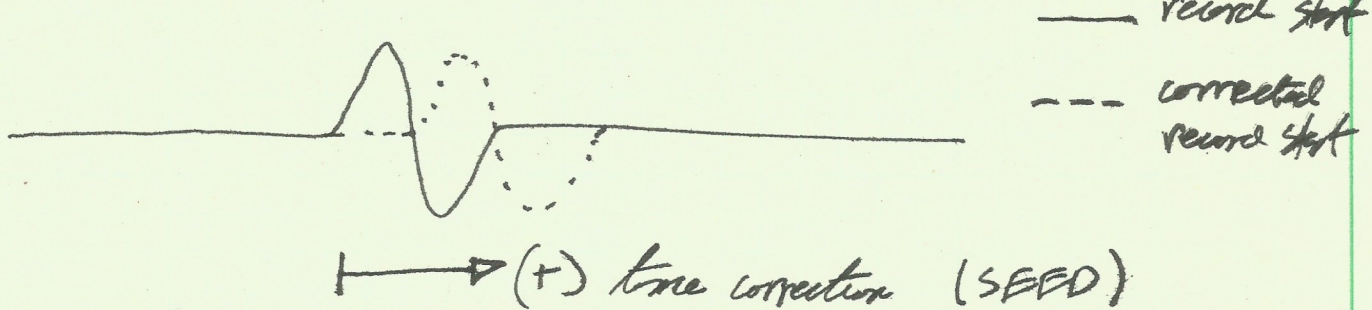
Time Correction & Time Delay, SEED

KEEP

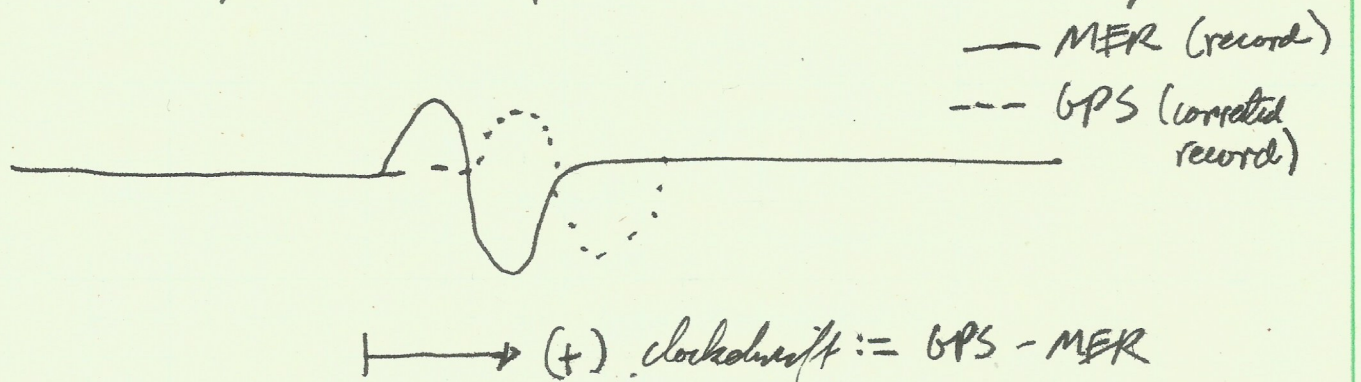
Definitions --

12-Jan-2021

FACT: a positive time correction in the MSEED advances record




Fact: a positive clockdrift correction advances record found




Fact: the sign of the SEED time correction & the MER/MSEED clockdrift correction is the same
48-byte fixed header

Fact: the sign of the SEED time correction (pg. 1009, note 16) is opposite the sign duration blockette [57] (pg. 77, nte 8)

Fact: unlike the opposite signs of the delay (advance in time) & time correction (go back in time) of the duration blockette, the clockdrift & its clockdrift correction measure time duration in the same duration $\Rightarrow$ (+) in time = advance for both (MER trying to "catch up" w/ GPS -- MER has not been delayed, yet)

(+) = advance in time for SEED header = advance in time for clockdrift correction = GPS ahead of MER time = MER negatively delayed wrt GPS.

12-Jan-2024

[1] $clockdrift = gps\text{-}time - mer\_time_u$

↖ uncorrected; time on board (aquisition)

[2] $mer\_time_c == gps\text{-}time$

↖ corrected; time on aquisition board ideally = gps

∴ $clockdrift = mer\_time_c - mer\_time_u$

$mer\_time_c = mer\_time_u + clockdrift$

↖ def correct_clockdrift()

(because ...

from [1] $clockdrift = gps\text{-}time - mer\_time_u$

from [2] $clockdrift = mer\_time_c - mer\_time_u$

$\Rightarrow clockdrift + mer\_time_u = mer\_time_c$

$\Rightarrow mer\_time_c = mer\_time_u + clockdrift$ )

This proves the addition (+) of clockdrift is the correct sign.

Examples & terminology:

ex1: $gps\text{-}time = 100$, $mer\_time_u = 87$ ← "negative time delay" (of $mer\_time_u$)

$clockdrift = +13$

POSITIVE clockdrift = uncorrected MERMAID time SLOW ~~EARLY~~ EARLIER w.r.t. GPS

ex2: $gps\text{-}time = 87$, $mer\_time = 100$ ← "positive time delay" (of $mer\_time_u$)

$clockdrift = -13$

NEGATIVE clockdrift = uncorrected MERMAID time FAST/LATER w.r.t. GPS