



Fermilab

TM-654
0330.000

SUITABILITY OF PRESENT BOOSTER RF CAVITY
FOR ACCELERATION OF MORE BUNCHES
PER MAIN-RING CYCLE

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It is desirable to learn of any parts of the Booster RF System which might not be able to function reliably at more than one second's worth of 15 Hz acceleration cycles per six-second main-ring cycle.

A standard booster rf cavity was operated at the test station with a 22 kV peak anode program. The test data indicates that the present equipment can operate at any acceleration duty cycle.

Conservative operation would make modifications to provide air cooling of the damper resistor and cavity ceramics.

Test Data (Taken @ 27°C Ambient)

Run Duration Hours	"Duty Cycle"		TEMPERATURE (°C)					
	Accel. Cycles	Max. Avail.	Tube Shroud	Blocker Fingers	Blocker Ceramic	Cav. Ceramic Vac. Seal	Damper Resis. Case	Damper Resistor
2	30	90	36.3	37.5	36.4	33.6	41	
1	8	15	39.5	41.5	41	38	46	
1	12	15	41	43.3	41.5	40	57.2	
1	15	15	48	48	48	45.5	71	165.5

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The basic cavity, power amplifier, modulator, and bias supply appear able to accelerate to 8 GeV continuously. To ensure reliable operation, I recommend forced air cooling of the cavity ceramics, blocker, and damper resistor. This can be accomplished by admitting a large quantity of low-pressure air to the PA port and providing exhaust ports at the cavity ceramics and damper resistor case. In addition, better insulated clamps should be provided for the bias bus bars because of the increased vibration duty cycle.