U.S. ATLAS E.T.C.
Cost Book

Funding Source: All **Funding Type:** All

Institutions: All

WBS Number: **Description:**

Institution : **Contact:**

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other

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

WBS Number: 1.1.1.1 **Description:** Mechanics and Final Assembly

Institution : **Contact:** G. Gilchriese

This estimate covers the US contribution to ATLAS pixel mechanics, services and final pixel system assembly.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
2586	1352	52	3938	530	342	601	1113	14.6	17.7

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	1898	1980	0	0	0	3566	0	0	341.630
MFG MC	0	0	0	0	738	1878	0	0	0	1102	0	0	185.212
MFG B/I	0	0	0	0	0	16360	0	0	0	0	0	0	768.739
EDIA P	0	2640	1295	6160	0	0	0	0	0	0	0	0	530.171
EDIA MC	0	0	3080	1320	0	0	0	0	0	0	0	0	389.537
EDIA B/I	0	0	12100	1320	0	1320	0	0	0	0	0	0	1219.368
	0	2640	16475	8800	2636	21538	0	0	0	4668	0	0	3434.657

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	716	4	0	0	0	295.0	1113.196
MFG MC	252	0	0	0	0	0.0	280.503
EDIA P	0	0	73	0	486	0.0	600.637
EDIA MC	0	0	40	0	0	0.0	48.000
	968	4	113	0	486	295.0	2042.336

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	1472	1162	1636	864	344	5477

WBS Number: 1.1.1.1.1 **Description:** Design

Institution : **Contact:** G. Gilchriese

This includes the cost of mechanical engineering labor for prototype and production design. The engineering labor is provided by Hytec, Inc under contract to LBNL and by LBNL.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
1131	539	48	1670	530	0	601	0	8.2	8.4

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA P	0	2640	1295	6160	0	0	0	0	0	0	0	0	530.171
EDIA MC	0	0	3080	1320	0	0	0	0	0	0	0	0	389.537
EDIA B/I	0	0	12100	1320	0	1320	0	0	0	0	0	0	1219.368
	0	2640	16475	8800	0	1320	0	0	0	0	0	0	2139.076

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
EDIA P	0	0	73	0	486	0.0	600.637
EDIA MC	0	0	40	0	0	0.0	48.000
	0	0	113	0	486	0.0	648.637

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	1043	604	522	469	150	2788

WBS Number: 1.1.1.1.1.1 **Description:** Prototype Design

Institution : **Contact:** G. Gilchriese

This includes the conceptual and prototype design of both the barrel and disk regions. System conceptual design is also included.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
136	41	30	177	106	0	30	0	1.0	0.5

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA P	0	0	1295	440	0	0	0	0	0	0	0	0	105.750
EDIA B/I	0	0	880	0	0	0	0	0	0	0	0	0	62.435
	0	0	2175	440	0	0	0	0	0	0	0	0	168.185

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
EDIA P	0	0	25	0	0	0.0	30.000
	0	0	25	0	0	0.0	30.000

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	198	0	0	0	0	198

WBS Number: 1.1.1.1.1.1.1 **Description:** Design - LBNL

Institution : LBNL/UC-Junior **Contact:** E. Anderssen

Engineering design at LBNL supported by internal funds and ATLAS project funds.

Basis of Estimate: Engineering judgement

Details of Estimate: On project funds assumes one ME for first half of FY01 and 50% of designer(0.25FTE) for same period for all prototype design effort. Another 0.5FTE ME is supported by base funds. Substantial travel costs will be incurred in the first half of FY01, resulting from multiple trips and long stays at RAL and CERN by the design team.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
106	34	32	140	76	0	30	0	0.8	0.5

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA P	0	0	880	440	0	0	0	0	0	0	0	0	76.306
EDIA B/I	0	0	880	0	0	0	0	0	0	0	0	0	62.435
	0	0	1760	440	0	0	0	0	0	0	0	0	138.741

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
EDIA P	0	0	25	0	0	0.0	30.000
	0	0	25	0	0	0.0	30.000

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
4	4	4	8	4	1	1	32

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	169	0	0	0	0	169

WBS Number: 1.1.1.1.1.1.2 **Description:** Design - HYTEC, Inc.

Institution : LBNL/UC-Junior **Contact:** W. Miller

The engineering design at HYTEC, Inc.

Basis of Estimate: Engineering judgement

Details of Estimate: Completion of ongoing prototype tasks and documentation of same in the first half of FY01. Extrapolated from effort in FY00.

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	29	7	24	37	29	0	0	0	0.2	0.0

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA P	0	0	415	0	0	0	0	0	0	0	0	0	29.444
	0	0	415	0	0	0	0	0	0	0	0	0	29.444

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	
	4	4	4	8	2	1	1	24

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	29	0	0	0	0	29

WBS Number: 1.1.1.1.1.2 **Description:** Production Design

Institution : **Contact:** G. Gilchriese

This includes production design of all US mechanical and services deliverables and of final assembly and installation at CERN. Design labor is provided by Hytec, Inc under contract to LBNL and by LBNL.

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	995	498	50	1493	424	0	571	0	7.3	7.9

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA P	0	2640	0	5720	0	0	0	0	0	0	0	0	424.421
EDIA MC	0	0	3080	1320	0	0	0	0	0	0	0	0	389.537
EDIA B/I	0	0	11220	1320	0	1320	0	0	0	0	0	0	1156.933
	0	2640	14300	8360	0	1320	0	0	0	0	0	0	1970.891

MATERIAL SUMMARY:	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
EDIA P	0	0	48	0	486	0.0	570.637
EDIA MC	0	0	40	0	0	0.0	48.000
	0	0	88	0	486	0.0	618.637

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	845	604	522	469	150	2590

WBS Number: 1.1.1.1.1.2.1 **Description:** Sectors

Institution : LBNL/UC- Senior **Contact:** G. Gilchriese

Production design of disk sectors.

Basis of Estimate: Engineering judgement

Details of Estimate: This includes final production drawings for sectors and related attachment parts. We assume here that the design has been largely finalized during the prototype phase(by first half of FY01 and before) and that only 220 hours of designer time is needed for possible drawing revisions, updates.

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	11	2	20	13	11	0	0	0	0.1	0.0

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA P	0	0	0	220	0	0	0	0	0	0	0	0	10.992
	0	0	0	220	0	0	0	0	0	0	0	0	10.992

CONTINGENCY FACTORS:	*Risk*				*Weight*			
	Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
	2	4	8	4	2	1	1	20

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	11	0	0	0	0	11

WBS Number: 1.1.1.1.1.2.2 **Description:** Disk Support Rings and Mounts

Institution : LBNL/UC- Senior **Contact:** W. Miller

Production design of disk support rings and the associated mounts to the support frame.

Basis of Estimate: Engineering judgement

Details of Estimate: The engineering design will be provided by Hytec, Inc under subcontract. A detailed estimate of effort is summarized in the supporting material. A total of $117.1K of design funding is required.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
124	25	20	148	0	0	124	0	0.0	0.0

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
EDIA P	0	0	0	0	117	0.0	123.539
	0	0	0	0	117	0.0	123.539

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
2	4	8	4	2	1	1	20

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	80	43	0	0	0	124

WBS Number: 1.1.1.1.1.2.3 **Description:** Support Frame

Institution : LBNL/UC- Senior **Contact:** W. Miller

Production design of support frame and mounts to the SCT.

Basis of Estimate: Engineering judgement

Details of Estimate: This work will be performed by Hytec, Inc under subcontract to LBNL. A detailed estimate is provided in the supporting documentation. A total of $369,100 is costed.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
389	78	20	467	0	0	389	0	0.0	0.0

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
EDIA P	0	0	0	0	369	0.0	389.498
	0	0	0	0	369	0.0	389.498

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
2	4	8	4	2	1	1	20

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	296	72	22	0	0	389

WBS Number: 1.1.1.1.1.2.4 **Description:** Thermal barriers

Institution : LBNL/UC- Senior **Contact:** E. Anderssen

Design of the the thermal/EMI barriers that support the pixel system.

Basis of Estimate: Engineering judgement

Details of Estimate: The initial design is covered under prototype design for the first half of FY01. Design effort after a decision point in mid-FY01 is contingent upon obtaining management contingency funding to proceed towards design and production of this item. All design effort and travel for second half of FY01 and beyond is put into management contingency or on base program.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
0	219	0	219	0	0	0	0	2.5	1.0

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA MC	0	0	3080	1320	0	0	0	0	0	0	0	0	389.537
EDIA B/I	0	0	1760	0	0	0	0	0	0	0	0	0	184.905
	0	0	4840	1320	0	0	0	0	0	0	0	0	574.442

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
EDIA MC	0	0	40	0	0	0.0	48.000
	0	0	40	0	0	0.0	48.000

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	**Cost**	**Schedule**	**Design**	**Technical**	**Cost**	**Schedule**	**Cont %**
6	15	8	15	2	1	1	50

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	207	173	173	70	0	622

WBS Number: 1.1.1.1.1.2.5 **Description:** Services

Institution : LBNL/UC-Junior **Contact:** E. Anderssen

Design of power cables, coolant tubing and integration of same into pxiel structure, external routing and interfaces to other systems.

Basis of Estimate: Engineering judgement

Details of Estimate: The work will be done by LBNL and New Mexico engineers and designers supported by ATLAS and the base program. The division of labor between LBL and New Mexico is not yet known, so all work is currently costed at LBL rates. Some LBL support from base program.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
307	113	37	420	271	0	36	0	3.0	1.8

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA P	0	2640	0	2640	0	0	0	0	0	0	0	0	270.530
EDIA B/I	0	0	3080	0	0	0	0	0	0	0	0	0	218.521
	0	2640	3080	2640	0	0	0	0	0	0	0	0	489.051

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
EDIA P	0	0	30	0	0	0.0	36.000
	0	0	30	0	0	0.0	36.000

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	**C o s t**	**Schedule**	**Des i gn**	**Technical**	**C o s t**	**Schedule**	**Cont %**
6	6	4	15	2	1	1	37

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	108	160	160	98	0	525

WBS Number: 1.1.1.1.1.2.6 **Description:** Disk Assembly

Institution : LBNL/UC- Senior **Contact:** F. Goozen

Design of disk assembly tooling and procedures. Disk assembly is placing sectors on disk rings.

Basis of Estimate: Engineering judgement

Details of Estimate: This work will be done by LBNL engineers supported by the base program and designers supported by ATLAS.

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	33	12	37	45	33	0	0	0	0.4	0.8

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA P	0	0	0	660	0	0	0	0	0	0	0	0	32.977
EDIA B/I	0	0	1320	0	0	0	0	0	0	0	0	0	138.679
	0	0	1320	660	0	0	0	0	0	0	0	0	171.656

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	Cost	Schedule	Design	Technical	Cost	Schedule	
	6	6	4	15	2	1	1	37

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	46	57	68	0	0	172

WBS Number: 1.1.1.1.1.2.7 **Description:** Final Assembly/Installation

Institution : LBNL/UC- Senior **Contact:** F. Goozen

Design of disk/support frame final assembly and installation tooling and procedures at CERN.

Basis of Estimate: Physicist estimate

Details of Estimate: Engineer supported by base program aided by part time designer supported by project.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
132	49	37	180	110	0	22	0	1.3	2.3

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA P	0	0	0	2200	0	0	0	0	0	0	0	0	109.922
EDIA B/I	0	0	3960	0	0	0	0	0	0	0	0	0	416.036
	0	0	3960	2200	0	0	0	0	0	0	0	0	525.958

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
EDIA P	0	0	18	0	0	0.0	21.600
	0	0	18	0	0	0.0	21.600

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
6	6	4	15	2	1	1	37

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	46	49	49	278	126	548

WBS Number: 1.1.1.1.1.2.8 **Description:** Test Equipment

Institution : LBNL/UC-Junior **Contact:** G. Gilchriese

Design of test equipment and supplies need for mechanical assembly.

Basis of Estimate: Physicist estimate

Details of Estimate: Technical staff supported by base program

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	0	0	0	0	0	0	0	0	0.0	1.5

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA B/I	0	0	0	1320	0	1320	0	0	0	0	0	0	83.226
	0	0	0	1320	0	1320	0	0	0	0	0	0	83.226

CONTINGENCY FACTORS:	*Risk*				*Weight*			
	Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
	6	6	4	15	2	1	1	37

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	28	28	28	0	0	83

WBS Number: 1.1.1.1.1.2.9 **Description:** Integration/Project Supervision

Institution : LBNL/UC- Senior **Contact:** E. Anderssen

Costs associated with overall systems integration, management and supervision.

Basis of Estimate: Physicist estimate

Details of Estimate: This will be done by LBNL engineers and supported by the base program.

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	0	0	0	0	0	0	0	0	0.0	0.6

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
EDIA B/I	0	0	1100	0	0	0	0	0	0	0	0	0	115.566
	0	0	1100	0	0	0	0	0	0	0	0	0	115.566

CONTINGENCY FACTORS:	*Risk*				*Weight*			
	Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
	6	6	4	15	1	1	1	31

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	23	23	23	23	23	116

WBS Number: 1.1.1.1.2 **Description:** Development and Prototypes

Institution : **Contact:** G. Gilchriese

This includes the procurement of prototype materials, testing equipment and fixtures, fabrication of prototypes, and technical labor needed for assembly and testing.

Details of Estimate: This includes the procurement of prototype materials, testing equipment and fixtures, fabrication of prototypes, and technical labor needed for assembly and testing.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
197	119	60	316	0	59	0	138	0.9	1.0

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	182	220	0	0	0	742	0	0	58.995
MFG MC	0	0	0	0	0	0	0	0	0	422	0	0	22.129
MFG B/I	0	0	0	0	0	1822	0	0	0	0	0	0	91.036
	0	0	0	0	182	2042	0	0	0	1164	0	0	172.160

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	124	0	0	0	0	0.0	138.062
MFG MC	32	0	0	0	0	0.0	35.705
	156	0	0	0	0	0.0	173.767

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	188	158	0	0	0	346

WBS Number: 1.1.1.1.2.1 **Description:** Disk Sectors

Institution : LBNL/UC- Senior **Contact:** G. Gilchriese

Prototype disk sector development.

Basis of Estimate: Parametric estimate

Details of Estimate: Extrapolation of current rate up to PRR date in Feb. 01.

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	17	2	14	19	0	11	0	6	0.1	0.3

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	0	220	0	0	0	0	0	0	10.992
MFG B/I	0	0	0	0	0	600	0	0	0	0	0	0	29.979
	0	0	0	0	0	820	0	0	0	0	0	0	40.971

MATERIAL SUMMARY:	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	5	0	0	0	0	0.0	5.565
	5	0	0	0	0	0.0	5.565

CONTINGENCY FACTORS:	*Risk*				*Weight*			Cont %
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	
	2	4	2	0	4	1	1	14

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	47	0	0	0	0	47

WBS Number: 1.1.1.1.2.2 **Description:** Disk Support Rings

Institution : LBNL/UC- Senior **Contact:** W. Miller

Prototype fabrication of disk support rings and mounts.

Details of Estimate: Remainder of work is covered under production.

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	0	0	0	0	0	0	0	0	0.0	0.0

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

WBS Number: 1.1.1.1.2.3 **Description:** Support Frame

Institution : LBNL/UC- Senior **Contact:** E. Anderssen

Prototype fabrication of support frame and associated elements.

Basis of Estimate: Engineering judgement

Details of Estimate: Prototype fabrication related to support frame is completed. B-layer support prototype is not and is costed here. Production procedures overlap with thermal barrier. If thermal barrier is released from management contingency, would not build B-layer support prototype - methods covered under thermal barrier prototype. B-layer support prototype estimated at 10665 in materials and 156 hours of shop time in FY01(on project) and 166 hours of mechanical tech(on base).

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
20	5	24	25	0	8	0	12	0.1	0.1

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	0	0	0	0	0	156	0	0	8.180
MFG B/I	0	0	0	0	0	166	0	0	0	0	0	0	8.294
	0	0	0	0	0	166	0	0	0	156	0	0	16.474

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	11	0	0	0	0	0.0	11.870
	11	0	0	0	0	0.0	11.870

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
4	4	4	8	2	1	1	24

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	20	8	0	0	0	28

WBS Number: 1.1.1.1.2.4 **Description:** Thermal Barriers

Institution : LBNL/UC- Senior **Contact:** E. Anderssen

Prototype fabrication of thermal barriers/EMI barriers.

Basis of Estimate: Engineering judgement

Details of Estimate: This includes both mockups and prototype using proposed materials and construction techniques. Prototype is put under management contingency. Mockup is costed here. Mockup is 1558 materials, 208 hours shop and 68 hours mech tech(base). Prototype is 32080 materials and 422 shop hours(both under management contingency) and 476 hours mech tech(base).

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
13	47	368	59	0	11	0	2	0.4	0.3

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	0	0	0	0	0	208	0	0	10.907
MFG MC	0	0	0	0	0	0	0	0	0	422	0	0	22.129
MFG B/I	0	0	0	0	0	544	0	0	0	0	0	0	27.181
	0	0	0	0	0	544	0	0	0	630	0	0	60.217

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	2	0	0	0	0	0.0	1.734
MFG MC	32	0	0	0	0	0.0	35.705
	34	0	0	0	0	0.0	37.439

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
8	15	4	15	4	1	1	66

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	52	46	0	0	0	98

WBS Number: 1.1.1.1.2.5 **Description:** Services

Institution : LBNL/UC-Junior **Contact:** E. Anderssen

Prototype fabrication of cables and coolant connections.

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	148	65	44	213	0	29	0	119	0.3	0.3

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	182	0	0	0	0	378	0	0	28.916
MFG B/I	0	0	0	0	0	512	0	0	0	0	0	0	25.582
	0	0	0	0	182	512	0	0	0	378	0	0	54.498

MATERIAL SUMMARY:	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	107	0	0	0	0	0.0	118.893
	107	0	0	0	0	0.0	118.893

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	70	104	0	0	0	173

WBS Number: 1.1.1.1.2.5.1 **Description:** Cables and Connections

Institution : LBNL/UC- Senior **Contact:** E. Anderssen

Fabrication of prototype cables and connections, PP0 and mechanical support.

Basis of Estimate: Engineering judgement

Details of Estimate: We assume four iterations of cable prototypes not including PP0.

Cable prototypes are in FY01: materials=23398 and 120 hours of mech tech. In FY02 materials = 31568 and 120 hours of mech tech.

Also include three rounds of PP0 prototypes at $4800k per round(verbal quote) + loading of PP0(150 hours of elec. Tech).

Prototype of mechanical support occurs in FY02. 7456 M&S, 178 hours of shop time, 272 hours of mechanical tech time(assumed to be base program) and 32 hours of elec. tech time.

Materials in FY01: 23398+9600=32998
in FY02:31568+4800+7456=43824

Mech tech in FY01: 120
in FY02: 120+272=392

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
104	46	44	150	0	18	0	86	0.2	0.3

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	182	0	0	0	0	178	0	0	18.428
MFG B/I	0	0	0	0	0	512	0	0	0	0	0	0	25.582
	0	0	0	0	182	512	0	0	0	178	0	0	44.010

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	77	0	0	0	0	0.0	85.503
	77	0	0	0	0	0.0	85.503

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
6	8	4	8	4	1	1	44

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	48	82	0	0	0	130

WBS Number: 1.1.1.1.2.5.2 **Description:** Coolant Connections

Institution : LBNL/UC-Junior **Contact:** E. Anderssen

Prototype fabrication of coolant connections.

Basis of Estimate: Physicist estimate

Details of Estimate: Extrapolation of current rate of expenditure on similar items into FY01 and FY02

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
44	19	44	63	0	10	0	33	0.1	0.0

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	0	0	0	0	0	200	0	0	10.488
	0	0	0	0	0	0	0	0	0	200	0	0	10.488

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	30	0	0	0	0	0.0	33.390
	30	0	0	0	0	0.0	33.390

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	**Cost**	**Schedule**	**Design**	**Technical**	**Cost**	**Schedule**	**Cont %**
6	8	4	8	4	1	1	44

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	22	22	0	0	0	44

WBS Number: 1.1.1.1.2.6 **Description:** Disk Assembly

Institution : LBNL/UC-Junior **Contact:** F. Goozen

Prototype fabrication associated with disk assembly

Details of Estimate: Covered under production.

COST SUMMARY: (Project)

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

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
0	0	0	0	0	0	0	0

WBS Number: 1.1.1.1.2.7 **Description:** Final Assembly and Installation

Institution : LBNL/UC-Junior **Contact:** F. Goozen

Prototype fabrication associated with final assembly and installation

Details of Estimate: Covered under production

COST SUMMARY: (Project)

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

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
0	0	0	0	0	0	0	0

WBS Number: 1.1.1.1.2.8 **Description:** Test Equipment

Institution : LBNL/UC-Junior **Contact:** G. Gilchriese

Prototype test equipment

Details of Estimate: Covered under production

COST SUMMARY: (Project)

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

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
0	0	0	0	0	0	0	0

WBS Number: 1.1.1.1.3 **Description:** Production

Institution : **Contact:** G. Gilchriese

Production of pixel mechanics and related services items, final assembly and installation.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
1258	694	55	1952	0	283	0	975	5.5	8.3

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	1716	1760	0	0	0	2824	0	0	282.635
MFG MC	0	0	0	0	738	1878	0	0	0	680	0	0	163.083
MFG B/I	0	0	0	0	0	14538	0	0	0	0	0	0	677.703
	0	0	0	0	2454	18176	0	0	0	3504	0	0	1123.421

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	592	4	0	0	0	295.0	975.134
MFG MC	220	0	0	0	0	0.0	244.798
	812	4	0	0	0	295.0	1219.932

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	241	399	1114	395	194	2343

WBS Number: 1.1.1.1.3.1 **Description:** Disk Sectors

Institution : LBNL/UC-Junior **Contact:** G. Gilchriese

Local supports - disk sectors - for the disk regions of the pixel system. All sectors are part of baseline scope.

Basis of Estimate: Engineering judgement

Details of Estimate: We assume production of 60 sectors to deliver 2*9+4*8=50 to the detector. See supporting notes for detailed fabrication costs.

Thermal QA uses IR thermography(equipment covered under Test Equipment) and labor is mechanical technician at 25% time for one year supported by base program.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
145	41	28	185	0	82	0	63	1.3	1.5

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	0	1760	0	0	0	501	0	0	81.756
MFG B/I	0	0	0	0	0	2640	0	0	0	0	0	0	83.226
	0	0	0	0	0	4400	0	0	0	501	0	0	164.982

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	57	0	0	0	0	0.0	63.140
	57	0	0	0	0	0.0	63.140

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	**Cost**	**Schedule**	**Design**	**Technical**	**Cost**	**Schedule**	**Cont %**
2	4	8	4	4	2	1	28

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	159	69	0	0	0	228

WBS Number: 1.1.1.1.3.2 **Description:** Disk Support Rings

Institution : LBNL/UC- Senior **Contact:** W. Miller

Support rings for disk sectors and mounts to attach to support frame. All disk rings/mounts are in baseline scope.

Basis of Estimate: Engineering judgement

Details of Estimate: The details of the estimate are provided in the accompanying supporting documentation.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
126	40	32	167	0	0	0	126	0.0	0.0

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	113	0	0	0	0	0.0	126.156
	113	0	0	0	0	0.0	126.156

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	Cont %
2	4	8	8	4	2	1	32

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	0	126	0	0	0	126

WBS Number: 1.1.1.1.3.3 **Description:** Support Frame

Institution : LBNL/UC- Senior **Contact:** W. Miller

Central support frame and end cones, disk region support frame, and external mounts.

Basis of Estimate: Engineering judgement

Details of Estimate: The details of the estimate are provided in the accompanying supporting documentation.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
243	78	32	321	0	0	0	243	0.0	0.0

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	0	0	0	0	0	230.0	243.377
	0	0	0	0	0	230.0	243.377

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	Cont %
2	4	8	8	4	2	1	32

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	0	122	122	0	0	243

WBS Number: 1.1.1.1.3.4 **Description:** B-layer Support

Institution : LBNL/UC- Senior **Contact:** E. Anderssen

Support shell and other structures for the B-layer that are attached to the support frame.

Basis of Estimate: Engineering judgement

Details of Estimate: In FY03: materials estimated at 14656 and 186 shop hours and 193 hours mech tech(base)
In FY04: materials estimated at 24905 and 186 shop hours and 193 hours mech tech(base)

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
64	30	47	93	0	20	0	44	0.2	0.2

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	0	0	0	0	0	372	0	0	19.507
MFG B/I	0	0	0	0	0	386	0	0	0	0	0	0	19.286
	0	0	0	0	0	386	0	0	0	372	0	0	38.793

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	40	0	0	0	0	0.0	44.025
	40	0	0	0	0	0.0	44.025

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
2	8	8	15	4	2	1	47

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	0	0	36	47	0	83

WBS Number: 1.1.1.1.3.5 **Description:** Thermal Barriers

Institution : LBNL/UC- Senior **Contact:** E. Anderssen

Thermal barrier for SCT system and integrated rails that support the pixel system. This is all in management contingency.

Basis of Estimate: Engineering judgement

Details of Estimate: FY02: 21060 materials, 248 hours shop and 24 hours mech tech
FY03: 141687 materials, 432 hours shop and 1854 mech tech.

All mech tech put in management contingency. Some would be base supported if moved to baseline scope.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
0	189	0	189	0	0	0	0	1.5	0.0

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG MC	0	0	0	0	0	1878	0	0	0	680	0	0	129.492
	0	0	0	0	0	1878	0	0	0	680	0	0	129.492

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG MC	163	0	0	0	0	0.0	181.137
	163	0	0	0	0	0.0	181.137

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	Cont %
8	10	4	15	4	1	1	61

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	0	38	273	0	0	311

WBS Number: 1.1.1.1.3.6 **Description:** Services

Institution : LBNL/UC- Senior **Contact:** E. Anderssen

Power and signal cables and connections. Cooling piping and connections. Mechanical supports for same.

Basis of Estimate: Engineering judgement

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	311	177	57	487	0	124	0	186	1.9	0.5

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	1716	0	0	0	0	861	0	0	124.214
MFG MC	0	0	0	0	738	0	0	0	0	0	0	0	33.591
MFG B/I	0	0	0	0	0	952	0	0	0	0	0	0	47.566
	0	0	0	0	2454	952	0	0	0	861	0	0	205.371

MATERIAL SUMMARY:	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	167	0	0	0	0	0.0	186.293
MFG MC	57	0	0	0	0	0.0	63.661
	225	0	0	0	0	0.0	249.954

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	0	31	424	0	0	455

WBS Number: 1.1.1.1.3.6.1 **Description:** Mechanical support

Institution : LBNL/UC- Senior **Contact:** E. Anderssen

Mechanical support of services within the ID volume.

Basis of Estimate: Engineering judgement

Details of Estimate: FY03: materials 40421, shop is 528 hours, mech tech 736(base). Includes mechanical integration of cables and shipping.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
84	36	43	120	0	39	0	45	0.4	0.4

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	224	0	0	0	0	528	0	0	38.880
MFG B/I	0	0	0	0	0	736	0	0	0	0	0	0	36.774
	0	0	0	0	224	736	0	0	0	528	0	0	75.654

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	40	0	0	0	0	0.0	44.989
	40	0	0	0	0	0.0	44.989

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
4	8	4	15	4	1	1	43

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	0	0	121	0	0	121

WBS Number: 1.1.1.1.3.6.2 **Description:** Cables and Connections

Institution : LBNL/UC- Senior **Contact:** E. Anderssen

Production materials and labor for low mass cables.

Basis of Estimate: Engineering judgement

Details of Estimate: Goals
FY02: 86 electech hours, 24057 materials
FY03: 1604 elec tech hours, 69629 materials

Baseline scope
FY02: 57 elec tech,
Mechanical tech time in services mechanical support.

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	126	64	51	190	0	56	0	70	1.0	0.0

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	1130	0	0	0	0	0	0	0	56.460
MFG MC	0	0	0	0	560	0	0	0	0	0	0	0	27.980
	0	0	0	0	1690	0	0	0	0	0	0	0	84.440

MATERIAL SUMMARY:	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	63	0	0	0	0	0.0	69.749
MFG MC	31	0	0	0	0	0.0	34.523
	94	0	0	0	0	0.0	104.272

CONTINGENCY FACTORS:	*Risk*				*Weight*			
	Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
	4	6	4	8	4	1	1	34

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	0	31	158	0	0	189

WBS Number: 1.1.1.1.3.6.3 **Description:** Coolant pipes and connectors

Institution : LBNL/UC- Senior **Contact:** E. Anderssen

Costs of coolant pipes and connectors for complete system up to PP2. Fittings not included for PP2. Items beyond PP2 are non-US responsibility.

Basis of Estimate: Engineering judgement

Details of Estimate: Materials 10020, shop time 333 hours, mech tech 216 hours. This assumes 80% yield of fittings to tubes.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
29	12	41	40	0	17	0	11	0.2	0.1

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	0	0	0	0	0	333	0	0	17.462
MFG B/I	0	0	0	0	0	216	0	0	0	0	0	0	10.792
	0	0	0	0	0	216	0	0	0	333	0	0	28.254

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	10	0	0	0	0	0.0	11.152
	10	0	0	0	0	0.0	11.152

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	Cont %
4	6	4	15	4	1	1	41

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	0	0	39	0	0	39

WBS Number: 1.1.1.1.3.6.4 **Description:** Patch Panel 0

Institution : LBNL/UC-Junior **Contact:** M. Garcia-Sciveres

Patch panel 0(PP0) located at the end of the pixel detector.

Basis of Estimate: Physicist estimate

Details of Estimate: Verbal quote of $1250 NRE +220 per part. Load time is estimated to be 1.5 hrs each.

Baseline scope is taken to be 241 PP0s. Fab costs are 1250+241x220=54270
Load is 362 hours.

Management contingency is 26180 for fab and 178 hours for load.

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	72	65	91	137	0	11	0	60	0.3	0.0

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	362	0	0	0	0	0	0	0	11.412
MFG MC	0	0	0	0	178	0	0	0	0	0	0	0	5.611
	0	0	0	0	540	0	0	0	0	0	0	0	17.023

MATERIAL SUMMARY:	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	54	0	0	0	0	0.0	60.403
MFG MC	26	0	0	0	0	0.0	29.138
	80	0	0	0	0	0.0	89.541

CONTINGENCY FACTORS:	*Risk*				*Weight*			
	Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
	8	6	8	15	4	1	1	61

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	0	0	107	0	0	107

WBS Number: 1.1.1.1.3.7 **Description:** Disk Assembly

Institution : LBNL/UC- Senior **Contact:** F. Goozen

Tooling and labor needed for disk assembly, placement of sectors on disk support rings and associated attachment of services and testing.

We also include here strain relief items that must be added to support services. These are not yet designed.

Basis of Estimate: Engineering judgement

Details of Estimate: See supporting note for tooling and shop labor.

We estimate the cost of composite strain relief pieces for services at $200 per octant per disk or $9600

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	94	51	54	145	0	50	0	44	0.5	1.5

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	0	0	0	0	0	950	0	0	49.817
MFG B/I	0	0	0	0	0	2640	0	0	0	0	0	0	131.906
	0	0	0	0	0	2640	0	0	0	950	0	0	181.723

MATERIAL SUMMARY:	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	40	0	0	0	0	0.0	44.075
	40	0	0	0	0	0.0	44.075

CONTINGENCY FACTORS:	*Risk*				*Weight*			
	Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
	4	15	8	15	4	1	1	54

PROFILE SUMMARY:	FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
	0	0	0	0	0	0	11	127	88	0	226

WBS Number: 1.1.1.1.3.8 **Description:** Disk Region Final Assembly

Institution : LBNL/UC- Senior **Contact:** F. Goozen

Tooling, fixtures, materials and supplies for disk and frame final assembly and test of system at LBNL and CERN.

Basis of Estimate: Physicist estimate

Details of Estimate: We assume tooling from disk assembly is reused. Additonal costs are documented in the notes and are 140 hours of shop time and 2350 for materials.

Testing
Cable trays and labor for cable installation 5,000
Racks(refurbished) 1,000
Patch panels/supports 2,000
Large environmental box 5,000
Subtotal 13,000
Shipping
This is at a very early stage. We assume we will ship each disk end as a unit
Shipping boxes(2) 3,000
Shipping disks 10,000
Subtotal 13,000

Assembly equipment at CERN
The US will provide support for assembly equipment at CERN and for shipment of equipment used at LBNL for trial assembly to CERN.
These estimates are at a very early stage

Assembly equipment at CERN 30,000
Ship equipment to CERN 5,000
Subtotal 35,000

Travel and stores costs are also included for the technical staff that will have to be resident at CERN during final assembly and installation.

Assembly labor is assumed to be covered by the base program.

There is currently a significant uncertainty in the assembly sequence and support at CERN

COST SUMMARY: (Project)	Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
	92	50	54	142	0	7	0	85	0.1	2.0

MANPOWER SUMMARY:	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG P	0	0	0	0	0	0	0	0	0	140	0	0	7.341
MFG B/I	0	0	0	0	0	3520	0	0	0	0	0	0	175.875
	0	0	0	0	0	3520	0	0	0	140	0	0	183.216

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	72	4	0	0	0	0.0	84.659
	72	4	0	0	0	0.0	84.659

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	Cont %
4	15	8	15	4	1	1	54

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	0	0	130	138	0	268

WBS Number: 1.1.1.1.3.9 **Description:** Test Equipment

Institution : LBNL/UC- Senior **Contact:** G. Gilchriese

Test equipment and supplies.

Basis of Estimate: Physicist estimate

Details of Estimate: This covers equipment and supplies that will be needed for testing during construction and during testing. It does not include electronics or cables but items for mechanical and thermal testing and clean room and misc. supplies.

IR camera for production sector QA	65000
SmartScope maintenance	2,000
Chiller maintenance	2,000
Environmental chamber	10,000

Consumables(not covered by base program) at $500 per month, $6000 per year for two years.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
100	39	39	139	0	0	0	100	0.0	0.0

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	28	0	0	0	0	65.0	99.934
	28	0	0	0	0	65.0	99.934

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
4	4	4	15	4	1	1	39

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	82	2	2	7	7	100

WBS Number: 1.1.1.1.3.10 **Description:** Installation

Institution : LBNL/UC- Senior **Contact:** F. Goozen

Tooling and fixtures for installation into ID at CERN.

Basis of Estimate: Level of Effort

Details of Estimate: This is currently set at a fixed level of effort in materials and manpower related to final insertion of pixel detector into ID.

COST SUMMARY: (Project)

Base Cost (k$)	Cont Cost (k$)	Cont %	Total Cost (k$)	EDIA Labor (k$)	Mfg Labor (k$)	EDIA Matls (k$)	Mfg Matls (k$)	FTEs Project	FTEs Other
83	0	0	83	0	0	0	83	0.0	2.5

MANPOWER SUMMARY:

	S.W. Prof (hrs)	EE (hrs)	ME (hrs)	Design (hrs)	ET (hrs)	MT (hrs)	Admin. Super. (hrs)	Other Admin. (hrs)	Contract Labor (hrs)	Shops (hrs)	Tech. Serv. (hrs)	Student (hrs)	Total w/ overhead (k$)
MFG B/I	0	0	0	0	0	4400	0	0	0	0	0	0	219.844
	0	0	0	0	0	4400	0	0	0	0	0	0	219.844

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	75	0	0	0	0	0.0	83.475
	75	0	0	0	0	0.0	83.475

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	Cont %
0	0	0	0	4	1	1	0

PROFILE SUMMARY:

FY 96 (k$)	FY 97 (k$)	FY 98 (k$)	FY 99 (k$)	FY 00 (k$)	FY 01 (k$)	FY 02 (k$)	FY 03 (k$)	FY 04 (k$)	FY 05 (k$)	Total (k$)
0	0	0	0	0	0	0	0	116	188	303