JUC Memo 6: File format for delay model output

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Rationale

The delay model output from CALC gives the delays for all scans for a given station, along with the name of the source. But the data for a given scan is terminated by a close-marker of a group of zeros, which means that to get to the next scan you need to read all the data for the previous scan. Also the header doesn't include the scan name, or which source it refers to – multiple sources are now possible.

For the Erlang control system we would very much like to be able to have something closer to random access, which can be achieved by simply stating the number of points in the header of each scan, so that it can be skipped. (We will still need to iterate over scans in this design, but that seems less likely to be a problem.)

Format

File header:

1*int_32 = header size

header_size*char = station name (zero-terminated string)

Scan header:

81*char = scan name (zero-terminated string, packed left with trailing spaces)

int_64 = number of sources

int_64 = index of following source

81*char = source name (zero-terminated string, packed left with trailing spaces)

int_64 = mjd of beginning of scan

double = second of day of beginning of scan

int_64 = number of delay points per second

int_64 = number of points in scan

Data block:

(number of points in scan)*2*double = pairs of second of day and delay value.

Notes

For each source in each scan the entire scan header is reproduced, followed by a datablock. The original intention was that the data block should not include time-stamps for the delays, but debugging changed my mind.