



CORE FLIGHT SOFTWARE SYSTEM (CFS)

MEMORY MANAGER (MM) APPLICATION

BUILD: 2.4.1.0

FSW VERSION DESCRIPTION DOCUMENT

RELEASE DATE: 11/17/2016



SIGNATURES

Approved by:

X

Susanne Strege/582

cFS Flight Software Product Development Lead



1.0 FSW VERSION DESCRIPTION

1.1 PURPOSE AND SUMMARY

The purpose of this build is to continue to refine the cFS Memory Manager (MM) application product. This build provides very minor bug fixes and enhancements and new assert based unit tests. This document serves as the notification of the Build 2.4.1.0 release of the cFS MM application.

MM version 2.4.1.0 is compatible with cFE builds 6.5.0 and above and OSAL 4.2.0 and above. It is recommended to run this version of MM with the latest releases of the cFE and OSAL which were used in build testing the application.

1.2 NEW FUNCTIONALITY/FEATURES IN THIS VERSION

Table 1.2-1 identifies new FSW functionality that has been implemented and is integrated into this FSW version. Requirement references are included.

Table 1.2-1 – New Functionality/Features in this Version

No.	FSB DCR # (or N/A)	Requirements	High Level Description of Functionality
	N/A		None

Table 1.2-2 identifies changes to FSW functionality from a previously delivered FSW version and the DCRs associated with these changes. See attachment 1 for a full listing of the DCRs and Trac Tickets included in this release.

Table 1.2-3 – Changes to Previously Delivered Functionality

Note: Trac ticket references are proceeded with a '#' character.

No.	FSB DCR # (or N/A)	Requirements	Functionality or Change Description
1	141142	MM1010	Incorrect error event message in mm_dump.c. The function MM_DumpMemToFile generates an error message that reports the incorrect value of the variable BytesRemaining. The variable BytesRemaining is set to 0 in response to the error condition prior to the generation of the event message. The event message has been updated to report the correct value of SegmentSize.
2	4076	N/A	MM file subtype definition and file description have been moved from private header file to the public platform configuration header file.
3	#32	N/A	Fixed potential buffer overruns in mm_dump.c.
4	#33	N/A	mm_load.c was updated to work correctly when using the new OSAL 4.2.0 filesystem abstractions.

1.3 MISSING PLANNED FEATURES AND KNOWN PROBLEMS

Table 1.3-1 identifies the functions and known discrepancies that are absent from MM Build 2.4.1.0. Any workarounds that may apply are identified.

Information on currently open DCRs is available at <http://tlserver3.ndc.nasa.gov:7001/index.html>. Information on currently open Trac tickets is available at https://babelfish.arc.nasa.gov/trac/cfs_apps/report/1. Note that these are restricted websites that requires a server account. Additional DCRs and/or Trac Tickets may have been submitted after preparation of this VDD. A cFS MM DCR report containing a listing of open DCRs and Trac tickets is available on request for customers who do not have access to the restricted servers. Please contact Susanne Strege, susie.strege@nasa.gov.

Table 1.3-1 – Functions absent from this Release

No.	FSB DCR # (or N/A)	Description	Reason for Absence	Affected Requirement or Component	Workaround	Planned Delivery
1	4122	Consider allowing files to be loaded to an address other than that specified in the file	Implementation is dependent on customer needs. Community input is needed.		None	Not Determined
2	4119	Add Trick Simulation Support	Implementation is dependent on customer needs. Community input is needed.	N/A	Add required ifdef statements to header files	Not Determined
3	4094	Add Cache Flushing Support	Implementation is dependent on customer needs. Community input is needed.	N/A	None	Not Determined
4	3976	Add EEPROM write enable flag to housekeeping telemetry	Implementation is dependent on PSP	MM8000	None	Not Determined
5	3975	Add support for reading/writing to registers and hardware I/O	Implementation is dependent on PSP memory type definitions	N/A	None	Not Determined
6	3816	Add command to get EEPROM write enable/disable status	Implementation is dependent on PSP	N/A	None	Not Determined

1.4 DEVELOPMENT TOOL VERSIONS ASSOCIATED WITH THIS FSW VERSION

Table 1.4-1 identifies the versions of development tools used to generate this FSW version:

Table 1.4-1 – Development Tool Versions Associated with this FSW Version

Tool Type.	Tool Name	Version Used
RTOS	BVTed with VxWorks 6.9, however, OSAL provides ability to use multiple OSes	6.9
Compiler	GNU	3.3.2
cFE	Core Flight Executive	6.5.0.0
OSAL	Operating System Abstraction Layer	4.2.0.0
cFE-PSP	cFE Platform Specific Package	1.3.0.0

2.0 DELIVERED PRODUCTS

Table 2-1 identifies the locations of FSW products relevant to this FSW Build. The version or date of the Build and where the product can be located are provided. Changes from a previous VDD are identified.

Table 2-1 – Delivered Products and their Locations

Software Element	Changed with this Version?	New Version or Date	Location
Executable for this build	Yes	2.4.1.0	Not applicable. Executables must be created for the specific mission/platform
Installation Procedures & Special Instructions (See Section 3.0)	No	3.1	See cFS Deployment Guide babelfish.arc.nasa.gov (in git system TOOLS master branches) and http://sourceforge.net/projects/coreflightexec
Source Code of this FSW Build	Yes	2.4.1.0	Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016 babelfish.arc.nasa.gov (in git system mm_app_master branch) and http://sourceforge.net/projects/cfs-mm
FSW Build Plan	N/A	N/A	None
Annotated S/W Detailed Design Docs	No	N/A	fsb.gsfc.nasa.gov/cFS

Software Element	Changed with this Version?	New Version or Date	Location
Ground System T&C Database	No	N/A	<p>Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016</p> <p>babelfish.arc.nasa.gov (in git system mm_app_master branch)</p> <p>and</p> <p>http://sourceforge.net/projects/cfs-mm</p>
Ground System Scripts developed by FSB	No	N/A	<p>Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016</p> <p>babelfish.arc.nasa.gov (in git system mm_app_master branch)</p> <p>and</p> <p>http://sourceforge.net/projects/cfs-mm</p>
Simulator and Test Data Generator Software	No	N/A	None
Executable - Ground Tools associated with FSW (tools to build stored command loads, etc.)	No	N/A	None
Source Code - Ground Tools associated with FSW (tools to build stored command loads, etc.)	No	N/A	Perl scripts to generate ground database and build verification procedures from templates (see cFS Deployment Guide)
Unit Test Procedures	Yes	2.4.1.0	<p>Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016</p> <p>babelfish.arc.nasa.gov (in git system mm_app_master branch)</p> <p>and</p> <p>http://sourceforge.net/projects/cfs-mm</p>
Unit Test Data	Yes	2.4.1.0	<p>Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016</p> <p>babelfish.arc.nasa.gov (in git system mm_app_master branch)</p> <p>and</p> <p>http://sourceforge.net/projects/cfs-mm</p>

Software Element	Changed with this Version?	New Version or Date	Location
Unit Test Results	Yes	2016/10/31	<p>Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016</p> <p>babelfish.arc.nasa.gov (in git system mm_app_master branch)</p> <p>and</p> <p>http://sourceforge.net/projects/cfs-mm</p>
FSW Make Files	No	2.4.1.0	<p>Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016</p> <p>babelfish.arc.nasa.gov (in git system mm_app_master branch)</p> <p>and</p> <p>http://sourceforge.net/projects/cfs-mm</p>
Linker & Compiler Configuration Files	Yes	2.4.1.0	<p>Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016</p> <p>babelfish.arc.nasa.gov (in git system mm_app_master branch)</p> <p>and</p> <p>http://sourceforge.net/projects/cfs-mm</p>
Requirements version (from MKS)	No	1.3	<p>Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016</p> <p>babelfish.arc.nasa.gov (in git system mm_app_master branch)</p> <p>and</p> <p>http://sourceforge.net/projects/cfs-mm</p>

3.0 INSTALLATION PROCEDURES

Table 3-1 identifies the nominal FSW Installation Procedure(s) for this FSW Build onto the intended target system (including the commercial applications used and the configuration settings). The procedure version identifier, the date of the procedure and where it can be located are also provided.

Table 3-1 FSW Installation Procedure(s)

Destination (Target System)	Filename	Version and Date	Location
N/A	See cFS Deployment Guide	Version 3.1	Available with cFE open source release: http://sourceforge.net/projects/coreflightexec/ babelfish.arc.nasa.gov (in git system TOOLS master branch) and on Tlserver3.ndc.nasa.gov

4.0 CONFIGURATION SUMMARY AND VERSION IDENTIFICATION

MM Build 2.4.1.0 can be found on tlserver3.gsfc.nasa.gov. Verification of the version can be done by sending a MM Noop command which produces an event message containing the version. In addition, the initialization event message generated during the application startup provides the version.

5.0 SOFTWARE COPYRIGHT NOTICE

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Acronyms

ACS	Attitude Control System
C&DH.....	Command and Data Handling
cFE.....	core Flight Executive
cFS.....	core Flight Software System
CM	Configuration Management
COTS	Commercial Off-The-Shelf
DCR	Discrepancy/Change Request
ETU.....	Engineering Test Unit
FSB.....	Flight Software Branch
FSW	Flight Software
MM.....	Memory Manager
I&T	Integration & Test
OSAL.....	Operating System Abstraction Layer
RTOS	Real-Time Operating System
T&C.....	Telemetry and Command
URL.....	Universal Resource Locator
VDD	Version Description Document

ATTACHMENT 1 – CFS MEMORY MANAGER BUILD 2.4.1.0 DCRS/TRAC TICKETS

Trac ticket references are proceeded with a '#' character.

No.	DCR/Trac Ticket #	Description	Type	Priority	State	Date Reported	Build Target
1	#32	MM: Fix potential buffer overruns in mm_dump.c	defect	major	Test Complete	06/29/2015	2.4.1.0
2	#33	MM: Update to work with new OSAL abstractions	defect	minor	Test Complete	06/29/2015	2.4.1.0
3	#39	Allow C99 code in APPS	defect	minor	Test Complete	01/28/2016	2.4.1.0
4	4076	Move MM file subtype and file description definitions from private header file to public platform configuration header file	enhancement	medium	Test Complete	09/17/2012	2.4.1.0
5	141142	Incorrect Error Message in mm_dump.c	defect	minor	Test Complete	12/04/2015	2.4.1.0
6	141232	Move function prototypes from .c files to .h files. Prototypes need to be accessed by unit tests	enhancement	minor	Test Complete	12/18/2015	2.4.1.0
7	141233	Implement assert based MM unit tests	enhancement	major	Test Complete	12/18/2015	2.4.1.0
8	145435	Use Constants for Version Number Checks. Some assert statements check the version number using a hard-coded value. These should be replaced with the version number constants in mm_version.h so they don't need to be updated for every release.	enhancement	minor	Test Complete	03/03/2016	2.4.1.0
9	145496	Update MM unit tests to utilize new UT-Assert PSP library additions	enhancement	medium	Test Complete	04/10/2016	2.4.1.0
10	145674	MM Unit Tests: Add C Macro Definition to Makefile for New cFE. With the new version of cFE (6.5.0), changes were made that caused the HK application unit tests to generate warning messages when calling CFE_EVS_SendEvent and CFE_ES_WriteSysLog. It was determined these messages were being generated because the constant OSAPI_NO_SPECIAL_ATTRIBS was not being defined. This definition was placed in the unit test suite's makefile.	enhancement	minor	Test Complete	06/22/2016	2.4.1.0
11	145729	MM Unit Test Makefile: Replace hard-coded paths with environment variables set in setvars.sh	enhancement	minor	Test Complete	07/22/2016	2.4.1.0
12	145879	MM - UT-Assert Unit Tests - Code Walkthrough Updates	enhancement	moderate	Test Complete	09/22/2016	2.4.1.0
13	145913	MM: Switch Statement in mm_dump.c missing default case	defect	minor	Test Complete	10/18/2016	2.4.1.0
14	145917	MM - CFE_EVS_SendEvent Format Warnings	defect	minor	Test Complete	10/24/2016	2.4.1.0
15	145932	HK Requirement Document Format Issues	enhancement	major	Test Complete		2.4.1.0