Injector System Layouts
(sans many sketches)

Injector Systems Group

December 14, 2000
Three Topics to Broach Today

- Status of Injector Systems topology options
- 3x4 Positron Target System
- An 8 GeV Drive Beam Return Beam Line
Why a Central Injector?

- NLC energy upgrade paths are straightforward.
- Better MTTR
- Better total system availability.
- Centralized Utilities
- Centralized Installation.
- Lower Cost? - Maybe
Current Candidates 12/13/00

- Shared Tunnel Perpendicular to Main Linac; max reuse of rf systems
- e- and e+ Injector Linacs located in e+ Main Linac Tunnel; common injector area, crosses IP, max. congestion
- e- and e+ Injector Linacs located in e- and e+ Main Linac Tunnels; avoids IP, less congestion
- Separate Injector Tunnels located at far ends of the Main Linacs; CD04 layout
- Also for a Dual Level Layout (FNAL deep tunnel layout) e- and e+ Injector Linacs located in a shared tunnel, parallel to Main Linac, pointed in opposite directions, vertical drop lines to lower elevation
Status of Current Candidates

• Have developed inventory and layouts of all candidates
• Developing Main Linac cross sectional view w/ Injector Beamlines to see how things fit in the tunnel
• Expect to have relative cost numbers for candidates in a few Weeks
• Working to better define and quantify perceived benefits and drawbacks to the various layouts
The NLC Injector Systems

Positron Injector Systems

Electron Injector Systems
The conventional $e^+$ source (ZDR) appears to be unworkable

An RF multiplexed $e^+$ source system is being adopted.

Many issues to be worked out;
  - optics (isochronicity), combiner (aperture, trajectory spread),
  - selective losses (photocathode gun?)

3 out of 4 target system scheme
• 4 targets: 3 operating, 1 spare/repair
• Access and 5m shielding between vaults sets scale
Basic Central Injector Layout
(Expanded Vertical Scale)

~26 km

10 mrad Big Bend

1 km

5 km
NLC - The Next Linear Collider Project

Basic Central Injector
250 MeV e+ Return Line

2 GeV L-Band Linac

2 GeV e- Drive Transport

6 GeV S-Band Linac

250 MeV e+ Return Line

e+ Source & 250 MeV Capture

e- Sources