

ICS 33.160
CCS M 64

GY

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GY/T 187-2002

**Serial multichannel audio digital interfance
(English Translation)**

Issued on: December 20, 2002

Implemented on: February 1, 2003

Issued by: State Administration of Radio and Television

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Foreword

This standard is equivalent to AES10-1991 (ANSI S4.43-1991) "Multi-channel Audio Digital Serial Interface", English name. Serial multichannel audio digital interface (MADI).

This standard was developed for the design, production, acceptance, operation, maintenance, and use of multi-channel audio digital serial interfaces and related equipment systems.

Use, especially multi-channel digital audio program production and exchange, and then improve the broadcast quality and level, providing a technical basis.

Appendix A to this standard is an informative appendix.

This standard is under the jurisdiction of the National Radio and Television Standardization Technical Committee.

This standard was drafted. Central People's Broadcasting Station.

1 Scope

This standard specifies the data composition and electrical characteristics of the multi-channel audio digital serial interface (MADI).

This standard applies to linear or coaxial cable or fiber optic cable. The sampling frequency ranges from 32kHz to 48kHz ($\pm 12.5\%$).

56-channel digital audio serial transmission with a resolution of 24 bits per channel (see Figure 1).

This standard only supports point-to-point connections from a transmitter to a receiver.

2 Normative references

The clauses in the following documents have become the clauses of this standard after being referenced. For dated references, all subsequent Neither amendments (excluding errata) or revised versions are applicable to this standard, however, parties who have reached an agreement under this standard are encouraged to study is the latest version of these files available? For undated references, the latest version applies to this standard.

GY/T 158-2000 studio digital audio signal interface

3 Terms and definitions

The following terms and definitions apply to this standard.

Audio sample data

An audio signal that is periodically sampled, quantized, and digitized in two's complement form.

Channel

A set of audio sample data corresponding to a signal transmitted within any period of the sampling frequency of the data source, which is accompanied by other Data bits.

Two-channel format

GY/T 158-2000 bit, block and sub-frame structure (without preamble).

Frame

Numbered 56-channel sequence from 0 to 55, each frame contains the audio sample data transmitted in any sampling period Processing and related data. Start with the first bit of channel 0 as the frame.

Link

Connection of a single serial multi-channel audio digital transmitter and a single multi-channel audio digital receiver.

4.1 Frame Format

Each frame contains 56 channels, represented by the numbers 0 to 55. Starting from channel 0, the channels in the frame are arranged continuously. The frame format is shown in Figure 2.

Show.

4.2 Channel format

Each channel contains 32 bits. 24 of which are allocated to audio or other data defined by audio/non-audio tags, with another 4 this bit is used to indicate the valid bit (V), user data bit (U), status data bit (C), and parity of the GY/T 158-2000 two-channel interface.

Check bit (P), the other 4 bits are used for mode confirmation. GY/T 158-2000 two-channel format is reserved here. The channel format is shown in Figure 3.

4.2.1 Mode bits

The mode bits are provided for frame synchronization. For example, the block of each two-channel interface in GY/T 158-2000 starts; GY/T 158-2000 two-way interface Discrimination of the A and B subframes in the channel interface; and the active/inactive status of each channel.

4.2.2 Description of audio data

In audio mode, the 24-bit audio data is represented in linear two's complement form, and the most significant bit (MSB) is transmitted last. All unused audio bits are set to 0, and the V, U, C, and P bits are set to default values. Their definitions are connected to the GY/T 158-2000 two-channel interface.

The format is the same.

4.2.3 Activate the channel

All active channels are arranged in order, starting from channel 0. The activation bit shall be set to 1 for each active channel.

4.2.4 Inactive channels

All bits, including the active bit, shall be set to 0 on all inactive channels. The channel number of the inactive channel is always the highest the higher channel number should be higher.

4.2.5 Bit description

The bit descriptions are shown in Tables 1 and 2.

4.3 Transmission Format

56 channels are serially transmitted through NRZI non-polar code, using 4B/5B encoding format.

Table 1 Bit description of channel data

Bit name description value

0 MADl channel 0 frame sync bit 1 = true

1 MADl channel activation channel activation bit 1 = true

2 MADl channel A/B GY/T 158-2000 A/B

3 MADl Channel Block Sync Channel Block Start 1 = true 4 ~ 27 GY/T 158-2000 The 27th bit of the data bit should be the most significant bit (MSB)

31 GY/T 158-2000 P Parity (except bits 0 to 3) Even parity

Table 2 Bits 2 and 3 (compatible with GY/T 158-2000)

Bit 2 and Bit 3 2 channel format description 0 0 Format 2 A channel 0 1 Format 1 A channel block start status 1 0 Format 3 B channel 1 1 Format 4a B channel block start status a Not available for every GY/T 158-2000 Coding diagram for encoding, the 32-bit channel data is divided into 8 words in groups of 4 bits, as shown in Table 3.

Each 4-bit (4B) word is encoded into a 5-bit word, see Table 4.

Every 5 bit (5B) words are transmitted from the left, see Table 5.

The coding scheme allows a low-current DC bias to remain on the link. Although the link signal is not DC, the audio signal can be can contain DC. Figure 4 shows the link transmission format of a channel. For clarity, Appendix A illustrates the encoding of a single channel word process.

Table 3 Word structure

Word channel data bits 2 89 ..

7 .. 31

Table 4 4B/5B coding

4-bit data 5-bit coded data

Table 5 Arrangement of data transmission within words

Word channel connection bit word channel connection bit

4.3.1 Sync Signal

A synchronization signal 11000 10001 should be inserted in the data stream at least once per frame to ensure synchronization between the transmitting end and the receiving end. Should be enough the synchronization signal and the encoded data word are interleaved into the frame to meet the requirements of the link. The synchronization signal is transmitted from the left.