

DFEE S/W 4.0 Release Note

The DFEE Software is delivered as 6 files:

FMOSW1
FMOSW2
FMDATA1
FMDATA2
FMDATEV
FMENERGY

These files are placed in ROM memory together with a monitor program TSTP88, which performs the loading to RAM memory and handles the technical connector interface. The monitor also clears the memory before loading.

To these files are added 4 groups of patches presented in the form of memory load commands.

A short description of the files follows.

The FMOSW files contains the program segments.

FMOSW1

This file contains the interrupt handlers, the command interpreter, the hardware control and the Hkdata generation. Also the control of the DFEE state, the memory loading and dump, control of the software parameters and the HV monitoring is contained here. The expansion of the limit parameters and the energy scale parameters are also performed here.

FMOSW2

This file contains the Event Data Analysis. Three versions of analysis is included: Normal data handling, Diagnostic data dump and Electronic Calibration event handling. The main output to the High speed line is also performed in this program segment.

The FMDATA files contains the data needed for the correct operation of the software.

FMDATA1

This file contains the constants and control variables needed in the operation of the software and the hardware.

FMDATEV

This file contains the software parameters used in the onboard analysis of the event data. 100 integer and 100 floating point parameters are placed in this file. An area between the two parameter sections is used to contain the constants needed to convert the positions into mm.

FMDATA2

This file contains the limits used in the acceptance tests of the event data. Upper and lower limits of the fast/slow ratio, the veto/anode ratio, the cathode/anode ratio and the backplane/anode ratio is used. This file is totally replaced with the Limits2 patch.

FMENERGY

This file contains the constants used to compress the energy scale from 12 to 8 bits. The data are used mainly when operating the instrument without the DPE. When the DPE is present the data are loaded from the DPE.

The files are placed as follows in the memory:

FMOBSW1	8000 + 9000
FMOBSW2	B000
FMDATA1	A000
FMDATEV	D500
FMDATA2	DA00
FMENERGY	AC00

A more detailed memory map follows here:

DFEE Memory Map

8000:

8120-813F	Interrupt Vector
8140-816F	Interrupt Links

9000:

9000-9FFF	Processing
9000	Processing initialization
909F	Rejection parameter unfolding
9115	USART Interrupt Processing
9154	Timer A Interrupt Processing
9162	Timer B Interrupt processing
9170	OBT Interrupt Processing
9186	HV Interrupt Processing
919E	Event Interrupt Processing
9287	Idle loop
9316	Input Message Handling
9344	Data Taking
9353	Calibration
935E	Data Dump
9367	Setup
93CB	Safe
93D6	Memory
93F1	State Changing
9553	Change Grey Filter
95CC	HV On
95FC	Memory Load (1st loader)
9626	Memory Dump
9667	Input Character Handling
96E7	Output Character Handling
9708	CRC Control
971F	FIFO Flush
9756	CRC Calculation
9773	Timer A Control
97C0	Timer B Control
9784	HV monitor
97F6	Read Board
9842	Integer Parameter Input
9856	Floating Parameter Input
986E	Software parameter table Dump
991B	Calculation of Memory CRC
9943	Memory Load (2nd loader)
9951	HW settings
997D	HV status
9989	HV Ready

99A6	HV Off
99BD	Modify HV1
9A13	Modify HV2
9AB8	Anode settings
9AC2	Discriminator settings
9ACD	HK data Collection
9BB5	Request Acknowledges
9BE0	Prepare Active State
9BFB	Energy Table Expansion
9C33	External HV Off

A000:

A000-A017	Request Acknowledge
A020-A077	Grey Filter Area
A078-A0AF	Constant Area
A0B0-A0BF	Processing Flags
A0C0-A0DF	Processing Variables
A0E0-A0FF	Input Buffer
A100-A1FF	Input Message Buffer
A200-A2FF	Output Message Buffer
A300-AAFF	Calibration Spectra
AB00-AB0F	Event Counters
AB10-ABFF	Processing Parameters
AC00-ACFF	Energy Table input

B000:

B000-BFFF	Event Analysis
B000	Initialize and determine Data Processing Mode
B01C	Data Analysis Mode
B0E4	Data Analysis Output
B104	Buffer Handling (All Modes)
B11F	Data Dump Mode
B25C	Data Dump Output
B27E	Calibration Mode
B28C	Calibration Mode Output
B2C1	Maximum Finder
B30A	Offset and Gain Correction

B323	Neighbourhood Calculation
B340	Footprint Calculation
B365	Calibration Source Calculation
B3C2	Cathode Hitpoint Calculation
B3D3	Backplane Hitpoint Calculation
B3E1	Slow anode Calculation
B404	Fast anode Calculation
B416	Veto Calculation
B428	Cathode-Backplane Coupling Calculation
B450	Fast-Slow Ratio Rejection
B495	Interpolation Calculation
B4AF	Correction for non-linearity
B4CA	Energy and Backplane corrections
B4E2	Anode-Cathode Coupling Calculation
B52B	Cathode Correction
B537	Cathode scale to mm
B564	Backplane scale to mm
B58F	Cathode index
B5A5	Backplane index
B5BB	Total Cathode Rejection
B5DD	Veto Rejection
B5FF	Total Backplane Rejection
B621	Energy position correction

C000:

D000:

D000-D0FF	Event Buffer Area
D100-D1FF	Event Processing Integer Variables
D200-D4FF	Event Processing Floating Point Variables
D500-D5FF	Integer Software Parameter Area
D600-D7FF	Floating Point Software Parameter Area
DA00-DBFF	Rejection Parameters (Folded)
DC00-DF00	Rejection Parameters

E000:

E000-EFFF	Energy Conversion Table
-----------	-------------------------

F000:

FC00-FF00

Rejection Parameter Differences

Compilation

The software is written according to MIL-STD-1750A(USAF) and compiled using a GEC Plessey Semiconductors Assembler (Release July 1991).

As we need to pack the software into the ROM memory each file is compiled separately to reduce the memory usage.