A Proposed Green Bank Interferometer Control System

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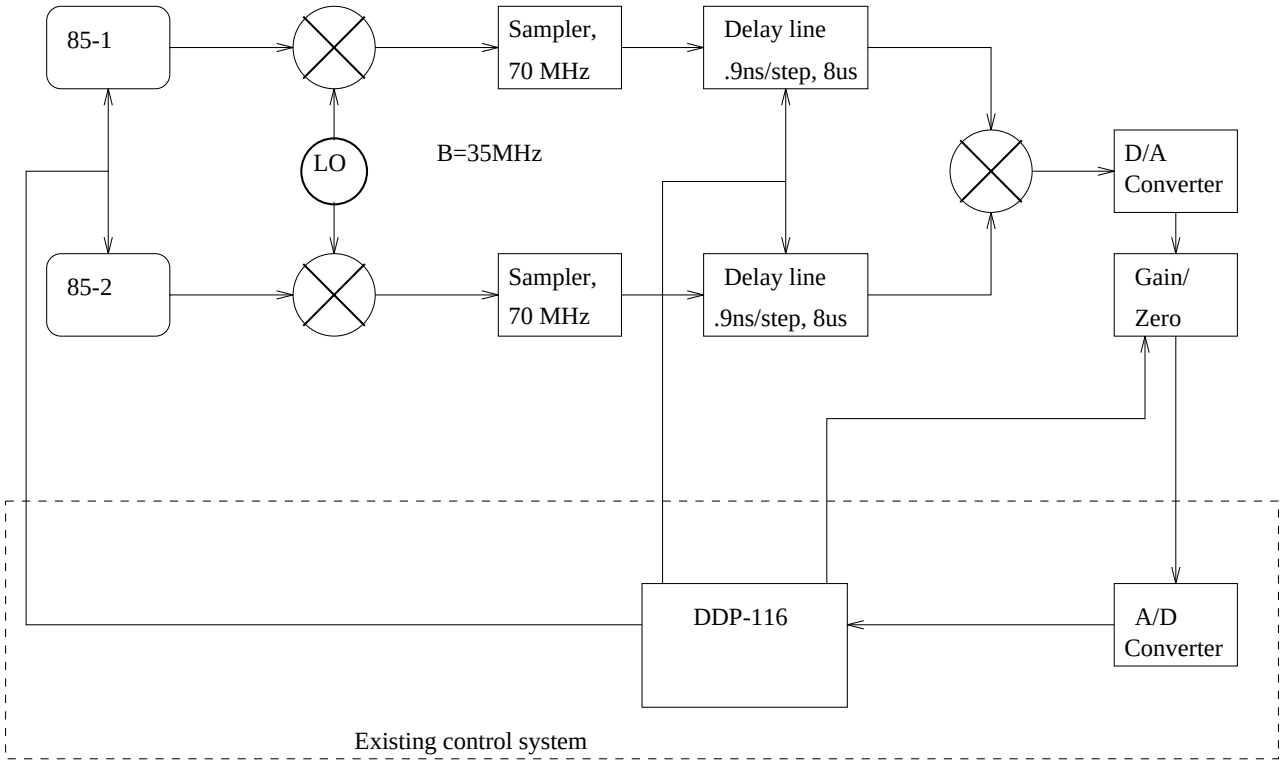
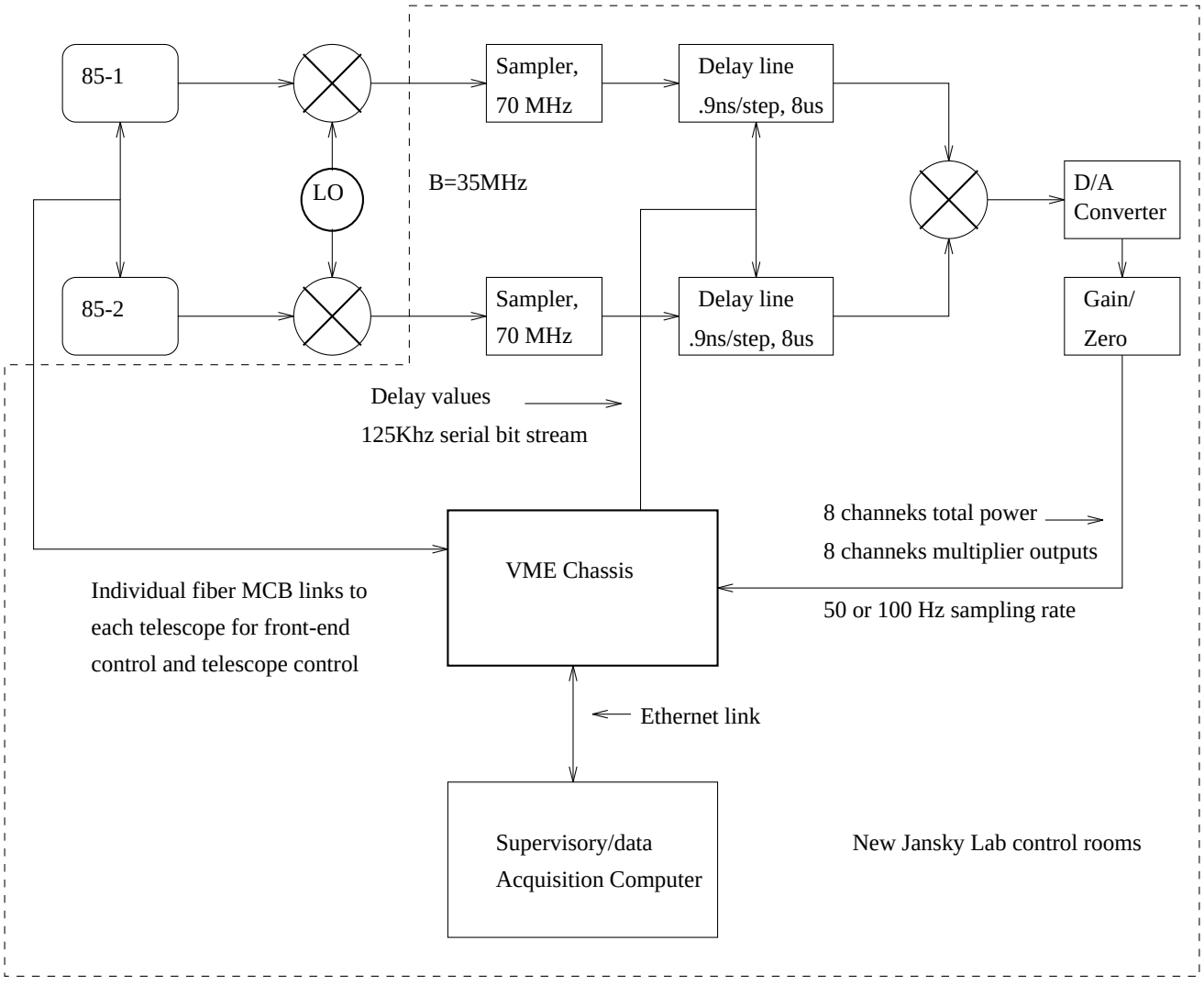
The GB Interferometer



Existing Telescope Hardware

- Polar mounted 85 ft. antennas
- Dual polarization S/X band Receivers
- Digital delay rack and multipliers
- DDP-116 Control Computer

New System Block Diagram



New Control System Hardware

- Control Computer
- Telescope Interfaces
- Digital Delay Interface
- A-D converter

Control Computer
12 slot VME chassis
BC-635 VME IRIG-B Decoder
VIP-616 IP Carrier
MVME-167 SBC

Telescope Interfaces

- Standard MCB interface
- Relay controls
- Fiber-optic emergency stop system

Digital delay line interface

- Off the Shelf IP modules
- Delays
- Gain control and zero

BSDO datasheet

IP480 datasheet

A/D Converter

- Off the Shelf IP module
- 16 differential channels at 16 bits
- Samples at intervals determined by on-board timer

IP330 datasheet

IP Carrier Board

- Carries 4 IP modules
- A32 or A16 Addressing
- Front panel or P2 I/O connections

VIP616 datasheet

Control Software General Principles

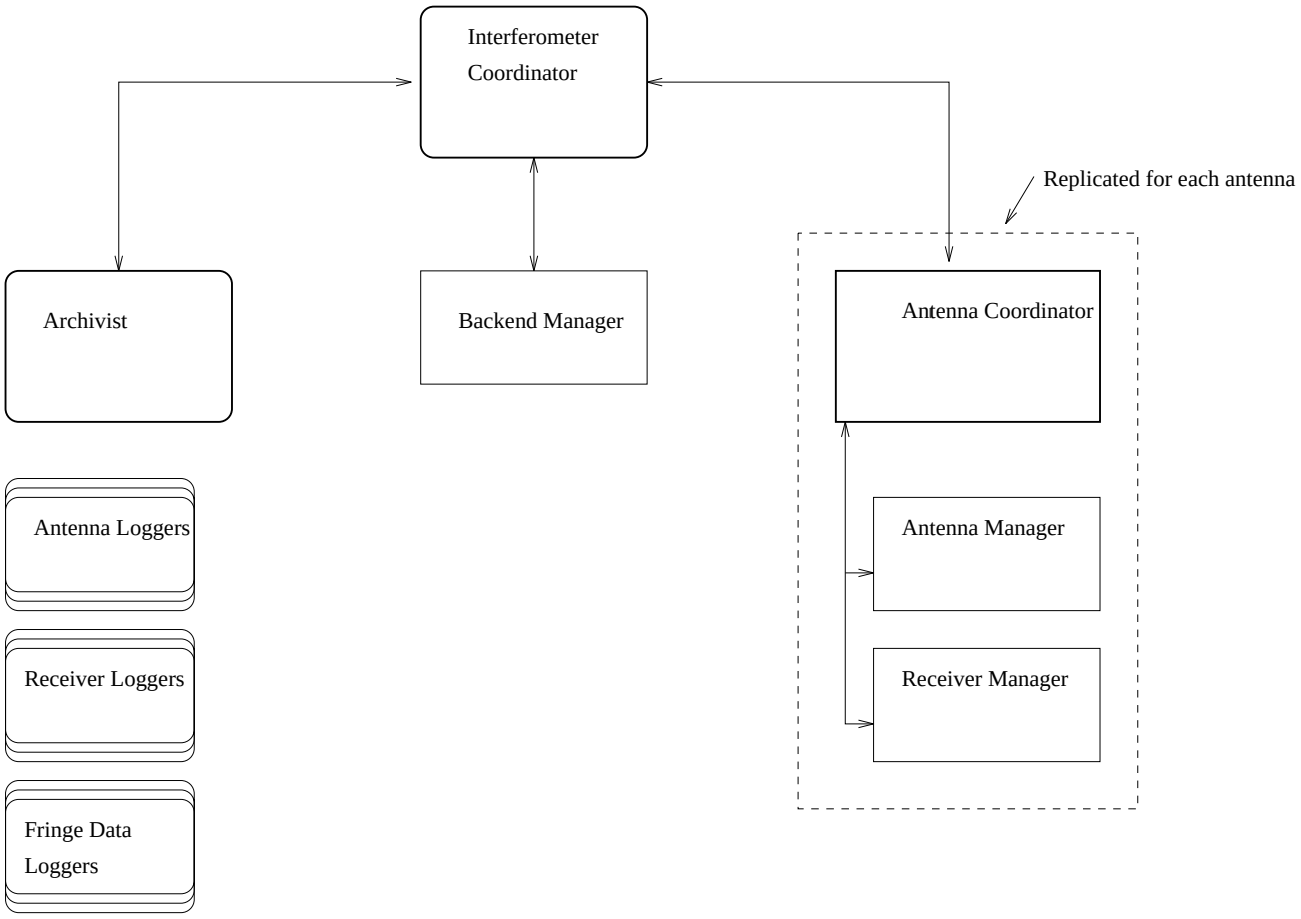
- Reconfigurable
- Resilient

Control Software modules

- Observing control
- Procedure control
- Time daemon
- Positions daemon
- Data acquisition and fringe Fitting
- Loggers
- Alarms

Ymir slide

Control Software



Device Managers

- Antenna Manager
- Receiver Manager
- Backend Manager

Coordinators

- Interferometer Coordinator
- Antenna Coordinator
- Archivist

Reused GBT software

- mcTime
- Message system
- Watchdog system
- TaskMaster system
- Monitor system
- Data logger system
- User interfaces
- Support libraries

Reused GBT software libraries, Part 1

ConfigIO handles reading and writing configuration files in a standard manner.

Control is the mother of all libraries. It contains the manager classes.

Coords handles coordinate transformations.

DataDesc is a library for accessing internal manager information.

DeviceAccess works with the above DataDesc library.

Reused GBT software libraries, Part 2

DynamicLoader is a library for loading shared objects at run-time.

FSM is a finite state machine library.

FitsIO encapsulates Pence's CFITSIO library to handle telescope data.

GServer is a Glish RPC server

IF provides support for calculating the frequency characteristics of an IF channel.

Reused GBT software libraries, Part 3

MCBInterface provides packaged classes for acessing words or parts of words on the MCB.

Matrix is a matrix math package.

MesgMuxIF is the interface to the system message multiplexer.

MesgProc contains all of the container classes for Messages.

Message implements the application or event-generating side of the Message system.

Reused GBT software libraries, Part 4

PVA is a base class to encapsulate Position / Velocity / Acceleration and duration.

RPC++ is a C++ Interface for remote procedure calls, including a system interface for the select system call.

Scan provides a framework for specification of arbitrarily complex movements of a mirror.

ScanSpec is used to sequence through XXXSegment lists, in real-time.

Sequencer flushes system defined vxWorks semaphores at their defined interval.

Reused GBT software libraries, Part 5

TaskLib implements vxWorks task management calls on Solaris

TimeKeeper is used by the coordinate transformation libraries to keep track of local time.

TimeStamp is a class for producing and manipulating Time reference tags or TimeStamps.

TimeStampUtl contains a routine to set the clock on a Unix machine.

util is a module with utility functions and classes for getting the environment, parsing text, etc.

Conclusion