

The Photo-Sonics F-16C/D camera is a fully qualified HUD camera for the F-16C/D aircraft. This camera has excellent environmental characteristics and superb image quality with high reliability (>22,000 MTBF). The camera is lightweight and designed around single-unit construction. It is easily installed and aligned in the aircraft in less than one hour. The camera incorporates extensive filtering to provide noise-free images using 115VAC, 400Hz, 3 phase aircraft power in accordance with MIL-STD-704A.

This camera will operate on both configurations of Wide-Angle Head-up Displays assemblies presently being used on the F-16C/D.

The camera assembly is mounted on the HUD in front of the combiner. In this position, the camera records only the outside world. The HUD symbology is electronically overlaid on the camera video in the HUD Electronic Unit. A precision periscope/lens assembly permits accurate boresighting with the aircraft computer resulting in minimal piper-to-target alignment errors, and camera coefficients are provided to ensure accurate alignment/calibration to the HUD.

The camera can replace either a one-, or two-piece HUD camera assembly. If the camera is used in an aircraft configured to accept a two-piece camera, an interface cable must also be installed in the aircraft. This cable is not necessary for an aircraft configured for a single-piece HUD camera. The cable can be purchased from Photo-Sonics or a cable and tray from Lockheed.

• Photo-Sonics Interface Cable Assembly: 93-4338-29

Photo-Sonics, Inc.

Lockheed Interface Cable and Tray Assembly: 3887-55942-01

Photo-Sonics has delivered more than 5000 gun sight film cameras and over 1800 HUD video cameras since 1969. During this time we developed unique camera configurations for over 14 different tactical aircraft models including the *F*-16A/B.

GENERAL FEATURES

- 115VAC, 400 Hz, three phase, < 5 watts
- Automatic Exposure Control (AEC)
- Visual event mark
- Sensor: Interline-transfer hyper HAD CCD, 1/3"
- Horizontal resolution: NTSC 470 TV lines
- Picture elements: NTSC 768(h) x 494(v)
- Luminance range: 1.8 Lux to 196,700 Lux
- Field of View 21.34 degrees X 16.1 degrees

- S/N ratio: Camera Video NTSC > -48dB
- Gamma 0.45
- White balance ATW
- AGC: Automatic 0 to -36dB
- Weight < 1.5 lbs
- MTBF: >22,000 hours
- Warranty: 18 to 24 months
- Format: NTSC

ENVIRONMENTAL SPECIFICATIONS to MIL-STD-810, MIL-E-5400

Tests Performed			
Temperature Shock		Gunfire Vibration	GF peak: 3.7 G's WF .016 GRMS ² /Hz 3 axes
Humidity/Moisture/Rain	MIL-E-5400P, 30 mins., 10 cycles MIL-STD-210 exposure time MIL-STD-108	Fungus (by analysis)	
Humidity	MIL-STD-810, Method 517, Procedure I, Cold soak: 4 hrs. at -40° C	Fluids (by analysis)	
Vibration	Non-gunfire Endurance: .053, 1 hr. Performance: .04, 1 hr.	Sunshine	82 watts per square foot
Temperature Altitude	Stowage: -54°C to +95°C Non-operating: -40°C to +95°C Operating: -40°C to +55°C Normal: 15.5 to 2.72 psia	Mechanical Shock	3 axes, Basic design 15 G's at 11msec. Crash safety: Longitudinal 40 G's 11 msec. Vertical 20 G's 11 msec. Lateral 15 G's 11 msec.
Salt Spray (500 hours)	MIL-E-5400P	Sand and Dust	MIL-E-5400P
Random Vibration	15-200 Freq. Endurance level .053, 1 hr. Performance level .04, 1 hr.	Explosive Atmosphere	MIL-STD-810, Method 511, Procedure I
Sinusoidal Vibration		Explosive Decompression	MIL-E-5400P, MIL-STD-108
Touch Temperature	Surrounding air: +27° C Temperature limits: +60° C	Temperature - Altitude	
Wind Blast	600 KEAS	Ultimate Crash Load Factors	Longitudinal: FWD 40 G's AFT 20 G's Vertical: Up 10 G's Down 20 G's Lateral: Left 14 G's Right 14 G's
		Corrosive Atmosphere	MIL-E-5400P

EMI/EMC Tests to MIL-STD-461/462

RE102	Radiated Emissions	2 MHz – 30 MHz / 30 MHz – 200 MHz / 200 MHz – 1 GHz / 1 MHz – 18 GHz
RS103	Radiated Susceptibility	30 MHz – 200 MHz / 200 MHz – 1 GHz / 1 GHz – 2 GHz / 2 GHz – 4GHz 4 GHz – 8 GHz / 8 GHz – 12 GHz / 12 GHz – 18 GHz
CE102	Conducted Emissions	10 kHZ – 10 MHz
CS101	Conducted Susceptibility	800 Hz – 50 kHz
CS114	Conducted Susceptibility	10 kHZ – 400 MHz
CS115	Conducted Susceptibility	(See CS115)
CS116	Conducted Susceptibility	10 kHz – 100 MHz