VIRTIS PC12 Report

May 26th 2010

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DOCUMENT CHANGE RECORD

ISSUE	DATE	AFFECTED PAGES	CHANGE DESCRIPTION
Issue 1	**26/05/2010**		

TABLE OF CONTENT

1 Scope

This document describes the functional performances of VIRTIS during the PC12 observations executed on the 25th of April 2010 and on the 1st of May 2010.

2 Reference Documents

RD01	**RO-SGS-TN-0028_5_-_Rosetta_Timeline_Details_Table_Active_PC12_2010Mar26**	Rosetta_Timeline_Details_Table_Active_PC12_2010Mar26

3 Activity Summary

The VIRTIS activity during PC12 has been divided in two steps:

- VR03 M Scan mirror and slit orientation verification

  Performs 15 lines acquisition (repetition 20sec) starting at 16:18 of 25th April 2010 to be repeated 6 times at the edges of the FOV.
  Duration: 1 hour and 11 minutes.

- VR04 Asteroid Vesta Light Curve

  Performs 15 lines acquisitions around WAC Boresight along with Osiris SR21 (repetition 20sec) starting at 05:50 of 1st May 2010 to be repeated several times (first 5 hours of the observation optimized for IR, the rest of the observation optimized for VIS).
  Duration: 11 hours.

4 Activity Description and Cubes Generated

- VR03 M Scan mirror and slit orientation verification

  The goal of the observation is to verify the correctness of the scan mirror read-out circuit and the alignment of the Virtis -M slit with the S/C Y axis.
  An additional task has been to verify image aberrations at the edges of the Field of View.
  The same target shall be located at the edges of the FOV in both scan and slit direction.

  For this purpose the star Arcturus (alpha-Bootes). has been chosen.

The following cubes were acquired :

Cube	Name
M Calibration	V1_PVA4PF24_QUB
M Calibration	I1_PIA4PF24_QUB
M1	V1_PVA4PG18_QUB
M2	I1_PIA4PG18_QUB
M3	V1_PVA4PG31_QUB
M4	I1_PIA4PG31_QUB
M5	V1_PVA4PG44_QUB
M6	I1_PIA4PG44_QUB
M7	V1_PVA4PG57_QUB
M8	I1_PIA4PG57_QUB
M9	V1_PVA4PH10_QUB
M10	I1_PIA4PH10_QUB
M11	V1_PVA4PH23_QUB
M12	I1_PIA4PH23_QUB

- VR04 Asteroid Vesta Light Curve

The goal of the observation is to obtain the light curve of Vesta (asteroid 4) through a 11 hours scan. The entire observation has been divided in 11 parts (cubes).
Cubes V1_PVA51550_QUB and I1_PVA51550_QUB contain two cubes each and they need to be split.
Cubes V1_PVA51949_QUB and I1_PVA51949_QUB contain six cubes each and they need to be split.

The following cubes were acquired :

Cube	Name
M Calibration	V1_PVA51519_QUB
M Calibration	I1_PIA51519_QUB
M1	V1_PVA51550_QUB
M2	I1_PIA51550_QUB
M3	V1_PVA51749_QUB
M4	I1_PIA51749_QUB
M5	V1_PVA51849_QUB
M6	I1_PIA51849_QUB
M7	V1_PVA51949_QUB
M8	I1_PIA51949_QUB
M9	V1_PVA51A49_QUB
M10	I1_PIA51A49_QUB

5 PC12 Results and Comments

- VR03 M Scan mirror and slit orientation verification

During the scan mirror and slit orientation verification a problem occurs due to a misunderstanding with RSOC about the S/C pointing.
Originally Virtis team asked a pointing as shown in Fig.1.
From RSOC it was proposed to change it into the pointing shown in Fig.2 to reduce and optimize the S/C movements and the new pointing was accepted by Virtis team.
But instead of the pointing shown in Fig.2, the real S/C pointing during PC12 Virtis-M scan mirror and slit orientation verification was the one shown in Fig.3.
As a result of this pointing, Virtis was able to verify the scan mirror and slit orientation only with the slit in the boresight (the two central cubes) which were not affected by the wrong pointing, since in the edges the S/C was pointing in a wrong position.
With the slit in the boresight the Virts-M scan mirror and slit orientation was good.

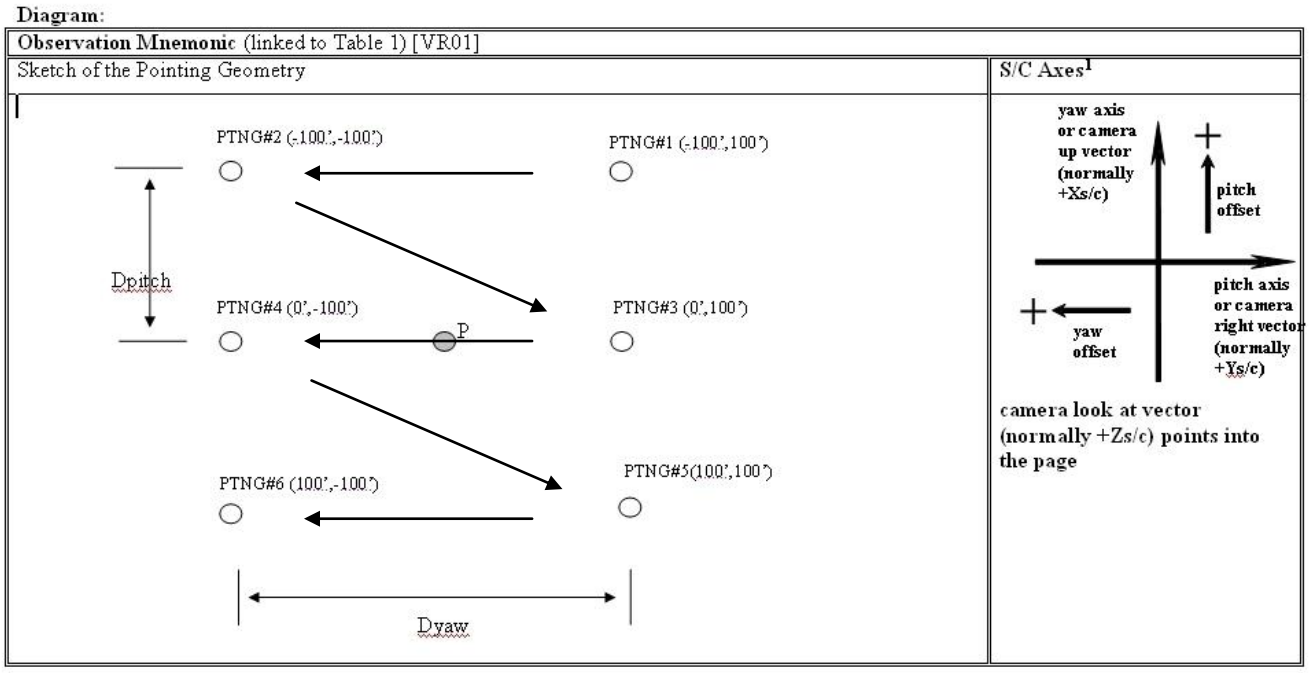
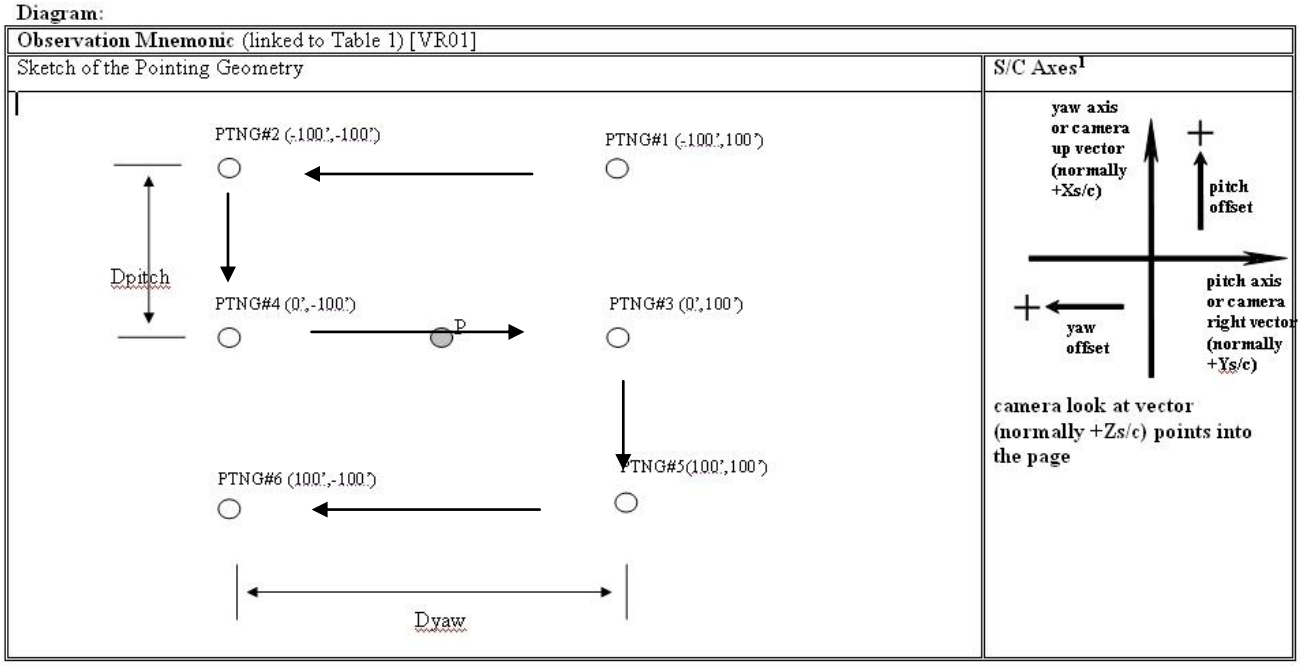


Fig.1

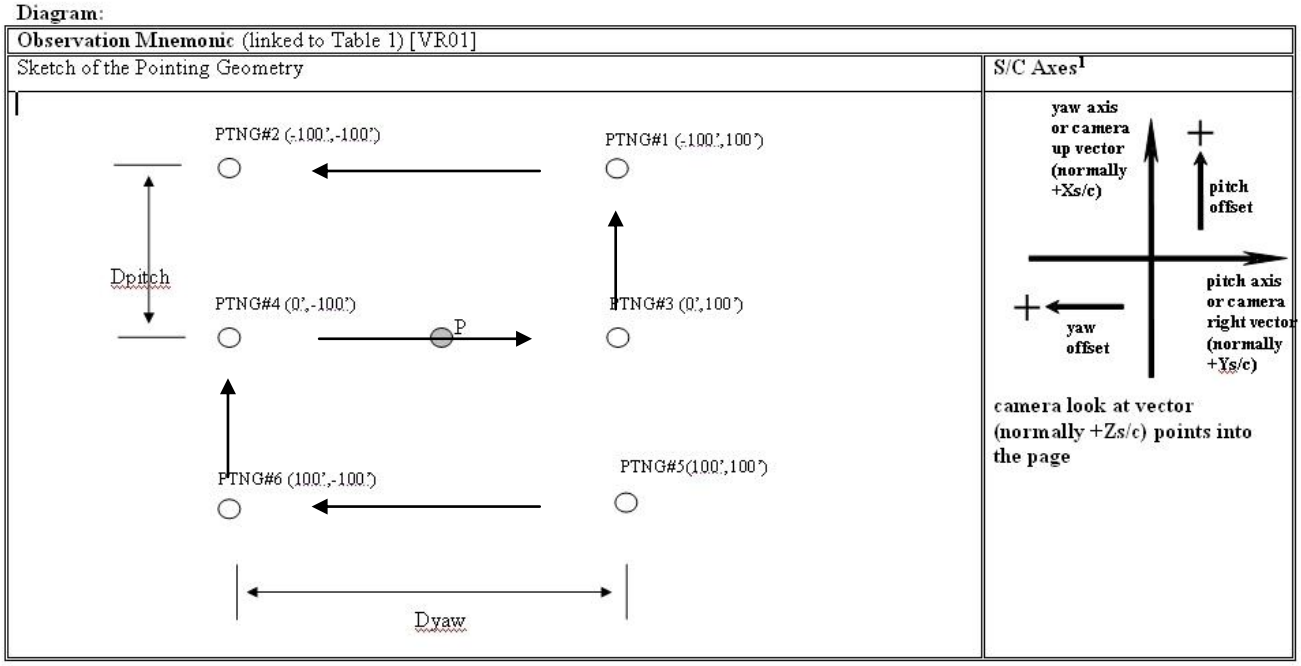
Diagram:



[1] **We define pitch, yaw and roll differently than used by pilots.** See note [1] in Scan/Raster Description section above.

Fig.2

Diagram:



[1] **We define pitch, yaw and roll differently than used by pilots.** See note [1] in Scan/Raster Description section above.

Fig.3

- VR04 Asteroid Vesta Light Curve

  During the VR04 observation the signal from Vesta was very low due to the great distance between Rosetta and Vesta ; Vesta's size was only 1/20th of a high resolution spatial pixels (Vesta at 0.28AU).
  The magnitude of Vesta at the time of observations was 4, which represent the limiting magnitude for VIRTIS.
  Virtis-M was able to receive a little signal from Vesta in the visible (about 4 DN) while no signal was detected in the IR.
  This proves that the pointing was right but the object was too far to obtain a fairly good signal.

6 PC12 Command History

PC12 Command history printout from time: 2010.115.14.15.00 to time: 2010.121.17.07.00					
OIOR	**TC**	**Mnemonic**	**Sequense**	**Execution Time**	
VR ON	ZDMX0047	Define Nom/Red branch for VIRTIS	AVRF001A	10.115.14.15.00.000	
	ZSKA8121	START VIRTIS Power On OBCP	AVRF001A	10.115.14.15.10.000	
	ZVR00125	M Cooler ON in Closed Loop	AVRS001A	10.115.14.25.00.000	
	ZVR00120	M PEM Switch ON	AVRS001A	10.115.14.25.10.000	
M scan mirror and slit orientation verification					
VR03	ZVR00061	MTC_DefaultConf	AVRF005A	10.115.15.25.00.000	**M Calibration**
	ZVR00143	M Set Calibration DP in RAM	AVRF005A	10.115.15.25.01.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF005A	10.115.15.25.02.000	
	ZVR00018	MTC_ChangeCal_R	AVRF005A	10.115.15.25.03.000	
	ZVR00104	Enable M Science on SSMM	AVRF005A	10.115.15.25.04.000	
	ZVR00106	Disable M Science on SSMM	AVRF005A	10.115.15.45.04.000	
	ZVR00123	M Cover Open	AVRF021A	10.115.16.18.00.000	**M Cube M1**
	ZVR00061	MTC_DefaultConf	AVRF010A	10.115.16.19.00.000	
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.115.16.19.01.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.115.16.19.02.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.115.16.19.03.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.115.16.19.04.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.115.16.19.05.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.115.16.24.00.000	
	ZVR00061	MTC_DefaultConf	AVRF010A	10.115.16.32.00.000	**M Cube M2**

	ZVR00142	M Set Science DP in RAM	AVRF010A	10.115.16.32.01.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.115.16.32.02.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.115.16.32.03.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.115.16.32.04.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.115.16.32.05.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.115.16.37.00.000	
	ZVR00061	MTC_DefaultConf	AVRF010A	10.115.16.45.00.000	**M Cube M3**
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.115.16.45.01.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.115.16.45.02.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.115.16.45.03.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.115.16.45.04.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.115.16.45.05.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.115.16.50.00.000	
	ZVR00061	MTC_DefaultConf	AVRF010A	10.115.16.58.00.000	**M Cube M4**
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.115.16.58.01.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.115.16.58.02.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.115.16.58.03.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.115.16.58.04.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.115.16.58.05.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.115.17.03.00.000	
	ZVR00061	MTC_DefaultConf	AVRF010A	10.115.17.11.00.000	**M Cube M5**
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.115.17.11.01.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.115.17.11.02.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.115.17.11.03.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.115.17.11.04.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.115.17.11.05.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.115.17.16.00.000	
	ZVR00061	MTC_DefaultConf	AVRF010A	10.115.17.24.00.000	**M Cube M6**
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.115.17.24.01.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.115.17.24.02.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.115.17.24.03.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.115.17.24.04.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.115.17.24.05.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.115.17.29.00.000	
VR OFF					
	ZVR00124	M Cover Close	AVRF023C	10.115.17.36.00.000	
	ZVR00135	H Cover Close	AVRF023C	10.115.17.38.00.000	
	ZVR00111	Switch PEMs OFF	AVRF023C	10.115.17.40.00.000	
	ZVR00115	Coolers OFF	AVRF022C	10.115.17.46.00.000	
	ZVR00037	VTC_EnterSafe	AVRF004D	10.115.17.47.40.000	
	ZDMX0213	Send Time to VIRTIS 51	AVRF004D	10.115.17.48.10.000	
	ZSKA8122	START VIRTIS Power Off OBCP	AVRF006A	10.115.17.50.00.000	

VR ON					
	ZDMX0047	Define Nom/Red branch for VIRTIS	AVRF001A	10.121.04.10.00.000	
	ZSKA8121	START VIRTIS Power On OBCP	AVRF001A	10.121.04.10.10.000	
	ZVR00125	M Cooler ON in Closed Loop	AVRS001A	10.121.04.20.00.000	
	ZVR00120	M PEM Switch ON	AVRS001A	10.121.04.20.10.000	
Asteroid Vesta Light Curve					
VR04	ZVR00061	MTC_DefaultConf	AVRF005A	10.121.05.20.00.000	**M Calibration**
	ZVR00143	M Set Calibration DP in RAM	AVRF005A	10.121.05.20.01.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF005A	10.121.05.20.02.000	
	ZVR00018	MTC_ChangeCal_R	AVRF005A	10.121.05.20.03.000	
	ZVR00104	Enable M Science on SSMM	AVRF005A	10.121.05.20.04.000	
	ZVR00106	Disable M Science on SSMM	AVRF005A	10.121.05.40.04.000	
	ZVR00123	M Cover Open	AVRF021A	10.121.05.50.00.000	
	ZVR00061	MTC_DefaultConf	AVRF010A	10.121.05.51.00.000	**M Cube M1**
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.121.05.51.01.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.121.05.51.02.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.121.05.51.03.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.121.05.51.04.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.121.05.51.05.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.121.06.50.00.000	**M Cube M2**
	ZVR00061	MTC_DefaultConf	AVRF010A	10.121.06.50.15.000	
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.121.06.50.16.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.121.06.50.17.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.121.06.50.18.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.121.06.50.19.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.121.06.50.20.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.121.07.50.00.000	**M Cube M3**
	ZVR00061	MTC_DefaultConf	AVRF010A	10.121.07.50.15.000	
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.121.07.50.16.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.121.07.50.17.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.121.07.50.18.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.121.07.50.19.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.121.07.50.20.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.121.08.50.00.000	**M Cube M4**
	ZVR00061	MTC_DefaultConf	AVRF010A	10.121.08.50.15.000	
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.121.08.50.16.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.121.08.50.17.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.121.08.50.18.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.121.08.50.19.000	

	ZVR00104	Enable M Science on SSMM	AVRF010A	10.121.08.50.20.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.121.09.50.00.000	**M Cube M5**
	ZVR00061	MTC_DefaultConf	AVRF010A	10.121.09.50.15.000	
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.121.09.50.16.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.121.09.50.17.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.121.09.50.18.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.121.09.50.19.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.121.09.50.20.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.121.10.50.00.000	**M Cube M6**
	ZVR00061	MTC_DefaultConf	AVRF010A	10.121.10.50.15.000	
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.121.10.50.16.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.121.10.50.17.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.121.10.50.18.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.121.10.50.19.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.121.10.50.20.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.121.11.50.00.000	**M Cube M7**
	ZVR00061	MTC_DefaultConf	AVRF010A	10.121.11.50.15.000	
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.121.11.50.16.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.121.11.50.17.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.121.11.50.18.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.121.11.50.19.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.121.11.50.20.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.121.12.50.00.000	**M Cube M8**
	ZVR00061	MTC_DefaultConf	AVRF010A	10.121.12.50.15.000	
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.121.12.50.16.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.121.12.50.17.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.121.12.50.18.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.121.12.50.19.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.121.12.50.20.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.121.13.50.00.000	**M Cube M9**
	ZVR00061	MTC_DefaultConf	AVRF010A	10.121.13.50.15.000	
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.121.13.50.16.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.121.13.50.17.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.121.13.50.18.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.121.13.50.19.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.121.13.50.20.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.121.14.50.00.000	**M Cube M10**
	ZVR00061	MTC_DefaultConf	AVRF010A	10.121.14.50.15.000	
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.121.14.50.16.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.121.14.50.17.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.121.14.50.18.000	

	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.121.14.50.19.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.121.14.50.20.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.121.15.50.00.000	**M Cube M11**
	ZVR00061	MTC_DefaultConf	AVRF010A	10.121.15.50.15.000	
	ZVR00142	M Set Science DP in RAM	AVRF010A	10.121.15.50.16.000	
	ZVR00016	MTC_ChangeOpe_R	AVRF010A	10.121.15.50.17.000	
	ZVR00014	MTC_ChangeFun_R	AVRF010A	10.121.15.50.18.000	
	ZVR00020	MTC_ChangeAlt_R	AVRF010A	10.121.15.50.19.000	
	ZVR00104	Enable M Science on SSMM	AVRF010A	10.121.15.50.20.000	
	ZVR00106	Disable M Science on SSMM	AVRF009A	10.121.16.50.00.000	
VR OFF					
	ZVR00124	M Cover Close	AVRF023C	10.121.16.53.00.000	
	ZVR00135	H Cover Close	AVRF023C	10.121.16.55.00.000	
	ZVR00111	Switch PEMs OFF	AVRF023C	10.121.16.57.00.000	
	ZVR00115	Coolers OFF	AVRF022C	10.121.17.03.00.000	
	ZVR00037	VTC_EnterSafe	AVRF004D	10.121.17.04.40.000	
	ZDMX0213	Send Time to VIRTIS 51	AVRF004D	10.121.17.05.10.000	
	ZSKA8122	START VIRTIS Power Off OBCP	AVRF006A	10.121.17.07.00.000	

7 VR03 Parameter List

	VR03 M Scan mirror and slit orientation verification						
Parameter List		**M1**		**M2**		**M3**	
M_ERT	Repetition Time	1	20 sec	1	20 sec	1	20 sec
M_ACQ_MODE	Acquisition Mode	5	All pix full window	5	All pix full window	5	All pix full window
M_COMP_MODE	Compression	1	Lossless compression	1	Lossless compression	1	Lossless compression
M_IR_EXPO	IR Exposure	100	10 sec	100	10 sec	100	10 sec
M_CCD_EXPO	CCD Exposure	130	13 sec	130	13 sec	130	13 sec
M_IR_WIN_Y1	Start Spatial Pixel	7		7		7	
M_IR_WIN_Y2	Stop Spatial Pixel	262		262		262	
M_CCD_WIN_Y1	Start Spatial Pixel	0		0		0	
M_CCD_WIN_Y2	Stop Spatial Pixel	255		255		255	
M_SU_MODE	Mirror Mode	1	scan	1	scan	1	Scan
M_Alpha_first	Start Angle	3157	15 lines around	3157	15 lines around	30182	15 lines around
M_Alpha_last	Stop Angle	6447	?????	6447	?????	33472	?????
M_D_BCK_RATE	Dark Rate	-----		-----		-----	
Expected duration (sec)			300		300		300
Expected Number of Science Lines			15		15		15
Expected Number of Dark			0		0		0
Expected Data Volume (kbit)			27500		27500		27500

	VR03 M Scan mirror and slit orientation verification						
Parameter List		**M4**		**M5**		**M6**	
M_ERT	Repetition Time	1	20 sec	1	20 sec	1	20 sec
M_ACQ_MODE	Acquisition Mode	5	All pix full window	5	All pix full window	5	All pix full window
M_COMP_MODE	Compression	1	Lossless compression	1	Lossless compression	1	Lossless compression
M_IR_EXPO	IR Exposure	100	10 sec	100	10 sec	100	10 sec
M_CCD_EXPO	CCD Exposure	130	13 sec	130	13 sec	130	13 sec
M_IR_WIN_Y1	Start Spatial Pixel	7		7		7	
M_IR_WIN_Y2	Stop Spatial Pixel	262		262		262	
M_CCD_WIN_Y1	Start Spatial Pixel	0		0		0	
M_CCD_WIN_Y2	Stop Spatial Pixel	255		255		255	
M_SU_MODE	Mirror Mode	1	scan	1	scan	1	scan
M_Alpha_first	Start Angle	30182	15 lines around	57207	15 lines around	57207	15 lines around
M_Alpha_last	Stop Angle	33472	?????	60497	?????	60497	?????
M_D_BCK_RATE	Dark Rate	-----		-----		-----	
Expected duration (sec)			300		300		300
Expected Number of Science Lines			15		15		15
Expected Number of Dark			0		0		0
Expected Data Volume (kbit)			27500		27500		27500

8 VR04 Parameter List

	VR04 Vesta Light Curve						
Parameter List		**M1**		**M2**		**M3**	
M_ERT	Repetition Time	1	20 sec	1	20 sec	1	20 sec
M_ACQ_MODE	Acquisition Mode	5	All pix full window	5	All pix full window	5	All pix full window
M_COMP_MODE	Compression	2	Wavelet compression	2	Wavelet compression	2	Wavelet compression
M_IR_EXPO	IR Exposure	30	3 sec	30	3 sec	20	2 sec
M_CCD_EXPO	CCD Exposure	13	1,3 sec	13	1,3 sec	160	16 sec
M_IR_WIN_Y1	Start Spatial Pixel	7		7		7	
M_IR_WIN_Y2	Stop Spatial Pixel	262		262		262	
M_CCD_WIN_Y1	Start Spatial Pixel	0		0		0	
M_CCD_WIN_Y2	Stop Spatial Pixel	255		255		255	
M_SU_MODE	Mirror Mode	1	scan	1	scan	1	scan
M_Alpha_first	Start Angle	24307	15 lines around	24307	15 lines around	24307	15 lines around
M_Alpha_last	Stop Angle	27597	WAC boresight	27597	WAC boresight	27597	WAC boresight
M_D_BCK_RATE	Dark Rate	15		15		15	
Expected duration (sec)			3540		3540		3540
Expected Number of Science Lines			177		177		177
Expected Number of Dark			11		11		11
Expected Data Volume (kbit)			82000		82000		82000

	VR04 Vesta Light Curve						
Parameter List		**M4**		**M5**		**M6**	
M_ERT	Repetition Time	1	20 sec	1	20 sec	1	20 sec
M_ACQ_MODE	Acquisition Mode	5	All pix full window	5	All pix full window	5	All pix full window
M_COMP_MODE	Compression	2	Wavelet compression	2	Wavelet compression	2	Wavelet compression
M_IR_EXPO	IR Exposure	30	3 sec	30	3 sec	20	2 sec
M_CCD_EXPO	CCD Exposure	13	1,3 sec	13	1,3 sec	160	16 sec
M_IR_WIN_Y1	Start Spatial Pixel	7		7		7	
M_IR_WIN_Y2	Stop Spatial Pixel	262		262		262	
M_CCD_WIN_Y1	Start Spatial Pixel	0		0		0	
M_CCD_WIN_Y2	Stop Spatial Pixel	255		255		255	
M_SU_MODE	Mirror Mode	1	scan	1	scan	1	scan
M_Alpha_first	Start Angle	24307	15 lines around	24307	15 lines around	24307	15 lines around
M_Alpha_last	Stop Angle	27597	WAC boresight	27597	WAC boresight	27597	WAC boresight
M_D_BCK_RATE	Dark Rate	15		15		15	
Expected duration (sec)			3540		3540		3540
Expected Number of Science Lines			177		177		177
Expected Number of Dark			11		11		11
Expected Data Volume (kbit)			82000		82000		82000

	VR04 Vesta Light Curve						
Parameter List		**M7**		**M8**		**M9**	
M_ERT	Repetition Time	1	20 sec	1	20 sec	1	20 sec
M_ACQ_MODE	Acquisition Mode	5	All pix full window	5	All pix full window	5	All pix full window
M_COMP_MODE	Compression	2	Wavelet compression	2	Wavelet compression	2	Wavelet compression
M_IR_EXPO	IR Exposure	20	2 sec	20	2 sec	20	2 sec
M_CCD_EXPO	CCD Exposure	160	16 sec	160	16 sec	160	16 sec
M_IR_WIN_Y1	Start Spatial Pixel	7		7		7	
M_IR_WIN_Y2	Stop Spatial Pixel	262		262		262	
M_CCD_WIN_Y1	Start Spatial Pixel	0		0		0	
M_CCD_WIN_Y2	Stop Spatial Pixel	255		255		255	
M_SU_MODE	Mirror Mode	1	scan	1	scan	1	scan
M_Alpha_first	Start Angle	24307	15 lines around	24307	15 lines around	24307	15 lines around
M_Alpha_last	Stop Angle	27597	WAC boresight	27597	WAC boresight	27597	WAC boresight
M_D_BCK_RATE	Dark Rate	15		15		15	
Expected duration (sec)			3540		3540		3540
Expected Number of Science Lines			177		177		177
Expected Number of Dark			11		11		11
Expected Data Volume (kbit)			82000		82000		82000

	VR04 Vesta Light Curve				
Parameter List		**M10**		**M11**	
M_ERT	Repetition Time	1	20 sec	1	20 sec
M_ACQ_MODE	Acquisition Mode	5	All pix full window	5	All pix full window
M_COMP_MODE	Compression	2	Wavelet compression	2	Wavelet compression
M_IR_EXPO	IR Exposure	20	2 sec	20	2 sec
M_CCD_EXPO	CCD Exposure	160	16 sec	160	16 sec
M_IR_WIN_Y1	Start Spatial Pixel	7		7	
M_IR_WIN_Y2	Stop Spatial Pixel	262		262	
M_CCD_WIN_Y1	Start Spatial Pixel	0		0	
M_CCD_WIN_Y2	Stop Spatial Pixel	255		255	
M_SU_MODE	Mirror Mode	1	scan	1	scan
M_Alpha_first	Start Angle	24307	15 lines around	24307	15 lines around
M_Alpha_last	Stop Angle	27597	WAC boresight	27597	WAC boresight
M_D_BCK_RATE	Dark Rate	15		15	
Expected duration (sec)			3540		3540
Expected Number of Science Lines			177		177
Expected Number of Dark			11		11
Expected Data Volume (kbit)			82000		82000

9 VIRTIS OIOR VR03

```
# $Log: OIOR_PIIRSO_D_0017_VR_03____.ITL,v $
#
#=============================================================================================#
# Filename:         OIOR_PIIRSO_D_0017_VR_01____.ITL
# Type:             Input Timeline file
#
# Description:      VIRTIS VR01 Scan Mirror and V-M Slit alignment
#
#                   name:     RSOC - Michael Kuppers
#                   email:    rsoc@rssd.esa.int
#
#                   name: Virtis team - Fabrizio Capaccioni - Stefano Giuppi
#                   email:    fabrizio.capaccioni@iasf-roma.inaf.it
#                   email:    stefano.giuppi@ifsi-roma.inaf.it
#
# Date:             17 February 2010
#
#
#=============================================================================================#

Version: 00001

Ref_date: 19-Apr-2010

Start_time:  000_00:00:00
End_time:    000_01:11:00
```

```
#Init_mode: VIRTIS IDLE

#=============================================================================================#
Description: "VR01 M scan mirror and slit orientation verification"
#=============================================================================================#


#
# S/C moves to PTR#1 X=-100' Y= - 100' and stares for 4 minutes
#

000_00:00:00        VIRTIS              IDLE        AVRF021A                    # Open VIRTIS-M Cover

000_00:01:00        VIRTIS              IDLE        AVRF010A( \                 # VIRTIS Start-M Nominal Science
                                                                    VVRG0051 = 1 \     # M_ERT              (repetition time 20s)
                                                                    VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                                    VVRG0054 = 1 \     # lossless compression
                                                                     VVRG0029 = 100 \  # M_IR_EXPO      (10s integration time)
                                                                    VVRG0035 = 130 \       # M_CCD_EXPO (13s integration time)
                                                                    VVRG0037 = 3157 \   # M_ALPHA_FIRST (15 slices around ?????)
                                                                    VVRG0038 = 6447 )    # M_ALPHA_LAST

000_00:06:00        VIRTIS              SCIENCE             AVRF009A            # VIRTIS-M Stop acquisition SSMM
#
# Data Volume of the above 27.5 Mbits = 3.5 MBytes
#
#
# S/C moves to PTR#1 X=-100' Y= + 100' and stares for 4 minutes
#
000_00:14:00        VIRTIS              IDLE        AVRF010A( \                 # VIRTIS Start-M Nominal Science
                                                                    VVRG0051 = 1 \     # M_ERT              (repetition time 20s)
                                                                    VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                                    VVRG0054 = 1 \     # lossless compression
                                                                     VVRG0029 = 100 \  # M_IR_EXPO      (10s integration time)
                                                                    VVRG0035 = 130 \       # M_CCD_EXPO (13s integration time)
                                                                    VVRG0037 = 3157 \   # M_ALPHA_FIRST (15 slices around ?????)
                                                                    VVRG0038 = 6447 )    # M_ALPHA_LAST
000_00:19:00        VIRTIS              SCIENCE             AVRF009A            # VIRTIS-M Stop acquisition SSMM
#
# Data Volume of the above 27.5 Mbits = 3.5 MBytes
#
#
# S/C moves to PTR#1 X= 0' Y= - 100' and stares for 4 minutes
#
000_00:27:00        VIRTIS              IDLE        AVRF010A( \                 # VIRTIS Start-M Nominal Science
                                                                     VVRG0051 = 1 \    # M_ERT              (repetition time 20s)
                                                                    VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                                    VVRG0054 = 1 \     # lossless compression
                                                                     VVRG0029 = 100 \  # M_IR_EXPO      (10s integration time)
                                                                     VVRG0035 = 130 \       # M_CCD_EXPO (13s integration time)
                                                                VVRG0037 = 30182 \   # M_ALPHA_FIRST (15 slices around ?????)
                                                                    VVRG0038 = 33472)    # M_ALPHA_LAST
000_00:32:00        VIRTIS              SCIENCE             AVRF009A            # VIRTIS-M Stop acquisition SSMM
#
# Data Volume of the above 27.5 Mbits = 3.5 MBytes
#
#
# S/C moves to PTR#1 X= 0' Y= + 100' and stares for 4 minutes
#
000_00:40:00        VIRTIS              IDLE        AVRF010A( \                 # VIRTIS Start-M Nominal Science
                                                                    VVRG0051 = 1 \     # M_ERT              (repetition time 20s)
                                                                    VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                                     VVRG0054 = 1 \    # lossless compression
                                                                     VVRG0029 = 100 \  # M_IR_EXPO      (10s integration time)
                                                                     VVRG0035 = 130 \       # M_CCD_EXPO (13s integration time)
                                                                VVRG0037 = 30182\   # M_ALPHA_FIRST (15 slices around ?????)
                                                                     VVRG0038 = 33472)    # M_ALPHA_LAST
```

```
000_00:45:00        VIRTIS              SCIENCE          AVRF009A                  # VIRTIS-M Stop acquisition SSMM
#
# Data Volume of the above 27.5 Mbits = 3.5 MBytes
#
#
# S/C moves to PTR#1 X= + 100' Y= - 100' and stares for 4 minutes
#
000_00:53:00        VIRTIS              IDLE      AVRF010A( \                     # VIRTIS Start-M Nominal Science
                                                                        VVRG0051 = 1 \     # M_ERT              (repetition time 20s)
                                                                         VVRG0053 = 5 \    # M_ACQ_MODE   (All pix full window)
                                                                         VVRG0054 = 1 \    # lossless compression
                                                                          VVRG0029 = 100 \  # M_IR_EXPO      (10s integration time)
                                                                        VVRG0035 = 130 \       # M_CCD_EXPO (13s integration time)
                                                                VVRG0037 = 57207\   # M_ALPHA_FIRST (15 slices around ?????)
                                                                        VVRG0038 = 60497)    # M_ALPHA_LAST

000_00:58:00        VIRTIS              SCIENCE          AVRF009A                  # VIRTIS-M Stop acquisition SSMM
#
# Data Volume of the above 27.5 Mbits = 3.5 MBytes
#
#
# S/C moves to PTR#1 X= + 100' Y= + 100' and stares for 4 minutes
#
000_01:06:00        VIRTIS              IDLE      AVRF010A( \                     # VIRTIS Start-M Nominal Science
                                                                         VVRG0051 = 1 \     # M_ERT              (repetition time 20s)
                                                                        VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                                        VVRG0054 = 1 \     # lossless compression
                                                                         VVRG0029 = 100 \  # M_IR_EXPO      (10s integration time)
                                                                        VVRG0035 = 130 \       # M_CCD_EXPO (13s integration time)
                                                                VVRG0037 = 57207\   # M_ALPHA_FIRST (15 slices around ?????)
                                                                        VVRG0038 = 60497 )    # M_ALPHA_LAST

000_01:11:00        VIRTIS              SCIENCE          AVRF009A                  # VIRTIS-M Stop acquisition SSMM
#
# Data Volume of the above 27.5 Mbits = 3.5 MBytes
#
#
# Total Data Volume 3.5 * 6 = 21.0 MBytes
#
# VIRTIS is left in IDLE Mode
```

10 VIRTIS OIOR VR04

```
# $Log: OIOR_PIIRSO_D_0017_VR_04___VVVVV.ITL,v $
#

#
#=============================================================================================#
# Filename:         OIOR_PIIRSO_D_0017_VR_04___VVVVV.ITL
# Type:             Input Timeline file
#
# Description:      VIRTIS Asteroid Vesta LightCurve
#
#                   name:     RSOC - Michael Kuppers
#                   email:    rsoc@rssd.esa.int
#
#                   name: Virtis team - Fabrizio Capaccioni - Stefano Giuppi
#                   email:    fabrizio.capaccioni@iasf-roma.inaf.it
```

```
#                   email:      stefano.giuppi@ifsi-roma.inaf.it
#
# Date:             16 March 2010
#
#
#=============================================================================================#

Version: 00001
Init_mode: VIRTIS IDLE


Ref_date:  01-May-2010

Start_time:  000_00:00:00
End_time:    000_11:00:00

#=============================================================================================#
Description: "VR04 Asteoid Vesta Light Curve"
#=============================================================================================#

# Start_time:  000_05:50:00 along with Osiris SR21
# End_time:    000_16:50:00


#
# Light curve in All pixels full window mode; optimized for IR
#

# New sequence open the M cover
000_00:00:00        VIRTIS              IDLE        AVRF021A          # Open VIRTIS-M Cover

000_00:01:00        VIRTIS              IDLE        AVRF010A(\        # VIRTIS Start-M Nominal Science
                                                                          VVRG0051 = 1 \     # M_ERT              (repetition time 20s)
                                                                          VVRG0053 = 5 \     # M_ACQ_MODE    (All pix full window)
                                                                          VVRG0054 = 2 \     # Wavelet compression (=8)
                                                                          VVRG0029 = 30 \   # M_IR_EXPO        (3s integration time)
                                                                          VVRG0035 = 13 \       # M_CCD_EXPO        (1.3s integration time)
                                                                    VVRG0037 = 24307 \   # M_ALPHA_FIRST (15 slices around WAC b/sight)
                                                                          VVRG0038 = 27597 \    # M_ALPHA_LAST
                                                                          VVRG0041 = 15 )       # Dark Rate (one dark every 15 spectra)

000_01:00:00        VIRTIS              SCIENCE             AVRF009A                  # VIRTIS-M Stop acquisition SSMM
000_01:00:15        VIRTIS              IDLE        AVRF010A(\                        # VIRTIS Start-M Nominal Science
                                                                          VVRG0051 = 1 \     # M_ERT              (repetition time 20s)
                                                                          VVRG0053 = 5 \     # M_ACQ_MODE    (All pix full window)
                                                                          VVRG0054 = 2 \     # Wavelet compression (=8)
                                                                          VVRG0029 = 30 \   # M_IR_EXPO        (3s integration time)
                                                                          VVRG0035 = 13 \       # M_CCD_EXPO (1.3s integration time)
                                                                    VVRG0037 = 24307 \   # M_ALPHA_FIRST (15 slices around WAC b/sight)
                                                                          VVRG0038 = 27597 \    # M_ALPHA_LAST
                                                                          VVRG0041 = 15 )   # Dark Rate (one dark every 15 spectra)

000_02:00:00        VIRTIS              SCIENCE             AVRF009A                  # VIRTIS-M Stop acquisition SSMM
000_02:00:15        VIRTIS              IDLE        AVRF010A(\                        # VIRTIS Start-M Nominal Science
                                                                          VVRG0051 = 1 \     # M_ERT              (repetition time 20s)
                                                                          VVRG0053 = 5 \     # M_ACQ_MODE    (All pix full window)
                                                                          VVRG0054 = 2 \     # Wavelet compression (=8)
                                                                          VVRG0029 = 30 \   # M_IR_EXPO        (3s integration time)
                                                                          VVRG0035 = 13 \       # M_CCD_EXPO (1.3s integration time)
                                                                    VVRG0037 = 24307 \   # M_ALPHA_FIRST (15 slices around WAC b/sight)
                                                                          VVRG0038 = 27597 \    # M_ALPHA_LAST
                                                                          VVRG0041 = 15 )   # Dark Rate (one dark every 15 spectra)

000_03:00:00        VIRTIS              SCIENCE             AVRF009A                  # VIRTIS-M Stop acquisition SSMM
000_03:00:15        VIRTIS              IDLE        AVRF010A(\                        # VIRTIS Start-M Nominal Science
                                                                          VVRG0051 = 1 \     # M_ERT              (repetition time 20s)
                                                                          VVRG0053 = 5 \     # M_ACQ_MODE    (All pix full window)
                                                                          VVRG0054 = 2 \     # Wavelet compression (=8)
                                                                          VVRG0029 = 30 \   # M_IR_EXPO        (3s integration time)
```

```
                                                VVRG0035 = 13 \      # M_CCD_EXPO (1.3s integration time)
                                        VVRG0037 = 24307 \   # M_ALPHA_FIRST (15 slices around WAC b/sight)
                                                VVRG0038 = 27597 \    # M_ALPHA_LAST
                                                VVRG0041 = 15 )  # Dark Rate (one dark every 15 spectra)

000_04:00:00    VIRTIS          SCIENCE         AVRF009A                # VIRTIS-M Stop acquisition SSMM
000_04:00:15    VIRTIS          IDLE    AVRF010A(\                      # VIRTIS Start-M Nominal Science
                                                VVRG0051 = 1 \     # M_ERT             (repetition time 20s)
                                                VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                VVRG0054 = 2 \     # Wavelet compression (=8)
                                                VVRG0029 = 30 \  # M_IR_EXPO       (3s integration time)
                                                VVRG0035 = 13 \      # M_CCD_EXPO (1.3s integration time)
                                        VVRG0037 = 24307 \   # M_ALPHA_FIRST (15 slices around WAC b/sight)
                                                VVRG0038 = 27597 \    # M_ALPHA_LAST
                                                VVRG0041 = 15 )   # Dark Rate (one dark every 15 spectra)

000_05:00:00    VIRTIS          SCIENCE         AVRF009A                # VIRTIS-M Stop acquisition SSMM

#
# Light curve in All pixels full window mode; optimized for VIS
#

000_05:00:15    VIRTIS          IDLE    AVRF010A(\                      # VIRTIS Start-M Nominal Science
                                                VVRG0051 = 1 \     # M_ERT             (repetition time 20s)
                                                VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                VVRG0054 = 2 \     # Wavelet compression (=8)
                                                VVRG0029 = 20 \  # M_IR_EXPO       (2s integration time)
                                                VVRG0035 = 160 \      # M_CCD_EXPO (16s integration time)
                                        VVRG0037 = 24307 \   # M_ALPHA_FIRST (15 slices around WAC b/sight)
                                                VVRG0038 = 27597 \    # M_ALPHA_LAST
                                                VVRG0041 = 15 )   # Dark Rate (one dark every 15 spectra)

000_06:00:00    VIRTIS          SCIENCE         AVRF009A                # VIRTIS-M Stop acquisition SSMM
000_06:00:15    VIRTIS          IDLE    AVRF010A(\                      # VIRTIS Start-M Nominal Science
                                                VVRG0051 = 1 \     # M_ERT             (repetition time 20s)
                                                VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                VVRG0054 = 2 \     # Wavelet compression (=8)
                                                VVRG0029 = 20 \  # M_IR_EXPO       (2s integration time)
                                                VVRG0035 = 160 \      # M_CCD_EXPO (16s integration time)
                                        VVRG0037 = 24307 \   # M_ALPHA_FIRST (15 slices around WAC b/sight)
                                                VVRG0038 = 27597 \    # M_ALPHA_LAST
                                                VVRG0041 = 15 )   # Dark Rate (one dark every 15 spectra)

000_07:00:00    VIRTIS          SCIENCE         AVRF009A                # VIRTIS-M Stop acquisition SSMM
000_07:00:15    VIRTIS          IDLE    AVRF010A(\                      # VIRTIS Start-M Nominal Science
                                                VVRG0051 = 1 \     # M_ERT (repetition time 20s)
                                                VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                VVRG0054 = 2 \     # Wavelet compression (=8)
                                                VVRG0029 = 20 \  # M_IR_EXPO (2s integration time)
                                                VVRG0035 = 160 \      # M_CCD_EXPO (16s integration time)
                                        VVRG0037 = 24307 \   # M_ALPHA_FIRST (15 slices around WAC b/sight)
                                                VVRG0038 = 27597 \    # M_ALPHA_LAST
                                                VVRG0041 = 15 )   # Dark Rate (one dark every 15 spectra)

000_08:00:00    VIRTIS          SCIENCE         AVRF009A                # VIRTIS-M Stop acquisition SSMM
000_08:00:15    VIRTIS          IDLE    AVRF010A(\                      # VIRTIS Start-M Nominal Science
                                                VVRG0051 = 1 \     # M_ERT             (repetition time 20s)
                                                VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                VVRG0054 = 2 \     # Wavelet compression (=8)
                                                VVRG0029 = 20 \  # M_IR_EXPO       (2s integration time)
                                                VVRG0035 = 160 \      # M_CCD_EXPO (16s integration time)
                                        VVRG0037 = 24307 \   # M_ALPHA_FIRST (15 slices around WAC b/sight)
                                                VVRG0038 = 27597 \    # M_ALPHA_LAST
                                                VVRG0041 = 15 )  # Dark Rate (one dark every 15 spectra)

000_09:00:00    VIRTIS          SCIENCE         AVRF009A                # VIRTIS-M Stop acquisition SSMM
000_09:00:15    VIRTIS          IDLE    AVRF010A(\                      # VIRTIS Start-M Nominal Science
                                                VVRG0051 = 1 \     # M_ERT             (repetition time 20s)
```

```
                                                VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                VVRG0054 = 2 \     # Wavelet compression (=8)
                                                 VVRG0029 = 20 \  # M_IR_EXPO       (2s integration time)
                                                 VVRG0035 = 160 \       # M_CCD_EXPO (16s integration time)
                                        VVRG0037 = 24307 \   # M_ALPHA_FIRST (15 slices around WAC b/sight)
                                                VVRG0038 = 27597 \    # M_ALPHA_LAST
                                                VVRG0041 = 15 )   # Dark Rate (one dark every 15 spectra)

000_10:00:00    VIRTIS          SCIENCE         AVRF009A                # VIRTIS-M Stop acquisition SSMM
000_10:00:15    VIRTIS          IDLE    AVRF010A(\                      # VIRTIS Start-M Nominal Science
                                                VVRG0051 = 1 \     # M_ERT            (repetition time 20s)
                                                VVRG0053 = 5 \     # M_ACQ_MODE   (All pix full window)
                                                VVRG0054 = 2 \     # Wavelet compression (=8)
                                                 VVRG0029 = 20 \  # M_IR_EXPO       (2s integration time)
                                                 VVRG0035 = 160 \       # M_CCD_EXPO (16s integration time)
                                        VVRG0037 = 24307 \   # M_ALPHA_FIRST (15 slices around WAC b/sight)
                                                VVRG0038 = 27597 \    # M_ALPHA_LAST
                                                 VVRG0041 = 15 )       # Dark Rate (one dark every 15 spectra)

000_11:00:00    VIRTIS          SCIENCE         AVRF009A                # VIRTIS-M Stop acquisition SSMM

#
# Data Volume = 82Mibit every hour = 902Mibit = 112.75 Mib
```