U.S. ATLAS Installation Cost Book

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

Institution All

U.S. ATLAS Installation Cost Book 12/10/2002 7:34:35 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
	449	0	0	449	36	135	0	278	2.0	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) (k$)	Total (hrs)
Mechanical Engineer MC	0	444	0	0	0	0	0	0	0	0	444
	0	36.386	0	0	0	0	0	0	0	0	36.386
Technician MC	448	2208	440	0	0	0	0	0	0	0	3096
	18.691	95.647	20.288	0	0	0	0	0	0	0	134.626
MC Total	448	2652	440	0	0	0	0	0	0	0	3540
	18.691	132.033	20.288	0	0	0	0	0	0	0	171.012
Total	448	2652	440	0	0	0	0	0	0	0	3540
	18.691	132.033	20.288	0	0	0	0	0	0	0	171.012

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	57.0	48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	141.750
Travel MC	21.0	57.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	136.515
MC Total	78.0	105.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	278.265
Total	78.0	105.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	278.265

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$)
	120	292	37	0	0	0	0	0	0	0	449

WBS 1.2 **Descriptio** TRT

Institution **Contact** Ogren

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
	449	0	0	449	36	135	0	278	2.0	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) (k$)	Total (hrs)
Mechanical Engineer MC	0	444	0	0	0	0	0	0	0	0	444
	0	36.386	0	0	0	0	0	0	0	0	36.386
Technician MC	448	2208	440	0	0	0	0	0	0	0	3096
	18.691	95.647	20.288	0	0	0	0	0	0	0	134.626
MC Total	448	2652	440	0	0	0	0	0	0	0	3540
	18.691	132.033	20.288	0	0	0	0	0	0	0	171.012
Total	448	2652	440	0	0	0	0	0	0	0	3540
	18.691	132.033	20.288	0	0	0	0	0	0	0	171.012

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	57.0	48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	141.750
Travel MC	21.0	57.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	136.515
MC Total	78.0	105.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	278.265
Total	78.0	105.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	278.265

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$)
	120	292	37	0	0	0	0	0	0	0	449

WBS 1.2.1 **Descriptio** Barrel Mechanics

Institution **Contact**

The mechanical part of the TRT, including module design, prototyping ,construction, gas/cooling, and installation.

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
	449	0	0	449	36	135	0	278	2.0	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) (k$)	Total (hrs)
Mechanical Engineer MC	0	444	0	0	0	0	0	0	0	0	444
	0	36.386	0	0	0	0	0	0	0	0	36.386
Technician MC	448	2208	440	0	0	0	0	0	0	0	3096
	18.691	95.647	20.288	0	0	0	0	0	0	0	134.626
MC Total	448	2652	440	0	0	0	0	0	0	0	3540
	18.691	132.033	20.288	0	0	0	0	0	0	0	171.012
Total	448	2652	440	0	0	0	0	0	0	0	3540
	18.691	132.033	20.288	0	0	0	0	0	0	0	171.012

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	57.0	48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	141.750
Travel MC	21.0	57.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	136.515
MC Total	78.0	105.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	278.265
Total	78.0	105.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	278.265

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$)
	120	292	37	0	0	0	0	0	0	0	449

WBS 1.2.1.3 **Descriptio** Installation

Institution **Contact** Ogren

TRT specific Installation work that must be carried out by US-TRT groups

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
	449	0	0	449	36	135	0	278	2.0	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) (k$)	Total (hrs)
Mechanical Engineer MC	0	444	0	0	0	0	0	0	0	0	444
	0	36.386	0	0	0	0	0	0	0	0	36.386
Technician MC	448	2208	440	0	0	0	0	0	0	0	3096
	18.691	95.647	20.288	0	0	0	0	0	0	0	134.626
MC Total	448	2652	440	0	0	0	0	0	0	0	3540
	18.691	132.033	20.288	0	0	0	0	0	0	0	171.012
Total	448	2652	440	0	0	0	0	0	0	0	3540
	18.691	132.033	20.288	0	0	0	0	0	0	0	171.012

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	57.0	48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	141.750
Travel MC	21.0	57.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	136.515
MC Total	78.0	105.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	278.265
Total	78.0	105.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	278.265

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$)
	120	292	37	0	0	0	0	0	0	0	449

WBS 1.2.1.3.1 **Descriptio** Spaceframe (8/03 -12/03)

Institution **Contact** Ogren

Align and bond spaceframe at CERN in building 154 and the SR Bulding.
This work is done under the direction of the TRT Project Engineer , the US Project engineer, a technician from Indiana , and a technician from CERN. The project engineers have worked out the following time line:
The tooling is scheduled to arrive at CERN in 8/03
Prepreparation and alignment of assembly jigs, including
install, adjust, align framework and rails
mount ,adjust, align assembly jigs

The spaceframe arrives at CERN in 9/03
Checkout of spaceframe and composite cylinders.
mount, adjust, align inner cylinder
mount, adjust, align end spaceframes
install optical monitoring system

Test and bond the spaceframe to the inner cylinder in 10/03
Alignment a attacment of the top cylinder to the frame.
Alignment a attacment of the bottom cylinder to the frame.
Mount, adjust, align SCT rails
Bond SCT rails

Final measurement of the assembled structure
Configure the frame for module insertion
Mount, adjust, align the module installation tools on frame ready 11/03

U.S. ATLAS % share of 50.00%

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**
	189	0	0	189	36	37	0	115	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) (k$)**	**Total (hrs)**
Mechanical Engineer MC	0	444	0	0	0	0	0	0	0	0	444
	0	36.386	0	0	0	0	0	0	0	0	36.386
Technician MC	448	448	0	0	0	0	0	0	0	0	896
	18.691	18.691	0	0	0	0	0	0	0	0	37.382
MC Total	448	892	0	0	0	0	0	0	0	0	1340
	18.691	55.077	0	0	0	0	0	0	0	0	73.768
Total	448	892	0	0	0	0	0	0	0	0	1340
	18.691	55.077	0	0	0	0	0	0	0	0	73.768

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	45.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.350
Travel MC	21.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.580

MC Total	66.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	114.930
Total	66.0	21.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	114.930

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$)**
	102	86	0	0	0	0	0	0	0	0	189

WBS 1.2.1.3.1.1 **Descriptio** Technical Support (Indiana)

Institution Indiana U. **Contact** Ogren

Specialized Technician 0.25 FTE for FY03 and 04.
This person has been involved with the spaceframe tooling design and with the module design. His specialized knowledge of the entire project is crucial. He will work with a CERN technician:

FY03- tasks include
1.0 months preparation of assemby jigs
2.0 months for assembly of spaceframe elements, alignment for initial gluing operations as indicated previously.
FY04 - tasks
1.5 month for completeing bonding and alignment of spaceframe.
1.5 months for preparation of spaceframe in SR buliding for reception of TRT modules.

$30/Y Travel **Details of Estimate:**

1.5k/trip
2 trips planned for each period

U.S. ATLAS % share of 50.00%

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**
	69	0	0	69	0	37	0	31	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	448	448	0	0	0	0	0	0	0	0	896
	18.691	18.691	0	0	0	0	0	0	0	0	37.382
MC Total	448	448	0	0	0	0	0	0	0	0	896
	18.691	18.691	0	0	0	0	0	0	0	0	37.382
Total	448	448	0	0	0	0	0	0	0	0	896
	18.691	18.691	0	0	0	0	0	0	0	0	37.382

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$)**	**FY 12 (k$)**	**Total w/ overhead (k$)**
Travel MC	10.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.290
MC Total	10.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.290
Total	10.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.290

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$)
	34	34	0	0	0	0	0	0	0	0	69

WBS 1.2.1.3.1.2 **Descriptio** Project Engineer

Institution Indiana U. **Contact** Ogren

Specialized engineering 0.25 FTE in FY03.
Supervision and planning of checkout of spaceframe components, and assembly,alignment and bonding.
Labor covered by project budget.
Ttravel paid by installation budget.

Specialized engineering 0.25 PE FTE in FY04 to coordinate the space frame assemby and alignment in SR building and preparation for Module installation.

$30/Y Travel**Details of Estimate:**

1.5k/trip
two trips planned for each year.

U.S. ATLAS % share of 50.00%

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**
	68	0	0	68	36	0	0	31	0.3	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)**
Mechanical Engineer MC	0	444	0	0	0	0	0	0	0	0	444
	0	36.386	0	0	0	0	0	0	0	0	36.386
MC Total	0	444	0	0	0	0	0	0	0	0	444
	0	36.386	0	0	0	0	0	0	0	0	36.386
Total	0	444	0	0	0	0	0	0	0	0	444
	0	36.386	0	0	0	0	0	0	0	0	36.386

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 MC	10.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.290
MC Total	10.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.290
Total	10.5	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.290

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$)**
	16	52	0	0	0	0	0	0	0	0	68

WBS 1.2.1.3.1.3 **Descriptio** Fixturing for Spaceframe

Institution Indiana U. **Contact** Ogren

Tooling contribution for bonding of spaceframe.
This is the US fraction(33%) of the tooling costs.
Much of this design has already taken place by the
US project engineer and designer.

spaceframe tooling $30000**Details of Estimate:**
33% US contribution
Assembly tooling that will be used to
hold and align the comoments
of the Spaceframe during assembly at CERN

U.S. ATLAS % share of 33.00%

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**
	30	0	0	30	0	0	0	30	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 MC	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.000
MC Total	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.000
Total	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.000

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$)**
	30	0	0	0	0	0	0	0	0	0	30

WBS 1.2.1.3.1.4 **Descriptio** Alignment and Module Insertion Equipment

Institution Indiana U. **Contact** Ogren

Optical and "onboard" CCD alignment needed during bonding.
US contribution(50%)to the optical system.
US contribution (100%) for fixturing for insertion and alignment of modules.
Two units will be built. They attach to the space frame on each end
and allow a controled movement of the module into the
space frame during insertion. Design will have been completed by
US and CERN

Alignment instrument contribution 50% US contribution **Details of Estimate:**
Engineering estimate of$5000.

Module insertion tooling fixturing isneeded
for installing the individual modules into frame.
The engineering estimated cost is $5000, Two will be needed
Total $10,000. Fixtures are 100% US contribution.

U.S. ATLAS % share of 75.00%

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**
	22	0	0	22	0	0	0	22	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 MC	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.350
MC Total	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.350
Total	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.350

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$)**
	22	0	0	0	0	0	0	0	0	0	22

WBS 1.2.1.3.2 **Descriptio** Module Install (10/03-1/05)

Institution **Contact** Ogren

The module installation activity involves the actual mounting of the TRT barrel modules into the spaceframe in the SR building, and the initial hookup of services to a six module gas and cooling manifold. This preparation activity starts in October, 03 and continues until January 05. There are 16 six-module sectors. Upon completion of all 16 sectors, the final gas and cooling manifolds will be attached and connected.

The installation starts November,03
The present estimate is that this operation will require 3 weeks/sector.

The detailed activites have been scheduled by the project engineer, they include:

install check six modules	1.2 days
Install cooling tubes and CO2 lines, check	1.2 days
Install electronics on front end	3.4 days
Install cooling plates and tubing front end	1.2 days
Install sector manifolds front end	1.2 days
Install electronics on backend	3.4 days
Install cooling plates and tubing back end	1.2 days
Install sector manifolds back end	1.2 days.
Sector cooling hookup	1 day

The installation is only part of the activitity in the SR building.
Following these operations, the additional testing of cooling, active gas, HV, Low volgtage, and signal noise for each sector are part of the M&O operations.
Continual monitoring of installed modules is also covered in the M&O which span the same period.

U.S. ATLAS % share of 50.00%

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**
	261	0	0	261	0	97	0	163	1.3	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) (k$)**	**Total (hrs)**
Technician MC	0	1760	440	0	0	0	0	0	0	0	2200
	0	76.956	20.288	0	0	0	0	0	0	0	97.244
MC Total	0	1760	440	0	0	0	0	0	0	0	2200
	0	76.956	20.288	0	0	0	0	0	0	0	97.244
Total	0	1760	440	0	0	0	0	0	0	0	2200
	0	76.956	20.288	0	0	0	0	0	0	0	97.244

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	12.0	48.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	89.400
Travel MC	0.0	36.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.935

MC Total	12.0	84.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	163.335
Total	12.0	84.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	163.335

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$)**
	18	206	37	0	0	0	0	0	0	0	261

WBS 1.2.1.3.2.1 **Descriptio** Technical Support (Duke)

Institution Duke University **Contact** Ogren

Specialized technician to assist in installation of modules
0.5 FTE in FY04 and 0.25FTE in FY05.
This person, who is an expert in module construction
will assist in the installation of modules, and the hookup of the services.

We estimate 3 weeks for each sector of 6 modules.
The technician will be involved in the module insertion,
attachment of services that is was listed in detail earlier.
This work will be done with one additional CERN technician,
and with an electronics technician, supervised by the
project engineer.

$30/Y Travel**Details of Estimate:**

1.5k/trip
two trips planned for each
yearly period.

U.S. ATLAS % share of 75.00%

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**
	106	0	0	106	0	61	0	45	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) (k$)**	**Total (hrs)**
Technician MC	0	880	440	0	0	0	0	0	0	0	1320
	0	40.577	20.288	0	0	0	0	0	0	0	60.865
MC Total	0	880	440	0	0	0	0	0	0	0	1320
	0	40.577	20.288	0	0	0	0	0	0	0	60.865
Total	0	880	440	0	0	0	0	0	0	0	1320
	0	40.577	20.288	0	0	0	0	0	0	0	60.865

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 MC	0.0	18.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.315
MC Total	0.0	18.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.315
Total	0.0	18.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.315

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	69	37	0	0	0	0	0	0	0	106

WBS 1.2.1.3.2.2 **Descriptio** Electronics Technician (Penn)

Institution U of Pennsylvania **Contact** Ogren

Specialized Electronics technician to assist in electronics hook up during installation 0.5 FTE FY04.
The primary tasks are prepartion of cables, the hookup of the HV, LV, installing electronics and cooling plate.
Total time for each 6 module sector is estimated at 3 weeks for the group of two mechcanical and one electonic technicians.

There will be interfacing and coordination with CERN electronics personal on project. Testing of electronics and noise suppression will be an on going process after the module insertion, and is coverd by the remaining electronics technician 0.5 FTE in the M&O.

$30/Y Travel**Details of Estimate:**

1.5k/trip
two trips planned

U.S. ATLAS % share of 75.00%

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**
	65	0	0	65	0	36	0	29	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	880	0	0	0	0	0	0	0	0	880
	0	36.379	0	0	0	0	0	0	0	0	36.379
MC Total	0	880	0	0	0	0	0	0	0	0	880
	0	36.379	0	0	0	0	0	0	0	0	36.379
Total	0	880	0	0	0	0	0	0	0	0	880
	0	36.379	0	0	0	0	0	0	0	0	36.379

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 MC	0.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.620
MC Total	0.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.620
Total	0.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.620

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	65	0	0	0	0	0	0	0	0	65

WBS 1.2.1.3.2.3 **Descriptio** Fixturing for Cooling

Institution Indiana U. **Contact** Ogren

Active cooling system for module electronics
These items are needed to check out the
active cooling system, both for the system tests
and immediately following the insertion of the modules.
The Fluorinert pump, small cooler, and presure valves
will be used for system tests and then move to CERN for
the 6 module checkout period.
Cooling manifold is attached after 16 sector tests are complete.

Details of Estimate:

FY03 Flourinert pump, small cooler and pressure indicators for balancing needed during systems tests in US then used in SR building.
Engineering estimate-a - $7K

FY04 cooling manfolds
Vendor quote, with updates- 18K

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**
	37	0	0	37	0	0	0	37	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 MC	7.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.250
MC Total	7.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.250
Total	7.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.250

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$)**
	10	27	0	0	0	0	0	0	0	0	37

WBS 1.2.1.3.2.4 **Descriptio** Fixturing for Gas

Institution Indiana U. **Contact** Ogren

Active gas system testing and supplies.
These items are needed for the active gas system
during the system tests and for the checkout of the
modules after insertion.
Active gas monitoring system will be used for system
tests and then moved to CERN for 6 module checkout

Details of Estimate:

FY03 gas control valves, meters and monitoring equiment
that will be used for system tests and then moved to SR bulding.
Engineering quote $5K-

FY04
manifold for active gas
Vendor quote with updates-$17K

manifold for CO2
Engineering estimate $7K
CO2 and active gas measuring equipment
engineering estmiate- $7K

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**
	52	0	0	52	0	0	0	52	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 MC	5.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.150
MC Total	5.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.150
Total	5.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.150

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$)**
	7	45	0	0	0	0	0	0	0	0	52