SD2 TELEMETRY ANALYZER USER MANUAL

Title:

Program: SD2

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CHANGE HISTORY RECORDS

Issue/ Revision	Date	Modified by:	Modified chapter(s)	Observations
1	15/11/2004	Fabio Malnati	-	First issue

DISTRIBUTION LIST

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ACRONYMS LIST

CDMS	Command & Data Management System
CMD	Command
CNES	Centre National d'Etudes Spatiales
CW	Clockwise
CCW	Counter Clockwise
DLR	Deutsches Zentrum fur Luft- und Raumfahrt
EEPROM	Electrically Erasable Programmable Read only Memory
ESA	European Space Agency
ESOC	European Space Operation Center
ESTEC	European space Technical Center
FCP	Flight Control Procedure
FOP	Flight Operation Plan
HK	House Keeping (data)
LCC	Lander Control Center
LDMP	Load Mission Plan
LIOR	Lander Instrument Operation Request
LOR	Lander Operation Request
MOST	Mission Operation Scheduling Tool
PDS	Planetary Data System
PI	Principal Investigator
SC	Science (data)
SONC	Scientific Operation & Navigation Center
TC	Telecommand
TM	Telemetry

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N/A

LIST OF FIGURES

1. INTRODUCTION

1.1. Purpose and Scope

The objective of this document is to provide the readers of this document an explanation of how to use the program SD2 Telemetry Analyzer.

1.2. Reference Document

	Title	Issue	Date
RD.1	SHARK-ICD-TS-043CDMS-SD2 Data Interface Control Document	Issue G	October 2002

1.3. Acronyms and Abbreviation

LDMP	Load Mission Plan
SD2-TA	SD2 Telemetry Analyser

2. OPERATIONAL ENVIROMENT

The program was developed under “Windows 2000” operating system but it can run under “Windows ‘98” operating system, for both solution if “Microsoft Visual C++” is not installed on the computer it is necessary to follw the instructions of chapter 3.1.

2.1. Develop Environment

The program was made using “Microsoft Visual C++ version 6.0” compiler. A User can launch the executable even without install the compiler but it is necessary to modify the source code of the program.
In order to install the executable follow the instructions of chapter 3.1.

3. OVERVIEW

3.1. How to install "SD2 Telemetry Analyzer"

In order to install SD2-TA (ONLY EXECUTABLE) on "Windows '98" or "Windows 2000" operating system the below steps shall be followed:

1. Create a directory where to put the program
2. Copy the file SD2.exe in a directory
3. Copy in the same directory the following fil .dll
    a. MFC42D.dll
    b. MFCO42D.dll
    c. MSVCRTD.dll
4. Test the program just by double click on the icon of SD2-TA

3.2. General Capability

The SD2-TA is in charge to load raw data from a file that can has one of the following extensions:

- ✓ .ROLBIN (from CDMS)
- ✓ .DAT (scientific data from CDMS-Simulator)
- ✓ .HK (House Keeping data from CDMS-Simulator).

Once the file containing the raw data has been loaded the program shows the packets contained in the file.

For ROLBIN files the Selection Window of Figure 3-1 shows the progressive number of the packet, the type of packet (SC for science, HK for house Keeping, ACK for acknowledge), and the on board time of the packet.

For DAT files only SC packets will be visualized and for HK files only HK packets will be visualized in Selection Window.

The selection of one of the packets from the Selection Window will show, in the left part of screen, the refined data of the packet selected.

After the loading of a file the User may choose to save data in a file .out which will contain several refined data.

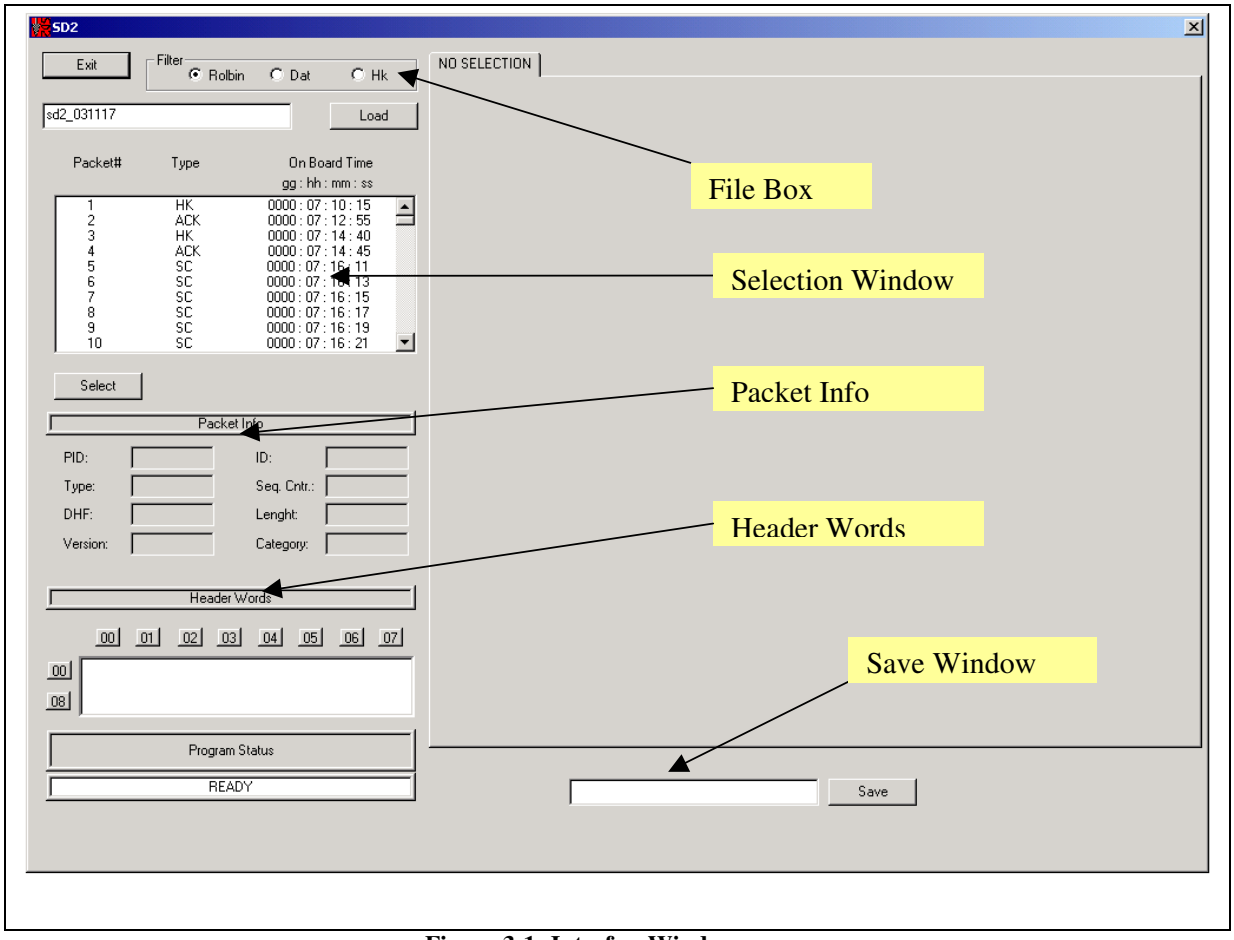

Figure 3-1: InterfaceWindow

3.2.1. Password

First of all the User must insert the password in the Save Window of Figure 3-1 and press the button PWD that will appear in the same place of the button Save.

The Program Status Window in the down-left corner ask to “INSERT PASSWORD”

If the password inserted is incorrect The Program Status Window will show the sentence “PASSWORD NOT CORRECT!!!”.

If the password inserted is correct The Program Status Window will show the sentence “READY” and the program is ready to work.

3.2.2. Load a File

After the insertion of the password the second step is to load a file, so the User must insert the complete path if the file that shall be loaded in not in the same directory of the executable of SD2-TA. So, if a file called "data.ROLBIN" is in the directory called "Telemetry" the User shall write in the window on the right side of button load the following path:
"c:/telemetry/data".
If the file is in the same directory of the executable of SD2-TA the User can just write the name of the file without path.
Then the User shall select which kind of file he is going to load so he has to choose from the File Box one of the extensions available. ROLBIN DAT or HK.
Then press Load Button and if the Selection Window of Figure 3-1 shows the packets and The Program Status Window shows "READY" message, the load is completed successfully.
If The Program Status Window shows the message "FILE NOT OPEN RETRY", probably the file do not exist of the path is incorrect.
Every time the User press Load Button the list of packets is updated. So if the User load a file called "data.ROLBIN" containing 100 packets and after 10 seconds the file "data.ROLBIN" contains 103 packets he can just press again Load Button without change the name of the file and the Selection Window will show all the 103 packets.

3.2.3. Select a Packet

The Figure 3-2 shows the detail of Selection Window. Once the User has loaded a file the Selection Window shows the packets contained in the file in chronological order, so the User can select one of the packets just by a click on the chosen packet.
The selection of one packet shows the data in the Packet Info and in the Header Words section (see Figure 3-1 and Figure 3-3) and, on the right side of Interface Window, the Hex value and ASCII value of data contained in the packet.

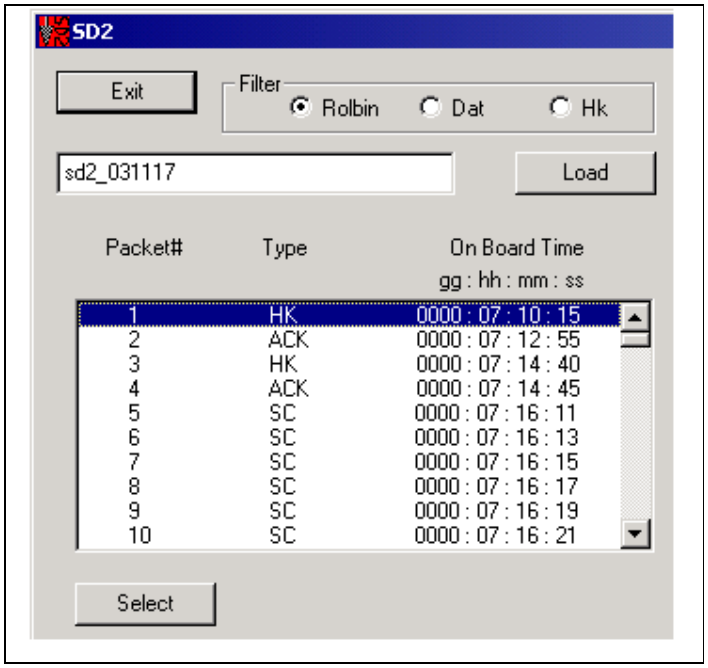

Figure 3-2: Selection Windows

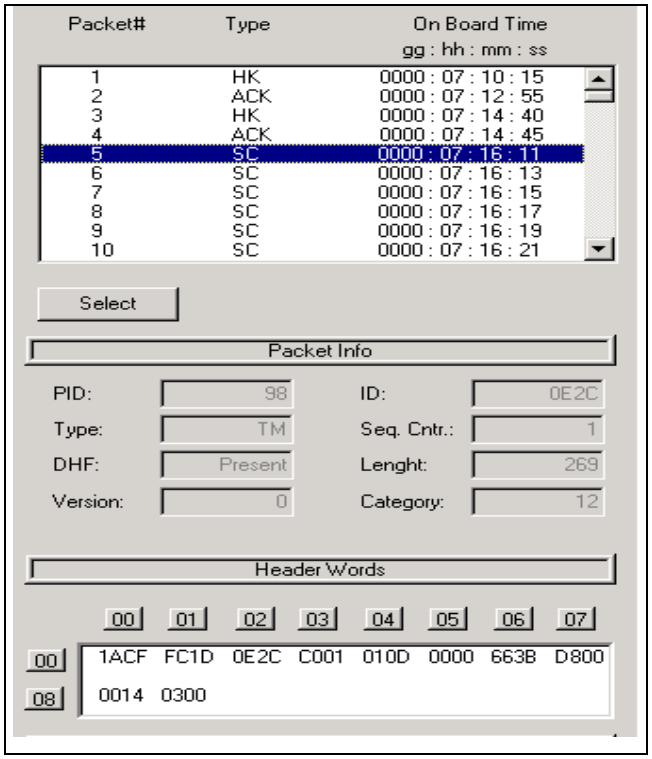

Figure 3-3: Packet Info and Header Words Sections

3.2.4. Select a set of Data

By the press of Select Button the Tables of Contents of the packet appears on the right side of Interface Window. The tables have different contents that depend on which kind of packet the User choose to see. To change the table is necessary to press one of the table etiquette showed in Figure 3-4 in the red rectangle.

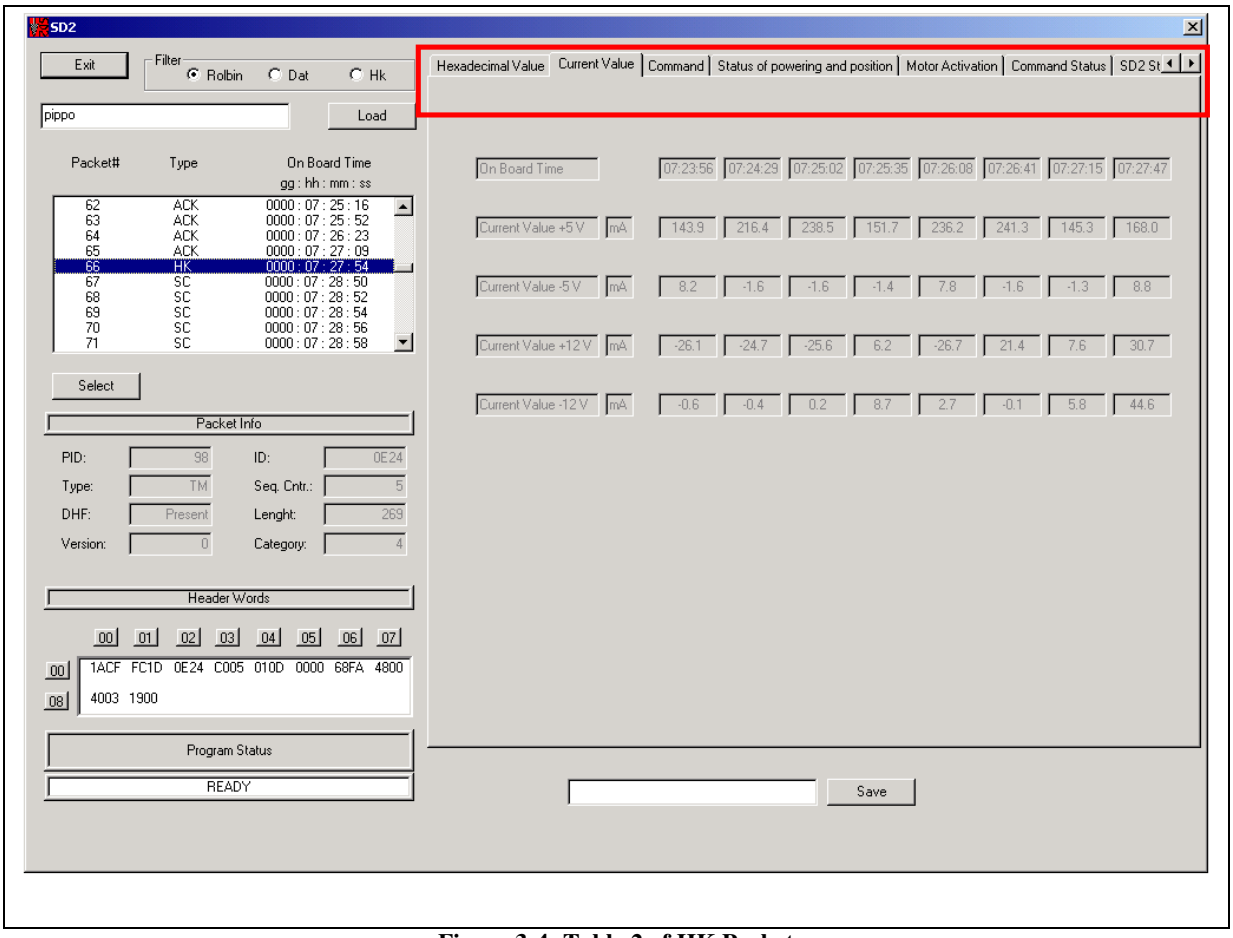

Figure 3-4: Table 2 of HK Packet

For the explanation of correlation between hexadecimal value of data and the real value displayed by SD2-TA the User can read RD.1.

3.2.5. SC Packet

The SC packet contain the following data

I.TABLE Hexadecimal Value

It contain hexadecimal and equivalent ASCII value for the words of the packet that contain scientific data.

II.TABLE Status of Powering and Position

It contain the following data

- ✓ Resolver 1 Position (drill traslation)
- ✓ Resolver 2 Position (Carousel Rotation)
- ✓ Drill Speed Rotation
- ✓ Drill Speed Driver
- ✓ Sampler Driver
- ✓ Carousel rotation driver
- ✓ Drill traslation driver main
- ✓ Drill traslation driver red (redundant)
- ✓ R/D converter drill traslation
- ✓ R/D converter drill rotation
- ✓ Volume Checker driver

III.TABLE Volume Checker Status

It contain the following data

- ✓ Volume Checker Displacement
- ✓ Volume Checker Displacement #1
- ✓ Volume Checker Displacement #2
- ✓ Volume Checker Displacement #3
- ✓ Volume Checker microswitch status (TOP /LOW)

IV.TABLE Moto Activation

It contain the following data

- ✓ Carousel Motor direction
- ✓ Drill Rotation Motor Direction

- ✓ Drill Traslation Motor Direction
- ✓ Volume Checker Motor Direction
- ✓ Drill Traslation Winding Main Activation
- ✓ Drill Traslation Winding Redundant Activation
- ✓ Drill Traslation Recovery Torque Selection

V.TABLE SD2 Status

It contain the following data

- ✓ SD2 Status
- ✓ Status of LDMP Command
- ✓ Status of Current Command

VI.TABLE Error Flag

It contain the following data

- ✓ Error Flag
- ✓ Hexadecimal value of Error Flag
- ✓ Error Handling Prtocedure
  - o Redundant Winding Recovery Procedure
  - o Soft Emergency Recovery Procedure
  - o Hard Emergency Recovery Procedure

VII.TABLE Memory Handler

It contain the following data

- ✓ Memory Address
- ✓ Content of Memory Address

VIII.TABLE Command in Execution

It contain the following data

- ✓ Replica of the last 10 specific command in execution (Hex value)

3.2.6. HK Packet

The HK packet contain the following data

I.TABLE Hexadecimal Value

It contain hexadecimal and equivalent ASCII value for the words of the packet that contain scientific data.

II.TABLE Current Value

It contain the following data

- ✓ Current Value on +5V line
- ✓ Current Value on -5V line
- ✓ Current Value on +12V line
- ✓ Current Value on -12 line

III.TABLE Command

It contain the following data

- ✓ Command in execution (Hex value)

IV.TABLE Status of Powering and Position

It contain the following data

- ✓ Resolver 1 Position (drill traslation)
- ✓ Resolver 2 Position (Carousel Rotation)
- ✓ Drill Speed Driver
- ✓ Sampler Driver
- ✓ Carousel rotation driver
- ✓ Drill traslation driver main
- ✓ Drill traslation driver red (redundant)
- ✓ R/D converter drill traslation
- ✓ R/D converter drill rotation
- ✓ Volume Checker driver

V.TABLE Motor Activation

It contain the following data

- ✓ Carousel Motor direction
- ✓ Drill Rotation Motor Direction
- ✓ Drill Traslation Motor Direction
- ✓ Volume Checker Motor Direction
- ✓ Drill Traslation Winding Main Activation
- ✓ Drill Traslation Winding Redundant Activation
- ✓ Drill Traslation Recovery Torque Selection

VI.TABLE Command Status

It contain the following data

- ✓ Speed Control Command
- ✓ Position Control Command
- ✓ Status Current Command

VII.TABLE SD2 Status

It contain the following data

- ✓ SD2 Status

VIII.TABLE Error Flag

It contain the following data

- ✓ Error Flag
- ✓ Hexadecimal value of Error Flag

3.2.7. ACK Packet

The ACK packet contain the following data

I.TABLE **Hexadecimal Value**

It contain hexadecimal and equivalent ASCII value for the words of the packet that contain scientific data.

3.2.8. How to Change a set of data

Every time the User want to change the Type of packet (for instance if the User are looking a SC packet and want to see a HK packet) he must choose the packet which shall be shown and then press Select Button (see Figure 3-3). In this way SD2-TA will display the first table (Hexadecimal Value) of the new packet.

If the User want to see a different packet of same Type of the one is dislpayed he has to change the packet selection in Selection Window (see Figure 3-2) and the data of new packet will be dispalyed.

In the second case if the User is looking a table (for instance the TABLE II of HK packet as shown in Figure 3-4) and change the packet with a packet of same Type SD2-TA shows the data of the new packet selected without change the Table.

3.2.9. Save formatted data

In order to save some important data of SC packet in a file the User Shall write in the Save Window (see Figure 3-1) the name of the file (wihtout extention) and eventually the path if he want to save the file in a different directory (if the User don't specify any directory the file will be created in the directory of SD2-TA executable). Then tha User must press Save Button .

For instance the User want to save the file "sd2_data" in a directory "store", so he shall write in Save window:

"c:/store/sd2_data"

then press Svae Button.

The Program Status Window shows "SAVING FILE …" message, during the saving phase and then "FILE SAVED – READY" when the file is saved succesfully.

The User can see the file .out in the directory specified. In our case we can find a file "sd2_data_SC.out" in store directory.

SD2-TA add at the end of the neame specified by user "_SC" to underline that the data are scientific data, and the extention ".out".

3.2.10. How to Read formatted Data

The data stored in file .out are :

Progressive number for stored data	On Board Time	Resolver Position 1	Resolver Position 2	Resolver Position 3	Volume Checker Displacement	Volume Checker Displacement #1	Volume Checker Displacement #2	Volume Checker Displacement #3

The On Board Time is given in seconds.

Resolver Position 1 is given in millimeter.

Resolver Position 2 is given in arc minute.

Resolver Position 3 is given in Round per Minute

Volume Checker Displacement, Volume Checker Displacement #1, Volume Checker Displacement #2, Volume Checker Displacement #3 are given in millimeter.

For the interpretation of Volume Checker Displacement data see RD.1.