



GE Medical Systems

Technical Publications

**Direction 46–322526
Revision 3**

EKG Interface Installation

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Service Documentation

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REVISION HISTORY

REV	DATE	Reason For Change
A	13 June 1993	Initial draft release of Direction. Gerry Heck.
0	22 June 1993	First product release. Paul Webb
1	11 October 1993	Second product release to include Release 1.5 software upgrade and other minor corrections.
2	3 October 1994	Release 2.0 Software and 'Extended Table Travel' feature, new backplanes and APs and no-tilt gantry, plus amendments and additions indicated by revision bars.
3	March 25, 1996	General documentation formatt upgrades that include the addition of the Electrical Notice on the back of the Title Page.

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SECTION 1 GENERAL EKG R WAVE TRIGGER INFORMATION

1.1 General Information

The *Advance*™ System allows for the installation of an R-Wave trigger for gated cardiac studies. The R-Wave is the peak in the EKG which represents the heartbeat. The *Advance*™ system software and hardware looks for the trigger from the EKG monitor, and acquires “bins” of data based on the R-Wave occurrences.

The R-Wave trigger output is an RS-232 level pulse. The connector used is a BNC.

1.1.1 Theory of Operation

The R-Wave trigger generates a signal for display of an EKG wave shape and a pulse (R-Wave trigger output) based on the occurrence of an R-Wave. The R-Wave trigger pulse is generated at the peak of each R-Wave. The time between the pulses is used to compute the heart beat rate. For a pulse to be detected it must exceed a threshold, which is based on the amplitude of the last accepted pulse.

1.2 EKG R-Wave Trigger Vendor Documentation

The EKG R-Wave Trigger is supplied with vendor documentation. Locate those documents for reference during the installation and functional check sequences.

Important These documents have important information not contained in this document.

1.3 Pre-Installation

For the high-level functional checks to be run, the workstation must have the *Advance*™ software installed and running. This is not a requirement for the unit-level checks, which are run on the EKG R-Wave Trigger.

Also, be sure the EKG R-Wave Trigger cable is long enough and that the monitor location meets the local requirements.

SECTION 2 EKG R-WAVE TRIGGER INSTALLATION

2.1 Installation

Follow these steps to install the R-Wave trigger and the R-Wave Recorder.

2.1.1 R-Wave Trigger to PET

1. Connect one end of the BNC cable to the R-Wave Trigger Monitor Output jack.
2. Connect the other end of the BNC cable to the EKG Trigger BNC jack in the footswitch area of the table. See the diagram in Illustration 1-1 and physical location in Illustration 1-2.

2.1.2 R-Wave Trigger Monitor to Recorder

The R-Wave Recorder is used to make a paper copy of the EKG. The connection to the R-Wave Trigger is a signal cable that is connected between the R-Wave Trigger Input jack on the R-Wave Recorder and the ECG X1000 output on the R-Wave Trigger monitor.

Illustration 1-1
EKG R-Wave TRIGGER CABLING

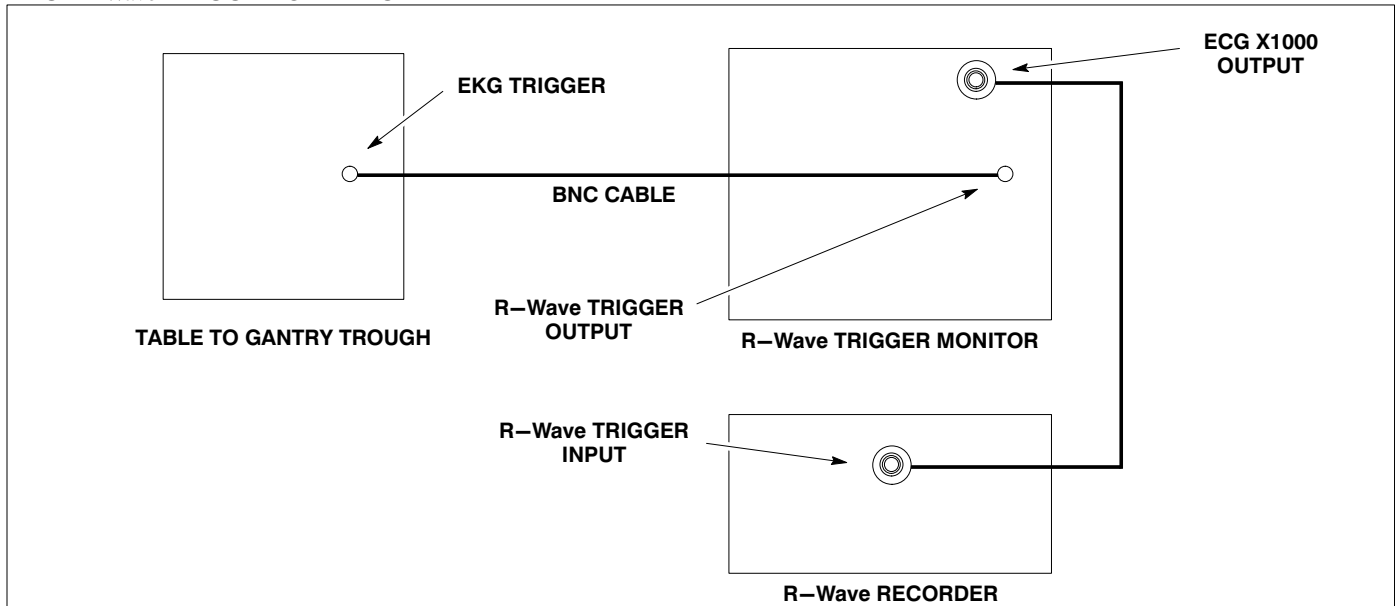
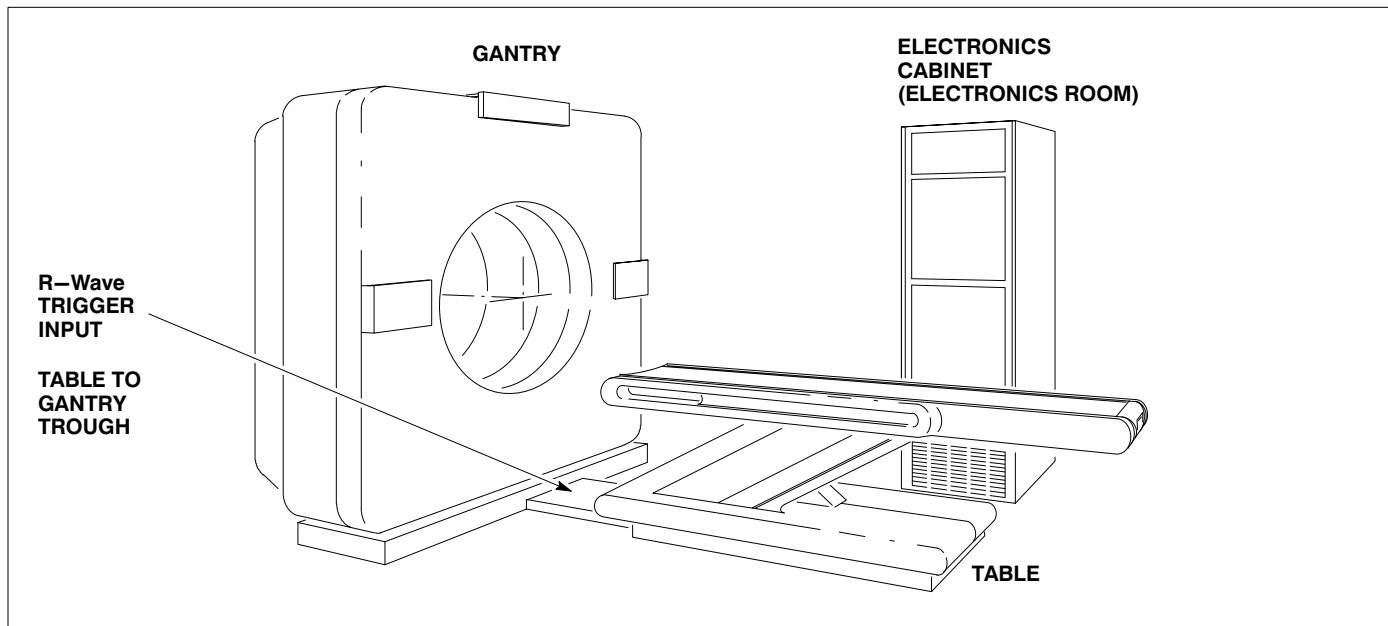


Illustration 1-2
R-Wave TRIGGER INPUT LOCATION



SECTION 3 FUNCTIONAL CHECK

3.1 Functional Tests

Use the following tests to confirm that the R-Wave Trigger and R-Wave Monitor are functioning properly.

3.1.1 R-Wave Trigger Monitor and Recorder Test

The R-Wave monitor controls are tested with an internally generated 1mV test signal at 70bpm.

1. Press and hold the monitor's **TEST** button. Make sure the trigger mark on the monitor is on.
2. Press **START** on the recorder and check each of the speed and gain settings.
 - At 25mm/s test pulses should occur approximately 21.5mm (4.3 boxes) apart.
 - At 50mm/s test pulses should occur approximately 43mm (8.6 boxes) apart.
 - At 5mm/mV the test pulses should be 5mm (one box) tall.
 - At 10mm/mV the test pulses should be 10mm (two boxes) tall.
 - At 20mm/mV the test pulses should be 20mm (four boxes) tall.

The baseline should be at the center of the chart.

3. Press **TRIGGER MARK** on the recorder and make sure the LED is on.

Make sure the trigger marks appear on the chart paper corresponding to the leading edge of each pulse.

Important

Each time you press **START** or change either the gain or speed, the gain and speed settings are printed at the bottom of the chart paper. If the trigger is on, the marks are temporarily suspended during the time the gain and speed settings are being printed.

Completion of the above test indicates that the R-Wave Monitor is functioning correctly.

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