

IMPACT SEPT Science Packet 0

APID 258h (600 decimal)

NOTE: Byte order here is as the packet is created in SEP-Central.

See SEPT Operation Control and Data Processing Requirements document for definitions of items

11/4/2004 Version J

Module	Item	Length (bytes)	Description
Primary header.			
SYSTEM	0 0 0 0 1 0 1 0	1	Version=000, Type=0, Secondary Header=1, APID = 258h
SYSTEM	0 1 0 1 1 0 0 0	1	LSB of APID
SYSTEM	1 1 c c c c c c	1	Packet Sequence Control. 11 indicates no grouping
SYSTEM	c c c c c c c c	1	14-bit APID source sequence count = 'c' - counts each APID separately.
SYSTEM	0 0 0 0 0 0 0 1	1	Application Data Field length (less 1) = 265 decimal
SYSTEM	0 0 0 0 1 0 0 1	1	
Secondary Header			
SYSTEM	Clock 0 (MSB)	1	Time stamp of the start of the accumulation interval for the SEPT data
SYSTEM	Clock 1	1	
SYSTEM	Clock 2	1	
SYSTEM	Clock 3 (LSB)	1	
SYSTEM	Subsecs	1	
SEPT-NS Science data			
SEPT-NS	PDFE0 cntrs	56	32 counters, compressed from 24 bits to 14 bits each
SEPT-NS	PDFE1 cntrs	56	32 counters, compressed from 24 bits to 14 bits each
SEPT-NS	PDFE2 cntrs	56	32 counters, compressed from 24 bits to 14 bits each
SEPT-NS	PDFE3 cntrs	56	32 counters, compressed from 24 bits to 14 bits each
SEPT-NS	Singles ctr 0 (MSB)	1	24-bit Singles counter, address of counter is in CTR_ADDR&MODE byte below
SEPT-NS	Singles ctr 1	1	
SEPT-NS	Singles ctr 2 (LSB)	1	
SEPT-NS LUT_SETTINGS			
SEPT-NS	G_PDFE0-SEPT-NS	1	Conversion gain adjustment PDFE0-SEPT-NS See note below
SEPT-NS	G_PDFE1-SEPT-NS	1	Conversion gain adjustment PDFE1-SEPT-NS
SEPT-NS	G_PDFE2-SEPT-NS	1	Conversion gain adjustment PDFE2-SEPT-NS
SEPT-NS	G_PDFE3-SEPT-NS	1	Conversion gain adjustment PDFE3-SEPT-NS
SEPT-NS	ML_PDFE0-SEPT-NS	1	Main event detection level PDFE0-SEPT-NS
SEPT-NS	ML_PDFE1-SEPT-NS	1	Main event detection level PDFE1-SEPT-NS
SEPT-NS	ML_PDFE2-SEPT-NS	1	Main event detection level PDFE2-SEPT-NS
SEPT-NS	ML_PDFE3-SEPT-NS	1	Main event detection level PDFE3-SEPT-NS
SEPT-NS	CL_PDFE0-SEPT-NS	1	Coincidence event detection level PDFE0-SEPT-NS
SEPT-NS	CL_PDFE1-SEPT-NS	1	Coincidence event detection level PDFE1-SEPT-NS
SEPT-NS	CL_PDFE2-SEPT-NS	1	Coincidence event detection level PDFE2-SEPT-NS
SEPT-NS	CL_PDFE3-SEPT-NS	1	Coincidence event detection level PDFE3-SEPT-NS
SEPT-NS STATUS WORDS			
SEPT-NS	INT_REG_OR 0 (MSB)	1	Bitwise OR of interrupt register contents
SEPT-NS	INT_REG_OR 1 (LSB)	1	
SEPT-NS	TIMER_A 0 (MSB)	1	Telescope A: time of counter sat, PDFE config error, or latchup
SEPT-NS	TIMER_A 1	1	
SEPT-NS	TIMER_A 2 (LSB)	1	
SEPT-NS	TIMER_B 0 (MSB)	1	Telescope B: time of counter sat, PDFE config error, or latchup
SEPT-NS	TIMER_B 1	1	
SEPT-NS	TIMER_B 2 (LSB)	1	
SEPT-NS	STATUS	1	See note below
SEPT-NS	MODEFLAGS	1	See note below
SEPT-NS	SEQUENCE	1	Sequence counter for SEPT-NS test mode, increments once/minute
SEPT-NS	ConfCal	1	ConfCal setting for Current Cycle
SEPT-NS	ConfFilter	1	ConfFilter settings for Current cycle (see note below)
SEPT-NS	Heater_Level	1	SEPT-NS Heater level
SEPT-NS	TemperatureA	1	SEPT-NS A-side temperature
SEPT-NS	TemperatureB	1	SEPT-NS B-side Temperature
SEPT	Spares	5	Unused space
SYSTEM	Checksum	1	Sum of all 272 bytes should equal zero
		272	Total Length of the Packet

Notes: In bit-field definitions below, bit 0 refers to the ls-bit of a byte.

G_, ML_, and CL_ items are derived from SEPT responses to cConfPDFE commands (steps 8,11,14,17 in normal mode sequence)
The 3 ms-bits of the G_ items are the PDFE mode bits. The 5 ls-bits are the gain level.

Item	Bit	Meaning	flags in software
STATUS	0	zero means SEPT NS A-side housekeeping is invalid	SPNAT-OK
	1	zero means SEPT NS B-side housekeeping is invalid	SPNBT-OK
	2	zero means SEPT-NS TA temp is reported in housekeeping, 1 means TB	SPN-TUSED
	3	zero means that SEPT-NS response to cReadData/cClrIrq commands is invalid	NSTAT-OK
	4,5,6	address of singles counter reported in THIS CYCLE	
	7	1 means that SEPT NS is in tgen mode	SPNTGEN
	MODEFLAGS	0	0 means all SEPT control disabled
1		0 means SEPT-NS control disabled	SPNFLG
2		0 means SEPT-NS A-side control disabled	SPNAFLG
3		0 means SEPT-NS B-side control disabled	SPNBFLG
4,5,6		0=initial, 1=powerup, 2=normal, 3=cal, 4=tgen, 5=unused, 6=powerdn	SPNMODE
7		1 indicates auto-handling of latch-up	SAUTOFLG
ConfFilter	0,1	Coin filter bits for PDFE0	
	2,3	Coin filter bits for PDFE1	
	4,5	Coin filter bits for PDFE2	
	6,7	Coin filter bits for PDFE3	

IMPACT SEPT Science Packet 1

APID 259h (601 decimal)

NOTE: Byte order here is as the packet is created in SEP-Central.

See SEPT Operation Control and Data Processing Requirements document for definitions of items

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Module	Item	Length (bytes)	Description
Primary header.			
SYSTEM	0 0 0 0 1 0 1 0	1	Version=000, Type=0, Secondary Header=1, APID = 259h
SYSTEM	0 1 0 1 1 0 0 1	1	LSB of APID
SYSTEM	1 1 c c c c c c	1	Packet Sequence Control. 11 indicates no grouping
SYSTEM	c c c c c c c c	1	14-bit APID source sequence count = 'c' - counts each APID separately.
SYSTEM	0 0 0 0 0 0 0 1	1	Application Data Field length (less 1) = 265 decimal
SYSTEM	0 0 0 0 1 0 0 1	1	
Secondary Header			
SYSTEM	Clock 0 (MSB)	1	Time stamp of the start of the accumulation interval for the SEPT data
SYSTEM	Clock 1	1	
SYSTEM	Clock 2	1	
SYSTEM	Clock 3 (LSB)	1	
SYSTEM	Subsecs	1	
SEPT-E Science data			
SEPT-E	PDFE0 cnts	56	32 counters, compressed from 24 bits to 14 bits each
SEPT-E	PDFE1 cnts	56	32 counters, compressed from 24 bits to 14 bits each
SEPT-E	PDFE2 cnts	56	32 counters, compressed from 24 bits to 14 bits each
SEPT-E	PDFE3 cnts	56	32 counters, compressed from 24 bits to 14 bits each
SEPT-E	Singles ctr 0 (MSB)	1	24-bit Singles counter, address of counter is in CTR_ADDR&MODE byte below
SEPT-E	Singles ctr 1	1	
SEPT-E	Singles ctr 2 (LSB)	1	
SEPT-E LUT_SETTINGS			
SEPT-E	G_PDFE0-SEPT-E	1	Conversion gain adjustment PDFE0-SEPT-E See note below
SEPT-E	G_PDFE1-SEPT-E	1	Conversion gain adjustment PDFE1-SEPT-E
SEPT-E	G_PDFE2-SEPT-E	1	Conversion gain adjustment PDFE2-SEPT-E
SEPT-E	G_PDFE3-SEPT-E	1	Conversion gain adjustment PDFE3-SEPT-E
SEPT-E	ML_PDFE0-SEPT-E	1	Main event detection level PDFE0-SEPT-E
SEPT-E	ML_PDFE1-SEPT-E	1	Main event detection level PDFE1-SEPT-E
SEPT-E	ML_PDFE2-SEPT-E	1	Main event detection level PDFE2-SEPT-E
SEPT-E	ML_PDFE3-SEPT-E	1	Main event detection level PDFE3-SEPT-E
SEPT-E	CL_PDFE0-SEPT-E	1	Coincidence event detection level PDFE0-SEPT-E
SEPT-E	CL_PDFE1-SEPT-E	1	Coincidence event detection level PDFE1-SEPT-E
SEPT-E	CL_PDFE2-SEPT-E	1	Coincidence event detection level PDFE2-SEPT-E
SEPT-E	CL_PDFE3-SEPT-E	1	Coincidence event detection level PDFE3-SEPT-E
SEPT-E STATUS WORDS			
SEPT-E	INT_REG_OR 0 (MSB)	1	Bitwise OR of interrupt register contents, obtained via cClearIrq commands during cycle
SEPT-E	INT_REG_OR 1 (LSB)	1	
SEPT-E	TIMER_A 0 (MSB)	1	Telescope A: time of counter sat, PDFE config error, or latchup
SEPT-E	TIMER_A 1	1	
SEPT-E	TIMER_A 2 (LSB)	1	
SEPT-E	TIMER_B 0 (MSB)	1	Telescope B: time of counter sat, PDFE config error, or latchup
SEPT-E	TIMER_B 1	1	
SEPT-E	TIMER_B 2 (LSB)	1	
SEPT-E	STATUS	1	See note below
SEPT-E	MODEFLAGS	1	See note below
SEPT-E	SEQUENCE	1	Sequence counter for SEPT-E test mode, increments once/minute
SEPT-E	ConfCal	1	ConfCal setting for Current Cycle
SEPT-E	ConfFilter	1	ConfFilter settings for Current cycle (see note below)
SEPT-E	Heater_Level	1	SEPT-E Heater level
SEPT-E	TemperatureA	1	SEPT-E A-side temperature
SEPT-E	TemperatureB	1	SEPT-E B-side Temperature
SEPT-E	Spares	5	Unused space
SYSTEM	Checksum	1	Sum of all 272 bytes should equal zero

272 Total Length of the Packet

Notes: In bit-field definitions below, bit 0 refers to the ls-bit of a byte.

**G_, ML_, and CL_ items are derived from SEPT responses to cConfPDFE commands (steps 8,11,14,17 in normal mode sequence)
The 3 ms-bits of the G_ items are the PDFE mode bits. The 5 ls-bits are the gain level.**

STATUS	Bit	Meaning	flags in software
	0	zero means SEPT E A-side housekeeping is invalid	SPEAT-OK
	1	zero means SEPT E B-side housekeeping is invalid	SPEBT-OK
	2	zero means SEPT-E TA temp is reported in housekeeping, 1 means TB	SPE-TUSED
	3	zero means that SEPT-E response to cReadData/cClrIrq commands is invalid	ESTAT-OK
	4,5,6	address of singles counter reported in THIS CYCLE	
	7	1 means that SEPT E is in tgen mode	SPETGEN
MODEFLAGS	Bit	Meaning	
	0	0 means all SEPT control disabled	SEPTFLG
	1	0 means SEPT-E control disabled	SPEFLG
	2	0 means SEPT-E A-side control disabled	SPEAFLG
	3	0 means SEPT-E B-side control disabled	SPEBFLG
	4,5,6	0=initial, 1=powerup,2=normal,3=cal,4=tgen,5=unused,6=powerdn	SPEMODE
	7	1 indicates auto-handling of latch-up	SAUTOFLG
ConfFilter	Bit	Meaning	
	0,1	Coin filter bits for PDFE0	
	2,3	Coin filter bits for PDFE1	
	4,5	Coin filter bits for PDFE2	
	6,7	Coin filter bits for PDFE3	