

OPINION ITU-R 93*

USE OF COMMUNICATIONS SATELLITES FOR A SERVICE OF TWO-WAY
TIME AND FREQUENCY TRANSFER

(Question ITU-R 201/7)

(1995)

The ITU Radiocommunication Assembly,

considering

- a) that the two-way method of time and frequency (T/F) transfer using various geostationary communication satellites has been under investigation for a number of years;
- b) that a range of modems designed to support two-way T/F transfer is now available;
- c) that, recently, a large programme of T/F transfer has been actively pursued, both within Europe and between Europe and North America, by virtue of the free access provided for one year at 14/12 GHz and 14/11 GHz bands to INTELSAT 513 satellite positioned at 307 °E;
- d) that this programme has demonstrated that regular (i.e. three times per week) time transfer with instabilities at the level of 1 ns, or less, can be achieved;
- e) that these results have been obtained with PN sequences having a bandwidth of 3.5 MHz (at the -18 dB point), the signals being immersed in noise for the small (~2-3 m) antennas in use by the T/F transfer community;
- f) that coordination and extension of this existing programme is necessary if the two-way method is to be introduced on a regular basis as a constituent part of international timekeeping and, also, if it is to realize its full potential as a means of intercontinental frequency transfer;
- g) that there is a good prospect of reducing instabilities to the region of 100 ps, which would make possible frequency transfer in the vicinity of 10^{-15} for a one-day averaging time,

is of the opinion

1. that the appropriate measures should be taken by the international communication satellite operators with the aim of securing the channel capacity required for a programme of regular T/F transfer, preferably at minimum cost, based on the low transponder powers involved;
2. that, in consequence, the T/F community should adjust its operational procedures to take account of possible access to the transponders at times of low commercial activity and/or possible pre-emptive measures.

* This Opinion should be brought to the attention of Radiocommunication Study Groups 4 and 8.