U.S. ATLAS E.T.C.
WBS Profile Estimates

Funding Source: All **Funding Type:** Project 11/12/01 3:42:25 PM

Institutions: All

WBS Number	Description	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
1.1.1	Pixels	0	0	0	0	0	0	2271	2452	520	6	5249
1.1.1.1	Mechanics and Final Assembly	0	0	0	0	0	0	1039	1105	236	6	2387
1.1.1.1.1	Design	0	0	0	0	0	0	458	304	75	0	837
1.1.1.1.1.1	Prototype Design	0	0	0	0	0	0	82	0	0	0	82
1.1.1.1.1.1.1	Design - LBNL	0	0	0	0	0	0	82	0	0	0	82
1.1.1.1.1.1.2	Design - HYTEC, Inc.	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.1.2	Production Design	0	0	0	0	0	0	376	304	75	0	755
1.1.1.1.1.2.1	Sectors	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.1.2.2	Disk Support Rings and Mo	0	0	0	0	0	0	55	0	0	0	55
1.1.1.1.1.2.3	Support Frame	0	0	0	0	0	0	141	64	0	0	205
1.1.1.1.1.2.4	Support Tube	0	0	0	0	0	0	166	236	75	0	478

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1.1.1.1.1.2.5	Services	0	0	0	0	0	0	13	4	0	0	17
1.1.1.1.1.2.5.1	Services Design - New Mex	0	0	0	0	0	0	13	4	0	0	17
1.1.1.1.1.2.5.2	Services Design - LBNL	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.1.2.6	Disk Assembly	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.1.2.7	Final Assembly	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.1.2.8	Test Equipment	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.1.2.9	Integration/Project Enginee	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.1.2.10	Installation	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.2	Development and Prototypes	0	0	0	0	0	0	191	0	0	0	191
1.1.1.1.2.1	Disk Sectors	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.2.2	Disk Support Rings	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.2.3	Support Frame	0	0	0	0	0	0	20	0	0	0	20
1.1.1.1.2.4	Support Tube	0	0	0	0	0	0	116	0	0	0	116
1.1.1.1.2.5	Services	0	0	0	0	0	0	54	0	0	0	54

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1.1.1.1.2.5.1	Cables and Connections	0	0	0	0	0	0	41	0	0	0	41
1.1.1.1.2.5.2	Coolant Connections	0	0	0	0	0	0	14	0	0	0	14
1.1.1.1.2.6	Disk Assembly	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.2.7	Final Assembly and Installa	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.2.8	Test Equipment	0	0	0	0	0	0	0	0	0	0	0
1.1.1.1.3	Production	0	0	0	0	0	0	390	801	161	6	1359
1.1.1.1.3.1	Disk Sectors	0	0	0	0	0	0	133	0	0	0	133
1.1.1.1.3.2	Disk Support Rings	0	0	0	0	0	0	127	0	0	0	127
1.1.1.1.3.3	Support Frame	0	0	0	0	0	0	130	130	0	0	260
1.1.1.1.3.4	End Plate Stiffener and Pix	0	0	0	0	0	0	0	19	0	0	19
1.1.1.1.3.5	Support Tube	0	0	0	0	0	0	0	345	12	0	357
1.1.1.1.3.6	Endplug Thermal Barrier	0	0	0	0	0	0	0	45	0	0	45
1.1.1.1.3.7	Services	0	0	0	0	0	0	0	260	0	0	260
1.1.1.1.3.7.1	Mechanical support	0	0	0	0	0	0	0	97	0	0	97
1.1.1.1.3.7.2	Cables and Connections	0	0	0	0	0	0	0	109	0	0	109
1.1.1.1.3.7.3	Coolant pipes and connect	0	0	0	0	0	0	0	35	0	0	35

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1.1.1.1.3.7.4	Patch Panel 0	0	0	0	0	0	0	0	19	0	0	19
1.1.1.1.3.8	Disk Assembly	0	0	0	0	0	0	0	0	50	0	50
1.1.1.1.3.9	Disk Region Final Assembl	0	0	0	0	0	0	0	0	90	0	90
1.1.1.1.3.10	Test Equipment	0	0	0	0	0	0	0	2	9	6	17
1.1.1.1.3.11	Installation	0	0	0	0	0	0	0	0	0	0	0
1.1.1.2	Sensors	0	0	0	0	0	0	39	0	0	0	39
1.1.1.2.1	Design/Engineering	0	0	0	0	0	0	39	0	0	0	39
1.1.1.2.1.1	Test design	0	0	0	0	0	0	39	0	0	0	39
1.1.1.2.1.1.1	Design - New Mexico	0	0	0	0	0	0	39	0	0	0	39
1.1.1.2.3	Production	0	0	0	0	0	0	0	0	0	0	0
1.1.1.2.3.1	Barrels, Disks and B-layer(	0	0	0	0	0	0	0	0	0	0	0
1.1.1.2.3.1.1	Preproduction	0	0	0	0	0	0	0	0	0	0	0
1.1.1.2.3.1.1.1	Preproduction costs - Alba	0	0	0	0	0	0	0	0	0	0	0
1.1.1.2.3.1.1.2	Preproduction - Ohio State	0	0	0	0	0	0	0	0	0	0	0
1.1.1.2.3.1.1.3	Preproduction - Oklahoma	0	0	0	0	0	0	0	0	0	0	0

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1.1.1.2.3.1.2	Production	0	0	0	0	0	0	0	0	0	0	0
1.1.1.2.3.1.3	Testing	0	0	0	0	0	0	0	0	0	0	0
1.1.1.3	Electronics	0	0	0	0	0	0	786	402	40	0	1227
1.1.1.3.1	Design/Engineering	0	0	0	0	0	0	493	220	11	0	724
1.1.1.3.1.1	IC design	0	0	0	0	0	0	242	81	0	0	323
1.1.1.3.1.1.1	Design - LBNL	0	0	0	0	0	0	242	81	0	0	323
1.1.1.3.1.1.1.1	Senior Engineering	0	0	0	0	0	0	183	70	0	0	253
1.1.1.3.1.1.1.2	Junior Engineering	0	0	0	0	0	0	59	11	0	0	71
1.1.1.3.1.1.2	Design-OSU	0	0	0	0	0	0	0	0	0	0	0
1.1.1.3.1.2	Test design	0	0	0	0	0	0	241	127	0	0	368
1.1.1.3.1.2.1	LBL Engineering	0	0	0	0	0	0	211	113	0	0	324
1.1.1.3.1.2.2	OSU Engineering	0	0	0	0	0	0	29	15	0	0	44
1.1.1.3.1.3	Systems Engineering	0	0	0	0	0	0	11	11	11	0	32
1.1.1.3.2	Development and Prototypes	0	0	0	0	0	0	251	0	0	0	251
1.1.1.3.2.1	Atmel/DMILL prototypes	0	0	0	0	0	0	0	0	0	0	0
1.1.1.3.2.1.1	FE-D2	0	0	0	0	0	0	0	0	0	0	0
1.1.1.3.2.1.2	FE-D3	0	0	0	0	0	0	0	0	0	0	0

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1.1.1.3.2.2	Honeywell	0	0	0	0	0	0	0	0	0	0	0
1.1.1.3.2.3	0.25 Micron	0	0	0	0	0	0	133	0	0	0	133
1.1.1.3.2.3.1	TSMC and IBM prototypes	0	0	0	0	0	0	22	0	0	0	22
1.1.1.3.2.3.2	1st prototype	0	0	0	0	0	0	47	0	0	0	47
1.1.1.3.2.3.3	2nd prototype	0	0	0	0	0	0	64	0	0	0	64
1.1.1.3.2.4	Test Equipment/Hardware/	0	0	0	0	0	0	119	0	0	0	119
1.1.1.3.2.4.1	Equipment/Test Boards	0	0	0	0	0	0	119	0	0	0	119
1.1.1.3.3	Production	0	0	0	0	0	0	41	182	29	0	252
1.1.1.3.3.1	Front-end ICs	0	0	0	0	0	0	18	129	29	0	176
1.1.1.3.3.1.1	Outer system	0	0	0	0	0	0	0	65	0	0	65
1.1.1.3.3.1.1.1	Layer1/2x1 disk	0	0	0	0	0	0	0	0	0	0	0
1.1.1.3.3.1.1.2	IBM	0	0	0	0	0	0	0	65	0	0	65
1.1.1.3.3.1.2	B-layer	0	0	0	0	0	0	0	30	0	0	30
1.1.1.3.3.1.3	FE Testing	0	0	0	0	0	0	18	34	29	0	81
1.1.1.3.3.2	Optoelectronics	0	0	0	0	0	0	23	53	0	0	76
1.1.1.3.3.2.1	Production	0	0	0	0	0	0	0	26	0	0	26
1.1.1.3.3.2.2	Testing, Dicing and Sorting	0	0	0	0	0	0	23	26	0	0	49
1.1.1.4	Flex Hybrids/Optical Hybrids	0	0	0	0	0	0	141	398	5	0	543

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1.1.1.4.1	Design/Engineering	0	0	0	0	0	0	20	47	0	0	67
1.1.1.4.1.1	Prototype design	0	0	0	0	0	0	11	0	0	0	11
1.1.1.4.1.1.1	Flex hybrid	0	0	0	0	0	0	9	0	0	0	9
1.1.1.4.1.1.2	Pigtail	0	0	0	0	0	0	2	0	0	0	2
1.1.1.4.1.1.3	Optical Hybrids	0	0	0	0	0	0	0	0	0	0	0
1.1.1.4.1.2	Production design	0	0	0	0	0	0	9	47	0	0	56
1.1.1.4.1.2.1	Flex Hybrid	0	0	0	0	0	0	9	18	0	0	28
1.1.1.4.1.2.2	Pigtail	0	0	0	0	0	0	0	29	0	0	29
1.1.1.4.1.2.3	Optical components	0	0	0	0	0	0	0	0	0	0	0
1.1.1.4.2	Development and Prototypes	0	0	0	0	0	0	110	24	0	0	134
1.1.1.4.2.1	Flex hybrids	0	0	0	0	0	0	69	0	0	0	69
1.1.1.4.2.2	Optical prototypes	0	0	0	0	0	0	17	24	0	0	41
1.1.1.4.2.3	Pigtails prototypes	0	0	0	0	0	0	24	0	0	0	24
1.1.1.4.3	Production	0	0	0	0	0	0	10	327	5	0	341
1.1.1.4.3.1	Flex hybrid	0	0	0	0	0	0	0	243	0	0	243
1.1.1.4.3.1.1	Bare Flex Hybrids	0	0	0	0	0	0	0	87	0	0	87
1.1.1.4.3.1.2	Components and Assembl	0	0	0	0	0	0	0	63	0	0	63
1.1.1.4.3.1.3	Testing	0	0	0	0	0	0	0	93	0	0	93
1.1.1.4.3.1.3.1	Albany	0	0	0	0	0	0	0	18	0	0	18

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1.1.1.4.3.1.3.2	Oklahoma	0	0	0	0	0	0	0	75	0	0	75
1.1.1.4.3.2	Pigtails	0	0	0	0	0	0	0	23	0	0	23
1.1.1.4.3.3	Optical hybrids	0	0	0	0	0	0	10	61	5	0	76
1.1.1.4.3.3.1	Optical packages and com	0	0	0	0	0	0	0	0	0	0	0
1.1.1.4.3.3.2	Optical hybrids	0	0	0	0	0	0	0	33	0	0	33
1.1.1.4.3.3.3	Testing	0	0	0	0	0	0	10	28	5	0	43
1.1.1.5	Module Assembly/Test	0	0	0	0	0	0	224	504	240	0	968
1.1.1.5.1	Design/Engineering	0	0	0	0	0	0	37	35	0	0	73
1.1.1.5.1.1	Prototype Design	0	0	0	0	0	0	0	0	0	0	0
1.1.1.5.1.2	Production Design	0	0	0	0	0	0	0	0	0	0	0
1.1.1.5.1.3	Testing Design	0	0	0	0	0	0	37	35	0	0	73
1.1.1.5.1.3.1	Mechanical Prototypes	0	0	0	0	0	0	0	0	0	0	0
1.1.1.5.1.3.2	Functional Prototypes	0	0	0	0	0	0	37	35	0	0	73
1.1.1.5.2	Development and Prototypes	0	0	0	0	0	0	143	84	0	0	227
1.1.1.5.2.1	X-ray Inspection	0	0	0	0	0	0	5	5	0	0	11
1.1.1.5.2.2	Wafer Thinning	0	0	0	0	0	0	6	3	0	0	10
1.1.1.5.2.3	Wafer Dicing and Die Sort	0	0	0	0	0	0	10	9	0	0	19

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1.1.1.5.2.4	Dummy wafers	0	0	0	0	0	0	13	0	0	0	13
1.1.1.5.2.5	Module Assembly and Test	0	0	0	0	0	0	88	65	0	0	153
1.1.1.5.2.5.1	Tooling	0	0	0	0	0	0	54	0	0	0	54
1.1.1.5.2.5.2	Assembly	0	0	0	0	0	0	14	13	0	0	27
1.1.1.5.2.5.3	Testing	0	0	0	0	0	0	20	52	0	0	72
1.1.1.5.2.5.4	Equipment	0	0	0	0	0	0	0	0	0	0	0
1.1.1.5.2.6	Module Attachment	0	0	0	0	0	0	20	1	0	0	21
1.1.1.5.2.6.1	Tooling	0	0	0	0	0	0	8	0	0	0	8
1.1.1.5.2.6.2	Assembly	0	0	0	0	0	0	8	1	0	0	9
1.1.1.5.2.6.3	Testing	0	0	0	0	0	0	5	0	0	0	5
1.1.1.5.3	Production	0	0	0	0	0	0	43	385	240	0	668
1.1.1.5.3.1	IC Wafer Thinning	0	0	0	0	0	0	0	22	11	0	32
1.1.1.5.3.2	Dicing of IC Wafers	0	0	0	0	0	0	0	18	6	0	24
1.1.1.5.3.3	IC Die Sort	0	0	0	0	0	0	0	0	0	0	0
1.1.1.5.3.4	Module Assembly	0	0	0	0	0	0	0	143	57	0	200
1.1.1.5.3.4.1	Tooling	0	0	0	0	0	0	0	8	0	0	8
1.1.1.5.3.4.2	Assembly - LBNL	0	0	0	0	0	0	0	86	32	0	118
1.1.1.5.3.4.3	Assembly - Ohio State	0	0	0	0	0	0	0	49	25	0	74
1.1.1.5.3.5	Module Testing	0	0	0	0	0	0	43	147	66	0	257
1.1.1.5.3.5.1	Bare Module Testing	0	0	0	0	0	0	0	54	17	0	72

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1.1.1.5.3.5.2	Assembled Module Testing	0	0	0	0	0	0	43	93	49	0	185
1.1.1.5.3.6	Module Attachment	0	0	0	0	0	0	0	15	49	0	64
1.1.1.5.3.7	Attach Type 0 cable to Sect	0	0	0	0	0	0	0	0	0	0	0
1.1.1.5.3.8	Sector Electrical Testing	0	0	0	0	0	0	0	27	46	0	73
1.1.1.5.3.9	Production database	0	0	0	0	0	0	0	13	5	0	18
1.1.1.6	Beam/System Test Support	0	0	0	0	0	0	43	43	0	0	86
1.1.1.6.1	Test Beam Support	0	0	0	0	0	0	16	16	0	0	32
1.1.1.6.2	System test support	0	0	0	0	0	0	27	27	0	0	54