

# **TrensCenter Central Station Cardiac Monitor Operator's Manual**

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<b>CARDIAC REHAB</b>	

**Revision 3.016R**

**Date July 2002**

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# TrensCenter Central Station Cardiac Monitor Operator's Manual

## PREFACE

This manual describes the operation and use of the *TrensCenter* Telemetry System. It is intended for use by clinicians trained in the use of clinical monitoring systems familiar with the associated terms and procedures. The system is intended to be used in any area of the hospital where cardiac monitoring is required. The system is intended to be used in accordance with accepted hospital and clinical protocols and the instructions contained in this manual. Use of the system with other than supplied accessories or parts may result in inaccurate patient information or damage to the monitor.

The manual contains detailed descriptions of all controls and indicators. Each control of the system is depicted in this manual by the use of hand symbols:



When a specific control function is described, a hand symbol will point to the location of that control key or button. When multiple control functions are described on a single display, the hand symbols will be numbered in the order that they are referenced in the text. Example: ① - ⑥.

Those controls appearing on a keyboard or keypad are referred to as keys. Additionally, Button Controls are as shown below:

VIEW STORED EVENTS		MANUAL STORE EVENT		SETUP PATIENT		VIEW WAVES	RECORD
08/10/01	10:00:00	SILENCE	VOLUME UP	VOLUME DOWN	STORE ALL	STATUS	RECORD

**NOTE** statements are for general information applicable to the current subject and appear in ***bold italic*** type style. Note statements appear as shown below:

### NOTES

#### ***Note Information.***

**CAUTION** statements in the manual identify conditions or operations that could result in damage to the system or other property. Caution statements appear in UPPERCASE as shown below:

### CAUTION

CAUTION INFORMATION.

**WARNING** statements in the manual identify conditions or operations that could result in personal injury. Warning statements appear in **UPPERCASE BOLD** type style as shown below:

### WARNING!

**WARNING INFORMATION.**

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## **SAFETY SUMMARY**

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- 1) **Do Not** autoclave the patient transmitters.
- 2) Frequent electrical and visual checks should be made on electrode wires. Broken or frayed electrode wires or loose fittings may cause interference or loss of signal. Particular attention should be paid to the point where the electrode wire enters the snap fittings since flexure will eventually cause breakage of strands at this point.
- 3) **Do Not** operate this product in the presence of flammable anesthetics. Explosion may result.
- 4) If the system is connected to accessory equipment, leakage current requirements must be maintained.
- 5) To insure patient safety, use only software, accessories and parts recommended by the manufacturer.
- 6) A product that has been dropped or severely abused should be checked by qualified service personnel to verify proper operation.
- 7) Component replacement or adjustment must be made by qualified service personnel only.
- 8) Patient transmitters have limited range. Ensure that patients remain within the area covered by the antenna system.
- 9) The system is intended as a complement to, not a substitute for, patient observation by trained health care personnel. Do not rely entirely on the alarm, arrhythmia or paging structure of the system.
- 10) **WARNING PACEMAKER PATIENTS.** Heart Rate Counts on patients with pacemakers may be erratic. Follow the instructions contained in the *Paced Patients* section of this manual. Keep pacemaker patients under close observation.
- 11) Do not place any item on top of the receiver enclosure that would obstruct air flow since heat may build up and cause damage to receivers.
- 12) Do not allow objects to rest on keyboard since erroneous data may be entered into patient chart and certain keys may cause adverse operations.

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## ARRHYTHMIA MONITORING

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Monitoring systems are aids to the nursing staff and are not intended to replace the vigilance of the staff to react to a displayed waveform on the monitor and take the appropriate action for the patient's well being even though the monitor has not alarmed. Qualified and trained monitoring technicians working in concert with arrhythmia detection systems produce the best results in detecting and alerting the nursing staff to patients' problems.

No arrhythmia detection algorithm is currently available from any supplier that can guarantee 100% accuracy. There is no method in use to simulate the infinite number of variations in patient waveforms. No arrhythmia system can, without some human intervention both at the monitor and the patient, detect and identify every type of morphology change that may occur in the total patient population.

The arrhythmia algorithm contained in the central station has been in use since the 1960's in many clinical environments. The algorithm has been tested against the AHA, MIT, and Beth Israel data bases and was found to be well over 90% accurate. This is well within the government standards.

The algorithm looks at five parameters of each and every ECG complex to decide if it is substantially different from the previously learned complexes from the subject patient. A decision is then made as to whether the ECG complex is normal or abnormal. If the ECG complex is determined to be abnormal, it is totaled in the abnormal counter. Should the number of abnormal exceed the operator set limit, an abnormal alarm will be generated and a sample of the abnormal will be stored for later recall. The total number of abnormal can be viewed and recorded on the *report screen*. (See the report generation section of this manual).

ST segment monitoring is accomplished by establishing a zero reference on the P-R interval during the *learn* process. A measurement is then taken 90ms from the peak of the "R" wave. Should the ST level exceed the operator set limit for a period of 15 seconds, an alarm notification will be presented on the display and a sample of the ECG will be stored. Since patient artifact is present in telemetry, no quantitative measurements are presented. If ST changes are present, revert to a proven method of ST detection such as a 12 lead EKG machine.

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## TM 8 DUAL LEAD TRANSMITTER

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The TM8 Dual Lead Transmitter is a crystal controlled transmitter operating in the VHF (174-216 Mhz) range. The transmitter utilizes 5 independent patient lead wires with snap electrode adapters for disposable electrodes.

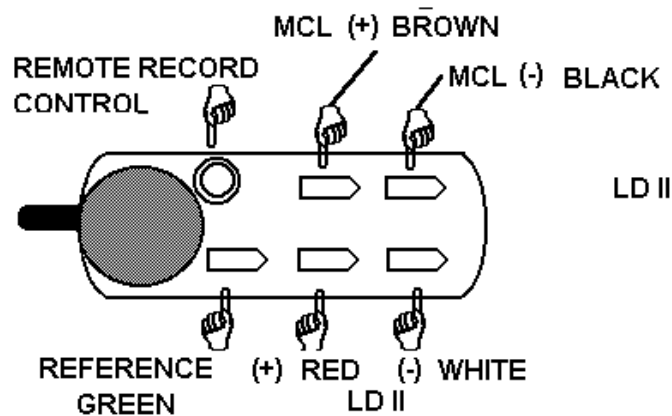
The ECG viewed from ECG1 is dependent upon the placement of the White (-) and the Red (+) electrodes. The ECG viewed from ECG2 is dependent upon the placement of the Black (-) and Brown (+) electrodes. Both ECG leads are transmitted all the time.

Should an electrode become detached, a *lead fault* message will be displayed at the central station. The central station will switch to the other lead.

A switch on the transmitter permits remote activation of the central station recorder.

The TM8A transmitter uses 2 each 1.5 volt "AAA" batteries. Average battery life is 7 to 10 days.

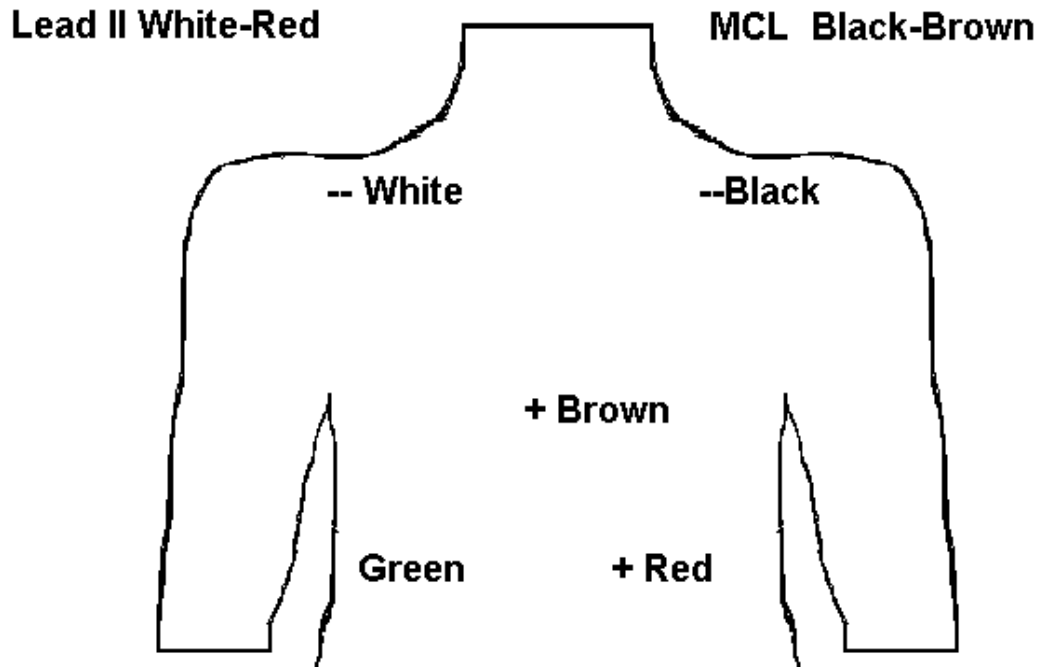
When the batteries reach an unsafe operating level, a *low bat* message will be displayed at the central station. Approximately 1 hour battery life is left when the *low bat* message is first displayed.



The TM8 transmitter utilizes 5 electrodes to provide Lead II and a Modified Chest Lead (MCL) for review at the central station. For optimum monitoring the electrodes should be placed in the following locations:

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TM8 DUAL LEAD TRANSMITTER**

**WHITE** Lead II negative electrode, **RIGHT CLAVICLE OR RIGHT STERNAL BORDER.**  
**RED** Lead II positive electrode, **LOWER LEFT RIB CAGE.**  
**BLACK** MCL negative electrode, **LEFT CLAVICLE OR LEFT STERNAL BORDER.**  
**BROWN** MCL positive electrode, **PLACE ON ANY OF 6 V-LEAD POSITIONS.**  
**GREEN** Reference electrode, **LOWER RIGHT RIB CAGE.**



The patient lead wires have a small ring on the bottom of the cable that plugs into the transmitter. When installing lead wires, press down until the cables snap into the transmitter.

If only one lead of ECG is required remove the brown and black lead wires from the transmitter. Refer to the section on **MULTI-VIEW WAVEFORMS** to disable lead fault on second channel.

**WARNING!**

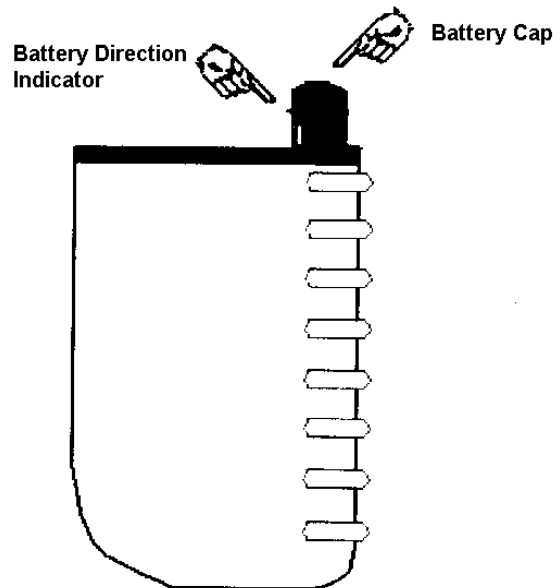
**ONLY USE THE SAFETY LEAD WIRES SUPPLIED WITH THE TRANSMITTER.**

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## Attaching the Transmitter to the Patient

Gently abrade the electrode sites with an alcohol prep pad until slight redness is observed. Dry the site before applying the electrodes. Attach the electrodes to the lead wires.

Insert the batteries in the transmitter as follows:



Hold the transmitter in one hand. Using the other hand thumb and index finger, grasp the battery cap and turn counter clockwise until the cap can be removed.

Insert both batteries with the positive ends up. See the battery direction indicator on the battery cap. Repeat the above instructions for the battery cap but rotate the cap clockwise.

### CAUTION

MAKE SURE THE BATTERIES ARE INSTALLED CORRECTLY. IF THE BATTERIES ARE INSTALLED INCORRECTLY, THE TRANSMITTER WILL NOT FUNCTION.

MAKE SURE THAT THE BATTERY CAP IS TIGHT. IF THE CAP IS NOT TIGHTENED PROPERLY, THE TRANSMITTER MAY BE INTERMITTENT AND THE WATER PROOFING SEAL MAY LEAK CAUSING DAMAGE TO THE TRANSMITTER

Attach the electrodes to the patient on the prepared sites. Apply pressure to the outer edges of the electrode, not the center. Applying pressure to the center may cause the electrode conductive jelly to ooze out resulting in a loose electrode.

If it is desirable to start the recorder from the transmitter, press and hold the *remote record* control for approximately 2 seconds. This will generate a 20 second strip at the central station. See the *Remote Record* section of this manual.

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## ALARM INDICATIONS

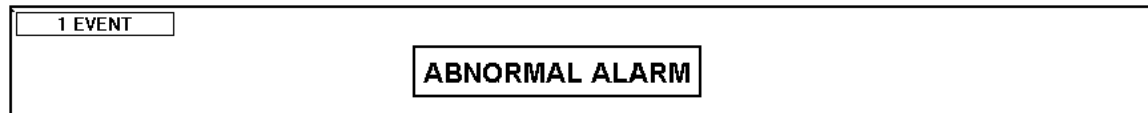
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### RATE ALARM:



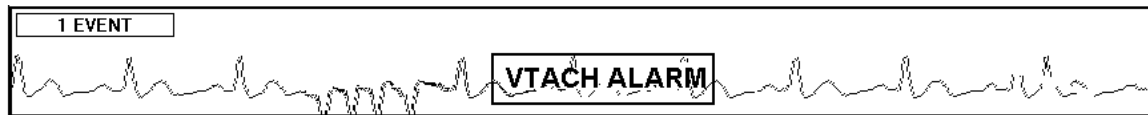
*Rate Alarm* messages indicate the heart rate has exceeded the high or low limits. For adjustments, see page 26.

### ABNORMAL ALARM:



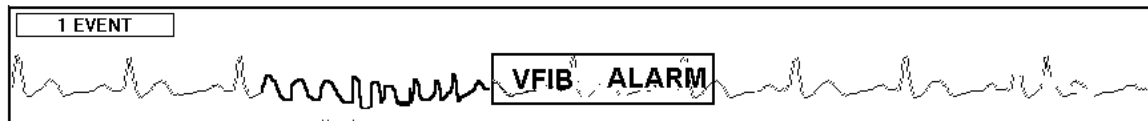
*Abnormal Alarm* messages indicate the abnormal per minute have exceeded the high alarm limit. For adjustments, see page 31.

### VTACH ALARM:



*VTACH Alarm* messages indicate that there has been an episode of consecutive abnormal. For adjustment, see page 32.

### VFIB ALARM:



*VFIB Alarm* messages indicate the system has detected an episode of **VFIB**.

### ASYSTOLE ALARM:



*Asystole Alarm* messages indicate that the system has detected an episode of Asystole.

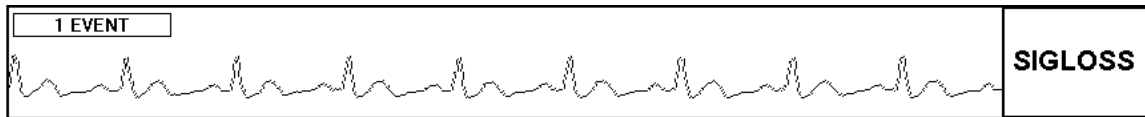


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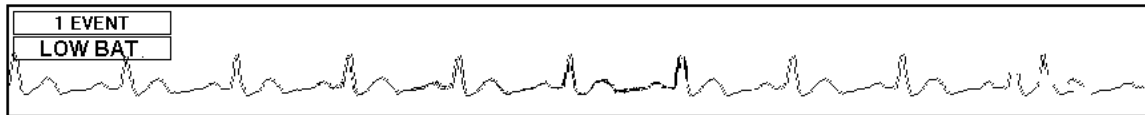
## OPERATOR ALERTS

### Operator Alerts

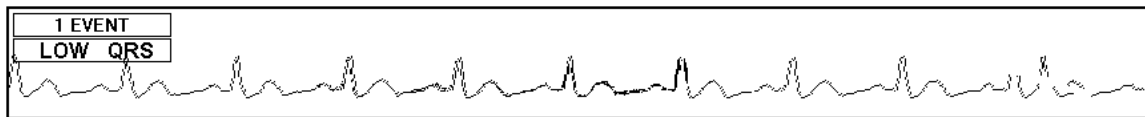
*LEAD FAULT* messages indicate an electrode is detached or is not making good contact. See pages 11, 66, 5.



*SIGNAL LOSS* messages indicate the central station is not receiving from the patient transmitter or there is too much noise on the trace for the system to analyze. Check to make sure the patient is within the designated monitoring area, the batteries are good, or there is AC interference on the baseline.



*LOW BAT* messages indicate the batteries have approximately one hour before they reach a level where the transmitter will no longer function. Replace the batteries as soon as possible when the message appears.



*LOW QRS* messages indicate the QRS complex is too small for reliable monitoring. See page 11 and page 36.

### Check Recorder

7/17/97	12:51:28 PM	ALARM SILENCE	VOL UP	VOL DOWN	STORE	CHECK RECORDER	RECORD
---------	-------------	---------------	--------	----------	-------	----------------	--------

Problems with the recorder are reported by the label of the control immediately to the left of the ALL RECORD button. The default label for this button is STATUS. If there is a problem with the recorder, the label changes to CHECK RECORDER as above. Check the recorder to insure that it is not out of paper or that the paper is jammed. See **LOADING PAPER AND RECORDINGS** section of this manual. Page 75 and page 76.

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**ALARM AND ALERT MATRIX**

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	RECORD	STORE	ALTERNATE SOUND	WARBLE SOUND	3-BEEP SOUND	COLOR
RATE	●	●	●			RED
ABNORMAL		●		●		RED
VTACH LESS 4 SECS		●		●		RED
VTACH MORE 4 SECS.	●	●	●	●		RED
VFIB	●	●	●	●		RED
ASYSTOLE	●	●	●	●		RED
ST CHANGE		●		●		RED
LEAD FAULT					●	AMBER
SIGNAL LOSS					●	RED
LOW BAT					●	AMBER
LOW QRS					●	RED

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## NEW PATIENT NAME ENTRY

VIEW STORED EVENTS	MANUAL STORE EVENT	SETUP PATIENT	VIEW WAVES	RECORD
				<b>OFF</b>

At the MAIN Screen, touch the area under the SETUP Column of the channel number desired as shown above.

CHANNEL	1	NAME	CALDWELS				ROOM	PATIENT ID				
MAIN	SETUP	REPORT	ALARMS	TRENDS	VIEW	EVENTS	DISCLOSURE					
1	2	3	4	5	6	7	8	9	0	DELETE	<b>NAME/R</b>	
A	B	C	D	E	F	G	H	I	J	ENTER	<b>R</b>	
K		L	M	N	O	P	Q	R	S	<b>T</b>		
QWERTY		T	U	V	W	X	Y	Z	<b>U</b>			
				SPACE				TYPE IN PATIENT NAME PRESS ENTER!				<b>R</b>
											<b>E</b>	
											<b>R</b>	
											<b>T</b>	
											<b>N</b>	

A keyboard is displayed beneath the patient waveforms. The above example shows the keyboard in ALPHA mode. If a typewriter keyboard is desired, touch the QWERTY key ①. The keyboard changes to a typewriter keyboard and the key toggles to ALPHA. The input focus is now at the NAME Window ②. Type in the patient name by touching the letters on the keyboard. Observe the name displayed in the NAME Window. In this example, the name CALDWELL has been entered. When correct, touch the ENTER Key ③.


After entering the patient name, you are now prompted to enter the patient room number. The input focus has tabbed to the ROOM Window ①. Type in the room number by touching the numbers on the keyboard. Observe the numbers in the ROOM Window. In this example, RM2709 has been entered. When the room number is correct, touch the ENTER Key ②.

After entering the patient room number, you are now prompted to enter the patient ID number. The input focus has tabbed to the PATIENT ID Window ①. Type in the ID number by touching the numbers on the keyboard. Observe the numbers in the PATIENT ID Window.

In this example, a patient ID number of 123456789 has been entered. When the patient ID number is correct, touch the SETUP key.

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## CHANGING PATIENT DISPLAY COLOR

VIEW STORED EVENTS	MANUAL STORE EVENT	SETUP PATIENT	VIEW WAVES	RECORD
1 EVENT			<b>HAYES</b>	<b>80</b>

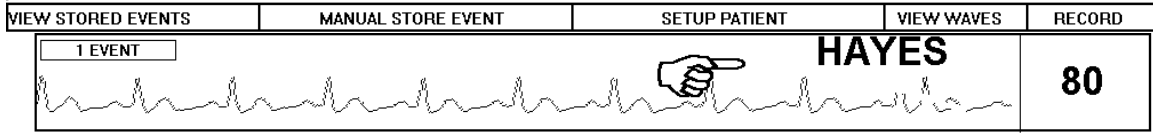
At the MAIN Screen, touch the area under the SETUP Column of the patient channel number desired as shown above.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	START	0 AM	ARRHY ON	2	7	12	17
FILTER	INT	0	PACER	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
			REMOTE REC	5	10	15	20
							<b>S E T U P</b>  <b>R E T U R N</b>

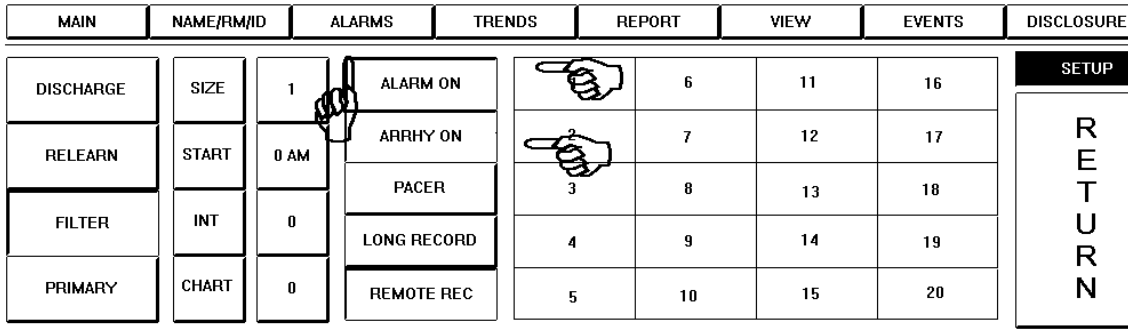
The panel beneath the patient waveforms contains a color selection keypad. In this example, the display color for patient HAYES is Color Number 1 and the Color Number 1 Key is depressed. Changing the display color to Color Number 17 is accomplished by touching the Color Number 17 Key on the keypad. The patient Label (Channel Number), waveform, ID Number, Name and Room Number are now displayed in Color Number 17. Touch RETURN to return to the MAIN screen. The patient's display color has been updated.

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## ALARM SETTINGS



At the MAIN Screen, touch the area under the SETUP Column of the patient channel number desired as shown above.



The SETUP Screen is displayed. Touch the ALARM Key①. The key displays as recessed and the label changes to ALARM ON. Touch the ARRHY Key②. The key displays as recessed and the label changes to ARRHY ON. Touch the ALARMS Button③ to go to the ALARMS Screen.

The alarm limit ranges and default values for the *TRENSCenter* Cardiac MONITOR are described in the following table:

	LOW	HIGH	DEFAULT
HEART RATE LOW	30	100	50
HEART RATE HIGH	110	250	150
SPO2	82	99	90
SYSTOLIC LOW	0	100	50
SYSTOLIC HIGH	110	250	180
DIASTOLIC LOW	20	70	50
DIASTOLIC HIGH	70	140	120
TEMP LOW	88	98	95
TEMP HIGH	95	109	101
RESP LOW	0	9	1
RESP HIGH	10	50	30
ABNORMAL	0	50	6
VTACH	2	8	4
ST	1	4	1

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### Alarm Settings - Heart Rate

MAIN	SETUP	NAME/RM/ID	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE																																																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">ALARM SETTINGS</th> <th style="width: 15%;">LOW</th> <th style="width: 15%;">HIGH</th> <td rowspan="6" style="width: 5%; text-align: center; vertical-align: middle;">           ↑  ↓         </td> <td style="width: 10%;">ABN</td> <td style="width: 10%;">6</td> <td style="width: 10%;">1</td> <td style="width: 10%;">2</td> <td style="width: 10%;">3</td> </tr> <tr> <td>HEART RATE</td> <td>40</td> <td>150</td> <td>VTACH</td> <td>4</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td></td> <td></td> <td></td> <td>ST</td> <td>1</td> <td>7</td> <td>8</td> <td>9</td> </tr> <tr> <td></td> <td></td> <td></td> <td>ST</td> <td>1</td> <td>DELETE</td> <td>0</td> <td>ENTER</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </thead> </table>							ALARM SETTINGS	LOW	HIGH	↑  ↓	ABN	6	1	2	3	HEART RATE	40	150	VTACH	4	4	5	6				ST	1	7	8	9				ST	1	DELETE	0	ENTER																	<b>ALARMS</b>  <b>R E T U R N</b>
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				ST	1	DELETE	0	ENTER																																																

**HEART RATE ALARM:** Heart Rate Low Limit range is 30 - 100. Heart Rate High Limit range is 110 - 250. The Heart Rate Alarm Limits are set by touching, in turn, the keys directly below the LOW<sup>①</sup> and HIGH<sup>②</sup> Column heading labels. Note that the key will be displayed as recessed as soon as you touch it, indicating that it is active. To *increase* the limit, touch the UP ARROW Key. To *decrease* the limit, touch the DOWN ARROW Key. Limit settings may also be made by touching the numbers on the numeric keypad. Touch ENTER to confirm the process. Upon touching ENTER, note that the key is no longer recessed. Touch the HEART RATE Key to enable the limit settings.

### Alarm Settings - Systolic Blood Pressure

CHANNEL	1	NAME	CALDWELL	ROOM	PCU 1	PATIENT ID	9876543																																																	
MAIN	SETUP	NAME/RM/ID	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE																																																	
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ALARM SETTINGS	LOW	HIGH	↑  ↓	ABN	6	1	2	3																																																
HEART RATE	40	150		VTACH	4	4	5	6																																																
BP SYST	100	160		ST	1	7	8	9																																																
BP DIAS	60	100		SpO2	90	DELETE	0	ENTER																																																
RESP	5	30																																																						
TEMP	95	104																																																						

**SYSTOLIC BLOOD PRESSURE ALARM:** Systolic Low Limit range is 0 - 100. Systolic High Limit range is 110 - 250. The Systolic Blood Pressure Alarm Limits are set by touching, in turn, the keys in the second row below the LOW<sup>①</sup> and HIGH<sup>②</sup> Column heading labels. As was the case in the previous example, the key will be displayed as recessed as soon as you touch it, indicating that it is active. To *increase* the limit, touch the UP ARROW Key. To *decrease* the limit, touch the DOWN ARROW Key. Limit settings may also be made by touching the numbers on the numeric keypad. Touch the ENTER Key to confirm the process. Upon touching ENTER, again note that the key is no longer recessed. Touch the BP SYST Key to enable the limit settings.

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## Alarm Settings - Diastolic Blood Pressure

CHANNEL	1	NAME	CALDWELL	ROOM	PCU 1	PATIENT ID	9876543	
MAIN	SETUP	NAME/RM/ID	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE	
<b>ALARM SETTINGS</b>	<b>LOW</b>	<b>HIGH</b>	↑ ↓	ABN	6	1	2	3
HEART RATE	40	150		VTACH	4	4	5	6
BP SYST	100	160		ST	1	7	8	9
BP DIAS	60	100		SpO2	90	DELETE	0	ENTER
RESP	5	30						
TEMP	95	104						
<b>ALARMS</b>								<b>R E T U R N</b>

**DIASTOLIC BLOOD PRESSURE ALARM:** Diastolic Low Limit range is 20 - 70. Diastolic High Limit range is 70 - 140. The Diastolic Blood Pressure Alarm Limits are set by touching, in turn, the keys in the third row below the LOW① and HIGH② Column heading labels. To *increase* the limit, touch the UP ARROW Key. To *decrease* the limit, touch the DOWN ARROW Key. Limit settings may also be made by touching the numbers on the numeric keypad. Touch the ENTER Key to confirm the limit. Touch the BP DIAS key to enable the limit settings.

## Alarm Settings - Respiration Rate

CHANNEL	1	NAME	CALDWELL	ROOM	PCU 1	PATIENT ID	9876543	
MAIN	SETUP	NAME/RM/ID	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE	
<b>ALARM SETTINGS</b>	<b>LOW</b>	<b>HIGH</b>	↑ ↓	ABN	6	1	2	3
HEART RATE	40	150		VTACH	4	4	5	6
BP SYST	100	160		ST	1	7	8	9
BP DIAS	60	100		SpO2	90	DELETE	0	ENTER
RESP	5	30						
TEMP	95	104						
<b>ALARMS</b>								<b>R E T U R N</b>

**RESPIRATION RATE ALARM:** Respiration Low Limit range is 0 - 9. Respiration High Limit range is 10 - 50. The Respiration Rate Alarm Limits are set by touching, in turn, the keys in the fourth row below the LOW① and HIGH② Column heading labels. To *increase* the limit, touch the UP ARROW Key. To *decrease* the limit, touch the DOWN ARROW Key. Limit settings may also be made by touching the numbers on the numeric keypad. Touch the ENTER Key to confirm the process. Touch the RESP key to enable the limit settings.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## Alarm Settings - Body Temperature

CHANNEL	1	NAME	CALDWELL	ROOM	PCU 1	PATIENT ID	9876543		
MAIN	SETUP	NAME/RM/ID	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE		
<b>ALARM SETTINGS</b>	<b>LOW</b>	<b>HIGH</b>	 	ABN	6	1	2	3	<b>ALARMS</b>  <b>R E T U R N</b>
HEART RATE	40	150		VTACH	4	4	5	6	
BP SYST	100	160		ST	1	7	8	9	
BP DIAS	60	100		SpO2	90	DELETE	0	ENTER	
RESP	5	30							
TEMP	95	104							

**BODY TEMPERATURE ALARM:** Temperature Low Limit range is 88 - 98. Temperature High Limit range is 95 - 109. The Body Temperature Alarm Limits are set by touching, in turn, the keys in the fifth row below the LOW<sup>①</sup> and HIGH<sup>②</sup> Column heading labels. To *increase* the limit, touch the UP ARROW Key. To *decrease* the limit, touch the DOWN ARROW Key. Limit settings may also be made by touching the numbers on the numeric keypad. Touch the ENTER Key to confirm the process. Touch the TEMP Key to enable the limit settings.

## Alarm Settings - Abnormals

CHANNEL	1	NAME	CALDWELL	ROOM	PCU 1	PATIENT ID	9876543		
MAIN	SETUP	NAME/RM/ID	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE		
<b>ALARM SETTINGS</b>	<b>LOW</b>	<b>HIGH</b>	 	ABN	6	1	2	3	<b>ALARMS</b>  <b>R E T U R N</b>
HEART RATE	40	150		VTACH	4	4	5	6	
BP SYST	100	160		ST	1	7	8	9	
BP DIAS	60	100		SpO2	90	DELETE	0	ENTER	
RESP	5	30							
TEMP	95	104							

**ABNORMALS ALARM:** Abnormal Limit Range is 0 - 50. The Abnormal Default Value is 6. Note the ABN Key<sup>①</sup>. The Abnormal Alarm Limit is set by touching the numeric key<sup>②</sup> immediately to the right of the ABN Key. To *increase* the limit, touch the UP ARROW Key. To *decrease* the limit, touch the DOWN ARROW Key. The abnormal limit setting may also be made by touching the numbers on the numeric keypad. Touch the ENTER Key to confirm the process..



# TrensCenter Central Station Cardiac Monitor Operator's Manual

## Alarm Settings - VTACH

CHANNEL	1	NAME	CALDWELL	ROOM	PCU 1	PATIENT ID	9876543	
MAIN	SETUP	NAME/RM/ID	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE	
<b>ALARM SETTINGS</b>	<b>LOW</b>	<b>HIGH</b>		ABN	6	1	2	3
HEART RATE	40	150		VTACH	4	4	5	6
BP SYST	100	160		ST	1	7	8	9
BP DIAS	60	100		SpO2	90	DELETE	0	ENTER
RESP	5	30						
TEMP	95	104						
								<b>ALARMS</b>  <b>R E T U R N</b>

**VTACH ALARM:** VTACH Limit Range is 2 - 8. The VTACH Default Value is 4. Note the VTACH Key①. The VTACH Alarm Limit is set by touching the numeric key② immediately to the right of the VTACH Key. To *increase* the limit, touch the UP ARROW Key. To *decrease* the limit, touch the DOWN ARROW Key. The VTACH Limit setting may also be made by touching the numbers on the numeric keypad. Touch the ENTER Key to confirm the process.

## Alarm Settings - SPO2

CHANNEL	1	NAME	CALDWELL	ROOM	PCU 1	PATIENT ID	9876543	
MAIN	SETUP	NAME/RM/ID	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE	
<b>ALARM SETTINGS</b>	<b>LOW</b>	<b>HIGH</b>		ABN	6	1	2	3
HEART RATE	40	150		VTACH	4	4	5	6
BP SYST	100	160		ST	1	7	8	9
BP DIAS	60	100		SpO2	90	DELETE	0	ENTER
RESP	5	30						
TEMP	95	104						
								<b>ALARMS</b>  <b>R E T U R N</b>

**SPO2 ALARM:** SPO2 Limit Range is 82 - 99. The SPO2 Default Value is 90. Note the SPO2 Key①. The SPO2 Alarm Limit is set by touching the numeric key② immediately to the right of the SPO2 Key. To *increase* the limit, touch the UP ARROW Key. To *decrease* the limit, touch the DOWN ARROW Key. The SPO2 Limit setting may also be made by touching the numbers on the numeric keypad. Touch the ENTER Key to confirm the process.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

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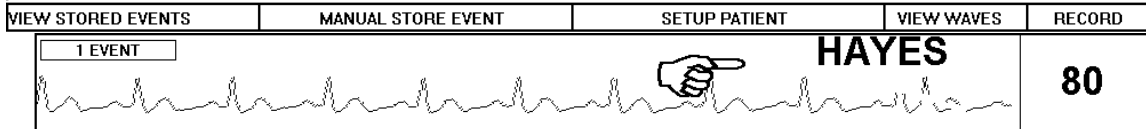
## Alarm Settings - ST

CHANNEL	1	NAME	CALDWELL	ROOM	PCU 1	PATIENT ID	9876543	
MAIN	SETUP	NAME/RM/ID	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE	
<b>ALARM SETTINGS</b>	<b>LOW</b>	<b>HIGH</b>					<b>ALARMS</b>	
HEART RATE	40	150	↑	ABN	6	1	2	3
BP SYST	100	160		VTACH	4	4	5	6
BP DIAS	60	100	↓	ST	1	7	8	9
RESP	5	30		SpO2	90	DELETE	0	ENTER
TEMP	95	104						
								RETURN

**ST ALARM:** The ST Limit Range is 1 - 4. The ST Default Value is 1. Note the ST Key①. The ST Alarm Limit is set by touching the numeric key② immediately to the right of the ST Key. To *increase* the limit, touch the UP ARROW Key. To *decrease* the limit, touch the DOWN ARROW Key. The ST Limit setting may also be made by touching the numbers on the numeric keypad. Touch the ENTER Key to confirm the process.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## ECG SIZE ADJUSTMENT

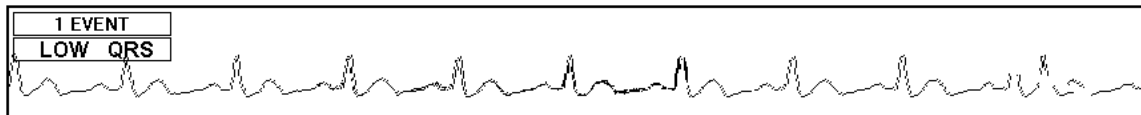


At the MAIN Screen, touch the area under the SETUP Column of the patient channel number desired as shown above.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	START	0 AM	ARRHY ON	2	7	12	17
FILTER	INT	0	PACER	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
			REMOTE REC	5	10	15	20
							<b>S E T U P</b>  <b>R E T U R N</b>

The SETUP Screen is displayed. Note the SIZE Label<sup>⓪</sup>. The ECG display size is adjusted by touching the numeric SIZE Key<sup>Ⓛ</sup> immediately to the right of the SIZE Label. The normal size setting is 1 as shown above. The ECG may be displayed at half normal size, normal size, twice normal size and four times normal size. In this example, touching the Size Key four times would cycle the ECG display size through 2, 4, ½, and back to 1.


### Low QRS Alert



If the size of the QRS is too small for the system to count, a LOW QRS message will be displayed. The electrodes must be repositioned to acquire a larger QRS. Normal monitoring should be accomplished through the use of Lead II (white electrode on right clavicle or mid sternum, red or black electrode on lower left rib cage). If the QRS is too small in Lead II, try a MCL lead (White electrode on left clavicle, red or black electrode in the V1 position (right of sternum, 4<sup>th</sup> or 5<sup>th</sup> intercostal space). If neither of these lead placements work, check the patient's 12 Lead Electrocardiogram to check which side of the heart is putting out the most voltage. Apply the electrodes there to simulate Lead I, II or III.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## RELEARN OF ECG RHYTHM

VIEW STORED EVENTS	MANUAL STORE EVENT	SETUP PATIENT	VIEW WAVES	RECORD
1 EVENT			<b>HAYES</b>	<b>80</b>

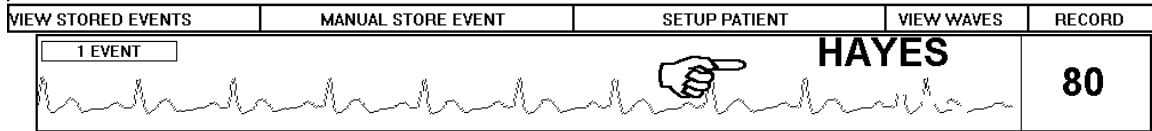
At the MAIN Screen, touch the area under the SETUP Column of the patient channel number desired.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	STAFF	0 AM	ARRHY ON	2	7	12	17
FILTER	INT	0	PACER	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
			REMOTE REC	5	10	15	20
							<b>S E T U P</b>  <b>R E T U R N</b>

If the system is counting a normal complex as an *abnormal*, such as, Bundle Branch Block, Aberrancy or Paced Patients, touch the RELEARN key. The system will look at the next 60 complexes to establish a new normal complex for that patient.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## FILTER AND MONITOR



At the MAIN Screen, touch the area under the SETUP Column of desired channel number.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	RETURN
RELEARN	START	0 AM	ARRHY ON	2	7	12	
MONITOR	INT	0	PACER	3	8	13	
PRIMARY	CHART	0	LONG RECORD	4	9	14	
			REMOTE REC	5	10	15	
							SETUP


The SETUP Screen is displayed. The FILTER selection is used to present a clean waveform by removing the artifact from the baseline of the ECG. Note the key labeled MONITOR. This is a two-state selection key to toggle between FILTER Mode and MONITOR Mode. In the above example, FILTER Mode is available for selection and MONITOR Mode is the active state. FILTER Mode is the default. Note that the key is recessed. Touch the MONITOR Key to go the next display. MONITOR Mode removes the artifact filter and allows more signal to be displayed. This might be used when a pacer spike is present and a larger spike is required for display.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	RETURN
RELEARN	START	0 AM	ARRHY ON	2	7	12	
FILTER	INT	0	PACER	3	8	13	
PRIMARY	CHART	0	LONG RECORD	4	9	14	
			REMOTE REC	5	10	15	
							SETUP

The key label has toggled to FILTER and the key is displayed as recessed. Filter mode is used to remove the artifact from baseline of the ECG to allow better viewing.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## BACK-UP TRANSMITTER

VIEW STORED EVENTS	MANUAL STORE EVENT	SETUP PATIENT	VIEW WAVES	RECORD
1 EVENT			<b>HAYES</b>	<b>80</b>

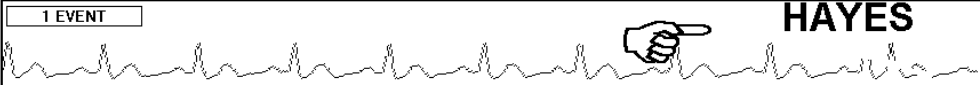
At the MAIN Screen, touch the area under the SETUP Column of the patient channel number desired.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	START	0 AM	ARRHY ON	2	7	12	17
MONITOR		0	PACER	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
			REMOTE REC	5	10	15	20
							<b>R E T U R N</b>

The SETUP Screen is displayed. The control for the receiver should show PRIMARY, as above. If it is necessary to use the Auxiliary (Back-up) Transmitter, touch the PRIMARY key. The key label changes to AUXILIARY. The system is now set up to use the Back-up Transmitter for that channel.


# TrensCenter Central Station Cardiac Monitor Operator's Manual

## DISCHARGING A PATIENT

VIEW STORED EVENTS	MANUAL STORE EVENT	SETUP PATIENT	VIEW WAVES	RECORD
1 EVENT				<b>80</b>

At the MAIN Screen, touch the area under the SETUP Column of desired channel number.


The SETUP Screen is displayed.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE 	1	ALARM ON	1	6	11	16	<b>RETURN</b>
RELEARN	0 AM	ARRHY ON	2	7	12	17	
FILTER	0	PACER	3	8	13	18	
PRIMARY	0	LONG RECORD	4	9	14	19	
		REMOTE REC	5	10	15	20	

### NOTES

***Discharging a patient erases all data for that patient.***

Touch the DISCHARGE Key as shown above to go to the next screen.

CHANNEL	1	NAME	CALDWELL	ROOM	PCU 1	PATIENT ID	9876543
MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
<p><b>DISCHARGE PATIENT CALDWELL?</b></p> <div style="display: flex; justify-content: center; align-items: center; gap: 20px;">  <div style="border: 1px solid black; padding: 5px 15px;">YES</div> <div style="border: 1px solid black; padding: 5px 15px;">NO</div> </div>							

You are prompted to confirm that you want to discharge the patient. If the patient is, in fact, to be discharged, touch the Yes Key①. If the DISCHARGE Key was touched in error, touching the No Key② will return you to the SETUP display.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## REPORT GENERATION

VIEW STORED EVENTS	MANUAL STORE EVENT	SETUP PATIENT	VIEW WAVES	RECORD
<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">1 EVENT</div> </div>			HAYES	80

At the MAIN Screen, touch the area under the SETUP Column of the patient channel number desired.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	11		RETURN
RELEARN	START	0 AM	ARRHY ON	2	7	17	
FILTER	INT	0	PACER	3	8	18	
PRIMARY	CHART	0	LONG RECORD		9	14	
			REMOTE REC	5		15	

The SETUP Screen is displayed. Touch the REPORT Button to go to the next display.

	HR	RESP	SYST	DIAS	SO2	TEMP	ABN	VTAC	VFIB	ASYST	REASON
5/4/99 8:10AM	89		120	80	98						
5/4/99 8:20AM	123		132	86	98						
5/4/99 8:20AM	115		120	80	96						
5/4/99 8:20AM	120		120	80	95						
5/4/99 8:20AM	90		120	80	97						

▲

▲▲

▲

▼

▼▼

▼

RETURN



The Reports Screen is displayed. In this example, a VTACH event is the reason for the report. The time of the report is displayed at left, as are the patient vitals. The Top and Bottom ARROW Keys are for moving to the beginning or end of the report. The Double Triangle ARROW Keys are for moving from page to page. The inside Up and Down ARROW Keys are for moving from line to line.

To print the report, touch inside the report window.




# TrensCenter Central Station Cardiac Monitor Operator's Manual

## PACEMAKER PATIENTS

VIEW STORED EVENTS	MANUAL STORE EVENT	SETUP PATIENT	VIEW WAVES	RECORD
1 EVENT		 <b>HAYES</b>		<b>80</b>
				

At the MAIN Screen, touch the area under the SETUP Column of desired channel number.


MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	START	0 AM	ARRHY ON	2	7	12	17
FILTER	INT	0	PACER 	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
			REMOTE REC	5	10	15	20
							<b>R E T U R N</b>

The SETUP Screen is displayed. Note the PACER Key. The system defaults to patients without pacemakers and the PACER Key is displayed as not being recessed. If a patient is admitted with a pacemaker, touch the PACER Key. The key becomes recessed. This will insure a more reliable heart rate count. Touch the FILTER button to the left of the screen. The button will change to MONITOR. This should enhance the pacer spike on the display.


### NOTES

***Do not monitor a non-pacer patient in the pacer mode. This could result in inaccurate heart rate count.***

# TrensCenter Central Station Cardiac Monitor Operator's Manual REMOTE RECORD

VIEW STORED EVENTS	MANUAL STORE EVENT	SETUP PATIENT	VIEW WAVES	RECORD
1 EVENT				<b>HAYES</b> <b>80</b>


At the MAIN Screen, touch the area under the SETUP Column of desired channel number.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	START	0 AM	ARRHY ON	2	7	12	17
FILTER	INT	0	PACER	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
			REMOTE REC 	5	10	15	20
<b>SETUP</b>							<b>R E T U R N</b>

The Setup Screen is displayed. The Remote Record Control may be turned on or off for each individual patient. Note the REMOTE REC Key above. The default is Remote Record Disabled and the REMOTE REC Key is not recessed. Touch the REMOTE REC Key to activate remote recording. The key is now recessed. To deactivate, touch the REMOTE REC Key. The key returns to non-recessed position. This prevents remote activation of the recorder.

## ALARM VOLUME CONTROL


### Alarm Volume Control

<b>1</b>	1 EVENT						♥ ABN 0(6) <b>80</b> 40-150
7/17/97	12:57:28 PM	ALARM SILENCE	VOL UP	VOL DOWN	STORE ALL	STATUS	RECORD ALL

The alarm volume can be increased or decreased at the MAIN Screen by touching the VOL UP<sup>①</sup> or VOL DOWN<sup>②</sup> Buttons. The volume controls are touch and release controls. Touch the button once and release, touch again to continue adjusting the volume. The volume controls are available at all screens in the same screen position as shown above. When the minimum and maximum levels are reached the controls will turn light blue.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## SETTING CHART INTERVALS

VIEW STORED EVENTS	MANUAL STORE EVENT	SETUP PATIENT	VIEW WAVES	RECORD
1 EVENT			<b>HAYES</b>	<b>80</b>

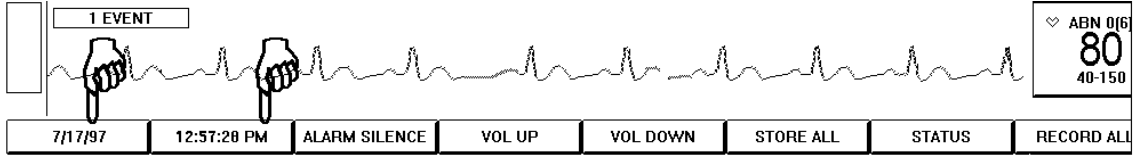
At the MAIN Screen, touch the area under the SETUP Column of desired channel number.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	START	0 AM	ARRHY ON	2	7	12	17
FILTER	INT	0	PACER	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
			REMOTE REC	5	10	15	20
							<b>SETUP</b>  <b>R E T U R N</b>

The SETUP Screen is displayed. Note the key immediately to the right of the CHART Label. This key is a touch and release control used to set the charting interval. The numeric value displayed on this control is the current number of minutes between automatic charting of patient vitals. This control changes the charting interval from minimum to maximum and back to minimum. The *TrensCenter* will automatically store all the patient vitals and trace data.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## DATE AND TIME SETTINGS



At the MAIN Screen, note the two buttons at the lower left corner. The leftmost button is the DATE Button①. Immediately to the right of the DATE Button is the TIME Button②. To change the date setting, touch the DATE Button. The DATE/TIME Screen will be displayed.

### Setting the Date

MAIN	SETUP	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS
NEW DATE <b>11/25/1997</b>		YEAR ↑ ↓	MONTH ↑ ↓	DAY ↑ ↓	1	2	3
NEW TIME <b>8:13 AM</b>		HOUR ↑ ↓	MINUTE ↑ ↓	AM/PM  SET	4	5	6
					7	8	9
					DELETE	0	ENTER
							DATE/TIME  RETURN

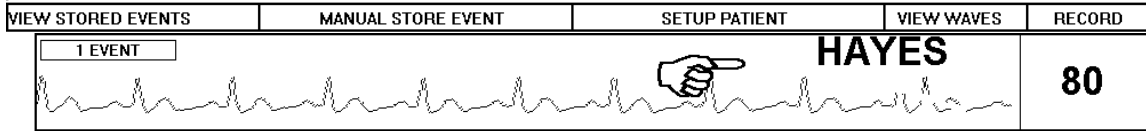
Touch the NEW DATE Key. Use the UP and DOWN ARROW Keys for YEAR, MONTH and DAY to increase or decrease the displayed date on the NEW DATE Key②. When the displayed date on the NEW DATE Key is correct touch the SET Key③ to complete the date setting. The NEW DATE key is no longer recessed and the DATE Key in the lower left corner of the screen displays the revised date.

### Setting the Time

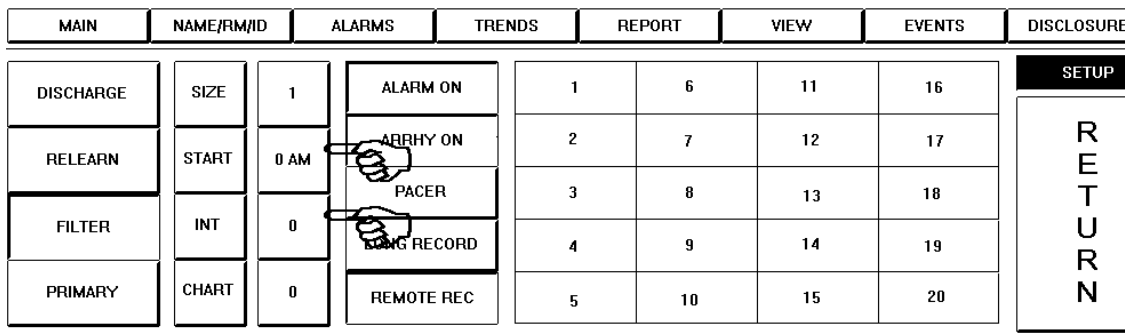
Touch the NEW TIME Key. Use the UP and DOWN ARROW Keys for HOUR and MINUTE to increase or decrease the displayed time on the NEW TIME Key①. When the displayed time on the NEW TIME Key is correct, Touch the SET Key② to complete the time setting. The NEW TIME key is no longer recessed and the DATE Key in the lower left corner of the screen displays the revised date.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## AUTOMATIC RECORDINGS



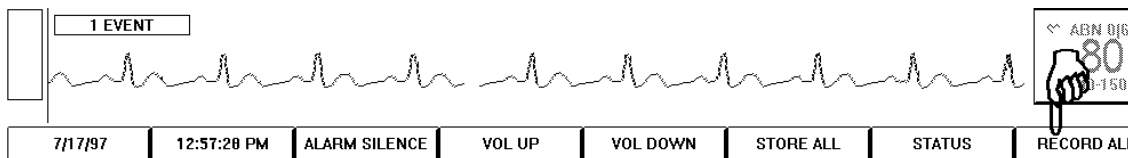
At the MAIN Screen, touch the area under the SETUP Column of desired channel number.



Automatic recordings are available for all patients at the end of the shift or at any preset interval. To set the time of the first recording, touch the setting key to the right of the START Label①. This setting key is a touch and release control to adjust the starting time. To set the hourly interval between recordings, touch the key to the right of the INT Label②. With settings of START 7 AM and INT 8, recordings would be generated at 7 AM, 3PM and 11PM.

## ALL RECORD


### All Record



To record a rhythm strip on all patients, make sure that the ECG waveforms are free of artifact. At the MAIN Screen, Touch the ALL RECORD Button as shown above. The system will record a 20 second strip for all patients. The length of the strip is determined by the settings in the REPORT configuration screen.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## SETTING LONG AND SHORT RECORDINGS

VIEW STORED EVENTS	MANUAL STORE EVENT	SETUP PATIENT	VIEW WAVES	RECORD
1 EVENT			<b>HAYES</b>	<b>80</b>

At the MAIN Screen, touch the area under the SETUP Column of desired channel number.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	START	0 AM	ARRHY ON	2	7	12	17
FILTER	INT	0	PACER	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
			REMOTE REC	5	10	15	20
							<b>R E T U R N</b>

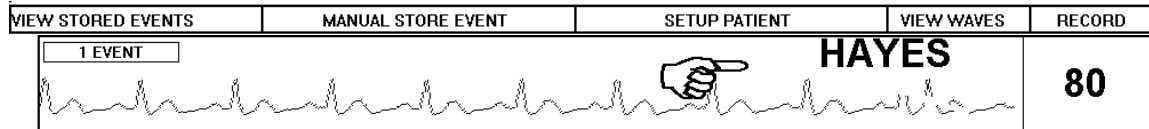
Note the LONG RECORD Key. There are two recording activation modes, long and short. The default is LONG RECORD and the LONG RECORD Key is not recessed. To select SHORT RECORD mode, touch the LONG RECORD Key. The key label changes to SHORT RECORD and the key displays as recessed. In the LONG RECORD mode, the recorder will only record arrhythmia alarm events which have a duration longer than 6 seconds. In the SHORT RECORD mode, the recorder is activated by any arrhythmia alarm event including ABNORMAL alarms. The LONG RECORD mode is used to prevent running of paper for repeat alarms.

# TrensCenter Central Station Cardiac Monitor Operator's Manual


## MANUAL RECORDING

To manually record an ECG strip, touch the Heart Rate Button. Touch again to stop the recorder.

To store a strip for later recording, touch the waveform directly under the MANUAL STORE EVENT window.



To freeze the waveform and store it for further examination, touch the area under the STORE Column at the MAIN Screen of the patient channel desired.

CHANNEL	1	NAME	CALDWELL	ROOM	PCU 1	PATIENT ID	9876543
MAIN	SETUP	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	DISCLOSURE
RECORD	1					↑	EVENTS
DELETE		MANUAL 12:04:46 PM, 7/17/97	LEARNED 12:04:46 PM, 7/17/97			↓	RETURN
LIST EVENTS							
PRINT							

The manually stored waveform is displayed on the EVENTS Screen.

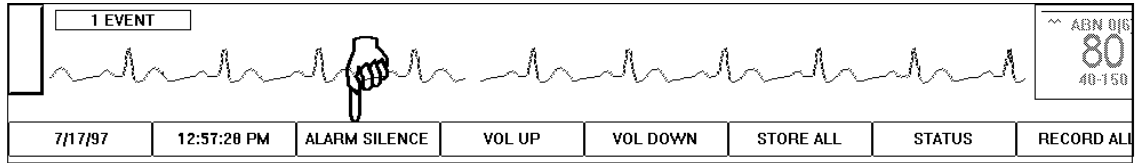
Touch the waveform and DELETE if the waveform is not important.

Touch the waveform and RECORD to make a permanent copy of the waveform.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## SILENCING ALARMS

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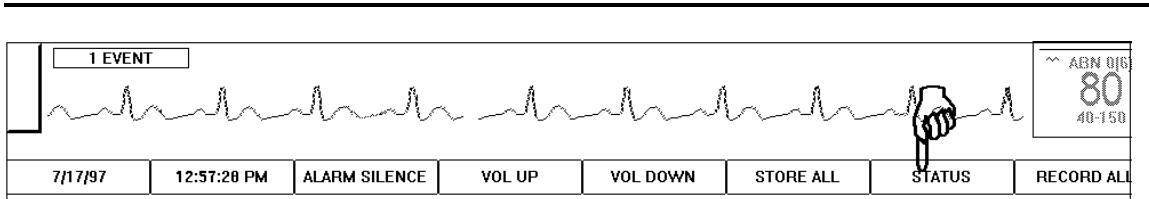


The SILENCE Button is used to temporarily silence the alarm tone. This button is a touch and release control. Touch once to silence alarms. This silences any alarms that are currently active. Any new alarm that occurs after the SILENCE Button has been touched will reactivate the audible alarms. The SILENCE function will time out after two minutes and resume the alarm in progress if the alarm still exists.

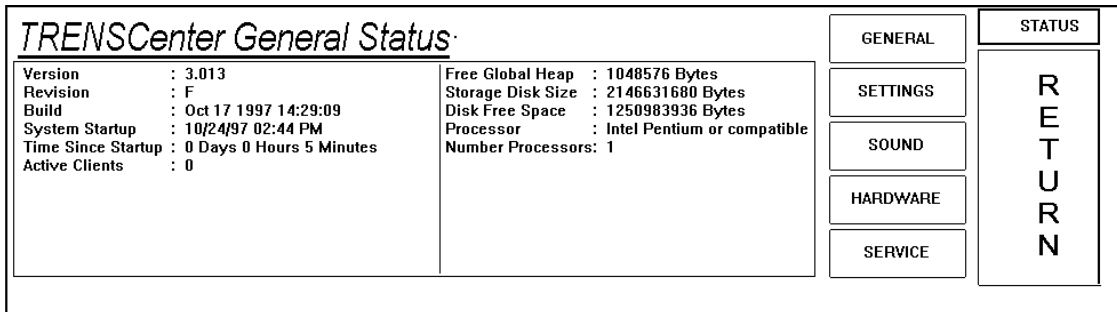


# TrensCenter Central Station Cardiac Monitor Operator's Manual

## SYSTEM STATUS

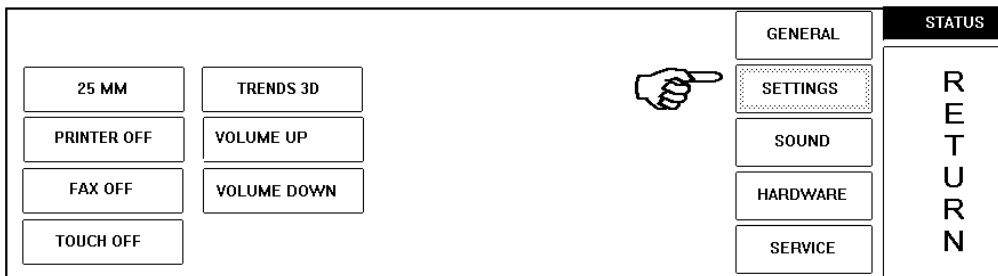


At the MAIN Screen, touch the STATUS Button as shown above.



The STATUS Screen is displayed<sup>①</sup>. Touch the GENERAL Key<sup>②</sup>. System information is displayed in the STATUS Window<sup>③</sup>. The information in this window gives a “snapshot” of system resource utilization. The STATUS Button is available from all screens.

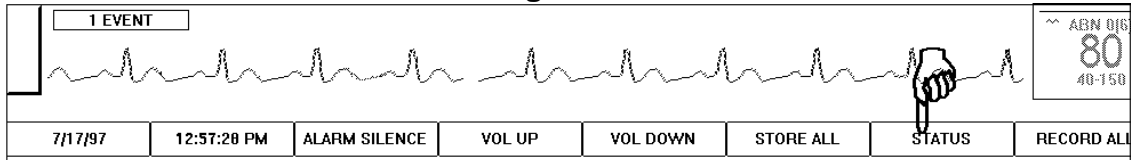
### Checking Settings



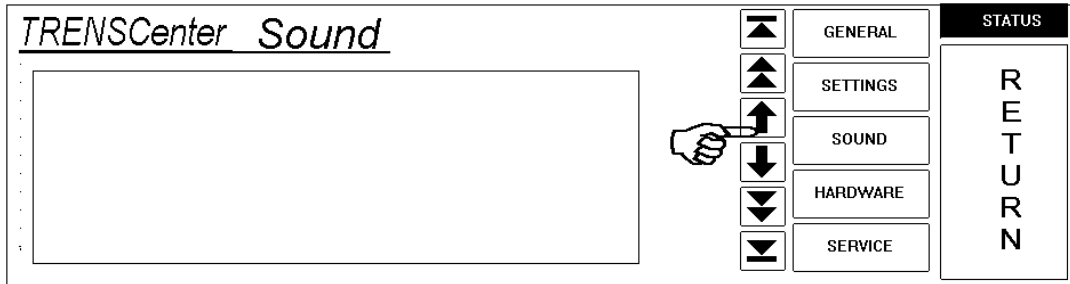
Touching the SETTINGS Key displays the settings controls. There is a chart recorder speed control. This is used to change the recorder speed to 50 mm/s. The Recorder control turns off the printer if only a laser printer is to be used. The trends control selects trend information in two dimensional or three dimensional mode. The TOUCH OFF control disables the touch screen for cleaning.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## Checking Sound Status

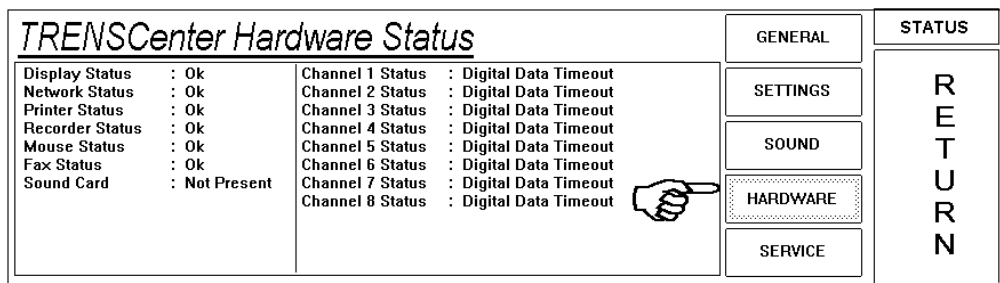


If you are not at the STATUS Screen, touch the STATUS Button at the lower right of the screen.



Touch the SOUND Key as shown above. Sound equipment and usage information is displayed in the STATUS Window. In this example, sound hardware has not yet been installed.

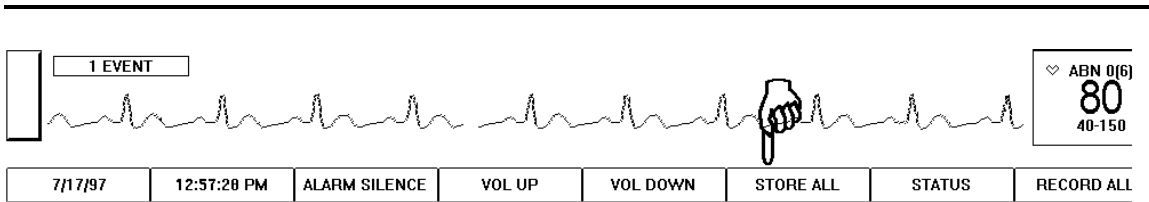
## Checking Hardware Status



Touch the HARDWARE Key. System hardware configuration is displayed in the left column of the STATUS Window as is hardware condition status. Channel condition status is reported in the right column.

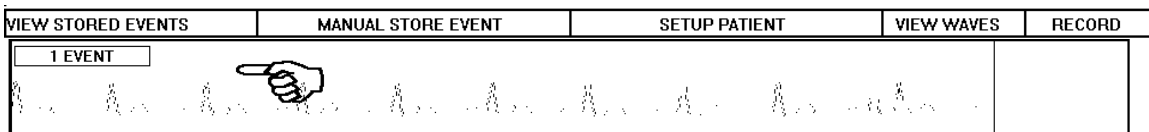
# TrensCenter Central Station Cardiac Monitor Operator's Manual

## STORE ALL EVENTS

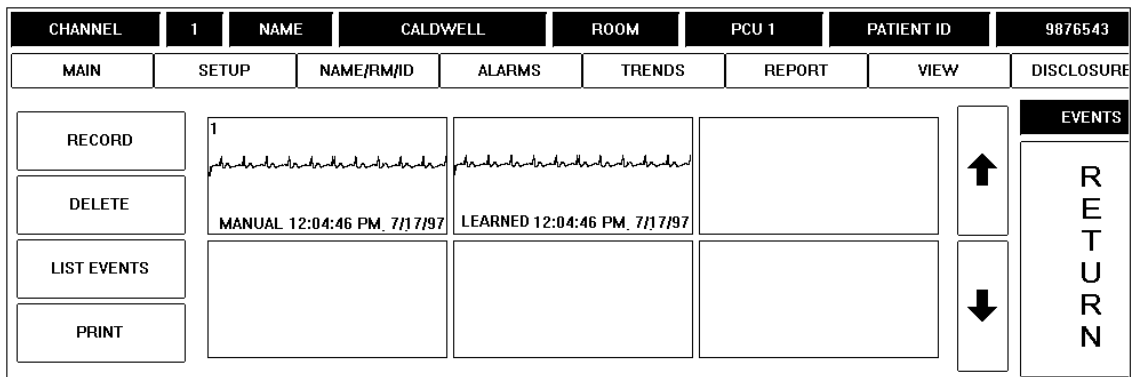


Events may be stored for all active channels. At the MAIN Screen, note the STORE ALL Button. The STORE ALL Button is a touch and release control. Touch the STORE ALL Button to store manual events for all patients. Touching this control is functionally the same as touching the STORE Column area for each patient.

## VIEW EVENTS



Touch the patient waveform under the VIEW STORED EVENTS Column of the patient channel desired.

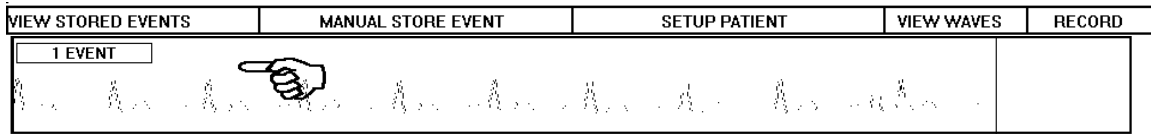


The EVENTS Screen is displayed. Both manually stored and learned events are displayed as above. If alarmed events have occurred, they are displayed as well.

# TrensCenter Central Station Cardiac Monitor

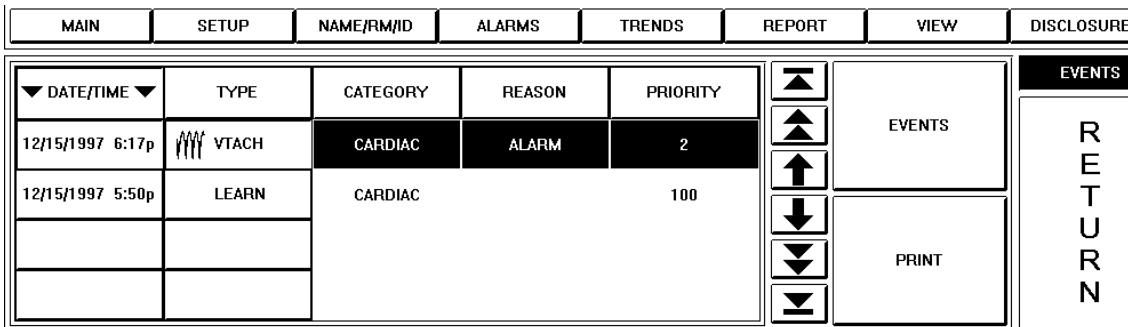
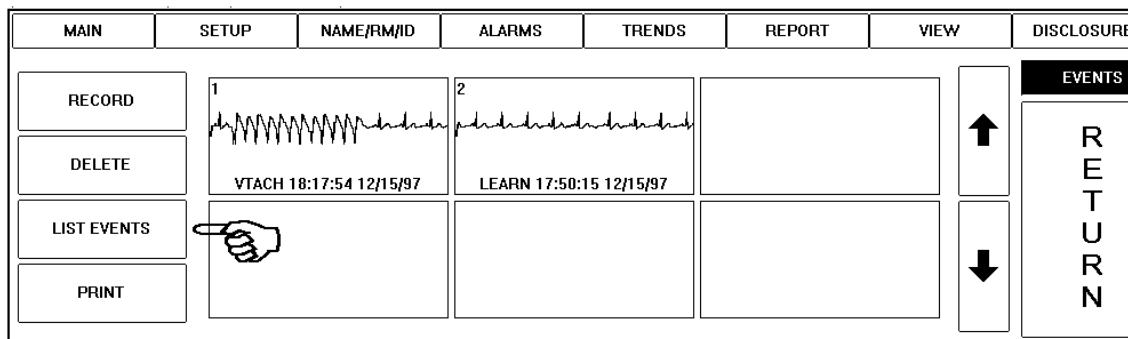
## Operator's Manual

### LIST EVENTS



Touch the area under the VIEW STORED EVENTS Column of the desired patient channel. If alarms have occurred for the patient, a message displayed in RED inside a RED RECTANGLE will appear as shown above listing the number of EVENTS. If the message is in AMBER, someone has looked at and edited the events.

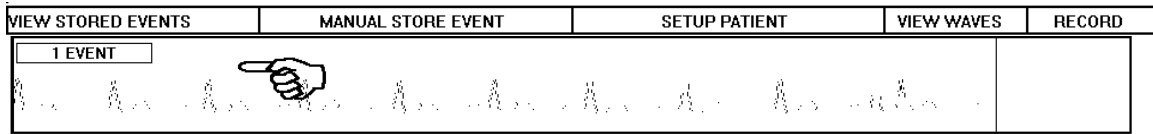
The EVENTS Screen is displayed. Touch the LIST EVENTS key to view the listing of events.



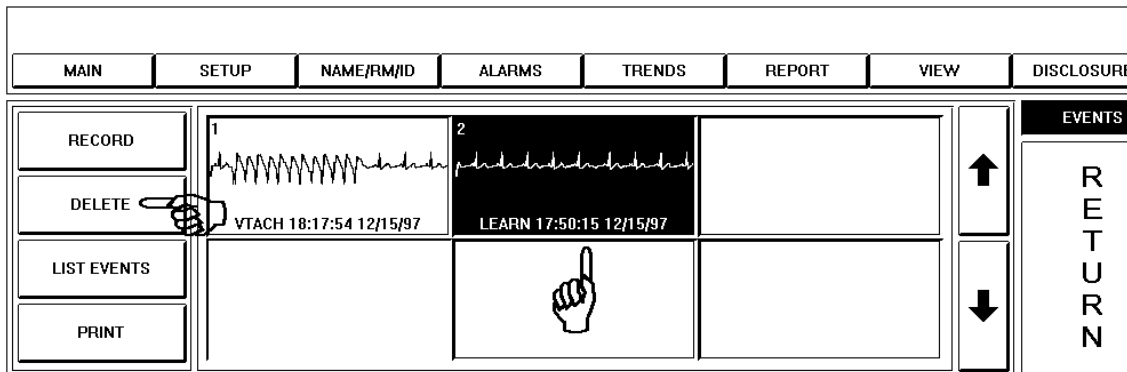
The EVENTS Listing is displayed. Touch the ARROW Keys to go to the beginning or end of the listing (top ARROW and bottom ARROW Keys). Touch the Double Triangle ARROW Keys to navigate between pages. Touch the inner arrow keys to navigate on a page. To print the strip of the event, touch the area under the CATEGORY Column of the desired event and then touch the PRINT Key<sup>3</sup>. The COLUMN Headings indicate the sort order of the listing. In the example above, the listing is sorted by DATE/TIME<sup>5</sup>. The listing may also be sorted by TYPE, CATEGORY, REASON, and PRIORITY. The sort order toggles between *ascending* or *descending* by touching the desired COLUMN Heading. Touch the EVENTS key<sup>6</sup> to go back to the previous display of the EVENTS Screen.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## DELETE A STORED EVENT



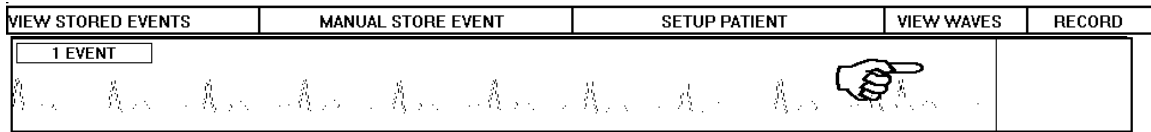
Touch the area under the VIEW STORED EVENT Column of the patient channel desired.



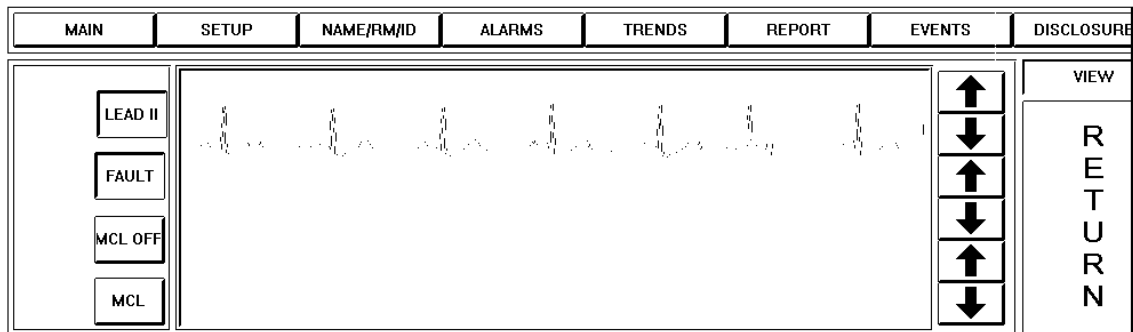
The EVENTS Screen is displayed. To delete a stored event, touch the event waveform to be deleted, the selected waveform is highlighted in reverse video as above①. Next touch the DELETE Key②. The DELETE Key deletes all highlighted(touched) waveforms.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## MULTI-VIEW (MULTI-LEAD) TELEMETRY



Touch the area under the VIEW WAVES Column of the patient channel desired as shown above.



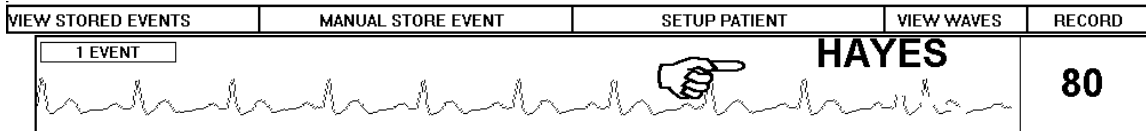
The button labeled MCL OFF indicates that the secondary lead (MCL) is not activated. To turn on MCL, touch the MCL OFF button. The button turns blue and MCL lead is displayed if the electrodes are attached. This function is controlled through the initial setup of the system.

The FAULT button determines whether a lead fault condition is reported on the main screen. With the FAULT on (button in blue) a lead fault message will appear on the main screen. With the button in white a lead fault will not be reported. If an electrode becomes detached and the lead fault is on, the lead fault message will indicate whether it is LEAD II or MCL lead. If the system designates LEAD FAULT II, check the WHITE and RED electrode. If the system designates LEAD FAULT MCL, check the BROWN and BLACK electrodes. If both waveforms are good, check the GREEN electrode. If the lead fault occurs on the Primary Lead, the system will switch automatically to the secondary lead. When the lead fault is corrected, the system will automatically switch back to the Selected Lead.

The bottom buttons are for selecting which lead is to be displayed on the main screen. In this situation LEAD II will be displayed. Touch MCL to make it the displayed lead.


# TrensCenter Central Station Cardiac Monitor Operator's Manual

## FULL DISCLOSURE

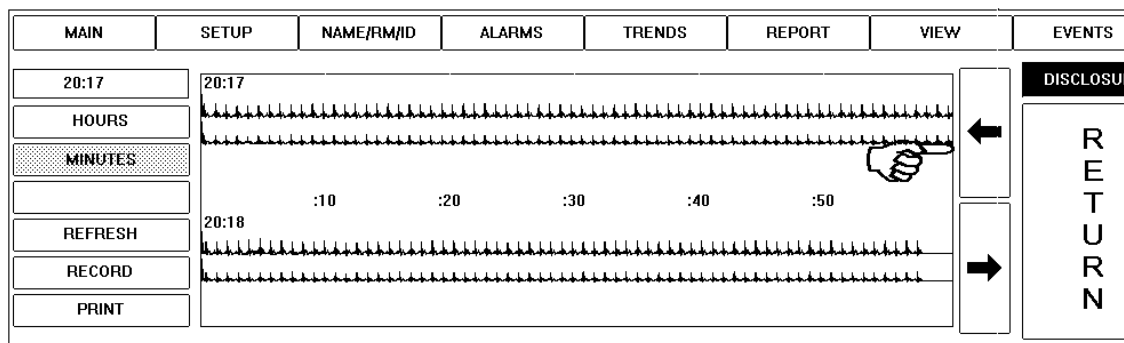


At the MAIN Screen, touch the area under the SETUP Column of desired channel number.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	START	0 AM	ARRHY ON	2	7	12	17
FILTER	INT	0	PACER	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
			REMOTE REC	5	10	15	20


  
**SET' P**  
**R**  
**E**  
**T**  
**U**  
**R**  
**N**

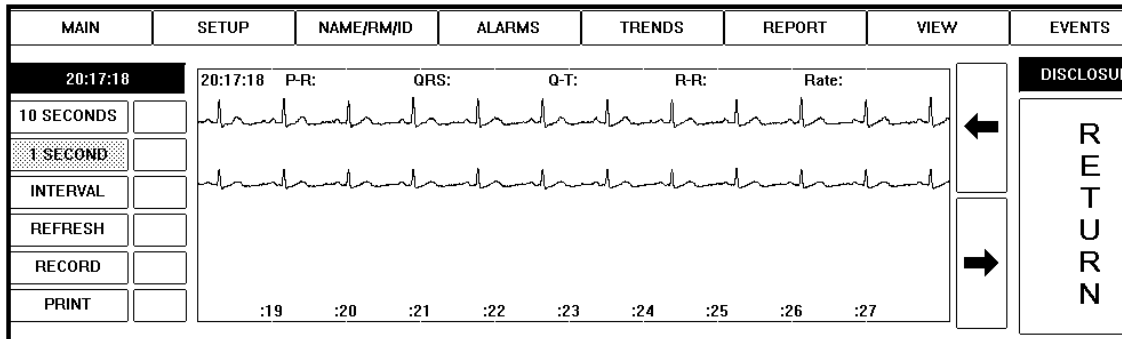
Note the DISCLOSURE Button above the Screen Label. Touch the DISCLOSURE Button to go to the next display.



The DISCLOSURE Screen is displayed<sup>①</sup>. Note the HOURS Key<sup>②</sup> and the MINUTES Key<sup>③</sup>. In this example, the MINUTES Key has been selected and is displayed as recessed. To view a minute by minute “snapshot” of the Chart for the selected patient, use the ARROW Keys with the MINUTE Key selected, as in this example. To go backward from the displayed time, touch the *Left* ARROW Key. To go forward, touch the *Right* ARROW Key. The MINUTE Key allows you to move forward and backward by minute. The HOURS key allows you to move forward and backward by hour.

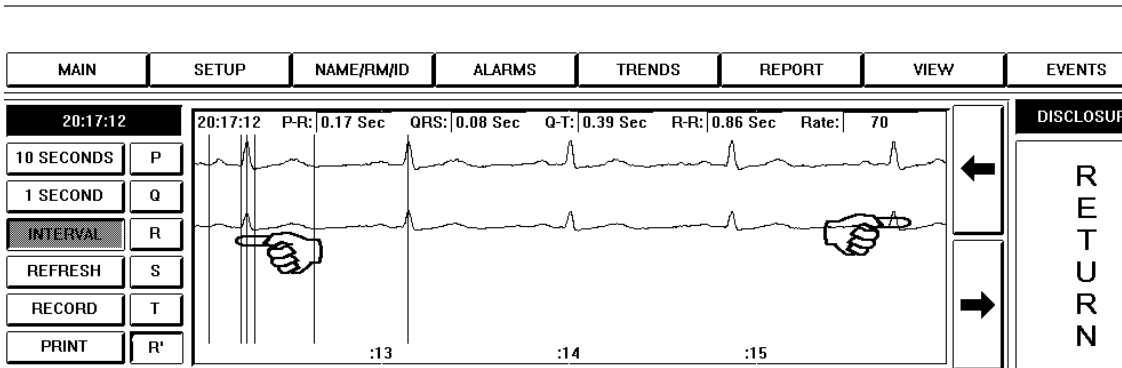
# TrensCenter Central Station Cardiac Monitor Operator's Manual

## Full Disclosure



The above example displays the expanded waveform in the 1 second zoomed view. To return to the two minute view, touch the waveform again. Touch the arrows to move forward or backward in time. The 1 second button will allow scrolling of the waveform. The 10 second button will move the waveform in 10 second increments.

## Full Disclosure Interval Markings

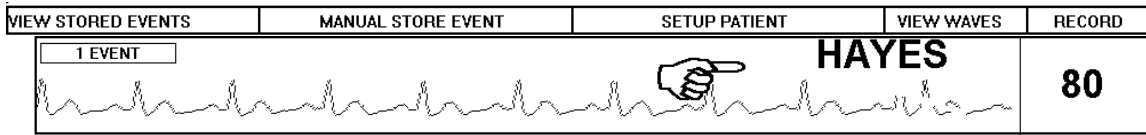


To measure the intervals of the ECG touch the **INTERVAL** button. Touch the **P** button to set the onset of the P wave. Use the left and right arrow keys to adjust the position of the red cursor. Continue touching the Q, R, S, T, and R' keys to adjust the cursor. The interval values will be displayed above the waveform.



# TrensCenter Central Station Cardiac Monitor Operator's Manual

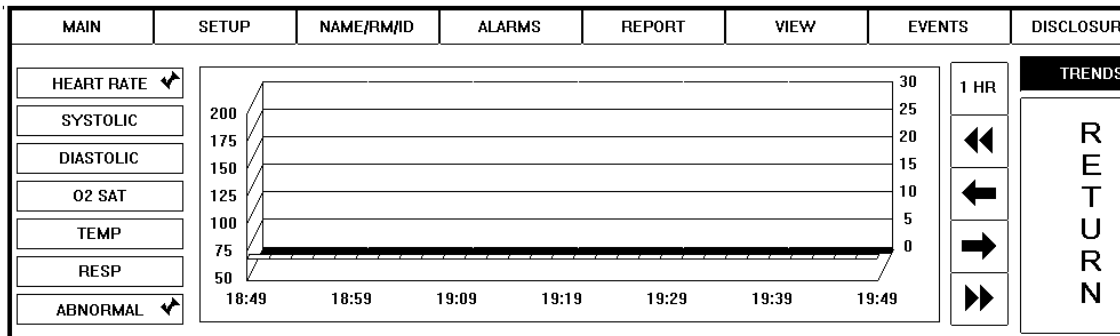
## VIEW TRENDS



At the MAIN Screen, touch the area under the SETUP Column of desired channel number.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	START	0 AM	ARRHY ON	2	7	12	17
FILTER	INT	0	PACER	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
			REMOTE REC	5	10	15	20
							SETUP
							RETURN

Note the TRENDS Button. Touch the TRENDS Button to go to the next display.

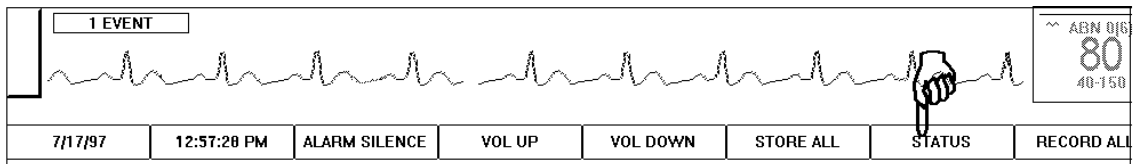


The TRENDS Screen is displayed. Trends can be displayed for all patient vitals. Touch the desired vitals key. It will display as recessed and a red check mark will display. In the above example, the HEART RATE Key and the ABNORMAL Key have been selected to display the heart rate and diastolic trends. These keys display as recessed and are marked with a red check mark. The Double Triangle ARROW Keys are for moving forward and back by one hour intervals. The Left and Right ARROW Keys are for moving forward and back by one minute intervals. The 50-200 scale on the left is the scale for heart rate, systolic and diastolic blood pressure, O2 saturation and body temperature. The 0-30 scale on the right is the scale for respiration rate and abnormal count. The trends information in this example is displayed in 3D mode.

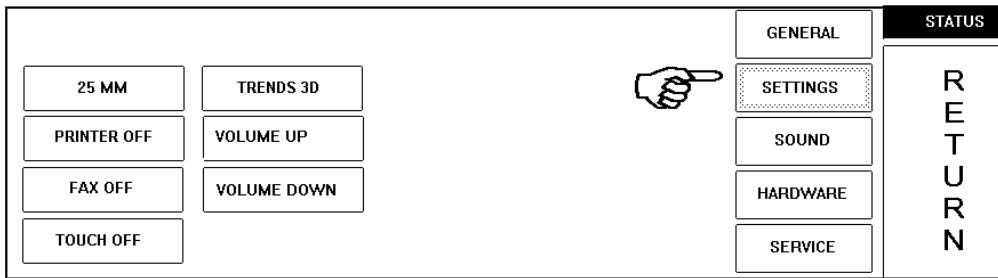
Touch the 1 Hour key to change to 12 or 24 hour interval.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

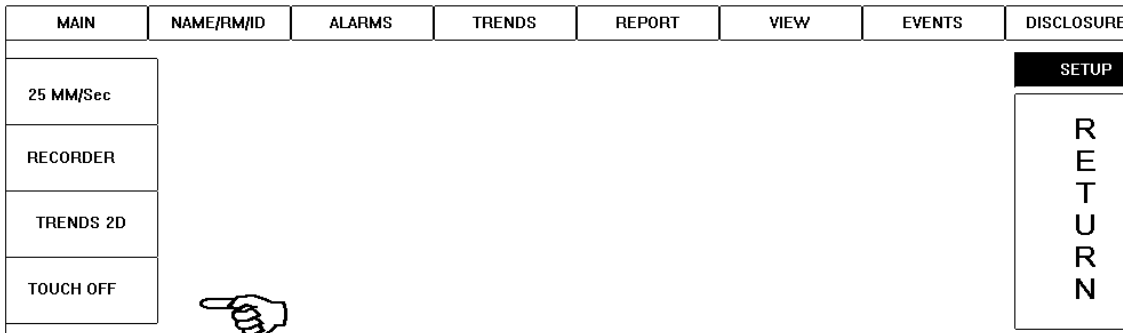
## CLEANING THE DISPLAY



Touch the STATUS button on the main display.



Touch SETTINGS button .



Touch the TOUCH OFF button. This will de-activate the touch screen for cleaning.

# **TrensCenter Central Station Cardiac Monitor Operator's Manual**

## **LOADING PAPER AND RECORDINGS**

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A red strip will appear on the chart paper when approximately 20 feet of paper is left on the roll. Change the paper at this time to ensure that there is enough paper to document an event should an alarm occur.

To load the paper, push on the top left of the recorder. There is a sign, PUSH TO OPEN, with an arrow indicating the correct place to touch. Remove the old paper core. Remove the sticker from the new roll of paper. Turn the paper roll so the paper is rolling off the bottom of the roll. Insert the paper roll between the two holders. Close the recorder door. Touch a patient record control to make sure that the recorder is printing. If the recorded strip is blank, open the door and turn the paper roll over.

Make sure the paper is straight to avoid a paper jam.

If a jam occurs or paper runs out, a CHECK RECORDER message will be displayed. See SYSTEM STATUS section of this manual.

The recorder has a standard 10 second delay in manual record. The delay is adjustable from 0 to 20 seconds.

In the event of a sustained alarm, the recorder will turn on and print 5 seconds of ECG prior to the alarm, the entire event and 10 seconds of ECG after the alarm. This ensures capture of the onset, alarm information and the ECG status following the alarm.

The recorder annotates all pertinent information concerning the status of the strip. The data is Channel Number, Name, Room Number, Heart Rate, Time, Date, Reason for Recording, Gain, Filter or Monitor and Primary Lead Selection and is configurable.

There are several reasons printed on the recorder. A table of definitions follows:

<b>MANUAL:</b>	Created by activation of the channel RECORD control.
<b>REMOTE:</b>	Created by activation of the REMOTE RECORD control on the transmitter.
<b>ALL:</b>	Created by activation of the ALL RECORD control or the AUTO RECORD.
<b>RATE:</b>	Created by a high or low RATE ALARM.
<b>VTACH:</b>	Created by a VTACH ALARM.
<b>VFIB:</b>	Created by a VFIB ALARM.
<b>ASYSTOLE:</b>	Created by an ASYSTOLE ALARM.
<b>ABN:</b>	Created by an ABNORMAL ALARM.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

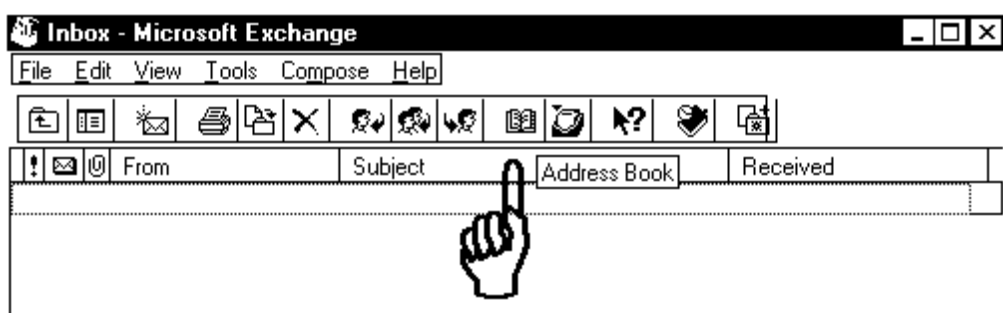
## SETUP THE FAX FROM THE TRENSCENTER

The TrensCenter is now capable of sending fax messages directly from the unit to any fax machine. The operation is very simple however several things must be taken into consideration.

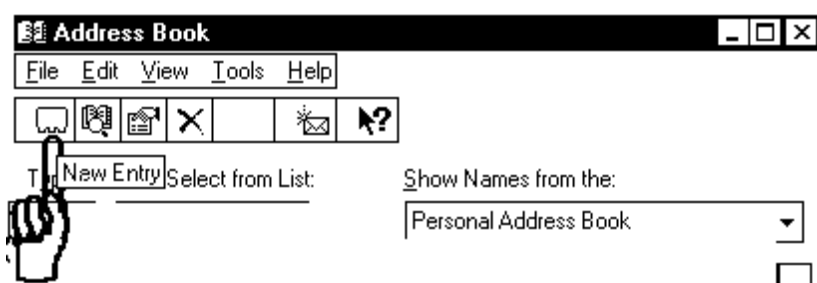
1. Facility must have access to single analog phone line.
2. Requires setup of the address book in the Windows operating system.

To set up the Windows address book: Click on the Inbox Icon on the Desktop.

Click on the Address Book Icon.



Click on the **Address Book** icon.



Click on **New Entry**.

## TrensCenter Central Station Cardiac Monitor Operator's Manual

**New Entry** [X]

Select the entry type:

**Microsoft Fax**

- Fax**
- Other Address
- Personal Distribution List

Put this entry

In the Personal Address Book

OK  
Cancel  
Help

Click on **Fax**.

**New Fax Properties** [X]

Business | Phone Numbers | Notes | FAX - Address

Name to show on cover page:

Fax Number:

Country code: United States of America (1)

Area code and fax number: (  )

Mailbox (optional):

Dial area code, even though it's the same as mine

OK Cancel Apply

Type in name and phone number. Click on **Apply**. Click on **OK**.

Continue adding new contacts until all Physicians or other facilities are entered.

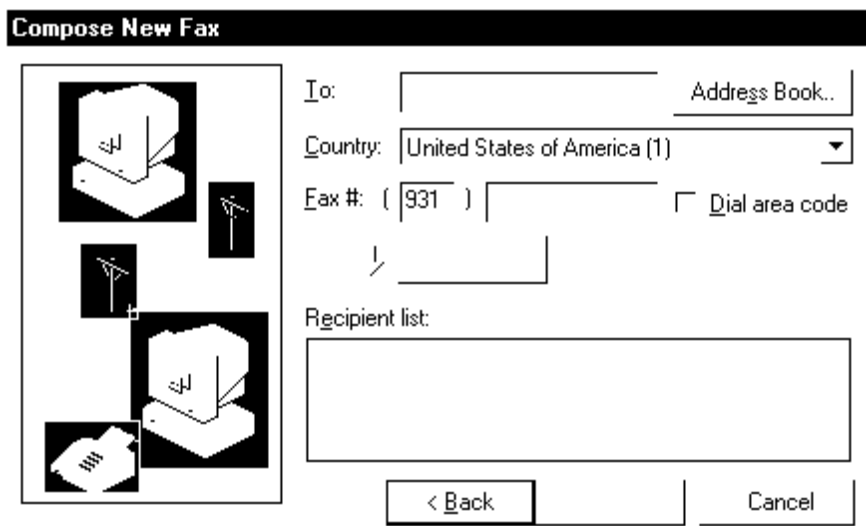
# TrensCenter Central Station Cardiac Monitor Operator's Manual FAX FROM THE TRENSCENTER

To turn on the fax, touch **STATUS** touch **SETTINGS**. The following screen will appear.



Touch **FAX OFF**. The button label will change to **FAX ON**. Any button labeled PRINT will now be a fax control. The print can be events, reports, full disclosure or anything that has a print button.

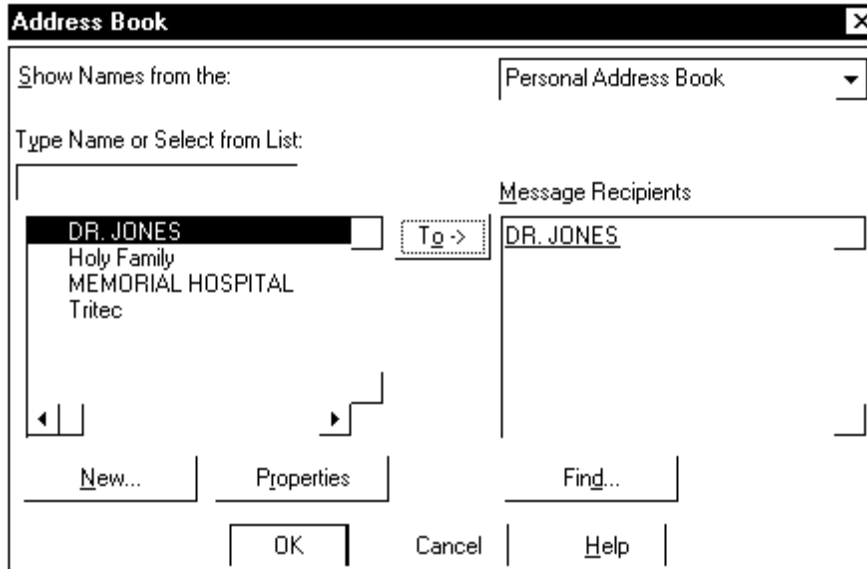
When the print is touched the system will bring up the system address book and the user will select to whom the fax should be sent.



Click on **Address Book**.

**TrensCenter Central Station Cardiac Monitor  
Operator's Manual  
FAX CONTINUED**

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Click on the recipient in the left column and click on the **To** control. To send to multiple locations, click on the recipient and the **To** control.

Click on **OK**.

The system will continue on through several screens asking for type cover sheet you want. Continue clicking on **NEXT** until the last page is displayed and click on **FINISH**.

# ***TrensCenter* Central Station Cardiac Monitor Operator's Manual**

## **CARDIAC REHAB TABLE OF CONTENTS**

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# TrensCenter Central Station Cardiac Monitor Operator's Manual

## ENTERING PATIENTS ITO THE DATABASE

**NOTE:** Ensure all settings in the Rehab Configuration Screens have been made before entering the original patient database.

<b>8</b>		<b>OFF</b>					
9/19/97	08:57:21 PM	ALARM SILENCE	DATABASE	ADMISSION	STATUS	STORE ALL	RECORD ALL

To enter patients into the Rehab Database, Touch DATABASE control at the bottom center of the screen. The Database screen will appear.

USE 'NEW' TO START A NEW ENTRY OR ARROWS TO SELECT ENTRIES.							
EDIT LOG	RHB REPORTS	NEW	ADD/SAVE	DELETE	GROUP	INACTIVE	ARCHIVE
FIRST: ROGER	SSN: 456-789-012	TREADMIL	TIME: 2	SPD: 1.0	ELEV: 1.0	<div style="border: 1px solid black; padding: 5px; display: inline-block;">DATABASE</div>  <div style="border: 1px solid black; padding: 5px; display: inline-block; text-align: center;">RETURN</div>	
LAST: CALDWELL	DOB: 02/19/44	ARM ERG	TIME: 2	WATS: 0.0	RPM: 0.0		
STREET: 1 MAIN STREET	AGE: 64	ROWING	TIME: 2	LEV: 0.0	RPM: 0.0		
CITY: ANYWHERE	MD: DR. JONES	BICYCLE	TIME: 2	WGHT: 0.0	WATS: 0.0		
STATE: TN	HT: 6'	WEIGHTS:	TIME: 2	RPM: 0.0			
ZIP: 34567	WT: 200	AIRDYNE:	TIME: 2	WATS: 0.0			
PHONE: (931)455-9016	SEX: M	TRACK:	TIME: 2	RPM: 0.0			
GROUP: 1 MWF 08:00 AM	ID#						
CHANNEL: 1	DIAG:						
COLOR: 1 <input type="checkbox"/>	MEDS:						
THR: 120	PLAN1:						
TLR: 80	PLAN2:						
INSURANCE: BCT Blue Cross of T	GOAL:						
SELECT INSURANCE	OUTCOME:						

To add new patients to the database touch the **NEW** control. This will present a new database screen with all entries blank. Type in the patient first name and ENTER, the cursor box will move to the patient last name. Continue entering data until all information is entered.

**NOTE:** Ensure that a last name is entered for all patients.


When entering the number for GROUP and COLOR enter the number desired and hit ENTER. The group information will be displayed. If the days and time are not correct move the cursor back to group, with arrows or mouse, and enter the desired group number. Use the same technique for the color of the waveform desired.

**NOTE:** To use the patient resting heart rate to determine the high target enter a number less than 40. If the number entered is 20, the system will determine the target by adding the resting rate and the 20 entered. Any number over 40 will be the target rate used.


When all information is entered touch the **ADD/SAVE** control. This saves the information in the database.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## ENTERING INSURANCE INFORMATION

<b>8</b>		OFF					
9/19/97	08:57:21 PM	ALARM SILENCE	DATABASE	ADMISSION	STATUS	STORE ALL	RECORD ALL

To enter insurance information into the Rehab Database, Touch DATABASE control at the bottom center of the screen. The Database screen will appear.

USE 'NEW' TO START A NEW ENTRY OR ARROWS TO SELECT ENTRIES.							
EDIT LOG	RHB REPORTS	NEW	ADD/SAVE	DELETE	GROUP	INDIVIDUAL	
FIRST: <u>ROGER</u>	SSN: 456-78-9012	TREADMILL: TIME: 2	SPD: 1.0	ELEV: 1.0	<div style="display: flex; align-items: center; justify-content: center;"> <div style="writing-mode: vertical-rl; text-orientation: mixed; font-weight: bold; font-size: 2em; margin-right: 5px;">RETURN</div> <div style="display: flex; flex-direction: column; gap: 10px;"> <div style="border: 1px solid black; padding: 2px;">▲</div> <div style="border: 1px solid black; padding: 2px;">↑</div> <div style="border: 1px solid black; padding: 2px;">↓</div> <div style="border: 1px solid black; padding: 2px;">▼</div> </div> </div>		DATABASE
LAST: CALDWELL	DOB: 02/02/34	ARM ERG: TIME: 2	WATS: 0.0	RPM: 0.0			
STREET: 1 MAIN STREET	AGE: 64	ROWING: TIME: 2	LEV: 0.0	RPM: 0.0			
CITY: ANYWHERE	MD: DR. JONES	BICYCLE: TIME: 2	LEV: 0.0	RPM: 0.0			
STATE: TN	HT: 6'	WEIGHTS: TIME: 2	WGHT: 0.0				
ZIP: 34567	WT: 200	AIRDYNE: TIME: 2	WATS: 0.0				
PHONE: (931)455-9016	SEX: M	TRACK: TIME: 2	RPM: 0.0				
GROUP: 1 MWF 08:00 AM	DIAG:						
CHANNEL: 1	MEDS:						
COLOR: 1 <input type="checkbox"/>	PLANT:						
THR: 120							
TLR: 80							
INSURANCE: BCT <span style="border: 1px solid black; padding: 0 5px;">...</span> 							
ACCT #:							

Place the cursor at the Insurance box. Type in the three letter Insurance code. If the insurance has not been entered three questions will appear. Touch the small control to the right of the insurance box. The Insurance selection screen will appear.

SELECT INSURANCE					
BCS BLUE CROSS\BLUE SHIELD					
O.K.	CANCEL	EDIT LIST		UP	DOWN

If the patients insurance is already listed touch OK. If the list of companies covers the entire page use the UP and DOWN to scroll the list. If the control was touched by mistake touch CANCEL.

If the insurance company desired is not listed touch EDIT LIST

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## ENTERING INSURANCE INFORMATION

The Insurance Input screen will appear.

The screenshot shows the 'Insurance Providers' screen. On the left, there is a list of providers with their codes and names: BCT (Blue Cross of Tennessee), PVT (Private Pay), and MED (Medicare). To the right of the list are buttons for 'New', 'Delete', 'Sort By Code', and 'Sort By Name'. Further right is a form for entering details for a selected provider. The form includes fields for 'Code', 'Acct #', 'Name', 'Address', 'City', 'State', and 'Zip'. A 'CLOSE' button is located at the bottom right of the screen.

If data needs to be changed touch the name of the insurance company and change the information displayed.


To add a new company, touch **NEW**. Position the cursor over the box to be added and type in new data.

When all information is entered touch the **CLOSE** control. This saves the information in the database.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## ENTERING ORDER OF EXERCISE DEVICES

To begin monitoring patients on the system, touch **ADMISSION** control at the bottom of the main screen.

<b>8</b>		<b>OFF</b>					
9/19/97	08:57:21 PM	ALARM SILENCE	DATABASE	ADMISSION	STATUS	STORE ALL	RECORD ALL

EDIT LOG	RHB REPORTS	SELECT	GROUP	ADMIT					
NAME	CHAN #	WT	SYST	DIAST	READMIL	ARM ERG	ROWING	BICYCLE	REHAB
CALDWELL, R (1)	1				1	2	3	4	R E T U R N
ROGERS, C (1)	3				1	2	3	4	
HAYES, T (1)	4				1	2	3	4	
CUTSHAW, B (1)	2				1	2	3	4	

The cursor can be moved around the screen with the mouse, keyboard arrows or by touching the box desired. When a patient is entered into the database the order of exercise is entered in the order of the device configuration screen. To change the order desired, place the cursor in the box under the device and on the patient line, that the patient will start the exercise session on. Enter a 1 in the box.

Move the cursor along the patient information row and enter the order of exercise until all desired devices are entered. If a device will not be used for this patient leave the column blank. **NOTE: If protocol dictates that a patient will use the same device more than once, all columns must be filled to allow the NEXT control to move past FINISHED.**

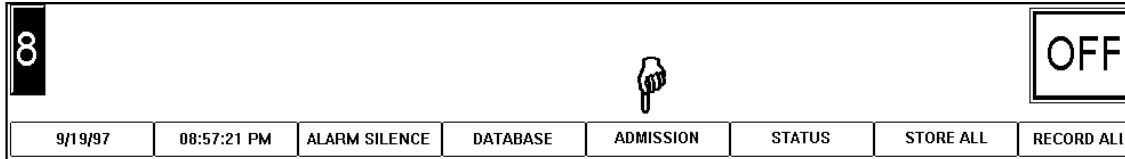
**NOTE: The exercise devices must be entered in the order of exercise. If you try to enter 4 under the first column the system will change to number 1. This feature is incorporated in case a device is deleted, then the system will automatically realign the order of exercise.**

**NOTE: The devices in the configuration are saved when the patient is entered into the Database. If the device configuration is changed later, the devices will not appear correctly when monitoring. It is important to do the device con figuration before you enter any patients.**

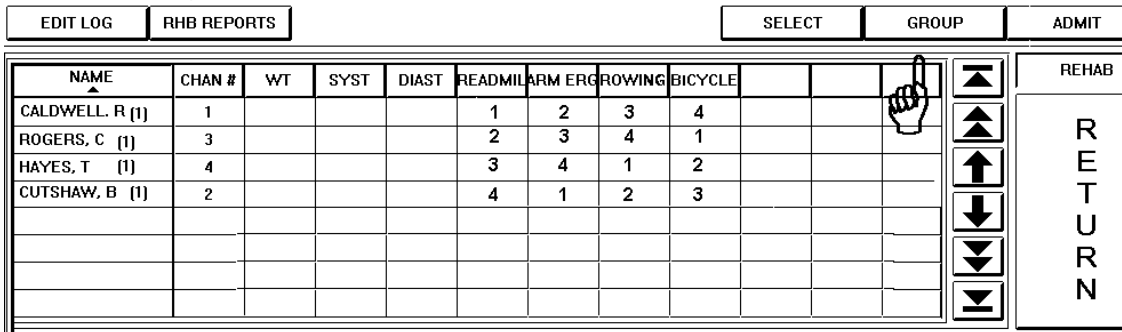
# TrensCenter Central Station Cardiac Monitor Operator's Manual

## ADMITTING PATIENTS TO THE SYSTEM—GROUP ADMIT

To begin monitoring patients on the system, touch **ADMISSION** control at the bottom of the main screen.



If the patients were admitted to the database in specific groups and will be monitored in groups touch the **GROUP** button. This will display Group 1.



Continue touching the Group button until the desired group is displayed. The group number is displayed above the screen on the instruction bar.

When the desired group is displayed it is now possible to enter the daily weight and resting pressures. Place the cursor in the box under weight for the desired patient. Type in the weight. Use TAB, arrows or mouse to move to SYST. Enter Systolic pressure. Repeat for diastolic pressure.

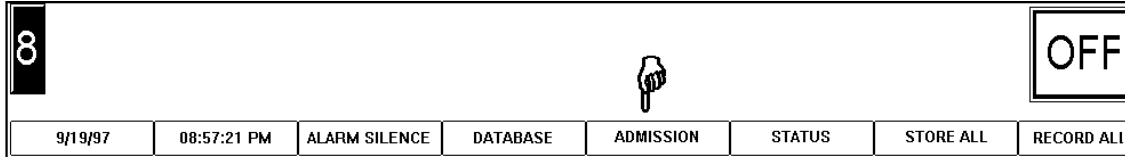
When all patient weight and pressures are entered, assign the transmitters to the patients based on the CHAN #. These are the channels assigned when the patient was admitted to the database. These numbers can be changed. Use caution that numbers are not duplicated since one patient will not be admitted.

When all information is correct touch **ADMIT**. All patients selected should now be displayed on main screen.

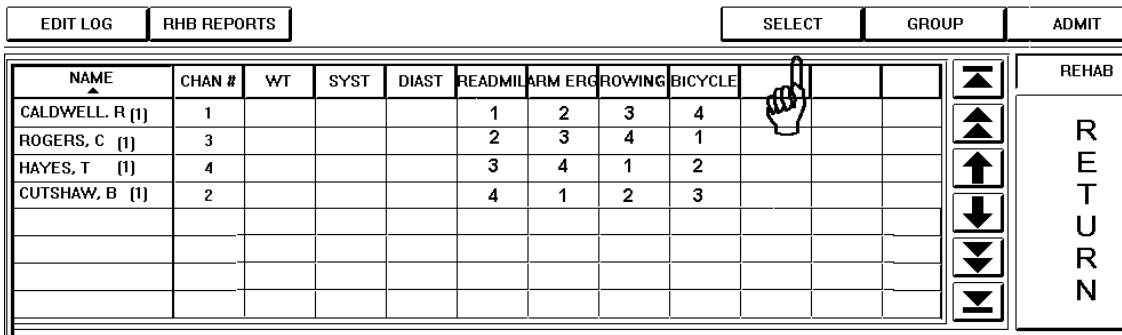
# TrensCenter Central Station Cardiac Monitor Operator's Manual

## ADMITTING PATIENTS TO THE SYSTEM—INDIVIDUAL ADMIT

To begin monitoring patients on the system, touch **ADMISSION** control at the bottom of the main screen.



The Admission Screen will be displayed.



If the patients were not admitted to the database in specific groups and will be monitored as individuals, touch the **SELECT** button, then touch the name of the patient desired. The patient name will be inverse to indicate that the patient is selected for monitoring.

CHAN# column indicates which channel is assigned when the patient was selected. The channels are assigned on a first come first served basis. The channel number may be changed by touching the patient name, until the desired channel is displayed.

When all patients are selected and high lighted it is now possible to enter the daily weight and resting pressures. Place the cursor in the box under weight for the desired patient. The previous entered weight will be displayed in AMBER. Type in the weight. Use TAB, arrows or mouse to move to SYST. Enter Systolic pressure. Repeat for diastolic pressure.

CHAN# column indicates which channel is assigned when the patient was selected. The channels are assigned on a first come first served basis. These numbers can be changed by selecting and deselecting the patient until the correct channel is displayed.

When all information is correct touch **ADMIT**. All patients selected should now be displayed on main screen.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## MONITORING PATIENTS

When the patients are admitted to the system the following MAIN screen will be displayed.

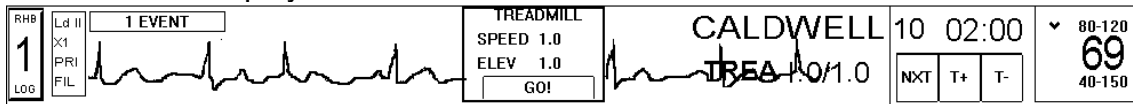


The patient name is displayed on the right side of the trace. The timer is displayed to the right of the patient name. The target limits are displayed above the heart rate and the main rate alarms are displayed below the rate.

When the start session button is displayed the patient is not monitored. Notice the ALARMS OFF message displayed to left of trace.

**NOTE: After admission it will take approximately 20 seconds to obtain a valid heart rate. Wait until the rate is stable, this rate is the resting heart rate and all values are determined from this rate.**

When a stable Heart Rate is displayed touch **START SESSION**. The following screen will be displayed.



When **START SESSION** is touched the system will automatically save an ECG strip, notice label 1 EVENT to left of trace, this strip will be the pre-test strip.

The first scheduled device will be flashing in green under the patient name. The time programmed for this device is displayed between name and heart rate.

If the device is not available or the order of exercise is to be changed for this session only touch **NXT** to bypass the treadmill and select the second device.

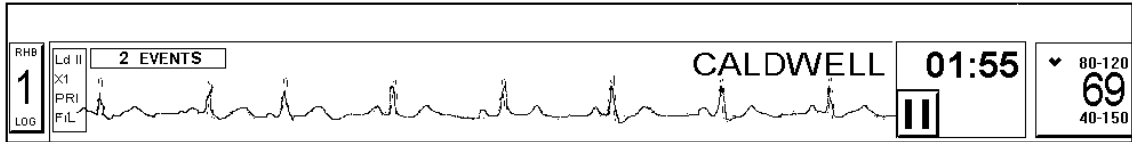
The **T+** AND **T-** keys are used to adjust the time of exercise by raising or lowering the timer.

The center box will indicate the settings for the device selected. To change these settings, with mouse or touch position the cursor over the setting to change, type in the new settings.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

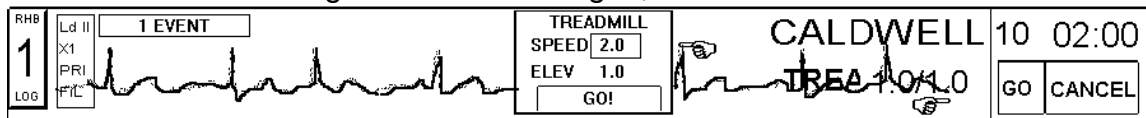
## MONITORING PATIENTS

When all settings are adjusted touch **GO** in the box in the middle of the screen. The screen will change to the following:



The timer has started counting down and will alarm when the session has 30 seconds (or user defined time) left.

The control under the timer is the **PAUSE** control. If the patient has to stop the test or if the workload settings need to be changed, touch the **PAUSE** control.



The **CANCEL** control will now be displayed. If the patient is able to continue touch the **GO** under the timer count, this will restart the timer. If the patient is unable to continue touch the **CANCEL** control. This cancels the test for this device.

To change the workload, touch the setting in the center box to change. Type in the new setting. To continue the test, using the elapsed time, touch the **GO** in the timer box. To reset the timer to the initial setting, touch the **GO** in the center device box.

If the test was cancelled or the device timed out, the system now indicates 2 EVENTS are stored. This event is the Maximum Rate strip for this exercise device. Touch the **channel number** of the patient monitored. The Rehab log will be displayed.

COMMENTS	HR	GLU	SYS	DIA	MTS	RPE	SO2	%TR	LO2	DYS	TIME	DEVICE	REASON	COMMENTS
5/4/99 8:10AM	89		120	80	1.6		98	55			10		PRETEST	
5/4/99 8:20AM	123		132	86	2.0	11	98	88			10	BIKE	MAX	
5/4/99 8:20AM	115		120	80	2.1	10	96	93			10	ERG	MAX	
5/4/99 8:20AM	120		120	80	1.8	11	95	98			10	NUSTEP	MAX	
5/4/99 8:20AM	90		120	80	1.7	10	97	87			10	RECUMBE	MAX	

PRINT

↑

↑

↑

↓

↓

↓

RHB LOG

RETURN



# TrensCenter Central Station Cardiac Monitor Operator's Manual

## MONITORING PATIENTS

Line 1 indicates all of the pretest information and line two represents the information for the Treadmill. Position the cursor over the box for SYS and type in the systolic pressure. Touch the DIA box and enter diastolic pressure. Continue with RPE and O2 saturation if desired.

Repeat the above steps for all remaining devices.

To enter data on all of the patients from one screen without having to go back and forth between patients do the following. Touch any patient's name.

MAIN	NAME/RM/ID	ALARMS	TRENDS	RHB LOG	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	START	0 AM	ARRHY ON	2	7	12	17
MONITOR	INT	0	PACER	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
MONITORED			REMOTE REC	5	10	15	20
<b>SETUP</b>							<b>R E T U R N</b>

Touch **REHAB LOG**.

PRINT COMMENTS	HR	GLU	SYS	DIA	MTS	RPE	SO2	%TR	LO2	DYSP	TIME	DEVICE	REASON	COMMENTS
CALDWELL,R	89		120	80			98	55					PRETEST	
ROGERS,C	123		132	86			98	88					PRETEST	
HAYES,T	115		120	80									PRETEST	
MCCONNELL,G	120		120	80									PRETEST	
STONE,P	90		120	80									PRETEST	
EXERCISE STAGES	PRETEST		1	2	3	4	5	6						

The above screen permits entry of vital signs data on all of the patients admitted from one screen. Touch the appropriate stage number to select the device the patient is presently on.

# *TrensCenter* Central Station Cardiac Monitor Operator's Manual

## CONFIGURING QUICK COMMENTS

---

There is space provided for entering up to 10 comments into the Rehab Log with the use of the F2 key. To enter these comments into the system perform the following:

Touch **STATUS** key. Touch **SETTINGS** key. Touch **RHB COMMENTS**. The following screen will be displayed.

Predefined Rehab Comments

Close

Rare PVC's  
Patient within Target Limit  
Short of Breath  
Chest Pain  
Normal Sinus Rhythm  
Elevated Pressure

Static: Elevated Pressure

Click in the Predefined Rehab Comments box to select a line for entry. The line selected will turn blue. Next click inside the Static box. Type in the comment desired.

When all entries have been made, click on the Close key.

# TrensCenter Central Station Cardiac Monitor

## Operator's Manual

### ENTERING COMMENTS

Comments may be placed into the patient log report in the **COMMENTS** column or on the bottom one third of the cover page.

#### LOG COMMENTS

To enter comments into the log report follow the steps below.

COMMENTS	HR	GLU	SYS	DIA	MTS	RPE	SO2	%TR	LO2	DYS	TIME	DEVICE	REASON	COMMENTS
<b>PRINT</b>														
5/4/99 8:10AM	89		120	80	1.6		98	55			10		PRETEST	
5/4/99 8:20AM	123		132	86	2.0	11	98	88			10	BIKE	MAX	
5/4/99 8:20AM	115		120	80	2.1	10	96	93			10	ERG	MAX	
5/4/99 8:20AM	120		120	80	1.8	11	95	98			10	NUSTEP	MAX	
5/4/99 8:20AM	90		120	80	1.7	10	97	87			10	RECUMBE	MAX	

RHB LOG  
  
 RETURN

Place the cursor on the line desired under COMMENTS section. Any information can be typed on this line or quick entries may be used.

To use the pre-defined quick entries, hit F2 Function key. The following pull down menu will be displayed.

COMMENTS	HR	GLU	SYS	DIA	MTS	RPE	SO2	%TR	LO2	DYS	TIME	DEVICE	REASON	COMMENTS
<b>PRINT</b>														
5/4/99 8:10AM	89		120	80	1.6		98	55			10		PRETEST	
5/4/99 8:20AM	123		132	86	2.0	11	98	88			10	BIKE	MAX	1 Rare PVC's
5/4/99 8:20AM	115		120	80	2.1	10	96	93			10	ERG	MAX	2 Normal Sinus Rhythm
5/4/99 8:20AM	120		120	80	1.8	11	95	98			10	NUSTEP	MAX	3 Within Target Limits
5/4/99 8:20AM	90		120	80	1.7	10	97	87			10	RECUMBE	MAX	4 Chest Pain
														5 Short of Breath

RHB LOG  
  
 RETURN

Select the number desired from keypad on keyboard 1, 2, etc. See previous page for instructions for setting up the quick entry comments.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## ENTERING ADDITIONAL COMMENTS

To enter comments in the additional comments section (bottom third) of the cover page touch the comments button on the rehab log.

COMMENTS	HR	GLU	SYS	DIA	MTS	RPE	SO2	%TR	LO2	DYS	TIME	DEVICE	REASON	COMMENTS
<b>PRINT</b>														
5/4/99 8:10AM	89		120	80	1.6		98	55			10		PRETEST	
5/4/99 8:20AM	123		132	86	2.0	11	98	88			10	BIKE	MAX	
5/4/99 8:20AM	115		120	80	2.1	10	96	93			10	ERG	MAX	
5/4/99 8:20AM	120		120	80	1.8	11	95	98			10	NUSTEP	MAX	
5/4/99 8:20AM	90		120	80	1.7	10	97	87			10	RECUMBE	MAX	

RHB LOG  
  
 RETURN

This will open a section of the screen to allow typing of approximately 800 characters.

COMMENTS	HR	GLU	SYS	DIA	MTS	RPE	SO2	%TR	LO2	DYS	TIME	DEVICE	REASON	COMMENTS
Enter Comments for Caldwell, Roger														

RHB LOG  
  
 RETURN

When all comments are typed touch RETURN.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## SETUP PATIENT FOR NON-ECG MONITORING

---

If the patient is not to be monitored for ECG yet the information should be placed in the REHAB LOG following is the procedure to use.

Admit the patient in the normal fashion. When the patient is admitted for the first time touch the **SETUP** control for that patient. The SETUP screen will appear.

MAIN	NAME/RM/ID	ALARMS	TRENDS	REPORT	VIEW	EVENTS	DISCLOSURE
DISCHARGE	SIZE	1	ALARM ON	1	6	11	16
RELEARN	START	0 AM	ARRHY ON	2	7	12	17
MONITOR	INT	0	PACER	3	8	13	18
PRIMARY	CHART	0	LONG RECORD	4	9	14	19
MONITORED			REMOTE REC	5	10	15	20

<b>SETUP</b>
<b>R E T U R N</b>

If the patient is to be monitored without ECG touch the **MONITORED** control. The control label will change to **NON-MONITORED**. The ECG will turn off but the patient name and exercise protocol will remain. It will be possible to enter data into the Rehab Log and retain that data for the duration of the exercise sessions.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## DISCHARGING PATIENTS

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When the patient's heart rate reaches the preset level the following screen will be displayed.



Touch the **DISCHARGE** button to discharge the patient. If the patient rate does not return to resting touch the waveform in the **MANUAL STORE** area this will store a posttest event and display the DISCHARGE button.

If it is necessary to discharge the patient before exercise is completed, touch the patient name. When the setup screen is displayed, touch DISCHARGE. The following screen will be displayed



If the patient is to be discharged touch the YES button. If all patients are to be discharged touch DISCHARGE ALL. All patients will be discharged. If discharge was touched by mistake touch NO and the system will return to the main screen,

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## EDIT THE LAST SESSION AND PRINT SESSION REPORT

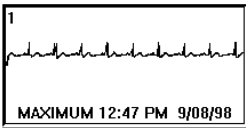
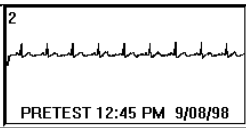
After the patient has been discharged and it becomes necessary to edit information, add additional comments or print a second copy of the report do the following.

Touch **ADMISSION**. Use the arrow keys to scroll the patient list to find the desired patient. Click on the **CHAN #** box of that patient. Click on **EDIT LOG**.

MAIN		EVENTS								DISCLOSURE				DEL SESSION	
COMMENTS PRINT	HR	GLU	SYS	DIA	MTS	RPE	SO2	%TR	LO2	DYSP	TIME	DEVICE	REASON	COMMENTS	RHB LOG
09/08 12:45 PM	89		120	80			98	55					PRETEST		RETURN ↑ ↓ ↓ ↓ ↓
09/08 12:47 PM	123		132	86	2.2	11	98	88		2 MIN	TREADMIL	MAXIMUM			

The **REHAB LOG** will be displayed from the last session attended. Any information can be changed or comments may be added to the report. When the patient is admitted the next time, this record will be locked.

Touch the **EVENTS** control to view the EKG strips for this session.

EDIT LOG		EVENTS		
RECORD	1	2		
DELETE				
LIST EVENTS				
PRINT				
			↑	RETURN ↑ ↓ ↓ ↓
			↓	

See the **EVENTS** section of the main manual for operation. Touch **RETURN** to return to the edit log screen.

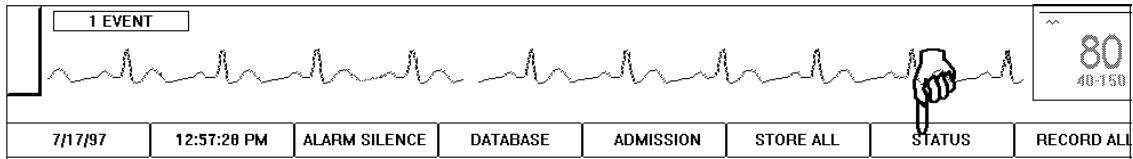
**NOTE.** If events are deleted from this screen the corresponding line of the rehab log will also be deleted with all vital sign information.

To view the Full Disclosure EKG touch the **DISCLOSURE** control.

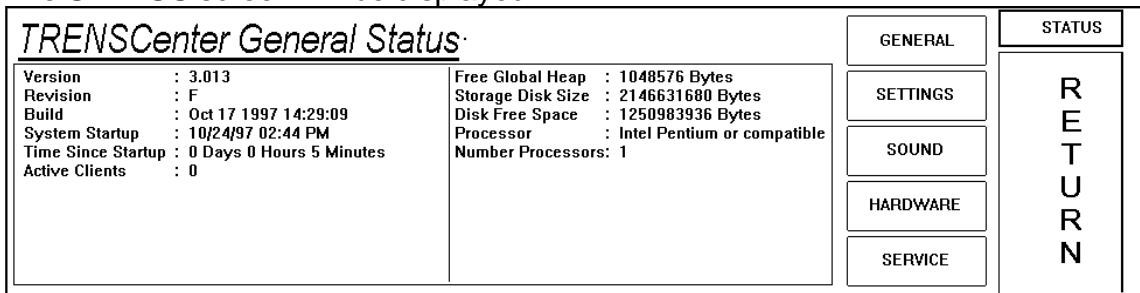
# TrensCenter Central Station Cardiac Monitor Operator's Manual

## ADJUSTING VOLUME CONTROL

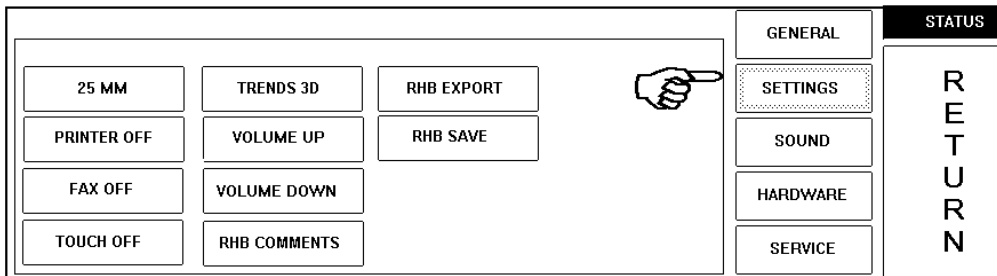
To change the volume of the alarms and notifications from the main screen touch **STATUS**.



The STATUS screen will be displayed.



Touch **SETTINGS**.



Touch the **VOLUME UP** or **VOLUME DOWN** to adjust the volume.



# TrensCenter Central Station Cardiac Monitor Operator's Manual

## GENERATING REHAB REPORTS

To generate the various reports for the rehab system, touch **DATABASE**.

EDIT LOG	RHB REPORTS	SELECT	GROUP	GROUP DELETE	DELETE	ADMIT			
NAME	CHANG	WT	SYST	DIAST	READMIL	ARM ERG	ROWING	BICYCLE	REHAB
CALDWELL, R (1)	3								R E T U R N
ROGERS, C (1)	4								
HAYES, T (1)	2								
CUTSHAW, B (1)									

Touch the **RHB REPORTS** control. The report screen will be displayed.

### *Rehab Patient Reports*

FIRST	LAST	GP	INS	SELECT	REPORT	INTERVAL	STRIPS	TYPE
John	Doe	1	BCS	↑	SESSIONS	DAILY	1 MAX HR	DETAIL
Jane	Doe	1	MED	↑	INDIVIDUAL	WEEK	PRE TEST	SUMMARY
Fred	Flintstone	2	PVT	↑	GROUP	MONTH	POST TEST	BY DEVICE
Barney	Rubble	2	MED	↓	INSURANCE	1ST & LAST	ALARM	
				↓	ALL	ATTENDANCE FROM <input style="width: 50px;" type="text"/>	MANUAL	PRINT
				↓	NONE	COMPLIANCE TO <input style="width: 50px;" type="text"/>	ALL	
				↓		COMMENTS ALL		

The headers over the patient list, control the sort order for the list. If the **LAST** name is touched the list will be sorted by last name. If the arrow is pointing up, the patients will be sorted in ascending order. Touch **GP** to sort by group or **INS** by Insurance.

Select the patients to be printed by **INDIVIDUAL**, **GROUP**, **INSURANCE** or **ALL** patients.

Next select the type of **REPORT** desired.

**Sessions** selection provides a report of all session activity for the selected patient(s).

**Trends** selection provides a trend report for all parameters selected in configuration screen.

**Ptn List** prints a list of all patients in the database with information checked in the configuration screen.

**Schedule** prints a schedule of groups with information checked in configuration screen.

# *TrensCenter* Central Station Cardiac Monitor Operator's Manual

## GENERATING REHAB REPORTS

---

**Attendance** prints the report of who was present for the specified period.

**Comments** adds the comments to the report.

**Compliance** report prints the attendance reports for patients selected.

Select the **INTERVAL** for the report.

**Week** selects the last completed week information.

**Month** selects the last completed month information.

**1<sup>st</sup> and Last** selects data from the first and last sessions for comparison.

**From To** allows selection of data from two specific sessions for comparison.

**All** allows selection of every session the patient has attended.

Select the **ECG STRIPS** desired with the report.

**1 MAX HR** selects the highest maximum heart rate strip during the selected reports.

**Pre Test** selects only the Pre Test strips from selected sessions.

**Post Test** selects only the Post Test strips from selected sessions.

**Alarm** selects only strips caused by alarm events from selected sessions.

**Manual** selects only strips caused by manually stored strips from selected sessions.

**All** selects all stored strips from selected sessions.

Next select the **PRINT** type of report.

**Detail** prints every entry made in all selected session reports.

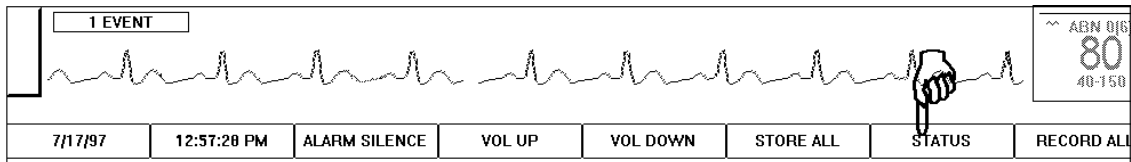
**Summary** reports one line from selected session report with min\max entries.

**By Device** prints a report with each selected session sorted by the type exercise device.

Touch **PRINT** to start printing.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## Exporting Data from TrensCenter to Outcome Program



Touch the **STATUS** control at the lower right side of the screen.

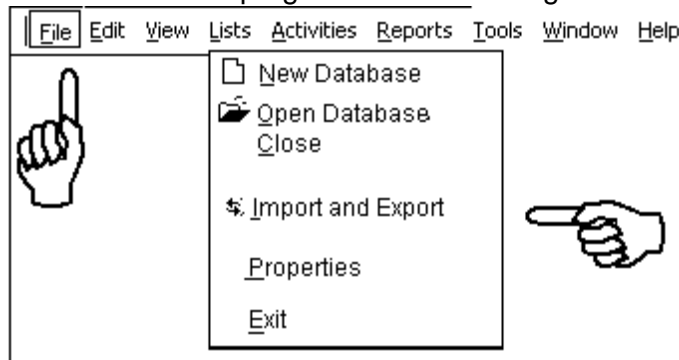


Touch the **SETTINGS** control. The SETTINGS screen will be displayed.



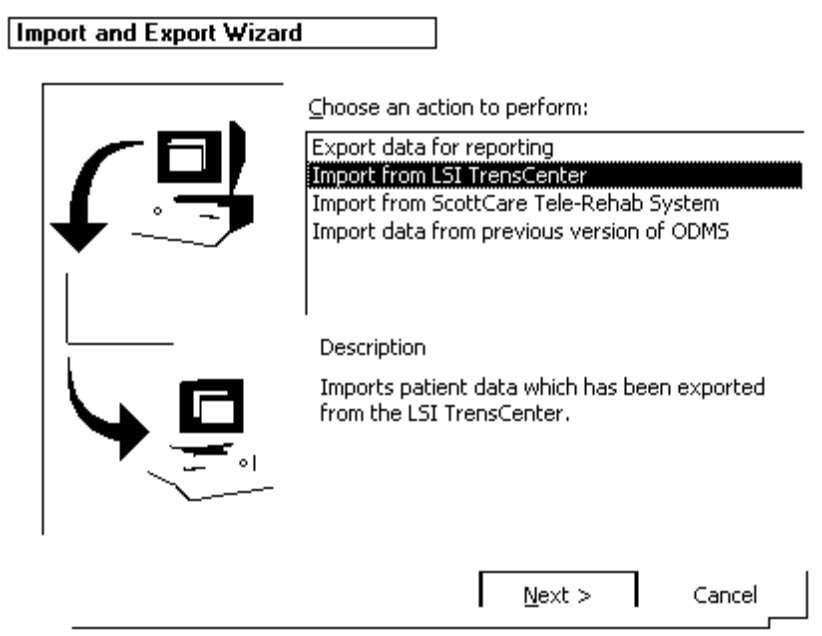
Touch the **RHBEXPORT** control. Touch **RETURN**. A file will be created with a list of all active patients demographic data. The name of the file is OUTCOME.TXT. This file will be imported into the Outcomes Program by the following method.

From the ODMS Clinic Edition program do the following:

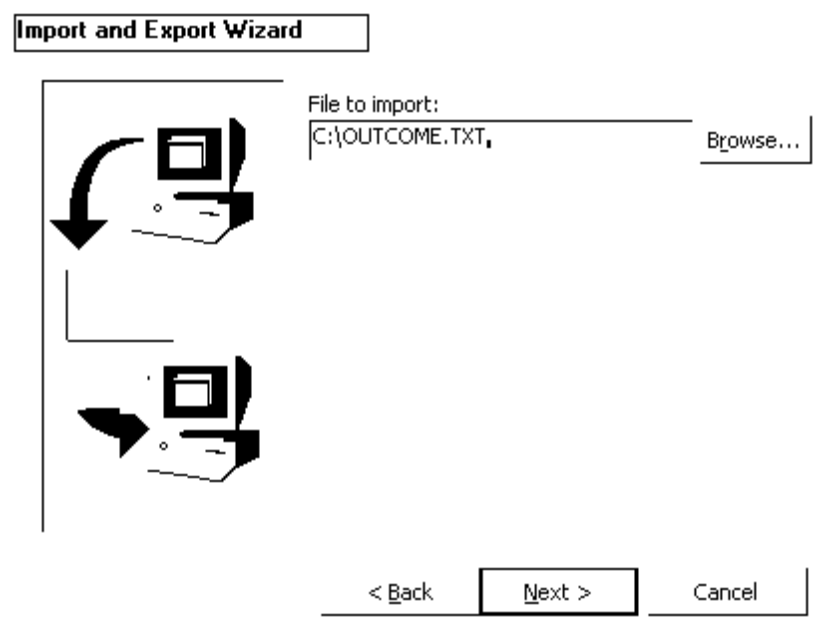


Click on **FILE**. Click on **Import and Export**.

# TrensCenter Central Station Cardiac Monitor Operator's Manual



Click on **Import from LSI TrensCenter**. Click on **Next**.



For Users of Orion 1.X software, place the cursor in the File to Import Box and type in the file name **C:\OUTCOME.TXT** and click **Next**. Click on **Finish**. The data file will be imported into the Outcomes Program.

For Users of Orion 2.X software, place the cursor in the File to Import Box and type in the file name **C:\OUTCOME1.TXT** and click **Next**. Click on **Finish**. The data file will be imported into the Outcomes Program.

# TrensCenter Central Station Cardiac Monitor Operator's Manual

## ARCHIVE PATIENT DATA

When a patient has completed all prescribed sessions and the data of these sessions are to be kept, it is possible to Archive this data onto a hard drive or removable disk for later analysis. To Archive patient files touch or click on **DATABASE**.

USE 'NEW' TO START A NEW ENTRY OR ARROWS TO SELECT ENTRIES.							
EDIT LOG	RHB REPORTS	NEW	ADD/SAVE	DELETE	GROUP	ARCHIVE	INACTIVE
FIRST: ROGER LAST: CALDWELL STREET: 1 MAIN STREET CITY: ANYWHERE STATE: TN ZIP: 34567 PHONE: (931)455-9016	SSN: 456-78-1012 DOB: 02/02/02 AGE: 64 MD: DR. JONES HT: 6' WT: 200 SEX: M	TREADMII ARM ERG ROWING. BICYCLE WEIGHTS: AIRDYNE: TRACK:	TIME: 2 TIME: 2 TIME: 2 TIME: 2 TIME: 2 TIME: 2 TIME: 2	SPD: 1.0 WATS: 0.0 LEV: 0.0 LEV: 0.0 WGHT: 0.0 WATS: 0.0 RPM: 0.0	ELEV: 1.0 RPM: 0.0 RPM: 0.0	   	 <b style="font-size: 12px; letter-spacing: 0.5em;">RETURN</b>
GROUP: 1 MWF 08:00 AM CHANNEL: 1 COLOR: 1 <input type="checkbox"/> THR: 120 TLR: 80 INSURANCE: BCT Blue Cross of T. <input type="button" value="SELECT INSURANCE"/>	ID# DIAG: MEDS: PLAN1: PLAN2: GOAL: OUTCOME:						

Select the patient to be archived. Touch the **ARCHIVE** control.

### ARCHIVE PATIENT CALDWELL?

YES

NO

If there is a need to recall that patient information touch the **INACTIVE** control and select the patient desired. All session reports are now available.