

YAMAHA

TQ5

TONE GENERATOR

OPERATING MANUAL

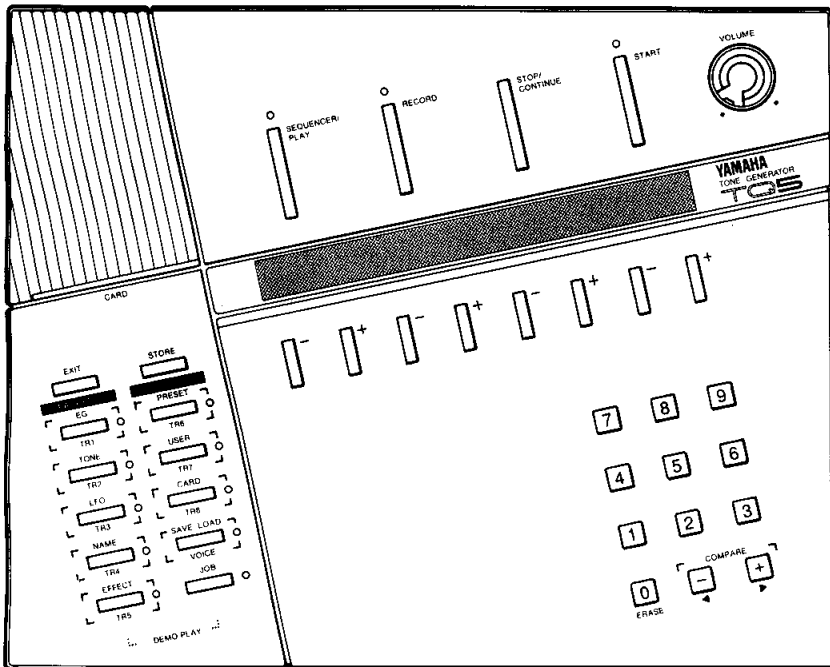
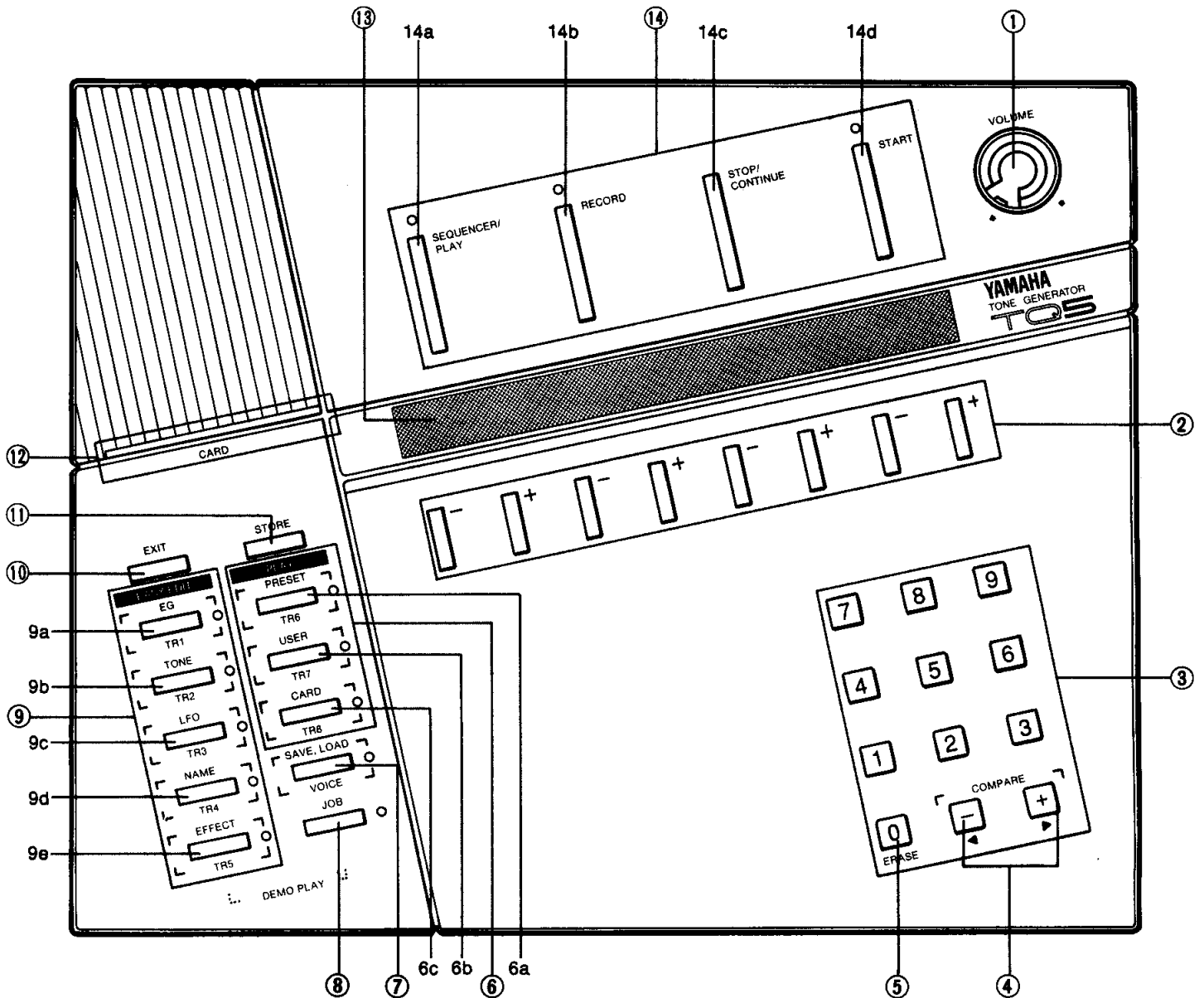


TABLE OF CONTENTS

HOW TO USE THIS MANUAL	1
FRONT/REAR PANELS	4
PRECAUTIONS	6
STARTING OUT	7
SETTING UP.....	7
BASIC STEPS IN SETTING UP THE TQ5.....	7
PLAYING THE TQ5.....	11
SELECTING PRESET VOICES.....	11
OPERATION BASICS	14
ABOUT THE CONTROLS.....	14
THE PLAY BUTTONS.....	14
THE EASY EDIT BUTTONS.....	14
THE EXIT KEY.....	14
THE STORE BUTTON.....	15
EDITING THE VOICES.....	16
CHANGING THE SOUND OF A PRESET VOICE.....	16
CHANGING THE TONE SETTINGS OF A VOICE.....	17
CHANGING THE LFO SETTINGS OF A VOICE.....	17
CHANGING THE EFFECT SETTINGS OF A VOICE.....	18
NAMING AN EDITED VOICE.....	19
STORING AN EDITED VOICE.....	21
CARD OPERATIONS.....	23
SELECTING CARD VOICES.....	23
STORING CARD VOICES TO USER MEMORY.....	24
SAVING VOICES TO MEMORY CARDS.....	26
DEMONSTRATION SONG PLAY.....	28
PLAYING DEMONSTRATION SONGS FROM CARD MEMORY.....	29
THE SEQUENCER SECTION	30
RECORDING TO A SEQUENCER TRACK.....	30
PLAYING BACK YOUR NEWLY RECORDED SONG.....	32
CHANGING VOICES AND MAKING EFFECT SETTINGS IN YOUR SONG.....	33
NAMING YOUR SONG.....	34
SAVING YOUR NEWLY RECORDED SONG.....	36
RECORDING TO A SEQUENCER TRACK — STEP RECORDING.....	36
SYNTHESIZER REFERENCE	42
PLAY MODE BUTTONS.....	42
EASY EDIT MODE BUTTONS.....	43
EG.....	43
TONE.....	44
LFO.....	45
NAME.....	46
EFFECT.....	47
SAVE, LOAD AND STORE OPERATIONS.....	48
SAVE, LOAD MODE.....	48
STORE.....	50
JOB MODE FUNCTIONS.....	52
JOB MODE.....	52
VOICE EDIT (Edit).....	52
CONTROL (Cntrl).....	53
MIDI BULK OUT (Bulk).....	53
MIDI CHANNEL (MIDI).....	53
SPLIT MODE (Split).....	55
CLOCK/CALENDAR FUNCTION.....	56
SETTING THE TIME AND DATE.....	56
MULTI MODE FUNCTIONS.....	57
MULTI MODE DISPLAY EXAMPLES.....	57
MAXIMUM NOTES (Max).....	58
MIDI RECEIVE CHANNEL (R ch).....	59
VOICE NUMBER (Voice).....	59

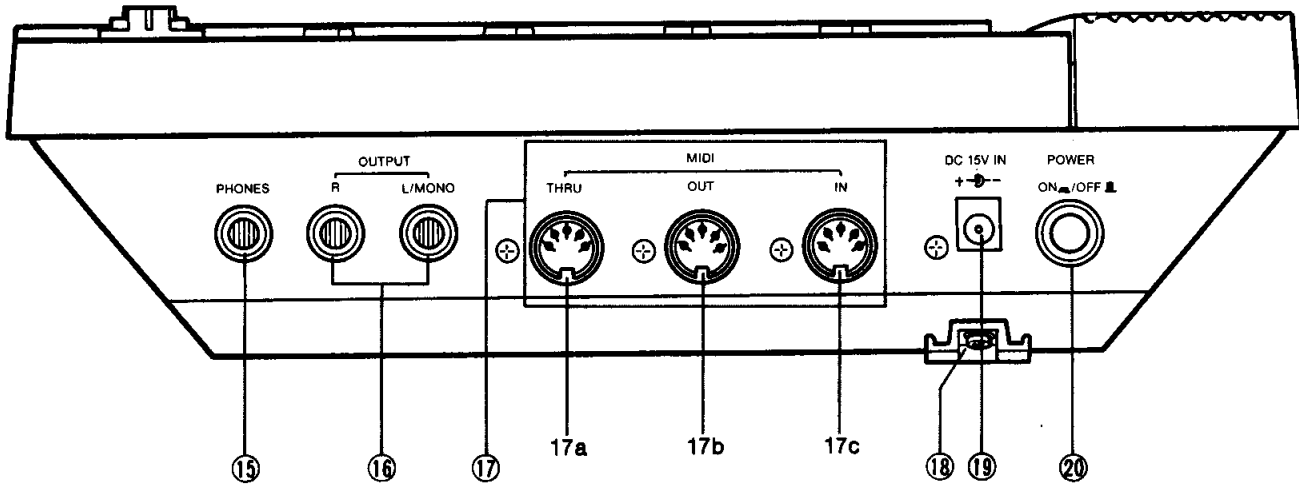
VOLUME (Volm)	59
PAN.....	59
DETUNE (Detun).....	60
NOTE LIMIT (Nlim)	60
LFO	60
MULTI MODE OPERATION — A SETUP EXAMPLE	62
SEQUENCER REFERENCE	65
WHAT IS A SEQUENCER?.....	65
TRACKS, VOICES AND SONGS.....	65
SEQUENCER FUNCTIONS.....	65
PLAY.....	67
RECORD.....	68
MULTI-TRACK RECORDING PROCEDURE	68
PART TYPE.....	69
PRESET PART TYPES.....	70
NORMAL RECORDING	71
PUNCH RECORDING.....	73
STEP RECORDING	74
SEQUENCER JOB.....	79
SONG	79
QUANTIZE	80
CONDITION	80
EDIT.....	81
TRACK MIX DOWN.....	84
CARD	85
RECORD MODE	86
EFFECT	86
VOICE.....	86
VOICE SELECT	87
MAX NOTES.....	87
MIDI TRANSMIT CHANNEL.....	88
APPENDICES	
FM SYNTHESIS	89
INTERESTING SOUNDS AND BORING SOUNDS	89
CARRIER AND MODULATOR.....	89
SOUNDS THAT CHANGE IN TIME.....	90
FOUR OPERATORS	91
FEEDBACK.....	91
MIDI AND MIDI APPLICATIONS	92
1. TQ5 PLUS RX120 DIGITAL RHYTHM PROGRAMMER.....	92
2. TQ5 AS A CONTROL CENTER FOR THE COMPLETE MIDI STUDIO	93
GLOSSARY	94
USING THE SOUNDS OF THE TQ5.....	94
SAVE, STORE, AND LOAD.....	94
PLAYING THE TQ5.....	95
EDITING VOICES.....	95
VOICE AND SEQUENCER EDITING MODES AND PARAMETERS.....	96
ERROR MESSAGES	97
VOICE LOADING AND SAVING MESSAGES.....	97
MIDI RECEPTION AND TRANSMISSION MESSAGES	98
MULTI MODE MESSAGES	99
SPECIFICATIONS	100
INDEX	101
MIDI DATA FORMAT	Add-1
SYNTHESIZER	Add-1
SEQUENCER.....	Add-5
MIDI IMPLEMENTATION CHART	Add-7

FRONT/REAR PANELS



FRONT PANEL

- ① VOLUME Control
- ② +/- SELECTOR Buttons (for data entry and function/parameter selection)
- ③ Numeric Keypad
- ④ Cursor Left and Cursor Right Keys (also serve as - and + data entry keys and, when pressed together, as COMPARE keys)
- ⑤ ERASE Key (also serves as "0" in the numeric keypad)
- ⑥ PLAY Mode Buttons
 - 6a) PRESET/TR6
 - 6b) USER/TR7
 - 6c) CARD/TR8
- ⑦ SAVE, LOAD/VOICE Button
- ⑧ JOB Button
- ⑨ EASY EDIT Mode Buttons
 - 9a) EG/TR1
 - 9b) TONE/TR2
 - 9c) LFO/TR3
 - 9d) NAME/TR4
 - 9e) EFFECT/TR5
- ⑩ EXIT Button
- ⑪ STORE Button
- ⑫ CARD Slot
- ⑬ LCD
- ⑭ Sequencer Mode Buttons
 - 14a) SEQUENCER/PLAY
 - 14b) RECORD
 - 14c) STOP/CONTINUE
 - 14d) START



REAR PANEL

- ⑮ Headphone Jack
- ⑯ Outputs
 - R (right stereo channel output)
 - L/MONO (serves as either mono out or, if Output R is connected, the left stereo channel)
- ⑰ MIDI Terminals
 - 17a) MIDI THRU
 - 17b) MIDI OUT
 - 17c) MIDI IN
- ⑱ Power Supply Cord Hook
 - The adaptor cord can be wound around this hook to prevent it from coming loose during performance.
- ⑲ DC 15V IN Jack (for connection of AC power adaptor)
- ⑳ Power Switch

PRECAUTIONS

- The voltage requirement for your TQ5 has been set specifically for the main supply voltage used in your area. If you have any doubts about voltage suitability, please consult your local Yamaha dealer. If you intend to use your TQ5 in an area with a different voltage, be sure to use the appropriate voltage convertor.
- Avoid placing your TQ5 in direct sunlight or close to a source of heat. Also, avoid locations where the instrument is likely to be subjected to vibration, excessive dust, cold or moisture. All of these conditions could have a detrimental effect on both the mechanisms and the circuitry incorporated into the TQ5.
- Do not use abrasive cleaners, waxes, solvents, or chemical dust cloths to clean the exterior of your TQ5 as these may damage the finish. Use a slightly damp cloth and a neutral cleanser. Never use aerosol sprays near the TQ5 as they can get into the circuitry and prevent accurate transmission of data.
- Your TQ5 contains no user serviceable parts. Opening it or tampering with it can lead to electrical shock as well as damage, and will void the product warranty. Refer all servicing to qualified Yamaha personnel.
- The TQ5 is equipped with an internal battery for preservation of stored data. Since the life of this battery is about five years, you should have a qualified Yamaha service representative replace the battery before that time (See "About the TQ5's internal battery", page 52 for the details.).
- All computer circuitry, including that of the TQ5, is sensitive to power surges or voltage spikes, such as those caused by lightning. For this reason, the TQ5 should be turned off and unplugged from the wall socket in the event of an electrical storm.
- Computer circuitry is sensitive to electromagnetic radiation, such as is generated by television sets. The TQ5's digital operation also generates high frequency pulses that may adversely affect radio or TV reception in the vicinity of the instrument. Use your TQ5 at a suitable distance from such equipment to avoid malfunctions in the TQ5 or any other connected equipment.
- Avoid applying excessive force to the controls. Also avoid dropping the instrument or otherwise subjecting it to impact. While the internal circuitry is of reliable integrated circuit design, the TQ5 should be treated with care.
- When unplugging cords (MIDI, audio, power, etc.) from the TQ5, never unplug by pulling on the cords; this can result in damage to the TQ5 or the cords.
- After studying this manual thoroughly, keep it in a safe place for future reference.

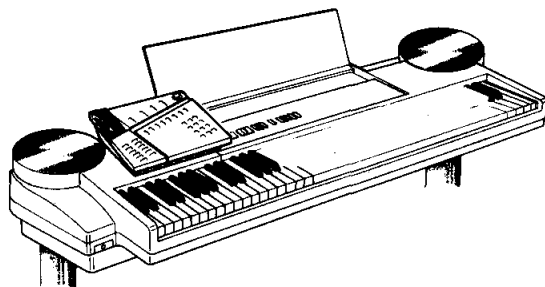
STARTING OUT

This chapter of the manual will guide you step by step as you use the TQ5 for the very first time. You will learn how to make all of the connections between the TQ5 and the rest of your equipment (including the MIDI keyboard or controller you are using).

Whether you've had experience using a MIDI-controlled tone generator before or not, we recommend that you take the time to read through this section so that you can follow these steps each time you set up and play your TQ5.

Before following any of the steps in this section, please read through the PRECAUTIONS chapter to ensure trouble-free operation and that the TQ5 will be in its optimum playing condition.

You'll find that the TQ5 fits securely and unobtrusively on top of most MIDI keyboards. The slightly slanted design of the control panel of the TQ5 makes it particularly easy to operate when placed on the left side of the controlling keyboard. The illustration below shows the TQ5 atop a Yamaha PF1500 Electronic Piano.



For more information on connecting your TQ5 to other MIDI instruments, additional setup suggestions and about MIDI in general, read the MIDI AND MIDI APPLICATIONS chapter of this manual.

SETTING UP

BASIC STEPS IN SETTING UP THE TQ5

To set up your TQ5 for playing (with a remote MIDI keyboard and an audio amplifier), follow these simple steps:

- 1) Connect all MIDI and audio cables to their appropriate terminals and jacks.
- 2) Connect all power cords to appropriate electrical outlets.
- 3) Turn on the power of the equipment in the following order: a) MIDI keyboard, b) TQ5, c) audio amplifier.
- 4) Make the appropriate MIDI settings on both the TQ5 and the MIDI keyboard.

Here, in more detail, is how to perform the above steps:

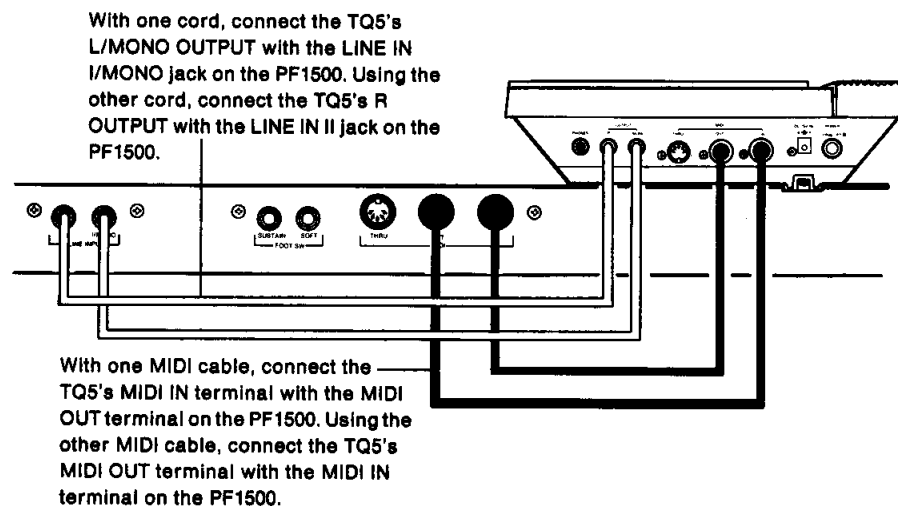
Note:

The following instructions refer specifically to use with the Yamaha PF1500 Electronic Piano. In this setup, the keyboard of the PF1500 is being used to play the voices of the TQ5, and the sequencer of the TQ5 is being used to control the voices of the PF1500. If you are using other MIDI keyboards/instruments/controllers, please refer to the owner's manuals of those devices for particular setup information.

- 1) Connect all MIDI and audio cables to their appropriate terminals and jacks. For this basic setup, you'll need the following cables:
 - a) 2 MIDI cables
 - b) 2 shielded audio cables, with 1/4" phone jack connectors

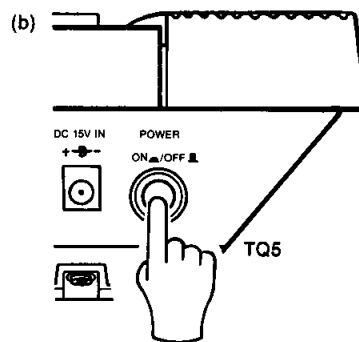
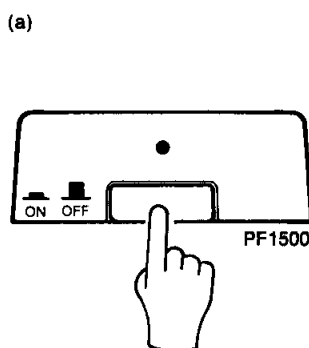
Having a pair of cables for each set is not absolutely necessary for operation, but we recommend this to take greatest advantage of the TQ5's MIDI functions and stereo capability.

Make the connections as shown in the illustration below.



In this example, the TQ5's voices will be heard through the speakers of the PF1500, along with the sound of the PF1500 itself. You can, however, connect the audio outputs of the TQ5 directly to an audio mixer and/or amplification system for playing it separately from the PF1500.

- 2) Connect all power cords to appropriate electrical outlets.
Connect the AC power cords of all equipment to AC electrical outlets of the same voltage rating. Consult your local Yamaha dealer if you have any doubts about voltage suitability.
- 3) Turn on the power of the equipment in the following order: a) MIDI keyboard, b) TQ5, c) audio amplifier.



You should always follow the above order when turning on the power of your audio equipment. The rule of thumb is to turn on your amplification system at the very last and then bring the various volume controls to a comfortable listening level. The rationale behind this is to ensure that whatever amplifier/speaker system you are using will not be damaged by any sudden sounds from the connected synthesizers. Turning on the connected MIDI equipment after the TQ5 may result in an error message on the TQ5. For this reason, it's best to turn the TQ5 on after all other connected MIDI equipment.

Note:

Inserting or removing a RAM memory card while the power is turned on may result in partial damage or complete deletion of voice data stored in the card. For this reason, insert or remove your RAM memory card from the CARD slot while the power is turned off.

Note:

The TQ5 is also equipped with an clock/calendar function. It is automatically displayed upon power on, or when no buttons have been pressed (nor any MIDI data, other than Active Sensing and clock, has been received) for one minute or longer.

When you turn on the power of the TQ5, the following display will briefly appear:

```
====< YAMAHA Tone Generator TQ 5 >====  
***** 12:00'15 '88-11-13 Sunday *****
```

The bottom line of the display shows the current time (in 24-hour format), the date and the day of the week.

If you leave the TQ5 on for one minute or longer without pressing any buttons on the panel, or without transmitting any MIDI data (with the exceptions of Active Sensing and clock) to it the following display will appear:

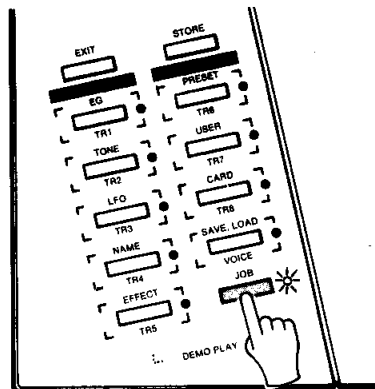
```
19:30 15 '88-12-25 Friday hit any key
```

To return the TQ5 to normal operation, press any key on the panel. The display will return to whatever condition or function was last selected.

For more information about the clock/calendar and how to set it, refer to the CLOCK/CALENDAR section in the SYNTHESIZER REFERENCE chapter.

- 4) Make the appropriate MIDI settings on both the TQ5 and the MIDI keyboard.
Since setting of the MIDI channels and other MIDI functions can be a fairly confusing affair to the uninitiated, we've kept things as simple as possible in this setup with the PF1500. All you have to do is:

- a) Press **JOB** on the front panel. Its red LED will light up.



PLAYING THE TQ5

If you've followed all the above steps properly, you can begin playing your TQ5.

When you first turn on the power to your new TQ5, Preset voice #00, Elegant, will be automatically selected and the following display will appear:

```
PLAY) PRESET VOICE   Tuning  Note shift
No.00   Elegant       +00    +00
```

Note:

Whenever you turn on the power, the TQ5 will, after a short warm-up, be set to the voice (or sound program) that was last selected, before the instrument was last turned off.

Adjust the volume using the rotary volume control. After playing this sound for a while, go on to the next section and explore some of the other sounds of the TQ5.

SELECTING PRESET VOICES

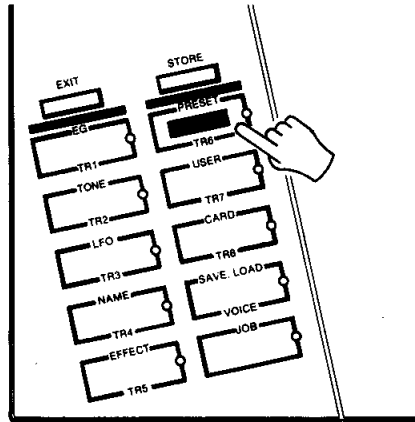
VOICE LIST

00	Elegant	25	FloatChime	50	Guitar 1	75	Sax 1
01	SoftBrass	26	Daybreak	51	Guitar 2	76	Sax 2
02	WideString	27	Tinkle	52	E. Guitar 1	77	Oboe 1
03	Cosmic	28	SandBell	53	Harp 1	78	Clarinet
04	LargePipes	29	Suspense	54	Koto	79	Flute
05	SynString 1	30	Fog	55	Marimba	80	Recorder
06	FolkGuitar	31	HuskyVoice	56	Violin 1	81	Harmonica 1
07	Plano 1	32	Swirlies	57	Cello 1	82	Whistle
08	E.Piano 1	33	HuskyChoir	58	CelloEns.	83	Castanet
09	DistGuitar	34	PluckBrass	59	UprightBass	84	Triangle
10	SoftString	35	AngelChoir	60	E.Bass 1	85	BellTree
11	SynString 2	36	FluteVoice	61	E.Bass 2	86	Referee
12	RichString	37	SmallPipes	62	SynBass 1	87	SteelDrum 1
13	SynBrass 1	38	E.Organ 1	63	SynBass 2	88	SteelDrum 2
14	SynBrass 2	39	E.Organ 2	64	SynBass 3	89	Ricochet
15	SynBrass 3	40	Piano 2	65	SynBass 4	90	Zapl
16	BrethBrass	41	E.Piano 2	66	SynBass 5	91	Shwhapl
17	SoftEns.	42	WireBrass	67	NasalLead	92	PoundWood
18	WarmEns.	43	EasyClav	68	SolidLead	93	OilDrum
19	OrchesEns.	44	FunkyClav	69	ClarLead	94	SynSnare
20	Sunbeam	45	Harpshchrd	70	Trumpet 1	95	DragonHit
21	Shimmer 1	46	Vibe	71	TightBrass	96	DuneHit
22	SoftCloud	47	Celeste	72	Trombone 1	97	Warp
23	Bamarimba	48	TubeBell	73	Horn 1	98	IceAge
24	Sandarimba	49	MusicBox	74	Horn 2	99	Encore

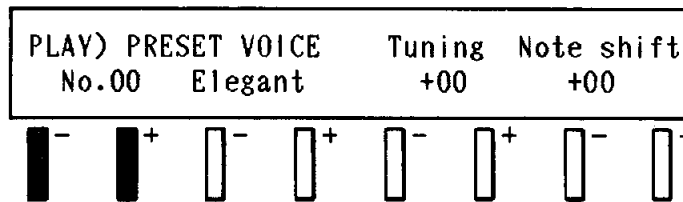
The TQ5 has 100 different voices that are stored in its internal Preset memory, and we're sure that you'll want to begin exploring those voices as soon as you turn the TQ5 on.

To select a Preset voice:

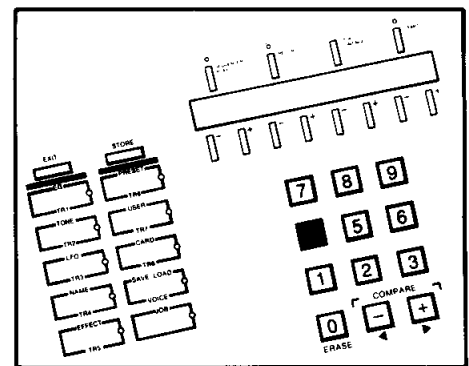
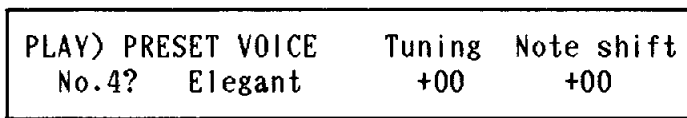
- 1) Press the **PRESET** button.



- 2) Use the left most pair of **+/- SELECTOR** keys (under the voice number) to step up or down to the desired voice. (The **- SELECTOR** key decreases the Preset voice number by one, while the **+ SELECTOR** key increases it by one.) Holding down either **SELECTOR** key causes the Preset voice numbers to advance rapidly in either direction.

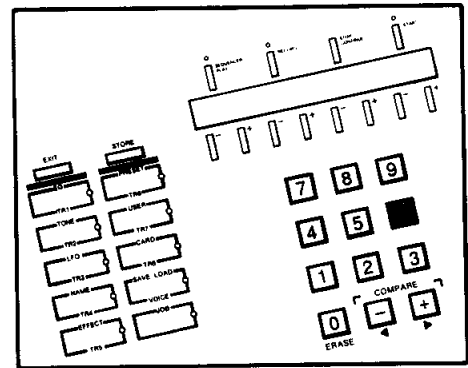


- The cursor left and cursor right keys can also be used to select voices, in the same way as the leftmost **+/- SELECTOR** button pair is used.
- You can also use the numeric keypad to select a Preset voice. Press the first digit of the Preset voice you wish to select. (As an example, let's select Preset voice #46, Vibe.) The display shown below will appear:



- The question mark after the number 4 indicates that you must press one more number on the numeric keypad to finally select the desired voice. So, press 6 to select voice #46.

PLAY)	PRESET VOICE	Tuning	Note shift
No.46	Vibe	+00	+00



That's all there is to it.

Now let's move on to the next section and make some changes in the sounds of some of the voices.

Note:

Some voices (among which include #47 Celeste, #49 MusicBox and #81 Harmonica1) have repeating octaves in the highest ranges; on voice #47 for example, playing C5 on your connected keyboard results in the same pitch as when playing C4.

OPERATION BASICS

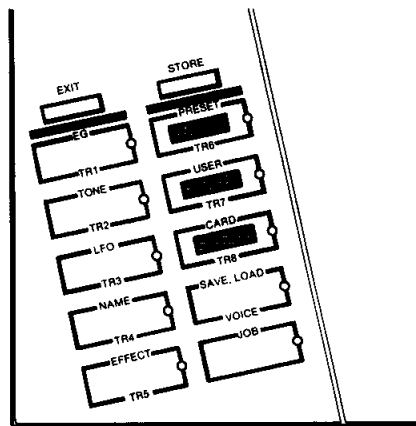
This chapter of the manual will guide you through the TQ5's basic operations. Here you will learn how to edit Preset voices, name and store the voices you create, select and edit effect settings for your voices, and use some of the card operations of the instrument. You will also learn how to use the sequencer portion of the TQ5, both by playing specially prepared demonstration songs, and by recording your own song.

ABOUT THE CONTROLS Let's begin this chapter by introducing you to some of the controls you will be using.

THE PLAY BUTTONS

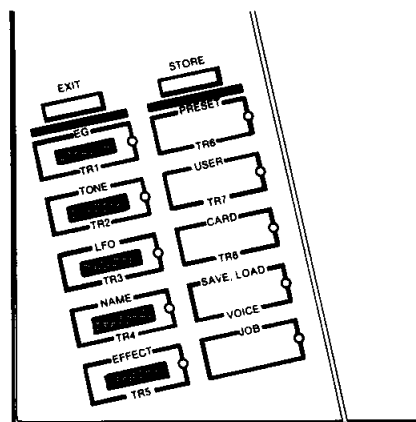
The **PLAY** buttons, labeled in purple, are used to select voices from the three different memory locations: PRESET, USER, and CARD. USER and PRESET are internal memory storage locations and can be selected at any time. CARD can only be used when a RAM or ROM card is inserted in the CARD slot. Each button has an LED which lights up in red when the button is pressed.

Try pressing each of the buttons in turn and notice what happens, both on each button's LED and the display.



THE EASY EDIT BUTTONS

There are five buttons in the **EASY EDIT** button column: **EG**, **TONE**, **LFO**, **NAME**, and **EFFECT**. The name "EASY EDIT" is appropriate since these buttons allow you to easily alter the character of a voice to your liking. As with the **PLAY** buttons, each has an LED which lights up in red when the button is pressed. Press each of these buttons in turn, as you did with the **PLAY** buttons above, and notice what happens.



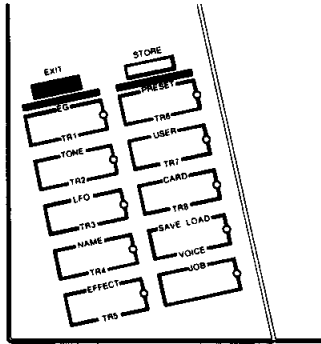
THE EXIT KEY

Pressing the **EXIT** button allows you to return to the last selected voice, regardless of the operation you are doing. You may, for example, be recording a song using the sequencer and suddenly decide to edit a voice you wish to use; a press of the **EXIT** button will return you to the voice you last selected, whether it is a Card, User,

or Preset voice.

Note:

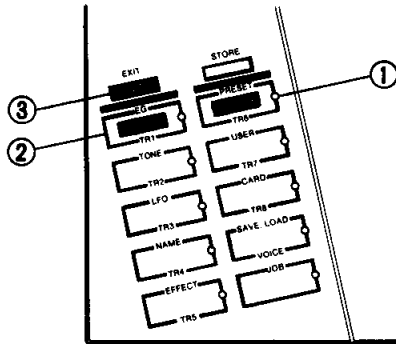
Pressing the **EXIT** button is the **ONLY** way (except for turning the power switch off and on again) to go from Sequencer operation to Synthesizer operation.



When you are using any of the **EASY EDIT** buttons to change the sound of a voice, the **EXIT** button also allows you to cancel those changes and return to the voice's original sound.

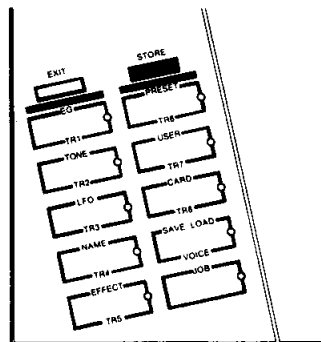
Watch how the display changes as you try the following steps:

- 1) Press the **PRESET** button.
- 2) Press the **EG** button.
- 3) Press the **EXIT** button. The display will be the same as you saw in step #1.



THE STORE BUTTON

This button allows you to store a voice to either the internal user memory or a RAM card. Pressing the **STORE** button while in any operation will let you store the currently selected voice to a chosen memory location.

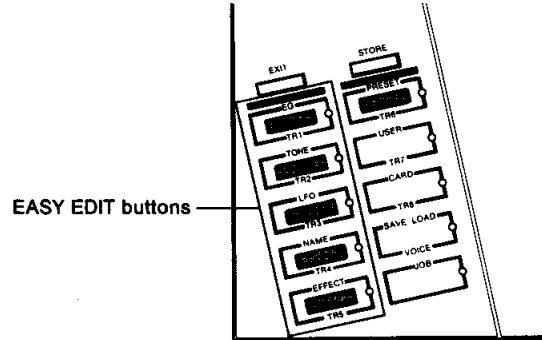


Now that you know something about some of the controls, let's actually begin using them!

EDITING THE VOICES

CHANGING THE SOUND OF A PRESET VOICE

Changing the sound of a voice — a process we'll call "editing" — is very simple. First, make sure that a Preset voice has been selected by pressing the **PRESET** button. Then, press the appropriate **EASY EDIT** buttons and change the values shown in the display.



Now it's time for you to create your own voice by editing a Preset voice.

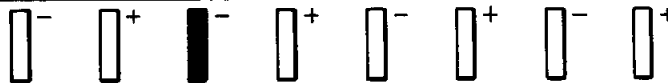
Try this:

- 1) Press **PRESET**. Its red LED should light up. Then use the numeric keypad to select voice #71, TightBrass.
- 2) Press the **EG** button. The red LED at the top of the button will light to indicate that the function is active. The following display will appear:

```
EDIT) EG  -Attack-  --Decay-  -Release-
vol+tone   +00      +00      +00
```

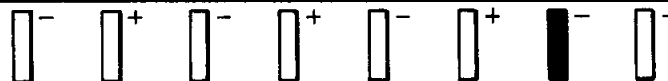
- 3) By using the four pairs of **+/- SELECTOR** buttons, you can edit the various EG parameters as shown in the display. For now, let's use the pair directly under the Attack parameter. Press and hold the **- SELECTOR** button until the Attack parameter's value is **-06**. (You can also use the numeric keypad to enter the value directly.) Play the voice now and notice the difference in how the sound starts when you press a key.

```
EDIT) EG  -Attack-  --Decay-  -Release-
vol+tone   -06      +00      +00
```



- 4) You can edit the release time by using the **+/- SELECTOR** buttons directly under — you guessed it — the Release parameter. Set this value to **-05** by holding down the **- SELECTOR** button and listen to the new sound you've created.

```
EDIT) EG  -Attack-  --Decay-  -Release-
vol+tone   -06      +00      -05
```



- 5) You can also compare your new sound with the Preset sound, listening to both in turn. Try this now. Firmly and simultaneously, press down the + and - keys on the numeric keypad (also labeled as the COMPARE keys). Notice that the LEDs of the bottom four **EASY EDIT** buttons flash in red. Play the sound. Do you recognize it? It's the one you started with, the sound before you began editing. To return to the sound you created in step #4 above, press the COMPARE keys together again. The LEDs will stop flashing and you can hear your new sound once again.

Note:

You may find that some parameter value displays are accompanied by an exclamation mark ("!") when edited beyond a certain value. This means that the actual parameter indicated does not change when adjusted to this value or beyond. Though the number (value) can be changed, the sound cannot.

CHANGING THE TONE SETTINGS OF A VOICE

There are three Tone parameters: Brilliance, Wave, and Input-4Nos!. By changing these you can determine the quality of the voice—whether it sounds harsh or mellow, thin or full, metallic or breathy.

The changes you made in the section above had some affect on the tone of the voice, but let's alter the tone even further here.

Try this:

- 1) Using the same voice as before (#71, TightBrass) and keeping the changes you made, press **TONE**.

EDIT)	TONE	Brilliance	Wave	Input-4Nos!
		+00	+00	0663
⁻	⁺	█ ⁻	⁺	⁻
⁻	⁺	⁻	⁺	⁻

- 2) Press and hold the - **SELECTOR** button directly below "Brilliance" in the display until the value is -08. Play the voice now to hear how it's changed.
- 3) Now, make a more dramatic change in the sound by pressing the + **SELECTOR** button directly below "Wave" in the display.

EDIT)	TONE	Brilliance	Wave	Input-4Nos!
		-08	+01	0663
⁻	⁺	⁻	█ ⁺	⁻
⁻	⁺	⁻	⁺	⁻

Notice that the voice has become more bell-like and has taken on a second pitch. If you like this sound, keep it and go on to the next section. If the voice sounded better to you before you changed the Wave parameter, press the - **SELECTOR** button directly below "Wave" to return the value to 00.

CHANGING THE LFO SETTINGS OF A VOICE

The initials LFO stand for Low Frequency Oscillator. Don't let the terminology intimidate you; this is just a fancy name for the method in which effects like vibrato and tremolo are created for synthesizer voices.

Vibrato and tremolo are age-old musical techniques used for both acoustic instruments and voice (the human kind!). A violinist, for example, rapidly moves his hand back and forth while holding a note in order to slightly waver the pitch. This is called vibrato, and in small amounts it gives the instrumental tone greater depth and an-

imation. Tremolo is a similar effect, except that the volume of the sound varies, not the pitch. The LFO makes it possible to imitate these acoustic effects, or to create even wilder, more obviously electronic sounds.

- By now, you're undoubtedly using the TQ5's functions with ease, so we'll just briefly introduce you to the parameters of the LFO and let you go exploring on your own!

- 1) Select a Preset voice and press **LFO**.
- 2) Change the three parameters one by one and listen to the effect created.

EDIT) LFO	Speed	Vibrato	Tremolo
	31	14	00
<input type="checkbox"/> - <input type="checkbox"/> +	<input checked="" type="checkbox"/> - <input checked="" type="checkbox"/> +	<input checked="" type="checkbox"/> - <input checked="" type="checkbox"/> +	<input checked="" type="checkbox"/> - <input checked="" type="checkbox"/> +

- **SPEED** (0 — 99)
This controls how fast the LFO varies the pitch or volume.
- **VIBRATO** (0 — 99)
This controls how deep the pitch variation will be.
- **TREMOLO** (0 — 99)
This controls how deep the volume variation will be.

CHANGING THE EFFECT SETTINGS OF A VOICE

The **EFFECT** section of the **EASY EDIT** Modes is one of the most dramatic. With the right effect, applied in the right amount, your voices can sound more dynamic and professional.

You'll learn more about effects and how to edit them to your liking in the **SYNTHESIZER REFERENCE** chapter of this manual. For the moment though, let's select a voice and use a few different effects on it so that you can see just how powerful this function can be.

Try this:

- 1) Using the same voice you've been editing, press **EFFECT**.

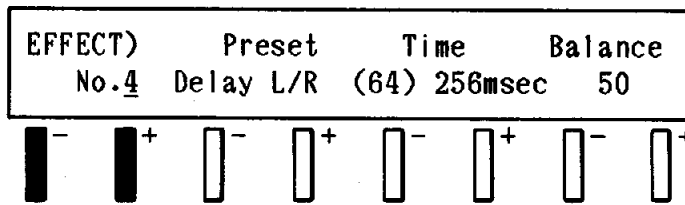
EFFECT)	Preset	Time	Balance
No. 1	Rev. Room	(12) 1.5sec	41

- 2) Press and hold down the **+ SELECTOR** button directly below "Time" in the display until the value is 2.6sec.

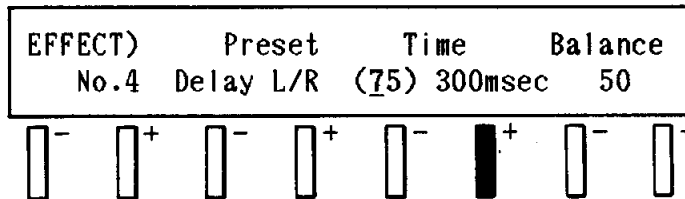
EFFECT)	Preset	Time	Balance
No. 1	Rev. Room	(20) 2.6sec	41
<input type="checkbox"/> - <input type="checkbox"/> +	<input type="checkbox"/> - <input type="checkbox"/> +	<input type="checkbox"/> - <input checked="" type="checkbox"/> +	<input type="checkbox"/> - <input type="checkbox"/> +

Play the voice again. You'll notice that it sounds as if it was being played in a spacious concert hall.

- 3) Using the leftmost **+/- SELECTOR** button pair, change the effect setting to #4, Delay L/R.



- 4) Press and hold down the + **SELECTOR** button directly below "Time" in the display until the value is 300msec.



Play the voice. This time the sound has definite echoes that rebound across the stereo image, adding greater interest and depth to the voice.

- 5) Change the effect setting once more, this time to # 7, Dist. (Distortion) + Echo. The definite echoes heard in the last effect are in this one as well, but there is a harder edge to the sound—the result of distortion—which makes the voice sound somewhat like the sustained tones of a heavily distorted guitar, especially when played in the middle octaves.

You can see that the **EFFECT** Mode is musically useful and adds tremendous depth to the already impressive sounds of the TQ5. Take some time and explore the other effect settings with other preset voices.

NAMING AN EDITED VOICE

Once you have edited a Preset voice to your liking, you'll probably want to give that newly edited voice a name and save it so that you can select it and play it again at any future time.

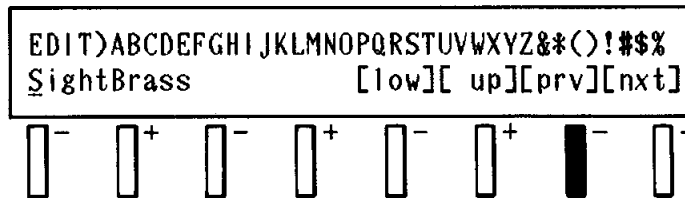
Now, let's change the name of the voice we've been editing from "TightBrass" to "Slow organ."

Try this:

- 1) Press **NAME** of the **EASY EDIT** buttons. Its red LED will light up and the following display will appear:



- 2) Press — just one time — the - **SELECTOR** button directly under [prv] (previous) in the display.



You've just changed the first letter in the name (at the bottom left of the display) from "T" to "S."

- 3) Now, let's change the second letter of the name from "i" to "l." First move the cursor under the first letter of the name by pressing the + **SELECTOR** button directly under the voice name.

```

EDIT)abcdefghijklmnopqrstuvwxyz/:;?=',.
S_ightBrass      [low][ up][prv][nxt]
|^-  |^+  |^-  |^+  |^-  |^+  |^-  |^+

```

The top line of characters will have changed to lowercase (since the second letter was originally entered in lowercase) and you can now change the second letter.

- 4) Using the + **SELECTOR** button directly under [nxt] (next) in the display, move the cursor in the top line of characters until it covers the letter "l."

```

EDIT)abcdefghijklmnopqrstuvwxyz/:;?=',.
S_lightBrass     [low][ up][prv][nxt]
|^-  |^+  |^-  |^+  |^-  |^+  |^-  |^+

```

Notice again that the letter in the name automatically changes when you press or hold the either of the +/- **SELECTOR** buttons under [prv] and [nxt].

- 5) Change the next two letters of the name to "o" and "w" to finish the word "Slow" of "Slow organ." Do this in the same way that you changed the first two letters of the name in steps #2 through #4 above: Use the +/- **SELECTOR** buttons under the name to advance or move back the cursor to the proper position, and press the +/- **SELECTOR** buttons under [prv] and [nxt] in the display to select the desired character.

```

EDIT)abcdefghijklmnopqrstuvwxyz/:;?=',.
Slow_tBrass     [low][ up][prv][nxt]
|^-  |^+  |^-  |^+  |^-  |^+  |^-  |^+

```

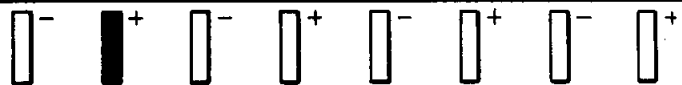
- 6) To enter a space after the word "Slow," move the cursor in the top line to the far right of the display (with the +/- **SELECTOR** buttons under [prv] and [nxt]) and press the + **SELECTOR** button under the name to advance the name cursor to the next position.

```

EDIT)abcdefghijklmnopqrstuvwxyz/:;?=',.
Slow_ Brass     [low][ up][prv][nxt]
|^-  |^+  |^-  |^+  |^-  |^+  |^-  |^+

```

```
EDIT) ABCDEFGHIJKLMNOPQRSTUVWXYZ&*()!#$%
Slow Brass [low][up][prv][nxt]
```



7) Next, let's enter a lowercase "o" to begin the word "organ." Though the top line of characters is already set to capital letters, you can change it by pressing one of the +/- **SELECTOR** buttons directly under [low] and [up] in the display. To change the case from capital ([up]) to lower ([low]), press the - **SELECTOR** button directly under [low] in the display.

```
EDIT) abcdefghijklmnopqrstuvwxyz/;:?'',.
Slow brass [low][up][prv][nxt]
```



8) Using the + **SELECTOR** button directly below [nxt], select the letter "o."

```
EDIT) abcdefghijklmnopqrstuvwxyz/;:?'',.
Slow orrass [low][up][prv][nxt]
```



9) Continue with the remaining letters of the name "organ" by following the directions in step #5 above.

```
EDIT) abcdefghijklmnopqrstuvwxyz/;:?'',.
Slow organ [low][up][prv][nxt]
```

Note:

Remember to always advance the cursor after selecting a character, otherwise the character will not be entered to the name. This includes the tenth character of a name; even though the cursor does not advance past the tenth space, you must press the leftmost + **SELECTOR** button once after selecting the character to actually enter it.

Note:

Since voice names can have a maximum of 10 characters, exercise a little creativity and judgement when naming voices. Try to be as descriptive as possible — it's much easier to remember how "Glass Bell" and "Bell Mute" sound than "Bell 1" and "Bell 2."

STORING AN EDITED VOICE

Once you've edited a voice to your satisfaction or made any changes that you wish to keep, you should store that voice to a memory location so that you can retrieve it whenever you need it. Keep in mind that until you actually store the changes that you made, all changes will be lost when you press the **EXIT** button, or the **Sequencer/Play** or turn off the power on the TQ5. The TQ5 has space in its internal User memory for 100 user-programmed voices, and optional RAM cards are also available for storing 100 voices.

Note:

Voices CANNOT be erased from Preset memory. Nor can newly edited voices be stored to a Preset memory location. To keep a newly edited Preset voice, you must store the edited voice to a User or Card memory location.

Let's store the "Slow organ" voice you created in the above sections to User memory.

Try this:

- 1) Directly after making the edits in the sections above (DON'T press the **EXIT** button or turn the power off!), press **STORE**.

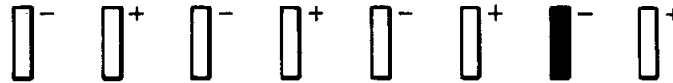
```
Store<Slow organ>to   Memory   Protect
71<TightBrass>?[yes]  user      on
```

- 2) Select the destination number to which the voice will be stored by using the numeric keypad. Any destination number will do; however, since this is your first edited voice, press 0 on the numeric keypad twice to call up voice No. 00 in the display.

```
Store<Slow organ>to   Memory   Protect
00<Elegant  >?[yes]  user      on
```

- 3) Press the rightmost - **SELECTOR** button (directly below the "Protect" parameter) to cancel the memory protect function. When this is set to ON, voices cannot be stored.

```
Store<Slow organ>to   Memory   Protect
00<Elegant  >?[yes]  user      off
```



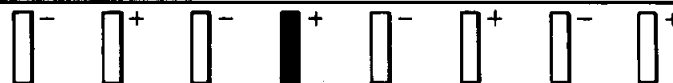
- 4) Press the - **SELECTOR** button directly below the "Memory" parameter to select User memory.
- 5) Now that you've set the memory type and destination number AND disabled the memory protect function, press the + **SELECTOR** button directly below [yes] in the display.

```
Store<Slow organ>to   Memory   Protect
00<Elegant  >?Sure?  user      off
```



- 6) Press the same + **SELECTOR** button, under the "Sure?" prompt in the display to finally store the voice.

```
Store<Slow organ>to   Memory   Protect
00<Completed!>?     user      off
```



Note:

The **STORE** button should be used immediately after editing a voice, if you want to keep that voice. Pressing some of the other buttons (**EXIT** in particular) may cause you to lose your edits.

Keep on experimenting with the **EASY EDIT** features. Use them with different Preset voices before you go to the next section, and when you come upon some combinations that you like, store them to User memory, as you did above.

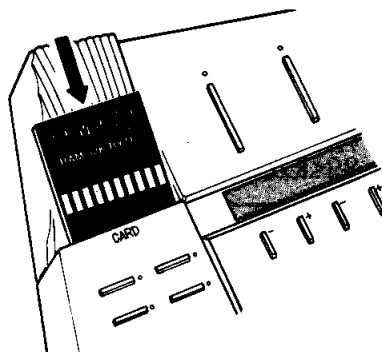
CARD OPERATIONS

In addition to the User and Preset voices, voices from memory cards are also available. Specially designed cards (ROM cards) can optionally be purchased, each with 100 voices created by expert programmers. If you have such a ROM card for the TQ5, here's how to use it and listen to some of its voices. (Also optionally available is the MCD32 RAM card for storing your own original voice data.)

SELECTING CARD VOICES

Try this:

- 1) Insert the ROM card into the **CARD** slot on the top left of the front panel. Gently slide it in face up until it is securely seated in the slot.



- 2) Press **CARD**.

```
PLAY) CARD  VOICE  Tuning  Note shift
No.00  Syn.Str 1   +00    +00
```

The above display should appear and you should now be ready to select and play the Card voices. If you haven't inserted a Card, or if you've improperly inserted the Card, the following display will appear:

```
PLAY) CARD  VOICE  Tuning  Note shift
*ERROR* Not ready!---Please insert card!
```

Carefully repeat steps #1 and #2 above to remedy the problem.

- 3) Now, select Card voices in exactly the same way you selected Preset voices (as described in the **STARTING OUT** chapter).

STORING CARD VOICES TO USER MEMORY

Let's take one of the Card voices now and store it to the internal User memory.

Try this:

- 1) Select the Card voice you wish to store. For our example, let's select voice No. 89, E.Organ 1. Press **CARD**, then enter 89 on the numeric keypad.

PLAY) CARD	VOICE	Tuning	Note shift
No.89	E.Organ 1	+00	+00

- 2) Press **STORE**.

Store<E.Organ 1>to	Memory	Protect
89<Ricochet >?[yes]	user	on

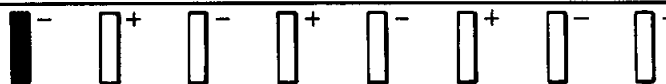
Note:

After pressing **STORE**, you can also use the leftmost + / - **SELECTOR** button pair to select the Card voice.

Try this:

- a) Following step #2 above, press the leftmost - **SELECTOR** button.

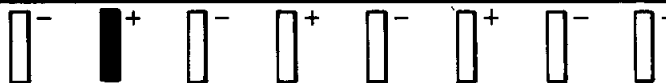
Store<Harmonica >to	Memory	Protect
89<Ricochet >?[yes]	user	on



Notice that the voice on the top line (the voice that will be stored) changed from "E.Organ 1" to "Harmonica."

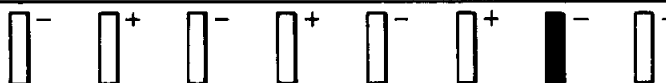
- b) Change the voice back to "E.Organ 1" by pressing the + **SELECTOR** button directly below the voice name in the display.

Store<E.Organ 1>to	Memory	Protect
89<Ricochet >?[yes]	user	on



- 3) Press the rightmost - **SELECTOR** button (directly below the "Protect" parameter) to cancel the memory protect function. When this is set to ON, voices cannot be stored to User memory.

Store<E.Organ 1>to	Memory	Protect
89<Ricochet >?[yes]	user	off



- 4) Press the - **SELECTOR** button directly below the "Memory" parameter to select User memory, if it hasn't already been selected.

- 5) Select the user memory number to which you want to store the card voice. Since we've already stored one voice to User memory voice No. 00, let's select the next available memory space, No. 01.

Note:

You can do this in one of two ways: by using the cursor left and cursor right keys (to step forward or backward through the voice numbers), or by using the numeric keypad (to directly enter the voice number).

Try this:

- a) Let's use the "step" method first. Press and hold down the left cursor key until voice No. 01 appears in the display. Since the voice numbers change quite rapidly, you may miss it and go all the way down to No. 00. If you do, simply press the right cursor key to step forward to No. 01.

Store<E.Organ 1>to Memory Protect
01<SoftBrass >?[yes] user off

- b) Alternatively, you can directly enter the number of the voice number on the numeric keypad. Press 0 twice to change the voice to No. 00.

Store<E.Organ 1>to Memory Protect
00<Elegant >?[yes] user off

Return to No. 01 by pressing the right cursor key or by entering 01 on the numeric keypad.

- 6) To store the voice to No. 01, press the + **SELECTOR** button directly below [yes] in the display.

Store<E.Organ 1>to Memory Protect
01<SoftBrass >?Sure? user off



- 7) Press the same + **SELECTOR** button, under the "Sure?" prompt in the display to complete the operation.

Store<E.Organ 1>to Memory Protect
01<Completed!>? user off



- 8) Now, simply press the + **SELECTOR** button below [yes] to execute the store operation.

SAVING VOICES TO MEMORY CARDS

You can also store voices to Card memory. However, the ROM card that you used to select voices from in the above operations cannot be used to store voices. For this you need a special kind of card — a memory card. You can find out more about memory cards in the SYNTHESIZER REFERENCE chapter. Memory cards allow you to store sequencer songs as well as voices, a feature you'll find out more about in the SYNTHESIZER REFERENCE chapter.

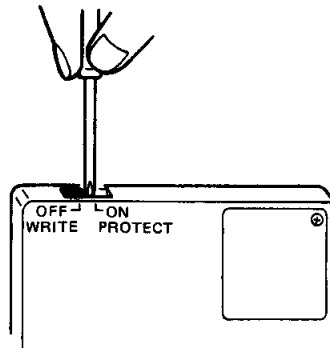
Note:

Inserting or removing a RAM memory card while the power is turned on may result in partial damage or complete deletion of voice data stored in the card. For this reason, insert or remove your RAM memory card from the CARD slot while the power is turned off.

If you have a RAM memory card, use it now for storing your original voice (No. 00, Slow organ).

Try this:

- 1) Set the WRITE PROTECT switch on the RAM memory card to OFF. Use a sharp-pointed tool such as a small screwdriver.



- 2) Insert the RAM memory card in the CARD slot (before turning the power on).

Note:

Before you can store voices to a new RAM memory card, it must be formatted. Formatting makes it possible for the TQ5 to write and read information on the card. There are two available formats: Voice and Sequencer. To save voices to a RAM memory card, you must format the card to Voice.

Try this:

- a) Press **SAVE,LOAD**.

To Card? From Card? Format <YS S/V>?
 [yes] [yes] for seq [yes]

- b) Press the **- SELECTOR** button directly under "Format" in the display, to select formatting for voice.

To Card? From Card? Format <YS S/V>?
 [yes] [yes] for voice [yes]



c) Press the rightmost + **SELECTOR** button (directly below the rightmost [yes] in the display).

To Card?	From Card?	Format	<YS S/V>?
[yes]	[yes]	for voice	Sure?[yes]

- + - + - + - +

d) Press the rightmost + **SELECTOR** button again to complete the formatting operation.

To Card?	From Card?	Format	<YS S/V>?
[yes]	[yes]	for voice	Completed!

- + - + - + - +

Now that the RAM card is formatted properly, you can go on to the following steps and store a voice to it.

3) Press **USER**.

PLAY) USER	VOICE	Tuning	Note shift
No.00	Slow organ	+00	+00

4) If a voice other than No. 00 shows in the display, select voice No. 00 manually. Use the leftmost +/- **SELECTOR** button pair or the cursor left and cursor right keys to step to the voice, or enter the voice number directly on the numeric keypad.

5) Press **STORE**.

Store<Slow organ>to	Memory	Protect
00<Slow organ>?[yes]	user	on

6) Press the + **SELECTOR** button directly below the "Memory" parameter to select Card memory, if it hasn't already been selected.

Store<Slow organ>to	Memory	Protect
00<Syn.Str 1>?[yes]	card	on

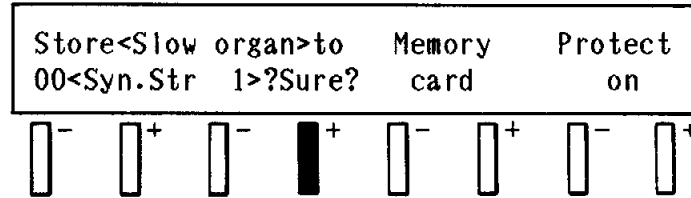
- + - + - + - +

The above display should appear and you should now be ready to store the voice to the RAM card. If you haven't inserted a Card, or if you've improperly inserted the Card, the following display will appear:

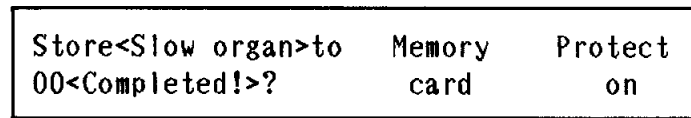
Store<Slow organ>to	Memory	Protect
00<check card>?[yes]	card	on

Repeat step #2 carefully, followed by steps #5 and #6, to remedy the problem.

7) To store the voice to card memory voice No. 00, press the + **SELECTOR** button directly below [yes] in the display.



8) Press the same + **SELECTOR** button, under the "Sure?" prompt in the display to complete the operation.



9) Finally, reset the the WRITE PROTECT switch on the RAM memory card to ON, in order to avoid erasing your recently stored voice.

The **SAVE, LOAD** button can also be used to carry out similar card operations. However, it is far more powerful — and potentially more destructive — than the **STORE** button. More powerful, because you can copy a whole card's contents into User memory at one time. More destructive, because in doing so, you erase whatever voices were in User memory originally.

Use the **STORE** button for the time being; it's safer and, initially, you probably won't need to throw 100-voice groups back and forth between Card and User memory. When you DO need to, though, you can find out more about the **SAVE, LOAD** button in the SYNTHESIZER REFERENCE chapter.

DEMONSTRATION SONG PLAY

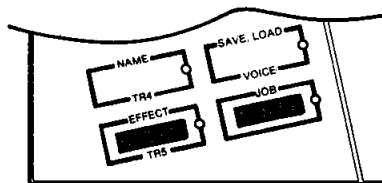
The TQ5 also is capable of playing specially prepared demonstration songs. Three such songs have been loaded into the internal memory and more can be played from current and soon-to- be-released ROM Voice Data cards.

The demonstration songs in both internal and Card memory should amply illustrate the powerful multi-voice capabilities of the TQ5.

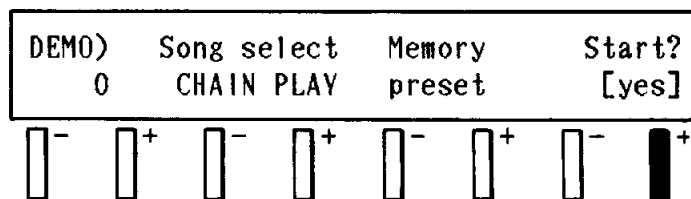
Let's play the Preset memory's demonstration songs.

Try this:

1) Press **EFFECT** and **JOB** simultaneously.



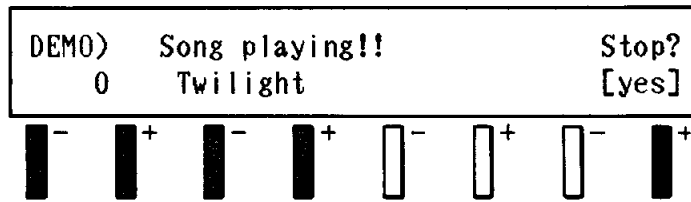
- | |
|---|
| Demonstration songs:
1. Twilight
2. BOPHOP
3. BeBallad |
|---|



2) The first selection ("CHAIN PLAY") automatically plays through the three demonstration songs in order, and repeats play indefinitely by pushing the rightmost

+ **SELECTOR** button (directly below "Start?" in the display) to play the demonstration songs.

- 3) The other selections allow you to play each of the songs individually. Select the song you wish to play with either the leftmost + / - **SELECTOR** button pair (directly below the song number) or the next + / - **SELECTOR** button pair (directly below the song name).



- 4) Press the rightmost + **SELECTOR** button (directly below "Start?" in the display) to play the selected song.
- 5) To stop playback at any point, press the same rightmost + **SELECTOR** button (directly below "Stop?" in the display).
- 6) To leave the demonstration song play function and return to normal operation, press **EXIT**.

Note:

Pressing the **EXIT** button is the only way, other than turning the power off and on, that you can return to other synthesizer and sequencer functions from demonstration song play.

Note:

With regard to the 3rd song, "BeBallad", the piano part is performed on an external tone generator. Connect the MIDI IN of the PF1500 to the TQ5's MIDI OUT (refer to "SETTING UP", page 7). Set the MIDI receive signal to channel 1, and after turning the OMNI to OFF, play the demo with the piano tone of your choice.

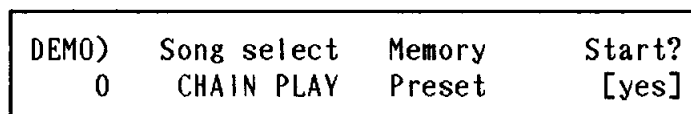
PLAYING DEMONSTRATION SONGS FROM CARD MEMORY

Yamaha's ROM Voice Data cards also have specially prepared demonstration songs that utilize various voices of the cards.

If you have a ROM Voice Data card, let's listen to the songs stored on it.

Try this:

- 1) Insert the card firmly and securely into the CARD slot (before turning the power on).
- 2) Hold down **EFFECT** and press **JOB**.



- 3) Press the + **SELECTOR** button directly below "Memory" in the display to select Card memory.
- 4) Select and play the songs in the same way described above in playing Preset memory songs (beginning with step #2).

Note:

The voices of the TQ5 cannot be played from the connected MIDI keyboard when the demonstration songs are being played.

Note:

These demonstration songs are in no way related to the TQ5 sequencer. Demonstration song data cannot be loaded or edited as sequence data.

THE SEQUENCER SECTION

Among the comprehensive features of the TQ5, one of the most impressive is the sequencer. In effect, it is like having a small recording studio right inside your synthesizer. With it you can record and play songs, using up to eight different voices of the TQ5, and even use it to play voices on other connected instruments.

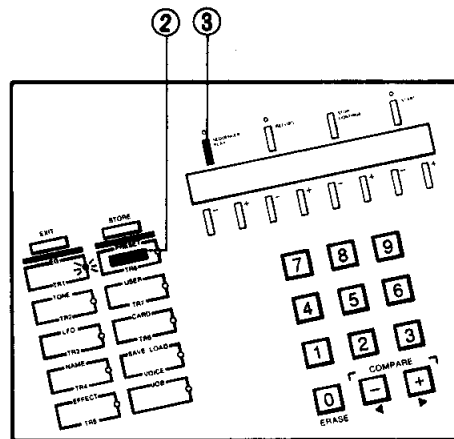
To get a basic idea of what the sequencer is capable of, take some time to explore the following sections.

RECORDING TO A SEQUENCER TRACK

In this section you'll record to the sequencer of the TQ5 from your connected MIDI keyboard. (In our example, as usual, we'll use the PF1500 Electronic Piano.)

Try this:

- 1) Make certain that all MIDI settings are correct for playing the voices of the TQ5 from your connected keyboard. (Refer to BASIC STEPS IN SETTING UP THE TQ5 in the SETTING UP section.)
- 2) Press **PRESET**. Doing this allows you to select voices in the next step from Preset memory. (Of course, User or Card may also be selected, but for our example, let's use the Preset voices.)



- 3) Press **SEQUENCER/PLAY**. The LED above the **SEQUENCER/PLAY** button will light up in red. The LED next to the **EG** button, which functions as the **TR1** (Track 1) button in the Sequencer Mode, lights up in green to indicate that Track 1 is ready for playback.

PLAY SONG)	Voice	Measure	Tempo
1:	P00:Elegant	001	120

- 4) Select a voice with which to record. A good, full-range voice to start out with is Preset voice No. 08, E.Piano 1. Select the voice by using the **+/- SELECTOR** button pair directly below the voice name in the display, or by entering the voice number directly on the numeric keypad.

PLAY SONG)	Voice	Measure	Tempo
1:	P08:E.Piano 1	001	120

- + - + - + - +

- 5) Press **RECORD**. The LED above the **RECORD** button will light up in red. The LED next to **TR1** will light up in red to indicate that Track 1 is ready for recording.

NORMAL REC)	Beat	Measure	Tempo
P08:E.Piano 1	4/4	001	120

- 6) If you've set up everything properly now, you're ready to record. Simply press **START** to begin recording. The LED above the button will light up in red. A metronome beep will begin after you press **START**, and will continue all the time you are recording to serve as a rhythmic guide while you play. The red LED above the **SEQUENCER/PLAY** button will also flash at the same rhythm as the metronome.

NORMAL REC)	Beat	Measure	Tempo
P08:E.Piano 1	4/4	-8	120

Recording doesn't begin immediately when you press **START**, however. The metronome will give you a two-measure lead-in before the sequencer actually records your play, in order that you can correctly anticipate the beginning of the first measure. The measure number in the display shows the number of beats remaining until recording begins, starting at -8 and counting down after **START** is pressed. The metronome beep has two pitches, high and low; the first beat of each measure is indicated by the high pitch and the rest of the beats by the low pitch.

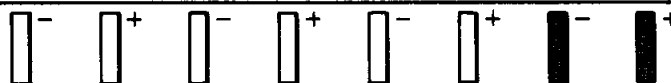
Note:

Before actually recording, you may want to set the tempo to a more comfortable or appropriate speed for your song. Rather than guess at the tempo number you want before recording, set the tempo while the sequencer is running so that you can "feel" your way to the right tempo.

Try this:

- Following steps #5 and #6 above, press and hold down the rightmost - **SELECTOR** button directly below "Tempo" in the display. The tempo will decrease as you do this, as will the tempo number shown in the display.
- To increase the tempo, press and hold down the rightmost + **SELECTOR** button directly below "Tempo" in the display.
- Once you've found the proper tempo by using the rightmost +/- **SELECTOR** button pair, press **STOP/CONTINUE**. The red LEDs above the **RECORD** and **START** buttons will turn off.

PLAY SONG)	Voice	Measure	Tempo
1:	P08:E.Piano 1	001	110



Since pressing **STOP/CONTINUE** cancels the record function and returns you Sequencer/Play operation, you'll have to:

- Press **RECORD** again, then **START**, to record at the newly set tempo.
- 7) To stop recording, press **STOP/CONTINUE**. The red LEDs above the **RECORD** and **START** buttons will turn off.

PLAYING BACK YOUR NEWLY RECORDED SONG

If you are still in the Sequencer Mode after recording (the LED above **SEQUENCER/PLAY** should be lit in red and the LED next to **TR1** should be lit in green), you're now ready to hear what you've just recorded.

Note:

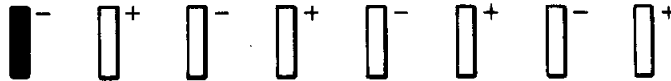
If you are not in Sequencer Mode, press **SEQUENCER/PLAY**.

PLAY SONG)	Voice	Measure	Tempo
1:	P00:Elegant	001	120

The voice number and name shown in the display may not be the one that you originally selected for the song. This has no effect on playback, however, and the originally selected voice will be heard (and displayed) when the song starts.

If also, for some reason, the song number displayed is something other than "1," your song will not play back.

PLAY SONG)	Voice	Measure	Tempo
2:	P00:Elegant	001	120



To return to song number 1, repeatedly press the leftmost – **SELECTOR** button (directly below the song number) until "1" appears in the display.

Let's play back your newly recorded song.

Try this:

- 1) Press **START** to begin playback.

PLAY SONG)	Voice	Measure	Tempo
1:	P08:E.Piano 1	001	120

Your song will begin playing from the first measure with the voice that you selected. The metronome beep will not be heard in playback, but the LED above **SEQUENCER/PLAY** will flash at the indicated tempo.

- 2) Press **STOP/CONTINUE** whenever you want to stop playback of the song.
- 3) To resume playback of the song from the point at which you stopped, press **STOP/CONTINUE** a second time.

To play back the song from the beginning after stopping it at any point, press **START**.

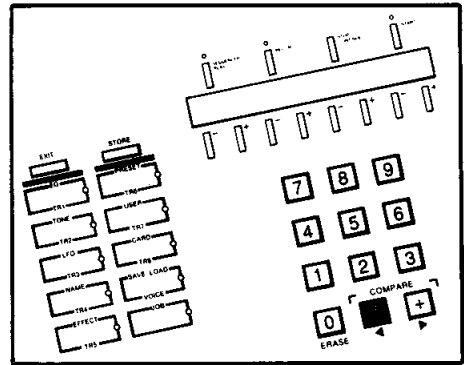
Note:

As the song plays, you'll notice that the measure number advances (just as it did in recording). In addition to the measure number indication in the display, however, there is also a unique stop watch feature. It can be turned on either in recording or playback.

Try this:

- a) While the sequencer is running, press the cursor right key on the numeric keypad.

PLAY SONG)	Voice	Total	Tempo
1:	P08:E.Piano 1	00'09 2	120



The stop watch feature is now displayed, with the total time of the song indicated in minutes, seconds and 1/10 seconds.

b) Press **STOP/CONTINUE** to stop both the watch and song playback.

The stop watch time is cumulative; in other words, it continues to run from the point at which it was last stopped, even if the song plays to its conclusion once and is played back again.

For example, if your song is 32 seconds in length, playing it back twice will result in a stop watch reading of 64 seconds.

c) You can reset the stop watch to zero at any time (even while it is running) by pressing the cursor left key on the numeric keypad.

CHANGING VOICES AND MAKING EFFECT SETTINGS IN YOUR SONG

The song that you just finished recording and listening to already has a specific voice assigned for playback. However, you don't need to keep that voice. Any voice in the selected memory type can be used for playback and you can even change the voice during playback.

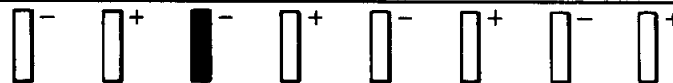
Try this:

1) While in the Sequencer Mode, press **START**.

PLAY SONG)	Voice	Measure	Tempo
1:	P08:E.Piano 1	001	120

2) With the sequencer running, press the **- SELECTOR** button directly below the voice number once.

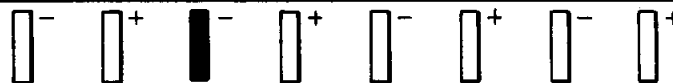
PLAY SONG)	Voice	Measure	Tempo
1:	P07:Piano 1	005	120



After a short delay (while the voice change is made), you'll hear another voice, "Piano 1," playing the song.

3) Press the same **- SELECTOR** button three more times to hear the song played with a pipe organ voice.

PLAY SONG)	Voice	Measure	Tempo
1:	P04:LargePipes	009	120



Go on and play back your song using other voices, changing them with the +/- **SELECTOR** buttons directly below the voice number and name.

Your entire song can also be given an effect setting, allowing you to apply reverb, delay or distortion as you wish.

Try this:

- 1) While in the Sequencer Mode but with song playback stopped, press **JOB**.

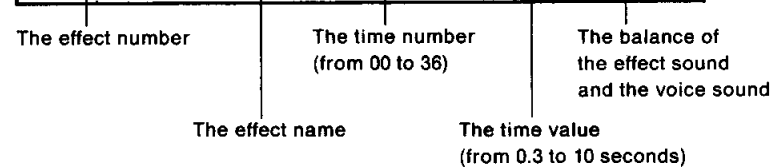
```

SEQUENCER JOB SELECT)  Select one!
Song Qntz  Cnd Edit  Mix Card  Rec Efct
  
```

- 2) Press the rightmost + **SELECTOR** button directly below "Efct" (Effect) in the display.

```

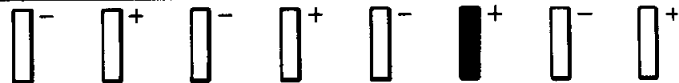
EFCT) Effect preset  Time  Balance
No.0  Rev. Hall  (00)  0.3sec  00
  
```



- 3) At the moment, the present effect is at its minimum setting, and will not affect the voice of the song. For a spacious reverb effect, press and hold down the + **SELECTOR** button directly under "Time" in the display, until the display reads "(17) 2.0sec," or thereabouts. Do the same with the rightmost + **SELECTOR** button to raise the balance to about 45.

```

EFCT) Effect preset  Time  Balance
No.0  Rev. Hall  (17)  2.0sec  45
  
```



- 4) To return to your song, press **SEQUENCER/PLAY**.

```

PLAY SONG) Voice  Measure  Tempo
1:         P00:Elegant  001    120
  
```

- 5) Finally, to hear your song with the new effect setting, press **START**.

NAMING YOUR SONG

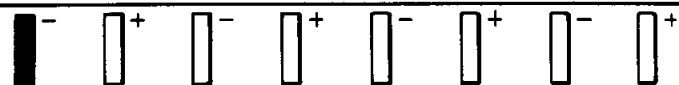
Now that you've recorded a song, assigned a voice and effect setting to it, let's give it a name.

Try this:

- 1) While in the Sequencer Mode, press **JOB** button.

```

SEQUENCER JOB SELECT)  Select one!
Song Qntz  Cnd Edit  Mix Card  Rec Efct
  
```



2) Press the leftmost - **SELECTOR** button to select "Song".

SONG) NAME	Tempo	Store	Song	clear			
	120	[yes]	[yes]	[yes]			
<input checked="" type="checkbox"/> -	<input checked="" type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +

3) Press the leftmost +/- **SELECTOR** button.

SONG) abcdefghijklmnopqrstuvwxyz/;?=',.	[low]	[up]	[prv]	[nxt]
-				

4) Enter a name (of up to 8 characters) for the song. As you did in NAMING AN EDITED VOICE in the OPERATION BASICS section, follow this procedure:

a) Use the rightmost +/- **SELECTOR** button pair to select the character.

SONG) abcdefghijklmnopqrstuvwxyz/;?=',.	[low]	[up]	[prv]	[nxt]			
-							
<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +	<input checked="" type="checkbox"/> -	<input checked="" type="checkbox"/> +

b) Use the +/- **SELECTOR** button pair to the left of those above to select the case of the letters (capital or lowercase).

SONG) abcdefghijklmnopqrstuvwxyz/;?=',.	[low]	[up]	[prv]	[nxt]			
-							
<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +	<input checked="" type="checkbox"/> -	<input checked="" type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +

c) Use the leftmost +/- **SELECTOR** button pair to move the cursor.

SONG) abcdefghijklmnopqrstuvwxyz/;?=',.	[low]	[up]	[prv]	[nxt]			
-							
<input checked="" type="checkbox"/> -	<input checked="" type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +

Note:

Remember to always advance the cursor after selecting a character, otherwise the character will not be entered to the name. This includes the eighth character of a name; even though the cursor does not advance past the eighth space, you must press the leftmost + **SELECTOR** button once after selecting the character to actually enter it.

d) Press **JOB** button to leave the naming operation.

SONG) NAME	Tempo	Store	Song	clear
	120	[yes]	[yes]	[yes]

SAVING YOUR NEWLY RECORDED SONG

Since all of the recording and settings you've made up to this point (including entering the name) are merely temporary and will be lost when you turn off the power of the TQ5, you'll probably want to save your newly recorded song to the internal memory of the sequencer.

Try this:

- 1) Press **JOB** button.

SEQUENCER JOB SELECT)				Select one!			
Song	Qntz	Cnd	Edit	Mix	Card	Rec	Efct
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 2) Press **SONG** button.

SONG) NAME	Tempo	Store	Song clear
My song	120	[yes]	[yes]

The song name that you entered in the previous section, NAMING YOUR SONG, will be shown in the display.

- 3) Press the + **SELECTOR** button directly below "Store" in the display.

SONG) NAME	Tempo	Store	Song clear
My song	120	Sure?[yes]	[yes]
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

- 4) Press the same + **SELECTOR** button as in step #3 to finally execute the store operation.

SONG) NAME	Tempo	Store	Song clear
My song	120	Completed!	[yes]
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Your song, with its voice and effect assignment and its name has now been saved to the TQ5's internal memory.

RECORDING TO A SEQUENCER TRACK — STEP RECORDING

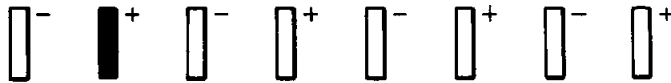
In addition to recording notes as you play them, the sequencer of the TQ5 lets you record notes individually. This step-by-step method of recording is called, naturally, Step recording. The primary benefit of Step recording is that it allows you to create very complex passages that would be difficult to play by hand.

Let's record a couple of measures using the Step recording method.

Try this:

- 1) Press **SEQUENCER/PLAY** button.

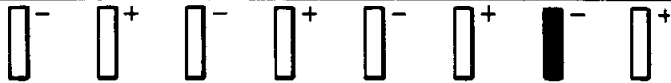
PLAY SONG)	Voice	Measure	Tempo
1:My song	P00:Elegant	001	120



2) Since you are about to record a new song, select a new song number. Press the leftmost + **SELECTOR** button to select song number 2.

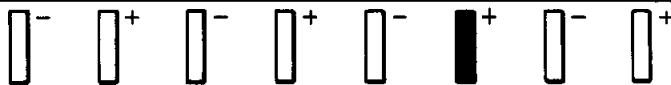
3) Press **JOB** button.

SEQUENCER JOB SELECT)	Select one!		
Song Qntz	Cnd Edit	Mix Card	Rec Efct



4) Press the - **SELECTOR** button directly below "Rec" (Record) in the display.

RECORD MODE)	Mode	Receive ch
Free memory= 98%	normal	omni



5) Press the + **SELECTOR** button directly below "Mode" in the display once to select Step recording.

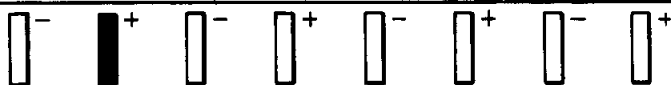
RECORD MODE)	Mode	Receive ch
Free memory= 98%	step	omni

6) Press **RECORD** button.

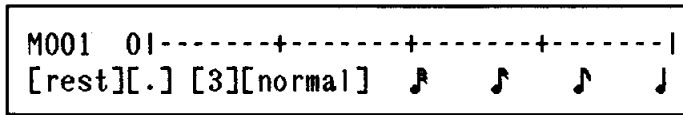
STEP REC)	Beat	Measure
P00:Elegant	4/4	001

7) Select the voice that you wish to use for the recording. For our example, we'll use voice No. 05, SynString1. Press the leftmost + **SELECTOR** button five times to call up this voice.

STEP REC)	Beat	Measure
P05:SynString1	4/4	001



8) Now you're ready to record, so press **START** button.



This is the basic Step recording display. The top line indicates the current measure number and shows that measure as a dotted line of 32 divisions (each division represents a 32nd note). The notes that you enter will appear on this line as diamond-shaped marks.

The bottom line of the display contains the commands that you use to enter the lengths of notes and rests.

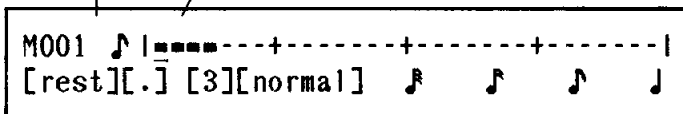
The pitches of the notes can be entered from your connected MIDI keyboard.

The staff below shows the notes we'll be recording.

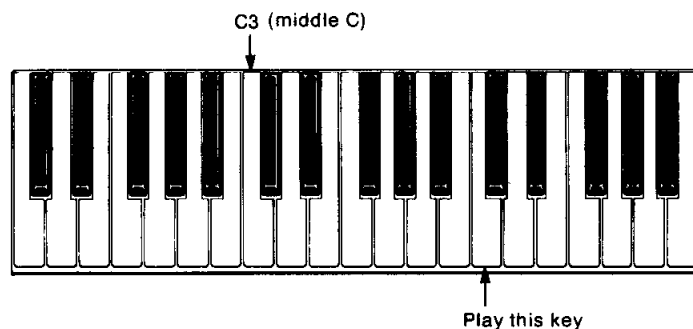
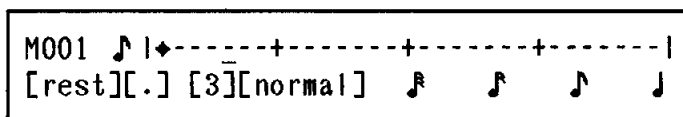


9) To record a note, first select its length. For our first note, press the rightmost **SELECTOR** button (directly below the 1/8 note in the display).

Note length (1/8 note symbol) Note length represented graphically (each bar equals 1/32 note)

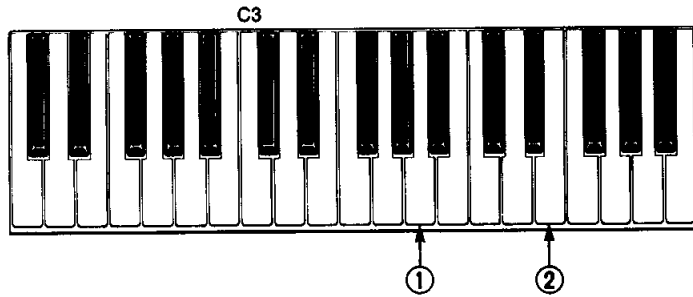
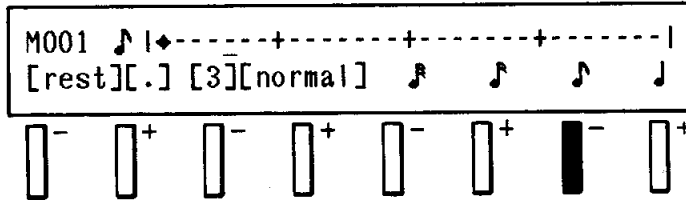


10) The note isn't actually recorded until its pitch is entered. To do this, play the key indicated on the keyboard illustration below:

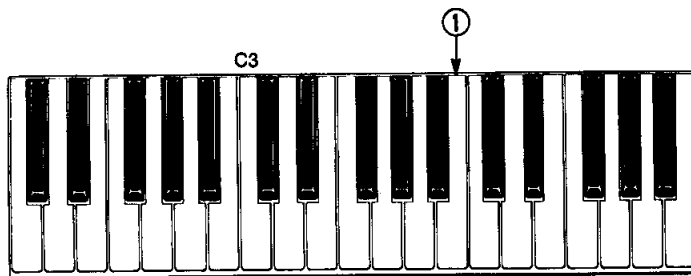
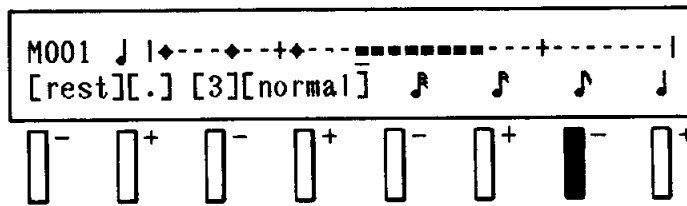


Notice that a diamond-shaped mark has been entered at the beginning of the measure and that the cursor has advanced the length of a 1/8 note.

11) Now, enter the next two notes. Since you're already specified the note value (in step #9) and the same note value will be used for the next two notes, it's not necessary to press the rightmost – **SELECTOR** button again; simply play the notes on your keyboard.

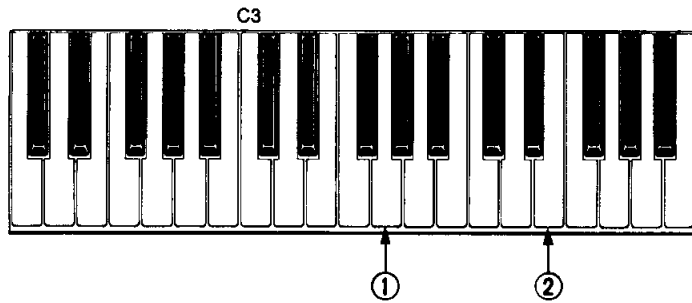


12) The next two notes are tied, effectively making a 1/4 note out of two 1/8 notes. To record the notes, press the – **SELECTOR** button below the 1/8 note in the display twice then play the note on the keyboard.



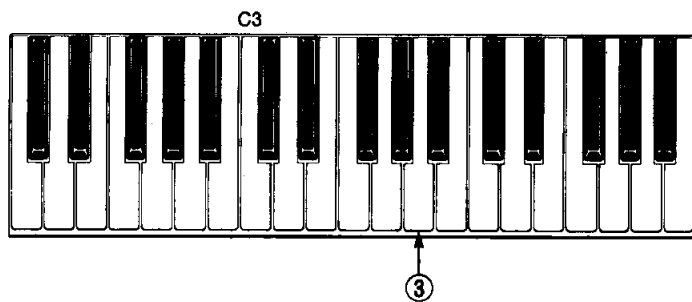
13) Record the next two notes just as you did in step #9, #10 and #11 above, selecting the 1/8 note length and playing the proper keys, as illustrated below.

M001 | ◆---◆---+◆---◆---+---|
 [rest][.] [3][normal]



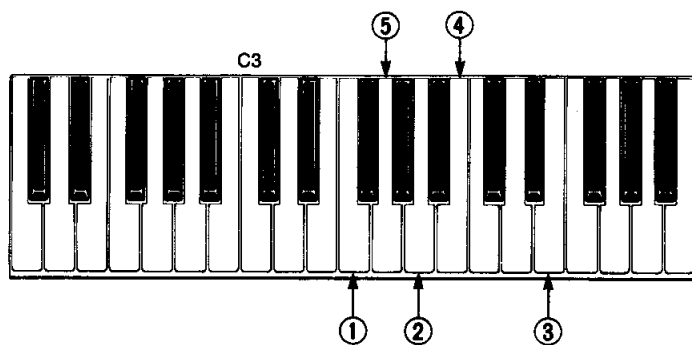
14) The next two notes are tied, so record them just as you did in step #12, playing A3 on the keyboard.

M001 | ◆---◆---+◆---◆---+---◆---+---|
 [rest][.] [3][normal]

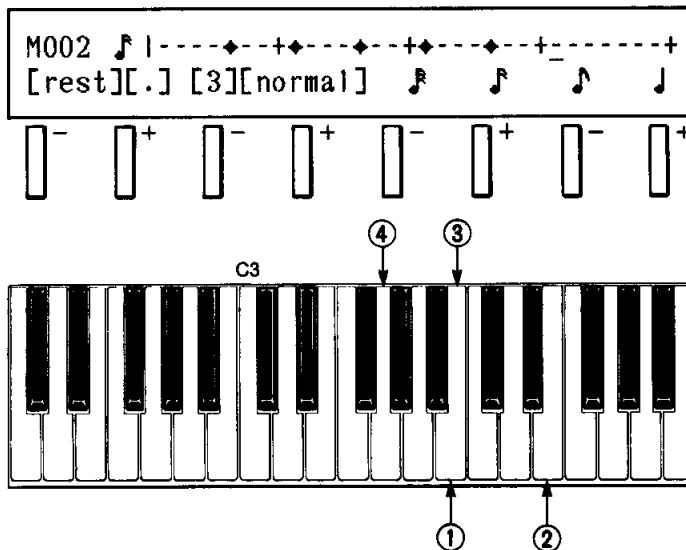


The cursor will automatically advance to the next available space in the next measure when the tie has been entered.

15) In measure #2, record the next five 1/8 notes by first selecting the note length (just as you did in step #9) and then playing the keys in the order shown below:



16) To add the final 1/16 notes, use the same procedure as you've done in step #15 above, this time pressing the + **SELECTOR** button below the 1/16 note in the display before playing the notes.



17) Finally, press **STOP/CONTINUE** to stop recording. The LED above **SEQUENCER/PLAY** will light in red, and you can now play the recorded passage in the normal way (by pressing **START** button).

PLAY SONG)	Voice	Measure	Tempo
3:	P05:SynString1	001	120

This completes your short tour through the basic recording and play functions of the TQ5's sequencer. For more detailed information on how to use the sequencer and its many functions, refer to the **SEQUENCER REFERENCE** section.

Now that you've completed this chapter, you should be able to operate most of the functions of the TQ5 with complete ease and confidence.

Go exploring again at your leisure — find sounds you like, change them around with the various editing features, and use them in songs of your own creation. If you're uncertain about how to do something, come back to this chapter to jog your memory. Or better yet, go to the next chapters, **SYNTHESIZER REFERENCE** and **SEQUENCER REFERENCE**. There you'll discover even more interesting and exciting ways to use the TQ5.

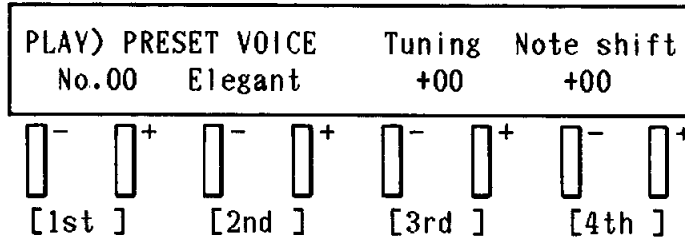
SYNTHESIZER REFERENCE

This chapter of the manual is a comprehensive guide to all of the synthesizer functions of the TQ5. We urge you to go through it casually at first; if some function or job strikes your interest, read about it and try to use it on your TQ5. You'll also find this section handy when you need to refresh your memory about a function or operation.

This chapter covers all Synthesizer operations. The next chapter covers all Sequencer operations. The Synthesizer Reference chapter describes functions in the order of the corresponding front panel buttons. The Sequencer Reference chapter generally describes functions in their logical order of use.

Note:

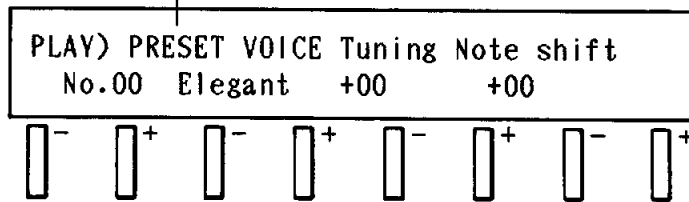
For brevity and to avoid possible confusion over use of the controls, we'll refer (when necessary) to the +/- **SELECTOR** button pairs as 1st, 2nd, 3rd or 4th as shown below:



PLAY MODE BUTTONS

Use the PLAY buttons (PRESET, CARD, USER) and the numeric key pad (or +/-) to select voices.

Select PRESET, CARD or USER.



■ +/- **SELECTOR** Button Pairs/Parameters/Ranges

- [1st] Select the voice number. (Numeric keypad or cursor left and cursor right keys can also be used to select values.)
Range: 00 — 99
- [2nd] Press these +/- **SELECTOR** buttons simultaneously to enter the Play Hold mode. (The Play Hold mode changes the way you enter voice numbers from the numeric keypad. Normally, you must press two buttons on the numeric keypad to enter a voice name; in the Play Hold mode, the tens digit is "held" and the numbers you press select corresponding voices within that "held" set. For example, if you enter Play Hold mode the after voice number 89 has been selected, pressing 2 on the numeric keypad selects voice number 82, pressing 5 selects 85, and so on.)
- [3rd] Adjust the tuning of the voice.
Range: -64 — +63 (± 1 half-step)
- [4th] Transpose the voice in half-steps.
Range: ± 24 (± 2 octaves)

EASY EDIT MODE BUTTONS

EG

■ **Functions:** Adjust envelope generator settings (Attack, Decay, and Release times) for both Volume and Tone

ABOUT EG:

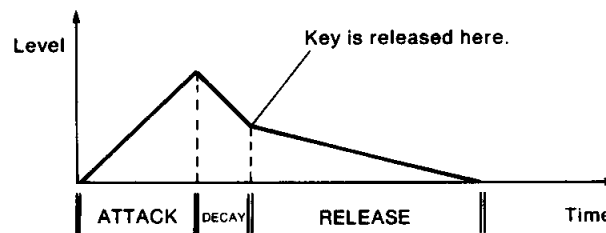
EG stands for envelope generator. Not that the words themselves are important to remember, but you should know what an envelope generator does.

Every sound that you hear, from the clanging of a bell to the screeching tires of a car coming to a sudden halt, has a direct relation to time. The volume of a sound takes a certain length of time to reach its loudest point — in the case of a bell, almost instantly — and it takes a certain length of time to die away.

Also, if you listen closely to the sound of a bell, you'll notice that the initial metallic clanging sound is gradually replaced by a softer, more mellow ringing tone. In other words, the tone of the bell also changes over time.

For a synthesizer to imitate the sounds of the real world and, in fact, for it to create sounds of any interest, it must be able to control these variations in volume and tone over time.

The TQ5 does this with its EG's Attack, Decay, and Release parameters. Their effect can be easily understood from this diagram:



The envelope generator controls how the sound changes in both volume and tone over time. Both volume and tone can be controlled together by the same EG setting, or independent EG settings can be made for each.

In FM synthesis terminology, the volume EG affects the carrier operator(s) and the tone EG affects the modulator operator(s).

■ + / - **SELECTOR Button Pairs/Parameters/Ranges**

[1st] Select the EG assignment.

- To set a separate EG for volume:
Press either button of the first + / - **SELECTOR** button pair until "volume" is displayed.
- To set a separate EG for tone:
Press either button of the first + / - **SELECTOR** button pair until "tone" is displayed.
- To set a common EG for volume and tone:
Press either button of the first + / - **SELECTOR** button pair until "vol + tone" is displayed.

[2nd] Adjust the attack rate. This determines the time it takes for the sound to reach its loudest point after the key is pressed.

Range: ± 10

[3rd] Adjust the decay rate. This determines the time it takes for the sound to decrease to its second volume.

Range: ± 10

[4th] Adjust the release rate. This determines the time it takes for the sound to reach silence from its second volume.

Range: ± 10

(Positive values DECREASE the time, or make the sound change faster; negative values INCREASE the time, or make the sound change more slowly.)

TONE

■ **Functions:** Set harmonic content and brilliance of tone; determine the waveforms of the voice.

The Brilliance parameter controls how bright or mellow the tone is. Positive values make the tone brighter; negative values make it more mellow. In FM synthesis terminology, Brilliance controls the output level of the modulator operator(s).

The Wave parameter affects the frequency (position) of the harmonics or overtones — i.e. it changes the fundamental character of the sound. Positive settings will produce higher overtones, and negative settings will produce lower overtones. Notice that changing this parameter can result in metallic or gritty sounds for some settings. In FM synthesis terminology, Wave controls the coarse frequency setting of the modulator operator(s).

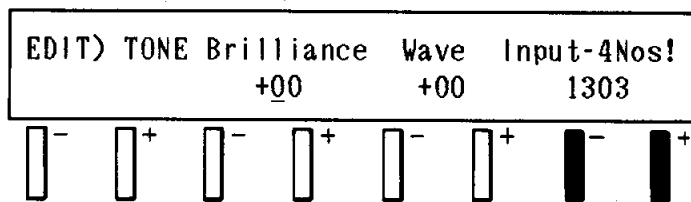
The Input-4Nos! parameter lets you change the waveforms that the voice uses for its sound generation. Each voice has four sound sources, and each can be given one of eight different waveforms. Because some waveforms are brighter than others, this parameter also helps determine the overall brightness and tone quality of the sound. In FM synthesis terminology, the Input-4Nos! parameter determines the waveform for each operator.

Use the numeric keypad (0~7) to select one of the eight waveforms for each individual sound source (operator), and use the rightmost +/- SELECTOR buttons to advance all sound sources' waveforms by one.

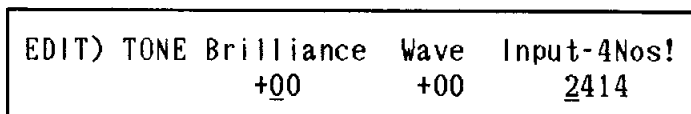
Each sound source (operator) is represented by a single digit in the four-digit display, and each can only be changed from 0 to 7.

Here are examples of the two methods of editing the Input-4Nos! parameter:

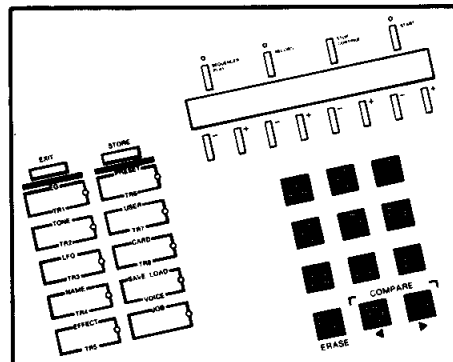
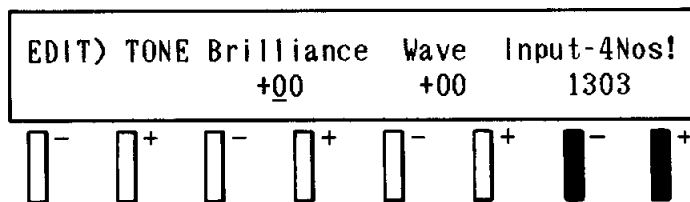
a) Using the rightmost +/- SELECTOR button pair



The rightmost +/- SELECTOR button pair advances all four digits in the display by one. For example, if you press the rightmost + SELECTOR button from the display above, the display will change as follows:

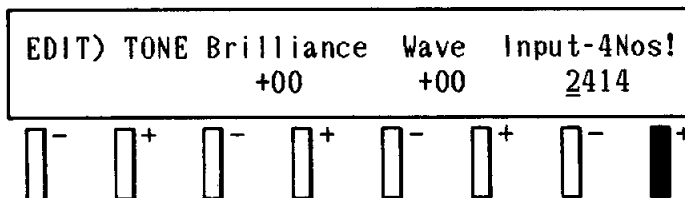


b) Using the numeric keypad



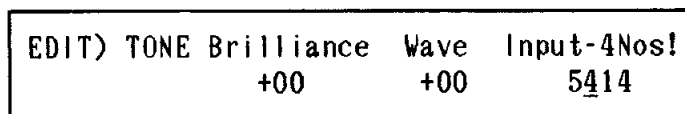
The numeric keypad can be used to directly enter the numbers. However, if the cursor (the line under the Brilliance value in the display above) is at Brilliance or Wave, you first have to press one of the rightmost +/- **SELECTOR** button pair to move the cursor to the Input-4Nos! parameter.

To see what we mean, press the rightmost + **SELECTOR** button.



Notice that the cursor is now beneath the Input-4Nos! parameter. Since the values have been changed by pressing the + **SELECTOR** button, you might want to return to the original values by pressing the - **SELECTOR** button next to it.

To enter individual values for each position, simply press the desired number, and that number is entered and the cursor automatically moves to the next position. For example, if you press 5 from the display above, the display will change as follows:



Note:

Since 7 is the highest value that can be entered, pressing either 8 or 9 on the numeric keypad also enters 7 to the display.

■ +/- **SELECTOR** Button Pairs/Parameters/Ranges

- [2nd] Adjust the brilliance of the tone.
Range: ± 10
- [3rd] Determine the frequency components of the voice.
Range: ± 10
- [4th] Determine the waveforms used by the sound sources. (Numeric keypad can also be used to select values.)
Range: 0 — 7 (for each operator indicated in the four-digit display.)

LFO

■ **Functions:** Adjust speed, depth and sensitivity of vibrato and tremolo effect.

The low frequency oscillator is used to modulate (cause periodic variations in) the pitch and/or volume of the sound. LFO-controlled pitch modulation is called Vibrato, and volume or amplitude modulation is called Tremolo.

- The speed of the modulation can be set.
- The Vibrato parameter adjusts both pitch modulation depth and sensitivity simultaneously.

- The Tremolo parameter adjusts both depth and sensitivity of amplitude modulation.

Note:

Two independent LFOs are available for voices when using the Multi Mode functions. Thus, when using 3 or more voices at the same time, the LFO applied to one voice could affect one or more of the other voices. See **LFO** in the MULTI MODE FUNCTIONS section of this chapter for more information.

■ **+/- SELECTOR Button Pairs/Parameters/Ranges**

- [2nd] Adjust the speed of the modulation.
Range: 0 — 99
- [3rd] Adjust the degree of pitch modulation.
Range: 0 — 99
- [4th] Adjust the degree of amplitude (volume) modulation.
Range: 0 — 99

NAME

■ **Function:** Assign names to voices.

Voice names can be up to ten characters in length. The available characters include letters of the alphabet, numbers, and 18 additional special characters and punctuation marks.

To enter a voice name:

- 1) Select the character set you wish to use: capital or lower case. Use the third pair of +/- **SELECTOR** buttons (directly below [low] and [up] in the display).
 - 2) Select the particular character you want to enter from the top line of the display. Use the fourth pair of +/- **SELECTOR** buttons (directly below [prv] and [nxt] in the display).
 - 3) Enter the selected character and advance the cursor to the next position in the name. Use the + **SELECTOR** button directly below the name in the display. To move the cursor back for re-entering characters, use the accompanying - **SELECTOR** button.
- Use the numeric keypad to enter numbers to voice names. The cursor left and cursor right buttons by the numeric keypad can be used to enter “-” and “+”, respectively. Spaces are entered by selecting the farthest right position of either character set on the top line of the display.

Note:

Remember to always advance the cursor after selecting a character, otherwise the character will not be entered to the name. This includes the tenth character of a name; even though the cursor does not advance past the tenth space, you must press the leftmost + **SELECTOR** button once after selecting the character to actually enter it.

■ **+/- SELECTOR Button Pairs/Parameters**

- [1st] Enter the selected character and move the cursor backward or forward.
- [3rd] Select the character set (capital or lower case).
- [4th] Select the character from the top line in the display.

EFFECT

■ **Functions:** Assign effect presets to voices; edit parameters of effect presets.

Ten effect presets are available:

- No. 0 Reverb — Hall
- No. 1 Reverb — Room
- No. 2 Reverb — Plate
- No. 3 Delay
- No. 4 Delay — Left/Right
- No. 5 Stereo Echo
- No. 6 Distortion + Reverb
- No. 7 Distortion + Echo
- No. 8 Gate Reverb
- No. 9 Reverse Gate

- The Reverb presets recreate the reflections of the sound as it would be heard in various environments and thus make the sound seem more natural and lifelike.
- The Delay preset adds a single repeat. The Delay — Left/Right adds a single repeat, first to the left, then to the right.
- The Stereo Echo preset adds gradually decaying repeats (left and right together).
- The Distortion presets add a hard-edged, gritty sound.
- The Gate preset creates a reverb that is cut off (i.e. "gated") before it can decay naturally. The Reverse Gate preset creates a reverb that grows louder with time (the opposite of natural reverb) before it is cut off.

Each preset has two parameters: Time (or, in the case of the two Gate reverb presets, Room Size) and Balance. The Time parameters in the Reverb presets basically determine the perceived size of the room by adjusting the length of reverberation. Time parameters in Delay and Echo presets determine the length of time between the original sound and the delayed repeats. The Room Size parameters in the Gate presets determine the amount of reverberant "wash" in the sound. Balance parameters in all presets allow adjusting of the relative level of the effect compared to the voice. A Balance setting of 0 turns the effect off.

Note:

Effect and Pan cannot be used at the same time. 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 following message will briefly appear and the pan setting(s) will be ignored.

```
EFFECT)      Preset      Time      Balance
*ATTENTION* Pan data was ignored!
```

■ **+ / — SELECTOR Button Pairs/Parameters/Ranges**

[1st] Select the preset effect.
Range: No.0 — No.9

[3rd] For presets #0 — #7, adjust the time of the reverb or delay effect. For presets #8 and #9, adjust the apparent room size.

Ranges:

Presets #0, 1, 2, 6: 0.3 — 10.0 sec
Presets #3, 4, 5, 7: 0.1 — 300 msec
Presets #8, 9: 0.5 — 3.2

[4th] Adjust the overall balance of the effect sound and the direct sound.
Range: 0 — 99

SAVE, LOAD AND STORE OPERATIONS

SAVE, LOAD MODE

■ **Functions:** Save TQ5 voices or sequencer data to RAM memory card; load voices or sequencer data to the TQ5 from ROM or RAM memory cards; format RAM memory cards for storage of either voice/system or sequencer data.

■ **FORMAT**

Before you can save TQ5 voice (or sequence) data to a RAM memory card, it must be formatted to accept YS voice (or sequence) data. The YS format is also used by the YS200, YS100 and B200 Digital Synthesizers. This means that all properly formatted cards can be used interchangeably on the TQ5 and any of the above mentioned synthesizers.

To format a RAM memory card:

- 1) Insert the appropriate RAM memory card in the CARD slot on the front panel.
- 2) Make certain that the memory protect on the card is set to OFF. (See "ABOUT THE RAM MEMORY CARD (MCD 32)" below.)
- 3) Press **SAVE, LOAD** button.

To Card? [yes]	From Card? [yes]	Format for seq	<YS S/V>? [yes]
<input type="checkbox"/> - <input type="checkbox"/> +	<input type="checkbox"/> - <input type="checkbox"/> +	<input checked="" type="checkbox"/> - <input checked="" type="checkbox"/> +	<input type="checkbox"/> - <input type="checkbox"/> +

- 4) Use the third +/- **SELECTOR** button pair to select the format.
- 5) Press the rightmost + **SELECTOR** button (directly below the rightmost [yes] in the display).

To Card? [yes]	From Card? [yes]	Format for voice	<YS S/V>? Sure?[yes]
<input type="checkbox"/> - <input type="checkbox"/> +	<input type="checkbox"/> - <input type="checkbox"/> +	<input type="checkbox"/> - <input type="checkbox"/> +	<input type="checkbox"/> - <input checked="" type="checkbox"/> +

- 6) The display will prompt for confirmation. Press the rightmost + **SELECTOR** button again to complete the formatting operation.

To Card? [yes]	From Card? [yes]	Format for voice	<YS S/V>? Completed!
<input type="checkbox"/> - <input type="checkbox"/> +	<input type="checkbox"/> - <input type="checkbox"/> +	<input type="checkbox"/> - <input type="checkbox"/> +	<input checked="" type="checkbox"/> - <input checked="" type="checkbox"/> +

You can cancel the operation (after step #5) by pressing either button of the third +/- **SELECTOR** button pair.

Note:

Formatting a previously used RAM memory card MAY erase the data that is saved on the card. Whether it does or not depends on the type of data that is stored to the card. The rules are:

- 1) Voice data on the RAM memory card is NOT erased when formatting for voice or sequencer.
- 2) Sequencer data on the RAM memory card is ALWAYS erased when formatting for voice or sequencer.

For this reason, make absolutely certain that no important data is on the RAM card you intend to format. If possible, use only blank RAM memory cards for the storage of new data.

■ SAVE, LOAD

The **SAVE, LOAD** function allows you to execute either of the following two operations:

- 1) **SAVE** all 100 voices contained in User or Preset memory to a RAM memory card.
- 2) **LOAD** all 100 voices contained on a ROM or RAM memory card to User memory.

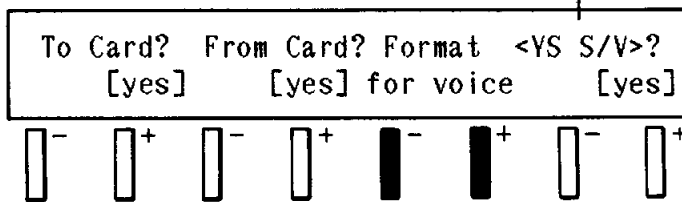
Note:

Loading data from a card into the User memory of the TQ5 will erase all previous voice in the TQ5. Similarly, saving data from the User memory of the TQ5 to a RAM card will erase all previous voice data stored to the card. If possible, save your important data to a blank RAM memory card before loading any new data.

To save data to or load data from card memory:

- 1) Insert the appropriate ROM or RAM memory card in the CARD slot on the front panel.
- 2) If you are saving data to a RAM memory card, make certain that the memory protect on the card is set to OFF. (See "ABOUT THE RAM MEMORY CARD (MCD 32)" on the next page.)
- 3) Press **SAVE, LOAD** button. The red LED near the **SAVE/LOAD** switch lights, and the following is displayed.

check whether <YS S/V> appears here.



Check that <YS S/V> is displayed for the format. If anything else is displayed, the voices of this card cannot be loaded to user memory.

- 4) If you are saving data to card, press the + **SELECTOR** button directly below "To Card?" in the display; if you are loading data from card press the + **SELECTOR** button directly below "From Card?" in the display.
- 5) The display will prompt for confirmation. Press the same + **SELECTOR** button again (as you did in step #5) to complete the save or load operation. You can cancel the operation (after step #5) by pressing either button of the third +/- **SELECTOR** button pair.

■ + / - SELECTOR Button Pairs/Parameters

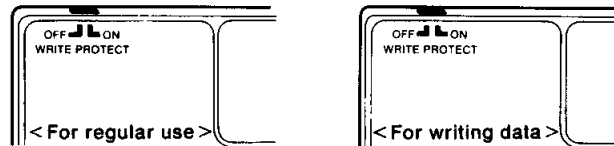
- [1st] Save internal data to card memory.
- [2nd] Load card data to internal memory.
- [3rd] Select the format type.
- [4th] Execute the formatting operation.

ABOUT THE RAM MEMORY CARD (MCD 32)

Data cannot be stored to the RAM memory card unless the Write Protect Switch on the card is set to OFF. The card is also equipped with a cell battery that must be replaced periodically.

1) Write Protect Switch (WRITE PROTECT)

Use a sharp-pointed tool such as a screwdriver to switch the Write Protect Switch to ON or OFF. Set the switch to ON for regular use in order to protect the data. Switch it to OFF when writing data.



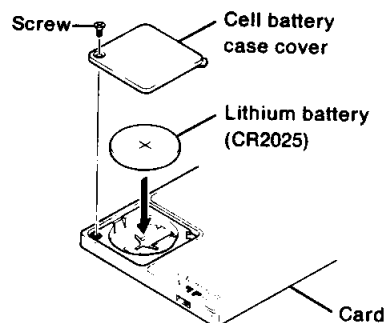
2) Replacement of Cell Batteries

Memorization of data requires a lithium battery. For regular use, a lithium battery lasts about five years. The RAM Memory Card is shipped with the lithium battery already installed. If the battery runs down, replace it with a new one, following the procedure below. Use a CR2025 lithium battery.

Note:

When the battery is replaced, all the data memorized in the RAM card will be erased. Load the necessary data to the TQ5's internal memory before replacing the battery.

- 1) Remove the screw and the cell battery case cover with a small Phillips screwdriver.
- 2) Remove the old cell battery and insert the new one (CR2025) with the + side facing upward.
- 3) Install the cover and fasten it with the screw.



STORE

■ **Functions:** Store single voices to User or Card memory; select memory type for storage; set memory protect; select destination number.

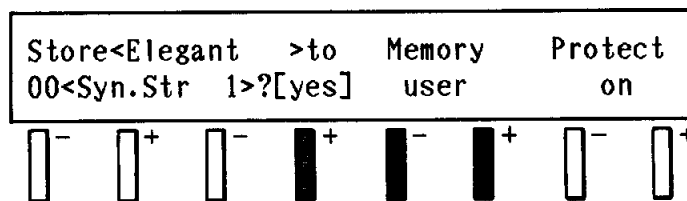
The **STORE** button allows you to quickly store a single voice to User or Card memory. With the sole exception of the Sequencer Mode, pressing the **STORE** button allows

you to exit from any mode and operation to store the currently selected voice.

Voices from any PLAY Mode location — Card, User, or Preset — may be stored to any Card or User location. This means that you can also move voices from one location to another.

To store a voice to User or Card memory:

- 1) Select the memory type from which the voice to be stored will be chosen. Use the three **PLAY** mode buttons.
- 2) Select the voice which will be stored (the top voice in the display). Use the first pair of **+/- SELECTOR** buttons, the cursor left and cursor right keys or the numeric keypad. You can also use the first pair of **+/- SELECTOR** buttons, after you have selected the STORE operation (step #3 below).
- 3) Press **STORE** button.



- 4) Select the memory type to which the voice will be stored: User or Card. Use the third pair of **+/- SELECTOR** buttons.
- 5) If you are storing a voice to Card memory, turn the Write Protect switch on the card off. If you are storing a voice to User memory, turn the User memory protect function off (with the right most **- SELECTOR** button).
- 6) Select the destination number to which the voice will be stored. Use the cursor left and cursor right keys or enter the number directly from the numeric keypad.
- 7) Press the **+ SELECTOR** button directly below [yes] in the display.
- 8) The display will prompt for confirmation. Press the same **+ SELECTOR** button again (as you did in the last step) to execute the operation.

■ +/- SELECTOR Button Pairs/Parameters

- [1st] Select the voice to be stored.
- [2nd] Execute the store operation (**+ SELECTOR** button only).
- [3rd] Select the memory type (User or Card).
- [4th] Turn on and off the User memory protect function.

Note:

The Store operation also applies to voices currently being edited. With this function, you can immediately save the voice you are editing to either User or Card memory. However, the source number cannot be selected; it remains the same as the number of the voice being edited.

Note:

Storing a voice to User or Card memory will automatically and irretrievably ERASE THE VOICE AT THE DESTINATION NUMBER. Make certain that the voice at the destination number is no longer needed or has been stored to another location.

■ About the TQ5's internal battery:

The TQ5's User voices are kept intact during periods of power off by an internal battery. This battery has a life of approximately five years and, if not replaced at the end of those five years, could result in irretrievable loss of voice data. To replace the battery, bring your TQ5 to the store where you purchased it or to your nearest Yamaha service center. Do not try to replace the battery yourself. When the battery is replaced, all the data memorized in User memory will be erased. Transfer the data to a RAM memory card before having the battery replaced.

JOB MODE FUNCTIONS

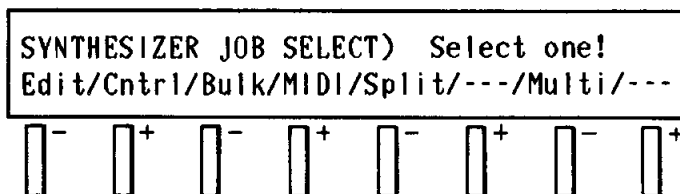
JOB MODE

The JOB Mode lets you delve deeper into the editing and control features of the TQ5. Within the JOB Mode are several sub-modes that allow you to:

- Edit additional voice parameters
- Edit real time performance control parameters
- Send voice and system data out to other MIDI devices
- Select MIDI transmission and reception channels
- Select the Play Mode to be used: Split or Multi
- Set a maximum of eight different voices to be used simultaneously, each with its own MIDI reception channel, key assignment, and volume, pan, LFO and detune settings

With the exception of the Sequencer Mode, the Synthesizer Job Mode can be selected from within any mode or operation.

1) Press **JOB** button.



2) Press the +/- **SELECTOR** button directly below the name of the sub-mode you wish to use.

VOICE EDIT (Edit)

■ **Functions:** Adjust the Feedback, Transpose and Touch Sensitivity settings of a voice; determine its Poly/Mono setting.

These are parameters which, in addition to the **EASY EDIT** parameters, let you create and shape the voices of the TQ5.

- The Feedback parameter determines the basic tone qualities of a voice; a low value makes the sound soft and mellow, while higher values generally brighten the sound and give it a metallic edge. In FM synthesis terminology, this parameter allows you to adjust the amount that the modulator operator feedbacks on itself.
- Transpose is used to raise or lower the pitch of the TQ5, in semitone steps, to any key.
- Touch Sensitivity determines the degree to which the volume and tone of the voice respond to your playing of the keyboard. The greater the value, the more sensitive the voice will be to your keyboard touch.
- "Poly/Mono" is normally set to "Poly". In PLAY mode, the voice will be able to play up to 8 simultaneous notes. In MULTI mode, the voice will be able to play as many simultaneous notes as specified by the max Notes setting.

"Mono" mode is a bit unusual. Only one note can be sounding at a time, but if you press a key before releasing the previously pressed key, the sound will change in pitch, but will not "re-attack". I.e., mono mode lets you play "smoothly". (If you then release the second key while the first key is still pressed, the sound will return to the first pitch.)

■ **Parameter ranges:**

FEEDBACK: 0 — 7
TRANPOSE: C1 — C5
TOUCH SENS.: 0 — 7
POLY/MONO: Poly, Mono

CONTROL (Cntrl)

■ **Functions:** Set pitch bend range; determine assignment of modulation wheel and breath control.

Note:

The four functions of the Control sub-mode only apply when using the TQ5 with MIDI instruments that transmit these kinds of information. (The PF1500 Electronic Piano does NOT transmit these four data types.) Check the owner's manuals of your MIDI instruments as to whether they are appropriately equipped as well as for more information on how to best use these functions.

If the preset Control settings for the voice have not been changed, the lower line of the LCD will show "-----" for each controller. You may select the following options for each controller.

PB Range:	Pitch bend range of 0 — 12 semitones (in either direction).
MW effect:	Select the effect that the MODULATION wheel will have. Select from vibrato, tremolo or wowwow.
Breath cnt:	Select the effect that a separately sold BC1 or BC2 Breath Control will have when plugged into the BREATH CONT jack of appropriately equipped instruments. Select from vibrato, tone or volume.
After tch:	Select the effect that pressing down on an after-touch equipped keyboard after a note is played will have. Select from vibrato, tone, tremolo or wowwow.

MIDI BULK OUT (Bulk)

■ **Functions:** Send currently edited voice (from edit buffer), 100 user voices, or system setup memory via MIDI OUT. System setup memory includes the following data; tuning, memory protect on/off, MIDI receive channel, MIDI transmit channel, settings for each instrument.

- To execute, press the + **SELECTOR** button directly below the [yes] display of the type of data you wish to send.

Note:

When transmitting 100 user voices to a 32-voice synthesizer (such as the DX11), only voice numbers 75 to 99 will be sent to the receiving synthesizer.

MIDI CHANNEL (MIDI)

■ **Functions:** Set the MIDI reception and transmission channels.

To receive play data (from external MIDI devices such as other sequencers and synthesizers) and send data, the proper MIDI channel settings must be made.

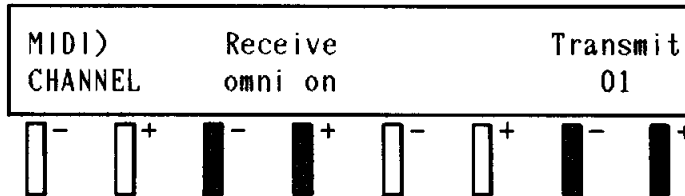
- For normal MIDI operation, the channels of the TQ5 and the MIDI device that is either sending or receiving must match.

- Omni On allows the TQ5 to receive MIDI data over all channels.
- The Off value disables MIDI reception and transmission in the respective parameters.

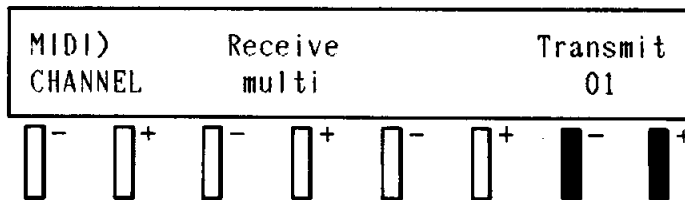
Set the MIDI receive channel by using the second pair of +/- **SELECTOR** buttons. Set the MIDI transmit channel by using the fourth pair of +/- **SELECTOR** buttons.

There are two different ways of selecting the MIDI Channel job, and the function as well as the display changes slightly depending on which way is selected.

The first way is directly from the Play Mode or after normal voice selection.



The second way is within the Multi Mode. If you return to the Synthesizer jobs directly from the Multi Mode (without pressing any of the **PLAY MODE** buttons or the **EXIT** button) and select MIDI Channel, the following display will appear:



The "multi" in the display indicates that the Receive channel must be set for each voice in the Multi Mode's MIDI Receive Channel job. Receive channel settings CANNOT be made here.

Note:

If you have made changes in the MIDI transmit and receive channels, you may discover that some voices will not sound when you play the connected MIDI keyboard or a sequencer song with several voices. Here is a short explanation of why that happens and how to avoid it:

Each voice can have its own MIDI receive channel (set in the Multi Mode's MIDI Receive Channel job). If that channel setting matches the MIDI transmit channel of the connected MIDI keyboard, the voice will sound. Assign different MIDI channels to different voices when:

- 1) You want to control different voices from different MIDI keyboards, or,
 - 2) You want to play different voices from different sequencer tracks.
- In normal operation, set all receive channels AND the transmit channel to the same value.

■ **Parameter ranges:**

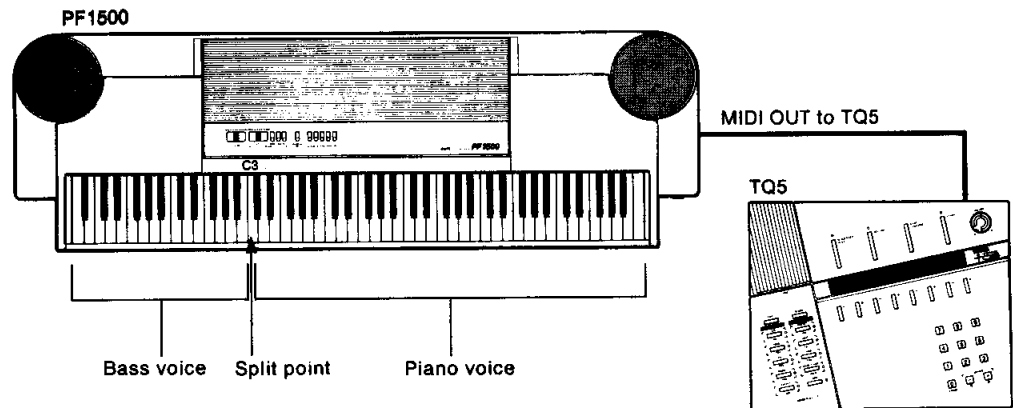
RECEIVE CHANNEL: Multi (after making Multi Mode settings only)
1 – 16, Omni On, Off

TRANSMIT CHANNEL: 1 – 16, Off

SPLIT MODE (Split)

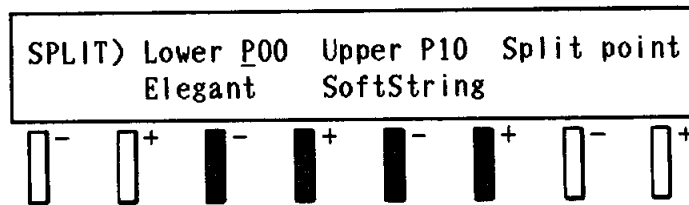
■ **Functions:** Set two voices to be played from separate parts of the connected keyboard and determine the split point that will separate them.

Split Mode allows two different voices to be assigned to separate sections of the connected MIDI keyboard. For example, you could set a split point at C3 (as shown in the illustration below) and have a bass voice be played from all keys B2 and lower, while the playing of keys C3 and higher could be set to sound a piano voice.



To set up the TQ5 for Split play:

- 1) Press **JOB** button.
- 2) Select Split Mode by pressing the **+/- SELECTOR** button.



- 3) Make certain that the cursor is at the voice number of the keyboard section you wish to edit first. You can move the cursor to the desired section by pressing either button of the **+/- SELECTOR** button pair directly below that desired section. For example, if you want to select the lower voice first, press either button of the second **+/- SELECTOR** button pair. (The upper voice is selected with the third pair of **+/- SELECTOR** buttons.)
- 4) Select the memory type from which the voice will be selected. Press **PRESET**, **USER** or **CARD**. The selected memory type will be indicated in the display, just in front of the voice number, by its initial: "P," "U" or "C."
- 5) Select the voice number for the keyboard section. There are three ways to select the number: 1) use the same **+/- SELECTOR** button pair as you did in step #2, 2) enter the voice number directly from the numeric keypad, or 3) use the cursor left and cursor right keys.
- 6) Finally, set the split point. There are two ways to set the split point: a) use the fourth pair of **+/- SELECTOR** buttons, or b) with the cursor at the split point parameter (press one of the fourth pair of **+/- SELECTOR** buttons to move it there), press the appropriate key on the connected MIDI keyboard. Each time you use the second method of entering the split point from a MIDI keyboard, you must first press one of the fourth pair of **+/- SELECTOR** buttons.
All keys played below the split point will sound the lower voice, while all keys above and including the split point will sound the upper voice.

■ Parameter ranges:

LOWER: Preset (P), User (U), or Card (C) voices 00 — 99
UPPER: Preset (P), User (U), or Card (C) voices 00 — 99
SPLIT POINT: C-2 — G8

Note:

You can edit voice data directly from the Split Mode by pressing the appropriate **EASY EDIT** button; however, only the low voice of the split can be selected automatically in this way.

To edit the high voice you must return to PLAY mode and select the voice.

Note:

In the Split Mode the original effect settings for the two voices are ignored. If you want to apply an effect to the voices, you must select a "global" effect — an effect setting that will be applied to both voices equally. To do this, press **EFFECT** while in the Split job and make the desired setting. Returning to Play Mode restores the original effect settings for the voices.

CLOCK/CALENDAR FUNCTION

The TQ5 has a built-in clock/calendar which is automatically displayed upon power on, when no buttons have been pressed for one minute or longer or when no MIDI data (with the exceptions of active sensing and clock) has been received.

When you turn on the power of the TQ5, the following display will briefly appear:

```
====< YAMAHA Tone Generator TQ 5 >====  
***** 12:00'15 '88-11-13 Sunday *****
```

The bottom line of the display shows the current time (in 24-hour format), the date and the day of the week.

If you leave the TQ5 on for one minute or longer without pressing any buttons on the panel and unaffected by MIDI data, the following display will appear:

```
19:30 15 Friday  
'88-12-25 hit any key
```

Press any front panel button to return the TQ5 to normal operation. The display will return to whatever condition or function was last selected.

SETTING THE TIME AND DATE

1) Press **EXIT** repeatedly until the following clock/calendar display appears.

```
19:30 15 Friday  
'88-12-25 [mode]
```

2) Press the rightmost + **SELECTOR** button (directly below [mode] in the display) to select the SET mode.

```
19:30 15 Friday SET  
'88-12-25 [sel][mode]
```

The seconds' counter of the clock will flash, indicating that it is ready to be set.

3) Reset the seconds' counter to zero by pressing either the cursor left or cursor right

keys.

- 4) Press the rightmost – **SELECTOR** button (directly below [sel] in the display) to select the minutes' counter.
- 5) Set the minutes' counter by using the cursor left and cursor right keys or by entering the number directly from the numeric keypad.
- 6) Repeat the above two steps for each remaining counter or entry: hours, year (the last two digits of the year are displayed), month (up to 12), date (up to 31) and day of the week (selectable with the cursor left and cursor right keys **only**).
- 7) After setting the correct time and date, press **EXIT** to return to normal operation.

MULTI MODE FUNCTIONS

The Multi Mode is a powerful function in which you can play up to eight different voices at the same time and set each to be controlled independently over separate MIDI channels. Each voice can also be given its own key assignment, and volume, pan and detune settings.

When you select the Multi Mode job, you will get the following display.

```
MULTI MODE JOB SELECT > Select one!  
Max/R.ch/Voice/Volm/Pan/Detun/Nl im/LFO  
[ ]- [ ]+ [ ]- [ ]+ [ ]- [ ]+ [ ]- [ ]+
```

Press one of the +/- **SELECTOR** buttons to choose a Multi Mode setting to adjust.

To exit any of the Multi Mode functions and return to the Multi Mode Job Select display (above), press **JOB**.

To exit the Multi Mode and return to the Synthesizer Job Select display (below), press **JOB** again.

```
SYNTHESIZER JOB SELECT) Select one!  
Edit/Cntrl/Bulk/MIDI/Split/---/Multi/---
```

MULTI MODE DISPLAY EXAMPLES

Here in a Multi Mode application example, the following screens show a setup with a mono bass voice assigned to the lowest octave, a five-note polyphonic piano to the next two octaves, and two different strings voices (each monophonic) together occupying the highest range, and slightly detuned to create a richer sound. The Piano Voice is assigned to be controlled by LFOb, allowing you to create a tremolo effect. (This will depend on the LFO settings for the Piano voice.) The two Strings voices are using vibrato.

```
MAX NOTES> MIDI R.ch=01 , P60 E.Bass 1  
 1 5 1 1 0 0 0 0
```

The 8 notes of polyphonic capability of the TQ5 must be divided among the instruments used in Multi Mode. (In the following LCDs, notice that a "----" is displayed for instruments whose "Max Note" setting is 0. You will not be able to change settings for these instruments.)

```
RECEIVE CH> Max Notes=1 , P60 E.Bass 1  
 01 01 01 01 ---- ---- ---- ----
```

Each instrument can be set to receive a different MIDI channel. This means that a MIDI sequencer connected to the TQ5 MIDI IN terminal can independently play specified voices if desired. The MIDI transmit channel of the connected MIDI keyboard must match the MIDI receive channels of the instruments in order to play those instruments. Instruments set to different receive channels will NOT sound. To play the voices in the display above, the MIDI transmit channel connected keyboard must be set to 1. (Refer to the owner's manual of your keyboard.)

```
VOICE NO.>Max Notes=1,R.ch=01,E.Bass 1
  P60 P07 P10 P02 --- --- --- ---
```

Select a voice (0 - 99) for each instrument.

```
VOLUME>MaxNotes=1,R.ch=01 P.60 E.Bass 1
  99 99 99 99 -- -- -- --
```

Adjust the volume balance of the instruments.

```
PAN> MaxNotes=1,R.ch,P60 E.Bass 1
<□> <■> <□> <■> -----
```

Each instrument can be panned to L, L+R or R in the audio output for a spacious effect when listening in stereo.

```
DETUNE>MaxNotes=1,R.ch=01,P60 E.Bass 1
  +0 +0 -1 +1 -- -- -- --
```

By detuning two voices that are to be played in unison (the two string voices in the above example), you can create a feeling of richness.

```
H B1 B3 C6 C6 -----
L C1 C2 C4 C4 -----
```

Each instrument can be limited to a specified area of the keyboard, to make complex keyboard splits.

```
LFO> MaxNotes=1,R.ch=01,P60 E.Bass 1
  off LFOb vib vib -----
```

Each instrument can use its own vibrato generator, or share one of the two LFOs (LFOa and LFOb) for tremolo effects.

MAXIMUM NOTES (Max)

■ **Function:** Set the maximum number of notes each voice can sound.

To set the number of maximum notes:

Use the cursor left and cursor right keys or enter the number directly by using the numeric keypad.

Note:

The total number of notes cannot exceed 8. For this reason, you may have to subtract notes from some instruments before you can increase notes in other instruments.

■ **Parameter ranges:**

MAXIMUM NOTES: 0 — 8

**MIDI RECEIVE CHANNEL
(R ch)**

■ **Function:** Set the MIDI receive channel for each voice.

To set the MIDI receive channel:

Use the cursor left and cursor right keys or enter the number directly by using the numeric keypad. (Entering numbers of 16 or higher on the numeric keypad all result in a MIDI channel setting of 16.)

■ **Parameter ranges:**

RECEIVE CHANNEL: 1 — 16, omni

VOICE NUMBER (Voice)

■ **Function:** Select the voice number (and the memory type from which it is selected) for each of the Multi Mode instrument slots.

To set the voice number:

- 1) Select the memory type: Preset (P), User (U), or Card (C). Press the appropriate PLAY Mode button.
- 2) Select the voice number. Use the cursor left and cursor right keys or enter the number directly by using the numeric keypad. The name of the selected voice will be shown in the upper right part of the display.

VOLUME (Volm)

■ **Function:** Set the volume for each voice.

To set the volume:

Use the cursor left and cursor right keys or enter the number directly by using the numeric keypad.

■ **Parameter ranges:**

VOLUME: 0 — 99

PAN

■ **Function:** Determine the pan setting for each voice.

- Use the + / - **SELECTOR** buttons below each voice slot parameter to select the pan setting (<◀◻> = Left, <■> = Center, <◻▶ = Right). Each press of the corresponding + or - **SELECTOR** button steps through one of the three pan settings.

Note:

Effect and Pan cannot be used at the same time. 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 following message will briefly appear and the effect setting(s) will be ignored.

PAN) MaxNotes=1,R.ch=01,P00 Elegant
ATTENTION Effect data was ignored!

■ **Parameter ranges:**

PAN: ◀◻▶ = Left, <■> = Center, ◻▶ = Right

DETUNE (Detun)

■ **Function:** Set the degree of detuning for each voice.

Each voice can be detuned up or down relative to the originally set central pitch. Setting different detuning values to different voices lends an overall richness to the sound.

To set the direction and amount of detuning

- 1) Set the direction of detuning: positive or negative. Use the cursor left (–) and cursor right (+) keys.
- 2) Enter the amount of detuning directly from the numeric keypad. (Entering numbers of 7 or higher on the numeric keypad all result in a detuning setting of 7.)

■ **Parameter ranges:**

DETUNE: –7 – +7

NOTE LIMIT (Nlim)

■ **Function:** Set the lowest and highest notes at which each voice will sound.

Note Limit allows you to assign up to eight different voices to sections of the connected keyboard, in any fashion you desire. This Multi Mode job, in conjunction with Maximum Notes and Voice Number, is most important in creating multi-voice keyboard setups.

For example, a bass voice and a piano voice could be assigned to opposite sides of the keyboard. Note Limit would be used to determine where on the keyboard those sounds could be played. Once the bass voice is selected (in Voice Number), the low note limit could be set to C1 and the high note limit to G2. The piano voice would then be assigned to the range above that (G#2 to C6), allowing you to play independent voices with your left and right hands.

Both the currently set high note limit and low note limit values are shown in two rows on the display, but only the lower row of values can be edited. Use the numeric keypad to reverse the position of the rows on the display: pressing any number from 0 to 4 puts the low note limit row at the bottom of the display for editing; pressing numbers 5 to 9 puts the high note limit at the bottom for editing. The note values for each voice can then be set by first selecting the instrument with the appropriate +/– **SELECTOR** button, and by entering the value from the cursor left/cursor right keys. The connected keyboard can also be used to enter a Note Limit value; simply press the appropriate instrument's +/– **SELECTOR** button and then press the key on the keyboard. To change your selection, repeat the process.

■ **Parameter ranges:**

LOW NOTE (L): C-2 – G8
HIGH NOTE (H): C-2 – G8

LFO

■ **Function:** Set the two independent LFOs and vibrato control for each voice.

The TQ5 is equipped with two independent LFOs that can be used simultaneously with any voice. However, since eight voices can be simultaneously sounded, no more than two different LFO settings (tremolo, tone, volume and wowwow) can be used at the same time. The only exception to this rule is vibrato, which is separate from the LFO (though is still considered as an LFO-type effect) and can be applied

is the next different LFO setting. For example, if a strings voice with an LFO setting of tremolo occupied the first, or leftmost, position in the display, "LFOa" would be set to tremolo, and all other voices given an "LFOa" value would have the same tremolo setting. The actual LFO values (Speed, Vibrato and Tremolo) are set in the LFO of the Easy Edit mode. Please refer to that section for more information.

■ **Parameter values:**

off, LFOa, LFOb, vib

Note:

You can edit voice data directly from the Multi Mode by pressing the appropriate **EASY EDIT** button; however, only the leftmost voice in the display can be selected automatically in this way. To edit other voices, you must return to PLAY mode and select the voice.

Note:

In the Multi Mode, all voices must share the same effect (reverb, delay, distortion, etc.). Initially, this 'global' effect for the Multi Mode will be No. 0 Rev.Hall. To change this, press EFFECT and make the desired setting. It will apply to all the voices. When you return to Play Mode, each voice will regain its original effect settings.

Note:

When editing voices directly from the Multi Mode, it is possible to edit a voice and yet not be able to hear it. This happens when the edited voice (the leftmost voice on the display) has a MIDI Receive channel that is different from the MIDI Transmit channel of the connected MIDI keyboard. To hear only the voice you are editing, you can:

- 1) Set the MIDI Receive channel (in the Multi Mode's MIDI Receive Channel job) to the same value as the MIDI Transmit channel of the connected MIDI keyboard.
- 2) Set the MIDI Receive channel (in the Multi Mode's MIDI Receive Channel job) of all other voices to a different value than that set above in step #1.
- 3) Press the desired **EASY EDIT** button and begin editing.

OR (if the above three steps appear too troublesome),

Select the voice manually (as described in the OPERATION BASICS chapter) and edit it as you usually do.

MULTI MODE OPERATION — A SETUP EXAMPLE

The Multi Mode has some very powerful features, but it also contains some of the more complicated functions of the TQ5. This section is meant to serve as a quick introduction to the operation of some of the Multi Mode jobs and give you a clearer grasp of how to use them for your own applications.

In this setup example, we'll create a keyboard arrangement in which three separate instrument sounds — piano, brass and solo violin — can be played.

The three voices used will be Preset voices #07 Piano 1, #56 Violin 1, and #75 Sax 1.

Before we assign these sounds to sections of the keyboard, we should find out what LFO settings these voices have and which are most important. Since the voice occupying the leftmost position in the Multi Mode displays determines the setting for "LFOa" (refer back to the description in the Multi Mode's LFO job), the voice whose LFO setting we feel is most important to keep should be assigned to the leftmost spot. (Remember that a voice's original LFO setting may be overridden or ignored if another voice precedes it in the display.) Our example is quite easy, since #56 Violin 1 is the only voice in which an LFO parameter is set to greater than 0 (in this case, tremolo = 15).

Now, let's set up the Multi parameters.

- 1) Press **JOB** and select **Multi**.
- 2) Select **Max** (since we must determine the maximum number of notes for each voice before doing anything else).
- 3) Press the leftmost — **SELECTOR** button.
- 4) Since the leftmost position will be occupied by the solo violin voice, enter "1" from the numeric keypad to make this a mono voice.

The previously selected voice

MAX NOTES) MIDI R.ch=01 , P00 Elegant							
<u>1</u>	0	0	0	0	0	0	0
█ ⁻	□ ⁺	□ ⁻	□ ⁺	□ ⁻	□ ⁺	□ ⁻	□ ⁺

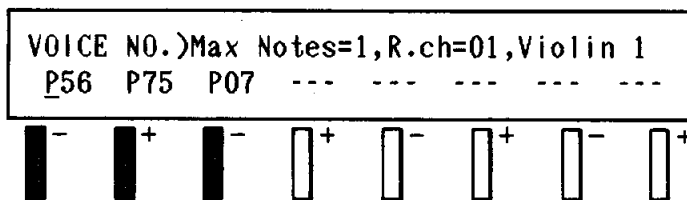
- 5) Now, set the maximum notes for the other two voices: 2 for voice #75 (the brass sound) and 5 for #07 (the piano sound).

MAX NOTES) MIDI R.ch=03 , P02 WideString							
1	2	<u>5</u>	0	0	0	0	0
□ ⁻	█ ⁺	█ ⁻	□ ⁺	□ ⁻	□ ⁺	□ ⁻	□ ⁺

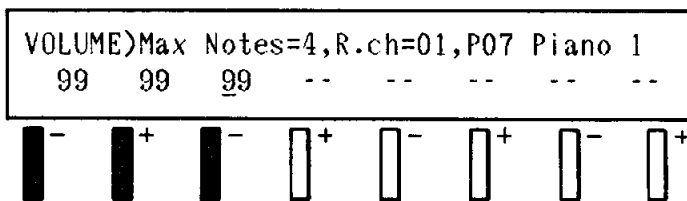
- 6) Press **JOB** again and select **R.ch** (Receive Channel) this time.
- 7) Set all Receive Channel values for the three voices to "01." The display should appear as shown below:

RECEIVE CH) Max Notes=5 , P02 WideString							
01	01	<u>01</u>	-----	-----	-----	-----	-----
█ ⁻	█ ⁺	█ ⁻	□ ⁺	□ ⁻	□ ⁺	□ ⁻	□ ⁺

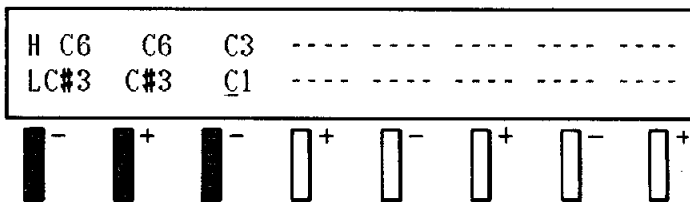
- 8) Select the voice numbers for each voice position. Press **JOB** again, then select **Voice**.
- 9) Press **PRESET** (since we must select the memory type in which the voice is located).
- 10) Enter "56" on the numeric keypad. Then enter Preset voices #75 and #07 in the same way. The display should appear as shown below:



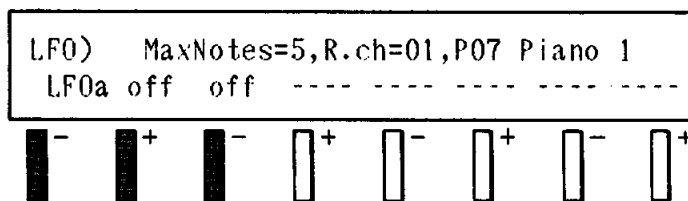
- 11) Press **JOB**, then select "Volm", and set the volumes of the voices to an appropriate balance.



- 12) Next, set the note limits for each voice. This will determine the part of the keyboard at which each voice can be played. Press **JOB** again, then select **Nlim**.
- 13) Now you can determine the note limits for each voice—the range of the keyboard over which they will sound. Note limit settings can be changed only for the lower line of the display. To switch the Low and High limit displays, press any numeric key 0 — 4 to set the Low key limit, and any numeric key 5 — 9 to set the High key limit. The first keyboard note you press after selecting a **SELECTOR** button will set the new note limit for that instrument. Or, you can use the cursor left and cursor right keys located below the numeric key pad to change the note limit setting.
- 14) Set the first two voices to the same low note and high note limit values (C#3 and C6) and set the third to low and high limits of C1 and C3. In this way, the lower two octaves will be used to play the piano voice and the top three octaves will be used for the brass and violin. The display should appear as follows.



15) Finally, select the LFO settings for each voice. Press **JOB**, then select **LFO**. Use the +/- **SELECTOR** buttons under the voice positions to select the desired voice, then use the + and - keys on the numeric keypad to set the value. The solo violin voice, since it has the only LFO setting, should be set to "LFOa." The other two voices may be set to "off."



Now, play the voices from the keyboard... and then go on to create and experiment with your own Multi Mode settings.

**CONCERNING THE
 RECEPTION OF VOICE
 DATA (MIDI BULK DATA
 RECEPTION)**

The TQ5 can send and receive voice data from other TQ5s. One voice (of Preset, User or Card memory) can be sent or received at one time, or voice data of User memory can be sent or received in banks of 100 voices.

To make the data transfer, simply select the MIDI BULK OUT function of the JOB Mode on the transmitting TQ5 and select the type of data transfer to be made ("voice" = one voice; "100 user" = bank of 100 user voices; "System" = system or control data). When receiving banks of 100 voices, the memory protect function of the receiving device should be set to OFF; you can easily release the memory protect function by pressing STORE. The memory protect has no effect, however, when receiving single voices. Singly received voices can be stored to User or Card memory; banks of 100 voices are automatically sent to User memory. Tuning and all other parameter values are sent with voice data.

Voice and system data transfer between the TQ5 and other Yamaha instruments is also possible to a certain extent, depending on the instrument used. Compatible instruments for which partial data transfer is possible include the DX100, DX21, DX27, DX27S and DX11 synthesizers and the TX81Z FM Tone Generator. The voice and system data of the TQ5 and the YS100, YS200 and B200 synthesizers are fully compatible. Voice and system data of the TQ5 can also be stored to floppy disks by sending it to the DX7IIFD synthesizer, the QX3 sequencer or the MDF1 MIDI Data Filer.

SEQUENCER REFERENCE

WHAT IS A SEQUENCER?

Having worked through the sequencer recording and playback examples in the OPERATION BASICS section and listened to the demonstration songs, you undoubtedly have a good idea of the creative possibilities of the TQ5's sequencer. This section will now take you further in your exploration and introduce you to all of the advanced features of the sequencer.

The sequencer built into the TQ5 is much like a multi-track tape recorder, with the important difference that instead of recording sound, it records a sequence of events; each note you play, each voice number you select, each press of the sustain pedal is stored in memory as data. In other words, instead of recording the **sound**, you are recording the **performance**.

When you play back a sequence, this data makes the TQ5's tone generating circuits produce sound.

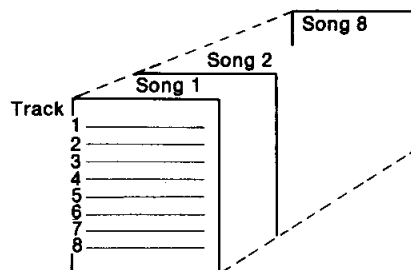
Sequence recording (as opposed to sound recording) has many advantages. For example, you can change sounds during playback. ("Maybe that Clarinet solo would be better played by an Oboe," etc.) The tempo can be changed without affecting the pitch, meaning that you can record a difficult passage at a slow tempo and play it back faster. To record especially complex parts, you can even enter notes one by one (this is called Step Recording). If you make a mistake, you can use Step Recording to re-record just that single wrong note.

TRACKS, VOICES AND SONGS

Most musical compositions are played by two or more instruments, each playing their own part. The TQ5's sequencer has **8 tracks**. Each track is an independent part (up to 999 measures long) and controls a different instrument. A track can contain voice changes, meaning that (for example) the same track could play a Sax voice, then a Trumpet, then a Horn.

The TQ5 can sound up to eight different voices at once, so by using a sequencer track for each voice, it is possible to create very complex songs.

Data for these 8 tracks can be given a name and tempo, and stored as a **Song**. The TQ5 can remember 8 different songs you create. Your songs can also be stored on a data cartridge.



SEQUENCER FUNCTIONS

Before we explain the operational details of the TQ5 sequencer, here's an overview of how it is organized and what it can do. (The Sequence Functions reference card included with this manual has a similar chart for your convenient reference.)

Important:

- To enter the Sequencer mode, press SEQ/PLAY. The LED will light (red), indicating that the sequencer is now active, and that **all buttons will now perform the functions printed in black**. For example, the Easy Edit button marked EG (with TR1 printed in black) will turn track 1 on and off. When explaining the Sequencer mode, we will be using these names for the buttons.
- To return to Synthesizer mode, press EXIT.

The two main Sequencer mode functions are to **play** a song and to **record** tracks to make a song.

PLAY A SONG

PLAY SONG)	Voice	Measure	Tempo
1:FUNKY	P01:A.PIANO	001	120

↑
 ○ SEQUENCER/PLAY ← Press SEQ/PLAY to enter Sequence mode ("Play" mode). Details on page 67.

Select a song. You can change the voice and tempo, and begin playing from any measure.

RECORD A SONG

NORMAL REC)	Beat	Measure	Tempo
P01:Piano	4/4	001	120

↑
 ○ RECORD ← Press RECORD to enter "Record" mode. (Normal, Punch or Step recording is selected in JOB, below.) Details on page 68.

You can change the voice, beat (time signature), and tempo of the song, and begin recording from any measure.

There are two other functions in Sequencer mode; Job (various editing and control functions) and Voice (select the voices used in the song).

JOB SELECT

Press **JOB**, then press one of the +/- **SELECTOR** buttons to select a job. Details on page 79.

SEQUENCER JOB SELECT)	Select one!
Song Qntz Cnd Edit Mix Card Rec Efct	

- Song: Set song name and tempo, store or clear a song
- Qntz: "Tighten up" timing of a track
- Cnd: Select sync and specify recording conditions
- Edit: Erase or Copy tracks, Delete or Insert measures
- Mix: Combine two tracks into one track
- Card: Save/Load data to card or MIDI
- Rec: Set record mode and receive channel
- Efct: Select an effect (Reverb, etc.)

VOICE SELECT

Repeatedly press **VOICE** to access "Voice Select", "Max Notes", or "MIDI Transmit Channel". Details on page 87.

Select the voice (sound) played by each track.

VOICE SELECT)	Voice name = Piano 1
P07	--- --- --- --- --- --- --- ---

The 8-note sound producing capability of the TQ5 must be distributed among the 8 instruments.

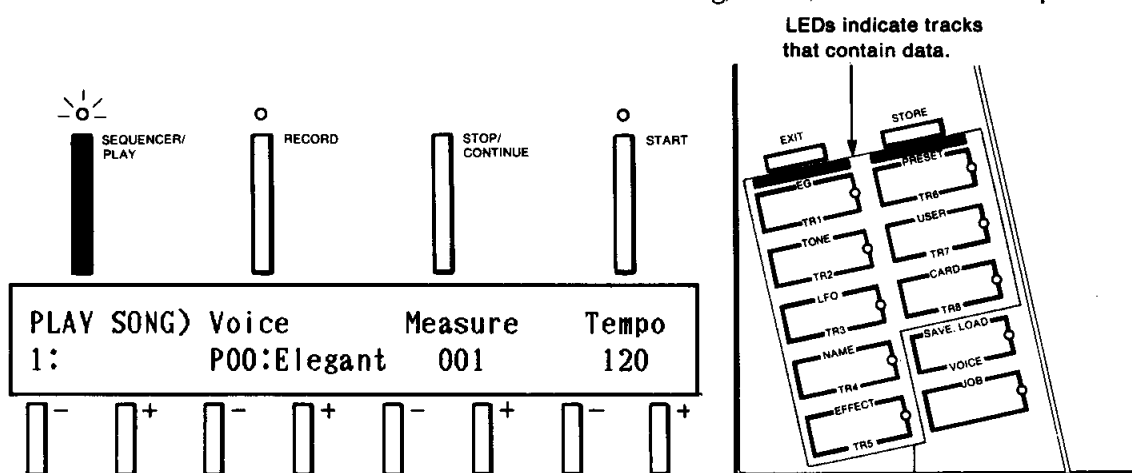
MAX NOTES)							
1	5	1	1	0	0	0	0

Each sequencer track can transmit data from MIDI OUT to control other synthesizers.

MIDI TRANSMIT CHANNEL)							
01	02	03	04	05	06	07	08

PLAY

This is where you play back a song. When you press SEQ/PLAY, the LED will light (red) indicating that you are in Sequencer mode. The display will be as follows. Use the -/+ buttons below the LCD to select Song, Voice, Measure and Tempo.



PLAY SONG: Select a song (1–8) to playback. If the song has a name it will be displayed.

Voice: Initially, the voice used in the first track will be displayed. You can play this voice from the keyboard, or select a different voice (00–99) if desired. (See note below.)

Measure: Select the measure from which to begin playback. (You will not be able to select a measure beyond the actual end of the song.) Playback from the selected measure is started by pressing **STOP/CONTINUE**. (Pressing **START** begins playback from the first measure.)

Tempo: Initially, this will be the Tempo you set when you Stored the song (see Store, page 50) but you can set a new Tempo of 60–180 quarter notes per minute.

Before starting playback, you can press a Track Select button to mute the track so that it will not be heard. (Blinking green = muted.) Pressing a Track Select button will reset the selected Measure to 001.

To begin playback from measure 1 press **START**. To playback from the location specified in "Measure" press **STOP/CONTINUE**. While playing, the **SEQ/PLAY** LED will blink to indicate the tempo of the song. To stop playback, press **STOP/CONTINUE**.

- Playing the connected keyboard will sound the voice indicated in "Voice", but remember that the voice will be limited by the Max Notes setting for that track.
- Before starting playback, you can press a track select button to mute/unmute a track.
- In addition to using the second pair of -/+ **SELECTOR** keys, you can also enter voice numbers directly from the numeric keypad. To select Preset, Cartridge or User voices, press **VOICE** and then **PRESET**, **USER**, or **CARTRIDGE**. See the detailed explanation of **VOICE SELECT**, page 87.
- In addition to the measure number indication in the display there is also a unique stop watch feature. The stop watch runs automatically when recording or playback begins and can be displayed either in recording or playback. It also stops automatically when recording or playback is stopped. The total time of the song is indicated in minutes, seconds and 1/10 seconds.

Use the cursor right key to switch between display of the measure number or the stop watch. Use the cursor left key to reset the stop watch to zero.

The stop watch time is cumulative; in other words, it continues to run from the point at which it was last stopped, even if the song plays to its conclusion once and is played back again. For example, if your song is 32 seconds in length, playing

it back twice will result in a stop watch reading of 64 seconds.

You can reset the stop watch to zero at any time (even while it is running) by pressing the cursor left key on the numeric keypad.

RECORD

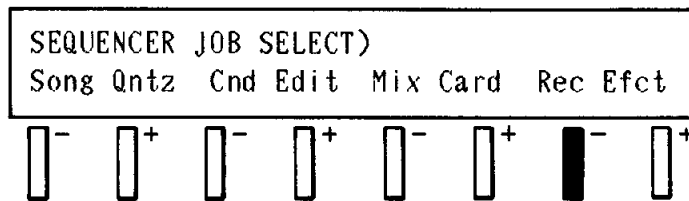
This is where you record tracks. A song contains 1 — 8 tracks, and each track is recorded separately. The TQ5 sequencer gives you three ways to record;

Normal Recording: Your keyboard playing will be recorded just as you hear it.

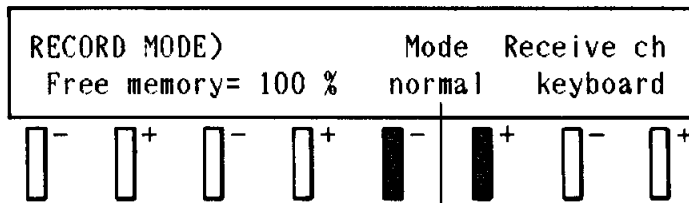
Punch Recording: The same as Normal recording except that recording takes place only during the measures you specify. For example you can re-record over a mistake and keep the rest of a track.

Step Recording: Enter individual notes one by one from the keyboard. This allows you to create very complex passages that would be difficult to actually play.

Initially, "Normal" recording mode is selected. If you need to change the recording mode, press JOB to get the following display.



Next press the +/- **SELECTOR** button that selects "Rec" to get the following display.



Use +/- **SELECTOR** keys to select normal, step or punch

Use the -/+ keys for "Mode" to select "normal", "step" or "punch". (This is explained in detail in the Job section, page 79.)

Finally, press RECORD (the LED lights red) to enter Record mode. (If the LED lights green and the LCD shows "PART TYPE", press RECORD again to make it light red.) Each recording mode (Normal, Punch and Step) will be explained separately in the following sections.

While playback is stopped, you can press a track select button (TR1 — TR8) to see (and change) the voice used in each track 1 — 8. If the track is playing an instrument that is set to Max Notes = 0, the display will show "----".

Note:

The TQ5 sequencer has a capacity of about 10,000 notes. If you run out of memory while recording in real time, the LCD will show "Memory Full", and ALL the data in the track being recorded will be lost. It is a good idea to check the "Free Memory" display (Record Mode job) before recording.

MULTI-TRACK RECORDING PROCEDURE

If you have ever used a multi-track tape recorder, operating the TQ5 sequencer will be a familiar experience. The basic idea of multi-track recording is to record a part, then record another part while listening to the first part. For example, you might first record a Piano part on track 1.

Track 1 Piano (recording)

Track 2

Track 3

Next you would record the Bass part on track 2 while listening to the Piano (track 1).

Track 1 Piano

Track 2 Bass (recording)

Track 3

Finally you would record a Sax part on track 3 while listening to the Piano and Bass (tracks 1 and 2).

Track 1 Piano

Track 2 Bass

Track 3 Sax (recording)

In this way, you can sound like an entire ensemble all by yourself!

Important:

Before you begin recording, you should set the TQ5 synthesizer to a combination of instruments (an "ensemble") appropriate to the song you will record, as explained in the next section, Part Type.

PART TYPE

The TQ5 sequencer has 8 tracks, and the TQ5 synthesizer can produce up to 8 parts simultaneously. However, since a maximum of only 8 simultaneous notes can be sounding at once, these 8 available notes must be distributed among the 8 voices. Thus, if you need to play chords of 2 or more notes with a single voice, one or more of the other voices need to be set to MaxNotes = 0. (This has already been explained in the Synthesizer section. See Multi Mode, Max Notes on page 57.)

There are two ways to set up a combination of parts, i.e., an "ensemble".

1. Use a preset Part Type (see the following section).
2. Use the Sequencer mode VOICE function.

However, setting the keyboard range for each part can be done only in Synthesizer mode, Multi Mode. You may have to go back to Multi Mode to change keyboard "splits" if necessary.

Here is a typical five-part "ensemble" of Harp, Violin, Cello, Flute and Oboe, each part played by a different track of the sequencer. Notice that the total number of simultaneous notes for all voices equals 8.

Track	Instrument	Voice	Maximum notes
Track 1	1	Harp	3
Track 2	2	Violin	2
Track 3	3	Cello	1
Track 4	4	Flute	1
Track 5	5	Oboe	1
Track 6	6	—	0
Track 7	7	—	0
Track 8	8	—	0

Total simultaneous notes for all voices is = 8 (max)

Sequencer tracks 1 — 5 will play the corresponding instrument. In the above example only five tracks are needed, and tracks 6 — 8 will not play a TQ5 instrument. (However these tracks can be used to play an external synthesizer via MIDI. See MIDI Transmit Channel, page 88.)

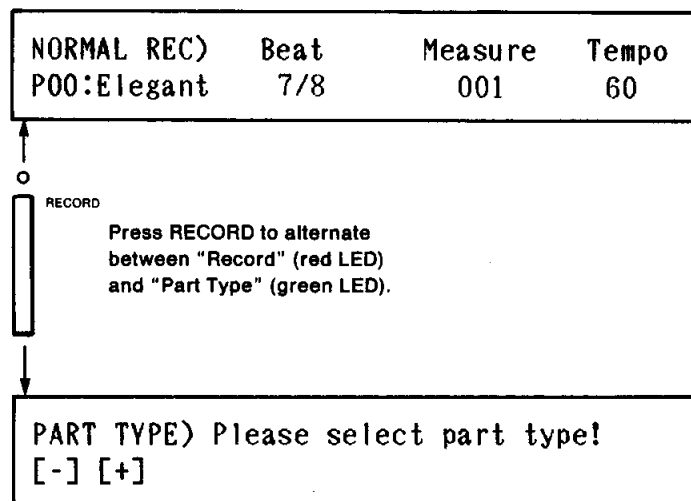
Each sequencer track can record up to 8 simultaneous notes. However, when recording a track, you should remember not to exceed the simultaneous note capacity for each instrument. For example, track 1 should contain chords of no more than 3 simultaneous notes. If track 1 contained chords of 4 or more notes, notes over the limit would make the previously played notes cut off unnaturally. Keep in mind that instruments like Cello and Oboe are usually played monophonically (one note at a time), and make the best of your 8 simultaneous notes.

PRESET PART TYPES

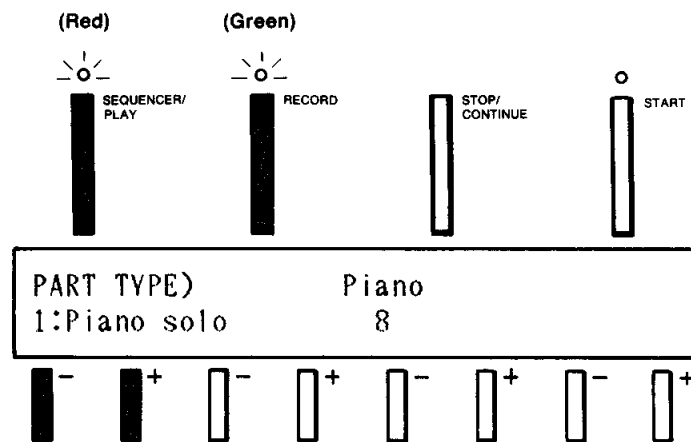
Seven different Part Types ("ensembles") are preset for your convenience.

For example by selecting preset Part Type "2:Pops", you instantly have available a four-member band of Bass, Piano, Strings and Vibe, with the Piano able to produce up to 5 notes simultaneously. This saves you the trouble of making settings in Sequencer Voice mode, page 86.

If you do **not** select one of the preset Part Types, the Synthesizer Multi Mode settings you made for Voice Select and Max Notes will be used. This allows you to use your very own ensemble combination.



To select a Part Type, press -/+ to see the 7 choices below.



Select a part type

PART TYPE	Track 1	Track 2	Track 3	Track 4	Track 5	Track 6	Track 7	Track 8
1 Piano solo	Piano 8 voices	x	x	x	x	x	x	x
2 Pops	Bass 1 voice	Piano 5 voices	Strings 1 voice	Vibes 1 voice				
3 Fusion	Bass 1 voice	Piano 5 voices	Brass 1 voice	Flute 1 voice				
4 Rock	Bass 1 voice	Brass 5 voices	Guitar 2 voices					
5 Jazz	Bass 1 voice	Piano 5 voices	Flute 1 voice	Vibes 1 voice				
6 Latin	Steel drum 1 voice	Piano 4 voices	Brass 1 voice	Marimba 1 voice	Percussion 1 voice			
7 Classic	Harp 3 voices	Violin 2 voices	Cello 1 voice	Flute 1 voice	Oboe 1 voice			

After selecting one of these preset Part Types, you can modify the settings by pressing VOICE and changing the settings for Voice Select, Max Notes and MIDI Transmit Channel (see Voice, page 86).

Note:

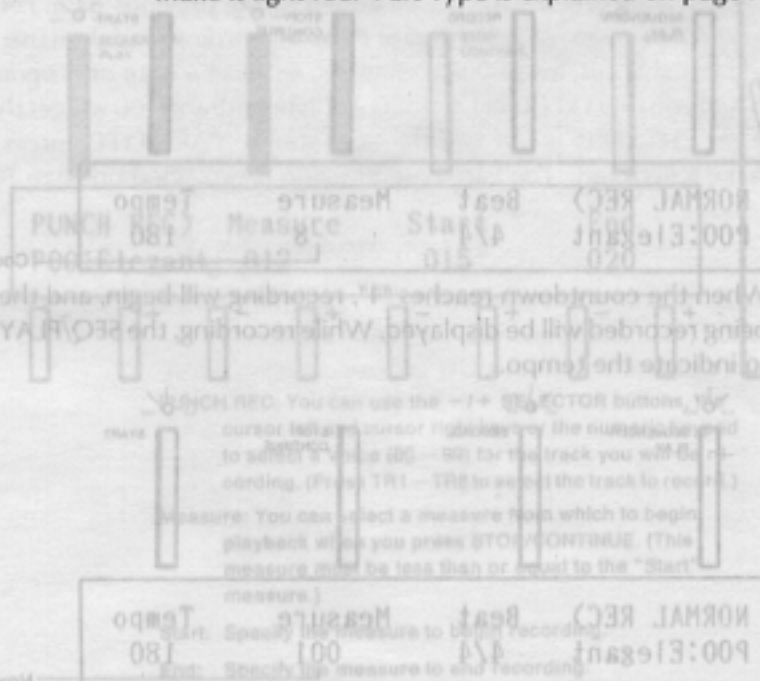
Remember that selecting one of these preset Part Types will replace the Sequencer Voice Mode settings you made for Voice Select and Max Notes. If you want to use the present instrument setup for your recording, **do not select a preset Part Type.**

When you return to Synthesizer mode, your previous Multi Mode settings will be restored.

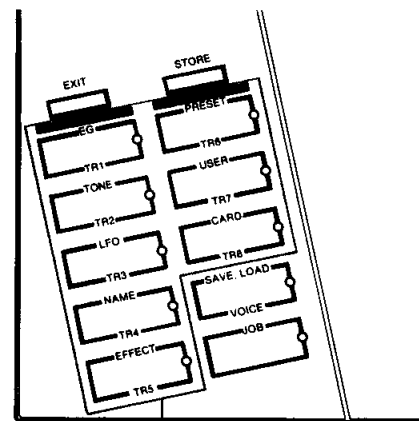
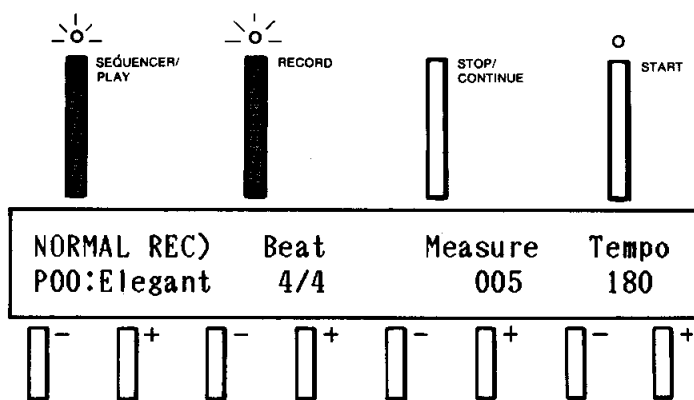
NORMAL RECORDING

In Normal recording, notes are recorded in the exact timing that you play them. Voice changes and movements of the Pitch and Modulation wheels, etc. (see below) will also be recorded, letting you record an expressive performance.

When you press RECORD, the LED will light (red) and you will get the following display. (If the LED lights green and the LCD shows "PART TYPE", press RECORD again to make it light red. Part Type is explained on page 70.)



A red LED indicates the track being recorded. (Press to select 1 - 8.)



A red LED indicates the track being recorded. (Press to select 1 – 8.)

NORMAL REC: You can use the -/+ buttons or the numeric key pad to select a Voice (00–99) for the track you will be recording. (Press TR1 – TR8 to select the track to record.)

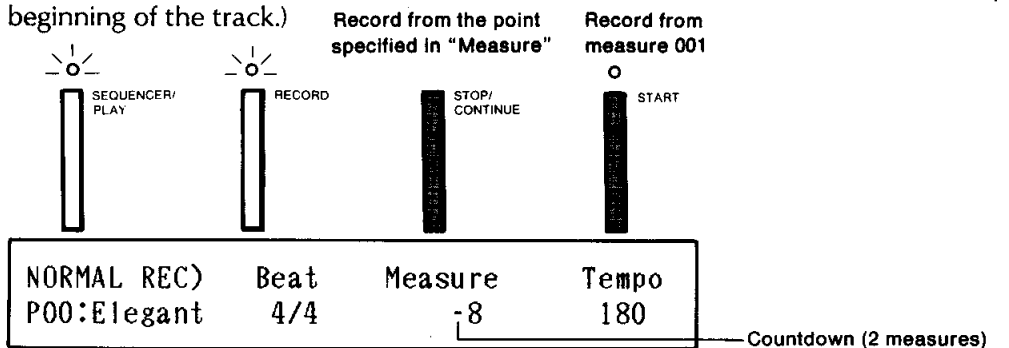
Beat: You can set a time signature (1/4 – 4/4, 1/8 – 8/8) for the song **only if all tracks are empty**. Once a track has been recorded, the time signature of the song cannot be changed. (All tracks share the same time signature for the entire song.)

Measure: You can select a measure from which to begin recording when you press STOP/CONTINUE. (You can select any measure 1 – 999 even if existing tracks in the song are not actually that long.)

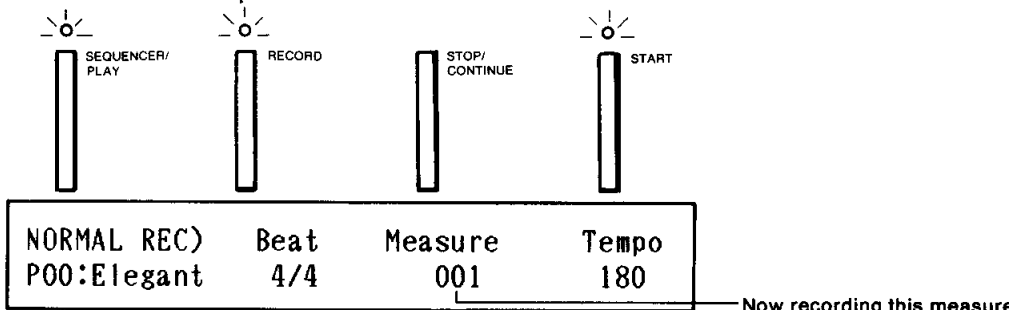
Tempo: You can set the tempo, or the speed at which the song will play or record, over a range of 60 – 180.

After you have selected a preset Part Type or manually set the instrument assignments in the Synthesizer Multi Mode (see page 57) or Sequencer Voice Mode (page 86), you are ready to record. For example to record on track 1, press the track switch TR1 (the LED lights red). You can record only one track at a time.

To begin recording from measure 1, press START. To begin recording from the location you specified in "Measure", press STOP/CONTINUE. There will be a two-measure countdown to give you the tempo. (If you play a note or move a controller before the countdown reaches "1", the note or controller data will be recorded at the very beginning of the track.)



When the countdown reaches "1", recording will begin, and the measure currently being recorded will be displayed. While recording, the SEQ/PLAY LED will blink (red), to indicate the tempo.



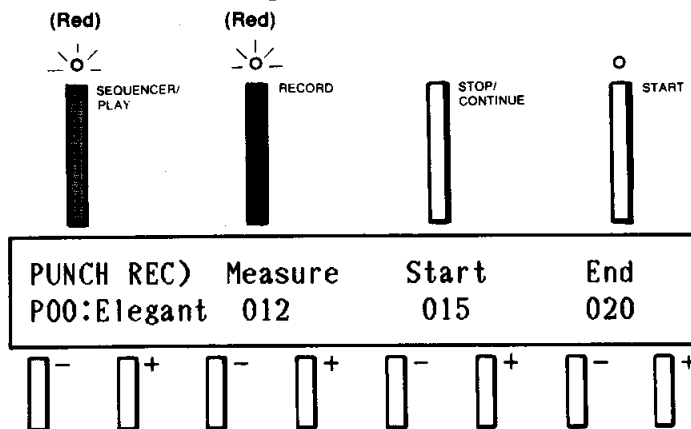
When you have finished recording or want to quit, press STOP/CONT. Recording will end and you will return to PLAY mode. (You can also stop recording by pressing EXIT, but you will then go back to Synthesizer mode.) To record another track, press RECORD, select another track (TR1 — TR8), and record again.

- If you have already recorded other tracks, you will probably want to listen to them while recording the new track. Tracks indicated by a green LED will playback as you record. In PLAY mode you can use the track select buttons TR1 — TR8 to switch a track between Play (green LED) and Mute (blinking green LED). In RECORD mode the track select buttons are used only to select a track for recording.
- In Normal recording if you record on a track that already contains data, the new recording will be **added** to the original data. This means that if you make a mistake, you will have to get rid of it by recording over it using Punch record (which will **erase** the original data), or by using the "Erase" function (page 81).
- During Normal and Punch recording, the TQ5 also records control data such as pitch bend, modulation wheel and breath control, if your connected MIDI keyboard is equipped with these controls. (The PF1500 Electronic Piano is not so equipped.) You can set the effect of modulation wheel and breath control data in the Control function (page 53) in the Synthesizer Job Mode. Voice changes (00 — 99) you make while recording are also memorized. (Use the left-most -/+ SELECTOR buttons or the numeric key pad.) However you cannot select a different **type** of voice (preset, user, card) while recording.
- Depending on the settings in the "Condition" job (page 80), Aftertouch and Velocity data can also be recorded. However, remember that the more controller data you record, the faster memory will be used up. (If **only** note data is recorded, the sequencer has a capacity of about 10,000 notes.)

PUNCH RECORDING

Punch In recording is the same as Normal recording with the difference that **only the measures you specify will be recorded**. This is very useful if you have made a mistake in just one section, but want to keep the rest of a track.

When you press RECORD, the LED will light (red) and you will get the following display. (If the LED lights green and the LCD shows "PART TYPE", press RECORD again to make it light red. Part Type is explained on page 70.)

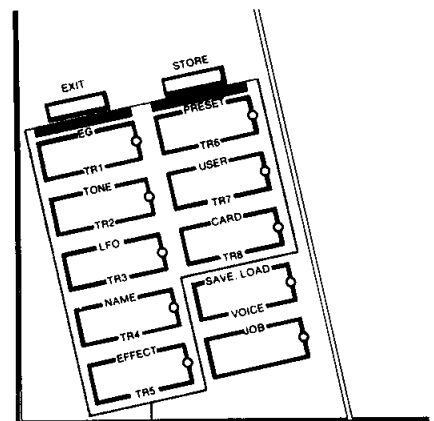


PUNCH REC: You can use the -/+ SELECTOR buttons, the cursor left and cursor right keys or the numeric keypad to select a Voice (00 — 99) for the track you will be recording. (Press TR1 — TR8 to select the track to record.)

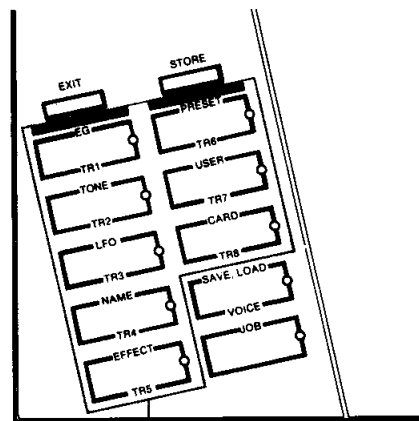
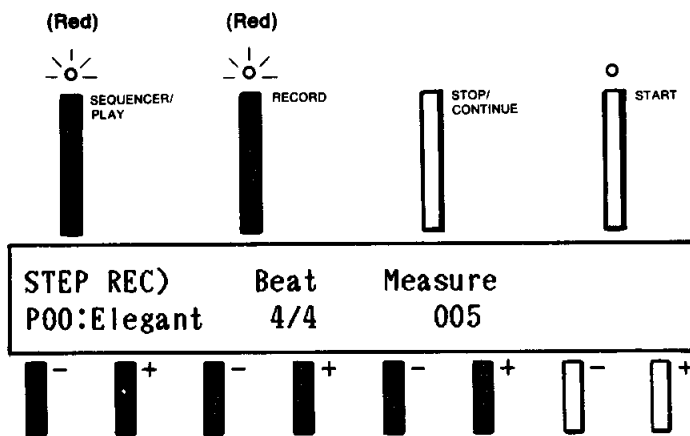
Measure: You can select a measure from which to begin **playback** when you press STOP/CONTINUE. (This measure must be less than or equal to the "Start" measure.)

Start: Specify the measure to begin recording.

End: Specify the measure to end recording.



A red LED indicates the track being recorded. (Press to select 1 — 8.)



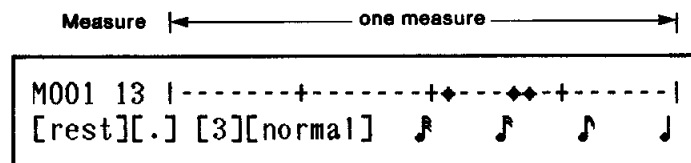
A red LED indicates the track being recorded. (Press to select 1 – 8.)

STEP REC: Use the -/+ **SELECTOR** buttons, the cursor left and cursor right keys or the numeric keypad to select a Voice (00 – 99) for the track you will be recording. (Press TR1 – TR8 to select the track to record.)

Beat: You can set a time signature (1/4 – 4/4, 1-8 – 8/8) for the song **only if all tracks are empty**. Once a track has been recorded, the time signature of the song cannot be changed. (All tracks share the same time signature for the entire song.)

Measure: You can select a measure from which to begin step recording when you press STOP/CONTINUE. (You can select any measure 1 – 999 regardless of whether or not such a measure is beyond the actual end of the song.)

As in Normal recording, press START to begin recording from measure 1, or press STOP/CONTINUE to begin recording from the location you specified in "Measure". In Step recording the LCD will graphically show one measure at a time (each division represents a 32nd note), and will look something like the following.



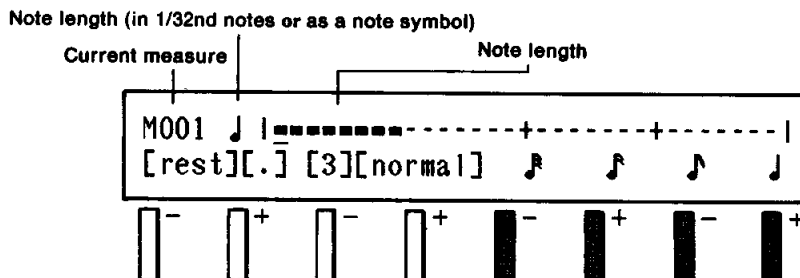
Notes are indicated by a diamond-shaped mark. In the above LCD you can see that the third beat of measure 4 contains three notes. (For details, see below.)

When you have finished recording, press STOP/CONT. Recording will end and you will return to PLAY mode. (You can also stop recording by pressing EXIT, but you will then go back to Synthesizer mode.)

■ RECORDING NOTES

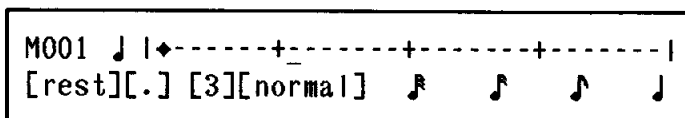
Each time you press and release a note on the connected keyboard, it will be recorded at the current position, and the position will advance. If you press more than one note before releasing the previous note, the notes will be recorded at the same position – i.e., a chord.

In Step Record, the length of each note is determined not by how long you press the key, but by the note length you select, 1/32, 1/16, 1/8 or 1/4 note. Press one of the four right SELECTOR buttons to select a note length. The selected note length will be displayed as a note symbol to the right of the Measure. The LCD will show a bar indicating the note length (in steps of a 1/32nd note), beginning from the current position in the measure. For example if you press the SELECTOR button to select a quarter note (the right-most SELECTOR button), the LCD will look as follows.



Selecting an additional note length will **add** to the note length. For example if you pressed the SELECTOR button again to select another quarter note, the result would be a half note. You can also use the cursor left and cursor right keys below the numeric key pad to adjust the length of the selected note, to make the note shorter or longer in steps of a 32nd note.

From the above LCD, if you press and release a note of the connected keyboard, a quarter note will be entered, and the cursor position will advance. The LCD will look as follows.



Notice that a diamond mark indicates the note you recorded. You may now press the connected keyboard to record another note of the same length, or select a new note length.

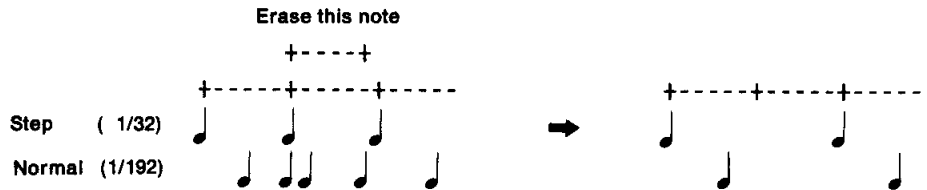
In this way, continue pressing and releasing the keyboard to record notes.

- Use the cursor left and cursor right keys (below the numeric key pad) to make fine adjustments in note length. If you continue pressing the cursor left key, the note length bar will become shorter, and finally disappear. **Now you can use the cursor left and cursor right keys to move to a different position.** (For example to record a note at an earlier location.)
- When you press the third SELECTOR button from left to select [3], the LCD will show **"*3*"**, and note lengths will be reduced to 2/3 of their normal value, letting you enter triplets. For example if you have selected a note length of 1/4 (eight 32nd notes), selecting [3] will make the note length equal six 32nd notes. (If the resulting note value does not divide evenly into 32, the next highest note value will be used.) Pressing the same SELECTOR button again will return to the "[3]" display, and note lengths will be their normal value.
- Selecting [.] (the second SELECTOR button from left) will increase all further note lengths by 50% to produce "dotted" notes. Press the SELECTOR button again to return to normal note lengths.

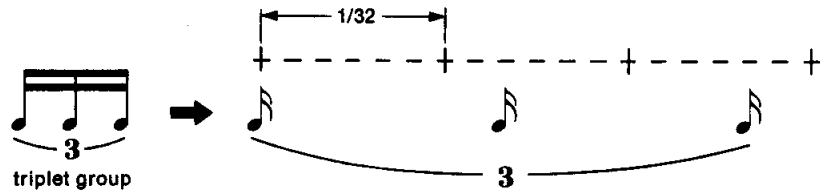
Note:

The timing precision in Step record mode is one 32nd note. Erasing data (a note or voice change) actually erases **all** data in the specified 32nd note region. Although Normal or Punch record modes have six times greater timing precision (one 192nd note), these "in-between" notes will be displayed and edited as though they were a single note at 32nd note intervals.

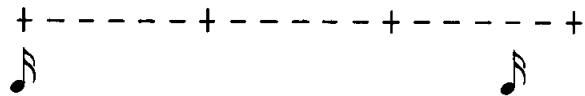
The following diagram illustrates this. The same track contains notes recorded in Step record (1/32 precision) **and** notes recorded in Normal record (1/192 precision). Notice how the track data changes when you erase a note.



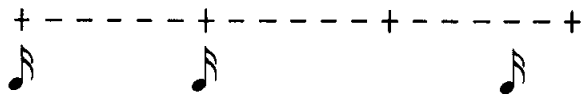
Since the maximum timing resolution is 1/32 note, editing of grouped notes that do not separate evenly into 1/32 divisions (such as triplets) will affect more than one note. Notes in the middle or at the end of such beamed groups cannot be edited individually but are edited with the entire note group. Similarly, you should be careful when editing notes of a beamed group, such as triplets. In an eighth-note triplet, for example, the individual notes of the group have a value of 1/24 ($1/8 \times 1/3$), and would occupy the track data according to the following diagram.



If you erase the middle note,



and record another one of the same value in its place,



the new note would be entered at the head of the nearest 1/32 division, thus canceling the triplet feel.

For this reason, always edit triplets from the first note of the group.

SEQUENCER JOB

The Sequencer Job mode provides some useful editing and control features. When you press **JOB**, the LED will light (red) and you will get the following display. (You cannot enter Job mode while playing back or recording.) Use the **+/- SELECTOR** buttons below the LCD to select one of 8 jobs.

SEQUENCER JOB SELECT) Select one!							
Song	Qntz	Cnd	Edit	Mix	Card	Rec	Efct
<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +

Song (Song): Set a name and tempo for the song. Store (or clear) a song.

Qntz (Quantize): "Tighten up" the timing of a song.

Cnd (Condition): Specify various recording conditions.

Edit (Edit): Erase or Copy tracks, Delete or Insert measures.

Mix (Mixdown): Combine the data of two tracks into a single track.

Card (Card): Save/load sequence data in card memory.

Also transmit/receive sequence data via MIDI.

Rec (Record mode): Set the record mode and reception channel.

Display the amount of free memory.

Efct (Effect): Select the type of effect (Reverb, Delay, etc.), and

make settings.

SONG

Song lets you name and store song data to the currently selected song memory. You can also clear the recorder memory. Press **JOB**, then press the **+/- SELECTOR** button selecting "Song" to get the following display.

SONG) NAME		Tempo	Store	Song clear
MySong		120	[yes]	[yes]
<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -
<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -	<input type="checkbox"/> +	<input type="checkbox"/> -

Song name Song tempo (60 — 180)

You can enter an 8-character name for your song as explained in Synthesizer mode Easy Edit, NAME (page 19). To call up the naming function, press the leftmost **- SELECTOR** button (directly below the song name in the Song job display shown above). You can use the same naming procedure as you do when naming voices (with an 8-character limit, however). You can also specify a tempo to be selected whenever this song is loaded into memory. When you press the **SELECTOR** button selecting "Store", the data in recorder memory will be stored in the currently selected song memory (Track 1 — 8). Each Song memory contains the following data:

- 8-character song name.
- Song tempo
- Time signature
- 8 tracks of data, each with a Voice Number, Voice Bank (preset, user or card) and Max Notes setting.
- Effect Number, Effect Time and Effect Balance.

You can also **erase** the currently selected song by pressing the **SELECTOR** button to select "Song clear". The song name will be set to all blanks, and all track data will be erased. Other settings (tempo, time signature, voice numbers, max notes, etc.) will not be affected. This function is useful when you want to redo the entire song.

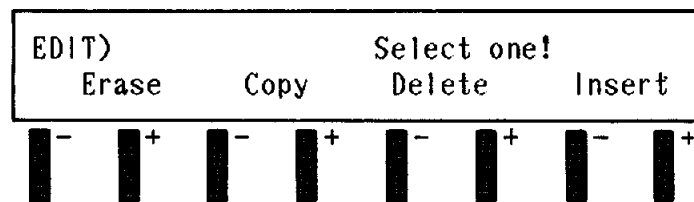
A.touch: When this is "on", Aftertouch data will be recorded whenever you press down on the connected keyboard. Aftertouch can be used for very expressive effects while playing, but it produces a lot of data, which will quickly fill up sequencer memory. If you don't need to record Aftertouch, conserve sequencer memory by setting this to "off". The effect that Aftertouch will have on each voice is determined by the settings in the "Edit" job of the Synthesizer mode.

Velocity: When this is "on", the force (velocity) with which you play each note will be recorded. This will make your recording more expressive, but if you don't need to record Velocity, you can save a bit of sequencer memory by setting this to "off". (Notes without velocity occupy 25% less data space.)

Metronome: This lets you select when the metronome will be heard. You can choose from "off" (always off), "rec" (on during recording), "play/rec" (on during recording and playback) or "always" (on at all times while you are in Sequencer mode). In most cases, you will need to hear the metronome only when recording.

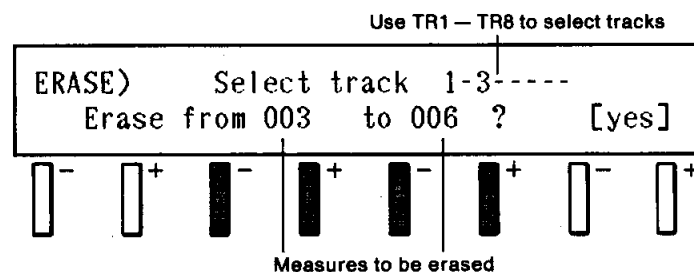
EDIT

Edit gives you four ways to modify the data in a track. Press JOB, then press the + **SELECTOR** button selecting "Edit" to get the following display.



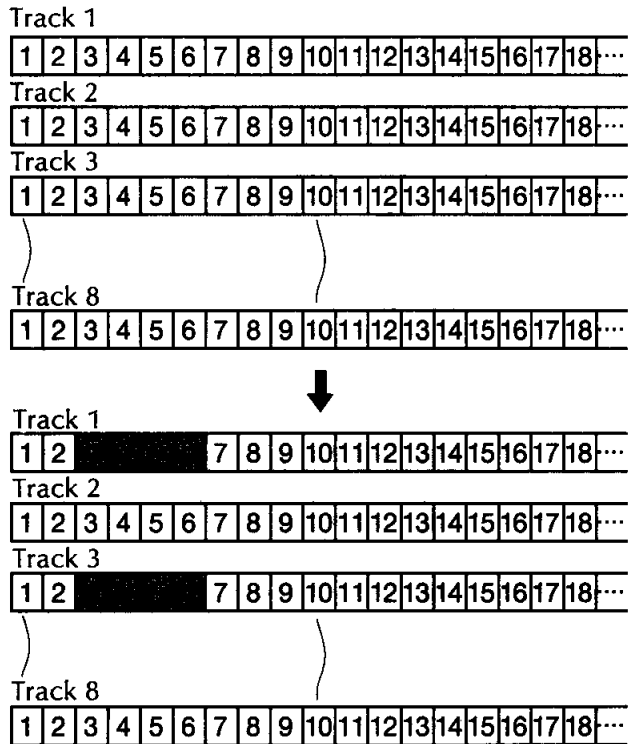
Press a +/- **SELECTOR** button to select the operation you need. After making the desired settings, execute the operation by pressing the button to select "yes". You will be asked "Sure?", so if you are sure you want to execute, select "yes" again.

■ **ERASE:** This will erase specified measures of specified tracks. The empty measures will remain in the track.

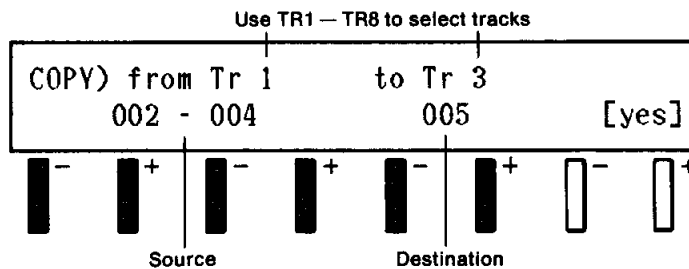


Press a track select button (TR1 — TR8) to select (or un-select) a track. Use the +/- **SELECTOR** buttons below the LCD to set the beginning and end of the area to be erased. When you press the **SELECTOR** button to select "yes", all data will be erased from the specified measures of the specified tracks.

For example if you selected "yes" in the above LCD, tracks 1 — 3 would change as follows.

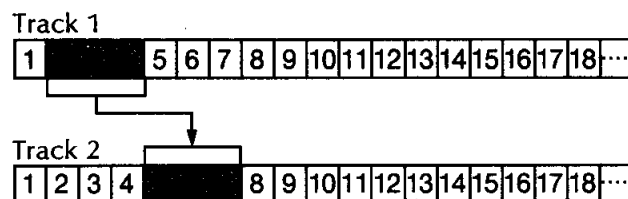


■ **COPY:** This allows you to copy specified measures of a track to another track.



Press two track select buttons (TR1 — TR8) to select a source and destination track. (First press selects the source, second press selects the destination.) Use the - / + buttons below the LCD to set the beginning and end of the area to be copied, and the destination to which to copy the measures. When you press the + **SELECTOR** button to select "yes", the specified source measures will be copied to the destination, **replacing the original data starting at the destination measure.**

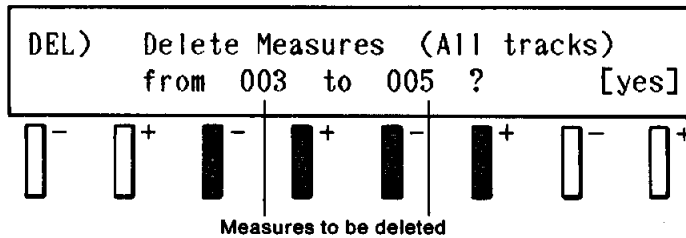
For example if you selected "yes" in the above LCD, the tracks would change as follows.



The data originally in measures 5 — 7 of track 3 would be lost.

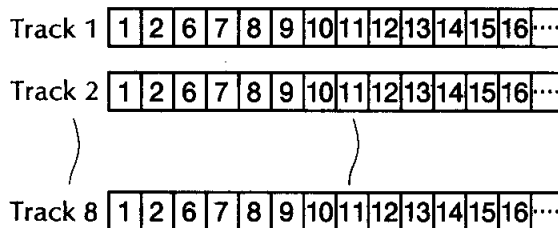
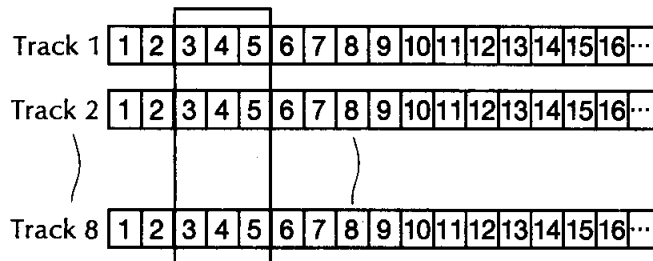
Of course the source and destination tracks can be the same if desired, letting you copy measures to another point in the same track. You might use this function to copy a rhythm pattern or melodic motif that repeats throughout the song.

■ **DELETE:** This allows you to delete specified measures **from all tracks**. I.e., the entire song (all tracks) will become shorter.

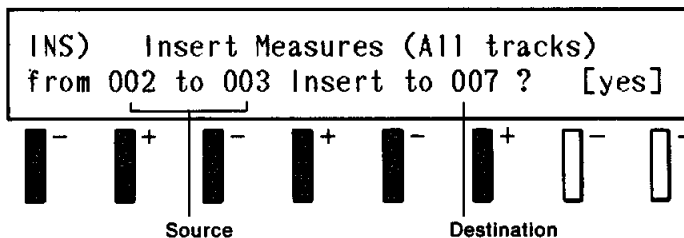


Use the +/- **SELECTOR** buttons below the LCD to set the beginning and end of the area to be deleted. When you press the + **SELECTOR** button to select "yes", the specified measures will be deleted.

For example if you selected "yes" in the above LCD, all tracks would change as follows.



■ **INSERT:** This allows you to insert (copy) specified measures **into all tracks**. I.e., the entire song (all tracks) will become longer.

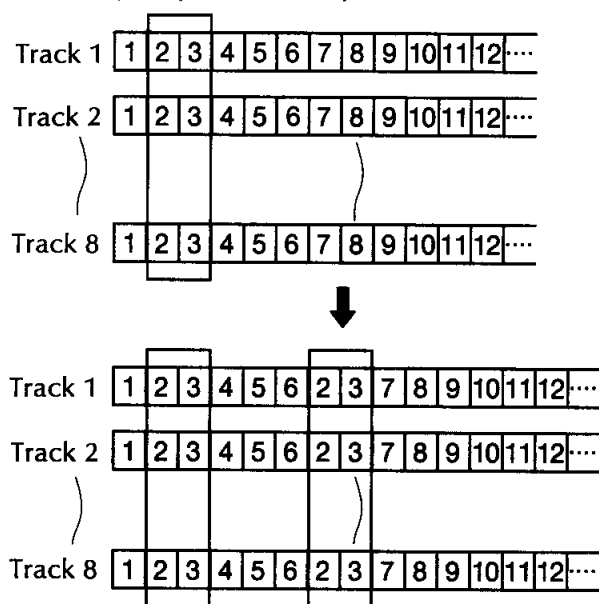


Use the +/- **SELECTOR** buttons below the LCD to set the beginning and end of the area to be inserted (copy source), and the destination to which to copy the measures.

When you press the selector button to select "yes", the specified source measures (of all tracks) will be copied to the destination. Measures beyond the destination

will be pushed back, making all tracks longer by the same amount.

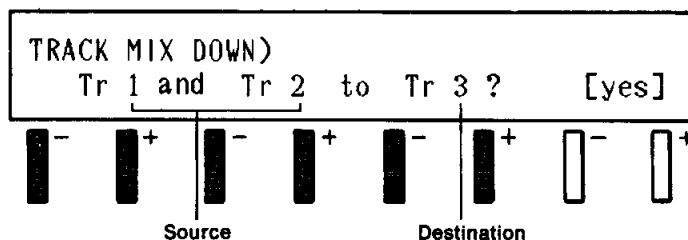
For example if you selected "yes" in the above LCD, all tracks would change as follows.



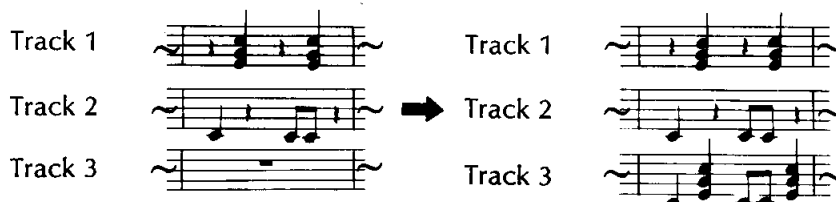
This function might be used to copy an entire chorus (all tracks) to another point in the song, saving the trouble of re-recording it.

TRACK MIX DOWN

Track Mix Down lets you combine the data of two tracks into a single track. Press **JOB**, then press the button selecting "Mix" to get the following display.



Use the +/- **SELECTOR** buttons below the LCD to set the source tracks and the destination track. When you press the + **SELECTOR** button to select "yes", the two source tracks will be mixed and added to the data in the destination track. The source tracks will retain their original data. For example if you selected "yes" in the above LCD, tracks 1, 2 and 3 would change as follows.



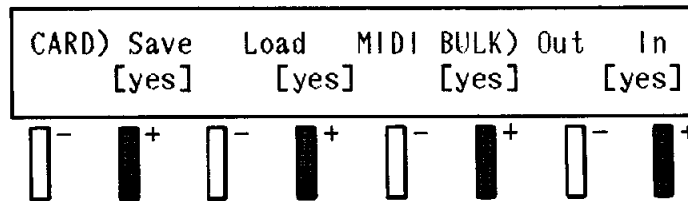
Use this function when you decide that two existing tracks should be played as one part. Each track can play only one voice, as specified in the initial voice number for the track. Even if in the above example, tracks 1 and 2 were playing brass and string parts, all notes in the resulting track 3 would simply play whatever voice was assigned to instrument 3 (see Sequencer VOICE mode, page 86).

Note:

While recording, a chord of up to 8 simultaneous notes can be recorded in each track. However you can exceed this limit by mixing tracks. This can be useful when playing external synthesizers via MIDI, but remember that the TQ5 synthesizer itself has a capacity of 8 simultaneous notes.

CARD

Card is where you save/load song data to a RAM memory card or to/from an external MIDI device. Press **JOB**, then press the button selecting "Card" to get the following display.



This job gives you 4 operations to save/load song data. Press the corresponding +/- **SELECTOR** button below the LCD to execute the operation.

CARD Save: When you select [yes], data for all songs will be saved from TQ5 internal memory to the RAM memory card. (The RAM card must be properly formatted to accept sequence data. If it is not, press EXIT to leave the sequencer mode, then press SAVE/LOAD to access the "Format" function. For details, see the SAVE, LOAD MODE instructions in the SAVE, LOAD AND STORE OPERATIONS section of this manual.)

CARD Load: When you select [yes], data for all songs will be loaded from the card into the TQ5 internal memory.

MIDI BULK Out: When you select [yes], data for the currently selected song will be transmitted from MIDI OUT as "bulk" data in the N-SEQ format. (Do not confuse this data with **playback** data. The whole song is sent as one package of data.) This bulk data can be received by another sequencer (another TQ5, a QX5FD etc.) for later playback. The operation manual of your other sequencer will tell you whether it can receive N-SEQ bulk sequence data.

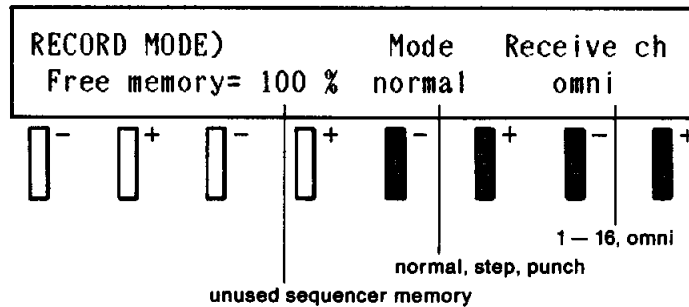
MIDI BULK In: When you select [yes], the currently selected song will be cleared, and the TQ5 will display "waiting", and wait for song bulk data (as explained above) to arrive. When the data begins to arrive, the display will change to "Receiving", and when finished, will show "Completed". (Due to minor data format differences between sequences, the TQ5 will sometimes adjust the measure divisions of the incoming sequence data.)

Note:

Data transmitted in MIDI BULK Out has a "channel number" corresponding to the channel you set in Synthesizer mode Transmit Channel. The device receiving this bulk data must be set to a matching receive channel, or the data will not be received. In the QX5FD, this is called the "device number".

RECORD MODE

Record Mode lets you select how to record; Normal, Punch or Step. Press **JOB**, then press the button selecting "Rec" to get the following display.



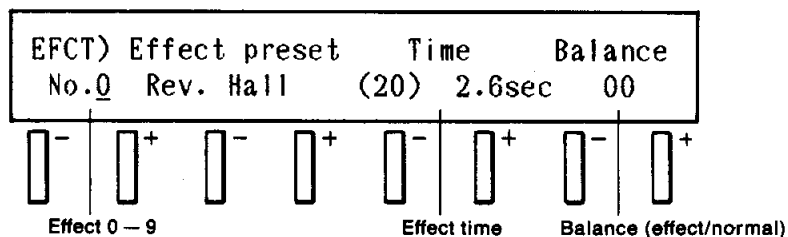
Free memory: This indicates the amount of unused sequencer memory. If nothing has been recorded, 100% will be free.

Mode: Here you can select one of the three ways to record music; normal, step or punch. These recording modes are explained at the beginning of the RECORD section.

Receive Channel: The TQ5 sequencer can record notes played on an external MIDI instrument (keyboard, wind controller, etc.). If you want to record from MIDI, select a channel 1 — 16 to be received, or "omni" to receive all channels. The operation manual for your MIDI instrument will explain how to set its transmit channel.

EFFECT

Effect lets you choose one of the ten effects (Reverb, etc.) to use in your song. Press **JOB**, then press the +/- **SELECTOR** button selecting "Efect" to get the following display.

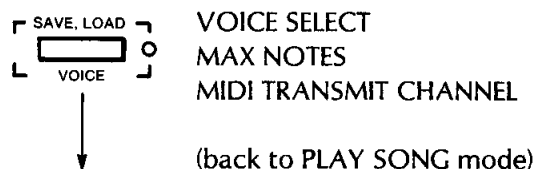


This is exactly the same function as explained in the Synthesizer mode, Effect. It is included here in Sequence **JOB** so that you can make settings without having to exit Sequence mode.

VOICE

After selecting a preset Part Type you may wish to make minor changes in your "ensemble". Remember that selecting another preset Part Type (or selecting another Song) will replace the Voice Select and Max Notes settings you have made here in Voice mode. (Settings for MIDI Transmit Channel will remain.)

Each press of the VOICE button will step through the following three displays, allowing you to make settings for "Voice Select", "Max Notes", and "MIDI Transmit Channel". The fourth time you press VOICE you will return to "Play Song" mode.



Important:

It is possible to leave Voice mode and return to Play Song mode by pressing **SEQUENCER/PLAY**. In this case, however, the song currently in song memory will be recalled, along with the initial voice numbers for each track in the song.

This means that any changes you have made in Voice mode will be forgotten. If you want to keep the changes you made in Voice mode, you must return to Play Song mode by pressing **VOICE** a fourth time. This will enter Play Song mode **without** loading a song from memory.

While still in Voice mode, you can store your settings by: 1)pressing **JOB**, 2)selecting **SONG**, and 3)pressing the **+ SELECTOR** button below **STORE** two times.

If you have done so, it does not matter how you return to Play Song mode — your settings will be kept.

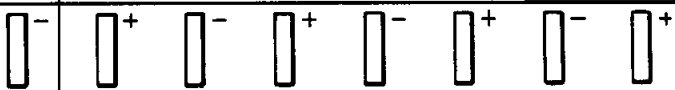
The examples below show what the LCD would look like if you had just selected preset Part Type "2:Pops".

VOICE SELECT

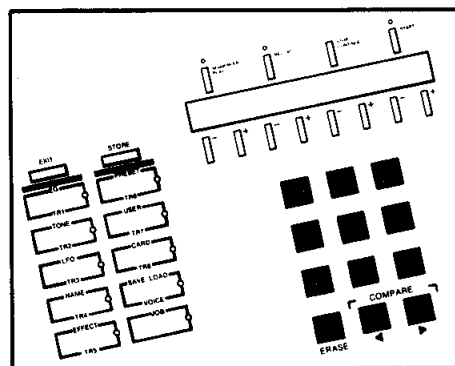
Select the voice initially used by each instrument.

Voice name of selected instrument

VOICE SELECT) Voice name = SynBass 4
 P65 P41 P02 P46 --- --- --- ---



Select a voice 00 — 99 (numeric key pad or +/-).
 Press PRESET, USER or CARD to select memory type.




Press a +/- **SELECTOR** button to select an instrument (the selected instrument will be indicated by the underline cursor). The voice name of the selected instrument will be shown in the upper line of the LCD. Use the numeric key pad (or the +/- keys below the numeric key pad) to select a voice (00 — 99). You can also press **PRESET, USER** or **CARD** to select the memory type.

The voice numbers you set here will be selected for each track whenever playback begins. A track can contain voice changes (00 — 99) in the middle of a song, but only within the memory **type** selected here. In other words, if a **PRESET** voice is used to start the song, voice changes in the track will change only to other **PRESET** voices. As shown in instruments 5 — 8 in the above example, a dash "—" instead of a voice number indicates that the instrument's Max Notes setting is 0.

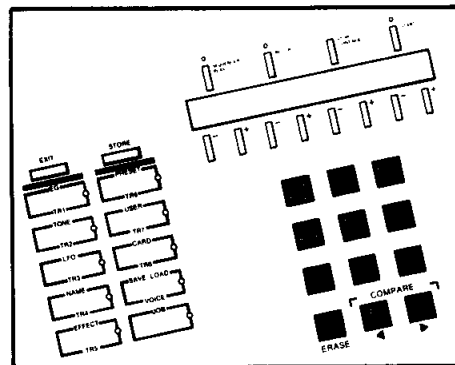
MAX NOTES

The 8-note sound producing capability of the TQ5 must be distributed among the 8 instruments.

MAX NOTES)
1 5 1 1 0 0 0 0



Set max note number 0 — 8 (numeric key pad 0 — 8 or +/- the cursor left and cursor right keys)

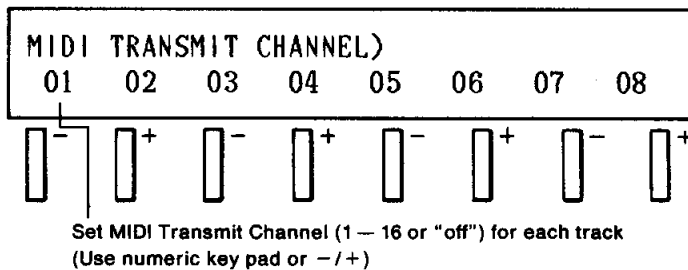


Press a +/- **SELECTOR** button to select an instrument (the selected instrument will be indicated by the underline cursor), and use the numeric key pad 0 — 8 (or the -/+ keys below the numeric key pad) to set a Max Notes number 0 — 8 for each instrument. These instruments will not sound, nor can a Voice number be set for them until they are given a value other than 0.

Remember that Max Notes for all instruments must total 8 or less. For example in the LCD shown above, if you want to use instrument 6 (currently set to Max Notes = 0), you must first **decrease** the Max Notes setting of another instrument.

MIDI TRANSMIT CHANNEL

In addition to controlling the eight synthesizer voices inside the TQ5, the eight tracks of the sequencer will transmit data from the MIDI OUT terminal to control other synthesizers. If you have another synthesizer (DX11, etc.) or tone generator (TX81Z, etc.) connected to the TQ5's MIDI OUT, the TQ5 sequencer will play this external device **in addition to** playing the TQ5's own sounds.



Press a SELECTOR button to select an instrument (the selected instrument will be indicated by the underline cursor), and use the numeric key pad (or the cursor left and cursor right keys below the numeric key pad) to set a MIDI Transmit Channel (1 — 16 or "off") for each instrument. Entering "0" will set the Transmit Channel to "off". When "off" is selected, that sequencer track will not transmit MIDI data. (Of course it will still play the TQ5's internal instrument.)

Note:

These MIDI Transmit Channel settings are meaningful only when other devices are connected to the TQ5's MIDI OUT terminal.

APPENDICES

FM SYNTHESIS

This section explains how the TQ5 produces sounds using a method called FM Synthesis. It is not absolutely necessary that you read this section to be able to use the TQ5, 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 TQ5 synthesizer is an easy, yet powerful way to create the complex sounds that make real instruments sound so good.

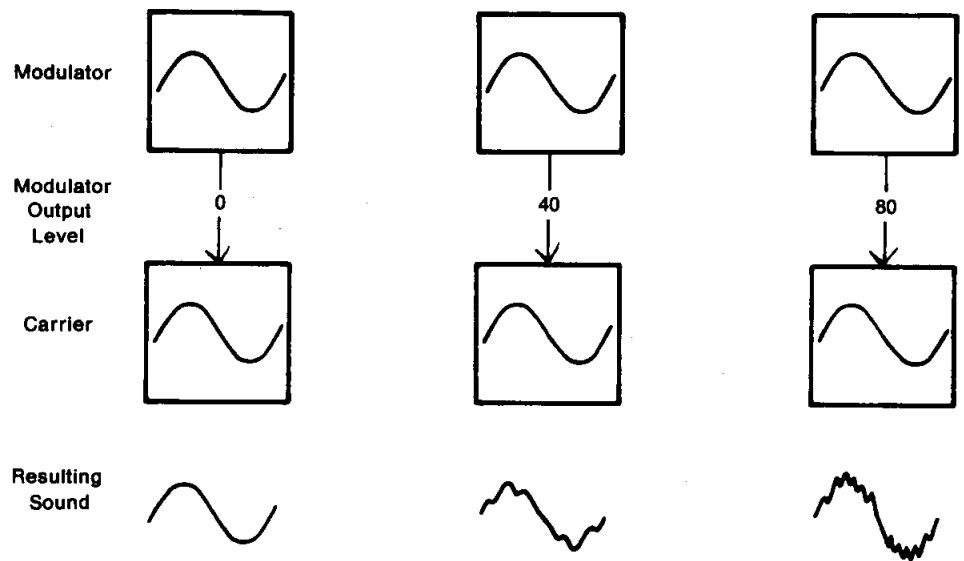
CARRIER AND MODULATOR

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 TQ5 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 TQ5 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 TQ5 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**.

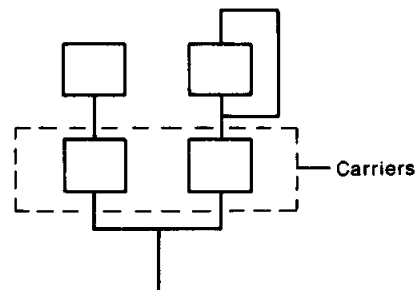
The component inside a synthesizer that produces this change is called the **Envelope Generator** (EG for short). Each Modulator and Carrier in the TQ5 has its own EG. Since the Modulator output level determines the tone, the EG of the Modulator will determine the change in **tone** over time. Since 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 TQ5 has its own output level, frequency and EG.

For simple FM synthesis only two operators are necessary, but the TQ5 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 TQ5 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 TQ5 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 TQ5, you can carry out an unlimited number of previously impossible performance operations, including the following:

- Play the voices of the TQ5 from any MIDI controller: MIDI pianos, MIDI guitars, rhythm machines, sequencers or even MIDI wind instruments.
- 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 TQ5.
- Control digital drum machines with the sequencer of the TQ5 for a perfectly synchronized performance.
- Use the sequencer of the TQ5 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 TQ5 effectively with other MIDI instruments. All you need to know is what MIDI devices can do, and how you can control them with your TQ5. 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 and the slave (a sound-generating instrument such as the TQ5) is played by it.

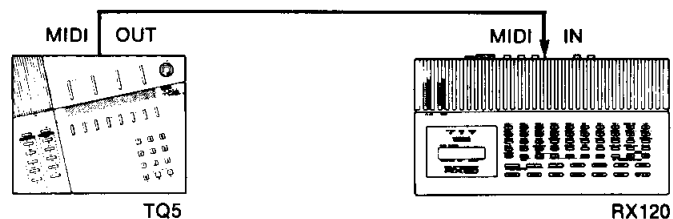
In essence, MIDI is extremely simple: it simply reduces all musical data to numbers, which can easily be sent from one instrument to another (hence the term "Digital Interface"). In practice, MIDI is unbelievably versatile, which is as it should be, for it is designed to fulfill the demands of professional 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 TQ5.

Note:

You should know how the MIDI messages transmitted by your connected MIDI keyboard affect the sound of the slave (i.e., your TQ5) and how you can program your TQ5 to respond to these messages. For that information, please refer to the sections on the control MIDI Synthesizer Jobs 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.

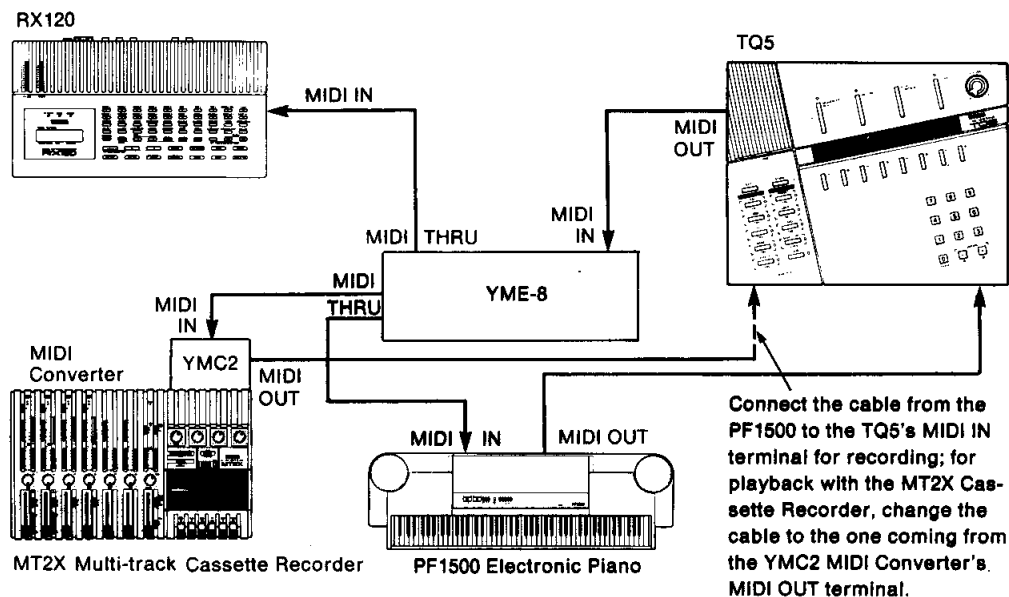
1. TQ5 PLUS RX120 DIGITAL RHYTHM PROGRAMMER



In this simple setup, the TQ5 is used to play the authentic drum and percussion sounds of the RX120 Digital Rhythm Programmer. Since each of the RX120's sounds is assigned to a different note, the TQ5's sequencer can be used to play the actual drum sounds of the RX120 along with the instrument voices of the TQ5. Rhythm patterns on the RX120 can also be played in perfect synchronization with sequencer

2. TQ5 AS A CONTROL CENTER FOR THE COMPLETE MIDI STUDIO

songs on the TQ5; simply set the Sync parameter of the Sequencer Cnd (condition) Job to "MIDI," and you're ready to go.



The comprehensive sequencing and sound generating capabilities of the TQ5 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:

- **PF1500 Electronic Piano.** As described throughout the manual, you can use this MIDI keyboard to record notes to the sequencer of the TQ5. As the TQ5 plays back songs, it can also play the voices of this instrument for a fuller, ensemble effect.
- **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 TQ5, and of course the RX120 will play in perfect synchronization with the music data recorded in the TQ5.
- **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 TQ5's sequencer to both the RX120 and the PF1500.
- **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 TQ5, plus the rhythm track played by the RX120. For example, your eight track synthesizer composition (with voices played on both the TQ5 and the PF1500) 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 TQ5'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) to "internal". On playback, reset the TQ5's Sync parameter to "MIDI." These signals ensure that the tape recorded music will always stay in time with the recorded sequencer tracks.

GLOSSARY

If the TQ5 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 TQ5'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 TQ5

To play a synthesizer such as the TQ5, the first thing you need are sounds. The TQ5 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 TQ5, 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 TQ5.

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 TQ5 that you play on your own.

The internal memory of the TQ5 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 TQ5 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 TQ5

The TQ5 is loaded with performance features that help you get the most out of its expressive synthesizer voices. Most MIDI devices can take advantage of these features through built-in **real-time controllers**, so-called 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.)

The TQ5 is not equipped itself with any real-time controllers (except for the VOLUME control), but it responds to a wide variety of controllers commonly found on MIDI keyboards and other devices.

Two very expressive real-time controllers that can be used with the TQ5 are 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 TQ5. 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 a properly equipped MIDI keyboard (including a breath controller) or a MIDI wind instrument (such as the WX7 Wind MIDI 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 TQ5 changes depending on how hard or soft you play the connected 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 connected 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 TQ5 can sound up to eight notes at a time. The eight simultaneous notes of the TQ5 can be played either **Polyphonically** or **Monophonically**. Polyphonic (or **Poly**) means that if eight notes are being played at once, all eight will be heard. This is the usual mode when playing piano or organ sounds. Monophonic (or **Mono**) play means that only the last played note will sound. This can be more realistic when playing sounds that are naturally monophonic, such as solo 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 TQ5 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 TQ5 are covered in clear explanations in both the OPERATION BASICS, SYNTHESIZER REFERENCE and SEQUENCER REFERENCE chapters, so please refer to those sections for information on specific modes and parameters.

ERROR MESSAGES

The TQ5 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. The exception to this is when receiving single voices from other MIDI instruments; in this case the voice is sent whether the memory protect is on or off and no error message will result.

- 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 TQ5 is used. Re-format the card for the TQ5.

- 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.

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* Pan 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* Effect 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

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
Rear Panel Terminals:	Output × 2 (L/MONO, R) Phones × 1 MIDI IN × 1 MIDI OUT × 1 MIDI THRU × 1 DC15V IN
Dimensions (W × D × H):	280 × 235 × 70 mm (11-1/8" × 9-1/4" × 2-3/4")
Weight:	1.5 kg (3 lbs 5 oz)
Included Accessory:	PA-1505 adaptor (15V)

INDEX

A

Aftertouch, sequencer condition, 81; glossary explanation of, 95

Algorithms, 91

B

Backup battery for card, see Card

Battery, backup battery for, see Card

Battery, replacement of internal, 6, 52

Breath controller, 53; glossary explanation of, 95

Bulk in/out, 53, 85

C

Calendar, 56

Card operations, 23; format, 48; save/load, 49, 85; backup battery for, 50

Changing, see Editing

Clock, 56

Condition (sequencer job), 80

Control (voice edit), 52

Controllers, glossary explanation of, 95

Copy, sequencer tracks, 82

D

Delete, sequencer tracks, 83

Demo song play, 28

Detune (multi mode), 60

E

EG (envelope generator), 43

Easy Edit buttons, 14, 43

Edit (sequencer job), 81

Editing a preset voice, 16, glossary explanation of editing voice, 95; effect settings, 18; LFO settings, 17; tone settings, 17; name, 19

Effect, editing settings, 18, 47; for sequencer song, 86

Ensemble, see Part type

Erase, sequencer tracks, 81; a note or voice change in step recording, 77

Exit button, 14

F

FM synthesis, 89;

Feedback, 52, 91

Format a card, 48

Free memory, checking, 86

Front/rear panel, 4

G

Glossary, 94

H

High note, see Note limit

How to use this manual, 1

I

Insert, sequencer tracks, 83; a voice change in step recording, 77

J

Job, mode, 52; sequencer, 79

L

LFO, 45; multi mode, 61; editing settings 17

Limit, note, see Note limit

Load, song from card, 85; see also Save/Store/Load

Low note, see Note limit

M

MIDI applications, 92; bulk data, 53, 85; channel, reception and transmission channel 53, 59; receive channel (multi mode), 59, transmit channel for each sequencer track, 88

MW, see Modulation wheel

Maximum notes (multi mode), 58; (sequencer mode), 87

Memory card, see Card

Memory, glossary explanation of, 94

Metronome, sequencer condition, 81

Mix down (sequencer job), 84

Mode, select recording, 86

Modulation wheel, 53; see also Controllers

Mono mode, 52

Multi mode, 57; setup example 62

Multi-track recording, 68

N

Name, voice, 19, 46

Normal recording, 71
Note length, step recording, 74
Note limit (multi mode), 60

Q

Omni, 54
Operation basics, 14
Operators, 91

P

PB, see Pitch bend
Pan (multi mode), 59
Parameters, glossary explanation of, 96
Part type, sequencer, 69
Pitch bend, (voice edit), 53; see also Controllers
Play mode buttons, 14, 42
Play, sequencer, 67
Playing, a demo song, 28; your song, 32
Poly/Mono, 53
Power, turning on the, 8
Precautions, 6
Preset, sequencer part types, 69; voices, 11
Punch recording, 73

R

Quantize (sequencer job), 80

R

RAM card, see Card
Receive channel, 54, 59; for recording, 86
Reception, MIDI, see MIDI
Record, mode, 86; sequencer, 68
Recording a song, 30

S

Save, voices to card, 15, 26, 49, 50; songs to card, 85
Save/Store/Load, operations, 49; glossary explanation of, 94
Selecting card voices, 23
Sequencer section, 30
Sequencer, mode, 65; jobs, 79
Setting up, 7
Song (sequencer job), 79
Song data, receive/transmit via MIDI, 85
Song, demo, see demo song

Split mode, 55
Starting out, 7
Step recording, 36, 74
Store, button, 15; a voice, 21, 51; a song, 79; card voices to user memory, 24; see also Save/Store/Load
Sync, sequencer condition, 80
Synthesized sound, 89

T

Tone, 44; editing settings, 17
Touch sensitivity, 52
Tracks, sequencer, 65, 68, 81
Transmission, MIDI, see MIDI
Transmit channel, 53; for each sequencer track, 88
Transpose, 52
Triplets, step recording, 76, 78

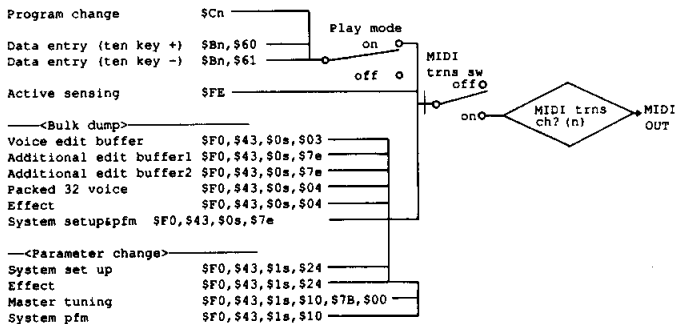
V

Velocity, sequencer condition, 81
Voice, sequencer mode, 86; change in step recording, 77; edit, 52; preset list, 11; multi mode voice number, 59; select for each instrument in song, 87
Volume (multi mode), 59

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) CONTROL CHANGE

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

CONTROL NUMBER

C-96 Data entry switch inc v=127:on (play mode only)
C-97 Data entry switch dec v=127:on (play mode only)

2) PROGRAM CHANGE (play mode only)

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

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
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

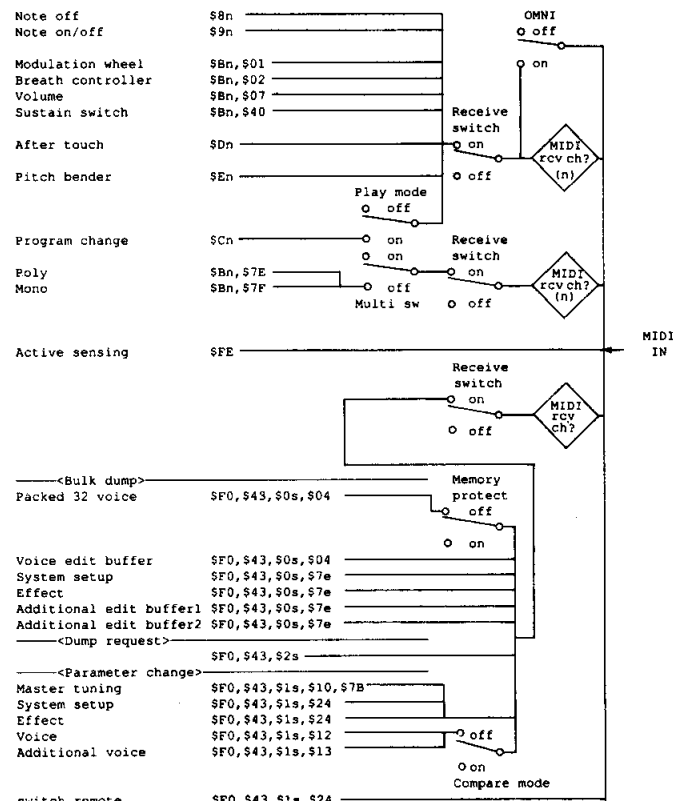
3) UNIVERSAL BULK DUMP

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
CLASSIFICATION-NAME 0aaaaaaa ASCII'L
0aaaaaaa ASCII'M
0aaaaaaa ASCII'
0aaaaaaa ASCII'
DATA FORMAT-NAME 0mmmmmmm ASCII'
DATA 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

(3) Receiving Condition



(4) 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. 0kkkkkk k=0(C-2)-127(G8)
VELOCITY 0vvvvvvv v is ignored

2) KEY ON/OFF
STATUS 1001nnnn (9n) n=channel number
NOTE No. 0kkkkkk 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
 VALUE 0vvvvvvv v=0-127

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

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 0mmmmmm
 Only m=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
 Not transmitted.

(2) System Realtime Messages

ACTIVE SENSING CLOCK
 STATUS 11111110 (FE)

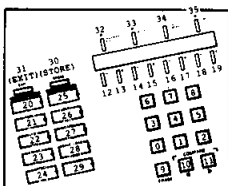
Sensing starts once this code is received. When neither status nor data are detected for longer than 300 msec., the MIDI receiving buffer will be cleared and all currently sounding voices and sustain switch data will be set to OFF. Also after touch, foot volume, modulation wheel and pitch bend data will 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 (1a)
 GROUP NUMBER (24)
 PARAMETER No. 0ppppppp p=switch number+91(91-127)
 DATA 0ddddd 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 (1a) s=Receive channel
 GROUP NUMBER 0ggggghh g=Group number
 PARAMETER No. 0ppppppp h=sub group number
 DATA 0ddddd
 DATA 0ddddd
 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)
 PACKED 32VOICE (f=4)
 NSEQ SEQUENCE (f=A)
 STATUS 11110000 (F0)
 ID No. 01000011 (43)
 SUB STATUS 0010ssss (2s) s=Receive channel
 GROUP NUMBER 0fffff 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)
 CLASSIFICATION- 0aaaaaaa ASCII'L
 NAME 0aaaaaaa ASCII'M
 0aaaaaaa ASCII'
 0aaaaaaa ASCII'
 DATA FORMAT- 0mmmmmm ASCII'
 NAME 0mmmmmm
 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 TQ5.

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	0	-EBS	0-7	
*	8	0	0	0	0	0	0	0	AME	0-1
*	9	0	0	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	0	0	-DET	0-6 (center=3)
*	13									OP.2
*	26									OP.3
*	39									OP.1

<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		DIR				0-31	*
2	0	0	0		DZR				0-31	*
3	0	0	0	0	RR				1-15	*
4	0	0	0	0	DIL				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)	*
9	0	0		CRS		x	x		0-63 (PIX)	*
	0	0	0	RS		DET			0-3,0-6	*
10										OP.2
20										OP.3
30										OP.1
40	0	SX		FBL		ALG			0-1,0-7,0-7	*
41	0			LFS					0-99	*
42	0			LFD					0-99	*
43	0			PRD					0-99	*
44	0			AND					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		SU		PO	PH	0-1,0-1,0-1,0-1,0-1
49	0					PORT			0-99	***
50	0					FC VOL			0-99	*
51	0					HM FITCH			0-99	*
52	0					HM AMPLI			0-99	*
53	0					BC FITCH			0-99	*
54	0					BC AMPLI			0-99	*
55	0					BC E 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										
67										same as DX21 VMEM
72										PEG PR1 PEG PL3
73	0	0			FIX					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 FITCH				
83	0					FC AMPLI				

*** VMEM for V2 ***

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

note) AT P.BIAS data 0,,,,,49,50,51,,,,,100
LCD -50,,,,-1, 0,+1,,,,,+50
MIDI 51,,,,,100,0,+3,,,,,+50

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

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	123,0	0									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	trane ch,16:off
3	3	0	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	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					0-14	7(center)
11	7	0	0			DETUNE				0-48	24(center)
12	8	0				NOTE SHIFT				0-99	
13	9	0	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	0	LFO SEL	0-3 0(off),1(I),2(II),3(vib)
15	11	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											£0,43,2n,03,£7
★ VMEM											£0,43,2n,04,£7
★ ACED + VCED											£0,43,2n,7e,LM_8976AE,£7
★ ACED2 + ACED + VCED											£0,43,2n,7e,LM_8023AE,£7
★ EFEDS + ACED2 + ACED + VCED											£0,43,2n,7e,LM_8036EF,£7
★ EFEDS + system setup											£0,43,2n,7e,LM_8036E_,£7
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_8036E_											4c,4d,20,20,38,30,33,36,53,20

<Attached list 5 >

parameter change No. List

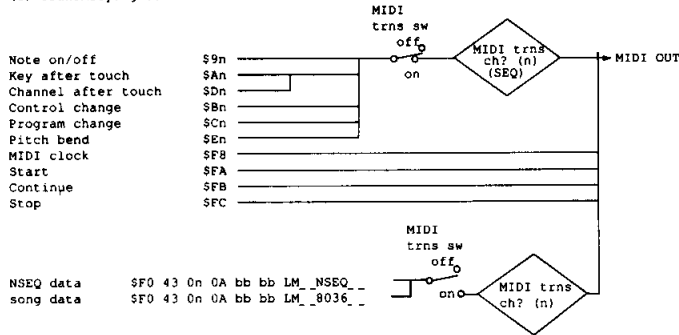
<<< \$F0,\$43,\$1n,... >>>

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

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

(1) Transmitting Conditions



(2.2) UNIVERSAL BULK DUMP (Song data)

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		
CLASSIFICATION-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		
CHECK SUM	0eeeeeee	38 bytes	
EOX	11110111	(F7)	

(2) Transmission 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		

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

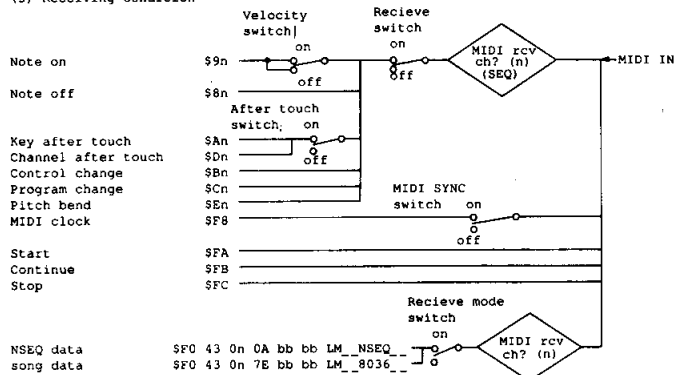
STATUS	11111011	(FB)	
--------	----------	------	--

(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		
CLASSIFICATION-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)	

(3) Receiving Condition



(4) Reception 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		

4-2 System Information

(1) System Realtime Messages

```
(1.1)TIMING CLOCK
      STATUS      11111000 (F0)

(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- 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          0ddddd

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.

(2.2)UNIVERSAL BULK DUMP (Song data)

```
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- 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          0ddddd      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.

< Attached list 1 >

* 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  11110000 (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 0pppppppp
channel a.touch 11111101 0vvvvvvv
pitch bend    11111110 0vvvvvvv 0vvvvvvv
```

<Attached list 2 >

* 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 (526) bytes

YAMAHA [Tone generator---synthesizer part] Date : 10/08, 1988
 Model TQ5 MIDI Implementation Chart Version : 1.0

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

Notes: *1 = play mode only

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO o : Yes
 Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO x : No

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 Key's	: o	: o *2	
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