

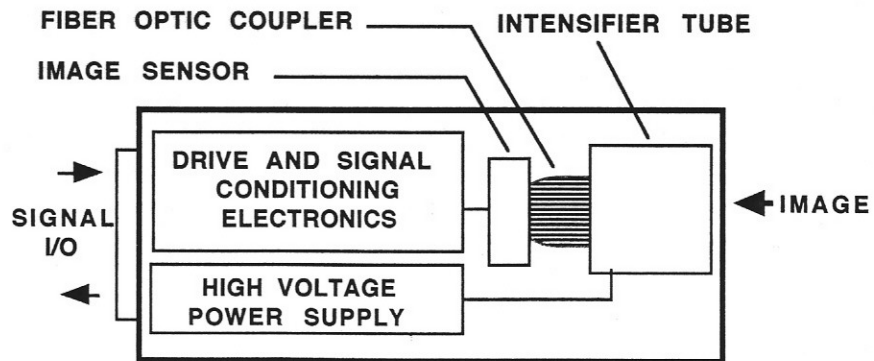
XR/M ICCD CAMERA

3/97-A

- *EXTENDED RESOLUTION**
- *FULL-FEATURED IMAGING IN COMPACT "MICRO" PACKAGE**
- *STATE OF THE ART GEN III "ULTRA" TECHNOLOGY**
- *LIGHT/IMAGE AMPLIFICATIONS OF 40,000**
- *SUPERIOR RESPONSE AND LOW LIGHT PERFORMANCE**

The **XR/M ICCD** Camera System from Stanford Photonics is the newest in its line of high performance, low-light imaging products incorporating GEN III Ultra intensifier tube technology. The GEN III Ultra offers the highest resolution, the highest visible and near IR sensitivity and the best signal-to-noise specifications of any 18 MM input format device. Stanford Photonics uses its own proprietary bonding process to couple these tubes via fiber-optic tapers directly to the CCD image sensor. Direct fiber-optic coupling results in a five to ten-fold increase in sensitivity and higher resolution and contrast in the final video image relative to ICCD cameras using relay optics between the intensifier and image sensor.

An added benefit of fiber-optic coupling is a reduction in package size: the **XR/M ICCD**, complete with intensifier tube, tube power supply, sensor and camera drive electronics, has a standard envelope dimension of 2" by 2.37" by 4.75" long. This "micro" size package opens up many opportunities for covert surveillance, remote piloted aircraft and transports, robotics, submersibles and machine vision, where volume and mass are critical in the application.



"MICRO" ENVELOPE: 2.00W BY 2.375 H BY 4.75 INCHES LONG

XR/M ICCD CAMERA COMPONENTS

The **XR/M** uses a 768(H) by 494(V) pixel, 2/3-inch format interline transfer CCD backed by full-featured RS-170 drive electronics. The 2/3-inch sensor requires less image reduction (smaller taper ratio for 18mm to 2/3-inch format conversion) and therefore provides better sensitivity than coupling based on 1/2 inch devices. The final system resolution of the combined intensifier tube-taper-sensor-electronics assembly exceeds 500 TVL(H). The superior low-light response of the **XR/M** camera allows imaging and detection at levels below 10⁻⁶ Lux.

The standard **XR/M** is designed for auto-gain/auto-iris lensing and complete hands-off operation. Other functions and features available on a custom basis or in other product configurations offered by Stanford Photonics include:

- | | | |
|----------------------------------|-------------------------------|-------------------------|
| *HIGH QE SELECTION | *PHOTOCATHODE GATING | *AUTO-GATING |
| *72 LP/MM TUBE SELECTION | *ZERO DEFECT COSMETICS | *MANUAL GAIN |
| *120-240 HZ. FAST FRAMING | *CUSTOM PACKAGING | *GEN II, GEN II+ |
| *600 TVL EXTENDED RES. | *OPEN FRAME OEM | *DIGITAL CAMERAS |

INTENSIFIER COMPONENTS/CONTROL AND SPECIFICATIONS 3/97-A; PAGE 2

IMAGE INTENSIFIER TUBE. GEN III ULTRA (UB/Ultra Blue/OMNI IV). 18mm input/output format. Minimum 64 lp/mm resolution with optional selection for 72 lp/mm. High quantum efficiency and photoresponse from 450 -900 nm. Extended response (minimum quantum efficiency of 38% at 546 nm) available on a limited basis. Luminous gain to 40,000 typ./80,000 max. Specifications:

PARAMETER

PHOTOCATHODE SENSITIVITY

LUMINOUS: 2856 °K	1800 MICRO AMP/LUMEN, MIN.
RADIANT: @ 830 NM.	190 MA/WATT, MIN.
RADIANT: @ 880 NM.	75 MA/WATT, MIN.

LUMINOUS GAIN, FL/FC 20,000-80,000

OUTPUT BRIGHTNESS, FL 0.7-4.5

EBI (EQUIVALENT BACKGROUND INPUT) 2.5 E-11 LUMENS.CM**2, MAX (0.25 μLUX)

SIGNAL-TO-NOISE RATIO 21.0 MINIMUM OVER FULL GAIN RANGE

RESOLUTION 64 LP/MM MIN; 72 LP/MM SELECT

MTF

@2.5 LP/MM	92% MIN.
@7.5 LP/MM	80% MIN.
@15 LP/MM	61% MIN.
@25 LP/MM	38% MIN.

HALO 1.25 MAX

PHOSPHOR P43

RELIABILITY (MIL-1-49428(CR)) 10,000

<u>SPOTS/COSMETICS (STD. AND "S")</u>	Z1	Z2	Z3	Z1S	Z2S	Z3S
>0.15"	0	0	0	0	0	0
0.012"-0.015"	0	0	0	0	0	0
0.009"-0.012"	0	0	0	0	0	0
0.006"-0.009"	0	1	2	0	0	0
0.003"-0.006"	0	2	3	0	0	0

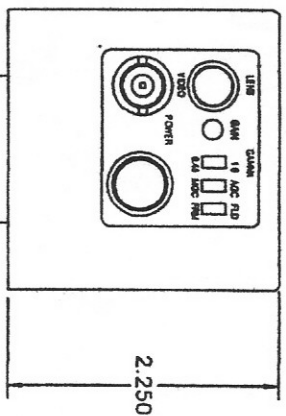
These specifications are derived from the manufacturer's most current published data and are subject to change without notice.

FIBER OPTIC COUPLING. 18mm:11mm fiber optic taper; 6.0 micron large end fiber; N.A. 1 with E.M.A. Direct adhesive bond to image sensor. Other mag ratios (2.2:1, straight through, etc.) available upon request.

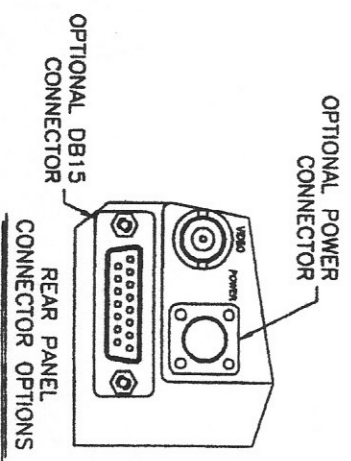
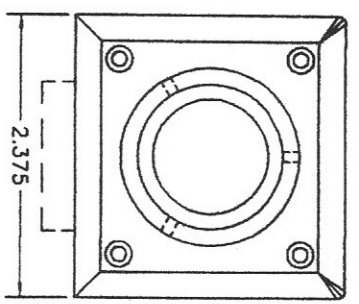
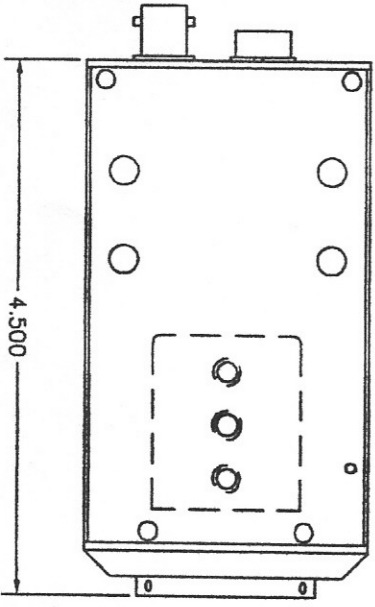
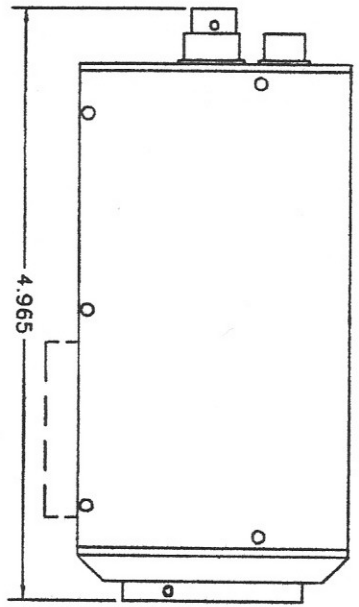
POWER SUPPLY. Standard ANVIS ABC/AGC supply. Optional manual and/or gateable unit. Gate widths down to 100ns with 50 ns (typ.) rise/fall times. Integral BSP and ABC protection circuitry. Gain control 0-10 VDC. (2x gain increase for each 0.4 volt increment from 6-10 VDC; 1000:1 range; other range options available on request). Gain step response 20 dB (10x) with 2 ms. (nominal) settling.

This product (GEN III Ultra) is controlled by the Office of Munitions Control, U.S. Department of State and requires a Department of State export license if shipped or taken out of the United States.

REVISIONS			DATE	APPROVED
ECD NO.	REV	DESCRIPTION		
	2X	PRELIMINARY RELEASE	10/21/98	RES



TRI-POD MOUNT (REF.)
CUSTOMER SPECIFIED



1. REMOVE ALL BURRS AND SHARP EDGES.
NOTES: UNLESS OTHERWISE SPECIFIED,

AUTHORIZED SIGNATURES ENGINEERING SERVICES DATE DATE DATE DATE DATE		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES .XX ± .01 .XXX ± .005	
MATERIAL FINISH N/A N/A		DRAWN BY RE SCHINDLER	
DATE 10/20/98		DATE 10/20/98	
TITLE STANFORD PHOTONICS 1032 BIRWELL COURT, SUITE 104, PALO ALTO, CA 94303		SCALE 1/1	
SIZE B		DWG NO. INST-98-100201-101	
PS&I NO. XR/M-AG CAMERA		SHEET 1 of 1	
REV 2X		REV 2X	