Middle Row of Keys on Control Panel

Blue-labeled keys — when pressed, gets you to a level where adjustments and changes can be made

Alarms — to turn *all* alarms off/on and *individual* alarms on/off, adjust alarm limits, and go to Standby

Other Patients — to view waveform and alarm from other beds.

Monitor Setup — to change settings such as screen displays and patient type, and make general configuration changes.

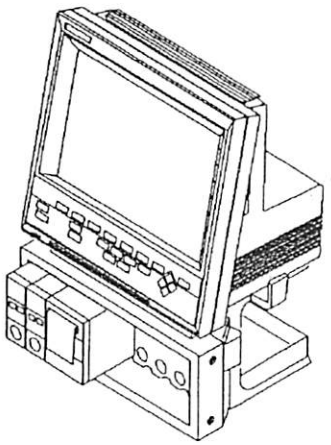
Procedures — to perform Cardiac Output and make ST segment monitoring adjustments.

Trends — to delete data from previous pt./collect data from current pt, view data in graphs and tables, and print reports.

Module Setup — to set up ECG, pressures, etc. - to turn parameters on/off and change settings (e.g. size, alarm limits).

HEWLE
PACKARL

HP OmniCare CMS Model 24



Quick Guide

HP Part No. M1204-90073
Printed in U.S.A.
April 1995

Bottom Row of Keys on Control Panel

Keys have **grey** labels.

[Silence/Reset] — silences an alarm and, if cause has been eliminated, resets it.

[Suspend] — switches ALL alarms on/off.

[Main Screen] — returns you to the standard monitoring screen.

[Realtime Record] — records realtime or current waves on the recorder.

[Delayed Record] — records waveforms that are no longer on the monitor screen.

Arrow Keys - [▲] [▼] [◄] [►] — to move highlighting and make selections in Task Windows — only active when lit.

4

Quick Start

1) Turn Power on.
2) Connect ECG leads.
3) NBP: Connect cuff.
   Press NBP [Start].

   SpO_2 : Connect sensor.
   Pressure: Connect transducer.
   Zero.

For parameter setup (to get into the Setup Task Window), go directly to the parameter key on the module.

When finished, return to the resting display (press [Main Screen]).

Overall Operation:

- To bring up a Selection Window, press a hard key (labeled key).
- Softkeys (plain gray keys) only function in the Selection and Task Windows.
- The arrow keys and [Confirm] key are always illuminated when available for use. (Whatever is highlighted is active.)
- **Adjust Alarms** key is always the rightmost softkey on a parameter task window.
- Pressing [Main Screen] always returns the monitor to the resting display.

In General:

- The monitor is rugged and designed to provide years of troublefree use. It has many safety features, and always asks for your confirmation before data is erased.
- ~~READ~~ THE SCREEN

2

Respiration (RESP) Setup

1) Place electrodes so that area of greatest chest movement is between the white and red electrodes.

2) Press [RESP] on module to bring up Task Window.

3) Press **Adjust Size** to adjust size.

4) Press **Change Mode** to select detection method.

   AUTO — monitor counts respiration and adjusts detection level automatically.

   MANUAL — you adjust the detection level.

   - Press **Adjust Level**
   - Move dotted threshhold line to just below peak of curve using the [▲] and [▼] arrow keys.

5) Press **Adjust Alarms**, then the **High Limit** and **Low Limit** softkeys to adjust the alarm limit. Press **Change Apnea** to adjust the apnea alarm time.

6) Press **On/Off Alarms** to turn alarms off and on. (The 🔕 next to parameter numeric shows that the alarms are off).

7) Press [Main Screen]

   Avoid the liver area and the ventricles of the heart in the line between the respiratory electrodes so as to avoid cardiac overlay or artifacts from pulsating blood flow.

7

ECG Setup

1) Press [ECG] on module to bring up Task Window.

2) Press **Change Lead** to select lead.

3) Press **Adjust Size** to adjust size.

4) Press **Change Bandwidth** to select bandwidth:

   FILTER — use only if excessive electrical interference (can impede ECG analysis).

   MONITOR — use for normal monitoring.

   DIAG — use when diagnostic quality required (may increase false alarms).

5) Press **Change Mode** to select QRS detection method — AUTO or MANUAL
   PACED or NONPACED

   Use AUTO except in rare cases where the monitor miscounts — if change to MANUAL, adjust detection level so only QRS complexes cross dotted threshold line.

6) Press **Adjust Alarms** then:

   a. **Low Limit** or **High Limit** softkeys to adjust alarm limits.

   b. Press **Change AlSource** - to highlight "HR" or "Pulse".

7) Press **On/Off Alarms** to turn alarms on (NO 🔕 next to parameter numeric).

8) Press [Main Screen] MAIN SCREEN

5

Preparing the Patient's Skin

1) Shave hair from electrode sites.

2) Wash sites thoroughly (preferably with soap and water).

3) Rinse well to remove all soap residue.

4) Dry briskly to increase capillary blood flow to the tissues and remove skin cells and oils.

Applying the Electrodes

1) Use low impedance silver/silver chloride electrodes.

2) Check the electrode for fresh, moist gel. All electrodes should be changed every 24 hours.

3) Attach the lead to the electrode.

4) Select a site where movement or respiration will not impede the signal.

5) For diaphoretic patients, apply skin drying substances only over the area where the electrode adhesive contacts, leaving the gel area free.

6) Apply electrodes to skin by placing an edge down, then "rolling down" the rest of the pad. Firmly press around the adhesive edge toward the center.

8

To turn off channels 2 and 3

1) Press [ECG] on module to bring up task window.

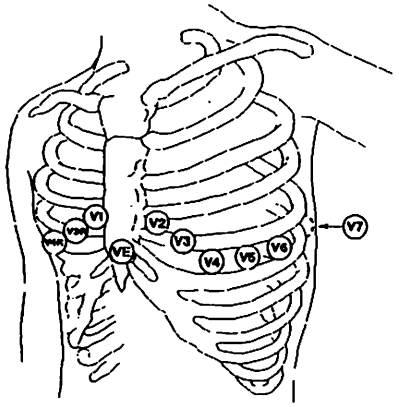
2) Press **Setup Next ECG** .

3) Press **On/Off ECG-CH2** to highlight **OFF**. (Channel 3 is turned off automatically.)

4) Press [Main Screen].

6

For 5-Lead configuration. Place the V electrode at one of the following locations:



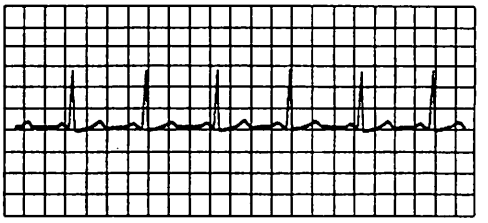
- V1 on the 4th intercostal space at the right sternal border.
- V2 on the 4th intercostal space at the left sternal border.
- V3 midway between V2 and V4 electrodes.
- V4 on 5th intercostal space at left midclavicular line.
- V5 on the left anterior axillary line, horizontal with V4.
- V6 on the left midaxillary line, horizontal with V4.

- V3R-V6R on the right side of the chest in positions corresponding to those on the left.
- VE over the xiphoid process.

For posterior V lead placement, place the V electrode at one of the following locations.

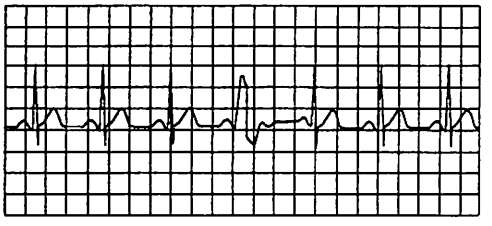
- V7 on posterior chest at the left posterior axillary line in the 5th intercostal space.
- V7R on posterior chest at the right posterior axillary line in the 5th intercostal space.

Characteristics of a Good ECG Signal



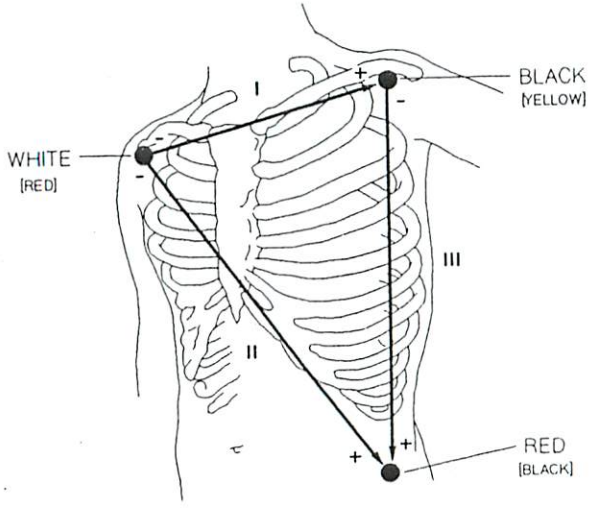
- Select a lead where the ECG wave is:
  - ➢ completely above or below the baseline.
  - ➢ free from electrical or muscle artifact.
  - ➢ without baseline wander.

Characteristics of a Good ECG for Arrhythmia Monitoring



- Choose a lead where the ECG:
  - ➢ QRS is 2-3 times the size of the P and T waves.
  - ➢ is free from artifact and baseline wander.
  - ➢ has stable amplitude.
  - ➢ has tall, narrow complexes for "normal" beats with different morphology for ectopic beats.
  - ➢ pace spikes should be about 50% of the R wave height.

Electrode Placement with 3-Lead Sets (Standard Configuration)



- White (RA) electrode—place directly below the clavicle and near the right shoulder.
- Black (LA) electrode—place directly below the clavicle and near the left shoulder.
- RED (LL) electrode—place in left lower abdomen.

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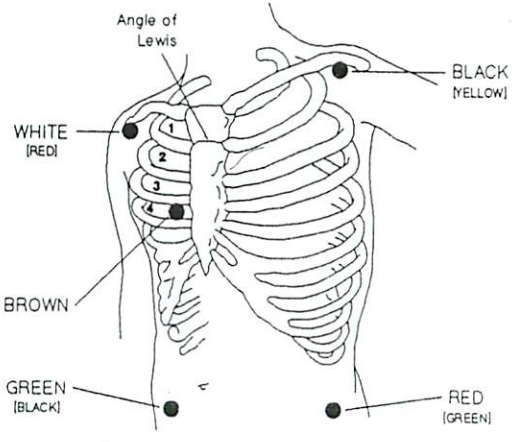
Electrode Placement with a 5-Lead Set



- White (RA) electrode—place directly below the clavicle and near the right shoulder.
- Black (LA) electrode—place directly below the clavicle and near the left shoulder.
- Green (REF) electrode—place in right lower abdomen.
- Red (LL) electrode—place in left lower abdomen.
- Brown (V) electrode—place on the chest as illustrated

10

ST Segment Setup

1) Check that the ECG channels for which you want to monitor ST are on (a channel does not have to be displayed).

2) If necessary, turn ST monitoring on in the Parameters On/Off Task Window.

3) Press Module Setup, then ST to bring up Task Window. If necessary, turn individual parameters on.

4) Press Adjust Meas Pts and adjust the measurement points (Isoelectric point and J/ST points).

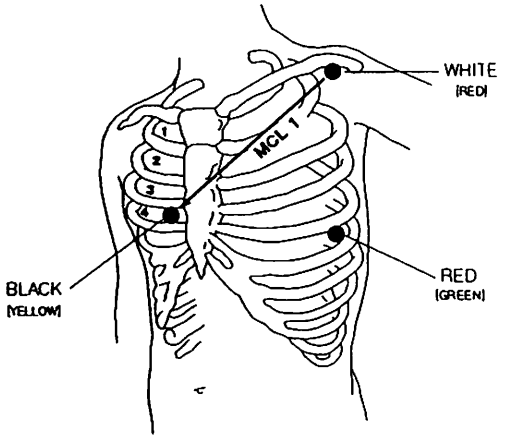
5) Press Setup ST.

6) Press Adjust Alarms, then Adjust Meas Pts to select the ST channel. Pres Low Limit or High Limit softkeys to adjust the alarm limits.

7) Press On/Off Alarms to turn alarms on (NO ⊠ next to parameter numeric).

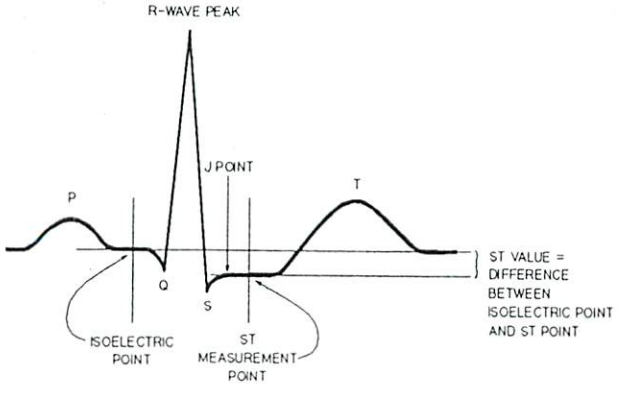
8) Press Main Screen.

Electrode Placement with 3-Lead Sets (MCL_1 Configuration)



Select **Lead I** for monitoring the MCL_1 configuration. Electrodes need to be moved or switched according to the following instructions. As you will notice, you must attach lead wires to areas of the chest that do not coincide with the electrode labels.

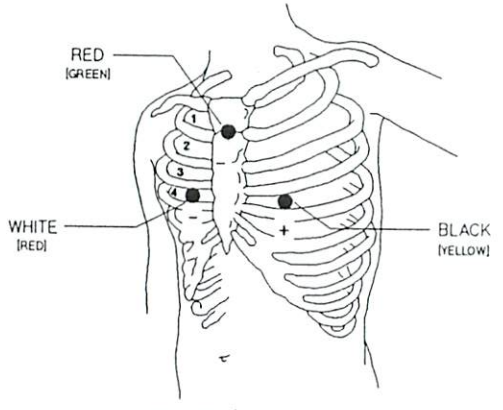
- White (RA) electrode—place directly below the clavicle and near the left shoulder.
- Black (LA) electrode—place on the 4th intercostal space at the right sternal border.
- Red (LL) electrode—place on the left midaxillary line at the 5th intercostal space.



Adjusting the ST Measurement Points

NOTE: J point = end of QRS Complex and beginning of ST Segment. The ST point is referenced from the J point at either +60 or +80 msec.

ECG Leads for Paced Patients



The pacemaker lead may provide the optimal waveform for paced patients. The electrodes typically go beneath the nipple line. White (RA) and Black (LA) electrodes are placed at the 4th intercostal space. Select **Lead I** for optimal waveform on paced patient.

Temperature (TEMP) Setup

1) Press [Temp] on module to bring up Task Window.

2) Press **Change Label** to change the label.

3) Press **Adjust Alarms**, then **Low Limit** or **High Limit** softkeys to adjust alarm limits.

4) Press **On/Off Alarms** to turn alarms on (NO ☒ next to parameter numeric).

To See:	Look for These ECG Changes:
1.Ischemia	ST Segment
Anterior Wall	Elevation V_1 thru V_4
Lateral Wall	Elevation I, aVL, V_5, V_6
Posterior Wall	Depression V_1 thru V_4
Inferior Wall	Elevation II, III, aVF
Subendocardial	Depression
2.Infarction	Q waves
Lateral Wall	I, aVL
Inferior Wall	II, III, aVF
Anterior Wall	V_1 thru V_4
Posterior	ST Depression in V_{1-3}
Note: small Q waves may be normal in V_5 and V_6; abnormal = 1/3 of R wave height	
3. Digitalis Effect	Blocks
	VPBs, Bigeminy
	V Tach
	Atrial or Ventricular Fibrillation
4. Hyperkalemia	Wide or absent P
	Wide QRS
	Peaked T
5. Hypokalemia	Flat T
	U wave
6. Hypercalcemia	Short Q - T
7. Hypocalcemia	Long Q - T

SpO_2 / Pleth Setup

1) Select and prepare the correct type and size of sensor.

2) Attach to appropriate part of patient's body and attach sensor cable to module.

3) Press [SpO_2] on module to bring up Task Window.

4) Press **Low Limit** or **High Limit** softkeys to adjust alarm limits.

5) Press **On/Off Alarms** to turn alarms on (NO ⊠ next to parameter numeric).

Pleth stands for plethysmogram, the pulse waveform used in determining the SpO_2.

SQI stands for signal quality indicator. If the pleth waveform gets smaller, it indicates improper sensor placement or poor perfusion.

Noninvasive Blood Pressure (NBP) Setup

1) Use appropriate cuff size (white line on edge of cuff fits between the arrows.

2) Press [NBP] on module to bring up Task Window.

3) Press **Change Mode** to change mode.

   If AUTO — press **Change Rep Time** to change repetition time.

4) Press **Adjust Alarms**. Change alarm parameter (sys, dia, mean) if needed, then press **Low Limit** or **High Limit** softkeys to adjust alarm limits.

5) Press **On/Off Alarms** to turn alarms on (NO ⊠ next to parameter numeric).

6) Press [Main Screen]

To do a single manual measurement, initiate the AUTO cycle:

Press **Start NBP** or [START] on module.

To do a STAT measurement (as many times as possible in a 5- minute period):

Press **Stat NBP** or [STAT] on module.

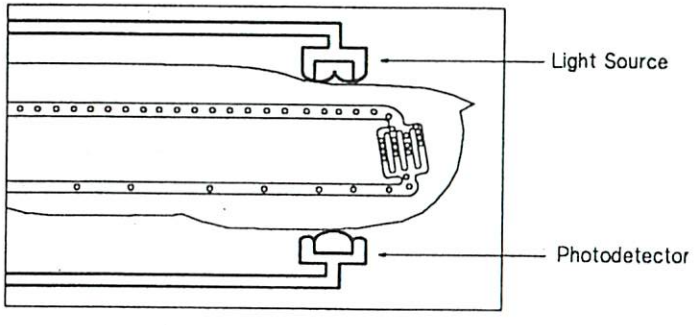
To STOP a measurement:

Press **Stop NBP** or [STOP] on module

SpO_2 Transducer Placement

For accurate measurements note the following:

1) All the light received by the transducer's photodetector must first have passed through the patient's arteriolar bed.
2) A minimum pulsatile flow must be present.
3) The light emitter and the photodetector must be opposite each other.



Positioning of the Light Emitters and Photodetector

For the best choice of application site, look for an ideal site considering:

- good perfusion
- no movement artifact
- comfortable for patient
- easy to use

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NBP Specifics

	Neonatal	Pediatric	Adult
Measurement range: (mmHg)			
Systolic	30-130	30-180	30-270
Diastolic	10-100	10-150	10-245
Mean	20-120	20-160	20-255
Initial inflation: (mmHg)	100	125	165
Max. time allowed for one blood pressure measurement:	60 sec	100 sec	100 sec

For example, excessive dysrhythmias and patient movement may cause the allowed measurement time to be exceeded.

NOTE: For all patient categories the acceptable HR range is 40-300 bpm.

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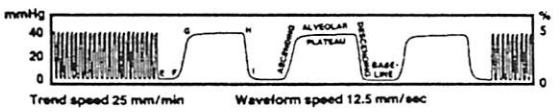
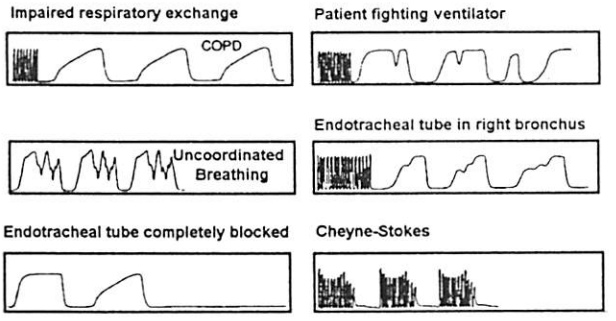
Normal Capnogram*



E – Beginning of exhalation
E-F – Anatomical dead space gas being exhaled
F-G – Ascending limb, increasing concentration of CO_2 from increasingly distal airways
G-H – Alveolar plateau containing mixed alveolar gases
H – End Tidal CO_2
H-I – Descending limb, inspiratory phase showing rapidly decreasing CO2 concentration as fresh gas is inhaled
J – End of Inspiratory phase; airways contain fresh gas

* Waveform is more rounded when a bacterial filter is used in sidestream measurements.

Abnormal Capnograms



CO_2 Setup

For accurate measurements, allow sensor to warm up 20 minutes if it has not been plugged into module.

DO ACCURACY CHECK:

- if module (with sensor attached) is moved to another monitor
- if using module with another patient
- once a day (routine) when in continuous use

1) Press CAL on module.
2) Check that value on screen matches value on Calstick — if it does not, calibrate.
3) Place sensor on Calstick cell labelled 0.0 mmHg. The reading in the display should be within ± 0.3 mmHg within one minute.
4) Repeat with other cell. The reading should be within ± 1.0 mmHg within one minute.
5) If the values match, you do not need to calibrate. If the values do not match, you need to calibrate.

CALIBRATE:

- if new (or different) sensor attached to module
- if cal value on screen doesn't match Cal stick
- if accuracy check fails

1) Press CAL on module.
2) Check that value on screen matches value on Calstick — press **Change Cal Value** and make them match.
3) Press Confirm.
4) Place sensor on either Calstick cell. Wait 3 minutes.

4) Turn timer on cal unit as far as it will go clockwise. Press **Start Calibr**. Cal will take 3-10 minutes (possibly 20).
5) The message "$tcpO_2/tcpCO_2$ calibration running" is replaced by "calibration complete". Turn off the gas timer on gas cal unit if still on.

Applying sensor to patient

(NOTE: If you wait longer than 30 minutes after calibration to apply the transducer, the heat is turned off. A new cal will be required.)

1) Clean site with alcohol and select site(s) with high blood flow and capillary density and no cardio-vascular disorders.
2) Apply fixation ring.
3) Place 3-5 drops contact fluid in ring.
4) Remove transducer from cal chamber and place in ring, 1/4 turn clockwise will fasten.
5) Wait 3-20 minutes (3-7 minutes for CO_2, 10-20 minutes for O_2) for readings to stabilize. (Timer activates when sensor is removed from chamber.)
6) Site timer displays time remaining from the $tcpO_2/tcpCO_2$ task window. Once done, the inop message "change site" and sound will occur. Recalibrate and change site.

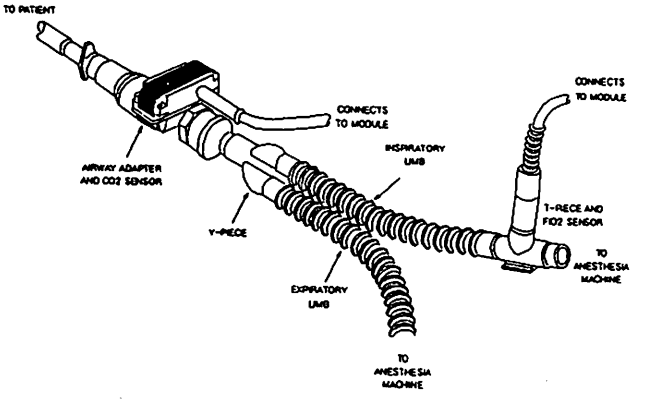
Remember: When done, fill the transducer cap with solution and cover. If out of use more than 24 hours and solution has dried out, start with "Changing the membrane on the transducer".

5) Repeat with other cell. For both cells value should match.

After doing the accuracy check or calibrating the sensor, attach it to the patient's breathing circuit.

ADJUSTMENTS TO CO_2:

1) Press **CO_2** on module to bring up Task Window.
2) Press **Change Scale** to change size of waveform.
3) Press **N_2O Corr On/Off** and set to ON if using an anesthetic gas containing N_2O; OFF if not in use.
4) Press **ETCO2 Alarms**, **AWRR Alarms** or **IMCO2 Alarms**, and use **Low Limit** or **High Limit** soft keys to adjust alarm limits.
   - $ETCO_2$: set low and high limits.
   - $IMCO_2$: set high limit.
   - AWRR: set apnea delay time and high limit.
5) Press **On/Off Alarms** to turn alarms on (NO ⊠ next to parameter numeric).
6) Press **Main Screen**



Alarms

To SILENCE and RESET alarms:

Press Silence/Reset.

To SUSPEND ALL alarms (turn alarms OFF):

1) Press Suspend.

   or

2) Press Alarms.

3) Press Suspend Alarms.

   Either "Alarms Suspended" or "Alarms Suspended 3Min"message appears.
   Large ⊠ appears on control panel.

To turn INDIVIDUAL parameter alarms ON/OFF or change limits:

1) Press Alarms.
2) Press Limits Review.
3) Press Select Parametr to highlight parameter.
4) Press Low Limit or High Limit softkeys to adjust limits.
5) Press On/Off Alarms

   or

   Get to Parameter Task Window and press Adjust Alarms then press On/Off Alarms to turn alarms off or on.

   If OFF, a ⊠ appears next to parameter numeric.

$tcpO_2/tcpCO_2$ Monitoring

Changing the membrane on the Transducer

When?

- Dry electrode solution under membrane
- New transducer: Change the membrane and wait 24 hours,
  Change membrane and use
- Failed calibration twice
- Activating transducer after period of use

See User's Reference Guide, Vol. 2 for remembraning procedure.

Calibrating $tcpO_2/tcpCO_2$

Required if:

- New membrane fitted
- Changing operating temperature
- Inop message: "tc cal required"

Recommended if:

- Accuracy of values in doubt
- If starting a new monitoring period
- If changing the operating site

Procedure:

1) Insert the transducer into the cal chamber on the module.
2) Plug module into rack and connect gas tubing.
3) Bring up $tcpO_2/tcpCO_2$ task window. Make adjustment to the transducer temp settings, site timer and alarm limits.

To View Other Patients

To view waveforms and vital signs on another patient:

1) Press [Other Patients].
2) Move highlighting to the line of softkeys with the bed you want, and press the softkey for that bed.
3) Press **Show NextWave** to view other waves.
4) Press **Show Next Bed** to view another bed.
5) Press [Main Screen].

To send alarms to/receive alarms from another bed:

1) Press [Other Patients].
2) Press **Overview Controls**.
3) Press **Show Roster** to see which group the bed you're sending to/receiving from is in.
4) If needed, press **Select Group** and highlight the desired group.
5) Press **Send Alarms** or **Receive Alarms** and highlight YES.
6) Press [Main Screen].

To go into Standby mode:

1) Press [Alarms].
2) Press **Monitor Standby**.

Pressing any control panel key (except [Suspend]), causes monitoring to be resumed.

To UNSUSPEND ALL alarms:

1) Press [Suspend].

or

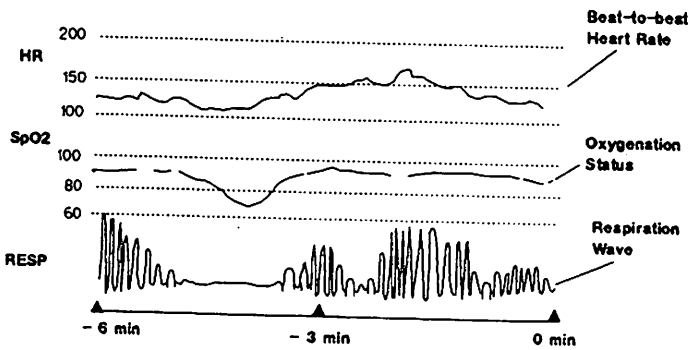
1) Press [Alarms].
2) Press **On/Off Alarms**.

NOTE: Any individual alarms previously turned off will still be off (a ⊠ appears next to numeric.)

Oxycardiorespirogram (oxyCRG)

To display the oxyCRG:

1) Press Monitor Setup.
2) Press oxyCRG ON.



To change oxygen channel (on the display and recording) and recorder speed:

1) Press Trends.
2) Press oxyCRG.
   - Press Change Channel to change the oxygen channel for recording and display.
   - Press Change Speed to change the recorder speed.
   - Press Main Screen.

Parameter Reminders

To turn on a parameter:

Connect the cable. ECG/Resp and NBP are always on unless you've turned them off.

To turn on a parameter that has been turned off with the cable left connected:

1) Press Module Setup.
2) Press Parametr On/Off.
3) Press Select Parametr to highlight the parameter you want.
4) Press On/Off Parametr to turn the parameter on.

To prepare a parameter when the cable is not yet available:

1) Press Module Setup.
2) Press Parametr On/Off.
3) Press On/Off Setup if you want to prepare the parameter settings for all parameters.

   or

   Press Select Parametr to highlight an individual parameter.
4) Follow individual parameter setup procedures.
5) When done, press Main Screen.

make an oxyCRG recording:

1) Press [Realtime Recordng].
2) Press oxyCRG PLUG-IN to produce the recording.
3) Press [Main Screen].

configure oxyCRG to be the alarm recording:

1) Press [Monitor Setup].
2) Press Recordng Setup. (Press More Choices to reveal this key if necessary.)
3) Press Delayed & Alarm.
4) Press Change AlRecTyp to highlight "oxyCRG".
5) Press [Main Screen].

If a Wave Is NOT on the Screen ...

Check that the parameter is ON.

Press [Module Setup].

Press Parametr On/Off.

If the parameter is off, press Select Parametr to highlight the parameter and press On/Off Parametr.

Check if it is on a different standard display screen:

Press [Monitor Setup].

Press Screen B or Screen C.

If it isn't on a display, assign the wave to a channel:

Press [Monitor Setup].

Press DisplayConfig (key will have label).

Press Select Channel to highlight the channel on the screen that you want.

Press Assign Wave to highlight the wave.

Change speed, format (# waves on screen), or layout (overlap) if needed.

Press [Main Screen].

Height Conversion Chart

cm	in	cm	in	cm	in	cm	in
130	51.2	150	59.1	170	66.9	190	74.8
131	51.6	151	59.4	171	67.3	191	75.2
132	52.0	152	59.8	172	67.7	192	75.6
133	52.4	153 [5']	60.2	173	68.1	193	76.0
134	52.8	154	60.6	174	68.5	194	76.4
135	53.1	155	61.0	175	69.3	195	76.8
136	53.5	156	61.4	176	69.7	196	77.2
137	53.9	157	61.8	177	69.9	197	77.6
138 [4'6"]	54.3	158	62.2	178	70.1	198 [6'6"]	78.0
139	54.7	159	62.6	179	70.5	199	78.3
140	55.1	160	63.0	180	70.9	200	78.7
141	55.5	161	63.4	181	71.3	201	79.1
142	55.9	162	63.8	182	71.7	202	79.5
143	56.3	163	64.2	183 [6']	72.0	203	79.9
144	56.7	164	64.6	184	72.4	204	80.3
145	57.1	165	65.0	185	72.8	205	80.7
146	57.5	166	65.4	186	73.2	206	81.1
147	57.9	167	65.7	187	73.6	207	81.5
148	58.3	168 [5'6"]	66.1	188	74.0	208	81.9
149	58.7	169	66.5	189	74.4	209	82.3

Weight Conversion Charts

kg		lb	kg		lb	kg		lb	kg		lb
0.5	—	1.10	1.2	—	2.64	1.9	—	4.18	2.6	—	5.72
0.6	—	1.32	1.3	—	2.86	2.0	—	4.40	2.7	—	5.94
0.7	—	1.54	1.4	—	3.08	2.1	—	4.62	2.8	—	6.16
0.8	—	1.76	1.5	—	3.30	2.2	—	4.84	2.9	—	6.38
0.9	—	1.98	1.6	—	3.52	2.3	—	5.06	3.0	—	6.60
1.0	—	2.20	1.7	—	3.74	2.4	—	5.28			
1.1	—	2.42	1.8	—	3.96	2.5	—	5.50			

kg		lb	kg		lb	kg		lb	kg		lb
3.25	—	7.15	3.75	—	8.25	4.25	—	9.35	4.75	—	10.45
3.5	—	7.70	4.0	—	8.80	4.5	—	9.90	5.0	—	11.0

kg		lb	kg		lb	kg		lb	kg		lb
5.5	—	12.1	9.5	—	20.9	13.5	—	29.7	17.5	—	38.5
6.0	—	13.2	10.0	—	22.0	14.0	—	30.8	18.0	—	39.6
6.5	—	14.3	10.5	—	23.1	14.5	—	31.9	18.5	—	40.7
7.0	—	15.4	11.0	—	24.2	15.0	—	33.0	19.0	—	41.8
7.5	—	16.5	11.5	—	25.3	15.5	—	34.1	19.5	—	42.9
8.0	—	17.6	12.0	—	26.4	16.0	—	35.2	20.0	—	44.0
8.5	—	18.7	12.5	—	27.5	16.5	—	36.3			
9.0	—	19.8	13.0	—	28.6	17.0	—	37.4			