Compandent’s MELPe suite is a hand optimized real-time implementation of the 2400/1200/600 bps MELPe vocoder, U.S. and NATO standard vocoder (MIL-STD-3005, STANAG 4591), running on Texas Instruments’ TMS320c54xx, TMS320c55xx, and OMAP’s DSP. The suite is versatile, easy and convenient to operate and integrate. Compandent MELPe suite provides complete state-of-the-art low rate voice communications.

Background
MELPe- Enhance Mixed-Excitation Linear Predictive (MELP) vocoder, known as military standard MIL-STD-3005 and NATO STANAG 4591, is a dual-rate low rate coder that operates at 2400, 1200 and 600 bps. Its quality surpasses that of the old MELP vocoder. The Compandent’s MELPe vocoder suite includes also compressed bit-stream transcoding between the two rates, and optional Noise Pre-Processor (NPP).

Operation
Compandent Inc. has participated in the research, development and implementation of the Enhanced Mixed-Excitation Linear Predictive (MELPE) vocoder. Compandent provides support as well as software and hardware related to the MELPe vocoder. Compandent is the only company that both participated in the MELPe R&D, and also provides related products, services, and support.

Compandent has been supporting and improving the MELPe real-time implementation. Compandent has ported MELPe to various DSPs by Texas Instruments such as TMS320c54xx, TMS320c55xx, and OMAP.

Available features:
The MELPe software suite includes the following features:
- Hand optimized Assembly real-time implementation of all algorithm components
- C-callable high-level functions
- Multi-channel per DSP
- Optional components available (customer can select desired combination):
  - MELPe at 2400 bps - high rate encoder and/or decoder
  - MELPe at 1200 bps - mid rate encoder and/or decoder
  - MELPe at 600 bps - low rate encoder and/or decoder
- Operation mode can be switched on the fly (no need to reload the program to the DSP)
- Very low-cost ($395) complete DSP development board and tools (CCS) on which Compandent’s MELPe may run.
- Comprehensive and detailed documentation that allows for smooth and easy integration
- Comprehensive and spectacular Real-Time demo, using DIP-switch control and LEDs indicators
- User friendly for simple integration.

<table>
<thead>
<tr>
<th>Algorithm / Memory</th>
<th>Data (Vars.)</th>
<th>Data (Table)</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>2400/1200/600 Full Duplex + NPP</td>
<td>15.7K</td>
<td>80.2K</td>
<td>31.7K</td>
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<tr>
<td>2400/1200 Full Duplex + NPP</td>
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<td>41.9K</td>
<td>24.8K</td>
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<td>2400 bps Full Duplex + NPP</td>
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<td>8.9K</td>
<td>14.5K</td>
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<td>2400/1200 Decoders</td>
<td>7.0K</td>
<td>40.5K</td>
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<td>2400 bps Decoder</td>
<td>3.6K</td>
<td>7.7K</td>
<td>6.2K</td>
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</tbody>
</table>

Table 1: Compandent’s MELPe MIPS
(NPP=Noise-Preprocessor)

Table 2: Compandent’s MELPe memory requirements in 16-bit words
(NPP=Noise-Preprocessor)

Please note: Compandent owns intellectual property (IP) in the official (standard’s) MELPe implementation, and any of its derivatives. Any party intending to develop commercial products based on MELPe should contact Compandent as well as other IP holders regarding licensing.

Compandent Inc., Speech, and Audio Compression Technologies
26666 Birch Hill Way, Los Altos Hills, CA 94022 USA
Tel: +1 (650) 241-9231 Fax: +1 (425) 790-0949
www.Compandent.com

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