

Mini-SAM II Tutorial

Glossary of terms:

MSII: Mini-SAM II unit.

Chunk: This pertains to the Operating System Filing System and indicates the absolute file number.

Sound/Message #: The numerical assignment of a wav type pcm audio file loaded into the MSII. This number should not be confused with the Chunk # and is always used as a reference for sound playback. This number defines which audio or control file is played.

Channel #: This is a numerical reference to either an audio channel (1,2,3, or 4 on the MSII) or a control channel (1 for W, 2 for X). This number defines where the audio or control file is played. For sound playback, channels 1 and 3 specify the left channel and channels 2 and 4 specify the right channel. All channels may be used simultaneously.

Sequence Program: The MSII system contains a built-in scripting language that provides customizable control of the MSII. Up to 32 sequences may be executed simultaneously in a single unit. Sequences are loaded into the MSII just like sound files and are assigned a unique number that is referenced for execution. Sequences are executed by any one of the three following methods:

- Execution at startup as defined by the Configuration file.
- Execution from the assertion of an input trigger as defined by the Configuration File
- Launched (executed) from another Sequence Program.

Control/DMX File: This file contains pre-recorded control output changes that are created in concert with a sound file. Created in either the Programmer or DMXEdit, they are stored in 8bit groups. Control files must have corresponding assignments to either channel W (channel 1 on J1) or channel X (channel 2 on J2) in the Configuration File or by a Sequence Program. They are loaded into the MSII just like sound and Sequence Programs and assigned a unique number that is referenced for playback..

Configuration File: This is a file created by the Bootloader program that is usually the first file loaded into the MSII. Only one configuration file is used in the MSII. If multiple files are loaded then the file with the highest Chunk # is used. It defines what the MSII does at startup. It can define audio and control looping, assign playback of audio, control data, or Sequence Programs based on external trigger assertion, and execution of Sequence Programs at startup.

Mini-Sam II Development Flow Description:

The most important concept in the MSII system is that Sound and Control files are generic. By themselves they have no assignment to a given channel and will not automatically playback based on an input trigger or because they are loaded. They must be activated by either the configuration file or through execution of a sequence. Likewise, sequence files will not automatically execute because they are loaded and must be started by an assignment in the configuration file. The following indicates the basic flow of development:

Task	Description	Software Program
1	Make a Configuration File	Bootloader
2	Load Configuration File to the MSII at Chunk # 0	Fileloader
3	Create wave pcm Audio Files: 16bit,mono, signed	(not provided)
4	Load pcm Audio Files	Fileloader
5*	Create Control/DMX files.	Programmer
6	Load control files into MSII.	Fileloader
7**	Create and Load a sequence file	Fileloader

* If the Control outputs are not used or the control is issued from a sequence program then this task may be omitted.

** Simple projects may not require a sequence program and may be handled by the configuration file.

Example - Using Sequence Programming to control the MSII:

This example will create a program that loops sound file 1 on channel 1. If trigger 1 is detected then sound file 2 is played on channel 1 and control file 1 is played on channel 1 (W) uninterrupted until completed. While playing sound file 2, bit 4 on channel 2 (X) will be activated. Upon completion, looping of sound file 1 on channel 1 is resumed.

Task 1: When using the Sequence method, the Configuration file is very simple. All that is required is to launch sequence #1 at startup. The sequence program will do the rest of the work. Fig. 1 shows the configuration.

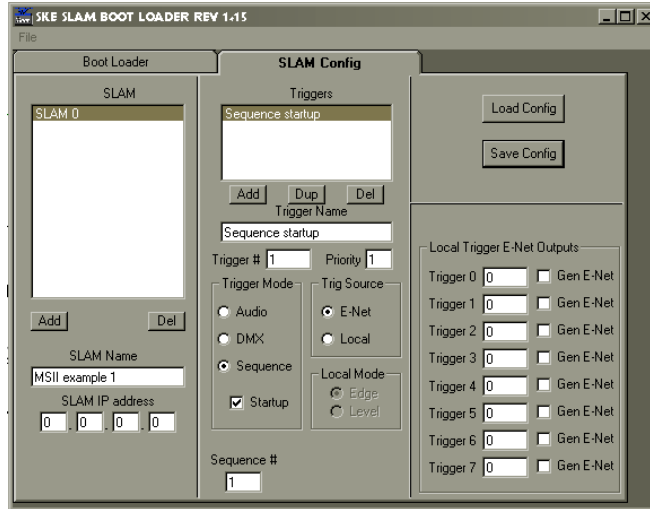


Figure 1

After entering the configuration parameters, press the Save “Config button” and enter the file name into file dialog. Then press the “Save” button creating the file “example1cfg.wav” as shown in Figure 2.

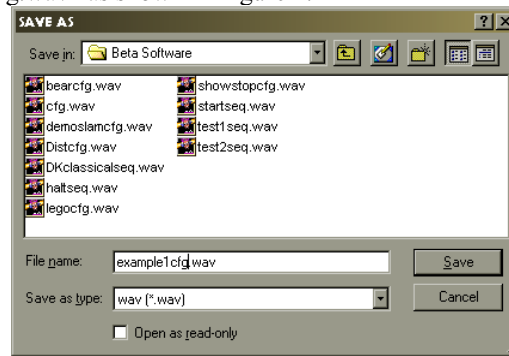


Figure 2

Task 2: From the Fileloader program, load the file “example1cfg.wav” into the MSII by typing “0” into the “Chunk Number” text box and pressing the “Replace” button. After loading the file, the directory should show as in Figure 3.
TIP- Hitting the “Next” button will retrieve the next available Chunk #.

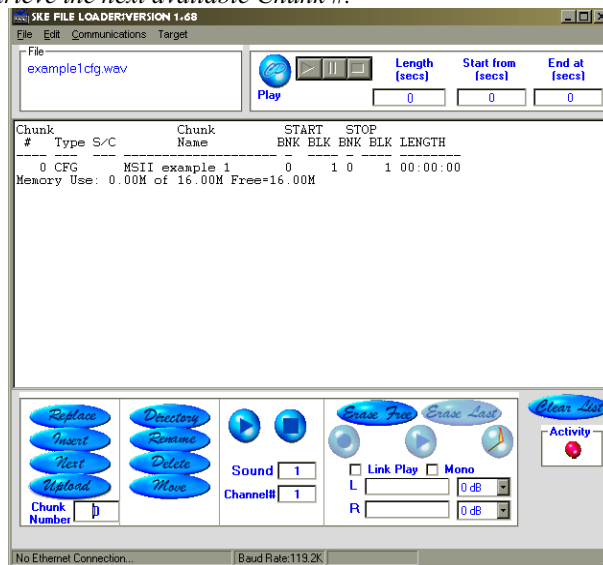


Figure 3.

Task 3 and 4: Next, instead of creating the 2 “.wav” sound files, use the files “Bach.wav” and “Drum Groove.wav” from the Sample SLAM sounds folder. Using the Fileloader, load “Bach.wav” at Chunk #1 and “Drum Groove.wav” into Chunk #2 as in Task 2. The directory should show as in Figure 4.

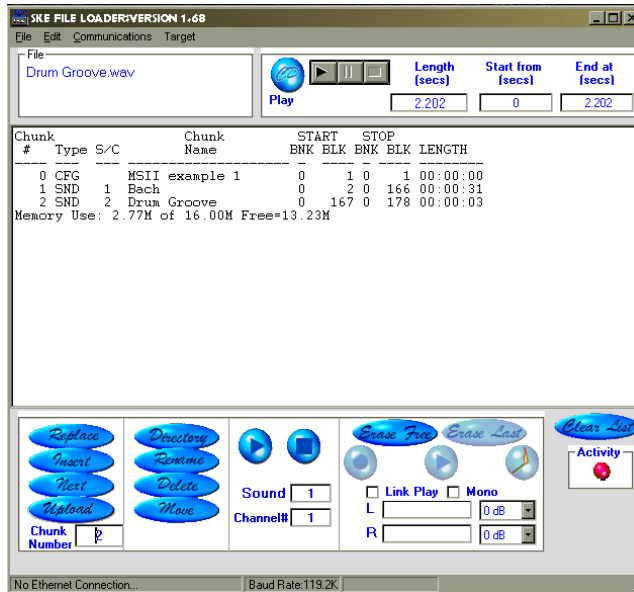


Figure 4

Task 5: The next step is to create a control/dmx file using the Programmer. Referring to Figure 5, type “2” into the “Mes #” text box. This specifies “Drum Groove” as the sound file to playback while control/dmx recording. Set the audio playback channel to the left channel by typing “1” in the “Ch#” text box. Type in the names for each bit in the bit label text boxes i.e. “Head Left”. The next procedure assumes the MSII is connected to the computer through a RS232 cable. Select the correct Serial Port radio button to be used. Click on the “REC” header in the Channel W area to select the Record mode on all 8 channel W bits. The indicator to the left should show RED for all 8 bits. To start recording hit the “CTRL” key on your keyboard. Using the default key map, the “A” key is assigned to W1 or “Head Left”, “S” key to W2 or “Head Right”, etc. Pressing these keys asserts the output bit for the time it is held. An asterisk appears in the indicator when the output is asserted. Releasing the key will de-assert the bit. To stop Recording, press the CTRL key again. To playback the control data recorded, press the PLAY button in the Channel W area to select play mode for all 8 bits. The indicators on the left should turn from RED too GREEN. Hit the CTRL key to start playback and the CTRL key again to stop playback.

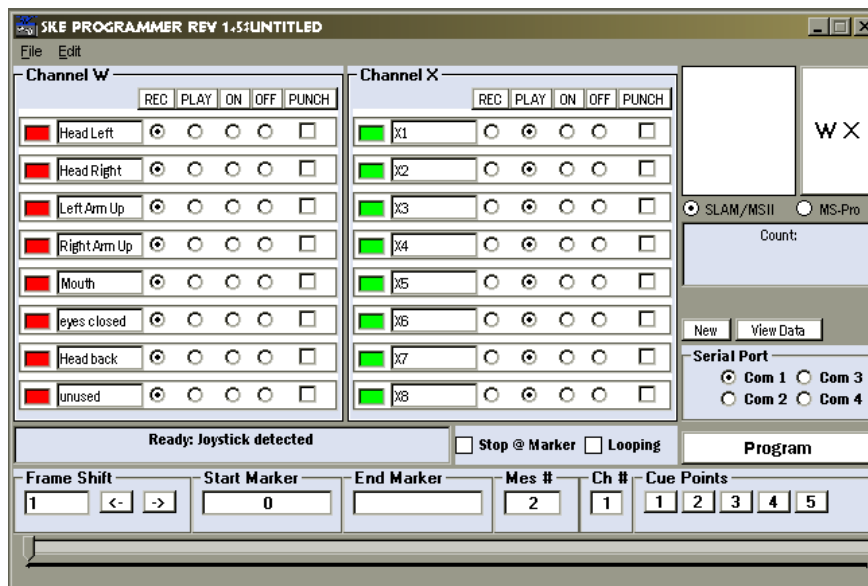


Figure 5

Next, Save the control/dmx file by selecting Load/Save... in the File menu. Figure 6 shows this dialog. Type “Drum Groove control” in the “Channel W Name” text box. This is the name that will appear in the Fileloader directory.

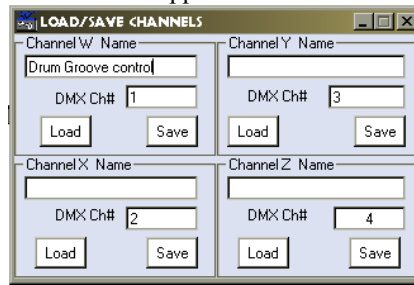


Figure 6

Next, hit the Save button to show the Save As dialog. Then, type in the file name “example1dmx.wav” and select the” Save” button as shown in Figure 7. This is the name that will appear in Windows directory.

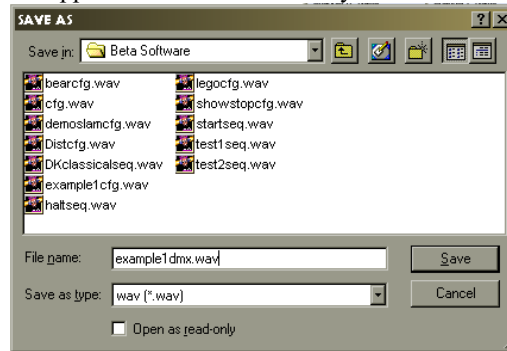


Figure 7

Task 6: With the Fileloader, open the “example1dmx.wav” file just created and load it into chunk #3. The directory should appear as Figure 8 when completed. Note that the Drum Groove control file and the Drum Groove Sound file have the same length.

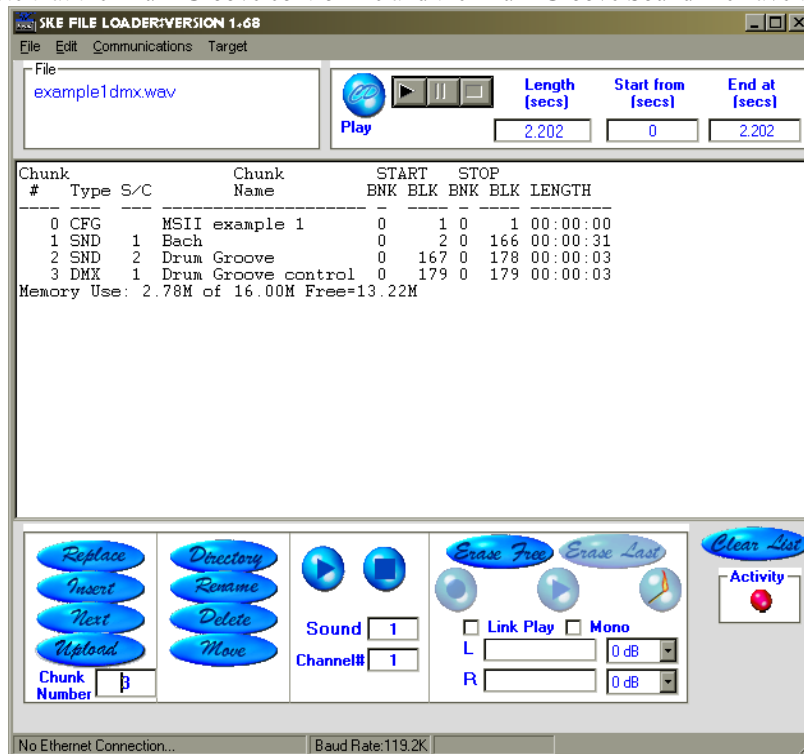


Figure 8

Task 7: The final step is to create the sequence program. From the Fileloader, select “sequence programming...” from the “File” menu. The window shown in Figure 9 should be displayed without the program steps. Begin by typing “example 1 program” in the Sequence Name text box. This is the name that will appear in the Fileloader directory. Next, drag and drop the instructions from the Command List to the Program List so they match the list show below. Each command has a corresponding set of Program Options. The options define the commands modes and provide the parameters to be executed. When looking at the program list, it should be noted that the “green” colored commands execute and continue on to the next instruction immediately. The “orange” commands pause after execution until an event occurs. This can be a timer or sound completion event “Red” commands (not shown here) cause the sequence to halt. A description of each command is as follows:

- Step 1: Play Sound -> Play Sound 1 on Channel 1. This plays “Bach” sound file on Channel 1.
- Step 2: Branch on trigger too -> Branch on Xtrigger 1 to Step 6. This polls input trigger 1 and if asserted, jumps to step 6.
- Step 3: Update -> Update. This is a special command that yields to the O.S. event manager for 20ms. It prevents the system from locking up because of a loop that consists of all green commands. If an orange command is in the loop then this command is not required. Also, note that if this command is omitted in this example then the program will still work but communication with the serial port will be lost.
- Step 4: Branch on Sound Channel Playing -> Branch if playing Sound Channel 1 to step 2. If “Bach” is still playing then check the input trigger on step 2 again.
- Step 5: Go To Step -> Go To Step 1. If not, jump to step 1 and restart “Bach”.
- Step 6: Set Output Bit -> DMX[2].bit 4=1. This turns on bit 4 on control channel 2 (X).
- Step 7: Play DMX -> Play DMX 1 On Channel 1. This plays the “Drum Groove Control” file on control channel 1 (W).
- Step 8: Play Sound -> Play Sound 2 on Channel 1. This stops “Bach” and plays “Drum Groove” sound file on Channel 1. The Program options “Wait until complete” check box is selected here causing the program to wait until playback is complete.
- Step 9: Clear Output Bit -> DMX[2].bit 4=0. This turns off bit 4 on control channel 2 (X).
- Step 10: Go To Step -> Go To Step 1. Restart “Bach”.

Tip: Selecting a sound # value of “0” will stop playback of a sound or control on the specified channel.
Tip: Holding the run/stop switch “SW2” at power-up will inhibit execution of all sequences. This is handy if there is a flaw in the sequence program. Also, this switch may be hit while the system is running to stop all sequence programs. Hitting the switch again will restart all sequences.

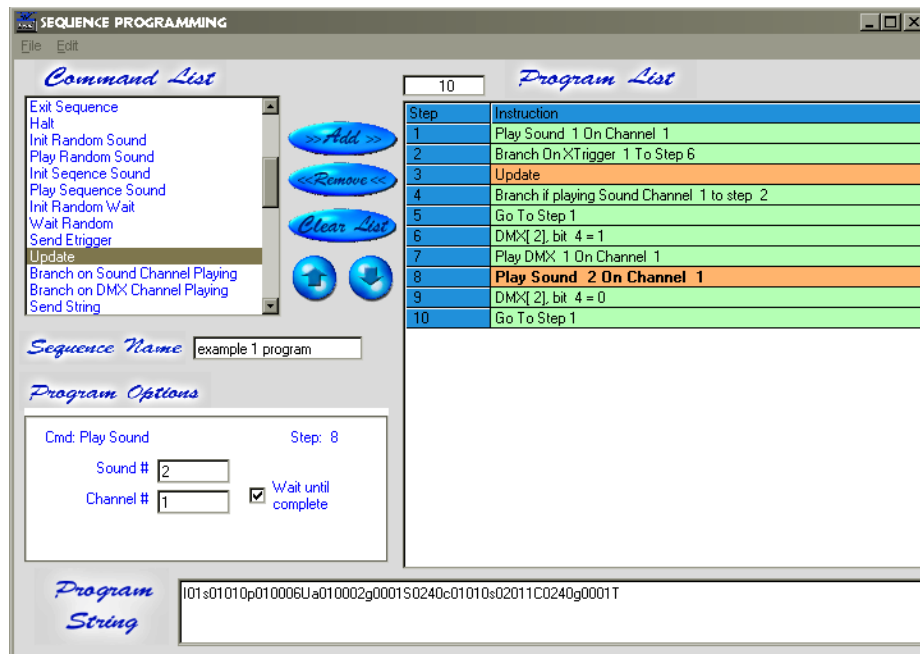


Figure 9

Now that the sequence program has been created it must be saved. Select “Save File” from the “File” menu and type in the file name “example1seq.wav” as shown in Figure 10. Next, click on the “Save” button to save the sequence file.

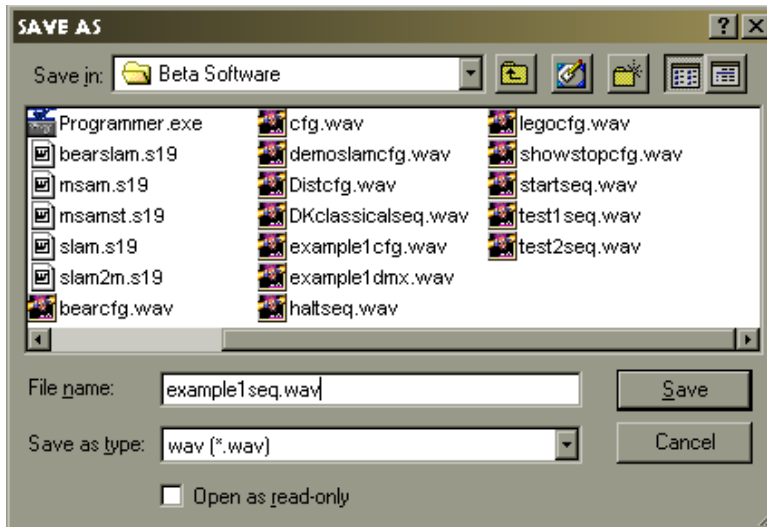


Figure 10

Finally, using the Fileloader, load the file example1seq.wav at chunk 4. The directory should appear as in Figure 11. This completes the configuration process.

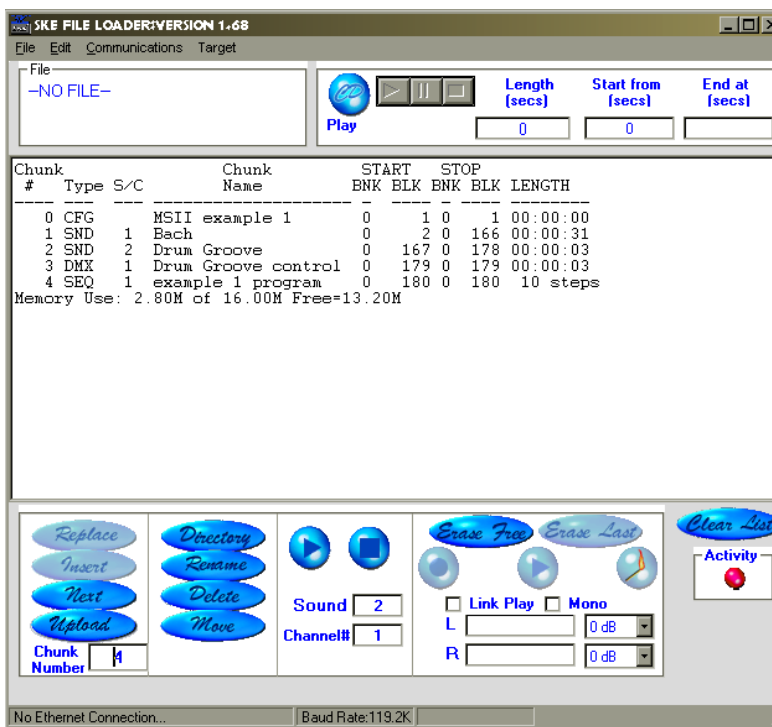


Figure 11

So why is the program not running? The configuration file launches the sequence only at startup so you must either hit the “Reset” button (SW1) or re-power the unit. It will come up and start loop playback of the “Bach” audio file. If a connection between “Trigger input 1” and ground is made the “Drum Groove” audio will interrupt “Bach”, the control file “Drum Groove control” will play on output channel “W” and bit 4 of output channel “X” will activate. When playback is complete the bit will be turned off and “Bach” will resume “Loop” playback.