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E-600
PORTABLE
RADIATION MONITOR
TECHNICAL MANUAL

Manual Insert: E600 Windows® program update

The following update notice is for those users who have the WINE600 calibration or RadMap software versions 2.05 or earlier. Contact Eberline for a free upgrade if you are using Version 2.05 or earlier. This E600 has firmware (version 3.12 or later) which will not communicate properly with the older versions of WINE600 (2.05 or earlier).

If you are currently running WINE600, the version of the program will be displayed on the top of the main display similarly to the line shown below:

"Eberline E-600 Interface Program V2.11"

To change the version of WINE600, delete your current version of WINE600.exe and then follow the install instructions on the new floppy disk.

Eberline *A subsidiary of Thermo Instrument Systems Inc.*

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Ref. No. 2258/MI2258/Rev A/July, 1998

MANUAL INSERT: SHP-380, Bracket Option Assembly

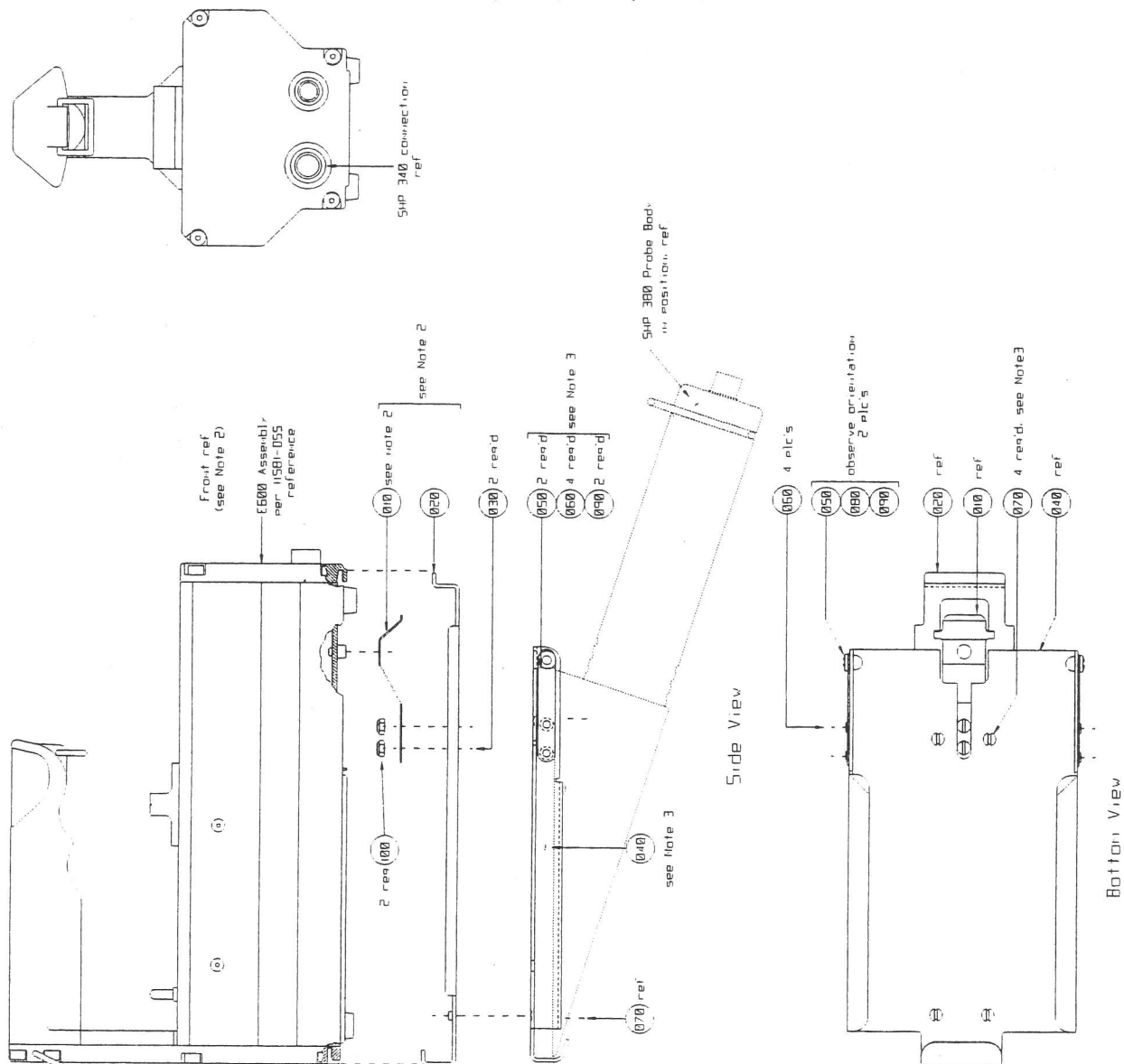
SPARE PARTS

ITEM #	DESCRIPTION	EBERLINE PART #	QTY.
10	SPRING CATCH, E-600 PROBE HOLDER	ZP11581042	1 ea.
20	OPTION BRACKET, E-600	ZP11581034	2 ea.
30	SCREW 4-40 x 3/16, BH, SS	SCBH0403	2 ea.
40	HP/SHP-380 HOLDER BRACKET, E-600 OPT-31	ZP11581103	1 ea.
50	SPRING DETENT, PROBE HOLDER E-600 OPT-31	ZP11581104	2 ea.
60	RIVET, ALUM, FH, 1/8 x 3/16 LG	HDFA28	4 ea.
70	SCREW, #4-40 x 1/4 LG SS UNDERCUT	SCMB33	4 ea.
80	PROBE HOLDER RETAINER BUTTON	ZP11581044	2 ea.
90	SCREW, 6-32 x 1/8 BH SS	SCBH602	2 ea.
100	1/2" WIDE, 10 MIL THK, TEFLON TAPE	HDTA97	2 ft.
110	1/2" WIDE, 3 MIL THK, TEFLON TAPE	HDTA98	1 ft.

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Ref. No. 2309MI2309Original/May 12, 1997



NOTES:

- 1 Encircled numbers refer to line item numbers on BOTH E600 OPT31
- 2 Fasten Screw Catch (item 010) loosely to Deton Bracket (item 020), using Screws (item 030) and Nuts (item 000) Insert this assembly under E600 Body, front edge (first Position, both ends, center and insert Screw Catch over protruding screw head of E600 Body, prior to tightening Screws
- 3 Assemble SHP 380 Bracket (item 040), to Spring Detents (item 050), one on each side, as shown, using Rivets (item 050) Attach Retainer Buttons (item 060) to Spring Detents (item 050) using screw thread adhesive of medium strength Loctite or equivalent, observe orientation, 4 (total) assembled SHP 380 Bracket (item 040), to Deton Bracket (item 020), using Screws (item 070).

SHP-280, BRACKET OPTION ASSEMBLY, E-600 OPT.31, 11581-B105 C

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THERMO ELECTRON CORP. RM&P
Western Service Center
PO Box 2108/504 Airport Rd.
Santa Fe, NM 87504-2108
505-471-3232
1-800-274-4212

THERMO ELECTRON CORP. RM&P
Eastern Service Center
312 Miami Street
West Columbia, SC 29170
803-822-8843
1-800-234-4212

STANDARD WARRANTY

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Extended warranty or service under a blanket contract is available.

March 2003

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Overview

General Description

Eberline's E-600 was designed to replace a wide range of portable radiation measurement instruments. Its simple analog circuitry may be configured under microprocessor control to support a wide range of detectors and to display measurement results in a variety of units and formats. A single instrument may be configured to suit the needs of an experienced user or to eliminate procedural errors and experimentation by a novice operator, and this configuration may be changed as often as necessary.

When used with Eberline's smart probes, the E-600 automatically loads the appropriate setup and calibration parameters from the probe. Connecting a new probe, even of a completely different type, immediately re-configures the instrument as necessary. Operation with a specific non-smart probe is also supported. In either case, a wide selection of display units and formats is available.

Perhaps the most distinctive feature of the E-600 is not actually part of the instrument at all: The potentiometers, jumpers, DIP switches and arcane keystroke sequences used to configure and calibrate most portable instruments have been replaced by a user-friendly interface program which may be installed on any PC-compatible computer running the Microsoft Windows® operating environment. This software makes the task of setting up an instrument quick and painless. Downloading a complete new personality into the E-600 requires only a few minutes, and complete records of each instrument's parameters is saved without extra paperwork.

Specifications

Length:	9.0	inch	22.9	cm
Width:	4.1		10.5	
Height:	6.0		15.3	
Weight:	3.4	lbs	1.53	kg (With batteries)
Batteries:	3 Alkaline "C" cells, life typically 50 to 100 hours			
Operating Temperature:	-20° to +50° C (-4° to +122° F)			
Storage Temperature:	-30° to +70° C (-22° to +155° F)			
Operating Humidity:	0 to 95% non-condensing			

Features

- Simple, user-friendly controls, ergonomically arranged.
- Analog and digital display of measurement results.
- Easy configuration via Windows®-based interface program.
- Site administrator may pre-define available operating modes.
- Simultaneous alpha, beta-gamma and total channels.
- Ratemeter, integration, scaler and peak hold measurement modes.
- Wide selection of rate and dose display units.
- Gross or net measurements.
- Log memory for 500 measurement results.
- Automatic setup when used with Eberline smart probes.
- Internal parameter storage for one conventional probe.
- Selectable enforcement of calibration due dates.
- May be configured for virtually any type of detector.
- Rugged construction with all-aluminum case.

CAUTION

Shock Hazard

Depending upon the type of probe used with this instrument, potentials in excess of 2,000 Volts may be present on the probe connector. This voltage may remain for up to one minute after the probe is disconnected or the unit is turned off. Never insert fingers or metallic objects into the probe connector on the instrument or probe cable.

This instrument should never be disassembled except by a qualified technician who is experienced in servicing radiation measurement equipment and familiar with the E-600 design.

Battery Warning

This instrument may be powered by either alkaline or nickel-cadmium batteries, both of which contain heavy metals and other hazardous materials which must be handled and disposed of properly. Do not mix batteries of different types or charge states in the same instrument. Recharge only batteries specifically designated as rechargeable, and always follow manufacturer's charging recommendations. Do not puncture, mutilate or attempt to disassemble batteries. Do not heat cells above 100°C (212°F). Eberline recommends that batteries be recycled at appropriate recycling centers or disposed of as required by local ordinances and regulations.

SECTION 2

Controls and Indicators

Dedicated Controls

Note: Configuration is accomplished by connecting the instrument to a personal computer on which the E-600 interface software is running. Refer to the interface program manual for detailed instructions on this procedure. Depending upon the operating modes and options enabled during instrument configuration, some of the following controls may not be active. Assuming that they are, in fact, active, the following definitions apply:

- | | |
|---------------|--|
| Mode Selector | In addition to turning the instrument on and off, this switch selects CHECK, BACKGROUND or one of four operating modes. These modes are described in detail in sections 4-6 of this manual. |
| Range Up/Down | These buttons (located on the front panel) increase and decrease the full-scale range of the display by a factor of ten. If necessary, the measurements are automatically adjusted as well. When automatic ranging is enabled, these switches have no effect. In check mode, these buttons adjust the alarm levels if Alarm Editing is enabled in instrument parameters. |
| Gross/Net | This button toggles the display between gross and net readings, assuming that background rate data is available for the channel(s) being displayed. |
| Speaker | Toggles the audible clicks for individual count events on or off. Audible alarms are not affected by this control. |
| Light | When this button (located on the control handle) is pressed, the main display will be illuminated for five seconds. This short interval is necessary to extend battery life; the display backlight consumes substantial amounts of current. |
| Channel | Steps to the next discriminator channel (if any), as defined in probe memory. Refer to section 3 of this manual for a discussion of channels. |
| Log | When this button is first pressed, an audible 'beep' is produced and the current display reading is frozen for a period of fifteen seconds. If the key is activated |

that interval, the current value is logged to memory and a triple 'beep' sound is heard. Refer to manual section 7 for more about data logging.

Response The operator may select slow, medium or fast display response to changes in the measured radiation field. The actual time constants for each switch position are defined in probe memory to insure that each switch position represents an appropriate value for the type of probe in use.

StarKey Functions

Located on the instrument handle, this key attempts to place the most-used function for each operating mode in a single convenient location: Directly under the operator's thumb. In the computer field, this is termed a 'soft' key because its use is defined in software rather than by hardwired connections. Note that in some modes the definition of this key may be changed during instrument configuration to suit specific needs or preferences. It is highly recommended that the same StarKey definitions be used for all E-600 instruments at any one site so that users will not be confused by different function assignments.

Note: In all modes, the StarKey is used to acknowledge alarms. If a rate or dose alarm is sounding, the first StarKey stroke will be used to silence that audible alarm indication. The "ALARM" icon on the display cannot be cancelled.

- Check Mode The StarKey is used to alternately display the alarm setpoints used with rate and integrated measurements. If enabled, the displayed alarm levels may be edited. If an ion chamber type probe, such as an SHP-400, is connected the Star Key is also used to initiate a fixed background count. Refer to the SHP-400 Technical Manual for more information about this feature.
- Ratemeter Mode As configuration options, the StarKey may be assigned to either bypass the normal response time calculations and force an instantaneous display update to the current measured value, or to initiate a fixed-time scaler rate count. The latter definition, with appropriately chosen parameters, is useful for quantifying suspected contamination located during rapid frisking.
- Integrate Mode Depending upon the option selected during configuration, the StarKey will either reset the accumulated information to zero or provide a temporary ratemeter display without disturbing the integration process.
- Scaler Mode Pressing the StarKey resets the displayed value to zero and initiates a new scaler count cycle.
- Peak-Trap Mode The StarKey resets the display to the currently measured rate value.

Units and Ranges

Each set of probe parameters specifies one unit of measure; both ratemeter and integrated measurements are expressed in the appropriate forms of that unit. If rate is displayed in counts per second, for example, integrated measurements are displayed in counts. Possible unit selections include:

Ratemeter: Bq, CPS, CPM, DPS, DPM, DPS, Bq, or DPM/100 cm², Sv/sec, Sv/hr, Gy/sec, Gy/hr, R/sec, R/hr, Rem/sec, Rem/hr.

Integrated: Gy, Sv, R, Rem, counts and disintegrations.

These units may be prefixed with an appropriate multiplier, such as:

μ (micro), n (nano), m (milli) or K (kilo).

Under all circumstances, the same base units and range multipliers apply to both the analog and digital displays. As different sensitivity ranges are selected, the number of zeros at the high end of the bargraph change and the decimal point of the numeric display moves as appropriate. Note that the digital display continues to provide accurate information up to twice the range of the meter scale.

It is important to remember that the available multiplier prefixes are spaced three decades apart, and that the displays can also span three decimal places or zeros. It is therefore possible to represent some readings in two ways, such as 1 R or 1000 mR. The operator must understand the interactions between the multipliers and full-scale ranges in order to correctly interpret the displayed readings.

Other Display Icons

Several special-purpose icons along the left side of the display window indicate abnormal conditions such as alarms, detector overrange conditions, low battery voltage, etc.

Audible Indications

The E-600 produces tones of two frequencies, 600 and 2400 Hz, which may be heard either through the built-in speaker or through an optional headset. These tones are used independently for particle clicks or together to indicate other conditions.