sp synth Vic20

Talk-Back (Allophone system) and Chatterbox (Voice Synthesiser) for the VIC 20

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Dropbox

Talk-Back for the VIC20 by Mark Brighton

"Allows speech to be easily included in programs, Allophone based system gives unlimited vocabulary, May be used with an unexpanded VIC - does not require large areas of memory, Speech output is direct to TV - no additional amplification needed "

This project is a 'plug-in' speech synthesizer for the VIC2O, enabling the computer to 'talk' to the user in response to any programmed input. The synthesizer uses a system where words are put together from allophones, the basic 'building block' sounds of speech. In this way the sixty four allophones available from this synthesizer can be strung together to form any English word or phrase, thus avoiding the need for several EPROMS each containing a limited vocabulary, as used by some speech synthesis systems. The synthesizer is under complete program control, and can therefore be used for any application, from remote I/O operations to making games sound more realistic, depending on the program used.

circuit description
    This circuit is built around the SP-0256 speech processor chip, an N channel
    MOS device incorporating the following functions: 1 A programmable digital

filter which simulates the human voice tract. 2. A 16K ROM which contains the data for the 64 allophones. 3. A micro controller which controls the flow of speech data to the filter and the linking of allophones to produce words. 4. A pulse width modulator. This creates a digital speech output. The speech processor is used by setting up an address on lines AO to A5, to define one of 64 speech entry points, and pulsing ALD low to speak. These address lines are connected, via a latch (IC 1), to the address lines AO to A5 on the VIC. The latch is enabled by lC2a when a block select pulse (I/O 3) is present, setting the speech entry points between 39936 and 39999. IC2 forms a monostable that delays the block select pulse which enables the speech processor chip after the address set up on AO to A5 is latched into IC1. R5, C5 and C6 form a 5kHz low pass filter that converts the pulse modulated output of IC3 to an analogue signal. This is then amplified by TR1 and TR2. TR2 is a low output impedance emitter follower stage, which drives the VIC modulator. IC4 is a voltage controlled oscilla tor, and provides the clock for lC3. The nominal frequency of this oscillator is set by C11 and R16 respectively. C3 and C4 prevent an abrupt change in clock frequency, and hence speech frequency, while R14 and R15 provide a discharge path for the capacitors. The following status and control signals are provided on the board for ease of use and possible future expansion: 1. Veropin 1 is connected to LRQ on IC1, and is a logic 1 output while the speech processor is busy. This signal is connected, via PL1, to the paddle port on the VIC. 2. The RESET pin on IC1 is connected to the NMI line on the VIC. The chip is therefore reset when the VIC 'restore' key is pressed and an NWI pulse is generated. 3. Veropins 2 to 9 are serial address, data and control lines which can be used by an external speech ROM.

Figure 1. Circuit diagram

Figure 2.
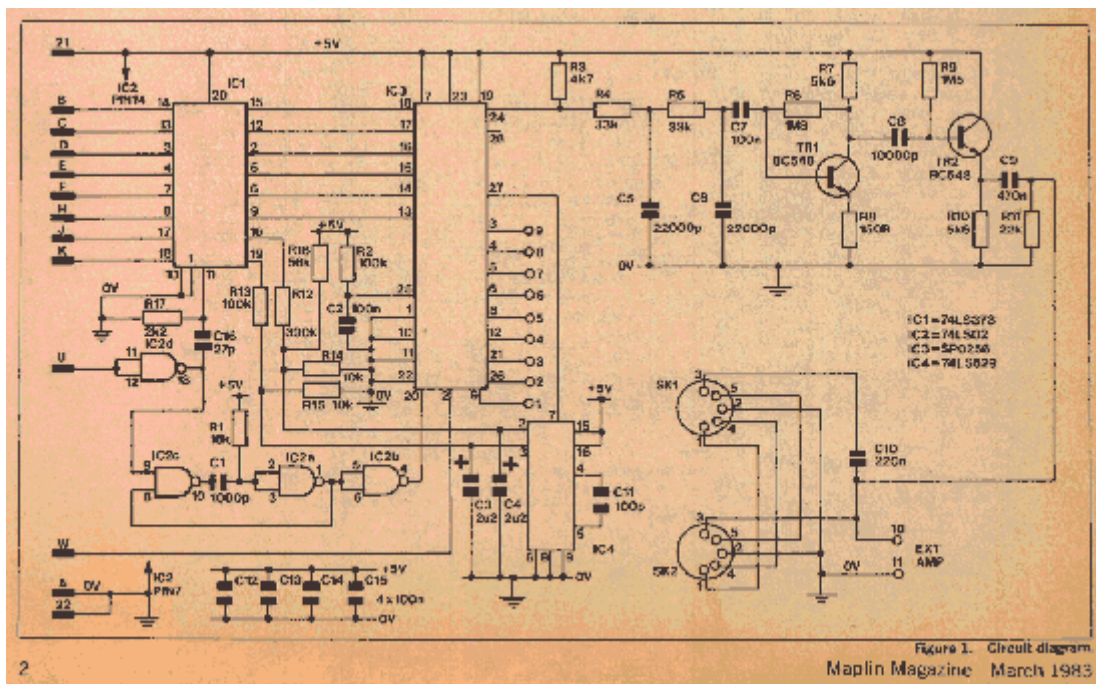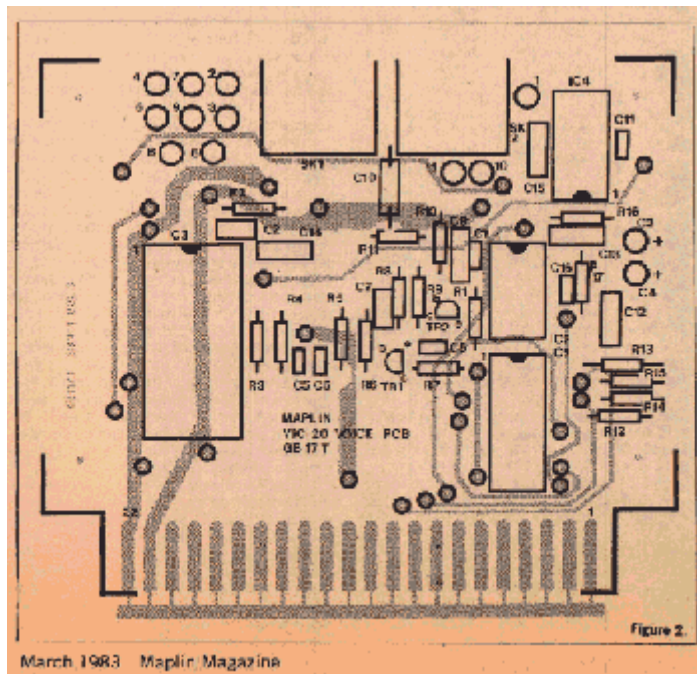
Use

To use the speech synthesizer, the correct addresses for each allophone in the phrase to be spoken must be POKEd sequentially with a value between 0 and 255 (the speech chip is linked to the address lines of the VIC, not the data lines, so the value POKEd may be any legal quantity). One of the easiest ways to do this is to use a data statement where each number corresponds to an offset from the base address, i.e. the address of the first allophone stored in the speech continued on page 7 VIC20 TALKBACK continued from page 3 chip (this base address has been set at 39936, by using the I/O 3 block select pulse on the edge connector). An example of this method is shown in Listing 1. A form of tonal inflection is also provided. To raise the tone of a given allophone, add 64 to the offset from the base address. To lower the tone, add 128. Best results will be achieved by experimentation.
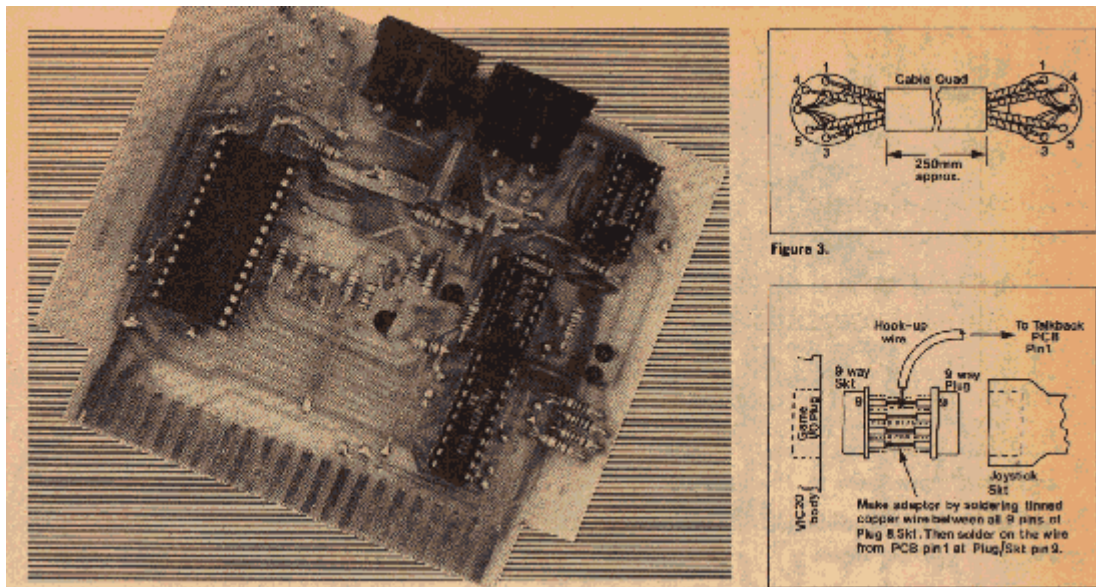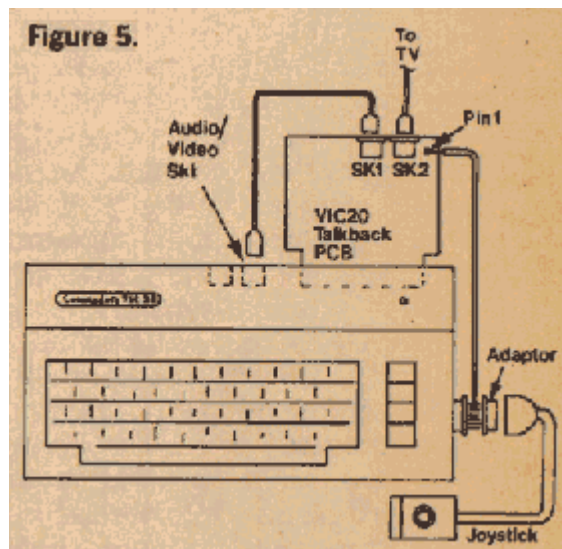

Figure 3.

Figure 5.

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1       POKE 37139,0 : POKE 37154,127 : REM SET
                        UP DDR FOR PADDLE PORT
5       CHIP = 39936
10      FOR NUMBER = 1 TO 23 :
        READ SPEECH :
        POKE CHIP+SPEECH,0 :
        WAIT 36872,128 :
        NEXT NUMBER
20      POKE 37154,255 : REM RESET DDR FOR
                        KEYBOARD
500     DATA    16,90,73,109,76,75,64,55,9,83,
                114,64,119,76,75,93,79,119,55,
                6,43,51,0
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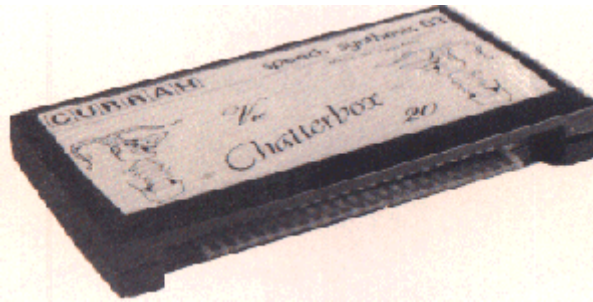
Construction

Referring to figure 2 and the parts list, assemble the project as follows: First, bend and insert resistors R1 to R17, and fit capacitors C1 to C16. Insert all veropins and IC sockets, TR1 and TR2. Solder all components into place, clean and inspect the track for dry joints and stort circuits, and fit the ICs into the holders. The connector leads are to be used with the plug-in board, and these should be wired to the plugs provided as shown in figures 3 and 4. Testing Using a meter switched to resistance, measure between +5V and 0V on the board, to ensure that no shorts exist. With the computer switched off, plug the board into the niemory expansion connector, and PL1 into the control port (joystick socket) on the side of the VIC. PL2 is plugged into the modulator socket on the VIC, and PL3 into 5K1 on the speech synthesizer board. The VIC modulator is then plugged into SK2 on the synthesizer (see figure 5). Switch the computer on. If the computer fails to display the 'CBM BASIC' and 'READY' messages switch off immediately and re-check all com-ponent placings and connections.

March 1983 Maplin Magazine

CHATTERBOX for the VIC20

"A voice synthesiser unit based on a remarkable chip from a recognized source which uses allophones (parts of speech) to generate English words."

N.B. This method of speech synthesis is the most suitable at present for providing an infinite vocabulary of words coupled with clarity of each spoken word.

CURRAH developed the hardware and at the same time took particular care over the design of the cartridge for plug in compatability with the VIC 20 on the expansion port. Component design is matched with a high quality P.T.H. board giving exceptionally good production quality. Supplied with the unit is the requisite adaptor for connection to a TV. The cartridge carries a humorous eye catching logo on the surface panel and is visually very presentable.

Furthermore, we have incorporated a series of software routines into EPROM to allow the user a very easy and flexible method of word construction. This aspect will ensure that the unit is successful with a beginner new to computing.

The synthesis of speech is simple to manipulate and involves concatenated allophones, drawn from a master list, to obtain a spoken word.

Practice doth make perfection!

Sophisticated design has enabled us to reduce component and general development costs to
benefit the end user so that we confidently expect to offer the most competitive price on the market.
Rigorous commitment by the Currah team enables us to offer our customers a price including
Postage. Packing and VAT of &#pound;57.45.

For both products a 12 month warranty is extended to all our customers. as we are confident of our co-ordinated approach to quality and unit life.

We believe all sorts of exciting applications will evolve in the home environment; innovative intruder alarms. dramatic improvements in games software and applications in the music industry. People will find it useful as a promotional tool, perhaps to advertise companies products. Have you considered the usefulness of using speech to advertise your products at the press of a function key? You will also notice the units educational merit.
ENJOY USING A FUN PRODUCT

The "MYNAH MODULE" for the Vic20

This unit has the same specifications as Chatterbox except for the integral software enhancement.
Both products include an informative manual with
tables and guidelines for using the allophones.
The MYNAH MODULE requires the same amount
of input information to voice speech. The
excluded software does not impair the operational
effectiveness of the unit. instead the user may
need to refer initially more often to the look up table

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