**** VP SYNTH v1.7 ****

Software Written By: Johnny Jump
Release Date: 08/23/24
Platform: Commodore 64

Section I - Overview

VPS v1.7 uses a volume pedal or some other type of variable resistance device (like a game paddle) to move through notes of a selected musical scale. 15 scales can be scheduled into the player que and the selectable scale types are Chromatic, Major, Minor, Harmonic Minor, Pentatonic, Diminished, Augmented, Whole Tone, or one of 6 custom created scales. Each standard scale type can have one of 12 keys assigned and one of 6 octaves.

As of VPS v1.7, only the triangle wave type is supported. The 6581 SID synthesizer is capable of doing far more than this version of the software gets into. Future versions should add more features regarding tones.

Playing VPS can maybe be thought of as tempo asynchronous—meaning, there's no clock source to keep its played notes in time with say, a backing track or live drummer with a determined tempo. Practice, and trial and error should be applied to learn playing the synth reasonably in time. There is a variable called “Sponge” that can assist with playing more with tempo as well as “scale note skipping”. More on Sponge later...

Section II - Loading The Software

VPS loads into the C64 in two parts. Two files are required to load. They are vpengine.prg and vpsynth.prg. Vpengine.prg is a machine language written program and must be loaded first. Vpsynth.prg is a BASIC language program and loads right after.

OEM Method From Floppy:

LOAD”VPENGINE”,8,1 [Return]

NEW [Return]

LOAD”VPSYNTTH”,8 [Return]

RUN [Return]

SD2IEC Load Method:

LOAD”VPENGINE.PRG”,8,1

NEW [Return]

LOAD”VPSYNTTH.PRG”,8

RUN [Return]

SD2IEC w/ Epyx FastLoad Method (and my favorite):

$ [Return]

% ”VPENGINE.PRG” PRG

/ ”VPSYNTTH.PRG” PRG

RUN [Return]

Section III – The Player Schedule Editor

Usage instructions for the Commodore 64 program, VP SYNTH (VPS v1.7)

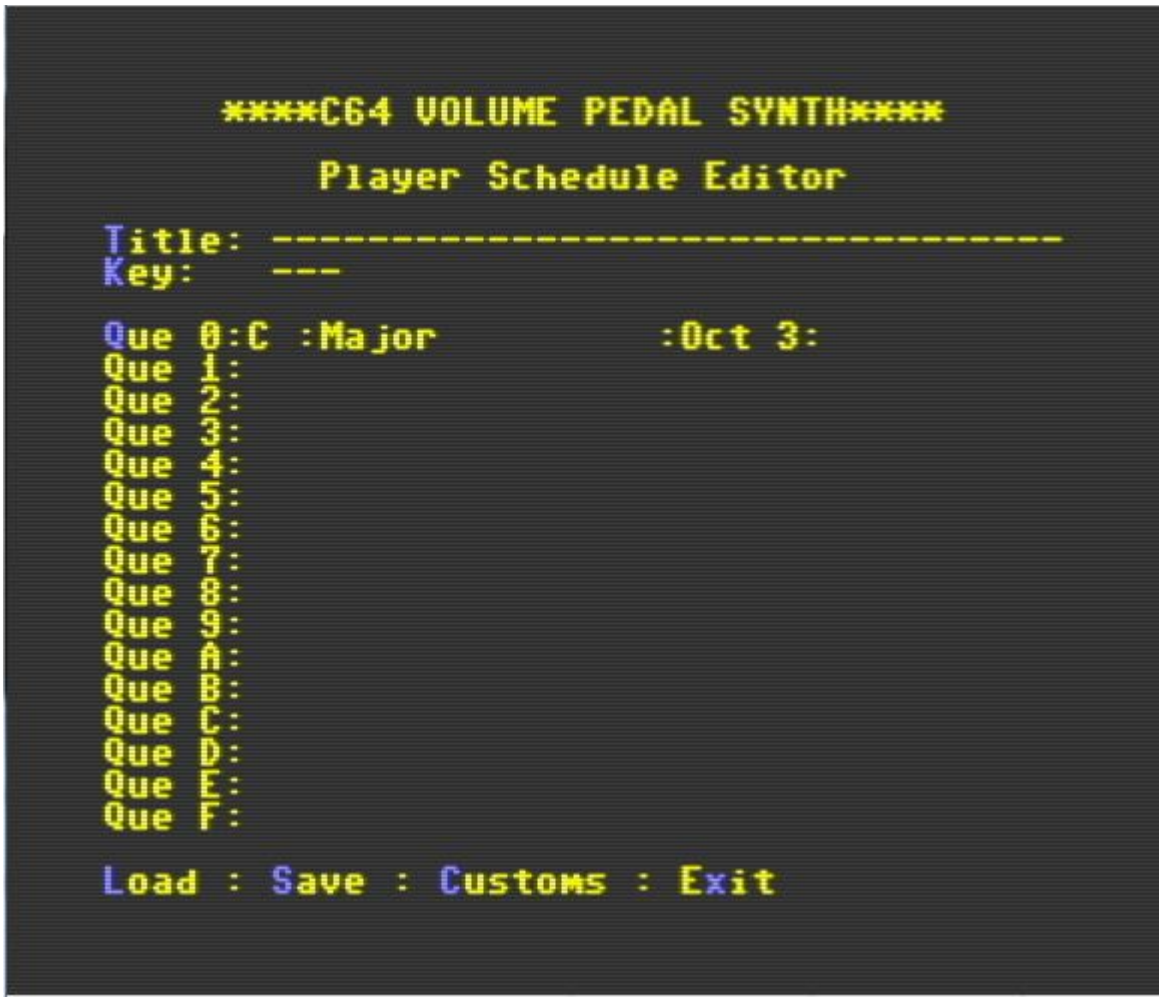

Fig. 3.1 Initial Screen (Scheduler Home Screen)

Fig 3.1 shows the screen at the launch of the program. This is the scheduler environment. From here, you can start adding scales to the player schedule. By default, Que 0 is populated with a C major scale using the 3rd octave. You can alter Que 0's scale settings to be anything in the scale/key/octave selectable range, but Que 0 cannot be deleted altogether like all subsequent ques can. To alter the settings of Que 0, press the letter 'Q', then select '0' as the target que, then RETURN.

Adding to, or Altering The Scale Schedule

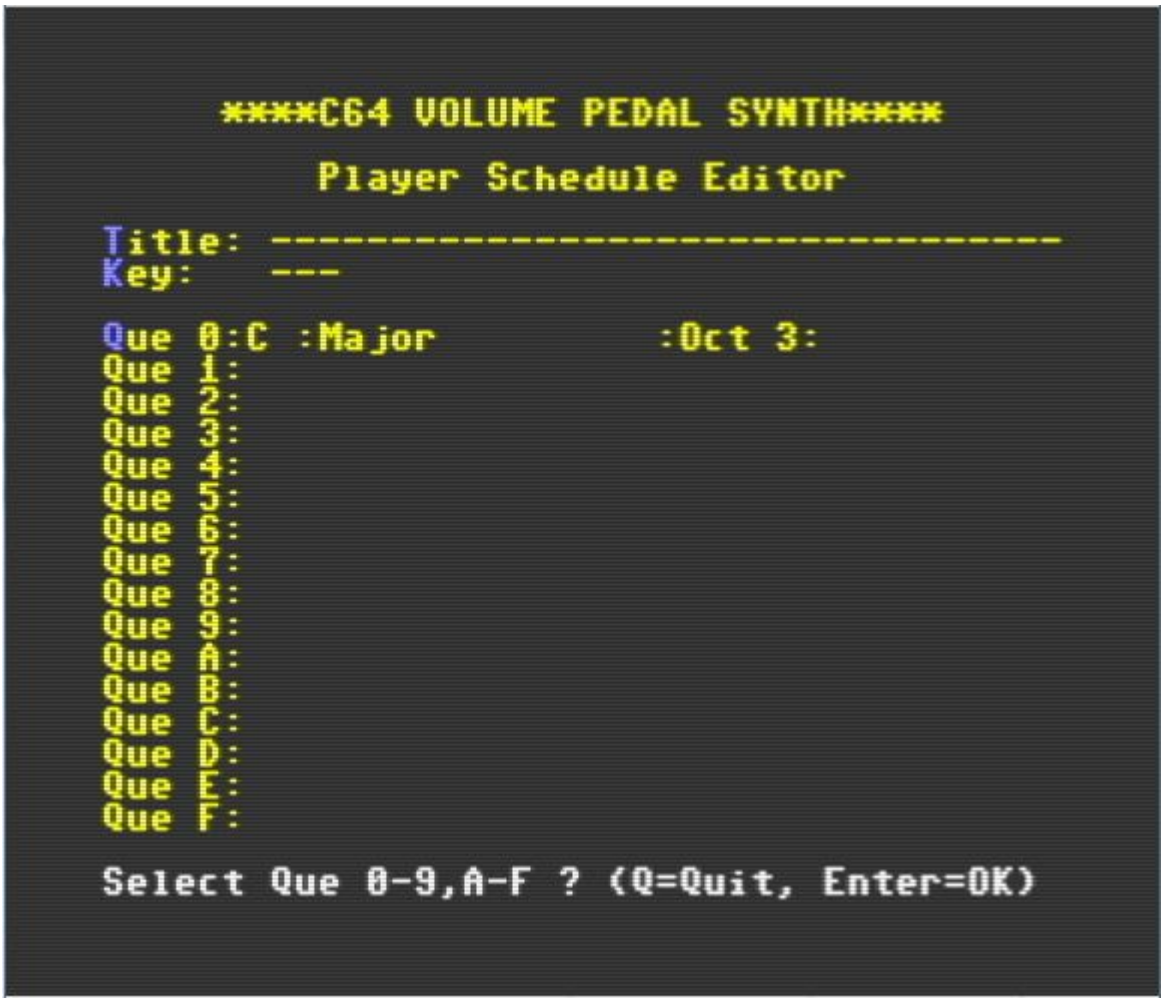

Fig. 3.2 – Prompting user for 0-9, A-F input.

Fig. 3.3 – Navigation hints at the bottom of the screen

Figure 3.3 shows the screen after Que 0 is selected. Navigation hints appear at the bottom of the screen indicating the arrow keys and Return key will make and save any modifications made. Pressing the 'S' key will allow the selected scale bound by its selected key and octave to be SAMPLED linearly start to finish at a hard-coded non-adjustable tempo. Right and Left arrows horizontally select the target field and become highlighted as white character(s). Up and Down arrows alter the targeted field. The RETURN key accepts any changes and returns the Que editor back to the 0-9,A-F selection point at Figure 3.2.

If an entry is added at this point, it MUST be to the next available empty Que. Skipping over empty ques to create higher ones is not allowed. Figure 4 shows a new entry on Que 1. The default key for a new entry is 'C', the default scale is Chromatic, and default octave is 0.

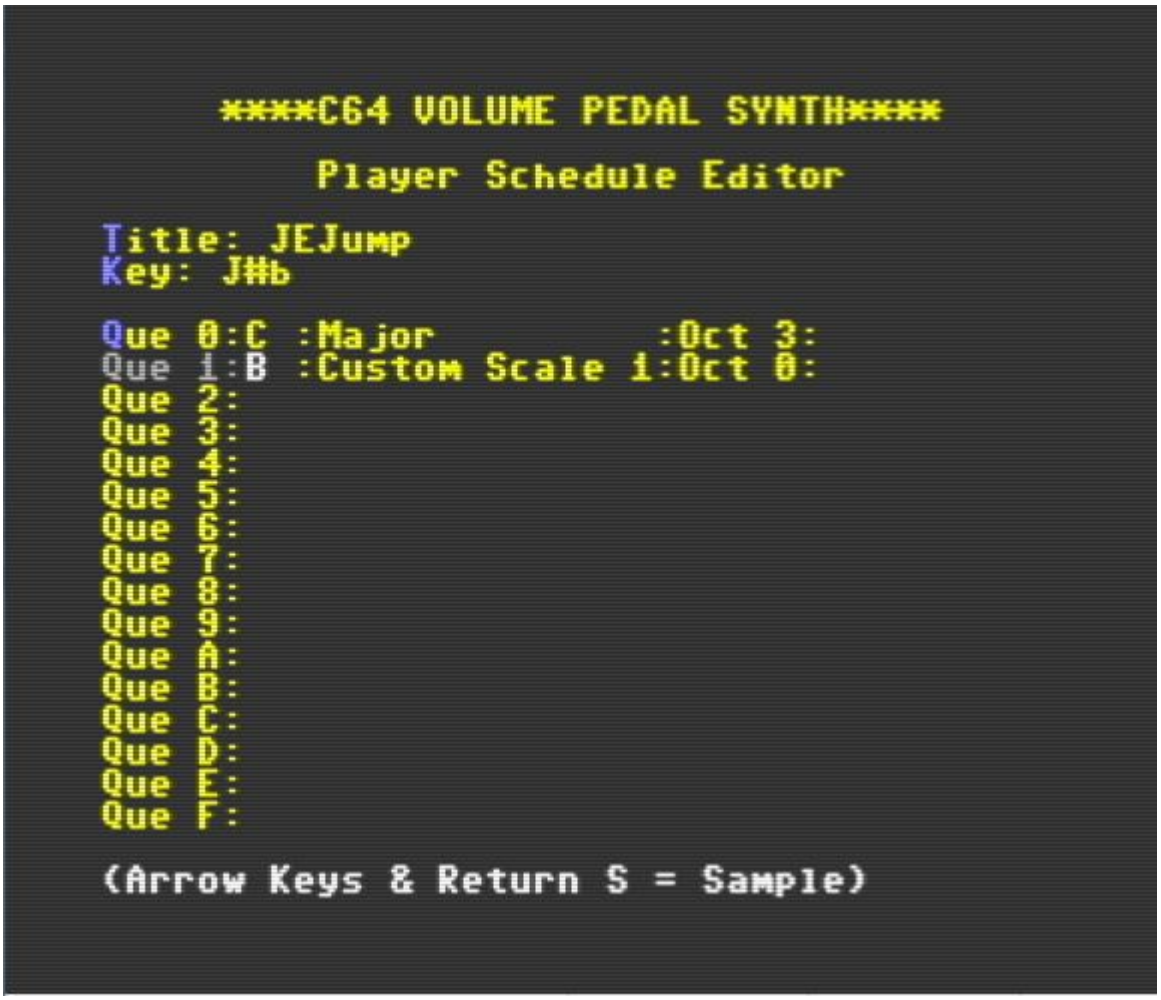

Fig. 3.4 – New entry on Que 1 with key and scale settings altered from the default values

Key/Octave Exception on Custom Scales

As of VPS v1.7, Custom Scales do not have key and octave assignments within the scheduler. Custom Scale notes with each note's chosen octave are handled in the Custom Scale editor. If a key and octave is specified in the scheduler for any custom scale instance, it is ignored by the software, but it is allowed to appear on the schedule and could serve as a useful visual reference for the user (i.e. a reminder for the chord the custom scale should be played over).

Deleting An Entry

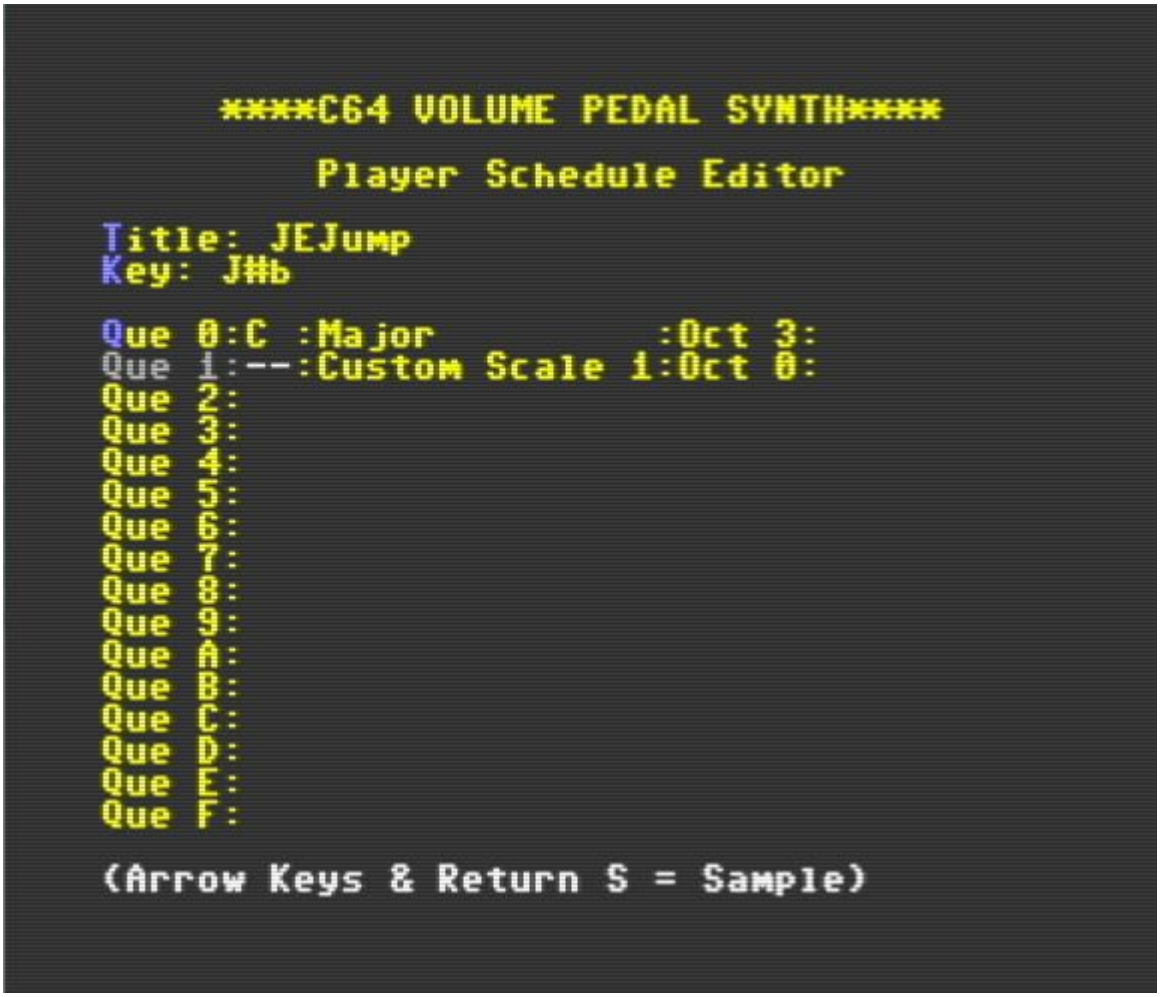

Fig. 3.5 – Deleting a schedule entry

Looking at Figure 3.5, notice the que Key field contains '- -'. This comes into view after choosing to edit Que n (n = 1 to F), and selecting down from the key of 'C' (the lowest key selection), BUT ONLY on the last used que. Pressing Return at this point will delete Que 1 from the schedule. Que 0 never shows '- -' as an option. Again, this is only shown as an option on the last used que, so if you're using Que 0 to Que 5, Ques 0 to 4 will not give the '- -' option until Que 5 is deleted. Then, Que 4 can be deleted, then Que 3, etc..

Referring back to Figure 3.1 (Scheduler Home Screen), there are additional user options:

T - Title the song (does not affect the song performance)
K - Give the song a Key (does not affect the song performance)
L - Load a saved song schedule from disk (must include '.prg' in file name if SD2IEC)
S - Save the current song schedule to disk (must include '.prg' in file name if SD2IEC)
C - Launch the Custom Scale editor.
X - Exit the Scheduler and start the Player

Section IV - The Custom Scales Editor

Fig. 4.1 – Custom Scales Editor Launched

Figure 4.1 shows the launch screen of the Custom Scale Editor. You can see here that 6 custom scales can be edited. The program is prompting the user for input. You may select a Custom to edit between 1 and 6, followed by the Return key. Pressing 'Q' at this point exits and returns to the Schedule Editor. Figure 4.2 shows the screen after Custom 1 is entered.

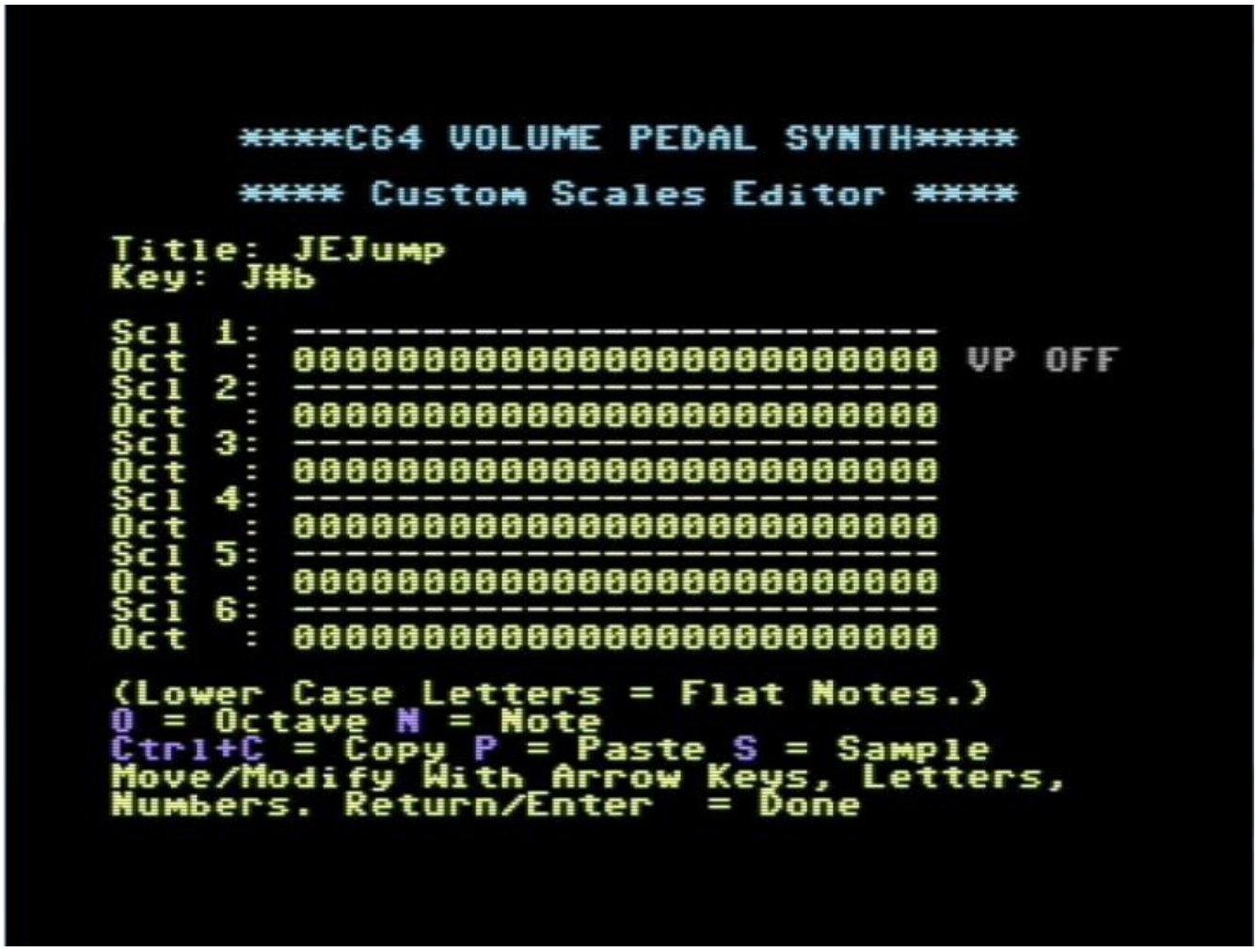

Fig. 4.2 – Custom 1 selected for editing and sampling.

Each scale is 25 notes in length, and each interval will support twelve notes ranging from C to B in semitones. Each note interval octave ranges from 0 to 7. Notice in the navigation hints at the bottom, the arrow keys move through the scale horizontally on the screen, but only if VP is OFF. 'S' determines the Sample source. Toggling the 'S' key switches between the VP device moving through the scale, or the left/right arrow keys moving through the scale. A note with its respective octave can easily be selected with VP OFF and positioning the cursor to the target horizontally, then pressing a letter A to G to place the note desired (or to get to the nearest natural note), up/down arrow keys move the selection +/- a semitone. Pressing number keys 0 to 7 will force the cursor down to the focused note's octave line setting. Lowercase letters indicate flat versions of the natural notes. Figure 4.3 illustrates this:

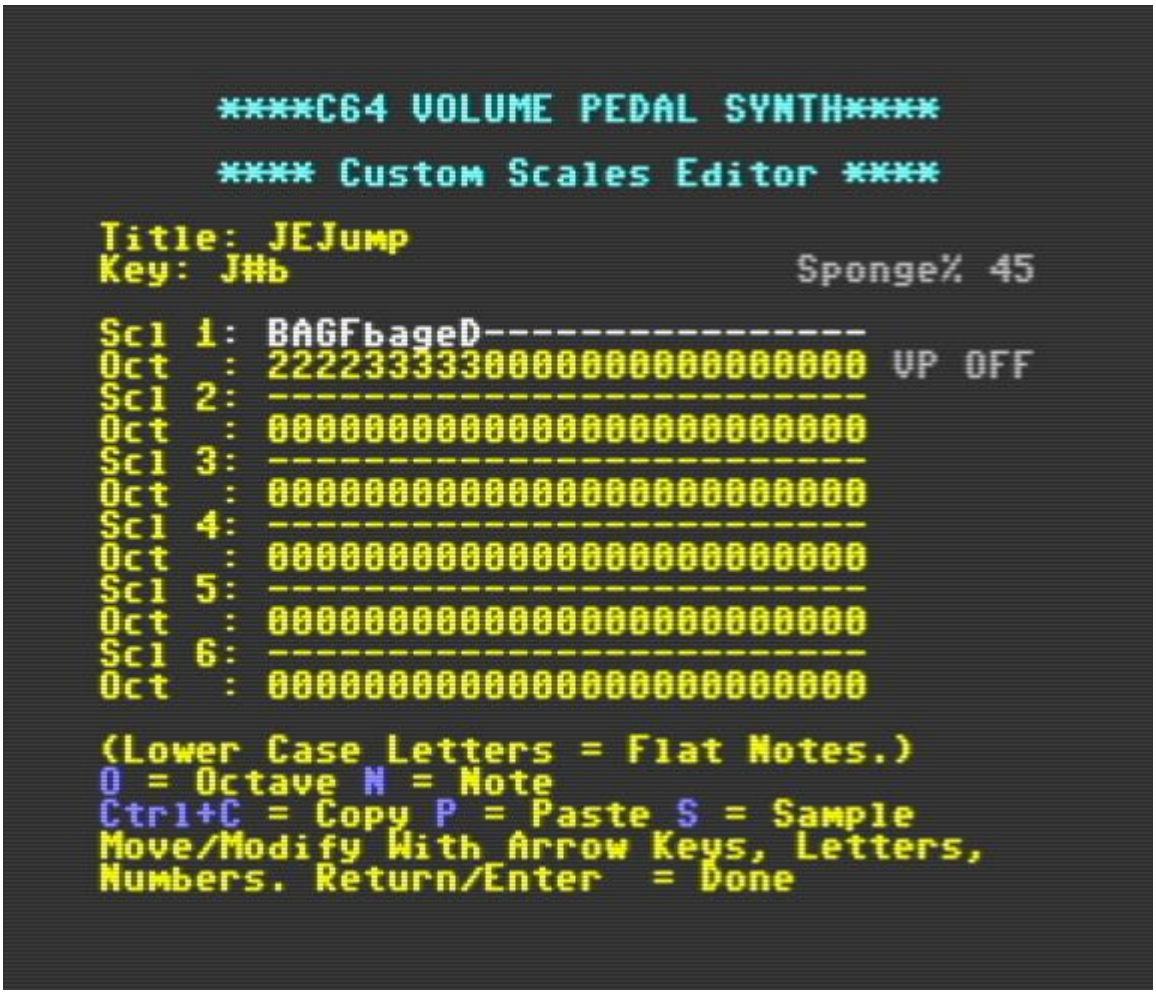

Fig. 4.3 – Scale 1 with nine notes added

Scale 1 begins with the natural notes B, A, G, and F--all at octave 2. Then, appear the following four flat notes Bb, Ab, Gb, and Eb--all at octave 3 and indicated by lowercase letters. With VP set to OFF, and when moving the arrow keys left/right through the scale of programmed notes, there will be a short audible burst produced of the landed note. If up/down arrow keys are pressed OR letters A through G are pressed, the note burst changes to reflect the new setting. This is also true of octave changes regarding up/down keys and number keys 0 to 7.

VP = nn (where nn = 0 to 25)

'S' key toggles the audio sampling source from a short tone burst produced from pressing various keys, to sustained note sampling done using the VP input. VP input gives a better perspective of how the scale will sound during play time, more so than playing the scale using left/right arrow key movement. When VP is not OFF, the value of the VP input is displayed to the right of VP. When the VP value displays 0, the audio is muted. Otherwise, VP values 1 to 25 play the scale intervals 1 to 25.

Figure 4.3 shows other Custom Editor hotkeys. They are:

'CTRL+C' = copy a single focused note and its octave
'P' = Paste the copied note/octave in focused point
'N' = Shift focus to the Scl line.
'O' = Shift focus to the Oct line.
'RETURN' = Accept scale changes and return to the selection point in figure 4.1.

Section V – Sponge Register

The Sponge variable is a program delay loop for wasting time. The higher the Sponge value, the more time is wasted. This is helpful for two reasons. First, if the Sponge% is set to 0 or nearby, you will hear every note that the VP passes through. This might be desirable at times and undesirable at other times. Bringing Sponge% to some value higher will play a targeted note, then go waste time for awhile instead of immediately sampling the VP input device again. It's during this "wasted time" that movement on the pedal isn't acknowledged and, with a high enough Sponge% value, the user can move the pedal farther than just to the next consecutive note and the in-between notes won't be heard. Trial and error and practice should be applied.

The second reason Sponge is helpful, is that it can aid in the timing of playing with a tempo of a backing track or other accompanying musicians. Again, practice is required. Play around with the controls.

Sponge%'s Controls

There are only two places to use Sponge%. One is here in the Custom Scale Editor and the other is during play time of the player schedule. Neither place has on screen hints for altering the Sponge% register, but control is the same in both places. This manual is the only place gain any clue on how to control Sponge% as of vpengine v1.7. Control is pretty simple:

' + ' key = increment Sponge% by +1
' - ' key = decrement Sponge% by – 1
'CTRL + ' keys = increment Sponge% by +10
'CTRL - ' key = decrement Sponge% by – 10

The Sponge% value can only be altered when VP is the active sampling source. As of v1.7, whatever value Sponge% is set for, will get applied to all scales in Custom Scale Editor and all ques in the schedule player. Perhaps in future versions, Sponge values can be unique to the individual scale in the schedule being played. That might be a nice feature. It should also be noted that Sponge%'s value gets saved as part of the saved song file. That's about all there is to know regarding Sponge%.

Section VI – The Schedule Player Screen

Once you're done with the Custom Scale Editor, press 'Q' to return to the Schedule Editor. Pressing 'X' from this point takes you out of the editing environment and starts the Schedule Player screen shown in figure 6.1.

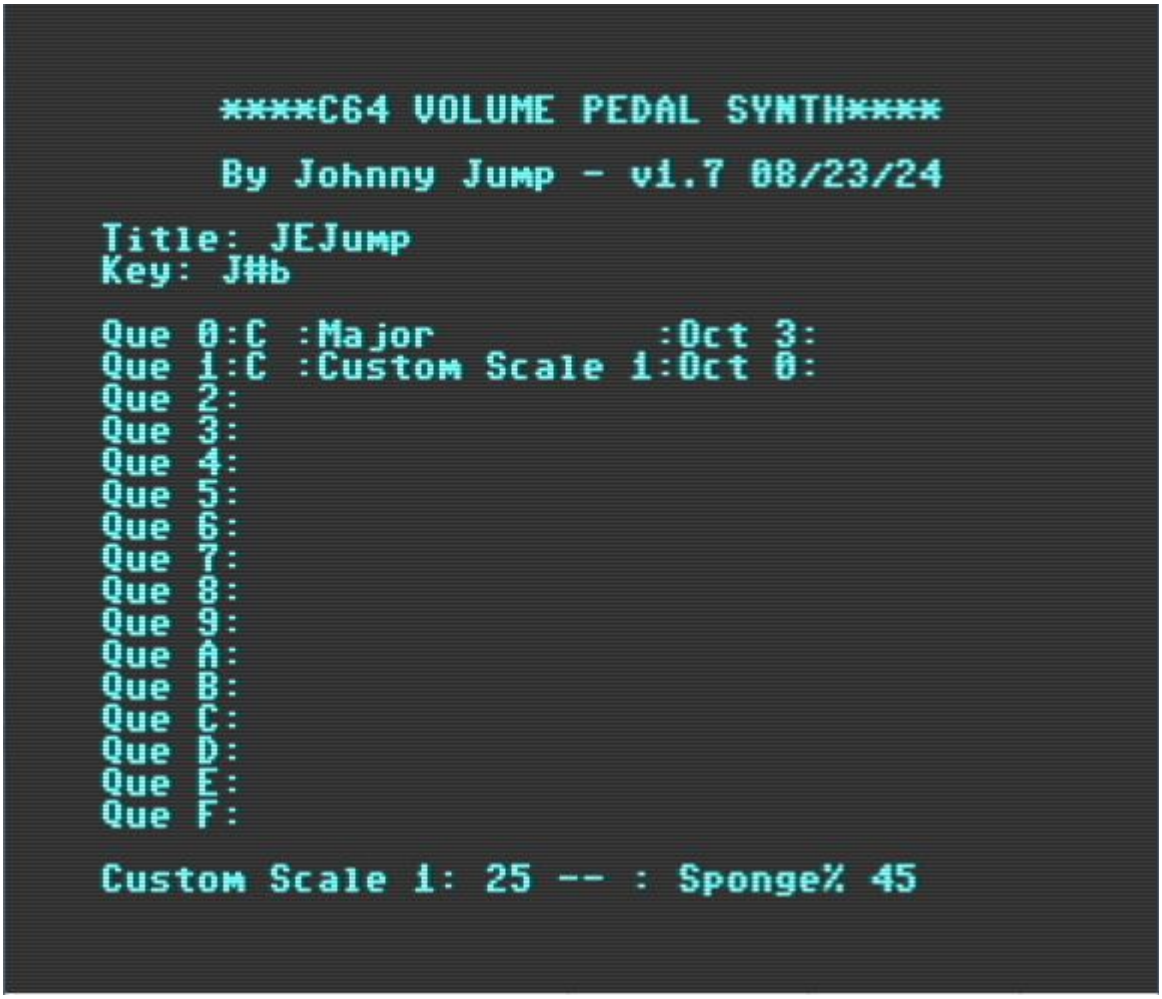

Fig. 6.1 – The Schedule Player Screen Launched

On the player screen, you see the all of the previously made scale selections. Pressing any number 0-9,A-F will move focus to the corresponding scale on the screen. Also, the software credits line changes to hotkey instructions for exiting the player shown in figure 6.2.

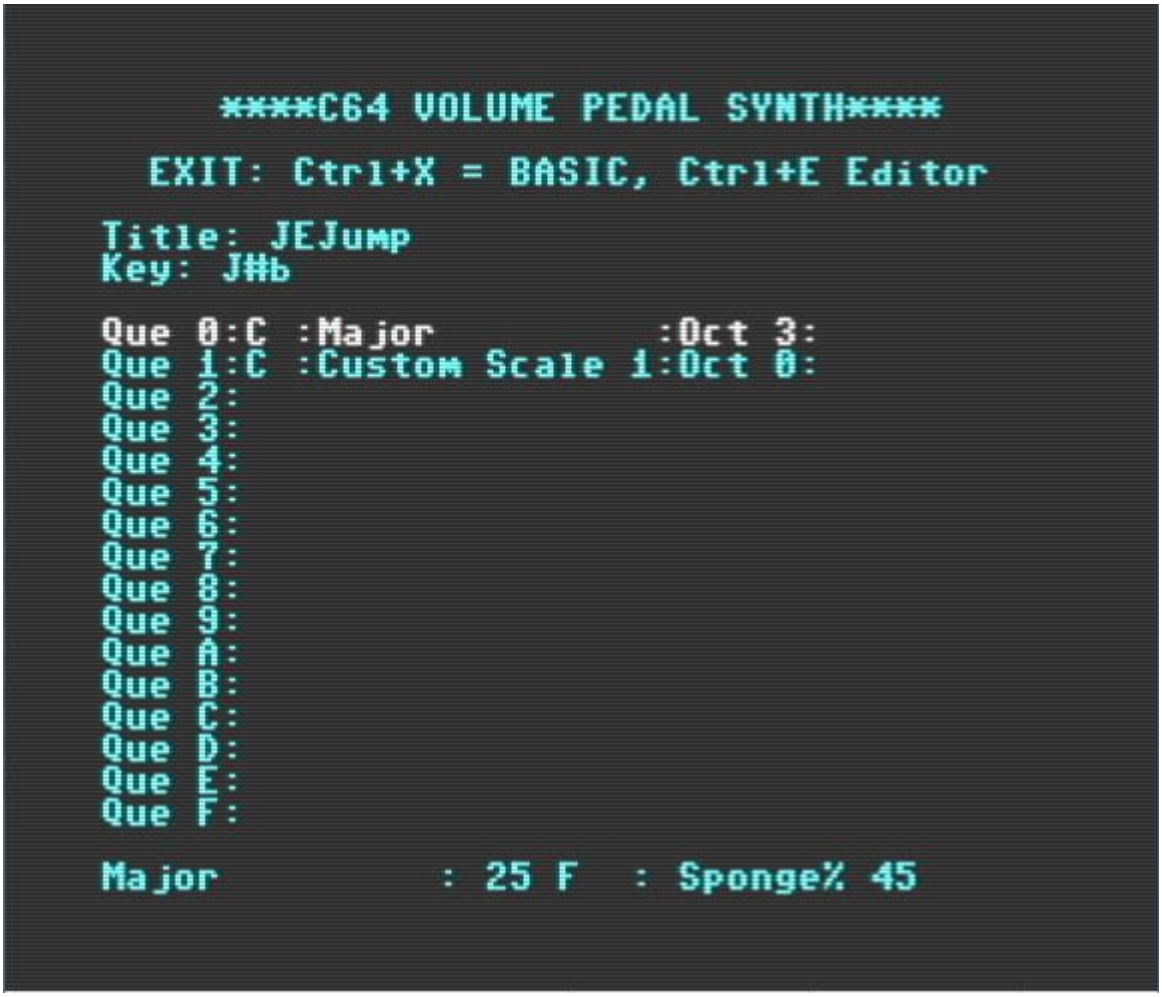

Fig. 6.2 – With exit instructions replacing the software credits line

In addition to 0 -- F direct selection of the schedule, the up/down arrow keys also move line focus +/- 1 line. When the last non-empty Que has focus and the down arrow key is pressed, focus then wraps around to the top at Que 0. Likewise, if Que 0 has focus and the up arrow key is pressed, focus wraps around to the last used Que. In v1.7, it is possible to select empty ques by direct letter/number entry, however, the player continues to work with the last valid Que chosen and only a visual indication on the empty Que line reflects that an empty line was selected.

Sponge% value can be changed here as well. See section V for details.

Actuating the VP device here will move through the focused scale. Its interval value and associated note is displayed in the middle of the bottom line (seen as : 25 F : in figure 6.2). When the interval is 0, '- -' is displayed as the interval note and the audio is muted.

To exit the player, 'CTRL+E' will put you back in the Schedule Editor environment. 'CTRL+X' will exit the software and return to the BASIC environment after a 'Y' confirmation response.

Appendix A – VP device

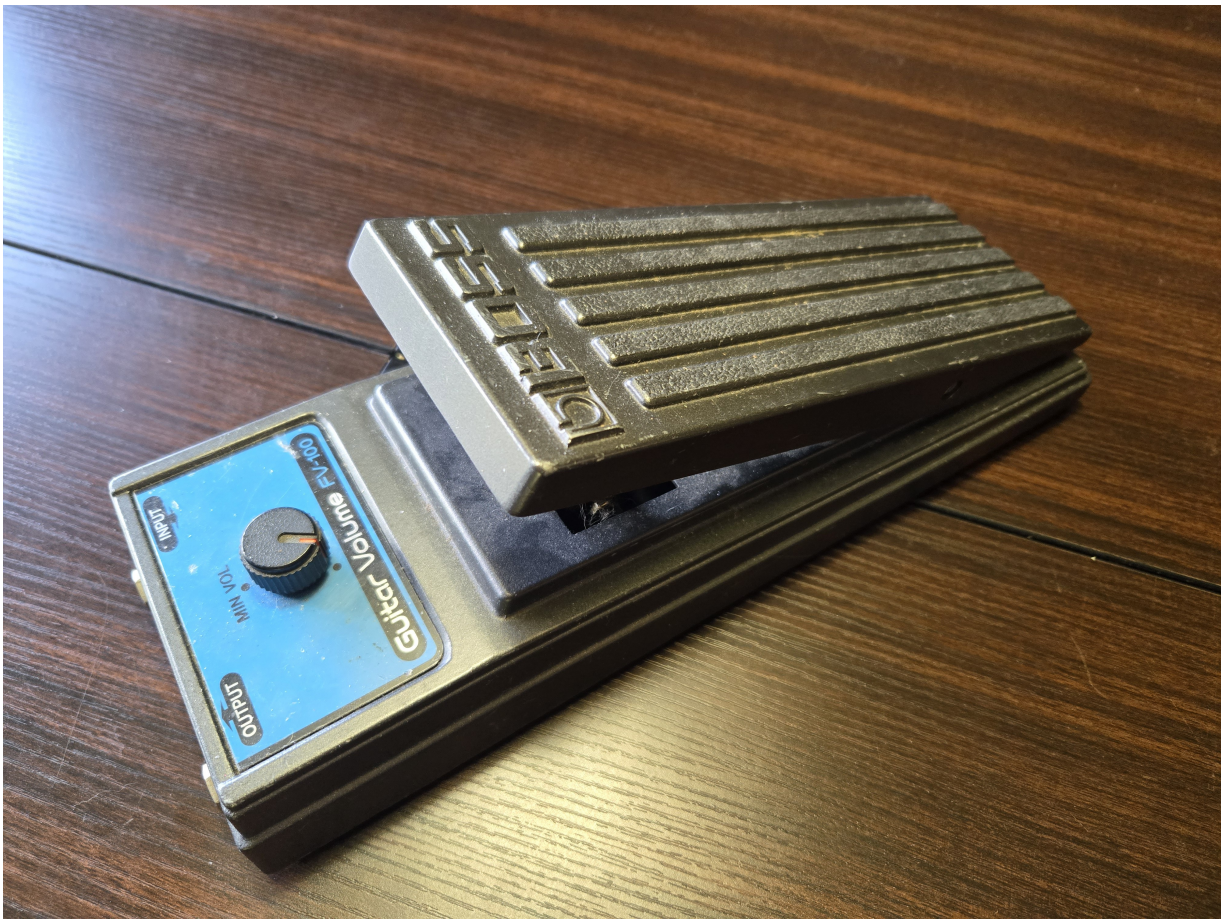

Fig. A.1 – My BOSS FV-100 Passive Volume Pedal

Most (if not all) volume pedals are passive devices. A passive VP is A MUST in this application. Please don't go connecting a wha-wha pedal or volume pedal with active electronics to your Commodore!! If you're unsure, look for evidence on the peddle for a battery compartment or external DC power connection.

Figure A.1 shows the Volume Pedal that I use for VP SYNTH. There's a “Minimum Volume” knob for setting the minimum volume when the pedal is in the fully back travel position. I keep my minimum volume setting at fully CCW position, but feel free to experiment.

No modification to the pedal was made, but arguably, the factory potentiometer (pot, for short) could be changed to better suit this application. The volume pot (or variable resistor) inside this unit is of the logarithmic type. For audio applications, this is almost always the type of pot used. The C64 game paddle pots are of linear type. Changing to a linear type of pot would give a more symmetrical division of the total travel of the pot/peddle. With a linear pot, the end-to-end resistance is sitting at the halfway point when the pot shaft is positioned at twelve o'clock, or exact middle of its travel. This is not true of logarithmic pot types and thus, for me, VP SYNTH note changes at the back end of the pot travel are harder to pinpoint than at the opposite end.

Appendix B – Cable Schematic

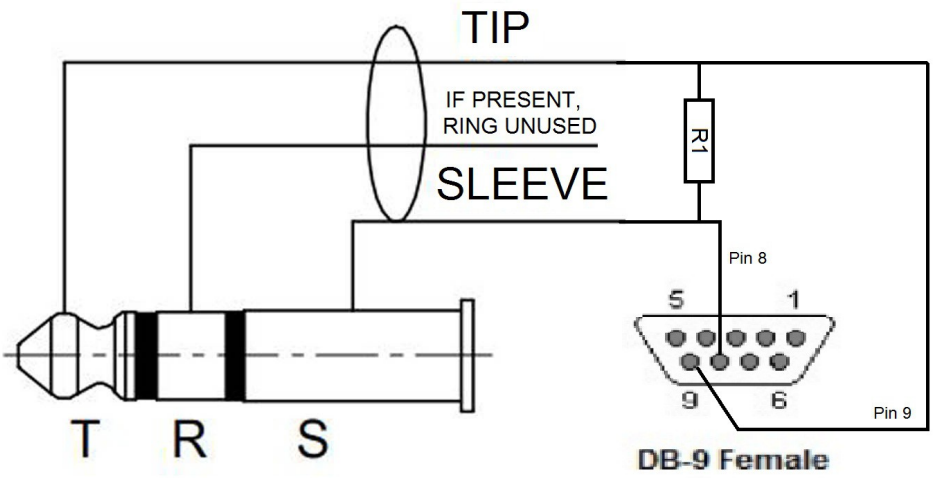

Fig B.1 - The Cable Schematic

The connecting cable is pretty straightforward. Only two conductors are needed for the cable and shielded cable is preferred, but not required. Connect the DB-9 side to the C64 control port 1, and the 1/4" phone plug to the volume pedal output. R1 is experimental and will affect the logarithmic issue discussed on the previous page. More importantly, the inclusion of R1 gives the pedal more travel across the 8-bit data range of the control port's A/D. Before I added R1 to my cable, I ran out of data range long before I ran out of pedal travel. My BOSS FV-100 has an open resistance measurement of 220KΩ and R1 for my cable is 5600Ω. R1 can exist in the DB9 hood, or inside the 1/4" phone jack barrel and the smaller package size, the easier to fit. 1/8W or 1/4W is perfect.

R1 could be omitted altogether, if your volume pedal's pot were replaced with a linear type taper whose resistance reasonably matches the resistance rating of the original C64 game paddle.