

Table of Contents

Foreword	iii
1. Surface plate testing, optical comparators and grinding of convex surfaces	3
2. Collimator use in measuring angles, centering and edging of concave surfaces	5
3. Collimators, modern types	7
4. Aspheric optical surface production	8
5. Diamond band saw	10
6. Lightweight mirror construction without cementing or fusing	11
7. Thin glass pieces held firmly enough for grinding, lapping and polishing but without appreciable strain	13
8. Russians do better, optics neglected in U.S.A.	15
9. American Optical is world leader: 133-year old firm has top role in space age projects	16
10. Bar spherometers	17
11. Quartz and special glass machined with diamonds	19
12. Quartz delay lines	21
13. Making a concave f/0.4 parabola	23
14. Optical history of a machine tool builder	25
15. Abstracting in the field of lasers	26
16. Viscos guiding of optical cementing bubbles	28
17. Grinding aspheric surfaces	29
18. Making large optical elements by cementing calcium fluoride	31
19. Making a 1.22-m diameter aluminum mirror	32
20. Making of a cylindrical ellipse	34
21. Making accurate concave hemispheres of definite radius	36
22. HUNTERLAB seminars explain the objective measurement of appearance	38
23. About flats and parallels	39
24. Making a large, shallow concave aspheric without a measuring engine	41
25. Fabrication of a 104-cm mirror from Cer-Vit ^R low expansion material	42
26. Need for, and training of, glassworkers and technicians	46
27. Making of long, narrow optical flats	47
28. Hanau quartz glass for optical components of high precision for use in measurement technology	49
29. Recent photogrammetric and geodetic instruments	52
30. Rule of thumb arranged for ten fingers	56
31. One of the many ways to make a Schmidt plate	57
32. Fabrication of a 90° off-axis ellipsoidal mirror	59
33. Breithaupt Digigon digital theodolite	60
34. Blackbody photon calculator	62
35. Cemented glass roof mirrors	65
36. Unusual application of infrared nondestructive testing	66
37. Fiber optic point sources	70
38. Optigami--a tool for optical systems design	72
39. Nomograph of grating characteristics for the spectroscopist	73
40. Use of a collimator for measuring domes	75
41. Parametric nomograph for enlargers	76
42. Drilling a large hole in a large disk	77

43. Optics at Rank Precision Industries	78
44. Bench lenses designed at Baus Optics, Inc.	79
45. Method for conversion of steradian measurement to visual angle .	80
46. Making two large narrow prisms of sapphire flat to 1/4 wavelength and angular accuracy to \pm 5 sec.	81
47. Making cylindrical mirrors	85
48. Apparatus for the accurate determination of flange focal distance	88
49. Device for deflecting light beams through very small angles . . .	91
50. Making accurate small off-axis parabolas	92
51. Glass spheres in the making	94
52. Method for approximating the radius of curvature of small concave spherical mirrors using a He-Ne laser	96
53. Making a long concave cylinder mirror	99
54. Achieving smoothness of optical surfaces	101
55. Spherical sawing	104
56. Optics and the LIRR	107
57. Aid to viewing test plate interference fringes	109
58. Making a Schmidt plate by vacuum deposition	111
59. Fabry lens	115
60. Equations for determining the focal length of on-axis parabolic mirrors by He-Ne laser reflection	117
61. Making accurate anamorphic lenses	120
62. Making optical-quality laminated windows	124
63. Scanning Murty interferometer for optical testing	125
64. Eight-way classification of interferometric and interferential fringes	127
65. Notes on using an aspheric forming vacuum shoe	128
66. Sensitive detector system	133
67. Optical recording angel	133
68. Optics at the Honeywell Radiation Center	134
69. A.D. Jones Optical Works, Burlington, Massachusetts	136
70. High technology turns to art	138
71. Simple method for machining aspherical surfaces	140
72. Extension of the Ritchey test	141
73. Producing highly accurate hemispherical surfaces on large domes .	143
74. Improved geometry for all reflecting Schmidt telescope	148
75. HADRON, Incorporated	149
76. Optical Coating Laboratory, Incorporated	151
77. Optical windows; Surface correction for refractive index inhomogeneity	153
78. Leitz Canada comes of age	157
79. Polishing plastic	159
80. Sharpening the fringes in the Ronchi test	163
81. Aspheric lens elements and spline functions	165
82. Industrial holographic measurements	168
83. Making concentric hemicylinder lenses	173
84. Testing the sphericity of short radii convex surfaces	176
85. Laser illuminated divergent ball bearing sources	177
86. Optical activities of Jos. Schneider & Co.	180
87. Making stainless steel masters for highway reflectors	185
88. Mechanism of the diamond lapping process	188
89. Testing technique for parabolas	194

90.	Eight-way classification of interferometric and interferential fringes: Supplement	197
91.	Making and testing an f10.5 parabola	199
92.	Nomograph for the calculation of the index of refraction of a prism	202
93.	Polishing plastic--2	203
94.	Edging a large oval piece of glass	205
95.	Two matched prisms	209
96.	India ink Q-switch	211
97.	Making a convex aspheric	213
98.	Electrooptical focus and alignment	215
99.	Making an 18-in. diameter integrating sphere	218
100.	Machining a copper off-axis parabola	221
101.	One way of making a long octagonal prism	224
102.	Testing a prism's compound reflecting angles	226
103.	Teflon polishers: their manufacture and use	228
104.	Infrared detector Dewars: increased LN ₂ hold time and vacuum jacket life spans	234
105.	Setting the optimum focus of the pinholes or reticle of a collimator lens	236
106.	Flux conversion nomograph	237
107.	Precision prism made of calcium fluoride	239
108.	Deviation prisms; controlling the 90° roof-angle ridge	244
109.	Making an octagonal prism from Plexiglas	245
110.	Making a steep, radically aspheric lens both concave and convex	247
111.	Optical figuring of prisms	252
112.	Testing germanium for heating absorbing inclusions	254
113.	Correcting glass-angles of a prism	256
114.	Summer, Pioneer Venus radiometer light pipes	259
115.	Choice of inks for printed anaglyphs	262
116.	Chemical spray silvering	263
117.	To make an aluminum polygon	266
118.	Deviation prism interferometric testing	267
119.	Production of a large unsupported carbon-film ultraviolet filter	268
120.	Quick fast off-axis parabolas	272
121.	Optical design of reflectors. Part 1	274
122.	Optical design of reflectors. Part 2	277
123.	Improved light diffuser based on the Kalliroscope effect	280
124.	Optical design of reflectors. Part 3	281
125.	Testing glass reflecting-angles of prisms	285
126.	Profiling pitch polishers	287
127.	Making a complete ellipse of rotation	290
128.	Optically figuring a Schmidt-Cassegrain system	292
129.	Near perfect optical square	293
130.	Quartz tube construction	296
131.	Twelve-sided polygon of hardened steel	299
132.	Rapid interferometric examination of glass for index homogeneity	300
133.	Generating large-diameter radius surfaces with small cutters	301
134.	Accurate convex hyperbola	302
135.	Simple determination of workpiece-focal-point window tolerances in laser-material processing	304
136.	Polygons in germanium and silicon	307

137. Generation of a spherical mirror in aluminum	310
138. Interpreting wave-front and glass-error slopes in an interferogram	312
139. Making a six-piece assembly of sapphire from a cylinder	313
140. Making two very steep parabolas	316
141. Simple method for making a hyperboloid lens	320
142. Making a plano-concave element of silicon nitride	322
143. Making lithium niobate rods with cylindrical ends	325
144. Oddly shaped concave mirrors: how to make a number of them by the electroplating replica method	327
145. Patterns of correlation of intereroferograms and Ronchigrams	329
146. Making masters for corner cube reflectors	331
147. Making glass polygons	334
148. Making lenses and aspheric surfaces of AgCl or KRS-5	336
149. Simple method for testing an axicon	339
150. Generation of the inside of a thin wall	341
151. Laser rodholder during grinding and polishing	343
152. Making small glass elements that distribute light linearly	345
153. Stainless steel chopper wheel	347
154. In-line anamorphic beam expanders	349
155. Replicating a large rectangular mirror	350
156. Stainless steel chopper blade flat and parallel to one wavelength	352
157. Effect of water on some optical cements	354
158. Highly accurate highly polished hollow cone	356
159. Replicating optical surfaces using UV curing cements: a method	358
160. To make a sapphire cone and lens	359
161. Holographic interferometer for testing aspheric molds and molded parts	362
162. New test patterns for camera lens evaluation	364
163. Silicon wedge	366
164. Making small diameter lenses	369
165. Polishing precision optical components: a technique for rigid stress-free blocking	372
166. Angular tolerance on Dove prisms	374
Subject Index	376