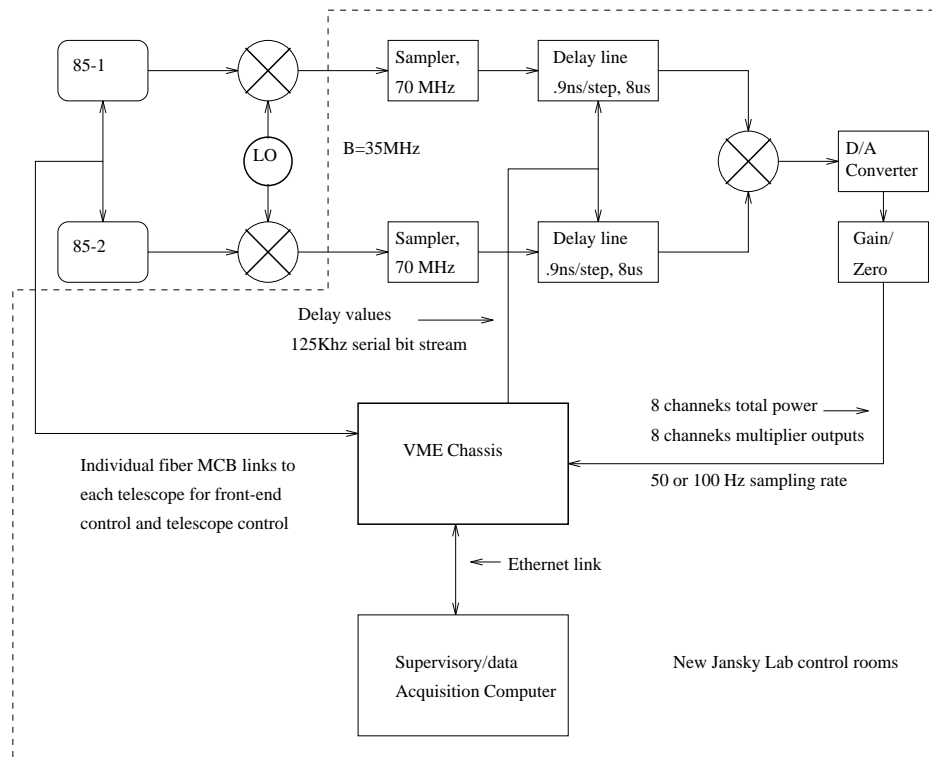


# **The Green Bank Interferometer Control System**

John Ford  
Frank Ghigo

# The new hardware interfaces



## **New Control System Hardware**

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

## **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

## **Analog interface**

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

## **Backend interface**

- Encapsulates the hardware interfaces into a class
- Allowed software and hardware to be developed separately

## **Software diagram**

## **Data Acquisition**

- Captures each sample in a buffer
- Accumulates an integration's worth of data
- Includes timeouts and error checking

## Use of the interface

- Set gains
- set timing
- go wait for the data

```
if( (gooddata = ATOD->getData( &databuf, idata)) != 0)
{  getDataMsg->check(1);
}
else          // here for good data from A2D
{  getDataMsg->check(0);
}
```

## **YGOR Software improvements and modifications**

- MonitorPoint class
- Configuration file driven DDL's

## MonitorPoint class

- Encapsulates all monitoring functions
- Keeps a count of out-of-range values and invokes messages after a predetermined number of bad readings.
- Knows how to read MCB registers for digital and analog data points
- *Configured from a configuration file*

## Config file for MonitorPoint

```
# Monitor Name Addr Min Max Level Reps Type Units Offset Scale
```

```
mp[0].Descr := "S-band LCP total power"  
mp[0].Name  := "TP_SL"  
mp[0].Addr  :=      0x08  
mp[0].Min   :=      0.  
mp[0].Max   :=      10.  
mp[0].Level :=      0  
mp[0].Reps  :=      1  
mp[0].Type  :=      "float"  
mp[0].Unit  :=      "Volts"  
mp[0].Offset :=      0.0  
mp[0].Scale :=      1.0
```

**more...**

```
mp[30].Descr := "Optical Receiver Level"  
mp[30].Name  := "OptRecvr"  
mp[30].Addr  :=      0x28  
mp[30].Level :=                0  
mp[30].Reps  :=                1  
mp[30].Type  :=                "Bool:1"  
mp[30].Unit  :=                "None"  
mp[30].ValString := "optr(low,norm)"
```

## Reused GBT software

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