

ALFA IF/LO System

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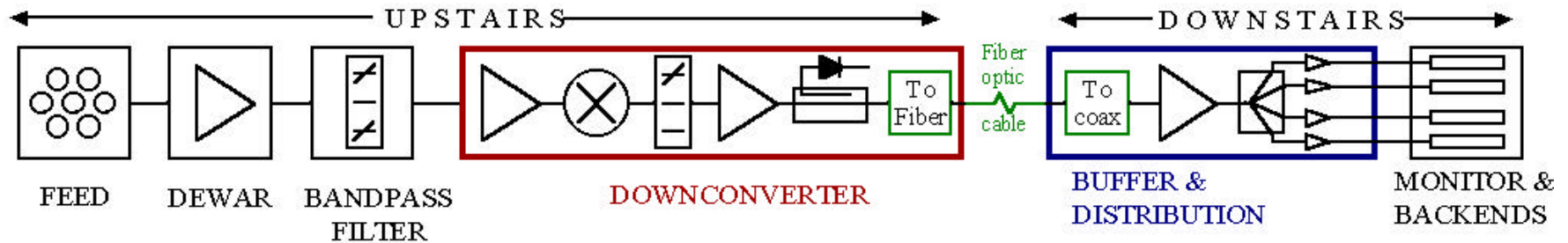
Electronics División



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ALFA Receiver System



Front End

- 7 element feed array
- corcal available
- 40 dB gain
- Bandpass filter module

Downconverter

- Single frequency downconversion
- RF: 1225-1525 MHz
- IF: 150-450 MHz
- Power monitor
- Fiber optic converter

Buffer & Distribution

- Divide signal to accommodate n backends simultaneously
- Goal: High isolation between backends and monitor



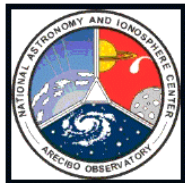
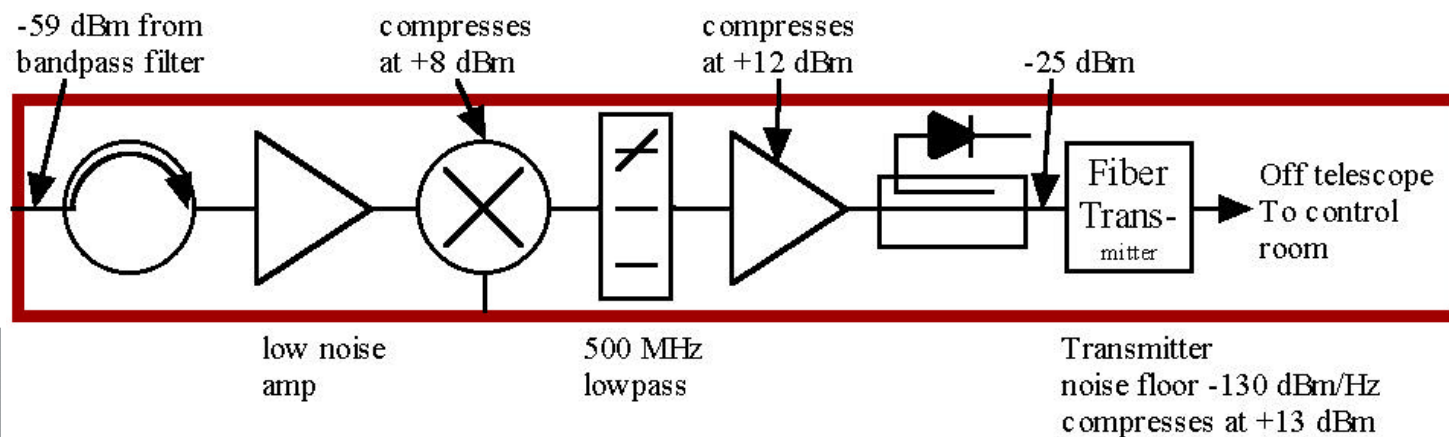
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Downconverter

upstairs, after dewar and bandpass filter module

- Single mixer conversion
- RF = 1225 to 1525 MHz, IF = 150-450 MHz
- LO either high-side: 1375+300 or low side: 1375-300
- 34 dB gain
- 58 dB dynamic range, limited by noise floor of fiber transmitter on low end (-45 dBm) and compression of fiber transmitter on high end (+13 dBm)



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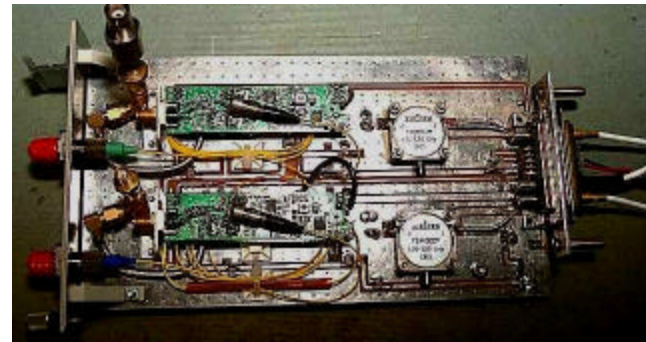
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More Downconverter Info

upstairs, after dewar and bandpass filter module

- Measured $T_{\text{eff}} = 750\text{K}$
(contributes $.075\text{K}$ to T_{sys})
- Anacom fiber optic transmitter: -130dBm/Hz noise floor (-43 dBm for 500 MHz)
- Fiber link is low-loss

- Small light-weight surface mount design



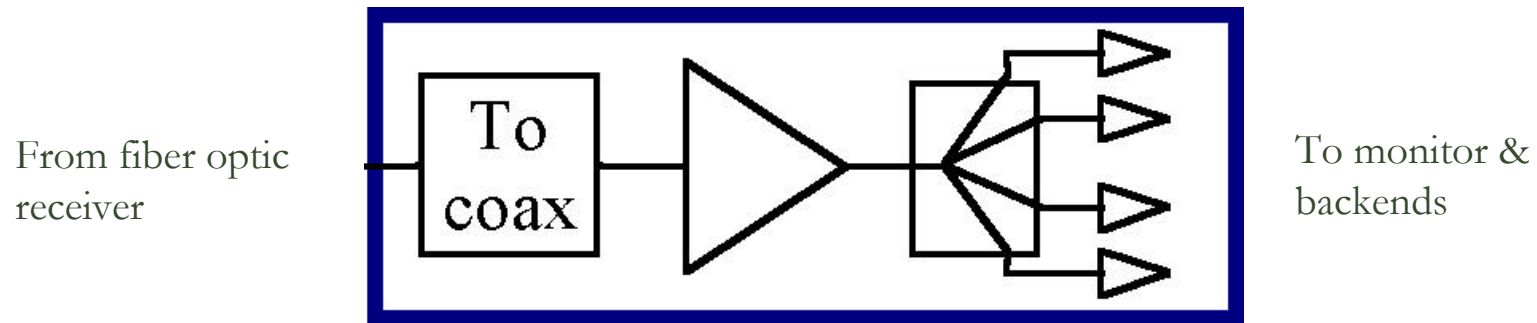
- Modular card cage



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Buffer + Distribution

Downstairs



- Receive signals from fiber optic cable, put on coax
- Provide enough buffering to isolate backends
- Provide distribution network for backends
- Monitoring: one path dedicated to monitoring

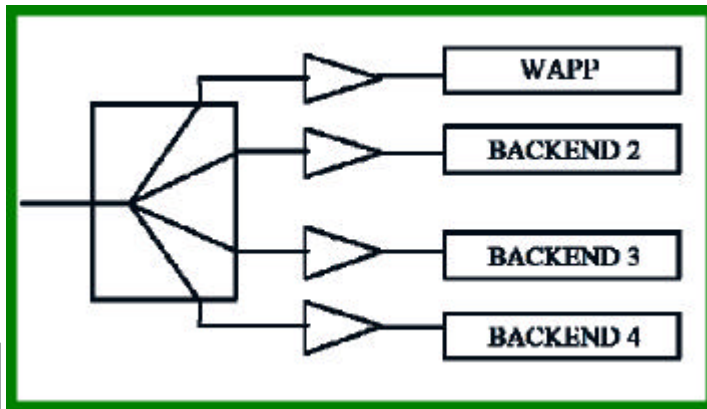


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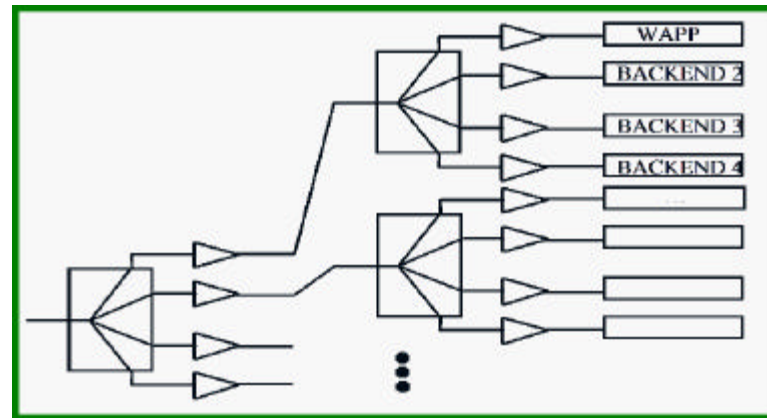
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More on Buffer + Distribution

- Divide signal to accommodate n backends ... how many?
 - WAPP is the dedicated backend
 - Others: Pulsar, Extragalactic, Galactic, SETI
- Monitor
 - 14 IFs brought out to control room
 - Slow sample (fixed tau) and record for debugging/
problem solving



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Acknowledgements

- Bill Sisk
- Ganesh
- Dudes in receiver section



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