

# **TARGET DESCRIPTION — ANNEX W2 WORKSHEET**

**Construction Details of the Fixed Optical/Video Calibration Target**

**Fixed Optical/Video Calibration Array  
Wright-Patterson AFB, Ohio**

**ANNEX W2 WORKSHEET**  
describing the  
**Fixed Optical/Video Calibration Array**  
at  
**Wright-Patterson AFB, OH**

**1. REFERENCES**

Appendix 1 to Annex D and Decisions 7, 12, 15 and appropriate Sections of the Guidance Document.

**2. TYPE**

OPTICAL : VIDEO :

**3. INSTALLATION & LOCATION OF THE TARGET**

**3.1 Geographic Coordinates**

Latitude: 39E 46.6125' N  
Longitude: 84E 07.0545' W

**3.2 Altitude Above Sea Level**

241.0 meters

**3.3 Target Orientation [Long Dimension of Bars relative to the True Track or LoF (Line of Flight)]**

Vertical Elements (XLoF):	135E/315ETrue	140E/320E Magnetic
Horizontal Elements (LoF):	045E/225ETrue	050E/230E Magnetic

**3.4 Surface Background**

Type: Painted Concrete, Texture Brushed Perpendicular True Track [i.e. Cross Line of Flight (XLoF)].

Relative Reflectance (average of resolution array reflectance data as of 27 January 2002, twenty-one months after the May 2000 target repainting).

	Optical ( $R_{420-700}$ )
Background:	7.0%
Bars:	60.6%
Contrast:	8.66: 1
Modulation:	0.79

**3.5 True Track for Data Collection**

Large to Small Elements:	045ETrue
Small to Large Elements:	225ETrue

**3.6 Deviation of Target from Horizontal**

LoF: OE

**3.7 State of the Ground**

Within Target Area: Painted Concrete  
Area Around Target: Adjacent to Target — Old, Unpainted Concrete Runway  
Adjacent to Runway — Grass, Mowed every two weeks (during growing season) to 20cm to 32cm.

## 4. OPTICAL / VIDEO TARGET

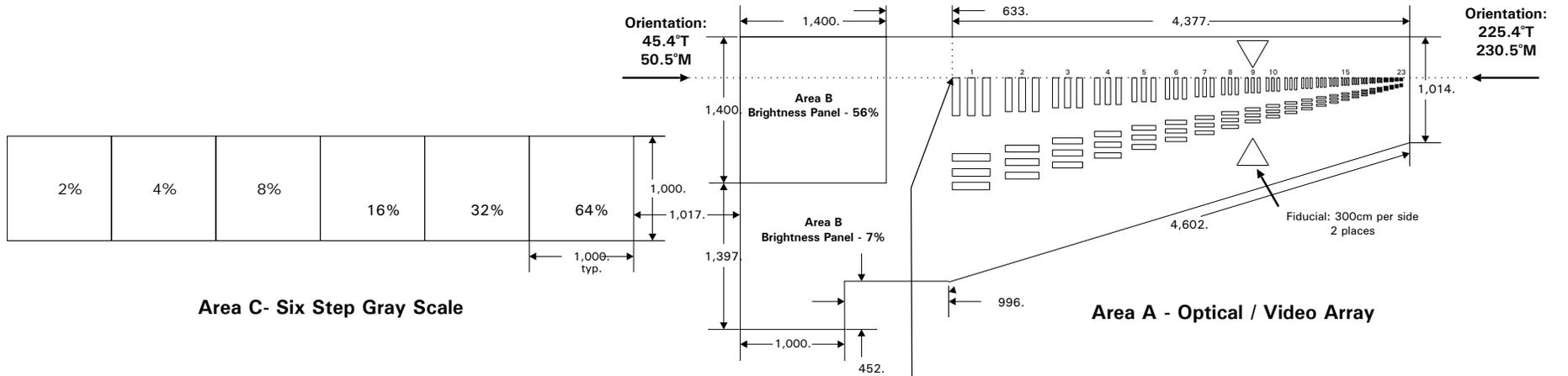
### 4.1 General Description

- 4.1.1 Number of Bars per Group: 3  
Optical: Light bars on Dark Background  
Video: Light bars on Dark Background
- 4.1.2 Basic Material Texture Brushed Concrete
- 4.1.3 Coating: Painted — acrylic polymer pigmented with carbon black and titanium dioxide with silica added to create diffuse surface.
- 4.1.4 Drawing / Picture of Target with Bar Groups Numbered: See Figure 2, Page 5

### 4.2 Geometric Data

- 4.2.1 Number of Bar Groups: 23
- 4.2.2 Ratio of Bar length of Bar Width: 5:1
- 4.2.3 Geometric Progression Between Bar Groups:  $2^{1/6} = 1.1225$
- 4.2.4 Distance Between Bar Groups:  $C_{N^{\circ}N+1} = 2W_{N+1}$ ;  
where:  $W_{N+1}$  is the width of the bar comprising the smaller of the two elements that are separated by distance C.
- 4.2.5 Overall Dimensions Including Brightness Panels: 6,410. cm (length)  
2,797. cm (wide end)  
1,014. cm (narrow end)
- 4.2.6 Brightness Panels (Optical & Video):  
Number: 2  
Size: 1,400. cm x 1,400. cm (56%)  
1,400. cm x 945. cm (7%)

# Oblique & Fixed Target Layout Drawing Wright-Patterson AFB, Ohio



**Area C- Six Step Gray Scale**

**Area A - Optical / Video Array**

- Notes:**
1. All dimensions in centimeters, unless noted otherwise.
  2. Target background 7% and bars 56% nominal reflectance.
  3. Design tolerance for bars and space dimensions is  $\pm 5\%$ .

**GEODETTIC COORDINATES**  
WGS-84 Geodetic System

Latitude: 39° 46.6125'  
Longitude: 84° 07.0545'  
Elevation: 241.0 meters  
790 feet

4.2.7 Optical / Video Bar Dimensions: Variance entries were calculated from the actual measured dimensions of the repainted bars as reported in Table 2 of this Annual Baseline 2001 Report (#G8T-GTR-01-081, March 2001).

Group Number N	Bar Width (cm)	Bar Length (cm)	Width Separating N and N+1 Bar Group (cm)	Ratio Bar Length: Width	Variance Width from that Stated (%)
1	75.60	378.00	134.70	5:1	-0.15
2	67.35	336.75	120.00	5:1	-0.29
3	60.00	300.00	106.90	5:1	-0.05
4	53.45	267.25	95.24	5:1	-0.12
5	47.62	238.10	84.84	5:1	-0.16
6	42.42	212.10	75.58	5:1	0
7	37.79	188.95	67.34	5:1	-0.03
8	33.67	168.35	60.00	5:1	-0.06
9	30.00	150.00	53.46	5:1	+ 0.05
10	26.73	133.65	47.62	5:1	-0.17
11	23.81	119.05	42.42	5:1	+ 0.04
12	21.21	106.05	37.80	5:1	-0.33
13	18.90	94.50	33.68	5:1	-0.21
14	16.84	84.20	30.00	5:1	-0.06
15	15.00	75.00	26.72	5:1	-0.30
16	13.36	66.80	23.80	5:1	-0.04
17	11.90	59.50	21.20	5:1	-0.59
18	10.60	53.00	18.88	5:1	+ 0.05
19	9.44	47.20	16.82	5:1	-0.16
20	8.41	42.05	15.00	5:1	-0.12
21	7.50	37.50	13.36	5:1	-0.33
22	6.68	33.40	11.90	5:1	-0.37
23	5.95	29.75	////	5:1	+ 0.08

### 4.3 Optical Target Data

#### 4.3.1 Spectral Reflectance Measurements

	Photopic Spectral Region (400 nm to 700 nm)		
Concrete Background Reflectance	<u>Average:</u> 20.2%	<u>STD:</u> 3.7%	
Grass Background Reflectance	11.9%	1.8%	
	<u>Average:</u>	<u>STD:</u>	<u>Modulation:</u>
Area A/Group 10 Resolution Segment - Black	7.0%	0.22%	0.79
Area A/Group 10 Resolution Segment - White	60.6%	1.55%	
Brightness Panel Area B – Black	6.4%	0.17%	0.80
Brightness Panel Area B – White	57.9%	1.99%	

4.3.2 Measurements of Luminance, Reflectivity and/or Photometric Measurements:

These data will be furnished at the conclusion of each day of target overflights.

**4.3.3 Summary of Resolution Array Optical Performance.** Table 6 provides the average spectral reflectance and modulation for the Area A/Group3 white and black bars at each of the four viewing angles. The average modulation data was derived from the spectral reflectance data presented in Section 5.3.1 by weighting the data with the standard luminosity function (photopic vision), then integrating the resultant function over the 400 nm to 700 nm spectral region as provided for by Section 2.6.2D14.SII.P4(C) of the Open Skies Treaty.

*Table 6. Summary of Resolution Target Photopic Reflectance and Modulation.*

	Photopic Spectral Region (400 nm to 700 nm)			
	In-line-of-Flight		Cross-line-of-Flight	
Black Background Reflectance	<u>Average:</u>	<u>STD:</u>	<u>Average:</u>	<u>STD:</u>
	0° 5.8%	0.02%	0° 5.7%	0.11%
	30° 6.3%	0.32%	30° 5.7%	0.05%
	45° 6.4%	0.10%	45° 5.9%	0.14%
	60° 6.9%	0.5%	60° 6.3%	0.17%
White Bar Reflectance	<u>Average:</u>	<u>STD:</u>	<u>Average:</u>	<u>STD:</u>
	0° 56.5%	0.33%	0° 56.3%	0.48%
	30° 55.7%	1.61%	30° 56.6%	2.20%
	45° 57.1%	2.62%	45° 57.3%	2.45%
	60° 57.7%	5.08%	60° 57.9%	2.97%
Average Modulation	0°	0.81	0°	0.82
	30°	0.80	30°	0.82
	45°	0.80	45°	0.81
	60°	0.79	60°	0.80