MODIS
SCIENCE DATA SUPPORT TEAM
PRESENTATION

July 24, 1992

AGENDA

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ACTION ITEMS:

04/24/92 [J. J. Pan] Develop a detailed schedule for a typical algorithm integration into the Level-2 processing shell. (A detailed task list and schedule were included in the handout on 07/17/92.) STATUS: Open. Due Date: 06/05/92

04/24/92 [Lloyd Carpenter & Team] Develop a staffing plan for the accomplishment of the tasks shown on the schedule. (The staffing plan depends upon the detailed schedules and staffing plans being developed for Level-1 and Level-2.) STATUS: Open. Due Date: 06/12/92

06/12/92 [Tom Goff] Develop separate detailed schedules using Microsoft Project for Level-1A and -1B software design and development. (Updated results are included in the handout.) STATUS: Open. Due Date: 07/10/92

04/24/92 [Lloyd Carpenter] Develop a system for collecting time keeping data for the SDST effort. (An updated form is included in the handout.) STATUS: Open. Due Date: 06/26/92

MODIS Airborne Simulator (MAS) Status

Liam E. Gumley
Progress up to 23 July 1992

(1) MAS Exabyte format data decode routine: tape to disk

A program has been developed which does the following:
(a) reads blocks of data from an MAS Exabyte aircraft tape,
(b) decodes/converts the MAS data to Intermediate format,
(c) writes the resulting Intermediate format data to disk.
This program is virtually identical to the previous version that performs disk-to-disk conversions. This is possible because the underlying C file access routines make no distinction between disk and tape devices when opening, closing, reading and writing. The advantage of converting on the fly from tape to disk is that a whole flight tape does not have to be loaded on disk just to convert it to Intermediate format on another disk. The only change remaining for this program is to allow the extraction of the INS data to a separate file.

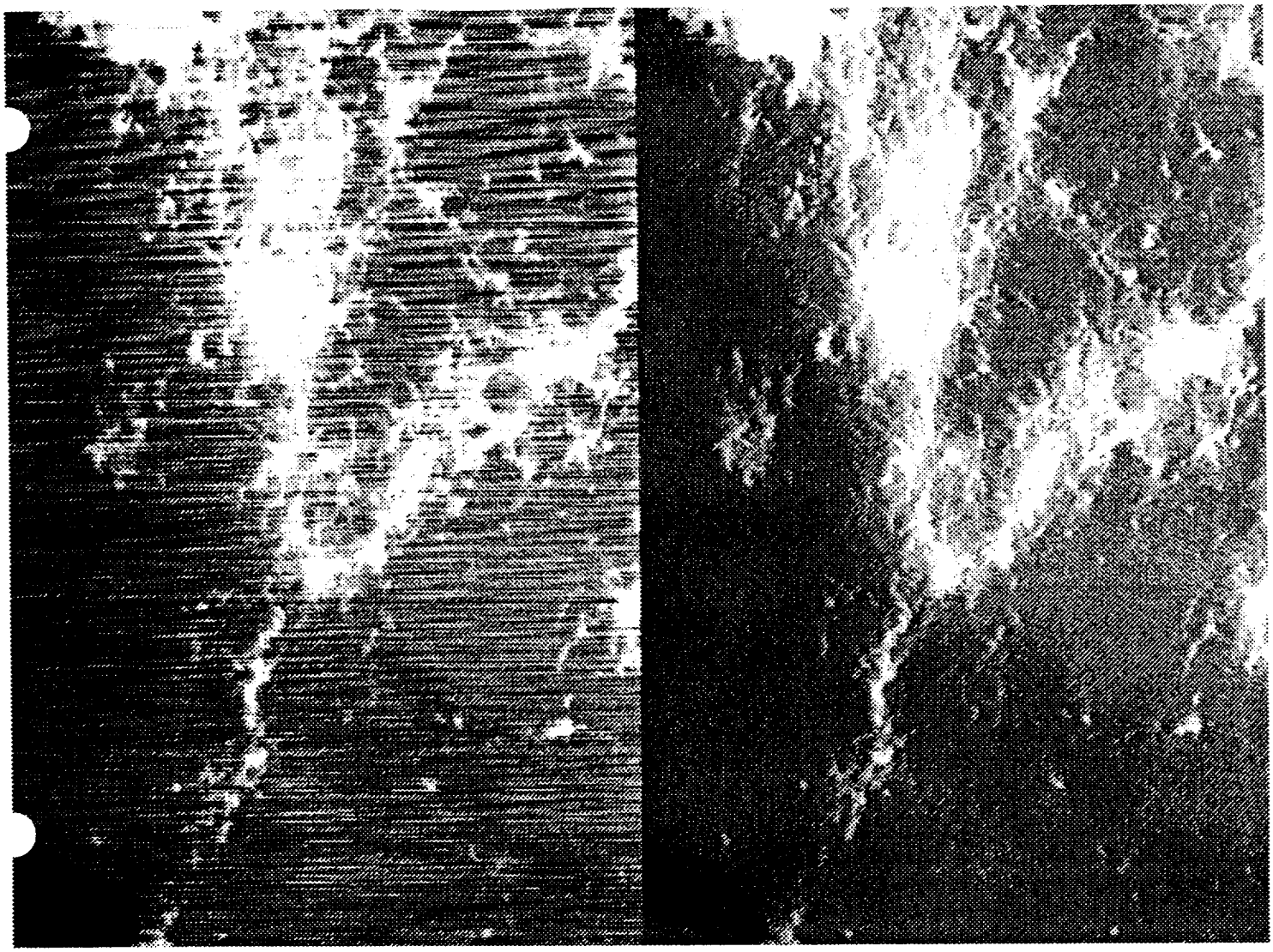
(2) MAS image noise removal

In order to get some feedback from the MAS users on the possible value of the image filtering programs we have examined, it was decided to create a 'before and after' test image using a noisy MAS channel. A section of channel 12 (12 micron) from the flight on June 8th, 1992 was used for this purpose. The section of data used was 512 lines by 512 pixels, starting at scanline 11078, pixel 1. This image was quite heavily contaminated by 400 Hz coherent noise, and incoherent striping noise. Two algorithms (supplied as source code by J.J. Pan) were used to process the image. The first operated in the frequency domain using a two-dimensional FFT approach. Noise 'spikes' in the image power spectrum corresponding to 400 Hz were identified and masked out using band reject filters. The reconstructed image was then processed by an adaptive two dimensional spatial averaging filter to remove the striping noise. The original and filtered images are shown overleaf. A copy of this image, and the full original and filtered image were loaded onto ltpindigo for FTP retrieval by Mike King and Paul Menzel. I spoke briefly to Chris Moeller at Wisconsin, who said the filtered image looked encouraging. They are currently using a 5x5 average/replace method to filter the noisy MAS IR channels.

I spoke to Pat Grant at Ames regarding the possibility of destriping the raw count image data using knowledge of the blackbodies. Pat's response was that this would be very difficult, given the somewhat exotic nature of the line to line calibration adjustment. It involves filtering the output from both blackbodies on one scan line to adjust the calibration offset on the next scanline. The nature of the filtering is not well understood at this point. A complicating factor is the presence of 400 Hz noise which is not adequately sampled during the blackbody views, leading to significant aliasing. In summary, Pat thought that this sort of approach would most likely cause more problems than it would solve.

(3) MAS processing

Processing/reprocessing of the MAS FIRE data will commence next week. After discussion with Mike King, the significant features will be:
(a) static visible/NIR calibration (no temperature dependence),
(b) line by line IR calibration (no smoothing of BB data),
(c) MAS/INS clock offset corrected.



Original Image
(320 pixels by 480 lines)

Filtered Image
(320 pixels by 480 lines)

Results from filtering noisy MAS channel 12 imagery

DRAFT

The Log of the MODIS Level-2 Processing Shell Design

J. J. Pan
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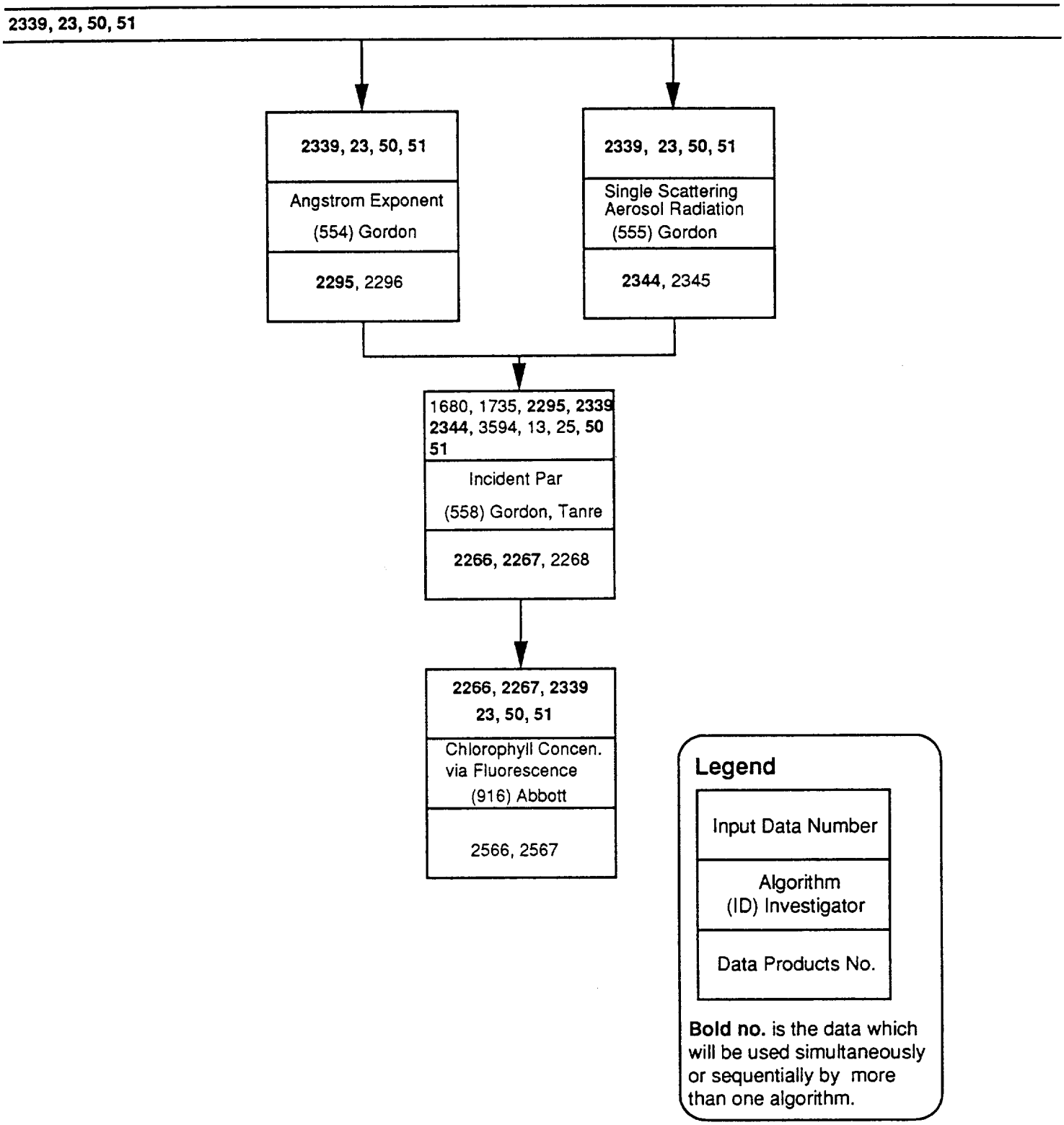
Date: July 20 - July 24, 1992

1. Algorithm Dependency Diagram
   An updated diagram of the algorithm dependency is attached. However, I am still waiting for the detailed input data description which will be provided by SPSO (Dr. Krupp is on vacation). Also, Phil Ardanuy and I will identify the dependency of these 54 algorithms.

2. Shell Design and Development
   I am reviewing Level-1B data description, with emphasis on data format and data volume which will affect the shell design. I am also simulating some C/FORTRAN interfaces to get familiar with data type declaration, arguments passing, and compiling/linking problems.

DRAFT
Algorithm Dependency in MODIS Level-2 Processing (Part 1)



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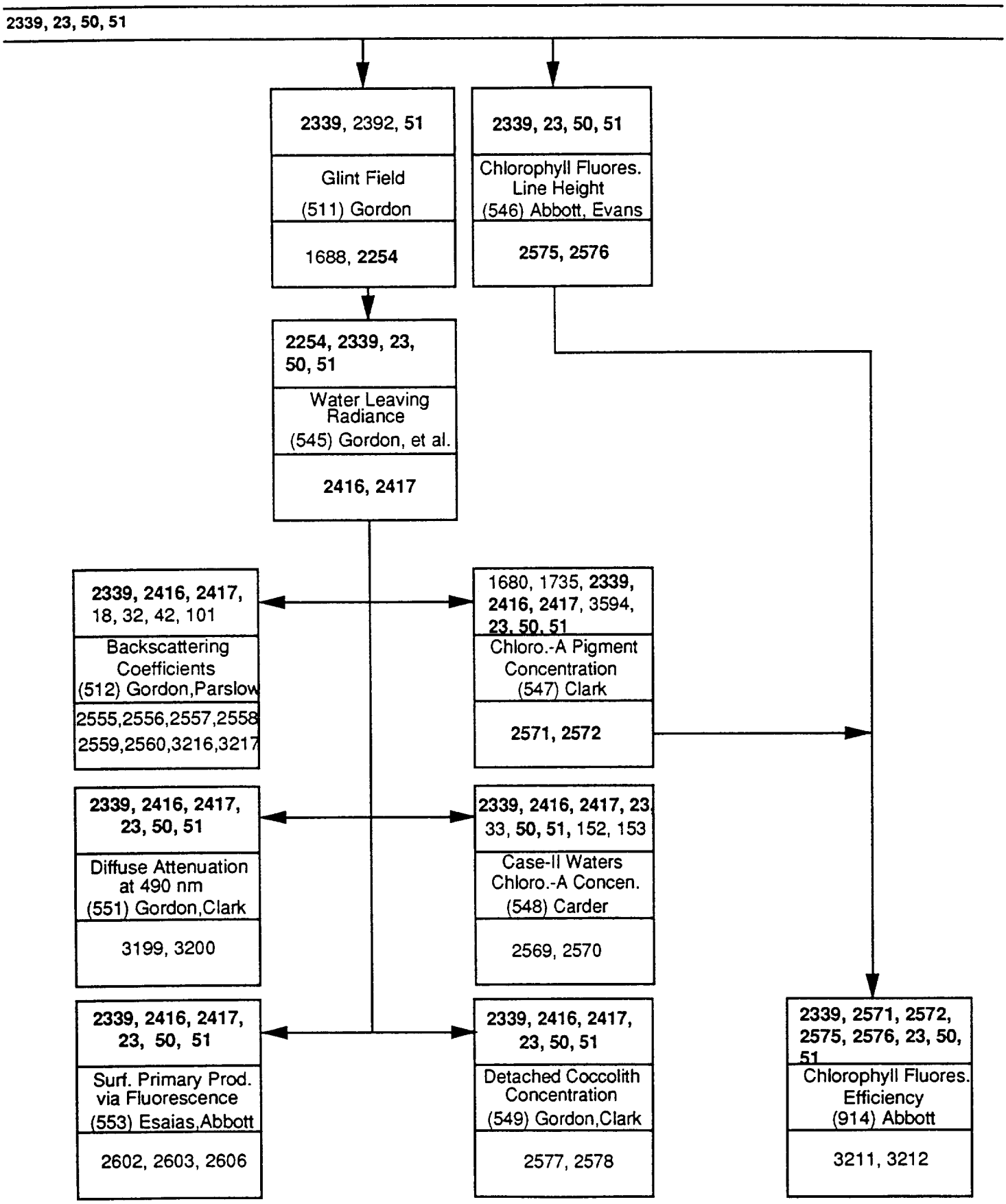
Algorithm Dependency in MODIS Level-2 Processing (Part 2)



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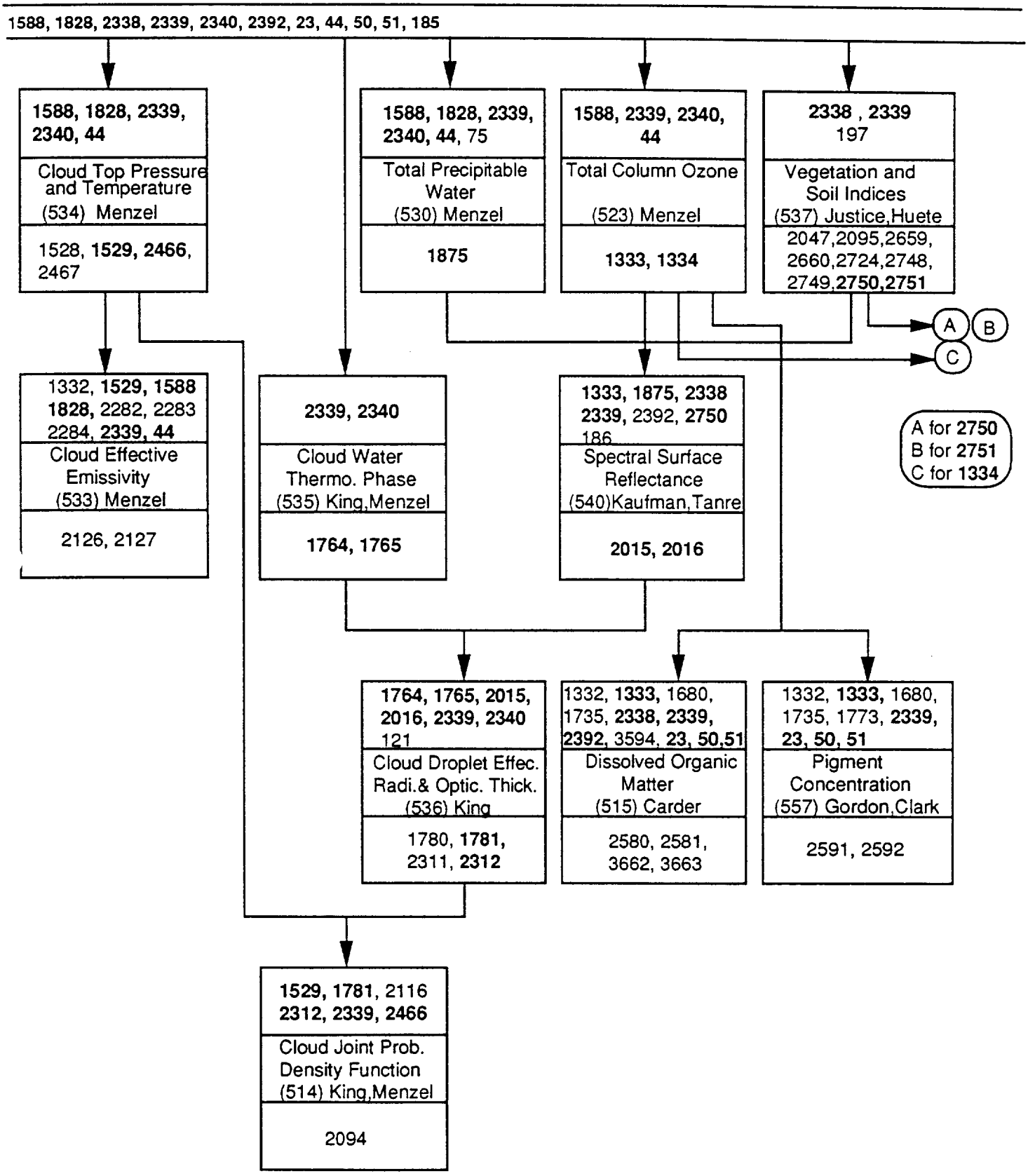
Algorithm Dependency in MODIS Level-2 Processing (Part 3A)



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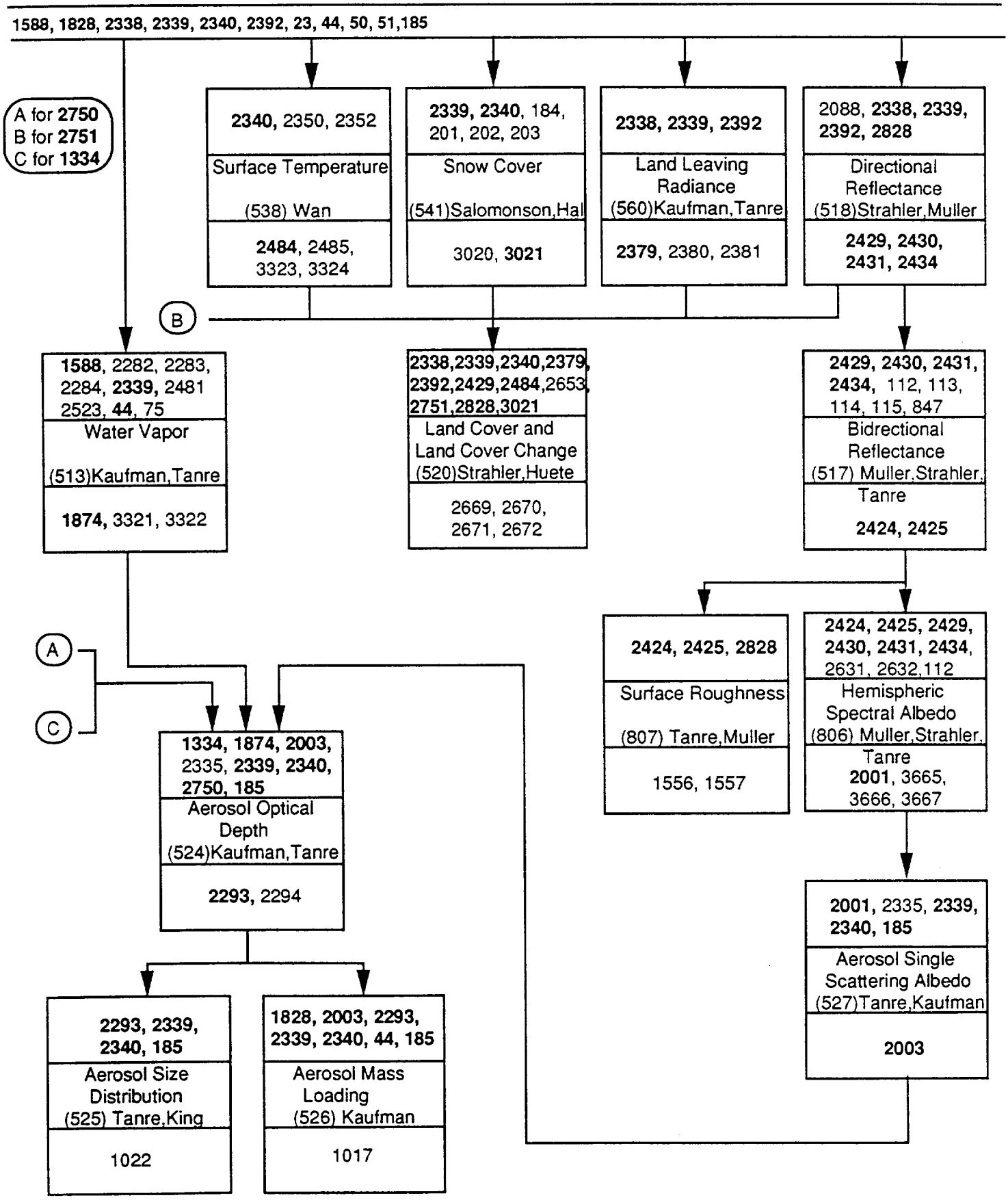
Algorithm Dependency in MODIS Level-2 Processing (Part 3B)

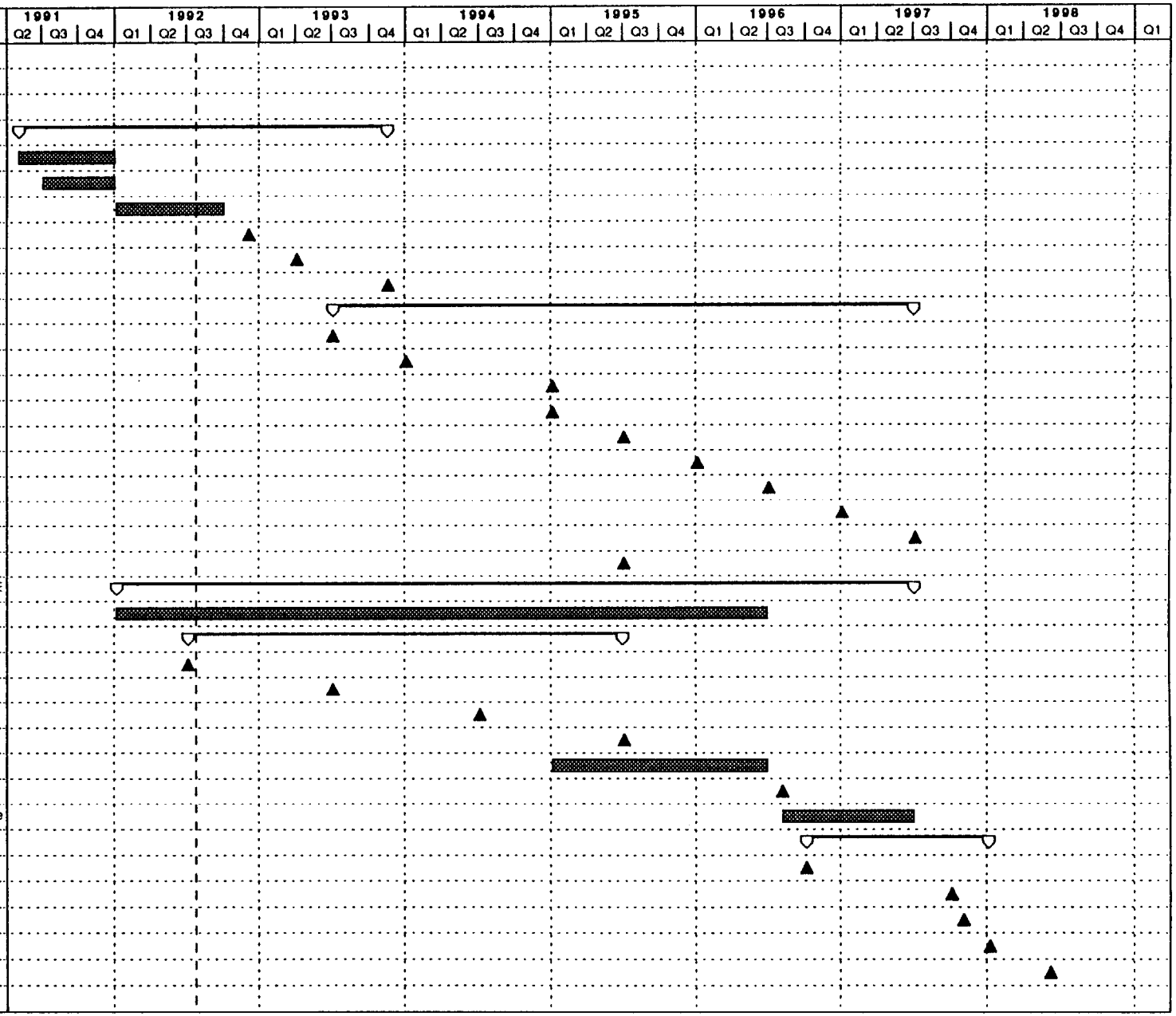


MODIS Data Prod enerator Design

MODIS Design - Gantt Chart

Resources, Tue 21 Jul, '92

ID	Name
1	EOSDIS (ECS) Milestone Chart
2	
3	
4	INTERFACE STUDY AND DEFINITION
5	interview team leaders/PIs
6	compile/analyse needs
7	review/revise study results
8	review study with ECS contractor
9	review tool specification development
10	review "final" specification
11	ECS SCHEDULE
12	SRR
13	PDR
14	CDR
15	SCF beta (toolkit delivery)
16	beta ECS release 1.1
17	SCF version 1 (revised toolkit)
18	version 1 ECS release 3
19	SCF version 2 (final AM toolkit)
20	version 2 ECS release 4
21	beta DAAC
22	SCIENCE SOFTWARE DEVELOPMENT SCHEDULE
23	develop science software for version 1
24	review progress
25	review # 1
26	review # 2
27	review # 3
28	review # 4
29	test interfaces and portability
30	deliver version 1 science software
31	develop and deliver version 2 science software
32	EOSDIS SCHEDULE
33	EOSDIS AM version 1
34	EOSDIS AM version 2 ATTR
35	AM ORR
36	EOSDIS AM launch ready
37	AM LAUNCH
38	



Project: MODIS Design
Date: 21/7/92

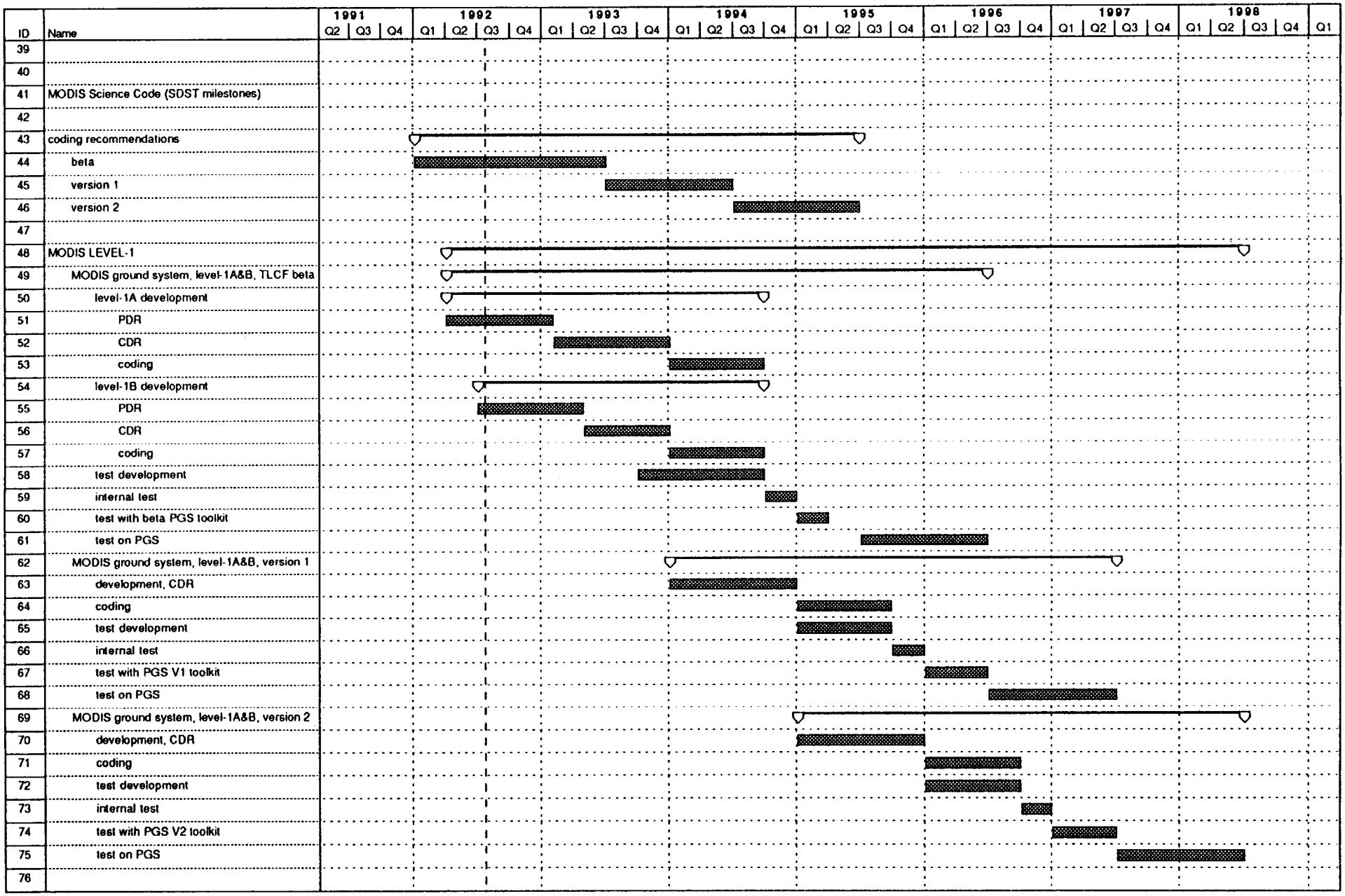
Critical Noncritical Progress Milestone Summary

NASA/GSFC/MODIS/SDST/RDC: Thomas E. Golf

MODIS Data Prod enerator Design

MODIS Design - Gantt Chart

Resources, Tue 21 Jul, '92



Project: MODIS Design
Date: 21/7/92

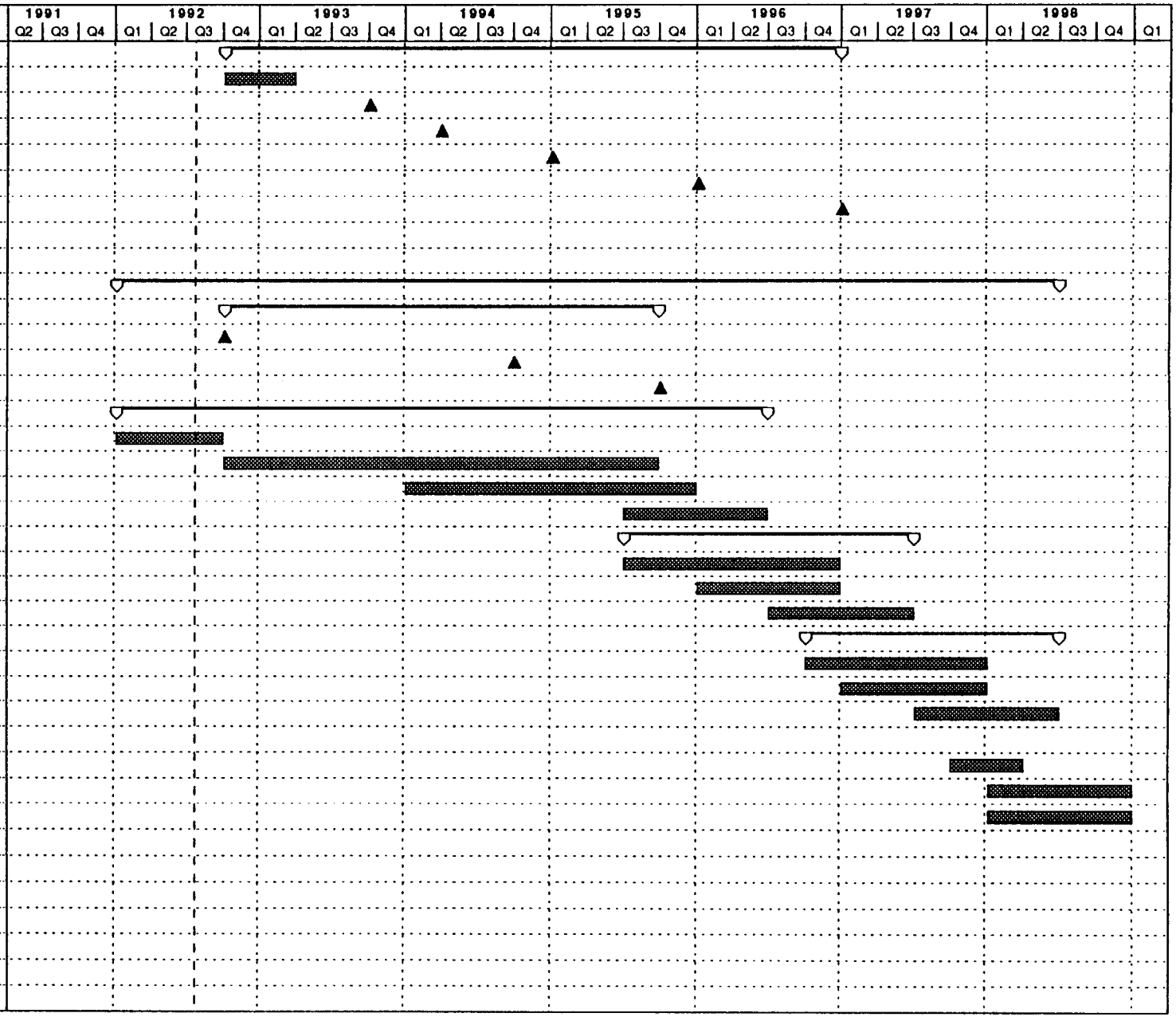
Critical Noncritical Progress Milestone Summary

NASA/GSFC/MODIS/SDST/RDC: Thomas E. Goff

MODIS Design - Gantt Chart

Resources, Tue 21 Jul, '92

ID	Name
77	MODIS LEVEL-2 to 4 Processing Shell
78	SRR
79	PDR
80	CDR
81	beta
82	version 1
83	version 2
84	
85	
86	SCIENCE ALGORITHMS
87	TM algorithm review
88	beta
89	version 1
90	version 2
91	TM beta version
92	coding concepts
93	TM code development
94	SDST integration
95	SDST deliver and test
96	TM version 1
97	code development
98	SDST integration
99	SDST deliver and test
100	TM version 2
101	code development
102	SDST integration
103	SDST deliver and test
104	
105	end-to-end test
106	first post launch development
107	SDST integration and test
108	
109	
110	
111	
112	
113	
114	



Project: MODIS Design
Date: 21/7/92

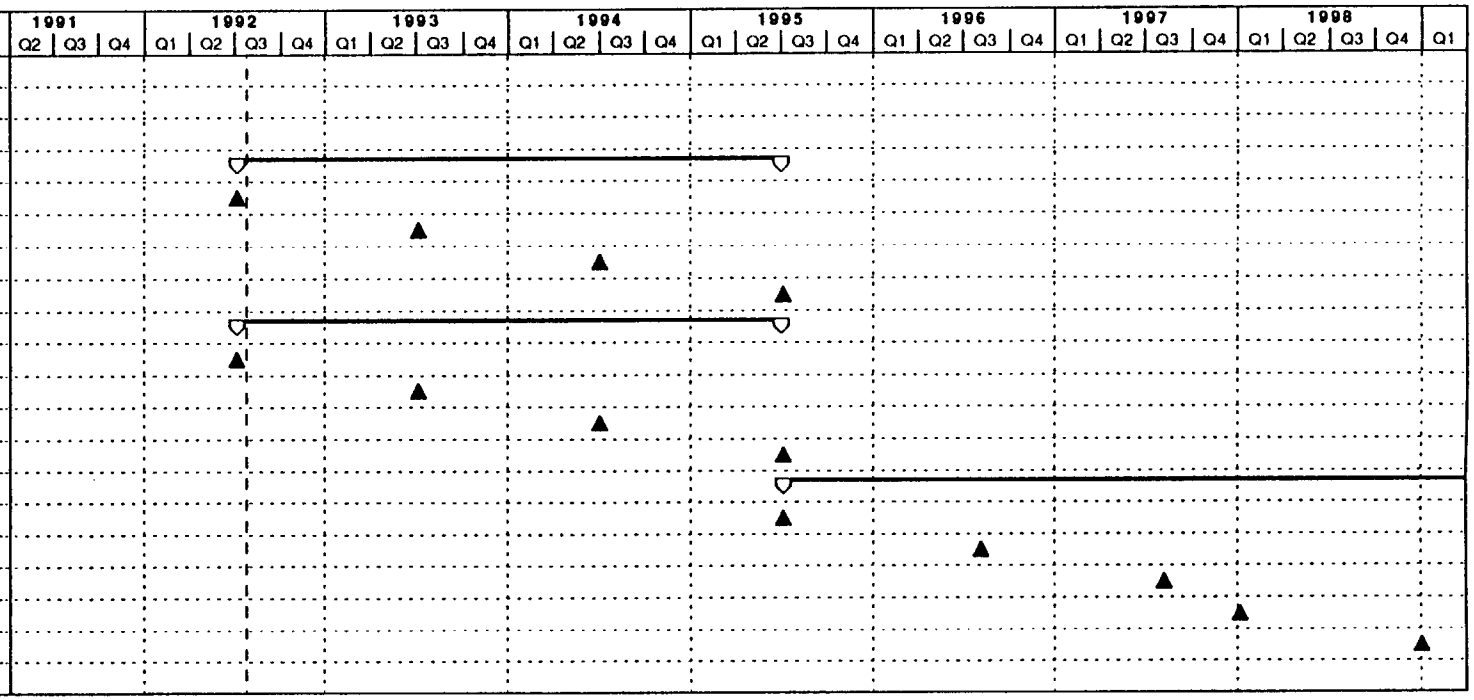
Critical Noncritical Progress Milestone Summary

MODIS Data Prod ienerator Design

MODIS Design - Gantt Chart

Resources, Tue 21 Jul, '92

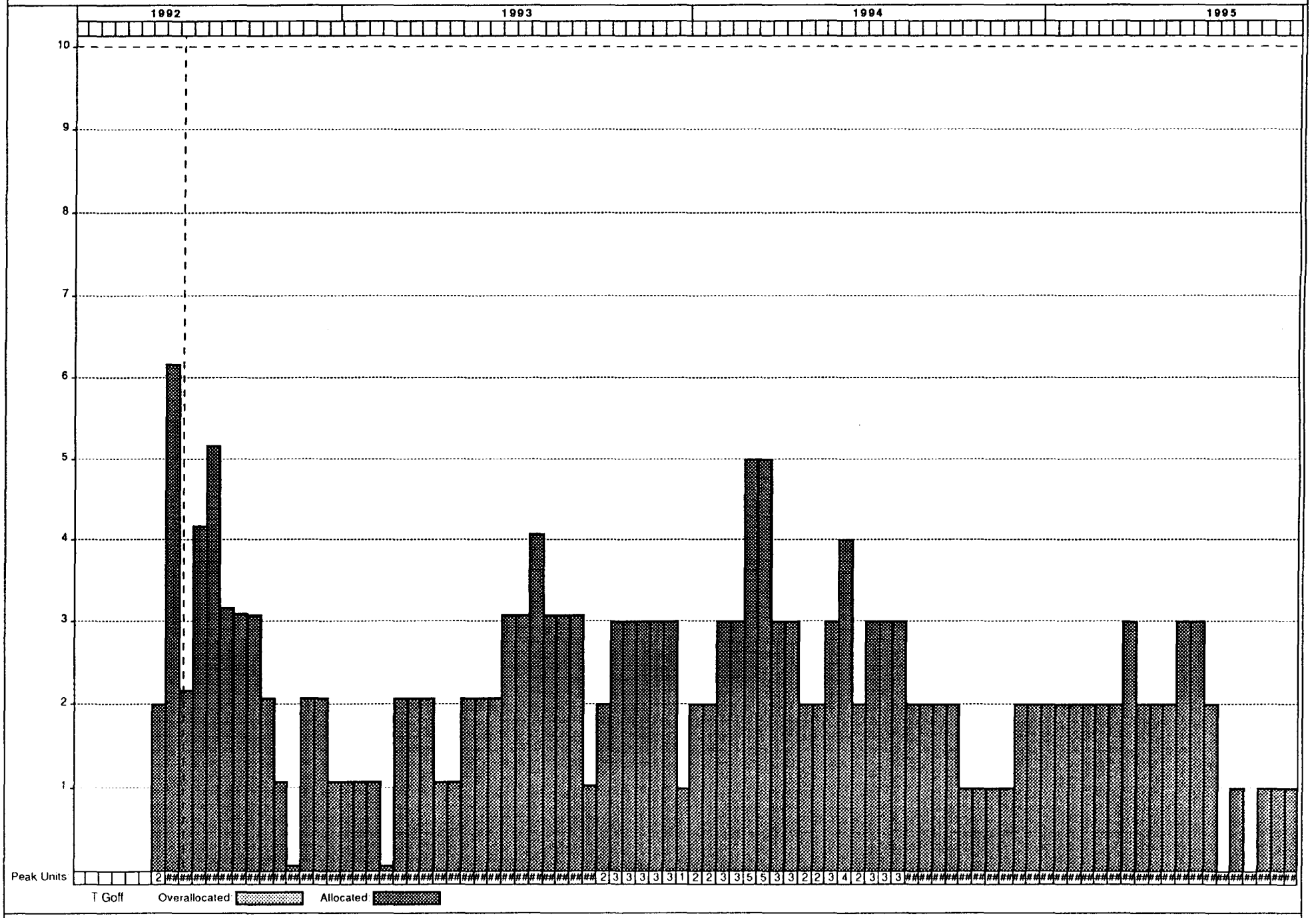
ID	Name
115	
116	EOS Project Deadlines
117	
118	Software & Data Management Plan
119	draft
120	revision
121	AM final
122	PM final
123	Science computing Facility Plan
124	draft
125	AM final
126	AM revision
127	PM final
128	Data Processing Software
129	beta version, AM-1
130	version 1, AM-1
131	version 2, AM-1
132	version 1, PM-1
133	version 2, PM-1
134	version 3, PM-1



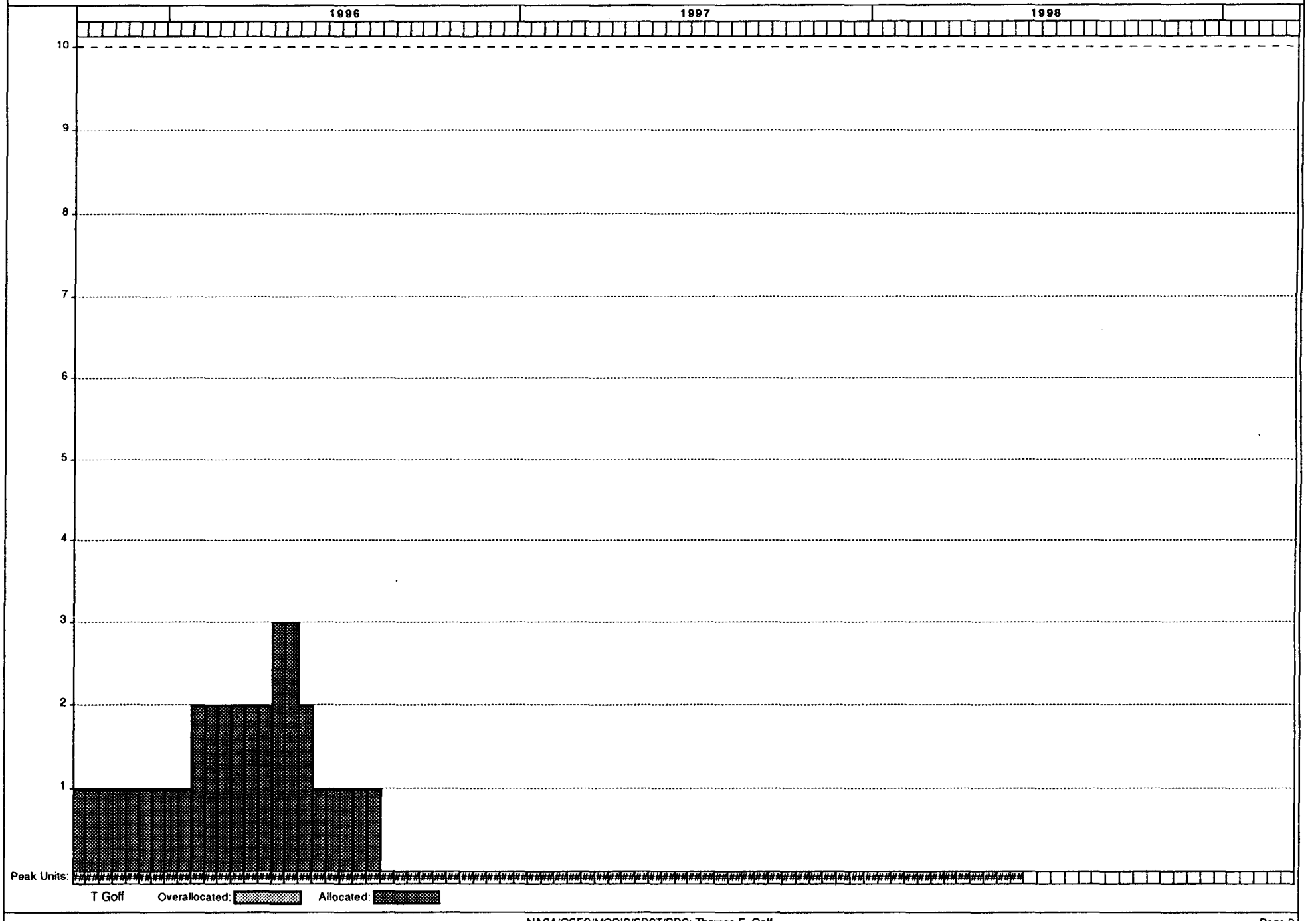
Project: MODIS Design
Date: 21/7/92

Critical Noncritical Progress Milestone Summary

MODIS Data Proc[illegible]nerator Design
- Resource Histogram
Overview Master, Thu 23 Jul, '92



MODIS Data Proc[illegible]enerator Design
- Resource Histogram
Overview Master, Thu 23 Jul, '92



MODIS SDST Time Record (Weekly)	July 1992					August 1992				September 1992			
Name:	Fri 3	Fri 10	Fri 17	Fri 24	Fri 31	Fri 7	Fri 14	Fri 21	Fri 28	Fri 4	Fri 11	Fri 18	Fri 25
Level-1													
Input													
Checking													
Calibration													
Geolocation													
Science Code													
Output													
Level-2													
Input													
Checking													
Science Code													
Output													
QC/Testing/Simulated Data													
Utilities & Support													
MAS													
Documentation													
Management													
Training													
Meetings													
Non-MODIS													
SL/Vacation													
Other Proj.													

MODIS\PLANS\TIMETBL.001, MODIS SDST Time Record Table, Lloyd Carpenter, Draft Version, July 22, 1992