USING THE REVERSE COMPILER

SCRIPT H2 DOCUMENTATION UPDATE

Revised

April 17, 1984

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PREFACE

The main feature in the H2 release of SCRIPT is an enhanced menu driven reverse compiler. You will also note that the new release H timbre definition parameters such as amplitude modulation, stereo modes and keyboard envelope, will appear in the reverse compiled timbre definitions.

The new SCRIPT reverse compiler converts a Synclavier (R) II sequence in the memory recorder into a SCRIPT composition for display and editing on the terminal. The output can be produced in several different formats, each of which is designed for convenience in specific situations. The notes on each track may be listed in SCRIPT musical notation or in the computer music format. In the computer music format, times may be expressed in absolute or relative time and in seconds or frames. With selective reverse compilation, you can instruct the computer to reverse compile certain tracks while ignoring others.

The reverse compiler can be activated at any time during real-time Synclavier (R) II operation. When you press the specified keys on the terminal, real-time operation will stop and your current selection will be temporarily held in memory. A menu will appear on the screen featuring options such as notelist format, key signature, and time references. The key you press to activate the reverse compiler determines which of several sets of defaults will be displayed. By changing the default selections on the menu, you can tailor the operation of the reverse compiler for your specific requirements. When you press the ENTER or ESCAPE key (depending on your terminal), the reverse compiler will begin to process your sequence, printing status information about the tracks as it runs. At the end, the monitor will be restored and the converted sequence will replace the current file. An asterisk will be added to the end of the name of the current file to prevent you from accidentally replacing a file with the same name on the user diskette.

SCRIPT FORMAT

The reverse compiler can produce notelists in either the computer music format or SCRIPT music notation.

The SCRIPT music notation format produces a notelist which consists of the P and R lines of SCRIPT music notation and represents times in terms of beats. The note resolution parameter on the menu is used to specify the shortest duration note that the reverse compiler should generate. If your material is made up of notes no shorter than eighth notes, for instance, you would set this to 8. The rhythmic output of the reverse compiler is quantized according to the specified note resolution so that any notes performed faster than this resolution will be lost. Also, triplets will be resolved into couplets in the given resolution. Thus, once your sequence has been reverse compiled, it may sound significantly different from the way you actually played it. Since the reverse compiled sequence becomes

the current file, the original sequence as you played it on the keyboard unit will be lost unless you have saved it. For this reason, you should always store a copy of your sequence on the diskette before running the reverse compiler.

Recording for SCRIPT

For best results with the SCRIPT format, set the click rate equal to the desired rhythmic value (one click per quarter note, one click per eighth note, etc.), turn on the click track output and record your sequence. The more precisely you play against the click during the recording, the more readable will be the reverse compiled score. For more on note resolution and recording, see the Music Printing User Guide.

COMPUTER MUSIC FORMAT

The computer music format produces a notelist that is a direct list of events in time. These times may be represented in a number of ways (see below) but, in all cases, they will be accurate to 0.005 seconds, which is the resolution of the Synclavier (R) II memory recorder. The exact time references of individual notes will be shown, with details of keyboard performance such as chord simultaneity or the exact time at which a note occurs for use in determining film synchronization points.

Absolute or Relative

In the computer music format, there are two choices for note starting times: absolute and relative. Each is designed for a different kind of editing.

Absolute note starting times are useful when editing polyphonic compositions. Notes can be added or deleted without affecting the timing or harmonization of the succeeding notes. You can also change a timbre in the middle of a sequence of notes by simply inserting an additional NOTELIST USING statement before the line containing the first note to be played in the new timbre. Of course, this process will cause another track in the memory recorder to be used.

On the other hand, if you select a format with relative note starting times, you can remove a note or an entire measure without leaving any rests. Subsequent notes will automatically move forward in time. You may have to adjust the starting time of the first note following the removed notes so that it will come out on the right beat. All other note starting times will be adjusted for you. Relative starting times are also useful when you want to move entire musical passages from one location to another or when you want to duplicate a passage.

Seconds or Frames

Times may be expressed in any of the following formats: seconds (i.e. seconds.tenths), frames (:minutes:seconds:frames.frametenths), or frames-only (:frames.frametenths). Times in frames are especially useful for film and video synchronization. Default frame rates of 24 or 30 frames per second are available, or you can enter any other frame rate, from 1.00 to 300.00 frames per second. You can combine the reverse compiler with the SCRIPT synchronization statements so that the starting times and tempo of a keyboard performance can be adjusted automatically for synchronization with film or video cues (see the chapter "Tempo Control and Synchronization" in Script User Guide.)

THE MENU

To bring up the reverse compiler menu on the screen, press the ESC key followed by a number. (On a VT100, you may use the PF keys on the right side of the terminal instead of ESC 1 through 4.) Each number activates a different format with different default settings. There will be one line on the menu for each recorded track in the memory recorder.

The following table shows the complete list of default menus:

FUNCTION KEY	NOTELIST FORMAT	STARTING TIME	TIME FORMAT
PF1 or ESC 1	Computer	Absolute	Seconds
PF2 or ESC 2	Computer	Relative	Seconds
PF4 or ESC 4	Script		
ESC 5	Computer	Absolute	Frames (24 FPS)
ESC 6	Computer	Relative	Frames (24 FPS)
ESC 7	Computer	Absolute	Frames (30 FPS)
ESC 8	Computer	Relative	Frames (30 FPS)
ESC 9	Computer	Absolute	Frames-only (24 FPS)

NOTE: PF3 or ESC 3 activates the Music Printing Option.

For each track listed on all menus, the following default settings will appear:

Track	Mode	Key Sig	Acc Format	Time Sig	Note Res	Abs/ Rel	Sec/ Frames	Frame Rate	Click Rate
1		C	#	4/4					4

The other default settings will vary depending on which menu has been brought up.

SELECTING ITEMS ON THE MENU

You begin your menu selection by moving the cursor arrow to the item you wish to change. With some items you will toggle, or flip from state to state by pressing any key on the keyboard. For other changes, you will simply type in the new value.

For example, when you want to select the Mode for your output, move the cursor to the Mode item and press any key on the keyboard. The value will flip from Computer to Script to Ignore and then back to Computer. When the selected Mode is Ignore, no notelist will be printed for that track. This feature allows you to print out only selected tracks. When the selected Mode is Computer, words will appear under Abs/Rel and Sec/Frames. If you then move the cursor to one of these items, you will be able to toggle between the two values by pressing any key. When the selected Mode is SCRIPT, a value will appear under Note Resolution. A new note resolution value may be typed in when the cursor is in this field.

(Note that the Abs/Rel and Sec/Frames items Sec/Frames items have no meaning in the SCRIPT music notation format and thus are not printed when the SCRIPT Mode is selected. Likewise the Note Resolution item has no meaning in computer music format and thus is not printed when the Computer Mode is selected.)

To change the time signature for a single track from 4/4 to 3/4, move the cursor to the Time Signature item on the appropriate track line and then type 3/4. You may have different time signatures on the different tracks.

When typing in a key signature, indicate sharp by a # and flat by an F or f. Use a capital letter (such as C, G, F#) to designate a major key and a lower case letter (such as c, bf, e) to designate a minor key. The KEYSIG statement that accompanies the reverse compiled composition will have the key written as a major key. If a minor key has been specified on the menu, the relative major will be listed in the statement followed by the actual minor key as a comment. For example, if the key signature item on the menu were "a", then the following KEYSIG statement would appear in the reverse compiled composition:

```
KEYSIG C /* a minor */.
```

To change the Frame Rate or Click Rate values, first move the cursor to the top-most line (or track 1), and then move it to the right to the appropriate item. The new value will apply for all track lines. The same frame rate and click rate must be used for all tracks. Note that the frame rate is written as a number which gives the frame rate times 100. Thus 2400 means 24 frames per second.

Try the following:

1. Record a short two-track sequence from the keyboard.

2. Save the sequence on diskette by simultaneously pressing ENTRY WRITE and one of the numbered RECORDER STORE/RECALL buttons.

3. Now press the PF1 key on the VT100 terminal, or ESCAPE followed by 1 on the ADM terminals. The menu appearing on the screen will list the options for each of the two tracks.

Track	Mode	Key Sig	Acc Format	Time Sig	Note Res	Abs/ Rel	Sec/ Frames	Frame Rate	Click Rate
1	Computer	C	#	4/4		Abs	Sec		
2	Computer	C	#	4/4		Abs	Sec		

This set of defaults will produce the simplest computer music format output.

4. Make the desired changes in key signature, accidental format, time signatures, etc.

5. Now press the ENTER key on the VT100 terminal, or the ESCAPE key on the ADM terminal.

   The reverse compiler will then run. As it runs, it will produce statistics on the number of notes and measures in your piece, and the type of preset information that is present. This is simply a guide to show its progress, since pieces that are several thousand notes will take a short while to process. At the end, you will be returned to monitor, and the reverse compiled output will be your current file.

6. Type LIST to see your reverse compiled sequence listed on the screen.

7. Type PLAY to return to the keyboard.

8. Now press PF4 or ESC-4 to activate the reverse compiler again with the default menu for the SCRIPT notation format.

9. Select a note resolution value that indicates the shortest note in your sequence. Change anything else as necessary.

10. Press ENTER (or ESC on the ADM).

11. Then LIST your composition. It will be displayed in SCRIPT P and R lines.

12. If you want to save the reverse compiled sequence on diskette, type SAVE.

SEQUENCES TOO LONG TO BE CONVERTED

Notes are stored more efficiently in the Synclavier (R) II operating system than in text files. A lengthy sequence that can be stored from the keyboard may be too long to be converted directly into text, depending on your memory and disk configuration. When you try to convert such a sequence, the following error message will appear on your terminal screen:

Sequence too long for conversion.

This means that the reverse compiler has compiled the sequence as far as it can and has run out of memory. If you forgot to save the sequence on diskette before you began compiling, it is lost now and you will have to record it all over again. If you remembered to store the sequence, you can convert it using the following procedure:

1. Clear out the half-compiled sequence by typing NEW followed by any character or string.

2. Type PLAY and then recall your saved sequence by pressing the appropriate track button under RECORDER STORE/RECALL at the Synclavier (R) II keyboard unit.

3. Re-activate the reverse compiler. When the menu comes up, set the mode to Ignore for some of the tracks.

4. Try running the reverse compiler. If the sequence is still too long, do steps 1-3 again, and this time set the mode to Ignore for more of the tracks. If the conversion is successful, save the converted tracks using the SAVE command at the terminal. Give the converted tracks a name that is different from the filename for the entire sequence, such as Tracka.

5. Return to the Synclavier (R) II, recall the sequence, and make another pass on the reverse compiler, selecting some of the remaining tracks. Save under a different name, such as Trackb.

6. When all tracks have been converted and saved, link the saved files together in a new file using INSERT statements:

```
10 INSERT 'TRACKA'
20 INSERT 'TRACKB'
30 INSERT 'TRACKC'
```

Note: If you want to edit this composition, you will have to recall the inserted files separately.

ERROR MESSAGES

The following error messages may appear from time to time on the terminal screen as you use the reverse compiler.

Sequence is too long for conversion.

The notelist output is too long for available memory or disk space. Follow the above procedure to selectively reverse compile the sequence.

Sequence type identification number is not valid.

The sequence does not contain the correct internal check codes, and is probably not a Synclavier (R) II sequence.

Sequence contains incorrect first note code.

The starting code for a track is incorrect. This indicates an internal error in the sequence, and probably indicates a memory error in the system.

SYSTEM ERROR - Out of Primes in Build-Template

An internal error has occured in creating the notelist scanning template, due to an unusual time signature or click rate.

There must be an integral number of clicks per measure

This warning indicates that the click rate produces a clicks per measure which is not an integer count, and thus was adjusted to an integer by the system.