cc: ACY, WGW, MWS, + Computer Group

AT/25.1.1/043

Control information

mjk, 14 March 1987

I attempt to collate here the control information needed to run the CA. I have attempted to account for all the control points known to us; some additional items I invented. Additions/deletions are expected and solicited.

Most of the traffic must pass through OBS.

At the start of each scan :

Required by the Correlator

bandwidth:	Observer's choice
number of sampling bits:	set by the bandwidth.
number of baselines :	This is set by the resources available.
number of products per baseline:	specified by the observer, but constrained by resources - the number of correlator products.
integration interval :	specified by the observer. 5 seconds by default.

Items that the ACC will need

PCC : antenna position	set by the observer. (The observer asks for RA, Dec once/scan; the ACC will then update AZ & EL at 15 Hz.) If the observing mode is "Mosaicing", then a new position will be sent every integration.
subreflector	set by the frequency? Set by Zenith angle? (ie. reset each integration?)
turret: its position.	set by the observer's choice of frequency.
LO : actual frequencies	set by the observer's choice of frequency and velocity offset. The ephemeris routine may add an LSR component. If the observing mode is "frequency switching", then the frequencies will be sent every integration.
sampler : number of bits	set by the choice of bandwidth.
receiver : solar attenuator	??

transfer switch — settable by OPER, perhaps, for debugging purposes. If used, we need to reset the IF assignments at the correlator, to keep the stokes parameters computations honest.

first receiver select switch — defined by the observer's frequency choice.
second receiver select switch

IF filter(s) — set by the bandwidth chosen.

bias control

Some items which may be altered for debugging purposes. It may be advisable to reset them every scan just to be safe.

LO: comb stabilisation

Rx: noise source
phase switch
x-head control
vac pump interlock

Each integration :

For the correlator :

start time
stop time

in general, these are set by the sampler synchronising cycle.

FIFO count (one for each IF)

For the ACC:

Start and Stop times. - need to fire up the event generators for the receivers, the samplers and the LOs.

LO : fringe rotators $\phi_0, \frac{d\phi}{dt}, \frac{d^2\phi}{dt^2}$

(In addition to the geometrical contribution to ϕ_0 we will add the LO stabilisation, the IF relative phase - half the phase difference found by the "polarisation noise source" - as well as the relative IF phase - that phase needed to "tie" the array).

A check sum for the phase rotator may be embedded in the 8 control bytes sent to the fringe rotator.

Samplers : phase rates : $\phi_0, \frac{d\phi}{dt}, \frac{d^2\phi}{dt^2}$

sampler synchronising window

coarse level control and ref. levels. These are internal to the ACC, which will read the counters associated with the samplers, in order to derive the levels.

Sampler synch cycle: the accumulator "pre-load" value.

Frequencies, if "Frequency switching"

RA, DEC if "Mosaicing"