E1101148-v2 H2 Recycling Cavity Length
1/18/2012

ADLIGO/IFO/E1101148-v2 H2_recycling-cavity-length_v5_0.076wedge.xls

	WEDGE		
	horizontal	vertical	thick side
ITM/ETM		0.076	down
CP-x	0.069		-Y
CP-y	0.069		-X
BS	0.074		right
PRM3/SRM3		0.10	down
PRM2/SRM2		1.00	down
PRM/SRM		1.00	down
Schnupp Assymetry	50		
Schnupp Assymetry correcti	0.00		

	COORDINATES, mm									
	ZEMAX			GLOBAL			LOCAL			CHAMBER
OPTIC	**X**	**Y**	**Z**	**X**	**Y**	**Z**	**X**	**Y**	**Z**	
FOLD_ITMY-RADIUS	80.0	9897.7	200.0	200.0	9897.7	-80.0	200.0	528.7	-80.0	WBSC8
FOLD_ITMY-CP	80.0	9677.7	200.0	200.0	9677.7	-80.0	200.0	308.7	-80.0	WBSC8
FMY	80.4	9004.4	199.7	199.7	9004.4	-80.4	199.7	-364.6	-80.4	WBSC8
BS AR	90.6	9113.7	9075.4	9075.4	9113.7	-90.6	-144.6	-255.3	-90.6	WBSC4
BS HR	90.7	9096.1	9139.1	9139.1	9096.1	-90.7	-80.9	-123.9	-90.7	WBSC4
PR3	113.1	9315.0	28559.9	28559.9	9315.0	-113.1	-782.1	95.0	-113.1	WHAM8
PR2	149.5	9750.5	13359.7	13359.7	9750.5	-149.5	308.7	530.5	-149.5	WHAM9
PRM	167.8	8569.2	29122.8	29122.8	8569.2	-167.8	-219.2	-650.8	-167.8	WHAM8
FOLD_ITMX-RADIUS	80.0	200.0	9920.7	9920.7	200.0	-80.0	551.7	200.0	-80.0	WBSC7
FOLD_ITMX-CP	80.0	200.0	9700.7	9700.7	200.0	-80.0	331.7	200.0	-80.0	WBSC7
FMX	80.4	199.7	9003.1	9003.1	199.7	-80.4	-365.9	199.7	-80.4	WBSC7
BS ARS	90.5	9159.6	9121.6	9121.6	9159.6	-90.5	-247.4	9159.6	-90.5	WBSC4
SR3	113.4	29261.5	9407.9	9407.9	29261.5	-113.4	187.9	-80.5	-113.4	WHAM11
SR2	131.1	13270.0	8683.0	8683.0	13270.0	-131.1	-537.0	219.0	-131.1	WHAM10
SRM	149.1	29222.6	8924.0	8924.0	29222.6	-149.1	-296.0	-119.4	-149.1	WHAM11
OUTPUT FARADAY IN	151.7	29575.7	8929.3	8929.3	29575.7	-151.7	-290.7	233.7	-151.7	WHAM11
OUTPUT FARADAY OUT	152.4	30082.3	8941.0	8941.0	30082.3	-152.4	-279.0	740.3	-152.4	WHAM11
OMC	154.4	31910.0	8940.8	8940.8	31910.0	-154.4	-279.2	2568.0	-154.4	WHAM12
ETMX	80.0	200.0	4005920.7	4005920.7	200.0	-80.0	-449.3	200.0	-80.0	WBSC5
ETMY	80.0	4005897.7	200.0	200.0	4005897.7	-80.0	200.0	-472.3	-80.0	WBSC6

		GLOBAL			GLOBAL					
OPTIC	**CHAMBER**	**RAY VECTOR COSINES**			**RAY VECTOR ANGLES, deg**					
		X	**Y**	**Z**	**X**	**Y**	**Z**			
FOLD_ITMY-RADIUS	WBSC8	0.000000	-1.000000	0.000000	90.000	0.000	0.000			
FOLD_ITMY-CP	WBSC8	0	-0.999999821	-0.0005969	90.000	0.000	-0.034			
FMY	WBSC8	-0.000541963	-0.999999702	-0.0005969	89.969	0.031	-0.034			
BS AR	WBSC4	0.999923527	0.012315151	-0.0011559	0.706	89.294	-0.066			
BS HR	WBSC4	0.963603556	-0.267334133	-0.0008046	164.494	-74.494	-0.046			
PR3	WHAM8	0.999935806	0.011270979	-0.0011559	0.646	89.354	-0.066			
PR2	WHAM9	-0.999586821	0.028643776	-0.0023945	178.359	-88.359	-0.137			
PRM	WHAM8	0.997202992	-0.074731573	-0.0011561	175.714	-85.714	-0.066			
FOLD_ITMX-RADIUS	WBSC7	-1	0	0	0.000	90.000	0.000			
FOLD_ITMX-CP	WBSC7	-0.999999821	0	-0.0005969	0.000	90.000	-0.034			
FMX	WBSC7	-0.999999702	-0.000541963	-0.0005969	0.031	89.969	-0.034			
BS ARS	WBSC4	N/A INTERNAL REFLECTION								
SR3	WHAM11	0.014235521	0.999898017	-0.0011291	89.184	0.816	-0.065			
SR2	WHAM10	-0.045284782	-0.998973489	-0.0011041	87.404	2.596	-0.063			
SRM	WHAM11	0.015105408	0.999885261	-0.0011291	89.134	0.866	-0.065			
OUTPUT FARADAY IN	WHAM11	0.015104407	0.999845564	-0.0089849	89.135	0.865	-0.515			
OUTPUT FARADAY OUT	WHAM11	0.005043935	0.999986649	-0.0011085	89.711	0.289	-0.064			
OMC	WHAM12	-0.002811305	0.99999541	-0.0011085	90.161	-0.161	-0.064			
ETMX	WBSC5									
ETMY	WBSC6									

Note: The following recycling cavity lengths are based upon an arm cavity length = 3996000 mm, Ref:T0900043-10

	CAVITY LENGTH		
	ACTUAL	**DESIGN**	**DIFF**
AC length	3996000.0	3996000.0	0.0
PRC length	60411.0	60411	0.0
SRC length	62137.0	62137	0.0
Arm Cavity X length	3996000.0	3996000.0	0.0
Arm Cavity Y length	3996000.0	3996000.0	0.0
Schnupp Asymmetry	50	50	-0.4
n	1.44963		

	GLOBAL		
CHAMBER	**X**	**Y**	**Z**
WBSC4	9220.0	9220.0	0.0
WBSC5	4006370.0	0.0	0.0
WBSC6	0.0	4006370.0	0.0
WBSC7	9369.0	0.0	0.0
WBSC8	0.0	9369.0	0.0
WHAM7	31912.0	9220.0	0.0
WHAM8	29342.0	9220.0	0.0
WHAM9	13051.0	9220.0	0.0
WHAM10	9220.0	13051.0	0.0
WHAM11	9220.0	29342.0	0.0
WHAM12	9220.0	31912.0	0.0

Note: The following recycling cavity lengths are based upon an arm cavity length = 3996000 mm, Ref:T0900043-10

z	x	y	Comment	distance	index	optical path	average length	Schnupp	design length
ACTUAL SPACING									
POWER RECYCLING CAVITY									
				Y-ARM					
-80.0	200	4005897.7	ETMY						
-80.0	200.0	9897.7	ITMY-RADIUS			0.0			
-80.0	200.0	9797.7	ITMY-RADIUS	100.0	1.450	145.0			
-80.0	200.0	9697.7	ITMY-RADIUS	100.0	1.450	145.0			
-80.0	200.0	9677.7	ITMY-CP	20.0	1.000	20.0			
-80.0	200.0	9577.7	ITMY-CP	100.0	1.450	145.0			
-80.4	199.7	9004.4	FMY	573.3	1.000	573.3			
-90.6	9075.4	9113.7	BSAR	8876.4	1.000	8876.4			
-90.7	9139.1	9096.1	BSHR	66.1	1.450	95.8			
-113.1	28559.9	9315.0	PRM3	19422.1	1.000	19422.1	29422.4		
-149.5	13359.7	9750.5	PRM2	15206.5	1.000	15206.5	15206.5		
-167.8	29122.8	8569.2	PRM	15807.3	1.000	15807.3	15807.3		
						60436.2			
				X-ARM					
-80.0	4005920.7	200.0	ETMX						
-80.0	9920.7	200.0	ITMX-RADIUS			0.0			
-80.0	9820.7	200.0	ITMX-RADIUS	100.0	1.450	145.0			
-80.0	9720.7	200.0	ITMX-RADIUS	100.0	1.450	145.0			
-80.0	9700.7	200.0	ITMX-CP	20.0	1.000	20.0			
-80.0	9600.7	200.0	ITMX-CP	100.0	1.450	145.0			
-80.4	9003.1	199.7	FMX	597.6	1.000	597.6			
-90.7	9139.1	9096.1	BSHR	8897.4	1.000	8897.4			
-113.1	28559.9	9315.0	PRM3	19422.1	1.000	19422.1			
-149.5	13359.7	9750.5	PRM2	15206.5	1.000	15206.5			
-167.8	29122.8	8569.2	PRM	15807.3	1.000	15807.3			
						60385.8	**60411.0**	**50.4**	

z	x	y	Comment	distance	index	optical path	average length	Schnupp	design length
ACTUAL SPACING									
SIGNAL RECYCLING CAVITY									
				Y-ARM					
-80.0	200.0	9897.7	ITMY-RADIUS			0.0			
-80.0	200.0	9797.7	ITMY-RADIUS	100.0	1.450	145.0			
-80.0	200.0	9697.7	ITMY-RADIUS	100.0	1.450	145.0			
-80.0	200.0	9677.7	ITMY-CP	20.0	1.000	20.0			
-80.0	200.0	9577.7	ITMY-CP	100.0	1.450	145.0			
-80.4	199.7	9004.4	FMY	573.3	1.000	573.3			
-90.6	9075.4	9113.7	BSAR	8876.4	1.000	8876.4			
-90.7	9139.1	9096.1	BSHR	66.1	1.450	95.8			
-90.5	9121.6	9159.6	BSARS	65.9	1.450	95.5			
-113.4	9407.9	29261.5	SRM3	20104.0	1.000	20104.0			
-131.1	8683.0	13270.0	SRM2	16007.9	1.000	16007.9			
-149.1	8924.0	29222.6	SRM	15954.4	1.000	15954.4			
						62162.2			
				X-ARM					
-80.0	9920.7	200.0	ITMX-RADIUS	0.0	1.450	0.0			
-80.0	9820.7	200.0	ITMX-RADIUS	100.0	1.450	145.0			
-80.0	9720.7	200.0	ITMX-RADIUS	100.0	1.450	145.0			
-80.0	9700.7	200.0	ITMX-CP	20.0	1.000	20.0			
-80.0	9600.7	200.0	ITMX-CP	100.0	1.450	145.0			
-80.4	9003.1	199.7	FMX	597.6	1.000	597.6			
-90.7	9139.1	9096.1	BSHR	8897.4	1.000	8897.4			
-90.5	9121.6	9159.6	BSARS	65.9	1.450	95.5			
-113.4	9407.9	29261.5	SRM3	20104.0	1.000	20104.0			
-131.1	8683.0	13270.0	SRM2	16007.9	1.000	16007.9			
-149.1	8924.0	29222.6	SRM	15954.4	1.000	15954.4			
						62111.8	**62137.0**	**50.4**	