9201 ITO 2/10/91

October 1, 1990

TO: Distribution
FROM: 725.3/Systems Engineering Section
SUBJECT: Data Packets for MODIS-T

This memo provides top level recommendations for four types of data packets for MODIS-T. The instrument manager and I developed this list. Details on how packets are configured may be found in the Consultative Committee for Space Data Systems (CCSDS) documents referenced in the General Instrument Interface Specification (GIIS).

1. Normal Data: This packet has science data, calibration data, and some engineering data. It includes half a frame of scan data or 6928 bits. These bits are 13 bits per pixel times 34 bands times 15 IFOV in the scan direction = 6630 bits (the readout from one half of the detector array) plus 298 bits for time, orientation, and voltages and currents.

Normal scan data is collected on the sun side of the orbit. On occasion, this type of packet could be collected on the dark side of the orbit.

During one scan of the Earth (one swath), 1007 frames of ground data, 5 dark frames, and 12 calibration frames are collected. The packet format would be the same for all this data, since the calibration and dark frames would use the same detector as the ground scene. Since each packet has data for one half of the detector, a particular pixel would appear in every other packet.

2. Swath End: This packet is collected at the end of each swath of data and consists of the following: electronic reference (2400 bits), thermistors (384 bits), platform position (96 bits), time tag (64bits), and instrument status (200 bits). Additional bits would be added for contingency to bring this packet to a desired size.

3. Night Data: This packet is collected normally during the dark portion of each orbit. For each frame, the 298 bits of time, orientation, and voltages and currents would be collected. A swath would include 1024 frames of 298 bits each, plus the 17 calibratioin frames of 13,260 bits each. The electronic reference, thermistors, POP position, time tag, instrument

status, and packet header would bring the total bits per swath to 537,345 for night data.

4. Diagnostic Data: This packet would be used only in a diagnostic mode. The header would include normal data, plus the type of diagnostic data, plus the number of data values. The size could be fixed, if convenient at about the normal packet size.

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6/10/91

Modis_T Telemetry

	A	B	C	D	E	F
1	Revised on		6/10/91			
2						
3						
4		Num.	Day	Night		Health/Safe
5	Ground Frames		1007	16		
6	Dark frames		5	5		
7	calibration frames		12	12		
8	**total frames**		**1024**	**33**		**1**
9						
10	**#bits/frame**					
11	frame(12 bit A/D plus gain bit)		13260	13260		13260
12	tilt		18	18		18
13	scan		18	18		18
14	time tag		64	64		64
15	**Total Bits per Frame**		**13360**	**13360**		**13360**
16						
17	**bits/swath**					
18	frames (total frames * total bits/frame)		13680640	440880		13360
19	electronic reference (30*13 bits):		390	390		390
20	**thermistors (48*8 bits each)**	**48**				
21	PDU	4	32 bits	32		32
22	C&DH (Side which is on)	4	32	32		32
23	Drive Box	4	32	32		32
24	Detector Drive Box	4	32	32		32
25	Thermal Box	2	16	16		16
26	Detector Power Supply	4	32	32		32
27	Signal Processing Box	4	32	32		32
28	Mechanisms (2 ea for the four mechanisms)	8	64	64		64
29	Calibration Spheres	4	32	32		32
30	PMP	2	16	16		16
31	Optical Bench	8	64	64		64
32	Photo-diode Calibration(4*12 bits)		48	48		
33	Diffuser Encoder		4	4		48
34	Aperture Encoder		8	8		4
35	**Relay Positions (256 * 1 bit each):**	**256**				8
36	Misc.	32				
37	PDU	32	32	32		
38	Mechanism Drive	32	32	32		32
39	C&DH (Side which is on)	32	32	32		32
40	Thermal Box(32)	32	32	32		32
41	Detector Drive Box(32)	32	32	32		32
42	Analog Processing Box(32)	32	32	32		32
43	Detector Power Supply(32)	32	32	32		32
44	**Voltages/Currents(96 - 8 bit):**	**96**				
45	PDU	16	128	128		128
46	C&DH	16	128	128		128
47	Mechanism Drive Electronics	16	128	128		128
48	Detector Drive Electronics	16	128	128		128
49	Analog Processing Electronics	16	128	128		128
50	Thermal Electronics	16	128	128		128
51						
52	Total Bits/Swath (before header):		13682466	441938		64
53	Packet Header (0.68%)		93041	3005	no packets	15218
54	**Total Bits per Swath**		**13775507**	**444943**		0
55						15218
56	Scan Mirror Speed (REV/Min)		6.6	6.6		
57	**Total Scan Time (sec)**		**4.545**	**4.545**	**every 3 scans**	6.6
58						13.636
59	**Transmitted Data Rate (Bits/sec)**		**3030611**	**97887**		
60						1116
61	Orbit Data Rate		day-40% 45	night-60% 55		
62	**Average Orbit Data Rate**		**1270977**			1116
63						

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