System/Prescription Data

File : C:\tbida\zemax\zemax\dct\rc\D10\RC_ADC_D11_LMI_ghost.ZMX
Title: F/6.1 R-C Corrected
Date : MON SEP 20 2010

LENS NOTES:

Notes...

GENERAL LENS DATA:

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Surfaces               :              32
Stop                   :               4
System Aperture        : Entrance Pupil Diameter = 4200
Glass Catalogs         : SCHOTT INFRARED
Ray Aiming             : Off
Apodization            : Uniform, factor =   0.00000E+000
Temperature (C)        :    2.00000E+001
Pressure (ATM)         :    1.00000E+000
 Adjust Index Data To Environment  : Off
Effective Focal Length  :        25489.48 (in air at system temperature and pressure)
Effective Focal Length  :        25489.48 (in image space)
Back Focal Length       :        10.60577
Total Track             :        7845.814
Image Space F/#         :        6.068924
Paraxial Working F/#    :        6.068924
Working F/#             :        6.068986
Image Space NA          :      0.08210873
Object Space NA         :   2.099999e-007
Stop Radius             :            2100
Paraxial Image Height   :        45.37734
Paraxial Magnification  :               0
Entrance Pupil Diameter :            4200
Entrance Pupil Position :            5700
Exit Pupil Diameter     :        502.9123
Exit Pupil Position     :       -3052.177
Field Type              : Angle in degrees
Maximum Radial Field    :           0.102
Primary Wavelength      :             0.5 µm
Lens Units              :   Millimeters
Angular Magnification   :        8.351219

Fields          : 2
Field Type: Angle in degrees
#        X-Value        Y-Value         Weight
 1       0.000000       0.000000       1.000000
 2       0.000000       0.102000       1.000000

Vignetting Factors
#       VDX       VDY       VCX       VCY       VAN
1  0.000000  0.000000  0.000000  0.000000  0.000000
2  0.000000 -0.000683  0.000000  0.000684  0.000000

Wavelengths     : 5
Units: µm
#          Value         Weight
 1       0.500000       1.000000
 2       0.570000       1.000000
 3       0.650000       1.000000
 4       0.720000       1.000000
 5       0.800000       1.000000
```

SURFACE DATA SUMMARY:

Surf	Type	Radius	Thickness	Glass	Diameter	Conic	Comment
OBJ	STANDARD	Infinity	Infinity		0	0	
1	ATMOSPHR	Infinity	0		4220.291	0	

2	STANDARD	Infinity	0		1400	0	
3	STANDARD	Infinity	5700		0	0	
STO	STANDARD	Infinity	137.7		0	0	Aperture sto
5	STANDARD	-15994.7	-5617.497	MIRROR	4201	-1.082674	Primary
6	STANDARD	-6926.407	5617.497	MIRROR	1310	-4.500899	Secondary
7	STANDARD	Infinity	400		0	0	Primary hole
8	TILTSURF	-	20	F_SILICA	470	-	ADC 1A
9	TILTSURF	-	20	LLF6	470	-	ADC 1B
10	STANDARD	Infinity	10		470	0	
11	STANDARD	64329.84	20	F_SILICA	470	0	ADC 2A
12	TILTSURF	-	20	LLF6	470	-	ADC 2B
13	TILTSURF	-	610		470	-	
14	STANDARD	Infinity	183.058		231.9414	0	Mounting fla
15	STANDARD	Infinity	179.44		203.0598	0	Upper bulkhe
16	STANDARD	Infinity	130		180	0	Fold Mirror
17	STANDARD	-3658.611	25	F_SILICA	350	0	Element 1
18	STANDARD	-1509.664	204.81		350	0	
19	STANDARD	-699.84	15	F_SILICA	310	0	Element 2
20	STANDARD	-2007.457	30.24		310	0	
21	STANDARD	Infinity	29.02		108.871	0	Guider axis
22	STANDARD	Infinity	22.5		104.9493	0	Shutter
23	STANDARD	Infinity	6.35		101.9088	0	Cube wall
24	STANDARD	Infinity	12.38		190.5	0	Filter housi
25	STANDARD	Infinity	10	F_SILICA	99.37769	0	Filter 1
26	STANDARD	Infinity	7.7		99.37769	0	
27	STANDARD	Infinity	10		99.37769	0	Filter 2
28	STANDARD	Infinity	18.97		99.37769	0	
29	STANDARD	Infinity	1		93.49354	0	Filter housi
30	STANDARD	Infinity	12	F_SILICA	93.3584	0	Dewar window
31	STANDARD	Infinity	10.64571		93.3584	0	
IMA	STANDARD	Infinity			90.83144	0	CCD231

SURFACE DATA DETAIL:

```
Surface OBJ     : STANDARD
Surface   1     : ATMOSPHR
 Zenith (deg)   :                0
 Height (m)     :             2300
 Temperature(k) :              293
 Pressure (mb)  :              780
 Humidity (rel) :              0.2
 Latitude (deg) :               35
Surface   2     : STANDARD
 Aperture       : Circular Obscuration
 Minimum Radius :             0
 Maximum Radius :           700
Surface   3     : STANDARD
Surface STO     : STANDARD Aperture stop
 Aperture       : Circular Aperture
 Minimum Radius :           500
 Maximum Radius :          2100
Surface   5     : STANDARD Primary
 Mirror Substrate : Curved, Thickness = 8.40200E+001
 Aperture       : Circular Aperture
 Minimum Radius :           500
 Maximum Radius :        2100.5
Surface   6     : STANDARD Secondary
 Mirror Substrate : Curved, Thickness = 2.62000E+001
 Aperture       : Circular Aperture
 Minimum Radius :             0
 Maximum Radius :           655
Surface   7     : STANDARD Primary hole
Surface   8     : TILTSURF ADC 1A
 X Tangent      :     0.0019296299
 Y Tangent      :                0
 Aperture       : Floating Aperture
 Maximum Radius :           235
Surface   9     : TILTSURF ADC 1B
 X Tangent      :     -0.016552752
 Y Tangent      :                0
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 Aperture       : Floating Aperture
 Maximum Radius :           235
Surface  10     : STANDARD
 Aperture       : Floating Aperture
 Maximum Radius :           235
Surface  11     : STANDARD ADC 2A
 Aperture       : Floating Aperture
 Maximum Radius :           235
Surface  12     : TILTSURF ADC 2B
 X Tangent      :     0.018515571
 Y Tangent      :               0
 Aperture       : Floating Aperture
 Maximum Radius :           235
Surface  13     : TILTSURF
 X Tangent      :    0.0019230692
 Y Tangent      :               0
 Aperture       : Floating Aperture
 Maximum Radius :           235
Surface  14     : STANDARD Mounting flange
Surface  15     : STANDARD Upper bulkhead
 Aperture       : Circular Aperture
 Minimum Radius :             0
 Maximum Radius :         215.9
Surface  16     : STANDARD Fold Mirror
 Tilt/Decenter  :      Decenter X      Decenter Y          Tilt X          Tilt Y          Tilt Z          C
 Before surface :               0               0              45               0               0 Decenter,
 After surface  :              -0              -0             -45              -0              -0 Tilt, Dece
Surface  17     : STANDARD Element 1
 Aperture       : Circular Aperture
 Minimum Radius :             0
 Maximum Radius :           175
Surface  18     : STANDARD
 Aperture       : Floating Aperture
 Maximum Radius :           175
Surface  19     : STANDARD Element 2
 Aperture       : Circular Aperture
 Minimum Radius :             0
 Maximum Radius :           155
Surface  20     : STANDARD
 Aperture       : Floating Aperture
 Maximum Radius :           155
Surface  21     : STANDARD Guider axis
Surface  22     : STANDARD Shutter
 Aperture       : Rectangular Aperture
 X Half Width   :            75
 Y Half Width   :            75
Surface  23     : STANDARD Cube wall
Surface  24     : STANDARD Filter housing
Surface  25     : STANDARD Filter 1
 Aperture       : Rectangular Aperture
 X Half Width   :        66.675
 Y Half Width   :        66.675
Surface  26     : STANDARD
 Aperture       : Rectangular Aperture, Pickup From Surface 25
 X Half Width   :        66.675
 Y Half Width   :        66.675
Surface  27     : STANDARD Filter 2
 Aperture       : Rectangular Aperture, Pickup From Surface 25
 X Half Width   :        66.675
 Y Half Width   :        66.675
Surface  28     : STANDARD
 Aperture       : Rectangular Aperture, Pickup From Surface 25
 X Half Width   :        66.675
 Y Half Width   :        66.675
Surface  29     : STANDARD Filter housing
Surface  30     : STANDARD Dewar window
 Aperture       : Circular Aperture
 Minimum Radius :             0
 Maximum Radius :          82.5
Surface  31     : STANDARD
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Surface IMA     : STANDARD CCD231
 Aperture       : Rectangular Aperture
 X Half Width   :          46.2
 Y Half Width   :          46.2

COATING DEFINITIONS:


EDGE THICKNESS DATA:

Surf          X-Edge         Y-Edge
   1       0.000000       0.000000
   2       0.000000       0.000000
   3    5700.000000    5700.000000
 STO      -0.174692      -0.174692
   5   -5510.353856   -5510.353856
   6    5648.228548    5648.228548
   7     400.453463     400.000000
   8      15.656640      20.000000
   9      23.889897      20.000000
  10      10.429235      10.429235
  11      23.921925      19.570765
  12      16.100762      20.000000
  13     609.548079     610.000000
  14     183.058000     183.058000
  15     179.440000     179.440000
  16     125.812272     125.812272
  17      19.010438      19.010438
  18     197.606832     197.606832
  19      26.387574      26.387574
  20      36.232884      36.232884
  21      29.020000      29.020000
  22      22.500000      22.500000
  23       6.350000       6.350000
  24      12.380000      12.380000
  25      10.000000      10.000000
  26       7.700000       7.700000
  27      10.000000      10.000000
  28      18.970000      18.970000
  29       1.000000       1.000000
  30      12.000000      12.000000
  31      10.645712      10.645712
 IMA       0.000000       0.000000

SOLVE AND VARIABLE DATA:

 Semi Diameter   2      : Fixed
 Semi Diameter   3      : Fixed
 Semi Diameter   4      : Fixed
 Thickness of   5       : Variable
 Semi Diameter   5      : Fixed
 Thickness of   6       : Solve, Pickup from surface 5 scaled by -1, offset by 0
 Semi Diameter   6      : Fixed
 Semi Diameter   7      : Fixed
 Semi Diameter   8      : Fixed
 Semi Diameter   9      : Solve, pickup from surface 8 scaled by 1
 Semi Diameter  10      : Solve, pickup from surface 8 scaled by 1
 Semi Diameter  11      : Solve, pickup from surface 8 scaled by 1
 Semi Diameter  12      : Solve, pickup from surface 8 scaled by 1
 Semi Diameter  13      : Solve, pickup from surface 8 scaled by 1
 Semi Diameter  16      : Fixed
 Semi Diameter  17      : Fixed
 Semi Diameter  18      : Solve, pickup from surface 17 scaled by 1
 Semi Diameter  19      : Fixed
 Semi Diameter  20      : Solve, pickup from surface 19 scaled by 1
 Semi Diameter  24      : Fixed
 Semi Diameter  26      : Solve, pickup from surface 25 scaled by 1
 Semi Diameter  27      : Solve, pickup from surface 25 scaled by 1
 Semi Diameter  28      : Solve, pickup from surface 25 scaled by 1
 Semi Diameter  31      : Solve, pickup from surface 30 scaled by 1
```

INDEX OF REFRACTION DATA:

System Temperature: 20.0000 Celsius
System Pressure   :   1.0000 Atmospheres
Absolute air index: 1.000274 at wavelength 0.500000 µm
Index data is relative to air at the system temperature and pressure.
Wavelengths are measured in air at the system temperature and pressure.

Surf	Glass	Temp	Pres	0.500000	0.570000	0.650000	0.720000	0.800000	
0		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
1		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
2		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
3		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
4		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
5	MIRROR	20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
6	MIRROR	20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
7		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
8	F_SILICA	20.00	1.00	1.46232649	1.45910794	1.45653497	1.45485100	1.45331725	so
9	LLF6	20.00	1.00	1.53801292	1.53274677	1.52870639	1.52617131	1.52396349	
10		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
11	F_SILICA	20.00	1.00	1.46232649	1.45910794	1.45653497	1.45485100	1.45331725	so
12	LLF6	20.00	1.00	1.53801292	1.53274677	1.52870639	1.52617131	1.52396349	
13		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
14		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
15		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
16		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
17	F_SILICA	20.00	1.00	1.46232649	1.45910794	1.45653497	1.45485100	1.45331725	so
18		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
19	F_SILICA	20.00	1.00	1.46232649	1.45910794	1.45653497	1.45485100	1.45331725	so
20		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
21		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
22		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
23		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
24		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
25	F_SILICA	20.00	1.00	1.46232649	1.45910794	1.45653497	1.45485100	1.45331725	so
26		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
27		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
28		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
29		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
30	F_SILICA	20.00	1.00	1.46232649	1.45910794	1.45653497	1.45485100	1.45331725	so
31		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	
32		20.00	1.00	1.00000000	1.00000000	1.00000000	1.00000000	1.00000000	

THERMAL COEFFICIENT OF EXPANSION DATA:

Surf	Glass	TCE *10E-6	
0		0.00000000	
1		0.00000000	
2		0.00000000	
3		0.00000000	
4		0.00000000	
5	MIRROR	0.00000000	
6	MIRROR	0.00000000	
7		0.00000000	
8	F_SILICA	0.51000000	source: The Infrared & Electro-Optical Systems Handbook V. III
9	LLF6	7.50000000	
10		0.00000000	
11	F_SILICA	0.51000000	source: The Infrared & Electro-Optical Systems Handbook V. III
12	LLF6	7.50000000	
13		0.00000000	
14		0.00000000	
15		0.00000000	
16		0.00000000	
17	F_SILICA	0.51000000	source: The Infrared & Electro-Optical Systems Handbook V. III
18		0.00000000	
19	F_SILICA	0.51000000	source: The Infrared & Electro-Optical Systems Handbook V. III
20		0.00000000	
21		0.00000000	
22		0.00000000	

23		0.00000000	
24		0.00000000	
25	F_SILICA	0.51000000	source: The Infrared & Electro-Optical Systems Handbook V. III
26		0.00000000	
27		0.00000000	
28		0.00000000	
29		0.00000000	
30	F_SILICA	0.51000000	source: The Infrared & Electro-Optical Systems Handbook V. III
31		0.00000000	
32		0.00000000	

GLOBAL VERTEX COORDINATES, ORIENTATIONS, AND ROTATION/OFFSET MATRICES:

Reference Surface: 5

Surf	R11	R12	R13	X	
	R21	R22	R23	Y	
	R31	R32	R33	Z	
1	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	-5.837700000E+003	
2	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	-5.837700000E+003	
3	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	-5.837700000E+003	
4	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	Aperture stop
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	-1.377000000E+002	
5	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	Primary
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	0.000000000E+000	
6	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	Secondary
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	-5.617496983E+003	
7	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	Primary hole
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	0.000000000E+000	
8	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	ADC 1A
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	4.000000000E+002	
9	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	ADC 1B
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	4.200000000E+002	
10	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	4.400000000E+002	
11	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	ADC 2A
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	4.500000000E+002	
12	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	ADC 2B
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	4.700000000E+002	
13	1.0000000000	0.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	1.0000000000	0.0000000000	0.000000000E+000	
	0.0000000000	0.0000000000	1.0000000000	4.900000000E+002	

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14   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Mounting flange
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.100000000E+003

15   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Upper bulkhead
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.283058000E+003

16   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Fold Mirror
     0.00000000000   0.7071067812  -0.7071067812   0.000000000E+000
     0.00000000000   0.7071067812   0.7071067812   1.462498000E+003

17   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Element 1
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.592498000E+003

18   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.617498000E+003

19   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Element 2
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.822308000E+003

20   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.837308000E+003

21   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Guider axis
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.867548000E+003

22   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Shutter
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.896568000E+003

23   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Cube wall
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.919068000E+003

24   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Filter housing
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.925418000E+003

25   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Filter 1
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.937798000E+003

26   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.947798000E+003

27   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Filter 2
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.955498000E+003

28   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.965498000E+003

29   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Filter housing
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.984468000E+003

30   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000 Dewar window
     0.00000000000   1.00000000000   0.00000000000  0.000000000E+000
     0.00000000000   0.00000000000   1.00000000000  1.985468000E+003

31   1.00000000000   0.00000000000   0.00000000000  0.000000000E+000
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```
      0.0000000000   1.0000000000   0.0000000000  0.000000000E+000
      0.0000000000   0.0000000000   1.0000000000  1.997468000E+003

 32   1.0000000000   0.0000000000   0.0000000000  0.000000000E+000 CCD231
      0.0000000000   1.0000000000   0.0000000000  0.000000000E+000
      0.0000000000   0.0000000000   1.0000000000  2.008113712E+003
```

GLOBAL SURFACE CENTER OF CURVATURE POINTS:

Reference Surface: 5

Surf	X	Y	Z	
1	-	-	-	
2	-	-	-	
3	-	-	-	
4	-	-	-	Aperture stop
5	0.0000000000	0.0000000000	-15994.7000000000	Primary
6	0.0000000000	0.0000000000	-12543.9039592478	Secondary
7	-	-	-	Primary hole
8	-	-	-	ADC 1A
9	-	-	-	ADC 1B
10	-	-	-	
11	0.0000000000	0.0000000000	64779.8365759837	ADC 2A
12	-	-	-	ADC 2B
13	-	-	-	
14	-	-	-	Mounting flange
15	-	-	-	Upper bulkhead
16	-	-	-	Fold Mirror
17	0.0000000000	0.0000000000	-2066.1130000000	Element 1
18	0.0000000000	0.0000000000	107.8340000000	
19	0.0000000000	0.0000000000	1122.4680000000	Element 2
20	0.0000000000	0.0000000000	-170.1490000000	
21	-	-	-	Guider axis
22	-	-	-	Shutter
23	-	-	-	Cube wall
24	-	-	-	Filter housing
25	-	-	-	Filter 1
26	-	-	-	
27	-	-	-	Filter 2
28	-	-	-	
29	-	-	-	Filter housing
30	-	-	-	Dewar window
31	-	-	-	
32	-	-	-	CCD231

ELEMENT VOLUME DATA:

For centered elements with plane or spherical circular faces, exact volumes are computed by assuming edges are squared up to the larger of the front and back radial aperture.

For all other elements, approximate volumes are numerically integrated to 0.1% accuracy. Zero volume means the volume cannot be accurately computed.

Single elements that are duplicated in the Lens Data Editor for ray tracing purposes may be listed more than once yielding incorrect total mass estimates.

	Volume cc	Density g/cc	Mass g
Element surf 8 to 9	3470.841375	2.200000	7635.851026
Element surf 9 to 10	3470.841375	2.810000	9753.064265
Element surf 11 to 12	3433.586117	2.200000	7553.889458
Element surf 12 to 13	3470.841375	2.810000	9753.064265
Element surf 17 to 18	2117.663669	2.200000	4658.860072
Element surf 19 to 20	1559.263731	2.200000	3430.380209
Element surf 25 to 26	177.822225	2.200000	391.208895
Element surf 30 to 31	256.589580	2.200000	564.497076
Total Mass:			43740.815265

F/# DATA:

F/# calculations consider vignetting factors and ignore surface apertures.

	Wavelength:	0.500000		0.570000		0.650000	
#	Field	Tan	Sag	Tan	Sag	Tan	Sag
1	0.0000, 0.0000 deg:	6.0688	6.0691	6.0692	6.0695	6.0695	6.0698
2	0.0000, 0.1020 deg:	6.0826	6.0726	6.0829	6.0729	6.0831	6.0732

	Wavelength:	0.720000		0.800000	
#	Field	Tan	Sag	Tan	Sag
1	0.0000, 0.0000 deg:	6.0697	6.0700	6.0698	6.0701
2	0.0000, 0.1020 deg:	6.0833	6.0733	6.0834	6.0735

CARDINAL POINTS:

Object space positions are measured with respect to surface 1.
Image space positions are measured with respect to the image surface.
The index in both the object space and image space is considered.

	Object Space	Image Space
W = 0.500000 (Primary)		
Focal Length :	-25489.482232	25489.482232
Focal Planes :	-207168.245970	-0.039944
Principal Planes :	-181678.763737	-25489.522177
Anti-Principal Planes :	-232657.728202	25489.442288
Nodal Planes :	-181678.763737	-25489.522177
Anti-Nodal Planes :	-232657.728202	25489.442288
W = 0.570000		
Focal Length :	-25490.937441	25490.937441
Focal Planes :	-206245.108392	-0.071716
Principal Planes :	-180754.170951	-25491.009157
Anti-Principal Planes :	-231736.045833	25490.865725
Nodal Planes :	-180754.170951	-25491.009157
Anti-Nodal Planes :	-231736.045833	25490.865725
W = 0.650000		
Focal Length :	-25492.104261	25492.104261
Focal Planes :	-205506.238808	-0.095254
Principal Planes :	-180014.134547	-25492.199515
Anti-Principal Planes :	-230998.343069	25492.009007
Nodal Planes :	-180014.134547	-25492.199515
Anti-Nodal Planes :	-230998.343069	25492.009007
W = 0.720000		
Focal Length :	-25492.872380	25492.872380
Focal Planes :	-205022.242579	-0.109265
Principal Planes :	-179529.370199	-25492.981645
Anti-Principal Planes :	-230515.114959	25492.763115
Nodal Planes :	-179529.370199	-25492.981645
Anti-Nodal Planes :	-230515.114959	25492.763115
W = 0.800000		
Focal Length :	-25493.577601	25493.577601
Focal Planes :	-204581.153852	-0.120606
Principal Planes :	-179087.576251	-25493.698206
Anti-Principal Planes :	-230074.731452	25493.456995
Nodal Planes :	-179087.576251	-25493.698206
Anti-Nodal Planes :	-230074.731452	25493.456995

PHYSICAL OPTICS PROPAGATION SETTINGS SUMMARY:

```
 OBJ STANDARD
    Use Rays To Propagate To Next Surface  : Off
    Recompute Pilot Beam                   : Off
    Do Not Rescale Beam Size Using Ray Data: Off
    Use Angular Spectrum Propagator        : Off
    Output Pilot Radius                    : Best Fit
   1 ATMOSPHR
```

```
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
   Output Pilot Radius                    : Best Fit
  2 STANDARD
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
   Output Pilot Radius                    : Best Fit
  3 STANDARD
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
   Output Pilot Radius                    : Best Fit
STO STANDARD        Aperture stop
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
   Output Pilot Radius                    : Best Fit
  5 STANDARD              Primary
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
   Output Pilot Radius                    : Best Fit
  6 STANDARD            Secondary
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
   Output Pilot Radius                    : Best Fit
  7 STANDARD         Primary hole
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
   Output Pilot Radius                    : Best Fit
  8 TILTSURF              ADC 1A
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
   Output Pilot Radius                    : Best Fit
  9 TILTSURF              ADC 1B
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
   Output Pilot Radius                    : Best Fit
 10 STANDARD
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
   Output Pilot Radius                    : Best Fit
 11 STANDARD              ADC 2A
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
   Output Pilot Radius                    : Best Fit
 12 TILTSURF              ADC 2B
   Use Rays To Propagate To Next Surface  : Off
   Recompute Pilot Beam                   : Off
   Do Not Rescale Beam Size Using Ray Data: Off
   Use Angular Spectrum Propagator        : Off
```

```
  Output Pilot Radius                    : Best Fit
13 TILTSURF
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
  Do Not Rescale Beam Size Using Ray Data: Off
  Use Angular Spectrum Propagator        : Off
  Output Pilot Radius                    : Best Fit
14 STANDARD      Mounting flange
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
  Do Not Rescale Beam Size Using Ray Data: Off
  Use Angular Spectrum Propagator        : Off
  Output Pilot Radius                    : Best Fit
15 STANDARD       Upper bulkhead
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
  Do Not Rescale Beam Size Using Ray Data: Off
  Use Angular Spectrum Propagator        : Off
  Output Pilot Radius                    : Best Fit
16 STANDARD          Fold Mirror
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
  Do Not Rescale Beam Size Using Ray Data: Off
  Use Angular Spectrum Propagator        : Off
  Output Pilot Radius                    : Best Fit
17 STANDARD            Element 1
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
  Do Not Rescale Beam Size Using Ray Data: Off
  Use Angular Spectrum Propagator        : Off
  Output Pilot Radius                    : Best Fit
18 STANDARD
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
  Do Not Rescale Beam Size Using Ray Data: Off
  Use Angular Spectrum Propagator        : Off
  Output Pilot Radius                    : Best Fit
19 STANDARD            Element 2
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
  Do Not Rescale Beam Size Using Ray Data: Off
  Use Angular Spectrum Propagator        : Off
  Output Pilot Radius                    : Best Fit
20 STANDARD
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
  Do Not Rescale Beam Size Using Ray Data: Off
  Use Angular Spectrum Propagator        : Off
  Output Pilot Radius                    : Best Fit
21 STANDARD          Guider axis
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
  Do Not Rescale Beam Size Using Ray Data: Off
  Use Angular Spectrum Propagator        : Off
  Output Pilot Radius                    : Best Fit
22 STANDARD              Shutter
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
  Do Not Rescale Beam Size Using Ray Data: Off
  Use Angular Spectrum Propagator        : Off
  Output Pilot Radius                    : Best Fit
23 STANDARD            Cube wall
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
  Do Not Rescale Beam Size Using Ray Data: Off
  Use Angular Spectrum Propagator        : Off
  Output Pilot Radius                    : Best Fit
24 STANDARD       Filter housing
  Use Rays To Propagate To Next Surface  : Off
  Recompute Pilot Beam                   : Off
```

```
    Do Not Rescale Beam Size Using Ray Data: Off
    Use Angular Spectrum Propagator        : Off
    Output Pilot Radius                    : Best Fit
  25 STANDARD             Filter 1
    Use Rays To Propagate To Next Surface  : Off
    Recompute Pilot Beam                   : Off
    Do Not Rescale Beam Size Using Ray Data: Off
    Use Angular Spectrum Propagator        : Off
    Output Pilot Radius                    : Best Fit
  26 STANDARD
    Use Rays To Propagate To Next Surface  : Off
    Recompute Pilot Beam                   : Off
    Do Not Rescale Beam Size Using Ray Data: Off
    Use Angular Spectrum Propagator        : Off
    Output Pilot Radius                    : Best Fit
  27 STANDARD             Filter 2
    Use Rays To Propagate To Next Surface  : Off
    Recompute Pilot Beam                   : Off
    Do Not Rescale Beam Size Using Ray Data: Off
    Use Angular Spectrum Propagator        : Off
    Output Pilot Radius                    : Best Fit
  28 STANDARD
    Use Rays To Propagate To Next Surface  : Off
    Recompute Pilot Beam                   : Off
    Do Not Rescale Beam Size Using Ray Data: Off
    Use Angular Spectrum Propagator        : Off
    Output Pilot Radius                    : Best Fit
  29 STANDARD       Filter housing
    Use Rays To Propagate To Next Surface  : Off
    Recompute Pilot Beam                   : Off
    Do Not Rescale Beam Size Using Ray Data: Off
    Use Angular Spectrum Propagator        : Off
    Output Pilot Radius                    : Best Fit
  30 STANDARD         Dewar window
    Use Rays To Propagate To Next Surface  : Off
    Recompute Pilot Beam                   : Off
    Do Not Rescale Beam Size Using Ray Data: Off
    Use Angular Spectrum Propagator        : Off
    Output Pilot Radius                    : Best Fit
  31 STANDARD
    Use Rays To Propagate To Next Surface  : Off
    Recompute Pilot Beam                   : Off
    Do Not Rescale Beam Size Using Ray Data: Off
    Use Angular Spectrum Propagator        : Off
    Output Pilot Radius                    : Best Fit
 IMA STANDARD               CCD231
    Use Rays To Propagate To Next Surface  : Off
    Recompute Pilot Beam                   : Off
    Do Not Rescale Beam Size Using Ray Data: Off
    Use Angular Spectrum Propagator        : Off
    Output Pilot Radius                    : Best Fit

FILES USED:

ZEMAX File
  C:\TBIDA\ZEMAX\ZEMAX\DCT\RC\D10\RC_ADC_D11_LMI_GHOST.ZMX
Session File
  C:\TBIDA\ZEMAX\ZEMAX\DCT\RC\D10\RC_ADC_D11_LMI_GHOST.SES
Glass Catalogs
  C:\PROGRAM FILES\ZEMAX\GLASSCAT\SCHOTT.AGF
  C:\PROGRAM FILES\ZEMAX\GLASSCAT\INFRARED.AGF
Coating Data
  C:\PROGRAM FILES\ZEMAX\COATINGS\COATING.DAT
```