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

GY/T 193-2003

**Synchronization of digital audio system
(English Translation)**

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Table of Contents

- Foreword
- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 4 Working mode
- 5 Device synchronization operation recommendations
 - 5.1 Digital Audio Reference Signal
 - 5.2 Allowable error of equipment sampling frequency
 - 5.3 Device timing relationship
 - 5.4 System implementation
- 6 Audio sample clock requirements

Foreword

With the development of digital technology, the digitalization process of the radio and television industry is gradually accelerating, and analog devices have been replaced by digital devices. along with the increase of digital equipment will inevitably lead to the synchronization problem of digital audio systems. To this end, the "Digital Audio System Synchronization" standard needs to be developed.

This standard is equivalent to AES11-1997 "Synchronization of Digital Studio Audio Equipment", which specifies the synchronization of digital studio audio equipment signal.

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 two sets of parameters. The first group is about performance requirements for the successful exchange of digital audio data between devices; the second group is about Performance requirements for clock recovery in digital/analog and analog/digital conversion.

This standard applies to the digital interconnection of digital audio equipment in a studio environment. It also applies to external connections to equipment in a studio environment.

Signal source and 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.

GB/T 14919-1994 Technical Specification for Digital Audio Signal Source Coding GY/T 158-2000 studio digital audio signal interface

3 Terms and definitions

The following terms and definitions apply to this standard.

Synchronization

Two digital audio signals should have exactly the same frame frequency (ie. two signals have the same number of frame). To successfully connect two digital audio devices, it is also necessary to ensure that the time difference between each sample of the two signals is within the allowable range. Time difference After the allowable value, even if the frequencies are exactly the same, one of the signals should be readjusted for synchronization.

Note: This definition does not include correction of block format data.

AES/EBU frame

Two consecutive and associated sub-frame sequences, each sub-frame carries audio sample data for one channel and is transmitted within a sampling period.

Time reference point GY/T 158-2000 The start conversion of the X or Z preamble of the digital audio signal frame.

4 Working mode

4.1

Digital audio equipment should have the ability to lock the internal sampling clock generator to a digital audio reference signal (DARS). build it is recommended to provide additional input interfaces for the use of DARS.

4.2

Equipment synchronization shall use one of the following three methods.

a) Use digital audio reference signals. This method ensures that the sampling clock of all

input/output devices is locked on this reference signal. This this method is usually used in the studio;

b) The digital audio input signal uses an embedded programmable sampling clock to lock the input/output sampling clock. This method will increase Add timing errors in cascaded digital device connections;

c) Using audio and video reference signals that can extract digital audio reference signals, lock the video and audio signals at the same sampling frequency on.

4.3

The position of the digital audio reference signal shall comply with GY/T 158-2000.

4.4

When connecting external signals to another synchronized audio studio or broadcasting center, one of two methods should be used.

a) When the input signal and the digital audio reference signal have the same sampling frequency but different phases, the number specified in GY/T 158-2000 should be used.

Word audio frame correction;

b) Sampling frequency conversion is required when the input signal and the digital audio reference signal have different sampling frequencies.

4.5

In an environment where video and audio are combined, the digital audio reference signal source should be locked to the video source to obtain the precision given in Table 1.

True relationship.

Table 1 Audio-video synchronization

TV or movie audio samples per frame	kHz 24Hz animation 25Hz 625 PAL and SECAM
30Hz 525 NTSC 30/1.001Hz NTSC 32 4000/3 1280 3200/3 16016/15 48.2000 1920 1600	
8008/5 44.1 3675/2 1764 1470 147147/100	

4.5.1

For video systems where one image frame contains an integer number of AES/EBU frame periods, the AES/EBU audio signal can be synchronized to image.

4.5.2

For video systems where one image frame contains non-integer AES/EBU frames, the audio signal specified in GY/T 158-2000 cannot Lock in sync with the video, unless there is an indicator in the video reference signal. Without this indicator, the video and audio output of the device are locked and cannot be used.

Can meet the phase requirements in 5.3.

5.1 Digital Audio Reference Signal

5.1.1

The digital audio reference signal should have the format and electrical configuration of a two-channel digital audio interface, and use GY/T 158-2000 Given the same connector. However, in the basic structure of the digital audio interface format, only when the sync preamble is set, digital audio the signal is considered a digital audio reference signal.

When using multiple sampling frequencies, or when the sampling frequency does not comply with GB/T 14919-1994 (CCIR 646 [4], IEC 899 [6]) 5.2 of this standard does not apply.

5.1.2

Digital audio reference signals can be divided into two levels.

- a) that the primary reference signal is a high-precision signal that synchronizes multiple studio complex systems or independent studios;
- b) The secondary reference signal is a means of synchronizing a single studio that is not technically and economically necessary to operate on the primary reference signal.

There are signals of recognized accuracy.

5.1.3

The main purpose of the digital audio reference signal is studio synchronization. For its specific application, the fourth word of the channel status data is required.

The states of bits 0 and 1 of a section are represented.

- 00. no reference signal (default value);
- 01. First-level accuracy;
- 10. secondary accuracy;
- 11. Reserved.

5.1.4

When the digital audio reference signal contains other data, making it unusable as a normal audio signal, it should be used as a non-audio the frequency signal is defined in the channel state.

5.2 Allowable error of equipment sampling frequency