U.S. ATLAS M&O Estimate
Cost Book

Funding All **Funding Type:** All
Institution All

U.S. ATLAS M&O Estimate Cost 2/1/2004 12:57:53 PM

WBS 3 **Description** U.S. ATLAS M&O Estimate

Institution **Contact**

U.S. ATLAS Maintenance and Operations (M&O) includes detector specific costs allocated to subsystems and Common Fund cost related to overall experimental operations.

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	22462	0	0	22462	17482	808	1148	3024	158.3	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	1320	3960	5020	1940	1060	1060	1240	1060
	0	0	70.885	119.332	157.873	54.69	38.541	38.541	60.933	38.541
Grad Student B/I	0	0	7040	10560	15840	7920	5280	5280	7040	5280
	0	0	177.855	299.869	448.157	224.078	132.567	132.567	158.841	132.567
Post Doc B/I	0	0	9680	19360	22720	12940	5020	5020	6780	5020
	0	0	538.631	1204.95	1448.32	811.653	319.9	319.9	396.53	319.9
Sr Research Scientist B/I	0	0	4400	7040	7320	2120	2120	2120	3880	2120
	0	0	581.975	931.868	971.362	280.854	280.854	280.854	499.798	280.854
Technician B/I	0	521	403	0	0	0	0	0	0	0
	0	35.196	27.204	0	0	0	0	0	0	0
Term Scientist B/I	0	0	880	3520	4400	1760	880	880	880	880
	0	0	89.716	358.864	448.58	179.432	89.716	89.716	89.716	89.716
Electrical Engineer MR	0	0	0	1155	680	0	0	0	0	0
	0	0	0	117.43	78.913	0	0	0	0	0
Mechanical Engineer MR	0	0	0	160	70	0	0	0	0	0
	0	0	0	13.05	5.709	0	0	0	0	0
Technician MR	0	595	0	1040	1010	0	0	0	0	0
	0	34.467	0	50.609	48.468	0	0	0	0	0
Computer Professional R	0	0	440	2200	2200	1940	1940	1940	1940	1940
	0	0	40.372	201.861	201.86	178.005	178.005	178.005	178.005	178.005

Electrical Engineer R	0	0	2640	3905	3280	1720	780	780	780	780
	0	0	247.984	410.482	338.634	183.812	87.007	87.007	87.007	87.007
Mechanical Engineer R	0	0	0	1040	1010	1080	200	200	200	200
	0	0	0	84.822	82.376	88.085	16.312	16.312	16.312	16.312
Technician R	0	0	1760	1920	4270	3520	3280	3280	5920	3280
	0	0	78.382	113.411	235.674	205.76	188.632	188.632	306.205	188.632

MATERIAL SUMMARY:	**FY 03 (k$)**	**FY 04 (k$)**	**FY 05 (k$)**	**FY 06 (k$)**	**FY 07 (k$)**	**FY 08 (k$)**	**FY 09 (k$)**	**FY 10 (k$)**	**FY 11 (k$)**	**FY 12 (k$)**
Other B/I	0.0	0.0	6.0	5.0	5.0	5.0	2.5	2.5	5.0	2.5
Travel B/I	0.0	0.0	27.0	112.0	96.0	56.0	45.0	45.0	56.0	45.0
Other MR	0.0	78.4	88.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	144.3	150.3	191.0	273.3	495.2	453.2	510.3	408.7	271.2
Travel R	0.0	0.0	22.0	77.5	87.5	53.0	35.5	33.0	83.0	33.0

PROFILE SUMMARY:	**FY 03 (k$)**	**FY 04 (k$)**	**FY 05 (k$)**	**FY 06 (k$)**	**FY 07 (k$)**	**FY 08 (k$)**	**FY 09 (k$)**	**FY 10 (k$)**	**FY 11 (k$)**	**FY 12 (k$)**
	0	300	2172	4319	4955	2833	1880	1935	2373	1695

WBS 3.1 **Description** Silicon

Institution **Contact**

Pre-operations, operations and maintenance of the silicon subsystem (pixels, SCT and RODs).

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	22462	0	0	22462	17482	808	1148	3024	158.3	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	1320	3960	5020	1940	1060	1060	1240	1060
	0	0	70.885	119.332	157.873	54.69	38.541	38.541	60.933	38.541
Grad Student B/I	0	0	7040	10560	15840	7920	5280	5280	7040	5280
	0	0	177.855	299.869	448.157	224.078	132.567	132.567	158.841	132.567
Post Doc B/I	0	0	9680	19360	22720	12940	5020	5020	6780	5020
	0	0	538.631	1204.95	1448.32	811.653	319.9	319.9	396.53	319.9
Sr Research Scientist B/I	0	0	4400	7040	7320	2120	2120	2120	3880	2120
	0	0	581.975	931.868	971.362	280.854	280.854	280.854	499.798	280.854
Technician B/I	0	521	403	0	0	0	0	0	0	0
	0	35.196	27.204	0	0	0	0	0	0	0
Term Scientist B/I	0	0	880	3520	4400	1760	880	880	880	880
	0	0	89.716	358.864	448.58	179.432	89.716	89.716	89.716	89.716
Electrical Engineer MR	0	0	0	1155	680	0	0	0	0	0
	0	0	0	117.43	78.913	0	0	0	0	0
Mechanical Engineer MR	0	0	0	160	70	0	0	0	0	0
	0	0	0	13.05	5.709	0	0	0	0	0
Technician MR	0	595	0	1040	1010	0	0	0	0	0
	0	34.467	0	50.609	48.468	0	0	0	0	0
Computer Professional R	0	0	440	2200	2200	1940	1940	1940	1940	1940
	0	0	40.372	201.861	201.86	178.005	178.005	178.005	178.005	178.005
Electrical Engineer R	0	0	2640	3905	3280	1720	780	780	780	780
	0	0	247.984	410.482	338.634	183.812	87.007	87.007	87.007	87.007
Mechanical Engineer R	0	0	0	1040	1010	1080	200	200	200	200
	0	0	0	84.822	82.376	88.085	16.312	16.312	16.312	16.312
Technician R	0	0	1760	1920	4270	3520	3280	3280	5920	3280
	0	0	78.382	113.411	235.674	205.76	188.632	188.632	306.205	188.632

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other B/I	0.0	0.0	6.0	5.0	5.0	5.0	2.5	2.5	5.0	2.5
Travel B/I	0.0	0.0	27.0	112.0	96.0	56.0	45.0	45.0	56.0	45.0
Other MR	0.0	78.4	88.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	144.3	150.3	191.0	273.3	495.2	453.2	510.3	408.7	271.2
Travel R	0.0	0.0	22.0	77.5	87.5	53.0	35.5	33.0	83.0	33.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	300	2172	4319	4955	2833	1880	1935	2373	1695

WBS 3.1.1 **Description** Pixels

Institution **Contact**

Pre-operations, operations and maintenance for the pixel subsystem.

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	12582	0	0	12582	11777	131	674	0	94.9	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	880	3520	4400	1760	880	880	880	880
	0	0	16.149	64.596	80.745	32.298	16.149	16.149	16.149	16.149
Grad Student B/I	0	0	3520	7040	10560	5280	2640	2640	2640	2640
	0	0	122.014	244.028	366.042	183.021	91.51	91.51	91.51	91.51
Post Doc B/I	0	0	3520	12320	15840	8800	3520	3520	3520	3520
	0	0	251.205	879.217	1130.42	628.012	251.205	251.205	251.205	251.205
Sr Research Scientist B/I	0	0	880	3520	4400	1760	1760	1760	1760	1760
	0	0	116.631	466.524	583.154	233.262	233.262	233.262	233.262	233.262
Term Scientist B/I	0	0	880	3520	4400	1760	880	880	880	880
	0	0	89.716	358.864	448.58	179.432	89.716	89.716	89.716	89.716
Electrical Engineer MR	0	0	0	275	440	0	0	0	0	0
	0	0	0	35.326	56.521	0	0	0	0	0
Mechanical Engineer MR	0	0	0	160	70	0	0	0	0	0
	0	0	0	13.05	5.709	0	0	0	0	0
Technician MR	0	0	0	160	130	0	0	0	0	0
	0	0	0	11.418	9.277	0	0	0	0	0
Computer Professional R	0	0	0	1760	1760	1760	1760	1760	1760	1760
	0	0	0	161.489	161.488	161.489	161.489	161.489	161.489	161.489
Electrical Engineer R	0	0	0	1265	880	640	400	400	400	400
	0	0	0	162.498	113.042	82.212	51.382	51.382	51.382	51.382
Mechanical Engineer R	0	0	0	1040	1010	1080	200	200	200	200
	0	0	0	84.822	82.376	88.085	16.312	16.312	16.312	16.312
Technician R	0	0	0	1040	1190	1320	1080	1080	1080	1080
	0	0	0	74.22	84.925	94.202	77.074	77.074	77.074	77.074

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel B/I	0.0	0.0	0.0	85.0	70.0	30.0	30.0	30.0	30.0	30.0
Other R	0.0	0.0	0.0	25.0	20.0	20.0	15.0	15.0	15.0	15.0
Travel R	0.0	0.0	0.0	37.0	47.5	35.0	20.5	18.0	18.0	18.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	596	2715	3271	1774	1059	1056	1056	1056

WBS 3.1.1.1 **Description** Pre-operations

Institution **Contact**

Pre-operations

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	3279	0	0	3279	3003	116	160	0	26.2	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	880	1760	880	0	0	0	0	0
	0	0	16.149	32.298	16.149	0	0	0	0	0
Grad Student B/I	0	0	3520	7040	3520	0	0	0	0	0
	0	0	122.014	244.028	122.014	0	0	0	0	0
Post Doc B/I	0	0	3520	7040	3520	0	0	0	0	0
	0	0	251.205	502.41	251.205	0	0	0	0	0
Sr Research Scientist B/I	0	0	880	1760	880	0	0	0	0	0
	0	0	116.631	233.262	116.631	0	0	0	0	0
Term Scientist B/I	0	0	880	1760	880	0	0	0	0	0
	0	0	89.716	179.432	89.716	0	0	0	0	0
Electrical Engineer MR	0	0	0	275	440	0	0	0	0	0
	0	0	0	35.326	56.521	0	0	0	0	0
Mechanical Engineer MR	0	0	0	160	0	0	0	0	0	0
	0	0	0	13.05	0	0	0	0	0	0
Technician MR	0	0	0	160	0	0	0	0	0	0
	0	0	0	11.418	0	0	0	0	0	0
Computer Professional R	0	0	0	1760	880	0	0	0	0	0
	0	0	0	161.489	80.744	0	0	0	0	0
Electrical Engineer R	0	0	0	1265	440	0	0	0	0	0
	0	0	0	162.498	56.521	0	0	0	0	0
Mechanical Engineer R	0	0	0	1040	0	0	0	0	0	0
	0	0	0	84.822	0	0	0	0	0	0
Technician R	0	0	0	1040	0	0	0	0	0	0
	0	0	0	74.22	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel B/I	0.0	0.0	0.0	45.0	30.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel R	0.0	0.0	0.0	37.0	11.0	0.0	0.0	0.0	0.0	0.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	596	1850	834	0	0	0	0	0

WBS 3.1.1.1.1 **Description** SR Building Facilities

Institution LBNL **Contact**

Preparation of SR building for pixel-specific tasks.

Physicist estimate **Basis of**

Details of Estimate:

Funding for materials, equipment and related items for the SR building are covered under WBS 3.1.4 to be in common with the SCT (and TRT).

Cost Summary: (All)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs All**	**FTEs Other**
	0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:	***Risk***				***Weight***			**Cont %**
	Technical	**C o s t**	**Schedule**	**Des i gn**	**Technical**	**C o s t**	**Schedule**	
	0	0	0	0	0	0	0	0

WBS 3.1.1.1.2 **Description** Mechanical support

Institution LBNL **Contact**

Design and other activity related to preoperations of pixel detector after the insertion/installation into the Inner Detector in mid-FY06. LBNL is the lead institution for pixel mechanics and, therefore, has a major role in both installation (not included here) and the follow-up maintenance activities, including preoperations with the other tracker devices, which is scheduled prior to beam-on operation. Mechanical support will be needed to document the installation/insertion procedures, to organize and carefully store the associated tooling and to prepare for removal in case problems occur during the preoperations (or operations) period.

Basis of Estimate: Physicist estimate

Details of Estimate: Preoperations follows immediately after the insertion/installation of the pixel detector into the Pixel Support Tube. The insertion procedures, the cabling procedures, the coolant tube connection procedures and other procedures related to initial operation e.g. testing PST heaters must be documented and approved by the ATLAS management. Note that the insertion also includes surveying the beam pipe location, adjustments of the beam pipe location and other items associated with the beam pipe, which is supported by the US-supplied support structure. Mechanical support must also be available on very short notice in case problems arise during the preoperations phase that require (a) recabling or reconnecting coolant tubes (at PP1) (b) beam pipe adjustment and c) the possibility for emergency removal of the pixel system and reinsertion. This support, beyond that described here, would have to come from contingency funds.

Documentation tasks	Duration (weeks)
Disk surface assembly	2
Disk integration with barrel	1
Barrel/disk cabling to PP0	1
Service panel installation and mechanical checks	2
Beam pipe integration into structure (incl adjust)	2
Package insertion in installation tube	1
Installation procedure into PST	2
PP1 cabling and connection procedure	4
Tooling inventory and storage	2
Removal procedures	2
Total	19

Approval duration of controlled documentation we take as 8 weeks, during which mechanical support must be available to interact with approvers. Some of this can overlap with actual documentation but not much. Thus we estimate total duration of about 26 weeks in FY06.
We assumed that the lead mechanical engineer and the senior tech associated with the US deliverables will be responsible for the documentation and related.

Travel costs at 3 trips to CERN of 1 week each are included.

Manpower all in FY06

Mechanical engineer	1040 hours
Senior techs	1040 hours

U.S. ATLAS % share of 67.00%

Cost Summary: (All)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs All**	**FTEs Other**
	216	0	0	216	159	24	32	0	1.4	0.0

MANPOWER	FY 03 (hrs)	FY 04 (hrs)	FY 05 (hrs)	FY 06 (hrs)	FY 07 (hrs)	FY 08 (hrs)	FY 09 (hrs)	FY 10 (hrs)	FY 11 (hrs)	FY 12 (hrs)
Mechanical Engineer MR	0	0	0	160	0	0	0	0	0	0
	0	0	0	13.05	0	0	0	0	0	0
Technician MR	0	0	0	160	0	0	0	0	0	0
	0	0	0	11.418	0	0	0	0	0	0
Mechanical Engineer R	0	0	0	1040	0	0	0	0	0	0
	0	0	0	84.822	0	0	0	0	0	0
Technician R	0	0	0	1040	0	0	0	0	0	0
	0	0	0	74.22	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other R	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel R	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	216	0	0	0	0	0	0

WBS 3.1.1.1.3 **Description** Electrical support

Institution LBNL **Contact**

Support of electronics preoperations, test systems, pixel-specific work on RODs. LBNL has major responsibilities for the front end chip and RODs, with other U.S. institutions taking the lead on the flex hybrid (Oklahoma) and opto-hybrid (Ohio State Univ.). European institutions have the lead on the controller chip. This task involves providing the high level of engineering to deal with problems during the initial preoperations of this very complex

Basis of Estimate: Physicist estimate

Details of Estimate: Our model assumes a continuation of systems engineering support after completion of the IC and off detector electronics system fabrication at about 1.0 FTE in FY06 when insertion/installation is complete. This is 1200 hours in FY06 and we assume this continues (as preoperations) up to first beam in the middle of FY07. Documentation is included. The manpower is currently ascribed to LBNL but may be a composite of engineers from LBL, OSU and Oklahoma.

Travel costs are included. We also include costs for electronics test equipment that will be used at CERN for extended periods.

U.S. ATLAS % share of 65.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	346	0	0	346	219	92	35	0	1.4	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Electrical Engineer MR	0	0	0	275	440	0	0	0	0	0
	0	0	0	35.326	56.521	0	0	0	0	0
Electrical Engineer R	0	0	0	1265	440	0	0	0	0	0
	0	0	0	162.498	56.521	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other R	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel R	0.0	0.0	0.0	15.0	7.5	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	Risk				Weight			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	225	121	0	0	0	0	0

WBS 3.1.1.1.4 **Description** Software support

Institution LBNL **Contact**

Support of software systems for preoperations. The various DAQ, calibration, and monitoring programs are being developed by John Richardson, who will become resident at CERN to continue his work during the preoperations, operations and maintenance. He will deal with problems that arise when running the full pixel system within the framework of the whole detector. Documentation is included.

Basis of Estimate: Physicist estimate

Details of Estimate: Software support of electronics, DAQ, monitoring, calibration by John Richardson during the preoperations phase in FY06 through the middle of FY07.

U.S. ATLAS % share of 25.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	254	0	0	254	242	0	11	0	1.5	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Computer Professional R	0	0	0	1760	880	0	0	0	0	0
	0	0	0	161.489	80.744	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel R	0.0	0.0	0.0	7.0	3.5	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	169	85	0	0	0	0	0

WBS 3.1.1.1.5 **Description** Physicist support

Institution LBNL **Contact**

Physicist support of preoperations and commissioning.

Physicist estimate **Basis of**

Currently ascribed all to LBNL for convenience, but includes LBNL and all universities. **Details of Estimate:**

Division among LBNL and universities is TBD.

U.S. ATLAS % share of 25.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	2464	0	0	2464	2383	0	81	0	22.0	0.0

MANPOWER SUMMARY: (k$)	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	880	1760	880	0	0	0	0	0
	0	0	16.149	32.298	16.149	0	0	0	0	0
Grad Student B/I	0	0	3520	7040	3520	0	0	0	0	0
	0	0	122.014	244.028	122.014	0	0	0	0	0
Post Doc B/I	0	0	3520	7040	3520	0	0	0	0	0
	0	0	251.205	502.41	251.205	0	0	0	0	0
Sr Research Scientist B/I	0	0	880	1760	880	0	0	0	0	0
	0	0	116.631	233.262	116.631	0	0	0	0	0
Term Scientist B/I	0	0	880	1760	880	0	0	0	0	0
	0	0	89.716	179.432	89.716	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel B/I	0.0	0.0	0.0	45.0	30.0	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* Cost	*Risk* Schedule	*Risk* Design	*Weight* Technical	*Weight* Cost	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	596	1240	628	0	0	0	0	0

WBS 3.1.1.2 **Description** Operations

Institution **Contact**

Operations during ATLAS data taking.

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	9131	0	0	9131	8613	15	503	0	67.9	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	0	1760	3520	1760	880	880	880	880
	0	0	0	32.298	64.596	32.298	16.149	16.149	16.149	16.149
Grad Student B/I	0	0	0	0	7040	5280	2640	2640	2640	2640
	0	0	0	0	244.028	183.021	91.51	91.51	91.51	91.51
Post Doc B/I	0	0	0	5280	12320	8800	3520	3520	3520	3520
	0	0	0	376.807	879.217	628.012	251.205	251.205	251.205	251.205
Sr Research Scientist B/I	0	0	0	1760	3520	1760	1760	1760	1760	1760
	0	0	0	233.262	466.523	233.262	233.262	233.262	233.262	233.262
Term Scientist B/I	0	0	0	1760	3520	1760	880	880	880	880
	0	0	0	179.432	358.864	179.432	89.716	89.716	89.716	89.716
Mechanical Engineer MR	0	0	0	0	70	0	0	0	0	0
	0	0	0	0	5.709	0	0	0	0	0
Technician MR	0	0	0	0	130	0	0	0	0	0
	0	0	0	0	9.277	0	0	0	0	0
Computer Professional R	0	0	0	0	880	1760	1760	1760	1760	1760
	0	0	0	0	80.744	161.489	161.489	161.489	161.489	161.489
Electrical Engineer R	0	0	0	0	440	440	200	200	200	200
	0	0	0	0	56.521	56.521	25.691	25.691	25.691	25.691
Mechanical Engineer R	0	0	0	0	810	880	200	200	200	200
	0	0	0	0	66.064	71.773	16.312	16.312	16.312	16.312
Technician R	0	0	0	0	1190	1320	1080	1080	1080	1080
	0	0	0	0	84.925	94.202	77.074	77.074	77.074	77.074

MATERIAL	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12
Travel B/I	0.0	0.0	0.0	40.0	40.0	30.0	30.0	30.0	30.0	30.0
Other R	0.0	0.0	0.0	0.0	20.0	20.0	15.0	15.0	15.0	15.0
Travel R	0.0	0.0	0.0	0.0	34.0	30.0	18.0	18.0	18.0	18.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	865	2418	1726	1030	1030	1030	1030

WBS 3.1.1.2.1 **Description** Mechanical Support

Institution LBNL **Contact**

Mechanical support of operations. Described earlier under 3.1.1.1.2. LBNL also responsible for complex cabling, services, and support structure. Will deal with problems in these areas.

Basis of Estimate: Physicist estimate

Details of Estimate: 0.5 FTE ME in FY07-FY08, assuming need for intervention (partial or complete pixel removal) and 0.1 FTE thereafter to be available to answer questions, address problems.. We assume 0.5 FTE tech equivalent support for operations is required and miscellaneous materials and equipment costs.

U.S. ATLAS % share of 50.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	709	0	0	709	571	15	123	0	4.5	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Mechanical Engineer MR	0	0	0	0	70	0	0	0	0	0
	0	0	0	0	5.709	0	0	0	0	0
Technician MR	0	0	0	0	130	0	0	0	0	0
	0	0	0	0	9.277	0	0	0	0	0
Mechanical Engineer R	0	0	0	0	810	880	200	200	200	200
	0	0	0	0	66.064	71.773	16.312	16.312	16.312	16.312
Technician R	0	0	0	0	750	880	880	880	880	880
	0	0	0	0	53.524	62.801	62.801	62.801	62.801	62.801

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other R	0.0	0.0	0.0	0.0	10.0	10.0	10.0	10.0	10.0	10.0
Travel R	0.0	0.0	0.0	0.0	15.0	15.0	6.0	6.0	6.0	6.0

CONTINGENCY FACTORS:	Risk				Weight			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	162	162	96	96	96	96

WBS 3.1.1.2.2 **Description** Electrical Support

Institution LBNL **Contact**

Support of electronics operations. Tasks described earlier under 3.1.1.1.3. Effort required is assumed to tail off over time, assuming system works relatively smoothly after bun-in period.

Basis of Estimate: Physicist estimate

Details of Estimate: 0.25 FTE EE in FY07 -FY08, which assumes need for intervention, fixing problems… and 0.1 FTE thereafter. Technical support at 0.25 FTE in FY07-FY08 and then 0.1 FTE thereafter.

U.S. ATLAS % share of 20.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	409	0	0	409	336	0	73	0	1.9	0.0

MANPOWER SUMMARY: (k$)	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Electrical Engineer R	0	0	0	0	440	440	200	200	200	200
	0	0	0	0	56.521	56.521	25.691	25.691	25.691	25.691
Technician R	0	0	0	0	440	440	200	200	200	200
	0	0	0	0	31.401	31.401	14.273	14.273	14.273	14.273

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other R	0.0	0.0	0.0	0.0	10.0	10.0	5.0	5.0	5.0	5.0
Travel R	0.0	0.0	0.0	0.0	10.0	6.0	3.0	3.0	3.0	3.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* Cost	*Risk* Schedule	*Risk* Design	*Weight* Technical	*Weight* Cost	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	110	105	49	49	49	49

WBS 3.1.1.2.3 **Description** Software support

Institution LBNL **Contact**

Support of software for operations. Tasks described earlier under 3.1.1.1.4. Steady, stable effort required as large data samples are accumulated.

Basis of Estimate: Physicist estimate

Details of Estimate: 1 FTE computer scientist/engineer, John Richardson for operation, maintenance of DAQ, software, calibration and related electronics systems.
Richardson currently is, and will likely be, on the only system pixel electronics engineer.

U.S. ATLAS % share of 25.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	947	0	0	947	888	0	58	0	5.5	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Computer Professional R	0	0	0	0	880	1760	1760	1760	1760	1760
	0	0	0	0	80.744	161.489	161.489	161.489	161.489	161.489

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel R	0.0	0.0	0.0	0.0	9.0	9.0	9.0	9.0	9.0	9.0

CONTINGENCY FACTORS:	Risk: Technical	Risk: Cost	Risk: Schedule	Risk: Design	Weight: Technical	Weight: Cost	Weight: Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	90	171	171	171	171	171

WBS 3.1.1.2.4 **Description** Physicist support

Institution LBNL **Contact**

Physicist support of operations.

Basis of Details of Estimate: Physicist estimate

Currently all ascribed to LBNL for convenience but includes LBNL and university physicists. Division among LBNL and specific universities is TBD.

U.S. ATLAS % share of 25.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	7067	0	0	7067	6818	0	248	0	56.0	0.0

MANPOWER SUMMARY: (k$)	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	0	1760	3520	1760	880	880	880	880
	0	0	0	32.298	64.596	32.298	16.149	16.149	16.149	16.149
Grad Student B/I	0	0	0	0	7040	5280	2640	2640	2640	2640
	0	0	0	0	244.028	183.021	91.51	91.51	91.51	91.51
Post Doc B/I	0	0	0	5280	12320	8800	3520	3520	3520	3520
	0	0	0	376.807	879.217	628.012	251.205	251.205	251.205	251.205
Sr Research Scientist B/I	0	0	0	1760	3520	1760	1760	1760	1760	1760
	0	0	0	233.262	466.523	233.262	233.262	233.262	233.262	233.262
Term Scientist B/I	0	0	0	1760	3520	1760	880	880	880	880
	0	0	0	179.432	358.864	179.432	89.716	89.716	89.716	89.716

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel B/I	0.0	0.0	0.0	40.0	40.0	30.0	30.0	30.0	30.0	30.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* Cost	*Risk* Schedule	*Risk* Design	*Weight* Technical	*Weight* Cost	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	865	2056	1288	714	714	714	714

WBS 3.1.1.3 **Description** Maintenance

Institution **Contact**

Maintenance activities during ATLAS shutdowns.

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	172	0	0	172	161	0	11	0	0.8	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Electrical Engineer R	0	0	0	0	0	200	200	200	200	200
	0	0	0	0	0	25.691	25.691	25.691	25.691	25.691
Mechanical Engineer R	0	0	0	0	200	200	0	0	0	0
	0	0	0	0	16.312	16.312	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel R	0.0	0.0	0.0	0.0	2.5	5.0	2.5	0.0	0.0	0.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	19	47	28	26	26	26

WBS 3.1.1.3.1 **Description** Mechanical support

Institution LBNL **Contact**

Mechanical support of maintenance. U.S. contribution to technical effort providing maintenance for pixel detector. Includes any minor repair work during shutdowns. Assumption is that larger effort required during initial running, tapering down after running. Initial estimate for ME considers removal of pixels and/or beam pipe after pilot runs.

Basis of Estimate: Physicist estimate

Details of Estimate: We assume some very small amount of mechanical support is needed in FY08 and FY09 to answer questions. Should the pixel system be removed after the first physics run i.e. in FY08 to put in the 3rd pixel, the significant support would come from the Upgrade category and not maintenance. Replacement of the B-layer would similarly be an Upgrade.

U.S. ATLAS % share of 20.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	38	0	0	38	33	0	5	0	0.2	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Mechanical Engineer R	0	0	0	0	200	200	0	0	0	0
	0	0	0	0	16.312	16.312	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel R	0.0	0.0	0.0	0.0	2.5	2.5	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	19	19	0	0	0	0

WBS 3.1.1.3.2 **Description** Electrical support

Institution LBNL **Contact**

Electrical engineering and technical support of maintenance. U.S. contributions to maintenance of electrical systems, including repairs during shutdowns. Areas of responsibility include cabling plant, and electronics systems.

Basis of Estimate: Physicist estimate

Details of Estimate: We assume some very small amount of non-ROD electrical support is needed in FY08 and FY09 to answer questions. Should the pixel system be removed after the first physics run i.e. in FY08 to put in the 3rd pixel, the significant support would come from the Upgrade category and not maintenance. Replacement of the B-layer would similarly be an Upgrade.

U.S. ATLAS % share of 20.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	134	0	0	134	128	0	5	0	0.6	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Electrical Engineer R	0	0	0	0	0	200	200	200	200	200
	0	0	0	0	0	25.691	25.691	25.691	25.691	25.691

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel R	0.0	0.0	0.0	0.0	0.0	2.5	2.5	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	0	28	28	26	26	26

WBS 3.1.1.3.3 **Description** Software support

Institution LBNL **Contact**

Software support of maintenance

Basis of Estimate: Physicist estimate

Details of Estimate: Covered under operations. It's practically not possible to distinguish between operations and maintenance in this category.

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	
	0	0	0	0	0	0	0	0

WBS 3.1.1.3.4 **Description** Physicist support

Institution LBNL **Contact**

Physicist support of maintenance.

Physicist estimate **Basis of**

Covered under operations **Details of Estimate:**

Cost Summary: (All)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs All**	**FTEs Other**
	0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:	***Risk***				***Weight***			**Cont %**
	Technical	**C o s t**	**Schedule**	**Des i gn**	**Technical**	**C o s t**	**Schedule**	
	0	0	0	0	0	0	0	0

WBS 3.1.1.3.5 **Description** Spares

Institution LBNL **Contact**

Spare items and parts. By definition these are not included in the initial fabrication or procurements.

Currently no spares are foreseen, since early upgrade is projected. **Details of Estimate:**

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	0	0	0	0	0	0	0	0	0.0	0.0

WBS 3.1.1.3.5.1 **Description** Mechanics/Services

Institution LBNL **Contact**

Mechanical elements, cables or coolant system parts or assemblies.

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	
	0	0	0	0	0	0	0	0

WBS 3.1.1.3.5.2 **Description** Sensors

Institution LBNL **Contact**

Procurement of silicon detectors and testing of them.

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	
	0	0	0	0	0	0	0	0

WBS 3.1.1.3.5.3 **Description** Electronics

Institution LBNL **Contact**

Procurement and testing of integrated circuit electronics or related test systems

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

WBS 3.1.1.3.5.4 **Description** Hybrids

Institution LBNL **Contact**

Procurement and testing of flex hybrid and optical hybrid parts and assemblies.

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	
	0	0	0	0	0	0	0	0

WBS 3.1.1.3.5.5 **Description** Modules

Institution LBNL **Contact**

Procurement of parts, assembly and testing for modules.

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	
	0	0	0	0	0	0	0	0

WBS 3.1.2 **Description** SCT

Institution **Contact**

Pre-operations, operations and maintenance for the SCT subsystem.

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	4274	0	0	4274	3185	478	269	342	40.2	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	440	440	620	180	180	180	360	180
	0	0	54.736	54.736	77.128	22.392	22.392	22.392	44.784	22.392
Grad Student B/I	0	0	1760	1760	3520	1760	1760	1760	3520	1760
	0	0	26.273	26.273	52.547	26.273	26.273	26.273	52.547	26.273
Post Doc B/I	0	0	2640	3520	3520	3520	880	880	2640	880
	0	0	114.946	153.261	153.261	153.261	38.315	38.315	114.945	38.315
Sr Research Scientist B/I	0	0	1760	1760	1320	180	180	180	1940	180
	0	0	218.944	218.944	164.208	22.392	22.392	22.392	241.336	22.392
Technician B/I	0	521	403	0	0	0	0	0	0	0
	0	35.196	27.204	0	0	0	0	0	0	0
Electrical Engineer MR	0	0	0	880	240	0	0	0	0	0
	0	0	0	82.104	22.392	0	0	0	0	0
Technician MR	0	595	0	880	880	0	0	0	0	0
	0	34.467	0	39.191	39.191	0	0	0	0	0
Electrical Engineer R	0	0	880	880	640	200	200	200	200	200
	0	0	82.104	82.104	59.712	18.66	18.66	18.66	18.66	18.66
Technician R	0	0	1760	880	2640	1760	1760	1760	4400	1760
	0	0	78.382	39.191	117.573	78.382	78.382	78.382	195.955	78.382

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other B/I	0.0	0.0	3.5	5.0	5.0	5.0	2.5	2.5	5.0	2.5
Travel B/I	0.0	0.0	9.0	12.0	20.0	20.0	9.0	9.0	20.0	9.0

Other MR	0.0	78.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	38.6	62.9	5.0	15.0	10.0	10.0	10.0	25.0	10.0
Travel R	0.0	0.0	10.0	22.5	24.0	6.0	6.0	6.0	56.0	6.0

PROFILE SUMMARY:	**FY 03 (k$)**	**FY 04 (k$)**	**FY 05 (k$)**	**FY 06 (k$)**	**FY 07 (k$)**	**FY 08 (k$)**	**FY 09 (k$)**	**FY 10 (k$)**	**FY 11 (k$)**	**FY 12 (k$)**
	0	195	696	749	761	369	238	238	793	238

WBS 3.1.2.1 **Description** Pre-operations

Institution **Contact**

Pre-operations

Details of Estimate: LBNL and UC Santa Cruz are currently the only US institutions involved in the SCT. We have made an estimate of the division of costs between these two in the subsequent lower levels, but it's the sum

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	1361	0	0	1361	1150	121	90	0	11.5	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	440	440	0	0	0	0	0	0
	0	0	54.736	54.736	0	0	0	0	0	0
Grad Student B/I	0	0	1760	1760	0	0	0	0	0	0
	0	0	26.273	26.273	0	0	0	0	0	0
Post Doc B/I	0	0	2640	3520	0	0	0	0	0	0
	0	0	114.946	153.261	0	0	0	0	0	0
Sr Research Scientist B/I	0	0	1760	1760	0	0	0	0	0	0
	0	0	218.944	218.944	0	0	0	0	0	0
Electrical Engineer MR	0	0	0	880	0	0	0	0	0	0
	0	0	0	82.104	0	0	0	0	0	0
Technician MR	0	0	0	880	0	0	0	0	0	0
	0	0	0	39.191	0	0	0	0	0	0
Electrical Engineer R	0	0	880	880	0	0	0	0	0	0
	0	0	82.104	82.104	0	0	0	0	0	0
Technician R	0	0	1760	880	0	0	0	0	0	0
	0	0	78.382	39.191	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other B/I	0.0	0.0	3.5	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel B/I	0.0	0.0	9.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0

Other R	0.0	0.0	10.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel R	0.0	0.0	10.0	22.5	0.0	0.0	0.0	0.0	0.0	0.0

PROFILE SUMMARY:	**FY 03 (k$)**	**FY 04 (k$)**	**FY 05 (k$)**	**FY 06 (k$)**	**FY 07 (k$)**	**FY 08 (k$)**	**FY 09 (k$)**	**FY 10 (k$)**	**FY 11 (k$)**	**FY 12 (k$)**
	0	0	613	749	0	0	0	0	0	0

WBS 3.1.2.1.1 **Description** Preoperations - LBNL

Institution LBNL **Contact**

Physicist and technical staff for preoperations and commissioning

Physicist estimate **Basis of**

No LBNL role in preoperations is projected. **Details of Estimate:**

U.S. ATLAS % share of 0.00%

Cost Summary: (All)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs All**	**FTEs Other**
	0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:	***Risk***				***Weight***			**Cont %**
	Technical	**C o s t**	**Schedule**	**Des i gn**	**Technical**	**C o s t**	**Schedule**	
	0	0	0	0	0	0	0	0

WBS 3.1.2.1.2 **Description** Preoperations - UCSC

Institution U. of California, Santa Cruz **Contact**

Basis of Estimate:

Physicist and technical staff for preoperations of SCT. Responsibilities for UCSC include debug of problems involving U.S.-provided modules and electrical system engineering problems related to grounding, shielding, and

Physicist estimate

EE in FY05 and 100% of FY06 for work on grounding, shielding, responding to questions regarding UCSC deliverables and other preoperations activities. trips per year to Europe are included.

Technician related to preoperations in UK and CERN, responding to questions about UCSC deliverables and other preoperations activities. Travel and misc expenses.

U.S. ATLAS % share of 10.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	1361	0	0	1361	1150	121	90	0	11.5	0.0

MANPOWER SUMMARY: (k$)	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	440	440	0	0	0	0	0	0
	0	0	54.736	54.736	0	0	0	0	0	0
Grad Student B/I	0	0	1760	1760	0	0	0	0	0	0
	0	0	26.273	26.273	0	0	0	0	0	0
Post Doc B/I	0	0	2640	3520	0	0	0	0	0	0
	0	0	114.946	153.261	0	0	0	0	0	0
Sr Research Scientist B/I	0	0	1760	1760	0	0	0	0	0	0
	0	0	218.944	218.944	0	0	0	0	0	0
Electrical Engineer MR	0	0	0	880	0	0	0	0	0	0
	0	0	0	82.104	0	0	0	0	0	0
Technician MR	0	0	0	880	0	0	0	0	0	0
	0	0	0	39.191	0	0	0	0	0	0
Electrical Engineer R	0	0	880	880	0	0	0	0	0	0
	0	0	82.104	82.104	0	0	0	0	0	0
Technician R	0	0	1760	880	0	0	0	0	0	0
	0	0	78.382	39.191	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other B/I	0.0	0.0	3.5	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel B/I	0.0	0.0	9.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	0.0	10.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel R	0.0	0.0	10.0	22.5	0.0	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	613	749	0	0	0	0	0	0

WBS 3.1.2.1.3 **Description** Preoperations - SR building/CERN

Institution U. of California, Santa Cruz **Contact**

Costs associated with SCT operation in SR building and other assembly/test sites at CERN.

Physicist estimate **Basis of**

These costs are covered under 3.1.4 as part of Common Silicon/ID costs **Details of Estimate:**

Cost Summary: (All)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	Cont %
0	0	0	0	0	0	0	0

WBS 3.1.2.2 **Description** Operations

Institution **Contact**

Operations during ATLAS data taking.

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	1804	0	0	1804	1602	22	179	0	22.1	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	0	0	440	180	180	180	180	180
	0	0	0	0	54.736	22.392	22.392	22.392	22.392	22.392
Grad Student B/I	0	0	0	0	3520	1760	1760	1760	3520	1760
	0	0	0	0	52.547	26.273	26.273	26.273	52.547	26.273
Post Doc B/I	0	0	0	0	2640	3520	880	880	880	880
	0	0	0	0	114.946	153.261	38.315	38.315	38.315	38.315
Sr Research Scientist B/I	0	0	0	0	880	180	180	180	180	180
	0	0	0	0	109.472	22.392	22.392	22.392	22.392	22.392
Electrical Engineer MR	0	0	0	0	240	0	0	0	0	0
	0	0	0	0	22.392	0	0	0	0	0
Electrical Engineer R	0	0	0	0	200	200	200	200	200	200
	0	0	0	0	18.66	18.66	18.66	18.66	18.66	18.66
Technician R	0	0	0	0	1760	1760	1760	1760	1760	1760
	0	0	0	0	78.382	78.382	78.382	78.382	78.382	78.382

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other B/I	0.0	0.0	0.0	0.0	5.0	5.0	2.5	2.5	5.0	2.5
Travel B/I	0.0	0.0	0.0	0.0	20.0	20.0	9.0	9.0	20.0	9.0
Travel R	0.0	0.0	0.0	0.0	9.0	6.0	6.0	6.0	6.0	6.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	492	359	228	228	270	228

WBS 3.1.2.2.1 **Description** LBNL

Institution LBNL **Contact**

Physicist and technical staff for operations. Continuation of operations activities described under 3.1.2.1.1.

Physicist estimate **Basis of**

None **Details of Estimate:**

U.S. ATLAS % share of 0.00%

Cost Summary: (All)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs All**	**FTEs Other**
	0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:	***Risk***				***Weight***			**Cont %**
	Technical	**C o s t**	**Schedule**	**Des i gn**	**Technical**	**C o s t**	**Schedule**	
	0	0	0	0	0	0	0	0

WBS 3.1.2.2.2 **Description** UCSC

Institution U. of California, Santa Cruz **Contact**

Operations support at UCSC. Continuation of operations activities described under 3.1.2.1.2.

Basis of Physicist estimate

Details of Estimate: 0.1FTE EE in FY07, 0.1 FTE thereafter. 1 FTE technical support as part of the SCT

U.S. ATLAS % share of 10.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	1804	0	0	1804	1602	22	179	0	22.1	0.0

MANPOWER SUMMARY: (k$)	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	0	0	440	180	180	180	180	180
	0	0	0	0	54.736	22.392	22.392	22.392	22.392	22.392
Grad Student B/I	0	0	0	0	3520	1760	1760	1760	3520	1760
	0	0	0	0	52.547	26.273	26.273	26.273	52.547	26.273
Post Doc B/I	0	0	0	0	2640	3520	880	880	880	880
	0	0	0	0	114.946	153.261	38.315	38.315	38.315	38.315
Sr Research Scientist B/I	0	0	0	0	880	180	180	180	180	180
	0	0	0	0	109.472	22.392	22.392	22.392	22.392	22.392
Electrical Engineer MR	0	0	0	0	240	0	0	0	0	0
	0	0	0	0	22.392	0	0	0	0	0
Electrical Engineer R	0	0	0	0	200	200	200	200	200	200
	0	0	0	0	18.66	18.66	18.66	18.66	18.66	18.66
Technician R	0	0	0	0	1760	1760	1760	1760	1760	1760
	0	0	0	0	78.382	78.382	78.382	78.382	78.382	78.382

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other B/I	0.0	0.0	0.0	0.0	5.0	5.0	2.5	2.5	5.0	2.5
Travel B/I	0.0	0.0	0.0	0.0	20.0	20.0	9.0	9.0	20.0	9.0

Travel R	0.0	0.0	0.0	0.0	9.0	6.0	6.0	6.0	6.0	6.0

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	**C o s t**	**Schedule**	**Des i gn**	**Technical**	**C o s t**	**Schedule**	
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	492	359	228	228	270	228

WBS 3.1.2.2.3 **Description** SR building/CERN

Institution U. of California, Santa Cruz **Contact**

Operations support for SCT at CERN

Physicist estimate **Basis of**

These are covered under 3.1.4. **Details of Estimate:**

Cost Summary: (All)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	Cont %
0	0	0	0	0	0	0	0

WBS 3.1.2.3 **Description** Maintenance

Institution U. of California, Santa Cruz **Contact**

Maintenance activities during ATLAS shutdowns. This also includes preparations for maintenance.

Basis of Details of Estimate: Physicist estimate

Spares are included in this element. We assume 15% spares are required. Routine maintenance operations on the SCT are covered under operations. We assume two interventions, the first in FY07 for 6 months for "minor" repairs and a major intervention for one year in FY11(arbitrary). Technical labor is arbitrarily assigned only to UCSC at this time. FY04 and FY05 figures are for spare modules. Maintenance assumes significant work during the first year of data collection, followed by minor contributions until a significant repair program, assumed to occur in FY11. FY11 program requires removal of SCT and module replacement using

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	1109	0	0	1109	433	334	0	342	6.6	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Faculty B/I	0	0	0	0	180	0	0	0	180	0
	0	0	0	0	22.392	0	0	0	22.392	0
Post Doc B/I	0	0	0	0	880	0	0	0	1760	0
	0	0	0	0	38.315	0	0	0	76.63	0
Sr Research Scientist B/I	0	0	0	0	440	0	0	0	1760	0
	0	0	0	0	54.736	0	0	0	218.944	0
Technician B/I	0	521	403	0	0	0	0	0	0	0
	0	35.196	27.204	0	0	0	0	0	0	0
Technician MR	0	595	0	0	880	0	0	0	0	0
	0	34.467	0	0	39.191	0	0	0	0	0
Electrical Engineer R	0	0	0	0	440	0	0	0	0	0
	0	0	0	0	41.052	0	0	0	0	0
Technician R	0	0	0	0	880	0	0	0	2640	0
	0	0	0	0	39.191	0	0	0	117.573	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)

Other MR	0.0	78.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	38.6	52.9	0.0	15.0	10.0	10.0	10.0	25.0	10.0
Travel R	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	50.0	0.0

PROFILE SUMMARY:	**FY 03 (k$)**	**FY 04 (k$)**	**FY 05 (k$)**	**FY 06 (k$)**	**FY 07 (k$)**	**FY 08 (k$)**	**FY 09 (k$)**	**FY 10 (k$)**	**FY 11 (k$)**	**FY 12 (k$)**
	0	195	83	0	269	10	10	10	523	10

WBS 3.1.2.3.1 **Description** Spares

Institution **Contact**

Spare items and parts. By definition these are not included in the initial fabrication or procurements. We assume that 15% spare parts/assemblies are needed. We assume that spare parts (ICs, hybrids, detectors, baseboards) are procured in time to produce 15% spare modules at the end of FY05. These costs will, predominantly, be labor. Will be updated at a later date after module construction normalizes.

Details of Estimate: Costs are for approximately 40 spare modules. Costs are scaled from present estimates for production.

U.S. ATLAS % share of 15.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	278	0	0	278	0	97	0	181	0.9	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Technician B/I	0	521	403	0	0	0	0	0	0	0
	0	35.196	27.204	0	0	0	0	0	0	0
Technician MR	0	595	0	0	0	0	0	0	0	0
	0	34.467	0	0	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other MR	0.0	78.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	38.6	52.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	195	83	0	0	0	0	0	0	0

WBS 3.1.2.3.1.2 **Description** Hybrid Assembly/Test

Institution **Contact**

Assembly of hybrids (from Japan) and testing of them.

This work is for spare hybrids, needed for the spare modules, described under 3.1.2.3.1. **Details of Estimate:**

Breakdown between LBNL and UCSC provided under next two WBS elements.

U.S. ATLAS % share of 15.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	83	0	0	83	0	37	0	46	0.3	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Technician B/I	0	149	115	0	0	0	0	0	0	0
	0	10.633	8.207	0	0	0	0	0	0	0
Technician MR	0	347	0	0	0	0	0	0	0	0
	0	18.11	0	0	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other MR	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	0.0	19.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	55	28	0	0	0	0	0	0	0

WBS 3.1.2.3.1.2.1 **Description** Hybrid Assembly/Test -LBNL

Institution LBNL **Contact**

Parametric estimate **Basis of**
All done at UCSC **Details of Estimate:**

U.S. ATLAS % share of 15.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	49	0	0	49	0	26	0	23	0.2	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Technician B/I	0	149	115	0	0	0	0	0	0	0
	0	10.633	8.207	0	0	0	0	0	0	0
Technician MR	0	99	0	0	0	0	0	0	0	0
	0	7.065	0	0	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other MR	0.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	0.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	29	20	0	0	0	0	0	0	0

WBS 3.1.2.3.1.2.2 **Description** Hybrid Assembly/Test - UCSC

Institution U. of California, Santa Cruz **Contact**

Basis of Parametric estimate

Details of Estimate: Assumes all hybrids complete

U.S. ATLAS % share of 15.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	34	0	0	34	0	11	0	23	0.1	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Technician MR	0	248	0	0	0	0	0	0	0	0
	0	11.045	0	0	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other MR	0.0	14.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	26	8	0	0	0	0	0	0	0

WBS 3.1.2.3.1.3 **Description** Module Assembly/Test

Institution **Contact**

Assembly of barrel modules and testing of them.

Details of Estimate: Assembly costs for modules, using hybrids bonded and tested in U.S. Costs are for labor scaled to production costs, with division between LBNL and UCSC detailed in the next two WBS elements.

U.S. ATLAS % share of 15.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	195	0	0	195	0	60	0	135	0.5	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Technician B/I	0	372	288	0	0	0	0	0	0	0
	0	24.563	18.997	0	0	0	0	0	0	0
Technician MR	0	248	0	0	0	0	0	0	0	0
	0	16.357	0	0	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other MR	0.0	53.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	38.6	33.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	140	55	0	0	0	0	0	0	0

WBS 3.1.2.3.1.3.1 **Description** Module Assembly/Test - LBNL

Institution LBNL **Contact**

Basis of Parametric estimate

Details of Estimate: Scaled as %of ETC00 estimate + base program supported labor.

U.S. ATLAS % share of 15.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	180	0	0	180	0	52	0	128	0.4	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Technician B/I	0	298	230	0	0	0	0	0	0	0
	0	21.267	16.414	0	0	0	0	0	0	0
Technician MR	0	198	0	0	0	0	0	0	0	0
	0	14.13	0	0	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other MR	0.0	49.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	38.6	30.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	130	50	0	0	0	0	0	0	0

WBS 3.1.2.3.1.3.2 **Description** Module Assembly/Test - UCSC

Institution U. of California, Santa Cruz **Contact**

Parametric estimate **Basis of**
All done at LBL **Details of Estimate:**

U.S. ATLAS % share of 15.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	16	0	0	16	0	8	0	8	0.1	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Technician B/I	0	74	58	0	0	0	0	0	0	0
	0	3.296	2.583	0	0	0	0	0	0	0
Technician MR	0	50	0	0	0	0	0	0	0	0
	0	2.227	0	0	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other MR	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	10	6	0	0	0	0	0	0	0

WBS 3.1.2.3.2 **Description** Manpower/materials

Institution U. of California, Santa Cruz **Contact**

Manpower and materials for maintenance. Activities described under 3.1.2.3 and represent a continuation of preoperation responsibilities described under 3.1.2.1.2. Repair activities assumed primarily for first year of data-taking and major intervention in FY11.

Basis of Physicist estimate

Details of Estimate: We assume normal operations and minor maintenance manpower is covered under operations. Manpower and materials here are for significant interventions, which we assume will occur in FY07(to fix problems seen in first run) and then again in FY11 for a major intervention to likely replace modules (spares). US maintenance expenses (apart from contribution to common pool) are included here.

U.S. ATLAS % share of 10.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	398	0	0	398	0	237	0	161	2.8	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Technician MR	0	0	0	0	880	0	0	0	0	0
	0	0	0	0	39.191	0	0	0	0	0
Electrical Engineer R	0	0	0	0	440	0	0	0	0	0
	0	0	0	0	41.052	0	0	0	0	0
Technician R	0	0	0	0	880	0	0	0	2640	0
	0	0	0	0	39.191	0	0	0	117.573	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other R	0.0	0.0	0.0	0.0	15.0	10.0	10.0	10.0	25.0	10.0
Travel R	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	50.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* Cost	*Risk* Schedule	*Risk* Design	*Weight* Technical	*Weight* Cost	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	153	10	10	10	205	10

WBS 3.1.3 **Description** RODs

Institution **Contact**

Pre-operations, operations and maintenance for the RODs. Costs include fabrication of spare RODs. WBS 3.1.3.1 contains cost for pre-operations (FY 05-07). WBS 3.1.3.2 contains cost for operations (FY 07-12). WBS 3.1.3.3 contains the spare RODs (FY 03-04) and repair of RODs (FY 07-12).

Details of Estimate:

The ROD is very complex both from a firmware and software reference. After the fabrication and installation a key concern is maintaining the expertise need to perform upgrades and maintenance. If the key expertise is lost it will be costly to support the RODs in the pre operation and operation phases. For example to bring up new firmware (VHDL) expertise will require 6 to 9 months of effort; and he software expertise will require 4 to 7 months of effort. If this were to happen it would severely hamper with large delays the efforts to operate the RODs in the pre-operation and maintenance phases. Experience has shown that as users use the ROD they find that new functionality is required in the firmware and software. Much effort has been put into defining the functionality with participation of users and reviews of the functionality but as users use the ROD they develop with experience and new and important changes in functionality are found. These changes are currently ongoing in the pre-operation phase and are expected in the early operation phase as the RODs functionality is fully

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	3078	0	0	3078	2519	199	205	154	23.3	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Grad Student B/I	0	0	1760	1760	1760	880	880	880	880	880
	0	0	29.568	29.568	29.568	14.784	14.784	14.784	14.784	14.784
Post Doc B/I	0	0	3520	3520	3360	620	620	620	620	620
	0	0	172.48	172.48	164.64	30.38	30.38	30.38	30.38	30.38
Sr Research Scientist B/I	0	0	1760	1760	1600	180	180	180	180	180
	0	0	246.4	246.4	224	25.2	25.2	25.2	25.2	25.2
Computer Professional R	0	0	440	440	440	180	180	180	180	180
	0	0	40.372	40.372	40.372	16.516	16.516	16.516	16.516	16.516
Electrical Engineer R	0	0	1760	1760	1760	880	180	180	180	180
	0	0	165.88	165.88	165.88	82.94	16.965	16.965	16.965	16.965
Technician R	0	0	0	0	440	440	440	440	440	440
	0	0	0	0	33.176	33.176	33.176	33.176	33.176	33.176

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other B/I	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Travel B/I	0.0	0.0	18.0	15.0	6.0	6.0	6.0	6.0	6.0	6.0
Other MR	0.0	0.0	88.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	0.0	5.0	7.0	9.0	9.0	7.0	7.0	7.0	7.0
Travel R	0.0	0.0	12.0	18.0	16.0	12.0	9.0	9.0	9.0	9.0

PROFILE SUMMARY:	**FY 03 (k$)**	**FY 04 (k$)**	**FY 05 (k$)**	**FY 06 (k$)**	**FY 07 (k$)**	**FY 08 (k$)**	**FY 09 (k$)**	**FY 10 (k$)**	**FY 11 (k$)**	**FY 12 (k$)**
	0	0	798	702	694	234	163	163	163	163

WBS 3.1.3.1 **Description** Pre-operations

Institution **Contact**

Pre-operations. To provide technical expertise to deal with ROD issues (for example; VHDL improvements) as the system is significantly exercised and used. Note: RODs are a 100% U.S. responsibility during construction.

Details of Estimate: Wisconsin, Iowa State and LBNL are currently the institutions involved in the RODs pre-operation. The division of labor and materials at lower levels is a best estimate at this time of the division among these institutions, but the sum is the more relevant number. Maintaining a viable support base for the ROD software and firmware needs to be maintained or the users will not be able to use the RODs in an effective way. As new functionality or defects are defined it is very important the correction be made is a short time.

U.S. ATLAS % share of 100.00 %

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	1401	0	0	1401	1309	0	91	0	10.5	0.0

MANPOWER SUMMARY: (k$)	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Grad Student B/I	0	0	1760	1760	0	0	0	0	0	0
	0	0	29.568	29.568	0	0	0	0	0	0
Post Doc B/I	0	0	3520	3520	0	0	0	0	0	0
	0	0	172.48	172.48	0	0	0	0	0	0
Sr Research Scientist B/I	0	0	1760	1760	0	0	0	0	0	0
	0	0	246.4	246.4	0	0	0	0	0	0
Computer Professional R	0	0	440	440	0	0	0	0	0	0
	0	0	40.372	40.372	0	0	0	0	0	0
Electrical Engineer R	0	0	1760	1760	0	0	0	0	0	0
	0	0	165.88	165.88	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other B/I	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel B/I	0.0	0.0	18.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	0.0	5.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel R	0.0	0.0	12.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	699	702	0	0	0	0	0	0

WBS 3.1.3.1.1 **Description** Wisconsin

Institution University of Wisconsin, Madison **Contact**

Support of RODs in use for macro assembly testing and pixel module testing before 1st collisions and at CERN for commissioning. About half the SCT RODs will be used in this phase. A smaller number of pixel RODs will be used (the number is still in the definition phase).

Basis of Estimate: Physicist estimate

Details of Estimate: 1 FTE EE support for responding to problems, VHDL support. SCT ROD fabrication is planned to be completed in FY03, pixel fabrication in FY04. Travel and miscellaneous expenses. Licenses are included. Currently there is a request about every 2 weeks for changes that improve the functionally or compatibility with developing software. Frequency of request is expected to decrees to about 1 request a month by the end of FY 06. There are also potential request to develop VHDL to correct for emerging defects in the SCT front end modules. For example there are front end module stuck bits that result in unwanted occupancy. The nature of the desired request is to have the ROD correct for the defect by filtering out the undesirable data. This would be a significant change to the ROD and use large portion of the free space in the FPGAs. An other example is to correct on the fly for loss of synchronization of the events from the front-end modules due to bit errors in the modules. This change is not in the requirement but some effort has been made in the architecture allow for the correction. More of this class of significant changes are expected with experience with the use of the RODs at the assemble sites. It is important to maintain the expertise of ROD personnel to respond in a timely way to the well-justified needs of the user community.

Project Costs
EE Effort
1760 EE hours per year for FY (05-06)
2k$ Licenses (DSP C code and VHDL simulators)
10k$ Low level expenses (parts etc.)
24k$ travel (8 trips in FY 05-06) for trips to the user evaluation sites as needed.

U.S. ATLAS % share of 100.00 %

Cost Summary: (All)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs All**	**FTEs Other**
	616	0	0	616	563	0	52	0	6.0	0.0

MANPOWER (k$) SUMMARY:	**FY 03 (hrs) (k$)**	**FY 04 (hrs) (k$)**	**FY 05 (hrs) (k$)**	**FY 06 (hrs) (k$)**	**FY 07 (hrs) (k$)**	**FY 08 (hrs) (k$)**	**FY 09 (hrs) (k$)**	**FY 10 (hrs) (k$)**	**FY 11 (hrs) (k$)**	**FY 12 (hrs)**
Grad Student B/I	0	0	1760	1760	0	0	0	0	0	0
	0	0	29.568	29.568	0	0	0	0	0	0
Post Doc B/I	0	0	1760	1760	0	0	0	0	0	0
	0	0	86.24	86.24	0	0	0	0	0	0
Electrical Engineer R	0	0	1760	1760	0	0	0	0	0	0
	0	0	165.88	165.88	0	0	0	0	0	0

MATERIAL	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other B/I	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel B/I	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	0.0	5.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel R	0.0	0.0	9.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	308	308	0	0	0	0	0	0

WBS 3.1.3.1.2 **Description** LBNL

Institution LBNL **Contact**

Support of RODs in use for macro assembly testing, pixels and for commissioning

Physicist estimate **Basis of**

0.25 FTE of software support for pixel/SCT-specific code. **Details of Estimate:**

The DSP C code needs to support the needs of the user community in a timely way with personnel with expertise in the code. This come is composed on primitives in the ROD the support calibration, read/write to variables etc. The examples in 3.1.3.1 will need code to support the VHDL function. In additions the user community will define new operations that will need DSP code to carry out the new operations.

Project Fund
880 hours of computer professional to maintain and write code.
6k$ Travel (2 trips in FY 05-06) to support the users,

U.S. ATLAS % share of 100.00 %

Cost Summary: (All)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs All**	**FTEs Other**
	87	0	0	87	81	0	6	0	0.5	0.0

MANPOWER (k$) SUMMARY:	**FY 03 (hrs) (k$)**	**FY 04 (hrs) (k$)**	**FY 05 (hrs) (k$)**	**FY 06 (hrs) (k$)**	**FY 07 (hrs) (k$)**	**FY 08 (hrs) (k$)**	**FY 09 (hrs) (k$)**	**FY 10 (hrs) (k$)**	**FY 11 (hrs) (k$)**	**FY 12 (hrs)**
Computer Professional R	0	0	440	440	0	0	0	0	0	0
	0	0	40.372	40.372	0	0	0	0	0	0

MATERIAL SUMMARY:	**FY 03 (k$)**	**FY 04 (k$)**	**FY 05 (k$)**	**FY 06 (k$)**	**FY 07 (k$)**	**FY 08 (k$)**	**FY 09 (k$)**	**FY 10 (k$)**	**FY 11 (k$)**	**FY 12 (k$)**
Travel R	0.0	0.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	***Risk***				***Weight***			**Cont %**
	Technical	**C o s t**	**Schedule**	**Des i gn**	**Technical**	**C o s t**	**Schedule**	
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	44	44	0	0	0	0	0	0

WBS 3.1.3.1.3 **Description** Iowa State

Institution Iowa State **Contact**

Support of RODs in use for macro assembly testing before 1st collisions and for commissioning

Physicist estimate **Basis of**

Physicist manpower only **Details of Estimate:**

U.S. ATLAS % share of 100.00 %

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	698	0	0	698	665	0	32	0	4.0	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Post Doc B/I	0	0	1760	1760	0	0	0	0	0	0
	0	0	86.24	86.24	0	0	0	0	0	0
Sr Research Scientist B/I	0	0	1760	1760	0	0	0	0	0	0
	0	0	246.4	246.4	0	0	0	0	0	0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel B/I	0.0	0.0	12.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	347	351	0	0	0	0	0	0

WBS 3.1.3.2 **Description** Operations

Institution **Contact**

Operations during ATLAS data taking. Continuation of effort described in 3.1.3.1 through initial data collection. Effort tapers off significantly after this period.

Details of Estimate:

Wisconsin, Iowa State and LBNL are currently the institutions involved in the RODs. The division of labor and materials at lower levels is a best estimate at this time of the division among these institutions, but the sum is the more relevant number. The operation phase covers the period of FY 07-12. The Effort is broken down as shown below:

WBS 3.1.3.2.1 Wisconsin, Firmware cost for the period 2007-2012,
WBS 3.1.3.2.2 LBL, DSP code effort for the period 2007-2012,
WBS 3.1.3.2.3 Iowa State, Software for the period 2007-2012.

Running of the detector for physics starts in 2007. There will be much learning with beam on during this period. New and interesting problems will be found in all of the ATLAS software and hardware. Those new problems that effect the ROD at the input our output will need to be addressed. It is expected that changes will have to be made to the VHDL and C code. The personnel with excellent knowledge of the ROD firmware and software will address these problems. The Effort is largest in FY 07, about half in FY 08 and down to a minimum from FY 09 to FY 12. This profiling is needed to meet the large needs in the beginning and then the lower needs for the following period.

U.S. ATLAS % share of 100.00 %

Cost Summary: (All)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs All**	**FTEs Other**
	1324	0	0	1324	1210	0	114	0	11.3	0.0

MANPOWER (k$) SUMMARY:	**FY 03 (hrs) (k$)**	**FY 04 (hrs) (k$)**	**FY 05 (hrs) (k$)**	**FY 06 (hrs) (k$)**	**FY 07 (hrs) (k$)**	**FY 08 (hrs) (k$)**	**FY 09 (hrs) (k$)**	**FY 10 (hrs) (k$)**	**FY 11 (hrs) (k$)**	**FY 12 (hrs)**
Grad Student B/I	0	0	0	0	1760	880	880	880	880	880
	0	0	0	0	29.568	14.784	14.784	14.784	14.784	14.784
Post Doc B/I	0	0	0	0	3360	620	620	620	620	620
	0	0	0	0	164.64	30.38	30.38	30.38	30.38	30.38
Sr Research Scientist B/I	0	0	0	0	1600	180	180	180	180	180
	0	0	0	0	224	25.2	25.2	25.2	25.2	25.2
Computer Professional R	0	0	0	0	440	180	180	180	180	180
	0	0	0	0	40.372	16.516	16.516	16.516	16.516	16.516
Electrical Engineer R	0	0	0	0	1760	880	180	180	180	180
	0	0	0	0	165.88	82.94	16.965	16.965	16.965	16.965

MATERIAL	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12
Travel B/I	0.0	0.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0
Other R	0.0	0.0	0.0	0.0	4.0	4.0	2.0	2.0	2.0	2.0
Travel R	0.0	0.0	0.0	0.0	13.0	9.0	6.0	6.0	6.0	6.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	651	192	120	120	120	120

WBS 3.1.3.2.1 **Description** Wisconsin

Institution University of Wisconsin, Madison **Contact**

Operations support via Wisconsin

Physicist estimate **Basis of**

1FTE EE support in FY07, 0.5 FTE in FY08, dropping to 0.1 FTE thereafter. Travel and **Details of Estimate:**
misc expenses. See 3.1.3.1 and 3.1.3.2 for the type of problem that need to be addressed.

Project funds
3360 EE hours to maintain and upgrade as needed the VHDL
28k$ Travel 9 trips to CERN
16k$ Low level expenses.

U.S. ATLAS % share of 100.00 %

Cost Summary: (All)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs All**	**FTEs Other**
	666	0	0	666	614	0	52	0	7.7	0.0

MANPOWER SUMMARY: (k$)	**FY 03 (hrs) (k$)**	**FY 04 (hrs) (k$)**	**FY 05 (hrs) (k$)**	**FY 06 (hrs) (k$)**	**FY 07 (hrs) (k$)**	**FY 08 (hrs) (k$)**	**FY 09 (hrs) (k$)**	**FY 10 (hrs) (k$)**	**FY 11 (hrs) (k$)**	**FY 12 (hrs)**
Grad Student B/I	0	0	0	0	1760	880	880	880	880	880
	0	0	0	0	29.568	14.784	14.784	14.784	14.784	14.784
Post Doc B/I	0	0	0	0	1760	440	440	440	440	440
	0	0	0	0	86.24	21.56	21.56	21.56	21.56	21.56
Electrical Engineer R	0	0	0	0	1760	880	180	180	180	180
	0	0	0	0	165.88	82.94	16.965	16.965	16.965	16.965

MATERIAL SUMMARY:	**FY 03 (k$)**	**FY 04 (k$)**	**FY 05 (k$)**	**FY 06 (k$)**	**FY 07 (k$)**	**FY 08 (k$)**	**FY 09 (k$)**	**FY 10 (k$)**	**FY 11 (k$)**	**FY 12 (k$)**
Other R	0.0	0.0	0.0	0.0	4.0	4.0	2.0	2.0	2.0	2.0
Travel R	0.0	0.0	0.0	0.0	10.0	6.0	3.0	3.0	3.0	3.0

CONTINGENCY FACTORS:	Risk				Weight			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	298	131	59	59	59	59

WBS 3.1.3.2.2 **Description** LBNL

Institution LBNL **Contact**

LBNL operations support

Basis of Details of Estimate: Physicist estimate

0.25 FTE computer scientist/engineer in FY07 dropping to 0.1 FTE thereafter. The profile is to address the expected needs found during the first physics data taking.

Project Funds
1340 hours Computer Professional to maintain the C code in the DSP.
18k$ Travel (One trip per year to CERN).

U.S. ATLAS % share of 100.00 %

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	142	0	0	142	123	0	19	0	0.8	0.0

MANPOWER SUMMARY: (k$)	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Computer Professional R	0	0	0	0	440	180	180	180	180	180
	0	0	0	0	40.372	16.516	16.516	16.516	16.516	16.516

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel R	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* Cost	*Risk* Schedule	*Risk* Design	*Weight* Technical	*Weight* Cost	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	44	20	20	20	20	20

WBS 3.1.3.2.3 **Description** Iowa State

Institution Iowa State **Contact**

Iowa State operations support

Physicist estimate **Basis of**

Physicists only **Details of Estimate:**

U.S. ATLAS % share of 100.00 %

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	516	0	0	516	473	0	43	0	2.8	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Post Doc B/I	0	0	0	0	1600	180	180	180	180	180
	0	0	0	0	78.4	8.82	8.82	8.82	8.82	8.82
Sr Research Scientist B/I	0	0	0	0	1600	180	180	180	180	180
	0	0	0	0	224	25.2	25.2	25.2	25.2	25.2

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Travel B/I	0.0	0.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	310	41	41	41	41	41

WBS 3.1.3.3 **Description** Maintenance

Institution University of Wisconsin, Madison **Contact**

Maintenance activities during ATLAS shutdowns. This also includes preparations for maintenance.

Basis of Estimate: Physicist estimate

Details of Estimate: Spares. 0.25 technical support ascribed to Wisconsin. Physicist labor covered under operations. Cost for FY03-FY05 for 10% spare RODs. Estimate based upon scaling production costs. Important because parts production by vendors for key parts will end before data taking begins. Also includes later costs for debugging and repair of problem boards during running from FY07 on.

U.S. ATLAS % share of 100.00 %

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	353	0	0	353	0	199	0	154	1.5	0.0

MANPOWER (k$) SUMMARY:	FY 03 (hrs) (k$)	FY 04 (hrs) (k$)	FY 05 (hrs) (k$)	FY 06 (hrs) (k$)	FY 07 (hrs) (k$)	FY 08 (hrs) (k$)	FY 09 (hrs) (k$)	FY 10 (hrs) (k$)	FY 11 (hrs) (k$)	FY 12 (hrs)
Technician R	0	0	0	0	440	440	440	440	440	440
	0	0	0	0	33.176	33.176	33.176	33.176	33.176	33.176

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other MR	0.0	0.0	88.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other R	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
Travel R	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	99	0	42	42	42	42	42	42

WBS 3.1.3.3.1 **Description** Spares

Institution University of Wisconsin, Madison **Contact**

Spare items and parts. By definition these are not included in the initial fabrication or procurements.

Parametric estimate **Basis of**

Zeroed out **Details of Estimate:**

U.S. ATLAS % share of 100.00 %

Cost Summary: (All)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs All**	**FTEs Other**
	99	0	0	99	0	0	0	99	0.0	0.0

MATERIAL SUMMARY:	**FY 03 (k$)**	**FY 04 (k$)**	**FY 05 (k$)**	**FY 06 (k$)**	**FY 07 (k$)**	**FY 08 (k$)**	**FY 09 (k$)**	**FY 10 (k$)**	**FY 11 (k$)**	**FY 12 (k$)**
Other MR	0.0	0.0	88.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CONTINGENCY FACTORS:	***Risk***				***Weight***			**Cont %**
	Technical	**C o s t**	**Schedule**	**Des i gn**	**Technical**	**C o s t**	**Schedule**	
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	**FY 03 (k$)**	**FY 04 (k$)**	**FY 05 (k$)**	**FY 06 (k$)**	**FY 07 (k$)**	**FY 08 (k$)**	**FY 09 (k$)**	**FY 10 (k$)**	**FY 11 (k$)**	**FY 12 (k$)**
	0	0	99	0	0	0	0	0	0	0

WBS 3.1.3.3.2 **Description** Personnel/materials

Institution University of Wisconsin, Madison **Contact**

Personnel and materials for maintenance operations.

Physicist estimate **Basis of**

0.25 technical support ascribed to Wisconsin. Physicist labor covered under operations. **Details of Estimate:**

$5k per year estimated for components for electronics repairs. The period covered is from FY 07 to FT 12.

It is expected that a few units (2-4%) or the some 200 RODs will fail per year the cost are directed at repair of the cards with some training to maintain capabilities.

Project costs
2640 ET hours 440 hours per year
30k$ low level costs for licenses and parts
18k$ travel , one trip per year.

U.S. ATLAS % share of 100.00 %

Cost Summary: (All)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs All**	**FTEs Other**
	254	0	0	254	0	199	0	55	1.5	0.0

MANPOWER (k$) SUMMARY:	**FY 03 (hrs) (k$)**	**FY 04 (hrs) (k$)**	**FY 05 (hrs) (k$)**	**FY 06 (hrs) (k$)**	**FY 07 (hrs) (k$)**	**FY 08 (hrs) (k$)**	**FY 09 (hrs) (k$)**	**FY 10 (hrs) (k$)**	**FY 11 (hrs) (k$)**	**FY 12 (hrs)**
Technician R	0	0	0	0	440	440	440	440	440	440
	0	0	0	0	33.176	33.176	33.176	33.176	33.176	33.176

MATERIAL SUMMARY:	**FY 03 (k$)**	**FY 04 (k$)**	**FY 05 (k$)**	**FY 06 (k$)**	**FY 07 (k$)**	**FY 08 (k$)**	**FY 09 (k$)**	**FY 10 (k$)**	**FY 11 (k$)**	**FY 12 (k$)**
Other R	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0	5.0	5.0
Travel R	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	3.0	3.0

CONTINGENCY FACTORS:	***Risk***				***Weight***			**Cont %**
	Technical	**C o s t**	**Schedule**	**Des i gn**	**Technical**	**C o s t**	**Schedule**	
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	0	0	0	42	42	42	42	42	42

WBS 3.1.4 **Description** Common Silicon/ID

Institution **Contact**

Pre-operation, operations and maintenance for the common silicon or ID activities.

Details of Estimate: Estimates are derived from CERN estimates assuming US silicon is 14% of total costs (without spares). This includes both pixel and SCT support of SR building, infrastructure, maintenance and operations. Costs to outfit SR building, which will be used for preoperations and maintenance. Includes clean space, ventilation, cabling, data readout, power, and gas systems. Estimated costs are based upon project leader estimates, after scrutiny group agreement. Equipment needs have been carefully detailed and costs estimated.

U.S. ATLAS % share of 14.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	2528	0	0	2528	0	0	0	2528	0.0	0.0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other R	0.0	105.7	82.4	154.0	229.3	456.2	421.2	478.3	361.7	239.2

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	106	82	154	229	456	421	478	362	239

WBS 3.1.4.1 **Description** Pre-operations

Institution LBNL **Contact**

Pre-operations before first LHC collisions.

Based on estimates done by ID project leader and ATLAS. Ascribed here to LBNL. **Details of Estimate:**

U.S. ATLAS % share of 14.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	0	0	0	0	0	0	0	0	0.0	0.0

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

WBS 3.1.4.2 **Description** Maintenance Operations

Institution BNL-common **Contact**

Maintenance and operations during ATLAS data taking and beam off periods

Details of Estimate: Estimates derived from those made by ID Project Leader and ATLAS. Both Pixels and SCT are covered here.

U.S. ATLAS % share of 14.00%

Cost Summary: (All)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs All	FTEs Other
	2528	0	0	2528	0	0	0	2528	0.0	0.0

MATERIAL SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
Other R	0.0	105.7	82.4	154.0	229.3	456.2	421.2	478.3	361.7	239.2

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* C o s t	*Risk* Schedule	*Risk* Des i gn	*Weight* Technical	*Weight* C o s t	*Weight* Schedule	Cont %
	0	0	0	0	0	0	0	0

PROFILE SUMMARY:	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	FY 06 (k$)	FY 07 (k$)	FY 08 (k$)	FY 09 (k$)	FY 10 (k$)	FY 11 (k$)	FY 12 (k$)
	0	106	82	154	229	456	421	478	362	239