CORE FLIGHT SOFTWARE SYSTEM (CFS)

MEMORY DWELL (MD) APPLICATION

BUILD: 2.3.1.0

FSW VERSION DESCRIPTION DOCUMENT

RELEASE DATE: 7/14/2017

SIGNATURES

Approved by:

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Date: 2017.07.14 13:04:20 -04'00'

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1.0 FSW VERSION DESCRIPTION

1.1 PURPOSE AND SUMMARY

The purpose of this build is to continue to refine the cFS Memory Dwell (MD) application product. This build provides the following revisions:

- Minor clean up to remove old history logs
- Minor clean up to remove unused Event ID
- Fixed Doxygen user's guide makefile
- Fixes use of an unsigned integer to store/reference a memory address
- Updated table verify to produce events consistent with other applications
- Changed table load to use table files vs. memory address
- Fixes CFE_EVS_SendEvent format warnings
- Adds new assert based unit tests.

This document serves as the notification of the Build 2.3.1.0 release of the cFS MD application.

Memory Dwell (MD) version 2.3.1.0 is compatible with cFE builds 6.5.0 and above and OSAL builds 4.2.0 and above.

1.2 NEW FUNCTIONALITY 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 in this Version

No.	FSB DCR # (or N/A)	Requirements	Functionality or Change Description
-	-	N/A	None

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

Table 1.2-2 – Changes to Previously Delivered Functionality

No.	FSB DCR # (or N/A)	Requirements	High Level Description of Functionality
1	3716	N/A	MD table verification event messages and default table location need to be updated to be consistent with other applications. Table verification event messages should be handled as follows: • Per table, generate and error event for the first error found • After verification is complete, generate an info event with the totals (ie "table_name verify results: good = x, bad = y, unused = z") (note: this event is generate at the end of every table verify, not just if there are errors). Added information event MD_DWELL_TBL_INF_EID 52 with message text: 'MD Dwell Tbl verify results: good = \%d, bad = \%d, unused = \%d' The default table location should be: /cf/apps/ Changed table load from memory address to use the table files. Table files have been renamed to have a base filename of 'md_dw' followed by 2 digits in sequential order starting from 1 and will read these from the /cf/apps directory e.g. "md_dw01.tbl" "md_dw02.tbl"

No.	FSB DCR # (or N/A)	Requirements	High Level Description of Functionality
2	146175	MD3000 MD4000	Fix use of uint32 to Store/Reference a Memory Address. MD used uint32 to define variables that store/access a memory address. This will not work on 64-bit architectures. The OSAL version 4.2.0 "common_types.h" introduced a "cpuaddr" type to address this -- it is defined as an integer type large enough to store a memory address on the local processor. All uses of uint32 to store/access a memory address has been replaced with the cpuaddr type for better portability. This is a requirement for a native 64-bit build to work. The following have been changed to cpuaddr type: • MD_DwellControlEntry_t.ResolvedAddress • MD_GetDwellData: local var DwellAddress • MD_ValidTableEntry : local var ResolvedAddr • MD_CopyUpdatedTbl : local var ResolvedAddr • MD_ProcessJamCmd : local var ResolvedAddr • MD_ValidAddrRange : Argument 1 : Addr

1.3 MISSING PLANNED FEATURES AND KNOWN PROBLEMS

Table 1.3-1 identifies the functions and known discrepancies that are absent from MD Build 2.3.1.0. Any workarounds that may apply are identified.

Information on currently open DCRs is available at:

http://gs580v-fsbmks10.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 MD 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

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

No.	FSB DCR or Trac #	Description	Reason for Absence	Affected Requirement or Component	Workaround	Planned Delivery
1	#89	MD Table Configuration is Not Consistent with Other Applications: MD does not allow the option to save/not save tables in the CDS MD does not allow default address to be configurable MD does not use the CFE_TBL_Manage feature	Implementation is dependent on resource/staff availability	MD Tables	N/A	Not Determined
2	4118	MD - Add Trick Simulation Support (JSC Request)	Implementation is dependent on customer needs. Community input is needed.	Trick	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

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	2.3.1.0	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 branch) and http://sourceforge.net/projects/coreflightexec
Source Code of this FSW Build	Yes	2.3.1.0	gs580v-fsbmks10.ndc.nasa.gov. MKS label MD-ALL-Build2.3.1.0_JUL14-2017 babelfish.arc.nasa.gov (in git system md_app_master branch) and http://sourceforge.net/projects/cfs-md
FSW Build Plan	N/A	N/A	None
Annotated S/W Detailed Design Docs	No	N/A	fsb.gsfc.nasa.gov/cFS
Ground System T&C Database	No	N/A	gs580v-fsbmks10.ndc.nasa.gov. MKS label MD-ALL-Build2.3.1.0_JUL14-2017 babelfish.arc.nasa.gov (in git system md_app_master branch) and http://sourceforge.net/projects/cfs-md

Software Element	Changed with this Version?	New Version or Date	Location
Ground System Scripts developed by FSB	Yes	2.3.1.0	gs580v-fsbmks10.ndc.nasa.gov. MKS label MD-ALL-Build2.3.1.0_JUL14-2017 babelfish.arc.nasa.gov (in git system md_app_master branch) and http://sourceforge.net/projects/cfs-md
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	2.3.1.0	gs580v-fsbmks10.ndc.nasa.gov. MKS label MD-ALL-Build2.3.1.0_JUL14-2017 babelfish.arc.nasa.gov (in git system md_app_master branch) and http://sourceforge.net/projects/cfs-md
Unit Test Data	Yes	2.3.1.0	gs580v-fsbmks10.ndc.nasa.gov. MKS label MD-ALL-Build2.3.1.0_JUL14-2017 babelfish.arc.nasa.gov (in git system md_app_master branch) and http://sourceforge.net/projects/cfs-md
Unit Test Results	Yes	2017/06/21	gs580v-fsbmks10.ndc.nasa.gov. MKS label CS-ALL-Build2.2.1.0_MAY3-2017 babelfish.arc.nasa.gov (in git system md_app_master branch) and http://sourceforge.net/projects/cfs-md

Software Element	Changed with this Version?	New Version or Date	Location
FSW Make Files	No	2.3.1.0	gs580v-fsbmks10.ndc.nasa.gov. MKS label MD-ALL-Build2.3.1.0_JUL14-2017 babelfish.arc.nasa.gov (in git system md_app_master branch) and http://sourceforge.net/projects/cfs-md
Linker & Compiler Configuration Files	No	2.3.1.0	gs580v-fsbmks10.ndc.nasa.gov. MKS label MD-ALL-Build2.3.1.0_JUL14-2017 babelfish.arc.nasa.gov (in git system md_app_master branch) and http://sourceforge.net/projects/cfs-md
Requirements version (from MKS)	No	1.3	MKS label – version 1.3

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 gs580v-fsbmks10.ndc.nasa.gov

4.0 CONFIGURATION SUMMARY AND VERSION IDENTIFICATION

MD Build 2.3.1.0 can be found on gs580v-fsbmks10.ndc.nasa.gov, sourceforge: http://sourceforge.net/projects/cfs-md, and babelfish.arc.nasa.gov (in git system md_app_master branch). Verification of the version can be done by sending a MD NOOP command which produces an event message containing the version information. In addition, the initialization event message generated during the application startup provides the version information.

5.0 SOFTWARE COPYRIGHT NOTICE

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
I&T ..... Integration & Test
MD……Memory Dwell Application
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 DWELL BUILD 2.3.1.0 DCRS/TRAC TICKETS

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

No.	DCR/Trac Ticket #	Description	Type	Priority	State	Date Reported	Build Target
1	3699	The MD User's Guide does not contain information in the Commands Section. The line in the user_doxy file for including _msgdefs.h was commented out. Uncommented this to include the Commands in the User Guide.	defect	minor	Test Complete	02/17/2010	2.3.1.0
2	3716	MD table verification event messages and default table location need to be updated to be consistent with other applications.	enhancement	minor	Test Complete	03/25/2010	2.3.1.0
3	4099	MD Event ID 48 Is Defined and Not Used	cosmetic	minor	Test Complete	12/29/2012	2.3.1.0
4	145924	MD - CFE_EVS_SendEvent Format Warnings	defect	minor	Test Complete	10/24/2016	2.3.1.0
5	146037	Implement UT-Assert Unit Tests for the MD Application	enhancement	major	Test Complete	01/27/2017	2.3.1.0
6	146038	MD: Move function prototypes from .c files to .h files. Unit tests need access to function definitions.	defect	minor	Test Complete	01/27/2017	2.3.1.0
7	146175	Fix use of uint32 to Store/Reference a Memory Address. MD used uint32 to define variables that store/access a memory address. This will not work on 64-bit architectures.	defect	moderate	Test Complete	05/11/2017	2.3.1.0
8	146178	MD - Remove MKS Logs and change copyright symbol to ASCII	cosmetic	minor	Test Complete	05/18/2017	2.3.1.0