



**L3HARRIS®**  
FAST. FORWARD.

# 150KV CINE RADIOGRAPHIC SYSTEM

The 150 kilovolt Cine Radiographic System creates revolutionary high-speed, time-resolved X-ray movies of ballistic, explosive and ultra-highspeed dynamic events

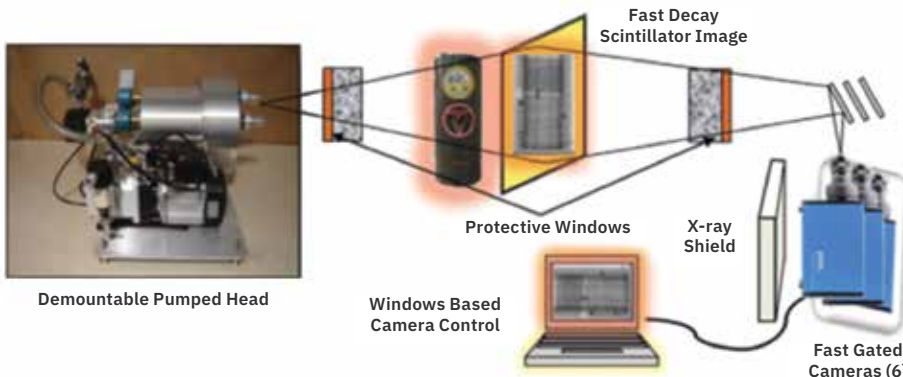
The system is designed to provide up to six sequential images, with each image being timed by the user to be 3 to 1000 microseconds apart. With the power of the PixelRay™ Command Control and Analysis Software, the user can capture, calibrate and precisely measure the image information. The system is modular and can be used with single-frame cameras, multi-frame cameras or CR Imaging.

SYSTEM SPECIFICATIONS	
X-ray generators	6 each - 150 kV Pulsers (Model 43731)
X-ray head	6-channel Cine demountable pumped X-ray head
Spot size	0.5 mm, 1 mm or 3 mm (nominal)
X-ray source diameter	~1.5 in
Dose	2.5 mR per pulse at 1 m
Inter-pulse time	3 to 1000 ms
Exposure time (pulse width)	70 x 10 <sup>-9</sup> sec
Source cart assembly size	37 in W x 60 in D x 65 in H
System control rack size	24 in W x 32 in D x 8 in H
High-voltage power supply (#130-314700)	
XCON (6 each all-in-one X-ray controller #43120B)	Delay trigger generator, trigger amplifier, pulsed event timer
Vacuum pump and controller	
Electrical power (including cameras)	120 V, 20 A
All system interconnecting and control cables included	



## SYSTEM CHARACTERISTICS

- > 6 each 150 kV pulsers (Model 43731)
- > X-ray control console (remote control optional)
- > 6-channel demountable pumped X-ray head
- > X-ray source service cart
- > Vacuum pump
- > Pump controller
- > All connecting cables
- > 6 each CCD cameras (option 1) or 3 each intensified cameras (option 2)
- > 6 each 55 mm 1.2 lenses
- > Mirror adjustment assembly
- > Fiber-optic communication bundle
- > Shielded camera housing mounted on adjustable service cart
- > Integrated communication
- > System camera control software



## CAMERA SPECIFICATIONS

	Camera option 1	Camera option 2
Frame rate	1 ms	< 100 ns
Spatial resolution	1376 x 1040 px	1360 x 1024 px at 12 bits
Quantum efficiency	1376 x 1040 px	38% @390 nm (HSS1), 62% @ 500 nm (GOS:Pr)
Low readout noise	2.4 counts/px	6/px = 1.2 counts/px
Pixel binning	2x2, 4x4, 8x8	2x2, 4x4, 8x8

## CAMERA COMMUNICATION AND CONTROL SOFTWARE INCLUDED

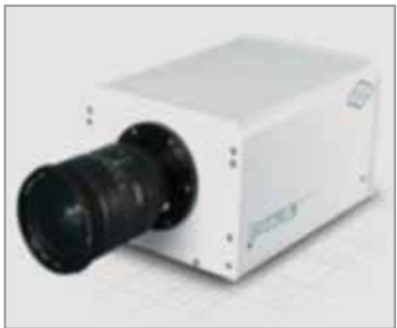
	Camera option 1	Camera option 2
High-resolution CCD	6 each	3 each
55 mm 1.2 Camera lenses	6 each	3 each
Fiber-optic communication bundle	6 each	3 each

## DIGITAL IMAGE SIZE

Screen size	Scan speed	File size
14 in by 17 in	100 μm	30 MB
14 in by 17 in	50 μm	120 MB
14 in by 51 in	50 μm	360 MB

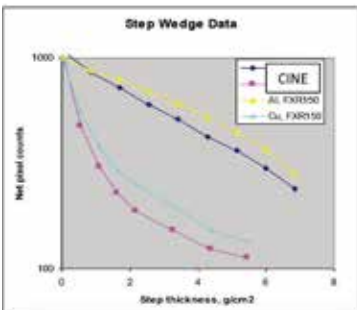


Camera Option 1

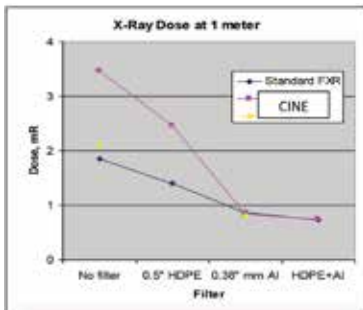


Camera Option 2

### FILTERED X-RAY DOSE DATA

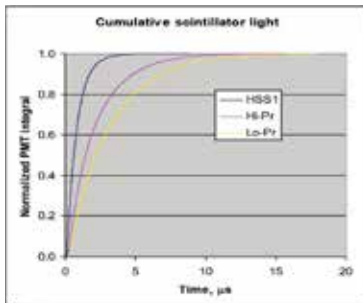
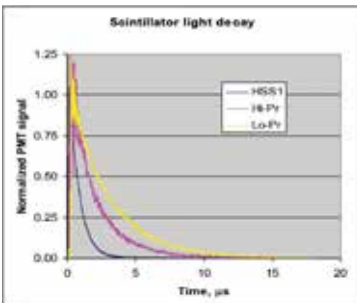


### AL AND CU STEP WEDGE DATA



### DOSE PER PULSE FILTRATION

X-ray dose per pulse depends upon filtration. Typically 0.5" HDPE for blast shield. Cine system gives higher dose for low filtration due to window differences: Cine 0.032" Al vs. standard FXR 0.003" Slope of step wedge data shows both sources have similar penetration and endpoint HSS1 99% of integrated light output within 4 ms < 0.1% ghost after 5 ms GOS:Pr High-Pr (2%) is marginal for 5-ms frames, good for >10-ms framing 90% of integrated light output within 5 ms, 99% within 10 ms Low-Pr (0.07).



### 150 kV Cine Radiographic System

© 2023 L3Harris Technologies, Inc. | 07/2023 | 62861 | EL

### Nonexport-controlled Information

L3Harris Technologies is a Trusted Disruptor for the global aerospace and defense industry. With customers' mission-critical needs always in mind, our 46,000 employees deliver end-to-end technology solutions connecting the space, air, land, sea and cyber domains.



1025 W. NASA Boulevard  
Melbourne, FL 32919