

Subject: Re: FW: Correlator time base changes

Date: Mon, 31 Jan 2000 10:01:54 -0500 (EST)

From: Al Wootten <awootten@NRAO.EDU>

To: "Brian Glendenning" <bglenden@ioc.nrao.edu>

CC: cbroadwe@polaris.cv.nrao.edu, jpisano@polaris.cv.nrao.edu, ldaddari@polaris.cv.nrao.edu, rheald@polaris.cv.nrao.edu, fstauffe@polaris.cv.nrao.edu

> >From: Jim Pisano [<mailto:jpisano@cv3.cv.nrao.edu>]

> >Sent: Friday, January 28, 2000 6:34 PM

> >To: Ron Heald; Fritz Stauffer; Brian Glendenning

> >Subject: Correlator time base changes

> >

> >

> >Chuck asked Larry about changing the correlator time base to something

> >other than 16 ms.

The 16msec came from the science requirement given in:

<http://www.mna.nrao.edu/library/whitepapers/corr/ruopen/index.html>

the Correlator White Paper, which suggests 16msec for a 12m antenna, so that large regions of sky may be mapped efficiently. As the time increases from 16msec, this becomes less easy. 48 or 50msec would produce an uncomfortable cost in efficiency.

Al

Subject: Re: FW: Correlator time base changes

Date: Mon, 31 Jan 2000 08:21:56 -0700 (MST)

From: "Larry D'Addario" <ldaddari@tuc.nrao.edu>

To: Al Wootten <awootten@nrao.edu>

CC: "Brian Glendenning" <bglenden@aac.nrao.edu>, cbroadwe@polaris.cv.nrao.edu, jpisano@polaris.cv.nrao.edu, ldaddari@polaris.cv.nrao.edu, rheald@polaris.cv.nrao.edu, fstauffe@polaris.cv.nrao.edu

Al,

You seem to have misunderstood. There has been no suggestion of increasing the correlator's minimum integration time, which is what was covered in the Rupen memo. The question was merely about how this integration time is synchronized with timing in the rest of the array, including the interaction of the correlator's control computer (CCC) with the array master control (ACC). I suggested that the latter be confined to 400 msec intervals. All this means is that a command from the ACC to the CCC might have to describe 25 integrations at a time.

Nevertheless, you should realize that insistence on 16 msec integrations will probably force you to give up some accuracy or dynamic range in interferometer mode due to the inability to complete a phase switching cycle.

--Larry

Subject: RE: FW: Correlator time base changes

Date: Mon, 31 Jan 2000 11:52:28 -0700

From: "Brian Glendenning" <bglenden@cv3.cv.nrao.edu>

To: "Larry D'Addario" <ldaddari@tuc.nrao.edu>, "Al Wootten" <awootten@cv3.cv.nrao.edu>

CC: "Brian Glendenning" <bglenden@zia.aoc.NRAO.EDU>, <cbroadwe@polaris.cv.nrao.edu>, <jpisano@polaris.cv.nrao.edu>, <ldaddari@polaris.cv.nrao.edu>, <rheald@polaris.cv.nrao.edu>, <fstauffe@polaris.cv.nrao.edu>

Is the implication that the correlator mode could only be changed every 400ms? If so, is that a problem for anyone?

Cheers,
Brian

Subject: RE: FW: Correlator time base changes

Date: Mon, 31 Jan 2000 14:26:44 -0700 (MST)

From: "Larry D'Addario" <ldaddari@tuc.nrao.edu>

To: "Brian Glendenning" <bglenden@cv3.cv.nrao.edu>

CC: "Larry D'Addario" <ldaddari@tuc.nrao.edu>, "Al Wootten" <awootten@cv3.cv.nrao.edu>, "Brian Glendenning" <bglenden@zia.aoc.nrao.edu>, <cbroadwe@polaris.cv.nrao.edu>, <jpisano@polaris.cv.nrao.edu>, <ldaddari@polaris.cv.nrao.edu>, <rheald@polaris.cv.nrao.edu>, <fstauffe@polaris.cv.nrao.edu>

Brian Glendenning writes:

> *Is the implication that the correlator mode could only be changed every*
> *400ms?*

Not exactly, but it depends a bit on what you mean by a "mode."
Commands should be effective only on the 400 ms boundaries, but one command could specify that the correlator makes internal changes at several different times (perhaps every 16 msec) prior to the next 400 ms boundary. The trouble is that any such "mode switch" within the correlator cannot readily be synchronized with the rest of the system, which finds it easiest to make its switches on 50 ms boundaries. They will not have a timing event in common until the next 400 ms boundary, even though each can make switches more often. So each makes life inconvenient for the other if it switches at other times.

--Larry

Subject: Re: FW: Correlator time base changes

Date: Mon, 31 Jan 2000 15:52:04 -0700 (MST)

From: "Larry D'Addario" <ldaddari@tuc.nrao.edu>

To: Fritz Stauffer <fstauffe@aoc.nrao.edu>

CC: "Larry D'Addario" <ldaddari@tuc.nrao.edu>, "Al Wootten" <awootten@cv3.cv.nrao.edu>, "Brian Glendenning" <bglenden@zia.aoc.nrao.edu>, <cbroadwe@polaris.cv.nrao.edu>, <jpisano@polaris.cv.nrao.edu>, <ldaddari@polaris.cv.nrao.edu>, <rheald@polaris.cv.nrao.edu>, <fstauffe@polaris.cv.nrao.edu>

Fritz Stauffer writes:

>
> *The 400 milliseconds forces a large time granularity. Things*
> *happen on the order of 400 ms. Small time granularity allows the*
> *system to be programmed with an asynchronous model. If a time*
> *tick is missed, the impact is not large. The large time*
> *granularity forces a strictly synchronous model with careful*
> *attention to pre-processing and setup before the next tick.*
> *I don't like this constraint. It forces a software model to accomodate*
> *a fundamental hardware feature.*
>
> *From the software point of view, it is a decision between forcing a*
> *software model and a hardware settable parameter.*

Fritz,

This makes no sense at all to me. You seem to be saying that having to deal with the correlator less often makes the software timing constraints tighter, which would be strange indeed. Don't even think about a software design that in which a "tick is missed." Such a thing should never happen. Everything from the ACC downwards must be "hard" real time, with all deadlines always met. Having a deadline every 400 ms must certainly be easier than having one every 50 ms or 16 ms or 1 ms.

BTW, I couldn't care less about software "models." The performance of the real software is what matters!

--Larry