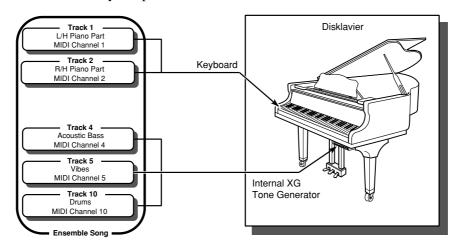
Chapter 7 Recording Ensemble Songs

This chapter describes how to record an Ensemble song.

Ensemble Songs

An SMF (Standard MIDI File) format Ensemble song can have two piano parts (left and right), and up to 14 accompanying instrument tracks. You can select any track for the piano parts and accompanying parts. Continuous piano pedal data is stored with piano parts. Track 10, however, is reserved for the rhythm part.

An E-SEQ Ensemble song can have two piano parts (left and right), and up to 13 accompanying instrument tracks. The piano parts are stored on tracks 1 and 2, continuous pedal data is stored on track 3, and track 10 is reserved for the rhythm part.



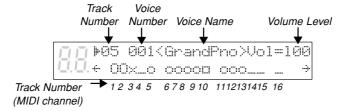
You can record your Ensemble song onto a Memory Disk or a floppy disk.

Note: You cannot record songs to a CD.

Ensemble Song Display

From the song title display, press [▶] to go to the Ensemble song display.

The Ensemble song display shows which tracks contain data and which tracks the Disklavier is playing.



The bottom line of the display shows the status of each of the 16 available tracks, using the following characters.

Symbol	Description	
0	Tracks that the piano plays (the piano	
	can play no more than two tracks at	
	the same time).	
0	Accompanying instrument track.	
	The rhythm track.	
	No part exists on this track.	
X	Continuous pedal data (half pedal).	
	(For E-SEQ songs only.)	

During playback, the above symbols show that note data is being played.

Recording Ensemble Tracks

Ensemble songs can be composed of up to 16 individually recorded tracks.

A track can be built up in stages by overdubbing, a method often used when creating a rhythm track. For example, you can record a bass drum first, and then overdub a snare drum, hi-hat, etc.

• See "Overdubbing a Track" on page 39.

You can also auto-correct the timing of constanttempo notes by "quantizing," another method often used for rhythm tracks.

See "Quantizing Notes" on page 40.

The voice and volume of each track can be altered after recording, and tracks can be mixed, copied, moved, transposed, and deleted.

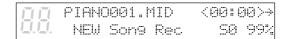
- See Chapter 8 "Editing Tracks".
- To record piano parts to the Ensemble song, see Chapter 6 "Recording L/R Songs".

Specify a disk.

Note: If you are recording to a floppy disk, make sure that the disk's erasure protection tab is set to "unprotected".

Press [REC] to engage the Record Standby mode.

The REC indicator lights and the PLAY/PAUSE indicator flashes.



A new song number is created for the new recording. For example, if the last song to be recorded was No. 6, then the new song will be No. 7.

If you are recording an additional track to an existing Ensemble song, select the song number of the Ensemble song using the Song Select function.

You can title your new song either now or after recording. In either case, see "Song Titling and Title Editing" on page 22.

3 Press [♠] or [VOICE].

A display similar to the following appears.



Existing tracks are indicated by the symbols on the bottom line of the display.

The following table shows the voice and volume parameters that can be set for each track.

Parameter	Range	Notes
Track	SMF songs:	Select the track to
	1 to 16	record.
	E-SEQ	Select the track to
	songs:	record.
	1 to 16	
	(excluding 3)	
Basic voice	1 to 128;	Select a basic voice,
	11 drum kit	drum kit or SFX
	types;	voice on the MIDI
	SFX voices	tone generator.
Variation	(0 to 101)	Select a variation
voice		voice where
		available. The
		bank number of the
		variation voice is
		temporarily
		displayed in place
		of the Vol
		parameter.
Volume	0 to 127	Set the volume of
		the voice.

See "XG Normal Voice List" on pages 11 and 12 in the Appendix section of this manual for a full listing of available voices.

Track 10 can only be used as the rhythm track. However, you can select a different track and set its voice to a drum kit.

4 Use the [-/NO] and [+/YES] buttons to select a track that you want to record.

Press [▶] once, then use the [-/NO] and [+/YES] buttons to select a basic voice (bank 0), drum kit, or SFX voice.

The voice number and name change accordingly.

- See Chapter 14 "Internal XG Tone Generator Voice & Drum Kit List" in the Basic Operation Manual for a listing of available voices.
- See also "XG Drum Voice List" on page 15 of the Appendix "MIDI Data Format" provided at the end of this manual for a list of voices assigned to each key.

Press [➡], then use the [-/NO] and [+/YES] buttons to select a variation voice.

The voice name changes accordingly, and its bank number is temporarily displayed in place of the Vol parameter.

See "XG Normal Voice List" on pages 11 and 12 in the Appendix section of this manual for a full listing of available voices.

Press [➡], then use [-/NO] and [+/YES] buttons to set the track's volume.

This volume setting only adjusts the volume of the currently selected track. The volume can be set from 0 to 127.

◆ The track's voice selection and volume setting can be edited after recording. See "Editing a Track's Voice & Volume" on page 42.

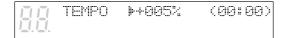
Press [METRONOME] and make the settings as necessary.

If you want to use the quantize function, you must set the metronome.

See "Recording with the Metronome" on page 24 for details about setting up the metronome. For new songs or when re-recording a song recorded in measures and beats, the following display appears.



When re-recording a song recorded in minutes and seconds, the following display appears.



Press [PLAY/PAUSE].

Recording will start immediately.

When you finish playing, press [STOP].

The following display appears.

Д Д Save		sk?	(+,+)
U.U. *SAVE	· #::::::::::::::::::::::::::::::::::::	*CANCEL	(ENT)

The following table gives a description of each of the options.

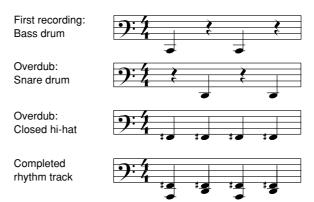
Option	Description
SAVE	The new track is saved with
	the existing tracks under the
	current song number.
NEW	The new track is saved and the
	existing tracks are saved under
	a new song number. The
	existing tracks are also kept
	under the current song number.
CANCEL	The new track is discarded.
	The existing tracks are kept
	under the current song number.

111 Use the $[\leftarrow]$ and $[\rightarrow]$ to select an option, then press [ENTER].

> The new track is saved as indicated or canceled.

Overdubbing a Track

Once a track has been recorded, extra parts can be overdubbed. This is especially useful for creating a rhythm track. For example, you can record a bass drum first, and then overdub a snare drum, hi-hat, etc.



Make the recording settings as described in the previous section, "Recording Ensemble Tracks" through step 8.

> Be sure to select the track to which you want to overdub the new recording.

Press [REC] until the following display appears.

ДЩQ.	uantize	HOFF	Ć		,)
4.4.Re	ecord Tr	=OVERDUB	Ć	÷	;	÷)

Be sure that the Record Tr parameter is set to OVERDUB.

If it is not, press [▶] to position the ▶ cursor next to the Record Tr parameter, then use the [-/NO] and [+/YES] buttons to set it to OVERDUB.

Option	Description
OVERDUB	The new recording is added
	to the existing parts.
REPLACE	The new recording replaces
	the existing parts.

3 Press [PLAY/PAUSE].

Recording starts immediately.

When you finish playing the overdub, press [STOP].

The following display appears.

	Save 1	⊿o disk?	(+,+)
1.0	*SAUE	MHEW *CANCEL	(ENT)

The following table gives a description of each of the options.

Option	Description
SAVE	The new overdub is saved with
	the existing track under the
	current song number.
NEW	The new overdub is saved with
	the existing tracks under a new
	song number. The existing
	track is kept under the current
	song number.
CANCEL	The new overdub is discarded.
	The existing track is kept
	under the current song number.

Use [♠] and [♠] to select an option, then press [ENTER].

The new overdub is saved as indicated or canceled.

Quantizing Notes

Quantize is a function for auto-correcting the timing of notes you play on the piano. It is especially useful for recording rhythm tracks.

In the following example, a measure of 8th notes is shown recorded first with quantize set to off, and then with quantize set to 1/8.

Quantize OFF



1/8 Quantize

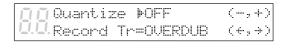
Each track overdub can be recorded using a different quantize value.

Note: Quantize is a permanent operation. A quantized track cannot be played back unquantized.

1 Make the recording settings as described in "Recording Ensemble Tracks" through step 8.

Be sure to set the metronome in step 8.

Press [REC] until the following display appears.



With the * cursor next to the Quantize parameter, use the [-/NO] and [+/YES] buttons to set a quantize value.

The Quantize parameter can be set to the following note values: off, 1/4, 1/6, 1/8, 1/12, 1/16.

4 Press [PLAY/PAUSE].

When you finish playing, press [STOP].

The following display appears.

ДД Save	to disk?	(+,+)
₩.₩. *SAVE	· INNERIO XXIIINI JET	(ENT)

The following table gives a description of each of the options.

Option	Description
SAVE	The new track is saved with
	the existing tracks under the
	current song number.
NEW	The new track and the existing
	tracks are saved under a new
	song number. The existing
	tracks are kept under the
	current song number.
CANCEL	The new track is discarded.
	The existing tracks are kept
	under the current song number.

6 Use [♠] and [♠] to select an option, then press [ENTER].

The quantized track is saved as indicated or canceled.

Chapter 8 Editing Tracks

You can edit a track's voice selection and volume setting after recording with a simple procedure described below.

You can also use the Track Editing functions to mix, move, copy, delete, and transpose tracks of an Ensemble song after recording.

Editing a Track's Voice & Volume

You can edit a track's voice selection and volume setting after recording and save the edited data.

- 1 Specify a disk.
- Press [REC] to engage the Record Standby mode.

The REC indicator lights and the PLAY/PAUSE indicator flashes.

- 3 Use the [SONG SELECT] buttons to select the song that you want to edit.
- 4 Press [♦] or [VOICE].

```
### ###<_____>Vol=###

# 0_xoo oooo oo___ *
```

Use the [-NO] and [+/YES] buttons to select the track whose voice or volume you want to change.

Press [▶], then use the [-/NO] and [+/YES] buttons to change the voice number.

```
04 • 035 < Pick Bass > Vol = 095
```

The voice number and name in the display change accordingly. You can select a voice number from 1 to 128.

- See Chapter 14 "Internal XG Tone Generator Voice & Drum Kit List" in the Basic Operation Manual for a listing of basic voices.
- Press [➡], then use the [-/NO] and [+/YES] buttons to select a variation voice.

The voice name changes accordingly, and its bank number is temporarily displayed in place of the Vol parameter.

- See "XG Normal Voice List" on pages 11 and 12 in the Appendix section at the end of this manual for a full listing of available voices.
- Press [➡] again, then use the [–/NO] and [+/YES] buttons to change the track's volume.

```
04 #035< PickBass>Vol=095
```

This volume setting only adjusts the volume of the currently selected track, not the overall volume of the tone generator. The volume can be set from 0 to 127.

Press [STOP].

The following display appears.

	Save :	to dis	ik?	(+,+)
耳.耳	*SAUE	MAEM	*CANCEL	(ENT)

The following table gives a description of each of the options.

Option	Description
SAVE	The voice and volume changes
	are saved with the existing
	tracks under the current song
	number.
NEW	The voice and volume changes
	are saved with the existing
	tracks under a new song
	number. The existing tracks
	will also be kept under the
	current song number.
CANCEL	The voice and volume changes
	are discarded. The existing
	tracks are kept under the
	current song number.

10 Use [♠] and [♠] to select an option, then press [ENTER].

The voice and volume changes are saved as indicated or canceled.

Mixing Two Tracks

- Specify a disk.
- Press [FUNC.]

The FUNC. indicator lights and the Function menu appears.

ДДH	Disk	*MIDI	'-amtuum
□.□. ₩	M-Tune	((+,+,ENT)

Press [▶] until the ⊮ cursor is next to Track, then press [ENTER].



The following display appears.

MIMix	1>01	+##	
#0000	000_0		_(ENT)

Press [▶] to position the * cursor at its next position, then use the [-/NO] and [+/YES] buttons to select the first track you want to mix.

> You can select tracks 01 to 16. The symbol of the selected track is blacked in.

ДД [Mix] •05	+##	
4.4.0000m	0000		_(ENT)

Press [▶] to position the * cursor next to the arrow, then use the [-/NO] and [+/YES] buttons to select the second track.



The above example shows that track 05 is to be mixed into track 06.

6 Press [ENTER].

A display similar to the following appears.

ПП	EMix	1>05	÷96	SURE?
	Occow	# 00 <u></u> 0		(YZN)

Press [+/YES] to mix the tracks.

The first track is merged into the second track and then deleted.

Note: The voice and volume data from the first track will be lost. The voice and volume data from the second track will be used.

Note: If a piano track is mixed with an

Ensemble track or vice versa, the piano
track's continuous pedal data (half
pedal) will be lost, but the on/off pedal
data will be kept.

If you do not want to mix the two tracks, press [-/NO] to cancel the function.

Moving a Track

You can move data from one track to a different track.

- 1 Specify a disk.
- Press [FUNC.].

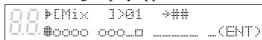
The FUNC. indicator lights and the Function menu appears.

	⊫Disk	*MIDI	Setur
<u> </u>	*M-Tune	(+	-,+,ENT)

Press [♣] until the ♠ cursor is next to Track, then press [ENTER].

ДД÷⊬Track	*Reset
	(+,+,EMT)

The following display appears.

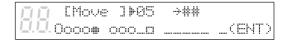


With the * cursor at the far left, press the [-/NO] and [+/YES] buttons until "Move" appears.

<u>∏</u> ⊫[Move	1>01	÷##	
Ū.Ū. ● oooo	000		_(ENT)

Press [▶] to move the F cursor to its next position, then use the [-/NO] and [+/YES] buttons to select the track you want to move.

The symbol of the selected track is blacked in.



6 Press [▶] to position the ⊨ cursor next to the arrow, then use the [-/NO] and [+/YES] buttons to select the destination track.



The above example shows that track 05 is to be moved to track 06.

Note: Any data that already exists on the destination track will be overwritten.

Press [ENTER].

A display similar to the following appears.

ДД EMove	1>05	÷96	SURE?
Ū.Ū.0ooo₩	# 000		(Y/N)

Press [+/YES] to move the track.

The selected track is moved to its new destination track and then deleted.

If you do not want to move the track, press [-/NO] to cancel the function.

Note: If a piano track is moved to an Ensemble track or vice versa, the piano track's continuous pedal data (half pedal) will be lost, but the on/off pedal data will be kept.

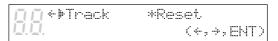
Copying a Track

You can copy tracks to another track.

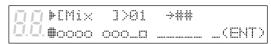
- Specify a disk.
- Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

Press [▶] until the ⊨ cursor is next to Track, then press [ENTER].



The following display appears.



With the * cursor at the far left, press the [-/NO] and [+/YES] buttons until "Copy" appears.

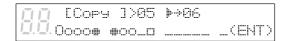
```
▶[Copy ]>01
₩0000 000_¤ _____
```

Press [▶] to move the ⊮ cursor to its next position, then use the [-/NO] and [+/YES] buttons to select the track you want to copy.

> The symbol of the selected track is blacked in.



Press [▶] to position the ▶ cursor next to the arrow, then use the [-/NO] and [+/YES] buttons to select the destination track.



The above example shows that track 05 is to be copied to track 06.

Note: Any data that already exists on the destination track will be overwritten.

7 Press [ENTER].

A display similar to the following appears.

ДД [Сорч	1>05	÷86	SURE?
4.4.0ooom #			(YZN)

8 Press [+/YES] to copy the track.

The selected track is copied to the destination track.

If you do not want to copy the track, press [–/NO] to cancel the function.

Note: If a piano track is copied to an

Ensemble track or vice versa, the piano
track's continuous pedal data (half
pedal) will be lost, but the on/off pedal
data will be kept.

Deleting a Track

- 1 Specify a disk.
- 2 Press [FUNC.].

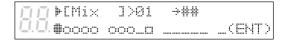
The FUNC. indicator lights and the Function menu appears.



Press [▶] until the ⊨ cursor is next to Track, then press [ENTER].

	+	Tr	ac	k:	*Res							
1_1.1_1						(÷	,	 ;	ΕN	T)

The following display appears.

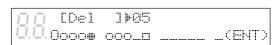


With the * cursor at the far left, press the [-/NO] and [+/YES] buttons until "Del" appears.

<u>п</u> п⊫[De]	1 241	
1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	000_0	 _(ENT)

Press [▶] to move the F cursor to its next position, then use the [-/NO] and [+/YES] buttons to select the track you want to delete.

The symbol of the selected track is blacked in.



The above example shows that track 05 is to be deleted.

6 Press [ENTER].

A display similar to the following appears.

III [De]	. 1>05	SURE?
4 .4.0ooo∎		 (Y/N)

Press [+/YES] to delete the track.

The selected track is deleted.

If you do not want to delete the track, press [-/NO] to cancel the function.

Transposing a Track

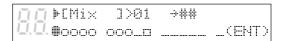
- Specify a disk.
- Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

Press [▶] until the 🖟 cursor is next to Track, then press [ENTER].



The following display appears.



With the * cursor at the far left, press the [-/NO] and [+/YES] buttons until "Trans" appears.

ПП	⊮[Trans]>01	99	
<u> </u>	₩0000 000_0		_(ENT)

Press [▶] to move the 🖟 cursor to its next position, then use the [-/NO] and [+/YES] buttons to select the track you want to transpose.

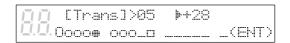
> You can select tracks 01 to 16 and ALL tracks.

The symbol of the selected track is blacked in.



Note: Even if you select ALL, a track containing rhythm parts cannot be transposed. However, they may be transposed in cases where the external data contains rhythm tracks that are assigned by MIDI system exclusive messages.

Press [▶] to move the ★ cursor to its next position, then press the [-/NO] and [+/YES] buttons to set the desired transposition value.



You can set transposition values from -60 to +60.

The above example shows that track 05 is to be transposed to a value of +28.

7 Press [ENTER].

A display similar to the following appears.



Press [+/YES] to transpose the track.

If you do not want to transpose the track, press [-/NO] to cancel the function.

Editing the Piano Track Assignments

You can change the piano track assignments for songs played by the Disklavier and save the changes with the song. This is especially helpful when you want to "correct" MIDI files from external sources in which the piano parts are assigned to tracks other than 1 and 2, so that they are played correctly on the Disklavier.

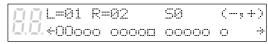
Note: The Disklavier cannot edit SMF format 1 songs. SMF format songs need to be converted to SMF format 0.

Note: With E-SEQ songs, piano parts are restricted to tracks 1 and 2. If you want to change the piano track assignments, either convert song type to SMF format 0, or use the Track Editing function for moving tracks (see "Moving a Track" on page 44).

- 1 Specify a disk.
- Press [REC] to engage the Record Standby mode.

The REC indicator lights and the PLAY/PAUSE indicator flashes.

- Use the [SONG SELECT] buttons to select the song that you want to edit.
- Press [▶] until a display similar to the following appears.



Existing tracks are indicated by the symbols on the bottom line of the display.

- Press [▶] until the 🖟 cursor is next to the L= parameter, then use the [-/NO] and [+/YES] buttons to select the track to which you want to assign the left piano part.
- 6 Press [➡] to position the ⊩ cursor next to the R= parameter, then use the [-/NO] and [+/YES] buttons to select the track to which you want to assign the right piano part.
- Press [STOP].

The following display appears.

The following gives a description of each of the options.

Option	Description
SAVE	The new track assignments are
	saved under the current song
	number.
NEW	The song with the new track
	assignments are saved under a
	new song number.
CANCEL	The new track assignments are
	discarded. The existing song is
	kept under the current song
	number.

8 Use [♠] and [♠] to select an option, then press [ENTER].

> The new track assignments are saved as indicated or canceled.

- If, after you play back the "corrected" song on the Disklavier, you want to adjust the volume of the piano part, see "Editing a Track's Voice & Volume" on page 42.
- For E-SEQ songs, you may want to use the Track Editing function for moving tracks. See "Moving a Track" on page 44.

Chapter 9 Song and Disk Formats and Compatibility

This chapter describes the song formats and disk types that the Disklavier uses to control song data on disks. This information is relevant to using the Disklavier song data with other Yamaha instruments or MIDI equipment.

Song Format

Song format refers to the format in which songs are recorded onto the Memory Disks or floppy disks. The Disklavier supports both the most commonly used Standard MIDI File (SMF) format and Yamaha's E-SEQ format.

SMF Format Songs

If you plan to edit your Disklavier songs on a MIDI instrument or computer music software, it would be wise to record them in the SMF format. It will provide you with access to a vast range of creative MIDI options. The Disklavier automatically records songs in SMF format if the disk on which the songs are to be recorded is formatted as an SMF type disk. (See "Disk Types" on the next page.)

Because the SMF format is the most convenient, the Disklavier records songs in SMF format 0 by default. (SMF format 1 is supported by the Disklavier for playback functions.)

When recording SMF songs, song tempo can be set between 30 and 400 bpm.

For songs with pedal data, incremental pedal data is stored on tracks 1 and 2.

You can also select any voice for tracks 3 to 9 and 11 to 16. Tracks 1 and 2 are for Disklavier piano parts and track 10 for the rhythm track.

E-SEQ Format Songs

If you plan to play back your Disklavier songs on earlier Disklavier models or the Clavinova series, you should record them in E-SEQ format. E-SEQ is a representative song file format developed by Yamaha, and its playback and recording functions are supported in full by the Disklavier. To record your Disklavier songs in E-SEQ format, the disk to which the songs are to be recorded should be formatted as an E-SEQ type disk. (See "Disk Types" on the next page.)

When recording E-SEQ songs, song tempo can be set between 30 and 280 bpm.

For songs with pedal data, on/off pedal data is stored on tracks 1 and 2, and incremental pedal data is stored on track 3.

You can also select any voice for tracks 4 to 9 and 11 to 16. Tracks 1 to 3 are for Disklavier piano parts and track 10 for the rhythm track.

Disk Types

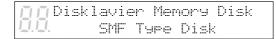
You can format the Memory Disks and floppy disks in either SMF or E-SEQ format, in accordance with the song format you want to use for recording your Disklavier songs. (See "Formatting Disks" on page 17 and "Converting Disk Type" on page 53.) Memory Disks are formatted as SMF type disks as a factory presetting.

Note: The terms "SMF type disk" and "E-SEQ type disk" are unique to the Yamaha Disklavier, and should not be confused with SMF and E-SEQ song formats described above. Nevertheless, with the Disklavier, song format and disk type have much to do with each other. This is described in detail below.

SMF Type Disks

Disklavier songs recorded to a disk formatted as an SMF type disk will be recorded in SMF format 0 by default. However, it is possible to copy E-SEQ songs to an SMF type disk.

If a disk is formatted as an SMF type disk, the following display should appear as the disk title display.

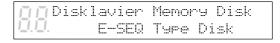


Up to 99 songs can be recorded onto an SMF type disk, depending on the size of the song file.

E-SEQ Type Disks

Disklavier songs recorded to a disk formatted as an E-SEQ type disk will be recorded in E-SEQ format only. It is not possible to copy SMF songs to an E-SEQ type disk. E-SEQ disks can be played back by earlier Disklavier models as well as by the Disklavier. (Some early models may not be able to play back portions of E-SEQ songs recorded using the Disklavier.)

If a disk is formatted as an E-SEQ type disk, the following display should appear as the disk title display.



Up to 60 songs can be recorded onto an E-SEQ type disk.

Cl and Other Type Disks

Disks formatted by instruments other than the Disklavier may be displayed as a Cl Type Disk or Other Type Disk. These disks can be played back by the Disklavier, but once Disklavier songs are recorded to these disks, they will automatically become SMF type disks, and you may no longer be able to play them back on the instruments in which they were originally formatted.

Converting Song Format

SMF songs can be converted to E-SEQ songs and vice versa.

Note: When converting songs from SMF to E-SEQ song format, if there is an instrumental part on track 3, incremental pedal data will be lost to accommodate the instrumental part on track 3.

1 Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

ДД⊮Disk	*MIDI Setup
Q.Q. *M-Tune	(+,→,ENT]

With the * cursor next to the Disk option, press [ENTER].

The Disk menu appears.

ДД	▶Format	*Son9Delete	
1.1.	*Son9Copy	*Son9Sort	

Press [➡] until the ⊨ cursor is next to the Song Convert option, then press [ENTER].

The following display appears.

+*DiskCopy	⊫Son9Convert
. *Counter	*DiskConvert

4 Use the [-/NO] and [+/YES] buttons to select the song that you want to convert.

When you have selected the song, press [▶] until the → cursor is next to the arrow. Then use the [-/NO] and [+/YES] buttons to select a song format: E-SEQ, SMF0 or SMF1.

Symbol	Song format
E-SEQ	E-SEQ format
SMF0	Standard MIDI File format 0
SMF1	Standard MIDI File format 1

		anne		Do	m	Ų	er.	Ϋ.]					Ç	Е	Ы	Ŧ	þ
1.1.	 -	01	1	ΙF	il-l	()I	313	1	=	M	ΙΙ)	٠E		9		0	

6 Press [ENTER].

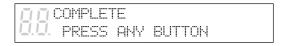
A display similar to the following appears.

			ISURE?(Y/N)
17.17.	01 F	PIPMO001	.MID→E-SEQ

Press [+/YES] to begin song conversion.

If you do not want to convert the song, press [-/NO].

When song conversion is completed, the following display appears. Press any button to return to the normal display.



When a song format is converted, the file name extension changes.

Converting Disk Type

SMF type disks can be converted to E-SEQ type disks and vice versa. This can be helpful when you want to play back a song recorded in the SMF format on an earlier Disklavier model, or when you want to use song data recorded in the E-SEQ format with other MIDI instruments.

- Specify a disk.
- Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

With the * cursor next to the Disk option, press [ENTER].

The Disk menu appears.

MFormat *Son9Delete *Son9Cory *Son9Sort

Press [▶] until the ⊮ cursor is next to the Disk Convert option, then press [ENTER].

> +*DiskCopy *Son9Convert *Counter ▶DiskConvert

The following display appears.

[DiskConvert] SMF→ME-SEQ Type (ENT)

Use the [-/NO] and [+/YES] buttons to select a song format.

> E-SEQ type disks can be converted to SMF type disks or Piano1 disks.

> SMF type disks can be converted to E-SEQ type disks or Piano1 disks.

Note: Piano1 is a format that can be played back by all Disklaviers. In the display, disk type for a Piano1 type disk will be shown as E-SEQ.

6 Press [ENTER].

The following display appears.

INSERT DESTINATION DISK

Insert the destination disk.

Depending on the size of the disk, the following display may appear.

INSERT SOURCE DISK

Eject the destination disk and insert the source disk. You may need to repeat this several times until the conversion is complete.

If all data cannot fit onto one disk, the following display appears. Insert another floppy disk and conversion will continue.

INSERT ANOTHER UDESTINATION DISK

When the conversion process is complete, the following display appears. Press any button to return to the normal display.

> COMPLETE PRESS ANY BUTTON

Chapter 10 The Disklavier & MIDI

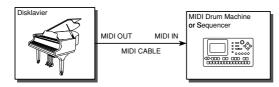
This chapter describes how the Disklavier can be used with other MIDI instruments. The Disklavier's MIDI functions are quite flexible, so there are many different connection possibilities. This chapter provides a few examples. Even if your particular application is not among these, you should be able to derive the information required to create your own setup by reading through these setup examples.

Note: For the MIDI setups described in this chapter, it is recommended that you connect your MIDI instrument to the MIDI OUT connector and set the HOST SELECT switch to MIDI so that the Disklavier functions properly. See "Setting the HOST SELECT Switch" on page 72.

Start/Stop Control of a MIDI Instrument with the Disklavier

In this setup, song disks are played on the Disklavier and a MIDI drum machine or sequencer plays in synchronization. When [PLAY] is pressed, the MIDI instrument starts to play. It can also be paused and stopped via the Disklavier. In addition, the tempo of the MIDI instrument will change as the tempo of the Disklavier is adjusted.

1 Connect the Disklavier's MIDI OUT to the MIDI instrument's MIDI IN connector using a MIDI cable.



2 Set the MIDI instrument to synchronize with the incoming MIDI clock, sometimes called "MIDI SYNC".

Refer to its operating manual for details.

3 Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

	Disk	*#14 I	Ι	5	∰.	ŀ,,	.JF		
Ū.Ū. ∗	:M-Tune		(4	÷.,	.j.	, [<u>=</u> 4	T)

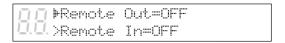
Press [➡] until the ⊨ cursor is next to the MIDI Setup option, then press [ENTER].

The following display appears.

∏ ⊮Piano Part	*MIDI Out
III.*Remote	*Local

Press [▶] until the ⊮ cursor is next to the Remote option, then press [ENTER].

The following display appears.



- 6 Press [+/YES] to set the Remote Out parameter to ON.
- Press [FUNC.] or [STOP] to exit the MIDI setup.

The Disklavier can now be used in the sequencer system.

Sending the Keyboard Data to a MIDI Instrument

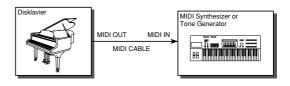
In this setup, as you play the Disklavier, a connected external MIDI tone generator or synthesizer plays as well. This is sometimes referred to as voice layering or unison. A typical combination may be the Disklavier and a strings voice, or the Disklavier and a vibes voice. From the Disklavier, you can select the tone generator's voice, set its volume, and its transposition.

It is also possible to set a split point on the keyboard, so that, for example, your left-hand part is backed by a bass guitar voice and your righthand part is backed by a marimba. MIDI data from each side of the split point is sent to a different MIDI channel, and the voice, volume, and transposition for each side can be set individually.

Note: This setup is not intended for Ensemble song playback. It is intended for manual piano playing with an external tone generator or synthesizer. To send Ensemble song data to an external MIDI instrument, see "Sending Song Data to a MIDI Instrument" on page 60.

The following procedure describes how to play MIDI instruments from the Disklavier using a keyboard split point.

Connect the Disklavier's MIDI OUT to the external MIDI instrument's MIDI IN connector using a MIDI cable.



Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

Press [➡] until the ⊨ cursor is next to the MIDI Setup option, then press [ENTER].

The following display appears.

Press [▶] until the ⊨ cursor is next to the MIDI Out option, then press [ENTER].

The following display appears.

- See "Summary of the MIDI Out Parameter in a MIDI Setup" on pages 68 and 69 for details on the MIDI Out parameter.
- 5 Press [**→**].

A display similar to the following appears.

To set a split point, press [▶] until the following display appears. Then, with the ⊨ cursor next to the Split parameter, use the keyboard or the [-/NO] and [+/YES] buttons to select a key.



A keyboard split point can be set from A1 to C7.

7 If you want to transpose the MIDI output, press [➡] to position the ★ cursor next to the Trans parameter, then use the [-/NO] and [+/YES] buttons to set a value.

The MIDI output can be transposed from -60 to +60 in one semitone steps.

Separate transposition values can be set for the left- and right-hand parts.

Press [] until the following display appears.

If you did not set a split point, the subsequent displays will be similar to the following.

Press [♠] until the in cursor is next to the Out Ch parameter, then use the [-/NO] and [+/YES] buttons to set a value.

The "Out Ch" option is used to select the MIDI channel/s through which the Disklavier will transmit MIDI data. It can be set to OFF, MIDI channels 1 to 16 or HP.

Channel	Description
OFF	No data is sent to the MIDI
	instrument.
1 to 16	The Disklavier keyboard data
	and pedal data is sent on the
	selected channel.
HP	Keyboard data and on/off pedal
	data will be sent on channel 1,
	and continuous pedal data (half
	pedal) will be sent on channel
	3. In this case the pedal data
	will be continuously variable
	(half pedal).

10 To select a voice for the MIDI output, press [▶] until the cursor is next to the Prg parameter, then use the [-/NO] and [+/YES] buttons to select a voice.

> **∏** +Out Ch=01,02 Probatta, ### Vol=###,###

If you had set a split point, you can set different voices for the left- and right-hand

A setting of "###" means no voice selection.

11 To set the volume of the MIDI output, press [▶] until the cursor is next to the Vol parameter, then use the [-/NO] and [+/YES] buttons to set the volume.

> Pr9=###,### Vol####,###

If you had set a split point, you can set different volume levels for the left- and right-hand piano parts.

A setting of "###" will not change the volume.

12 Press [FUNC.] or [STOP] to exit the MIDI setup.

Filtering KBD Out Data

When sending data for the piano part you play on the Disklavier keyboard to an external MIDI instrument, the data contains keyboard touch data and continuous pedal data as well. These data can be filtered so that only basic MIDI messages are output.

- Perform up to step 7 of "Sending the Keyboard Data to a MIDI Instrument".
- Press [⇒].

The following display appears.

+Key Touch⊮ON Pedal=CONT

Use the [-/NO] and [+/YES] buttons to to set the filtering options.

Parameter	Option	Description
Key Touch	ON	Sends silent notes,
	(default)	diminishing sounds
	OFF	Doesn't send key
		touch data
Pedal	CONT	Sends continuous
	(default)	pedal data
	SWITCH	Sends On/Off
		pedal data

Go back to step 8 in "Sending the **Keyboard Data to a MIDI** Instrument".

Receiving Data from a MIDI Sequencer

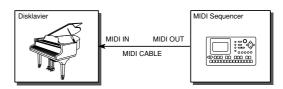
In this setup, the Disklavier is connected to a MIDI sequencer for song recording and playback. In this way you can use a MIDI sequencer's powerful recording and editing functions for creating your Disklavier songs. The sequencer can be a dedicated music sequencer, a MIDI data recorder, or a MIDI sequencer program running on a computer.

A 500 millisecond delay is applied to the incoming MIDI data so that the Disklavier plays more fluently. Because of the delay, be aware that the beat indicator on the sequencer is slightly ahead of the actual sounds being produced. Be aware of this. To control the Disklavier in real time, see "Controlling the Disklavier in Real Time" on page 59.

The Disklavier's Piano Rcv Ch parameter must be set to match that of the sequencer track that contains the piano parts. For example, if the piano part is recorded on sequencer track 7 and track 7 is transmitting on MIDI channel 12, the Disklavier should be set to receive on MIDI channel 12. The Piano Rcv Ch parameter has the following options.

Option	Description	
##	MIDI IN data is played by just the	
	internal tone generator.	
01 to 16	MIDI IN data is played by the piano	
	on the specified MIDI channel.	
HP	MDI IN data is played by the piano.	
	Left-hand part on MIDI channel 1,	
	right-hand part on MIDI channel 2,	
	and half pedal data on MIDI channel 3.	
1+2	MIDI IN data is played by the piano.	
	Left-hand part on MIDI channel 1,	
	right-hand part on MIDI channel 2.	
Prg	MIDI IN data is played by the piano	
	on the channel with the smallest	
	number containing a piano group	
	voice.	
Prg(all)	All channels that contain a piano	
	group voice in the MIDI IN data is	
	played by the piano.	

Connect the MIDI sequencer's MIDI OUT to the Disklavier's MIDI IN with a MIDI cable.

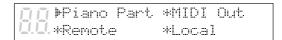


Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

Press [➡] until the ⊨ cursor is next to the MIDI Setup option, then press [ENTER].

The following display appears.



With the * cursor next to the Piano Part option, press [ENTER].

The following display appears.

耳耳	⊫Piano	Rov Ch=01	
1.1.	>Delay	In(500ms)=ON	

- Use the [-/NO] and [+/YES] buttons to select a MIDI channel.
 - See the list of available options on the left.
- Press [▶] until the ⊨ cursor is next to the Delay In parameter, then use the [-/NO] and [+/YES] buttons to set the Delay In (500 ms) to ON.

	≻Piano	Rcv Ch=1+2	÷
<u> </u>	▶Delay	In(500ms)=0N	

■ For more information on the 500 ms delay function, see "Controlling the Disklavier in Real Time" on page 59.

Press either [FUNC.] or [STOP] to return to the normal display.

The Disklavier can now be used in the sequencer system.

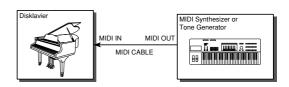
Controlling the Disklavier in Real Time

As the Disklavier uses a mechanical system for driving the piano keys, incoming MIDI data cannot be played instantly. For this reason a fixed delay of 500 ms is usually applied to all incoming MIDI data. For most applications this delay will not be a problem.

If you want to play the Disklavier in "real time" via a MIDI master keyboard, synthesizer, or MIDI guitar controller, this fixed delay can be turned off. However, it will still take the Disklavier time to respond to incoming MIDI data and the Disklavier piano response time will vary based on the velocity of the notes and is not usercontrollable.

You need to set the Delay In parameter to OFF, and set the Piano Rcv Ch parameter to match that of the other keyboard's MIDI transmit channels. If the channels do not match, the Disklavier will not respond to the MIDI data.

- Refer to the other keyboard's user guide for information on setting its transmit MIDI channels.
- Connect the MIDI controller's MIDI **OUT to the Disklavier's MIDI IN** using a MIDI cable.



Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

Press [➡] until the ⊨ cursor is next to the MIDI Setup option, then press [ENTER].

The following display appears.

	⊭Piano	Part.	*MIDI	Out.
<u> </u>	*Remote	::	*Local	

With the * cursor next to the Piano Part option, press [ENTER].

The following display appears.

	⊮Piano	Rcv Ch=01 In(500ms)=ON	÷
<u> </u>	>Delay	In(500ms)=ON	

- Use the [-/NO] and [+/YES] buttons to select a MIDI channel.
 - See page 58 for a list of available options.
- 6 Press [▶] until the F cursor is next to the Delay In parameter, then use the [-/NO] and [+/YES] buttons to set the Delay In (500 ms) to OFF.

Piano Rov Ch=1+2 → DD Delay In(500ms)=OFF

Press [FUNC.] or [STOP] to return to the normal display.

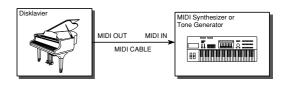
Sending Song Data to a MIDI Instrument

The parts of an Ensemble song are usually played by the internal XG tone generator. However, because the song data that is sent to the internal XG tone generator is simultaneously sent to the MIDI OUT connector, you can also output the song file to an external tone generator or a MIDI instrument such as a synthesizer.

When playing back songs from a computer, for example, it is a good idea to connect an external tone generator if the song has more than 16 channels. In this case, the Disklavier will play channels 1 to 16 and the rest of the channels will be played by the external tone generator. See "Playing Back More than 16 Channels" on page 74.

For the best compatibility, your external MIDI instrument should support Yamaha XG, General MIDI (GM), or both.

1 Connect the Disklavier's MIDI OUT to the external MIDI instrument's MIDI IN connector using a MIDI cable.



2 Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

Press [▶] until the ▶ cursor is next to the MIDI Setup option, then press [ENTER].

The following display appears.

⊫Piano	Part.	*MIDI	Out
.*Remote		*Local	L

- Press [▶] until the ⊮ cursor is next to the MIDI Out option, then press [ENTER].
- Use the [-/NO] and [+/YES] buttons to select ESBL Out.

直直	MMIDI	Out=ESBL	Out
1_1.1_1.			(500ms)

- See "Summary of the MIDI Out Parameter in a MIDI Setup" on pages 68 and 69 for details on the MIDI Out parameter.
- Press [FUNC.] or [STOP] to exit the MIDI Setup mode.

Playing Back Import Files

Songs recorded onto floppy disks using MIDI equipment other than the Disklavier can be played back with the Disklavier. These are called "import files". For these files, you must specify the tracks to be played by the Disklavier piano, because piano parts in import files may be stored on any track.

- Insert the song disk into the disk
- Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

Press [▶] until the ⊮ cursor is next to the MIDI Setup option, then press [ENTER].

The following display appears.

	⊮Piano	Part.	*:MIDI	Out.
<u> </u>	*Renote		*Local	

With the cursor next to the Piano Part option, press [ENTER]. Then, press [▶] until the following display appears.

∏∏+Import	File LM)1 R=##
	art ESBL	Out.=OFF

Use the [-/NO] and [+/YES] buttons to set the piano part channels.

Option	Description	
##	The import file is played by	
	the tone generator only.	
01 to 16	The import file is played by	
	the piano on the specified	
	MIDI channel.	

Prg	The import file is played by the	
	piano on the channel with the	
	smallest number containing a	
	piano group voice.	
Prg(all)	All channels that contain a	
	piano group voice in the	
	import file is played by the	
	piano.	

Press [PLAY] to play back the song disk.

Synchronization Using the MTC

MTC Synchronization Settings

In order to achieve synchronization using the MTC (MIDI time code), the settings for sending and receiving the MTC are performed.

This Disklavier has a function that uses the MIDI time code (MTC) to synchronize with an external component.

This Disklavier can function either as the Master or as the Slave when synchronization is to be achieved using the MTC. Set the MTC-related parameters in order to use the synchronization function.

1 Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

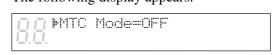
Press [➡] until the ⊮ cursor is next to the MIDI setup option, then press [ENTER].

The following display appears.

∏∏ ⊫Piano Part	*MIDI Out
4.4. *Remote	*Local +

Press [➡] until the ⊮ cursor is next to the MTC, then press [ENTER].

The following display appears.



One of the following three MTC mode parameters can be selected.

OFF: The synchronization function is

(default) set to OFF.

Disklavier operates in response to Slave:

the MTC received from the

external component.

Master: Disklavier sends the MTC to the

external component.

Note: The MTC settings are stored in the memory when the power is turned off.

 Depending on the MTC settings, some restrictions apply to the remote function. See "Correlation between MTC Settings and Remote Function, and Behavior" on page 67.

To Operate Disklavier in the Slave Mode

4a Use the [-/NO] and [+/YES] buttons to select "MTC Mode=Slave".

> MMTC Mode=Slave Thru=OFF

The MTC can be received at any of the rates shown below. The rate is detected automatically.

Rate parameter

24fps

25fps

DF

30fps

Press [▶] to position the 🖹 cursor next to the "Thru", and set the output port.

Set the connector from which the MTC which has been received is to be output.

Thru parameter: OFF (default)

> **MIDI HOST**

"fps" stands for frames per second. "DF" stands for dropped frame.

To Operate Disklavier in the Master Mode

4b Use the [-/NO] and [+/YES] buttons to select "MTC Mode=Master".

> MMTC Mode=Master >Rate=30fps Out =MIDI

Press [➡] to position the ⊨ cursor next to the "Rate", and set the frame rate.

> Select the setting that corresponds to the Frame Rate of the external component to be synchronized with.

Rate parameter

24fps

25fps

DF

30fps (default)

6b Press [♦] to position the ⊩ cursor next to "Out," and set the destination where the MTC is to be sent.

> The MTC can be output from either the MIDI OUT connector or TO HOST connector. Select the output destination here.

Out parameter: MIDI (default)

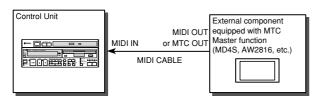
HOST

Using Disklavier as the MTC Slave

In this status, Disklavier operates in synchronization with the time information of the external component.

Example of connections

Receiving the MTC from MIDI IN



MTC Mode=Slave

Establish the MTC
Master mode by
following the
instructions in the
manual
accompanying the
external component.

MTC Sync Playback (Slave Mode)

The MTC (MIDI time code) is received, and the MIDI song is played back in synchronization with the external component that supports the MTC. "Slave" must have already been selected as the MTC/MTC mode setting.

Select the song that supports synchronization and that you want to play using [SONG SELECT] buttons. Press [PLAY/PAUSE] button to engage the Playback Standby mode.

The letters "MTC" flash on the counter area of the playback screen, the following display appears, and "MTC" flashes on the display.



- Operate the external component.
 (The external component must first be set up to serve as the MTC Master.)
- Playback is performed in synchronization with the MTC received from the external component.

Finely Adjusting the MTC Synchronization Time

Playback can also be synchronized with an offset applied to the received MTC. A deviation in the synchronization can be adjusted using this parameter.

During song selection, press [♠] on the song name display to display the previous screen.

The following display appears.



Set the offset time.



Parameter - 500 ms to + 500 ms (in 10 ms increments)

Note: In the case of E-SEQ format songs, songs that do not support MTC synchronization, CD playback or Smartkey playback, it is not possible to perform MTC sync playback.

If pause, fast forward or reverse is performed using the Disklavier panel or remote controller during MTC sync playback, the MTC sync playback is suspended. However, sync playback can be resumed in response to signals from the external component by pressing the [STOP] button, and then pressing the [START] button.

MTC Offset appears only when a song that supports synchronization has been selected.

The MTC Offset parameter is stored in the memory even when the power is turned off.

Note: By pressing the [PLAY/PAUSE] button again in the playback standby mode in step 1, a song that supports synchronization can also be played back in the same way as a regular song.

MTC Sync Recording (Slave Mode)

Sync recording is performed while the MTC is received from the external component. "Slave" must have already been selected as the MTC/ MTC mode setting.

Press [REC] to engage the Record Standby mode.

> The REC indicator lights and the PLAY/PAUSE indicator flashes.

Press [PLAY/PAUSE] and recording will begin.

The PLAY/PAUSE indicator stops flashing.

3 Operate the external component. (The external component must first be set up to serve as the MTC Master.)

> **Note:** Bear in mind that regular recording will be performed if you start playing the song before the MTC message is output from the external component. (You must not step on the pedals.)

- Start playing your song in synchronization with the external component.
- Upon completion of the song, stop the external component, and then press [STOP].

Note: MTC sync recording is for recording new songs only.

> Song recorded by MTC sync recording are supported by MTC synchronization.

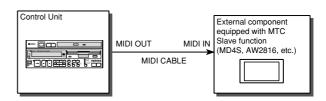
Songs recorded by E-SEQ recording, metronome recording or CD sync recording are not supported by MTC synchronization.

Using Disklavier as the MTC Master

During playback and recording, Disklavier sends the MTC, and the external component operates in synchronization with the MTC.

Example of connections

Sending the MTC from MIDI OUT

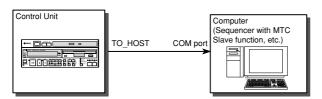


MTC Mode=Master Rate = Adjust to the external component's rate.

Out=MIDI

Establish the MTC Slave mode by following the instructions in the manual accompanying the external component.

Sending the MTC from TO HOST



MTC Mode=Master Rate=Adjust to the external component's rate.

Out=HOST

Establish the MTC Slave mode by following the instructions in the manual

accompanying the

soft.

1 Set the MTC-compatible external component to the MTC receiving standby mode.

Refer to its operating manual for details.

Proceed with playback or recording using the control unit.

The MTC is sent, and the MTC-compatible external component starts sync playback.

Correlation between MTC Settings and Remote Function, and **Behavior**

NATIONAL I	Remote		Transmit				Receive		
MTC Mode	Out	In	FA-FC	F2	F8	MTC	FA-FC	F2	MTC
OFF	OFF	OFF	×	×	×	×	×	×	×
	OFF	ON	×	×	×	×	О	O	×
	ON	OFF	О	O	О	×	×	×	×
	ON	ON	О	O	О	×	О	О	×
Slave	OFF	OFF	×	×	×	Thru	×	×	О
	OFF	ON	×	×	×	Thru	О	×	О
	ON	OFF	О	O	×	Thru	×	×	О
	ON	ON	О	O	×	Thru	О	×	О
Master	OFF	OFF	×	×	×	О	×	×	×
	OFF	ON	×	×	×	О	О	×	×
	ON	OFF	О	×	×	O	×	×	×
	ON	ON	О	×	×	О	О	×	×

When the song position has exceeded [7F 7F], F2 (Song Position), F8 (Continue) and F8 (Timing Clock) are not sent.

Summary of the MIDI Out Parameter in a MIDI Setup

The following tables show the differences among the MIDI OUT settings (KBD Out, ESBL Out, Thru Port2) with the **HOST SELECT switch set to MIDI**.

MIDI OUT = KBD Out

Action	TO HOST connector	MIDI OUT connector	Piano/Internal XG tone generator	
Play on keyboard	×	MIDI data sent if Out Ch ≠ OFF.	No internal tone generator sounds unless Voice button is ON and Local = ON.	
Playback of ensemble song file	×	No data sent except for pedal data. (See note.)	Piano and internal tone generator play normally.	
MIDI data received from TO HOST connector	×	×	×	
MIDI data received from MIDI IN connector	×	No MIDI data passed through except for pedal data. (See note.)	Piano and internal tone generator play normally; delay applied if Delay In = ON.	

 $[\]times$ = TO HOST connector inactive

Note: When pedals are played (activated) by data, the depth of the pedals is read by the sensors and sent (KBD Out) via channels selected in the Out Ch setting (as, unlike the keyboard, the pedals cannot distinguish whether they are being activated by foot or by data).

MIDI OUT = ESBL Out

Action	TO HOST connector	MIDI OUT connector	Piano/Internal XG tone generator		
Play on keyboard	×	No MIDI data sent unless Voice button in ON.	No internal tone generator sounds unless Voice button is ON and Local = ON.		
Playback of ensemble song file	×	All MIDI data sent except for piano parts (pedals always sent on piano channel); piano parts sent if PianoPart ESBL OUT = ON; if E-SEQ song, incremental pedals not sent on channel 3.	Piano and internal tone generator play normally.		
MIDI data received from TO HOST connector	×	×	×		
MIDI data received from MIDI IN connector		All MIDI data passed through except piano parts; piano parts sent if PianoPart ESBL OUT = ON; delay applied if Delay In = ON.	Piano and internal tone generator play normally; delay applied if Delay In = ON.		

 $[\]times$ = TO HOST connector inactive

MIDI OUT = Thru Port2

Action	TO HOST connector	MIDI OUT connector	Piano/Internal XG tone generator
Play on keyboard	×	No MIDI data sent.	No internal tone generator sounds unless Voice button is ON and Local = ON.
Playback of ensemble song file	×	No MIDI data sent.	Piano and internal tone generator play normally.
MIDI data received from TO HOST connector	×	×	×
MIDI data received from MIDI IN connector	×	No MIDI data passed through.	Piano and internal tone generator play normally; delay applied if Delay In = ON.

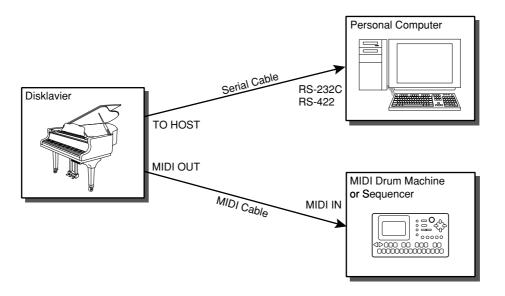
 $[\]times$ = TO HOST connector inactive

Chapter 11 The Disklavier & Personal Computers

Creating music with computers used to be a job for professionals only. However, in this age of multimedia and personal computers, almost anyone can enjoy creating music.

General MIDI and Standard MIDI File (SMF) formats supported by the Disklavier are formats common to most personal computers and MIDI instruments. For example, use your personal computer to download SMF data from the Internet and play it on the Disklavier.

The Disklavier can be connected to a personal computer using the TO HOST connector. It can also be connected via MIDI IN/OUT connectors, but a separate MIDI interface is required. The TO HOST connector allows you to connect your Disklavier to a personal computer without the MIDI interface.



Note: To use the Disklavier properly with the computer setups described in this chapter, it is recommended that you connect your computer to the TO HOST connector and set the HOST SELECT switch to PC1, PC2, or MAC depending on your computer type. See "Setting the HOST SELECT Switch" on page 72.

Connecting to a Personal Computer

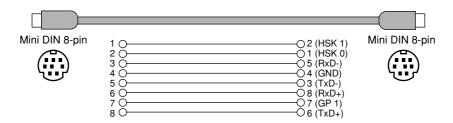
Specifically, Apple Macintosh, IBM PC/AT, and NEC PC-9801/9821 series computers can be directly connected to the Disklavier. Connect the RS-232C or RS-422 connector on your computer to the TO HOST connector on the Control Unit using the specified cables shown below (available separately). Also refer to your computer's operating manual to make sure the connection is made properly.

Your computer may also require a serial port driver for this function. This software is used for controlling the MIDI interface. For further information, please consult your Yamaha dealer.

Note: Be sure to turn the computer and Disklavier power switches off before making the connections and setting the HOST SELECT switch.

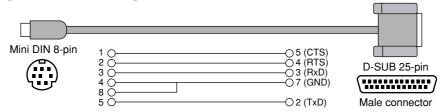
Connecting to an Apple Macintosh Series Computer

Use a standard Macintosh 8-pin system peripheral cable.



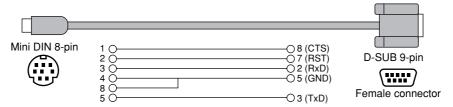
Connecting to an NEC PC-9801/9821 Series Computer

Use a standard 8-pin MINI DIN → 25-pin D-SUB cross cable.

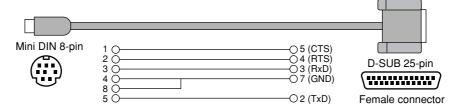


Connecting to an IBM PC/AT Series Computer

(a) Use a standard 8-pin MINI DIN → 9-pin D-SUB cross cable.



(b) Use a standard 8-pin MINI DIN → 25-pin D-SUB cross cable.



Setting the HOST SELECT Switch

Set the HOST SELECT switch on the rear panel of the Control Unit according to your computer type.

PC1 PC2 MIDI NAC

HOST SELECT	Computer type	Baud rate	Remarks
MAC	Apple Macintosh series	31,250	On the computer side, set the clock speed to 1 MHz.
PC1	NEC PC-9801/9821 series	31,250	Some software require the HOST SELECT switch to be set to PC2 (38,400 bps) in order to function properly.
PC2	IBM PC/AT series	38,400	
MIDI	General MIDI equipment	31,250	MIDI data is sent/received via MIDI OUT/IN connectors, and not the TO HOST connector.

^{*} Apple and Macintosh are trademarks of Apple Computer, Inc.

Playing Back Songs Created in a Computer

Songs created and stored in your computer system can be played back by the Disklavier.

1 Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

Press [➡] until the ⊨ cursor is next to the MIDI Setup option, then press [ENTER].

The following display appears.

<u>∏</u> ⊯Piano Part	*MIDI Out
U.U.*Remote	*Local

With the * cursor next to the Piano Part option, press [ENTER].

The following display appears.

<u>∏</u> ⊫Piano	Roy Ch=01	÷
U.U.>Delas	In(500ms)=ON	

With the rursor next to the Piano Rcv Ch parameter, use the [-/NO] and [+/YES] buttons to select the channel for the piano part.

The selected channel will be played by the Disklavier piano, and the other channels by the internal XG tone generator. See "Receiving Data from a MIDI Sequencer" on page 58 for details on MIDI channels.

^{*} IBM PC/AT is a trademark of International Business Machines Corporation.

^{*} PC-9801/9821 is a trademark of NEC Corporation.

Press [▶] until the ▶ cursor is next to the Delay In parameter, then use the [-/NO] and [+/YES] buttons to set it.

> >Piano Rov Ch=1+2 ☑.⊫Delay In(500ms)=ON

Option	Description
ON	A delay of 500 ms is applied to all
	incoming MIDI data from the
	computer so that the timing of the
	piano and the internal XG tone
	generator match for smooth
	playback.
OFF	The delay is not applied, and the
	piano is played in "real time".
	However, playback will not be
	smooth. When Piano Rcv Ch is
	set to ##, all channels are played
	by the internal XG tone generator,
	so Delay In is automatically set to
	OFF.

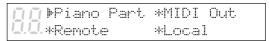
- For more information on the 500 ms delay function, see "Controlling the Disklavier in Real Time" on page 59.
- Press [FUNC.] or [STOP] to return to the normal display.

Recording Songs to a Computer (Sequencer)

You can record keyboard and pedal data onto a computer.

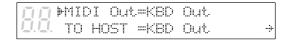
- Press [FUNC.].
- Press [▶] until the ⊮ cursor is next to the MIDI Setup option, then press [ENTER].

The following display appears.



Press [▶] until the ▶ cursor is next to the MIDI Out option, then press [ENTER].

The following display appears.



- See "Summary of the MIDI Out Parameter in a Computer Setup" on pages 76 and 77 for details on the MIDI Out parameter.
- With the * cursor next to the MIDI Out parameter, press [▶].



The "Out Ch" option is used to select the MIDI channel on which the Disklavier will transmit MIDI data. It can be set to OFF, MIDI channels 1 to 16, or HP.

Channe	l Description
OFF	No data is sent to the MIDI
	instrument.
1 to 16	The Disklavier keyboard data and
	pedal data is sent on the selected
	channel.
HP	Keyboard data and on/off pedal
	data will be sent on channel 1,
	and continuous pedal data (half
	pedal) will be sent on channel 3.
	In this case the pedal data will be
	continuously variable (half pedal).

If you want to play the piano parts on the internal XG tone generator, set Piano Rcv Ch to ##. There will be no delay effect if all channels are monitored on the internal XG tone generator.

See "Controlling the Disklavier in Real Time" on page 59 for details on the 500 ms delay effect.

To monitor all recording parts on the internal XG tone generator, set the "Echo Back" or "Patch Thru" options on the computer or sequencer to ON. See their operating manuals for details.

Press [FUNC.] or [STOP] to return to the normal display.

Playing Back More than 16 Channels

You can play back from a computer song data that contains up to 32 channels by connecting the Disklavier's TO HOST connector to the serial port on a computer and its MIDI OUT connector to a MIDI instrument. The 32 channels are sent to the Disklavier using software corresponding to port signals. The Disklavier plays channels 1 to 16 (port 1), and channels 17 to 32 (port 2) are output to an external MIDI instrument.

- 1 Press [FUNC.].
- Press [➡] until the ⊨ cursor is next to the MIDI Setup option, then press [ENTER].

The following display appears.

Press [▶] until the ⊮ cursor is next to the MIDI Out option, then press [ENTER].

The following display appears.

ПП	MMIDI	Out=KBD	Out.	
<u> </u>	TO H	OST =KBD	Out.	je

- See "Summary of the MIDI Out Parameter in a Computer Setup" on pages 76 and 77 for details on the MIDI Out parameter.
- With the F cursor next to the MIDI Out parameter, use the [-/NO] and [+/YES] buttons to select "Thru Port2".
- Press [FUNC.] or [STOP] to return to the normal display.

Temporarily Deactivating the Internal Tone Generators

When you are using the Disklavier's internal XG tone generator from a computer and do not want any interference from the keyboard, you can set the Disklavier so that the tone generator and keyboard are temporarily disconnected. Even when the Voice function is on, no sound is produced from the piano. It will sound only by messages received through the MIDI IN or TO HOST connectors.

Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

Press [▶] until the 🖟 cursor is next to the MIDI Setup option, then press [ENTER].

The following display appears.

	⊮Piano	Part	*MIDI	Out
<u> </u>	*Remote		*Local	

- Press [▶] until the ⊮ cursor is next to the Local option, then press [ENTER].
- Use the [-/NO] and [+/YES] buttons to set Local to OFF.

The following display appears.

MLocal=OFF (Mot memorized!) **Note:** The OFF setting remains in effect only until the Disklavier is switched off. The next time you switch on the Disklavier, the "Local" setting is returned to ON (default).

Press [FUNC.] or [STOP] to return to the normal display.

Summary of the MIDI Out Parameter in a Computer Setup

The following tables show the differences among the MIDI OUT settings (KBD Out, ESBL Out, Thru Port2) with the **HOST SELECT switch set to PC1, PC2 or MAC**.

MIDI OUT = KBD Out

Action	TO HOST connector	MIDI OUT connector	Piano/Internal XG tone generator
Play on keyboard	MIDI data sent if Out Ch ≠ OFF.	MIDI data sent if Out Ch ≠ OFF.	No internal tone generator sounds unless Voice button is ON and Local = ON.
Playback of ensemble song file	No MIDI data sent.	No MIDI data sent.	Piano and internal tone generator play normally.
from TO HOST through except for pedal through		No MIDI data passed through except for pedal data. (See note.)	Piano and internal tone generator play normally; delay applied if Delay In = ON.
MIDI data received from MIDI IN connector	No MIDI data passed through without delay.	No MIDI data passed through.	Piano and internal tone generator do not respond.

Note: When pedals are played (activated) by data, the depth of the pedals is read by the sensors and sent (KBD Out) via channels selected in the Out Ch setting (as, unlike the keyboard, the pedals cannot distinguish whether they are being activated by foot or by data).

MIDI OUT = ESBL Out

Action	TO HOST connector	MIDI OUT connector	Piano/Internal XG tone generator
Play on keyboard	MIDI data sent if Out Ch ≠ OFF.	MIDI data sent unless Voice button is ON.	No internal tone generator sounds unless Voice button is ON and Local = ON.
Playback of ensemble song file	No MIDI data sent except for pedal data. (See note.)	All MIDI data sent except for piano parts (pedal always sent on piano channel); piano parts sent if PianoPart ESBL OUT = ON; if E-SEQ song, incremental pedals not sent on channel 3.	Piano and internal tone generator play normally.
MIDI data received from TO HOST connector	No MIDI data passed through except for pedal data. (See note.)	All MIDI data passed through; delay applied if Delay In = ON.	Piano and internal tone generator play normally; delay applied if Delay In = ON.
MIDI data received from MIDI IN connector	All MIDI data passed through without delay.	No MIDI data passed through.	Piano and internal tone generator do not respond.

Note: When pedals are played (activated) by data, the depth of the pedals is read by the sensors and sent (KBD Out) via channels selected in the Out Ch setting (as, unlike the keyboard, the pedals cannot distinguish whether they are being activated by foot or by data).

MIDI OUT = Thru Port2

Action	TO HOST connector	MIDI OUT connector	Piano/Internal XG tone generator
Play on keyboard	MIDI data sent if Out Ch ≠ OFF.	No MIDI data sent.	No internal tone generator sounds unless Voice button is ON and Local = ON.
Playback of ensemble song file	No MIDI data sent except for pedal data. (See note.)	No MIDI data sent.	Piano and internal tone generator play normally.
MIDI data received from TO HOST connector	No MIDI data passed through except for pedal data. (See note.)	All MIDI data on channels 17-32 sent; delay applied if Delay In = ON.	Piano and internal tone generator play channels 1-16 normally; delay applied if Delay In = ON.
MIDI data received from MIDI IN connector	All MIDI data passed through.	No MIDI data passed through.	Piano and internal tone generator do not respond.

Note: When pedals are played (activated) by data, the depth of the pedals is read by the sensors and sent (KBD Out) via channels selected in the Out Ch setting (as, unlike the keyboard, the pedals cannot distinguish whether they are being activated by foot or by data).

Chapter 12 Resetting Your Disklavier

If you want to return your Disklavier to its initial factory settings, follow the Reset function below.

Resetting Your Disklavier

You can reset all settings, the Memory Disks, or both.

1 Specify a disk.

When you select a Memory Disk, the reset function will be effective for the selected disk only.

If you select Memory Disk 0, the disk is reset in SMF format, and an "opening" song or songs are automatically re-recorded on the disk. If you select Memory Disk 1 to F, the disks are reset in SMF format, and nothing is recorded on the disk.

Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

Press [→] until the ⊨ cursor is next to the Reset option, then press [ENTER].

The following display appears.

Use the [-/NO] and [+/YES] buttons to select the item that you want to reset. Then press [ENTER].

Option	Description
Setup	All settings (See next page.)
Memory	Memory disk number [X] and
Disk [X] +	all settings (SMF format;
Setup	sample song included) (See
	also next pag e.)
Memory	Memory disk number [X]
Disk [X]	only (SMF format; sample
	song included)
Factory init.	All Memory Disks are ret-
setting	urned to initial factory settings

The table on the next page lists the default settings for the items that can be reset.

Disk [X] + Setup or Memory Disk [X], press [+/YES] when a display similar to the following appears.

==Reset== SURE?(YES,NO) MemoryDisk[2]+Setup

If you selected Factory init. setting, press [ENTER] when the following display appears, then press [+/YES].

ALL data will be erased!
Okay? (ENT,NO)



SURE?(YES,NO)
#Factory init. setting

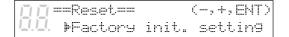
Forced Reset

When the message "UNFORMATTED MEMORY DISK" appears, this indicates that all Memory Disks are damaged.



In the Reset display, press [ENTER].

The following display appears.



Reset the Memory Disk as described above.

Note: If you accidentally turn off the Control Unit while data is being stored to a Memory Disk, one or all Memory Disks may be damaged. They can only be recovered by returning them to initial factory settings.

Note: Be sure to keep a backup of important data.

Note: You cannot back up write-protected songs such as PianoSoft and PianoSoft Plus songs onto floppy disks.

Parameter	Default	Options	
General	'	'	
Volume	0	-10 to 0	
Tempo	0	-50 to +20	
Transpose	0	-24 to +24	
Repeat	OFF	ALL, RPT, RND, A-B	
Pedal Cancel	PD on	PDoff, PD on	
Voice			
Basic Voice	001	001 to 128	
Variation Voice	0	0 to 101 (depending on basic voice)	
Vol	100	000 to 127	
Metronome	,	·	
Click	ON	OFF, ON	
Tempo	117	30 to 400	
Beat	4/4	1/4 to 9/4	
Pedal Count	OFF	OFF, ON	
M-Tune	<u>'</u>	<u> </u>	
TG Master Tune	00	-50 to 00 to +50	
BALANCE		'	
TG Master Balance	100	0 to 127, OFF	
CD Master Balance	64	0 to 127, OFF	
MIDI Setup	!		
Piano Rcv Ch	01	##, 01 - 16, 1+2, Prg, Prg(all)	
Delay In (500 ms)	ON	ON, OFF	
Import File L	Prg	##, 01 - 16, Prg, Prg(all)	
Import File R	Prg	##, 01 - 16, Prg	
Piano Part ESBL Out	OFF	OFF, ON	
MIDI Out	KBD OUT	ESBL Out, KBD Out, Thru Port2	
Out Ch	01	01 to 16	
Split	OFF	OFF, A1 to C7	
Trans L	00	-60 to 00 to +60	
Trans R	00	-60 to 00 to +60	
Remote Out	OFF	OFF, ON	
Remote In	OFF	OFF OFF, ON	
Local	ON	OFF, ON	

Restoring Demo Songs

You can restore demo songs if you made a back up copy in advance.

- See "Making Backups of the Demo Songs" on page 14 in Basic Operation Manual for details on the backup procedure.
- Insert a backup disk into the disk drive.
- Press the [SELECT] buttons to specify a destination Memory Disk.
- 3 Press [FUNC.].

The FUNC. indicator lights and the Function menu appears.

Press [▶] until the cursor is next to the Reset option, then press [ENTER].

The following display appears.

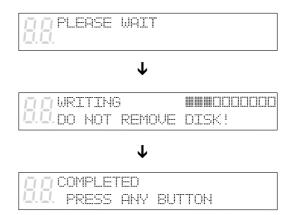


Use the [-/NO] and [+/YES] buttons to select the Restore Demo Song option.

The following display appears.



6 Press [ENTER].



Note: When the message "INSERT SOURCE DISK" appears, this indicates that no floppy disk is inserted in the disk drive or all songs on the inserted disk have been copied. In this case, insert the next floppy disk into the disk drive to restart restoring procedure or press [STOP] to cancel.

Press [FUNC.] or [STOP] to exit the restore procedure.

Chapter 13 Troubleshooting

If you are having difficulty operating your Disklavier, see if any of the symptoms listed below apply to your problem and follow the recommended remedy.

Power

You cannot turn on the Disklavier.

- Make sure the power cord is connected to a suitable AC outlet.
- Switch on the Disklavier's "MAINS" switch.
- Press the [STANDBY / ON] button and turn on the Control Unit.
- If the Disklavier still cannot be turned on, disconnect it from the AC wall outlet, and consult your Disklavier dealer.
- See "Turning On the Disklavier" on page 12 in the Basic Operation Manual.

Control Unit

The Control Unit does not appear to work correctly.

- Turn off the Control Unit, wait 5 seconds, then turn it back on.
 - If the problem continues, consult your Disklavier dealer.

Remote Control

You cannot control the Disklavier using the remote control.

- Make sure that you are pointing the remote control at the Control Unit's remote control sensor.
- Make sure that you are within the remote control's specified operating range.
- ► See "Using the Remote Control" on page 2 in the Basic Operation Manual.

- Make sure that the remote control's batteries have been installed correctly.
- **☞** See "Installing Batteries in the Remote Control" on page 2 in the Basic Operation Manual.
- Check the condition of the remote control's batteries.
- See "Battery Replacement" on page 2 in the Basic Operation Manual.

Playback

None of the playback functions can be

Insert a Disklavier song disk into the disk drive.

Songs are played back at the wrong tempo or in the wrong key.

Reset the tempo or transposition functions. Once the tempo or transposition functions have been set, they will affect playback of all songs until another disk is inserted, or they are reset.

Songs are not played back in the normal song order.

- Check that the "RND" and "RPT" repeat functions are off.
- See "All Song, Single Song, Random Repeat" on page 29 in the Basic Operation Manual.

You selected a song using the remote control's number pad, but the last song on the disk is selected.

• If a song number higher than the last song number on the disk is specified, the last song will be selected.

A search time is specified using the remote control, but the end of the song is selected.

• If a time value higher than the total length of the song is specified, the end of the song will be selected.

During playback, complex note trills and faint pianissimo passages are occasionally missed.

• Increase the Disklavier's volume level.

The Disklavier lowers the playback volume by reducing the force applied to each hammer. So for notes that are already quiet (pianissimo, etc.), when the playback volume is reduced there may not be enough force applied to a hammer for it to strike the strings.

The metronome does not sound during song playback.

 Check that the song uses a measures and beats time format. If not, the metronome will not sound.

When you play back a song you downloaded from the internet, the volume of the piano parts is too loud.

- Song data created for use with other electronic instruments often include sound with high velocity (loudness). Edit the volume of the track containing high velocity.
- See "Editing a Track's Voice & Volume" on page 42.

PianoSmart

Pianosmart fails to work (fails to synchronize).

 Check whether the CD is the same as the number of the CD printed on the Smart PianoSoft package, etc.

- When the songs are all the same even if the CD is different, copy Smart PianoSoft onto the memory disk, and execute "Change to a different CD."
- When a copied CD and Smart PianoSoft are to be played simultaneously, their playback timing may not coincide.

Pedal

During playback, the pedals do not operate.

- Check that the pedal cancel function is not set to "PDoff."
- The sustain pedal is not made to move. Only the internal mechanism operates.
- See "Operating the Pedals Yourself" on page 34 in the Basic Operation Manual.

Tone Generator (Ensemble Playback)

During Ensemble song playback, the Ensemble parts cannot be heard.

- Make sure that the amp's volume control is set to an appropriate level.
- Readjust the volume balance.
- See "Balancing the Ensemble Volume (TG Master Balance)" on page 25 in the Basic Operation Manual.

The pitch of the Disklavier and internal XG tone generator do not match.

- Use the TG Master Tune function to tune the internal XG tone generator.

The TG Master Balance function does not adjust the volume of the internal XG tone generator.

 Make sure that the BALANCE parameter is set to OFF. ► See "Balancing the Ensemble Volume (TG Master Balance)" on page 25 in the Basic Operation Manual.

Recording

When recording the second part of an L/R song, the first part will not play back for monitoring.

- Set the Monitor Piano option to ON.
- See "Re-Recording One Part" on page 33.

When recording a new part to an existing track, the new part replaces the existing parts.

- Set the Record Tr option to OVERDUB.
- See "Overdubbing a Track" on page 39.

You cannot re-record.

• Re-recording is not possible on protected disks such as PianoSoft and PianoSoft Plus disks.

Connection with External Devices

The Disklavier cannot send and receive MIDI data with other MIDI instruments.

• Make sure the MIDI cables are connected properly.

A MIDI loop was accidentally created when you connected a computer to the MIDI OUT connector on your Disklavier, so that song data is sent back and forth between the computer and and piano.

- Set MIDI Out to KBD Out.
- Computers".

Disk Utilities

You cannot copy a song in the Memory Disk onto a floppy disk.

- Copy-protected songs in the Memory Disk cannot be copied onto a floppy disk. They can only be copied onto the Memory Disk.
- Make sure that the floppy disk's erasure tab is set to "unprotected."
- See "Floppy Disk Accidental Erasure Protection" on page 18.

Chapter 14 Display Error Messages

While operating your Disklavier an error message may appear in the display. If an error message appears, refer to the table below for an explanation of the message.

Note: This table does not explain every error message.

GIR CANNOT RE-RECORD PROTECTED FILE	PianoSoft songs are write-protected and cannot be re-recorded.
CANNOT EXECUTE. PROTECTED FILES EXIST	The current function cannot be executed because protected files exist on the floppy disk.
DISK FULL! INSERT ANOTHER DISK	No more song data can be recorded onto the floppy disk because the disk is full. Use another floppy disk.
DISK WRITE PROTECTED!	The current function cannot be performed because the floppy disk's erasure protection tab is set to "protected." Set the disk's erasure protection tab to "unprotected." See "Floppy Disk Accidental Erasure Protection" on page 18.
NOT ENOUGH DISK SPACE	No more song data can be recorded onto the disk because the disk is nearly full.
CANNOT RECORD MORE THAN 60 SONGS	No more than 60 songs can be recorded onto an E-SEQ type disk.
CANNOT RECORD D.D. MORE THAN 99 SONGS	No more than 99 songs can be recorded onto an SMF type disk.
SONG FILE NOT FOUND	The current function cannot be performed because this disk contains no songs or only one song.
WRONG DESTINATION DISK	A wrong floppy disk has been inserted as the destination disk. Insert the correct floppy disk.
UNFORMATTED DISK	The floppy disk is either new and has not yet been formatted for use with the Disklavier or uses a format not recognized by the Disklavier. Format the floppy disk. See "Formatting Disks" on page 17.

B.B. UNSUITABLE DISK FORMAT	In order to be copied, the destination disk must be the same format as the floppy disk.
B.B. SELECT REC TRACK!	You must select the track you want to record before recording.
DOULY E-SEQ FILES COMED	Only E-SEQ files can be recorded onto an E-SEQ type disk.
ERROR HAS OCCURRED!	The disk may be damaged. Press the Stop key to clear the message. If this message appears frequently with other disks as well, contact your nearest Yamaha service representative.

Chapter 15 Glossary

This glossary provides basic definitions of terms used frequently in Disklavier manuals.

bpm

An abbreviation for beats per minute.

Chain Play

A Disklavier function for playing back multiple disks sequentially.

Clavinova™

A series of Yamaha digital pianos.

Continuous Pedal

See "Incremental Pedal".

Cursor

The "\"" symbol that is used on the LCD to show the currently selected function or option. When entering song or disk titles, the cursor will be the "_" symbol. Do not confuse this with the [\(\leftilde{\pi} \)] and [\(\leftilde{\pi} \)] buttons.

Disk

Storage media for data. For clarity in the Disklavier manuals, "disk" is used as a generic term to refer to floppy disks, CDs and Memory Disks.

A song which contains piano parts and

Ensemble Song

accompanying instrumental voices. An Ensemble song contains the same left and right-hand parts as an L/R song, and in addition, up to 13 accompanying instrument tracks. These extra tracks are played by the internal XG tone generator. The accompanying tracks may be used for acoustic bass, drums, strings, vibes, etc.

E-SEQ Song Format

A song file format developed by Yamaha for saving songs.

E-SEQ Type Disk

One of two disk types that the Disklavier uses to format disks. E-SEQ type disks are compatible with earlier Disklavier models.

Fast Forward & Reverse

Two Disklavier functions that allow you to quickly locate a position within a song. This is faster than preview and review, but the Disklavier does not play.

Fast Preview & Review

Two Disklavier functions that allow you to search quickly through a song with the Disklavier playing.

Floppy Disk

The magnetic storage medium that the Disklavier uses to save songs. The Disklavier uses the 3.5 inch 2DD and 2HD floppy disks commonly used for computers.

Formatting

New floppy disks must be formatted before they can be used with the Disklavier. Formatting prepares the disk so that it is ready to store Disklavier song data.

General MIDI (GM)

An addition to the MIDI standard that simplifies the transfer of MIDI song files between instruments of different manufacturers. A MIDI song recorded using a GM compatible tone generator should play back correctly when used with any GM compatible tone generator. The standard specifies that a GM compatible tone generator must support 24-note polyphony, 16 parts, and 128 standard voices.

Half Pedal

See "Incremental Pedal".

Import File

Songs recorded onto floppy disks using MIDI equipment other than the Disklavier and played back by the Disklavier.

Incremental Pedal

Piano pedals are not always completely up or down and may be held somewhere in-between. Using incremental pedal data (also called continuous or half pedal data) the Disklavier precisely records the up and down movement of the piano pedals.

LCD

Liquid Crystal Display. The Control Unit has an LCD that shows 2 large characters and 2 lines of 24 small characters. For clarity in the Disklavier manuals, the LCD is referred to as the "display".

LED

Light Emitting Diode. The Control Unit's front panel indicators are LEDs.

L/R Song

In a L/R song, the left-hand piano part is stored on track 1 (L) and the right-hand piano part is stored on track 2 (R). During playback you can cancel either part, and then play that part yourself. When recording an L/R song, you can record the two parts simultaneously or separately.

Memory Disk

The Disklavier has 16 internal Memory Disks that allow you to store song data without a floppy disk. Each Memory Disk has a memory capacity of 1MB.

Metronome

A built-in device designed to mark exact time by a regularly repeated click and flashing LED. Used for both recording and playback.

MIDI

An acronym for Musical Instrument Digital Interface, MIDI allows electronic musical instruments to communicate with each other.

Overdub

The addition of tracks to an existing recording. For example, a Disklavier rhythm track can be created with overdubbing by recording a track with a bass drum, then a track with a snare, then hi-hat, etc.

Piano Parts

Refers to the left- and right-hand piano parts of a song. The left-hand piano part is recorded onto track 1 and the right-hand piano part is recorded onto track 2. These track assignments are the default settings and can be changed.

PianoSoft™

The PianoSoft Disk Collection is a library of prerecorded song disks made by Yamaha specifically for use with the Disklavier.

PianoSoft-Plus™

PianoSoft·Plus disks contain Ensemble songs that can be played on the Disklavier.

Polyphony

The maximum number of voices (or sounds) that can be produced at a time from MIDI instruments.

Program Change Message

MIDI messages used for selecting programs or voices. When an Ensemble song starts playing, Program Change messages are sent to the tone generator to select the correct instrument voices for each ensemble track.

Quantize

A function for auto-correcting the timing of notes you play on the piano. With the quantize function on, the timing of notes played using the Disklavier keyboard will automatically be corrected to the specified quantize value.

Rhythm Track

Tracks of an ensemble song designated for the accompanying rhythm. The rhythm track is unaffected by the playback transposition function.

Search

A Disklavier function that allows you to start playback from a specific point within a song. This function is set using the remote control.

Sequencer

A sequencer can be used with the Disklavier to play back and record MIDI data.

Smart PianoSoft™

Software made by Yamaha containing MIDI signals for playing back along with standara audio CDS.

SMF

Abbreviation for Standard MIDI File.

SMF Song Format

A song file format supported by MIDI sequencers and music software.

SMF Type Disk

One of two disk types that the Disklavier uses to format disks. SMF type disks automatically record songs using SMF format 0.

Song

Normally, a short piece of music with lyrics. However, for clarity in Disklavier manuals, the term is used to refer to any piece of music of any genre.

Song Format

The method used to store song data in a file. PianoSoft and PianoSoft·Plus songs use the E-SEQ format. The Disklavier also supports songs in the Standard MIDI File (SMF) format.

Song Number

All songs on a Disklavier disk are numbered sequentially. The currently selected song number is shown in the LCD. Songs can be selected directly by entering the song number using the remote control's number pad.

Song Sort

A Disklavier function that allows you to rearrange the order of songs on a disk.

Split Point

When a keyboard split point is set before recording, notes played on the left-hand side of the split point are saved as the left-hand part and notes played on the right-hand side of the split point are saved as the right-hand part. This allows you to play the left- and right-hand parts simultaneously, but on different tracks.

Standard MIDI File (SMF)

A file of MIDI data that can be read and used by a number of different MIDI devices and computers. The Disklavier supports all SMF playback functions.

System Exclusive Messages

MIDI messages used for sending system data to a connected MIDI device. For example, when tuning the internal XG tone generator or an external tone generator, System Exclusive Messages are sent via MIDI.

TG Master Balance

A function that allows you to balance the volume levels of the Disklavier and the internal XG tone generator.

TG Master Tune

The function that allows you to tune the internal XG tone generator, and if connected, an external tone generator simultaneously so that their tunings match that of the Disklavier.

Timer Play

A Disklavier function for automatically playing back groups of disks at various pre-set times.

Tone Generator

An electronic device that can generate tones or instrument voices.

Track

Disklavier ensemble song data is organized as tracks. One song can be composed of up to 16 tracks.

Transpose

Changing the key of a song. For example, a song in the key of C is transposed to the key of D when it is moved up two semitones.

Velocity

Because the loudness of a piano note is determined by the speed (velocity) with which a string is struck by a hammer, note loudness is referred to as velocity.

Voice

The sounds produced by a tone generator expressing various instruments. See Chapter 14 "Internal XG Tone Generator Voice & Drum Kit List" in the *Basic Operation Manual* for a listing of basic voices, and the Appendix "MIDI Data Format" at the very end of this manual for a full listing of available voices.

XG

Yamaha XG is an extension of the GM (General MIDI) format. Its greater polyphony, more voices, and use of effects enhances the compatibility between MIDI devices. When a song in the Yamaha XG format is played on another XGcompatible tone generator or synthesizer, it plays and sounds as the original composer/creator intended.

Chapter 16 Specifications

	Key Sensors	Single-beam, optical, incremental (GP)		
Sensor System	Pedal Sensors	Sustain & shift: incremental, position-sensing, optical		
Drive System	Keys	16-note polyphonic		
Drive System	Pedals	Sustain & shift: incremental response		
Data Storage	Internal Memory	4 MB × 16 flash memory disks (64 MB (Maximum)); up to 9 groups and 99 program sets; built-in calendar/clock/timer		
	File Format	Standard MIDI File (format 0, 1) / E-SEQ		
Removable	Floppy Disk	3.5" 2DD (720 KB) or 2HD (1.44 MB) floppy disk		
Media	Compact Disc	Yamaha PianoSoftPlusAudio, audio CD		
	Main Display	Song number plus 24-character × 2-line LCD		
	Function Indicators	LEDs, including drive/disk number indicator		
Control Unit	Drive	CD and floppy disk		
Control Unit	Switches	Power, Host Select (MIDI, PC1, PC2, Mac)		
	Dimensions (WHD)	227 × 87 × 180 mm (9" × 3 1/2" × 7")		
	Weight	2.2 kg (4.8 lbs)		
Amplification		$60W \times 2$; tone and volume controls		
(GP)	Speakers	16 cm (6 1/4") woofer × 2, 2.5 cm (1") tweeter × 2		
Outlet Box (UP)		AC Outlet × 2, Main Switch, Output Jack × 2		
Connectors		MIDI In/Out, AUX In/Out (R, L/Mono), To Host (serial port), To Piano, CD Control, Audio/Analog MIDI In, Foot Controller		
	Type	Advanced Wave Memory 2 (AWM2)		
	Polyphony	32-note max.		
	Ensemble Parts	16		
Ensemble Tone	Voice Module Modes	XG, GM		
	Normal Voices	676 (480 selectable)		
	Drum Voices	21 kits total (11 selectable)		
	Pitch	Set at A=440, tunable ±50 cents in 1-cent steps (in unison with digital piano tone)		
SmartKey Capability		Yes		
Power Source		Local AC current		
Supplied Accessories		Wireless remote control unit w/batteries, PianoSoft sample disk, CD software, blank 3.5" 2HD floppy disk, owner's manuals, control unit suspension bracket (GP),		
Optional Access	ories	FC-4, FC-5 foot switches, FC-7 foot controller		
1				

Function & Controls

	Media Select	Floppy disk, Memory Disks (1 to 16), CD		
	Song Select	Rev/fwd, song by song; numerical selection		
Playback	Music Search	Rev/fwd, w/ or w/o sound; direct by time or measure		
Functions	Repeat	Disk, song, random, segment A~B, segment A~		
	Programming	9 disk groups, 99 program sets, chain play, timer play		
	Others	L/R part select, auto start, space playbacK		
	Volume	11 levels (0 ~ -10)		
	Tempo	-50 ~ +20 in 1 % steps		
Playback Controls	Transposition	±24 semitones (2 octaves) in 1-semitone steps		
Controls	Balance	Balancing volume of ensemble voices and piano		
	Others	Keyboard cancel, pedal count-in		
	Tracks	16 (including 2 for piano)		
Recording	L/R Dual Recording	Separate L/R or assignable split point		
Functions	Quantize	1/4, 1/6, 1/8, 1/12, 1/16 of a quarter note		
	Others	Re-recording		
	Range	30 ~ 400 beats per minute		
Metronome	Time Signatures	1/4, 2/4, 3/4, 4/4, 5/4, 6/4, 7/4, 8/4, 9/4		
	Function	Audible (tick, on/off), visual (LEDs)		
Editing Functions	Track	Mix, move, copy, delete, transpose		
	Song	Copy, sort, delete, type convert (SMF, E-SEQ, earlier Disklavier), time format convert		
Utility	Disk	Format, copy, type convert		
Functions	Calendar/Clock/Timer	Current time display, time/date stamp for recording		
	Title Entry	Disk: 64 characters max. Song: 32 characters max.		
		<u> </u>		

Specifications are subject to change without prior notice.



disklavier

Mark III Series
DGC1B

Appendix MIDI Data Format

Appendix MIDI Data Format

If you are familiar with MIDI, or are using a computer to control your music software with computergenerated MIDI messages, the data provided in this section can help you to control your Disklavier.

Messages include those that can be received by the piano part and/or those that can be received by an ESBL part. Messages that can be transmitted as well as received are shown as "transmitted".

CHANNEL MESSAGES

Key On / Key Off

(Piano Part, ESBL Part) (transmitted)

Piano Part reception note range = A-1~C7: C3=60 ESBL part reception note range = C-2~G8

Velocity range = 1~127 (Only the Key On velocity is received)

1.2 Control Change

1.2.1 Bank Select

(ESBL Part) (transmitted)

Parameter Data Range Bank Select MSB 0: Normal. 63: User voice, 64: SFX, 126: SFX kit. 127: Drum 32. Bank Select LSB 0 127

You can select the Voice banks with MSB and LSB numbers. MSB and LSB functions differently depending on the play

In XG mode, MSB numbers select Voice type (Normal Voice or Drum Voice), and LSB number select Voice banks.

In TG300B mode, LSB is fixed, and MSB numbers select Voice hanks

(See Normal Voice List Drum Voice List.)

A new bank selection will not become effective until the next Program Change message is received.

1.2.2 Modulation (ESBL Part)

Cntrl# Parameter Data Range Modulation 0 127

Portamento Time 1.2.3

(ESBL Part)

Data Range Portamento Time 0...127

When the parameter 1.2.9 Portamento = ON, values will adjust the speed of pitch change.

A setting of 0 - minimum portamento time, and 127 - maximum portamento time.

1.2.4 Data Entry

(ESBL Part)

Messages which set the value for the parameter specified by RPN/NRPN.

Cntrl#	Parameter	Data Range
6	Data Entry MSB	0127
38	Data Entry LSB	0127

Parameter value is determined by combining MSB and LSB.

Main Volume

(Piano Part, ESBL Part) (transmitted)

Cntrl# Parameter Data Range Main Volume 0...127

1.2.6 Pan

(ESBL Part)

Parameter Cntrl# Data Range 10 Pan 0...127

Expression

(Piano Part, ESBL Part)

Cntrl# Parameter Data Range 11 Expression 0...127

1.2.8 Hold1

(Piano Part, ESBL Part) (transmitted)

Cntrl# Parameter Data Range Hold1 0...127

(0-63:off, 64-127:on)

1.2.9 Portamento

(ESBL Part)

Cntrl# Data Range Parameter 65 Portamento 0...127

(0-63:off, 64-127:on)

1.2.10 Sostenuto

(Piano Part, ESBL Part) (transmitted)

Cntrl# Data Range Parameter Sostenuto 0...127

(0-63:off, 64-127:on)

1.2.11 Soft Pedal

(Piano Part, ESBL Part) (transmitted)

Cntrl# Parameter Data Range Soft Pedal 0...127

(0-63:off, 64-127:on)

1.2.12 Harmonic Content

(ESBL Part)

Messages which adjust the resonance set for each Voice.

Cntrl# Data Range 71 Harmonic Content 0...127 (0:-64, 64:+0, 127:+63)

Higher values will result in a more characteristic, resonant

Depending on the Voice, the effective range may be narrower than the range available for adjustment.

1.2.13 Release Time

(ESBL Part)

Messages which adjust the envelope release time set for each Voice.

	Cntrl# 72	Parameter Release Tim	e	Data Range 0127		\$01	\$63	\$mm		mm: \$00 - \$40 - \$7F (-64 - 0 - +63) EG Attack Time
1.2.14	Attack Ti	me		(0:-64, 64:+0, 127:+63)		\$01	\$64	\$mm		mm: \$00 - \$40 - \$7F (-64 - 0 - +63) EG Decay Time
	(ESBL Part	,	envelone	attack time set for each		\$01	\$66	\$mm		mm: \$00 - \$40 - \$7F (-64 - 0 - +63) EG Release Time mm: \$00 - \$40 - \$7F (-64 - 0 - +63)
	Voice.		onverope			\$14	\$rr	\$mm		Drum Filter Cutoff Frequency mm: \$00 - \$40 - \$7F (-64 - 0 - +63)
	Cntrl# 73	Parameter Attack Time		Data Range 0127		\$15	\$rr	\$mm		rr : drum instrument note number Drum Filter Resonance
1.2.15	Brightnes			(0:-64, 64:+0, 127:+63)						mm : \$00 - \$40 - \$7F (-64 - 0 - +63) rr : drum instrument note number
	(ESBL Part Messages w	,	filter cut	off frequency set for each		\$16	\$rr	\$mm		Drum EG Attack mm : \$00 - \$40 - \$7F (-64 - 0 - +63)
	Voice. Cntrl#	Parameter		Data Range		\$17	\$rr	\$mm		rr : drum instrument note number Drum EG Decay Rate
	74	Brightness		0127 (0:-64, 64:+0, 127:+63)						mm: \$00 - \$40 - \$7F (-64 - 0 - +63) rr: drum instrument note number
1.2.16	Portamer (ESBL Part	nto Control		(** **, * ****, *_****		\$18	\$rr	\$mm		Applies to both Decay1 and 2. Drum Instrument Pitch Coarse mm: \$00 - \$40 - \$7F (-64 - 0 - +63)
	_	which apply a pote and the subs		between the currently- ote.		\$19	\$rr	\$mm		rr : drum instrument note number Drum Instrument Pitch Fine mm : \$00 - \$40 - \$7F (-64 - 0 - +63)
	Cntrl# 84	Parameter Portamento	Control	Data Range 0127		\$1A	\$rr	\$mm		rr : drum instrument note number Drum Instrument Level
1.2.17	Effect1 D (ESBL Part	epth (Rever	b Send	Level)						mm: \$00 - \$7F (0 - max) rr: drum instrument note number
	Cntrl#	Parameter Effect1 Dept	th	Data Range 0127		\$1C	\$rr	\$mm		Drum Instrument Pan mm : \$00 - \$40 - \$7F (random, left - center - right)
1.2.18	Effect3 D (ESBL Part	epth (Choru)	s Send	Level)		\$1D	\$rr	\$mm		rr : drum instrument note number Drum Instrument Reverb Send Level mm : \$00 - \$7F (0 -max)
	Cntrl# 93	Parameter Effect3 Dept	th	Data Range 0127		\$1E	\$rr	\$mm		rr : drum instrument note number Drum Instrument Chorus Send Level
1.2.19	Effect4 D (ESBL Part	•	ion Effe	ect Send Level)						mm: \$00 - \$7F (0 - max) rr: drum instrument note number
	Cntrl#	Parameter Effect4 Dept	·h	Data Range 0127		\$1F	\$rr	\$mm		Drum Instrument Variation Send Level mm: \$00 - \$7F (0 - max) rr: drum instrument note number
1.2.20	20 Data Increment / Decrement (for RPN) (ESBL Part)								is valid only if the Multi Part DRUMS 1 or DRUMS2 for that	
	Cntrl#	Parameter		Data Range		chann	el. (If F	PART MO	DE =	DRUM, no values will be changed.)
	96 97	RPN Increm RPN Decrem		0127 0127	1.2.22		(Regis	tered P	aran	neter Number)
1.2.21	NRPN (No (ESBL Part	_	d Paran	neter Number)		Cntrl#	ŧ	Paramet RPN LS		Data Range 0127
	Cntrl# 98	Parameter NRPN LSB		Data Range 0127		101		RPN MS		0127
	99	NRPN MSB		0127		RPN	Data (ımber	s can be received.
	parameter v		ontrolled.	N LSB to specify the Then use Data Entry to set		MSB	LSB	MSB		PARAMETER NAME and VALUE RANGE
	* Note that subsequent value chang	once the NRPN data entry will e. Therefore, a	I has beer be recogr fter you u	iset for a channel ized as the same NRPN's se the NRPN, you should set unexpected result.		00H	00H	mmH		Pitch Bend Sensitivity mm:00-18H (0-24 chromatic steps) Assignable in chromatic steps up to 2 octaves Default: 02H
	The followi	ng NRPN num	ber can b	e received.		00H	01H	mmH	11H	LSB value is ignored. Fine Tuning
	NRPN MSB LSE	Data entry MSB	PARAN	METER NAME and VALUE		00H		mmH		mm: 00H-40H-7FH (-64-0-+63) Coarse Tuning
	\$01 \$08	\$mm	RANG! Vibrato	Ε						mm: 28H - 40H - 58H (-24 - +24 chromatic steps)
	\$01 \$09	\$mm	Vibrato			7FH	7FH	_	_	LSB value is ignored. RPN null Cancels RPN and NRPN numbers
	\$01 \$0A	\$mm	Vibrato	,	1.2.23	Chan	nel M	lode M	essag	
	\$01 \$20 \$mm : \$00 - \$40 - \$7F (-64 - 0 - +63) Filter Cutoff Frequency mm : \$00 - \$40 - \$7F (-64 - 0 - +63)							l Mod	de Messages can be received.	
	\$01 \$21	\$mm		esonance		2nd b 120	•	3rd byte 0		All Sound Off

121	0	Reset All Controllers
123	0	All Note Off
124	0	Omni Off
125	0	Omni On
126	0 ~ 16	Mono
127	0	Poly

1.2.23.1 All Sound Off

(Piano Part, ESBL Part) (transmitted)

ESBL part;

Terminates all sounds currently sounding on the specified channel. However, the status of channel messages such as Note On and Hold On is maintained.

Piano Part:

The status of channel messages is not maintained.

1.2.23.2 Reset All Controllers

(ESBL Part)

The values of the following controllers will be reset to the defaults.

CONTROLLER	VALUE
Pitch Bend Change	±O (center)
Channel Aftertouch	0 (off)
Polyphonic Aftertouch	0 (off)
Modulation	0 (off)
Expression	127 (max)
Hold 1	0 (off)
Portamento	0 (off)
Sostenuto	0 (off)
Soft Pedal	0 (off)
Portamento Control	cancels the Portamento Source Key
	Number that was received
RPN	number not specified; internal data
	will not change
NRPN	number not specified; internal data
	will not change

1.2.23.3 All Note Off

(Piano Part, ESBL Part) (transmitted)

Terminates all notes currently on for the specified channel. However, if Hold 1 or Sostenuto is on, notes will continue sounding until these are turned off.

1.2.23.4 Omni Off

(Piano Part, ESBL Part)

Performs the same function as when an All Notes Off message is received

1.2.23.5 Omni On

(Piano Part, ESBL Part)

Performs the same function as when an All Notes Off message is

1.2.23.6 Mono

(Piano Part, ESBL Part)

Performs the same function as when an All Sounds on message is received, and if the 3rd byte (mono number) is in the range of 0 - 16, sets the corresponding channel to Mono Mode (Mode 4 : m = 1).

1.2.23.7 Poly

(Piano Part, ESBL Part)

Performs the same function as when an All Sounds Off message is received. and sets the corresponding channel to Poly Mode (Mode 3).

1.2.24 Local Control

(Piano Part, ESBL Part)

Disklavier keyboard does not play the internal voices. 127;On

1.3 Program Change

(ESBL Part) (transmitted)

Messages for Voice selection.

With a combination of Bank Select, you can select not only basic Voice numbers, but also variation Voice bank numbers.

1.4 Pitch Bend

(ESBL Part)

When Multi Part Parameter Rcv PITCH BEND CHANGE=OFF, pitch bend for that part is not received.

1.5 Channel Aftertouch

(ESBL Part)

1.6 Polyphonic Aftertouch

(ESBL Part) (PianoPart) (transmitted)

Applying further pressure on the key does not output "key aftertouch" information. Instead, key position is transmitted as additional information.

2. SYSTEM EXCLUSIVE MESSAGES

2.1 Parameter Change

The Disklavier receives the following parameter change

[UNIVERSAL REALTIME MESSAGE]

1) Master Volume

[UNIVERSAL NON REALTIME MESSAGE]

1) General MIDI Mode On

[XG NATIVE]

- 1) XG System on
- 2) XG System Data parameter change
- 3) Multi Effect1 Data parameter change
- 4) Multi Part Data parameter change
- 5) Drums Setup Data parameter change

[OTHER]

- 1) Master tuning
- 2) TG300 System Data Parameter change
- 3) TG300 Multi Effect Data parameter change
- 4) TG300 Multi Part Data parameter change

2.1.2 Universal Realtime Messages

2.1.2.1 Master Volume

11110000

(Piano Part, ESBL Part)

FΩ

11110000	1.0	- Exclusive status
01111111	7F	= Universal Real Time
01111111	7F	= ID of target device
00000100	04	= Sub-ID #1=Device Control Message
00000001	01	= Sub-ID #2=Master Volume
Osssssss	*SS	= Volume LSB
Ottttttt	TT	= Volume MSB
11110111	F7	= End of Exclusive
or		
11110000	F0	= Exclusive status
01111111	7F	= Universal Real Time
0xxxnnnn	XN	= Device Number, $xxx =$ don't care
00000100	04	= Sub-ID #1=Device Control Message
00000001	01	= Sub-ID #2=Master Volume
Osssssss	SS	= Volume LSB
Otttttt	TT	= Volume MSB
11110111	F7	= End of Exclusive

= Exclusive status

When received, the Volume MSB will be effective for the System Parameter MASTER VOLUME.

* "SS" is the hexadecimal expression of Osssssss; same as for "tt", "aa", etc.

2.1.3 Universal Non-Realtime Messages

2.1.3.1 General MIDI Mode On

(ESBL Part)

11110000	F0	= Exclusive status
01111110	7E	= Universal Non-Real Time
01111111	7F	= ID of target device
00001001	09	= Sub-ID #1=General MIDI Message
00000001	01	= Sub-ID #2=General MIDI On
11110111	F7	= End of Exclusive
or		
11110000	F0	= Exclusive status
01111110	7E	= Universal Non-Real Time
0xxxnnnn	XN	= Device Number, $xxx =$ don't care
00001001	09	= Sub-ID #1=General MIDI Message

00000001 01 = Sub-ID #2=General MIDI On 11110111 F7 = End of Exclusive

When General MIDI Mode On is received, the play mode will be changed to XG mode.

When this happens, the ESBL part will receive the MIDI messages which compatible with GM System Level 1, and consequently will not receive NRPN and Bank Select messages. Since approximately 50ms is required to execute this messag, be sure to leave an appropriate interval before the subsequent message.

2.1.4 XG Native Parameter Change

(ESBL Part)

With the Parameter Change messages as listed below, you can change the characteristic of a Voice, such as by Effect Type or effect parameter, transpose, tuning, and others.

11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0001nnnn	1n	Device Number
01001100	4C	XG Model ID
0aaaaaaa	aaaaaaa	Address High
0aaaaaaa	aaaaaaa	Address Mid
0aaaaaaa	aaaaaaa	Address Low
0ddddddd	ddddddd	Data
1	I	
11110111	F7	End of Exclusive

^{*} Any number is OK since the device number for the Disklavier is fixed to "All".

For parameters with data size of 2 or 4, transmit the appropriate number of data bytes.

When sending the parameter change messages consecutively, be sure to leave an appropriate interval (if the time base is 480. ca 5 unit) between the messages.

2.1.4.1 XG System On (ESBL Part)

11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0001nnnn	1N	Device Number
01001100	4C	XG Model ID
Oaaaaaaa	00	Address High
0aaaaaaa	00	Address Mid
0aaaaaaa	7E	Address Low
00000000	00	Data
11110111	F7	End of Exclusive

When this data is received, the Disklavier will switch to XG mode and all the parameters will be initialized accordingly, and XG-compatible messages such as NRPN and Bank Select messages can be received.

Since approximately 50ms is required to execute this message, be sure to leave an appropriate interval before the subsequent message

2.1.4.2 XG System Data parameter change (ESBL Part)

See tables <1-1> and <1-2>.

2.1.4.3 Multi Effect1 Data parameter change (ESBL Part)

See tables <1-1> and <1-3>.

2.1.4.4 Multi Part Data parameter change (ESBL Part)

See tables <1-1> and <1-4>.

2.1.4.5 Drums Setup Data parameter change (ESBL Part)

See tables <1-1> and <1-5>.

If a Drum Setup Reset parameter change message is received, the Drum Setup parameter values will be initialized. Selecting a Drum Set will cause the Drum Setup parameter values to be initialized.

2.1.5 Other parameter changes

2.1.5.1 Master Tuning

(ESBL Part)

11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0001nnnn	1n	Device Number
00100111	27	Model ID
00110000	30	Sub ID2
00000000	00	
00000000	00	
0mmmmmmm	mm	Master Tune MSB
01111111	11	Master Tune LSB
Осссссс	cc	
11110111	F7	End of Exclusive

This message simultaneously changes the pitch of all channels.

2.2 Bulk Dump

(ESBL Part)

The Disklavier receives the following bulk dump data.

IXG NATIVE

- 1) XG System Data
- 2) Multi Effect1 Data
- 3) Multi Part Data
- 4) Drums Setup Data

[QS300 NATIVE]

1) QS300 User Normal Voice Data

2.2.1 XG Native Bulk Dump

11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0000nnnn	On	Device Number
01001100	4C	XG Model ID
0bbbbbbb	bbbbbbb	ByteCount
0bbbbbbb	bbbbbbb	ByteCount
Oaaaaaaa	aaaaaaa	Address High
Oaaaaaaa	aaaaaaa	Address Mid
Oaaaaaaa	aaaaaaa	Address Low
0ddddddd	dd	Data
1	1	
I	1	
0cccccc	cccccc	Checksum
11110111	F7	End of Exclusive

For the Address and Byte Count, refer to the supplementary tables.

The Checksum is the value that results in a value of 0 for the lower 7 bits when the Start Address, Byte Count, plus the Checksum itself are added.

2.2.1.1 XG System Data bulk dump

(ESBL Part)

See tables <1-1> and <1-2>.

2.2.1.2 Multi Effect1 Data bulk dump (ESBL Part)

See tables <1-1> and <1-3>.

2.2.1.3 Multi Part Data bulk dump (ESBL Part)

See tables <1-1> and <1-4>.

2.2.1.4 Drums Setup Data bulk dump (ESBL Part)

See tables <1-1> and <1-5>.

2.2.2 QS300 Native Bulk Dump

11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0000nnnn	On	Device Number
01001101	4B	QS300 Model ID
0bbbbbbb	bbbbbbb	ByteCount
0bbbbbbb	bbbbbbb	ByteCount
0aaaaaaa	aaaaaaa	Address High
0aaaaaaa	aaaaaaa	Address Mid

0aaaaaaa	aaaaaaa	Address Low
0ddddddd	dd	Data
1	I	
1	1	
Осссссс	cccccc	Checksum
11110111	F7	End of Exclusive

2.2.2.1 QS300 User Normal Voice Data bulk damp (ESBL Part)

See tables <2-1> and <2-2>.

SYSTEM COMMON MESSAGES

3.1 Song Position Pointer

Transmission

This message is transmitted only when the REMOTE OUT parameter is set to On.

Reception

This message is received only when REMOTE IN Parameter is set to On.

3.2 Song Select

a) Transmission

This message is transmitted only when the REMOTE OUT parameter is set to On.

This message is received only when REMOTE IN Parameter is set to On.

4. SYSTEM REALTIME MESSAGES

4.1 Active Sensing

<Table 1-1>

<Table 1-2>

Parameter Bass Address Model ID = 4C [XG]

	Parameter Change			
	I	Addres	S	
	(H)	(M)	(L)	Description
XG SYSTEM	00	00	00	System
	00	00	7D	Drum setup Reset
	00	00	7E	XG System On
	00	00	7F	All Parameter Reset
EFFECT1	02	01	00	Effect1 (Reverb, Chorus, Variation)
MULTI PART	08	00	00	Multi Part 1
				:
	08	0F	00	Multi Part 16
DRUM	30	18	00	Drum Setup 1
	30	18	00	Drum Setup 2

Transmission Transmitted.

Reception

Once FE has been received. if no MIDI data is subsequently received for longer than an interval of approximately 300msec. the Disklavier will perform the same function as when ALL SOUNDS OFF. ALL NOTES OFF, and RESET ALL CONTROLLERS messages are received, and will then return to a status in which FE is not monitored.

4.2 Timing Clock

a) Transmission

This message is transmitted only when the REMOTE OUT parameter is set to On.

Reception Not recognized.

4.3 Start

a) Transmission

This message is transmitted only when the REMOTE OUT parameter is set to On.

Reception

This message is received only when REMOTE IN Parameter is Set to On.

4.4 Stop

Transmission

This message is transmitted only when the REMOTE OUT parameter is set to On.

Reception

This message is received only when REMOTE IN Parameter is Set to On.

١		Address	S	Parameter
	3n	0B	00	note number 13
	3n	0C	00	note number 14
		:		:
	3n	5B	00	note number 91

n: Drum setup number (0, 1)

MIDI Parameter Change table (SYSTEM) [XG]

Addres	SS	(H)	Si (H)	ize Data Parameter	Description Default value (H)	
00	00 00	4	0000-07FF	MASTER TUNE	-102.4 - +102.3 [cent]	00 04 00 00
					1st bit3-0→bit15-12	-400
					2nd bit3-0→bit11-8	
					3rd bit3-0→bit7-4	
					4th bit3-0→bit3-0	
	04	1	00 - 7F	MASTER VOLUME	0 - 127	7F
	05	1	00 - 7F	not used		
	06	1	28 - 58	TRANSPOSE	-24 - +24 [semitones]	40
	7D		n	DRUM SETUP RESET	n=Drum setup number	
	7E		00	XG SYSTEM ON	00=XG system ON (receive only)	
	7F		00	ALL PARAMETER RESET	00=ON (receive only)	
TOTA	L SIZE		07			

<Table 1-3>
MIDI Parameter Change table (EFFECT 1) [XG]

(H)		Size	Data	Parameter	Description	Default value
		(H)	(H)			(H)
02 01	00	2	00-7F	REVERB TYPE MSB	see Effect Type List	01(=HALL1)
			00-7F	REVERB TYPE LSB	00 : basic type	00
	02	1	00-7F	REVERB PARAMETER 1	see Effect Parameter List	Depends on reverb type
	03	1	00-7F	REVERB PARAMETER 2	,,	**
	04	1	00-7F	REVERB PARAMETER 3	,,	"
	05	1	00-7F	REVERB PARAMETER 4	"	"
	06	1	00-7F	REVERB PARAMETER 5	,,	22
	07	1	00-7F	REVERB PARAMETER 6	"	"
	08	1	00-7F	REVERB PARAMETER 7	"	"
	09	1	00-7F	REVERB PARAMETER 8	"	"
	0A	1	00-7F	REVERB PARAMETER 9	,,	22
	0B	1	00-7F	REVERB PARAMETER 10	,,	22
	0C	1	00-7F	REVERB RETURN	-∞dB0dB+6dB(064127)	40
	0D	1	01-7F	REVERB PAN	L63CR63(164127)	40
TOTAL SIZ		0E	01-71	REVERD IAIV	L03CR03(104127)	40
02 01	10	1	00-7F	REVERB PARAMETER 11	see Effect Parameter List	Depends on reverb type
02 01					"	"
	11	1	00-7F	REVERB PARAMETER 12	"	,,
	12	1	00-7F	REVERB PARAMETER 13		
	13	1	00-7F	REVERB PARAMETER 14	"	"
	14	1	00-7F	REVERB PARAMETER 15	"	"
	15	1	00-7F	REVERB PARAMETER 16	"	"
TOTAL SIZ	ZE	6				
02 01	20	2	00-7F	CHORUS TYPE MSB	see Effect Type List	41 (=CHORUS1)
			00-7F	CHORUS TYPE LSB	00 : basic type	00
	22	1	00-7F	CHORUS PARAMETER 1	see Effect Parameter List	Depends on chorus Type
	23	1	00-7F	CHORUS PARAMETER 2	"	"
	24	1	00-7F	CHORUS PARAMETER 3	"	"
	25	1			"	22
			00-7F	CHORUS PARAMETER 4	22	"
	26	1	00-7F	CHORUS PARAMETER 5	"	_
	27	1	00-7F	CHORUS PARAMETER 6		"
	28	1	00-7F	CHORUS PARAMETER 7	"	"
	29	1	00-7F	CHORUS PARAMETER 8	"	"
	2A	1	00-7F	CHORUS PARAMETER 9	"	"
	2B	1	00-7F	CHORUS PARAMETER 10	"	27
	2C	1	00-7F	CHORUS RETURN	-∞dB0dB+6dB(064127)	40
	2D	1	01-7F	CHORUS PAN	L63CR63(164127)	40
	2E	1	00-7F	SEND CHORUS TO REVERB	-∞dB0dB +6dB(064127)	00
TOTAL SIZ	ZE	0F			,	
02 01	30	1	00-7F	CHORUS PARAMETER 11	see Effect Parameter List	Depends on chorus Type
02 01	31	1	00-7F	CHORUS PARAMETER 12	"	"
	32	1	00-7F	CHORUS PARAMETER 13	"	"
	33	1		CHORUS PARAMETER 13 CHORUS PARAMETER 14	"	22
			00-7F		,,	"
	34	1	00-7F	CHORUS PARAMETER 15	"	"
	35	1	00-7F	CHORUS PARAMETER 16	"	"
TOTAL SIZ		6				
02 01	40	2	00-7F	VARIATION TYPE MSB	see Effect Type List	05 (=DELAY L, C, R)
			00-7F	VADIATION TVDE I CD		
				VARIATION TYPE LSB	00 : basic type	00
	42	2	00-7F	VARIATION 1 THE LSB VARIATION PARAMETER 1 MSB	00 : basic type see Effect Parameter List	00
	42	2				00
	42 44	2	00-7F	VARIATION PARAMETER 1 MSB	see Effect Parameter List	00
			00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB	see Effect Parameter List	00 Depends on variation ty
	44	2	00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB	see Effect Parameter List	00 Depends on variation ty
			00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB	see Effect Parameter List	00 Depends on variation ty
	44 46	2	00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB	see Effect Parameter List	00 Depends on variation ty " " "
	44	2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB	see Effect Parameter List	00 Depends on variation ty " " "
	44 46 48	2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB	see Effect Parameter List	00 Depends on variation ty " " "
	44 46	2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB	see Effect Parameter List	00 Depends on variation ty " " "
	44 46 48	2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB	see Effect Parameter List	00 Depends on variation ty " " "
	44 46 48	2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB	see Effect Parameter List	00 Depends on variation ty " " "
	44 46 48 4A	2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 LSB	see Effect Parameter List	00 Depends on variation ty " " " " " " " " " "
	44 46 48 4A	2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 LSB VARIATION PARAMETER 5 LSB VARIATION PARAMETER 5 MSB	see Effect Parameter List	00 Depends on variation ty
	44 46 48 4A 4C	2 2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 LSB VARIATION PARAMETER 5 LSB VARIATION PARAMETER 6 MSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 7 MSB	see Effect Parameter List	00 Depends on variation ty
	44 46 48 4A 4C 4E	2 2 2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 LSB VARIATION PARAMETER 5 LSB VARIATION PARAMETER 6 MSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 LSB	see Effect Parameter List	00 Depends on variation ty
	44 46 48 4A 4C	2 2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 LSB VARIATION PARAMETER 6 MSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 8 MSB	see Effect Parameter List	00 Depends on variation ty
	44 46 48 4A 4C 4E 50	2 2 2 2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 LSB VARIATION PARAMETER 6 MSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 MSB	see Effect Parameter List " " " " " " " " " " " " " " " " " "	00 Depends on variation ty " " " " " " " " " " " " "
	44 46 48 4A 4C 4E	2 2 2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 LSB VARIATION PARAMETER 6 MSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB	see Effect Parameter List " " " " " " " " " " " " " " " " " "	00 Depends on variation ty " " " " " " " " " " " " "
	44 46 48 4A 4C 4E 50 52	2 2 2 2 2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 9 MSB VARIATION PARAMETER 9 MSB VARIATION PARAMETER 9 MSB VARIATION PARAMETER 9 LSB	see Effect Parameter List " " " " " " " " " " " " " " " " " "	00 Depends on variation ty " " " " " " " " " " " " "
	44 46 48 4A 4C 4E 50	2 2 2 2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 LSB VARIATION PARAMETER 6 MSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB	see Effect Parameter List " " " " " " " " " " " " " " " " " "	00 Depends on variation ty " " " " " " " " " " " " "
	44 46 48 4A 4C 4E 50 52	2 2 2 2 2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 9 MSB VARIATION PARAMETER 9 MSB VARIATION PARAMETER 9 MSB VARIATION PARAMETER 9 LSB	see Effect Parameter List " " " " " " " " " " " " " " " " " "	00 Depends on variation ty " " " " " " " " " " " " "
	44 46 48 4A 4C 4E 50 52	2 2 2 2 2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 9 MSB VARIATION PARAMETER 9 MSB VARIATION PARAMETER 9 LSB VARIATION PARAMETER 9 LSB VARIATION PARAMETER 9 LSB VARIATION PARAMETER 9 LSB VARIATION PARAMETER 10 MSB	see Effect Parameter List " " " " " " " " " " " " " " " " " "	00 Depends on variation ty " " " " " " " " " " " " "
	44 46 48 4A 4C 4E 50 52	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 6 MSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 9 MSB VARIATION PARAMETER 9 LSB VARIATION PARAMETER 9 LSB VARIATION PARAMETER 10 MSB VARIATION PARAMETER 10 MSB VARIATION PARAMETER 10 LSB VARIATION PARAMETER 10 LSB VARIATION PARAMETER 10 LSB VARIATION RETURN	see Effect Parameter List " " " " " " " " " " " " " " " " " " "	OO Depends on variation typ " " " " " " " " " " " " " " " " " "
	44 46 48 4A 4C 4E 50 52 54	2 2 2 2 2 2 2 2 2 2 2	00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F 00-7F	VARIATION PARAMETER 1 MSB VARIATION PARAMETER 1 LSB VARIATION PARAMETER 2 MSB VARIATION PARAMETER 2 LSB VARIATION PARAMETER 3 MSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 3 LSB VARIATION PARAMETER 4 MSB VARIATION PARAMETER 4 LSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 5 MSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 6 LSB VARIATION PARAMETER 7 MSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 7 LSB VARIATION PARAMETER 8 MSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 8 LSB VARIATION PARAMETER 9 MSB VARIATION PARAMETER 9 MSB VARIATION PARAMETER 9 LSB VARIATION PARAMETER 9 LSB VARIATION PARAMETER 10 MSB VARIATION PARAMETER 10 MSB VARIATION PARAMETER 10 MSB VARIATION PARAMETER 10 LSB	see Effect Parameter List " " " " " " " " " " " " " " " " " "	00 Depends on variation type " " " " " " " " " " " " " " " " " "

	5A	1	00-01	VARIATION CONNECTION	0:INSERTION, 1:SYSTEM	00
	5B	1	00-0F,7F	VARIATION PART	Part116(015)	7F
					0FF (127)	
	5C	1	00-7F	MW VARIATION CONTROL DEPTH	-64 - +63	40
	5D	1	00-7F	BEND VARIATION CONTROL DEPTH	-64 - +63	40
	5E	1	00-7F	CAT VARIATION CONTROL DEPTH	-64 - +63	40
	5F	1	00-7F	AC1 VARIATION CONTROL DEPTH	-64 - +63	40
	60	1	00-7F	AC2 VARIATION CONTROL DEPTH	-64 - +63	40
TOTAL SIZE		21				
02 01	70	1	00-7F	VARIATION PARAMETER 11	see Effect Parameter List	Depends on variation type
	71	1	00-7F	VARIATION PARAMETER 12	"	"
	72	1	00-7F	VARIATION PARAMETER 13	,,	"
	73	1	00-7F	VARIATION PARAMETER 14	,,	"
	74	1	00-7F	VARIATION PARAMETER 15	"	"
	75	1	00-7F	VARIATION PARAMETER 16	,,	"
TOTAL SIZE		6				

<Table 1-4> MIDI Parameter Change table (MULTI PART) [XG]

		9	~.	_			
Addres	SS		Size	Data	Parameter	Description	Default value
(H)		00	(H)	(H)	ELEMENT DECEDVE	0. 22	(H)
	nn	00 01	1	00 - 20 00 - 7F	ELEMENT RESERVE	0 - 32 0 - 127	part10=0, other =2
	nn	02	1	00 - 7F 00 - 7F	BANK SELECT LSB	0 - 127	part10=7F, other=0 00
	nn nn	03	1	00 - 7F 00 - 7F	BANK SELECT LSB PROGRAM NUMBER	1 - 128	00
	nn	03	1	00 - 71 00 - 0F. 7F	Rev CHANNEL	1 - 16,0FF	part no.
	nn	05	1	00 - 01	MONO/POLY MODE	0:MONO	01
	1111	03	1	00 - 01	MONO/I GET MODE	1:POLY	01
	nn	06	1	00 - 02	SAME NOTE NUMBER KEY ON ASSIGN		1 (all part)
		00		00 02	SHIP TO TE TO HELD EN RET OTT TO SHOT	1:MULTI	part10=2, other=0
						2:INST (for DRUM)	F,
	nn	07	1	00 - 03	PART MODE	0:NORMAL	00 (other than Part10)
						1:DRUM	02 (Part10)
						2-3:DRUMS1 - 2	, , , ,
	nn	08	1	28 - 58	NOTE SHIFT	-24 - +24 [semitones]	40
	nn	09	2	00 - FF	DETUNE	-12.8 - +12.7 [Hz]	08 00
	nn	0A				1st bit3-0→bit7-4	(80)
						2nd bit3-0→bit3-0	
	nn	0B	1	00 - 7F	VOLUME	0 - 127	64
	nn	0C	1	00 - 7F	VELOCITY SENSE DEPTH	0 - 127	40
	nn	0D	1	00 - 7F	VELOCITY SENSE OFFSET	0 - 127	40
	nn	0E	1	00 - 7F	PAN	0/random, 1/L63-64/C-127/R63	40
	nn	0F	1	00 - 7F	NOTE LIMIT LOW	C-2 - G8	00
	nn	10	1	00 - 7F	NOTE LIMIT HIGH	C-2 - G8	7F
	nn	11	1	00 - 7F	DRY LEVEL	0 - 127	7F
	nn	12	1	00 - 7F	CHORUS SEND	0 - 127	00
	nn	13	1	00 - 7F	REVERB SEND	0 - 127	40
	nn	14	1	00 - 7F	VARIATION SEND	0 - 127	00
	nn	15	1	00 - 7F	VIBRATO RATE	-64 - +63	40
	nn	16	1	00 - 7F	VIBRATO DEPTH	-64 - +63	40 (drum part ignores)
	nn	17	1	00 - 7F	VIBRATO DELAY	-64 - +63	40 (drum part ignores)
	nn	18	1	00 - 7F	FILTER CUTOFF FREQUENCY	-64 - +63	40
	nn	19	1	00 - 7F	FILTER RESONANCE	-64 - +63	40
	nn	1A	1	00 - 7F	EG ATTACK TIME	-64 - +63	40
	nn	1B	1	00 - 7F	EG DECAY TIME	-64 - +63	40
	nn	1C	1	00 - 7F	EG RELEASE TIME	-61 - +63	40
		10		20 50	MANA DITTOM CONTENOS	24 - 24 5 - 2- 1	40
	nn	1D 1E	1	28 - 58	MW PITCH CONTROL	-24 -+24 [semitones]	40 40
	nn	1F	1	00 - 7F 00 - 7F	MW FILTER CONTROL	-9600 - +9450 [cent]	40
	nn	20	1	00 - 7F 00 - 7F	MW AMPLITUDE CONTROL MW LFO PMOD DEPTH	-64 - +63 0 - 127	0A
	nn nn	21	1	00 - 7F	MW LFO FMOD DEFTH MW LFO FMOD DEPTH	0 - 127	00 00
	nn	22	1	00 - 7F	MW LFO AMOD DEPTH	0 - 127	00
	1111	22	1	00 - 71	MW EPOAMODDEI III	0-12/	00
	nn	23	1	28 - 58	BEND PITCH CONTROL	-24 - +24 [semitones]	42
	nn	24	1	00 - 7F	BEND FILTER CONTROL	-9600 - +9450 [cent]	40
	nn	25	1	00 - 7F	BEND AMPLITUDE CONTROL	-64 - +63	40
	nn	26	1	00 - 7F	BEND LFO PMOD DEPTH	+100 - +100 [%]	40
	nn	27	1	00 - 7F	BEND LFO FMOD DEPTH	+100 - +100 [%]	40
	nn	28	1	00 - 7F	BEND LFO AMOD DEPTH	+100 - +100 [%]	40
TOTAI			29				
	nn	30	1	00 - 01	Rcv PITCH BEND	0/OFF, 1/ON	01
	nn	31	1	00 - 01	Rcv CH AFTER TOUCH (CAT)	0/OFF, 1/ON	01
	nn	32	1	00 - 01	Rcv PROGRAM CHANGE	0/OFF, 1/ON	01

	nn	33	1	00 - 01	Rcv CONTROL CHANGE	0/OFF, 1/ON	01
	nn	34	1	00 - 01	Rcv POLY AFTER TOUCH (PAT)	0/OFF, 1/ON	01
	nn	35	1	00 - 01	Rcv NOTE MESSAGE	0/OFF, 1/ON	01
	nn	36	1	00 - 01	Rcv RPN	0/OFF, 1/ON	01
	nn	37	1	00 - 01	Rcv NRPN	0/OFF, 1/ON	XG=01, GM=00
	nn	38	1	00 - 01	Rcv MODULATION	0/OFF, 1/ON	01
	nn	39	1	00 - 01	Rcv VOLUME	0/OFF, 1/ON	01
	nn	3A	1	00 - 01	Rcv PAN	0/OFF, 1/ON	01
	nn	3B	1	00 - 01	Rcv EXPRESSION	0/OFF, 1/ON	01
	nn	3C	1	00 - 01	Rev HOLD1	0/OFF, 1/ON	01
	nn	3D	1	00 - 01	Rcv PORTAMENTO	0/OFF, 1/ON	01
	nn	3E	1	00 - 01	Rev SOSTENUTO	0/OFF, 1/ON	01
	nn	3F	1	00 - 01	Rcv SOFT PEDAL	0/OFF, 1/ON	01
	nn	40	1	00 - 01	Rcv BANK SELECT	0/OFF,1/ON	XG=01, GM=00
	nn	41	1	00 - 7F	SCALE TUNING C	-64 - +63 [cent]	40
	nn	42	1	00 - 7F	SCALE TUNING C#	-64 - +63 [cent]	40
	nn	43	1	00 - 7F	SCALE TUNING D	-64 - +63 [cent]	40
	nn	44	1	00 - 7F	SCALE TUNING D#	-64 - +63 [cent]	40
		45	1	00 - 7F	SCALE TUNING E	-64 - +63 [cent]	40
	nn						
	nn	46	1	00 - 7F	SCALE TUNING F	-64 - +63 [cent]	40
	nn	47	1	00 - 7F	SCALE TUNING F#	-64 - +63 [cent]	40
	nn	48	1	00 - 7F	SCALE TUNING G	-64 - +63 [cent]	40
	nn	49	1	00 - 7F	SCALE TUNING G#	-64 - +63 [cent]	40
	nn	4A	1	00 - 7F	SCALE TUNING A	-64 - +63 [cent]	40
	nn	4B	1	00 - 7F	SCALE TUNING A#	-64 - +63 [cent]	40
	nn	4C	1	00 - 7F	SCALE TUNING B	-64 - +63 [cent]	40
	1111	70		00 - 71	SCIEL TOTAL OF	-04 - 105 [cent]	40
		470		20 50	CAT DITION CONTROL	24 - 24 F - 2 - 3	40
	nn	4D	1	28 - 58	CAT PITCH CONTROL	-24 - +24 [semitones]	40
	nn	4E	1	00 - 7F	CAT FILTER CONTROL	-9600 - +9450 [cent]	40
	nn	4F	1	00 - 7F	CAT AMPLITUDE CONTROL	-64 - +63	40
	nn	50	1	00 - 7F	CAT LFO PMOD DEPTH	0 - 127	00
	nn	51	1	00 - 7F	CAT LFO FMOD DEPTH	0 - 127	00
	nn	52	1	00 - 7F	CAT LFO AMOD DEPTH	0 - 127	00
	••••	02	-	00 /1	C. II 21 C . II. 102 B21 111	0 12,	
	nn	53	1	28 - 58	PAT PITCH CONTROL	-24 - +24 [semitones]	40
	nn					-	
	nn	54	1	00 - 7F	PAT FILTER CONTROL	-9600 - +9450 [cent]	40
	nn	55	1	00 - 7F	PAT AMPLITUDE CONTROL	-64 - +63	40
	nn	56	1	00 - 7F	PAT LFO PMOD DEPTH	0 - 127	00
	nn	57	1	00 - 7F	PAT LFO FMOD DEPTH	0 - 127	00
	nn	58	1	00 - 7F	PAT LFO AMOD DEPTH	0 - 127	00
	nn	59	1	00 - 5F	AC1 CONTROLLER NUMBER	0 - 95	10
		5A	1	28 - 58	AC1 PITCH CONTROL		
	nn					-24 - +24 [semitones]	40
	nn	5B	1	00 - 7F	AC1 FILTER CONTROL	-9600 - +9450 [cent]	40
	nn	5C	1	00 - 7F	AC1 AMPLITUDE CONTROL	-64 - +63	40
	nn	5D	1	00 - 7F	AC1 LFO PMOD DEPTH	0 - 127	00
	nn	5E	1	00 - 7F	AC1 LFO FMOD DEPTH	0 - 127	00
	nn	5F	1	00 - 7F	AC1 LFO AMOD DEPTH	0 - 127	00
	nn	60	1	00 - 5F	AC2 CONTROLLER NUMBER	0 - 95	11
	nn	61	1	28 - 58	AC2 PITCH CONTROL	-24 - +24 [semitones]	40
	nn	62	1	00 - 7F	AC2 FILTER CONTROL	-9600 - +9450 [cent]	40
	nn	63	1	00 - 7F	AC2 AMPLITUDE CONTROL	-64 - +63	40
	nn	64	1	00 - 7F	AC2 LFO PMOD DEPTH	0 - 127	00
	nn	65	1	00 - 7F	AC2 LFO FMOD DEPTH	0 - 127	00
	nn	66	1	00 - 7F	AC2 LFO AMOD DEPTH	0 - 127	00
	1111	00	•	00 /1	THE ET OTHEROD DELTIT	0 127	00
		67	1	00 01	DODTA MENTO CWITCH	O/OFE 1/ON	00
	nn	67	1	00 - 01	PORTAMENTO SWITCH	0/OFF, 1/ON	00
	nn	68	1	00 - 7F	PORTAMENTO TIME	0 - 127	00
	nn	69	1	00 - 7F	PITCH EG INITIAL LEVEL	-64 -+63	40
	nn	6A	1	00 - 7F	PITCH EG ATTACK TIME	-64 - +63	40
	nn	6B	1	00 - 7F	PITCH EG RELEASE LEVEL	-64 - +63	40
	nn	6C	1	00 - 7F	PITCH EG RELEASE TIME	-64 - +63	40
		6D	1	00 - 7F	VELOCITY LIMIT LOW	1 - 127	01
	nn						
mc-	nn	6E	1	01 - 7F	VELOCITY LIMIT HIGH	1 - 127	7F
10	TAL SI	LE.	3F				

nn = Part Number (0:1Part, 1:2Part, 2:3Part, ..., 15:16Part) For the DRUM PART, the following parameters have no effect.

- SOFT PEDAL
 BANK SELECT LSB
- MONO/POLY
- SCALE TUNING • PORTAMENTO
- PITCH EG INITIAL LEVEL
- PITCH EG ATTACK TIME
- PITCH EG RELEASE LEVEL
- PITCH EF RELEASE TIME
- POLY AFTER TOUCH

<Table 1-5> MIDI Parameter Change table (DRUM SETUP) [XG]

Addr	ess		Size	Data	Parameter	Description	Default
(H)			(H)	(H)			(H)
3n	rr	00	1	00 - 7F	PITCH COARSE	-64 - +63	40
3n	rr	01	1	00 - 7F	PITCH FINE	-64 - +63 [cent]	40
3n	rr	02	1	00 - 7F	LEVEL	0 - 127	Depends on the note
3n	rr	03	1	00 - 7F	ALTERNATE GROUP	0/OFF, 1 - 127	,,
3n	rr	04	1	00 - 7F	PAN	0/random, 1/L63 - 64/C - 127/R63	"
3n	rr	05	1	00 - 7F	REVERB SEND	0 - 127	"
3n	rr	06	1	00 - 7F	CHORUS SEND	0 - 127	"
3n	rr	07	1	00 - 7F	VARIATION SEND	0 - 127	7F
3n	rr	08	1	00 - 01	KEY ASSIGN	0/SINGLE, 1/MULTI	00
3n	rr	09	1	00 - 01	Rcv NOTE OFF	0/OFF, 1/ON	Depends on the note
3n	rr	0A	1	00 - 01	Rcv NOTE ON	0/OFF, 1/ON	01
3n	rr	0B	1	00 - 7F	FILTER CUTOFF FREQUENCY	-64 - +63	40
3n	rr	0C	1	00 - 7F	FILTER RESONANCE	-64 - +63	40
3n	rr	0D	1	00 - 7F	EG ATTACK RATE	-64 - +63	40
3n	rr	0E	1	00 - 7F	EG DECAY1 RATE	-64 - +63	40
3n	rr	0F	1	00 - 7F	EG DECAY2 RATE	-64 - +63	40
TOT	AL SI	ZE	10				

[Note]

n: Drum number (0 - 1)

rr: note number (0D - 5B)

When XG system on or GM mode on messages are received, all Drum Setup parameters are initialized.

The Drum Setup Reset message can be used to initialized each Drum Setup parameter.

Selecting a Drum Set will cause the Drum Setup parameter values to be initialized.

<Table 2-1>

Parameter Bass Address Model ID = 4B [QS300]

Bull	k Dumj	p		
	4	Addres	S	Description
	(H)	(M)	(L)	
USER	11	00	00	User Normal Voice 1
NORMAL				:
VOICE	00	1F	00	User Normal Voice 32

<Table 2-2> MIDI Bulk Dump table (USER NORMAL VOICE) [QS300]

Addr	ess		Size	Data (H)	Parameter	Description	Default (H)
(H)			(H)	(II)		[Common]	(n)
11	nn	00	17D	20-7E	Voice Name	[
		:					
		07					
		08			not used		
		:			"		
		0A			"		
		0B		01-03	Element Switch	1:Element 1 on, 2:Element 2 on, 3:Eleme	ent 1 and 2 on
		0C		00-7F	Voice Level		
		OD					
		0D			not used		
		: 3C			,,		
		30				[Element 1]	
		3D		00-7F	Wave Number High	bit13-bit7	
		3E		00-7F	Wave Number Low	bit6-bit0	
		3F		00-7F	Note Limit Low	ono-ono	
		40		00-7F	Note Limit High		
		41		00-7F	Velocity Limit Low		
		42		00-7F	Velocity Limit High		
		43		00-01	Filter EG Velocity Curve		
		44		00-02	LFO Wave Select	0:saw, 1:tri, 2:S&H	
		45		00-01	LFO Phase Initialize	0:OFF, 1:ON	
		46		00-3F	LFO Speed	,	
		47		00-7F	LFO Delay		
		48		00-7F	LFO Fade Time		
		49		00-3F	LFO PMD Depth		
		4A		00-0F	LFO CMD Depth		
		4B		00-1F	LFO AMD Depth		

```
4C
                       20-60
                                  Note Shift
           4D
                       0E -72
                                  Detune
           4E
                       00-05
                                  Pitch Scaling
                                                                        0:100%, 1:50%, 2:20%, 3:10%, 4:5%, 5:0%
                       00-7F
                                  Pitch Scaling Center Note
           4F
           50
                       00-03
                                  Pitch EG Depth
                                                                        0:1/2oct, 1:1oct, 2:2oct, 3:4oct
           51
                       39-47
                                  Velocity PEG Level Sensitivity
                       39-47
                                  Velocity PEG Rate Sensitivity
           52
                                  PEG Rate Scaling
           53
                       39-47
           54
                       00-7F
                                  PEG Rate Scaling Center Note
           55
                       00-3F
                                  PEG Rate 1
           56
                       00-3F
                                  PEG Rate 2
                                  PEG Rate 3
           57
                       00-3F
           58
                       00-3F
                                  PEG Rate 4
           59
                       00-7F
                                  PEG Level 0
           5A
                       00-7F
                                  PEG Level 1
           5B
                       00-7F
                                  PEG Level 2
           5C
                       00-7F
                                  PEG Level 3
           5D
                                  PEG Level 4
                       00-7F
           5E
                       00-3F
                                  Filter Resonance
           5F
                       00-07
                                  Velocity Sensitivity
           60
                       00-7F
                                  Cutoff Frequency
                       00-7F
                                  Cutoff Scaling Break Point 1
           61
                       00-7F
                                  Cutoff Scaling Break Point 2
           62
           63
                       00-7F
                                  Cutoff Scaling Break Point 3
           64
                       00-7F
                                  Cutoff Scaling Break Point 4
           65
                       00-7F
                                  Cutoff Scaling Offset 1
           66
                       00-7F
                                  Cutoff Scaling Offset 2
           67
                       00-7F
                                  Cutoff Scaling Offset 3
           68
                       00-7F
                                  Cutoff Scaling Offset 4
           69
                       39-47
                                  Velocity FEG Level Sensitivity
           6A
                       39-47
                                  Velocity FEG Rate Sensitivity
                       39-47
                                  FEG Rate Scaling
           6B
                       00-7F
                                  FEG Rate Scaling Center Note
           6C
                                  FEG Rate 1
           6D
                       00-3F
           6E
                       00-3F
                                  FEG Rate 2
           6F
                       00-3F
                                  FEG Rate 3
           70
                       00-3F
                                  FEG Rate 4
           71
                       00-7F
                                  FEG Level 0
           72
                       00-7F
                                  FEG Level 1
           73
                       00-7F
                                  FEG Level 2
           74
                       00-7F
                                  FEG Level 3
           75
                       00-7F
                                  FEG Level 4
           76
                       00-7F
                                  Element Level
                                  Level Scaling Break Point 1
           77
                       00-7F
           78
                       00-7F
                                  Level Scaling Break Point 2
           79
                       00-7F
                                  Level Scaling Break Point 3
           7A
                       00-7F
                                  Level Scaling Break Point 4
           7B
                       00-7F
                                  Level Scaling Offset 1
           7C
                       00-7F
                                  Level Scaling Offset 2
            7D
                       00-7F
                                  Level Scaling Offset 3
           7E
                       00-7F
                                  Level Scaling Offset 4
           7F
                       00-06
                                  Velocity Curve
           80
                       00-0F
                                  Pan
                                                                        0 (Left)-14 (Right), 15:Scaling
                                  AEG Rate Scaling
           81
                       39-47
                       00-7F
           82
                                  AEG Scaling Center Note
           83
                       00-0F
                                  AEG Key on Delay
           84
                       00-7F
                                  AEG Attack Rate
           85
                       00-7F
                                  AEG Decay 1 Rate
           86
                       00-7F
                                  AEG Decay 2 Rate
           87
                       00-7F
                                  AEG Release Rate
                       00-7F
                                  AEG Decay 1 Level
           88
           89
                       00-7F
                                  AEG Decay 2 Level
                                                                        bit13-bit7
           8A
                       00-7F
                                  Address Offset High
           8B
                       00-7F
                                  Address Offset Low
                                                                         bit6-bit0
           8C
                       39-47
                                  Resonance Sensitivity
                                                                         [Element 2]
           8D
                                                                         same as [Element 1]
           DC
                                                                        [Element 3]
           DD
                                                                        not used
            12C
            12D
                                                                         [Element 4]
                                                                        not used
           17C
TOTAL SIZE
                 17D
nn=Voice Number (00-1F)
```

XG Normal Voice List

Bank Select MSB = 000, LSB = Bank Number

Voice names in bold typeface are voices that can be selected in the Disklavier.

The Disklavier can produce all the voices listed below, but can only display bank 0 voices.

Instrument Group	Program #	Bank #	Voice Name	Ele- ment	Instrument Group	Program #	Bank #	Voice Name	Ele- ment	Instrument Group	Program #	Bank #	Voice Name	Ele- ment	Instrument Group	Program #	Bank #	Voice Name	Ele- men
Piano	1	0	GrandPno	1	Organ	17	0	DrawOrgn	1	Bass	33	0	Aco.Bass	1	Ensemble	49	0	Strings1	1
		1	GrndPnoK	1			32	DetDrwOr	2			40	JazzRthm	2			3	S.Strngs	2
		18	MelloGrP	1			33	60sDrOr1	2			45	VXUprght	2			8	SlowStr	1
		40	PianoStr	2			34	60sDrOr2	2		34	0	FngrBass	1			24	ArcoStr	2
		41	Dream	2			35	70sDrOr1	2			18	FingrDrk	2			35	60sStrng	2
	2	0	BritePno	1			36	DrawOrg2	2			27	FlangeBa	2			40	Orchestr	2
		1	BritPnoK	1			37	60sDrOr3	2			40	Ba&DstEG	2			41	Orchstr2	2
	3	0	E.Grand	2			38	EvenBar	2			43	FngrSlap	2			42	TremOrch	2
		1	ElGrPnoK	2			40	16+2"2/3	2			45	FngBass2	2			45	VeloStr	2
		32	Det.CP80	2			64	Organ Ba	1			65	ModAlem	2		50	0	Strings2	1
		40	ElGrPno1	2			65	70sDrOr2	2		35	0	PickBass	1			3	S.SlwStr	2
		41	ElGrPno2	2			66	CheezOrg	2			28	MutePkBa	1			8	LegatoSt	2
	4	0	HnkyTonk	2			67	DrawOrg3	2		36	0	Fretless	1			40	Warm Str	2
		1	HnkyTnkK	2		18	0	PercOrgn	1			32	Fretles2	2			41	Kingdom	2
	5	0	E.Piano1	2			24	70sPcOr1	2			33	Fretles3	2			64	70s Str	1
		1	El.Pno1K	1			32	DetPrcOr	2			34	Fretles4	2			65	Str Ens3	1
		18	MelloEP1	2			33	LiteOrg	2			96	SynFretl	2		51	0	Syn.Str1	2
		32	Chor.EP1	2			37	PercOrg2	2			97	Smooth	2			27	ResoStr	2
		40	HardEl.P	2		19	0	RockOrgn	2		37	0	SlapBas1	1			64	Syn Str4	2
		45	VX El.P1	2			64	RotaryOr	2			27	ResoSlap	1			65	SS Str	2
		64	60sEl.P	1			65	SloRotar	2			32	PunchThm	2		52	0	Syn.Str2	2
	6	0	E.Piano2	2			66	FstRotar	2		38	0	SlapBas2	1		53	0	ChoirAah	1
		1	El.Pno2K	1		20	0	ChrchOrg	2			43	VeloSlap	2			3	S.Choir	2
		32	Chor.EP2	2		20	32	ChurOrg3	2		39	0	SynBass1	1			16	Ch.Aahs2	2
		33	DX Hard	2			35	ChurOrg2	2		-	18	SynBa1Dk	1			32	MelChoir	2
		34	DXLegend	2			40	NotreDam	2			20	FastResB	1			40	ChoirStr	2
		40	DX Phase	2			64	OrgFlute	2			24	AcidBass	1		54	0	VoiceOoh	1
		41	DX+Analg	2			65	TrmOrgFl	2			35	Clv Bass	2		55	0	SynVoice	1
		42	DXKotoEP	2		21	0	ReedOrgn	1			40	TeknoBa	2		33	40	SynVoice SynVox2	2
		45	VX El.P2	2		21	40	Puff Org	2			64	Oscar	2			41	Choral	2
	7	0	Harpsi.	1		22	0	Acordion	2			65	SqrBass	1			64	AnaVoice	1
	l '	1	Harpsi.K	1		22	32	AccordIt	2			66	RubberBa	2		56	0	Orch.Hit	2
		25	Harpsi.2	2		23	0	Harmnica	1			96	Hammer	2		30	35	OrchHit2	2
		35	Harpsi.3	2		23	32	Harmo 2	2		40	0	SynBass2	2			64	Impact	2
	8	0	Clavi.	2		24	0	TangoAcd	2		40	6	MelloSB1	1	Brass	57	0	Trumpet	1
	0	1	Clavi. K	1		24	64	TngoAcd2	2			12	Seq Bass	2	Diass	31	16	Trumpet2	1
		27	ClaviWah	2	Guitar	25	0	NylonGtr	1			18		2			17	_	2
		64	PulseClv	1	Guitai	23	16		1			19	ClkSynBa SynBa2Dk	1			32	BriteTrp WarmTrp	2
		65	PierceCl	2			25	NylonGt2 NylonGt3	2			32	SmthBa 2	2		58	0	Trombone	1
7L	9	0		1			43		2			40				36	18		2
Chromatic	10	0	Clesta				96	VelGtHrm	1			l	ModulrBa	2 2		50	0	Trmbone2	1
Percussion	11	0	Glocken	2		26		Ukulele	1			41	DX Bass	2		59		Tuba	
	11		MusicBox	2		26	0	SteelGtr		G. :	4.1	64	X WireBa			60	16	Tuba 2	1
	12	64	Orgel	-			16	SteelGt2	1	Strings	41	0	Violin	1		60	0	Mute.Trp	_
	12	0	Vibes	1			35	12StrGtr	2 2		42	8	SlowVln	1		61		Fr.Horn	2
		1	VibesK	1			40	Nyln&Stl	1 1		42		Viola				6	FrHrSolo	2
	12	45	HardVibe	2			41	Stl&Body	2		43	0	Cello	1			32	FrHorn2	1
	13	0	Marimba	1		27	96	Mandolin	2		44	0	Contrabs	1		62	37	HornOrch	2
		1	MarimbaK	1		21	0	Jazz Gtr	1		43		Trem.Str	1		62	0	BrasSect	1
		64	SineMrmb	2			18	MelloGtr	1			8	SlowTrStr	1			35	Tp&TbSec	2
		97	Balafon2	2		20	32	JazzAmp	2		16	40	Susp Str	2			40	BrssSec2	2
	14	98	Log Drum	2		28	0	CleanGtr	1		46	0	Pizz.Str	1			41	HiBrass	2
	14	0	Xylophon	1			32	ChorusGt	2		47	0	Harp	1			42	MelloBrs	2
	15	0	TubulBel	1		29	0	Mute.Gtr	1		40	40	YangChin	2		63	0	SynBras1	2
		96	ChrchBel	2			40	FunkGtr1	2		48	0	Timpani	1			12	QuackBr	2
	16	97	Carillon	2			41	MuteStlG	2								20	RezSynBr	2
	16	0	Dulcimer	1			43	FunkGtr2	2								24	PolyBrss	2
		35	Dulcimr2	2		20	45	Jazz Man	1								27	SynBras3	2
		96	Cimbalom	2		30	0	Ovrdrive	1								32	JumpBrss	2
		97	Santur	2		-	43	Gt.Pinch	2								45	AnaVelBr	2
						31	0	Dist.Gtr	1							L.	64	AnaBrss1	2
							40	FeedbkGt	2							64	0	SynBras2	1
						L	41	FeedbGt2	2								18	Soft Brs	2
						32	0	GtrHarmo	1								40	SynBras4	2
							65	GtFeedbk	1								41	ChorBrss	2
							66	GtrHrmo2	1								45	VelBras2	2
															1	1	64	AnaBras2	2

Bank 0 : (GM) Bank 18: Dark Bank 34 : Detune 3 Bank 43: Velo-Switch Bank 71: Other wave Bank 1: Key Scale Planning Bank 19 : Dark Bank 35 : Octave 1 Bank 45 : Velo-Xfade Bank 72: Other wave Bank 20: Resonant Bank 3: Stereo Bank 36: Octave 2 Bank 64: Other wave Bank 96: Other wave Bank 6: Single Bank 24: Attack Bank 37:5th 1 Bank 65: Other wave Bank 97: Other wave Bank 8: Slow Bank 24: Release Bank 38:5th 2 Bank 66: Other wave Bank 98: Other wave Bank 12: Fast Decay Bank 27: Reso Sweep Bank 39: Bend Bank 67: Other wave Bank 99: Other wave Bank 40 : Tutti Bank 100: Other wave Bank 14: Double Attack Bank 28: Muted Bank 68: Other wave Bank 16: Bright Bank 32: Detune 1 Bank 41: Tutti Bank 69: Other wave Bank 101: Other wave Bank 17: Bright Bank 33 : Detune 2 Bank 42 : Tutti Bank 70: Other wave

Bank Select MSB = 064, LSB = 000 SFX Voice

Instrument	Program	Bank		Ele-	П
Group	#	#	Voice Name	ment	П
Reed	65	0	SprnoSax	1	П
	66	0	Alto Sax	1	П
		40	Sax Sect	2	П
		43	HyprAlto	2	П
	67	0	TenorSax	1	П
		40 41	BrthTnSx SoftTenr	2 2	П
		64	TnrSax 2	1	П
	68	0	Bari.Sax	1	П
	69	0	Oboe	2	П
	70	0	Eng.Horn	1	П
	71	0	Bassoon	1	П
	72	0	Clarinet	1	П
Pipe	73	0	Piccolo	1	П
	74	0	Flute	1	П
	75	0	Recorder	1	П
	76	0	PanFlute	1	П
	77	0	Bottle	2	П
	78	0	Shakhchi	2	П
	79	0	Whistle	1	П
C4l- T J	80	0	Ocarina	1	П
Synth Lead	81	0 6	Square 2	2	П
		8	Square 2 LMSquare	2	П
		18	Hollow	1	П
		19	Shmoog	2	П
		64	Mellow	2	П
		65	SoloSine	2	П
		66	SineLead	1	П
	82	0	Saw.Lead	2	П
		6	Saw 2	1	П
		8	ThickSaw	2	П
		18	DynaSaw	1	П
		19	DigiSaw	2	П
		20	Big Lead	2	П
		24	HeavySyn	2	П
		25	WaspySyn	2	П
		40 41	PulseSaw Dr. Lead	2	П
		45	VeloLead	2	П
		96	Seq Ana	2	П
	83	0	CaliopLd	2	П
		65	Pure Pad	2	П
	84	0	Chiff Ld	2	П
		64	Rubby	2	П
	85	0	CharanLd	2	П
		64	DistLead	2	П
		65	WireLead	2	П
	86	0	Voice Ld	2	П
		24	SynthAah	2	П
	97	64	VoxLead	2	П
	87	0 35	Fifth Ld	2 2	П
	88	0	Big Five Bass &Ld	2	П
	00	16	Big&Low	2	П
		64	Fat&Prky	2	П
	1	65	SoftWurl	2	П
		0.5		_	. 1
Synth Pad	89	65 0	NewAgePd	2	IJ
Synth Pad	89		NewAgePd Fantasy2	2 2	
Synth Pad	89	0			
Synth Pad		0 64 0 16	Fantasy2 Warm Pad ThickPad	2 2 2	
Synth Pad		0 64 0 16 17	Fantasy2 Warm Pad ThickPad Soft Pad	2 2 2 2	
Synth Pad		0 64 0 16 17 18	Fantasy2 Warm Pad ThickPad Soft Pad SinePad	2 2 2 2 2	
Synth Pad		0 64 0 16 17 18 64	Fantasy2 Warm Pad ThickPad Soft Pad SinePad Horn Pad	2 2 2 2 2 2	
Synth Pad	90	0 64 0 16 17 18 64 65	Fantasy2 Warm Pad ThickPad Soft Pad SinePad Horn Pad RotarStr	2 2 2 2 2 2 2 2	
Synth Pad		0 64 0 16 17 18 64 65 0	Fantasy2 Warm Pad ThickPad Soft Pad SinePad Horn Pad RotarStr PolySyPd	2 2 2 2 2 2 2 2 2	
Synth Pad	90	0 64 0 16 17 18 64 65 0 64	Fantasy2 Warm Pad ThickPad Soft Pad SinePad Horn Pad RotarStr PolySyPd PolyPd80	2 2 2 2 2 2 2 2 2 2	
Synth Pad	90	0 64 0 16 17 18 64 65 0	Fantasy2 Warm Pad ThickPad Soft Pad SinePad Horn Pad RotarStr PolySyPd	2 2 2 2 2 2 2 2 2	

Instrument Group	Program #	Bank #	Voice Name	Ele- ment
Synth Pad	92	0	ChoirPad	2
		64	Heaven2	2
		66	Itopia	2
		67	CC Pad	2
	93	0	BowedPad	2
		64	Glacier	2
	0.4	65	GlassPad	-
	94	0	MetalPad Tine Pad	2
		64 65	Pan Pad	2
	95	0	Halo Pad	2
	96	0	SweepPad	2
	1	20	Shwimmer	2
		27	Converge	2
		64	PolarPad	2
		66	Celstial	2
Synth	97	0	Rain	2
Effects		45	ClaviPad	2
		64	HrmoRain	2
		65	AfrenWnd	2
		66	Caribean	2
	98	0	SoundTrk	2
		27	Prologue	2
		64	Ancestrl	2
	99	0	Crystal	2
		12	SynDrCmp	2
		14	Popcorn	2
		18 35	TinyBell RndGlock	2
		40	GlockChi	2
		41	ClearBel	2
		42	ChorBell	2
		64	SynMalet	1
		65	SftCryst	2
		66	LoudGlok	2
		67	XmasBell	2
		68	VibeBell	2
		69	DigiBell	2
		70	AirBells	2
		71	BellHarp	2
		72	Gamelmba	2
	100	0	Atmosphr	2
		18	WarmAtms	2
		19	HollwRls	2
		40	NylonEP	2
		64	NylnHarp	2
		65	Harp Vox	2
		66	AtmosPad	2
	101	67	Planet	2
	101	0 64	Bright FantaBel	2
		96	Smokey	2
	102	0	Goblins	2
	102	64	GobSyn	2
		65	50sSciFi	2
		66	Ring Pad	2
		67	Ritual	2
		68	ToHeaven	2
		70	Night	2
		71	Glisten	2
		96	BelChoir	2
	103	0	Echoes	2
		8	EchoPad2	2
		14	Echo Pan	2
		64	EchoBell	2
		65	Big Pan	2
		66	SynPiano	2
		67	Creation	2
	1	68	Stardust	2
		69	Reso Pan	2
	104	69 0 64	Reso Pan Sci-Fi Starz	2 2

	Instrument Group	Program #	Bank #	Voice Name	Ele- ment
1	Ethnic	105	0	Sitar	1
Ш			32	DetSitar	2
Ш			35	Sitar 2	2
Ш			96	Tambra	2
1			97	Tamboura	2
Ш		106	0	Banjo	1
Ш			28	MuteBnjo	1
1			96	Rabab	2
Ш			97	Gopichnt	2
Ш			98	Oud	2
1		107	0	Shamisen	1
П		108	0	Koto	1
П			96	T. Koto	2
Ш			97	Kanoon	2
П		109	0	Kalimba	1
		110	0	Bagpipe	2
		111	0	Fiddle	1
		112	0	Shanai	1
			64	Shanai2	1
			96	Pungi	1
П			97	Hichriki	2
П	Percussive	113	0	TnklBell	2
Ш			96	Bonang	2
Ш			97	Gender	2
П			98	Gamelan	2
П			99	S.Gamlan	2
П			100	Rama Cym	2
П			101	AsianBel	2
П		114	0	Agogo	2
П		115	0	SteelDrm	2
П			97	GlasPerc	2
П			98	ThaiBell	2
П		116	0	WoodBlok	1
			96	Castanet	1
		117	0	TaikoDrm	1
			96	Gr.Cassa	1
		118	0	MelodTom	2
			64	Mel Tom2	1
			65	Real Tom	2
			66	Rock Tom	2
		119	0	Syn.Drum	1
			64	Ana Tom	1
			65	ElecPerc	2
		120	0	RevCymbl	1
	Sound	121	0	FretNoiz	2
	Effects	122	0	BrthNoiz	2
		123	0	Seashore	2
		124	0	Tweet	2
		125	0	Telphone	1
		126	0	Helicptr	1
		127	0	Applause	1
I		128	0	Gunshot	1

Program	MSB=064	Ele-	Program	MSB=064	Ele-
#	LSB=000	ment	#	LSB=000	ment
1	CuttngNz	1	65	Tel.Dial	1
2	CttngNz2	2		DoorSqek	1
3	0. 01		67	Door Slam	1
4	Str Slap	1	68	Scratch	1
5			69	Scratch 2	2
6			70	WindChm	1
7			71	Telphon2	1
8			72		
9			73		
10			74		
11			75		
12			76		
13			77		
14			78		
15			79		
16			80		
17	Fl.KClik	1	81	CarEngin	1
18			82	Car Stop	1
19			83	Car Pass	1
20			84	CarCrash	1
21			85	Siren	2
22			86	Train	1
23			87		2
24			88	Jetplane	2
25			88	Starship Burst	2
_			_		_
26			90	Coaster	2
27			91	SbMarine	2
28			92		
29			93		
30			94		
31			95		
32			96		
33	Rain	1	97	Laughing	1
34	Thunder	1	98	Scream	1
35	Wind	1	99	Punch	1
36	Stream	2	100	Heart	1
37	Bubble	2	101	FootStep	1
38	Feed	2	102		
39			103		
40			104		
41			105		
42			106		
43			107		
44			107		
45					
_			109		
46			110		
47			111		
48			112	3411.5	
49	Dog	1	113	MchinGun	1
50	Horse	1	114	LaserGun	2
51	Bird 2	1	115	Xplosion	2
52			116	FireWork	2
53			117		
54			118		
55	Ghost	2	119		
56	Maou	2	120		
57			121		
58			122		
59			123		
60			124		
61			125		
62			126		
63			127		
64			128		

TG300B Normal Voice List

Bank Select MSB = Bank Number, LSB = 000

Instrument Group	Program #	Bank #	Voice Name	Ele- ment	Instrument Group	Program #	Bank #	Voice Name	Ele- ment	Instrument Group	Program #	Bank #	Voice Name	Ele- ment	Instrument Group	Program #	Bank #	Voice Name	Ele- ment
Piano	1	0	GrandPno	1	Organ	17	0	DrawOrgn	1	Guitar	29	0	Mute.Gtr	1	Strings	41	0	Violin	1
		8	GrndPnoK	1			1	70sDrOr1	2			8	FunkGtr1	2			8	SlowVln	1
		16	MelloGrP	1			8	DetDrwOr	2			16	FunkGtr2	2			126	E-Organ4	2
		126	A-Piano1	2			9	70sDrOr2	2			126	A-Bass	2			127	synecho1	2
	2	127 0	a.piano1 BritePno	1			16 17	60sDrOr1 60sDrOr2	2 2		30	127	Synbass1 Ovrdrive	1		42	0 126	Viola E-Organ5	1 2
	2	8	BritPnoK	1			18	60sDrOr3	2		30	126	Choir-1	1			127	rain	2
		126	A-Piano2	2			24	CheezOrg	2			127	synbass2	1		43	0	Cello	1
		127	a.piano2	1			32	DrawOrg2	2		31	0	Dist.Gtr	1			126	E-Organ6	2
	3	0	E.Grand	2			33	EvenBar	2			8	FeedbkGt	2			127	synoboe	2
		1	ElGrPno1	2			40	Organ Ba	1			9	FeedbGt2	2		44	0	Contrabs	1
		2	ElGrPno2	2			126	Slap-2	2			126	Choir-2	1			126	E-Organ7	2
		8	ElGrPnoK	2			127	harpsi1	1			127	synbass3	2			127	synecho2	2
		126	A-Piano3	2		18	0	PercOrgn	1		32	0	GtrHarmo	1		45	0	Trem.Str	1
		127	a.piano3	1			1	70sPcOr1	2			8	GtFeedbk	1			8	SlowTrStr	1
	4	0	HnkyTonk	2			8	DetPrcOr	2			126	Choir-3	2			9	Susp Str	2
		8	HnkyTnkK	2 2			32	PercOrg2	2 2	D	22	127	synbass4	1			126	E-Organ8	2 2
		126 127	A-Piano4	1			126 127	Slap-3	2	Bass	33	126	Aco.Bass Choir-4	1 2		46	127	synsolo Pizz.Str	1
	5	0	e.piano1 E.Piano1	2		19	0	harpsi2 RockOrgn	2			127	newagepd	2		40	126	E-Organ9	2
	,	8	Chor.EP1	2		17	8	RotaryOr	2		34	0	FngrBass	1			127	synrdorg	2
		16	VX El.P1	2			16	SloRotar	2			1	FngBass2	2		47	0	Harp	1
		24	60sEl.P	1			24	FstRotar	2			126	Strngs-1	2			126	SoftTP-1	1
		25	HardEl.P	2			126	Slap-4	2			127	synharmo	2			127	synbell	1
		26	MelloEP1	2			127	harpsi3	1		35	0	PickBass	1		48	0	Timpani	1
		32	El.Pno1K	1		20	0	ChrchOrg	2			8	MutePkBa	1	1		126	SoftTP-2	1
		126	A-Piano5	1			8	ChurOrg2	2			126	Strngs-2	2			127	squareld	2
		127	e.piano2	1			16	ChurOrg3	2		L	127	choir pd	2	Ensemble	49	0	Strings1	1
	6	0	E.Piano2	2			24	OrgFlute	2		36	0	Fretless	1	1		1	Slow Str	1
		8	Chor.EP2	2			32	TrmOrgFl	2			1	Fretles2	2			8 9	Orchestr	2
		16 24	VX El.P2 DX Hard	2 2			126 127	Slap-5 clavi1	2			2	Fretles3 Fretles4	2 2			10	Orchstr2 TremOrch	2 2
		32	El.Pno2K	1		21	0	ReedOrgn	1			4	SynFretl	2			11	ChoirStr	2
		126	A-Piano6	1		21	126	Slap-6	2			5	Smooth	2			16	S.Strngs	2
		127	e.piano3	1			127	clavi2	1			126	Strngs-3	2			24	VeloStr	2
	7	0	Harpsi.	1		22	0	Acordion	2			127	bowed pd	2			126	TP/TRB-1	1
		8	Harpsi.3	2			8	AccordIt	2		37	0	SlapBas1	1			127	strsect1	2
		16	Harpsi.K	1			126	Slap-7	2			8	ResoSlap	1		50	0	Strings2	1
		24	Harpsi.2	2			127	clavi3	1			126	Strngs-4	2			1	70s Str	1
		126	A-Piano7	1		23	0	Harmnica	1			127	soundtrk	2			8	LegatoSt	2
		127	e.piano4	1			1	Harmo 2	2		38	0	SlapBas2	1			9	Warm Str	2
	8	0	Clavi.	2			126	Slap-8	2			126	E-Organ1	2			10	S.SlwStr	2
		8	Clavi. K	1			127	celesta1	1		20	127	atmosphr	2			126	TP/TRB-2	1
		126	E-Piano1	2 2		24	0	TangoAcd	2		39	0	SynBass1	1			127	strsect2	2
Chromatic	9	127 0	hnkytnk Celesta	1			126 127	Finger-1 celesta2	1 1			1 8	SynBa1Dk AcidBass	1		51	0	Syn.Str1 Syn Str4	2 2
Percussion	,	126	E-Piano2	2	Guitar	25	0	NylonGtr	1			9	FastResB	1			126	TP/TRB-3	1
rereassion		127	e.organ1	2	Guitai	20	8	Ukulele	1			10	TeknoBa	2			127	strsect3	2
	10	0	Glocken	1			16	NylonGt3	2			16	ResoBass	1		52	0	Syn.Str2	2
		126	E-Piano3	2			24	VelGtHrm	2			126	E-Organ2	2			126	TP/TRB-4	1
		127	e.organ2	2			32	NylonGt2	1			127	syn warm	2			127	pizz.str	1
	11	0	MusicBox	2			40	LequintG	1		40	0	SynBass2	2	1	53	0	ChoirAah	1
		126	A-Guitr1	1			126	Finger-2	2			1	ClkSynBa	2	1		8	S.Choir	2
		127	e.organ3	1		26	127	synbras1	2			2	ModulrBa	2			9	MelChoir	2
	12	0	Vibes	1		26	0	SteelGtr	1 2			3 8	Seq Bass	2 2			32	Ch.Aahs2	2 2
		1 8	HardVibe VibesK	2			8 9	12StrGtr Nyln&Stl	2 2			9	DX Bass X WireBa	2 2	1		126 127	TP/TRB-5 violin 1	2
		8 126	A-Guitr2	2			16	Mandolin	2 2			16	RubberBa	2 2	1	54	0	Violin I VoiceOoh	1
		127	e.organ4	1			32	SteelGt2	1			17	SynBa2Dk	1			126	TP/TRB-6	2
	13	0	Marimba	1			126	Picked-1	1			18	MelloSB1	1			127	violin 2	1
		8	MarimbaK	1			127	synbras2	2			19	SmthBa 2	2		55	0	SynVoice	1
		17	Balafon2	2		27	0	Jazz Gtr	1			126	E-Organ3	2	1		8	SynVox2	2
		24	Log Drum	2			1	MelloGtr	1			127	synfunny	1	1		126	Sax-1	1
		126	A-Guitr3	2			8	PdlSteel	1								127	cello 1	1
		127	pipeorg1	2			126	Picked-2	2							56	0	Orch.Hit	2
	14	0	Xylophon	1		20	127	synbras3	2								1	OrchHit2	2
		126	E-Guitr1	2		28	0	CleanGtr	1						1		8	Impact	2
	15	127	pipeorg2	2			126	ChorusGt EratleBe	2						1		16	LoFiRave	2
	15	0 8	TubulBel ChrchBel	1 2			126 127	FretlsBs synbras4	1 2								126 127	Sax-2 cello 2	1
		9	Carillon	2	L		12/	Synords4	-								14/	CCHO 2	1
		126	E-Guitr2	1															
		127	pipeorg3	2															
	16	0	Dulcimer	1															
I		1	Dulcimr2	2															
		8	Cimbalom	2															
		8 126 127	Cimbalom Slap-1 acordion	2 2 2															

I	ь	D. 1		F. 1
Instrument Group	Program #	Bank #	Voice Name	Ele- ment
Brass	57	0	Trumpet	1
		1 24	Trumpet2 BriteTrp	1 2
		25	WarmTrp	2
		126	Sax-3	1
		127	contrabs	1
	58	0	Trombone	1
		1	Trmbone2	2 2
		126 127	Sax-4 harp 1	1
	59	0	Tuba	1
		1	Tuba 2	1
		126	Brass-1	1
		127	harp 2	1
	60	0	Mute.Trp	1
		126 127	Brass-2 guitar 1	1 1
	61	0	Fr.Horn	2
		1	FrHorn2	2
		8	FrHrSolo	1
		16	HornOrch	2
		126	Brass-3	2
	62	127	guitar 2 BrasSect	1
	02	8	BrasSect BrssSec2	2
		126	Brass-4	2
		127	elecgtr1	2
	63	0	SynBras1	2
		1	PolyBrss	2
		8	SynBras3	2
		9 16	QuackBr AnaBrss1	2 2
		126	Brass-5	2
		127	elecgtr2	2
	64	0	SynBras2	1
		1	Soft Brs	2
		8	SynBras4	2
		16	AnaBrss2	2
		17 126	VelBras2 Orch-Hit	2
		127	sitar	1
Reed	65	0	SprnoSax	1
		127	a.bass 1	1
	66	0	Alto Sax	1
		8	HyprAlto	2
	67	127	a.bass 2 TnrSax 2	1
	0,	8	BrthTnSx	2
		127	e.bass 1	1
	68	0	Bari.Sax	1
		127	e.bass 2	1
	69	0	Oboe	2
	70	127	slapbas1 Eng.Horn	1
	'	127	slapbas2	1
	71	0	Bassoon	1
		127	fretles1	1
	72	0	Clarinet	1
Di	72	127	fretles2	1
Pipe	73	0 127	Piccolo flute1	1
	74	0	Flute	1
		127	flute2	1
	75	0	Recorder	1
		127	piccolo1	1
	76	0	PanFlute	1
	77	127	piccolo2	2
	77	0 127	Bottle recorder	2
	78	0	Shakhchi	2
	"	127	panpipes	2
	79	0	Whistle	1
		127	sax1	2
	80	0	Ocarina	1
		127	sax2	1

Instrument	Program	Bank	Voice Name	Ele-
Group	#	#		ment
Synth Lead	81	0	SquareLd	2
		2	Square 2 Hollow	1
		3	Mellow	2
		4	SoloSine	2
		5	Shmoog	2
		6	LMSquare	2
		8	SineLead	1
		127	sax3	1
	82	0	Saw.Lead	2
		1	Saw 2	1
		2	PulseSaw	2
		3	ThickSaw	2
		4	Big Lead	2
		5	VeloLead	2
		6	HeavySyn	2
		7	DynaSaw	1
		8	Dr. Lead	2
		16	WaspySyn	2
		127	sax4	1
	83	0	CaliopLd	2
		2	Pure Pad	2
	0.4	127	clarint1	1
	84	0	Chiff Ld	2
	0.5	127	clarint2	1
	85	0	CharanLd	2
		8	DistLead	2
	96	127	oboe Voice Ld	2
	86	0	1	
	87	127	eng.horn Fifth Ld	2
	07	1	Big Five	2
		127	bassoon	1
	88	0	Bass &Ld	2
	00	1	Big&Low	2
		2	Fat&Prky	2
		127	harmnica	l ī
Synth Pad	89	0	NewAgePd	2
•		1	Fantasy2	2
		127	trumpet1	1
	90	0	Warm Pad	2
		1	ThickPad	2
		2	Horn Pad	2
		3	RotarStr	2
		4	Soft Pad	2
	L	127	trumpet2	1
	91	0	PolySyPd	2
		1	PolyPd80	2
		127	trmbone1	2
	92	0	ChoirPad	2
		1	Heaven2	2
		127	trmbone2	2
	93	0	BowedPad	2
	0.4	127	fr.horn1	1
	94	0	MetalPad	2
		1	Tine Pad	2
		2 127	Pan Pad fr.horn2	2 2
	95		Halo Pad	2
	93	0 127	tuba	2
	96	0	SweepPad	2
	20	1	PolarPad	2
			i Dian du	14
			1	2
		8	Converge	2 2
			1	2 2 2

Instrument Group	Program #	Bank #	Voice Name	Ele mer
Synth	97	0	Rain	2
Effects		1	HrmoRain	2
		2	AfrenWnd	2
		8	ClaviPad	2
	00	127	brssect2	2
	98	0	SoundTrk	2
		1 2	Ancestrl	2 2
		127	Prologue vibe1	1
	99	0	Crystal	2
	22	1	SynMalet	1
		2	SftCryst	2
		3	RndGlock	2
		4	LoudGlok	2
		5	GlockChi	2
		6	ClearBel	2
		7	XmasBell	2
		8	VibeBell	2
		9	DigiBell	2
		16	ChorBell	2
		17	AirBells	2
		18	BellHarp	2
		19	Gamelmba	2
		127	vibe2	1
	100	0	Atmosphr	2
		1	WarmAtms	2
		2	NylnHarp	2
		3	Harp Vox	2
		4	HollwRls	2 2
		6	NylonEP AtmosPad	2
		127	symallet	1
	101	0	Bright	2
	101	127	maletwin	2
	102	0	Goblins	2
		1	GobSyn	2
		2	50sSciFi	2
		127	glocken	2
	103	0	Echoes	2
		1	EchoBell	2
		2	Echo Pan	2
		3	EchoPad2	2
		4	Big Pan	2
		6	SynPiano	2
		127	tubulbel	1
	104	0	Sci-Fi	2
		1	Starz	2
		127	xylophon	1
Ethnic	105	0	Sitar	1
		1	Sitar 2	2
		2	DetSitar	2
		8	Tambra	2
		16	Tamboura	2
	106	127	marimba Banio	1
	106	0	Banjo MutaBnio	1
		8	MuteBnjo Rabab	2
		16	Gopichnt	2
		24	Oud	2
		127	koto	1
	107	0	Shamisen	1
		127	sho	2
	108	0	Koto	1
		8	T. Koto	2
		16	Kanoon	2
		127	shakhchi	2
	109	0	Kalimba	1
		127	whistle1	2
	110	0	Bagpipe	2
		127	whistle2	1
	111	0	Fiddle	1
		127	bottle	2
	112	0	Shanai	1
		1	Shanai2	1
		8	Pungi	1
		16	Hichriki	2
		127	breath	2

Group	Program #	Bank #	Voice Name	Ele- ment
Percussive	113	0	TnklBell	2
		8	Bonang	2
		9	Gender	2
		10	Gamelan	2
		11	S.Gamlan	2
		16	Rama Cym	2
		127	timpani	1
	114	0	Agogo	2
		127	melotom	1
	115	0	SteelDrm	2
	115	127	deepsnar	1
	116	0	WoodBlok	1
	110	8	Castanet	1
		127	e.perc1	1
	117	0	TaikoDrm	1
		8	Gr.Cassa	1
		127	e.perc2	1
	118	0	MelodTom	2
		1	Real Tom	2
		8	Mel Tom2	1
		9	Rock Tom	2
		127	taiko	1
	119	0	Syn.Drum	1
		8	Ana Tom	1
		9	ElecPerc	2
ĺ		127	taikorim	1
	120	0	RevCymbl	1
	120			2
C1	121	127	cymbal FretNoiz	
Sound	121	0		2
Effects		1	CuttngNz	1
		2	Str Slap	1
		3	CttngNz2	2
		127	castanet	1
	122	0	BrthNoiz	2
		1	Fl.KClik	1
		127	triangle	1
	123	0	Seashore	2
		1	Rain	1
		2	Thunder	1
		3	Wind	1
		4	Stream	2
		5	Bubble	2
		127	orchehit	1
	124			_
	124	0	Tweet	2
		1	Dog	1
		2	Horse	1
		3	Bird 2	1
		127	telphone	1
	125	0	Telphone	1
		1	Tel.Dial	1
		2	DoorSqek	1
		3	DoorSlam	1
		4	Scratch	1
ĺ		5	WindChm	1
ĺ		6	Scratch2	2
ĺ		127	bird	1
I	126	0	Helicptr	1
		1	CarEngin	1
				1
		2	Car Stop	
		2	Car Stop Car Pass	
		3	Car Pass	1
		3 4	Car Pass CarCrash	1
		3 4 5	Car Pass CarCrash Siren	1 1 2
		3 4 5 6	Car Pass CarCrash Siren Train	1 1 2 1
		3 4 5 6 7	Car Pass CarCrash Siren Train Jetplane	1 1 2 1 2
		3 4 5 6 7 8	Car Pass CarCrash Siren Train Jetplane Starship	1 1 2 1 2 2
		3 4 5 6 7 8 9	Car Pass CarCrash Siren Train Jetplane Starship Burst	1 1 2 1 2 2 2
		3 4 5 6 7 8 9 16	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster	1 1 2 1 2 2 2 2
		3 4 5 6 7 8 9 16 127	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam	1 1 2 1 2 2 2 2 1
	127	3 4 5 6 7 8 9 16 127	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam Applause	1 1 2 1 2 2 2 2 1
	127	3 4 5 6 7 8 9 16 127	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam	1 1 2 1 2 2 2 2 1
	127	3 4 5 6 7 8 9 16 127	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam Applause	1 1 2 1 2 2 2 2 1
	127	3 4 5 6 7 8 9 16 127 0	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam Applause Laughing	1 1 2 1 2 2 2 2 1 1 1
	127	3 4 5 6 7 8 9 16 127 0 1 2	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam Applause Laughing Scream	1 1 2 1 2 2 2 2 2 1 1 1 1
	127	3 4 5 6 7 8 9 16 127 0 1 2 3	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam Applause Laughing Scream Punch	1 1 2 1 2 2 2 2 2 1 1 1 1 1
	127	3 4 5 6 7 8 9 16 127 0 1 2 3 4 5	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam Applause Laughing Scream Punch Heart FootStep	1 1 2 1 2 2 2 2 2 1 1 1 1 1
	127	3 4 5 6 7 8 9 16 127 0 1 2 3 4	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam Applause Laughing Scream Punch Heart FootStep efctwatr	1 1 2 1 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1
		3 4 5 6 7 8 9 16 127 0 1 2 3 4 5 127	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam Applause Laughing Scream Punch Heart FootStep efetwatr Gunshot	1 1 2 1 2 2 2 2 2 1 1 1 1 1 1 1 1 2 1
		3 4 5 6 7 8 9 16 127 0 1 2 3 4 5 5 127 0 1	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam Applause Laughing Scream Punch Heart FootStep efctwatr Gunshot MchinGun	1 1 2 1 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1
		3 4 5 6 7 8 9 16 127 0 1 2 3 4 5 127	Car Pass CarCrash Siren Train Jetplane Starship Burst Coaster jam Applause Laughing Scream Punch Heart FootStep efetwatr Gunshot	1 1 2 1 2 2 2 2 2 1 1 1 1 1 1 1 1 2 1

XG Drum Voice List

Bank Select MSB = Bank Number, LSB = 000

Drum kit names in bold typeface are those that can be selected in the Disklavier.

Bank				127	127	127	127	127	127	127	127	127	126	126
Progran	1#			1	2	9	17	25	26	33	41	49	1	2
Note#	Note	Key	Alternate	Standard Kit	Standard2 Kit	Room Kit	Rock Kit	Electro Kit	Analog Kit	Jazz Kit	Brush Kit	Classic Kit	SFX 1	SFX 2
		off	assign											
13	C# -1		3	Surdo Mute										
14	D -1	-	3	Surdo Open										
15	D# -1	-		Hi Q										
16	E -1	-		Whip Slap										
17	F -1	_	4	Scratch Push										
18	F# -1	_	4	Scratch Pull										
19	G -1	-		Finger Snap										
20	G# -1	_		Click Noise										
21	A -1	-		Metronome Click										
22	A# -1	-		Metronome Bell										
23	B -1	-		Seq Click L										
24	C 0	-		Seq Click H										
25	C# 0			Brush Tap										
26	D 0	0		Brush Swirl L										
	D# 0	-		Brush Slap						-				
28	E 0	0		Brush Swirl H	0 0 00			Reverse Cymbal	Reverse Cymbal	-				
29		0		Snare Roll	Snare Roll 2			ur o	TE O					
30	F# 0	-		Castanet				Hi Q	Hi Q					
31	G 0	-		Snare L	Snare L 2		SD Rock M	Snare M	SD Rock H		Brush Slap L			
32	G# 0	-	-	Sticks			D D	B D	D D 11			P P 7.2		
33	A 0	-	-	Bass Drum L	Once Pin St. 15		Bass Drum M	Bass Drum H 4	Bass Drum M			Bass Drum L2		
34	A# 0	-	-	Open Rim Shot	Open Rim Shot 2		D D. ***	DD D. J	DD Andr Y			C C		
35	B 0	-	-	Bass Drum M	Bass Drum M 2		Bass Drum H 3	BD Rock	BD Analog L	DD I	DD C-C	Gran Cassa	Color Cont. N. I	Distres
36	C 1	-	-	Bass Drum H	Bass Drum H 2		BD Rock	BD Gate	BD Analog H	BD Jazz	BD Soft	Gran Cassa Mute	Guitar Cutting Noise	Dial Tone
37	C# 1	-	-	Side Stick	C M 2	CD D.	ep.p:	CD D l .*	Analog Side Stick		Donald Cl. 31	Manhing C 34	Guitar Cutting Noise 2	Door Creaking
38	D 1	-	-	Snare M	Snare M 2	SD Room L	SD Rock	SD Rock L	Analog Snare L		Brush Slap M	Marching Sn M	Chile Class	Door Slam
39	D# 1	\vdash	-	Hand Clap	C II 2	CD D. T	CD D D.	CD D at 1	Andre Co. T		David Co. 11	Manhine C. W.	String Slap	Scratch
40	E 1	1	-	Snare H	Snare H 2	SD Room H	SD Rock Rim	SD Rock H	Analog Snare H		Brush Tap H	Marching Sn H		Scratch 2
41	F 1			Floor Tom L		Room Tom 1	Rock Tom 1	E Tom 1	Analog Tom 1	Jazz Tom 1	Brush Tom 1	Jazz Tom 1		Windchime
42	F# 1	-	1	Hi-Hat Closed					Analog HH Closed 1					Telephone Ring2
43	G 1	_		Floor Tom H		Room Tom 2	Rock Tom 2	E Tom 2	Analog Tom 2	Jazz Tom 2	Brush Tom 2	Jazz Tom 2		
44	G# 1	-	1	Hi-Hat Pedal					Analog HH Closed 2					
45	A 1	-		Low Tom		Room Tom 3	Rock Tom 3	E Tom 3	Analog Tom 3	Jazz Tom 3	Brush Tom 3	Jazz Tom 3		
46	A# 1	_	1	Hi-Hat Open					Analog HH Open					
47	B 1	_		Mid Tom L		Room Tom 4	Rock Tom 4	E Tom 4	Analog Tom 4	Jazz Tom 4	Brush Tom 4	Jazz Tom 4		
48	C 2	_		Mid Tom H		Room Tom 5	Rock Tom 5	E Tom 5	Analog Tom 5	Jazz Tom 5	Brush Tom 5	Jazz Tom 5		
49	C# 2			Crash Cymbal 1					Analog Cymbal			Hand Cym.Open L		
50	D 2			High Tom		Room Tom 6	Rock Tom 6	E Tom 6	Analog Tom 6	Jazz Tom 6	Brush Tom 6	Jazz Tom 6		
51	D# 2	_		Ride Cymbal 1								Hand Cym.Closed L		
52	E 2	_		Chinese Cymbal									FL.Key Click	Engine Start
53	F 2			Ride Cymbal Cup										Tire Screech
54	F# 2			Tambourine										Car Passing
55	G 2			Splash Cymbal										Crash
56	G# 2			Cowbell					Analog Cowbell					Siren
57	A 2			Crash Cymbal 2								Hand Cym.Open H		Train
58	A# 2	_		Vibraslap										Jetplane
59	B 2			Ride Cymbal 2								Hand Cym.Closed H		Starship
60	C 3			Bongo H										Burst Noise
61	C# 3	_		Bongo L										Coaster
62	D 3	-	-	Conga H Mute					Analog Conga H					SbMarine
63	D# 3	-		Conga H Open					Analog Conga M					
64	E 3	1		Conga L					Analog Conga L					
65	F 3	-		Timbale H										
66	F# 3	-	-	Timbale L										
67	G 3	-	-	Agogo H										
68	G# 3	-	-	Agogo L									Rain	Laughing
69	A 3	-		Cabasa									Thunder	Screaming
70	A# 3	-		Maracas					Analog Maracas				Wind	Punch
71	B 3	0	-	Samba Whistle H									Stream	Heartbeat
72	C 4	0	-	Samba Whistle L									Bubble	Footsteps
73	C# 4	-	-	Guiro Short									Feed	
74	D 4	0	-	Guiro Long										
/5	D# 4	-		Claves					Analog Claves					
	E 4	-	-	Wood Block H										
77	F 4	-	-	Wood Block L				0 115 1	0 110 1					
	F# 4	-	-	Cuica Mute				Scratch Push	Scratch Push					
79	G 4	-	-	Cuica Open				Scratch Pull	Scratch Pull					
80	G# 4	-	2	Triangle Mute										
81	A 4	-	2	Triangle Open										
82	A# 4	-		Shaker										
83	B 4	-		Jingle Bell										
84	C 5	-		Bell Tree									Dog	Machine Gun
85	C# 5	_											Horse Gallop	Laser Gun
86	D 5	-	-										Bird 2	Explosion
87	D# 5	-	1											FireWork
88	E 5	-												
	F 5	1												
89														
90 91	F# 5 G 5									_			Ghost Maou	

: Same as Standard kit

: No sound

TG300B Drum Voice List

Program	n #		1	9	17	25	26	33	41	49	57	128
Note#	Note	Alternate	Standard Kit	Room Kit	Power Kit	Electro Kit	Analog Kit	Jazz Kit	Brush Kit	Orchestra Kit	SFX Set	C/M Kit
		assign										
25	C# 0	<u> </u>	Snare Roll									
26	D 0		Finger Snap									
27	D# 0		Hi Q							Hi-Hat Closed		
28	E 0		Whip Slap							Hi-Hat Pedal		
29	F 0	7	Scratch Push							Hi-Hat Open		
30	F# 0	7	Scratch Pull							Ride Cymbal 1		
31	G 0	· .	Sticks							rade Cymour r		
32	G# 0		Click Noise									
33	A 0		Metronome Click									
34			Metronome Bell									
										DD I		
35	B 0		Bass Drum M							BD Jazz		
36	C 1		Bass Drum H		BD Power	BD Electronic	BD Analog H	BD Jazz	BD Soft	Gran Cassa		
37	C# 1		Side Stick				Analog Side Stick					
38	D 1		Snare M		SD Power	SD Electronic	Analog Snare L		Brush Tap	Concert SD		
39	D# 1		Hand Clap						Brush Slap	Castanet	High-Q	
40	E 1		Snare H			SD Power			Brush Swirl	Concert SD	Slap	SD Electro
41	F 1		Floor Tom L	Room Tom 1	Room Tom 1	E Tom 1	Analog Tom 1	Jazz Tom 1	Jazz Tom 1	Timpani F	Scratch Push	
42	F# 1	1	Hi-Hat Closed				Analog HH Closed 1			Timpani F#	Scratch Pull	
43	G 1		Floor Tom H	Room Tom 2	Room Tom 2	E Tom 2	Analog Tom 2	Jazz Tom 2	Jazz Tom 2	Timpani G	Sticks	
44	G# 1	1	Hi-Hat Pedal				Analog HH Closed 2			Timpani G#	Square Click	Hi-Hat Open 1
45	A 1		Low Tom	Room Tom 3	Room Tom 3	E Tom 3	Analog Tom 3	Jazz Tom 3	Jazz Tom 3	Timpani A	Metronome Click	
46	A# 1	1	Hi-Hat Open				Analog HH Open			Timpani A#	Metronome Bell	Hi-Hat Open 2
47	B 1		Mid Tom L	Room Tom 4	Room Tom 4	E Tom 4	Analog Tom 4	Jazz Tom 4	Jazz Tom 4	Timpani B	Guitar Fret Noise	
48	C 2		Mid Tom H	Room Tom 5	Room Tom 5	E Tom 5	Analog Tom 5	Jazz Tom 5	Jazz Tom 5	Timpani C	Guitar Cutting Down	
49	C# 2	+	Crash Cymbal 1				Analog Cymbal			Timpani C#	Guitar Cutting Up	
50	D 2	+		Room Tom 6	Room Tom 6	E Tom 6		Jazz Tom 6	Jazz Tom 6	Timpani C#	•	
		+	High Tom	ROOM TOW 0	AUGIII 10M 0	L 10m 0	Analog Tom 6	Jack 10m 0	Jazz 10m 0		Ac Bass Slap	
51	D# 2	+	Ride Cymbal 1			n c				Timpani D#	FL.Key Click	
52	E 2	-	Chinese Cymbal			Reverse Cymbal				Timpani E	Laughing	
53	F 2		Ride Cymbal Cup							Timpani F	Screaming	
54	F# 2		Tambourine								Punch	
55	G 2		Splash Cymbal								Heartbeat	
56	G# 2		Cowbell				Analog Cowbell				Footsteps 1	
57	A 2		Crash Cymbal 2							Hand Cym.1	Footsteps 2	
58	A# 2		Vibraslap								Applause	
59	B 2		Ride Cymbal 2							Hand Cym.2	Door Creaking	
60	C 3	+	Bongo H							- Zuna Cynn.2	Door Slam	
		-							-			
61	C# 3	+	Bongo L				Andre Gr. T				Scratch	
62	D 3	-	Conga H Mute				Analog Conga H				Windchime	
63	D# 3		Conga H Open				Analog Conga M				Engine Start	
64	E 3		Conga L				Analog Conga L				Tire Screech	
65	F 3		Timbale H								Car Passing	
66	F# 3		Timbale L								Crash	
67	G 3		Agogo H								Siren	
68	G# 3		Agogo L								Train	
69	A 3		Cabasa								Jetplane	
70	A# 3		Maracas				Analog Maracas				Helicopter	
71	В 3	2	Samba Whistle H				7 marog maracas				Starship	
72	C 4	2	Samba Whistle L								Gunshot	
												1775 1
73	C# 4	3	Guiro Short								Machine Gun	Vibraslap
74	D 4	3	Guiro Long								Laser Gun	
75	D# 4		Claves				Analog Claves				Explosion	
76	E 4		Wood Block H								Dog	Laughing
77	F 4		Wood Block L								Horse Gallop	Screaming
78	F# 4	4	Cuica Mute								Bird Tweet	Punch
79	G 4	4	Cuica Open								Rain	Heartbeat
80	G# 4	5	Triangle Mute								Thunder	Footsteps 1
81	A 4	5	Triangle Open								Wind	Footsteps 2
82	A# 4		Shaker								Seashore	Applause
83	B 4		Jingle Bell								Stream	Door Creaking
84	C 5	<u> </u>	Bell Tree								Bubble	Door Slam
85	C# 5		Castanet									Scratch
86	D 5	6	Surdo Mute									Windchime
87		6	Surdo Open							A 1		Engine Start
88	E 5	+								Applause		Tire Screech
89	F 5	-										Car Passing
90	F# 5											Crash
91	G 5											Siren
92	G# 5											Train
93	A 5											Jetplain
94	A# 5											Helicopter
95	B 5											Starship
96	C 6	+										Gunshot
		+										
97	C# 6	+										Machine Gun
98	D 6	+										Laser Gun
99	D# 6											Explosion
100	E 6											Dog
101	F 6											Horse Gallop
102	F# 6											Bird Tweet
103	G 6											Rain
	G# 6											Thunder
104	A 6											Wind
104												
105												Seashore
105 106	A# 6											Seashore
105 106 107												Seashore Stream Bubble

: Same as Standard kit

: No sound

Effect Type List

ill also apply to the effect sound.
in also apply to the effect sound.
rill also apply to the effect sound.
in also appry to the effect sound.
delays are provided.
IR.
verb.
verb.
erb.
erb.
erb.
er) etc. to control the cread of rotation
ler) etc. to control the speed of rotation.
nt, front and back.
n, nom and odek.
ts.
C1 etc. this can function as a pedal wah

^{*} MSB, LSB is represented in hexadecimal.

* LCB=0 is the basic effect type.

Effect Parameter List

	Parameter	Range	Value	See Table	Con- trol	110	Parameter	Range	Value	See Table
T	11 114112	ROOM 1, 2, 3, STAG	F 1 2 P		1401	FC	СНО	<u> </u>	1	1
								10.1.255.0	11 2250	
	verb Time	0.3~30.0s	0-69	table#4		1 1	Lch Delay1	0.1~355.0ms	1-3350	
	ısion	0~10	0-10			2	Lch Feedback Level	-63~+63	1-127	
Initia	l Delay	0~63	0-63	table#5		3	Rch Delay1	0.1~355.0ms	1-3550	
HPF	Cutoff	Thru~8.0kHz	0-52	table#3		4	Rch Feedback Level	-63~+63	1-127	
LP	F Cutoff	1.0k~Thru	34-60	table#3		5	High Damp	0.1~1.0	1-10	
						6	Lch Delay2	0.1~355.0ms	1-3550	
						7	Rch Delay2	0.1~355.0ms	1-3550	
						8	Delay2 Level	0~127	0-127	
						9				
	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td></td><td>1 ' 1</td><td>Dry/Wet</td><td>D63>W~D=W~D<w63< td=""><td>1-127</td><td></td></w63<></td></w63<>	1-127			1 ' 1	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td></w63<>	1-127	
	•	0~63	0-63	table#5		11	Diy/ wet	D032W~D=W~D <w03< td=""><td>1-12/</td><td></td></w03<>	1-12/	
	Rev Delay			table#5		12				
		0~3	0-3			1 1		5011 2 01 11	0.40	
	Er/Rev Balance	E63>R ~ E=R ~ E>R63	1-127			1 1	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3
						1 1	EQ Low Gain	-12~+12dB	52-76	
	Feedback Level	-63~+63	1-127			1 1	EQ High Frequency	500Hz~16.0kHz	28-58	table#3
						16	EQ High Gain	-12~+12dB	52-76	
F	HTE ROOM.	TUNNEL, BASEMEN	T			CR	ROSS DELAY			
		·		4.1.1.44	1	—		0.1.255.0	1 2550	
	Reverb Time	0.3~30.0s	0-69	table#4		$\begin{vmatrix} 1 \\ 2 \end{vmatrix}$	L->R Delay	0.1~355.0ms	1-3550 1-3550	
	Diffusion	0~10	0-10			$\begin{vmatrix} 2 \\ 2 \end{vmatrix}$	R->L Delay	0.1~355.0ms		
		0~63	0-63	table#5		3	Feedback Level	-63~+63	1-127	
	HPF Cutoff	Thru~8.0kHz	0-52	table#3		1 1	Input Select	L, R, L&R	0-2	
	LPF Cutoff	1.0k~Thru	34-60	table#3		5	High Damp	0.1~1.0	1-10	
	Width	0.5~10.2m	0-37	table#11		6				
ľ	Height	0.5~20.2m	0-73	table#11		7			1	
		0.5~30.2m	0-104	table#11		8			1	
	Wall Vary	0~30	0-30			9				
	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td></td><td>10</td><td>Dry/Wet</td><td>D63>W~D=W~D<w63< td=""><td>1-127</td><td></td></w63<></td></w63<>	1-127			10	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td></w63<>	1-127	
ı	Rev Delay	0~63	0-63	table#5		11	Diyi wee	Boss II B-II B II 05	1 127	
	•		0-03	table#3		12				
	Density	0~3				1 1		5011 2 01 11	0.40	. 11 //2
	Er/Rev Balance	E63>R~E=R~E>R63	1-127			1 1	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3
							EQ Low Gain	-12~+12dB	52-76	
	Feedback Level	-63~+63	1-127				EQ High Frequency	500Hz~16.0kHz	28-58	table#3
						16	EQ High Gain	-12~+12dB	52-76	
	LAY L, C, R					EA	RLY REF1, E	ARLY REF2		
	Lch Delay	0.1~715.0ms	1-7150			1	Type	S-H, L-H, Rdm, Rvs, Plt, Spr	0-5	
	•	0.1~715.0ms	1-7150			2	Room Size	0.1~7.0	0-44	table#6
1	•					1 1	Diffusion	0~10	0-10	ιασιοπο
	-	0.1~715.0ms	1-7150			1 1				4.1.1.45
1	•	0.1~715.0ms	1-7150			4	Initial Delay	0~63	0-63	table#5
1	Feedback Level	-63~+63	1-127			5	Feedback Level	-63~+63	1-127	
ľ	Cch Level	0~127	0-127			6	HPF Cutoff	Thru~8.0kHz	0-52	
ľ	High Damp	0.1~1.0	1-10			7	LPF Cutoff	1.0k~Thru	34-60	
						8				
l						9				
ŀ	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td>1</td><td></td><td>10</td><td>Dry/Wet</td><td>D63>W~D=W~D<w63< td=""><td>1-127</td><td></td></w63<></td></w63<>	1-127	1		10	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td></w63<>	1-127	
1		2007 II D=II D\II 00	1.12/	1		1 1	Liveness	0~10	0-10	
ĺ				1		1 1	Density	0~3	0-10	
١	FO.1 - F	5011- 2 01-11-	0.40	4ak1. #2		1 1	•		1	
	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3		1 1	High Damp	0.1~1.0	1-10	
	EQ Low Gain	-12~+12dB	52-76	1		14			1	
	EQ High Frequency	500Hz~16.0kHz	28-58	table#3		15			1	
	EQ High Gain	-12~+12dB	52-76	L		16				<u></u>
	LAY L, R					GA	TE REVERB.	REVERSE GATE		
	Lch Delay	0.1~715.0ms	1-7150	Ι		1	Type	TypeA, TypeB	0-1	
ı	•	0.1~715.0ms		1		$\begin{vmatrix} 1 \\ 2 \end{vmatrix}$	Room Size	0.1~7.0	0-44	table#6
			1-7150	1		1 1			1	table#6
	Feedback Delay1		1-7150	1		3	Diffusion	0~10	0-10	
	Feedback Delay2		1-7150	1		1 1	Initial Delay	0~63	0-63	table#5
	Feedback Level	-63~+63	1-127			1 1	Feedback Level	-63~+63	1-127	
	High Damp	0.1~1.0	1-10	1		6	HPF Cutoff	Thru~8.0kHz	0-52	
	•			1		7	LPF Cutoff	1.0k~Thru	34-60	
				1		8			1	
				1		9			1	
	Dry/Wat	D63>W D-W D-W63	1 127	1		1 ' 1	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td></w63<>	1-127	
	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td> • </td><td>1 1</td><td>•</td><td></td><td></td><td></td></w63<>	1-127		•	1 1	•			
				1		1 1	Liveness	0~10	0-10	
			_			1 1	Density	0~3	0-3	
	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3		13	High Damp	0.1~1.0	1-10	
ŀ	EQ Low Gain	-12~+12dB	52-76			14			1	
	EQ High Frequency	500Hz~16.0kHz	28-58	table#3		15			1	
		-12~+12dB	52-76	1		16			1	
						10				
]	EQ High Gain	controlled by AC1 (A	obla Car	troller 1						
	: Can be	controlled by AC1 (Assign			.,,,1	Fold - 1	1 25			
	: Can be : T hese i	controlled by AC1 (Assign numbers correspond to the o "Effect Data Assign Table	Paramete		umber	Table 1	1-3>			

No	Parameter	Range	Value	See	Con-	No	Parameter	Range	Value	See	ſ
_	D LOWE 1 2			Table	trol			ZED		Table	
1	ARAOKE 1, 2,						OTARY SPEAF				
l	Delay Time	0~127	0-127	table#7		1 1	LFO Frequency	0.00~39.7Hz	0-127	table#1	
2	Feedback Level	-63~+63	1-127				LFO Depth	0~127	0-127		
3	HPF Cutoff	Thru~8.0kHz	0-52			3					
4	LPF Cutoff	1.0k~Thru	34-60			4					
5						5		5011 2 01 11	0.40	. 11 //2	
6						6	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3	
7						7	EQ Low Gain	-12~+12dB	52-76	table#3	
8							EQ High Frequency	500Hz~16.0kHz	28-58	table#3	
-	D // // . 4	D(2, W, D, W, D, W(2)	1 127			1 1	EQ High Gain	-12~+12dB	52-76		
10	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td> • </td><td>1 1</td><td>Dry/Wet</td><td>D63>W~D=W~D<w63< td=""><td>1-127</td><td></td><td></td></w63<></td></w63<>	1-127		•	1 1	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td></td></w63<>	1-127		
11 12						11 12					
13						13					
14						14					
15						15					
16						16					
	TODUC 1 2 2	4 CELECTE 1 2 2	1				EMOLO				_
		4, CELESTE 1, 2, 3, 4	0-127	tob1, #1		1	REMOLO	0.00 20 711-	0.127	tob1: #1	_
1	1 2		1	table#1		1 1	LFO Frequency	0.00~39.7Hz	0-127 0-127	table#1	
2	LFO PM Depth Feedback Level	0~127	0-127			2	AM Depth	0~127			
3		-63~+63	1-127	tob1-#2		1 1	PM Depth	0~127	0-127		
4 5	Delay Offset	0~127	0-127	table#2		4 5					
5 6	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3		5 6	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3	
7	EQ Low Frequency EQ Low Gain	-12~+12dB	52-76	table#3		1 1	EQ Low Frequency EQ Low Gain	-12~+12dB	52-76	laule#3	
8	EQ Low Gain EQ High Frequency	500Hz~16.0kHz	28-58	table#3		1 1	EQ Low Gain EQ High Frequency	500Hz~16.0kHz	28-58	table#3	
9	EQ High Gain	-12~+12dB	52-76	table#3		9	EQ High Gain	-12~+12dB	52-76	table#3	
10	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td> . </td><td>10</td><td>LQ High Gain</td><td>-12/4+12dD</td><td>32-70</td><td></td><td></td></w63<>	1-127		.	10	LQ High Gain	-12/4+12dD	32-70		
11	Diyi wet	D03211 D=11 D<11 03	1-12/			11					
12						12					
13						13					
14						14		-180~+180deg	4-124		
15	Input Mode	mono/stereo	0-1			1 1	Input Mode	mono/stereo	0-1		
16	F					16	1				
FI	ANGER 1, 2, 3	}			' 	ΑU	JTO PAN			1	_
1	LFO Frequency	0.00~39.7Hz	0-127	table#1		1	LFO Frequency	0.00~39.7Hz	0-127	table#1	_
2	LFO Depth	0~127	0-127				L/R Depth	0~127	0-127		
3	Feedback Level	-63~+63	1-127			1 1	F/R Depth	0~127	0-127		
4	Delay Offset	0~63	0-63	table#2		4	PAN Direction	L<->R, L->R, L<-R,			
5	•							Lturn, Rturn, L/R	0-5		
6	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3		5					
7	EQ Low Gain	-12~+12dB	52-76			6	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3	,
8	EQ High Frequency	500Hz~16.0kHz	28-58	table#3		7	EQ Low Gain	-12~+12dB	52-76		
9	EQ High Gain	-12~+12dB	52-76			8	EQ High Frequency	500Hz~16.0kHz	28-58	table#3	,
10	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td> • </td><td>9</td><td>EQ High Gain</td><td>-12~+12dB</td><td>52-76</td><td></td><td></td></w63<>	1-127		•	9	EQ High Gain	-12~+12dB	52-76		
11						10					
12						11					
13						12					
	LFO Phase Differenc	-180~+180deg	4-124			13					
15						14					
16						15					
Sĭ	MPHONIC					16					
1	LFO Frequency	0.00~39.7Hz	0-127	table#1			IASER1, PHAS				
2	LFO Depth	0~127	0-127			1	LFO Frequency	0.00~39.7Hz	0-127	table#1	_
3	Delay Offset	0~127	0-127	table#2			LFO Depth	0~127	0-127		
4						3	Phase Shift	0~127	0-127		
5						4	Feedback Level	-63~+63	1-127		
6	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3		5					
7	EQ Low Gain	-12~+12dB	52-76			6	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3	
8	EQ High Frequency	500Hz~16.0kHz	28-58	table#3		1 1	EQ Low Gain	-12~+12dB	52-76		
9	EQ High Gain	-12~+12dB	52-76			1 1	EQ High Frequency	500Hz~16.0kHz	28-58	table#3	į
10		D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td> • </td><td>1 1</td><td>EQ High Gain</td><td>-12~+12dB</td><td>52-76</td><td></td><td></td></w63<>	1-127		•	1 1	EQ High Gain	-12~+12dB	52-76		
11	•					1 ' 1	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td></td></w63<>	1-127		
12							Stage	3~10	3-10		
13							Diffusion	Mono/Stereo	0-1		
						1 1	LFO Phase Di	-180~+180deg	4-124		
14		I	1		1 1	14		1			
14 15											
						15					

• : Can be controlled by AC1 (Assignable Controller 1)

No.* : T hese numbers correspond to the Parameter Suffix numbers in <Table 1-3>

See Table** : Refer to "Effect Data Assign Table"

No	Parameter	Range	Value	See	Con-
				Table	trol
DI	STORTION, O	VERDRIVE			
1	Drive	0~127	0-127		•
2	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3	
3	EQ Low Gain	-12~+12dB	52-76		
4	LPF Cutoff	1.0k~Thru	34-60	table#3	
5	Output Level	0~127	0-127		
6	- mp				
7	EQ Mid Frequency	500Hz~10.0kHz	28-54	table#3	
8	EQ Mid Gain	-12~+12dB	52-76		
9	EQ Mid Width	1.0~12.0	10-120		
	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td></td></w63<>	1-127		
11	Edge (Clip Curve)		0-127	mild ~sharp	
12	Euge (Chp Cui ve)	0 127	0 127	mid shap	
13					
14					
15					
16					
-	THEAD AND CL	MULATOD			
	JITAR AMP SI			1	
1	Drive	0~127	0-127		•
2	AMP Type	Off, Stack, Combo, Tube	0-3		
3	LPF Cutoff	1.0k~Thru	34-60	table#3	
4	Output Level	0~127	0-127		
5					
6					
7					
8					
9					
10	Dry/Wet	D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td></td></w63<>	1-127		
11	Edge (Clip Curve)	0~127	0-127	mild ~sharp	
12					
13					
14					
15					
16					
3-I	BAND EQ				
1	EQ Low Gain	-12~+12dB	52-76		
2	EQ Mid Frequency	500Hz~10.0kHz	28-54	table#3	
3	EQ Mid Gain	-12~+12dB	52-76	taore	
4	EQ Mid Width	1.0~12.0	10-120		
5	EQ High Gain	-12~+12dB	52-76		
6	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3	
7	EQ High Frequency	500Hz~16.0kHz	28-58	table#3	
8	EQ Trigit Frequency	30011Z-10.0K11Z	20-30	шистэ	
9					
10					
11					
12					
13 14					
15					
16					

No	Parameter	Range	Value	See	Con-
				Table	trol
2-1	BAND EQ				
1	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3	
2	EQ Low Gain	-12~+12dB	52-76		
3	EQ High Frequency	500Hz~16.0kHz	28-58	table#3	
4	EQ High Gain	-12~+12dB	52-76		
5					
6					
7					
8					
9					
10					
11	EQ Mid Frequency	100Hz~10.0kHz	14-54	table#3	
	EQ Mid Gain	-12~+12dB	52-76		
	EQ Mid Width	1.0~12.0	10-120		
14					
15 16					
	JTO WAH	_			
1	LFO Frequency	0.00~39.7Hz	0-127	table#1	
2	LFO Depth	0~127	0-127		
3	Cutoff Frequency		0-127		•
4	Resonance	1.0~12.0	10-120		
5		5011 2 01 11	0.40	. 11 #2	
6	EQ Low Frequency	50Hz~2.0kHz	8-40	table#3	
7	EQ Low Gain	-12~+12dB	52-76	. 11 #2	
8	EQ High Frequency	500Hz~16.0kHz	28-58 52-76	table#3	
_	EQ High Gain	-12~+12dB D63>W~D=W~D <w63< td=""><td>1-127</td><td></td><td></td></w63<>	1-127		
10 11	Dry/Wet	W ~ W ~ W < W 03	1-12/		
12					
13					
14					
15					
16					
10	I		1		

• : Can be controlled by AC1 (Assignable Controller 1)

No.* : T hese numbers correspond to the Parameter Suffix numbers in <Table 1-3>

See Table** : Refer to "Effect Data Assign Table"

Effect Data Assign Table

Table#1

LFO Frequency (Hz)									
Data	Value	Data	Value	Data	Value				
0	0.00	43	1.81	86	5.38				
1	0.04	44	1.85	87	5.55				
2	0.08	45	1.89	88	5.72				
3	0.13	46	1.94	89	6.06				
4	0.17	47	1.98	90	6.39				
5	0.21	48	2.02	91	6.73				
6	0.25	49	2.06	92	7.07				
7	0.29	50	2.10	93	7.40				
8	0.34	51	2.15	94	7.74				
9	0.38	52	2.19	95	8.08				
10	0.42	53	2.23	96	8.41				
11	0.46	54	2.27	97	8.75				
12	0.51	55	2.31	98	9.08				
13	0.55	56	2.36	99	9.42				
14	0.59	57	2.40	100	9.76				
15	0.63	58	2.44	101	10.10				
16	0.67	59	2.48	102	10.80				
17	0.72	60	2.52	103	11.40				
18	0.76	61	2.57	104	12.10				
19	0.80	62	2.61	105	12.80				
20	0.84	63	2.65	106	13.50				
21	0.88	64	2.69	107	14.10				
22	0.93	65	2.78	108	14.80				
23	0.97	66	2.86	109	15.50				
24	1.01	67	2.94	110	16.20				
25	1.05	68	3.03	111	16.80				
26	1.09	69	3.11	112	17.50				
27	1.14	70	3.20	113	18.20				
28	1.18	71	3.28	114	19.50				
29	1.22	72	3.37	115	20.90				
30	1.26	73	3.45	116	22.20				
31	1.30	74	3.53	117	23.60				
32	1.35	75	3.62	118	24.90				
33	1.39	76	3.70	119	26.20				
34	1.43	77	3.87	120	27.60				
35	1.47	78	4.04	121	28.90				
36	1.51	79	4.21	122	30.30				
37	1.56	80	4.37	123	31.60				
38	1.60	81	4.54	124	33.00				
39	1.64	82	4.71	125	34.30				
40	1.68	83	4.88	126	37.00				
41	1.72	84	5.05	127	39.70				
42	1.77	85	5.22						

Table#2

Modulation Delay Offset (ms)

Data Value Data Value Data Value 0 0.0 43 4.3 86 8.6 1 0.1 44 4.4 87 8.7 2 0.2 45 4.5 88 8.8 3 0.3 46 4.6 89 8.9 4 0.4 47 7.7 90 9.0 5 0.5 48 4.8 91 9.1 6 0.6 49 4.9 92 9.2 7 0.7 50 5.0 93 9.3 8 0.8 51 5.1 94 9.4 9 0.9 52 5.2 95 9.5 10 1.0 53 5.3 96 9.6 11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3		ation D				
1 0.1 44 4.4 87 8.7 2 0.2 45 4.5 88 8.8 3 0.3 46 4.6 89 8.9 4 0.4 47 4.7 90 9.0 5 0.5 48 4.8 91 9.1 6 0.6 49 4.9 92 9.2 7 0.7 50 5.0 93 9.3 8 0.8 51 5.1 94 9.4 9 0.9 52 5.2 95 9.5 10 1.0 53 5.3 96 9.6 11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 5						
2 0.2 45 4.5 88 8.8 3 0.3 46 4.6 89 8.9 4 0.4 47 4.7 90 9.0 5 0.5 48 4.8 91 9.1 6 0.6 49 4.9 92 9.2 7 0.7 50 5.0 93 9.3 8 0.8 51 5.1 94 9.4 9 0.9 52 5.2 95 9.5 10 1.0 53 5.3 96 9.6 11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 11 16 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td></td<>						
3 0.3 46 4.6 89 8.9 4 0.4 47 4.7 90 9.0 5 0.5 48 4.8 91 9.1 6 0.6 49 4.9 92 9.2 7 0.7 50 50 93 9.3 8 0.8 51 5.1 94 9.4 9 0.9 52 5.2 95 9.5 10 1.0 53 5.3 96 9.6 11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7						
4 0.4 47 4.7 90 9.0 5 0.5 48 4.8 91 9.1 6 0.6 49 4.9 92 9.2 7 0.7 50 5.0 93 9.3 8 0.8 51 5.1 94 9.4 9 0.9 52 5.2 95 9.5 10 1.0 53 5.3 96 9.6 11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8						
5 0.5 48 4.8 91 9.1 6 0.6 49 4.9 92 9.2 7 0.7 50 5.0 93 9.3 8 0.8 51 5.1 94 9.4 9 0.9 52 5.2 95 9.5 10 1.0 53 5.3 96 9.6 11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9						
6 0.6 49 4.9 92 9.2 9.2 7 0.7 50 50.0 93 9.3 8 0.8 51 5.1 94 9.4 9.9 90.9 52 5.2 95 9.5 10 10.0 53 5.3 96 9.6 11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 2.6 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 34 77 7.7 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0						
7 0.7 50 5.0 93 9.3 8 0.8 51 5.1 94 9.4 9 0.9 52 5.2 95 9.5 10 1.0 53 5.3 96 9.6 11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1<						
8 0.8 51 5.1 94 9.4 9 0.9 52 5.2 95 9.5 10 1.0 53 3.3 96 9.6 11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2						
9 0.9 52 5.2 95 9.5 10 1.0 53 5.3 96 9.6 11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3 56 56 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 59 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4						
10 1.0 53 5.3 96 9.6 11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 2.6 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24						
11 1.1 54 5.4 97 9.7 12 1.2 55 5.5 98 9.8 13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25		0.9	52		95	9.5
12 1.2 55 5.5 98 9.8 13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26	10	1.0	53	5.3	96	9.6
13 1.3 56 5.6 99 9.9 14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 112 26.5 27 2.7		1.1	54	5.4	97	9.7
14 1.4 57 5.7 100 10.0 15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.2 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 2.6 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 20.2 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 113 28.0 28 2.8	12	1.2	55	5.5	98	9.8
15 1.5 58 5.8 101 11.1 16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29		1.3		5.6	99	9.9
16 1.6 59 5.9 102 12.2 17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 30	14	1.4	57	5.7	100	10.0
17 1.7 60 6.0 103 13.3 18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 32.8 31	15	1.5	58	5.8	101	11.1
18 1.8 61 6.1 104 14.4 19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 7.2 7.2 115 31.2 30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 <td>16</td> <td>1.6</td> <td>59</td> <td>5.9</td> <td>102</td> <td>12.2</td>	16	1.6	59	5.9	102	12.2
19 1.9 62 6.2 105 15.5 20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 32.3 31 3.1 74 7.4 117 34.3 33 33 76 7.6 119 37.5 33 3.5 <td>17</td> <td>1.7</td> <td>60</td> <td>6.0</td> <td>103</td> <td>13.3</td>	17	1.7	60	6.0	103	13.3
20 2.0 63 6.3 106 17.1 21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34	18	1.8	61	6.1	104	14.4
21 2.1 64 6.4 107 18.6 22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35	19	1.9	62	6.2	105	15.5
22 2.2 65 6.5 108 20.2 23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 38.3 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36	20	2.0	63	6.3	106	17.1
23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 31.2 33 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 37 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 7.9 7.9 122 42.2 37 3.7 80 8.0 <td< td=""><td>21</td><td>2.1</td><td>64</td><td>6.4</td><td>107</td><td>18.6</td></td<>	21	2.1	64	6.4	107	18.6
23 2.3 66 6.6 109 21.8 24 2.4 67 6.7 110 23.3 25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 31.2 33 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 32.8 37.5 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 <	22	2.2	65	6.5	108	20.2
25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39	23	2.3			109	21.8
25 2.5 68 6.8 111 24.9 26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39	24	2.4	67	6.7	110	23.3
26 2.6 69 6.9 112 26.5 27 2.7 70 7.0 113 28.0 28 2.8 71 7.1 114 29.6 29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40	25	2.5	68	6.8	111	24.9
28 2.8 71 7.1 114 29.6 29 2.9 72 72.2 115 31.2 30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0	26		69	6.9	112	26.5
29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 24.2 24.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0	27	2.7	70	7.0	113	28.0
29 2.9 72 7.2 115 31.2 30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0						
30 3.0 73 7.3 116 32.8 31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0	29	2.9	72	7.2	115	31.2
31 3.1 74 7.4 117 34.3 32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0	30		73			32.8
32 3.2 75 7.5 118 35.9 33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 8.3 8.3 126 48.4 41 4.1 84 8.4 127 50.0			74			
33 3.3 76 7.6 119 37.5 34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0						
34 3.4 77 7.7 120 39.0 35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0						
35 3.5 78 7.8 121 40.6 36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0						
36 3.6 79 7.9 122 42.2 37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0						
37 3.7 80 8.0 123 43.7 38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0						
38 3.8 81 8.1 124 45.3 39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0						
39 3.9 82 8.2 125 46.9 40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0						
40 4.0 83 8.3 126 48.4 41 4.1 84 8.4 127 50.0						
41 4.1 84 8.4 127 50.0						

Table#3

EQ Fre	equency (Hz	z)	
Data	Value	Data	Value
0	THRU(20)	43	2.8k
1	22	44	3.2k
2	25	45	3.6k
3	28	46	4.0k
4	32	47	4.5k
5	36	48	5.0k
6	40	49	5.6k
7	45	50	6.3k
8	50	51	7.0k
9	56	52	8.0k
10	63	53	9.0k
11	70	54	10.0k
12	80	55	11.0k
13	90	56	12.0k
14	100	57	14.0k
15	110	58	16.0k
16	125	59	18.0k
17	140	60	THRU(20.0k)
18 19	160 180		
20 21	200 225		
22	250		
23	280		
24	315		
25	355		
26	400		
27	450		
28	500		
29	560		
30	630		
31	700		
32	800		
33	900		
34	1.0k		
35	1.1k		
36	1.2k		
37	1.4k		
38	1.6k		
39	1.8k		
40	2.0k		
41	2.2k		
42	2.5k		

Table#4

Reverb		· ,	
Data	Value	Data	Value
0	0.3	43	4.6
1	0.4	44	4.7
2	0.5	45	4.8
3	0.6	46	4.9
4	0.7	47	5.0
5	0.8	48	5.5
6	0.9	49	6.0
7	1.0	50	6.5
8	1.1	51	7.0
9	1.2	52	7.5
10	1.3	53	8.0
11	1.4	54	8.5
12	1.5	55	9.0
13	1.6	56	9.5
14	1.7	57	10.0
15	1.8	58	11.0
16 17	1.9 2.0	59	12.0 13.0
18	2.0	60 61	14.0
19	2.1	62	15.0
20	2.3	63	16.0
21	2.4	64	17.0
22	2.5	65	18.0
23	2.6	66	19.0
24	2.7	67	20.0
25	2.8	68	25.0
26	2.9	69	30.0
27	3.0		
28	3.1		
29	3.2		
30	3.3		
31	3.4		
32	3.5		
33	3.6		
34	3.7		
35	3.8		
36	3.9		
37	4.0		
38	4.1		
39	4.2		
40	4.3		
41	4.4		
42	4.5		

Table#5

Delay -	Γime (n	ns)			
Data	Value	Data	Value	Data	Value
0	0.1	43	67.8	86	135.5
1	1.7	44	69.4	87	137.0
2	3.2	45	70.9	88	138.6
3	4.8	46	72.5	89	140.2
4	6.4	47	74.1	90	141.8
5	8.0	48	75.7	91	143.3
6	9.5	49	77.2	92	144.9
7	11.1	50	78.8	93	146.5
8	12.7	51	80.4	94	148.1
9	14.3	52	81.9	95	149.6
10	15.8	53	83.5	96	151.2
11	17.4	54	85.1	97	152.8
12	19.0	55	86.7	98	154.4
13	20.6	56	88.2	99	155.9
14	22.1	57	89.8	100	157.5
15	23.7	58	91.4	101	159.1
16	25.3	59	93.0	102	160.6
17	26.9	60	94.5	103	162.2
18	28.4	61	96.1	104	163.8
19	30.0	62	97.7	105	165.4
20	31.6	63	99.3	106	166.9
21	33.2	64	100.8	107	168.5
22	34.7	65	102.4	108	170.1
23	36.3	66	104.0	109	171.7
24	37.9	67	105.6	110	173.2
25	39.5	68	107.1	111	174.8
26	41.0	69	108.7	112	176.4
27	42.6	70	110.3	113	178.0
28	44.2	71	111.9	114	179.5
29	45.7	72	113.4	115	181.1
30	47.3	73	115.0	116	182.7
31	48.9	74	116.6	117	184.3
32	50.5	75	118.2	118	185.8
33	52.0	76	119.7	119	187.4
34	53.6	77	121.3	120	189.0
35	55.2	78	122.9	121	190.6
36	56.8	79	124.4	122	192.1
37	58.3	80	126.0	123	193.7
38	59.9	81	127.6	124	195.3
39	61.5	82	129.2	125	196.9
40	63.1	83	130.7	126	198.4
41	64.6	84	132.3	127	200.0
42	66.2	85	133.9		

Table#6

Room Size (m)								
	Data	Value	Data	Value				
	0	0.1	43	6.8				
	1	0.3	44	7.0				
	2	0.4						
	3	0.6						
	4	0.7						
	5	0.9						
	6	1.0						
	7	1.2						
	8	1.4						
	9	1.5						
	10	1.7						
	11 12	1.8						
	13	2.0 2.1						
	14	2.1						
	15	2.5						
	16	2.6						
	17	2.8						
	18	2.9						
	19	3.1						
	20	3.2						
	21	3.4						
	22	3.5						
	23	3.7						
	24	3.9						
	25	4.0						
	26	4.2						
	27	4.3						
	28	4.5						
	29	4.6						
	30	4.8						
	31	5.0						
	32	5.1						
	33	5.3						
	34	5.4						
	35	5.6						
	36	5.7						
	37	5.9						
	38	6.1						
	39	6.2						
	40	6.4						
	41	6.5						
	42	6.7						

Table#7
Delay Time

Data Valu

0 0.

1	3.2	44	138.6	87	274.0
2	6.4	45	141.8	88	277.2
3	9.5	46	144.9	89	280.3
4	12.7	47	148.1	90	283.5
5	15.8	48	151.2	91	286.6
6	19.0	49	154.4	92	289.8
7	22.1	50	157.5	93	292.9
8	25.3	51	160.7	94	296.1
9	28.4	52	163.8	95	299.2
10	31.6	53	167.0	96	302.4
11	34.7	54	170.1	97	305.5
12	37.9	55	173.3	98	308.7
13	41.0	56	176.4	99	311.8
14	44.2	57	179.6	100	315.0
15	47.3	58	182.7	101	318.1
16	50.5	59	185.9	102	321.3
17	53.6	60	189.0	103	324.4
18	56.8	61	192.2	104	327.6
19	59.9	62	195.3	105	330.7
20	63.1	63	198.5	106	333.9
21	66.2	64	201.6	107	337.0
22	69.4	65	204.8	108	340.2
23	72.5	66	207.9	109	343.3
24	75.7	67	211.1	110	346.5
25	78.8	68	214.2	111	349.6
26	82.0	69	217.4	112	352.8
27	85.1	70	220.5	113	355.9
28	88.3	71	223.7	114	359.1
29	91.4	72	226.8	115	362.2
30	94.6	73	230.0	116	365.4
31	97.7	74	233.1	117	368.5
32	100.9	75	236.3	118	371.7
33	104.0	76	239.4	119	374.8
34	107.2	77	242.6	120	378.0
35	110.3	78	245.7	121	381.1
36	113.5	79	248.9	122	384.3
37	116.6	80	252.0	123	387.4
38	119.8	81	255.2	124	390.6
39	122.9	82	258.3	125	393.7
40	126.1	83	261.5	126	396.9
41	129.2	84	264.6	127	400.0
42	132.4	85	267.7		

Table#8

‡7						Table	:#8				
me (ms)						Reverb Width; Depth; Height					
Value	Data	Value	Data	Value		Data	Value	Data	Value	Data	Value
0.1	43	135.5	86	270.9		0	0.5	43	11.8	86	24.2
3.2	44	138.6	87	274.0		1	0.8	44	12.1	87	24.5
6.4	45	141.8	88	277.2		2	1.0	45	12.3	88	24.9
9.5	46	144.9	89	280.3		3	1.3	46	12.6	89	25.2
12.7	47	148.1	90	283.5		4	1.5	47	12.9	90	25.5
15.8	48	151.2	91	286.6		5	1.8	48	13.1	91	25.8
19.0	49	154.4	92	289.8		6	2.0	49	13.4	92	26.1
22.1	50	157.5	93	292.9		7	2.3	50	13.7	93	26.5
25.3	51	160.7	94	296.1		8	2.6	51	14.0	94	26.8
28.4	52	163.8	95	299.2		9	2.8	52	14.2	95	27.1
31.6	53	167.0	96	302.4		10	3.1	53	14.5	96	27.5
34.7	54	170.1	97	305.5		11	3.3	54	14.8	97	27.8
37.9	55	173.3	98	308.7		12	3.6	55	15.1	98	28.1
41.0	56	176.4	99	311.8		13	3.9	56	15.4	99	28.5
44.2	57	179.6	100	315.0		14	4.1	57	15.6	100	28.8
47.3	58	182.7	101	318.1		15	4.4	58	15.9	101	29.2
50.5	59	185.9	102	321.3		16	4.6	59	16.2	102	29.5
53.6	60	189.0	103	324.4		17	4.9	60	16.5	103	29.9
56.8	61	192.2	104	327.6		18	5.2	61	16.8	104	30.2
59.9	62	195.3	105	330.7		19	5.4	62	17.1		
63.1	63	198.5	106	333.9		20	5.7	63	17.3		
66.2	64	201.6	107	337.0		21	5.9	64	17.6		
69.4	65	204.8	108	340.2		22	6.2	65	17.9		
72.5	66	207.9	109	343.3		23	6.5	66	18.2		
75.7 78.8	67 68	211.1 214.2	110 111	346.5 349.6		24	6.7	67	18.5		
82.0	69	217.4	112	352.8		25	7.0	68	18.8		
85.1	70	220.5	113	355.9		26 27	7.2 7.5	69 70	19.1 19.4		
88.3	71	223.7	114	359.1		28	7.5 7.8	70	19.4		
91.4	72	226.8	115	362.2		29	8.0	71	20.0		
94.6	73	230.0	116	365.4		30	8.3	73	20.0		
97.7	74	233.1	117	368.5		31	8.6	74	20.2		
100.9	75	236.3	118	371.7		32	8.8	75	20.8		
104.0	76	239.4	119	374.8		33	9.1	76	21.1		
107.2	77	242.6	120	378.0		34	9.4	77	21.4		
110.3	78	245.7	121	381.1		35	9.6	78	21.7		
113.5	79	248.9	122	384.3		36	9.9	79	22.0		
116.6	80	252.0	123	387.4		37	10.2	80	22.4		
119.8	81	255.2	124	390.6		38	10.4	81	22.7		
122.9	82	258.3	125	393.7		39	10.7	82	23.0		
126.1	83	261.5	126	396.9		40	11.0	83	23.3		
129.2	84	264.6	127	400.0		41	11.2	84	23.6		
132.4	85	267.7				42	11.5	85	23.9		

YAMAHA [Disklavier] MIDI IMPLEMENTATION CHART

Date: 01-Feb-2000 Model: Mark III Full-Function Version: 1.00

Func	tion	Transmitted	Recognized	Remarks	
Basic Channel	Default Changed	1-16 1-16	1-16 1-16	Memorized	
Mode	Default Messages Altered	3 × *********	3 3, 4 (m=1) *2, *3 ×		
Note Number :	True voice	0-127 *******	0-127 0-127		
Velocity	Note ON Note OFF	O 9nH, v=1-127 O	O v=1-127		
After Touch	Key s Ch s	O *5	O O *1, *2		
Pitch Bend		×	O 0-24 semi *1, *2		
Control Change	0, 32 7, 11 1, 5, 10 6, 38 64 65 66 67 71-74, 84 91, 93, 94 96-101	O O O X X X O X 44 O X X X X	O *1, *2 O *1 O *1, *2 O	Bank Select Data Entry Hold1 (Sustain) Portament Sostenuto Soft (Shift) Pedal Effect Depth	
Prog Change : True	#	O 0-127 *******	O 0-127 *2		
System Exclu	sive	0	0		
: So Common : So : Tu	_	O *1 O *1 X	O *1 O *1 ×		
System Real Time	: Clock : Commands	O O *1	× O *1		
: Rese : Loca : All	Sound OFF et All Cntrls al ON/OFF Notes OFF ve Sense et	O	O (120, 126, 127) O (121) O (123-125) O x		

Notes

Mode 1 : OMNI ON. POLY Mode 2: OMNI ON. MONO O: Yes Mode 3: OMNI OFF. POLY Mode 4: OMNI OFF. MONO x : No

^{*1 =} Received (transmitted) if switch is on.

^{*2 =} Only ESBL Part can recognize.

^{*3 =} m is always treated as 1 regardless of its value.

^{*4 =} Transmit if this model has a Sostenuto Pedal.

^{*5 =} Applying further pressure on the key does not output key aftertouch information. Instead, key position is transmitted as additional information.

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