Proprietary Voice Algorithms

SEDA Solutions'® unique understanding of algorithm and system design allows us to address the challenges of system hardware down to the algorithm level. SEDA Solutions® has designed many algorithms based on clients' specific needs and system requirements. Such algorithms have been implemented and incorporated in home consumer electronics worldwide. Below are examples of some of our most successful algorithms in today's everyday use:

■ **Flexpeech® Compression Overview**
SEDA Solutions'® Flexpeech® compression technology is a flexible voice and speech compression technology that allows a number of system design parameters to be adaptive and variable without noticeable loss of quality. Every vocoder design must achieve a balance between voice quality, device complexity and band-width efficiency. Device complexity includes requirements for processor speed, memory size and allowable delay. Flexpeech® is designed to smoothly integrate with other system design parameters at any point in the system design. The main features of Flexpeech® are:

• High Compression Quality
• High to Mid-low Compression Rates
• Multi-rate System
• Variable Rate System
• Robust to Channel Errors
• Low Memory Requirement

Flexpeech® is based on a mixture of frequency and time-based CELP-like technique. It provides very high quality compression with any setting for any of the configurable parameters. The system operates from bit rates as high as 16000 bps to as low as 3000b/s and has Multi-Rate capability that is controlled by outside system parameters. It also operates in a Variable-Rate mode and can be configured to be variable in complexity and processor requirements, controlled by outside system parameters. The system is designed to be tolerant in the presence of channel errors.

■ **FlexiTAD® Storage Overview**
FlexiTAD® is a unique patent pending algorithm embedded in telephone answering device (TAD) technology that employs variable time recording to deliver adaptive, efficient and reliable playback systems with the highest quality output.

FlexiTAD® integrated Flexpeech® produces a proprietary storage method where the memory configuration gives an already-compressed bit stream output of multiple levels. Thus, if the system is running low in memory, it automatically discards high bit rate data and retains the low bit rate information. FlexiTAD® provides superior performance in playback quality and for a given storage capacity. No additional memory is required by the system relative to the methodologies mentioned above.

■ **TalkBack Overview**
TalkBack utilizes voice compression technology that requires less than 150 MOPS of arithmetic instructions and less than 300 bytes of data RAM. The low complexity feature of this playback algorithm allows implementation on a fairly simple, low-cost processor, keeping expense and power consumption low, making it ideal for portable consumer end products. The current version of TalkBack compresses the speech signal to as low as 5000 bps.

For more information on Voice related products and services please visit our web site at **www.sedasolutions.com** or contact us by email at **info@sedasolutions.com**.

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