unlocked, the patient is also automatically admitted to Event Disclosure when you admit him/her to Full Disclosure (and vice versa).

The Admit window displays a list of patients who are either currently not admitted to Full Disclosure (status: *Not Admitted*) or whose Full Disclosure data collection has been interrupted (status: *Inactive*).

The *Inactive* status occurs during PICK AND GO (e.g., transfers for procedures, O.R., bed transfer, etc.). As long as the patient remains on the same monitor, the waveform data collection resumes upon reconnection to the monitoring unit of his MULTIVIEW WORKSTATION.

The patient list in the Admit window shows only those patients and their Full Disclosure status who are in the monitoring unit of the MULTIVIEW WORKSTATION.

Full Disclosure (O

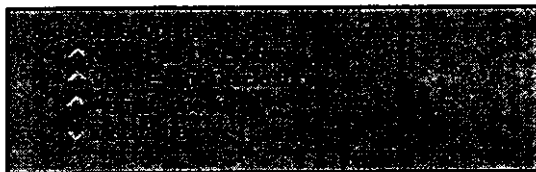
The lower portion shows the Select Patient list, which contains the patients with their ID numbers and current Full Disclosure status. The list changes depending on whether you are in Full Disclosure, Admit/Append or Discharge mode.

Display mode of Census screen	List label	Status
View Full Disclosure	No label	Patients who admitted to the selected Full Disclosure server
Admit/Append	<i>Inactive</i> or <i>Not Admitted</i>	Patients admitted to this server, but no longer available on the network; or Patients not admitted to this server
Discharge	<i>Admitted</i> or <i>Inactive</i>	Patients admitted to this server

Layout of the Census Screen

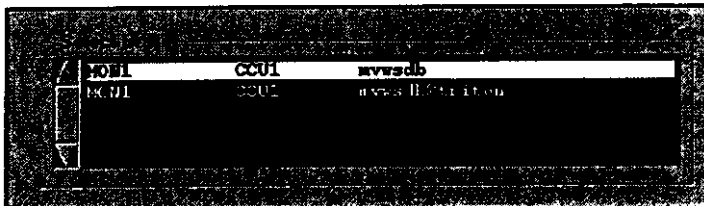
The Census screen is divided into three sections:

The upper portion contains the radio buttons for **Census Operation(s)**: **View Full Disclosure** (if option is unlocked), **View Event Disclosure**, **Admit/Append** and **Discharge**. These buttons determine the mode of the Census screen (e.g. View mode or Discharge mode). Depending on which of these buttons you select, the layout and the configuration of the screen varies.



NOTE: If your MULTIVIEW WORKSTATION is only equipped with *Client* version, the **Admit/Append** and **Discharge** buttons are ghosted. Furthermore, the **View Event Disclosure** button and the **View Full Disclosure** button are only visible if both the Event Disclosure option and the Full Disclosure options have been unlocked. Otherwise only the button corresponding to the unlocked option is visible.

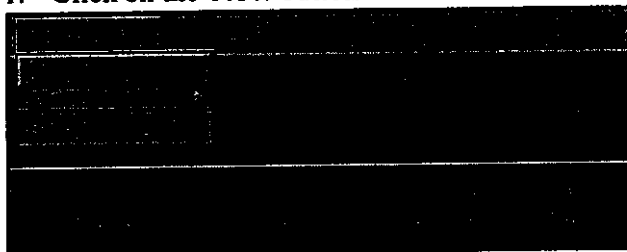
The middle section shows the Select Unit list with all available Full Disclosure servers. The server listed as... mvwsdb... is the local server on which you are working. Servers listed as...mvws@xxxx... are the names of other servers on the network that appear when the client option is unlocked. This list is displayed in View mode only.



Full Disclosure (O

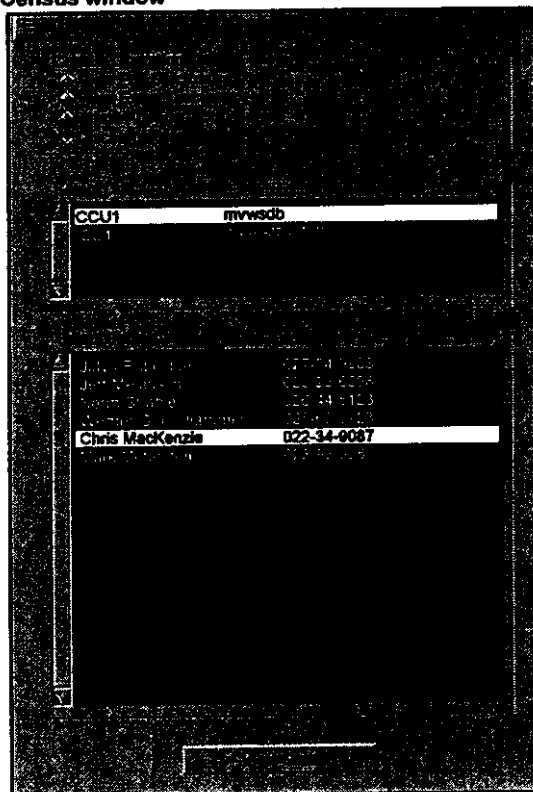
From CLUSTERVIEW:

1. Click on the **View** button.



2. Click on the **Full Disclosure...** button (this activates compressed screen).

The Census window



The Full Disclosure Census Window

Full Disclosure Census operations include:

Admitting a patient to Full Disclosure (only from a server)

Appending a patient to an existing data set (only from a server)

Discharging a patient from Full Disclosure (only from a server)

Viewing Full Disclosure data of a patient

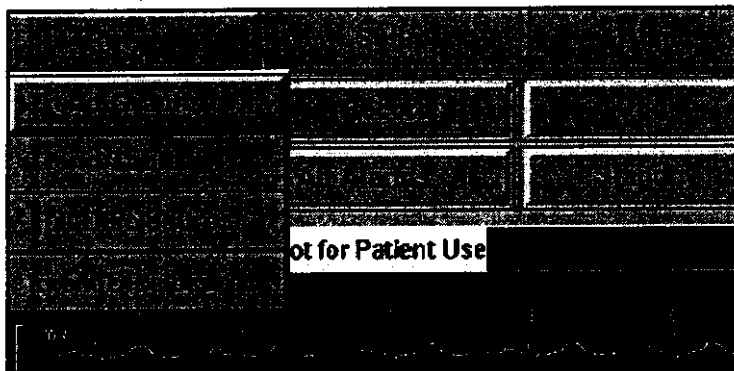
Accessing the Census Screen



NOTE: The **Full Disclosure...** button is only visible if the Full Disclosure option has been unlocked. You may also see a **Event Disclosure...** button if the Event Disclosure option has been unlocked.

From BEDVIEW:

1. Click on the **Review** button in BEDVIEW.
2. Click on the **Full Disclosure...** button to activate the Census window.



Full Disclosure (O

Once a patient is admitted to Full Disclosure, waveform begins immediately.

A patient is identified in the Full Disclosure database by and identification number as stored at his or her bedside monitor. As long as the patient remains on the same monitor, Full Disclosure data collection automatically resumes if there is an interruption in network monitoring, e.g. when patient is disconnected from the network. However, if the source monitor changes, the patient must be readmitted and the new data appended to the previous data set.

Full Disclosure data is stored and displayed until the patient is discharged from the Full Disclosure application at the MVIEW WORKSTATION.



Overview

The Full Disclosure function is an option which allows you to store and review up to four continuous waveforms for as many sixteen patients. The Full Disclosure application always stores the most recent 28 hours of data for each patient. As soon as the 28 hours are filled, the oldest data is replaced by the most recent.

The Full Disclosure application is only accessible on MULTIVIEW WORKSTATIONS operating with enhanced level software. As soon as the option is unlocked (see chapter 17, *Biomed Functions*), the Full Disclosure function is available.



NOTE: If you unlock the Full Disclosure and the Event Disclosure application at the same time but select the 1-8 Patient option for the Full Disclosure application and the 9-16 Patient option for the other, the MULTIVIEW WORKSTATION defaults to the lower patient number for both options. In addition, if both options are unlocked and you admit a patient to Full Disclosure, he or she is automatically admitted to Event Disclosure as well (and vice versa).

Full Disclosure is available in two different versions:

- The *Full Disclosure Server* version allows you to store continuous waveforms, select waveforms for storage, view Full Disclosure data from that server and request reports as well as admit and discharge patients to and from Full Disclosure.
- The *Client* version allows you to view Full Disclosure data from any Full Disclosure server and request reports. However, you cannot admit and/or discharge patients from Full Disclosure or perform any waveform storage configuration functions.



NOTE: On a MULTIVIEW WORKSTATION with the Full Disclosure Server option enabled, you can only view Full Disclosure data for 'its own' patients (e.g. patients that are admitted to the Full Disclosure application of that MULTIVIEW WORKSTATION). However, if you have the Client option enabled in addition to the Full Disclosure Server option, you can view patients of other Full Disclosure servers.

14 Full Disclosure (Option)

This chapter describes the Full Disclosure option of the I
VIEW WORKSTATION.

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Admitting a New Patient	
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Full Disclosure Strip Report	
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Requesting a Full Disclosure One-Hour Report	
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Requesting a Trend Report

You can print out the currently displayed trend window on a laser printer. Depending on your setup, this printer is either connected directly to the MULTIVIEW WORKSTATION or it is an assigned network laser printer.

Steps:

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Review** button.
3. Click on one of the following menu selections:

Trend Graphs... to view the trend graphs

Trend Table... to view the trend table.

4. Click on the BEDVIEW **Print** button.



NOTE: If the Print button appears ghosted, the printer connection was set to Off in the Configure Central menu (see chapter 17, *Biomed Functions*).

Condition	Representation in Trend Table		Representation in Trend	
	Telemetry Patients	Non-Telemetry Patients	Telemetry Patients	Non
Time change at the bedside monitor	<i>not applicable</i>	Yellow line between trend columns (only the last time change is identified)	<i>not applicable</i>	Blank the g
A trend event has been stored by initiating a mini-calc computation at the bedside.	<i>not applicable</i>	Column designated with this symbol  and a green time stamp	<i>not applicable</i>	not si graph
Change in units of measure	The new units take effect during the next patient admission.	<i>not applicable</i>	The new units take effect during the next patient admission.	<i>not a</i>
Power loss in server	Blank spaces are stored in place of trend values			
Telemetry receiver goes offline.	Blank spaces instead of trend values	<i>not applicable</i>	Blank spaces instead of trend values	<i>not a</i>
Patient is put into standby.	Blank spaces are stored in place of trend values			
Change of language	Text strings appear in current language			
Relearning of ST complexes	R	<i>not applicable</i>	Vertical dotted line that extend the entire graph	
Changing of ST measuring points	CHG	<i>not applicable</i>	Vertical solid line that extend the entire graph	

Representation of Special Conditions

Special events, such as an asystole or a lead-off condition, are indicated in the trend table and the trend graphs in place of a trend value as follows:

Condition	Representation in Trend Table		Representation in Trend Graph	
	Telemetry Patients	Non-Telemetry Patients	Telemetry Patients	Non-Telemetry Patients
Discrete trend samples such as those associated with NBP and CO measurements	<i>not applicable</i>	Column designated with a green time stamp	<i>not applicable</i>	Vertical line with a gap in the center indicating mean value
A trend event that has been stored by selecting the Mark Event fixed key at the SC 9000 bedside monitor	<i>not applicable</i>	Column designated with this symbol  and a green time stamp	<i>not applicable</i>	Not shown in graphs
Physiological conditions such as an asystole or an apnea	 ASY = Asystole  VF = ventricular Fibrillation	 ASY = Asystole  FIB = Ventricular Fibrillation  APN = Apnea	 Parameter value of 0	 Parameter value of 0  Parameter value of 0  Parameter value of 0
No parameter could be derived.	* * *		Blanks in the graphs	
Lead-Off condition	*L*	***	*L*	***
Out-of range values	+ + + (high) or - - - (low)		blanks (if you move the cursor over the blanks, the actual values are displayed)	
Artifact	*A*	***	*A*	***
Lead wires, electrodes are unplugged	*U*		*U*	
Hardware failure	*F*		*F*	
Interference	*I*	<i>not applicable</i>	blanks in the graphs	<i>not applicable</i>
No signal	*N*	Blank spaces instead of trend values	Blanks in the graphs	



Displaying the Trend Cursor

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Review** button.
3. Click on the **Trend Table...** or **Trend Graphs...** menu selection.
4. Click on the **Show Cursor** button in the lower left corner of the trend screen.

If the cursor is already active when you access the trend screen, it is displayed according to the following rules:

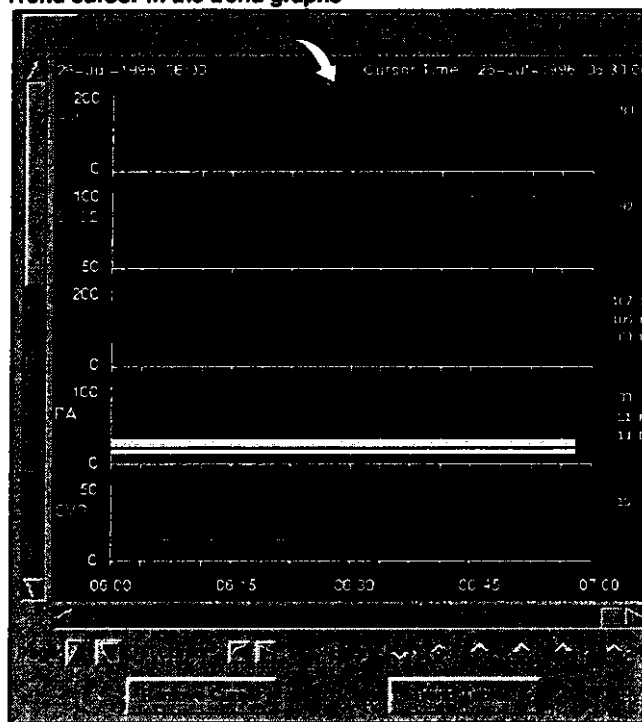
- If the cursor time matches one of the column time slots in the *trend table* exactly, the cursor is positioned on that column and appears in the center of the screen. If the cursor is in *trend graphs* is within the time boundaries of the current trend screen, the cursor is displayed along with the trend values corresponding to the cursor's position.
- If the cursor time does not exactly match one of the columns in the trend table, as may be the case if you switch from trend graphs to the trend table, the cursor time is displayed but the cursor itself is not. In this case, click on any time column to display it on the current trend table page.



NOTE: Whenever you move the cursor as described above, the cursor time changes accordingly.

- If the cursor time is not within the boundaries of the current trend page, the cursor time is displayed, but the cursor is not. In this case, scroll to the desired data to display the cursor on the current trend page.
- If the cursor time is older than any of the available trend data, the oldest trend data is displayed without the cursor. In this case, the cursor time is displayed.

Trend cursor in the trend graphs



If the cursor is active, you can move it over the displayed trend data by clicking anywhere on the trend graphs or on any displayed column in the trend table.



NOTE: In the trend graphs you can also use the cursor arrow buttons to move the cursor over the graphs in small increments.

The time corresponding to the cursor position is displayed in the time and date header. However, if the trend cursor is not active, this field is blank.

Trend cursor in the trend table

[illegible]



Changing the Time Interval

You can select the time interval between the trend table columns as follows:

1. Click on the patient's parameter area in **CLUSTERVIEW** to access the **BEDVIEW** window.
2. Click on the **Review** button.
3. Click on the **Trend Table...** menu selection.
4. Click on the desired **Interval (min)** radio button located below the trend table: 1, 5, 15, 30, or 60 minutes. The button highlighted in a different color represents the selected setting.



NOTE: If the trend cursor is active, the trend data is centered around the cursor time when you choose a different time interval.

- The **interval buttons**  located below the trend table allow you to select the time interval between different trend samples (see page 13-18).
- The **Show Cursor/Remove Cursor** button, located in the lower left corner of the trend window, is used to display or remove the trend cursor (see page 13-19).
- The  button allows you to access the trend graphs from the trend table window.
- The **Exit** button, located in the upper left corner of the trend display, allows you to leave the trend table and return to the BEDVIEW main screen.



- the **time stamps** along the top of the trend window appear gray and indicate the time the trend samples for all parameters were taken. Time stamps appear gray unless they identify a trend sample initiated between scheduled intervals by performing a calculation or by pressing the **Mark** fixed key at SC 9000.
- the **trend cursor** appears as a box around the time stamp highlighting a patient's condition at a specific time (for more detailed information, refer to page 13-21). Its date and time are displayed in the date and time header.
- the **vertical scroll bar**, located along the left edge of the trend window, allows you to scroll through the trend table. Click on one of the arrows at either end of the scroll bar to scroll up or down by one row (clicking on the arrows without releasing the mouse key allows you to scroll through the data automatically).



NOTE: You can also click on the sliders inside the vertical and horizontal scroll bars and 'drag' them to the desired data.

- The **horizontal scroll bar**, located below the trend table, allows you to scroll forward or backward in time one column at a time.
- The  arrow buttons, located below the trend table, allow you to view the previous or the next trend page.

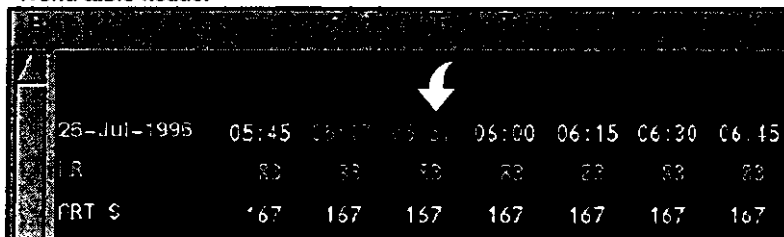
The Trend Table Layout

Regardless of the selected time interval, a trend table (see tion on page 13-12) contains 8 columns of data (fewer co less data is available). A trend table may also represent sj events such as a lead-off condition (see page 13-22 for m detail).

A trend table consists of the following elements:

- the **time and date header** spans across the top of the table. At the left edge it contains the starting time and date trend data followed by the time stamps (hour and min above each column. The cursor time appears above tl stamps in the upper right corner of the window. If the is not active, this field appears blank.

Trend table header



25-Jul-1995	05:45	05:57	06:00	06:15	06:30	06:45
IR	83	83	83	83	83	83
FRT S	167	167	167	167	167	167

- parameter labels** appear in the first column of the table. Parameter labels appear in shades of dark and light grey. Time stamps appear light grey.



NOTE: If units for selected parameters are displayed at the side monitors, they are also displayed in the trend table window. For telemetry patients units are always displayed.

- A non-selectable green **mark event icon** may appear in the first table row above the column time stamps. This identifies that a trend sample has been stored between the selected time intervals by selecting the **Mark** fixed key on a 9000 monitor. Such a trend sample is further labeled with a green time stamp.

Accessing a Patient's Trend Table

1. Click on the patient's parameter area in CLUSTERVIEW to access the BEDVIEW window.
2. Click on the **Review** button.
3. Click on the **Trend Table...** menu selection.



NOTE: If you are in the trend graphs window, click on the **Tre Table...** button at the bottom of the window to access the trend table.

The displayed trend data portion depends on the cursor's status when you access the trend table.

Cursor is active Yes/No?	Then the Trend Graph displays...
No	The most recent trend data
Yes	Data is centered around the cursor time. Note: If centering the data around the cursor would leave part of the trend table blank, the trend display shifts so the available data fills the trend window.

To make the trend table more easily readable, the trend values appear in rows or groups of associated parameter rows in alternating shades of dark and light grey.

Discrete events such as an NBP or CO measurement cause a new set of trend data to be stored for all parameters. Such data appears in a separate trend column and is labeled with a green time stamp. The same is true for an SC 9000 when the **Mark** fixed key is pressed or a mini-calc computation has been initiated. In addition to the green time stamp, 'mark event' trend samples and calculations are further identified with the 'mark event' icon .

If you are viewing the most recent trend data, the trend table updates automatically whenever a time interval elapses. The new column with the most recent time stamp appears at the right and the whole table shifts to the left to accommodate the new data.

Trend Table

The trend table arranges stored trend data in an easy-to-read tabular format. Each row in the table represents one parameter, and each column represents one set of trend data for all parameters at a certain time. If a parameter that is assigned to a trend slot does not have any data, the row is still displayed with the label, but without the data.

Sample trend table

26-Jul-1995	05:45	05:50	05:55	06:00	06:15	06:30	06:45	06:59
IR	80	80	80	80	80	80	80	80
PRT S	167	167	167	167	167	167	167	167
PRT D	69	69	69	69	69	69	69	69
PRT H	106	106	106	106	106	106	106	106
PP S	23	23	23	23	23	23	23	23
PP D	11	11	11	11	11	11	11	11
PP H	21	21	21	21	21	21	21	21
PltP								
C/F	15	15	15	15	15	15	15	15
VFACFD	0	0	0	0	0	0	0	0
PtCt	87	87	87	87	87	87	87	87
PLS	83	83	83	83	83	83	83	83
NET S		121	121					
NET D		81	76					
NET H		104	95					



Choosing a Different Time Base

You can determine the time span of the displayed data in graph as follows:

1. Click on the patient's parameter area in CLUSTERVIEW access the BEDVIEW window.
2. Click on the **Review** button.
3. Click on the **Trend Graphs...** menu selection.
4. Click on the desired **Hours** radio buttons which are at the bottom of the trend graphs window: 1, 2, 4, 8, 1 hours. The button highlighted in a different color represents the selected setting.



NOTE: If the trend cursor is activated, the trend data is centered around the cursor time when you choose a different time base.

- 
- The **Show Cursor/Remove Cursor** button, located in the lower left corner of the trend window, allows you to display and remove the trend cursor (see page 13-19 for further information).
 - The  arrow buttons, located below the trend graphs when the cursor is displayed, allow you to move the cursor over the trend graphs in small increments. To scroll through the data faster, click on the arrows without releasing the left mouse button.
 - The  button allows you to access the trend table from the trend graphs window.
 - The **Exit** button, located in the upper left corner of the trend graphs window, allows you to leave the trend graphs and return to the BEDVIEW main screen.



- the **vertical scroll bar**, located along the left edge of the trend graphs window, allows you to scroll through the graphs. Click on one of the arrows at either end of the bar to scroll up or down by one graph (clicking on the bar without releasing the mouse key allows you to scroll the data automatically).



NOTE: You can also click on the sliders inside the vertical horizontal scroll bars and 'drag' them to the desired data.

- the **horizontal scroll bar**, located below the trend graphs window, allows you to scroll forward or backward in time. Click on one of the arrows at either end of the scroll bar to scroll backwards or forward in time according to the time base (see the following table).

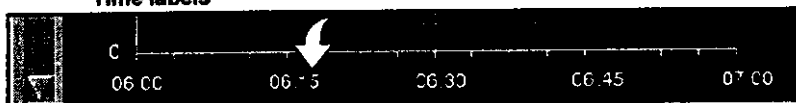
Selected Time Base	Scrolling Interval
1 hour	15 minute
4 hours	30 minutes
8 hours	1 hour
12 hours	1 hour
24 hours	1 hour

- The  buttons, located below the trend graphs window, allow you to view the previous or the next page of data.

- The **Hours** radio buttons,  located below the trend graphs window, allow you to select the time base (see page 13-11 for further information). The button highlighted in a different color represents the selected setting.

- **scale bars** with tic marks indicating the top, bottom, and middle of the scale are displayed to the left of each graph. The scale range is indicated at the top and bottom tic mark
- the **time labels** are located below the trend graphs. All graphs share a common time line. Labeled time intervals in the time line vary according to the selected time base as described in the following table:

Time labels



Selected Time Base	Time Intervals on Time Line
1 hour	15 minutes
2 hours	15 minutes
4 hours	30 minutes
8 hours	1 hour
12 hours	90 minutes
24 hours	3 hours

A short, vertical, yellow line beneath the time line marks the latest time change.

- the **trend cursor** appears, when activated, in trend graphs as a vertical line that extends from the first graph down to the time line. Its date and time are displayed in the time and date header.

Layout of the Trend Graphs

In addition to the individual graphs, the window consists of elements described below as well as special events such as a low battery condition (please refer to page 13-22 for further information).

- the **time and date header** spans across the top of the graphs window. At the left edge it contains the start time and date of the trend data. At the right edge the header contains the date and time corresponding to the cursor's position. If the cursor is not active, this field appears blank.

Trend graph header



- Depending on the parameter type, each trend graph is represented in a unique way (see following table).

Parameter Type	Representation on Trend Graph
Single-value, continuous such as HR	Single, continuous line
Single-value, intermittent such as C.O.	Cross hairs representing each value.
Multi-value, continuous such as ART	Colored band with a black line indicating mean value.
Multi-value, intermittent such as NBP	Vertical colored line with a black dot indicating the mean value

- parameter labels** are displayed along the left edge of the trend graphs window.



NOTE: If units for selected parameters are displayed at the side monitors, they are also displayed in the trend graphs below the parameter label. For telemetry patients, units are not displayed.

Trend Graph Scales

For non-telemetry patients the trend scales are determined by the bedside monitor. For telemetry patients, they are listed in the following table.

Parameter	Lower/Upper Scale
HR	0 to 200 beats/min
PVC/min	0 to 60
% Paced	0 to 100%
SpO ₂	50 to 100%
PLS	0 to 200 beats/min
ST I	-5mm to 5mm -0.5mV to 0.5mV
ST II	
ST III	
ST aVR	
ST aVL	
ST aVF	
ST V	

Display Order

For non-telemetry patients, the individual graphs are displayed in the order specified at the bedside monitor. For telemetry patients, the display order is fixed (see the following table).

Parameter	Display Order
HR	1
PVC/min	2
% paced	3
ST I	4
ST II	5
ST III	6
ST aVR	7
ST aVL	8
ST aVF	9
ST V	10
SpO ₂	11
PLS	12

Event Disclosure (O

Deleting Events

To make room for additional events you can either delete individual events or entire event categories as follows:

Steps: Deleting individual events

1. Access the Event Review screen (see page 15-19).
2. Select the event you wish to delete (see page 15-19 for information on how to access an individual event).
3. Click on the **Delete...** button.
4. Click on the **Event** button to delete the currently displayed event (the previous event is displayed; if no previous event exists, the next event is displayed instead).

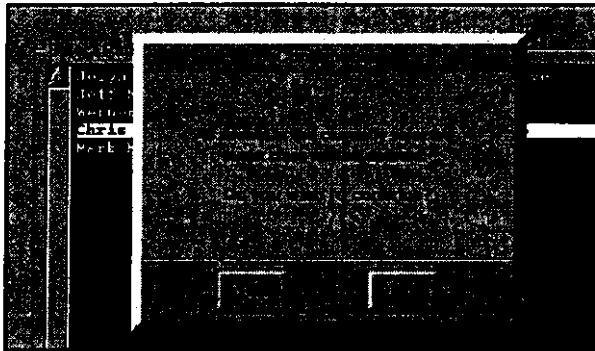
As soon as you delete an event, the number of stored events in the event class button reflects the change.

Steps: Deleting an entire event class

1. Access the Event Review screen (see page 15-19).
2. Click on the event class button (see arrow) to activate a list of available event classes.



3. Click on the event class you wish to delete.
4. Click on the **Delete...** button.
5. Click on the **Event Class** button to delete the entire event class. This activates the following confirmation popup.



6. Click on the **Yes** button within the popup to delete all of the events for the selected class or on the **No** button to exit the popup without deleting any events.

Event Disclosure (O

Selecting Waveforms for Storage

You can determine which waveforms or parameters will be 'tured' in the Event Disclosure database for each patient. waveforms are initially selected at the time of admission; ever, you can change them at any time. The defaults for each channel are outlined in the following table.

Channel 1	Lead II
Channel 2	Lead V
Channel 3	None
Channel 4	SpO ₂

Steps:

1. Access the Event Review screen (see page 15-19).
2. Click on the **Options** button in the upper menu bar.
3. Click on the **Storage Options...** menu selection to the Patient Setup window.
4. Click on the option button for the channel you wish to configure under the 'Parameter' heading. This activates a pop-up window with a list of all available waveforms from the bedside monitor.

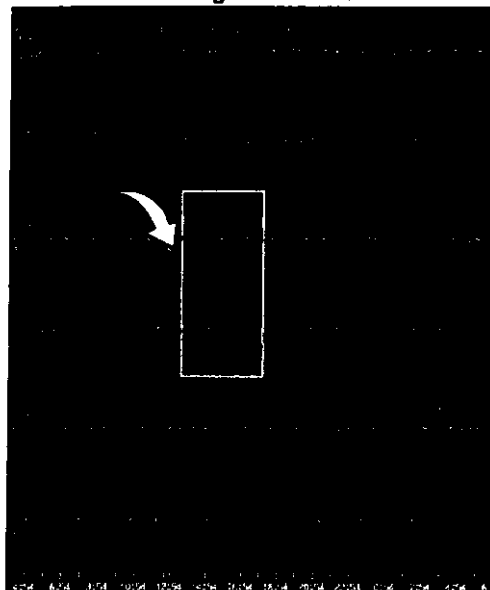
Channel	Parameter	Options
Channel 1	Lead II	None
Channel 2	Lead V	None
Channel 3	Lead I	None
Channel 4	Lead aVF	None

5. Click on the desired selection.
6. Repeat steps 4 and 5 for the other channels.
7. Click on the **Accept** button to confirm your selection or on the **Defaults** button to return to the factory defaults (see above) or on the **Cancel** button to cancel the procedure.

Cursor

The cursor is a tool that identifies a point in time on a waveform. It also allows you to 'capture' a certain segment of a waveform and the corresponding data in order to view it in different applications (e.g. you can move from Event Disclosure to Trends). If the cursor is active when you enter the Event Disclosure application, the displayed data is centered around the cursor's time. When the cursor is not active, the screen displays the most recent waveform data. When the cursor is active, the corresponding cursor time is displayed in the upper right corner. If the cursor is not active, the field appears blank. In the Event Disclosure screen the cursor appears as a box (see illustration below).

Event Disclosure segment with cursor



You can move the cursor on the screen by pointing and clicking the mouse on the displayed waveforms.



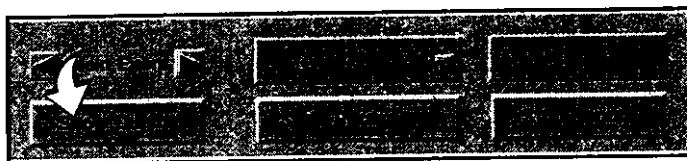
NOTE: The cursor's time does not change when you scroll through the events with the scroll bar or select a time on the timeline. The cursor time only changes when you point and click on an actual waveform.

Displaying/Removing the Cursor

You can either display or remove the cursor.

Steps:

1. Access the Event Review screen (see page 15-19).



2. Click on the **Remove Cursor** button to hide the cursor. Click on the **Show Cursor** button to display it. Whenever you click on the button, it toggles to its opposite.

Event Disclosure Strip Reports



NOTE: You can request Event Disclosure reports from a server as well as a client.

An event disclosure strip report consists of 20 seconds of even data (10 seconds pre-event and 10 seconds post-event data). The report also includes the cause of the event (event class label), the time of the event, the date and, if applicable, the ECG lead on which the event was detected.

Sample Event Strip Report

John Smith	Event Time: 16:04:49	Comments:
111-22-3333	Event Date: 19-Nov-1997	
Event Disclosure Strip Report	Delay: 10 Seconds	
HR > 50 (Lead II)	Speed: 25mm/Second	

St. John's	Report Time: 19-Nov-1997 16:09	Page 1 of 1
------------	--------------------------------	-------------

You can request a total of 10 reports at one time. You are notified when the print queue is full. Please wait until some of the reports are printed before requesting any more. A message in the status area of CLUSTERVIEW indicates when a report is requested or rejected.

Event Disclosure (Op

All Event Disclosure reports are either printed on a network printer or on a laser printer that is connected directly to the MULTIVIEW WORKSTATION, depending on the printer settings. Event Disclosure report requests are processed even if you are not running the Event Disclosure application.

Pacer marks and time change indicators are printed where applicable.



NOTE: You cannot cancel Event Disclosure strip recording.

Requesting a Strip Recording

You can request a strip recording of a stored event provided a laser printer is configured (see page 17-9).

Steps:

1. Access the Event Review screen (see page 15-19).
2. Click on the time line to select a tic mark and access the desired event

or

Click on the event class button and select the desired event category. This allows you to narrow your search by 'filter out' tic marks of unwanted event categories on the time line.

3. Click on the **Strip Report** button.



Special Conditions

Different circumstances during patient monitoring may affect collection of Event Disclosure data as indicated in the following table.

Special Condition	Effect
The monitoring device is being powered up	No events are stored until the monitor is operational.
The monitoring device is powered down	The Event Disclosure data is preserved.
CPS/bedside monitor is offline, has failed or is powered down	No events are stored during the interruption.
The patient is put in standby	No events are stored for the duration of the standby.
Standby is canceled	Storage of Event Disclosure data resumes.
Patient is discharged at the bedside	Event disclosure data remains until manually deleted at the MULTIVIEW WORKSTATION.
Patient demographics are changed	Event Disclosure data is stored under the new demographics
Bedside monitor is disconnected	No events are stored while the monitor is disconnected.
Network date and/or time changes	Up to 20 system time changes are stored. The time stamps on the event calls and the waveform indicate the time of the actual event storage.

16 The VIEWSTATION Option

The VIEWSTATION™ is a scaled-down model of an Enhar MULTIVIEW WORKSTATION. With this option you can review vital patient information from almost anywhere in the hospital and perform certain basic functions away from the MULTIVIEW WORKSTATION. Because patient information is accessible to many users, access to setup functions is restricted. You can view, but not change any the patient setup.

The VIEWSTATION is available as a single screen option that displays up to 16 patients in a single waveform format. The screens and functions mimic the MULTIVIEW WORKSTATION with the exception of remote control capabilities and audio alarms.

VIEWSTATION Capabilities

On a VIEWSTATION you can

- assign patients to one of four CLUSTERVIEW layouts
- request timed and continuous recordings from CLUSTERVIEW
- access BEDVIEW screens and other patient data
- stop waveforms
- view logs
- request print screens

The following functions are not available on a VIEWSTATION

- remote control functions including: alarm silence, bed silence, alarm limits setup, arrhythmia setup, relearn, and editing of patient demographics (these functions appear ghosted and are non-selectable).
- audible and visual alarms (with the exception of alarm messages which are displayed as described below).
- attention/error tones, bed silence enable, and bed control enable in the Setup Central menu.

CLUSTERVIEW

You can assign patients within the monitoring unit of the VIEWSTATION to any of the following layouts in the VIEWSTATION CLUSTERVIEW (main screen):

- 8 x 1 - 8 patients, one waveform each
- 4 x 2 - 4 patients, 2 waveforms each
- 8 x 2 - 8 patients, 2 waveforms each
- 2 x 4 - 2 patients, 4 waveforms each
- 4 x 4 - 4 patients; 4 waveforms each
- 16 x 1 - 16 patients, 1 waveform each.

You can perform all other CLUSTERVIEW functions on the VIEWSTATION. Please refer to the CLUSTERVIEW chapter of the MULTIVIEW WORKSTATION User's Guide for detailed information.

The ViewStation C

BEDVIEW

The BEDVIEW screen of the VIEWSTATION is similar to the MULTIVIEW WORKSTATION. It allows you to view an individual patient's data but the **Relearn** and the **Bed Silence** buttons are ghosted. You can view the alarm settings table, and arrhythmia setup, but you cannot edit it. You can perform all other BEDVIEW functions from the ViewStation. Please refer to the Patient Chapter for detailed information.

Alarms

The VIEWSTATION does not issue audible alarms. An alarm message is shown in the upper left corner of the waveform area. The color corresponding to the grade of the alarm. Please refer to the Alarms Chapter for more detailed information on alarms.

Full Disclosure/Event Disclosure

The VIEWSTATION offers the *Client* option which allows you to view stored full disclosure and/or event disclosure waveforms from any server in the network. Although you can request a waveform from the VIEWSTATION, you must admit or discharge the patient to and from the full disclosure/event disclosure server. Please refer to the section(s) entitled *Full Disclosure (Option)* and *Event Disclosure (Option)* for detailed information.

Biomed

The only locked option that you can activate/deactivate at the VIEWSTATION is the Client Option. Please refer to the 'Biomed' section for detailed information.



17 Biomed Functions

This chapter describes the password-protected Biomed menus, for biomedical or service personnel, and is divided into two parts. Part I addresses general functions such as accessing Biomed menus, listing available options and viewing logs, while Part II, beginning on page 17-23, deals with Biomed functions specific to the telemetry system.

Part I - General Setup

Part I - General Setup	
Part II - Telemetry Setup	
Overview	
Accessing the Biomed Menus	
The Show Devices Menu	
Layout of the Show Devices Menu	
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Modifying Available Selections	
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Unlocking/Locking Available Options	
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Available Report Formats	
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Part II - Telemetry Setup

Accessing the Telemetry Setup Menus	
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Available Functions on the Transmitter Setup menu	
Configuring the Transmitter Buttons	
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Radio Frequency Diagnostics	
Available Information on the RF Diagnostics Menu	

Overview

The Biomed menus are password-protected and intended only for the hospital's biomedical or Siemens service personnel. These menus provide important information regarding the status of the MULTIVIEW WORKSTATION and other devices on the network and offer a variety of setup features.



NOTE: Anyone who has access to the Biomed password automatically has access to the functions protected by the clinical password.

The following Biomed menus are available.

Name of Menu	Description
Show Devices...	This menu allows your Biomed to view the status of networked devices (e.g. offline, standby, discharged etc.) within the monitoring unit of this MULTIVIEW WORKSTATION.
Configure Central...	This menu provides access to setup features (e.g. language, the clinical password on/off feature etc.)
Configure Locked Options...	This menu allows your Biomed to unlock available options.
Configure Telemetry...	See page 17-23.
System Console...	This menu activates a UNIX window with a prompt from where remote diagnostics can be performed, the MULTIVIEW WORKSTATION can be shut down, Rest ECG report formats can be selected etc.
Clinical Events log	The <i>clinical events log</i> contains information on 1000 events of clinical significance, such as alarm detection, alarm silence requests, recording status, and remote control of bedside monitors.
Diagnostic log	the <i>diagnostic log</i> contains a record of 1000 hardware and software error conditions. These logs are helpful in determining the status of the system.

Accessing the Biomed Menus

1. Click on the **Biomed** button in the CLUSTERVIEW menu bar. This activates a pull-down menu with the names of the available Biomed menus.
2. Click on the desired menu selection (**Show Devices**, **Configure Central...**, **Configure Locked Options**, **System Console...**, **Clinical Events log**, **Diagnostic log** or **Configure Telemetry** (see page 17-23). The word popup window appears.
3. Enter the Biomed password. As you type the password, asterisks (****) are displayed instead of the actual characters to safeguard the password.
4. Click either on the **Accept** button to confirm the password or on the **Cancel** button to dismiss the popup and return to CLUSTERVIEW.

If the password is accepted, the requested window is displayed. If not, an error tone sounds, the text entry box is cleared, and an error message in the popup informs you that the password was entered incorrectly. Verify the password and try to enter it again as described above.

Once you have accessed a Biomed menu, you can cycle through all other Biomed menus without having to enter the Biomed password each time you wish to view another menu unless you return to CLUSTERVIEW or select another menu bar button, in which case you will have to perform the above-mentioned steps.

The Show Devices Menu

This menu lists status information for all network devices (recorders, CPS, bedside monitors, receivers etc.) assigned to monitoring unit of the respective MULTIVIEW WORKSTATION

Device Label	Host Label	Device Type	Software Version	Link Status
DBED36	DCPS36	SC9000	lan24.00	ONLINE
DIRS54	CPS54			DISCONNECTED
TBED130	C11	SC9000	xhm_vb1_b.3	ONLINE
TBED131	C32	SC9000	xhm_vb1_b.3	ONLINE
TBED145	C69	SC9000	xhm_vb1_b.3	ONLINE
TBED53	C53	SC9000	xhm_vb1_b.3	ONLINE
	NEBULA	MultiView	VB1.0	ONLINE
	QUASAR	MultiView	VB1.0	ONLINE
	VENUS	MultiView	VB1.0	ONLINE
	callist	MultiView	XB1.16	ONLINE
	charon	MultiView	XB1.17	ONLINE
	C11	CPS	oc_vb0_i.36	ONLINE
	C32	CPS	oc_vb0_i.36	ONLINE
	C53	CPS	oc_vb0_i.36	ONLINE
	C69	CPS	oc_vb0_i.36	ONLINE
	CPS54	CPS	oc_vb0_q.35	ONLINE
	DCPS36	CPS	oc_vb0_q.35	ONLINE
DRFC56	DCPS36	R50	oc_vb0_q.35	ONLINE
EFCS4	CPS54	R50	oc_vb0_q.35	DISCONNECTED
RSLOT1	C69	R50	oc_vb0_i.36	ONLINE
RSLOT2	C52	R50	oc_vb0_i.36	DISCONNECTED
RSLOT3	C11	R50	oc_vb0_i.36	DISCONNECTED
TRIC53	C53	R50	oc_vb0_i.36	DISCONNECTED

Layout of the Show Devices Menu

The Show Devices menu consists of the following elements:

Network information area

This area displays the following information for each device on the network and within the monitoring unit of the MULTIVIEW WORKSTATION:

- *device label* - for bedside monitors and recorders only (assigned to the devices during network configuration BED 1.)
- *host label* - either the label of the CPS or the MULTIVIEW WORKSTATION (e.g. CPS 1)
- *device type* (SC6000, SC9000, MULTIVIEW, CPS, R 5 (for Telemetry beds) blank if patient is disconnected)
- *software version* (e.g. VC0)
- *link status* (e.g. standby, online, offline, etc.)

Page up/down arrow buttons

These buttons enable you to scroll through the available information page by page.

Show Central Status button

This button activates the following popup with current status information.



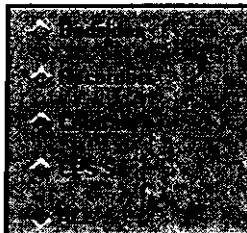
To dismiss the popup, click on the **Continue** button.

Network information filter button

You can view the information in the Show Devices window either for an individual device or for all devices together.

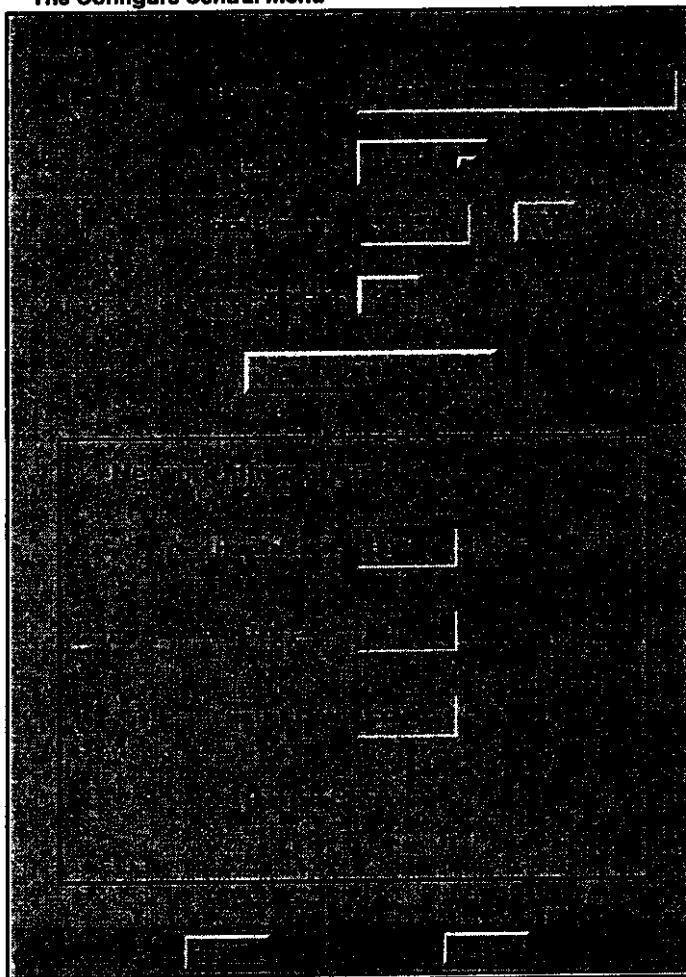
Click on one of the 'filter' buttons, located in the lower portion of the Show Devices menu, to view only the information of a particular device category.

If no information is available for a certain device category, the Show Devices window appears blank. The **All** button disables the filter and displays the information for all devices.



This menu offers a variety of setup possibilities. Specifica can configure such settings as the hospital name, the care label, the language, etc.

The Configure Central menu



The following sections describe the various functions.

Modifying Available Selections

The following table lists the selections that can be configured the Configure Central menu. To modify a setting, proceed as follows:

1. Access the Configure Central menu (see page 17-3 for details).
2. Click on the button or the text entry box corresponding to selection(s) that you wish to change. The available selections are listed in the table below. Depending on your selection list of available choices appears, the selected button toggles to its opposite state, or you can enter text with the keyboard in the text entry box.



NOTE: The flashing "I" bar indicates when a text box can accept text.

3. Click on the **Accept** button to store your selections, or click on the **Undo** button to retain the previous settings.

Selection	Description	Available Settings	Factory Default
Hospital Name	This selection defines the hospital's name.	Up to 25 characters	None
Language	This selection determines the language of the MULTIVIEW WORKSTATION. Note: With each change in language, a popup appears indicating that the MULTIVIEW WORKSTATION has to be restarted before the new language takes effect. Each language change causes an entry to be stored in the clinical events log.	English, French, German, Italian, and Spanish.	None

Note: Click on the **Accept** button to store your changes, or click on the **Undo** button to retain the previous settings.

Biomed Function

Selection	Description	Available Settings	Factor Default
Clinical Password	This selection defines the clinical password. It functions in conjunction with the On/Off button located next to the text entry box. Note: Whenever the clinical password is modified, an entry is stored in the clinical events log.	Up to 8 characters	MVWS
Clinical Password On/Off	This selection enables or disables the clinical password. If this function is enabled, the setup menus can only be accessed after the clinical password (see above) has been entered correctly.	ON / OFF	ON
Printer Connected	This selection determines the printer connection.	•Local (the printer is connected directly to the MULTIVIEW WORKSTATION) •Network (the central is connected to a network printer) •Off	
Network Printer Address	This field (next to the assigned printer label) displays the IP address configured during installation (for viewing only). This is the IP address for the network printer connection		

Note: Click on the **Accept** button to store your changes, or click on the **Undo** to retain the previous settings.



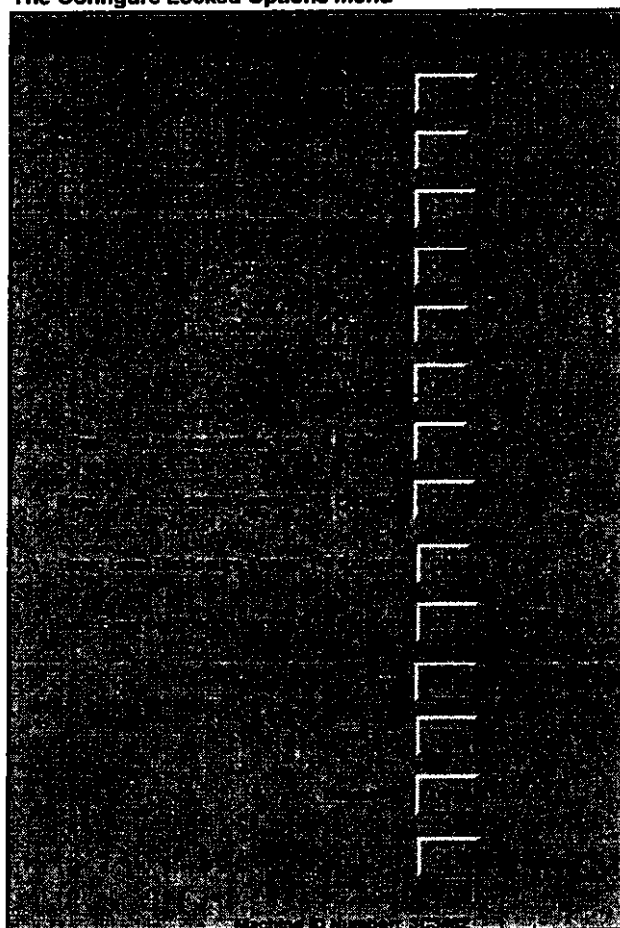
Selection	Description	Available Settings	Factory Default
Restore Default Settings	This selection restores settings to defaults. As soon as you click on this button, a confirmation popup appears to inform you that all settings will be restored to defaults except for network configuration information, central layout configurations, and locked options. Note: Whenever you restore defaults, a popup appears indicating that the MULTIVIEW WORKSTATION has to be restarted before they take effect. In addition an entry is stored in the clinical events log.	Not applicable	Not applicable
Hospital Label	This selection defines the hospital label for the network.	Up to 7 characters	
Monitoring Unit Label	This selection defines the monitoring unit to which the MULTIVIEW WORKSTATION is assigned.	Up to 7 characters	
Care Unit Label	This selection defines the care unit to which the MULTIVIEW WORKSTATION is assigned.	Up to 7 characters	
Host Label	View only		

Note: Click on the **Accept** button to store your changes, or click on the **Undo** button to retain the previous settings.

The Configure Locked Options Menu

This menu offers several options that must be purchased separately. An option can only be 'unlocked' after the Biomedec the password for that option which is unique for each MUL WORKSTATION.

The Configure Locked Options menu



The following sections describe the available functions.



Unlocking/Locking Available Options

1. Access the Configure Locked Options menu (see page 17)
2. Click on one of the following available menu choices (the password popup appears):

- VIEWSTATION On/Off
- Basic 1 - 8 Patients On/Off (always ON and ghosted)
- Basic 9 - 16 Patients On/Off
- Enhanced 9 - 16 Patients On/Off
- Enhanced 1 - 8 Patients On/Off
- Dual Display On/Off
- Basic Full Disclosure Server 1 - 8 Patients On/Off
- Basic Full Disclosure Server 9 - 16 Patients On/Off
- Basic Event Disclosure Server 1 - 8 Patients On/Off
- Basic Event Disclosure Server 9 - 16 Patients On/Off
- Client On/Off
- RestECG On/Off
- Telemetry On/Off
- ST On/Off



NOTE: If you unlock the Full Disclosure and the Event Disclosure application at the same time but select the 1-8 Patient option for one and the 9-16 Patient option for the other, the MULTIVIEW WORKSTATION defaults to the lower patient number for both options. In addition, if both options are unlocked and you admit a patient to Full Disclosure, he or she is automatically admitted to Event Disclosure as well (and vice versa).

3. Enter the password for the option you wish to unlock/lock. As you type the password, asterisks (****) are displayed instead of the actual characters to safeguard the password.



NOTE: You can only enter the password if the mouse pointer is within the boundaries of the password popup window.

Continued on next page...

Biomed Func

4. Click either on the **Accept** button to confirm the password or on the **Cancel** button to dismiss the popup and return to the Configure Locked Options menu. If the password is accepted, the corresponding feature is unlocked. In some instances unlocking a feature is only possible after a feature has been unlocked previously.

After an option has been unlocked, a popup window appears to inform you that for the unlocked features to take effect, the MULTIVIEW WORKSTATION must be restarted.

Whenever you lock or unlock a feature, a message is stored in the clinical events log.



The System Console

This menu consists of a UNIX window with a prompt that allows the Biomed or service personnel to:

- run remote diagnostics for all network devices
- shut down or restart the MULTIVIEW WORKSTATION
- view an alarm history log for telemetry patient channels consisting of the last 5000 events (with time and date of the alarm occurrences).
- select RestECG report formats

Refer to page 17-3 for information on how to access the System Console. For more detailed information, consult the Service documentation.

RestECG Reports

RestECG reports are available in several formats.



NOTE: For the US, only the following report format is available: 4x3 waves, 2.5 seconds with no diagnostic statements.

The format determines the content and the presentation of the report. Because several formats are available, you always have the flexibility to customize the Rest ECG reports according to your needs.

As soon as the data arrives from the SC 9000, the MULTIVIEW WORKSTATION analyzes it and generates the report according to the selected format. The data is then sent either to a local or network printer, depending on the selected printer assignment (see page 17-9).

An entry is made in the clinical events log whenever the MULTIVIEW WORKSTATION issues a report successfully. If a report cannot be processed successfully, a corresponding entry is made in the diagnostic log (see page 17-19).

If multiple printing requests exist, the RestECG report is held until the assigned printer becomes available.



WARNING: Diagnosis based on interpretation of lead monitoring results should only be done by qualified personnel. Prior to final interpretation and diagnosis, qualified physicians should review suggested diagnostic statements and all other available information.

Available Report Formats

The format of a RestECG report determines the layout and the type of information included in the report. For example, some formats display complexes and waveforms whereas other formats display waveforms and diagnostic strings. Please consult the following table for a description of each format. For more detail information on report formats, please refer to the SC 9000 User Guide.



NOTE: The Rest ECG function is pending 510 (K) review and is not yet commercially available in the US.

Report Type	Resolution	Diagnostic Statements Y/N	# of Pages	Orientation
6x2 waves, 2.5 s	50 mm/s	Y	1	Landscape
6x2 waves, 2.5 s		N	1	
6x2 waves, 2.5 s		Y	2	Landscape, Cabrera
6x2 waves, 2.5 s		N	1	
Complexes and 3 waves (V1, II, V5) 7 s	Complexes: 50mm/s Waveforms: 25mm/s	Y	1	Portrait, standard
12 waveforms, each 5 s	50 mm/s	N	2	Cabrera
12 waveforms, each 5 s	50 mm/s	N	2	Landscape
3x4 waveforms, each 2.5 s	50 mm/s	N	1	
3x4 waveforms, each 2.5 s	50 mm/s	Y	2	

Steps: Choosing the Report Format

1. Access the System Console (see page 17-3).
2. Enter the following string (exactly as stated) at the \$-
rekgSelect

The following selection menu appears:

```

      Rest ECG Report Selection Menu

1. 6x2 waves @ 2.5 secs, with diagnostics
2. 6x2 waves @ 2.5 secs, without diagnostics
3. 6x2 waves @ 2.5 secs, with diagnostics, cabrera format
4. 6x2 waves @ 2.5 secs, without diagnostics, cabrera format
5. Complexes @ 3 waves @ 7 secs, matrix diags
6. 12 waves @ 5 secs, cabrera format (2 pages)
7. 12 waves @ 5 secs (2 pages)
8. 3x4 waves @ 2.5 secs, without diagnostics
9. 3x4 waves @ 2.5 secs, with diagnostics (2 pages)
99. Set or change hospital name

Select from 1 - 9, 99 or press <Enter> for the default (1)
Enter Q or q to quit.
Select: █
    
```

3. Enter the number corresponding to the report format ; wish to select (1 through 9).
4. Type in the letter Q or q to exit the RestECG menu o ;
tinue with step 3 in the following section to enter the l
name.

- rekgSelect**

- 99. Set or change hospital name**

Select:

- ПДД 47 40

Viewing Logs

The password-protected diagnostic log and clinical events store records of hardware and software conditions and clinical events. These logs are especially helpful to biomedical and service personnel for identifying possible equipment malfunctions.

The *diagnostic log* contains a record of 1000 hardware and software error conditions. These logs are helpful in determining the status of the system.

The *clinical events log* contains information on 1000 events of clinical significance, such as alarm detection, alarm silence requests, recording status, and remote control of bedside monitors.

Together, these logs are a useful tool for biomedical or service personnel in analyzing possible malfunctions. In addition to viewing the logs, you can also copy them to disk.

Log entries are displayed in chronological order with the most recent entry at the top of the screen. Each log entry appears on a separate line and displays the following information:

- date and time
- event class
- event code
- description of event

Please refer to page 17-3 for information on how to access these menus.

[illegible]

Case No.	Case Name	Case No.	Case Name
101	101-101-101-101	101	101-101-101-101
102	102-102-102-102	102	102-102-102-102
103	103-103-103-103	103	103-103-103-103
104	104-104-104-104	104	104-104-104-104
105	105-105-105-105	105	105-105-105-105
106	106-106-106-106	106	106-106-106-106
107	107-107-107-107	107	107-107-107-107
108	108-108-108-108	108	108-108-108-108
109	109-109-109-109	109	109-109-109-109
110	110-110-110-110	110	110-110-110-110
111	111-111-111-111	111	111-111-111-111
112	112-112-112-112	112	112-112-112-112
113	113-113-113-113	113	113-113-113-113
114	114-114-114-114	114	114-114-114-114
115	115-115-115-115	115	115-115-115-115
116	116-116-116-116	116	116-116-116-116
117	117-117-117-117	117	117-117-117-117
118	118-118-118-118	118	118-118-118-118
119	119-119-119-119	119	119-119-119-119
120	120-120-120-120	120	120-120-120-120
121	121-121-121-121	121	121-121-121-121
122	122-122-122-122	122	122-122-122-122
123	123-123-123-123	123	123-123-123-123
124	124-124-124-124	124	124-124-124-124
125	125-125-125-125	125	125-125-125-125
126	126-126-126-126	126	126-126-126-126
127	127-127-127-127	127	127-127-127-127
128	128-128-128-128	128	128-128-128-128
129	129-129-129-129	129	129-129-129-129
130	130-130-130-130	130	130-130-130-130
131	131-131-131-131	131	131-131-131-131
132	132-132-132-132	132	132-132-132-132
133	133-133-133-133	133	133-133-133-133
134	134-134-134-134	134	134-134-134-134
135	135-135-135-135	135	135-135-135-135
136	136-136-136-136	136	136-136-136-136
137	137-137-137-137	137	137-137-137-137
138	138-138-138-138	138	138-138-138-138
139	139-139-139-139	139	139-139-139-139
140	140-140-140-140	140	140-140-140-140
141	141-141-141-141	141	141-141-141-141
142	142-142-142-142	142	142-142-142-142
143	143-143-143-143	143	143-143-143-143
144	144-144-144-144	144	144-144-144-144
145	145-145-145-145	145	145-145-145-145
146	146-146-146-146	146	146-146-146-146
147	147-147-147-147	147	147-147-147-147
148	148-148-148-148	148	148-148-148-148
149	149-149-149-149	149	149-149-149-149
150	150-150-150-150	150	150-150-150-150
151	151-151-151-151	151	151-151-151-151
152	152-152-152-152	152	152-152-152-152
153	153-153-153-153	153	153-153-153-153
154	154-154-154-154	154	154-154-154-154
155	155-155-155-155	155	155-155-155-155
156	156-156-156-156	156	156-156-156-156
157	157-157-157-157	157	157-157-157-157
158	158-158-158-158	158	158-158-158-158
159	159-159-159-159	159	159-159-159-159
160	160-160-160-160	160	160-160-160-160
161	161-161-161-161	161	161-161-161-161
162	162-162-162-162	162	162-162-162-162
163	163-163-163-163	163	163-163-163-163
164	164-164-164-164	164	164-164-164-164
165	165-165-165-165	165	165-165-165-165
166	166-166-166-166	166	166-166-166-166
167	167-167-167-167	167	167-167-167-167
168	168-168-168-168	168	168-168-168-168
169	169-169-169-169	169	169-169-169-169
170	170-170-170-170	170	170-170-170-170
171	171-171-171-171	171	171-171-171-171
172	172-172-172-172	172	172-172-172-172
173	173-173-173-173	173	173-173-173-173
174	174-174-174-174	174	174-174-174-174
175	175-175-175-175	175	175-175-175-175
176	176-176-176-176	176	176-176-176-176
177	177-177-177-177	177	177-177-177-177
178	178-178-178-178	178	178-178-178-178
179	179-179-179-179	179	179-179-179-179
180	180-180-180-180	180	180-180-180-180
181	181-181-181-181	181	181-181-181-181
182	182-182-182-182	182	182-182-182-182
183	183-183-183-183	183	183-183-183-183
184	184-184-184-184	184	184-184-184-184
185	185-185-185-185	185	185-185-185-185
186	186-186-186-186	186	186-186-186-186
187	187-187-187-187	187	187-187-187-187
188	188-188-188-188	188	188-188-188-188
189	189-189-189-189	189	189-189-189-189
190	190-190-190-190	190	190-190-190-190
191	191-191-191-191	191	191-191-191-191
192	192-192-192-192	192	192-192-192-192
193	193-193-193-193	193	193-193-193-193
194	194-194-194-194	194	194-194-194-194
195	195-195-195-195	195	195-195-195-195
196	196-196-196-196	196	196-196-196-196
197	197-197-197-197	197	197-197-197-197
198	198-198-198-198	198	198-198-198-198
199	199-199-199-199	199	199-199-199-199
200	200-200-200-200	200	200-200-200-200

The Clinical Events Log

[illegible]



Copying the Logs to Disk

1. Insert a 3.5" high-density disk into the disk drive on the front of the MULTIVIEW WORKSTATION CPU.



NOTE: You do not need to format the disk before you copy the logs.

2. Access the log you wish to copy (see page 17-19).
3. Click on the **Copy Logs To Disk** button. The MULTIVIEW WORKSTATION formats the disk automatically. This can take approximately 2 minutes.



NOTE: The Diagnostic and the Clinical Events log are copied regardless of the windows from which you request a copy.

The logs are copied as individual files. Status messages, displayed in the status area, inform you of the start and end of the copying process. An attention tone accompanies the end of the copying message. During the copying process, the MULTIVIEW WORKSTATION is fully operational and you can execute any function, including exiting and re-entering the log screens. The only exception is the **Copy Logs To Disk** button, which remains ghosted until the copying process is completed.

If copying of the logs should fail (e.g. due to a faulty disk), a status message with an accompanying advisory tone will inform you.

Telemetry Setup

The following Biomed setup functions pertain exclusively to the Telemetry System. Before you can perform any of these functions, you must unlock the Telemetry option (see page 100 in this chapter for details).

Accessing the Telemetry Setup Menus	
Receiver Setup	
Available Functions on the Receiver Setup Menu	
Programmable Operating VHF Frequency Bands	
Programmable UHF Operating Frequency Bands	
Transmitter Setup	
Available Functions on the Transmitter Setup menu	
Configuring the Transmitter Buttons	
Programming the Transmitters	
Transmitter Messages	
Radio Frequency Diagnostics	
Available Information on the RF Diagnostics Menu	
Radio Frequency Statistics.....	

Accessing the Telemetry Setup Menus

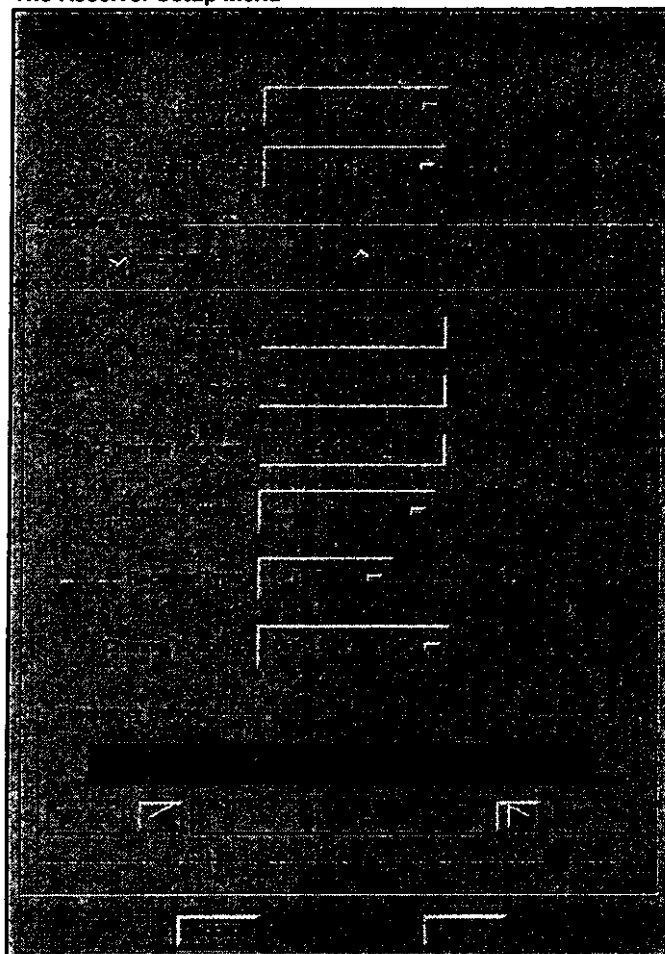
1. Access the **Configure Telemetry...** menu (see page 17-24 for details).
2. Click either on the **Receiver Setup...**, **Transmitter Setup...**, or **RF Diagnostics...** menu selection to access the desired menu.
3. Enter the Biomed password. As you type the password, asterisks (****) are displayed instead of the actual characters to safeguard the password.
4. Click either on the **Accept** button to confirm the password or on the **Cancel** button to dismiss the popup and return to CLUSTERVIEW. If the password is accepted, the requested window is displayed. If not, an error tone sounds, the text entry box is cleared, and an error message in the popup informs you that the password was entered incorrectly. Verify the password and try to enter it again as described above.

Once you have accessed a Telemetry Setup menu under the Biomed password, you can cycle through all other Telemetry Setup menus without having to enter the Biomed password each time you wish to view another menu unless you return to the CLUSTERVIEW or select another menu bar button, in which case you will have to access the Telemetry Setup menus as described above.

Receiver Setup

The Receiver Setup menu, illustrated below, is further protected by a special password, which is only accessible to authorized service personnel. For detailed information on the various settings and functions of this menu, please consult the accompanying documentation.

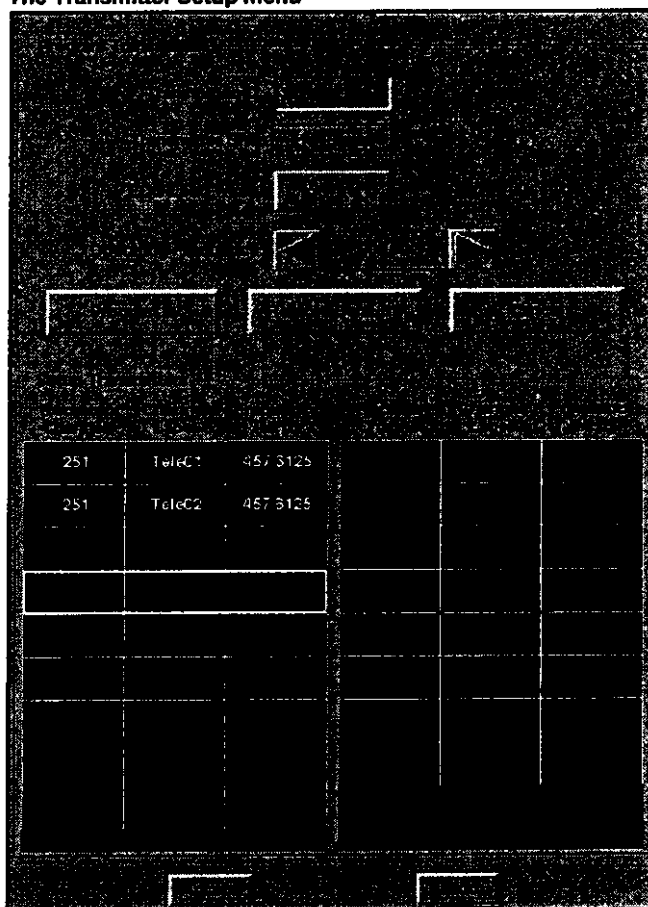
The Receiver Setup menu



The Transmitter Setup menu allows you to

- **configure the transmitter buttons**
- **select either the 3-lead or 5-lead ECG cable**
- **enter the transmitter ID#**
- **set the individual receiver's channel operating frequency**
- **select the transmitter's operating frequency**

The Transmitter Setup menu



Biomed Function

Available Functions on the Transmitter Setup

The following table outlines the various functions that can be configured for each transmitter. Please refer to page 17-24 for information on how to access the Transmitter Setup menu.

Menu Button	Description	Available Settings	Factory Default
Transmitter Record	This selection determines the operating mode of the transmitter's recording button (see chapter 2, page 2-12).	• All On • All Off • Per Patient	All On
Transmitter Staff Alert	This selection determines the operating mode of the transmitter's staff alert button (see chapter 2, page 2-12).	• All On • All Off • Per Patient	All On
Receiver Channel	This selection determines the receiver channel/transmitter pair to be programmed.	• 1, 2, ... 16 • Spare	
Channel Label	This selection determines the receiver channel/transmitter pair to be programmed.	Any 7 characters	Tele x
Frequency	This selection assigns a frequency to the transmitter within the receiver's range.		Any of frequency within select receiver frequency
Note: Click on the Accept button to store your changes or click on the Undo button to return to the previous settings.			

Configuring the Transmitter Buttons

In the Transmitter Setup menu, you can configure the transmitter recording  and the staff alert  buttons. Basically, the selected setting determines whether or not a recording or a staff alert can be initiated from the transmitter.

Steps:

1. Access the Transmitter Setup menu (see page 17-24).



The upper part of the menu contains the **Transmitter Record** and the **Transmitter Staff Alert** buttons.

2. Click on the **Transmitter Record** or the **Transmitter Staff Alert** button and scroll to one of the following settings:
 - ☐ **All On** - this selection activates the transmitter staff alert and recording  buttons for **all** telemetry channels. Therefore, if you press the recording  button, a timed recording is initiated and if you press the staff alert  button, a series alarm is generated at the MULTIVIEW WORKSTATION for corresponding patient. Furthermore, an alarm message is played in the corresponding waveform area of the CLUSTER VIEW and the BEDVIEW screens.
 - ☐ **All Off** - the transmitter staff alert  button and recording button are deactivated for **all** telemetry channels. You can generate any recordings or staff alert calls from any transmitter.
 - ☐ **Per Patient** - this setting allows you the greatest flexibility because the transmitter buttons can be enabled or disabled each patient **individually** on the Transmitter Setup menu (page 17-28).
3. Click on the **Accept** button to store the setting or click on the **Undo** button to revert to the previous setting.

Programming the Transmitters

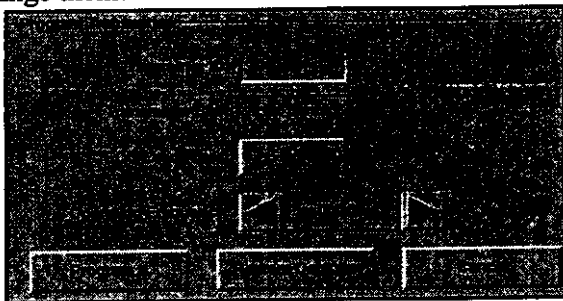
You can program each transmitter to its own receiver channel as follows:



NOTE: You cannot program a spare transmitter to the same frequency to which another transmitter is already programmed.

1. Access the Transmitter Setup menu (see page 17-24).
2. Make sure the programming port is connected properly to the MULTIVIEW WORKSTATION CPU.
3. Click on the row corresponding to the setup function which you wish to program a transmitter (you can only program one row at a time). A popup with the message *Insert Transmitter In Programming Slot and Press Continue* appears.
4. Insert the transmitter into the programming port and click on **Continue** in the popup. The message *Reading Transmitter Data* appears.

As soon as the communication with the transmitter is established, the following popup appears. It shows the current settings of the transmitter and allows you to change them.



5. Configure the desired settings within the Setup Transmitt popup. The available settings are listed in the following table:

Menu Button	Description	Available Settings	Factory Default
Transmitter ID	This setting is a unique identifier for the transmitter. Transmitters are shipped with an ID of '0'. This setting must be changed before the transmitter can be programmed. Note: Make sure every transmitter has a unique ID #.	1 to 255	
Transmitter S/W	This setting identifies the transmitter's software.		
ECG Lead Wires	This setting identifies the transmitter's lead mode (3 or 5 lead).	• 3 leads • 5 leads	5 leads
Operating Frequency	This selection identifies the transmitter's frequency. The available frequency settings depend on the country's regulatory frequency, the selected center frequency, and the channel spacing.	abc.defg.MHz (abc.defg is any center frequency within the selected receiver frequency range)	Closest 'legal' frequency to center of setup receiver band
Restore Defaults	This selection restores all the transmitter's EEPROM settings to the factory defaults for the selected receiver type.		

6. Click on the **Program** button to transfer the changes to the transmitter or on the **Cancel** button to exit the popup and retain the previous settings.



CAUTION: Do not remove the transmitter from the program port until the popup with the message *Programming Transmitter...Warning, Do Not Remove Transmitter from Service Port During Programming* disappears.

7. Remove the transmitter.
8. Insert a new transmitter and repeat steps 3 to 7 for additional transmitters.

Transmitter Messages

The messages listed in the following table may appear during programming of a transmitter.

Message	Description	Action
<i>Reading Transmitter Data</i>	The transmitter's current settings are being retrieved for display in the Setup Transmitter popup.	
<i>Setup Data Write Error, try again</i>	The programmed settings could not be read back for the second time to the transmitter for display in the Setup Transmitter popup.	Try to program the transmitter again.
<i>Programming transmitter...Warning, Do Not Remove Transmitter from Service Port During Programming</i>	The new settings are being written to the transmitter.	Wait until the message disappears.
<i>No Transmitter in Programming Port</i>	Communication with a transmitter cannot be established.	Make sure that the transmitter battery is charged and reinsert the transmitter into the programming slot. Check that the programming port is connected to the MULTIVIEW WORKSTATION.
<i>Transmitter is not compatible with current receiver settings</i>	The transmitter type is not compatible with the selected receiver.	Change the receiver to match the transmitter or vice versa.
<i>Insert Transmitter in programming port and press Continue</i>	Reads the transmitter's settings.	Wait until the popup appears.

Radio Frequency Diagnostics

The RF Diagnostics menu contains important information about the receiver.

RF Diagnostics menu

1	4576125	251	00	00	00	00	00	00
2	4576125	251	00	00	00	00	00	00
3	00000	2	00	00	00	00	00	00
4	00000	3	00	00	00	00	00	00
5	00000	4	00	00	00	00	00	00
6	00000	5	00	00	00	00	00	00
7	00000	6	00	00	00	00	00	00
8	00000	7	00	00	00	00	00	00
9	00000	8	00	00	00	00	00	00
10	00000	9	00	00	00	00	00	00
11	00000	10	00	00	00	00	00	00
12	00000	11	00	00	00	00	00	00
13	00000	12	00	00	00	00	00	00
14	00000	13	00	00	00	00	00	00
15	00000	14	00	00	00	00	00	00
16	00000	15	00	00	00	00	00	00

Available Information on the RF Diagnostics Menu

The RF Diagnostics menu provides the information outlined in the following table. This information is updated every minute even as you are viewing it. Please consult the accompanying reference documentation for further information.

Information	Description	Possible Values
Receiver Channel	Lists the channels of the receiver reported by the receiver subsystem	1 to 4; 1 to 8; 1 to 12; 1 to 16; blank
Frequ. MHz	Lists the center operating frequencies of the receiver's channels.	abc.defg; blank
ID	Lists the transmitter ID number for each channel as reported by the receiver subsystem. A blank means that no ID is reported (the transmitter signal is not being received).	1 to 255; blank
RSSI-dBm	Receiver's signal strength indicator for each channel (averaged over 1 minute)	0 to -125 dBm
1 min, 5 min, 10 min, 1 Hour, 24 Hours	Percentage of good ECG signal samples received over the specified interval	0 to 100%

[REDACTED]

A Patient Preparation

This appendix provides information on how to prepare a patient for telemetry monitoring and how to achieve the clearest signals.

Overview	
Selecting Electrodes	
Selecting Lead Wires	
Preparing the Patient.....	
Preparing the Electrodes	
Attaching the Electrodes	
Attaching the MicroO2 Pulse Oximeter	

➤

The procedures outlined in this appendix are recommended by Siemens. They can, however, be replaced with your hospital's methods.

Ag/AgCl electrodes (adhesive and disposable) are recommended for their stability.

Selecting Lead Wires

Inspect all lead wires for visible damage before using them.

Preparing the Patient

Prepare your patient according to your hospital's procedure.

Preparing the Electrodes

1. Attach the leads to the electrodes.
2. Apply $\frac{1}{4}$ to $\frac{1}{2}$ inch ($\frac{1}{2}$ to 1 cm) of gel to the contact area of disposable electrodes without gel.
3. Examine pregelled, disposable electrodes to ensure that gel has not dried out and a sufficient quantity remains. Do not use disposable electrodes past their expiration date.

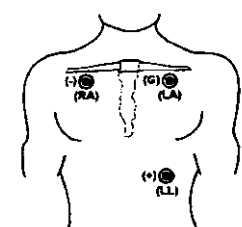


CAUTION: *Conductive parts of electrodes and associated connectors for applied parts, including the neutral electrode, should not contact other conductive parts including earth.*

Attaching the Electrodes

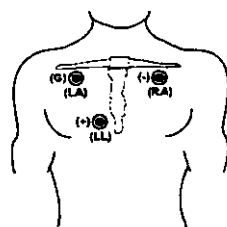
1. Position the electrodes in the configuration that provides the best ECG waveform (P and T wave amplitude of 1/3 or less of the QRS amplitude).
2. Select a flat, nonmuscular site to maximize electrode contact and minimize muscle artifact. Avoid joints or bony prominences.
3. Apply the electrodes to the prepared skin site. To prevent gel from being squeezed out, apply the electrode pad with circular motion on the adhesive area first, then press gently on the gel area. (To prevent motion artifact, secure the lead wires with tape directly beneath the connection.)

NOTE: Replace electrodes at least once every 24 - 48 hours.



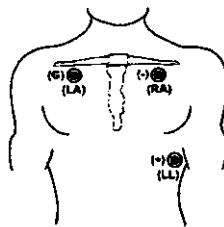
3 Lead Cable: RA-White: right shoulder, below clavicular hollow.
LA-Black: left shoulder, below clavicular hollow.
LL-Red: left side of chest, lowest palpable rib, mid-clavicular hollow.

• Lead II: Heart rhythm monitoring, shows clear p-waves.

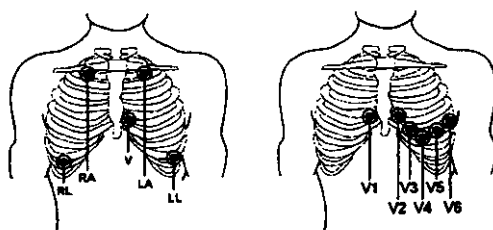


MCL1: LL-Red (+): fourth ICS, right sternal border (V1 position).
RA-White (-): left shoulder, below clavicular hollow.
LA-Black (G): right shoulder, below clavicular hollow.

• Distinguish left from right ventricular ectopy.
• Identify RBBB and LBBB.
• Has clear waves.
• Differentiate left ventricular ectopy from RBBB aberrations.



MCL6: LL-Red (+): left side of chest, lowest palpable rib, mid-axillary line.
RA-White (-): left shoulder, below clavicular hollow.
LA-Black (G): right shoulder, below clavicular hollow.



Chest Electrode Placement for V leads

A Patient Preparation

Attaching the MICRO2 Pulse Oximeter

Observe the following guidelines as you apply the oximeter to the patient:

1. Select a well perfused site such as a finger or a toe that will be subjected to a minimum of motion artifact.
2. Remove any nailpolish (if present).
3. Cover the sensor with an opaque material to prevent interference from direct sunlight.



B Technical Data

This appendix lists all the technical data for the MULTIVIEW WORKSTATION and the INFINITY Telemetry Option.

➤ NOTE: Specifications are subject to change.

MultiView WorkStation Display	
MultiView WorkStation CPU	
Uninterruptible Power Supply (UPS), 120V	
Uninterruptible Power Supply (UPS), 230V	
UL544 Medical Power Conditioner - Isolation Transformer	
IEC 601-1 Medical Power Conditioner - Isolation Transformer	
Telemetry Vital Signs Measuring Capabilities	
INFINITY Telemetry Receiver/CPU.	
Infinity Transmitter Requirements	
Transmitter Programming Port	
Four-Channel Receiver Unit	
150 - 566 MHz Antenna Amplifier	

MultiView WorkStation Display

General	
Type	CRT flat screen (SVGA compatible)
Size	432 mm (17 inches) diagonal
Viewing area	■ 399 mm (15.7 inches) diagonal, ■ 300 x 225 mm (11.8 x 8.9 inches)
Resolution	1280 x 1024 pixels
User Interface	
Inputs	Video and sync, audio
Audio output	Dual speakers, 2 Watts each (typical), Note: Dual speakers are not active for the MULTI VIEW REMOTE DISPLAY.
Frequency response	100 Hz to 20 kHz (typical)
Physical Attributes	
Size (H x W x D)	418 x 438 x 438 mm (16.4 x 17.2 x 17.2 inches)
Weight	18.5 kg (40.7 lbs)
Electrical Specifications	
Input voltage	100 to 240 VAC (nominal), 50 or 60 Hz
Power consumption	1.5 A
Environmental Requirements	
Temperature range	Operating: 0°C to 35°C
Relative humidity	Operating: 5% to 90% (non-condensing)
Atmospheric pressure	Operating: 525 mmHg (70 kPa) minimum
Regulatory Standards	
Compliances	UL 1950, CSA 22.2 No. 950, FCC Class B, MPR II, EN60950, EMC Directive

MultiView WorkStation CPU

User Interface	
User controls	■ Mouse (to control on-screen menu) ■ keyboard
Disk drive	1.44 Mbyte 3.5 inch floppy drive
CD ROM	Quad speed
Alarms	■ life-threatening ■ serious ■ advisory
Connections	■ Two asynchronous serial ports ■ SCSI port ■ RGB video output ■ audio output ■ Ethernet 10BASE-T ■ keyboard
Physical Attributes	
Cooling	Temperature-controlled fan
Size (H x W x D)	159 x 419 x 457 mm (6.25 x 16.5 x 18 inches)
Weight	15.9 kg (35 lbs)
Electrical Specifications	
Input voltage	■ 100 to 125 VAC (nominal), 5.2 A (maximum) ■ 200 to 245 VAC (nominal), 2.6 A (maximum)
Mains frequency	50/60 Hz (nominal)
Power consumption	≤ 200 Watts (fully loaded)



MULTIVIEW WORKSTATION CPU (Continued)	
Environmental Requirements	
Temperature range	Operating: 16°C to 32°C Storage: 1°C to 60°C
Relative humidity	Operating: 8% to 80%, 23°C wet bulb Storage: 5% to 80%, 29°C wet bulb
Atmospheric pressure	operating: 586 mmHg (78 kPa) minimum
Regulatory Standards	
Compliances	FCC Class B, CISPR 22 Class B, EMC and Low Voltage Directives, VCCI Class 2, EN 60950, UL 1950.

Technical

Uninterruptible Power Supply (UPS), 120V

Physical Attributes	
Connections	MULTIVIEW WORKSTATION
Audio output	< 45 dB at 1 m (3 ft.)
Size (H x W x D)	165 x 114 x 368 cm (6.5 x 4.5 x 14. inches)
Weight	11.3 kg (25 lbs)
Electrical Specifications	
Input voltage	110, 120, 127 VAC $\pm$ 20 % (nomina selectable)
Mains frequency	60 Hz $\pm$ 5%
Output voltage	120 VAC
Output power	400 VA
VAC Regulation (on battery)	+ 5%, sinusoidal wave
Frequency regulation (on battery)	+ 0.5%
Battery charging time	3 to 8 hours
Backup time	5 to 10 minutes, fully loaded
Environmental Requirements	
Temperature range	Operating: 0°C to 40°C Storage: -20°C to 70°C
Relative humidity	Operating: 0% to 95% (non-conden Storage: 0% to 95% (non-condensi
Atmospheric pressure	Operating: 525 mmHg (70 kPa) min
Regulatory Standards	
Compliances	IEEE 446, NEMA PE1, ANSI C62.4 FCC Part 15 J, IEC 801-146, NSTA 1778, CSA 22.2, VDE approved, IE SEMKO, SETI