



NATIONAL RADIO ASTRONOMY OBSERVATORY

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September 15, 1994

To: GBT Memo File
From: David H. Parker
Subject: GBT Actuator/retroreflector/panel Spreadsheet

The laser group has built a Quattro Pro spreadsheet from the actuator and panel information on drawings 120520 sheet 2 (November 13, 1992), and 121010 sheet 7 revision A (November 12, 1993). This spreadsheet expands the two tables on these two drawings to identify each of the 2209 actuators.

The active surface group will be expanding this spreadsheet to include:

1. retroreflector tilt angle
2. mounted retroreflector locations (including offset)
3. nominal panel corner heights (correcting for reduced panel molds)
4. panel setting tool inclinometer angle
5. mounted panel serial number
6. panel CMM data

The open loop active surface group and the laser group have agreed to adopt the identification scheme on drawing 121010 sheet 7, e.g., retroreflector ZG12+680 is located on hoop 12, and 68.0° clockwise from the line of symmetry. It is suggested that all other groups maintain the same nomenclature.

The attached example sheet and actuator summary by hoop shows the format of the spreadsheet. We can make complete printed copies, or Quattro Pro files available for those that would like to use this information, or build on the spreadsheet.

cc: M0914.1

Hoop Number		R1	R2	R3	R4	R5							Calculated			
ACT PLATE LOC	ANGL	inner	midpoint	outer	panel inner	panel outer	Z@R1	RI (in)	ZI (in)	SLOPE(deg)	OFFSET(In)		Actuator Coordinates			
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
hoop #													X	Y	Z	
1	-480	157.48	207.492	257.463	157.46	257.463	2.625	158.29	-21.76	1.9		1	-117.030	105.375	2.625	
1	-320	157.48	207.492	257.463	157.46	257.463	2.625	158.29	-21.76	1.9		1	-83.452	133.551	2.625	
1	-160	157.48	207.492	257.463	157.48	257.463	2.825	158.29	-21.78	1.9		1	-43.407	151.379	2.625	
1	0	157.48	207.492	257.463	157.48	257.463	2.625	158.29	-21.78	1.9		1	0.000	157.480	2.625	
1	160	157.48	207.492	257.463	157.48	257.463	2.625	158.29	-21.76	1.9		1	43.407	151.379	2.625	
1	320	157.48	207.492	257.463	157.48	257.463	2.625	158.29	-21.76	1.9		1	83.452	133.551	2.625	
1	480	157.48	207.492	257.463	157.48	257.463	2.625	158.29	-21.78	1.9		1	117.030	105.375	2.625	
2	-560	257.483	307.428	357.33	257.483	754.793	7.015	260.17	-17.27	3.1		2	-213.447	143.971	7.015	
2	-480	257.463	307.428	357.33	257.463	754.793	7.015	260.17	-17.27	3.1		2	-191.332	172.276	7.015	
2	-400	257.483	307.428	357.33	257.463	754.793	7.015	261.55	-17.2	3.2	1.375	2	-165.494	197.228	7.015	
2	-320	257.463	307.428	357.33	257.463	754.793	7.015	260.17	-17.27	3.1		2	-136.435	218.341	7.015	
2	-240	257.463	307.428	357.33	257.463	754.793	7.015	261.55	-17.2	3.2	1.375	2	-104.720	235.204	7.015	
2	-160	257.463	307.428	357.33	257.483	754.793	7.015	260.17	-17.27	3.1		2	-70.966	247.489	7.015	
2	-80	257.463	307.428	357.33	257.463	754.793	7.015	261.55	-17.2	3.2	1.375	2	-35.832	254.957	7.015	
2	0	257.463	307.428	357.33	257.463	754.793	7.015	260.17	-17.27	3.1		2	0.000	257.483	7.015	
2	80	257.463	307.428	357.33	257.463	754.793	7.015	261.55	-17.2	3.2	1.375	2	35.832	254.957	7.015	
2	160	257.463	307.428	357.33	257.463	754.793	7.015	260.17	-17.27	3.1		2	70.966	247.489	7.015	
2	240	257.463	307.428	357.33	257.463	754.793	7.015	261.55	-17.2	3.2	1.375	2	104.720	235.204	7.015	
2	320	257.463	307.428	357.33	257.463	754.793	7.015	260.17	-17.27	3.1		2	136.435	218.341	7.015	
2	400	257.463	307.428	357.33	257.483	754.793	7.015	261.55	-17.2	3.2	1.375	2	185.494	197.228	7.015	
2	480	257.463	307.428	357.33	257.463	754.793	7.015	260.17	-17.27	3.1		2	191.332	172.276	7.015	
2	560	257.463	307.428	357.33	257.463	754.793	7.015	260.17	-17.27	3.1		2	213.447	143.971	7.015	
3	-640	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	-321.168	156.643	13.513	
3	-580	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	-298.240	199.818	13.513	
3	-480	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	-285.546	239.100	13.513	
3	-400	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	-229.687	273.731	13.513	
3	-320	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	-189.356	303.033	13.513	
3	-240	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	-145.339	326.437	13.513	
3	-180	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	-98.493	343.488	13.513	
3	-80	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	-49.731	353.852	13.513	
3	0	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	0.000	357.330	13.513	
3	80	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	49.731	353.852	13.513	
3	160	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	98.493	343.488	13.513	
3	240	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	145.339	326.437	13.513	
3	320	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	189.356	303.033	13.513	
3	400	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	229.687	273.731	13.513	
3	480	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	285.548	239.100	13.513	
3	560	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	298.240	199.818	13.513	
3	640	357.33	407.227	457.039	754.793	754.793	13.513	359.17	-10.82	4.3		3	321.166	156.643	13.513	
4	-640	457.039	506.846	556.547	754.793	754.793	22.107	459.39	-2.18	5.5		4	-410.764	200.353	22.107	
4	-560	457.039	506.846	556.547	754.793	754.793	22.107	459.39	-2.18	5.5		4	-378.903	255.573	22.107	
4	-480	457.039	506.846	556.547	754.793	754.793	22.107	459.39	-2.18	5.5		4	-339.646	305.819	22.107	
4	-400	457.039	506.846	556.547	754.793	754.793	22.107	459.39	-2.18	5.5		4	-293.779	350.112	22.107	
4	-320	457.039	506.846	556.547	754.793	754.793	22.107	459.39	-2.16	5.5		4	-242.194	367.591	22.107	
4	-240	457.039	506.846	556.547	754.793	754.793	22.107	459.39	-2.16	5.5		4	-185.695	417.526	22.107	
4	-160	457.039	506.846	556.547	754.793	754.793	22.107	459.39	-2.18	5.5		4	-125.977	439.334	22.107	
4	-80	457.039	506.846	556.547	754.793	754.793	22.107	459.39	-2.18	5.5		4	-63.608	452.591	22.107	

ACTUATOR W.P. TABLE REV 2 J.S. 9-8-94

DWG NO. 120520 sheet Radii

ACT PL WP (24.4 OS)

DWG NO. 121010 sheet 7

Calculated

Actuator Coordinates

Hoop Number		R1	R2	R3	R4	R5							Actuator Coordinates			
ACT PLATE LOC	ANGL	inner	midpoint	outer	panel inner	panel outer	Z@R1	RI (in)	ZI (in)	SLOPE(deg)	OFFSET(in)		X	Y	Z	
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	=====	hoop #			
43	130	3942.153	3980.573	4018.687	3787.232	3787.232	1644.71	3957.79	1625.98	39.8		43	886.791	3841.116	1644.710	
43	140	3942.153	3980.573	4018.687	3787.232	3787.232	1644.71	3957.79	1625.98	39.8		43	953.693	3825.054	1644.710	
43	150	3942.153	3980.573	4018.687	3787.232	3787.232	1644.71	3957.79	1625.98	39.8		43	1020.304	3807.827	1644.710	
43	160	3942.153	3980.573	4018.687	3787.232	3787.232	1644.71	3957.79	1625.98	39.8		43	1086.605	3789.441	1644.710	
43	170	3942.153	3980.573	4018.887	3787.232	3787.232	1644.71	3957.79	1625.98	39.8		43	1152.574	3769.900	1644.710	
44	-130	4018.687	4056.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	-904.008	3915.688	1709.192	
44	-120	4018.687	4058.802	4094.814	3787.232	3787.232	1709.192	4034.49	1890.8	40.4		44	-835.532	3930.889	1709.192	
44	-110	4018.687	4056.802	4094.814	3787.232	3787.232	1709.192	4034.49	1690.8	40.4		44	-768.802	3944.852	1709.192	
44	-100	4018.687	4056.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	-897.838	3957.634	1709.192	
44	-90	4018.687	4058.802	4094.814	3787.232	3787.232	1709.192	4034.49	1690.8	40.4		44	-628.661	3969.210	1709.192	
44	-80	4018.687	4058.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	-559.293	3979.577	1709.192	
44	-70	4018.687	4056.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	-489.755	3988.732	1709.192	
44	-60	4018.687	4056.802	4094.814	3787.232	3787.232	1709.192	4034.49	1890.8	40.4		44	-420.087	3998.872	1709.192	
44	-50	4018.687	4056.802	4094.814	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	-350.252	4003.395	1709.192	
44	-40	4018.687	4058.802	4094.814	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	-280.329	4008.898	1709.192	
44	-30	4018.687	4058.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	-210.322	4013.180	1709.192	
44	-20	4018.687	4056.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	-140.250	4018.239	1709.192	
44	-10	4018.687	4056.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	-70.138	4018.075	1709.192	
44	0	4018.687	4058.802	4094.814	3787.232	3787.232	1709.192	4034.49	1890.8	40.4		44	0.000	4018.687	1709.192	
44	10	4018.687	4058.802	4094.814	3787.232	3787.232	1709.192	4034.49	1890.8	40.4		44	70.138	4018.075	1709.192	
44	20	4018.687	4056.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	140.250	4018.239	1709.192	
44	30	4018.687	4056.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	210.322	4013.180	1709.192	
44	40	4018.687	4058.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	280.329	4008.898	1709.192	
44	50	4018.687	4056.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	350.252	4003.395	1709.192	
44	60	4018.687	4056.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	420.067	3998.872	1709.192	
44	70	4018.687	4058.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	489.755	3988.732	1709.192	
44	80	4018.687	4058.802	4094.814	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	559.293	3979.577	1709.192	
44	90	4018.687	4058.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.8	40.4		44	628.661	3969.210	1709.192	
44	100	4018.687	4056.802	4094.814	3787.232	3787.232	1709.192	4034.49	1890.8	40.4		44	697.838	3957.834	1709.192	
44	110	4018.687	4056.802	4094.814	3787.232	3787.232	1709.192	4034.49	1690.6	40.4		44	766.802	3944.852	1709.192	
44	120	4018.687	4056.802	4094.614	3787.232	3787.232	1709.192	4034.49	1890.6	40.4		44	835.532	3930.869	1709.192	
44	130	4018.687	4056.802	4094.614	3787.232	3787.232	1709.192	4034.49	1690.8	40.4		44	904.008	3915.688	1709.192	
45	-70							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	-60							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	-50							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	-40							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	-30							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	-20							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	-10							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	0							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	10							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	20							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	30							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	40							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	50							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	60							4110.59	1755.95	40.9		45	0.000	0.000	0.000	
45	70							4110.59	1755.95	40.9		45	0.000	0.000	0.000	

Hoop No.	Number of Actuators
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1	7
2	15
3	17
4	17
5	17
6	35
7	35
8	35
9	35
10	35
11	35
12	69
13	67
14	65
15	65
16	63
17	63
18	61
19	59
20	59
21	57
22	55
23	55
24	53
25	51
26	51
27	97
28	63
29	61
30	59
31	57
32	55
33	53
34	51
35	49
36	89
37	65
38	61
39	57
40	51
41	47
42	41
43	35
44	27
45	15

2209 Total