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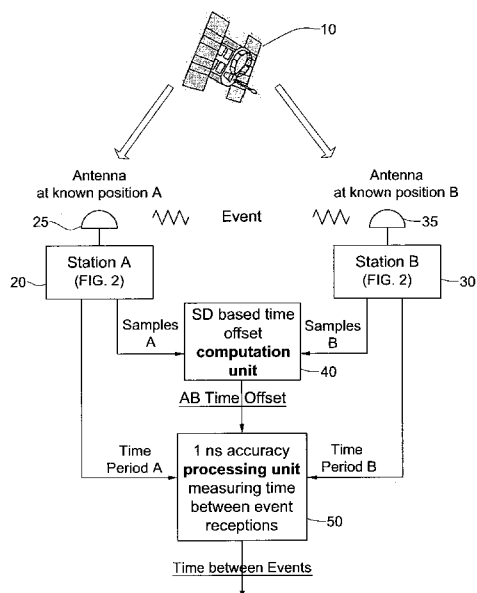
**(54) Title: RELATIVE TIME MEASUREMENT SYSTEM WITH NANOSECOND LEVEL ACCURACY**

FIG. 1

**(57) Abstract:** A system for instantaneous and continuous nanosecond-level accuracy determination of a relative time offset between at least two non-collocated timing units, the system comprising at least two non-collocated timing units located at known positions, each timing unit comprising a frequency source and a collocated receiver, each frequency source being disciplined at a frequency domain using a time source to generate corrections of the relative frequency drift between the frequency source and the time source so as to be limited by the following condition: the product of a duration of any time period extending between adjacent discrete points of time in a sequence of discrete points of time, multiplied by the sum of all frequency corrections effected during the time period and divided by a frequency value characterizing the frequency sources, is at least one order of magnitude less than the required accuracy, each receiver being synchronized by a synchronization signal supplied by the frequency source and being operative to receive an external signal stream defining a time-line and to derive therefrom a stream of pseudo-range sample and integrated Doppler sample pairs, to generate, for each individual pair in at least a subset of the pairs, a periodic pulse synchronized with the frequency source, thereby to define a periodic pulse corresponding to the individual pair and to output each individual pair in the subset, simultaneously with the individual pair's corresponding periodic pulse; and at least one time offset computation unit operative to use the timing units' known positions and at least one sample pair from each of the timing units in order to compute time offset between periodic pulses generated by the two timing units respectively, using a single difference technique.