



Radio Frequency (RF) Systems (LLRF and HPRF)

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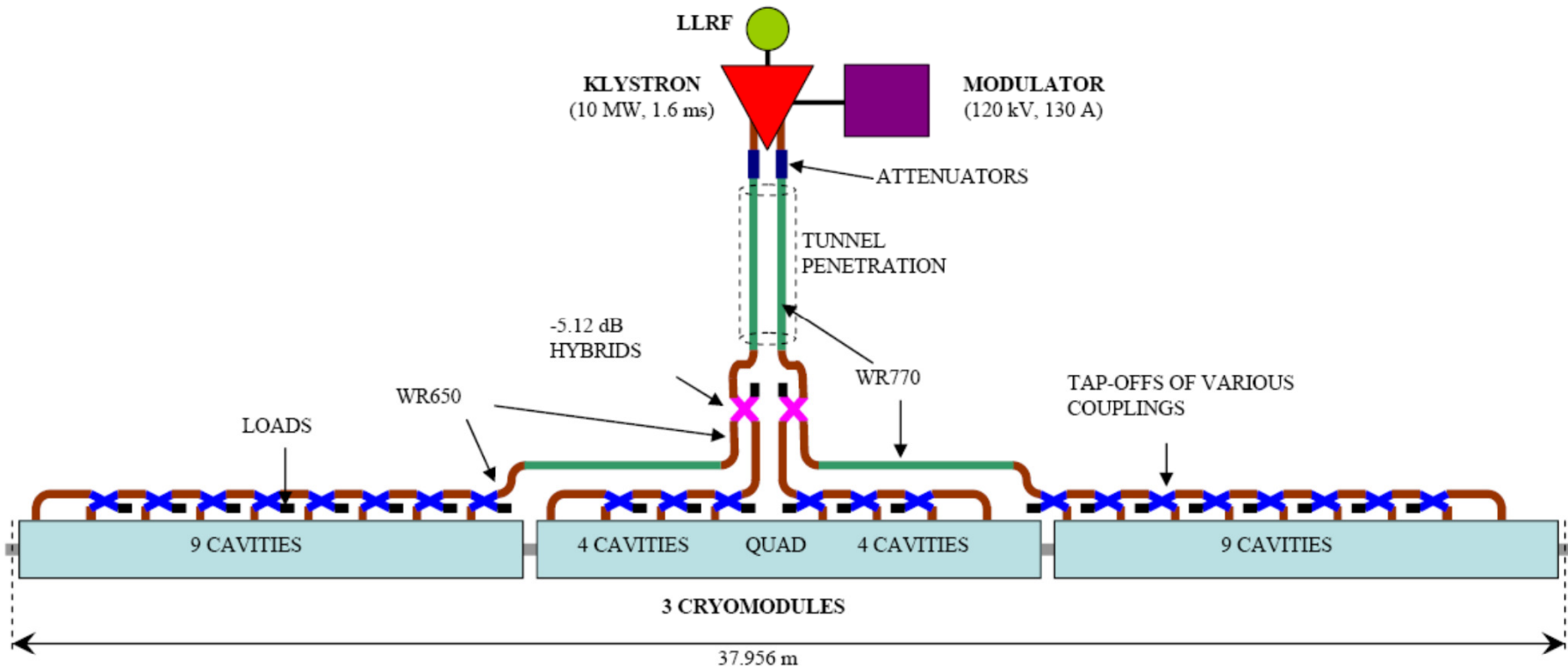


Outline

- RF system overview
- Control Theory
- Low Level RF
 - Requirements
 - Sources of Perturbations
 - Control Concepts
 - RF Control
- High Power RF
 - Klystrons
 - Modulator
 - RF distribution



RF Station with Power Distribution

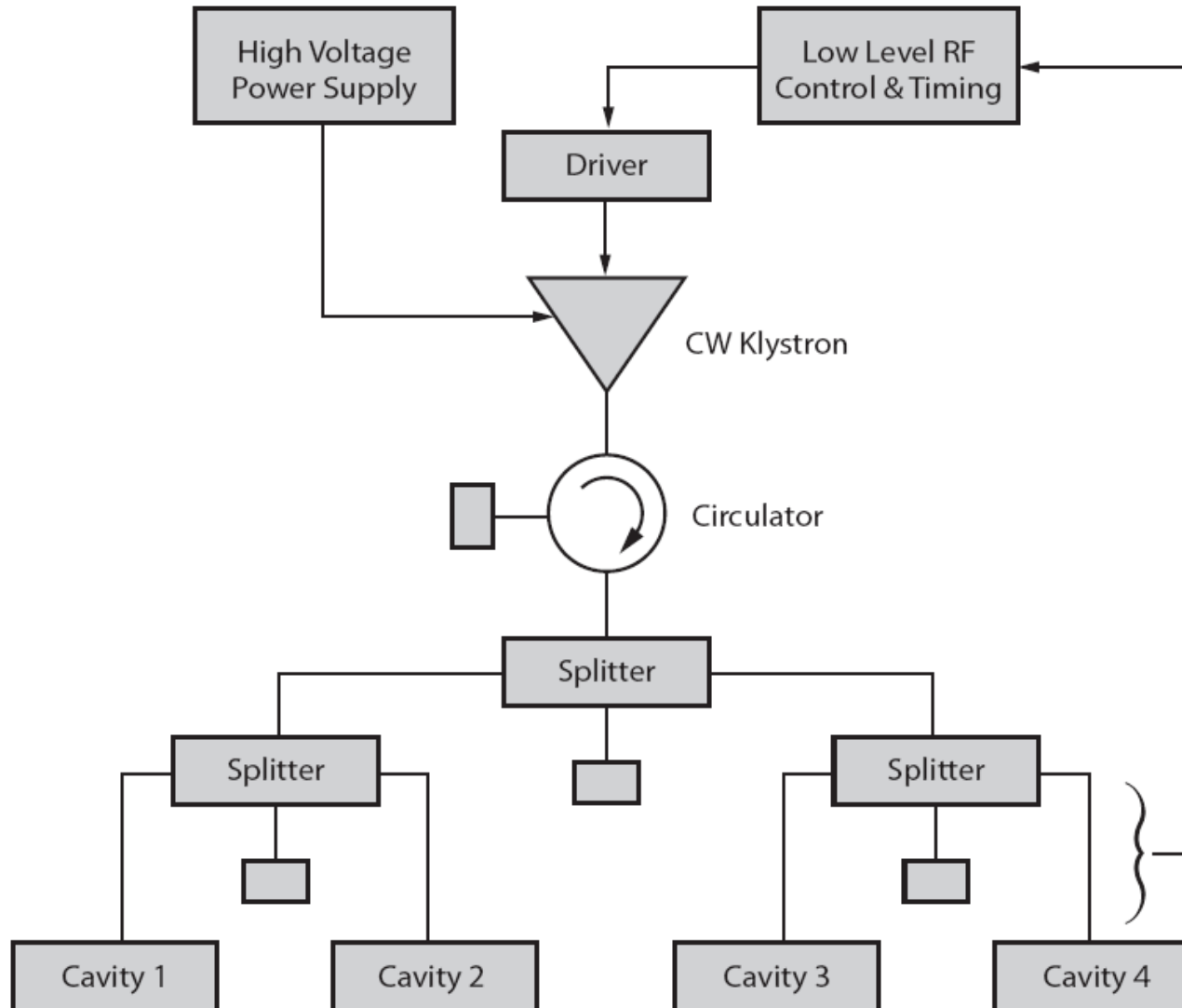


Modulator distribution by type and area.

Modulator type	Total	e ⁻		e ⁺		e ⁻		e ⁺	
		Inj	Inj	RTML	RTML	Linac	Linac	DR	DR
10 MW-1.3 GHz-5 Hz	646	13	39	17	17	282	278	0	0
1.2 MW-650 MHz-CW	20	0	0	0	0	0	0	10	10

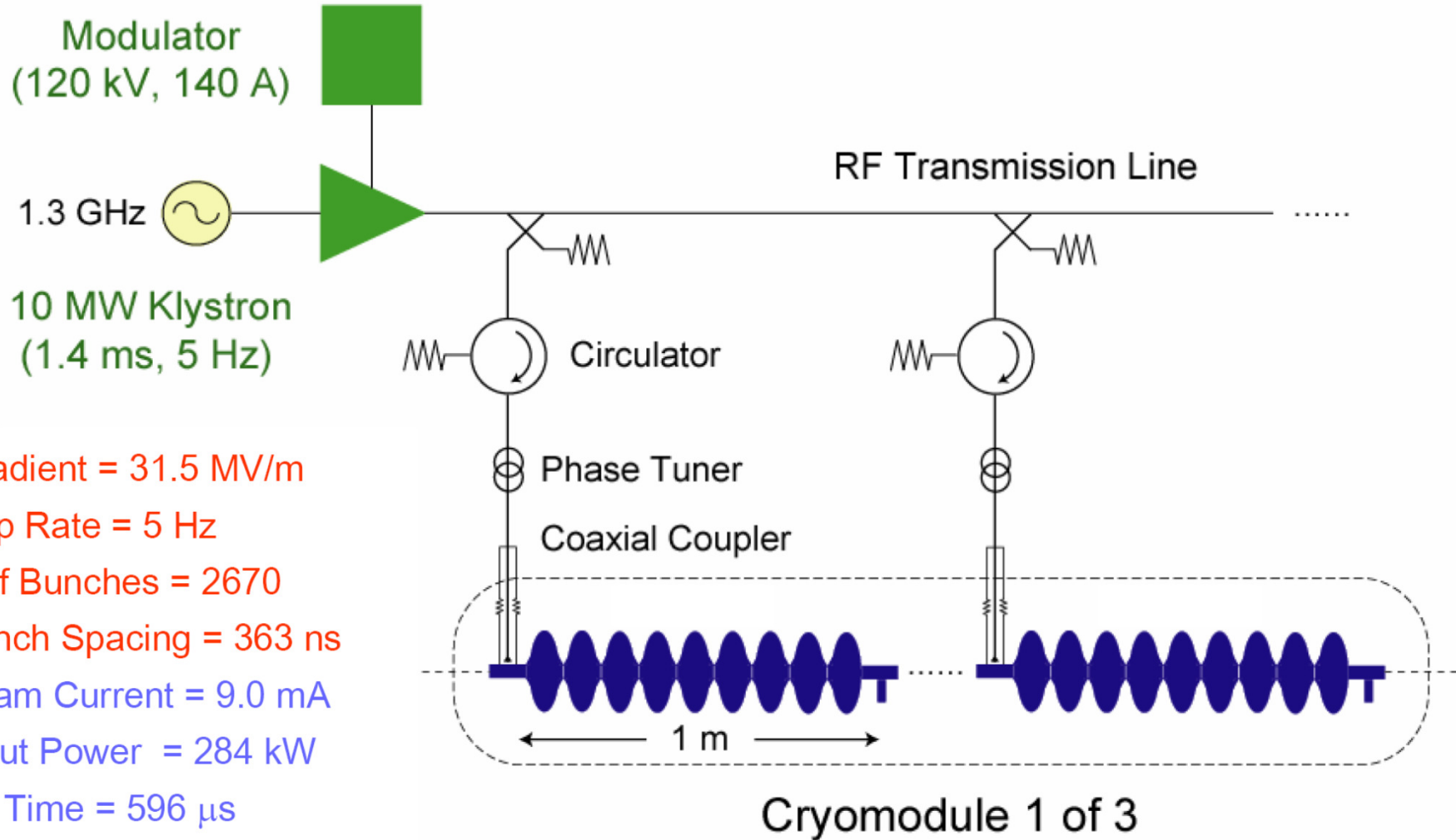


Schematic for Damping Ring RF Station





ILC RF Unit for Main Linacs (x560)



- Gradient = 31.5 MV/m
- Rep Rate = 5 Hz
- # of Bunches = 2670
- Bunch Spacing = 363 ns
- Beam Current = 9.0 mA
- Input Power = 284 kW
- Fill Time = 596 μ s
- Train Length = 969 μ s

(9-8-9 Cavities per Cryomodule)



Integration LLRF, HPRF, Timing/Synchronization

