



SERVICE INFORMATION LETTER

MODIFICATION TO THE ONBOARD DISCHARGER (OBD) TO INCORPORATE THE USE OF A DATA LOGGER TO MEASURE AND RECORD THE BATTERY VOLTAGE DURING CAPACITY TESTING OF THE 263BA101-2 B777 MAIN AND APU BATTERY.

1. Planning Information

A. Effectivity

This change applies to the test set shown below.

Part Number Acme Aerospace: 274TS101-1

Serial Number ALL

B. Reason

B777 operators have inquired into the availability of test procedures or tools that could be utilized to determine the health of the cells in the battery. Measuring and recording the battery voltage during the onboard capacity test will indicate the presence of weak cells in the battery. If weak cells are identified, the battery should be removed and sent to the shop for additional analysis and repair. Incorporation of this modification and the enhanced testing should reduce the number of battery removals due to shorted cells.

C. Description

This service information letter describes the modification to the 274TS101-1 On Board Discharger to accomplish this change. Instructions for set-up of the data logger and for graphing of the battery voltage data after the completion of the capacity test are included. The part number of the OBD will change to 374TS101-1 after incorporation of the modification.

D. Compliance

Incorporation of this service information letter is highly recommended for all operators.

E. Approval

No approval required.

F. Manpower

Approximately 2 man-hours are required for modification.



G. Material - Cost and Availability

Two modification kits are available to make this change. The 274KT101-1 mod kit contains all of the material indicated below required to modify the 274TS101-1 OBD for use with the data logger and the data logger configured to this application. The cost of the -1 modification kit is \$2650.00. 274KT101-2 contains the material manufactured by Acme Electric only and requires that the data logger and accessories be procured separately. The cost of -2 modification kit is \$845.00. The lead time for either kit is 4 weeks ARO.

Nomenclature	Part/Model Number	Manufacturer	-1 Kit	-2 Kit
Wire Harness Assy.	274TS303-1	Acme Electric	X	X
Interface Cable	274TS302-2	Acme Electric	X	X
Pocket Logger	XR440M	Pace Scientific	X	
Input Scaling Module	ISM-S-S-30V-30V	Pace Scientific	X	
Interface Cable	IC209	Pace Scientific	X	
USB Adapter	USB-01	Pace Scientific	X	
ON/OFF switch S3	600519	Acme Electric	X	X
Logger Holder	274TS516-1	Acme Electric	X	X
Screw 4ea.	500540	Acme Electric	X	X
Washer 4ea.	500411	Acme Electric	X	X
Mounting Flange	701533	Acme Electric	X	X
Top Panel	274TS517-1	Acme Electric	X	X
Cable Tie 6ea.	710043	Acme Electric	X	X
Screw 4ea.	500540	Acme Electric	X	X
Washer 4ea.	500501	Acme Electric	X	X
Washer 4ea.	500411	Acme Electric	X	X
Nut 4ea.	500522	Acme Electric	X	X
Hot Surface Label	274TS511-1	Acme Electric	X	X
Part Number Label	274TS519-1	Acme Electric	X	X

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H. Tooling - Price and Availability

There is no special tooling required to accomplish this service information letter.

I. Accomplishment

Incorporation of this modification can be accomplished by the customer at their facility or the OBD can be returned to Acme Electric for modification. Contact Acme Electric Customer Service at 480 894-6864 prior to returning unit to ensure modification kit availability.

J. References

The following ground support equipment manual will be required to accomplish this service information letter.

Data Identification	Date	Type of Data
ATA 24-39-01 R1	Jul 23/97	Ground Support Equipment On Board Discharger P/N 274TS101-1

K. Other Publications Affected

Ground Support Equipment Manual 24-39-16 will be issued to incorporate this change and the new part number for the Onboard Battery Discharger (OBD).

2. Modification Instructions

Note: The 274TS101-1 Ground Support Equipment manual (CMM) 24-39-01 Revision 1, dated July 23/97, will be required as a reference for these procedures. Refer to Section 2-4, Removal and Installation and Figure 4-1 of the Illustrated Parts List.

1. Remove the left-side panel (Ref 4-1, Fig. 4-1, Item 15) as follows:
 - a. Remove 25 screws (20) and washers (25, 30).
 - b. Remove left-side panel from chassis (460).
2. Remove the top panel (Ref 4-1, Fig. 4-1, Item 55) as follows:
 - a. Remove 4 screws (40) and washers (45, 50) securing top panel (55) to right-side panel (35).
 - b. Remove 10 screws (60) and washers (65, 70) securing top panel (55) to chassis (460).

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- c. Remove 2 screws (120) and washers (125, 130) securing the handle (115) to the top cover (55). Discard the top cover (55).
3. Remove the ON/OFF switch S3 (Ref 4-1, Fig. 4-1, Item 135) as follows:
 - a. Unsolder wires 123, 124, 125 and 126 and mark terminal locations for installation later.
 - b. Depress the locking tabs and remove ON/OFF switch S3 (135). Discard switch.
4. Remove the CELL COUNT switch S1 (Ref 4-1, Fig. 4-1, Item 140) as follows:
 - a. Remove 4 nuts (145), washers (150, 155) and screws (160).
 - b. Remove CELL COUNT switch S1 (140).
5. Remove the DISCHARGE CURRENT switch S2 (Ref 4-1, Fig. 4-1, Item 165) as follows:
 - a. Remove 4 nuts (170), washers (180, 185) and screws (190).
 - b. Remove DISCHARGE CURRENT switch S2 (165).
6. Remove the DISPLAY ASSEMBLY A4 (Ref 4-1, Fig. 4-1, Item 190) as follows:
 - a. Remove 4 screws (195) and washers (200, 205).
 - b. Remove DISPLAY ASSEMBLY A4 (190).
7. Insert the J1 connector on the 274TS303-1 Wire Harness Assembly through the rear of the new top panel 274TS517-1. Mount the connector using 4ea. 500540 screws, 4ea. 500411 washers and mounting flange 500771.
8. Re-install the DISPLAY ASSEMBLY A4 (190) removed in Step 6.
9. Re-install the DISCHARGE CURRENT switch S2 (165) removed in Step 5.
10. Re-install the CELL COUNT switch S1 (140) removed in Step 4.
11. Install the new ON/OFF switch S3 600519 by depressing the locking tabs and inserting it through the front of the top panel with terminals 1 and 4 toward the top of the panel.
12. Install and solder wires 123 on S3-2, 124 and 125 on S3-3 and 126 on S3-1 on the new ON/OFF switch S3.
13. Install and solder the blue wire on the 274TS303-1 Wire Harness Assembly to S3-6.
14. Install and solder the white wire on the 274TS303-1 Wire Harness Assembly to S3-5.
15. Remove the nut and washer securing the wires to the positive (+) terminal of TB1 (380).



16. Install the red wire on the 274TS303-1 Wire Harness Assembly on the positive (+) terminal and install the nut and washer.
17. Remove the nut and washer securing the wires to the negative (-) terminal of TB1 (380).
18. Install the black wire on the 274TS303-1 Wire Harness Assembly on the negative (-) terminal and install the nut and washer.
19. Re-install the handle (115) removed in Step 2 on the top cover (55).
20. Secure the blue and white wires on the 274TS303-1 wire harness to the existing wiring using cable ties (710043). Do not secure the red and black wires on the 274TS303-1 wire harness to the existing wiring. Allow them to hang freely.
21. Using the 274TS516-1 logger holder as a template, locate the mounting bracket on the left side panel (15) approximately as shown in Figure 1. Drill 4 holes in the left side panel (15) and mount the logger holder using 4 screws (500540), washers (500501, 500411) and nuts (500522).
22. Re-install the left side panel (15) removed in Step 1. Install all screws and washers before tightening.
23. Install the new top panel (55). Install all screws and washers before tightening.
24. Install the Hot Surface label 274TS511-1 on the new top panel.
25. Install the 274TS519-1 part number label over the existing ID label identifying the new part number of the OBD as 374TS101-1 after modification. The serial number and date of manufacture indicated on the ID label should remain visible.
26. After the modification is completed, the OBD will appear as in Figure 2.

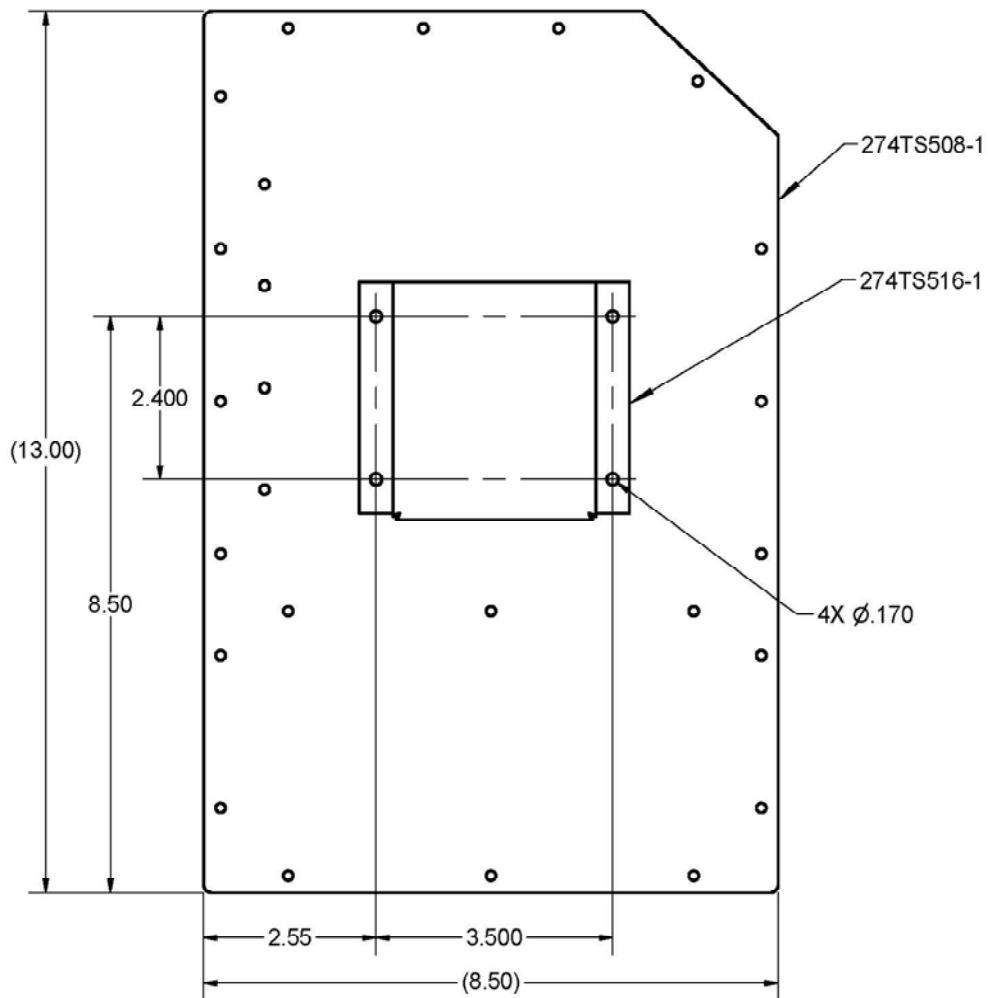


Figure 1

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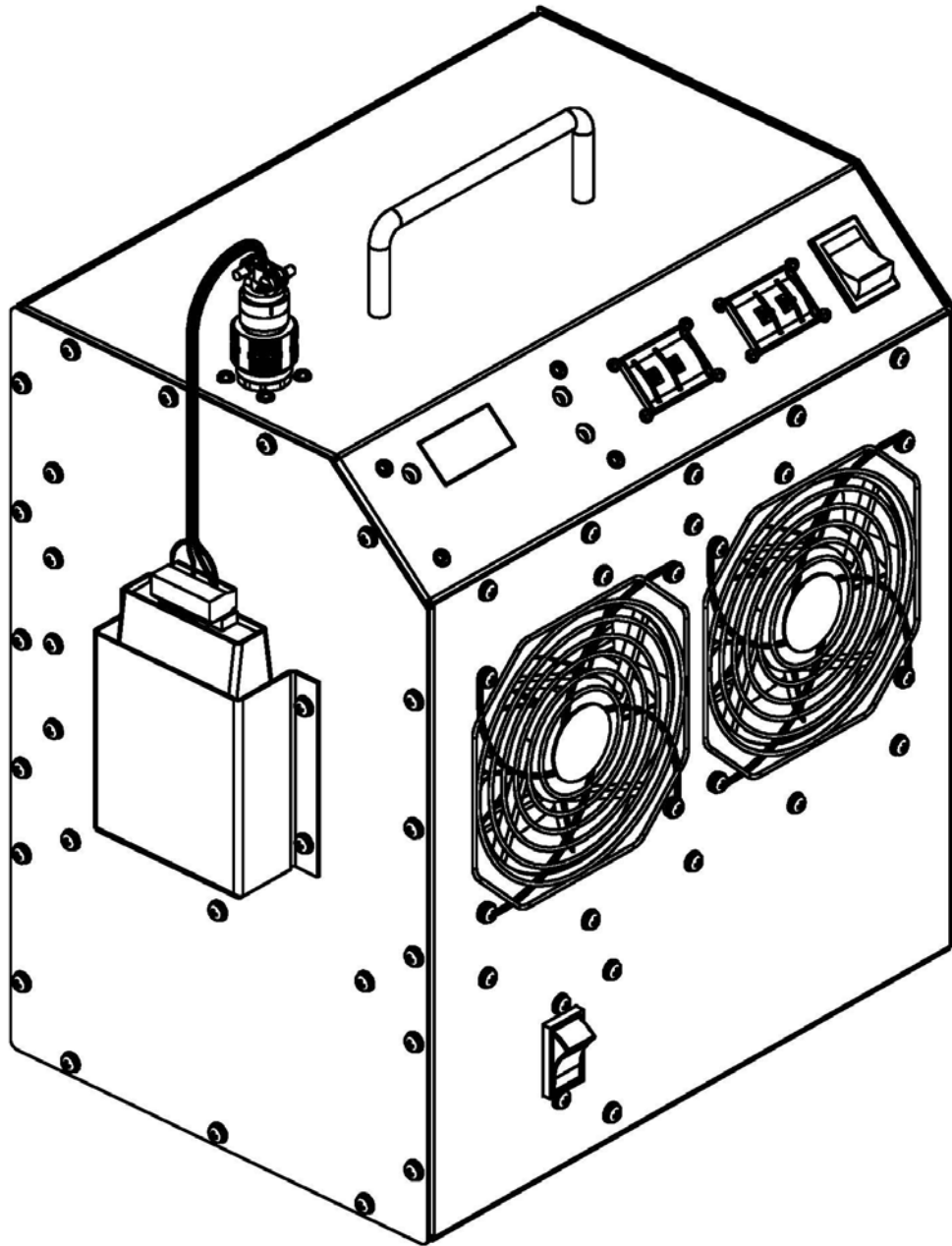


Figure 2

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3. Data Logger Set-up and Operation

The following procedures describe the programming of the data logger for performing the onboard capacity test of the 263BA101-2 B777 battery. The data logger is used to measure and record the battery voltage during the capacity test and will provide a graph of the battery voltage/time at the conclusion of the capacity test. Examination of the graph will identify the presence of a weak cell(s) in the battery.

A. Test Equipment Requirements

Nomenclature	Part/Model Number	Manufacturer
On-Board Discharger	374TS101-1	Acme Electric
Interface Cable	274TS302-2	Acme Electric
Pocket Logger	XR440M	Pace Scientific
Input Scaling Module	ISM-S-S-30V-30V	Pace Scientific
Interface Cable	IC209	Pace Scientific
USB Adapter	USB-01	Pace Scientific

B. Data Logger Configuration and Programming

The data logger is a Pace Scientific XR440M. The “M” designation indicates the more memory option. In the 263BA101-2 battery capacity test, the data logger is used with the ISM-S-S-30V-30V Input Scaling Module. This enables the data logger to measure and record the battery voltage during discharge.

Data Logger Configuration

The data logger is configured as follows:

Ch1 Standard Input.

Ch2 Standard Input

Ch3 0-30Vdc.

Ch4 0-30Vdc.



Programming

Connect the data logger to a PC using the IC209 Interface cable and the USB-01 USB adapter. The PC is not included in the kit. The PC must be loaded with the Pace Scientific communications software. A disk containing the software is included with the -1 modification kit. If the -2 modification kit is selected, the software is included with the data logger and accessories procured from Pace Scientific. A free download of the software is also available at www.pace-sci.com

Click on File, then Setup. The Setup screen will appear. Program the channels as follows:

<u>Channel</u>	<u>Table</u>	<u>Type</u>	<u>Description</u>
Ch1 "Off"	Select thermistor "C"	Standard	Channel 1
Ch2 "Off"	Select thermistor "C"	Standard	Channel 2
Ch3 "On"	Select "New Linear Scale"	Average	Channel 3 ~20,28

Enter these Low and High scaling values:

Low 0 High 30

Ch4 "Off"	Select thermistor "C"	Standard	Channel 4
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Type in "Session description" field "Bat S/N XXXX". XXXX = battery S/N.

Set "Start" field to "when ch1 temp. probe is attached"

Set "Sample Rate" field to "10 sec"

Set "Resolution" field to "12 Bit (high)"

Set "Run" field to "until ch1 temp. probe is detached"

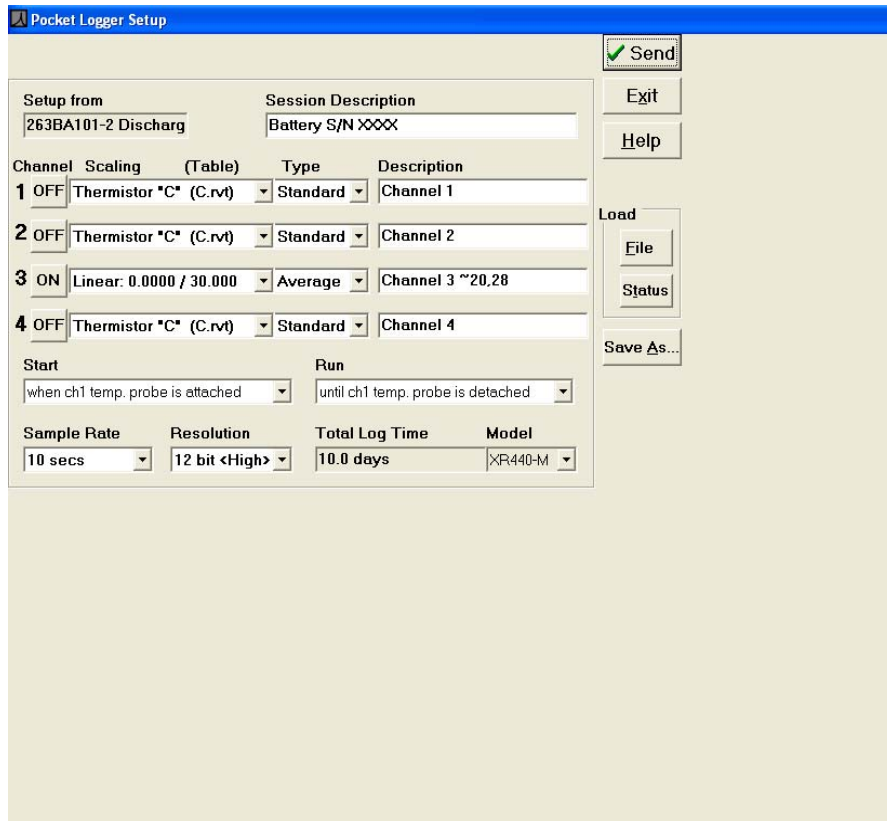
When completed the setup screen should appear as in Figure 3 below.

When you have completed the setup on the Setup screen, click the Send button. If you encounter a communications error with the data logger, click on the Settings icon and select the proper Com port on the computer. If you are not sure, click on the Utilities icon and perform the Com test as directed. After communication has been established return to the setup screen and click the Send button. You will be warned that the Pocket Logger's memory is about to be erased. After clicking OK, the setup will transfer to the data logger. It is good practice to select Receive | Status (from the Main Menu) after sending a Setup to verify that the Pocket Logger is functioning as expected.

Click Save As to retain the setup for future programming. The data logger must be re-programmed prior to each subsequent battery capacity test.

Close the software program. The data logger is now ready for the battery capacity test.

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Pocket Logger Setup

Setup from: 263BA101-2 Discharg Session Description: Battery S/N XXXX

Channel	Scaling	(Table)	Type	Description
1 OFF	Thermistor *C* (C.rvt)		Standard	Channel 1
2 OFF	Thermistor *C* (C.rvt)		Standard	Channel 2
3 ON	Linear: 0.0000 / 30.000		Average	Channel 3 ~20.28
4 OFF	Thermistor *C* (C.rvt)		Standard	Channel 4

Start: when ch1 temp. probe is attached Run: until ch1 temp. probe is detached

Sample Rate: 10 secs Resolution: 12 bit <High> Total Log Time: 10.0 days Model: XR440-M

Buttons: Send, Exit, Help, Load, File, Status, Save As...

Figure 3

C. Connecting the Data Logger to the 374TS101-1 OBD

The data logger comes equipped with a standard input scaling module. The module snaps into the top of the data logger. This module must be removed and replaced with the ISM-S-S-30V-30V input scaling module.

Connect the 274TS302-2 Interface Cable to the screw terminals of the ISM-S-S-30V-30V module as follows:

Pin A to terminal 1.

Pin B and Pin C to terminal C.

Pin D to terminal 3.

Ensure the S3 Power Switch on the OBD is in the OFF position before connecting the data logger to the OBD. The data logger begins recording data when S3 is closed (ON) and stops recording data when S3 is open (OFF). Failure to do so will require re-programming of the data logger.



Connect the data logger to the mating connector on the OBD. Place the data logger in the holder on the left side panel.

The OBD is now ready to perform the onboard capacity test of the Main/APU batteries described in the AMM.

D. Downloading and Graphing Test Data

The test results can be stored for later viewing or monitored “real time” with a portable personal computer (PC). Connect the data logger to a PC using the IC209 Interface cable and the USB-01 USB adapter. Initiate the data logger software program.

Click on the Receive icon.

Click on Data.

The receive data screen will appear and ask you to name the file and where the test data will be saved. You can use the battery serial number or any name you wish. When completed, click on Save.

When the download is complete an information screen will appear and let you know the download is complete and ask if you want to graph the data. Click on Yes.

A graph of the battery voltage vs time will appear as in Figure 4 below. The discharge curve in Figure 4 represents a normal battery discharge curve.

The discharge curve in Figure 5 represents an abnormal battery discharge curve. This curve indicates a weak cell in the battery. A battery displaying a weak cell should be removed from the aircraft and sent to the shop for further analysis and repair.

E. Real Time Data Monitoring and Graphing

Real time data monitoring and graphing can be accomplished during the onboard capacity test by connecting the data logger to a laptop running the data logger software. The PC should have a processor speed of 90Mhz or higher for “real time” viewing. Prior to starting the onboard capacity test, ensure the laptop and the data logger are in communication by following the instructions in the Programming section above.

After initiating the onboard capacity test, Click on Receive. Select Real Time to monitor the battery voltage data. Select Real Time Graph to graph the battery voltage discharge curve. The discharge curve will appear quite jittery when viewed real time, but will smooth out over the course of the capacity test.

Real time data monitoring and graphing will significantly increase the load on the data logger's internal battery and reduce battery life. Check the data logger software Help screen for additional information.

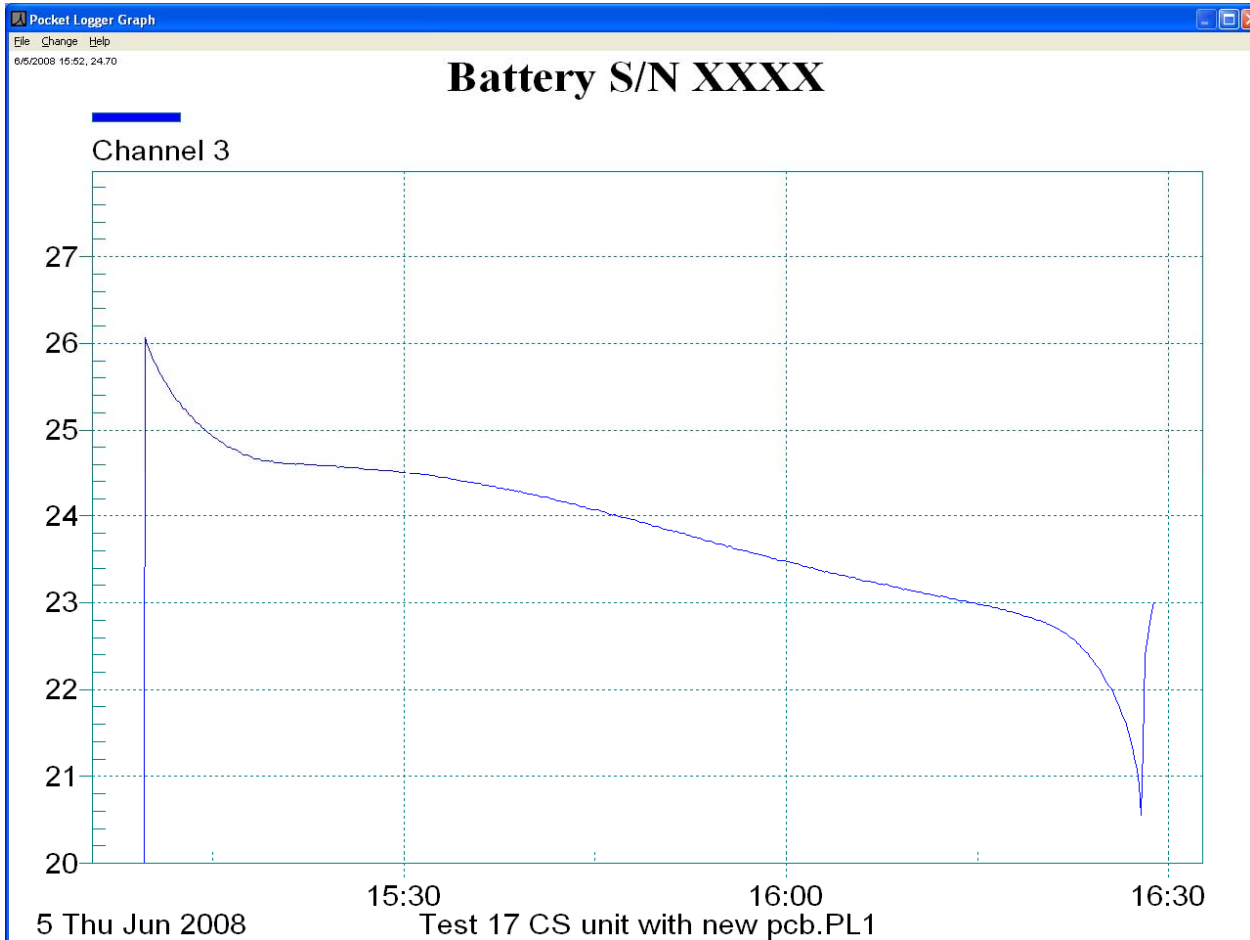


Figure 4

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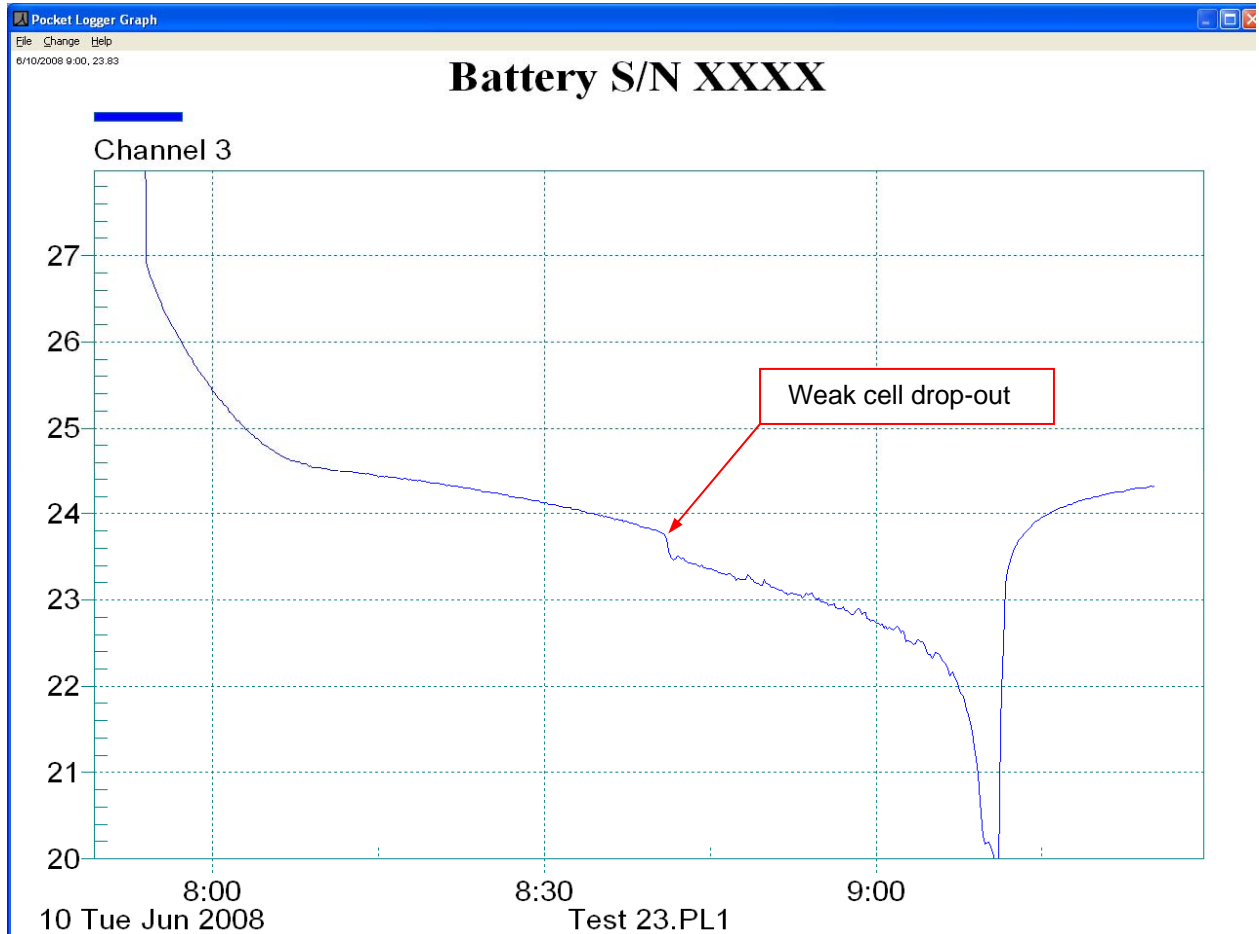


Figure 5