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# **SoundX (with DazzleDemo1)**

## **Game Program Instructions**

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Cartridge construction by Hozer Video Games, 1994

## 1.0 Introduction

SoundX is a game program cartridge for the Atari 2600 Video Computer System that lets you take control of the sounds inside your game console! You use both joystick controllers to change the sounds in real time.

## 2.0 The sound capabilities of the Atari 2600

One of the most important components of the Atari 2600 game console is a computer chip called the Television Interface Adapter (TIA for short.) Sometimes it is also called the "Stella" chip. The features and peculiarities of the TIA chip are what truly gives the Atari 2600 it's unique personality.

Along with the television picture, sound is generated within the TIA chip. There are two independent sound generators in the TIA. Each sound generator has three parameters that define how the tones will sound.

**TYPE** - This parameter defines the overall nature of the sound. Some values produce a low growling noise, while other values produce a flute-like noise, and other sounds in between. Some values produce "noise" that cannot actually be heard, and some values produce the same noises as other values. The range of possible values is from 0 through 15.

00 ....	Inaudible	06 ....	Bass	12 ....	Obo
01 ....	Buzz	07 ....	Buzzer	13 ....	Obo
02 ....	Motor	08 ....	Rocket	14 ....	Motorcycle
03 ....	Flying Saucer	09 ....	Buzzer	15 ....	Car
04 ....	Whistle	10 ....	Muted Hum		
05 ....	Whistle	11 ....	Inaudible		

**PITCH** - This parameter defines how high or low the noise will be. Smaller values produce high notes, larger values produce low notes. The range of possible values is from 0 through 31. It may seem strange that higher values produce lower tones, but this parameter is really used to divide a basic frequency of 30KHz. For example,  $30000\text{Hz}/2=15000\text{Hz}$  and  $30000\text{Hz}/3=10000\text{Hz}$  which means that the larger numbers produce lower tones.

**VOLUME** - This parameter defines how loud a noise will play. Smaller values make the noise softer, and larger values make the noise louder. The range of possible values is from 0 through 15.

### 3.0 Using the controllers and console switches.

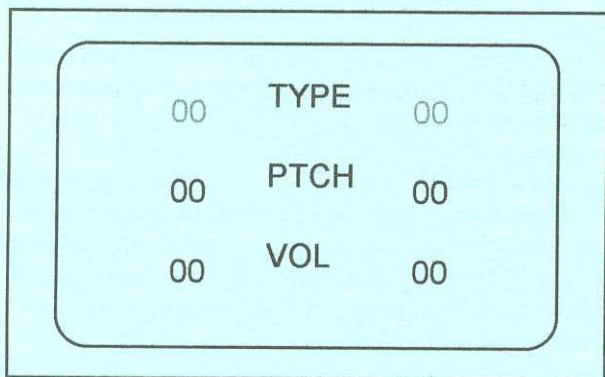


Figure 1 - The SoundX Screen

Make sure your Atari 2600 Video Computer System console is hooked up and plugged in according to the manufacturer's directions. Insert the SoundX game program cartridge into your console as you would any other Atari 2600 game. Be sure that the power on the console is OFF before removing or inserting any game program cartridge, or you may damage your console and/or cartridge. Once the cartridge has been inserted, turn the console power on. If the SoundX screen (shown above) fails to come up, turn the power off, check all your connections, and try again. If it still fails, try another cartridge to make sure that all the console wires are correct.

**Joysticks** - Use the left joystick to control the sound parameters in the left column, and the right joystick to control the sound parameters in the right column.

Notice that in each column, one of the numbers is brighter than the others. This is the value that is "selected". To select the number below the current one, press down on the joystick. To select the number above the current one, press up on the joystick. This selection process "wraps around". For example, if the bottom number is selected, and you press down, the top number will now be selected.

Once the parameter you want to change has been selected, pressing right on the joystick will increase the value by one, and pressing left on the joystick will decrease the value by one. The values will wrap around. For example, if TYPE is currently 15, and you press right, it will change to 00.

The button toggles the sound on/off. When the numbers in a column are blue, the sound for that channel will not be played, even if the volume is set to maximum. Pressing the button will cause the numbers in that column to turn

gold, and the sound will play (assuming an audible TYPE has been selected, with a VOL greater than 00). Pressing the button again will cause the numbers to go back to blue, and the sound will turn off.

Both channels are completely independent, and can be turned on/off at any time. If a sound is playing while you change one of the parameters, the change will take effect immediately.

**Left Difficulty** - When this switch is in the "B" position, the joysticks operate in a "one shot" mode. For example, in order to increase a value by more than one, you will need to press the joystick right, release it, and press it right again. When this switch is in the "A" position, the joysticks operate in a "continuous" mode. For example, holding the joystick right will cause the currently selected value increase very quickly.

**Right Difficulty** - When the left difficulty switch is in "A", this switch controls how fast the values may change. When this switch is in the "B" position, the values change slowly. When it is in the "A" position, the values change very rapidly.

**Game Reset** - Pressing this switch will cause all the parameters to be reset to 00, which is a quick way to quiet things down in a hurry!

**Game Select** - Pressing this switch changes the SoundX display to a dazzling display of colors. In the center of the screen will be displayed the serial number of your game program cartridge.

The Color/B&W switch is not used for this game program.

#### **4.0 Notes from the Designer:**

Remember, sound TYPE of 00 is inaudible, so to make a noise, you need to change at least the TYPE and VOL parameters, and well as press the button on the joystick.

Putting both difficulty switches on "A" and decreasing the PTCH value by holding the joystick right with the sound on can sound like a laser!

Putting both difficulty switches on "A" and decreasing the VOL by holding the joystick left with the sound on can sound like a bell!

Something interesting to try, if you are technically minded, and have the equipment: Hook up the audio output of your television to an oscilloscope, and see the wave forms that each of the different TYPEs of sounds makes. See the exact frequencies that each PTCH produces. If you come up with a complete map, drop me a line, I'd love to hear from you!

Ed Federmeyer