

Overview

Software 1.8.1 is a field upgrade for CH 2000 systems running the Windows 95 operating system, and incorporates the changes described below. Software 1.8.1 may be installed onto your CH 2000 system by following the instructions in the Installation Notes provided with this upgrade.

Changes for Alternans Testing

(Applicable to CH 2000 systems with Alternans Option only)

1. The user interface for conducting alternans testing has been upgraded. To conduct alternans testing using software 1.8.1, follow the steps in the sections below entitled “Treadmill Stress Test with Alternans”, “Bicycle Stress Test with Alternans” and “Alternans Processing”. If you plan to conduct alternans testing using a bicycle, note that the pedaling metronome and tachometer display module are no longer used.
2. The Alternans Report Classifier included in 1.8.1 provides a classification message at the bottom of the alternans report. The computerized classification is not intended as the sole basis for diagnosis and should be reviewed by a qualified physician. The Alternans Report Classifier can be activated by selecting “Yes” next to the “Alternans Report Classifier” option in the CH 2000 Installation program. Refer to Chapter 6 of the Physician’s Guide provided with software 1.8.1 for more information regarding the Alternans Report Classifier.

Other Changes

(Applicable to CH 2000 systems with laser printer only)

1. Software 1.8.1 provides support for the Okipage 14e laser printer, which may now be used as a service replacement for the OL600e laser printer. No changes to the CH 2000 software setup are required to replace the printer.

Treadmill Stress Test with Alternans

To perform a treadmill stress test with alternans calculation, follow these steps:

1. Select a treadmill protocol from the main menu. The following protocols are recommended based on the patient’s resting heart rate:

Resting Heart Rate (BPM)	Protocol
≤ 75	Bruce
75-100	Modified Bruce/Naughton
≥100	No exercise (See Note below)

Release Notes V1.8.1

NOTE

If a patient's resting heart rate is ≥ 100 BPM, no exercise may be required. Ask the patient to stand on the treadmill; if the HR begins decreasing, ask the patient to grip the handrails. If the HR drops below 90 BPM, start the treadmill belt in pre-exercise mode at a very slow rate (≤ 1.0 mph).

2. When ready, start the treadmill at minimum speed and zero percent grade. Ensure that the treadmill is operating properly before asking the patient to step onto the belt. Then instruct the patient to step carefully onto the belt and to practice walking for 15 to 30 seconds.

NOTE

Do not allow the patient to grip the handrails tightly, because the resultant muscle noise may interfere with the alternans measurement. Have the patient place his or her arms loosely hanging over the handrails.

3. When ready, start the exercise phase of the stress test. (See section below on Alternans Processing.)

Bicycle Stress Test with Alternans

To perform a bicycle stress test with alternans calculation, follow these steps:

1. Select the appropriate TWA (T-wave alternans) protocol from the Main Menu. The following ramp protocol is highly recommended for optimal T-wave alternans results: Initiate stage 1 of exercise at a workload of 15 watts for a duration of one minute (if 15-watt load is not available on your system, use the lowest available workload). During the test, increase workload by 5 watts each minute until you achieve a heart rate of 120 BPM.
2. For some patients, the initially low workload will be too light. For patients with heart rates < 90 BPM, increase the workload by 5-watt increments every 15 seconds until the workload begins to feel comfortable.

NOTE

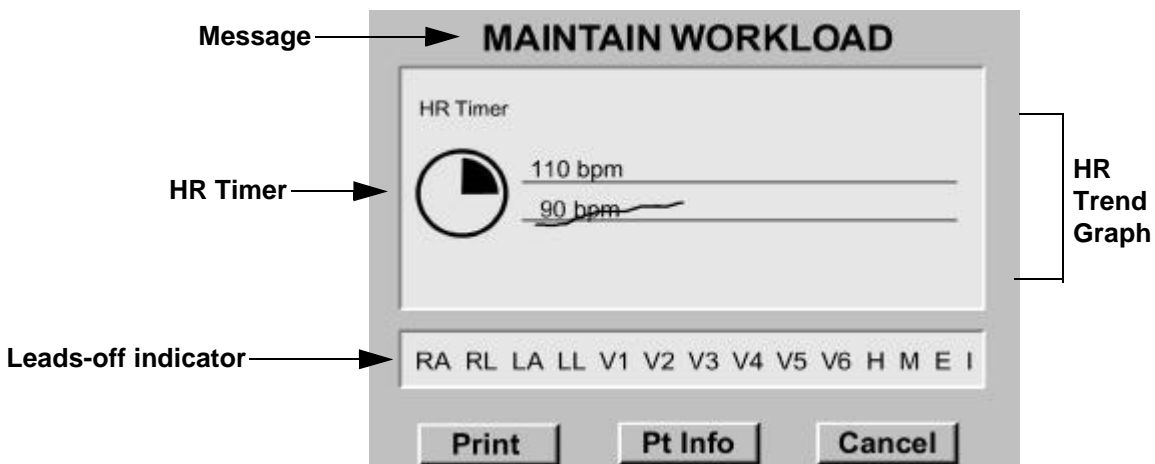
If a patient's resting heart rate is ≥ 100 BPM, no exercise may be required. Ask the patient to sit on the ergometer; if the heart rate begins to decrease, ask the patient to grip the handrails. If the heart rate drops below 90 BPM, have the patient start pedaling at the lowest workload of the ergometer.

- When ready, start the exercise phase of the stress test. (See section below on Alternans Processing).

NOTE

To avoid the generation of artifactual alternans between 100 and 120 BPM, the patient should refrain from pedaling in the 50-60 RPM range.

Alternans Processing

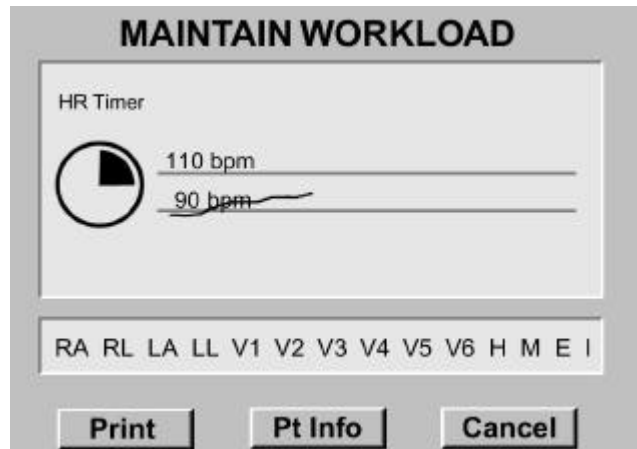


HR Timer	Measures the amount of time the patient's heart rate (HR) remains between 90 and 110 beats per minute (BPM). For accurate alternans processing, the HR must remain between 90 and 110 BPM for at least 2½ minutes. At the 2½-minute mark, the timer fills in completely.
Leads-off indicator	Displays the leads-off status of each electrode. If one or more electrodes should loosen or otherwise lose their connections, the text for the electrode(s) will be displayed in light-colored characters on a dark background.
Message	Provides prompts to "Maintain Workload", "Reduce Workload", "Proceed to 120 BPM" and "Proceed With Test". (See items 2, 3 and 4 on next two pages.)
HR Trend Graph	Continuously updated graph depicting the most recent 10 minutes of heart rate data.

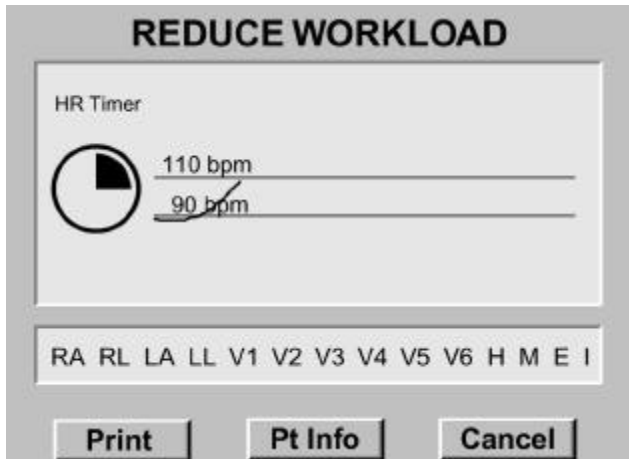
- When the patient's heart rate reaches 90 BPM, the HR timer begins filling in. For accurate alternans processing, the patient's heart rate must be maintained between 90 and 110 BPM for 2½ minutes.

Release Notes V1.8.1

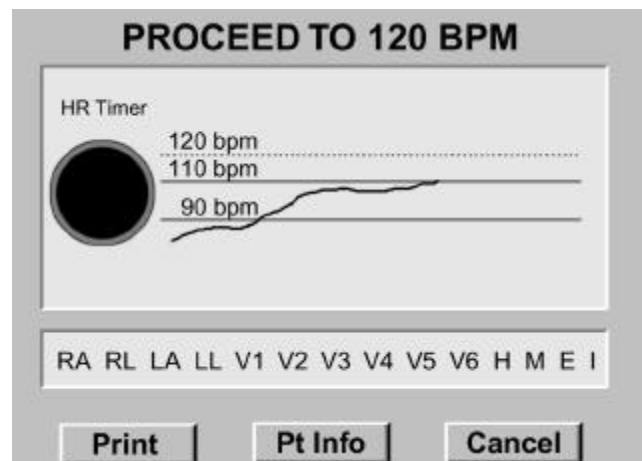
2. If a single beep sounds and the “Maintain Workload” message appears, consider holding the workload at its current level until the pie chart fills, especially to avoid a stage change.



3. If the patient’s heart rate begins rising too quickly toward 110 BPM, two beeps will sound and the “Reduce Workload” message appears. Each time this message appears, consider reducing the workload in order to keep the heart rate within range.



4. When the HR timer is filled in, the “Proceed to 120 BPM” message appears. Continue the stress test, proceeding normally to at least 120 BPM, using the standard stress protocol.



5. When the heart rate reaches 120 BPM, the “Proceed With Test” message appears. Continue with the stress test until the target HR is attained, or until another standard stopping criterion is reached (e.g., fatigue).

