Naval Biodynamics Laboratory
NBDL-93R009

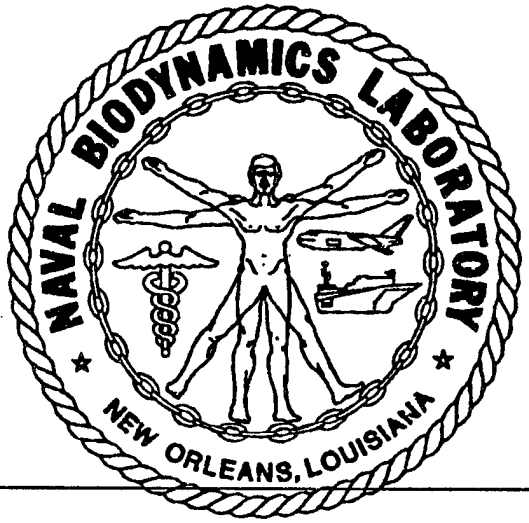
CAMERA NETWORK DESIGN FOR HEAD ANTHROPOMETRY AND INITIAL CONDITION DETERMINATION

GPA Associates
P.O.Box 1200
New Orleans, LA 70148

Final Technical Report

August 1991

Naval Biodynamics Laboratory
P.O. Box 29407
New Orleans, La 70189-0407



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Prepared for

Naval Medical Research and Development Command
Bethesda, MD 20889-5044

Camera Network Design
for
Head Anthropometry and Initial Condition Determination

GPA Associates
P. O. Box 1200
New Orleans, LA 70148

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August, 1991

SITE SURVEY

Before any determination of either head anthropometry or initial conditions could be performed, optimal positioning of the camera stations had to be done and control determined for this placement. Six cameras were placed on the light frame of the vertical accelerator, two on each side of the chair and two in front. Each had an unobstructed view of the intended control points and the expected range of positions of targets on the test subjects.

We had the tools to do a better site survey using photogrammetic techniques than the classical and ponderous optical tooling methods. A calibrated 3-dimensional target (a spyder) was fabricated and attached to a pre-existing target cube and the transformation between the spyder coordinate system and the lab coordinate system was obtained. Additional targets were placed at strategic positions for a better control geometry after the removal of the spyder. Photos of this setup were taken with the six cameras. The negatives were digitized on the Mann Comparator and processed separately by PREP with the image data merged into one GIANT run. (Outputs are in Appendix 1)

Site survey results included the positions and attitudes of the six cameras and the locations of the eight corners of three target (control) cubes and several survey targets at various locations on the sled.

HEAD ANTHROPOMETRY

The classical method of head anthropometry was based on two x-rays which gave a minimally determined solution for the head anatomic coordinate system. At our suggestion, this was increased to four and the positional uncertainties dropped to about 1mm. Unfortunately, the exposure of the subjects increased. We thought we could eliminate the need for any exposure of the head by using the optical photogrammetric tools we were developing for initial conditions. The x-ray targets were visible except for those in the subject's ear canals. We developed "antennae" with visible targets whose locations would mathematically give us the positions of the end points which were out of sight (in his ears).

Six photos were taken using the cameras located in the site survey. Photo coordinates were obtained from enlargements using the Altek digitizer. A custom version of PREP was developed to automate this process and to create the GIANT input image file. Several subjects were processed with typical errors in object coordinates on the order of 1mm. The output of GIANT also gives the position and orientation of the mouth mount coordinate system with respect to the head coordinate system. This new method is as accurate as the four x-ray method and much safer. (See Appendix 2)

INITIAL CONDITIONS

The new motion detectors require only that initial conditions be determined for the test subject's position and attitude for both head and neck. These same six cameras are aimed to see targets attached to both head and neck and hence target positions can be obtained photogrammetrically. The cameras are tied in to the firing sequence and are simultaneously exposed a fraction of a second prior to the impact pulse. Enlargements are processed on the Altek digitizer and the customized PREP program. The resulting image file is then read into GIANT. The output has the locations of the digitized targets on the mouth and T-1 mounts. (See Appendix 3)

The particular targets may change with the design of the new sensor package, so some of the developed scripts may need future modifications.

Appendix 1

Site Survey

Original Digitization of Site Survey Frames Using Mann Comparator

kodak at top right reading	camera # 1 6A		camera # 2 6A		camera # 3 5A		camera # 4 6A		camera # 5 6A		camera # 6 6A	
fiducials (3 on each edge)												
left	173919	211447	167644	176435	161494	141436	177027	68586	220586	108843	213690	27845
	173751	223963	167455	190001	161171	152695	176737	81357	220287	120650	213705	40926
	173610	234824	167338	199598	160900	162640	176500	91044	220371	117970	213679	43309
top	172955	235345	166812	200218	154494	164676	176232	91625	217146	130837	212895	44099
	156152	235075	147349	199927	136263	164170	160610	91691	199041	130453	191706	44069
	138371	234795	132264	199710	125528	163801	146298	91347	184335	130089	178187	44084
rt	137421	234682	131150	199344	124682	163279	140361	89602	183898	129278	177494	43148
	137622	221100	131335	187790	125013	151294	140659	76595	184155	118464	177483	31436
	137627	212798	131468	176811	125349	140407	140774	72642	184418	106955	177508	22432
bot	142659	210655	132205	175526	126217	139651	146896	67166	184977	105897	177193	19868
	155964	210870	152638	175818	142157	140122	163600	67537	197665	106181	192533	19884
	173657	211104	167197	176003	160384	140620	176787	67853	214668	106595	198039	19910
control spider												
c1	164961	231230	154751	193946	137515	155986	154272	85930	194774	125685	185082	33622
c2	166921	231300	156006	194114	138090	156330	154192	86320			181702	33379
c3	166892	231726			136584	156325	152402	86274	191822	125610		
c4	164969	231634	153873	194158	136959	155980	152424	85891	193157	125275	185161	32305
c5	164997	229360	154751	192420	137656	154350	154316	84145	194891	123664		
c6	166943	229381	155992	192576	138235	154734						
c7									191955	123575	182060	29027
c8			153884	192640	136117	154345	152496	84081	193296	123210	185287	29250
y-24	166229	221716			158426	155242	175228	85743	208596	128551	183495	41047
y-22	166173	222834			156537	155244	173535	85706	207655	128313		
y-20	166129	223832	166337	190335	154681	155259	171843	85672	206668	128062		
y-18	166088	224738	164896	190725	152859	155271	170133	85637	205656	127799		
y-16	166049	225578	163535	191094	151073	155279	168412	85587	204593	127519		
z+10					136310	163689						
z+08			154911	199574	136477	161971						
z+06			154928	197977	136637	160263	153167	90662			182715	40939
z+04	165860	234309	154928	196414	136796	158593	153226	88806	193093	128748	183003	37560
z+02	165896	232371	154929	194865	136952	156936	153288	86967	193225	126642	183231	34270
y+12					128311	155359	142213	84880				
y+10			150887	194445	129738	155364	144112	84963	184216	122176		
y+08			151627	194258	131168	155364	145994	85020	186231	122737		
y+06			152402	194055	132619	155351	147857	85065	188173	123243		
y+04			153227	193836	134085	155356	149714	85124	189998	123724		
y+02					135574	155341	151538	85167	191728	124187		
x+13	153849	230082	146074	192143	132335	152514	153739	82003	203788	122018	203919	32996
x+11	155670	230155	147563	192366	133220	153036	153661	82578	201962	122471	200981	32747
x+09	157568	230236	149010	192562	134030	153523	153594	83146	200200	122907	197930	32505
x+07	159348	230295	150372	192758	134795	153979	153541	83666	198527	123341	194801	32239
x+05			151726	192945	135507	154405	153479	84171	196967	123730	191648	31996
x+03			153059	193132	136187	154817	153424	84630	195465	124104	188409	31742
left reference cube												
lfc1					133113	154358	148802	83958	189905	122186		
lfc2					133807	154716	148883	84390	188527	122602		
lfc3			152686	193502	132499	154750	147073	84356	186707	122091		
lfc4			151491	193331	131669	154363	146956	83902	188031	121660		
lfc5			152249	191698	133286	152788	148898	82179	190072	120071		
lfc6			153349	191849	133919	153149						
lfc7									187952	119975		
lfc8			151465	191930	131851	152803	147071	82119	188265	119518	186920	21062
right reference cube												
rtc1	159155	214706	160290	181530	151339	145846	170251	76277	208885	119318	190444	30348
rtc2	161542	214623	161816	181883	151694	146512	169757	76951	207562	119709	188337	30210
rtc3	161787	215724	160620	182483	149930	146620	168039	76904	206466	119288	188405	29314
rtc4	159505	215775	159165	182119	149550	145946	168455	76222	207806	118874	190563	29455
rtc5	159279	212598	160254	179745	151396	144125			208848	117747		
rtc6	161607	212505	161753	180132	151753	144824						
rtc7									206456	117703	188504	27401
rtc8			159126	180379	149609	144245	168395	74529	207776	117258	190641	27532
surveying targets												
a	168561	232141	161980	195438	146051	158918	162759	89189	199463	130354		
b			158806	195810	141317	158628	157510	88856	195253	129340	179298	38870
c	168458	219520	161579	185773	146535	149477	162618	79437	199810	120250		
d			158570	187032	141967	149713	157668	79355	195894	118949		
e									219404	117798		
f			149906	183582	133559	143273	150591	71603	195455	108824		
g					157832	159404	167443	89598				
h					136741	159198	144822	89346				
j	156409	234932	136394	195570								
k	157573	223091	135528	183595								
s6x1									192689	122403		
calculated fiducials from program fid												
lr	137679	210592	131494	175520	125365	139634	140900	67025	184445	105879	177502	19866
ur	137438	234779	131152	199692	124661	163793	140316	91366	183881	130089	177488	44075
ul	173602	235354	167326	200224	160835	164877	176488	91695	220039	130911	213691	44094
ll	173923	211114	167647	176014	161513	140658	177047	67854	220641	106732	213693	19931

Sample Prep Input File for Site Survey Data (Camera # 1)

```
80            -55.003       0.030      0.030   #1-580       -0.005
-0.022    1.0
     1        18.1126  -12.1263
     2        18.1047   12.1259
     3       -18.1199   12.1311
     4       -18.1053  -12.1263
0000000000
 1.924312E-04        -2.839673E-06
 1.940416E-08        -4.715753E-11


      #1
         1    137679    210592
         2    137438    234779
         3    173602    235354
         4    173923    211114

        c1    164961    231230
        c2    166921    231300
        c3    166892    231726
        c4    164969    231634
        c5    164997    229360
        c6    166943    229381
      y-24    166229    221716
      y-22    166173    222834
      y-20    166129    223832
      y-18    166088    224738
      y-16    166049    225578
      z+04    165860    234309
      z+02    165896    232371
      x+13    153849    230082
      x+11    155670    230155
      x+09    157568    230236
      x+07    159348    230295
      rtc1    159155    214706
      rtc2    161542    214623
      rtc3    161787    215724
      rtc4    159505    215775
      rtc5    159279    212598
      rtc6    161607    212505
         a    168561    232141
         c    168458    219520
         j    156409    234932
         k    157573    223091

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Sample Prep Output File for the Site Survey Data (Camera # 1)

PC Giant Preprocessor JAN 1991

Calibrated Fiducial Coordinates

Fid	X	Y
1	18.113	-12.126
2	18.105	12.126
3	-18.120	12.131
4	-18.105	-12.126

Calibrated Focal Length = -55.003 mm. Xoff= -0.005 mm. Yoff= -0.022 mm.

Lens Distortion

Radial Parameters

K0=+0.19243120D-03 K1=-0.28396730D-05 K2=+0.19404160D-07
K3=-0.47157530D-10

Fiducial Measurements of Frame #1

ID	Average		Max Spread	
	X	Y	X	Y
1	137.679	210.592	0.000	0.000
2	137.438	234.779	0.000	0.000
3	173.602	235.354	0.000	0.000
4	173.923	211.114	0.000	0.000

8-Parameter Residuals of the Fiducial Coordinates

Fid	X	Y
1	0.000	0.000
2	0.000	0.000
3	0.000	0.000
4	0.000	0.000
Rms	0.000	0.000
Rms(check)	0.081	24.235

Transformation Parameters Are:

-0.987643 -0.011917 156.3740 0.000057 -0.000096
-0.014912 0.988865 -218.1689

Sample Prep Output File for the Site Survey Data (Camera # 1)

Plate Coordinates for Frame #1

ID	Measured		Adjusted	
	X	Y	X	Y
c1	164.961	231.230	-9.421	8.154
c2	166.921	231.300	-11.382	8.193
c3	166.892	231.726	-11.359	8.621
c4	164.969	231.634	-9.435	8.559
c5	164.997	229.360	-9.433	6.279
c6	166.943	229.381	-11.379	6.269
y-24	166.229	221.716	-10.565	-1.396
y-22	166.173	222.834	-10.523	-0.276
y-20	166.129	223.832	-10.493	0.724
y-18	166.088	224.738	-10.463	1.632
y-16	166.049	225.578	-10.435	2.473
z+04	165.860	234.309	-10.360	11.227
z+02	165.896	232.371	-10.371	9.283
x+13	153.849	230.082	1.712	7.176
x+11	155.670	230.155	-0.112	7.221
x+09	157.568	230.236	-2.013	7.272
x+07	159.348	230.295	-3.795	7.304
rtc1	159.155	214.706	-3.408	-8.303
rtc2	161.542	214.623	-5.792	-8.420
rtc3	161.787	215.724	-6.050	-7.323
rtc4	159.505	215.775	-3.771	-7.239
rtc5	159.279	212.598	-3.506	-10.411
rtc6	161.607	212.505	-5.830	-10.538
a	168.561	232.141	-13.032	9.010
c	168.458	219.520	-12.762	-3.626
j	156.409	234.932	-0.910	12.002
k	157.573	223.091	-1.930	0.111

35mm Still Camera Station & Control Determination

07/05/91 12:10

GPA Associates
UNO Box 1200
New Orleans, LA 70148
(504) 286-1200

Object Space Reference System is Rectangular

Rotation Angles are Object-to-Photo

Complete Triangulation process is requested

Error Propagation is requested

[Eigenvector/Eigenvalue output]

Unit Variance will be based on completely free camera parameters

All Image Residuals will be listed

Triangulated Object Coordinates will be saved

Adjusted Camera Station Parameters will be saved

35mm Still Camera Station & Control Determination

FRAME #1

PRINCIPAL DISTANCE = -57.0920 mm
Std. Dev. of X = 0.0800 mm
Std. Dev. of Y = 0.0800 mm

CAMERA STATION PARAMETERS

P O S I T I O N		Std. Dev.	A T T I T U D E (Object to Photo)		Std. Dev.
X =	-22.6790 in	0.0600 in	OMEGA = 69 00 50.8980	00 05	0.0000
Y =	-31.2340 in	0.0600 in	PHI = - 11 48 57.7340	00 05	0.0000
Z =	71.7030 in	0.0600 in	KAPPA = - 00 53 32.3380	00 05	0.0000

PLATE COORDINATES in millimeters

ID	X	Y	ID	X	Y
c1	-9.4213	8.1537	c2	-11.3820	8.1932
c3	-11.3585	8.6207	c4	-9.4346	8.5586
c5	-9.4331	6.2786	c6	-11.3788	6.2695
y-24	-10.5647	-1.3956	y-22	-10.5234	-0.2759
y-20	-10.4925	0.7238	y-18	-10.4634	1.6316
y-16	-10.4354	2.4733	z+04	-10.3600	11.2270
z+02	-10.3711	9.2831	x+13	1.7123	7.1755
x+11	-0.1117	7.2205	x+09	-2.0126	7.2722
x+07	-3.7946	7.3037	rtc1	-3.4080	-8.3026
rtc2	-5.7915	-8.4204	rtc3	-6.0502	-7.3233
rtc4	-3.7710	-7.2390	rtc5	-3.5057	-10.4114
rtc6	-5.8297	-10.5380	a	-13.0318	9.0101
c	-12.7618	-3.6258	j	-0.9096	12.0020
k	-1.9301	0.1113			

35mm Still Camera Station & Control Determination

FRAME #2

PRINCIPAL DISTANCE = -56.9880 mm
Std. Dev. of X = 0.0800 mm
Std. Dev. of Y = 0.0800 mm

CAMERA STATION PARAMETERS

POSITION		Std. Dev.	ATTITUDE (Object to Photo)		Std. Dev.
X =	19.9440 in	0.0600 in	OMEGA =	71 09 20.1700	00 05 0.0000
Y =	-32.1560 in	0.0600 in	PHI =	27 26 50.4440	00 05 0.0000
Z =	71.9670 in	0.0600 in	KAPPA =	09 07 18.9560	00 05 0.0000

PLATE COORDINATES in millimeters

ID	X	Y	ID	X	Y
c1	-5.4812	5.9407	c2	-6.7399	6.0907
c4	-4.6051	6.1662	c5	-5.4605	4.4108
c6	-6.7049	4.5490	c8	-4.5954	4.6441
z+08	-5.7193	11.5808	z+06	-5.7139	9.9791
z+04	-5.6922	8.4122	z+02	-5.6720	6.8594
y+10	-1.6183	6.4978	y+08	-2.3570	6.2995
y+06	-3.1305	6.0846	y+04	-3.9538	5.8529
x+13	3.2373	4.2583	x+11	1.7418	4.4609
x+09	0.2888	4.6368	x+07	-1.0789	4.8138
x+05	-2.4381	4.9816	x+03	-3.7759	5.1496
lfc3	-3.4074	5.5260	lfc4	-2.2080	5.3721
lfc5	-2.9449	3.7233	lfc6	-4.0488	3.8587
lfc8	-2.1626	3.9674	rtc1	-10.8528	-6.5878
rtc2	-12.3854	-6.2554	rtc3	-11.1963	-5.6369
rtc4	-9.7348	-5.9815	rtc5	-10.7922	-8.3773
rtc6	-12.2982	-8.0102	rtc8	-9.6716	-7.7257
a	-12.7382	7.3316	b	-9.5661	7.7501
c	-12.2019	-2.3519	d	-9.2081	-1.0472
f	-0.4836	-4.3869	j	12.8919	7.8352
k	13.9287	-4.1703			

35mm Still Camera Station & Control Determination

FRAME #3

PRINCIPAL DISTANCE = -57.2950 mm
Std. Dev. of X = 0.0800 mm
Std. Dev. of Y = 0.0800 mm

CAMERA STATION PARAMETERS

POSITION		Std. Dev.	ATTITUDE (Object to Photo)		Std. Dev.
X =	39.6560 in	0.0600 in	OMEGA =	49 23 55.5020	00 05 0.0000
Y =	0.5460 in	0.0600 in	PHI =	66 44 43.0190	00 05 0.0000
Z =	71.0320 in	0.0600 in	KAPPA =	39 58 16.7780	00 05 0.0000

PLATE COORDINATES in millimeters

ID	X	Y	ID	X	Y
c1	5.4189	3.8326	c2	4.8332	4.1604
c3	6.3413	4.1994	c5	5.3253	2.1893
c6	4.7344	2.5572	c8	6.8665	2.2291
y-24	-15.4745	2.4734	y-22	-13.5881	2.5308
y-20	-11.7338	2.6002	y-18	-9.9134	2.6656
y-16	-8.1288	2.7261	z+08	6.2844	9.8576
z+06	6.1736	8.1422	z+04	6.0629	6.4650
z+02	5.9550	4.8007	y+12	14.6587	3.4740
y+10	13.2280	3.4371	y+08	11.7945	3.3950
y+06	10.3408	3.3394	y+04	8.8721	3.3015
y+02	7.3813	3.2429	x+13	10.7076	0.5045
x+11	9.8058	1.0018	x+09	8.9804	1.4662
x+07	8.2010	1.9009	x+05	7.4756	2.3070
x+03	6.7827	2.7000	lfc1	9.8747	2.3298
lfc2	9.1691	2.6683	lfc3	10.4784	2.7406
lfc4	11.3214	2.3771	lfc5	9.7469	0.7513
lfc6	9.1024	1.0947	lfc8	11.1843	0.8083
rtc1	-8.1245	-6.7258	rtc2	-8.4986	-6.0692
rtc3	-6.7380	-5.9106	rtc4	-6.3386	-6.5746
rtc5	-8.1322	-8.4507	rtc6	-8.5092	-7.7610
rtc8	-6.3486	-8.2795	a	-3.2107	6.5176
b	1.5354	6.3674	c	-3.4248	-2.9523
d	1.1417	-2.5837	f	9.7488	-8.7942
g	-14.9985	6.6543	h	6.1004	7.0725

35mm Still Camera Station & Control Determination

FRAME #4

PRINCIPAL DISTANCE = -57.4340 mm
Std. Dev. of X = 0.0800 mm
Std. Dev. of Y = 0.0800 mm

CAMERA STATION PARAMETERS

POSITION		Std. Dev.	ATTITUDE (Object to Photo)		Std. Dev.
X =	39.3980 in	0.0600 in	OMEGA = - 10 13 42.7210	00 05	0.0000
Y =	25.1870 in	0.0600 in	PHI = 71 38 6.0490	00 05	0.0000
Z =	70.8380 in	0.0600 in	KAPPA = 100 28 14.0670	00 05	0.0000

PLATE COORDINATES in millimeters

ID	X	Y	ID	X	Y
c1	4.5045	6.4095	c2	4.5750	6.8017
c3	6.3567	6.7761	c4	6.3438	6.3920
c5	4.5028	4.6179	c8	6.3149	4.5769
y-24	-16.6227	5.9619	y-22	-14.8984	5.9467
y-20	-13.1753	5.9334	y-18	-11.4367	5.9189
y-16	-9.6906	5.8897	z+06	5.4935	11.1670
z+04	5.4780	9.3053	z+02	5.4595	7.4608
y+12	16.4529	5.5056	y+10	14.5865	5.5655
y+08	12.7305	5.5989	y+06	10.8894	5.6205
y+04	9.0503	5.6564	y+02	7.2408	5.6772
x+13	5.1278	2.4760	x+11	5.1919	3.0541
x+09	5.2452	3.6249	x+07	5.2856	4.1473
x+05	5.3354	4.6547	x+03	5.3793	5.1157
lfc1	9.9804	4.5014	lfc2	9.8902	4.9325
lfc3	11.6806	4.9218	lfc4	11.8067	4.4696
lfc5	9.9269	2.7204	lfc8	11.7345	2.6863
rtc1	-11.3379	-3.5656	rtc2	-10.8524	-2.8739
rtc3	-9.1108	-2.8913	rtc4	-9.5159	-3.5889
rtc8	-9.4154	-5.3013	a	-4.0682	9.5926
b	1.2043	9.3117	c	-3.7012	-0.2411
d	1.2683	-0.2445	f	8.4953	-7.8956
g	-8.8034	9.9583	h	13.7842	9.9299

35mm Still Camera Station & Control Determination

FRAME #5

PRINCIPAL DISTANCE = -57.2920 mm
Std. Dev. of X = 0.0800 mm
Std. Dev. of Y = 0.0800 mm

CAMERA STATION PARAMETERS

P O S I T I O N		Std. Dev.	A T T I T U D E (Object to Photo)		Std. Dev.
X =	21.9730 in	0.0600 in	OMEGA = - 61 29 56.7390	00 05	0.0000
Y =	58.9510 in	0.0600 in	PHI = 41 08 12.4610	00 05	0.0000
Z =	71.5110 in	0.0600 in	KAPPA = 160 15 44.8820	00 05	0.0000

PLATE COORDINATES in millimeters

ID	X	Y	ID	X	Y
c1	7.3078	7.3442	c3	10.2659	7.3384
c4	8.9369	6.9711	c5	7.2395	5.3158
c7	10.1813	5.2954	c8	8.8473	4.8981
y-24	-6.6061	9.8950	y-22	-5.6574	9.6782
y-20	-4.6624	9.4494	y-18	-3.6422	9.2093
y-16	-2.5705	8.9534	z+04	8.9180	10.4552
z+02	8.8361	8.3401	y+10	17.9529	4.0726
y+08	15.9310	4.5894	y+06	13.9765	5.0515
y+04	12.1376	5.4908	y+02	10.3940	5.9141
x+13	-1.6292	3.4586	x+11	0.1885	3.9554
x+09	1.9424	4.4336	x+07	3.6071	4.9075
x+05	5.1595	5.3336	x+03	6.6542	5.7434
lfc1	12.2674	3.9516	lfc2	13.6374	4.4008
lfc3	15.4709	3.9312	lfc4	14.1564	3.4685
lfc5	12.1505	1.8284	lfc8	13.9731	1.3168
rtc1	-6.6665	0.6329	rtc2	-5.3516	1.0558
rtc3	-4.2439	0.6597	rtc4	-5.5753	0.2134
rtc5	-6.5904	-0.9403	rtc7	-4.1947	-0.9283
rtc8	-5.5051	-1.4051	a	2.4985	11.9166
b	6.7402	10.9982	c	2.3980	1.7799
d	6.3499	0.5679	f	7.0336	-9.5600

35mm Still Camera Station & Control Determination

FRAME #6

PRINCIPAL DISTANCE = -57.5390 mm
Std. Dev. of X = 0.0800 mm
Std. Dev. of Y = 0.0800 mm

CAMERA STATION PARAMETERS

P O S I T I O N		Std. Dev.	A T T I T U D E (Object to Photo)		Std. Dev.
X =	-18.9260 in	0.0600 in	OMEGA = - 66 34 5.2750	00 05	0.0000
Y =	60.0510 in	0.0600 in	PHI = - 08 23 6.1540	00 05	0.0000
Z =	71.6720 in	0.0600 in	KAPPA = -175 56 45.2120	00 05	0.0000

PLATE COORDINATES in millimeters

ID	X	Y	ID	X	Y
c1	10.4841	1.6102	c2	13.8614	1.3696
c4	10.4059	0.2902	c7	13.5059	-2.9912
c8	10.2816	-2.7715	y-24	12.0660	9.0539
z+06	12.8452	8.9456	z+04	12.5596	5.5587
z+02	12.3333	2.2611	x+13	-8.3672	0.9661
x+11	-5.4247	0.7191	x+09	-2.3686	0.4791
x+07	0.7657	0.2151	x+05	3.9220	-0.0257
x+03	7.1609	-0.2773	lfc8	8.6544	-10.9774
rtc1	5.1274	-1.6774	rtc2	7.2337	-1.8131
rtc3	7.1662	-2.7114	rtc4	5.0088	-2.5730
rtc7	7.0680	-4.6288	rtc8	4.9316	-4.5009
b	16.2542	6.8710			

35mm Still Camera Station & Control Determination

O B J E C T C O N T R O L D A T A

		Position	Std. Dev.	
	X =	-20.0840 in	0.0100	
c1	Y =	26.2870 in	0.0100	TYPE = 0
	Z =	58.5760 in	0.0100	
	X =	-22.0840 in	0.0100	
c2	Y =	26.3470 in	0.0100	TYPE = 0
	Z =	58.5760 in	0.0100	
	X =	-22.0240 in	0.0100	
c3	Y =	28.3450 in	0.0100	TYPE = 0
	Z =	58.5760 in	0.0100	
	X =	-20.0240 in	0.0100	
c4	Y =	28.2850 in	0.0100	TYPE = 0
	Z =	58.5760 in	0.0100	
	X =	-20.0840 in	0.0100	
c5	Y =	26.2870 in	0.0100	TYPE = 0
	Z =	56.5760 in	0.0100	
	X =	-22.0840 in	0.0100	
c6	Y =	26.3470 in	0.0100	TYPE = 0
	Z =	56.5760 in	0.0100	
	X =	-22.0240 in	0.0100	
c7	Y =	28.3450 in	0.0100	TYPE = 0
	Z =	56.5760 in	0.0100	
	X =	-20.0240 in	0.0100	
c8	Y =	28.2850 in	0.0100	TYPE = 0
	Z =	56.5760 in	0.0100	
	X =	-21.7740 in	0.0100	
y-24	Y =	3.3290 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-21.7140 in	0.0100	
y-22	Y =	5.3280 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-21.6540 in	0.0100	
y-20	Y =	7.3270 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-21.5940 in	0.0100	
y-18	Y =	9.3260 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-21.5340 in	0.0100	
y-16	Y =	11.3250 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	

35mm Still Camera Station & Control Determination

O B J E C T C O N T R O L D A T A

		Position	Std. Dev.	
	X =	-21.0540 in	0.0100	
z+08	Y =	27.3160 in	0.0100	TYPE = 0
	Z =	65.5660 in	0.0100	
	X =	-21.0540 in	0.0100	
z+06	Y =	27.3160 in	0.0100	TYPE = 0
	Z =	63.5660 in	0.0100	
	X =	-21.0540 in	0.0100	
z+04	Y =	27.3160 in	0.0100	TYPE = 0
	Z =	61.5660 in	0.0100	
	X =	-21.0540 in	0.0100	
z+02	Y =	27.3160 in	0.0100	TYPE = 0
	Z =	59.5660 in	0.0100	
	X =	-20.7060 in	0.0100	
y+12	Y =	38.9100 in	0.0100	TYPE = 2
	Z =	57.5760 in	0.0100	
	X =	-20.7540 in	0.0100	
y+10	Y =	37.3110 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-20.8140 in	0.0100	
y+08	Y =	35.3120 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-20.8740 in	0.0100	
y+06	Y =	33.3130 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-20.9340 in	0.0100	
y+04	Y =	31.3140 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-20.9940 in	0.0100	
y+02	Y =	29.3150 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-8.0700 in	0.0100	
x+13	Y =	26.9260 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-10.0690 in	0.0100	
x+11	Y =	26.9860 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-12.0680 in	0.0100	
x+09	Y =	27.0460 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	

35mm Still Camera Station & Control Determination

O B J E C T C O N T R O L D A T A

		Position	Std. Dev.	
	X =	-14.0670 in	0.0100	
x+07	Y =	27.1060 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-16.0660 in	0.0100	
x+05	Y =	27.1660 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	
	X =	-18.0650 in	0.0100	
x+03	Y =	27.2260 in	0.0100	TYPE = 0
	Z =	57.5760 in	0.0100	

35mm Still Camera Station & Control Determination

C A M E R A S T A T I O N S C O R R E C T I O N S

	------- P O S I T I O N -------				--------- A T T I T U D E ------		
	X	Y	Z		Omega	Phi	Kappa
				Iteration 1			
#1	-0.0005	-0.0002	0.0002	in	-0.000001	0.000000	-0.000005
#2	0.0002	0.0001	0.0004	in	-0.000002	0.000008	-0.000001
#3	-0.0025	-0.0032	-0.0012	in	0.000132	-0.000038	-0.000110
#4	-0.0018	0.0000	0.0006	in	0.000011	-0.000009	-0.000009
#5	-0.0004	-0.0003	-0.0002	in	0.000007	0.000006	-0.000001
#6	0.0005	0.0011	0.0004	in	0.000002	0.000024	0.000004

Provisional Weighted Sum of Squares = 366.232

				Iteration 2			
#1	0.0000	0.0000	0.0000	in	0.000000	0.000000	0.000000
#2	0.0001	-0.0001	0.0000	in	0.000000	0.000000	0.000001
#3	0.0003	0.0000	0.0000	in	0.000000	0.000001	0.000000
#4	0.0002	0.0000	0.0000	in	0.000000	0.000002	0.000000
#5	0.0002	0.0000	0.0000	in	0.000000	0.000004	-0.000001
#6	-0.0002	-0.0009	-0.0004	in	-0.000001	-0.000004	-0.000005

Provisional Weighted Sum of Squares = 341.446

				Iteration 3			
#1	0.0000	0.0000	0.0000	in	0.000000	0.000000	0.000000
#2	0.0000	0.0000	0.0000	in	0.000000	0.000000	0.000000
#3	0.0000	0.0000	0.0000	in	0.000000	0.000000	0.000000
#4	0.0000	0.0000	0.0000	in	0.000000	0.000000	0.000000
#5	0.0000	0.0000	0.0000	in	0.000000	0.000000	0.000000
#6	0.0000	0.0000	0.0000	in	0.000000	0.000000	0.000000

Provisional Weighted Sum of Squares = 341.450

35mm Still Camera Station & Control Determination

T R I A N G U L A T E D I M A G E P O I N T S R E S I D U A L S
(in micrometers)

c1 *0*	#1	#2	#3	#4	#5	#6
	-24	-63	-121	-145	-89	19
	-40	-31	19	38	6	-71
c2 *0*	#1	#2	#3	#4	#6	
	-82	-88	-145	-187	-52	
	-38	-26	18	22	-80	
c3 *0*	#1	#3	#4	#5		
	-73	-78	-111	-30		
	-36	16	23	-7		
c4 *0*	#2	#1	#4	#5	#6	
	-23	-41	-69	-44	9	
	-9	-17	29	0	20	
c5 *0*	#2	#3	#4	#1	#5	
	-45	-119	-177	-16	-111	
	-64	-34	-29	-88	-16	
c6 *0*	#2	#3	#1			
	-74	-133	-62			
	-31	-34	-53			
y-24 *0*	#3	#4	#5	#1	#6	
	63	82	-49	77	4	
	96	45	42	-31	-105	
y-22 *0*	#1	#3	#4	#5		
	43	110	121	1		
	-32	94	35	21		
y-20 *0*	#1	#3	#4	#5		
	18	154	172	45		
	-14	82	23	3		
y-18 *0*	#3	#1	#4	#5		
	199	-5	216	106		
	71	6	13	-12		
y-16 *0*	#3	#4	#5	#1		
	248	262	161	-29		
	65	17	-24	16		
z+04 *0*	#1	#3	#2	#4	#5	#6
	-103	-129	-89	-94	-21	45
	49	111	38	131	53	7
z+02 *0*	#1	#3	#4	#2	#5	#6
	-85	-118	-120	-70	-53	-36
	21	67	83	17	31	80

35mm Still Camera Station & Control Determination

TRIANGULATED IMAGE POINTS RESIDUALS
(in micrometers)

x+13 *0*	#2	#3	#1	#4	#5	#6
	77	-30	176	157	44	-70
	-59	-43	-5	-43	-3	7
x+11 *0*	#3	#2	#4	#1	#5	#6
	-24	75	95	162	39	-29
	-43	-72	-15	-17	3	7
x+09 *0*	#3	#1	#2	#4	#5	#6
	-38	201	71	43	5	-42
	-41	-34	-63	-22	3	-2
x+07 *0*	#3	#1	#4	#2	#5	#6
	-46	101	4	23	-29	-77
	-38	-31	-20	-61	-16	5
rtc1	#3	#1	#2	#4	#5	#6
	-8	-14	4	-2	-24	38
	-59	59	0	-33	-4	22
rtc2	#3	#4	#1	#2	#5	#6
	21	-62	-35	19	-14	28
	-48	-48	47	24	-3	10
rtc3	#3	#4	#5	#1	#2	#6
	28	-38	-24	-39	3	23
	-56	-55	-12	52	18	33
rtc4	#3	#2	#4	#1	#5	#6
	3	12	-14	-20	-16	40
	-58	7	-44	54	-13	39
rtc5	#2	#3	#1	#5		
	-6	-30	-35	-27		
	24	-84	60	-13		
rtc6	#1	#2	#3			
	-14	2	-30			
	33	26	-67			
a	#4	#1	#2	#3	#5	
	-10	-13	32	5	-2	
	44	-42	-34	59	-12	
c	#2	#3	#4	#1	#5	
	52	63	-104	-71	-14	
	38	-34	-33	24	-2	
j	#2	#1				
	-1	0				
	-22	21				

35mm Still Camera Station & Control Determination

T R I A N G U L A T E D I M A G E P O I N T S R E S I D U A L S
(in micrometers)

k		#1	#2			
		0	-3			
		20	-20			
c8	*0*	#5	#3	#4	#6	#2
		-67	-60	-94	-118	-4
		-26	-19	-19	19	-17
z+08	*0*	#3	#2			
		-155	-148			
		219	97			
z+06	*0*	#2	#4	#6	#3	
		-109	-63	88	-142	
		71	202	0	169	
y+10	*0*	#2	#3	#5	#4	
		53	150	205	221	
		17	-12	-15	3	
y+08	*0*	#4	#5	#3	#2	
		153	119	104	32	
		-2	-31	-13	0	
y+06	*0*	#5	#4	#2	#3	
		78	81	15	55	
		-21	2	-10	-2	
y+04	*0*	#2	#5	#4	#3	
		13	27	17	-2	
		-13	-12	-6	-9	
x+05	*0*	#5	#4	#3	#2	#6
		-34	-44	-62	7	-75
		-11	-38	-33	-55	-13
x+03	*0*	#3	#5	#4	#2	#6
		-69	-55	-87	5	-91
		-38	-11	-41	-54	-26
lfc3		#4	#2	#5	#3	
		-64	-25	16	84	
		-15	-4	28	-20	
lfc4		#4	#5	#2	#3	
		4	2	5	-5	
		-5	15	0	-15	
lfc5		#4	#5	#2	#3	
		-21	18	12	12	
		-20	39	3	-33	

35mm Still Camera Station & Control Determination

TRIANGULATED IMAGE POINTS RESIDUALS
(in micrometers)

lfc6	#3	#2			
	-1	-1			
	-16	18			
lfc8	#4	#5	#3	#2	#6
	73	-201	203	236	228
	-92	-57	-82	15	108
rtc8	#5	#3	#4	#2	#6
	0	15	2	18	57
	-6	-76	-49	52	73
b	#5	#2	#4	#3	#6
	17	-17	-38	-12	-34
	-7	16	83	82	-98
d	#5	#3	#2	#4	
	39	54	-5	-89	
	10	-36	63	-38	
f	#2	#4	#5	#3	
	2	-44	55	42	
	85	-101	125	-117	
y+12 *2*	#4	#3			
	19	-25			
	40	-10			
y+02 *0*	#4	#3	#5		
	-65	-63	-21		
	0	2	-11		
lfc1	#5	#3	#4		
	3	7	-5		
	14	-14	-4		
lfc2	#3	#4	#5		
	17	-21	7		
	3	-3	0		
g	#4	#3			
	0	0			
	-40	39			
h	#3	#4			
	0	0			
	11	-10			
c7 *0*	#6	#5			
	50	-79			
	-59	-18			

35mm Still Camera Station & Control Determination

T R I A N G U L A T E D I M A G E P O I N T S R E S I D U A L S
(in micrometers)

rtc7	#5	#6
	9	2
	-28	24

Weighted Sum of Squares (Camera)	=	0.0
Weighted Sum of Squares (Object)	=	8.7
Weighted Sum of Squares (Plates)	=	323.6
Weighted Sum of Squares (Total)	=	332.3
Degrees of Freedom.....	=	337

a posteriori Variance of Unit Weight = 0.986

35mm Still Camera Station & Control Determination

T R I A N G U L A T E D C A M E R A S T A T I O N S (Object to Photo)

Ident	Position		Error Ellipsoid			--->	Length
	X =	-22.6795 in	+0.0018	-0.8746	+0.4848	--->	0.0540 in
#1	Y =	-31.2341 in	-0.9438	+0.1587	+0.2898	--->	0.0420 in
	Z =	71.7032 in	+0.3304	+0.4581	+0.8252	--->	0.0406 in
		Omega =	69 00 50.7019				00 02 44.9448
	Attitude:	Phi =-	11 48 57.7783	Std Dev:			00 02 52.7234
		Kappa =-	00 53 33.2312				00 04 17.7258
	X =	19.9443 in	+0.6144	-0.6996	+0.3647	--->	0.0553 in
#2	Y =	-32.1561 in	-0.7779	-0.6143	+0.1323	--->	0.0504 in
	Z =	71.9675 in	-0.1315	+0.3650	+0.9217	--->	0.0470 in
		Omega =	71 09 19.8329				00 02 40.6488
	Attitude:	Phi =	27 26 52.1799	Std Dev:			00 02 32.0061
		Kappa =	09 07 18.9401				00 04 2.5736
	X =	39.6537 in	+0.9490	-0.2587	+0.1803	--->	0.0495 in
#3	Y =	0.5428 in	-0.3146	-0.7384	+0.5965	--->	0.0492 in
	Z =	71.0308 in	+0.0211	+0.6228	+0.7821	--->	0.0298 in
		Omega =	49 24 22.6738				00 03 36.5120
	Attitude:	Phi =	66 44 35.4110	Std Dev:			00 02 38.3469
		Kappa =	39 57 54.1230				00 03 52.3716
	X =	39.3964 in	+0.9747	-0.0048	+0.2235	--->	0.0491 in
#4	Y =	25.1870 in	+0.2188	-0.1844	-0.9582	--->	0.0474 in
	Z =	70.8385 in	-0.0458	-0.9828	+0.1786	--->	0.0230 in
		Omega =-	10 13 40.4642				00 03 50.2768
	Attitude:	Phi =	71 38 4.4316	Std Dev:			00 02 42.6034
		Kappa =	100 28 12.3645				00 03 52.4146
	X =	21.9729 in	+0.9111	+0.3612	+0.1984	--->	0.0521 in
#5	Y =	58.9507 in	+0.4121	-0.8032	-0.4302	--->	0.0438 in
	Z =	71.5108 in	-0.0039	-0.4737	+0.8807	--->	0.0367 in
		Omega =-	61 29 55.1718				00 03 5.7478
	Attitude:	Phi =	41 08 14.4415	Std Dev:			00 02 47.1369
		Kappa =	160 15 44.4387				00 03 57.1582
	X =	-18.9257 in	+0.0174	+0.9293	+0.3689	--->	0.0496 in
#6	Y =	60.0512 in	-0.9344	+0.1464	-0.3247	--->	0.0363 in
	Z =	71.6720 in	+0.3557	+0.3390	-0.8709	--->	0.0356 in
		Omega =-	66 34 5.0528				00 03 12.9598
	Attitude:	Phi =-	08 23 2.1804	Std Dev:			00 03 15.3360
		Kappa =-	175 56 45.4750				00 04 16.7149

S U M M A R Y S T A T I S T I C S F O R C A M E R A S T A T I O N S

RMS For Standard Deviations

		X =	0.0469 in	Omega =	00 03 13.5008
Count =	6	Y =	0.0447 in	Phi =	00 02 48.5941
		Z =	0.0426 in	Kappa =	00 04 3.3873

35mm Still Camera Station & Control Determination

T R I A N G U L A T E D O B J E C T P O I N T S

Ident		Position (meters)		Error Ellipsoid --->		Length (in)
	X =	-23.4631	-7.778E-01	+5.852E-01	-2.293E-01	0.0540
a	Y =	17.0510	-5.935E-01	-8.039E-01	-3.869E-02	0.0513
	Z =	61.3688	-2.070E-01	+1.060E-01	+9.726E-01	0.0373
	X =	-23.5544	+3.354E-01	+9.106E-01	+2.417E-01	0.0529
b	Y =	22.8076	-9.106E-01	+3.790E-01	-1.645E-01	0.0444
	Z =	61.1117	-2.414E-01	-1.649E-01	+9.563E-01	0.0343
	X =	-23.5144	-7.743E-01	+4.593E-01	-4.354E-01	0.0602
c	Y =	17.0522	-5.232E-01	-8.516E-01	+3.202E-02	0.0521
	Z =	49.8886	-3.561E-01	+2.526E-01	+8.997E-01	0.0405
	X =	-23.6187	+9.308E-01	-4.791E-02	+3.624E-01	0.0953
d	Y =	22.8365	-4.241E-02	-9.988E-01	-2.315E-02	0.0547
	Z =	49.9257	-3.631E-01	-6.177E-03	+9.317E-01	0.0477
	X =	-15.2930	+8.652E-01	-6.531E-02	+4.971E-01	0.0885
f	Y =	30.7358	+1.182E-02	-9.885E-01	-1.504E-01	0.0514
	Z =	44.3323	-5.013E-01	-1.360E-01	+8.545E-01	0.0442
	X =	-52.7118	+9.870E-01	+7.208E-02	+1.435E-01	0.6850
g	Y =	5.6081	-1.602E-01	+3.846E-01	+9.091E-01	0.0929
	Z =	57.3856	+1.036E-02	-9.203E-01	+3.911E-01	0.0899
	X =	-52.9960	+9.515E-01	-2.746E-01	+1.385E-01	0.7910
h	Y =	41.6769	+2.674E-01	+5.158E-01	-8.139E-01	0.0969
	Z =	57.4706	+1.520E-01	+8.115E-01	+5.642E-01	0.0934
	X =	-5.5913	+4.723E-02	-9.860E-01	+1.601E-01	0.3953
j	Y =	56.8546	-9.335E-01	+1.345E-02	+3.583E-01	0.0941
	Z =	57.9690	+3.554E-01	+1.664E-01	+9.198E-01	0.0916
	X =	-4.6482	+4.052E-02	-9.347E-01	+3.530E-01	0.5321
k	Y =	65.5155	-5.266E-01	-3.202E-01	-7.875E-01	0.1105
	Z =	34.9114	+8.491E-01	-1.540E-01	-5.052E-01	0.1084
	X =	-20.0824	+1.010E-01	+9.777E-01	+1.840E-01	0.0097
c1 *0*	Y =	26.2919	+9.503E-01	-1.496E-01	+2.730E-01	0.0096
	Z =	58.5779	+2.945E-01	+1.473E-01	-9.442E-01	0.0095
	X =	-22.0822	+1.108E-01	-9.852E-01	-1.307E-01	0.0098
c2 *0*	Y =	26.3516	-9.222E-01	-5.288E-02	-3.831E-01	0.0096
	Z =	58.5785	-3.706E-01	-1.629E-01	+9.144E-01	0.0095
	X =	-22.0226	-9.533E-01	-2.004E-01	-2.259E-01	0.0098
c3 *0*	Y =	28.3481	+1.590E-01	-9.690E-01	+1.889E-01	0.0098
	Z =	58.5762	-2.568E-01	+1.442E-01	+9.557E-01	0.0097
	X =	-20.0233	+1.779E-01	+9.554E-01	+2.359E-01	0.0098
c4 *0*	Y =	28.2871	-9.361E-01	+2.382E-01	-2.589E-01	0.0096
	Z =	58.5755	+3.036E-01	+1.747E-01	-9.366E-01	0.0095

35mm Still Camera Station & Control Determination

T R I A N G U L A T E D O B J E C T P O I N T S

Ident		Position (meters)	Error Ellipsoid --->			Length (in)
	X =	-20.0841	-9.476E-01	+1.168E-01	-2.972E-01	0.0098
c5	*0* Y =	26.2933	-1.493E-01	-9.848E-01	+8.890E-02	0.0097
	Z =	56.5794	-2.823E-01	+1.286E-01	+9.507E-01	0.0096
	X =	-22.0818	+4.699E-01	-8.425E-01	+2.635E-01	0.0099
c6	*0* Y =	26.3494	+8.697E-01	+4.929E-01	+2.517E-02	0.0098
	Z =	56.5777	+1.511E-01	-2.173E-01	-9.643E-01	0.0098
	X =	-22.0234	+2.804E-01	+8.671E-01	+4.118E-01	0.0099
c7	*0* Y =	28.3453	-9.599E-01	+2.518E-01	+1.234E-01	0.0097
	Z =	56.5776	-3.308E-03	+4.298E-01	-9.029E-01	0.0097
	X =	-20.0276	+2.244E-01	+8.975E-01	+3.796E-01	0.0097
c8	*0* Y =	28.2883	-9.289E-01	+3.148E-01	-1.952E-01	0.0097
	Z =	56.5771	-2.947E-01	-3.088E-01	+9.043E-01	0.0095
	X =	-19.9014	+9.562E-01	+8.981E-02	+2.787E-01	0.1131
lfc1	Y =	32.2076	+9.699E-02	-9.952E-01	-1.207E-02	0.0515
	Z =	56.5767	-2.762E-01	-3.857E-02	+9.603E-01	0.0476
	X =	-21.9391	+9.588E-01	+8.843E-02	+2.699E-01	0.1195
lfc2	Y =	32.3109	+8.769E-02	-9.960E-01	+1.483E-02	0.0525
	Z =	56.5658	-2.702E-01	-9.449E-03	+9.628E-01	0.0489
	X =	-21.9551	+9.589E-01	-5.063E-02	+2.792E-01	0.0892
lfc3	Y =	34.1895	+5.647E-02	+9.983E-01	-1.291E-02	0.0503
	Z =	56.5529	+2.781E-01	-2.815E-02	-9.601E-01	0.0447
	X =	-19.9158	+9.566E-01	-4.748E-02	+2.877E-01	0.0855
lfc4	Y =	34.1199	+4.849E-02	+9.988E-01	+3.617E-03	0.0493
	Z =	56.5554	+2.875E-01	-1.049E-02	-9.577E-01	0.0436
	X =	-19.9598	+9.470E-01	-4.796E-02	+3.175E-01	0.0867
lfc5	Y =	32.2360	-3.877E-02	-9.986E-01	-3.522E-02	0.0504
	Z =	54.6072	-3.188E-01	-2.105E-02	+9.476E-01	0.0443
	X =	-21.7841	+7.430E-01	-6.266E-01	+2.353E-01	0.2947
lfc6	Y =	32.2705	+6.424E-01	+7.662E-01	+1.183E-02	0.0758
	Z =	54.6054	+1.877E-01	-1.424E-01	-9.718E-01	0.0738
	X =	-19.5206	+2.091E-01	+8.300E-01	+5.170E-01	0.0491
lfc8	Y =	34.1752	-9.286E-01	+3.343E-01	-1.612E-01	0.0385
	Z =	54.6332	+3.066E-01	+4.464E-01	-8.407E-01	0.0316
	X =	-15.8938	+2.810E-02	+9.879E-01	-1.524E-01	0.0466
rtc1	Y =	9.9997	+8.872E-01	+4.559E-02	+4.591E-01	0.0443
	Z =	48.6420	-4.605E-01	+1.481E-01	+8.752E-01	0.0352
	X =	-17.8830	-3.857E-02	+9.823E-01	-1.832E-01	0.0473
rtc2	Y =	9.9729	+8.860E-01	+1.184E-01	+4.483E-01	0.0444
	Z =	48.6382	-4.620E-01	+1.450E-01	+8.749E-01	0.0355

35mm Still Camera Station & Control Determination

T R I A N G U L A T E D O B J E C T P O I N T S

Ident		Position (meters)		Error Ellipsoid --->		Length (in)
	X =	-17.9076	+9.091E-03	+9.943E-01	-1.060E-01	0.0475
rtc3	Y =	11.8963	+8.844E-01	+4.149E-02	+4.649E-01	0.0446
	Z =	48.6335	-4.667E-01	+9.800E-02	+8.790E-01	0.0356
	X =	-15.9390	+5.886E-02	+9.949E-01	-8.240E-02	0.0468
rtc4	Y =	11.9068	+8.835E-01	-1.350E-02	+4.681E-01	0.0444
	Z =	48.6191	-4.646E-01	+1.004E-01	+8.798E-01	0.0353
	X =	-15.9248	+3.217E-01	-7.972E-01	+5.108E-01	0.0643
rtc5	Y =	9.9594	+8.642E-01	+4.677E-01	+1.856E-01	0.0520
	Z =	46.6702	+3.869E-01	-3.818E-01	-8.394E-01	0.0419
	X =	-17.8617	+4.019E-01	-7.473E-01	+5.291E-01	0.0880
rtc6	Y =	9.8849	-9.061E-01	-4.081E-01	+1.117E-01	0.0539
	Z =	46.6847	-1.325E-01	+5.243E-01	+8.412E-01	0.0457
	X =	-17.9092	+2.324E-01	+8.631E-01	+4.485E-01	0.1861
rtc7	Y =	11.9577	-9.726E-01	+2.083E-01	+1.031E-01	0.0627
	Z =	46.6692	+4.460E-03	+4.601E-01	-8.878E-01	0.0599
	X =	-15.9655	+8.496E-01	+1.824E-01	+4.948E-01	0.0579
rtc8	Y =	11.9157	-2.515E-01	+9.649E-01	+7.617E-02	0.0497
	Z =	46.6562	-4.635E-01	-1.892E-01	+8.657E-01	0.0394
	X =	-18.0679	+1.006E-01	+9.413E-01	+3.222E-01	0.0097
x+03 *0*	Y =	27.2287	+9.556E-01	-1.816E-01	+2.321E-01	0.0097
	Z =	57.5789	+2.770E-01	+2.846E-01	-9.178E-01	0.0095
	X =	-16.0683	+3.532E-02	-9.562E-01	-2.906E-01	0.0097
x+05 *0*	Y =	27.1677	+9.607E-01	-4.759E-02	+2.734E-01	0.0097
	Z =	57.5784	+2.752E-01	+2.888E-01	-9.170E-01	0.0095
	X =	-14.0711	+7.214E-02	-9.818E-01	-1.756E-01	0.0097
x+07 *0*	Y =	27.1070	-9.597E-01	-2.039E-02	-2.802E-01	0.0096
	Z =	57.5783	-2.716E-01	-1.888E-01	+9.437E-01	0.0094
	X =	-12.0728	+1.436E-01	-9.773E-01	-1.559E-01	0.0097
x+09 *0*	Y =	27.0458	-9.536E-01	-9.447E-02	-2.859E-01	0.0096
	Z =	57.5781	-2.647E-01	-1.897E-01	+9.455E-01	0.0094
	X =	-10.0726	+2.201E-01	-9.664E-01	-1.325E-01	0.0097
x+11 *0*	Y =	26.9843	-9.398E-01	-1.737E-01	-2.943E-01	0.0096
	Z =	57.5777	-2.614E-01	-1.893E-01	+9.465E-01	0.0094
	X =	-8.0748	+3.007E-01	-9.479E-01	-1.049E-01	0.0097
x+13 *0*	Y =	26.9228	-9.171E-01	-2.573E-01	-3.045E-01	0.0096
	Z =	57.5779	-2.617E-01	-1.878E-01	+9.467E-01	0.0094
	X =	-20.9938	+9.610E-01	+1.133E-01	+2.524E-01	0.0099
y+02 *0*	Y =	29.3170	+1.146E-01	-9.934E-01	+9.639E-03	0.0098
	Z =	57.5763	-2.518E-01	-1.966E-02	+9.676E-01	0.0097

35mm Still Camera Station & Control Determination

T R I A N G U L A T E D O B J E C T P O I N T S

Ident		Position (meters)		Error Ellipsoid --->			Length (in)
		X =	-20.9340	+9.639E-01	-4.074E-02	+2.632E-01	0.0099
y+04	*0*	Y =	31.3133	+4.467E-02	+9.990E-01	-8.995E-03	0.0097
		Z =	57.5765	+2.626E-01	-2.043E-02	-9.647E-01	0.0097
		X =	-20.8740	+9.631E-01	-4.481E-02	+2.655E-01	0.0099
y+06	*0*	Y =	33.3098	+5.126E-02	+9.985E-01	-1.743E-02	0.0097
		Z =	57.5762	+2.644E-01	-3.040E-02	-9.639E-01	0.0097
		X =	-20.8143	+9.621E-01	-5.002E-02	+2.680E-01	0.0099
y+08	*0*	Y =	35.3062	-5.982E-02	-9.978E-01	+2.853E-02	0.0097
		Z =	57.5763	-2.659E-01	+4.348E-02	+9.630E-01	0.0097
		X =	-20.7542	+9.611E-01	-5.666E-02	+2.705E-01	0.0099
y+10	*0*	Y =	37.3020	-7.108E-02	-9.965E-01	+4.384E-02	0.0097
		Z =	57.5753	-2.670E-01	+6.136E-02	+9.617E-01	0.0097
		X =	-20.7058	+7.680E-03	-1.000E+00	+2.158E-03	0.0680
y+12	*2*	Y =	39.0212	-9.779E-01	-7.961E-03	-2.090E-01	0.0099
		Z =	57.5755	-2.090E-01	+5.048E-04	+9.779E-01	0.0098
		X =	-21.5314	+6.786E-01	+7.342E-01	+2.151E-02	0.0098
y-16	*0*	Y =	11.3161	+6.757E-01	-6.355E-01	+3.736E-01	0.0098
		Z =	57.5751	-2.880E-01	+2.390E-01	+9.273E-01	0.0096
		X =	-21.5922	+6.126E-01	+7.900E-01	-2.698E-02	0.0098
y-18	*0*	Y =	9.3190	+7.337E-01	-5.556E-01	+3.910E-01	0.0097
		Z =	57.5751	-2.939E-01	+2.593E-01	+9.200E-01	0.0096
		X =	-21.6532	+5.497E-01	+8.319E-01	-7.545E-02	0.0098
y-20	*0*	Y =	7.3220	+7.792E-01	-4.781E-01	+4.054E-01	0.0097
		Z =	57.5750	-3.012E-01	+2.816E-01	+9.110E-01	0.0096
		X =	-21.7142	+4.933E-01	+8.611E-01	-1.228E-01	0.0098
y-22	*0*	Y =	5.3249	+8.128E-01	-4.060E-01	+4.178E-01	0.0097
		Z =	57.5748	-3.099E-01	+3.059E-01	+9.002E-01	0.0096
		X =	-21.7754	+3.127E-01	+9.463E-01	-8.264E-02	0.0098
y-24	*0*	Y =	3.3272	+8.815E-01	-2.566E-01	+3.964E-01	0.0097
		Z =	57.5759	-3.539E-01	+1.968E-01	+9.143E-01	0.0096
		X =	-21.0524	+1.231E-01	+9.747E-01	+1.867E-01	0.0097
z+02	*0*	Y =	27.3212	+9.497E-01	-1.703E-01	+2.628E-01	0.0096
		Z =	59.5611	+2.879E-01	+1.450E-01	-9.466E-01	0.0094
		X =	-21.0490	+1.090E-01	+9.824E-01	+1.514E-01	0.0097
z+04	*0*	Y =	27.3198	-9.616E-01	+1.428E-01	-2.342E-01	0.0096
		Z =	61.5602	-2.517E-01	-1.201E-01	+9.603E-01	0.0094
		X =	-21.0489	+2.031E-01	-9.692E-01	-1.394E-01	0.0098
z+06	*0*	Y =	27.3193	-9.486E-01	-1.595E-01	-2.732E-01	0.0097
		Z =	63.5596	-2.425E-01	-1.877E-01	+9.518E-01	0.0096

35mm Still Camera Station & Control Determination

T R I A N G U L A T E D O B J E C T P O I N T S

Ident		Position (meters)	Error Ellipsoid --->			Length (in)
	X =	-21.0513	+7.846E-01	-6.129E-01	+9.363E-02	0.0099
z+08	*0* Y =	27.3189	+6.171E-01	+7.866E-01	-2.177E-02	0.0098
	Z =	65.5618	+6.030E-02	-7.486E-02	-9.954E-01	0.0098

S U M M A R Y S T A T I S T I C S F O R O B J E C T P O I N T S

RMS For Standard Deviations

Count =	24	X =	0.2226 inches
Count =	25	Y =	0.1530 inches
Count =	24	Z =	0.0809 inches

35mm Still Camera Station & Control Determination

CORRECTIONS APPLIED TO OBJECT CONTROL

	X =	-0.0002 in		X =	0.0008 in
y+10	Y =	-0.0090 in	y-20	Y =	-0.0050 in
	Z =	-0.0007 in		Z =	-0.0010 in
	X =	-0.0036 in		X =	0.0016 in
x+11	Y =	-0.0017 in	c1	Y =	0.0049 in
	Z =	0.0017 in		Z =	0.0019 in
	X =	0.0002 in		X =	0.0016 in
y+02	Y =	0.0020 in	z+02	Y =	0.0052 in
	Z =	0.0003 in		Z =	-0.0049 in
	X =	0.0002 in		X =	-0.0002 in
y+12	Y =(	0.0000 m)	y-22	Y =	-0.0031 in
	Z =	-0.0005 in		Z =	-0.0012 in
	X =	0.0018 in		X =	-0.0029 in
c2	Y =	0.0046 in	x+03	Y =	0.0027 in
	Z =	0.0025 in		Z =	0.0029 in
	X =	-0.0048 in		X =	0.0014 in
x+13	Y =	-0.0032 in	c3	Y =	0.0031 in
	Z =	0.0019 in		Z =	0.0002 in
	X =	0.0000 in		X =	0.0050 in
y+04	Y =	-0.0007 in	z+04	Y =	0.0038 in
	Z =	0.0005 in		Z =	-0.0058 in
	X =	-0.0014 in		X =	0.0007 in
y-24	Y =	-0.0018 in	c4	Y =	0.0021 in
	Z =	-0.0001 in		Z =	-0.0005 in
	X =	-0.0023 in		X =	-0.0001 in
x+05	Y =	0.0017 in	c5	Y =	0.0063 in
	Z =	0.0024 in		Z =	0.0034 in
	X =	0.0000 in		X =	0.0051 in
y+06	Y =	-0.0032 in	z+06	Y =	0.0033 in
	Z =	0.0002 in		Z =	-0.0064 in
	X =	0.0026 in		X =	0.0022 in
y-16	Y =	-0.0089 in	c6	Y =	0.0024 in
	Z =	-0.0009 in		Z =	0.0017 in
	X =	-0.0041 in		X =	0.0006 in
x+07	Y =	0.0010 in	c7	Y =	0.0003 in
	Z =	0.0023 in		Z =	0.0016 in
	X =	-0.0003 in		X =	0.0027 in
y+08	Y =	-0.0058 in	z+08	Y =	0.0029 in
	Z =	0.0003 in		Z =	-0.0042 in

35mm Still Camera Station & Control Determination

CORRECTIONS APPLIED TO OBJECT CONTROL

	X =	0.0018 in		X =	-0.0036 in
y-18	Y =	-0.0070 in	c8	Y =	0.0033 in
	Z =	-0.0009 in		Z =	0.0011 in
	X =	-0.0048 in			
x+09	Y =	-0.0002 in			
	Z =	0.0021 in			

X .... Number of Components =	29	RMS =	0.0026 inches
Y .... Number of Components =	28	RMS =	0.0042 inches
Z .... Number of Components =	29	RMS =	0.0025 inches

Appendix 2

Head Anthropometry

The options data file for both head anthro & initial conditions

```
01111000001009000 10                    0.0       0.0
     .0005     .0005          object space control
  #1-580      -57.092
  #2-736      -56.988
  #3-674      -57.295
  #4-623      -57.434
  #5-591      -57.292
  #6-806      -57.539
********
       #1       -0.568       -0.753        1.814      .003      .003      .003
       #1   683906.049  -110621.831    -5352.714     1000.     1000.     1000.
       #2        0.482       -0.766        1.805      .003      .003      .003
       #2   703306.784   281928.600    94119.799     1000.     1000.     1000.
       #3        0.944        0.022        1.782      .003      .003      .003
       #3   480917.242   673248.507   410907.276     1000.     1000.     1000.
       #4        0.938        0.643        1.782      .003      .003      .003
       #4  -104827.900   712901.752  1005452.090     1000.     1000.     1000.
       #5        0.519        1.458        1.805      .003      .003      .003
       #5  -605142.686   404115.931  1594513.781     1000.     1000.     1000.
       #6       -0.482        1.467        1.792      .003      .003      .003
       #6  -665321.724   -71919.543 -1762801.860     1000.     1000.     1000.
********
         a     -0.5960       0.4331       1.5588
         b     -0.5983       0.5793       1.5522
         c     -0.5973       0.4331       1.2672
         d     -0.5999       0.5801       1.2681
         f     -0.3884       0.7807       1.1260
         g     -1.3389       0.1424       1.4576
         h     -1.3461       1.0586       1.4598
         j     -0.1420       1.4441       1.4724
         k     -0.1181       1.6641       0.8867
      rtc1     -0.4037       0.2540       1.2355
      rtc2     -0.4542       0.2533       1.2354
      rtc3     -0.4549       0.3022       1.2353
      rtc4     -0.4049       0.3024       1.2349
      rtc5     -0.4045       0.2530       1.1854
      rtc6     -0.4537       0.2511       1.1858
      rtc7     -0.4549       0.3037       1.1854
      rtc8     -0.4055       0.3027       1.1851
      cen1     -0.5095       0.6710       1.4376
      cen2     -0.5603       0.6734       1.4379
      cen3     -0.5575       0.7225       1.4373
      cen4     -0.5082       0.7203       1.4369
      cen5     -0.5098       0.6719       1.3874
      cen6     -0.5594       0.6728       1.3869
      cen7     -0.5582       0.7230       1.3879
      cen8     -0.5101       0.7207       1.3865
      lfc1     -0.5055       0.8181       1.4371
      lfc2     -0.5573       0.8207       1.4368
      lfc3     -0.5577       0.8684       1.4364
      lfc4     -0.5059       0.8666       1.4365
      lfc5     -0.5070       0.8188       1.3870
      lfc6     -0.5533       0.8197       1.3870
      lfc7     -0.5577       0.8684       1.3870
      lfc8     -0.5059       0.8666       1.3870
********
```

Sample image data file for head anthropometry

```
5.2  5.2
      #1      -55.003       0.055      0.055  #1-580
       a      -12.3188      9.0206                Photo      #1
       c      -12.0050     -3.5446                Photo      #1
       j       -0.1462     12.1096                Photo      #1
       k       -1.1756      0.1784                Photo      #1
    rtc1       -2.7023     -8.2464                Photo      #1
    rtc2       -5.0659     -8.3239                Photo      #1
    rtc3       -5.2952     -7.2704                Photo      #1
    rtc5       -2.8086    -10.3270                Photo      #1
    rtc6       -5.0768    -10.4238                Photo      #1
     rtp       10.2500      -0.4822               Photo      #1
     ctp       10.4343       2.8732               Photo      #1
     ron        8.2949       2.3420               Photo      #1
  ear1-r        7.7673      -1.9778               Photo      #1
  ear2-r        7.1819      -1.1699               Photo      #1
  ear3-r        6.5890      -0.3577               Photo      #1
  ear4-r        5.9910       0.3969               Photo      #1
********
      #2      -55.003       0.055      0.055  #2-736
       a      -11.9092      7.9235                Photo      #2
       b       -8.7623      8.3150                Photo      #2
       c      -11.3774     -1.7504                Photo      #2
       d       -8.4348     -0.4699                Photo      #2
       j       13.7311      8.2216                Photo      #2
       k       14.6514     -3.7571                Photo      #2
    rtc1      -10.0720     -5.9582                Photo      #2
    rtc2      -11.5606     -5.5799                Photo      #2
    rtc3      -10.4116     -5.0053                Photo      #2
    rtc5      -10.0415     -7.6364                Photo      #2
    rtc6      -11.4765     -7.3298                Photo      #2
    cen3       -4.7645      5.3578                Photo      #2
    cen4       -3.7672      5.1707                Photo      #2
     rtp        4.2049     -2.5055                Photo      #2
     ctp        6.7155      0.2730                Photo      #2
     ltp        7.1379     -0.8374                Photo      #2
     ron        3.8294      0.2708                Photo      #2
  ear1-r        0.1265     -3.0753                Photo      #2
  ear2-r        0.1809     -2.3310                Photo      #2
  ear3-r        0.2526     -1.6122                Photo      #2
  ear4-r        0.2869     -0.9241                Photo      #2
********
      #3      -55.005       0.055      0.055  #3-674
       a       -1.9143      6.4813                Photo      #3
       b        2.8000      6.3342                Photo      #3
       c       -2.1217     -2.9602                Photo      #3
       g      -13.7086      6.6334                Photo      #3
       h        7.3243      7.1279                Photo      #3
    rtc1       -6.8061     -6.7017                Photo      #3
    rtc2       -7.1898     -6.0411                Photo      #3
    rtc6       -7.2044     -7.7590                Photo      #3
    lfc1       11.1947      2.3118                Photo      #3
    lfc2       10.5475      2.6419                Photo      #3
    lfc3       11.8092      2.7423                Photo      #3
    lfc4       12.6184      2.3641                Photo      #3
    lfc5       11.0755      0.7606                Photo      #3
    lfc6       10.4179      1.0795                Photo      #3
     rtp        3.2684     -7.0554                Photo      #3
```

ctp	7.6381	-4.7917		Photo	#3
ltp	10.6219	-6.5881		Photo	#3
ron	5.0760	-3.9725		Photo	#3
lon	8.0872	-3.6275		Photo	#3
ear1-r	-0.6235	-6.3835		Photo	#3
ear2-r	0.1041	-5.6511		Photo	#3
ear3-r	0.8103	-4.9755		Photo	#3
ear4-r	1.4700	-4.3028		Photo	#3
ear1-l	11.8631	-5.1788		Photo	#3
ear2-l	10.9852	-4.6835		Photo	#3
ear3-l	10.1394	-4.2026		Photo	#3
********				Photo	
#4	-55.004	0.055	0.055	#4-623	
a	-4.1085	9.5052		Photo	#4
b	1.0733	9.2341		Photo	#4
d	1.1956	-0.2615		Photo	#4
f	8.4488	-7.8960		Photo	#4
g	-8.9285	9.8658		Photo	#4
h	13.7225	9.9844		Photo	#4
rtc1	-11.3311	-3.5990		Photo	#4
cen1	4.4632	4.5218		Photo	#4
cen2	4.5075	4.9905		Photo	#4
cen3	6.2221	4.9767		Photo	#4
cen4	6.2641	4.5410		Photo	#4
cen5	4.4515	2.7862		Photo	#4
cen8	6.2838	2.7991		Photo	#4
lfc1	9.9517	4.4639		Photo	#4
lfc2	9.8599	4.9063		Photo	#4
lfc3	11.6354	4.9151		Photo	#4
lfc4	11.7847	4.4186		Photo	#4
lfc5	9.9039	2.6946		Photo	#4
rtp	-8.3443	-4.8883		Photo	#4
ctp	-4.5829	-2.9565		Photo	#4
ltp	-0.0434	-5.2564		Photo	#4
ron	-5.5861	-1.8630		Photo	#4
lon	-2.1328	-1.7687		Photo	#4
ear1-r	-10.3767	-3.8373		Photo	#4
ear2-r	-9.4179	-3.1951		Photo	#4
ear3-r	-8.5031	-2.5242		Photo	#4
ear4-r	-7.6095	-1.9186		Photo	#4
ear1-l	3.8889	-3.9218		Photo	#4
ear2-l	2.9682	-3.2581		Photo	#4
ear3-l	2.0791	-2.6296		Photo	#4
ear4-l	1.1421	-2.0188		Photo	#4
********					
#5	-55.002	0.055	0.055	#5-591	
b	7.0105	11.2362		Photo	#5
c	2.6505	1.9942		Photo	#5
d	6.5946	0.7890		Photo	#5
f	7.2587	-9.3250		Photo	#5
cen1	7.5167	5.5281		Photo	#5
cen2	8.8245	5.9553		Photo	#5
cen3	10.4415	5.5222		Photo	#5
cen4	9.0996	5.0634		Photo	#5
cen5	7.4070	3.5746		Photo	#5
cen7	10.3350	3.5391		Photo	#5
cen8	8.9934	3.0451		Photo	#5
lfc1	12.5765	4.1393		Photo	#5
lfc2	13.9444	4.6006		Photo	#5
lfc3	15.7423	4.1289		Photo	#5

lfc4	14.4535	3.6221		Photo	#5
lfc5	12.4141	2.0623		Photo	#5
rtp	-13.9239	-0.0840		Photo	#5
ctp	-13.2971	0.9657		Photo	#5
ltp	-9.8467	-2.4228		Photo	#5
lon	-9.4847	1.3175		Photo	#5
ear1-r	-12.2656	1.0484		Photo	#5
ear1-l	-4.1154	-2.5385		Photo	#5
ear2-l	-4.3943	-1.7720		Photo	#5
ear3-l	-4.7328	-0.7936		Photo	#5
ear4-l	-5.0535	0.0441		Photo	#5
********					
#6	-55.005	0.055	0.055	#6-806	
b	14.8464	6.8951		Photo	#6
rtc1	3.6811	-1.6273		Photo	#6
rtc2	5.7796	-1.8098		Photo	#6
rtc8	3.4704	-4.5291		Photo	#6
cen1	8.8667	-1.4132		Photo	#6
cen2	12.0635	-1.6912		Photo	#6
cen3	12.1965	-3.1327		Photo	#6
cen4	8.7802	-2.8747		Photo	#6
cen7	12.0277	-6.0329		Photo	#6
cen8	8.5492	-5.8317		Photo	#6
lfc1	8.4946	-5.8926		Photo	#6
lfc2	12.3763	-6.3245		Photo	#6
lfc3	12.5109	-8.3592		Photo	#6
lfc4	8.4113	-7.9651		Photo	#6
ctp	-15.2780	2.0800		Photo	#6
ltp	-15.6286	-2.5282		Photo	#6
lon	-12.7223	1.0577		Photo	#6
ear1-l	-12.5352	-5.1427		Photo	#6
ear2-l	-11.6996	-4.0604		Photo	#6
ear3-l	-10.9029	-3.0166		Photo	#6
ear4-l	-10.1382	-2.0149		Photo	#6
********					

Object Space Reference System is Rectangular

Rotation Angles are Object-to-Photo

Complete Triangulation process is requested

Error Propagation is requested

[Eigenvector/Eigenvalue output]

Unit Variance will be based on completely free camera parameters

All Image Residuals will be listed

Triangulated Object Coordinates will be saved

Adjusted Camera Station Parameters will be saved

E R R O R W A R N I N G S

POINTS NOT PHOTOGRAPHED

rtc4 rtc7 cen6 lfc7
lfc8

35mm Still Camera System For Head Anthropometry Of HRV # = 0000

C A M E R A S T A T I O N S C O R R E C T I O N S

	------- P O S I T I O N -------			--------- A T T I T U D E ------		
	X	Y	Z	Omega	Phi	Kappa
			Iteration 1			
#1	-0.0001	0.0013	-0.0010 m.	0.000349	0.000123	0.000166
#2	-0.0026	0.0002	-0.0003 m.	0.000457	-0.000955	0.000195
#3	-0.0006	-0.0007	0.0003 m.	-0.000467	-0.000655	0.000481
#4	-0.0008	-0.0003	0.0000 m.	-0.000381	-0.000154	0.000452
#5	-0.0023	-0.0003	0.0010 m.	0.000831	-0.000947	-0.000468
#6	-0.0007	-0.0030	-0.0013 m.	-0.000152	-0.000203	0.000267

Provisional Weighted Sum of Squares = 304.821

			Iteration 2			
#1	0.0000	0.0000	0.0000 m.	0.000000	0.000001	-0.000001
#2	0.0000	0.0000	0.0000 m.	0.000001	0.000001	-0.000002
#3	0.0000	0.0000	0.0000 m.	-0.000002	0.000000	0.000004
#4	0.0000	0.0000	0.0000 m.	0.000005	-0.000003	0.000000
#5	0.0000	0.0000	0.0000 m.	-0.000006	0.000000	0.000005
#6	0.0000	0.0000	0.0000 m.	-0.000004	0.000002	0.000006

Provisional Weighted Sum of Squares = 280.211

			Iteration 3			
#1	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000
#2	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000
#3	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000
#4	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000
#5	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000
#6	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000

Provisional Weighted Sum of Squares = 280.222

35mm Still Camera System For Head Anthropometry Of HRV # = 0000

T R I A N G U L A T E D I M A G E P O I N T S R E S I D U A L S
(in micrometers)

a *0*	#1	#2	#3	#4		
	38	62	20	-12		
	-84	-11	126	105		
c *0*	#1	#2	#3	#5		
	-25	71	48	-46		
	-3	41	12	34		
j *0*	#2	#1				
	4	-26				
	-4	-127				
k *0*	#2	#1				
	-15	-12				
	-4	129				
rtc1 *0*	#1	#2	#3	#4	#6	
	1	-16	3	-41	7	
	31	-13	-26	-11	-78	
rtc2 *0*	#1	#2	#3	#6		
	-23	-32	39	0		
	-19	-24	-17	-24		
rtc3 *0*	#2	#1				
	6	-50				
	-4	33				
rtc5 *0*	#2	#1				
	1	-13				
	-104	22				
rtc6 *0*	#2	#3	#1			
	-42	-2	-29			
	-27	-11	-28			
rtp	#2	#1	#3	#4	#5	
	-19	8	-5	-10	15	
	18	45	-14	-38	0	
ctp	#2	#3	#4	#1	#5	#6
	-3	-2	23	61	-23	36
	29	35	10	-21	4	-59
ron	#3	#1	#4	#2		
	-15	22	24	-9		
	8	-12	-3	7		
ear1-r	#2	#3	#4	#5	#1	
	-20	-12	8	-9	0	
	7	-22	-11	-10	37	

35mm Still Camera System For Head Anthropometry Of HRV # = 0000

	TRIANGULATED IMAGE POINTS (in micrometers)				RESIDUALS
ear2-r	#2	#1	#3	#4	
	-7	-4	-6	-1	
	6	29	-35	2	
ear3-r	#3	#2	#4	#1	
	-3	-17	11	15	
	-1	13	-11	1	
ear4-r	#3	#1	#4	#2	
	0	29	22	-22	
	0	-20	13	5	
b *0*	#4	#5	#2	#6	#3
	40	-21	59	-43	14
	122	-42	-1	86	116
d *0*	#4	#2	#5		
	-38	86	10		
	-14	61	27		
cen3 *0*	#4	#5	#2	#6	
	26	-26	-123	-96	
	16	-55	-8	38	
cen4 *0*	#4	#5	#2	#6	
	-19	0	70	-76	
	17	-15	-4	43	
ltp	#2	#3	#4	#5	#6
	-26	25	27	-18	29
	26	-24	-52	18	37
g *0*	#4	#3			
	269	107			
	-67	-30			
h *0*	#3	#4			
	-136	-80			
	-140	-118			
lfc1 *0*	#3	#4	#5	#6	
	-4	-18	-10	-19	
	41	59	25	-86	
lfc2 *0*	#5	#3	#4	#6	
	-15	-64	-31	71	
	4	56	40	-74	
lfc3 *0*	#4	#5	#3	#6	
	-60	35	52	169	
	-3	9	-11	5	

35mm Still Camera System For Head Anthropometry Of HRV # = 0000

T R I A N G U L A T E D I M A G E P O I N T S R E S I D U A L S
(in micrometers)

lfc4 *0*	#3	#5	#4	#6
	12	19	-7	50
	14	24	52	8
lfc5 *0*	#5	#3	#4	
	40	-11	-35	
	-14	-14	22	
lfc6 *0*	#3			
	-31			
	22			
lon	#3	#5	#4	#6
	-22	-31	37	13
	21	-28	-1	8
ear1-1	#4	#5	#3	#6
	32	19	8	18
	-40	10	-49	66
ear2-1	#5	#4	#3	#6
	-1	40	1	10
	106	-65	-53	6
ear3-1	#5	#3	#4	#6
	16	-28	20	-13
	9	-8	-23	20
f *0*	#4	#5		
	-21	72		
	-98	57		
cen1 *0*	#6	#4	#5	
	-89	-56	-39	
	-15	88	-29	
cen2 *0*	#6	#4	#5	
	6	-46	-3	
	10	52	-58	
cen5 *0*	#5	#4		
	-2	-48		
	-61	24		
cen8 *0*	#4	#5	#6	
	-75	33	8	
	-33	-11	-2	
ear4-1	#4	#5	#6	
	8	1	5	
	-17	-1	16	

35mm Still Camera System For Head Anthropometry Of HRV # = 0000

T R I A N G U L A T E D I M A G E P O I N T S R E S I D U A L S
(in micrometers)

cen7 *0*	#6	#5
	-151	-15
	-28	-10
rtc8 *0*	#6	
	50	
	25	

Weighted Sum of Squares (Camera)	=	3.7
Weighted Sum of Squares (Object)	=	28.1
Weighted Sum of Squares (Plates)	=	206.9
Weighted Sum of Squares (Total)	=	238.7
Degrees of Freedom.....	=	205

a posteriori Variance of Unit Weight = 1.164

T R I A N G U L A T E D C A M E R A S T A T I O N S
(Object to Photo)

Ident		Position	Error Ellipsoid --->	Length
#1	X =	-0.5681 m.	+0.0416 -0.7136 +0.6993 --->	0.0021 m.
	Y =	-0.7517 m.	+0.9124 -0.2581 -0.3177 --->	0.0017 m.
	Z =	1.8130 m.	-0.4072 -0.6513 -0.6403 --->	0.0015 m.
	Attitude: Omega =	68 40 17.9721		00 04 18.4043
	Phi =-	11 05 56.2784	Std Dev:	00 04 20.6840
	Kappa =-	00 53 18.6261		00 05 29.7354
#2	X =	0.4794 m.	+0.7870 -0.2694 +0.5550 --->	0.0022 m.
	Y =	-0.7658 m.	+0.6131 +0.2413 -0.7523 --->	0.0019 m.
	Z =	1.8047 m.	+0.0687 +0.9323 +0.3551 --->	0.0017 m.
	Attitude: Omega =	70 34 41.3583		00 04 36.8752
	Phi =	28 16 11.7509	Std Dev:	00 04 5.0862
	Kappa =	09 41 59.5477		00 05 17.3670
#3	X =	0.9434 m.	+0.5820 -0.5828 +0.5672 --->	0.0021 m.
	Y =	0.0213 m.	+0.7908 +0.5682 -0.2275 --->	0.0017 m.
	Z =	1.7823 m.	+0.1897 -0.5809 -0.7916 --->	0.0012 m.
	Attitude: Omega =	48 07 40.3894		00 06 44.1592
	Phi =	67 30 33.3367	Std Dev:	00 03 54.5066
	Kappa =	41 10 47.2189		00 06 33.4254
#4	X =	0.9372 m.	+0.6538 +0.1259 +0.7461 --->	0.0020 m.
	Y =	0.6427 m.	-0.7567 +0.1085 +0.6447 --->	0.0015 m.
	Z =	1.7820 m.	+0.0002 -0.9861 +0.1662 --->	0.0010 m.
	Attitude: Omega =-	10 49 45.5940		00 07 23.0512
	Phi =	71 28 29.4370	Std Dev:	00 03 57.4686
	Kappa =	100 56 25.2486		00 06 44.8661
#5	X =	0.5167 m.	-0.6611 +0.6887 +0.2977 --->	0.0023 m.
	Y =	1.4577 m.	+0.2095 -0.2115 +0.9547 --->	0.0018 m.
	Z =	1.8060 m.	+0.7204 +0.6935 -0.0045 --->	0.0017 m.
	Attitude: Omega =-	60 48 52.5559		00 06 33.6858
	Phi =	40 38 0.6367	Std Dev:	00 05 48.8194
	Kappa =	159 43 38.3433		00 05 25.7527
#6	X =	-0.4827 m.	+0.3814 +0.7254 +0.5731 --->	0.0019 m.
	Y =	1.4640 m.	-0.3355 -0.4690 +0.8170 --->	0.0012 m.
	Z =	1.7907 m.	+0.8614 -0.5038 +0.0644 --->	0.0010 m.
	Attitude: Omega =-	66 53 54.0664		00 04 34.2251
	Phi =-	07 20 1.0047	Std Dev:	00 04 35.1312
	Kappa =-	176 27 5.5788		00 05 15.5437

S U M M A R Y S T A T I S T I C S F O R C A M E R A S T A T I O N S

RMS For Standard Deviations

		X =	0.0018 m.	Omega =	00 05 49.5854
Count =	6	Y =	0.0017 m.	Phi =	00 04 29.8086
		Z =	0.0018 m.	Kappa =	00 05 49.7213

T R I A N G U L A T E D O B J E C T P O I N T S

Ident		Position (meters)		Error Ellipsoid --->			Length (m)
		X =	-0.5962	-7.635E-01	+6.130E-01	-2.031E-01	0.0005
a	*0*	Y =	0.4330	+6.240E-01	+7.813E-01	+1.212E-02	0.0005
		Z =	1.5585	+1.661E-01	-1.175E-01	-9.791E-01	0.0005
		X =	-0.5986	+3.596E-01	+9.030E-01	+2.349E-01	0.0005
b	*0*	Y =	0.5792	-9.124E-01	+3.931E-01	-1.141E-01	0.0005
		Z =	1.5513	-1.954E-01	-1.733E-01	+9.653E-01	0.0004
		X =	-0.5974	-4.580E-01	+7.926E-01	-4.024E-01	0.0005
c	*0*	Y =	0.4329	-8.080E-01	-5.600E-01	-1.832E-01	0.0005
		Z =	1.2670	-3.706E-01	+2.412E-01	+8.969E-01	0.0005
		X =	-0.6000	+9.164E-01	+1.223E-01	+3.812E-01	0.0005
d	*0*	Y =	0.5800	-1.118E-01	+9.925E-01	-4.977E-02	0.0005
		Z =	1.2679	+3.844E-01	-3.016E-03	-9.232E-01	0.0005
		X =	-0.3883	+8.163E-01	+2.662E-01	+5.126E-01	0.0005
f	*0*	Y =	0.7806	-4.364E-01	+8.657E-01	+2.453E-01	0.0005
		Z =	1.1261	+3.785E-01	+4.239E-01	-8.228E-01	0.0005
		X =	-1.3388	+9.879E-01	+8.070E-02	+1.322E-01	0.0005
g	*0*	Y =	0.1416	-1.431E-01	+1.489E-01	+9.784E-01	0.0005
		Z =	1.4578	+5.927E-02	-9.855E-01	+1.587E-01	0.0005
		X =	-1.3460	+9.517E-01	-2.778E-01	+1.306E-01	0.0005
h	*0*	Y =	1.0590	+2.395E-01	+4.059E-01	-8.820E-01	0.0005
		Z =	1.4603	+1.920E-01	+8.707E-01	+4.528E-01	0.0005
		X =	-0.1420	+5.758E-02	-9.859E-01	+1.570E-01	0.0005
j	*0*	Y =	1.4441	-9.576E-01	-1.007E-02	+2.880E-01	0.0005
		Z =	1.4727	+2.824E-01	+1.669E-01	+9.447E-01	0.0005
		X =	-0.1181	+4.698E-02	-9.350E-01	+3.515E-01	0.0005
k	*0*	Y =	1.6640	-8.480E-01	-2.233E-01	-4.807E-01	0.0005
		Z =	0.8865	-5.280E-01	+2.755E-01	+8.033E-01	0.0005
		X =	-0.0403	-7.844E-01	+5.522E-01	-2.825E-01	0.0009
ctp		Y =	0.4931	+5.094E-01	+8.334E-01	+2.145E-01	0.0008
		Z =	1.3997	+3.539E-01	+2.435E-02	-9.350E-01	0.0007
		X =	-0.1078	+9.422E-01	-5.605E-02	+3.302E-01	0.0011
lon		Y =	0.5340	+5.270E-02	-9.488E-01	-3.114E-01	0.0009
		Z =	1.3997	+3.308E-01	+3.108E-01	-8.911E-01	0.0007
		X =	-0.0625	+8.592E-01	-4.036E-01	+3.144E-01	0.0010
ltp		Y =	0.5786	-2.575E-01	-8.721E-01	-4.161E-01	0.0009
		Z =	1.3423	+4.422E-01	+2.766E-01	-8.532E-01	0.0007
		X =	-0.1079	+8.741E-01	-3.194E-01	+3.660E-01	0.0012
ron		Y =	0.4629	-3.979E-01	-9.030E-01	+1.623E-01	0.0010
		Z =	1.3966	-2.787E-01	+2.875E-01	+9.163E-01	0.0008

35mm Still Camera System For Head Anthropometry Of HRV # = 0000

T R I A N G U L A T E D O B J E C T P O I N T S

Ident		Position (meters)		Error Ellipsoid --->			Length (m)
	X =	-0.0706	-9.062E-01	-9.043E-02	-4.131E-01		0.0010
rtp	Y =	0.4101	+1.213E-02	+9.709E-01	-2.391E-01		0.0009
	Z =	1.3440	+4.227E-01	-2.217E-01	-8.787E-01		0.0007
	X =	-0.5100	+3.537E-01	+8.447E-01	+4.017E-01		0.0005
cen1 *0*	Y =	0.6712	+9.205E-01	-3.906E-01	+1.076E-02		0.0005
	Z =	1.4376	-1.660E-01	-3.660E-01	+9.157E-01		0.0004
	X =	-0.5603	+3.876E-01	+8.327E-01	+3.955E-01		0.0005
cen2 *0*	Y =	0.6735	+9.087E-01	-4.173E-01	-1.197E-02		0.0005
	Z =	1.4379	-1.551E-01	-3.640E-01	+9.184E-01		0.0004
	X =	-0.5579	+2.952E-01	+8.713E-01	+3.921E-01		0.0005
cen3 *0*	Y =	0.7228	-9.162E-01	+3.746E-01	-1.427E-01		0.0004
	Z =	1.4373	+2.712E-01	+3.171E-01	-9.088E-01		0.0004
	X =	-0.5088	+2.427E-01	+8.880E-01	+3.906E-01		0.0005
cen4 *0*	Y =	0.7204	-9.322E-01	+3.250E-01	-1.597E-01		0.0004
	Z =	1.4367	+2.687E-01	+3.253E-01	-9.066E-01		0.0004
	X =	-0.5098	+8.928E-01	+3.322E-01	+3.044E-01		0.0005
cen5 *0*	Y =	0.6720	+3.433E-01	-9.390E-01	+1.769E-02		0.0005
	Z =	1.3875	-2.917E-01	-8.872E-02	+9.524E-01		0.0005
	X =	-0.5591	+2.735E-01	+8.447E-01	+4.601E-01		0.0005
cen7 *0*	Y =	0.7230	-9.529E-01	+1.728E-01	+2.491E-01		0.0005
	Z =	1.3882	-1.309E-01	+5.065E-01	-8.522E-01		0.0004
	X =	-0.5100	+3.384E-01	+8.141E-01	+4.719E-01		0.0005
cen8 *0*	Y =	0.7208	-9.300E-01	+3.659E-01	+3.568E-02		0.0005
	Z =	1.3866	+1.436E-01	+4.509E-01	-8.809E-01		0.0004
	X =	-0.5055	+2.826E-01	+8.346E-01	+4.729E-01		0.0005
lfc1 *0*	Y =	0.8180	-9.352E-01	+3.494E-01	-5.767E-02		0.0004
	Z =	1.4372	+2.133E-01	+4.259E-01	-8.792E-01		0.0004
	X =	-0.5567	+3.439E-01	+8.135E-01	+4.690E-01		0.0005
lfc2 *0*	Y =	0.8207	-9.138E-01	+4.050E-01	-3.237E-02		0.0004
	Z =	1.4369	+2.163E-01	+4.174E-01	-8.826E-01		0.0004
	X =	-0.5565	+3.322E-01	+8.015E-01	+4.973E-01		0.0005
lfc3 *0*	Y =	0.8683	-9.201E-01	+3.913E-01	-1.592E-02		0.0004
	Z =	1.4363	+2.073E-01	+4.523E-01	-8.675E-01		0.0004
	X =	-0.5055	+2.665E-01	+8.232E-01	+5.012E-01		0.0005
lfc4 *0*	Y =	0.8666	-9.448E-01	+3.260E-01	-3.312E-02		0.0004
	Z =	1.4361	+1.907E-01	+4.647E-01	-8.647E-01		0.0004
	X =	-0.5069	+9.451E-01	+8.341E-02	+3.160E-01		0.0005
lfc5 *0*	Y =	0.8188	-1.117E-01	+9.911E-01	+7.251E-02		0.0005
	Z =	1.3870	+3.072E-01	+1.038E-01	-9.460E-01		0.0005

TRIANGULATED OBJECT POINTS

Ident		Position (meters)		Error Ellipsoid --->			Length (m)
		X =	-0.5532	+8.593E-01	-4.584E-01	+2.269E-01	0.0005
lfc6	*0*	Y =	0.8198	+2.727E-01	+3.526E-02	-9.614E-01	0.0005
		Z =	1.3869	+4.327E-01	+8.881E-01	+1.553E-01	0.0005
		X =	-0.4037	-4.215E-01	+8.180E-01	-3.914E-01	0.0005
rtc1	*0*	Y =	0.2540	+8.048E-01	+5.363E-01	+2.542E-01	0.0005
		Z =	1.2358	+4.179E-01	-2.079E-01	-8.844E-01	0.0004
		X =	-0.4541	+3.137E-01	-8.902E-01	+3.303E-01	0.0005
rtc2	*0*	Y =	0.2533	+8.403E-01	+4.223E-01	+3.400E-01	0.0005
		Z =	1.2357	+4.421E-01	-1.709E-01	-8.805E-01	0.0005
		X =	-0.4547	+1.869E-01	-8.621E-01	+4.709E-01	0.0005
rtc3	*0*	Y =	0.3021	-9.756E-01	-1.067E-01	+1.918E-01	0.0005
		Z =	1.2352	+1.151E-01	+4.953E-01	+8.611E-01	0.0005
		X =	-0.4045	+1.603E-01	-8.372E-01	+5.229E-01	0.0005
rtc5	*0*	Y =	0.2531	-9.812E-01	-7.725E-02	+1.771E-01	0.0005
		Z =	1.1856	+1.079E-01	+5.414E-01	+8.338E-01	0.0005
		X =	-0.4535	+4.067E-01	-7.400E-01	+5.358E-01	0.0005
rtc6	*0*	Y =	0.2513	-9.050E-01	-4.063E-01	+1.257E-01	0.0005
		Z =	1.1860	-1.247E-01	+5.360E-01	+8.350E-01	0.0005
		X =	-0.4053	-5.881E-02	+8.851E-01	+4.616E-01	0.0005
rtc8	*0*	Y =	0.3028	-1.712E-01	-4.645E-01	+8.689E-01	0.0005
		Z =	1.1850	+9.835E-01	-2.793E-02	+1.789E-01	0.0005
		X =	-0.1509	+9.300E-01	-9.533E-02	+3.549E-01	0.0010
ear1-l		Y =	0.6571	-7.646E-02	+8.944E-01	+4.406E-01	0.0009
		Z =	1.3362	+3.594E-01	+4.370E-01	-8.246E-01	0.0007
		X =	-0.1526	-9.136E-01	-1.155E-01	-3.899E-01	0.0010
ear1-r		Y =	0.3485	+3.329E-03	+9.566E-01	-2.913E-01	0.0009
		Z =	1.3329	+4.067E-01	-2.674E-01	-8.736E-01	0.0007
		X =	-0.1599	+9.319E-01	-6.985E-02	+3.560E-01	0.0010
ear2-l		Y =	0.6375	-8.969E-02	+9.065E-01	+4.126E-01	0.0009
		Z =	1.3469	+3.515E-01	+4.165E-01	-8.384E-01	0.0007
		X =	-0.1618	+8.437E-01	-3.316E-01	+4.221E-01	0.0012
ear2-r		Y =	0.3679	-4.396E-01	-8.782E-01	+1.887E-01	0.0010
		Z =	1.3448	-3.081E-01	+3.447E-01	+8.867E-01	0.0008
		X =	-0.1683	+9.337E-01	-4.142E-02	+3.556E-01	0.0010
ear3-l		Y =	0.6178	-1.053E-01	+9.175E-01	+3.834E-01	0.0009
		Z =	1.3587	+3.422E-01	+3.955E-01	-8.524E-01	0.0007
		X =	-0.1709	+8.466E-01	-3.439E-01	+4.063E-01	0.0012
ear3-r		Y =	0.3871	-4.424E-01	-8.790E-01	+1.778E-01	0.0010
		Z =	1.3569	-2.960E-01	+3.302E-01	+8.963E-01	0.0008

T R I A N G U L A T E D O B J E C T P O I N T S

Ident	Position (meters)		Error Ellipsoid --->			Length (m)
ear4-l	X =	-0.1768	+4.624E-01	+7.382E-01	+4.912E-01	0.0012
	Y =	0.5971	+8.481E-01	-5.299E-01	-2.032E-03	0.0010
	Z =	1.3694	+2.588E-01	+4.175E-01	-8.711E-01	0.0008
ear4-r	X =	-0.1807	+8.481E-01	-3.572E-01	+3.913E-01	0.0012
	Y =	0.4057	-4.471E-01	-8.787E-01	+1.670E-01	0.0010
	Z =	1.3682	-2.842E-01	+3.166E-01	+9.050E-01	0.0008

S U M M A R Y S T A T I S T I C S F O R O B J E C T P O I N T S

RMS For Standard Deviations

Count =	13	X =	0.0010 meters
Count =	13	Y =	0.0009 meters
Count =	13	Z =	0.0008 meters

35mm Still Camera System For Head Anthropometry Of HRV # = 0000

CORRECTIONS APPLIED TO OBJECT CONTROL

	X =	0.0000 m		X =	0.0000 m
lfc1	Y =	-0.0001 m	rtc1	Y =	0.0000 m
	Z =	0.0001 m		Z =	0.0003 m
	X =	-0.0005 m		X =	0.0006 m
cen1	Y =	0.0002 m	lfc2	Y =	0.0000 m
	Z =	0.0000 m		Z =	0.0001 m
	X =	0.0001 m		X =	0.0000 m
rtc2	Y =	0.0000 m	cen2	Y =	0.0001 m
	Z =	0.0003 m		Z =	0.0000 m
	X =	0.0012 m		X =	0.0002 m
lfc3	Y =	-0.0001 m	rtc3	Y =	-0.0001 m
	Z =	-0.0001 m		Z =	-0.0001 m
	X =	-0.0004 m		X =	0.0004 m
cen3	Y =	0.0003 m	lfc4	Y =	0.0000 m
	Z =	0.0000 m		Z =	-0.0004 m
	X =	-0.0006 m		X =	0.0001 m
cen4	Y =	0.0001 m	lfc5	Y =	0.0000 m
	Z =	-0.0002 m		Z =	0.0000 m
	X =	0.0000 m		X =	0.0000 m
rtc5	Y =	0.0001 m	cen5	Y =	0.0001 m
	Z =	0.0002 m		Z =	0.0001 m
	X =	0.0001 m		X =	0.0002 m
lfc6	Y =	0.0001 m	rtc6	Y =	0.0002 m
	Z =	-0.0001 m		Z =	0.0002 m
	X =	-0.0009 m		X =	0.0002 m
cen7	Y =	0.0000 m	rtc8	Y =	0.0001 m
	Z =	0.0003 m		Z =	-0.0001 m
	X =	0.0001 m		X =	-0.0002 m
cen8	Y =	0.0001 m	a	Y =	-0.0001 m
	Z =	0.0001 m		Z =	-0.0003 m
	X =	-0.0003 m		X =	-0.0001 m
b	Y =	-0.0001 m	c	Y =	-0.0002 m
	Z =	-0.0009 m		Z =	-0.0002 m
	X =	-0.0001 m		X =	0.0001 m
d	Y =	-0.0001 m	f	Y =	-0.0001 m
	Z =	-0.0002 m		Z =	0.0001 m
	X =	0.0001 m		X =	0.0001 m
g	Y =	-0.0008 m	h	Y =	0.0004 m
	Z =	0.0002 m		Z =	0.0005 m

C O R R E C T I O N S A P P L I E D T O O B J E C T C O N T R O L

	X =	0.0000 m		X =	0.0000 m
j	Y =	0.0000 m	k	Y =	-0.0001 m
	Z =	0.0003 m		Z =	-0.0002 m

X .... Number of Components = 28 RMS = 0.0004 meters
Y .... Number of Components = 28 RMS = 0.0002 meters
Z .... Number of Components = 28 RMS = 0.0003 meters

A N T H R O P O M E T R Y O U T P U T

T-PLATE ORIGIN WITH RESPECT TO HEAD ANATOMICAL ORIGIN

X= 15.8314cm Y= -0.3694cm Z= -0.1397cm

T-PLATE ORIENTATION WITH RESPECT TO HEAD ANATOMICAL SYSTEM

-0.460303	0.013689	-0.887657
0.026691	0.999642	0.001575
0.887361	-0.022968	-0.460503

Appendix 3

Initial Conditions

Sample image file for initial conditions

#1	-55.003	0.055	0.055	#1-580	
a	-12.3229	9.0747		Photo	#1
j	-0.1462	12.0458		Photo	#1
k	-1.1604	0.1484		Photo	#1
rtc1	-2.6443	-8.1870		Photo	#1
rtc2	-5.0185	-8.3058		Photo	#1
rtc3	-5.2952	-7.1772		Photo	#1
rtc4	-3.0332	-7.1048		Photo	#1
rtc5	-2.7811	-10.2187		Photo	#1
rtc6	-5.0491	-10.4173		Photo	#1
m_r1	9.3830	-0.3995		Photo	#1
m_r4	9.0757	0.0168		Photo	#1
m_t1	10.4282	2.6233		Photo	#1
m_b1	10.7903	1.0147		Photo	#1
m_b4	10.4137	1.4097		Photo	#1
t_r1	-3.2238	-1.3632		Photo	#1
t_r4	-3.2952	-0.9265		Photo	#1
t_c1	-6.2339	0.1084		Photo	#1
t_c4	-6.2729	0.5269		Photo	#1
t_l1	-3.7334	1.0037		Photo	#1
t_l4	-3.7434	1.3314		Photo	#1
********					
#2	-55.003	0.055	0.055	#2-736	
a	-11.5539	7.9885		Photo	#2
b	-8.4188	8.3810		Photo	#2
d	-8.1138	-0.4059		Photo	#2
j	14.1446	8.3757		Photo	#2
k	15.0071	-3.7281		Photo	#2
rtc1	-9.7779	-5.8816		Photo	#2
rtc2	-11.2553	-5.5416		Photo	#2
rtc3	-10.0937	-4.9038		Photo	#2
rtc4	-8.6489	-5.2763		Photo	#2
rtc5	-9.6890	-7.6234		Photo	#2
rtc6	-11.1618	-7.2694		Photo	#2
rtc8	-8.6150	-7.0114		Photo	#2
m_r1	4.4242	-2.3108		Photo	#2
m_r4	4.8398	-2.0305		Photo	#2
m_t1	7.0405	0.1411		Photo	#2
m_t4	7.3903	0.3570		Photo	#2
m_b1	7.6067	-1.4941		Photo	#2
m_b4	7.9171	-1.2198		Photo	#2
t_r1	-5.7092	-1.1412		Photo	#2
t_r4	-5.2085	-0.8800		Photo	#2
t_c1	-5.9850	0.1581		Photo	#2
t_c4	-5.5242	0.4019		Photo	#2
********					
#3	-55.005	0.055	0.055	#3-674	
a	-1.9449	6.5747		Photo	#3
b	2.7335	6.4519		Photo	#3
c	-2.1652	-2.8557		Photo	#3
g	-13.6841	6.6583		Photo	#3
h	7.2667	7.1524		Photo	#3
rtc1	-6.8213	-6.6127		Photo	#3
rtc2	-7.1799	-5.9485		Photo	#3
rtc3	-5.4639	-5.7723		Photo	#3
rtc4	-5.0687	-6.4261		Photo	#3
rtc6	-7.2172	-7.6036		Photo	#3
rtc8	-5.1318	-8.1290		Photo	#3

lfc1	11.1441	2.3952		Photo	#3
lfc2	10.4525	2.7489		Photo	#3
lfc3	11.7575	2.8220		Photo	#3
lfc4	12.5596	2.4495		Photo	#3
lfc5	10.9825	0.8464		Photo	#3
lfc6	10.3387	1.1965		Photo	#3
m_r1	4.1134	-6.9140		Photo	#3
m_r4	5.0916	-6.7914		Photo	#3
m_t1	7.7366	-4.9568		Photo	#3
m_t4	8.6945	-4.9103		Photo	#3
m_b1	8.0382	-7.1358		Photo	#3
m_b4	8.9526	-6.9838		Photo	#3
m_l1	9.4809	-6.3654		Photo	#3
m_l4	10.3704	-6.2970		Photo	#3
t_r4	0.4015	-3.2213		Photo	#3
********					
#4	-55.004	0.055	0.055	#4-623	
a	-4.1247	9.4416		Photo	#4
b	1.0530	9.2320		Photo	#4
f	8.3093	-7.8413		Photo	#4
g	-8.9406	9.7243		Photo	#4
h	13.7389	9.9850		Photo	#4
rtc1	-11.3965	-3.6032		Photo	#4
rtc3	-9.2470	-2.9755		Photo	#4
rtc4	-9.6029	-3.6131		Photo	#4
rtc5	-11.2399	-5.2740		Photo	#4
rtc8	-9.5268	-5.3236		Photo	#4
cen1	4.3395	4.5554		Photo	#4
cen2	4.3921	4.9817		Photo	#4
cen3	6.1954	4.9790		Photo	#4
cen4	6.1863	4.5563		Photo	#4
cen5	4.3329	2.8398		Photo	#4
cen8	6.1349	2.7898		Photo	#4
lfc1	9.8721	4.4781		Photo	#4
lfc2	9.7797	4.9047		Photo	#4
lfc3	11.5840	4.9463		Photo	#4
lfc4	11.6941	4.4723		Photo	#4
lfc5	9.7896	2.7554		Photo	#4
m_r1	-7.0371	-4.9656		Photo	#4
m_r4	-5.9191	-4.9676		Photo	#4
m_t1	-4.4465	-3.2918		Photo	#4
m_t4	-3.2582	-3.2647		Photo	#4
m_b1	-4.3442	-5.5753		Photo	#4
m_b4	-3.1496	-5.5666		Photo	#4
m_l1	-0.8598	-4.9654		Photo	#4
m_l4	0.2410	-5.0359		Photo	#4
t_l4	1.3671	-0.8491		Photo	#4
********					
#5	-55.002	0.055	0.055	#5-591	
a	2.9678	12.0539		Photo	#5
b	7.1615	11.2085		Photo	#5
c	2.8039	1.9720		Photo	#5
d	6.7478	0.7786		Photo	#5
f	7.3448	-9.3246		Photo	#5
cen1	7.6531	5.4993		Photo	#5
cen2	8.9951	5.9094		Photo	#5
cen3	10.6691	5.4514		Photo	#5
cen4	9.2615	5.0707		Photo	#5
cen5	7.5430	3.5462		Photo	#5
cen7	10.4953	3.5461		Photo	#5

cen8	9.1427	3.0377		Photo	#5
lfc1	12.7104	4.1477		Photo	#5
lfc2	14.1182	4.6233		Photo	#5
lfc3	15.9527	4.1538		Photo	#5
lfc4	14.6124	3.6750		Photo	#5
lfc5	12.5421	2.0721		Photo	#5
m_r1	-12.6128	-0.5163		Photo	#5
m_t1	-13.0016	0.6208		Photo	#5
m_t4	-12.3250	0.3306		Photo	#5
m_b1	-13.3864	-1.4529		Photo	#5
m_b4	-12.7357	-1.8011		Photo	#5
m_l1	-9.3173	-2.0240		Photo	#5
m_l4	-8.6748	-2.4231		Photo	#5
t_c1	1.0887	2.3089		Photo	#5
t_c4	1.7164	2.1428		Photo	#5
t_l1	1.0997	0.7886		Photo	#5
t_l4	1.7560	0.5204		Photo	#5
********					
#6	-55.005	0.055	0.055	#6-806	
b	14.8346	6.9224		Photo	#6
rtc2	5.8371	-1.7465		Photo	#6
rtc3	5.7615	-2.6224		Photo	#6
cen1	8.9069	-1.2350		Photo	#6
cen2	12.1375	-1.5026		Photo	#6
cen3	12.1562	-2.9709		Photo	#6
cen4	8.7701	-2.7357		Photo	#6
cen7	11.5253	-5.8835		Photo	#6
cen8	8.6243	-5.6181		Photo	#6
lfc1	8.5077	-5.7265		Photo	#6
lfc2	12.3561	-6.1046		Photo	#6
lfc3	12.5171	-8.1391		Photo	#6
lfc4	8.5251	-7.7862		Photo	#6
m_r4	-12.1645	-0.2939		Photo	#6
m_t1	-15.1312	1.7025		Photo	#6
m_t4	-15.5705	1.2272		Photo	#6
m_b1	-15.7057	-0.2357		Photo	#6
m_b4	-16.1516	-0.7614		Photo	#6
m_l1	-14.0539	-2.3048		Photo	#6
m_l4	-14.5220	-2.9318		Photo	#6
t_r1	2.7032	-1.2649		Photo	#6
t_r4	2.5565	-1.7554		Photo	#6
t_c1	5.7031	-2.7130		Photo	#6
t_c4	5.6178	-3.2287		Photo	#6
t_l1	1.6812	-4.3144		Photo	#6
t_l4	1.4217	-4.9378		Photo	#6
********					

Object Space Reference System is Rectangular

Rotation Angles are Object-to-Photo

Complete Triangulation process is requested

Error Propagation is requested

[Variance/Covariance output]

Unit Variance will be based on completely free camera parameters

All Image Residuals will be listed

Triangulated Object Coordinates will be saved

Adjusted Camera Station Parameters will be saved

E R R O R W A R N I N G S

POINTS NOT PHOTOGRAPHED

rtc7 cen6

35mm Still Camera System For Initial Conditions RUN # = 1z0741

	CAMERA STATIONS			CORRECTIONS		
	POSITION			ATTITUDE		
	X	Y	Z	Omega	Phi	Kappa
			Iteration 1			
#1	-0.0003	0.0018	-0.0022 m.	0.001295	-0.000274	0.000453
#2	-0.0004	0.0011	-0.0009 m.	0.000337	0.000127	-0.000020
#3	0.0000	-0.0004	0.0004 m.	-0.000015	-0.000425	0.000187
#4	0.0001	0.0007	-0.0009 m.	-0.001092	0.000268	0.001123
#5	-0.0013	0.0008	-0.0003 m.	-0.000680	-0.000879	0.000848
#6	-0.0002	-0.0010	-0.0007 m.	-0.000295	-0.000158	0.000666

Provisional Weighted Sum of Squares = 294.199

			Iteration 2			
#1	0.0000	0.0000	0.0000 m.	0.000002	-0.000001	-0.000002
#2	0.0000	0.0000	0.0000 m.	0.000001	0.000000	-0.000001
#3	0.0000	0.0000	0.0000 m.	-0.000001	0.000001	0.000000
#4	0.0000	0.0000	0.0000 m.	0.000000	0.000001	0.000000
#5	0.0000	0.0000	0.0000 m.	-0.000003	-0.000001	0.000003
#6	0.0000	0.0000	0.0000 m.	0.000000	-0.000001	0.000002

Provisional Weighted Sum of Squares = 281.517

			Iteration 3			
#1	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000
#2	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000
#3	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000
#4	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000
#5	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000
#6	0.0000	0.0000	0.0000 m.	0.000000	0.000000	0.000000

Provisional Weighted Sum of Squares = 281.519

T R I A N G U L A T E D I M A G E P O I N T S R E S I D U A L S
(in micrometers)

a *0*	#1	#2	#3	#4	#5	
	58	14	22	-40	-73	
	-39	-23	112	144	32	
j *0*	#1	#2				
	-9	-52				
	-78	-49				
k *0*	#2	#1				
	9	-37				
	41	118				
rtc1 *0*	#2	#3	#1	#4		
	3	-17	-33	-12		
	-19	4	14	0		
rtc2 *0*	#2	#3	#1	#6		
	-21	-8	-56	-34		
	6	5	8	-18		
rtc3 *0*	#1	#2	#3	#4	#6	
	-43	-3	31	33	-21	
	-1	-23	-20	34	-6	
rtc4 *0*	#1	#2	#3	#4		
	-17	6	16	-6		
	8	-13	-30	-14		
rtc5 *0*	#2	#1	#4			
	-30	-24	-54			
	-30	-33	-34			
rtc6 *0*	#2	#1	#3			
	-39	-47	-29			
	-11	8	-42			
m_r1	#2	#3	#1	#4	#5	
	13	-37	5	1	24	
	-1	-24	60	-24	1	
m_r4	#1	#2	#3	#4	#6	
	-3	-6	-4	16	5	
	10	2	-28	-12	30	
m_t1	#3	#1	#2	#4	#5	#6
	-33	22	21	20	-5	8
	0	6	3	27	-3	-33
m_b1	#3	#1	#4	#2	#5	#6
	-40	0	5	-6	-21	6
	19	82	-35	9	-21	-34

35mm Still Camera System For Initial Conditions RUN # = lz0741

T R I A N G U L A T E D I M A G E P O I N T S R E S I D U A L S
(in micrometers)

m_b4	#1	#3	#4	#5	#2	#6
	5	39	22	-17	-14	39
	-6	-14	-37	33	-10	34
t_r1	#1	#2	#6			
	64	-19	41			
	9	22	-30			
t_r4	#2	#3	#1	#6		
	8	9	35	32		
	2	19	-18	-3		
t_c1	#2	#5	#1	#6		
	-18	7	21	-2		
	14	19	-8	-18		
t_c4	#1	#5	#2	#6		
	5	24	8	-5		
	-32	9	7	14		
t_l1	#1	#5	#6			
	37	36	-2			
	-42	48	-6			
t_l4	#4	#5	#1	#6		
	0	37	13	-17		
	-1	41	-49	4		
b *0*	#5	#3	#6	#4	#2	
	-2	39	-68	-3	21	
	-38	82	115	113	-1	
d *0*	#5	#2				
	4	83				
	18	64				
rtc8 *0*	#2	#3	#4			
	34	65	37			
	19	-49	-12			
m_t4	#4	#2	#5	#6	#3	
	29	-6	-40	26	0	
	-22	0	-4	0	29	
c *0*	#5	#3				
	-45	51				
	36	14				
g *0*	#4	#3				
	253	64				
	21	16				

T R I A N G U L A T E D I M A G E P O I N T S R E S I D U A L S
(in micrometers)

h *0*	#3	#4		
	-121	-162		
	-113	-151		
lfc1 *0*	#5	#4	#6	#3
	15	-26	-35	-19
	8	54	-61	39
lfc2 *0*	#5	#4	#6	#3
	-29	-39	61	-35
	-22	55	-82	35
lfc3 *0*	#5	#3	#4	#6
	0	40	-91	140
	-21	-6	-20	14
lfc4 *0*	#4	#3	#5	#6
	-10	-4	35	-26
	17	14	-27	54
lfc5 *0*	#3	#4	#5	
	9	-14	61	
	-10	-19	-23	
lfc6 *0*	#3			
	-18			
	-8			
m_l1_	#5	#3	#4	#6
	2	-23	30	0
	0	2	-29	29
m_l4	#5	#6	#4	#3
	6	27	46	3
	19	73	-48	-47
f *0*	#5	#4		
	115	31		
	61	-116		
cen1 *0*	#5	#6	#4	
	-21	-122	-17	
	-2	-51	68	
cen2 *0*	#4	#5	#6	
	-10	-11	-68	
	70	-20	-39	
cen3 *0*	#4	#6	#5	
	-21	-73	-88	
	16	17	-1	

T R I A N G U L A T E D I M A G E P O I N T S R E S I D U A L S
(in micrometers)

cen4 *0*	#5	#6	#4
	-3	-77	-17
	-32	51	9
cen5 *0*	#5	#4	
	11	-9	
	-39	-17	
cen8 *0*	#4	#6	#5
	-15	-49	36
	-7	-36	-5
cen7 *0*	#6	#5	
	199	-63	
	-8	-53	

Weighted Sum of Squares (Camera)	=	2.7
Weighted Sum of Squares (Object)	=	29.7
Weighted Sum of Squares (Plates)	=	206.8
Weighted Sum of Squares (Total)	=	239.1
Degrees of Freedom.....	=	226

a posteriori Variance of Unit Weight = 1.058

T R I A N G U L A T E D C A M E R A S T A T I O N S
(Object to Photo)

Ident	Position/Attitude		Covariance Matrix		
#1	X =	-0.5693 m.	+2.472E-06	-2.834E-07	-7.670E-08
	Y =	-0.7502 m.	-2.834E-07	+3.121E-06	-9.909E-07
	Z =	1.8078 m.	-7.670E-08	-9.909E-07	+3.227E-06
	Omega =	68 48 42.1261	+1.412E-06	+2.358E-08	-3.042E-08
	Phi =-	11 09 4.2833	+2.358E-08	+1.411E-06	-4.787E-07
	Kappa =-	00 46 34.3309	-3.042E-08	-4.787E-07	+2.272E-06
#2	X =	0.4816 m.	+4.159E-06	-1.781E-07	+4.103E-07
	Y =	-0.7639 m.	-1.781E-07	+2.842E-06	-2.332E-07
	Z =	1.8031 m.	+4.103E-07	-2.332E-07	+3.734E-06
	Omega =	70 27 24.3912	+1.765E-06	+1.012E-08	-9.949E-07
	Phi =	28 40 33.3514	+1.012E-08	+1.366E-06	-1.963E-07
	Kappa =	09 40 57.0275	-9.949E-07	-1.963E-07	+2.095E-06
#3	X =	0.9470 m.	+2.668E-06	-3.385E-07	+6.300E-07
	Y =	0.0206 m.	-3.385E-07	+2.561E-06	-9.962E-07
	Z =	1.7804 m.	+6.300E-07	-9.962E-07	+2.261E-06
	Omega =	48 10 49.3796	+3.464E-06	-7.784E-08	-2.324E-06
	Phi =	67 28 29.8539	-7.784E-08	+1.151E-06	-1.911E-07
	Kappa =	41 11 5.5096	-2.324E-06	-1.911E-07	+3.114E-06
#4	X =	0.9411 m.	+2.285E-06	+1.477E-07	+6.563E-07
	Y =	0.6447 m.	+1.477E-07	+9.927E-07	+3.394E-07
	Z =	1.7801 m.	+6.563E-07	+3.394E-07	+2.726E-06
	Omega =-	10 53 55.1105	+3.989E-06	-7.013E-08	-2.903E-06
	Phi =	71 34 28.2392	-7.013E-08	+1.114E-06	-5.118E-08
	Kappa =	100 58 35.8532	-2.903E-06	-5.118E-08	+3.393E-06
#5	X =	0.5187 m.	+3.328E-06	-1.062E-06	-3.234E-07
	Y =	1.4588 m.	-1.062E-06	+3.632E-06	+3.343E-07
	Z =	1.8037 m.	-3.234E-07	+3.343E-07	+3.118E-06
	Omega =-	61 01 20.0071	+3.112E-06	+1.363E-07	-1.356E-06
	Phi =	40 33 5.0254	+1.363E-07	+2.577E-06	-4.903E-08
	Kappa =	159 57 14.1435	-1.356E-06	-4.903E-08	+2.022E-06
#6	X =	-0.4832 m.	+1.439E-06	+7.576E-07	+4.550E-07
	Y =	1.4709 m.	+7.576E-07	+2.093E-06	+6.503E-07
	Z =	1.7913 m.	+4.550E-07	+6.503E-07	+1.964E-06
	Omega =-	66 54 43.9126	+1.715E-06	+1.455E-07	-4.587E-07
	Phi =-	07 22 15.2293	+1.455E-07	+1.709E-06	+1.723E-07
	Kappa =-	176 26 11.4209	-4.587E-07	+1.723E-07	+1.826E-06

S U M M A R Y S T A T I S T I C S F O R C A M E R A S T A T I O N S

RMS For Standard Deviations

		X =	0.0017 m.	Omega =	00 05 31.0496
Count =	6	Y =	0.0016 m.	Phi =	00 04 17.1850
		Z =	0.0017 m.	Kappa =	00 05 23.0937

T R I A N G U L A T E D O B J E C T P O I N T S

Ident		Position (meters)		Covariance Matrix			Std Dev (m)
		X =	-0.5963	+2.132E-07	-1.404E-09	+7.288E-09	0.0005
a	*0*	Y =	0.4333	-1.404E-09	+2.073E-07	-2.505E-09	0.0005
		Z =	1.5582	+7.288E-09	-2.505E-09	+1.802E-07	0.0004
		X =	-0.5987	+1.935E-07	+4.405E-09	+6.770E-09	0.0004
b	*0*	Y =	0.5794	+4.405E-09	+2.045E-07	+7.760E-09	0.0005
		Z =	1.5512	+6.770E-09	+7.760E-09	+1.679E-07	0.0004
		X =	-0.5974	+2.506E-07	+4.384E-09	+9.483E-09	0.0005
c	*0*	Y =	0.4331	+4.384E-09	+2.343E-07	+2.500E-09	0.0005
		Z =	1.2671	+9.483E-09	+2.500E-09	+2.299E-07	0.0005
		X =	-0.6000	+2.422E-07	+2.404E-09	+8.158E-09	0.0005
d	*0*	Y =	0.5799	+2.404E-09	+2.404E-07	+1.092E-09	0.0005
		Z =	1.2679	+8.158E-09	+1.092E-09	+2.295E-07	0.0005
		X =	-0.3882	+2.444E-07	+7.522E-09	+1.820E-08	0.0005
f	*0*	Y =	0.7804	+7.522E-09	+2.206E-07	+7.359E-09	0.0005
		Z =	1.1261	+1.820E-08	+7.359E-09	+2.250E-07	0.0005
		X =	-1.3388	+2.637E-07	+1.580E-09	+2.340E-09	0.0005
g	*0*	Y =	0.1418	+1.580E-09	+2.438E-07	+5.912E-10	0.0005
		Z =	1.4576	+2.340E-09	+5.912E-10	+2.464E-07	0.0005
		X =	-1.3460	+2.625E-07	-4.958E-09	+1.934E-09	0.0005
h	*0*	Y =	1.0591	-4.958E-09	+2.464E-07	-1.557E-09	0.0005
		Z =	1.4604	+1.934E-09	-1.557E-09	+2.467E-07	0.0005
		X =	-0.1419	+2.474E-07	-8.057E-10	+2.920E-11	0.0005
j	*0*	Y =	1.4442	-8.057E-10	+2.630E-07	-2.600E-09	0.0005
		Z =	1.4727	+2.920E-11	-2.600E-09	+2.470E-07	0.0005
		X =	-0.1180	+2.525E-07	-4.323E-10	+2.056E-10	0.0005
k	*0*	Y =	1.6640	-4.323E-10	+2.625E-07	-3.850E-09	0.0005
		Z =	0.8864	+2.056E-10	-3.850E-09	+2.537E-07	0.0005
		X =	-0.5101	+1.933E-07	+1.116E-08	+8.239E-09	0.0004
cen1	*0*	Y =	0.6710	+1.116E-08	+2.152E-07	+1.900E-08	0.0005
		Z =	1.4377	+8.239E-09	+1.900E-08	+1.813E-07	0.0004
		X =	-0.5606	+1.938E-07	+1.360E-08	+8.820E-09	0.0004
cen2	*0*	Y =	0.6734	+1.360E-08	+2.163E-07	+1.907E-08	0.0005
		Z =	1.4380	+8.820E-09	+1.907E-08	+1.825E-07	0.0004
		X =	-0.5581	+1.893E-07	+1.353E-08	+9.033E-09	0.0004
cen3	*0*	Y =	0.7229	+1.353E-08	+2.132E-07	+2.084E-08	0.0005
		Z =	1.4372	+9.033E-09	+2.084E-08	+1.797E-07	0.0004
		X =	-0.5087	+1.891E-07	+1.084E-08	+8.284E-09	0.0004
cen4	*0*	Y =	0.7205	+1.084E-08	+2.121E-07	+2.070E-08	0.0005
		Z =	1.4368	+8.284E-09	+2.070E-08	+1.787E-07	0.0004

TRIANGULATED OBJECT POINTS

Ident		Position (meters)		Covariance Matrix			Std Dev (m)
		X =	-0.5098	+2.498E-07	+1.198E-08	+1.202E-08	0.0005
cen5	*0*	Y =	0.6719	+1.198E-08	+2.223E-07	+4.425E-09	0.0005
		Z =	1.3876	+1.202E-08	+4.425E-09	+2.180E-07	0.0005
		X =	-0.5573	+1.918E-07	+1.485E-08	+7.361E-09	0.0004
cen7	*0*	Y =	0.7231	+1.485E-08	+2.307E-07	+2.636E-08	0.0005
		Z =	1.3880	+7.361E-09	+2.636E-08	+1.964E-07	0.0004
		X =	-0.5103	+1.907E-07	+1.073E-08	+8.803E-09	0.0004
cen8	*0*	Y =	0.7205	+1.073E-08	+2.110E-07	+2.237E-08	0.0005
		Z =	1.3867	+8.803E-09	+2.237E-08	+1.831E-07	0.0004
		X =	-0.5056	+1.791E-07	+5.287E-09	+8.325E-09	0.0004
lfc1	*0*	Y =	0.8180	+5.287E-09	+1.949E-07	+2.036E-08	0.0004
		Z =	1.4372	+8.325E-09	+2.036E-08	+1.668E-07	0.0004
		X =	-0.5568	+1.784E-07	+8.663E-09	+9.529E-09	0.0004
lfc2	*0*	Y =	0.8207	+8.663E-09	+1.960E-07	+2.082E-08	0.0004
		Z =	1.4371	+9.529E-09	+2.082E-08	+1.680E-07	0.0004
		X =	-0.5568	+1.754E-07	+8.767E-09	+9.486E-09	0.0004
lfc3	*0*	Y =	0.8686	+8.767E-09	+1.933E-07	+2.209E-08	0.0004
		Z =	1.4364	+9.486E-09	+2.209E-08	+1.681E-07	0.0004
		X =	-0.5060	+1.768E-07	+5.248E-09	+7.844E-09	0.0004
lfc4	*0*	Y =	0.8667	+5.248E-09	+1.923E-07	+2.165E-08	0.0004
		Z =	1.4362	+7.844E-09	+2.165E-08	+1.669E-07	0.0004
		X =	-0.5069	+2.446E-07	+3.403E-09	+1.500E-08	0.0005
lfc5	*0*	Y =	0.8186	+3.403E-09	+2.060E-07	+1.735E-09	0.0005
		Z =	1.3871	+1.500E-08	+1.735E-09	+2.042E-07	0.0005
		X =	-0.5533	+2.594E-07	-7.770E-09	+3.614E-09	0.0005
lfc6	*0*	Y =	0.8197	-7.770E-09	+2.489E-07	-2.091E-09	0.0005
		Z =	1.3870	+3.614E-09	-2.091E-09	+2.465E-07	0.0005
		X =	-0.0246	+6.633E-07	-3.162E-08	+1.109E-07	0.0008
m_b1		Y =	0.4993	-3.162E-08	+6.255E-07	-3.339E-09	0.0008
		Z =	1.3496	+1.109E-07	-3.339E-09	+4.601E-07	0.0007
		X =	-0.0258	+6.620E-07	-3.848E-08	+1.098E-07	0.0008
m_b4		Y =	0.5226	-3.848E-08	+6.230E-07	-6.108E-10	0.0008
		Z =	1.3497	+1.098E-07	-6.108E-10	+4.580E-07	0.0007
		X =	-0.0832	+9.260E-07	-4.930E-08	+1.804E-07	0.0010
m_l1		Y =	0.5625	-4.930E-08	+7.074E-07	+8.406E-08	0.0008
		Z =	1.3384	+1.804E-07	+8.406E-08	+5.938E-07	0.0008
		X =	-0.0833	+9.141E-07	-5.845E-08	+1.748E-07	0.0010
m_l4		Y =	0.5851	-5.845E-08	+7.011E-07	+8.506E-08	0.0008
		Z =	1.3368	+1.748E-07	+8.506E-08	+5.884E-07	0.0008

T R I A N G U L A T E D O B J E C T P O I N T S

Ident		Position (meters)		Covariance Matrix			Std Dev (m)
	X =	-0.0838	+8.617E-07	+4.398E-08	+1.838E-07		0.0009
m_r1	Y =	0.4354	+4.398E-08	+7.034E-07	-3.670E-08		0.0008
	Z =	1.3360	+1.838E-07	-3.670E-08	+5.518E-07		0.0007
	X =	-0.0838	+7.969E-07	-1.155E-07	+1.286E-07		0.0009
m_r4	Y =	0.4587	-1.155E-07	+7.325E-07	-5.142E-08		0.0009
	Z =	1.3366	+1.286E-07	-5.142E-08	+5.214E-07		0.0007
	X =	-0.0403	+6.591E-07	-2.988E-08	+9.597E-08		0.0008
m_t1	Y =	0.4968	-2.988E-08	+6.303E-07	-1.364E-09		0.0008
	Z =	1.3919	+9.597E-08	-1.364E-09	+4.389E-07		0.0007
	X =	-0.0411	+7.912E-07	-9.026E-08	+1.315E-07		0.0009
m_t4	Y =	0.5200	-9.026E-08	+6.674E-07	+1.605E-08		0.0008
	Z =	1.3914	+1.315E-07	+1.605E-08	+4.932E-07		0.0007
	X =	-0.4036	+2.104E-07	-3.542E-09	+1.176E-08		0.0005
rtc1	*0* Y =	0.2541	-3.542E-09	+2.056E-07	-1.418E-08		0.0005
	Z =	1.2355	+1.176E-08	-1.418E-08	+1.930E-07		0.0004
	X =	-0.4540	+1.978E-07	-7.738E-09	+6.645E-09		0.0004
rtc2	*0* Y =	0.2533	-7.738E-09	+2.185E-07	-1.028E-08		0.0005
	Z =	1.2354	+6.645E-09	-1.028E-08	+1.926E-07		0.0004
	X =	-0.4548	+1.951E-07	-4.367E-09	+9.780E-09		0.0004
rtc3	*0* Y =	0.3020	-4.367E-09	+2.043E-07	-6.655E-09		0.0005
	Z =	1.2354	+9.780E-09	-6.655E-09	+1.823E-07		0.0004
	X =	-0.4049	+2.119E-07	-4.327E-09	+1.209E-08		0.0005
rtc4	*0* Y =	0.3024	-4.327E-09	+2.070E-07	-1.365E-08		0.0005
	Z =	1.2350	+1.209E-08	-1.365E-08	+1.935E-07		0.0004
	X =	-0.4044	+2.134E-07	-1.299E-09	+7.457E-09		0.0005
rtc5	*0* Y =	0.2533	-1.299E-09	+2.221E-07	-1.578E-08		0.0005
	Z =	1.1857	+7.457E-09	-1.578E-08	+2.076E-07		0.0005
	X =	-0.4535	+2.147E-07	-8.570E-09	+8.392E-09		0.0005
rtc6	*0* Y =	0.2513	-8.570E-09	+2.227E-07	-1.868E-08		0.0005
	Z =	1.1859	+8.392E-09	-1.868E-08	+2.084E-07		0.0005
	X =	-0.4057	+2.405E-07	-7.542E-09	+1.807E-08		0.0005
rtc8	*0* Y =	0.3023	-7.542E-09	+2.129E-07	-6.136E-09		0.0005
	Z =	1.1852	+1.807E-08	-6.136E-09	+2.126E-07		0.0005
	X =	-0.4590	+6.203E-07	+7.998E-08	+5.608E-08		0.0008
t_c1	Y =	0.5008	+7.998E-08	+1.790E-06	+1.594E-07		0.0013
	Z =	1.3277	+5.608E-08	+1.594E-07	+6.257E-07		0.0008
	X =	-0.4584	+6.130E-07	+8.776E-08	+5.769E-08		0.0008
t_c4	Y =	0.5248	+8.776E-08	+1.767E-06	+1.885E-07		0.0013
	Z =	1.3289	+5.769E-08	+1.885E-07	+6.243E-07		0.0008

T R I A N G U L A T E D O B J E C T P O I N T S

Ident	Position (meters)		Covariance Matrix			Std Dev (m)
t_l1	X =	-0.3885	+7.256E-07	+3.110E-07	+1.012E-07	0.0009
	Y =	0.5713	+3.110E-07	+2.347E-06	+5.105E-07	0.0015
	Z =	1.3234	+1.012E-07	+5.105E-07	+8.114E-07	0.0009
t_l4	X =	-0.3864	+6.867E-07	+1.655E-07	+1.048E-07	0.0008
	Y =	0.5959	+1.655E-07	+1.127E-06	+2.188E-07	0.0011
	Z =	1.3234	+1.048E-07	+2.188E-07	+5.964E-07	0.0008
t_r1	X =	-0.3941	+7.665E-07	-2.857E-07	+2.536E-08	0.0009
	Y =	0.4245	-2.857E-07	+2.954E-06	-8.142E-08	0.0017
	Z =	1.3197	+2.536E-08	-8.142E-08	+7.862E-07	0.0009
t_r4	X =	-0.3933	+7.444E-07	-2.396E-07	+6.742E-08	0.0009
	Y =	0.4489	-2.396E-07	+1.487E-06	-5.671E-08	0.0012
	Z =	1.3201	+6.742E-08	-5.671E-08	+6.238E-07	0.0008

S U M M A R Y S T A T I S T I C S F O R O B J E C T P O I N T S

RMS For Standard Deviations

Count =	14	X =	0.0009 meters
Count =	14	Y =	0.0011 meters
Count =	14	Z =	0.0008 meters

CORRECTIONS APPLIED TO OBJECT CONTROL

	X =	-0.0001 m		X =	0.0001 m
lfc1	Y =	-0.0001 m	rtc1	Y =	0.0001 m
	Z =	0.0001 m		Z =	0.0000 m
	X =	-0.0006 m		X =	0.0005 m
cen1	Y =	0.0000 m	lfc2	Y =	0.0000 m
	Z =	0.0001 m		Z =	0.0003 m
	X =	0.0002 m		X =	-0.0003 m
rtc2	Y =	0.0000 m	cen2	Y =	0.0000 m
	Z =	0.0000 m		Z =	0.0001 m
	X =	0.0009 m		X =	0.0001 m
lfc3	Y =	0.0002 m	rtc3	Y =	-0.0002 m
	Z =	0.0000 m		Z =	0.0001 m
	X =	-0.0006 m		X =	-0.0001 m
cen3	Y =	0.0004 m	lfc4	Y =	0.0001 m
	Z =	-0.0001 m		Z =	-0.0003 m
	X =	0.0000 m		X =	-0.0005 m
rtc4	Y =	0.0000 m	cen4	Y =	0.0002 m
	Z =	0.0001 m		Z =	-0.0001 m
	X =	0.0001 m		X =	0.0001 m
lfc5	Y =	-0.0002 m	rtc5	Y =	0.0003 m
	Z =	0.0001 m		Z =	0.0003 m
	X =	0.0000 m		X =	0.0000 m
cen5	Y =	0.0000 m	lfc6	Y =	0.0000 m
	Z =	0.0002 m		Z =	0.0000 m
	X =	0.0002 m		X =	0.0009 m
rtc6	Y =	0.0002 m	cen7	Y =	0.0001 m
	Z =	0.0001 m		Z =	0.0001 m
	X =	-0.0002 m		X =	-0.0002 m
rtc8	Y =	-0.0004 m	cen8	Y =	-0.0002 m
	Z =	0.0001 m		Z =	0.0002 m
	X =	-0.0003 m		X =	-0.0004 m
a	Y =	0.0002 m	b	Y =	0.0001 m
	Z =	-0.0006 m		Z =	-0.0010 m
	X =	-0.0001 m		X =	-0.0001 m
c	Y =	0.0000 m	d	Y =	-0.0002 m
	Z =	-0.0001 m		Z =	-0.0002 m
	X =	0.0002 m		X =	0.0001 m
f	Y =	-0.0003 m	g	Y =	-0.0006 m
	Z =	0.0001 m		Z =	0.0000 m

: O R R E C T I O N S A P P L I E D T O O B J E C T C O N T R O L

	X =	0.0001 m		X =	0.0001 m
h	Y =	0.0005 m	j	Y =	0.0001 m
	Z =	0.0006 m		Z =	0.0003 m
	X =	0.0001 m			
k	Y =	-0.0001 m			
	Z =	-0.0003 m			

X .... Number of Components =	29	RMS =	0.0004	meters
Y .... Number of Components =	29	RMS =	0.0002	meters
Z .... Number of Components =	29	RMS =	0.0003	meters

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