



YAMAHA

PORTATONE

PSR-230
PSR-220

OWNER'S MANUAL
BEDIENUNGSANLEITUNG
MODE D'EMPLOI
MANUAL DE INSTRUCCIONES



ENGLISH

DEUTSCH

FRANÇAIS

ESPAÑOL

SPECIAL MESSAGE SECTION

This product utilizes batteries or an external power supply (adapter). DO NOT connect this product to any power supply or adapter other than one described in the manual, on the name plate, or specifically recommended by Yamaha.

This product should be used only with the components supplied or; a cart, rack, or stand that is recommended by Yamaha. If a cart, etc., is used, please observe all safety markings and instructions that accompany the accessory product.

SPECIFICATIONS SUBJECT TO CHANGE:

The information contained in this manual is believed to be correct at the time of printing. However, Yamaha reserves the right to change or modify any of the specifications without notice or obligation to update existing units.

This product, either alone or in combination with an amplifier and headphones or speaker/s, may be capable of producing sound levels that could cause permanent hearing loss. DO NOT operate for long periods of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.

IMPORTANT: The louder the sound, the shorter the time period before damage occurs.

NOTICE:

Service charges incurred due to a lack of knowledge relating to how a function or effect works (when the unit is operating as designed) are not covered by the manufacturer's warranty, and are therefore the owners responsibility. Please study this manual carefully and consult your dealer before requesting service.

ENVIRONMENTAL ISSUES:

Yamaha strives to produce products that are both user safe and environmentally friendly. We sincerely believe that our products and the production methods used to produce them, meet these goals. In keeping with both the letter and the spirit of the law, we want you to be aware of the following:

Battery Notice:

This product MAY contain a small non-rechargeable battery which (if applicable) is soldered in place. The average life span of this type of battery is

approximately five years. When replacement becomes necessary, contact a qualified service representative to perform the replacement.

This product may also use "household" type batteries. Some of these may be rechargeable. Make sure that the battery being charged is a rechargeable type and that the charger is intended for the battery being charged.

When installing batteries, do not mix batteries with new, or with batteries of a different type. Batteries MUST be installed correctly. Mismatches or incorrect installation may result in overheating and battery case rupture.

Warning:

Do not attempt to disassemble, or incinerate any battery. Keep all batteries away from children. Dispose of used batteries promptly and as regulated by the laws in your area. Note: Check with any retailer of household type batteries in your area for battery disposal information.

Disposal Notice: Should this product become damaged beyond repair, or for some reason its useful life is considered to be at an end, please observe all local, state, and federal regulations that relate to the disposal of products that contain lead, batteries, plastics, etc. If your dealer is unable to assist you, please contact Yamaha directly.

NAME PLATE LOCATION:

The name plate is located on the bottom of the product. The model number, serial number, power requirements, etc., are located on this plate. You should record the model number, serial number, and the date of purchase in the spaces provided below and retain this manual as a permanent record of your purchase.

Model

Serial No.

Purchase Date

PLEASE KEEP THIS MANUAL

FCC INFORMATION (U.S.A.)

IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!

This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.

IMPORTANT:

When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product MUST be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.

NOTE:

This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other

electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures:

- Relocate either this product or the device that is being affected by the interference.
- Utilize power outlets that are on different branch(circuit breaker or fuse) circuits or install AC line filter/s.
- In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial type cable.

If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Ave, Buena Park, CA90620

- This applies only to products distributed by Yamaha Corporation of America.

Congratulations on your purchase of the Yamaha PortaTone!

You now own a portable keyboard that combines advanced functions, great sound and exceptional ease-of-use in a highly compact package. Its outstanding features also make it a remarkably expressive and versatile instrument.

Read this Owner's Manual carefully while playing your new PortaTone in order to take full advantage of its various features.

CONTENTS

● Main Features	1	● Playing Songs — The Song Mode	28
● Precautions — Taking Care of Your PortaTone	2	Selecting and Playing a Song	28
● Setting Up	3	Using the Repeat Play Function	29
Power Requirements	3	Using the Guide Function (PSR-230 only)	30
PHONES/AUX OUT Jack	4	Using the Minus One Function	31
SUSTAIN Jack	4	Selecting individual channels for Minus One	31
Music Stand	4	Song Sub Menu	32
● Getting Started — Playing the Demo Songs	5	Song Volume	32
● Panel Controls and Terminals	6	One Touch Setting in the Song Mode	33
● Basic Display Operations	8	● Recording User Songs — Easy Chord Memory	33
● Playing Voices — The Voice Mode	10	Real-time Recording	34
Selecting and Playing a Voice — Main Voice Mode	10	Step Recording	35
Main Voice Sub Menu	11	Song Clear	35
Percussion Kit Voice Chart	12	User Song Playback	35
Playing Two Voices — Dual Voice Mode	12	● Music Cartridge (PSR-230)	36
Dual Voice Sub Menu	13	Inserting a Music Cartridge	36
Playing Two Voices — Split Voice Mode	14	Music Cartridge Precautions	36
Split Voice Sub Menu	15	Selecting Styles on a Music Cartridge	37
● Other Voice Controls	16	Selecting Songs on a Music Cartridge	37
Chorus	16	● MIDI Functions	38
Harmony/Echo	16	MIDI Basics	38
Harmony/Echo Sub Menu	17	MIDI Sub Menu	40
Reverb	18	● Appendix	41
Touch Response	18	Data Backup and Initialization	41
Overall Controls	19	Initialize Operation	41
Reverb/Others Sub Menu	19	Voice List	42
● Playing Auto Accompaniment — The Style Mode	20	Voice Polyphony	42
Selecting a Style and Playing an Auto Accompaniment	20	Panel Voice List	42
About the METRONOME Icon	21	GM Voice List	43
Sync-Stop Function	24	Troubleshooting	44
Changing the Fingering Mode	24	Index	45
Fingered	25	MIDI Implementation Chart	46
Full	26	Specifications	48
Single Finger	26		
Changing the Accompaniment Split Point	26		
One Touch Setting	27		



Main Features

The PortaTone is a sophisticated yet easy-to-use keyboard with the following features and functions:

Exceptionally **realistic, high-quality Voices** (100 Panel, 129 GM Voices (128 Voices + 1 Percussion Kit)), created with AWM (Advanced Wave Memory) technology, which utilizes digital recordings of actual instruments.

A convenient **Voice Set** function that automatically calls up the most suitable Voice-related settings whenever you select a Panel Voice.

100 auto accompaniment Styles, each with different **Intro, Main A and B**, four **Fill-ins**, and **Ending sections**. Each of the 100 Styles also features a special **Jam Track section**, providing stylistically appropriate chord progressions and section changes for playing along with.

Large custom LCD gives you easy, at-a-glance confirmation of all important settings.

One Touch Setting buttons, for automatically calling up an appropriate Voice (along with matching effect and other settings) for playing with the Style you select. Each of the 100 Styles features four different One Touch Settings.

Touch Response function for natural, expressive control over the Voices.

Rich, luscious-sounding effects — including **Reverb, Chorus, Harmony** and **Echo** — for enhancing the Voices.

Easy Chord Memory for recording your own chord progressions — letting you create automatic backing for your original songs.

Guide lamps (on PSR-230), and the **Minus One** and **Repeat Play** functions provide convenient, powerful tools for learning new songs and improving your keyboard technique.

Music Cartridge slot (on PSR-230) lets you plug in optional Yamaha Music Cartridges for adding new accompaniment Styles and Songs.

Comprehensive MIDI control, including 16-part multi-timbral capacity and full General MIDI compatibility.

Built-in high-quality **stereo amplifier/speaker system**.

Precautions — Taking Care of Your PortaTone

Your new PortaTone is a fine musical instrument — and should be treated as such. Handle it with care and common sense, and it will give you years of enjoyment.

Location

- Avoid exposure to direct sunlight or other sources of heat. Never leave it inside a car where it can get very hot. Also avoid highly humid or dusty places.

Interference From Electromagnetic Fields

- Do not use your PortaTone close to television sets, radios or similar equipment since this may cause interference noise in the other appliance.

Handling

- Protect your PortaTone from strong impact. Be careful not to drop it or place heavy objects on it. Avoid applying excessive force to the controls and keys.
- Always unplug cables by gripping the plug firmly, and not by pulling on the cable.

Turn Power Off When Making Connections

- To avoid damage to the PortaTone or other equipment, turn off the power of all related equipment — including the PortaTone — before connecting or disconnecting any cables.

When Not Using the PortaTone

- After use, always turn off the POWER switch. When not using your PortaTone for long periods, be sure to remove the batteries to avoid damage through battery leakage. When using the PortaTone with an AC adaptor, unplug the adaptor from the electrical outlet, if the instrument is not to be used for a long period of time, or during electrical storms.

Cleaning

- Clean the exterior with a soft, dry cloth. To remove stubborn stains, use a slightly moistened cloth.
- Never use alcohol, thinner, or other chemical solvents, since they will damage the finish. Also, do not leave vinyl chloride material on the PortaTone for a long time, since it may adhere to the exterior.

Service and Modification

- Your PortaTone contains no user-serviceable parts. Opening it or tampering with it in any way may result in damage and even electrical shock. Refer all servicing to qualified Yamaha personnel.

NOTE

- Yamaha is not responsible for damage caused by improper usage.

Setting Up

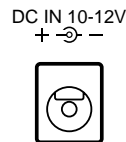
This section contains information about setting up your PortaTone for playing. Make sure to read this section carefully before using the instrument.

Power Requirements

Your PortaTone can run either on batteries (sold separately) or on normal household current by using the optional Yamaha PA-3/3B Power Adaptor (or another adaptor specifically recommended by Yamaha).

Using an AC Power Adaptor

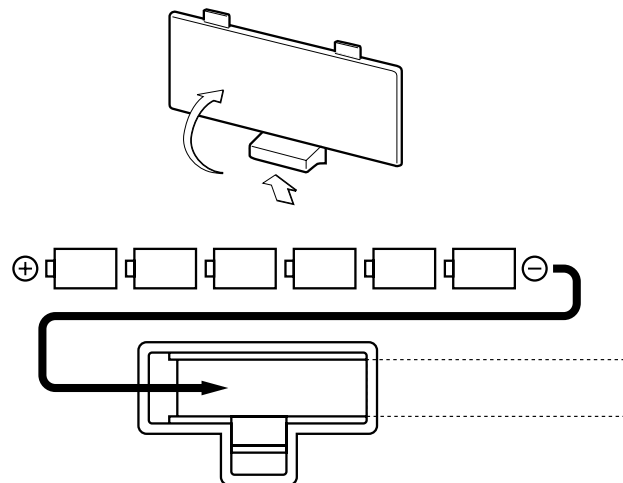
To connect your PortaTone to a wall socket, you will need the optionally available Yamaha PA-3/3B Power Adaptor. Use of other AC adaptors could result in damage to the instrument, so be sure to ask for the right kind. Plug the adaptor into a convenient wall outlet and its connector into the **DC IN 10-12V** jack on the back of your PortaTone.



Using Batteries

Inserting Batteries

Turn the instrument upside-down and remove the battery compartment lid. Insert six 1.5-volt size “D” batteries as shown in the illustration, making sure that the positive and negative terminals are properly aligned, and replace the lid.



When the Batteries Run Down

When the batteries run low and the battery voltage drops below a certain level, the PortaTone may not sound or function properly, or it may reset to the default status. As soon as this happens, replace them with a complete set of six new batteries. Never mix old and new batteries or different types of batteries (e.g., alkaline and manganese).

NOTE

- To prevent possible damage from battery leakage, remove the batteries from the instrument if it is not to be used for an extended period of time.

PHONES/AUX OUT Jack

Using Headphones

For private practicing and playing without disturbing others, connect a set of stereo headphones to the rear panel **PHONES/AUX OUT** jack. Sound from the built-in speaker system is automatically cut off when you insert a headphone plug into this jack.

PHONES /
AUX OUT



Connecting a Keyboard Amplifier or Stereo System

Though the PortaTone is equipped with a built-in speaker system, you can also play it through an external amplifier/speaker system. First, make sure the PortaTone and any external devices are turned off, then connect one end of a stereo audio cable to the **LINE IN** or **AUX IN** jack(s) of the other device and the other end to the rear panel **PHONES/AUX OUT** jack on the PortaTone.

SUSTAIN Jack

An optional Yamaha FC4 or FC5 footswitch can be connected to the rear panel **SUSTAIN** jack for sustain control. The footswitch functions like the damper switch on a piano: press and hold to sustain the sound, and release for normal decay.

For normal operation, turn the power off before connecting the footswitch, then turn the PortaTone on without pressing the footswitch. Also, do not disconnect the switch while the power is on.

SUSTAIN

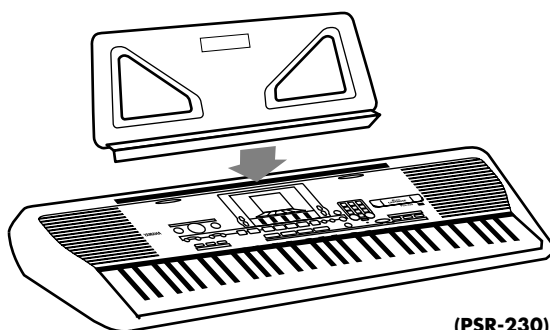


NOTE ▶

- Make sure to turn the power off before connecting or disconnecting the footswitch.

Music Stand

Insert the bottom edge of the included music stand into the slot located at the top rear of the PortaTone control panel.



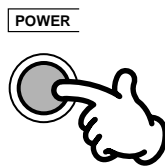
(PSR-230)

Getting Started — Playing the Demo Songs

The PortaTone has sixteen various Demo Songs, specially recorded to showcase the dynamic sounds and rhythms and give you an idea of what you can do with the instrument.

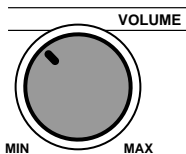
1 First, turn on the power.

Press the **POWER ON/OFF** button. Whenever the power is turned on, the Voice mode is automatically called up and set to play Voice 01 (GRAND PIANO).



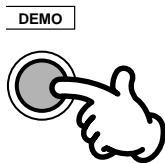
2 Set the Volume.

Initially, turn the **VOLUME** control about a third of the way up. You can adjust the control for optimum level once you start playing.



3 Press the DEMO button.

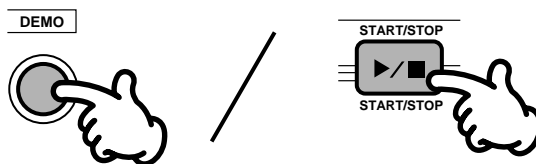
The Demo Songs will play in sequence from Song number 01. You can also play along on the keyboard with the Songs.



NOTE

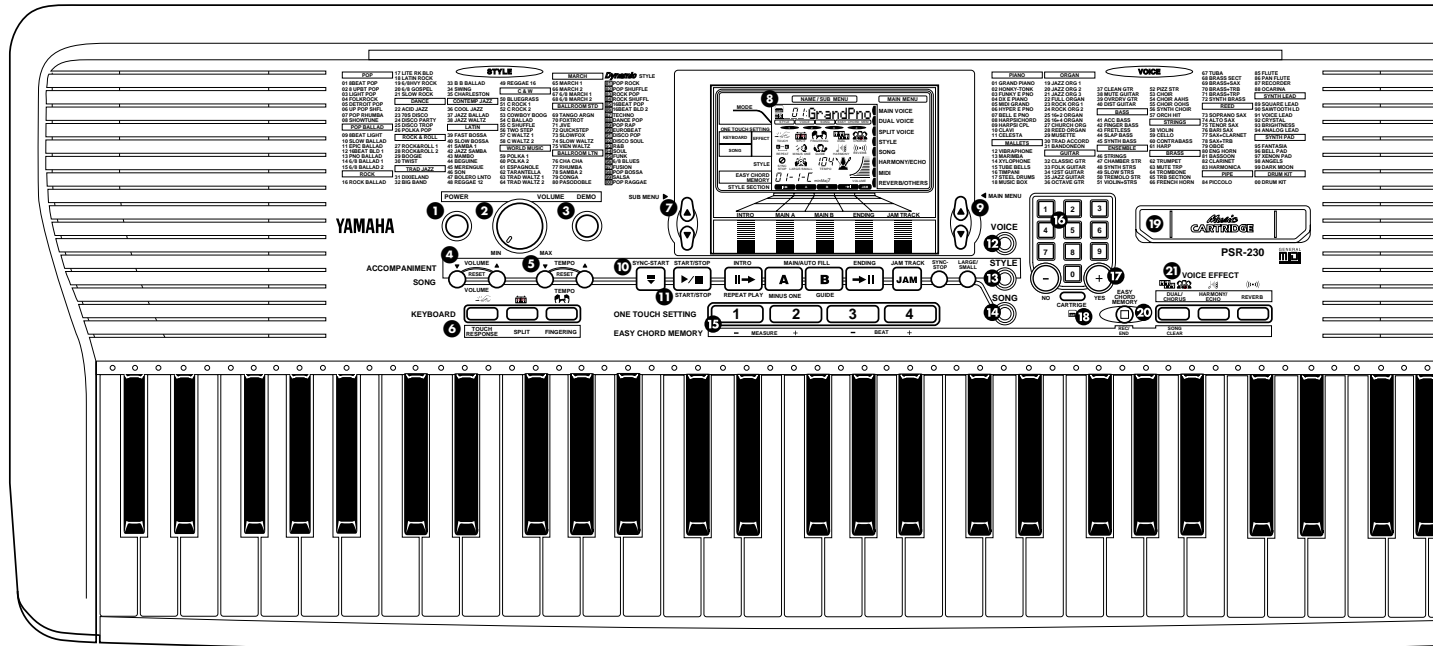
- When Demo Songs that use the internal accompaniment Styles are played back, chord names are indicated in the display as the chords of the Song change.

To stop playback, press the **DEMO** button again or press the **START/STOP** button.

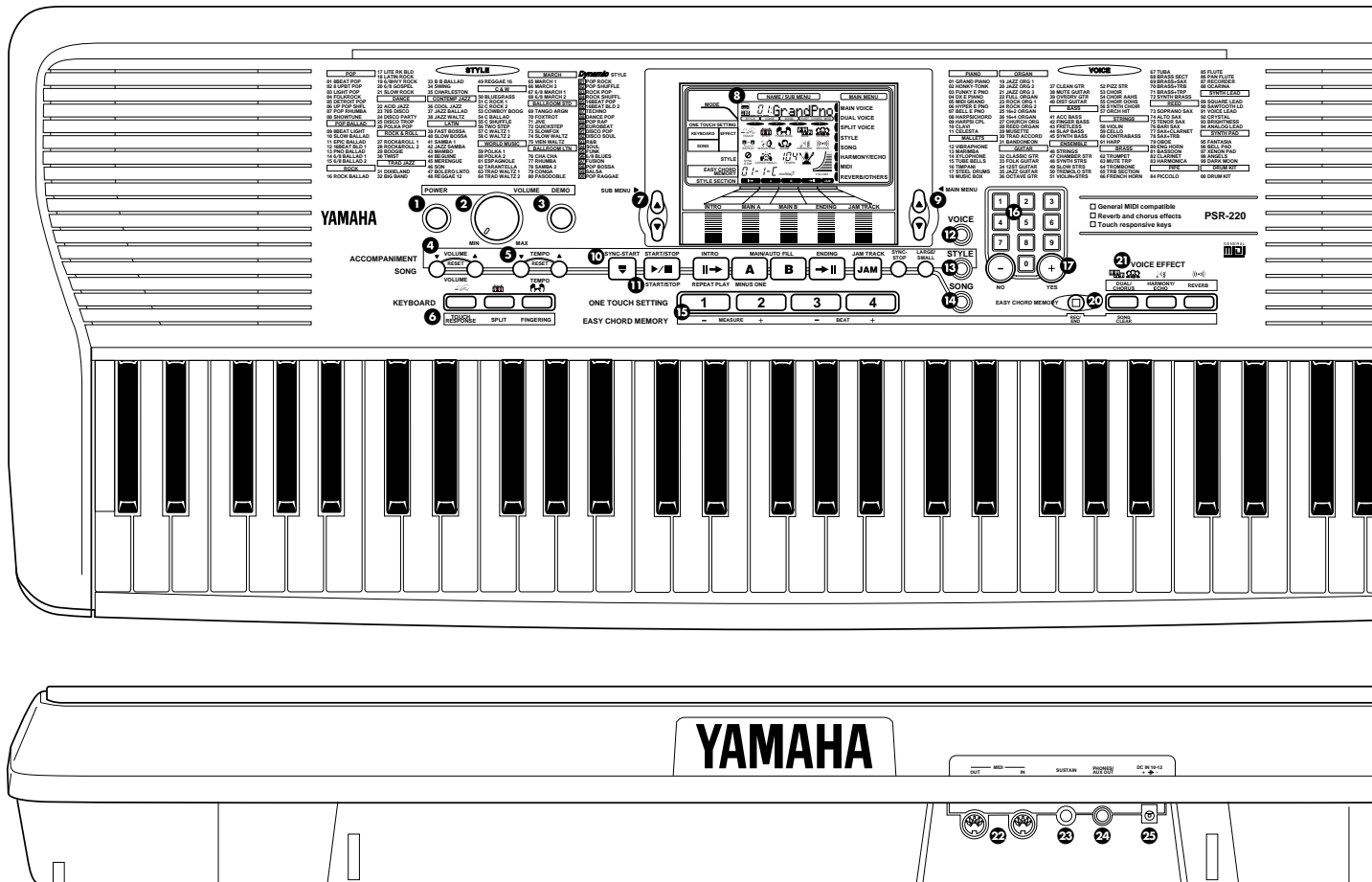


Panel Controls and Terminals

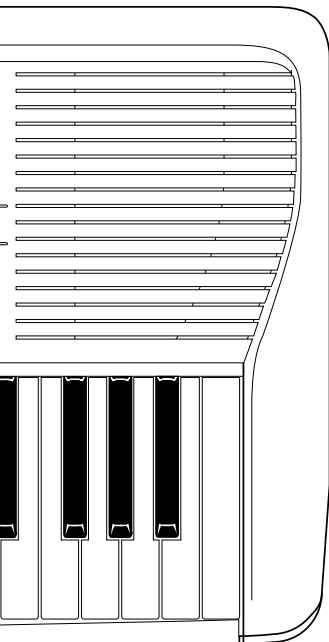
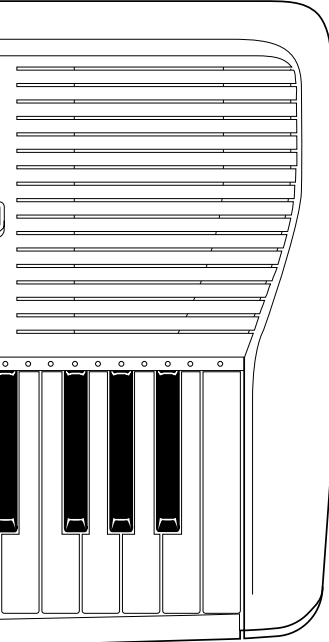
PSR-230



PSR-220



Top Panel Controls



❶ POWER switch	page 5
❷ VOLUME control	page 5
❸ DEMO button	page 5
❹ ACCOMPANIMENT/SONG VOLUME controls	pages 23, 32
❺ ACCOMPANIMENT/SONG TEMPO controls	page 22
❻ KEYBOARD controls	
• TOUCH RESPONSE button	page 18
• SPLIT button	page 14
• FINGERING button	page 24
❼ SUB MENU buttons	pages 8, 11
❽ Panel Display	page 8
❾ MAIN MENU buttons	pages 8, 11
❿ ACCOMPANIMENT controls	
• SYNC-START button	page 21
• START/STOP button	page 21
• INTRO button	page 21
• MAIN/AUTO FILL A, B buttons	pages 21, 22
• ENDING button	page 24
• JAM TRACK button	page 23
• SYNC-STOP button	page 24
• LARGE/SMALL button	page 23
⓫ SONG controls	
• START/STOP button	page 29
• REPEAT PLAY button	page 29
• MINUS ONE button	page 31
• GUIDE button (PSR-230 only)	page 30
⓬ VOICE Mode button	page 10
⓭ STYLE Mode button	page 20
⓮ SONG Mode button	page 28
⓯ ONE TOUCH SETTING 1 - 4 buttons	pages 27, 33
(also:) EASY CHORD MEMORY controls	page 35
• MEASURE +/- buttons	page 35
• BEAT +/- buttons	page 35
⓰ Numeric keypad	page 10
⓱ -/NO, +/YES buttons	page 11
⓲ CARTRIDGE button (PSR-230)	page 37
⓳ Music Cartridge slot (PSR-230)	page 36
⓴ EASY CHORD MEMORY (REC/END) button	page 34
⓵ VOICE EFFECT controls	
• DUAL/CHORUS button	pages 12, 16
(also:) SONG CLEAR button for Easy Chord Memory	page 35
• HARMONY/ECHO button	page 16
• REVERB button	page 18

Rear Panel Terminals

⓶ MIDI IN/OUT terminals	page 38
⓷ SUSTAIN jack	page 4
⓸ PHONES/AUX OUT jack	page 4
⓹ DC IN 10-12V jack	page 3

Basic Display Operations

The PortaTone features a large multi-function display that shows all important settings for the instrument. The section below briefly explains the various icons and indications in the display.

MAIN MENU • NAME/SUB MENU

The Main Menu and the Sub Menus give you access to the detailed settings for the PortaTone. These include settings for the Main, Dual and Split Voices, as well as various settings for the Styles, Songs and effects. They also include MIDI settings and overall controls. The display indicates the selected Main Menu item, and shows the name and number of the selected Voice, Style, or Song, or the selected Sub Menu parameter.

Use the MAIN MENU buttons to select a Main Menu item, and the SUB MENU buttons to select a Sub Menu item. The first Sub Menu item can be directly selected by pressing both SUB MENU buttons simultaneously.

KEYBOARD

This section contains indications for the keyboard-related functions: Touch Response (page 18), Split mode (page 14), and Fingering (page 24). Pressing the appropriate button in the KEYBOARD section of the panel turns the corresponding function on/off. (The display indication appears or disappears accordingly.)



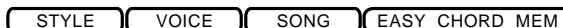
SONG

This section contains indications for the Song-related functions: Repeat Play (page 29), Minus One (page 31), and Guide (PSR-230 only) (page 30). Pressing the appropriate button on the panel turns the corresponding function on/off. (The display indication appears or disappears accordingly.)



MODE

This section indicates which mode is selected — Voice, Style, Song, or Easy Chord Memory. To select the desired mode, press the corresponding button: **VOICE**, **STYLE**, **SONG**, or **EASY CHORD MEMORY (REC/END)**.



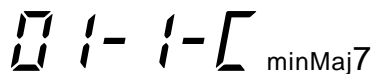
ONE TOUCH SETTING

This indicates which of the One Touch Settings have been called up. To select a One Touch Setting, press one of the ONE TOUCH SETTING buttons. (See pages 27, 33.)



EASY CHORD MEMORY

This section contains indications for the Easy Chord Memory function (page 33). These include the current measure and beat, as well as the chord name entered at the current position. The chord name is also displayed when playing chords in the Auto Accompaniment section of the keyboard (page 22). The current measure and beat are also displayed during Song playback (page 28).



STYLE

This section contains indications for the Style-related functions: Sync Stop (page 24), Large/Small (page 23), and Tempo (page 22). Pressing the SYNC-STOP button turns that function on/off. Pressing the LARGE/SMALL button switches between the two accompaniment ensemble “sizes”: Large and Small. Using the TEMPO controls changes the playback speed and the TEMPO value in the display. The metronome icon flashes in time with the current tempo.



Main Menus and Sub Menus

• Main Voice (page 11)

- Main Voice Name
- Main Voice Volume
- Main Voice Octave
- Main Voice Pan
- Main Voice Reverb Level
- GM Voice

• Dual Voice (page 13)

- Dual Voice Name
- Dual Voice Volume
- Dual Voice Octave
- Dual Voice Pan
- Dual Voice Reverb Level
- GM Voice

• Harmony/Echo (page 17)

- Type Name
- Harmony Volume
- Echo Speed

• MIDI (page 40)

- Remote Channel
- Keyboard Out
- Accompaniment Out
- Receive Channel Select
- Receive Switch
- Local Control
- External Clock

• Reverb/Others (page 19)

- Reverb Type Name
- Transpose
- Tuning
- Voice Set
- Touch Sensitivity
- Guide Lamp (PSR-230 only)
- Metronome

• CART (Cartridge) (PSR-230 only)

When a Music Cartridge Song or Style is selected, this icon appears.



• General MIDI

When a GM Voice is selected, this icon appears.



• Split Voice (page 15)

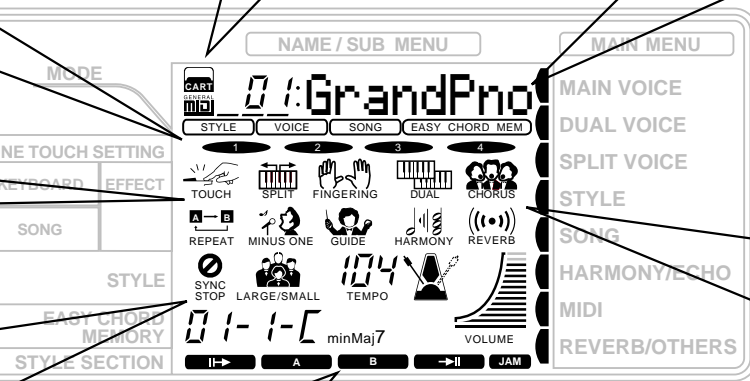
- Split Voice Name
- Split Voice Volume
- Split Voice Octave
- Split Voice Pan
- Split Voice Reverb Level
- Split Point 1
- Split Point 2
- GM Voice

• Style (page 20, 26)

- Style Name
- Accompaniment Split Point

• Song (page 32)

- Song Name
- Minus One Part
- Minus One Right Hand Channel
- Minus One Left Hand Channel



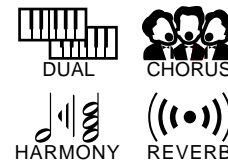
STYLE SECTION

This indicates playback of the Styles, or the rhythm/accompaniment patterns. Each Style has different "sections" — Intro, Main A and B, four Fill-ins, Ending, and Jam Track — each of which is indicated in the display as it plays. These can be played by pressing the appropriate button during accompaniment playback. (See page 22.)



EFFECT

This section contains indications for the Voice effect-related functions: Dual mode (page 12), Chorus (page 16), Harmony/Echo (page 16), and Reverb (page 18). Pressing the appropriate button in the VOICE EFFECT section of the panel turns the corresponding function on/off. (The display indication appears or disappears accordingly.)



VOLUME

This graphic indication shows the Accompaniment and Song volume.



VOLUME

Playing Voices — The Voice Mode

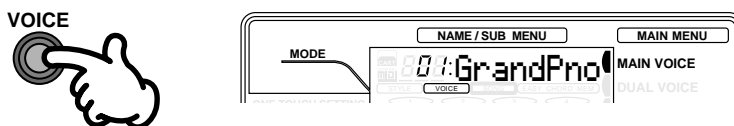
The PortaTone features a wealth of dynamic, realistic Voices — 100 Panel Voices, or 129 GM Voices (128 Voices + 1 Percussion Kit). (See pages 42, 43.) The Voice mode gives you many powerful and versatile tools for playing and enhancing these Voices.

The Voice mode is actually divided into three separate modes: Main, Dual and Split. In the **Main Voice** mode (see below), you can play a single Voice over the entire range of the keyboard. The **Dual Voice** mode (page 12) allows you to “layer” two different Voices together for rich, complex sounds. The **Split Voice** mode (page 14) lets you set up two different Voices for playing from separate sections of the keyboard. Moreover, a special **Voice Effect** section (page 16 - 18) lets you enhance the sound of the Voice or Voices with Chorus, Harmony, Echo, and Reverb effects.

Selecting and Playing a Voice — Main Voice Mode

1 Select the Voice mode.

Press the **VOICE** button. (The VOICE indications appear in the display, indicating that the Voice mode and Main Voice menu are selected.)



NOTE

- You can quickly select the first parameter in the Main Voice menu (Main Voice Volume) by pressing and holding the VOICE button.
- Selecting MAIN VOICE (or DUAL VOICE, SPLIT VOICE) with the Main Menu buttons does not change the selected mode; the Style or Song mode is still active, but the appropriate Voice menu is called up.

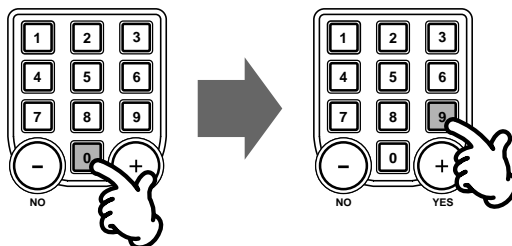
2 Select the desired Voice number.

Use the numeric keypad. Available Voices are listed on the upper right of the panel.

You can either enter the Voice number directly with the number buttons, or step up and down through the Voices by using the +/- buttons.

Using the number buttons

Be sure to enter a two-digit number, as is printed next to each Voice name on the panel. For example, to select Voice 09, first press “0” on the numeric keypad, then “9.”



For GM Voices, make sure to enter three-digit numbers.

Using the +/- buttons

Press the + button to select the next Voice, and press the - button to select the previous Voice. Holding down either button continuously scrolls up or down through the numbers. The +/- buttons have a “wrap around” feature. For example, pressing the + button from the last number returns to Voice 01.

About Panel Voices and GM Voices

Keep in mind that the PortaTone has two separate sets of Voices: 100 Panel Voices and 129 GM (General MIDI) Voices. The GM Voices can also be used for optimum playback of GM-compatible song data. This means that any GM song data (played from a sequencer or other MIDI device) will sound just as the composer or programmer intended.

To change between Panel and GM Voices, use the Sub Menu in the Main, Dual, or Split Voice modes (see pages 11, 13, 15).

3 Play the selected Voice.

To change to another Voice, repeat step 2 above.

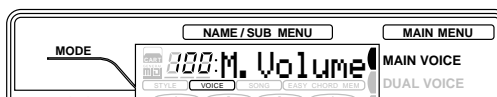
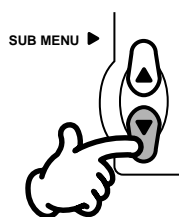
NOTE

- You can also play rhythm Styles in the Voice mode by simply pressing the START/STOP button. The Style last selected from the Style mode will be played.

4 Change other settings for the Voice — Volume, Octave, Pan, etc. — if you wish.

Whenever you select a Panel Voice for the Main Voice, the Sub Menu parameters for that Voice are automatically set to values that best suit the Voice. This is the Voice Set function. (See page 19.)

However, you can change the Voice settings if you wish by using the Sub Menu. First, select the desired Sub Menu parameter with the **SUB MENU** buttons. Then, use the numeric keypad or +/- buttons to change the setting.



Main Voice Sub Menu

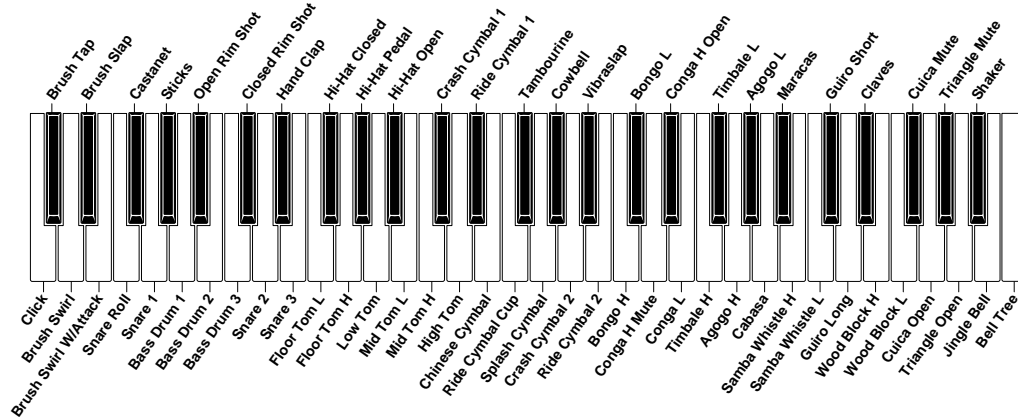
Parameter Name	Display Name	Range	Description
Main Voice Name	—	01 - 00/001 - 129	This determines the Main Voice. Panel Voices are from 01 - 00, and GM Voices are from 001 - 129. (To change between Panel and GM Voices, use the GM Voice parameter below.)
Main Voice Volume	M. Volume	000 - 127	This determines the volume of the Main Voice, letting you create the optimum blend with the Dual Voice.
Main Voice Octave	M. Octave	-2 - +2 octaves	This determines the octave range for the Main Voice.
Main Voice Pan	M. Pan	-7 (full left) - +7 (full right)	This determines the pan position of the Main Voice in the stereo image.
Main Voice Reverb Level	M. RevLvl	000 - 127	This determines how much of the Main Voice's signal is sent to the Reverb effect. Higher values result in a louder Reverb effect.
GM Voice	GMvoice	on, off	This determines whether the Main Voice is selected from the Panel Voices (off), or from the GM Voices (on). When GM Voice is on, the General MIDI icon will appear at the left of the Voice number in the display.

NOTE

- The Main Voice Volume parameter can be directly selected by pressing and holding down the VOICE button.
- The Main Voice Name parameter can be directly selected by pressing both MAIN MENU buttons simultaneously.
- **Reset to default settings**
To reset the selected Main Voice parameter to its default settings, simultaneously press the +/- buttons.
- **Negative values**
To directly enter negative values (for Octave and Pan parameters), press the desired number button while holding down the - button.

Percussion Kit Voice Chart

The PortaTone also has a special Percussion Kit Voice (Panel Voice #00, or GM Voice #129) that lets you play various drum and percussion sounds from the keyboard. Symbols for the sounds are also printed above the keyboard, conveniently indicating which sounds are played from which keys.



NOTE

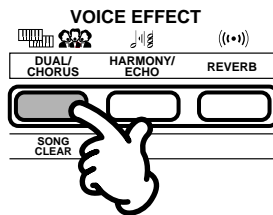
- The corresponding MIDI note numbers for the notes are actually one octave lower. For example, the MIDI note number for note #36 (C1) is note #24 (C0).

Playing Two Voices — Dual Voice Mode

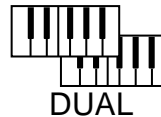
The Dual Voice mode lets you create richly textured sounds by “layering” two different Voices together — one Voice being the Main Voice selected in the normal way (page 10), and the other a Dual Voice selected as described below.

1 Turn on the Dual Voice mode.

Press the **DUAL/CHORUS** button (in the VOICE EFFECT section) once, or repeatedly until the Dual Voice icon appears in the display.



DUAL/CHORUS button

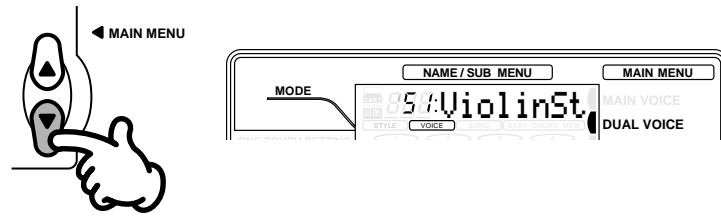


DUAL icon in display

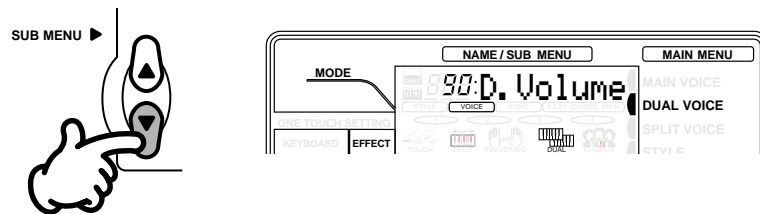
When you play the keyboard, both the currently selected Main and Dual Voices will be heard.

2 Select the desired Dual Voice and make other settings for the Voice, if desired.

First, use the **MAIN MENU** buttons to select **DUAL VOICE** in the display.



Next, select the desired Sub Menu parameter with the **SUB MENU** buttons. Then, use the numeric keypad or +/- buttons to change the setting.



Dual Voice Sub Menu

Parameter Name	Display Name	Range	Description
Dual Voice Name	—	01 - 00/001 - 129	This determines the Dual Voice. Panel Voices are from 01 - 00, and GM Voices are from 001 - 129. (To change between Panel and GM Voices, use the GM Voice parameter below.)
Dual Voice Volume	D. Volume	000 - 127	This determines the volume of the Dual Voice (relative to the Main Voice's volume), letting you create the optimum blend with the Main Voice.
Dual Voice Octave	D. Octave	-2 - +2 octaves	This determines the octave range for the Dual Voice (relative to the Main Voice's octave setting).
Dual Voice Pan	D. Pan	-7 (full left) - +7 (full right), -- (opposite of Main Voice)	This determines the pan position of the Dual Voice in the stereo image. To set Dual Voice Pan to the opposite of that of the Main Voice ("--"), press the + or - button (past +7 or -7).
Dual Voice Reverb Level	D. RevLvl	000 - 127	This determines how much of the Dual Voice's signal is sent to the Reverb effect. Higher values result in a louder Reverb effect for the Dual Voice.
GM Voice	GMvoice	on, off	This determines whether the Dual Voice is selected from the Panel Voices (off), or from the GM Voices (on). When GM Voice is on, the General MIDI icon will appear at the left of the Voice number in the display.

NOTE

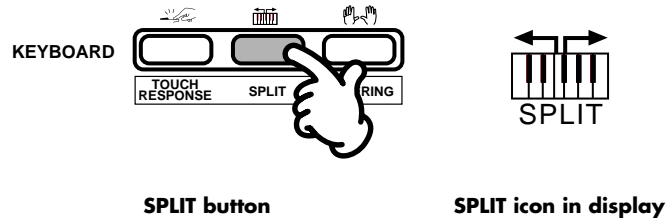
- If the Voice Set function (page 19) is on, the Dual Voice parameters will change automatically whenever a different Panel Voice is selected in the Main Voice menu.
- The Dual Voice Name parameter can be directly selected by pressing and holding down the DUAL/CHORUS button.
- **Reset to default settings**
To reset the selected Dual Voice parameter to its default settings, simultaneously press the +/- buttons.
- **Negative values**
To directly enter negative values (for Octave and Pan parameters), press the desired number button while holding down the - button.

Playing Two Voices — Split Voice Mode

In the Split Voice mode, you can assign two different Voices to opposite sections of the keyboard, and play one Voice with your left hand while your right plays another. For example, you could play bass with the left hand and play piano with the right. The right-hand (or upper) Voice is selected in the Main Voice mode, and the left-hand (or lower) Voice is selected in the Split Voice mode, as described below.

1 Turn on the Split Voice mode.

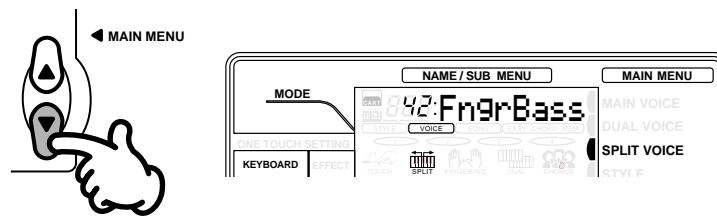
Press the **SPLIT** button (in the **KEYBOARD** section) so that the Split Voice icon appears in the display.



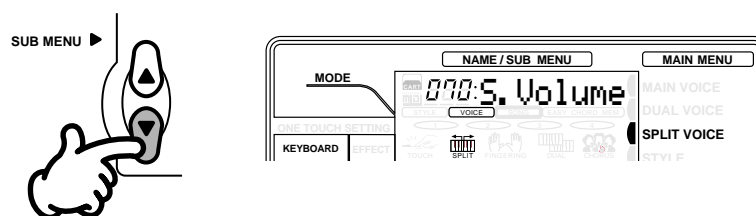
When you play the keyboard, both the currently selected Main and Split Voices will be heard.

2 Select the desired Split Voice and make other settings for the Voice, if desired.

First, use the **MAIN MENU** buttons to select **SPLIT VOICE** in the display.



Next, select the desired Sub Menu parameter with the **SUB MENU** buttons. Then, use the numeric keypad or +/- buttons to change the setting.



NOTE

- Dual Voice and Split Voice can be used together. You can have the Split Voice play in the lower section of the keyboard and play the Main and Dual Voices together in the upper.

Split Voice Sub Menu

Parameter Name	Display Name	Range	Description
Split Voice Name	—	01 - 00/001 - 129	This determines the Split (lower) Voice. Panel Voices are from 01 - 00, and GM Voices are from 001 - 129. (To change between Panel and GM Voices, use the GM Voice parameter below.)
Split Voice Volume	S. Volume	000 - 127	This determines the volume of the Split (lower) Voice, letting you create the optimum blend with the Main (upper) Voice.
Split Voice Octave	S. Octave	-2 - +2 octaves	This determines the octave range for the Split (lower) Voice.
Split Voice Pan	S. Pan	-7 (full left) - +7 (full right)	This determines the pan position of the Split (lower) Voice in the stereo image.
Split Voice Reverb Level	S. RevLvl	000 - 127	This determines how much of the Split (lower) Voice's signal is sent to the Reverb effect. Higher values result in a louder Reverb effect for the Split Voice.
Split Point 1	SplPt1	36 - 96 (C1 - C6)	This determines the Split Point — i.e., the key that separates the Split (lower) and Main (upper) Voices — when the Voice mode or Song mode is active. (The Split Voice sounds up to and including the Split Point key.) The default for Split Point 1 is 59 (B2). Split Point 1 can also be set directly by pressing the desired key while this parameter is selected.
Split Point 2	SplPt2	37 - 96 (C#1 - C6)	This determines the Split Point — i.e., the key that separates the Split (lower) and Main (upper) Voices — when the Style mode is active. (The Split Voice sounds up to and including the Split Point key.) The default for Split Point 2 is 71 (B3). Split Point 2 can also be set directly by pressing the desired key while this parameter is selected.
GM Voice	GMvoice	on, off	This determines whether the Split Voice is selected from the Panel Voices (off), or from the GM Voices (on). When GM Voice is on, the General MIDI icon will appear at the left of the Voice number in the display.

NOTE

- If the Voice Set function (page 19) is on, the Split Voice parameters (excepting Split Points 1 and 2) will change automatically whenever a different Panel Voice is selected in the Main Voice menu.
- The Split Voice Name parameter can be directly selected by pressing and holding down the SPLIT button.
- Split Point 2 cannot be set lower than the Accompaniment Split Point. (See page 26.)
- The Split Point 1 and 2 settings are retained in memory when power is turned off, as long as batteries are installed or an AC adaptor is connected.
- **Reset to default settings**
To reset the selected Split Voice parameter to its default settings, simultaneously press the +/- buttons.
- **Negative values**
To directly enter negative values (for Octave and Pan parameters), press the desired number button while holding down the - button.

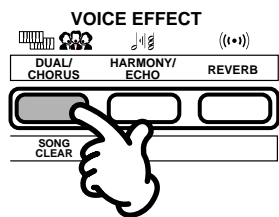
Other Voice Controls

Chorus

The Chorus effect lets you enhance the sound of a Voice with chorus modulation. This slightly detunes the Voice with itself, creating a thicker and warmer sound.

Turn on the Chorus effect.

Press the **DUAL/CHORUS** button once or twice, or until the CHORUS icon appears in the display.



DUAL/CHORUS button



CHORUS icon in display

NOTE

- The Chorus effect can be applied to the Main Voice.

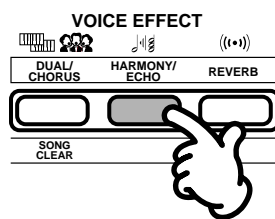
Harmony/Echo

Harmony and Echo are two separate effects that can be applied to a Voice. **Harmony** is used in conjunction with the auto accompaniment features (page 20), and creates automatic harmonies (for notes played in the upper section of the keyboard) to match the accompaniment chords. **Echo** produces delayed repeats of the sound for special effects. Various settings for the two effects can be changed in the Sub Menu.

To use Harmony or Echo:

1 Turn on the Harmony/Echo effect.

Press the **HARMONY/ECHO** button. (The HARMONY icon appears in the display.)



HARMONY/ECHO button

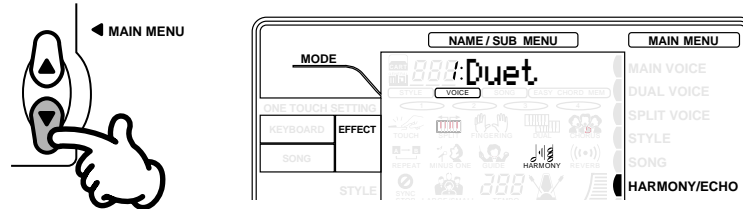


HARMONY icon in display

When you play the keyboard, the currently selected Harmony or Echo effect will be heard.

2 Change the Harmony/Echo type and make other settings for the effect, if desired.

Use the **MAIN MENU** buttons to select the **HARMONY/ECHO** menu, and select the desired Sub Menu parameter with the **SUB MENU** buttons. Then, use the numeric keypad or +/- buttons to change the setting.



Harmony/Echo Sub Menu

Parameter Name	Display Name	Range	Description
Type Name	—	1 - 8 (1-5: Harmony types; 6-8: Echo types)	This determines the type of effect for Harmony or Echo. The Harmony types are (1) Duet, (2) Trio, (3) Block, (4) Country, and (5) Octave. The Echo types are (6) Trill, (7) Tremolo, and (8) Echo.
Harmony Volume	HarmVol	000 - 127	This determines the volume of the Harmony effect, letting you create the optimum blend with the original note.
Echo Speed	EchoSpd	1 - 7	This determines the “speed” of the Echo effect, or the amount of time between the delayed repeats — which is based on note values. The actual Echo speed depends on the selected tempo. Settings: 1 — 04: 1/4 note 2 — 06: 1/4 note triplets 3 — 08: 1/8 note 4 — 12: 1/8 note triplets 5 — 16: 1/16 note 6 — 24: 1/16 note triplets 7 — 32: 1/32 note

NOTE

- The Harmony effect is not available in the Voice mode, nor when the Auto Accompaniment Chord Cancel function (page 25) is on.
- If the Voice Set function (page 19) is on, the Harmony/Echo parameters will change automatically whenever a different Panel Voice is selected in the Main Voice menu.
- The Harmony/Echo Type Name parameter can be directly selected by pressing and holding down the HARMONY/ECHO button.
- **Reset to default settings**
To reset the selected Harmony/Echo parameter to its default settings, simultaneously press the +/- buttons.
- Harmony/Echo is not available when the Full Fingering mode (page 26) is on, and will automatically be turned off when the Full Fingering mode is selected.

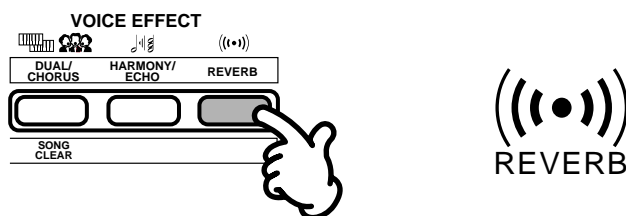
Reverb

The Reverb effect reproduces the natural ambient “wash” that occurs when a sound is heard in a room or concert hall. Several different Reverb types are available in the Sub Menu.

To use Reverb:

1 Turn on the Reverb effect.

Press the **REVERB** button. (The REVERB icon appears in the display.)



REVERB button

REVERB icon in display

When you play the keyboard, the currently selected Reverb effect will be heard.

2 Change the Reverb type, if desired.

First, select **REVERB/OTHERS** in the Main Menu, then select the Reverb Type Name parameter with the **SUB MENU** buttons, and use the numeric keypad or +/- buttons to change the setting. (For details, see the REVERB/OTHERS Sub Menu chart on page 19.)

NOTE

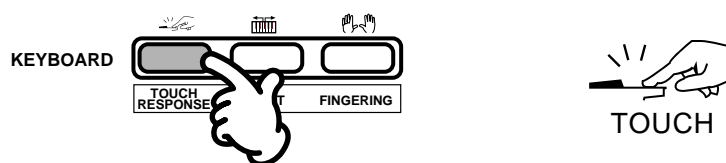
- The Reverb Type will change automatically whenever a different Style is selected in the Style menu.
- The Reverb Type Name parameter can be directly selected by pressing and holding down the REVERB button.
- Reverb is turned on whenever the power is turned on.
- The Reverb Send Level can be adjusted independently for each of the Main, Dual and Split Voice modes. (See pages 11, 13 and 15)
- If Reverb Type 9 (No Effect) is selected. Reverb will not be applied to the Sound, even when the REVERB button is pressed.

Touch Response

The PortaTone keyboard has a Touch Response feature, letting you expressively play the Voices, controlling the volume by how soft or hard you strike the keys. Touch Response can be turned on or off, and the Touch Sensitivity (the degree of Touch Response) can be adjusted.

1 Turn on the Touch Response feature.

Press the **TOUCH RESPONSE** button. (The TOUCH icon appears in the display.)



TOUCH RESPONSE button

TOUCH RESPONSE icon in display

2 Change the Touch Sensitivity, if desired.

First, select **REVERB/OTHERS** in the Main Menu, then select the Touch Sensitivity parameter with the **SUB MENU** buttons, and use the numeric keypad or +/- buttons to change the setting. (For details, see the REVERB/OTHERS Sub Menu chart on page 19.)

NOTE

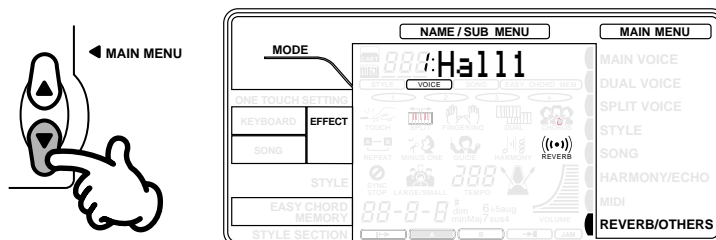
- The Touch Sensitivity parameter can be directly selected by pressing and holding down the TOUCH RESPONSE button.
- The Touch Response on/off setting is retained in memory when power is turned off, as long as batteries are installed or an AC adaptor is connected.

Overall Controls

Various controls related to the overall operation of the PortaTone are contained in the Reverb/Others menu. These include the Reverb Type parameter as well as the following overall parameters: Transpose, Tuning, Voice Set, Touch Sensitivity, Guide Lamp (PSR-230 only), and Metronome.

Reverb/Others Sub Menu

First, use the **MAIN MENU** buttons to select the Reverb/Others menu, and select the desired Sub Menu parameter with the **SUB MENU** buttons. Then, use the numeric keypad or +/- buttons to change the setting.



Parameter Name	Display Name	Range	Description
Reverb Type Name	—	1 - 9	This determines the type of Reverb effect. The Reverb types are (1) Hall 1, (2) Hall 2, (3) Room 1, (4) Room 2, (5) Plate 1, (6) Plate 2, (7) Delay 1, (8) Delay 2, and (9) No Effect.
Transpose	Transpos	-12 - +12 semitones (+/- 1 octave)	This determines the overall pitch of the instrument, up or down in semitone increments.
Tuning	Tuning	-50 - +50 cents (+/- approx. 1 semitone)	This determines the overall fine pitch setting of the instrument.
Voice Set	VoiceSet	on/off	This determines whether the Voice Set feature is on or off. When Voice Set is on (default), selecting a Panel Voice in the Main Voice menu automatically sets the Voice-related parameters to values that best match the selected Voice. (Voice Set includes all parameters for the Main, Dual, and Split Voices — with the exception of Split Points 1 and 2 — as well as all Harmony/Echo parameters.)
Touch Sensitivity	TouchSns	0 - 9	This determines the degree of touch sensitivity for the keyboard (when Touch Response is on). (See page 18.) Higher values result in a wider dynamic range and give you more expressive control over the level of the Voices. The default Touch Sensitivity setting is 5.
Guide Lamp (PSR-230 only)	LAMP	on/off	This turns the keyboard guide lamps on or off. Red lamps correspond to the white keys and green lamps to the black keys. (See page 30.)
Metronome	Metronom	on/off	This turns the metronome function on or off. When set to on, the metronome sounds during Auto Accompaniment and Song playback.

NOTE

- **Reset to default settings**
To reset the selected parameter to its default settings, simultaneously press the +/- buttons.
- **Negative values**
To directly enter negative values (for Transpose and Tuning parameters), press the desired number button while holding down the - button.
- The following settings are retained in memory when power is turned off, as long as batteries are installed or an AC adaptor is connected: Tuning, Voice Set, Touch Sensitivity, Guide Lamp (PSR-230 only), and Metronome.
- Transpose cannot be changed during Accompaniment or Song playback, or when the keyboard is being played.

Playing Auto Accompaniment — The Style Mode

The Style mode provides rhythm/accompaniment patterns for various popular music styles, as listed on the panel. A total of 100 different Styles are available. Each Style is made up of different “sections” — Intro, Main A and B, four Fill-ins, Ending, and Jam Track — letting you call different accompaniment patterns as you perform.

Each Style’s Jam Track section features specially programmed chord progressions and section changes that are ideal for the selected musical Style. If you’re a novice and not familiar with playing chords, the convenient Jam Track section automatically plays stylistically appropriate chord and section changes for you to “jam” over.

The Auto Accompaniment features that are built into the rhythms add the excitement of instrumental backing to your performance, letting you control the accompaniment by the chords you play.

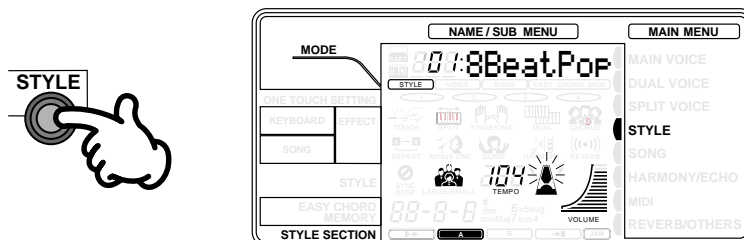
NOTE

- The default split point for the Auto Accompaniment section is 54 (F#2). However, this can be changed in the Style Sub Menu. (See page 26.)

Selecting a Style and Playing an Auto Accompaniment

1 Select the Style mode.

Press the **STYLE** button. (The STYLE indications appear in the display, indicating that the Style mode and the Style menu are selected.)

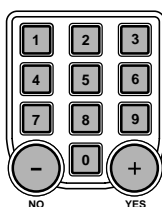


NOTE

- Selecting STYLE with the Main Menu buttons does not change the selected mode; the Voice or Song mode is still active, but the Style menu is called up.

2 Select the desired Style number.

Use the numeric keypad. Available Styles are listed on the upper left of the panel.



You can either enter the Style number directly with the number buttons, or step up and down through the Styles by using the +/- buttons.

NOTE• **Dynamic Style**

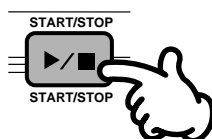
The Style numbers 81~00 are the Dynamic Styles, which play more complex and interesting accompaniment patterns than the others since they may contain tension notes and so on. Because the note other than the notes derived from the chord you designated may be played back, some Dynamic Styles may not match the song you play.

3 Start the selected Style.

You can do this in one of three ways:

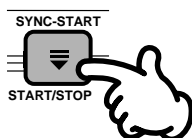
Pressing the **START/STOP** button

The rhythm starts playing immediately without bass and chord accompaniment. The currently selected Main A or B section will play. (You can select either pattern by pressing the appropriate button — **MAIN/AUTO FILL A** or **B** — before pressing the **START/STOP** button.)



Using **Synchro Start**

The PortaTone also has a Synchro Start function that allows you to start the rhythm/accompaniment by simply playing a chord on the keyboard. To use Synchro Start, first press the **SYNC-START** button (the metronome icon flashes to indicate Synchro Start stand-by), then play a chord in the Auto Accompaniment section of the keyboard.



Using **Synchro Start with an Intro pattern**

First, press one of the section buttons — **MAIN/AUTO FILL A, B**, or **JAM** — to select which pattern follows the Intro. Next, press the **INTRO** button, followed by the **SYNC-START** button. (The **INTRO** indication in the display lights, and the metronome icon and the **MAIN A /B/JAM** indication flashes to indicate Synchro Start stand-by.) To actually start the Intro pattern and accompaniment, play a chord in the Auto Accompaniment section of the keyboard.

NOTE

- Selecting the Style mode by pressing the **STYLE** button automatically sets Synchro Start to stand-by.
- Pressing the **SYNC-START** button during accompaniment playback automatically stops the accompaniment and sets Synchro Start to stand-by.

About the **METRONOME** Icon

The **METRONOME** icon in the display moves in time with the current tempo during playback of an accompaniment Style (or Song). The flashing pattern provides a visual indication of both the tempo and time signature of the Style or Song. The icon flashes at the first beat of each measure.

NOTE

- The metronome sound can be turned on or off as needed. (See page 19.)

4 Change chords using the Auto Accompaniment feature.

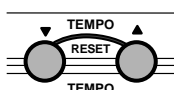
Try playing some chords in the Auto Accompaniment section of the keyboard, and notice how the bass and chord accompaniment change with each chord you play. (Refer to the section “Changing the Fingering Mode” on page 24 for more information.) The chord name recognized will be shown in the display.

NOTE

- When the Single or Fingering mode (pages 25, 26) is selected, chords played in the Auto Accompaniment section of the keyboard are also detected and played when the accompaniment is stopped. In this condition (Stopped Accompaniment function), the Voices used for the bass and chords are automatically selected.
- The range of the Auto Accompaniment section can be changed; see “Changing the Accompaniment Split Point” (page 26).

5 Change the tempo of the Style, if you wish.

Use the **TEMPO** buttons to change the tempo of the Style.



Press **TEMPO** to increase the speed and **TEMPO** to decrease it; holding down the appropriate button continuously increases/decreases the speed. The tempo value appears in the display. Tempo range is from 32 to 280 bpm (in 1 bpm steps).

To reset the tempo to its original default setting, press both **TEMPO** buttons simultaneously.

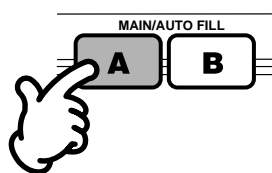
NOTE

- **Default Tempos** — Each Song and Style has been given a default or standard tempo. If you change the tempo, you can set it back to the original default setting, by pressing both TEMPO buttons simultaneously. Also, the tempo of a Song or Style returns to the default setting when selecting a different Song or Style. If a Style is playing and the One Touch Setting is off (see page 27), the set tempo remains even when switching Styles. When you turn on the power of the PortaTone, the tempo is automatically set to the default setting of Style 01.

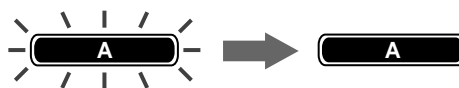
6 Change the Style section (Main A, Main B, or Jam Track), if you wish.

Main A and Main B

While the Style is playing, you can add variation in the rhythm/accompaniment by pressing the **MAIN/AUTO FILL A** or **B** button. This automatically plays one of four Fill-in patterns, and smoothly leads into the next section — even if it is the same section.



MAIN/AUTO FILL A or B buttons



A indication in display

Jam Track

The Jam Track is a special accompaniment pattern that includes automatic chord progressions and section changes that match the selected Style. Press the **JAM TRACK** button during playback, and the accompaniment will continue, changing chords according to the programmed progression and sections letting you “jam” or play along with the changes.



Since the Jam Track progression is based on the last chord played, you may want to play the root chord before pressing **JAM TRACK**. (For example, if you are playing a song in the key of E, play an E chord before pressing JAM TRACK.)

NOTE

- If you press the MAIN A or B button, the Fill-in will begin immediately, and the new section will actually begin playing from the top of the next measure — unless the MAIN A or B button is pressed during the last beat of the measure, in which case the Fill-in will begin from the first beat of the next measure.

7 Change the accompaniment ensemble “size” (LARGE/SMALL), if you wish.

Press the **LARGE/SMALL** button.



This switches between “large” ensemble and “small” ensemble accompaniment, allowing you change the instrumental texture and dynamics of the Auto Accompaniment as you play. (The icon shows four people when set to LARGE, and one person when set to SMALL.)

NOTE

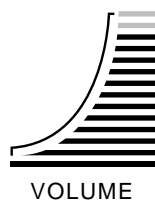
- LARGE is selected whenever the power is turned on.

8 Change Set the Accompaniment Volume, if you wish.

You may want to adjust the accompaniment volume, separate from the overall instrument volume. To do this, use the **VOLUME** buttons in the STYLE mode.



Press **VOLUME** to increase the accompaniment volume and **VOLUME** to decrease it; holding down the appropriate button continuously increases/decreases the accompaniment volume. The level is shown in the display.



To reset the accompaniment volume to its original default setting, press both **VOLUME** buttons simultaneously.

9 Stop the Style.

You can do this in one of two ways:

Pressing the **START/STOP** button

The rhythm/accompaniment stops playing immediately.

Using an **Ending pattern**

Press the **ENDING** button (the **ENDING** indication in the display flashes). An ending pattern plays from the next measure, then playback stops.

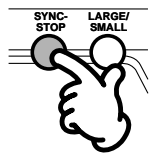
Sync-Stop Function

The Sync-Stop function lets you easily add natural sounding breaks and pauses in the accompaniment as you play.

To use Sync-Stop:

1 Turn on the Sync-Stop function.

Press the **SYNC-STOP** button. (The **SYNC-STOP** icon appears in the display.)



SYNC-STOP button



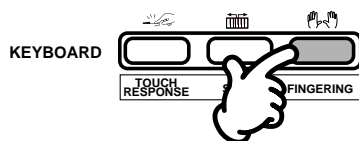
SYNC-STOP icon in display

2 While playing the accompaniment, release your fingers from the keyboard in the Auto Accompaniment section.

This automatically stops the accompaniment, and sets Synchro Start to stand-by. (The **SYNC-STOP** icon flashes.) You can resume accompaniment playback of the selected section by playing the keyboard again.

Changing the Fingering Mode

The PortaTone provides three different fingering modes for controlling the Auto Accompaniment function: Fingered, Full, and Single Fingered. To select among the three, press the **FINGERING** button in the **KEYBOARD** section until the appropriate mode is called up.



FINGERING button



FINGERING **FINGERING** **FINGERING**

Single Finger

Fingering

Full



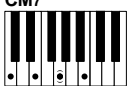





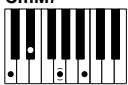
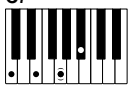
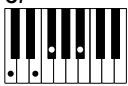
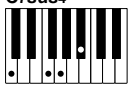
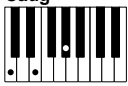
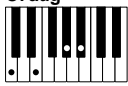
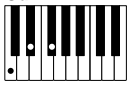
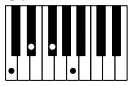

NOTE

- The Fingering mode setting is retained in memory when power is turned off, as long as batteries are installed or an AC adaptor is connected.

Fingered

In the Fingered mode, you can play complete three- or four-note chords yourself in the Auto Accompaniment section of the keyboard and the PortaTone will produce full accompaniment in the selected Style.

Using the key of C as an example, the chart below shows the types of chords that can be recognized in the Fingered mode. (Notes in parentheses may be omitted.)

Example for "C" chords		Abbreviation	Normal Voicing
		Major [M] Minor [m]	1-3-5 1- \flat 3-5
		Major seventh [M7] Major sixth [6]	1-3-(5)-7 1-(3)-5-6
		Suspended fourth [sus4] Minor sixth [m6]	1-4-5 1- \flat 3-5-6
		Minor seventh [m7] Minor seventh flatted fifth [m7]	1- \flat 3-(5)- \flat 7 1- \flat 3- \flat 5- \flat 7
		Minor major seventh [mM7] Seventh [7]	1- \flat 3-(5)-7 1-3-(5)- \flat 7
		Seventh flatted fifth [7 \flat 5] Seventh suspended fourth [7sus4]	1-3- \flat 5- \flat 7 1-4-5- \flat 7
		Augmented [aug] (Seventh augmented [7aug])	1-3- \sharp 5 1-3- \sharp 5- \flat 7
		Diminished [dim] (Diminished seventh [dim7])	1- \flat 3- \flat 5 1- \flat 3- \flat 5-6
		One + Two + Five	1-2-5

NOTE

- If the chord is inverted (i.e., C-E-G is played as G-C-E), the PortaTone will still recognize it as a C chord.
- Chord fingerings are listed here in "root" position; however, other inversions can be used — with the following exceptions:
 - * Major 6th chords are recognized only in root position. All other inversions are interpreted as minor 7th.
 - * Minor 6th chords are recognized only in root position. All other inversions are interpreted as minor 7th flatted 5th.
 - * One + two + five chords are recognized only in root position. All other inversions are interpreted as suspended 4th.
 - * If augmented chord is inverted, the lowest note will be recognized as the root.
 - * For 7th flatted 5th chords, the lowest note played is recognized as the root or the flatted 7th.
- 7th augmented and diminished 7th chords are interpreted as simple augmented and diminished.
- For one+two+five chords, only the root is displayed.

Chord Cancel function

The PortaTone also has a Chord Cancel function to stop the chord accompaniment but allow the rhythm pattern to continue playing. To use Chord Cancel, simultaneously press any three consecutive notes in the Auto Accompaniment section; for example, C, C \sharp and D.

Full

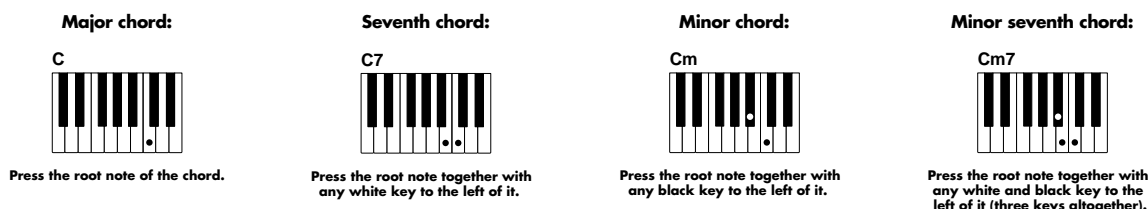
In the Full mode, chords played anywhere on the keyboard are recognized for producing Auto Accompaniment. Here, the PortaTone “intelligently” distinguishes between the playing of your right and left hands and produces accompaniment. (A single note eleven notes higher than the lowest note of the chord is recognized as a right-hand or melody note.) Chords recognized are the same as in Fingered above.

NOTE

- The Harmony/Echo effect is not available when the Full mode is selected.

Single Finger

Single Finger mode makes it easy to produce fully orchestrated accompaniment by simply playing a one-, two- or three-finger chord indication (in the Auto Accompaniment section), as shown below. The key of C is used here as an example; other keys follow the same rules. For example, B^b7 is played as B^b and A.



Changing the Accompaniment Split Point

This function allows you to set the highest key in the Auto Accompaniment section of the keyboard. (All keys below and including this point will be used for Auto Accompaniment.) Accompaniment Split Point is the only parameter in the Style menu.

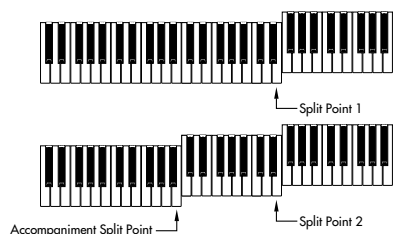
1 Call up the Accompaniment Split Point parameter.

Select **STYLE** in the Main Menu (with the MAIN MENU buttons) and use the **SUB MENU** buttons to select Accompaniment Split Point.

You can also directly select the Accompaniment Split Point parameter by pressing and holding either the **STYLE** or **FINGERING** button.

2 Set the parameter.

Set this directly by pressing the desired key on the keyboard. You can also use the numeric keypad or +/- buttons to enter the key number. The lowest key on the keyboard (C1) is 36, while middle C (C3) is 60, and the highest key (B5) is 95.



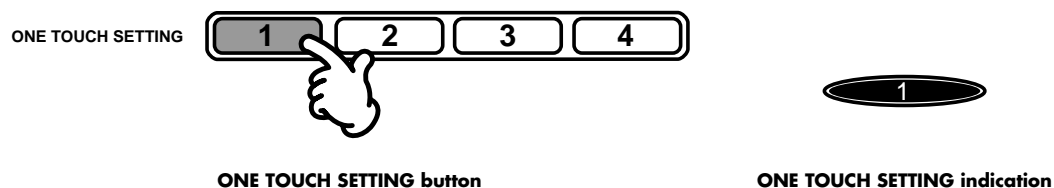
NOTE

- The default Accompaniment Split Point is F[#]2 (54) and can be restored by simultaneously pressing the +/- buttons.
- The Accompaniment Split Point cannot be set higher than the Split Point 2 parameter (page 15).
- The Accompaniment Split Point setting is retained in memory when power is turned off, as long as batteries are installed or an AC adaptor is connected.

One Touch Setting

The One Touch Setting function automatically selects an appropriate Voice (or Voices) and other important settings for playing with the Style you select. In other words, when one of the One Touch Settings is turned on, the Voice and other settings automatically change when you change the Style. (See list below.)

To turn on One Touch Setting, press one of the **ONE TOUCH SETTING** buttons (1 - 4) in the STYLE mode to select the desired type. (The selected One Touch Setting is indicated in the display, and other settings may change accordingly.)



To change to a different One Touch Setting, press a different numbered **ONE TOUCH SETTING** button.

The following parameters and settings may be changed when selecting a One Touch Setting:

- Main Voice — all settings
- Dual Voice — all settings
- Dual/Chorus — on/off
- Split Voice — all settings (excepting Split Points 1 & 2)
- Harmony/Echo — on/off, all settings
- Reverb — on/off
- Accompaniment Volume
- Accompaniment Large/Small
- Tempo
- Synchro Start — set to on

Changing any of the panel settings while a One Touch Setting is active turns off the selected ONE TOUCH SETTING indication.

NOTE ▶

- A "No OTS" indication appears in the display if you have selected a One Touch Setting for an optional Music Cartridge which has no One Touch Setting data (PSR-230 only).

Playing Songs — The Song Mode

The Song mode features special Songs that have been created using the rich and dynamic sounds of the PortaTone.

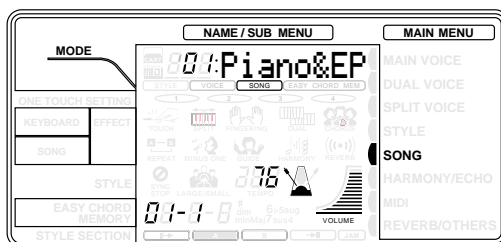
These Songs (#01 - #16) are generally for your listening enjoyment; however, you can also play along with them on the keyboard. By using the **Minus One** function, you can “mute” the original melody and play it manually on the keyboard yourself. The Song mode also features convenient practice tools such as the **Repeat Play** function — which lets you repeat playback of any portion of a Song — and the **Guide lamps** (PSR-230 only) — which show you which melody notes to play, and waits for you to play them.

The Song mode also lets you create and save your own original Songs. This is done with the four **User Songs** (#17 - #20), to which you can record your own chord and section changes by using the **Easy Chord Memory** function. (See page 33.)

Selecting and Playing a Song

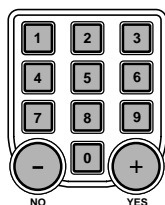
1 Select the Song mode.

Press the **SONG** button. The Song mode and the Song menu are selected. (The SONG indications light in the display.)



2 Select the desired Song number.

Use the numeric keypad.



You can either enter the Song number (two digits) directly with the number buttons, or step up and down through the Songs by using the +/- buttons. Songs 01 - 16 are the Demo Songs, and Songs 17 - 20 are User Songs. (For more information on User Songs, see page 33.)

3 Start the selected Song.

Press the **START/STOP** button.

NOTE

- You can play along with the Song using the currently selected Voice, or even select a different Voice for playing along. Simply select MAIN VOICE in the Main Menu while the Song is playing back and select the desired Voice.
- Pressing the VOICE or STYLE button during Song playback selects the VOICE or STYLE menu but does not change the mode; the Song mode is still active.

4 If you want to change to another Song, repeat step 2 above.

5 Stop the Song.

Press the **START/STOP** button. If playback was started by pressing the **START/STOP** button, the selected Song stops automatically at the end.

NOTE

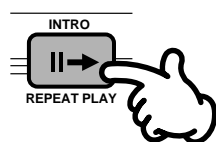
- If you start Song playback with the DEMO button, all Songs play back repeatedly in succession (starting with Song #01), indefinitely.

Using the Repeat Play Function

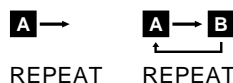
The Repeat Play function in the Song mode lets you continuously repeat playback of any portion of a Song. This comes in particularly handy when practicing a Song with the Minus One and/or Guide (PSR-230 only) functions. For example, you could have the verse portion of a Song repeatedly play back while you practice with it.

While the Song is playing, press the REPEAT PLAY button twice — once to set the beginning point for the repeat and a second time to set the end point.

Press the **REPEAT PLAY** button once at the beginning of the section to be repeated (the REPEAT "A" indication lights), and a second time at the end of the section (the REPEAT "B" indication lights).



REPEAT PLAY button



**REPEAT PLAY "A" and
REPEAT PLAY "A-B" indicators**

As soon as the end point (B) has been selected, the specified section begins playing back repeatedly. To stop playback, press the **START/STOP** button. You can use **START/STOP** to alternately start and stop Repeat Play of the specified section. To cancel Repeat Play at any time, press the **REPEAT PLAY** button again.

NOTE

- When only the A point is set, playback repeats from the A point to the end of the Song.
- Repeat playback is per measure.
- The end point (B) tempo or your manually adjusted tempo will be used during Repeat playback.

Using the Guide Function (PSR-230 only)

The Guide function in the Song mode serves as an automatic music “tutor,” showing you which notes to play on the keyboard. It even waits for you to play each note, before going on to the next. This lets you learn to play the Songs of the Song mode at your own pace, and makes practicing the Songs extremely natural (and fun!).

1 Select a Song.

Press the **SONG** button to enter the Song mode, then use the numeric keypad to select the desired Song.

2 Select the desired “guided” part.

The Guide function lets you choose which part of a Song is to be guided. For example, you can select the right-hand melody part to be guided — in which case, the guide lamps will light to help you play the right-hand melody part. Or, you could select the left-hand chord backing part.

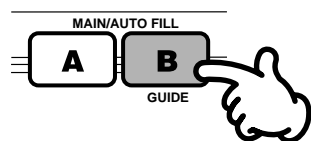
With “MinusMod” selected in the Song menu, select the desired Minus One Part (guided part setting). (See page 32.)

NOTE

- The Minus One Part parameter in the Song menu can be directly selected (in Song mode only) by pressing and holding the **GUIDE** button.

3 Press the **GUIDE** button.

The **GUIDE** icon appears in the display, indicating that the Guide function is on.



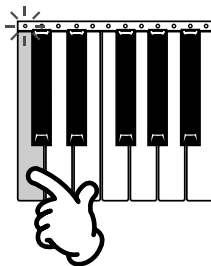
GUIDE button



GUIDE icon in display

4 Start playback.

When you press the **START/STOP** button to begin playback, the Song introduction will automatically play up to the first note(s) of the main section of the Song, and pause until you play the next note(s). The notes to be played are indicated by the Guide lamps above each key (red for the white keys and green for the black). As you play each correct note, Song playback will continue, pausing until you play the correct notes each time.



5 If desired, turn on the Minus One function to mute the guided part.

Normally, the guided part also plays back along with your performance. You can mute this part, however, and play the guided part yourself. To do this, press the **MINUS ONE** button. (The Minus One icon appears in the display.)

Song playback stops automatically when the end is reached. To stop the Song manually, press the **START/STOP** button.

NOTE

• Turning off the Guide lamps

If you find the Guide lamps distracting or wish to play the part without them, use the Lamp parameter in the REVERB/OTHERS Menu (page 19) to turn the Guide lamps off. (Keep in mind that this doesn't turn off the Guide function, but only the lamps.)

Using the Minus One Function

Minus One, as its name implies, takes away (or mutes) a part of the Song, allowing you to play that part yourself. You can turn Minus One on before starting a Song, or do it even while a Song is playing.

1 Select a Song.

2 Select the part of the Song you wish to mute.

Minus One lets you choose which part of a Song is to be muted. For example, you can mute the right-hand melody part and play it yourself, or do the same for the left-hand chord backing part.

With “MinusMod” selected in the Song menu, select the desired Minus One Part setting: left-hand, right-hand, or both. (See page 32.)

NOTE

- The Minus One Part parameter in the Song menu can be directly selected (in Song mode only) by pressing and holding the GUIDE button (PSR-230).

Selecting individual channels for Minus One

Each Song actually has more than just one right-hand and one left-hand part. For example, one Song may be made up of a melody, a harmony, chord backing, pad, and rhythm parts — each on a different channel. Also, the right-hand and left-hand parts have different channels. Minus One lets you specify which channel you wish to mute, for both the right-hand and left-hand parts.

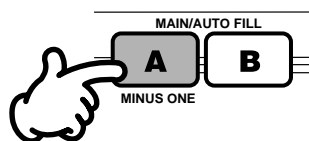
With “MinusChR” or “MinusChL” selected in the Song menu, select an individual channel for the Minus One right-hand and left-hand parts. Also, set the desired Minus One Part setting: left-hand, right-hand, or both. (See “SONG Sub Menu” chart below.)

NOTE

- The “MinusChR” parameter in the Song menu can be directly selected (in Song mode only) by pressing and holding the MINUS ONE button.
- If the selected Song contains Minus One right- and left-hand channel settings, the channel for the corresponding parts will be automatically selected. (A “--” indication appears in the display.)

3 Turn on the Minus One function.

Press the **MINUS ONE** button. (The Minus One icon appears in the display.)



MINUS ONE button



MINUS ONE icon in display

4 Start playback.

Play the appropriate part along with the Song. Song playback stops automatically when the end is reached. To stop the Song manually, press the **START/STOP** button.

SONG Sub Menu

First, use the **MAIN MENU** buttons to select the Song menu, and select the desired Sub Menu parameter with the **SUB MENU** buttons. Then, use the numeric keypad or +/- buttons to change the setting.

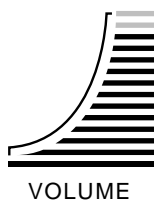
Parameter Name	Display Name	Range	Description
Song Name	—	01 - 20	This determines the Song to be played (or edited). Songs 01 - 16 are the Demo songs, and Songs 17 - 20 are User Songs (for use with Easy Chord Memory). Music Cartridge Songs can be selected by pressing the CARTRIDGE button (PSR-230 only). (See page 37)
Minus One Part	MinusMod	L, r, L_r	This determines which part of the Song is to be turned off for the Minus One function: the left-hand (L), the right-hand (r), or both (L_r). It also determines which part is used with the Guide function (page 30). The default Minus One Part is "r."
Minus One Right Hand Channel	MinusChR	01 - 16	This determines the channel of the right-hand part which is to be muted with the Minus One function. To reset to the default channel (01), press the +/- buttons simultaneously.
Minus One Left Hand Channel	MinusChL	01 - 16	This determines the channel of the left-hand part which is to be muted with the Minus One function. To reset to the default channel (02), press the +/- buttons simultaneously.

Song Volume

The Song Volume can be adjusted separately from the main instrument volume. This is particularly useful when using Minus One, since it lets you control the balance between the Song and the Voice you play on the keyboard. To change the Song Volume, use the **VOLUME** buttons in the song mode.



Press **VOLUME** (up arrow) to increase the song volume and **VOLUME** (down arrow) to decrease it; holding down the appropriate button continuously increases/decreases the song volume. The level is shown in the display.

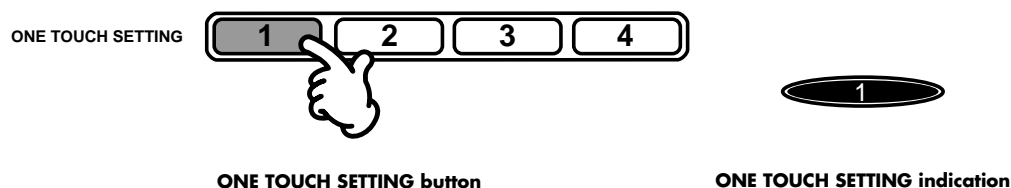


To reset the Song Volume to its original default setting, press both **VOLUME** buttons simultaneously.

One Touch Setting in the Song Mode

The One Touch Setting function is convenient when used with the Minus One function, and lets you automatically select an appropriate Voice for playing the Minus One Part along with the Song you select. Also, if you've specified Minus One channels (see page 32), One Touch Setting automatically selects appropriate Voices for those channels.

To turn on One Touch Setting, press one of the **ONE TOUCH SETTING** buttons (1 - 4) in the song mode. (The selected One Touch Setting is indicated in the display.)



To turn the function off, press the same button again.

NOTE

- Keep in mind that even with the One Touch Setting function on, there are some Songs which change the selected Voice in the middle of the Song.
- For some Music Cartridge Songs, use of One Touch Setting will call up the piano Voice regardless of the Minus One Channel settings (PSR-230 only).

Recording User Songs — Easy Chord Memory

The Easy Chord Memory feature lets you record your own chord progressions (or chord “sequences”) and create automatic backing tracks for your original songs. Once you've recorded and saved your own chord sequences (to User Songs 17 - 20), you can perform along with them — playing the melody part, for example, over the custom backing tracks.

You can record Songs in two different ways: Real-time and Step. Real-time recording lets you play the chord changes normally as the rhythm accompaniment plays back, while Step recording lets you manually enter each chord at specific positions in the Song. (Each beat can have a different chord.) Generally, Real-time recording is the basic recording method, while Step recording is used to edit Songs already recorded in real time.

Easy Chord Memory has a capacity up to about 120 measures (total for all four User Songs, in 4/4 time).

Easy Chord Memory records the following data to User Songs (17 - 20):

- Chord changes and timing (per beat)
- Style number* (incl. Cartridge Styles; PSR-230 only)
- Section changes (Fill-ins: per beat; others: per measure)
- Accompaniment Volume setting*
- Tempo setting*
- Large/Small setting*

* Recorded only at the beginning of a Song; changes cannot be made during recording.

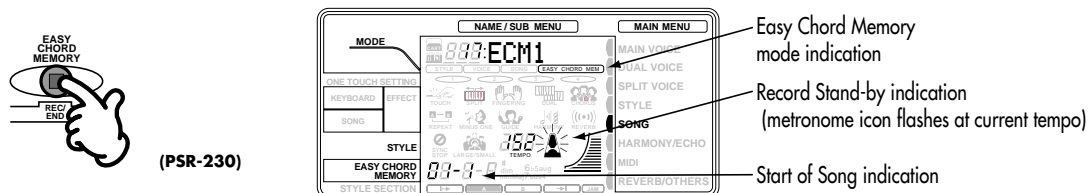
NOTE

- Section changes cannot be entered in Step recording.
- Material recorded in Easy Chord Memory is retained in memory even when power is turned off — as long as an AC adaptor is connected or a set of batteries is installed. However, if the batteries fail and the AC adaptor is disconnected, the recorded data will be lost.

Real-time Recording

In Real-time recording, you can record chord changes for a Song by simply playing them along with the rhythm.

- 1 Select a User Song number.**
Select one of the User Song numbers 17 - 20. (See page 28.)
- 2 Select a Style and set other parameters, if desired.**
Select a Style. (See page 20.) Also, make settings for Accompaniment Volume, Tempo, and Large/Small, if desired.
- 3 Enter the Easy Chord Memory mode.**
Press the **EASY CHORD MEMORY (REC/END)** button.



NOTE

- If you press the EASY CHORD MEMORY (REC/END) button when a non-User Song number has been selected, an "empty" User Song number (one not containing data) will automatically be selected. If all User Songs contain data, User Song number 17 will be selected.

- 4 Record the chord sequence.**
Recording begins as soon as you play a chord in the Auto Accompaniment section of the keyboard. The recognized chord name appears in the display.



chord indication

NOTE

- If you wish to record only the rhythm, use the Chord Cancel function. (See page 25)

- 5 Stop recording.**
Press the **EASY CHORD MEMORY (REC/END)** button. (The display returns to the beginning of the Song: measure number 01, beat number 1.)

To record an Ending section at the end of the Song, first press the **ENDING** button, then (after the Ending has played back) press the **EASY CHORD MEMORY (REC/END)** button.

Operation automatically returns to the Song mode.

NOTE

- Easy Chord Memory automatically changes to Step Record Ready mode in the following conditions:
 - * When an Ending section has been recorded and the accompaniment is stopped.
 - * When the memory is full. (A "Full" message appears in the display.) In this case, you can use the Song Clear operation (see below) to delete the Song.
 - * When the recording is stopped by pressing the START/STOP button.
- Timing is important when stopping Real-time recording. If you press the START/STOP button before the second beat of the intended final measure, the actual end of the Song will be at the previous measure. However, if you press the button after the second beat, the Song will end properly at that measure.

Step Recording

Step recording allows you to manually enter chord changes to a Song, one by one. As such, it's convenient for editing and making precise changes to an existing Song. In general, use Real-time recording to create a Song, and use Step recording to polish it up and finish it.

1 Enter the Step Record Ready mode.

With the desired Song selected and record stand-by engaged (see Real-time Recording, steps 2 and 3), press the **SYNC-START** button.

NOTE ▶

- You can also enter the Step Record Ready mode by pressing the START/STOP button during Real-time recording.

2 Specify the desired position in the Song.

Use the **MEASURE +/-** and **BEAT +/-** buttons to specify the exact place in the Song to which the desired chord is to be entered. Press the appropriate button to step through the values, or hold down the button to continuously advance or reverse through the values.



3 Enter a chord.

Play a chord in the Auto Accompaniment section of the keyboard. The recognized chord name appears in the display and is entered at the selected measure/beat.

4 Stop recording.

Press the **EASY CHORD MEMORY (REC/END)** button. (Operation automatically returns to the Song mode.)

NOTE ▶

- Section changes cannot be entered in Step recording.
- You can play back the User Song within Step recording by pressing the START/STOP button.

Song Clear

The Song Clear operation lets you delete selected User Song data.

To clear data of a Song:

1 Select the User Song to be cleared.

2 Enter the Easy Chord Memory mode.

Press the **EASY CHORD MEMORY (REC/END)** button. Make sure to disengage recording stand-by by pressing the **SYNC-START** button.

3 Press the SONG CLEAR button.

A “Clear ?” message appears, prompting you for confirmation. Press the **+ / YES** button to clear the selected Song, or press the **- / NO** button to cancel.

NOTE ▶

- Song Clear cannot be executed during Real-time recording and recording stand-by states. Also, Song Clear is available only in Easy Chord Memory mode.

User Song Playback

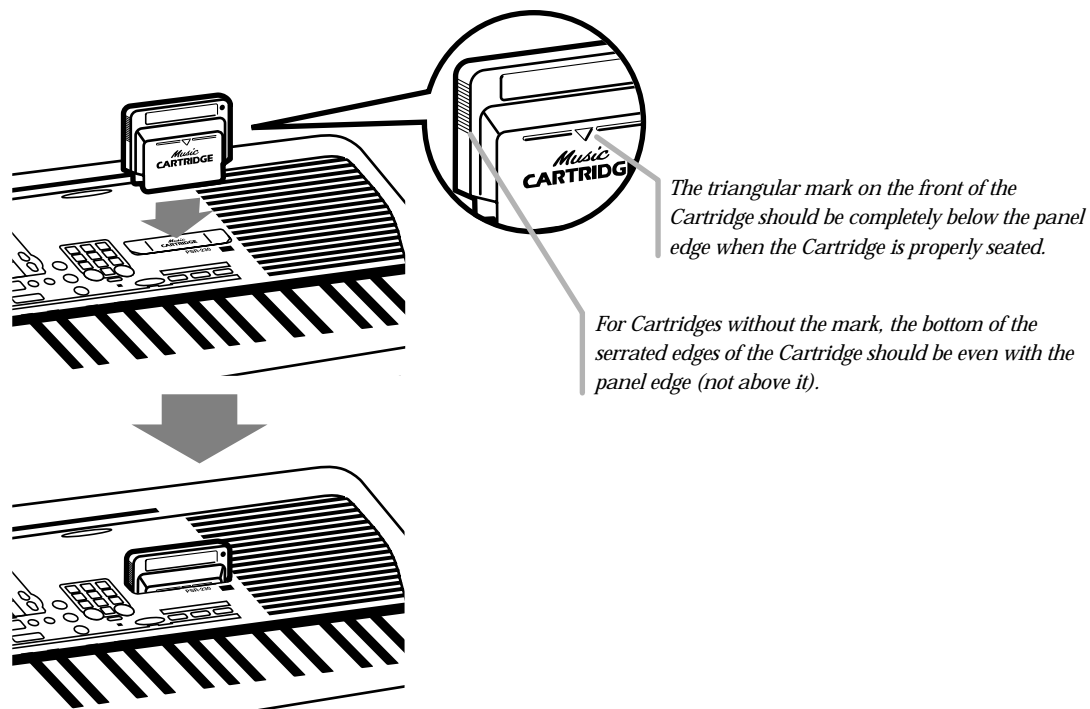
Playback of User Songs is exactly the same as with other Songs. (See page 28.) Remember, that you can play along on the keyboard with your original chord accompaniment — making your performances more dynamic and enjoyable.

Music Cartridge (PSR-230)

The PSR-230 features a cartridge slot for use with special Yamaha Music Cartridges containing accompaniment Style and Song data. These Cartridges give you instant access to an ever-expanding library of new Styles and Songs. The PSR-230 includes a sample Music Cartridge. To obtain other Cartridges, see your Yamaha dealer.

Inserting a Music Cartridge

With the power off, insert the Music Cartridge into the cartridge slot as shown, and press down firmly until the Cartridge is seated properly (as shown in the illustration). The Cartridge is shaped so that it will only fit in the slot one way - don't try to force it in the wrong way. Turn the power back on again after inserting.



Music Cartridge Precautions

- Do not leave Music Cartridges in locations which are subject to excessive heat or humidity.
- Do not drop Music Cartridges or subject them to strong shock.
- Do not disassemble Music Cartridges.
- Do not directly touch the Music Cartridge's electrical contacts. Static electricity can cause loss of data and unreliable operation.
- Do not insert objects or cartridges other than Yamaha Music Cartridges in the cartridge slot. Doing so can result in serious damage to the instrument.
- Do not insert Music Cartridges in other instruments or devices. Doing so can result in serious damage to the Cartridges.
- Never attempt to insert or remove a Music Cartridge when the power is on. Doing so may result in loss of data or unreliable operation.
- Dust or foreign particles on the electrical contacts of the Music Cartridge may prevent proper selection or playback of Cartridge data. If this occurs, insert and remove the Cartridge several times, and try the operation again. If the problem persists, clean the electrical contacts with a soft, dry cloth.

NOTE

- Make sure that the Music Cartridge is properly inserted when playing back a Song based on Cartridge data. Otherwise, the Song may not play back, and a "No Cart" or "WrongCrt" message may appear.

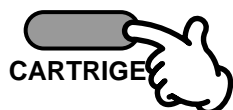
Selecting Styles on a Music Cartridge

1 Select the Style mode.

Press the **STYLE** button. (The Style mode and Style menu are selected.)

2 Select a Style from the Cartridge.

First, press the **CARTRIDGE** button below the numeric keypad. (The Cartridge icon appears at the upper left of the display.) Then, enter the Cartridge Style number directly with the number buttons, or step up and down through the Styles by using the +/- buttons.



CARTRIDGE button



Cartridge icon in display

Cartridge Styles are used in exactly the same way as the internal accompaniment Styles. (See page 20.)

NOTE ▶

- The cartridge styles can be selected by using the +/- buttons to go beyond the highest or lowest internal style numbers —e.g. pressing the + button while internal style number 00 is selected will select cartridge style number 01.
- The cartridge styles have no Jam Track Sections.
- A "No OTS" message appears in the display if the selected Cartridge Styles have no One Touch Setting data.

Selecting Songs on a Music Cartridge

1 Select the Song mode.

Press the **SONG** button. (The Song mode and Song menu are selected.)

2 Select a Song from the Cartridge.

First, press the **CARTRIDGE** button below the numeric keypad. (The Cartridge icon appears at the upper left of the display.) Then, enter the Cartridge Song number directly with the number buttons, or step up and down through the Songs by using the +/- buttons.



CARTRIDGE button



Cartridge icon in display

Cartridge Songs are used in exactly the same way as the internal Songs. (See page 28.)

NOTE ▶

- For Cartridge Songs created with Cartridge accompaniment Styles:
 - * Chord names are indicated in the display as the chords of the Cartridge Song change.
 - * The Harmony effect can be applied when playing along with the chord progression of the Song.
- The Minus One, Repeat Play, and Guide (PSR-230 only) functions can be used with Cartridge Songs.

MIDI Functions

The PortaTone is MIDI-compatible and provides a variety of MIDI-related controls. What is MIDI? MIDI — Musical Instrument Digital Interface — is a worldwide standard that makes it possible for various electronic musical instruments and other devices to “communicate” with each other. For example, you could connect a computer or sequencer to the PortaTone and play back a song on the sequencer using the PortaTone’s Voices.

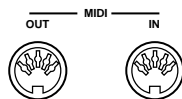
The PortaTone is also compatible with the GM (General MIDI System Level 1) format. One of the most important features of General MIDI is in the standardization of Voices. This means that a song recorded in GM format can be played back on any GM-compatible instrument and sound just as the composer intended. With the GM-compatible PortaTone and a computer or sequencer, you can take advantage of the vast wealth of musical material recorded in that format.

MIDI Basics

MIDI is a huge, complex subject, and it would be impossible to cover all its aspects here. However, this short section will introduce you to some MIDI basics, and help you use this powerful tool in your own system.

MIDI Terminals

The MIDI terminals are located on the rear panel of the PortaTone. MIDI IN receives MIDI data from an external device, and MIDI OUT transmits MIDI data from the PortaTone — which includes, for example, performance data when you play the keyboard.



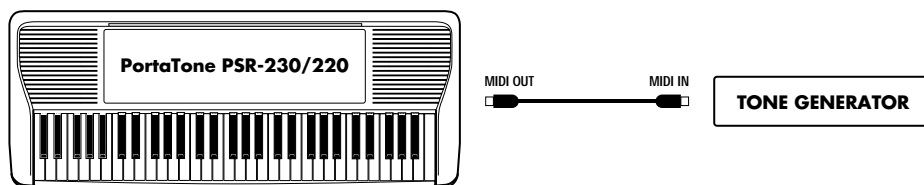
MIDI Channels

MIDI data is usually sent and received over one of sixteen MIDI channels. In order to get two devices to properly communicate with each other, you should set them to the same MIDI channel. On the PortaTone, the relevant parameters are Keyboard Out and Receive Channel Select in the MIDI Sub Menu (page 40).

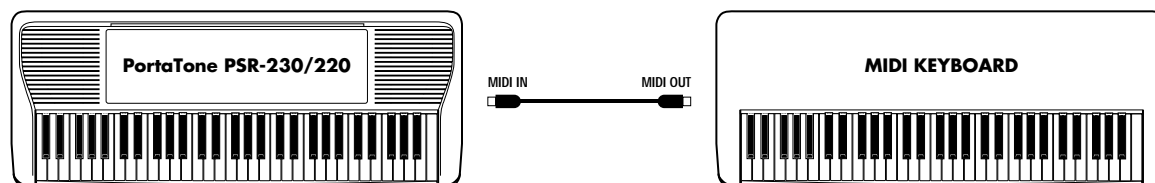
You can also use the PortaTone as a sixteen-channel multi-timbral sound source. This means that you can play song data on a connected MIDI sequencer (see “Using with a Computer or Sequencer” below) and have up to sixteen different instrument Voices sound simultaneously. To do this, make sure that the MIDI Receive Switch is set to “on” (see MIDI Sub Menu page 40), and set Remote Channel (also MIDI Sub Menu) to “off.”

Using with a MIDI Tone Generator or Second Keyboard

In the simple MIDI connection shown below, the PortaTone is used to play sounds on a tone generator (essentially a synthesizer without a keyboard). This lets you play both instruments at once, giving you thick multi-instrument sounds. Depending on how the other device is set up, this system also lets you change sounds on the tone generator from the PortaTone's panel (via program change messages).

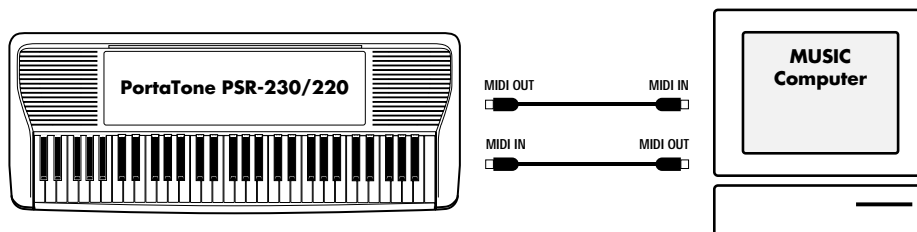


In a similar example, the PortaTone is connected to a second MIDI keyboard. This allows you to play and control the PortaTone from the other keyboard. In this application, first make sure that the MIDI Receive Switch is set to "on" (see MIDI Sub Menu below), then set the Remote Channel (also MIDI Sub Menu below) and the MIDI Send Channel on the other keyboard to the same value.



Using with a Computer or Sequencer

If you have a sequencer or a computer with a MIDI interface, you can easily and instantly integrate the PortaTone into your system. And with its GM-compatibility, the PortaTone is a natural for multimedia/computer music applications, letting you playback any GM song data with the high-quality Voices.



NOTE

- To avoid a MIDI feedback loop, check that the MIDI Thru (or MIDI Echo) setting on the external device and the Local Control setting on the PortaTone are set appropriately. If both are set to ON, MIDI feedback may occur.

MIDI Sub Menu

First, use the **MAIN MENU** buttons to select the MIDI menu, and select the desired Sub Menu parameter with the **SUB MENU** buttons. Then, use the numeric keypad or +/- buttons to change the setting.

Parameter Name	Display Name	Range	Description
Remote Channel	RemoteCh	off, 01 - 16	This determines how the PortaTone is controlled by a "remote" (external) MIDI keyboard. Set this to one of the 16 channels (01 - 16) for using an external keyboard to remotely control the PortaTone functions over the selected channel. (The remaining 15 channels can be used for multi-timbral operation.) When this is set to "off," the PortaTone can be used as a full 16-channel multi-timbral sound source. The default setting is "off."
Keyboard Out	KeybdOut	off, 01 - 16	This determines over which channel keyboard data for the Main Voice is transmitted. The default setting is channel 01.
Accompaniment Out	AcompOut	on/off	This determines whether Auto Accompaniment data is transmitted via MIDI OUT or not. When set to "on," Auto Accompaniment data is transmitted over channels 3 - 10. The default setting is "off."
Receive Channel Select	RcvChSel	01-16	This determines over which channel MIDI data is received. The default setting is channel 01 .
Receive Switch	Rcv SW	on/off	This determines whether MIDI data is received over the selected MIDI channel or not, set in Receive Channel Select above. (This parameter works in tandem with Receive Channel Select.)
Local Control	Local	on/off	This determines whether the keyboard is "connected" to the internal Voices of the PortaTone. When set to "on," the Voices respond to notes played from the keyboard. When set to "off," the Voices respond only to incoming MIDI data (via MIDI IN). The default setting is "on." If you are routing the MIDI OUT on the PortaTone to a sequencer and back to the MIDI IN, you may want to set this to "off" to avoid MIDI "feedback."
External Clock	ExtClock	on/off	This determines whether the Style and Song playback functions are controlled by the PortaTone's internal clock (off) or by MIDI clock data from an external sequencer or computer (on). This should be set to "on" when you want to have Style or Song playback follow the external device. The default setting is "off."

NOTE

- Whenever using a MIDI device to control the PortaTone, make sure that the Receive Switch is set to "on" for the appropriate channel or channels.
- For the Keyboard Out parameter, performance data of the Main Voice can be sent over the specified MIDI channel, but the other Voices are fixed as follows:
 - Dual Voice — channel 11
 - Split Voice — channel 2
 - Auto Accompaniment — channels 3 - 10
- To reset any parameter to its default setting, press the +/- buttons simultaneously.
- All settings in the MIDI Sub Menu are retained in memory when the power is turned off, as long as batteries are installed or an AC adaptor is connected.
- In the Song or Easy Chord Memory mode, MIDI data cannot be transmitted or received, and none of the MIDI menu settings have any effect.

Appendix

Data Backup and Initialization

Except for the settings listed below, all PortaTone panel settings are reset to their initial settings whenever the power is turned on. The parameter settings listed below are retained in memory as long as an AC adaptor is connected or a set of “live” batteries is installed.

- Touch Response on/off
- Touch Sensitivity
- Fingering mode
- Split Points 1 and 2, Auto Accompaniment Split Point
- Easy Chord Memory (User Song)
- All MIDI Sub Menu settings
- Tuning
- Voice Set on/off
- Guide Lamp on/off (PSR-230 only)
- Metronome on/off

Initialize Operation

All data can be initialized and restored to the factory preset condition by simultaneously holding the +\ buttons and turning on the power. (A “C1r All!” message appears briefly in the display.)

NOTE ▶

- If operation of the PortaTone “hangs up” or “freezes” due to static electricity or other causes, turn the power off and execute the Initialize operation.

Voice List

Voice Polyphony

The PortaTone has a maximum polyphony of 28 — in other words, it can play up to 28 individual notes at the same time. This includes all Voices used: Dual, Split, Auto Accompaniment, and Song. If the maximum polyphony is exceeded, some notes and sounds may be cut off.

Another feature affecting polyphony is the fact that some Voices are actually made up of two Voices (as indicated in the list below). Using these Voices correspondingly reduces the available polyphony.

Panel Voice List

Voice Number	MIDI			Voice Name	Number of Notes Used
	Bank Select		*Program Number		
	MSB	LSB			
PIANO					
01	0	0	0	Grand Piano	1
02	0	0	1	Honky-tonk Piano	2
03	0	0	2	Funky Electric Piano	2
04	0	0	3	DX Electric Piano	2
05	0	0	4	MIDI Grand Piano	2
06	0	0	5	Hyper Electric Piano	2
07	0	0	6	Bell Electric Piano	2
08	0	0	7	Harpsichord	1
09	0	0	8	Harpsichord Coupled	2
10	0	0	9	Clavi	1
11	0	0	10	Celesta	1
MALLETS					
12	0	0	11	Vibraphone	1
13	0	0	12	Marimba	1
14	0	0	13	Xylophone	1
15	0	0	14	Tubular Bells	1
16	0	0	15	Timpani	1
17	0	0	16	Steel Drums	2
18	0	0	17	Music Box	2
ORGAN					
19	0	0	18	Jazz Organ 1	2
20	0	0	19	Jazz Organ 2	2
21	0	0	20	Jazz Organ 3	2
22	0	0	21	Full Organ	2
23	0	0	22	Rock Organ 1	2
24	0	0	23	Rock Organ 2	2
25	0	0	24	16'+2' Organ	2
26	0	0	25	16'+4' Organ	2
27	0	0	26	Church Organ	2
28	0	0	27	Reed Organ	2
29	0	0	28	Musette Accordion	2
30	0	0	29	Traditional Accordion	2
31	0	0	30	Bandoneon	2
GUITAR					
32	0	0	31	Classical Guitar	1
33	0	0	32	Folk Guitar	1
34	0	0	33	12Strings Guitar	2
35	0	0	34	Jazz Guitar	2
36	0	0	35	Octave Guitar	2
37	0	0	36	Clean Guitar	2
38	0	0	37	Muted Guitar	1
39	0	0	38	Overdriven Guitar	2
40	0	0	39	Distortion Guitar	2
BASS					
41	0	0	40	Acoustic Bass	1
42	0	0	41	Finger Bass	1
43	0	0	42	Fretless Bass	1
44	0	0	43	Slap Bass	1
45	0	0	44	Synth Bass	2
ENSEMBLE					
46	0	0	45	Strings	2
47	0	0	46	Chamber Strings	2
48	0	0	47	Synth Strings	2
49	0	0	48	Slow Strings	2
50	0	0	49	Tremolo Strings	2
51	0	0	50	Violin+Strings	2
52	0	0	51	Pizzicato Strings	1
53	0	0	52	Choir	2
54	0	0	53	Choir Aahs	2
55	0	0	54	Choir Oohs	2
56	0	0	55	Synth Choir	2
57	0	0	56	Orchestra Hit	2

Voice Number	MIDI			Voice Name	Number of Notes Used
	Bank Select		*Program Number		
	MSB	LSB			
STRINGS					
58	0	0	57	Violin	1
59	0	0	58	Cello	1
60	0	0	59	Contrabass	1
61	0	0	60	Harp	2
BRASS					
62	0	0	61	Trumpet	1
63	0	0	62	Muted Trumpet	1
64	0	0	63	Trombone	1
65	0	0	64	Trombone Section	2
66	0	0	65	French Horn	1
67	0	0	66	Tuba	1
68	0	0	67	Brass Section	2
69	0	0	68	Brass+Sax	2
70	0	0	69	Brass+Trombone	2
71	0	0	70	Brass+Trumpet	2
72	0	0	71	Synth Brass	2
REED					
73	0	0	72	Soprano Sax	1
74	0	0	73	Alto Sax	1
75	0	0	74	Tenor Sax	1
76	0	0	75	Baritone Sax	1
77	0	0	76	Sax+Clarinet	2
78	0	0	77	Sax+Trombone	2
79	0	0	78	Oboe	1
80	0	0	79	English Horn	1
81	0	0	80	Bassoon	1
82	0	0	81	Clarinet	1
83	0	0	82	Harmonica	1
PIPE					
84	0	0	83	Piccolo	1
85	0	0	84	Flute	1
86	0	0	85	Pan Flute	1
87	0	0	86	Recorder	1
88	0	0	87	Ocarina	1
SYNTH LEAD					
89	0	0	88	Square Lead	2
90	0	0	89	Sawtooth Lead	2
91	0	0	90	Voice Lead	2
92	0	0	91	Crystal	2
93	0	0	92	Brightness	2
94	0	0	93	Analog Lead	2
SYNTH PAD					
95	0	0	94	Fantasia	2
96	0	0	95	Bell Pad	2
97	0	0	96	Xenon Pad	2
98	0	0	97	Angels	2
99	0	0	98	Dark Moon	2
DRUM KIT					
00	0	0	99	Drum Kit	1

* The MIDI Program Number column indicates the numbers that are used to select the corresponding voices from an external MIDI device.

GM Voice List

Voice Number	MIDI			Voice Name	Number of Notes Used
	Bank Select		*Program Number		
	MSB	LSB			
Piano					
001	0	0	0	Acoustic Grand Piano	1
002	0	0	1	Bright Acoustic Piano	1
003	0	0	2	Electric Grand Piano	2
004	0	0	3	Honky-tonk Piano	2
005	0	0	4	Electric Piano 1	2
006	0	0	5	Electric Piano 2	2
007	0	0	6	Harpsichord	1
008	0	0	7	Clavi	1
Chromatic Percussion					
009	0	0	8	Celesta	1
010	0	0	9	Glockenspiel	1
011	0	0	10	Music Box	2
012	0	0	11	Vibraphone	1
013	0	0	12	Marimba	1
014	0	0	13	Xylophone	1
015	0	0	14	Tubular Bells	1
016	0	0	15	Dulcimer	2
Organ					
017	0	0	16	Drawbar Organ	2
018	0	0	17	Percussive Organ	2
019	0	0	18	Rock Organ	2
020	0	0	19	Church Organ	2
021	0	0	20	Reed Organ	1
022	0	0	21	Accordion	2
023	0	0	22	Harmonica	1
024	0	0	23	Bandoneon	2
Guitar					
025	0	0	24	Acoustic Guitar (nylon)	1
026	0	0	25	Acoustic Guitar (steel)	1
027	0	0	26	Electric Guitar (jazz)	1
028	0	0	27	Electric Guitar (clean)	2
029	0	0	28	Electric Guitar (muted)	1
030	0	0	29	Overdriven Guitar	1
031	0	0	30	Distortion Guitar	1
032	0	0	31	Guitar Harmonics	1
Bass					
033	0	0	32	Acoustic Bass	1
034	0	0	33	Electric Bass (finger)	1
035	0	0	34	Electric Bass (pick)	1
036	0	0	35	Fretless Bass	1
037	0	0	36	Slap Bass 1	1
038	0	0	37	Slap Bass 2	1
039	0	0	38	Synth Bass 1	1
040	0	0	39	Synth Bass 2	1
Strings					
041	0	0	40	Violin	1
042	0	0	41	Viola	1
043	0	0	42	Cello	1
044	0	0	43	Contrabass	1
045	0	0	44	Tremolo Strings	2
046	0	0	45	Pizzicato Strings	2
047	0	0	46	Orchestral Harp	1
048	0	0	47	Timpani	1
Ensemble					
049	0	0	48	Strings Ensemble 1	1
050	0	0	49	Strings Ensemble 2	1
051	0	0	50	Synth Strings 1	2
052	0	0	51	Synth Strings 2	2
053	0	0	52	Choir Aahs	1
054	0	0	53	Voice Oohs	1
055	0	0	54	Synth Voice	1
056	0	0	55	Orchestra Hit	1
Brass					
057	0	0	56	Trumpet	1
058	0	0	57	Trombone	1
059	0	0	58	Tuba	1
060	0	0	59	Muted Trumpet	1
061	0	0	60	French Horn	1
062	0	0	61	Brass Section	1
063	0	0	62	Synth Brass 1	2
064	0	0	63	Synth Brass 2	2
Reed					
065	0	0	64	Soprano Sax	1
066	0	0	65	Alto Sax	1
067	0	0	66	Tenor Sax	1
068	0	0	67	Baritone Sax	1
069	0	0	68	Oboe	1
070	0	0	69	English Horn	1
071	0	0	70	Bassoon	1
072	0	0	71	Clarinet	1
Pipe					
073	0	0	72	Piccolo	1
074	0	0	73	Flute	1
075	0	0	74	Recorder	1
076	0	0	75	Pan Flute	1
077	0	0	76	Blown Bottle	2
078	0	0	77	Shakuhachi	1
079	0	0	78	Whistle	1
080	0	0	79	Ocarina	1
Synth Lead					
081	0	0	80	Lead 1 (square)	2
082	0	0	81	Lead 2 (sawtooth)	2
083	0	0	82	Lead 3 (calliope)	2
084	0	0	83	Lead 4 (chiff)	2
085	0	0	84	Lead 5 (charang)	2
086	0	0	85	Lead 6 (voice)	2
087	0	0	86	Lead 7 (fifth)	2
088	0	0	87	Lead 8 (bass+Lead)	2
Synth Pad					
089	0	0	88	Pad 1 (new age)	2
090	0	0	89	Pad 2 (warm)	2
091	0	0	90	Pad 3 (polysynth)	2
092	0	0	91	Pad 4 (choir)	2
093	0	0	92	Pad 5 (bowed)	2
094	0	0	93	Pad 6 (metallic)	2
095	0	0	94	Pad 7 (halo)	2
096	0	0	95	Pad 8 (sweep)	2
Synth Effects					
097	0	0	96	FX 1 (rain)	2
098	0	0	97	FX 2 (soundtrack)	2
099	0	0	98	FX 3 (crystal)	2
100	0	0	99	FX 4 (atmosphere)	2
101	0	0	100	FX 5 (brightness)	2
102	0	0	101	FX 6 (goblins)	2
103	0	0	102	FX 7 (echoes)	2
104	0	0	103	FX 8 (sci-fi)	2
Ethnic					
105	0	0	104	Sitar	1
106	0	0	105	Banjo	1
107	0	0	106	Shamisen	1
108	0	0	107	Koto	1
109	0	0	108	Kalimba	1
110	0	0	109	Bagpipe	2
111	0	0	110	Fiddle	1
112	0	0	111	Shanai	1
Percussive					
113	0	0	112	Tinkle Bell	2
114	0	0	113	Agogo	1
115	0	0	114	Steel Drums	2
116	0	0	115	Woodblock	1
117	0	0	116	Taiko Drum	1
118	0	0	117	Melodic Tom	1
119	0	0	118	Synth Drum	1
120	0	0	119	Reverse Cymbal	1
Sound Effects					
121	0	0	120	Guitar Fret Noise	1
122	0	0	121	Breath Noise	1
123	0	0	122	Seashore	2
124	0	0	123	Bird Tweet	2
125	0	0	124	Telephone Ring	1
126	0	0	125	Helicopter	2
127	0	0	126	Applause	2
128	0	0	127	Gunshot	1
Percussion Kit					
129	127	0	0	Standard Kit	1

* The MIDI Program Number column indicates the numbers that are used to select the corresponding voices from an external MIDI device.

* The following voices use only one voice in the indicated ranges : 46 (Pizzicato Strings) : all notes below C#2 and above F5, 110 (Bagpipe) : all notes above A#2.

Troubleshooting

Problem	Possible Cause and Solution
When the PortaTone is turned on or off, a buzzing or popping sound is temporarily produced.	This is normal and indicates that the PortaTone is receiving electrical power.
The sound of the Voices or rhythms seems unusual or strange. The display has gone out and the panel settings have been returned to default.	The battery power is too low. Replace all batteries with new ones of the same type. (See page 3.)
Not all notes are heard when playing a number of notes simultaneously.	Too many keys are pressed at the same time. The PortaTone is polyphonic up to a maximum of 28 notes. (See page 42.)
There is no sound when the keyboard is played.	The Local Control setting could be off. Make sure Local Control is turned on. (See page 40.)
The Auto Accompaniment does not function properly. Chords played in the lower section of the keyboard do not sound or sound different than expected.	Make sure that you're playing in the Auto Accompaniment section of the keyboard. (See page 22.) Also, make sure that you're using the proper Fingering mode and that you're playing "legal" chords that the PortaTone can recognize. For example, when playing Single Finger chords, make sure that the Single Finger mode is selected. (See page 26.)
There is no sound even when the keyboard is played or when a Song is being played back.	Check that nothing is connected to the PHONES/AUX OUT jack on the rear panel. When a set of headphones is plugged into this jack, no sound is output.
The selected Voice does not sound properly.	Make sure that the following settings are appropriate: Main Voice Volume (page 11), Dual Voice Volume (page 13), and Split Voice Volume (page 15)
The selected Accompaniment Style or Song does not sound properly.	Make sure that the Accompaniment Volume or Song Volume is set to an appropriate level. (See pages 23, 32.)
Split Point 2 cannot be entered, or the Accompaniment Split Point cannot be entered.	Split Point 2 (page 15) cannot be set lower than the Accompaniment Split Point (page 26). Also, the Accompaniment Split Point cannot be set higher than Split Point 2.
The footswitch operation is reversed; releasing the footswitch causes sustain.	Connecting the footswitch after power is on reverses the footswitch operation (polarity). For normal operation, turn off the power, connect the footswitch, then turn the power back on (without pressing the footswitch).
Cartridge data cannot be selected or properly played back.	Make sure that an appropriate Yamaha Music Cartridge is properly inserted into the Cartridge slot. Also, make sure that the electrical contacts on the Cartridge are clean and free from foreign particles. Insert and remove the Cartridge several times, and try the operation again. If the problem persists, clean the contacts with a soft, dry cloth.
The Harmony effect cannot be heard properly.	Make sure that the Harmony Volume is set to an appropriate level. (See page 17.)
The Harmony or Echo effect cannot be used.	Harmony/Echo is not available when the Full Fingering mode (page 26) is on, and will automatically be turned off when the Full Fingering mode is selected.
The PortaTone does not respond to or work with a connected MIDI device.	Whenever using a MIDI device to control the PortaTone, make sure that the Receive Switch is set to "on" for the appropriate channel or channels. (See page 40.)
MIDI data cannot be transmitted or received.	When the Song or Easy Chord Memory mode is selected, MIDI data cannot be transmitted or received, and none of the MIDI menu settings have any effect. Select another mode (Voice or Style).
The mode cannot be changed.	While a Song or Rhythm/Accompaniment are being played back, the mode cannot be changed. Stop the Song or Rhythm/Accompaniment and press the VOICE, STYLE, SONG, or EASY CHORD MEMORY (REC/END) button.

Index

A

AC power adaptor 3
Accompaniment Out 40
Accompaniment Split Point 26
Accompaniment Volume 9, 23
Auto Accompaniment 20

B

batteries 3

C

Cartridge 9, 36
Chorus 16

D

data backup 41
data initialization 41
Demo 5
Demo Songs 5
Dual Voice GM Voice 13
Dual Voice menu 13
Dual Voice mode 12
Dual Voice Octave 13
Dual Voice Pan 13
Dual Voice Reverb Level 13
Dual Voice Volume 13

E

Easy Chord Memory 8, 33
Echo Speed 17
Effect controls 9
Ending section 24
External Clock 40

F

Fill-in section 22
Fingered 25
Fingering modes 24
Full (Fingering mode) 26

G

GM Voice, Dual Voice 13
GM Voice, Main Voice 11
GM Voice, Split Voice 15
Guide Lamps (PSR-230 only) 30

H

Harmony Volume 17
Harmony/Echo 16
Harmony/Echo type 16
Harmony/Echo menu 17
headphones 4

I

Intro section 21

J

Jam Track section 23

K

Keyboard controls 8
Keyboard Out 40

L

Large/Small 23
Local Control 40

M

Main A and B sections 21, 22
Main Voice GM Voice 11
Main Voice menu 11
Main Voice Octave 11
Main Voice Pan 11
Main Voice Reverb Level 11
Main Voice Volume 11
Metronome 19, 21
MIDI 38
MIDI Implementation Chart 46
MIDI menu 40
Minus One 31
Minus One Channel
Settings (Left, Right) 31, 32
Minus One Part Setting 31, 32
Music Cartridge (PSR-230 only) 36
Music Stand 4

N

numeric keypad 10

O

Octave, Dual Voice 13
Octave, Main Voice 11
Octave, Split Voice 15
One Touch Setting, Song 33
One Touch Setting, Style 27

P

Pan, Dual Voice 13
Pan, Main Voice 11
Pan, Split Voice 15
Percussion Kit Voice 12
PHONES/AUX OUT 4
Power switch 5

R

Real-time recording 34
REC/END (Easy Chord Memory) 34
Receive Channel Select 40
Receive Switch 40
Recording, Real-time 34
Recording, Step 35
Remote Channel 40
Repeat Play 29
Reverb 18
Reverb Level, Dual Voice 13
Reverb Level, Main Voice 11
Reverb Level, Split Voice 15
Reverb Type 19
Reverb/Others menu 19

S

sections 9, 22
Single Finger 26
Song Clear 35
Song menu 32
Song Volume 9, 32
Songs, Demo 5
Songs, selecting 28
Songs, User 33
Split Point 1, 2 15
Split Voice GM Voice 15
Split Voice menu 15
Split Voice mode 14
Split Voice Octave 15
Split Voice Pan 15
Split Voice Reverb Level 15
Split Voice Volume 15
Start/Stop 21, 24, 29
Step recording 35
Stopped Accompaniment function 22
Style menu 26
Style mode 20
Styles, selecting 20
Sustain 4
Sync-Stop 24
Synchro Start 21

T

Tempo 22
Touch Response 18
Touch Sensitivity 19
Transpose 19
Troubleshooting 44
Tuning 19

U

User Songs 33

V

Voice List 42
Voice Polyphony 42
Voice Set 19
Voices, selecting 10
Volume control 5
Volume, Accompaniment 9, 23
Volume, Dual Voice 13
Volume, Main Voice 11
Volume, Song 9, 32
Volume, Split Voice 15

MIDI Implementation Chart / Implementierungstable

YAMAHA [Portable Keyboard]
Model : PSR-220 / 230

Date: 14-Feb-1996
Version: 1.0

Function		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1 - 16 1 - 16	1 - 16 (*0) 1 - 16 (*0)	
Mode	Default Messages Altered	Mode 3 × * * * * *	(*0) × ×	
Note Number	: True voice	0 - 127 * * * * *	0 - 127 0 - 127	
Velocity	Note on Note off	○ 9nH, v = 1 - 127 × 9nH, v = 0	○ 9nH, v = 1 - 127 × 9nH, v = 0 or 8nH	
After Touch	Key's Ch's	× ×	× ×	
Pitch Bender		○	○	
Control Change		0,32 ○ (*1) 1 ○ 6,38 ○ 7 ○ 10 ○ 11 ○ 64 ○ 66 × 84 ○ 90 × 91 ○ 96 × 97 × 100, 101 ○ (*2) 120 ○ 121 ○	○ (*1) ○ ○ ○ ○ ○ ○ ○ ○ ○ × ○ ○ ○ ○ ○ ○ (*2) ○ ○ ○ (*3)	Bank select MSB, LSB Modulation depth Data entry MSB, LSB Volume Pan Expression Sustain Sostenuto Portament control Dry send level Reverb depth RPN data increment RPN data decrement RPN LSB, MSB All sound off Reset All Controllers
Program Change	: True number	○ 0 - 127 * * * * *	○ 0 - 127 0 - 127	
System Exclusive		○ (*4)	○ (*4)	
System Common	: Song Position : Song Select : Tune	× × ×	× × ×	
System Real Time	: Clock : Commands	○ ○ (*6)	○ (*5) ○ (*6)	
Aux Messages	: Local On/Off : All Notes Off : Active Sense : Reset	× × ○ ×	× ○ ○ ×	

Mode 1: OMNI ON, POLY
Mode 3: OMNI OFF, POLY

Mode 2: OMNI ON, MONO
Mode 4: OMNI OFF, MONO

○ : Yes
× : No

/ Table d'implémentation / Gráfico de implementación

*0 PSR-220/230 function as 16 MIDI channel multi-timbral tone generator.

The Remote Keyboard channel can be set by the panel settings.

The designated channels on the PSR-220/230 can be controlled by an external device and receive the following data:

- Note Off
- Note On
- Control Change:
 - Bank select MSB, LSB
 - Volume
 - Pan
 - Sustain
 - Reverb depth
 - All sounds off
 - Reset all controllers
- Program Change
- Exclusive (Panel voice / GM voice select)

*1 Bank select transmission: The LSB is fixed at 00H.
Bank select reception: The bank select MSB is used for melody voice and rhythm voice switching.

MSB 00H: Melody voice.
MSB 7FH: Rhythm voice.

The bank select LSB is ignored.
The bank select on the channel 10 is ignored.
No voice change will occur when only a bank select is received.
When a program change is received, the latest bank select value is used.

*2 RPN transmits and receives the following data:

Pitch bend sensitivity: BnH, 64H, 00H, 65H, 00H
Fine tuning: BnH, 64H, 01H, 65H, 00H
Coarse tuning: BnH, 64H, 02H, 65H, 00H
Null: BnH, 64H, 7FH, 65H, 7FH

*3 Reset all controllers.
Pitch bend, modulation, expression, sustain, sostenuto, and registered parameter number are returned to their default values.
Portamento is reset.

*4 Exclusive.

< GM1 System On >

F0H, 7EH, 7FH, 09H, 01H, F7H

All parameters except MIDI Master Tuning are reset to their default values.

< DISK ORCHESTRA ON >

F0H, 43H, 73H, 01H, 14H, F7H

< DISK ORCHESTRA OFF >

F0H, 43H, 73H, 01H, 13H, F7H

< MIDI Master Volume >

F0H, 7FH, 7FH, 04H, 01H, ll, mm, F7H

Allows the volume of all channels to be changed simultaneously (universal system exclusive).

"mm" is used as the MIDI Master Volume value ("ll" is ignored).

The relation between MIDI Master Volume value and the actual volume is the same as the one between control change master volume value and the actual volume.

The default value for "mm" is 7FH.

This value is reset by a GM1 System On message.

< MIDI Master Tuning >

F0H, 43H, 1nH, 27H, 30H, 00H, 00H, mm, ll, cc, F7H

Allows the pitch of all channels to be changed simultaneously.

"mm, ll" is used as the MIDI Master Tuning value, and the actual tuning value is represented as follows:

$$T = M \times 200 / 256 - 100$$

Where T is the actual tuning value in cents. M is decimal value represented by 1-byte using bits 0..3 of "mm" as the MSB and bits 0..3 of "ll" as the LSB.

The default values of "mm" and "ll" are 07H and 0FH, respectively.

"n" and "cc" are also recognized.

This value is not reset by a GM1 System On or Reset All Controllers message.

< Panel Voice >

F0H, 43H, 76H, 1BH, cc, vv, F7H

This message alternately selects Panel voice or GM voice.

cc: MIDI channel

vv: 00 = GM voice mode, 01 = Panel voice mode

*5 Internal / External clock selectable.

*6 Start / Stop message is transmitted.

Start / Stop message is received as a message for "STYLE".

GM System Level 1

The existing MIDI protocol allows performance and other data to be transferred between different instruments, even if they are from different manufacturers. This means, for example, that sequence data that was originally created to control a tone generator from manufacturer A can also be used to control a different tone generator from manufacturer B. Since the voice allocation in different devices from different manufacturers is usually different, however, appropriate program change data must be transmitted to select the right voices.

The General MIDI protocol was developed to minimize confusion and the need for re-programming when playing software created by one MIDI device on another. This has been achieved by defining a standard voice allocation in which the same or similar voices are accessed by the same program change numbers or MIDI channels. The current standard recognized by the International MIDI Association is known as "GM System Level 1." The PSR-230/220 voice allocation complies with the GM System Level 1 standard.

Specifications / Technische Daten / Spécifications / Especificaciones

Keyboard:

61 standard-size keys (C1-C6) with touch response (with Touch Sensitivity parameter).

Display:

Large multi-function display

Voice:

AWM 100 (Panel) / 128 + 1 Percussion Kit (GM)
Maximum Polyphony: 28 notes
Modes: Main, Dual, Split
Parameters: Volume, Octave, Pan,
Reverb Send Level, GM on/off, Split Points 1 & 2

Effect:

- Chorus
- Harmony/Echo: 5 types Harmony, 3 types Echo (with Harmony Volume, Echo Speed parameters)
- 9 types Reverb

Style

100 Styles
Auto Accompaniment
Fingering Modes: Fingered, Full, Single Finger
Sections: Intro, Main A, Main B, Fill-in x 4, Ending
100 Jam Track (1 per Style)
Other Controls: Tempo (32 - 280), Large/Small,
Accompaniment Volume, Accompaniment Split Point
400 One Touch Setting (4 per Style)

Song

Song: 16 Preset, 4 User
Minus One
Repeat
Guide (PSR-230 only)
Song Volume
One Touch Setting

Easy Chord Memory

4 User Songs: Real-time Recording, Step Recording,
Song Clear

Overall Controls

Transpose
Tuning
Metronome

Music Cartridge

PSR-230: Yes
PSR-220: No

Guide Lamps

PSR-230: Yes
PSR-220: No

Controls

POWER, VOLUME, DEMO, SUB MENU, MAIN MENU, TOUCH RESPONSE, SPLIT, FINGERING, VOLUME, TEMPO, SYNC-START, START/STOP, INTRO/REPEAT PLAY, MAIN/AUTO FILL A and B [also MINUS ONE, GUIDE (PSR-230 only)], ENDING, JAM TRACK, SYNC-STOP, LARGE/SMALL, ONE TOUCH SETTING 1 - 4 (MEASURE +/-, BEAT +/-), VOICE, STYLE, SONG, Numeric Keypad, CARTRIDGE (PSR-230 only), EASY CHORD MEMORY (REC/END), DUAL/CHORUS, HARMONY/ECHO, REVERB

Other Terminals & Fittings

Music Cartridge slot (PSR-230 only)
DC IN 10-12V jack
PHONES/AUX OUT jack
SUSTAIN jack
MIDI IN/OUT terminals
Music Stand slot

Amplifier

Stereo: 3.0 W + 3.0 W (with PA-3B adaptor);
6.0 W+6.0 W (with batteries)

PHONES/AUX OUT Output

48 Ω impedance $\pm 5\%$

Speakers

10 cm x 2

Power Consumption

12 W (with PA-3B adaptor)

Rated Power Supply

DC 10-12 V: 6 "D" size / R-20 / SUM-1 (1.5 V) batteries,
or PA-3/3B Power Adaptor

Dimensions (W x D x H)

933 x 372 x 126mm (36-3/4" x 14-5/8" x 5")

Weight

PSR-230: 7.1 Kg (15.7 lbs.) excluding batteries
PSR-220: 7.0 Kg (15.4 lbs.) excluding batteries

Supplied Accessories

- Music Stand
- Owner's Manual
- Music Cartridge (PSR-230 only)

Optional Accessories

Headphones: HPE-3 or HPE-150
AC Power Adaptor: PA-3 or PA-3B
Keyboard Stand: L-2L or L-2C

* Specifications are subject to change without notice.

* Änderungen ohne Vorankündigung vorbehalten,

* Sous toute réserve de modification des caractéristiques sans préavis.

* Especificaciones sujetas a cambios sin previo aviso.

Limited Warranty

90 DAYS LABOR

1 YEAR PARTS

Yamaha Corporation of America, hereafter referred to as Yamaha, warrants to the original consumer of a product included in the categories listed below, that the product will be free of defects in materials and/or workmanship for the periods indicated. This warranty is applicable to all models included in the following series of products:

PSR SERIES OF PORTASOUND ELECTRONIC KEYBOARDS

If during the first 90 days that immediately follows the purchase date, your new Yamaha product covered by this warranty is found to have a defect in material and/or workmanship, Yamaha and/or its authorized representative will repair such defect without charge for parts or labor.

If parts should be required after this 90 day period but within the one year period that immediately follows the purchase date, Yamaha will, subject to the terms of this warranty, supply these parts without charge. However, charges for labor, and/or any miscellaneous expenses incurred are the consumers responsibility. Yamaha reserves the right to utilize reconditioned parts in repairing these products and/or to use reconditioned units as warranty replacements.

THIS WARRANTY IS THE ONLY EXPRESS WARRANTY WHICH YAMAHA MAKES IN CONNECTION WITH THESE PRODUCTS. ANY IMPLIED WARRANTY APPLICABLE TO THE PRODUCT, INCLUDING THE WARRANTY OF MERCHANTABILITY IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY. YAMAHA EXCLUDES AND SHALL NOT BE LIABLE IN ANY EVENT FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Some states do not allow limitations that relate to implied warranties and/or the exclusion of incidental or consequential damages. Therefore, these limitations and exclusions may not apply to you.

This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

CONSUMERS RESPONSIBILITIES

If warranty service should be required, it is necessary that the consumer assume certain responsibilities:

1. Contact the Customer Service Department of the retailer selling the product, or any retail outlet authorized by Yamaha to sell the product for assistance. You may also contact Yamaha directly at the address provided below.
2. Deliver the unit to be serviced under warranty to: the retailer selling the product, an authorized service center, or to Yamaha with an explanation of the problem. Please be prepared to provide proof purchase date (sales receipt, credit card copy, etc.) when requesting service and/or parts under warranty.
3. Shipping and/or insurance costs are the consumers responsibility.* Units shipped for service should be packed securely.

*Repaired units will be returned PREPAID if warranty service is required within the first 90 days.

IMPORTANT: Do NOT ship anything to ANY location without prior authorization. A Return Authorization (RA) will be issued that has a tracking number assigned that will expedite the servicing of your unit and provide a tracking system if needed.

4. Your owners manual contains important safety and operating instructions. It is your responsibility to be aware of the contents of this manual and to follow all safety precautions.

EXCLUSIONS

This warranty does not apply to units whose trade name, trademark, and/or ID numbers have been altered, defaced, exchanged removed, or to failures and/or damages that may occur as a result of:

1. Neglect, abuse, abnormal strain, modification or exposure to extremes in temperature or humidity.
2. Improper repair or maintenance by any person who is not a service representative of a retail outlet authorized by Yamaha to sell the product, an authorized service center, or an authorized service representative of Yamaha.
3. This warranty is applicable only to units sold by retailers authorized by Yamaha to sell these products in the U.S.A., the District of Columbia, and Puerto Rico. This warranty is not applicable in other possessions or territories of the U.S.A. or in any other country.

Please record the model and serial number of the product you have purchased in the spaces provided below.

Model _____ Serial # _____ Sales Slip # _____

Purchased from _____ Date _____
(Retailer)

YAMAHA CORPORATION OF AMERICA
Electronic Service Division
6600 Orangethorpe Avenue
Buena Park, CA 90620

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