

Field Guide for the Microtops Sun Photometer

Version 2

Original Created by: S. B. Kelday and K. Anderson, 2002

Last revision: 13/07/05

Ownership: ©NERC FSF

This document provides step-by-step instructions on the best use of the Microtops II Sun Photometer. This instrument is a 5 channel hand-held instrument for measuring the atmospheric column easily, accurately and dependably. The Pool's Microtops II has been configured with five filters including two at 936nm for the measurement of total water vapour, and 1020nm for the determination of aerosol optical thickness (AOT). Microtops II features an accuracy comparable to much larger and more expensive instruments.

1. Switching on

To switch the instrument on, press the ON/OFF button on the bottom left hand side of the keypad. Keep the sensor heads covered with the black panel during the hardware setup and initialisation process.

The opening menu will give the following message:

```
RDY Sitename... ID=1  
DDMMYY HH:MM:SS
```

Where `sitename` is the name of the site which has been pre-programmed into the Microtops.

2. Setting the time and date

To set the correct time, use a GPS system or the talking clock (number 123). It is recommended that you use GMT rather than BST.

Press the menu button 3 times, navigating past the menus **CLOCK**, **Adjust Clock**, and then entering the time and date zone. Use the right and left arrow keys to navigate along the date and time line, and then use the up and down keys to change these parameters accordingly. Set the clock to the next whole minute and press **ENTER** when your GPS records the same time.

Press escape twice to return to the front screen.

3. Connecting the Sun Photometer to the computer

This is necessary for the setting up of a new site within the instrument parameter settings, and later for downloading your scans.

1. Connect to the serial port (COM 1) of your computer using the cable provided. The jack end should be placed into the socket at the left-hand side of the Microtops itself.
2. Switch the sun photometer on.
3. Launch the Microtops Software (you will need to install this on your computer using the diskettes provided).
4. Go to the **TOOLS** menu.
5. Choose the option called **Change Instrument Locations**.
6. Enter a new site name into one of the 6 site boxes. (Use an empty field if possible rather than overwriting existing sites).
7. Enter the site position in decimal degrees +N and +E. Use www.streetmap.com to convert your co-ordinates if necessary.

8. Enter the height in metres above sea level in the final column.
9. Press **SET**.
10. The parameter will now be sent to the instrument and will appear as a new site under the site location options.

4. Setting a new site location with the Microtops head

Once you have sent the geographic co-ordinates of your site to the Microtops head, it is necessary to programme the head to the new site location. Press the **MENU** button once, followed by the upwards pointing arrow cursor 4 times. This will display the **LOCATION** menu option. Press the right arrow cursor to select this menu, and proceed through the **Saved Location** menu by pressing the right cursor again. Now scroll through the site options (there will be 6 in total), using the upwards cursor until you reach your desired site. To select your site, press the right cursor. Then press the **ESCAPE** button until you return to the main screen. Your site name should now be displayed on the front screen.

5. Collecting a sun measurement

Once you have set the site location, date and time, you are ready to collect a measurement. Open the black cover on the front of the Sun Photometer, and point the unit at the sun. Look in the window labelled **SUN TARGET** for a small bright white dot, which is actually the Solar disc focussed on the instrument. This dot must appear as close to the centre of the target as possible. Keep the instrument stable, and press **SCAN**.

The instrument will beep once and display a message saying:

```
Scan X  
Point at the sun
```

... where x is the scan ID written to file.

When the instrument has finished collecting the measurement, it will emit 2 audible beeps which signify the end of data collection. Make a note in your field notebook of the date and time of each scan (this will be saved, but it is advisable to keep a note), plus the ID of any other corresponding measurements you may be collecting simultaneously (i.e. spectra).

The instrument records in 5 wavelengths: 440nm, 675nm, 870nm, 936nm, and 1020nm.

6. Downloading the data

Once you have collected a day's measurements, you will need to download the data and clear the memory of the Sun Photometer before the next day.

Note that the default installation of the Microtops software creates a database called data.dbf in the same folder as the program file. All data downloaded from the Microtops are appended to this file. If the database does not exist, the program will prompt for it to be created.

1. Connect the sun photometer to the serial port (COM 1) of your computer using the cable provided. The jack end should be placed into the socket at the left-hand side of the microtops itself.
2. Switch the sun photometer on.
3. Is the Microtops II Organizer software already installed?

NO: Install the software onto your computer using the diskettes provided
Run the program (this creates the database)

YES: Run the program (the database will already have been created when you ran the program for the first time).

4. Check the [OPTIONS] [COMMUNICATIONS] menu, set the **Baud Rate** and the **Comm Port** to **Auto detect**.
5. Click **Download**. The scans will be downloaded into the standard microtops DATA.DBF database which is located on C:\ [PROGRAM FILES] [SOLAR LIGHT CO] [MICROTOPS II ORGANIZER] [DATA.DBF]. (A DATA.MDX file is also created; this is used by the Microtops software.)
6. Provide a description for the database entry (e.g. site name).
7. Exit from the Microtops software before opening the data.dbf file (the database is not filled until the program has been terminated).
8. The DBF file can be opened in Excel.

Tip: When downloading data from different days, use the same computer as the software can then appended data to an existing database.

7. Deleting data from the on-board memory

This is referred to as "Clearing the memory buffer". It can be performed by selecting the **Clear Buffer** command in the **TOOLS** menu. The user will be prompted to ensure that all is well before the data are cleared from memory. Only perform this operation if you have already downloaded the data from the Microtops II to your computer.

If you have any questions relating to the use of the Microtops II Sun Photometer, please do not hesitate to contact EPFS.

Tel: 0131 6505926
