

# SPEECH PRODUCTS

READER SERVICE NO. 400

GIM designs and manufactures a variety of speech synthesis and recognition devices. They perform speech-related functions such as synthesis and extraction based on linear predictive coding (LPC), formant synthesis, discrete word

recognition, and allophone synthesis. All the devices allow an unlimited English-language vocabulary to be used. Supporting devices include a serial speech ROM, a serial-to-parallel interface circuit, and a speech synthesis

development board with a synthesis code generator. GIM speech circuits are used in telecommunications and in appliances, automotive systems, educational aids, warning systems, and toys and games.

## SP1000 LPC RECOGNITION AND SYNTHESIS DEVICE

### DESCRIPTION

The SP1000 is an LPC feature extractor that includes a reconfigurable digital filter. The SP1000 is designed to be supported by an 8-bit microcontroller, which controls the SP1000's synthesis function and compares extracted speech input signal features against a user-defined audio template stored in memory. The result of this comparison allows the computer to make a speech recognition decision. The SP1000/microcomputer combination provides a recognition system in which key audio features are defined by the system design engineer. Thus, the SP1000 can be used to recognize both isolated words and connected speech in either speaker-dependent or speaker-independent modes. The SP1000 offers two major advantages: First, the design engineer is not locked into a recognition algorithm and, second, the recognition algorithm can be easily upgraded with-

out hardware redesign, since it is contained in software or firmware.

#### SP1000 features include:

- a standard microprocessor interface, including an interface to the 6809,
- an on-chip oscillator,
- a software-controlled feature recognition sampling frequency from 5.0 kHz to 15.9 kHz,
- an automatic gain control output for controlling an external input amplifier,
- an 8-stage LPC lattice analyzer,
- a 10-stage lattice audio synthesizer,
- a software-controlled synthesizer sampling frequency from 4.0 kHz to 12.7 kHz,
- an excitation look-up ROM for voice/nonvoice sources,
- 8-bit on-chip D/A conversion with pulse modulated digital output,
- TTL compatibility,
- a single +5 V power supply, and
- a 28-pin DIP.

