

INDEX

- 1/f noise, 183, 187, 198, 203
Aberrations, 26, 70, 111, 227
Abingdon Cross benchmark, 295
Absorption, 93
AC coupling, 35, 109, 154, 160, 206, 249
Accuracy, 293
ADC, 46, 121, 128, 147, 153, 173, 223
Aerial reconnaissance, 142
AGC, 34, 83, 110, 130, 153, 157
Airy disk, 140, 147, 232
Algorithm efficiency, 295
Aliasing, 40, 214
Ambient temperature, 100, 366
Amplitude normalization, 254
AMRT, 331
Analog-to-digital converter. *See* ADC
ANSI target, 292
Aperiodic transfer function., *See* ATF
Apparent DAS, 143
Apparent ΔT , 78, 99, 111, 156, 362
Artifacts, 22, 59
Aspect ratio, 58, 118
ATF, 70, 140, 166
ATF/SRF test procedure, 170
Atmospheric transmittance, 5, 19, 65, 117, 363
Automated MRT. *See* AMRT
Automated testing, 18, 331
Automated vision system, 292
Automatic gain control. *See* AGC

Background removable, 241
Baffle, 101, 115
Bar/dot pattern, 284
Beat frequency, 41, 290
Bias, 356
Bias variation, 361
Bidirectional, 194
Bidirectional scan. *See* Interlace
Black hot, 60
Blackbody, 93
Blackbody law, 73
Blur diameter, 70, 140
Blur efficiency. *See* PVF
Bolometer, 26
Boost, 48, 249
Boresight alignment, 290

Calibration, 365
Calibration points. *See* NUC
Camera formula, 75
Cathode ray tube. *See* CRT
Centroid location, 238, 266, 284
Chi-squared, 180, 202
Circle array, 285
Circle distortion test procedure, 286
Closely spaced objects, 140, 293
Clutter, 5
Cold spike, 28
Collimator, 64, 111, 362
Color temperature, 73
Comfort zone, 304
Commercial, 2
Common aperture, 291
Common module, 23, 30, 32, 33, 52, 76, 182
Complex target, 104, 139
Confidence, 325
Consistent observer, 300
Contrast threshold, 303
Contrast transfer function. *See* CTF
Cool down, 175
Cooled, 24
Cooler, 33
 mechanical, 25
 thermoelectric, 25
Cooper-Harper, 11, 125, 211, 297
Cosine $^N\theta$, 27, 67, 161
Crosstalk, 287
CRT, 22, 55, 133
CTF, 137, 219, 221, 267
CTF test procedure, 273
Cutoff, 44

D operator, 188
D*, 181

| | |
|--|-------------------------------------|
| DAS, 29, 39, 129, 140, 145 | Example |
| Data analysis, 16 | 2-1, 32 |
| Datel, 146, 189 | 2-2, 45 |
| DC restoration, 35 | 2-3, 46 |
| DC system, 206 | 2-4, 46 |
| Defective element, 286 | 2-5, 46 |
| Delta T. <i>See</i> Apparent ΔT | 2-6, 54 |
| Depth of focus, 132 | 2-7, 57 |
| Detector | 3-1, 76 |
| strapped, 286 | 3-2, 77 |
| Detector angular subtense. <i>See</i> DAS | 3-3, 82 |
| Detector cutoff, 44 | 3-4, 85 |
| Detector pitch, 46 | 4-1, 102 |
| DFT, 251 | 4-2, 115 |
| Diagonal line target, 286 | 5-1, 142 |
| Diamond turned, 116 | 5-2, 147 |
| Diffraction, 70, 140 | 5-3, 148 |
| Digitization, 40, 230, 310 | 6-1, 156 |
| DIRSP, 339 | 6-2, 173 |
| Discrete Fourier transform. <i>See</i> DFT | 7-1, 201 |
| Disel, 146 | 7-2, 201 |
| Display. <i>See</i> Monitor | 7-3, 214 |
| Distortion, 278, 283 | 8-1, 232 |
| Dixel, 146 | 8-2, 232 |
| Documentation, 17 | 8-3, 256 |
| Drift, 243, 366 | 8-4, 258 |
| Droop, 36, 160 | 8-5, 269 |
| Dynamic infrared scene projector. <i>See</i> DIRSP | 10-1, 304 |
| Dynamic MRT, 324 | 10-2, 314 |
| Dynamic range, 48, 171, 209 | 10-3, 326 |
| Dynamic sampling, 323 | 12-1, 358 |
| Edge detection, 139 | Extended ESF test procedure, 262 |
| Edge spread response. <i>See</i> ESF | Extended source, 67 |
| Effective instantaneous-field-of-view. <i>See</i> EIFOV | |
| EIFOV, 144 | Far infrared, 4 |
| Emissive target, 96, 104 | Fast Fourier transform, 251 |
| Emittance, 75, 93, 99, 221, 363 | Field testing, 19, 332 |
| Emitter array, 340 | Field of view. <i>See</i> FOV |
| EMUX, 23 | Fill factor, 39 |
| Ensquared power. <i>See</i> PVF | FIR, 4 |
| EOMUX, 23, 269 | Fixed pattern noise. <i>See</i> FPN |
| Ergodic, 194 | Flare, 249 |
| ESF, 226, 238, 246 | Flat-panel display, 57 |
| | FLIR, 23 |
| | Flood illumination, 66, 164, 178 |
| | Flying spot scanner, 230 |

- f-naught, 223, 307
- F-number, 66, 111
- Focus, 127, 326
- Focus/resolution test procedure, 131
- Forward looking infrared. *See* FLIR
- Fourier transform, 215, 224
- FOV, 29, 279, 290
- FPN, 34, 48, 84, 166, 187, 192, 194, 204, 248
- FPN test procedure, 207
- Fractional uncertainty, 361
- Frame grabber, 119
- Frequency resolution, 251
- Frequency scaling, 250, 255
- Frequency-of-seeing, 300, 321, 370
- Full-width, half-maximum. *See* FWHM
- Fuzzy logic, 335
- FWHM, 141, 231
- Gain uniformity, 166
- Gain/level normalization. *See* NUC
- Gamma, 53, 56
- Gamma correction, 52
- Gaussian distribution, 165, 179, 301, 353
- Gaussian MTF. *See* MTF
- Geometric distortion, 30, 283
- Geometric transfer function, 278
- Ghosting, 32
- Glare, 29
- Gray level, 47, 105
- Gray scale, 128
- GRD, 143
- Ground resolved distance. *See* GRD
- Hanning window, 253
- Hardware-in-the-loop. *See* HWIL
- Hot spot detection. *See* PVF
- HWIL, 298, 333, 339
- IFOV, 141
- Image evaluation, 10, 333
- Image processing, 48, 295
- Image quality, 6, 10, 48, 58, 140, 297
- Imaging resolution, 145, 167
- Indium antimonide, 25
- Indium gallium arsenide, 24
- Infrared search and track system, 2, 140, 167, 293
- InGaAs, 24
- In-phase contrast transfer function. *See* IPCTF
- In-phase CTF test procedure, 274
- Input-to-output, 6
- Instantaneous field of view. *See* IFOV
- Integration time, 83, 186
- Interlace, 30, 286
- Interlace target, 286
- IPCTF, 59, 272
- ISO 12233, 238
- Isoplanatic, 227
- ITU, 53
- Jaggies, 41
- Jitter, 243
- JND, 53
- Just noticeable difference. *See* JND
- Kell factor, 58
- Kirchoff's law, 93
- Knife edge. *See* ESF
- Lambertian source, 73
- Laser speckle, 223
- Leakage, 253
- Least significant bit. *See* LSB
- Light emitting diode, 45
- Limiting resolution, 129
- Line scanner, 23
- Line spread function. *See* LSF
- Linearity, 49, 57, 78, 164, 171, 228
- Line-to-line interpolation, 286
- Log-normal distribution, 300
- Long wavelength infrared. *See* LWIR
- Low frequency removal, 195
- LSB, 47
- LSF, 224, 230, 235, 246, 249
- LWIR, 4, 24
- Machine vision, 2, 14, 21, 292
- Magnification, 66
- Man-in-the-loop, 298

- MAVISS, 134, 193, 309, 336
MDT, 2, 10, 297, 307
Mean, 179, 350
Measurement resolution, 145, 159, 167
Measurement uncertainty, 362
Mercury cadmium telluride, 25
Micro-emitter array, 340
Microphonics, 191, 216
Microscan, 33
Minimum detectable temperature. *See* MDT
Minimum resolvable temperature. *See* MRT
Modulation, 220
Modulation transfer function. *See* MTF
Moiré pattern, 40, 133
Monitor, 36, 52, 55, 57, 88, 118, 128, 133, 141, 147, 148, 281, 303, 315
Monitor luminance, 120
Mounting fixture, 118
MRT, 2, 10, 16, 42, 81, 99, 135, 136, 297, 307
MRT uncertainty, 370
MRT/MDT test procedure, 317
MRTSim, 306
MTF, 54, 136, 138, 220, 223
 Detector, 259
 Diffraction, 259
 Direct, 224
 Gaussian, 256
 Indirect, 224
MTF test procedure, 259
MWIR, 4, 24
Narcissus, 28, 195, 210
NEBW, 181, 213
NEDT, 8, 80, 171, 181, 186, 194, 199
NEDT test procedure, 200
NEDT/MTF approach, 337
NEFD, 211
Newtonian mount, 113
Nichrome wire, 108
Nodal point, 279
Noise, 130, 161, 177, 244, 305
Noise equivalent bandwidth. *See* NEBW
Noise equivalent differential temperature. *See* NEDT
Noise equivalent flux density. *See* NEFD
Noise equivalent irradiance. *See* NEFD
Noise power spectral density. *See* NPSD
Noise statistics, 179
Noisy element, 286
Nonuniformity, 32, 38, 185, 194, 208, 243, 364
Nonuniformity correction. *See* NUC
Nonuniformity test procedure, 210
Normal deviate. *See* Z statistic
Normal distribution. *See* Gaussian distribution
Normalization, 83
NPSD, 194, 213, 305
NUC, 27, 34, 48, 165, 187, 198, 204, 206, 207, 209
Nyquist frequency, 40, 45, 137, 214, 219, 252, 260, 272
Objective MRT, 334
Observer qualification, 306
Observer variability, 135, 306
Off-axis parabola, 112
Offset, 364
Offset temperature, 99, 155
Optical cutoff, 44
Optical prefiltering, 324
Optical transfer function, 219
Optical transmittance, 66, 85
Padding zeros, 252
Parallel scan. *See* Interlace
PAS, 33, 39, 129
Pass/fail, 17, 124, 149, 282, 326, 331
Passive target, 108
Pedestal, 241
Pel, 146
Periodic array, 233
Phase transfer function. *See* PTF
Phasing effects, 109, 135, 272, 310, 336
Physical measures, 10, 333

- Pixel, 146
 Pixel angular subtense. *See* PAS
 Pixels on target, 335
 Planck's blackbody law, 73
 Platinum silicide, 25
 Point source, 68, 72, 211, 234
 Point source detection. *See* PVF
 Point spread function. *See* PSF
 Point visibility factor. *See* PVF
 Power spectra, 253
 Precision, 356
 PSF, 224, 235
 PTF, 264
 PVF, 72, 136, 140, 167, 211, 307
 Pyroelectric, 26

 Quantization, 47, 121
 Quantum well, 26

 Radiometry, 63
 Random variation, 361
 Range, 354
 Raster pattern, 133, 304
 Raster scan, 30
 Rating scale, 10
 Rayleigh criterion, 140
 Readout electronics, 191
 Reconstruction, 55
 Record length, 252
 Rectangle, 283
 Reflectance, 363
 Reflective target, 102
 Relative precision, 357
 Relative uncertainty, 361
 Repeatability, 293, 351
 Resel, 146
 Resistive array, 340
 Resolution, 8, 52, 58, 127, 139
 Resolved source, 66
 Responsivity, 76, 152
 Responsivity uniformity, 164
 RMS value. *See* Standard deviation
 RS-170, 52

 Sample-scene phase, 229
 Sampling, 40, 122, 223, 229

 Sampling effects. *See* Phasing effects
 Sampling theory, 41
 Saturation, 171
 Sayce target, 132, 135, 149, 225
 Scale factor, 256
 Scan efficiency, 32, 289
 Scan noise, 29, 195
 Scan nonlinearity, 286
 Scan velocity, 289
 Scanner, 29
 Scanning system, 181, 198
 Scene-based correction, 51
 Scene generator, 107, 339
 Scene projector, 339
 Scenel, 146, 340
 Second generation, 23
 Sensitivity, 8
 Separate aperture, 290
 SFR, 238
 Shading, 27, 195, 208, 243
 Shared aperture, 291
 Signal transfer function. *See* SiTF
 SiTF, 77, 82, 100, 153, 189, 205
 SiTF test procedure, 163
 SiTF uncertainty, 369
 Skewed edge. *See* Tilted edge
 Slit array, 235
 Slit response function. *See* SRF
 Slit target, 226, 237
 Sobel operator, 139
 Sparrow criterion, 140
 Spatial frequency, 87
 Spatial frequency response. *See* SFR
 Spatial noise, 191
 Spatial resolution, 128
 Specification
 Boresight alignment, 296
 Distortion, 296
 FOV, 296
 FPN, 217
 In focus, 151
 Machine vision, 296
 MDT, 328
 MRT, 328
 NEDT, 217
 Noise, 217

- Nonuniformity, 217
- Resolution, 151
- Scan linearity, 296
- SiTF, 176
- TOD, 328
- Spot-size ratio, 144
- SPRITE, 26, 30
- Square-wave response. *See* CTF
- SRF, 145, 166
- Stability, 364
- Standard Correlation Target Set, 293
- Standard deviation, 180, 181, 350
- Staring arrays, 82, 186, 199
- Stars, 132
- Statistical analysis, 343
- Step response. *See* ESF
- Strapped detector, 34, 286
- Student t-test, 161, 358
- Subjective evaluation, 10
- Sun glint, 5, 24
- Sweep frequency. *See* Sayce target
- Sweet spot, 208, 278
- SWIR, 4
- Systematic variation, 361
- Tangential sampling, 239
- Target, 95
- Target projector, 92
- Target signature, 3, 19
- Target simulator, 92
- Target transfer function, 72, 167
- Target wheels, 104
- TDI, 30, 289
- Temperature coefficient, 365
- Temperature references, 48
- Temperature sensor, 365
- Temporal noise, 191
- Test engineer, 125
- Test equipment, 16, 121
- Test philosophy, 14
- Test plan, 15
- Test procedures, 15
- Thermal derivative, 78
- Thermoelectric cooler, 25
- Third generation, 24
- Three-dimensional noise model, 187, 306
- Threshold, 298, 300, 353
- Tilted edge, 233, 238
- Tilted slit, 237
- Time-delay-and-integration. *See* TDI
- T-number, 68
- TOD, 321
- Tonal transfer curve, 59
- Trackers, 294
- Trend analyses, 17
- Trend removal, 195
- Triangle orientation discrimination. *See* TOD
- Tri-bar target, 150
- Turbulence, 118
- TV limiting resolution, 140
- Type A uncertainty, 362
- Type B uncertainty, 362
- Uncertainty, 360
- Uncertainty analysis, 350
- Uncooled, 24, 83, 161
- Uniformity. *See* NUC
- USAF 1951 target, 149
- Variance. *See* Standard deviation
- Very long wave infrared, 4
- Vibration, 118, 244
- Vignetting, 27
- Visual angle, 303
- VLWIR, 4
- Wave front error, 132, 135, 138
- Wedges, 132, 148
- White hot, 60
- Wien's law, 74
- Window, 253
- Working distance, 115
- Young's fringes, 223
- Z statistic, 325, 353, 372