

From kouba@geod.nrcan.gc.ca Thu Oct 29 06:54:34 EST 1998  
 Received: from macs.geod.nrcan.gc.ca (kouba@macs.geod.nrcan.gc.ca [132.156.28.2])  
 by maia.usno.navy.mil (8.8.6 (PHNE\_14041)/8.8.6) with SMTP id GAA05407  
 for ; Thu, 29 Oct 1998 06:54:33 -0500 (EST)  
 Message-Id: <199810291154.GAA05407@maia.usno.navy.mil>  
 Received: by macs.geod.nrcan.gc.ca  
 (1.38.193.4/16.2) id AA10465; Thu, 29 Oct 1998 11:52:41 GMT  
 From: Jan Kouba  
 Subject: Satellite Antenna Offsets, etc.  
 To: bock@pgga.ucsd.edu (Dr. Y. Bock), gend@gfz-potsdam.de (Dr. G. Gendt),  
 gerry@mozart.grdl.noaa.gov (Dr. Gerry Mader),  
 jdow@esoc.esa.de (Dr. J. Dow),  
 rothacher@aiub.unibe.ch (Dr. M. Rothacher),  
 mbh@cobra.jpl.nasa.gov (M.B. Heflin),  
 pierre@geod.emr.ca (Pierre Tetreault),  
 pfang@pgga.ucsd.edu (Dr. Peng Fang),  
 mark@tony.grdl.noaa.gov (Dr. M.S. Schenewerk),  
 tmur@esoc.esa.de (J.T. Martin Mur),  
 springer@aiub.unibe.ch (Dr. T. Springer),  
 jimr@Maia.usno.navy.mil (Dr. Jim Ray),  
 mmw@cobra.jpl.nasa.gov (Dr. M.M. Watkins),  
 jrr@clem.usno.navy.mil (Jim Rhode), matthijs@lox.ucsd.edu (matthijs)  
 Date: Thu, 29 Oct 1998 11:52:41 +0000 (UTC)  
 Cc: beutler@aiub.unibe.ch (Prof. G. Beutler)  
 X-Mailer: ELM [version 2.4 PL24alpha3]  
 Mime-Version: 1.0  
 Content-Type: text/plain; charset=ISO-8859-1  
 Content-Transfer-Encoding: 8bit  
 Status: RO

Dear AC colleagues,

However, the main reason, why we're writing to you today is to seek and suggest a consensus on the SATELLITE ANTENNA OFFSETS, (recall this is one of the agenda item ("Action 1.B" to be specific) of the "IGS Clock Analysis Plan" distributed recently by Jim Ray of USNO). If our recollection is correct we, after extensive discussions over the summer months, agreed to a principle that ACs in their analyses should be free to use any satellite offsets they prefer, but their clock solutions submitted to IGS must be consistent with the "conventional" (agreed upon) IGS satellite antenna offsets. We've also agreed that for the time being, since there are conflicting offset information / solutions for PRN13, the best value for PRN13 (Block IIR) offset would be 0 for all coordinates. So the remaining issue is to choose the conventional antenna offsets for the remaining Block II satellites (The Block II and IIA are assumed to be the same). For your information and convenience, below we've compiled the list of antenna offsets used by each of the 7 ACs. The list was compiled from the ACN AC summary files currently available at the IGS CB (BTW, some of the ACN files are rather old, one of them dates from Feb. 1995! Perhaps a new year resolution to update the ACN file might be a good idea for some of ACs!):

COD	Block II	.2794	0.	1.0259 m
	Block IIR	.0	0.	1.2053 m
EMR	Block II	.279	0.	1.0229 m
ESA	Block II	.279	0.	1.026 m
GFZ	Block II	.2794	0.	1.0229 m
JPL	Block II	.2794	0.	0.9529 m
NGS	Block II	.2790	0.	1.0230 m (Note: BRD clocks)
SIO	Block II	.2794	0.	0.9519 m (Note: no clock sol.)
	Block IIR	-.0031	-.0012	0.0000 m ( " " )

As you can see for Block II's most ACs use the the value of about 1.02 m, differing only by

a few mm with the exception of JPL and SIO who use about .95m. Though the difference of about 7 cm (about 0.23 ns) on all satellites is hardly of any significance as it can be fully absorbed into the corresponding station reference clock error. However, for the sake of consistency and perhaps in view of the future local clock calibrations, we feel we should agree upon and use (for AC clock solution submissions), a common Block II antenna offset. Based on the above table, and the fact that the old IERS Standards (1992) gave the z value of 1.0229 (p. 9) and no GPS offset values are given in the 1996 IERS conventions, we would like to suggest that 1.023m is adopted as the conventional value for the Block II's. So, in summary we would like to suggest the following set of Block II and Block IIR values be adopted as the conventional values for all AC clock solution reporting and submissions:

Block II & IIa dx=0.279m dy=0.000m and dz=1.023m  
Block IIR dx=0.000m dy=0.000m and dz=0.000m

If you agree, we should adopt it as soon as possible. However, for the sake of consistency, it should be adopted at the same time and for both Final and Rapid clock solutions! Otherwise we could develop problems for PRN13 clock combinations. We suggest, if you agree, to start it again for the week starting on Nov. 29, (GPS Wk 986), the date already suggested for the new (16:00h) rapid submissions. Also ACs could, for the sake of completeness and to publicize the newly adopted satellite offset values, include them in the clock file headers (e.g. in the comment lines). If you have better suggestions how to and where to include the above adopted offset values and how to make them public, (in addition to IGS Mail) please let us know.

As indicated before, we'd also like to encourage you to start, ASAP, submitting your Final station and satellite clock solutions, at 15 min intervals, in the new format and both included in single file (this is another action item (1.C) of the above mentioned clock plan!). Note that the satellite clock solutions should be included in both the sp3 as well as in the new clock file (in the new clock format).

As a minimum, as suggested in the above mentioned plan, ACs should include station clock solutions for as many stations as possible of the 22 Primary Fiducial Clock Stations listed below (all equipped with H masers):

ALGO, DRAO, FAIR, FORT, GODE, GOL2, HOB2, IRKT, KOKB, MAD2,  
MATE, NLIB, NYAL, ONSA, PIE1, TID2, WES2, WTZR, YELL,  
BRUS, NRC1, USNO.

ACs are also encouraged to include (or consider including) the following "secondary fiducial clock" stations;

HRAO, MDVO, MEDI, METS, MKEA, NOTO (H masers)  
GRAZ, MAS1, MD01, TSKB, VILL, YAR1 (Cs')

As mentioned in the plan, we hope to develop the station clock combination early the next year (by Feb. 99), and also after that we should address the Rapid clock solution submissions/combinations. In any case, in order to get ready, as well as to provide individual AC station clock solutions to the timing pilot project, it is important that we start submitting the new station clock solutions (in the new clock format) ASAP.

At the end, we again, would like to thank you for your super effort and support,

with many greetings

Jan & Tim

cc. Prof. G. Beutler

--

Jan Kouba  
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Ottawa, Ontario, Canada  
Internet: kouba@geod.emr.ca

From kouba@geod.nrcan.gc.ca Tue Nov 10 03:31:24 EST 1998  
Received: from macs.geod.nrcan.gc.ca (kouba@macs.geod.nrcan.gc.ca [132.156.28.2])  
by maia.usno.navy.mil (8.8.6 (PHNE\_14041)/8.8.6) with SMTP id DAA18389  
for ; Tue, 10 Nov 1998 03:31:23 -0500 (EST)  
Message-Id: <199811100831.DAA18389@maia.usno.navy.mil>  
Received: by macs.geod.nrcan.gc.ca  
(1.38.193.4/16.2) id AA28388; Tue, 10 Nov 1998 08:30:16 GMT

From: Jan Kouba  
Subject: Re: Satellite Antenna Offsets, etc. (fwd)  
To: bock@pgga.ucsd.edu (Dr. Y. Bock), gend@gfz-potsdam.de (Dr. G. Gendt),  
gerry@mozart.grdl.noaa.gov (Dr. Gerry Mader),  
jdow@esoc.esa.de (Dr. J. Dow),  
rothacher@aiub.unibe.ch (Dr. M. Rothacher),  
mbh@cobra.jpl.nasa.gov (M.B. Heflin),  
pierre@geod.emr.ca (Pierre Tetreault),  
pfang@pgga.ucsd.edu (Dr. Peng Fang),  
mark@tony.grdl.noaa.gov (Dr. M.S. Schenewerk),  
tmur@esoc.esa.de (J.T. Martin Mur),  
springer@aiub.unibe.ch (Dr. T. Springer),  
jimr@Maia.usno.navy.mil (Dr. Jim Ray),  
mmw@cobra.jpl.nasa.gov (Dr. M.M. Watkins),  
jrr@clem.usno.navy.mil (Jim Rhode), matthijs@lox.ucsd.edu (matthijs)

Date: Tue, 10 Nov 1998 08:30:16 +0000 (UTC)  
Cc: noll@cddis.gsfc.nasa.gov (Carey Noll)  
X-Mailer: ELM [version 2.4 PL24alpha3]  
Mime-Version: 1.0  
Content-Type: text/plain; charset=ISO-8859-1  
Content-Transfer-Encoding: 8bit  
Status: RO

Forwarded message:

>From kouba Mon Nov 9 12:14:25 1998  
Subject: Re: Satellite Antenna Offsets, etc.  
To: gend@gfz-potsdam.de (Gerd Gendt)  
Date: Mon, 9 Nov 1998 12:14:25 +0000 (UTC)  
In-Reply-To: <199811021212.NAA10502@mehl.gfz-potsdam.de> from "Gerd Gendt" at Nov 2, 98 01:12:17 pm  
X-Mailer: ELM [version 2.4 PL24alpha3]  
MIME-Version: 1.0  
Content-Type: text/plain; charset=ISO-8859-1  
Content-Transfer-Encoding: 8bit  
Content-Length: 3579

Dear Gerd,

The 5 min sampling is fine, we'll skip the unwanted epochs in the combinations as long as we can get the 15 min intervals. Please start submitting as soon as possible, as you recall, according the new clock format convention, this new sat/station clock file should be named CCCWWWD.CLK, I'll write to Carey Noll to warn her about these new clock files form ACs.

Regarding some standardization in the sp3 header comments for the inclusion of the sat offset used for clocks (BTW the same comment line should be pu into the CCCWWWD.CLK file as well) I would suggest to use one line (#22) and for that to use the last comment line (starting with /\*), i.e. the comment line which is followed by the epoch and the format proper with no comment lines). For the line we could use e.g.

```
/* SV ANT OFFSETS USED FOR CLOCKS: BLK II/IIA .279 .0 1.023m; BLK IIR .0 .0 .0m
```

Hope this is OK with all ACs, we've checked (with Tim) all AC sp3 and for most this line is not used.



by maia.usno.navy.mil (8.8.6 (PHNE\_14041)/8.8.6) with SMTP id MAA26501  
for ; Tue, 10 Nov 1998 12:03:42 -0500 (EST)  
Message-Id: <199811101703.MAA26501@maia.usno.navy.mil>  
Received: by macs.geod.nrcan.gc.ca  
(1.38.193.4/16.2) id AA07164; Tue, 10 Nov 1998 16:36:32 GMT

From: Jan Kouba  
Subject: Re: Satellite Antenna Offsets, etc. (fwd)  
To: mireault@macs.geod.nrcan.gc.ca (Yves Mireault)  
Date: Tue, 10 Nov 1998 16:36:31 +0000 (UTC)  
Cc: bock@pgga.ucsd.edu (Dr. Y. Bock), gend@gfz-potsdam.de (Dr. G. Gendt),  
gerry@mozart.grdl.noaa.gov (Dr. Gerry Mader),  
jdow@esoc.esa.de (Dr. J. Dow),  
rothacher@aiub.unibe.ch (Dr. M. Rothacher),  
mbh@cobra.jpl.nasa.gov (M.B. Heflin),  
pierre@geod.emr.ca (Pierre Tetreault),  
pfang@pgga.ucsd.edu (Dr. Peng Fang),  
mark@tony.grdl.noaa.gov (Dr. M.S. Schenewerk),  
tmur@esoc.esa.de (J.T. Martin Mur),  
springer@aiub.unibe.ch (Dr. T. Springer),  
jimr@Maia.usno.navy.mil (Dr. Jim Ray),  
mmw@cobra.jpl.nasa.gov (Dr. M.M. Watkins),  
jrr@clem.usno.navy.mil (Jim Rhode), matthijs@lox.ucsd.edu (matthijs)  
In-Reply-To: from "Yves Mireault" at Nov 10, 98 01:39:07 pm  
X-Mailer: ELM [version 2.4 PL24alpha3]  
Mime-Version: 1.0  
Content-Type: text/plain; charset=ISO-8859-1  
Content-Transfer-Encoding: 8bit  
Status: RO

Yves, you're absolutely right, it's only 60 chars!  
Here is our (Tim's & mine) 'counter' proposal, as we thought  
eating up 2 out of 4 comment lines is too much to ask:

```
/* CLK ANT Z-OFFSET(M): II/IIA 1.023; IIR 0.000
```

This is 47 chars in total and has the potential to 'grow', hope  
you like it. Sorry for not including you amongst ACs, it is a big  
mistake on my part!

Thanks for the help

Greetings  
Jan

PS Tim told me, again, but that he dislike AWK, I wonder why?  
Would you happen to know why?

```
>  
> > ...  
> > Regarding some standardization in the sp3 header comments for the inclusion  
> > of the sat offset used for clocks (BTW the same comment line should be  
> > pu into the CCCWWD.CLK file as well) I would suggest to use one  
> > line (#22) and for that to use the last comment line (starting with /*), i.e.  
> > the comment line which is followed by the epoch and the format proper  
> > with no comment lines). For the line we could use e.g.  
> >  
> > /* SV ANT OFFSETS USED FOR CLOCKS: BLK II/IIA .279 .0 1.023m; BLK IIR .0 .0 .0m  
> >  
> > Hope this is OK with all ACs, we've checked (with Tim) all AC sp3 and for  
> > most this line is not used.  
> >  
> > Please let me know if this is acceptable to you, and if so if I can  
> > forward this (including your original message) to all ACs for information  
> > and comments/actions.  
> >  
>  
> Tim,  
>  
> If you see this before Jan does, please tell him I just send him a copy as well  
> Thanks.  
>
```

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> Jan,
>
> I got your message via P. Tetreault. I have two comments:
>
> 1- Be aware that according to the SP3 format, lines 19-22 should be
>     columns 1-2   Symbols /*
>     column 3     Unused
>     column 4-60  Comments
>
>     So the comment you proposed is too long !
>
> /* SV ANT OFFSETS USED FOR CLOCKS: BLK II/IIA .279 .0 1.023m; BLK IIR .0 .0 .0m
>
>
> 2- Thinking about Unix (grep, cut, awk, etc.) it would be preferable to have
>     a LABEL followed by a SPACE between the LABEL and each offset.
>     For Example you could use the following (on 2 lines!) or something
>     similar.
>
> /* SV ANT OFFSETS (CLOCKS): BLK_II/IIA: .279 .0 1.023 m;
> /*                               BLK_IIR:   .0   .0   .0 m;
>
>
>
> --
> =====
> # Yves Mireault                /\           Geodetic Survey of Canada #
> # Internet: mireault@geod.emr.ca  \/\         Ottawa, Ontario, Canada #
> =====
>

```

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From tim.springer@aiub.unibe.ch Thu Nov 26 07:04:39 EST 1998
Received: from arwen.unibe.ch (arwen.unibe.ch [130.92.9.52])
        by maia.usno.navy.mil (8.8.6 (PHNE_14041)/8.8.6) with SMTP id HAA22525;
        Thu, 26 Nov 1998 07:04:26 -0500 (EST)
Resent-From: tim.springer@aiub.unibe.ch
Resent-Message-Id: <199811261204.HAA22525@maia.usno.navy.mil>
Received: from ubecx01 (actually ubecx01.unibe.ch) by arwen with smtpL;
        Thu, 26 Nov 1998 13:01:02 +0100
Received: from ubecx01.unibe.ch by ubecx01.unibe.ch (PMDF V5.1-10 #21734)
        id <OF3100H012RTP9@ubecx01.unibe.ch>;
        Thu, 26 Nov 1998 13:02:17 +0100 (MET)
Resent-date: Thu, 26 Nov 1998 13:02:17 +0100 (MET)
Date: Thu, 26 Nov 1998 13:02:17 +0100 (MET)
From: Tim Springer
Subject: Antenna Offset Change
Sender: tim.springer@aiub.unibe.ch
To: tim.springer@aiub.unibe.ch (Tim Springer),
    rothacher@aiub.unibe.ch (Markus Rothacher),
    schaer@aiub.unibe.ch (Stefan Schaer),
    daniel.ineichen@aiub.unibe.ch (Daniel Ineichen),
    cagarcia@esoc.esa.de (C. Garcia-Martinez),
    pbernedo@esoc.esa.de (Pelayo Bernedo), jdow@esoc.esa.de (J. Dow),
    gend@gfz-potsdam.de (G. Gend),
    gerry@mozart.grdl.noaa.gov (Gerry Mader),
    billk@ngs.noaa.gov (Bill Kass), pfang@pgga.ucsd.edu (P. Fang),
    bock@pgga.ucsd.edu (Y. Bock),
    matthijs@lox.ucsd.edu (Matthijs v Domselaar),
    pault@rses.anu.edu.au (Paul Tregoning),
    mmw@cobra.jpl.nasa.gov (Mike Watkins),
    yeb@cobra.jpl.nasa.gov (Yoaz E. Bar-Sever),

```

