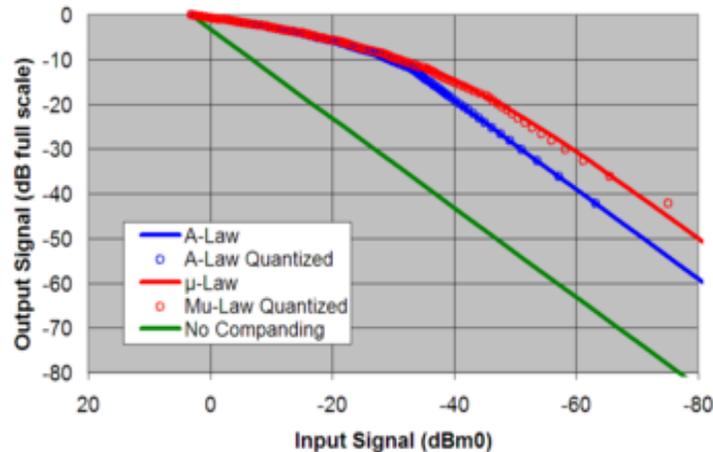


T1 and E1 Encoding



Overview

The companding (A and μ) laws are used for Audio level compression, which is used for many purposes as explained below:

The mu-law algorithm (μ -law) is a companding algorithm, primarily used in the digital telecommunication systems of North America and Japan. It is similar to the A-law algorithm used in Europe. The default encoding used by T1 is Mu-Law (μ -law). T1 facilitates to operate at 1.544 MBPS and uses 8 kbps for framing/synchronization. Framing may be either Superframe (D4) or Extended Superframe (ESF).

An a-law algorithm is a standard companding algorithm, used in European digital communications systems to optimize, i.e., modify, the dynamic range of an analog signal for digitizing. The default encoding used by E1 is A-Law. E1 facilitates to operate at 2.048 MBPS and uses timeslot 0 for Synchronization, Alarm Transport, and International Carrier. Timeslot 16 may be used for signaling using either Channel Associated Signaling (CAS) or Common Channel Signaling (CCS) information.

Configuration Menu Options

Generally T1 systems use μ -law codec, and E1 systems use A-law codec for voice band signal encoding and decoding. The Encoding Option in T1/E1 Analyzer software permits encoding and decoding using any one of the formats. Standard Idle code for E1 (D5) and T1 (7F) are used in E1 and T1 configurations respectively.

A-Law and Mu-Law encoding feature affect the following applications of T1/E1:

Playback From File, Record Data to File, Transmit Tone, DTMF/MF/MFC-R2 Digits, Spectral Display, Oscilloscope Display, and Tx Gaussian Noise

Playback From File and Record Data to File for E1/ T1 systems

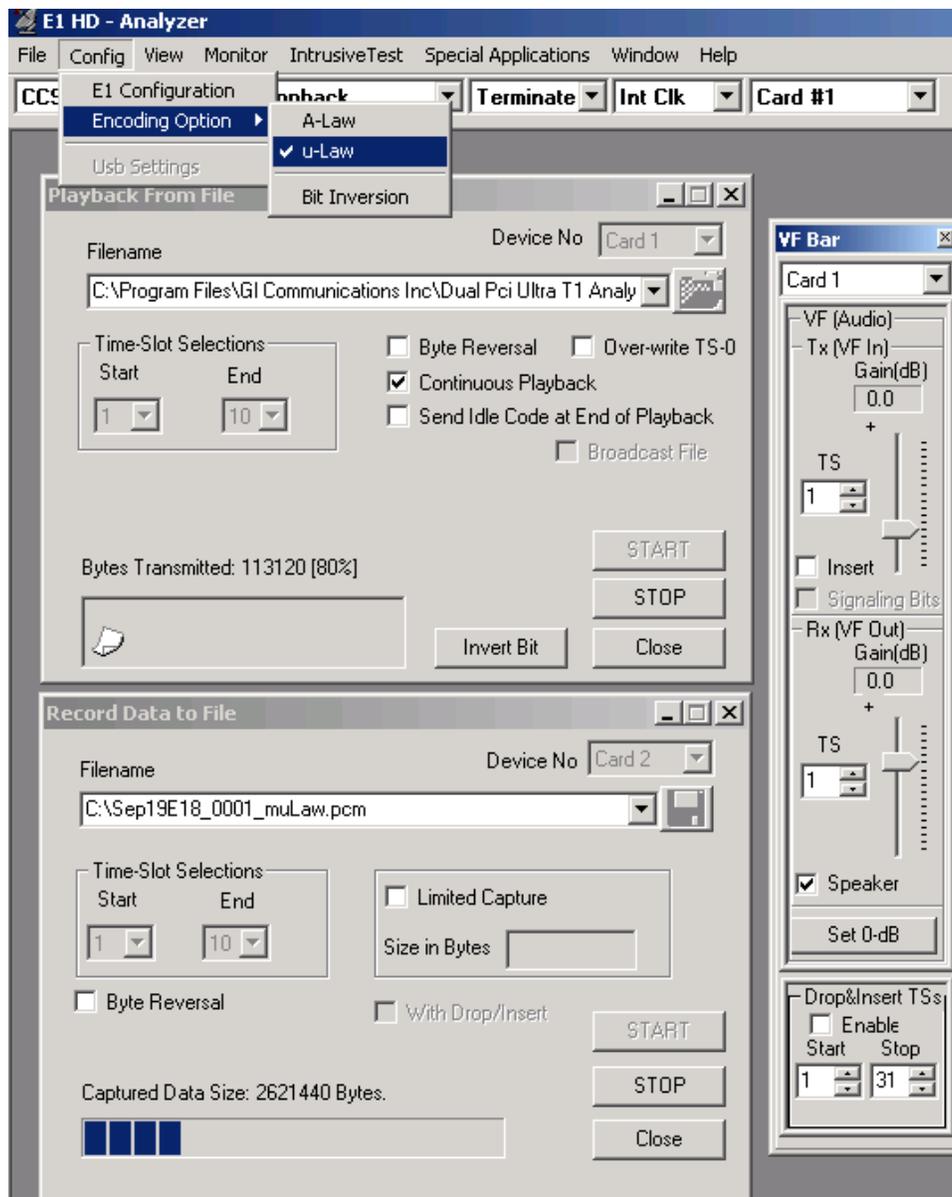
'Playback From File' is optional software, which permits the user to transmit and/or capture any signal on T1 or E1 lines with GL's T1/E1 Analyzer. Typical applications include transmission or reception of prerecorded video files, traffic loading applications and protocol analysis. Files of any length can be transmitted continuously (without loss) in user selected contiguous timeslots. Repeated transmission of a single file is also possible.

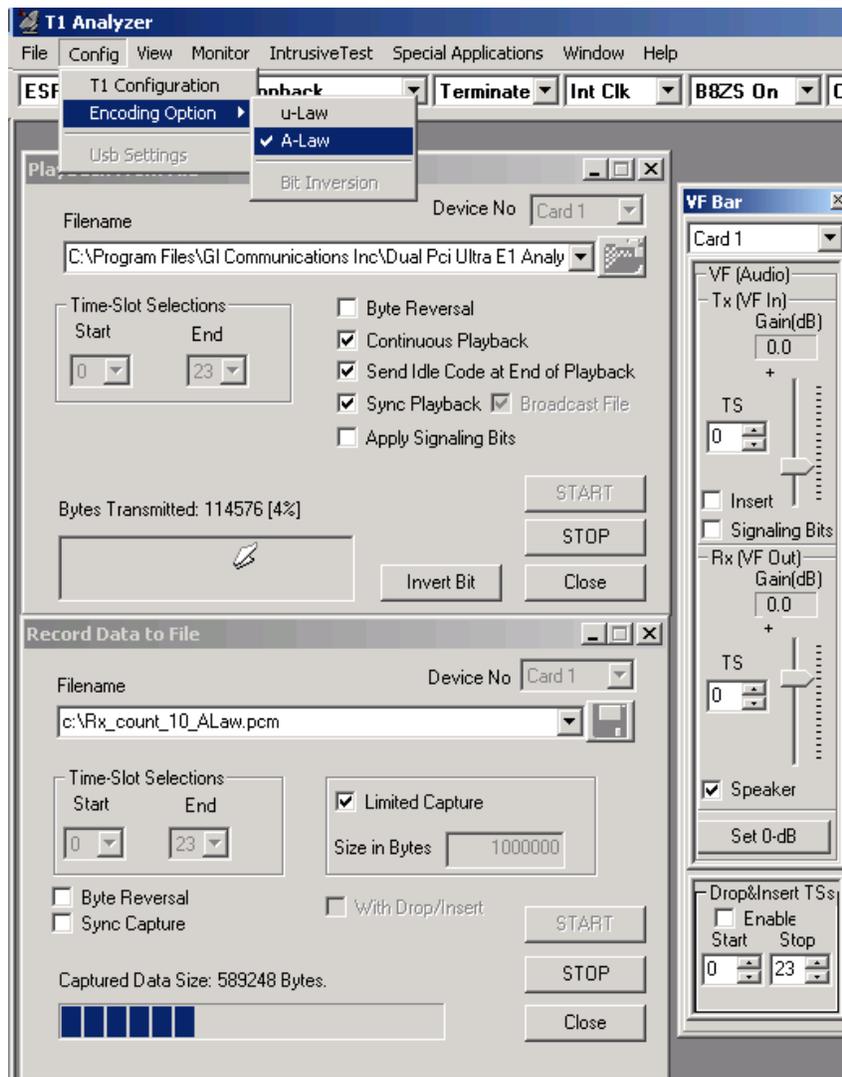
'Record Data to File' is an application, which permits capture of data being transmitted on (any one) the T1/E1 cards to a file. **Continuous capture** and **Limited Capture** (Specific number of bytes) to a file from all or selectable contiguous time slots are the basic features of this optional software.

E1 systems use A-law codec and T1 systems use μ -law codec for voice band signal encoding.

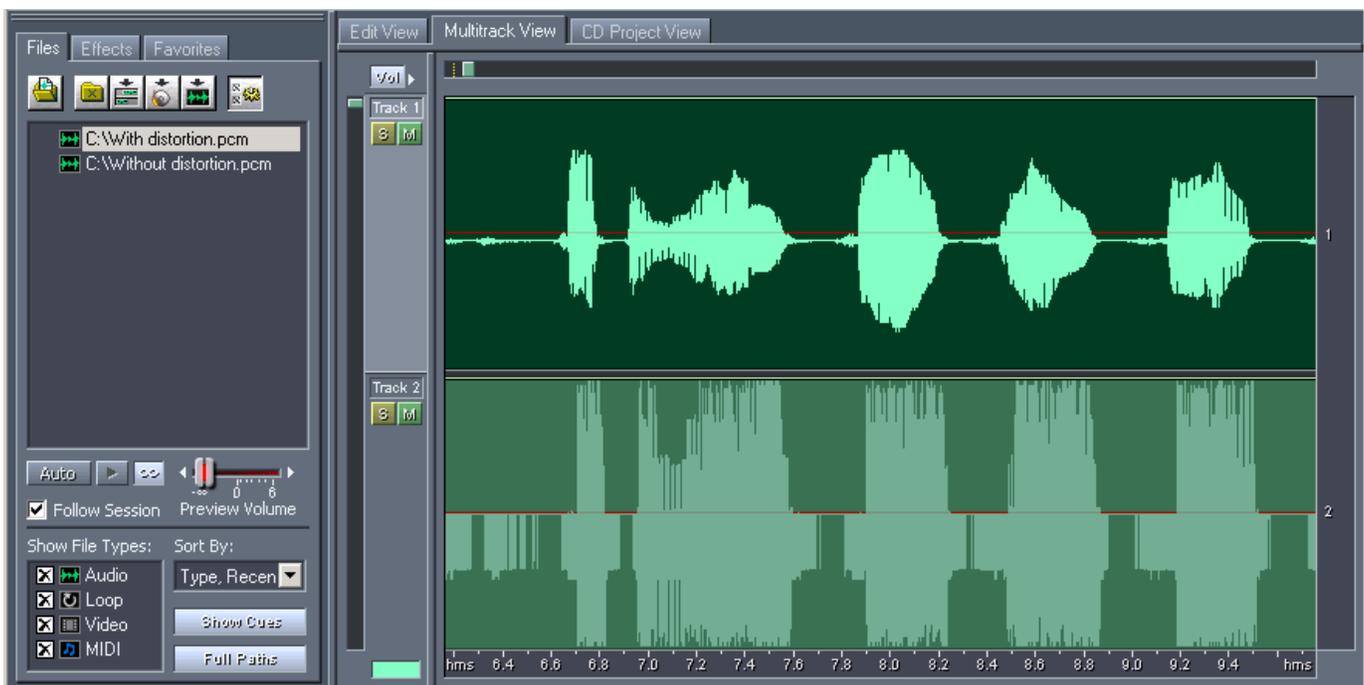
Shown below are the screens to illustrate the application of incorrect codecs during transmission /

reception of data. The figure 1 shows the Record and Playback applications with μ -law encoding in E1. The figure 2 shows the Record and Playback applications with A-law encoding in T1.





The files thus captured are verified for distortions using adobe audition software and speaker.



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Bit Inversion

Bit Inversion is part of the A-Law/ μ -Law Companding Option. The bit inversion facility is targeted mainly at converting proprietary codes into standard A-Law or μ -Law codebook values and vice versa. This extends the range of encoded values that can be monitored, analyzed, and generated by the GL Communications Inc., suite of tools.