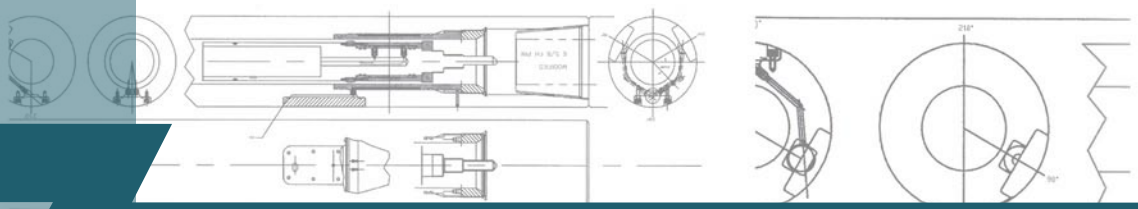
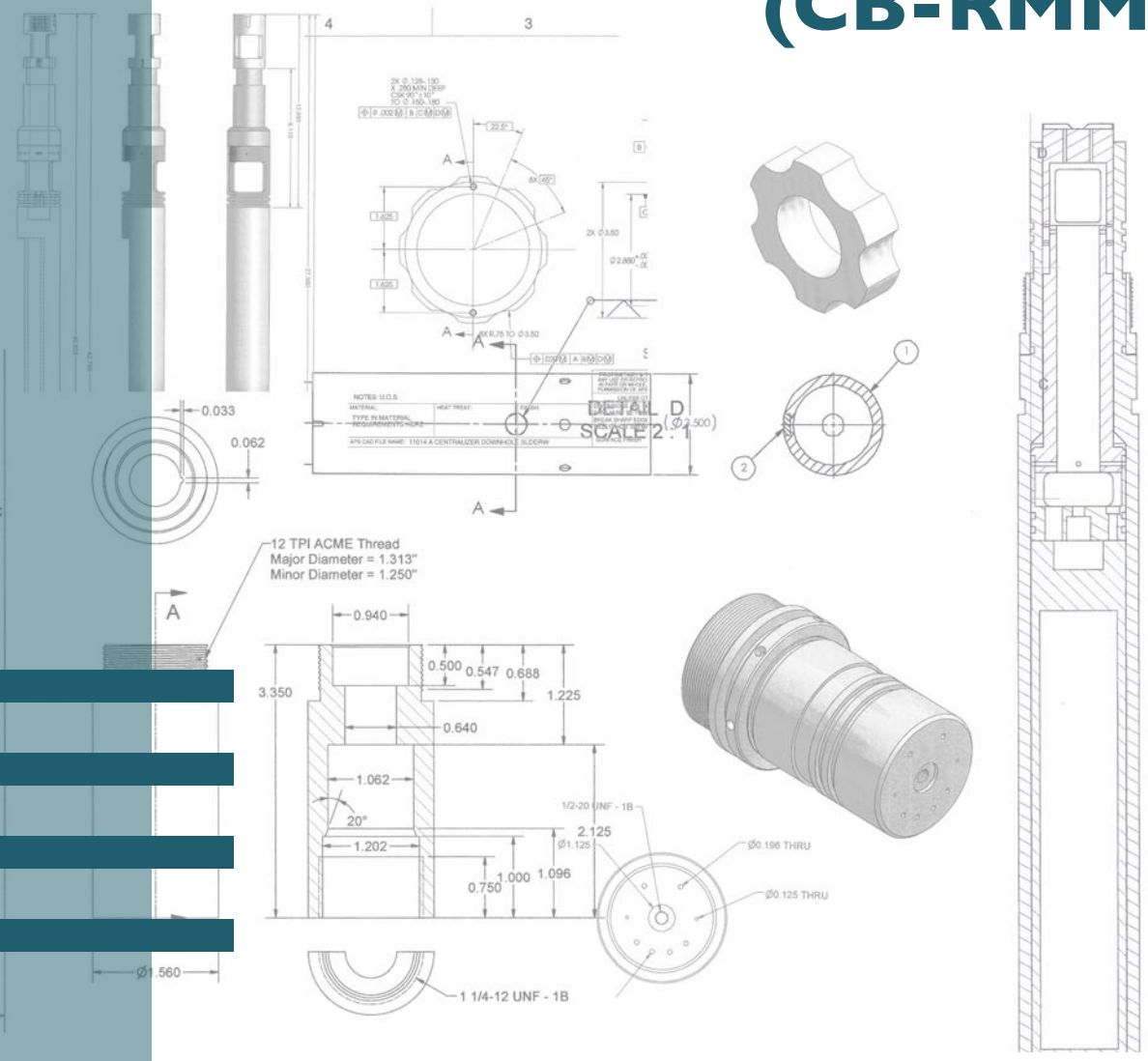


# Core Barrel Retrievable Memory Module (CB-RMM)




2/2004


# Core Barrel Retrievable Memory Module (CB-RMM)

## Operation Instructions

## Table Of Contents

# Section I

## Overview and Structure

The CB-RMM is a measurement and data recording tool that may be deployed routinely with all standard ODP core barrels. The tool has been designed to capture incoming data from the Drilling Sensor Sub (DSS) via a wireless inductive link. Data is transmitted between two coils, one mounted in the DSS and one mounted on the RMM antenna. The DSS will transmit data continuously even when the RMM is not present. When the RMM is present, it recognizes the incoming data and stores it in the onboard memory.

The RMM consists of three primary sections and a full suite of adapters for the APC, XCB and RCB core barrels. A schematic representation is shown below.

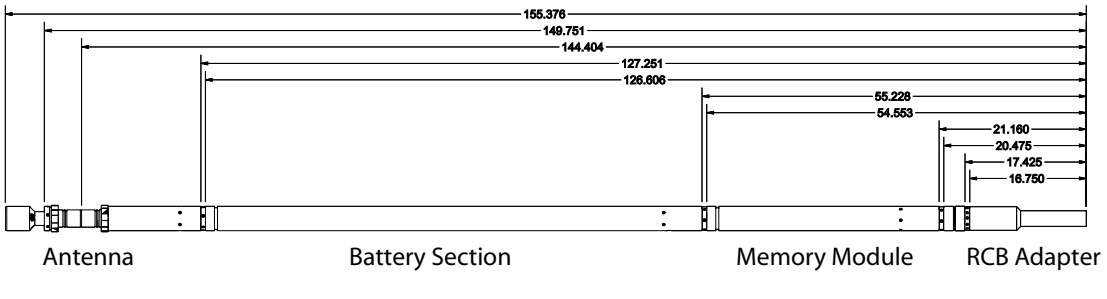



Figure 1. Schematic overview of the CB-RMM. Measurements are in inches.

Figures 2, 3 and 4 (pages 3 & 4) show the antenna, battery section and memory module, respectively.

For complete instructions on how to assemble and disassemble the CB-RMM, see the document "Core Barrel Tool Disassembly and Assembly."

Figure 2. The antenna of the CB-RMM.

Figure 3. The battery section.

Figure 4. The memory module.

The RMM can be run with two different sets of acquisition electronics — the primary electronics and backup electronics. To switch between modes, a small electronic board must be swapped in and three small jumpers need to be changed. Figures 5 and 6 below show the lower part of the battery section and the electronics board that must be swapped depending on the mode (primary or backup). In the configuration shown in Figure 5, the primary mode has been selected, as indicated by the presence of the rabbit board.

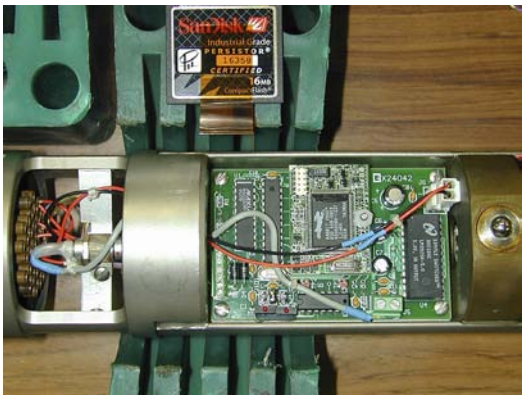



Figure 5. Lower part of the battery section (primary electronics mode). Should backup mode be desired, the "comm.-logger" board shown in Figure 6 must be installed.

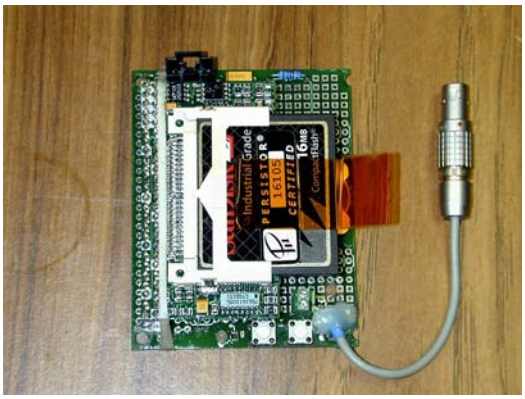
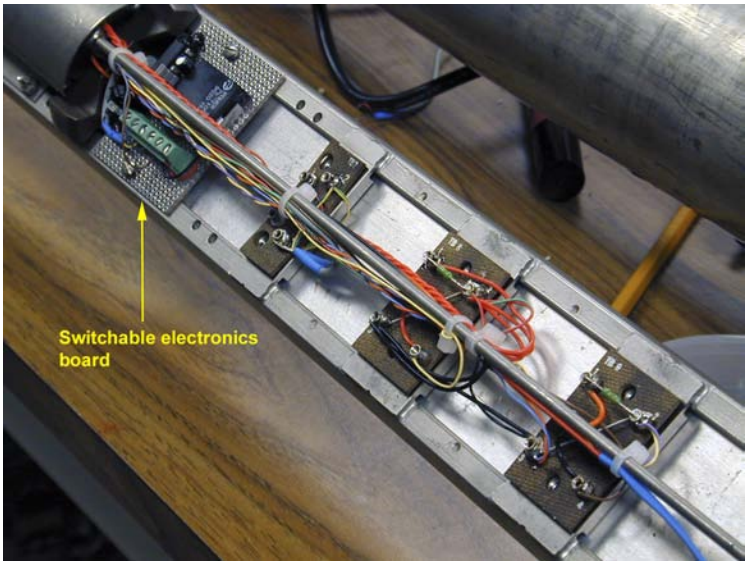
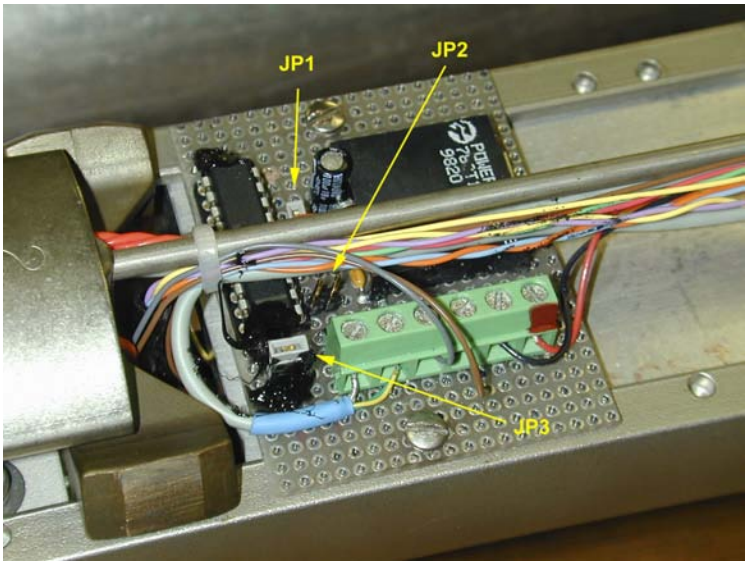



Figure 6. This electronic board should be installed prior to using the RMM in backup mode. The wire on the right includes the "Lemo" barrel connector.




The jumpers must be set in the correct position, as shown on the board below. This board is located on the back of the battery section. For primary mode, there must be a jumper on JP3 only. For backup mode, there must be a jumper on JP1 and JP2 only.



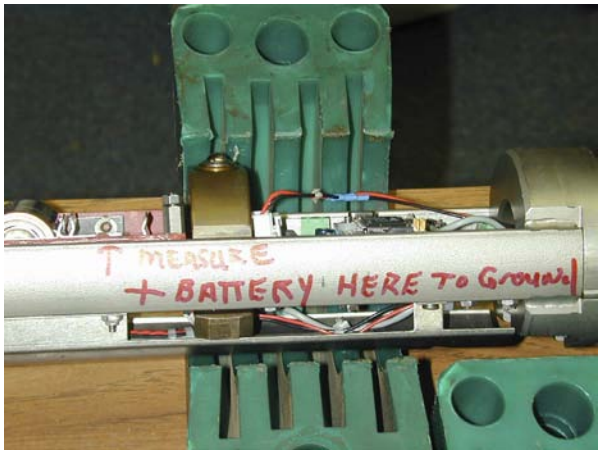
## Section II

## Tool Operation in Primary Electronics Mode

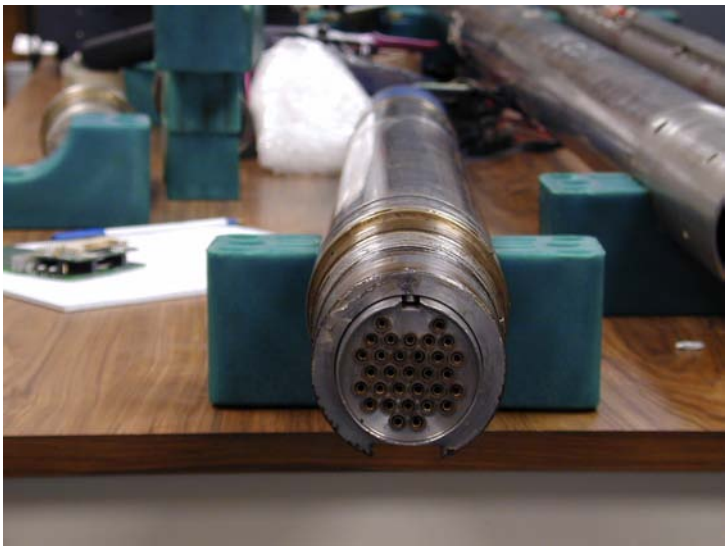
A. Ensure battery voltage is sufficient.

1. Pull out the battery section chassis with the chassis extraction tool.

2. Using a multimeter, measure the DC voltage of the positive battery chain and the negative battery chain. If the voltage is 15 volts or higher, the system will work; however, the positive side will only last about 12 hours after a fresh set of batteries has been installed. Plan on replacing the positive side every 12 hours. The negative side should have a much longer battery life.


3. Reinsert the battery chassis into the housing, making sure the chassis is aligned to the housing. Notice that on the top of the connector there is a notch. Make sure the notch aligns with the pin.



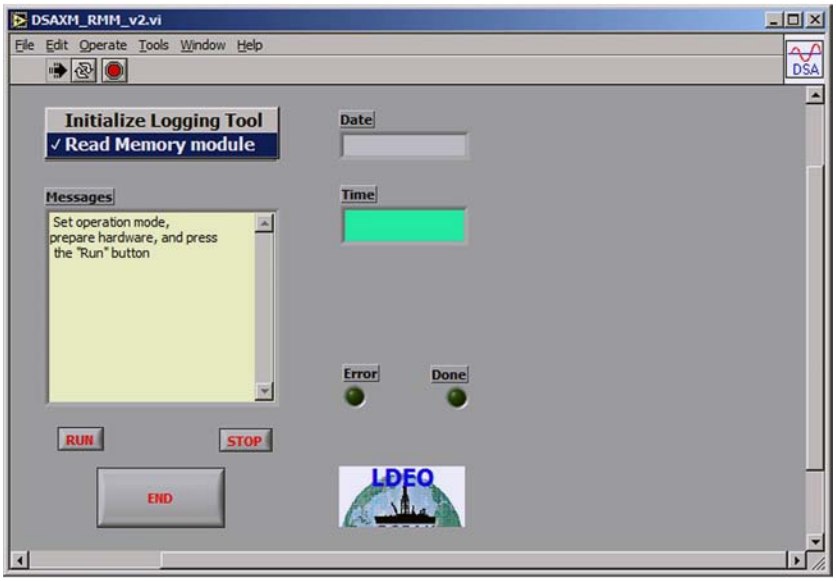
B. Remove the chassis from the memory module section by loosening the lower field joint until the chassis can be pulled out.

C. Using a PC computer, launch the application "DSA_rmm" and connect to the primary electronics via an RS-232 serial connection.

The primary electronics software interface is a familiar looking LabView program. The program to launch is "DSA_RMM.EXE." This automatically launches the DSAXM_RMM_v2.vi. The software has two modes: 1) Initialize logging tool; and 2) Read memory module.

To initialize the RMM with the primary electronics installed:

1. Start the program in "Initialize logging tool" mode:




2. With tool power off ("0" position), connect the serial cable.

3. Make sure there is a memory chip installed on the main board.

4. Switch tool to the one ("1") position. You will now see an initialization dialog in the program window.

5. Select the RMM mode.

6. Enter date and time.

7. Enter start depth:

    a) Enter "0" (zero) for bench testing
    b) Enter depth (seafloor mbrf minus 250 m) for actual logging.

8. When you are prompted to disconnect the cable, do so without delay. Make sure you leave the tool TURNED ON.

D. When the tool returns from deployment, perform the following steps:

1. With the application running, reconnect the serial cable.

2. Press "Enter" on the keyboard twice. You should now see a prompt from the tool in the program window.

3. Switch off the tool and remove the memory chip by first removing the nylon nuts, then gently prying the chip off the board, as shown in the picture below.

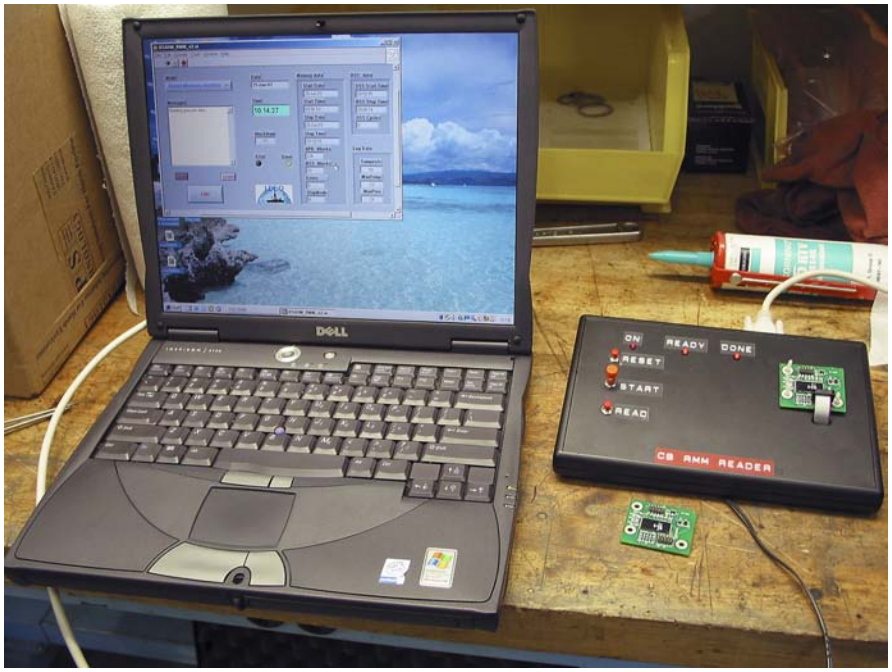

E. Place the chip in the reader (see figure, next page) and:

1. End the initialization program by pressing the STOP button.

2. With the memory chip in the reader, press the following buttons sequentially: RESET, START and READ.

3. Start the "Read Memory Module" program by selecting the "Read Memory Module" mode on the computer screen and then pressing the RUN button.

4. You will now be asked to create names for the files you are about to retrieve. Please choose logical names that will be easy for future users of this data. Site name, core number and possibly the date are important to include.



## Section III

## Tool Operation in Backup Electronics Mode

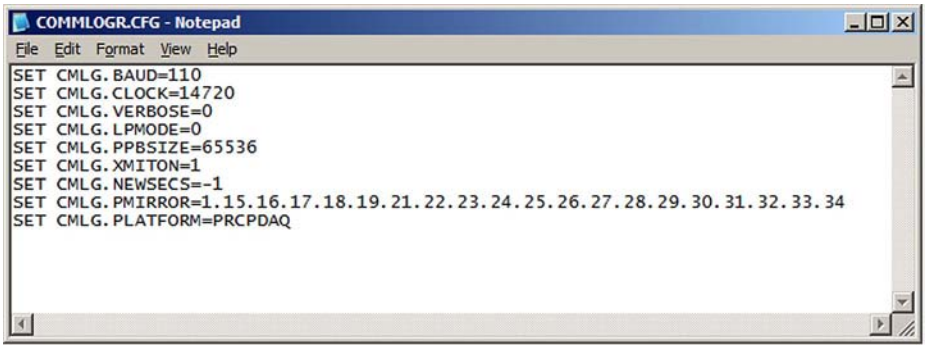
A. Install the "comm logger" board in the battery section. (A picture of this device was shown previously in Figure 6 on page 4.)

1. Use the same screws to fasten board to chassis.

2. Plug in the "Lemo" barrel connector.

3. Change the jumper setting on the data conversion board. Make sure there are jumpers on JP1 and JP2, but ***not*** JP3.

   IMPORTANT: The Compact flash card you use must have the file "commlogr.cfg". This file is a text file that can be created with any text editor. The contents of the file must be the same as depicted below:




B. With the compact flash memory uninstalled, you should see an LED flashing red/green. Place the memory in the memory slot, and press and release button #1. The LED should now flash green, indicating that serial data can now be recorded.

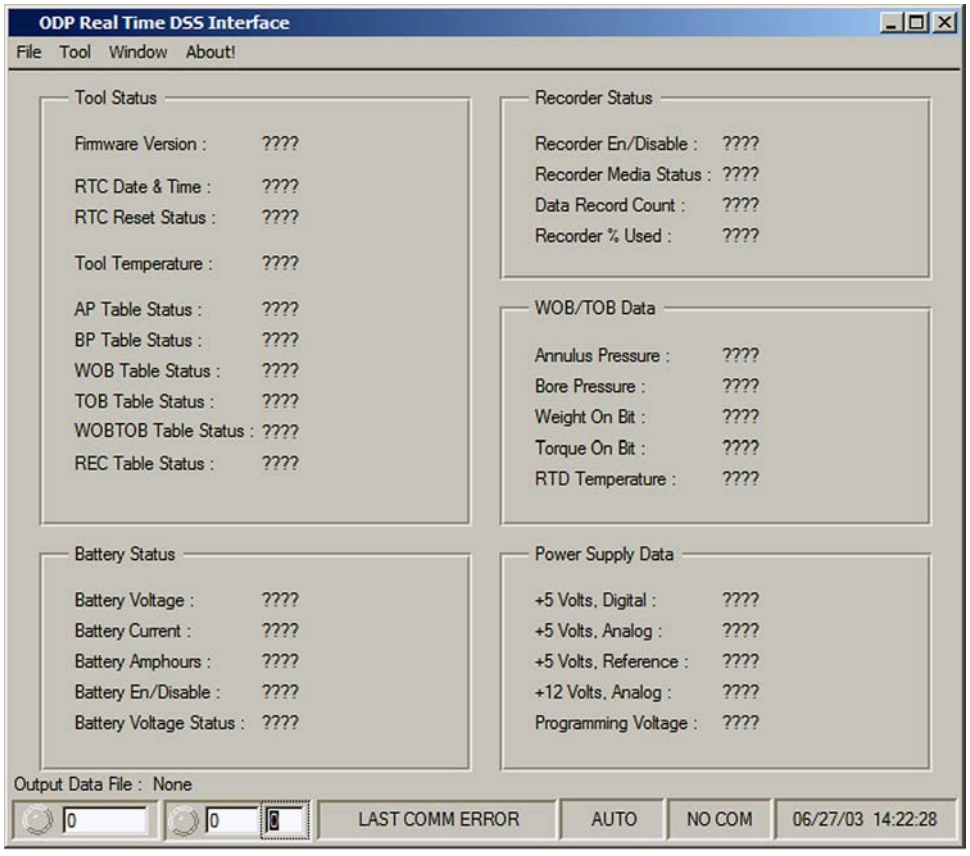
C. Reinstall the battery chassis into the housing. The tool is now ready for deployment.

D. When the tool has been retrieved and data acquired, remove the chassis from the housing, press button #1 and hold for ~1-2 seconds and release. The flashing LED will turn solid green.

E. Remove the compact flash card and place in a reader connected to a PC with "ODP" software

installed.

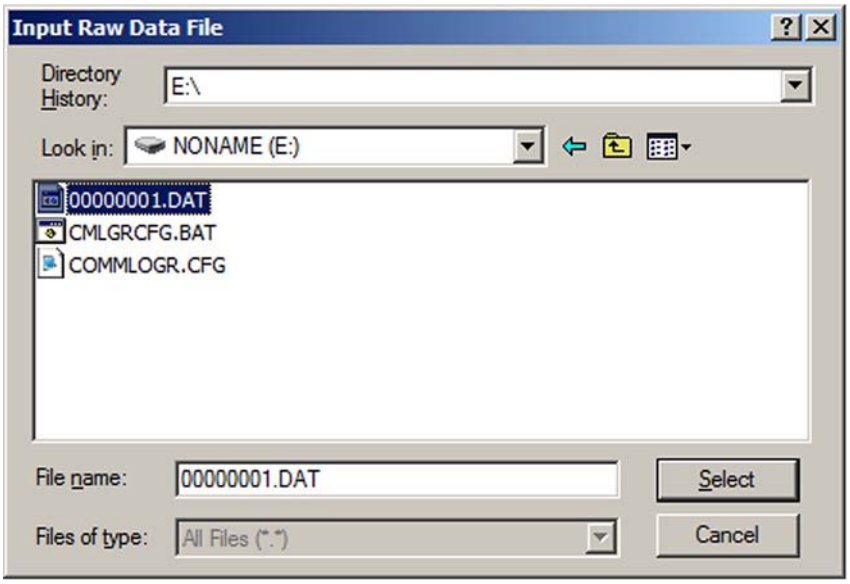
F. Start the ODP software. The program interface is as shown below:



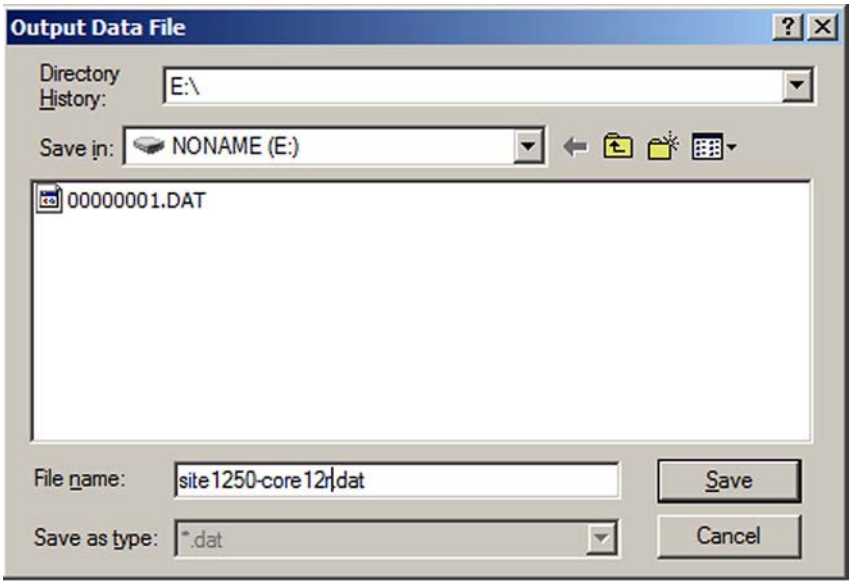

G. Two consecutive procedures are required to convert the files into readable data. Using the ODP program, go to the File menu and you will see several options including the two listed below.

1. Convert receiver file
2. Process data file ….primary data

H. Click on "Convert receiver file" and you will be prompted to Input the Raw Data File:

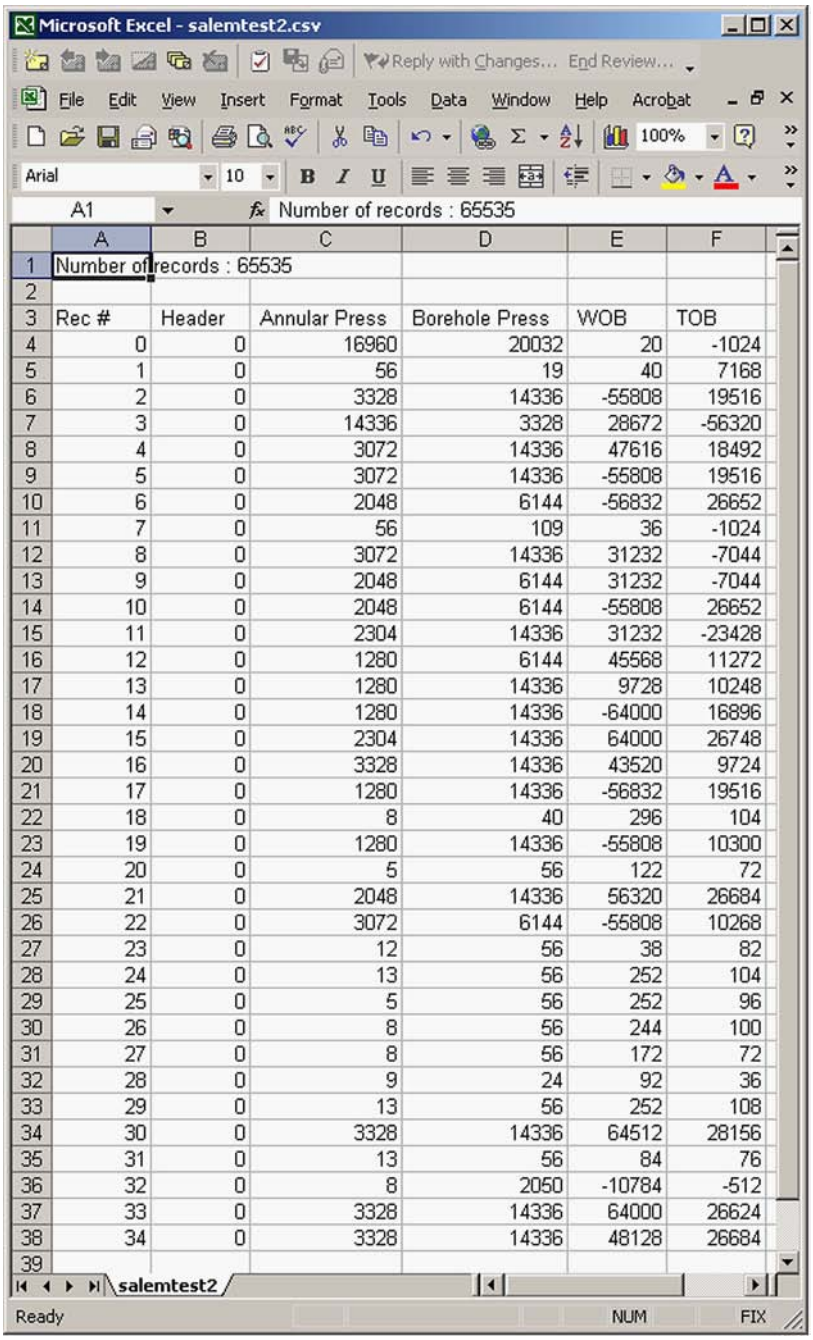



I. Now you will be prompted for the output data file name. Give the file a name that will make future use of the file easy. A name that includes the site, core and date would be adequate:




J. After you have completed converting the receiver file, proceed to processing the data file. Select primary data.

K. Now choose the input file. (This is the file you just created in the previous step.) Create an output name. Use the same name as before; however, now you must use the .csv extension. Once this step is complete, you can import the file directly into MS Excel. The data should look as follows:



Microsoft Excel - salemtest2.csv

File Edit View Insert Format Tools Data Window Help Acrobat

A1 Number of records : 65535

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Number of records : 65535 | | | | | |
| 2 | | | | | | |
| 3 | Rec # | Header | Annular Press | Borehole Press | WOB | TOB |
| 4 | 0 | 0 | 16960 | 20032 | 20 | -1024 |
| 5 | 1 | 0 | 56 | 19 | 40 | 7168 |
| 6 | 2 | 0 | 3328 | 14336 | -55808 | 19516 |
| 7 | 3 | 0 | 14336 | 3328 | 28672 | -56320 |
| 8 | 4 | 0 | 3072 | 14336 | 47616 | 18492 |
| 9 | 5 | 0 | 3072 | 14336 | -55808 | 19516 |
| 10 | 6 | 0 | 2048 | 6144 | -56832 | 26652 |
| 11 | 7 | 0 | 56 | 109 | 36 | -1024 |
| 12 | 8 | 0 | 3072 | 14336 | 31232 | -7044 |
| 13 | 9 | 0 | 2048 | 6144 | 31232 | -7044 |
| 14 | 10 | 0 | 2048 | 6144 | -55808 | 26652 |
| 15 | 11 | 0 | 2304 | 14336 | 31232 | -23428 |
| 16 | 12 | 0 | 1280 | 6144 | 45568 | 11272 |
| 17 | 13 | 0 | 1280 | 14336 | 9728 | 10248 |
| 18 | 14 | 0 | 1280 | 14336 | -64000 | 16896 |
| 19 | 15 | 0 | 2304 | 14336 | 64000 | 26748 |
| 20 | 16 | 0 | 3328 | 14336 | 43520 | 9724 |
| 21 | 17 | 0 | 1280 | 14336 | -56832 | 19516 |
| 22 | 18 | 0 | 8 | 40 | 296 | 104 |
| 23 | 19 | 0 | 1280 | 14336 | -55808 | 10300 |
| 24 | 20 | 0 | 5 | 56 | 122 | 72 |
| 25 | 21 | 0 | 2048 | 14336 | 56320 | 26684 |
| 26 | 22 | 0 | 3072 | 6144 | -55808 | 10268 |
| 27 | 23 | 0 | 12 | 56 | 38 | 82 |
| 28 | 24 | 0 | 13 | 56 | 252 | 104 |
| 29 | 25 | 0 | 5 | 56 | 252 | 96 |
| 30 | 26 | 0 | 8 | 56 | 244 | 100 |
| 31 | 27 | 0 | 8 | 56 | 172 | 72 |
| 32 | 28 | 0 | 9 | 24 | 92 | 36 |
| 33 | 29 | 0 | 13 | 56 | 252 | 108 |
| 34 | 30 | 0 | 3328 | 14336 | 64512 | 28156 |
| 35 | 31 | 0 | 13 | 56 | 84 | 76 |
| 36 | 32 | 0 | 8 | 2050 | -10784 | -512 |
| 37 | 33 | 0 | 3328 | 14336 | 64000 | 26624 |
| 38 | 34 | 0 | 3328 | 14336 | 48128 | 26684 |
| 39 | | | | | | |

salemtest2

Ready NUM FIX

In this example, the data values vary widely. In an actual deployment, the data should be spurious in the first part of the file, then good, and then back to spurious data. This may be explained by the initial lack of a link with the DSS while the core barrel is running down to the BHA; once latched in place, the coil in the DSS and RMM will be aligned and good data should be transmitted. When the core barrel is retrieved, the inductive data link will be broken and useful data will not be available for storage in memory.

## Section IV

# Tips for Tool Deployment

- The RMM configuration is slightly different for each ODP core barrel in order to accommodate the varying lengths of core barrels. In the figure on the following page, the three main configurations are depicted. Adapters for each core barrel were shipped with the tool.

- Make sure the correct adapter is provided to the core techs at least one day prior to the deployment!

- The tool is assembled from the bottom, up. It probably is best to ask the core techs to coordinate the assembly of the tool. Your job is to make sure they attach the sections in the correct order!

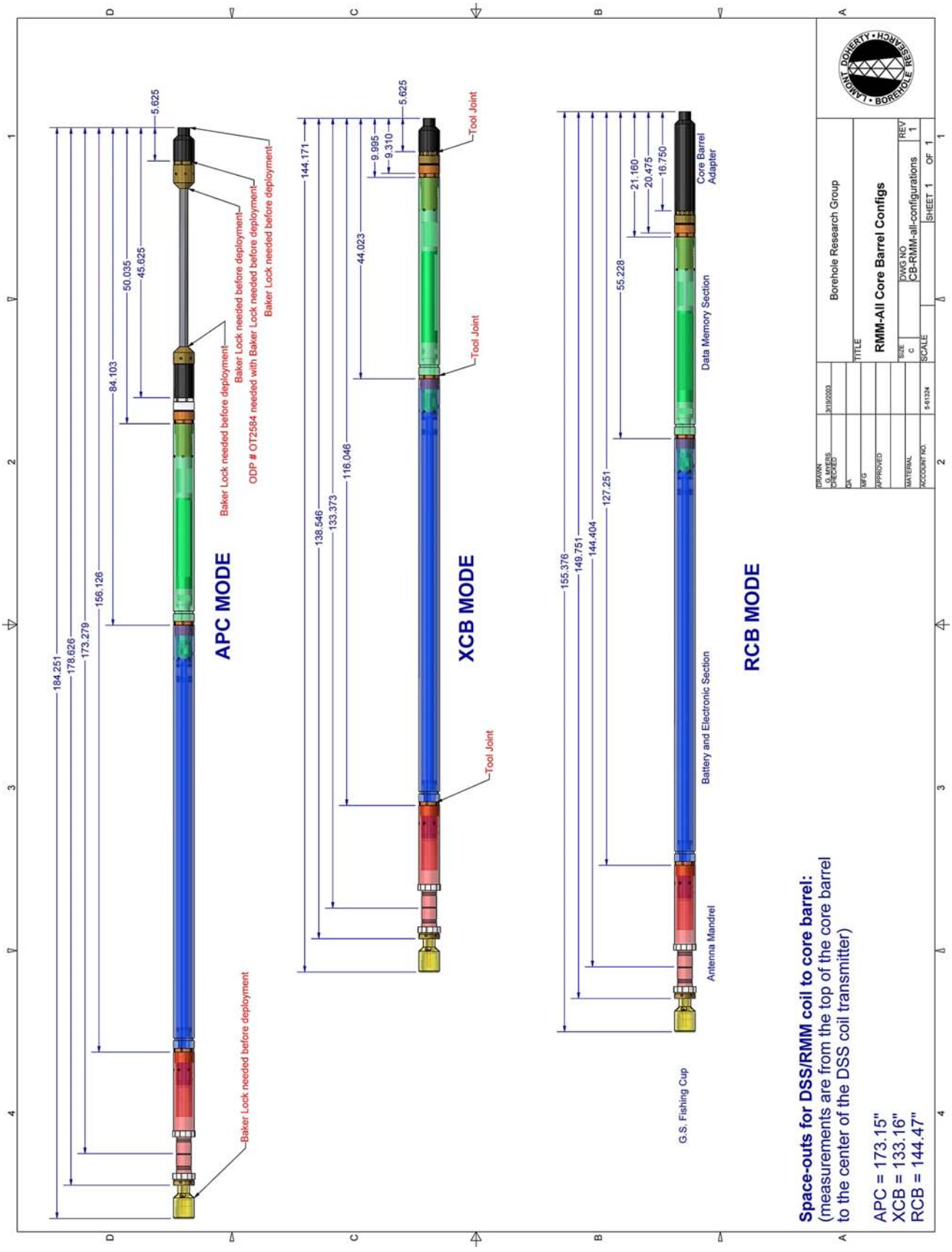
- All connections must be tight and locked with a set screw where applicable.

- Do not use any thread-locking compound on the threaded field joints between each section.

- O-rings. Most likely there will be no reason to remove the antenna sleeve, but if you do, it is very important that only the inner two o-rings are installed on the antenna mandrel!!! The O-ring size is 228 with a durometer of 70-85. Two small o-rings have been placed in the outer grooves which ***must not*** be replaced with a #228. The outer groove may either be left empty or filled with an o-ring that will not contact the coil sleeve. The main o-rings on the upper ends of the battery housing and memory module housing should be changed once every 20 runs or so. Make sure that the o-rings are properly lubricated with lubriplate grease prior to each deployment.

- A schematic drawing of the relationships between bottom hole assemblies and core barrels is shown on page 19.

- For complete instructions on how to assemble and disassemble the CB-RMM, see the document "Core Barrel Tool Disassembly and Assembly."


APC MODE
XCB MODE
RCB MODE
5.625
184.251
178.626
173.279
156.126
84.103
50.035
45.625
Baker Lock needed before deployment
Baker Lock needed before deployment
ODP # OT2584 needed with Baker Lock needed before deployment
Baker Lock needed before deployment
Baker Lock needed before deployment
5.625
9.995
9.310
144.171
138.546
133.373
116.046
44.023
Tool Joint
Tool Joint
Tool Joint
155.376
149.751
144.404
127.251
55.228
21.160
20.475
16.750
Core Barrel Adapter
Data Memory Section
Battery and Electronic Section
Antenna Mandrel
G.S. Fishing Cup
Space-outs for DSS/RMM coil to core barrel:
(measurements are from the top of the core barrel to the center of the DSS coil transmitter)
APC = 173.15"
XCB = 133.16"
RCB = 144.47"
Borehole Research Group
RMM-All Core Barrel Configs
DWG NO CB-RMM-all-configurations
REV 1
SHEET 1 OF 1


APC ASSEMBLY
XCB ASSEMBLY
RCB ASSEMBLY