PSG TINKERER

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PSG TINKERER is a utility software program that runs on the Intellivision. It allows you to experiment with all of the features of the Intellivision's sound chip. I built this program in the process of teaching myself Intellivision programming. I wanted a way to freely sample all of the sound chip's abilities without having to go through a lot of trial-and-error programming. I have tried to make this program easy to use for anyone who is interested in the Intellivision's sound capabilities. However, it is not perfect nor comprehensive. I make no guarantees about this program, and am not responsible if it ruins your project, hardware, or life.

To actually program the Intellivision's PSG, please refer to the documentation in Joe Zbiciak's development kit. You will probably find his "gimini.asm" library file useful for this.

Getting started:

You will see all of the modifiable PSG register values laid out on the screen. Each value is mapped to one of the keypad buttons on the left or right controllers. Accompanying each value is notation describing which button controls that value. For example, "R7" means the 7 button on the right controller.

When you first start up PSG TINKERER, all of the sound channels are disabled – so you will not hear anything. On the left keypad, press 4, then 5, then 6 to enable tones in channels A, B, and C. You will then hear an intermittent set of tones playing from your Intellivision. From there, you can start toggling the various values by pressing the keypad buttons. The + and – values at the bottom do not modify the PSG registers, but instead control the amount of time that the tones are playing and paused.

Some notes:

The range of values for each of the settings is:
Tone Period: $0000 - $0FFF (Low values mean higher pitches.)
Tone Enable: $0000 or $0001 (0 = open, 1 = closed)
Noise Enable: $0000 or $0001 (0 = open, 1 = closed)
Envelope / Amplitude Select: $0000 - $0003 (0 = use amplitude, 3 = use envelope)
Amplitude: $0000 - $000F (Quiet to Loud)
Noise Period: $0000 - $001F (Low values mean higher/smoother noise.)
Envelope Characteristics: $0000 - $000F (several of these values do the same things)
Envelope Period: $0000 - $FFFF (Short to Long)

The range of values that you can toggle between is different for each channel's tone period. The values in channel A allow for better access to the lowest pitches available on the Intellivision. The values in channel C allow for better access to the highest pitches.

I have split the envelope period into two separate modifiable values. One value controls the high byte, and the other value controls the lower byte of the envelope period value. (So keep in mind that these two values are actually added together to make the envelope period value.) I built the program this way because of the very differing effects using low or high values has on this attribute. By setting the high part to zero, and the low part to very small values, you can effect the timbre of tones or noise being played. On the other hand, by raising the high byte of the value, you get noticeable envelope effects such as making a tone sound like the ding of a bell, or noise sounding like a gunshot.

CHANNEL A   CHANNEL B   CHANNEL C

TONE PERIOD →
TONE ENABLE →
NOISE ENABLE →
AMP / ENV MODE SELECT →
CHANNEL AMPLITUDE →

← NOISE PERIOD
← ENVELOPE CHARACTER
← ENVELOPE PERIOD (SEPERATE CONTROL VALUES FOR HIGH AND LOW PARTS OF WORD)

SOUND DURATION   PAUSE DURATION