U.S. ATLAS Installation Cost Book

Funding All **Funding Type:** Project + MC

Institution All

U.S. ATLAS Installation Cost Book 12/10/2002 7:45:29 AM

WBS 1 **Descriptio** U.S. ATLAS Installation Estimate

Institution **Contact**

U.S. ATLAS Installation includes detector specific costs for installation of subsystems which are not currently in the approved baseline scope.

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	1184	0	0	1184	609	0	574	0	10.7	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) (k$)	Total (hrs)
Technician MC	0	7075	8109	2255	0	0	0	0	0	0	17439
	0	229.687	262.733	71.967	0	0	0	0	0	0	564.387
MC Total	0	7075	8109	2255	0	0	0	0	0	0	17439
	0	229.687	262.733	71.967	0	0	0	0	0	0	564.387
Electrical Engineer P	0	0	320	0	0	0	0	0	0	0	320
	0	0	16.9	0	0	0	0	0	0	0	16.900
Technician P	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
P Total	0	558	884	0	0	0	0	0	0	0	1442
	0	13.95	31	0	0	0	0	0	0	0	44.950
Total	0	7633	8993	2255	0	0	0	0	0	0	18881
	0	243.637	293.733	71.967	0	0	0	0	0	0	609.337

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	52.0	59.3	15.5	0.0	0.0	0.0	0.0	0.0	0.0	127.886
Travel MC	0.0	148.0	168.2	84.9	0.0	0.0	0.0	0.0	0.0	0.0	411.345
MC Total	0.0	200.1	227.5	100.3	0.0	0.0	0.0	0.0	0.0	0.0	539.231
Other P	0.0	0.4	22.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.200
Travel P	0.0	0.0	10.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.776
P Total	0.0	0.4	32.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.976
Total	0.0	200.5	260.5	100.3	0.0	0.0	0.0	0.0	0.0	0.0	574.207

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$)	FY 12 (k$)	Total (k$)
	0	449	561	174	0	0	0	0	0	0	1184

WBS 1.5 **Descriptio** Muon Subsystem

Institution **Contact** F. Taylor

Cost of labor and materials needed to install the US ATLAS Muon system deliverables. There are three object types covered by this WBS. 240 MDT chambers, 32 CSC chambers and 80 Global Alignment Bars and associated monitors. The installation work will be conducted starting in Q2 of FY04 and extending through the end of CY05. Installation costs are primarily labor of experienced mechanical technicians who are responsible for staging the chambers and alignment components prior to installation and conducting the installations, followed by precision location adjustment (~ 3 mm) of objects in the support structures . The installation crew is supervised by personnel supported by the U.S. Base Program.
Among the three object types the following hours are assigned to stage, install and adjust position in the support structures:
CSC Chambers- 6 hours / chamber
MDT Chambers- 12 hours / chamber
Alignment Bars and related Components - 8 hours / bar
For optimal efficiency it is planned that the installation crew work as unit of approximately 5 FTEs concentrating on one installation task, such as mounting the CSC chambers on the Small Wheels, then moving to the next task. The integral FTEs over the entire installation task of about 2 years is 10.7.
Of the 5 FTEs, 2 would be specialized and of US origin.
1-Engineering Physicist - Overall coordinator
1-Mechanical Engineer/Floor Manager

Cost Summary: (Project + MC)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs Project + MC**	**FTEs Other**
	1184	0	0	1184	609	0	574	0	10.7	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) (k$)**	**Total (hrs)**
Technician MC	0	7075	8109	2255	0	0	0	0	0	0	17439
	0	229.687	262.733	71.967	0	0	0	0	0	0	564.387
MC Total	0	7075	8109	2255	0	0	0	0	0	0	17439
	0	229.687	262.733	71.967	0	0	0	0	0	0	564.387
Electrical Engineer P	0	0	320	0	0	0	0	0	0	0	320
	0	0	16.9	0	0	0	0	0	0	0	16.900
Technician P	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
P Total	0	558	884	0	0	0	0	0	0	0	1442
	0	13.95	31	0	0	0	0	0	0	0	44.950
Total	0	7633	8993	2255	0	0	0	0	0	0	18881
	0	243.637	293.733	71.967	0	0	0	0	0	0	609.337

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$)**	**FY 12 (k$)**	**Total w/ overhead (k$)**
Other MC	0.0	52.0	59.3	15.5	0.0	0.0	0.0	0.0	0.0	0.0	127.886
Travel MC	0.0	148.0	168.2	84.9	0.0	0.0	0.0	0.0	0.0	0.0	411.345
MC Total	0.0	200.1	227.5	100.3	0.0	0.0	0.0	0.0	0.0	0.0	539.231

Other P	0.0	0.4	22.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.200
Travel P	0.0	0.0	10.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.776
P Total	0.0	0.4	32.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.976
Total	0.0	200.5	260.5	100.3	0.0	0.0	0.0	0.0	0.0	0.0	574.207

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$)**	**FY 12 (k$)**	**Total (k$)**
	0	449	561	174	0	0	0	0	0	0	1184

WBS 1.5.4 **Descriptio** CSC

Institution **Contact** F. Taylor

Cost of labor and materials to install the CSC chamber system.

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	129	0	0	129	52	0	78	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) (k$)	Total (hrs)
Technician MC	0	395	449	116	0	0	0	0	0	0	960
	0	21.233	24.13	6.242	0	0	0	0	0	0	51.605
MC Total	0	395	449	116	0	0	0	0	0	0	960
	0	21.233	24.13	6.242	0	0	0	0	0	0	51.605
Total	0	395	449	116	0	0	0	0	0	0	960
	0	21.233	24.13	6.242	0	0	0	0	0	0	51.605

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	2.6	3.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	7.461
Travel MC	0.0	24.7	28.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0	70.224
MC Total	0.0	27.3	31.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	77.685
Total	0.0	27.3	31.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	77.685

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$)	FY 12 (k$)	Total (k$)
	0	53	60	16	0	0	0	0	0	0	129

WBS 1.5.4.7 **Descriptio** CSC Installation

Institution Composite U. **Contact** F. Taylor

Encompassed in this WBS is work related to the mechanical aspects of the 32 CSCs - such as staging chambers prior to installation, mounting chambers on the small wheels by means of their kinematic mounts and locating them to be within the convergence radius of the alignment system (~ 3 mm).

Basis of Estimate: Physicist estimate

Details of Estimate: Assumes a crew of approximately 5 FTEs at peak working during mid FY04 to the end of CY05 with a labor time of 6 hours to stage, install and adjust each CSC chamber. Travel is included for this team. Costs for M&S items, such as tools and travel are included. Supervision is supplied by base program personnel.

U.S. ATLAS % share of 100.00 %

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	129	0	0	129	52	0	78	0	0.5	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) (k$)	Total (hrs)
Technician MC	0	395	449	116	0	0	0	0	0	0	960
	0	21.233	24.13	6.242	0	0	0	0	0	0	51.605
MC Total	0	395	449	116	0	0	0	0	0	0	960
	0	21.233	24.13	6.242	0	0	0	0	0	0	51.605
Total	0	395	449	116	0	0	0	0	0	0	960
	0	21.233	24.13	6.242	0	0	0	0	0	0	51.605

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	2.6	3.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	7.461
Travel MC	0.0	24.7	28.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0	70.224
MC Total	0.0	27.3	31.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	77.685
Total	0.0	27.3	31.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	77.685

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$)	FY 12 (k$)	Total (k$)
	0	53	60	16	0	0	0	0	0	0	129

WBS 1.5.4.7.1 **Descriptio** BNL Muon

Institution BNL-muon **Contact** F. Taylor

Basis of Physicist estimate

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	111	0	0	111	46	0	64	0	0.4	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) (k$)	Total (hrs)
Technician MC	0	316	359	93	0	0	0	0	0	0	768
	0	19.021	21.61	5.598	0	0	0	0	0	0	46.229
MC Total	0	316	359	93	0	0	0	0	0	0	768
	0	19.021	21.61	5.598	0	0	0	0	0	0	46.229
Total	0	316	359	93	0	0	0	0	0	0	768
	0	19.021	21.61	5.598	0	0	0	0	0	0	46.229

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	2.1	2.4	0.6	0.0	0.0	0.0	0.0	0.0	0.0	6.186
Travel MC	0.0	19.7	22.4	5.8	0.0	0.0	0.0	0.0	0.0	0.0	58.224
MC Total	0.0	21.8	24.8	6.4	0.0	0.0	0.0	0.0	0.0	0.0	64.410
Total	0.0	21.8	24.8	6.4	0.0	0.0	0.0	0.0	0.0	0.0	64.410

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$)	FY 12 (k$)	Total (k$)
	0	46	52	13	0	0	0	0	0	0	111

WBS 1.5.4.7.2 **Descriptio** UC-Irvine

Institution **Contact** F. Taylor

Cost Summary: (Project + MC)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	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 1.5.4.7.3 **Descriptio** SUNY Stony Brook

Institution SUNY SB-muon **Contact** F. Taylor

Basis of Physicist estimate

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	19	0	0	19	5	0	13	0	0.1	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) (k$)	Total (hrs)
Technician MC	0	79	90	23	0	0	0	0	0	0	192
	0	2.212	2.52	0.644	0	0	0	0	0	0	5.376
MC Total	0	79	90	23	0	0	0	0	0	0	192
	0	2.212	2.52	0.644	0	0	0	0	0	0	5.376
Total	0	79	90	23	0	0	0	0	0	0	192
	0	2.212	2.52	0.644	0	0	0	0	0	0	5.376

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	0.5	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.275
Travel MC	0.0	4.9	5.6	1.5	0.0	0.0	0.0	0.0	0.0	0.0	12.000
MC Total	0.0	5.5	6.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	13.275
Total	0.0	5.5	6.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	13.275

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$)	FY 12 (k$)	Total (k$)
	0	8	9	2	0	0	0	0	0	0	19

WBS 1.5.7 **Descriptio** MDT

Institution Composite U. **Contact** F. Taylor

Cost of Labor and materials to install the MDT chamber system. Installation is defined as staging chambers prior to installation, mounting chambers on the support structures (Small Wheel, Big Wheel) and EIL4-support frames located on the ends of the barrel muon system and performing fine adjustments of their positions to ~ 3 mm. Installation work for the chambers of the Small Wheels (EIL1, EIL2-3, EIS1, EIS2) will be conducted above pit before Small Wheels are lowered into the pit. The installation of the EIL4 chambers will be conducted in the pit on the support frames mounted on the ends of the muon barrel system. The installation of the Big Wheel chambers (EML1,2,3,4,5; EMS1,2,3,4,5) will be conducted above the pit on sectors of the Big Wheel. The labor time needed

Physicist estimate **Basis of**

Cost Summary: (Project + MC)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs Project + MC**	**FTEs Other**
	840	0	0	840	461	0	380	0	8.2	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) (k$)**	**Total (hrs)**
Technician MC	0	5922	6729	1750	0	0	0	0	0	0	14401
	0	189.504	215.328	56	0	0	0	0	0	0	460.832
MC Total	0	5922	6729	1750	0	0	0	0	0	0	14401
	0	189.504	215.328	56	0	0	0	0	0	0	460.832
Total	0	5922	6729	1750	0	0	0	0	0	0	14401
	0	189.504	215.328	56	0	0	0	0	0	0	460.832

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$)**	**FY 12 (k$)**	**Total w/ overhead (k$)**
Other MC	0.0	42.5	48.3	12.5	0.0	0.0	0.0	0.0	0.0	0.0	103.275
Travel MC	0.0	104.4	118.6	53.3	0.0	0.0	0.0	0.0	0.0	0.0	276.276
MC Total	0.0	146.9	166.9	65.8	0.0	0.0	0.0	0.0	0.0	0.0	379.551
Total	0.0	146.9	166.9	65.8	0.0	0.0	0.0	0.0	0.0	0.0	379.551

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$)**	**FY 12 (k$)**	**Total (k$)**
	0	336	382	122	0	0	0	0	0	0	840

WBS 1.5.7.11 **Descriptio** MDT Mechanical Installation

Institution **Contact** F. Taylor

Costs of labor and materials for the mechanical installation of the end cap MDT chambers in the locations as described above. The chambers will be supported by their kinematic mounts that are attached through struts to mounting brackets placed on the support structures. The chambers have to be placed to ~ 3 mm or better in their nominal positions on the support structures in order to be well within the convergence radius of the global alignment

U.S. ATLAS % share of 20.50%

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	840	0	0	840	461	0	380	0	8.2	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) (k$)	Total (hrs)
Technician MC	0	5922	6729	1750	0	0	0	0	0	0	14401
	0	189.504	215.328	56	0	0	0	0	0	0	460.832
MC Total	0	5922	6729	1750	0	0	0	0	0	0	14401
	0	189.504	215.328	56	0	0	0	0	0	0	460.832
Total	0	5922	6729	1750	0	0	0	0	0	0	14401
	0	189.504	215.328	56	0	0	0	0	0	0	460.832

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	42.5	48.3	12.5	0.0	0.0	0.0	0.0	0.0	0.0	103.275
Travel MC	0.0	104.4	118.6	53.3	0.0	0.0	0.0	0.0	0.0	0.0	276.276
MC Total	0.0	146.9	166.9	65.8	0.0	0.0	0.0	0.0	0.0	0.0	379.551
Total	0.0	146.9	166.9	65.8	0.0	0.0	0.0	0.0	0.0	0.0	379.551

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$)	FY 12 (k$)	Total (k$)
	0	336	382	122	0	0	0	0	0	0	840

WBS 1.5.7.11.1 **Descriptio** MDT Installation - Small Wheel above Pit

Institution Composite U.-Muon **Contact** F. Taylor

Installation of EIL1, EIL2-3, EIS1, EIS2 chambers (64 total) on the Small Wheels.

Details of Estimate: Assumes a crew of approximately 5 FTEs at peak working during mid FY04 to the end of CY05 working for 12 hours to stage, install and adjust position to ~ 3 mm. Travel is included for this team. Costs for M&S items, such as tools and travel are included. Supervision is supplied by base program personnel.

Cost Summary: (Project + MC)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
227	0	0	227	123	0	105	0	2.2	0.0

MANPOWER 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$)	FY 12 (hrs) (k$)	Total (hrs)
Technician MC	0	1579	1794	467	0	0	0	0	0	0	3840
	0	50.528	57.408	14.944	0	0	0	0	0	0	122.880
MC Total	0	1579	1794	467	0	0	0	0	0	0	3840
	0	50.528	57.408	14.944	0	0	0	0	0	0	122.880
Total	0	1579	1794	467	0	0	0	0	0	0	3840
	0	50.528	57.408	14.944	0	0	0	0	0	0	122.880

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	11.0	12.5	3.3	0.0	0.0	0.0	0.0	0.0	0.0	26.775
Travel MC	0.0	22.8	25.9	29.2	0.0	0.0	0.0	0.0	0.0	0.0	77.815
MC Total	0.0	33.8	38.4	32.4	0.0	0.0	0.0	0.0	0.0	0.0	104.590
Total	0.0	33.8	38.4	32.4	0.0	0.0	0.0	0.0	0.0	0.0	104.590

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

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$)	FY 12 (k$)	Total (k$)
0	84	96	47	0	0	0	0	0	0	227

WBS 1.5.7.11.2 **Descriptio** MDT Installation - Big Wheel Sectors above Pit

Institution Composite U.-Muon **Contact** F. Taylor

Installation of EML1,2,3,4,5; EMS1,2,3,4,5 chambers (160 total) on the Big Wheel Sectors all 5 large chamber types on each of the 'large sectors' and all 5 small chamber types on each of the 'small sectors'.

Basis of Estimate: Physicist estimate

Details of Estimate: Assumes a crew of approximately 5 FTEs at peak working during mid FY04 to the end of CY05 working for 12 hours to stage, install and adjust position to ~ 3 mm. Travel is included for this team. Costs for M&S items, such as tools and travel are included. Supervision is supplied by base program personnel.

Cost Summary: (Project + MC)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
515	0	0	515	307	0	207	0	5.5	0.0

MANPOWER 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$)	FY 12 (hrs) (k$)	Total (hrs)
Technician MC	0	3948	4486	1166	0	0	0	0	0	0	9600
	0	126.336	143.552	37.312	0	0	0	0	0	0	307.200
MC Total	0	3948	4486	1166	0	0	0	0	0	0	9600
	0	126.336	143.552	37.312	0	0	0	0	0	0	307.200
Total	0	3948	4486	1166	0	0	0	0	0	0	9600
	0	126.336	143.552	37.312	0	0	0	0	0	0	307.200

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	28.3	32.2	8.4	0.0	0.0	0.0	0.0	0.0	0.0	68.850
Travel MC	0.0	56.9	64.7	16.8	0.0	0.0	0.0	0.0	0.0	0.0	138.461
MC Total	0.0	85.2	96.9	25.2	0.0	0.0	0.0	0.0	0.0	0.0	207.311
Total	0.0	85.2	96.9	25.2	0.0	0.0	0.0	0.0	0.0	0.0	207.311

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	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$)	FY 12 (k$)	Total (k$)
0	212	240	62	0	0	0	0	0	0	515

WBS 1.5.7.11.3 **Descriptio** MDT Installation - EIL4 Frame in Pit

Institution Composite U.-Muon **Contact** F. Taylor

Installation of EIL4 chambers (16 total) 8 on each frame A and C sides, respectively.

Details of Estimate: Assumes a crew of approximately 5 FTEs at peak working during mid FY04 to the end of CY05 working for 12 hours to stage, install and adjust position to ~ 3 mm. Travel is included for this team. Costs for M&S items, such as tools and travel are included. Supervision is supplied by base program personnel.

Cost Summary: (Project + MC)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
98	0	0	98	31	0	68	0	0.5	0.0

MANPOWER 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$)	FY 12 (hrs) (k$)	Total (hrs)
Technician MC	0	395	449	117	0	0	0	0	0	0	961
	0	12.64	14.368	3.744	0	0	0	0	0	0	30.752
MC Total	0	395	449	117	0	0	0	0	0	0	961
	0	12.64	14.368	3.744	0	0	0	0	0	0	30.752
Total	0	395	449	117	0	0	0	0	0	0	961
	0	12.64	14.368	3.744	0	0	0	0	0	0	30.752

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	3.1	3.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	7.650
Travel MC	0.0	24.7	28.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0	60.000
MC Total	0.0	27.8	31.6	8.2	0.0	0.0	0.0	0.0	0.0	0.0	67.650
Total	0.0	27.8	31.6	8.2	0.0	0.0	0.0	0.0	0.0	0.0	67.650

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

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$)	FY 12 (k$)	Total (k$)
0	40	46	12	0	0	0	0	0	0	98

WBS 1.5.11 **Descriptio** CSC Electronics

Institution **Contact** F. Taylor

CSC Electronics includes design, development, and production of the CSC readout system from the custom monolithic front end IC up to and including the Readout Drivers (ROD), Low/High voltage power modules and their

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	51	0	0	51	17	0	34	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) (k$)	Total (hrs)
Electrical Engineer P	0	0	320	0	0	0	0	0	0	0	320
	0	0	16.9	0	0	0	0	0	0	0	16.900
P Total	0	0	320	0	0	0	0	0	0	0	320
	0	0	16.9	0	0	0	0	0	0	0	16.900
Total	0	0	320	0	0	0	0	0	0	0	320
	0	0	16.9	0	0	0	0	0	0	0	16.900

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other P	0.0	0.0	22.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.500
Travel P	0.0	0.0	10.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.776
P Total	0.0	0.0	32.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.276
Total	0.0	0.0	32.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.276

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$)	FY 12 (k$)	Total (k$)
	0	0	51	0	0	0	0	0	0	0	51

WBS 1.5.11.5 **Descriptio** ROD's

Institution **Contact** F. Taylor

Design, development and production of Readout Drivers for the CSC.

The ROD receives data via the Back-of-Crate card (BOC) from the sparsifiers. The ROD buffers the data, checks it for errors, applies calibration constants and reformats it for output to the readout buffers. It also sends the timing, trigger, and control signals to the detector, monitors detector performance and performs calibration routines.

Much of the functionality of the ROD is implemented with digital signal processors (DSPs). The DSPs are mounted on modules that plug into the ROD motherboard. One DSP, the host, controlls the global functions of the ROD, while additional DSPs, the decoders, handle the data stream from the sparsifers. Prototype boards include 2 or 3 DSP modules, while the production boards include 9 DSP modules.

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	20	0	0	20	0	0	20	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$)	FY 12 (k$)	Total w/ overhead (k$)
Other P	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.000
P Total	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.000
Total	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.000

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$)	FY 12 (k$)	Total (k$)
	0	0	20	0	0	0	0	0	0	0	20

WBS 1.5.11.5.5 **Descriptio** ROD Installation

Institution U. of California, Irvine **Contact** F. Taylor

Installation of the ROD modules at CERN.

U.S. ATLAS % share of 100.00 %

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	20	0	0	20	0	0	20	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$)	FY 12 (k$)	Total w/ overhead (k$)
Other P	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.000
P Total	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.000
Total	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.000

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$)	FY 12 (k$)	Total (k$)
	0	0	20	0	0	0	0	0	0	0	20

WBS 1.5.11.6 **Descriptio** Support Electronics

Institution **Contact** F. Taylor

Support electronics includes design, development and production of custom backplanes for VME crates. Two of these crates are needed for the sparsifiers and one for the RODs. One more crate is kept as a spare. Additionally, test setups at CERN, BNL and UCI require one crate each.

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	22	0	0	22	17	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) (k$)	Total (hrs)
Electrical Engineer P	0	0	320	0	0	0	0	0	0	0	320
	0	0	16.9	0	0	0	0	0	0	0	16.900
P Total	0	0	320	0	0	0	0	0	0	0	320
	0	0	16.9	0	0	0	0	0	0	0	16.900
Total	0	0	320	0	0	0	0	0	0	0	320
	0	0	16.9	0	0	0	0	0	0	0	16.900

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other P	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.500
Travel P	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.500
P Total	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.000
Total	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.000

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$)	FY 12 (k$)	Total (k$)
	0	0	22	0	0	0	0	0	0	0	22

WBS 1.5.11.6.5 **Descriptio** Support Electronics Installation

Institution U. of California, Irvine **Contact** F. Taylor

Installation of the support electronics.

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	22	0	0	22	17	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) (k$)	Total (hrs)
Electrical Engineer P	0	0	320	0	0	0	0	0	0	0	320
	0	0	16.9	0	0	0	0	0	0	0	16.900
P Total	0	0	320	0	0	0	0	0	0	0	320
	0	0	16.9	0	0	0	0	0	0	0	16.900
Total	0	0	320	0	0	0	0	0	0	0	320
	0	0	16.9	0	0	0	0	0	0	0	16.900

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other P	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.500
Travel P	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.500
P Total	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.000
Total	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.000

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$)	FY 12 (k$)	Total (k$)
	0	0	22	0	0	0	0	0	0	0	22

WBS 1.5.11.9 **Descriptio** CSC Electronics installation

Institution BNL-muon **Contact** F. Taylor

CSC Electronics installation

U.S. ATLAS % share of 100.00 %

Cost Summary: (Project + MC)	**Base Cost (k$)**	**Cont Cost (k$)**	**Cont %**	**Total Cost (k$)**	**EDIA Labor (k$)**	**Mfg Labor (k$)**	**EDIA Matls (k$)**	**Mfg Matls (k$)**	**FTEs Project + MC**	**FTEs Other**
	9	0	0	9	0	0	9	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$)**	**FY 12 (k$)**	**Total w/ overhead (k$)**
Travel P	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.276
P Total	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.276
Total	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.276

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$)**	**FY 12 (k$)**	**Total (k$)**
	0	0	9	0	0	0	0	0	0	0	9

WBS 1.5.12 **Descriptio** Global Alignment System

Institution Brandeis Univesity **Contact** F. Taylor

Encompassed in this WBS is work related to the endcap alignment system. This includes the in-plane alignment system and global alignment system.

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	163	0	0	163	80	0	83	0	1.8	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) (k$)	Total (hrs)
Technician MC	0	758	931	389	0	0	0	0	0	0	2078
	0	18.95	23.275	9.725	0	0	0	0	0	0	51.950
MC Total	0	758	931	389	0	0	0	0	0	0	2078
	0	18.95	23.275	9.725	0	0	0	0	0	0	51.950
Technician P	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
P Total	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
Total	0	1316	1495	389	0	0	0	0	0	0	3200
	0	32.9	37.375	9.725	0	0	0	0	0	0	80.000

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	6.9	8.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	17.150
Travel MC	0.0	19.0	21.6	24.3	0.0	0.0	0.0	0.0	0.0	0.0	64.845
MC Total	0.0	25.9	29.6	26.5	0.0	0.0	0.0	0.0	0.0	0.0	81.995
Other P	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.700
P Total	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.700
Total	0.0	26.3	29.9	26.5	0.0	0.0	0.0	0.0	0.0	0.0	82.695

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$)	FY 12 (k$)	Total (k$)
	0	59	67	36	0	0	0	0	0	0	163

WBS 1.5.12.5 **Descriptio** Alignment System Installation

Institution **Contact** F. Taylor

Encompassed in this WBS is work related to the endcap alignment system. This includes staging, installation and fine position adjustment of 80 alignment bars and associated monitors of the global alignment system.

U.S. ATLAS % share of 90.00%

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	163	0	0	163	80	0	83	0	1.8	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) (k$)	Total (hrs)
Technician MC	0	758	931	389	0	0	0	0	0	0	2078
	0	18.95	23.275	9.725	0	0	0	0	0	0	51.950
MC Total	0	758	931	389	0	0	0	0	0	0	2078
	0	18.95	23.275	9.725	0	0	0	0	0	0	51.950
Technician P	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
P Total	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
Total	0	1316	1495	389	0	0	0	0	0	0	3200
	0	32.9	37.375	9.725	0	0	0	0	0	0	80.000

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	6.9	8.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	17.150
Travel MC	0.0	19.0	21.6	24.3	0.0	0.0	0.0	0.0	0.0	0.0	64.845
MC Total	0.0	25.9	29.6	26.5	0.0	0.0	0.0	0.0	0.0	0.0	81.995
Other P	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.700
P Total	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.700
Total	0.0	26.3	29.9	26.5	0.0	0.0	0.0	0.0	0.0	0.0	82.695

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$)	FY 12 (k$)	Total (k$)
	0	59	67	36	0	0	0	0	0	0	163

WBS 1.5.12.5.1 **Descriptio** Alignment System Installation

Institution **Contact** F. Taylor

Work related to the installation of the endcap alignment system. Covered are the alignment of both the CSC and MDT chamber systems. The work consists of mounting alignment bars and associated monitors on the Small, Big Wheels and on the EIL4 frame in the pit and positioning them to be within dynamic range of the global alignment

U.S. ATLAS % share of 90.00%

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	163	0	0	163	80	0	83	0	1.8	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) (k$)	Total (hrs)
Technician MC	0	758	931	389	0	0	0	0	0	0	2078
	0	18.95	23.275	9.725	0	0	0	0	0	0	51.950
MC Total	0	758	931	389	0	0	0	0	0	0	2078
	0	18.95	23.275	9.725	0	0	0	0	0	0	51.950
Technician P	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
P Total	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
Total	0	1316	1495	389	0	0	0	0	0	0	3200
	0	32.9	37.375	9.725	0	0	0	0	0	0	80.000

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	6.9	8.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	17.150
Travel MC	0.0	19.0	21.6	24.3	0.0	0.0	0.0	0.0	0.0	0.0	64.845
MC Total	0.0	25.9	29.6	26.5	0.0	0.0	0.0	0.0	0.0	0.0	81.995
Other P	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.700
P Total	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.700
Total	0.0	26.3	29.9	26.5	0.0	0.0	0.0	0.0	0.0	0.0	82.695

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$)	FY 12 (k$)	Total (k$)
	0	59	67	36	0	0	0	0	0	0	163

WBS 1.5.12.5.1.1 **Descriptio** Installation Global Alignment System Components

Institution **Contact** F. Taylor

Labor and materials needed to install the end cap global alignment system. Alignment bars are installed along the radial members of the Small and Big Wheel sectors and along radial members of the EIL4 frames.

Details of Estimate: Assumes a crew of approximately 5 FTEs at peak working during mid FY04 to the end of CY05 working for 8 hours to stage, install and adjust position to ~ 3 mm. Travel is included for this team. Costs for M&S items, such as tools and travel are included. Supervision is supplied by base program personnel.

U.S. ATLAS % share of 90.00%

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	163	0	0	163	80	0	83	0	1.8	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) (k$)	Total (hrs)
Technician MC	0	758	931	389	0	0	0	0	0	0	2078
	0	18.95	23.275	9.725	0	0	0	0	0	0	51.950
MC Total	0	758	931	389	0	0	0	0	0	0	2078
	0	18.95	23.275	9.725	0	0	0	0	0	0	51.950
Technician P	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
P Total	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
Total	0	1316	1495	389	0	0	0	0	0	0	3200
	0	32.9	37.375	9.725	0	0	0	0	0	0	80.000

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	6.9	8.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	17.150
Travel MC	0.0	19.0	21.6	24.3	0.0	0.0	0.0	0.0	0.0	0.0	64.845
MC Total	0.0	25.9	29.6	26.5	0.0	0.0	0.0	0.0	0.0	0.0	81.995
Other P	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.700
P Total	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.700
Total	0.0	26.3	29.9	26.5	0.0	0.0	0.0	0.0	0.0	0.0	82.695

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$)	FY 12 (k$)	Total (k$)
	0	59	67	36	0	0	0	0	0	0	163

WBS 1.5.12.5.1.1.1 **Descriptio** Brandeis

Institution Brandeis Univesity **Contact** F. Taylor

Basis of Physicist estimate

U.S. ATLAS % share of 90.00%

Cost Summary: (Project + MC)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project + MC	FTEs Other
	163	0	0	163	80	0	83	0	1.8	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) (k$)	Total (hrs)
Technician MC	0	758	931	389	0	0	0	0	0	0	2078
	0	18.95	23.275	9.725	0	0	0	0	0	0	51.950
MC Total	0	758	931	389	0	0	0	0	0	0	2078
	0	18.95	23.275	9.725	0	0	0	0	0	0	51.950
Technician P	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
P Total	0	558	564	0	0	0	0	0	0	0	1122
	0	13.95	14.1	0	0	0	0	0	0	0	28.050
Total	0	1316	1495	389	0	0	0	0	0	0	3200
	0	32.9	37.375	9.725	0	0	0	0	0	0	80.000

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$)	FY 12 (k$)	Total w/ overhead (k$)
Other MC	0.0	6.9	8.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	17.150
Travel MC	0.0	19.0	21.6	24.3	0.0	0.0	0.0	0.0	0.0	0.0	64.845
MC Total	0.0	25.9	29.6	26.5	0.0	0.0	0.0	0.0	0.0	0.0	81.995
Other P	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.700
P Total	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.700
Total	0.0	26.3	29.9	26.5	0.0	0.0	0.0	0.0	0.0	0.0	82.695

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$)	FY 12 (k$)	Total (k$)
	0	59	67	36	0	0	0	0	0	0	163