

SMPTE STANDARD

Transmission of Date and Time
Zone Information in Binary Groups
of Time and Control Code



Table of Contents	Page
Foreword	2
Intellectual Property	2
1 Scope	3
2 Conformance Notation	3
3 Normative References	3
4 Glossary	4
5 Date and Time Zone in Binary Groups	4
5.1 Time Zone, Date Format and Daylight Saving Time in Binary Groups 7 and 8.....	4
5.2 Date as Binary Coded Decimal Digits.....	6
5.3 Modified Julian Date.....	6
5.4 Time and Date Coordination	6
Annex A Differences between GPS Time and UTC Time (Informative)	8
Annex B Additional Data in Binary Groups (Informative).....	9
Annex C Modified Julian Date (MJD) (Informative)	10
Annex D Bibliography (Informative)	11

Foreword

SMPTE (the Society of Motion Picture and Television Engineers) is an internationally-recognized standards developing organization. Headquartered and incorporated in the United States of America, SMPTE has members in over 80 countries on six continents. SMPTE's Engineering Documents, including Standards, Recommended Practices, and Engineering Guidelines, are prepared by SMPTE's Technology Committees. Participation in these Committees is open to all with a bona fide interest in their work. SMPTE cooperates closely with other standards-developing organizations, including ISO, IEC and ITU.

SMPTE Engineering Documents are drafted in accordance with the rules given in Part XIII of its Operations Manual.

SMPTE ST 309 was prepared by Technology Committee 33TS.

Intellectual Property

At the time of publication no notice had been received by SMPTE claiming patent rights essential to the implementation of this Standard. However, attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. SMPTE shall not be held responsible for identifying any or all such patent rights.

1 Scope

This standard specifies a coding technique for the transmission of date and time zone information in the user groups of a time and control code signal. A two-digit hexadecimal code in a pair of binary groups specifies the time zone and the format for the date encoding in the remaining six binary groups. Date information is encoded either as six decimal digits to display the date in the YYMMDD format or as six decimal digits in the modified Julian date (MJD) format.

2 Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except: the Introduction, any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:"

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document.

The keyword "reserved" indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword "forbidden" indicates "reserved" and in addition indicates that the provision will never be defined in the future.

A conformant implementation according to this document is one that includes all mandatory provisions ("shall") and, if implemented, all recommended provisions ("should") as described. A conformant implementation need not implement optional provisions ("may") and need not implement them as described.

Unless otherwise specified, the order of precedence of the types of normative information in this document shall be as follows: Normative prose shall be the authoritative definition; Tables shall be next; followed by formal languages; then figures; and then any other language forms.

3 Normative References

Note: All references in this document to other SMPTE documents use the current numbering style (e.g. SMPTE ST 12-1:2008) although, during a transitional phase, the document as published (printed or PDF) may bear an older designation (such as SMPTE 12M-1-2008). Documents with the same root number (e.g. 12-1) and publication year (e.g. 2008) are functionally identical.

The following standards contain provisions which, through reference in this text, constitute provisions of this recommended practice. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this recommended practice are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

SMPTE ST 12-1:2008, Television — Time and Control Code

ISO 8601:2004, Data Elements and Interchange Formats — Information Interchange — Representation of Dates and Times

ITU-R TF.457-2 1997, Use of the Modified Julian Date by the Standard Frequency and Time-Signal Services

4 Glossary

Coordinated Universal Time or Universal Time, Coordinated (UTC): UTC is an international atomic time standard and is the basis for civil time. It is the current term for what was commonly referred to as Greenwich Mean Time (GMT). Zero (0) hours UTC is midnight in Greenwich, England, which lies on the zero longitudinal meridian.

Daylight Saving Time (DST): The civil time observed when daylight saving is adopted in a country or region.

Julian Date (JD): The Julian day number is a count of days that have elapsed since Greenwich mean noon on 1 January 4713 B.C., Julian proleptic calendar.

Modified Julian Date (MJD): The MJD is an abbreviated version of the Julian date (JD) dating method. It is defined as $MJD = JD - 2400000.5$. An MJD day thus begins at midnight, civil date.

Standard Time: The civil time adopted for a country or region.

5 Date and Time Zone in Binary Groups

Two binary groups (BG7 and BG8) encode the time zone and define the format for the encoding of the date in the remaining six binary groups. The date, as specified by a date format flag bit in binary group 8, may be either six decimal digits in YYMMDD format or a six-decimal digit modified Julian date (MJD).

Note: The bit positions of the binary groups are described in Table 11 of SMPTE ST 12-1 for LTC and VITC applications and in Table 6 of SMPTE ST 12-2 for ATC applications.

Table 1 – Date format and time zone offset coding in binary codes

Binary group	Assignment	Description
7.0 7.1 7.2 7.3 8.0 8.1	TZ-0 TZ-1 TZ-2 TZ-3 TZ-4 TZ-5	1's bit 2's bit 4's bit 8's bit 16's bit 32's bit Time zone code 0-63 (00-3F _{HEX}) — see Table 2
8.2	DST flag	0 = DST not in effect 1 = DST in effect.
8.3	MJD flag	0 = YYMMDD format 1 = MJD (6-digit) format

5.1 Time Zone, Date Format and Daylight Saving Time in Binary Groups 7 and 8

Binary groups 7 and 8 as detailed in Table 1 define the format of the date encoded in binary groups 1 through 6, daylight saving time observance and the time zone (refer to Table 2).

5.1.1 MJD format flag bit

If this bit is logical zero, then the date is specified as six decimal digits in the format YYMMDD (see Section 5.2). The time address represents the local clock time that has been offset from coordinated universal time