

# 811-B Ultrasonic Doppler Flow Detector

## Operating / Service Manual



The 811-B Ultrasonic Doppler Flow Detector has clinical applications for vascular studies and detecting blood pressures. The high-frequency 8.2 MHz probe is used to detect blood flow for the measurement of systolic pressures at sites where a stethoscope cannot be used, as well as pulses that are too faint for a stethoscope to detect reliably. The sound of blood flow can be monitored during surgery with the 811-B.

This Doppler can be utilized in emergency vehicles, emergency and recovery rooms, intensive care units, surgical wards, veterinary, urology, pediatric and vascular clinics.



**Read this manual prior to use.**


**Follow manufacturer's guidelines for safety and maintenance of equipment.**

This instrument was manufactured to comply with all relevant national or international regulations and left the factory in safe condition. In order to keep this instrument in a perfect and safe condition, it is up to the user to observe all instructions and warnings included in this manual.

# Preface

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## Declaration Of Conformity

 **Manufacturer:**  
**PARKS MEDICAL ELECTRONICS, INC.**  
19460 SW Shaw  
Aloha, OR 97007  
U.S.A.

Telephone: **503-649-7007**  
Fax: 503-591-9753



**European Representative:**  
**KARSCHNY MEDIZINTECHNIK**  
Schallesbuchstr. 3  
D-65207 Wiesbaden  
Germany

Telephone: **+49 6122 1 28 28**  
Telefax: +49 6122 1 29 80

Instrument #                      Instrument Name

MDD Class                      Doppler Type

811-B                                  Vascular                                  IIA                                  Non directional

We hereby declare under our sole responsibility that the above mentioned products meet the requirements of EC Directive 93/42/EEC as amended from time to time.

Parks Medical Electronics has a certified Quality Management system according to Annex II, Article 3 of the Directive through TÜV Rheinland LGA Products GmbH.

The following standards have been applied to establish compliance:  
EN60601-1; EN60601-1-2; EN60601-1-4; EN60601-1-6; EN60601-2-37; EN14971; EN10993-1; and EN980.

Certification of our Quality System:

Certificate # SX 60029163 0001	Dated: 05 March 2010	Expires: 04 March 2015
TÜV Rheinland LGA Products GmbH		Notification No. 0197
Tillystrasse 2, 90431 Nuremberg Germany		

Place: Aloha, OR 97007

Date: 11 March 2010

Signature: 

Signature: 

Name: A. Afarin

Name: Loren Parks

Title: Quality Systems Administrator  
Parks Medical Electronics, Inc.

Title: President  
Parks Medical Electronics, Inc.

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## Compliance



The CE marking certifies that this medical device has met European Union consumer safety, health and environmental requirements. The CE marking is an acronym for the French "Conformité Européenne".

### Class Ila

This instrument uses a rechargeable battery as its power source and meets the safety requirements for a Class Ila Active Medical Device. In order to prevent electric shock, the instrument utilizes a safety circuit that prevents it from operating while connected to a battery charger.

### Type B Applied Part

All equipment that comes in contact with the patient complies with directives for the degree of protection against electric shock.

### Acoustical Output Power

The acoustical output power of this Doppler is within limits set by the European Union.

## The Model 811-B kit

- 811-B Doppler, factory tuned to 8.2 MHz.
- Battery Charger with 24V  $\approx$  0.625A output and international socket adaptors for ac outlets.
- 8.2 MHz Pencil Probe or Flat Probe
- Ultrasound Transmission Gel.
- 811-B Operating / Service Manual.

This Doppler uses a rechargeable 12 volt, 1.2 Ah sealed lead acid battery for its power source. The Doppler is shipped ready to use, with fully charged battery installed.

## Safety

This instrument is intended for use by health care professionals only.

The following symbols are used throughout this manual:



**CAUTION:** Indicates a potentially hazardous situation that, if not avoided, could result in personal injury or damage to the instrument.



**DANGEROUS VOLTAGE:** Indicates a potential electrical hazard that, if not avoided, could result in personal injury or damage to the instrument.



TYPE B APPLIED PART  
MEDICAL EQUIPMENT

**Type B Applied Part:** complies with degree of protection against electric shock required by IEC 60601-1.

### Class IIa Equipment:

This noninvasive ultrasound Doppler meets the safety requirements specified for a Class IIa active medical device.

**Acoustic Output Power** is within limits set by the FDA and the European Union.

This device is intended for vascular studies. It is not intended for obstetrical use.

Parks Medical Electronics, Inc. manufactures a complete line of obstetrical Dopplers.

## Instrument Identification Information

Write the information from your instrument bar code label here or on the parts page for reference when reordering parts or requesting technical support:

Serial Number _____	Part Number _____
Model _____	Date of Manufacture _____
Date instrument purchased _____	Customer Number _____

# Preface

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## Setting Up The Instrument

1. This instrument is shipped charged and ready to use.
2. Place this instrument on a clean, non conductive, level surface.
  - The instrument should not be placed near devices which may cause radio interference or grounding.
  - The instrument should not come into contact with metal surfaces or other electronic devices.
3. Plug the probe cable into the jacks. The cable connectors can plug into either probe jack.
4. Remove the red protective cover from the probe tip prior to use.
5. Use ultrasonic gel as a contact medium between the tip of the probe and the skin.



## Warranty

Parks Medical Electronics, Inc. warrants this Doppler against defects in materials and workmanship for a period of one year, probes for six months. Parks will, at its discretion, replace or repair free of charge, including labor, all parts which prove to be defective and subject to such warranty.

This warranty does not apply to any instrument or probe not used according to instructions or damaged by abuse, accident, alteration, misuse, and/or tampering.

The bar code label attached to the probes contain the part description, the part number, the date of manufacture and the serial number. Removal of this label will void the probe's warranty.

## Most problems can be taken care of by telephone.

You or your biomedical engineer should phone us before sending the instrument back for service.

Phone your sales representative or area distributor for instrument acquired outside of the U.S.A.

### **PARKS Medical Electronics, Inc.**

Mailing Address: PO Box 5669, Aloha, OR 97006 USA

Shipping Address: 19460 SW Shaw, Aloha, OR 97007 USA

Phone: **503-649-7007** 1-800-547-6427 Fax: 503-591-9753

e-mail: [Info@parksmed.com](mailto:Info@parksmed.com) Website: [www.parksmed.com](http://www.parksmed.com)

Parks Medical Electronics, Inc. was established in 1961 as Parks Electronics Laboratory. Parks was the second company in the world to make vascular Dopplers and is now the world's oldest maker of Dopplers.

## Front Panel



### 1. Bar Code Label

Lists serial number (SN), part number, description, and date of manufacture.

### 2. Battery Indicator Lamp

This lamp lights when the unit is turned on. The lamp blinks if the battery needs charging.

### 3. Power Control Knob

Turn knob to left to turn instrument off.  
 Turn knob to right to turn instrument on.

### 4. Probe Jacks

The probe cable plugs into these jacks. Label next to jacks identifies tuned frequency.

### 5. Battery Charger Lamp

This lamp lights when the unit is charging.

### 6. Battery Charger Jack

The battery charger plugs into this jack.

### 7. Headphone Jack

Headphones plug into this jack.

### 8. Internal Speaker

Disconnects when headphones plugged in.

### 9. Volume Control Knob

This knob controls the speaker volume. Turning the knob clockwise increases the volume, counterclockwise decreases the volume.

### Non operational symbols

Do not dispose of in garbage.

Recyclable.

Complies with EC Directives

Serial Number

Type B Applied Part


Date of Manufacture

Manufactured by: Parks Medical Electronics, Inc.

# Equipment Description

## Probes

The Doppler comes equipped with either a standard pencil probe or adult or infant flat probe. The optional skinny pencil probe may also be ordered at additional cost. The pencil probes are used for detecting blood flow and taking systolic blood pressure. The flat probes are designed to be taped in place for repeated blood pressure measurements.

Each probe consists of two crystals; one transmits ultrasound waves and one receives the reflected waves. The probe's two connectors can be plugged into either of the two jacks. The initial energy beam is as wide as the crystal. The crystals are the parallel gold-colored strips embedded in epoxy at the end of the probe.  Damage to either crystal will impair or prevent probe function. The material covering the crystals can be damaged by ECG cream or paste, abrasion, soaking in alcohol or disinfectant and excessive heat. You should use ultrasonic coupling gel between the tip of the probe and the skin.

### **The probe must match the tuned frequency of the Doppler.**

This frequency is identified on the panel next to the jacks and on the label attached to the probe cable. The frequency of this instrument is nominal 8 - 9 MHz (8.2 MHz for the European Union).

It is always best to have a spare probe. Probes with double-shielded cables can be ordered for use in areas with high interference. Cable length: 1.5 m (5 ft) standard. 2.1 m (7 ft) and 3.0 m (10 ft) cable lengths are available by special order.



**Standard Pencil Probe**  
Diameter: 9.5 mm (3/8 in).



**Skinny Pencil Probe**  
Diameter: 6.35 mm (1/4 in).

The smaller probe crystal of the optional Skinny Pencil Probe, concentrates power to produce a beam with higher intensity than the standard probe. It provides better resolution for small vessels.



**Infant Flat Probe**  
Size: 12.7 mm X 15.9 mm (1/2 in X 5/8 in).




**Adult Flat Probe**  
Size: 15.9 mm X 19 mm (5/8 in X 3/4 in).

Crystals are set into the plastic so that a 10 mm wide ultrasound beam goes into the vessel at about 15 degrees from perpendicular. Flat probes are easily taped into place for repeated measurements.

## Battery Charger

This Doppler is supplied with either a domestic or international battery charger.

- Domestic Units - Output: 24V  $\approx$  0.63A
- International Units - Output: 24V  $\approx$  0.625A with international socket adaptors for ac outlets.

 The charger plugs into the Doppler and must be connected to an electrical outlet. The Doppler cannot be operated while it is connected to the battery charger. This is a safety feature to prevent electric shock. The charger cannot overcharge the battery.

## Electrical Safety

### **CAUTION!**

This instrument is intended for use by health care professionals only.

Follow the instructions for the use of this equipment.

Misuse of this equipment and inappropriate electrical connections can create a shock hazard. What may appear to be a simple connection to other equipment can put the patient and/or the operator at risk of electrical shock.

The following is a guide to avoiding common potential hazards. It is not comprehensive. Always seek the advice of a qualified bioengineer before making any electrical connections.

**1. Use caution when connecting the Doppler unit to other equipment.**

Connecting the Doppler unit to a computer, amplifier or intercom system can be extremely hazardous. There is a shock hazard unless a medical grade isolation transformer is used. The combined equipment must comply with medical systems standard 60601-1-1 for the safety of the patient and the operator. Have a qualified technician or bioengineer review and approve any proposed connections.

**2. Operate this instrument only with the prescribed battery as the power source.**

**3. This device cannot be used while connected to a charger.**

This equipment is not intended to allow operation on a patient while being charged and any modification altering this will no longer comply with the tested requirements. This safety feature provides protection from electrical shock.

**4. Do not rewire or modify the battery charging circuitry in this Doppler unit.**

The battery charger must comply with the relevant national requirements (e.g. EN60601-1:1990 +A1:1993+ A2:1995). The battery charging input circuitry must not be modified or altered in the field. Changing this safety feature would compromise safety and violate 21 cfr 898.12.



**5. Do not use this instrument in the presence of flammable gas or high oxygen concentrations.**

**6. Do not position this instrument so that it comes in contact with metal surfaces, cautery, or other electronic equipment during use.**

Burns can occur through the probe if the Doppler unit's metal case is inadvertently grounded when the electrocautery back plate is not connected properly. To protect against this, ensure that the cautery instrument's ground plate is on, and only suspend the Doppler from an insulator if it is hung on an IV pole.

**7. Inspect the probe covering for damage before each use.**

Before using the probe, inspect for any cracks or breaks in the protective epoxy covering. Damage that could allow for ingress of conductive fluids, such as acoustical coupling gel, can create a shock or burn hazard if the Doppler unit's metal case is grounded and comes in contact with or is used with other electronic equipment.

**8. This instrument should not be used with a defibrillator.**

The probe can transmit an electric shock or cause burns when used with a defibrillator.

Parks assumes no responsibility for the misuse of this equipment.

# Operating Instructions

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## Operating Conditions

- Ambient Temperature: 10° C to 40° C.
- Relative Humidity: 30% to 75%.
- Atmospheric Pressure: 700 hPa to 1060 hPa.
- IPXO Rating: Degree of protection against ingress of water... none provided.

## Environmental Conditions for Transport and Storage (601-I)

- Ambient Temperature: -40° C to 70° C.
- Relative Humidity: 10% to 100%, including condensation.
- Atmospheric Pressure: 500 hPa to 1060 hPa.

## Cleaning the Instrument

Clean the outside of the instrument as needed. First turn off the power and unplug the battery charger. Remove dust with a soft cloth or small paint brush. Wash with a soft cloth dampened in a mild solution of detergent and water. Never use abrasive cleaners. To disinfect surface, use a soft cloth dampened with liquid disinfectant or use a surface germicidal cloth. After cleaning/germicidal agent dries, remove any residue with a soft cloth dampened with water. Never let the inside of the instrument get wet.

## Cleaning the Probes

1. Remove the gel with a soft tissue after each probe use.
2. Wash any dried gel off the probe with running water.
3. DO NOT scrape off dried gel to avoid damaging the coating over the crystals.
4. User may opt to wipe probe with alcohol, surface germicidal cloth, or liquid disinfectant; rinse probe with warm water to remove any residue after cleaning/germicidal agent dries. Do not use bleach.



## Sterilizing the Probes

### Preparation for Sterilization

1. Wash the probe with warm soapy water.
2. Inspect the epoxy covering that protects the crystal. If it has cracks or has pulled away from the probe housing, organic material can become trapped and the probe cannot be sterilized successfully.



### Sterilization

If you need to sterilize PARKS pencil probes, they should be sterilized by STERRAD 100S sterilization procedures only. PARKS pencil probes have been tested to a sterility assurance level (SAL) of  $10^{-6}$  using STERRAD 100S sterilization procedures. A copy of the sterility test report is available by calling us toll free at **1-800-547-6427**.



### Do Not Autoclave the Probes

Temperatures above 57.2 degrees Celsius (135 degrees Fahrenheit) destroy the crystal activity and cause the covering over the individual cables and the outer sheath to shrink and crack. With a raised temperature, a severe loss of sensitivity will occur. Autoclaving will void the probe's warranty.





## Please Read This

Information contained in this manual is provided to help the user operate the instrument controls. In no way must a diagnosis be made on the basis of information provided in the manual. We provide procedures which we believe to be in current usage. However, the procedure to be used and the diagnosis of an individual patient must be determined by the attending physician from information in the scientific literature and from other medical sources.

# Operating Instructions

## Using the Probe

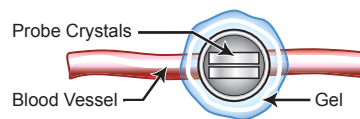
Parks' pencil probes are positioned differently than other Doppler probes because they are designed to detect blood flow in vessels that are too deep to feel. The initial energy of the beam is only as wide as the crystals in the probe, so you must always search the area of the vessel and tilt the probe to obtain best Doppler sounds. Parks recommends that you practice searching for arteries six inches distal and proximal to the elbow.



1. Inspect the probe for cleanliness and damage prior to each use (See Electrical Safety).
2. The probes require a conductive medium to maintain an interface between the skin and the probe for signal transmission. Use only a coupling gel made for ultrasonic applications. **DO NOT** use ECG cream or paste, which may damage the probe covering.
3. Invert the gel squeeze bottle and shake it downward to get the gel near the bottle opening. Squeeze about 6mm ( $\frac{1}{4}$  inch) of gel onto the tip of the probe, making sure there are no air bubbles.
4. Turn the volume control knob all the way down (counterclockwise).
5. Turn the instrument on.
6. Gradually turn up the volume (clockwise).  
A rumbling sound can be caused by the vibration of the gel from operator movement.

## Positioning the Pencil Probe

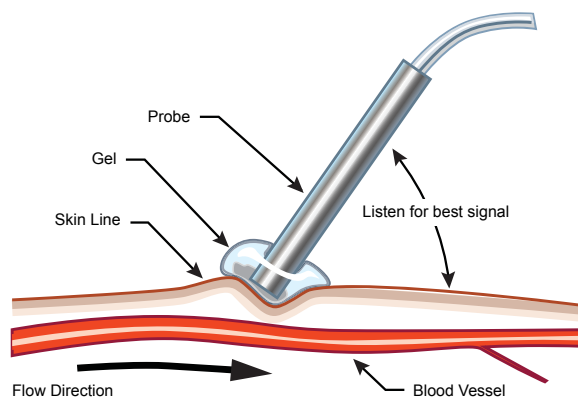
1. Place the pencil probe over the approximate position of the target vessel.  
Align the probe's crystals parallel to the vessel for best artery-vein separation.



2. Tilt the back of the pencil probe to an angle of about 15 degrees from perpendicular, making certain there is gel in the pathway between the probe and the skin, and listen for the best signal.
3. Move the probe and the skin to try to find the center of the vessel.

- Search for the most "present" sound.
- The Doppler sound for an artery is a hissing noise at systole.
- Background sounds are more or less continuous.
- If you do not hear any sounds, move probe to a different location.
- Note that too much pressure on the skin can occlude an artery.

4. Turn the volume up to near maximum to search for deep arteries, small or obstructed arteries, and veins.
  - The Doppler sounds associated with low-velocity blood flow have a very low pitch.
  - The higher volume setting will also increase the transient background noise.
5. Avoid unnecessary movement of the probe on the skin to minimize transient background noise.



## Positioning the Flat Probe

1. Position the flat probe over an artery with the crystals pointed antegrade.
2. Secure the flat probe with a velcro strap or tape and anchor the cable at least one place distal to the probe.

## Using the Probe Under Water

The probe and cables can be fully immersed in water for vascular tests. **Be careful to keep the Doppler dry.** Liquids can seep into the instrument and short out electronic components.



Please pay special attention to the Electrical Safety page in this manual.

## Headphones

The speaker is disconnected when stereo headphones are plugged in. You will always hear more through the headphones, especially when checking weak flow or veins.

## Shutting Down the Instrument After Use

1. Turn the volume control knob all the way down (counterclockwise).
2. Turn the instrument off.
3. Wipe the gel off of the probe with a soft tissue.  
Disconnect the probe from the Doppler unit only if it is to be sterilized. Repeated insertion and removal of the plugs wears out the connectors and ultimately causes static. If you remove a probe, pull and twist the connector itself. If you pull on the cable you can break internal wires.
4. Connect the instrument to the battery charger.
5. Disconnect battery charger and remove battery if equipment is not likely to be used for some time.

## The Battery

### Low Battery


A blinking battery indicator lamp warns that the battery needs to be charged. The Doppler will continue to operate for a few hours if necessary after the light begins to flash, but should be recharged as soon as possible.

Keep the VOLUME low or use headphones to get the maximum operating time from a weak battery.

### Keep The Battery On Charge When Not In Use.

The battery is charged using an external battery charger. The instrument should be put on the battery charger when not in use or after the last usage of the day. **The battery cannot be overcharged.**

1. Plug the connector of the battery charger into the battery charger jack on the front of the instrument.
2. Plug the power cord of the charger into an ac outlet.  
The battery charger indicator lamp will light up to show that the Doppler battery is being charged.


 The Doppler cannot be operated while the battery is being charged. Only the charging circuit is active. This is a safety feature to protect both the patient and the operator from electric shock.

### Battery Life

Battery life between charges for a new battery will be more than 16 hours on a full charge. The battery life will decrease as the battery ages or if it is not kept fully charged. With normal service and care, a battery can be expected to last two to three years.

### Charging the Doppler in the Optional Carrying Case

If your Doppler came in the larger 800 or 901 carrying case, Parks recommends that you keep the it on charge with the carrying case lid off. The carrying case has slip hinges that allow for easy removal of the lid.

 If you do not remove the lid during charging, be sure the charger cord is in the small rubber grommeted half-moon cutout before closing the lid of the carrying case. This will prevent damage to the charger cord which might lead to electrical shock.

# Diagnostic Procedures

## Performing Diagnostic Procedures

Follow the attending physician's and the institution's protocols for diagnostic procedures. This section of the manual is provided only as a guide, not to determine how a diagnosis is made.

This instrument has clinical applications for vascular studies, both to detect blood flow and to measure blood pressures. The Doppler is used to measure systolic pressures at sites where a stethoscope is not used, as well as to detect blood pressures that are too low for a stethoscope to measure reliably.

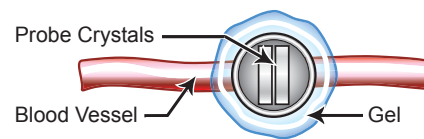
### Blood Pressure (BP) Measurement

A Doppler can be used to make accurate systolic pressure measurements, with greater sensitivity than a stethoscope. A stethoscope is only used to take arm blood pressure, but a Doppler can be used for both upper and lower extremity blood pressures. The Doppler allows for the detection of low blood pressure in legs, fingers, and in animal legs and tails. Measurements as low as 10 mm Hg have been documented.

Diastolic pressure can only be estimated, not accurately measured by Doppler use. To estimate diastolic pressure, insert the probe under the lower edge of the BP cuff and listen for either the loss of sound as diastolic pressure passes or the return of the diastolic notch, which is the beginning of the cardiac cycle.

### Measuring Systolic Pressure

Because the sound quality is not as critical, it is possible to align the pencil probe's crystals perpendicular to the vessels to take blood pressures (BP). Follow the operating instructions for positioning the pencil probe to optimize Doppler sounds.



Accurate systolic measurements require a BP cuff width suitable to the limb being tested. The cuff is inflated 20-30 mm Hg above estimated systolic pressure and then released, just as with BP measurements using a stethoscope. The systolic pressure is the sphygmomanometer reading when the Doppler detects the first flow sound as the cuff is deflated.

Patients with calcified arteries, resulting from diabetic or renal disease processes, can have falsely elevated blood pressures.

## Blood Pressure Measurements on Animals

There are two primary sites for taking blood pressure measurements, the limbs and the tail. Which one you use depends on the animal and the conditions under which the measurements are taken. There is also a matter of personal choice.

Most people use the pressure measurement as a reference point, such as before, during and after surgery. Obtaining an absolute value is trickier because the accuracy of the measurement is dependent on the width of the cuff with respect to the cross-sectional area of the limb or tail. Anatomical hiding of the vessel may make it almost incompressible or compressible with difficulty, making readings too high. Vasoconstriction is of serious concern when measuring pressures on the tail of a rat.

The cuff width should be selected based on the limb size and should never be smaller than the diameter of the limb used, but can be up to twice this diameter without affecting accuracy. To figure diameter from circumference, multiply the circumference by .3.

Wherever you measure, you should have the inflating part of the cuff over the artery of interest. Place the Doppler probe downstream from the cuff. The Doppler sounds should be clear, before the occlusion, so that when blood does surge under the cuff you can hear it as a distinct change in the background noise. If you move the probe off the vessel simply because you can not hold it steady, you will get either nothing or a reading that is too low. The manometer is read when blood flow is heard to return, as the cuff is gradually deflated. If this end point is not distinct, you may be picking up flow from another vessel as well as the one of interest. It is common to make more than one attempt to get a measurement. Be sure to deflate the cuff completely between measurements. Creating a reactive hyperemia from tissue anoxia can dilate the distal bed and make the end point more clear.

The School of Veterinary Medicine at Davis, California, was the first school to use the Doppler, some 20 years ago. Another active school is at the University of Florida, Gainesville. If you have a particular application you might want to contact them.

There are two types of probes to be used. The most commonly used is the flat probe, which can be affixed to the tail or leg with a Velcro band or non-sticky first aid tape. A pencil-shaped probe is also available. On humans, the pencil probe is preferred for use on the limbs because you can push it in close to the vessel. However, it must be held on target while you inflate the cuff or the beam will be off the artery when you deflate.

# Technical Information and Notes

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## Specifications And Replacement Parts

<b>Doppler</b>	Ultrasonic Doppler Flow Detector, Model 811-B.
Height:	19.7 cm (7.76 in).
Width:	13.6 cm (5.39 in).
Depth:	8.0 cm (3.27 in).
Weight:	1.34 kg (2.87 lb) with battery.
<b>Battery</b>	12 V, 1.2 Ah sealed lead acid rechargeable battery. Fully charged at 14.5 V, needs charging at $\approx$ 11.3 V, fails at $\approx$ 10 V. <ul style="list-style-type: none"><li>• <i>Parks part # 854-0017-01.</i></li><li>or</li><li>• <i>Power-Sonic Europe LTD part # PS-1212.</i></li></ul>
<b>Battery Charger</b>	24V $\Rightarrow$ 0.625A output with international socket adaptors for ac outlets. <i>Parks part #984-0020-00R.</i> 16 VAC $\sim$ 250 mA charger may be used also.
<b>Fuse</b>	500mA, 250 volt, Slow. <i>Parks part #865-6002-00.</i>
<b>Internal Speaker</b>	Speaker disconnects when headphones are plugged in.
<b>Headphones</b>	Acquire 32 ohm stereo headphones locally.
<b>Tuning</b>	All 811-B Dopplers for the European Union are factory tuned to 8.2 MHz.
<b>Probes</b>	Order probes to match the 8.2 MHz frequency of the Doppler. Standard Pencil Probe: 9.5 mm (3/8 in) diameter. Skinny Pencil Probe: 6.35 mm (1/4 in) diameter. Adult Flat Probe: 15.9 mm x 19 mm (5/8 in x 3/4 in). Infant Flat Probe: 12.7 mm x 15.9 mm (1/2 in x 5/8 in). Probes are available with double shielded cable.
<b>Replacement Probe Cable lengths</b>	
Standard Cable Length:	1.5 m (5 ft).
Optional Cable Length:	2.1 m (7 ft).
Optional Cable Length:	3.0 m (10 ft).
<b>Ultrasound Gel</b>	
0.25 Liter:	<i>Parks part #748-0003-00.</i>
1.0 Liter:	<i>Parks part #748-0001-00.</i>
<b>PARKS 811-B, CE Operating / Service Manual</b>	<i>Parks part #051-811B-00.</i>

# Technical Information and Notes

When ordering replacement parts, refer to the Instrument Identification Information section of this manual on page 3 or check the unit for bar code information.

## Bar Code Label

The bar code contains information about your Doppler.

When requesting service or parts, please have this information available.



## Carrying Cases

Optional rugged aluminum cases with welded corners, handle, removable lid, and room for accessories.

**800** is large enough to hold the Doppler, a bottle of gel, probe and battery charger.

18 cm X 23.5 cm X 10 cm

(7.25 in x 9.25 in x 4 in), blue case.

Parks part # 798-0016-02.

**901** will hold the Doppler, a bottle of gel, probe, battery charger, manometer and a few cuffs.

21.6 cm X 28.9 cm X 11.4 cm

(8.5 in x 11.375 in x 4.5 in), white case.

Parks part # 798-0018-05.



## Contact Information

### PARKS Medical Electronics, Inc.

Mailing Address: PO Box 5669, Aloha, OR 97006 USA

Shipping Address: 19460 SW Shaw, Aloha, OR 97007 USA

Phone: 503-649-7007 1-800-547-6427 Fax: 503-591-9753

e-mail: [Info@parksmed.com](mailto:Info@parksmed.com) Website: [www.parksmed.com](http://www.parksmed.com)

# Technical Information and Notes

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## Physiological Effects of Ultrasound

### Ultrasound Instrument Console and Transducer Assembly

The biological effects of ultrasound on tissue appear to be threshold effects, contrary to what is assumed for X-ray. When tissue is repeatedly exposed to ultrasound, with rest intervals in between, there will likely be no cumulative biological effect. If a certain threshold has been passed, biological effects may occur. A temperature rise from 37° C to 41° C is permissible for extended periods, whereas a temperature rise to 45° C may not be acceptable.

### Implanted Devices

Implanted devices such as cardiac pacemakers should be avoided due to the possibility of affecting their operation. Some plastics used in replacement surgery may be affected by absorption of ultrasonic energy. Metal implants can reflect ultrasound signals.

### Studies Near Sensitive Tissues

Extreme care should be taken when treating areas near any sensitive nervous tissue. Extreme care should be taken when treating areas near the eye because of the risk of damage to the retina.

## Environmental Hazards

### Battery and Instrument

Batteries must be recycled or disposed of according to your local ordinances.



Do not dispose of old instruments or lead acid batteries in land fills. Please contact local authorities for recycling information.

### Ultrasound Coupling Gel

There are no potential environmental hazards from the gels recommended for use with the probes.

### Radio Interference

**This instrument is intended for use by health care professionals only.** This instrument may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take precautionary measures, such as reorienting or relocating equipment, or shielding the location.

### Warning

The use of ACCESSORIES, transducers and cables other than those specified, with the exception of transducers and cables sold by the manufacturer of the EQUIPMENT as replacement parts for internal components, may result in increased EMISSIONS or decreased IMMUNITY of the EQUIPMENT.

The following PARKS cable lengths are in compliance with the requirements of 36.201 and 36.202 of 60601-1-2 © IEC:2001(E):

- Standard Cable Length - 1.5 m (60 in), Maximum length - 1.6 m (63 in)
- Optional Cable Length - 2.1 m (84 in), Maximum length - 2.6 m (85 in)
- Optional Cable Length - 3 m (120 in), Maximum length - 3.07 m (121 in)

PARKS probes are available with a shielded cable.

### Static

Portable and mobile radio frequency communications equipment can affect MEDICAL ELECTRICAL EQUIPMENT. This Doppler may experience a high pitched tone or buzzing noise from radio interference caused by a cell phone, mobile service, another Doppler, electrocautery, defective fluorescent lighting, or neon signs.



## Routine Maintenance

The Doppler unit does not require regularly scheduled maintenance. The battery may need to be replaced every two or three years. The probe jacks can wear out with extended use.

### To Check the Battery:

1. Determine how long, at most, the Doppler is kept on continuously.
2. Recharge the battery for at least 8 hours.
3. Connect a dry probe to the unit, turn the unit on, and turn the volume 2/3 of the way up.
4. After one hour or twice the longest period of continuous use, whichever is greater, check the battery indicator lamp. If the lamp is blinking, replace the battery.

### To Check the Probe Jacks:

1. Bend back the four sections of the ground flange of the plug of a *defunct probe*.
2. Insert the center pin of the plug into each probe jack.
3. If there is no friction or resistance, replace the probe jack.
4. If you do not have a defunct probe, contact technical support.



### Tuning

The Doppler unit is tuned by the manufacturer, and the tuning of the circuit is very stable. If sensitivity problems are suspected, do not attempt to adjust the instrument; contact your sales representative or Parks Medical Electronics, Inc.


## Troubleshooting Guide

This table lists common problems for the 811-B and suggestions for troubleshooting them.  
If a problem persists after these actions have been taken, contact Parks Medical Electronics, Inc.

Problem	Situation	Suggested Actions
<b>1.0</b> Doppler unit doesn't turn on.	<b>1.1</b> The power control knob is on but the battery indicator lamp does not light up.	<ul style="list-style-type: none"> <li>• Disconnect the battery charger.</li> <li>• Replace fuse.</li> <li>• Replace battery if over three years old.</li> </ul>
	<b>1.2</b> The power control knob is on and the battery indicator lamp lights up.	<ul style="list-style-type: none"> <li>• Listen with headphones. If there is sound with the headphones but not the speakers, go to 3.2.1.</li> </ul>
<b>2.0</b> Battery is not charging.	<b>2.1</b> Battery CHARGER lamp does not light up when Doppler is turned off and charger is connected.	<ul style="list-style-type: none"> <li>• Replace the battery charger.</li> </ul>
	<b>2.2</b> Battery CHARGER lamp lights up when connected to charger with Doppler off. Battery INDICATOR lamp blinks with Doppler on and charger disconnected after charging for at least 8 hours.	<ul style="list-style-type: none"> <li>• See Routine Maintenance.</li> <li>• Replace the battery.</li> </ul>
<b>3.0</b> Hard to hear blood sounds. (Poor signal to noise ratio.)	<b>3.1</b> Too much noise.	<b>3.1.1</b> Prevent feedback (screeching sound): <ul style="list-style-type: none"> <li>• Keep the probe against the skin once gel is applied.</li> <li>• Keep the probe out of line with the sound waves from the speaker.</li> <li>• Keep probe cable from looping around and touching itself.</li> </ul>
		<b>3.1.2</b> Check for a noisy circuit: <ol style="list-style-type: none"> <li>1. Disconnect the probes and turn the Doppler unit on.</li> <li>2. Turn the volume all the way up.</li> <li>3. You should hear smooth white noise or hissing like the noise of wind or surf. It may be loud, but it must be smooth.</li> <li>4. If you hear crackling or sputtering, the circuit is noisy. Call Parks' technical support.</li> </ol>
		<b>3.1.3</b> Check for a microphonic circuit: <ol style="list-style-type: none"> <li>1. Tap or drum on panel and case with your fingers. You should hear a dull thud.</li> <li>2. If you hear a ringing noise, the circuit may be microphonic. This makes it prone to scream whenever there is gel on the probe. Call Parks' technical support.</li> </ol>

## Troubleshooting Guide

This table lists common problems for the 811-B and suggestions for troubleshooting them. If a problem persists after these actions have been taken, contact Parks Medical Electronics, Inc.

Problem	Situation	Suggested Actions
<p><i>(continued)</i></p> <p><b>3.0</b> Hard to hear blood sounds. (Poor signal to noise ratio.)</p>	<p><i>(continued)</i></p> <p><b>3.1</b> Too much noise.</p>	<p><b>3.1.4</b> Check for noisy probe:</p> <ol style="list-style-type: none"> <li>1. Clean and dry the crystal end of the probe.</li> <li>2. Connect the probe to the Doppler unit, turn the Doppler unit on, and turn the volume up.</li> <li>3. Wiggle the probe plugs. If you hear a crackling sound, the connection is noisy.</li> <li>4. Clean and tighten the probe plugs:</li> <li>5. Wipe the pin in the center of the plug and the flange around it with contact cleaner or isopropyl alcohol.</li> <li>6. Squeeze the flange with your fingers (or gently with pliers). Make the flange form a smaller circle so that it grips the jacks on the Doppler panel more tightly.</li> <li>7. Check for noise again. If there is still noise, bend the cable here and listen.</li> </ol>  <p>Send the cable back to the factory for new plugs if the noise originates here.</p> <ol style="list-style-type: none"> <li>8. Flex the cable near the crystals. If the cable is noisy near the transducer replace probe. It cannot be repaired.</li> <li>9. Press gently on each crystal with your fingernail. If a crackling or popping sound occurs, replace probe. The probe cannot be repaired.</li> </ol>
		<p><b>3.1.5</b> Check for electromagnetic interference. Noise that is probably caused by an electromagnetic field:</p> <ul style="list-style-type: none"> <li>• a tone or whistle that does not change pitch.</li> <li>• a buzz or a hum.</li> <li>• a noise like a radio station.</li> <li>• a ticking sound that seems periodic</li> </ul> <p>Confirmation criteria.</p> <ul style="list-style-type: none"> <li>• The noise worsens when the probe is held or applied to the patient.</li> <li>• The noise disappears when the Doppler unit is used at another site.</li> <li>• Possibly, if the noise lessens when the probe is disconnected.</li> </ul>

## Troubleshooting Guide

This table lists common problems for the 811-B and suggestions for troubleshooting them.  
If a problem persists after these actions have been taken, contact Parks Medical Electronics, Inc.

Problem	Situation	Suggested Actions
<p><i>(continued)</i></p> <p><b>3.0</b> Hard to hear blood sounds. (Poor signal to noise ratio.)</p>	<p><i>(continued)</i></p> <p><b>3.1</b> Too much noise.</p>	<p><i>(continued)</i></p> <p><b>3.1.5</b> Check for electromagnetic interference Identify and eliminate the source:</p> <ul style="list-style-type: none"> <li>• If the noise is a buzz or hum, the ballast in fluorescent lights, motors, and battery chargers are suspect.</li> <li>• Try turning off lights and unplugging nearby devices. Circuitry in cell phones and laptop computers can cause interference even when turned off.</li> </ul>
	<p><b>3.2</b> Weak signal.</p>	<p><b>3.2.1</b> No sound or very little sound:</p> <ul style="list-style-type: none"> <li>• If battery indicator lamp is blinking, see 2.2.</li> <li>• Check headphone/speaker connection:               <ol style="list-style-type: none"> <li>1. Listen with stereo headphones. If there is sound in the headphones, but not in the speaker, the inside of the headphone jack is probably bent.</li> <li>2. Unplug the headphones.</li> <li>3. Remove the four screws on the outside corners of the front panel and gently remove the Doppler unit from the case.</li> <li>4. Turn the volume control all the way up and squeeze the contacts on the inside of the headphone jack.</li> <li>5. If you hear bursts of sound from the speaker, bend the contacts to restore the connection.</li> </ol> </li> </ul>
		<p><b>3.2.2</b> The speaker is loud, but flow sounds are weak:</p> <ul style="list-style-type: none"> <li>• Check the frequency shown above the jack and the probe frequency to be certain they are the same. If not, obtain probe of matching frequency.</li> <li>• If you have another Parks Doppler unit of the same frequency and a probe that works with it, try the suspect probe on the good Doppler unit and the good probe on the suspect Doppler unit.</li> <li>• If the probe is suspect, replace the probe.</li> <li>• If the Doppler unit is suspect, call Parks' technical support.</li> <li>• Probes fail more often than Doppler units. If you do not have extra equipment to check against, get a new probe.</li> <li>• If replacing the probe does not solve the problem, contact Parks' technical support.</li> </ul>

## Replacing the Battery

This device uses a 12V, 1.2 Ah sealed lead acid rechargeable battery for its power source. Replace with Parks Part # 854-0017-01.

**⚡ Caution:** Replace only with the same size sealed lead-acid rechargeable battery. The use of a larger battery could cause the terminals to come in contact with the circuit board or metal case. Never allow battery terminals to come into contact with any metal part of the instrument. This could result in fire or internal damage to the instrument.

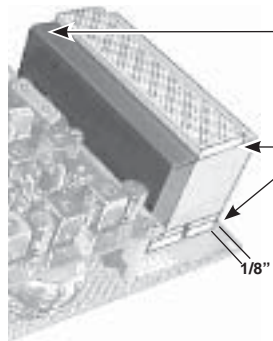
### To Replace the Battery:



1. Be sure the instrument is turned off and the charger is disconnected.
2. Open the case by removing the four corner screws.
3. Carefully remove circuit board assembly from the case.
4. Locate the battery and note how the battery wires are connected.



5. For safety reasons, disconnect the black battery wire first and then the red wire. Wiggle and gently pull the connectors, being careful not to break the insulation or short to ground.
6. The battery is mounted to the panel with adhesive. Gently pry or cut the battery loose.



1. Position battery with positive terminal next to front panel, so both wire leads reach battery terminals.

2. Center and attach battery 1/8" from edge of circuit board with two strips of two layered double sided tape.

3. Use single strip of tape for padding.

Attach tape to battery, but do not remove top plaid covering.

7. Follow the instructions in the accompanying illustration to position and secure the new battery.

8. Gently reconnect the red wire first and then the black wire.

**⚡ Caution:** Failure to match wire and terminal colors will do permanent damage to the instrument.

9. Carefully replace the circuit board assembly in the case.

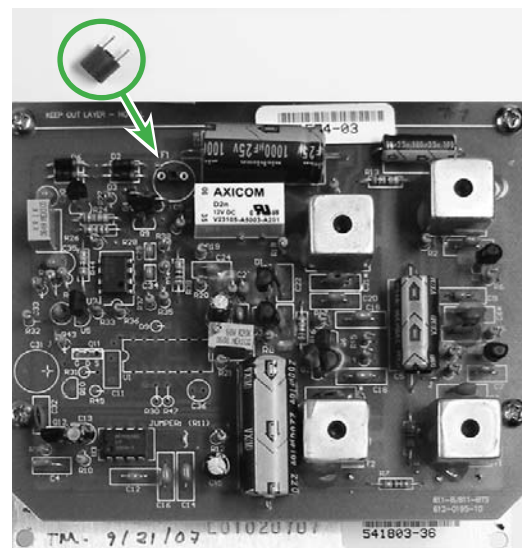
10. Replace the four corner screws.

## Replacing the Fuse

If the Doppler will not turn on (see Trouble Shooting Guide 1.1), and replacing the battery does not solve the problem, the fuse may need to be replaced.

### To Replace the Fuse:

1. Be sure the instrument is turned off.
2. Open the case by removing the four corner screws.
3. Carefully remove the circuit board assembly.
4. Refer to F1 on the Parts Location Diagram to find the location of the fuse, or see accompanying photo.
5. Replace with a 500mA, 250 volt, slow fuse, Parks part #865-6002-00.
6. Carefully replace the circuit board assembly in the case.
7. Replace the four corner screws.



## Technical Support and Service

If following the troubleshooting guide does not correct problems you are experiencing with the Doppler, call Parks Medical Electronics, Inc. for technical support.

Should this Doppler unit require technical service, Parks recommends that the instrument be returned to the factory. The manufacturer will ensure that electrical components meet the company's standard of performance.