Included in this zip file are:

- This README file

- Three SEAS FM63 bulletins that were delivered to the Global Telecommunications System (GTS). These files are 05870Fse.BBX, 05833Bse.BBX and 058305se.BBX.

- Three corresponding files that represent the full resolution data that is delivered to the National Oceanographic Data Center (NODC) in real-time.

- calc_crc32.cpp source code

- calc_crc32 PDF listing

The NODC files contain the GTS CRC which was computed using the calc_crc32 routine. The GTS CRC was computed on the FM63 profile that was delivered to the GTS. Also contained in these files is the SEAS ID which is computed on the SEAS binary message using calc_crc32 and embedded within the binary message.

The GTS CRC uniquely identifies an FM63 coded profile and is used to identify duplicate profiles transmitted on the GTS. Including the GTS CRC in these NODC files provides a means to quickly identify the corresponding full resolution SEAS profile.

The 32 bit CRC routine included here was provided by ISDM of Fisheries and Oceans Canada. The main routine was added to demonstrate how the FM63 bulletin is prepared to apply the CRC calculation. The routine was compiled using Microsoft Visual Studio 6.0 but should easily compile using any C++ compiler.
How to compute the CRC on a WMO FM63 Coded Profile

1. To compute the CRC for the profile in Figure 1, first tokenize the string to eliminate all white space, control characters and the equals sign. In the main routine, each token is added to a vector of strings as depicted in Figure 2.

2. This is to ensure we are only dealing with the data in the bulletin without regard for how the bulletin may have been modified in transit. For example, if a bulletin was created on a Windows computer and rewritten on a UNIX computer, there is the potential of bulletin alteration due to the control characters.

3. Reassemble the bulletin by appending to an empty string the first token after having inserted a space character before it. Continue to append the remaining tokens to the string inserting a space before each token. After appending the last token, append an equals sign to the string. **Do not prepend a space character here.** The equals sign should be adjacent to the call sign.

4. Find the 8888 group in the string and take all characters following this group as shown in Figure 3 beginning with the space following 88887 token. Invoke the calc_crc32 routine with this string and the string length which for this profile is 2755 characters. The calc_crc32 returns an unsigned long with the hexadecimal value of 5F3BA9DB.
Figure 1. WMO FM63 coded profile
Figure 2. Vector of tokens from the profile
Figure 3. Characters to include in CRC calculation
Figure 4. Output for the three included files