

RECOMMENDATION 808*

THE BROADCASTING OF TIME AND DATE INFORMATION IN CODED FORM

(Question 29/11)

(1992)

The CCIR,

considering

- a) that there are cases, notably in HF and satellite broadcasting, where a transmission is received over a large geographical area containing many time zones;
- b) that there should occur further time differences during the year due to the practice of implementing “daylight-saving” time in some countries;
- c) that there would be advantages in adopting a standard time reference independent of time zones and daylight-saving discontinuities;
- d) that the transmission of the local time offset at the source from a standardized time reference might be desirable in some cases;
- e) that there is an increasing interest to convey time and date information in a coded form particularly suitable for controlling the operation of equipment;
- f) that standardized encoding methods for broadcasting time and date would also permit operating economy and simplify the calculation of relative timings;
- g) that common worldwide time and date conventions have already been defined in Recommendations 460 and 457,

recommends

- 1. that all coded broadcast time and date signals should be expressed only in Coordinated Universal Time (UTC) and Modified Julian Date (MJD) in accordance with Recommendations 457 and 460;
- 2. that a coded local time offset, expressed in multiples of half an hour with range –12 h to +15 h should be appended when required to indicate the difference between UTC and the time currently applicable locally within a particular time zone.

Note 1 – Additional information on the conventions for the expression of standard time and date, and a method for conversion between date conventions are given in Annex 1.

ANNEX 1

A note on standard time and date conventions

1. Introduction

There are already international standards concerning the distribution of time and date information. This Annex indicates how these standards relate to each other, and to the needs of broadcasting.

* This Recommendation should be brought to the attention of Study Group 7.

Time and date information is used to label the actual or nominal point of origin of material (a document, a television or radio programme) or the actual or anticipated point of receipt. The difference represents the propagation delay. There is also a requirement for indicating local clock-time and date in their own right, or for use together with such labels for assisting decisions or controlling processes associated with broadcasting.

The broadcasting and telecommunications environment provides the possibility of sending signals worldwide within 1 s of time. It is therefore necessary to accommodate the variations in local time (and date) in any method of coding intended to be consistent worldwide. There are also known discontinuities in local time (the duplicated hour at the end of “summer time”, and the “leap second”) to be taken into account.

2. Standard time

The standard unit of time is the second, obtained by defining the frequency of the caesium atomic transition as 9 192 631 770 Hz. For the purpose of creating a regular time scale these seconds are counted to give days, hours and minutes since 1 January 1958. This is known as International Atomic Time (TAI). This time scale, based on a physical property, drifts out of step with a time scale, such as Universal Time (UT) or Greenwich mean time (GMT), obtained from astronomical observation. Since the origin of TAI was set in agreement with UT at the beginning of 1958, TAI has advanced by about 21 s with respect to UT. In order to provide a time scale with seconds coincident to those of TAI, but within a close tolerance (± 0.8 s) of UT, a version of TAI offset by a whole number of seconds is maintained by the Bureau international des poids et mesures (BIPM). This is known as Coordinated Universal Time (UTC). The tolerance is maintained by occasionally adding (or, in principle, deleting) a single second to make a 61 s (or 59 s) minute. The preferred occasions are at the end or middle of the year, with at least eight weeks' notice. For example, one of these “leap seconds” occurred at 0000 h UTC on 1 July 1982 when the UTC seconds marker sequence was:

30 June 1982	23 h 59 min 59 s
	23 h 59 min 60 s
1 July 1982	00 h 00 min 00 s

All of the standard time signals used by broadcasters worldwide are derived from the UTC time scale, and the times are often, wrongly, referred to in terms of Greenwich mean time (GMT) and an offset. For reasons given above, the UTC time signal known in the UK as “the Greenwich time signal”, will sometimes differ from true GMT by more than half a second. This confusion of name is of little practical consequence in everyday life, but it is significant to astronomers, navigators and lawyers.

Recommendation 460 recommends “that all . . . time signal emissions conform as closely as possible to Coordinated Universal Time (UTC) . . . from 1 January 1975”.

2.1 Time offsets

In practice all countries refer their national time or times to UTC with an offset. There are 38 different offsets currently in use. Except for Nepal (+5 h 40 min) all the offsets are multiples of half an hour and range from –11 h (Samoa) to +14 h (Anadyr, Russian Federation, in summer time). Many countries advance their time by one hour during local summer (dependent on hemisphere); exceptionally Cook Islands advance by half an hour. There are various dates and times for summer time changes. Within some countries (Australia, Canada) there are some time zones differing by half an hour. There are some states (Queensland, Australia; Arizona and Indiana, USA) which, unlike their neighbours, do not adopt summer time.

It would probably be sufficient to provide a method of signalling a local time offset with a six-bit code giving half an hour steps in a range –12 to +15 h. In some applications, the local offset of the programme source or of the transmitter would be signalled; in other cases, the local offset applicable to the receiver site would be required.