ATARI® PROGRAM exchange

SOUND EDITOR

by
Bob Smith

USER INSTRUCTIONS
(5/01/81)

USER-WRITTEN SOFTWARE FOR ATARI PERSONAL COMPUTER SYSTEMS

(APX-10018)
(APX-20018)

SOUND EDITOR

by

Robert G. Smith

USER INSTRUCTIONS

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INTRODUCTION

OVERVIEW

Clang! Clang! Cro-o-o-o-ak! Beep! Beep!
Rattle, rattle, rattle. VRRRooooooom!

SOUND EDITOR lets you take advantage of the ATARI computer's sound generation capabilities. This is a joystick-driven, graphical program for creating and modifying short sounds. It's not appropriate for developing tunes, jingles, or sounds lasting longer than one second.

SOUND EDITOR uses a graphical approach. It divides a one-second sound into two voices. These voices correspond to two of the four sound channels in the SOUND command of ATARI BASIC. Working with one voice at a time, you specify three parameters, which correspond to the three other variables of the SOUND command: volume, frequency (corresponding to SOUND's "pitch"), and distortion. For each parameter, SOUND EDITOR displays a box containing 20 discrete dots. Each dot represents .05 seconds of your sound. You use a joystick controller to position the value for each .05-second segment. Your positioned dots form a visual plot of the parameter.

You can play your new sound at any time and then modify it. You can also store your sounds on cassette or diskette and recall them later. In addition, you can merge a stored voice with a RAM-resident voice.

Creating these sounds is fun and instructive in itself. But, to make SOUND EDITOR even more useful, we've included in these user instructions a program that lets you incorporate your creations into your BASIC programs.

These user instructions and SOUND EDITOR's plot parameters assume familiarity with the SOUND command and with the hardware aspects of producing sounds on ATARI Personal Computers. See pages 57 - 58 of the BASIC REFERENCE MANUAL, 1980 (Part No. CO15307 REV. 1) for an explanation of the SOUND command. See the ATARI Personal Computer Systems Hardware Manual, 1980 (Part No. CO16555) for disucssions of the POKEY chip (pp. II.23 - II.25) and AUDIO (pp. III.12 - III.14).

REQUIRED ACCESSORIES

16K RAM for cassette version
24K RAM for ATARI 810 diskette version
ATARI BASIC Language Cartridge
ATARI 410 Program Recorder for cassette
ATARI 810 Disk Drive for diskette
ATARI Joystick Controller

PROPERTY OF
TRI-COUNTY ATARI
USER'S CLUB

GETTING STARTED

SETTING UP

1. Insert the ATARI BASIC Language Cartridge in the (Left Cartridge) slot of your computer.

2. Plug your joystick controller into the first controller jack on your computer console.

3. If you have the cassette version of SOUND EDITOR:

   a. Insert the SOUND EDITOR cassette in the program recorder, press REWIND, and then press PLAY.

   b. Type CLOAD and press RETURN twice.

   c. After the cassette loads into RAM, you'll see the READY prompt. Type RUN and press RETURN.

If you have the diskette version of SOUND EDITOR:

   a. Turn on your disk drive and insert the SOUND EDITOR diskette.

   b. Power up your computer and turn on your video screen.

   c. At the READY prompt, type RUN "D:NOISY" and press the RETURN key. If you're using more than one disk drive, remember to follow the device initial (D) with the number of the drive containing the diskette (e.g., RUN "D2:NOISY" for disk drive two). The program will load into RAM and start.

THE FIRST DISPLAY SCREEN

The following information then displays:

```
          ATARI 800 NOISE CREATION
            COPYRIGHT 1981 ATARI

     This will allow 20 volume, frequency
   and control values to be written to 2
   audio channels during a one second
   'play'.  Sounds may be saved on disk.
   You must have a joystick in Jack 1
   (the left jack) to use this.

L -> Load and Save will do disk I/O;
S -> Merge allows single voice loads.
R -> Rotate changes parameter being
     altered.
V -> Voice chooses one of two voices.
P -> Play will play once; Continuous
     will play until stopped (C).
H -> Hex will update the hexadecimal
     tables of values to be written.
O -> Off will turn off all sound.


        --> press upon any key <--
```

Figure 1. First Display Screen

This display screen lists the eight, one-letter commands you use to perform various activities. These eight commands also display at the top of the three work screens (one screen for each parameter). To use these commands, type their first letter. For example, press P to play back your sound. Pressing the RETURN key isn't necessary (except when you respond to command prompts). Descriptions of these commands appear later in the COMMANDS section.

USING SOUND EDITOR

INTRODUCTION

You use your joystick controller to position dots within a control box to create and edit your sounds, and you type the one-letter commands to work with your sounds in various ways. You may mix joystick and letter commands as needed. You can create one-voice or two-voice sounds.

WORK SCREENS

SOUND EDITOR uses three work screens, one for each parameter. You do all work on these screens with your joystick controller. The work screen for the first parameter, FREQUENCY, looks roughly as follows ("#" represents the flashing cursor indicating your current position and "*" shows the initial default values you replace with your own):

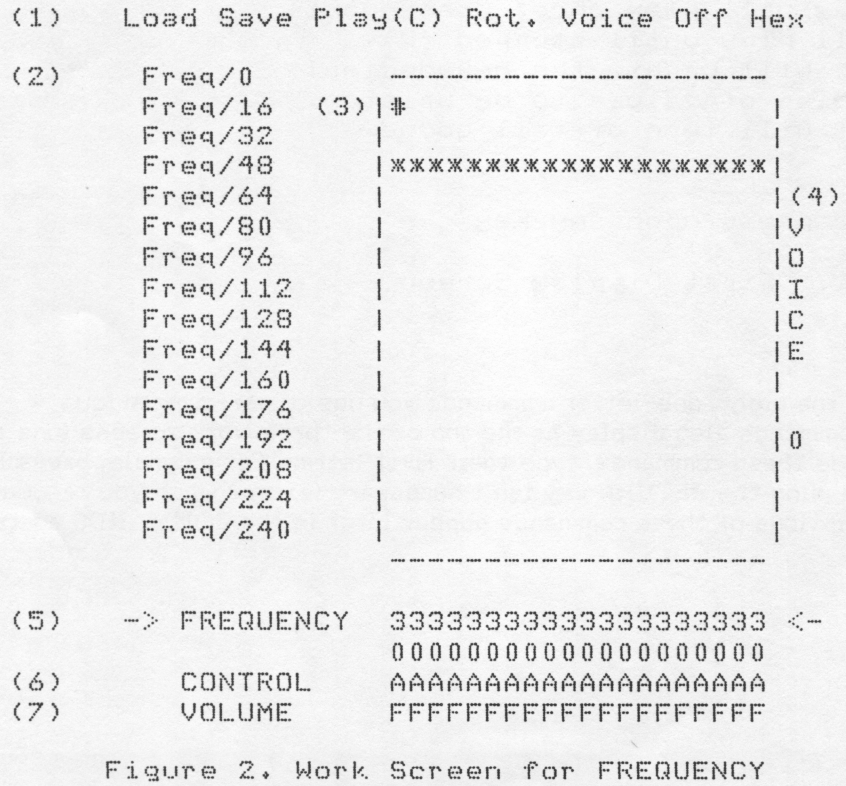

Figure 2. Work Screen for FREQUENCY

The first line (1) of the work screen lists the commands for quick recall. Whenever you use one of these commands, any prompts for user input associated with the activity will display in this line. (See the discussions in the COMMANDS section for command prompts.)

Along the left-hand side of the display screen--beginning at (2)--are the values you use to plot each parameter. Arrows point to the parameter currently displayed, in this case FREQUENCY (5). Therefore, these values are for the FREQUENCY work screen. Other parameter values display here for CONTROL and VOLUME work screens.

On the right-hand side of the display screen is the control box in which you plot your values for the parameter. The flashing cursor (3) always indicates your current position in the box. Each "dot" (*) represents one segment (1/20) of a one-second sound. Replace the initial default values by positioning the flashing cursor vertically above or below a segment so that it aligns with the desired value at the left and then pressing the red button. Continue in this manner for each segment. The current voice displays to the right of this box (4).

At the bottom of the screen are the three sound parameters (5 - 7) and their current hexadecimal values for each segment. (Use the Hex (H) command whenever you want to update this information.)

CREATING A SOUND

There is no predetermined order of steps by which you create a sound. One approach is as follows.

Working with one voice at a time, use your joystick controller to position your desired values for a parameter. Recall that the flashing cursor indicates your current position within the box, and arrows at the bottom of the display screen point to the parameter you're currently working with. (Note. SOUND EDITOR sets up initial default values for each of the three parameters, and you see the plot of these values. To create your sound, replace these values with your own.) Thus, for voice 0, first you plot the 20 dots for FREQUENCY by positioning the flashing cursor in the area of the box opposite the value you want to assign that segment and then pressing the red button. Continue in this way until you have all 20 segments plotted for frequency.

To try out your sound at any point, press P for a single playback or C for continuous playback (press O, or move your joystick, or press the red button on your joystick to stop the playback). (Note. SOUND EDITOR plays both voices by default whenever you use the P or C command. To turn off one voice temporarily, plot the VOLUME segments to 0 for the voice you want to eliminate.)

When you're ready to work on the next parameter, type R to rotate to the distortion (labeled CONTROL) work screen. You then position these 20 dots in the same way. When you play back your sound, you'll now hear both your distortion values and your frequency values. (Your sound will still use the default volume values until you plot your own.) Thus, you always hear the cumulative effect of your sound when you play it back. Next, rotate the display screen to VOLUME and plot these 20 segments.

When you're ready to turn to the second voice, type V. You'll see the VOICE 1 display for the same work screen as you last worked on. Repeat the same sequence to plot the three parameters for your second voice.

Another approach to creating a two-voice sound might be to plot one parameter at a time for the two voices. Once you're satisfied with the combination, you then go on to the next parameter.

MERGING A SAVED VOICE WITH A VOICE IN MEMORY

Suppose you want to combine a voice you've just created and have in memory, with a voice you have saved on tape or disk. To combine these voices, use the Load command. This command lets you assign each voice a different number at the time you merge them. This feature gets around the problem of your having assigned the same voice number to the RAM-resident voice and the saved voice. When you type L, a prompt asks you whether you want to merge a RAM-resident voice with a saved voice or erase your RAM-resident sound and load a saved sound.

To merge voices to form new sounds, you'll need to keep track of the file names or tape locations of your sounds. A short description of each voice for a sound will also help you with future mergers. See the discussion under the LOAD command for more information.

COMMANDS

Following is a summary of the function of each command, together with its prompts. Remember to press the RETURN key after answering prompts.

LOAD (L)

Use this command to load sounds you've saved on diskette or cassette. When you type L, the command line prompts:

```
LOAD- Dev:Filen :?
```

Respond by specifying the device on which you stored your sound (also specify the name of your file if you stored your sound on disk). For example, type C: if you're loading from cassette, making sure your tape counter is set to the location at which you recorded your sound. If you stored your file on diskette, enter both the device code (and number if you're using other than disk drive one) and the file name (e.g., D2:WEIRD to load a file named WEIRD from disk drive two).

The command line then prompts:

```
Type an 'M' to merge voices
```

You have two choices: (1) you can erase both your RAM-resident voices and load in another sound, or (2) you can merge a voice saved as part of a sound on cassette or diskette with one of your RAM-resident voices. To erase and replace your RAM-resident sound, respond to this prompt by typing any letter except M. SOUND EDITOR will replace your RAM-resident sound (both voices) with your specified sound from cassette or diskette. To merge a saved voice with a RAM-resident voice, type M. You then see the prompt:

```
Enter Source Voice # :?
```

Enter the number of the voice (0 or 1) you want SOUND EDITOR to load in. For example, to load VOICE 0, type 0. Finally, you'll see the prompt:

```
Enter Destination Voice # ?
```

Enter the number (0 or 1) you want SOUND EDITOR to assign to the voice it loads. Thus, if you want SOUND EDITOR to assign your VOICE 0 as VOICE 1 in RAM, then type 1. SOUND EDITOR erases your current VOICE 1 and loads in your specified voice as the new VOICE 1. You now have a new sound!

SAVE (S)

Use this command to save a sound you've created. SOUND EDITOR automatically saves both voices. Keep a record of which voice contains which parts of your sound for future reference. When you type S, you see the prompt:

```
SAVE- Dev:Filen :?
```

If you change your mind, press RETURN to cancel the command. Otherwise, enter your device code (and file name for a sound saved on diskette) the same way you specify a file to

load it. (If you save your sound on tape, remember to cue the tape to the proper location and to press the PLAY and RECORD buttons.)

PLAY (P)

Use this command to play back your sound one time. SOUND EDITOR plays both voices simultaneously, using default values for any parameters you haven't set yet.

CONTINUOUS (C)

Use this command to play back your sound repeatedly, until you press O or move your joystick.

ROTATE (R)

Use this command to rotate the work screen until it displays your desired parameter. When you first enter SOUND EDITOR, the first work screen to display is FREQUENCY. Enter R to rotate to the CONTROL work screen, and type R again to rotate to the VOLUME work screen. Enter R another time to rotate back to the FREQUENCY work screen, and so on.

VOICE (V)

Use this command to change voices. If you're currently working with VOICE 0, typing V causes SOUND EDITOR to display the same work screen for VOICE 1. If you're currently working with VOICE 1, typing V causes SOUND EDITOR to display the same work screen for VOICE 0.

OFF (O)

If the final segment of VOLUME is not zero, then your sound will not stop automatically. Use this command to turn off all sound that SOUND EDITOR is currently generating.

HEX (H)

Use this command to update the hexidecimal display at the bottom of a work screen so that this information reflects the current values you've positioned in the control box. The hex display gives you a numerical equivalent of your voice parameter segments should you need this information for programming purposes. With this command you can avoid time-consuming calculations for what might be a transitory value.

INCORPORATING SOUNDS INTO PROGRAMS

Here are two programs for incorporating the sounds you create into your BASIC programs. Both programs do the same thing, but they do it differently. Program I uses the SOUND command and thus is much easier to understand. However, it uses more memory because it needs an extra array. Program II uses POKES, which eliminate an array, but makes it harder to understand.

Use these programs by incorporating them into your BASIC programs as subroutines. Both programs load from whatever file you specify (or they load from tape if you so specify) in line 20: OPEN #1,4,0,"D:filename" for diskette or OPEN #1,4,0,"C:" for cassette. The first portion of the program (lines 20-65) load the control arrays; place these lines anywhere prior to calling the sound. Lines 20 - 65 contain the sound play subroutine; owing to BASIC's method for finding subroutines and FOR/NEXT loops, it's best to place these lines as close to the beginning of your program as possible. (That is, if your subroutine is buried deep in your program, it may change your sound's timing somewhat).

PROGRAM I

```
5 REM **THIS PROGRAM ALLOWS YOU TO **
6 REM **USE SOUNDS CREATED WITH THE**
7 REM **SOUND EDITOR IN YOUR BASIC **
8 REM **          PROGRAMS          **
9 REM **      **LOAD SOUND**        **
10 DIM FREQ(4),CTROL(40),VOL(40)
15 FOR I=1 TO 40:FREQ(I)=0:CTROL(I)=0:VOL(I)=0:NEXT I
20 OPEN #1,4,0,"D:filename" -- or OPEN #1,4,0,"C:"
25 FOR I=1 TO 40
30 GET #1,X:FREQ(I)=X
40 GET #1,X:CTROL(I)=X
50 GET #1,Y:VOL(I)=Y
60 NEXT I
65 CLOSE #1
69 REM ***PLAY SOUND***
70 FOR J=1 TO 20
80 SOUND 0,FREQ(J),CTROL(J),VOL(L)
85 SOUND 1,FREQ(J+20),CTROL(J+20),VOL(J+20)
90 NEXT J
100 GOTO 70
110 END
```

PROGRAM II

```
5 REM **THIS PROGRAM ALLOWS YOU TO **
6 REM **USE SOUNDS CREATED WITH THE**
7 REM **SOUND EDITOR IN YOUR BASIC **
8 REM **        PROGRAMS            **
9 REM **     **LOAD SOUND**         **
10 DIM FREQ(40),PLAY(40)
15 FOR I=1 TO 40:FREQ(I)=0:PLAY(I)=0:NEXT I
20 OPEN #1,4,0,"D:filename" -- or OPEN #1,4,0,"C:"
25 FOR I=1 TO 40
30 GET #1,X:FREQ(I)=X
40 GET #1,X
50 GET #1,Y
55 PLAY(I)=Y+X*6
60 NEXT I
65 CLOSE #1
69 REM ***PLAY SOUND***
70 FOR J=1 TO 20
80 POKE 53760,FREQ(J):POKE 53761,PLAY(J)
85 POKE 53762,FREQ(J+20):POKE 53763,PLAY(J+20)
90 NEXT J
100 GOTO 70
110 END
```

TROUBLESHOOTING

PROGRAM OPERATION WARNINGS AND LIMITATIONS

The flashing cursor must be present in the control box before you can enter a command or change a segment value. Sometimes SOUND EDITOR takes several seconds to execute a command and replace the cursor.

If SOUND EDITOR refuses to accept your commands even though the flashing cursor is present in the control box and your joystick control works fine, you might have accidentally pressed the CAPS/LOWER key and are in lowercase mode. Press CAPS/LOWER while holding down the SHIFT key to reset to uppercase mode.

To obtain the best results from SOUND EDITOR requires some patience. It isn't easy at first to translate the graphical representation of the sound or the hexidecimal notation. After some practice and experimentation, however, you'll start noticing a correlation between the hex notation and the work screen. Then you're on your way to mastering the sound capabilities of the ATARI computer via SOUND EDITOR!

ADVANCED TECHNICAL INFORMATION

You might want to expand SOUND EDITOR to support all four voices (sound channels). It will run more slowly if you do and it will take some programming work, but an intermediate programmer should be able to write the code. To play all four channels at once, you'll need to POKE the array values into locations 53764 - 53767 in the same way as in lines 710 - 720 of the SOUND EDITOR program. You'll also need to change the control functions to account for the additional input. And third, you'll need to change the BASIC subroutines to accept four voices as follows: (1) double the length of the arrays, (2) OPEN another file to handle the input from the new voices, (3) append this input to the end of the existing arrays or DIMension new ones, and (4) change the output routine to play the extra elements.

ATARI PROGRAM EXCHANGE

REVIEW FORM

We're interested in your experiences with APX programs and documentation, both favorable and unfavorable. Many software authors are willing and eager to improve their programs if they know what users want. And, of course, we want to know about any bugs that slipped by us, so that the software author can fix them. We also want to know whether our documentation is meeting your needs. You are our best source for suggesting improvements! Please help by taking a moment to fill in this review sheet. Fold the sheet in thirds and seal it so that the address on the bottom of the back becomes the envelope front.

1. Name and APX number of program _____

2. If you have problems using the program, please describe them here.

_____

_____

_____

3. What do you especially like about this program?

_____

_____

_____

4. What do you think the program's weaknesses are?

_____

_____

_____

5. How can the catalog description be more accurate and/or comprehensive?

_____

_____

6. On a scale of 1 to 10, 1 being "poor" and 10 being "excellent", please rate the following aspects of this program:

_____ Easy to use
_____ User-oriented (e.g., menus, prompts, clear language)
_____ Enjoyable
_____ Self-instructive
_____ Useful (for non-game software)
_____ Imaginative graphics and sound

7. Describe any technical errors you found in the user instructions (please give page numbers)

_____

_____

_____

8. What did you especially like about the user instructions?

_____

_____

_____

9. What revisions or additions would improve these instructions?

_____

_____

_____

10. On a scale of 1 to 10, 1 representing "poor" and 10 representing "excellent", how would you rate the documentation and why?

_____

_____

11. Other comments about the software or the user instructions:

_____

_____

_____

_____

_____

_____

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|     |
|STAMP|
|     |
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