THE EOS DATA AND INFORMATION SYSTEM

Albert J. Fleig
Goddard Space Flight Center

WHAT DATA COMPRESSION WILL DO

ON BOARD
- HIGH SPEED NETWORK
- TAPE RECORDERS
  - SIZE
  - RATE
- MULTIPLEXER, Xfr FRAME

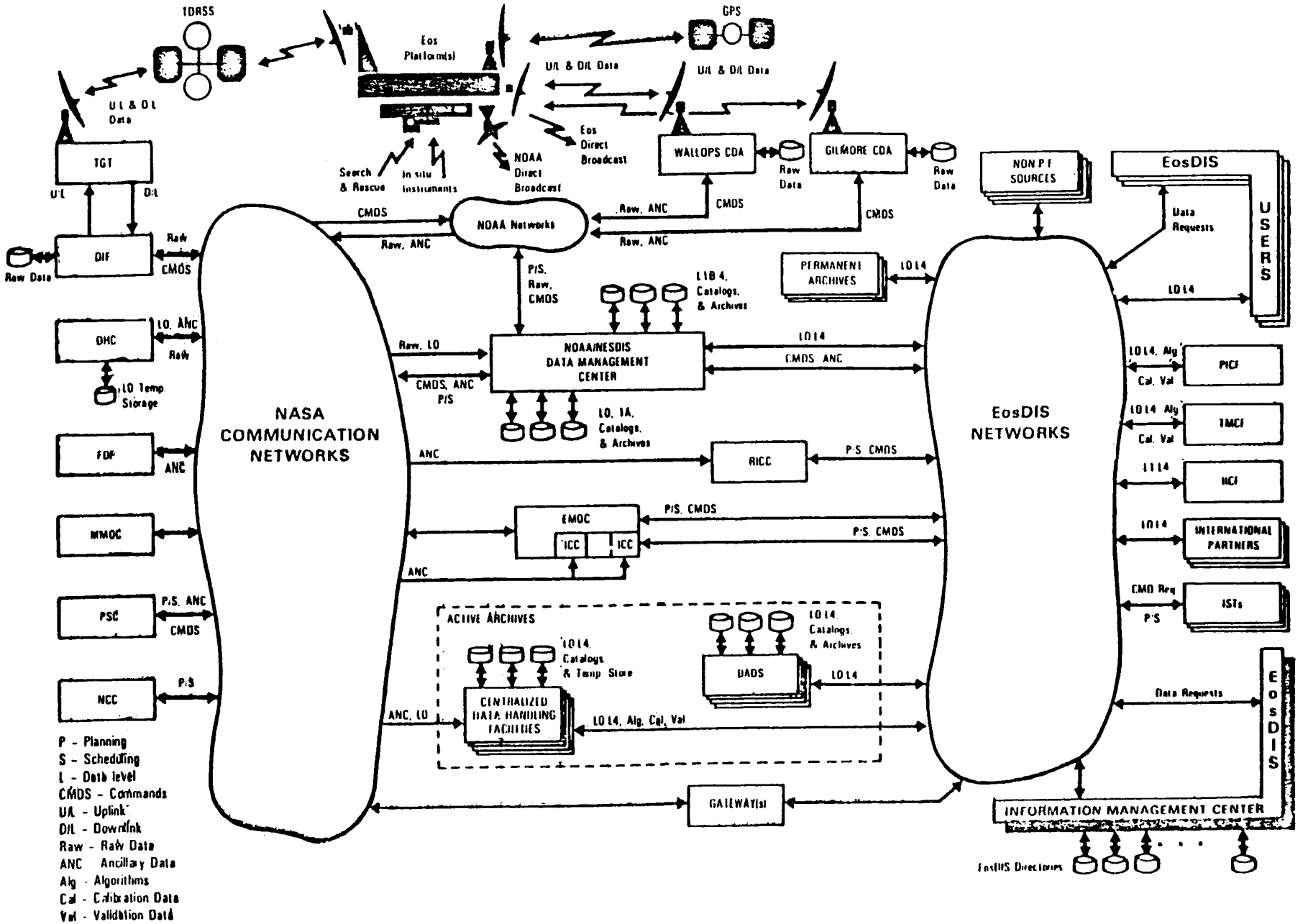
DOWNLINK
- SIMPLIFY SCHEDULING
- REDUCE TIME

DIF/DHC
- SMALLER COMPUTERS
- LESS STORAGE
- EASIER TRANSMISSION

L1-4 PROCESSING
- LESS COMPUTE
- LESS STORAGE
- REDUCE OPERATING COSTS
- EASIER TRANSMISSION

ARCHIVAL
- LESS COMPUTE (SUBSETS, PRODUCTS)
- LESS STORAGE
- REDUCE OPERATING COSTS
- EASE DELIVERY
- EASE MAINTENANCE

SCIENCE USER
- REDUCE COST (?) NOT FOR HIGHER LEVEL
- EASE INGEST (?) NOT FOR HIGHER LEVEL
- REDUCE PROCESSING LOAD NOT FOR HIGHER LEVEL



PRELIMINARY EOS DIS ARCHITECTURE

OVERVIEW: APPROXIMATE INSTRUMENT DATA REQUIREMENTS

NPOP - 1 P.M.

INSTRUMENT	SUPPLIER/ CLASS	OPERATING DATA/RATE MBPS (AVG/PK)	ESTIMATED DUTY CYCLE %D	%N	ESTIMATED DAILY VOL. TERABITS	LINK TDRSS/DB		DATA PROCESSING LEVEL RESPONSIBILITY 0	1	2	3	4
ALT-1	N; OPS	.008/.013	100	100	.0007	T	DB	N/T	N	i	i	i
AMRIR	N; OPS	5.5	100	100	0.475	T	DB	N/T	N	i	i	i
AMSR *1	J; RES	.01	100	100	0.0009	T	--	T	J	i	i	i
AMSU (2)	N; OPS	.0065	100	100	0.0005	T	DB	N/T	N	i	i	i
ARGOS +	F: OPS	.0025	100	100	.0002	?	DB	N	F	i	i	i
CR	AO; RES	.001	100	100	<.0001	T	--	T	DC	i	i	i
ERBI (NS)	N; OPS	.001	100	100	<.0001	T	DB	N/T	N	i	i	i
ERBI (S)	FRG;OPS	.001	100	100	<.0001	T	DB	N/T	N	i	i	i
GOMR *2	N,C;OPS	.01	100	100	0.0009	T	DB	N/T	N	i	i	i
HIRIS *3	U; FAC	10/280	2	0	0.86	T	--	T?	DC	DC/i	DC/i	i
ITIR *4	J; FAC	8.3/52	20	20	0.72	T		T	DC	DC/i	DC/i	i
MAG	AO; RES	.002	100	100	0.0002	T	--	T	DC	i	i	i
MERIS *5	E; FAC	2.4/4.5	100		0.21	T		T	DC	DC/i	DC/i	i
MODIS-N *6	U; FAC	4.85/8.3	100	0	0.42	T	--	T	DC	DC/i	DC/i	i
MPD	AO; RES	.001	100	100	<.0001	T	--	T	DC	i	i	i
PPS/PODS	AO; RES	<.001	100	100	<.0001	T	DB	N/T				
S & R	I; OPS	.0001	100	100	0.00001	-	DB	I				
SCATT-1	N; OPS	.0032	100	100	0.0003	T	DB	N/T	N	i	i	i
SEM	N; OPS	.003	100	100	<.0003	T	DB	N/T	N	i	i	i

* SEE NOTE PAGE

T = CDOS I = INTERNATIONAL DC = DATA CENTER i = INVESTIGATOR

OVERVIEW: APPROXIMATE INSTRUMENT DATA REQUIREMENTS

EPOP - 1 A.M.

INSTRUMENT	SUPPLIER/ CLASS	OPERATING DATA/RATE MBPS (AVG/PK)	ESTIMATED DUTY CYCLE %D	%N	ESTIMATED DAILY VOL. TERABITS	LINK DR/DB		DATA PROCESSING LEVEL RESPONSIBILITY 0	1	2	3	4
ALT-2	E; P/O	.013	100	100	0.001	DR	?	E	E			
AMIR	IT.;RES	.1	100	100	0.009	DR	--	E	IT	i	i	i
AMRIR	N; OPS	5.5/5.5	100	100	0.475	--	DB	E/N	E			
AMSU (2)	UK; OPS	.0065	100	100	0.0006	-	DB	E/N	UK			
ARGOS +	F: OPS	.0025	100	100	0.0002	--	DB	E/N	F			
ATLID	E; RES	.01	50	50	0.0004	DR	--	E	E	D	i	
ATSR +	AUS;OPS	.213	100	100	0.184	--	DB	E/N	AUS			
CSR	FRG;P/O	.008	100	100	0.0007	DR	?	E	FRG			
GLRS	U; RES	.09/.5	15	15	0.008	DR	--	E/T	E/DC	DC/i	DC/i	
HRIS *10	E; RES	39/200	20		2.2	DR	--	E	E			
MAG	AO; RES	.002	100	100	0.0002	DR	--	E	E/DC			
MPD	AO; RES	.001	100	100	<.0001	DR	--	E	E/DC			
PPS/PODS	AO; P/O	.0001	100	100	0.00001	DR	?	E	E			
S & R	I; OPS	.0001	100	100	0.00001	--	DB	I				
SAR-C *11	E; RES	75/200	50	25	6.5	DR	--	E	E	E	E	E
SCATT-2	J; P/O	.003/.005	53	53	0.0003	DR	?	E/N	E			
SEM	N; OPS	.003	100	100	0.0003	--	DB	E/N	E			

* SEE NOTE PAGE
T = CDOS I = INTERNATIONAL DC = DATA CENTER i = INVESTIGATOR

OVERVIEW: APPROXIMATE INSTRUMENT DATA REQUIREMENTS

NPOP - 2 P.M.

INSTRUMENT	SUPPLIER/ CLASS	OPERATING DATA/RATE MBPS (AVG/PK)	ESTIMATED DUTY CYCLE %D	%N	ESTIMATE DAILY VOL. TERABITS	LINK TDRSS/DB		DATA PROCESSING LEVEL RESPONSIBILITY 0	1	2	3	4
F/P-INT	AO; RES	.005	100	100	0.0004	T	--	T	DC	i	i	i
IR-RAD *7	AO; RES	.004	100	100	0.0003	T	--	T	DC	i	i	i
MAG	AO; RES	.002	100	100	0.0002	T	--	T	DC	i	i	i
MLS	AO; RES	.30	100	100	0.0026	T	--	T	DC	i	i	i
MPD	AO; RES	.001	100	100	<.0001	T	--	T	DC	i	i	i
PEM	AO; RES	.004	100	100	0.0003	T	--	T	DC	i	i	i
SAR *8	U,I;RES	20.3/280	50	50	1.754	T/	DB	T?/C	DC/i	DC/i	DC/i	
SUB-MM *9	AO; RES	.003	100	100	<.0003	T	--	T	DC	i	i	i
SUSIM	AO; RES	.002	100	0	<.0002	T	--	T	DC	i	i	i

* SEE NOTE PAGE
T = CDOS I = INTERNATIONAL DC = DATA CENTER i = INVESTIGATOR

REV-3 8/10/87

OVERVIEW: APPROXIMATE INSTRUMENT DATA REQUIREMENTS

JPOP - 1 A.M.

INSTRUMENT	SUPPLIER/ CLASS	OPERATING DATA/RATE MBPS (AVG/PK)	ESTIMATED DUTY CYCLE %D	%N	ESTIMATED DAILY VOL. TERABITS	LINK DR/DB		DATA PROCESSING LEVEL RESPONSIBILITY 0	1	2	3	4
OCTS	J; RES	/2.1				DR	?	J				
AVNIR	J; RES	/60				DR	?	J				
LAWS	U; RES	.05/.1	50	50	.0043	DR	?	J				
AMSR	J; RES	0.1	100	100	.001	DR	?	J				
(SAR-L)	J; RES					DR	?	J				
SAR-X	J; RES	/200				DR	?	J				

INSTRUMENT DATA REQUIREMENTS OVERVIEW

REV 3 8/10/87

* NOTES

*1	AMSR	ASSUMES INTELSAT LINK (TBD)
*2	GOMR	TWO INSTRUMENTS, TOMS - TOTAL OZONE MONITOR GLS - GLOBAL LIMB SCANNER
*3	HIRIS	AVERAGE RATE IS 10 MBPS, LONG TERM AVERAGE IS APPROXIMATELY 3 MBPS
*4	ITIR	ASSUMED AVERAGE RATE
*5	MERIS	SOME OCEAN DATA MAY BE VIA DB: TBD
*6	MODIS-N	DAY RATE 8.4 MBPS, NIGHT RATE 1.5 MBPS
*7	IR-RAD	ESA INSTRUMENT IS THE CSLR
*8	SAR	MAPPING MODE @ 100 MBPS; RESEARCH MODE @ 300 MBPS
*9	SUB-MM	ESA INSTRUMENT IS THE FIRE
*10	HRIS	PLATFORM DATA VOLUME MAY BE LIMITED TO $1x10^{12}$ BITS/DAY TOTAL
*11	SAR-C	PLATFORM DATA VOLUME MAY BE LIMITED TO $1x10^{12}$ BITS/DAY TOTAL

ADDITIONAL NOTES

SAR ON ESA PLATFORM IS A SINGLE FREQUENCY SAR; DATA RATE QUOTED MAY BE HIGHER.

INSTRUMENT ASSIGNMENTS REFLECT THE INTERNATIONAL CO-ORDINATION MEETING (OTTAWA, MAY 87) AND NOT THE AUGUST 1986 BASELINE.

DATA RATES AND VOLUME ARE ESTIMATES ONLY; A DATA RELAY SATELLITE IS ASSUMED FOR THE ESA AND THE JAPANESE PLATFORMS.

ALTHOUGH CSLR AND FIRE ARE BOTH LISTED, IT MAY BE UNLIKELY THAT BOTH WILL BE PROVIDED.

JPOP-1 INSTRUMENT DATA NOT YET AVAILABLE.

LEGEND

AO	SUPPLIED UNDER AO; P.I. CLASS
AUS	AUSTRALIA
C	CANADA
DB	DIRECT BROADCAST
DR	DATA RELAY SATELLITE (ESA)
E	ESA
F	FRANCE
FAC	FACILITY INSTRUMENT (SAME AS CORE INSTRUMENT)
FRG	FEDERAL REPUBLIC OF GERMANY
I	INTERNATIONAL
J	JAPAN
N	NOAA
OPS	OPERATIONAL
P/O	POTENTIAL OPERATIONAL INSTRUMENT
RES	RESEARCH INSTRUMENT
U	U.S.A.
U.K.	UNITED KINGDOM

LIST OF INSTRUMENT ACRONYMS USED IN ANNEX 1

ALT	Radar Altimeter (TOPEX Class of instrument)
AMSR	Advanced Microwave Scanning Radiometer (1500 Km swath; 5 bands (5-60 GHz); 2-20 Km resolution)
AMSU	Advanced Microwave Sounding Unit (as on NOAA - K,L,M)
ARGOS+	An advanced version of the Data Collection and Localization System of NOAA - K,L,M
ATLID	Atmospheric Lidar (a backscatter lidar)
ATSR+	An advanced version of the Along Track Scanning Radiometer provided for ERS-1
AVHRR	Advanced Very High Resolution Radiometer (as on NOAA-K,L,M)
CLSR	Cooled infra-red Limb Sounding Radiometer
CR	Correlation Radiometer (a gas cell non-dispersive spectrometer)
CSR	Conical Scan Radiometer (for measuring Earth radiation budget)
Direct	A direct downlink similar to HRPT, APT, and DSB on NOAA - Broadcast K,L,M
FIRE	Far Infra-Red Experiment (a submillimetre wave limb sounder)
F/P-INT	Fabry-Perot Interfermeter
GLRS	Geodynamic Laser Ranging System
GOMR	Global Ozone Monitoring System
HIRIS	High Resolution Imaging Spectrometer (as propose by NASA)
HIRS	High Resolution Infra-red Radiation Sounder (as on NOAA - K,L,M)
HRIS	High Resolution Imaging Spectrometer (as proposed by Europe)
MAG	Magnetic Field Monitor

MERIS	Medium Resolution Imaging Spectrometer (for ocean and coastal ocean monitoring)
MLS	Microwave Limb Sounder
MODIS-N	Moderate Resolution Imaging Spectrometer - Nadir looking
MODIS-T	Moderate Resolution Imaging Spectrometer - Tiltable
MPD	Magneto-Plasma Dynamics
OCTS	Ocean Color and Temperature Scanner
PEM	Particle Environment Monitor
PPS/PODS	Precise Positioning System/Precise Orbit Determination System
SAR	Synthetic Aperture Radar
SEM	Space Environment Monitor
S & R	Search and Rescue (as on NOAA - K,L,M)
STP	Solar Terrestrial Physics
SUSIM	Solar Ultraviolet Spectral Irradiance Monitor
WIND-SCATTEROMETER	Microwave Wind Scatterometer; double sided swath