

***Microwave Schottky
Pickups at
Fermilab***

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Microwave Schottky Pickups

⌘ *Microwave Schottky Pickups at Fermilab*

⌘ *Pickup Design*

⌘ *Mechanical*

⌘ *Electrical*

⌘ *Recycler*

⌘ *System Response*

⌘ *Performance*

⌘ *Tevatron*

⌘ *Common Mode*

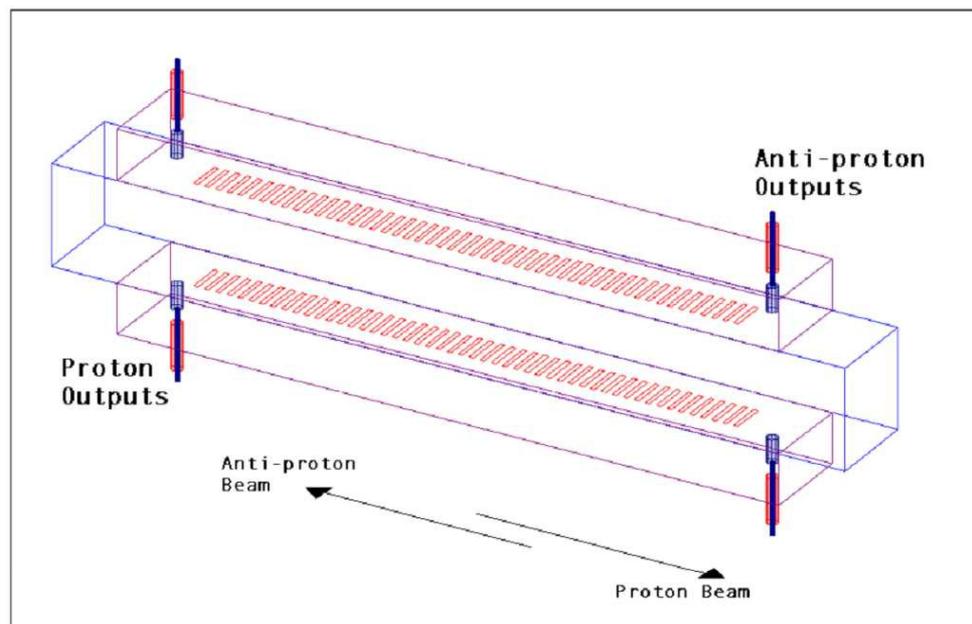
⌘ *Signal Processing*

⌘ *Performance*



Microwave Schottky Pickups

Slotted Waveguide Pickup

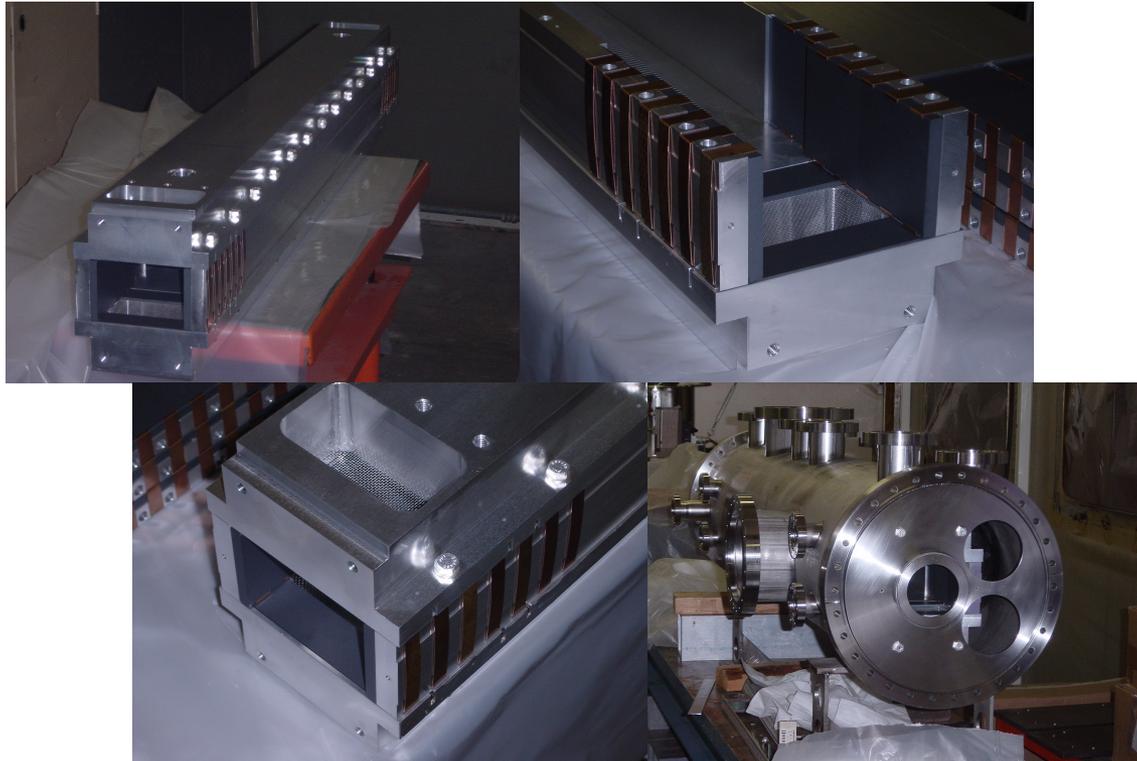


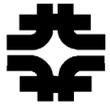
1.7 GHz 109 x 75 mm aperture



Microwave Schottky Pickups

Array Assembly





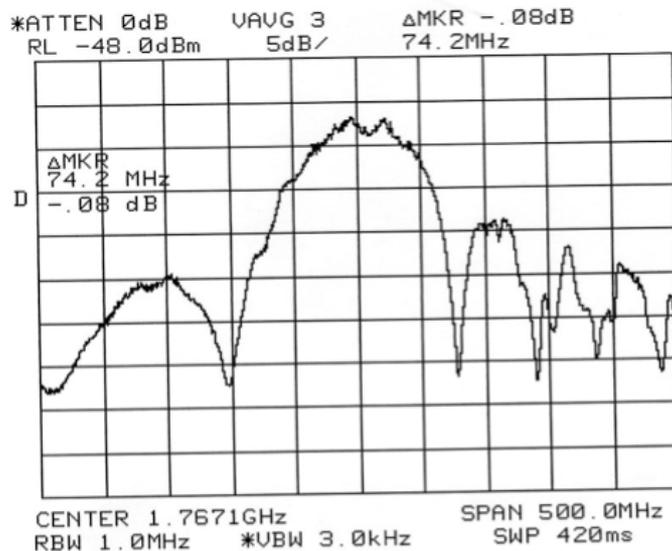
Microwave Schottky Pickups

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

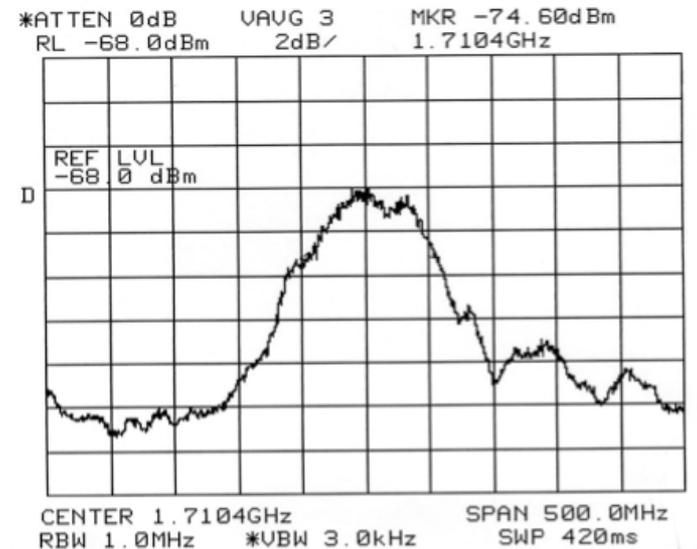


Microwave Schottky Pickups

Measured Pickup Sensitivity in Recycler



Sum Mode



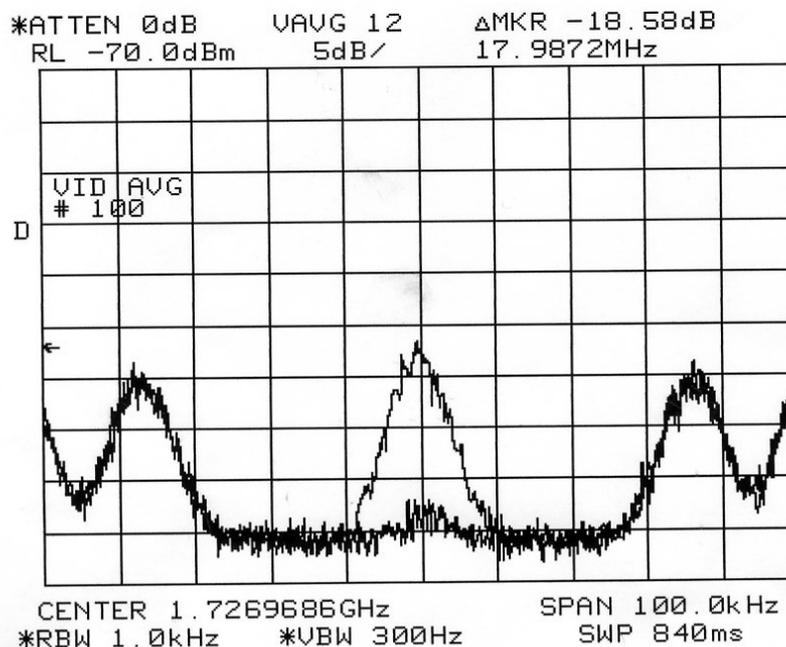
Difference Mode

Directivity Measured at 12-15 dB



Microwave Schottky Pickups

Beam Centering Reduces Common Mode



Recycler Horizontal Pickup 1×10^{11} Protons



Microwave Schottky Pickups

Recycler Automated Vector Signal Analyzer Program

QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.

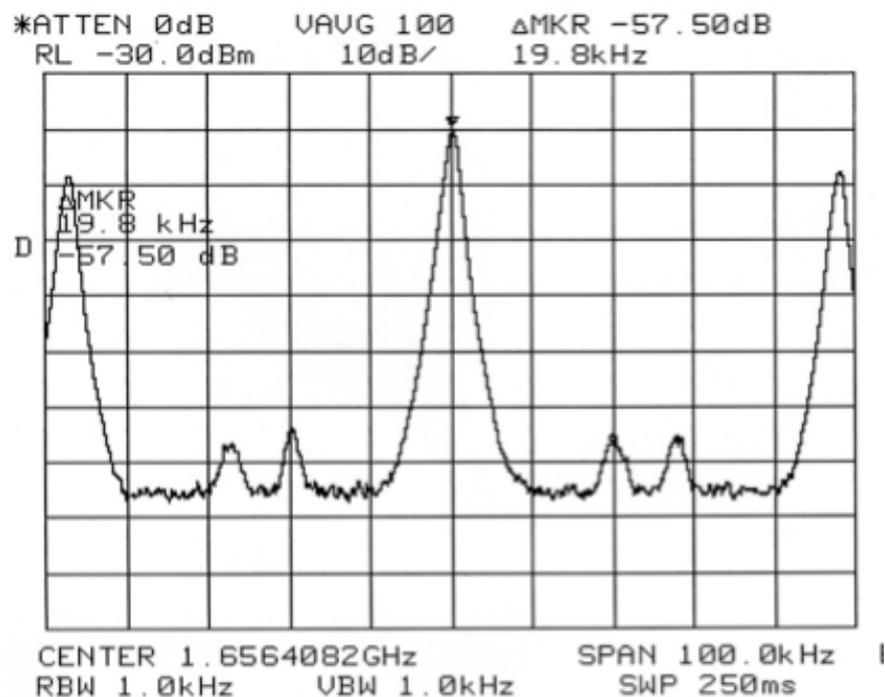
Provides momentum spread, tune, revolution frequency, calculated emittance.

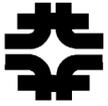


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Tevatron Schottky Signal

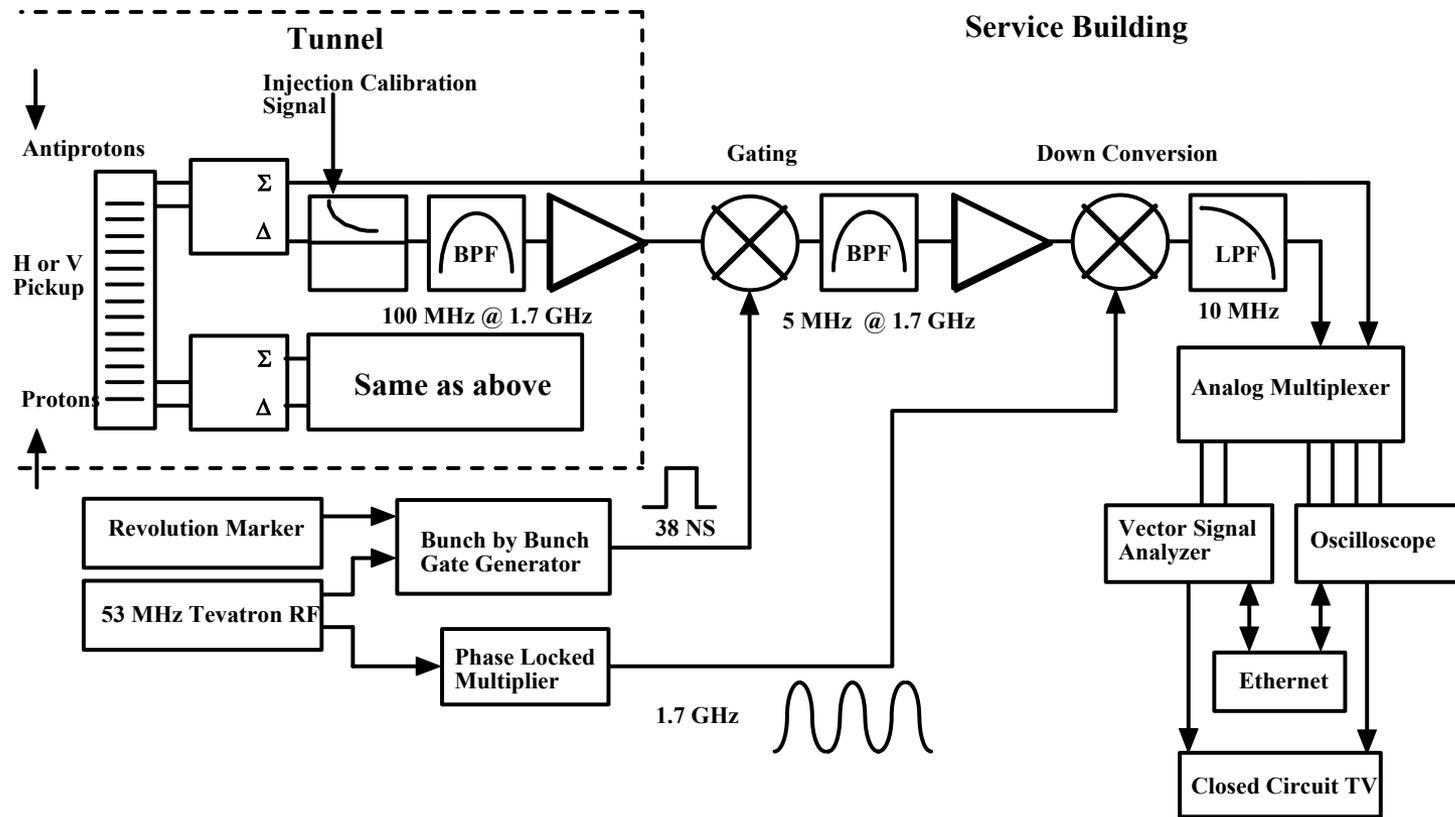
Large Common Mode Signal Requires High Dynamic Range





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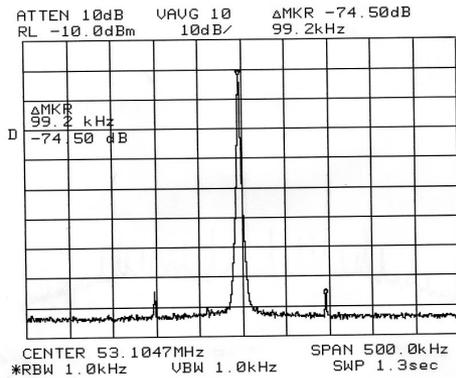
Tevatron Schottky Signal Processing



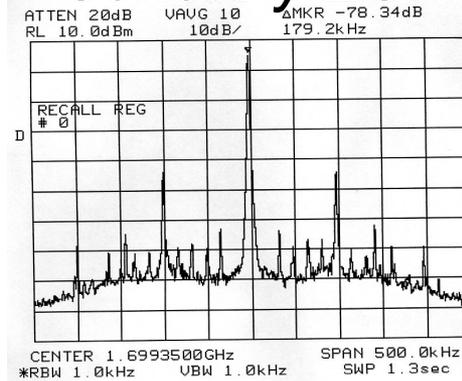


Microwave Schottky Pickups

Tev RF



Schottky LO

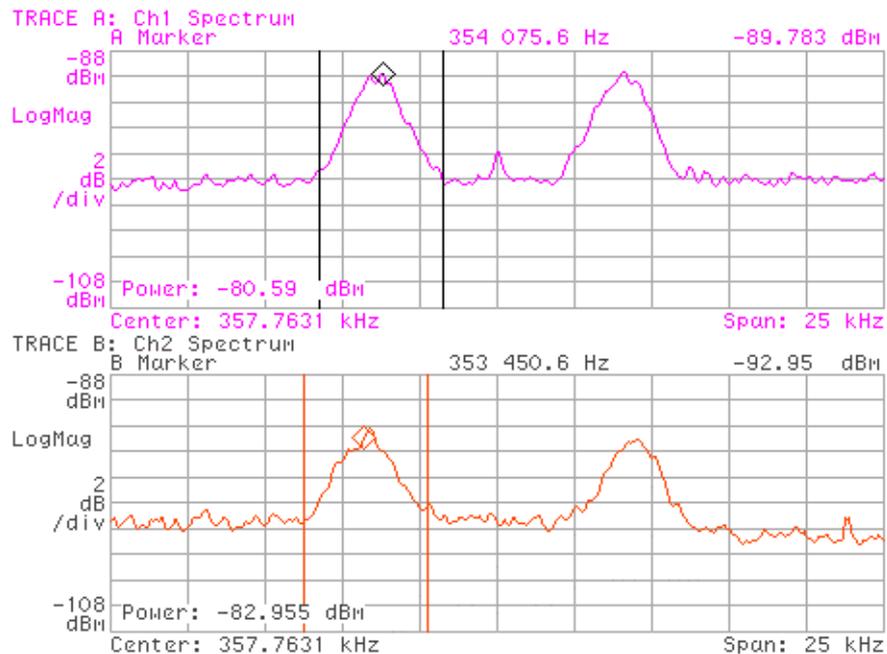




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Tevatron Antiproton Schottky Signals

Date: 04-17-03 Time: 07:57 AM



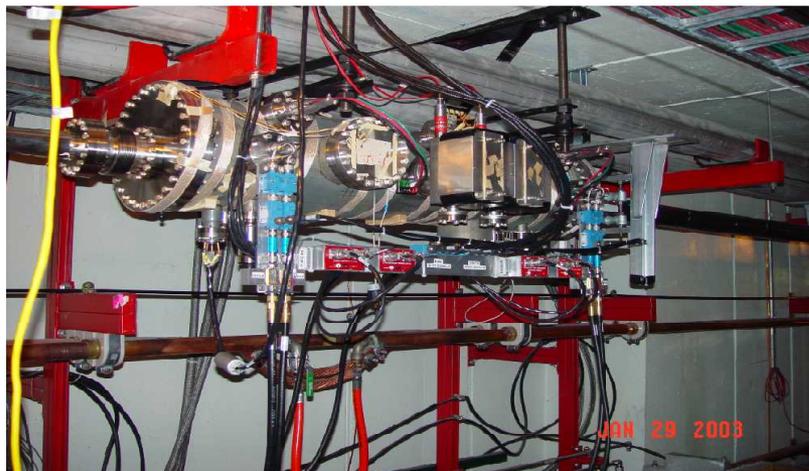
Horizontal

Vertical

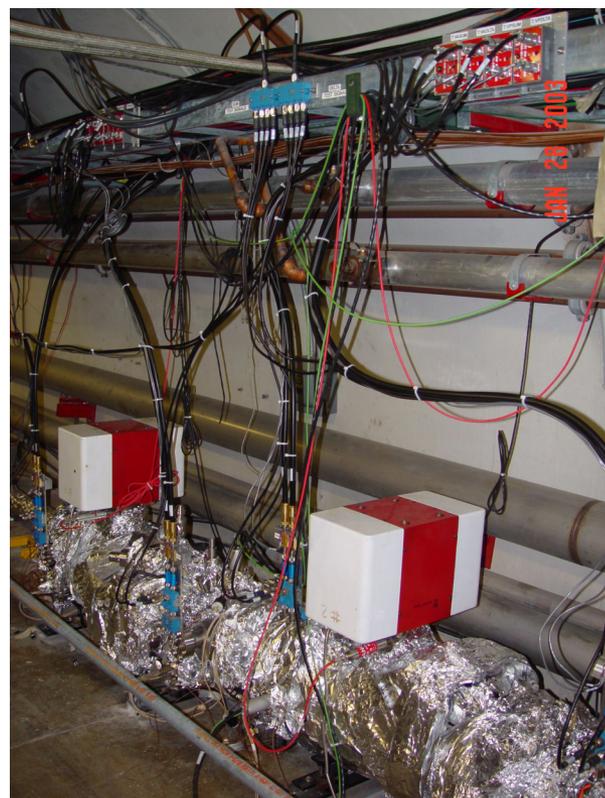


Microwave Schottky Pickups

Tevatron Installation



Recycler Installation





Microwave Schottky Pickups

⌘ Status

⌘ *Recycler*

- ⊗ *Pickups installed and in daily use*
- ⊗ *Single Sideband down conversion and gating in the works*
- ⊗ *Continuous Emittance monitor*

⌘ *Tevatron*

- ⊗ *Pbar H and V temporarily installed and used to measure tunes*
- ⊗ *New signal processing filters to be delivered by mid May*
- ⊗ *Access required to install filters and equalize cable delays*
- ⊗ *Emittance monitor being studied*