

INSTRUCTION MANUAL

Federal law restricts this device to sale by or on the order of a Physician or Physical Therapist.

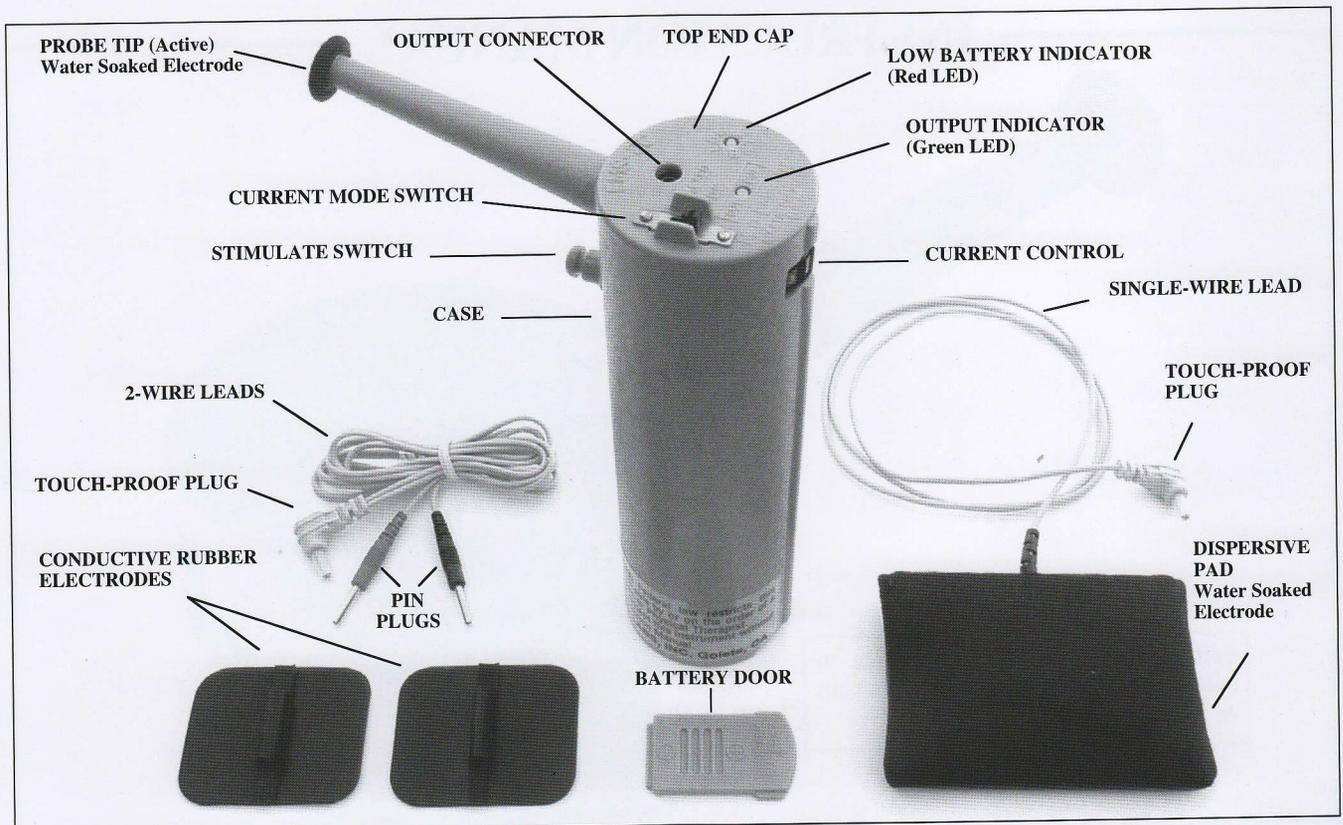
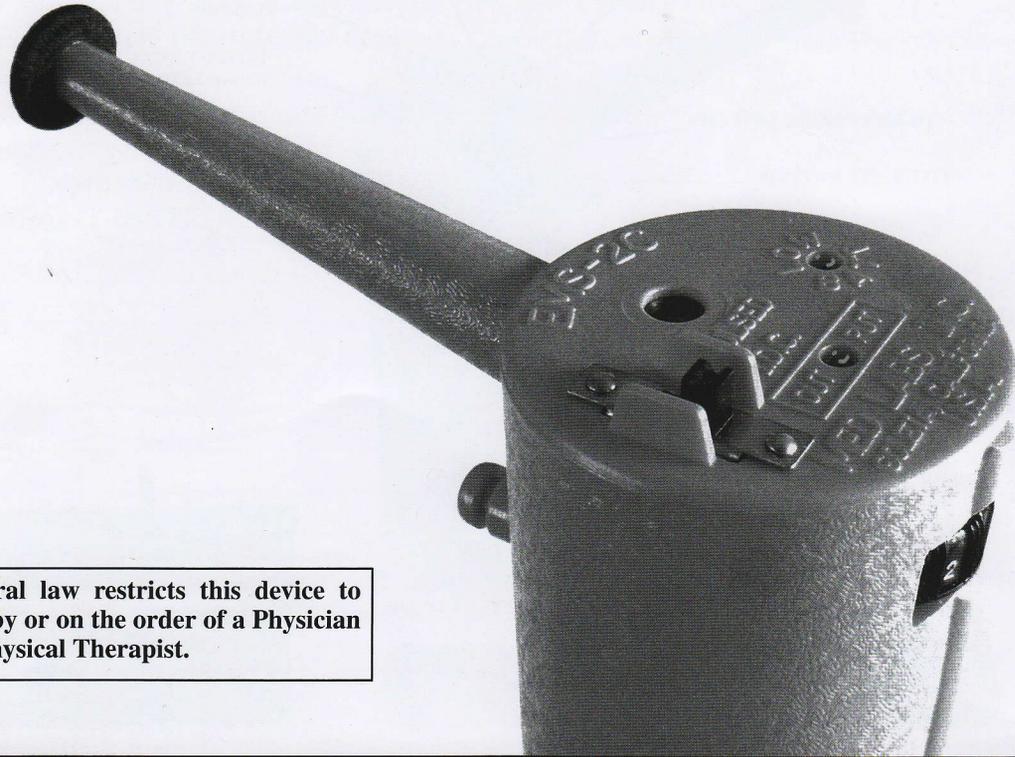


Figure 1. EMS-1C / EMS-2C parts identification.

**MUSCLE / NEUROMUSCULAR STIMULATOR  
INFORMATION AND INSTRUCTIONS**

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**FOR USE ONLY UNDER THE DIRECTION OF A PHYSICIAN OR PHYSICAL THERAPIST**

Note: The following list of Indications, Contraindications, Warnings, Precautions, and Adverse Effects is taken directly from the F.D.A. "Labeling Guidance for Powered Muscle Stimulators".

**INDICATIONS:**

- These electrical stimulators may be used for:
1. Preventing or retarding disuse atrophy.
  2. Relaxing muscle spasms.
  3. Muscle re-education.

**CONTRAINDICATIONS:**

1. Powered muscle stimulators should not be used on patients with cardiac demand pacemakers.

**WARNINGS:**

1. The long-term effects of chronic electrical stimulation are unknown.
2. Stimulation should not be applied over the carotid sinus nerves, particularly in patients with a known sensitivity to the carotid sinus reflex.

3. Stimulation should not be applied over the neck or mouth. Severe spasm of the laryngeal and pharyngeal muscles may occur and the contractions may be strong enough to close the airway or cause difficulty in breathing.
4. Stimulation should not be applied transthoracically in that the introduction of electrical current into the heart may cause cardiac arrhythmias.
5. Stimulation should not be applied transcerebrally.
6. Stimulation should not be applied over swollen, infected, or inflamed areas or skin eruptions, e.g., phlebitis, thrombophlebitis, varicose veins, etc.
7. Stimulation should not be applied over, or in proximity to, cancerous lesions.

**PRECAUTIONS:**

1. Safety of powered muscle stimulators for use during pregnancy has not been established.
2. Caution should be used for patients with suspected or diagnosed heart problems.
3. Caution should be used for patients with suspected or diagnosed epilepsy.
4. Caution should be used in the presence of the following:
  - a. When there is a tendency to hemorrhage following acute trauma or fracture;
  - b. Following recent surgical procedures when muscle contraction may disrupt the healing process;
  - c. Over the menstruating or pregnant uterus; and
  - d. Over areas of the skin which lack normal sensation.
5. Some patients may experience skin irritation or hypersensitivity due to the electrical stimulation or electrical conductive medium. The irritation can usually be reduced by using an alternate conductive medium, or alternate electrode placement.
6. Electrode placement and stimulation settings should be based on the guidance of the prescribing practitioner.
7. Powered muscle stimulators should be kept out of the reach of children.
8. Powered muscle stimulators should be used only with the leads and electrodes recommended for use by the manufacturer.
9. Portable powered muscle stimulators should not be used while driving, operating machinery, or during any activity in which involuntary muscle contractions may put the user at undue risk of injury.

**ADVERSE EFFECTS:**

1. Skin irritation and burns beneath the electrodes have been reported with the use of powered muscle stimulators.

**DESCRIPTION:**

The Med Labs Electronic Muscle/Neuromuscular Stimulators, models EMS-1C and EMS-2C are portable, battery powered, safe, effective devices, designed for easy one hand operation. They are improved versions of the EMS-1A and EMS-2A, and feature single-connector leads, a standard 9 volt battery, and automatic pulse width and pulse rate control in both Pulsed and Interrupted DC modes. They also have an LED to indicate proper operation and output, and another LED to indicate a low battery.

The EMS-1C is capable of Interrupted DC (also known as Direct Current or "Galvanic" stimulation).

The EMS-2C can produce Interrupted DC and PULSED stimulation. Both units are housed in the same size case; the only external difference is that the EMS-2C has a switch on the TOP END CAP to select between the DC and PULSED current modes. In both modes, the output is amplitude adjustable, current sourced, and monophasic.

**NOMINAL SPECIFICATIONS**

- EMS-1C:** IDC (Interrupted Direct Current or "Galvanic") only—  
Peak Current: 0-18 milliamps; Pulse width: 30 msec.; Pulse Rate: 1/sec.
- EMS-2C:** IDC (Interrupted Direct Current or "Galvanic")—  
Peak Current: 0-18 milliamps; Pulse width: 30 msec.; Pulse Rate: 1/sec.  
**PULSED—**  
Peak Current: 0-25 milliamps; Pulse width: 250  $\mu$ sec.; Pulse Rate: 80/sec.
- Battery:** Use only a High Quality 9 volt Battery (Standard, Alkaline, or Rechargeable).

**ELECTRODE SELECTION:**

The EMS-1C and EMS-2C may be used with either our standard WATER SOAKED ELECTRODES (cloth covered PAD and PROBE) or with CONDUCTIVE RUBBER ELECTRODES. These accessories, with appropriate lead wires, are included with each instrument.

Electrode selection is based on four factors: effectiveness, comfort, convenience, and cost. Effectiveness is a judgement for the medical professional. The other three, however, may be a joint decision of the professional and the patient.

The advantages of the standard WATER SOAKED ELECTRODES are:

1. Easy set-up.
2. Easy repositioning of the active electrode.
3. Most comfortable for many patients.
4. Easy clean-up, just dry off.
5. Most economical to use.

The CONDUCTIVE RUBBER ELECTRODE may be

used in two ways: 1) as a water soaked electrode, by placing a thin wet foam pad or sponge between the electrode and the skin, or 2) as a conductive gel coated electrode.

The advantages of a CONDUCTIVE RUBBER ELECTRODE are:

1. As the ACTIVE ELECTRODE, it may be a better size than the PROBE for treating large muscles.
2. It may be trimmed to desired size and shape.
3. It is more readily cleaned or sterilized.
4. As a gel coated electrode, it will not dry out as fast, and may be left in place longer.
5. Some users may find it more comfortable.

The two sections which follow, describe in detail the procedure for using the two electrode types. The two types may be mixed (i.e. Active PROBE and Dispersive CONDUCTIVE RUBBER). Simply follow the appropriate steps in both sections for electrode preparation and use.

**OPERATION WITH WATER SOAKED ELECTRODES:**

(See Fig. 2 for typical use.)

1. With soap and warm water, thoroughly wash areas of the skin where the electrodes will be placed.
2. Insert the TOUCH-PROOF PLUG on the end of the cloth covered DISPERSIVE PAD wire into the OUTPUT CONNECTOR on the TOP END CAP.
3. **THOROUGHLY SOAK** both electrodes (PAD and PROBE TIP) in warm water. Avoid getting the case wet.
4. Place the wet DISPERSIVE PAD **firmly** against the skin at any convenient location, such as under a forearm, **on the same extremity being treated.** If you wish, a Velcro™ or soft elastic strap may be used to hold it in place.
5. Make sure that the CURRENT CONTROL is set to "0".
6. For the EMS-2C only: Select the current mode (IDC or PULSED).  
For the EMS-1C: skip this step.
- Note:** It is usually necessary to "search" somewhat for motor points. A change in the PROBE location of only 1/4 inch can often cause a large change in the strength of a muscle contraction.
7. Place the **wet** ACTIVE ELECTRODE (PROBE TIP) **firmly** against the skin, over the motor point, and press the STIMULATE SWITCH briefly.
8. Increase the CURRENT CONTROL setting slightly, and again press the STIMULATE SWITCH briefly.
9. Move the PROBE location on the skin slightly, and again press the STIMULATE SWITCH briefly.
10. Repeat steps 8 and 9 until the motor point is located, and the desired muscle contraction is obtained.
11. Continue treatment as directed by your physician or physical therapist.
12. Wash the PAD and PROBE TIP in warm soapy water, then rinse and dry before storage. (If you store the instrument in a closed container, with wet electrodes, the instrument may be damaged and/or develop mildew.)
13. The brightness of the green OUTPUT INDICATOR gives a relative indication of stimulation current level.

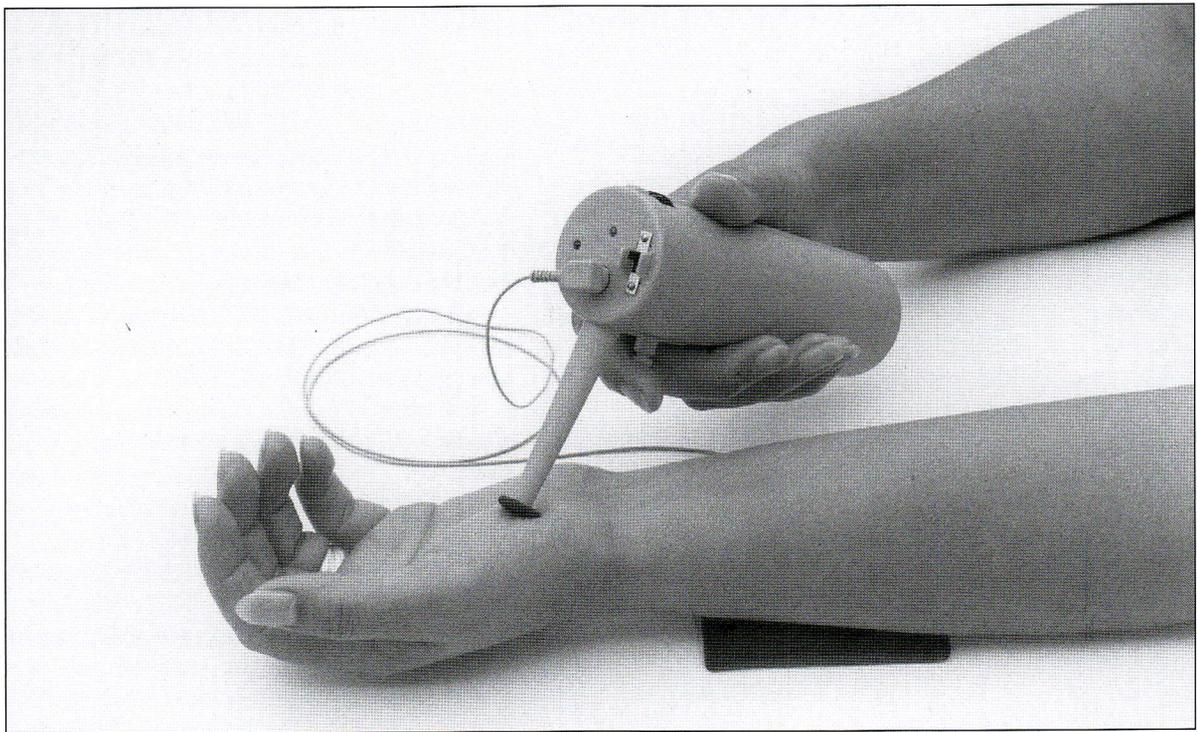


Figure 2. Typical use with WATER SOAKED ELECTRODES.

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### OPERATION WITH CONDUCTIVE RUBBER ELECTRODES:

(See Fig. 3 for typical use.)

1. Using the 2-WIRE LEADS, insert the **red** PIN PLUG into the hole in either CONDUCTIVE RUBBER ELECTRODE.
2. Insert the **black** PIN PLUG into the hole in the other CONDUCTIVE RUBBER ELECTRODE.
3. Insert the TOUCH-PROOF PLUG on the opposite end of the 2-WIRE LEADS into the OUTPUT CONNECTOR on the TOP END CAP.
4. With soap and warm water, thoroughly wash areas of the skin where the electrodes will be placed.
5. Coat the CONDUCTIVE RUBBER ELECTRODES with conductive gel, or place on water soaked foam pads.
6. Secure the DISPERSIVE ELECTRODE (attached to the red PIN PLUG) **firmly** against the skin, in any convenient location, **on the same extremity being treated**. You may use a conductive adhesive gel (TAC GEL™) to hold the electrode in place. Or if you wish, Velcro™ or soft elastic strap or medical tape may be used.
7. If you need to increase the spacing between electrodes, slide the clear plastic band farther up the 2-WIRE LEADS and gently pull the wires apart.
8. Secure the ACTIVE ELECTRODE (connected to the black PIN PLUG) firmly against the skin, over the motor point. (Same as step 6.)
9. Make sure that the CURRENT CONTROL is set to "0".
10. For the EMS-2C only: Select the current mode (IDC or PULSED). For the EMS-1C skip this step.
11. Press the STIMULATE SWITCH briefly.
12. Increase the CURRENT CONTROL setting slightly, and again press the STIMULATE SWITCH briefly.
13. Repeat step 11, until a satisfactory contraction is obtained. If patient discomfort becomes a problem, return the CURRENT CONTROL to zero. Relocate the uncomfortable electrode, and return to step 11. (See Notes on page 9.)
14. Continue treatment as directed by your physician or physical therapist.
15. Wash the electrodes in warm soapy water, then rinse and dry before storage. (If you store the instrument in a closed container, with wet electrodes, the instrument may be damaged and/or develop mildew.)
16. The brightness of the green OUTPUT INDICATOR gives a relative indication of stimulation current level.

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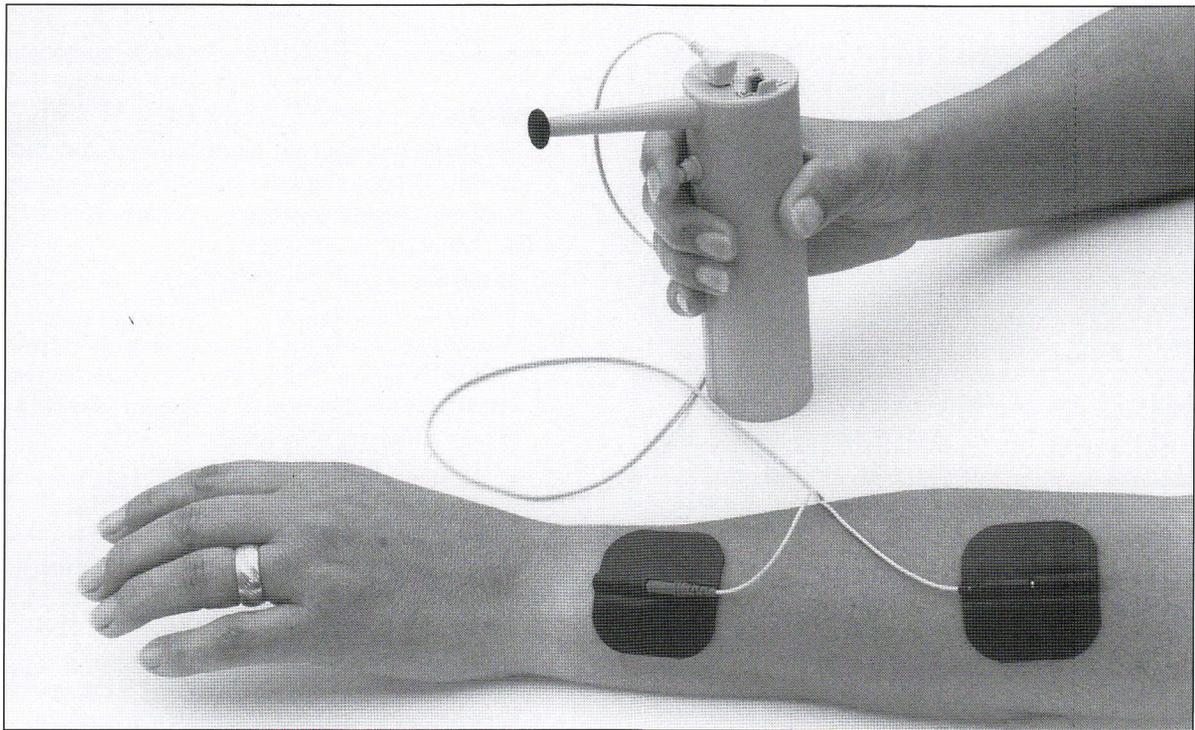


Figure 3. Typical use with CONDUCTIVE RUBBER ELECTRODES.

**Notes:**

1. When using a CONDUCTIVE RUBBER ELECTRODE, a higher current setting will be required than when using the PROBE.
2. Unless there is some specific reason to use a CONDUCTIVE RUBBER ACTIVE ELECTRODE, the PROBE is generally preferred, especially when working on smaller muscles.
3. When using a CONDUCTIVE RUBBER ACTIVE ELECTRODE, it is often helpful to first locate the motor point using the PROBE.

**COMFORT AND EFFICACY:**

If any problems are encountered in producing good contractions at comfortable current levels, the following suggestions may help. They are, of course, subject to the advice of your physician or physical therapist.

1. Work in a warm room. Muscles function better when they are warm.
2. A hot pack or even a wash cloth soaked in warm water and placed over the muscle for five to ten minutes before stimulator treatment may improve the results (better contraction at lower current levels).

3. Make sure the skin is clean. This will reduce stinging.

For WATER SOAKED ELECTRODES:

4. Use fresh water (tap or bottled) for soaking the electrodes. Do not add salt, since this will increase any stinging. (If your tap water has a high saline content, or is "softened", use bottled water.)
5. A mild soap may be added to the water. This helps keep skin resistance low.
6. Make sure that the water soaked electrodes are **THOROUGHLY WET**, since the pads covering these electrodes will not properly conduct electrical signals if they are dry or only damp.

With any electrodes:

7. Maintain **firm** contact between electrodes and skin.
8. If stimulator does not seem to operate properly, check all electrode connections. Next, check the electrodes for adequate water or gel, respectively. Then remove battery and check battery polarity. (See **BATTERY TEST AND REPLACEMENT** and **TESTING YOUR INSTRUMENT** sections.).

## BATTERY TEST AND REPLACEMENT:

If the red LOW BATT indicator is lit while the STIMULATE SWITCH is pressed, or if your instrument does not seem to be working properly, replace the battery. (Ignore momentary flashes when the switch is pressed or released.) To replace the battery:

1. Slide open the BATTERY DOOR on the bottom end of the instrument CASE.
2. Slide out the old BATTERY.
3. Observe the polarity of the new BATTERY. Negative terminal goes towards the front of instrument, below the STIMULATE SWITCH, and the positive terminal towards the rear of instrument, below the CURRENT CONTROL. Positive (+) and negative (-) polarities are marked on the BATTERY and on the BATTERY DOOR.
4. Slide a new BATTERY into the CASE and close the BATTERY DOOR. DO NOT USE A TIGHT BATTERY!
5. If the instrument does not work, remove BATTERY and recheck polarity. (The instrument will not be damaged by BATTERY reversal, but it will not work while it is reversed.)

## TESTING YOUR INSTRUMENT:

If your instrument seems to be malfunctioning, the following tests can help you determine and correct most problems.

1. Insert the TOUCH-PROOF PLUG on the end of the 2-WIRE LEADS into the OUTPUT CONNECTOR.

2. For the EMS-2C, switch to the IDC position.
3. Hold the two PIN PLUGS together.
4. Press and hold the STIMULATE SWITCH, and slowly increase the CURRENT CONTROL.
5. The green OUTPUT INDICATOR should flash once per second.
6. Repeat the tests for the EMS-2C, in the PULSED mode. The indicator should appear to be on continuously.
7. The brightness of the indicator should increase with the setting of the CURRENT CONTROL. At "0" and very low settings you will not see any light.

To test the DISPERSIVE PAD and its wire and plug:

1. Insert the TOUCH-PROOF PLUG on the end of the DISPERSIVE PAD wire into the OUTPUT CONNECTOR.
2. Thoroughly soak the DISPERSIVE PAD and the PROBE TIP in water.
3. Press the PROBE TIP firmly against the DISPERSIVE PAD.
4. Press and hold the STIMULATE SWITCH, and slowly increase the CURRENT CONTROL.
5. Again, the OUTPUT INDICATOR should flash or light continuously, depending on the mode.

If your instrument works with one set of electrode wires, but not with the other, then the non-working wire(s) should be replaced. If it still does not seem to be working properly, return the entire unit, including BATTERY, LEAD WIRES and ELECTRODES to MED LABS for complete testing.

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## INSTRUMENT CARE:

MED LABS Stimulators are electronic instruments, and should be given the same care you would give other electronic equipment. Although the device will take moderate abuse, it should not be dropped or struck. Also, the case should not be immersed in water or other liquids. Small amounts of moisture will not hurt the stimulator, but soaking may damage some of the electronic components. If it should accidentally get soaked, quickly remove the battery, drain and shake out as much water as possible, and allow the instrument to dry thoroughly in a warm room, before attempting to use it again.

Do not leave the EMS-1C or EMS-2C in a hot location such as a closed car. It may damage the instrument.

**DO NOT SHARPLY BEND OR FOLD THE ELECTRODE WIRES!** We use the highest quality wire, but even that will eventually break if it is repeatedly bent or folded.

## CLEANING:

The CASE may be cleaned by wiping it with a tissue or small cloth dampened in isopropyl alcohol. The CONDUCTIVE RUBBER ELECTRODES may be cleaned with alcohol or disinfectant soap and warm water. The WATER SOAKED ELEC-

TRODES may be cleaned by washing them thoroughly in disinfectant soap and warm water. Rinse thoroughly and allow them to dry after washing.

## WARRANTY:

MED LABS Stimulators carry a two year warranty on parts and workmanship. This does not include physical abuse, and does not apply to the battery. Battery life will vary with usage.

## REPAIR:

If your stimulator stops working properly, and a new BATTERY or different ELECTRODES or WIRE LEADS do not eliminate the problem, return the unit, **with BATTERY, ELECTRODES and WIRE LEADS**. It should be shipped postage paid and insured to MED LABS for testing. If covered by warranty, the unit will be repaired as quickly as possible. If it is not covered by warranty, or the warranty has expired, an estimate of the repair cost will be sent to the customer. You can avoid this delay by authorizing the repair in writing when you return the instrument.

Return authorization is not required. Send the shipment with a copy of your original invoice, and a contact name to:

## MED LABS, INC.

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