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VOICE HARP USER'S MANUAL  
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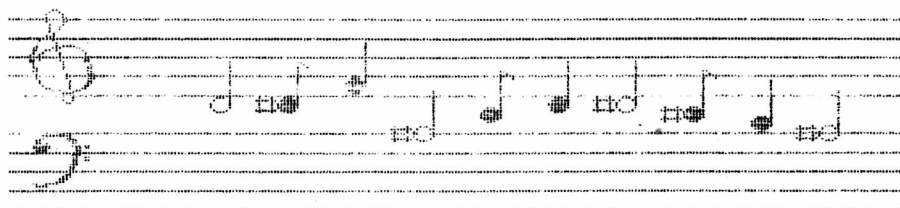
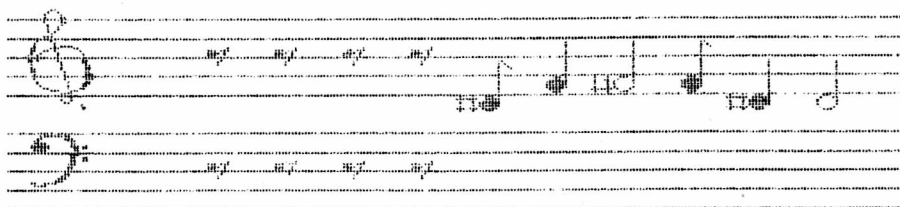
For COMMODORE 64/128, ATARI 800, XL, XE,  
and APPLE II+/IIe/IIc

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Manual written by Brad Stewart & Don Vaccarino

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Sample of the Voice Harp music score print out.

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## THE VOICE HARP COMPOSER

(For the Apple, Atari, and Commodore)

Programmer: **Donald X. Vaccarino**

The Composer program lets you create music by whistling or humming. Then, you can edit the music, correcting any notes that may have been off-key, and/or adding in rests, or changing durations, or any number of things. And you can save these compositions on disk or cassette, and play them back any time you wish to. This program requires a Covox Voice Master for proper use. The Voice Master measures the pitch of your voice and converts it into musical notation. Be sure to read over this manual thoroughly. The Voice Harp Composer program is quite sophisticated and entirely unique.

### Loading the Program

1. Loading from the Voice Master Menu. Just select the proper menu option. The program will be loaded in, and ready to go.
2. Loading from BASIC. This varies with the computer. For the C64, type `LOAD "COMPOSER",8,1`. Then type `SYS 16032` to run the program. For the Atari, type `RUN "D:COMPOSER"`. For the Apple, type `BRUN COMPOSER`, or `BRUN COMPOSER SM`, if you have the Sound Master.
3. Loading from Atari DOS. On the Atari, you can load the Composer from DOS by typing `'L'` for Load Binary File, and then `'COMPl.COM'`, which is the name of the file. The program will run automatically.

### The Title Page

Now that you've loaded the program in, you see the Title Page. Press any keyboard key. On the C64 and Atari, you will be asked to specify the printer you will be using. Gemini, Star, Epson, and Panasonic are supported for all computers, plus the Commodore printer for the C64, the Prowriter for the Atari, and the Apple Dot Matrix for the Apple. If you don't have a printer, simply hit return for each of the questions. Note that the Apple version won't ask for your printer type until you try to print something. The Atari version will not ask you for the printer type unless you have a printer attached.

## **The Main Menu**

First, you probably want to know how to move the cursor around. You can use the up/down arrow keys, or 'I' and 'M' on the Apple, and send it moving through the list of menu options. Or, you can type the number or letter of any given option and the cursor will move to the proper row. Note that you should not hold down Control with the arrow keys on the Atari.

Once you've positioned the cursor on the option you want, press return to activate it.

Note: if the program is not responding to the keyboard, it might be because you have shift/lock down on the Commodore, or you do not have shift/lock down on an Apple IIe/IIc, or have inverse, lower-case, or control characters set on an Atari.

## **The First Session**

So here you are. The first time you sit down at the composer. How should you begin?

Is your Voice Master plugged in? If it isn't, or if it's plugged into the wrong controller jack, then it won't work. Refer to the speech section of the manual for information as to connecting and calibrating your Voice Master. This is important for proper operation.

So why not record something? Select option one and press return. You should see a red RECORD screen (Apple version has black screen), with a bass and treble clefs, some words at the bottom of the screen, and eighth rests scrolling by.

Note: If your Voice Master is not plugged in, you will not be able to input notes. But, if everything went properly, you can try humming a note into the microphone now.

Note again: Make sure the microphone is plugged into the Voice Master, as explained in your owner's manual. For the Composer, best results are obtained with the microphone held just under your nose. The best method of humming is to make an "ah" sound, such "la" or "da". The "ah" sound is quite robust and is the easiest voiced sound for the Voice Master to detect.

If you hum loud enough, a note appears on the screen. If you find it necessary to hum too loud, simply increase the gain setting of your Voice Master. Try humming higher and lower notes. Hold a note for a while. Notice that as soon as you stop humming, the note scrolls by and the computer is waiting for you to enter the next note. Try humming in a little tune. Don't hum it too quickly, or the computer won't pick up all the notes. Also be sure to put a

discernible gap between notes, or the computer will think that you just haven't made up your mind yet on the first note. (See MODE option.)

At the bottom of the screen is a little text window showing you various things you can change, plus some other data. The computer is only capable of reading the keyboard when there is no sound being detected by the Voice Master. Also, it may be necessary to hold down the key until the appropriate response occurs. Here is a list of the options:

**MODE** - Pressing the "M" key toggles between DISCREET and CONTINUAL modes. If the mode is DISCREET, you have to pause, i.e. stop humming, for the computer to display the next note. If the mode selected is CONTINUAL, it keeps plotting eighth notes at the given tempo.

**INPUT** - This tells the computer whether you are going to hum or whistle. Press "W" for whistled input and "H" for hummed input. If you try to hum when it thinks you will whistle, or vice-versa, the computer will not respond with the correct notes.

**SOUND** - Press the "S" key to toggle the sound on or off. Sound ON means it plays back the displayed note as you hum or whistle. Sound OFF means it does not - but it still plays them back later in play or edit.

**OCTAVE** - Press the "O" key to toggle between NORMAL and DOWN octaves. Octave DOWN means the computer records every note as if you had hummed it in an octave lower than you really did. This is handy if you are female or have a high pitched voice. Octave NORMAL means it doesn't.

**FILTER** - Press the "F" key to toggle filter on or off. The filter affects only hum input. When the filter is on, second harmonics of your voice pitch are reduced. This helps stop quavering or octave jumping with some male voices, especially for "oo" sounds as in "new". Turning the filter on will reduce your input octave range.

**TEMPO** - Pressing the "T" key selects between fast, medium, or slow tempo settings. The tempo determines the playback and recording speeds, i.e. the rate at which the notes change in eighth note intervals.

**NOTE** - This indicates the value of the current note displayed between the markers at the extreme right side of the screen. Octave is not specified. Notes are always printed with sharps, never flats, e.g. "A#".

**VOICE** - This indicates what voice setting (1-8) is currently valid. Refer to the section on voices.

You can change any of these (except NOTE and VOICE) by pressing the letter displayed in inverse video. So press 'H' to set input to HUM, 'W' to set it to WHISTLE, 'T' to change the tempo, and so on.

Now that you've hummed and whistled, and experimented with the tempos and filter, how do you get back to the menu? Simply press the space bar, and the menu will fill the screen once again. You can also get out by typing an 'E', which bypasses the main menu and places you in the editor.

Another note: The next time you go back to the record mode, the next note will be placed at the end of whatever you have already recorded.

### **Playing It Back**

Now that you've recorded your masterpiece, you probably wonder what it sounds like. Select option number two (from the main menu) and press return to listen to your composition. The screen will change to blue indicating playback mode (except Apple). You can press the space bar any time during playback to return to the menu. You can also press any of the keys that worked in the record mode, except the "M" key. Pressing the "E" key places you directly in the edit mode.

### **Edit Mode**

This is menu option three. The screen changes to green in the edit mode (except Apple). There are two important keys to remember here: the space bar, which returns you to the main menu, and the escape key (left arrow on the C-64), which displays the help screen.

Note: while you are in edit mode, the note you are currently editing is the one at the far right on the screen between the markers.

In edit mode you can use all of the commands you could use in record mode, with the exception of the "M" key (MODE), which has no effect, and "E" key, which serves a different function (see below).

A list of the edit commands can be reviewed by pressing the ESC key on the Atari and Apple versions, and the left arrow key on the C-64, while in the edit mode. To return back to the edit mode, simply press any key.

The list of the edit commands is presented below:

|                   |                         |
|-------------------|-------------------------|
| A .....           | Add a note.             |
| B .....           | Jump to Beginning.      |
| C .....           | Change a note.          |
| D .....           | Delete a note.          |
| E .....           | Jump to End.            |
| F .....           | Filter on/off.          |
| H .....           | Hum input.              |
| I or up arrow.... | Raise note.             |
| J or left arrow.. | Scroll left.            |
| K or right arrow. | Scroll right.           |
| L .....           | Alter note Length.      |
| M or down arrow.. | Lower note.             |
| O .....           | Octave normal/lower.    |
| R .....           | Insert eighth rest.     |
| S .....           | Sound on/off            |
| T .....           | Change tempo.           |
| W .....           | Whistle input.          |
| 0-8 .....         | Selects voice.          |
| Space Bar .....   | Leave Edit mode.        |
| < or , (comma)... | Shorten note duration.  |
| > or . (period).. | Lengthen note duration. |
| / or ? .....      | Insert a measure bar.   |

The following explains the edit commands in more detail:

**A - Add a Note.** This waits for you to hum or whistle in a note, and then inserts it in front of the note displayed at the markers..

**B - Begin.** This places you at the beginning of your composition.

**C - Change a Note.** This waits for you to hum or whistle a note, and then replaces the current note with the note you hummed or whistled.

**D - Delete a Note.** This deletes the note between the markers from your score. It also deletes rests and measure bars. All the notes to the right of the makers are shited to the left one position. If there is nothing left to delete, you will be returned to the main menu.

**E - End.** This places you at the end of your composition.

**L - Alter Note Lengths.** This will change the note you are at to an eighth note, and then steadily increase its duration at the selected tempo as you hold down the L key. Let go of the L key and it will scroll to the next note. Use this to tap out a melody's rhythm. For the Apple II+, it will be necessary to hold down the REPT key.

**P - Print.** This dumps everything on the graphics screen to the printer. Then it moves you ten notes further into the music, so that you can just press 'P' again to print out the



next part of your song. For the Atari, you must press Control-P.

**R - Rest.** This inserts an eighth rest at the current position.

**Up Arrow or I** - This key raises a note one half-step in pitch. Keep holding down the key to keep raising the note. For C-64, use the SHIFT up/down cursor key.

**Down Arrow or M** - This lowers a note one half-step.

**Left Arrow or J** - This moves you left in the note buffer.

**Right Arrow or K** - This moves you to the right in the note buffer and plays the note. Holding down this key plays back the song at the selected tempo.

**< or .** - This shortens the duration of the current note.

**> or ,** - And this lengthens it.

**/ or ?** - This inserts a measure bar. These are only for "decoration", and printouts; they do not change the way the music is played except there is a slight pause in the Apple while the bar scrolls by.

**0-8** - Typing one of these numbers (0 through 8) changes the sound, or voice, of the current note, as well as all the notes following it, until another sound setting is encountered. A zero clears the sound; one through eight sets it. A little number will appear at the bottom of the note, and you will hear it played. The sound/voice settings are user definable by selecting Option A in the main menu.

The user cannot define the voices on an Apple II without the optional Covox Sound Master, or on an Apple IIc. In this case, we have assigned the following default voices:

1. Normal note.
2. One octave higher.
3. One octave lower.
4. Normal note and one octave lower.
5. Flange on normal note.
6. Two-note major chord.
7. Trilled note.
8. Upwards Portiamento, or "Lasar Zap".

The default voice/sound settings for the C-64, Atari, and Apple with Sound Master are similiar

### **Saving and Loading Music**

Well, now you've created your composition, and you've edited it and perfected it. Now what?

You might want to save it. Use menu option number six. You will be asked for the filename you want to save it under. Enter the filename, and your composition will be saved. Note that on the Atari, you have to enter the full



filename, such as 'D:SONG.MUS' for a disk file, or 'C:' to save to cassette.

Option number five lets you load files back in. There is also an append option. This loads a file on to the end of what you already have in memory. This feature is useful for repeating a section in your composition. Simply save the section you want repeated under a different filename and append it to your working composition.

### Changing the Voices

There are eight voices, or sounds, which you can define in the Composer (except Apple IIc or Apple II without a Sound Master). Each music synthesizer supported, i.e. SID, POKEY, or Sound Master, comprises at least three tone oscillators, noise generators, and envelope modulators. Thus, you could define a voice to sound like an explosion or a musical chord. Each voice can be defined at 16 different loudness levels so that you can vary the volume during playback.

If you select menu option A, you will be prompted to enter requested information. (In each case, the current setting is shown in reverse video. To keep the same setting, just press RETURN.) First you will be asked which of the eight voices you want to define, numbered 1 to 8. If you enter a 0, you will get back to the main menu. After selecting the particular voice you want to program, you will be asked for other information depending on your computer:

For the Commodore 64:

For each of the three sound channels, you will be asked the following:

**ON?.** Type yes if you wish this channel to be activated.

**WAVEFORM.** Enter the letter for the type of waveform you wish to be used for this channel. Select "T" for triangle, "S" for sawtooth, "P" for pulse, or "N" for noise.

**ATTACK.** Select envelope attack time. Range is 0 to 15.

**DECAY.** Enter envelope decay rate. Range is 0 to 15.

**SUSTAIN.** Enter envelope sustain level. Range is 0 to 15.

**RELEASE.** Enter envelope release time. Range is 0 to 15.

**OCTAVE.** Select octave value for playback. A zero or four plays back the octave entered by the user. A value of one selects the lowest octave with seven as the highest.

**INTERVAL.** This is the number of half-steps up in pitch from the note displayed on the screen. Thus, for a C, 1 would mean play C, 2 would mean C#, 3 would be D, 4 would be D#, up to 12, which would be B. Zero is a special case, playing a note slightly out of tune. Playing interval zero in one sound channel with interval 1 in another produces a flanging, or ring modulation, effect. Playing interval 1 with, say, interval 5, would produce a major third chord. Other chords can be generated in a similar fashion.

**PULSE WIDTH.** These two bytes, a low byte and a high byte, are used to determine the width for the pulse. You will only be asked this question if you choose the pulse waveform.

**VOLUME.** This is the overall volume for the three channels. Range is 0 to 15.

**FILTER.** Answer "Y" or "N". A "Y" will turn on the SID filter for this channel, and the following questions related to the filter setting will be asked:

**RESONANCE.** This is the amount by which you want to emphasize the cutoff frequency. Range is 0 to 15.

**CUTOFF FREQUENCY.** This is the upper 8 bits of the filter cutoff frequency. Range is 0 to 255.

**LOWPASS.** Answer "Y" if you want a lowpass filter.

**BANDPASS.** Answer "Y" for a bandpass filter.

**HIGHPASS.** Answer "Y" for a highpass filter.

For the Atari:

You will be asked the same four pieces of information for each of the four sound channels:

**VOLUME.** This is the amplitude level for this channel. Range is 0 to 15.

**DISTORTION.** Enter a 10 for pure tones, a 12 for buzzes, or an 8 for noise. Refer to a book on the Atari for detailed information on distortion.

**OCTAVE.** Same as Commodore.

**INTERVAL.** This is the same as for the Commodore.

For the Apple:

If Apple II+/IIe is equipped with a Sound Master, the following questions will be asked:

**ENVELOPE SHAPE.** This defines the shape of the envelope. Range is 0-15. Details can be found in the Sound Master manual.

**ENVELOPE PERIOD.** Defines the envelope period or modulation frequency. Smaller numbers produce faster changing envelopes. Range is 0 to 255.

**NOISE PERIODICITY.** This defines the noise quality when any of the noise channels are on. Range is 0 to 31.

**SLOT.** This is the slot you have the Sound Master plugged into. Slot four is default. You can have two Sound Masters plugged into two different slots, and thus create stereo effects by changing the slot value for different voices.

For each of the three sound channels(A,B,C), you will be asked the following:

**tone ON.** Answer "Y" to activate this tone channel.

**Noise ON.** Answer "Y" to activate this noise channel. Note that a channel can generate both a tone and a noise at the same time.

**AMPLITUDE.** Sets the volume level for a channel. Enter a 16 if you wish the volume to be controlled by the envelope generator.

**OCTAVE.** This is the same as for the Atari and C-64.

**INTERVAL.** This is also the same as for the Atari and C-64.

After you have created a voice, you can test it out by typing that number on a note when you are in edit mode.

You can save your voice settings with option C, and load them back in with option B. When using the Atari version, the voice filename must be preceded with a "D:" for disk, or a "C:" for cassette.

### Changing Key

The options KEY UP and KEY DOWN on the main menu move all of the notes in the music buffer one half-step up or down. They may seem to do nothing, when you are at the menu, but when you play back your music, it will be in a different key.

If you do a key up or key down when a note is at the very top or bottom of the scale, it will wrap around, and a very high note will become a very low note, or vice versa.

### Clearing Memory

Option four lets you erase the song you have in memory and start from scratch. It will ask you first if you're sure you want to do this.

### Leaving the Composer

Option zero from the main menu will let you leave the Voice Harp Composer program and perform a "warm start". This will normally return you to BASIC or the Voice Master menu. Any music that you had in the note buffer will be lost, as (usually) will any BASIC program you previously had in memory.

## **Listing the Disk Directory**

Menu option D (A on an Apple without the Sound Master) will display the directory of your disk. Press a key to return to the main menu.

## **Tips on Using the Composer**

The following tips will assist you in becoming proficient at using the Voice Harp Composer:

Use the input method you are most comfortable with. Some people cannot hum if their lives depended upon it. So try whistling. The Voice Master measures the pitch frequency of your voice or whistle. It then tries to match that pitch to the nearest note in the chromatic scale. You may notice that you are consistent in producing notes that are always on half-step too high or too low. The Composer was written to allow you to easily correct your mistakes. In addition, you will find that your sense of pitch will improve tremendously after using the Composer. Most users find that they can enter their favorite songs into the computer very quickly and naturally, even if they have had little or no musical training.

Enter your music at the slow tempo setting and set mode to DISCREET. This will result in only eighth notes being plotted, and few if any rests. After you have recorded a short section, go into the edit mode (by pressing the "E" key in the record mode). Once in the edit mode, press the "B" key to take you to the beginning of your composition. Now "single-key-play" your score using the right arrow or "K" key. When a sour note is encountered, press the "C" key and hum or whistle the proper note. Or if you prefer, raise or lower the note using the up/down arrow keys or the "I" and "M" keys. You can also use the "A" key to add in a note that was not recorded. Then continue using the single-key-play technique until you have reached the end of your composition. Now that the notes are correct in pitch, go back to your starting point, set the tempo to medium or fast, and tap out the rhythm using the "L" key (and the REPT key on a II+). Once that is accomplished, go over your composition and make adjustments to the durations using the "<" or ">" keys, insert rests if needed, and add in the voices. If your composition repeats a section or theme, consider saving what you have just composed to disk and appending that saved section to your working buffer using the append option. This is similar to a "block repeat" function in a word processor.

## How To Goof Up

1. Try to load a game or BASIC program in as a music or voice file.
2. Walk away and leave the computer running in RECORD mode. After recording for about one hour, 59 minutes and fourteen seconds, the system will produce garble. This can also be a problem if you tend to compose things that are an hour and 59 minutes and fourteen seconds long. You can get the same effect by appending a file over and over again until it fills up memory.

## A Few Neat Things To Try

Change all your voices to normal tones, but with different volumes. Then you can have your music fade in and out.

Set the input to whistle and play a flute or a recorder (that's the woodwind, not a tape recorder) while in RECORD mode. Or try patching the audio output of a synthesizer (programmed with a flute-like sound) directly to the microphone input of the Voice Master.

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## THE COVOX VOICE HARP 'HUM-ALONG'

by Brad Stewart

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### INTRODUCTION:

The Voice Harp Hum-Along program is available only for the Commodore 64 and 128 personal computers. The primary reason this is so is because of the unique hardware configuration of these computers which make it possible to accurately track your voice pitch to within one millionth of a second.

The Hum-Along program is essentially an "Electronic Kazoo". It is written in BASIC and machine language. The BASIC program is called "HUM-ALONG", the M/L program is called "PERFORMANCE.0", and there is a sequential file called "PRESET-1." All of these programs must be copied for a complete backup.

## GETTING STARTED

From the Voice Master Menu, select item 7 to load and run Hum-Along. From BASIC, type LOAD "HUM-ALONG",8 and type RUN after the program has been loaded. After a few moments, you will be advised that presets are to be loaded (a file named "PRESET-1") from cassette tape or disk (T or D). Press RETURN for disk. After the presets are loaded, a menu with 19 numbered choices will appear.

### 1 - 8 = (select ) PRESETS

The first eight (1-8) items in the menu select one-of-eight user definable presets. The presets define settings in the Commodore's SID music synthesizer. You can alter them in many ways to obtain a wide variety of sounds. Each group of eight presets can be saved to disk or cassette using Option 10.

In order to familiarize yourself with a preset, try Option 1, a "funky bass", and start humming. The best hum sound is "ah". This produces the clearest and most robust voicing sound. Humming works fine, but you may need to place the microphone under your nose (because you hum with your mouth closed). When you first start using the Voice Harp, start slowly and try to keep your voice steady. You may find it necessary to turn down the volume of the TV set or monitor to avoid feedback. If unsuccessful at humming, try whistling. To do this, press the space bar (when not humming) so that you return to the main menu. Then select Option 14 and then Option one. Now your whistling will produce the "funky bass"! With just a little practice, you will be amazed at how quickly you improve your musical abilities.

### 9 = DEFINE (presets)

This option allows you to observe and/or change the presets that define the SID settings. You will be asked what preset number you wish to examine. In all cases, current values will be displayed in reverse video on the screen. Pressing the return key without entering new values leaves the current values unchanged. There are seven octave values available. Selecting "4" will play back the same pitch that you hum in. There are 12 interval values. Selecting a "1" will play in unison with your voice at the selected octave. An interval of "5" will play a major third harmony with your voice. Note: The interval refers to the note on the chromatic scale. Example: If you sing a "C", the fifth interval is five notes up (including

the "C"), or an "E" (C,C#,D,D#,E--1,2,3,4,5). It is helpful to visualize counting the white and black keys on a piano.

The ADSR function of the SID (i.e. attack/decay, sustain/release) takes control with the onset of your voice or whistle. The release cycle starts after you stop humming or whistling.

Oscillator 1 of the SID is always set to ring modulate with Oscillator 3. (See Commodore manual for definitions and details.) An example of this is Option 7. In order for ring modulation to be audible, the triangle waveform of Oscillator 1 must be selected and Oscillator 3 must be set to some frequency other than zero. None of the other parameters for Voice 3 have any effect on ring modulation.

#### 10 = SAVE/LOAD/DIR (presets)

Select this option to save or load your eight presets to or from disk (or tape cassette). You can also view the disk directory with this option. (Not applicable with tape systems.)

#### 11 = DIGITAL FILTER

This option allows you to turn on or off a software digital filter (for hum input only) which reduces second harmonics in your voice pitch. You may need to use this filter if you have a deep voice, or if you insist on singing with an "oo" (as in "new") sound rather than the preferred "mmm" or "ahh" sound. If you turn on the filter, you will be asked for a filter value. Try a value of 12 to start with. A higher value has more of an effect. When the filter is on, abrupt octave changes will occur as you go up in voice pitch; the audio effect is like shifting gears in a sports car. In most applications, this filter can be left off.

#### 12 = INTEGRATION TIME

This selects the number of input pitch cycles to be analyzed before the note is played or displayed. Normal (default) setting is "long". Longer integration "smooths" out the rough edges in your voice, but slows down the response time somewhat. In the whistle input mode, a short integration time can yield satisfactory results.

#### 13 = HUM/VOICE

This selects humming or singing input. Unvoiced



sounds, such as whistles or sibilents (e.g. "sh") will not work properly.

14 = WHISTLING

This selects whistle input. Voicing or humming should not be used in this mode. It may be necessary to move the microphone away from the mouth because whistling creates blowing noises which can interfere with the signal.

15 = CONTINUOUS (Output Mode)

In this mode, the music is continuous such that the output will closely track input voice or whistle frequency. Thus you can produce a seemingly infinite variation in frequency. This can be especially useful for portamento and vibrato effects.

16 = DISCRETE (Output Mode)

In this mode, the music playback frequency is that which is closest to a note on a chromatic scale. That is, only twelve notes per octave, and not the tones in between.

17 = ON (Display)

This option will display octave and note values in the lower right corner of the screen. The displayed notes correspond to the closest note in the chromatic scale. Up to three notes are displayed at a time depending upon what SID oscillators are activated and upon the interval and octave settings. Notes are displayed with sharps only.

18 = OFF (Display)

This has the effect of negating option 17 above. Fastest response time is achieved when the display is off (Option 18), the output mode is continuous (Option 15), and the integration time is short (Option 12).

19 = END

This will terminate the Voice Harp program and return you to the Voice Master Menu.