Eventide
the next step

HS322/HS395 Sampling Option Version 1.3 for the H3000 Ultra-Harmonizer(R)

ADDENDUM to the H3000 INSTRUCTION MANUAL

SECOND PRINTING: October 1991, incorporates HS395 hardware and version 1.3 software changes.

EVENTIDE INC. • ONE ALSAN WAY • LITTLE FERRY, NEW JERSEY 07643 • 201-641-1200

EVENTIDE INC.
WARRANTY REGISTRATION FORM - Model HS322/HS395 Sampling Option

Date Purchased_____ Serial Number of H3000_____

H3000 Configuration Info: H3000S ( ) H3000B ( ) H3000SE ( ) VAIROM ( )

From Whom Purchased_____

_____

Purchaser's Name_____

Street Address_____

City_____ State_____ ZIP_____

Telephone ( )_____

In the future, information about sampler updates may be available. To whom should this information be sent?

Name_____

_____

Please help us by answering the following questions:

How did you learn of Eventide equipment?_____

Do you plan to use MIDI with the H3000? Yes ( ) No ( )

Do you own or use a personal computer? Yes ( ) No ( )

If you use a computer, please indicate which type:

Atari ( ) Commodore ( ) Macintosh ( ) IBM PC or PC compatible ( ) Other ( )

_____

If you would like information on other Eventide products, please check the appropriate boxes below:

BD1000 Digital Video Delay ( ) BD980 Broadcast Delay ( )

PD860 Precision Delay ( ) BD941/942 Broadcast Delay ( )

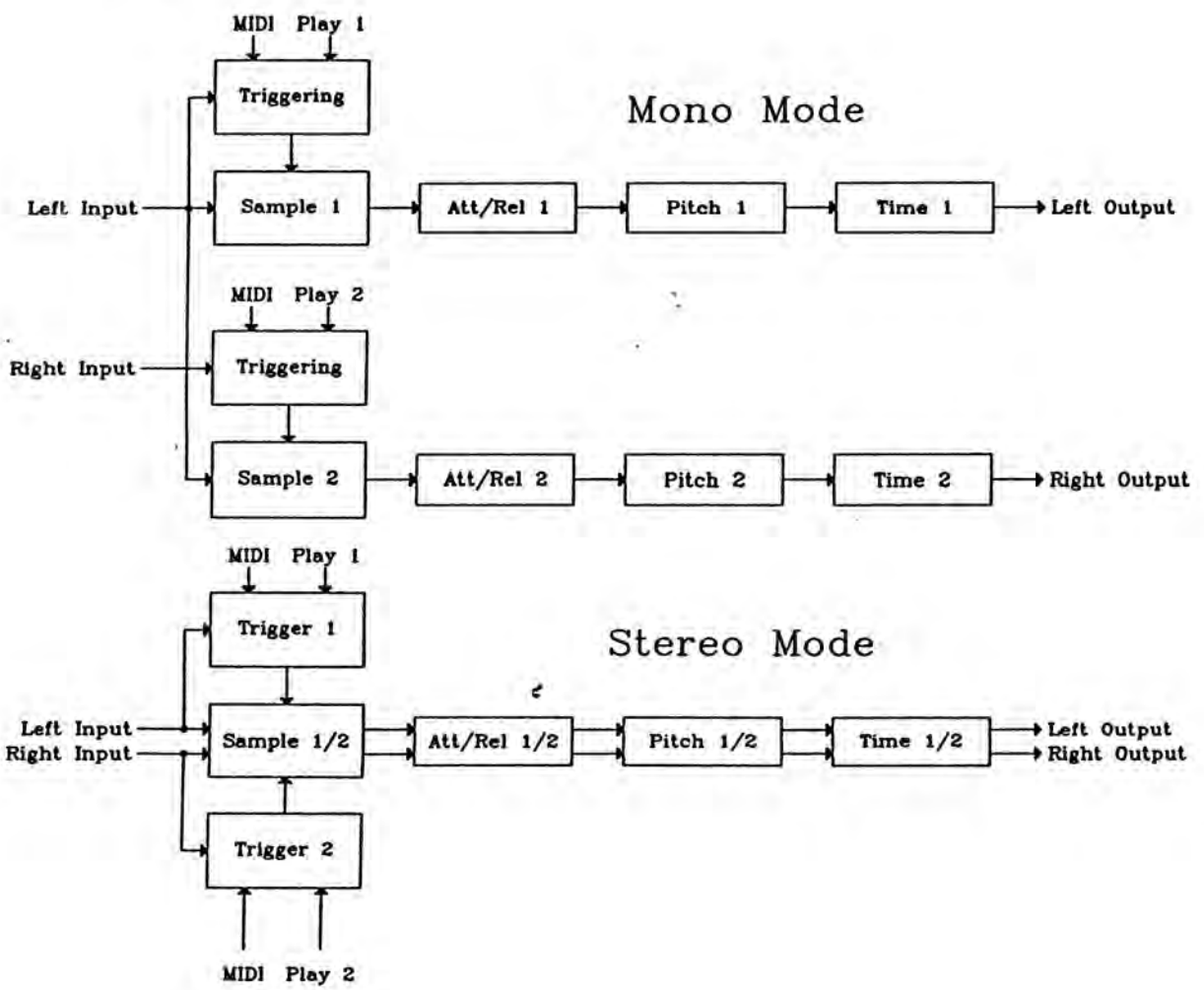
IMPORTANT: Please FOLD and MAIL this POSTAGE PAID form within ten days of purchase.

Algorithm 120 - Studio Sampler

Description

This algorithm, when used with the HS322 or HS395 sampling option hardware, will digitally record 11.8 seconds of stereo audio, or 23.7 seconds of mono audio. With the extra memory of the HS395 option, recording time will be 45.1 seconds of stereo and 95.1 seconds of mono audio. Two separate samples can be recorded into memory and played back using front panel buttons, audio triggering, or with a MIDI keyboard. The begin and end points of the two samples can be edited using "rock 'n' reel" style editing. Also, the pitch of the samples can be shifted over a six octave range, without altering the playback length. Conversely, the length of the sample can be altered without changing pitch. This allows independent control of the length and pitch of the recorded samples.

Block Diagram



New for Version 1.3

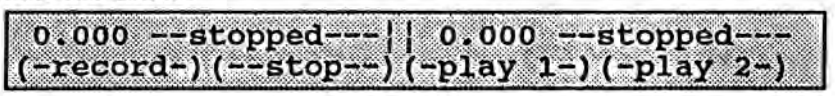
With the new HS395 sampling option, recording time is increased to 95 seconds in mono and 47.5 seconds in stereo.

Stereo samples are now re-triggerable. In previous versions, audio triggering of stereo samples required that the entire sample be played out before it could be re-triggered.

Additional trigger keys have been added to allow easy auditioning of samples while adjusting the pitch, time, attack and release parameters.

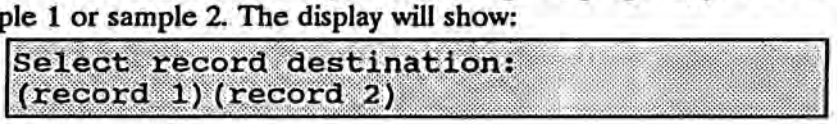
Recording

After loading the Studio Sampler program, the display will show the sample memory being cleared and will then present this menu:



To record a sample into the H3000, first press the "record" key. If the program has just been loaded, the display will then show:

If a sample has been recorded into memory since loading the program, you will have the option of recording to sample 1 or sample 2. The display will show:



Press "Record 1" or "Record 2" to select which of the samples you wish to record to. The display will then show the "set trigger" menu.

At this point, the LCD display will show a VU meter indicating the recording level, and the H3000 will be passing its audio input to both output channels. To use the audio source to trigger the recording, use the knob to adjust the trigger threshold relative to the VU reading. The small "t" will show the location of the trigger threshold. Press "-trg en-" to enable the audio trigger for recording. To manually start the recording, press "-record-". To cancel the recording, press the parameter key. To stop recording, press "--stop--".

Once the sample is recorded, the display will return to the main menu, and will probably be flashing the message "--analyzing--". This indicates that the H3000 is analyzing the newly recorded sample for the purpose of time alteration and pitch shifting. If you wish to play back the sample without pitch shift or time scale modification, disregard the flashing message; the playback will be perfectly normal. If, however, you wish to shift the pitch or change the time of the sample, you may hear some "glitches" in the output. These will disappear once the "analyzing" message has stopped flashing.

Playback

To play a sample that was recorded into memory, press "play 1" or "play 2". The two keys will play samples 1 and 2 respectively. In mono mode, sample 1 will be played in the left output channel and sample 2 will be played in the right output channel. In stereo mode, each sample uses both output channels, and only one sample may be played at a time. Pressing the play keys repetitively will re-trigger the samples, creating a "stutter" effect.

Press "stop" to stop the playback of both of the samples.

Use pitch 1 and 2 to control the pitch of the samples.

Use time 1 and 2 to stretch or compress the samples in time.

To "loop" the samples (i.e., play them back repetitively, in an infinite loop) press and hold the appropriate play key for about 1 second. The display will show "--looping--", when the sample is in loop mode. To disengage the loop mode, press the appropriate play key; the loop will play out to the end of the sample. To stop the sample immediately, press "stop".

Editing

Press the "-edit 1-" and "-edit 2-" keys to edit the start and end points of the two samples. Then press the "start" key to edit the start point of the sample, or press the "stop" key to edit the stop point of the sample. Turning the knob will control the start and stop points, and the display will indicate the times in seconds. The audio output will mimic the effect of an analog tape recorder that is being manually shuttled back and forth to find an edit point. Think of the knob as a reel on that imaginary tape recorder. (Note: Because of the quantized nature of the front panel controls, turning the knob very slowly will not shuttle the edit point.) Press "play" to quickly preview the edit.

If the sample to be edited was "looping" when edit mode was entered, the editing function is slightly different. The audio will continue looping while the start and stop points are changed. The knob will still control the edit points. Simply adjust the start and stop points until the loop sounds right.

To play the sample backwards, set the stop time larger than the start time. Playback will always begin at the start point and end at the stop point, regardless of the settings.

Parameters

#0	**Pitch 1**	**-3600 to 3600 cents**	**Modulation**
#1	**Pitch 2**	**-3600 to 3600 cents**	**Modulation**

This parameter controls the playback pitch of sample 1 and 2.

#2	**Time 1**	**0 to 800 per cent**	**Modulation**
#3	**Time 2**	**0 to 800 per cent**	**Modulation**

This parameter controls the playback speed of the sample, independent of pitch. A setting of 100 per cent will result in normal speed playback. Higher settings will "compress" the

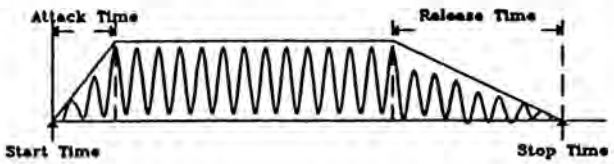
sample in time, resulting in higher speed playback, without altering the pitch of the sample.

#4	**Attack 1**	**1 to 1000 milliseconds**
#5	**Attack 2**	**1 to 1000 milliseconds**

Attack 1 and 2 control the length of the attack portion of the envelope of two samples.

#6	**Release 1**	**1 to 1000 milliseconds**
#7	**Release 2**	**1 to 1000 milliseconds**

Release 1 and 2 control the length of the release portion of the envelope of samples 1 and 2. The release portion begins at a point before the preset stop time such that the end of the envelope will coincide with the end of the sample. A press of the "stop" key or the reception of a note off command (when triggering with MIDI) will cause the sample to begin its release phase early.



#8	**Mix**	**0 to 100 per cent**

The mix control allows the dry input signal to be mixed in with the output of the sampler. A setting of 0 per cent will allow only the input signal to be heard at the outputs, and a setting of 100 per cent will pass only the sampler output.

Expert Parameters

Triggers

#9	**Trigger Mode**	**off or audio trigger**

The Trigger Mode parameter is used to enable or disable audio level triggering of the sample playback.

#10 **Threshold 1**
#11 **Threshold 2**

These two parameters determine the threshold at which an audio signal will trigger sample playback. Threshold 1 is used for the triggering of sample 1 by the left input channel and Threshold 2 is used for sample 2 with the right input channel.

MIDI

#12 MIDI Mode **off, keyboard split, or layered (mono only)**

MIDI Mode determines how MIDI note events will trigger the sample playback.

Keyboard Split mode allows the MIDI keyboard to be split into two zones, determined by the Key Split parameter. Notes played below the split point will trigger sample 1 and notes played above it will trigger sample 2. In mono mode, the playback will be polyphonic (two voice) while in stereo mode, only 1 voice may sound at a time.

Layered Mode, only offered while in mono record mode, will trigger both samples 1 and 2 from a single MIDI note event. This is useful to create thick layered sounds. It can also be used to fatten monophonic sounds by setting the edit points of sample 1 and 2 to the same values. By subtly altering the pitches and playback times of sample 1 and 2, a very convincing double track effect may be obtained.

#13 Base Note **C-1 to C8**
#14 Base Note 1 **C-1 to C8**
#15 Base Note 2 **C-1 to C8**

The Base Note determines which MIDI note will give a non-pitch-shifted playback. Playing above the base note will shift the pitch upward; playing below will lower the pitch. The Base Note parameter is used with the "layered" MIDI mode and Base Note 1 and 2 are used for the "Key Split" MIDI mode.

#16 Split Point **C-1 to C8**

The split point parameter is used only in conjunction with the "Keyboard Split" MIDI mode. Notes played below the split point will trigger sample 1; those played above will trigger sample 2.

#17 Drum Trigger **off or on**

The drum trigger enable is used in conjunction with MIDI trigger of the samples. When drum triggering is on, a single note-on message will play the entire sample; the note off will be ignored. For normal, keyboard-type playback, this parameter should be set to "off".

Sampler Control

#18 Shift Mode **constant length, generic sampler**

In constant length mode, splicing is used to shift the pitch of the sample without changing the playback length. In generic sample mode, the sample is simply played back faster or slower to alter the pitch.

#19 Record Mode **monophonic, stereophonic**

The Record Mode setting determines whether the H3000 records in stereo or mono. The record mode should only be changed before recording a new sample. More specifically, a sample recorded in mono cannot be changed into a stereo sample by changing this parameter. Also, when the record mode is set to stereo, the available recording time will be halved and only one sample may be played back at a time.

IMPORTANT NOTICE! PLEASE READ BEFORE INSTALLING SAMPLER!

The installation of the sampler board is a tricky process. While we have written, tested, and supplied what we believe are explicit instructions, executing them requires a fair amount of dexterity and experience with electronic wiring and soldering. "Field" installation is possible, but Eventide recommends factory installation of this product.

We ask that, before you attempt to install it, you **thoroughly read the instructions** while looking at the Harmonizer® main circuit board. If, after having done so, you have any doubt about your ability to complete the installation successfully, send the unit back to us. We will perform the complete installation and check it out. We will also resolve any potential compatibility problems between the ROM operating system in your unit and the sampler ROMs.

IF YOU DECIDE TO RETURN THE UNIT. . .

Pack your Harmonizer and the entire HS322 kit carefully. Refer to the Harmonizer manual for packing and shipping instructions. Enclose a check for $100 for installation and return shipping.* If you have a Version 1.53 operating system, enclose an additional $150 for an operating system upgrade and a Steve Vai preset ROM, which is the minimum upgrade required for the Sampler to function. If you have an H3000B with (minimum) revision 2.11, or an H3000SE or H3000S with the 2.16 operating system, no upgrade is required. If your H3000SE has SEROM3 version 2.16, it will operate but there will be minor bugs. If this is your situation, please notify us and we will provide SEROM3 version 2.17 at no charge.

This is also a good time to consider getting additional upgrades. Please refer to the H3000B and H3000SE literature enclosed. If you wish to order either or both upgrades, enclose a check for the appropriate amount. We will install them at the same time as we install the Sampler at no additional charge.

IF YOU DECIDE TO PERFORM THE INSTALLATION YOURSELF. . .

Be careful! Of course, the sampler is a factory-approved modification and you don't "void the warranty" by installing it. However, if you screw up the installation, it is possible to seriously damage the Harmonizer, the Sampler, and your bank account. While we are always available to rescue you if the installation goes awry, we will not do it for free! This has been an official "word to the wise."

Because of the complexity of the installation, we cannot offer telephone support. If it doesn't work when you're done, you will have to return it to us.

In either case, thank you for purchasing the HS322 Sampler board for your Eventide Harmonizer. We hope that you are pleased with our effort to enhance the H3000 series, and that you are getting good use from it.

*Offer good in United States only. Outside of U.S., please contact your dealer.

HS322 Internal Sampler Board
Installation Instructions
For H3000 Ultra Harmonizers

The installation kit contains:

- HS322 Sampler Board
- 40 pin, ribbon cable (3.5 inches long)
- 40 pin, male P.C. connector (J14)
- 4 - Male/Female standoffs
- A rectangular piece of insulating paper
- 4 - screws (4-40 thread)
- 4 - nuts (4-40 thread)
- 7 - lockwashers
- 1 - nylon washer
- An 18 inch length of hookup wire
- 2 - EPROMs...SAMPLER/512 and SAMPLER/256

The tools needed are:

- Soldering iron and electronic grade solder
- A small, very sharp Exacto knife or razor blade
- Small phillips screwdriver
- nutdriver set for tightening standoffs and nuts
- Pair of long nosed pliers
- Pair of small diagonal cutters

Before beginning:
This kit contains all of the components necessary to convert H3000 Ultra Harmonizers with software versions 2.11 or higher. In order to convert earlier H3000-S units with version 1.53 Operating Systems a software update must be purchased separately.

Special note to SE owners: Please contact Eventide about acquiring a replacement EPROM for your H3000 (SEROM3 version 2.17) in order to assure compatibility between the HS322 and the SE software. See cautionary letter.

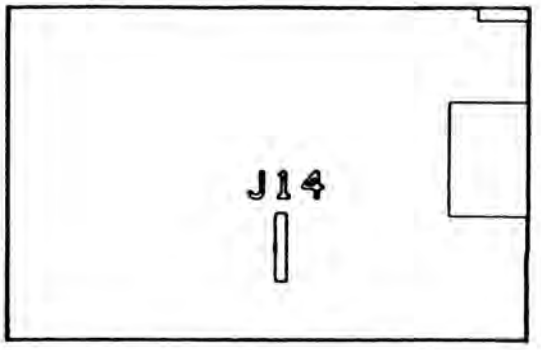
Warning:
The following instructions if followed step by step have the potential for trouble-free installation of the HS322 kit. Do not attempt this procedure if you are not accomplished with a soldering iron and agile with an Exacto knife. Mistakes in the installation can lead to damage of the H3000's hardware and/or software, hours of extra (costly) repair work and can void the warranty. Read the instructions and cautionary letter fully before beginning.

Installation instructions:

1. Begin by removing the H3000 from any rack or case and place it on a flat, conductive working surface. Static electricity can be a problem with integrated circuits so be careful of the working environment. Remove the AC line cord and any other cables connected to the rear of the unit.

2. Remove the top and bottom covers of the H3000 by unscrewing the 11 phillips head screws on the top and bottom. Note the placement of the 2 machine screws (4-40 thread) at the front, center and the 9 sheet metal screws around the perimeter on both the top and bottom.

3. Insert the 40 pin, male connector into the holes marked J14 in the diagram below making sure that the connector is on the component side of the board and in the correct location and that the notch faces the left side of the board. Once that is checked and double checked carefully solder in the connector. Be careful that the connector stays tight to the P.C. board while soldering. **If by some chance you find that you've soldered it into the wrong set of holes DO NOT ATTEMPT TO DESOLDER IT!!!.** This can lead to P.C. board damage that is difficult to fix. Contact Eventide for another connector.



4. The next step is a series of 4 cuts on the P.C. board and 4 jumpers to install. Cut #1 and jumper #1 are done on the top of the P.C. board.
Cut #1: With a sharp Exacto knife cut away the trace that connects U206, pin 10 to the +5 volt power line. This trace is fairly wide and will require several cuts with the knife. The cut is alongside pin #10 which makes it a bit tricky. Refer to figure #1 for exact location of the cut.

5. Jumper #1: Cut a 1 inch piece of hookup wire, strip both ends and solder one end to U206, pin #1 (refer to figure #1) and the other end to U206, pin #4. This is done best by adding a small amount of solder to the I.C. pins first, then tinning the wire before connecting it to the I.C. pins.

6. The remaining 3 cuts and 3 jumpers are done on the bottom of the P.C. board. Turn the H3000 upside down and position it in the same manner as in figure #2.
Cut #2: Locate cut #2 figure #2. Make absolutely sure that the trace you are cutting is correct and that no adjoining traces are inadvertently cut. Cut #2 is between the J14 connector and U134 (a socketed PROM). Cut the trace carefully.

7. Cut #3: This cut is located to the left of U221 (a socketed 74LS74). Cut the trace in the exact location shown in figure #2, above the feedthrough.

8. Cut #4: This cut is located underneath U206 as shown in figure #2. Carefully cut the trace.

9. Jumper #2: Cut a 9 inch piece of hookup wire and strip the insulation from both ends. One connection point is located between the J14 connector and U134 (the socketed PROM). The other end is on the right side of the board at U200,

pin 12 (a 74F04). Solder the wire at both ends being careful not to cause any solder bridging between traces.

10. Jumper #3: Prepare a 2.5 inch piece of hookup wire as before. Connect one end to the resistor that connects to U205, pin 5 (U205 is a 74F00, the resistor is R168) and the other end to U206, pin 10 as shown in figure #2. Carefully solder the wire in place.

11. Jumper #4: This requires a 2 inch piece of prepared hookup wire. Connect one end as shown in figure #2, to U201, pin 5 (U201 is a 74F74) and the other end to U200 (a 74F04), pin 13.

12. The next step is to install one of the EPROMs from the kit. The SAMPLER EPROM contains the program for the HS322 board. Please refer to figure #3. This is the component layout for the H3000 Main P.C. board. At the right rear of the Main P.C. there are 4 sockets. U250, U251, U252 and U253 are all sockets available for H3000 program EPROMs. Take note of the EPROM labels in your machine then follow the appropriate step below.

    If you have version 2.11 or 2.13 EPROMs the SAMPLER/512 EPROM provided in the kit can be directly installed in any one of the 4 sockets (U250, U251, U252 or U253) that may be unoccupied.

    If you have H3000-SE EPROMs use the SAMPLER/512 EPROM from the kit (install it in any one of the 4 sockets mentioned which is unoccupied) but refer to the note on the first page "Before beginning".

    If you have an H3000-S version 2.16 (with SROM1, SROM2, SROM3 and SROM4) use the SAMPLER/256 EPROM from the kit (again, install it in any of the unoccupied sockets).

    If you have an H3000-S version 1.53 refer to the note on the first page "Before beginning".

    If there are no empty sockets available, contact Eventide for further instructions.

    Installing the EPROM: IT IS VITAL THAT THE EPROM BE INSTALLED WITH THE NOTCH AS SHOWN, i.e., to the LEFT. Installing it backwards will destroy it when power is applied. DO NOT RELY ON THE LABEL BEING ON CORRECTLY! LOOK FOR THE NOTCH. The socket has more pins than the EPROM; the EPROM should be placed all the way to the right with 4 empty socket holes on the left, to the left of the notch.

13. Carefully inspect your work for shorts and soldering quality. Be sure that all pins of the EPROM are inserted fully and none are bent underneath the body of the component.

14. This step involves the mechanical assembly of the HS322. If your H3000 has a Tape Speed Controller board mounted underneath the Main P.C. board use the

directions from step #16. With no Tape Speed Controller proceed with this step. The HS322 Sampler Board should arrive with the insulating paper attached to the solder side of the board by the screws, washers and standoffs. The 40 pin, ribbon connector should be plugged into the HS322 already so begin by plugging the other end into the J14 connector that you installed in step #3. Make certain that the notch is aligned properly and the connectors are pressed firmly in.

15. Insert the male ends of the 4 standoffs into the appropriate holes on the Main P.C. board. On the standoff closest to the H3000's front panel power switch, insert the nylon washer between the standoff and the Main ciruit board. On the remaining three standoffs use metal lockwashers. Secure each standoff with a nut on the underside of the main P.C. board. Tighten the nuts with a nutdriver. Now, skip to step #19.

16. If a Tape Speed Controller board is already installed in the H3000 remove the 4 screws and washers from the top of the Main P.C. that hold it into place. These won't be needed anymore. Remove the Tape Speed board and take off it's 4 female standoffs by unscrewing the 4 screws from the component side of the Tape Speed board. These standoffs will be used to secure the HS322 board in place in the same holes that the Tape Speed board used.

17. One end of the 40 pin ribbon connector already should be plugged into the HS322. Plug the other end into the J14 connector that you installed in step #3. Make certain that the notch is aligned properly and the connectors are pressed firmly in.

18. Insert the 4 male ends of the HS322 board's standoffs into the appropriate holes on the Main P.C. board. On the standoff closest to the H3000's front panel power switch, insert the nylon washer between the standoff and the Main ciruit board. On the remaining three standoffs use metal lockwashers. Secure each of the male standoffs of the HS322 with the female standoffs that were removed earlier. The female standoffs should be attached on the underside the main P.C. board and tightened with a nutdriver. Then, re-install the Tape Speed board from the bottom with the 4 screws that were removed.

Important

Please make sure that the standoffs and washers have been installed correctly and are fastened securely to the main circuit board of the H3000. The three metal lockwashers are needed to insure an adequate electrical ground connection between the HS322 and the H3000. If these are improperly or loosely fastened, the HS322 will not function correctly. In addition, make sure that the standoff closest to the power switch of the H3000 is separated from the main circuit board with a nylon washer. Again, this is vital for the proper functioning of the HS322.

19. Check the mechanical assembly completely for loose or missing parts. If all seems well, it's time to turn the H3000 on and test the Sampler. Plug the AC power cord into the back and turn the unit on. The standard H3000 welcome message should appear on the display and the last program loaded should appear. Press the Program button and scroll through the program list until program #120 "Studio Sampler" appears and press the "Load" key. If all goes well up to this point the installation has most likely been successful. Trying the program out requires a bit of knowledge of the operation. Read the program description that came with the HS322 for further information.

20. At this point the top and bottom covers can be reattached with the sheet metal and machine screws removed earlier (remember their location?) and the installation considered finished.

21. If you have a problem, carefully recheck your work. If you cannot resolve the problem, you will have to return your unit to Eventide. Please refer to the "Warning" letter.

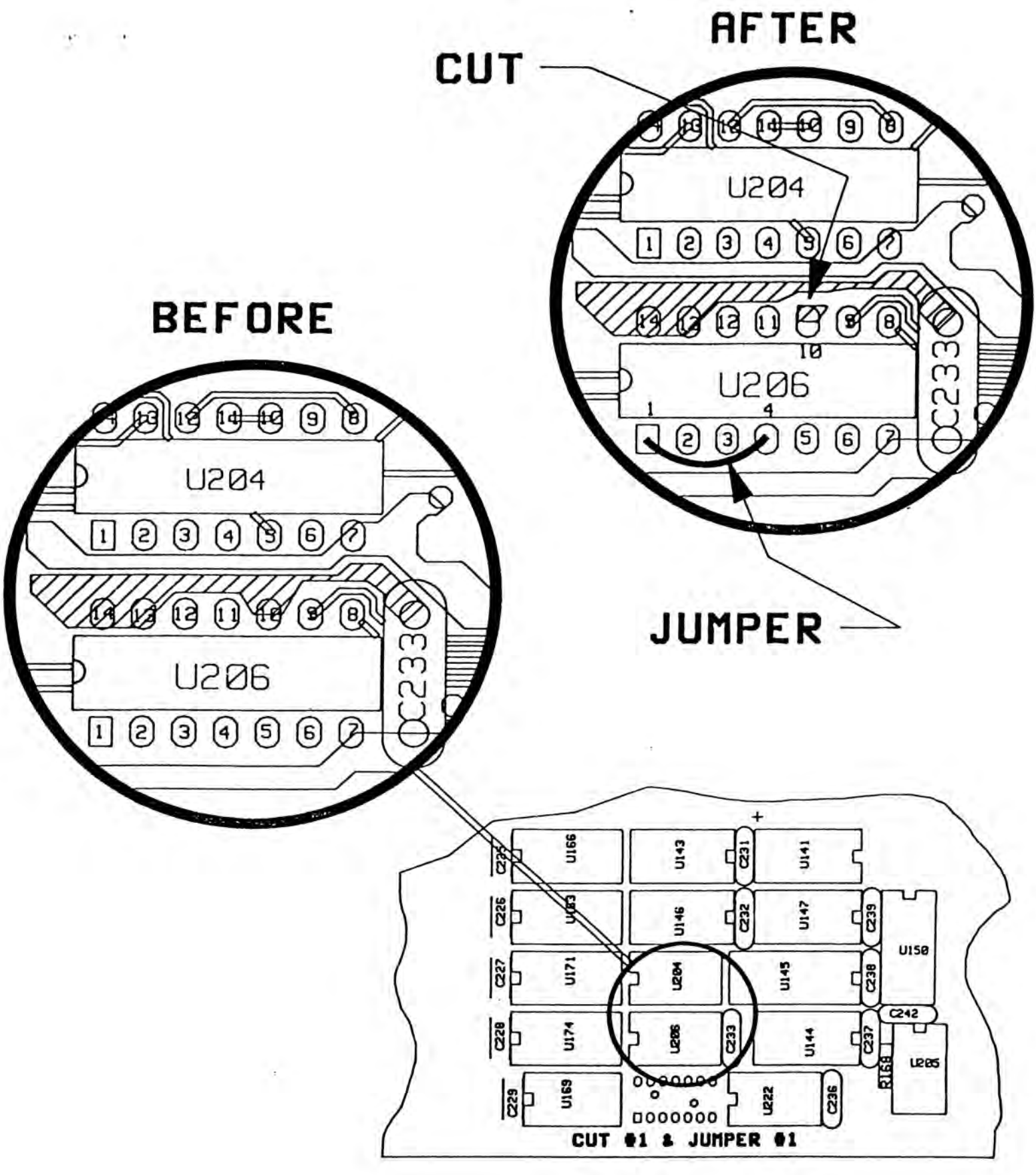

AFTER
CUT
BEFORE
U204
U206
OC233
JUMPER
U166
U143
U141
U146
U147
U150
U171
U145
U174
U144
U169
U222
U205
C231
C232
C233
C236
C237
C238
C239
C242
CUT #1 & JUMPER #1

FIGURE #1

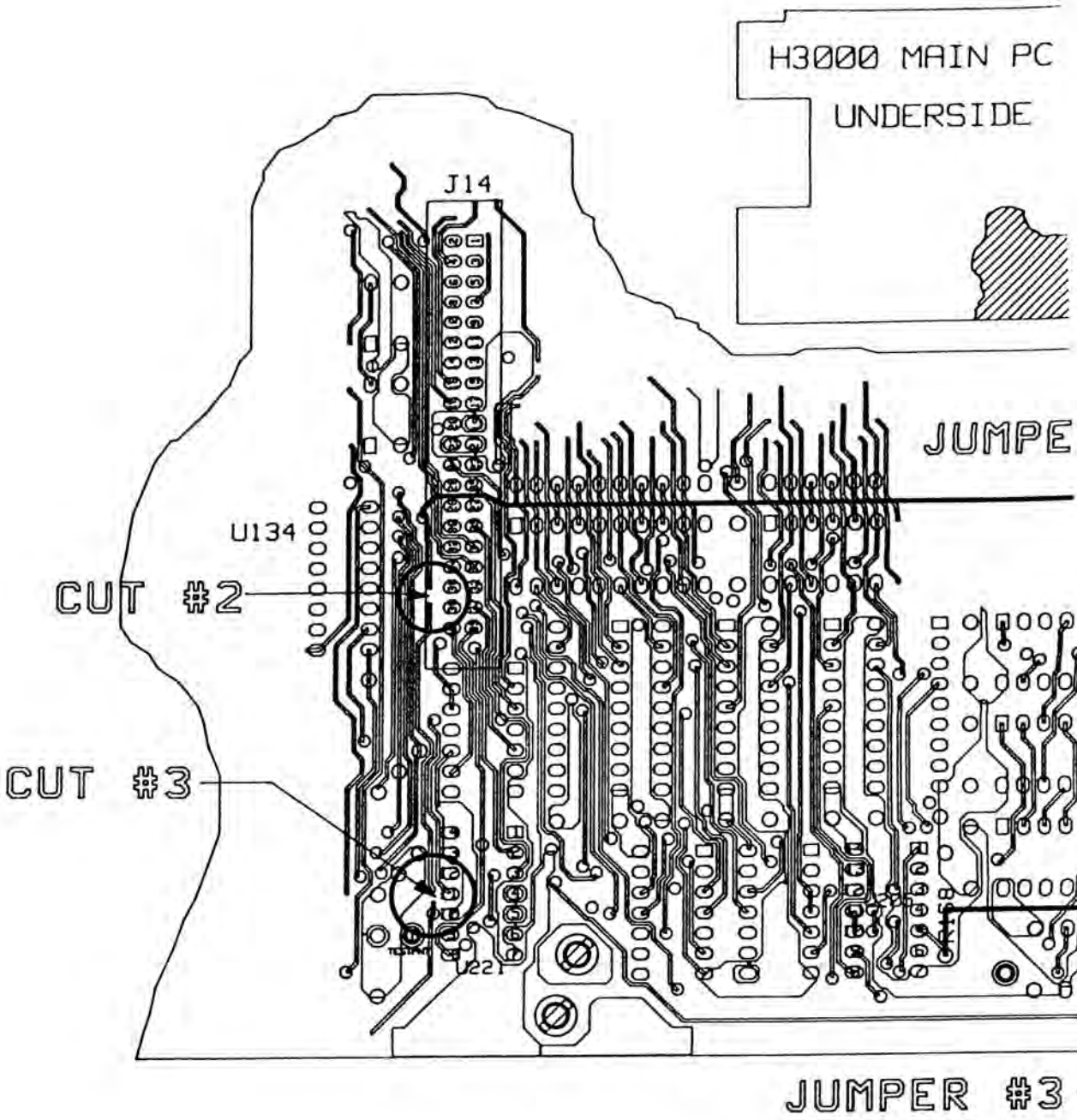
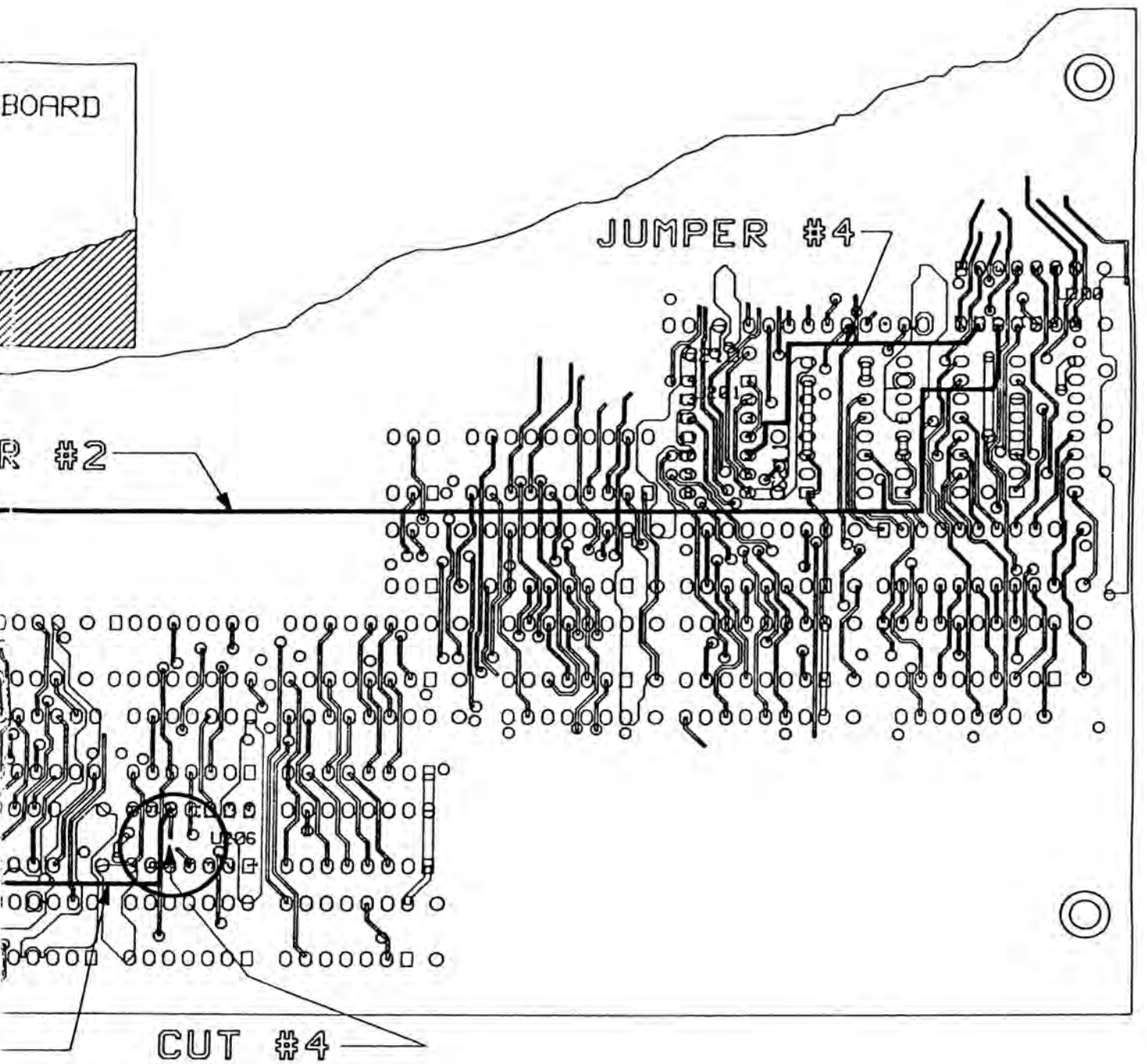

H3000 MAIN PC
UNDERSIDE
J14
JUMPE
U134
CUT #2
CUT #3
J22
JUMPER #3

FIGURE #



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