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# 1 - The Stress Option



Stress Icon

## STRESS

1. Systolic loops
2. Quad display
3. Loop comparison

*Appendix A  
provides a short  
overview of scientific  
papers.*

The Stress Echo option requires a software licence to be installed on the **MyLab**.

A **kinetic** assessment of the left ventricle (LV) requires multiple echographic views to visualize all segments. Typically, parasternal long axis (LAX) and short axis at the papillary level (SAX PM), apical 4 (A4C) and apical 2 (A2C) chambers are considered the ideal combination for wall motion (WM) assessments

The Stress Echo package offers specific Real Time modes to capture a number of ECG R wave triggered **2D loops**. Each loop consists of eight consecutive frames and is representative of one cardiac cycle, from end-diastole to end-systole. These loops can then be combined into **WM Quads**. A WM Quad displays up to four 2D loops in cine mode at user selectable speeds. It is useful to display different cardiac views simultaneously

This package also allows the user to serially build multiple WM Quads and compare acquired loops at different times. A WM Quad consisting of one "preferred" cardiac cycle for each view is a **Primary Quad**. The user can then assess LV motion through one Primary Quad or study the variations through serial Primary Quads. A typical application of this option is Stress Echo where detection of the occurrence of stress-induced wall motion abnormalities is derived through comparison of 2D loops, displaying wall motion at rest and during or after stress.

## Principle of Operations

WM loops are obtained through special modes, **Wall Motion Protocols**. The WM Review features allow the user to select preferred cycles into Primary Quads for comparison and digital data storage.

### Note

Stress files are compressed, and have a minimal loss of information. Carefully read the "Measurements and Calculations" section of the Getting Started manual.



A protocol contains all the elements to automatically run a wall motion test.

Cardiac Loops Capture	There are two ways to capture loops: <b>Prospective</b> and <b>Retrospective</b> Modes. In Prospective Mode, the <b>ACQUIRE</b> key starts the loops acquisition: the number of captured loops depends on the protocol settings. In Retrospective mode, the system continuously captures consecutive loops: the <b>ACQUIRE</b> key stops the acquisition and the last captured loops (whose number is set by the protocol) are shown on the screen. In both cases, the system will save a region of interest (i.e. not the entire sector) to minimize the memory requirements for each cycle.
Stages Number	The programming of the protocol can include a specific number of <b>STAGES</b> , each stage will require its own Primary Quad. For example, a typical treadmill stress echo would require a three stages protocol, with a rest QUAD, an immediate post exercise QUAD and a post exercise control QUAD.
Stages Names	Each stage can be labeled to identify loops while reviewing the test.
Stage Views	For each stage, the views can be independently set (1 to 5) to be acquired, as well as the acquisition order.
Loops Number	Definition of the number of loops must be temporarily saved to build the Primary Quad. For example, the rest Quad may be built by directly saving one cycle for each view and saving a larger amount of memory for the peak stage.

#### Note

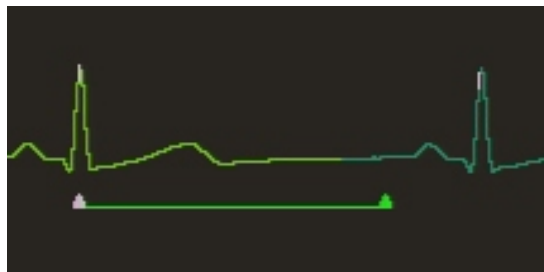
While running a WM protocol, most system features and Real Time modes will be available; scrolling memories will be reduced while saving loops.

## Loops Timing

While capturing in prospective protocols, the ECG R wave trigger automatically starts up a loop acquisition. In retrospective modes, the system will start each loop from the frame nearest to the R wave trigger.

Loops are composed of up to thirty consecutive frames, which must be timed to cover the set cardiac cycle. The factory setting covers a full cardiac cycle.

*The horizontal line displayed below the ECG trace identifies the part of the cardiac cycle which is used for the acquisition*

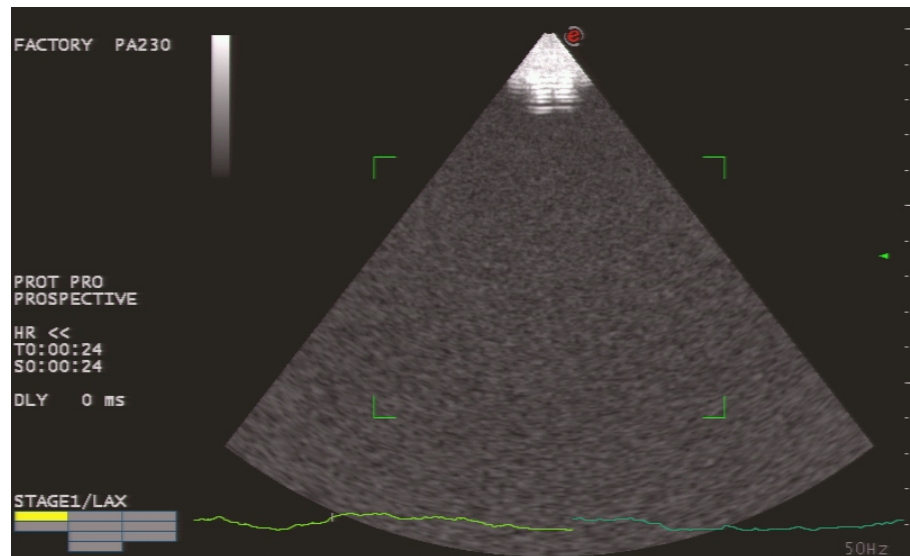


When an internal trigger is available, the **PHYSIO** key sets the part of cardiac cycle used for the acquisition. The **L-MARK** and **R-MARK** keys move the end of the line towards left or towards right respectively.

## The Screen Lay-Out

The following figure shows the screen lay-out while running a WM test:

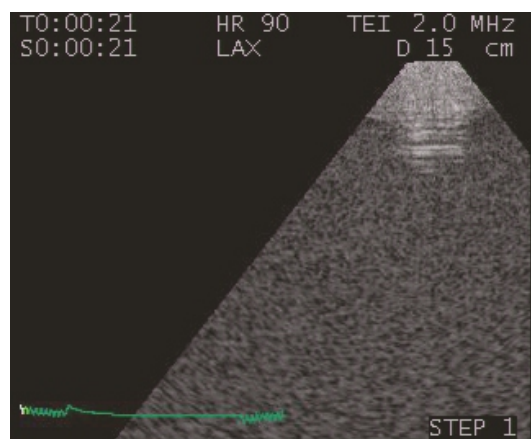
*T*:mm:ss and *S*:mm:ss are the two test timers: *T* can be used to monitor the entire test duration, *S* as the single stage timer.  
*DLY* is the set delay for the R trigger



The VIEWS Box (bottom left side of the screen) shows the current protocol stage, the view being captured (yellow background), the number of stages which have already been captured (green background) and the number of stages which have been selected for the Primary Quad (blue background).

Captured loops are shown on the screen with the following layout.

*Timers are shown on the top left portion of the screen; the labels on the top middle part of the screen indicate the heart rate and the view, while the stage appears on the right bottom portion. Frequency and depth are displayed on the top right side of the screen.*



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