18th MEETING OF THE
INFORMAL SOUTH PACIFIC AIR TRAFFIC SERVICES COORDINATING GROUP
(ISPACG/18)

North Atlantic (NAT) Timekeeping General Procedures

Importance of Accurate Time

It must be recognised that proper operation of a correctly functioning long range navigation system will ensure that the aircraft follows its cleared track. Air traffic control (ATC) applies at least the minimum standard separation between cleared tracks and thereby assures the safe **lateral** separation of aircraft. However, longitudinal separation between subsequent aircraft following the same track and between aircraft on intersecting tracks are assessed in terms of differences in estimated times of arrival (ETA) and actual time of arrival (ATA) at common waypoints. Aircraft clock errors which contribute to position report time errors can therefore lead to an erosion of actual longitudinal separation between aircraft. It is thus vitally important that prior to entry into the NAT Minimum Navigations Performance Specification (MNPS) airspace, the time reference system used during flight is accurately synchronised to coordinated universal time (UTC), and that the calculation of waypoint ETAs and the reporting of waypoint ATAs are based on this system. Many modern aircraft master clocks can only be reset while the aircraft is on the ground. Thus, the pre-flight procedures for any NAT MNPS flight **must include** a UTC time check and re-synchronisation of the aircraft master clock. Lists of acceptable time sources for this purpose have been promulgated by NAT air traffic service (ATS) providers.

The following are examples of acceptable time standards:

(1) Global positioning system (GPS) (corrected to UTC) - Available at all times to those crews who can access time via approved on-board GPS (TSO-C129) equipment.

(2) WWV - National Institute of Standards (NIST - Fort Collins, Colorado). WWV operates continually H24 on 2500, 5000, 10,000, 15,000 and 20,000 kHz (AM/SSB) and provides UTC (voice) once every minute.

(3) CHU - National Research Council (NRC - Ottawa, Canada) - CHU operates continually H24 on 3330, 7335 and 14,670 kHz (SSB) and provides UTC (voice) once every minute (English even minutes, French odd minutes).

(4) BBC - British Broadcasting Corporation (United Kingdom). The BBC transmits on a number of domestic and world-wide frequencies and transmits the Greenwich time signal (referenced to UTC) once every hour on most frequencies, although there are some exceptions.

Further details of these and other acceptable time references can be found in aeronautical information publications of the NAT ATS Provider States. In general, any other source of UTC that can be shown to the State of the Operator or the State of Registry of the aircraft to be equivalent, may be allowed for this purpose.

NAT Definition of "Other Means"

OTHER MEANS - Position information derived from advanced ATC ground automation systems that take into account multiple sources of information, namely voice reports, automatic dependent surveillance and/or controller-pilot data link communication reports, estimates and weather information, may be the basis for applying all time-based longitudinal separation standards.