Rebis Audio Ltd. RA226 Digital Sampler User Guide

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CAUTION

The Rebis RA226 Digital Sampler contains Static Sensitive devices. Handle only by the front panel unless in a suitable anti-static environment.

Store in the conductive plastic bag supplied until installed in a Rebis rack frame.

POWERING UP

When the RA226 is used with the Rebis Modular Rack Mount power supply and a selection of other modules in the same rack the power button on the power supply has to be pressed twice quickly to achieve the full 40V required to drive the RA226.

The LED on the power supply will be bright when the output is correct.

CONTROLS:

LEDS: Indicate signal level at the input to the digital section.
Red LED indicates overload.

INPUT: Adjusts the input gain of the unit. (up to +20dBm)

MIX: Output blend control sets a balance between input and output.

FEEDBK: Sets the amount of output signal fed back to the input to control the number of repeats in delay mode.

PITCH: In playback mode varies the pitch of the sample. Also sets both the maximum sample and delay time and the bandwidth of the processed signal.

START: Used to set the beginning point of the sample both in record and playback modes**.**

END: Used to set the end point of the sample in record and playback and the range and length of the delay time.

DELAY: Selects the echo mode ofoperation.On pushing this button either 2 Seconds or full delay range is selected depending on the position of the END control. The associated LED indicates when delay mode is selected.

REC: Selects the sample mode of operation. When pushed it's associated LED starts flashing indicating that the unit is waiting for an input over a preset threshold level. On receiving a signal over this level the LED illuminates continuously and the input signal is recorded into the section of memory defined by the positions of the START and END controls.

LOOP: Joins the start and end of the sample to form a continuous loop. Pushing a second time deselects the option.

LATCH: Changes play buttons from momentary to latching action. Pushing a second time deselects the option.

REV: This button starts or stops the sample playing in the reverse direction. It's LED illuminates while the sample is being played in reverse.

FWD: This button starts or stops the sample playing in the forward direction. It's LED illuminates while the sample is being played forwards.

PITCH:

Bandwidth on the unit is variable and can be traded off against available recording time using the Pitch control. This control has the same effect as the speed control on a tape machine, if it is used after a recording has been made then it directly varies the pitch of the sound when played back. The C.V. input to the module when used takes over control of this function so that samples can be played musically using any keyboard which has a C.V. output. The front panel control acts a fine tune when the C.V. input is being used.

When recording samples the Pitch control or C.V. if connected still operate so these controls must be set to the centre of the required range (by playing a suitable note on the keyboard with C.V.) if the full pitch range is required on playback. If full bandwidth and a lower pitch range is required then this control should be set nearer the clockwise end (higher up the keyboard with C.V.).

Detailed Description of Operation

Input Level Set:

To obtain the best results with the RA226 it is essential to set the input level accurately. This is adjusted with the input Level control and correct operation is obtained when all three green LEDs are on for most of the time with the red LED only flashing occasionally.

Recording:

Recording samples on the RA226 is made easy by an automatic record function which is set internally at a preset threshold level of -20dBm. Pushing the Record button starts the Record LED flashing and the unit waiting for a suitable input level. When an input is detected which is above the internal threshold level then the input signal is recorded into a section memory defined by the positions of the Start and End controls.

While the signal is being recorded the Record LED stays on continuously and when the section of memory is full the sample just recorded is played back forwards, indicated by the FWD LED coming on.

Pushing either the Loop or Latch buttons will stop this automatic playback if required.

Sampling:

The simplest way to get a feel for how to operated the unit as a sampler is to record a full length sample of speech into the unit and then play it back in all the different modes. To do this set the Start control fully anti- clockwise, the End control fully clockwise, the Pitch control to +.5 oct, the Mix control central and the Feedback control anticlockwise. Connect the unit to the insert points of a microphone channel and set the Level control to obtain the correct reading on the LEDs while speaking into the microphone. Now push the Record button and talk for eight seconds.

The unit will playback the sample auto- matically when it has finished recording. You can now experiment with the different play modes and Start and End edit controls as described in the Introduction section

of this manual. In addition you can try varying the pitch of the sample whilst in playback with the Pitch control.

Sampling: (cont)

Samples can be recorded into any part of memory by setting the Start and End controls to define the section before pushing the Record button**,** but make sure that the End control is set more clockwise than the Start control.

Multiple Samples:

Multiple samples can be recorded into memory by adjusting the Start and End controls before recording each sample. These samples can then be played back independently by resetting the Start and End controls to the original settings before pushing the FWD button.

Samples can be 'dropped into' any section of an existing recording by defining the section beforehand with the Start and End controls.

A special remote control unit will soon be available which will allow up to eight user defined sections of memory to be played back instantly in either direction.

Editing:

All of the recorded material can be heard by setting the Start control fully anticlockwise, the End control fully clockwise and pushing the FWD button. Any recorded sample can be edited down to individual notes by the use of these same controls.

If the Start control is set later in memory than the End control when the sample is played then the whole of memory is played except the section between the controls. This is useful in editing out part of a sample which is not required.

Setting any controls or operating any buttons except Delay and Record will not permanently alter any sample in memory but merely select a different section to be played back. Feel free to experiment with the edit controls and playback modes described later, you cannot damage your sample, it will all still be in memory if you require it.

Playback:

There are four different playback modes which can be used in either direction and are defined by the state of the Loop and Latch switches in combination as follows:

1. Loop and Latch off.

The sample plays once only in the selected direction while the play button is held down. Pushing either play button at any time always starts the playback from the selected end.

2. Latch on.

The play buttons only have to be touched to start playback in the selected direction once only. Touching the opposite play button before the end of playback reverses playback from the point reached.

3. Loop on.

The sample is played for as long as the play buttons are held down in a continuous cyclic loop in the selected direction. The sample is played each time from the point last reached.

4. Latch and Loop on.

The play buttons only have to be touched to start continuous cyclic playback in the selected direction. Touching the same play button again stops the playback, touching it again restarts playback from the end selected. Touching the opposite play button whilst in playback reverses the playback from the point reached.

A few minutes experience with the RA226 audibly demonstrates that these play modes simply provide a vast range of sample effects.
the same as the maximum sample time and is dependant on the number of expansion boards installed.

Once the Delay button has been pushed and the Delay LED is on then the End control sets the actual delay time obtained as a percentage of whichever maximum time has been selected.

When the maximum delay time is 1.3 seconds the delay mode uses the last 1.3 seconds of memory only, any samples stored in memory up to this point will not be affected by using the Delay mode. However when the full delay time is selected all of memory is used and any samples will be lost.

Delay Mode:

The delay mode is selected with the Delay pushbutton and when pushed one of two maximum delay times are selected depending on the setting of the End control.

Before selecting this mode you should decide whether you require any more than 1.3 seconds delay (at 16kHz bandwidth), if you do then you must set the End control clockwise before pushing the Delay button. If 1.3 seconds is adequate set the End control anticlockwise and push the Delay button.

When the maximum delay time is 1.3 seconds the delay mode uses the last 1.3 seconds of memory only, any samples stored in memory up to this point will not be affected by using the Delay mode. However when the full delay time is selected all of memory is used and any samples will be lost.

The Mix control should be used to obtain the required blend of input and output signals. If an echo send line is being used to drive the unit then none of the input signal will normally be needed at the output and the Mix control can be turned fully clockwise. Alternately if the unit is wired into the insert points of a mixing console then the amount of echo mixed with the input will be controlled on the RA226 by setting the Mix control near it's centre.

The delay time is now variable with the End control from two milliseconds (anticlockwise) to the maximum time selected (clockwise).

The Feedback control is used to set the number of repeats, from one with it anticlockwise to almost an infinite number with it fully clockwise.

The Pitch control will set the bandwidth of the delayed signal and can be useful in making echoed signals sound more natural. This control also has an effect on the delay time and can be used as a fine tune if a particular time is required.

Operating Instructions (brief)

Record
1.Set MIX control midway.
2.Adjust INPUT control
(optimum level = +10db).
3.Set START to 0%.
4.Set END to 100%.
5.Set PITCH to +1.
6.Press RECord button.

RECord LED flashes while RA226 waits for input.
LED steady indicates RA226 is recording.

Sample will playback automatically when memory is full.

If sample is satisfactory turn MIX control to OP to disable input.

The automatic playback can be stopped if necessary by pressing LOOP or LATCH.

Playback

Momentary	- Press FWD or REV buttons for momentary playback.
One Shot	- Engage LATCH button first for single touch playback of entire sample.
Continuous Loop	- Engage both LOOP and LATCH buttons.
Step	- Engage LOOP button only to step through looped sample.

Editing

The START and END controls define which part of the recorded sample will be played.

1.Turn the START control CW to edit from the front of the sample.

2.Turn the END control ACW to edit from the end of the sample.

Swap the positions of these two controls to remove a "window" from the sample.

Note: START/END settings are scanned at the moment the sample starts to play therefore adjusting the END control while sample is playing will have no effect until next play.

To save time when editing long samples it is advisable to adjust the end point first. i.e.Set the START control a little before the required end point to save playing the whole sample.

It is also worth considering use of the REVerse and PITCH controls to assist precise editing.

Multiple Samples

The START and END controls can be adjusted prior to recording a sample to define the memory zone which it will occupy.

This facility can be used to reduce the time taken to record short samples. It also allows several samples to be stored in memory simultaneously and short samples to be inserted in longer ones.

Drop Ins

The RA226 can be switched in and out of record to perform orthodox drop ins.

1.Set mode, LATCH on, LOOP off.

2.Play sample with FWD button held down.

3.Press REC button and RA226 will start recording. (Both buttons can now be released).

4.Press REC button to drop out of record.

Pitch Shift

A sample recorded with the PITCH set to +1 can be transposed down through two octaves by rotating the PITCH control anti-clockwise before or during playback.

If playback at a higher pitch is required the sample must be recorded at a lower PITCH setting.

e.g.1 Record at PITCH 0 to allow playback to be transposed through one octave up or down.

e.g.2 Record at PITCH -1 to allow playback to be transposed up through two octaves.

Using the PITCH control will have an effect on the bandwidth of recordings. See table 1.

Sample length

Sample length can be increased by up to 400% by using a lower PITCH setting when recording. This will result in a proportional reduction in bandwidth. Extra memory cards, RAM5S, can be installed to increase storage capacity to a maximum of 22 seconds @ 16kHz (88 seconds @ 4kHz).

These cards can be switched out at times when finer edit resolution is required. See Memory Expansion.

Bandwidth

The effect of the PITCH control on storage time and bandwidth are;

PITCH CW	5.5 Seconds @16kHz
PITCH Centre	11 Seconds @ 8kHz
PITCH ACW	22 Seconds @ 4kHz

Delay/Echo

To enter delay mode set START control to 0%, MIX control to IP, and press DELAY. With the PITCH control set to +1 the RA226 will now provide up to 1.4 seconds delay at 16kHz bandwidth. The END control adjusts delay length and repeat echo can be introduced with the FEED-BACK control.

The dry signal can be removed by turning the MIX control to OP.

In this mode only the last 1.4 seconds of memory is used, so samples stored in the rest of memory will not be erased.

If you wish to use the entire memory, set the START control to 100% before selecting DELAY.

Phasing/Tube effects

Set MIX control midway
Adjust INPUT control
Set START control to 0%
Set END control to 0%
Press DELAY
Manual phasing can now be created with the PITCH control.
Turn MIX control to IP
Add FEEDBACK
PITCH control now gives resonant tube effect.

Both these effects can be controlled musically by using a CV keyboard instead of the PITCH control.

Keyboard Control

Any keyboard or sequencer equipped with a 1 volt per octave CV and gate outputs can be used for musical control of samples.

When the keyboard is connected it takes over the role of the PITCH control during recording as well as playback.

The last key pressed before recording will define the PITCH setting. This key will be the reference point for play back of the sample from the keyboard. (Refer to Pitch Shift section). The PITCH control itself now acts as a fine tune control.

Audio Trigger

Samples can be synchronously triggered by an external audio source by feeding signal to one of the audio trigger inputs.

If the track being used to trigger the sample contains excessive cross-talk it should first be gated using a frequency conscious gate such as the Rebis RA224.

Audio trigger input 1 operates like the FWD play button, and obeys the LOOP & LATCH mode settings.

Audio trigger input 2 plays all the edited sample and will not retrigger until the sample has finished playing. Thus a sample lasting for 2 bars can be triggered from a snare drum playing 4 to the bar.

Remote Trigger

* Play : Connect to FWD or REV play switch remotes as required.
* +5V : Available on Pin 4 of outer card.

INSTALLATION

Handling

There is a slight risk of damage to some of the devices in the RA226 in areas prone to high static build up. To eliminate this risk it is advisable to take a few simple precautions when handling the module.

1.The RA226 is supplied in a conductive plastic bag. Do not remove it from the bag until you are ready to install it in the rack frame.
2.Make sure that the rack frame is securely connected to mains earth.
3.Immediately before handling the module touch something which you know is connected to mains earth to discharge any static build up.
4.Always make sure that the power to the rack frame is disconnected before inserting or removing the module.
5.Always return the module to its conductive plastic bag if it has to be removed from the rack - especially if repacking unit for shipping.

Audio connections

Screened cable should be used for signal connections, the screens being connected to 0 volts at the edge connector only for the inputs and at the jackfield only for the output.

A separate wire should join the Rack 0 volts to the main jackfield 0 volts.

Phono Rack

When the RA226 is plugged into a RA14RP phono type rack frame its input and output will appear on the phono sockets behind the left hand module slot. Before inserting the RA226 check the PCB on the rear of the rack, earlier models have a track link between pins 5 and 6 on each slot and pin 8s on each pair. These links must be broken before the RA226 is installed.

If other connections to the RA226 are required then the racks rear connector board can be suitably modified by your Rebis dealer or a qualified engineer.

Earthing

When installing the module in a Rebis Rack Frame ensure that it is firmly screwed in and that the rack is earthed, as it is essential both for safety and screening that the front panel is ultimately connected to mains earth.

Memory Expansion

RAM5S memory expansion cards are simply installed by removing the screening plate, plugging the new card into the existing memory card and securing it with the two screws provided. The double switch located on the bottom edge of the central PCB should then be adjusted as follows;

Standard Module - 1 ON 2 ON
Plus one expansion card - 1 OFF 2 ON
Plus two expansion cards - 1 ON 2 OFF
Plus three expansion cards - 1 OFF 2 OFF

On occasions when finer edit resolution is required memory cards can be bypassed using the above settings.

Remote Control

Most of the functions of the RA226 can be quite simply remote controlled as shown in the connection diagram.

To enable remote control of the START/END functions the switches located on the rear edge of the outer PCB should both be switched off. Important: These switches disable the front panel START/END controls.

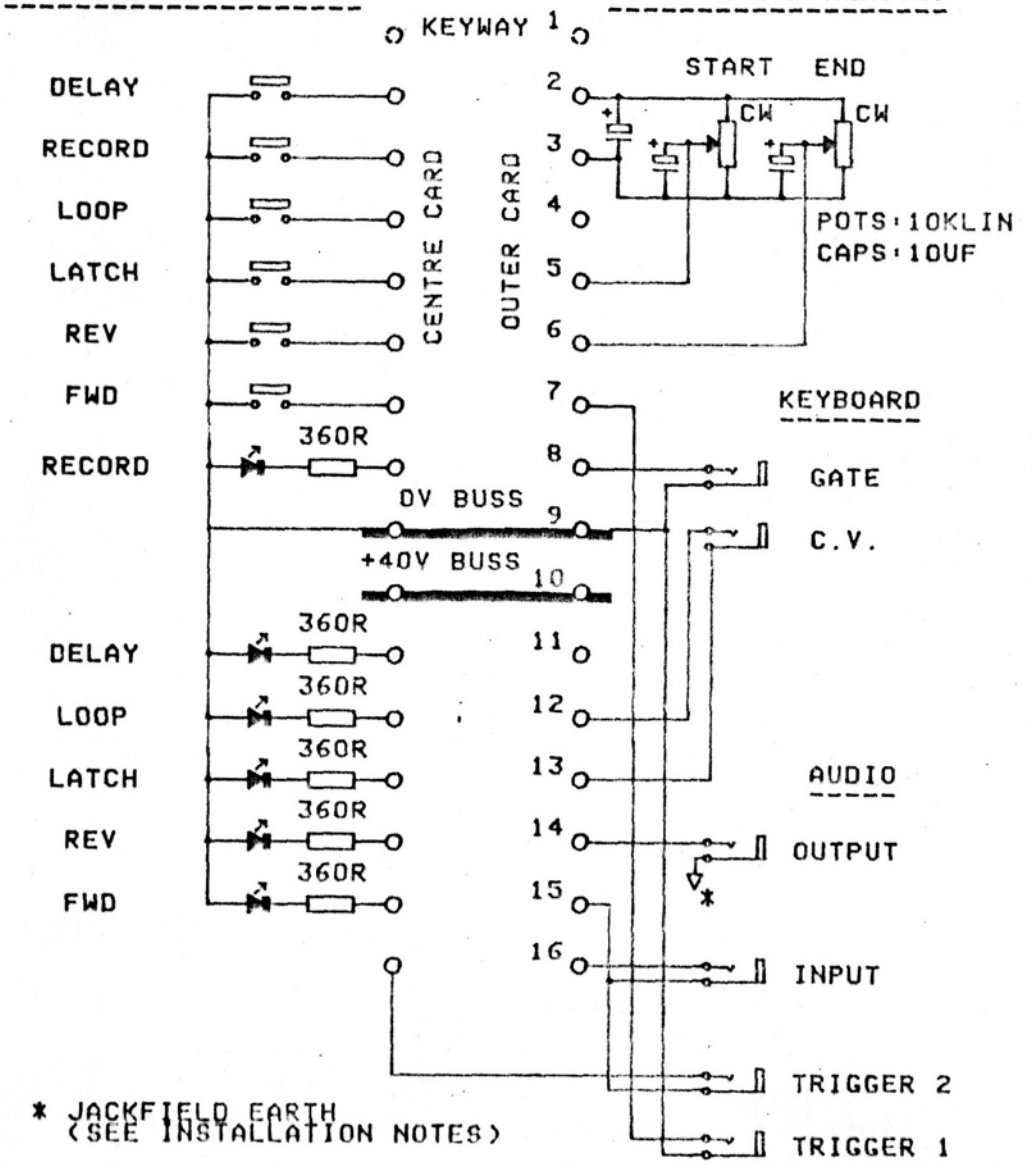
Rack Mount Power Supply

When the RA226 is used with the Rebis Modular Rack Mount power supply and a selection of other modules in the same rack the power button on the power supply has to be pressed twice quickly to achieve the full 40V required to drive the RA226.

This is due to the surge current limiter built into the regulator and is not a fault.

CONNECTION DIAGRAM

Note: Optional wiring shown for remotes, keyboard and audio trigger is not essential for basic sampler operation.



PIN CONNECTIONS

Connector 1 (analogue board, outer PCB)

1) Keyway slot
2) +5 volts out for pots
3) 0 volts out for pots
4) +5 volts out for remote
5) START pot in from remote
6) END pot in from remote
7) Audio trigger input 1
8) keyboard gate in
9) Main 0 volts
10) +40 volts in
11) Clock out to remote
12) C.V. in
13) C.V. screen
14) Audio output
15) Input screen
16) Audio input

Connector 2 (digital board, centre PCB)

1) Keyway slot
2) DELAY switch remote
3) RECORD " "
4) LOOP " "
5) LATCH " "
6) REV " "
7) FWD " "
8) RECORD LED remote
9) Spare
10) "
11) DELAY LED remote
12) LOOP " "
13) LATCH " "
14) REV " "
15) FWD " "
16) Audio trigger input 2

SPECIFICATIONS

Maximum Input level: +20dBm

Maximum Output level: +20dBm into 600 ohms

Input Impedance: 100 kilohms

Output Impedance: Less than 50 ohms

Control Voltage Range (CV): 0.5V to 2.5V

Frequency Response: L.F. -2dB @ 20Hz,
H.F. Variable between
-3dB @ 16kHz @ 5.5 Secs and
-3dB @ 4kHz @ 22 Secs

Distortion: Less than 0.2% THD @ 1kHz @ +10dBm

Dynamic Range: 85dBm

Delay/Storage Time: Variable between 5.5 and 22 seconds. Expandable to between 22 and 88 seconds with three RAM5S expansion boards.

Trigger Input: Audio input for FWD play

Power Requirements: +40 volts @ 175mA standard, 250mA with three expansion boards (RAM5S)

Dimensions: 5.25" x 2" x 7.9" behind front panel