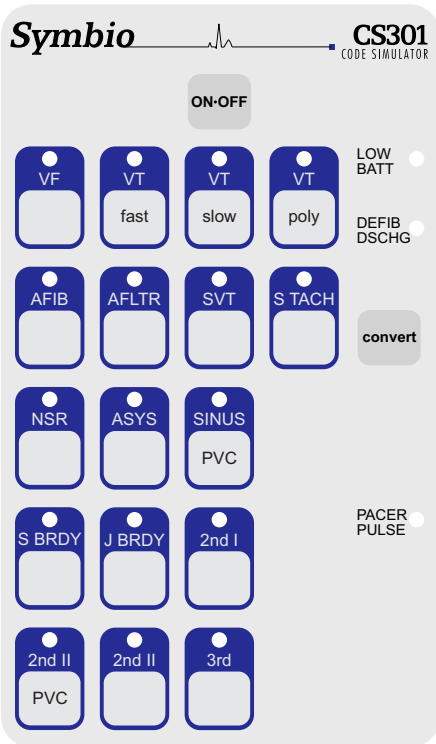




OPERATING INSTRUCTIONS

Controls and Indicators	1
Rhythms for Defibrillator Training	2
Rhythms for External Pacer Training	2
Defibrillator Exercises	2
External Pacing Exercises	3
Battery Saver Feature	3
Service	3

Controls and Indicators



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

LOW BATT
Red indicator illuminates when battery should be replaced.

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.

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

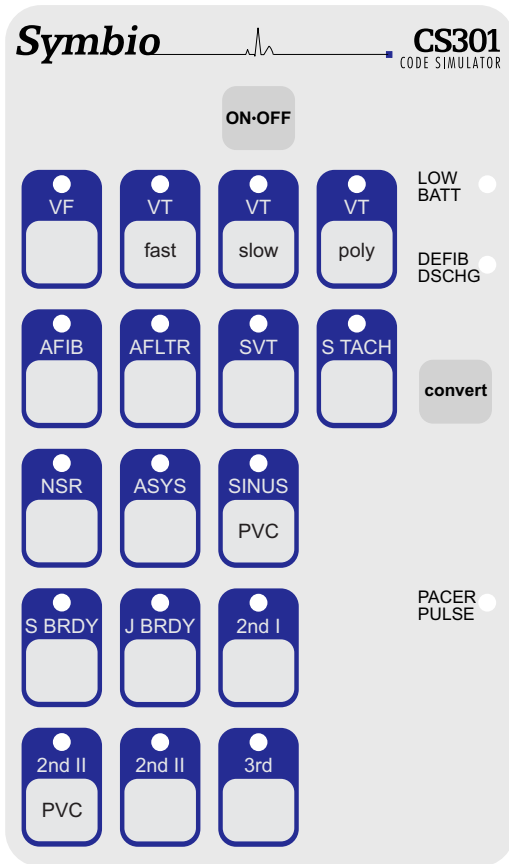
1. Press **convert** key. The indicator of the running rhythm pulses brighter.
2. Press key of the waveform to run after the defib discharge.
3. Deliver discharge from defib set to 50J or more.

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.



Rhythms for Defibrillator Training

VF	Ventricular Fibrillation
VT-fast	Ventricular Tachycardia - fast. Wide QRS. Rate: 185 bpm
VT-slow	Ventricular Tachycardia - slow. Wide QRS. Rate: 140 bpm
VT-poly	Ventricular Tachycardia - fluctuating QRS axis.
AFIB	Atrial Fibrillation. P waves absent. Rapid, varying ventricular response. Rate: 120 - 160 bpm
AFLTR	Atrial Flutter. 2:1 AV conduction. Rate: 150 bpm
SVT	SVT alternates with NSR, then remains in SVT Rate: 216 bpm. PAC falls on T wave. Symmetric T wave inversion.
S TACH	Sinus Tachycardia. Rate: 120 bpm.
NSR	Normal Sinus Rhythm. Rate: 72 bpm.
ASYS	Asystole.
SINUS PVC	Sinus Rhythm with PVCs. Sinus rate 72 bpm.

Defibrillator Exercises

Exercise: Convert VF to NSR.

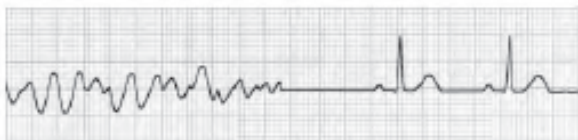
Connect simulator to defibrillator.

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 360J 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 simulator, NSR indicator glows steadily, and VF indicator is off.



VF

NSR

Rhythms for External Pacer Training

S BRDY	Sinus Bradycardia Rate: 40 bpm.
J BRDY	Junctional Bradycardia. Rate: 42 bpm.
2nd I	2nd deg. type I AV Block (4:3). Atrial Rate: 60 bpm.
2nd II PVC	2nd deg. type II AV Block (4:3). PVCs. Wide QRS. Atrial Rate: 60 bpm.
2nd II	2nd deg. type II AV Block (4:3). Wide QRS. Atrial rate: 60 bpm.
3rd	3rd deg. AV Block. Wide QRS. Ventricular rate: 37 bpm.



External Pacer Exercise

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 **Current** must be greater than simulator capture level.

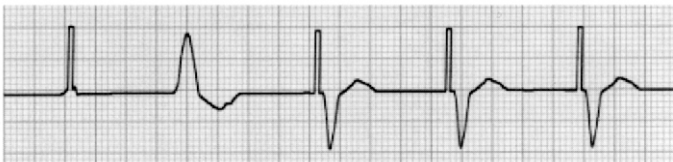
at simulator:

1. Press **3rd** key. Confirm 3rd degree AV block is displayed on monitor.

at pacer:

2. Select **Pacer On**. Verify sense markers are displayed with each R wave. (if not, press **ECG Size** button until R wave markers are observed.)
3. Select rate of 70 ppm using **Rate** control.
5. Press **Start/Stop** button to start pacing.
6. Increase pacer current, using **Output** control, until you observe paced beats on monitor. Pacer current should be 60mA to 70mA.

Initiate pacing to simulate paced beats.



Adult 3rd degree AV block

Paced beats at 70 ppm

Note: If VF is selected rhythm, simulator won't generate paced beats.

Battery Saver Feature

The CS301 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.

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.

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.

Warranty and Service

The CS301 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.

Symbio Corporation
1600 NE Compton Drive
Suite 120
Hillsboro, Oregon 97006

www.symbiocorp.com
information@symbiocorp.com
503-748-2030