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: 1.1.1.3 **Description:** Electronics

Institution : **Contact:** K. Einsweiler

This covers the US activities associated with pixel integrated circuit electronics. The US will contribute to the design and fabrication of the front-end IC(FE) and the optical driver/receiver ICs. The European groups have the responsibility for the design and fabrication of the Module Control Chip(MCC). The US will provide test systems for IC wafer probing(and other testing of modules that uses some of the same equipment).

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
	1830	656	36	2486	861	62	81	826	8.4	6.9

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$)
MFG P	0	0	0	0	0	0	0	0	2640	0	0	300	61.722
EDIA P	0	9152	0	0	0	0	0	0	0	0	0	0	861.409
EDIA MC	0	0	0	0	0	0	0	0	2640	0	0	0	58.240
EDIA B/I	0	12144	0	0	0	0	0	0	0	0	0	0	1091.639
	0	21296	0	0	0	0	0	0	5280	0	0	300	2073.010

MATERIAL SUMMARY:	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	314	0	0	56	0	380.4	825.878
MFG MC	0	0	0	0	0	459.6	486.212
EDIA P	0	0	68	0	0	0.0	81.000
	314	0	68	56	0	840.0	1393.090

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	1173	1439	829	26	0	3466

WBS Number: 1.1.1.3.1 **Description:** Design/Engineering

Institution : **Contact:** K. Einsweiler

This covers the design engineering of the FE chip and the optical ICs.

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
942	269	28	1211	861	0	81	0	5.2	6.9

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	9152	0	0	0	0	0	0	0	0	0	0	861.409
EDIA B/I	0	12144	0	0	0	0	0	0	0	0	0	0	1091.639
	0	21296	0	0	0	0	0	0	0	0	0	0	1953.048

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	68	0	0	0.0	81.000
	0	0	68	0	0	0.0	81.000

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	798	798	438	0	0	2034

WBS Number: 1.1.1.3.1.1 **Description:** IC design

Institution : **Contact:** K. Einsweiler

Design of prototypes of the FE and optical ICs. FE design is done at LBL and optical IC design at OSU. In both cases this is a collaborative effort with European groups.

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
469	117	25	586	415	0	54	0	2.6	6.9

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	4576	0	0	0	0	0	0	0	0	0	0	414.714
EDIA B/I	0	12144	0	0	0	0	0	0	0	0	0	0	1091.639
	0	16720	0	0	0	0	0	0	0	0	0	0	1506.353

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	45	0	0	0.0	54.000
	0	0	45	0	0	0.0	54.000

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	606	667	287	0	0	1560

WBS Number: 1.1.1.3.1.1.1 **Description:** Design - LBNL

Institution : **Contact:** K. Einsweiler

The FE design activity is supported by both internal LBL funding and ATLAS project funding.

Details of Estimate: The FE design activity is supported by both internal LBL funding and ATLAS project funding.

FY01 1.25 FTE junior designers, 2.0 senior designers
FY02 1.0 junior designers, 2.5 senior designers
FY03 0.5 junior designers, 1 senior designer

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
469	117	25	586	415	0	54	0	2.6	5.7

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$)
EDIA P	0	4576	0	0	0	0	0	0	0	0	0	0	414.714
EDIA B/I	0	9944	0	0	0	0	0	0	0	0	0	0	945.654
	0	14520	0	0	0	0	0	0	0	0	0	0	1360.368

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	45	0	0	0.0	54.000
	0	0	45	0	0	0.0	54.000

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	547	609	258	0	0	1414

WBS Number: 1.1.1.3.1.1.1.1 **Description:** Senior Engineering

Institution : LBNL/UC- Senior **Contact:** K. Einsweiler

See higher level.

Basis of Estimate: Physicist estimate

Details of Estimate: See higher level.

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
313	78	25	392	277	0	36	0	1.5	4.0

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	2640	0	0	0	0	0	0	0	0	0	0	277.358
EDIA B/I	0	7040	0	0	0	0	0	0	0	0	0	0	739.620
	0	9680	0	0	0	0	0	0	0	0	0	0	1016.978

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	1	8	4	2	1	1	25

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	384	477	192	0	0	1053

WBS Number: 1.1.1.3.1.1.1.2 **Description:** Junior Engineering

Institution : LBNL/UC-Junior **Contact:** K. Einsweiler

See higher level.

Basis of Estimate: Physicist estimate

Details of Estimate: See higher level.

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
155	39	25	194	137	0	18	0	1.1	1.7

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$)
EDIA P	0	1936	0	0	0	0	0	0	0	0	0	0	137.356
EDIA B/I	0	2904	0	0	0	0	0	0	0	0	0	0	206.034
	0	4840	0	0	0	0	0	0	0	0	0	0	343.390

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	15	0	0	0.0	18.000
	0	0	15	0	0	0.0	18.000

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
6	1	8	4	2	1	1	25

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	163	132	66	0	0	361

WBS Number: 1.1.1.3.1.1.2 **Description:** Design-OSU

Institution : Ohio State U. **Contact:** KK Gan

Design of optoelectronics ICs

Basis of Estimate: Physicist estimate

Details of Estimate: Work is 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	1.3

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 B/I	0	2200	0	0	0	0	0	0	0	0	0	0	145.985
	0	2200	0	0	0	0	0	0	0	0	0	0	145.985

CONTINGENCY FACTORS:	*Risk*				*Weight*			
	Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	Cont %
	6	1	8	4	2	1	1	25

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	58	58	29	0	0	146

WBS Number: 1.1.1.3.1.2 **Description:** Test design

Institution : **Contact:** K. Einsweiler

This covers the engineering design of test boards and the development of test procedures.

Details of Estimate: This covers the engineering design of test boards and the development of test procedures.

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
	169	54	32	223	169	0	0	0	1.1	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	1936	0	0	0	0	0	0	0	0	0	0	169.337
	0	1936	0	0	0	0	0	0	0	0	0	0	169.337

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	140	29	0	0	0	169

WBS Number: 1.1.1.3.1.2.1 **Description:** LBL Engineering

Institution : LBNL/UC- Senior **Contact:** K. Einsweiler

Engineering will be needed for test design. This includes design of test boards

Basis of Estimate: Physicist estimate

Details of Estimate: FY01 50% of V. Risk, and 10% of J. Joseph. Other 50% of Risk in FY01 is under 1.1.1.5.1.3.2

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
	111	40	36	151	111	0	0	0	0.6	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	1056	0	0	0	0	0	0	0	0	0	0	110.943
	0	1056	0	0	0	0	0	0	0	0	0	0	110.943

CONTINGENCY FACTORS:	*Risk*				*Weight*			
	Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
	8	4	8	8	2	1	1	36

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	111	0	0	0	0	111

WBS Number: 1.1.1.3.1.2.2 **Description:** OSU Engineering

Institution : Ohio State U. **Contact:** KK Gan

Engineering will be needed for test design of optical ICs.

Basis of Estimate: Physicist estimate

Details of Estimate: We estimate that 880 hrs of junior engineering will be needed.

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
	58	14	24	72	58	0	0	0	0.5	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$)
EDIA P	0	880	0	0	0	0	0	0	0	0	0	0	58.394
	0	880	0	0	0	0	0	0	0	0	0	0	58.394

CONTINGENCY FACTORS:	*Risk*				*Weight*			
	Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
	8	4	8	4	1	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	29	0	0	0	58

WBS Number: 1.1.1.3.1.3 **Description:** Systems Engineering

Institution : LBNL/UC- Senior **Contact:** K. Einsweiler

Systems engineering of pixel electronics system

Basis of Estimate: Physicist estimate

Details of Estimate: Assumes following fractions of senior engineer(limited by availability of suitable manpower).
FY01 25%
FY02 50%
FY03 75%

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
304	97	32	402	277	0	27	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$)
EDIA P	0	2640	0	0	0	0	0	0	0	0	0	0	277.358
	0	2640	0	0	0	0	0	0	0	0	0	0	277.358

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	23	0	0	0.0	27.000
	0	0	23	0	0	0.0	27.000

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
6	4	8	8	2	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	52	101	151	0	0	304

WBS Number: 1.1.1.3.2 **Description:** Development and Prototypes

Institution : **Contact:** K. Einsweiler

This covers the procurement of prototype chips and the technical labor needed for test board layout, assembly and testing.

Details of Estimate: This covers the procurement of prototype chips and the technical labor needed for test board layout, 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
512	80	16	592	0	0	0	512	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	280	0	0	10	0	159.5	511.528
	280	0	0	10	0	159.5	511.528

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	374	137	0	0	0	512

WBS Number: 1.1.1.3.2.1 **Description:** Atmel/DMILL prototypes

Institution : **Contact:** K. Einsweiler

Prototypes with Temic. FE-D2 and FE-D3.

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
160	0	0	160	0	0	0	160	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	120	0	0	0	0	0.0	160.476
	120	0	0	0	0	0.0	160.476

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	160	0	0	0	0	160

WBS Number: 1.1.1.3.2.1.1 **Description:** FE-D2

Institution : SUNY at Albany **Contact:** K. Einsweiler

2nd DMILL prototype run

Basis of Estimate: Actual price

Details of Estimate: Committed in FY00 and costed in FY01.

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	0	0	33	0	0	0	33	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	33	0	0	0	0	0.0	33.440
	33	0	0	0	0	0.0	33.440

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
0	0	0	0	0	0	0	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	33	0	0	0	0	33

WBS Number: 1.1.1.3.2.1.2 **Description:** FE-D3

Institution : Ohio State U. **Contact:** K. Einsweiler

Pre-series DMILL run. Funds may flow through different institutions.

Basis of Estimate: In Contract

Details of Estimate: Assumes two full lot runs(2 x 20 wafers minimum). Cost is based on Temic Frame contract with CERN and US fraction of total cost.

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
127	0	0	127	0	0	0	127	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	87	0	0	0	0	0.0	127.036
	87	0	0	0	0	0.0	127.036

CONTINGENCY FACTORS:

Risk				Weight			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
0	0	0	0	0	0	0	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	127	0	0	0	0	127

WBS Number: 1.1.1.3.2.2 **Description:** Honeywell

Institution : Ohio State U. **Contact:** K. Einsweiler

Costs of FE-H1 now cancelled.

Basis of Estimate: Actual price

Details of Estimate: Penalty payment of $10,000 for cancellation of FE-H1

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
10	0	0	10	0	0	0	10	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	10	0	0.0	10.000
	0	0	0	10	0	0.0	10.000

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
0	0	0	0	0	0	0	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	10	0	0	0	0	10

WBS Number: 1.1.1.3.2.3 **Description:** 0.25 Micron

Institution : **Contact:** K. Einsweiler

Prototypes in 0.25 micron technology

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	19	22	103	0	0	0	84	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	84.5	84.457
	0	0	0	0	0	84.5	84.457

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	31	54	0	0	0	84

WBS Number: 1.1.1.3.2.3.1 **Description:** 1st prototype

Institution : Ohio State U. **Contact:** K. Einsweiler

6 wafer run with IBM. Funds may go through other institutions.

Basis of Estimate: In Contract

Details of Estimate: Cost based on Frame Contract between IBM and CERN and US fraction(22%) of total cost.. Contingency is for additional wafers.

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
31	7	22	37	0	0	0	31	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	30.7	30.724
	0	0	0	0	0	30.7	30.724

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
4	2	8	4	2	1	1	22

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	31	0	0	0	0	31

WBS Number: 1.1.1.3.2.3.2 **Description:** 2nd prototype

Institution : Ohio State U. **Contact:** K. Einsweiler

2nd prototype run with 0.25 micron IBM

Basis of Estimate: In Contract

Details of Estimate: Assumes 48 wafer run. Cost based on Frame Contract and US fraction of total cost. Contingency costs cover possible penalty payments explained in Frame Contract.

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
54	12	22	66	0	0	0	54	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	53.7	53.733
	0	0	0	0	0	53.7	53.733

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	Cont %
4	2	8	4	2	1	1	22

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	54	0	0	0	54

WBS Number: 1.1.1.3.2.4 **Description:** Test Equipment/Hardware/Software

Institution : **Contact:** K. Einsweiler

This covers test equipment during the prototype phase. Funds are needed for test board fabrication, probe cards, misc. hardware and misc. software. Funds are needed for a probe station for the 8" 0.25 micron wafers.

Details of Estimate: This covers test equipment during the prototype and preproduction phase. Logic analyzers, manual probe stations, automated probe stations and other standard laboratory test equipment already exists or will be provided by LBNL. Funds are needed for test board fabrication, probe cards, misc. hardware and misc. software and 8" probe station for 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
257	62	24	318	0	0	0	257	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	159	0	0	0	0	75.0	256.595
	159	0	0	0	0	75.0	256.595

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	173	83	0	0	0	257

WBS Number: 1.1.1.3.2.4.1 **Description:** Equipment/Test Boards

Institution : LBNL/UC- Senior **Contact:** K. Einsweiler

Testing equipment and test boards. We assume these boards will be used also in production.

Basis of Estimate: Physicist estimate

Details of Estimate: 8" probe station: $75K.

VME test boards -PLLs. Components for 10 PLLs funded in FY00 but not board fabrication or loading. Additional 10 boards to be fabricated for total of 20 to support all of pixel collaboration. Costs(components + board + loading) are estimated at
10*(500+500) + 10(2275+500+500)=42750.

PICT boards are estimated at 5*(1500+500+500)=12,500

PCC boards are estimated at 15*(500+300+300)=16,500

Board debugging(engineering labor) covered under design and supplemented by physicists.

Probe cards are assumed to be produced in Europe and provided to collaboration.

Single chip and module support card costs are extrapolated from existing cards and are 50*250=12,500

Total materials costs 84,250 + 75000=159250

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
257	62	24	318	0	0	0	257	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	159	0	0	0	0	75.0	256.595
	159	0	0	0	0	75.0	256.595

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
4	4	8	4	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	173	83	0	0	0	257

WBS Number: 1.1.1.3.3 **Description:** Production

Institution : **Contact:** K. Einsweiler

Front-end IC and optoelectronics production and associated 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
376	307	82	683	0	62	0	314	3.2	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$)
MFG P	0	0	0	0	0	0	0	0	2640	0	0	300	61.722
EDIA MC	0	0	0	0	0	0	0	0	2640	0	0	0	58.240
	0	0	0	0	0	0	0	0	5280	0	0	300	119.962

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	34	0	0	46	0	221.0	314.350
MFG MC	0	0	0	0	0	459.6	486.212
	34	0	0	46	0	680.5	800.562

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	504	391	26	0	921

WBS Number: 1.1.1.3.3.1 **Description:** Front-end ICs

Institution : **Contact:** K. Einsweiler

Production and associated testing of front-end ICs

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
274	236	86	510	0	58	0	216	3.0	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	0	0	0	0	2640	0	0	0	58.240
EDIA MC	0	0	0	0	0	0	0	0	2640	0	0	0	58.240
	0	0	0	0	0	0	0	0	5280	0	0	0	116.480

MATERIAL SUMMARY:

	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	34	0	0	0	0	168.0	215.630
MFG MC	0	0	0	0	0	459.6	486.212
	34	0	0	0	0	627.6	701.842

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	481	311	26	0	818

WBS Number: 1.1.1.3.3.1.1 **Description:** Outer system

Institution : **Contact:** K. Einsweiler

Production costs of barrel and disk front-end ICs(outer system, not B-layer).

Details of Estimate: The cost estimate is based on using Atmel/DMILL for barrel Layer 1 and one of the three disks on each end. The remainder of the system is assumed to use IBM 0.25 micron. Costs are based on yields given in the module yield model table and from Frame Contract prices with each vendor. Minimum contractual yield(17%) from Atmel/DMILL is assumed. IBM yield is assumed to be 50%.

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
121	170	140	291	0	0	0	121	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	114.5	121.098
MFG MC	0	0	0	0	0	459.6	486.212
	0	0	0	0	0	574.0	607.310

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	423	184	0	0	607

WBS Number: 1.1.1.3.3.1.1.1 **Description:** Atmel(DMILL)

Institution : LBNL/UC- Senior **Contact:** K. Einsweiler

FE IC production for barrel Layer 1 and 2x1 disks. This is all in management contingency.

Basis of Estimate: Vendor quotation

Details of Estimate: 497 DMILL wafers are required. Costs are based on Frame Contract for 500 wafers.

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	107	0	107	0	0	0	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$)
MFG MC	0	0	0	0	0	459.6	486.212
	0	0	0	0	0	459.6	486.212

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	**C o s t**	**Schedule**	**Des i gn**	**Technical**	**C o s t**	**Schedule**	**Cont %**
4	2	8	4	2	1	1	22

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	423	63	0	0	486

WBS Number: 1.1.1.3.3.1.1.2 **Description:** IBM

Institution : LBNL/UC- Senior **Contact:** K. Einsweiler

IBM FE ICs

Basis of Estimate: Vendor quotation

Details of Estimate: 170 wafers are required assuming yields given in module yield table(50% native yield). Costs are based on Frame Contract with 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
121	63	52	184	0	0	0	121	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	114.5	121.098
	0	0	0	0	0	114.5	121.098

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
8	2	8	8	4	2	1	52

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: 1.1.1.3.3.1.2 **Description:** B-layer

Institution : LBNL/UC- Senior **Contact:** K. Einsweiler

B-layer FE ICs

Basis of Estimate: Vendor quotation

Details of Estimate: Assumes IBM. 54 wafers required. Costs based on Frame Contract. Contingency should cover uncertainty in yield. 50% yield is assumed for base cost.

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
57	29	52	86	0	0	0	57	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	53.6	56.690
	0	0	0	0	0	53.6	56.690

CONTINGENCY FACTORS:

Risk				*Weight*			
Technical	C o s t	Schedule	Des i gn	Technical	C o s t	Schedule	Cont %
8	2	8	8	4	2	1	52

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	57	0	0	57

WBS Number: 1.1.1.3.3.1.3 **Description:** FE Testing

Institution : LBNL/UC- Senior **Contact:** K. Einsweiler

Equipment and labor for testing all front-end ICs.

Basis of Estimate: Physicist estimate

Details of Estimate: Equipment, Materials and Supplies

Test equipment for production testing will largely be in hand at the end of the development period. However, some additional items will be required. Estimates are based on previous experience.
Wafer storage in production $5000
Probe station shielding/environmental control $3,000
Probe station maintenance $2,000 per year starting in FY02 for three years
Active probe cards $10,000
Miscellaneous supplies $2,000 per year starting in FY03 for two years.
Database and other software licenses $2,000 per year starting in FY02 for three years.

FY02 5+3+2+5+2=17
FY03 2+5+2+2=11
FY04 2+2+2=6

Labor

Testing labor will be provided by temporary personnel supervised by physicists and postdocs. We assume the US will test(probe) 50% of all wafers.

DMILL testing is assumed to take 18 FTE months including a 6 month training period.
IBM testing is assumed to take 18 FTE months including a 6 month training period

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
	96	37	39	133	0	58	0	38	3.0	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	0	0	0	0	2640	0	0	0	58.240
EDIA MC	0	0	0	0	0	0	0	0	2640	0	0	0	58.240
	0	0	0	0	0	0	0	0	5280	0	0	0	116.480

MATERIAL SUMMARY:	Pur. Mat. (k$)	Stores (k$)	Travel (k$)	Low Level (k$)	R + D (k$)	High Level (k$)	Total w/ overhead (k$)
MFG P	34	0	0	0	0	0.0	37.842
	34	0	0	0	0	0.0	37.842

CONTINGENCY FACTORS:

	Risk				Weight			
	Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
	4	4	8	4	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	0	58	70	26	0	154

WBS Number: 1.1.1.3.3.2 **Description:** Optoelectronics

Institution : **Contact:** KK Gan

Production and associated testing of ICs for optoelectronics

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
102	71	69	173	0	3	0	99	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$)
MFG P	0	0	0	0	0	0	0	0	0	0	0	300	3.482
	0	0	0	0	0	0	0	0	0	0	0	300	3.482

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	46	0	52.9	98.720
	0	0	0	46	0	52.9	98.720

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	23	79	0	0	102

WBS Number: 1.1.1.3.3.2.1 **Description:** Production

Institution : Ohio State U. **Contact:** KK Gan

Optical ICs production

Basis of Estimate: Physicist estimate

Details of Estimate: Costs are based on minimum DMILL engineering run, Frame Contract and US fraction(50%).

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
53	53	100	106	0	0	0	53	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	52.9	52.920
	0	0	0	0	0	52.9	52.920

CONTINGENCY FACTORS:

Risk				Weight			
Technical	Cost	Schedule	Design	Technical	Cost	Schedule	Cont %
10	15	15	15	4	2	1	100

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	53	0	0	53

WBS Number: 1.1.1.3.3.2.2 **Description:** Testing, Dicing and Sorting

Institution : Ohio State U. **Contact:** KK Gan

Testing, dicing and sorting of optical ICs. 50% done in US.

Basis of Estimate: Physicist estimate

Details of Estimate: Wafer storage 1K
Probe station shielding/environmental control 3K
Probe station maintenance 2K
Probe cards 4K
Test cards 1K
Burn-in equipment 2K
Supplies 2K
Database licenses 2K
Dicing 27K. Costs are large as result of dicing many small die.
Die sort 1.6K
Shipping 0.2K

Total materials 45.8K

Labor is 300 hours(student rate)

This assumes DMILL. If IBM is used instead, need 8" probe stations(50K project from contingency + 25K base support) is assumed.

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
	49	18	36	67	0	3	0	46	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$)
MFG P	0	0	0	0	0	0	0	0	0	0	0	300	3.482
	0	0	0	0	0	0	0	0	0	0	0	300	3.482

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	46	0	0.0	45.800
	0	0	0	46	0	0.0	45.800

CONTINGENCY FACTORS:	*Risk* Technical	*Risk* Cost	*Risk* Schedule	*Risk* Design	*Weight* Technical	*Weight* Cost	*Weight* Schedule	Cont %
	8	4	8	8	2	1	1	36

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	23	26	0	0	49