

## NVIS Compatibility - Ground Evaluation Setup

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#### a. Required Items:

(1) A facility that can be sealed from all light sources. The facility must have a minimum of 25 feet of space in front and sufficient room to either side of the aircraft to accommodate test equipment setup.

Note: If the Tri-bar chart is visible with unaided vision, the facility is not dark enough.

(2) Visual Acuity Chart (a USAF 1951 Resolution Resolving Power Target Medium Contrast (Tri-Bar) Chart and USAF 1951 Resolution Resolving Power Target High Contrast (Tri-Bar) Chart, copies at end of checklist)

(3) Visual acuity chart illuminator capable of illuminating acuity charts at levels found in Table 1 – Lux. (See attachment 3 for suggestions on how to build an illuminator)

(4) Light meter capable of measuring in hundredths of LUX at levels found in Table 1 – Lux.

(5) At least two NVG helmets with mounts for front seat evaluators. NVG hand held mounts with power supply can be used for other observers if desired.

(6) A minimum of one set of NVG for each front seat evaluator that meets TSO-C164 or RTCA/DO-275 specifications.

- Use the same type/model of NVG that operator will use in flight if possible.

(7) Familiarize evaluator crew with A/C switch locations/positions so they can activate correct switches in a dark environment (BAT, NAV, COMM, Lights, operation equipment, etc.)

#### b. Setup

(1) Position the aircraft in a facility that can be sealed from all light sources. The facility must have a minimum of 25 feet of space in front and sufficient room to either side of the aircraft to accommodate test equipment setup.

(2) Check and clean the windscreen/windows if necessary to remove any smudges and bugs. Ensure the windscreen is not excessively scratched.

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(3) Provide at least two each NVG helmets with mounts for front seat evaluators. NVG hand held mounts with power supply if desired for other observers.

(4) Provide at least two each Night Vision Goggles with the same model used by the applicant for operations. Record the NVG information below.

(5) Connect appropriate ground power unit to facility power and to the aircraft GPU connector. Do not turn ground power on until instructed.

(6) Evaluator must be familiar with A/C switch positions and be able to activate correct switches during a darkened condition (BAT, NAV, COMM, Lights, operating equipment, etc.).

(7) Position a USAF 1951 Resolution Resolving Power Target Medium Contrast (Tri-Bar) Chart and USAF 1951 Resolution Resolving Power Target High Contrast (Tri-Bar) Chart 20 feet in front of and level with the pilot's eye position (see Figure 1).

(8) Use a Visual Acuity Chart Illuminator to illuminate the resolution chart. Place the illuminator at the distance discussed in the chart from Table 1. Assess whether or not the light source illuminates or casts shadows into the cockpit. If it does, move the light source to eliminate any cockpit illumination or shadows.

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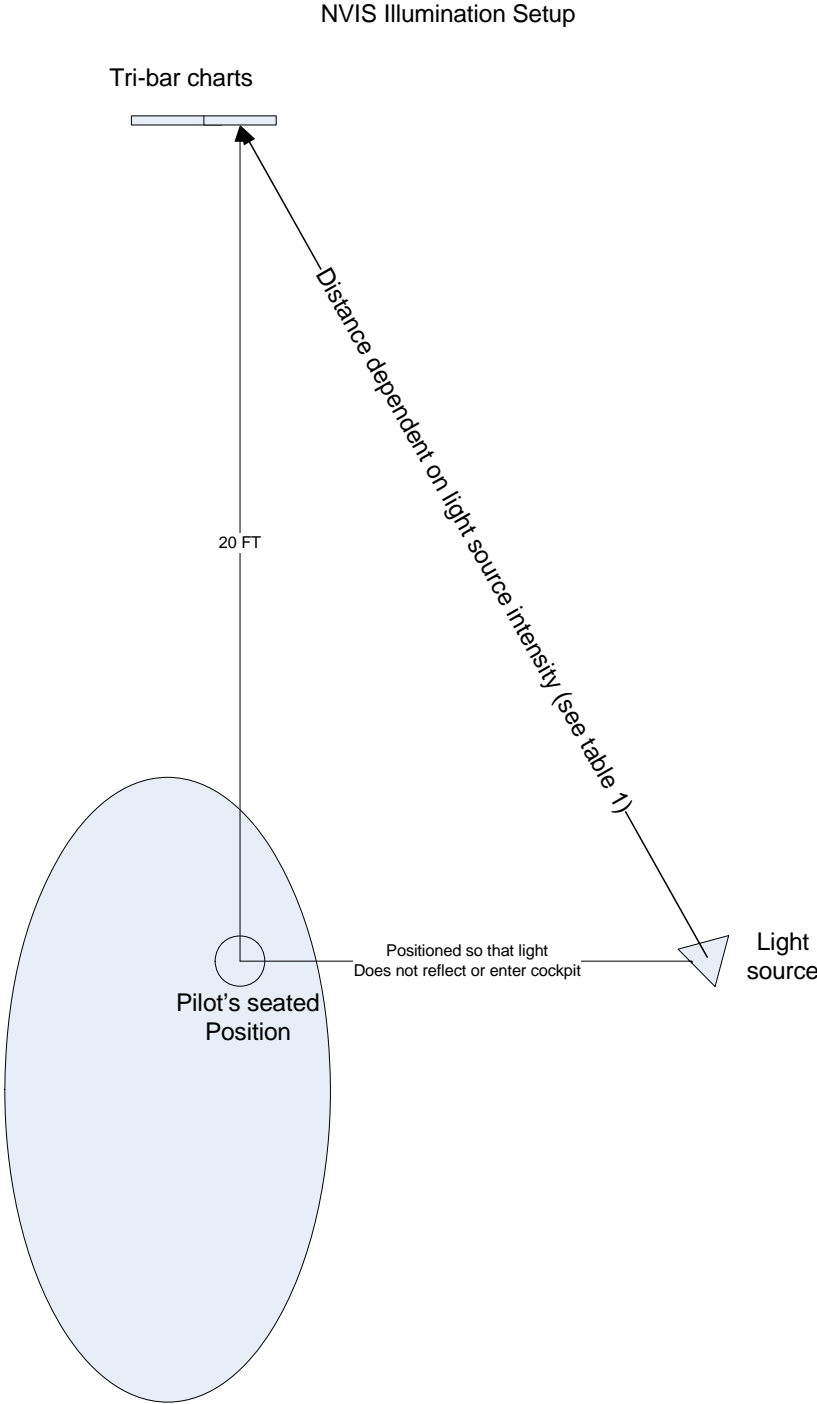


Figure 1 – Target and Illuminator Setup

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(9) Connect the illuminator to correct power supplied from the testing facility.

(10) Position light meter sensor 12.0 inches (30.5 cm) from the front of the light source baffle.

Note: Distance is critical, be as accurate as possible.

(11) Set the light meter switch to measure in LUX.

(12) Turn on the Illuminator and turn off all hangar lights.

(13) Record the reading for the light meter.

Light meter Lux Reading: \_\_\_\_\_

(14) Locate the Lux value in the first column of the Table 1 below and record value.

Lux @ 12 inches (30.5 cm)	Distance				
	Decimal (ft)	Feet	Inches	M	cm
.08	14.48	14	5 <sup>3</sup> / <sub>4</sub>	4.41	441.35
.09	15.35	15	4 <sup>1</sup> / <sub>4</sub>	4.68	467.87
.10	16.18	16	2 <sup>1</sup> / <sub>4</sub>	4.93	493.17
.11	16.97	16	11 <sup>3</sup> / <sub>4</sub>	5.17	517.25
.12	17.73	17	8 <sup>3</sup> / <sub>4</sub>	5.40	540.41
.13	18.45	18	5 <sup>1</sup> / <sub>2</sub>	5.62	562.36
.14	19.15	19	1 <sup>3</sup> / <sub>4</sub>	5.84	583.69
.15	19.82	19	9 <sup>3</sup> / <sub>4</sub>	6.04	604.11
.16	20.47	20	5 <sup>3</sup> / <sub>4</sub>	6.24	623.93
.17	21.10	21	1 <sup>1</sup> / <sub>4</sub>	6.43	643.13
.18	21.71	21	8 <sup>1</sup> / <sub>2</sub>	6.62	661.72
.19	22.31	22	3 <sup>3</sup> / <sub>4</sub>	6.80	680.01
.20	22.89	22	10 <sup>3</sup> / <sub>4</sub>	6.98	697.69
.21	23.45	23	5 <sup>1</sup> / <sub>2</sub>	7.15	714.76
.22	24.01	24	0	7.32	731.82
.23	24.55	24	6 <sup>1</sup> / <sub>2</sub>	7.48	748.28
.24	25.07	25	<sup>3</sup> / <sub>4</sub>	7.64	764.13
.25	25.59	25	7	7.80	779.98
.26	26.10	26	1 <sup>1</sup> / <sub>4</sub>	7.96	795.53

Table 1 – Lux

Lux Distance Value: \_\_\_\_\_

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(15) Set the distance from the Illuminator to the Target by moving the Illuminator to the distance recorded in Step 14 (See Figure 1).

(16) Ensure the target is centered in the illuminated area and that the light does not enter the cockpit or reflect into the cockpit onto the instrument panel. This may be accomplished by observing the cockpit and instrument panel using NVGs.

NVG focusing and baseline acuity may be accomplished now or prior to the aided evaluation.

NVG Focusing:

Preparation:

If possible, allow at least 10 minutes to let eyes adjust to darkness.

1. Focus NVG goggles per manufacturer's instruction. This is best accomplished using a slightly higher light condition than provided by the illuminator.
2. Verify NVGs are functioning properly and have no defects that would affect test results.
3. Turn on the chart illuminator (turn off all other lights)
4. Stand outside aircraft, abeam pilot position (20 feet from illuminated chart) and focus NVG to obtain maximum resolution on chart (smallest set of horizontal and vertical bars). Record the chart line resolution below:
5. Note: All chart readings will use the original resolution as the baseline comparison. The object is to determine visual degradation as a result of light/object/reflection interference.
6. Original (Base Line) Chart line resolution:\_\_\_\_\_.