FIPS PUB 59

FEDERAL INFORMATION
PROCESSING STANDARDS PUBLICATION

1979 FEBRUARY 1

U.S. DEPARTMENT OF COMMERCE / National Bureau of Standards

REPRESENTATIONS OF UNIVERSAL TIME, LOCAL TIME DIFFERENTIALS, AND UNITED STATES TIME ZONE REFERENCES FOR INFORMATION INTERCHANGE

FEDERAL GENERAL DATA STANDARD
REPRESENTATIONS AND CODES

U.S. DEPARTMENT OF COMMERCE, Juanita M. Kreps, *Secretary*

Jordan J. Baruch, *Assistant Secretary* for Science and Technology

NATIONAL BUREAU OF STANDARDS, Ernest Ambler, *Director*

Foreword

Federal Information Processing Standards Publications of the National Bureau of Standards are adopted and promulgated under the provisions of Public Law 89-306, and Part 6 of Title 15 Code of Federal Regulations. The standards are required for implementation by Federal agencies in the acquisition, development and use of automated information systems and in the interchange of data between and among agencies and with the public. The use of such standards which are adopted after extensive review by Federal agencies, industry and the public are intended to reduce government costs and improve the effectiveness of government services.

Comments concerning Federal Information Processing Standards Publications are welcomed, and should be addressed to the Director, Institute for Computer Sciences and Technology, National Bureau of Standards, Washington, D.C. 20234.

M. Zane Thornton, *Acting Director*
Institute for Computer Sciences and Technology

Abstract

This FIPS PUB announces the adoption of American National Standard X3.51-1975, Representations of Universal Time, Local Time Differentials, and United States Time Zone References for Information Interchange. This standard provides the means for representing universal time, local time differentials, and U.S. time zone references to facilitate interchange of information among data systems.

Key words: American National Standard Representation for Calendar Date and Ordinal Date for Information Interchange; local time differentials; meridiem designator; time differential factor; time zone references; Uniform Time Act of 1966; universal time.

Nat. Bur. Stand. (U.S.), Fed. Info. Process. Stand. Publ. (FIPS PUB) 59, 4 pages.

(1979)

CODEN:FIPPAT

For sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161

American National Standard

representations of universal time, local time differentials, and United States time zone references for information interchange

Approved August 4, 1975 Secretariat: Computer and Business Equipment Manufacturers Association

Adopted for Use by the Federal Government

FIPS PUB 59
See Notice on Inside Front Cover

1. General

1.1 Scope and Purpose

1.1.1 Scope. The scope of this standard is limited to the interchange of data among systems. This standard was not designed for (nor does it preclude) usage by humans as input to, or output from, data systems.

1.1.2 Purpose. The purpose of this standard is to provide standard means for representing Universal Time, Local Time Differentials, and United States Time Zone References to facilitate interchange of data among data systems. Specifically, it is intended to:

(1) Reduce the time required to record or format time expressions, or both, and transmit them

(2) Improve clarity and accuracy of interchange

(3) Minimize the amount of human intervention required for communicating time expressions

(4) Reduce costs

1.2 Qualifications. This standard does not prescribe file sequences, storage media, programming languages, or other features of information processing to be used in its implementation.

The use of this standard to represent Universal Time, Local Time Differentials, or U.S. Time Zone References does not ensure that the representation is accurate.

This standard provides more than one means whereby local time expressions can be related to Universal Time or a particular time zone. In applications using this standard, the particular form used should be defined in related record or file descriptions.

1.3 Related Standards. American National Standard Representation for Calendar Date and Ordinal Date for Information Interchange, X3.30-1971, can be used in combination with this standard for representing date-time groups.[1]

2. Specifications

2.1 Representation of Universal Time

2.1.1 Universal Time (Greenwich Mean Time) is represented by an uppercase letter "Z" directly following the low-order (or extreme right-hand) time element of the 24-hour clock time expression.

2.1.2 In 12-hour clock time expressions Universal Time is represented by a space followed by the uppercase letters "GMT," directly following the meridian designator (the low-order element). (Refer to Example 1 in Section 3.)

2.1.3 In systems limited to a lowercase character set, the lowercase "z" or "gmt" will be used to represent Universal Time in the same manner as indicated in 2.1.1 and 2.1.2, respectively.

2.2 Representation of a Local Time Differential Factor (TDF)

2.2.1 Many applications require that time be expressed as local civil clock time. A Time Differential Factor (TDF) is a means for facilitating information interchange by relating local time expressions to Universal Time (GMT). The TDF should not be used to imply or derive geographical references for the local time expression.

[1] In addition, a standard on representations for local time of the day for information interchange has been developed by the X3 Standards Committee and is being considered for adoption as an American National Standard.

ANSI X3.51-1975

2.2.2 The TDF expresses the difference in hours and minutes between local time and Universal Time. It is represented by a four-digit number preceded by a plus (+) or minus (−) sign, indicating the hours and minutes the local time is ahead of or behind Universal Time, respectively.

2.2.3 The TDF for Universal Time is represented as +0000. Local times throughout the world vary from Universal Time by as much as 13 hours. When local times are behind (slower than) Universal Time, the TDF varies from −0001 to −1200. When local times are ahead of (faster than) Universal Time, the TDF varies from +0001 to +1300.

2.2.4 The TDF follows, without separators, the low-order (or extreme right-hand) time element of the 24-hour clock expression. (Refer to Example 2 in Section 3.) It is not to be used in expressions of 12-hour clock times.

2.3 Representation of Local Time Zones in General Use within the United States

2.3.1 Many applications within the United States require that local time be expressed referencing a particular time zone. Table 1 provides most of the time zone references that are used in these applications.

2.3.2 In accordance with the Uniform Time Act of 1966, "During the period commencing at 2 a.m. on the last Sunday in April of each year and ending at 2 a.m. on the last Sunday in October, the standard time is advanced one hour except in those states which have by law exempted themselves from observance of advanced time." This advanced time is commonly referred to as "Daylight" or "Daylight Saving" time. Table 2 provides codes for advanced time references.

Table 1
Time Zone References for
U.S. Standard Time Zones

Time Zone Reference Code	Standard Time	TDF
NST	Newfoundland Standard Time	−0330
AST	Atlantic Standard Time	−0400
EST	Eastern Standard Time	−0500
CST	Central Standard Time	−0600
MST	Mountain Standard Time	−0700
PST	Pacific Standard Time	−0800
YST	Yukon Standard Time	−0900
HST	Alaska-Hawaii Standard Time	−1000
BST	Bering Standard Time	−1100

Table 2
Time Zone References for
U.S. Advanced Time Zones

Advanced Time Reference Code	Advanced Time	TDF
ADT	Atlantic Daylight Time	−0300
EDT	Eastern Daylight Time	−0400
CDT	Central Daylight Time	−0500
MDT	Mountain Daylight Time	−0600
PDT	Pacific Daylight Time	−0700
YDT	Yukon Daylight Time	−0800
HDT	Alaska-Hawaii Daylight Time	−0900
BDT	Bering Daylight Time	−1000

2.3.3 A Time Zone Reference Code is represented by the uppercase three-letter code given in Tables 1 and 2. It is separated from the low-order time element of a local time expression by a space. (Refer to Example 3 in Section 3.) In systems having only a lowercase character set, the lowercase equivalents of the codes given in Tables 1 and 2 will be used as indicated.

3. Examples

The following examples represent a local time of 2 hours, 9 minutes, and 23 seconds past noon in the U.S. Eastern Standard Time Zone.

Example 1 (Universal Time)
Representation: 190923Z or 07:09:23P GMT

Example 2 (Local Time with a Time Differential Factor)
Representation: 140923-0500

Example 3 (Local Time with a Time Zone Reference)
Representation: 02:09:23P EST or 140923 EST

This standard has been adopted for Federal Government use.

Details concerning its use within the Federal Government are contained in FIPS PUB 59, Representations of Universal Time, Local Time Differentials, and United States Time Zone References for Information Interchange. For a complete list of the publications available in the Federal Information Processing Standards Series, write to the Office of Technical Information and Publications, National Bureau of Standards, Washington, D.C. 20234.

Federal Information
Processing Standards Publication 59

1979 February 1

ANNOUNCING THE STANDARD FOR

REPRESENTATIONS OF UNIVERSAL TIME, LOCAL TIME DIFFERENTIALS, AND UNITED STATES TIME ZONE REFERENCES FOR INFORMATION INTERCHANGE

Federal Information Processing Standards Publications are issued by the National Bureau of Standards pursuant to the Federal Property and Administrative Services Act of 1949, as amended, Public Law 89–306 (79 Stat. 1127), Executive Order 11717 (38 FR 12315, dated May 11, 1973) and Part 6 of Title 15 Code of Federal Regulations (CFR).

Name of Standard. REPRESENTATIONS OF UNIVERSAL TIME, LOCAL TIME DIFFERENTIALS, AND UNITED STATES TIME ZONE REFERENCES FOR INFORMATION INTERCHANGE.

Category of Standard. Federal General Data Standard, Representations and Codes.

Explanation. This standard provides the means for representing Universal Time, Local Time Differentials, and United States Time Zone References to facilitate interchange of data among data systems. It also provides the means whereby local time expressions can be related to Universal Time or a particular time zone.

Approving Authority. Secretary of Commerce.

Maintenance Agency. Department of Commerce, National Bureau of Standards (Institute for Computer Sciences and Technology).

Cross Index.

a. Federal Information Processing Standards Publication (FIPS PUB) 4, Calendar Date.

b. American National Standard X3.30–1971, Representation for Calendar Date and Ordinal Date for Information Interchange.

c. ISO Standard 3307–1975, Information Interchange—Representations of Time of the Day.

d. American National Standard X3.51–1975, Representations of Universal Time, Local Time Differentials, and United States Time Zone References for Information Interchange.

e. ISO Standard 4031, Information Interchange—Representation of Local Time Differentials.

f. Federal Information Processing Standards Publication (FIPS PUB) 59, Representations of Local Time of the Day for Information Interchange.

Applicability. This standard is required for use by Federal agencies in representing Universal Time, Local Time Differentials, and United States Time Zone References in the interchange of information among Federal agencies and between Federal agencies and the public. In using this standard, the particular form of representation used should be specified in related documentation, forms and file descriptions.

Specifications. This standard adopts American National Standard X3.51–1975, Representations of Universal Time, Local Time Differentials, and United States Time Zone References for Information Interchange, for Federal use.

Implementation Schedule. This standard becomes effective six months after publication. Federal agencies, based upon their specific operational requirements, will develop procedures for implementing this standard by their operating units and personnel.

Waiver Procedure. Heads of agencies may request that the provisions of this standard be waived in instances where its use would seriously affect the capability of the agency in performing its operational mission. Such waiver requests will be reviewed and approved by the Secretary of Commerce. Correspondence setting forth the reasons and justification for the waiver should be included in the waiver request.

Forty days should be allowed for review and response by the Secretary of Commerce. Waiver requests shall be submitted to the Secretary of Commerce, Washington, D.C. 20230, and labeled as a Request for Waiver to a Federal Information Processing Standard. No action will be taken by the agency to deviate from the standard prior to the receipt of a waiver approval response from the Secretary of Commerce.

Qualifications. The reference in paragraph 2.2.1 of American National Standard X3.51–1975 to "GMT" as the designator for Universal Time is no longer used. The current designation of Universal Time is "UTC."

Where To Obtain Copies. Copies of this publication are available for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161. (Sale of the included specifications document is by arrangement with the American National Standards Institute.) When ordering, refer to Federal Information Processing Standards Publication 59 (NBS–FIPS–PUB–59), and title. Payment may be made by check, money order, or deposit account. Information concerning current prices and other related standards may be obtained from the NBS Office of ADP Standards Management, Washington, D.C. 20234.

☆ U. S. GOVERNMENT PRINTING OFFICE : 1979 O - 284-851