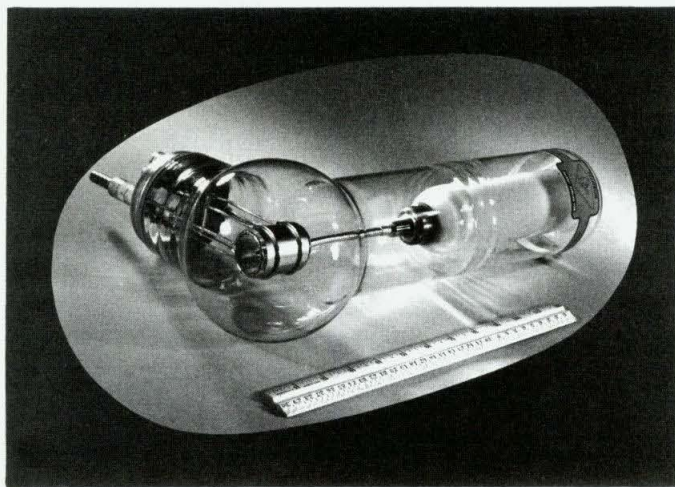


FEXITRON

FLASH X-RAY TUBE*

1200 MEGAWATT

MODEL 506



FEXITRON Flash X-ray tube
Model 506, T-600-2000-0.2



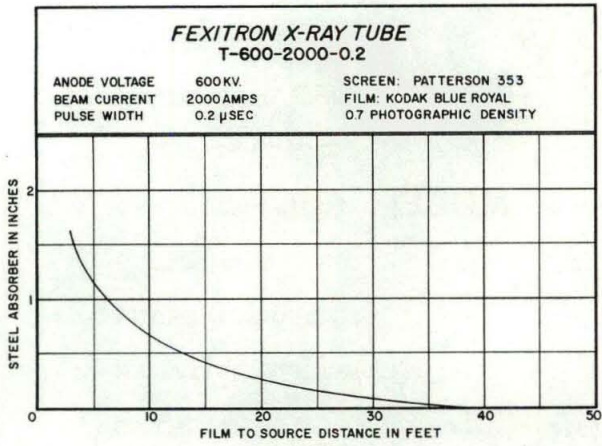
FIELD EMISSION CORPORATION

611 THIRD STREET
McMINNVILLE, OREGON

The FEXITRON flash x-ray tube, Model 506, Type T-600-2000-0.2, is designed for flash radiography where high intensity radiation from a small source is desired. Stop-motion pictures of high speed events in opaque media can be obtained at velocities up to 20,000 ft/sec (6×10^6 mm/sec). The Model 506 tube provides a film density of 0.7 through 6 1/2 inches of aluminum at a film-to-source distance of 4 feet, and shadow-graphs in air at distances up to 39 feet. An x-ray dosage rate of 2×10^8 R/sec is provided at the tube envelope.

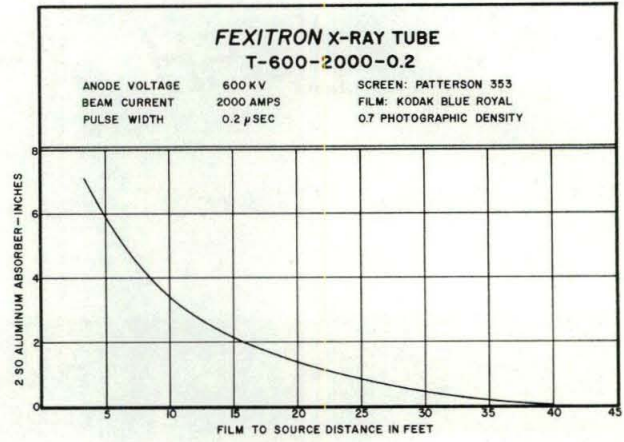
FEXITRON flash x-ray tubes use the newly developed T-F emission electron source (Phys. Rev. 95, 325, 1954) in which current is a consistent, reproducible function of voltage and temperature; the vacuum arc source employed by earlier flash x-ray tubes is not used. When the FEXITRON tube with the T-F source is used with a square wave voltage pulse, spectrum and resolution are maximized since optimum anode power is provided for a given x-ray yield. Maximum life, reliability, and reproducibility are provided on a pulse-to-pulse basis. The Model 506 tube has an effective x-ray source size of 9.4 mm diameter, and an envelope size of 5" diameter x 16 1/4" long. A peak power of 1200 megawatts is generated and dissipated in a beam volume of 3.5 cc (600 kv, 2000 amps, 0.2 μ sec).

PERFORMANCE DATA



STEEL PENETRATION - 600 KV; 0.2 μ s

Figure 1



ALUMINUM PENETRATION - 600 KV; 0.2 μ s

Figure 2

DIMENSIONAL DRAWING

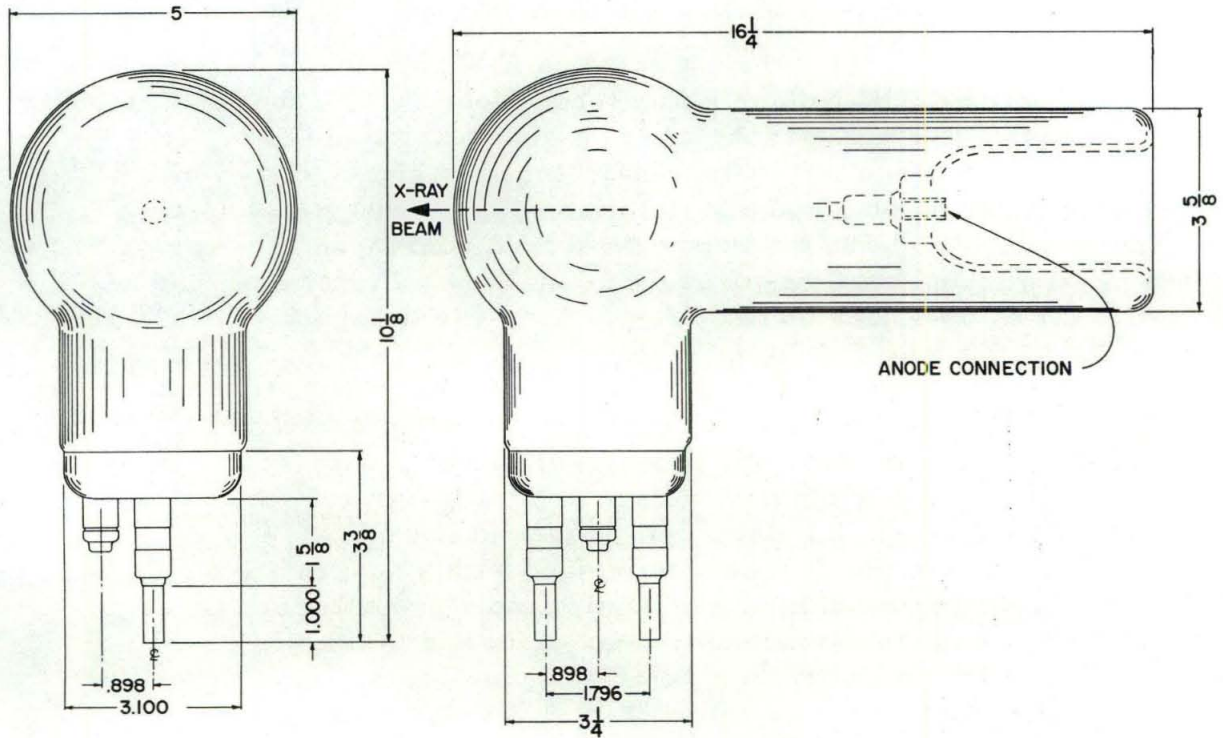


Figure 3

PERFORMANCE RATINGS

	<u>MAXIMUM RATINGS</u>	<u>TYPICAL OPERATION</u>
PEAK POWER:	1200 megawatts at 0.2 microsecond	1020 megawatts at 0.2 microsecond
ANODE:	Tungsten	Tungsten
ANODE TEMPERATURE:	3000° K	2000° K
ANODE VOLTAGE:	600 kv	550 kv
BEAM CURRENT:	2000 amperes	1850 amperes
PULSE DURATION:	0.2 microsecond	0.2 microsecond
PULSE OVERSHOOT:	Maximum 5%	Up to 5%
NEGATIVE OVERSHOOT:	Maximum 10%	Up to 10%
CATHODE:	T-F emission, Tungsten	T-F emission, Tungsten
CATHODE VOLTAGE:	9 volts ac, 50-60 cps	8.5 to 9 volts ac
CATHODE CURRENT:	180 amperes	160 to 180 amperes (pulsed for 1 sec.)
X-RAY SOURCE SIZE:	9.4 mm dia.	9.4 mm dia.
DOSAGE RATE:	2×10^8 R/sec at 3"	

CHARACTERISTICS

BEAM DIRECTION:	Parallel to anode axis
COOLING:	Air circulation not required.
RESIDUAL PRESSURE:	10^{-12} mm of Hg.
LIFE:	Cathode life is determined by evaporation and therefore is a function of current and power level at which the tube is operated; general experience with FEXITRON tubes at typical operating voltages indicates an average life of several hundred pulses - see FEXITRON Operating Instructions for methods of extending tube life.
TIME INTERVAL BETWEEN PULSES:	Nominally 3 minutes; for more rapid repetition rates see special tube bulletin.
DURATION OF FILAMENT CURRENT:	The filament operating time should be restricted to not greater than 3 seconds per x-ray pulse (see auxiliary equipment data sheet on FEXITRON Sequential Timer).
TUBE PERFORMANCE:	The performance of FEXITRON x-ray tubes is shown in Figures 1 and 2. All tubes are individually tested at full ratings.
BASE CONNECTIONS:	The anode end of the FEXITRON x-ray tube terminates in a female receptacle with inside diameter of 0.277" suited for use with a giant banana plug (Johnson No. 108) and the cathode end is provided with 3/8" diameter copper base pins.
PHYSICAL DIMENSIONS:	Length: 16-1/4" Diameter: 5" inches (see outline drawing)
PRICE:	\$980 Discounts available on quantities over 40 tubes; write for schedule.



COLT .45 AUTOMATIC PISTOL: BULLET IN FLIGHT

Flash x-ray picture taken with FEXITRON PS-600-2000-0.2 system. Film-to-source distance - 12 feet; 500 kilovolts, 1300 amperes, 0.2 microsecond pulse. Pistol hand held; 220 grain bullet stopped in flight just before exit from barrel.

FIELD EMISSION CORPORATION

McMINNVILLE, OREGON



McMinnville, Oregon/telephone 472-5101

Field Emission Corporation

WARRANTY STATEMENT

Fexitron X-ray Tube, Model *506A483*

Field Emission Corporation (Manufacturer) warrants each new Fexitron x-ray tube to be free from defects in factory workmanship or material under normal use for ninety (90) days from date of delivery to the original purchaser, or *50* pulses, whichever event shall first occur. Should the tube fail prior to the ninety (90) days and/or specified pulses, a prorated adjustment will be made when returned, transportation prepaid during warranty period. Manufacturer's obligation under this warranty is limited to the Fexitron x-ray tube.

This warranty is valid except when a Fexitron x-ray tube has been subjected to misuse, accident, or negligent damage in transit or handling, or operation outside the conditions prescribed in the operating manual.

This warranty is in lieu of all other warranties, expressed or implied.

FIELD EMISSION CORPORATION
611 Third Street
McMinnville, Oregon

FEXITRON X-RAY TUBE CHARACTERISTICS

Tube Type	<u>506</u>	Date Tested	<u>5-28-63</u>
Serial No.	<u>506A483</u>	Tested By	<u>Jerry</u>
Anode Type	<u>.375 in / 7° cone</u>	Date Shipped	_____
Cathode Type	<u>.050 BHP X.1</u>	Shipped To	_____

Cathode Clean-up and Preheat -- Filament Voltage _____

Gettering -- Getter Current 5.2A / 3 min
Cycle filer 1/2 + 2 1/2 min at 8.7 volts during getter.
Wait 20 min. after getter

Characteristic Curve for Constant Tube Impedance of 300 ohms.

