
DYNAMIC PROCESSING

00. CHANGE VOICE	149
11. ATTEN/TUNING/DELAY	151
12. VCA AHDSR	151
13. FILTER SETUP	154
14. FILTER AHDSR	156
15. LFO SETUP	157
16. LFO TO	158
17. VELOCITY TO A	159
18. VELOCITY TO B	160
19. PANNING	161
20. CHORUS	162
21. KYBD MODE	163
22. CONTROL ENABLE	164

DYNAMIC PROCESSING

DYNAMIC PROCESSING 00

CHANGE CURRENT VOICE(S)

This function lets you change the current voice assignment.

1. Activate **DYNAMIC PROCESSING 00**. The display will say:

```
Edit Pri, Sec or  
Both Voices: XXX
```

...where XXX is either Pri, Sec or Both.

2. Use the data slider to select whether the primary , secondary, or both voices are to be included in the current voice group, then press **ENTER**.
3. You may select the *entire keyboard* by pressing the **DYNAMIC PROCESSING** or the **ENTER** button twice in succession.
4. If the preset contains only primary or secondary voices, the Emax II is smart enough to bypass the first screen and say:

```
Lo: XX  
Select Lo Voice
```

...where XX defaults to the lowest note of the lowest voice. Press a key in the range of the low voice that you want to process, or to quickly select the low voice, use the data slider. While selecting the low voice, the lower display line will show the voice number, its original pitch. After selecting the low voice, press **ENTER**.

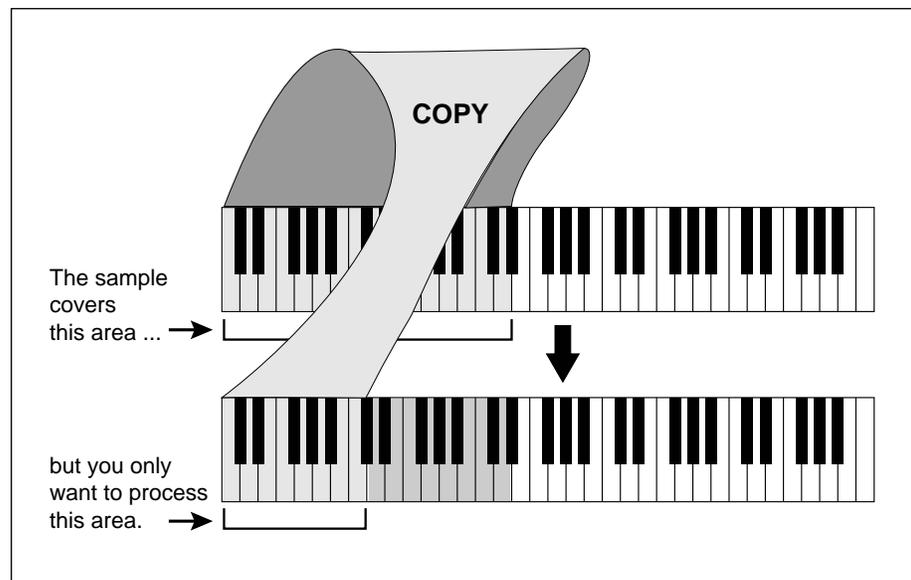
5. The display now says:

```
Lo:XX -> Hi:HH  
Select Hi Voice
```

... where XX is the previously-selected low note and HH is the highest note of the voice that contains the lowest note. Press a key in the range of the high voice that you want to process, or to quickly select the high voice, use the data slider. After selecting the high voice, press **ENTER** to complete the current voice selection and return to the module identifier.

DYNAMIC PROCESSING

If the selected range includes part of a voice (sample), then the entire voice range will be processed, even though the display indicates the partial range. If, however, you wish to process just a portion of the voice assignment, simply copy the desired range (PRESET DEFINITION 1) back into the current preset. Emax II will now consider this a whole new voice for independent processing.



Copying a voice back to a subset of its former range gives you more voices that use the same samples. Using this technique, you could dynamically process each key separately if so desired.

DYNAMIC PROCESSING

DYNAMIC PROCESSING 11

VOICE ATTENUATION, TUNING, and DELAY

This function varies the attenuation, tuning, and delay for the current voice.

1. Activate **DYNAMIC PROCESSING 11**. The display will say:

```
Attn Tune Delay
00dB +00ct 00
```

2. Select the desired parameter for adjustment with the cursor (left arrow/right arrow) buttons, then vary the parameter as needed:

- **Attn:** Use the data slider to attenuate the voice up to 46 dB.
- **Tune:** Use the data slider to tune the voice pitch between +45 and -48 cents.
- **Delay:** Use the data slider to vary the delay between the time a key is first pressed (or MIDI data received at the MIDI input) to the onset of the note. The range is 0 to 63.

3. After making your selections, press **ENTER** to return to the module identifier.

■ *Alternate keyboard tunings may be obtained by defining each key as a voice and adjusting the voice tuning for each key.*

DYNAMIC PROCESSING 12

VCA ENVELOPE

This function sets the attack, hold, decay, sustain, and release characteristics of the VCA's AHDSR envelope generator.

Application: Change a voice's dynamics with respect to time.

1. Activate **DYNAMIC PROCESSING 12**. The display will say:

```
A: A H D S R
   XX XX XX XX XX
```

...where XX is a two-digit numeral between 01 and 32.

Hint: Filter and VCA settings interact. For example, if the VCA is set for an extremely short decay and sustain level is near 0, then you won't hear the effects of setting a long filter decay.

DYNAMIC PROCESSING

2. Select the desired parameter for adjustment with the cursor buttons, then use the data slider to change the parameter value. Refer to the diagram as you read the following descriptions of the five envelope parameters.

■ **A (Attack):** Varies the VCA envelope attack time from 01 to 32 (higher values increase the attack time).

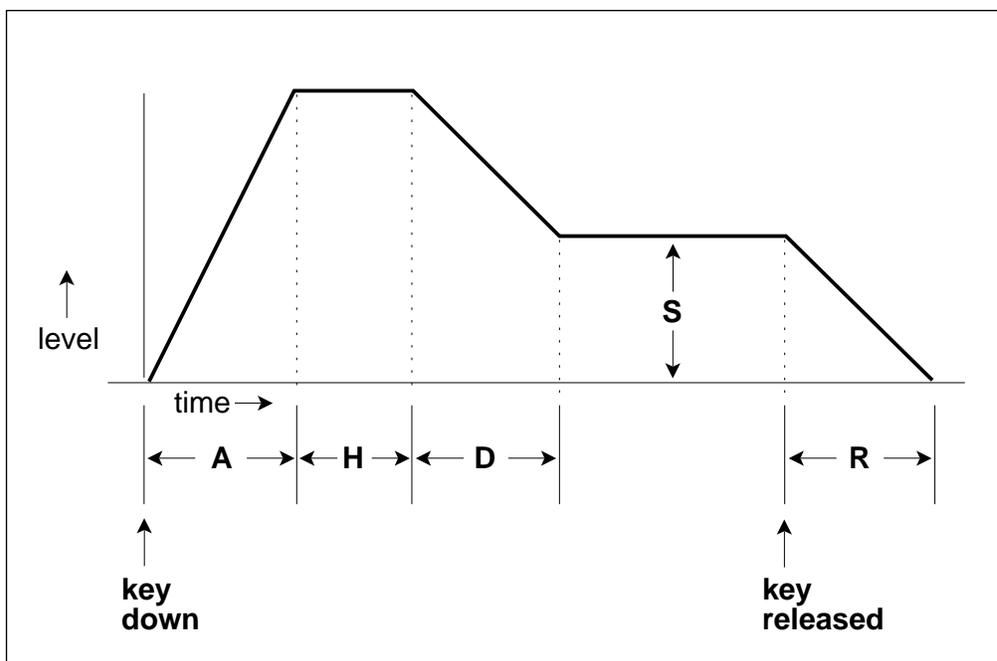
■ **H (Hold):** Sets the duration of the peak. If a key is held down longer than the hold duration, the decay phase will begin. If a key is released during the hold duration, the release phase will begin.

■ **D (Decay):** Varies the initial decay time from 01 to 32 (higher values increase the initial decay time). 32 gives "infinite decay" (envelope stays at maximum amplitude for as long as you hold down keys).

■ **S (Sustain):** Varies the envelope sustain level from 01 to 32 (higher values give higher sustain levels).

■ **R (Release):** Varies the release time from 01 to 32 (higher values increase the release time). A setting of 32 inhibits the release phase of the envelope, thus keeping the VCA open at the previously selected Sustain level. This is useful if you want to trigger a long sound by simply tapping a key.

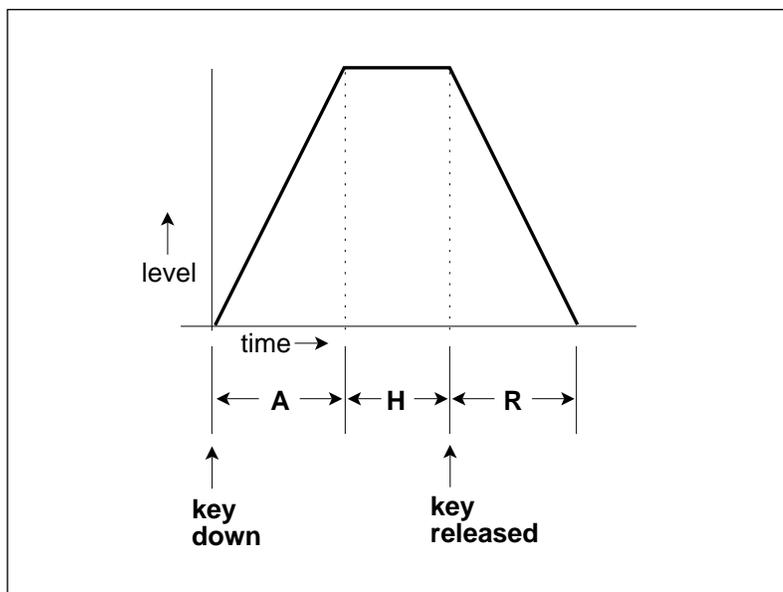
3. After making your selections, press **ENTER** to return to the module identifier.



The Envelope Generators are used to shape the sound over the course of the note.

DYNAMIC PROCESSING

Note: If the filter and VCA release are both at 32 (also see **DYNAMIC PROCESSING 14**), a key will sustain at the sustain level even after you take your fingers off the keys. This is like the HOLD function found on standard synthesizers. The sound will continue to sustain unless you play more notes than there are available channels, in which case previously assigned channels will be assigned to newly played notes.



If a key is released during the Hold (H) phase, the Release (R) phase begins.

DYNAMIC PROCESSING

DYNAMIC PROCESSING 13

FILTER FREQUENCY, Q, ENVELOPE AMOUNT, TRACKING

This function determines the filter's initial cutoff frequency and Q (sharpness), the extent to which the associated AHDSR envelope affects the filter cutoff frequency, and the effect of keyboard position on cutoff frequency.

Application: Change the timbral quality of a sound.

1. Activate **DYNAMIC PROCESSING 13**. The display will say:

Fc	Q	Env	Trk
XXX	XX	±XX	X.XX

Hint: Filter and VCA settings interact. For example, if the VCA is set for an extremely short decay, then you won't hear the effects of setting a long filter decay.

2. Select the desired parameter for adjustment with the cursor buttons, then use the data slider to change the parameter value. These are the parameters:

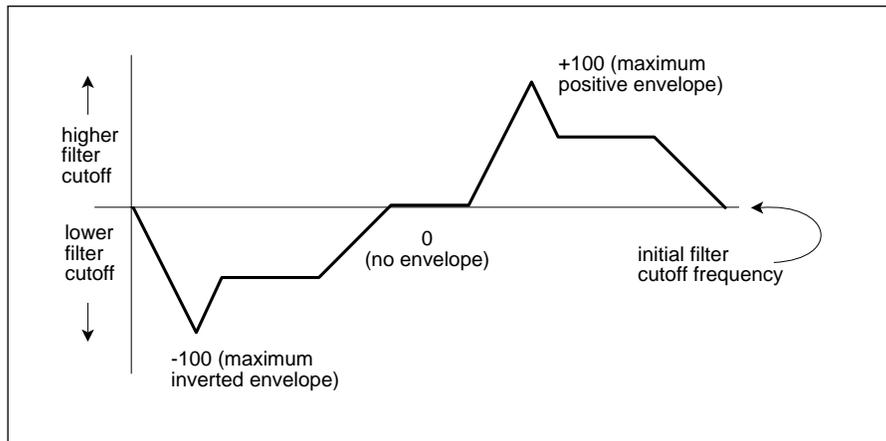
■ **Freq:** Varies the lowpass filter cutoff from 0 to 120. Higher values correspond to higher filter cutoff frequencies, hence a sound with more treble. The maximum filter sweep range is most obvious with Env set to +00.

■ **Q:** Varies the Q (resonance) from 00 to 99. Higher values correspond to increased resonance, accentuating the filter cutoff frequency, which gives a purer, more whistling sound.

■ **Env:** Varies the effect of the filter envelope (see **DYNAMIC PROCESSING 14**) on the filter cutoff frequency from -50 (maximum inverted envelope) to +00 (no envelope) to +50 (maximum positive envelope). It is usually necessary to raise the filter cutoff value when using inverted envelopes.

■ **Trk:** Varies the filter cutoff with respect to the note(s) being played on the keyboard from 0.00 (no tracking) to 1.87 (overtracking) filter-oct/keyboard-oct. With 0.00 tracking, the filter cutoff will not be affected by the keyboard pitch. With 1.00 tracking, the filter cutoff will track the keyboard pitch. With 1.87 tracking, the filter cutoff will change at almost twice as fast a rate as keyboard pitch changes.

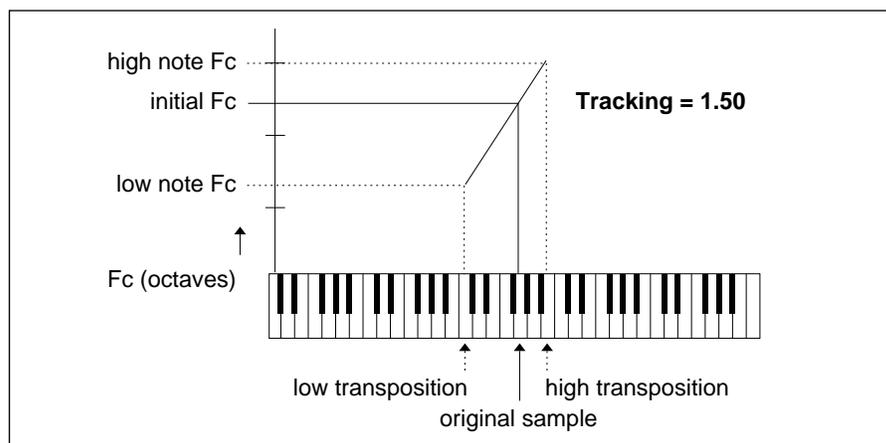
DYNAMIC PROCESSING



Inverted envelopes can be generated by applying a negative envelope amount.

Keyboard Tracking Application: With no tracking, a voice will become progressively less bright as you play higher on the keyboard. This is useful with some bass sounds, where you don't want the high notes to sound too trebly. With normal tracking (keyboard amount 1.00), the timbre of a voice remains constant as you play up the keyboard. This generally gives the most realistic synthesizer and instrument sounds. With overtracking (keyboard amount greater than 1.00), the overall timbre of the voice becomes brighter as you play higher up on the keyboard. This is useful for playing upper keyboard register leads that really "cut" while also playing a more sedate, muted line in the lower registers.

2. After making your selections, press **ENTER** to return to the module identifier.



Use Filter Tracking to make the filter frequency follow the keyboard.

DYNAMIC PROCESSING

DYNAMIC PROCESSING 14

FILTER ENVELOPE

This function sets the attack, decay, sustain, and release characteristics of the filter AHDSR envelope generator.

Application: Change the filter cutoff frequency dynamically over time.

1. Activate **DYNAMIC PROCESSING 14**. The display will say:

F:	A	H	D	S	R
	XX	XX	XX	XX	XX

...where XX is a two-digit numeral between 00 and 32.

Hint: Filter and VCA settings interact. For example, if the VCA is set for an extremely short decay and 0 sustain level, then you won't hear the effects of setting a long filter decay.

2. Select the desired parameter for adjustment with the cursor buttons, then use the data slider to change the parameter value.

The envelope generators for the VCA and Filter are identical. Refer to the AHDSR diagram for the VCA as you read the following descriptions of the five parameters.

■ **A (Attack):** Varies the Filter envelope attack time from 01 to 32 (higher values increase the attack time).

■ **H (Hold):** Sets the duration of the peak attained during the attack phase. If a key is held down longer than the hold duration, the decay phase will begin. If a key is released during the hold duration, the release phase will begin.

■ **D (Decay):** Varies the initial decay time from 01 to 32 (higher values increase the initial decay time). 32 gives "infinite decay" (envelope stays at maximum amplitude for as long as you hold down keys).

■ **S (Sustain):** Varies the envelope sustain level from 01 to 32 (higher values give higher sustain levels).

■ **R (Release):** Varies the release time from 01 to 32 (higher values increase the release time). A setting of 32 inhibits the release phase of the envelope, thus keeping the Filter open at the previously selected Sustain level. This is useful if you want to trigger a long sound by simply tapping a key.

3. After making your selections, press **ENTER** to return to the module identifier.

DYNAMIC PROCESSING

Note: If the filter and VCA release are both at 32 (also see **DYNAMIC PROCESSING 12**), a key will sustain at the sustain level even after you take your fingers off the keys. This is like the HOLD function found on some synthesizers.

DYNAMIC PROCESSING 15 LFO SETUP (RATE, DELAY, VARIATION)

A Low Frequency Oscillator, or LFO, is simply a wave repeats at a slow rate. The Emax II contains a triangle wave LFO for each of its 16 channels. The triangle wave is very useful because it provides realistic vibrato and tremolo effects.

The LFO setup function sets three LFO parameters (initial rate, delay before onset of LFO modulation, and LFO variation).

Application: After pressing a key(s), LFO delay delays the onset of vibrato by an adjustable amount. This simulates an effect often used by string players, where the vibrato is brought in only after the initial note pitch has been clearly established.

Application: LFO variation adds a randomized quality to ensemble sounds by providing slightly different vibrato rates for each key being held down. This can make orchestral voices sound truly polyphonic.

1. Activate **DYNAMIC PROCESSING 15**. The display will say:

Rate	Delay	Vari
XXX	XX	XX

2. Select the desired parameter for adjustment with the cursor buttons, then use the data slider to change the parameter value. These are the available parameters:

■ **LFO Rate:** Varies from 1 to 120; higher values give a faster modulation rate.

■ **LFO Delay:** Sets the amount of time between hitting a key and the onset of modulation. Range is from 00 to 99, with higher values giving longer delays.

■ **LFO Variation:** In addition to having true, one-LFO-per-voice polyphonic modulation, the Emax II also has a great feature called variation. With 00 variation, each key will have the same vibrato rate. Increasing variation (to a maximum of 15) alters the LFO rate every time you hit a key; the higher the number, the greater the variation in LFO frequency. For effects such as ensemble playing, the variation feature is invaluable as it creates the illusion of multiple players, each having their own vibrato rate.

DYNAMIC PROCESSING

3. After making your selections, press **ENTER** to return to the module identifier.

DYNAMIC PROCESSING 16

LFO TO (VIBRATO, TREMOLO, FILTER Fc, PANNING)

The LFO can modulate four different parameters—pitch, amplitude, filter cutoff frequency, and stereo placement. The modulation depth (index) is variable from 00 to 15.

Application: LFO modulating the pitch provides vibrato effects; LFO modulating VCA provides tremolo effects (as used for years in guitar amplifiers—attention surf music fans); LFO modulating filter provides timbre modulation effects; LFO modulating panning sweeps the sound back and forth between the left and right channels (i.e., spatial modulation).

1. Activate **DYNAMIC PROCESSING 16**. The display will say:

Vib	Trem	Fc	Pan
XX	XX	XX	XX

2. Select the desired parameter for adjustment with the cursor buttons, then use the data slider or increment buttons to change the parameter value as desired:

■ **Vibrato:** Determines the extent to which the LFO modulates pitch. Range is from 00 to 15, with higher values giving more modulation.

■ **Tremolo:** Determines the extent to which the LFO modulates the VCA. Range is from 00 to 15, with higher values giving more modulation.

■ **Fc (Filter Cutoff):** Determines the extent to which the LFO modulates the filter cutoff frequency. Range is from 00 to 15, with higher values giving more modulation.

■ **Pan:** Determines the extent to which the LFO modulates the stereo placement. Range is from 00 to 15, with higher values giving more drastic motion between the left and right channels.

3. After making your selections, press **ENTER** to return to the module identifier.

DYNAMIC PROCESSING

DYNAMIC PROCESSING 17

VELOCITY TO (LEVEL, FILTER Fc, FILTER Q, PITCH)

This function ties dynamics (level), filter cutoff, filter Q, and pitch to how forcefully you play the keyboard.

Application: Sample sounds from an instrument (i.e. older synthesizers) without dynamics, and assign velocity dynamics in the Emax II.

Application: Acoustic instruments often sound brighter when played forcefully. Emax II can simulate this effect by tying filter cutoff to keyboard dynamics.

Application: Increasing Q with increasing velocity thins out a sound, yet also increases its sharpness. This can work well with percussive voices when you want a more intense, but not necessarily louder, sound.

Application: Since each voice in a preset can have its own keyboard dynamics settings, lower register bass sounds can have minimum dynamics to provide a constant bottom, while upper register lead sounds can be played more dynamically.

1. Activate **DYNAMIC PROCESSING 17**. The display will say:

```
Vel:Lv Fc Q Pit
   XX XX XX XX
```

2. Select the desired parameter for adjustment with the cursor buttons, then use the data slider to change the parameter value. Here are your choices:

■ **Level:** Determines the extent to which keyboard velocity controls dynamics. When set to 00, the overall level is at maximum (loudest possible dynamics) no matter how forcefully or softly you play the keyboard. Progressively *higher* values give a progressively wider dynamic range by making soft sounds softer. Example: When set to 05, softly played notes sound somewhat quieter than forcefully played notes; when set to 15, softly played notes sound *drastically* quieter than forcefully played notes.

■ **Fc:** Determines the extent to which keyboard velocity controls filter cutoff frequency. When set to 00, the filter cutoff frequency remains constant no matter how forcefully or softly you play the keyboard. Progressively *higher* values give a wider cutoff frequency range by lowering the cutoff frequency for softer playing. Example: When set to 05, softly played notes have a somewhat lower cutoff frequency than forcefully played notes; when set to 15, softly played notes have a *drastically* lower cutoff frequency.

■ *When using Emax II with an external sequencer, it is often necessary to increase the amount of velocity to level.*

DYNAMIC PROCESSING

■ **Q:** Determines the extent to which keyboard velocity controls filter Q. When set to 00, no matter how hard or soft you play the Q stays constant. With positive values (up to +15), playing more forcefully increases the Q. With negative values (down to -16), playing more forcefully decreases Q. Note that overall volume levels can change with changes in Q; this is normal.

Note: The Fc and Q settings interact with the Filter controls (**DYNAMIC PROCESSING 13**). You will probably need to “tweak” the Filter module settings for optimum results.

■ **Pitch:** Determines where pitch will be held relative to keyboard dynamics. When set to 00, the pitch remains constant no matter how forcefully or softly you play the keyboard. Progressively *higher* values give higher-pitched notes as you play more forcefully. Example: When set to 05, softly played notes are fairly close to (if not the same as) concert pitch and are somewhat lower in pitch than forcefully played notes; when set to 15, forcefully played notes are much higher in pitch than softly played notes. This can be useful for percussive sounds.

3. After making your selections, press **ENTER** to return to the module identifier.

DYNAMIC PROCESSING 18

VELOCITY TO (VCA ATTACK, FILTER ATTACK, PANNING)

This function ties the VCA attack time, filter envelope attack time, and panning to how forcefully you play the keyboard.

Application: Keyboard-controlled VCA attack is excellent for string and horn sounds, where bowing or blowing softly produces a slower attack than rapid bowing or blowing, which produces a much faster attack.

Application: Tying keyboard dynamics to filter attack is very useful with string parts when you want legato sections to sound more timbrally muted than staccato sections.

1. Activate **DYNAMIC PROCESSING 18**. The display will say:

Vel:Atk	FAtk	Pan
XX	XX	XX

...where XX is a two-digit number between 00 and 15.

DYNAMIC PROCESSING

2. Select the desired parameter for adjustment with the cursor buttons, then use the data slider to change the parameter value. These are the available parameters:

■ **Atk**: Determines the extent to which keyboard velocity controls VCA attack time. When set to 00, no matter how hard or soft you play the attack time will remain as set in **DYNAMIC PROCESSING 12**, VCA Attack. Increasing the value causes the attack time to increase as you play more softly. A setting of 15 gives the greatest variation in attack times between hard and soft playing.

■ **FAtk (Filter Attack)**: Determines the extent to which keyboard velocity controls filter attack time. When set to 00, no matter how hard or soft you play, the filter attack time will remain as set in **DYNAMIC PROCESSING 14**, Filter Attack. Increasing the value causes the filter attack time to increase as you play more softly. A setting of 15 gives the greatest variation in attack times between hard and soft playing.

■ **Pan**: Determines the extent to which keyboard velocity controls stereo placement. When set to 00, no matter how hard or soft you play, the panning will remain as set in **DYNAMIC PROCESSING 19**, Panning. Increasing the value causes the signal to pan in the opposite direction of the current spatial placement; the higher the value, the greater the difference in stereo spread between soft and forceful keyboard playing. Example: With the voice panned slightly to the left and a high pan velocity value, playing softly leaves the voice slightly to the left, which playing forcefully pans the voice towards the right extreme. In-between dynamics produce placement in-between the two extremes.

3. After making your selections, press **ENTER** to return to the module identifier.

DYNAMIC PROCESSING 19

PANNING

This function controls the static stereo placement of a voice or voices. The stereo placement may additionally be modulated via the LFO (**DYNAMIC PROCESSING 16**), keyboard dynamics (**DYNAMIC PROCESSING 18**) or realtime controls (**PRE-SET DEFINITION 9**).

1. Activate **DYNAMIC PROCESSING 19**. The display will say:

Panning:	+00
L	>< R

...and a marker will appear somewhere in the lower line of the display to indicate current position in the stereo field. The number in the upper display correlates to stereo position, where -07 is all the way left and +07 is all the way to the right. +00 indicates center.

DYNAMIC PROCESSING

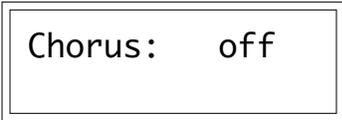
2. Use the data slider to vary the stereo placement; moving the marker to the left shifts the sound to the left, and moving the marker to the right shifts the sound to the right.
3. After making your selections, press **ENTER** to return to the module identifier.

DYNAMIC PROCESSING 20

CHORUS

This function provides a thicker, richer sound by doubling the primary voice and slightly detuning this double sound.

1. Activate **DYNAMIC PROCESSING 20**. The display will say:



Chorus: off

...where off is the default position. Use the **ON**, **OFF** buttons or the data slider to choose chorus status and the amount of detuning. Chorus detuning is variable from 1 to 20 cents at the original pitch.

2. After making your selections, press **ENTER** to return to the module identifier.

Note: Chorus uses both halves of one channel, as in Stereo Voice mode (**PRESET DEFINITION 4**). Therefore, you can still play sixteen note polyphony while in Chorus mode. Using Chorus mode with Stereo samples detunes the primary and secondary voices from each other.

Also note: The effective amount of detuning will gradually increase as a voice is shifted downward in pitch. Therefore, you may wish to copy a chorused voice several times in order to apply a different amount of chorus to several keyboard ranges. (See Copy Voice, **PRESET DEFINITION 1**.)

■ To create a stereo chorus effect, slightly change the pan position of the chorused voice.

DYNAMIC PROCESSING

DYNAMIC PROCESSING 21 **KEYBOARD MODE** **(Solo, Non-Transpose,** **Output Channel Assignment)**

■ **Output Channel Assignment:** allows you to reassign any area of the keyboard to specific outputs without having to assign each individual voice.

■ **Solo mode:** provides the playing action of a monophonic synthesizer with single triggering and last-note priority. With single triggering, you must lift your finger off a key to initiate a new envelope.

■ **Nontranspose:** lets a voice play throughout its assigned keyboard range but at its original pitch only—there will be no transposition.

Solo Application: Produce more realistic effects when working with monophonic instrument sounds (i.e. solo trumpet, flute, sax, etc.) since this mode does not allow you to play a chord. Simulate the keying action of monophonic synthesizers.

Nontranspose Application: Determine the original note at which a voice was recorded. Or, if you're playing drum parts on the keyboard, you might want to assign the bass drum to the entire left-most octave of the keyboard so that it makes an easy target compared to hitting one key. In this case, put the bass drum into Nontranspose mode so that no matter where you hit, the sound is consistent. Or, if you have an environmental ocean sound layered beyond a melodic line, but don't want the ocean to transpose as you play the melody, Nontranspose the ocean sound.

Nontranspose Application: Assign a non-transposed sound and play several keys at almost the same time; you'll hear some pretty neat phasing/flanging effects.

Output Assignment Application: Assign a drum set which has been placed on one end of the keyboard to a set of submix outputs to add external processing such as reverb or EQ.

1. Activate **DYNAMIC PROCESSING 21**. The display will say:

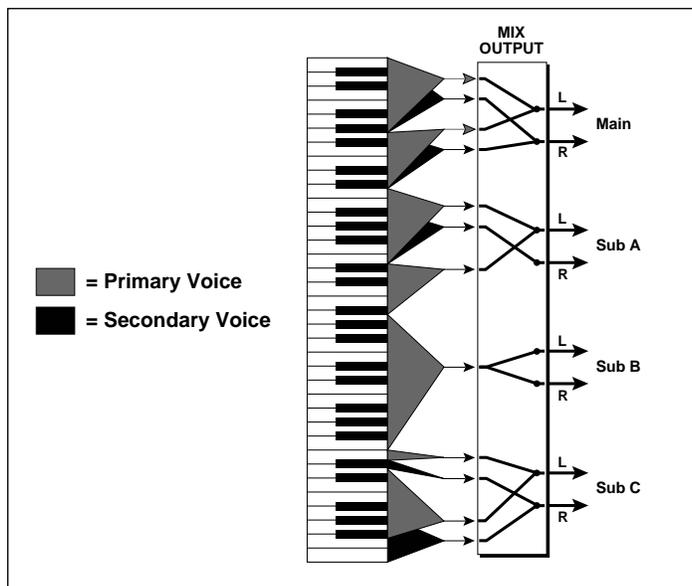
```

Outs Solo Transp
Main  off  Enabl'd
```

2. Select the desired parameter for adjustment with the cursor buttons, then use the **ON**, **OFF** buttons or slider to choose the desired status.

3. After making your selections, press **ENTER** to return to the module identifier.

DYNAMIC PROCESSING



Groups of voices can be assigned to specific output channels using Dynamic Processing 21.

DYNAMIC PROCESSING 22

CONTROL ENABLE

This unique function allows you to exempt specific voices from certain real-time control functions.

Application: Exempt bass notes with long release times from pitch bending by disabling pitch bend for the bass voices. You may then bend pitch in the upper range without affecting the bass notes.

1. Activate **DYNAMIC PROCESSING 22**. The display will say.....

Control Enable
Use Cursor Keys

2. Press the right cursor key. The cursor keys scan through the various real time control destinations (see **PRESET DEFINITION 9**) in the following order: Pitch, LFO to Pitch, LFO to Filter, LFO to VCA, Filter cutoff frequency, Level, Attack, and Pan.
3. The default setting for all destinations is **ON**. To exempt the current voice from a particular control destination, press **OFF**. Example: To exempt the current voice from being pitch-bent, press **OFF** when the display shows Pitch.
4. After disabling the unwanted control destinations, press **ENTER** to return to the module identifier.