



# NLC Collaboration Meeting

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## Structure Fabrication

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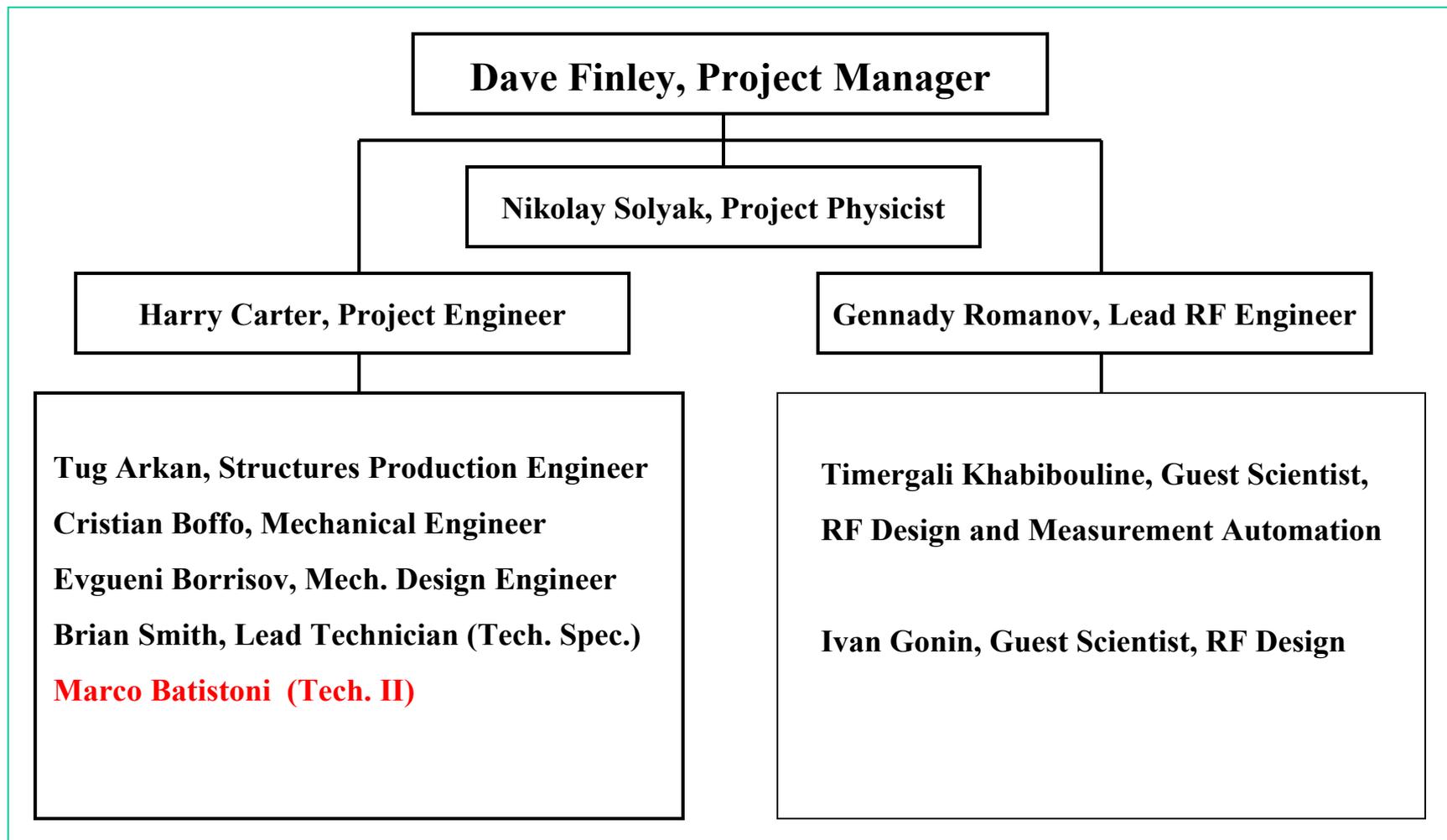
# Structure Fabrication: Outline

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- **Organizational Changes**
- **Work Accomplished (Since Last Collaboration Meeting)**
- **Status of Ongoing Work**
- **Future Plans**



## RF Technology Development – Conventional Personnel & Responsibilities

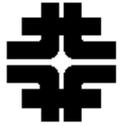




# Work Accomplished

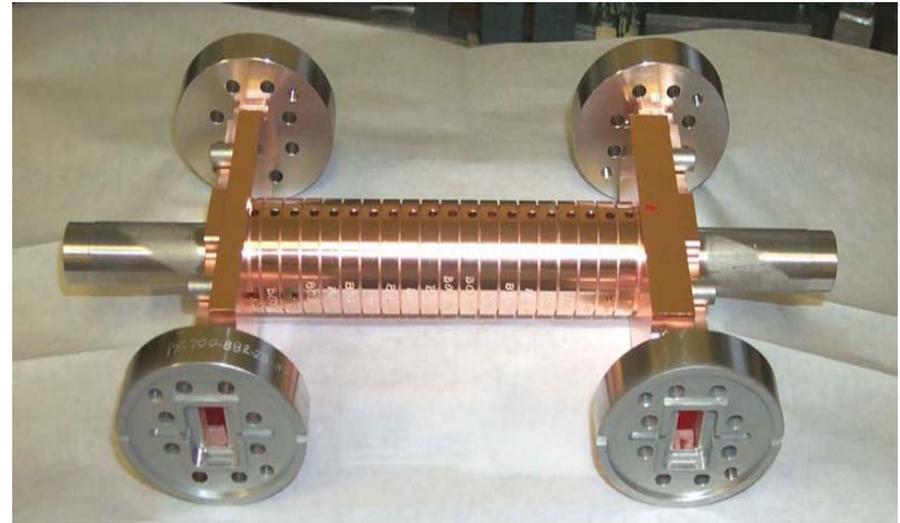
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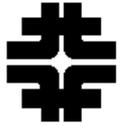
- Structure Production
- Engineering Teams
- RF Development & Testing
- Industrialization of X-Band Structure Production
- Special Projects



## Work Accomplished: Structure Production

- We have produced two 20 cm. long traveling wave structures thus far: FXA-001 and FXA-002.
- We are in the process of producing FXA-003 and **FXB-001**, both currently delayed due to the lack of receipt of the large vacuum furnace from AVS (due the end of this month)
- We are continuing to improve our fabrication methods and processes
- We are working to broaden our base of vendors capable of producing high precision machined parts (disks and couplers) for structures





# Work Accomplished: Engineering Teams

Originally created to help focus on **Technical Division FY02-03 goals for Linear Collider R&D.**

## For X-Band (NLC)

- **Structures (Mechanical)**
- **Structures (Electrical/RF)**
- **Girders**
- **Vacuum System**
- **Cooling Water System**
- **Specifications Development**
- **Quality Assurance Development**
- **8 Pack Integration**

## Both TESLA and NLC

- **FNAL Cleaning Facility**
- **SBIRs**
- **Permanent Magnets**
- **Demonstration of Remote Accelerator Operation**
- **Siting LC's near Fermilab**



## Status of Ongoing Work: RF Development & Testing

- **RF Design Work**
  - **Have Acquired Software and Hardware to Facilitate RF Design and Analysis**
  - **Have Worked to More Fully Understand the Relationship Between Component Mechanical Design and Electrical Performance**
  - **We are reviewing both standing wave and traveling wave designs**



## Status of Ongoing Work: RF Development & Testing

### RF Testing:

- Have developed single cell, bead pull, and plunger RF measurement hardware and have automated the measurement process using LabView





## Future Plans: Structures for Eight Pack Test

- Eight Pack Test at SLAC (Dave Schultz, Project Leader)
  - In Phase II, a “pack of eight klystrons” will feed
    - 11.424 GHz X-Band power into a modified DLDS system and power two girders worth of structures with the full power and energy required by the NLC design.
  - The goal is to be operational by mid 2004
- Girder A System: Nine 0.6 m Long High Gradient Test Structures (FXBs)
- Girder B System: Six 0.9 m long NLC Main Linac Structures (FXCs)





# Future Plans: NLC in TD for FY02

- In the remainder of FY02 (with \$1.95M):
  - Complete FXA-003
    - 20 cm long, conventional machined, high gradient, 45 mm OD
  - Make FXB-001 thru 003
    - 60 cm long, conventional machined, high gradient, high phase advance, 61 mm OD
    - Assume same coupler design we had in FY01
  - Start to order parts for FXC Prototype
    - Prototype NLC Main Linac Design >>> The Real Thing (at least the first accelerating structure prototype)
    - 90 cm long, assume diamond turned, real accelerators
    - **Note: Need FXC design (including couplers) by July 2002**

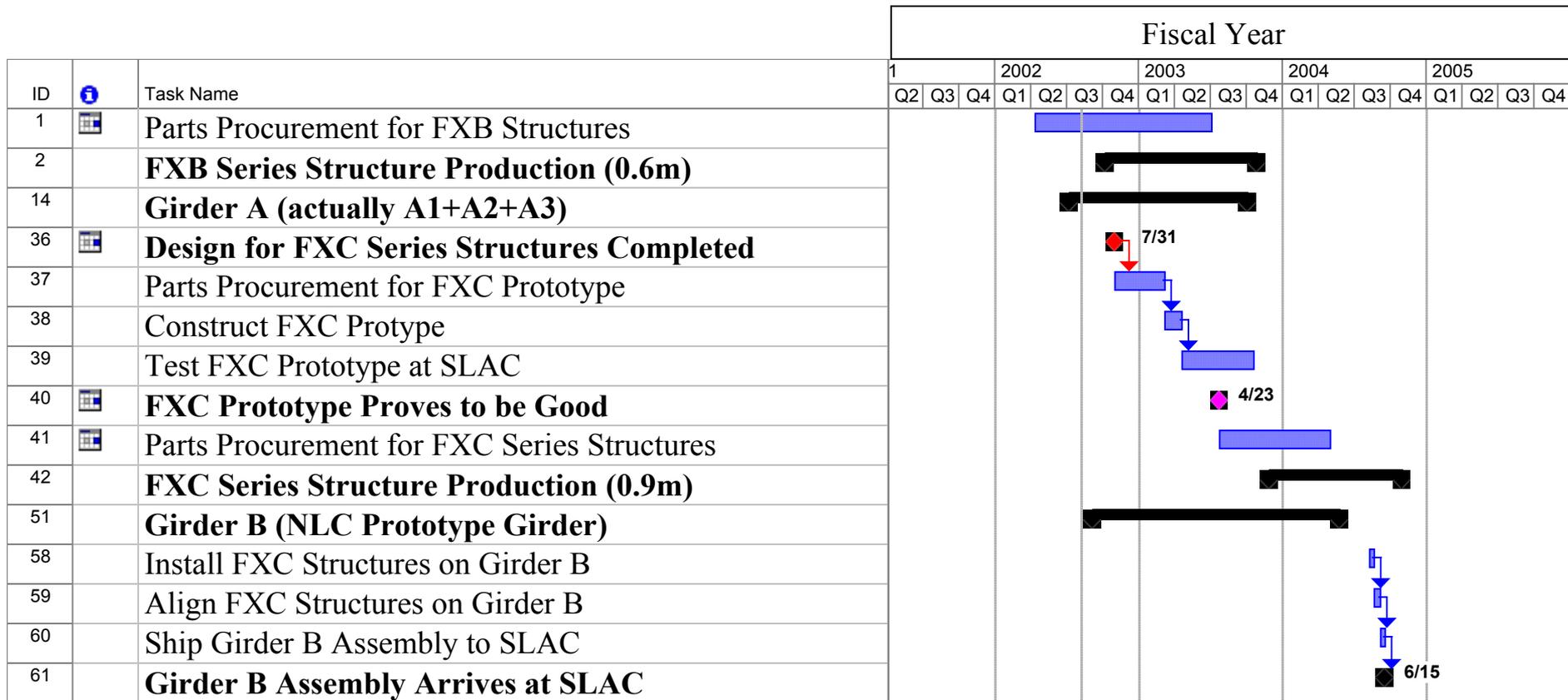


## Future Plans: NLC in TD for FY03

- In FY03 (\$?.?M, need ~\$3.3M to accomplish items below---if flat funded, we just can't do it!):
  - Build FXB-004 thru 009 (plus two extras)
    - Assume better coupler design than we had in FY01 and FY02.
  - Build FXC Prototype, then FXC-001 thru 006 (plus two extras)
  - See how many we actually have in mid to late FY03 and decide what to do in FY04
  - Finalize NLC Girder Design and Make One (or two) for Installation in NLCTA



# Production Schedule





# Summary

- Delay in receipt of our large vacuum furnace has impacted our structures production schedule, but we will meet our FY02 plan.
- We are continually improving our RF testing and measurement capability in support of structure production.
- We are strengthening our structure and coupler design capability.
- Girder R&D work is in progress.
- Funding will remain a serious constraint on our (as well as the rest of the collaboration's) ability to accomplish our goals in a timely manner.