

<b>IDL Routines</b>	<b>4</b>
<b>Binary Table Extensions</b>	<b>5</b>
<b>ICU Binary Table Extensions</b>	<b>6</b>
<i>Extension 1 - ICU PSU VOLTAGES</i>	<i>6</i>
<i>Extension 2 - ICU PSU CURRENTS</i>	<i>7</i>
<i>Extension 3 - ICU PSU TEMPERATURES</i>	<i>7</i>
<i>Extension 4- ICU MISC PARAMETERS</i>	<i>7</i>
<i>Extension 5 - ICU STATUS PARAMETERS</i>	<i>8</i>
<i>Extension 6 - PSU STATUS PARAMETERS</i>	<i>9</i>
<i>Extension 7 - HEALTH MONITOR STATUS PARAMETERS</i>	<i>9</i>
<i>Extension 8 - ICU INTERFACE PARAMETERS</i>	<i>10</i>
<i>Extension 9 - ICU ERROR PARAMETERS</i>	<i>10</i>
<i>Extension 10 - ICU COUNTER PARAMETERS</i>	<i>11</i>
<i>Extension 11 - ICU SCIENCE STATUS PARAMETERS</i>	<i>11</i>
<i>Extension 12 - SPACECRAFT</i>	<i>12</i>
<b>CAM Binary Table Extensions</b>	<b>13</b>
<i>Extension 1 - CAM VOLTAGES</i>	<i>13</i>
<i>Extension 2 - CAM CURRENTS</i>	<i>14</i>
<i>Extension 3 - CAM CCD BIASES</i>	<i>14</i>
<i>Extension 4 - CAM PSU VOLTAGES</i>	<i>15</i>
<i>Extension 5 - CAM PSU CURRENTS</i>	<i>15</i>
<i>Extension 6 - CAM ICU PARAMETERS</i>	<i>15</i>
<i>Extension 7 - CAM MISC</i>	<i>16</i>
<i>Extension 8 - CAM TEMPERATURES</i>	<i>16</i>
<i>Extension 9 - SPACECRAFT</i>	<i>17</i>
<b>MHC Binary Table Extensions</b>	<b>18</b>
<i>Extension 1 - MHC REFERENCES</i>	<i>18</i>

<i>Extension 2 - MHC VOLTAGES</i>	19
<i>Extension 3 - MHC CURRENTS</i>	19
<i>Extension 4 - MHC GP0 TEMPERATURES</i>	19
<i>Extension 5 - MHC GP2 TEMPERATURES</i>	20
<i>Extension 6 - MHC MECHANISMS</i>	21
<i>Extension 7 - MHC STATUS</i>	21
<i>Extension 8 - MHC COUNTERS</i>	21
<i>Extension 9 - MHC QCM STATUS</i>	22
<i>Extension 10 - MHC SUBCOM TABLE</i>	22
<i>Extension 11 - MHC SUBCOM PARAMETERS (not implemented)</i>	22
<i>Extension 11 - SPACECRAFT</i>	23
<b>Spacecraft Binary Table Extensions - HK1</b>	<b>24</b>
<i>Extension 1 - HK1 TEMPERATURES</i>	24
<i>Extension 2 - HK1 STATUS PARAMETERS</i>	25
<i>Extension 3 - HK1 MDP PARAMETERS</i>	25
<i>Extension 4 - SPACECRAFT</i>	25
<b>Spacecraft Binary Table Extensions - HK2</b>	<b>26</b>
<i>Extension 1 - HK2 STATUS PARAMETERS</i>	26
<i>Extension 2 - SPACECRAFT</i>	26
<b>AOCS Binary Table Extensions</b>	<b>27</b>
<i>Extension 1 - S/C ACU STATUS PARAMETERS</i>	27
<i>Extension 2 - SPACECRAFT</i>	27
<b>SOT Doppler Velocity Binary Table Extensions</b>	<b>28</b>
<i>Extension 1 - SOT DOPPLER VELOCITY PARAMETERS</i>	28
<i>Extension 2 - SPACECRAFT</i>	28
<b>EIS-MDP Binary Table Extensions</b>	<b>29</b>
<i>Extension 1 - EIS MDP STATUS PARAMETERS</i>	29

<i>Extension 2 - SPACECRAFT</i>	<i>29</i>
<b>ICU/PSU parameters in extension order.</b>	<b>31</b>
<b>ICU/PSU parameters in alphabetical order.</b>	<b>35</b>
<b>CAM parameters in extension order</b>	<b>39</b>
<b>CAM parameters in alphabetical order</b>	<b>39</b>
<b>MHC parameters in id order</b>	<b>40</b>

## **IDL Routines**

```
data = eis_read_fits_data('file_name', 'parameter_name',header_number [,header=header])
```

```
hdr = eis_read_fits_header('file_name',header_number)
```

```
eis_get_status_data, 'file_name',arr,'parameter_name',header_number,start_time,end_time
```

## Binary Table Extensions

NUMBER	TYPE	APID	CAPACITY (bytes)	FREQUENCY (seconds)
1	<a href="#">ICU</a>	0x5C4	110	2
2	<a href="#">CAM</a>	0x5C6	160	10
3	<a href="#">MHC</a>	0x5C8	160	10
4	<a href="#">HK1</a>	0x420	436	2
5	<a href="#">HK2</a>	0x428	436	2
6	<a href="#">AOCS1</a>	0x440	436	1
7	<a href="#">SOT</a>	0x542	208	2
8	<a href="#">EISMDP</a>	0x5C2	29	2

## ICU Binary Table Extensions

Extension Number	Extension Name	Number Of Parameters
1	<a href="#">ICU PSU VOLTAGES</a>	5
2	<a href="#">ICU PSU CURRENTS</a>	5
3	<a href="#">ICU PSU TEMPERATURES</a>	3
4	<a href="#">ICU MISC PARAMETERS</a>	8
5	<a href="#">ICU STATUS PARAMETERS</a>	30
6	<a href="#">PSU STATUS PARAMETERS</a>	15
7	<a href="#">HM STATUS PARAMETERS</a>	8
8	<a href="#">ICU INTERFACE PARAMETERS</a>	14
9	<a href="#">ICU ERROR PARAMETERS</a>	20
10	<a href="#">ICU COUNTER PARAMETERS</a>	5
11	<a href="#">ICU SCIENCE PARAMETERS</a>	3
12	<a href="#">SPACECRAFT</a>	2

Contained in eis\_sts1\_YYYYMMDD\_hhmmss.fits

### Extension 1 - ICU PSU VOLTAGES

Number	Name	Unit	Conversion Routine
1	ICU_P2V5	Volts	eis_convert_icu_voltage_p2p5v
2	ICU_P5V	Volts	eis_convert_icu_voltage_p5v
3	ICU_P15V	Volts	eis_convert_icu_voltage_p15v
4	ICU_N15V	Volts	eis_convert_icu_voltage_n15v
5	MBUS_28V	Volts	eis_convert_icu_voltage_mbus28v

## Extension 2 - ICU PSU CURRENTS

Number	Name	Unit	Conversion Routine
1	ICU_P2I5	Amps	eis_convert_icu_current_p2p5v
2	ICU_P5I	Amps	eis_convert_icu_current_p5v
3	ICU_P15I	Amps	eis_convert_icu_current_p15v
4	ICU_N15I	Amps	eis_convert_icu_current_n15v
5	MBUS_28I	Amps	eis_convert_icu_current_mbus28v

## Extension 3 - ICU PSU TEMPERATURES

Number	Name	Unit	Conversion Routine
1	CCDA_TEMP	Degrees C	eis_convert_ccda_temperature
2	CCDB_TEMP	Degrees C	eis_convert_ccdb_temperature
3	ICU_PROC_TEMP	Degrees C	eis_convert_icu_proc_temperature

## Extension 4- ICU MISC PARAMETERS

Number	Name	Unit	Conversion Routine
1	ICU_SW_ID	None	
2	PORT_READ	None	
3	LAST_BC1_R	None	
4	LAST_BC2_R	None	
5	LAST_BC3_R	None	
6	LAST_CMD_L_R	None	
7	HC_TARGET_T	Degrees C	eis_convert_icu_temperature
8	HC_DUTY_CYCLE	None	

## Extension 5 - ICU STATUS PARAMETERS

Number	Name	Unit	Conversion Routine
1	EIS_MODE	None	
2	CCD_BUF_TEST_STAT	None	
3	CCD_BUF_TEST_ERR	None	
4	CCD_BUF_TEST_WR_ERR	None	
5	CCD_BUF_TEST_RD_ERR	None	
6	ET_STAT	None	
7	CMD_BUF_STAT	None	
8	XRT_FF_STAT	None	
9	EIS_FF_STAT	None	
10	HM_MON_STAT	None	
11	AEC_STAT	None	
12	MEM_DMP_STAT	None	
13	SEQ_STAT	None	
14	MODE_EN_STAT	None	
15	XRT_FF_REC	None	
16	XRT_X_COR	None	
17	XRT_Y_COR	None	
18	MD_BUF_STAT	None	
19	ICU_VF	None	
20	PSU_VF	None	
21	CAM_VF	None	
22	MHC_VF	None	
23	ASRC_STAT	None	
24	MHC_LOAD_STAT	None	
25	HC_STAT	None	
26	EEPROM_STAT1	None	
27	EEPROM_STAT2	None	
28	EPROM_COPY_REQ_STAT	None	



Number	Name	Unit	Conversion Routine
29	EPROM_COPY_PROG_STAT	None	
30	CAM_MHC_PWR_ON	None	

### Extension 6 - PSU STATUS PARAMETERS

Number	Name	Unit	Conversion Routine
1	PSU_MARK	None	
2	PSU_CCDB_HTR_EN	None	
3	PSU_CCDA_HTR_EN	None	
4	PSU_CCDB_BHTR_STAT	None	
5	PSU_CCDA_BHTR_STAT	None	
6	PSU_MHC_HTR_P28V	None	
7	PSU_MHC_MECH_P28V	None	
8	PSU_MHC_ELEC_P28V	None	
9	PSU_MHC_MHTR	None	
10	PSU_CAM_MHTR	None	
11	PSU_CAM_P39V	None	
12	PSU_CAM_N8V	None	
13	PSU_CAM_P7V	None	
14	PSU_CAM_P8V	None	
15	PSU_CAM_P13V	None	

### Extension 7 - HEALTH MONITOR STATUS PARAMETERS

Number	Name	Unit	Conversion Routine
1	HM_ALERT_OOL	None	
2	HM_PSU_TO	None	
3	HM_CAM_TO	None	
4	HM_MHC_TO	None	
5	HM_PSU_OOL	None	

Number	Name	Unit	Conversion Routine
6	HM_CAM_OOL	None	
7	HM_MHC_OOL	None	
8	HM_PARM_ID	None	

### Extension 8 - ICU INTERFACE PARAMETERS

Number	Name	Unit	Conversion Routine
1	CMD_IF_STAT1	None	
2	MD_IF_STAT1	None	
3	STAT_IF_STAT1	None	
4	WD_IF_STAT1	None	
5	CMD_IF_STAT2	None	
6	MD_IF_STAT2	None	
7	STAT_IF_STAT2	None	
8	WD_IF_STAT2	None	
9	MHC_422_STAT1	None	
10	ROE_IF_STAT1	None	
11	ROE_IF_STAT2	None	
12	HSL_IF_STAT1	None	
13	HSL_IF_STAT2	None	
14	MHC_422_STAT2	None	

### Extension 9 - ICU ERROR PARAMETERS

Number	Name	Unit	Conversion Routine
1	TC_FAILED_EC	None	
2	CMD_IF_ERROR	None	
3	PSU_STAT_ERROR	None	
4	TC_FAILED_CMD_ID	None	
5	ICU_ERROR_F	None	

Number	Name	Unit	Conversion Routine
6	XRT_ERROR	None	
7	HC_DUTY_ERROR	None	
8	HC_PSU_TO	None	
9	MDP_LL_ERROR	None	
10	MHC_CMD_H	None	
11	FT_ERROR	None	
12	AEC_WIN_ERROR	None	
13	AEC_PARMS_ERROR	None	
14	AEC_TIME_ERROR	None	
15	CAM_IF_ERROR	None	
16	SEQ_ABORT_CODE	None	
17	CMD_ID_FAILED_INT	None	
18	MHC_IF_ERROR	None	
19	EEPROM_ERROR	None	
20	ET_ERROR	None	

### Extension 10 - ICU COUNTER PARAMETERS

Number	Name	Unit	Conversion Routine
1	MDP_TIME	TI	
2	STATUS_PC	Packets	
3	TC_REC_PKTC	Packets	
4	RASTER_RUN_REM	Rasters	
5	SEQ_RUN_REM	Sequences	
6	EXP_NUM	Exposures	

### Extension 11 - ICU SCIENCE STATUS PARAMETERS

Number	Name	Unit	Conversion Routine
1	SEQ_I	Sequence	

Number	Name	Unit	Conversion Routine
2	SEQ_P	None	
3	LL_I	Linelist	

### Extension 12 - SPACECRAFT

Number	Name	Unit	Conversion Routine
1	TIME	TI	
2	SEQ_COUNTER	None	

# CAM Binary Table Extensions

Extension Number	Extension Name	Number Of Parameters
1	<a href="#">CAM VOLTAGES</a>	12
2	<a href="#">CAM CURRENTS</a>	10
3	<a href="#">CAM CCD BIASES</a>	9
4	<a href="#">CAM PSU VOLTAGES</a>	5
5	<a href="#">CAM PSU CURRENTS</a>	5
6	<a href="#">CAM ICU PARAMETERS</a>	23
7	<a href="#">CAM MISC</a>	3
8	<a href="#">CAM TEMPERATURES</a>	2
9	<a href="#">SPACECRAFT</a>	2

Contained in eis\_sts2\_yyyymmdd\_hhmmss.fits

## Extension 1 - CAM VOLTAGES

Number	Name	Unit	Conversion Routine
1	CAM_P5V1_DIG	Volts	eis_convert_cam_voltage_p5v1dig
2	CAM_P2V5_DIG	Volts	eis_convert_cam_voltage_p2v5dig
3	CAM_P5V_AN_A	Volts	eis_convert_cam_voltage_p5vana
4	CAM_P5V_AN_B	Volts	eis_convert_cam_voltage_p5vanb
5	CAM_N5V_AN_A	Volts	eis_convert_cam_voltage_n5vana
6	CAM_N5V_AN_B	Volts	eis_convert_cam_voltage_n5vanb
7	CAM_P36V_A	Volts	eis_convert_cam_voltage_p36va
8	CAM_P36V_B	Volts	eis_convert_cam_voltage_p36vb
9	CAM_P12V_A	Volts	eis_convert_cam_voltage_p12va
10	CAM_P12V_B	Volts	eis_convert_cam_voltage_p12vb
11	CAM_N10V_A	Volts	eis_convert_cam_voltage_n10va
12	CAM_N10V_B	Volts	eis_convert_cam_voltage_n10vb

## Extension 2 - CAM CURRENTS

Number	Name	Unit	Conversion Routine
1	CAM_P5VI_DIG	Amps	eis_convert_cam_curremt_p5vdig
2	CAM_P2V5I_DIG	Amps	eis_convert_cam_curremt_p2v5vdig
3	CAM_P5VI_AN_A	Amps	eis_convert_cam_curremt_p5vana
4	CAM_P5VI_AN_B	Amps	eis_convert_cam_curremt_p5vanb
5	CAM_N5VI_AN_A	Amps	eis_convert_cam_curremt_n5vana
6	CAM_N5VI_AN_B	Amps	eis_convert_cam_curremt_n5vanb
7	CAM_P36VI_A	Amps	eis_convert_cam_curremt_p36va
8	CAM_P36VI_B	Amps	eis_convert_cam_curremt_p36vb
9	CAM_P12VI_A	Amps	eis_convert_cam_curremt_p12va
10	CAM_P12VI_B	Amps	eis_convert_cam_curremt_p12vb

## Extension 3 - CAM CCD BIASES

Number	Name	Unit	Conversion Routine
1	CAM_VOD_A	Volts	eis_convert_cam_bias_vod_a
2	CAM_VRD_A	Volts	eis_convert_cam_bias_vrd_a
3	CAM_VSS_A	Volts	eis_convert_cam_bias_vss_a
4	CAM_VOD_B	Volts	eis_convert_cam_bias_vod_b
5	CAM_VRD_B	Volts	eis_convert_cam_bias_vrd_b
6	CAM_VSS_B	Volts	eis_convert_cam_bias_vss_b
7	CAM_VOD	Volts	eis_convert_cam_bias_vod
8	CAM_VRD	Volts	eis_convert_cam_bias_vrd
9	CAM_VSS	Volts	eis_convert_cam_bias_vss

#### Extension 4 - CAM PSU VOLTAGES

Number	Name	Unit	Conversion Routine
1	PSU_CAM_P39V	Volts	eis_convert_cam_voltage_psup39v
2	PSU_CAM_P7V	Volts	eis_convert_cam_voltage_psup7v
3	PSU_CAM_N8V	Volts	eis_convert_cam_voltage_psun8v
4	PSU_CAM_P8V	Volts	eis_convert_cam_voltage_psup8v
5	PSU_CAM_P13V	Volts	eis_convert_cam_voltage_psup13v

#### Extension 5 - CAM PSU CURRENTS

Number	Name	Unit	Conversion Routine
1	PSU_CAM_P39VI	Amps	eis_convert_cam_current_psup39v
2	PSU_CAM_P7VI	Amps	eis_convert_cam_current_psup7v
3	PSU_CAM_N8VI	Amps	eis_convert_cam_current_psun8v
4	PSU_CAM_P8VI	Amps	eis_convert_cam_current_psup8v
5	PSU_CAM_P13VI	Amps	eis_convert_cam_current_psup13v

#### Extension 6 - CAM ICU PARAMETERS

Number	Name	Unit	Conversion Routine
1	CCD_BUF_ADD_F	None	
2	CCD_BUF_COUNT	None	
3	MHC_ALIVE_SYSEC	None	
4	EIS_XRT_X	Arc seconds	
5	EIS_XRT_Y	Arc seconds	
6	CMIR_POS_ARCS	Arc seconds	
7	FMIR_OFFSET	None	
8	FMIR_SLOPE	None	

Number	Name	Unit	Conversion Routine
9	CMIR_SLOPE	None	
10	CMIR_RES_PX	None	
11	CMIR_RES_NX	None	
12	MHC_RESPONSE_TO	None	
13	FMIR_S_TIME	None	
14	CMIR_SPAN_ARCS	None	
15	EIS_XFOV	Arc seconds	
16	FT_XF	None	
17	FT_YF	None	
18	FT_XBIN_PEAK	Pixels	
19	FT_YBIN_PEAK	Pixels	
20	ET_XF	None	
21	ET_YF	None	
22	ET_XBIN_PEAK	Pixels	
23	ET_YBIN_PEAK	Pixels	

### Extension 7 - CAM MISC

Number	Name	Unit	Conversion Routine
1	CAM_CTL_REG1	None	
2	CAM_CTL_REG2	None	
3	CAM_SEU_COUNTER	None	

### Extension 8 - CAM TEMPERATURES

Number	Name	Unit	Conversion Routine
1	CAM_UP_TEMP	Degrees C	eis_convert_cam_up_temperature
2	CAM_LO_TEMP	Degrees C	eis_convert_cam_lo_temperature



## Extension 9 - SPACECRAFT

Number	Name	Unit	Conversion Routine
1	TIME	TI	
2	SEQ_COUNTER	Integer	

# MHC Binary Table Extensions

Extension Number	Extension Name	Number Of Parameters
1	<a href="#">MHC REFERENCES</a>	5
2	<a href="#">MHC VOLTAGES</a>	8
3	<a href="#">MHC CURRENTS</a>	4
4	<a href="#">MHC GP0 TEMPERATURES</a>	13
5	<a href="#">MHC GP2 TEMPERATURES</a>	16
6	<a href="#">MHC MECHANISMS</a>	6
7	<a href="#">MHC STATUS</a>	8
8	<a href="#">MHC COUNTERS</a>	8
9	<a href="#">MHC QCM STATUS</a>	5
10	<a href="#">MHC SUBCOM TABLE</a>	2
11	<a href="#">MHC SUBCOM PARAMETERS</a>	24
11	<a href="#">SPACECRAFT</a>	2

Contained in eis\_sts3\_yyyymmdd\_hhmmss.fits

## Extension 1 - MHC REFERENCES

Number	Name	Id	Unit	Conversion Routine
1	MHC_SGV_REF	9	Volts	
2	MHC_GND_I_REF	14	Amps	
3	MHC_REF_THER_0	29	Degree C	
4	MHC_CAL_THER_0	30	Degree C	
5	MHC_GND_F_REF	47	Volts	

## Extension 2 - MHC VOLTAGES

Number	Name	Id	Unit	Conversion Routine
1	MHC_SG_OP	1	Volts	eis_convert_mhc_strain_gauge_op
2	MHC_P5VD	2	Volts	eis_convert_mhc_voltage_p5vdig
3	MHC_P15V_A	3	Volts	eis_convert_mhc_voltage_p15vana
4	MHC_N15V_A	4	Volts	eis_convert_mhc_voltage_n15vana
5	MHC_P15V_M	5	Volts	eis_convert_mhc_voltage_p15vmech
6	MHC_P120V_PZT	8	Volts	eis_convert_mhc_voltage_p120vpzt
7	MHC_PZT_DRIVE	55	Volts	eis_convert_mhc_voltage_pzt_drive
8	MHC_VAC_GAUGE	73	Volts	doh!

## Extension 3 - MHC CURRENTS

Number	Name	Id	Unit	Conversion Routine
1	MHC_P5V_DI	10	Amps	eis_convert_mhc_current_p5vdig
2	MHC_P15V_AI	11	Amps	eis_convert_mhc_current_p15vana
3	MHC_N15V_AI	12	Amps	eis_convert_mhc_current_n15vana
4	MHC_RDC_I	15	Amps	eis_convert_mhc_current_rdc

## Extension 4 - MHC GP0 TEMPERATURES

Number	Name	Id	Unit	Conversion Routine
1	MHC_DB_T0	16	Degrees C	eis_convert_mhc_temperature
2	MHC_BOX_T1	17	Degrees C	eis_convert_mhc_temperature
3	MHC_PB_T2	18	Degrees C	eis_convert_mhc_temperature
4	MHC_PB_T3	19	Degrees C	eis_convert_mhc_temperature
5	MHC_SLA_T4	20	Degrees C	eis_convert_mhc_temperature
6	MHC_SLA_T5	21	Degrees C	eis_convert_mhc_temperature

Number	Name	Id	Unit	Conversion Routine
7	MHC_HARNESS_T6	22	Degrees C	eis_convert_mhc_temperature
8	MHC_MIR_BASE_T7	23	Degrees C	eis_convert_mhc_temperature
9	MHC_MIR_PZT_T8	24	Degrees C	eis_convert_mhc_temperature
10	MHC_MIR_MOTOR_T9	25	Degrees C	eis_convert_mhc_temperature
11	MHC_GRA_MOTOR_T10	26	Degrees C	eis_convert_mhc_temperature
12	MHC_GRA_ASM_T11	27	Degrees C	eis_convert_mhc_temperature
13	MHC_PB_D4_T12	28	Degrees C	eis_convert_mhc_temperature

### Extension 5 - MHC GP2 TEMPERATURES

Number	Name	Id	Unit	Conversion Routine
1	MHC_HZ_T0	31	Degrees C	eis_convert_mhc_temperature
2	MHC_HZ_T1	32	Degrees C	eis_convert_mhc_temperature
3	MHC_HZ_T2	33	Degrees C	eis_convert_mhc_temperature
4	MHC_HZ_T3	34	Degrees C	eis_convert_mhc_temperature
5	MHC_HZ_T4	35	Degrees C	eis_convert_mhc_temperature
6	MHC_HZ_T5	36	Degrees C	eis_convert_mhc_temperature
7	MHC_HZ_T6	37	Degrees C	eis_convert_mhc_temperature
8	MHC_HZ_T7	38	Degrees C	eis_convert_mhc_temperature
9	MHC_HZ_T8	39	Degrees C	eis_convert_mhc_temperature
10	MHC_HZ_T9	40	Degrees C	eis_convert_mhc_temperature
11	MHC_HZ_T10	41	Degrees C	eis_convert_mhc_temperature
12	MHC_HZ_T11	42	Degrees C	eis_convert_mhc_temperature
13	MHC_HZ_T12	43	Degrees C	eis_convert_mhc_temperature
14	MHC_HZ_T13	44	Degrees C	eis_convert_mhc_temperature
15	MHC_HZ_T14	45	Degrees C	eis_convert_mhc_temperature
16	MHC_HZ_T15	46	Degrees C	eis_convert_mhc_temperature

## Extension 6 - MHC MECHANISMS

Number	Name	Id	Unit	Conversion Routine
1	MHC_GRA_POS_AN	6		
2	MHC_SS_POS_STEPS	7		
3	MHC_CMIR_POS_STEPS	13		
4	MHC_CMIR_POS	48		
5	MHC_SS_POS	49		
6	MHC_GRA_SW_POS	52		

## Extension 7 - MHC STATUS

Number	Name	Id	Unit	Conversion Routine
1	MHC_MOTOR_OPT_ENC	50		
2	MHC_ACT_OPT_ENC	51		
3	MHC_ACT_STAT	56		
4	MHC_CAL_SRC_STAT	57		
5	MHC_HTR_STAT	58		
6	MHC_SEC_MSW	68		
7	MHC_SEC_LSW	69		
8	MHC_SYS_STAT	72		

## Extension 8 - MHC COUNTERS

Number	Name	Id	Unit	Conversion Routine
1	MHC_EXP_T1	53		
2	MHC_EXP_T2	54		
3	MHC_CMD_REC	64		
4	MHC_CMD_ACK	65		

Number	Name	Id	Unit	Conversion Routine
5	MHC_CMD_NACK	66		
6	MHC_CMD_ID	67		
7	MHC_TIME_MSW	70		
8	MHC_TIME_LSW	71		

### Extension 9 - MHC QCM STATUS

Number	Name	Id	Unit	Conversion Routine
1	MHC_QCM_MSW	59		
2	MHC_QCM_LSW	60		
3	MHC_QCM1_TEMP	61		
4	MHC_QCM2_TEMP	62		
5	MHC_QCM_INT_CLOCK	63		

### Extension 10 - MHC SUBCOM TABLE

Number	Name	Id	Unit	Conversion Routine
1	MHC_PERFORM_INDEX	74		
2	MHC_PERFORM_PARM	75		

### Extension 11 - MHC SUBCOM PARAMETERS (not implemented)

Number	Name	Id	Unit	Conversion Routine
1	MHC_ANA_BRD_TEMP	76	Degree C	
2	MHC_AUX_BRD_TEMP	77	Degree C	
3	MHC_VOLT_REF	78	Volts	
4	MHC_AUX_BRD_VOLT_REF	79	Volts	

Number	Name	Id	Unit	Conversion Routine
5	CAL_LED1_CURRENT	80	Amps	
6	CAL_LED2_CURRENT	81	Amps	
7	CAL_LED1_VOLTAGE	82	Volts	
8	CAL_LED2_VOLTAGE	83	Volts	
9	AUTOSAFE_MSW	84	None	
10	AUTOSAFE_LSW	85	None	
11	ACTIVE_HTR_LIST	86	None	
12	MHC_N5V_ANALOG	87	None	
13	MHC_P5V_ANALOG	88	None	
14	PTABLE_XSUM	89	None	
15	RAM_XSUM	90	None	
16	SW_VERSION_MSW	91	None	
17	SW_VERSION_LSW	92	None	
18	TRACE_BUFFER_ENA	93	None	
19	SPARE	94	None	
20	SPARE	95	None	
21	SPARE	96	None	
22	SPARE	97	None	
23	SPARE	98	None	
24	SPARE	99	None	

### Extension 11 - SPACECRAFT

Number	Name	Unit	Conversion Routine
1	TIME	TI	
2	SEQ_COUNTER	None	

## Spacecraft Binary Table Extensions - HK1

Extension Number	Extension Name	Number Of Parameters
1	<a href="#">HK1 TEMPERATURES</a>	12
2	<a href="#">HK1 STATUS PARAMETERS</a>	4
3	<a href="#">HK1 MDP PARAMETERS</a>	3
4	<a href="#">SPACECRAFT</a>	2

Contained in eis\_hk1\_yyyymmdd\_hhmmss.fits

### Extension 1 - HK1 TEMPERATURES

Number	Name	Unit	Conversion Routine
1	HK1_EIS_A_HTR_TMP	Degrees C	eis_convert_hk1_htra_temp
2	HK1_EIS_B_HTR_TMP	Degrees C	eis_convert_hk1_htrb_temp
3	HK1_EIS_C_HTR_TMP	Degrees C	eis_convert_hk1_htrc_temp
4	HK1_EIS_ICU_1_TEMP	Degrees C	eis_convert_hk1_icu1_temp
5	HK1_EIS_ICU_2_TEMP	Degrees C	eis_convert_hk1_icu2_temp
6	HK1_EIS_STR_1_TEMP	Degrees C	eis_convert_hk1_str1_temp
7	HK1_EIS_STR_2_TEMP	Degrees C	eis_convert_hk1_str2_temp
8	HK1_EIS_STR_3_TEMP	Degrees C	eis_convert_hk1_str3_temp
9	HK1_EIS_STR_4_TEMP	Degrees C	eis_convert_hk1_str4_temp
10	HK1_EIS_STR_5_TEMP	Degrees C	eis_convert_hk1_str5_temp
11	HK1_EIS_STR_6_TEMP	Degrees C	eis_convert_hk1_str6_temp
12	HK1_EIS_STR_7_TEMP	Degrees C	eis_convert_hk1_str7_temp



## Extension 2 - HK1 STATUS PARAMETERS

Number	Name	Unit	Conversion Routine
1	HK1_EIS_ON_OFF	None	
2	HK1_EIS_A_HTR_ED	None	
3	HK1_EIS_B_HTR_ED	None	
4	HK1_EIS_C_HTR_ED	None	

## Extension 3 - HK1 MDP PARAMETERS

Number	Name	Unit	Conversion Routine
1	HK1_DIST_28V_VOLT	Volts	
2	HK1_DIST_28V_CUR	Amps	
3	EIS_DATA_RATE	512 bytes	

## Extension 4 - SPACECRAFT

Number	Name	Unit	Conversion Routine
1	TIME	TI	
2	SEQ_COUNTER	None	

# Spacecraft Binary Table Extensions - HK2

Extension Number	Extension Name	Number Of Parameters
1	<a href="#">HK2 STATUS PARAMETERS</a>	6
2	<a href="#">SPACECRAFT</a>	2

Contained in eis\_hk2\_yyyymmdd\_hhmmss.fits

## Extension 1 - HK2 STATUS PARAMETERS

Number	Name	Unit	Conversion Routine
1	TR_MODE	None	
2	UFSAUSE	None	
3	UFSBUSE	None	
4	SC_ATT_X	None	
5	SC_ATT_Y	None	
6	SC_ATT_Z	None	

## Extension 2 - SPACECRAFT

Number	Name	Unit	Conversion Routine
1	TIME	TI	
2	SEQ_COUNTER	None	

# AOCS Binary Table Extensions

Extension Number	Extension Name	Number Of Parameters
1	<a href="#">'HK S/C ACU STATUS PARAMETERS</a>	6
2	<a href="#">SPACECRAFT</a>	2

Contained in eis\_aocs1\_yyyymmdd\_hhmmss.fits

## Extension 1 - S/C ACU STATUS PARAMETERS

Number	Name	Unit	Conversion Routine
1	SAT_ROT	None	
2	UFSAXANG	None	
3	UFSAYANG	None	
4	UFSBXANG	None	
5	UFSBYANG	None	
6	ERRANGZ	None	

## Extension 2 - SPACECRAFT

Number	Name	Unit	Conversion Routine
1	TIME	TI	
2	SEQ_COUNTER	None	

# SOT Doppler Velocity Binary Table Extensions

Extension Number	Extension Name	Number Of Parameters
1	<a href="#">SOT DOPPLER VELOCITY PARAMETERS</a>	4
2	<a href="#">SPACECRAFT</a>	2

Contained in eis\_sot\_yyyymmdd\_hhmmss.fits

## Extension 1 - SOT DOPPLER VELOCITY PARAMETERS

Number	Name	Unit	Conversion Routine
1	MDP_DSC_V_SAT	m/s	
2	MDP_DSC_V_SUN	m/s	
3	MDP_DSC_V_ETH	m/s	
4	MDP_DSC_V_RST	m/s	

## Extension 2 - SPACECRAFT

Number	Name	Unit	Conversion Routine
1	TIME	TI	
2	SEQ_COUNTER	None	

# EIS-MDP Binary Table Extensions

Extension Number	Extension Name	Number Of Parameters
1	<a href="#">EIS MDP STATUS PARAMETERS</a>	16
2	<a href="#">SPACECRAFT</a>	2

Contained in eis\_eismdp\_YYYYMMDD\_hhmmss.fits

## Extension 1 - EIS MDP STATUS PARAMETERS

Number	Name	Unit	Conversion Routine
1	CMD_EIS_SRQ_CNT	None	
2	CMD_EIS_DHU_CNT	None	
3	STS_EIS_RP1_CNT	None	
4	STS_EIS_RP2_CNT	None	
5	STS_EIS_RP3_CNT	None	
6	STS_EIS_RP4_CNT	None	
7	STS_EIS_ERR	None	
8	STS_EIS_RCV	None	
9	STS_EIS_ERR_TIM	None	
10	IMG_EIS_BUSY	None	
11	IMG_EIS_QUE_SIZ	None	
12	IMG_EIS_RCV_CNT	None	
13	IMG_EIS_RCV_SIZ	None	
14	EIS_FLR_FLG	None	
15	EIS_FLR_LOC_X	None	
16	EIS_FLR_LOC_Y	None	

## Extension 2 - SPACECRAFT

Number	Name	Unit	Conversion Routine
1	TIME	TI	
2	SEQ_COUNTER	None	

## ICU/PSU parameters in extension order.

Extension	Name	Conversion Routine
1	ICU_N15V	
1	ICU_P15V	
1	ICU_P2V5	
1	ICU_P5V	
1	MBUS_28V	
2	ICU_N15I	
2	ICU_P15I	
2	ICU_P2I5	
2	ICU_P5I	
2	MBUS_28I	
3	CCDA_TEMP	
3	CCDB_TEMP	
3	ICU_PROC_TEMP	
4	ICU_SW_ID	
4	PORT_READ	
4	LAST_BC1_R	
4	LAST_BC2_R	
4	LAST_BC3_R	
4	LAST_CMD_L_R	
4	HC_TARGET_T	
4	HC_DUTY_CYCLE	
5	EIS_MODE	
5	CCD_BUF_TEST_STAT	
5	CCD_BUF_TEST_ERR	
5	CCD_BUF_TEST_WR_ERR	
5	CCD_BUF_TEST_RD_ERR	
5	ET_STAT	
5	CMD_BUF_STAT	

<b>Extension</b>	<b>Name</b>	<b>Conversion Routine</b>
5	XRT_FF_STAT	
5	EIS_FF_STAT	
5	HM_MON_STAT	
5	AEC_STAT	
5	MEM_DMP_STAT	
5	SEQ_STAT	
5	MODE_EN_STAT	
5	XRT_FF_REC	
5	XRT_X_COR	
5	XRT_Y_COR	
5	MD_BUF_STAT	
5	ICU_VF	
5	PSU_VF	
5	CAM_VF	
5	MHC_VF	
5	ASRC_STAT	
5	MHC_LOAD_STAT	
5	HC_STAT	
5	EEPROM_STAT1	
5	EEPROM_STAT2	
5	EPROM_COPY_REQ_STAT	
5	EPROM_COPY_PROG_STAT	
5	CAM_MHC_PWR_ON	
6	PSU_MARK	
6	PSU_CCDB_HTR_EN	
6	PSU_CCDA_HTR_EN	
6	PSU_CCDB_BHTR_STAT	
6	PSU_CCDA_BHTR_STAT	
6	PSU_MHC_HTR_P28V	
6	PSU_MHC_MECH_P28V	
6	PSU_MHC_ELEC_P28V	



<b>Extension</b>	<b>Name</b>	<b>Conversion Routine</b>
6	PSU_MHC_MHTR	
6	PSU_CAM_MHTR	
6	PSU_CAM_P39V	
6	PSU_CAM_N8V	
6	PSU_CAM_P7V	
6	PSU_CAM_P8V	
6	PSU_CAM_P13V	
7	HM_ALERT_OOL	
7	HM_PSU_TO	
7	HM_CAM_TO	
7	HM_MHC_TO	
7	HM_PSU_OOL	
7	HM_CAM_OOL	
7	HM_MHC_OOL	
7	HM_PARM_ID	
8	MD_IF_STAT1	
8	STAT_IF_STAT1	
8	WD_IF_STAT1	
8	CMD_IF_STAT2	
8	MD_IF_STAT2	
8	STAT_IF_STAT2	
8	WD_IF_STAT2	
8	MHC_422_STAT1	
8	CMD_IF_STAT1	
8	ROE_IF_STAT1	
8	ROE_IF_STAT2	
8	HSL_IF_STAT1	
8	HSL_IF_STAT2	
8	MHC_422_STAT2	
9	TC_FAILED_EC	
9	CMD_IF_ERROR	

<b>Extension</b>	<b>Name</b>	<b>Conversion Routine</b>
9	PSU_STAT_ERROR	
9	TC_FAILED_CMD_ID	
9	ICU_ERROR_F	
9	XRT_ERROR	
9	HC_DUTY_ERROR	
9	HC_PSU_TO	
9	MDP_LL_ERROR	
9	MHC_CMD_H	
9	FT_ERROR	
9	AEC_WIN_ERROR	
9	AEC_PARAMS_ERROR	
9	AEC_TIME_ERROR	
9	CAM_IF_ERROR	
9	SEQ_ABORT_CODE	
9	CMD_ID_FAILED_INT	
9	MHC_IF_ERROR	
9	EEPROM_ERROR	
9	ET_ERROR	
10	MDP_TIME	
10	STATUS_PC	
10	TC_REC_PKTC	
10	RASTER_RUN_REM	
10	SEQ_RUN_REM	
10	EXP_NUM	
11	SEQ_I	
11	SEQ_P	
11	LL_I	

## ICU/PSU parameters in alphabetical order.

Name	Extension	Conversion Routine
AEC_PARMS_ERROR	9	
AEC_STAT	5	
AEC_TIME_ERROR	9	
AEC_WIN_ERROR	9	
ASRC_STAT	5	
CAM_IF_ERROR	9	
CAM_MHC_PWR_ON	5	
CAM_VF	5	
CCD_BUF_TEST_ERR	5	
CCD_BUF_TEST_RD_ERR	5	
CCD_BUF_TEST_STAT	5	
CCD_BUF_TEST_WR_ERR	5	
CCDA_TEMP	3	
CCDB_TEMP	3	
CMD_BUF_STAT	5	
CMD_ID_FAILED_INT	9	
CMD_IF_ERROR	9	
CMD_IF_STAT1	8	
CMD_IF_STAT2	8	
EEPROM_ERROR	9	
EEPROM_STAT1	5	
EEPROM_STAT2	5	
EIS_FF_STAT	5	
EIS_MODE	5	
EPROM_COPY_PROG_STAT	5	
EPROM_COPY_REQ_STAT	5	
ET_ERROR	9	
ET_STAT	5	

Name	Extension	Conversion Routine
EXP_NUM	10	
FT_ERROR	9	
HC_DUTY_CYCLE	4	
HC_DUTY_ERROR	9	
HC_PSU_TO	9	
HC_STAT	5	
HC_TARGET_T	4	
HM_ALERT_OOL	7	
HM_CAM_OOL	7	
HM_CAM_TO	7	
HM_MHC_OOL	7	
HM_MHC_TO	7	
HM_MON_STAT	5	
HM_PARM_ID	7	
HM_PSU_OOL	7	
HM_PSU_TO	7	
HSL_IF_STAT1	8	
HSL_IF_STAT2	8	
ICU_ERROR_F	9	
ICU_N15I	2	
ICU_N15V	1	
ICU_P15I	2	
ICU_P15V	1	
ICU_P2I5	2	
ICU_P2V5	1	
ICU_P5I	2	
ICU_P5V	1	
ICU_PROC_TEMP	3	
ICU_SW_ID	4	
ICU_VF	5	
LAST_BC1_R	4	

Name	Extension	Conversion Routine
LAST_BC2_R	4	
LAST_BC3_R	4	
LAST_CMD_L_R	4	
LL_I	11	
MBUS_28I	2	
MBUS_28V	1	
MD_BUF_STAT	5	
MD_IF_STAT1	8	
MD_IF_STAT2	8	
MDP_LL_ERROR	9	
MDP_TIME	10	
MEM_DMP_STAT	5	
MHC_422_STAT1	8	
MHC_422_STAT2	8	
MHC_CMD_H	9	
MHC_IF_ERROR	9	
MHC_LOAD_STAT	5	
MHC_VF	5	
MODE_EN_STAT	5	
PORT_READ	4	
PSU_CAM_MHTR	6	
PSU_CAM_N8V	6	
PSU_CAM_P13V	6	
PSU_CAM_P39V	6	
PSU_CAM_P7V	6	
PSU_CAM_P8V	6	
PSU_CCDA_BHTR_STAT	6	
PSU_CCDA_HTR_EN	6	
PSU_CCDB_BHTR_STAT	6	
PSU_CCDB_HTR_EN	6	
PSU_MARK	6	

Name	Extension	Conversion Routine
PSU_MHC_ELEC_P28V	6	
PSU_MHC_HTR_P28V	6	
PSU_MHC_MECH_P28V	6	
PSU_MHC_MHTR	6	
PSU_STAT_ERROR	9	
PSU_VF	5	
RASTER_RUN_REM	10	
ROE_IF_STAT1	8	
ROE_IF_STAT2	8	
SEQ_ABORT_CODE	9	
SEQ_I	11	
SEQ_P	11	
SEQ_RUN_REM	10	
SEQ_STAT	5	
STAT_IF_STAT1	8	
STAT_IF_STAT2	8	
STATUS_PC	10	
TC_FAILED_CMD_ID	9	
TC_FAILED_EC	9	
TC_REC_PKTC	10	
WD_IF_STAT1	8	
WD_IF_STAT2	8	
XRT_ERROR	9	
XRT_FF_REC	5	
XRT_FF_STAT	5	
XRT_X_COR	5	
XRT_Y_COR	5	

## **CAM parameters in extension order**

TBS

## **CAM parameters in alphabetical order**

TBS

## MHC parameters in id order

Id	Name	Extension	Param Number	Conversion Routine
1	MHC_SG_OP	2	1	
2	MHC_P5VD	2	2	eis_convert_mhc_voltage_p5vdig
3	MHC_P15V_A	2	3	eis_convert_mhc_voltage_p15vana
4	MHC_N15V_A	2	4	eis_convert_mhc_voltage_n15vana
5	MHC_P15V_M	2	5	eis_convert_mhc_voltage_p15vmech
6	MHC_GRA_POS_AN	6	1	
7	MHC_SS_POS_STEPS	6	2	
8	MHC_P120V_PZT	2	6	eis_convert_mhc_voltage_p120vpzt
9	MHC_SGV_REF	1	1	
10	MHC_P5V_DI	3	1	eis_convert_mhc_current_p5vdig
11	MHC_P15V_AI	3	2	eis_convert_mhc_current_p15vana
12	MHC_N15V_AI	3	3	eis_convert_mhc_current_n15vana
13	MHC_CMIR_POS_STEPS	6	3	
14	MHC_GND_I_REF	1	2	
15	MHC_RDC_I	3	4	eis_convert_mhc_current_rdc
16	MHC_DB_T0	4	1	eis_convert_mhc_temperature
17	MHC_BOX_T1	4	2	eis_convert_mhc_temperature
18	MHC_PB_T2	4	3	eis_convert_mhc_temperature
19	MHC_PB_T3	4	4	eis_convert_mhc_temperature
20	MHC_SLA_T4	4	5	eis_convert_mhc_temperature
21	MHC_SLA_T5	4	6	eis_convert_mhc_temperature
22	MHC_HARNESS_T6	4	7	eis_convert_mhc_temperature
23	MHC_MIR_BASE_T7	4	8	eis_convert_mhc_temperature
24	MHC_MIR_PZT_T8	4	9	eis_convert_mhc_temperature
25	MHC_MIR_MOTOR_T9	4	10	eis_convert_mhc_temperature
26	MHC_GRA_MOTOR_T10	4	11	eis_convert_mhc_temperature



<b>Id</b>	<b>Name</b>	<b>Extension</b>	<b>Param Number</b>	<b>Conversion Routine</b>
27	MHC_GRA_ASM_T11	4	12	eis_convert_mhc_temperature
28	MHC_PB_D4_T12	4	13	eis_convert_mhc_temperature
29	MHC_REF_THER_0	1	3	
30	MHC_CAL_THER_0	1	4	
31	MHC_HZ_T0	5	1	eis_convert_mhc_temperature
32	MHC_HZ_T1	5	2	eis_convert_mhc_temperature
33	MHC_HZ_T2	5	3	eis_convert_mhc_temperature
34	MHC_HZ_T3	5	4	eis_convert_mhc_temperature
35	MHC_HZ_T4	5	5	eis_convert_mhc_temperature
36	MHC_HZ_T5	5	6	eis_convert_mhc_temperature
37	MHC_HZ_T6	5	7	eis_convert_mhc_temperature
38	MHC_HZ_T7	5	8	eis_convert_mhc_temperature
39	MHC_HZ_T8	5	9	eis_convert_mhc_temperature
40	MHC_HZ_T9	5	10	eis_convert_mhc_temperature
41	MHC_HZ_T10	5	11	eis_convert_mhc_temperature
42	MHC_HZ_T11	5	12	eis_convert_mhc_temperature
43	MHC_HZ_T12	5	13	eis_convert_mhc_temperature
44	MHC_HZ_T13	5	14	eis_convert_mhc_temperature
45	MHC_HZ_T14	5	15	eis_convert_mhc_temperature
46	MHC_HZ_T15	5	16	eis_convert_mhc_temperature
47	MHC_GND_F_REF	1	5	
48	MHC_CMIR_POS	6	4	
49	MHC_SS_POS	6	5	
50	MHC_MOTOR_OPT_ENC	7	1	
51	MHC_ACT_OPT_ENC	7	2	
52	MHC_GRA_SW_POS	6	6	
53	MHC_EXP_T1	8	1	
54	MHC_EXP_T2	8	2	
55	MHC_PZT_DRIVE	2	7	eis_convert_mhc_voltage_pzt_drive

<b>Id</b>	<b>Name</b>	<b>Extension</b>	<b>Param Number</b>	<b>Conversion Routine</b>
56	MHC_ACT_STAT	7	3	
57	MHC_CAL_SRC_STAT	7	4	
58	MHC_HTR_STAT	7	5	
59	MHC_QCM_MSW	9	1	
60	MHC_QCM_LSW	9	2	
61	MHC_QCM1_TEMP	9	3	
62	MHC_QCM2_TEMP	9	4	
63	MHC_QCM_INT_CLOCK	9	5	
64	MHC_CMD_REC	8	3	
65	MHC_CMD_ACK	8	4	
66	MHC_CMD_NACK	8	5	
67	MHC_CMD_ID	8	6	
68	MHC_SEC_MSW	7	6	
69	MHC_SEC_LSW	7	7	
70	MHC_TIME_MSW	8	7	
71	MHC_TIME_LSW	8	8	
72	MHC_SYS_STAT	7	8	
73	MHC_VAC_GUAGE	2	8	
74	MHC_PERFORM_INDEX	10	1	
75	MHC_PERFORM_PARM	10	2	