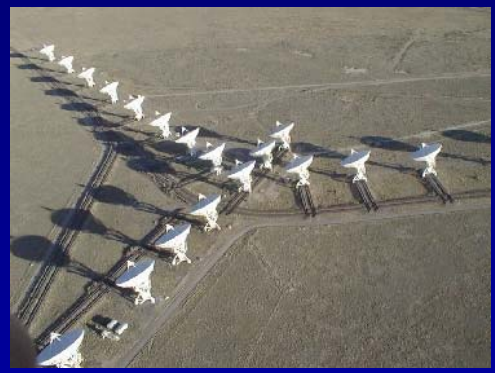

EVLA MONITOR AND CONTROL HARDWARE REQUIREMENTS

BASIC REQUIREMENTS

- All Monitors/Controls Available Online
- Fieldbus
- Data Rates
- Timing Requirements
- RFI Requirements
- MIB Requirements
- Transition Requirements

FIELDBUS

- 1 Gigabit Full Duplex Switched Ethernet Between Control Building and Antennas
- 100 Megabit Full Duplex Switched Ethernet to EVLA Modules

WHY ETHERNET?

- COTS Equipment Available
- Maintainable Due To Widespread Commercial Use
- Large Packet Size => Low Overhead
- Protocols Built Into Operating Systems
- High Data Rates

WHY ETHERNET?

- Allows Same Fieldbus for Entire Monitor and Control System
- Slot Addressing Scheme Possible
- Convenient to Place Control Computer On Any Part of the Network
- Indeterminacy is Not a Problem Because of Using a Switched Network

DATA RATES

- Maximum Monitor Data Rate From EVLA Antenna Estimated At 200 Kbits/Second
- Maximum Monitor Data Rate From EVLA Module is 128 Kbits/Second
- Maximum Command Data Rate is Much Slower

TIMING REQUIREMENTS

- Commands Must Be Implemented Within 100 μs of Intended Implementation Time
- Monitor Response Time is 10 – 100 ms
- Monitor Data Must Be Gathered, Time Stamped, Sent to an Archive

TIMING REQUIREMENTS

- Monitor and Control System Must Keep Absolute Time to Resolution of Better Than 10 ms
- Accuracy of Absolute Time Must be Within 10 ns

RFI REQUIREMENT

- Design for Minimum Emission of RFI
- Some Choices Driven By This Requirement

MODULE INTERFACE BOARD (MIB)

- Interfaces Fieldbus To Module
- Must Be Small In Size
- Must Be As Simple As Possible
- Ability to Implement Some Control Tasks Pertaining to Module Being Controlled
- Must Implement the Fieldbus Protocol

MODULE INTERFACE BOARD (MIB)

- Must Implement Module Communication Protocols
- A MIB Is Not Specific To a Module – It Obtains its Software From The Module
- Must be Able to Send Monitor Data Periodically, or On Demand

TRANSITION REQUIREMENTS

- VLA and EVLA Monitor and Control Systems Must be Used Concurrently During EVLA Construction
- A Combination of Old and New Modules Must Be Supported During Construction
- Prohibit or At Least Minimize Use of VLA Modules in EVLA Antenna

OTHER REQUIREMENTS

- Telephone System – VOIP
- Antenna Control Unit (ACU) – Servo System
- Utility Module