

# A New Digital SSB Longitudinal Feedback System for the Fermilab Booster (MOPP41)

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## Abstract

The Fermilab Booster accelerates bunches and accelerates proton beams from 400 MeV to 8 GeV. During the acceleration the Radio Frequency (RF) cavities are swept from 38MHz to 52.8MHz and requires crossing through transition where accelerating phase is shifted 90 degrees. In order to keep the beam stable and minimize losses and emittance growth a coupled bunch longitudinal damping system is used. In 2016, the original analog system was replaced by a digital system. This system is being upgraded to Single Side-Band to improve performance at higher beam power.

- Post Transition, RF 51.8-52.8MHz
- Rev Freq 617kHz-628kHz
- Synchrotron Frequency 1800Hz-2800Hz

