NOT MEASUREMENT SENSITIVE

NOTICE OF CHANGE

MIL-STD-188-216A
NOTICE 1
6 September 1993

MILITARY STANDARD
INTEROPERABILITY STANDARDS
FOR DATA ADAPTER CONTROL MODE

TO ALL HOLDERS OF MIL-STD-188-216A:

1. THE FOLLOWING PAGES OF MIL-STD-188-216A HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
129	6 September 1993	129	20 February 1993
129a	6 September 1993	129	20 February 1993

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-STD-188-216A will verify that page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the military standard is completely revised or canceled.

Custodians:
Army - SC
Navy - EC
Air Force - 90
DISA - DC

Review Activities:
Army - AC
Navy - NC, TD, OM
Air Force - 02, 17
OASD - IR

Preparing Activity:
DISA - DC

User Activities:
Army - CR
Navy - MC
Air Force - 13

(Project TCTS-2161)

AREA TCSS

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40.1.1.1 Check bits derivation. The transmitting DA/MS shall generate the check bits using the following generator polynomial:

$$g(x) = x^{11} + x^{10} + x^6 + x^5 + x^4 + x^2 + 1$$

as specified herein. Note, that, using modulo 2 addition,

$$x^{23} + 1 = \underbrace{(x^{11} + x^{10} + x^6 + x^5 + x^4 + x^2 + 1)}_{g(x)}(x^{11} + x^9 + x^7 + x^6 + x^5 + x + 1)(x + 1)$$

the eleven check bits shall be as derived from the following generator matrix G:

	22 21	20 19	18 17	16 15	14 13	12 11	10 9	8 7	6 5	4 3	2 1	0
$x^{11}\cdot g(x) =$	1	1	0	0	0	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0
$x^{10}\cdot g(x) =$	0	1	1	0	0	0	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0
$x^9\cdot g(x)+x^{11}\cdot g(x) =$	1	1	1	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
$x^8\cdot g(x)+x^{10}\cdot g(x) =$	0	1	1	1	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0
$x^7\cdot g(x)+x^9\cdot g(x) =$	0	0	1	1	1	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0
$(x^6+x^8+x^{11})\cdot g(x) =$	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0
$(x^5+x^7+x^{10})\cdot g(x) =$	0	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0
$(x^4+x^6+x^9)\cdot g(x) =$	0	0	1	1	0	1	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0
$(x^3+x^5+x^8+x^{11})\cdot g(x) =$	1	1	0	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0
$(x^2+x^4+x^7+x^{10}+x^{11})\cdot g(x) =$	1	0	1	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0
$(x+x^3+x^6+x^9+x^{10}+x^{11})\cdot g(x) =$	1	0	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1
$(1+x^2+x^5+x^8+x^9+x^{10}+x^{11})\cdot g(x) =$	1	0	0	0	1	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
													I								P	

$= -G$

New page

where the matrix contains the coefficients of the polynomials on the left. By interchanging the I and P columns to obtain matrix T; i.e.

$$T = \left[\begin{array}{cccccccccccccccccccccc}
1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 1 & 0 \\
0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 1 \\
0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 0 & 1 & 0 & 0 \\
0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 0 & 1 & 0 \\
0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 & 1 & 0 & 1 \\
0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 1 & 1 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 0 & 0 & 1 & 1 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 1 & 1 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 1 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 1 & 0 & 1
\end{array}\right]$$

$$\underbrace{\qquad\qquad}_{I} \qquad\qquad \underbrace{\qquad\qquad}_{P}$$

$$G=[P,I]_{(12x23)} \Rightarrow [I,P]_{(12x23)} = T$$

the transmission order and value of the code word bits can be obtained by matrix multiplication (modulo 2 addition without carry) as follows:

$$\underset{\text{FIRST BIT TRANSMITTED}}{\left[ib_1 \quad \text{INFO BITS} \quad ib_{12} \right]}_{(1x12)} \cdot \left[I, P \right]_{(12x23)} = \underset{\text{FIRST BIT TRANSMITTED}}{\left[\text{INFO BITS, CHECK BITS} \right]}_{(1x23)}$$

40.1.2 Double code word transmission. Double code word transmission (1/4 rate Golay) is the transmission of a 1/2 rate Golay code word twice contiguously (see figure 31).

40.1.3 Quadruple code word transmission. Quadruple code word transmission (1/8 rate Golay) is the transmission of a 1/2 rate Golay code word four times contiguously (see figure 31).

New page