

## **APPENDIX 4.5.A**

### **OPTICAL PRESCRIPTION**

Zemax output prepared for New Initiatives Office, December 2001.

# OPTICAL PRESCRIPTION

## System/Prescription Data

File : GSMT.zmx  
Title: GSMT  
Date : MON DEC 17 2001

## GENERAL LENS DATA:

Surfaces : 7  
Stop : 4  
System Aperture : Float By Stop Size  
Ray aiming : On  
X Pupil shift : 0  
Y Pupil shift : 0  
Z Pupil shift : 0  
Apodization : Uniform, factor = 0.000000  
Eff. Focal Len. : 562500 (in air)  
Eff. Focal Len. : 562500 (in image space)  
Total Track : 37800  
Image Space F/# : 18.75  
Working F/# : 18.8155  
Obj. Space N.A. : 1.49993e-006  
Stop Radius : 1000  
Parax. Ima. Hgt.: 981.6  
Parax. Mag. : 0  
Entr. Pup. Dia. : 30000  
Entr. Pup. Pos. : 448300  
Exit Pupil Dia. : 2000  
Exit Pupil Pos. : -37498.3  
Field Type : Angle in degrees  
Maximum Field : 0.0999849  
Primary Wave : 30.000000  
Lens Units : Millimeters  
Angular Mag. : 15

Fields : 5

Field Type: Angle in degrees

#	X-Value	Y-Value	Weight
1	-0.070700	0.070700	1.000000
2	0.070700	0.070700	1.000000
3	0.000000	0.000000	0.500000
4	-0.070700	-0.070700	1.000000
5	0.070700	-0.070700	1.000000

Vignetting Factors

#	VDX	VDY	VCX	VCY
1	0.000000	0.000000	0.000000	0.000000
2	0.000000	0.000000	0.000000	0.000000
3	0.000000	0.000000	0.000000	0.000000
4	0.000000	0.000000	0.000000	0.000000
5	0.000000	0.000000	0.000000	0.000000

Wavelengths : 1

Units: Microns

#	Value	Weight
1	30.000000	1.000000

SURFACE DATA SUMMARY:

Surf	Type	Radius	Thickness	Glass	Diameter	Conic
OBJ	STANDARD	Infinity	Infinity		0	0
1	STANDARD	Infinity	0		31558.64	0
2	STANDARD	Infinity	28300		31094.67	0
3	STANDARD	-60000	-28000	MIRROR	31027.45	-1
STO	STANDARD	-4225.352	28000	MIRROR	2000	-1.238056
5	STANDARD	-60000	9500		1852.361	-1
6	STANDARD	Infinity	-1.712366		1974.369	0
IMA	STANDARD	-2151.392	0		1953.081	0

SURFACE DATA DETAIL:

Surface OBJ : STANDARD  
 Comment : NATURAL STAR  
 Surface 1 : STANDARD  
 Surface 2 : STANDARD  
 Aperture : Circular Obscuration  
 Minimum Radius : 0  
 Maximum Radius : 1000  
 Surface 3 : STANDARD  
 Comment : PRIMARY  
 Surface STO : STANDARD  
 Comment : SECONDARY  
 Surface 5 : STANDARD  
 Surface 6 : STANDARD  
 Surface IMA : STANDARD  
 Comment : CASSEGRAIN FOCUS

SOLVE AND VARIABLE DATA:

Semi Diam 1 : Fixed  
 Thickness of 4 : Solve, pick up value from 3, scaled by -1.00000  
 Semi Diam 4 : Fixed  
 Curvature of 5 : Solve, pick up value from 3, scaled by 1.00000  
 Conic of 5 : Pickup from 3 times 1.000000  
 Thickness of 6 : Variable

INDEX OF REFRACTION DATA:

Surf	Glass	30.000000
0		1.00000000
1		1.00000000
2		1.00000000
3	MIRROR	1.00000000
4	MIRROR	1.00000000
5		1.00000000
6		1.00000000
7		1.00000000

F/# DATA:

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

Wavelength: 30.000000  
# Field Tan Sag  
1 -0.0707, 0.0707 deg: 18.7072 18.7072  
2 0.0707, 0.0707 deg: 18.7072 18.7072  
3 0.0000, 0.0000 deg: 18.8155 18.8155  
4 -0.0707, -0.0707 deg: 18.7072 18.7072  
5 0.0707, -0.0707 deg: 18.7072 18.7072

GLOBAL VERTEX COORDINATES AND DIRECTIONS:

Surf	X coord	Y coord	Z coord	X direc	Y direc	Z direc
1	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000
2	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000
3	0.000000	0.000000	28300.000000	0.000000	0.000000	1.000000
4	0.000000	0.000000	300.000000	0.000000	0.000000	1.000000
5	0.000000	0.000000	28300.000000	0.000000	0.000000	1.000000
6	0.000000	0.000000	37800.000000	0.000000	0.000000	1.000000
7	0.000000	0.000000	37798.287634	0.000000	0.000000	1.000000

ELEMENT VOLUME DATA:

Units are cubic cm.

Values are only accurate for plane and spherical surfaces.