

A Family of ICs for All Digital Telephone Answering Devices (TAD) and Voice Recorders

General Description

The D6000 family of products are digital speech/signal processing ICs that implement all functions of TRUESPEECH[®] speech compression and decompression, voice prompts, telephone line signal processing, and memory management. These devices allow for easy design of sophisticated, yet affordable all digital answering machines. All of the D6000 devices are fully controlled by the system Host through a simple interface protocol. The Host processor interfaces to the keypad and display, controls the telephone line interface, and provides control of system functions by sending commands to the D6000 processor.

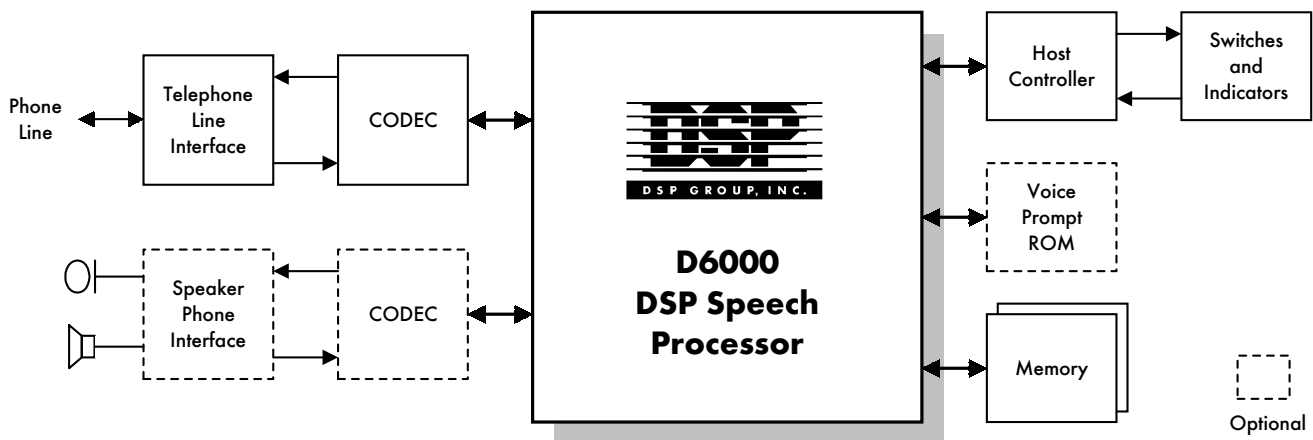


Figure 1. D6000 System Block Diagram

Key Features

- Three generations of high-quality, low rate TRUESPEECH digital speech compression algorithms
- Flexible storage of incoming messages (ICM) and outgoing messages (OGM), supporting multiple OGMs and multiple mailboxes.
- TRUESPEECH natural-sound voice prompting for Day/Time stamp and voice instructions
- DTMF generation and detection with near-end echo cancellation for superior performance
- Supports “offset playback” for jumps within a message
- Support for a variety of 4 Mb or 16 Mb Memory Devices (ARAM and low cost Flash)
- Simple Host interface
- Some of the products incorporate the advanced features of:
 - Superior quality TRUESPEECH Triple Rate Coder[™]
 - True FULL Duplex SpeakerPhone[®] with both acoustical and near-end echo cancellation
 - Caller ID and Call Waiting CID
 - PCM voice prompt, record and playback
 - Programmable sensitivity of the DTMF, VOX, CPT, and CAS detectors
 - Digital volume control
 - FLEXISPEECH[™] variable speed, natural sound playback (50% - 200%)
 - Selectable sampling rate
 - Selectable Slave or Master Codec mode
 - A-law and μ -law codec support
 - AGC
 - Speech Recognition

System Functions

All of the speech and signal processing tasks are done by the D6000 processor (DSP). This allows the use of a very low cost microcontroller to be used for basic control of the system. The Host needs to send high level commands to perform functions such as Record, Playback, or Delete Message. The operation is performed by the DSP which will report the status of the operation to the Host. All memory interface and management is performed by the DSP, requiring the Host to only handle control functions. A summary of the functions performed by the DSP and Host Controller are shown in Figure 2 below.

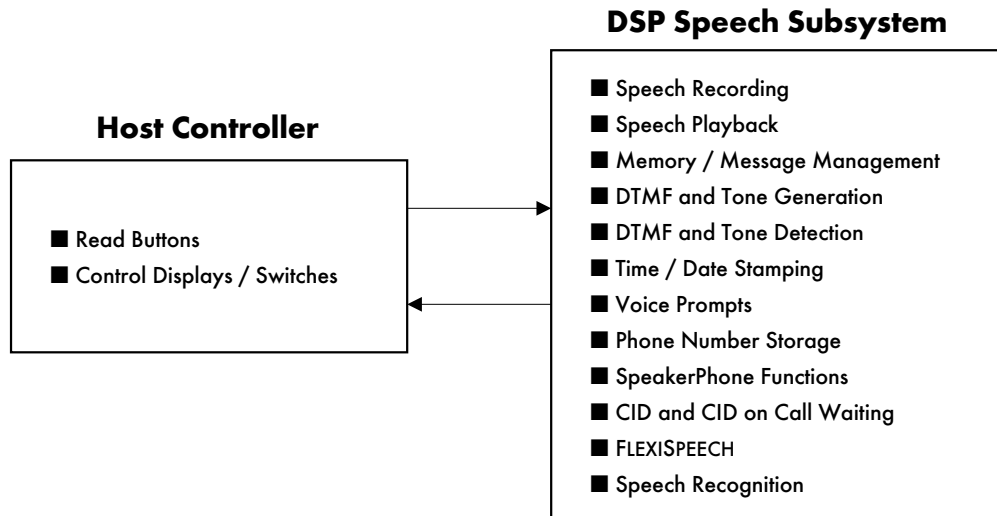


Figure 2. System Functions

Simple Hardware Interface

The hardware interface between the D6000 device and the Host Controller is simple, requiring only an 8-bit parallel port and 4 handshake lines. The Host writes high level commands to the DSP, and the DSP will respond with status information. Once a command is issued, the DSP uses the ACK pin to indicate that the status is available to be read. The hardware interface between the D6000 and Host is shown in Figure 4 below.

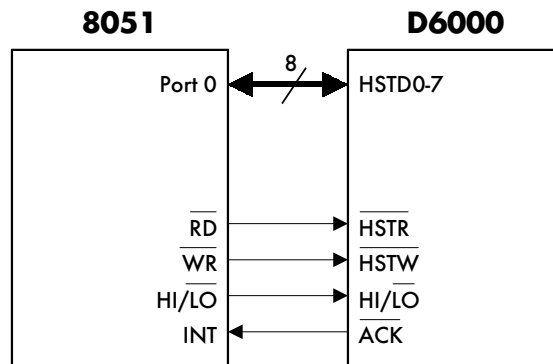


Figure 3. D6000 / Host Interface

D6000 Family Products

[illegible]

Benefits of the D6000 Family

- Flexibility of design allows for easy integration into such devices as:
 - Standalone answering machines and telephones
 - Cordless telephones
 - Portable recording devices
 - Facsimile machines
 - Car kits
- Proven technology used by world leaders.
- Easy conversion throughout the family:
 - Pin-for-pin compatible or very minor hardware changes (ARAM versus Flash interface)
 - Host control software is backward compatible
- Instant message retrieval and selective message deletion.
- Allows flexibility in design for features such as multiple mailboxes and multiple OGM's, enabling the design of a product that is truly a Personal Voice Mail System.
- Flexibility of memory usage allows storage of telephone numbers, CID, LCR, or other information.
- TRUESPEECH natural sounding voice prompts and time/date stamping allow design of a high quality and professional sounding product. In addition, the D6365B/C supports top quality PCM voice prompts.
- True FULL Duplex SpeakerPhone capability allows a professional sounding speakerphone to be added to your product with minimal additional cost.
- CID and Call Waiting CID functions (Bell 202 and V.23 compatible) eliminate the need for additional components.
- The Host-selectable configurations allow for flexibility in design for various countries and different applications.
- Superior quality TRUESPEECH Triple Rate Coder allowing selectable 11, 15, 25, minutes of recording time thus providing a flexible combination of top quality voice compression with long recording time.



DSP Group, Inc.:
3120 Scott Boulevard
Santa Clara, CA 95054
Tel: (408) 986.4300
Fax: (408) 986.4490
<http://www.dspg.com>

DSP Solutions, LTD:
Unit 1923, 19/F Metro Centre 1
32 Lam Hing Street, Kowloon Bay
Kowloon, Hong Kong
Tel: 852.2750.7325
Fax: 852.2305.0640

DSP Group Europe:
18 rue de l'effort mutuel
91300 Massey
France
Tel: (33) 6.0768.6754
Fax: (33) 1.6010.5187

DSP Technology, LTD:
#A-1216, Champs-Elysee Center
889-5, Daechi-Dong, Kangnam-Ku
Seoul, 135-280, Korea
Tel: 822.554.7494
Fax: 822.554.7495

Nihon DSP Group, K.K:
Yasuda Kasai Building - 2nd Floor
2-3-1 Higashi Gotanda
Shinagawa-Ku, Tokyo 141
Japan
Tel: (81) 3.3449.7851
Fax: (81) 3.3449.8006

DSP Application, LTD:
12F-12, 79, Hsin Tai Wu Road, Sec. 1
Hsi Chih, Taipei Hsien
Taiwan, R.O.C.
Tel: 886.2.698.4320
Fax: 886.2.698.4133