1.11_V2.0 Flight Software Standard Set of Patches

Last Revised: June 25, 1999
Filename: sw_stdpatch

BRIEF FUNCTIONAL DESCRIPTION:
The as-launched ACIS Flight Software has a set of minor known problems. To the best of our knowledge, none of these problems are serious enough to warrant the risk of re-burning an already well tested instrument program. The instrument may be operated, albeit at some minor risk to the science data, without fixing these problems. Therefore, instead of re-burning the instrument, the ACIS maintenance team will provide, and will continue to provide over the life of the mission, a standard set of ACIS patches to address these and future problems that arise during flight. Although the current set of standard patches only contain fixes to known problems, future versions of the standard patch load may also contain enhancements to the functionality of the instrument.

NOTE on MIT version identifiers: Numeric revision identifiers are preliminary, and, although logged and controlled, have not been subjected to peer review and sign-off. Letter revision identifiers reflect items which have undergone peer review and sign-off. This procedure loads the "standard Rev. A" version.

The FOT should implement the loading of the patches (steps 2.1 and 2.2) as a realtime command load in order to maximize the uplink efficiency. The command system should be configured with a blocking factor of 90 and a minimum time delay of 3 s.

The following procedure loads the current, standard set of patches into the ACIS instrument, and dumps the load to the ground for verification. This procedure implements the following basic operations:

1. Reset the contents of the patch list to remove any installed patches, dump the contents of the patch list to verify that the list is empty
2. Load the "standard Rev. A" patch load
3. Dump the contents of the patch list to verify the load
4. Warm boot the DPA to activate the new load and verify proper BEP boot

Refer to the Standard Patch Release Notes, for MIT 36-58010 Rev. A for a detailed description of the effects of this patch load.

The verifiers for the procedure will be:

1. A command echo for the reset patch list command
2. A command echo for the 1st dumpPatchlist command
3. A single bepReadReply packet for the 1st empty dump
4. A series of command echoes for the addPatch commands
5. A command echo for the 2nd dumpPatchlist command
6. A series of bepReadReply packets for the 2nd dump command (non-empty list)

7. A bepStartupMessage packet with a modified “version == 26” field

ACIS flight software personnel will review the contents of the various dumps after the procedure has been run.

ASSUMED INSTRUMENT STATE:
This assumes that at least one side of the DPA is on and the flight SW is running on one of the BEPs.

SPECIAL INITIAL CONDITIONS:
The OCC command system must be configured with “Minimum Time Delay of 3 s” and a “Blocking Factor” of 90.
Spacecraft telemetry must be in Format 1 or Format 2 throughout the operation.

OPERATIONAL CONSTRAINTS/CAUTIONS:
In order to avoid truncating a dump, each dumpPatchlist command must be followed by at least a 10 second delay.

REFERENCES:

1. MIT 36-58010 Standard Patch Release, Rev. A
2. MIT Software Problem Report SPR-113
3. MIT Software Problem Report SPR-115
4. MIT Software Problem Report SPR-116
5. MIT Software Problem Report SPR-117

CHANGE HISTORY:

V1.2

- updated the “addPatch” commands in step 2.1 and a new step 2.2 to contain the “standard-release-A” patches.
- added commandEcho values for all SW command packets
- changed comments in “Description” column to be consistent with the new patch load
- added steps 4.5, 4.6, 4.7 to verify the BEP boot

V2.0

- ACIS Team signed-off version
- changed “standard-release-A” to “standard Rev. A”

Table 1: **ACIS Flight Software Standard Patch Load**

Step #	Title (Revision 1.11_V2.0)	Time Req	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
1	Reset the Patchlist							
1.1	Empty the Patchlist	1	removePatches	AUALLPATCH				
1.2	Read the empty Patchlist	1	dumpPatchlist	RU_0000001				
2	Load Standard Patches							
2.1	Load “standard Rev. A” patches	1	addPatch	WUSTANDA01 WUSTANDA02 WUSTANDA03 WUSTANDA04 WUSTANDA05 WUSTANDA06 WUSTANDA07 WUSTANDA08 WUSTANDA09 WUSTANDA10 WUSTANDA11 WUSTANDA12 WUSTANDA13 WUSTANDA14 WUSTANDA15 WUSTANDA16 WUSTANDA17				
2.2	Load the version number	1	addPatch	WUFSV0001A				
3	Dump Installed Patches							
3.1	Dump Patchlist	1	dumpPatchlist	RU_0000001				
4	Activate Patches							
4.1	Set Boot Modifier off	0.1	DPA FS Boot Modifier	1BMODIBM(0)				
4.2	Set Warm Boot Flag on	0.1	DPA Warm Boot	1WRMBTSB(1)				
4.3	Halt BEP	0.1	Halt BEP	1RSETIRT(1)				
4.4	Restart BEP	1	Restart BEP	1RSETIRT(0)				

Table 2: (CONT) **ACIS Flight Software Standard Patch Load**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
1									
1.1	Check cmdResult == 1 commandEcho 326		A			Y	1or2		
1.2	Check cmdResult == 1 commandEcho 65		B	bepReadReply, ACIS EGSE verifies single packet reply		Y	1or2		
2									
2.1	commandEcho 898		A	Expect to send 17 packets. Total load size ∼ 456 bytes.		Y	1or2		
	commandEcho 900		A						
	commandEcho 903		A						
	commandEcho 904		A						
	commandEcho 907		A						
	commandEcho 909		A						
	commandEcho 910		A						
	commandEcho 912		A						
	commandEcho 915		A						
	commandEcho 917		A						
	commandEcho 918		A						
	commandEcho 921		A						
	commandEcho 922		A						
	commandEcho 924		A						
	commandEcho 927		A						
	commandEcho 928		A						
	commandEcho 931		A						
2.2	commandEcho 933		A	Sets version number to 26.		Y	1or2		
3									
3.1	check cmdResult = 1 commandEcho 65			bepReadReply, ACIS EGSE verifies reply against file wustanda.dumpedPatches.txt.		Y	1or2		
4									
4.1				disables uplink boot		Y	1or2		
4.2						Y	1or2		
4.3						Y	1or2		
4.4	bepStartupMessage			ACIS EGSE verifies "version" field == 26 decimal		Y	1or2		

Table 1: **ACIS Flight Software Standard Patch Load(Page 2)**

Step #	Title (Revision 1.11_V2.0)	Time Req	Command Description	Command Mnemonic	Telemetry Description	Telemetry Mnemonic	Expected Value	Units
4.5	Check BEP Boot	2.0						
4.6	Check HW LEDs	2.0			BEP Select	1STAT4ST	0or1	
					BEP FIFO Not Full	1STAT6ST	1	
					BEP FIFO Not Empty	1STAT7ST	0	
4.7	Check SW LEDs	2.0			BEP initialization	1STAT3ST	0	
					Watchdog boot	1STAT2ST	1	
					Science run status	1STAT1ST	1	
						1STAT0ST	0or1	
	Total Time	12.3						

Table 2: (CONT) **ACIS Flight Software Standard Patch Load(Page 2)**

Step #	Telemetry EGSE	Other Verifier	Crit	Description	Notes	RT Con	Tlm Fmt	Min Alt	SIM Pos
4.5	Check bepStartupMessage:		A			Y	1or2		
	bepTickCounter < 10; version =26;		A						
	watchdogFlag = 0, patchValidFlag =1		A						
	warmbootFlag = 1		A						
	Check swHousekeeping messages:								
	startingBepTickCounter < 10;		B						
	endingBepTickCounter=		B						
	=startingBepTickCounter+640								
	version =26		A						
4.6			2	0/1 indicates BEP A/B is selected		Y	1or2		
			2	1 means FIFO not full					
			2	1 means not FIFO empty					
4.7			1	0 means BEP SW is running		Y	1or2		
			2	1 means no watchdog boot					
			2	1 means science idle					
			2	this bit toggles to indicate BEP is running					