WARNING: This feature may not work correctly for systems which contain coordinate breaks or other special su

Ghost Trace Data

File : C:\tbida\zemax\zemax\dct\rc\D10\RC_ADC_D11_LMI_ghost.ZMX
Title: F/6.1 R-C Corrected
Date : THU SEP 9 2010

Units are Millimeters.

Wavelength: 0.500000 µm
Type: Double Bounces
The '****' denotes a possible internal focus
RMS is the RMS spot radius on axis at the primary wavelength.
RMS values of 0.00 indicate that an accurate RMS
could not be computed, usually due to ray errors.

This analysis may be inaccurate if the system is
non-rotationally symmetric or uses non-standard surfaces.

Ghost reflection off surface 8 then 6. (GH008006.ZMX)
Surf Marginal F/# RMS
10 -1.4746E+003 48.927239 1.0446E+003
Marginal ray height : -1474.6172
Chief ray height : 0.0000
Distance to ghost pupil: -160381.2348
Distance to ghost focus: 144297.8986
Effective focal length : 205494.4058

Ghost reflection off surface 8 then 5. (GH008005.ZMX)
Surf Marginal F/# RMS
8 -1.4746E+003 48.927239 1.0446E+003
Marginal ray height : -1474.6172
Chief ray height : 0.0000
Distance to ghost pupil: -160381.2348
Distance to ghost focus: 144297.8986
Effective focal length : 205494.4058

Ghost reflection off surface 9 then 8. (GH009008.ZMX)
Surf Marginal F/# RMS
32 -2.2435E+000 6.032074 1.7288E+000
Marginal ray height : -2.2435
Chief ray height : 0.0000
Distance to ghost pupil: -3045.9740
Distance to ghost focus: -27.0660
Effective focal length : 25334.7110

Ghost reflection off surface 9 then 6. (GH009006.ZMX)
Surf Marginal F/# RMS
10 -1.4800E+003 49.351671 1.0503E+003
Marginal ray height : -1479.9956
Chief ray height : 0.0000
Distance to ghost pupil: -159925.6748
Distance to ghost focus: 146080.5094
Effective focal length : 207277.0165

Ghost reflection off surface 9 then 5. (GH009005.ZMX)
Surf Marginal F/# RMS
8 -1.4800E+003 49.351671 1.0503E+003
Marginal ray height : -1479.9956
Chief ray height : 0.0000
Distance to ghost pupil: -159925.6748
Distance to ghost focus: 146080.5094
Effective focal length : 207277.0165

Ghost reflection off surface 10 then 9. (GH010009.ZMX)
Surf Marginal F/# RMS
32 -2.1333E+000 6.033877 1.6474E+000
Marginal ray height : -2.1333

```
Chief ray height       :         0.0000
Distance to ghost pupil:     -3047.1827
Distance to ghost focus:       -25.7437
Effective focal length :     25342.2834

Ghost reflection off surface 10 then 8. (GH010008.ZMX)
Surf     Marginal          F/#          RMS
  32 -4.3735E+000     5.997450  3.0907E+000
Marginal ray height    :        -4.3735
Chief ray height       :         0.0000
Distance to ghost pupil:     -3057.3658
Distance to ghost focus:       -52.4594
Effective focal length :     25189.2893

Ghost reflection off surface 10 then 6. (GH010006.ZMX)
Surf     Marginal          F/#          RMS
  10 -1.4851E+003    49.762101  1.0520E+003
Marginal ray height    :     -1485.1093
Chief ray height       :         0.0000
Distance to ghost pupil:   -159584.7668
Distance to ghost focus:    147804.3173
Effective focal length :    209000.8245

Ghost reflection off surface 10 then 5. (GH010005.ZMX)
Surf     Marginal          F/#          RMS
   8 -1.4851E+003    49.762101  1.0520E+003
Marginal ray height    :     -1485.1093
Chief ray height       :         0.0000
Distance to ghost pupil:   -159584.7668
Distance to ghost focus:    147804.3173
Effective focal length :    209000.8245

Ghost reflection off surface 11 then 10. (GH011010.ZMX)
Surf     Marginal          F/#          RMS
  32  4.5839E+000     6.461875  3.2646E+000
Marginal ray height    :         4.5839
Chief ray height       :         0.0000
Distance to ghost pupil:     -2868.7418
Distance to ghost focus:        59.2410
Effective focal length :     27139.8744

Ghost reflection off surface 11 then 9. (GH011009.ZMX)
Surf     Marginal          F/#          RMS
  32  2.5568E+000     6.424064  1.7312E+000
Marginal ray height    :         2.5568
Chief ray height       :         0.0000
Distance to ghost pupil:     -2865.4591
Distance to ghost focus:        32.8501
Effective focal length :     26981.0696

Ghost reflection off surface 11 then 8. (GH011008.ZMX)
Surf     Marginal          F/#          RMS
  32  4.2479E-001     6.384771  3.2135E-001
Marginal ray height    :         0.4248
Chief ray height       :         0.0000
Distance to ghost pupil:     -2875.3900
Distance to ghost focus:         5.4244
Effective focal length :     26816.0383

Ghost reflection off surface 11 then 6. (GH011006.ZMX)
Surf     Marginal          F/#          RMS
  10 -1.4024E+003    51.321868  9.9315E+002
Marginal ray height    :     -1402.3632
Chief ray height       :         0.0000
Distance to ghost pupil:   -192147.6980
Distance to ghost focus:    143943.7924
Effective focal length :    215551.8441

Ghost reflection off surface 11 then 5. (GH011005.ZMX)
Surf     Marginal          F/#          RMS
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   8 -1.4024E+003    51.321868  9.9315E+002
Marginal ray height    :     -1402.3632
Chief ray height       :         0.0000
Distance to ghost pupil:   -192147.6980
Distance to ghost focus:    143943.7924
Effective focal length :    215551.8441

Ghost reflection off surface 12 then 11. (GH012011.ZMX)
Surf     Marginal          F/#          RMS
  32 -1.1121E+001     5.517743  8.0782E+000
Marginal ray height    :       -11.1213
Chief ray height       :         0.0000
Distance to ghost pupil:     -3402.3195
Distance to ghost focus:      -122.7290
Effective focal length :     23174.5217

Ghost reflection off surface 12 then 10. (GH012010.ZMX)
Surf     Marginal          F/#          RMS
  32 -6.7589E+000     5.832393  4.9634E+000
Marginal ray height    :        -6.7589
Chief ray height       :         0.0000
Distance to ghost pupil:     -3147.4649
Distance to ghost focus:       -78.8412
Effective focal length :     24496.0503

Ghost reflection off surface 12 then 9. (GH012009.ZMX)
Surf     Marginal          F/#          RMS
  32 -8.9360E+000     5.799304  6.9798E+000
Marginal ray height    :        -8.9360
Chief ray height       :         0.0000
Distance to ghost pupil:     -3123.2571
Distance to ghost focus:      -103.6455
Effective focal length :     24357.0788

Ghost reflection off surface 12 then 8. (GH012008.ZMX)
Surf     Marginal          F/#          RMS
  32 -1.1226E+001     5.764906  8.1229E+000
Marginal ray height    :       -11.2258
Chief ray height       :         0.0000
Distance to ghost pupil:     -3152.1447
Distance to ghost focus:      -129.4316
Effective focal length :     24212.6056

Ghost reflection off surface 12 then 6. (GH012006.ZMX)
Surf     Marginal          F/#          RMS
  10 -1.5342E+003    49.974217  1.0893E+003
Marginal ray height    :     -1534.1973
Chief ray height       :         0.0000
Distance to ghost pupil:   -144967.4405
Distance to ghost focus:    153340.6172
Effective focal length :    209891.7116

Ghost reflection off surface 12 then 5. (GH012005.ZMX)
Surf     Marginal          F/#          RMS
   8 -1.5342E+003    49.974217  1.0893E+003
Marginal ray height    :     -1534.1973
Chief ray height       :         0.0000
Distance to ghost pupil:   -144967.4405
Distance to ghost focus:    153340.6172
Effective focal length :    209891.7116

Ghost reflection off surface 13 then 12. (GH013012.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.1811E+000     6.031961  1.6762E+000
Marginal ray height    :        -2.1811
Chief ray height       :         0.0000
Distance to ghost pupil:     -3047.2641
Distance to ghost focus:       -26.3126
Effective focal length :     25334.2376
```

Ghost reflection off surface 13 then 11. (GH013011.ZMX)
Surf   Marginal   F/#   RMS
  32 -1.3147E+001   5.495174 9.3417E+000
Marginal ray height   :   -13.1470
Chief ray height   :   0.0000
Distance to ghost pupil: -3416.5833
Distance to ghost focus: -144.4899
Effective focal length :   23079.7299

Ghost reflection off surface 13 then 10. (GH013010.ZMX)
Surf   Marginal   F/#   RMS
  32 -8.8883E+000   5.801073 6.3107E+000
Marginal ray height   :   -8.8883
Chief ray height   :   0.0000
Distance to ghost pupil: -3159.2215
Distance to ghost focus: -103.1234
Effective focal length :   24364.5086

Ghost reflection off surface 13 then 9. (GH013009.ZMX)
Surf   Marginal   F/#   RMS
  32 -1.1065E+001   5.768344 8.0200E+000
Marginal ray height   :   -11.0650
Chief ray height   :   0.0000
Distance to ghost pupil: -3152.1926
Distance to ghost focus: -127.6537
Effective focal length :   24227.0466

Ghost reflection off surface 13 then 8. (GH013008.ZMX)
Surf   Marginal   F/#   RMS
  32 -1.3354E+001   5.734318 9.4706E+000
Marginal ray height   :   -13.3544
Chief ray height   :   0.0000
Distance to ghost pupil: -3163.7042
Distance to ghost focus: -153.1566
Effective focal length :   24084.1337

Ghost reflection off surface 13 then 6. (GH013006.ZMX)
Surf   Marginal   F/#   RMS
  10 -1.5390E+003   50.404645 1.0904E+003
Marginal ray height   :   -1539.0289
Chief ray height   :   0.0000
Distance to ghost pupil: -144731.6196
Distance to ghost focus: 155148.4134
Effective focal length :   211699.5077

Ghost reflection off surface 13 then 5. (GH013005.ZMX)
Surf   Marginal   F/#   RMS
   8 -1.5390E+003   50.404645 1.0904E+003
Marginal ray height   :   -1539.0289
Chief ray height   :   0.0000
Distance to ghost pupil: -144731.6196
Distance to ghost focus: 155148.4134
Effective focal length :   211699.5077

Ghost reflection off surface 17 then 13. (GH017013.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.3335E+002   3.229484 1.6675E+002
Marginal ray height   :   -233.3474
Chief ray height   :   0.0000
Distance to ghost pupil: -342.8202
Distance to ghost focus: -1507.1834
Effective focal length :   13563.8346

Ghost reflection off surface 17 then 12. (GH017012.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.3601E+002   3.216660 1.6942E+002
Marginal ray height   :   -236.0101
Chief ray height   :   0.0000
Distance to ghost pupil: -366.2873
Distance to ghost focus: -1518.3282

```
Effective focal length :     13509.9722

Ghost reflection off surface 17 then 11. (GH017011.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.3312E+002     3.308528  1.6656E+002
Marginal ray height    :      -233.1173
Chief ray height       :         0.0000
Distance to ghost pupil:      -433.1434
Distance to ghost focus:     -1542.5503
Effective focal length :     13895.8184

Ghost reflection off surface 17 then 10. (GH017010.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.3902E+002     3.226380  1.7087E+002
Marginal ray height    :      -239.0240
Chief ray height       :         0.0000
Distance to ghost pupil:      -419.4177
Distance to ghost focus:     -1542.3644
Effective focal length :     13550.7945

Ghost reflection off surface 17 then 9. (GH017009.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4164E+002     3.214180  1.7343E+002
Marginal ray height    :      -241.6422
Chief ray height       :         0.0000
Distance to ghost pupil:      -441.4880
Distance to ghost focus:     -1553.3630
Effective focal length :     13499.5540

Ghost reflection off surface 17 then 8. (GH017008.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4440E+002     3.201447  1.7478E+002
Marginal ray height    :      -244.3960
Chief ray height       :         0.0000
Distance to ghost pupil:      -462.4777
Distance to ghost focus:     -1564.8415
Effective focal length :     13446.0779

Ghost reflection off surface 17 then 6. (GH017006.ZMX)
Surf     Marginal          F/#          RMS
  10 -2.3994E+003   168.128977  1.6983E+003
Marginal ray height    :     -2399.3812
Chief ray height       :         0.0000
Distance to ghost pupil:    184380.6445
Distance to ghost focus:    806811.0252
Effective focal length :    706141.7037

Ghost reflection off surface 17 then 5. (GH017005.ZMX)
Surf     Marginal          F/#          RMS
   8 -2.3994E+003   168.128977  1.6983E+003
Marginal ray height    :     -2399.3812
Chief ray height       :         0.0000
Distance to ghost pupil:    184380.6445
Distance to ghost focus:    806811.0252
Effective focal length :    706141.7037

Ghost reflection off surface 18 then 17. (GH018017.ZMX)
Surf     Marginal          F/#          RMS
  32 -1.9582E+001     3.998846  1.3987E+001
Marginal ray height    :       -19.5818
Chief ray height       :         0.0000
Distance to ghost pupil:       590.5143
Distance to ghost focus:      -156.6089
Effective focal length :     16795.1531

Ghost reflection off surface 18 then 13. (GH018013.ZMX)
Surf     Marginal          F/#          RMS
  32 -3.3291E+002     2.336770  2.4068E+002
Marginal ray height    :      -332.9103
Chief ray height       :         0.0000
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Distance to ghost pupil:     -1382.1142
Distance to ghost focus:     -1555.8699
Effective focal length :      9814.4352

Ghost reflection off surface 18 then 12. (GH018012.ZMX)
Surf     Marginal          F/#          RMS
  32 -3.3653E+002     2.327651  2.4450E+002
Marginal ray height    :      -336.5264
Chief ray height       :         0.0000
Distance to ghost pupil:     -1393.4988
Distance to ghost focus:     -1566.6321
Effective focal length :      9776.1352

Ghost reflection off surface 18 then 11. (GH018011.ZMX)
Surf     Marginal          F/#          RMS
  32 -3.3148E+002     2.404173  2.3954E+002
Marginal ray height    :      -331.4794
Chief ray height       :         0.0000
Distance to ghost pupil:     -1412.7037
Distance to ghost focus:     -1593.8671
Effective focal length :     10097.5245

Ghost reflection off surface 18 then 10. (GH018010.ZMX)
Surf     Marginal          F/#          RMS
  32 -3.4026E+002     2.337935  2.4617E+002
Marginal ray height    :      -340.2636
Chief ray height       :         0.0000
Distance to ghost pupil:     -1418.0051
Distance to ghost focus:     -1591.0283
Effective focal length :      9819.3268

Ghost reflection off surface 18 then 9. (GH018009.ZMX)
Surf     Marginal          F/#          RMS
  32 -3.4382E+002     2.329242  2.4984E+002
Marginal ray height    :      -343.8163
Chief ray height       :         0.0000
Distance to ghost pupil:     -1429.2153
Distance to ghost focus:     -1601.6626
Effective focal length :      9782.8152

Ghost reflection off surface 18 then 8. (GH018008.ZMX)
Surf     Marginal          F/#          RMS
  32 -3.4755E+002     2.320168  2.5167E+002
Marginal ray height    :      -347.5529
Chief ray height       :         0.0000
Distance to ghost pupil:     -1442.4327
Distance to ghost focus:     -1612.7624
Effective focal length :      9744.7058

Ghost reflection off surface 18 then 6. (GH018006.ZMX)
Surf     Marginal          F/#          RMS
  10 -3.2940E+003   146.603695  2.3336E+003
Marginal ray height    :     -3294.0137
Chief ray height       :         0.0000
Distance to ghost pupil:    570956.2052
Distance to ghost focus:    965829.1504
Effective focal length :    615735.5197

Ghost reflection off surface 18 then 5. (GH018005.ZMX)
Surf     Marginal          F/#          RMS
   8 -3.2940E+003   146.603695  2.3336E+003
Marginal ray height    :     -3294.0137
Chief ray height       :         0.0000
Distance to ghost pupil:    570956.2052
Distance to ghost focus:    965829.1504
Effective focal length :    615735.5197

Ghost reflection off surface 19 then 18. (GH019018.ZMX)
Surf     Marginal          F/#          RMS
  32 -7.0687E+001     3.057208  5.0387E+001
```

Marginal ray height   :   -70.6871
Chief ray height   :   0.0000
Distance to ghost pupil: -213.3115
Distance to ghost focus: -432.2100
Effective focal length :   12840.2724

Ghost reflection off surface 19 then 17. (GH019017.ZMX)
Surf   Marginal   F/#   RMS
  32 -7.0178E+001   3.317152 4.9935E+001
Marginal ray height   :   -70.1777
Chief ray height   :   0.0000
Distance to ghost pupil: -271.4613
Distance to ghost focus: -465.5801
Effective focal length :   13932.0383

Ghost reflection off surface 19 then 13. (GH019013.ZMX)
Surf   Marginal   F/#   RMS
  32 -3.5081E+002   2.404024 2.5394E+002
Marginal ray height   :   -350.8117
Chief ray height   :   0.0000
Distance to ghost pupil: -1598.1237
Distance to ghost focus: -1686.7196
Effective focal length :   10096.9010

Ghost reflection off surface 19 then 12. (GH019012.ZMX)
Surf   Marginal   F/#   RMS
  32 -3.5416E+002   2.395086 2.5763E+002
Marginal ray height   :   -354.1599
Chief ray height   :   0.0000
Distance to ghost pupil: -1607.1213
Distance to ghost focus: -1696.4867
Effective focal length :   10059.3612

Ghost reflection off surface 19 then 11. (GH019011.ZMX)
Surf   Marginal   F/#   RMS
  32 -3.4651E+002   2.502040 2.5066E+002
Marginal ray height   :   -346.5132
Chief ray height   :   0.0000
Distance to ghost pupil: -1638.7666
Distance to ghost focus: -1733.9800
Effective focal length :   10508.5695

Ghost reflection off surface 19 then 10. (GH019010.ZMX)
Surf   Marginal   F/#   RMS
  32 -3.5667E+002   2.414705 2.5837E+002
Marginal ray height   :   -356.6740
Chief ray height   :   0.0000
Distance to ghost pupil: -1633.3841
Distance to ghost focus: -1722.5249
Effective focal length :   10141.7610

Ghost reflection off surface 19 then 9. (GH019009.ZMX)
Surf   Marginal   F/#   RMS
  32 -3.5996E+002   2.406138 2.6190E+002
Marginal ray height   :   -359.9556
Chief ray height   :   0.0000
Distance to ghost pupil: -1642.3570
Distance to ghost focus: -1732.2055
Effective focal length :   10105.7783

Ghost reflection off surface 19 then 8. (GH019008.ZMX)
Surf   Marginal   F/#   RMS
  32 -3.6341E+002   2.397192 2.6349E+002
Marginal ray height   :   -363.4071
Chief ray height   :   0.0000
Distance to ghost pupil: -1654.4735
Distance to ghost focus: -1742.3132
Effective focal length :   10068.2076

Ghost reflection off surface 19 then 6. (GH019006.ZMX)

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Surf     Marginal          F/#          RMS
  10 -3.1444E+003   336.058456  2.2243E+003
Marginal ray height    :     -3144.3866
Chief ray height       :         0.0000
Distance to ghost pupil:   1168156.9991
Distance to ghost focus:   2113395.4070
Effective focal length :   1411445.5163

Ghost reflection off surface 19 then 5. (GH019005.ZMX)
Surf     Marginal          F/#          RMS
   8 -3.1444E+003   336.058456  2.2243E+003
Marginal ray height    :     -3144.3866
Chief ray height       :         0.0000
Distance to ghost pupil:   1168156.9991
Distance to ghost focus:   2113395.4070
Effective focal length :   1411445.5163

Ghost reflection off surface 20 then 19. (GH020019.ZMX)
Surf     Marginal          F/#          RMS
  32  3.8828E+000    10.091535  2.7709E+000
Marginal ray height    :         3.8828
Chief ray height       :         0.0000
Distance to ghost pupil:      -502.5022
Distance to ghost focus:        78.3678
Effective focal length :     42384.4450

Ghost reflection off surface 20 then 18. (GH020018.ZMX)
Surf     Marginal          F/#          RMS
  32 -4.5509E+001     4.552803  3.2277E+001
Marginal ray height    :       -45.5094
Chief ray height       :         0.0000
Distance to ghost pupil:      -936.4015
Distance to ghost focus:      -414.3906
Effective focal length :     19121.7711

Ghost reflection off surface 20 then 17. (GH020017.ZMX)
Surf     Marginal          F/#          RMS
  32 -4.6258E+001     4.811609  3.2790E+001
Marginal ray height    :       -46.2576
Chief ray height       :         0.0000
Distance to ghost pupil:     -2883.2956
Distance to ghost focus:      -445.1465
Effective focal length :     20208.7558

Ghost reflection off surface 20 then 13. (GH020013.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4415E+002     3.432566  1.7453E+002
Marginal ray height    :      -244.1548
Chief ray height       :         0.0000
Distance to ghost pupil:      -243.0607
Distance to ghost focus:     -1676.1552
Effective focal length :     14416.7786

Ghost reflection off surface 20 then 12. (GH020012.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4651E+002     3.419753  1.7699E+002
Marginal ray height    :      -246.5091
Chief ray height       :         0.0000
Distance to ghost pupil:      -267.7386
Distance to ghost focus:     -1686.0008
Effective focal length :     14362.9630

Ghost reflection off surface 20 then 11. (GH020011.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4131E+002     3.569177  1.7244E+002
Marginal ray height    :      -241.3087
Chief ray height       :         0.0000
Distance to ghost pupil:      -347.5311
Distance to ghost focus:     -1722.5472
Effective focal length :     14990.5450
```

Ghost reflection off surface 20 then 10. (GH020010.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.4833E+002   3.446720 1.7757E+002
Marginal ray height   :   -248.3332
Chief ray height   :   0.0000
Distance to ghost pupil: -326.7187
Distance to ghost focus: -1711.8698
Effective focal length :   14476.2237

Ghost reflection off surface 20 then 9. (GH020009.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.5064E+002   3.434443 1.7991E+002
Marginal ray height   :   -250.6412
Chief ray height   :   0.0000
Distance to ghost pupil: -349.8389
Distance to ghost focus: -1721.6259
Effective focal length :   14424.6625

Ghost reflection off surface 20 then 8. (GH020008.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.5307E+002   3.421626 1.8103E+002
Marginal ray height   :   -253.0687
Chief ray height   :   0.0000
Distance to ghost pupil: -371.7707
Distance to ghost focus: -1731.8124
Effective focal length :   14370.8275

Ghost reflection off surface 20 then 6. (GH020006.ZMX)
Surf   Marginal   F/#   RMS
  10 -2.2054E+003   436.550541 1.5597E+003
Marginal ray height   :   -2205.4451
Chief ray height   :   0.0000
Distance to ghost pupil: 174539.3417
Distance to ghost focus: 1925576.5085
Effective focal length :   1833512.2702

Ghost reflection off surface 20 then 5. (GH020005.ZMX)
Surf   Marginal   F/#   RMS
   8 -2.2054E+003   436.550541 1.5597E+003
Marginal ray height   :   -2205.4451
Chief ray height   :   0.0000
Distance to ghost pupil: 174539.3417
Distance to ghost focus: 1925576.5085
Effective focal length :   1833512.2702

Ghost reflection off surface 25 then 20. (GH025020.ZMX)
Surf   Marginal   F/#   RMS
  32 -1.7061E+001   5.852208 1.2088E+001
Marginal ray height   :   -17.0613
Chief ray height   :   0.0000
Distance to ghost pupil: -921.4319
Distance to ghost focus: -199.6926
Effective focal length :   24579.2715

Ghost reflection off surface 25 then 19. (GH025019.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.0774E+001   5.162577 1.4726E+001
Marginal ray height   :   -20.7742
Chief ray height   :   0.0000
Distance to ghost pupil: -422.7393
Distance to ghost focus: -214.4972
Effective focal length :   21682.8243

Ghost reflection off surface 25 then 18. (GH025018.ZMX)
Surf   Marginal   F/#   RMS
  32 -6.7062E+001   3.818160 4.7615E+001
Marginal ray height   :   -67.0623
Chief ray height   :   0.0000
Distance to ghost pupil: -720.9545

```
Distance to ghost focus:      -512.1091
Effective focal length :     16036.2711

Ghost reflection off surface 25 then 17. (GH025017.ZMX)
Surf     Marginal          F/#          RMS
  32 -6.0826E+001     4.705397  4.3124E+001
Marginal ray height    :       -60.8257
Chief ray height       :         0.0000
Distance to ghost pupil:     -1064.1326
Distance to ghost focus:      -572.4177
Effective focal length :     19762.6693

Ghost reflection off surface 25 then 13. (GH025013.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.3500E+002     3.719014  1.6784E+002
Marginal ray height    :      -234.9973
Chief ray height       :         0.0000
Distance to ghost pupil:     -2274.5550
Distance to ghost focus:     -1747.9165
Effective focal length :     15619.8600

Ghost reflection off surface 25 then 12. (GH025012.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.3711E+002     3.705508  1.7008E+002
Marginal ray height    :      -237.1111
Chief ray height       :         0.0000
Distance to ghost pupil:     -2276.3262
Distance to ghost focus:     -1757.2346
Effective focal length :     15563.1341

Ghost reflection off surface 25 then 11. (GH025011.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.3134E+002     3.891746  1.6517E+002
Marginal ray height    :      -231.3396
Chief ray height       :         0.0000
Distance to ghost pupil:     -2405.7437
Distance to ghost focus:     -1800.6301
Effective focal length :     16345.3337

Ghost reflection off surface 25 then 10. (GH025010.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.3840E+002     3.742438  1.7031E+002
Marginal ray height    :      -238.3982
Chief ray height       :         0.0000
Distance to ghost pupil:     -2326.3042
Distance to ghost focus:     -1784.3808
Effective focal length :     15718.2411

Ghost reflection off surface 25 then 9. (GH025009.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4047E+002     3.729460  1.7244E+002
Marginal ray height    :      -240.4675
Chief ray height       :         0.0000
Distance to ghost pupil:     -2328.3576
Distance to ghost focus:     -1793.6282
Effective focal length :     15663.7331

Ghost reflection off surface 25 then 8. (GH025008.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4264E+002     3.715907  1.7341E+002
Marginal ray height    :      -242.6440
Chief ray height       :         0.0000
Distance to ghost pupil:     -2338.2925
Distance to ghost focus:     -1803.2852
Effective focal length :     15606.8102

Ghost reflection off surface 25 then 6. (GH025006.ZMX)
Surf     Marginal          F/#          RMS
  10 -2.0152E+003  1221.517974  1.4249E+003
Marginal ray height    :     -2015.2005
```

```
Chief ray height       :         0.0000
Distance to ghost pupil:   -429265.9009
Distance to ghost focus:   4923207.2436
Effective focal length :   5130375.4896

Ghost reflection off surface 25 then 5. (GH025005.ZMX)
Surf     Marginal          F/#          RMS
   8 -2.0152E+003  1221.517974  1.4249E+003
Marginal ray height    :     -2015.2005
Chief ray height       :         0.0000
Distance to ghost pupil:   -429265.9009
Distance to ghost focus:   4923207.2436
Effective focal length :   5130375.4896

Ghost reflection off surface 26 then 25. (GH026025.ZMX)
Surf     Marginal          F/#          RMS
  32 -1.1301E+000     6.068924  7.9570E-001
Marginal ray height    :        -1.1301
Chief ray height       :         0.0000
Distance to ghost pupil:     -3065.8537
Distance to ghost focus:       -13.7168
Effective focal length :     25489.4822

Ghost reflection off surface 26 then 20. (GH026020.ZMX)
Surf     Marginal          F/#          RMS
  32 -1.8372E+001     5.776310  1.3017E+001
Marginal ray height    :       -18.3720
Chief ray height       :         0.0000
Distance to ghost pupil:      -922.2516
Distance to ghost focus:      -212.2452
Effective focal length :     24260.5017

Ghost reflection off surface 26 then 19. (GH026019.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.2627E+001     4.949527  1.6042E+001
Marginal ray height    :       -22.6270
Chief ray height       :         0.0000
Distance to ghost pupil:      -422.8269
Distance to ghost focus:      -223.9856
Effective focal length :     20788.0152

Ghost reflection off surface 26 then 18. (GH026018.ZMX)
Surf     Marginal          F/#          RMS
  32 -6.9209E+001     3.738018  4.9146E+001
Marginal ray height    :       -69.2090
Chief ray height       :         0.0000
Distance to ghost pupil:      -721.1157
Distance to ghost focus:      -517.4088
Effective focal length :     15699.6763

Ghost reflection off surface 26 then 17. (GH026017.ZMX)
Surf     Marginal          F/#          RMS
  32 -6.2444E+001     4.648506  4.4273E+001
Marginal ray height    :       -62.4437
Chief ray height       :         0.0000
Distance to ghost pupil:     -1064.7211
Distance to ghost focus:      -580.5399
Effective focal length :     19523.7233

Ghost reflection off surface 26 then 13. (GH026013.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.3693E+002     3.699525  1.6925E+002
Marginal ray height    :      -236.9258
Chief ray height       :         0.0000
Distance to ghost pupil:     -2275.6362
Distance to ghost focus:     -1753.0255
Effective focal length :     15538.0034

Ghost reflection off surface 26 then 12. (GH026012.ZMX)
Surf     Marginal          F/#          RMS
```

```
  32 -2.3905E+002     3.686116  1.7150E+002
Marginal ray height    :      -239.0465
Chief ray height       :         0.0000
Distance to ghost pupil:     -2277.3961
Distance to ghost focus:     -1762.3066
Effective focal length :     15481.6867

Ghost reflection off surface 26 then 11. (GH026011.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.3318E+002     3.873114  1.6651E+002
Marginal ray height    :      -233.1751
Chief ray height       :         0.0000
Distance to ghost pupil:     -2407.0474
Distance to ghost focus:     -1806.2273
Effective focal length :     16267.0787

Ghost reflection off surface 26 then 10. (GH026010.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4031E+002     3.723400  1.7171E+002
Marginal ray height    :      -240.3120
Chief ray height       :         0.0000
Distance to ghost pupil:     -2327.4348
Distance to ghost focus:     -1789.5552
Effective focal length :     15638.2807

Ghost reflection off surface 26 then 9. (GH026009.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4239E+002     3.710513  1.7385E+002
Marginal ray height    :      -242.3879
Chief ray height       :         0.0000
Distance to ghost pupil:     -2329.4772
Distance to ghost focus:     -1798.7668
Effective focal length :     15584.1548

Ghost reflection off surface 26 then 8. (GH026008.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4457E+002     3.697055  1.7482E+002
Marginal ray height    :      -244.5712
Chief ray height       :         0.0000
Distance to ghost pupil:     -2339.4103
Distance to ghost focus:     -1808.3865
Effective focal length :     15527.6303

Ghost reflection off surface 26 then 6. (GH026006.ZMX)
Surf     Marginal          F/#          RMS
  10 -2.0244E+003  1369.410576  1.4313E+003
Marginal ray height    :     -2024.3586
Chief ray height       :         0.0000
Distance to ghost pupil:   -428232.5547
Distance to ghost focus:   5544356.1746
Effective focal length :   5751524.4206

Ghost reflection off surface 26 then 5. (GH026005.ZMX)
Surf     Marginal          F/#          RMS
   8 -2.0244E+003  1369.410576  1.4313E+003
Marginal ray height    :     -2024.3586
Chief ray height       :         0.0000
Distance to ghost pupil:   -428232.5547
Distance to ghost focus:   5544356.1746
Effective focal length :   5751524.4206

Ghost reflection off surface 30 then 26. (GH030026.ZMX)
Surf     Marginal          F/#          RMS
  32 -6.2103E+000     6.068924  4.3971E+000
Marginal ray height    :        -6.2103
Chief ray height       :         0.0000
Distance to ghost pupil:     -3127.5168
Distance to ghost focus:       -75.3799
Effective focal length :     25489.4822
```

Ghost reflection off surface 30 then 25. (GH030025.ZMX)
Surf   Marginal   F/#   RMS
  32 -7.3371E+000   6.068924 5.1947E+000
Marginal ray height   :   -7.3371
Chief ray height   :   0.0000
Distance to ghost pupil: -3141.1937
Distance to ghost focus: -89.0568
Effective focal length :   25489.4822

Ghost reflection off surface 30 then 20. (GH030020.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.5592E+001   5.391160 1.8140E+001
Marginal ray height   :   -25.5923
Chief ray height   :   0.0000
Distance to ghost pupil: -926.6710
Distance to ghost focus: -275.9445
Effective focal length :   22642.8702

Ghost reflection off surface 30 then 19. (GH030019.ZMX)
Surf   Marginal   F/#   RMS
  32 -3.2833E+001   4.032764 2.3308E+001
Marginal ray height   :   -32.8329
Chief ray height   :   0.0000
Distance to ghost pupil: -423.2972
Distance to ghost focus: -264.8146
Effective focal length :   16937.6085

Ghost reflection off surface 30 then 18. (GH030018.ZMX)
Surf   Marginal   F/#   RMS
  32 -8.1034E+001   3.350611 5.7595E+001
Marginal ray height   :   -81.0342
Chief ray height   :   0.0000
Distance to ghost pupil: -721.9827
Distance to ghost focus: -543.0282
Effective focal length :   14072.5654

Ghost reflection off surface 30 then 17. (GH030017.ZMX)
Surf   Marginal   F/#   RMS
  32 -7.1357E+001   4.358234 5.0614E+001
Marginal ray height   :   -71.3569
Chief ray height   :   0.0000
Distance to ghost pupil: -1067.9091
Distance to ghost focus: -621.9805
Effective focal length :   18304.5827

Ghost reflection off surface 30 then 13. (GH030013.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.4755E+002   3.595723 1.7702E+002
Marginal ray height   :   -247.5491
Chief ray height   :   0.0000
Distance to ghost pupil: -2281.4996
Distance to ghost focus: -1780.2359
Effective focal length :   15102.0379

Ghost reflection off surface 30 then 12. (GH030012.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.4971E+002   3.582829 1.7934E+002
Marginal ray height   :   -249.7079
Chief ray height   :   0.0000
Distance to ghost pupil: -2283.1985
Distance to ghost focus: -1789.3211
Effective focal length :   15047.8810

Ghost reflection off surface 30 then 11. (GH030011.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.4329E+002   3.773593 1.7390E+002
Marginal ray height   :   -243.2858
Chief ray height   :   0.0000
Distance to ghost pupil: -2414.1218
Distance to ghost focus: -1836.1236

```
Effective focal length :     15849.0920

Ghost reflection off surface 30 then 10. (GH030010.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.5085E+002     3.621904  1.7943E+002
Marginal ray height    :      -250.8543
Chief ray height       :         0.0000
Distance to ghost pupil:     -2333.5672
Distance to ghost focus:     -1817.1406
Effective focal length :     15211.9985

Ghost reflection off surface 30 then 9. (GH030009.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.5297E+002     3.609498  1.8163E+002
Marginal ray height    :      -252.9663
Chief ray height       :         0.0000
Distance to ghost pupil:     -2335.5502
Distance to ghost focus:     -1826.1625
Effective focal length :     15159.8918

Ghost reflection off surface 30 then 8. (GH030008.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.5519E+002     3.596541  1.8260E+002
Marginal ray height    :      -255.1875
Chief ray height       :         0.0000
Distance to ghost pupil:     -2345.4732
Distance to ghost focus:     -1835.5849
Effective focal length :     15105.4721

Ghost reflection off surface 30 then 6. (GH030006.ZMX)
Surf     Marginal          F/#          RMS
  10 -2.0748E+003  4111.599287  1.4670E+003
Marginal ray height    :     -2074.8069
Chief ray height       :         0.0000
Distance to ghost pupil:   -422708.3870
Distance to ghost focus:  17061548.7610
Effective focal length :  17268717.0070

Ghost reflection off surface 30 then 5. (GH030005.ZMX)
Surf     Marginal          F/#          RMS
   8 -2.0748E+003  4111.599287  1.4670E+003
Marginal ray height    :     -2074.8069
Chief ray height       :         0.0000
Distance to ghost pupil:   -422708.3870
Distance to ghost focus:  17061548.7610
Effective focal length :  17268717.0070

Ghost reflection off surface 31 then 30. (GH031030.ZMX)
Surf     Marginal          F/#          RMS
  32 -1.3554E+000     6.068924  9.5522E-001
Marginal ray height    :        -1.3554
Chief ray height       :         0.0000
Distance to ghost pupil:     -3068.5890
Distance to ghost focus:       -16.4521
Effective focal length :     25489.4822

Ghost reflection off surface 31 then 26. (GH031026.ZMX)
Surf     Marginal          F/#          RMS
  32 -7.5625E+000     6.068924  5.3542E+000
Marginal ray height    :        -7.5625
Chief ray height       :         0.0000
Distance to ghost pupil:     -3143.9290
Distance to ghost focus:       -91.7921
Effective focal length :     25489.4822

Ghost reflection off surface 31 then 25. (GH031025.ZMX)
Surf     Marginal          F/#          RMS
  32 -8.6893E+000     6.068924  6.1518E+000
Marginal ray height    :        -8.6893
Chief ray height       :         0.0000
```

```
Distance to ghost pupil:     -3157.6059
Distance to ghost focus:      -105.4690
Effective focal length :     25489.4822

Ghost reflection off surface 31 then 20. (GH031020.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.7165E+001     5.313973  1.9255E+001
Marginal ray height    :       -27.1652
Chief ray height       :         0.0000
Distance to ghost pupil:      -927.6127
Distance to ghost focus:      -288.7102
Effective focal length :     22318.6875

Ghost reflection off surface 31 then 19. (GH031019.ZMX)
Surf     Marginal          F/#          RMS
  32 -3.5056E+001     3.876356  2.4892E+001
Marginal ray height    :       -35.0562
Chief ray height       :         0.0000
Distance to ghost pupil:      -423.3969
Distance to ghost focus:      -271.7804
Effective focal length :     16280.6956

Ghost reflection off surface 31 then 18. (GH031018.ZMX)
Surf     Marginal          F/#          RMS
  32 -8.3610E+001     3.276634  5.9436E+001
Marginal ray height    :       -83.6102
Chief ray height       :         0.0000
Distance to ghost pupil:      -722.1670
Distance to ghost focus:      -547.9203
Effective focal length :     13761.8627

Ghost reflection off surface 31 then 17. (GH031017.ZMX)
Surf     Marginal          F/#          RMS
  32 -7.3299E+001     4.299745  5.1995E+001
Marginal ray height    :       -73.2986
Chief ray height       :         0.0000
Distance to ghost pupil:     -1068.5859
Distance to ghost focus:      -630.3307
Effective focal length :     18058.9284

Ghost reflection off surface 31 then 13. (GH031013.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4986E+002     3.573879  1.7871E+002
Marginal ray height    :      -249.8633
Chief ray height       :         0.0000
Distance to ghost pupil:     -2282.7565
Distance to ghost focus:     -1785.9621
Effective focal length :     15010.2919

Ghost reflection off surface 31 then 12. (GH031012.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.5203E+002     3.561092  1.8105E+002
Marginal ray height    :      -252.0303
Chief ray height       :         0.0000
Distance to ghost pupil:     -2284.4423
Distance to ghost focus:     -1795.0064
Effective focal length :     14956.5852

Ghost reflection off surface 31 then 11. (GH031011.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4549E+002     3.752588  1.7551E+002
Marginal ray height    :      -245.4884
Chief ray height       :         0.0000
Distance to ghost pupil:     -2415.6392
Distance to ghost focus:     -1842.4336
Effective focal length :     15760.8705

Ghost reflection off surface 31 then 10. (GH031010.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.5315E+002     3.600524  1.8111E+002
```

```
Marginal ray height    :      -253.1509
Chief ray height       :         0.0000
Distance to ghost pupil:     -2334.8820
Distance to ghost focus:     -1822.9515
Effective focal length :     15122.2009

Ghost reflection off surface 31 then 9. (GH031009.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.5527E+002     3.588218  1.8332E+002
Marginal ray height    :      -255.2707
Chief ray height       :         0.0000
Distance to ghost pupil:     -2336.8523
Distance to ghost focus:     -1831.9337
Effective focal length :     15070.5158

Ghost reflection off surface 31 then 8. (GH031008.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.5750E+002     3.575366  1.8430E+002
Marginal ray height    :      -257.5002
Chief ray height       :         0.0000
Distance to ghost pupil:     -2346.7732
Distance to ghost focus:     -1841.3148
Effective focal length :     15016.5353

Ghost reflection off surface 31 then 6. (GH031006.ZMX)
Surf     Marginal          F/#          RMS
  10 -2.0858E+003  7292.906189  1.4748E+003
Marginal ray height    :     -2085.7966
Chief ray height       :         0.0000
Distance to ghost pupil:   -421541.4264
Distance to ghost focus:  30423037.7480
Effective focal length :  30630205.9939

Ghost reflection off surface 31 then 5. (GH031005.ZMX)
Surf     Marginal          F/#          RMS
   8 -2.0858E+003  7292.906189  1.4748E+003
Marginal ray height    :     -2085.7966
Chief ray height       :         0.0000
Distance to ghost pupil:   -421541.4264
Distance to ghost focus:  30423037.7480
Effective focal length :  30630205.9939

Ghost reflection off surface 32 then 31. (GH032031.ZMX)
Surf     Marginal          F/#          RMS
  32 -1.7574E+000     6.068924  1.2413E+000
Marginal ray height    :        -1.7574
Chief ray height       :         0.0000
Distance to ghost pupil:     -3073.4683
Distance to ghost focus:       -21.3314
Effective focal length :     25489.4822

Ghost reflection off surface 32 then 30. (GH032030.ZMX)
Surf     Marginal          F/#          RMS
  32 -3.1096E+000     6.068924  2.1984E+000
Marginal ray height    :        -3.1096
Chief ray height       :         0.0000
Distance to ghost pupil:     -3089.8805
Distance to ghost focus:       -37.7436
Effective focal length :     25489.4822

Ghost reflection off surface 32 then 26. (GH032026.ZMX)
Surf     Marginal          F/#          RMS
  32 -9.3166E+000     6.068924  6.5973E+000
Marginal ray height    :        -9.3166
Chief ray height       :         0.0000
Distance to ghost pupil:     -3165.2205
Distance to ghost focus:      -113.0836
Effective focal length :     25489.4822

Ghost reflection off surface 32 then 25. (GH032025.ZMX)
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```
Surf     Marginal          F/#          RMS
  32 -1.0443E+001     6.068924  7.3949E+000
Marginal ray height    :       -10.4434
Chief ray height       :         0.0000
Distance to ghost pupil:     -3178.8973
Distance to ghost focus:      -126.7604
Effective focal length :     25489.4822

Ghost reflection off surface 32 then 20. (GH032020.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.9206E+001     5.217073  2.0703E+001
Marginal ray height    :       -29.2057
Chief ray height       :         0.0000
Distance to ghost pupil:      -928.8234
Distance to ghost focus:      -304.7363
Effective focal length :     21911.7082

Ghost reflection off surface 32 then 19. (GH032019.ZMX)
Surf     Marginal          F/#          RMS
  32 -3.7940E+001     3.690662  2.6950E+001
Marginal ray height    :       -37.9404
Chief ray height       :         0.0000
Distance to ghost pupil:      -423.5249
Distance to ghost focus:      -280.0505
Effective focal length :     15500.7809

Ghost reflection off surface 32 then 18. (GH032018.ZMX)
Surf     Marginal          F/#          RMS
  32 -8.6952E+001     3.185397  6.1829E+001
Marginal ray height    :       -86.9521
Chief ray height       :         0.0000
Distance to ghost pupil:      -722.4037
Distance to ghost focus:      -553.9538
Effective focal length :     13378.6655

Ghost reflection off surface 32 then 17. (GH032017.ZMX)
Surf     Marginal          F/#          RMS
  32 -7.5818E+001     4.226167  5.3788E+001
Marginal ray height    :       -75.8175
Chief ray height       :         0.0000
Distance to ghost pupil:     -1069.4560
Distance to ghost focus:      -640.8351
Effective focal length :     17749.9001

Ghost reflection off surface 32 then 13. (GH032013.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.5287E+002     3.545933  1.8092E+002
Marginal ray height    :      -252.8654
Chief ray height       :         0.0000
Distance to ghost pupil:     -2284.3764
Distance to ghost focus:     -1793.2878
Effective focal length :     14892.9186

Ghost reflection off surface 32 then 12. (GH032012.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.5504E+002     3.533282  1.8327E+002
Marginal ray height    :      -255.0433
Chief ray height       :         0.0000
Distance to ghost pupil:     -2286.0453
Distance to ghost focus:     -1802.2799
Effective focal length :     14839.7857

Ghost reflection off surface 32 then 11. (GH032011.ZMX)
Surf     Marginal          F/#          RMS
  32 -2.4835E+002     3.725684  1.7761E+002
Marginal ray height    :      -248.3457
Chief ray height       :         0.0000
Distance to ghost pupil:     -2417.5955
Distance to ghost focus:     -1850.5156
Effective focal length :     15647.8745
```

Ghost reflection off surface 32 then 10. (GH032010.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.5613E+002   3.573161 1.8330E+002
Marginal ray height   :   -256.1302
Chief ray height   :   0.0000
Distance to ghost pupil: -2336.5768
Distance to ghost focus: -1830.3885
Effective focal length :   15007.2750

Ghost reflection off surface 32 then 9. (GH032009.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.5826E+002   3.560983 1.8553E+002
Marginal ray height   :   -258.2602
Chief ray height   :   0.0000
Distance to ghost pupil: -2338.5306
Distance to ghost focus: -1839.3201
Effective focal length :   14956.1273

Ghost reflection off surface 32 then 8. (GH032008.ZMX)
Surf   Marginal   F/#   RMS
  32 -2.6050E+002   3.548264 1.8651E+002
Marginal ray height   :   -260.5004
Chief ray height   :   0.0000
Distance to ghost pupil: -2348.4488
Distance to ghost focus: -1848.6484
Effective focal length :   14902.7072

Ghost reflection off surface 32 then 6. (GH032006.ZMX)
Surf   Marginal   F/#   RMS
  10 -2.1001E+003 1936368.947646 1.4849E+003
Marginal ray height   :   -2100.0535
Chief ray height   :   0.0000
Distance to ghost pupil: -420046.2399
Distance to ghost focus: -8132956747.9509
Effective focal length : -8132749576.5035

Ghost reflection off surface 32 then 5. (GH032005.ZMX)
Surf   Marginal   F/#   RMS
   8 -2.1001E+003 1936368.947646 1.4849E+003
Marginal ray height   :   -2100.0535
Chief ray height   :   0.0000
Distance to ghost pupil: -420046.2399
Distance to ghost focus: -8132956747.9509
Effective focal length : -8132749576.5035

Closest ghost pupil   :   -213.3115 at 19 then 18
Closest ghost focus   :   5.4244 at 11 then 8