

### JOIN

This page (accessed by pressing the **JOIN** button from the TRIM page) allows cutting, mixing or joining samples or parts of samples to each other. If the mood takes you, it is possible to join a chord from a Beethoven symphony onto the end of a reversed cymbal sample. Other, more practical, examples will no doubt suggest themselves.

The samples to be joined together are known here as A and B, and the resulting JOINed sample is called J. Though A and B can be the same sample, the resulting (J) sample cannot be the same as either A or B. Press **NAME** to enter a new sample name for J. Existing samples can be overwritten and therefore can be used for J.

As mentioned earlier, this page has three basic functions: to copy a part of a sample to another sample (**A->J**), to splice a sample (or part of a sample) to another sample (**SPLI**) or to mix two samples (or parts of samples) together (**MIX**). In addition, other pages can be accessed using the other soft keys (**SLCT**, **TRIM**, **LOOP** and **ED.2**).

The principles behind these three operations are similar, and so the operations common to all of them will be described together.

Select the A and B samples, using the DATA knob or the **+/\*** and **-/\*** buttons. You must then choose a name for the J sample. This can either be the name of an existing, unwanted sample, or you can enter a new name using the **NAME** button.

Now you should select the portions of the A and B samples which are to be combined ("first" and "last"). You may want to splice the attack portion of A to the sustain portion of B, or mix parts of two samples together. If you want to hear exactly what part of a sample you are going to use, you can set the first and last points of A, and then press **A->J** so that only the relevant part of A will be played when you press the **ENT/PLAY** button (you can overwrite J later, and you've done no permanent damage to A if you get things wrong).

Notice how the figures at the bottom alter as the lengths of samples A and B are changed. The figure before the "spli" is the total length of the selected portions of the two samples (minus the X-fade length — see below), and the figure before the "mix" is the length of the longest sample portion to be included.

**X-fade over** To avoid a sharp break in sounds when you splice (**SPLI**) them together, one sound can be faded into another for a certain number of samples. The crossfading will start before the "last" point of A, the time at which crossfading starts depending on the number of samples set in this field. Crossfading has no effect, of course, on mixing samples together.

<b>JOIN</b>	A then B --> J			Free: 360000= 34%
		first	last	scale
A:	SYNTOM 1	233	22557	+00db
B:	CLAP	1044	28412	+00db
J:	SYNCLAP	.X-fade over:		7089
	- new name -	42836	spli	27368 mix
<b>SLCT</b> <b>TRIM</b> <b>LOOP</b> <b>JOIN</b> <b>ED.2</b> <b>A-&gt;J</b> <b>SPLI</b> <b>MIX</b>				



### J (joined sample)

*This is an example of two samples being spliced together with no crossfading. There will be a sudden jump in the sound at the splicing point.*



### J (joined sample)

*In this example, two samples are spliced together using crossfading to make a smooth join between samples.*

You can adjust the relative volumes of A and B by  $\pm 25\text{dB}$ , using the "scale" parameters. However, if you put these too high, you may get a distorted sound, so use these with care.

When you've set up the start and end points for both samples, you can **MIX** them together or splice them (**SPLI**). Press the appropriate button. If sample J already contains data, you will be asked if you want to overwrite it (**GO** or **ABORT**). Now wait, as the process will take a few seconds (depending on the length of the samples, and the amount of crossfading). When the operation is complete, you can listen to the new sound by pressing the **ENT/PLAY** button. If you're happy with the new sound, save it to disk, otherwise carry on joining and mixing till you get the sound you want.

Of course, any loops which were present in the original samples (A and B) will not be played back when you play back J. You must reset loops in J if you want them.

Though the process of creating the sound you want may take some time, it's possible you may discover some new sounds along the way which weren't quite what you were expecting, but could find a place in later compositions.

### ED.2

The ED.2 page (accessed from the EDIT SAMPLE SLCT or JOIN page) allows you to perform some further sophisticated editing functions. On the PARAMETERS page (the first one you access when you press the **ED.2** button), the first parameter is the name of the sample you want to edit. This may be changed with the DATA knob or the **+/-** and **-/+** buttons.

The next parameter allows you to alter the original pitch at which the sample was recorded, so that when you replay it on the keyboard, it will come out at the correct pitch. Further fine tuning (in semitones and cents) can be done with the next parameter.

The next parameter determines the way in which the sample will be played back. There are four options available here.

The first is **LOOP IN RELEASE**. This means that when a key is pressed, the sample will play through all the loops until the first **HOLD** loop is reached. When the key is released, the **HOLD** loop will continue to play as the release falls away.

**LOOP UNTIL RELEASE** is slightly different. Again, the sample will play, with all loops, until the first **HOLD** loop is reached. However, when the key is released, the loop will end, and the remaining portion of the sample (if any) will be played. This is a useful setting for sounds which have a definite attack, an indefinite sustain period (set with the loop), and a definite release characteristic.

The next setting, **NO LOOPING**, does what its name suggests — it plays the sample through without loops for as long as the key is held down. As soon as the key is released, the sound will start to decay.

**PLAY TO SAMPLE END** is useful for drum trigger units such as the ME-35T and the like. Like the previous setting, no loops are played, but an instantaneous trigger signal or key press will play the whole of the sample (the key does not have to be pressed for the whole length of the sample).

The last parameter, "loop tune offset" allows you set a pitch shift for a **HOLD** loop by  $\pm 50$  cents (one semitone). This shift will only occur once on the first occurrence of the loop. Subsequent loops will be replayed at the shifted pitch of the first loop, *ie* this tuning offset is not an incremental process.

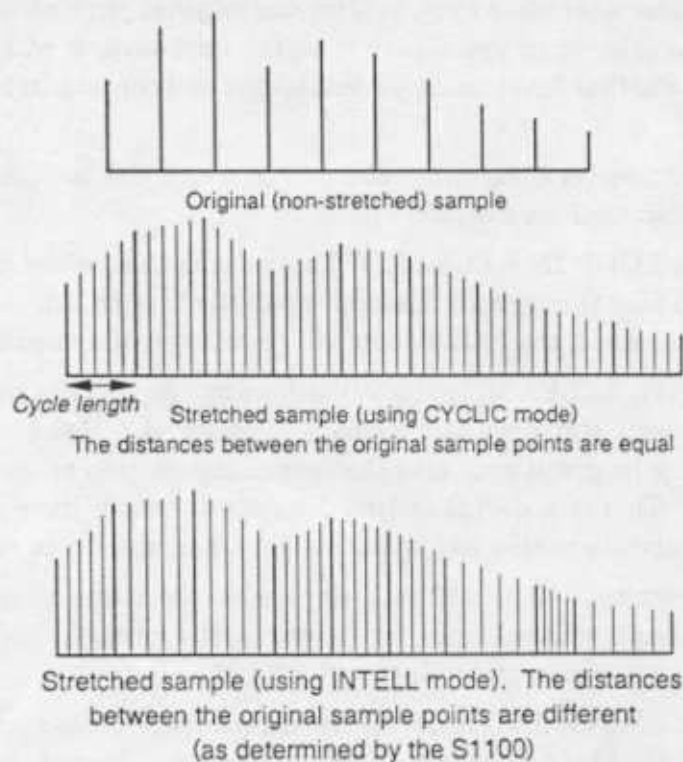
There is one "action" button — **REV**. When this soft key is pressed, the sample will be reversed. Pressing **REV** again will reverse the sample back to its original form. Note that any loop points you have set will stay in the same absolute positions, and will not be reversed with the sample.

### TIME

Pressing the **TIME** button from the ED.2 page enters the **TIME-STRETCH** page. This enables you to lengthen or shorten a sample or a selected part of a sample from 25% of its original length to 2000% (twenty times). Since this operation can take a lot of memory, it's as well to delete unwanted samples from memory (after you've made sure that they're saved to disk).

Uses for time-stretching include: altering the length of a sampled rhythm passage to fit in with the rest of the track without altering the pitch, maintaining the same vibrato speed for a number of "multi-samples" created from one original sample, and fitting sound effects, vocal phrases, etc to video soundtracks for precise timing. Two modes are available for stretching: **CYCLIC**, in which a fixed interpolation rate is maintained throughout the whole of the sample (suitable for individual instrument samples), and **INTELL**, in which the S1100 "intelligently" varies the interpolation rate according to the sample content (suitable for speech and music).

## Sampler functions



Select the sample to be stretched on the top line of the page, and then move down a line to select the part of the sample that you want stretched ("stretch zone" and "to").

When you have selected the part of the sample to be stretched, you can listen to this part of the sample by pressing the **[ZONE]** button. This will replay this part of the sample stretched at the set cycle length (but only if you are using CYCLIC mode).

Since you cannot stretch a sample to itself, you must find another name for the new sample. Use the **[NAME]** button to enter a new sample name. You can use an existing sample name for this (but make sure that you don't want this sample any more, or you have a copy saved to disk).

There are two ways in which you can stretch a sample ("stretch mode") — either by picking a fixed cycle time at which the S1100 will stretch (CYCLIC), or by allowing the S1100 to make its own decisions as it proceeds with the stretching (INTELL). Be warned, though — although the intelligent mode will produce better results, the time taken for this operation is much longer than when the CYCLIC mode (up to several minutes).

If you decide to use the CYCLIC mode, you can set the cycle length (in samples) in the "Cycle length" field. The soft key **[autC]** can be used to help you find the right sample length. As with autolooping, the S1100 applies software logic to the sample to calculate what it believes is the right answer. Again, like autolooping, what the S1100 calculates will often help you, but it is not always infallible.



The next parameter to set up is the time factor by which the original sample is to be stretched (from 25% to 2000%). As this is altered, the length and time of the new stretched sample (and the percentage of memory it will occupy) are displayed. Make sure that these figures do not exceed the amount of memory available. These figures also vary, of course, according to the length of the portion of the original sample which is to be stretched.

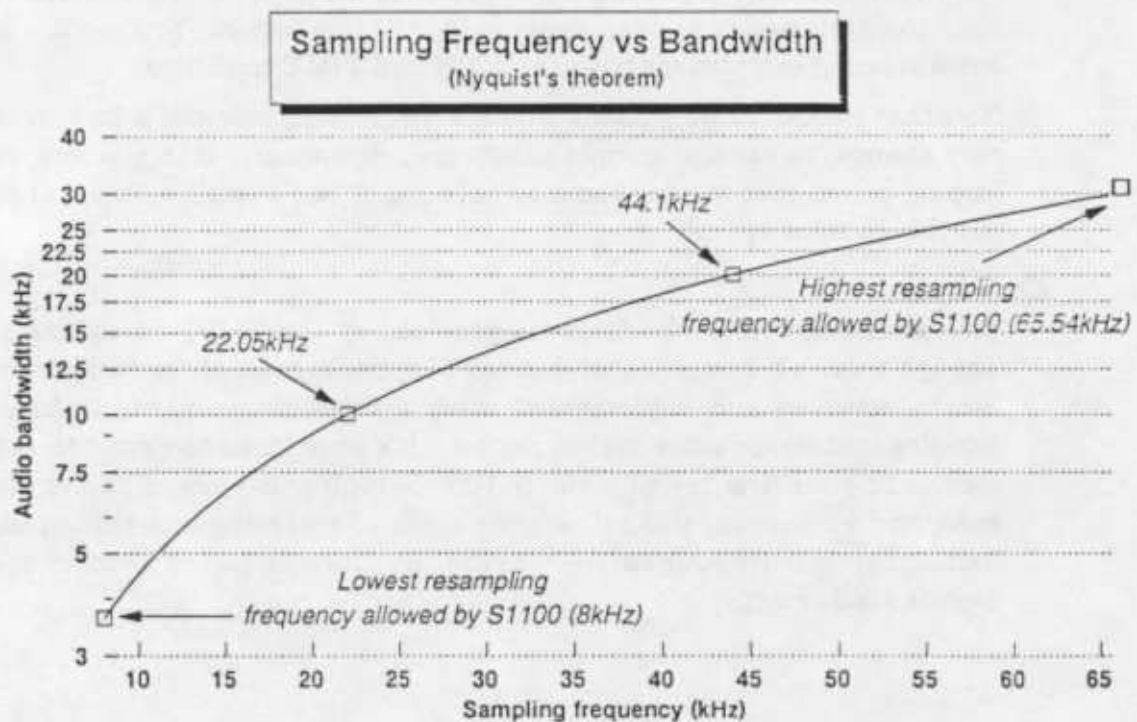
The "quality" (the time that the S1100 spends determining cycle lengths) and the "width" of stretch crossfading in the final stretched sample may also be altered from 01 to 99. This only applies to the INTELL mode.

When you are ready, press **GO**. You can abort the operation by holding down **FB**, for a few seconds, otherwise the process may take a few minutes (depending on the length of the sample being stretched). The display will display a message showing that the time-stretch is in progress, and will also show you how much processing time remains before finishing.

When the sample has been stretched, the "in progress" message will be replaced by the soft key legends, and you can replay the stretched sample with the **PLAY** soft key. Pressing the **ENT/PLAY** key will replay the original sample — not the stretched sample. If you are happy with the sound of the stretched sample, you can proceed to edit, trim and loop it, just as if it was a freshly-recorded sample.

### Re-sampling

From the ED.2 or TIME page, press **RATE** in order to enter the re-sampling page. In this page, the existing samples are resampled at a lower rate in order to conserve memory space (or they can be sampled at a higher rate, though there's little practical use for this!).



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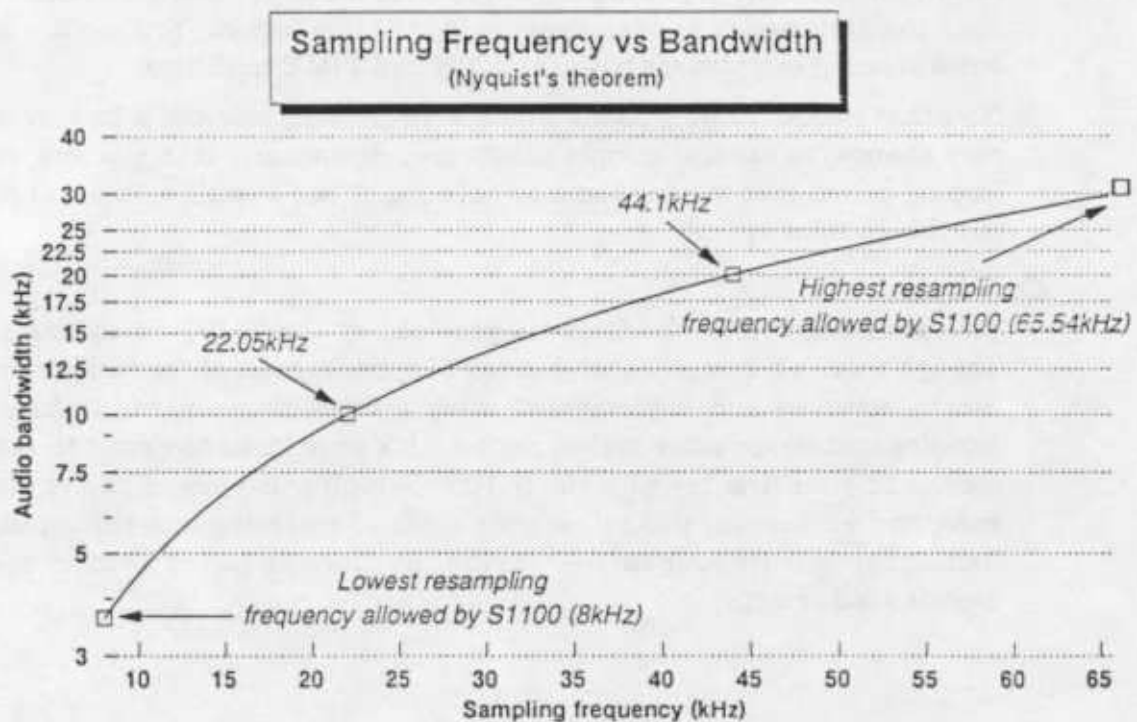
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## Sampler functions

First select the sample to be re-sampled using the DATA knob or the  $\boxed{+/\rightarrow}$  and  $\boxed{-/\leftarrow}$  buttons. You cannot resample a sample to itself, so you must give the resampled data a new name, using the  $\boxed{\text{NAME}}$  button.

Next, select the new rate at which resampling is to be done. The default value is one-half of the original sample rate, for example, a sample made at 44100Hz will have the default value set to 22050Hz. If you adjust this value, ("new sample rate"), the fields below this will change: the length of the new sample, together with the amount of memory space it will take up, and the amount by which the new sample will be detuned, relative to the old sample ("tune offset"). By simple mathematics, you can work out that if a sample is resampled at half the frequency of the original, but the original time of the sample is maintained, there will only be half as many sample points as before, and the overall pitch will be dropped by one octave.

In addition to the new sampling frequency, a filter can be chosen to prevent aliasing or "glitching" in the new sample. There is a choice of four different filter types (Filter 1 being the highest-frequency filter, and Filter 4 being the lowest-frequency), in addition to an "autoF" facility, which lets the S1100 pick the most appropriate filter for the resampling being done.

Two specially-configured soft keys,  $\boxed{3/4}$  and  $\boxed{2/3}$ , allow you to resample at 0.75 or 0.67 of the original sample rate. These will drop the pitch by 5 or 7 semitones respectively. Simply press either of these soft keys in order to perform resampling at these rates.

If you are not using these pre-defined resampling rates, press  $\boxed{\text{GO}}$ . After a while, the "re-sampling in progress" message will disappear, and you can press the  $\boxed{\text{PLAY}}$  soft key to listen to the resampled sound (pressing  $\boxed{\text{ENT/PLAY}}$  will give you the original sound). If you are not happy with the new, resampled sound, you can alter the parameters and try again using the  $\boxed{\text{GO}}$  button. You can always overwrite existing samples (as with the JOIN and TIME facilities).

Note that smooth looping points which were carefully selected prior to resampling may change, as critical sample points may disappear. If this occurs, reset the looping points (but moving them by only one or two sample points will generally put things right again).

### Conclusion

This ends the tour of the facilities provided by the S1100 for editing samples. Though there's a comprehensive array of options, most of the facilities provided can be accessed and implemented using a little common-sense. As with any complex system, practice makes perfect. It's unrealistic to expect to get perfect results on your first try with the S1100. Sampling is more of an art than a science, and experience will refine your skills of recording and editing sampling. Remember to trust your ears — they're the ultimate test of whether something sounds good or not.

## EDIT PROG

When you press the **EDIT PROG** button, you are now in the PROGRAM EDIT main page. This is where you set up the way in which the samples you have recorded, trimmed, looped, etc, will be replayed from a keyboard or other MIDI controller.

<b>PROGRAM EDIT</b>	PROGRAM: <b>EST PROGRAM</b>	0%
name: TEST PROGRAM	keygroups: 1	
*existing prog*	samples: 4	
(REN to rename)	(DEL to delete)	
(COPY for new prog)	Progs in mem: 2	
	free mem: 34%	
SLCT	<b>KGRP</b>	<b>MIDI</b> <b>OUT</b> <b>PTCH</b> <b>COPY</b> <b>REN</b> <b>DEL</b>

You can set layer samples, create velocity splits, keyboard splits, and assign envelopes and filtering to the basic sounds. In some ways, you can treat this section as if the S1100 were a multi-timbral synthesizer module, except that the waveforms you use are not preset, but are digital samples.

The first page of the EDIT PROG section allows you to change only one parameter — the program which is to be edited. However, you can use the **NAME** button to enter a new name and then copy or rename (**COPY** or **REN**) the program to this new name. You can also delete the selected program (**DEL**). Once you have selected the program you will be working on, the next stage is to edit the keygroups (**KGRP**).

### Keygroups

As explained in the Glossary, keygroups are the way in which samples are combined and parameters assigned so that they can be played from a keyboard. When you press the **KGRP** button from the initial EDIT PROG page, the KEYGROUPS page will be displayed.

Up to 99 keygroups can be assigned to a program. The first parameter on this page allows you to decide which keygroup will be edited. This number cannot, of course, be greater than the number of keygroups which are currently assigned to the program. This number is displayed directly below the number of the keygroup to be edited.

Another way to select a keygroup for editing is to press and hold down the **EDIT PROG** button. While holding down the button, press the key on the MIDI keyboard which will play the keygroup you want to edit. This will automatically select the keygroup. If the key plays more than one keygroup, the first keygroup will be selected, and successive presses of the key will cycle through all appropriate keygroups. This method of holding down the **EDIT PROG** button and pressing a key works for all sub-pages in the KEYGROUP page.

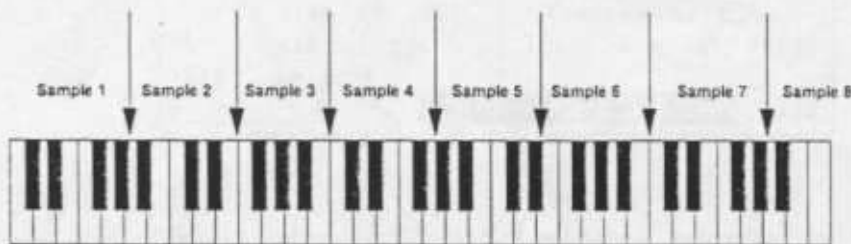
**NOTE** This number ("change number of KEYGROUPS") can be changed, but only by using the **+/-** and **-/+** buttons, not by using the DATA knob or the number pad.



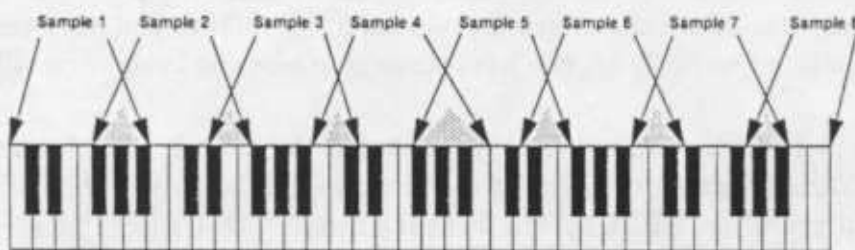
## Sampler functions

To save you work when editing a program with a large number of keygroups, the next parameter allows you to specify whether editing changes to the keygroups will take place over all keygroups, or just the one which has been selected. If you choose ALL in a multi-sample program, it is then relatively easy to go back and "fine-tune" individual keygroups.

The "overlapping group CROSSFADE" parameter may be set ON or OFF. If ON, then any keygroups whose keyspans overlap will automatically be crossfaded at the overlap points, giving a smoother sound for multisampled programs.



*In this multi-sample program, there is no keyboard crossfading, so there may be audible "jumps" between samples.*



*In this multi-sample program, keyboard crossfading has been implemented. The gray triangles represent areas of crossfading, where two samples overlap, and a smoother transition is achieved at these points.*

The last parameter on this page "note-on sample COHERENCE" requires a little explanation. When the sampler portion of the S1100 receives information from an external MIDI source which requires it to play a number of samples simultaneously, a finite amount of time is taken to perform the calculations necessary to play each sound. When playing a note which plays a number of percussive samples, it is possible that you may hear a slight "staggering" of the notes in the chord. To avoid this, set this COHERENCE parameter to ON. In that way, the S1100 will wait until the data for all notes in the chord is ready, and then play all notes simultaneously. There may be a slight processing lag, but in the normal run of events, this should be unnoticeable. Your sequencer may allow you to correct the timing, in any case. It is suggested that you use this parameter to ON when using stereo samples, or velocity or keygroup crossfading.

SPAN

KEYSPAN	edit:ONE	KG	LOW	HIGH	TUNE	BEAT
.....		1	C_0	G_8	+00.00	+00
.....		2	A*1	C_8	+00.00	+00

SLCT	KGRP	SPAN	FILT	ENV1	ENV2	SMP1	SMP2
------	------	------	------	------	------	------	------

The **SPAN** button allows you to set the keyspan of any keygroups in the program. On the left of this page are up to four diagrams of a keyboard with a keyspan underneath the keyboard (represented by a horizontal bar), and to the right of this are displayed the corresponding keygroups with their HIGH and LOW ranges. These may be displayed either as MIDI note numbers or as note names. Press SPAN once again to toggle between note names and numbers. You can then select the keygroup number you want (place the cursor on a field in the KG column, and use the DATA knob to select the keygroup) before altering the HIGH and LOW limits of the keygroup. Note that if you are editing using the note names, placing the cursor over the whole note name will alter the value by an octave for each click of the DATA knob. Alternatively, place the cursor on the "LOW" field of the first keyspan and play the appropriate key on the MIDI keyboard. The cursor will move to the next note value field (the high value of the same keyspan, or the low value of the next), ready for you to play the next note.

In this page, you can also alter the tuning (TUNE) of the samples played in this keyspan in semitones and cents (useful if you have a split keyboard setup, and you want each half of the split to sound at the correct pitch).

The other parameter in this page is BEAT, which is used to create a fixed offset to the original pitch. Unlike the TUNE parameter, this tuning offset is constant, no matter what the played pitch of the sample. You may like to use this to create a "chorus" effect, by adding a small amount of fixed offset to one of two otherwise identical samples.

## Sampler functions

### FILTER

The FILTER page (**FILT**) allows you to apply a 18dB/octave low-pass filter to modify the sound of samples within a keygroup. Essentially, the parameters on this page are what you would expect to find on an analog synthesizer (though the S1100's filter is digital). The top line of the page allows you to select the keygroup number and ALL/ONE, or to alter the program which is currently being edited.

```
FILTER  KG: 1 ED:ONE  TEST PROGRAM  0%
frequency: 99          velocity > freq: +00
key follow:+12        pressure > freq: +00
                      envelope-2 > freq: +00
-----
vel>loud offset:+00   env-2 >pitch: +00
SLCT KGRP SPAN FILT ENV1 ENV2 SMP1 SMP2
```

The next line allows you to adjust the cutoff frequency of the filter. At its highest value (99), the filter lets all the sound through, and at its lowest, (00) no sound passes through. Unlike the filters on some synthesizers, however, there is no resonance control, and the filter cannot go into self-oscillation.

The next parameter, "key follow", sets the amount (from 00 to 24) by which the position of the key played will affect the cutoff frequency of the filter. When this is set to a positive value, the higher the key played, the brighter the sound (negative values reverse this effect). This parameter sets the amount of this tracking. This can be used to simulate the effect of natural acoustic instruments.

"velocity > freq" allows you to affect the cutoff frequency, depending on the velocity with which a key is pressed. The value can be set from values of +99 to -99. A positive value will make the sound brighter, the faster the key is depressed, and a negative value will make the sound duller, when the key is pressed faster.

The next parameter, "pressure > freq", allows the cutoff frequency of the filter to be altered by the amount of aftertouch (Channel Pressure). Again, this value is variable from +50 to -50, and positive values will increase the brightness of the sound when aftertouch is applied; negative values will make the sound duller.

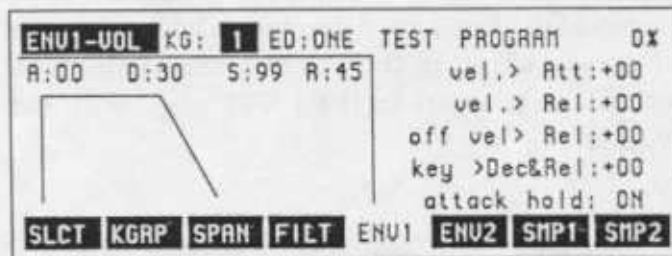
"envelope-2 > freq" determines the effect of the second ADSR envelope generator on the frequency of the filter. Variable from +50 to -50, a positive value will produce a "wah" effect, and a negative value will produce an "inverted wah".

At the bottom of the page are two parameters which are not strictly related to the filter, but are related to the control parameters transmitted from the keyboard and the way in which they affect the sound of the keygroup. The first is "vel>loud offset" (+50 to -50). This controls the overall volume of the keygroup as determined by the velocity of the key pressed, and is an offset added to (or subtracted from) individual sample levels. Positive values will make the keygroup louder the faster the key is depressed. Negative values will have the opposite effect.

"env-2 >pitch" allows the pitch of the samples in this keygroup to be altered according to the values of the second ADSR envelope (+50 to -50). A positive value will make the pitch rise with the attack, fall with the decay, etc, and a negative value will do the reverse.

### ENV-1

Pressing the **ENV-1** button will bring up this page. Here you can set various parameters relating to volume. The first line allows you to pick the keygroup, ALL/ONE and the program to be edited.



The next parameters above the graphic representation of the envelope shape allow you to alter the attack rate, delay rate, sustain level and release rate of this envelope. As you change the values, the shape of the envelope will change correspondingly. As the legend in the top left of this page shows, this envelope controls the volume of the samples in this keygroup.

Once the basic envelope has been set up, other factors can be used to affect the speed of the envelope. These are all on the right of the graphic envelope. The first, "vel.> Att", is variable from +50 to -50, and determines the amount by which the attack speed will be changed depending on the Note On velocity. A positive value will increase the attack time if the key is pressed fast, while a negative value will slow down the attack rate if the key is pressed fast. This parameter is useful for imitating the characteristics of some acoustic instruments (for instance, most wind instruments have a faster attack rate when played loudly).

The next parameter, "vel.> Rel" is used to vary the release rate relative to the Note On velocity value (+50 to -50). Again, a positive value will increase the release rate relative to the Note On velocity, and a negative value will shorten the release time.

However, the parameter below this, "off vel.> Rel" (+50 to -50) is possibly more relevant to natural-sounding playing. The MIDI specification allows for Note Off velocity as well as Note On velocity. Though many keyboards do not accept or transmit this, assuming a mean value of 64, all AKAI keyboards provide a full implementation of this function. The speed with which the key is released can be used here to affect the release rate (positive values mean that a fast release lengthens the release rate, and *vice versa*). This allows more expressiveness and realism, but demands a slight relearning of keyboard technique (similar to an acoustic piano).



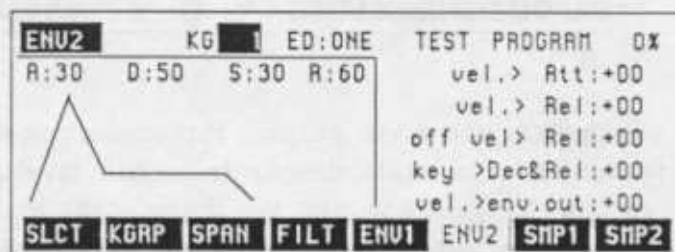
## Sampler functions

The "key >DEC&REL" parameter (+50 to -50) allows you to control the amount by which the key position affects the decay and release rates. Setting this to a negative value means that the higher the note played on the keyboard, the shorter the decay and release times (similar to most acoustic instruments). Setting this to a positive number will reverse this effect.

The final parameter on this page, "attack hold" can be set to ON or OFF. When ON, the attack portion of the envelope will be held until looping begins, and when OFF, the envelope will continue along the set values, regardless of loop settings.

### ENV2

The second ADSR envelope is used primarily, but not exclusively, for altering the cutoff frequency of the low-pass filter dynamically. It can also be used for altering the pitch of the sound (set in the FILTER page, above). All the parameters here are identical to the ones set in the ENV1 page, with the exception of the last: "vel.>env.out"



This parameter (+50 to -50) determines the absolute amplitude of the envelope relative to the velocity of the key. When this is set to a positive value, a higher key velocity will produce a higher attack level, etc (the rate will be unaffected). Setting this to a negative value will have the reverse effect.

### Choosing the samples for a keygroup

The last three pages, **SMP1**, **SMP2** and **SMP3** all refer to the samples which will be included in a keygroup. The last page, **SMP3**, is only accessible from the second sample page.

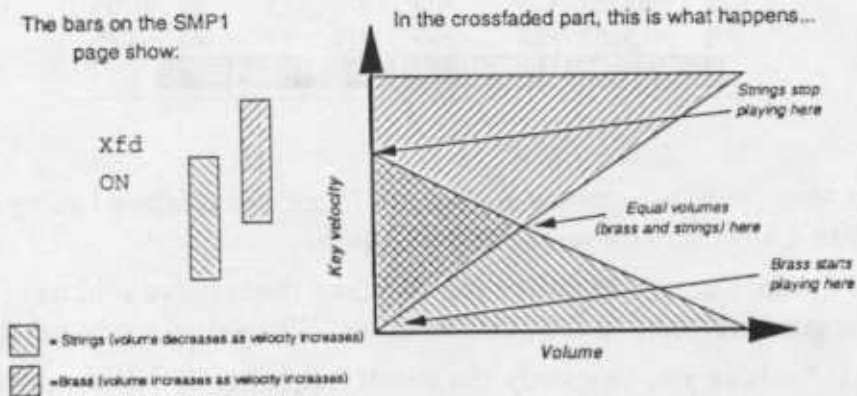
### SMP1

C_D-G_1	KG: 1	ED: ONE	BASS	VEL	94x
zn	sample	U-lo	U-hi	Pitch	
1	BASS	0	127	TRACK	Xfd
2	THUD BASS	1	45	TRACK	OH
3	SINE	?	1	0	TRACK
4	PULL BASS	60	127	TRACK	

At the bottom of the table are buttons: SLCT, KGRP, SPAN, FILT, ENV1, ENV2, SMP1, SMP2. To the right of the table is a small bar chart with four bars labeled 1, 2, 3, 4.

Pressing the **SMP1** button will bring up the samples to be included in a keygroup. As with other pages in the EDIT PROG mode, the top line of the page allows you to specify the keygroup number, ONE/ALL or the name of the program being edited. Additionally, the first line also allows you to specify the keyspan of this sample. Up to four samples can be allocated to each keygroup (if you feel you want more, create more keygroups for the program, overlapping each other).

Within a keygroup, these four samples can be set to play at different velocities. The tonal characteristics of acoustic instruments can vary radically from loud to soft (a classic example of an instrument which does this is the Japanese end-blown flute, the *shakuhachi*), and so you may want to take a few samples of the same instrument being played at different volumes, as well as different pitches. Alternatively, you may wish to incorporate a velocity switch as a special effect — a keygroup could be set to produce only the sound of a string section when played softly, but change to or add the sound of a brass section when played at a higher velocity.



The next parameter is "Xfd" (crossfade) which may be either ON or OFF. If ON, any note which has a velocity which falls within two velocity zones will play both samples, the relative volume being adjusted accordingly.

To select a sample to include in a keygroup, move the cursor to the sample field and select a sample. If the sample has been previously selected as part of an existing program, but has not yet been loaded into memory, a question mark will be shown by the sample name. Note that a SINE "sample" is given as a default for a new program.

On some of the supplied program disks, the "samples" SINE, SQUARE, SAWTOOTH and PULSE are included. This enables you to create "synthesizer" sounds by adding these regular waveforms to sampled sounds.

Next, select the "velocity window" within which the sample will be played. MIDI Note On velocity values can be from 0 (ppp) to 127 (fff), so if you want the sample to be played all the time, set "V-lo" to 0, and "V-hi" to 127. Otherwise, set the velocity windows accordingly.

There is one other parameter for each keygroup - the CONST/TRACK parameter. When set to "TRACK", the keyboard will produce pitched notes corresponding to the key being struck. If set to "CONST", however, the pitch of the sample will

## Sampler functions

remain at the constant pitch of the edited sample, no matter what key is pressed. This can be useful if you want to add a constant pitch percussion sound to a pitched instrument, for instance.

### The second sample page (SMP2)

In the second sample page, (**SMP2**), you can set further parameters relating to each sample in a keygroup. The top line allows you to set the keyspan of the keygroup, the keygroup to be edited, the ALL/ONE parameter and the program currently being edited. Each of the other parameters in this page can be applied to each velocity zone (sample) individually.

C_D-G_1	KG: 1	ED:ONE	BASS	VEL	94%	
zn	sem.cnt	loud	filt	Pan	out	Playback
1	+00.00	+00	+00	MID	+0	AS SAMPL
2	+00.00	+00	+00	MID	+0	AS SAMPL
3	+00.00	+00	+00	MID	+0	AS SAMPL
4	+00.00	+00	+00	MID	+0	AS SAMPL
<b>SLCT</b>	<b>KGRP</b>	<b>SPAN</b>	<b>FILT</b>	<b>ENU1</b>	<b>ENU2</b>	<b>SMP1</b> SMP2

The "sem.cnt" parameter allows you to set the relative tuning of each sample within a keygroup (in semitones and cents).

The "loud" parameter allows you to adjust the relative volume of each sample in a keygroup relative to the other samples. This value can be set from -50 to +50.

"filt" allows you to specify the cutoff frequency of the low-pass filter for each sample relative to the other samples in the keygroup.

When a program is being played through the stereo outputs, the stereo position of each sample in a keygroup can be set using the "pan" parameter. The values here can range from L50 (panned hard left) through MID (the signal is sent equally to the left and right channels) to R50 (panned hard right).

The "out" parameter requires a little explanation. If a program is assigned to be played through one of the eight individual output channels, an "offset" can be added to each sample in the program which is added to the basic output channel to determine the output channel from which the sample will eventually be output. For example, if a program is assigned to be played through channel 3, and four sample "out"s are set in this page to be 0, +1, +1 and +2, these samples will be played through channels 3, 4, 4 and 5 respectively. If value of the basic output channel added to the offset here goes above 8, the number "wraps round". In this way, if the basic out channel is 6, and the offset value set here is 6, the total is 12. This will be automatically changed to 4 (12 - 8).

The last parameter on this page allows you to set up the way the sample is to be played back, overriding the settings made in the ED.2 page of the EDIT SAMPLE mode, if you want. There are five values which are allowed. AS SAMPLE plays back the sample exactly as set up in the ED.2 page (loops included). LP in R is the same as the LOOP IN RELEASE mode of the ED.2 page, and "LP til R" is the same as LOOP UNTIL RELEASE. NO LOOPS is self-explanatory, and TO END

is the same as the ED.2 PLAY TO SAMPLE END. The ability to reset the playback parameters of a sample allows you a lot of flexibility - the same sample can be used in different ways in different programs.

### The third sample page (SMP3)

```

C_D-G_1  KG: 1 ED:ONE  BASS VEL  91%
zn vel>sm start
1 +0000
2 +0000
3 +0000
4 +0000
SLCT KGAP SPAN FILT ENU1 ENU2 SMP1 SMP2
    
```

This page is only accessible from the SMP2 page (press **SMP3**), and has only one parameter, which allows you to determine the way in which velocity affects the playback starting point for each sample in a keygroup. This figure is variable from +9999 to -9999. The higher the positive number, the earlier in the sample playback will start relative to the key velocity (ie, a high key velocity will start playback earlier in the sample). A negative number has the opposite effect (a high key velocity will start playback later in the sample than a low key velocity). This effect is particularly useful for simulating percussion instruments (try it with a bass drum).

### MIDI in the EDIT PROG mode

To enter the MIDI page in the EDIT PROG mode, press **SLCT** to get to the opening EDIT PROG page, and then press the **MIDI** button. The top line of this page contains a field which allows you to change the sample currently being edited.

```

MIDI RESPONSE (COMMON) TEST PROGRAM 2%
Program number: 1          PLAY RANGE
MIDI channel: 1          low high
Polyphony: 16           C_D G_B
Priority:NORM  octave shift: +0
reassignment:OLDEST
SLCT KGAP MIDI OUT PTCH   
    
```

The next field allows you to set the program number of the program. This is the number which will be called up on receipt of a MIDI Program Change message, and corresponds to a patch number on a synthesizer. Unlike a synthesizer, though, the S1100 allows different programs to share a patch number, so when a Program Change message is received, all programs with the corresponding number will be selected simultaneously.



## Sampler functions

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The next parameter allows you to change the MIDI channel on which this program will receive information (OMN, 1-16).

NOTE that the channel on which Program Change information is received may be selected in the MIDI mode to be OMNI or any other channel, so that program changes can be made independently of this MIDI channel setting.

The S1100 is capable of playing up to sixteen notes (samples) at one time. If a keygroup is set to use four samples which will all be played when one key is pressed, then only four notes of that keygroup can be played simultaneously. If it only uses one sample, then 16 notes of this keygroup can be played at one time. Remember that velocity crossfading may use two samples simultaneously from one key, which will reduce the polyphony of the program using this feature. The next parameter, "polyphony", allows you to select how many notes (1 to 16) can be played at a time by this particular program. If the program allows a large number of notes to be played, but other programs are playing other notes, more notes may be "stolen" from this program or from the other programs (see the "PRIORITY" parameter below).

The "PRIORITY" parameter allows you to specify how notes will be "stolen" by other programs if this is necessary. There are four settings: LOW, NORM, HIGH and HOLD. If a program is set to LOW priority, then notes from this program will be "stolen" first. If set to HIGH, then notes from other programs with lower priority will be "stolen" before they are stolen for this program. NORM is, of course, normal priority. If you are playing a complex piece of music using many programs, it is a good idea to set important, "lead-line" programs to HIGH, and less important background programs to LOW. HOLD is a special priority. If a program's priority is set to HOLD, notes from this program can only be "stolen" by the same program.

The notes which will be "stolen" are determined by the "reassignment" parameter - either the OLDEST note will stop playing, or the QUIETEST one.

The keyboard range is the next parameter on this page, and setting here will override any keygroup range settings made in the keygroup SPAN page. Remember that pressing the soft MIDI button will redisplay this page, toggling between MIDI note numbers and note names.

Finally, on this page, the pitch of the program can be shifted by  $\pm 2$  octaves (which allows you to adjust for the actual playing position on the keyboard).

### OUT

By pressing the **OUT** button from the main EDIT PROG, the EDIT PROG MIDI or EDIT PROG PTCH page, you can control the audio output of the program from the S1100. The first line of this page allows you to choose the program whose OUT parameters are to be edited.

OUTPUT (COMMON)	TEST PROGRAM	2X
	mono out:OFF	PRN MOD.
loudness: 80	efct out:OFF	speed: 50
vel>loud: 20	ster.lev: 99	depth: 00
key>loud:+00	ster.pan:MID	delay: 50
prs>loud:+00	key>pan:+00	modwhl:+00
<b>SLCT</b> <b>KGAP</b> <b>MIDI</b> <b>OUT</b>	<b>PTCH</b> <input style="width: 30px;" type="text"/>	<input style="width: 30px;" type="text"/>

The next parameter allows you to set the overall volume of the program (00 to 99) relative to any other programs being played.

The three parameters following affect the volume of the sound as controlled by three keyboard parameters: velocity, key position, and aftertouch (pressure).

The first, "vel>loud", can take values from +50 to -50. If this value is positive, the higher the velocity, the louder the sound produced, and a negative value will produce a quieter sound with a high key velocity. Setting two programs in the same keyrange, one with this value set positive, and one with it set negative, can produce a velocity cross-fading effect.

The next parameter, "key>loud", determines the volume of the sound depending on the key being played. When this parameter is positive, the higher the key, the louder the sound, and when negative, the higher the key, the quieter the sound (like most acoustic instruments).

Finally, in this column, "prs>loud" allows you to specify the effect of aftertouch on program volume. Positive values will increase the volume as aftertouch is applied, and negative numbers will reduce the volume when aftertouch is applied.

"mono out" specifies the output channel (OFF or 1 to 8) from which the program is played. Note that this setting interacts with the "out" parameter in the SMP2 page of the keygroup setting, and is used as the "base" number to which offsets set up in the SMP2 page are added. If this value is set to OFF, then the program will only be output from the stereo connectors. It is also possible to set a base working level for these outputs and the range is -6dB, 0dB and +12dB. This allows you to boost or cut the level of each individual output for increased signal to noise ratios on external mixers.

### **efct out:**

As mentioned in the guide to the rear panel, programs can be sent through the S1100's own effects loop prior to output. This parameter is also used to send a program to the S1100's internal effects. The "efct out." parameter can be set with seven level settings which are expressed as a percentage. The range is OFF, 14%, 29% 43% 57%, 71%, 86% and MAX and these can be set individually for each program. If you are playing a large number of programs simultaneously, then you might consider using the EFFECT OUT as an extra individual output channel.

The "ster.lev" parameter allows you to set the level of the program from the stereo outputs. It has no effect on the level from individual outputs. This parameter interacts with all other volume settings you have made for this program, notably the "loudness" parameter. If the loudness parameter is set to 00, no sound will be produced from the stereo outputs, even if the "ster.lev" parameter is set to 99. It is possible to boost the overall output level by +6dB if you wish to obtain better signal to noise ratios on a mixer, especially professional desks that run at +4db.

"ster.pan" controls the overall pan position of the program in the stereo image, interacting with the individual pan settings in the SMP2 page. This parameter can take values from L50 through MID to R50. Of course, this parameter will have no effect on the output from individual outputs.

The last parameter in this column, "keyspan" can be used to create a pseudo-stereo sample from a mono sample. It can take values from +50 to -50. When set to positive values, the higher the key being played, the further to the right the program will be placed in the stereo image. Negative values will reverse this effect. Useful, perhaps, for a piano sample, to give the illusion of "keyboard spread" between the speakers or to spread a single tom sample played on a range of keys across the image. This parameter has no effect on the output from the individual outputs.

The last column of this page is concerned exclusively with the control of the pan position of the program from the stereo outputs. The first three parameters control an LFO which is used for autopanning. The "speed" and "depth" parameters (both 00 to 99) do exactly what you'd expect: the "depth" parameter providing the greatest amount of panning when set to high values, and the "delay" parameter is used to set the delay time between the key being pressed and the LFO taking full effect.

The last parameter on this page, "modwh1", allows you to use a modulation wheel or any controller which has been assigned the MIDI controller number 1 to affect the pan position of the sound. Setting this to a positive value will start the sound in the left half of the image, and moving the modulation wheel will send it to the right. A negative value will have the opposite effect. Try setting up two identical programs, but with this parameter positive on one and negative on the other. Moving the modulation wheel will produce some interesting effects!

### Pitch

The **PITCH** button will bring up the PITCH and MOD page, allowing you to specify the parameters for a pitch modulation LFO, the amount by which the depth of this LFO can be increased by keyboard parameters, and parameters affecting pitchbend. In addition, the overall tuning of the program and synchronisation of the LFOs can be set here.

<b>PITCH-MOD</b>		(COMMON)		<b>TEST PROGRAM</b>		94%	
LFO	KEY	EXTRA	DEPTH	PITCH-BEND			
speed:50	+00	modwheel:30	bendwheel: 2				
depth:00	+00	Pressure:00	Pressure:+00				
delay:50	+00	velocity:00					
tuning:+00.00			LFO desync:OFF				
<b>SLCT</b>	<b>KGAP</b>	<b>MIDI</b>	<b>PTCH</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

The pitch modulation LFO has three parameters — "speed", "depth" and "delay", which work as you would expect on a synthesizer LFO. The "delay" parameter specifies the time from the key press to the LFO taking full effect. The "key" parameters vary the amount of LFO parameter applied, depending on the key position (positive numbers increase the values for high keys).

The depth of the pitch modulation LFO can be affected by three real-time performance parameters: the modulation wheel ("modwheel"), the aftertouch ("pressure") applied to the keyboard, and the speed ("velocity") with which the key is hit. All these parameters can take values from 00 to 99 — the higher the number, the greater the depth of the pitch modulation LFO when these performance parameters increase.

The amount of pitchbend (in semitones) that can be effected using the pitch bend wheel is set by the "bendwheel" parameter. If set to 0 (minimum), no pitchbend will take place when the wheel is moved. The maximum value is 12 (one octave) up or down from the center position when the pitch bend wheel is moved appropriately.

Aftertouch ("pressure") can also be used to affect the pitch of the program. This parameter is variable from +12 to -12 (semitones). When set to positive values, the pitch will increase as aftertouch is applied (to a maximum of +12 semitones — one octave). If this is a negative value, the pitch will decrease as aftertouch is applied (to a maximum of -12 semitones — one octave).

The "tuning" parameter allows final adjustment of the program's pitch by  $\pm 50$  semitones in semitone/cent steps.

Finally, the "LFO desync" parameter when ON, sets all the pitch modulation LFOs for different notes to a slightly different frequency. This mimics the effect of (say) a string ensemble, where each player produces vibrato at a slightly different rate from the other players. When OFF, each LFO will be set to the same frequency.

### Conclusion

As you can see, setting up programs on the S1100 is not radically different from setting up patches on a multi-timbral synthesizer. The same principles of envelope shape, filter and LFOs apply to both. The main difference is that you start with sampled waveforms, rather than generated or prerecorded PCM waveforms, giving you an almost infinite flexibility in the sounds you can create.



### 3 MIDI

The MIDI mode allows you to set up various parameters relating to the S1100. Of course, MIDI receive channels, etc, can be set up from the EDIT PROG mode, but this mode gives you control over some more "global" parameters.

#### BASIC MIDI

When you first press the **MIDI** button, the BASIC MIDI CHANNEL CONTROL page is entered. This selects a number of parameters which affect the MIDI response of the whole instrument.

BASIC MIDI CHANNEL CONTROL	
Program select enable:	<b>ON</b>
Program select channel:	1
OMNI for Program select:	ON
selected Program number:	1
OMNI override for Play input:	OFF
CHAN	<b>FILT PPHs RCUE TRAN EXCL SCSI KBD</b>

The first parameter is the "program select enable" parameter. This can be set ON or OFF to enable or disable Program Change commands. Disabling Program Change commands can be important when controlling the S1100 from an external sequencer, as it will stop nonexistent programs being selected accidentally, with the resulting embarrassing periods of silence.

However, if you decide to enable Program Change, the next parameter allows you to specify the MIDI channel on which the S1100 will accept these messages. Note that S1100 starts numbering its programs at 01, as opposed to some MIDI devices, whose programs start at 00.

You can override the Program Change channel by switching the Program Change OMNI to ON. This does not mean that notes will be received and played on any channel, but only Program Change messages.

The currently selected program number is displayed and may be changed underneath this. Remember that a program number on the S1100 does not mean that a single program has been selected — instead it means that all programs with that number are selected.

Finally, the "OMNI override for play input" does what its name implies — playing data (Note On/Off, etc) will be accepted from any MIDI channel, which means that when you are testing and editing a program, you don't have to worry about setting the keyboard or any MIDI source to the right channel number. Of course, when performing from a keyboard and/or a sequencer (using a MIDI merge), you can turn this off to take full advantage of the multi-timbral capability of the S1100.

**FILT**

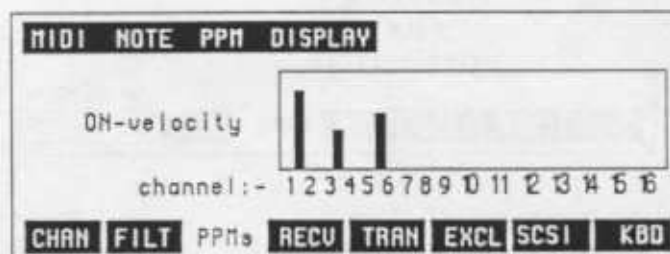
This is another filter, but this one has no effect on the sound. Instead, it filters out specific MIDI information. When you enter this page, the cursor will be at the top left of a grid of "+" signs, in a long rectangular box. As you turn the CURSOR knob, the cursor will move to the right and then go down a line.

MIDI RECEIVE FILTERS																	+on	-off	
CHAN:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	all		
ON:	-	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	-	<	
WHL:	-	+	+	+	+	+	+	-	-	+	+	+	+	+	+	-	-	<	
PRES:	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	<	
LOUD:	-	+	+	+	+	+	+	-	+	+	+	+	+	+	+	-	-	<	
CHAN	FILT	PPMs	RCUE	TRAN	EXCL	SCSI	KBD												

In this grid, the columns represent MIDI channels (1-16), and the rows represent MIDI information which the S1100 will accept or filter. The first row, "ON", affects the S1100's receive capabilities for all information on that channel, the next, "WHL", refers to the pitch and modulation wheels, the third ("PRES") refers to aftertouch, and the last, "LOUD", refers to an external MIDI volume control (controller 7). The last column in each row, "all", will affect the appropriate information for all MIDI channels. "+" signs mean that the S1100 accepts this information, "-" mean that this information is filtered out.

If you turn the DATA knob counterclockwise, the "+" which the cursor covers will change to a "-". If you make this change on the top row, all "+" signs underneath will change to a "-", and if you make this change in the "all" column, the parameter for all MIDI channels will be changed. The top right corner of the display ("ON"/"all") is a special case — all parameters will be changed.

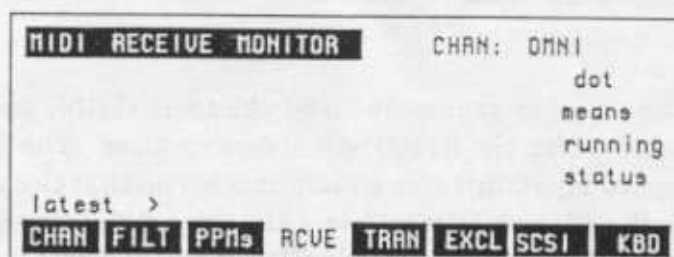
By using this filter, you can control the response of the S1100 to MIDI events. By filtering out aftertouch on a percussion program where it is not needed, for instance, you can improve the response of the S1100 when a lot of MIDI data is received.

**PPMs**

This page (accessed with the **PPMs** button), has no parameters. Instead, it provides a real-time display of all Note On information received on the 16 MIDI channels. The higher the bar on the display, the greater the velocity of the received note. This page is called "PPMs" because it simulates the behavior of audio bar-graph Peak Program Meters.

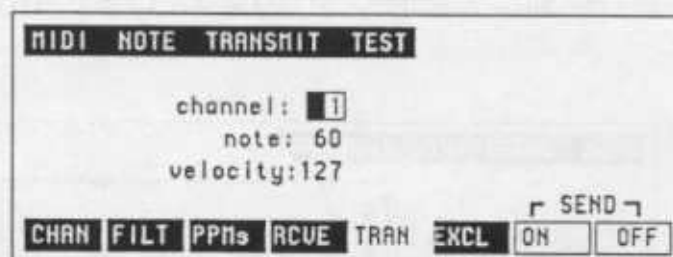
## Receive Monitor

In this page (press **RCVE**), you can monitor the MIDI information received by the S1100. This is especially useful if you are faultfinding on your MIDI system — you're convinced that you're transmitting note information on a certain channel, but the S1100 isn't responding. Information from the MIDI IN is displayed, and a channel filter may be set at the top of the screen (OMNI or 1 to 16).



If the information is not displayed on this monitor, the information is not reaching the S1100. Check your connections or the output channel of the transmitting equipment. If the information appears to be correct, but no sound or unexpected sounds are being produced, then the fault may lie in the MIDI setting of the program(s). You may discover that the piano track of the sequencer is playing the drum samples, for example.

## TRAN



In this page, you can produce a test transmission of a MIDI note, and set the channel, key and velocity of the note to be transmitted, using the "SEND" **ON** and **OFF** buttons. This key value and velocity will also be used by the **ENT/PLAY** key when testing samples and programs.

## MIDI data dumps

Samples can be transferred between the S1100 and other samplers via MIDI. If you do this, you must make a MIDI loop (MIDI OUT of the S1100 connected to MIDI IN of the other sampler, and vice versa). This is necessary because of the way in which MIDI sample dumps are performed (in computer terms, a handshake protocol with error detection/correction).

Though the S1100 is a 16-bit sampler, it can accept samples from other samplers, including those from other manufacturers which use a lower bit resolution, padding low bits with zeroes. If transmitting to another sampler which uses fewer bits, it simply truncates the low bits. Instead of another sampler, samples can be transmitted to and accepted from other devices (such as computers) which are capable of storing and/or editing sample data. However, in this section we will always refer to the other device as a "sampler".

<b>MIDI EXCLUSIVE</b>	channel:	<input type="text" value="1"/>	(tran & rec)
	type of transmission:	ALL PROGRAMS	
	sample Protocol:	STANDARD	
	single Program:	TEST PROGRAM	
	single sample:		
	sample number override:	<input type="text" value="3"/>	
<b>CHAN</b>	<b>FILT</b>	<b>PPMs</b>	<b>RCUE</b>
<b>TRAN</b>	<b>EXCL</b>	<b>SCSI</b>	<b>SEND</b>

The first parameter, "channel", does not refer to a MIDI channel, but a "logical channel" used in System Exclusive protocol. Both samplers must be set to the same channel for transfer to take place.

The "type of transmission" refers to what will actually be transmitted over MIDI. This can be ALL PROGRAMS, ALL SAMPLES, SINGLE PROGRAM, SINGLE SAMPLE, and DRUM SETTINGS. The meanings of these values are self-explanatory.

Two protocols for sample transfer are available, "STANDARD", which conforms to the MIDI sample dump standard, and "S1000", which is a superset of the MIDI sample dump standard. Use the "S1000" setting only if you are transferring data between two S1000-compatible machines (this includes the S1100, S1000, S1000KB, S1000HD, and the S1000PB).

If you have selected SINGLE PROGRAM transmission, the next parameter, "single program", allows you to specify the program which will be transmitted.

If you have selected SINGLE SAMPLE transmission, the next parameter, "single sample", allows you to specify the sample which will be transmitted.

You can override the default sample number (based on the order in which samples appear in the S1100's memory) with the last parameter, "sample number override".