

8/6/79

25 Meter Millimeter Wave Telescope

Memo # 124

Log of Funding Plans

Fund-Plan Number	Date Prepared	Number of Funding Increments & Type	Form of Submittal
1	Sep. 75	1 - All in one funding	Proposal Vol. I
2	Mar 76	2 - 2M start + Rest	Telephone Request
3	July 77	1 - All in one funding	Proposal Vol. II
4	Dec 77	2 - 3.5 M + Rest (several)	Telephone M.G. & #103 ^{Memo}
5	Jan 78	3 - 1.9 M + 2 yrs	Telephone W.E.H.
6	Jan 78	4 - 1.6 M + 3 yrs	Telephone W.E.H.
7	Mar. 78	2 - 1.7 M + Rest	Letter - NSF
8	Mar. 78	3 - 2.0 M + 2 yrs	Letter - NSF
9	Mar. 78	4 - 1.9 M + 3 yrs	Letter - NSF
10	Apr-79	2 - 4.4 M + Rest	Letter - NSF
11	Apr-79	3 - 4.4 M + 2 yrs	Letter - NSF
12	Apr-79	4 - 4.4 M + 3 yrs.	Letter - NSF
13	July-79	2 - 1.7 M + Rest	Letter - NSF
14	July-79	3 - 1.7 M + 2 yrs.	Letter - NSF
15	July-79	4 - 1.7 M + 3 yrs	Letter - NSF
16	July-79	3 - 1.7 M + $\frac{1}{2}$ + $\frac{1}{2}$	Letter - NSF
17	July-79	3 - 4.4 M + $\frac{1}{2}$ + $\frac{1}{2}$	Letter - NSF
18	July-79	4 - 1.7 M + $\frac{1}{3}$ + $\frac{1}{3}$ + $\frac{1}{3}$	Letter - NSF
19	July-79	4 - 4.4 M + $\frac{1}{3}$ + $\frac{1}{3}$ + $\frac{1}{3}$	Letter - NSF

25-M MILLIMETER WAVE TELESCOPE

Cost and Funding Schedules

In the following tables, the 25-m telescope construction project has been subdivided into major activities. These subdivisions are as follows:

- | | |
|------------------|--|
| Telescope | - Part 1 Surface Plates |
| | - Part 2 Intermediate Panels, Backup Structure, Counterweights, Bearings and Drives, Tower Structure, Freight, High Altitude Construction Premiums |
| | - Part 3 Computer |
| | - Part 4 Feed Support, Subreflector, Servo, Ladders, Cabling, Painting, Final Setting, Electronic Interface, Intercom, Boresight Telescope, Visitor Area |
| | - Part 5 Telescope Foundations |
| Astrodome | - Part 1 Astrodome |
| | - Part 2 Air Handling and Crane |
| Site Development | - Part 1 Water, Electricity, Grading, Access Roads |
| | - Part 2 Buildings at the Telescope Site |
| | - Part 3 Base Level Facility |

25-m Telescope Construction Funding Plan [FP 10 (4.4M + Rest)]
(in thousands of dollars)

		1981	1982	1983	1984	Sum
		2	2	2	2	
Telescope	Design	770				770
	Const. Part 1	2000				2000
	Part 2		3410			3410
	Part 3		594			594
	Part 4		1298			1298
	Part 5		462			462
Astrodome	Design	760				760
	Const. Part 1		6633			6633
	Part 2		616			616
Site	Design	310				310
	Const. Part 1		539			539
	Part 2		1562			1562
	Part 3		1023			1023
Subtotal		3840	16137			19977
Burden ³		-	-			-
Project Management ¹		160	600			760
Subtotal		4000	1674			20737
Contingency ~ 10%		400	1674			2047
TOTAL		4400	18411			22811

¹ Assumes an average of 12 people during life of construction project

² Escalation assumed 10% per year

³ Burden is the estimated extra cost because of stretched out funding (smaller contracts, in and out costs, etc.)

25-m Telescope Construction Funding Plan [FP 11 (4.4 M + 2 years)]
(in thousands of dollars)

		1981	1982	1983	1984	Sum
		2	2	2	2	
Telescope	Design	770				770
	Const. Part 1	2000				2000
	Part 2		3410			3410
	Part 3			653		653
	Part 4			1428		1428
	Part 5		462			462
Astrodome	Design	760				760
	Const. Part 1		6633			6633
	Part 2			678		678
Site	Design	310				310
	Const. Part 1		539			539
	Part 2			1718		1718
	Part 3			1125		1125
Subtotal		3840	11044	5602		20486
Burden ³ (7%)			773	392		1165
Project Management ¹		160	600	660		1420
Subtotal		4000	12417	6654		23071
Contingency ≈ 10%		400	1242	665		2307
TOTAL		4400	13659	7320		25378

¹ Assumes an average of 12 people during life of construction project

² Escalation assumed 10% per year

³ Burden is the estimated extra cost because of stretched out funding (smaller contracts, in and out costs, etc.)

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25-m Telescope Construction Funding Plan [FP 12 (4.4M + 3 years)]
(in thousands of dollars)

		1981	1982	1983	1984	Sum
		2	2	2	2	
Telescope	Design	770				770
	Const. Part 1	2000				2000
	Part 2			3751		3751
	Part 3				719	719
	Part 4			1428		1428
	Part 5		462			462
Astrodome	Design	760				760
	Const. Part 1		6633			6633
	Part 2				745	745
Site	Design	310				310
	Const. Part 1		539			539
	Part 2				1890	1890
	Part 3				1238	1238
Subtotal		3840	7634	5179	4592	21245
Burden ³ (7%)			534	363	318	1215
Project Management ¹		160	600	660	726	2146
Subtotal		4000	8768	6202	5636	24606
Contingency ~ 10%		400	877	620	559	2456
TOTAL		4400	9645	6822	6195	27062

¹ Assumes an average of 12 people during life of construction project

² Escalation assumed 10% per year

³ Burden is the estimated extra cost because of stretched out funding (smaller contracts, in and out costs, etc.)

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25-m Telescope Construction Funding Plan [FP 13 (1.7M + Rest)]
(in thousands of dollars)

		1981	1982	1983	1984	Sum
		2	2	2	2	
Telescope	Design	770				770
	Const. Part 1		2200			2200
	Part 2		3410			3410
	Part 3		594			594
	Part 4		1298			1298
	Part 5		462			462
Astrodome	Design	760				760
	Const. Part 1		6633			6633
	Part 2		616			616
Site	Design		341			341
	Const. Part 1		539			539
	Part 2		1562			1562
	Part 3		1023			1023
Subtotal		1530	18678			20208
Burden ³		-	-			-
Project Management ¹			750			750
Subtotal		1530	19428			20958
Contingency ~ 10%		170	1926			2096
TOTAL		1700	21354			23054

¹ Assumes an average of 12 people during life of construction project

² Escalation assumed 10% per year

³ Burden is the estimated extra cost because of stretched out funding (smaller contracts, in and out costs, etc.)

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25-m Telescope Construction Funding Plan [FP 14 (1.7M + 2 years)]
(in thousands of dollars)

		1981	1982	1983	1984	Sum
		2	2	2	2	
Telescope	Design	770				770
	Const. Part 1		2200			2200
	Part 2		3410			3410
	Part 3			653		653
	Part 4			1428		1428
	Part 5		462			462
Astrodome	Design	760				760
	Const. Part 1		6633			6633
	Part 2			678		678
Site	Design		341			341
	Const. Part 1		539			539
	Part 2			1718		1718
	Part 3			1125		1125
Subtotal		1530	13585	5602		20717
Burden ³ (7%)			951	392		1343
Project Management ¹			680	748		1428
Subtotal		1530	15216	6742		23488
Contingency ~ 10%		170	1522	674		2366
TOTAL		1700	16738	7416		25854

¹ Assumes an average of 12 people during life of construction project

² Escalation assumed 10% per year

³ Burden is the estimated extra cost because of stretched out funding (smaller contracts, in and out costs, etc.)

25-m Telescope Construction Funding Plan [FP 15 (1.7M + 3 years)]
(in thousands of dollars)

		1981	1982	1983	1984	Sum
		2	2	2	2	
Telescope	Design	770				770
	Const. Part 1		2200			2200
	Part 2			3751		3751
	Part 3				719	719
	Part 4			1428		1428
	Part 5		462			462
Astrodome	Design	760				760
	Const. Part 1		6633			6633
	Part 2				745	745
Site	Design		341			341
	Const. Part 1		539			539
	Part 2			1718		1718
	Part 3				1238	1238
Subtotal		1530	10175	6897	2702	21304
Burden ³ (7%)			712	483	189	1384
Project Management ¹			680	748	726	2154
Subtotal		1530	11567	8128	3617	24842
Contingency ~ 10%		170	1157	813	362	2502
TOTAL		1700	12724	8941	3979	27344

¹ Assumes an average of 12 people during life of construction project

² Escalation assumed 10% per year

³ Burden is the estimated extra cost because of stretched out funding (smaller contracts, in and out costs, etc.)

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25-m Telescope Construction Funding Plan [FP 16 (1.7M+1/2+1/2)]
(in thousands of dollars)

		1981	1982	1983	1984	Sum
		2	2	2	2	
Telescope	Design	770				770
	Const. Part 1		1760	484		2244
	Part 2			3751		3751
	Part 3			653		653
	Part 4			1428		1428
	Part 5		462			462
Astrodome	Design	760				760
	Const. Part 1		6633			6633
	Part 2			678		678
Site	Design		341			341
	Const. Part 1		539			539
	Part 2			1718		1718
	Part 3			1125		1125
Subtotal		1530	9735	9837		21102
Burden ³ (9%)			876	885		1761
Project Management ¹			680	748		1428
Subtotal		1530	11291	11470		24291
Contingency ~ 10%		170	1129	1147		2446
TOTAL		1700	12420	12617		26737

¹ Assumes an average of 12 people during life of construction project

² Escalation assumed 10% per year

³ Burden is the estimated extra cost because of stretched out funding (smaller contracts, in and out costs, etc.)

25-m Telescope Construction Funding Plan [FP 17 (4.4M+1/2+1/2)]
(in thousands of dollars)

		1981	1982	1983	1984	Sum
		2	2	2	2	
Telescope	Design	770				770
	Const. Part 1	2000				2000
	Part 2		990	2662		3652
	Part 3			653		653
	Part 4			1428		1428
	Part 5		462			462
Astrodome	Design	760				760
	Const. Part 1		6633			6633
	Part 2			678		678
Site	Design	310				310
	Const. Part 1		539			539
	Part 2			1718		1718
	Part 3			1125		1125
Subtotal		3840	8624	8264		20728
Burden ³ (9%)			776	744		1520
Project Management ¹		160	600	660		1420
Subtotal		4000	10000	9668		23668
Contingency ~ 10%		400	1000	967		2367
TOTAL		4400	11000	10635		26035

¹ Assumes an average of 12 people during life of construction project

² Escalation assumed 10% per year

³ Burden is the estimated extra cost because of stretched out funding (smaller contracts, in and out costs, etc.)

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25-m Telescope Construction Funding Plan [FP 18 (1.7M+1/3+1/3+1/3)]
(in thousands of dollars)

		1981	1982	1983	1984	Sum
		2	2	2	2	
Telescope	Design	770				770
	Const. Part 1		990	1331		2321
	Part 2			3025	799	3824
	Part 3				719	719
	Part 4				1571	1571
	Part 5		462			462
Astrodome	Design	760				760
	Const. Part 1		4400	2456		6856
	Part 2				745	745
Site	Design		341			341
	Const. Part 1		539			539
	Part 2				1890	1890
	Part 3				1238	1238
Subtotal		1530	6732	6812	6962	22036
Burden ³ (10%)		-	673	681	696	2050
Project Management ¹		-	680	748	726	2154
Subtotal		1530	8085	8241	8384	26240
Contingency ≈ 10%		170	809	824	838	2641
TOTAL		1700	8894	9065	9222	28881

¹ Assumes an average of 12 people during life of construction project

² Escalation assumed 10% per year

³ Burden is the estimated extra cost because of stretched out funding (smaller contracts, in and out costs, etc.)

25-m Telescope Construction Funding Plan [FP 19 (4.4M+1/3+1/3+1/3)]
(in thousands of dollars)

		1981	1982	1983	1984	Sum
		2	2	2	2	
Telescope	Design	770				770
	Const. Part 1	2000				2000
	Part 2			3751		3751
	Part 3				719	719
	Part 4				1571	1571
	Part 5		462			462
Astrodome	Design	760				760
	Const. Part 1		4730	2093		6823
	Part 2				745	745
Site	Design	310				310
	Const. Part 1		539			539
	Part 2				1890	1890
	Part 3				1238	1238
Subtotal		3840	5731	5844	6163	21578
Burden ³ (9%)			516	526	555	1597
Project Management ¹		160	600	660	726	2146
Subtotal		4000	6847	7030	7444	25321
Contingency ≈ 10%		400	685	703	744	2532
TOTAL		4400	7532	7733	8188	27853

¹ Assumes an average of 12 people during life of construction project

² Escalation assumed 10% per year

³ Burden is the estimated extra cost because of stretched out funding (smaller contracts, in and out costs, etc.)