NASA GSFC FLIGHT SOFTWARE SYSTEMS BRANCH

FSW VERSION DESCRIPTION DOCUMENT

CFS HOUSEKEEPING (HK) APPLICATION

BUILD: HK 2.4.3

RELEASE DATE: 10/8/2020

1.0 FSW VERSION DESCRIPTION

1.1 PURPOSE AND SUMMARY

The purpose of this build is to continue to refine the cFS Housekeeping (HK) application product. This build provides various bug fixes and enhancements, but does not include any new functionality. The primary purpose of this release is to ensure compatibility between the HK application and cFS Bootes.

This document serves as the notification of the Build 2.4.3 release of the cFS HK application.

Housekeeping (HK) version 2.4.3 is compatible with cFE builds 6.8.0 and above and OSAL builds 5.0 and above.

1.2 NEW/CHANGED FUNCTIONALITY IN THIS VERSION

Table 1.2-1 identifies the DCRs that have been implemented in this FSW version. For each DCR the "Key" column shows the corresponding DCR in the GSFC cFS tracking system.

Table 1.2-1 – DCRs Implemented in this Version

Key	Summary	Description
GSFCCFS-1124	Update HK Doxygen user guide	Suggest updating the doxygen user guide file and adding a doxygen configuration file to allow users to successfully generate the doxygen guide themselves.
GSFCCFS-1153	HK should build with -Werror and OMIT_DEPRECATED enabled	HK should build against the latest cFE with -Werror and OMIT_DEPRECATED enabled.
GSFCCFS-1188	In HK, MemPoolHandle should be of type CFE_ES_MemHandle_t, not uint32	In the HK_AppData_t struct, MemPoolHandle is defined as a uint32. This causes HK to exit while running on a 64 bit platform, as an 8byte pointer is written to this and overwrites the adjacent RunStatus field.
GSFCCFS-1225	HK does not compile on test machine	HK has format errors during compilation on test machine

1.3 MISSING PLANNED FEATURES AND KNOWN PROBLEMS

Table 1.3-1 identifies currently open DCRs that are not addressed in this build. Any workarounds that may apply are identified.

Information on currently open DCRs is available at:

https://etdjira.gsfc.nasa.gov/projects/GSFCCFS/issues

Note that this is a restricted website that requires a server account. Additional DCRs may have been submitted after preparation of this VDD. A cFS HK DCR report containing a listing of open DCRs is available upon request for customers who do not have access to the restricted server. Please contact Elizabeth Timmons, elizabeth.timmons@nasa.gov.

Table 1.3-1 – Currently open DCRs

Key	Summary	Description
GSFCCFS-1181	HK has static code analysis findings	In analysis done on 7/10/2020, CodeSonar flagged the attached findings.
GSFCCFS-991	HK Count track times packet is not found	In file hk_utils.c function HK_SendCombinedHkPacket, Steven Seeger suggests: HK app hk packet could keep track of number of times packet is not found. HK_AppData.MissingDataCtr could be repurposed for this. Finding from JSC code review
GSFCCFS-987	HK Macro Change	In hk_utils.h suggest setting HK_INPUTMID_SUBSCRIBED to 1 instead of 0xFF. Finding in JSC code review.
GSFCCFS-1090	Migrate HK unit tests to distributed UT Assert	
GSFCCFS-986	Add HK_UNDEFINED_ENTRY check to hk_verify.h	Steven Seeger recommends adding the following check to hk_verify.h HK_UNDEFINED_ENTRY is #define to 0 in hk_utils.h. I would consider, since any uninitialized entries in the table will be zeroed out, to put: #if HK_UNDEFINED_ENTRY != 0 #error HK_UNDEFINED_ENTRY must be set to 0 #endif
GSFCCFS-1076	Change HK_UNDEFINED_ENTRY to an actual undefined value	The current value of HK_UNDEFINED_ENTRY in hk_utils.h is 0, which is a potentially valid entry value. We should consider changing the definition to something that is actually an undefinable value, for example 0xFFFF.

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
Source Code of this FSW Build	Yes	2.4.3	https://github.com/nasa/hk
Doxygen Documentation	Yes	N/A	https://github.com/nasa/hk
Unit Test Data	Yes	2.4.3	https://github.com/nasa/hk
FSW Make Files	Yes	2.4.3	https://github.com/nasa/hk

3.0 INSTALLATION PROCEDURES

In order to build and install the HK application, it must be added to the cFE CMake build system. This is done by modifying the TGTX_APPLIST in the cFE targets.cmake file. This is shown in the trivial example below.

```
SET(TGT1_NAME cpu1)
SET(TGT1_APPLIST hk)
SET(TGT1_FILELIST cfe_es_startup.scr)
```

After HK is added to the targets.cmake file, it is built and installed using the standard cFE CMake build instructions. These instructions are available in cFE CMake documentation:

https://github.com/nasa/cFE/blob/main/cmake/README.md

4.0 CONFIGURATION SUMMARY AND VERSION IDENTIFICATION

This software can be found in the HK GitHub repository (https://github.com/nasa/HK) under the tag "2.4.3".

Verification of the version can be done by sending an HK 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.

ACRONYMS

ACS ..... Attitude Control System
C&DH ..... Command and Data Handling
cFS ..... Core Flight System
CM ..... Configuration Management
COTS ..... Commercial Off-The-Shelf
CPU ..... Central Processing Unit
DCR ..... Discrepancy/Change Request
ETU ..... Engineering Test Unit
FSB ..... Flight Software Branch
FSW ..... Flight Software
GSFC ..... Goddard Space Flight Center
HK ..... Housekeeping
I&T ..... Integration & Test
JSC ..... Johnson Space Center
POSIX ..... Portable Operating System Interface
RTOS ..... Real-Time Operating System
SMP ..... Symmetric Multiprocessing
T&C ..... Telemetry and Command
TBD ..... To Be Determined
URL ..... Universal Resource Locator
VDD ..... Version Description Document