

# **Maintenance & Technical Manual**

**For the CI-600 Root Growth and Monitoring system**



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## CARE OF THE CI-600

This instrument is designed for portable or lab use. When used in the field, the CI-600 is versatile and lightweight as well as accurate and user-friendly. The manufacturer would like to give you a few suggestions to help you to take better care of your instrument.

***The computer supplied with the CI-600 is an integrated component. The introduction of an unrelated software program is not recommended and may void warranty.***

Although the instrument can operate while in motion, avoid any unnecessary movement and avoid drastic shock. Due to the lightweight design, the CI-600 represents features that are sensitive to the given precautions.

Do not allow water or excessive moisture to get into the instrument. In addition, if used in the field environment, please avoid extremely dusty conditions.

When not in use, store the instrument in a cool and dry location. Preferably, place the CI-600 back in the carrying case in an ambient or reasonably cool room.

Do not open or break the seal on the instrument. Under conditions that require attention internally, immediately contact the nearest representative or manufacturer to assist you.

## CLEANING

To keep your CI-600 computer clean, wipe the exterior case and LCD with a slightly damp cloth. A mild detergent may be used if necessary. Do not use solvents of any kind.

***WARNING: Keep liquid, including cleaning fluid, out of the computer keyboard, speaker grill and other openings. Never spray cleaner directly onto the computer. Never use harsh or caustic chemical products to clean the computer.***

## MOVING THE COMPUTER

Before moving your computer, even across the room:

- Make sure all disk activity has ended (the disk light is off).

- If a diskette is in the PC Card FDD, remove it, and disconnect the PC Card FDD.

- Shut down Windows and turn the computer off.

- Disconnect the power cord.

- Close all port covers.

*Note: Do not pick up the laptop by its display panel or by the back (where the ports are located).*

For long trips, transport the CI-600 and its computer in the carrying case/bag.

## **PROTECTING THE COMPUTER**

To keep your computer in prime operating condition, make sure your work area is free from:

Dust and moisture.

Liquids and corrosive chemicals.

Equipment that generates a strong electromagnetic fields, such as stereo speakers (other than speakers you have connected to the computer) or speaker phones.

Rapid changes in temperature or humidity and sources of temperature changes such as air conditioners or heat vents.

Extreme heat, cold or humidity.

## **USING THE COMPUTER BATTERY**

Please read the section(s) about using the battery and preserving battery power in the computer manual carefully.

## **USING THE CI-600B BATTERY PACK BATTERY**

The CI-600B Battery Pack contains a lead-acid battery. A NI-MH Battery Pack is also available.

8 hours are needed to charge the battery. You do not need to discharge the battery before recharging.

**IMPORTANT:** Be sure to charge the battery every day when using it. Never let the battery power run completely out. Doing so may damage the battery.

# TROUBLESHOOTING:

## 1. Cannot scan picture.

A. With the computer on and Windows open, plug the USB connector into both the computer and the CI-600. Check that the computer has recognized the CI-600 as CanoScan N1240U by opening **Control Panel/Scanners/Properties**. If the scanner is recognized, the scanner should start the motor and turn until it reaches its stopping point, at which time it will light the scan window. Holding the CI-600 in your hand by the rod end you should see the opposite end rotate in a smooth rotation through 360 degrees. Once you hold opposite end, the center on the scanner should rotate until it reaches its end point, at which time it will light the scan window. The scanner will look to see **White** so you have to make sure the scanner is in the white portion of the tube (after first plugging in the scanner). After that you can scan anywhere in the tube.

## 2. Drive End does not rotate.

A. Remove the Drive End of the scanner by loosening the set screw and removing End. Plug cable back into scanner and see if the shaft rotates. If shaft rotates reinstall Drive End and secure the set screw into the slot in shaft. If the shaft does not rotate and the motor can be heard running there is a broken gear.

## 3. Blurred Images.

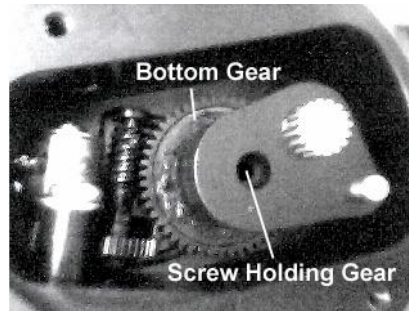
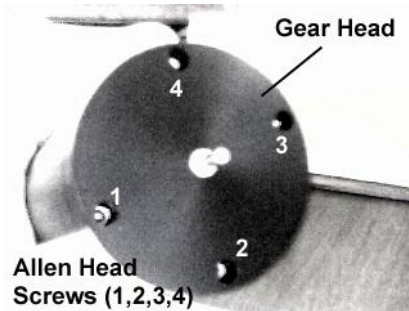
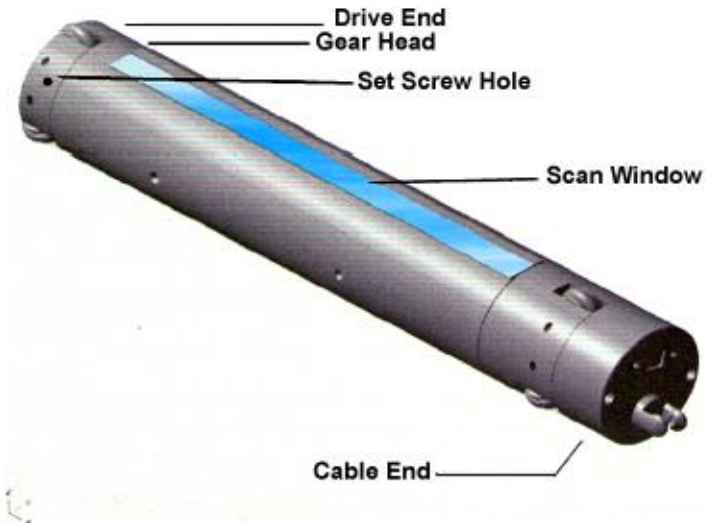
- A. Because of the inner circumference of the tube, the settings for pictures are 8.5X7.7
- B. Dirt on the scan window, fingerprints, etc.

# Instructions for Changing Gear Assembly of CI-600 Scanner

1. Remove set screw from *Drive End*. Then carefully remove the *Drive End* from scanner body.

2. Remove 4 *Allen Head Screws* from *Gear Head* and remove it.

3. There is a screw in the *Gear Assembly* that holds the assembly to a *Bottom Gear* underneath. Remove the screw and lift out *Gear Assembly*.



4. Reinstall new *Gear Assembly* and reassemble every part back in reverse order.

# CI-600 BILL OF MATERIAL

## CI-600 SOIL PROFILE SCANNER AND ROOT GROWTH MONITORY SYSTEM

|    |                   |   |          |
|----|-------------------|---|----------|
| 5  | CNWTMO8-50-0114   | PIN FOR MOLEX HOUSING                   |          |
| 1  | CNW1M22-01-3027   | 2 PIN FEMALE MOLEX HOUSING              |          |
| 1  | CNW1M22-01-3037   | 3 PIN FEMALE MOLEX HOUSING              |          |
| 1  | GRGSPH47-19       | SPUR GEAR, 19T,                         |          |
| 1  | GRGSPH49-44       | SPUR GEAR, 44T                          |          |
| 7' | WIM15/28AWG       | 15 CONDUCTOR BRAID SHIELD CABLE, 28 AWG |          |
| 2  | SWP3C8125J832BE22 | SWITCH, PUSH-BUTTON, SQUARE, SPDT       |          |
| 1  | EQCS/TSC2300PC    | TRAVEL SCAN PORTABLE SCANNER            |          |
| 1  | PLTAI/2"IDX6'     | 2" ID TUBE WITH END CAP INSTALLED       |          |
| 1  | EQ6/BORSET        | BORING SET                              |          |
| 1  | EQ6/REAMER        | FINAL SIZING REAMER.                    |          |
| 1  | EQC/COMPUTER      | COMPUTER                                |          |
| 1  | 00AC-TUMMYTOP     | PORTABLE COMPUTER STAND.                |          |
| 1  | BATTERY           |   |          |
| 1  | BATTERY CHARGER   |   |          |
| 1  | BDAS-CID10948     | CI-600 BOARD ASSEMBLY                   |          |
| 1  | BDBD-CID10948     | CI-600 BARE BOARD                       |          |
| 3  | CPOG/U000.01V50   | CAP, .01UF 50V MONO CERAMIC .1"LS       | C2,C3,C5 |
| 1  | CPOG/U000.1V50    | CAP, .1UF 50V MONO CERAMIC .1"LS        | C4       |
| 1  | CPEG/U047V16S     | CAP, 47UF 16V, RAD ELECTRO(SHRT BODY)   | C1       |
| 1  | CNPMM22-23-2021   | MOLEX LOCKING HEADER, MALE 2P           | J2       |
| 1  | CNPMM22-23-2031   | MOLEX LOCKING HEADER, MALE 3P           | J3       |
| 1  | ICDL/TS556CN      | IC DLTS556CN STM LINEAR CMOS DUAL       | U1       |
| 1  | RS4M/K165         | RESISTOR, 165K 1/4W, 1%                 | R2       |
| 1  | RS4M/K030.1       | RESISTOR, 30.1 1/4W, 1%                 | R4       |
| 1  | RS45/K220         | RESISTOR, 220 1/4W, 5%                  | R1       |
| 1  | RS45/K013         | RESISTOR, 13K 1/4W, 5%                  | R3       |
| 1  | PLTAI/2"IDX6'     | 2"ID TUBE CLEAR 6' W/END CAPS           |          |
| 1  | MAMC-CID10950     | SOIL TUBE END CAP                       |          |
| 2  | MAMC-CID10963     | CI-600 SOIL TUBE END CAPS               |          |

|            |                 |                               |       |
|------------|-----------------|-------------------------------|-------|
| CI-600-2   | EQ6/BORSET      | BORING SET                    | 1.000 |
| CI-600-2   | EQ6/REAMER      | FINAL SIZING REAMER           | 1.000 |
| CI-600-2   | PLTAI/2"IDX6'   | 2"ID TUBE CLEAR 6' W/END CAPS | 1.000 |
| CI-600-2   | EQCS/TSC-2300PC | TRAVELSCAN PORTABLE SCANNER   | 1.000 |
| CI-600TU-6 | PLTAI/2"IDX6'   | 2"ID TUBE CLEAR 6' W/END CAPS | 1.000 |