

**Consumer audio/video equipment —
Digital interface —
Part 6: Audio and music data transmission protocol**

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Audio and Music Data Transmission Protocol

Version 1.0
May 1997

Sponsored by:
Audio/Video Working Group of the 1394 Trade Association

Approved for Release by:
1394 Trade Association Steering Committee

Abstract: This specification defines a protocol for the transmission of audio and music data over IEEE Std. 1394-1995. Currently this includes the transport of IEC 60958 digital format, raw audio samples, and MIDI data.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONSUMER AUDIO/VIDEO EQUIPMENT — DIGITAL INTERFACE —

Part 6: Audio and music data transmission protocol

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Introduction

Scope of the Audio and Music Data Transmission Protocol

This document defines the audio and music data transmission protocol as an instance of a real-time data transmission protocol standardized in IEC 61883-1. The audio and music data transmission protocol (hereafter referred to as the A/M protocol) can be applied to all modules or devices which have any kind of audio and/or music data processing, generation and conversion function blocks.

This specification deals only with the transmission of audio and music data; the control, status and machine readable description of these modules or devices should be defined outside of this specification according to each application area.

All modules or devices which implement this A/M protocol should have the capability of "arbitrated short bus reset" defined in IEEE P1394a in order to prevent the interruption of audio and music data transmission when a bus reset occurs.

References

This document assumes that the reader is familiar with the content of the reference material noted here; it does not attempt to provide introductory or background information which can be found elsewhere. For a complete understanding of the Audio and Music Data Transmission Protocol, the following documents will be helpful:

IEEE 1394 — 1995, Standard for a High Performance Serial Bus

ISO/IEC 13213 — 1994, Control and Status Register (CSR) Architecture for Microcomputer Buses

IEC 61883-1 Digital Interface for consumer electronics audio/video equipment - Part 1: General

IEC 60958 Digital audio interface

MIDI 1.0 Detailed Specification, Version 4.1 January 1989

IEEE 754 — 1985, Standard for Binary Floating-Point Arithmetic

Definitions and Abbreviations

Abbreviations and Acronyms

A/M Protocol Audio and Music Data Transmission Protocol

MIDI Musical Instrument Digital Interface - a standard for the interconnection of digital music processing devices (e.g. keyboards, signal processors) and computers together.

Technical glossary

stream Uni-directional data transmission.

- time stamp** Quantized timing in which an event occurs based on a reference clock. The reference clock is CYCLE_TIME unless specified in this document.
- music data** Data generally used for controlling a tone generator. The data defined in the MIDI specification, which may be called MIDI data, is an example of music data.
- 32-bit floating-point data** Data type which is defined in IEEE 754-1985, Standard for Binary Floating-Point Arithmetic.

Bit, Byte and Quadlet Ordering

This document defines the ordering of bits, bytes and quadlets for bus packets according to the IEEE 1394-1995 standard.

Withhold

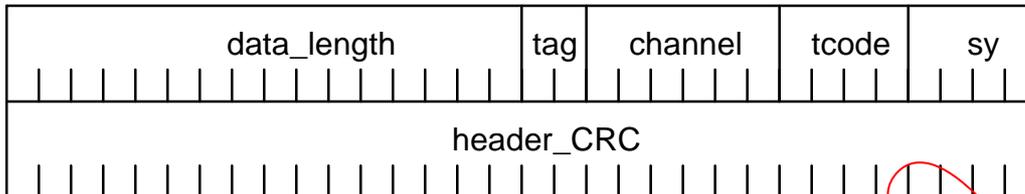
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Packet Header for Audio and Music Data

Isochronous Packet Header Format

The header for an isochronous packet which conforms to the Audio and Music Data transmission protocol shall have the following format:

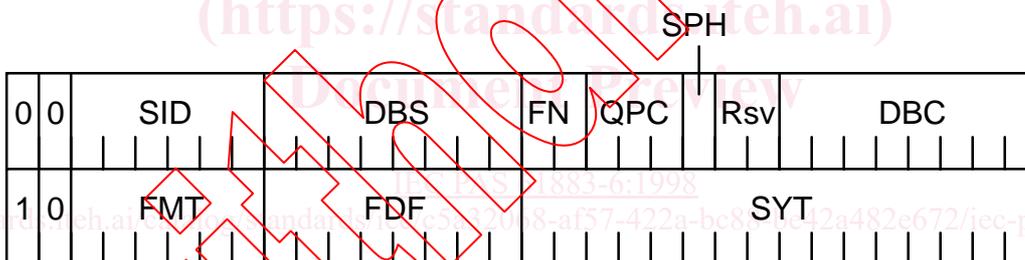


The following table defines the fields with unique values that are specified by this protocol:

field	value	comments
tag	01 b	This value indicates that a CIP header is included in the packet.
tcode	A ₁₆	This value indicates that this is an isochronous data packet.
sy	0 ₁₆	This field is reserved. The transmitter shall set this field to 0 ₁₆ .

CIP Header Format

The CIP header format for an isochronous packet which conforms to the Audio and Music Data transmission protocol shall be as follows.



The following table defines the fields with unique values that are specified by this protocol:

field	value	comments
FMT	10 ₁₆	This value indicates that the format is for Audio and Music Data.
FN	0 ₁₆	
QPC	0 ₁₆	
SPH	0 ₁₆	
SYT	xx	This field shall contain the time when the specified event is to be presented at a receiver.
FDF	see note*	see note*

NOTE: * There are currently no special bit or bit field definitions for the FDF field. This was done intentionally to leave room for new subformats to be defined in the future.

When defined, each subformat must allocate a range of FDF space and define its usage. In addition, it must specify the packetization attributes of EVENT TYPE and DBS, which are described in the section titled Event Type which begins on page 11.

Note: Other optional attributes may be defined in each subformat.