

**Michiephone Base Station**  
**Instruction Manual**

**Speleonics**

**June 2002**

### **Electromagnetic Compatibility Note**

The Base Station, like the Michiephones, transmits audio frequency radiation from the long Michiephone Line which may interfere with other electronic equipment. It should only be used in the cave environment for which it was designed.

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# Speleonics

## Michiephone Base Station

### Instruction Manual

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# 1 Preliminaries

## 1.1 Base Station Kit

The supplied Base Station kit should contain the following items:

- Base Station
- Earth wire (green)
- Earth stake (tent peg)
- Positive lead (red)
- Negative lead (black)
- Bridging lead (black)
- Two bare banana plugs tied together (used to test Michiephones)
- Base Station Instruction Manual

## 1.2 Transportation and Storage

The Base Station should be transported to and from the rescue site in a dedicated case (not supplied). A plastic “Pelikan” case or an aluminium box “camera case” are ideal. Foam padding can be used to protect the Base Station, especially if it is transported some distance through a difficult cave.

Cases are available in a range of sizes and provide compartments for the Base Station, batteries, the associated connecting leads and for a few Michiephones. A dedicated case is also useful for storage of the unit so that it may be quickly grabbed when needed.

## 1.3 Other Useful Items to Include

Other useful items that could be included in the case with the Base Station are a notebook and some pens (or pencils and sharpener). This provides the materials for the Base Station operator or their assistant to take notes or make logs of important communications and times.

Spare Michiephone batteries and tools to replace the batteries in Michiephones, bare Michiephone wire, and a small piece of sandpaper to clean the earth stake in case it becomes rusty can come in useful.

The Base Station takes considerably more power than the Michiephones. Spare Lantern batteries are suggested.

These items are summarised below:

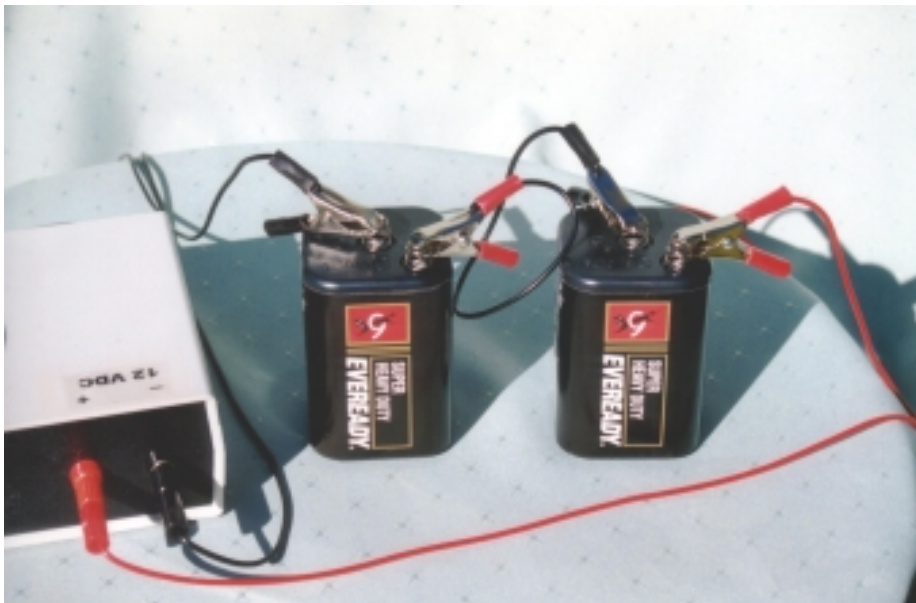
- notepad and pens or pencils
- small wire cutter/stripper
- spare 9 Volt batteries for Michiephones
- posidrive screwdriver for opening Michiephone case
- sandpaper for cleaning earth stake to get a good earth contact
- spare 6 Volt Lantern batteries for Base Station

## 2 Connecting up the Base Station for Use

The following procedure assumes that you are using two 6 Volt “Lantern” batteries in series to provide the 12 Volts supply. If you are using a 12 Volt car battery then the bridging lead will not be required.

### 1. Connect Power

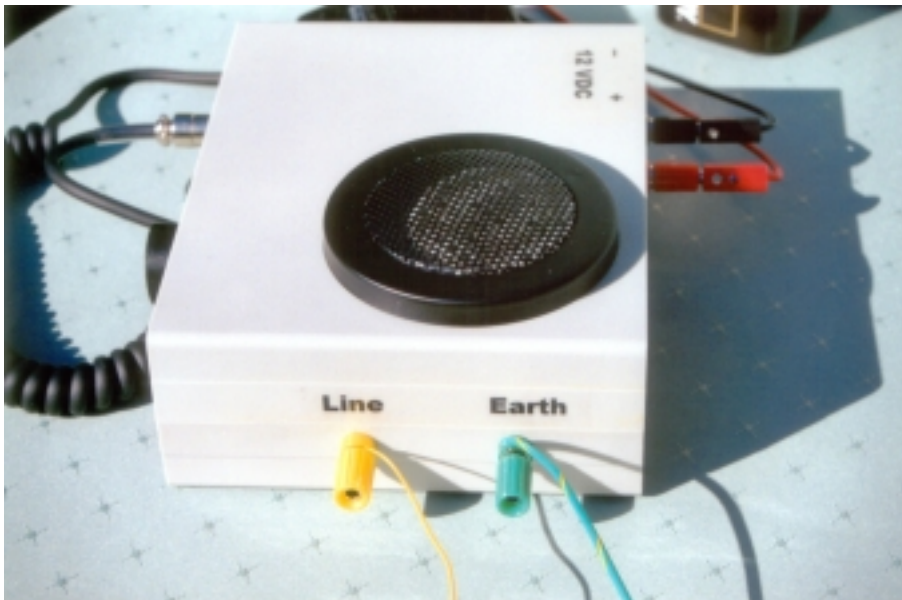
- Connect the *positive* power lead (red) to the red *positive* terminal of the Base Station and to the *positive* terminal of one of the 6 Volt batteries.
- Connect the *negative* power lead (black) to the black *negative* terminal of the Base Station and the the *negative* terminal of the other 6 Volt battery.
- Connect the bridging power lead between the negative of the first battery and the positive of the second battery.



connecting two lantern batteries

## 2. Connect Michiephone Line and Earth Lead

- Connect the Michiephone Line (ie. the long wire which users connect their Michiephones to) to the connection marked “**Line**”.
- Connect the bare end of the Earth lead (green) to the connector marked “**Earth**” and the other end, with the crocodile clip, to an earth stake that is **well earthed**.
- Double check that the connections are good, especially the earth connection to the ground.



Side view showing Line and Earth connections



Earth stake connection

### 3. Attach Microphone and Switch On

- Attach the CB radio type microphone<sup>1</sup>.
- Switch on the Base Station via the red switch. The green LED should illuminate.



Front panel view of Basestation

### 4. Test using a Michiephone – the Feedback Test

The test described below is a simple way to ensure that each Michiephone handed out to a team works. The proximity of the Michiephone speaker to the Base Station speaker results in feedback which is heard as a loud whistle.

- Attach a Michiephone to a bared section of the Michiephone line next to the Base Station (or to a bare banana plug clipped into the “Line” connector).
- Hold the Michiephone in you hand and earth yourself (touch the earth stake or a bare banana plug clipped into the “Earth” connector).
- While holding the Michiephone a few inches from the Base Station speaker press the **PTT** button on the Michiephone and check that a hum can be heard from the Base Station speaker.

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<sup>1</sup>Note: by using a case for storing and transporting the Base Station the microphone can be left attached to the Base Station.



This is a better test than using your own voice because if you connect a Michiephone up to the Line next to the Base Station and talk into the Michiephone you may not notice your own voice. Similarly, when speaking into the microphone you may not be able to hear your own voice from a Michiephone connected to the line.

An alternative to the feedback test is to get someone else to talk into the Microphone or scratch the front of the microphone with ones finger.

Note: the two banana plugs tied together can be plugged into the “Line” and “Earth” connectors and provide convenient places to connect a Michiephone cable to and to earth yourself on respectively when testing Michiephones.

**Power:** The two 6 Volt batteries are setup in series so that 12 Volts is provided to the Base Station. The Base Station draws a significant amount of power and the Lantern batteries will not last as long as the Michiephones. *The Base Station is protected against reverse polarity.*



Testing a Michiephone handset using feedback and the Base Station.

### 3 Receiving and Sending Messages

The Base Station can be setup on a small table. The operator can then make themselves comfortable on a chair rather than sitting on the ground. The Earth Line is long enough that it will reach down to the ground where it attaches to the Earth stake using the crocodile clip.



View of Base station setup for use.

#### 3.1 Receiving

Set the volume control so that the white dot on the knob is uppermost. This will set the volume to a level that is comfortable to hear. This volume control only effects the received volume – it does not effect the transmitted volume. Any messages transmitted by any Michiephones will be received as the Base Station is a party-line system like the Michiephones.

#### 3.2 Transmitting

To send a message depress the button on the microphone and speak into it in a normal level voice. Follow your normal radio protocols for communicating; wait till there is an opportunity to speak, transmit your message, say “over” if you expect a reply or “out” if you do not expect a reply.

You must release the press-to-talk button on the microphone to be able to receive messages.

## 4 Trouble Shooting

If the received signal from Michiephones is faint then:

### Check the Base Station

- Check green LED is on; if not check power connections.
- Check that the volume control is sufficient.
- Check that the Michiephone Line is still connected to the yellow terminal
- Check that the Earth Line from the green terminal is still connected to ground.

A water bottle can be useful to wet the ground surrounding the earth stake if a good earth connection is hard to obtain in dry ground.

### Check that the users are earthing themselves adequately

- Ask the Michiephone user to moisten their fingers when they hold the Michiephone to improve earth contact.
- Check the Michiephone user is earthing themselves with their other hand or finger on the ground or cave wall.
- Can you hear other Michiephone users clearly; is just one user faint or are all users faint?

### Check the Michiephone line

There may be an earth short somewhere along the line (where a bared section of line is resting in a pool of water or on damp earth) or a break in the line. By contacting each Michiephone and determining what unit is faint and what units are not faint one may be able to narrow down what the section of line has the problem. One can then send someone to checkout the line.

If Michiephone users say that the Base Station sounds faint then:

- Check the Base Station as above.
- Check the users as above.
- Check the Michiephone Line.

## 5 Care and Maintenance

The Base Station should not normally be disassembled. If however it has accidentally become wet inside it must be taken apart and allowed to dry.

The two screws at the base of the unit can be removed and the top cover carefully lifted off. Take care as the speaker wires are connected between the speaker and the circuit board. Excessive disassembly may result in these wires breaking.

Leave the case open to dry and then re-assemble.

## 6 Specifications

Exterior dimensions of case:	205 mm width x 160 mm depth x 65 mm height
Maximum exterior dimensions:	230 mm width x 205 mm depth x 75 mm height
Weight (excluding batteries):	kg
Rated voltage:	12 Volts DC
Quiescent current (typical):	20 mA
Receive current (typ.):	50 mA
Transmit current (typ.):	100 mA

Table 1: Base Station Specifications