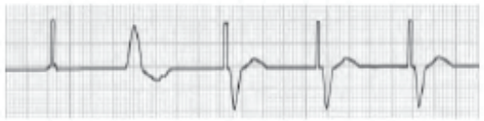
External Pacer Exercise 4

Exercise: Pace 3rd degree AV block at rate of 70 ppm.

Connect simulator to external pacer.
To simulate paced beats, pacer **Rate** must be greater than rate of selected rhythm, and pacer **Output** must be greater than simulator capture level.

at simulator:
1. Press **3rd** key. Confirm 3rd degree AV block is displayed on monitor.
2. Press **capture** key once to select capture level II (75 to 80mA capture level).

at pacer:
3. Select **Pacer On**. Verify sense markers are displayed with each R wave. (If not, press **ECG Size** button until R wave markers are observed.)
4. Select rate of 70 ppm using Rate control.
5. Press **Start/Stop** button to start pacing.
6. Using **Output** control, increase pacer current until paced beats are displayed. Pacer current setting will be 75 to 80 mA.



3rd degree AV block paced beats at 70ppm

Battery Saver Feature

The ST1503 powers-off automatically 30 minutes after a key was last pressed, or after defib or pacer energy was last detected. This is normal battery saver operation. To enable the simulator to remain powered-on after 30 minutes of inactivity, follow these instructions:

1. With the simulator powered-off, press and hold down **convert** key, then press and release **ON OFF** key.
2. Watch the **NSR** indicator. When it flashes rapidly, release the **convert** key.

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Warranty and Service 5

The ST1503 STEMI ECG Simulator is warrantied to be free of defects in material or workmanship for three years from date of purchase. If your simulator needs service, or if you have questions about its operation, please contact Symbio Corporation.

NOTE: Damaged caused by battery acid corrosion is not covered by the warranty. Removing the batteries between uses is recommended.

Maintenance and Calibration

Based on the product's design, and based on experience with units in the field, Symbio does not recommend regular calibration of our Simulators. From a design standpoint, the time base used to generate ECG waveforms and to measure the duration of defib and pacer pulses is crystal-controlled;therefore, ECG waveform rates and defib/pacer measurement criteria remain constant over time.

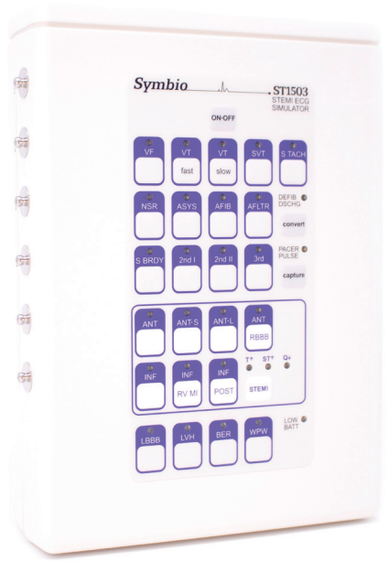
For Training with Stryker LIFEPAK® 35

When training with the Stryker LIFEPAK® 35 monitor/defibrillator, use VT slow to elicit an inconclusive decision from cprINSIGHT® automated rhythms analysis.
For the latest information and documentation for the LIFEPAK® 35 monitor/defibrillator, visit ifu.stryker.com.
Note: Simulated waveforms are designed to showcase function and features but should not be used to test performance of diagnostic algorithms.

9915-901 Rev A

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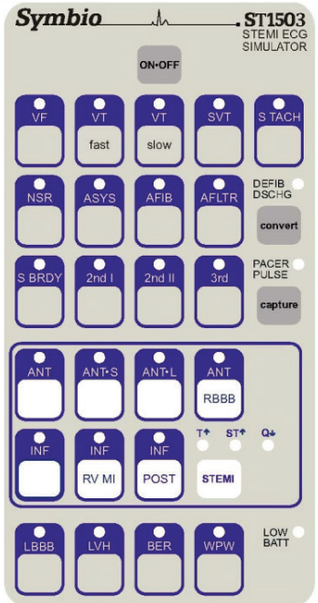
ST1503
STEMI ECG SIMULATOR



OPERATING INSTRUCTIONS

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Controls and Indicators 1



ON·OFF
Press to power-on and to power-off.

DEFIB DSCHG
Green indicator illuminates for two seconds when discharge is delivered from defib set to 50J or more.

convert
When enabled, a pre-selected rhythm becomes the running rhythm when a defib delivers 50J or more.

PACER PULSE
Brightness indicates pacing capture level selected.

capture
Selects capture current levels: 70, 80, 90 and 100 mA and "ignore".

STEMI
Key selects STEMI stage: hyperacute (T↑), acute (ST↑) and post-acute (Q↓)

LOW BATT
Red indicator illuminates when battery should be replaced.

convert
When enabled, a pre-selected rhythm becomes the running rhythm, when a defib delivers 50J or more.

1. Press **convert** key. The indicator of the running rhythm pulses brighter.
2. Press key of the waveform to run after the defib discharge.
3. Deliver discharge from defib set to 50J or more. The pre-selected rhythm is now the running rhythm.

To cancel a convert operation before its completed, press either the **convert** key or the key of the running rhythm. If a convert operation is started but not completed in two minutes, it will cancel automatically.

capture
When the pacer's current and rate are properly adjusted, paced beats are displayed and the **PACER PULSE** indicator blinks off with each pacer pulse detected.

Press **capture** key to select one of five pacing capture levels: 70, 80, 90 and 100 mA, or "ignore". Brightness of **PACER PULSE** indicates the level selected. At 70 mA, the brightness is lowest. At 100 mA, the brightness is highest. When the **PACER PULSE** indicator is off, "ignore" is selected and the simulator won't respond to pacer pulses. At power-on, the default pacing capture level is 70 mA.

STEMI
Press the **STEMI** key to select one of three phases of STEMI progression.



T↑ Hyperacute
T waves are broad, peaked (seconds after occluson)



ST↑ Acute
ST segments are elevated (minutes to hours after occlusion)



Q↓ Post-acute
Q waves deepen (less than 24 hours after occlusion)

Hyperacute is the default phase when a STEMI is selected.

STEMIs 2

Select STEMI from the keybad, then use the STEMI key to present the waveform in one of three phases: Hyperacute (T↑), acute (ST↑) or post-acute (Q↓).

ANT Anterior STEMI. Observe changes in leads V2-V4.

ANT S Anteroseptal STEMI. Observe changes in leads V1-V4, I and III.

ANT L Anterolateral STEMI. Observe changes in leads V2-V6, I and III.

ANT RBBB Anterior STEMI with RBBB. Observe changes in leads V1-V4 and broad slurred S waves in V5, V6 and in I, III and avL.

INF Inferior STEMI. Observe changes in leads II and III.

INF RV MI Inferior STEMI with right ventricular involvement. Observe changes in leads V1, V4R, II and III. When (ST↑) is selected, observe ST elevation in V1 and ST depression in V2.

INF POST Inferior STEMI with posterior involvement. Observe changes in leads V1-V3, V8, V9, II and III. When (ST↑) is selected, observe horizontal ST depression in V1-V3.

STEMI Imposters

LBBB Left Bundle Branch Block. Rate: 78 bpm
- QRS duration > 120 mS
- Dominant Q/S waves in V1
- Broad monophasic R waves and absence of Q waves in I, avL, V5, V6
- Prolonged R wave peak time > 60 mS in V5, V6
- ST segments and T waves discordant to the main vector of QRS complex
- Poor R wave progression in chest leads.

LVH Left Ventricular Hypertrophy. Rate: 60 bpm
- ST elevation in V1-V3
- ST segment depression and T wave inversion in I, V5, V6
- voltage: R wave in I plus S wave in III > 25 mm
- voltage: R wave in avL > 11 mm
- voltage: R wave in V6 plus S wave in V1 > 35 mm
- Left atrial enlargement
- Left axis deviation

BER Benign Early Repolarization. Rate: 78 bpm
- ST elevation limited to precordial leads.
- No reciprocal ST depression.
- V6 ST segment/T wave ratio <0.25
- J point slurring in V3
- Concave up ST elevation in V2-V6

WPW Wolff-Parkinson-White (type A). Rate: 80 bpm
- Positive delta waves throughout. PR interval < 100 mS.
- QRS duration > 110 mS.
- ST-T waves discordant in V1-V3
- R/S > 1 in V1
- Prominent R waves in V1-V3 mimic posterior MI.

Bradycardias 3

S BRDY	Sinus Bradycardia. Rate: 40 bpm
2nd I	2nd degree AV block type I. 4:3 conduction. Rate: 41-47 bpm
2nd II	2nd degree AV block type II. 4:3 conduction. Rate 40-48 bpm
3rd	3rd degree AV block. Wide QRS. Rate: 32 bpm

Fibrillations and Tachycardias

VF	Ventricular Fibrillation
VT fast	Ventricular Tachycardia - fast. Wide QRS. Rate: 270 bpm
VT slow	Ventricular Tachycardia - slow. Wide QRS. Rate: 140 bmp
SVT	Supra Ventricular Tachycardia. P waves not visible. Rate: 166 bpm
S TACH	Sinus Tachycardia. Visible P waves. Rate: 130 bpm
AFIB	Atrial Fibrillation. P waves absent. Rapid, varying ventricular response. Rate: 154 - 160 bpm
AFLTR	Atrial Flutter. 2:1 AV conduction. Rate: 150 bpm

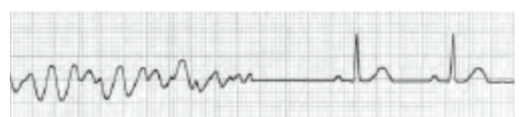
Defibrillator Exercises

Exercise: Convert VF to NSR.

Connect simulator to defibrillator.

at simulator:
1. Press **VF** key. VF indicator glows steadily. Confirm VF is displayed on monitor.
2. Press **convert** key. VF indicator pulses brighter.
3. Press **NSR** key. NSR indicator flashes on and off. VF indicator glows steadily again.

at defibrillator:
4. Select 200J using **Energy Select** switch (1).
5. Press **Charge** button (2). Listen for charge ready tone.
6. Press **Discharge** button(s) (3).
7. After discharge observe that:
   On monitor, NSR is displayed
   At simualtor, NSR indicator glows steadily, and VF indicator is off.



VF NSR

WARNING: Shock Hazard Exists

When discharging the defibrillator, keep hands and all objects clear of the simulator. Be sure the simulator cable or ECG cable is securely plugged into the defibrillator. Be sure that the simulator housing is intact, and that the cable is free of nicks, cracks and cuts. Do not discharge the defibrillator into the simulator more than three times within one minute. Never discharge more than 360 joules into the simulator. Do not immerse or set the simulator in liquid. Using the device in standing water can present a shock hazard to the operator and anyone nearby.