TALKER 2.0

Text to speech converter
For VS-100 Voice synthesizer.

USER'S MANUAL

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How to Use TALKER 2.0

Loading TALKER 2.0

TALKER 2.0 requires a minimum of one disk drive and 32K of memory.
Model III: Rrefer to the VS 100 Manual to transfer the "TALKER" file onto a Model III disk.
Model I: All the features of TALKER 2.0 will work on the Model I VS-100 except the "background speech feature," which will only work on VS-100 (Model I) shipped after March 1984.

The file is called "TALKER;" it is a command file about 6K long.
Since TALKER is self-relocatable, be careful not to load it several times, as you will end up filling memory with duplicate TALKERs. TALKER will remain in high memory until you reboot the computer.

After you transfer the TALKER file to your own disk (Model III must CONVERT), simply type "TALKER" from DOS READY.
TALKER will load itself into memory in the highest available space. A banner will appear on the screen and control is returned to DOS. We will see later that many options can be specified when loading. From this point, you may go into BASIC and experiment with the power of PRINT★ and PRINT!.

The Beauty of PRINT★ and PRINT!

(★ is an asterisk, read it "Print star")
Anytime TALKER is loaded, BASIC will recognize two new statements:
PRINT★ is a new "speak" statement. To experience the power of PRINT★ let's load TALKER, go into BASIC and type:
PRINT★ "It is working" or type: A=1234.56 : PRINT★ A
Note: PRINT★ can be abbreviated using ?★.
The new PRINT★ command will accept *any* valid string or numeric constant or variable. You can even include complex expressions or functions, such as MID$, LEFT$, SIN, etc.

PRINT! is another new BASIC statement: It prints on the screen exactly as a regular PRINT command, and in addition, the text is spoken. So PRINT! is the same as PRINT and PRINT★ together.
To get your favorite BASIC program to talk, simply LOAD, then LIST the program. Add a few "!" to the existing PRINT statements, where you want speech. (Remember that the beauty of PRINT! is that the ! does not affect the PRINT function. It *adds* speech without affecting the PRINT to the screen).

New control codes

In addition to standard text, many new control codes can be sent to TALKER 2.0 with PRINT★ or PRINT!. A control code is defined by one or two letters or numbers enclosed in slashes. Example: /4/ select pitch 4

The Automatic Echo Options

In addition to PRINT★ and PRINT!, TALKER 2.0 allows two more ways to get speech. Since it is easier to demonstrate than to explain, let's do the following:

If you start from scratch, Turn the computer on. At DOS READY type TALKER, go into BASIC, and then type:
PRINT★"/KL/" **KL** stands for **K**eyboard echo by **L**etter.
Nothing happened, but you just sent the control code KL to TALKER 2.0.
From now on, any key you press will be echoed. Try pressing a few keys.
This feature stays on even if you return to DOS or run some other programs.
To turn the automatic keyboard echo off, simply type (from BASIC)
PRINT★"/KN/" (**K**eyboard echo **N**o)
Now type PRINT★"/KW/" (**K**eyboard echo by **W**ord).
From now on, everything you type will be said word by word. TALKER considers a word to be completed when you key a space, ENTER, CLEAR, the arrows, etc.
To terminate the echo function type PRINT★"/KN/" (**K**eyboard echo **N**o).

Automatic Video Echo

This function is similar to the keyboard echo. Anything that is sent to the screen is said. As with the keyboard echo, you have the option to have the text spelled, or said word by word. The control codes are:
/VL/ **V**ideo echo by **L**etter
/VW/ **V**ideo echo by **W**ord
/VN/ **V**ideo echo **N**o (turns echo off)
Now type PRINT★"/VW/" and try out the Video echo.
Note: The automatic video and keyboard echo stay in effect until turned off, (by a control code) even if you exit BASIC. Some machine language programs, such as Scripsit, have their own keyboard or display routines, so they bypass TALKER, and there will be no speech.

Background Speech

Did you notice that your computer does not slow down a bit and that the control is never lost. Your cursor is active even while the VS-100 is talking. This is what "background speech" is, and here is how it works:
When PRINT★ or PRINT! is in use, and also when the automatic echo is enabled, text is sent to TALKER for processing. There, the phoneme codes are generated and immediately sent to a buffer area. Every few milliseconds (each interrupt) the TALKER program checks to see if the VS-100 is free for the next phoneme. If it is free, the next phoneme code in the buffer is sent to the VS-100. Then the computer returns to what it was doing. If the VS-100 is not free, (still busy saying the previous phoneme), then nothing is sent. This all happens in a few microseconds (millionths of a second) and the user does not even notice it.

The buffer

When you load "TALKER" a standard buffer is set for 256 bytes, which is enough for about 25 seconds of continuous speech. The buffer is emptied little by little as the VS-100 speaks. The buffer is filled every time the PRINT★ or PRINT! or automatic echo is used.
What happens when the buffer is filled up? That means that you are sending text to be spoken faster than the VS-100 can speak. In this case, the computer waits until some space is freed in the buffer. The computer slows down but no speech is lost.

Introducing the Variable Buffer

In most applications, the VS-100 does not output speech continuously, and therefore the standard 256 byte buffer is sufficient. However, the buffer size can be chosen up to 10K. This is accomplished by adding a space and a number when you load TALKER. The number, from 1 to 40, is the number of 256 byte blocks reserved.

Example: From reboot type TALKER 40. When you press ENTER, TALKER will load and reserve 40x256=10K bytes of memory for the speech buffer. *This is enough for 20 minutes of continuous speech!* You might want a buffer this long if you have a long ASCII file created by a word processor, or maybe downloaded from a database.
Example: You could type TALKER 40 /VW/. This command will load TALKER, reserve a 10K buffer *and* turn on the video echo by word feature. From then on, if you listed an ASCII file (from DOS, e.g. LIST TEXT) the text would be listed on the screen as usual, but it would also be sent to TALKER and converted to phoneme codes. The codes would then be sent to the buffer, and since we set up a 10K buffer, up to 20 minutes of speech could then be stored. The control would be returned to DOS, but the VS will keep talking until the end of the text.
You may clear the whole buffer at any time by hitting shift space.

Now you get an idea of the power of TALKER, but there is still much more. Here is an example:
After rebooting, type TALKER /KL//VW//PY/ from DOS READY. Talker is loaded, the **K**eyboard is echoed by **L**etter, the **V**ideo is echoed by **W**ord, and all **P**unctuation will be pronounced. (PY = **P**unctuation **Y**es)
From now on, in DOS or in BASIC, every key you press is said, and at the end of each word, the word is pronounced. With this function, a blind person could conceivably use the computer for many tasks, and could also access bulletin boards and databases.

More Control Codes
Now let's see the other control codes. Reboot, then from DOS READY type TALKER, then go into BASIC. Type in this short program:

10 CLEAR 300 : LINEINPUT A$: PRINT★ A$: GOTO 10
Run the program. This allows us to enter any text and control codes to try them out.
Type /SY/ (**S**pell **Y**es) From now on, all text sent to TALKER is spelled letter by letter instead of being pronounced normally. Enter some text and experiment.
Type /SN/ (**S**pell **N**o) Now it's speaking as usual again.
For example type: Radio Shack is spelled /SY/Radio Shack/SN/ usually.

Punctuation control
Type /PY/ (**P**unctuation **Y**es). Now all punctuation is said. Type some punctuation in and press enter.
Type /PN/ (**P**unctuation **N**o). Now the following punctuation marks are ignored: ! " ' ( ) : - ; , . ?

Speech Delivery Control (Speed)
There are 14 speeds from A (fast) to N (*very* slow).
When TALKER is loaded, speed delivery is set to DP (**D**elivery **P**roportional) This means that each phoneme is spoken with its own duration. This is the normal mode of operation. Phonemes can be sent at fixed intervals by issuing the command /Dx/ where x is a letter from A (fastest) to N (super slow).
Type /DA/ and some text. How does it sound?
Type /DN/ and some text. See how the speech is slowed so much that you can hear the individual sound components forming each syllable. Now type /DP/ to return to the more natural proportional mode.

Pitch Control
The VS-100 is capable of speaking at any of 4 pitch levels. They are selected by sending any one of the following contol codes: /1/ Lowest pitch, /2/ Standard default pitch, /3/ Higher pitch, and /4/ Highhest pitch Try typing /1/Hello /2/Hello /3/Hello /4/Hello.
You can simulate a dialogue using pitches 1 and 4.

Math Mode
This mode is selected with /MY/ (**M**ath **Y**es). To see its effect, type the following:
/MY/ 31*45−10/6 > 100
In this mode, the * − . / > < are pronounced with their mathematical meanings. To return to normal mode, type /MN/ (**M**ath **N**o). Now the "*" is pronounced "star", the "-" is ignored and the "/" becomes "slash". This feature is handy in educational programs dealing with mathematics.

The Quiet Mode
Speech can be totally turned on and off in two ways:
- Using the control codes /QY/ (**Q**uiet **Y**es) and /QN/ (**Q**uiet **N**o)
- In the direct mode (DOS or BASIC) by pressing 3 keys at the same time.
Shift-space-Y is the same as Quiet Yes, and Shift-space-N is the same as Quiet No.
Note: If the VS-100 is talking, hold shift-space-Y down for a few seconds. Also, while /QY/ is in effect, all control codes are still recognized.

Blank compression
The blanks (spaces between words or at the end of lines) can be ignored, by issuing the /BY/ (**B**lank compress **Y**es) control code.
In this mode, the regular space between words is shortened, and any extra spaces are ignored. This will give a quicker and more natural sounding speech. If the code /BN/ (**B**lank compress **N**o) is issued, all spaces are converted into pauses during speech output.

Remember that many codes can be combined. For example, type: (Note: we are still running our little line 10 program)
/4//VL//KW//PY//BY//SY/ This is a test.
This is a valid PRINT★ line, which will do the following:
/4/ select pitch 4 (highest)
/VL/ Turn on the automatic video echo by letter
/KW/ Turn on the automatic keyboard echo by word
/PY/ Tell the text to speech translator to pronounce all the punctuation.
/BY/ Compress the blanks, and ignore extra spaces if more than one.
/SY/ Turn the spelling mode on (as opposed to standard word by word mode)
Now with these codes in effect, anything you type will be said several times. First when you type it in (keyboard echo), then when it goes to the screen (video echo), then when it is processed by PRINT★ (in our line 10 program.)
This is obviously an overkill, it is just to illustrate the possibilities of TALKER.
Remember that all the control codes can be put into effect at the time when you are loading TALKER. For example, when you first turn the computer on and from DOS READY type:
TALKER /4//VW//KL//PY//BY//SY/"TALKER is loaded"
When you press ENTER, All the codes will be put into effect and "Talker is loaded" will also be spoken. You can include any message when TALKER is loaded. e.g. TALKER SYSTEM READY.
Note: TALKER always says "OK" when it finishes loading, then the optional message is spoken.

Remember to turn the computer off or to hit reset to avoid loading TALKER more than once in memory.