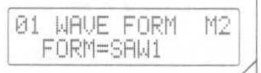
01 WAVEFORM

Related Functions

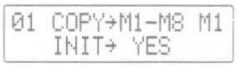
Parameters	O/S	EDIT—PAGE/PAGE DOWN—PAGE—CURSOR—VALUE

Domain		
	Mode	**Normal**
FORM = SINE / SAW1 / SAW2 / SAW3 / SAW4 / SAW5 / NOISE1 / NOISE2	Keyboard	MODULAR
	Guitar	
	Wind	

A



B



C

With this function, you can choose the basic waveforms which are produced by each module. Waveforms determine the basic timbre — one of the three basic elements of any sound (pitch, timbre and volume). You can choose from 8 basic waveforms. (See information below for details on various types of waveforms.)
Note that waveforms can be selected for each module independently.

COPY/INITIALIZE
This function features COPY and INTIIALIZE functions which allow you to "copy" waveform specifications from one module to another, and to "initialize" the selected module to a SINE wave.

To COPY the waveform of the selected module to another module, first select VOICE-01 and the module containing the waveform you want to copy from. Next, hold down the WRITE key (FIG-C) and then press the PROG NO key corresponding to the module you want to copy into.

To INTIALIZE the selected module, first select VOICE-01 and the module containing the waveform you want to initialize. Next, hold down the WRITE key and then press the YES key. A SINE wave (initialized setting) will be selected for the FORM parameter.

About Waveforms
You can choose from 8 different waveforms.
These waveforms have the following types of characteristics.
Sine – the purest waveform possible with only the fundamental frequency and no other harmonics present. A "pure" whistling type of sound.
Saw 1 ~ 5 – A "buzzing" type of waveform with harmonics present from the fundamental on higher in decreasing amplitude. (Saw 1 has the least amount of uppr harmonics and Saw 5 has the most.)
Noise 1– A waveform consisting of all harmonics present, producing a non-pitched type of sound resembling static.
Noise 2 –Anothr noise waveform which does have the fundamntal pitch present along with the "static".

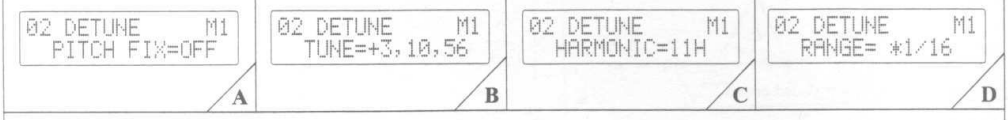
02 DETUNE

Related Functions

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

PITCH FIX = ON / OFF
ON: RANGE = ×1 / ×1/16
OFF: HARMONIC = 1/63 ~ 63
TUNE = +/− (POLARITY), 0 ~ 5 (OCT), 0 ~ 11 (NOTE), 0 ~ 63 (FINE)

Domain	
Mode	**Normal**
Keyboard	MODULAR
Guitar	
Wind	



This function lets you establish the pitch independently for each module. By detuning some modules, you can create a "thick" sound, or emphasize certain "harmonic", etc.

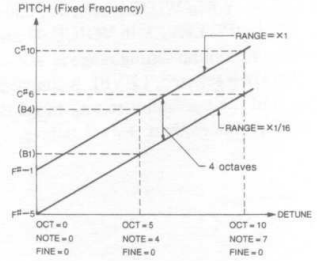
The PITCH FIX parameter can also be set in this function. This lets you simulate the "attack" sound of certain instruments, by fixing the frequency of one module so that the same pitch is produced by any note number.

Parameters with PITCH FIX set to OFF (normal detuning)
HARMONIC: Used to set the harmonic level at which the detuned module will sound in comparison with the standard frequency. When the harmonic level is set, other parameters are adjusted to appropriate corresponding levels automatically. At a value of "1," the standard frequency is specified and no detuning is effected.
With PITCH FIX set to OFF, the TUNE parameter features a total of four different settings; Polarity, Octave, Note and Fine Tuning.
POLARITY (POL): Used to specify whether the module will be tuned above (+) or below (−) the standard frequency.
OCTAVE (OCT): Used to raise pitch in 1-octave increments.
NOTE (NOTE): Used to raise or lower fixed pitch in half-tone (100-cent) increments.
FINE TUNING (FINE): Used to alter pitch in 1.6-cent increments (approximate).

When detuning is effected with the NOTE and FINE parameters, the resulting harmonic will not be an "exact" harmonic of the standard frequency. Because of this, "H" and "L" marks to the right of the HARMONIC indicate that the harmonic is slightly higher or lower than the displayed harmonic value (differs with detuning).
(FIG-C)

Parameters with PITCH FIX set to ON
RANGE (×1 or 1/16): When set to "×1", the "octave range" of the fixed-pitch sound will correspond to the MIDI instrument pitch (and OCTAVE parameter setting), within a range of approximately F# -1 to C# 10.

By selecting the "×1/16" parameter (FIG-D), the fixed-pitch sound will be shifted to a range is equal to F# -5 to approximately C# 6. (In some cases, the sound will not be audible, as it's frequency is too low for the human ear. Try raising the OCT value in this case.)



With PITCH FIX set to ON, the TUNE parameter features a total of four different settings; Octave, Note and Fine Tuning.
OCTAVE: Used to raise pitch in 1-octave increments. (When the NOTE parameter is set to a value higher than "7", the OCTAVE parameter can be set between "0" and "9".)
NOTE (NOTE): Used to raise or lower fixed pitch in half-tone (100-cent) increments. (When OCT is set to "10," this range is limited to between "0" and "7.")
FINE TUNING (FINE): Used to alter pitch in 1.6-cent increments.

COPY/INITIALIZE
This function features COPY and INITIALIZE functions which allow you to "copy" detune specifications from one module to another, and to "reset" the selected module to an initialized setting (DETUNE OFF).
To COPY the detuning specifications of the selected module to another module, first select VOICE-02 and the module containing the detune settings you want to copy from. Next, hold down the WRITE key and then press the PROG NO key corresponding to the module you want to copy into.
To INITIALIZE the selected module, first select VOICE-02 and the module containing the detuning specifications you want to initialize. Next, hold down the WRITE key and then press the YES key. Detuning settings will be reset to initialized values (DETUNE OFF).

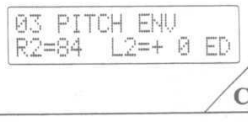
03 PITCH ENV (DCO)

Related Functions
VOICE—04, 05, 17, 18

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
R1 ~ R8 (RATE) = 0 ~ 99 L1 ~ L8 (LEVEL) = −63 ~ +63 SS = SUSTAIN STEP (YES key) ED = END (NO key)	Domain	
	Mode	Normal
	Keyboard	GLOBAL
	Guitar	
	Wind	

A

B



C

The DCO envelope determines the change in pitch over time for all 8 modules. The unit features 8-step envelopes, which means that RATEs and LEVELs can be set at up to 8 points in the envelope.

A level value of "0" indicates no change in pitch. (standard pitch played on keyboard). This means that positive values cause the pitch to rise, while negative values lower the pitch.

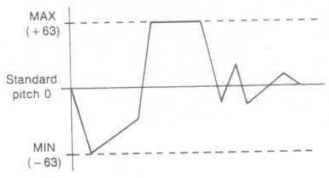
SS & ED POINTS
In addition to RATE and LEVEL values, SS (Sustain, FIG-B) and ED (End, FIG-C) points can be specified at any step in the DCO envelope.

•To enter an SS point in any step, press the YES (VALUE ▲).

When a sustain point is inserted in the envelope, the PITCH will be sustained until a note off message is received. The step immediately following the SS step then becomes the "release" point (as in ADSR type pitch envelopes).

•To delete a sustain point, press the YES (VALUE ▲) key once again.

•To enter an ED point in any step, simply press the NO (VALUE ▼) key.



As there are up to 8 steps in the DCO envelope, the end point is initially set in step 8. The end point can be moved to any step, however subsequent steps will automatically be deleted.

Note that ED points can be set for any step, regardless of its LEVEL value.

•To delete the end point from any step (1 through 7), simply move the cursor to the step and press the NO (VALUE ▼) key once again. The end point returns to step 8 automatically.

Note that the actual change affected by the level parameter depends on the setting of the envelope depth in VOICE-04. When this depth is at its maximum, a value of −63 to +63 represents more than a 5-octave change in pitch (up or down).

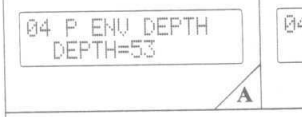
INITIALIZE
To INITIALIZE the patch, first select VOICE-03 and the module containing the specifications you want to initialize. Next, hold down the WRITE key and then press the YES key.

Note that when this function is initialized, the PITCH ENVELOPE of the selected module as well as enabled steps in the PITCH ENV of VOICE-18 are initialized.

04 P ENV DEPTH (DCO)

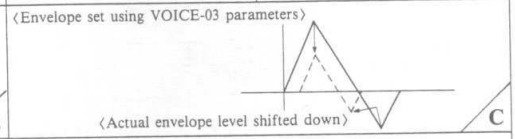
Related Functions
VOICE—03, 05

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
DEPTH = 0 ~ 63 RANGE = WIDE / NARROW	Domain	
	Mode	Normal
	Keyboard	GLOBAL
	Guitar	
	Wind	



A

B



C

This function contains two parameters — DEPTH and RANGE. Both of these parameters affect the DCO ENVELOPE settings which are specified in function 03 (VOICE-03).

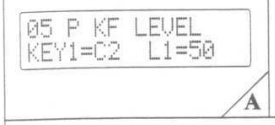
The ENVELOPE DEPTH parameter can be used to "shift" the level of the entire envelope produced using the DCO ENVELOPE parameters (03). At a value of "63", the envelope is produced as set in VOICE-03. And at a value of "0", the pitch is not changed by DCO ENVELOPE set in VOICE-03.

The RANGE parameter is a toggle which can be set to either WIDE or NARROW. When WIDE is selected, units used in setting the ENVELOPE LEVEL in VOICE-03 are equal to 100 cents and the maximum setting range is +/− 5 octaves. When NARROW is selected, LEVEL is changed in 25-cent increments, and the maximum setting range is decreased to approximately more than +/−1 octave.

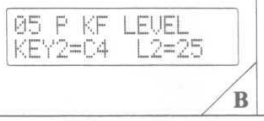
05 P KF LEVEL (DCO)

Related Functions
VOICE—03, 04, 16

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
KEY 1~KEY 6=C0~C9 L1~L6 (LEVEL)=0~63	Domain	
	Mode	Normal
	Keyboard	GLOBAL
	Guitar	
	Wind	



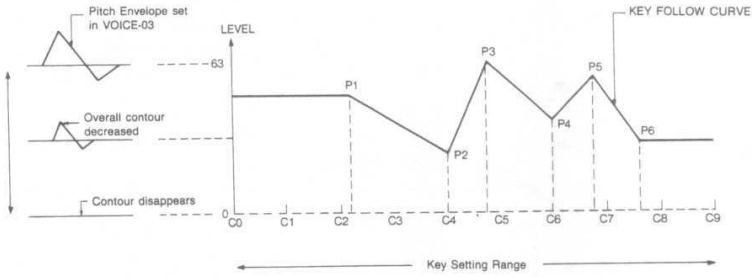
A



B

The parameters in this function are used to determine how Keyboard Follow (KF) affects the DCO envelope (pitch) produced using the parameters in VOICE-03 and VOICE-04. The unit features 6-step keyboard follow, which means that LEVELs can be set at 6 points in the KEYBOARD FOLLOW CURVE.

The key parameter represents positions in the Key Setting Range (C0 ~ C9). In this state, each "POINT" in the KF curve can be moved in harf-tone increments. As the "LEVEL" parameter value is increased, the contour of the curve is increased, while it is decreased as the value is decreased.

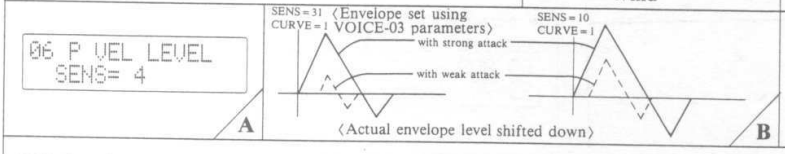


POINT	P1	P2	P3	P4	P5	P6
KEY	E2	C4	A4	C6	A♭6	F♯7
LEVEL	50	25	63	35	57	28

06 P VEL LEVEL (DCO)

Related Functions
VOICE—03, 04, 05

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
SENS (SENSITIVITY) = 0 ~ 31 CURVE = 1 ~ 8	Domain	
	Mode	Normal
	Keyboard	GLOBAL
	Guitar	
	Wind	

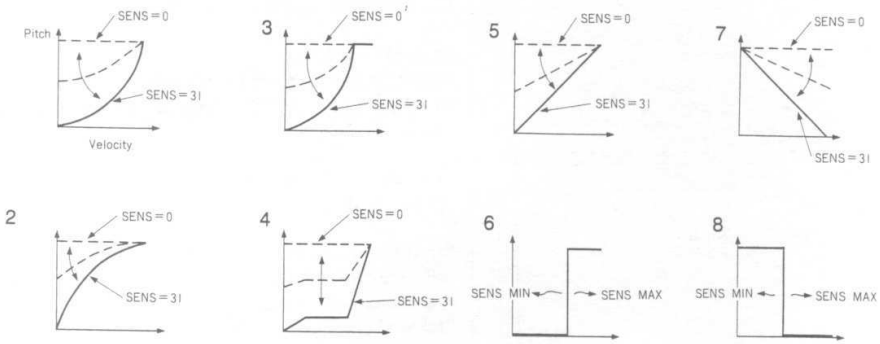


This function features 2 basic parameters which are used to contour the velocity level message control over the DCO (pitch) envelope's level for all modules (M1 ~ M8). In other words, these settings — SENSITIVITY and CURVE — determine how responsive all 8 modules will be to key touch dynamics with regards to changes in pitch.

The CURVE parameter lets you choose from any of 8 different velocity curves, which determine the contour of velocity message control over time. The SENSITIVITY parameter lets you set the range of change in the DCO ENVELOPE by velocity message control. At a setting of "0", the selected module will be totally unresponsive to velocity message control — in other words, your keyboard attack will have no effect over changes in pitch. A setting of "31" indicates maximum sensitivity. (FIG-B)

The CURVE parameter is used to select one of the 8 velocity curves (contours) as shown in the figures below. These curves determine how the pitch actually changes over time.

[CURVES]



07 VIBRATO (DCO)

Related Functions

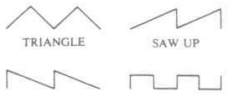
Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

WAVE = TRIANGLE / SAW UP / SAW DOWN / SQUARE
DEPTH = 0 ~ 99
RATE = 0 ~ 99
DELAY = 0 ~ 99
MULTI = ON / OFF

Domain	
Mode	**Normal**
Keyboard	GLOBAL
Guitar	
Wind	

A

B



C

The VIBRATO function corresponds to the LFO of an analog synthesizer. It oscillates the low frequencies of the DCO, and this oscillation adds a "vibrato" effect to the selected waveform. There are five basic parameters within this function — WAVE, DEPTH, RATE, DELAY and MULTI.

The WAVE parameter lets you choose the basic waveform of the vibrato oscillation. There are 4 — SQUARE, SAW DOWN, SAW UP, and TRIANGLE. (FIG-C) (See information below for details on various types of waveforms which can be selected.)

You can use the DEPTH parameter to set the "depth" of vibrato oscillation (how strong the vibrato is). The larger the value, the deeper the vibrato effect. (If this is set to "0", no vibrato will be generated. Be sure to raise the value before altering other settings.)

The RATE parameter is used to set the "speed" of vibrato oscillation. The higher the value, the faster the vibrato effect.

The DELAY parameter is used to set the period of time from initial note on message until the point where vibrato oscillation begins. The larger the value, the longer the delay before vibrato is applied.

The MULTI parameter features a toggle which can be set to either ON or OFF. When MULTI is set to ON, the vibrato effect is engaged independently as keys are played, so that each note's vibrato is independent (not synchronized with vibrato delay and oscillation of note messages received previously or subsequently). This effect is useful in creating "ensemble" sounds.

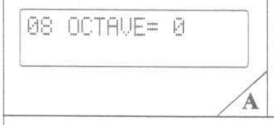
When this parameter is set to OFF, vibrato oscillation is synched for all notes, regardless of when they are sounded (in unison or independently).

[WAVEFORMS]
Triangle – produces a smooth repeating up and down pitch variation.
Saw Up – produces a repeating pitch rise starting from the fundamental frequency.
Saw Down – produces a repeating pitch "swoop" down from above to the fundamental frequency.
Square – produces a repeating "trill" between the original pitch and a higher pitch.

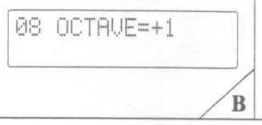
08 OCTAVE

Related Functions

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
OCTAVE = −2/−1/0/+1/+2	Domain	
	Mode	**Normal**
	Keyboard	GLOBAL
	Guitar	
	Wind	



A



B

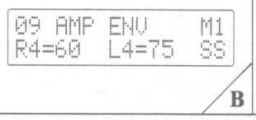
This function features only one parameter — OCTAVE, which is used to raise or lower the overall octave of all 8 modules (M1 ~ M8) globally. At a value of "0", the octave for all 8 modules is set at the standard pitch level (A4 = 442Hz). (This is assuming that "Detune" is set to "Harmonic 1" for the module in question. . . . .). You can raise or lower the octave by a maximum of 2 octaves, in 1-octave increments.

09 AMP ENV (DCA)

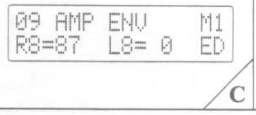
Related Functions
VOICE—10, 11, 17, 19

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
R1 ~ R8 (RATE) = 0 ~ 99 L1 ~ L8 (LEVEL) = 0 ~ 99 SS = SUSTAIN STEP (YES key) ED = END (NO key)	Domain	
	Mode	Normal
	Keyboard	MODULAR
	Guitar	
	Wind	

A



B



C

This function basically contains 8 "STEPs", each of which is broken down into RATEs and LEVELs which you can use to create 8-step (maximum) amplitude envelopes for each module (M1 ~ M8).

These DCA "envelopes" determine how the amplitude (remember, amplitude = loudness) of each module changes over time. In other words, the sound attack and decay, and all the changes in volume which the sound goes through in between.
Furthermore, as mentioned in the section on the iPD Sound Source, if the module LINE is set to EXT PHASE for the next LINE, ENVELOPE DCA affects the timbre of the succeeding LINE.

(For more information on ENVELOPEs, RATEs, LEVELs and STEPs, refer to the VZ Sound Seminar.)

SS & ED POINTS
In addition to RATE and LEVEL values, SS (Sustain, FIG-B) and ED (End, FIG-C) points can be specified at any step in the DCA envelope.

•To enter an SS point in any step, simply press the YES (VALUE ▲).

When a sustain point is inserted in the envelope, the sound will be sustained until a note off message is received. The step immediately following the SS step then becomes the "release" point (as in ADSR type amplitude envelopes).

•To delete a sustain point, press the YES (VALUE ▲) key once again.

•To enter an ED point in any step, simply press the NO (VALUE ▼) key.
As there are up to 8 steps in the DCA envelope, the end point is initially set in step 8. The end point can be moved to any step, however subsequent steps will automatically be deleted.

To delete the end point from any step (1 through 7), simply move the cursor to the step and press the NO (VALUE ▼) key once again. The end point returns to step 8 automatically.

COPY / INITIALIZE
This function features COPY and INITIALIZE functions which allow you to "copy" DCA specifications from one module to another, and to "reset" the selected module to an initialized setting.
To COPY the DCA specifications of the selected module to another module, first select VOICE-09 and the module containing the detune settings you want to copy from. Next, hold down the WRITE key and then press the MODULE SELECT key corresponding to the module you want to copy into. When this procedure is carried out, complete DCA data (VOICE-10, 11, 12, 14, 17) is copied into the destination module.
To INITIALIZE the selected module, first select VOICE-09 and the module containing the specifications you want to initialize. Next, hold down the WRITE key and then press the YES key. DCA settings for VOICE-09 and VOICE-19 (VEL RATE) will be reset to initialized values.

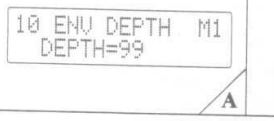
Note that when this function is initialized, the AMP ENVELOPE of the selected module, as well as enabled steps in the AMP ENV of VOICE-19 are initialized.

10 ENV DEPTH (DCA)

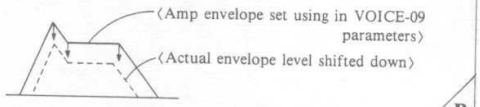
Related Functions
VOICE—09, 11

Parameters	**O/S**	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

	Domain	
	Mode	**Normal**
ENV DEPTH = 0 ~ 99	Keyboard	MODULAR
	Guitar	
	Wind	



A



B

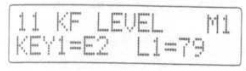
This function lets you raise or lower the entire contour of the DCA envelopes for all 8 modules, created using VOICE-09 (DCA Envelope). Note that this function has no direct effect on the actual envelope, but simply raises or lowers its overall "level". Simply speaking, the overall volume level of the selected module is decreased as you lower the ENV DEPTH level. Settings can be made for all 8 modules independently.

11 KF LEVEL (DCA)

Related Functions
VOICE—09, 10

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

	Domain	
KEY 1~KEY 6=C0~C9 L1~L6 (LEVEL)=0~99	**Mode**	**Normal**
	Keyboard	MODULAR
	Guitar	
	Wind	

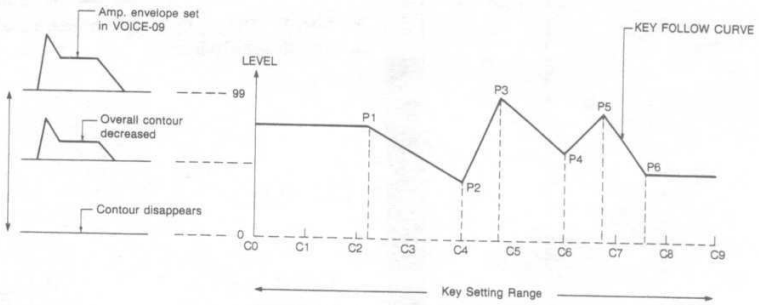


A

B

The parameters in this function are used to determine how Keyboard Follow (KF) affects the DCA envelope (loudness) produced using the parameters in VOICE-09 and VOICE-10. The unit features 6-step keyboard follow, which means that LEVELs can be set at 6 points in the KEYBOARD FOLLOW CURVE.

The settings for this function are made in exactly the same way is in the DCO (pitch) KF LEVEL function (VOICE-05). But, DCA KF LEVEL can be set for each MODULE independently.

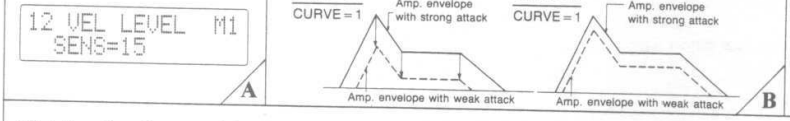


POINT	P1	P2	P3	P4	P5	P6
KEY	E2	C4	A4	C6	A♭6	F#7
LEVEL	79	40	99	56	90	44

12 VEL LEVEL (DCA)

Related Functions
VOICE—09, 10, 11
EFFECT—14

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
SENS (SENSITIVITY) = 0 ~ 31 CURVE = 1 ~ 8	Domain	
	Mode	Normal
	Keyboard	MODULAR
	Guitar	
	Wind	



This function features 2 basic parameters which are used to contour the key-touch control over the DCA (amplifier) envelope's level, for each module (M1 ~ M8). In other words, these settings — SENSITIVITY and CURVE — determine how responsive the waveform produced by any given module will be to key touch dynamics.

The CURVE parameter lets you choose from any of 8 different velocity curves, which determine the contour of velocity control over time. The SENSITIVITY parameter lets you select values between "0" and "31". At a setting of "0", the selected module will be totally unresponsive to velocity control message. A setting of "31" indicates maximum sensitivity.

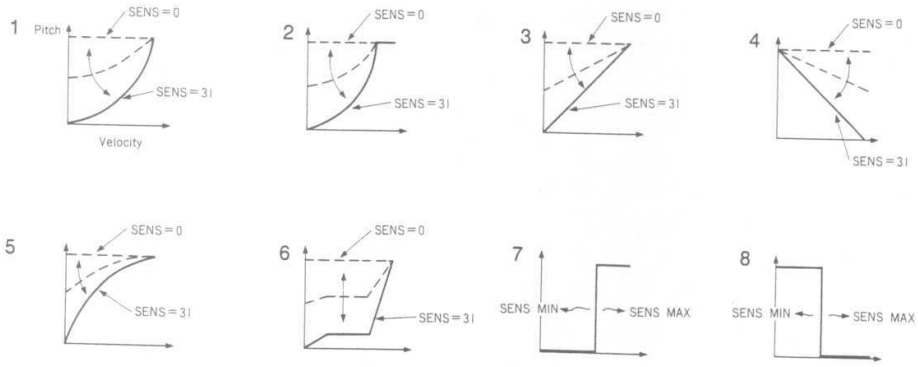
The CURVE parameter is used to select one of the 8 velocity curves (contours) as shown in the figures below. These curves determine how the amplitude actually changes with key velocity.

Notice that if you choose — for example — curve 7 for one module and curve 8 for another, each will sound quite differently according to the velocity message.

Note that the degree of this effect is dependent on settings mode in VOICE-10 (AMP ENV) as well as in VOICE-11 (KF. ENV.)

NORMAL

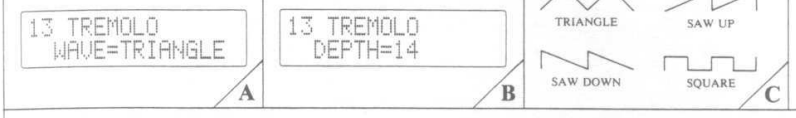
[CURVES]



13 TREMOLO

Related Functions
VOICE—14

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
WAVE = TRIANGLE/SAW UP/ SAW DOWN/SQUARE DEPTH = 0 ~ 99 RATE = 0 ~ 99 DELAY = 0 ~ 99 MULTI = ON/OFF	**Domain**	
	Mode	**Normal**
	Keyboard	GLOBAL
	Guitar	
	Wind	



Tremolo is a form of low-frequency oscillation which affects the DCA to produce cyclical changes in volume characteristics. The parameters in this function are used to create a "tremolo" effect globally. Note, however, that settings for parameters in VOICE-14 (AMP SENS) can be made independently for each module. This allows you to control the depth of each module independently, while settings in the TREMOLO function (VOICE-13) are used to create and control the "actual" tremolo oscillation.

The WAVE parameter lets you choose the basic waveform of the tremolo oscillation. There are 4 — SQUARE, SAW DOWN, SAW UP, and TRIANGLE. (See information below for details on how various types of waveforms affect volume changes.)

You can use the DEPTH parameter to set the "depth" of tremolo oscillation (how strong the tremolo is). The larger the value, the deeper the tremolo effect. (If this parameter is set to "0", no tremolo will be generated. Be sure to raise this level before altering other parameter settings.)

The RATE parameter is used to set the "speed" of tremolo oscillation. The higher the value, the faster the tremolo effect.

The DELAY parameter is used to set the period of time from initial key depression until the point where tremolo oscillation begins. The larger the value, the longer the delay before tremolo is applied.

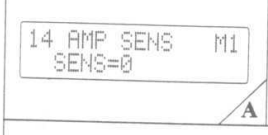
The MULTI parameter features a toggle which can be set to either ON or OFF. When MULTI is set to ON, the tremolo effect is engaged independently as Note On messages are received, so that each note's tremolo is independent (not synchronized with tremolo delay and oscillation of messages received previously or subsequently). When this parameter is set to OFF, tremolo oscillation is synched for all keys, regardless of when the note on messages are received (in unison or independently).

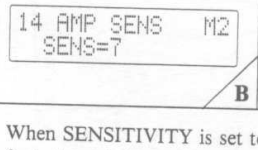
[WAVEFORMS]
Triangle – produces a smooth "pulsating" volume shift.
Saw Up – produces a repeating rise and then cutoff in volume.
Saw Down – produces a repeating "swoop" down in volume.
Square – produces an "on and off" volume characteristic.

14 AMP SENS (DCA)

Related Functions
VOICE — 13
EFFECT — 03 ~ 06, 19

Parameters	O/S	EDIT — PAGE DOWN — PAGE — CURSOR — VALUE
SENS (SENSITIVITY) = 0 ~ 7	Domain	
	Mode	Normal
	Keyboard	MODULAR
	Guitar	
	Wind	





This function features only one parameter, SENSITIVITY, which is set independently for each module. This "sensitivity" level determines how "sensitive" each module is to the effects listed below. (Or, in simpler terms, SENSITIVITY determines the degree of "depth" or "strength" the effects have in the specified module.)

When SENSITIVITY is set to a value of "0", the all effects listed below will not affect the specified module's sound. At a value of "7", the effects will be strongest.

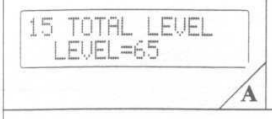
〈Related Functions〉
VOICE-13 TREMOLO DEPTH
EFFECT-03 TREMOLO DEPTH (After Touch)
EFFECT-04 TREMOLO DEPTH (Modulation Wheel)
EFFECT-05 TREMOLO DEPTH (Definable Control)
EFFECT-06 TREMOLO DEPTH (Foot VR)
EFFECT-03 DCA ENV BIAS (After Touch)
EFFECT-04 DCA ENV BIAS (Modulation Wheel)
EFFECT-05 DCA ENV BIAS (Definable Control)
EFFECT-06 DCA ENV BIAS (Foot VR)
EFFECT-19 DEPTH (Total Tremolo)

15 TOTAL LEVEL (DCA)

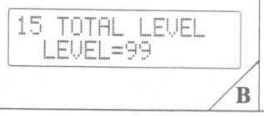
Related Functions

Parameters	**O/S**	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

LEVEL = 0 ~ 99	**Domain**	
	Mode	**Normal**
	Keyboard	GLOBAL
	Guitar	
	Wind	



A



B

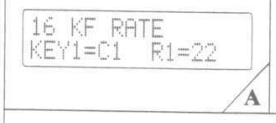
This function features only one parameter, TOTAL LEV, which is used to control the overall amplitude (volume) level of the unit (for all modules, M1 ~ M8).

This parameter acts as a "governer", controlling the maximum possible volume level which can be attained with the volume control. With a value of "0", no sound is output — even when the volume slider is set to MAX. The maximum amplitude level can be selected by inputting a level of "99".

16 KF RATE (DCO/DCA)

Related Functions
VOICE—03, 05, 09, 11

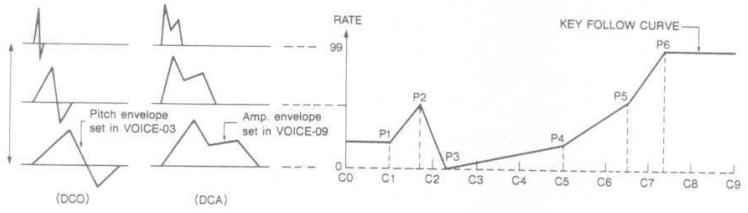
Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
KEY 1 ~ KEY 6 = C0 ~ C9 R1 ~ R6 (RATE) = 0 ~ 99	Domain	
	Mode	Normal
	Keyboard	GLOBAL
	Guitar	
	Wind	



This function features a total of 6 "POINTs", which are used to create a KEY FOLLOW CURVE. This function is directly related to the KF LEVEL functions (VOICE-05 and VOICE-11). Notice that with the LEVEL functions, you can set specify KEYs and LEVELs for each POINT in the curve(s). The KF RATE function is used to specify the RATE (remember, rate and level together determine time) for each point in the curve.

These settings are global, affecting all DCO and DCA envelopes (VOICE-03 and VOICE-09).

In steps where the rate value is higher, a rapid "attack" or "decay" is effected. In a position where the rate value is low, the rate of the envelope is equal to that set in VOICE-03 and VOICE-09.



POINT	P1	P2	P3	P4	P5	P6
KEY	C1	A1	E2	C5	F#6	F7
RATE	22	50	0	22	53	99

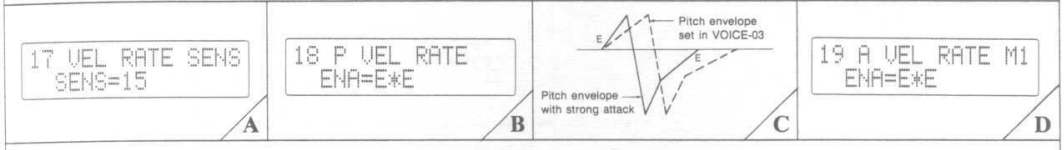
17, 18, 19 VEL RATE (DCO/DCA)

Related Functions
17; VOICE—03, 09, 18, 19
18; VOICE—03, 17
19; VOICE—09, 17

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

17 ⟨VEL RATE SENS⟩
SENS (SENSITIVITY) = 0 ~ 31
CURVE = 1 ~ 8
18 ⟨P VEL RATE⟩
ENA = E / ∗
19 ⟨A VEL RATE⟩
ENA = E / ∗

Domain	
Mode	**Normal**
Keyboard	17, 18 } GLOBAL
Guitar	
Wind	19 MODULAR



This function features parameters which are used to control velocity RATE, in correspondence with DCO and DCA envelopes created using VOICE-03 and VOICE-09.

While the velocity RATE setting is global (affects all 8 modules), you can choose whether RATE control is enabled or disabled for each step in both the DCO and DCA envelopes.

Within function No. 17 ("VEL RATE SENS"), the SENSITIVITY and CURVE parameters can be selected.

When SENSITIVITY is set to a value of "0", velocity will be disabled entirely. As SENSITIVITY is raised, the envelope rate becomes more acute when the external keyboard is played with a strong (fast) attack (high "velocity").

The CURVE parameter lets you choose from one of 8 different VELOCITY RATE curves, as diagrammed below. The horizontal axis of the VELOCITY CURVE represents additive values to the rate parameter. As the value is increased, the rate of steps in the envelope (DCO/DCA) are increased further.

Within function No. 18 ("P VEL RATE"), you can specify whether or not the VEL RATE curve will affect the individual steps of the PITCH ENV (DCO envelope) which is set using VOICE-03.
This setting is global, affecting all 8 modules (M1 ~ M8).

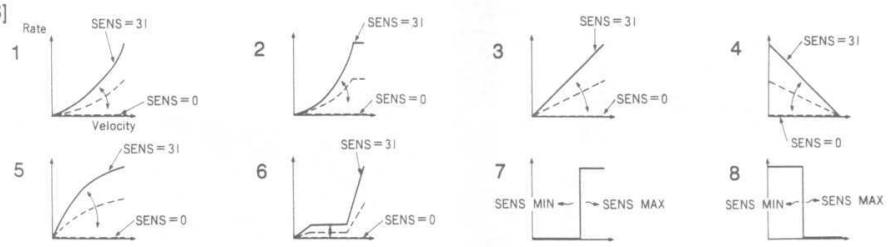
To ENABLE (make effective) the VEL RATE for any step in the envelope, simply move the cursor to the desired step position and press the YES key ("E" is displayed). To disable, simply press the NO key ("∗" is displayed). (If you set less than 8 steps, steps following END POINT are not displayed.) If the parameter is set as in FIG-B, the envelope changes as illustrated in FIG-C, with a strong attack (The rate of steps 1 and 4 become acute).

Within function No. 19 ("A VEL RATE"), you can specify whether or not the VEL RATE curve will affect the individual steps of the AMP ENV (DCA envelope) which is set using VOICE-09. These settings can be made for each module (M1 ~ M8) individually.

To ENABLE the VEL RATE for any step in the envelope, simply move the cursor to the desired step position and press the YES key ("E" is displayed). To disable, simply press the NO key ("∗" is displayed).

Notice that there are no identifying "numbers" assigned to the step display. Note, however, that there are "∗" or "E" which corresponds to each active step position.

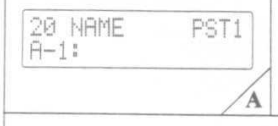
[CURVES]



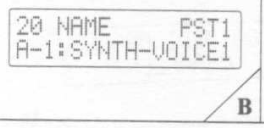
20 VOICE NAME

Related Functions

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
Alphabet = A ~ Z Numeral = 0 ~ 9 Marks = " . ", " – ", " / "	Domain	
	Mode	Normal
	Keyboard	GLOBAL
	Guitar	
	Wind	



A



B

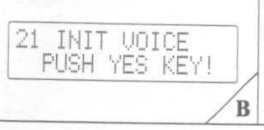
This function is used to assign a name to the "patches" created using other VOICE menu functions.

The names you choose may contain both letters and numbers, and may be up to 12 characters in length.
Character input is carried out using the VALUE keys, with alphanumeric characters and marks being displayed cyclically by holding either VALUE key down.

21 INIT VOICE

Related Functions

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
EXECUTE? (YES) PUSH YES KEY!	**Domain**	
	Mode	**Normal**
	Keyboard	GLOBAL
	Guitar	
	Wind	



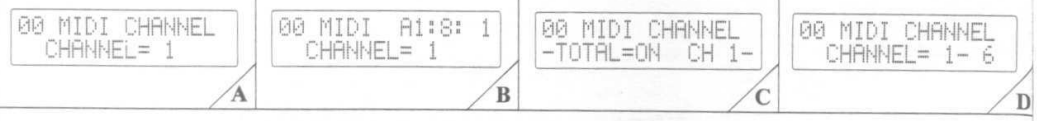
This function is used to intialize all VOICE MENU data. By executing this function, initialized data is loaded to the internal memory's COMPARE/RECALL area. (Note that once initialization is completed, the COMPARE/RECALL key indicator comes ON, if the COMPARE/RECALL function has not already been selected.)

Respond to the [EXECUTE?] prompt by pressing the YES key and then press it once again to execute initialization. The display appears as in FIG-B. Parameter values and settings will all be reset to the initialized values shown on page 94 of this manual.

00 MIDI CHANNEL

Related Functions
TOTAL—04

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE			
	Domain				
	Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
CHANNEL = 1 ~ 16	K	GLOBAL	GLOBAL		AREA
	G		GLOBAL		
	W		GLOBAL		



The MIDI CHANNEL function is used to assign the MIDI receive channel for the basic operating modes — the NORMAL mode, COMBI mode and MULTI-CH mode.
Note that if function 04 in the TOTAL CONTROL menu (MIDI CHANNEL) is set to ON in either the NORMAL or COMBI mode, it will be impossible to set the MIDI channel using TOTAL-04.

It's important to remember that the channel set using this function is held in Operation Memory along with other parameter settings.

Notice that in the "G" Performance Mode, the parameter is displayed as shown in FIG-D, however the cursor cannot be moved. Notice also that the number on the right changes automatically when the number on the left is altered (the number on the right being 5 "strings" higher than the number on the left).
In the MULTI CH mode, the Area Number, polyphony and MIDI channel are all shown on the display, as illustrated in FIG-B.

To select the Area Number, use the PROG NO keys. The MIDI channel number on the upper right side changes automatically when the Area Number is altered.

01 PORTAMENTO/SOLO

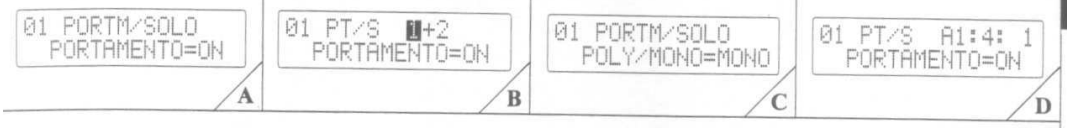
Related Functions

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

PORTAMENTO = ON/OFF
PORTM TIME = 0~99
PORTM MODE = TIME CONST/
RATE CONST
SOLO = ON/OFF
[Guitar] POLY/MONO = POLY/MONO

Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	GLOBAL	PATCH	GLOBAL	AREA
G		GLOBAL	GLOBAL	
W		GLOBAL	GLOBAL	



The parameters in this function are used to establish and control built-in portamento and "solo" effects.

The PORTAMENTO parameter is a "toggle" (or switch) which is used to turn the portamento effect simply ON or OFF.

NOTE: The PORTAMENTO parameter must be set to "ON", in order to control portamento time using AFTER TOUCH, MOD WHEEL, DEF CONTROL or FOOT VR.

The PORTM TIME parameter determines the "portamento time" between notes — in other words, the time that it takes the pitch to "glide" from one note to the next note message received. The higher the value of this parameter, the longer the portamento time.
Note that even when the PORTM TIME is set to "0", the portamento effect can affect the overall sound, depending on the patch or sound which is being edited.
The PORTM MODE parameter determines whether the "constant" which portamento is based on. When this parameter is set to TIME CONST, the time required for pitch to glide between notes is constant — regardless of the distance between the notes. (FIG-E)

When the PORTM MODE parameter is set to RATE CONST, the rate or "speed" of portamento glide becomes constant. (FIG-F)

FIG-E

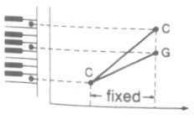
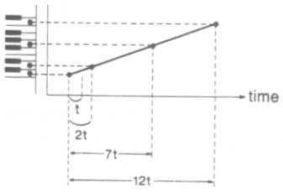


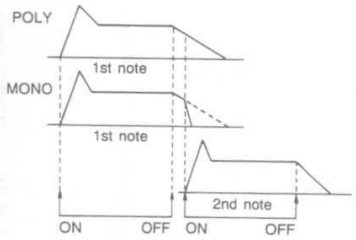
FIG-F



The SOLO parameter is a toggle which can be used to turn the solo function ON or OFF. The solo function is a "last note priority" effect. When this function is ON and more than one note on message is received, the system will cause the only the last one received to sound.
When the SOLO parameter is set to ON, Portamento effect can only be attained by legato performance (notes played without breaks in between).

When the "G" performance mode is selected, the portamento function operates as follows;
With SOLO parameter OFF: Portamento sweep executed independently for each MIDI channel (each string).
With SOLO parameter ON: Portamento sweep executed only when a NOTE ON message is generated while a previous NOTE message is still ON (legato play), regardless of MIDI channel (string).

The POLY/MONO parameter can be set in the "G" Performance Mode. When set to POLY, the notes are sound polyphonically through each MIDI channel (notes can be played during "release" time). When this parameter is set to MONO, notes through each MIDI channel are sounded only monophonically.



When PORTAMENTO-related MIDI mode messages are received, operations automatically switch to this function.

02 PITCH BEND

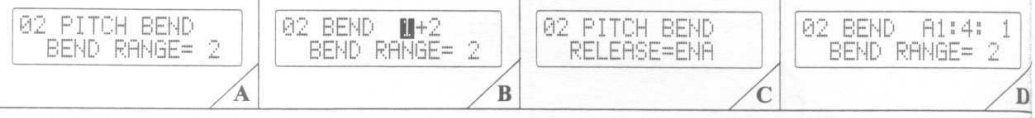
Related Functions

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

BEND RANGE = 0 ~ 48
RELEASE = ENA / DIS

Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	GLOBAL	PATCH	GLOBAL	AREA
G		GLOBAL	GLOBAL	
W		GLOBAL	GLOBAL	



This function features two parameters — BEND RANGE and RELEASE — which are used to determine how the external MIDI instrument pitch bend wheel can be used to raise or lower pitch.

The BEND RANGE parameter can be used to raise or lower the maximum limit that pitch can be bended by an external MIDI instrument, in half-step increments. At the minimum value of "0", the pitch bend wheel has no effect on pitch, while at the maximum value of "48", you can bend notes a maximum of 48 half-steps (4 octaves), up and down.

The RELEASE parameter lets you choose whether or not the external keyboard pitch bend wheel can be used to bend sounds which are sustained after the keyboard is released. When this parameter is set to DIS (disable), you can bend notes only before actually receiving note off message (before the release point in DCA curve).

When set to ENA (enable), you can also bend any note that is still sounding (portion of sound following the release point in DCA curve) — even after releasing the corresponding key on the external keyboard. (FIG-C)

In the "G" performance mode, parameters set for the sound programmed to MIDI Channel 1 affect the other 5 MIDI channels. The pitch bend message, however, can be received by each string independently.

When PITCH BEND-related MIDI mode messages are received, operations automatically switch to this function.

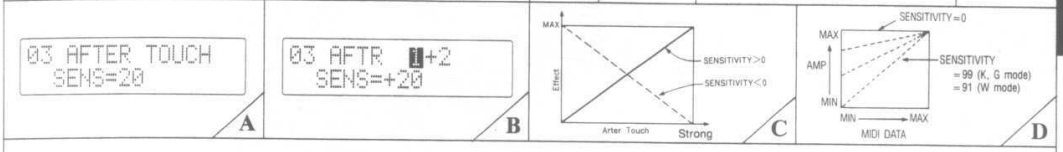
03 AFTER TOUCH

Related Functions
VOICE—14

Parameters		O/S	EDIT—PAGE—CURSOR—VALUE
SENSITIVITY (NORMAL, MULTI-CHANNEL) = 0 ~ 99 (COMBINATION) = −99 ~ +99 VIB DEPTH = ON/OFF VIB RATE = ON/OFF	PITCH = +ON/−ON/OFF PORTM TIME = ON/OFF TREM DEPTH = ON/OFF TREM RATE = ON/OFF A ENV BIAS = ON/OFF		

Domain

Mode	Normal	Combination 4 mix/split	Combination 8 mix	Multi channel
K	GLOBAL	PATCH*1		AREA
G		PATCH*2		
W		PATCH*2		



This function is used to specify the sensitivity of an external MIDI controller "after touch", and the effects that after touch is used to control.

The SENSITIVITY parameter is used to determine how "sensitive" the external controller is to after touch. If sensitivity is high (at a level of "99", for example), it only takes a small amount of pressure on the key to engage the effect(s) which are being controlled by after touch. At a level of "0", the after touch function is totally non-operational.
In the COMBINATION mode, you can set this parameter in a range of −99 to +99 (FIG-C). When negative values are input, after touch is inversed.

The other parameters in this function are toggles, which let you determine which effects will be controlled by after touch message (and how they will be affected).
Note that these effects may already be engaged — even without using after touch. In this case, after touch can be used to make the effects "deeper" or "stronger" than the normal settings which are already engaged. For example, let's assume you have already set a VIB DEPTH value in VOICE-07 (VIBRATO function), so vibrato is engaged in your patch. If you turn the AFTER TOUCH "VIB DEPTH" parameter ON, then the vibrato depth will be increased even further when you use after touch.

The following chart lists how after touch can be used to control various sound effect functions.

VIB DEPTH = ON/OFF
ON: Vibrato depth set in VOICE-07 increased
OFF: After touch message does not control vibrato depth

VIB RATE = ON/OFF
ON: Vibrato rate set in VOICE-07 increased
OFF: After touch message does not control vibrato rate

PITCH BEND = −ON/OFF/+ON
−ON: Pitch bent down (max = 1 octave with sensitivity of "99")
OFF: After touch message does not affect pitch
+ON: Pitch bent up (max = 1 octave with sensitivity of "99")
•Pitch bend range does not correspond to EFFECT-02 setting.

PORTM TIME = ON/OFF
ON: PORTM time set in EFFECT-01 is increased
OFF: PORTM time is not affected by after touch message

Note that PORTM TIME can only be set to "ON" when the PORTM/SOLO function (EFFECT-01) "Portamento" parameter is first set to "ON".

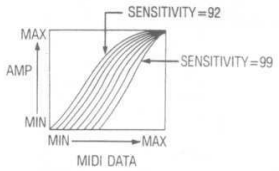
TREM DEPTH = ON/OFF
ON: Tremolo depth set in VOICE-13 is increased
OFF: Tremolo depth is not affected by after touch message

TREM RATE = ON/OFF
ON: Tremolo rate set in VOICE-13 is increased
OFF: Tremolo rate is not affected by after touch message

AMP ENV BIAS = ON/OFF
ON: Amplitude envelope bias increased by after touch message, with max. level as set in VOICE-09
OFF: Amplitude envelope bias is not affected by after touch message

In the "W" Performance Mode, aftertouch reacts slightly differently than with the other two performance modes. The curve in FIG-D shows how the SENS parameter affects aftertouch characteristics when set between values of "0" and "91". Notice the changes in these characteristics between values of "92" and "99"(FIG-E). For further details, refer to page 12.

FIG-E
< SPECIAL AFTER TOUCH SENSITIVITY 92 ~ 99 >



Note that TREM DEPTH, TREM RATE and AMP ENV BIAS levels can be set for each module (M1 ~ M8) independently, in VOICE-14 (AMP SENS). Naturally, these independent settings also affect after touch message characteristics for the above parameters.

*1 In COMBI "K" mode, ON/OFF and SENSITIVITY of only the PITCH (BEND) and A ENV BIAS parameter affect the patches (1 ~ 8) independently.
*2 In COMBI "G" or "W" mode, ON/OFF and SENSITIVITY of only the PORTAMENTO TIME parameter affect the patches (1 ~ 8) globally.