

INTEGRATION AND CYCLE TIMES IN THE AT

As a consequence of the system we plan to use for synchronising data from the various CA antennas (AT / 20.1.1 / 027) arbitrary integration times will no longer be possible.

Sampler clock and synchronisation cycle time.

A basic 5 second cycle will be adopted for updating the phase shifters associated with the LOs and sampler clocks. Thus at the end of each 5 second interval data taking will cease for 8m sec while these phase shifters are reset. At the end of this period new synchronising pulses will be transmitted on the digitized IF data streams. These pulses will be used to align data streams at the correlator.

Integration times

An integration time is the time for which correlation data is accumulated before being output to optical disc. It may be an integral multiple or submultiple of 5 seconds. (ie. several cycles can be accumulated into one integration or many integrations can be recorded in one cycle time.)

Bandwidth Synthesis

During bandwidth synthesis the frequency must remain constant for an integral number of cycles.

Monitor Accumulation Times

Monitor information such as sample statistics, T_{sys} , LO round trip phase, XY switched correlator phase etc should normally be accumulated for a whole cycle. Where this monitor information is needed immediately for control purposes it should be accumulated for approximately 4 seconds and then transmitted for implementation in the dead time before the next cycle.

The exception is for bandwidth synthesis where separate accumulations must be made at each frequency. The implementation of the resulting control information is then held over until the dead time between cycles after which that frequency is again to be used. Linear extrapolation may be appropriate if the time between accumulation of monitor information and implementation of the control is too long.

For integration times less than 5 seconds, no frequency switching is involved, and the same monitor information will apply for all integrations in a given 5 second cycle.

For integration times longer than 5 seconds processing will be done separately in the correlator control computer for data from each 5 second cycle. Processed data from several cycles may then be summed before recording to optical disc.

Graham J Nelson
24 September, 1986