MCST Presentation on Schedules

to the

Calibration Working Group

of the

MODIS Science Team

from

MCST (MODIS Characterization Support Team)

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1015 Wednesday, 15 April 1992

Goddard Space Flight Center
Building 8 Auditorium
Greenbelt, Maryland

Attachment 3.14

EOS PM Instrument Science Algorithm and Science Computing Facility Delivery Schedule

February 21, 1992

Deliverable	Date	Version
Software and Data Management Plan	6/92	preliminary
	6/93	draft
	6/94	revision
	6/95	final
Science Computing Facility Plan	6/92	preliminary
	6/93	draft
	6/94	revision
	6/95	final
	as needed	revisions
Calibration Plan	6/95	draft
	6/96	revision
	6/97	final
Software review materials	annually	
Software, test data, and documentation	launch -36m	Version 1
	launch -24m	Version 2
	launch -12m	Version 3
Status reports	monthly	
533 financial reports	quarterly <$500k/year monthly >$500k/year	

Documents Expected From MODIS-N Contractor (SBRC)

Preliminary Plans (delivered 17 SEP 91)

- MODIS-N Calibration Management Plan
- MODIS-N Performance Verfication Plan

Final Plans (to be delivered one day before OCT92 PDR for EOS review)

- MODIS-N Calibration Management Plan
- MODIS-N Performance Verfication Plan

Operational Documents

- User's Guide for Operating MODIS-N
  (delivered via MCST to ICC/EOC/ECS/EOSDIS
  on same schedule as algorithms)
- Results of Pre-Launch Characterization and Calibration
  (delivered by Instrument following Pre-Ship Reviews)

Key MCST Hardware Milestones

To Monitor MODIS-N Instrument-Level I & T

Ambient and thermal vacuum testing and calibration
about 6 months before delivery from SBRC/HAC to GE

October 1994	Engineering Model
December 1995	Prototype Model for EOS-AM1 Observatory
June 1997	Flight 1 Model for EOS-PM1 Observatory
December 1998	Flight 2 Model for EOS-AM2 Observatory

To Monitor MODIS-N Spacecraft-Level I & T

June 1996	Prototype Model for EOS-AM1 Observatory
December 1997	Flight 1 Model for EOS-PM1 Observatory
June 1999	Flight 2 Model for EOS-AM2 Observatory

MCST/EOC Workstation Delivery

Hardware up-grades on 3 year centers

January 1995	Prototype Model
January 1998	Operational Model 1 for EOS-AM1 ICC
June 2001	Operational Model 2 for EOS-PM1 ICC

Key MCST Software Milestones

To Monitor MODIS-N Instrument-Level I & T

October 1992	Concept Development of Engineering Model
April 1993	Code Engineering Model Software
October 1993	Test Engineering Model Software
April 1994	Deliver Engineering Model Software
June 1995	Prototype Model for EOS-AM1 Observatory
January 1997	Flight 1 Model for EOS-PM1 Observatory
June 1998	Flight 2 Model for EOS-AM2 Observatory

To Monitor MODIS-N Spacecraft-Level I & T

June 1996	Prototype Model for EOS-AM1 Observatory
December 1997	Flight 1 Model for EOS-PM1 Observatory
June 1999	Flight 2 Model for EOS-AM2 Observatory

MCST/EOC Workstation Software Delivery

Software up-grades on 1 year centers

January 1995	Prototype Model
January 1998	Operational Model 1 for EOS-AM1 ICC
June 2001	Operational Model 2 for EOS-PM1 ICC

Key MCST Algorithm Milestones

MCST Algorithm Deliveries

October 1992	Peer Review of Algorithms
January 1993	Version 0 Algorithms to MSDST
January 1994	Version 0 Algorithms for MSDST Integration
January 1994	**ECS PDR**
June 1995	Version 0 Algorithms for MSDST Test and Delivery
June 1995	Version 1 Algorithms to MSDST
January 1996	Version 1 Algorithms for MSDST Integration
June 1996	Version 1 Algorithms for MSDST Test and Delivery
June 1996	**ECS Version 1 Delivery**
October 1996	Version 2 Algorithms to MSDST
April 1997	Version 2 Algorithms for MSDST Integration
June 1997	Version 2 Algorithms for MSDST Test and Delivery
June 1997	End-to-End Software Test
June 1997	**ECS Version 2 Delivery**
January 1998	Post-Launch Algorithm Development
June 1998	**Launch of EOS-AM Platform**

1 April 1992

To: 423/Acting EOSDIS Manager/H. K. Ramapriyan
From: 925/Head, MCST/John Barker
Subject: MCST GSFC/Test Site Communication Link Requirements

At our March 24th meeting with you, Jack Peddicord, Bernie Cullinan, Joann Harnden and myself, you indicated that you could probably support the pre-launch MCST (MODIS Characterization Support Team) communication requirements for data in near-real time from the MODIS instruments, however, you did want to see those requirements explicitly presented so that your communication expert could identify the most cost-effective link. Per your request, this memo sets out the approximate MCST communication link requirements. Actual requirements will be identified as test procedures and schedules are approved. MCST needs near-real-time access to pre-launch MODIS test data as it is taken; these test sessions are of limited duration and happen about five times in the course of the development of each copy of the instrument.

The most convenient and scientifically useful method of communication is to transmit the full data stream from the instrument as it is generated and sent to the bench test equipment. However, this is also the worst case communciation requirement (11Mbps). If the full 11 Mbps is not utilized for test data and if SBRC agreees to provide a buffer at their end then our needs may be satisfied with lower rates. Access is needed to the line during the whole period of the test, however, meaningful data will usually be obtained from the instrument in bursts of several hours at a time, and usually for less than 12 hours in any twenty-four hour period. A summary of our approximate requirements is given in the attached table. Communication links are from the location listed to MCST's facility in the EOSDIS Building at GSFC.

It is assumed that two-way access to MCST and SBRC computer files will be possible over standard Internet connections throughout the entire period of the MODIS SBRC contract.

cc
M. Banks/423
W. Barnes/970
B. Grant/925
B. Guenther/925
J. Harnden/925
M. King/913
V. Salomonson/900
L. Stuart/920
S. Tompkins/510.1
R. Weber/421

Approximate Requirements for MCST GSFC/MODIS Test Site Communication Links

Test	Amount of Data (Mbps)	Total Active Transmisstion Time (Hours)	Integration & Test Period Start Date	End Date	Location
Eng Cal.	11	~1000	JUL 1994	DEC 1994	SBRC/Santa Barbara, CA
PF Cal	11	~1000	JUL 1995	DEC 1995	SBRC/Santa Barbara, CA
F1 Cal	11	~1000	MAY 1996	JAN 1997	SBRC/Santa Barbara, CA
F2 Cal	11	~1000	MAY 1997	NOV 1997	SBRC/Santa Barbara, CA
F3 Cal	11	~1000	MAR 2000	AUG 2000	SBRC/Santa Barbara, CA
PF TV	11	~700	FEB 1996	APR 1996	HAC/El Segundo, CA
F1 TV	11	~700	MAR 1997	MAY 1997	HAC/El Segundo, CA
F2 TV	11	~700	JAN 1998	MAR 1998	HAC/El Segundo, CA
F3 TV	11	~700	OCT 2000	DEC 2000	HAC/El Segundo, CA
PF Cross-Cal	11	~350	JUL 1996	DEC 1996	GE/East Windsor, NJ
EOSAM1 TV	11	~700	JAN 1997	DEC 1997	GE/East Windsor, NJ
F1 Cross-Cal	11	~350	FEB 1998	AUG 1998	GE/East Windsor, NJ
EOSPM1 TV	11	~700	SEP 1998	SEP 1999	GE/East Windsor, NJ
F2 Cross-Cal	11	~350	AUG 1999	JAN 2000	GE/East Windsor, NJ
EOSAM2 TV	11	~700	FEB 2000	FEB 2001	GE/East Windsor, NJ
F3 Cross-Cal	11	~350	FEB 2001	AUG 2001	GE/East Windsor, NJ
EOSPM2 TV	11	~700	SEP 2001	SEP 2002	GE/East Windsor, NJ
EOSAM1 Launch	0.004	~175	MAY 1998	JUN 1998	Vandenberg AFB, CA
EOSPM1 Launch	0.004	~175	MAY 2000	JUN 2000	Vandenberg AFB, CA

FILTER PROCUREMENT IS ON TRACK

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- RFQ MAILED
- BIDDERS HAVE SIX WEEKS TO PREPARE RESPONSE
- SBRC WILL HAVE 4 WEEKS TO EVALUATE PROPOSALS AND SELECT VENDOR(S)
- SBRC/GSFC WILL HAVE FOUR WEEKS TO APPROVE PURCHASE ORDER
- CONTRACT AWARD TO VENDORS
- DELIVERY OF ALL FILTERS AND DICHROICS: EM, PFM, FM1, FM2, 1 SPARE SET 30

14 FEB 1992	30 MAR 1992	24 APR 1992	29 MAY 1992	10 JUN 1992	FEB 1993

14JWF3/6/92

MODIS-N SUMMARY SCHEDULE

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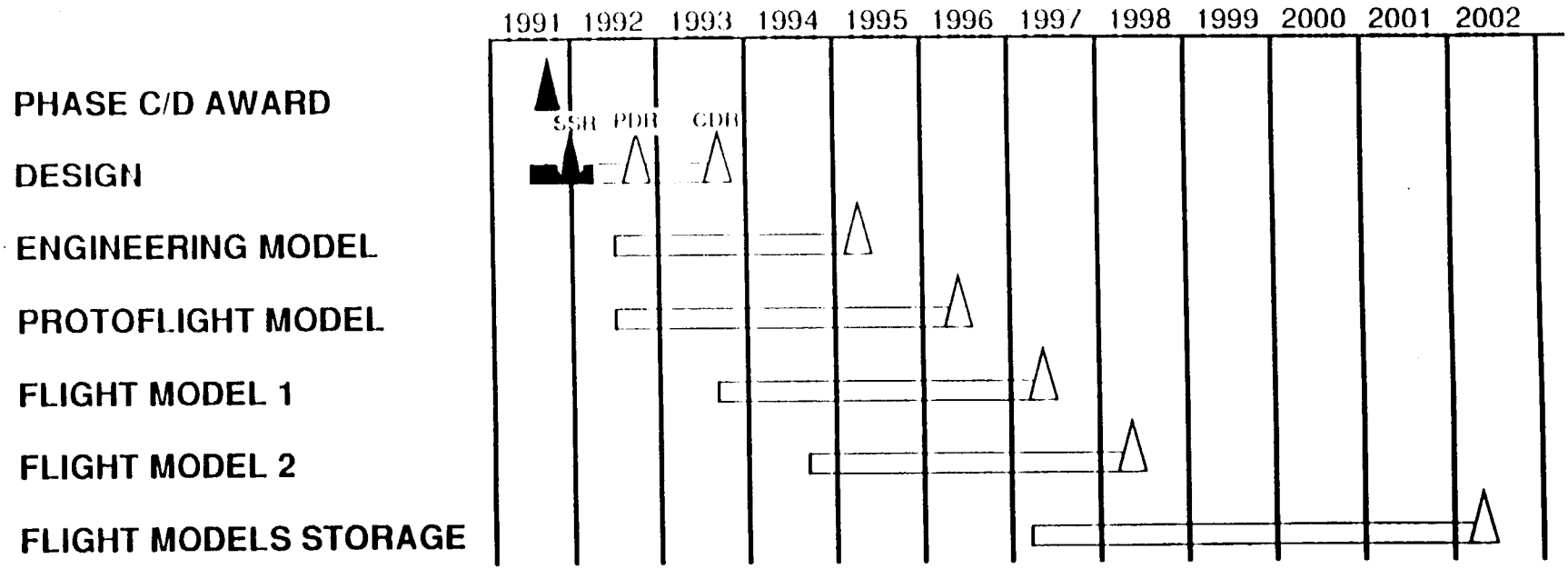

03/92
92-0163-16

SYSTEM INTEGRATION &TEST RESPONSIBILITIES

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- FOR EACH MODIS-N INSTRUMENT:
  - INTEGRATE 16 MAJOR SUBASSEMBLIES
  - PERFORM AT LEAST 20 SYSTEM-INTEGRATION TESTS
  - PERFORM AT LEAST 25 SYSTEM-LEVEL TESTS & MEASUREMENTS
- CONTINUING INTEGRATION & TEST PLANNING IAW THIS PROGRAM SCHEDULE:

```
                                |--1993--|--1994--|--1995--|--1996--|--1997--|--1998-
- ENGINEERING MODEL        9/16Δ----------Δ 4/21
- PROTOFLIGHT MODEL                 9/30Δ----------Δ 3/11
- FLIGHT MODEL 1                              1/1Δ----------Δ 5/1
- FLIGHT MODEL 2                                  12/2 Δ----------Δ 3/2
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3/6/92
92-0000-2

FLIGHT SOFTWARE STATUS & PLANS

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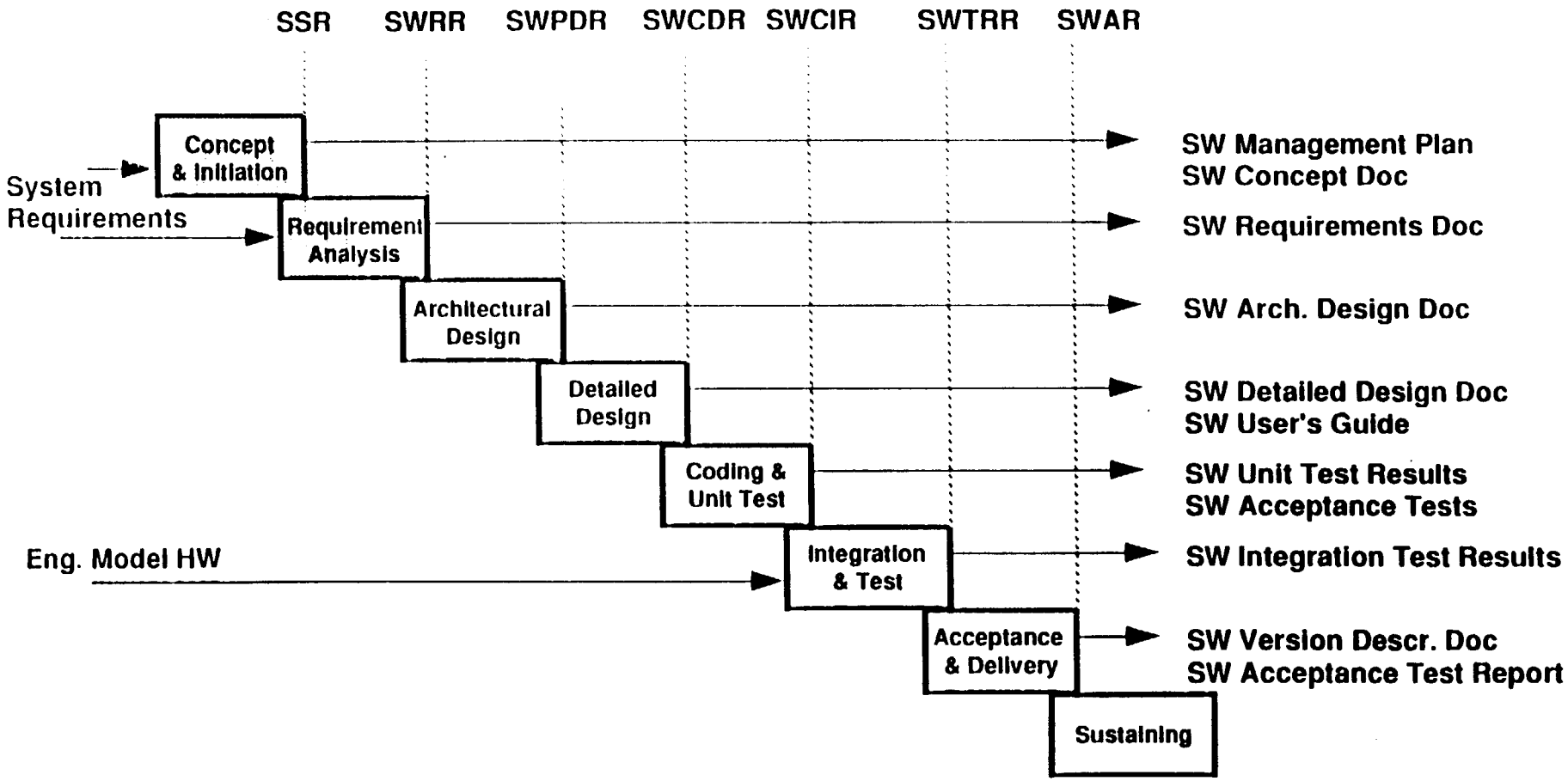
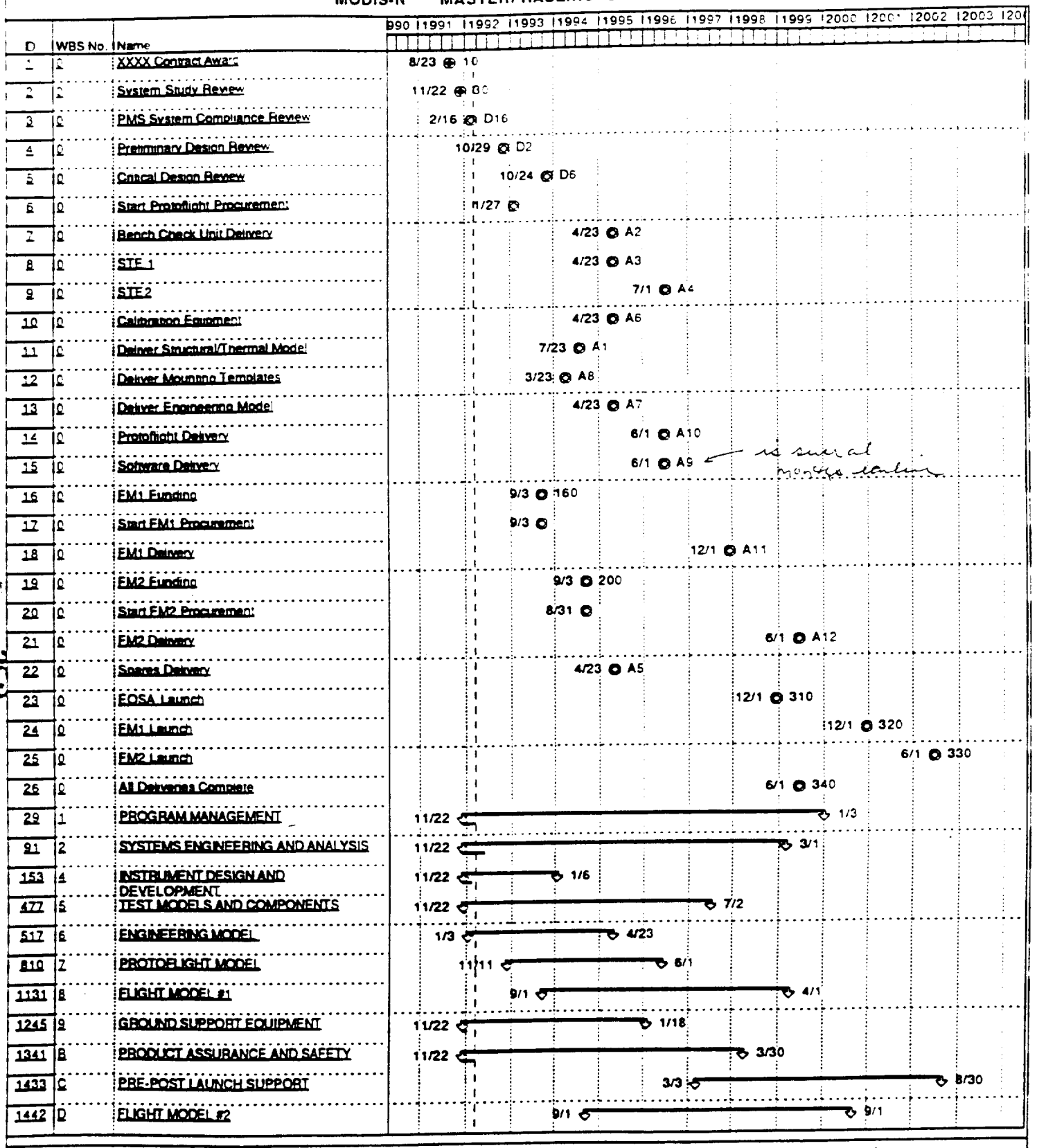


03/93
92-0163-257

MODIS-N MASTERPHASEING SCHEDULE



ID	WBS No.	Name	Start	Finish
1	0	XXXX Contract Award	8/23	10
2	0	System Study Review	11/22	30
3	0	PMS System Compliance Review	2/16	D16
4	0	Preliminary Design Review	10/29	D2
5	0	Critical Design Review	10/24	D6
6	0	Start Protoflight Procurement	11/27	
7	0	Bench Check Unit Delivery	4/23	A2
8	0	STE 1	4/23	A3
9	0	STE 2	7/1	A4
10	0	Calibration Equipment	4/23	A6
11	0	Deliver Structural/Thermal Model	7/23	A1
12	0	Deliver Mounting Templates	3/23	A8
13	0	Deliver Engineering Model	4/23	A7
14	0	Protoflight Delivery	6/1	A10
15	0	Software Delivery	6/1	A9 ← is several months earlier
16	0	FM1 Funding	9/3	160
17	0	Start FM1 Procurement	9/3	
18	0	FM1 Delivery	12/1	A11
19	0	FM2 Funding	9/3	200
20	0	Start FM2 Procurement	8/31	
21	0	FM2 Delivery	6/1	A12
22	0	Spares Delivery	4/23	A5
23	0	EOSA Launch	12/1	310
24	0	FM1 Launch	12/1	320
25	0	FM2 Launch	6/1	330
26	0	All Deliveries Complete	6/1	340
29	1	PROGRAM MANAGEMENT	11/22	1/3
91	2	SYSTEMS ENGINEERING AND ANALYSIS	11/22	3/1
153	4	INSTRUMENT DESIGN AND DEVELOPMENT	11/22	1/6
477	5	TEST MODELS AND COMPONENTS	11/22	7/2
517	6	ENGINEERING MODEL	1/3	4/23
810	7	PROTOFLIGHT MODEL	11/11	6/1
1131	8	FLIGHT MODEL #1	9/1	4/1
1245	9	GROUND SUPPORT EQUIPMENT	11/22	1/18
1341	B	PRODUCT ASSURANCE AND SAFETY	11/22	3/30
1433	C	PRE-POST LAUNCH SUPPORT	3/3	8/30
1442	D	FLIGHT MODEL #2	9/1	9/1

Project: VJ50

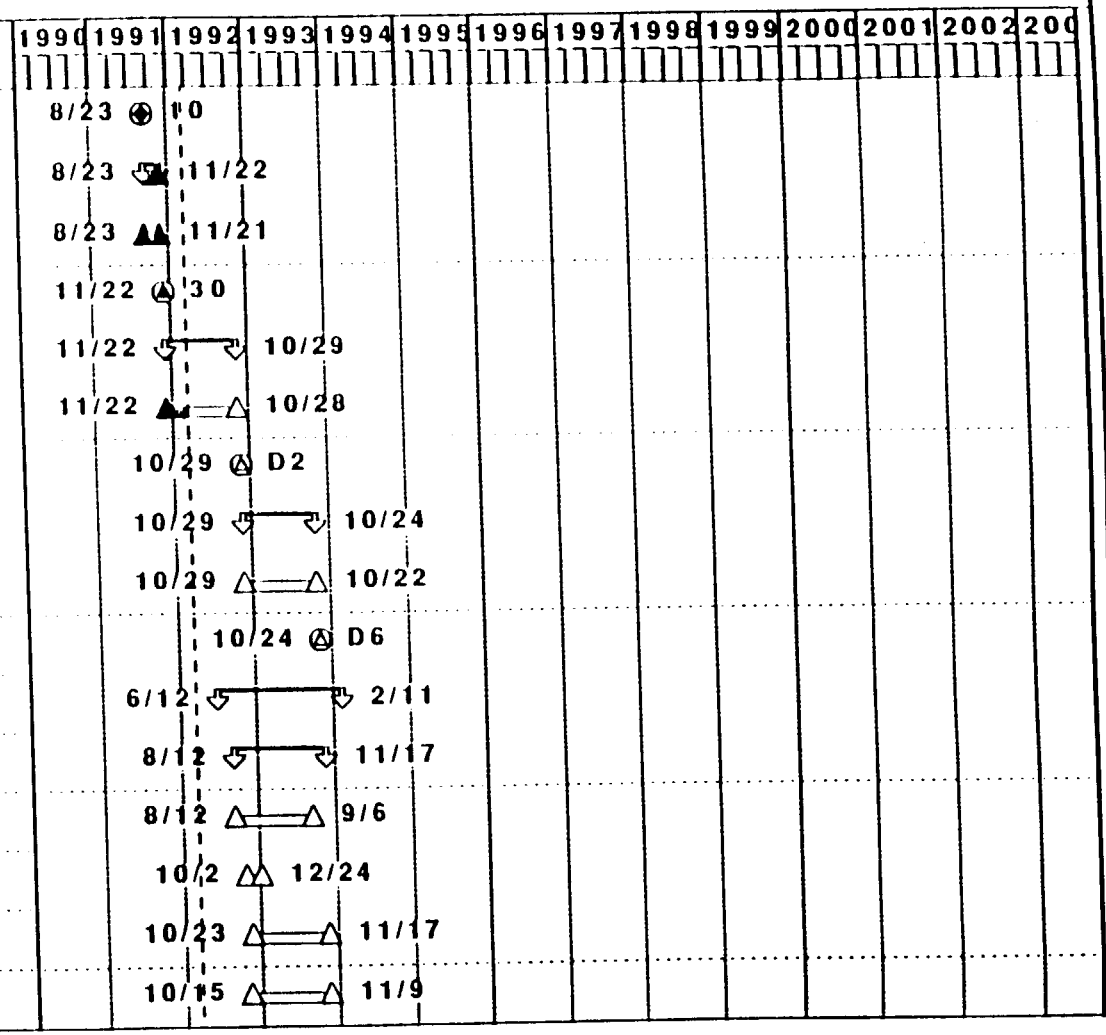
Date: 3/6/92 3:30 pm

Baseline
Critical
Noncritical
Progress
Milestone
Complete Milestone
Control Milestone
Comp. Ctrl. Mstone
Summary
Summary Progress
Completed Work
Slippage
Slippage complete

L.CANDELL

360

MODIS-N EXPANDED SUMMARY SCHEDULE



Project: VJ50

Date: 3/4/92 7:01 pm

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Noncritical
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Milestone
Complete Milestone
Control Milestone
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Summary
Summary Progress
Completed Work
Slippage
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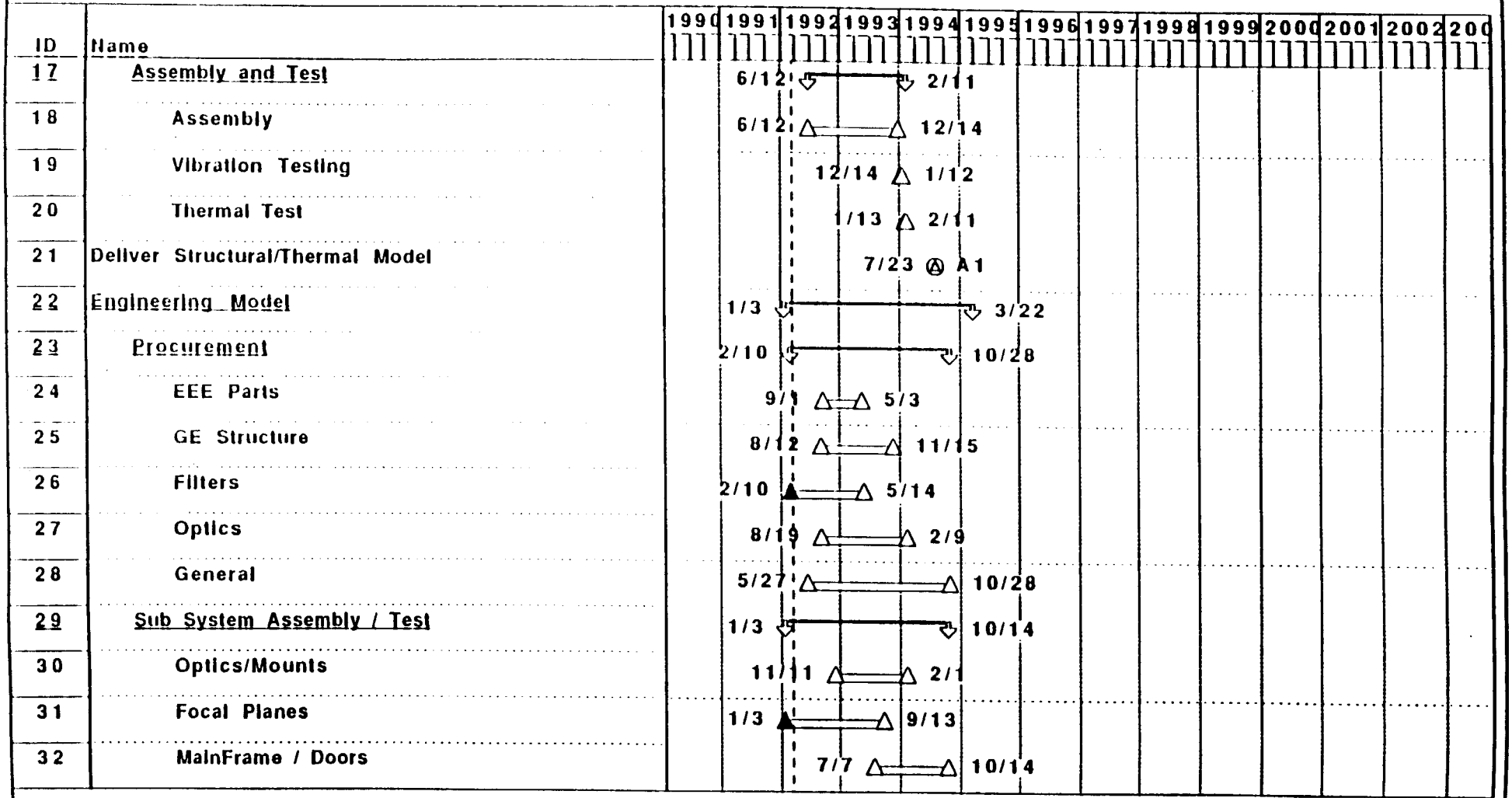
MODIS-N EXPANDED SUMMARY SCHEDULE



Project: VJ50

Date: 3/4/92 7:01 pm

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Summary
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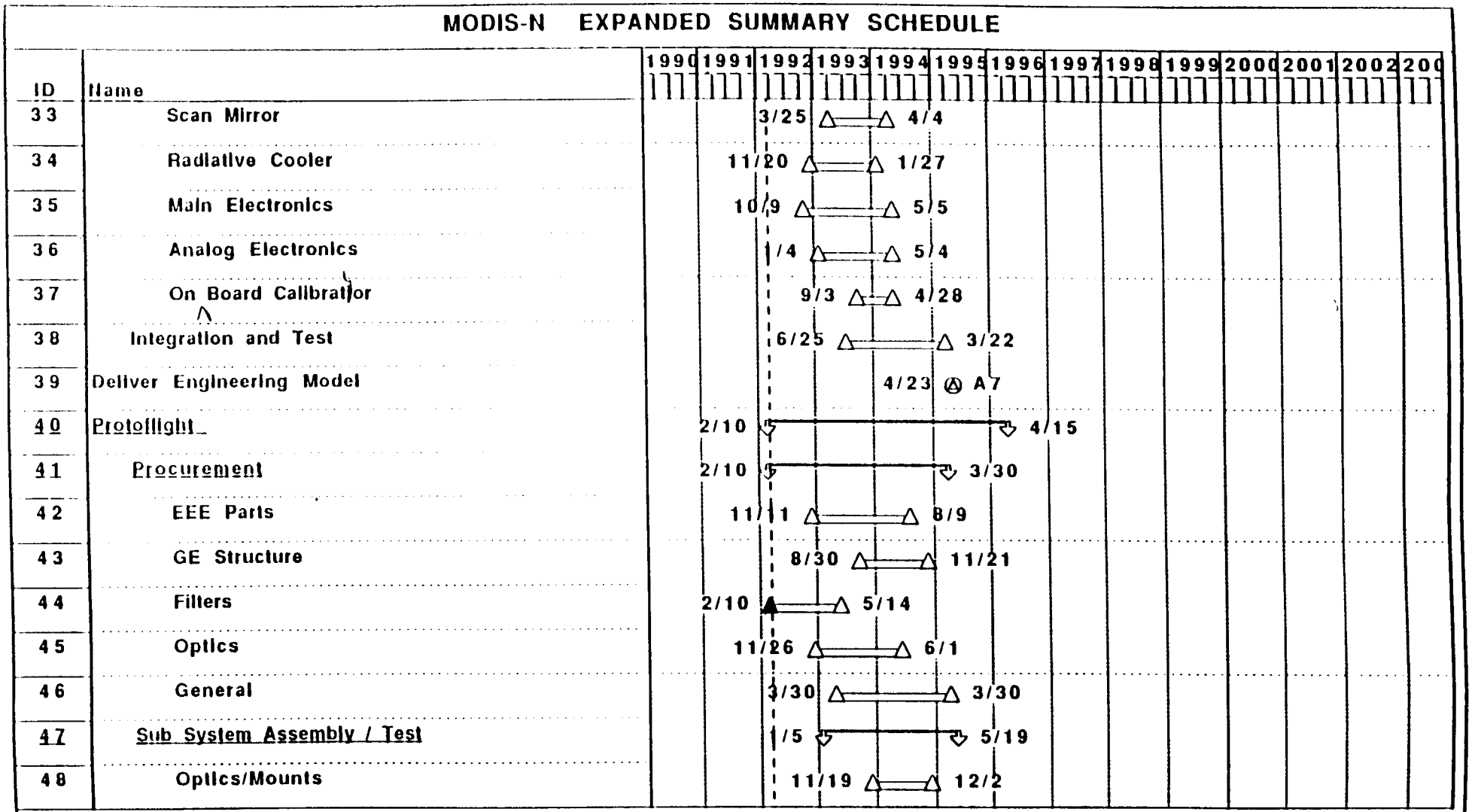
MODIS-N EXPANDED SUMMARY SCHEDULE

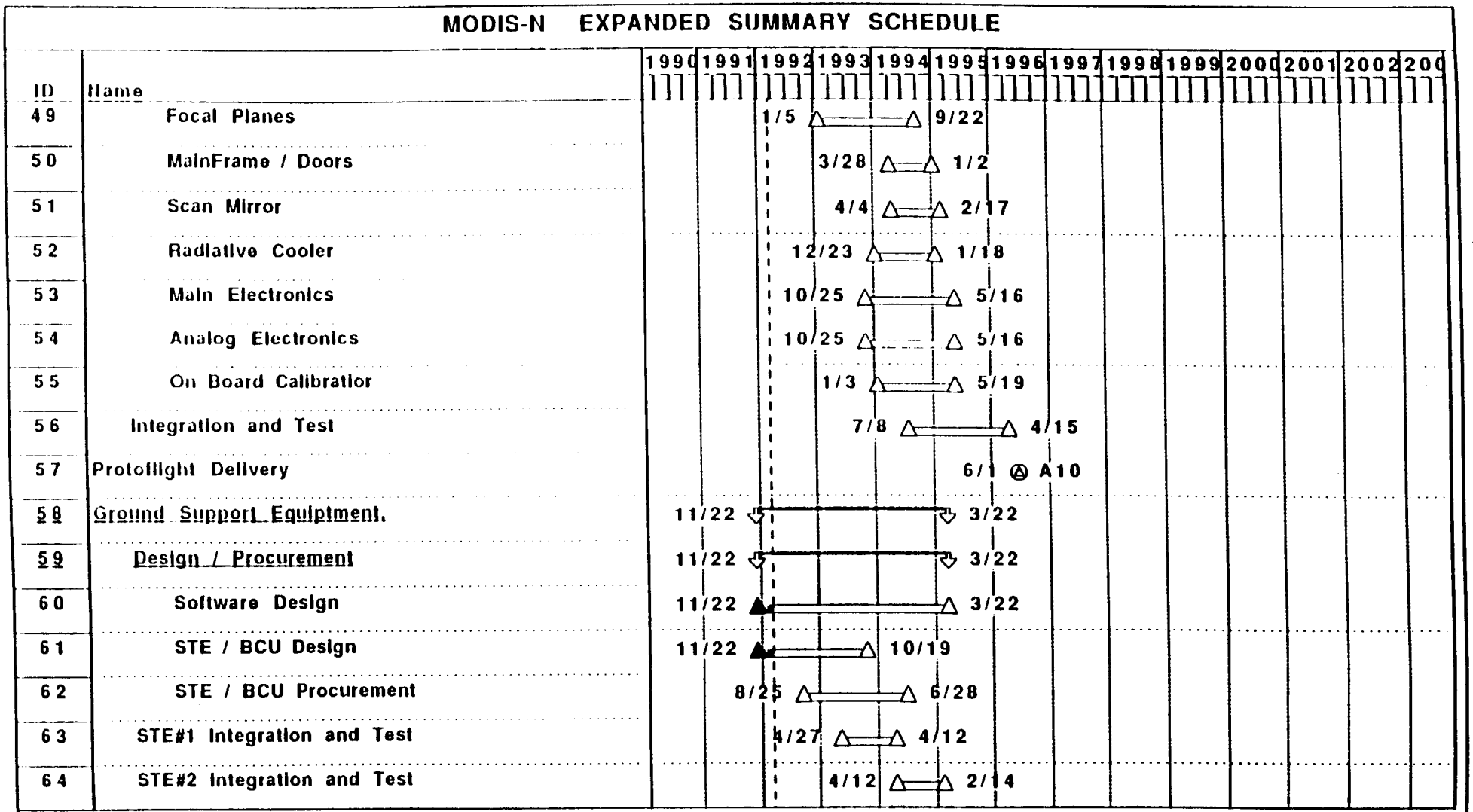


Project: VJ50

Date: 3/4/92 7:01 pm

Baseline	Complete Milestone	Completed Work
Critical	Control Milestone	Slippage
Noncritical	Comp. Ctrl. Mstone	Slippage complete
Progress	Summary	
Milestone	Summary Progress	

MODIS-N EXPANDED SUMMARY SCHEDULE

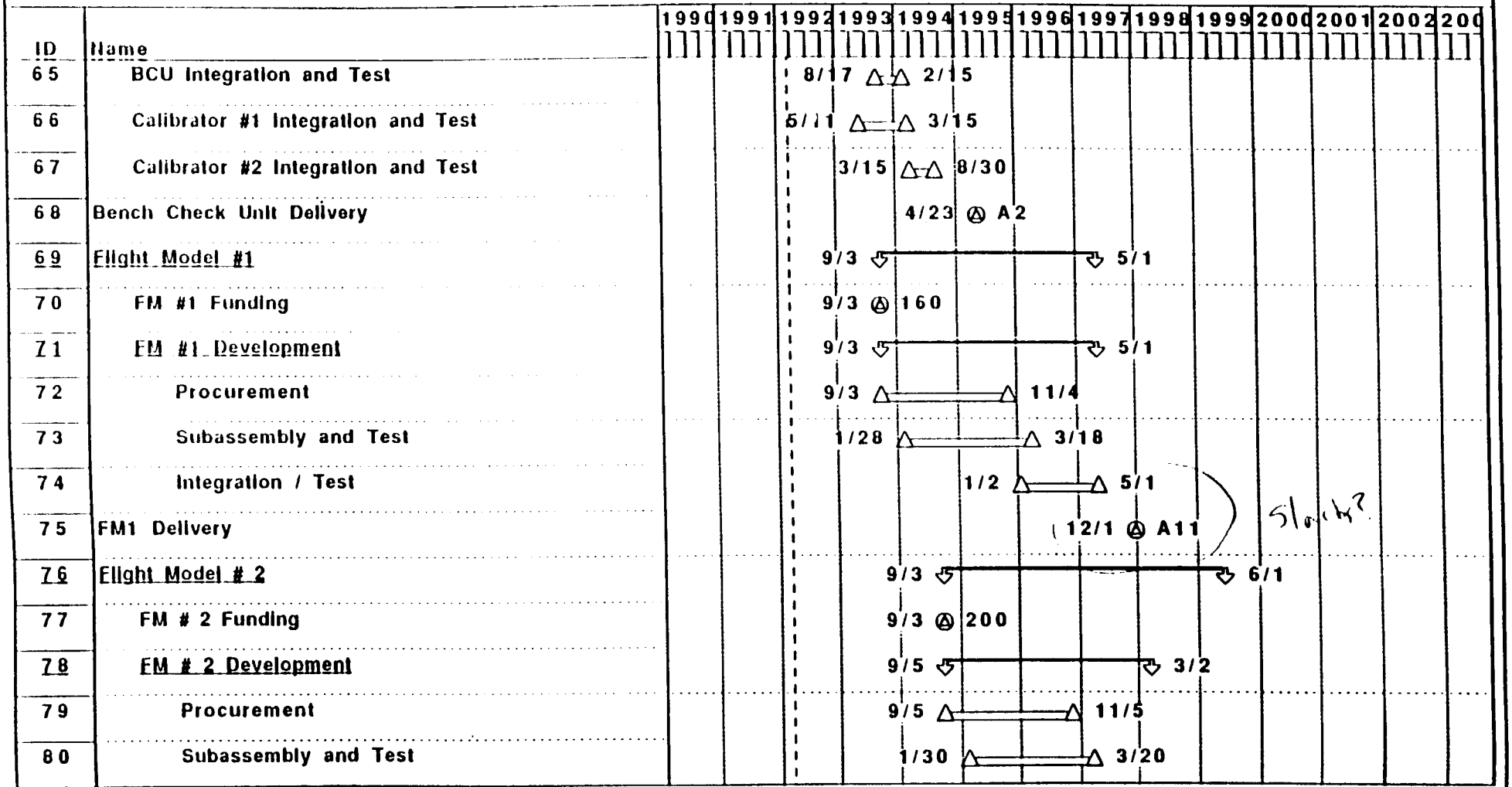


Project: VJ50

Date: 3/4/92 7:01 pm

Baseline	Complete Milestone	Completed Work
Critical	Control Milestone	Slippage
Noncritical	Comp. Ctrl. Mstone	Slippage complete
Progress	Summary	
Milestone	Summary Progress	

MODIS-N EXPANDED SUMMARY SCHEDULE



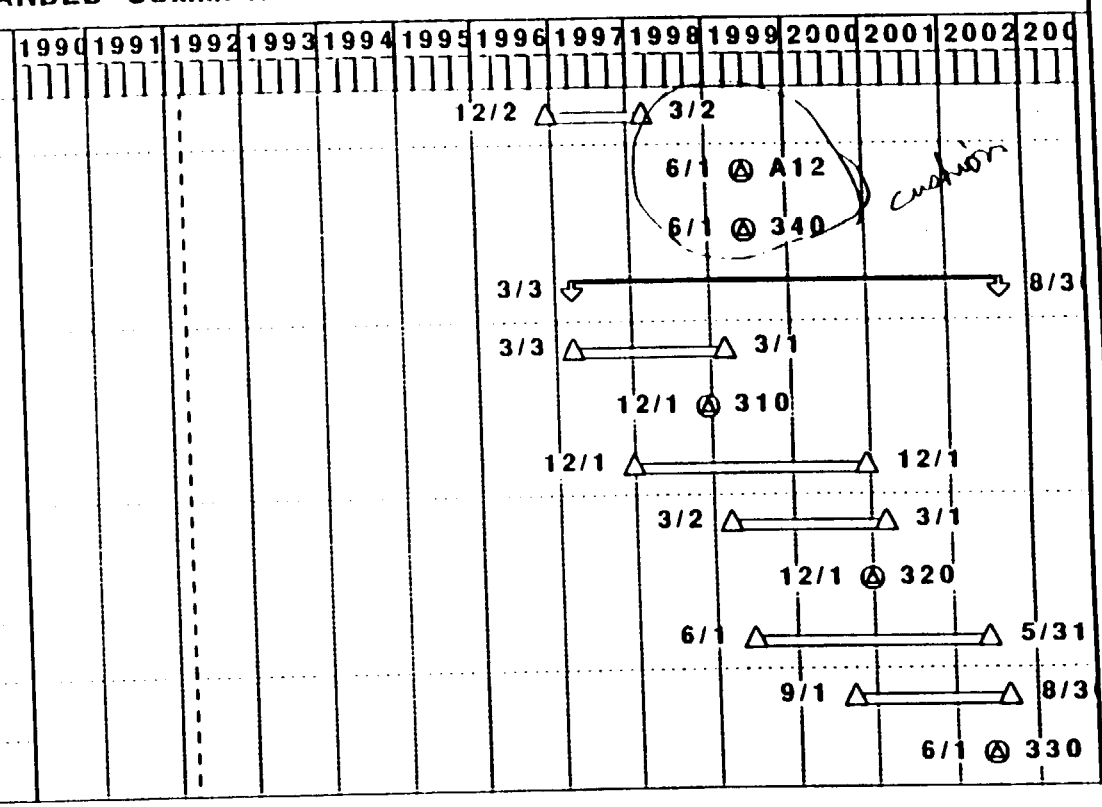
Project: VJ50

Date: 3/4/92 7:01 pm

Baseline	Complete Milestone	Completed Work
Critical	Control Milestone	Slippage
Noncritical	Comp. Ctrl. Mstone	Slippage complete
Progress	Summary	
Milestone	Summary Progress	

MODIS-N EXPANDED SUMMARY SCHEDULE

ID	Name
81	Intergration and Test
82	FM2 Delivery
83	All Deliveries Complete
84	Storage / Launch Support
85	PF Pre / Post Launch Support
86	EOSA Launch
87	FM1 Storage
88	FM1 Pre /Post Launch Support
89	FM1 Launch
90	FM2 Storage
91	FM2 Pre / Post Launch Support
92	FM2 Launch



Project: VJ50

Date: 3/4/92 7:01 pm

Baseline
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Progress
Milestone

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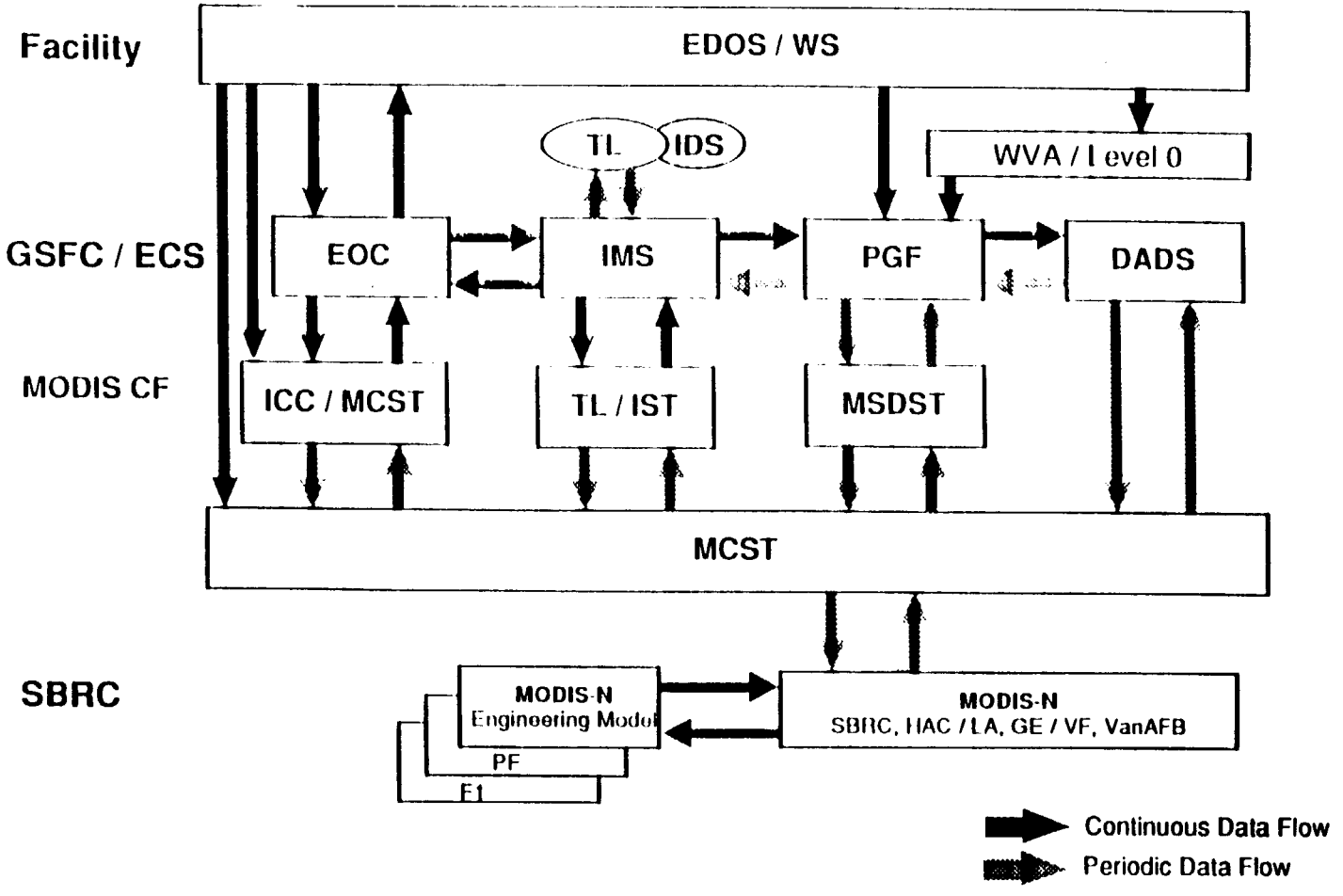
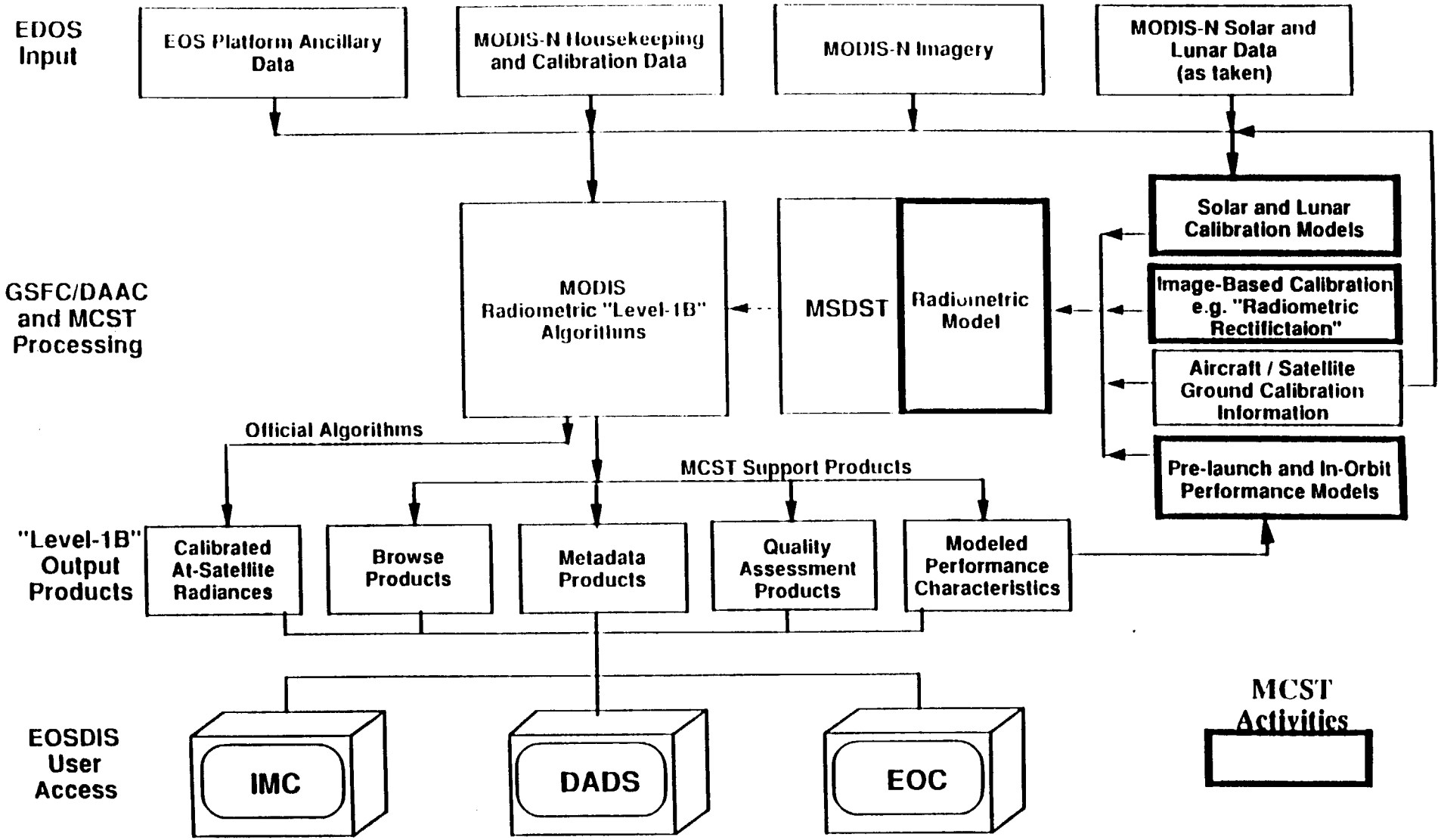
Slippage complete

EDOS to MCST Communication Links for MODIS



Illustrative Flow Diagram
MODIS "Level-1B" Radiometric Processing