



*Encore Software Limited*  
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**Press Release**

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**Encore Software develops GSM-AMR (3GPP-AMR) speech coder for 3G wireless applications**

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Encore Software Ltd., a Bangalore based DSP technology developer announced today that it has developed GSM-AMR also known as 3GPP-AMR, a multirate speech coder that is specified for use in 3G wireless applications. Encore thus joins a select group of companies who have developed such an advanced speech coder for 3G applications.

A Speech Coder, also known as "Codec" for compression/decompression, is a piece of DSP software that compresses digitized speech to reduce transmission channel or storage capacity requirements, and then decompresses received samples to reconstruct the original speech signal with some loss in signal quality. Each speech coder is assigned a subjective measure that defines its closeness to "toll quality", a measure of acceptance for telephony applications. In order to interwork across different communicating equipment, a speech coder must conform to specified standards. Encore has developed speech coders in conformance with several such standards.

GSM-AMR is an Adaptive Multi Rate (AMR) speech coder standard introduced by the 3rd Generation Partnership Project (3GPP), a partnership project of various standards organizations, for compressing speech and yet maintaining toll quality. The AMR speech codec can handle bit rates between 4.75 and 12.2 Kbps (specifically, 12.2, 10.2, 7.95, 7.40, 6.70, 5.90, 5.15 and 4.75 Kbps) and uses the principle of Algebraic Code Excited Linear Prediction (ACELP) for all specified bit rates. A variable-rate encoding technique is used to change the rate at which to send speech data in accordance with the distance from the base station, or to prevent interference from electrical waves. As the standard to be employed in the upcoming 3G cellular phone services (W-CDMA), AMR is expected to bring about an improvement in speech quality of the communication channel. This codec includes multi-rate speech coding, silence compression, comfort noise generation and error concealment functions. While it is specifically designed for 3G cellular services, it can also be used in other applications requiring variable rate speech communication and storage.

The coder works on a frame of 160 speech samples (20 msec), and no look-ahead is required. So the algorithmic delay for the coder is 20 msec.

## Features of Encore's GSM-AMR

- Fully compatible/bit-exact with the GSM-AMR standard version 7.3.0, with discontinuous transmission (DTX) support, using Voice Activity Detection (VAD) and Comfort Noise Generation (CNG).
- Texas Instruments eXpressDSP™ compatible software architecture.
- Coder bit rate selection (any of the 8 rates) and DTX (VAD-CNG) enabling or disabling can be done on a per-frame basis (every 20 msecs).
- Selection of VAD options (NO\_VAD, VAD1 or VAD2) at the time of initialization.
- Full duplex multi-channel capability, allowing OEMs to use it in high channel density applications.
- Flexible interface with 'C' callability, with a single archive file for all functions.
- Built-in scratch memory management to avoid run-time overloading of system stack memory.
- Relocatable program and data spaces. Static (state) and scratch data spaces are dynamically relocatable. Program and table data spaces can be fragmented.
- The code is interruptible and re-entrant. It can be used in systems with multi threaded software architecture.

Mr. Prasanthan, Manager in-charge of the Speech Technology Group at Encore, said, "Our DSP-based speech technology is well designed to provide great flexibility to the System Integrator (SI) who is the ultimate user of our product. The built-in scratch memory, a feature that is almost unique in Encore's GSM-AMR saves a lot of resources for the SI. It is just like having plug and play capability in DSP-based systems", Prasanthan added.

Encore has initially implemented this coder on the Texas Instruments' TMS320C54x DSP and the technology is available for licensing in the form of source code or as binary code.

## About Encore Software Ltd.

Encore Software is a Bangalore based technology developer operating in the areas of DSP and Embedded Systems. Encore licenses its DSP based modems, speech coders and VoIP protocols to some of the world's leading semiconductor and telecommunication equipment manufacturers. For more information please visit [www.ncoretech.com](http://www.ncoretech.com).

For product related information please contact [ip@ncoretech.com](mailto:ip@ncoretech.com) or

Encore Software Ltd.  
44 & 45 Residency Cross Road  
Bangalore 560 025. INDIA  
Tel: +91-80-4112 4291 / 92  
Fax : +91-80-2558 7690