CORONAL DIAGNOSTIC SPECTROMETER

SOHO

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CDS FITS GENERATION SOFTWARE

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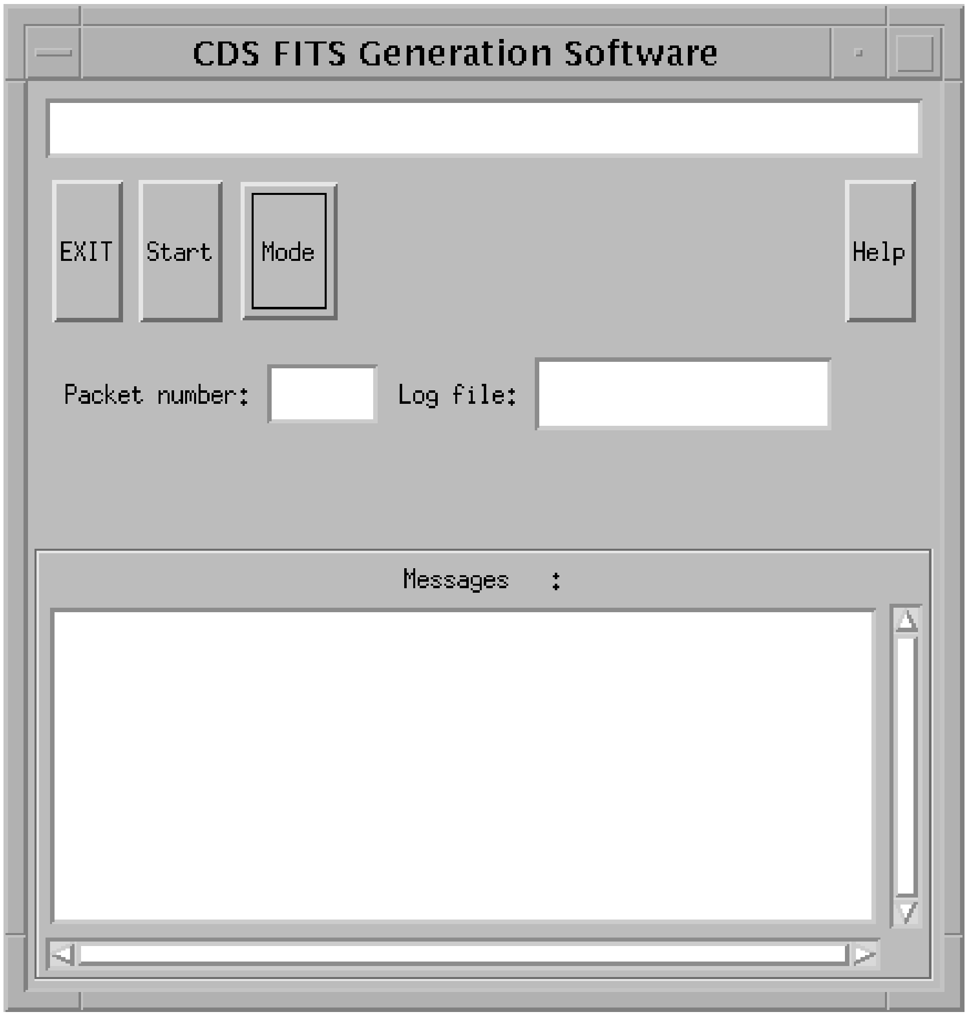

Figure 1: FITSGEN control widget, realtime configuration.

1 Running the FITSGEN program

The IDL routine FITSGEN converts CDS telemetry to FITS files. It is a widget-based program—to run it, simply enter

```
IDL> FITSGEN
```

Figure 1 displays the IDL widget that appears. At the top is a message box that displays information about the current processing mode that the software is in. Below this are the following buttons:

Exit: Exit the software.

Start: Start processing telemetry.

Mode: Select between realtime and playback telemetry modes.

Help: Bring up an on-line help menu.

After this there is a line containing display areas for:

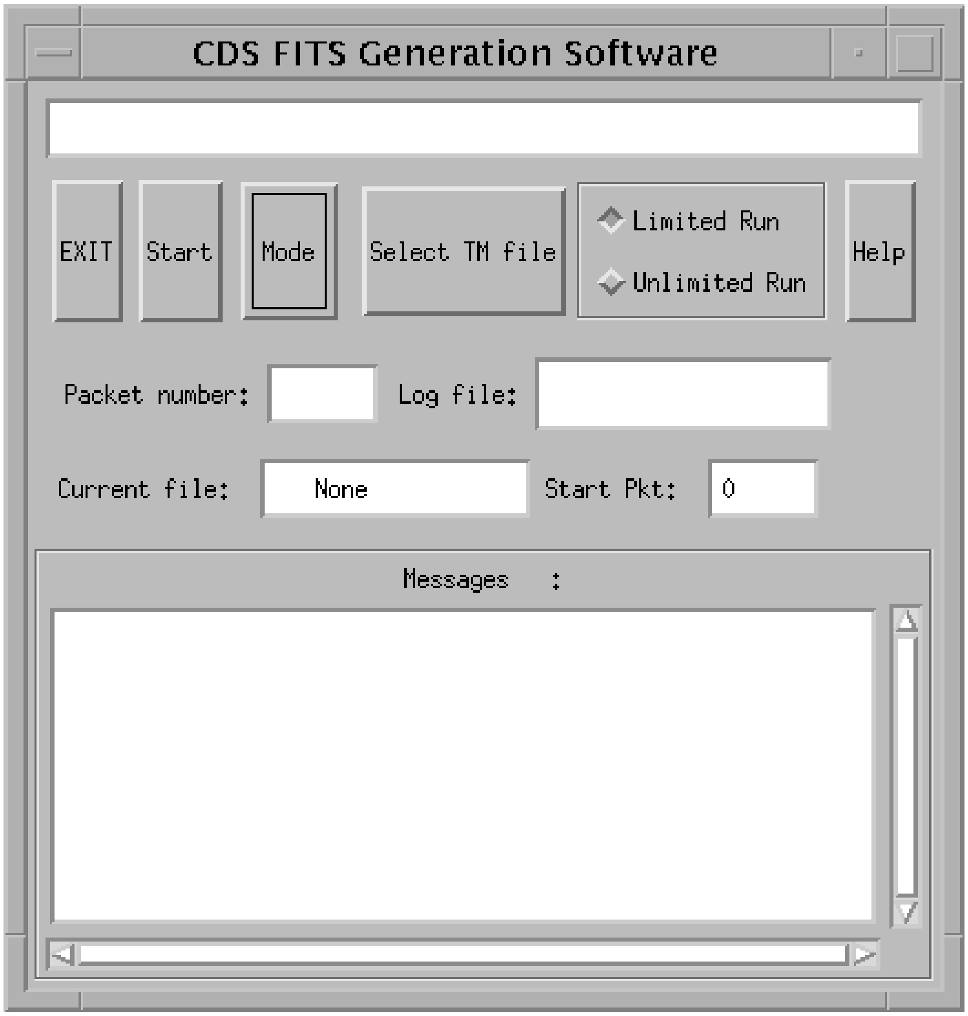

Figure 2: FITSGEN control widget, playback configuration.

Packet number: A counter for the number of packets processed so far. It is updated every 10 packets. It resets to zero each time a new telemetry file is opened.

Log file: The name of a file containing a copy of the messages generated during the telemetry processing.

At the bottom is a text display for informational messages. During processing, these messages are also stored in a file.

2 Processing modes

There are two possible processing modes for the FITSGEN program, either realtime or playback. The program starts up in realtime mode. When playback is selected from the "Mode" menu, then the appearance of the control widget changes, as shown in Figure 2. Several additional widgets and display areas appear:

Select TM file: Select the telemetry files to replay.

Limited/Unlimited Run: Ordinarily, the software will only process those telemetry files that were requested. However, if "Unlimited Run" is selected, then once the last of the requested telemetry files is processed, the software will try to determine for itself what the next file in the sequence should be and continue from there until it can't find any more files to process.

Current file: The name of the telemetry file currently being processed.

Start packet: The index of the packet to start with in the first telemetry file. Normally, this is zero, but it can be set to a positive value to cause the program to skip over that many packets at the beginning of the file. This only applies to the first file in the chain.

3 Selecting telemetry files

In replay mode, one needs to first select the telemetry files to process. When one presses the "Select TM file" button, another widget pops up to allow you to select one or more telemetry files to process. This widget is shown in Figure 3. It contains the following widgets:

Data Root: The directory currently being displayed.

Central Data: Pushing this button changes the "Data Root" directory to a central repository of telemetry files, defined by CDS_TM_DATA.

User Data: Pushing this button changes the "Data Root" directory to be the user's current default directory. This is the startup configuration.

Edit Path Name: Selecting this allows one to directly edit the "Data Root" directory.

Below these is a text box for displaying which files have been selected so far, and then below this is a list of files which are in the directory specified by the "Data Root" directory.

To select a telemetry file, click on the desired files in the order that you wish them to be processed. When you are done, push the "Done" button. Pushing the "Cancel" button cancels the entire transaction and returns you to the FITSGEN widget.

There are several kinds of telemetry files that can be selected:

EGSE-stored telemetry files: Telemetry files stored by the CDS EGSE software have filenames such as

```
tm.93_298_15
```

This name is built up from the year, the day-of-year, and the hour. These files are simply raw copies of the telemetry packets, except that each packet header has six extra bytes.

Quicklook telemetry files: The telemetry data from the SOHO tape recorder dumps is stored by the ECS in files which are then transferred via ftp to the CDS workstations and processed. These files have names such as

```
CDSSCM_941116_131528.QKL
```

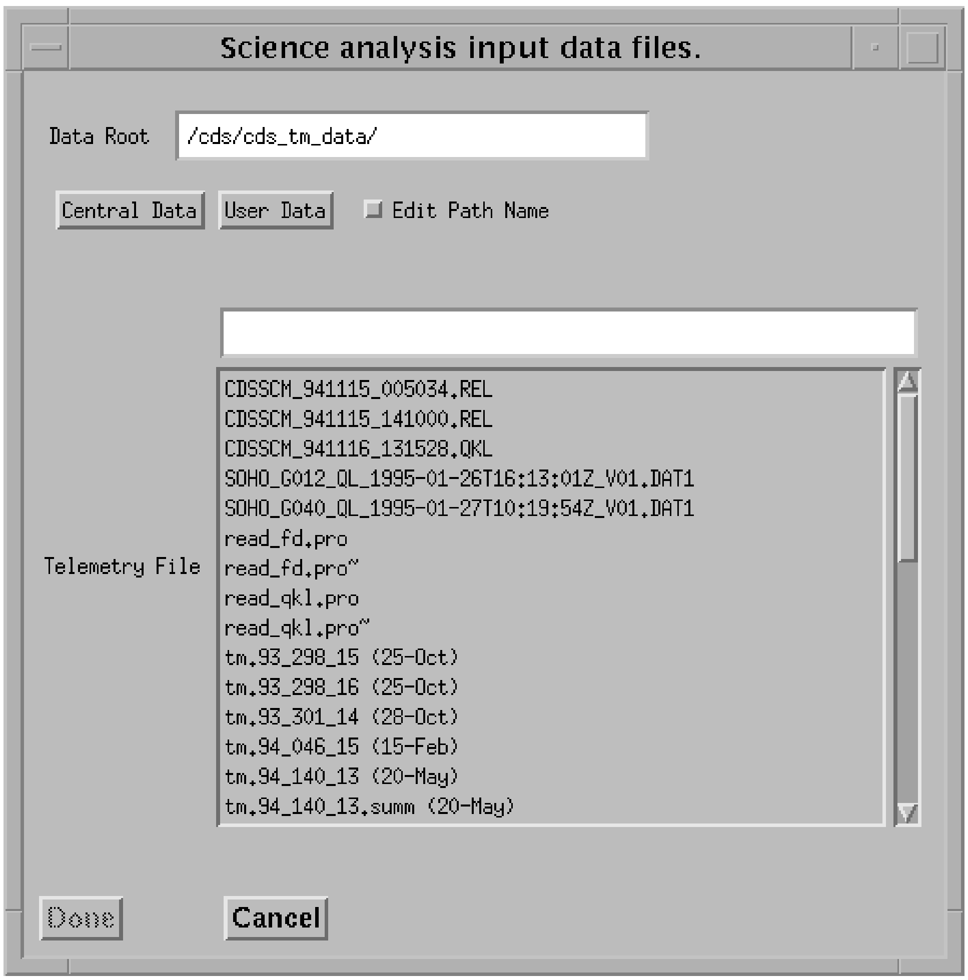

Figure 3: Telemetry file selection widget.

This can be translated as CDS science (SC) medium rate (M) telemetry taken on 1994-11-16 at 13:15:28 UTC. These files start with an ASCII header, followed by the telemetry packets. At the end of the telemetry packets, there are quality assurance (QAC) records.

ECS-stored realtime telemetry files: The CDS EGSE workstation has the capability of capturing and storing CDS realtime telemetry. However, these packets are also captured and stored by the ECS. These files have the same format and filenaming convention as the quicklook files, except that they have the file extension ".REL".

Final distribution files: The final distribution of SOHO telemetry data will be on CDROM. The telemetry files will have names such as

`SO_LZ_G027_19940915_V01.DAT1`

although on the CDROM this will appear as

`/cdrom/data/so/lz/g027/94091501.dat`

or possibly

`/cdrom/DATA/SO/LZ/G027/94091501.DAT;1`

if the CDROM is mounted without the "-o noversion" option. The format is similar to that of the ".QKL" or ".REL" files, except that the header is binary instead of ASCII.

The FITSGEN program decides which format a telemetry file is in by its extension. If the extension is neither ".QKL", ".REL", nor some variation on ".DAT" (e.g. ".DAT1", ".DAT;1" or ".dat"), then EGSE-stored telemetry files are assumed. It is not necessary that all the selected files be of the same kind—one can mix-and-match the files to, for example, glue together realtime data with tape recorder dumps.

4 Starting processing

Once one is ready to start processing, then pressing the "Start" button begins processing. The "Start" button turns into a "Stop" button, and all other control widgets are disabled. No more human interaction is required until there is no more data to process. Thus, if one starts the program at the beginning of the realtime pass, it will continue processing until the end of the realtime pass.

Normally, one shouldn't have to stop processing by hand, except in emergencies. However, if the "Stop" button is pressed, then processing will continue until the current raster is completed, and only then will the processing stop. There is currently no "Resume" button, though one may be added in the future.

The FITSGEN program should be run:

- Just after the start of the realtime pass, when telemetry is coming in and being stored in "tm." files. It doesn't matter too much exactly when the program is started, since it was always start with the first packet in the current telemetry file.
- After copying over quicklook (".QKL") tape recorder files.
- After mounting the final distribution CDROM.

5 Environment variables

There are a number of environment variables that control the behavior of the FITSGEN program:

CDS_TM_DATA: The directory where CDS telemetry files can be found.

CDS_TM_LOG: The directory where the FITSGEN log files should be written. If not defined, then the log files are written to the current directory.

CDS_FITS_DATA: The directory where the FITS files should be written. If not defined, then the FITS files are written to the current directory.

CDS_CP_MISC: The directory where the file "max_study_counter.dat" is stored. This file contains the maximum value encountered so far in the telemetry of the study counter parameter. It is used by CPT to reset the on-board study counter whenever power is lost to the CDS instrument.

CDS_OPERATOR: Contains the email address of someone that should be notified of any critical messages that appear during the telemetry processing. If not defined, then the messages are simply printed to the screen and the bell is rung.