



Ambulatory Blood Pressure Report Generator

90239A

Operations Manual

070-0399-03 Rev. E

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CAUTION:

- US Federal law restricts the devices documented herein to sale by, or on the order of, a physician.

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Report Generator

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Overview

Report Generator

The 90239A ABP Report Generator works in conjunction with a Spacelabs Medical ambulatory blood pressure (ABP) monitor (90207, 90217). It receives patient data collected by the monitor, processes that data, and prints it out in graphical and/or tabular formats on either its small built-in printer or an optional external printer.

The report generator can be configured by the user via a simple-to-use menu system. You can step through the entire menu and change every setting, or you can quickly access just those parameters that you wish to alter. The menu items are self-explanatory, requiring you simply to enter a numeric value.

The report generator software can be upgraded via a ROM card that fits into a card slot below the control panel. Contact your sales representative for details.

Data Card Option

The Data Card option (P/N 040-0549-00) permits multiple blood pressure reports to be stored to and printed from a data card that inserts into the card slot under the control panel (refer to *Figure 1-1*, item ④).

When you connect the serial port on the report generator to a serial port on a PC running 90219-02 or 90219-03 ABP Analysis software (version 4.00.00 or higher) the report generator becomes a data card reader. Patient data can then be transferred from the data card to the computer's memory and printed.

External Printer Option

90239A Report Generators with software versions 1.13.04 and higher can print reports and messages on an external printer connected to the 25-pin connector located on the back panel (refer to *Figure 1-2*, item ③). This configuration requires use of a parallel printer cable and, if the Data Card option is used, a data key must be installed between the 90239A rear panel connector and the printer cable. (Refer to *Figure 1-5*.)

Ambulatory Blood Pressure Report Generator

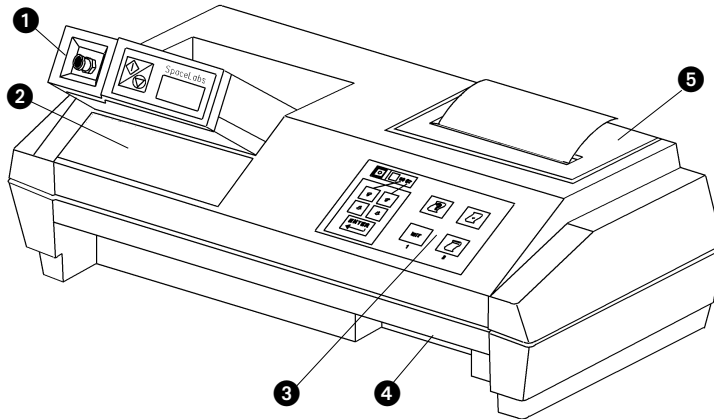


Figure 1-1: 90239A ABP Report Generator

- ❶ ABP monitor placed in chute of 90239A Report Generator for data transfer
- ❷ Label providing definitions for menu items
- ❸ User control panel
- ❹ Card slot for Data Card option
- ❺ Removable plastic cover to access printer paper

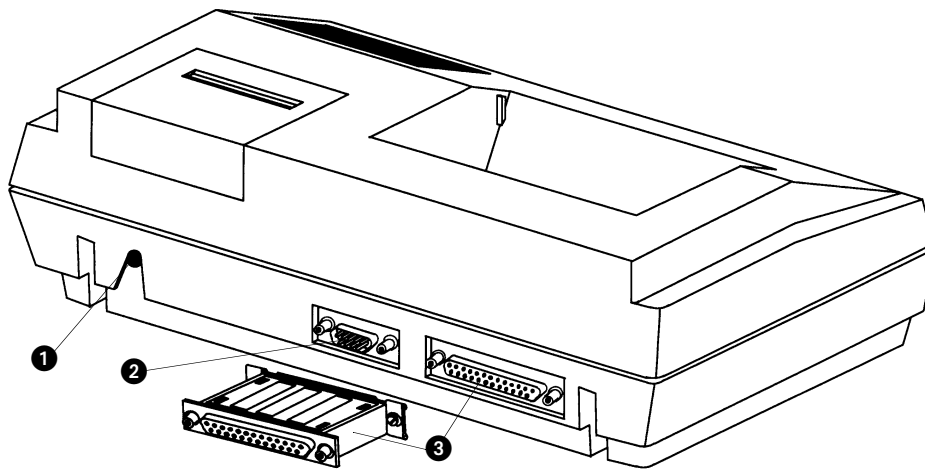


Figure 1-2: 90239A rear view

- ❶ Input connector for power adapter, 9 VDC, 800 ma (110 V: P/N 655-0636-00; 230 V: P/N 119-0125-00)
- ❷ Serial port for connection to a PC containing 90219-02 or 90219-03 ABP Analysis software
- ❸ Data key and data key/external printer port

Attaching a data key to this connector enables the data card option and adds menu items for printing report summaries and selecting patient data for printing.

Control Panel Keys

The control panel keys are functionally divided into a group of five keys on the left and a group of four keys on the right (refer to *Figure 1-3* below).



- The ABP monitor must be switched ON and placed in the report generator's chute before most control panel keys will function. Otherwise, an error message will print.

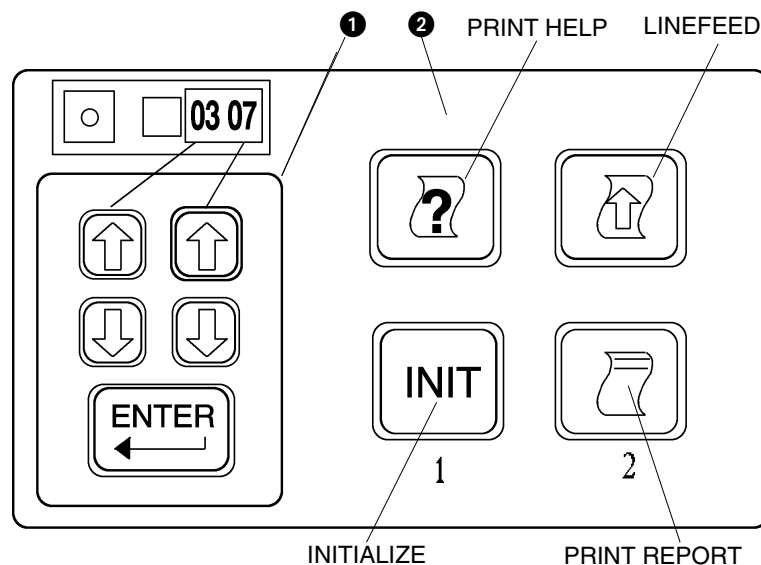


Figure 1-3: Control Panel keys

- 1 The group of five keys on the left provides printing and menu configuring functions. Refer to *Printing the Configuration Menu* on page 1-8 and *Configuration Menu Setup* on page 1-6 for details.
- 2 The four keys on the right are as follows: Print Help, Linefeed, Initialize, and Print Report.

PRINT HELP

Press this key once to print brief definitions of the four keys on the right. When printing is complete, press it again to print brief definitions of the five keys on the left. This key also prints specified menu items (refer to *Changing Menu Configurations* on page 1-8). Press this key during printing to abort printing the key definitions.

LINEFEED

This key feeds one line of paper and moves the print head across the print area each time it is pushed. This is the only key that is functional when an ABP monitor is not in the chute. If the paper jams while printing, clear the jam and then press this key to clear the error from memory and stop the ABP monitor from beeping. (Beeping indicates an error condition.)

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INITIALIZE

Press this key to erase any patient data stored in the ABP monitor and to load current ABP monitor settings from the menu (refer to *Initializing the ABP Monitor* on page 1-9).

PRINT REPORT

Press this key to print a patient data report. Press it again during printing to abort the print process (refer to *Printing Patient Data* on page 1-10 for more information). With the Data Card option installed, this key copies patient data from the ABP monitor onto a data card inserted into the card slot rather than printing the report on paper. Remove the data card to physically print a report.

Setup

Paper Loading and Clearing (internal printer)



CAUTION:

- Use only Spacelabs Medical thermal paper in the printer (P/N 006-0210-02). The print mechanism may be permanently damaged if other brands of paper are used.

1. Ensure that the print head is positioned at the far left. If not, apply electrical power to the report generator. The print head will now make one or more passes across the print area. When it holds its position against the left side for several seconds, disconnect electrical power.
2. Remove the plastic cover over the cradle for the thermal paper and orient the roll so that the paper feeds from the bottom. Fold the left corner back so that the right corner forms a point (*Figure 1-4*).

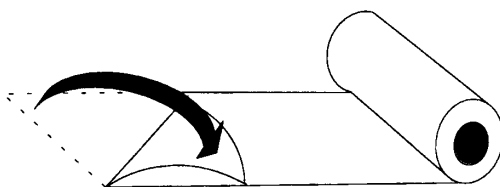


Figure 1-4: Loading the paper

3. Feed the point of the thermal paper through the slot in the bottom of the paper roll cradle until the point emerges up in the print area. Use tweezers to help pull the paper through until the entire fold clears the print head.
4. Thread the point through the slot in the plastic cover for the paper cradle and replace the plastic cover. This cover **MUST** be in place during printing.



- If an external printer is used, consult its operator's manual for paper loading instructions.

External Printer Configuration

Beginning with software version 1.13.04, the 90239A can print reports and messages on an external printer connected to the 25-pin connector located on the back of the report generator. This configuration requires use of a centronics parallel printer cable and, if the Data Card option is used, a data key installed between the 90239A rear panel connector and printer cable. Refer to *Figure 1-5* below.

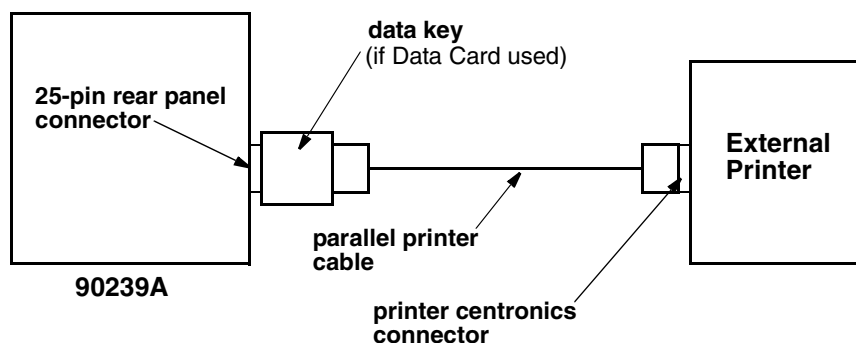


Figure 1-5: External printer configuration

Either of these two printers can be used:

- Okidata Microline 320 (or 100% compatible)
- IBM ProPrinter (or 100% compatible)

Two additional menu items now appear on the 90239A to support use of an external printer.

Menu Item	Selections Available	Description
37	00	Messages printed on <i>internal</i> printer.
	01	Messages printed on <i>external</i> printer.
38	01	An <i>Okidata</i> is connected to the 90239A.
	02	An <i>IBM ProPrinter</i> is connected to the 90239A.

Ambulatory Blood Pressure Report Generator

Configuration Menu Setup

The report generator's configuration menu allows you to define certain modes of its operation according to individual requirements. Each menu item is identified on a front panel label (refer to *Figure 1-1*, item ②). To select a menu item, press the left UP or DOWN arrow key on the report generator control panel until the desired two-digit menu item appears as the left pair of digits in the ABP monitor display.

The right pair of digits on the monitor display reflects the current setting for the menu item; press the right UP or DOWN arrow key on the control panel to display the desired value, then press ENTER to select that value.



- When a YES or NO response is required, **00 = NO** and **01 = YES**.

Menu Functions

Item #	Function (for software versions 1.17.00 or higher)	Default
01	Press ENTER to print a description of all menu items and their current settings.	---
02	Specify start of waking hours.	06:00
03	Specify start of sleeping hours.	23:00
04	Specify time interval between each measurement during waking hours.	20 minutes
05	Is a tone to sound 5 seconds before each programmed reading taken during waking hours (yes or no)?	Yes
06	Specify the time interval between each measurement during sleeping hours.	60 minutes
07	Is a reading to be displayed on the monitor after each measurement (yes or no)?	Yes
08	Is cuff pressure to be displayed during each measurement (yes or no)?	Yes
09	Specify how time is to be displayed (A.M./P.M. or 24-hour format) on the monitor.	24
10-14	Specify current hour, minute, year, month, and day, respectively.	---
15	Specify the maximum allowable cuff pressure (displayed on monitor as value divided by 10).	290
16	Are summary tables to be printed on report (yes or no)?	Yes
17	Are raw data tables to be printed on report (yes or no)? Refer to <i>Sample Printouts</i> on page 1-13.	Yes
18	Are hourly average blood pressure graphs to be printed on report (yes or no)? Refer to <i>Sample Printouts</i> on page 1-13.	Yes

Item #	Function (for software versions 1.17.00 or higher)	Default
19	Are raw blood pressure data graphs to be printed on reports (yes or no)? Refer to <i>Sample Printouts</i> on page 1-13.	Yes
20	Are heart rate graphs to be printed on reports (yes or no)? Refer to <i>Sample Printouts</i> on page 1-13.	Yes
21	Specify the waking hours systolic statistical boundary used to compute the statistical summaries (displayed as value minus 100).	140
22	Specify the waking hours diastolic statistical boundary used to compute the statistical summaries.	90
23	Specify the sleep hours systolic statistical boundary (displayed on monitor as value minus 100).	120
24	Specify the sleep hours diastolic statistical boundary.	80
25	Are readings that violate the auto edit limits to be removed (yes or no)?	Yes
26	Specify the auto edit limit for maximum systolic (displayed on monitor as value divided by 10).	260
27	Specify the auto edit limit for minimum systolic (displayed on monitor as value divided by 10).	70
28	Specify the auto edit limit for maximum diastolic (displayed on monitor as value divided by 10).	150
29	Specify the auto edit limit for minimum diastolic (displayed on monitor as value divided by 10).	40
30	Specify the auto edit limit for maximum pulse pressure (displayed on monitor as value divided by 10).	150
31	Specify the auto edit limit for minimum pulse pressure (displayed on the monitor as value divided by 10).	20
32	Specify the auto edit limit for maximum heart rate (displayed on monitor as value divided by 10).	200
33	Specify the auto edit limit for minimum heart rate (displayed on monitor as value divided by 10). Default: 40	40
34	Specify the language (1 = English, 2 = French, 3 = German, 4 = Italian, 5 = Spanish).	---
35	Should graphs be automatically scaled to match data values (yes or no)?	Yes
36	Press ENTER to reset all menu items to factory default settings.	---
37	Should messages be printed on an external printer (yes or no)?	No
38	Specify the external printer type (01 = Okidata, 02 = IBM).	01
39	Press ENTER to print a summary of the reports stored on the data card. (Optional Data Card must be installed.)	---

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Item #	Function (for software versions 1.17.00 or higher)	Default
40	Select item value 00 and press ENTER to print a list of currently queued reports. (Optional Data Card must be installed.)	---
41	Press ENTER to format the data card. (Optional Data Card must be installed.)	---

Changing Menu Configurations

1. Turn the ABP monitor power ON and place it in the report generator chute. Press the left UP or DOWN arrow key until the desired menu item number is displayed on the monitor. (To print the menu item and its current setting, press the PRINT HELP key.)
2. Press the right UP or DOWN arrow key until the desired value is displayed on the right side of the ABP monitor. When a YES or NO response is required, 00 = NO and 01 = YES.
3. Press ENTER.

Menu Configuration Example

Menu item 02 allows you to specify the time the patient normally wakes up. Assume that you want to change this wake-up time from the current setting of 06:00 (meaning 6:00 AM) to 08:00.

1. Ensure that the ABP monitor power switch is ON and that the monitor is placed in the report generator chute. Connect the report generator to external power.
2. After the ABP monitor shows a steady "0000," press the left UP arrow key on the report generator control panel until "0206" appears (where 02 is the menu item and 06 represents 6:00 A.M.).
3. Press the right UP arrow key on the control panel until "08" is displayed in the right half of the ABP monitor (the new value will start flashing). If you hold the arrow key down, you will see that the numbers scroll to 23 (denoting 11:00 P.M.) and then start over at 00. (The menu is always in a 24-hour format.)
4. Press ENTER to change the waking hour to the displayed value. The new value will stop flashing when it has been saved to memory.



- *The ABP monitor will continue to use the previous wake-up setting of 6:00 A.M. if the ENTER key is not pressed.*

Printing the Configuration Menu

A printout of current menu settings is useful when configuring the report generator. To print a copy of this menu:

1. Ensure that the ABP monitor has fresh batteries installed and the report generator has paper loaded and is connected to external power.
2. Turn the ABP monitor power switch ON.
3. A four-digit number will be displayed on the ABP monitor, and then a time value will appear with a flashing colon (you can later set the correct time via the menu).
4. Place the ABP monitor in the chute. It will display "9999" and then quickly run through a series of numbers. The display will then show a steady "0000."

5. Press the left UP arrow key once. The ABP monitor should now display "0100." If the display shows anything other than 0100, press the left UP or DOWN arrow key until the ABP monitor displays 0100.
6. Press ENTER. The report generator will now print out the full menu along with the current settings (if this is the first time to print the menu, it will reflect factory default settings). This process takes several minutes.

Keep this menu printout for future reference.

Report Generator Operation

Initializing the ABP Monitor

Initializing the ABP monitor erases all stored patient data and loads any new monitor-related menu changes.

To initialize the ABP monitor:

1. Turn the ABP monitor power switch ON and place the monitor in the report generator chute. Menu changes can now be made (refer to *Configuration Menu Setup* on page 1-6).
2. Press the INIT key.

The paper automatically advances one linefeed and the report generator indicates a successful initialization by printing a "Ready for use" message.

If you try to initialize the ABP monitor before its stored data has been printed or stored to a data card, the report generator prints the message "Monitor contains unprocessed data. This data will be lost if initialization continues!" When this happens, either:

- Press the INIT key again to continue initialization (the un-printed data will be erased), or
- Press ENTER to abort the initialization process. In this case, the report generator prints "Monitor initialization aborted."

Copying ABP Monitor Data to a Data Card

To copy patient data from an ABP monitor to a data card (optional):

1. Insert a data card into the card slot on the front of the ABP Report Generator (refer to *Figure 1-1*, item ④). Ensure that the data key is also connected to the back of the report generator.



- *If either the data card or data key is not installed, patient data will print out on the report generator instead of being copied to the data card.*

2. Turn the ABP monitor power switch ON and place the monitor in the report generator chute.
3. Wait until the ABP monitor display reads "0000," then press the PRINT REPORT key. The report generator will print "Reading monitor." The patient report will now be copied to the data card and receive the next sequential number.



- *To abort copying the data to the data card, press the PRINT REPORT key a second time.*

To erase patient data in the ABP monitor, refer to *Initializing the ABP Monitor* above.

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Printing Patient Data



- *When a red stripe appears on the print paper, it indicates that 5 to 8 feet (1.3m to 2.4m) of paper remain on the roll. Do not start printing a report when this stripe appears. The report generator will attempt to continue printing even after it has run out of paper. Cut or tear off the paper from the roll. Pull the paper strip remaining in the print unit out in the same direction as normal paper movement and load a fresh roll of paper.*

Patient data can be printed either directly from the ABP monitor or from a data card. Patient data prints in the order shown below (graphs and/or tables may not print depending upon your menu selections):

1. Patient demographic header and technical data.
2. Data summary tables (total, daytime, and nighttime).
3. Hourly average data table (one table for each 24 hours).
4. Hourly average pressure graph (one graph for each 24 hours).
5. Hourly average heart rate graph (one graph for each 24 hours).
6. Raw data table (one table for each 24 hours).
7. Edited data table (one table for each 24 hours).
8. Raw data pressure graph (one graph for each 24 hours).
9. Raw data heart rate graph (one graph for each 24 hours).

Data that was obtained when the patient manually started a reading via the ABP monitor's START/STOP switch will be tagged with an "m" (for manual reading).

Data that was obtained on a second try after the ABP monitor failed to obtain a valid reading the first time will be tagged with an "r" (for retry).

Data that was obtained at pre-programmed times via menu settings will be un-tagged.

To Print Patient Data from the ABP Monitor

1. Turn the ABP monitor power switch ON and place the monitor in the report generator chute.
2. Wait until the ABP monitor display reads "0000," then press the PRINT REPORT key. The report generator will print "Reading monitor."



- *If the ABP monitor contains no data, the message "Monitor contains no readings" prints.*

3. The patient data report will now print in accordance with the current menu settings on the report generator.



- *To abort printing, press the PRINT REPORT key a second time.*

The ABP monitor retains patient data until it is initialized (refer to *Initializing the ABP Monitor* on page 1-9).

To Print Patient Reports from a Data Card

1. Insert the data card into the report generator card slot.
2. Each patient report that is copied onto a data card is numbered sequentially. This number is used to select each report for printing. If the sequential number of the report to be printed is already known, move ahead to step 3. If not, use the left UP or DOWN arrow key to select menu item 39, and press ENTER. This prints a list of the patient reports on the data card along with their sequential numbers.
3. Select menu item 40 and use the right UP or DOWN arrow key to select the sequential number of the first patient data report to be printed. Press ENTER to transfer this number to the print queue, which is a list of the patient data reports to be printed. Additional patient data reports can be added to the print queue by selecting their numbers and pressing ENTER.
4. To verify the report numbers in the print queue prior to printing, use the left UP or DOWN arrow key to select menu item 40, then use the right UP or DOWN arrow key to select 00. Press ENTER to print a list of all report numbers that are in the queue ready for printing.
5. To print all the patient reports in the print queue, press the PRINT REPORT key.



- *To abort printing patient, press the PRINT REPORT key a second time.*

Printing and Copying a Patient Report

To print a patient report prior to copying it to a data card:

1. Press the PRINT REPORT key without inserting the data card.
2. After the data has been printed, insert the data card into the card slot (the data key must also be connected), and press the PRINT REPORT key.

Reverse steps 1 and 2 if patient data is to be copied to a data card first and then printed.

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Correcting Printer Paper Problems

The ABP monitor beeps continuously if an error occurs during printing, such as torn paper in the print area or the paper not feeding freely through the paper-feed mechanism. To clear the problem, cut off the paper roll and pull the remaining paper strip in the direction of normal paper movement. Reload fresh paper and press the LINEFEED key on the control panel to clear the error from memory.



CAUTION:

- Do NOT pull the paper backwards through the printer. Reversing the normal direction of paper flow may permanently damage the paper-feed mechanism. Pull the remaining paper out only in the direction indicated in *Figure 1-6*.

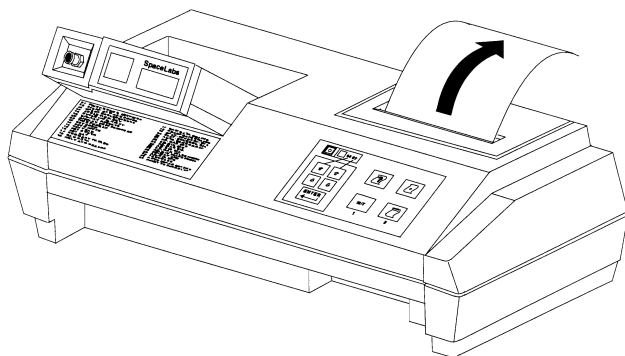


Figure 1-6: Clearing paper jams

Routine Maintenance

The following maintenance activities should be done on an as-needed basis:

- Wipe all external surfaces with a damp cloth. Ensure that no dust, lint, etc., obstructs the infrared window in the bottom of the chute.
- Remove the printer cover and vacuum out accumulated dirt and paper fiber from the print head area. Use tweezers to remove any paper scraps.

Performance Verification

Report Generator

The report generator performs a self-test each time it is connected to power. Following a successful self-test, the following information is printed:

- Model name (ABP Report Generator).
- Software version (for the report generator).
- Year of copyright.
- Software version (for the ABP monitor).
- Current date and time (programmable via the menu).

ABP Monitor

The ABP monitor performs a self-test each time its power switch is turned ON. Following a successful self-test, the monitor displays its software version number (0209 or a similar value) and then displays the current time. If the ABP monitor is inserted into the chute of the report generator at this time, it flashes a series of numbers and then displays "0000."



- *If the ABP monitor maintains a display of "9999," the report generator is not powered up.*

An unsuccessful self-test will display "EC25," indicating that the ABP monitor's software program has been corrupted. Place the ABP monitor in the chute, and the report generator will reload the software program. When the reloading process is complete, the ABP monitor will display "0000" and the report generator prints the message "Monitor software successfully installed in monitor."



- *Event Code (EC) numbers are defined in your ABP monitor manual.*

Sample Printouts

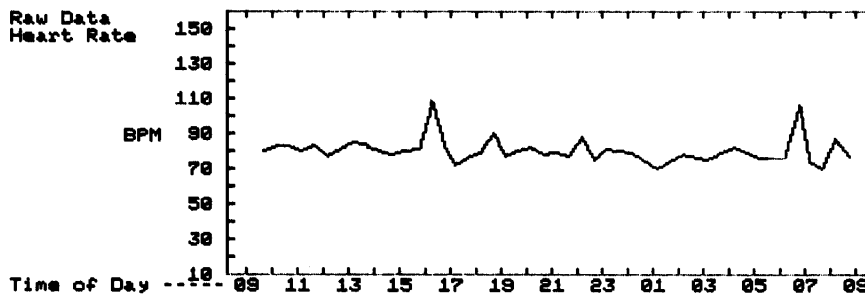
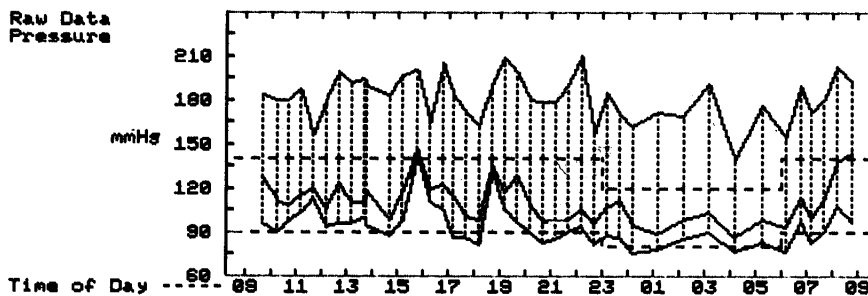
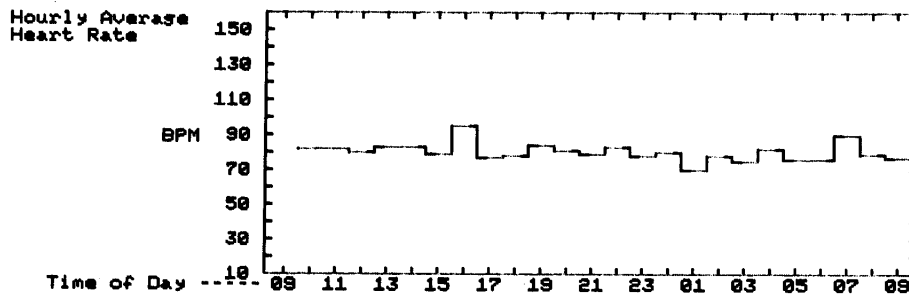
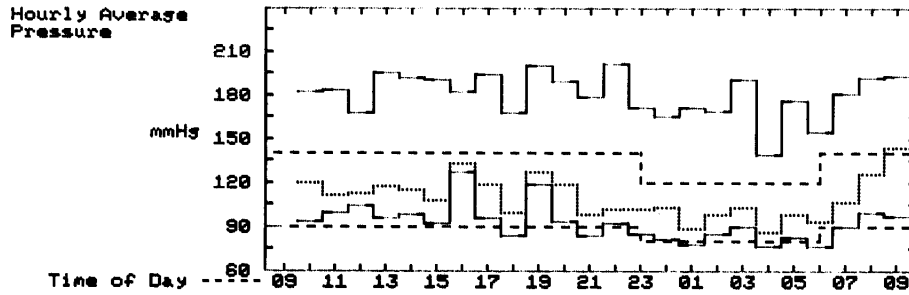
The following pages show examples of internal and external printouts.



- *For explanations of Event Code (EC) numbers, refer to your ABP monitor's manual.*

Ambulatory Blood Pressure Report Generator

Internal Printer Samples



Internal Printer Samples (continued)

Ambulatory Blood Pressure Report
Copyright (c) 1991-1993, 1994
SpaceLabs Medical, Inc.

Date: 23-Feb-94

Patient Name:

Physician Name:

Monitor Initialized:

Date: 17-Jun-93
Time: 06:29

Monitor Read:

Date: 23-Feb-94
Time: 11:32

ABP Scan Began:

Date: 17-Jun-93
Time: 09:42

ABP Scan Ended:

Date: 18-Jun-93
Time: 08:45

Total time (hours): 24
Number of Readings: 41
Percent Successful: 95%

Summary			
(mmHg)	Min	Mean	Max
Systolic	139	180	210
Diastolic	75	92	142
MAP	86	109	146
Heart Rate	70	80	108
Above stat boundaries -			
Systolic	100%		
Diastolic	61%		
Highest Sys	210 mmHg	22:12	
Highest Dia	142 mmHg	15:45	
Lowest Sys	139 mmHg	04:12	
Lowest Dia	75 mmHg	00:12	

Daytime Summary 6:00 - 22:59

(mmHg)	Min	Mean	Max
Systolic	155	185	210
Diastolic	77	96	142
MAP	94	114	146
Heart Rate	70	81	108
Systolic >	140 mmHg	100%	
Diastolic >	90 mmHg	61%	
Highest Sys	210 mmHg	22:12	
Highest Dia	142 mmHg	15:45	
Lowest Sys	155 mmHg	06:12	
Lowest Dia	77 mmHg	06:12	

Nighttime Summary 23:00 - 5:59

(mmHg)	Min	Mean	Max
Systolic	139	169	191
Diastolic	75	82	90
MAP	86	97	111
Heart Rate	70	77	82
Systolic >	120 mmHg	100%	
Diastolic >	80 mmHg	63%	
Highest Sys	191 mmHg	03:12	
Highest Dia	90 mmHg	03:12	
Lowest Sys	139 mmHg	04:12	
Lowest Dia	75 mmHg	00:12	

Hourly Average

Hr	#RD	Sys	Dia	MAP	Pul	HR
09	0	0	0	0	0	0
10	2	182	93	120	89	82
11	2	184	100	112	84	82
12	2	168	104	113	65	80
13	2	196	96	117	100	83
14	2	192	98	115	95	83
15	2	191	92	108	99	79
16	2	182	127	133	55	95
17	2	194	96	119	98	77
18	2	168	84	100	84	78
19	2	200	119	127	82	84
20	2	190	94	119	96	81
21	2	179	84	98	95	79
22	2	201	92	102	109	83
23	2	171	85	102	86	78
00	2	166	81	103	86	80
01	1	171	78	89	93	70
02	1	169	85	98	84	78
03	1	191	90	103	101	75
04	1	139	77	86	62	82
05	1	176	83	98	93	76
06	1	155	77	94	78	76
07	2	181	90	107	91	90
08	2	192	99	126	93	79
09	1	193	97	144	96	77

Reading Data

RD #	Time	Sys	Dia	Map	HR
3	09:42	183	96	127	80
5r	10:15	180	90	112	83
6	10:42	180	97	108	83
7	11:12	187	103	115	80
8	11:42	156	113	120	83
9	12:12	180	94	106	77
10	12:42	199	96	123	81
11	13:12	192	96	110	85
12	13:42	194	100	110	84
13m	13:47	190	95	119	82
15	14:42	184	87	98	78
16	15:12	197	97	117	80
18r	15:45	200	142	146	81
20r	16:16	184	112	119	100
22r	16:45	205	106	122	82
23	17:12	183	86	115	72
24	17:42	172	86	101	76
25	18:12	163	81	98	79
26	18:42	191	132	136	90
27	19:12	209	105	118	77
28	19:42	199	97	128	80
29	20:12	180	90	109	82
30	20:42	179	83	97	78
31	21:12	179	85	98	79
32	21:42	191	90	98	77
33	22:12	210	94	106	88
34	22:42	157	82	96	75
35	23:12	185	88	107	81
36	23:42	170	86	111	80
37	00:12	162	75	95	79
38	01:12	171	78	89	70
39	02:12	169	85	98	78
40	03:12	191	90	103	75
41	04:12	139	77	86	82
43r	05:14	176	83	98	76
44	06:12	155	77	94	76
46r	06:44	190	97	114	106
47	07:12	172	83	100	74
48	07:42	180	90	113	70
49	08:12	203	108	138	87
51r	08:45	193	97	144	77

m = Manually Initiated
r = Automatic Retry
<> = Estimated

Edited Data

RD #	Time	Sys	Dia	Map	HR	S	E
1	09:12			EC =	21	E	
2r	09:14			EC =	21	E	
4	10:12			EC =	30	E	
14	14:12	188	172	185	185	A	
17	15:42			EC =	38	E	
19	16:12			EC =	40	E	
21	16:42			EC =	21	E	
42	05:12			EC =	21	E	
45	06:42			EC =	21	E	
50	08:42			EC =	40	E	

A = Auto Edit
E = Event Edit
m = Manually Initiated
r = Automatic Retry
<> = Estimated

Ambulatory Blood Pressure Report Generator

External Printer Samples

Ambulatory Blood Pressure Report

Date: 14-Feb-94

Patient Name: _____

Physician Name: _____

Technical Data

Monitor Initialized:	Date: 17-Jun-89	Time: 06:29
Monitor Read:	Date: 14-Feb-94	Time: 16:02
ABP Scan Began:	Date: 17-Jun-89	Time: 09:42
ABP Scan Ended:	Date: 18-Jun-89	Time: 08:45
Total time (hours):	24	
Number of Readings:	41	
Percent Successful:	91%	

Summary

	Min	Mean	Max
Systolic	139	180	210 mmHg
Diastolic	75	92	142 mmHg
MAP	86	109	146 mmHg
Heart Rate	70	80	108 BPM

Above stat boundaries -

Systolic	100%
Diastolic	61%

Highest Sys	210 mmHg	22:12
Highest Dia	142 mmHg	15:45
Lowest Sys	139 mmHg	04:12
Lowest Dia	75 mmHg	00:12

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External Printer Samples (continued)

Daytime Summary 6:00 - 22:59

	Min	Mean	Max
Systolic	155	185	210 mmHg
Diastolic	77	96	142 mmHg
MAP	94	114	146 mmHg
Heart Rate	70	81	108 BPM
Systolic >	140 mmHg	100%	
Diastolic >	90 mmHg	61%	
Highest Sys	210 mmHg		22:12
Highest Dia	142 mmHg		15:45
Lowest Sys	155 mmHg		06:12
Lowest Dia	77 mmHg		06:12

Nighttime Summary 23:00 - 5:59

	Min	Mean	Max
Systolic	139	169	191 mmHg
Diastolic	75	82	90 mmHg
MAP	86	97	111 mmHg
Heart Rate	70	77	82 BPM
Systolic >	120 mmHg	100%	
Diastolic >	80 mmHg	63%	
Highest Sys	191 mmHg		03:12
Highest Dia	90 mmHg		03:12
Lowest Sys	139 mmHg		04:12
Lowest Dia	75 mmHg		00:12

Ambulatory Blood Pressure Report Generator

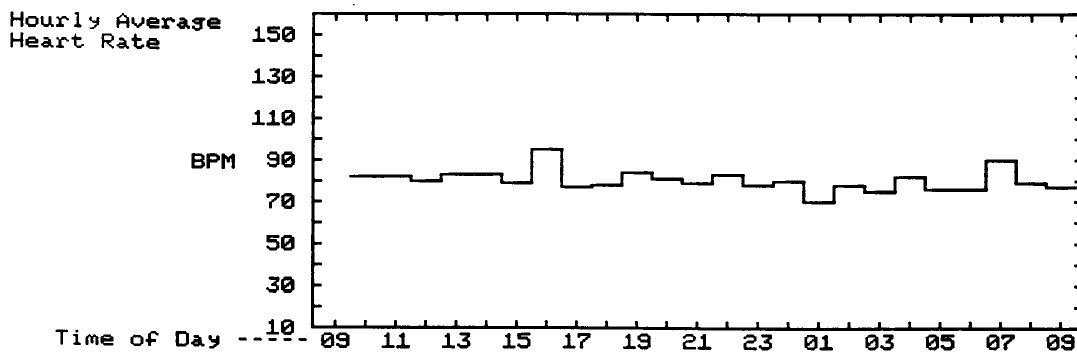
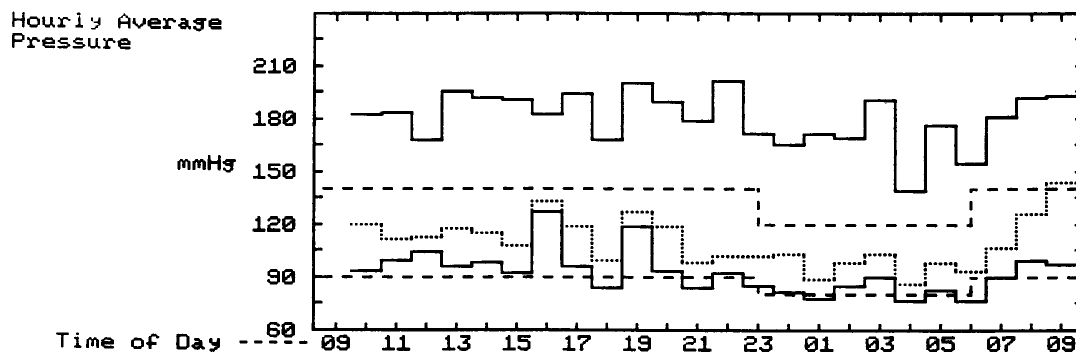
External Printer Samples (continued)

Hourly Average

<u>Hr</u>	<u>#RD</u>	<u>Sys</u>	<u>Dia</u>	<u>MAP</u>	<u>Pul</u>	<u>HR</u>
09:00	0	0	0	0	0	0
10:00	2	182	93	120	89	82
11:00	2	184	100	112	84	82
12:00	2	168	104	113	65	80
13:00	2	196	96	117	100	83
14:00	2	192	98	115	95	83
15:00	2	191	92	108	99	79
16:00	2	182	127	133	55	95
17:00	2	194	96	119	98	77
18:00	2	168	84	100	84	78
19:00	2	200	119	127	82	84
20:00	2	190	94	119	96	81
21:00	2	179	84	98	95	79
22:00	2	201	92	102	109	83
23:00	2	171	85	102	86	78
00:00	2	166	81	103	86	80
01:00	1	171	78	89	93	70
02:00	1	169	85	98	84	78
03:00	1	191	90	103	101	75
04:00	1	139	77	86	62	82
05:00	1	176	83	98	93	76
06:00	1	155	77	94	78	76
07:00	2	181	90	107	91	90
08:00	2	192	99	126	93	79
09:00	1	193	97	144	96	77

External Printer Samples (continued)

Hourly Average



Ambulatory Blood Pressure Report Generator

External Printer Samples (continued)

Reading Data

RD #	Time	Sys	Dia	MAP	HR
3	09:42	183	96	127	80
5 r	10:15	180	90	112	83
6	10:42	180	97	108	83
7	11:12	<187>	103	115	80
8	11:42	156	113	<120>	83
9	12:12	180	< 94>	106	77
10	12:42	199	96	123	81
11	13:12	192	96	110	85
12	13:42	194	100	110	84
13 m	13:47	190	95	119	82
17	14:42	184	87	98	78
18	15:12	197	97	117	80
20 r	15:45	200	142	146	81
22 r	16:16	164	112	119	108
24 r	16:45	205	106	122	82
25	17:12	183	86	115	72
26	17:42	172	86	101	76
27	18:12	163	81	98	79
28	18:42	191	132	136	90
29	19:12	209	105	118	77
30	19:42	199	97	128	80
31	20:12	180	90	109	82
32	20:42	179	83	97	78
33	21:12	179	85	98	79
34	21:42	191	90	98	77
35	22:12	210	94	106	88
36	22:42	157	82	96	75
37	23:12	185	88	107	81
38	23:42	170	86	111	80
39	00:12	162	75	95	79
40	01:12	171	78	89	70
41	02:12	169	85	98	78
42	03:12	191	90	103	75
43	04:12	139	77	86	82
45 r	05:14	176	83	98	76
46	06:12	155	77	94	76
48 r	06:44	190	97	114	106
49	07:12	172	83	100	74
50	07:42	180	90	113	70
51	08:12	203	108	138	87
53 r	08:45	193	97	144	77

m = Manually Initiated r = Automatic Retry
<> = Estimated

External Printer Samples (continued)

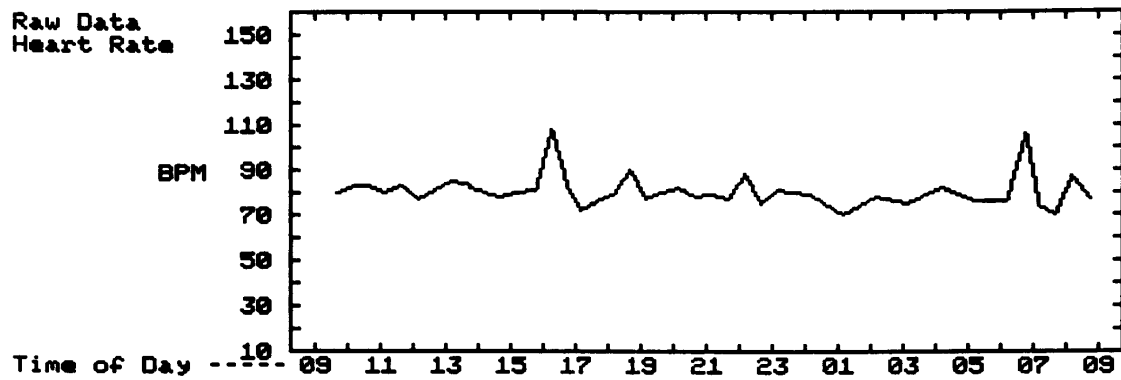
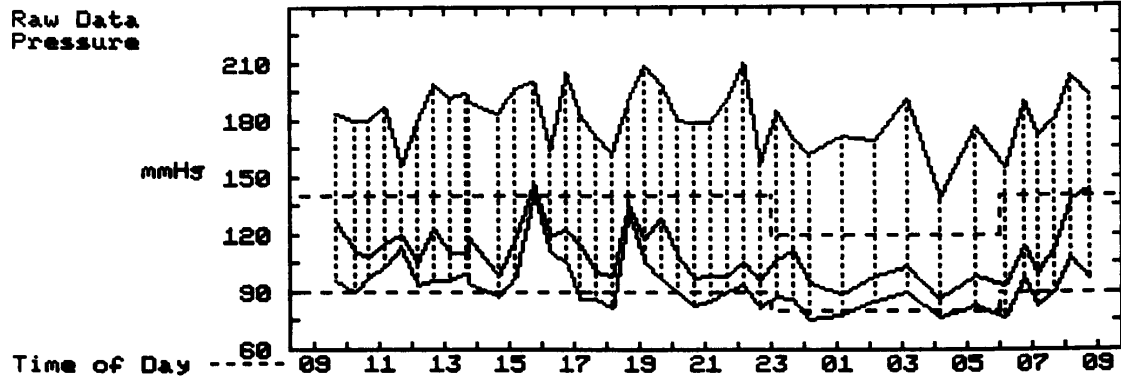
Edited Data

RD #	Time	Sys	Dia	MAP	HR	ES
1	09:12				EC = 21	E
2 r	09:14				EC = 21	E
4	10:12				EC = 30	E
14	14:12	<188>	172	185	185	A
15	14:22	188	172	<185>	185	A
16	14:32	188	<172>	185	185	A
19	15:42				EC = 38	E
21	16:12				EC = 40	E
23	16:42				EC = 21	E
44	05:12				EC = 21	E
47	06:42				EC = 21	E
52	08:42				EC = 40	E

 A = Auto Edit E = Event Edit
 m = Manually Initiated r = Automatic Retry
 <> = Estimated

























Ambulatory Blood Pressure Report Generator

External Printer Samples (continued)











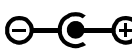


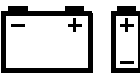




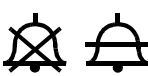



Symbols





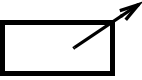
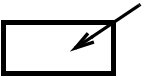






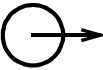
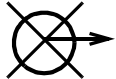












The following list of international and safety symbols describes all symbols used on Spacelabs Medical products. No one product contains every symbol.

Symbol	Description	Symbol	Description
	UCW or Ultraview 1700 HELP Key		UCW or Ultraview 1700 MONITOR SETUP Key
	UCW or Ultraview 1700 SPECIAL FUNCTIONS Key		UCW or Ultraview 1700 ALARMS Key
	UCW or Ultraview 1700 RECORD Key		UCW or Ultraview 1700 PREVIOUS MENU Key
	UCW or Ultraview 1700 NORMAL SCREEN Key		UCW or Ultraview 1700 mouse connection
	UCW or Ultraview 1700 Keyboard Connection		ON — Power Connection to Mains
	OFF — Power Disconnection from Mains		On Position for Push button Power Switch
	Off Position for Push button Power Switch		STOP or CANCEL Key
	CONTINUE Key		START/STOP Key
	START/STOP		START (NIBP) Key
	On Direction		ON/OFF
	Television; Video Display		Recycle
	Protective Earth Ground		Functional Earth Ground



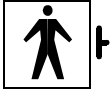






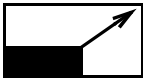


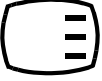





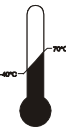

Ambulatory Blood Pressure Report Generator

Symbol	Description	Symbol	Description
	ON — Part of the Instrument Only		OFF — Part of the Instrument Only
	Partial ON/OFF		STAND-BY Key
	All batteries should be disposed of properly to protect the environment. Lithium batteries should be fully discharged before disposal. Batteries such as lead-acid (Pb) and nickel-cadmium (Ni-Cd) must be recycled. Please follow your internal procedures and or local (provincial) laws regarding disposal or recycling.		Caution - hazardous voltages. To reduce risk of electric shock, do not remove the cover or back. Refer servicing to a qualified service personnel (U.S.A.). DANGER - High Voltage (International)
	PAUSE or INTERRUPT		Slow Run
	Replace Fuse Only as Marked		Fuse
	Power supply jack polarity. (+ / - Signs May be Reversed)		Equipotentiality Terminal
	Battery Replace only with the appropriate battery.		Replace only with the appropriate battery. (+ / - Signs May be Reversed)
	Alternating Current		Direct Current
	Both Direct and Alternating Current		AC/DC Input
A	Amperes	Hz	Hertz
V	Volts	W	Watts
	Temporary Shut Off of Alarm Tone or Screen Indicators		Alarm

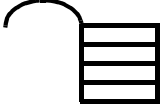
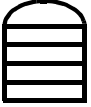





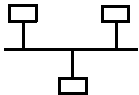
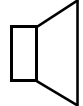


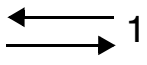
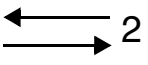

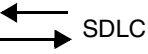
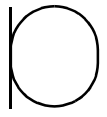
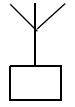
Symbols

Symbol	Description	Symbol	Description
	ENTER Key		PRINT REPORT Key
	Attention - Consult Operations or Service Manual for Description		Risk of Explosion if Used in the Presence of Flammable Anesthetics
	Indicator — Remote control		Indicator — Local Control
	Return Unit to Monitor Mode		Indicator — Out of Paper
	Activate Recorder for Graphics		Recorder Paper
	Indoor Use Only		Auto Mode (NIBP)
	Output		No Output (Terminated)
	Data Input/Output		HELP (Explain Prior Screen) Key
	Clock/Time Setting Key		Input/Output
	Monitor Setup Select Program Options		Set Initial Conditions Menu
	Access Special Function Menu		Normal Screen
	Return to Prior Menu		TREND/TIMER Key
	Gas Exhaust		Electrocardiograph or Defibrillator Synchronization






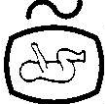












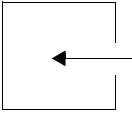
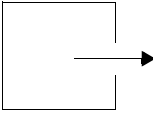
Ambulatory Blood Pressure Report Generator

Symbol	Description	Symbol	Description
	Arterial Pulse		IEC 601-1 Type BF equipment. The unit displaying this symbol contains an F-type isolated (floating) patient-applied part providing an adequate degree of protection against electric shock.
	IEC 601-1 Type BF equipment which is defibrillator-proof. The unit displaying this symbol contains an F-type isolated (floating) patient-applied part which contains an adequate degree of protection against electric shock, and is defibrillator-proof.		IEC 601-1 Type CF equipment. The unit displaying this symbol contains an F-type isolated (floating) patient-applied part providing a high degree of protection against electric shock.
	IEC 601-1 Type CF equipment. The unit displaying this symbol contains an F-type isolated (floating) patient-applied part providing a high degree of protection against electric shock, and is defibrillator-proof.		ETL Laboratory Approved
	IEC 601-1 Type B equipment. The unit displaying this symbol contains an adequate degree of protection against electric shock.		Canadian Standards Association Approved
	Keypad		Enlarge, Zoom
	Menu Keys		Delete
	Waveform/Parameter Keys		PCMCIA Card
	Keep Dry		Fragile; handle with care
	Foot Switch		This Way Up
	Environmental Shipping/Storage Temperature Limitations		Environmental Shipping/Storage Humidity Limitations





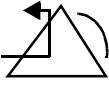






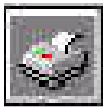
Symbols

Symbol	Description	Symbol	Description
	Open Padlock		Closed Padlock
	Down Arrow		Up Arrow
	Event	TEMP temp	Temperature
	Antenna		Environmental Shipping/Storage Altitude Limitations
	Network Connection		Audio Output, Speaker
	Remote Alarm; Nurse Alert		Nurse Call
	Serial Port 1		Serial Port 2
	External marker push button connection		SDLC Port
	Microphone		Mermaid Connector

Ambulatory Blood Pressure Report Generator

Symbol	Description	Symbol	Description
	Note		Video Output
	Warning About Potential Danger to Human Beings		Caution About Potential Danger to Equipment
	Non-Invasive Blood Pressure (NIBP), Neonate		Fetal Monitor Connection (Analog)
	Fetal Monitor Connection RS232 (Digital)		Physiological Monitor Connection RS232 (Digital)
	Input		Reset
	Hard Drive		Power Indicator LED
	Activate Telemetry Recorder		Omnidirectional Microphone
	Battery Status		Universal Serial Bus
	Stand-by		Low Battery
	Gas Sampling Port		Gas Return Port

Symbols

Symbol	Description	Symbol	Description
	Operates on Non-Harmonized Radio Frequencies in Europe		Service Message
	Happy Face		Sad Face
	Reset		Power Indicator LED
	Magnifying Glass		Compression
	File Cabinet		List of Rooms
	Arrows		Printer

Ambulatory Blood Pressure Report Generator

Abbreviations used as symbols are shown below.

Symbol	Description	Symbol	Description
1 - 32	Access Codes 1 Through 32	AIR	Air
ANT 1 ANT 2	Diversity Antenna System 1 Diversity Antenna System 2	Arr1 ArrNet2	Arrhythmia Net 1 Arrhythmia Net 2
CH ch	EEG, EMG, or ECG Channel EEG Channels - CH1, CH2, CH3, CH4 EMG Channel - CH5	cmH₂O	Centimeters of Water
CMV	Controlled Mechanical Ventilation	C.O. CO co	Cardiac Output
DIA dia	Diastolic	ECG ecg	Electrocardiogram
EEG eeg	Electroencephalogram	EMG emg	Electromyogram
ESIS	Electrosurgical Interference Suppression	EXT	External
FECG	Fetal Electrocardiogram	FHR1 FHR2	Fetal Heart Rate, Channel 1 Fetal Heart Rate, Channel 2
GND gnd	Patient Isolated Ground	HLO hlo	High-Level Output
I:E	Inspiration Expiration Ratio	Multiview	Multi-Lead Electrocardiogram
NIBP nibp	Non-Invasive Blood Pressure	N₂O	Nitrous Oxide
O₂	Oxygen	PEEP	Positive End Expiratory Pressure
PRESS press PRS	Pressure	Pmin	Minimum Inspiratory Pressure

Symbol	Description	Symbol	Description
Ppeak	Peak Inspiratory Pressure	RESP resp	Respiration
SDLC	Synchronous Data Link Control	SPO2 SpO2 SpO₂ SaO₂	Arterial Oxygen Saturation as Measured by Pulse Oximetry
SVO2 SvO2 SvO₂	Mixed Venous Oxygen Saturation	SYS sys	Systolic
T1 T2 T3 T4	Temperature 1 Temperature 2 Temperature 3 Temperature 4	UA	Uterine Activity or Umbilical Artery
VAC	Vacuum connection		

BirthNet, CVScan, Data Shuttle, FT1000, FT3000, Flexchart, Flexform, Flexport, Flextable, Flextools, Flexview, Global Participant Index, Intesys, Multiview, Neoscan, PCIS, PCMS, PrintMaster, Quicknet, Sensorwatch, Spaceview, TRU-CAP, TRU-CUFF, TRU-LINK, UCW, Ultralite, Ultraview, Ultraview Clinical Messenger, Uni-Pouch, Universal Flexport, Varitrend, Web Source and WinDNA are trademarks of Datex-Ohmeda, Inc.

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