

ZEMAX MODEL: D0901920-v6

		ZEMAX WEDGE (DEG)					DESIGN WEDGE (DEG)				
		ALONG Y		ALONG X			HORIZONTAL		VERTICAL		
ZEMAX NAME	INDEX	FRONT ANGLE	BACK ANGLE	FRONT ANGLE	BACK ANGLE	OPTIC	MIN	MAX	MIN	MAX	THICK SIDE ORIENTATION
ETMX	859		0.08			ETMX	--	--	0.07	0.10 (0.085 goal)	DOWN
ETMY	937		0.08			ETMY					
ITMX	805		0.10			ITMX					
ITMY	883		0.10			ITMY					
ITMX-CP	807			0.04		CPX	0.01	0.08	--	--	-Y
ITMY-CP	885			0.04		CPY					+X
BS	786			-0.03	0.03	BS	0.05	0.08	--	--	-X/-Y
PR3	781		-0.60			PR3	--	--	0.52	0.68	DOWN
SR3	980		-0.60			SR3					
PR2	746		1.00			PR2	--	--	0.90	1.10	DOWN
SR2	986		1.00			SR2					
PRM	722		1.00			PRM	--	--	0.90	1.10	DOWN
SRM	1011		1.00			SRM					

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	OBJECT					REF1				REF2				REF3				REF4	Corrections to Zemax				ZEMAX COORD. (mm)		
ZEMAX NAME	INDEX	Xtilt	Ytilt	Ztilt	Thick	INDEX	Xtilt	Ytilt	Ztilt	INDEX	Xtilt	Ytilt	Ztilt	INDEX	Xtilt	Ytilt	Ztilt	INDEX	T	X	Y	Z	X	Y	Z
PRIMARY OPTICS																									
ITMY-RADIUS	884	-90.00	0.00	0.00	100.00	881	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	-1				80.00	5001.30	-200.00
ITMY-CP	885	0.00	0.00	0.00	130.00	882	-90.00	0.10	0.00	881	0.00	0.00	0.00	0	0.00	0.00	0.00	0	1				79.76	4796.30	-200.00
BS	786	45.04	0.00	0.00	57.40	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				83.81	-183.55	-198.50
(BS AR)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				83.78	-201.51	-135.23
(BS ARS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA				83.85	-246.73	-180.57
PR3_RADIUS	780	0.00	0.04	0.00	50.00	777	180.65	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				99.16	-172.15	-19739.90
PR2_RADIUS	745	0.00	-0.04	0.00	37.50	743	0.42	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				92.11	-530.67	-3588.00
PRM_RADIUS	721	0.00	0.05	0.00	37.50	719	179.57	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				105.17	-653.98	-20191.20
SM2	704	143.53	0.31	0.00	25.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.83	-657.58	-20680.90
PMMT2	697	-64.07	0.00	0.00	25.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.83	487.70	-20320.10
FR CENTER	693	-56.00	0.00	0.00	100.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.83	15.00	-20640.00
PMMT1	682	116.16	0.00	0.00	25.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.83	-477.80	-20980.10
SM1	672	-125.81	0.03	0.00	25.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.83	747.48	-20582.89
MC3 HR	661	-134.35	0.03	0.00	75.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.83	720.00	-20072.00
MC2	649	0.00	-0.04	0.00	75.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				98.50	487.50	-3833.10
MC1 HR	639	134.34	0.03	0.00	75.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.83	255.00	-20072.00
PSL PERI TOP	636	0.00	-45.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				-114.20	-0.72	-20320.00
PSL PERI BOTTOM	637	90.00	45.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.83	-0.72	-20320.00
ITMX-RADIUS	806	0.00	0.00	0.00	100.00	803	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	1				80.00	-200.00	5001.10
ITMX-CP	807	0.00	0.00	0.00	130.00	804	0.00	0.10	0.00	803	0.00	0.00	0.00	0	0.00	0.00	0.00	0	1				79.76	-200.00	4796.10
SR3_RADIUS	979	0.00	0.00	0.00	50.00	977	89.15	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				99.06	-19614.80	-156.85
SR2_RADIUS	985	267.55	0.00	0.00	37.50	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				111.59	-4160.40	-594.00
SRM_RADIUS	1010	0.00	0.05	0.00	37.50	1008	86.63	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				123.94	-19858.80	306.40
ETMX-RADIUS	858	0.00	0.00	0.00	100.00	557	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	80.00	-200.00	3999501.30
ETMY-RADIUS	936	0.00	0.00	0.00	100.00	912	-90.00	0.00	0.00	376	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	80.00	3999501.30	-200.00
TRANSMISSION MONITOR (TransMon)																									
UPPER SUSPENSION1	1172	0.00	0.04	0.00	355.00	857	0.00	0.00	0.00	557	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0			3930000	-1310.00	-200.00	4000051.30
ETMXPO mirror M1	1164	0.00	0.00	0.00	-1.00	1160	0.00	0.04	-90.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	-481.21	-200.00	4000730.34
UPPER SUSPENSION1	1244	0.00	0.04	0.00	355.00	935	0.00	0.00	0.00	912	-90.00	0.00	0.00	376	0.00	0.00	0.00	0	0			3930000	-1310.00	4000200.00	51.30
ETMXPO mirror M1	1236	0.00	0.00	0.00	-1.00	1232	-90.00	0.04	-90.00	376	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	-481.21	4000730.34	-200.00
THERMAL COMPENSATION SYSTEM (TCS)																									
CO2 TCS TABLE ITMY	1085	90.00	90.00	0.00	762.00	1065	270.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				1140.00	4202.00	2536.20
LOWER PERISCOPE ITMY	1107	0.00	-45.00	0.00	0.00	1065	270.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				1038.40	3528.90	2294.90
UPPER PERISCOPE ITMY	1108	142.50	-45.00	0.00	0.00	1065	270.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				0.00	3528.90	2294.90
CO2-ITMY STEER M1 ITMY	1109	76.62	3.80	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				0.00	5663.00	650.00
CO2-ITMY STEER M2 ITMY	1110	-82.30	-7.21	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				830.00	-1050.00	-645.00
CO2 TCS TABLE ITMX	1130	90.00	90.00	0.00	762.00	1110	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				1140.00	2536.20	4202.00
LOWER PERISCOPE ITMX	1152	0.00	-45.00	0.00	0.00	1110	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				1038.40	2294.90	3528.90
UPPER PERISCOPE ITMX	1153	-142.50	-45.00	0.00	0.00	1110	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				0.00	2294.90	3528.90
CO2-ITMX STEER M1 ITMX	1154	13.40	-3.80	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				0.00	650.00	5663.00
CO2-ITMX STEER M2 ITMX	1155	-7.63	-7.20	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				830.00	-645.00	-1050.00
STRAY LIGHT CONTROL (SLC)																									
ARM CAVITY BAFFLE REF ITMX	813	0.00	0.00	0.00	0.00	326	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				0.00	-322.00	5280.00
ARM CAVITY BAFFLE REF ETMX	863	180.00	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	0.00	322.00	3999200.00
ARM CAVITY BAFFLE REF ITMY	889	270.00	0.00	0.00	0.00	281	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				0.00	5280.00	322.00
ARM CAVITY BAFFLE REF ETMY	942	90.00	0.00	0.00	0.00	376	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	0.00	3999200.00	-322.00
CRYOBAF END ETMX	846	0.00	0.00	0.00	913.00	557	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	0.00	0.00	3994360.00
CRYOBAF END ETMY	924	0.00	0.00	0.00	913.00	912	-90.00	0.00	0.00	376	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	0.00	3994360.00	0.00
ERR BAF MC1 ref	644	0.00	0.00	0.00	0.00	638	134.34	0.03	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.79	319.37	-20009.10
MC SCRAPER ref	653	90.00	0.00	0.00	0.00	648	0.00	-0.04	0.00	0	0.00	0.0													

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	OBJECT					REF1				REF2				REF3				REF4	Corrections to Zemax				ZEMAX COORD. (mm)			
ZEMAX NAME	INDEX	Xtilt	Ytilt	Ztilt	Thick	INDEX	Xtilt	Ytilt	Ztilt	INDEX	Xtilt	Ytilt	Ztilt	INDEX	Xtilt	Ytilt	Ztilt	INDEX	T	X	Y	Z	X	Y	Z	
ERR-BAF2-PMMT1	684	116.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.83	-405.00	-20945.00	
ERR-BAF-PMMT2	699	115.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.83	409.00	-20360.00	
ERR-BAF-SM2-1	728	3.00	0.00	0.00	0.00	719	179.57	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				105.17	-656.77	-20566.19	
ERR-BAF-SM2-2	732	-15.00	0.00	0.00	0.00	703	143.53	0.31	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				108.30	-537.83	-20645.06	
PR2 SCRAPE BAF REF	759	90.00	0.00	0.00	0.00	743	0.42	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				92.11	-526.08	-3937.98	
ELLIP BAF ITM-X ref	792	-90.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				83.08	-201.23	750.00	
ELLIP BAF ITM-Y ref	798	180.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				80.00	750.00	-198.60	
MANIFOLD BAF END ITMX	826	0.00	0.00	0.00	913.00	482	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				0.00	0.00	37633.00	
MANIFOLD BAF END ITMY	903	0.00	0.00	0.00	913.00	895	-90.00	0.00	0.00	496	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				0.00	37633.00	0.00	
SR3AR BAF PLATE	984	-3.00	0.00	0.00	140.00	977	89.15	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				99.06	-19839.78	-153.53	
SR2 SCRAPER BAF	998	-90.00	0.00	0.00	0.00	984	267.55	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				111.59	-4710.96	-595.47	
SR2 OUT BAF REF	1005	4.00	0.00	0.00	0.00	984	267.55	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				111.60	-3510.56	-611.80	
SRM IN BAF REF	1015	3.00	0.00	0.00	0.00	1008	86.63	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				123.94	-19459.79	277.90	
FI INPUT BAF	1033	5.00	0.00	0.00	0.00	1031	86.63	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				127.30	-20258.18	329.23	
FI REFL BAF	1051	5.00	0.00	0.00	0.00	1031	86.63	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				127.30	-20912.28	363.74	
faraday ref	1032	86.63	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				127.30	-20363.00	335.40	
OPTICAL LEVERS (OptLev)																										
BS OPTLEV IN BSC2 VP7	317	45.00	0.00	0.00	12.70	301	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				355.60	-1005.80	1005.80	
OPTLEV HAM2 WAMCB1 VP5	416	180.00	0.00	0.00	9.30	405	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				1013.89	469.90	-6014.95	
DLC HAM2 OPTLEV	410	-1.70	3.20	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				225.00	75.00	-19200.00	
OPTLEV PR3 IN WAMCB1 VP7	418	180.00	0.00	0.00	9.30	405	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				1077.38	-336.79	-6014.95	
OPTLEV PR3 OUT	423	0.00	0.00	0.00	0.00	405	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				-677.38	-336.79	-6000.00	
OPTLEV HAM3 IN WAMCA1 VP5	434	0.00	0.00	0.00	9.30	426	0.00	0.00	0.00	405	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				1013.89	-469.90	-17805.32	
DLC HAM3 OPTLEV	426	-2.70	-3.15	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				225.00	154.00	-4700.00	
OPTLEV SR3 IN WAMCB2 VP5	456	90.00	0.00	0.00	9.30	445	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				965.09	-6014.95	-367.21	
OPTLEV SR3 OUT WAMCB2 VP1	451	90.00	0.00	0.00	9.30	445	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				-765.09	-6014.95	-367.21	
WAMCA2 VP5	475	90.00	0.00	0.00	9.30	465	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				913.89	-17805.32	469.90	
DLC HAM4 OPTLEV	469	88.50	2.90	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				225.00	-4700.00	114.00	
OPTLEV HAM5 IN WAMCB2 VP7	458	90.00	0.00	0.00	9.30	445	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				913.89	-6014.95	469.90	
DLC HAM5 OPTLEV	450	91.80	-3.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				225.00	-19250.00	75.00	
A1-A VP3	492	0.00	0.00	0.00	9.65	482	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				748.00	145.40	37773.00	
A1-A VP6	495	0.00	0.00	0.00	9.65	482	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				-509.90	-566.30	37773.00	
A1-B VP4	507	90.00	0.00	0.00	9.65	496	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				748.00	37773.00	145.40	
A1-B VP1	504	90.00	0.00	0.00	9.65	496	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0				-509.90	37773.00	-566.30	
A1-A VP4	594	0.00	0.00	0.00	9.65	577	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	748.00	145.40	3994247.02	
A1-A VP1	597	0.00	0.00	0.00	9.65	577	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	-509.90	-566.30	3994247.02	
A-1A VP3	623	0.00	0.00	0.00	9.50	618	-90.00	0.00	0.00	605	0.00	0.00	0.00	376	0.00	0.00	0.00	0	0		3930000		748.00	3994247.02	145.40	
A-1A VP6	620	0.00	0.00	0.00	9.50	618	-90.00	0.00	0.00	605	0.00	0.00	0.00	376	0.00	0.00	0.00	0	0		3930000		-509.90	3994247.02	-566.30	
PHOTON CALIBRATION (PCal)																										
A1-A VP2	596	0.00	0.00	0.00	9.65	577	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	0.00	-762.00	3994247.02	
A1-A VP5	593	0.00	0.00	0.00	9.65	577	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	0.00	762.00	3994247.02	
PHOTCAL1 ETMX H1 IN	585	9.97	2.06	0.00	0.00	577	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	0.00	724.00	3994242.02	
PHOTCAL2 ETMX H1 IN	586	10.77	-0.34	0.00	0.00	577	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	0.00	800.00	3994242.02	
PERI1-1 PHOTCAL ETMX	587	40.00	-2.00	0.00	0.00	577	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	295.00	-716.00	3996672.02	
PERI1-2 PHOTCAL ETMX	588	46.20	4.50	0.00	0.00	577	0.00	0.00	0.00	349	0.00	0.00	0.00	0	0.00	0.00	0.00	0	0			3930000	295.00	-820.00	3996672.02	
PERI2-1 PHOTCAL ETMY	616	-130.00	-2.00	0.00	0.00	606	0.00	0.00	0.00	605	0.00	0.00	0.00	376	0.00	0.00	0.00	0	0			3930000	-48.00	66797.02	3929285.00	
PERI2-2 PHOTCAL ETMY	617	-135.60	-2.90	0.00	0.00	606	0.00	0.00	0.00	605	0.00	0.00	0.00	376	0.00	0.00	0.00	0	0			3930000	-48.00	66797.02	3929180.00	
A-1A VP2	624	0.00	0.00	0.00	9.50	618	-90.00	0.00	0.00	605	0.00	0.00	0.00	376	0.00	0.00										

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ZEMAX NAME	OBJECT					REF1				REF2				REF3				REF4	Corrections to Zemax				ZEMAX COORD. (mm)		
	INDEX	Xtilt	Ytilt	Ztilt	Thick	INDEX	Xtilt	Ytilt	Ztilt	INDEX	Xtilt	Ytilt	Ztilt	INDEX	Xtilt	Ytilt	Ztilt	INDEX	T	X	Y	Z	X	Y	Z
PERI2-1 PHOTCAL ETMY	616	-130.00	-2.00	0.00	0.00	606	0.00	0.00	0.00	605	0.00	0.00	0.00	376	0.00	0.00	0.00	0	0		3930000		-48.00	3996797.02	-715.00
PERI2-2 PHOTCAL ETMY	617	-135.60	-2.90	0.00	0.00	606	0.00	0.00	0.00	605	0.00	0.00	0.00	376	0.00	0.00	0.00	0	0		3930000		-48.00	3996797.02	-820.00
CHAMBERS																									
BSC1 REF	282					0				0				0				0					0.00	4580.00	0.00
BSC2 REF	302					0				0				0				0					0.00	0.00	0.00
BSC3 REF	327					0				0				0				0					0.00	0.00	4580.00
BSC9 REF	81					0				0				0				0				3930000	0.00	0.00	4000000.00
BSC10 REF	82					0				0				0				0			3930000		0.00	4000000.00	0.00
HAM1 REF	112					0				0				0				0					0.00	0.00	-22692.00
HAM2 REF	146					0				0				0				0					0.00	0.00	-20122.00
HAM3 REF	183					0				0				0				0					0.00	0.00	-3831.00
HAM4 REF	214					0				0				0				0					0.00	-3831.00	0.00
HAM5 REF	249					0				0				0				0					0.00	-20122.00	0.00
HAM6 REF	248					0				0				0				0					0.00	-22692.00	0.00

WARNINGS:

1) REFERENCING ONLY 3 LEVELS DEEP. Make sure REF4 column is all zeros.

2) The referencing only handles rotation of the 1st reference (REF1). Check that (Xtilt, Ytilt, Ztilt) for REF2 & REF3 are all zero. Check coordinates of objects using referencing carefully.

3) "Corrections to Zemax": 'T' refers to whether the thickness needs to be added, subtracted or ignored. This depends upon how the object was created/oriented in Zemax. If the {x,y,z} coordinates refer to the face desired then leave 0. If the coordinates refer to the backface, but you want the front face, then 1. If the coordinates refer to the frontface, but you want the backface, then -1. {X,Y,Z} refers to translational corrections to the Zemax object. Currently this is only for the ends stations since Zemax has an end station at 70 m instead of 4 km (for practical reasons).

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*center, unless otherwise specified

			GLOBAL (mm)				LOCAL (mm)			Angle (deg)	
DESCRIPTION	LABEL	POINT*	X	Y	Z	CHAMBER	X	Y	Z	Pitch	Yaw
PRIMARY OPTICS											
Input Test Mass, y-arm	ITMY	HR	-200.0	5001.3	-80.0	BSC1	-200.0	421.3	-80.0	0.0000	90.0000
Compensation Plate, y-arm	CPY	ESD	-200.0	4796.3	-79.8	BSC1	-200.0	216.3	-79.8	0.1000	90.0000
Beamsplitter	BS HR	HR	-198.5	-183.5	-83.8	BSC2	-198.5	-183.5	-83.8	0.0000	45.0410
Beamsplitter, AR in-line	BS AR	AR	-135.2	-201.5	-83.8	BSC2	-135.2	-201.5	-83.8	NA	NA
Beamsplitter, AR off-line	BS ARS	AR	-180.6	-246.7	-83.9	BSC2	-180.6	-246.7	-83.9	NA	NA
Power Recycling Cavity Mirror 3	PR3	HR	-19739.9	-172.1	-99.2	HAM2	382.1	-172.1	-99.2	0.0350	180.6530
Power Recycling Cavity Mirror 2	PR2	HR	-3588.0	-530.7	-92.1	HAM3	243.0	-530.7	-92.1	-0.0350	0.4230
Power Recycling Mirror	PRM	HR	-20191.2	-654.0	-105.2	HAM2	-69.2	-654.0	-105.2	0.0450	179.5740
Steering Mirror 2	SM2	HR	-20680.9	-657.6	-108.8	HAM2	-558.9	-657.6	-108.8	0.3060	143.5330
Pre-Mode Matching Telescope, Mirror 2	PMMT2	HR	-20320.1	487.7	-108.8	HAM2	-198.1	487.7	-108.8	0.0000	-64.0730
Input Faraday Isolator	IFI	input	-20640.0	15.0	-108.8	HAM2	-518.0	15.0	-108.8	0.0000	-56.0000
Pre-Mode Matching Telescope, Mirror 1	PMMT1	HR	-20980.1	-477.8	-108.8	HAM2	-858.1	-477.8	-108.8	0.0000	116.1570
Steering Mirror 1	SM1	HR	-20582.9	747.5	-108.8	HAM2	-460.9	747.5	-108.8	0.0300	-125.8120
Mode Cleaner Mirror 3	MC3	HR	-20072.0	720.0	-108.8	HAM2	50.0	720.0	-108.8	0.0250	-134.3500
Mode Cleaner Mirror 2	MC2	HR	-3833.1	487.5	-98.5	HAM3	-2.1	487.5	-98.5	-0.0350	0.0000
Mode Cleaner Mirror 1	MC1	HR	-20072.0	255.0	-108.8	HAM2	50.0	255.0	-108.8	0.0250	134.3350
PSL Input Beam, Periscope, Top	PSL M2	HR	-20320.0	-0.7	114.2	HAM2	-198.0	-0.7	114.2	-45.0000	0.0000
PSL Input Beam, Periscope, Bottom	PSL M1	HR	-20320.0	-0.7	-108.8	HAM2	-198.0	-0.7	-108.8	45.0000	90.0000
Input Test Mass, x-arm	ITMX	HR	5001.1	-200.0	-80.0	BSC3	421.1	-200.0	-80.0	0.0000	180.0000
Compensation Plate, x-arm	CPX	ESD	4796.1	-200.0	-79.8	BSC3	216.1	-200.0	-79.8	0.1000	180.0000
Signal Recycling Cavity Mirror 3	SR3	HR	-156.9	-19614.8	-99.1	HAM5	-156.9	507.2	-99.1	-0.0007	89.1540
Signal Recycling Cavity Mirror 2	SR2	HR	-594.0	-4160.4	-111.6	HAM4	-594.0	-329.4	-111.6	0.0007	267.5500
Signal Recycling Mirror	SRM	HR	306.4	-19858.8	-123.9	HAM5	306.4	263.2	-123.9	0.0450	86.6300
End Test Mass, x-arm	ETMX	HR	3999501.3	-200.0	-80.0	BSC9	-498.7	-200.0	-80.0	0.0000	0.0000
End Test Mass, y-arm	ETMY	HR	-200.0	3999501.3	-80.0	BSC10	-200.0	-498.7	-80.0	0.0000	-90.0000
TRANSMISSION MONITOR (TransMon)											
TransMonSUS, X-Arm, Upper Structure center	TrsMonX Struct	facing ERM	4000051.3	-200.0	1310.0	BSC9	51.3	-200.0	1310.0	0.0350	0.0000
TransMonSUS, X-Arm, Primary Mirror center	TrsMonX PM	HR	4000730.3	-200.0	481.2	BSC9	730.3	-200.0	481.2	0.0350	0.0000
TransMonSUS, Y-Arm, Upper Structure center	TrsMonY Struct	HR	51.3	4000200.0	1310.0	BSC10	51.3	200.0	1310.0	0.0350	0.0000
TransMonSUS, Y-Arm, Primary Mirror center	TrsMonY PM	HR	-200.0	4000730.3	481.2	BSC10	-200.0	730.3	481.2	0.0350	-90.0000
THERMAL COMPENSATION SYSTEM (TCS)											
TCS CO2 Projector Optics Table Y	CO2 TableY	top	2536.2	4202.0	-1140.0	BSC2	2536.2	4202.0	-1140.0	90.0000	360.0000
TCS CO2 Projector, Y-Periscope, lower mirror	CO2 PY1	HR	2294.9	3528.9	-1038.4	BSC2	2294.9	3528.9	-1038.4	-45.0000	270.0000
TCS CO2 Projector, Y-Periscope, upper mirror	CO2 PY2	HR	2294.9	3528.9	0.0	BSC2	2294.9	3528.9	0.0	-45.0000	412.5000
TCS CO2 Projector, Steering Mirror MY1	CO2 MY1	HR	650.0	5663.0	0.0	BSC1	650.0	1083.0	0.0	3.8000	76.6200
TCS CO2 Projector, Steering Mirror MY2	CO2 MY2	HR	-645.0	-1050.0	-830.0	BSC2	-645.0	-1050.0	-830.0	-7.2100	-82.3000
TCS CO2 Projector Optics Table X	CO2 TableX	top	4202.0	2536.2	-1140.0	BSC2	4202.0	2536.2	-1140.0	90.0000	90.0000
TCS CO2 Projector, X-Periscope, lower mirror	CO2 PX1	HR	3528.9	2294.9	-1038.4	BSC2	3528.9	2294.9	-1038.4	-45.0000	0.0000
TCS CO2 Projector, X-Periscope, upper mirror	CO2 PX2	HR	3528.9	2294.9	0.0	BSC2	3528.9	2294.9	0.0	-45.0000	-142.5040
TCS CO2 Projector, Steering Mirror MX1	CO2 MX1	HR	5663.0	650.0	0.0	BSC3	1083.0	650.0	0.0	-3.8000	13.4000
TCS CO2 Projector, Steering Mirror MX2	CO2 MX2	HR	-1050.0	-645.0	-830.0	BSC2	-1050.0	-645.0	-830.0	-7.2000	-7.6300
STRAY LIGHT CONTROL (SLC)											
Arm Cavity Baffle ITMX reference	ACB-ITMX	side plate	5280.0	-322.0	0.0	BSC3	700.0	-322.0	0.0	0.0000	0.0000
Arm Cavity Baffle ETMX reference	ACB-ETMX	side plate	3999200.0	322.0	0.0	BSC9	-800.0	322.0	0.0	0.0000	180.0000
Arm Cavity Baffle ITMY reference	ACB-ITMY	side plate	322.0	5280.0	0.0	BSC1	322.0	700.0	0.0	0.0000	270.0000
Arm Cavity Baffle ETMY reference	ACB-ETMY	side plate	-322.0	3999200.0	0.0	BSC10	-322.0	-800.0	0.0	0.0000	90.0000
Manifold/Cryopump Baffle End, ETMX	MCB-ETMX	flange end	3994360.0	0.0	0.0	BSC9	-5640.0	0.0	0.0	0.0000	0.0000
Manifold/Cryopump Baffle End, ETMY	MCB-ETMY	flange end	0.0	3994360.0	0.0	BSC10	0.0	-5640.0	0.0	0.0000	-90.0000
Errant Beam Baffle, MC1 reference	EBB-MC1	ref	-20009.1	319.4	-108.8	HAM2	112.9	319.4	-108.8	0.0250	134.3350
Scraper Baffle, MC reference	SB-MC1	ref	-4333.1	486.5	-98.8	HAM3	-502.1	486.5	-98.8	-0.0350	90.0000
Errant Beam Baffle, MC3 reference	EBB-MC3	ref	-20009.1	655.6	-108.8	HAM2	112.9	655.6	-108.8	0.0250	-134.3500
Errant Beam Baffle, SM1 reference	EBB-SM1	ref	-20462.0	746.7	-108.8	HAM2	-340.0	746.7	-108.8	0.0000	0.0000

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*center, unless otherwise specified

DESCRIPTION	LABEL	POINT*	GLOBAL (mm)			CHAMBER	LOCAL (mm)			Angle (deg)	
			X	Y	Z		X	Y	Z	Pitch	Yaw
Errant Beam Baffle, PMMT1 reference	EBB-PMMT1	ref	-20945.0	-405.0	-108.8	HAM2	-823.0	-405.0	-108.8	0.0000	116.0000
Errant Beam Baffle, PMMT2 reference	EBB-PMMT2	ref	-20360.0	409.0	-108.8	HAM2	-238.0	409.0	-108.8	0.0000	115.0000
Errant Beam Baffle, SM2-1 reference	EBB-SM2-1	ref	-20566.2	-656.8	-105.2	HAM2	-444.2	-656.8	-105.2	0.0000	182.5740
Errant Beam Baffle, SM2-2 reference	EBB-SM2-2	ref	-20645.1	-537.8	-108.3	HAM2	-523.1	-537.8	-108.3	0.3060	128.5330
Scraper Baffle, PR2 reference	SB-PR2	ref	-3938.0	-526.1	-92.1	HAM3	-107.0	-526.1	-92.1	0.0000	90.4230
Elliptical Baffle, ITMX reference	ELB-ITMX	ref	750.0	-201.2	-83.1	BSC2	750.0	-201.2	-83.1	0.0000	-90.0000
Elliptical Baffle, ITMY reference	ELB-ITMY	ref	-198.6	750.0	-80.0	BSC2	-198.6	750.0	-80.0	0.0000	180.0000
Manifold/Cryopump Baffle, ITMX	MCB-ITMX	flange end	37633.0	0.0	0.0	BSC2	37633.0	0.0	0.0	0.0000	0.0000
Manifold/Cryopump Baffle, ITMY	MCB-ITMY	flange end	0.0	37633.0	0.0	BSC2	0.0	37633.0	0.0	0.0000	-90.0000
Baffle Plate, SR3 reference	BP-SR3	ref	-153.5	-19839.8	-99.1	HAM5	-153.5	282.2	-99.1	0.0000	86.1540
Scraper Baffle, SR2 reference	SB-SR2	ref	-595.5	-4711.0	-111.6	HAM4	-595.5	-880.0	-111.6	0.0007	177.5500
Baffle Plate, SR2 reference	BP-SR2	ref	-611.8	-3510.6	-111.6	HAM4	-611.8	320.4	-111.6	0.0007	271.5500
Baffle Plate, SRM reference	BP-SRM	ref	277.9	-19459.8	-123.9	HAM5	277.9	662.2	-123.9	0.0000	89.6300
Output Faraday Isolator, Input Baffle ref	BAF-OFI-IN	ref	329.2	-20258.2	-127.3	HAM5	329.2	-136.2	-127.3	0.0000	91.6300
Output Faraday Isolator, Reflected Baffle ref	BAF-OFI-REFL	ref	363.7	-20912.3	-127.3	HAM5	363.7	-790.3	-127.3	0.0000	91.6300
Output Faraday Isolator reference	OFI	input wedge	335.4	-20363.0	-127.3	HAM5	335.4	-241.0	-127.3	0.0000	86.6300
OPTICAL LEVERS (OptLev)											
OptLev BS Tx & Rc Viewport	OL BS VP	outer face	1005.8	-1005.8	-355.6	BSC2	1005.8	-1005.8	-355.6	0.0000	45.0000
OptLev HAM2, TX & Rc Viewport	OL HAM2 VP	outer face	-6015.0	469.9	-1013.9	HAM2	14107.1	469.9	-1013.9	0.0000	180.0000
OptLev HAM2, Reference Mirror	OL HAM2 M1	HR	-19200.0	75.0	-225.0	HAM2	922.0	75.0	-225.0	3.2000	-1.7000
OptLev PR3, Tx Viewport	OL PR3 Tx VP	outer face	-6015.0	-336.8	-1077.4	HAM2	14107.1	-336.8	-1077.4	0.0000	180.0000
OptLev PR3, Rc Viewport	OL PR3 Rc VP	outer face	-6000.0	-336.8	677.4	HAM2	14122.0	-336.8	677.4	0.0000	0.0000
OptLev HAM3, TX & Rc Viewport	OL HAM3 VP	outer face	-17805.3	-469.9	-1013.9	HAM3	-13974.3	-469.9	-1013.9	0.0000	0.0000
OptLev HAM3, Reference Mirror	OL HAM3 M1	HR	-4700.0	154.0	-225.0	HAM3	-869.0	154.0	-225.0	-3.1500	-2.7000
OptLev SR3, Tx Viewport	OL SR3 Tx VP	outer face	-367.2	-6015.0	-965.1	HAM5	-367.2	14107.1	-965.1	0.0000	90.0000
OptLev SR3, Rc Viewport	OL SR3 Rc VP	outer face	-367.2	-6015.0	765.1	HAM5	-367.2	14107.1	765.1	0.0000	90.0000
OptLev HAM4, Tx & Rc Viewport	OL HAM4 VP	outer face	469.9	-17805.3	-913.9	HAM4	469.9	-13974.3	-913.9	0.0000	90.0000
OptLev HAM4, Reference Mirror	OL HAM4 M1	HR	114.0	-4700.0	-225.0	HAM4	114.0	-869.0	-225.0	2.9000	88.5000
OptLev HAM5, Tx & Rc Viewport	OL HAM5 VP	outer face	469.9	-6015.0	-913.9	HAM5	469.9	14107.1	-913.9	0.0000	90.0000
OptLev HAM5, Reference Mirror	OL HAM5 M1	HR	75.0	-19250.0	-225.0	HAM5	75.0	872.0	-225.0	-3.0000	91.8000
OptLev ITMX, Tx Viewport	OL ITMX Tx VP	outer face	37773.0	145.4	-748.0	BSC3	33193.0	145.4	-748.0	0.0000	0.0000
OptLev ITMX, Rc Viewport	OL ITMX Rc VP	outer face	37773.0	-566.3	509.9	BSC3	33193.0	-566.3	509.9	0.0000	0.0000
OptLev ITMY, Tx Viewport	OL ITMY Tx VP	outer face	145.4	37773.0	-748.0	BSC1	145.4	33193.0	-748.0	0.0000	90.0000
OptLev ITMY, Rc Viewport	OL ITMY Rc VP	outer face	-566.3	37773.0	509.9	BSC1	-566.3	33193.0	509.9	0.0000	90.0000
OptLev ETMX, Tx Viewport	OL ETMX Tx VP	outer face	3994247.0	145.4	-748.0	BSC9	-5753.0	145.4	-748.0	0.0000	0.0000
OptLev ETMX, Rc Viewport	OL ETMX Rc VP	outer face	3994247.0	-566.3	509.9	BSC9	-5753.0	-566.3	509.9	0.0000	0.0000
OptLev ETMY, Tx Viewport	OL ETMY Tx VP	outer face	145.4	3994247.0	-748.0	BSC10	145.4	-5753.0	-748.0	0.0000	-90.0000
OptLev ETMY, Rc Viewport	OL ETMY Rc VP	outer face	-566.3	3994247.0	509.9	BSC10	-566.3	-5753.0	509.9	0.0000	-90.0000
PHOTON CALIBRATION (PCal)											
PCal Viewport ETMX Transmit	ETMY	outer face	3994247.0	-762.0	0.0	BSC9	-5753.0	-762.0	0.0	0.0000	0.0000
PCal Viewport ETMX Receive	ETMY	outer face	3994247.0	762.0	0.0	BSC9	-5753.0	762.0	0.0	0.0000	0.0000
PCal Beam 1 ETMX Inject	ETMY	ref	3994242.0	724.0	0.0	BSC9	-5758.0	724.0	0.0	2.0600	9.9650
PCal Beam 2 ETMX Inject	ETMY	ref	3994242.0	800.0	0.0	BSC9	-5758.0	800.0	0.0	-0.3400	10.7650
PCal Beam 1 ETMX Periscope 1, Mirror 1	ETMY	HR	3996672.0	-716.0	-295.0	BSC9	-3328.0	-716.0	-295.0	-2.0000	40.0000
PCal Beam 1 ETMX Periscope 1, Mirror 2	ETMY	HR	3996672.0	-820.0	-295.0	BSC9	-3328.0	-820.0	-295.0	4.5000	46.2000
PCal Beam 2 ETMX Periscope 2, Mirror 1	ETMY	HR	3929285.0	66797.0	48.0	BSC9	-70715.0	66797.0	48.0	-2.0000	-130.0000
PCal Beam 2 ETMX Periscope 2, Mirror 2	ETMY	HR	3929180.0	66797.0	48.0	BSC9	-70820.0	66797.0	48.0	-2.9000	-135.6000
PCal Viewport ETMY Receive	ETMY	outer face	762.0	3994247.0	0.0	BSC10	762.0	-5753.0	0.0	0.0000	-90.0000
PCal Viewport ETMY Transmit	ETMY	outer face	-762.0	3994247.0	0.0	BSC10	-762.0	-5753.0	0.0	0.0000	-90.0000
PCal Beam 1 ETMY Inject	ETMY	ref	724.0	3994242.0	0.0	BSC10	724.0	-5758.0	0.0	2.0300	-99.9650
PCal Beam 2 ETMY Inject	ETMY	ref	800.0	3994242.0	0.0	BSC10	800.0	-5758.0	0.0	-0.3300	-100.7650
PCal Beam 1 ETMY Periscope 1, Mirror 1	ETMY	HR	-674.0	3996797.0	-289.0	BSC10	-674.0	-3203.0	-289.0	-2.0000	-130.0000
PCal Beam 1 ETMY Periscope 1, Mirror 2	ETMY	HR	-820.0	3996797.0	-289.0	BSC10	-820.0	-3203.0	-289.0	4.1000	-136.2000

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*center, unless otherwise specified

DESCRIPTION	LABEL	POINT*	GLOBAL (mm)			CHAMBER	LOCAL (mm)			Angle (deg)	
			X	Y	Z		X	Y	Z	Pitch	Yaw
PCal Beam 2 ETMy Periscope 2, Mirror 1	ETMY	HR	-715.0	3996797.0	48.0	BSC10	-715.0	-3203.0	48.0	-2.0000	-130.0000
PCal Beam 2 ETMy Periscope 2, Mirror 2	ETMY	HR	-820.0	3996797.0	48.0	BSC10	-820.0	-3203.0	48.0	-2.9000	-135.6000
CHAMBERS											
BSC1			0.0	4580.0	0.0						
BSC2			0.0	0.0	0.0						
BSC3			4580.0	0.0	0.0						
BSC9			4000000.0	0.0	0.0						
BSC10			0.0	4000000.0	0.0						
HAM1			-22692.0	0.0	0.0						
HAM2			-20122.0	0.0	0.0						
HAM3			-3831.0	0.0	0.0						
HAM4			0.0	-3831.0	0.0						
HAM5			0.0	-20122.0	0.0						
HAM6			0.0	-22692.0	0.0						

NOTE:

The transformation to local coordinates does not (yet) include the tip/tilt of the global plane relative to local horizontal. It is simply a shift to the local chamber center. As a consequence the heights (z) may be off by as much as 0.7 mm. A more useful local coordinate reference is the center of the optics table, with the optics table locally level.

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CAVITY	CAVITY LENGTHS (mm)				LENGTH ERROR
	MAX	NOMINAL	MIN	DESIGN	
X-ARM	3995104.0	3994500.2	3994395.8	3994500.0	-0.2
Y-ARM	3995104.0	3994500.0	3994280.0	3994500.0	0.0
PRC	59590.3	57657.6	55181.6	57656.0	-1.6
SRC	60005.3	56004.7	54737.4	56008.0	3.3
IMC	33480.3	32946.1	31668.5	32946.1	0.0
Schnupp Asymmetry		46.8		50.4	3.6

Design lengths are from T0900043-v10

OPTIC	NOMINAL GLOBAL COORDS			OPTIC POSITION RANGE			
	X	Y	Z	X MIN	X MAX	Y MIN	Y MAX
ITMX	5001.1	-200.0	-80.0	4660.0	5014.2		
ITMY	-200.0	5001.3	-80.0			4660.0	5130.0
BS AR	-135.2	-201.5	-83.8				
BS HR	-198.5	-183.5	-83.8				
BS ARS	-180.6	-246.7	-83.9				
PR3	-19739.9	-172.1	-99.2	-20500	-19650		
PR2	-3588.0	-530.7	-92.1	-4305	-3455		
PRM	-20191.2	-654.0	-105.2	-20267	-19670		
ETMX	3999501.3	-200.0	-80.0	3999410	3999764		
ETMY	-200.0	3999501.3	-80.0			3999410	3999764
SR3	-156.9	-19614.8	-99.1			-20500	-19645
SR2	-594.0	-4160.4	-111.6			-4350	-3400
SRM	306.4	-19858.8	-123.9			-20500	-19250
MC1	-20072.0	255.0	-108.8	-20077	-19828		
MC2	-3833.1	487.5	-98.5	-4225	-3568		
MC3	-20072.0	720.0	-108.8	-20071	-19822		

Warning: The min & max position ranges for the optics have not been checked recently against the SolidWorks layout.

MATERIAL	INDEX
Fused Silica	1.44963
Vacuum	1

NOMINAL SPACING								
X	Y	Z	Comment	distance	index	optical path	average length	Schnupp
POWER RECYCLING CAVITY								
				Y-ARM				
-200.0	5001.3	-80.0	ITMY HR			0.0		
-200.0	4801.3	-80.0	ITMY AR	200.0	1.450	289.9		
-200.0	4796.3	-80.0	ITMY-CP	5.0	1.000	5.0		
-200.0	4666.3	-80.0	ITMY-CP	130.0	1.450	188.5		
-198.5	-183.5	-83.8	BSHR	4849.9	1.000	4849.9		
-19739.9	-172.1	-99.2	PR3	19541.4	1.000	19541.4		
-3588.0	-530.7	-92.1	PR2	16155.9	1.000	16155.9		
-20191.2	-654.0	-105.2	PRM	16603.7	1.000	16603.7		
						57634.2		
				X-ARM				
5001.1	-200.0	-80.0	ITMX HR			0.0		
4801.1	-200.0	-80.0	ITMX AR	200.0	1.450	289.9		
4796.1	-200.0	-80.0	ITMX-CP	5.0	1.000	5.0		
4666.1	-200.0	-80.0	ITMX-CP	130.0	1.450	188.5		
-135.2	-201.5	-83.8	BSAR	4801.3	1.000	4801.3		
-198.5	-183.5	-83.8	BSHR	65.8	1.450	95.3		
-19739.9	-172.1	-99.2	PR3	19541.4	1.000	19541.4		
-3588.0	-530.7	-92.1	PR2	16155.9	1.000	16155.9		
-20191.2	-654.0	-105.2	PRM	16603.7	1.000	16603.7		
						57681.0	57657.6	46.8
SIGNAL RECYCLING CAVITY								
				Y-ARM				
-200.0	5001.3	-80.0	ITMY HR			0.0		
-200.0	4801.3	-80.0	ITMY AR	200.0	1.450	289.9		
-200.0	4796.3	-80.0	ITMY-CP	5.0	1.000	5.0		
-200.0	4666.3	-80.0	ITMY-CP	130.0	1.450	188.5		
-198.5	-183.5	-83.8	BSHR	4849.9	1.000	4849.9		
-180.6	-246.7	-83.9	BSARS	65.7	1.450	95.2		
-156.9	-19614.8	-99.1	SR3	19368.1	1.000	19368.1		
-594.0	-4160.4	-111.6	SR2	15460.6	1.000	15460.6		
306.4	-19858.8	-123.9	SRM	15724.2	1.000	15724.2		
						55981.3		
				X-ARM				
5001.1	-200.0	-80.0	ITMX HR			0.0		
4801.1	-200.0	-80.0	ITMX AR	200.0	1.450	289.9		
4796.1	-200.0	-80.0	ITMX-CP	5.0	1.000	5.0		
4666.1	-200.0	-80.0	ITMX-CP	130.0	1.450	188.5		
-135.2	-201.5	-83.8	BSAR	4801.3	1.000	4801.3		
-198.5	-183.5	-83.8	BSHR	65.8	1.450	95.3		
-180.6	-246.7	-83.9	BSARS	65.7	1.450	95.2		
-156.9	-19614.8	-99.1	SR3	19368.1	1.000	19368.1		
-594.0	-4160.4	-111.6	SR2	15460.6	1.000	15460.6		
306.4	-19858.8	-123.9	SRM	15724.2	1.000	15724.2		
						56028.1	56004.7	46.8
MODECLEANER								
-20072.0	255.0	-108.8	MC1			0.0		
-20072.0	720.0	-108.8	MC3	465.0	1.000	465.0		
-3833.1	487.5	-98.5	MC2	16240.6	1.000	16240.6		
-20072.0	255.0	-108.8	MC1	16240.6	1.000	16240.6		
						32946.1		