Votrax makes the speech synthesis kit for under $1K

by John McDaniel, April 26, 1976

Dear Jim:

This letter is to confirm our conversation with regard to the VOTRAX Synthesizer Kit which we had discussed. As I indicated in our conversation, VOTRAX was not aware of the computer hobbyist market, and therefore had not addressed itself to providing anything for that community. As a result of preliminary investigation, I am pleased to relate to you that we could provide a VOTRAX Synthesizer in a kit form for a price not to exceed $1000. However, we require more information as to the specifications of the kit and the size of market potential, before we can commit to this price. Our quotation on a minimum order and delivery would be contingent on receiving this data.

Based on the text of your announcement in Dr. Dobb's Journal [Volume 1, Number 3, page 12], I believe that I have mislead you with regard to the size of the VOTRAX market. Your inference was that the VOTRAX market is not very large at present. This is not correct and, I am afraid, would tend to mislead your readers as to the impact the hobbyist market would have. This is not to say, however, that we're not interested in providing something for those users. I hope that this information will be of benefit to you. I look forward to meeting with you again at the Home-Brew Computer Club Meeting. If I can be of further service, please don't hesitate to contact me.

Sincerely, John H. McDaniel 4340 Campus Dr., No.212, Regional Sales Manager Newport Beach CA 92660, Vocal Interface Division (714) 557-9181

BASIC SYNTHESIZER INTERFACE SPECIFICATIONS GENERAL DESCRIPTION

The synthesizer requires 8 parallel data bits on its input pins in order to operate. Of these 8 bits, 6 are used for phoneme selection and 2 are used for inflection level selection.

The synthesizer provides a clock output which must be used to time the input data. Data should only be presented or changed on the positive transition of this clock. Also provided is a status indicator (zero decode), which signals the presence of input data. This is useful when the synthesizer is operated from a buffer memory interface. All signals are TTL signal levels. except audio output. Pin Description, Conn. 6, (Front Mother Board)

<table>
<thead>
<tr>
<th>Connector</th>
<th>Pin No.</th>
<th>Function; Description; See Signal Function</th>
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<tr>
<td></td>
<td>4</td>
<td>Data In, Inflection MSB 1 TTL load, Neg. True A</td>
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<tr>
<td></td>
<td>5</td>
<td>Data In, Inflection LSB 1 TTL load, Neg. True A</td>
</tr>
</tbody>
</table>
6 Data In, Phoneme MSB 1 UL load, Neg. True A
7 Data In, Phoneme 1 UL load, Neg. True A
8 Data In, Phoneme 1 TTL load, Neg. True A
9 Data In, Phoneme 1 UL load, Neg. True A
10 Data In, Phoneme 1 UL load, Neg. True A
11 Data In, Phoneme LSB 1 TTL load, Neg. True A
2 Output, Phoneme Clock 2 TTL loads, Neg. Pulse B
3 Output, Zero Decode 2 TTL loads, Pos. True C
13 Output, Audio Control Ext. 50K Vol. Con. Wiper D
15 Output, Audio Ground Audio Return D
1 and 10 Output, +5 VDC Interface Supply E
S Output, + 12 VDC Interface Supply E
P Output, - 12 Interface Supply E
A and N Ground Signal Return E

SIGNAL FUNCTION DESCRIPTION
A. Data In (Pins 1-11) Six bit phoneme code and 2 bit inflection code inputs. All phoneme inputs high are Null code causing no output condition.
B. Phoneme Clock Output (Pin 2) Provides internal timing of synthesizer and must be used to control dat. input. Data should only be presented or changed on the positive edge of this signal. When all phoneme data inputs are high, this clock runs with a period of 6 milliseconds. When data input is present, the period lengthens, depending on speech rate and the particular phoneme.
C. Zero Decode Output (Pin 3) This signal indicates the status of data by a high signal in absence of data and low signal when any phoneme data input is low.
D. Audio Control Output (Pins 13 and 15) 1-2 volt maximum audio signal from 50K external volume control, Additional external audio amplifier required to drive speaker.
E. Power Supply Voltages. The basic synthesizer requires the following power:
+5 VDC regulated @ 120 MA
+12 VDC regulated @ 160 MA
-12 VDC regulated @ 200 MA
Pins A and N should be used for power supply returns, and Pin 15 for external audio amplifier ground return.
IT CAN TALK... BUT CAN IT SING?

Votrax is proposing making the guts of this English language synthesizer system available in kit form for $1K. More details, next issue.
Note that the system described below is a turn-key, off-the-shelf item that has been on the market for several years.
The VOTRAX Model VS-6 is a new departure in voice response technology. This unique system combines low unit cost, unlimited vocabulary, operational simplicity and low data requirements to provide the ultimate in flexibility and cost effectiveness. The price of the VS-6 with parallel buffered interface is $3605 in single-unit quantity. Purchase prices are discounted for quantity buys starting at two units. Maximum discount is over 50%.
The VS-6 is programmed to speak based on phonetic coding principles. Each eight–it command word selects one of 61 phonemes (sounds) and one of four levels of inflection (pitch). Utterances are spelled phonetically to produce all combinations of words and phrases required by the application. Since words and phrases are stored in the form of digital information in some storage medium. such as magnetic disc or solid-state memory, there is virtually no limitation as to the amount of vocabulary VOTRAX can produce. One well-known computer services company reports a vocabulary in excess of 300,000 words. The value of unlimited
Two 25-pin interconnect boards, an 80-byte buffer for the incoming phoneme.

First of all, the price that Jim quoted was for a turnkey system; (one that includes two 25-pin interconnect boards, an 80-byte buffer for the incoming phoneme...)

VOTRAX machine to allow a computer to synthesize speech [article is reprinted, herein]. In the article, he indicated that the machine, essentially a solid-state phoneme generator, was priced at about $3500 for a basic system ... a bit high for most hobbyists budget. (Phonemes are the basic components that make up spoken words.)

Well, we just finished talking to the west coast rep for Votrax for about an hour and a half, and have some exciting possibilities to report!

Votrax is currently selling relatively few of their systems. It would be easy for the computer hobbyist community to significantly increase their sales (and, presumably, thereby drive the price per unit significantly downward). And, the rep didn’t even know the hobbyist market existed; he does now.

First of all, the price that Jim quoted was for a turnkey system; (one that includes two 25-pin interconnect boards, an 80-byte buffer for the incoming phoneme...)

If you are interested in having this available in $1 K kits, write to: John McDaniel, Vocal Interface Div., 4340 Campus Dr., Suite 212, Newport Beach CA 92660, (714) 557-9181

Dr. Dobb’s Journal of Computer Calisthenics and Orthodontia, Box 310. Menlo Park CA 94025 March, 1976

**COMPUTERS THAT TALK - UPDATE**

Jim Day had an article in the most recent issue of PCC discussing the use of a Votrax machine to allow a computer to synthesize speech [article is reprinted, herein]. In the article, he indicated that the machine, essentially a solid-state phoneme generator, was priced at about $3500 for a basic system ... a bit high for most hobbyists budget. (Phonemes are the basic components that make up spoken words.)

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For the hobbyist, the Votrax system is essentially a high-performance loudspeaker driver. It is a small, compact, and portable unit that can be easily integrated into any computer system. Although it is primarily designed for use with computers, it can also be used with other audio equipment, such as record players and televisions. The Votrax system uses digital signal processing technology to generate high-quality audio output, which is then amplified to provide powerful and clear sound. The system includes a range of features, such as adjustable volume control, equalization settings, and a variety of output options, allowing for flexibility and customization. It is suitable for hobbyists who are interested in experimenting with audio and sound production, as well as for those who simply want to enhance their computer's audio capabilities.
codes, an amplifier, and a power supply. Such a configuration is usually expected and demanded by the commercial and industrial users. However, it's a different matter with computer hobbyists. Hobbyists are accustomed to using breadboarding, can supply their own buffering via their system's memory, invariably have the ability to input to a hi fi amp, and usually can find super-cheap power supplies.

Assuming this, all that one really needs to purchase are the four phoneme generator boards, and have access to the interface engineering specifications and schematics. These are available for under $2K in small quantities; $1800 @ in groups of ten, and $1600 @ in groups of fifty.

Would you rather have a $1600 hardcopy device or the ability to generate English speech, including inflection? Since the Votrax equipment is based on phoneme generation, the vocabulary is essentially unlimited. Further, since the generators are entirely electronic, the equipment has much greater reliability than electro-mechanical equipment. Also, the Votrax equipment and circuitry has been in the field for about half a decade, now, and is thoroughly debugged.

If you would like for Votrax equipment to become available to the hobbyist community: (1) Write to John McDaniel, Votrax, 4340 Campus Dr., No.212 Newport Beach, Ca. 92660; tell him that you would like for your computer to be able to talk to you, and indicate how much you would be willing to pay for that facility. Give him correspondence to support him when he approaches Votrax management. Make him and them aware of their untapped potential market for stripped-down systems in the hobbyist community. (2) Tell the owners of your local computer store about Votrax and encourage them to contact Mr. McDaniel.

Page 32 Februari 1976: Dr. Dobb's Journal of Computer Calisthenics and Orthodontia, Box 310. Menlo Park CA 94025