ADAT

Alesis Multi-Channel Optical Digital Interface

The optical data transmission format ADAT was realised by the company Alesis for it´s multitrack recorders (ADAT XT / XT-20 / LX-20 / M-20). This format enables 8 audio channels to be transmitted within one bit stream. (ADAT = Alesis Digital Audio Tape).

Optical interface components and optical fibres are identical to the cost effective components as applied with the optical S/PDIF (TOSLINK) interface.

Alesis XT20

ADAT machines are based on VHS cassettes as storage media. These machines were the origin of the same denominated interface.

Specifications

- 8 channels
- optical link
- TOSLINK connector
- audio data up to 24Bit / 48kHz
- maximal cable length: 5m

Mode of Operation

Data transmission is optical with ADAT. A light emitting diode (LED) is switched on and off according to the bit values. Samples of the 8 channels are transmitted consecutively. At lower resolutions unused bit positions are filled with ´0´. One block of 8 channel sample data is accompanied by 4 bits free at users disposition.

To allow the receiver for synchronization with the incoming data stream an exceptional bit sequence - the SYNC - marks the start of a block of sample data and user bits. Sync, user bits and sample data form a frame of 256 bits.

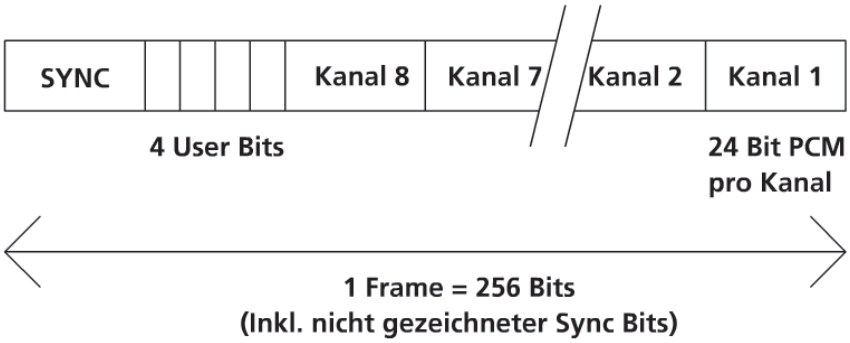

Figure
The ADAT data frame of 8 channel sample data, 4 userbits and SYNC. Only 4 bits are transmitted for a block of samples from 8 channels. The SYNC sequence enables reconstruction of frame and sample clock at the receiver.

Subcode

ADAT does not transmit any information as AES3 channel status data. On the other side, even if seldom used, the optical interface makes available other interesting possibilities:

- transmission of time code
- transfer of MIDI data

Transmission of these data takes place by use of the first two user bits. How this is done is specified by the ADAT standard. There is no specification assigned to the remaining two user bits.

Difference between ADAT Type I and Type II

First generation of the ADAT interface (Type I) masters 20 bit audio data transmission, since launch of Type II interfaces 24 bit data transmission is possible. Both types of interfaces may be interconnected. If connecting a Type II transmitter to a Type I receiver the 4 last significant bits of 24 bit data are lost.

Cable

A cost effective optical fiber cables made from plastic is applied. Cable types of different coatings are available to meet different requirements on mechanical stress allowed.

Practice revealed that ADAT optical transmission is possible over distances even exceeding 5 meters. Of course clean and dust-free optical connections are decisive.

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