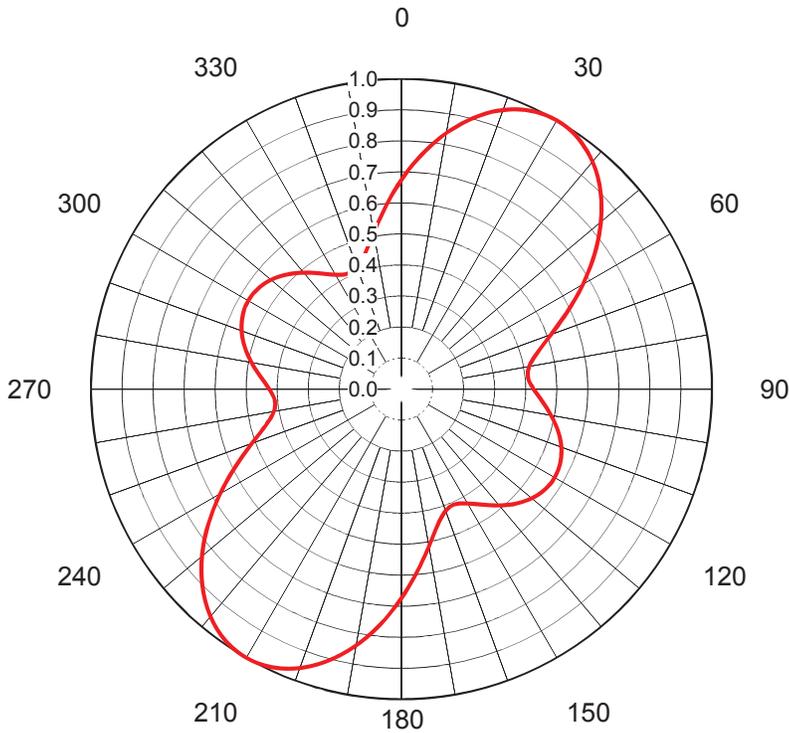


## AZIMUTH PATTERN Horizontal Polarization



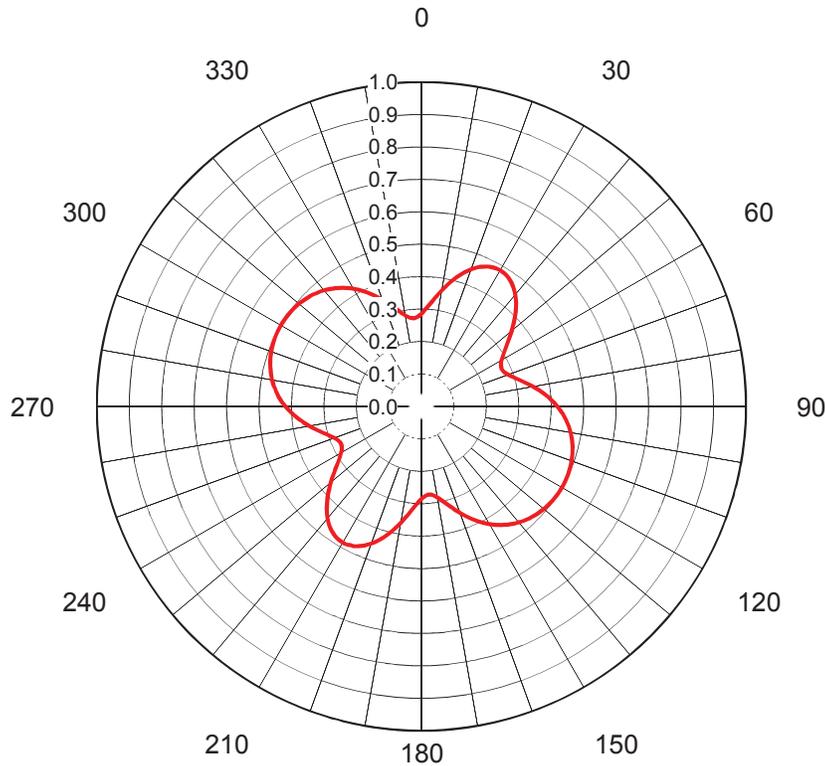
Proposal No. **C-70411**  
 Date **8-Mar-17**  
 Call Letters **WPFO**  
 Channel **17**  
 Frequency **491 MHz**  
 Antenna Type **TFU-17ETT/VP-R P230**  
 Gain **2.31 (3.64dB)**  
**Calculated**  
  
 Drawing # **H975-P2-CH17**

| Deg | Value |
|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|
| 0   | 0.674 | 36  | 0.984 | 72  | 0.486 | 108 | 0.539 | 144 | 0.462 | 180 | 0.674 | 216 | 0.984 | 252 | 0.486 | 288 | 0.539 | 324 | 0.462 |
| 1   | 0.692 | 37  | 0.979 | 73  | 0.474 | 109 | 0.543 | 145 | 0.455 | 181 | 0.692 | 217 | 0.979 | 253 | 0.474 | 289 | 0.543 | 325 | 0.455 |
| 2   | 0.709 | 38  | 0.972 | 74  | 0.463 | 110 | 0.548 | 146 | 0.449 | 182 | 0.709 | 218 | 0.972 | 254 | 0.463 | 290 | 0.548 | 326 | 0.449 |
| 3   | 0.726 | 39  | 0.965 | 75  | 0.453 | 111 | 0.552 | 147 | 0.442 | 183 | 0.726 | 219 | 0.965 | 255 | 0.453 | 291 | 0.552 | 327 | 0.442 |
| 4   | 0.743 | 40  | 0.957 | 76  | 0.444 | 112 | 0.556 | 148 | 0.436 | 184 | 0.743 | 220 | 0.957 | 256 | 0.444 | 292 | 0.556 | 328 | 0.436 |
| 5   | 0.760 | 41  | 0.948 | 77  | 0.435 | 113 | 0.559 | 149 | 0.431 | 185 | 0.760 | 221 | 0.948 | 257 | 0.435 | 293 | 0.559 | 329 | 0.431 |
| 6   | 0.776 | 42  | 0.939 | 78  | 0.428 | 114 | 0.562 | 150 | 0.426 | 186 | 0.776 | 222 | 0.939 | 258 | 0.428 | 294 | 0.562 | 330 | 0.426 |
| 7   | 0.792 | 43  | 0.928 | 79  | 0.422 | 115 | 0.564 | 151 | 0.421 | 187 | 0.792 | 223 | 0.928 | 259 | 0.422 | 295 | 0.564 | 331 | 0.421 |
| 8   | 0.808 | 44  | 0.917 | 80  | 0.418 | 116 | 0.566 | 152 | 0.417 | 188 | 0.808 | 224 | 0.917 | 260 | 0.418 | 296 | 0.566 | 332 | 0.417 |
| 9   | 0.824 | 45  | 0.906 | 81  | 0.414 | 117 | 0.568 | 153 | 0.414 | 189 | 0.824 | 225 | 0.906 | 261 | 0.414 | 297 | 0.568 | 333 | 0.414 |
| 10  | 0.839 | 46  | 0.894 | 82  | 0.411 | 118 | 0.569 | 154 | 0.411 | 190 | 0.839 | 226 | 0.894 | 262 | 0.411 | 298 | 0.569 | 334 | 0.411 |
| 11  | 0.853 | 47  | 0.881 | 83  | 0.410 | 119 | 0.570 | 155 | 0.410 | 191 | 0.853 | 227 | 0.881 | 263 | 0.410 | 299 | 0.570 | 335 | 0.410 |
| 12  | 0.867 | 48  | 0.867 | 84  | 0.409 | 120 | 0.570 | 156 | 0.409 | 192 | 0.867 | 228 | 0.867 | 264 | 0.409 | 300 | 0.570 | 336 | 0.409 |
| 13  | 0.881 | 49  | 0.853 | 85  | 0.410 | 121 | 0.570 | 157 | 0.410 | 193 | 0.881 | 229 | 0.853 | 265 | 0.410 | 301 | 0.570 | 337 | 0.410 |
| 14  | 0.894 | 50  | 0.839 | 86  | 0.411 | 122 | 0.569 | 158 | 0.411 | 194 | 0.894 | 230 | 0.839 | 266 | 0.411 | 302 | 0.569 | 338 | 0.411 |
| 15  | 0.906 | 51  | 0.824 | 87  | 0.414 | 123 | 0.568 | 159 | 0.414 | 195 | 0.906 | 231 | 0.824 | 267 | 0.414 | 303 | 0.568 | 339 | 0.414 |
| 16  | 0.917 | 52  | 0.808 | 88  | 0.417 | 124 | 0.566 | 160 | 0.418 | 196 | 0.917 | 232 | 0.808 | 268 | 0.417 | 304 | 0.566 | 340 | 0.418 |
| 17  | 0.928 | 53  | 0.792 | 89  | 0.421 | 125 | 0.564 | 161 | 0.422 | 197 | 0.928 | 233 | 0.792 | 269 | 0.421 | 305 | 0.564 | 341 | 0.422 |
| 18  | 0.939 | 54  | 0.776 | 90  | 0.426 | 126 | 0.562 | 162 | 0.428 | 198 | 0.939 | 234 | 0.776 | 270 | 0.426 | 306 | 0.562 | 342 | 0.428 |
| 19  | 0.948 | 55  | 0.760 | 91  | 0.431 | 127 | 0.559 | 163 | 0.435 | 199 | 0.948 | 235 | 0.760 | 271 | 0.431 | 307 | 0.559 | 343 | 0.435 |
| 20  | 0.957 | 56  | 0.743 | 92  | 0.436 | 128 | 0.556 | 164 | 0.444 | 200 | 0.957 | 236 | 0.743 | 272 | 0.436 | 308 | 0.556 | 344 | 0.444 |
| 21  | 0.965 | 57  | 0.726 | 93  | 0.442 | 129 | 0.552 | 165 | 0.453 | 201 | 0.965 | 237 | 0.726 | 273 | 0.442 | 309 | 0.552 | 345 | 0.453 |
| 22  | 0.972 | 58  | 0.709 | 94  | 0.449 | 130 | 0.548 | 166 | 0.463 | 202 | 0.972 | 238 | 0.709 | 274 | 0.449 | 310 | 0.548 | 346 | 0.463 |
| 23  | 0.979 | 59  | 0.692 | 95  | 0.455 | 131 | 0.543 | 167 | 0.474 | 203 | 0.979 | 239 | 0.692 | 275 | 0.455 | 311 | 0.543 | 347 | 0.474 |
| 24  | 0.984 | 60  | 0.674 | 96  | 0.462 | 132 | 0.539 | 168 | 0.486 | 204 | 0.984 | 240 | 0.674 | 276 | 0.462 | 312 | 0.539 | 348 | 0.486 |
| 25  | 0.989 | 61  | 0.657 | 97  | 0.469 | 133 | 0.533 | 169 | 0.499 | 205 | 0.989 | 241 | 0.657 | 277 | 0.469 | 313 | 0.533 | 349 | 0.499 |
| 26  | 0.993 | 62  | 0.640 | 98  | 0.476 | 134 | 0.528 | 170 | 0.513 | 206 | 0.993 | 242 | 0.640 | 278 | 0.476 | 314 | 0.528 | 350 | 0.513 |
| 27  | 0.996 | 63  | 0.623 | 99  | 0.483 | 135 | 0.522 | 171 | 0.527 | 207 | 0.996 | 243 | 0.623 | 279 | 0.483 | 315 | 0.522 | 351 | 0.527 |
| 28  | 0.998 | 64  | 0.606 | 100 | 0.490 | 136 | 0.516 | 172 | 0.542 | 208 | 0.998 | 244 | 0.606 | 280 | 0.490 | 316 | 0.516 | 352 | 0.542 |
| 29  | 1.000 | 65  | 0.590 | 101 | 0.497 | 137 | 0.510 | 173 | 0.557 | 209 | 1.000 | 245 | 0.590 | 281 | 0.497 | 317 | 0.510 | 353 | 0.557 |
| 30  | 1.000 | 66  | 0.573 | 102 | 0.503 | 138 | 0.503 | 174 | 0.573 | 210 | 1.000 | 246 | 0.573 | 282 | 0.503 | 318 | 0.503 | 354 | 0.573 |
| 31  | 1.000 | 67  | 0.557 | 103 | 0.510 | 139 | 0.497 | 175 | 0.590 | 211 | 1.000 | 247 | 0.557 | 283 | 0.510 | 319 | 0.497 | 355 | 0.590 |
| 32  | 0.998 | 68  | 0.542 | 104 | 0.516 | 140 | 0.490 | 176 | 0.606 | 212 | 0.998 | 248 | 0.542 | 284 | 0.516 | 320 | 0.490 | 356 | 0.606 |
| 33  | 0.996 | 69  | 0.527 | 105 | 0.522 | 141 | 0.483 | 177 | 0.623 | 213 | 0.996 | 249 | 0.527 | 285 | 0.522 | 321 | 0.483 | 357 | 0.623 |
| 34  | 0.993 | 70  | 0.513 | 106 | 0.528 | 142 | 0.476 | 178 | 0.640 | 214 | 0.993 | 250 | 0.513 | 286 | 0.528 | 322 | 0.476 | 358 | 0.640 |
| 35  | 0.989 | 71  | 0.499 | 107 | 0.533 | 143 | 0.469 | 179 | 0.657 | 215 | 0.989 | 251 | 0.499 | 287 | 0.533 | 323 | 0.469 | 359 | 0.657 |

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## AZIMUTH PATTERN Vertical Polarization

Proposal No. **C-70411**  
 Date **8-Mar-17**  
 Call Letters **WPFO**  
 Channel **17**  
 Frequency **491 MHz**  
 Antenna Type **TFU-17ETT/VP-R P230**  
 Gain **1.5 (1.77dB)**  
**Calculated**  
  
 Drawing # **V975-P2-CH17**



| Deg | Value |
|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|
| 0   | 0.285 | 36  | 0.472 | 72  | 0.295 | 108 | 0.489 | 144 | 0.451 | 180 | 0.285 | 216 | 0.472 | 252 | 0.295 | 288 | 0.489 | 324 | 0.451 |
| 1   | 0.290 | 37  | 0.467 | 73  | 0.301 | 109 | 0.491 | 145 | 0.446 | 181 | 0.290 | 217 | 0.467 | 253 | 0.301 | 289 | 0.491 | 325 | 0.446 |
| 2   | 0.296 | 38  | 0.462 | 74  | 0.307 | 110 | 0.492 | 146 | 0.441 | 182 | 0.296 | 218 | 0.462 | 254 | 0.307 | 290 | 0.492 | 326 | 0.441 |
| 3   | 0.303 | 39  | 0.456 | 75  | 0.314 | 111 | 0.494 | 147 | 0.436 | 183 | 0.303 | 219 | 0.456 | 255 | 0.314 | 291 | 0.494 | 327 | 0.436 |
| 4   | 0.311 | 40  | 0.450 | 76  | 0.321 | 112 | 0.495 | 148 | 0.430 | 184 | 0.311 | 220 | 0.450 | 256 | 0.321 | 292 | 0.495 | 328 | 0.430 |
| 5   | 0.318 | 41  | 0.443 | 77  | 0.328 | 113 | 0.496 | 149 | 0.425 | 185 | 0.318 | 221 | 0.443 | 257 | 0.328 | 293 | 0.496 | 329 | 0.425 |
| 6   | 0.327 | 42  | 0.435 | 78  | 0.335 | 114 | 0.497 | 150 | 0.419 | 186 | 0.327 | 222 | 0.435 | 258 | 0.335 | 294 | 0.497 | 330 | 0.419 |
| 7   | 0.336 | 43  | 0.427 | 79  | 0.342 | 115 | 0.498 | 151 | 0.413 | 187 | 0.336 | 223 | 0.427 | 259 | 0.342 | 295 | 0.498 | 331 | 0.413 |
| 8   | 0.345 | 44  | 0.419 | 80  | 0.350 | 116 | 0.499 | 152 | 0.406 | 188 | 0.345 | 224 | 0.419 | 260 | 0.350 | 296 | 0.499 | 332 | 0.406 |
| 9   | 0.354 | 45  | 0.410 | 81  | 0.357 | 117 | 0.499 | 153 | 0.400 | 189 | 0.354 | 225 | 0.410 | 261 | 0.357 | 297 | 0.499 | 333 | 0.400 |
| 10  | 0.364 | 46  | 0.401 | 82  | 0.365 | 118 | 0.500 | 154 | 0.393 | 190 | 0.364 | 226 | 0.401 | 262 | 0.365 | 298 | 0.500 | 334 | 0.393 |
| 11  | 0.373 | 47  | 0.392 | 83  | 0.372 | 119 | 0.500 | 155 | 0.386 | 191 | 0.373 | 227 | 0.392 | 263 | 0.372 | 299 | 0.500 | 335 | 0.386 |
| 12  | 0.383 | 48  | 0.383 | 84  | 0.379 | 120 | 0.500 | 156 | 0.379 | 192 | 0.383 | 228 | 0.383 | 264 | 0.379 | 300 | 0.500 | 336 | 0.379 |
| 13  | 0.392 | 49  | 0.373 | 85  | 0.386 | 121 | 0.500 | 157 | 0.372 | 193 | 0.392 | 229 | 0.373 | 265 | 0.386 | 301 | 0.500 | 337 | 0.372 |
| 14  | 0.401 | 50  | 0.364 | 86  | 0.393 | 122 | 0.500 | 158 | 0.365 | 194 | 0.401 | 230 | 0.364 | 266 | 0.393 | 302 | 0.500 | 338 | 0.365 |
| 15  | 0.410 | 51  | 0.354 | 87  | 0.400 | 123 | 0.499 | 159 | 0.357 | 195 | 0.410 | 231 | 0.354 | 267 | 0.400 | 303 | 0.499 | 339 | 0.357 |
| 16  | 0.419 | 52  | 0.345 | 88  | 0.406 | 124 | 0.499 | 160 | 0.350 | 196 | 0.419 | 232 | 0.345 | 268 | 0.406 | 304 | 0.499 | 340 | 0.350 |
| 17  | 0.427 | 53  | 0.336 | 89  | 0.413 | 125 | 0.498 | 161 | 0.342 | 197 | 0.427 | 233 | 0.336 | 269 | 0.413 | 305 | 0.498 | 341 | 0.342 |
| 18  | 0.435 | 54  | 0.327 | 90  | 0.419 | 126 | 0.497 | 162 | 0.335 | 198 | 0.435 | 234 | 0.327 | 270 | 0.419 | 306 | 0.497 | 342 | 0.335 |
| 19  | 0.443 | 55  | 0.318 | 91  | 0.425 | 127 | 0.496 | 163 | 0.328 | 199 | 0.443 | 235 | 0.318 | 271 | 0.425 | 307 | 0.496 | 343 | 0.328 |
| 20  | 0.450 | 56  | 0.311 | 92  | 0.430 | 128 | 0.495 | 164 | 0.321 | 200 | 0.450 | 236 | 0.311 | 272 | 0.430 | 308 | 0.495 | 344 | 0.321 |
| 21  | 0.456 | 57  | 0.303 | 93  | 0.436 | 129 | 0.494 | 165 | 0.314 | 201 | 0.456 | 237 | 0.303 | 273 | 0.436 | 309 | 0.494 | 345 | 0.314 |
| 22  | 0.462 | 58  | 0.296 | 94  | 0.441 | 130 | 0.492 | 166 | 0.307 | 202 | 0.462 | 238 | 0.296 | 274 | 0.441 | 310 | 0.492 | 346 | 0.307 |
| 23  | 0.467 | 59  | 0.290 | 95  | 0.446 | 131 | 0.491 | 167 | 0.301 | 203 | 0.467 | 239 | 0.290 | 275 | 0.446 | 311 | 0.491 | 347 | 0.301 |
| 24  | 0.472 | 60  | 0.285 | 96  | 0.451 | 132 | 0.489 | 168 | 0.295 | 204 | 0.472 | 240 | 0.285 | 276 | 0.451 | 312 | 0.489 | 348 | 0.295 |
| 25  | 0.476 | 61  | 0.281 | 97  | 0.455 | 133 | 0.487 | 169 | 0.290 | 205 | 0.476 | 241 | 0.281 | 277 | 0.455 | 313 | 0.487 | 349 | 0.290 |
| 26  | 0.479 | 62  | 0.277 | 98  | 0.459 | 134 | 0.485 | 170 | 0.285 | 206 | 0.479 | 242 | 0.277 | 278 | 0.459 | 314 | 0.485 | 350 | 0.285 |
| 27  | 0.482 | 63  | 0.275 | 99  | 0.463 | 135 | 0.482 | 171 | 0.281 | 207 | 0.480 | 243 | 0.275 | 279 | 0.463 | 315 | 0.482 | 351 | 0.281 |
| 28  | 0.483 | 64  | 0.274 | 100 | 0.467 | 136 | 0.480 | 172 | 0.278 | 208 | 0.483 | 244 | 0.274 | 280 | 0.467 | 316 | 0.480 | 352 | 0.278 |
| 29  | 0.485 | 65  | 0.273 | 101 | 0.470 | 137 | 0.477 | 173 | 0.275 | 209 | 0.485 | 245 | 0.273 | 281 | 0.470 | 317 | 0.477 | 353 | 0.275 |
| 30  | 0.485 | 66  | 0.274 | 102 | 0.474 | 138 | 0.474 | 174 | 0.274 | 210 | 0.485 | 246 | 0.274 | 282 | 0.474 | 318 | 0.474 | 354 | 0.274 |
| 31  | 0.485 | 67  | 0.275 | 103 | 0.477 | 139 | 0.470 | 175 | 0.273 | 211 | 0.485 | 247 | 0.275 | 283 | 0.477 | 319 | 0.470 | 355 | 0.273 |
| 32  | 0.483 | 68  | 0.278 | 104 | 0.480 | 140 | 0.467 | 176 | 0.274 | 212 | 0.483 | 248 | 0.278 | 284 | 0.480 | 320 | 0.467 | 356 | 0.274 |
| 33  | 0.482 | 69  | 0.281 | 105 | 0.482 | 141 | 0.463 | 177 | 0.275 | 213 | 0.482 | 249 | 0.281 | 285 | 0.482 | 321 | 0.463 | 357 | 0.275 |
| 34  | 0.479 | 70  | 0.285 | 106 | 0.485 | 142 | 0.459 | 178 | 0.277 | 214 | 0.479 | 250 | 0.285 | 286 | 0.485 | 322 | 0.459 | 358 | 0.277 |
| 35  | 0.476 | 71  | 0.290 | 107 | 0.487 | 143 | 0.455 | 179 | 0.281 | 215 | 0.476 | 251 | 0.290 | 287 | 0.487 | 323 | 0.455 | 359 | 0.281 |

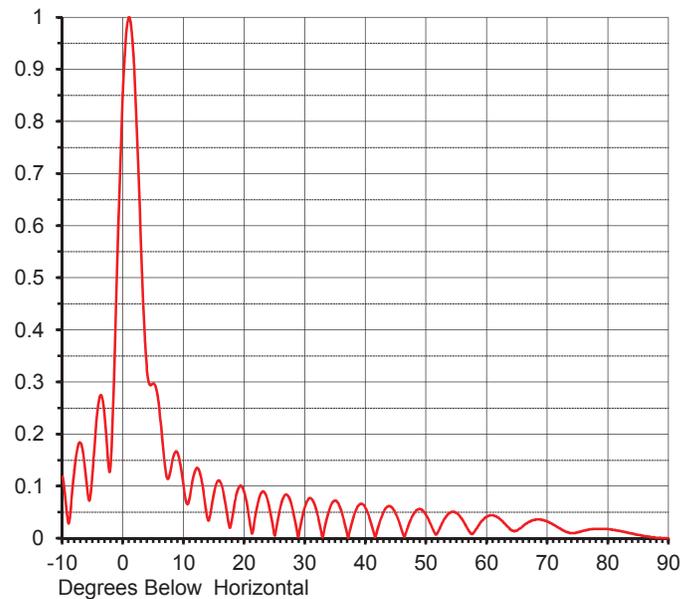
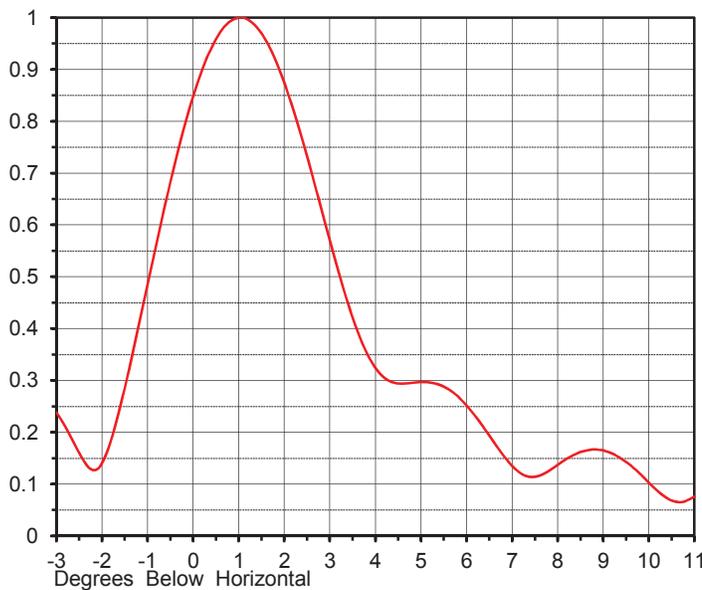
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## ELEVATION PATTERN

Proposal No. **C-70411**  
 Date **8-Mar-17**  
 Call Letters **WPFO**  
 Channel **17**  
 Frequency **491 MHz**  
 Antenna Type **TFU-17ETT/VP-R P230**

RMS Directivity at Main Lobe **16.5 ( 12.17 dB )**  
 RMS Directivity at Horizontal **11.9 ( 10.76 dB )**  
**Calculated**

Beam Tilt **1.00 deg**  
 Drawing Number **17E165100**



| Angle | Field |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| -10.0 | 0.118 | 10.0  | 0.094 | 30.0  | 0.062 | 50.0  | 0.043 | 70.0  | 0.032 |
| -9.0  | 0.028 | 11.0  | 0.082 | 31.0  | 0.076 | 51.0  | 0.018 | 71.0  | 0.026 |
| -8.0  | 0.138 | 12.0  | 0.133 | 32.0  | 0.046 | 52.0  | 0.014 | 72.0  | 0.019 |
| -7.0  | 0.182 | 13.0  | 0.105 | 33.0  | 0.008 | 53.0  | 0.038 | 73.0  | 0.012 |
| -6.0  | 0.099 | 14.0  | 0.034 | 34.0  | 0.056 | 54.0  | 0.050 | 74.0  | 0.010 |
| -5.0  | 0.138 | 15.0  | 0.089 | 35.0  | 0.072 | 55.0  | 0.048 | 75.0  | 0.011 |
| -4.0  | 0.266 | 16.0  | 0.108 | 36.0  | 0.050 | 56.0  | 0.034 | 76.0  | 0.015 |
| -3.0  | 0.225 | 17.0  | 0.054 | 37.0  | 0.004 | 57.0  | 0.014 | 77.0  | 0.017 |
| -2.0  | 0.159 | 18.0  | 0.042 | 38.0  | 0.042 | 58.0  | 0.014 | 78.0  | 0.018 |
| -1.0  | 0.525 | 19.0  | 0.096 | 39.0  | 0.065 | 59.0  | 0.031 | 79.0  | 0.018 |
| 0.0   | 0.875 | 20.0  | 0.086 | 40.0  | 0.057 | 60.0  | 0.042 | 80.0  | 0.017 |
| 1.0   | 1.000 | 21.0  | 0.021 | 41.0  | 0.023 | 61.0  | 0.044 | 81.0  | 0.016 |
| 2.0   | 0.849 | 22.0  | 0.056 | 42.0  | 0.020 | 62.0  | 0.038 | 82.0  | 0.014 |
| 3.0   | 0.538 | 23.0  | 0.090 | 43.0  | 0.052 | 63.0  | 0.027 | 83.0  | 0.011 |
| 4.0   | 0.313 | 24.0  | 0.064 | 44.0  | 0.061 | 64.0  | 0.016 | 84.0  | 0.009 |
| 5.0   | 0.297 | 25.0  | 0.005 | 45.0  | 0.045 | 65.0  | 0.015 | 85.0  | 0.006 |
| 6.0   | 0.241 | 26.0  | 0.064 | 46.0  | 0.013 | 66.0  | 0.024 | 86.0  | 0.004 |
| 7.0   | 0.127 | 27.0  | 0.083 | 47.0  | 0.023 | 67.0  | 0.032 | 87.0  | 0.002 |
| 8.0   | 0.143 | 28.0  | 0.052 | 48.0  | 0.049 | 68.0  | 0.036 | 88.0  | 0.001 |
| 9.0   | 0.162 | 29.0  | 0.010 | 49.0  | 0.056 | 69.0  | 0.035 | 89.0  | 0.000 |
|       |       |       |       |       |       |       |       | 90.0  | 0.000 |

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