

FED-STD-1003-A
August 19, 1981

Supersedes
FED-STD-1003
March 8, 1979

FEDERAL STANDARD
TELECOMMUNICATIONS: SYNCHRONOUS BIT ORIENTED DATA LINK CONTROL PROCEDURES
(ADVANCED DATA COMMUNICATIONS CONTROL PROCEDURES)

This standard is issued by the General Services Administration pursuant to the Federal Property and Administrative Services Act of 1949, as amended. Its application to telecommunications systems is mandatory on all Federal agencies to the extent specified herein.

1. Scope

1.1 Description. This standard specifies the frame structure, elements of procedures, and codes of practice (classes of procedure) for data communication systems that transmit synchronous binary data, by electrical or electromagnetic means and which have automatic error detection capabilities. The application of the data link control procedures described in this standard to automatic data processing (ADP) systems will be the subject of a related Federal Information Processing Standard.

1.2 Purpose. This standard is to facilitate interoperability between telecommunication facilities and systems of the Federal Government and compatibility of these facilities and systems at the computer-communications interface with data processing equipment.

2. Application. Federal agencies shall use this standard in the design and procurement of data communications systems and equipment, using bit oriented link control procedures. It is not mandatory for new systems whose design was irrevocably committed to the use of other data link control procedures on or before the issue date of this standard. Nor is it applicable to equipment being procured as replacement for, or extensions to, existing systems which use other data link control procedures.

3. Premises. This standard is defined in terms of the actions that occur on the data link upon receipt of commands at secondary stations and combined stations connected to the data link. To assure standardization (hence compatibility), all features of a stipulated basic class of procedures must apply when equipment is to be operated within the constraints of this standard.

4. Applicable documents. With the inclusion of the additional requirements and exceptions listed in paragraph 5.0, this standard adopts in its entirety the provisions of American National Standard X3.66-1979. Copies may be obtained from ANSI, Inc., 1430 Broadway, New York, NY 10018.

5. Additional requirements and exceptions. References cited at the end of each requirement refer to the most pertinent applicable parts in American National Standard X3.66-1979.

5.1 All systems conforming to this Federal Standard shall implement the 16-bit frame check sequence (FCS) specified in the basic document. When a 32-bit FCS is required to obtain a higher degree of error protection, it shall use the generating polynomial

$$X^{32} + X^{26} + X^{23} + X^{22} + X^{16} + X^{12} + X^{11} + X^{10} + X^8 + X^7 + X^5 + X^4 + X^2 + X^1 + 1$$

The 32-bit FCS, if used, shall be generated according to the procedures in section 12, of ANS X3.66-1979, appropriately extended to 32 bits. That is

$$L(X) = X^{31} + X^{30} + X^{29} \dots X^2 + X^1 + 1$$

(See paragraph 3.5, section 12, and appendix D of ANS X3.66-1979.)

5.2 When the address field consists of a single octet, the least significant bit (bit number 1) shall always be set to 1, except when the null address is intended, making it consistent with the extended format prescribed by section 4.3.2 of ANS X3.66-1979. The basic address format prescribed by section 4.3.1 shall not be used. (See paragraph 4.3.1, 4.3.2, and 4.5 of ANS X3.66-1979.)

5.3 The nonreserved commands and responses shall not be specified or used. (See paragraphs 7.4.5 and 7.5.5 of ANS X3.66-1979.)

5.4 To maximize emergency interoperability among major Federal data communication networks, while still allowing flexibility to tailor a network for efficient day-to-day use, the following features, within the scope of ANS X3.66-1979, are required:

FED-STD-1003-A

a. The W bit in the frame reject (FRMR) information field will be set to indicate the cause of the frame rejection condition. (See paragraph 7.5.3.1 in ANS X3.66-1979.)

b. A FRMR with the W bit set to one notifies a primary/combined station that an invalid or unimplemented frame was received by the remote secondary/combined station. (See American National Standard X3.66-1979, section 7.5.3.1.) During the remainder of the physical connection, and while the primary/combined station remains on-line, the primary/combined station shall not subsequently transmit this invalid or unimplemented frame to the remote station.

6. Changes. When a Federal department or agency considers that this standard does not provide for its essential needs, a statement citing inadequacies shall be sent in duplicate to the General Services Administration (GSA), Washington, D.C. 20405, in accordance with provisions of Federal Property Management Regulations 41 CFR 101-29.3. The General Services Administration will determine the appropriate action to be taken, and will notify the agency.

Preparing Activity:

National Communications System (NCS)
Office of Technology and Standards
Washington, D.C. 20305

MILITARY INTEREST

military Coordinating Activity

DCA - DC

Custodians

Army - CR
Navy - EC
Air Force - 90

Review Activities

Army - CR, SC
Navy - EC, NOSC
Air Force - 90, XOKC

This document is available from the General Services Administration (GSA), acting as agent for the Superintendent of Documents. A copy for bidding and contracting purposes is available from GSA Business Centers. Copies are for sale at the GSA, Specification Unit (WFSIS), 7th and D Street, SW., Room 6039, Washington, D.C. 20407; telephone (202) 472-2205. Please call in advance for pickup service.

