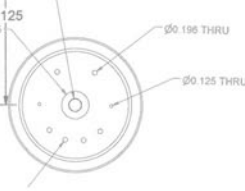
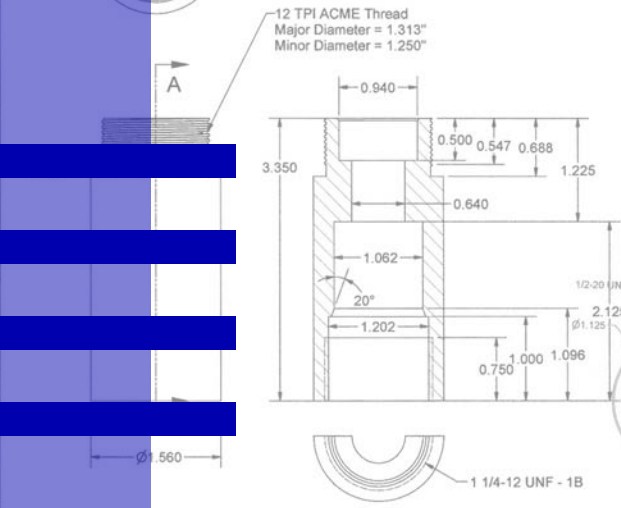
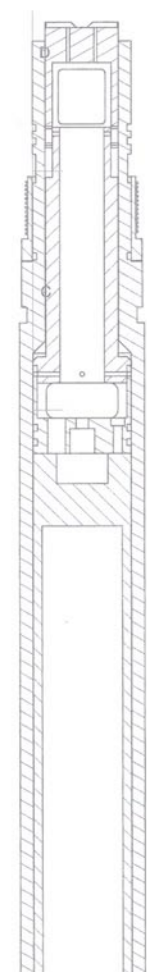
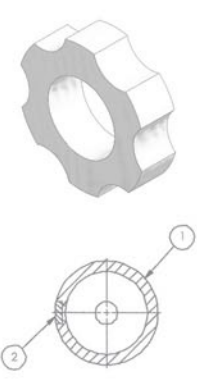
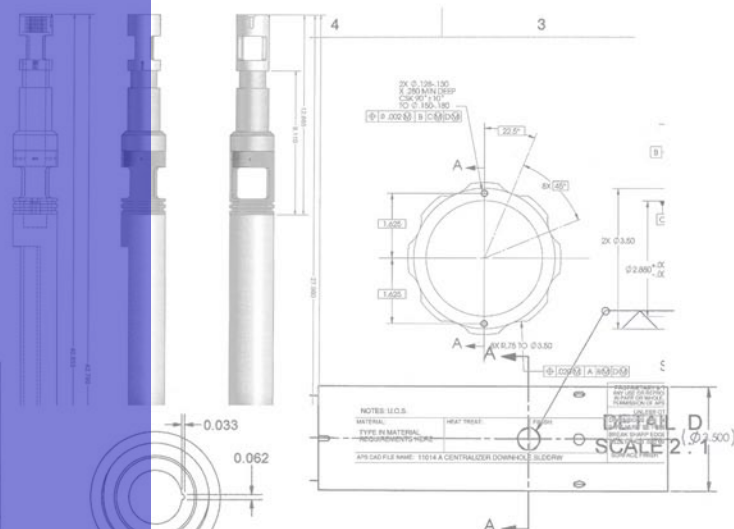


# Core Barrel Tool Assembly and Disassembly





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This document covers the assembly and disassembly procedure for two variants of the Core Barrel modular system:

**Core Barrel-Drill String Acceleration-Extended Memory (CB-DSA-XM)**  
**Core Barrel-Retrieval Memory Module (CB-RMM)**

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## Section I

### Differences Between the DSA-XM and CB-RMM

- A. The difference between the DSA-XM and CB-RMM can be clearly seen by looking at the top of the memory module: the DSA-XM utilizes a pressure case (housing) that has the same threads on either end (see Figure 1). It is also important to note that the DSA-XM can be run alone without any other cartridges; the RMM requires antenna, battery section and the memory module. The housing ends of the CB-RMM, on the other hand, are not the same - the top of the RMM includes a Schlumberger-type connection (see Figure 2).



Figure 1. The DSA-XM. Note that the housing ends are the same.

- B. The RMM must be used if data is to be acquired from the instrumented BHA, also known as the Drilling Sensor Sub (DSS). The DSA-XM should be used when high frequency vibration sampling up to 100 Hz on X,Y and Z channels is required. The RMM samples vibration at 50 Hz on only one horizontal channel and the Z channel. The RMM also records pressure and most importantly it interfaces with the DSS.



Figure 2. The CB-RMM. Note the Schlumberger-type connection on the section of the tool in the foreground.

## Section II

### Tools Needed

To service core barrel tools, the following hand tools are required:

1. Spanner wrench
2. Chain vise
3. Schlumberger chassis extraction tool (RMM only)
4. Plastic hammer

## Section III

### CB-DSA-XM

Following the removal of the DSA-XM from the top of the core barrel, lay the tool on a pipe horse or bench and locate the bottom of the tool. Place a spanner on the first brass collar and loosen until the threads fully disengage.



Figure 3. Loosening the bottom of the DSA-XM.

Now pull the whole assembly out of the bottom of the housing. Expect some resistance as the chassis is removed.

If desired, although not necessary, the upper end cap can be removed by loosening the threaded collar at the top of the tool and pulling the cap out (see Figure 4, next page).



Figure 4. Removing the upper end of the DSA-XM.

When reassembling the DSA-XM, the usual practice is to first have the upper end cap installed, and then slide the chassis back into the housing. The housing has no preferred orientation when re-assembling the tool. Engage the threads of the collar and begin tightening slowly, then check that the upper chassis prong and the corresponding prong groove on the top cap are aligned. This can be accomplished primarily by feel, but you can take visual cues from the alignment marks on the top cap (see Figure 5).



Figure 5. Alignment marks on the top cap.



Figure 6. The housing of the DSA-XM, with the location of the prong shown by the blue arrow. The tool cannot be assembled unless the prong on the housing and the grooves on the chassis are properly aligned.



## Section IV

### CB-RMM

The CB-RMM has three sections, each of which has its own unique handling requirements. From the bottom section upward, the three sections are:

- A. The Memory Module (lower-most section)
- B. The battery and electronics module (mid-section)
- C. The antenna mandrel (top section)

#### A. Memory Module

The memory module of the RMM is very similar to the DSA-XM. The main differences are the addition of a Schlumberger-style connector on the top, and a reduction in the acceleration measurement capabilities to accommodate the “space” required for the drill string sensor sub (DSS) data.



Figure 7. Housing and chassis of the CB-RMM.

To remove the chassis from the RMM, place the spanner on the first bronze collar below the housing and loosen it until the threads disengage (see Figure 8, below).



Figure 8.

Now pull the chassis straight out, **making sure that you support the full length of the chassis** (see Figure 9, below). It is long, and the 31-pin connector cannot bear much weight. Also, **do not twist the chassis**, or you might damage the connector.



Figure 9.

To re-assemble, pay very close attention to the alignment of the chassis to the housing. The top of the housing has an alignment pin that must be positioned to a corresponding groove on the 31-pin connector.



Figure 10. The top of the CB-RMM housing; the yellow arrow shows the location of the alignment pin.

## B. Battery Section

The chassis of the battery section must be removed with a Schlumberger chassis extractor. First insert the extractor into the lower end of the tool and push in the spring-loaded plunger. Next, rotate the “T” handle to engage the chassis (Figure 11, next page), and pull the chassis out. The battery section is long, so make sure you leave enough room behind you to pull it all the way out (Figure 12, next page).



Figure 11. Rotating the "T" handle with the spring loaded plunger pushed in.



Figure 12. Pulling the chassis of the CB-RMM out of the lower end of the tool.

Remove the 8 cap screws on the cover plate to reveal the potted PC board. Once the cover plate is removed, the PC board may be lifted out.



Figure 13. With the cover plate removed, the encapsulated PC board is revealed.

### C. Antenna Mandrel

If disassembly of the antenna mandrel is required, begin by removing the fishing neck at the top of the tool. The fishing neck is “baker-locked” onto the mandrel; therefore, heat must be applied to remove it. **This process must only be attempted by the core techs or by LDEO engineers.**

Following the removal of the fishing neck, remove the locking ring with a spanner. The centralizer below will now slip off.

The antenna coil assembly must be gently removed from the mandrel by tapping with a plastic hammer and a soft wedge such as a block of wood or other plastic material. Do not attempt to pry the antenna coil off, as the material will deform and damage will occur. Strike the assembly as depicted in Figure 14 (next page).



Figure 14. How to remove the antenna coil assembly.

After tapping, the components will begin to separate (Figure 15).



Figure 15. Separation of the antenna coil assembly from the mandrel.

Now pull the antenna coil off. Significant force is required to remove the coil due to the friction of the O-ring seals (Figure 16, below).



Figure 16. Removing the antenna coil.

**Important:** Use only #228 size O-rings on the two **inner** O-ring grooves on the antenna mandrel. The outer two must remain unused. Failure to do so will cause the plastic coil cover to crack and thereby allow fluid to pass into the tool.

When reassembling the tool, make sure the alignment pins and sockets are all properly aligned as depicted in Figures 17 and 18 (next page).

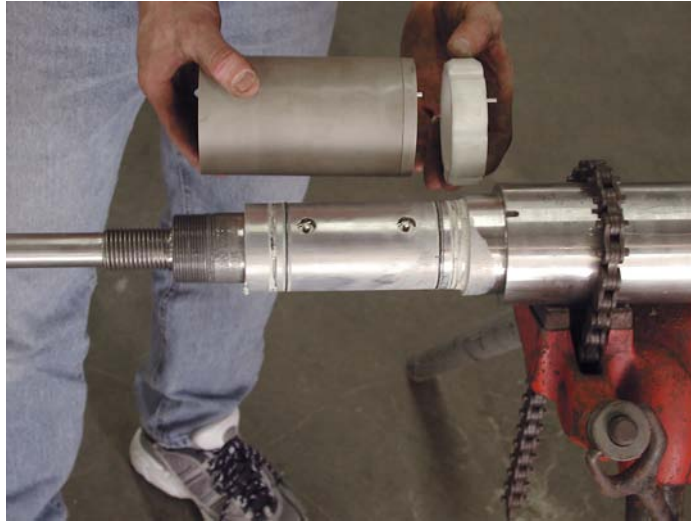


Figure 17.

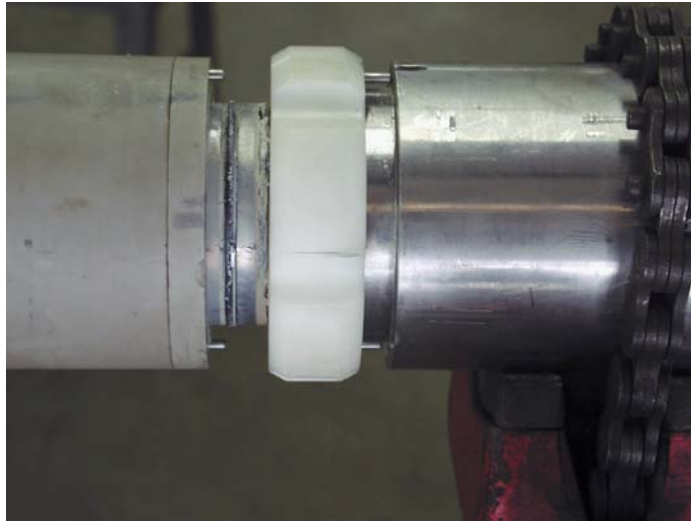


Figure 18.



Furthermore, when tightening the locking ring at the top of the mandrel (Figure 19, below), USE AN ANTI-SEIZE COMPOUND, such as nickel anti-seize or KOPR KOTE on the locking threads.



Figure 19.

The RMM is assembled on the rig floor starting from the bottom up. The battery section and antennae mandrel should be assembled prior to rig-up on the rig floor. The alignment of these two sections is critical. Failure to align the two sections properly will damage the tool. Figure 20 (next page) depicts the proper alignment.

Bring the battery/antenna and the memory modules out to the rig floor and get assistance from the rig crew to assemble the tools in the mouse hole prior to attaching to the core barrel.



Figure 20. Alignment of the CB-RMM battery section and antenna mandrel.