

THE ELECTRON LINEAR ACCELERATOR

AT CRANE DIVISION

NAVAL SURFACE WARFARE CENTER

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I. INTRODUCTION

A. General. This brochure describes the Electron Linear Accelerator (LINAC) and associated support facilities available at Crane Division, Naval Surface Warfare Center (NAVSURFWAR-CENDIV) for conducting Transient Radiation Effects on Electronics (TREE) experiments and tests.

B. Facility Overview. The LINAC is located in Building 3059 at the west edge of NSWC near the Crane gate. The Data Acquisition System (DAS) is linked via high-speed local area net to facilitate data storage and analysis or completion off-Center. The Crane LINAC is operated by the U.S. Navy for radiation effects testing.

II. LINAC TECHNICAL INFORMATION

A. Facility Layout on page 2.

B. TECHNICAL CHARACTERISTICS:

	Operating Frequency	1.3 GHz	Pulse Rate Frequency	1-10 pps
			<u>STEADY STATE MODE</u>	<u>TRANSIENT MODE</u>
2022B	Dose rate (max.)	1 E11 rad (Si) / sec.		1 E12 rad (Si) / sec.
injection 20A-30A (50A max)	Energy	10 - 40 MeV		10 - 60 MeV
P.H.E. 15A.	Pulse width	50 - 10000 ns		3 - 100 ns
10-100ns	Risetime(10-90%)	10 ns		1.0 ns
20-50ns	Fall time	10 ns		1.5 ns
	Dose per pulse (max.)	1 E6 rad (Si)		0.5 E6 rad (Si)
	Energy (total)	200 J · 10		30 J
	Energy droop (15 A / 50 ns)			32 MeV
	Energy spread (80% of e)	+/- 10%		
	Nominal pulse height	0.5 A		15 A
	Fluence (max.)	50 cal / cm ²		25 cal / cm ²
	Reproducibility	+/- 2%		+/- 2%
	Target area (diameter)	0.5 cm		0.25 cm
	Bremsstrahlung Mode:			
	Dose per pulse	1 E4 rad (Si)		0.5 E4 rad (Si)
	Dose Rate	>1 E8 rad (Si) / sec.		>1 E9 rad (Si) / sec

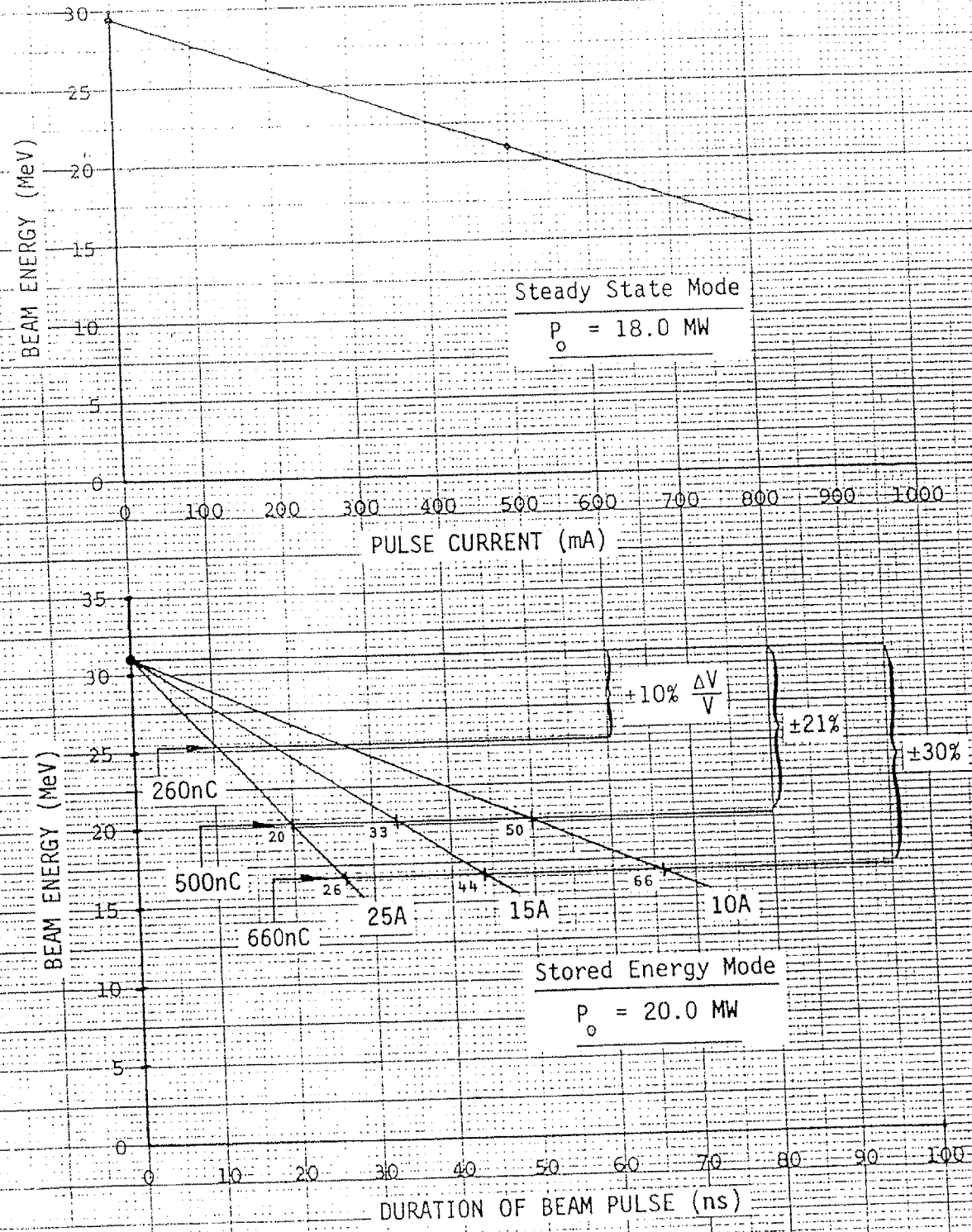


Figure 4. Waveguide Section No. 2
Steady State and Stored Energy Beam Characteristics for Synchronous Operation with Bunch Centroid Phased Slightly Ahead of Crest.