

MMA Correlator Facts

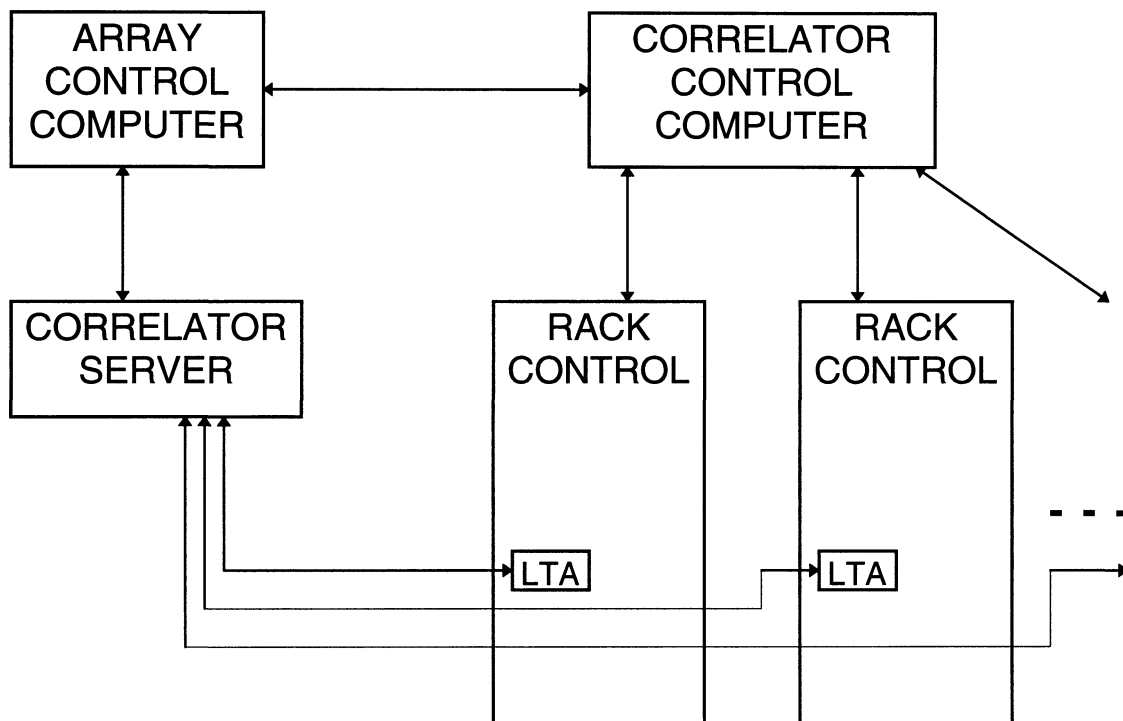
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In the architecture proposed for the MMA Correlator in Ray Escoffier's memo 166, there are some features which may not be evident at first reading:

1. The proposed architecture provides all polarization products in a manner which minimizes the number of cables and interconnections. The overall architecture is I.F. oriented rather than antenna oriented.
2. A single correlator card (of which there are 128 in the system) processes 1/32 of a single I.F. band for all 40 antennas and provides all cross-products for that fraction of the data.
3. It takes 32 cards (2 racks) to process a single I.F. pair (1 frequency, 2 polarizations), regardless of the number of antennas which are actually connected. If fewer than 40 antennas are connected, then some of the chips on the cards are doing nothing.
4. The minimum useful build is $\frac{1}{4}$ of the entire correlator. If you need 2 I.F. pairs simultaneously, then you need $\frac{1}{2}$ of the entire correlator. For the 4-antenna test array, the correlator (ultimately to become the VLA correlator) might use partially-populated cards or else a variant design might be needed (extra expense).
5. Control and data flow have not been worked out in detail. Requirements depend on whether the outputs of the Long-Term Accumulators are to be processed locally within the correlator racks (FFT's, calibrations, *etc.*) or shipped to a huge computer which will do all those things, providing more flexibility but needing a lot of computing power. In either case, there is a lot of data to be transferred and something like a single Ethernet connection is inadequate.

MMA Correlator Control



OUTLINE OF THE MMA PROJECT SCHEDULE
May 1997

ACC = Array Control Computer

OSF = Operations Support Facility (in San Pedro de Atacama)

1997

June Planning begins (receiver, software, LO, etc)

Oct Prototype Antenna RFP issued

1998

Jan Begin Antenna Contract

Jan Adopt Correlator Development Plan including software

Apr Site soil testing

June Select Project A/E

Oct Approval of Contractor's antenna design

1999

Jan Site use agreement with CONICYT

Jan OSF Site Agreement with Region II/Bienes Nacionales

June Deliver Antenna #1

June Deliver Prototype Rx #1

June Draft of final MMA Costing

Aug Antenna #1 testing begins

Aug External Review of MMA Costing

Oct Final MMA Costing

2000

Jan 2-station Interim Correlator to Test Array

Jan ACC software coding begins

Jan Deliver Antenna #2

Jan Deliver Prototype Rx #2 (real MMA prototype)

Apr First fringes on test array

Apr Retrofit Prototype Rx#1 with real MMA prototype

June Begin Correlator hardware construction

Oct Start MMA Phase II (Construction)

Dec Final Antenna RFP

2001

Jan OSF Construction

Jan Site Construction civil works begins

Feb Approval of final Antenna Contract

Oct Antennas 3,4 to Test Array

2002

? Antennas 5-12 to Chile Site

Dec Correlator capability in Chile

2003

- ? Antennas 13-20 to Chile
- ? Test observations

2004

- ? Antennas 21-28 to Chile

2005

- ? Antennas 29-36 to Chile

2006

- ? Antennas 37-41 to Chile
- ? Antennas 1-4 from test array to Chile