CHAPTER 9

TELEMETRY ATTRIBUTES TRANSFER STANDARD (TMATS)

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CHANGES TO THIS EDITION OF CHAPTER 9

Updates to this Appendix are in **blue font**. The blue font indicates either a completely new item or an update to a previously existing item.

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CHAPTER 9

TELEMETRY ATTRIBUTES TRANSFER STANDARD (TMATS)

9.1 General

Telemetry attributes are those parameters required by the receiving/processing system to acquire, process, and display the telemetry data received from the test item/source. The Telemetry Attributes Transfer Standard (TMATS) provides a common definition and format to facilitate the transfer of information between the user and the test range and between ranges. The telemetry attributes defined in this chapter provide the information required to set up the telemetry receiving and processing equipment. The format, while not necessarily compatible with any receiving/processing system, will allow test ranges or other receiving systems to develop a computer conversion program to extract the information and to set up data required for their unique equipment configuration. Nonstandard parameter variations are not included in the attribute tables later in the chapter, but may be included by exception in the comments section of each attribute group.

The intent of this chapter is to cover, primarily, attributes and terminology included in or consistent with the other chapters within this telemetry standards document (IRIG Standard 106, Part I). For example, PCM format attributes should comply with the PCM standards as given in Chapter 4. Other attributes are sometimes included for service and utility, but should not be construed as endorsements apart from the other chapters.

9.2 Scope

The TMATS provides the definition of the telemetry attributes and specifies the media and data format necessary to permit the transfer of the information required to set up the telemetry receiving/processing functions at a test range. The standard does not conform to, nor does it define, existing or planned capabilities of any given test range. The parameters included in this document are defined by specific reference. Other nonstandard parameter values/definitions may be included in the comments section of each group.

9.3 Purpose

The TMATS provides a common format for the transfer of information between the user and a test range or between ranges (see Appendix H). This format will minimize the "station unique" activities that are necessary to support any test item. In addition, TMATS is intended to relieve the labor intensive process required to reformat the information by providing the information on computer compatible media, thereby reducing errors and requiring less preparation time for test support.

9.4 Media and Data Structure

A variety of physical and electronic media is available for use in exchanging attribute information. The most important factor in selecting a medium is that the parties involved agree to using that specific medium. If any data compression (such as Backup/Restore or Zip/Unzip) will be used, both parties should agree to its use.

A cover sheet describing the system that produced the attribute medium should accompany the attribute information. A recommended format for the cover sheet is given in Appendix I.

9.4.1 Physical Format. Attributes for each mission configuration are to be supplied in a single physical file with contents as 7-bit ASCII coded characters. Line feed (LF) and carriage return (CR) may be used to improve readability of the information. Nonprintable characters will be discarded by the destination agency prior to translating the attributes into telemetry system configuration information.

For disks, multiple mission configurations may be provided on a single disk; however, each configuration must be in a separate file identified in the disk directory. File names should use the file extensions '.TXT' to indicate a text file, or '.TMT' or '.TMA' to indicate a TMATS file. A stick-on label and the accompanying cover sheet identify the file names corresponding to the mission configuration used for each mission.

On magnetic tape, physical records may be any size up to 2048 bytes. A single end-of-file (EOF) mark indicates the end of a mission configuration. Additional mission configurations can be included in sequential files on a single tape. A double EOF is used to indicate the end of the last mission configuration on the tape. A stick-on label and an accompanying cover sheet identifying the missions for each configuration are required.

9.4.2 Logical Format. Each attribute appears in the file as a unique code name and as a data item. The code name appears first, delimited by a colon. The data item follows, delimited by a semicolon. Thus, an attribute is formatted as A:B; - where A is the code name and B is the data item, in accordance with the tables in paragraph 9.5. Numeric values for data items may be either integer or decimal. Scientific notation (± d.dddddE± ee) is allowed only for the specific data items defined for its use in the tables in paragraph 9.5. For alphanumeric data items, including keywords, either upper or lower case is allowed; all defined keyword values are shown as upper case and enclosed in quotes in the tables in paragraph 9.5. Semicolons are not allowed in any data item (including comment items). Any number of attributes may be supplied within a physical record; however, the number of attributes supplied is subject to the 2048 byte maximum length limitation of a single physical record (see subparagraph 9.4.1 above). Attributes may appear in any order.

The two basic types of attribute code names are single-entry and multiple-entry. Single-entry attributes are those for which there is only one data item. Multiple-entry attributes appear once in the definition tables in paragraph 9.5 but have multiple items; these items are assigned a number. The number appears in the code name preceded by a hyphen. For example, data source

identifiers might have the following entries:

G\DSI-1:Aircraft;
G\DSI-2:Missile;
G\DSI-3:Target;

The code name COMMENT may be used to interject comments to improve readability. The comment data items, such as G\COM, are intended to convey further details within the TMATS file itself. Comments must follow the attribute logical format, as shown below:

COMMENT: This is an example of a comment;

Refer to paragraph 9.5 for detailed definitions of code names and attributes and Appendix J for an example application of this standard.

9.4.3 XML (eXtensible Markup Language) Format. In addition to the code name format described in paragraph 9.4.2, TMATS attributes can also be expressed in XML. The TMATS XML format is implemented as a standard XML schema (open the file Tmats.xml).

The TMATS XML schema is identical in content to the telemetry attributes described in paragraph 9.5 below, with the following exceptions:

a. The schema contains only the Word/Frame location type in the "D" group and no subframe definitions in the "P" group.
b. There is a C group for each data link instead of only one C group in the TMATS file.
c. The schema has no counter ("\N") attributes; they are not needed in XML.
d. Keyword attribute values are expanded for readability in the schema.
e. Date and time formats are different; the schema uses the XML standard date and time formats (not the ones in paragraph 9.5).
f. Text entries in the XML schema may contain semicolons; the code name format uses the semicolon as a delimiter.
g. The XML schema implies order, while the code name format allows the attributes to be given in any order.

In addition to the TMATS XML schema, there is a separate XML schema which describes commonly used types of data displays. The schema is called Data Display Markup Language (DDML). Refer to paragraph 9.6 for a description of this standard format for data display definitions.

9.5 Telemetry Attributes

The description of the mission configuration includes all potential sources of data; these sources are RF links, pre- or post-detected tapes, and onboard recorded tapes and storage media. Each of these data sources has unique characteristics that must be defined. Each source is given a unique identity and its characteristics are specifically defined in associated attribute fields. In multiplexed systems, each data stream is uniquely identified by a data link name, which is related to the data source name.

Only the information that is essential to define the attributes of a system is required. Non-applicable information does not need to be included in the file. However, all attribute information given is to be provided in the specified format.

The attributes defined in this section proceed from the general level to the detailed level. The groups, defined in terms of data to be entered, are:

a. General Information: Establishes the top-level program definition and identifies the data sources.
b. Transmission Attributes: Define an RF link. There will be one group for each RF link identified in the General Information Group.
c. Recorder-Reproducer Attributes: Identify a tape or storage data source.
d. Multiplex/Modulation Attributes: Describe the FM/FM, FM/PM, or PM/PM multiplex characteristics. Each multiplexed waveform must have a unique set of attributes. For the analog measurement, the tie to the engineering units conversion is made in this group.
e. Digital Data Attributes: Are divided into four groups: the PCM Format Attributes, the PCM Measurement Description, the Bus Data Attributes, and the Packet Format Attributes.
f. PCM Format Attributes: Define the PCM data format characteristics, including subframes and embedded formats. Each PCM format will have a separate format attributes group.
g. PCM Measurement Descriptions: Define each PCM measurement within the overall PCM format.
h. Bus Data Attributes: Specify the PCM encoded MIL-STD-1553 or ARINC 429 bus format characteristics, or the direct recorder track/channel MIL-STD-1553 or ARINC 429 bus format characteristics.
i. Message Data Attributes: Specify the message based data streams.
j. PAM Attributes: Contain the definition of the PAM system. It includes the PAM format characteristics and measurement attributes. The tie to the engineering unit conversion is made for the measurands contained in the PAM format.
k. Data Conversion Attributes: Contain the data conversion information for all measurements in this telemetry system. The calibration data and conversion definition of raw telemetry data to engineering units is included. The tie to the measurands of the telemetry systems defined in the previous groups is via the measurement name.
l. Airborne Hardware Attributes: Define the configuration of airborne instrumentation hardware in use on the test item.
m. Vendor Specific Attributes: Provide information that is specific to a vendor.

9.5.1 Contents. The following subparagraphs discuss the organization of the attributes and their relationships with the various groups.

9.5.1.1 Organization. Attribute information is organized according to a hierarchical structure in which related items are grouped and given a common heading. The number of levels varies within the overall structure and is a function of the logical association of the attributes. At the highest level, the telemetry attributes are defined for the following groups:

Identifier	Title
G	General Information
T	Transmission Attributes
R	Recorder-Reproducer Attributes
M	Multiplexing/Modulation Attributes
P	PCM Format Attributes
D	PCM Measurement Description
B	Bus Data Attributes
S	Message Data Attributes
A	PAM Attributes
C	Data Conversion Attributes
H	Airborne Hardware Attributes
V	Vendor Specific Attributes

Within the structure, a lower case letter, for example, n, p, or r, indicates a multiple entry item with the index being the lower case letter. The range of these counters is from one to the number indicated in another data entry, usually with the appendage \N.

Within the tables, the code name, definition, and maximum field size are given for each individual attribute. The maximum field size is intended to be a guideline indicating the intended use of the attribute, and does not imply support of the maximum capacity by all ranges. For example, the fact that the Number of Data Sources attribute is two characters long does not mean that 99 data sources are supported. Each range should be consulted as to their specific capabilities.

	Code names denoted with a *R-CH10* shall indicate the minimum required IRIG 106 Chapter 10 TMATS Setup Record attributes. Code names denoted with a *RO-CH10* shall indicate the minimum required IRIG 106 Chapter 10 TMATS Setup Record attributes for portions of IRIG 106 Chapter 10 which are optional and/or supported data channel dependent.

9.5.1.2 Group Relationships. The interrelationships between the various groups are shown pictorially in Figure 9-1.

NOTE	a. Data Source ID is unique within a General Information Group (G). It ties the Transmission Group (T) or the Recorder-Reproducer Group (R) or both to the G group and to the Multiplex/Modulation Group (M). b. The tie from the M group to a PCM Group (P), or a PAM Group (A) is the Data Link Name. c. The tie from the P group to an embedded P group is another Data Link Name. d. The tie from the M group to the Data Conversion Group (C) for an analog measurement is the Measurement Name. e. The tie from the P group to the PCM Measurement Description Group (D) or Bus Group (B) is the Data Link Name. f. The tie from the R group to the B group is from the Channel Data Link Name or Sub-Channel Name (R) to the Data Link Name (B). g. The tie from the R group to the Message Data Group (S) is from the Channel Data Link Name, Sub-Channel Name, or Network Name (R) to the Data Link Name (S). h. The tie from either the A, D, B or S group to the Data Conversion Group is the Measurement Name.

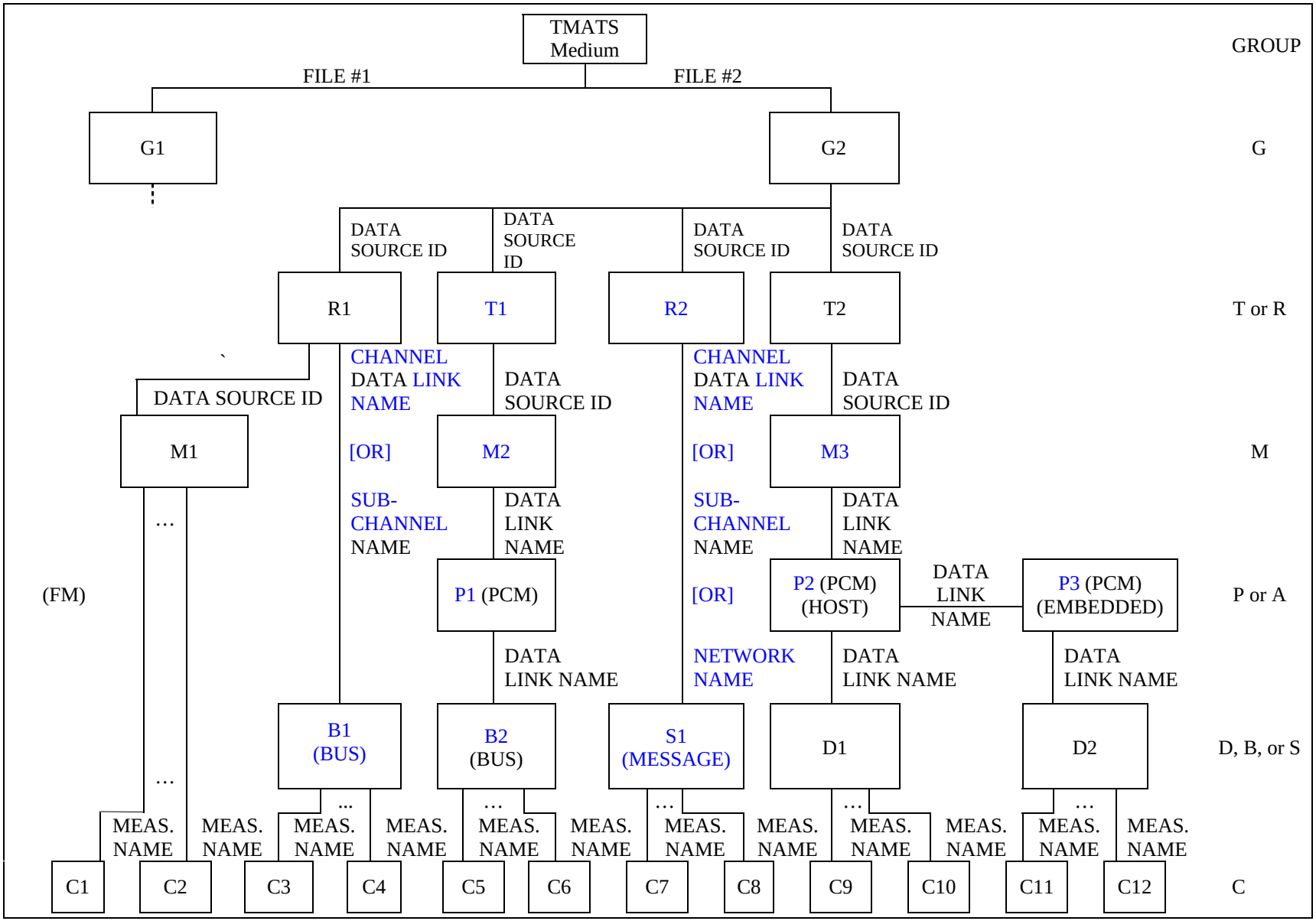

Figure 9-1. Group relationships.

9.5.2 General Information (G). The General Information Group provides overall program information. Figure 9-2 below gives the overall information that is included in this group. Table 9-1 identifies and defines the data required including the dates associated with the detailed information. Since the identification of the data sources is an integral part of the remaining groups, each source must be uniquely identified.

General Information Group (G)

	CODE NAME	REFERENCE PAGE
PROGRAM NAME	(G\PN)	(9-9)
TEST ITEM	(G\TA)	(9-9)
*INFORMATION		
TMATS FILE NAME	(G\FN)	
IRIG 106 REVISION LEVEL	(G\106)	
ORIGINATION DATE	(G\OD)	
REVISION NUMBER	(G\RN)	
REVISION DATE	(G\RD)	
UPDATE NUMBER	(G\UN)	
UPDATE DATE	(G\UD)	
TEST NUMBER	(G\TN)	
NUMBER OF POINTS OF CONTACT	(G\POC\N)	
*POINT OF CONTACT		(9-10)
NAME	(G\POC1-n)	
AGENCY	(G\POC2-n)	
ADDRESS	(G\POC3-n)	
TELEPHONE	(G\POC4-n)	
*DATA SOURCE IDENTIFICATION		(9-10)
NUMBER OF DATA SOURCES	(G\DSI\N)	
DATA SOURCE ID	(G\DSI-n)	
DATA SOURCE TYPE	(G\DST-n)	
*TEST INFORMATION		(9-10)
TEST DURATION	(G\TI1)	
PRE-TEST REQUIREMENT	(G\TI2)	
POST-TEST REQUIREMENT	(G\TI3)	
SECURITY CLASSIFICATION	(G\SC)	(9-11)
* COMMENTS		
COMMENTS	(G\COM)	(9-11)

***Heading Only - No Data Entry**

Figure 9-2. General Information Group (G).

TABLE 9-1. GENERAL INFORMATION GROUP (G)

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
PROGRAM NAME	16	G\PN	NAME OF PROGRAM
TEST ITEM	64	G\TA	TEST ITEM DESCRIPTION IN TERMS OF NAME, MODEL, PLATFORM, OR IDENTIFICATION CODE, AS APPROPRIATE
INFORMATION			
TMATS FILE NAME	256	G\FN	NAME OF THIS TMATS FILE
IRIG 106 REVISION LEVEL	2	G\106 *R-CH10*	VERSION OF IRIG 106 STANDARD USED TO GENERATE THIS TMATS FILE
ORIGINATION DATE	10	G\OD	DATE OF ORIGINATION OF THIS MISSION CONFIGURATION. DD - DAY MM - MONTH YYYY – YEAR (MM-DD-YYYY)
REVISION NUMBER	4	G\RN	REVISION NUMBER ASSOCIATED WITH THIS MISSION CONFIGURATION
REVISION DATE	10	G\RD	DATE OF REVISION. DD - DAY MM - MONTH YYYY – YEAR (MM-DD-YYYY)
UPDATE NUMBER	2	G\UN	UPDATE NUMBER OF CURRENT CHANGE WHICH HAS NOT BEEN INCORPORATED AS A REVISION
UPDATE DATE	10	G\UD	DATE OF UPDATE. DD - DAY MM - MONTH YYYY – YEAR (MM-DD-YYYY)
TEST NUMBER	16	G\TN	TEST IDENTIFICATION
NUMBER OF POINTS OF CONTACT	1	G\POC\N	NUMBER OF POINTS OF CONTACT TO BE GIVEN

Table 9-1 (Continued). General Information Group (G) Page 2 x 3

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
POINT OF CONTACT: NAME AGENCY ADDRESS TELEPHONE	 24 48 48 20	 G\POC1-n G\POC2-n G\POC3-n G\POC4-n	LIST EACH OF THE RESPONSIBLE AGENCIES AND THEIR POINT OF CONTACT.
DATA SOURCE IDENTIFICATION			
NUMBER OF DATA SOURCES	2	G\DSI\N *R-CH10*	SPECIFY THE NUMBER OF DATA SOURCES: FOR RF TELEMETRY SYSTEMS, GIVE THE NUMBER OF CARRIERS; FOR TAPE OR STORAGE RECORDED DATA, IDENTIFY THE NUMBER OF TAPE OR STORAGE SOURCES.
DATA SOURCE ID	32	G\DSI-n *R-CH10*	PROVIDE A DESCRIPTIVE NAME FOR THIS SOURCE. EACH SOURCE IDENTIFIER MUST BE UNIQUE.
DATA SOURCE TYPE	3	G\DST-n *R-CH10*	SPECIFY THE TYPE OF SOURCE: RF - 'RF' TAPE - 'TAP' STORAGE - 'STO' DISTRIBUTED SOURCE – 'DSS' DIRECT SOURCE – 'DRS' REPRODUCER – 'REP' OTHER - 'OTH'
NOTE: PROVIDE THE ABOVE TWO ITEMS FOR EACH DATA SOURCE.			
TEST INFORMATION			
TEST DURATION	4	G\TI1	APPROXIMATE DURATION OF TEST IN HOURS.
PRE-TEST REQUIREMENT	1	G\TI2	INDICATE WHETHER A PRE-TEST REQUIREMENT IS APPLICABLE ('Y' OR 'N'). PROVIDE DETAILS IN COMMENTS RECORD.
POST-TEST REQUIREMENT	1	G\TI3	SPECIFY WHETHER A POST-TEST REQUIREMENT IS APPLICABLE ('Y' OR 'N'). PROVIDE DETAILS IN COMMENTS RECORD.

Table 9-1 (Continued). General Information Group (G) Page 3 x 3

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
SECURITY CLASSIFICATION	1	G\SC	PROVIDE THE CLASSIFICATION OF THE PROJECT DATA. PROVIDE A DESCRIPTION OF THE CLASSIFICATION GUIDE AND ANY INFORMATION CONCERNING DECLASSIFICATION AND/OR DOWNGRADING IN COMMENTS RECORD. UNCLASSIFIED - 'U' CONFIDENTIAL - 'C' SECRET - 'S' TOP SECRET - 'T' OTHER - 'O'
COMMENTS			
COMMENTS	1600	G\COM	PROVIDE THE ADDITIONAL INFORMATION REQUESTED OR ANY OTHER INFORMATION DESIRED.

9.5.3 Transmission Attributes (T). The Transmission Attributes are presented graphically in Figure 9-3 and specified in Table 9-2. The information contained within this group is used to set up the RF receiver through the detection and recovery of the baseband composite waveform. The format contains the information needed to configure the antenna and receiver subsystems.

Additional equipment inserted in a specific range configuration such as microwave or other relay is intended to be transparent to the user and is not described under Transmission Attributes.

Because the information is mutually exclusive, only the appropriate frequency modulation (FM) or phase modulation (PM) system data set is required for a link.

Transmission Attributes Group (T)	CODE NAME	REFERENCE PAGE
DATA SOURCE ID	(T-x\ID)	(9-13)
*SOURCE RF ATTRIBUTES		
TRANSMITTER ID	(T-x\TID)	
FREQUENCY	(T-x\RF1)	
RF BANDWIDTH	(T-x\RF2)	
DATA BANDWIDTH	(T-x\RF3)	
MODULATION TYPE	(T-x\RF4)	
TOTAL CARRIER MODULATION	(T-x\RF5)	
POWER (RADIATED)	(T-x\RF6)	
NUMBER OF SUBCARRIERS	(T-x\SCO\N)	(9-13)
SUBCARRIER NUMBER	(T-x\SCO1-n)	(9-14)
MODULATION INDEX	(T-x\SCO2-n)	
MODULATOR NON-LINEARITY	(T-x\RF7)	
*PREMODULATION FILTER		(9-14)
BANDWIDTH	(T-x\PMF1)	
SLOPE	(T-x\PMF2)	
TYPE	(T-x\PMF3)	
*TRANSMIT ANTENNA		(9-14)
TRANSMIT ANTENNA TYPE	(T-x\AN1)	
TRANSMIT POLARIZATION	(T-x\AN2)	
ANTENNA LOCATION	(T-x\AN3)	
*ANTENNA PATTERNS		(9-15)
DOCUMENT	(T-x\AP)	
*POINT OF CONTACT		
NAME	(T-x\AP\POC1)	
AGENCY	(T-x\AP\POC2)	
ADDRESS	(T-x\AP\POC3)	
TELEPHONE	(T-x\AP\POC4)	
*GROUND STATION ATTRIBUTES		(9-15)
IF BANDWIDTH	(T-x\GST1)	
BASEBAND COMPOSITE BANDWIDTH	(T-x\GST2)	
*GAIN CONTROL		(9-15)
AGC TIME CONSTANT	(T-x\GST3)	
OR		
MGC GAIN SET POINT	(T-x\GST4)	
AFC/APC	(T-x\GST5)	
TRACKING BANDWIDTH	(T-x\GST6)	
POLARIZATION RECEPTION	(T-x\GST7)	(9-16)
*FM SYSTEMS		(9-16)
OR DISCRIMINATOR BANDWIDTH	(T-x\FM1)	
DISCRIMINATOR LINEARITY	(T-x\FM2)	
*PM SYSTEMS		(9-16)
PHASE LOCK LOOP BANDWIDTH	(T-x\PLL)	
*COMMENTS		
COMMENTS	(T-x\COM)	(9-16)

*** Heading Only – No Data Entry**

Figure 9-3. Transmission Attributes Group (T).

TABLE 9-2. TRANSMISSION ATTRIBUTES GROUP (T)			
PARAMETER	**MAXIMUM FIELD SIZE**	**CODE NAME**	**DEFINITION**
DATA SOURCE ID	32	T-x\ID	DATA SOURCE ID CONSISTENT WITH GENERAL INFORMATION GROUP
SOURCE RF ATTRIBUTES			
TRANSMITTER ID	12	T-x\TID	TRANSMITTER IDENTIFICATION
FREQUENCY	6	T-x\RF1	CARRIER FREQUENCY, IN MHz. IF PROGRAMMABLE, ENTER 'P', AND DEFINE IN COMMENTS RECORD.
RF BANDWIDTH	6	T-x\RF2	TOTAL RF BANDWIDTH (-60 dB) OF MODULATED SIGNAL, IN MHz
DATA BANDWIDTH	6	T-x\RF3	COMPOSITE BASEBAND DATA BANDWIDTH (3 dB), IN kHz.
MODULATION TYPE	12	T-x\RF4	DEFINE THE MODULATION TYPE: 'FM' 'PM' 'BPSK' 'DPSK' 'QPSK' 'FQPSK-B' 'FQPSK-JR' 'SOQPSK-TG' 'MULTI-H CPM' 'OTHR'
TOTAL CARRIER MODULATION	6	T-x\RF5	FOR FM SYSTEM, DEFINE TOTAL CARRIER DEVIATION, PEAK-TO-PEAK, IN kHz. FOR PM SYSTEM, DEFINE TOTAL PHASE MODULATION, PEAK-TO-PEAK, IN RADIANS.
POWER (RADIATED)	4	T-x\RF6	TOTAL TRANSMITTED POWER WHEN MODULATED, IN WATTS
NUMBER OF SUBCARRIERS	2	T-x\ SCO\N	NUMBER OF SUBCARRIERS IN THE COMPOSITE BASEBAND WAVEFORM, n. IF NONE, ENTER 'NO'.

Table 9-2 (Continued). Transmission Attributes Group (T) Page 2 x 4

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
SUBCARRIER NUMBER	5	T-x\ SCO1-n	GIVE THE IRIG CHANNEL NUMBER FOR THE SUBCARRIER. IF NONSTANDARD SUBCARRIER, ENTER 'NO', AND ENTER FREQUENCY IN THE COMMENTS SECTION WHERE n IS AN IDENTIFICATION TAG FOR THE SUBCARRIER.
MODULATION INDEX	4	T-x\ SCO2-n	SPECIFY THE MODULATION INDEX FOR EACH SUBCARRIER IN THE COMPOSITE WAVEFORM, AS APPROPRIATE.
MODULATOR NONLINEARITY	4	T-x\RF7	MODULATOR NONLINEARITY, IN PERCENT
PREMODULATION FILTER			
BANDWIDTH	6	T-x\PMF1	PRE-MODULATION COMPOSITE FILTER BANDWIDTH, 3 dB CUT-OFF FREQUENCY, IN kHz
SLOPE	2	T-x\PMF2	PRE-MODULATION FILTER ASYMPTOTIC ROLL-OFF SLOPE, dB/OCTAVE
TYPE	2	T-x\PMF3	SPECIFY THE FILTER TYPE: CONSTANT AMPLITUDE - 'CA' CONSTANT DELAY - 'CD' OTHER - 'OT'
TRANSMIT ANTENNA			
TRANSMIT ANTENNA TYPE	16	T-x\AN1	TRANSMIT ANTENNA TYPE
TRANSMIT POLARIZATION	4	T-x\AN2	TRANSMIT ANTENNA POLARIZATION. 'RHCP' 'LHCP' LINEAR - 'LIN'
ANTENNA LOCATION	16	T-x\AN3	DESCRIBE THE ANTENNA LOCATION.

Table 9-2 (Continued). Transmission Attributes Group (T) Page 3 x 4

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
ANTENNA PATTERNS			
DOCUMENT	16	T-x\AP	IDENTIFY DOCUMENT HAVING ANTENNA PATTERNS.
POINT OF CONTACT: NAME AGENCY ADDRESS TELEPHONE	 24 48 48 20	 T-x\ AP\POC1 T-x\ AP\POC2 T-x\ AP\POC3 T-x\ AP\POC4	IDENTIFY THE POINT OF CONTACT FOR ADDITIONAL INFORMATION.
GROUND STATION ATTRIBUTES			
IF BANDWIDTH	6	T-x\GST1	DEFINE THE IF BANDWIDTH (3 dB) IN MHz.
BASEBAND COMPOSITE BANDWIDTH	6	T-x\GST2	DEFINE THE CUTOFF FREQUENCY (3 dB), OF THE OUTPUT FILTER, IN kHz.
GAIN CONTROL			
AGC TIME CONSTANT	4	T-x\GST3	SPECIFY THE AGC TIME CONSTANT DESIRED IN MILLISECONDS.
MGC GAIN SET POINT	6	T-x\GST4	PROVIDE THE MANUAL GAIN CONTROL SET POINT IN TERMS OF RECEIVED SIGNAL STRENGTH, dBm.
AFC/APC	3	T-x\GST5	SPECIFY AUTOMATIC FREQUENCY CONTROL (‘AFC’) OR AUTOMATIC PHASE CONTROL (‘APC’) OR NONE (‘NON’).
TRACKING BANDWIDTH	4	T-x\GST6	SPECIFY TRACKING LOOP BAND-WIDTH, IN Hz.

Table 9-2 (Continued). Transmission Attributes Group (T) Page 4 x 4

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
POLARIZATION RECEPTION	5	T-x\GST7	SPECIFY POLARIZATION TO BE USED: RHCP - 'RHCP' LHCP - 'LHCP' BOTH - 'BOTH' BOTH WITH DIVERSITY COMBINING: PRE-DETECTION-'B&DPR' POST-DETECTION-'B&DPO' DIVERSITY COMBINING (ONLY): PRE-DETECTION-'PRE-D' POST-DETECTION-'POS-D' OTHER - 'OTHER', SPECIFY IN COMMENTS.
FM SYSTEMS			
DISCRIMINATOR BANDWIDTH	4	T-x\FM1	SPECIFY THE DISCRIMINATOR BANDWIDTH REQUIRED, IN MHz.
DISCRIMINATOR LINEARITY	4	T-x\FM2	SPECIFY THE REQUIRED LINEARITY OVER THE BANDWIDTH SPECIFIED.
PM SYSTEMS			
PHASE LOCK LOOP BANDWIDTH	4	T-x\PLL	SPECIFY THE PHASE LOCKED LOOP BANDWIDTH.
COMMENTS			
COMMENTS	1600	T-x\COM	PROVIDE THE ADDITIONAL INFORMATION REQUESTED OR ANY OTHER INFORMATION DESIRED.

9.5.4 Recorder-Reproducer Attributes (R). This group describes the attributes required when the data source is a magnetic tape as specified in Appendix D or a data storage device as specified in Chapter 10. In the case of the tape data link identification, each data source must be identified. In some cases, the data source identification may be identical, particularly when the same information has been received from different receiver sites, on different polarizations, or on different carriers for redundancy purposes. Some of the information requested will be available only from the recording site or the dubbing location.

Figure 9-4 indicates the information required. Various categories of information have been included. In the data section of the attributes, it will be necessary to repeat the items until all of the data sources have been defined, including the multiple tracks, which contain ground station data of interest. Table 9-3 defines the information required. Any nonstandard tape recordings will require explanation in the comments and may require supplemental definition.

Recorder – Reproducer filtering and post process data filtering and overwrite will use TMATS attributes to describe the requirements. Recorder – Reproducer channel types that support filtering and overwrite will define these attributes. PCM channels will use R, P and D attributes and bus channels will use R and B attributes to define filtering and overwrite definitions.

Recorder-Reproducer Attributes Group (R)		CODE NAME	REFERENCE PAGE
DATA SOURCE ID		(R-x\ID)	(9-23)
	RECORDER-REPRODUCER ID	(R-x\RID)	(9-23)
	RECORDER-REPRODUCER DESCRIPTION	(R-x\R1)	
	*RECORDER-REPRODUCER MEDIA CHARACTERISTICS		(9-23)
	RECORDER-REPRODUCER MEDIA TYPE	(R-x\TC1)	
	RECORDER-REPRODUCER MEDIA MANUFACTURER	(R-x\TC2)	
	RECORDER-REPRODUCER MEDIA CODE	(R-x\TC3)	
	RECORDER-REPRODUCER MEDIA LOCATION	(R-x\RML)	
	EXTERNAL RMM BUS SPEED	(R-x\ERBS)	
	TAPE WIDTH	(R-x\TC4)	
	TAPE HOUSING	(R-x\TC5)	
	TYPE OF TRACKS	(R-x\TT)	
	NUMBER OF TRACKS/CHANNELS	(R-x\N)	
	RECORD SPEED	(R-x\TC6)	
	DATA PACKING DENSITY	(R-x\TC7)	
	TAPE REWOUND	(R-x\TC8)	
	NUMBER OF SOURCE BITS	(R-x\NSB)	
	*RECORDER-REPRODUCER INFORMATION		(9-24)
	RECORDER-REPRODUCER MANUFACTURER	(R-x\RI1)	
	RECORDER-REPRODUCER MODEL	(R-x\RI2)	
	ORIGINAL RECORDING	(R-x\RI3)	
	ORIGINAL RECORDING DATE AND TIME	(R-x\RI4)	
	*CREATING ORGANIZATION POINT OF CONTACT		(9-25)
	NAME	(R-x\POC1)	
	AGENCY	(R-x\POC2)	
	ADDRESS	(R-x\POC3)	
	TELEPHONE	(R-x\POC4)	
	DATE AND TIME OF COPY	(R-x\RI5)	
	*COPYING ORGANIZATION POINT OF CONTACT		(9-25)
	NAME	(R-x\DPOC1)	
	AGENCY	(R-x\DPOC2)	
	ADDRESS	(R-x\DPOC3)	
	TELEPHONE	(R-x\DPOC4)	
	POST PROCESS MODIFIED RECORDING	(R-x\RI6)	
	POST PROCESS MODIFICATION TYPE	(R-x\RI7)	
	DATE AND TIME OF MODIFICATION	(R-x\RI8)	
	*MODIFYING ORGANIZATION POINT OF CONTACT		
	NAME	(R-x\MPOC1)	
	AGENCY	(R-x\MPOC2)	
	ADDRESS	(R-x\MPOC3)	
	TELEPHONE	(R-x\MPOC4)	
	CONTINUOUS RECORDING ENABLED	(R-x\CRE)	
	RECORDER-REPRODUCER SETUP SOURCE	(R-x\RSS)	
	RECORDER SERIAL NUMBER	(R-x\RI9)	

Figure 9-4. Recorder-Reproducer Attributes Group (R). Page 1 x 5

RECORDER FIRMWARE REVISION	(R-x\RI10)	
NUMBER OF MODULES	(R-x\RIM\N)	
MODULE ID	(R-x\RIMI-n)	
MODULE SERIAL NUMBER	(R-x\RIMS-n)	
MODULE FIRMWARE REVISION	(R-x\RIMF-n)	
NUMBER OF RMM'S	(R-x\RMM\N)	
RMM IDENTIFIER	(R-x\RMMID-n)	
RMM SERIAL NUMBER	(R-x\RMMS-n)	
RMM FIRMWARE REVISION	(R-x\RMMF-n)	
*RECORDING EVENT DEFINITIONS		(9-27)
RECORDING EVENTS ENABLED	(R-x\EV\E)	
NUMBER OF RECORDING EVENTS	(R-x\EV\N)	
RECORDER INTERNAL EVENTS ENABLED	(R-x\EV\IEE)	
*RECORDING EVENT		(9-27)
EVENT ID	(R-x\EV\ID-n)	
EVENT DESCRIPTION	(R-x\EV\D-n)	
EVENT TYPE	(R-x\EV\T-n)	
EVENT PRIORITY	(R-x\EV\P-n)	(9-28)
EVENT CAPTURE MODE	(R-x\EV\CM-n)	
EVENT INITIAL CAPTURE	(R-x\EV\IC-n)	
RECORDING EVENT LIMIT COUNT	(R-x\EV\LC-n)	
EVENT TRIGGER MEASUREMENT SOURCE	(R-x\EV\MS-n)	
EVENT TRIGGER MEASUREMENT NAME	(R-x\EV\MN-n)	
*RECORDING INDEX		(9-29)
RECORDING INDEX ENABLED	(R-x\IDX\E)	
RECORDING INDEX TYPE	(R-x\IDX\IT)	
* TIME INDEX TYPE ATTRIBUTE		(9-29)
INDEX TIME VALUE	(R-x\IDX\ITV)	
OR		
* COUNT INDEX TYPE ATTRIBUTE		
INDEX COUNT VALUE	(R-x\IDX\ICV)	
*MIL-STD-1553 RECORDER CONTROL		(9-29)
MESSAGE MONITOR RECORD CONTROL ENABLED	(R-x\MRC\E)	
CHANNEL ID NUMBER	(R-x\MRC\ID)	
MESSAGE RECORD CONTROL TYPE	(R-x\MRC\RCT)	
STOP-PAUSE COMMAND WORD	(R-x\MRC\SPM)	
START-RESUME COMMAND WORD	(R-x\MRC\SRM)	
*DATA		
TRACK NUMBER/ CHANNEL ID	(R-x\TK1-n)	
RECORDING TECHNIQUE	(R-x\TK2-n)	
DATA SOURCE ID	(R-x\DSI-n)	(9-30)
DATA DIRECTION	(R-x\TK3-n)	(9-30)

Figure 9-4. Recorder-Reproducer Attributes Group (R). (Page 2 x 5)

RECORDER PHYSICAL CHANNEL NUMBER			(R-x\TK4-n)	
CHANNEL ENABLE			(R-x\CHE-n)	
CHANNEL DATA TYPE			(R-x\CDT-n)	
CHANNEL DATA LINK NAME			(R-x\CDLN-n)	
*DATA TYPE ATTRIBUTES				
	*PCM DATA TYPE ATTRIBUTES			(9-31)
		PCM DATA TYPE FORMAT	(R-x\PDTF-n)	
		DATA PACKING OPTION	(R-x\PDP-n)	
		INPUT CLOCK EDGE	(R-x\ICE-n)	
		INPUT SIGNAL TYPE	(R-x\IST-n)	
		INPUT THRESHOLD	(R-x\ITH-n)	
		INPUT TERMINATION	(R-x\ITM-n)	
	OR	PCM VIDEO TYPE FORMAT	(R-x\PTF-n)	
		PCM RECORDER-REPRODUCER MINOR FRAME FILTERING ENABLED	(R-x\MFF\E-n)	
		PCM POST PROCESS OVERWRITE AND FILTERING ENABLED	(R-x\POF\E-n)	
		PCM POST PROCESS OVERWRITE AND FILTERING TYPE	(R-x\POF\T-n)	
	*MIL-STD-1553 BUS DATA TYPE ATTRIBUTES			(9-33)
		MIL-STD-1553 BUS DATA TYPE FORMAT	(R-x\BTF-n)	
	OR	MIL-STD-1553 RECORDER – REPRODUCER FILTERING ENABLED	(R-x\MRF\E-n)	
		MIL-STD-1553 POST PROCESS OVERWRITE AND FILTERING ENABLED	(R-x\MOF\T-n)	
		MIL-STD-1553 MESSAGE FILTERING DEFINITION TYPE	(R-x\MFD\FDT-n)	
		NUMBER OF MESSAGE FILTERING DEFINITIONS	(R-x\MFD\N-n)	
		MESSAGE TYPE	(R-x\MFD\MT-n-m)	
		REMOTE TERMINAL ADDRESS	(R-x\MFD\TRA-n-m)	
		TRANSMIT/RECEIVE MODE	(R-x\MFD\TRM-n-m)	
		SUBTERMINAL ADDRESS	(R-x\MFD\STA-n-m)	
		DATA WORD COUNT/MODE CODE	(R-x\MFD\DWC-n-m)	
		RT/RT REMOTE TERMINAL ADDRESS	(R-x\MFD\RTRA-n-m)	
		RT/RT SUBTERMINAL ADDRESS	(R-x\MFD\RSTA-n-m)	
		RT/RT DATA WORD COUNT	(R-x\MFD\RDWC-n-m)	
	*ANALOG DATA TYPE ATTRIBUTES			(9-34)
		ANALOG DATA TYPE FORMAT	(R-x\ATF-n)	
		NUMBER OF ANALOG CHANNELS/PKT	(R-x\ACH\N-n)	
		DATA PACKING OPTION	(R-x\ADP-n)	
		SAMPLE RATE	(R-x\ASR-n)	
		MEASUREMENT NAME	(R-x\AMN-n-m)	(9-35)

Figure 9-4. Recorder-Reproducer Attributes Group (R). Page 3 x 5

	DATA LENGTH	(R-x\ADL-n-m)	
	BIT MASK	(R-x\AMSK-n-m)	
	MEASUREMENT TRANSFER ORDER	(R-x\AMTO-n-m)	
	SAMPLE FACTOR	(R-x\ASF-n-m)	
	SAMPLE FILTER 3DB BANDWIDTH	(R-x\ASBW-n-m)	
	AC/DC COUPLING	(R-x\ACP-n-m)	
	RECORDER INPUT IMPEDANCE	(R-x\AII-n-m)	
	INPUT CHANNEL GAIN	(R-x\AGI-n-m)	
	INPUT FULL SCALE RANGE	(R-x\AFSI-n-m)	
	INPUT OFFSET VOLTAGE	(R-x\AOVI-n-m)	
	INPUT TYPE	(R-x\AIT-n-m)	
	AUDIO	(R-x\AV-n-m)	
OR	AUDIO FORMAT	(R-x\AVF-n-m)	
*DISCRETE DATA TYPE ATTRIBUTES			(9-36)
	DISCRETE DATA TYPE FORMAT	(R-x\DTF-n)	
	DISCRETE MODE	(R-x\DMOD-n)	
	SAMPLE RATE	(R-x\DSR-n)	
	NUMBER OF DISCRETE MEASUREMENTS	(R-x\NDM\N-n)	
	MEASUREMENT NAME	(R-x\DMN-n-m)	
	BIT MASK	(R-x\DMSK-n-m)	
OR	MEASUREMENT TRANSFER ORDER	(R-x\DMTO-n-m)	
*ARINC 429 BUS DATA TYPE ATTRIBUTES			(9-37)
	ARINC 429 BUS DATA TYPE FORMAT	(R-x\ABTF-n)	
	NUMBER OF ARINC 429 SUB-CHANNELS	(R-x\NAS\N-n)	
	ARINC 429 SUB-CHANNEL NUMBER	(R-x\ASN-n-m)	
OR	ARINC 429 SUB-CHANNEL NAME	(R-x\ANM-n-m)	
*VIDEO DATA TYPE ATTRIBUTES			(9-37)
	VIDEO DATA TYPE FORMAT	(R-x\VTF-n)	
	MPEG-2 CHANNEL XON2 FORMAT	(R-x\VXF-n)	
	VIDEO SIGNAL TYPE	(R-x\VST-n)	
	VIDEO SIGNAL FORMAT TYPE	(R-x\VSF-n)	
	VIDEO CONSTANT BIT RATE	(R-x\CBR-n)	
	VIDEO VARIABLE PEAK BIT RATE	(R-x\VBR-n)	
OR	VIDEO ENCODING DELAY	(R-x\VED-n)	
	OVERLAY ENABLED	(R-x\VCO\OE-n)	
	OVERLAY X POSITION	(R-x\VCO\X-n)	
	OVERLAY Y POSITION	(R-x\VCO\Y-n)	
	OVERLAY EVENT TOGGLE ENABLED	(R-x\VCO\OET-n)	
	OVERLAY FORMAT	(R-x\VCO\OLF-n)	
	OVERLAY BACKGROUND	(R-x\VCO\OBG-n)	
	ANALOG AUDIO CHANNEL INPUT LEFT	(R-x\ASI\ASL-n)	
	ANALOG AUDIO CHANNEL INPUT RIGHT	(R-x\ASI\ASR-n)	
	VIDEO DATA ALIGNMENT	(R-x\VDA-n)	

Figure 9-4. Recorder-Reproducer Attributes Group (R). Page 4 x 5

*TIME DATA TYPE ATTRIBUTES		(9-39)
TIME DATA TYPE FORMAT	(R-x\TTF-n)	
TIME FORMAT	(R-x\TFMT-n)	
OR TIME SOURCE	(R-x\TSRC-n)	
*IMAGE DATA TYPE ATTRIBUTES		(9-40)
IMAGE DATA TYPE FORMAT	(R-x\ITF-n)	
OR STILL IMAGE TYPE	(R-x\SIT-n)	
*UART DATA TYPE ATTRIBUTES		(9-40)
UART DATA TYPE FORMAT	(R-x\UTF-n)	
NUMBER OF UART SUB-CHANNELS	(R-x\NUS\N-n)	
UART SUB-CHANNEL NUMBER	(R-x\USCN-n-m)	
OR UART SUB-CHANNEL NAME	(R-x\UCNM-n-m)	
UART SUB-CHANNEL BAUD RATE	(R-x\UCR-n-m)	
UART SUB-CHANNEL BITS PER WORD	(R-x\UCB-n-m)	
UART SUB-CHANNEL PARITY	(R-x\UCP-n-m)	
UART SUB-CHANNEL STOP BIT	(R-x\UCS-n-m)	
UART SUB-CHANNEL INTERFACE	(R-x\UCIN-n-m)	
UART SUB-CHANNEL BLOCK SIZE	(R-x\UCBS-n-m)	
UART SUB-CHANNEL SYNC WORD LENGTH	(R-x\UCSL-n-m)	
UART SUB-CHANNEL BLOCK SYNC VALUE	(R-x\UCSV-n-m)	
UART SUB-CHANNEL BLOCK RATE	(R-x\UCBR-n-m)	
*MESSAGE DATA TYPE ATTRIBUTES		(9-41)
MESSAGE DATA TYPE FORMAT	(R-x\MTF-n)	
NUMBER OF MESSAGE SUB-CHANNELS	(R-x\NMS\N-n)	
MESSAGE SUB-CHANNEL NUMBER	(R-x\MSCN-n-m)	
OR MESSAGE SUB-CHANNEL NAME	(R-x\MCNM-n-m)	
*IEEE-1394 DATA TYPE ATTRIBUTES		(9-42)
OR IEEE-1394 DATA TYPE FORMAT	(R-x\IETF-n)	
*PARALLEL DATA TYPE ATTRIBUTES		(9-42)
OR PARALLEL DATA TYPE FORMAT	(R-x\PLTF-n)	
*ETHERNET DATA TYPE ATTRIBUTES		(9-42)
ETHERNET DATA TYPE FORMAT	(R-x\ENTF-n)	
NUMBER OF ETHERNET NETWORKS	(R-x\NNET\N-n)	
ETHERNET NETWORK NUMBER	(R-x\ENBR-n-m)	
ETHERNET NETWORK NAME	(R-x\ENAM-n-m)	
*REFERENCE TRACK		(9-42)
NUMBER OF REFERENCE TRACKS	(R-x\RT\N)	
TRACK NUMBER	(R-x\RT1-n)	
REFERENCE FREQUENCY	(R-x\RT2-n)	
*COMMENTS		
COMMENTS	(R-x\COM)	(9-43)

*Heading Only - No Data Entry

Figure 9-4. Recorder-Reproducer Attributes Group (R). (Page 5 x 5)

TABLE 9-3. RECORDER-REPRODUCER ATTRIBUTES GROUP (R)

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
DATA SOURCE ID	32	R-x\ID *R-CH10*	DATA SOURCE ID CONSISTENT WITH GENERAL INFORMATION GROUP
RECORDER-REPRODUCER ID	32	R-x\RID *R-CH10*	RECORDER-REPRODUCER IDENTIFICATION
RECORDER-REPRODUCER DESCRIPTION	32	R-x\R1	RECORDER-REPRODUCER DESCRIPTION
RECORDER-REPRODUCER MEDIA CHARACTERISTICS			
RECORDER-REPRODUCER MEDIA TYPE	4	R-x\TC1	SPECIFY THE RECORDER-REPRODUCER MEDIA TYPE: ANALOG - 'ANAL' CASSETTE - 'CASS' HDDR - 'HDDR' PARALLEL - 'PARA' SOLID STATE RECORDER - 'SSR' MAGNETIC DISK - 'MD' NONE – 'N', DATA PUBLISHING ONLY OTHER - 'OTHR', DEFINE IN COMMENTS RECORD.
RECORDER-REPRODUCER MEDIA MANUFACTURER	8	R-x\TC2	NAME OF MANUFACTURER OF THE RECORDER-REPRODUCER MEDIA
RECORDER-REPRODUCER MEDIA CODE	8	R-x\TC3	SPECIFY MANUFACTURER'S RECORDER-REPRODUCER MEDIA DESIGNATION CODE.
RECORDER – REPRODUCER MEDIA LOCATION	1	R-x\RRML *R-CH10*	INDICATES THE LOCATION OF THE RECORDER-REPRODUCER MEDIA. 'I' = INTERNAL, 'E' = EXTERNAL, 'B' = BOTH INTERNAL AND EXTERNAL
EXTERNAL RMM BUS SPEED	5	R-x\ERBS *R-CH10*	INDICATES THE SPEED OF AN EXTERNAL RMM IEEE-1394B BUS. "AUTO" "S100" "S200" "S400" "S800" "S1600" "S3200"

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 2 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
TAPE WIDTH	4	R-x\TC4	PHYSICAL DIMENSION OF TAPE WIDTH, IN INCHES
TAPE HOUSING	5	R-x\TC5	STATE THE REEL SIZE, INCHES: '10.5' '14.0' '15.0' '16.0' 'OTHER' STATE THE CASSETTE SIZE, MM: '12.65' '19.0' 'OTHER'
TYPE OF TRACKS	2	R-x\TT	STATE THE TYPE OF TRACKS ON THE TAPE: LONGITUDINAL - 'LO' ROTARY - 'RO'
NUMBER OF TRACKS/ CHANNELS	5	R-x\N *R-CH10*	STATE THE NUMBER OF TRACKS ON THE TAPE OR THE NUMBER OF CHANNELS ON THE STORAGE MEDIA.
RECORD SPEED	4	R-x\TC6	STATE RECORD SPEED (inches/second).
DATA PACKING DENSITY	2	R-x\TC7	STATE RECORDING SYSTEM BANDWIDTH: INTERMEDIATE BAND - 'IM' WIDE BAND - 'WB' DOUBLE DENSITY - 'DD' OTHER - 'OT'
TAPE REWOUND	1	R-x\TC8	YES - 'Y' NO - 'N'
NUMBER OF SOURCE BITS	2	R-x\NSB *R-CH10*	NUMBER OF MOST SIGNIFICANT BITS OF THE CHANNEL ID USED FOR MULTIPLEXER SOURCE ID. DEFAULT IS ZERO (ONE SOURCE).
RECORDER-REPRODUCER INFORMATION			
RECORDER-REPRODUCER MANUFACTURER	8	R-x\RI1	NAME OF RECORDER-REPRODUCER DEVICE MANUFACTURER
RECORDER-REPRODUCER MODEL	8	R-x\RI2	MANUFACTURER'S MODEL NUMBER OF RECORDER-REPRODUCER DEVICE USED TO CREATE THE RECORDING
ORIGINAL RECORDING	1	R-x\RI3 *R-CH10*	INDICATES IF THIS IS AN ORIGINAL RECORDING FROM THE SOURCE YES - 'Y' NO - 'N'

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 3 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
ORIGINAL RECORDING DATE AND TIME	19	R-x\RI4	DATE AND TIME ORIGINAL RECORDING WAS CREATED: DD - DAY MM - MONTH YYYY - YEAR HH - HOUR MI – MINUTE SS - SECOND (MM-DD-YYYY-HH-MI-SS)
CREATING ORGANIZATION POC: NAME AGENCY ADDRESS TELEPHONE	 24 48 48 20	 R-x\POC1 R-x\POC2 R-x\POC3 R-x\POC4	POINT OF CONTACT AT THE FACILITY CREATING THE TAPE OR STORAGE MEDIA: NAME, AGENCY, ADDRESS, AND TELEPHONE
DATE AND TIME OF COPY	19	R-x\RI5 *RO-CH10*	DATE AND TIME THE COPY WAS MADE: DD – DAY MM – MONTH YYYY – YEAR HH – HOUR MI – MINUTE SS - SECOND (MM-DD-YYYY-HH-MI-SS)
COPYING ORGANIZATION POC: NAME AGENCY ADDRESS TELEPHONE	 24 48 48 20	 R-x\DPOC1 R-x\DPOC2 R-x\DPOC3 R-x\DPOC4	POINT OF CONTACT AT THE COPYING AGENCY: NAME, ADDRESS, AND TELEPHONE
POST PROCESS MODIFIED RECORDING	1	R-x\RI6 *R-CH10*	INDICATES MODIFIED RECORDING YES - ‘Y’, NO - ‘N’
POST PROCESS MODIFICATION TYPE	2	R-x\RI7 *R-CH10*	INDICATES THE TYPE OF POST PROCESS MODIFICATION TO THE RECORDING ‘1’ = TIME SUBSET ‘2’ = CHANNEL SUBSET ‘3’ = TIME - CHANNEL SUBSET ‘4’ = CHANNEL SUPERSET ‘5’ = TIME SUBSET - CHANNEL SUPERSET ‘6’ = FILTER ‘7’ = OVERWRITE

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 4 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
DATE AND TIME OF MODIFICATION	19	R-x\RI8 *RO-CH10*	DATE AND TIME THE COPY WAS MADE: DD – DAY MM – MONTH YYYY – YEAR HH – HOUR MI – MINUTE SS – SECOND (MM-DD-YYYY-HH-MI-SS)
MODIFYING ORGANIZATION POC: NAME AGENCY ADDRESS TELEPHONE	 24 48 48 20	 R-x\MPOC1 R-x\MPOC2 R-x\MPOC3 R-x\MPOC4	POINT OF CONTACT AT THE MODIFYING AGENCY: NAME, ADDRESS, AND TELEPHONE
CONTINUOUS RECORDING ENABLED	1	R-x\CRE *R-CH10*	INDICATES IF CONTINUOUS RECORDING IS ENABLED. 'T' = TRUE, 'F' = FALSE
RECORDER – REPRODUCER SETUP SOURCE	2	R-x\RSS *R-CH10*	INDICATES THE RECORDER-REPRODUCER SETUP SOURCE. 'R' = SETUP FILE ON RMM ONLY 'C' = COMMAND SETUP FILE ONLY 'RP' = RMM PRIMARY – COMMAND SECONDARY 'CP' = COMMAND PRIMARY – RMM SECONDARY
RECORDER SERIAL NUMBER	64	R-x\RI9	SERIAL NUMBER OF THE RECORDER
RECORDER FIRMWARE REVISION	256	R-x\RI10	FIRMWARE REVISION NUMBER FOR THE RECORDER
NUMBER OF MODULES	3	R-x\RIM\N	NUMBER OF MODULES IN THE RECORDER
MODULE ID	64	R-x\RIMI-n	IDENTIFY THIS MODULE

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R)			Page 5 x 21
PARAMETER	**MAX FIELD SIZE**	**CODE NAME**	**DEFINITION**
MODULE SERIAL NUMBER	64	R-x\RIMS-n	SERIAL NUMBER OF THIS MODULE
MODULE FIRMWARE REVISION	256	R-x\RIMF-n	FIRMWARE REVISION NUMBER FOR THIS MODULE
NUMBER OF RMM'S	2	R-x\RMM\N	NUMBER OF REMOVABLE MEMORY MODULES (RMM)
RMM IDENTIFIER	64	R-x\RMMID-n	IDENTIFY THIS RMM
RMM SERIAL NUMBER	64	R-x\RMMS-n	SERIAL NUMBER OF THE RMM
RMM FIRMWARE REVISION	256	R-x\RMMF-n	FIRMWARE REVISION NUMBER OF THE RMM
RECORDING EVENT DEFINITIONS			
RECORDING EVENTS ENABLED	1	R-x\EV\E *RO-CH10*	INDICATES IF EVENTS ARE ENABLED. EVENTS MUST BE ENABLED TO GENERATE EVENT PACKETS. 'T' = TRUE, 'F' = FALSE
NUMBER OF RECORDING EVENTS	3	R-x\EV\N *RO-CH10*	SPECIFY THE NUMBER OF INDIVIDUAL RECORDING EVENT TYPES
RECORDER INTERNAL EVENTS ENABLED	1	R-x\EV\IEE *RO-CH10*	INDICATES IF RECORDER INTERNAL EVENTS ARE ENABLED. 'T' = TRUE, 'F' = FALSE
RECORDING EVENT			
EVENT ID	32	R-x\EV\ID-n *RO-CH10*	IDENTIFY THE NAME OF THE INDIVIDUAL RECORDING EVENT
EVENT DESCRIPTION	256	R-x\EV\D-n *RO-CH10*	IDENTIFY THE DESCRIPTION OF THE EVENT

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 6 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
EVENT TYPE	1	R-x\EV\T-n *RO-CH10*	INDICATE THE RECORDING EVENT TYPE EXTERNAL – 'E' MEASUREMENT DISCRETE – 'D' MEASUREMENT LIMIT – 'L' RECORDER – 'R' OTHER – 'O'
EVENT PRIORITY	1	R-x\EV\P-n *RO-CH10*	INDICATE THE RECORDING EVENT PRIORITY PRIORITY 1 – '1' PRIORITY 2 – '2' PRIORITY 3 – '3' PRIORITY 4 – '4' PRIORITY 5 – '5'
EVENT CAPTURE MODE	1	R-x\EV\CM-n *RO-CH10*	INDICATE THE RECORDING EVENT CAPTURE MODE MODE 1 – '1' MODE 2 – '2' MODE 3 – '3' MODE 4 – '4' MODE 5 – '5' MODE 6 – '6'
EVENT INITIAL CAPTURE	1	R-x\EV\IC-n *RO-CH10*	INDICATES IF INITIAL CAPTURE OF EVENT IS ENABLED. 'T' = TRUE, 'F' = FALSE
RECORDING EVENT LIMIT COUNT	8	R-x\EV\LC-n *RO-CH10*	SPECIFY THE LIMIT COUNT FOR THE INDIVIDUAL RECORDING EVENT
EVENT TRIGGER MEASUREMENT SOURCE	32	R-x\EV\MS-n *RO-CH10*	IDENTIFY THE DATA LINK NAME CONSISTENT WITH THE MUX/MOD GROUP WHICH CONTAINS THE EVENT TRIGGER MEASUREMENT IF EVENT TYPE IS 'D' OR 'L'
EVENT TRIGGER MEASUREMENT NAME	32	R-x\EV\MN-n *RO-CH10*	IDENTIFY THE EVENT TRIGGER MEASURAND NAME IF THE EVENT TYPE IS 'D' OR 'L'

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 7 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
RECORDING INDEX			
RECORDING INDEX ENABLED	1	R-x\IDX\E *RO-CH10*	INDICATES IF INDEX IS ENABLED. INDEX MUST BE ENABLED TO GENERATE INDEX PACKETS. 'T' = TRUE, 'F' = FALSE
RECORDING INDEX TYPE	1	R-x\IDX\IT *RO-CH10*	TIME – 'T' COUNT – 'C'
TIME INDEX TYPE ATTRIBUTE			
INDEX TIME VALUE	8	R-\IDX\ITV *RO-CH10*	IDENTIFY THE NUMBER OF MICROSECONDS FOR EACH INDEX ENTRY GENERATION
COUNT INDEX TYPE ATTRIBUTE			
INDEX COUNT VALUE	4	R-\IDX\ICV *RO-CH10*	IDENTIFY THE NUMBER OF PACKETS FOR EACH INDEX ENTRY GENERATION
MIL-STD-1553 RECORDER CONTROL			
MESSAGE MONITOR RECORD CONTROL ENABLED	1	R-x\MRC\E	INDICATES IF MESSAGE MONITOR RECORD CONTROL IS ENABLED. 'T' = TRUE, 'F' = FALSE
CHANNEL ID NUMBER	5	R-x\MRC\ID	SPECIFY THE MIL-STD-1553 CHANNEL ID THAT CONTAINS THE RECORD CONTROL MESSAGE
MESSAGE RECORD CONTROL TYPE	2	R-x\MRC\RCT	SPECIFY THE MIL-STD-1553 MESSAGE MONITOR RECORD CONTROL TYPE "0" = STOP-START "1" = PAUSE-RESUME
STOP-PAUSE COMMAND WORD	4	R-x\MRC\SPM	SPECIFY THE COMMAND WORD OF THE MIL-STD-1553 MESSAGE TO BE USED FOR STOP-PAUSE IN HEXADECIMAL FORMAT

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 8 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
START-RESUME COMMAND WORD	4	R-x\MRC\SRM	SPECIFY THE COMMAND WORD OF THE MIL-STD-1553 MESSAGE TO BE USED FOR START-RESUME IN HEXADECIMAL FORMAT
DATA			
NOTE: Define information contained on each track of the tape or each channel of the storage media.			
TRACK NUMBER/ CHANNEL ID	5	R-x\TK1-n *R-CH10*	SPECIFY THE TRACK NUMBER OR THE CHANNEL ID THAT CONTAINS THE DATA TO BE SPECIFIED.
RECORDING TECHNIQUE	6	R-x\TK2-n	SPECIFY THE RECORDING TECHNIQUE USED FOR THIS TRACK: FM/FM - 'FM/FM' HDDR - 'HDDR' PRE-DETECTION - 'PRE-D' DIRECT - 'DIRECT' FM-WIDE BAND GRP I - 'FMWBI' FM-WIDE BAND GRP II - 'FMWBII' FM-INTERMEDIATE BAND - FM-IM' FM-NARROW BAND - 'FM-NB' DOUBLE DENSITY - 'DOUDEN' ROTARY (SINGLE TRACK) - 'RO-K' ROTARY (MULTIPLEXED) - 'RO-MUX' SOLID STATE - 'SSR' OTHER - 'OTHER'
DATA SOURCE ID	32	R-x\DSI-n *R-CH10*	SPECIFY THE DATA SOURCE IDENTIFICATION. FOR A SITE RECORDED MULTIPLEXED TRACK, PROVIDE A DATA SOURCE IDENTIFICATION.
DATA DIRECTION	3	R-x\TK3-n	FORWARD - 'FWD' REVERSE - 'REV'
RECORDER PHYSICAL CHANNEL NUMBER	2	R-x\TK4-n *R-CH10*	SPECIFY THE RECORDER PHYSICAL CHANNEL FOR THE CHANNEL ID (TK1).

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 9 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
CHANNEL ENABLE	1	R-x\CHE-n *R-CH10*	INDICATES IF SOURCE IS ENABLED. SOURCE MUST BE ENABLED TO GENERATE DATA PACKETS. 'T' = TRUE, 'F' = FALSE
CHANNEL DATA TYPE	6	R-x\CDT-n *R-CH10*	SPECIFY THE TYPE OF SOURCE IF 'STO' WAS SPECIFIED IN G GROUP DATA SOURCE TYPE: PCM INPUT – 'PCMIN' ANALOG INPUT – 'ANAIN' DISCRETE INPUT – 'DISIN' IRIG TIME INPUT – 'TIMEIN' VIDEO INPUT – 'VIDIN', UART INPUT – 'UARTIN' 1553 INPUT – '1553IN', ARINC 429 INPUT – '429IN' MESSAGE DATA INPUT – 'MSGIN' IMAGE DATA INPUT – 'IMGIN' IEEE-1394 INPUT – '1394IN' PARALLEL INPUT – 'PARIN' ETHERNET INPUT – 'ETHIN'
CHANNEL DATA LINK NAME	32	R-x\CDLN-n *R-CH10*	IDENTIFY THE DATA LINK NAME CONSISTENT WITH THE MUX/MOD GROUP FOR THE CHANNEL.
DATA TYPE ATTRIBUTES			
PCM DATA TYPE ATTRIBUTES			
PCM DATA TYPE FORMAT	1	R-x\PDTF-n *RO-CH10*	PCM DATA TYPE FORMAT: FORMAT 0 (RESERVED) – '0' FORMAT 1 (IRIG 106 CH 4/8) – '1'
DATA PACKING OPTION	3	R-x\PDP-n *RO-CH10*	HOW DATA IS PLACED IN THE PACKETS: UNPACKED – 'UN' PACKED WITH FRAME SYNC – 'PFS' THROUGHPUT MODE – 'TM'
INPUT CLOCK EDGE	3	R-x\ICE-n *RO-CH10*	SPECIFIES THE INPUT CLOCK EDGE RELATIVE TO THE DATA IN DEGREES: 0 DEGREES – '0' 180 DEGREES – '180'

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 10 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
INPUT SIGNAL TYPE	5	R-x\IST-n *RO-CH10*	TYPE OF INPUT SIGNAL: SINGLE ENDED – 'SE' DIFFERENTIAL – 'DIFF' RS-422 STANDARD DIFFERENTIAL – 'RS422' SINGLE ENDED WITH TTL – 'TTL'
INPUT THRESHOLD	5	R-x\ITH-n *RO-CH10*	SPECIFIES THE INPUT THRESHOLD LEVEL FOR SELECTABLE ELECTRICAL INTERFACE. THE VALUE IS THE THRESHOLD LEVEL IN VOLTS.
INPUT TERMINATION	6	R-x\ITM-n *RO-CH10*	SPECIFIES THE INPUT TERMINATION IF SELECTABLE: 'LOW-Z' or 'HIGH-Z'.
PCM VIDEO TYPE FORMAT	5	R-x\PTF-n *RO-CH10*	COMPRESSION TECHNIQUE FOR VIDEO RECORDED AS STANDARD CHAPTER 4 PCM. THE COMPRESSED DATA IS ENCAPSULATED IN ISO STANDARD TRANSPORT STREAM (TS) FRAMES. IF TYPE FORMAT IS 'OTHER', THEN A VENDOR SPEC IS REQUIRED TO IDENTIFY THE DATA COMPRESSION TECHNIQUE. SPECIFY 'NONE' IF DATA IS NOT VIDEO DATA. 'NONE' 'MPEG1' 'MPEG2' 'H261' 'WAVE' 'OTHER'
PCM RECORDER – REPRODUCER MINOR FRAME FILTERING ENABLED	1	R-x\MFF\E-n *RO-CH10*	INDICATES IF RECORDER – REPRODUCER MINOR FRAME FILTERING IS ENABLED FOR THE PCM CHANNEL: 'T' = TRUE, 'F' = FALSE (NOT APPLICABLE FOR THROUGHPUT MODE PCM CHANNELS)
PCM POST PROCESS OVERWRITE AND FILTERING ENABLED	1	R-x\POF\E-n *RO-CH10*	INDICATES IF POST PROCESS OVERWRITE AND FILTERING IS ENABLED FOR THE PCM CHANNEL: 'T' = TRUE, 'F' = FALSE

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 11 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
PCM POST PROCESS OVERWRITE AND FILTERING TYPE	2	R-x\POF\T-n *RO-CH10*	INDICATES THE TYPE OF POST PROCESS OVERWRITE AND FILTERING FOR THE PCM CHANNEL: 'MF' = MINOR FRAME 'SM' = SELECTED MEASUREMENT 'B' = BOTH
MIL-STD-1553 BUS DATA TYPE ATTRIBUTES			
MIL-STD-1553 BUS DATA TYPE FORMAT	1	R-x\BTF-n *RO-CH10*	MIL-STD-1553 BUS DATA TYPE FORMAT: FORMAT 0 (RESERVED) – '0' FORMAT 1 (MIL-STD-1553B DATA) – '1' FORMAT 2 (16PP194 BUS) – '2'
MIL-STD-1553 RECORDER – REPRODUCER FILTERING ENABLED	1	R-x\MRF\E-n *RO-CH10*	INDICATES IF RECORDER – REPRODUCER FILTERING IS ENABLED FOR THE MIL-STD-1553 CHANNEL: 'T' = TRUE, 'F' = FALSE
MIL-STD-1553 POST PROCESS OVERWRITE AND FILTERING ENABLED	1	R-x\MOF\T-n *RO-CH10*	INDICATES IF POST PROCESS OVERWRITE AND FILTERING IS ENABLED FOR THE MIL-STD-1553 CHANNEL: 'T' = TRUE, 'F' = FALSE
MIL-STD-1553 MESSAGE FILTERING DEFINITION TYPE	2	R-x\MFD\ FDT-n	SPECIFY THE MESSAGE FILTERING DEFINITION TYPE. "IN" = INCLUSIVE FILTERING "EX" = EXCLUSIVE FILTERING
NUMBER OF MESSAGE FILTERING DEFINITIONS	2	R-x\MFD\N-n	SPECIFY THE NUMBER OF MESSAGE FILTERING DEFINITIONS.
MESSAGE TYPE	4	R-x\MFD\ MT-n-m	SPECIFY THE MESSAGE TYPE RT/RT – 'RTRT' RT/BC – 'RTBC' BC/RT – 'BCRT' MODE CODE – 'MC'

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 12 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
REMOTE TERMINAL ADDRESS	5	R-x\MFD\ TRA-n-m	SPECIFY THE FIVE BIT REMOTE TERMINAL ADDRESS FOR THIS MESSAGE. USE 'X' TO INDICATE A "DON'T CARE" VALUE.
TRANSMIT/ RECEIVE MODE	1	R-x\MFD\ TRM-n-m	INDICATE IF THIS COMMAND WORD IS A TRANSMIT OR RECEIVE COMMAND. FOR RT/RT, SPECIFY TRANSMIT. TRANSMIT – '1' RECEIVE – '0'
SUBTERMINAL ADDRESS	5	R-x\MFD\ STA-n-m	SPECIFY THE FIVE BIT SUBTERMINAL ADDRESS FOR THIS MESSAGE. USE 'X' TO INDICATE A "DON'T CARE" VALUE.
DATA WORD COUNT/MODE CODE	5	R-x\MFD\ DWC-n-m	ENTER THE NUMBER OF DATA WORDS AS A BINARY STRING, USING 'X' TO INDICATE A "DON'T CARE" VALUE. IF THE SUBTERMINAL ADDRESS INDICATES A MODE CODE, ENTER THE MODE CODE VALUE AS A BINARY STRING.
RT/RT REMOTE TERMINAL ADDRESS	5	R-x\MFD\ RTRA-n-m	SPECIFY THE FIVE BIT REMOTE TERMINAL ADDRESS FOR THIS RT/RT MESSAGE.
RT/RT SUBTERMINAL ADDRESS	5	R-x\MFD\ RSTA-n-m	SPECIFY THE FIVE BIT SUBTERMINAL ADDRESS FOR THIS RT/RT MESSAGE. USE 'X' TO INDICATE A "DON'T CARE" VALUE.
RT/RT DATA WORD COUNT	5	R-x\MFD\ RDWC-n-m	ENTER THE NUMBER OF DATA WORDS AS A BINARY STRING, USING 'X' TO INDICATE A "DON'T CARE" VALUE. EXCLUDE STATUS AND TIME WORDS (AN RT/RT MESSAGE CANNOT CONTAIN A MODE CODE).
ANALOG DATA TYPE ATTRIBUTES			
ANALOG DATA TYPE FORMAT	1	R-x\ATF-n *RO-CH10*	ANALOG DATA TYPE FORMAT: FORMAT 0 (RESERVED) – '0' FORMAT 1 (ANALOG DATA) – '1'

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 13 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
NUMBER OF ANALOG CHANNELS/PKT	3	R-x\ACH\N-n *RO-CH10*	SPECIFY THE NUMBER OF ANALOG CHANNELS PER PACKET.
DATA PACKING OPTION	3	R-x\ADP-n *RO-CH10*	HOW DATA IS PLACED IN THE PACKETS: PACKED – 'YES' UNPACKED – 'NO'
SAMPLE RATE	7	R-x\ASR-n *RO-CH10*	SAMPLE RATE OF THE FASTEST CHANNEL (S) IN SAMPLES PER SECOND
MEASUREMENT NAME	32	R-x\AMN-n-m *RO-CH10*	IDENTIFY THE MEASUREMENT NAME CONSISTENT WITH THE MUX/MOD GROUP FOR AN ANALOG CHANNEL.
DATA LENGTH	2	R-x\ADL-n-m *RO-CH10*	NUMBER OF BITS PER DATA WORD
BIT MASK	64	R-x\AMSK-n-m *RO-CH10*	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BITS IN A WORD LOCATION THAT ARE ASSIGNED TO THIS MEASUREMENT. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER - 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED
MEASUREMENT TRANSFER ORDER	1	R-x\AMTO-n-m *RO-CH10*	MOST SIGNIFICANT BIT FIRST - 'M' LEAST SIGNIFICANT BIT FIRST - 'L' DEFAULT - 'D'
SAMPLE FACTOR	2	R-x\ASF-n-m *RO-CH10*	1/(2^N) TIMES THE FASTEST SAMPLE RATE (DEFINED ABOVE) GIVES THE SAMPLE RATE FOR THIS CHANNEL. SPECIFY THE VALUE 'N' IN THIS FIELD.
SAMPLE FILTER 3db BANDWIDTH	9	R-x\ASBW-n-m *RO-CH10*	SAMPLE FILTER IN UNITS OF HZ (000,000,000)
AC/DC COUPLING	1	R-x\ACP-n-m *RO-CH10*	ANALOG SIGNAL COUPLING AC – 'A' DC – 'D'

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 14 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
RECORDER INPUT IMPEDANCE	6	R-x\AII-n-m *RO-CH10*	ANALOG SIGNAL INPUT IMPEDANCE TO THE RECORDER. UNITS OF OHMS (000,000)
INPUT CHANNEL GAIN	6	R-x\AGI-n-m *RO-CH10*	SIGNAL GAIN OF ANALOG SIGNAL. MILLI UNITS (10X = 010000)
INPUT FULL SCALE RANGE	6	R-x\AFSI-n-m *RO-CH10*	FULL SCALE RANGE OF INPUT SIGNAL. UNITS OF MILLI-VOLTS (20Vpp = 020000) (Vpp = 2XVp)
INPUT OFFSET VOLTAGE	6	R-x\AOVI-n-m *RO-CH10*	OFFSET VOLTAGE OF INPUT SIGNAL. UNITS OF MILLI-VOLTS (10V=010000)
INPUT TYPE	1	R-x\AIT-n-m *RO-CH10*	TYPE OF INPUT SIGNAL. SINGLE ENDED – ‘S’ DIFFERENTIAL – ‘D’
AUDIO	1	R-x\AV-n-m *RO-CH10*	INDICATE IF INPUT SIGNAL IS AUDIO. AUDIO PRESENT – ‘Y’ AUDIO NOT PRESENT – ‘N’
AUDIO FORMAT	4	R-x\AVF-n-m *RO-CH10*	FORMAT OF AUDIO IF PRESENT. RAW – ‘RAW’ WAV – ‘WAV’ LPCM – ‘LPCM’ AC3 – ‘AC3’ PreD – ‘PRED’ PstD – ‘PSTD’ OTHER – ‘O’
DISCRETE DATA TYPE ATTRIBUTES			
DISCRETE DATA TYPE FORMAT	1	R-x\DTF-n *RO-CH10*	DISCRETE DATA TYPE FORMAT: FORMAT 0 (RESERVED) – ‘0’ FORMAT 1 (DISCRETE DATA) – ‘1’
DISCRETE MODE	4	R-x\DMOD-n *RO-CH10*	INDICATE THE MODE WHEREBY DISCRETE EVENTS ARE PLACED IN THE PACKETS: ‘EV’ – EVENT MODE ‘SAMP’ – SAMPLE MODE

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 15 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
SAMPLE RATE	7	R-x\DSR-n *RO-CH10*	SAMPLE RATE IN SAMPLES PER SECOND
NUMBER OF DISCRETE MEASUREMENTS	3	R-x\NDM\N-n *RO-CH10*	SPECIFY THE NUMBER OF DISCRETE MEASUREMENTS
MEASUREMENT NAME	32	R-x\DMN-n-m *RO-CH10*	IDENTIFY THE MEASUREMENT NAME FOR ONE OR MORE DISCRETE BITS
BIT MASK	64	R-x\DMSK-n-m *RO-CH10*	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BITS IN A WORD LOCATION THAT ARE ASSIGNED TO THIS MEASUREMENT. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED
MEASUREMENT TRANSFER ORDER	1	R-x\DMTO-n-m *RO-CH10*	MOST SIGNIFICANT BIT FIRST – 'M' LEAST SIGNIFICANT BIT FIRST - 'L' DEFAULT - 'D'
ARINC 429 BUS DATA TYPE ATTRIBUTES			
ARINC 429 BUS DATA TYPE FORMAT	1	R-x\ABTF-n *RO-CH10*	ARINC 429 BUS DATA TYPE FORMAT: FORMAT 0 (ARINC 429 DATA) – '0' FORMAT 1 (RESERVED) – '1'
NUMBER OF ARINC 429 SUB-CHANNELS	5	R-x\NAS\N-n *RO-CH10*	NUMBER OF ARINC 429 BUS SUB-CHANNELS
ARINC 429 SUB-CHANNEL NUMBER	5	R-x\ASN-n-m *RO-CH10*	ARINC 429 BUS SUB-CHANNEL ID
ARINC 429 SUB-CHANNEL NAME	32	R-x\ANM-n-m *RO-CH10*	ARINC 429 BUS SUB-CHANNEL NAME
VIDEO DATA TYPE ATTRIBUTES			
VIDEO DATA TYPE FORMAT	1	R-x\VTF-n *RO-CH10*	VIDEO DATA TYPE FORMAT: FORMAT 0 (MPEG-2/H.264) – '0' FORMAT 1 (MPEG-2 ISO 13818) – '1' FORMAT 2 (MPEG-4 ISO 14496) – '2'

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 16 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
MPEG-2 CHANNEL XON2 FORMAT	1	R-x\VXF-n *RO-CH10*	TYPE OF VIDEO CARRIED FOR XON2 FORMATS (MPEG-2 VIDEO CHANNELS) 2ON2 (MPEG-2) – '0' 264ON2 (H.264) – '1'
VIDEO SIGNAL TYPE	1	R-x\VST-n *RO-CH10*	THE VIDEO SIGNAL INPUT TYPE AUTO DETECT – '0' COMPOSITE – '1' YUV – '2' S-VIDEO – '3' DVI – '4' RGB – '5' SDI – '6' VGA – '7'
VIDEO SIGNAL FORMAT TYPE	2	R-x\VSF-n *RO-CH10*	THE VIDEO SIGNAL INPUT TYPE AUTO DETECT – '0' NTSC – '1' PAL – '2' ATSC – '3' DVB – '4' ISDB – '5' SECAM – '6'
VIDEO CONSTANT BIT RATE	10	R-x\CBR-n *RO-CH10*	CONTAINS AGGREGATE STREAM BIT RATE IN BITS PER SECOND. SCIENTIFIC NOTATION MAY BE USED.
VIDEO VARIABLE PEAK BIT RATE	10	R-x\VBR-n *RO-CH10*	CONTAINS PEAK STREAM BIT RATE IN BITS PER SECOND. SCIENTIFIC NOTATION MAY BE USED.
VIDEO ENCODING DELAY	8	R-x\VED-n *RO-CH10*	DELAY INTRODUCED BY VIDEO ENCODING HARDWARE IN MILLISECONDS
OVERLAY ENABLED	1	R-x\VCO\OE-n	INDICATES IF OVERLAY IS ENABLED. 'T' = TRUE, 'F' = FALSE
OVERLAY X POSITION	5	R-x\VCO\X-n	SPECIFY THE X PIXEL POSITION OF THE OVERLAY IN THE VIDEO CHANNEL. ZERO INDICATES THE LEFTMOST POSITION OF THE VIDEO IMAGE.

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 17 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
OVERLAY Y POSITION	5	R-x\VCO\Y-n	SPECIFY THE Y LINE POSITION OF THE OVERLAY IN THE VIDEO CHANNEL. ZERO INDICATES THE UPPERMOST POSITION OF THE VIDEO IMAGE.
OVERLAY EVENT TOGGLE ENABLED	1	R-x\VCO\OET-n	INDICATES IF OVERLAY EVENT TOGGLE IS ENABLED. 'T' = TRUE, 'F' = FALSE
OVERLAY FORMAT	1	R-x\VCO\OLF-n	INDICATES FORMAT OF THE TIME OVERLAY. 'DT' DAY AND TIME (DDD:HH:MM:SS) 'TO' TIME ONLY (HH:MM:SS) 'TM' TIME AND MILLISECONDS (HH:MM:SS:SSS) 'DTM' DAY, TIME AND MILLISECONDS (DDD:HH:MM:SS:SSS)
OVERLAY BACKGROUND	3	R-x\VCO\OBG-n	INDICATES BACKGROUND OF THE TIME OVERLAY. 'BOT' - BLACK ON TRANSPARENT 'WOT' - WHITE ON TRANSPARENT 'BOW' - BLACK ON WHITE 'WOB' - WHITE ON BLACK
ANALOG AUDIO CHANNEL INPUT LEFT	5	R-x\ASI\ASL-n	INDICATES THE ANALOG CHANNEL SOURCE OF THE LEFT AUDIO CHANNEL ID FOR THE VIDEO CHANNEL.
ANALOG AUDIO CHANNEL INPUT RIGHT	5	R-x\ASI\ASR-n	INDICATES THE ANALOG CHANNEL SOURCE OF THE RIGHT AUDIO CHANNEL ID FOR THE VIDEO CHANNEL.
VIDEO DATA ALIGNMENT	1	R-x\VDA-n *RO-CH10*	SPECIFIES THE DATA ALIGNMENT OF THE VIDEO DATA WITHIN THE PACKET. LITTLE ENDIAN - 'L' BIG ENDIAN - 'B'
TIME DATA TYPE ATTRIBUTES			
TIME DATA TYPE FORMAT	1	R-x\TTF-n *R-CH10*	TIME DATA TYPE FORMAT: FORMAT 0 (RESERVED) – '0' FORMAT 1 (TIME DATA) – '1'

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 18 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
TIME FORMAT	1	R-x\TFMT-n *R-CH10*	INDICATE THE FORMAT FOR THE TIME: IRIG-A – 'A' IRIG-B – 'B' IRIG-G – 'G' INTERNAL – 'I' NATIVE GPS TIME – 'N' UTC TIME FROM GPS – 'U' NONE – 'X'
TIME SOURCE	1	R-x\TSRC-n *R-CH10*	INDICATE THE TIME SOURCE: INTERNAL – 'I' EXTERNAL – 'E' INTERNAL FROM RMM – 'R' NONE – 'X'
IMAGE DATA TYPE ATTRIBUTES			
IMAGE DATA TYPE FORMAT	1	R-x\ITF-n *RO-CH10*	IMAGE DATA TYPE FORMAT: FORMAT 0 (IMAGE) – '0' FORMAT 1 (STILL IMAGERY) – '1'
STILL IMAGE TYPE	2	R-x\SIT-n *RO-CH10*	TYPE OF STILL IMAGERY FORMAT NITF – '0' JPEG – '1' JPEG2 – '2' PNG – '3'
UART DATA TYPE ATTRIBUTES			
UART DATA TYPE FORMAT	1	R-x\UTF-n *RO-CH10*	UART DATA TYPE FORMAT: FORMAT 0 – '0' FORMAT 1 – '1'
NUMBER OF UART SUB-CHANNELS	5	R-x\NUS\N-n *RO-CH10*	SPECIFY THE NUMBER OF UART SUB-CHANNELS INCLUDED WITHIN THIS CHANNEL.
UART SUB-CHANNEL NUMBER	5	R-x\USCN-n-m *RO-CH10*	SPECIFY THE UART SUB-CHANNEL NUMBER.
UART SUB-CHANNEL NAME	32	R-x\UCNM-n-m *RO-CH10*	SPECIFY THE UART SUB-CHANNEL NAME.

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 19 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
UART SUB-CHANNEL BAUD RATE	12	R-x\UCR-n-m *R0-CH10*	BAUD RATE IN BITS PER SECOND (00000000.000)
UART SUB-CHANNEL BITS PER WORD	1	R-x\UCB-n-m *R0-CH10*	BITS PER WORD (7, 8 or 9)
UART SUB-CHANNEL PARITY	1	R-x\UCP-n-m *R0-CH10*	PARITY. 'O'-ODD 'E'-EVEN 'N'-NONE
UART SUB-CHANNEL STOP BIT	1	R-x\UCS-n-m *R0-CH10*	STOP BIT SIZE. '0' – 1.0 '1' – 1.5 '2' – 2.0
UART SUB-CHANNEL INTERFACE	1	R-x\UCIN-n-m	UART INTERFACE '0' – OTHER '3' – RS-485 '1' – RS-232 '4' - TTL '2' – RS-422
UART SUB-CHANNEL BLOCK SIZE	6	R-x\UCBS-n-m	BLOCK (FRAME) SIZE IN WORDS XXX,XXX WORDS
UART SUB-CHANNEL SYNC WORD LENGTH	1	R-x\UCSL-n-m	SYNC WORD LENGTH IN WORDS (0 – 9 WORDS MAXIMUM)
UART SUB-CHANNEL BLOCK SYNC VALUE	81	R-x\UCSV-n-m	BLOCK SYNC WORD VALUE IN BINARY. SPECIFY ALL BITS.
UART SUB-CHANNEL BLOCK RATE	12	R-x\UCBR-n-m	BLOCK RATE IN HZ (00000000.000)
MESSAGE DATA TYPE ATTRIBUTES			
MESSAGE DATA TYPE FORMAT	1	R-x\MTF-n *RO-CH10*	MESSAGE DATA TYPE FORMAT: FORMAT 0 (MESSAGE DATA) – '0'

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R) Page 20 x 21

PARAMETER	MAX FIELD SIZE	CODE NAME	DEFINITION
NUMBER OF MESSAGE SUB-CHANNELS	5	R-x\NMS\N-n *RO-CH10*	SPECIFY THE NUMBER OF MESSAGE SUB-CHANNELS INCLUDED WITHIN THIS CHANNEL
MESSAGE SUB-CHANNEL NUMBER	5	R-x\MSCN-n-m *RO-CH10*	SPECIFY THE MESSAGE SUB-CHANNEL NUMBER.
MESSAGE SUB-CHANNEL NAME	32	R-x\MCNM-n-m *RO-CH10*	SPECIFY THE MESSAGE SUB-CHANNEL NAME.
IEEE-1394 DATA TYPE ATTRIBUTES			
IEEE-1394 DATA TYPE FORMAT	1	R-x\IETF-n *RO-CH10*	IEEE-1394 DATA TYPE FORMAT: FORMAT 0 (IEEE-1394 TRANS) – ‘0’ FORMAT 1 (IEEE-1394 PHY) – ‘1’
PARALLEL DATA TYPE ATTRIBUTES			
PARALLEL DATA TYPE FORMAT	1	R-x\PLTF-n *RO-CH10*	PARALLEL DATA TYPE FORMAT: FORMAT 0 (PARALLEL) – ‘0’
ETHERNET DATA TYPE ATTRIBUTES			
ETHERNET DATA TYPE FORMAT	1	R-x\ENTF-n *RO-CH10*	ETHERNET DATA TYPE FORMAT: FORMAT 0 (ETHERNET DATA) – ‘0’
NUMBER OF ETHERNET NETWORKS	5	R-x\NNET\N-n *RO-CH10*	SPECIFY THE NUMBER OF ETHERNET NETWORKS INCLUDED WITHIN THIS CHANNEL
ETHERNET NETWORK NUMBER	5	R-x\ENBR-n-m *RO-CH10*	SPECIFY THE ETHERNET NETWORK NUMBER
ETHERNET NETWORK NAME	32	R-x\ENAM-n-m *RO-CH10*	SPECIFY THE ETHERNET NETWORK NAME
REFERENCE TRACK			
NUMBER OF REFERENCE TRACKS	1	R-x\RT\N	SPECIFY THE NUMBER OF REFERENCE TRACKS
TRACK NUMBER	2	R-x\RT1-n	STATE THE TRACK LOCATION OF THE REFERENCE SIGNAL

Table 9-3 (Continued). Recorder-Reproducer Attributes Group (R)			Page 21 x 21
PARAMETER	**MAX FIELD SIZE**	**CODE NAME**	**DEFINITION**
REFERENCE FREQUENCY	6	R-x\RT2-n	FREQUENCY OF REFERENCE SIGNAL, IN kHz
NOTE: THERE WILL BE ONE TAPE/STORAGE SOURCE ATTRIBUTES GROUP FOR EACH TAPE OR STORAGE SOURCE.			
COMMENTS			
COMMENTS	3200	R-x\COM *RO-CH10*	PROVIDE THE ADDITIONAL INFORMATION REQUESTED OR ANY OTHER INFORMATION DESIRED

9.5.5 Multiplex/Modulation (Mux/Mod) Attributes (M). The composite baseband waveform is received from the receiver or tape reproducer electronics and is passed to the demultiplexer/ demodulator for further processing. Figure 9-5 summarizes the information that is required to continue processing the data. The composite baseband waveform may consist of any number of signals, which are modulated directly onto the RF carrier including a baseband data signal, and one or more subcarriers.

The baseband data signal may be PCM, pulse amplitude modulation (PAM), or analog data. The PCM and PAM data streams must be defined in terms of a data link name. This data link name is unique for each system that contains different data, has a different format, or has a different data rate. The analog measurand is typically converted into engineering units appropriate for the measurand. The measurement name provides the connection to the Data Conversion Attributes Group (C).

Subcarriers, both standard and nonstandard, may be part of the baseband composite waveform. These, in turn, may be modulated with PCM, PAM, or analog data. As with the baseband data signal, these data channels must be defined. Table 9-4 specifies the required information for the data signal attributes.

Multiplex/Modulation Attributes Group (M)	CODE NAME	REFERENCE PAGE
DATA SOURCE ID	(M-x\ID)	(9-45)
*COMPOSITE SIGNAL STRUCTURE		(9-45)
SIGNAL STRUCTURE TYPE	(M-x\BB1)	
MODULATION SENSE	(M-x\BB2)	
COMPOSITE LPF BANDWIDTH	(M-x\BB3)	
*BASEBAND SIGNAL		(9-45)
BASEBAND SIGNAL TYPE	(M-x\BSG1)	
*LOW PASS FILTER		
BANDWIDTH	(M-x\BSF1)	
TYPE	(M-x\BSF2)	
*BASEBAND DATA LINK TYPE		(9-46)
*PCM OR PAM		
OR DATA LINK NAME	(M-x\BB\DLN)	
*ANALOG		
MEASUREMENT NAME	(M-x\BB\MN)	
*SUBCARRIERS		(9-46)
NUMBER OF SUBCARRIERS	(M-x\SCO\N)	
*IRIG SUBCARRIERS		
NUMBER OF SCOs	(M-x\SI\N)	
SCO NUMBER	(M-x\SI1-n)	
SCO #n DATA TYPE	(M-x\SI2-n)	
MODULATION SENSE	(M-x\SI3-n)	
*LOW PASS FILTER		(9-46)
BANDWIDTH	(M-x\SIF1-n)	
TYPE	(M-x\SIF2-n)	
*DATA LINK TYPE		(9-47)
*PCM OR PAM		
OR DATA LINK NAME	(M-x\SI\DLN-n)	
*ANALOG		
MEASUREMENT NAME	(M-x\SI\MN-n)	
OTHER	(M-x\SO)	(9-47)
REFERENCE CHANNEL	(M-x\RC)	
*COMMENTS		
COMMENTS	(M-x\COM)	(9-47)

***Heading Only – No Data Entry**

Figure 9-5. Multiplex/Modulation Attributes Group (M).

TABLE 9-4. MULTIPLEX/MODULATION GROUP (M)			
PARAMETER	**MAXIMUM FIELD SIZE**	**CODE NAME**	**DEFINITION**
DATA SOURCE ID	32	M-x\ID	DATA SOURCE IDENTIFICATION
COMPOSITE SIGNAL STRUCTURE			
SIGNAL STRUCTURE TYPE	7	M-x\BB1	SPECIFY THE COMPOSITE BASEBAND SIGNAL STRUCTURE: 'PCM' HYBRID: 'PAM' 'ANA/SCO' 'ANALOG' 'PAM/SCO' 'SCO's' 'PCM/SCO' 'OTHER'
MODULATION SENSE	3	M-x\BB2	SPECIFY THE MODULATION SENSE: 'POS' – INDICATES THAT AN INCREASING VOLTAGE RESULTS IN AN INCREASE IN FREQUENCY. 'NEG' – INDICATES THAT A DECREASING VOLTAGE RESULTS IN AN INCREASE IN FREQUENCY
COMPOSITE LPF BANDWIDTH	6	M-x\BB3	GIVE THE LOW PASS BANDWIDTH OF THE COMPOSITE WAVEFORM (3 dB CUTOFF FREQUENCY), IN kHz.
BASEBAND SIGNAL			
BASEBAND SIGNAL TYPE	3	M-x\BSG1	TYPE OF BASEBAND DATA: 'PCM' 'ANA' (ANALOG) 'PAM' 'OTH' (OTHER) 'NON' (NONE)
LOW PASS FILTER			
BANDWIDTH	6	M-x\BSF1	SPECIFY LOW PASS FILTER BANDWIDTH (3 dB CUTOFF FREQUENCY), IN kHz.
TYPE	2	M-x\BSF2	SPECIFY THE FILTER TYPE: CONSTANT AMPLITUDE - 'CA' CONSTANT DELAY - 'CD' OTHER - 'OT', DEFINE IN THE COMMENTS RECORD.

Table 9-4 (Continued). Multiplex/Modulation Group (M) Page 2 x 3

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
BASEBAND DATA LINK TYPE			
PCM OR PAM			
DATA LINK NAME	32	M-x\BB\DLN	SPECIFY THE DATA LINK NAME FOR PCM OR PAM DATA FORMAT.
ANALOG			
MEASUREMENT NAME	32	M-x\BB\MN	GIVE THE MEASURAND NAME.
SUBCARRIERS			
NUMBER OF SUBCARRIERS	2	M-x\SCO\N	SPECIFY THE NUMBER OF SUBCARRIERS ON THIS DATA LINK.
IRIG SUBCARRIERS			
NUMBER OF SCOs	2	M-x\SI\N	SPECIFY THE NUMBER OF IRIG SUBCARRIERS.
SCO NUMBER	5	M-x\SI1-n	GIVE THE IRIG CHANNEL NUMBER FOR THE SUBCARRIER.
SCO #n DATA TYPE	3	M-x\SI2-n	SPECIFY THE TYPE OF DATA ON THE SUBCARRIER: PCM - 'PCM' PAM - 'PAM' ANALOG - 'ANA' OTHER - 'OTH'
MODULATION SENSE	3	M-x\SI3-n	SPECIFY THE MODULATION SENSE: 'POS' - INDICATES THAT AN INCREASING VOLTAGE RESULTS IN AN INCREASE IN FREQUENCY 'NEG' - INDICATES THAT A DECREASING VOLTAGE RESULTS IN AN INCREASE IN FREQUENCY.

Table 9-4 (Continued). Multiplex/Modulation Group (M) Page 3 x 3

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
LOW PASS FILTER			
BANDWIDTH	6	M-x\SIF1-n	SPECIFY THE LOW PASS FILTER CUTOFF FREQUENCY (3 dB), IN kHz.
TYPE	2	M-x\SIF2-n	SPECIFY THE FILTER TYPE: CONSTANT AMPLITUDE - 'CA' CONSTANT DELAY - 'CD' OTHER - 'OT', DEFINE IN THE COMMENTS RECORD.
DATA LINK TYPE			
PCM OR PAM			
DATA LINK NAME	32	M-x\SI\DLN-n	SPECIFY THE DATA LINK NAME FOR PCM AND PAM DATA FORMATS.
ANALOG			
MEASUREMENT NAME	32	M-x\SI\MN-n	GIVE THE MEASURAND NAME.
NOTE: REPEAT THE ABOVE FOR EACH IRIG SUBCARRIER ON THIS CARRIER.			
OTHER	1	M-x\SO	ARE THERE NONSTANDARD SUBCARRIERS? YES - 'Y' NO -'N' DEFINE IN THE COMMENTS RECORD.
REFERENCE CHANNEL	6	M-x\RC	FREQUENCY OF REFERENCE CHANNEL IN kHz, IF APPLICABLE
COMMENTS			
COMMENTS	3200	M-x\COM	PROVIDE THE ADDITIONAL INFORMATION REQUESTED OR ANY OTHER INFORMATION DESIRED.

9.5.6 Digital Data Attributes. The digital data attributes are separated into four groups containing PCM-related attribute information. The PCM Format Attributes Group (P) is described in subparagraph 9.5.6.1 below. The PCM Measurement Description Attributes, contained in (D), are described in subparagraph 9.5.6.2. Subparagraph 9.5.6.3 depicts the MIL-STD-1553 or ARINC 429 Bus Data Attributes (B). Subparagraph 9.5.6.4 describes the Message Data Attributes (S).

9.5.6.1 PCM Format Attributes (P). The PCM Format Attributes Group contains the information required to decommutate the PCM data stream. Operations of both class I and II are included. Limited information is incorporated for class II operations. Figure 9-6 presents the flow and summary of the information required. In general, only standard methods of synchronization have been included except for cases where considerable application is already in place. Inclusion should not be taken to mean that the nonstandard approaches are better or desired. Table 9-5 contains the PCM Format Attributes. The group defines and specifies the frame format and the information necessary to set up the PCM decommutation. Refer to Chapter 4 for the definition of terms (such as major and minor frames and subframes) and word numbering conventions.

PCM Format Attributes Group (P)	CODE NAME	REFERENCE PAGE
DATA LINK NAME	(P-d\DLN)	(9-52)
*INPUT DATA		(9-52)
PCM CODE	(P-d\D1)	
BIT RATE	(P-d\D2)	
ENCRYPTED	(P-d\D3)	
POLARITY	(P-d\D4)	
AUTO-POLARITY CORRECTION	(P-d\D5)	
DATA DIRECTION	(P-d\D6)	
DATA RANDOMIZED	(P-d\D7)	
RANDOMIZER LENGTH	(P-d\D8)	
*FORMAT		(9-53)
TYPE FORMAT	(P-d\TF)	
COMMON WORD LENGTH	(P-d\F1)	
WORD TRANSFER ORDER	(P-d\F2)	
PARITY	(P-d\F3)	
PARITY TRANSFER ORDER	(P-d\F4)	
*MINOR FRAME		(9-53)
NUMBER OF MINOR FRAMES IN MAJOR FRAME	(P-d\MF\N)	
NUMBER OF WORDS IN A MINOR FRAME	(P-d\MF1)	
NUMBER OF BITS IN A MINOR FRAME	(P-d\MF2)	
SYNC TYPE	(P-d\MF3)	
*SYNCHRONIZATION PATTERN		(9-54)
LENGTH	(P-d\MF4)	
PATTERN	(P-d\MF5)	
*SYNCHRONIZATION CRITERIA		(9-54)
IN SYNC CRITERIA	(P-d\SYNC1)	
SYNC PATTERN CRITERIA	(P-d\SYNC2)	
*OUT OF SYNCHRONIZATION CRITERIA		(9-54)
NUMBER OF DISAGREES	(P-d\SYNC3)	
SYNC PATTERN CRITERIA	(P-d\SYNC4)	
*MINOR FRAME FORMAT DEFINITION		(9-55)
WORD NUMBER	(P-d\MFW1-n)	
NUMBER OF BITS IN WORD	(P-d\MFW2-n)	
*SUBFRAME SYNCHRONIZATION		(9-55)
NUMBER OF SUBFRAME ID COUNTERS	(P-d\ISF\N)	
SUBFRAME ID COUNTER NAME	(P-d\ISF1-n)	
SUBFRAME SYNC TYPE	(P-d\ISF2-n)	
*ID COUNTER		(9-55)
SUBFRAME ID COUNTER LOCATION	(P-d\IDC1-n)	
ID COUNTER WORD LENGTH	(P-d\IDC2-n)	
ID COUNTER MSB STARTING BIT LOCATION	(P-d\IDC3-n)	(9-56)
ID COUNTER LENGTH	(P-d\IDC4-n)	
ID COUNTER TRANSFER ORDER	(P-d\IDC5-n)	

Figure 9-6. PCM Format Attributes Group (P). (Page 1 of 3)

	ID COUNTER INITIAL VALUE	(P-d\IDC6-n)	
	INITIAL COUNT SUBFRAME NUMBER	(P-d\IDC7-n)	
	ID COUNTER END VALUE	(P-d\IDC8-n)	
	END COUNT SUBFRAME NUMBER	(P-d\IDC9-n)	
	COUNT DIRECTION	(P-d\IDC10-n)	
* SUBFRAME DEFINITION			(9-56)
NUMBER OF SUBFRAMES		(P-d\SF\N-n)	
SUBFRAME NAME		(P-d\SF1-n-m)	
SUPERCOM		(P-d\SF2-n-m)	
LOCATION DEFINITION		(P-d\SF3-n-m)	
SUBFRAME LOCATION		(P-d\SF4-n-m-w)	
INTERVAL		(P-d\SF5-n-m)	
SUBFRAME DEPTH		(P-d\SF6-n-m)	
* FILTERING			
MINOR FRAME FILTERING DEFINITION TYPE		(P-d\MFF\FDT)	
NUMBER OF MINOR FRAME FILTERING DEFINITIONS		(P-d\MFF\N)	
FILTERED MINOR FRAME NUMBER		(P-d\MFF\MFN-n)	
*ASYNCHRONOUS EMBEDDED FORMAT			(9-58)
NUMBER OF ASYNCHRONOUS EMBEDDED FORMATS		(P-d\AEF\N)	
DATA LINK NAME		(P-d\AEF\DLN-n)	(9-58)
SUPERCOM		(P-d\AEF1-n)	(9-58)
LOCATION DEFINITION		(P-d\AEF2-n)	
LOCATION		(P-d\AEF3-n-w)	
INTERVAL		(P-d\AEF4-n)	(9-59)
WORD LENGTH		(P-d\AEF5-n-w)	
MASK		(P-d\AEF6-n-w)	
*FORMAT CHANGE			(9-59)
*FRAME FORMAT IDENTIFIER			
LOCATION		(P-d\FFI1)	
MASK		(P-d\FFI2)	
*MEASUREMENT LIST CHANGE			(9-60)
OR	NUMBER OF MEASUREMENT LISTS	(P-d\MLC\N)	
	FFI PATTERN	(P-d\MLC1-n)	
	MEASUREMENT LIST NAME	(P-d\MLC2-n)	
*FORMAT STRUCTURE CHANGE			(9-60)
NUMBER OF FORMATS		(P-d\FSC\N)	
FFI PATTERN		(P-d\FSC1-n)	
DATA LINK ID		(P-d\FSC2-n)	
*ALTERNATE TAG AND DATA			(9-60)
NUMBER OF TAGS		(P-d\ALT\N)	
NUMBER OF BITS IN TAG		(P-d\ALT1)	
NUMBER OF BITS IN DATA WORD		(P-d\ALT2)	
FIRST TAG LOCATION		(P-d\ALT3)	
SEQUENCE		(P-d\ALT4)	

Figure 9-6. PCM Format Attributes Group (P). (Page 2 of 3)

*ASYNCHRONOUS DATA MERGE FORMAT		(9-61)
NUMBER OF ASYNCHRONOUS DATA MERGE FORMATS	(P-d\ADM\N)	
DATA MERGE NAME	(P-d\ADM\DMN-n)	(9-61)
SUPERCOM	(P-d\ADM1-n)	
LOCATION DEFINITION	(P-d\ADM2-n)	
LOCATION	(P-d\ADM3-n-w)	
INTERVAL	(P-d\ADM4-n)	
DATA LENGTH	(P-d\ADM5-n)	
MSB LOCATION	(P-d\ADM6-n)	
PARITY	(P-d\ADM7-n)	
*COMMENTS		
COMMENTS	(P-d\COM)	(9-62)

***Heading Only - No Data Entry**

Figure 9-6. PCM Format Attributes Group (P). (Page 3 of 3)

TABLE 9-5. PCM FORMAT ATTRIBUTES GROUP (P)			
PARAMETER	**MAXIMUM FIELD SIZE**	**CODE NAME**	**DEFINITION**
DATA LINK NAME	32	P-d\DLN *RO-CH10*	IDENTIFY THE DATA LINK NAME CONSISTENT WITH THE MUX/MOD GROUP.
INPUT DATA			
PCM CODE	6	P-d\D1 *RO-CH10*	DEFINE THE DATA FORMAT CODE: 'NRZ-L' 'BIO-L' 'RNRZ-L' 'NRZ-M' 'BIO-M' 'OTHER' 'NRZ-S' 'BIO-S'
BIT RATE	9	P-d\D2 *RO-CH10*	DATA RATE IN BITS PER SECOND. SCIENTIFIC NOTATION MAY BE USED.
ENCRYPTED	1	P-d\D3	DATA IS ENCRYPTED – 'E' DATA IS UNENCRYPTED – 'U' IF THE DATA IS ENCRYPTED, PROVIDE DETAILS IN COMMENTS RECORD.
POLARITY	1	P-d\D4 *RO-CH10*	DATA POLARITY: NORMAL – 'N' INVERTED – 'I'
AUTO-POLARITY CORRECTION	1	P-d\D5	IS AUTOMATIC POLARITY CORRECTION TO BE USED? YES – 'Y' NO – 'N'
DATA DIRECTION	1	P-d\D6	TIME SEQUENCE OF DATA: NORMAL – 'N' REVERSED – 'R'
DATA RANDOMIZED	1	P-d\D7 *RO-CH10*	YES – 'Y' NO – 'N'
RANDOMIZER LENGTH	3	P-d\D8 *RO-CH10*	SPECIFY THE RANDOMIZER LENGTH: STANDARD (15 BITS) – 'STD' OTHER – 'OTH', DEFINE IN COMMENTS RECORD NOT APPLICABLE – 'N/A'

Table 9-5 (Continued). PCM Format Attributes Group (P) Page 2 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
FORMAT			
TYPE FORMAT	4	P-d\TF *RO-CH10*	TYPE OF PCM FORMAT: CLASS I - 'ONE' CLASS II – 'TWO' 1553 BUS - '1553' BUS – 'BUS' ALTERNATE TAG AND DATA-'ALTD' OTHER - 'OTHR', DESCRIBE IN COMMENTS.
COMMON WORD LENGTH	2	P-d\F1 *RO-CH10*	NUMBER OF BITS IN COMMON WORD LENGTH
WORD TRANSFER ORDER	1	P-d\F2 *RO-CH10*	DEFINE THE DEFAULT FOR THE FIRST BIT TRANSFERRED IN NORMAL TIME SEQUENCE: MOST SIGNIFICANT BIT - 'M' LEAST SIGNIFICANT BIT - 'L'
PARITY	2	P-d\F3 *RO-CH10*	NORMAL WORD PARITY EVEN - 'EV' ODD - 'OD' NONE - 'NO'
PARITY TRANSFER ORDER	1	P-d\F4	PARITY BIT LOCATION LEADS WORD - 'L' TRAILS WORD - 'T'
MINOR FRAME			
NUMBER OF MINOR FRAMES IN MAJOR FRAME	3	P-d\MF\N *RO-CH10*	NUMBER OF MINOR FRAMES IN A MAJOR FRAME
NUMBER OF WORDS IN A MINOR FRAME	4	P-d\MF1 *RO-CH10*	SPECIFIES THE NUMBER OF WORDS IN A MINOR FRAME, AS DEFINED IN CHAPTER 4, PARAGRAPH 4.3. (THE MINOR FRAME SYNCHRONIZATION PATTERN IS ALWAYS CONSIDERED AS ONE WORD, REGARDLESS OF ITS LENGTH.)

Table 9-5 (Continued). PCM Format Attributes Group (P) Page 3 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
NUMBER OF BITS IN A MINOR FRAME	5	P-d\MF2 *RO-CH10*	NUMBER OF BITS IN A MINOR FRAME INCLUDING MINOR FRAME SYNCHRONIZATION PATTERN
SYNC TYPE	3	P-d\MF3	DEFINE MINOR FRAME SYNCHRONIZATION TYPE: FIXED PATTERN - 'FPT' OTHER - 'OTH'
SYNCHRONIZATION PATTERN			
LENGTH	2	P-d\MF4 *RO-CH10*	SPECIFY THE MINOR FRAME SYNCHRONIZATION PATTERN LENGTH IN NUMBER OF BITS.
PATTERN	33	P-d\MF5 *RO-CH10*	DEFINE MINOR FRAME SYNCHRONIZATION PATTERN IN BITS ("1"s and "0"s) WITH THE LEFT MOST BIT AS THE "FIRST BIT TRANSMITTED"
SYNCHRONIZATION CRITERIA			
IN SYNC CRITERIA	2	P-d\SYNC1	THIS SPECIFIES THE DESIRED CRITERIA FOR DECLARING THE SYSTEM TO BE IN SYNC: FIRST GOOD SYNC – 0 CHECK - NUMBER OF AGREES (1 OR GREATER) NOT SPECIFIED - 'NS'
SYNC PATTERN CRITERIA	2	P-d\SYNC2	NUMBER OF BITS THAT MAY BE IN ERROR IN THE SYNCHRONIZATION PATTERN
OUT OF SYNCHRONIZATION CRITERIA			
NUMBER OF DISAGREES	2	P-d\SYNC3	SPECIFIES THE DESIRED CRITERIA FOR DECLARING THE SYSTEM OUT OF SYNC: NUMBER OF DISAGREES, (1 OR GREATER) NOT SPECIFIED - 'NS'
SYNC PATTERN CRITERIA	2	P-d\SYNC4	NUMBER OF BITS THAT MAY BE IN ERROR IN THE SYNCHRONIZATION PATTERN

Table 9-5 (Continued). PCM Format Attributes Group (P) Page 4 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
MINOR FRAME FORMAT DEFINITION			
WORD NUMBER	4	P-d\MFW1-n *RO-CH10*	WORD POSITION #n IN A MINOR FRAME, OR FOR CLASS II SYSTEMS, THE POSITION IN THE DEFINED FRAME. WORD POSITION 1 FOLLOWS THE SYNCHRONIZATION PATTERN.
NUMBER OF BITS IN WORD	2	P-d\MFW2-n *RO-CH10*	THE NUMBER OF BITS IN WORD POSITION #n. IF DEFAULT VALUE, DO NOT INCLUDE.
NOTE: THE ABOVE PAIR SET MUST BE DEFINED FOR ALL WORDS THAT HAVE A LENGTH OTHER THAN THE COMMON WORD LENGTH. THEREFORE, ALL WORD POSITIONS NOT INCLUDED IN THE ABOVE WILL HAVE THE COMMON WORD LENGTH AS A DEFAULT VALUE.			
SUBFRAME SYNCHRONIZATION			
NUMBER OF SUBFRAME ID COUNTERS	2	P-d\ISF\N *RO-CH10*	SPECIFY THE NUMBER OF SUBFRAME ID COUNTERS DEFINED WITHIN THE MINOR FRAME.
SUBFRAME ID COUNTER NAME	32	P-d\ISF1-n *RO-CH10*	SPECIFY THE SUBFRAME ID COUNTER NAME.
SUBFRAME SYNC TYPE	2	P-d\ISF2-n *RO-CH10*	DEFINE THE SUBFRAME SYNCHRONIZATION TYPE: ID COUNTER - 'ID' OTHER - 'OT' DEFINE IN COMMENTS.
ID COUNTER			
SUBFRAME ID COUNTER LOCATION	4	P-d\IDC1-n *RO-CH10*	IF ID COUNTER IS DESIGNATED AS THE SUBFRAME SYNC TYPE, GIVE THE MINOR FRAME WORD POSITION OF THE COUNTER.
ID COUNTER WORD LENGTH	2	P-d\IDC2-n *RO-CH10*	SPECIFY THE MINOR FRAME WORD LENGTH OF THE WORD CONTAINING THE ID COUNTER, NUMBER OF BITS.

Table 9-5 (Continued). PCM Format Attributes Group (P) Page 5 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
ID COUNTER MSB STARTING BIT LOCATION	2	P-d\IDC3-n *RO-CH10*	SPECIFY THE BIT LOCATION OF THE ID COUNTER MSB WITHIN THE WORD.
ID COUNTER LENGTH	2	P-d\IDC4-n *RO-CH10*	SPECIFY THE SUBFRAME ID COUNTER LENGTH, NUMBER OF BITS.
ID COUNTER TRANSFER ORDER	1	P-d\IDC5-n *RO-CH10*	SPECIFY WHETHER THE MOST OR LEAST SIGNIFICANT BIT IS TRANSFERRED FIRST: MOST SIGNIFICANT - 'M' LEAST SIGNIFICANT - 'L' DEFAULT - 'D' (AS SPECIFIED IN TABLE 9-5, WORD TRANSFER ORDER)
ID COUNTER INITIAL VALUE	3	P-d\IDC6-n *RO-CH10*	SPECIFY THE INITIAL VALUE OF THE ID COUNTER.
INITIAL COUNT SUBFRAME NUMBER	3	P-d\IDC7-n *RO-CH10*	SPECIFY THE MINOR FRAME NUMBER ASSOCIATED WITH THE INITIAL COUNT VALUE.
ID COUNTER END VALUE	3	P-d\IDC8-n *RO-CH10*	SPECIFY THE END VALUE OF THE ID COUNTER.
END COUNT SUBFRAME NUMBER	3	P-d\IDC9-n *RO-CH10*	SPECIFY THE MINOR FRAME NUMBER ASSOCIATED WITH THE END COUNT VALUE.
COUNT DIRECTION	3	P-d\IDC10-n *RO-CH10*	SPECIFY THE DIRECTION OF THE COUNT INCREMENT: INCREASING - 'INC' DECREASING - 'DEC'
SUBFRAME DEFINITION			
NUMBER OF SUBFRAMES	4	P-d\SF\N-n	SPECIFY THE NUMBER OF SUBFRAMES ASSOCIATED WITH THE SUBFRAME ID COUNTER NAMED ABOVE.
SUBFRAME NAME	32	P-d\SF1-n-m	SPECIFY THE SUBFRAME NAME.

Table 9-5 (Continued). PCM Format Attributes Group (P) Page 6 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
SUPERCOM	2	P-d\SF2-n-m	IF NOT SUPERCOMMUTATED, ENTER - 'NO'. OTHERWISE, ENTER THE NUMBER OF WORD POSITIONS.
LOCATION DEFINITION	2	P-d\SF3-n-m	IF SUPERCOMMUTATED, SPECIFY HOW THE WORD LOCATIONS ARE DEFINED: FIRST WORD AND INTERVAL - 'FI' EVERY LOCATION - 'EL' NOT APPLICABLE - 'NA'
SUBFRAME LOCATION	4	P-d\SF4-n-m-w	SPECIFY THE FIRST WORD WITHIN THE MINOR FRAME THAT CONTAINS THE SUBFRAME IDENTIFIED. FOR THE CASE WHEN EVERY WORD LOCATION IS DEFINED, REPEAT THIS ENTRY FOR EACH WORD POSITION APPLICABLE. FOR THE FIRST WORD AND INTERVAL, INCLUDE THE NEXT ENTRY TO DEFINE THE INTERVAL.
INTERVAL	4	P-d\SF5-n-m	SPECIFY THE INTERVAL TO BE USED TO DEFINE THE WORD LOCATIONS.
SUBFRAME DEPTH	3	P-d\SF6-n-m	SPECIFY THE SUBFRAME DEPTH. IF NO ENTRY, THEN THE SUBFRAME ID COUNTER DEPTH WILL BE USED AS THE DEFAULT VALUE.
NOTE: REPEAT THE ABOVE FOR EACH SUBFRAME IN THE MINOR FRAME FORMAT.			
FILTERING			
MINOR FRAME FILTERING DEFINITION TYPE	2	P-d\MFF\FDT *RO-CH10*	SPECIFY THE PCM MINOR FRAME FILTERING DEFINITION TYPE. "IN" = INCLUSIVE FILTERING "EX" = EXCLUSIVE FILTERING
NUMBER OF MINOR FRAME FILTERING DEFINITIONS	3	P-d\MFF\N *RO-CH10*	SPECIFY THE NUMBER OF PCM MINOR FRAME FILTERING DEFINITIONS.

Table 9-5 (Continued). PCM Format Attributes Group (P) Page 7 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
FILTERED MINOR FRAME NUMBER	3	P-d\MFF\MFN-n *RO-CH10*	SPECIFY THE PCM MINOR FRAME NUMBER TO BE FILTERED
NOTE: FOR PCM FORMATS WITH MULTIPLE SUBFRAME ID COUNTERS, ALL MINOR FRAME NUMBERS DEFINED FOR FILTERING ARE ASSOCIATED WITH THE FIRST SUBFRAME ID COUNTER.			
ASYNCHRONOUS EMBEDDED FORMAT			
NUMBER OF ASYNCHRONOUS EMBEDDED FORMATS	1	P-d\AEF\N	SPECIFY THE NUMBER OF ASYNCHRONOUS EMBEDDED FORMATS: ONE - '1' TWO –'2' NONE - '0'
DATA LINK NAME	32	P-d\AEF\DLN-n	PROVIDE THE DATA LINK NAME FOR THIS ASYNCHRONOUS EMBEDDED FORMAT. REPEAT NAME AND THE FOLLOWING ENTRIES FOR THE SECOND FORMAT, AS APPROPRIATE. (A SEPARATE DATA LINK DEFINITION MUST BE PROVIDED FOR EACH ASYNCHRONOUS EMBEDDED FORMAT.)
SUPERCOM	3	P-d\AEF1-n	IF THE ASYNCHRONOUS FORMAT IS NOT SUPERCOMMUTATED, ENTER - 'NO'. OTHERWISE, ENTER THE NUMBER OF HOST MINOR FRAME WORDS THAT ARE USED.
LOCATION DEFINITION	2	P-d\AEF2-n	IF SUPERCOMMUTATED, SPECIFY HOW THE WORD LOCATIONS ARE DEFINED: FIRST WORD AND INTERVAL - 'FI' EVERY LOCATION - 'EL' CONTIGUOUS WORDS - 'CW' NOT APPLICABLE - 'NA'

Table 9-5 (Continued). PCM Format Attributes Group (P) Page 8 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
LOCATION	4	P-d\AEF3-n-w	SPECIFY THE FIRST WORD WITHIN THE MINOR FRAME THAT CONTAINS THE ASYNCHRONOUS EMBEDDED FORMAT IDENTIFIED. FOR THE METHOD WHEN EVERY WORD LOCATION IS DEFINED, REPEAT THIS ENTRY FOR EACH WORD POSITION APPLICABLE. FOR THE FIRST WORD AND INTERVAL METHOD, INCLUDE THE NEXT ENTRY TO DEFINE THE INTERVAL.
INTERVAL	4	P-d\AEF4-n	SPECIFY THE INTERVAL TO BE USED TO DEFINE THE ASYNCHRONOUS EMBEDDED FORMAT LOCATIONS.
WORD LENGTH	2	P-d\AEF5-n-w	SPECIFY THE NUMBER OF EMBEDDED BITS IN THIS HOST WORD LOCATION.
MASK	64	P-d\AEF6-n-w	IF THE ASYNCHRONOUS PORTION OF THE WORD IS SHORTER THAN THE WORD LENGTH, THEN PROVIDE THE BINARY MASK REQUIRED TO INDICATE WHICH BITS ARE USED (1s USED, 0s NOT USED). LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
FORMAT CHANGE			
FRAME FORMAT IDENTIFIER			
LOCATION	4	P-d\FFI1	SPECIFY THE POSITION IN THE MINOR FRAME THAT CONTAINS THE FRAME FORMAT IDENTIFICATION (FFI) WORD. IF MORE THAN ONE WORD LOCATION, PROVIDE THE DETAILS IN THE COMMENTS RECORD.

Table 9-5 (Continued). PCM Format Attributes Group (P) Page 9 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
MASK	64	P-d\FFI2	IF THE FFI IS SHORTER THAN THE WORD LENGTH, THEN PROVIDE THE BINARY MASK REQUIRED TO INDICATE WHICH BITS ARE USED. LEFTMOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
MEASUREMENT LIST CHANGE			
NUMBER OF MEASUREMENT LISTS	2	P-d\MLC\N	SPECIFY THE NUMBER OF MEASUREMENT LISTS THAT ARE REQUIRED TO BE SELECTED. IF NONE, ENTER 'NO'. OTHERWISE, ENTER THE NUMBER, n.
FFI PATTERN	16	P-d\MLC1-n	SPECIFY THE FFI PATTERN THAT CORRESPONDS TO THE MEASUREMENT LIST (1s and 0s). THIS ENTRY AND THE NEXT ARE AN ORDERED PAIR.
MEASUREMENT LIST NAME	32	P-d\MLC2-n	SPECIFY THE MEASUREMENT LIST NAME.
FORMAT STRUCTURE CHANGE			
NUMBER OF FORMATS	2	P-d\FSC\N	SPECIFY THE NUMBER OF FORMATS TO BE DEFINED.
FFI PATTERN	16	P-d\FSC1-n	SPECIFY THE FFI PATTERN THAT CORRESPONDS TO THE FORMAT THAT IS DEFINED. THIS ENTRY AND THE NEXT ARE AN ORDERED PAIR.
DATA LINK ID	32	P-d\FSC2-n	IDENTIFY THE FORMAT THAT CORRESPONDS TO THIS FFI CODE.
ALTERNATE TAG AND DATA			
NUMBER OF TAGS	3	P-d\ALT\N	SPECIFY THE NUMBER OF PARAMETERS INCLUDED WITHIN THIS CATEGORY, THAT IS, THE NUMBER OF TAGS.

Table 9-5 (Continued). PCM Format Attributes Group (P) Page 10 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
NUMBER OF BITS IN TAG	2	P-d\ALT1	SPECIFY THE NUMBER OF BITS THAT ARE IN THIS TAG.
NUMBER OF BITS IN DATA WORD	2	P-d\ALT2	SPECIFY THE NUMBER OF BITS THAT ARE IN THE COMMON DATA WORD.
FIRST TAG LOCATION	2	P-d\ALT3	IDENTIFY THE LOCATION OF THE START OF THE FIRST TAG LOCATION IN TERMS OF BITS, WITH THE FIRST BIT POSITION AFTER THE SYNCHRONIZATION PATTERN BEING NUMBER 1.
SEQUENCE	1	P-d\ALT4	IF THE TAG/DATA WORD SEQUENCE IS TAG, THEN DATA ENTER 'N' FOR NORMAL. IF THE DATA PRECEDES THE TAG, ENTER 'R' FOR REVERSED.
ASYNCHRONOUS DATA MERGE FORMAT			
NUMBER OF ASYNCHRONOUS DATA MERGE FORMATS	1	P-d\ADM\N	SPECIFY THE NUMBER OF ASYNCHRONOUS DATA MERGE FORMATS.
DATA MERGE NAME	32	P-d\ADM\DMN-n	PROVIDE THE DATA MERGE NAME FOR THIS ASYNCHRONOUS DATA MERGE FORMAT. THIS CAN BE USED TO IDENTIFY THE SOURCE OF THE DATA MERGE FORMAT, AS APPROPRIATE. (USE THE COMMENTS FIELD TO DESCRIBE THIS DATA SOURCE FOR THE ASYNCHRONOUS DATA MERGE FORMAT.)
SUPERCOM	3	P-d\ADM1-n	IF THE ASYNCHRONOUS DATA MERGE FORMAT IS NOT SUPER-COMMUTATED, ENTER - 'NO'. OTHERWISE, ENTER THE NUMBER OF HOST MINOR FRAME WORDS THAT ARE USED.

Table 9-5 (Continued). PCM Format Attributes Group (P) Page 11 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
LOCATION DEFINITION	2	P-d\ADM2-n	IF SUPERCOMMUTATED, SPECIFY HOW THE WORD LOCATIONS ARE DEFINED: FIRST WORD AND INTERVAL - 'FI' EVERY LOCATION - 'EL' CONTIGUOUS WORDS - 'CW' NOT APPLICABLE - 'NA'
LOCATION	4	P-d\ADM3-n-w	SPECIFY THE FIRST WORD WITHIN THE MINOR FRAME THAT CONTAINS THE ASYNCHRONOUS DATA MERGE FORMAT IDENTIFIED. FOR THE METHOD WHEN EVERY WORD LOCATION IS DEFINED, REPEAT THIS ENTRY FOR EACH WORD POSITION APPLICABLE. FOR THE FIRST WORD AND INTERVAL METHOD, INCLUDE THE NEXT ENTRY TO DEFINE THE INTERVAL.
INTERVAL	4	P-d\ADM4-n	SPECIFY THE INTERVAL TO BE USED TO DEFINE THE ASYNCHRONOUS DATA MERGE FORMAT LOCATIONS.
DATA LENGTH	2	P-d\ADM5-n	SPECIFY THE NUMBER OF DATA BITS USED IN THIS DATA MERGE FORMAT.
MSB LOCATION	2	P-d\ADM6-n	PROVIDE THE MOST SIGNIFICANT BIT (MSB) POSITION WITHIN THE HOST MINOR FRAME LOCATION.
PARITY	2	P-d\ADM7-n	IF USED, SPECIFY THE PARITY INFORMATION: EVEN - 'EV' ODD - 'OD' NONE - 'NO'
COMMENTS			
COMMENTS	6400	P-d\COM	PROVIDE THE ADDITIONAL INFORMATION REQUESTED OR ANY OTHER INFORMATION DESIRED.

9.5.6.2 PCM Measurement Description Group (D). Figure 9-7 and Table 9-6 contain the PCM Measurement Descriptions. The descriptions define each measurand or data item of interest within the frame format specified in the PCM attributes. Table 9-6 includes the measurement name, which links the measurement to the Data Conversion Attributes Group.

	Note: Beginning with 106-09, it is recommended that the "Word and Frame" location type be used instead of the other six traditional location types. Additionally, when using Word and Frame, it is recommended to avoid the use of subframes (as defined in the Subframe Definitions section of the PCM Format Attributes Group) and locate measurements by word number and frame number within the major frame. Word and Frame is the only location type contained in the TMATS XML schema. The other location types are still supported at present, but may be removed from 106 Chapter 9 in future releases. Subframe definitions are not included in the TMATS XML schema; they may also be removed from 106 Chapter 9 in future releases.

PCM Measurement Description Group (D)	CODE NAME	REFERENCE PAGE
DATA LINK NAME	(D-x\DLN)	(9-66)
NUMBER OF MEASUREMENT LISTS	(D-x\ML\N)	
MEASUREMENT LIST NAME	(D-x\MLN-y)	
NUMBER OF SELECTED MEASUREMENT FILTERING AND OVERWRITE DEFINITIONS	(D-x\SMF\N-y)	
SELECTED MEASUREMENT NAME	(D-x\SMF\SMN-y-n)	
NUMBER OF MEASURANDS	(D-x\MN\N-y)	
MEASUREMENT NAME	(D-x\MN-y-n)	(9-66)
PARITY	(D-x\MN1-y-n)	
PARITY TRANSFER ORDER	(D-x\MN2-y-n)	
MEASUREMENT TRANSFER ORDER	(D-x\MN3-y-n)	
MEASUREMENT FILTER-OVERWRITE TAG	(D-x\MFOT-y-n)	
*MEASUREMENT LOCATION		(9-67)
MEASUREMENT LOCATION TYPE	(D-x\LT-y-n)	
*MINOR FRAME		(9-67)
MINOR FRAME LOCATION	(D-x\MF-y-n)	
BIT MASK	(D-x\MFM-y-n)	
*MINOR FRAME SUPERCOMMUTATED		(9-68)
OR NUMBER OF MINOR FRAME LOCATIONS	(D-x\MFS\N-y-n)	
LOCATION DEFINITION	(D-x\MFS1-y-n)	
*INTERVAL		(9-68)
OR LOCATION IN MINOR FRAME	(D-x\MFS2-y-n)	
BIT MASK	(D-x\MFS3-y-n)	(9-68)
INTERVAL	(D-x\MFS4-y-n)	
*EVERY LOCATION		(9-69)
MINOR FRAME LOCATION	(D-x\MFSW-y-n-e)	
BIT MASK	(D-x\MFSM-y-n-e)	
*MINOR FRAME FRAGMENTED		(9-69)
OR NUMBER OF FRAGMENTS	(D-x\FMF\N-y-n)	
MEASUREMENT WORD LENGTH	(D-x\FMF1-y-n)	
LOCATION DEFINITION	(D-x\FMF2-y-n)	(9-69)
*INTERVAL		
OR LOCATION IN MINOR FRAME	(D-x\FMF3-y-n)	
BIT MASK	(D-x\FMF4-y-n)	
INTERVAL	(D-x\FMF5-y-n)	
*EVERY LOCATION		(9-70)
MINOR FRAME LOCATION	(D-x\FMF6-y-n-e)	
BIT MASK	(D-x\FMF7-y-n-e)	
FRAGMENT TRANSFER ORDER	(D-x\FMF8-y-n-e)	
FRAGMENT POSITION	(D-x\FMF9-y-n-e)	(9-70)
* SUBFRAME		
OR SUBFRAME NAME	(D-x\SF1-y-n)	
LOCATION IN SUBFRAME	(D-x\SF2-y-n)	
BIT MASK	(D-x\SFM-y-n)	

Figure 9-7. PCM Measurement Description Group (D). (Page 1 of 2)

	*SUBFRAME SUPERCOMMUTATED		(9-71)
OR	SUBFRAME NAME	(D-x\SFS1-y-n)	
	NUMBER OF SUBFRAME LOCATIONS	(D-x\SFS\N-y-n)	
	LOCATION DEFINITION	(D-x\SFS2-y-n)	
	*INTERVAL		(9-71)
OR	LOCATION IN SUBFRAME	(D-x\SFS3-y-n)	
	BIT MASK	(D-x\SFS4-y-n)	(9-71)
	INTERVAL	(D-x\SFS5-y-n)	
	*EVERY LOCATION		(9-71)
	SUBFRAME LOCATION	(D-x\SFS6-y-n-e)	
	BIT MASK	(D-x\SFS7-y-n-e)	
	*SUBFRAME FRAGMENTED		(9-72)
OR	NUMBER OF FRAGMENTS	(D-x\FSF\N-y-n)	
	MEASUREMENT WORD LENGTH	(D-x\FSF1-y-n)	
	NUMBER OF SUBFRAMES	(D-x\FSF2\N-y-n)	
	SUBFRAME NAME	(D-x\FSF3-y-n-m)	
	LOCATION DEFINITION	(D-x\FSF4-y-n-m)	
	*INTERVAL		(9-72)
OR	LOCATION IN SUBFRAME	(D-x\FSF5-y-n-m)	
	BIT MASK	(D-x\FSF6-y-n-m)	
	INTERVAL	(D-x\FSF7-y-n-m)	
	*EVERY LOCATION		(9-73)
	SUBFRAME LOCATION	(D-x\FSF8-y-n-m-e)	
	BIT MASK	(D-x\FSF9-y-n-m-e)	
	FRAGMENT TRANSFER ORDER	(D-x\FSF10-y-n-m-e)	
	FRAGMENT POSITION	(D-x\FSF11-y-n-m-e)	(9-73)
	*WORD AND FRAME		
	NUMBER OF MEASUREMENT LOCATIONS	(D-x\MML\N-y-n)	
	NUMBER OF FRAGMENTS	(D-x\MNF\N-y-n-m)	
	MEASUREMENT WORD LENGTH	(D-x\MWL-y-n-m)	
	WORD POSITION	(D-x\WP-y-n-m-e)	
	WORD INTERVAL	(D-x\WI-y-n-m-e)	
	END WORD POSITION	(D-x\EWP-y-n-m-e)	
	FRAME POSITION	(D-x\FP-y-n-m-e)	(9-74)
	FRAME INTERVAL	(D-x\FI-y-n-m-e)	
	END FRAME POSITION	(D-x\EFP-y-n-m-e)	
	BIT MASK	(D-x\WFM-y-n-m-e)	
	FRAGMENT TRANSFER ORDER	(D-x\WFT-y-n-m-e)	
	FRAGMENT POSITION	(D-x\WFP-y-n-m-e)	
*COMMENTS			
	COMMENTS	(D-x\COM)	(9-76)

***Heading Only - No Data Entry**

Figure 9-7. PCM Measurement Description Group (D). (Page 2 of 2)

TABLE 9-6. PCM MEASUREMENT DESCRIPTION GROUP (D)

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
DATA LINK NAME	32	D-x\DLN	PROVIDE THE DATA LINK NAME.
NUMBER OF MEASUREMENT LISTS	2	D-x\ML\N	SPECIFY THE NUMBER OF MEASUREMENT LISTS TO BE PROVIDED.
MEASUREMENT LIST NAME	32	D-x\MLN-y	PROVIDE THE MEASUREMENT LIST NAME ASSOCIATED WITH THE FOLLOWING ATTRIBUTES. THE FOLLOWING INFORMATION WILL HAVE TO BE REPEATED FOR EACH MEASUREMENT LIST IDENTIFIED IN THE PCM FORMAT ATTRIBUTES GROUP.
NUMBER OF SELECTED MEASUREMENT FILTERING AND OVERWRITE DEFINITIONS	2	D-x\SMF\N-y *RO-CH10*	SPECIFY THE NUMBER OF PCM SELECTED MEASUREMENT FILTERING AND OVERWRITE DEFINITIONS.
SELECTED MEASUREMENT NAME	32	D-\SMF\SMN-y-n *RO-CH10*	SPECIFY THE PCM SELECTED MEASUREMENT NAME TO BE FILTERED AND OVERWRITTEN
NUMBER OF MEASURANDS	7	D-x\MN\N-y	SPECIFY THE NUMBER OF MEASURANDS INCLUDED WITHIN THIS MEASUREMENT LIST.
MEASUREMENT NAME	32	D-x\MN-y-n	MEASURAND NAME.
PARITY	2	D-x\MN1-y-n	SPECIFY PARITY: EVEN-‘EV’; ODD - ‘OD’; NONE - ‘NO’ MINOR FRAME DEFAULT - ‘DE’ (AS SPECIFIED IN TABLE 9-5, PARITY)

Table 9-6 (Continued). PCM Measurement Description Group (D) Page 2 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
PARITY TRANSFER ORDER	1	D-x\MN2-y-n	PARITY BIT LOCATION: LEADS WORD - 'L' TRAILS WORD - 'T' MINOR FRAME DEFAULT - 'D' (AS SPECIFIED IN TABLE 9-5, PARITY TRANSFER ORDER)
MEASUREMENT TRANSFER ORDER	1	D-x\MN3-y-n	MOST SIGNIFICANT BIT FIRST – 'M' LEAST SIGNIFICANT BIT FIRST - 'L' DEFAULT - 'D' (AS SPECIFIED IN TABLE 9-5, WORD TRANSFER ORDER)
MEASUREMENT FILTER – OVERWRITE TAG	1	D-x\MFOT-y-n *RO-CH10*	INDICATES IF THE MEASUREMENT IS TAGGED FOR EITHER FILTERING OR OVERWRITING 'O' - OVERWRITE 'F' - FILTER 'N' – NO FILTERING (DEFAULT)
MEASUREMENT LOCATION			
MEASUREMENT LOCATION TYPE	4	D-x\LT-y-n	SPECIFY THE NATURE OF THE LOCATION OF THIS MEASURAND. MINOR FRAME - 'MF' MINOR FRAME SUPERCOMMUTATED –'MFSC' MINOR FRAME FRAGMENTED –'MFFR' SUBFRAME – 'SF' SUBFRAME SUPERCOMMUTATED –'SFSC' SUBFRAME FRAGMENTED –'SFFR' WORD AND FRAME – 'WDFR'
MINOR FRAME			
MINOR FRAME LOCATION	4	D-x\MF-y-n	THE MINOR FRAME WORD POSITION OF THE MEASUREMENT.

Table 9-6 (Continued). PCM Measurement Description Group (D) Page 3 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
BIT MASK	64	D-x\MFM-y-n	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BITS IN A WORD LOCATION THAT ARE ASSIGNED TO THIS MEASUREMENT. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER - 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
MINOR FRAME SUPERCOMMUTATED			
NUMBER OF MINOR FRAME LOCATIONS	4	D-x\MFS\N-y-n	NUMBER OF WORD POSITIONS THAT THE SUPERCOMMUTATED CHANNEL OCCUPIES, N.
LOCATION DEFINITION	1	D-x\MFS1-y-n	TO SPECIFY: INTERVAL, ENTER - 'I' EVERY WORD LOCATION, ENTER - 'E'
INTERVAL			
LOCATION IN MINOR FRAME	4	D-x\MFS2-y-n	SPECIFY THE FIRST WORD LOCATION IN THE MINOR FRAME.
BIT MASK	64	D-x\MFS3-y-n	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BITS IN A WORD LOCATION THAT ARE ASSIGNED TO THIS SUPERCOMMUTATED MEASUREMENT. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER - 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
INTERVAL	3	D-x\MFS4-y-n	SPECIFY THE INTERVAL COUNT THAT IS THE OFFSET FROM THE FIRST WORD LOCATION AND EACH SUBSEQUENT LOCATION.

Table 9-6 (Continued). PCM Measurement Description Group (D) Page 4 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
EVERY LOCATION			
MINOR FRAME LOCATION	4	D-x\MFSW-y-n-e	ENTER THE MINOR FRAME WORD POSITION OF THE MEASUREMENT.
BIT MASK	64	D-x\MFSM-y-n-e	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BITS IN A WORD LOCATION THAT ARE ASSIGNED TO THIS SUPERCOMMUTATED MEASUREMENT. IF THE FULL WORD IS USED FOR THE MEASUREMENT, ENTER - 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
NOTE: ENTER THE MINOR FRAME LOCATION AND BIT MASK FOR EACH OF THE WORD POSITIONS THAT THE SUPERCOMMUTATED CHANNEL OCCUPIES, (N) LOCATIONS.			
MINOR FRAME FRAGMENTED			
NUMBER OF FRAGMENTS	1	D-x\FMF\N-y-n	NUMBER OF MINOR FRAME WORD POSITIONS THAT THE FRAGMENTED CHANNEL OCCUPIES, N.
MEASUREMENT WORD LENGTH	3	D-x\FMF1-y-n	TOTAL LENGTH OF THE RECONSTRUCTED BINARY DATA WORD
LOCATION DEFINITION	1	D-x\FMF2-y-n	TO SPECIFY: INTERVAL, ENTER - 'I' EVERY WORD LOCATION, ENTER-'E'
INTERVAL			
LOCATION IN MINOR FRAME	4	D-x\FMF3-y-n	SPECIFY THE FIRST WORD POSITION THAT THE FRAGMENTED WORD OCCUPIES IN THE MINOR FRAME.

Table 9-6 (Continued). PCM Measurement Description Group (D) Page 5 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
BIT MASK	64	D-x\FMF4-y-n	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BITS IN A WORD POSITION THAT ARE ASSIGNED TO THIS FRAGMENTED CHANNEL. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
INTERVAL	4	D-x\FMF5-y-n	SPECIFY THE INTERVAL THAT IS THE OFFSET FROM THE FIRST WORD LOCATION AND EACH SUBSEQUENT LOCATION.
EVERY LOCATION			
MINOR FRAME LOCATION	4	D-x\FMF6-y-n-e	ENTER THE MINOR FRAME WORD POSITION OF THE MEASUREMENT.
BIT MASK	64	D-x\FMF7-y-n-e	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BITS IN A WORD POSITION THAT ARE ASSIGNED TO THIS FRAGMENTED MEASUREMENT. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER - 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
FRAGMENT TRANSFER ORDER	1	D-x\FMF8-y-n-e	MOST SIGNIFICANT BIT FIRST - 'M' LEAST SIGNIFICANT BIT FIRST - 'L' DEFAULT - 'D' (AS SPECIFIED IN TABLE 9-5, WORD TRANSFER ORDER)
FRAGMENT POSITION	1	D-x\FMF9-y-n-e	A NUMBER FROM 1 TO N SPECIFYING THE POSITION OF THIS FRAGMENT WITHIN THE RECONSTRUCTED BINARY DATA WORD. 1 CORRESPONDS TO THE MOST SIGNIFICANT FRAGMENT. EACH FRAGMENT POSITION FROM 1 TO N MUST BE SPECIFIED ONLY ONCE.
NOTE: ENTER THE MINOR FRAME LOCATION AND BIT MASK FOR EACH OF THE WORD POSITIONS THAT THE FRAGMENTED CHANNEL OCCUPIES, (N) LOCATIONS.			
SUBFRAME			
SUBFRAME NAME	32	D-x\SF1-y-n	ENTER THE SUBFRAME NAME.

Table 9-6 (Continued). PCM Measurement Description Group (D) Page 6 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
LOCATION IN SUBFRAME	3	D-x\SF2-y-n	SPECIFY THE WORD NUMBER IN THE SUBFRAME.
BIT MASK	64	D-x\SFM-y-n	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BITS IN A WORD LOCATION THAT ARE ASSIGNED TO THIS MEASUREMENT. IF THE FULL WORD IS USED FOR THE MEASUREMENT, ENTER - 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
SUBFRAME SUPERCOMMUTATED			
SUBFRAME NAME	32	D-x\SFS1-y-n	ENTER THE SUBFRAME NAME.
NUMBER OF SUBFRAME LOCATIONS	3	D-x\SFS\N-y-n	NUMBER OF SUBFRAME WORD POSITIONS THAT THE SUPERCOMMUTATED CHANNEL OCCUPIES.
LOCATION DEFINITION	1	D-x\SFS2-y-n	TO SPECIFY: INTERVAL, ENTER - 'I' EVERY WORD LOCATION, ENTER - 'E'
INTERVAL			
LOCATION IN SUBFRAME	3	D-x\SFS3-y-n	SPECIFY THE FIRST WORD POSITION THAT THE SUPERCOMMUTATED WORD OCCUPIES IN THE SUBFRAME.
BIT MASK	64	D-x\SFS4-y-n	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BIT LOCATIONS IN A WORD POSITION THAT ARE ASSIGNED TO THIS SUPER-COMMUTATED CHANNEL. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER - 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
INTERVAL	3	D-x\SFS5-y-n	SPECIFY THE INTERVAL THAT IS THE OFFSET FROM THE FIRST WORD LOCATION AND EACH SUBSEQUENT LOCATION.
EVERY LOCATION			
SUBFRAME LOCATION	3	D-x\SFS6-y-n-e	ENTER THE SUBFRAME WORD POSITION OF THE MEASUREMENT.

Table 9-6 (Continued). PCM Measurement Description Group (D) Page 7 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
BIT MASK	64	D-x\SFS7-y-n-e	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BIT LOCATIONS IN A WORD POSITION THAT ARE ASSIGNED TO THIS SUPER-COMMUTATED MEASUREMENT. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
NOTE: ENTER THE SUBFRAME LOCATION AND BIT MASK FOR EACH OF THE WORD POSITIONS THAT THE SUPERCOMMUTATED CHANNEL OCCUPIES, (N) LOCATIONS.			
SUBFRAME FRAGMENTED			
NUMBER OF FRAGMENTS	1	D-x\FSF\N-y-n	NUMBER OF SUBFRAME WORD POSITIONS THAT THE FRAGMENTED CHANNEL OCCUPIES, N.
MEASUREMENTWORD LENGTH	3	D-x\FSF1-y-n	TOTAL LENGTH OF THE RECONSTRUCTED BINARY DATA WORD
NUMBER OF SUBFRAMES	1	D-x\FSF2\N-y-n	NUMBER OF SUBFRAMES CONTAINING THE FRAGMENTS
SUBFRAME NAME	32	D-x\FSF3-y-n-m	ENTER THE SUBFRAME NAME.
LOCATION DEFINITION	1	D-x\FSF4-y-n-m	TO SPECIFY: INTERVAL, ENTER - 'I' EVERY WORD LOCATION, ENTER - 'E'
INTERVAL			
LOCATION IN SUBFRAME	3	D-x\FSF5-y-n-m	SPECIFY THE FIRST WORD POSITION THAT THE FRAGMENTED WORD OCCUPIES IN THE SUBFRAME.
BIT MASK	64	D-x\FSF6-y-n-m	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BIT LOCATIONS IN A WORD POSITION THAT ARE ASSIGNED TO THIS FRAGMENTED CHANNEL. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER - 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.

Table 9-6 (Continued). PCM Measurement Description Group (D) Page 8 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
INTERVAL	3	D-x\FSF7-y-n-m	SPECIFY THE INTERVAL THAT IS THE OFFSET FROM THE FIRST WORD LOCATION AND EACH SUBSEQUENT LOCATION.
EVERY LOCATION			
SUBFRAME LOCATION	3	D-x\FSF8-y-n-m-e	ENTER THE SUBFRAME WORD POSITION OF THE MEASUREMENT.
BIT MASK	64	D-x\FSF9-y-n-m-e	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BIT LOCATIONS IN A WORD POSITION THAT IS ASSIGNED TO THIS FRAGMENTED MEASUREMENT. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
FRAGMENT TRANSFER ORDER	1	D-x\FSF10-y-n-m-e	MOST SIGNIFICANT BIT FIRST - 'M' LEAST SIGNIFICANT BIT FIRST - 'L' DEFAULT - 'D' (AS SPECIFIED IN TABLE 9-5, WORD TRANSFER ORDER)
FRAGMENT POSITION	1	D-x\FSF11-y-n-m-e	A NUMBER FROM 1 TO N SPECIFYING THE POSITION OF THIS FRAGMENT WITHIN THE RECONSTRUCTED BINARY DATA WORD. 1 CORRESPONDS TO THE MOST SIGNIFICANT FRAGMENT. EACH FRAGMENT POSITION FROM 1 TO N MUST BE SPECIFIED ONLY ONCE.
NOTE: ENTER THE SUBFRAME LOCATION AND BIT MASK FOR EACH OF THE WORD POSITIONS THAT THE FRAGMENTED CHANNEL OCCUPIES, (N) LOCATIONS.			
NOTE: REPEAT THE ABOVE ENTRIES, AS APPROPRIATE FOR EACH SUBFRAME THAT CONTAINS THE COMPONENTS OF THE FRAGMENTED WORD.			
WORD AND FRAME			
NUMBER OF MEASUREMENT LOCATIONS	4	D-x\MML\N-y-n	SPECIFY THE NUMBER OF LOCATION DEFINITIONS TO FOLLOW FOR THIS MEASUREMENT.

Table 9-6 (Continued). PCM Measurement Description Group (D) Page 9 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
NUMBER OF FRAGMENTS	1	D-x\MNF\N-y-n-m	NUMBER OF WORD POSITIONS THAT EACH FRAGMENTED MEASUREMENT LOCATION OCCUPIES, N. ENTER "1" IF THIS MEASUREMENT IS NOT FRAGMENTED.
MEASUREMENT WORD LENGTH	3	D-x\MWL-y-n-m	TOTAL LENGTH OF THE RECON-STRUCTED BINARY DATA WORD
WORD POSITION	4	D-x\WP-y-n-m-e	SPECIFY THE MINOR FRAME WORD POSITION OF THIS MEASUREMENT LOCATION OR FRAGMENT.
WORD INTERVAL	4	D-x\WI-y-n-m-e	SPECIFY THE INTERVAL THAT IS THE OFFSET FROM THE FIRST WORD POSITION AND EACH SUBSEQUENT WORD POSITION. AN INTERVAL OF ZERO INDICATES THAT THERE IS ONLY ONE WORD POSITION BEING DEFINED.
END WORD POSITION	4	D-x\EWP-y-n-m-e	SPECIFY THE LAST MINOR FRAME WORD POSITION OF THIS MEASUREMENT LOCATION OR FRAGMENT. IF NOT PRESENT, DEFAULT IS THE END OF THE MINOR FRAME, ACCORDING TO THE WORD INTERVAL. IF WORD INTERVAL IS ZERO, END WORD POSITION IS NOT USED.
FRAME POSITION	3	D-x\FP-y-n-m-e	SPECIFY THE FRAME LOCATION OF THIS MEASUREMENT LOCATION OR FRAGMENT.
FRAME INTERVAL	3	D-x\FI-y-n-m-e	SPECIFY THE INTERVAL THAT IS THE OFFSET FROM THE FIRST FRAME LOCATION AND EACH SUBSEQUENT FRAME LOCATION. AN INTERVAL OF ZERO INDICATES THAT THERE IS ONLY ONE FRAME LOCATION BEING DEFINED.

Table 9-6 (Continued). PCM Measurement Description Group (D) Page 10 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
END FRAME POSITION	3	D-x\EFP-y-n-m-e	SPECIFY THE LAST FRAME LOCATION OF THIS MEASUREMENT LOCATION OR FRAGMENT. IF NOT PRESENT, DEFAULT IS THE END OF THE MAJOR FRAME, ACCORDING TO THE FRAME INTERVAL. IF FRAME INTERVAL IS ZERO, END FRAME POSITION IS NOT USED.
BIT MASK	64	D-x\WFM-y-n-m-e	BINARY STRING OF 1S AND 0S TO IDENTIFY THE BIT LOCATIONS USED IN EACH MEASUREMENT LOCATION OR FRAGMENT. IF THE FULL WORD IS USED, ENTER 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
FRAGMENT TRANSFER ORDER	1	D-x\WFT-y-n-m-e	MOST SIGNIFICANT BIT FIRST – 'M' LEAST SIGNIFICANT BIT FIRST – 'L' DEFAULT – 'D' (AS SPECIFIED IN TABLE 9-5, WORD TRANSFER ORDER)
FRAGMENT POSITION	1	D-x\WFP-y-n-m-e	A NUMBER FROM 1 TO N SPECIFYING THE POSITION OF THIS FRAGMENT WITHIN THE RECONSTRUCTED BINARY DATA WORD. 1 CORRESPONDS TO THE MOST SIGNIFICANT FRAGMENT. EACH FRAGMENT POSITION FROM 1 TO N MUST BE SPECIFIED ONLY ONCE.

NOTE: MEASUREMENT WORD LENGTH, FRAGMENT TRANSFER ORDER, AND FRAGMENT POSITION ATTRIBUTES DO NOT APPLY WHEN THE "NUMBER OF FRAGMENTS" ATTRIBUTE FOR A MEASUREMENT IS 1.

Table 9-6 (Continued). PCM Measurement Description Group (D) Page 11 x 11

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
COMMENTS			
COMMENTS	3200	D-x\COM	PROVIDE THE ADDITIONAL INFORMATION REQUESTED OR ANY OTHER INFORMATION DESIRED.
NOTE: THIS GROUP WILL CONTAIN A REPETITION OF THE ABOVE INFORMATION UNTIL EACH MEASUREMENT HAS BEEN DEFINED. ANY WORD POSITION NOT INCLUDED WILL BE TREATED AS A SPARE CHANNEL OR A "DON'T CARE" CHANNEL. INFORMATION WILL NOT BE PROCESSED FOR THESE "SPARE" CHANNELS. NOTE THAT MEASUREMENT LIST CHANGES AND FORMAT CHANGES THAT ARE A PART OF CLASS II SYSTEMS ARE INCLUDED IN THE ABOVE, SINCE THE KEY TO THE MEASUREMENT DEFINITION IS THE DATA LINK NAME (FORMAT) AND THE MEASUREMENT LIST.			

9.5.6.3 Bus Data Attributes (B). Figure 9-8 and Table 9-7 describe bus-originated data formats. The Bus Data Attributes Group defines the attributes of a MIL-STD-1553 data acquisition system that is compliant with IRIG 106, Chapter 8 or an ARINC 429 data acquisition system that is consistent with the Aeronautical Radio Inc. specification of ARINC 429 bus data. The primary components of this group are the recording description and message content definition. The former defines the method by which the data were recorded on the tape such as track spread versus composite. The latter consists of the message identification information and the measurement description set. The message identification information defines the contents of the control word that identifies each bus message. The measurement description set describes the measurement attributes and contains the measurement name that links the measurand to the Data Conversion Attributes Group (C).

Mode codes are described in the message identification information. If the Subterminal Address (STA) field contains 00000 or 11111, the information in the Data Word Count/Mode Code field is a mode code and identifies the function of the mode code. If the mode code has associated data words, they are described in this section of the attributes. If the bus message is a remote terminal to remote terminal transfer, both the transmit command and the receive command are used to identify the message.

Bus Data Attributes Group (B)

DATA LINK NAME		CODE NAME	REFERENCE PAGE
		(B-x\DLN)	(9-79)
	TEST ITEM	(B-x\TA)	
	BUS PARITY	(B-x\BP)	
	NUMBER OF BUSES	(B-x\NBS\N)	
	BUS NUMBER	(B-x\BID-i)	
	BUS NAME	(B-x\BNA-i)	
	BUS TYPE	(B-x\BT-i)	
	* USER DEFINED WORDS		
	USER DEFINED WORD 1 MEASUREMENT	(B-x\UMN1-i)	
	PARITY	(B-x\U1P-i)	
	PARITY TRANSFER ORDER	(B-x\U1PT-i)	
	BIT MASK	(B-x\U1M-i)	
	TRANSFER ORDER	(B-x\U1T-i)	
	USER DEFINED WORD 2 MEASUREMENT	(B-x\UMN2-i)	
	PARITY	(B-x\U2P-i)	
	PARITY TRANSFER ORDER	(B-x\U2PT-i)	
	BIT MASK	(B-x\U2M-i)	
	TRANSFER ORDER	(B-x\U2T-i)	
	USER DEFINED WORD 3 MEASUREMENT	(B-x\UMN3-i)	
	PARITY	(B-x\U3P-i)	
	PARITY TRANSFER ORDER	(B-x\U3PT-i)	
	BIT MASK	(B-x\U3M-i)	
	TRANSFER ORDER	(B-x\U3T-i)	
	*RECORDING DESCRIPTION		(9-81)
	NUMBER OF TRACKS	(B-x\TK\N-i)	
	TRACK SEQUENCE	(B-x\TS-i-k)	
	*MESSAGE CONTENT DEFINITION		(9-82)
	NUMBER OF MESSAGES	(B-x\NMS\N-i)	
	MESSAGE NUMBER	(B-x\MID-i-n)	
	MESSAGE NAME	(B-x\MNA-i-n)	
	REMOTE TERMINAL NAME	(B-x\TRN-i-n)	
	REMOTE TERMINAL ADDRESS	(B-x\TRA-i-n)	
	SUBTERMINAL NAME	(B-x\STN-i-n)	
	SUBTERMINAL ADDRESS	(B-x\STA-i-n)	
	TRANSMIT/RECEIVE MODE	(B-x\TRM-i-n)	
	DATA WORD COUNT/MODE CODE	(B-x\DWC-i-n)	
	SPECIAL PROCESSING	(B-x\SPR-i-n)	
	MESSAGE FILTER-OVERWRITE TAG	(B-x\BMG\FOT-i-n)	
	*ARINC 429 MESSAGE DEFINITION		(9-83)
	ARINC 429 LABEL	(B-x\LBL-i-n)	
	ARINC 429 SDI CODE	(B-x\SDI-i-n)	

Figure 9-8. Bus Data Attributes Group (B). (Page 1 of 2)

		*RT/RT RECEIVE COMMAND LIST		(9-83)
		REMOTE TERMINAL NAME	(B-x\RTRN-i-n-m)	
		REMOTE TERMINAL ADDRESS	(B-x\RTRA-i-n-m)	
		SUBTERMINAL NAME	(B-x\RSTN-i-n-m)	
		SUBTERMINAL ADDRESS	(B-x\RSTA-i-n-m)	
		DATA WORD COUNT	(B-x\RDWC-i-n-m)	
		*MODE CODE		(9-84)
		MODE CODE DESCRIPTION	(B-x\MCD-i-n)	
		MODE CODE DATA WORD DESCRIPTION	(B-x\MCW-i-n)	
		*MEASUREMENT DESCRIPTION SET		(9-84)
		NUMBER OF MEASURANDS	(B-x\MN\N-i-n)	
		MEASUREMENT NAME	(B-x\MN-i-n-p)	
		MEASUREMENT TYPE	(B-x\MT-i-n-p)	
		PARITY	(B-x\MN1-i-n-p)	
		PARITY TRANSFER ORDER	(B-x\MN2-i-n-p)	
		MEASUREMENT FILTER-OVERWRITE TAG	(B-x\BME\FOT-i-n-p)	
		*MEASUREMENT LOCATION		(9-85)
		NUMBER OF MEASUREMENT LOCATIONS	(B-x\NML\N-i-n-p)	
		MESSAGE WORD NUMBER	(B-x\MWN-i-n-p-e)	
		BIT MASK	(B-x\MBM-i-n-p-e)	(9-85)
		TRANSFER ORDER	(B-x\MTO-i-n-p-e)	
		FRAGMENT POSITION	(B-x\MFP-i-n-p-e)	
	*COMMENTS			
		COMMENTS	(B-x\COM)	(9-85)

*Heading Only – No Data Entry

Figure 9-8. (Continued) Bus Data Attributes Group (B). (Page 2 of 2)

TABLE 9-7. BUS DATA ATTRIBUTES GROUP (B)

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
DATA LINK NAME	32	B-x\DLN	IDENTIFY THE DATA LINK NAME CONSISTENT WITH THE MULTIPLEX/MODULATION GROUP. THE PCM FORMAT OF THE DATA STREAM SHALL BE DEFINED IN THE PCM FORMAT ATTRIBUTES GROUP.
TEST ITEM	16	B-x\TA	TEST ITEM DESCRIPTION IN TERMS OF NAME, MODEL, PLATFORM, OR IDENTIFICATION CODE THAT CONTAINS THE DATA ACQUISITION SYSTEM.
BUS PARITY	2	B-x\BP	SPECIFY WHETHER THE MSB OF THE 1553 WORDS IS A PARITY BIT. IF PARITY IS USED, IT MUST BE ODD PARITY, AS SPECIFIED IN CHAPTER 8, PARAGRAPH 8.2.2 ODD – 'OD' NONE – 'NO'
NUMBER OF BUSES	2	B-x\NBS\N	SPECIFY THE NUMBER OF BUSES INCLUDED WITHIN THIS DATA LINK. IF PARITY IS USED, THE MAXIMUM IS 8 BUSES, AND IF PARITY IS NOT USED, THE MAXIMUM IS 16 BUSES, AS SPECIFIED IN CHAPTER 8, PARAGRAPH 8.2.3
BUS NUMBER	4	B-x\BID-i	ENTER THE BUS NUMBER AS A BINARY STRING.
BUS NAME	32	B-x\BNA-i	SPECIFY THE BUS NAME.
BUS TYPE	8	B-x\BT-i	SPECIFY THE BUS TYPE: 1553 BUS – '1553' ARINC 429 BUS – 'A429'
USER DEFINED WORDS			
USER DEFINED WORD 1 MEASUREMENT	32	B-x\UMN1-i	SPECIFY THE MEASUREMENT NAME ASSOCIATED WITH THE CONTENT ID LABEL (BITS 5-8) VALUE OF '0010'

Table 9-7 (Continued). Bus Data Attributes Group (B) Page 2 x 7

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
PARITY	2	B-x\U1P-i	SPECIFY PARITY. EVEN - 'EV' ODD - 'OD' NONE - 'NO'
PARITY TRANSFER ORDER	1	B-x\U1PT-i	PARITY BIT LOCATION LEADS WORD - 'L' TRAILS WORD - 'T'
BIT MASK	16	B-x\U1M-i	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BIT LOCATIONS THAT ARE ASSIGNED TO THIS MEASUREMENT IN THE WORD IDENTIFIED ABOVE. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
TRANSFER ORDER	3	B-x\U1T-i	MOST SIGNIFICANT BIT FIRST - 'MSB' LEAST SIGNIFICANT BIT FIRST - 'LSB' DEFAULT – 'DEF' (AS SPECIFIED IN TABLE 9-5, WORD TRANSFER ORDER)
USER DEFINED WORD 2 MEASUREMENT	32	B-x\UMN2-i	SPECIFY THE MEASUREMENT NAME ASSOCIATED WITH THE CONTENT ID LABEL (BITS 5-8) VALUE OF '0011'
PARITY	2	B-x\U2P-i	SPECIFY PARITY. EVEN - 'EV' ODD - 'OD' NONE - 'NO'
PARITY TRANSFER ORDER	1	B-x\U2PT-i	PARITY BIT LOCATION LEADS WORD - 'L' TRAILS WORD - 'T'
BIT MASK	16	B-x\U2M-i	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BIT LOCATIONS THAT ARE ASSIGNED TO THIS MEASUREMENT IN THE WORD IDENTIFIED ABOVE. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.

Table 9-7 (Continued). Bus Data Attributes Group (B) Page 3 x 7

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
TRANSFER ORDER	3	B-x\U2T-i	MOST SIGNIFICANT BIT FIRST - 'MSB' LEAST SIGNIFICANT BIT FIRST - 'LSB' DEFAULT – 'DEF' (AS SPECIFIED IN TABLE 9-5, WORD TRANSFER ORDER)
USER DEFINED WORD 3 MEASUREMENT	32	B-x\UMN3-i	SPECIFY THE MEASUREMENT NAME ASSOCIATED WITH THE CONTENT ID LABEL (BITS 5-8) VALUE OF '0100'. (VALID ONLY FOR 1553, WHEN RESPONSE TIME IS NOT USED.)
PARITY	2	B-x\U3P-i	SPECIFY PARITY. EVEN - 'EV' ODD - 'OD' NONE - 'NO'
PARITY TRANSFER ORDER	1	B-x\U3PT-i	PARITY BIT LOCATION LEADS WORD - 'L' TRAILS WORD - 'T'
BIT MASK	16	B-x\U3M-i	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BIT LOCATIONS THAT ARE ASSIGNED TO THIS MEASUREMENT IN THE WORD IDENTIFIED ABOVE. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
TRANSFER ORDER	3	B-x\U3T-i	MOST SIGNIFICANT BIT FIRST - 'MSB' LEAST SIGNIFICANT BIT FIRST - 'LSB' DEFAULT – 'DEF' (AS SPECIFIED IN TABLE 9-5, WORD TRANSFER ORDER)
RECORDING DESCRIPTION			
NUMBER OF TRACKS	2	B-x\TK\N-i	ENTER THE NUMBER OF TAPE TRACKS USED TO RECORD DATA. ANY ENTRY GREATER THAN ONE INDICATES THAT THE DATA HAS BEEN SPREAD ACROSS MULTIPLE TRACKS.

Table 9-7 (Continued). Bus Data Attributes Group (B) Page 4 x 7

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
TRACK SEQUENCE	3	B-x\TS-i-k	IN THESE ENTRIES, GIVE THE SEQUENCE ORDER OF TAPE TRACKS THAT SHOULD BE USED TO RECOVER THE DATA STREAM IN THE CORRECT ORDER. (THE ORDER GIVEN SHOULD CORRESPOND TO THE ACTUAL SKEW OF THE DATA ON THE TAPE.)
MESSAGE CONTENT DEFINITION			
NUMBER OF MESSAGES	8	B-x\NMS\N-i	THE NUMBER OF MESSAGES TO BE DEFINED.
MESSAGE NUMBER	8	B-x\MID-i-n	THE MESSAGE NUMBER THAT CONTAINS THE FOLLOWING DATA.
MESSAGE NAME	32	B-x\MNA-i-n	SPECIFY THE MESSAGE NAME.
REMOTE TERMINAL NAME	32	B-x\TRN-i-n	ENTER THE NAME OF THE REMOTE TERMINAL THAT IS SENDING OR RECEIVING THIS MESSAGE. FOR RT/RT, SPECIFY THE SENDING REMOTE TERMINAL NAME.
REMOTE TERMINAL ADDRESS	5	B-x\TRA-i-n	SPECIFY THE FIVE BIT REMOTE TERMINAL ADDRESS FOR THIS MESSAGE.
SUBTERMINAL NAME	32	B-x\STN-i-n	ENTER THE NAME OF THE SUBTERMINAL THAT IS SENDING OR RECEIVING THIS MESSAGE.
SUBTERMINAL ADDRESS	5	B-x\STA-i-n	SPECIFY THE FIVE BIT SUBTERMINAL ADDRESS FOR THIS MESSAGE. USE ‘X’ TO INDICATE A “DON’T CARE” VALUE.
TRANSMIT/ RECEIVE MODE	1	B-x\TRM-i-n	INDICATE IF THIS COMMAND WORD IS A TRANSMIT OR RECEIVE COMMAND. FOR RT/RT, SPECIFY TRANSMIT. TRANSMIT - ‘1’ RECEIVE - ‘0’

Table 9-7 (Continued). Bus Data Attributes Group (B) Page 5 x 7

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
DATA WORD COUNT/MODE CODE	5	B-x\DWC-i-n	ENTER THE NUMBER OF DATA WORDS AS A BINARY STRING, USING 'X' TO INDICATE A "DON'T CARE" VALUE. IF THE SUBTERMINAL ADDRESS INDICATES A MODE CODE, ENTER THE MODE CODE VALUE AS A BINARY STRING.
SPECIAL PROCESSING	200	B-x\SPR-i-n	PROVIDE ANY SPECIAL PROCESSING REQUIREMENTS PERTAINING TO THIS MESSAGE.
MESSAGE FILTER – OVERWRITE TAG	1	B-x\BMG\ FOT-i-n	INDICATES IF THE MESSAGE IS TAGGED FOR FILTERING OR OVERWRITING 'T' = TRUE, 'F' = FALSE
ARINC 429 MESSAGE DEFINITION			
ARINC 429 LABEL	8	B-x\LBL-i-n	SPECIFY THE EIGHT-BIT ARINC 429 LABEL FOR THIS MESSAGE.
ARINC 429 SDI CODE	3	B-x\SDI-i-n	SPECIFY THE TWO-BIT ARINC 429 SDI CODE FOR THIS MESSAGE: ALL SDI – 'ALL' SDI CODE 0 – '0' SDI CODE 1 – '1' SDI CODE 2 – '2' SDI CODE 3 – '3'
RT/RT RECEIVE COMMAND LIST			
REMOTE TERMINAL NAME	32	B-x\RTRN-i-n-m	ENTER THE NAME OF THE REMOTE TERMINAL THAT IS RECEIVING THIS RT/RT MESSAGE.
REMOTE TERMINAL ADDRESS	5	B-x\RTRA-i-n-m	SPECIFY THE FIVE BIT REMOTE TERMINAL ADDRESS FOR THIS RT/RT MESSAGE.
SUBTERMINAL NAME	32	B-x\RSTN-i-n-m	ENTER THE NAME OF THE SUB-TERMINAL THAT IS RECEIVING THIS RT/RT MESSAGE.

Table 9-7 (Continued). Bus Data Attributes Group (B) Page 6 x 7

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
SUBTERMINAL ADDRESS	5	B-x\RSTA-i-n-m	SPECIFY THE FIVE BIT SUBTERMINAL ADDRESS FOR THIS RT/RT MESSAGE. USE 'X' TO INDICATE A "DON'T CARE" VALUE.
DATA WORD COUNT	5	B-x\RDWC-i-n-m	ENTER THE NUMBER OF DATA WORDS AS A BINARY STRING, USING 'X' TO INDICATE A "DON'T CARE" VALUE. EXCLUDE STATUS AND TIME WORDS. (AN RT/RT MESSAGE CANNOT CONTAIN A MODE CODE.)
MODE CODE			
MODE CODE DESCRIPTION	200	B-x\MCD-i-n	DESCRIBE THE FUNCTION OR ACTION ASSOCIATED WITH THIS MODE CODE.
MODE CODE DATA WORD DESCRIPTION	200	B-x\MCW-i-n	IF THE MODE CODE HAS AN ASSOCIATED DATA WORD FOLLOWING THE MODE CODE COMMAND, PROVIDE A COMPLETE DESCRIPTION OF THE DATA WORD.
MEASUREMENT DESCRIPTION SET			
NUMBER OF MEASURANDS	7	B-x\MN\N-i-n	SPECIFY THE NUMBER OF MEASURANDS.
MEASUREMENT NAME	32	B-x\MN-i-n-p	MEASURAND NAME
MEASUREMENT TYPE	1	B-x\MT-i-n-p	CONTENT IDENTIFICATION: DATA WORD – 'D' COMMAND WORD – 'C' STATUS WORD – 'S' TIME WORD – 'T'
PARITY	2	B-x\MN1-i-n-p	SPECIFY PARITY. EVEN - 'EV' ODD - 'OD' NONE - 'NO'
PARITY TRANSFER ORDER	1	B-x\MN2-i-n-p	PARITY BIT LOCATION LEADS WORD - 'L' TRAILS WORD - 'T'

Table 9-7 (Continued). Bus Data Attributes Group (B) Page 7 x 7

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
MEASUREMENT FILTER – OVERWRITE TAG	1	B-x\BME\FOT-i-n-p	INDICATES IF THE MEASUREMENT IS TAGGED FOR FILTERING OR OVERWRITING 'T' = TRUE, 'F' = FALSE
MEASUREMENT LOCATION			
NUMBER OF MEASUREMENT LOCATIONS	2	B-x\NML\N-i-n-p	IF THIS MEASUREMENT IS CONTAINED IN ONE WORD, ENTER '1'. IF THIS MEASUREMENT IS FRAGMENTED, ENTER THE NUMBER OF FRAGMENTS.
MESSAGE WORD NUMBER	3	B-x\MWN-i-n-p-e	ENTER THE DATA WORD NUMBER WITHIN A MESSAGE THAT CONTAINS THE MEASUREMENT OR THE FRAGMENTED MEASURAND.
BIT MASK	64	B-x\MBM-i-n-p-e	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BIT LOCATIONS THAT ARE ASSIGNED TO THIS MEASURE-MENT IN THE WORD IDENTIFIED ABOVE. IF THE FULL WORD IS USED FOR THIS MEASUREMENT, ENTER 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
TRANSFER ORDER	3	B-x\MTO-i-n-p-e	MOST SIGNIFICANT BIT FIRST - 'MSB' LEAST SIGNIFICANT BIT FIRST- 'LSB' DEFAULT – 'DEF' (AS SPECIFIED IN TABLE 9-5, WORD TRANSFER ORDER)
FRAGMENT POSITION	1	B-x\MFP-i-n-p-e	A NUMBER FROM 1 TO N SPECIFYING THE POSITION OF THIS FRAGMENT WITHIN THE RECONSTRUCTED BINARY DATA WORD. 1 CORRESPONDS TO THE MOST SIGNIFICANT FRAGMENT. EACH FRAGMENT POSITION FROM 1 TO N MUST BE SPECIFIED ONLY ONCE.
NOTE: REPEAT THE ABOVE TO DESCRIBE EACH FRAGMENT OF A FRAGMENTED WORD. THE TRANSFER ORDER INDICATES WHETHER TO TRANSPOSE THE ORDER OF THE BIT SEQUENCE OR NOT (LSB INDICATES TO TRANSPOSE THE BIT SEQUENCE).			
COMMENTS			
COMMENTS	3200	B-x\COM	PROVIDE THE ADDITIONAL INFORMATION REQUESTED OR OTHER INFORMATION DESIRED.

9.5.6.4 Message Data Attributes (S). The Message Data Attributes are presented graphically in Figure 9-9 and specified in Table 9-8. The information contained within this group is used to describe the characteristics and measurement locations within data streams as described by the UART, Message, Ethernet, and IEEE-1394 Chapter 10 channel data types.

Message Data Attributes Group (S)

	CODE NAME	REFERENCE PAGE
DATA LINK NAME	(S-d\DLN)	(9-88)
TEST ITEM	(S-d\TA)	(9-88)
NUMBER OF STREAMS	(S-d\NS\N)	
STREAM NAME	(S-d\SNA-i)	
MESSAGE DATA TYPE	(S-d\MDT-i)	
MESSAGE DATA LAYOUT	(S-d\MDL-i)	
MESSAGE ELEMENT SIZE	(S-d\MES-i)	
MESSAGE ID LOCATION	(S-d\MIDL-i)	
MESSAGE LENGTH	(S-d\MLEN-i)	
MESSAGE DELIMITER	(S-d\MDEL-i)	
MESSAGE DELIMITER LENGTH	(S-d\MDLEN-i)	
FIELD DELIMITER	(S-d\FDEL-i)	
DATA ORIENTATION	(S-d\DO-i)	
*MESSAGE CONTENT DEFINITION		(9-89)
NUMBER OF MESSAGES	(S-d\NMS\N-i)	
MESSAGE ID	(S-d\MID-i-n)	
MESSAGE DESCRIPTION	(S-d\MNA-i-n)	
NUMBER OF FIELDS	(S-d\NFLDS\N-i-n)	
FIELD NUMBER	(S-d\FNUM-i-n-m)	
FIELD START	(S-d\FPOS-i-n-m)	
FIELD LENGTH	(S-d\FLEN-i-n-m)	
*MEASUREMENT DESCRIPTION SET		(9-89)
NUMBER OF MEASURANDS	(S-d\MN\N-i-n)	
MEASUREMENT NAME	(S-d\MN-i-n-p)	
PARITY	(S-d\MN1-i-n-p)	
PARITY TRANSFER ORDER	(S-d\MN2-i-n-p)	
DATA TYPE	(S-d\MBFM-i-n-p)	
FLOATING POINT FORMAT	(S-d\MFPF-i-n-p)	
DATA ORIENTATION	(S-d\MDO-i-n-p)	

Figure 9-9. Message Data Attributes Group (S)

(Page 1 of 2)

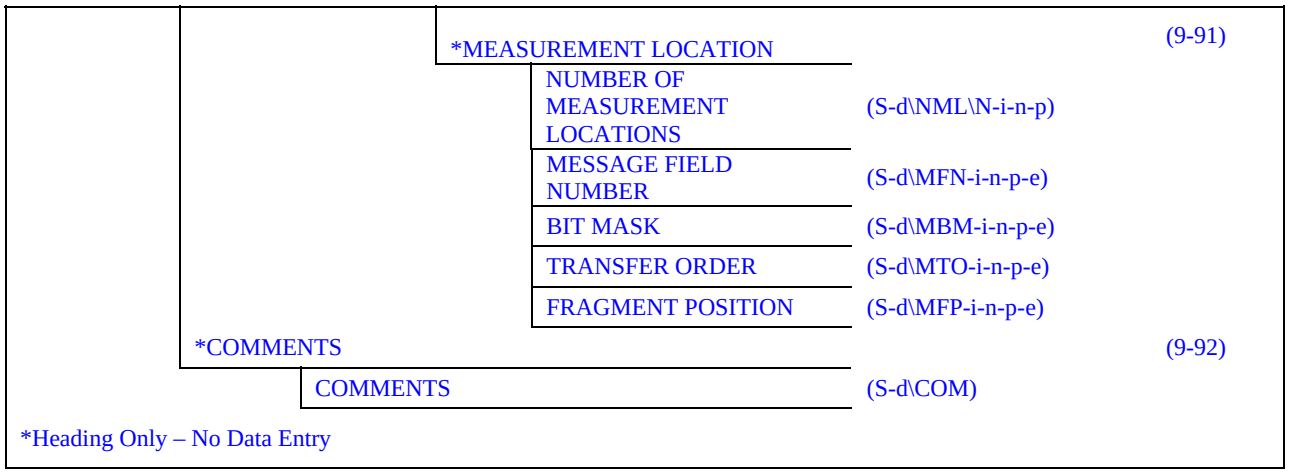

Figure 9-9. Message Data Attributes Group (S)

(Page 2 of 2)

TABLE 9-8. MESSAGE DATA ATTRIBUTES GROUP (S)

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
DATA LINK NAME	32	S-d\DLN	IDENTIFY THE DATA LINK NAME CONSISTENT WITH THE RECORDER-REPRODUCER GROUP.
TEST ITEM	16	S-d\TA	TEST ITEM DESCRIPTION IN TERMS OF NAME, MODEL, PLATFORM, OR IDENTIFICATION CODE THAT CONTAINS THE DATA ACQUISITION SYSTEM.
NUMBER OF STREAMS	2	S-d\NS\N	SPECIFY THE NUMBER OF MESSAGE DATA STREAMS INCLUDED WITHIN THIS DATA LINK.
STREAM NAME	32	S-d\SNA-i	SPECIFY THE MESSAGE DATA STREAM NAME. (SUBCHANNEL NAME OR SAME AS DATA LINK NAME IF NO SUBCHANNEL.)
MESSAGE DATA TYPE	8	S-d\MDT-i	DATA TYPE – ‘ASCII’ OR ‘BINARY’.
MESSAGE DATA LAYOUT	11	S-d\MDL-i	DATA LAYOUT – ‘DELIMITED’ (ASCII DATA TYPE ONLY) ‘FIXED’ (ASCII OR BINARY DATA TYPES)
MESSAGE ELEMENT SIZE	2	S-d\MES-i	ELEMENT SIZE IN NUMBER OF BITS.
MESSAGE ID LOCATION	4	S-d\MIDL-i	MESSAGE ID FIELD NUMBER.
MESSAGE LENGTH	8	S-d\MLEN-i	MESSAGE LENGTH IN NUMBER OF MESSAGE ELEMENTS. (FIXED DATA LAYOUT ONLY)
MESSAGE DELIMITER	6	S-d\MDEL-i	MESSAGE DELIMITER – ‘CRLF’ OR ‘CR’ OR ‘LF’ OR HEX VALUE (DELIMITED LAYOUT ONLY).
MESSAGE DELIMITER LENGTH	2	S-d\MDLEN-i	MESSAGE DELIMITER LENGTH IN NUMBER OF MESSAGE ELEMENTS (DELIMITED LAYOUT ONLY).
FIELD DELIMITER	10	S-d\FDEL-i	FIELD DELIMITER – ‘,’ OR ‘|’, OR ‘BLANK‘ OR ‘TAB’, OR HEX VALUE (DELIMITED LAYOUT ONLY)

Table 9-8 (Continued). Message Data Attributes Group (S) Page 2 x 5

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
NOTE: A FIELD IS A SET OF ELEMENTS DETERMINED BY THE NUMBER OF ELEMENTS OR ELEMENTS BETWEEN FIELD DELIMITERS. A MESSAGE CONSISTS OF ONE OR MORE FIELDS, WHICH CAN BE FIXED OR VARIABLE LENGTH.			
DATA ORIENTATION	1	S-d\DO-i	DATA ORIENTATION. LITTLE ENDIAN - 'L' BIG ENDIAN - 'B' (BINARY DATA TYPE ONLY)
MESSAGE CONTENT DEFINITION			
NUMBER OF MESSAGES	8	S-d\NMS\N-i	THE NUMBER OF MESSAGES TO BE DEFINED.
MESSAGE ID	32	S-d\MID-i-n	MESSAGE ID VALUE. ASCII VALUE IN QUOTES OR HEX VALUE.
MESSAGE DESCRIPTION	64	S-d\MNA-i-n	MESSAGE DESCRIPTION
NUMBER OF FIELDS	4	S-d\NFLDS\N-i-n	NUMBER OF FIELDS IN THE MESSAGE.
FIELD NUMBER	4	S-d\FNUM-i-n-m	SPECIFY THE FIELD NUMBER.
FIELD START	5	S-d\FPOS-i-n-m	ENTER THE ELEMENT POSITION OF THE FIELD (ONLY FOR FIXED COLUMN MESSAGE DATA LAYOUT)
FIELD LENGTH	5	S-d\FLEN-i-n-m	ENTER THE FIELD LENGTH (ONLY FOR FIXED MESSAGE DATA LAYOUT). IF MESSAGE DATA TYPE IS ASCII, ASCII STRING IN FIELD IS CONVERTED TO SPECIFIED DATA TYPE, i.e., FLOAT. IF MESSAGE DATA TYPE IS BINARY, FIELD IS CAST AS SPECIFIED DATA TYPE, i.e., UNSIGNED, SIGNED, FLOAT, ASCII, etc.
MEASUREMENT DESCRIPTION SET			
NUMBER OF MEASURANDS	4	S-d\MN\N-i-n	SPECIFY THE NUMBER OF MEASURANDS.
MEASUREMENT NAME	32	S-d\MN-i-n-p	MEASURAND NAME.
PARITY	2	S-d\MN1-i-n-p	NORMAL WORD PARITY: EVEN-'EV'; ODD - 'OD'; NONE - 'NO'

Table 9-8 (Continued). Message Data Attributes Group (S) Page 3 x 5

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
PARITY TRANSFER ORDER	1	S-d\MN2-i-n-p	PARITY BIT LOCATION: LEADS WORD - 'L' TRAILS WORD - 'T'
DATA TYPE	8	S-d\MBFM-i-n-p	DATA TYPE. 'ASCII' 'FLOAT' 'SIGNED' 'UNSIGNED' 'HEX' (ASCII characters 0-9, A-F) 'OCTAL' (ASCII characters 0-7) 'BINARY' (ASCII characters 0 and 1) IF MESSAGE DATA TYPE IS BINARY THEN ONLY ASCII, SIGNED, UNSIGNED, AND FLOAT ARE VALID
NOTE: FOR BINARY MESSAGES THE DATA TYPE DESCRIBES THE FORMAT OF THE RAW INPUT DATA AS IT APPEARS IN THE STREAM. IF FLOAT IS SPECIFIED IN A BINARY MESSAGE, THE FLOATING POINT FORMAT ATTRIBUTE DESCRIBES THE SPECIFIC FLOATING POINT DATA TYPE. FOR ASCII MESSAGES, FLOAT, SIGNED, AND UNSIGNED DEFINE HOW TO INTERPRET THE ASCII DATA FOR CONVERSION TO AN OUTPUT DATA TYPE FOR NUMERIC PROCESSING.			
FLOATING POINT FORMAT	8	S-d\MFPF-i-n-p	IF DATA TYPE IS 'FLOAT', SPECIFY WHICH FLOATING POINT FORMAT WILL BE USED. IEEE 754 SINGLE PRECISION - 'IEEE_32' IEEE 754 DOUBLE PRECISION – 'IEEE_64' MIL STD 1750A SINGLE PRECISION – '1750A_32' MIL STD 1750A DOUBLE PRECISION – '1750A_48' DEC SINGLE PRECISION – 'DEC_32' DEC DOUBLE PRECISION – 'DEC_64' DEC "G" DOUBLE PRECISION – 'DEC_64G'

Table 9-8 (Continued). Message Data Attributes Group (S) Page 4 x 5

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
			IBM SINGLE PRECISION – 'IBM_32' IBM DOUBLE PRECISION – 'IBM_64' TI SINGLE PRECISION – 'TI_32' TI EXTENDED PRECISION – 'TI_40' OTHER FORMATS ARE NOT EXCLUDED. SEE APPENDIX O FOR MORE INFORMATION. (ONLY FOR BINARY MESSAGE DATA TYPE)
DATA ORIENTATION	1	S-d\MDO-i-n-p	DATA ORIENTATION. LITTLE ENDIAN - 'L' BIG ENDIAN - 'B' (ONLY FOR BINARY MESSAGE DATA TYPE)
MEASUREMENT LOCATION			
NUMBER OF MEASUREMENT LOCATIONS	2	S-d\NML\N-i-n-p	IF THIS MEASUREMENT IS CONTAINED IN ONE FIELD, ENTER '1'. IF THIS MEASUREMENT IS FRAGMENTED, ENTER THE NUMBER OF FRAGMENTS.
MESSAGE FIELD NUMBER	4	S-d\MFN-i-n-p-e	ENTER THE FIELD NUMBER WITHIN A MESSAGE THAT CONTAINS THE MEASUREMENT OR THE FRAGMENTED MEASURAND.
BIT MASK	64	S-d\MBM-i-n-p-e	BINARY STRING OF 1s AND 0s TO IDENTIFY THE BIT LOCATIONS THAT ARE ASSIGNED TO THIS MEASURE-MENT IN THE FIELD IDENTIFIED ABOVE. IF THE ENTIRE FIELD IS USED FOR THIS MEASUREMENT, ENTER 'FW'. LEFT-MOST BIT CORRESPONDS TO FIRST BIT TRANSMITTED.
TRANSFER ORDER	3	S-d\MTO-i-n-p-e	SPECIFY IF THE START BIT IS MOST SIGNIFICANT - 'MSB' LEAST SIGNIFICANT - 'LSB'
FRAGMENT POSITION	1	S-d\MFP-i-n-p-e	A NUMBER FROM 1 TO N SPECIFYING THE POSITION OF THIS FRAGMENT WITHIN THE RECONSTRUCTED BINARY FIELD. 1 CORRESPONDS TO THE MOST SIGNIFICANT FRAGMENT. EACH FRAGMENT POSITION FROM 1 TO N MUST BE SPECIFIED ONLY ONCE.

Table 9-8 (Continued). Message Data Attributes Group (S)			Page 5 x 5
NOTE: REPEAT THE ABOVE TO DESCRIBE EACH FRAGMENT OF A FRAGMENTED FIELD. THE TRANSFER ORDER INDICATES WHETHER TO TRANSPOSE THE ORDER OF THE BIT SEQUENCE OR NOT (LSB INDICATES TO TRANSPOSE THE BIT SEQUENCE).			
COMMENTS			
COMMENTS	3200	S-d\COM	PROVIDE THE ADDITIONAL INFORMATION REQUESTED OR ANY OTHER INFORMATION DESIRED.

9.5.7 PAM Attributes (A). This group provides the information necessary to define the channelization and measurand definition for a PAM waveform. As with the PCM signal, the tie to the calibration data is with the measurement name. Figure 9-10 below summarizes the types of inputs required. Table 9-9 specifies the details required. The information that defines the measurand for each channel is required for the channels of interest.

PAM Attributes Group (A)		CODE NAME	REFERENCE PAGE
DATA LINK NAME		(A-x\DLN)	(9-93)
	INPUT CODE	(A-x\A1)	
	POLARITY	(A-x\A2)	
	SYNC PATTERN TYPE	(A-x\A3)	
	SYNC PATTERN (OTHER)	(A-x\A4)	
	CHANNEL RATE	(A-x\A5)	
	CHANNELS PER FRAME	(A-x\A\N)	
	NUMBER OF MEASURANDS	(A-x\A\MN\N)	
	*REFERENCE CHANNELS		(9-94)
	0% SCALE CHANNEL NUMBER	(A-x\RC1)	
	50% SCALE CHANNEL NUMBER	(A-x\RC2)	
	FULL SCALE CHANNEL NUMBER	(A-x\RC3)	
	*SUBFRAME DEFINITION		(9-94)
	NUMBER OF SUBFRAMES	(A-x\SF\N)	
	SUBFRAME n LOCATION	(A-x\SF1-n)	
	SUBFRAME n SYNCHRONIZATION	(A-x\SF2-n)	
	SUBFRAME n SYNCHRONIZATION PATTERN	(A-x\SF3-n)	
	*CHANNEL ASSIGNMENT		(9-95)
	MEASUREMENT NAME	(A-x\MN1-n)	
	SUBCOM	(A-x\MN2-n)	
	SUPERCOM	(A-x\MN3-n)	
	*LOCATION		(9-95)
	CHANNEL NUMBER	(A-x\LCW-n-s)	
	SUBFRAME CHANNEL NUMBER	(A-x\LCN-n-s-r)	
	*COMMENTS		
	COMMENTS	(A-x\COM)	(9-95)

***Heading Only – No Data Entry**

Figure 9-10. PAM Attributes Group (A).

TABLE 9-9. PAM ATTRIBUTES GROUP (A)			
PARAMETER	**MAXIMUM FIELD SIZE**	**CODE NAME**	**DEFINITION**
DATA LINK NAME	32	A-x\DLN	IDENTIFY THE DATA LINK NAME.
INPUT CODE	2	A-x\A1	DEFINE THE INPUT CODE: 50% DUTY CYCLE - 'RZ' 100% DUTY CYCLE (NRZ) - 'NR'
POLARITY	1	A-x\A2	NORMAL - 'N' INVERTED - 'I'
SYNC PATTERN TYPE	3	A-x\A3	SPECIFY THE SYNCHRONIZATION PATTERN IRIG 106 - 'STD' OTHER - 'OTH'
SYNC PATTERN (OTHER)	5	A-x\A4	DEFINE THE OTHER (NONSTANDARD) SYNCHRONIZATION PATTERN IN TERMS OF: 0 – ZERO SCALE H – HALF SCALE F – FULL SCALE X – DON'T CARE
CHANNEL RATE	6	A-x\A5	SPECIFY THE CHANNEL RATE IN CHANNELS PER SECOND.
CHANNELS PER FRAME	3	A-x\A\N	SPECIFY THE NUMBER OF CHANNELS PER FRAME INCLUDING THE SYNC PATTERN AND CALIBRATION CHANNELS. MAXIMUM ALLOWED IS 128.
NUMBER OF MEASURANDS	4	A-x\A\MN\N	INDICATE THE NUMBER OF MEASURANDS ASSOCIATED WITH THIS DATA LINK (SOURCE).

Table 9-9 (Continued). PAM Attributes Group (A) Page 2 x 3

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
REFERENCE CHANNELS			
0% SCALE CHANNEL NUMBER	3	A-x\RC1	CHANNEL NUMBER OF 0% SCALE REFERENCE. IF NOT USED, ENTER 'NON' (NONE).
50% SCALE CHANNEL NUMBER	3	A-x\RC2	CHANNEL NUMBER OF 50% SCALE REFERENCE. IF NOT USED, ENTER 'NON' (NONE).
FULL SCALE CHANNEL NUMBER	3	A-x\RC3	CHANNEL NUMBER OF FULL SCALE REFERENCE. IF NOT USED, ENTER 'NON' (NONE).
SUBFRAME DEFINITION			
NUMBER OF SUBFRAMES	1	A-x\SF\N	SPECIFY THE NUMBER OF SUBMULTIPLEXED CHANNELS IN THE FRAME.
SUBFRAME n LOCATION	3	A-x\SF1-n	CHANNEL NUMBER OF THE SUBFRAME. (REPEAT THIS ENTRY AND THE FOLLOWING TWO ENTRIES FOR EACH SUBFRAME AS A SET.)
SUBFRAME n SYNCHRONIZA-TION	3	A-x\SF2-n	SPECIFY THE SYNCHRONIZATION PATTERN FOR THE SUBFRAME: IRIG 106 - 'STD' OTHER - 'OTH'
SUBFRAME n SYNCHRONIZA-TION PATTERN	5	A-x\SF3-n	DEFINE THE OTHER (NONSTANDARD) SYNCHRONIZATION PATTERN IN TERMS OF: 0 – ZERO SCALE H – HALF SCALE F – FULL SCALE X – DON'T CARE OTH – OTHER

Table 9-9 (Continued). PAM Attributes Group (A) Page 3 x 3

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
CHANNEL ASSIGNMENT			
MEASUREMENT NAME	32	A-x\MN1-n	GIVE THE MEASUREMENT NAME.
SUBCOM	1	A-x\MN2-n	IS THIS A SUBCOMMUTATED CHANNEL? 'Y' OR 'N'
SUPERCOM	1	A-x\MN3-n	IS THIS A SUPERCOMMUTATED CHANNEL? IF YES, ENTER THE NUMBER OF POSITIONS IT OCCUPIES – n. IF NO, ENTER - 'N' A SUPERCOMMUTATED SUBCOMMUTATED PARAMETER IS ALLOWABLE AND WILL HAVE ENTRIES IN THIS AND THE PREVIOUS RECORD.
LOCATION			
CHANNEL NUMBER	3	A-x\LCW-n-s	NUMBER OF THE CHANNEL THAT CONTAINS THIS MEASURAND. IF THIS IS A SUBCOMMUTATED CHANNEL, ENTER THE CHANNEL THAT CONTAINS THE SUBCOMMUTATED CHANNEL.
SUBFRAME CHANNEL NUMBER	3	A-x\LCN-n-s-r	CHANNEL NUMBER IN THE SUBFRAME, IF APPROPRIATE.
COMMENTS			
COMMENTS	3200	A-x\COM	PROVIDE THE ADDITIONAL INFORMATION REQUESTED OR ANY OTHER INFORMATION DESIRED.

9.5.8 Data Conversion Attributes (C). The Data Conversion Attributes Group includes a definition of the method by which the raw telemetry data is to be converted to meaningful information. The sensor calibration is contained in the group for each type of sensor that uses a standard calibration curve or for each sensor or parameter that has a unique calibration requirement. The calibration information can be entered in several different formats. Provision is made to permit a test organization to convert data set entries to coefficients of an appropriate curve fit and record the derived coefficients. Figure 9-11 shows the structure of the data conversion attributes. Table 9-10 contains the detailed information required.

For reference purposes, the following telemetry unit definitions apply:

- PCM – natural binary range as indicated by binary format entry
- PAM – 0 to full scale (100)
- FM (Analog) – lower band edge (–100) to upper band edge (+100).

MEASUREMENT NAME	**Data Conversion Attributes Group (C)**	CODE NAME	REFERENCE PAGE
		(C-d\DCN)	(9-99)
	*TRANSDUCER INFORMATION		(9-99)
	TYPE	(C-d\TRD1)	
	MODEL NUMBER	(C-d\TRD2)	
	SERIAL NUMBER	(C-d\TRD3)	
	SECURITY CLASSIFICATION	(C-d\TRD4)	
	ORIGINATION DATE	(C-d\TRD5)	
	REVISION NUMBER	(C-d\TRD6)	
	ORIENTATION	(C-d\TRD7)	
	*POINT OF CONTACT		(9-99)
	NAME	(C-d\POC1)	
	AGENCY	(C-d\POC2)	
	ADDRESS	(C-d\POC3)	
	TELEPHONE	(C-d\POC4)	
	*MEASURAND		(9-100)
	DESCRIPTION	(C-d\MN1)	
	MEASUREMENT ALIAS	(C-d\MNA)	
	EXCITATION VOLTAGE	(C-d\MN2)	
	ENGINEERING UNITS	(C-d\MN3)	
	LINK TYPE	(C-d\MN4)	
	*TELEMETRY VALUE DEFINITION		(9-100)
	BINARY FORMAT	(C-d\BFM)	
	*FLOATING POINT		
	FLOATING POINT FORMAT	(C-d\FPF)	
	*BIT WEIGHT		
	NUMBER OF BITS	(C-d\BWT\N)	
	BIT NUMBER	(C-d\BWTB-n)	
	BIT WEIGHT VALUE	(C-d\BWTV-n)	
	*INFLIGHT CALIBRATION		(9-101)
	NUMBER OF POINTS	(C-d\MC\N)	
	STIMULUS	(C-d\MC1-n)	
	TELEMETRY VALUE	(C-d\MC2-n)	
	DATA VALUE	(C-d\MC3-n)	
	*AMBIENT VALUE		(9-102)
	NUMBER OF AMBIENT CONDITIONS	(C-d\MA\N)	
	STIMULUS	(C-d\MA1-n)	
	TELEMETRY VALUE	(C-d\MA2-n)	
	DATA VALUE	(C-d\MA3-n)	
	*OTHER INFORMATION		(9-102)
	HIGH MEASUREMENT VALUE	(C-d\MOT1)	
	LOW MEASUREMENT VALUE	(C-d\MOT2)	
	HIGH ALERT LIMIT VALUE	(C-d\MOT3)	
	LOW ALERT LIMIT VALUE	(C-d\MOT4)	
	HIGH WARNING LIMIT VALUE	(C-d\MOT5)	
	LOW WARNING LIMIT VALUE	(C-d\MOT6)	
	SAMPLE RATE	(C-d\SR)	

Figure 9-11. Data Conversion Attributes Group (C). (Page 1 of 2)

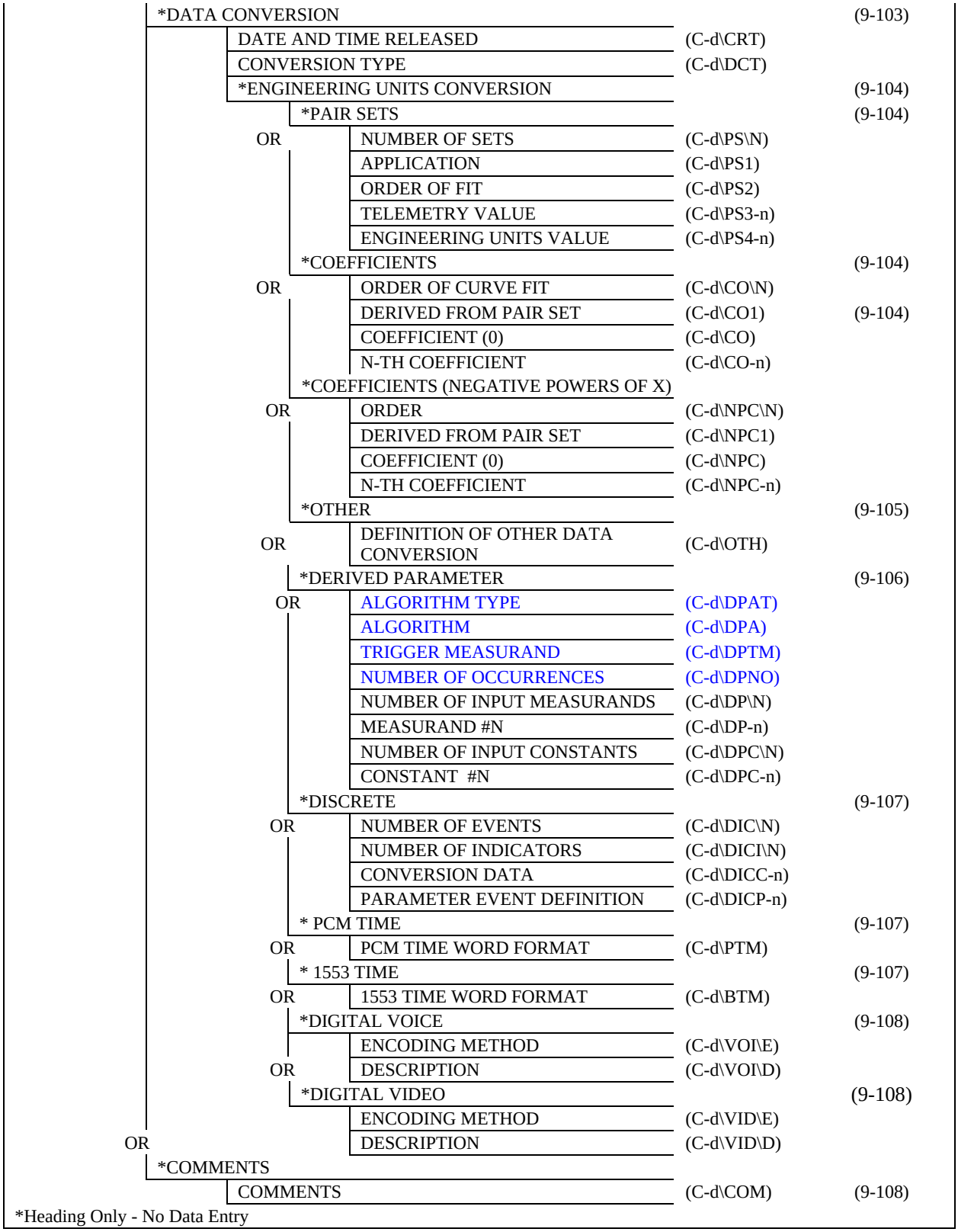

Figure 9-11. Data Conversion Attributes Group (C). (Page 2 of 2)

TABLE 9-10. DATA CONVERSION ATTRIBUTES GROUP (C)			
PARAMETER	**MAXIMUM FIELD SIZE**	**CODE NAME**	**DEFINITION**
MEASUREMENT NAME	32	C-d\DCN	GIVE THE MEASUREMENT NAME.
TRANSDUCER INFORMATION			
TYPE	32	C-d\TRD1	TYPE OF SENSOR, IF APPROPRIATE
MODEL NUMBER	32	C-d\TRD2	IF APPROPRIATE
SERIAL NUMBER	32	C-d\TRD3	IF APPLICABLE
SECURITY CLASSIFICATION	2	C-d\TRD4	ENTER THE SECURITY CLASSIFICATION OF THIS MEASURAND. UNCLASSIFIED - 'U' CONFIDENTIAL - 'C' SECRET - 'S' TOP SECRET - 'T' OTHER - 'O' APPEND THE FOLLOWING: IF RECEIVED TELEMETRY SIGNAL (COUNTS) IS CLASSIFIED, ADD 'R'. IF EXPRESSED IN ENGINEERING UNITS, THE MEASURAND VALUE IS CLASSIFIED, ADD 'E'. IF BOTH ARE CLASSIFIED, ADD 'B'.
ORIGINATION DATE	10	C-d\TRD5	DATE OF ORIGINATION OF THIS DATA FILE. DD – DAY MM – MONTH YYYY – YEAR (MM-DD-YYYY)
REVISION NUMBER	4	C-d\TRD6	SPECIFY THE REVISION NUMBER OF THE DATA PROVIDED.
ORIENTATION	32	C-d\TRD7	DESCRIBE THE PHYSICAL ORIENTATION OF THE SENSOR.
POINT OF CONTACT: NAME AGENCY ADDRESS TELEPHONE	 24 48 48 20	 C-d\POC1 C-d\POC2 C-d\POC3 C-d\POC4	POINT OF CONTACT WITH THE ORGANIZATION THAT PROVIDED THE CALIBRATION DATA

Table 9-10 (Continued). Data Conversion Attributes Group (C) Page 2 x 10

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
MEASURAND			
DESCRIPTION	64	C-d\MN1	DESCRIBE THE PARAMETER BEING MEASURED.
MEASUREMENT ALIAS	32	C-d\MNA	ALTERNATE MEASURAND NAME
EXCITATION VOLTAGE	10	C-d\MN2	SENSOR REFERENCE VOLTAGE, IN VOLTS
ENGINEERING UNITS	16	C-d\MN3	DEFINE THE ENGINEERING UNITS APPLICABLE TO THE OUTPUT DATA.
LINK TYPE	3	C-d\MN4	DEFINE THE SOURCE DATA LINK TYPE: FM (ANALOG) - 'ANA' PCM - 'PCM' PAM - 'PAM' OTHER - 'OTH'
TELEMETRY VALUE DEFINITION			
BINARY FORMAT	3	C-d\BFM	FORMAT OF THE BINARY INFORMATION: INTEGER - 'INT' UNSIGNED BINARY - 'UNS' SIGN AND MAGNITUDE BINARY (+=0) – 'SIG' SIGN AND MAGNITUDE BINARY (+=1) – 'SIM' ONE'S COMPLEMENT - 'ONE' TWO'S COMPLEMENT - 'TWO' OFFSET BINARY - 'OFF' FLOATING POINT - 'FPT' BINARY CODED DECIMAL -'BCD' BIT WEIGHT – 'BWT' OTHER - 'OTH,' DEFINE IN COMMENTS.
FLOATING POINT			
FLOATING POINT FORMAT	8	C-d\FPF	IF BINARY FORMAT IS 'FPT', SPECIFY WHICH FLOATING POINT FORMAT WILL BE USED. IEEE 754 SINGLE PRECISION - 'IEEE_32' IEEE 754 DOUBLE PRECISION – 'IEEE_64' MIL STD 1750A SINGLE PRECISION – '1750A_32'

Table 9-10 (Continued). Data Conversion Attributes Group (C) Page 3 x 10

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
			MIL STD 1750A DOUBLE PRECISION – '1750A_48' DEC SINGLE PRECISION – 'DEC_32' DEC DOUBLE PRECISION – 'DEC_64' DEC "G" DOUBLE PRECISION – 'DEC_64G' IBM SINGLE PRECISION – 'IBM_32' IBM DOUBLE PRECISION – 'IBM_64' TI SINGLE PRECISION – 'TI_32' TI EXTENDED PRECISION – 'TI_40' OTHER FORMATS ARE NOT EXCLUDED. SEE APPENDIX O FOR MORE INFORMATION.
BIT WEIGHT			
NUMBER OF BITS	2	C-d\BWT\N	SPECIFY THE NUMBER OF BITS THAT WILL HAVE A WEIGHTED VALUE ASSIGNED
BIT NUMBER	2	C-d\BWTB-n	BIT NUMBER, AS DEFINED IN CHAPTER 4, PARAGRAPH 4.3.1.3 (MSB IS BIT 1)
BIT WEIGHT VALUE	32	C-d\BWTV-n	NUMERICAL VALUE INDICATED BY EACH BIT. SCIENTIFIC NOTATION MAY BE USED. TO SPECIFY THE SIGN BIT, ENTER – 'S'.
INFLIGHT CALIBRATION			
NUMBER OF POINTS	1	C-d\MC\N	IS INFLIGHT CALIBRATION REQUIRED? 'N' FOR NO OR A NUMBER BETWEEN 1 AND 5, IF IT IS REQUIRED. A MAXIMUM OF FIVE CALIBRATION POINTS MAY BE INCLUDED.
STIMULUS	32	C-d\MC1-n	PROVIDE THE STIMULUS FOR THIS CALIBRATION POINT.
TELEMETRY VALUE	16	C-d\MC2-n	TELEMETRY UNITS VALUE
DATA VALUE	32	C-d\MC3-n	ENGINEERING UNITS VALUE, SCIENTIFIC NOTATION MAY BE USED.

NOTE: THE ABOVE SET OF THREE ENTRIES MUST BE REPEATED FOR EACH INFLIGHT CALIBRATION POINT.

Table 9-10 (Continued). Data Conversion Attributes Group (C) Page 4 x 10

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
AMBIENT VALUE			
NUMBER OF AMBIENT CONDITIONS	1	C-d\MA\N	NUMBER OF STATIC OR SIMULATED CONDITIONS
STIMULUS	32	C-d\MA1-n	DESCRIPTION OF THE STATIC ENVIRON-MENT IN WHICH A NONTEST STIMULUS OR SIMULATOR IS THE DATA SOURCE
TELEMETRY VALUE	16	C-d\MA2-n	TELEMETRY UNITS VALUE FOR THE STATIC STIMULUS
DATA VALUE	32	C-d\MA3-n	ENGINEERING UNITS VALUE FOR THE STATIC OR SIMULATED CONDITION. SCIENTIFIC NOTATION MAY BE USED.
OTHER INFORMATION			
HIGH MEASUREMENT VALUE	32	C-d\MOT1	HIGHEST ENGINEERING UNIT VALUE DEFINED BY THE CALIBRATION DATA, SCIENTIFIC NOTATION MAY BE USED.
LOW MEASUREMENT VALUE	32	C-d\MOT2	LOWEST ENGINEERING UNIT VALUE DEFINED IN THE CALIBRATION DATA, SCIENTIFIC NOTATION MAY BE USED.
HIGH ALERT LIMIT VALUE	32	C-d\MOT3	HIGHEST ENGINEERING UNIT VALUE EXPECTED OR SAFE OPERATING VALUE OF THE PARAMETER (“RED”), SCIENTIFIC NOTATION MAY BE USED.
LOW ALERT LIMIT VALUE	32	C-d\MOT4	LOWEST ENGINEERING UNIT VALUE EXPECTED OR SAFE OPERATING VALUE OF THE PARAMETER (“RED”), SCIENTIFIC NOTATION MAY BE USED.
HIGH WARNING LIMIT VALUE	32	C-d\MOT5	HIGHEST ENGINEERING UNIT VALUE EXPECTED OR SAFE OPERATING VALUE OF THE PARAMETER (“YELLOW”), SCIENTIFIC NOTATION MAY BE USED.

Table 9-10 (Continued). Data Conversion Attributes Group (C) Page 5 x 10

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
LOW WARNING LIMIT VALUE	32	C-d\MOT6	LOWEST ENGINEERING UNIT VALUE EXPECTED OR SAFE OPERATING VALUE OF THE PARAMETER (“YELLOW”), SCIENTIFIC NOTATION MAY BE USED.
SAMPLE RATE	6	C-d\SR	ENTER THE SAMPLE RATE IN TERMS OF SAMPLES/SECOND.
DATA CONVERSION			
DATE AND TIME RELEASED	19	C-d\CRT	DATE AND TIME CALIBRATION WAS RELEASED: DD – DAY MM – MONTH YYYY – YEAR HH – HOUR MI – MINUTE SS – SECOND (MM-DD-YYYY-HH-MI-SS)
CONVERSION TYPE	3	C-d\DCT	DEFINE THE CHARACTERISTICS OF THE DATA CONVERSION: NONE - ‘NON’ ENGINEERING UNITS: PAIR SETS - ‘PRS’ COEFFICIENTS - ‘COE’ COEFFICIENTS (NEGATIVE POWERS OF X)–‘NPC’ DERIVED - ‘DER’ DISCRETE - ‘DIS’ PCM TIME - ‘PTM’ 1553 TIME - ‘BTM’ DIGITAL VOICE - ‘VOI’ DIGITAL VIDEO - ‘VID’ SPECIAL PROCESSING - ‘SP’ (ENTER IN COMMENTS RECORD.) OTHER - ‘OTH’

Table 9-10 (Continued). Data Conversion Attributes Group (C) Page 6 x 10

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
ENGINEERING UNITS CONVERSION			
PAIR SETS			
NUMBER OF SETS	2	C-d\PS\N	SPECIFY THE NUMBER OF PAIR SETS PROVIDED, n.
APPLICATION	1	C-d\PS1	ARE THE PAIR SETS TO BE USED TO DEFINE A POLYNOMINAL CURVE FIT? 'Y' (YES) OR 'N' (NO). IF THE ANSWER IS NO, THEN THE PAIR SETS ARE TO BE USED AS A "TABLE LOOKUP" WITH LINEAR INTERPOLATION BETWEEN THE DEFINED POINTS.
ORDER OF FIT	2	C-d\PS2	SPECIFY THE ORDER OF THE CURVE FIT TO BE PERFORMED, m. AT LEAST 2 PAIR SETS MUST BE PROVIDED, AND A MAXIMUM OF 32 PAIR SETS MAY BE INCLUDED. TWELVE OR MORE PAIR SETS ARE RECOMMENDED FOR A FIFTH ORDER FIT.
TELEMETRY VALUE	16	C-d\PS3-n	TELEMETRY UNITS VALUE
ENGINEERING UNITS VALUE	32	C-d\PS4-n	ENGINEERING UNITS VALUE, SCIENTIFIC NOTATION MAY BE USED.
NOTE: REPEAT THE ABOVE FOR THE n PAIR SETS.			
COEFFICIENTS			
ORDER OF CURVE FIT	2	C-d\CO\N	SPECIFY THE ORDER OF THE POLYNOMINAL CURVE FIT, n.
DERIVED FROM PAIR SET	1	C-d\CO1	WERE THE COEFFICIENTS DERIVED FROM THE PAIR SET CALIBRATION DATA PROVIDED ('Y' OR 'N')? IF YES, PROVIDE A POINT OF CONTACT IN THE COMMENTS RECORD.
COEFFICIENT (0)	32	C-d\CO	VALUE OF THE ZERO ORDER TERM (OFFSET), SCIENTIFIC NOTATION MAY BE USED.

Table 9-10 (Continued). Data Conversion Attributes Group (C) Page 7 x 10

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
N-TH COEFFICIENT	32	C-d\CO-n	VALUE OF THE COEFFICIENT OF THE N-TH POWER OF X (FIRST ORDER COEFFICIENT IS THE EQUIVALENT OF BIT WEIGHT). SCIENTIFIC NOTATION MAY BE USED.
NOTE: REPEAT UNTIL ALL N+1 COEFFICIENTS ARE DEFINED.			
COEFFICIENTS (NEGATIVE POWERS OF X)			
ORDER	2	C-d\NPC\N	SPECIFY THE ORDER OF NEGATIVE POWER COEFFICIENTS, n.
DERIVED FROM PAIR SET	1	C-d\NPC1	WERE THE COEFFICIENTS DERIVED FROM THE PAIR SET CALIBRATION DATA PROVIDED ('Y' OR 'N')? IF YES, PROVIDE A POINT OF CONTACT IN THE COMMENTS RECORD.
COEFFICIENT (0)	32	C-d\NPC	VALUE OF THE ZERO ORDER TERM (OFFSET), SCIENTIFIC NOTATION MAY BE USED.
N-TH COEFFICIENT	32	C-d\NPC-n	VALUE OF THE COEFFICIENT OF THE NEGATIVE N-TH POWER OF X . SCIENTIFIC NOTATION MAY BE USED.
NOTE: REPEAT UNTIL ALL N+1 COEFFICIENTS ARE DEFINED. THIS SECTION DESCRIBES THE CONVERSION EQUATION Y=C0 + C1*(1/X) + C2*(1/X^2) + …+ Cn*(1/X^n), WHERE C0, C1, C2,…,Cn ARE THE COEFFICIENTS, X IS THE TELEMETRY VALUE, AND Y IS THE RESULTING EU VALUE.			
OTHER			
DEFINITION OF OTHER DATA CONVERSION	1000	C-d\OTH	DEFINE OTHER DATA CONVERSION TECHNIQUE OR SPECIAL PROCESSING REQUIREMENT.

Table 9-10 (Continued). Data Conversion Attributes Group (C) Page 8 x 10

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
DERIVED PARAMETER			
ALGORITHM TYPE	1	C-d\DPAT	SPECIFY WHETHER THE ALGORITHM WILL BE GIVEN (IN C-d\DPA) AS: NAME OF ALGORITHM – 'N' ALGORITHM – 'A' SEE APPENDIX P FOR ADDITIONAL DETAILS.
ALGORITHM	240	C-d\DPA	DEFINE THE ALGORITHM TO BE USED IN DERIVING THE PARAMETER. SEE APPENDIX P FOR ADDITIONAL DETAILS.
TRIGGER MEASURAND	32	C-d\DPTM	SPECIFY THE NAME OF THE INPUT MEASURAND THAT TRIGGERS THE CALCULATION OF THE DERIVED PARAMETER
NUMBER OF OCCURRENCES	2	C-d\DPNO	SPECIFY HOW MANY TIMES THE TRIGGER MEASURAND MUST OCCUR BEFORE THE CALCULATION IS DONE. DEFAULT IS 1.
NUMBER OF INPUT MEASURANDS	2	C-d\DP\N	SPECIFY THE NUMBER OF INPUT MEASURANDS USED TO DERIVE THIS PARAMETER.
MEASURAND #N	32	C-d\DP-n	SPECIFY THE NAME OF THE N-TH INPUT MEASURAND.
NOTE: CONTINUE UNTIL ALL N MEASURANDS ARE DEFINED.			
NUMBER OF INPUT CONSTANTS	2	C-d\DPC\N	SPECIFY THE NUMBER OF INPUT CONSTANTS USED TO DERIVE THIS PARAMETER.
CONSTANT #N	32	C-d\DPC-n	SPECIFY THE VALUE FOR THE N-TH CONSTANT. SCIENTIFIC NOTATION MAY BE USED.
NOTE: CONTINUE UNTIL ALL N CONSTANTS ARE DEFINED.			

Table 9-10 (Continued). Data Conversion Attributes Group (C) Page 9 x 10

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
DISCRETE			
NUMBER OF EVENTS	2	C-d\DIC\N	HOW MANY EVENTS ARE ASSOCIATED WITH THIS DISCRETE FIELD, n?
NUMBER OF INDICATORS	2	C-d\DICI\N	NUMBER OF INDICATORS: FOR A PCM SYSTEM, PROVIDE THE NUMBER OF BITS USED FOR THIS DISCRETE SET. FOR A PAM OR ANALOG CHANNEL, PROVIDE THE NUMBER OF LEVELS USED TO DEFINE THIS DISCRETE SET.
CONVERSION DATA	16	C-d\DICC-n	TELEMETRY VALUE, COUNTS FOR PCM, PERCENT OF FULL SCALE FOR PAM OR ANALOG.
PARAMETER EVENT DEFINITION	240	C-d\DICP-n	DEFINE THE EVENT FOR THE BIT OR BIT FIELD IN A WORD THAT CORRESPONDS TO A DISCRETE EVENT OR THE PERCENT FULL SCALE VALUE SUCH AS SWITCH ON OR OFF.
NOTE: CONTINUE TO DEFINE THE EVENTS FOR EACH BIT PATTERN OR VALUE OF THE DISCRETE MEASURAND.			
PCM TIME			
PCM TIME WORD FORMAT	1	C-d\PTM	SPECIFY THE PCM TIME WORD FORMAT USED, AS DEFINED IN CHAPTER 4 (PARAGRAPH 4.7). HIGH ORDER TIME - ‘H’ LOW ORDER TIME - ‘L’ MICROSECOND TIME - ‘M’
1553 TIME			
1553 TIME WORD FORMAT	1	C-d\BTM	SPECIFY THE 1553 TIME WORD FORMAT USED, AS DEFINED IN CHAPTER 4 (PARAGRAPH 4.7) AND CHAPTER 8 (PARAGRAPH 8.3) HIGH ORDER TIME - ‘H’ LOW ORDER TIME - ‘L’ MICROSECOND TIME - ‘M’ RESPONSE TIME - ‘R’

Table 9-10 (Continued). Data Conversion Attributes Group (C) Page 10 x 10

PARAMETER	MAXIMUM FIELD SIZE	CODE NAME	DEFINITION
DIGITAL VOICE			
ENCODING METHOD	4	C-d\VOI\E	SPECIFY THE VOICE ENCODING METHOD USED: CVSD - 'CVSD' OTHER - 'OTHR'
DESCRIPTION	640	C-d\VOI\D	SPECIFY THE DECODING ALGORITHM TO BE USED.
DIGITAL VIDEO			
ENCODING METHOD	64	C-d\VID\E	SPECIFY THE VIDEO ENCODING METHOD USED.
DESCRIPTION	640	C-d\VID\D	SPECIFY THE DECODING ALGORITHM TO BE USED.
COMMENTS			
COMMENTS	3200	C-d\COM	PROVIDE THE ADDITIONAL INFORMATION REQUESTED OR ANY OTHER INFORMATION DESIRED.

9.5.9 Airborne Hardware Attributes (H). The Airborne Hardware Attributes Group defines the specific configuration of airborne instrumentation hardware in use on the item under test. This group allows the same TMATS file to describe the airborne hardware as well as the telemetry attributes.

Specific information on the structure and definition of airborne hardware attributes is not included in this standard. There are far too many hardware systems to try to define them all in one group. The main purpose of identifying this group is to reserve the 'H' designation for those instrumentation organizations that choose to use the TMATS standard in this way.

The only H group attributes defined in this standard are the following:

a. Test Item (code name H\TA) - specifies the item under test and ties the H group to the G group.
b. Airborne System Type (code name H\ST-n) - identifies the airborne systems being described in the current file and determines how the rest of the attributes in the H group will be interpreted.

For anyone wishing to define an H group, it is strongly recommended that the conventions laid out in this standard be followed. The resultant document should maintain the look and feel of this standard for consistency.

9.5.10 Vendor Specific Attributes (V). The Vendor Specific Attributes Group provides information that is specific to a vendor. This group allows the TMATS file to include information about a particular vendor's equipment in use during a test. Detailed information about specific vendors' equipment is not included in this standard.

The only V-group attributes defined in this standard are the following:

a. Data Source ID (code name V-x\ID) - specifies the Data Source ID consistent with the General Information Group and ties the V-group to the G group.
b. Vendor Name (code name V-x\VN) - a three-character acronym that identifies the specific vendor and determines how the rest of the attributes in the V group are interpreted.

All other code names for vendor specific attributes will have the form:

V-x\acr\attribute-string

Where:

acr - is the three-character acronym identifying a specific vendor.
attribute-string - is any attribute that applies to this vendor.

For anyone wishing to define a V group, it is strongly recommended that the conventions laid out in this standard be followed. The resultant document should maintain the look and feel of this standard for consistency.

9.6 Data Display Standard: Data Display Markup Language (DDML)

The standard format, DDML, has been developed to describe commonly used data displays. This DDML standard exists only as an XML schema; it does not exist in the TMATS code name format described in paragraph 9.5. The DDML schema can be found at (ddml31.xsd). The following paragraphs explain the purpose, objectives, and structure of DDML, and define the global elements in the schema.

9.6.1 DDML Purpose and Objectives. The purpose of DDML is to serve as the neutral interchange language between data display languages supported by different vendors. Built on the eXtensible Markup Language (XML), DDML has been designed with the following objectives in mind:

a. To include a standard terminology for describing data display components.
b. To be robust and highly expressive in order to accommodate any data display language.
c. To be highly unified and not a loose grouping of vendor formats.

9.6.2 DDML Layered Structure. DDML is built off of a layered structure as shown on the left of Figure 9-12 below. This structure is parallel to a typical software layered architecture composed of graphics resources, visualization and user interfaces, information management, and persistence modules as shown on the right side of Figure 9-12.

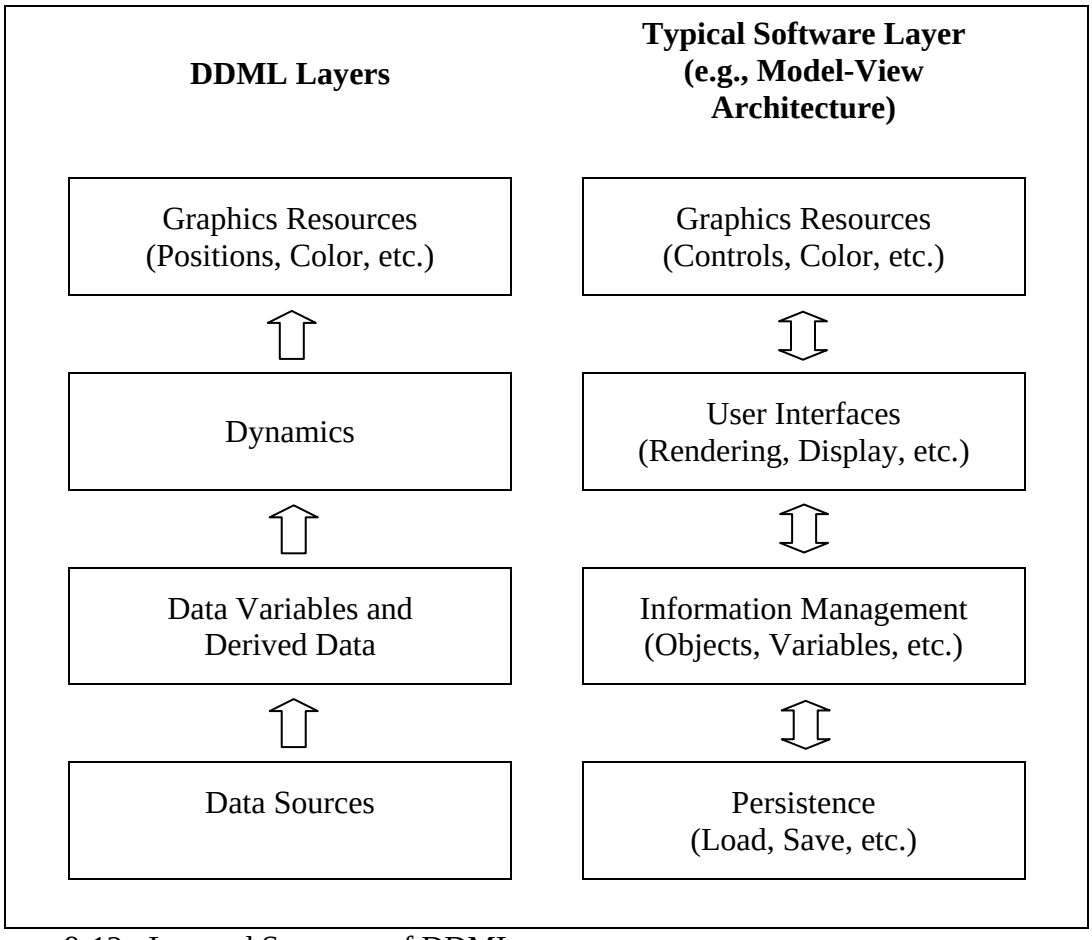

Figure 9-12. Layered Structure of DDML.

Parallel to the typical software modules, DDML is also composed of layers as shown in Figure 9-12 and as described below:

a. Graphics Resources. This layer is similar to "graphics resources" of a typical software tool. In DDML this layer includes the visual components of a data display system such as sliders, plots, and strip charts as well as low-level graphic elements such as lines, rectangles, etc. Basic graphical shapes are modeled using a World Wide Web Consortium (W3C) recommended format called "Scalable Vector Graphics (SVG)."
b. Dynamics. The dynamics layer handles the behavior of an object. It manages the rules and the variable instances attached to an object.
c. Data Variables. Data variables are the links between the objects and the data sources. Data variables can be atomic or derived. Derived variables may use other derived or atomic variables in a mathematical expression.
d. Data Sources. The last layer of the DDML architecture is the Data Sources layer. This layer handles various data sources such as text files, Open Database Connectivity (ODBC), network ports, and ports on data acquisition cards.

At each layer, the parameters used to describe each DDML element are divided into two groups: DDML sub-elements and custom parameters. DDML sub-elements make up the most common and most necessary pieces of information needed to represent each element. They are stored as named sub-elements in DDML. Custom parameters are used to store any vendor-specific information that is not explicitly defined as a DDML sub-element. These parameters are stored as DDML 'param' elements.

9.6.3 DDML Global Element Glossary. The DDML element names and descriptions can be seen at Table 9-11.

TABLE 9-11. DDML GLOBAL ELEMENT GLOSSARY	
Element Name	**Description**
mathml:apply	Defined in the mathml schema and used as a sub-element of variable in DDML, defines a variable as a function of other variables.
axis	A sub-element of a display object, represents an axis of any chart-type display object. It has a sub-element axisType that can be one of two values: VALUE or TIME. Other sub-elements allow the setting of min and max values, colors, grid line properties, etc.
barchart	A display object that shows one or more variables as vertical or horizontal bars whose lengths correspond to the values.
button	A display object that consists of an image or icon that, when clicked, can assign a value to a variable.
color	A commonly-used sub-element of many DDML elements, it simply specifies the color of its parent object. All colors in DDML are stored as base-10 integers that are encoded as 0xRRGGBB.
comparisonOperator	Used in rules, defines the comparison between two values. Can be either GT (greater-than), LT (less-than), GTE (greater-than-or-equal), LTE (less-than-or-equal), EQ (equal), or NEQ (not equal).
custom_parameters	A sub-element of a display object, serves as the parent element of a group of param elements that specify all of the custom (vendor-specific) parameters for a particular display object.
data_source	A pool-level data source that is available for use by any of the variables in the variable pool.
data_source_pool	Contains data_source child elements representing all of the data sources used by the various objects in the DDML file. Information about all data sources (files, db connections, etc.) is kept in the data source pool.
ddml	Root element of a DDML file describing a collection of data displays.
dial	A display object that consists of a circular or arc value axis and some sort of marker or needle that points to the current value along this axis. Example: a gauge or a compass.
display_objects	A sub-element of a model, serves as a container for all of the display objects in that model.

Table 9-11 (Continued). DDML Global Element Glossary Page 2 x 4

Element Name	Description
dynamics	A set of variable uses and rules used to define the dynamic behavior of a display object. The dynamicType sub-element describes the dynamic behavior while the variable_use and rules child elements define how variable values affect that behavior. A dynamicType of 'builtin' is used for display objects that have implicit dynamic behavior, such as charts and sliders. Other possible values of dynamicType include: visibility, text, subdrawing, scale, scaleY, scaleX, rotate, relativeMoveY, relativeMoveX, pathMove, lineWidth, lineStyle, foregroundColor, fillUp, fillRight, fillLeft, fillDown, fillEffect, curveType, blink, backgroundColor, arcDirection, absoluteMoveX, absoluteMoveY, fillColor, edgeColor.
else	Part of a rule, specifies what to do if the criteria specified in the if element are false. The else element can be the parent of one or more additional rules, or can just specify a value or variable reference.
frequencyplot	A display object that is a chart in the frequency domain.
frequencyresponse	A display object that is a graph consisting of two value axes (frequency and magnitude) plotted against a single frequency axis.
grid	A table. The grid element is used to group several display objects (including other grids) together in a tabular layout. Each display sub-object's location in the grid is specified with its gridRow and gridColumn elements.
hud	A display object that resembles a typical aircraft heads-up display that consists of three vertical axes (typically used for velocity, pitch, and altitude) and one horizontal axis (typically for heading). The center vertical axis rotates according to a fifth variable (typically roll). The variable_uses in the dynamics section are applied in this order: center vertical axis rotation (roll), center vertical axis (pitch), horizontal axis (heading), right vertical axis (altitude), left vertical axis (velocity).
if	Part of a rule, specifies a comparison between the current variable and some value.
map	An area of a model that displays longitude/latitude map info. The coordinates of all child objects of a map are in decimal latitude/longitude values. For distance attributes (e.g. a circle's radius), degrees latitude are used as the measurement unit.
model	A container for data displays. Typically interpreted as a single screen or "page" of display objects. The model object defines its own coordinate system with the minX, minY, maxX, maxY, xDirection and yDirection sub-elements. All sub-objects of a model are specified in coordinates that conform to the system defined by the model.

Table 9-11 (Continued). DDML Global Element Glossary Page 3 x 4

Element Name	Description
object	A generic display object. An 'object' can be any display object not specified in the DDML definition, or can be used as the top-level element in a group of sub-objects.
param	Used to specify any parameter of a DDML element that is not explicitly specified elsewhere in the schema. These are commonly referred to as "custom parameters" and are mostly used for vendor-specific information.
piechart	A circular display object that shows the values of multiple variables as a percentage slice of their sum.
project	A collection of models.
radialchart	A display object that represents variable values as distances outward from a central point. A radial chart consists of two axes: a linear value axis and a circular axis. The circular axis can be either a time axis or a value axis. The type of the circular axis is controlled by its axisType sub-element, which can have a value of either 'TIME' or 'VALUE'. If the value is 'VALUE', then a series of xyPair objects will specify how the variables are paired. In each of these xyPairs, the X-value corresponds to the value in the circular axis direction, and the Y-value corresponds to the value in the radial axis direction.
rule	Specifies a change in a property (e.g., color, visibility) when a variable reaches a certain value or range of values. The ranges of values and resulting property values are specified with if, then, and else child elements.
rules	The parent element of a group of rule elements
slider	A display object that consists of some kind of indicator or icon that slides along a single value axis. A slider can be vertical or horizontal. Example: A 'gauge' in Range View or a 'fader' in Data Views.
stripchart	A display object that is essentially a line graph that plots values vs. time along a scrolling "paper" grid. A stripchart can be vertical or horizontal, and can scroll in any of the four directions (up, down, left, right). This is controlled by the scrollDirection sub-element. The scrollDirection element refers to the direction that the paper or background scrolls. For example, in a DataViews horizontal strip chart, the paper scrolls to the left while new values are plotted at the right edge of the graph. Thus, the scrollDirection is 'left'.

Table 9-11 (Continued). DDML Global Element Glossary Page 4 x 4

Element Name	Description
svg:svg	Stands for "Scalable Vector Graphics." SVG is a World Wide Web Consortium (W3C) Recommendation and is defined in its own schema. In DDML, the <svg> element is used as a sub-element of <object> to define a display object in terms of the basic shapes that it is composed of.
textual	A display object used for representing text and labels, including both static and dynamic text (such as annunciators). If the text is dynamic, the valuePosition sub-element specifies where the dynamic value is in relation to the static label. Use valuePosition='center' if there is no label. The valueFormat sub-element is a C printf-style format string that specifies the format of the dynamic value. For example valueFormat="%4.2f" indicates that the value should be output as a floating-point value with a maximum width of 4 and with 2 decimal places.
then	Part of a rule, the then element specifies the value to set the attribute to if the criteria specified in the if element is true. The then element can specify either the desired value, or a reference to a variable containing the desired value.
variable	A pool-level data variable that is available for use by any of the display objects in the DDML file.
variable_pool	Contains variable child elements representing all of the variables used by the various display objects in the DDML file.
variable_use	A child of the dynamics element, variable_use is used to specify which variable from the variable pool is used. The pool_ref attribute must refer to the id attribute of a variable element from the variable_pool.
xychart	A display object that is a line or xy scatter plot of variables in the y axis vs. other variables in the x axis. The x,y variable pairs are specified with the xyPair sub-elements.
xyPair	A sub-element of certain display objects, it describes how a chart's variable_use items are paired. Each xVar and yVar sub-element must refer to the id of a variable_use element in the display object's dynamics section.

****** END OF CHAPTER 9 ******