YAMAHA

WX5

WIND MIDI CONTROLLER

Owner's Manual

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.

WARNING: Do not place this product in a position where anyone could walk on, trip over ,or roll anything over power or connecting cords of any kind. The use of an extension cord is not recommended! IF you must use an extension cord, the minimum wire size for a 25' cord (or less) is 18 AWG. NOTE: The smaller the AWG number ,the larger the current handling capacity. For longer extension cords, consult a local electrician.

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.

Some Yamaha products may have benches and / or accessory mounting fixtures that are either supplied with the product or as optional accessories. Some of these items are designed to be dealer assembled or installed. Please make sure that benches are stable and any optional fixtures (where applicable) are well secured BEFORE using.
Benches supplied by Yamaha are designed for seating only. No other uses are recommended.

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 instrument body inside the battery cover. The name plate lists the product's model number, power requirements, and other information. The serial number is located on the instrument body inside the battery cover. Please record the model number, serial number, and date of purchase in the spaces provided below, and keep this manual as a permanent record of your purchase.

Model _____

Serial No. _____

Purchase Date _____

92-BP

PLEASE KEEP THIS MANUAL

FCC INFORMATION (U.S.A.)

1. 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.

2. 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.

3. 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 co-axial 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

The above statements apply ONLY to those products distributed by Yamaha Corporation of America or its subsidiaries.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

* This applies only to products distributed by YAMAHA CORPORATION OF AMERICA.

CANADA

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

• This applies only to products distributed by Yamaha Canada Music Ltd.
• Ceci ne s'applique qu'aux produits distribués par Yamaha Canada Musique Ltée.

PRECAUTIONS

PLEASE READ CAREFULLY BEFORE PROCEEDING

* Please keep these precautions in a safe place for future reference.

⚠ *WARNING*

Always follow the basic precautions listed below to avoid the possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

- Do not open the instrument or attempt to disassemble the internal parts or modify them in any way. The instrument contains no user-serviceable parts. If it should appear to be malfunctioning, discontinue use immediately and have it inspected by qualified Yamaha service personnel.
- Do not expose the instrument to rain, use it near water or in damp or wet conditions, or place containers on it containing liquids which might spill into any openings.
- If the AC adaptor cord or plug becomes frayed or damaged, or if there is a sudden loss of sound during use of the instrument, or if any unusual smells or smoke should appear to be caused by it, immediately turn off the power switch, disconnect the adaptor plug from the outlet, and have the instrument inspected by qualified Yamaha service personnel.
- Use the specified adaptor (PA-3B or an equivalent recommended by Yamaha) only. Using the wrong adaptor can result in damage to the instrument or overheating.
- Before cleaning the instrument, always remove the electric plug from the outlet. Never insert or remove an electric plug with wet hands.
- Check the electric plug periodically and remove any dirt or dust which may have accumulated on it.

⚠ *CAUTION*

Always follow the basic precautions listed below to avoid the possibility of physical injury to you or others, or damage to the instrument or other property. These precautions include, but are not limited to, the following:

- Do not place the AC adaptor cord near heat sources such as heaters or radiators, and do not excessively bend or otherwise damage the cord, place heavy objects on it, or place it in a position where anyone could walk on, trip over, or roll anything over it.
- When removing the electric plug from the instrument or an outlet, always hold the plug itself and not the cord.
- Do not connect the instrument to an electrical outlet using a multiple-connector. Doing so can result in lower sound quality, or possibly cause overheating in the outlet.
- Unplug the AC power adaptor when not using the instrument, or during electrical storms.
- Always make sure all batteries are inserted in conformity with the +/- polarity markings. Failure to do so might result in overheating, fire, or battery fluid leakage.
- Always replace all batteries at the same time. Do not use new batteries together with old ones. Also, do not mix battery types, such as alkaline batteries with manganese batteries, or batteries from different makers, or different types of batteries from the same maker, since this can cause overheating, fire, or battery fluid leakage.
- Do not dispose of batteries in fire.
- Do not attempt to recharge batteries that are not intended to be charged.
- If the instrument is not to be in use for a long time, remove the batteries from it, in order to prevent possible fluid leakage from the battery.
- Keep batteries away from children.
- Before connecting the instrument to other electronic components, turn off the power for all components. Before turning the power on or off for all components, set all volume levels to minimum.
- Do not expose the instrument to excessive dust or vibrations, or extreme cold or heat (such as in direct sunlight, near a heater, or in a car during the day) to prevent the possibility of panel disfiguration or damage to the internal components.
- Do not use the instrument near other electrical products such as televisions, radios, or speakers, since this might cause interference which can affect proper operation of the other products.
- Do not place the instrument in an unstable position where it might accidentally fall over.
- Before moving the instrument, remove all connected adaptor and other cables.
- When cleaning the instrument, use a soft, dry cloth. Do not use paint thinners, solvents, cleaning fluids, or chemical-impregnated wiping cloths. Also, do not place vinyl or plastic objects on the instrument, since this might discolor the panel or keyboard.
- Do not rest your weight on, or place heavy objects on the instrument, and do not use excessive force on the buttons, switches or connectors.
- Do not operate the instrument for a long period of time at a high or uncomfortable volume level, since this can cause permanent hearing loss. If you experience any hearing loss or ringing in the ears, consult a physician.

Yamaha cannot be held responsible for damage caused by improper use or modifications to the instrument, or data that is lost or destroyed.

Always turn the power off when the instrument is not in use.

Make sure to discard used batteries according to local regulations.

Congratulations!

Your Yamaha WX5 is a state-of-the-art Wind MIDI Controller which takes wind MIDI control to new levels of performance and playability. With precise, responsive wind and lip sensors, a choice of single-reed or recorder type mouthpieces, and a range of fingering modes, the WX5 makes expressive wind control more accessible than ever before. While it gives experienced wind players a new medium and vastly expanded sonic possibilities in a familiar format, it is playable enough that beginners can become proficient in a relatively short time. The WX5 also provides expressive control and nuances that are simply not available with keyboards or other MIDI controllers. Although it is ideal for use with just about any MIDI tone generator or synthesizer, combined with a state-of-the-art tone generator such as the Yamaha VL70-m Virtual Acoustic Tone Generator, the WX5 is capable of expressive depth and tonal subtlety that rival the finest acoustic instruments.

Refer to this owner's manual while becoming familiar with the many functions and features provided by the WX5, and keep it in a safe place for later reference.

Contents

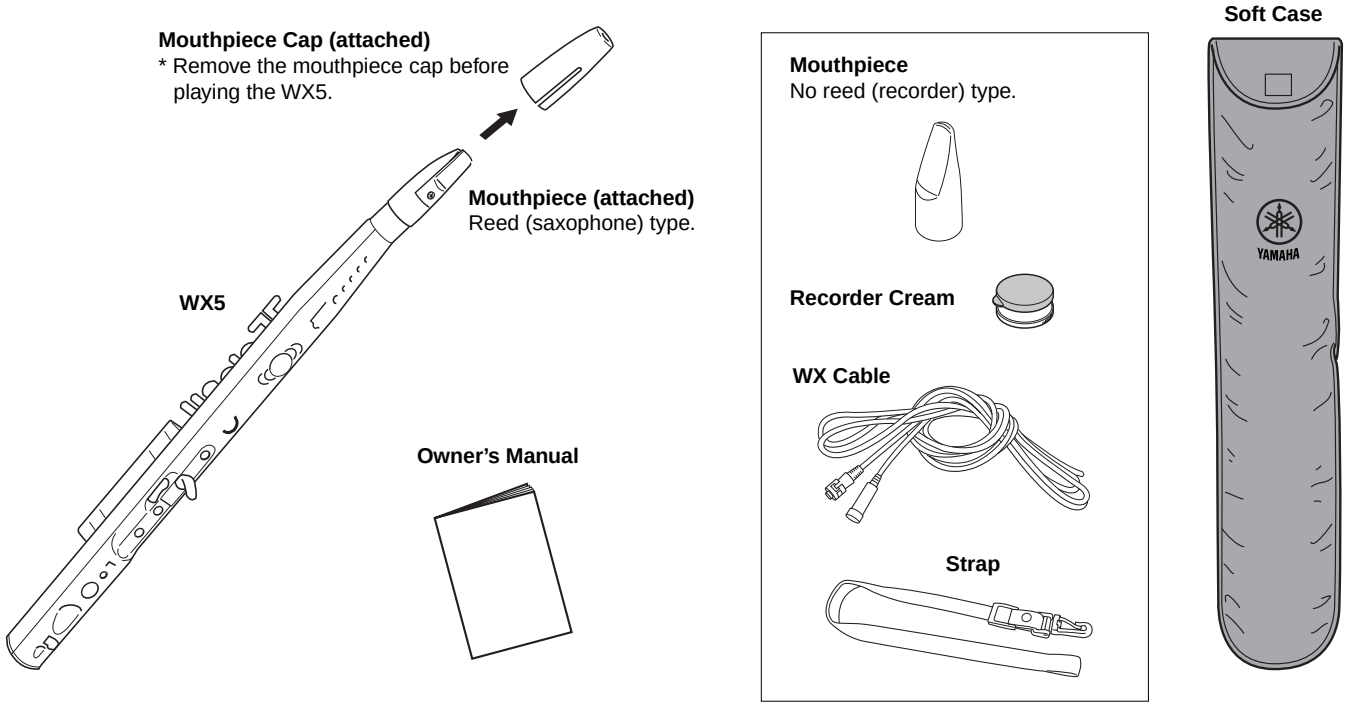
Main WX5 Features

- Realistic wind-instrument type response and playability offers unprecedented expressive control.
- A 16-key layout similar to the standard saxophone layout, and a choice of four fingering modes, make the WX5 easily accessible to most wind players. Beginners can select the fingering mode that they find easiest to play.
- With a WX5, a tone generator, and a pair of headphones, you can play anytime, anywhere, without worrying about disturbing neighbors.
- Dedicated connector and cable provides direct connection to Yamaha WX-series tone generators such as the VL70-m Virtual Acoustic Tone Generator.
- Built-in MIDI output connector means the WX5 can be directly connected to any standard MIDI tone generator or synthesizer without the need for an external MIDI interface.
- High-resolution wind sensor achieves precise breath response for smooth, natural velocity/volume control. 5 sensitivity settings provide optimum response for all players.
- Responsive lip sensor allows lip control of pitch and other parameters when used with the reed (saxophone type) mouthpiece.
- Thumb-controlled pitch-bend wheel allows convenient pitch bend control when either the reed (saxophone type) or recorder type mouthpiece is used.
- Octave keys allow pitch to be shifted over a ±3-octave range.
- MIDI program change transmission means that voices can be switched directly from the WX5.
- Four key-hold button modes - normal, follow, portamento, and sustain - provide a range of expressive control options.
- Built-in LED display facilitates lip-zero adjustment.
- Stable, precise response eliminates false triggering and transient tones.

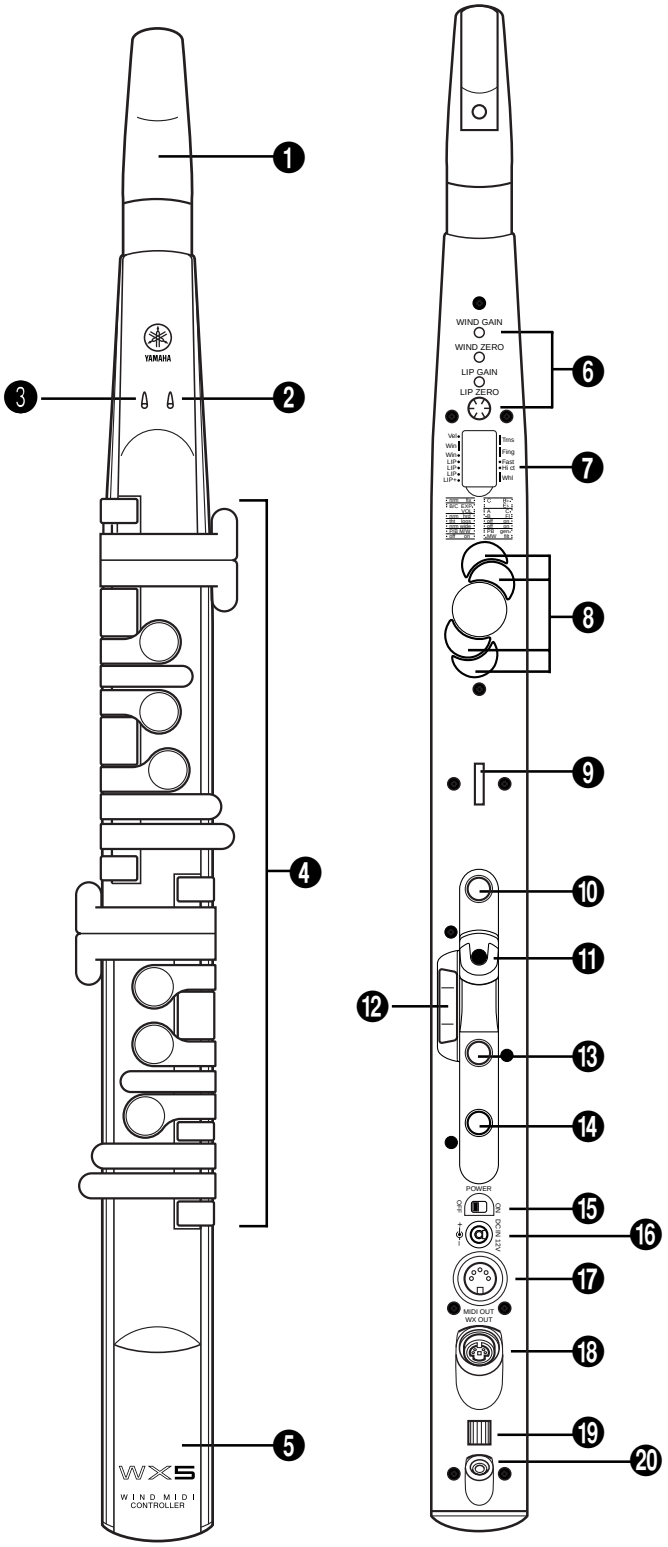
The illustrations in this owner's manual are for instructional purposes only, and may be different from the ones on your instrument.

❖ Packing List

After opening the WX5 package, make sure that it includes all of the items listed below.



The WX5 Controls & Connectors



❶ Mouthpiece

The WX5 is supplied with two mouthpieces: a saxophone-type mouthpiece with a reed, and a recorder-type mouthpiece with no reed. The WX5 is initially shipped with the saxophone-type mouthpiece attached. To remove and replace the mouthpiece see the "Maintenance" section on page 28.

❷ LED 1 Indicators
❸ LED 2 Indicators

Viewed from the key side of the instrument (as in the illustration), the LED indicator on the right shows lip sensor status, and the LED indicator on the left shows wind sensor status. Details on page 11.

❹ Keys

These are the keys used to play the WX5. The actual fingering used will depend on the fingering type selected via the setup switches (page 12, 30).

❺ Battery Cover

Batteries can be installed or removed after removing this cover (page 8).

❻ Sensor Gain Controls

These four controls adjust the gain and zero point of the wind and lip sensors. The upper three controls can be adjusted using a small "minus" screwdriver, while the LIP ZERO control can be adjusted using a finger. Adjustment details on page 25.

❼ Setup Switches

The DIP switches below the switch cover determine many of the WX5's basic functions - e.g. fingering, breath and lip response, the instrument's base key, and more. Details on page 22.

❽ Octave Keys

These keys allow you to shift the pitch of the instrument up or down by one, two, or three octaves while playing. Details on page 13.

❾ Strap Ring

The supplied neck strap attaches to this ring. See "Attaching the Strap", below.

❿ Setup Button

Used in conjunction with other WX5 control buttons, the Setup Button allows software wind gain, octave transpose, and other settings to be changed while playing. Details on page 20.

⓫ Thumb Hook

This hook allows the instrument to be supported by the right-hand thumb while playing. See "Positioning the Thumb Hook", below.

⓬ Pitch Bend Wheel

Like the pitch bend wheel on keyboard synthesizers, the WX5 pitch bend wheel can be used to produce smooth upward or downward pitch bends. Details on page 13.

⓭ Key Hold Button

The Key Hold button controls any of four assignable key hold functions including sustain. Details on page 14.

⓮ Program Change Button

Used in conjunction with the instrument's keys, the Program Change button can be used to transmit MIDI program change numbers to the connected tone generator in order to change voices directly from the WX5. Details on page 16.

⓯ Power Switch

Turns the WX5 power on or off.

⓰ DC IN 12V Connector

When using a Yamaha PA-3B AC Adaptor to power the WX5, the adaptor's output cable should be connected here. Details on page 8.

⓱ MIDI OUT Connector

When not using the WX cable (below), use this connector to connect the WX5 to a MIDI tone generator or synthesizer via a standard MIDI cable. Details on page 9.

⓲ WX OUT Connector

This connector allows the WX5 to be directly connected to compatible Yamaha tone generators (such as the VL70-m) which have a WX IN connector via the supplied WX cable. Details on page 9.

⓳ Cable Holder

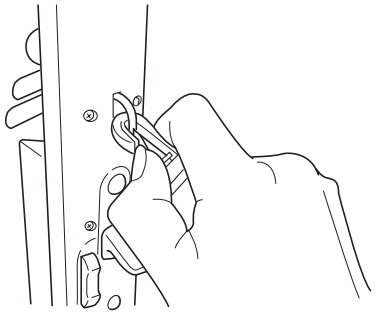
Supports the AC adaptor output cable and the MIDI or WX cable connected to the WX5, preventing accidental disconnection.

⓴ Water Drain

Breath and built-up water escape from this aperture - do not block this aperture.

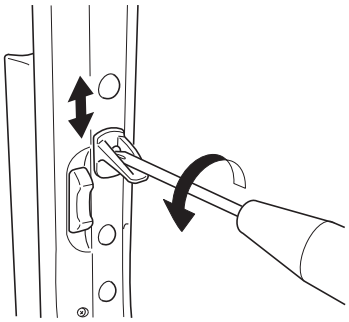
❖ Attaching the Strap

When using the supplied neck strap with the WX5, attack the strap hook to the strap ring as shown in the illustration.



❖ Positioning the Thumb Hook

The thumb hook rests on the right-hand thumb while playing, supporting and steadying the instrument. For maximum comfort and playability, the thumb hook can be positioned as required by loosening the screw using a small "plus" screwdriver, as shown in the illustration, positioning the thumb hook as required, and then tightening the screw. Do not use excessive force when tightening the thumb-hook screw.



Since the WX5 is a MIDI controller, it must be used with a MIDI tone generator to produce sound. Yamaha recommends the VL70-m or an MU-series XG tone generator, but just about any MIDI tone generator can be used.

WX-Compatible Tone Generators
When the WX5 is connected to a WX-compatible tone generator such as the VL70-m via the supplied WX cable (the tone generator must have a WX IN connector) power is supplied to the WX5 via the WX cable and no other power supply is required. This means that you don't have an extra cable connected to the instrument, or the extra weight of batteries inside the instrument.

Standard MIDI Tone Generators
When using the WX5 with a standard MIDI tone generator or synthesizer, connection must be made via an optional MIDI cable (see your music instrument dealer). In this case power must be supplied to the WX5 either from an optional Yamaha PA-3B AC Adaptor, or a set of six SUM-4 batteries installed in the instrument. See "Power Supply", below.

Power Supply

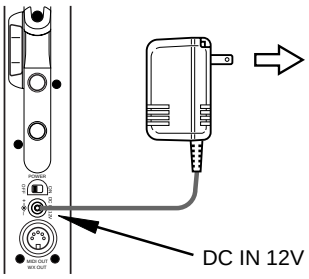
The power supply connection or battery installation described in this section is only necessary if you will be connecting the WX5 to a standard MIDI tone generator via a MIDI cable.

AC Adaptor

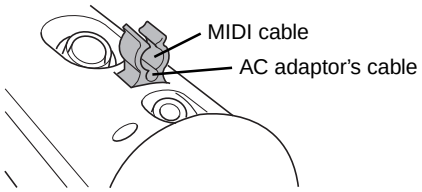
Use only a Yamaha PA-3B AC Adaptor to power the WX5 from a household AC outlet.

1 Connect the DC output cable from the PA-3B to the DC IN 12V connector on the WX5.

2 Plug the PA-3B into a convenient AC wall outlet.



3 Clip the AC adaptor's output cable into the cable holder on the WX5 before clipping a MIDI cable in to the cable holder.

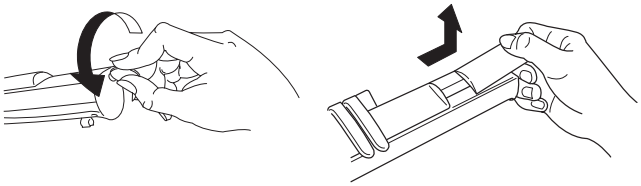


WARNING

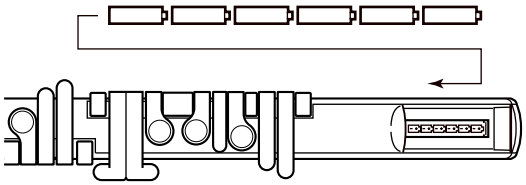
- *Use only a Yamaha PA-3B AC Adaptor to power the WX5 from a household AC outlet. The use of other AC adaptors will void the warranty, and possibly damage the WX5.*

Batteries

1 Use a coin to unlock the battery cover, then remove the cover as shown in the illustration.



2 Install a complete set of six new SUM-4 batteries, being sure to orient the polarity of the batteries properly as in the illustration.



3 Replace and lock the battery cover.

NOTE

- *When the batteries are almost depleted the LED indicators will flash and the sound may become distorted or reduced in volume. Be sure to replace the batteries early to minimize sound quality degradation.*
- *When an AC adaptor is plugged into the WX5 the internal batteries are automatically disconnected.*

CAUTION

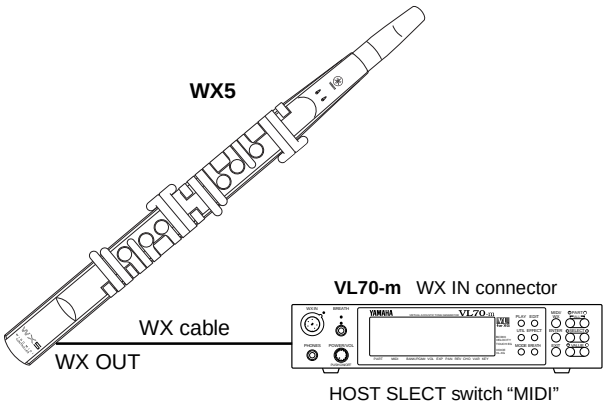
- *Always replace all six batteries with new ones at the same time. Never mix new batteries with old ones, and don't mix different types of batteries (i.e. standard and alkaline), or different brands of batteries.*

Connecting to a Tone Generator

Connecting to a Tone Generator with a WX Connector

The Yamaha VL70-m Virtual Acoustic Tone Generator was designed for optimum matching with Yamaha WX-series Wind MIDI Controllers, and is recommended for use with the WX5 to make the most of the WX5's expressive capabilities.

To connect the WX5 to the VL70-m, simply connect the supplied WX cable to the WX5's WX OUT connector, and to the WX IN connector on the VL70-m. No other connections are required (the VL70-m supplies power to the WX5 via the WX cable).



WX5 Connection

Connect the end of the WX cable with the screw ring to the WX5. Insert the connector with the arrow on the cable connector facing upward, then tighten the screw ring to ensure a solid connection. Finally, clip the cable into the cable holder for extra security.

VL70-m Connection

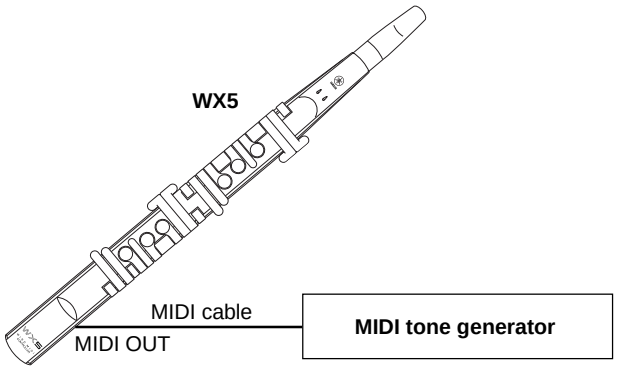
Align the protrusion on the VL70-m end of the cable with the groove in the VL70-m WX IN connector, and plug in firmly. Also be sure to set the HOST SELECT switch on the VL70-m rear panel to "MIDI", and set the VL70-m breath mode to BC/WX (refer to the VL70-m owner's manual for details).

NOTE

- *The WX5 can also be directly connected to the Yamaha WT11 Wind Tone Generator via the WX cable.*

Connecting to a Standard MIDI Tone Generator

In addition to connecting an AC adaptor or installing batteries as described on page 8, connect the MIDI OUT connector of the WX5 to the MIDI IN connector of the tone generator or synthesizer to be used via a standard MIDI cable (sold separately).



Before using the WX5 to control a standard MIDI tone generator, it may be necessary to make several settings on the tone generator side. Refer to your tone generator's owner's manual for details, as well as the "Tone Generator Settings" section of this manual (page 27).

Also be sure to set the SW1-1(Vel), SW1-2(Win), and SW1-3(Win) DIP switches (page 22) as shown below to ensure smooth breath volume and timbre control.

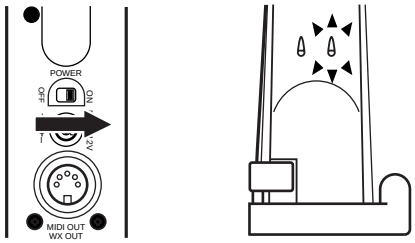
Switch	Setting
SW1-1(Vel)	ON
SW1-2(Win)	ON
SW1-3(Win)	OFF

NOTE

- *In order to make the most of the WX5's expressive capabilities, it is recommended that you use a tone generator which is capable of receiving MIDI Breath Controller control change data (control change number 2). Breath control is ideally suited to controlling volume and timbre via breath pressure, as well as applying a range of other effects.*
- *When using an XG tone generator, the tone generator's Assignable Controller parameter is set to allow reception of breath controller data, but setting the WX5's "Wind Controller to MIDI Data" setup switches to "Expression" (page 22) can produce better results for volume control in some cases.*
- *The WX5 can also be connected to a MIDI tone generator via the WX cable and an optional Yamaha BT7 Power Box.*

Turning the Power On

Whether you are powering the WX5 via the WX cable connected to a VL70-m tone generator, or via an AC adaptor or batteries, the WX5 power is switched on by sliding the POWER switch to the "ON" position. Turn the power off by sliding the POWER switch to the "OFF" position.



NOTE

- *Depending on the setup switch settings (page 10) and sensor adjustment (page 25), the LED indicators may not light when the power is turned on.*

Selecting a Mouthpiece

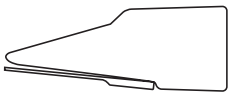
The WX5 is supplied with two different mouthpieces. Select the type that best suits your playing style and/or the type of music you intend to play.

NOTE

- *When changing mouthpieces, be careful not to bend or otherwise damage the cantilever inside the mouthpiece cavity.*

Reed Mouthpiece (Saxophone Type)

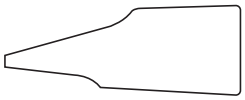
This mouthpiece features a reed which can be used to control pitch according to your "bite". This mouthpiece provides playability and expressive control essentially equivalent to a saxophone or clarinet.



Reedless Mouthpiece (Recorder Type)

This mouthpiece has no reed and thus does not allow lip control. Playing the reedless mouthpiece is similar to playing a recorder.

When using the reedless mouthpiece, set the lip mode to "Loose Lip" via the setup switches, as described on page 22.



NOTE

- *The WX5 is initially shipped with the Reed Mouthpiece attached.*

Selecting a Lip Mode: Tight Lip or Loose Lip

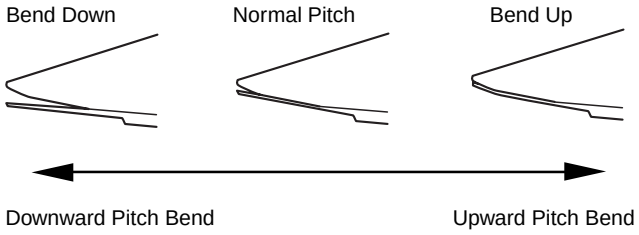
The WX5 has two basic playing modes: Tight Lip and Loose Lip, described below. Select the mode which best suits your playing style.

NOTE

- *The Tight Lip or Loose Lip mode is set via the setup switches, as described on page 22.*
- *The WX5 is initially shipped with the Tight Lip mode selected.*

■ Tight Lip

The tight lip mode, which is the way most acoustic single-reed instruments are played, simply means that a certain amount of bite (lip pressure) is applied to the reed when playing at normal pitch. Increased pressure on the reed raises pitch, and decreased pressure on the reed (and/or moving the bite towards the tip of the mouthpiece) lowers pitch. The Tight Lip mode means that accurate pitch must be determined by the player's ear, but is probably the best choice for players who have experience with single-reed instruments.

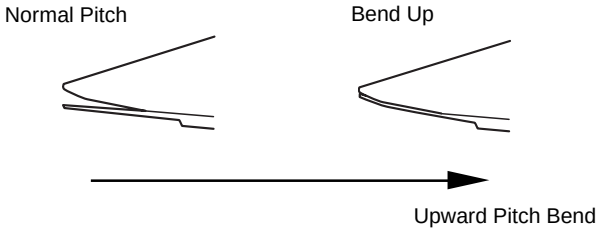


NOTE

- *The lip range (the amount of variation caused by a given change in lip- pressure), and the type of effect produced by lip pressure (pitch or modulation) can be adjusted via the Lip Range and Lip Data setup switches, as described on page 22, 23.*

■ Loose Lip

In the loose lip mode no pressure (or very slight pressure) is applied to the reed when playing normally. Pressure applied to the reed causes an increase in pitch. Thus, in the loose lip mode only upward pitch bend can be applied, but the amount of upward pitch bend that can be applied is greater than that available in the tight lip mode.



NOTE

- *Always select the Loose Lip mode when using the reedless mouthpiece.*
- *The lip range (the amount of variation caused by a given change in lip- pressure), and the type of effect produced by lip pressure (pitch or modulation) can be adjusted via the Lip Range and Lip Data setup switches, as described on page 22,23.*

About the Wind and Lip Sensors

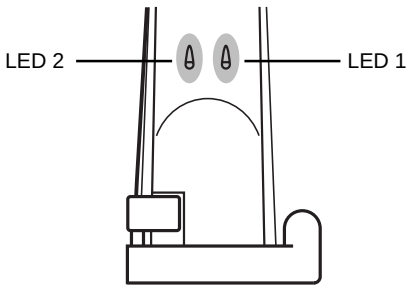
The WX5 has two sensors - wind and lip - which may have to be adjusted for optimum playability (page 25).

NOTE

- *When the WX5 is initially shipped, the Tight Lip mode is selected, and both sensors are adjusted for "average" playing conditions.*

■ The LED Indicators

The WX5 has two LED indicators which indicate the status of the wind and lip sensors. Viewing the instrument from the front (the key side) the indicator on the right is "LED 1", and the indicator on the left is "LED 2".



● LED1 (Lip Sensor Data)

LED 1 responds as follows in the Tight Lip mode, and with the initially factory settings:

LED On : Reed open (bend down).
LED Off : Reed at center (no bend).
LED On : Reed closed (bend up).

In the Loose Lip mode LED 1 responds as follows:

LED Off : Reed completely open (pitch bend data "0").
LED On : Reed closed (bend up).

When flute fingering is selected (page 12), LED 1 responds as follows (in this mode the Tight/Loose Lip setting is ignored):

LED Off : Reed completely open (pitch as fingered).
LED On : Reed closed (pitch one octave above fingered pitch).

● LED 2 (Wind Sensor Data)

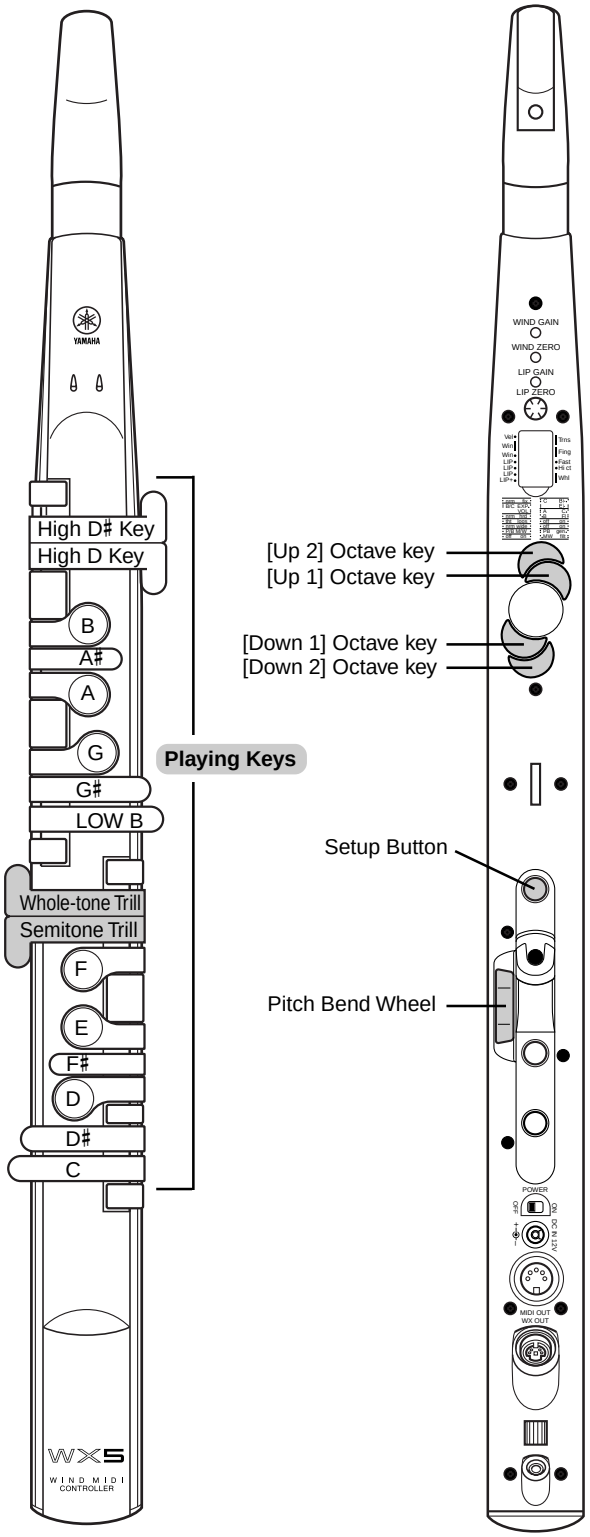
LED On : Breath applied (sound will be produced if the WX5 is connected to a tone generator).
LED Off : No breath pressure (no sound will be produced by the tone generator connected to the WX5)

NOTE

- *Both LED indicators will flash when the batteries (if used) are almost depleted. If this happens, replace all six batteries with new ones as soon as possible.*

❖ About Tonguing

"Tonguing" is a technique which is used to add attack to notes, and to rapidly repeat notes. Rather than simply blowing into the mouthpiece, the tip of the tongue is used as if saying "tu" at the beginning of a note. A little practice is required, but the extra expressive capability is well worth the effort. Refer to a recorder or flute or saxophone method book for details on tonguing technique.
All other playing techniques which can be used with the WX5 -breath and lip control - are essentially the same as those used with acoustic wind instruments, so referring to appropriate wind instrument method books can be of great value.



Fingering Modes

The WX5 offers a choice of four fingering modes. Refer to the explanations of each mode, below, and the fingering charts on page 32, to determine which fingering mode is best for you.

* The fingering mode is set via the setup switches, as described on page 23.

* The WX5 is initially shipped with the Saxophone(a) fingering mode selected.

■ Saxophone(a)

Basically the same as saxophone fingering, except that the fingering remains the same in all octaves (you only need to use the octave keys to change octaves), and thus is easy to learn.

■ Saxophone(b)

This mode is similar to Saxophone(a), but with additional trill key functions to facilitate rapid passages. This mode is ideal for players who are experienced with the WX11.

■ Saxophone(c)

A variation of the Saxophone(a) fingering mode, this mode allows saxophone-type alternate fingerings. Although alternate fingerings produce the same note, they produce slight variations in pitch and timbre which can be used for musical effect. The Saxophone(c) fingering mode simulates these effects.

* When using the Saxophone(c) mode, set the tone generator pitch bend range to “2” (±200 cents).

■ Flute

Similar to flute fingering, this mode is ideal for players who are familiar with flute fingering. Rather than continuous pitch bend in response to lip pressure, the pitch jumps up one octave when lip pressure is applied. The Lip Mode setting (page 11) is ignored when Flute fingering is selected.

❖ The Whole-tone and Semitone Trill Keys

Pressing the whole-tone trill key raises the pitch a whole tone above the current fingering.

Pressing the semitone trill key raises the pitch a semitone above the current fingering.

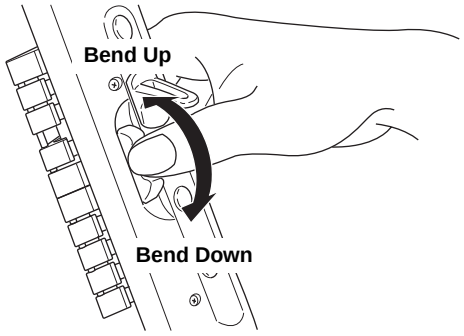
Octave Shift

The octave keys can be used to shift the pitch up or down by one, two, or three octaves while playing, as follows:

[Up 2] Octave Key	3 octaves up
[Up 1] + [Up 2] Octave Keys	2 octaves up
[Up 1] Octave Key	1 octave up
[Down 1] Octave Key	1 octave down
[Down 1] + [Down 2] Octave Keys	2 octaves down
[Down 2] Octave Key	3 octaves down

Pitch Bend Wheel

The WX5 pitch bend wheel makes it possible to produce smooth upward and downward bends over a greater range than is possible via lip control. Rolling the wheel upward (towards the mouthpiece end of the instrument) produces an upward pitch bend, and rolling the wheel downward produces a downward pitch bend.



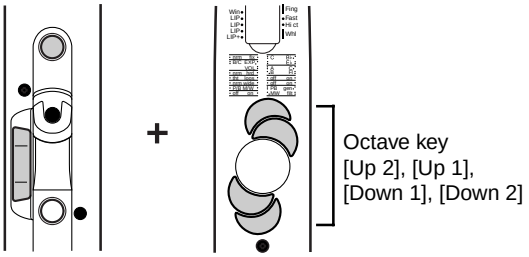
NOTE

- *Using the neck strap and thumb hook provides maximum instrument stability, making it easier to produce accurate pitch bends using the pitch bend wheel.*
- *Set the required pitch bend range via the corresponding parameter on your tone generator.*
- *Don't turn the WX5 power on while moving the pitch bend wheel. Doing so will cause the center wheel position to shift, thereby causing the instrument to play out of tune.*
- *Be careful not to accidentally press the Key Hold button while operating the Pitch Bend Wheel.*

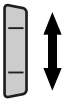
■ Changing the Pitch Bend Wheel Function

The function of the pitch bend in the upward and downward directions (i.e. the MIDI data it generates when rolled upward or downward) can be changed by using the Setup and Octave buttons while the pitch bend wheel is rolled all the way up or down, as listed below:

Pitch bend wheel + Setup Button + Octave Key



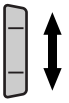
Pitch Bend Wheel + Setup Button + [Up 2] Octave Key



Pitch bend up data

Pitch bend down data

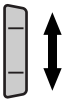
Pitch Bend Wheel + Setup Button + [Up 1] Octave Key



Modulation wheel data

Pitch bend down data

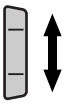
Pitch Bend Wheel + Setup Button + [Down 1] Octave Key



Control change #16 (0 … 127) data

Control change #17 (0 … 127) data

Pitch Bend Wheel + Setup Button + [Down 2] Octave Key

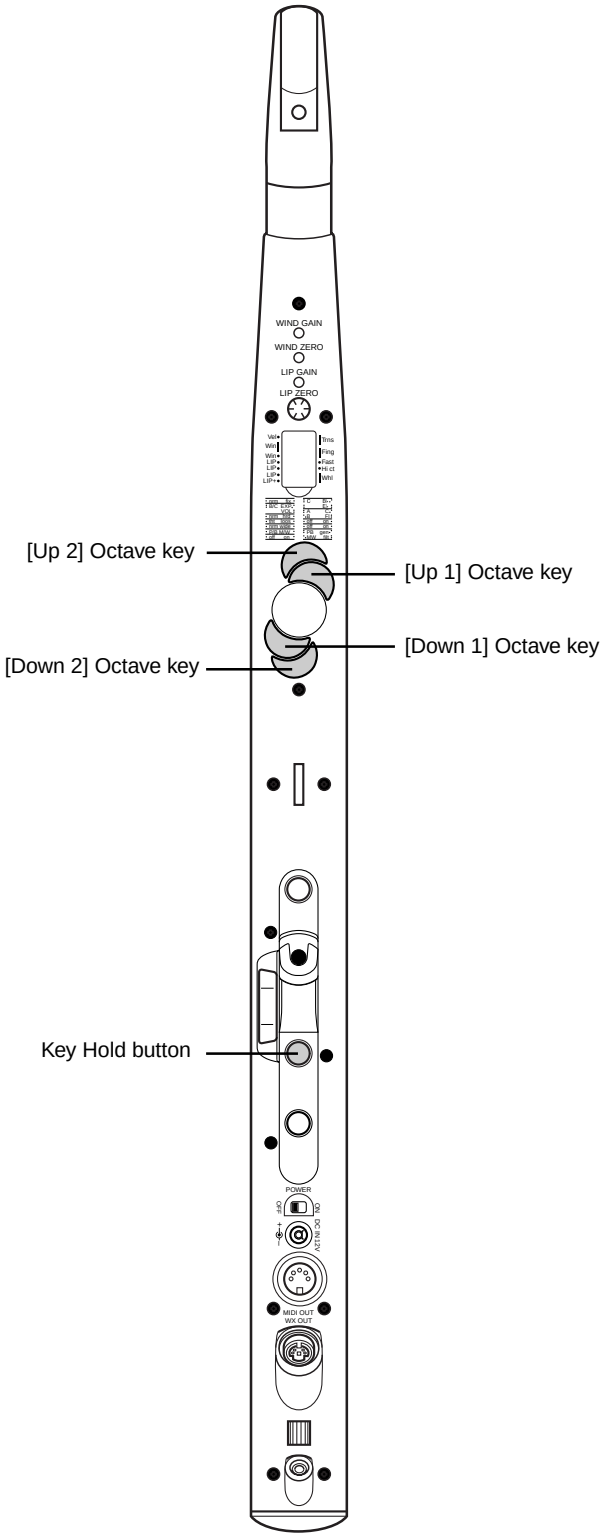


Brightness up (control change #74) data

Brightness down (control change #74) data

NOTE

- *When brightness control is selected, the wheel transmits control change #74 value 64 at its center position, value 127 in the maximum upward position, and value 0 in the maximum downward position.*
- *According to GM (General MIDI) specifications, control change numbers #16 and #17 are non-reserved and available for general use. If your tone generator allows parameters to be assigned to MIDI control numbers, you can use the pitch bend wheel to control any available parameter. With the VL70-m, for example, you might want to assign the scream, growl, or other expressive parameters to control change numbers #16 and #17, so that they can be controlled via the WX5 pitch control wheel.*



Key Hold

The Key Hold function can be used to hold a specified note while playing other notes, thus allowing more than one note to be played at the same time. You actually have a choice of four different Key Hold functions - Normal Hold, Follow Hold, Sustain, and Portamento - selected by holding the Key Hold button and pressing one of the Octave keys.

NOTE

- *When using a monophonic tone generator such as the VL70-m, the Normal Hold and Follow Hold functions cannot be used.*

■ Normal Hold

Select the Normal Hold mode by pressing the [Down 1] Octave key while holding the Key Hold button.
Normal Hold allows a specified note to be held while other notes are played.

Applying Normal Hold

1 Play a note on the WX5.

2 While playing the note, rapidly press and release the Key Hold button. The note will be held.

3 Any subsequently played notes will sound simultaneously with the held note.

Changing the Held Note

1 Play a different note than the held note.

2 While playing the new note, rapidly press and release the Key Hold button. The note will be held in place of the previous held note.

3 Any subsequently played notes will sound simultaneously with the held note.

Press the Key Hold button while no note is being played to disengage the Key Hold function.

In the Normal Hold mode, no key off message is transmitted to the tone generator when breath pressure is stopped. Rather, the sound is stopped because the wind sensor produces a volume value of "0". Depending on the settings of your tone generator, the held note may continue to sound even when breath pressure to the WX5 is stopped. This will depend on whether or not your tone generator is receiving the MIDI data generated by the WX5 wind sensor. For example, if the WX5 is transmitting wind sensor data as MIDI breath controller data (control change #02, the factory preset default) and your tone generator is not set up to receive this type of data, the sound will continue even when breath pressure is stopped. In such a case setting the WX5 to transmit wind sensor data as system expression or volume data may solve the problem (page 22).

NOTE

- *The Normal Hold mode is automatically selected whenever the WX5 power switch is turned on.*

■ Follow Hold

Select the Follow Hold mode by pressing the [Down 2] Octave key while holding the Key Hold button.
In the Follow Hold mode whenever a note is played a second note will sound at a specified interval from the fingered note. Volume, timbre, pitch bend and other variations will apply to both notes simultaneously.

Applying Follow Hold

1. Play a note on the WX5.
2. While playing the note, rapidly press and release the Key Hold button.
3. The next note played will determine the interval to be maintained by the Follow Hold function. Both the second note and the note played during steps **1** and **2**, above, will sound simultaneously. Any subsequently played notes will sound simultaneously with a second note at the specified interval.

Changing the Held Interval

1. Play a note (a second note will sound at the specified interval).
2. Rapidly press and release the Key Hold button. The second note will stop playing and only the fingered note will sound.
3. Play a different note to determine the interval to be maintained. Both the second note and the note played during steps **1** and **2**, above, will sound simultaneously. Any subsequently played notes will sound simultaneously with a second note at the specified interval.

   Press the Key Hold button while no note is being played to disengage the Key Hold function.

■ Sustain

Select the Sustain mode by pressing the [Up 2] Octave key while holding the Key Hold button.
In this mode pressing the Key Hold button will cause a MIDI sustain message (control change #64) to be transmitted, alternately turning sustain on and off ("sustain on" will be transmitted the first time the Key Hold button is pressed after this mode is engaged).

■ Portamento

Select the Portamento mode by pressing the [Up 1] Octave key while holding the Key Hold button.
In this mode pressing the Key Hold button will cause a MIDI portamento message (control change #65) to be transmitted, alternately turning portamento on and off ("portamento on" will be transmitted the first time the Key Hold button is pressed after this mode is engaged). Portamento produces a "glide" effect between notes played.

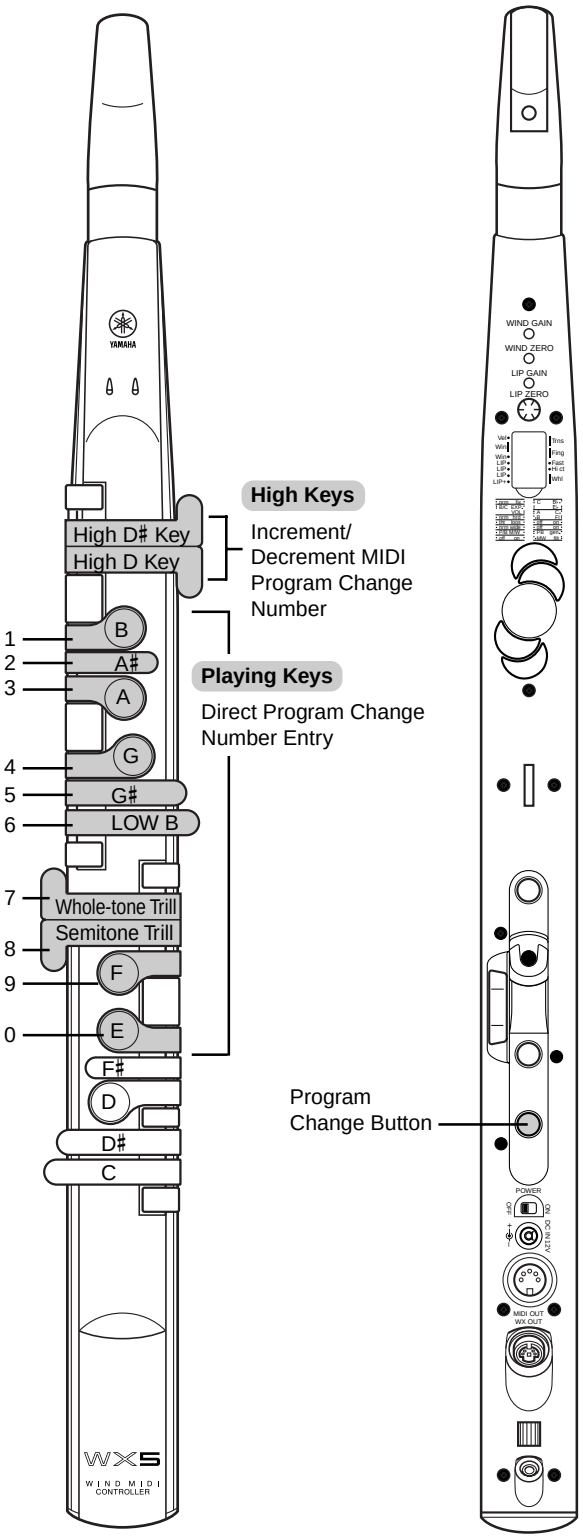
NOTE

- *When using the WX5 to transmit portamento data, make sure your tone generator is set up to receive MIDI portamento data. Refer to your tone generator's owner's manual for details.*

Program Change Control

By using the playing keys and octave keys in conjunction with the Program Change button, it is possible to change voices and other MIDI functions on your tone generator directly from the WX5.

NOTE • *Refer to your tone generator's owner's manual for details on the pertinent MIDI settings and functions.*



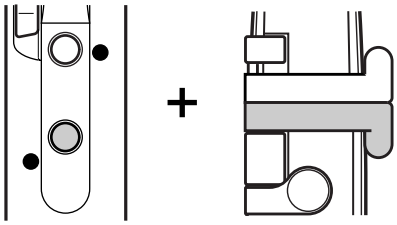
Changing Voices

■ Program Change Increment & Decrement

The voice number currently selected on your tone generator can be increment or decremented by using the WX5 high keys while pressing the Program Change button.

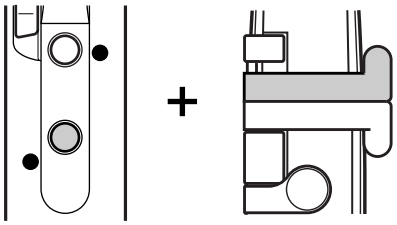
Program Change Button + High D Key

Increments the current voice number by one. Hold the key to increment continuously.



Program Change Button + High D♯ Key

Decrements the current voice number by one. Hold the key to decrement continuously.



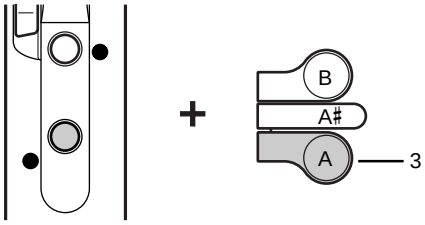
NOTE • *This method cannot be used to change the bank select number. To change the bank number see page 17.*

■ Direct Program Change Entry

Specific program change numbers can be directly transmitted from the WX5 by using the playing keys (numbers 1 through 0 are assigned to the keys - see illustration above) while pressing the Program Change button.

1-digit Example: Program Change Number 003

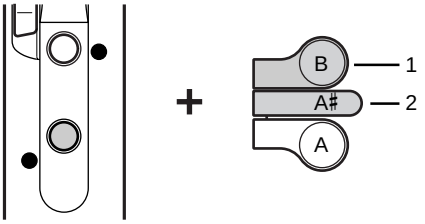
Press the A key (number 3) while holding the Program Change button. Program change number 003 will actually be transmitted when the Program Change key is released.



An alternative method is to enter all three digits of the number in sequence - [0][0][3]. In this case the program change number will actually be transmitted as soon as the last digit is entered.

2-digit Example: Program Change Number 012

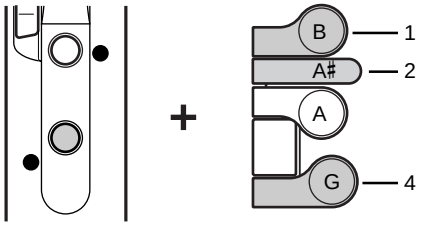
Press the B key (number 1) and then the A♯ key (number 2) while holding the Program Change button. Program change number 012 will actually be transmitted when the Program Change key is released.



An alternative method is to enter all three digits of the number in sequence - [0][1][2]. In this case the program change number will actually be transmitted as soon as the last digit is entered.

3-digit Example: Program Change Number 124

Press the B key (number 1), the A♯ key (number 2), and then the G key (number 4) while holding the Program Change button. Program change number 124 will actually be transmitted as soon as the last digit is entered.



NOTE

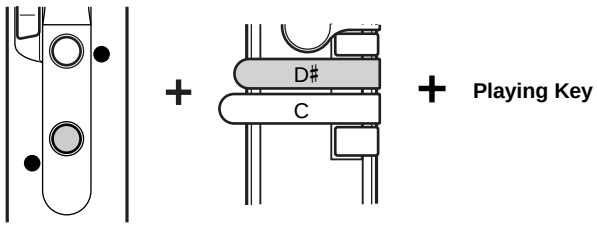
- *This method cannot be used to change the bank select number. The specified voice number within the current bank will be selected. To change the bank number see "Bank Number Transmission", below.*

Bank Number Transmission

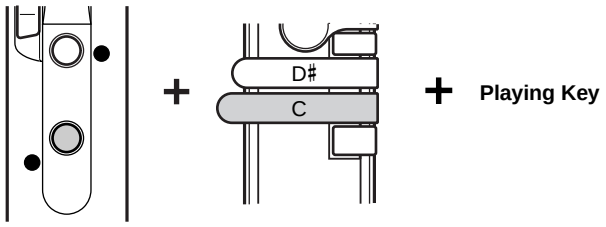
By specifying bank MSB (Most Significant Bits) and LSB (Least Significant Bits) numbers before transmitting a program change number, it is possible to change banks and voices at the same time.

Enter the 3-digit bank select MSB number while holding the Program Change button and the D♯ key, then enter the 3-digit bank select LSB number while holding the Program Change button and the C key.

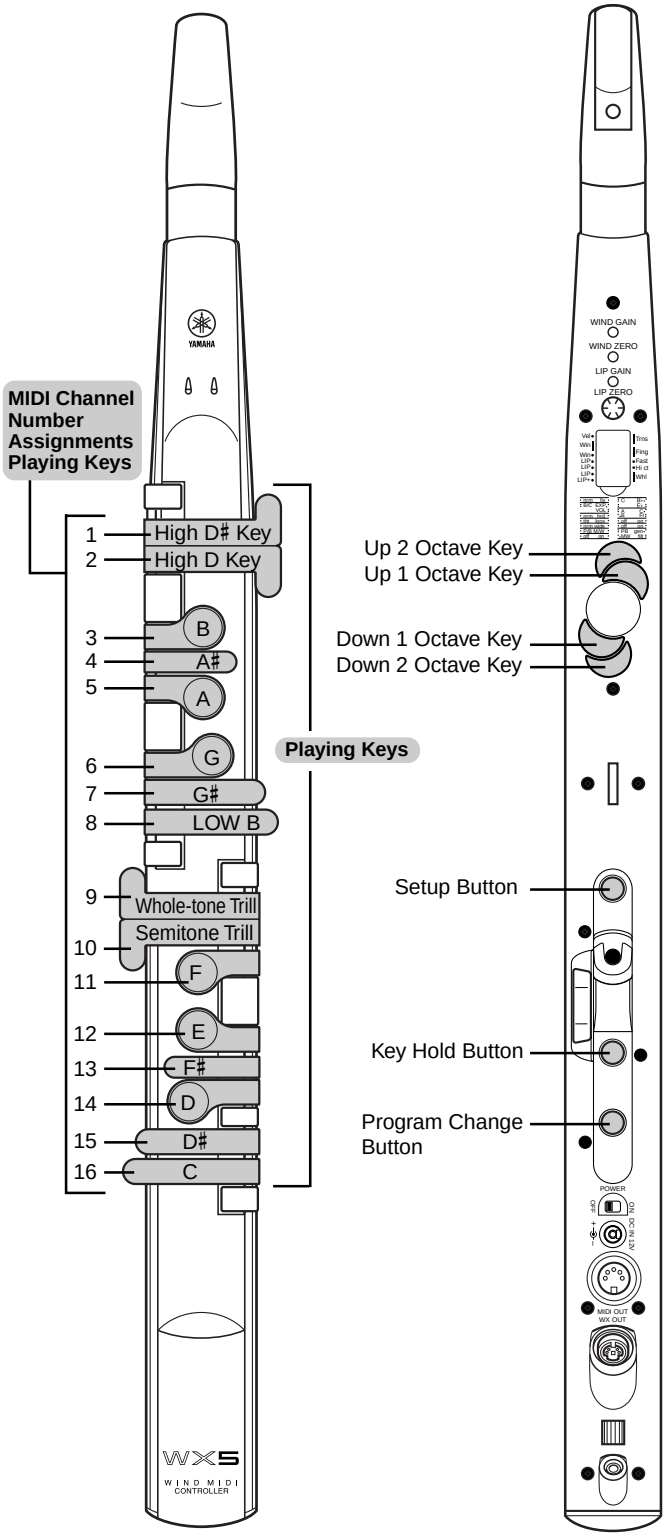
Bank Select MSB



Bank Select LSB

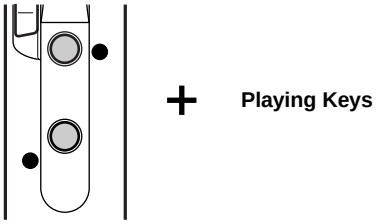


The specified bank select MSB and LSB numbers will not be transmitted until the next program change number is transmitted, as described in the preceding section.



Changing the MIDI Transmit Channel

The WX5 MIDI transmit channel can be changed by pressing the appropriately numbered playing key (see the channel number assignment illustration to the left) while holding the Program Change button and the Key Hold button.



NOTE

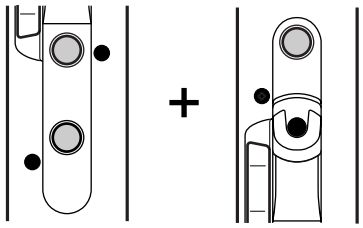
- *The default MIDI transmit channel is channel 1.*
- *Make sure that your tone generator is set to receive on the same MIDI channel as the WX5 is set to transmit on.*

Parameter Reset

All WX5 parameters can be reset to their initial power-on default values by pressing the Setup button while holding the Program Change button and Key Hold button.

The following parameters are reset:

- **Octave Transpose**
- **Wind Gain**
- **MIDI Transmit Channel**
- **Key Hold**
- **High Control Key Toggle**
- **Pitch Bend Wheel Function**



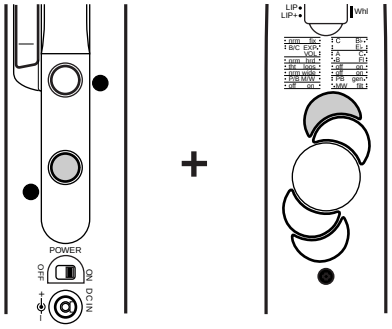
Mono/Poly & Portamento Switching

By using the Octave Keys while holding the Program Change button, it is possible to transmit MIDI Mono, Poly, and Portamento mode messages to your tone generator.

* See your tone generator's owner's manual for details on how it responds to MIDI Mono, Poly, and Portamento mode messages.

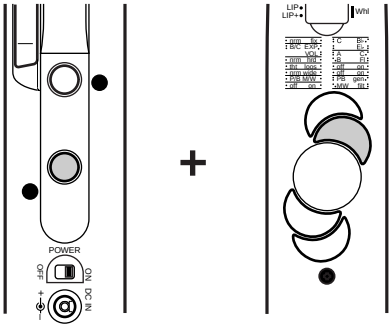
Program Change Button + Up 2 Octave Key

MIDI "Poly ON" message transmitted.



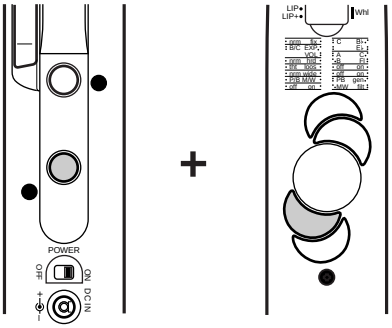
Program Change Button + Up 1 Octave Key

MIDI "Mono ON" message transmitted.



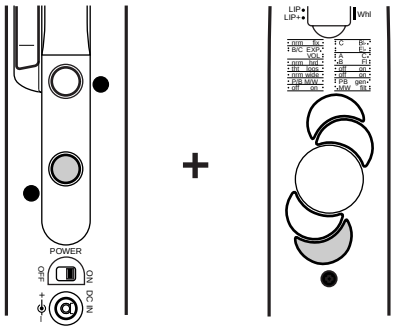
Program Change Button + Down 1 Octave Key

MIDI "Portamento ON" message transmitted.



Program Change Button + Down 2 Octave Key

MIDI "Portamento OFF" message transmitted.

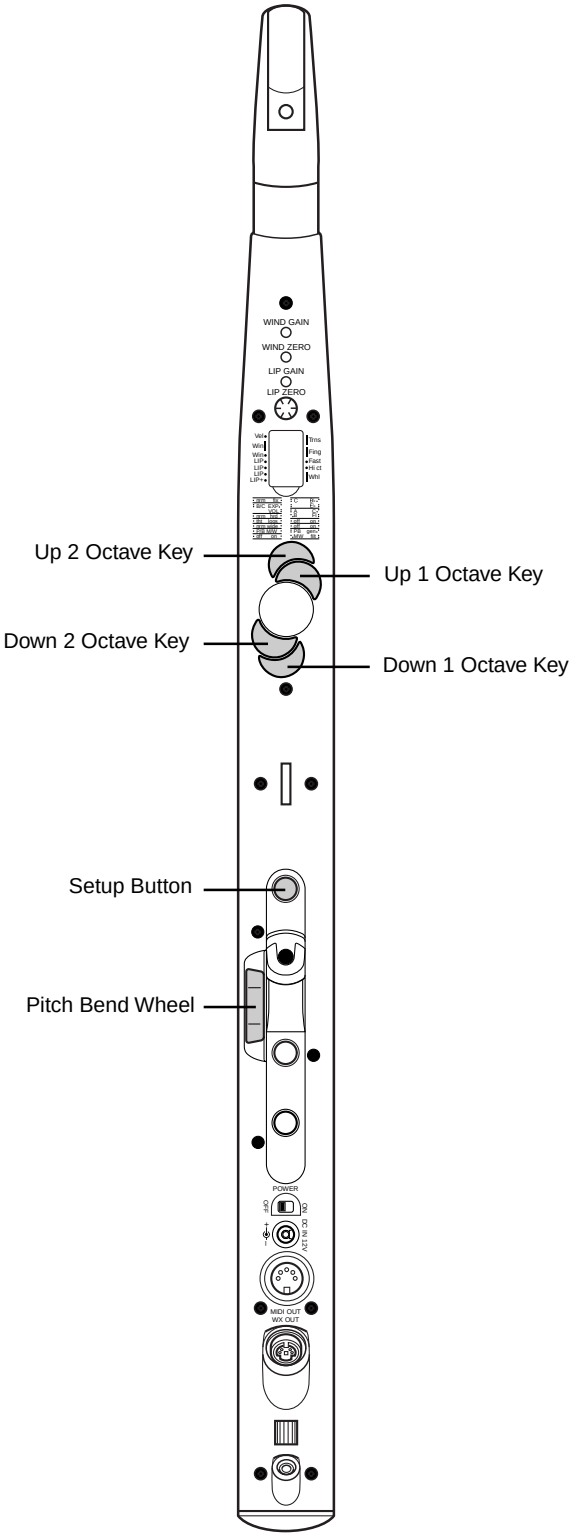


NOTE

- *If a "Poly ON" or "Mono ON" message is transmitted while the Key Hold button is being used to transmit "Sustain ON" or "Portamento ON", the held note, sustain, and portamento will automatically be turned off.*

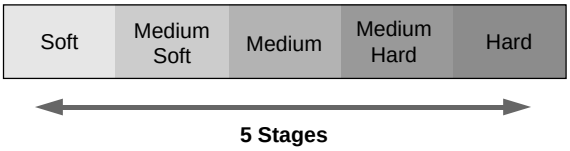
Using the Setup Button

A number of important WX5 parameters can be changed as required by using the Setup button in conjunction with the Octave keys or Pitch Bend wheel.



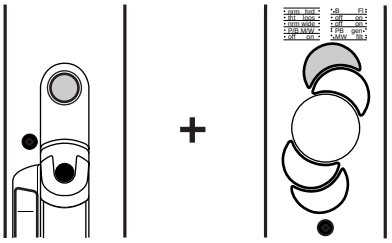
Sensitivity (Software Wind Gain)

The WX5's software sensitivity setting (software wind gain) can be adjusted in five stages by using the Octave keys while holding the Setup button. The software wind gain settings are: Soft, Medium Soft, Medium, Medium Hard, and Hard. The power-on default setting is "Medium".



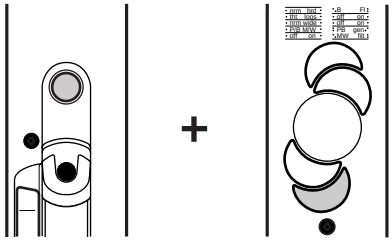
Setup Button + Up 2 Octave Key

The software wind gain setting shifts one stage toward "Hard" each time the Up 2 Octave key is pressed.



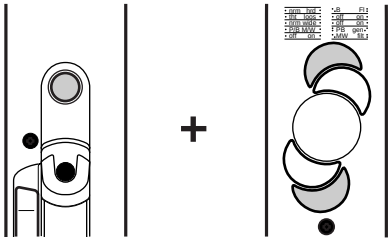
Setup Button + Down 2 Octave Key

The software wind gain setting shifts one stage toward "Soft" each time the Down 2 Octave key is pressed.



Setup Button + Up 2 and Down 2 Octave Keys

Resets software wind gain to "Medium".

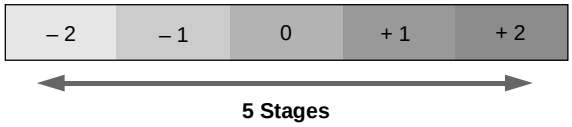


NOTE

- *The WX5 hardware wind gain for the wind sensor is set as described on page 25. Set both the hardware and software wind gain for optimum playability.*

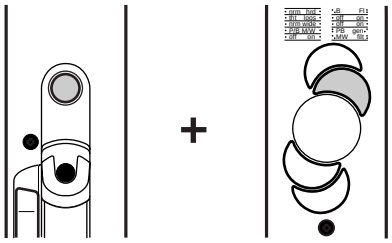
Octave Transpose

The MIDI note numbers transmitted by the WX5 can be shifted up or down by one or two octaves by using the Octave keys in conjunction with the Setup button.



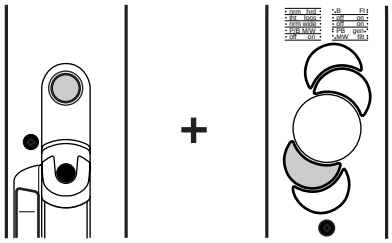
Setup Button + Up 1 Octave Key

MIDI note numbers shifted up one octave each time the Up 1 Octave key is pressed.



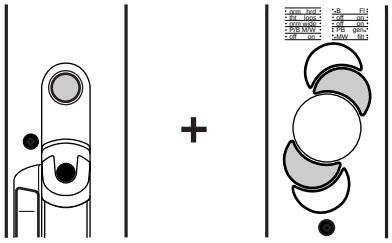
Setup Button + Down 1 Octave Key

MIDI note numbers shifted down one octave each time the Down 1 Octave key is pressed.



Setup Button + Up 1 and Down 1 Octave Keys

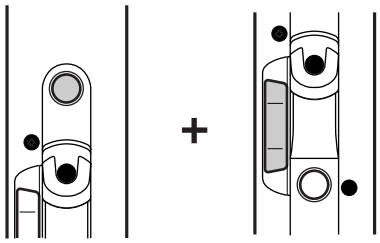
Resets the octave to “0”.



Audition Function On/Off

When the Audition function is on, the tone generator will produce sound even when breath pressure is not applied to the WX5. This can be handy when selecting voices or checking system operation.

Rotate the Pitch Bend wheel while holding the Setup button to turn the Audition function on. The connected tone generator will then produce sound whenever the Pitch Bend wheel is rotated.

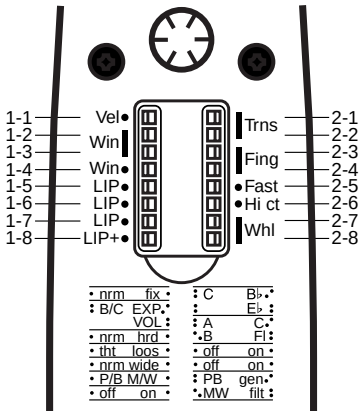


Press the Setup button again to turn the Audition function off.

Setup Switch Settings

The WX5 has 16 DIP switches which can be used to set up a range of important basic parameters. These switches are not intended for frequent use, but rather to set up the WX5 to match your individual playing requirements. Read the descriptions below carefully before changing the setup switch settings.

- Remove the rubber switch cover, and use a small screwdriver or similar implement to change the switch settings as required.
- The switches are OFF when flipped to the left, and ON when flipped to the right. All switches are OFF when the WX5 is initially shipped.



● Switch 1-1 (Vel) - Velocity

Determines whether the key-on velocity will be fixed or controlled by wind pressure.

SW 1-1	Setting
OFF	Variable (fixed time delay)
ON	Fixed (velocity - 100)

● Switch 1-2 & 3 (Win) - Wind Sensor to MIDI Data

Specifies the type of MIDI data via which the WX5 wind data will be transmitted.

SW 1-2	SW 1-3	Setting
OFF	–	Breath Controller (control change #2)
ON	OFF	Expression (control change #11)
ON	ON	Volume (control change #7)

NOTE • *When using the WX5 with a tone generator which does not have a WX IN connector, be sure to set the SW1-1(Vel) switch ON so that a fixed velocity value is transmitted, and set the SW1-2(Win) and SW1-3(Win) switches so that MIDI expression control (SW1-2 ON, SW1-3 OFF) or volume control (SW1-2 ON, SW1-3 ON) is transmitted.*

● Switch 1-4 (Win) - Wind Curve

Determines the relationship between breath pressure and the output MIDI volume data.

SW 1-4	Setting
OFF	Normal
ON	Hard (requires considerable breath pressure to produce maximum volume)

● Switch 1-5 (Lip) - Tight Lip/Loose Lip Mode

Selects the Tight Lip or Loose Lip playing mode. In the Tight Lip mode pitch can be bent up and down via lip pressure, but in the Loose Lip mode pitch can only be bent upward via lip pressure (page 11).

SW 1-5	Setting
OFF	Tight Lip
ON	Loose Lip

● Switch 1-6 (Lip) - Lip Data Range

Determines the range of data which can be produced via lip control, depending also on the setting of Switch 1-7 (Lip Data), below.

SW 1-6	Setting
OFF	Normal
ON	Wide (greater range)

When Lip Data is set to "Pitch Bend"

Tight Lip Mode

	Normal	Wide
Reed Open	-16	-64
Center	0	0
Maximum	+32	+63

Loose Lip Mode

	Normal	Wide
Reed Open	0	0
Maximum	+32	+63

When Lip Data is set to "Modulation Wheel"

Tight Lip Mode

	Normal	Wide
Reed Open	48	0
Center	64	64
Maximum	96	127

Loose Lip Mode

	Normal	Wide
Reed Open	0	0
Maximum	64	127

● Switch 1-7 (Lip) - Lip Data

Specifies the type of MIDI data via which the WX5 lip data will be transmitted.

SW 1-7	Setting
OFF	Pitch Bend
ON	Modulation Wheel

● Switch 1-8 (Lip+) - Lip + Control Change Data

Determines whether or not MIDI control change number #18 (GEN3: general control 3) will be added to the lip data transmitted by the WX5.

SW 1-8	Setting
OFF	No control change data added
ON	Control change data added

The control range of this data is not affected by the settings of Switch 1-6 or 1-7. The overall range is always 0 … 127, as listed below for the Tight Lip and Loose Lip modes.

• Tight Lip Mode

Reed Open = 0, Center = 64, Maximum = 127

• Loose Lip Mode

Reed Open = 0, Maximum = 127

NOTE

• According to the GM standard, control change #18 is for "general control" and is not assigned to any specific control function. By using the VL70-m Control Edit function it is possible to assign Scream, Growl, or other parameters to this control change number, thus making it possible to create a range of expressive effects.

● Switch 2-1 & 2 (Trns) - Transpose

Sets the "key" of the WX5: i.e. the actual pitch played when all keys are closed.

SW 2-1	SW 2-2	Setting
OFF	–	C2
ON	OFF	B♭1
ON	ON	E♭2

● Switch 2-3 & 4 (Fing) - Fingering

Specifies the WX5 fingering mode (page 12).

SW 2-3	SW 2-4	Setting
OFF	OFF	Saxophone(a)
OFF	ON	Saxophone(b)
ON	OFF	Saxophone(c)
ON	ON	Flute

● Switch 2-5 (Fast) - Fast Response

Sets the speed at which the WX5 will respond when a note is played.

When OFF incidental tones are less likely to occur between notes, but notes may sometimes not be properly recognized when playing very fast passages. Beginning players should set this switch OFF, while advanced players who are capable of playing very fast passages may achieve better response with this switch set ON.

SW 2-5	Setting
OFF	Slow response (less incidental tones)
ON	Fast response (incidental tones may occur)

● Switch 2-6 (Hi ct) - High D/D♯ Key Assign

Determines whether the high D and D♯ keys will be used normally as playing keys, or to transmit control change data.

SW 2-6	Setting
OFF	Normal playing key operation
ON	Control change data transmission

When used to transmit control change data, the D and D♯ keys transmit the following control change numbers and values:

• High D

Press to transmit control change #81 (GEN6) with value 127, and release for value 0.

• High D♯

Press to alternately transmit control change #80 (GEN5) with values 0 and 127.

NOTE

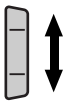
• According to the GM standard, control change #80 and #81 are for "general control" and are not assigned to any specific control functions. By using the VL70-m Control Edit function it is possible to assign Scream, Growl, or other parameters to these control change numbers, thus making it possible to create a range of expressive effects.

● Switch 2-7 & 8 (Whl) - Pitch Bend to MIDI Data

Determines the initial power-on Pitch Bend Wheel control mode (page 13).

SW 2-7	SW 2-8	Setting
OFF	OFF	Mode 1
OFF	ON	Mode 2
ON	OFF	Mode 3
ON	ON	Mode 4

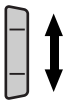
Mode 1



Pitch bend up data

Pitch bend down data

Mode 2



Modulation wheel data

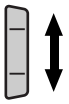
Pitch bend down data

Mode 3

Control change #16 (0 … 127) data

Control change #17 (0 … 127) data

Mode 4



Brightness up (control change #74) data

Brightness down (control change #74) data

NOTE

- *After the power has been turned on, these setting can be changed by using the Setup button and octave keys as described on page 13.*

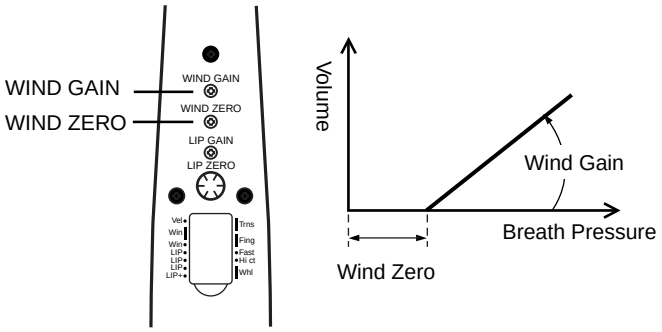
Wind & Lip Sensor Adjustment

Perform the sensor adjustments after selecting the required playing mode (page 10).

Wind Zero & Wind Gain Adjustment

Adjust both Wind Zero and Wind Gain to set the ideal relationship between wind pressure input and MIDI data output for your playing style.

- **Wind Gain**
  Sets the sensitivity to breath pressure.
- **Wind Zero**
  Sets the minimum amount of breath pressure which must be applied before sound is produced.

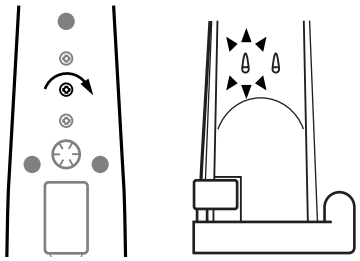


Before adjusting the wind gain and wind zero, be sure to check the type of MIDI data which is being transmitted by the WX5 in response to breath input, and make sure that your tone generator is set up to receive that type of data (page 22). For example, if the WX5 is set to transmit Breath Controller data (control change #02) but the tone generator is not set up to receive Breath Controller data, the wind sensor cannot be adjusted. Adjusting the wind gain and wind zero parameter is equivalent to selecting the ideal mouthpiece and reed for an acoustic wind instrument, so be sure to make these adjustments carefully.

Adjustment Procedure

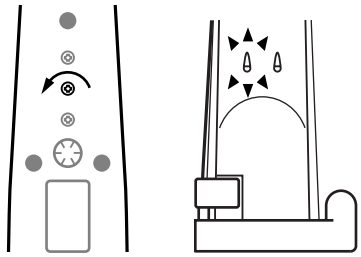
1 Select a voice which is responsive to breath control, and apply breath pressure to the WX5. For this adjustment it is better to select a sustained (non-decaying) type of voice such as organ, rather than a decaying voice like piano.

2 Using a small screwdriver, rotate the WIND ZERO control clockwise until LED 2 lights and the note begins to sound (page 11).



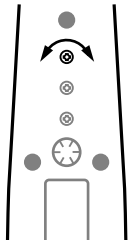
NOTE • *If no sound is produced, check your connections and MIDI channel settings.*

3 When the note begins to sound, rotate the WIND ZERO control counterclockwise just until LED 2 goes out and the sound stops.



4 Applying only the minimum amount of breath pressure you want to produce sound output, repeat steps **2** and **3**, above, until set as required.

5 Using a small screwdriver, adjust the WIND GAIN control for optimum sensitivity while applying breath pressure to the WX5. Rotating the control clockwise increases sensitivity.



6 The WIND ZERO setting may change slightly when WING GAIN is adjusted, so you may have to repeat the WIND ZERO and WIND GAIN adjustments a few times to get everything exactly right.

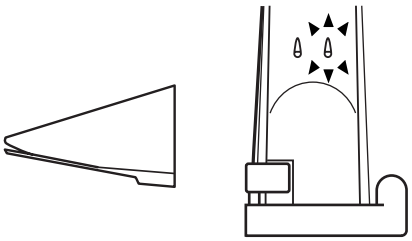
Lip Zero & Lip Gain Adjustment

The WX5 lip sensor translates lip pressure applied to the WX5 reed to MIDI pitch bend data. Greater lip pressure raises the pitch. In the Tight Lip mode, however, the range of pitch variation which can be produced via lip pressure is much smaller than that which can be produced via the Pitch Bend Wheel. The adjustment procedures for the Tight Lip and Loose Lip modes are different, so use the adjustment procedure which is appropriate for the playing mode you have chosen.

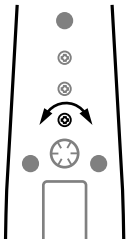
When Flute fingering is selected use the Loose Lip adjustment procedure (the Tight/Loose Lip settings have no effect on playability when Flute fingering is selected).

Tight Lip Mode Adjustment Procedure

1. Select a voice on your tone generator.
2. Play a note while applying normal lip pressure to the WX5 reed.
3. Watch the LED1 indicator and, if it is lit, adjust the LIP ZERO control so that it just goes out.



4. Using a small screwdriver, adjust the LIP GAIN control for optimum lip sensitivity. Rotating the control clockwise increases sensitivity.

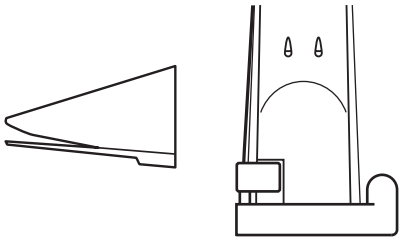


5. Repeat steps **2** through **4** as many times as necessary until the lip zero and lip gain are set satisfactorily.

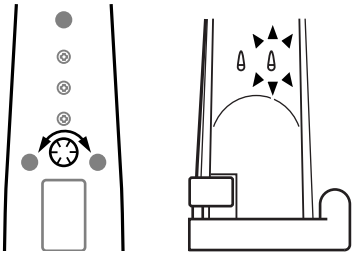
NOTE • *Lip sensor adjustments can only be made with the reed (saxophone type) mouthpiece.*

Loose Lip Mode Adjustment Procedure

1. Play a note while applying no lip pressure to the WX5 reed and confirm that the LED 1 indicator is not lit. If it is lit, adjust the LIP ZERO control so that it just goes out.



2. Select a voice on your tone generator.
3. Beginning with no pressure applied to the reed, play a note and gradually increase your lip pressure.
4. Adjust the LIP ZERO control so that the pitch begins to change at the desired point as lip pressure is increased.



5. Using a small screwdriver, adjust the LIP GAIN control for optimum lip sensitivity. Rotating the control clockwise increases sensitivity.

* When the Flute fingering is selected (page 12), adjust LIP GAIN so that normal pitch is produced when the reed is completely open, and so that the pitch shifts up one octave when appropriate lip pressure is applied.

NOTE • *Please note that sensitivity is greater when the loose lip mode is selected.*

6. Repeat steps **3** through **5** as many times as necessary until the lip zero and lip gain are set satisfactorily.

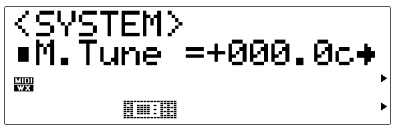
NOTE • *For some players it might be better to adjust for lip zero when a slight amount of pressure is applied to the reed. Adjust for the playing feel that best suits your style.*

Two tuning methods are possible with the WX5: Tone Generator Tuning, and Lip Sensor Tuning.

■ Tone Generator Tuning

Most tone generators have a master tuning parameter that can be used to tune the tone generator's sound. When using a Yamaha VL70-m or MU-series tone generator, use the Master Tune parameter in the System Setup display in the UTILITY mode to set overall system tuning. Refer to your tone generator's owner's manual for tuning details.

VL70-m Display Setting



NOTE

- *It may be convenient to use the Audition function (page 21) to produce output while tuning.*
- *The VL70-m also has special "WX Lip" and "WX Lip Lock" parameters which can be used for optimum tuning and playability.*

■ WX5 Tuning (Lip Sensor Tuning)

See page 26.

Tone Generator Settings

The WX5 transmits a range of MIDI messages which can be used to control tone generator parameters. Familiarity with your tone generator and how it responds to the MIDI data transmitted by the WX5 is vital for realizing the maximum musical potential of your WX5 system. Refer to the tips below, and your tone generator's owner's manual for details.

■ Pitch Bend

The WX5 Lip Sensor and Pitch Bend Wheel data are transmitted in the form of MIDI pitch bend data. Be sure to set an appropriate pitch bend range on your tone generator. For subtle control a pitch bend range setting of between about 2 and 4 should be ideal. For broader control try a range setting between about 5 and 7. For really sweeping pitch bends, try a setting of 8 or more.

■ Velocity

The WX5 transmits breath attack information in the form of MIDI velocity data. Yamaha recommends, however, that you set your tone generator's velocity to a fixed value in order to facilitate breath control of volume. However, if velocity is the only means you have of controlling volume and timbre, then it might be a good idea to allow some velocity sensitivity particularly when playing voices such as bass, drums, and piano, which depend on the characteristics of the attack for their sound.

■ Breath Control

Breath strength information is transmitted by the WX5 in the form of MIDI breath control data which is primarily used to control volume and timbre. Initially set the breath control response of your tone generator so that the full breath control range can be used, then readjust for the optimum range while actually playing the WX5.

When using a Yamaha VL70-m be sure to set the Breath Mode parameter to "BC/WX."

■ Program Change

The WX5 is capable of transmitting MIDI program change data in order to switch voices on your tone generator. Make sure your tone generator is set up to receive program change data, unless you only intend to play one voice and don't want that voice to be accidentally changed.

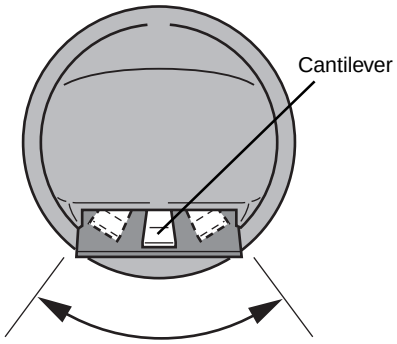
A Yamaha MFC10 MIDI Foot Controller can be set up for convenient foot selection of a specified range of voices.

Maintenance

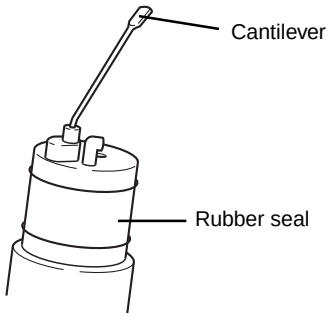
Although the WX5 does not require the constant maintenance that acoustic wind instruments do, the simple maintenance steps described below will ensure that your WX5 will deliver optimum performance at all times.

- When the mouthpiece and/or reed become dirty, remove and wash the mouthpiece with plain water or a dilute neutral detergent solution, as required. Wipe the instrument itself with a soft, dry cloth.
  Be careful not to bend or otherwise damage the lip sensor cantilever inside the mouthpiece cavity when removing or replacing the mouthpiece. The mouthpiece can be rotated slightly to facilitate removal.

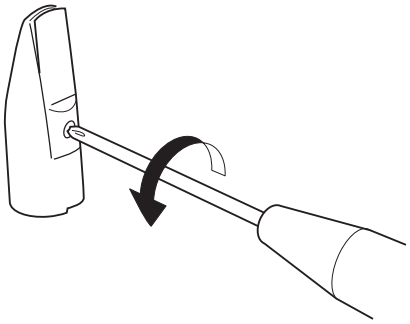
Top view of mouthpiece



Mouthpiece can be rotated over approximately this range



The reed can be removed for cleaning by using a screwdriver, as shown in the illustration.



- When replacing the mouthpiece, a little “Recorder Cream” (supplied with the WX5) applied to the rubber seal on the instrument can make insertion smoother.

- Clean the cantilever and seal rubber by wiping with a soft, dry cloth. Be careful not to bend or otherwise damage the cantilever.

CAUTION

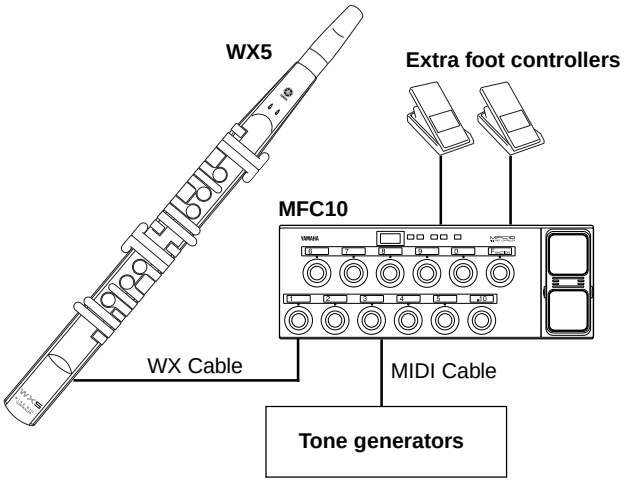
- *Maintenance procedures commonly used on acoustic wind instruments (e.g. key oil, pad replacement, etc.) can damage the WX5 and should be avoided.*

MIDI System Setup Examples

The WX5 can be used with MIDI devices other than just tone generators for expanded capabilities.

Foot Control

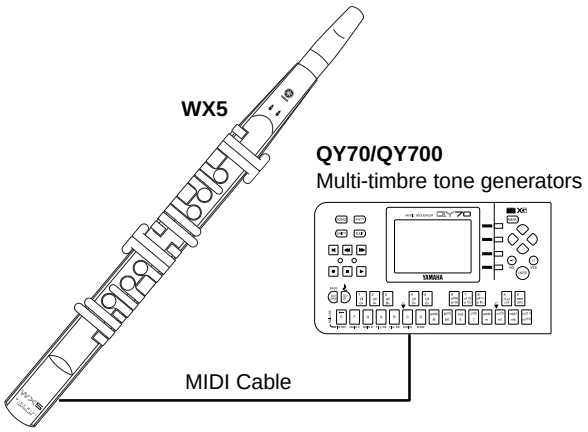
Data from a Yamaha MFC10 MIDI Foot Controller can be added to the MIDI output from the WX5 for extra control capability.



- Up to 128 MIDI program change numbers can be memorized and transmitted to the tone generator via convenient foot control.
- Up to 100 types of MIDI control change data can be memorized and transmitted to the tone generator as required.
- The MFC10 foot controller can be used to transmit just about any type of continuous MIDI control change data.
- Two extra foot controllers can be connected to the MFC10's own foot controller.

Sequencer Recording & Playback

The WX5 can be connected to an integrated sequencer/tone generator unit such as the Yamaha QY70 or QY700 to allow convenient recording and playback of MIDI data.



- Since the QY70 and QY700 feature built-in multi-timbre tone generators, no extra equipment is required for high-quality sequence recording and playback.
- The WX5 could also be connected to a computer equipped with music sequencing software for advanced sequencing and editing capabilities.

Troubleshooting

PROBLEM	POSSIBLE CAUSE/SOLUTION
The LED indicators don't light when the power is turned on.	• The Loose Lip mode is selected. When the Loose Lip mode is selected the LED indicators may not light. This is normal. • If the Tight Lip mode is selected, the lip sensor may not be adjusted properly. Follow the adjustment procedure outlined on page 26.
No sound is produced when breath pressure is applied to the WX5.	• The wind sensor may not be properly adjusted. Follow the adjustment procedure outlined on page 25. • The Audition function may be turned on. Try turning the Audition function off as described on page 21. • The tone generator power may be off, or its MIDI settings may be not be set up properly for use with the WX5. Check your tone generator.
Volume too low, or it is too difficult to produce sufficient volume.	• The wind sensor may not be properly adjusted. Follow the adjustment procedure outlined on page 25. • The sensitivity (software wind gain) setting may be too low. Refer to page 20. • Also check the voice you are using as well as relevant tone generator settings.
Sound is produced even when no breath pressure is applied to the WX5.	• If the LED2 indicator is lit when no breath pressure is applied, this may mean that the wind sensor is not adjusted properly. Follow the adjustment procedure outlined on page 25. • The Key Hold function may be engaged. Try pressing the Key Hold button to disengage Key Hold. • The Audition function may be turned on. Try turning the Audition function off as described on page 21.
The pitch doesn't change as expected when lip pressure is applied to the reed.	• No lip pressure can be applied if you are using the reedless (recorder type) mouthpiece. Use the reed (saxophone type) mouthpiece if you want to use lip control. • The setup switches related to lip sensor operation may not be set properly. Refer to the instructions for switches 1-6 and 1-7 on page 22, 23. • The voice you have selected may not allow pitch control. Use a voice that is set up to allow pitch control.
The volume doesn't change as expected when breath pressure is varied.	The volume control settings of the WX5 and tone generator may not be matched properly. If the WX5 wind sensor is set to transmit breath data as MIDI breath control data (control change #02), then the tone generator must be set up to allow volume control via the same type of data. Either change the WX5 wind sensor data type to match that of the tone generator (page 22), or set the tone generator to allow breath control.

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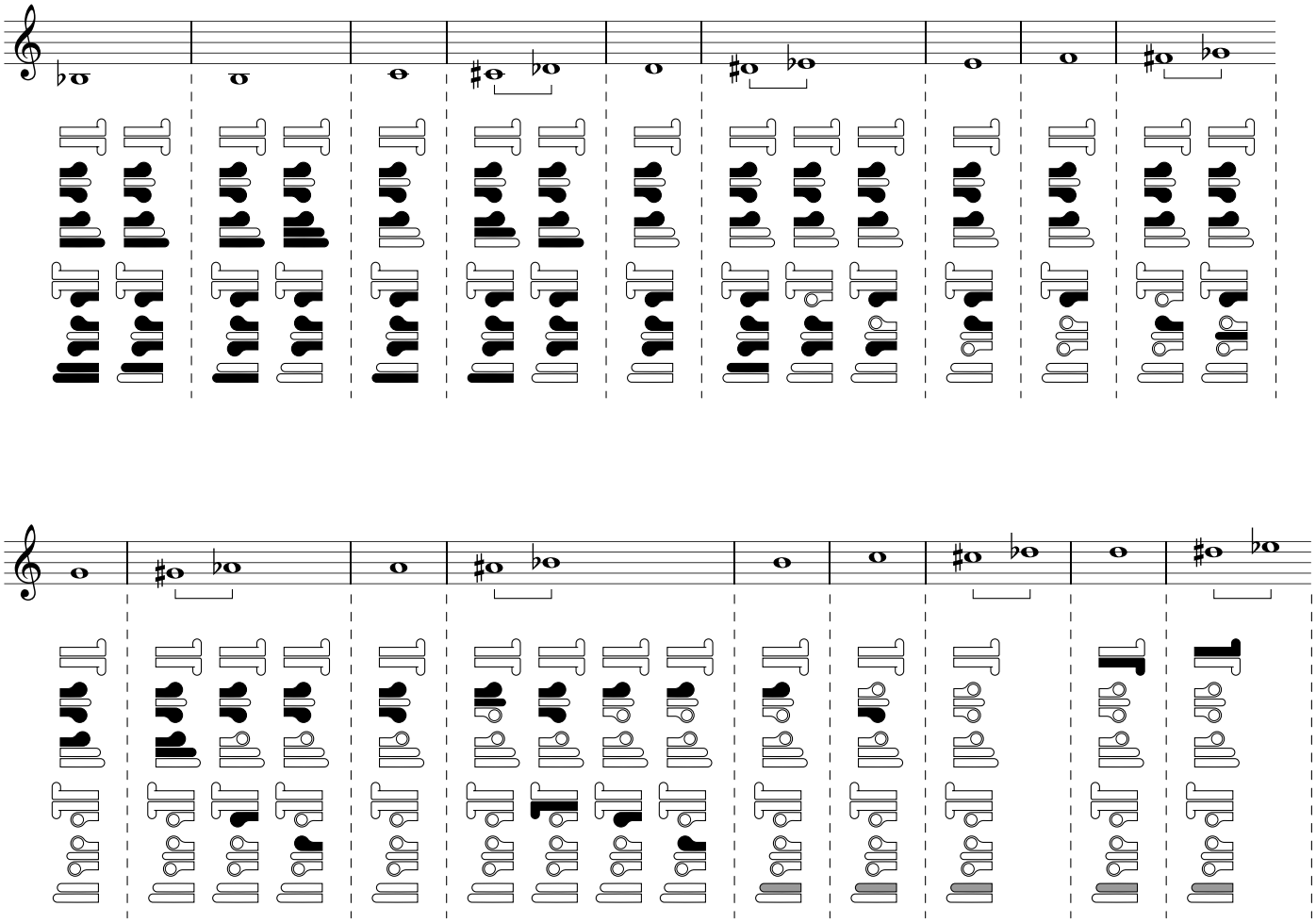
WX5 Fingering

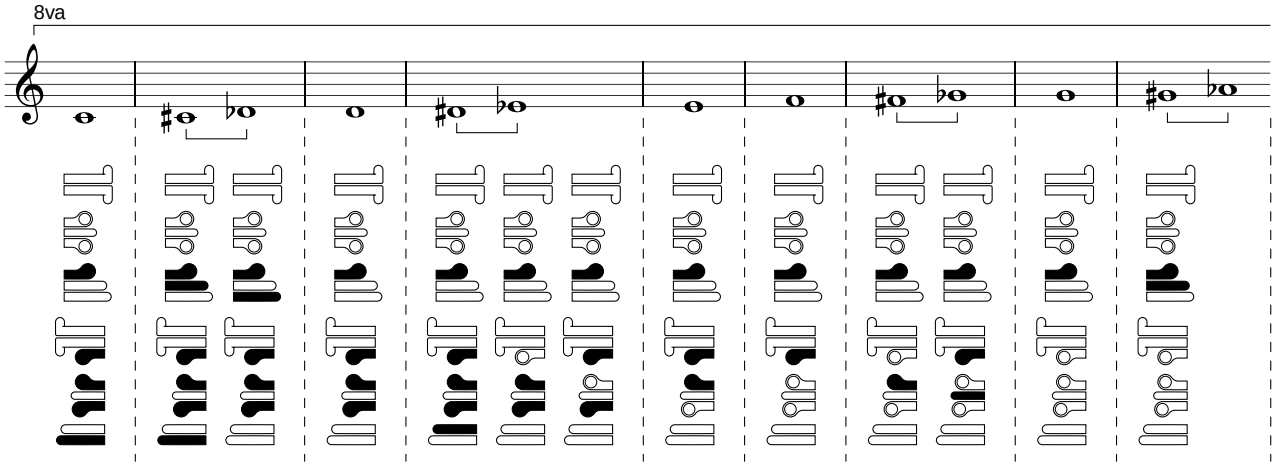
Refer to page 12 for more information about the WX5 fingerings.

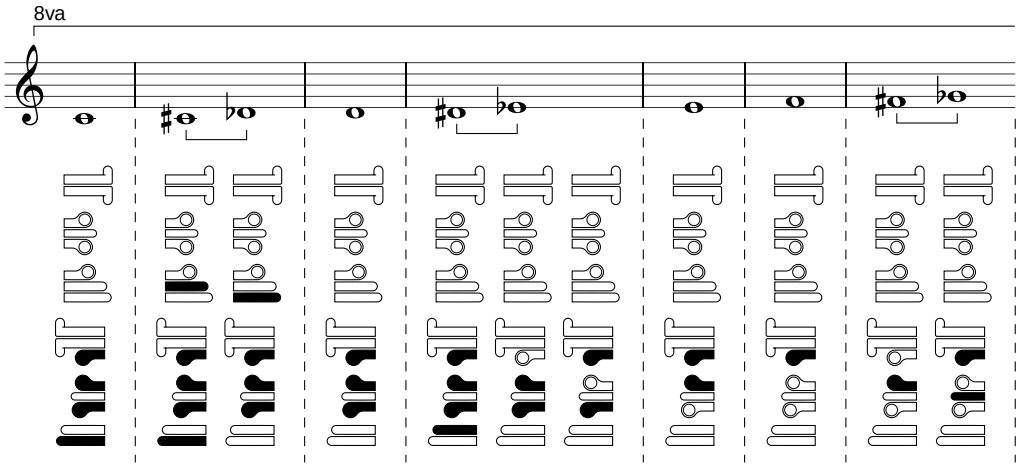
Saxophone(a)

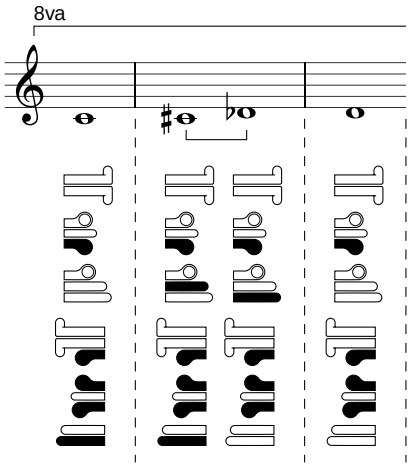


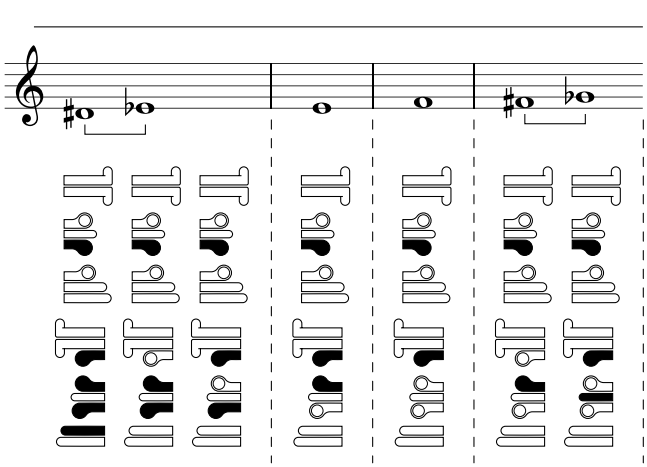
- The whole-tone trill key (side E) and semitone trill key (side A♯) raise the pitch of all notes a whole tone or semitone, respectively.
- The cross-hatched keys raise the pitch of notes in the range shown above a semitone in the same way as the semitone trill key.

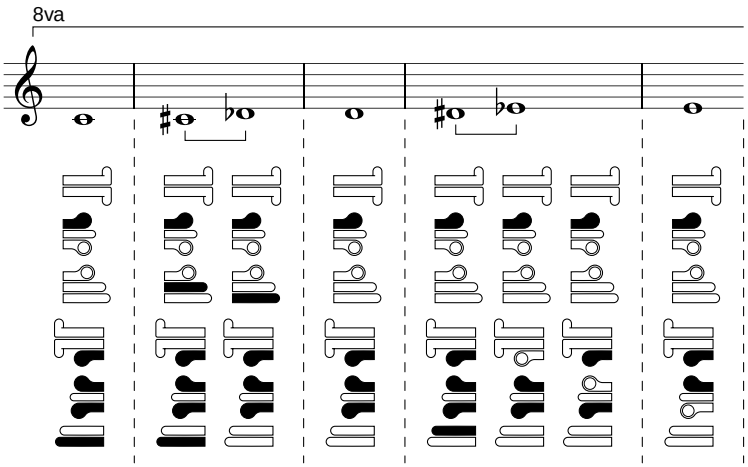
Saxophone(a)
Octave up



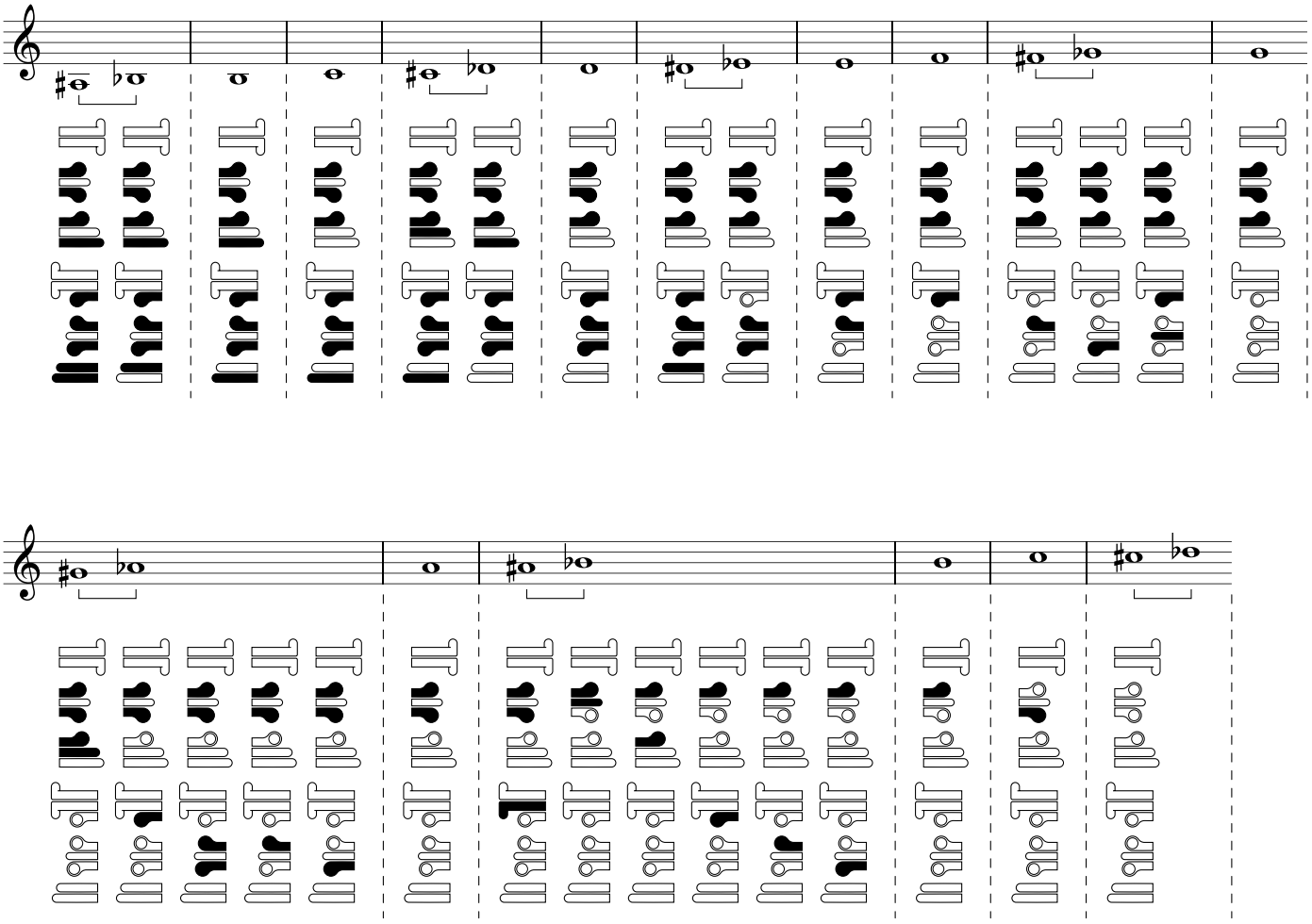






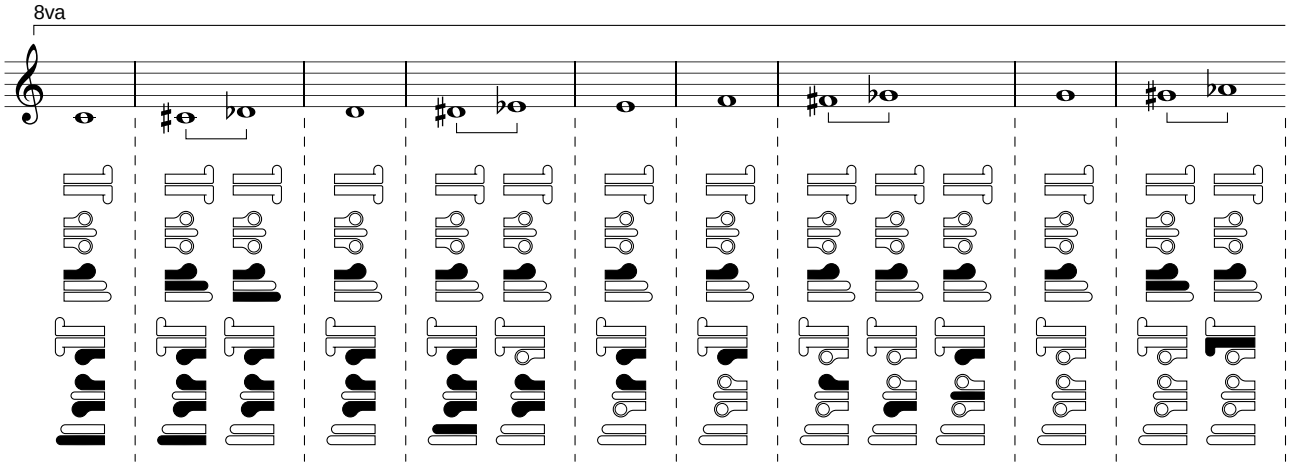


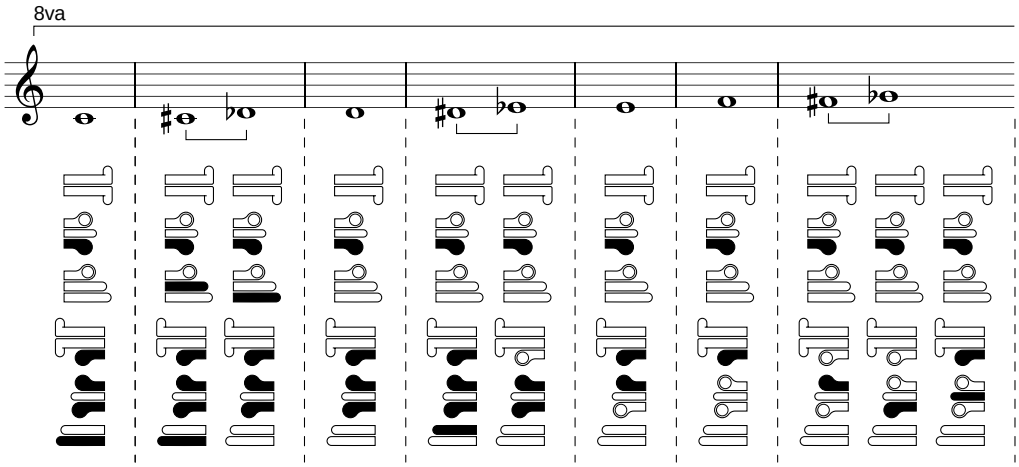
Saxophone(b)

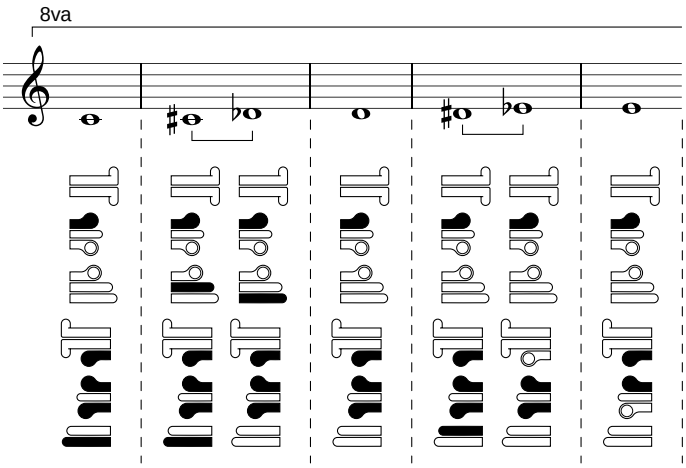


- The whole-tone trill key and semitone trill key raise the pitch of all notes a whole tone or semitone, respectively.
- The High D♯ key and High D key raise the pitch of all notes a whole tone or semitone, respectively.
- The G♯ key raises the pitch of notes outside the G … C♯ (D♭) range a semitone.
- The B key and C key lower the pitch of all notes a semitone or whole tone, respectively.
- The D♯ key raises the pitch of all notes a semitone.

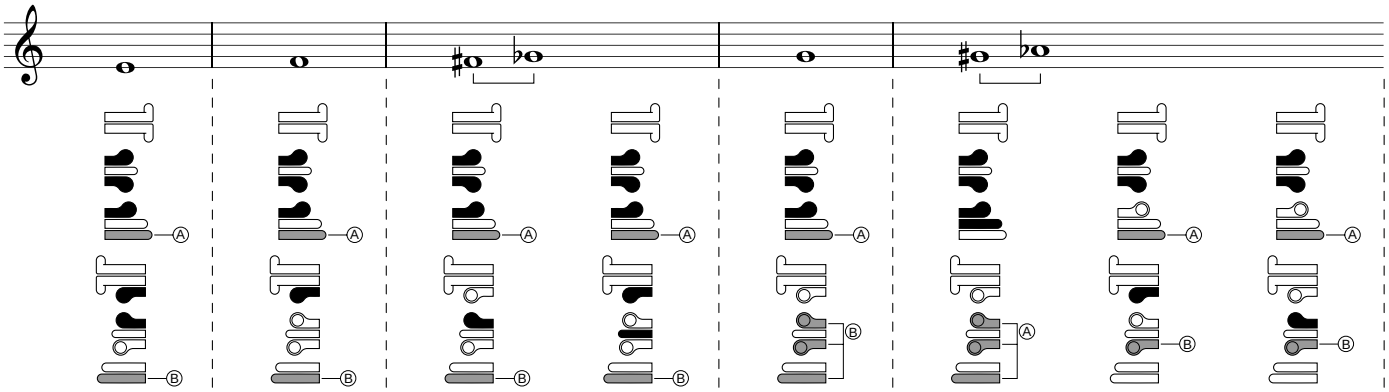
Saxophone(b)
Octave up

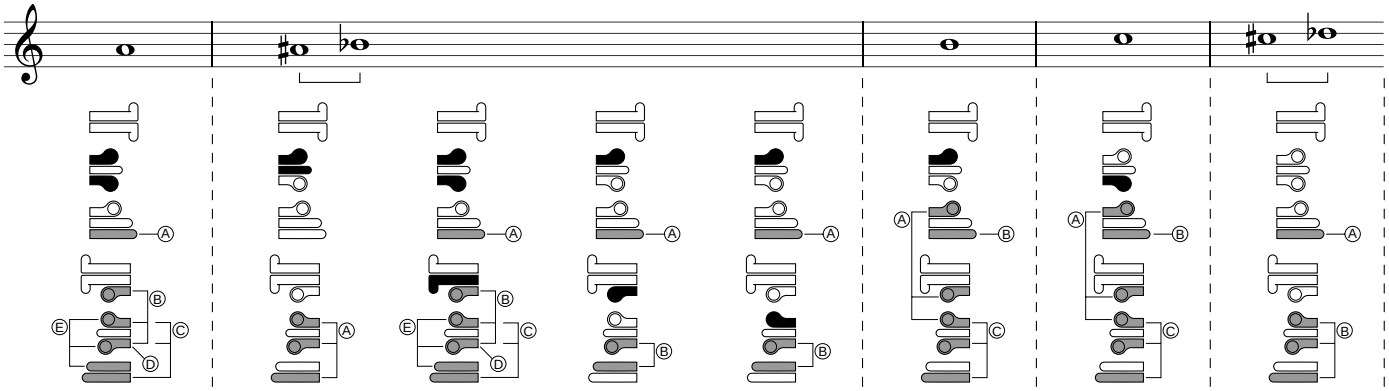


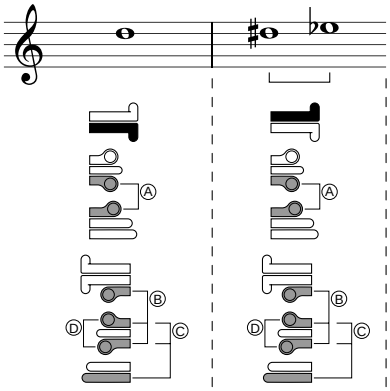




Saxophone(c)



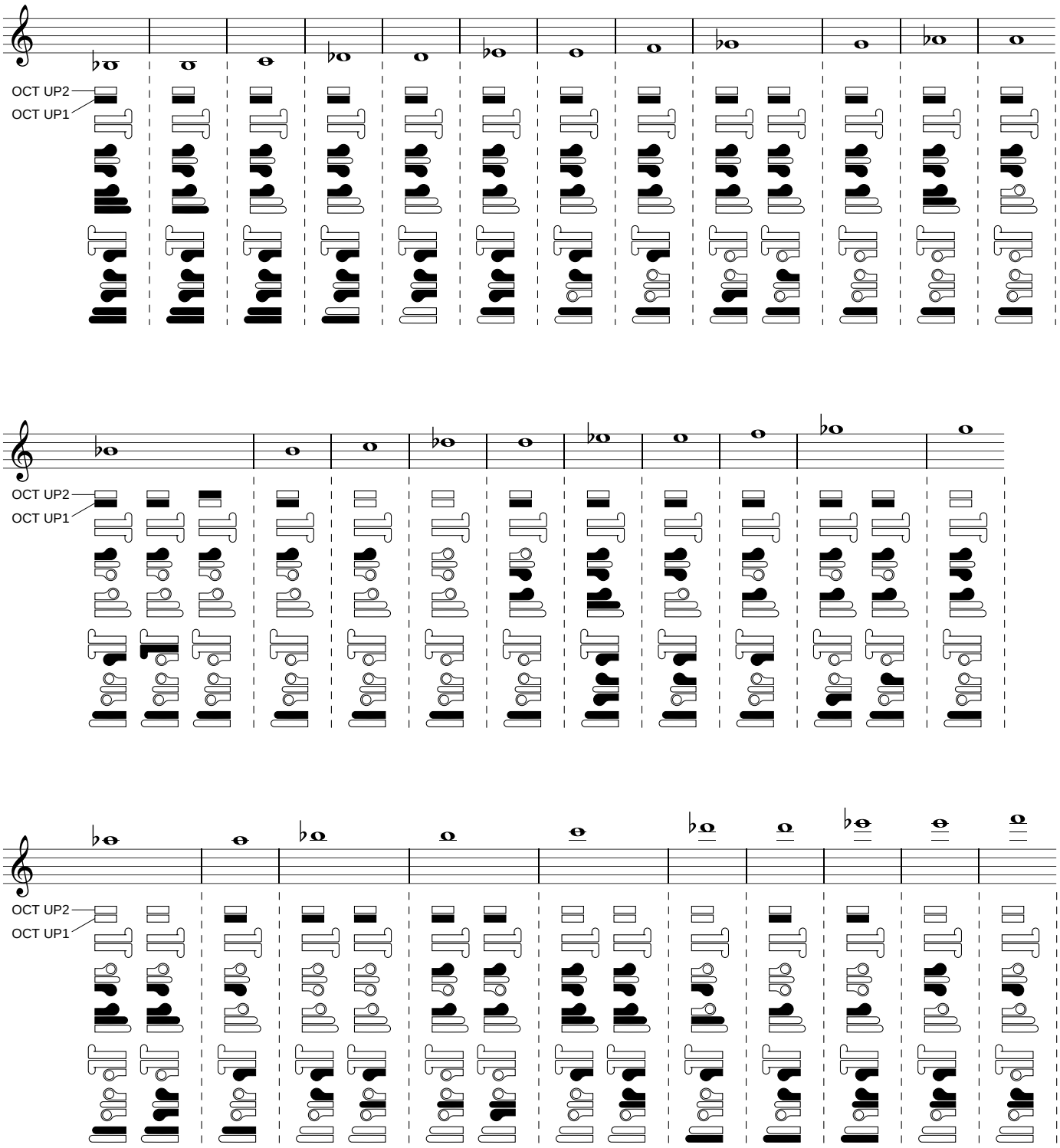




This chart shows only the alternate fingerings provided in addition to the Saxophone(a) fingerings.

- Alternate fingering variations are shown in A through E.
- When more that one key is shown in A through E, press all keys shown simultaneously.

Flute



MIDI Data Format

1. TRANSMIT DATA

1-1. CHANNEL VOICE MESSAGES

1-1-1. NOTE ON/OFF

STATUS	1001nnnn	($9n)
NOTE No.	0kkkkkkk	
	k = 10 (Bb-2) - 104 (G#6)	
	k = 0 (C-2) - 127 (G8)	
	when Follow Hold is ON.	
VELOCITY	0vvvvvvv	v = 0 Note Off

1-1-2 CONTROL CHANGE

STATUS	1011nnnn	($Bn)
CONTROL No.	0ccccccc	
DATA	0vvvvvvv	

* Transmit CONTROL NUMBER

c = 0	BANK SELECT MSB
c = 1	MODULATION
c = 2	BREATH CONTROLLER
c = 7	VOLUME
c = 11	EXPRESSION
c = 16	GENERAL CONTROL 1
c = 17	GENERAL CONTROL 2
c = 18	GENERAL CONTROL 3
c = 32	BANK SELECT LSB
c = 64	SUSTAIN
c = 65	PORTAMENTO
c = 74	BRIGHTNESS
c = 80	GENERAL CONTROL 5
c = 81	GENERAL CONTROL 6

1-1-3. PROGRAM CHANGE

STATUS	1100nnnn	($Cn)
PROGRAM No.	0ppppppp	p = 0 - 127

1-1-4. PITCH BEND

STATUS	1110nnnn	($En)
LSB	0vvvvvvv	
MSB	0vvvvvvv	

9-bit transmit resolution.

2. CHANNEL MODE MESSAGES

2-1. MONO

STATUS	1011nnnn	($Bn)
MONO	01111110	($7E)
DATA	00000001	m = 1

2-2. POLY

STATUS	1011nnnn	($Bn)
POLY	01111111	($7F)
DATA	00000000	

3. SYSTEM EXCLUSIVE MESSAGE

Not transmitted.

4. REALTIME MESSAGE

4-1. ACTIVE SENSING

STATUS	11111110	($FE)

Active sensing is transmitted approximately once every 150 msec.

YAMAHA [Wind MIDI Controller] Date:17-Nov-1997
Model WX5 MIDI Implementation Chart Version : 1.0

Function ...		Transmitted	Remarks
Basic	Default	1	
Channel	Changed	1 - 16	
Mode	Default	x	
	Messages	x	
	Altered	**********	
Note Number		10 - 104	
	True voice	**********	
Velocity	Note ON	o 9nH,v=1-127	
	Note OFF	x 9nH,v=0	
After Touch	Key's	x	
	Ch's	x	
Pitch Bender		o *1	7 bit resolution
Control Change	0,1,2,7,11		
	16,17,18,32		
	64,65,74,80,81	o *1	
Prog Change		o 0 - 127	
	True #	**********	
System Exclusive		x	
System common	Song Pos.	x	
	Song Sel.	x	
	Tune	x	
System Real Time	Clock	x	
	Commands	x	
Aux	Local ON/OFF	x	
	All Notes OFF	x	
Mes-sages	Active Sense	o	
	Reset	x	

Notes: *1 ; assignable

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

WX5 Specifications

Sensors	Wind Sensor, Lip Sensor
Keys/Buttons/Switches	16 keys, Octave keys (Up2, Up1, Down1, Down2), Setup Button, Pitch Bend Wheel, Key Hold Button, Program Change Button, Power Switch, Setup Switches(16 DIP Switches)
Trim Controls	WIND GAIN, WIND ZERO, LIP GAIN, LIP ZERO
Terminals	DC IN 12V Connector, MIDI OUT Connector, WX OUT Connector
MIDI Transmit Channels	Channel 1-16
Power Supply	Power supplied by a WX-compatible tone generator when connected via the WX cable. 6 SUM-4(1.5V) batteries PA-3B AC Power Adaptor
Power Consumption	450 mW (when using the PA-3B power adaptor)
Dimensions	611(L) x 62(W) x 70(H) mm (24-1/6” x 2-1/2” x 2-3/4”)
Weight	520g (1 lbs. 2 oz) , excluding batteries
Supplied Accessories	Mouthpieces: Saxophone Type (attached), Recorder Type Mouthpiece Cap (attached) WX Cable Strap Recorder Cream Soft Case Owner’s Manual

** Specifications subject to change without notice.*

Key Operation Chart / MIDI Message Assignments

• **Key Operation Chart** ... This chart lists key operations other than fingering.

Setup Button	Audition Function Off	
Setup Button + Pitch Bend Wheel	Audition Function On	
Setup Button + Octave Key [Up1], [Down1]	Octave Transpose	
Setup Button + Octave Key [Up2], [Down2]	Sensitivity (Software Wind Gain)	
Pitch Bend Wheel + Setup Button + Octave Key [Up2]	Pitch Bend Wheel Function :	Pitch Bend Up, Pitch Bend Down
Pitch Bend Wheel + Setup Button + Octave Key [Up1]	Pitch Bend Wheel Function :	Modulation Wheel, Pitch Bend Down
Pitch Bend Wheel + Setup Button + Octave Key [Down1]	Pitch Bend Wheel Function :	Control Change #16, 17
Pitch Bend Wheel + Setup Button + Octave Key [Down2]	Pitch Bend Wheel Function :	Brightness Up, Brightness Down
Program Change Button + Octave Key [Up2]	Poly On	
Program Change Button + Octave Key [Up1]	Mono On	
Program Change Button + Octave Key [Down1]	Portamento On	
Program Change Button + Octave Key [Down2]	Portamento Off	
Program Change Button + Playing Keys	Program Change	
Program Change Button + High D, D♯ Keys	Program Change Increment/Decrement	
Program Change Button + D♯ Key + Playing Keys	Bank Select MSB	
Program Change Button + C Key + Playing Keys	Bank Select LSB	
Program Change Button + Key Hold Button + Playing Keys	MIDI Transmit Channel	
Program Change Button + Key Hold Button + Setup Button	Parameter Reset	
Key Hold Button + Octave Key [Up2]	Sustain	
Key Hold Button + Octave Key [Up1]	Portamento	
Key Hold Button + Octave Key [Down1]	Normal Hold	
Key Hold Button + Octave Key [Down2]	Follow Hold	

• **MIDI Message Assignments** ... The MIDI messages which can be transmitted by sensor, pitch bend wheel, and key operation are listed below.

	PB	MW	BC	VOL	EXP	GEN1	GEN2	GEN3	BR	GC5	GC6
Lip	❍							❍			
Lip		❍						❍			
Wind			❍								
Wind				❍							
Wind					❍						
PB	❍										
PB	❍	❍									
PB						❍	❍				
PB									❍		
High Keys										❍	❍
When Saxophone(c) fingering selected	❍								❍		

PB = Pitch Bend
MW = Modulation Wheel
BC = Breath Controller
VOL = Volume
EXP = Expression
GEN = General Control
BR = Brightness

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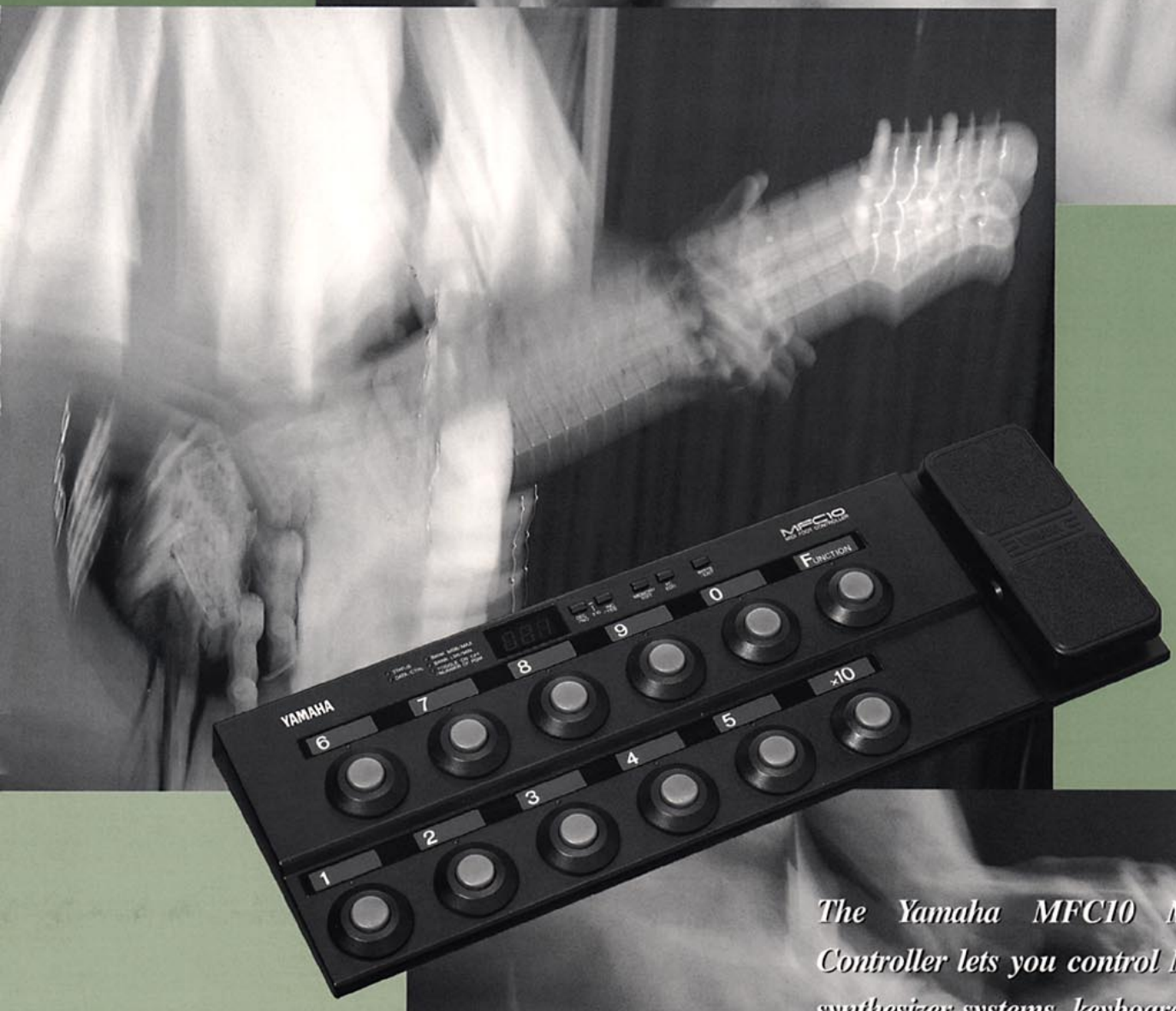
MFC10

MIDI FOOT CONTROLLER



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