

APPENDICES

FM SYNTHESIS

This section explains how the B200 produces sounds using a method called FM Synthesis. It is not absolutely necessary that you read this section to be able to use the B200, but understanding the “inner workings” of FM synthesis will help you use the Easy Edit functions to modify sounds to your liking.

INTERESTING SOUNDS AND BORING SOUNDS

The buzzing and beeping sounds used in early electronic music were very easy for a computer to make, but boring for humans to listen to. These boring sounds had a very simple “waveform” (sound wave). Sounds of real instruments (sax, piano, voice, etc.) are more interesting to listen to, but have a much more complex waveform. The following diagram shows a simple sound wave and a complex sound wave. (Of course these waveforms are not visible to the eye — they are just graphs of the sound wave that reaches our ear.)



Simple Sound Wave
(boring, “electronic-sounding”)



Complex Sound Wave
(interesting, “natural-sounding”)

The **FM Synthesis** used in the B200 synthesizer is an easy, yet powerful way to create the complex sounds that make real instruments sound so good.

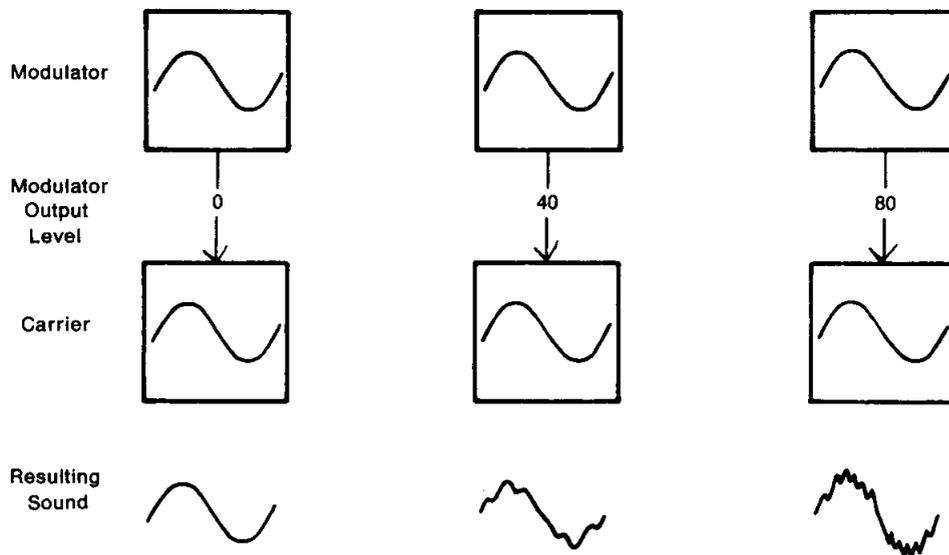
CARRIER AND MODULATOR

FM synthesis is very simple, but very versatile. It uses two simple sound waves, and **frequency modulates** one wave with the other. (“FM” stands for Frequency Modulation, just like in FM radio.)

Frequency Modulation is just another name for Vibrato, or continuous change in pitch. Musical vibrato (the type found in the B200 Easy Edit LFO parameter) is relatively slow—usually no faster than ten cycles of pitch change every second. However the frequency modulation or “vibrato” in FM synthesis is so fast, that it results not in a changing pitch, but in a **more complex sound**.

You can probably guess that the greater the modulation, the more complex the resulting sound will be. (The harder you step on a cat’s tail, the louder it complains!) The following diagram shows the effect of three different amounts of modulation. (The B200 Easy Edit TONE Brilliance parameter determines the amount of modulation.)

To help you understand what is happening, the two sound waves in the diagram are labeled **Modulator** (the wave that modulates) and **Carrier** (the wave that is being modulated, or “carries” the modulation).



From left to right, the diagrams show the effect of increasing modulation to produce an increasingly complex sound. If the Modulator output is increased even more, the resulting sound will become more and more complex, until it finally becomes just noise — a rasping or buzzing sound. On the other hand, if we change the output level of the Carrier (the sound wave **being** modulated), only the **volume** of the resulting sound will be affected. We can summarize this in the following two rules; 1. **The modulator output level determines the tone**, and 2. **the carrier output level determines the volume**.

Another way to change the resulting sound is to change the frequency (pitch) of the Modulator (this is what the B200 Easy Edit TONE Wave parameter does). The frequency of the Modulator determines the **intervals** at which overtones (the individual pitches or harmonics that combine to make a single “tone”) are produced, and affects the basic character of the resulting sound. In general, positive settings of the Wave parameter will make more widely-spaced overtones (higher overtones), resulting in a more sparkling sound.

Some settings of the TONE Wave parameter can produce metallic or gritty sounds. In most instrumental sounds, overtones are at regular multiples of the fundamental pitch. However if the Modulator frequency is an irregular multiple of the Carrier frequency, the overtones will be at irregular multiples of the fundamental pitch (the first harmonic), resulting in a dissonant sound.

SOUNDS THAT CHANGE IN TIME

Most sounds in the real world change (in both volume and tone) as time goes by. For example, a piano note begins loud and bright-sounding, and decays to a quieter volume and a softer tone. An organ note stays at the same volume and tone as long as a key is pressed. In technical terms, this “shape in time” is called the **Envelope**.

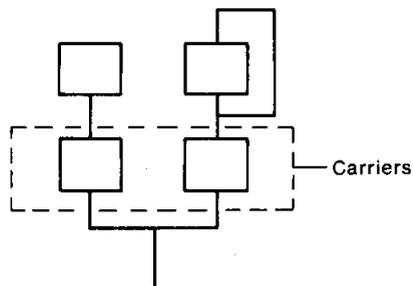
The component inside a synthesizer that produces this change is called the **Envelope Generator** (EG for short). Each Modulator and Carrier in the B200 has its own EG. Since the Modulator output level determines the tone, the EG of the Modulator will determine the change in **tone** over time. Since the Carrier output level determines the volume, the EG of the Carrier determines the change in **volume** over time.

The Easy Edit EG parameters let you independently adjust the envelopes for “volume” (the EG of the Carrier), or “tone” (the EG of the Modulator), or “both” (the EG of both Carrier and Modulator).

FOUR OPERATORS

Whether it is being used as a Modulator or Carrier, each sound source in Yamaha FM synthesizers is called an **operator**. Each operator in the B200 has its own output level, frequency and EG.

For simple FM synthesis only two operators are necessary, but the B200 has **four**, providing a wide variety of possibilities. These four operators can be connected in eight different ways. Each combination of the four operators is known as an **algorithm**, and every B200 sound uses one of these algorithms. For example, the algorithm shown below connects the four operators to make **two** independent Modulator/Carrier pairs, for even more complex, interesting sounds.



Other algorithms use one Modulator to modulate three Carriers, or three Modulators all modulating a single Carrier. Obviously, the role of each of the four operators will be different depending on whether it is used as a Carrier or Modulator. (However, the B200 Easy Edit functions do not allow you to see or change the algorithm of the four operators.)

Each operator is able to produce one of eight different sound waves; the simple sound wave shown in the first diagram, or a more complex sound wave. The Easy Edit TONE Input-4Nos! parameter lets you specify a sound wave 0–7 for each operator. Of course, if a complex Carrier is modulated, or if the Modulator itself is complex, the result will be an even more complex sound wave. This allows the TONE Input-4Nos! parameter to produce major changes in tone quality.

FEEDBACK

FM synthesis requires a Modulator and a Carrier, but it is possible for a single operator to **modulate itself!** This is called Feedback. In each combination of operators, one of the operators is able to modulate itself. (In the above diagram in "Four Operators", this is indicated by the line connecting the upper right operator with itself.)

The Synthesizer Job VOICE EDIT Feedback parameter allows you to adjust this Feedback level from 0–7. Increasing the Feedback has the same type of effect as increasing Modulator output level—a more complex, brighter sound.

MIDI AND MIDI APPLICATIONS

The Musical Instrument Digital Interface (MIDI), first brought out in 1982, has proved to be one of the most important developments in electronic music. By applying the power of MIDI to your B200, you can carry out an unlimited number of previously impossible performance operations, including the following:

- Play several synthesizers at one time from one B200.
- Control performance functions such as pitch bend and modulation on other synthesizers as expressively as if they were being played directly.
- Change voices on other synthesizers and tone generators from your B200, for impressive and effortless sound changes in real time.
- Set effects devices such as digital delay and digital reverberation units to change their effects programs along with voice program changes, to complement and add to the effects section of the B200.
- Control digital drum machines with the sequencer of the B200 for perfectly synchronized performance.
- Use the sequencer of the B200 to play back sounds on other synthesizers and tone generators (as well as samplers and rhythm machines) for a complete multi-instrumental MIDI performance.
- Use a Tape Sync signal recorded onto one channel of a multitrack tape deck, to perfectly synchronize MIDI sequencers and drum machines with a vocal or acoustic performance recorded on tape. In this way, the seemingly opposed worlds of traditional acoustic music and state-of-the-art digital music can be blended and merged, providing enormous creative potential.

As you can see, MIDI is a very powerful musical tool. However, you won't need a course in computer science to use your B200 effectively with other MIDI instruments. All you need to know is what MIDI devices can do, and how you can control them with your B200. After that, MIDI does all the work for you.

In every MIDI setup there is a master and a slave. The master can be a keyboard or sequencer — or both, like the B200 — and the slave (a sound-generating instrument) is played by it.

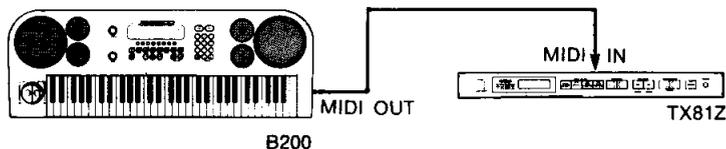
In essence, MIDI is extremely simple: it simply reduces all musical data to numbers, which can easily be sent from one instrument to another (hence the term "Digital Interface"). In practice, MIDI is unbelievably versatile, which is as it should be, for it is designed to fulfill the demands of professional musicians. Indeed, new uses of MIDI are being discovered at an extraordinary rate, both by MIDI engineers, and by musicians like yourself, experimenting and refining the art of digital music on stages and in studios around the world.

To illustrate some of the possibilities of MIDI and perhaps to trigger some ideas of your own, here are a few applications of the B200.

Note:

You should know how the MIDI messages transmitted by the B200 affect the sound of the slave (i.e., your MIDI synthesizer or tone generator) and how you can program your MIDI instrument to respond to these messages. For that information, please refer to the sections on the MIDI Synthesizer Job and the MIDI TRANSMIT CHANNEL Sequencer Job in the SYNTHESIZER REFERENCE chapter. The basic procedure is to match the MIDI Transmit and Receive channels on the respective instruments. Also be sure to consult the owner's manuals of the particular MIDI instruments you are using.

1. B200 PLUS TX81Z MULTI-TIMBRAL FM TONE GENERATOR.

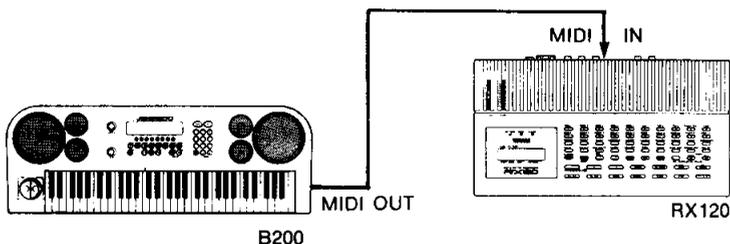


In this basic yet versatile arrangement, the B200 is used to control the Yamaha TX81Z FM Tone Generator, which, like the B200, can create up to eight superb FM voices simultaneously. The eight voices of both instruments could be set to play from different sections of the keyboard for a full, powerful sound.

Programming each voice to occupy a separate register of the B200's keyboard also allows you to experiment with various split and layer combinations. For example, program a bass sound for C1 to C2, piano and cello sounds layered together in the C#2 to C4 range, 4 different string sounds between C#4 and F5, and a clarinet sound at the top. Depending on which register you play in, you can get four distinct sounds. Voices can also be set to overlap, for added tonal interest.

By connecting the audio outputs of the TX81Z to the B200's LINE INPUTs, you can hear the sound of both instruments through the B200's speaker system.

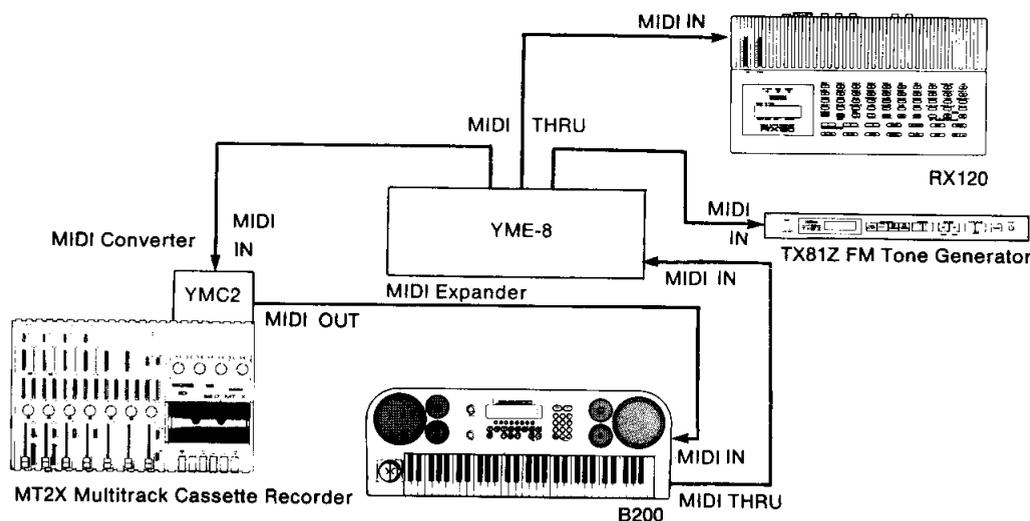
2. B200 PLUS RX120 DIGITAL RHYTHM PROGRAMMER



In another simple setup, the B200 is used to play the authentic drum and percussion sounds of the RX120 Digital Rhythm Programmer. Each of the RX120's sounds can be played from a different key. This feature also makes it possible, with the use of the B200's sequencer, to program a rhythm track of actual drum sounds to play along with the other instrument sounds on songs you have created. Rhythm patterns on the RX120 can also be played in perfect synchronization with sequencer songs on the B200; simply set the Sync parameter of the Sequencer "Cnd" (condition) Job to "MIDI," and you're ready to go.

By connecting the audio outputs of the RX120 to the B200's LINE INPUTs, you can hear the sound of both instruments through the B200's speaker system.

3. B200 AS A CONTROL CENTER FOR THE COMPLETE MIDI STUDIO



The comprehensive sequencing and sound generating capabilities of the B200 are taken to the limit as it functions as the control center for this full-blown MIDI studio system. This advanced MIDI system provides an example of the awesome power of digital music. It utilizes the following Yamaha digital equipment:

- TX81Z FM Tone Generator. The TX81Z is capable of playing up to eight different voices at the same time, perfectly complementing the similar capability of the B200. It could be used here to double, and thus "fatten up," musical passages recorded on the B200.
- The RX120 Digital Rhythm Programmer allows you to add realistic drum and percussion sounds to your MIDI music performance. Up to 20 different "songs" (percussion parts programmed in as many as 500 rhythm patterns to make up a complete song) can be recorded, using any of the RX's 38 realistic sampled sounds. Start and stop of playback can be controlled automatically from the B200, and of course the RX120 will play in perfect synchronization with the music data recorded in the B200.
- YME-8 MIDI Expander. With two MIDI IN and eight MIDI THRU terminals, this device allows you to control up to four different MIDI instruments simultaneously. In this case, the YME-8 is needed in order to send recorded MIDI data from the B200's sequencer to both the RX120 and the TX81Z.
- MT2X Multitrack Cassette Recorder (with YMC2 MIDI Converter). This pair rounds out our studio system by giving you the chance to combine three tracks of tape recorded music with the eight tracks of music recorded on the B200, plus the rhythm track played by the RX120. For example, your eight track synthesizer composition (with voices played on both the B200 and the TX81Z) can be accompanied by the actual drum sounds of the RX120, plus guitar, piano, and vocals recorded on the MT2X. And everything plays back in perfect synchronization.

In this system, the YMC2 converts the MIDI timing signals from the B200's sequencer into signals which can be recorded on track 4 of the tape. When recording these MIDI timing signals, set the Sync parameter of the Sequencer "Cnd" (condition) Job to "internal". On playback, reset the B200's Sync parameter to "MIDI." These signals ensure that the tape recorded music will always stay in time with the recorded sequencer tracks.

The three tape recorder tracks can also be used to record sounds from the B200 and the TX81Z. With a little planning, some clever programming to take advantage of the eight-voice capability of the two synthesizers, and careful mixing of the two instruments onto each MT2X track, your song can be played back with a phenomenal total of 64 synthesizer voices!

If you have an audio mixer such as the Yamaha KM802, you can mix the audio output from the other instruments and input it into the B200's LINE INPUT jacks, to listen to your entire ensemble through the B200's speaker system.

GLOSSARY

If the B200 happens to be the very first synthesizer you've ever owned or played, chances are that a few of the words in this manual are unfamiliar to you.

Let's say you're reading through a few pages of the manual, and the words "parameter," "polyphonic," and "pitch bend" shoot by in rapid succession. If your heart catches in fear or your brain suddenly shuts down at this point, then this section of the manual is for you!

The GLOSSARY will take you on a short guided tour of some of the B200's main functions and, at the same time, explain briefly and simply some synthesizer jargon.

Be sure to also take a look at the FM SYNTHESIS and MIDI AND MIDI APPLICATIONS sections for more information and ideas.

USING THE SOUNDS OF THE B200

To play a synthesizer such as the B200, the first thing you need are sounds. The B200 is capable of making a wealth of sounds and sound effects, and we call each of these sounds **voices**. Expert sound engineers have designed hundreds of voices for the B200, and you can choose any one of them at any time because they are kept permanently (or temporarily, in some cases) in voice memory.

There are two main groups of voice memory:

Internal memory keeps voices within the synthesizer itself. Voices in internal memory can be selected any time you play the B200.

External memory keeps voices on devices outside the synthesizer. An example of external memory is the voice card, which allows you to, for example, play the same voices on your friend's B200 that you play on your own.

The internal memory of the B200 has two types: **Preset** and **User**.

Preset memory cannot be erased or changed; it is permanent.

User memory CAN be erased or changed. You can keep the voices that you create yourself in user memory.

External memory for the B200 is in the form of cards and also comes in two types: **ROM** cards and **RAM** cards.

ROM cards, just like Preset memory, are permanent and cannot be erased or changed.

RAM cards (MCD32 memory card, sold separately) are like User memory because you can change and erase voices on them.

SAVE, STORE, and LOAD

Save, Store, and Load are memory operations. You use these when you want to move voices between different memory types.

The **Save** operation (**SAVE, LOAD** button) is used to move a group of voices (100 voices per group) from internal memory to external memory. For example, when you have filled up the User memory with 100 of your own original voices and need more space, you can save those 100 voices to RAM card instantly by using the Save operation.

The **Store** operation (**STORE** button) is used to move only one voice between memory locations. Unlike Save above, you can move the voice within memory types as well as between them. You use this operation mainly to keep voices to User or Card memory just after editing them. You could also use this operation to change the order of User or Card voices.

The **Load** operation (**SAVE, LOAD** button) is the opposite of Save. It is used to move a group of voices (100 voices per group) from external memory to internal memory.

Use this when you want to put a new group of voices in the User memory.

PLAYING THE B200

The B200 is loaded with performance features that help you get the most out of its expressive synthesizer voices. These are called **real-time controllers** because they can be used to control the sound while you are playing. (See the CONTROL Job in the SYNTHESIZER REFERENCE chapter for more about controllers.)

To the left of the keyboard are two of the main controllers, the **pitch bend wheel** and the **modulation wheel**.

The pitch bend wheel allows you to raise or lower the pitch of the instrument as you play it.

The modulation wheel allows you to control the amount of **modulation** (vibrato, tremolo, or wowwow effect) on a voice in real time. (**Vibrato** creates a wavering of the pitch of a sound, **Tremolo** creates a wavering of the volume, and **Wowwow** creates a wavering of the tone or brightness. These effects, by the way, are created by the **LFO** section of the B200. You can learn more about the LFO in the CHANGING THE LFO SETTINGS OF A VOICE section of the OPERATION BASICS chapter.)

Here are some other performance controllers you can use:

Breath Control — With the use of an optional BC1 breath controller, you can control the volume or the amount of LFO modulation by blowing into the mouthpiece.

Key Velocity — With this feature, the volume of the B200 changes depending on how hard or soft you play the keyboard, just as an acoustic piano does. This is also known as **Touch Sensitivity**.

Sustain Pedal — Holding the sustain pedal down as you play and release notes causes the notes to remain sounding as if you didn't release them.

After Touch — By pressing down on the keyboard after you play a note, you can make changes in the tone of the sound or in the amount of LFO modulation. The harder you press, the greater the change.

Each voice of the B200 can sound up to eight notes at a time. The eight simultaneous notes of the B200 can be played either **polyphonically** or **monophonically**. Polyphonic (or **Poly**) play means that if you hold four notes with your left hand and four with your right, all eight notes will be heard. This is usual when playing piano or organ sounds. Monophonic (or **Mono**) play means that only one note will sound at a time. In other words, only the last played note will sound. This can be more realistic when playing sounds that are naturally monophonic, such as wind or brass instruments, since only one note will be heard at a time.

EDITING VOICES

Do you remember what we told you about User and Preset memory? That you CAN'T change Preset memory voices, and that you CAN change User memory voices? Well, that's not true. Not technically, that is.

The fact is, any voice — Preset or User — can be changed, but not within its memory location. To change the sound of a voice, you have to bring it to a special memory location in the B200 by selecting the voice, change it there, and then store it to User memory or RAM card. (Remember, you can't keep a new voice in preset memory or ROM; the voices kept there are permanent.)

When you do this, you are **editing** a voice. Making edits in a voice can involve anything from changing its name to changing its LFO setting.

When you edit a voice, you can only change one thing at a time. For example, if

you edit the LFO setting, there are actually three parts of LFO you can change: Speed, Vibrato, and Tremolo. Each of these is called a **parameter**. A parameter is the a part or aspect of a voice that can be edited, and each voice has at least a dozen parameters.

And when you edit a parameter — the Speed parameter, for instance — you're changing the number that indicates the speed or, in other words, you're editing the **value** of the parameter.

VOICE AND SEQUENCER EDITING MODES AND PARAMETERS

All of the editing functions of the B200 are covered in clear explanations in both the OPERATION BASICS and SYNTHESIZER REFERENCE chapters, so please refer to those sections for information on specific modes and parameters.

ERROR MESSAGES

The B200 will display one of the following messages to indicate an unexpected event or an aborted operation. Make changes as suggested here and repeat the operation.

- All error messages appear on the bottom row of the display.

VOICE LOADING AND SAVING MESSAGES

ERROR Verify NG!-----Please try again!

This appears if a mistake was made during saving or loading. Removing a card while in the saving or loading process will result in this message. Try to save or load again.

ERROR Protect!---Reset memory protect!

This appears when internal memory protect or write protect switch of RAM is on when executing a saving or loading operation. This message will also result when MIDI data (including voice data) is received while internal memory protect is on. When memory protect (or write protect) is on, data cannot be saved or received. Set the memory protect (or write protect) to off and attempt the operation again.

- See CARD OPERATIONS in the OPERATION BASICS section and SAVE, LOAD AND STORE OPERATIONS in the SYNTHESIZER REFERENCE section for more information.

ERROR Format!-----Please format card!

This message will appear when trying to save from or load to an unformatted card. This will also result when a card formatted to a system other than the B200 is used. Re-format the card for the B200.

- See CARD OPERATIONS in the OPERATION BASICS section and SAVE, LOAD AND STORE OPERATIONS in the SYNTHESIZER REFERENCE section for more information.

ERROR Not ready!---Please insert card!

This message will appear if a card has not been inserted properly when card voices are selected or when save, load or store operations are attempted. Insert the card

securely into the slot.

B_T

This message will appear if User voices or Card voices are selected when battery power is low.

When User voices are selected, this message indicates that the battery inside the B200 is getting low. When Card voices are selected, this message indicates that the battery inside the RAM memory card is getting low.

If the battery is not replaced soon after this message appears, voice data will be irretrievably lost. Replace the battery as soon as possible.

- For internal battery replacement: bring your B200 to the store where you purchased it or to your nearest Yamaha service center. Do not try to replace the battery yourself.
- For RAM memory card battery replacement: purchase the appropriate battery and replace it yourself. See the owner's manual of the RAM memory card or the SAVE, LOAD AND STORE OPERATIONS part of the SYNTHESIZER REFERENCE section of this manual.

When the battery is replaced, all the data memorized in the card will be erased. Transfer the data to the B200's internal memory or another card before replacing the battery.

MIDI RECEPTION AND TRANSMISSION MESSAGES

ERROR Check sum NG!--Please try again!

ERROR MIDI data error!-----try again!

This will appear when MIDI data has not been received during a transfer operation. Try the operation again.

ERROR MIDI buffer full!-----try again!

This will appear when MIDI data has been received more quickly than can be handled. Try the operation again.

***ERROR* MIDI ch!-Please set Transmit ch!**

This will appear when voice data is transmitted when the MIDI transmit channel is off. Set the MIDI transmit channel to a value other than OFF. (See MIDI CHANNEL in the SYNTHESIZER REFERENCE section.)

MULTI MODE MESSAGES

***ATTENTION* Effect data was ignored!**

This message will appear if an effect setting is adjusted for a voice while that voice or any other in the Multi Mode arrangement has a pan setting. The pan setting(s) will be ignored in the Multi Mode when effects are used. (See EFFECT MODE in the SYNTHESIZER REFERENCE section.)

***ATTENTION* Pan data was ignored!**

This message will appear if a pan setting of left or right is adjusted for a voice while that voice or any other in the Multi Mode arrangement has an effect setting. The effect setting(s) will be ignored in the Multi Mode when pan is used. (See PAN of the MULTI MODE FUNCTIONS in the SYNTHESIZER REFERENCE section.)

SPECIFICATIONS

Keyboard:	61 velocity-sensitive keys with aftertouch
Sound Source:	FM (4-operator/8-algorithm), simultaneous 8 notes output
Internal Program RAM:	100 voice programs
Internal Program ROM:	100 voice programs
External Memory:	RAM/ROM card (32 kBytes), for programs (100 programs × 1 bank), for sequencer (to save 1 song bank to internal memory)
Display:	LCD: 40 characters × 2 lines
Controls:	Rotary Volume, Pitch Bend Wheel, Modulation Wheel
Switches:	SPEAKER ON/OFF switch (left panel)
Left Panel Terminals:	LINE INPUT L, R OUTPUT L/MONO, R PHONES CONT (for optional BC-1 or BC-2 Breath Controller)
Right Panel Terminals:	VOLUME (for optional FC-7 Foot Controller) SUSTAIN (for optional FC-4, FC-5 Foot Switch) MIDI THRU MIDI OUT MIDI IN
Amp/Speaker System:	5 cm tweeter × 2, 16 cm woofer × 2, 20 watts × 2 power amp
Power Consumption:	General model 220 — 240 V 50/60 Hz, 60 W US & Canada models 120 V 50/60 Hz, 60 W
Dimensions (W × D × H):	1,019 × 364 × 124 mm (40-1/8" × 14-1/4" × 4-7/8")
Weight:	14.5 kg (32 lb)

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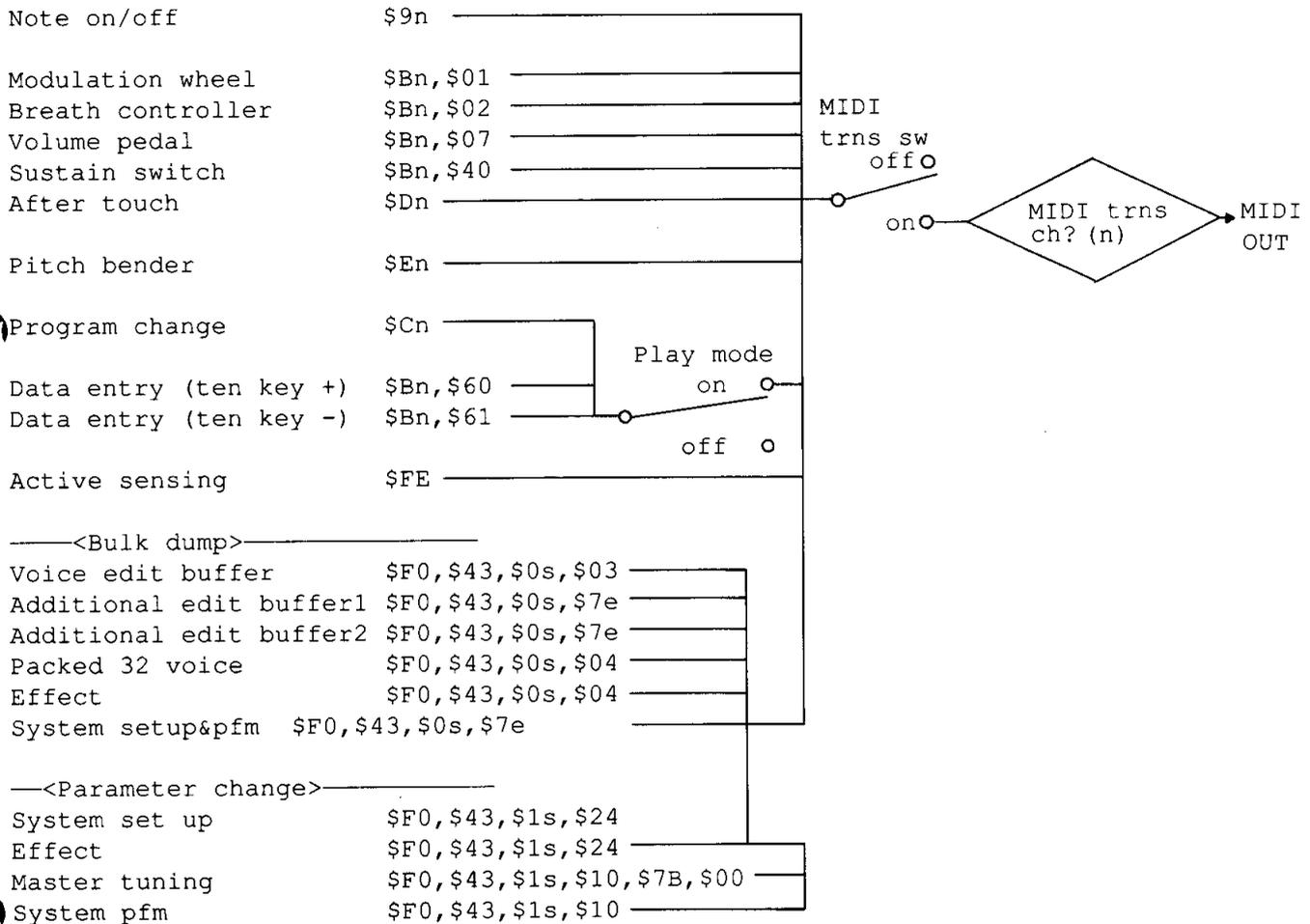
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Volume (multi mode), 32

MIDI DATA FORMAT

1. SYNTHESIZER

(1) Transmitting Conditions



(2) Transmitting Conditions

Transmits when the transmit channel is set to a value other than OFF.

2-1 Channel Information

(1) Channel Voice Message

1) KEY ON/OFF

STATUS	1001nnnn	(9n)	n=channel number
NOTE No.	0kkkkkkk		k=36 (C1)~96 (C6)
VELOCITY	0vvvvvvv	(v=0)	KEY ON
CONTROL value	00000000	(v=0)	KEY OFF

2) CONTROL CHANGE

STATUS	1011nnnn	(Bn)	n=channel number
CONTROL No.	0ccccccc		
DATA	0vvvvvvv		

CONTROL NUMBER

C=1	Modulation wheel	v=0~127
C=2	Breath controller	v=0~127
C=7	Foot volume	v=0~127
C=64	Sustain switch	v=0:off,127:on
C=96	Data entry switch inc	v=127:on (play mode only)
C=97	Data entry switch dec	v=127:on (play mode only)

3) PROGRAM CHANGE (play mode only)

STATUS	1100nnnn	(Cn)	n=channel number
PROGRAM No.	0ppppppp		p=0~99

4) AFTER TOUCH

STATUS	1011nnnn	(Dn)	n=channel number
VALUE	0vvvvvvv		v=0~127

5) PITCH BENDER

STATUS	1110nnnn	(En)	n=channel number
VALUE (LSB)	0uuuuuuu		
VALUE (MSB)	0vvvvvvv		

Resolution: 7bit

Transmission of data occurs as follows:

MSB			LSB			
0000	0000	(00)	0000	0000	(00)	minimum value
0100	0000	(40)	0000	0000	(00)	middle value
0111	1111	(7F)	0111	1110	(7E)	maximum value

2-2 System Information

(1) System Common Messages

Not transmitted.

(2) System Realtime Messages

ACTIVE SENSING CLOCK
 STATUS 11111110 (FE)

(3) System Exclusive Messages

1) PARAMETER CHANGE

STATUS 11110000 (F0)
 ID No. 01000011 (43)
 SUB STATUS 0001ssss (1s) s=Transmit channel
 GROUP NUMBER 0ggggghh g=Group number
 h=Sub group number
 PARAMETER No. 0ppppppp
 DATA 0ddddddd
 | |
 DATA 0ddddddd
 EOX 11110111 (F7)

This is a list of the parameter group numbers and parameter numbers of the 4 types.

Type	g	h	p	Data bit number
SYSTEM SET UP	9	0	1~3,7	1
SYSTEM PFM	4	0	0~95	1
EFFECT	9	0	88~90	1
MASTER TUNING	4	0	123	2

2) BULK DUMP

STATUS 11110000 (F0)
 ID No. 01000011 (43)
 SUB STATUS 0000ssss (0s) s=Transmit channel
 GROUP NUMBER 0ffffff f=Format number
 BYTE COUNT (MSB) 0bbbbbbb
 BYTE COUNT (LSB) 0bbbbbbb
 DATA 0ddddddd
 |]
 0ddddddd
 CHECK SUM 0eeeeeee
 EOX 11110111 (F7)

This is a list of the format numbers of the 2 types.

Type	f	Byte count
VOICE EDIT BUFFER	3	93
PACKED 32 VOICE	4	4096

3) UNIVERSAL BULK DUMP

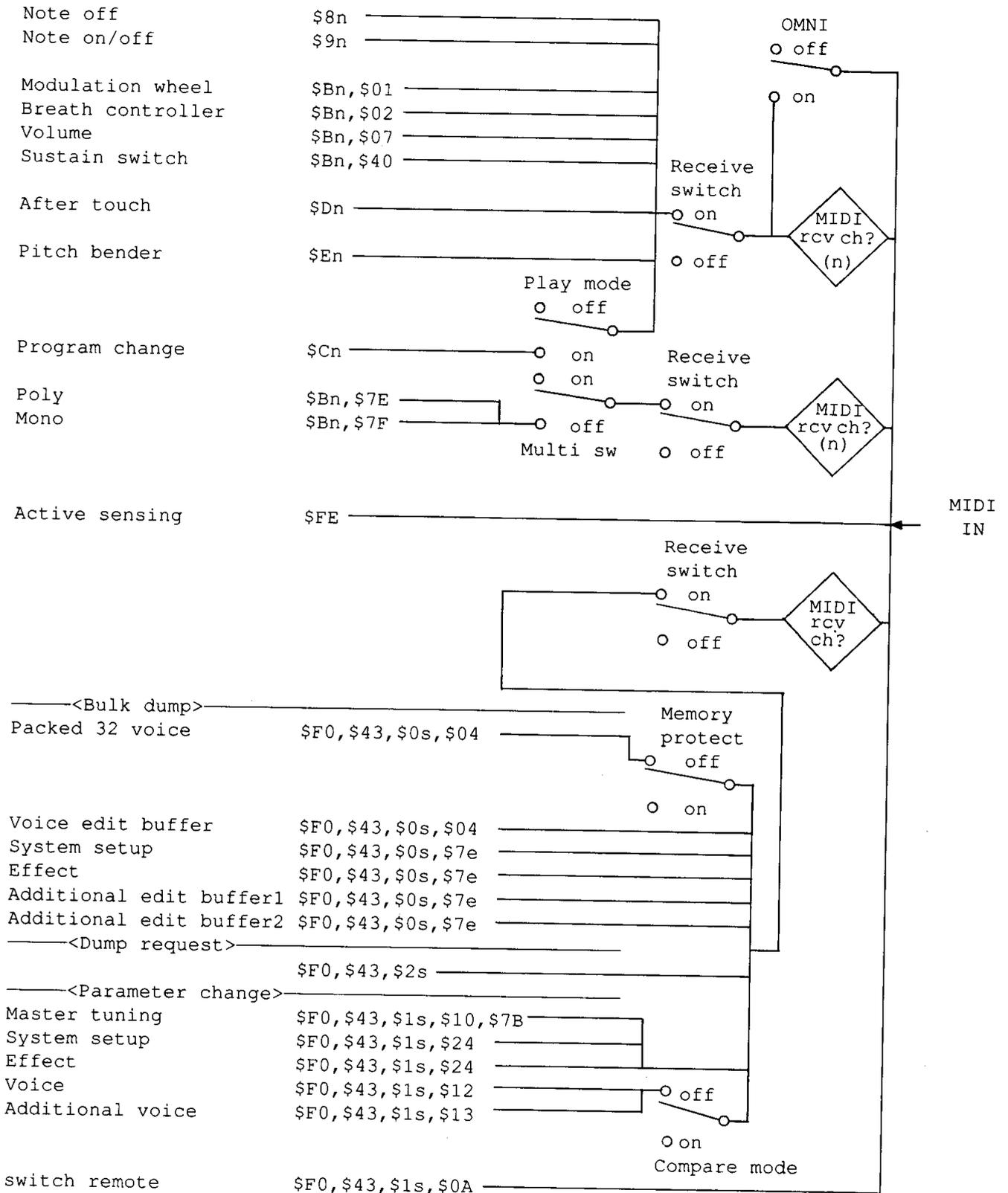
```

STATUS          11110000          (F0)
ID No.          01000011          (43)
SUB STATUS      0000ssss          (0s)   s=Transmit channel
GROUP NUMBER    01111110          (7E)
BYTE COUNT (MSB) 0bbbbbbb
BYTE COUNT (LSB) 0bbbbbbb
CLASIFICATION-  0aaaaaaaa          ASCII'L
NAME            0aaaaaaaa          ASCII'M
                0aaaaaaaa          ASCII'
                0aaaaaaaa          ASCII'
DATA FORMAT-    0rrrrrrrrrr       ASCII
NAME
                0rrrrrrrrrr
DATA            0ddddddd
                0ddddddd
CHECK SUM       0eeeeeee
EOX             11110111          (F7)
    
```

This is a list of the formats of 4 type.

Type	b	a	m
SYSTEM SETUP & PFM	100	LM__	8036S_
EFFECT	3	LM__	EFEDS_
Additional Edit Buffer1	23	LM__	8976AE
Additional Edit Buffer2	10	LM__	8023AE

(1.3) Receiving Condition



Reception Data

4-1 Channel Information

There are 8 MIDI reception channels, from INST 1 to INST 8, when MULTI is ON.

(1) Channel Voice Messages

1) KEY OFF

STATUS	1000nnnn	(8n)	n=channel number
NOTE No.	0kkkkkkk		k=0 (C-2) ~127 (G8)
VELOCITY	0vvvvvvv		v is ignored

2) KEY ON/OFF

STATUS	1001nnnn	(9n)	n=channel number
NOTE No.	0kkkkkkk		k=0 (C-2) ~127 (G8)
VELOCITY	0vvvvvvv	(v=0)	KEY ON
	00000000	(v=0)	KEY OFF

3) CONTROL CHANGE

STATUS	1011nnnn	(Bn)	n=channel number
CONTROL No.	0ccccccc		
CONTROL VALUE	0vvvvvvv		

—— CONTROL NUMBER ——

C=1	Modulation wheel	v=~127
C=2	Breath controller	v=~127
C=7	Volume	v=~127
C=64	Sustain switch	v=0:off,127:on

4) PROGRAM CHANGE (play mode only)

STATUS	1100nnnn	(Cn)	n=channel number
PROGRAM No.	0ppppppp		p=0~127

Selection of CARD/PRESET/USER can be done only from the front panel switches.

p=100~127 are received as 0~27.

5) AFTER TOUCH

STATUS	1101nnnn	(Dn)	n=channel number
	0vvvvvvv		v=0~127

6) PITCH BENDER

STATUS 1110nnnn (En) n=channel number
 VALUE (LSB) 0uuuuuuu
 VALUE (MSB) 0vvvvvvvv

Only data of the MSB side are active.

Resolution: 7bit

MSB	
0000 0000 (00)	minimum value
0100 0000 (40)	middle value
0111 1111 (7F)	maximum value

(2) Channel Mode Messages

Not received when MULTI is ON.
 OMNI switch is not available.

1) MONO/ALL NOTE OFF

STATUS 1011nnnn (Bn) n=channel number
 CONTROL No. 01111111 (7E)
 CONTROL VALUE 0mmmmmmmm
 Only 1 is recognized and sets MONO MODE.

Ignored when m=1

2) POLY/ALL NOTE OFF

STATUS 1011nnnn (Bn) n=channel number
 CONTROL No. 01111110 (7F)
 CONTROL 00000000

4-2 System Information

(1) System Common Messages
Same as transmitting.

(2) System Realtime Messages

ACTIVE SENSING CLOCK
STATUS 11111110 (FE)

Sensing starts once this code is received. When neither status nor data are detected for longer than 300 msec., the MIDI receiving buffer will be cleared and all currently sounding voices and sustain switch data will be set to OFF. Also after touch, foot volume, modulation wheel and pitch bend data will be initialized.

(3) System Exclusive Messages

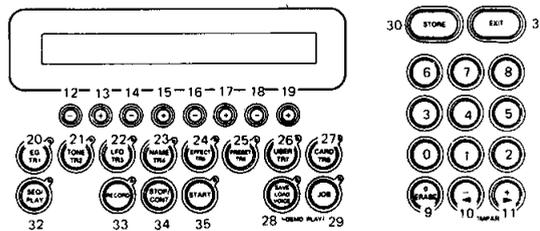
INST 1 channel receives when MULTI is ON.

1) PARAMETER CHANGE SWITCH REMOTE

STATUS 11110000 (F0)
ID No. 01000011 (43)
SUB STATUS 0001ssss (1s)
GROUP NUMBER (24)
PARAMETER No. 0ppppppp p=switch number+91 (91~127)
DATA 0ddddddd d=0:off, d=127:on
EOX 11110111 (F7)

This is received regardless of the Receive sw/channel setting. Switch numbers correspond to the positions indicated on the chart below.

p=127 is power on reset.



The following messages are received when Receive channels match.

3) PARAMETER CHANGE

```

STATUS      11110000      (F0)
ID No.      01000011      (43)
SUB STATUS  0001ssss      (1s)   s=Receive channel
GROUP NUMBER 0ggggghh      g=Group number
                                     h=sub group number

PARAMETER No. 0ppppppp
DATA          0ddddddd
|
DATA          0ddddddd
EOX           11110111      (F7)
    
```

This is a list of the parameter group numbers and parameter numbers of the 6 types.

Type	g	h	p	Data byte number
VOICE	4	2	0~93	1
ADDITIONAL VOICE	4	3	0~26	1
EFFECT	9	0	4~6	1
SYSTEM SET UP	9	0	1~3, 7	1
SYSTEM PFM	4	0	0~95	1
MASTER TUNING	4	0	123	2

4) BULK DUMP
Same as transmission.

5) UNIVERSAL BULK DUMP
Same as transmission.

6) DUMP REQUEST

VOICE EDIT BUFFER		(f=3)	] In this condi- tion.
PACKED 32VOICE		(f=4)	
SONG SEQUENCE		(f=10)	
STATUS	11110000	(F0)	
ID No.	01000011	(43)	
SUB STATUS	0010ssss	(2s)	s=Receive channel
GROUP NUMBER	0fffffff		f=FormatNo. (3,4,10)
EOX	11110111	(F7)	

7) UNIVERSAL BULK DUMP REQUEST

STATUS	11110000	(F0)	
ID No.	01000011	(43)	
SUB STATUS	0010ssss	(2s)	s=Receive channel
GROUP NUMBER	01111110	(7E)	
CLASIFICATION-	0aaaaaaaa	ASCII'L	
NAME	0aaaaaaaa	ASCII'M	
	0aaaaaaaa	ASCII'__	
	0aaaaaaaa	ASCII'__	
DATA FORMAT-	0mmmmmmmm	ASCII	
NAME	|		
	0mmmmmmmm		
EOX	11110111	(F7)	

This is a list of the formats of 4 types.

Type	a	m
ACED + VCED	LM__	8976AE
ACED2 + ACED +VCED	LM__	8023AE
EFEDS + ACED2 + ACED +VCED	LM__	8036EF
EFEDS + SYSTEM SETUP	LM__	8036S_

< Attached list 1 >

Parameters indicated as %%% in the list are of common format with the DX11, but they do not function with B200.

Parameter list of parameter change and bulk

*** VCED *** 93 byte voice edit parameter (1 bulk edit format)
para. cng g=4, h=2

VCED address (para.cng)	b7	b6	b5	b4	b3	b2	b1	b0	
edit	0	0	0	0	---	AR	---		1-31
	1	0	0	0	---	D1R	---		0-31
	2	0	0	0	---	D2R	---		0-31
	3	0	0	0	0	---	RR	---	1-15
	4	0	0	0	0	---	D1L	---	0-15
	5	0	---	---	---	LS	---	---	0-99
	6	0	0	0	0	0	0	-RS-	0-3 OP.4
	7	0	0	0	0	0	---	EBS-	0-7
	8	0	0	0	0	0	0	AME	0-1
	9	0	0	0	0	0	---	KVS-	0-7
	10	0	---	---	---	---	---	OUT	0-99
	11	0	0	---	---	CRS	---	---	0-63 (RATIO)
		0	0	---	---	CRS	---	x x	0-63 (FIX)
	12	0	0	0	0	0	---	DET	0-6 (center=3)
	13								
	.								OP.2
	.								
	26								
	.								OP.3
	.								
	39								
	.								OP.1
	.								
	52	0	0	0	0	0	---	ALG	0-7
	53	0	0	0	0	0	---	FBL	0-7
	54	0	---	---	---	---	---	LFS	0-99
	55	0	---	---	---	---	---	LFD	0-99
	56	0	---	---	---	---	---	PMD	0-99
	57	0	---	---	---	---	---	AMD	0-99
	58	0	0	0	0	0	0	SY	0-1 LFO SYNC
	59	0	0	0	0	0	0	-LFW-	0-3
	60	0	0	0	0	0	---	PMS	0-7
	61	0	0	0	0	0	0	-AMS-	0-3
	62	0	0	---	---	---	---	TRPS	0-48 (center=24)

```

*
*      function      63      0  0  0  0  0  0  0  MO  : MONO
*      64      0  0  0  0  0  ——— PBR ——— 0-12
*      65      0  0  0  0  0  0  0  0  PM  : PORMOD
*      %%%      66      0  ———— PORT ———— 0-99
*      67      0  ———— FC VOL ———— 0-99
*      %%%      68      0  0  0  0  0  0  0  SU  0-1 sus. (F.SW)
*      %%%      69      0  0  0  0  0  0  0  PO  0-1 por. (F.SW)
*      %%%      70      0  0  0  0  0  0  0  CH  0-1 chorus set 0
*      71      0  ———— MW PITCH ———— 0-99
*      72      0  ———— MW AMPLI ———— 0-99
*      73      0  ———— BC PITCH ———— 0-99
*      74      0  ———— BC AMPLI ———— 0-99
*      75      0  ———— BC P BIAS ———— 0-100 (center0=50)
*      76      0  ———— BC E BIAS ———— 0-99
*      77      0  ——— VOICE NAME 1 ——— 32-127
*      78      0  ——— VOICE NAME 2 ———
*      79      0  ——— VOICE NAME 3 ———
*      80      0  ——— VOICE NAME 4 ———
*      81      0  ——— VOICE NAME 5 ———
*      82      0  ——— VOICE NAME 6 ———
*      83      0  ——— VOICE NAME 7 ———
*      84      0  ——— VOICE NAME 8 ———
*      85      0  ——— VOICE NAME 9 ———
*      86      0  ——— VOICE NAME 10 ———
*
*
*      %%%      87      0  ———— PR1 ———— 0-99 PEG
*      %%%      88      0  ———— PR2 ———— 0-99
*      %%%      89      0  ———— PR3 ———— 0-99
*      %%%      90      0  ———— PL1 ———— 0-99 (center=50)
*      %%%      91      0  ———— PL2 ———— 0-99
*      %%%      92      0  ———— PL3 ———— 0-99
*

```

*** parameter change only ***

```

*
*      nn      b7  b6  b5  b4  b3  b2  b1  b0  dd  comment
*      (para.no)
*      93      0  0  0  0  OP1 OP2 OP3 OP4  0-1  op. on(1)/off(0)
*

```

*** ACED *** 23 byte additional parameters (1 bulk edit format)
 para. cng g=4, h=3

NO.(para)	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	0	0	0	0	0	0	FIX 0-1	OP.4
1	1	0	0	0	0	0	---	---	FIXRG --- 0-7 0(255Hz)-7(32KHz)	
2	2	0	0	0	0	---	---	---	FINE --- 0-15(7:F=0-3)	
3	3	0	0	0	0	0	---	---	OSW --- 0-7	
4	4	0	0	0	0	0	0	---	-EGSFT- 0-3 0(off)-3(12dB)	
5	5									OP.2
10	10									OP.3
15	15									OP.1
19	19								0(off)	
20	20	0	0	0	0	0	---	---	---REV--- 0-7	0(off),7(first)
21	21	0	---	---	---	---	---	---	FC PITCH --- 0-99	
22	22	0	---	---	---	---	---	---	FC AMPLI --- 0-99	

*** ACED2 *** 10 byte additional parameter 2 for V2
 para. cng g=4, h=3

NO. para.	Nob7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	23	0	---	---	---	---	---	---	AT PITCH --- 0-99	
1	24	0	---	---	---	---	---	---	AT AMPLI --- 0-99	
2	25	0	---	---	---	---	---	---	AT P. BIAS --- 0-100	center 0 = 50
3	26	0	---	---	---	---	---	---	AT EG BIAS --- 0-99	
4	27	0	---	---	---	---	---	---	reserved	
5	28	0	---	---	---	---	---	---	reserved	
6	29	0	---	---	---	---	---	---	reserved	
7	30	0	---	---	---	---	---	---	reserved	
8	31	0	---	---	---	---	---	---	reserved	
9	32	0	---	---	---	---	---	---	reserved	

*** EFEDS *** 3 byte effect parameter for YS
 para. cng g=9, h=0

NO. para.	Nob7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	4	0	0	0	0				EFFECT PRESET No. 0-10	
1	5	0	0	---	---	---	---	---	---EFFECT TIME --- 0-40	
2	6	0	---	---	---	---	---	---	---EFFECT BALANCE --- 0-99	

*** remote switch ***
para. cng g=9, h=0

g	h p	switch
9	0 91	ten key 0
92		ten key 1
93		ten key 2
94		ten key 3
95		ten key 4
96		ten key 5
97		ten key 6
98		ten key 7
99		ten key 8
100		ten key 9
101		ten key -
102		ten key +
103		left -
104		left +
105		left center -
106		left center +
107		right center -
108		right center +
109		right -
110		right +
111		eg
112		tone
113		lfo
114		effect
115		name
116		card
117		user
118		preset
119		sv,ld
120		job
121		store
122		exit
123		seq/play
124		rec
125		stop/cont.
126		start
127		power on reset

<Attached list 2 >

Detail of Bulk Dump Format

★ VCED

f = 3
data size = 93 (\$005D)
data format = 7bit binary
total bulk size = 93+8 = 101

f0,43,0n,03,00,5D,<VCED data>,sum,f7

★ VMEM

f = 4
data size = 128x32 = 4096 (\$1000)
data format = 7bit binary
total bulk size = 4096+8 = 4104

f0,43,0n,04,20,00,<VMEM data>,sum,f7

★ ACED

f = 126 LM__8976AE
data size = 23+10 = 33 (\$0021)
data format = 7bit binary
total bulk size = 33+8 = 41

f0,43,0n,7e,00,21,LM__8976AE,<ACED data>,sum,f7

★ ACED2

f = 126 LM__8023AE
data size = 10+10 = 20 (\$0014)
data format = 7bit binary
total bulk size = 20+8 = 28

f0,43,0n,7e,00,14,LM__8023AE,<ACED2 data>,sum,f7

★ EFEDS

f = 126 LM__8036EF
data size = 3+10 = 13 (\$000D)
data format = 7bit binary
total bulk size = 13+8 = 21

f0,43,0n,7e,00,0D,LM__8036EF,<EFEDS data>,sum,f7

★ SYSTEM SETUP + PFM

f = 126 LM__8036S_

data size = 10+100 = 110 (\$006E)
data format = 7bit binary
total data size = 110+8 = 118

f0,43,0n,7e,00,62,LM__8036S_,<system data>,sum,f7

<Attached list 3 >

*** VMEM *** 128 byte (91 byte is used) voice data (memory format)

*	address	b7	b6	b5	b4	b3	b2	b1	b0	dd	comment	*
*										(value)		*
*	0	0	0	0	_____	AR	_____			1-31		*
*	1	0	0	0	_____	D1R	_____			0-31		*
*	2	0	0	0	_____	D2R	_____			0-31		*
*	3	0	0	0	0	_____	RR	_____		1-15		*
*	4	0	0	0	0	_____	D1L	_____		0-15	OP.4	*
*	5	0				_____	LS	_____		0-99		*
*	6	0	AME	_____	EBS	_____	KVS	_____		0-1,0-7,0-7		*
*	7	0				_____	OUT	_____		0-99		*
*	8	0	0			_____	CRS	_____		0-63 (RATIO)		*
*		0	0			_____	CRS	_____	x	x	0-63 (FIX)	*
*	9	0	0	0	_____	RS	_____	DET	_____	0-3,0-6		*
<hr/>												
*	10											*
*	.										OP.2	*
*	.											*
<hr/>												
*	20											*
*	.										OP.3	*
*	.											*
<hr/>												
*	30											*
*	.										OP.1	*
*	.											*
<hr/>												
*	40	0	SY	_____	FBL	_____	ALG	_____		0-1,0-7,0-7		*
*	41	0				_____	LFS	_____		0-99		*
*	42	0				_____	LFD	_____		0-99		*
*	43	0				_____	PMD	_____		0-99		*
*	44	0				_____	AMD	_____		0-99		*
*	45	0	_____	PMS	_____	AMS	_____	LFW	_____	0-7,0-3,0-3		*
*	46	0	0			_____	TRPS	_____		0-48		*
*	47	0	0	0	0	_____	PBR	_____		0-12		*
*	48	0	0	0	CH	MO	SU	PO	PM	0-1,0-1,0-1,0-1,0-1		*
*	%%%	49	0			_____	PORT	_____		0-99		*
*	50	0				_____	FC VOL	_____		0-99		*
*	51	0				_____	MW PITCH	_____		0-99		*
*	52	0				_____	MW AMPLI	_____		0-99		*
*	53	0				_____	BC PITCH	_____		0-99		*
*	54	0				_____	BC AMPLI	_____		0-99		*
*	55	0				_____	BC P BIAS	_____		0-100		*
*	56	0				_____	BC E BIAS	_____		0-99		*

```

*      57      0  _____ VOICE NAME 1  _____ 32-127      *
*      58      0  _____ VOICE NAME 2  _____      *
*      59      0  _____ VOICE NAME 3  _____      *
*      60      0  _____ VOICE NAME 4  _____      *
*      61      0  _____ VOICE NAME 5  _____      *
*      62      0  _____ VOICE NAME 6  _____      *
*      63      0  _____ VOICE NAME 7  _____      *
*      64      0  _____ VOICE NAME 8  _____      *
*      65      0  _____ VOICE NAME 9  _____      *
*      66      0  _____ VOICE NAME 10 _____      *
* _____
* %%% 67      0  _____ PR1  _____ 0-99      *
* %%% 68      0  _____ PR2  _____ 0-99      *
* %%% 69      0  _____ PR3  _____ 0-99      *
* %%% 70      0  _____ PL1  _____ 0-99      *
* %%% 71      0  _____ PL2  _____ 0-99      *
* %%% 72      0  _____ PL3  _____ 0-99      *
*
*****

```

*** VMEM ***

No.	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	.	.	.	.	.	.	.	.		same as DX21 VMEM
67	.	.	.	.	.	.	.	.		PEG PR1
72	.	.	.	.	.	.	.	.		PEG PL3
73	0	0	-EGSFT-	FIX	---	FIXRG	---			OP.4
74	0		--- OSW ---	---		FINE	---			
75										OP.2
77										OP.3
79										OP.1
81	0	0	0	0	0	---	REV	---		FUNCTION
82	0									FC PITCH
83	0									FC AMPLI

*** VMEM for V2 ***

No.	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
84	0									AT PITCH
85	0									AT AMPLI
86	0									AT P.BIAS
87	0									AT EG BIAS
88-90	0	0	0	0	0	0	0	0		

*** VMEM for YS ***

No.	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
91	0	0	0	0						EFFECT PRESET No. 0-10
92	0	0								EFFECT TIME 0-40
93	0									EFFECT BALANCE 0-99
94-127	0	0	0	0	0	0	0	0		

note) AT P.BIAS data 0,,,,,,49,50,51,,,,,,100
 LCD -50,,,,,-1, 0,+1,,,,,,+50
 MIDI 51,,,,,100,0,+1,,,,,,+50

*** SYSTEM SETUP *** 100 byte system set up
 para. cng g=4, h=0

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note	
0	123,0	0	TUNE								0-127	master tune center=64

para. cng g=9, h=0

1	1	0	0	0	MIDBCH					0-16	basic rcv ch 16:omni,17:off
2	2	0	0	0	0	MIDTCH				0-15	trans ch,16:off
3	3	0	0	0	0	0	0	0	MLOCK	0-1	mem. protect

para. cng g=4, h=0

4	0	0	0	0	0	NUM of NOTE				0-8	INST1
5	1	0	0	0	0	0	0	0	Mem type	0-2	0:preset,1:user,2:card
6	2	0	Voice Number							0-99	
7	3	0	0	0	Recv. ch					0-16	16(omni)
8	4	0	LIMIT/L							0-127	0(C-2)-127(G8)
9	5	0	LIMIT/H							0-127	
10	6	0	0	0	0	DETUNE				0-14	7(center)
11	7	0	0	NOTE SHIFT						0-48	24 (center)
12	8	0	VOLUME							0-99	
13	9	0	0	0	0	0	0	0	OUT_ASGN	0-3	0(off),1(I),2(II),3(I II)
14	10	0	0	0	0	0	0	0	LFO_SEL	0-3	0(off),1(I),2(II),3(vib)
15	11	0	0	0	0	0	0	0	0	0	reserved

16 12 INST2

28 24 INST3

40 36 INST4

52 48 INST5

64 60 INST6

76 72 INST7

88 84 INST8

99 95

para. cng (only)g=9, h=0

7	0	0	0	0	0	0	0	0	0	bulk block	0-4	midi bulk block
---	---	---	---	---	---	---	---	---	---	------------	-----	-----------------

<Attached list 4 >

Dump Request Messages

★ VCED f0,43,2n,03,f7
★ VMEM f0,43,2n,04,f7
★ ACED + VCED f0,43,2n,7e,LM__8976AE,f7
★ ACED2 + ACED + VCED f0,43,2n,7e,LM__8023AE,f7
★ EFEDS + ACED2 + ACED + VCED f0,43,2n,7e,LM__8036EF,f7
★ EFEDS + system setup f0,43,2n,7e,LM__8036S_,f7

note) Ascii number HEX

★ LM__8976AE 4c,4d,20,20,38,39,37,36,41,45
★ LM__8023AE 4c,4d,20,20,38,30,32,33,41,45
★ LM__8036EF 4c,4d,20,20,38,30,33,36,45,46
★ LM__8976S_ 4c,4d,20,20,38,39,37,36,53,20

<Attached list 5 >

parameter change No. List

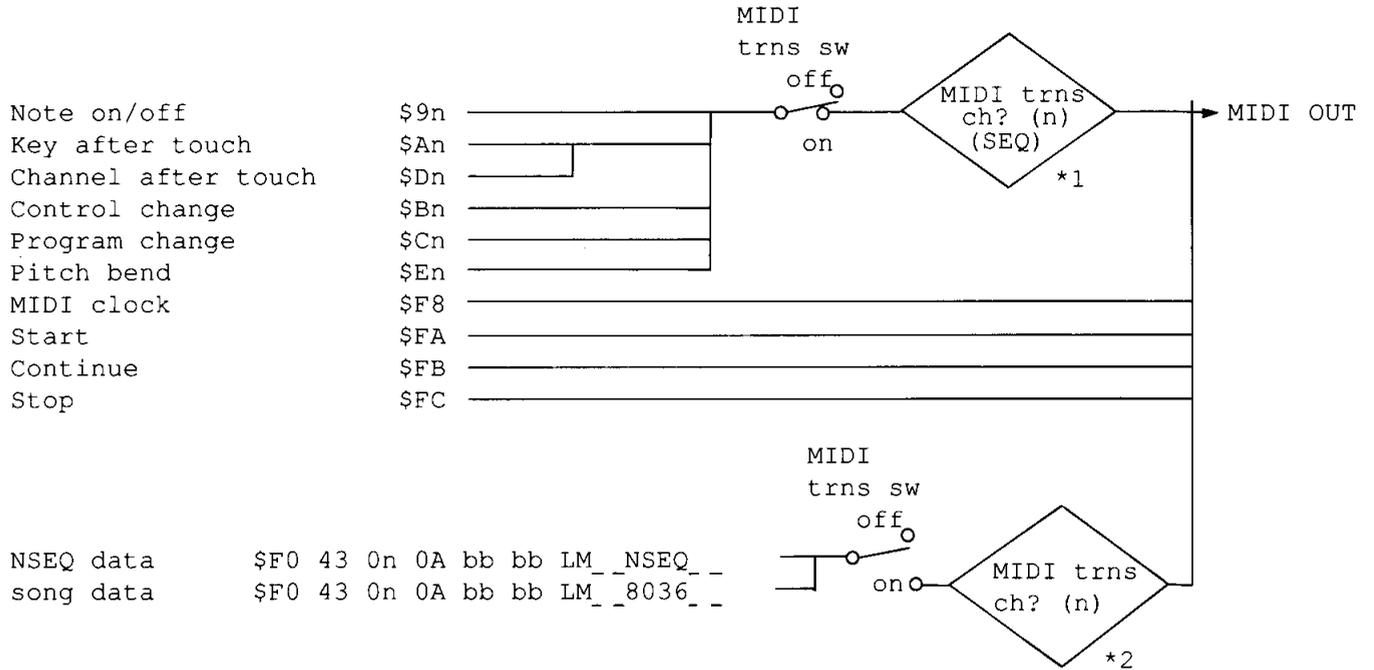
<<< \$F0,\$43,\$1n,... >>>

VCED	\$12 (g=4, h=2), p=0-92, 93
ACED	\$13 (g=4, h=3), p=0-22
ACED2 (V2)	\$13 (g=4, h=3), p=23-33
SYS (sw remote)	\$24 (g=9, h=0), p=91-127
SYS (setup)	\$24 (g=9, h=0), p=0-7
SYS (pfm)	\$10 (g=4, h=0), p=0-95
MASTER TUNING	\$10 (g=4, h=0), p=123

2. SEQUENCER

The B200 sequencer can also record incoming data from other MIDI devices (keyboards, wind controllers, guitars, etc.) connected to the MIDI IN terminal. Data can be recorded and played back as shown in the following diagrams. Notice that reception and transmission of some types of data will depend on Record Mode and Condition settings

(1) Transmitting Conditions



Note:

*1: MIDI transmit Channel set for each track

*2: Determined by the Synthesizer mode Transmit Channel

(2)Transmission Data

(2.2)UNIVERSAL BULK DUMP (Song data)

2-1 Channel Information

Data is transmitted only during play and overdubbing.

(1) Channel Voice Messages

(1.1)KEY ON/OFF

STATUS	1001nnnn	(9n)	n=channel number
NOTE No.	0kkkkkkk		k=1 (C#-2)~111(D#7)
VELOCITY	0vvvvvvv	(v≠0)	KEY ON
VALUE	00000000	(v=0)	KEY OFF

(1.2)POLYPHONIC AFTER TOUCH

STATUS	1010nnnn	(An)	n=channel number
NOTE No.	0kkkkkkk		k=1 (C#-2)~127(G8)
VALUE	0vvvvvvv		v=0~127

(1.3)CONTROL CHANGE

STATUS	1011nnnn	(Bn)	n=channel number
CONTROL No.	0ccccccc		c=0~121
CONTROL VALUE	0vvvvvvv		

(1.4)PROGRAM CHANGE

STATUS	1100nnnn	(Cn)	n=channel number
PROGRAM No.	0ppppppp		p=0~99

(1.5)AFTER TOUCH

STATUS	1101nnnn	(Dn)	n=channel number
VALUE	0vvvvvvv		v=0~127

(1.6)PITCH BENDER

STATUS	1110nnnn	(En)	n=channel number
VALUE (LSB)	0uuuuuuu		
VALUE (MSB)	0vvvvvvv		

STATUS	11110000	(F0)	
ID No.	01000011	(43)	
SUB STATUS	0000ssss	(0s)	s=Transmit channel
GROUP NUMBER	01111110	(7E)	
BYTE COUNT (MSB)	0bbbbbbb		
BYTE COUNT (LSB)	0bbbbbbb		
CLASIFICATION-	0aaaaaaa	ASCII'L	
NAME	0aaaaaaa	ASCII'M	
	0aaaaaaa	ASCII'_	
	0aaaaaaa	ASCII'_	
DATA FORMAT-	00111000	ASCII'8	
NAME	00110000	ASCII'0	
	00110011	ASCII'3	
	00110110	ASCII'6	
	00100000	ASCII'_	
	00100000	ASCII'_	
DATA	0ddddddd		
	0ddddddd	38 bytes	
CHECK SUM	0eeeeeee		
EOX	11110111	(F7)	

Transmitted on the transmission channel of synthesizer mode.
Transmitted when MIDI BULK "OUT" is executed in sequencer mode.

2-2 System Information

(1) System Realtime Messages

(1.1)TIMING CLOCK

STATUS	11111000	(F8)	
--------	----------	------	--

(1.2)START

STATUS	11111001	(F9)	
--------	----------	------	--

(1.3)CONTINUE

STATUS	11111010	(FA)	
--------	----------	------	--

(1.4)STOP

STATUS	11111011	(FB)	
--------	----------	------	--

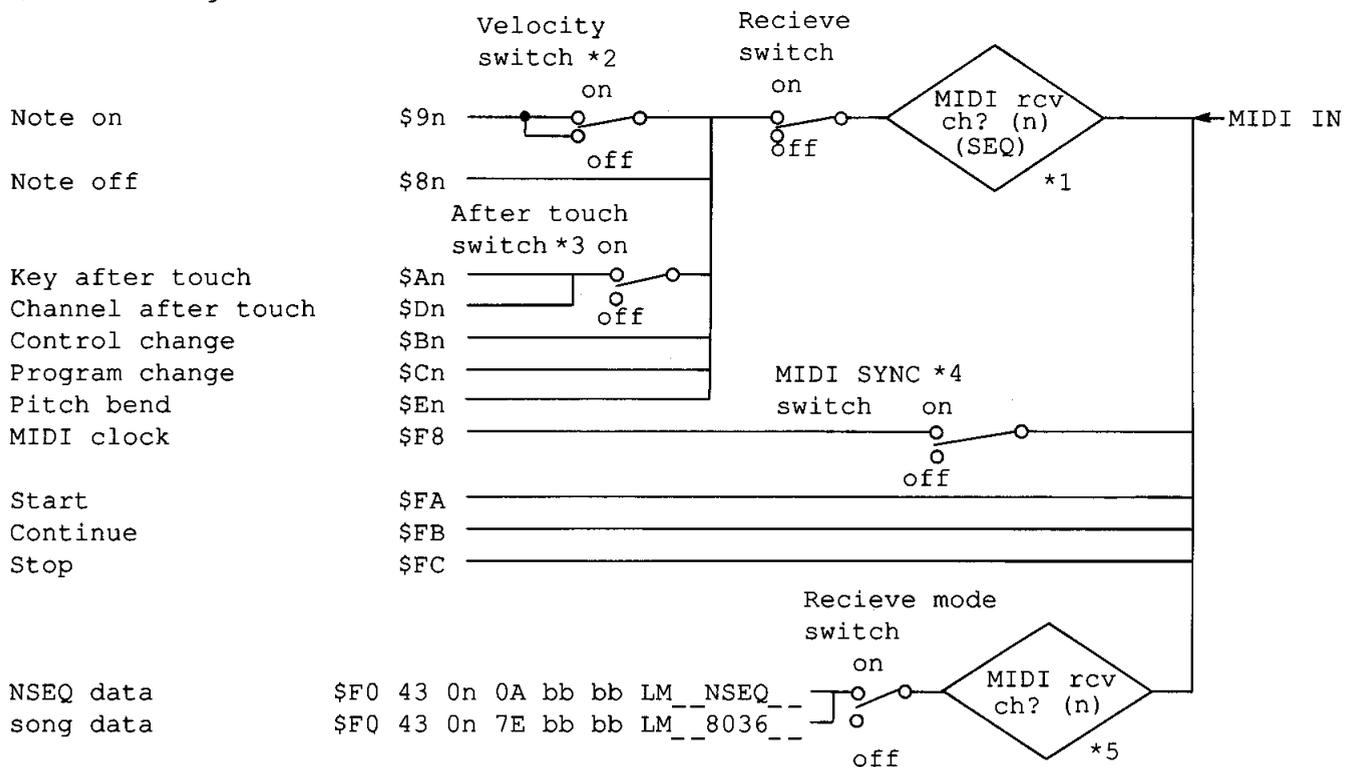
(2) System Exclusive Messages

(2.1)SEQUENCE DUMP

STATUS	11110000	(F0)	
ID No.	01000011	(43)	
SUB STATUS	0000ssss	(0s)	s=Transmit channel
GROUP NUMBER	00001010	(0A)	
BYTE COUNT (MSB)	0bbbbbbb		
BYTE COUNT (LSB)	0bbbbbbb		
CLASIFICATION-	01001100	ASCII'L	
NAME	01001101	ASCII'M	
	00100000	ASCII'_	
	00100000	ASCII'_	
DATA FORMAT-	01001110	ASCII'N	
NAME	01010011	ASCII'S	
	01000101	ASCII'E	
	01010001	ASCII'Q	
	00100000	ASCII'_	
	00100000	ASCII'_	
DATA	0ddddddd		
	0ddddddd		
CHECK SUM	0eeeeeee		
EOX	11110111	(F7)	

Transmitted on the transmission channel of synthesizer mode.
Transmitted when MIDI BULK "OUT" is executed in sequencer mode.

(3) Receiving Condition



Note:

- *1: Reception channel in Recording Mode
- *2: Velocity on/off in Condition
- *3: Aftertouch on/off in Condition
- *4: Received when Sync is set to "MIDI"
- *5: Determined by the Synthesizer mode Receive Channel

(4) Reception Data

(2.2) UNIVERSAL BULK DUMP (Song data)

4-1 Channel Information

Data is received only during recording.

(1) Channel Voice Messages

(1.1) KEY ON/OFF

STATUS	1001nnnn	(9n)	n=channel number
NOTE No.	0kkkkkkk		k=1 (C#-2)~111 (D#7)
VELOCITY	0vvvvvvv	(v≠0)	KEY ON
VALUE	00000000	(v=0)	KEY OFF

(1.2) POLYPHONIC AFTER TOUCH

STATUS	1010nnnn	(An)	n=channel number
NOTE No.	0kkkkkkk		k=1 (C#-2)~127 (G8)
VALUE	0vvvvvvv		v=0~127

(1.3) CONTROL CHANGE

STATUS	1011nnnn	(Bn)	n=channel number
CONTROL No.	0ccccccc		c=0~121
CONTROL VALUE	0vvvvvvv		

(1.4) PROGRAM CHANGE

STATUS	1100nnnn	(Cn)	n=channel number
PROGRAM No.	0ppppppp		p=0~99

(1.5) AFTER TOUCH

STATUS	1101nnnn	(Dn)	n=channel number
VALUE	0vvvvvvv		v=0~127

(1.6) PITCH BENDER

STATUS	1110nnnn	(En)	n=channel number
VALUE (LSB)	0uuuuuuu		
VALUE (MSB)	0vvvvvvv		

STATUS	11110000	(F0)	
ID No.	01000011	(43)	
SUB STATUS	0000ssss	(0s)	s=Receive channel
GROUP NUMBER	01111110	(7E)	
BYTE COUNT (MSB)	0bbbbbbb		
BYTE COUNT (LSB)	0bbbbbbb		
CLASIFICATION-NAME	0aaaaaaaa	ASCII'L	
	0aaaaaaaa	ASCII'M	
	0aaaaaaaa	ASCII' _	
	0aaaaaaaa	ASCII' _	
DATA FORMAT-NAME	00111000	ASCII'8	
	00110000	ASCII'0	
	00110011	ASCII'3	
	00110110	ASCII'6	
	00100000	ASCII' _	
	00100000	ASCII' _	
DATA	0ddddddd		
	0ddddddd	38 bytes	
CHECK SUM	0eeeeeee		
EOX	11110111	(F7)	

Received on the reception channel of synthesizer mode. Received only when MIDI BULK "IN" is executed in sequencer mode.

4-2 System Information

(1) System Realtime Messages

(1.1) TIMING CLOCK			
STATUS	11111000	(F8)	
(1.2) START			
STATUS	11111001	(F9)	
(1.3) CONTINUE			
STATUS	11111010	(FA)	
(1.4) STOP			
STATUS	11111011	(FB)	

(2) system Exclusive Messages

(2.1) SEQUENCE DUMP

STATUS	11110000	(F0)	
ID No.	01000011	(43)	
SUB STATUS	0000ssss	(0s)	s=Receive channel
GROUP NUMBER	00001010	(0A)	
BYTE COUNT (MSB)	0bbbbbbb		
BYTE COUNT (LSB)	0bbbbbbb		
CLASIFICATION-NAME	01001100	ASCII'L	
	01001101	ASCII'M	
	00100000	ASCII' _	
	00100000	ASCII' _	
DATA FORMAT-NAME	01001110	ASCII'N	
	01010011	ASCII'S	
	01000101	ASCII'E	
	01010001	ASCII'Q	
	00100000	ASCII' _	
	00100000	ASCII' _	
DATA	0ddddddd		
	0ddddddd		
CHECK SUM	0eeeeeee		
EOX	11110111	(F7)	

Received on the reception channel of synthesizer mode. Received only when MIDI BULK "IN" is executed in sequencer mode.

(5) Sequence Bulk Data

The B200 sequencer can transmit and receive sequence memory as a MIDI Bulk Data message. This allows you to exchange sequence data with other sequencers that use the Yamaha N-SEQ data format. There are two types of B200 sequence bulk data.

- N-SEQ data (the sequence data itself)
- Song data (max notes, voice bank and voice number for each track)

Since the Song Data is unique to the B200, it will be ignored when transmitted to other N-SEQ format devices such as the QX5FD. In the MIDI BULK IN job (Sequence JOB mode), the YS200 will transmit a Dump Request message for N-SEQ data. A device connected to the B200 MIDI IN will respond by transmitting data. The B200 will respond to a Dump Request message in the same way.

• NSEQ DATA FORMAT

NSEQ data for one song consists of multiple tracks, each track beginning with F0h (on) (N=track number), and ending with F2h. If a track is empty, that track is not included. Between the F0h and F2h are time/event/control data bytes as follows.

hex	description
F0	top of track #1
00	
--	time/event/control data
--	
F2	end of record
--	
--	track #2 ~ #7 data
--	
F0	top of track #8
07	
--	time/event/control data
--	
F2	end of record

NSEQ time/event/control data format (binary)

short time	0ttttttt	(length in 384th notes)
long time	0ttttttt 0ttttttt	(in order of MS byte, LS byte)
short note	10ddddd 0kkkkkkk 0vvvvvvv	
long note	110ddddd 0ddddd 0kkkkkkk 0vvvvvvv	
short note	10ddddd 1kkkkkkk	(when velocity=\$40)
long note	110ddddd 0ddddd 1kkkkkkk	(when velocity=\$40)

ddd = duration (length in 96th notes)

kkk = MIDI note number

vvv = MIDI velocity

measure mark	11110101	(measure mark)
no operation	11111000	(does nothing)

(Except for MSB, the following are the same format as MIDI)

poly a.touch	11111010 0kkkkkkk 0vvvvvvv
control change	11111011 0ccccccc 0vvvvvvv
program change	11111100 0ppppppp
channel a.touch	11111101 0vvvvvvv
pitch bend	11111110 0vvvvvvv 0vvvvvvv

• SONG DATA FORMAT

Song data consists of max notes, voice bank, voice select, and tempo, effect, beat (time signature) and song name, in the following format.

count	hex	description		
0	00	max notes	of tr1	(0~7)
1	01	voice bank	of tr1	(0~2)
2	02	voice select	of tr1	(0~99)
3	03	max notes	of tr2	
4	04	voice bank	of tr2	
5	05	voice select	of tr2	
6	06	max notes	of tr3	
7	07	voice bank	of tr3	
8	08	voice select	of tr3	
9	09	max notes	of tr4	
10	0A	voice bank	of tr4	
11	0B	voice select	of tr4	
12	0C	max notes	of tr5	
13	0D	voice bank	of tr5	
14	0E	voice select	of tr5	
15	0F	max notes	of tr6	
16	10	voice bank	of tr6	
17	11	voice select	of tr6	
18	12	max notes	of tr7	
19	13	voice bank	of tr7	
20	14	voice select	of tr7	
21	15	max notes	of tr8	
22	16	voice bank	of tr8	
23	17	voice select	of tr8	
24	18	effect number		(1~10)
25	19	effect time		
26	1A	effect balance		
27	1B	song name 1		(ASCII)
28	1C	song name 2		
29	1D	song name 3		
30	1E	song name 4		
31	1F	song name 5		
32	20	song name 6		
33	21	song name 7		
34	22	song name 8		
35	23	tempo		(60~180)
36	24	time signature		(0=1/4, 1=2/4, 2=3/4, ,, 10=7/8, 11=8/8)
37	25	(reserved)		

total 38 (\$26) bytes

Function ...	Transmitted	Recognized	Remarks
Basic Default	: 1 - 16	: 1 - 16	:memorized
Channel Changed	: 1 - 16	: 1 - 16	:
Default	: 3	: 1, 2, 3, 4	:memorized
Mode Messages	: x	: POLY, MONO(M=1)	:single mode only:
Altered	: *****	: x	:
Note Number : True voice	: 36 - 96 : *****	: 0 - 127 : 12 - 107	:
Velocity Note ON	: o 9nH,v=1-127	: o v=1-127	:
Note OFF	: x 9nH,v=0	: x	:
After Key's	: x	: x	:
Touch Ch's	: o	: o	:
Pitch Bender	: o	: o 0-12 semi	:7 bit resolution
Control	1 : o 2 : o 7 : o	: o : o : o	:Modulation wheel: :Breath control :Volume
Change	64 : o	: o	:Sustain
	96 : o	: x	:Data entry +1
	97 : o	: x	:Data entry -1 :(Play mode only)
Prog Change : True #	: o 0 - 99 : *****	: o 0 - 127 *1 : 0 - 99	:
System Exclusive	: o	: o	:Voice parameters
System : Song Pos	: x	: x	:
: Song Sel	: x	: x	:
Common : Tune	: x	: x	:
System :Clock	: x	: x	:
Real Time :Commands	: x	: x	:
Aux :Local ON/OFF	: x	: x	:
:All Notes OFF	: x	: o (126,127)	:single mode only:
Mes- :Active Sense	: o	: o	:
sages:Reset	: x	: x	:

Notes: *1 = play mode only

Function ...	Transmitted	Recognized	Remarks
Basic Default	: 1 - 16	: 1 - 16	: memorized
Channel Changed	: 1 - 16	: 1 - 16	:
Mode Default	: x	: x	:
Mode Messages	: x	: x	:
Mode Altered	: *****	: x	:
Note Number : True voice	: 1 - 111 : *****	: 1 - 111	:
Velocity Note ON	: o 9nH,v=1-127	: o v=1-127 *1	:
Velocity Note OFF	: x 9nH,v=0	: x	:
After Touch Key's	: o	: o *2	:
After Touch Ch's	: o	: o *2	:
Pitch Bender	: o	: o	:
Control Change	: 0 - 121 : o	: o	:
Prog Change : True #	: o 0 - 99 : *****	: o 0 - 99	:
System Exclusive	: o	: o *3	: Song data
System : Song Pos	: x	: x	:
System : Song Sel	: x	: x	:
Common : Tune	: x	: x	:
System :Clock	: o	: o *4	:
Real Time :Commands	: o	: o	:
Aux :Local ON/OFF	: x	: x	:
Aux :All Notes OFF	: x	: x	:
Mes- :Active Sense	: x	: x	:
sages:Reset	: x	: x	:
Notes:	*1 = receive if velocity switch is on. (if switch is off, velocity is fixed to 64.)		
	*2 = receive if after touch switch is on.		
	*3 = receive when bulk data receive function is set.		
	*4 = receive in MIDI sync mode.		
Mode 1 : OMNI ON, POLY	Mode 2 : OMNI ON, MONO	o : Yes	
Mode 3 : OMNI OFF, POLY	Mode 4 : OMNI OFF, MONO	x : No	

YAMAHA