

## 2. SETTING UP THE INSTRUMENT

### 2.1 PRECAUTIONS

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The SYNTHOPHONE is reliably built and easy-to-use. However, the differences in handling it, compared to a regular sax, are very important. Read the following instructions carefully, before assembling your instrument. Make sure you understand all the procedures before making any connections. Do not make any adjustments to the function controls before you fully understand them.

### 2.2 UNPACKING AND ASSEMBLY

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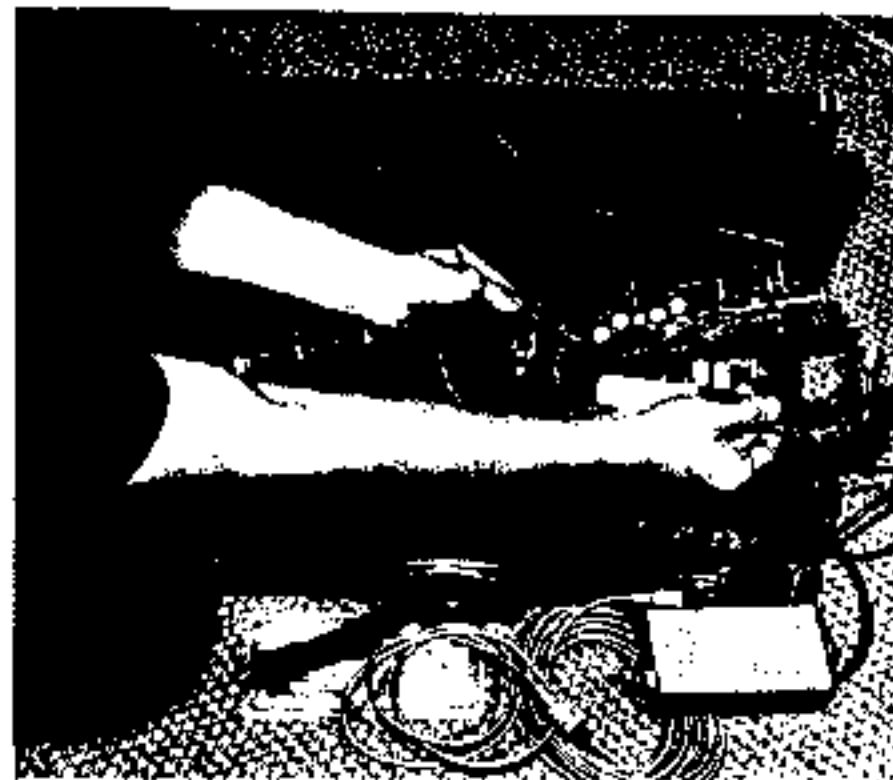
Check for the following materials:

- SYNTHOPHONE, including special mouthpiece
- Power supply
- One long and one short MIDI cable
- Spare set containing 3 ready-to-use reeds and 2 screwdrivers
- A neck strap
- Cleaning cloth (protecting the sax neck, while in the case)

Carefully take out your instrument. The neck is connected to the body with a spiral cable. Insert the neck into the body as usual, but make sure that the spiral cable is not tangled.

Examine your power supply for correct voltage setting:

Make sure the power box is unplugged before opening it. With the flat screwdriver supplied, open the box and set the 110 V / 220 V switch to the position needed. Make sure the correct voltage selection has been made before plugging it into your outlet. If a new fuse is needed, replace it with a 200ma type. Note that both sizes of fuses will be accepted by the built in fuse holder.



## 2.3 REED MOUNTING

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There is a reed already mounted on your mouthpiece when the instrument is shipped.

**Reeds for the SYNTHOPHONE have to be specially prepared, to give input to the lip pressure sensor inside the mouthpiece. DO NOT USE standard reeds with the SYNTHOPHONE. Reeds have to be set exactly in place in order to perform well.**

**Take a little time to understand the function of the reed:**

As you can see from the spare reeds supplied, there is a metal attachment mounted to each reed, which supports a small magnet at the tip of its protruding tongue. **The height of this tongue is important for a proper function of the lip pressure sensor, since the magnet has to be very close to the sensor inside the mouthpiece. Mount the reed and bend the tongue as illustrated.** The height of the tip can be measured by the width of a spare reed at its rear end.

## 2.4 SYSTEM CONNECTIONS

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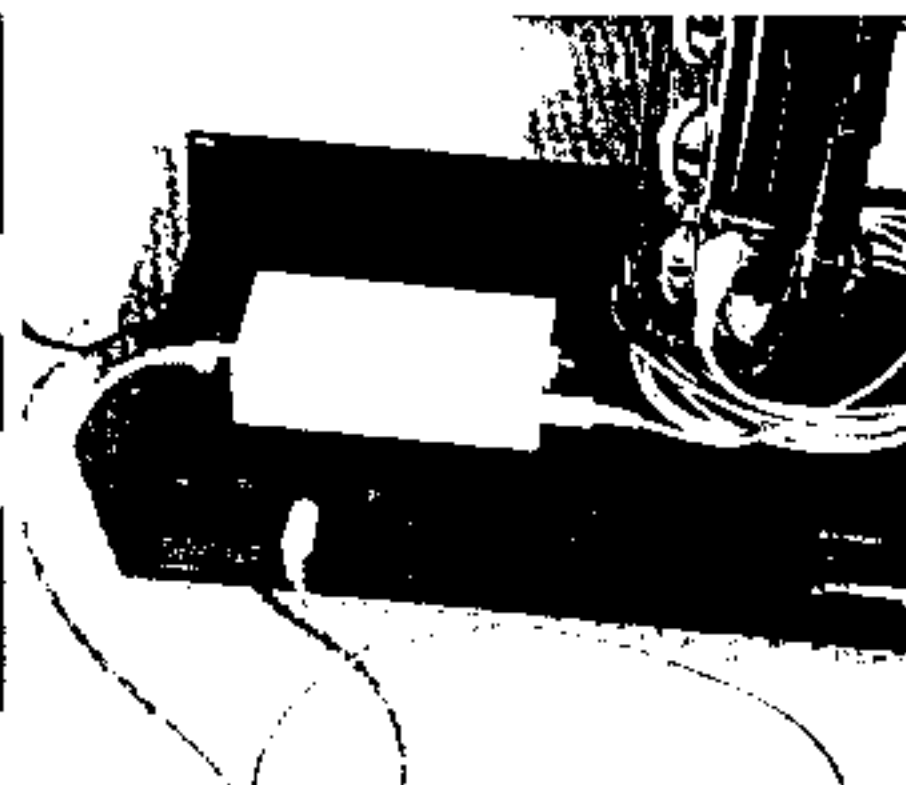
After your instrument is properly assembled and the voltage on your power supply correctly set, connect it with the LONG MIDI CABLE supplied, the angled plug to the MIDI socket on the instrument and the other connector to the front end of the power box, where you see the power switch and the L.E.D. above it. Plug the power cord into your outlet and switch on power. **The lamp inside the switch must now be "ON".** The L.E.D should be dark, but may blink irregularly when the instrument isn't held completely still. Now connect the other MIDI cable from either of the 2 MIDI OUT sockets in the back of the SYNTHOPHONE power box to your synthesizer's MIDI IN socket. Make sure your synthesizer is connected to a sound system and switch on all necessary equipment.

## 2.5 GETTING STARTED

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**You should be able to play your first notes on the SYNTHOPHONE.**

If no sound is produced, refer to chapter 8 in this manual and/or your synthesizer manual. Now read the following chapters about the use of additional functions built into the SYNTHOPHONE.



### 3. PERFORMANCE CONTROLS

#### 3.1 PANIC FUNCTION

On many of today's MIDI instruments there is some kind of a "panic button" that provides for an easy way out from some unknown conditions the instrument may be in. The SYNTHOPHONE panic function is used to return to known performance conditions immediately when you get lost. It's also a very helpful when starting out programming new patches. Because of its importance, a complete list of reset conditions is given below. But only when understanding of all special functions explained in the following chapters, you will fully appreciate the power of the panic function.

- press side Bb, side C & side E ---> activate the panic function

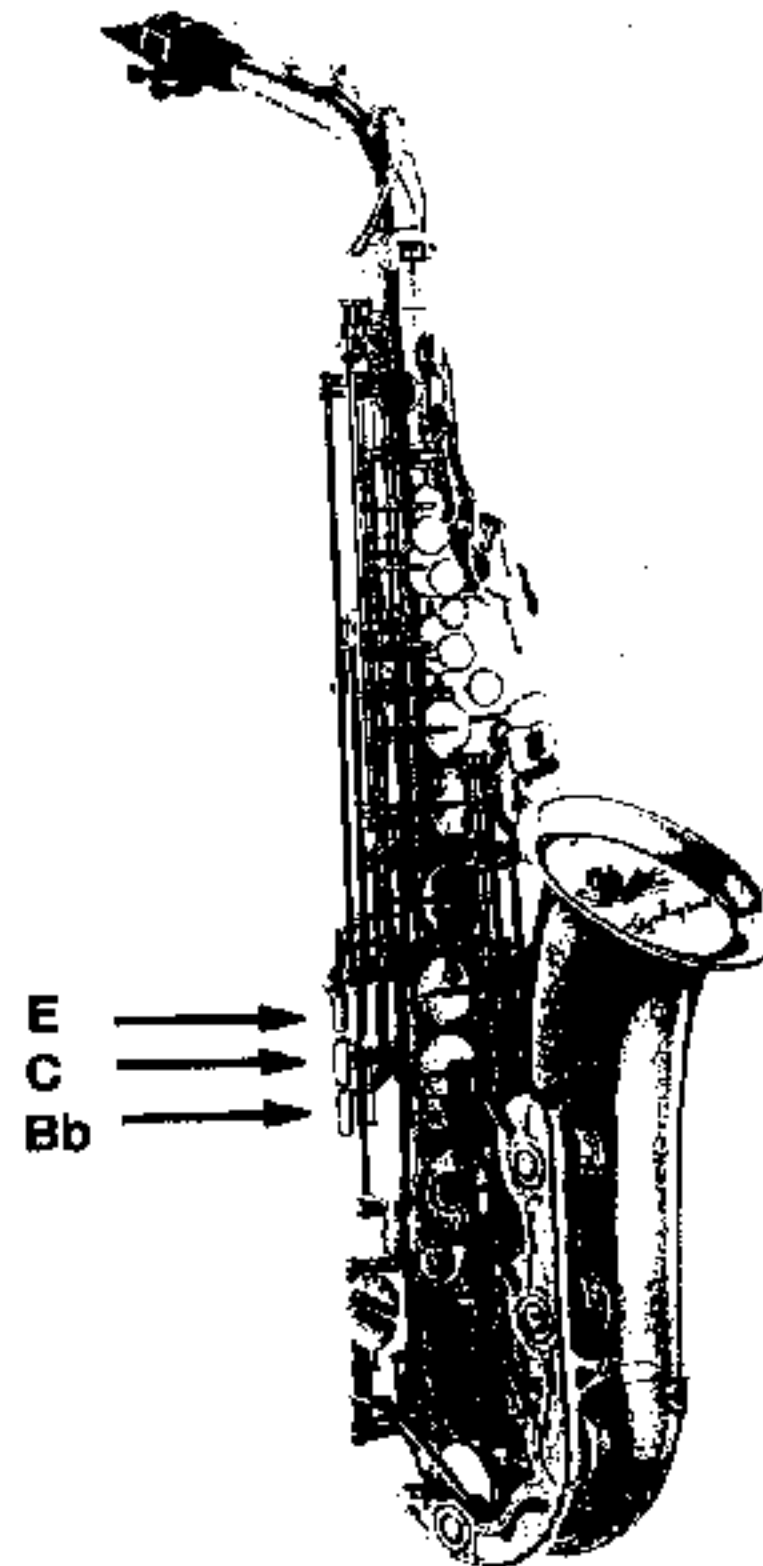
#### What the panic function does:

- Lip & wind sensors are automatically calibrated.  
(Therefore do not apply lip or wind pressure while pressing the panic keys.)
- Panic sends an extra "all note off" command, should a note have been "stuck on".  
(On power up, an extra "all note off" command is sent out from the SYNTHOPHONE.)

#### - in addition, the following user adjustable settings are reset:

Tuning of instrument	in C
Preset number	unchanged
MIDI channel	unchanged
Patch number (memory)	unchanged
Modulation control	level 2
Pitch Bend control	level 0
Breath control	level 5
Volume control	level 2
Aftertouch control	level 0
Velocity range	level 5
Key speed control	middle position
Transposition	middle octave
Dynamic harmony	single voice mode
Tonality (of harmony)	key of C
Freeze harmony	off
Harmony base	chords in thirds
Chord variation by lip	inversions
Harmony base exchange	inactive
Multi channel mode	poly (single channel)
Lip switching functions	inactive
Thumb-X-press	off

#### PANIC FUNCTION



## 3.2 ALTERNATE TUNINGS in Bb, C &amp; Eb

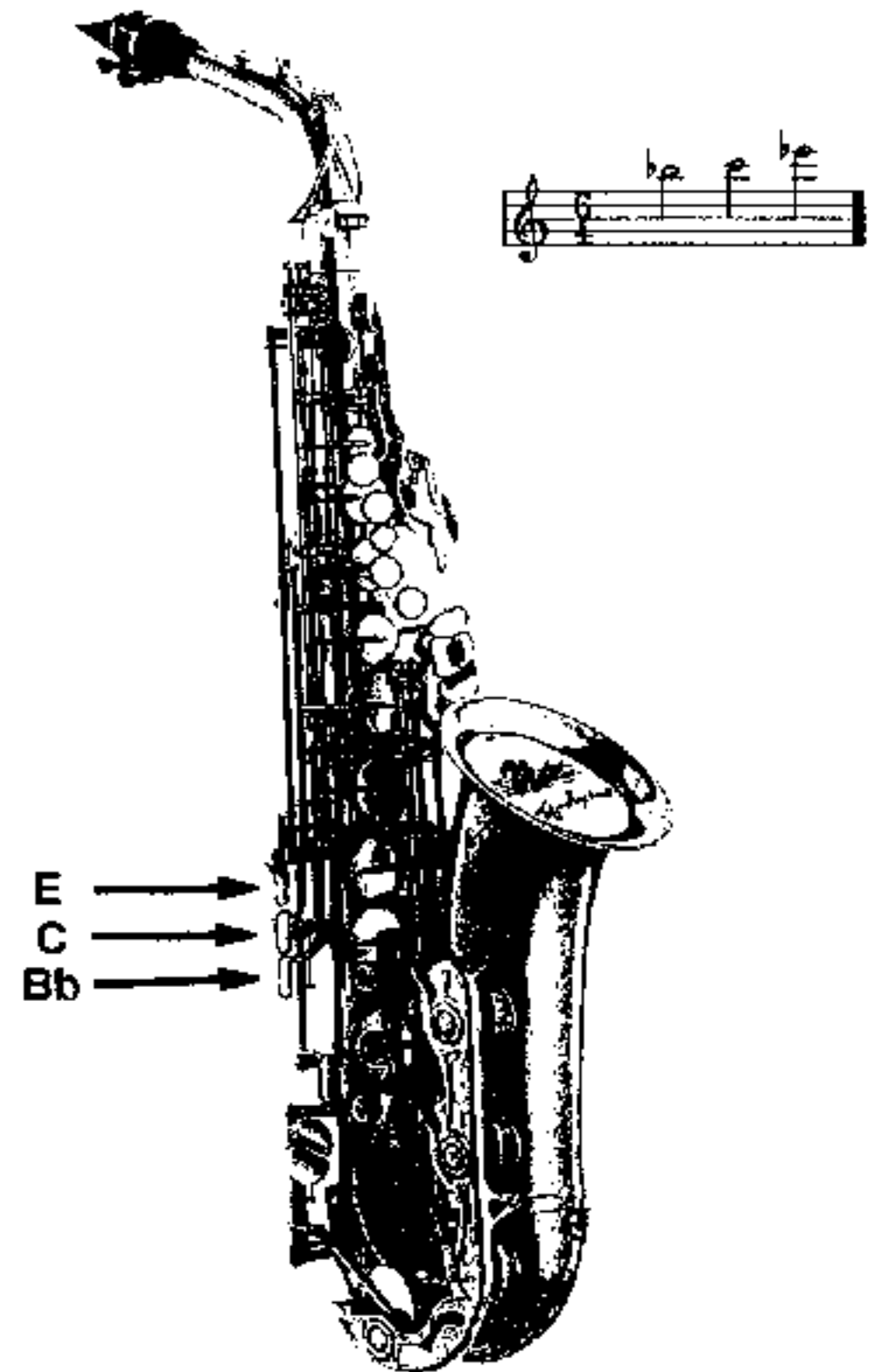
Your SYNTHOPHONE can be transposed instantly to any of three standard tunings:

- finger standard (top) Eb and press the "panic-keys" ---> key of Eb
- finger standard (front) Bb and press the "panic-keys" ---> key of Bb
- finger standard (middle) C and press the "panic-keys" ---> key of C

The panic function (s. 3.1) resets the instrument to the key of C!

**MUSICAL APPLICATIONS**

*Play your favorite tenor / soprano tunes on the "Bb-SYNTHOPHONE". Read concert parts (flute) in C. Eb-parts can be played in their original range without fingering problems.*



### 3.3 PRESET SELECTION

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128 Presets can be selected directly from the instrument.

- |                                  |                             |
|----------------------------------|-----------------------------|
| - hold F#-trill and press Eb (*) | ---> increase preset number |
| - hold F#-trill and press C (*)  | ---> decrease preset number |
| - hold F#-trill and press Eb/C   | ---> reset to preset #1     |

(\*) Sustained pressure on these fingerings will cause the preset counter to "scroll" forward or backward in a rapid change of presets.

The selected PRESET can be stored into memory (s. 3.6) along with its PATCH configuration.

The panic function does not change the selected PRESET number.

#### MUSICAL APPLICATIONS

*Some drastic sound changes can be achieved through simply changing presets. Programming very closely related sounds in a series of memory locations will give you "one" instrument, but with timbral nuances, different ranges, and other performance characteristics.*

### PRESET SELECTION



### 3.4 MIDI CHANNEL SELECTION

It is important, that your synthesizer(s) be set to receive the same MIDI channel on which the SYNTHOPHONE is transmitting its MIDI data.

Any of 16 MIDI channels available may be selected:

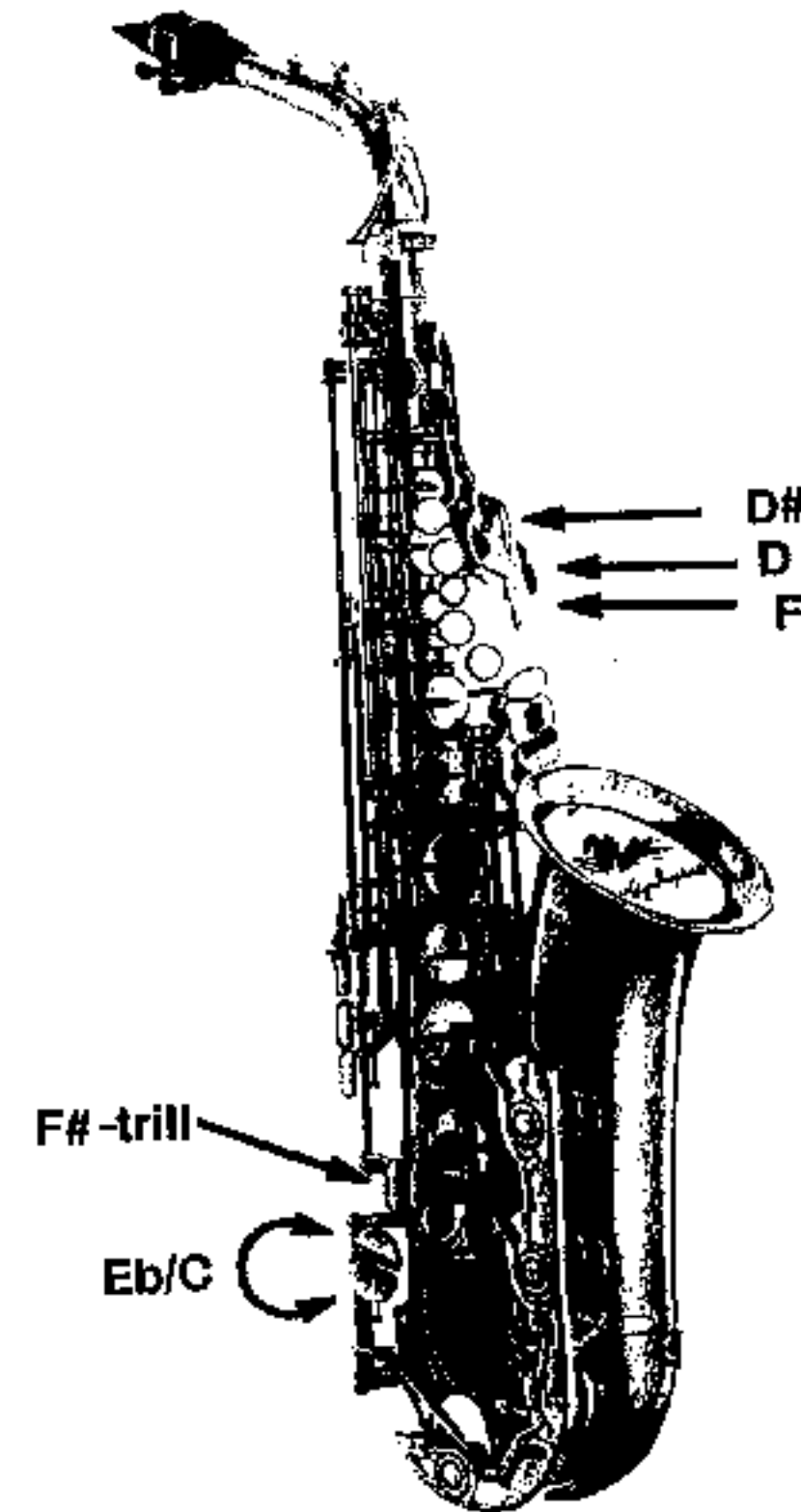
- F#-trill, side-D, D#, F and press Eb	--->	MIDI channel number + 1
- F#-trill, side-D, D#, F and press C	--->	MIDI channel number - 1
- F#-trill, side-D, D#, F and press Eb/C	--->	resets to MIDI channel #1

The panic function does not affect the selected MIDI channel.

#### MUSICAL APPLICATIONS

*In a multiple synthesizer setup, you can set each synthesizer to receive on a different MIDI channel. You can then select each sound module individually by simply stepping through different MIDI channels. As each PATCH (s. 3.6) may contain a different MIDI channel, it is advisable to keep track of each setting, especially when working with complex MIDI setups. Synthesizers, set to OMNI ON, will receive on all channels.*

### MIDI CHANNEL SELECTION



## 3.5 PATCH SELECTION

There are 32 PATCHES available from the built in memory. Each patch contains a COMPLETE configuration and can be recalled anytime, even after months of power down. When stepping up or down in PATCH numbers, the corresponding patches are immediately available.

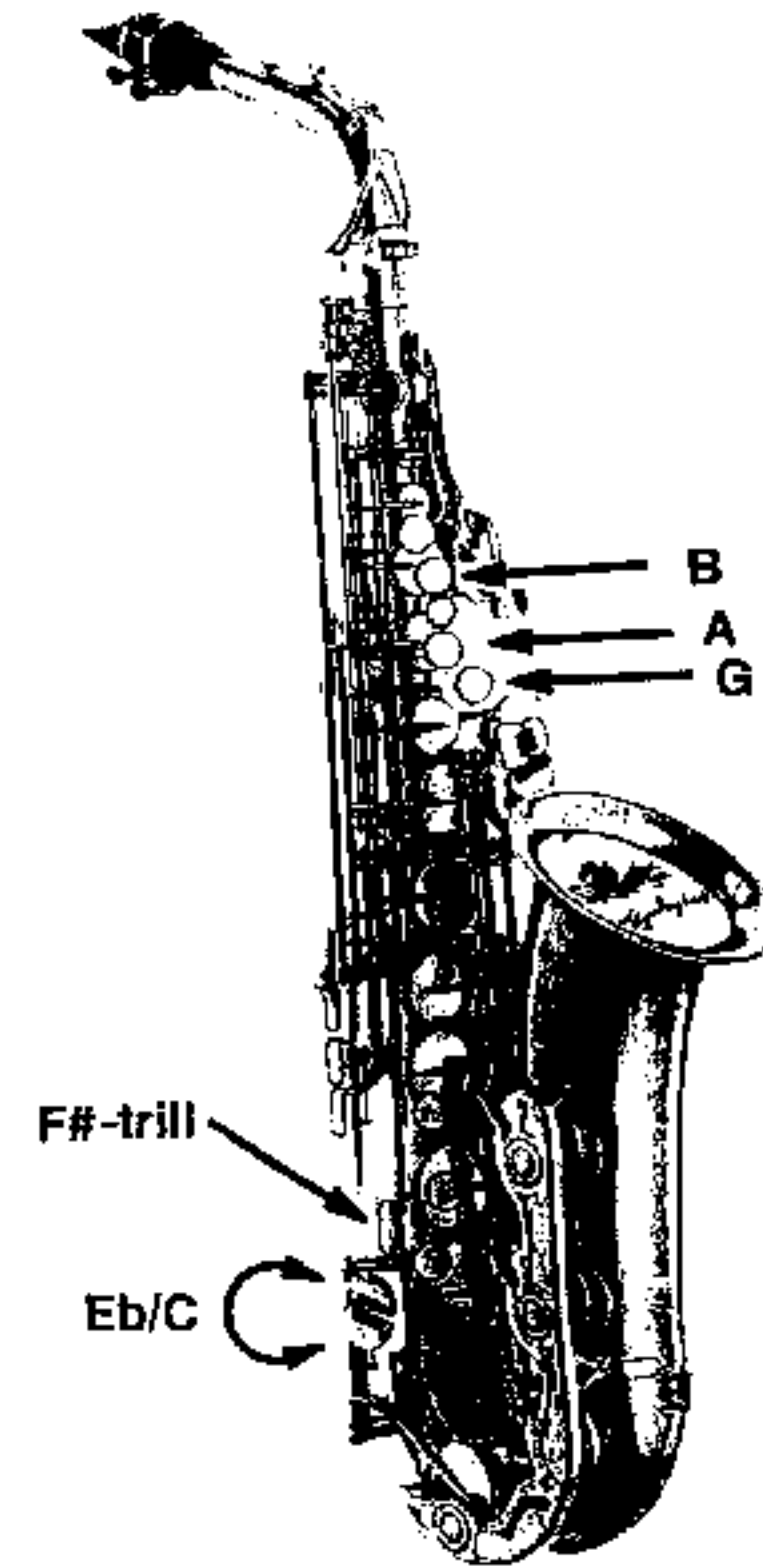
- |                                       |                        |
|---------------------------------------|------------------------|
| - G, A, B & F#-trill and press Eb (*) | ---> PATCH number + 1  |
| - G, A, B & F#-trill and press C (*)  | ---> PATCH number - 1  |
| - G, A, B & F#-trill and press Eb/C   | ---> Reset to PATCH #1 |

(\*) Sustained pressure of these fingerings will cause the PATCH counter to "scroll" forward or backward in a rapid change of PATCHES.

The panic function does not affect any of the information stored in memory.

## MUSICAL APPLICATIONS

PATCHES are very practical on stage where you don't want to worry about individual settings for a particular sound. Simply recall that PATCH you had previously established and play. Remember, that even the tuning Eb, Bb, C, the MIDI channel and your harmony applications can be saved and recalled with one simple fingering.



### 3.6 STORE PATCH TO MEMORY

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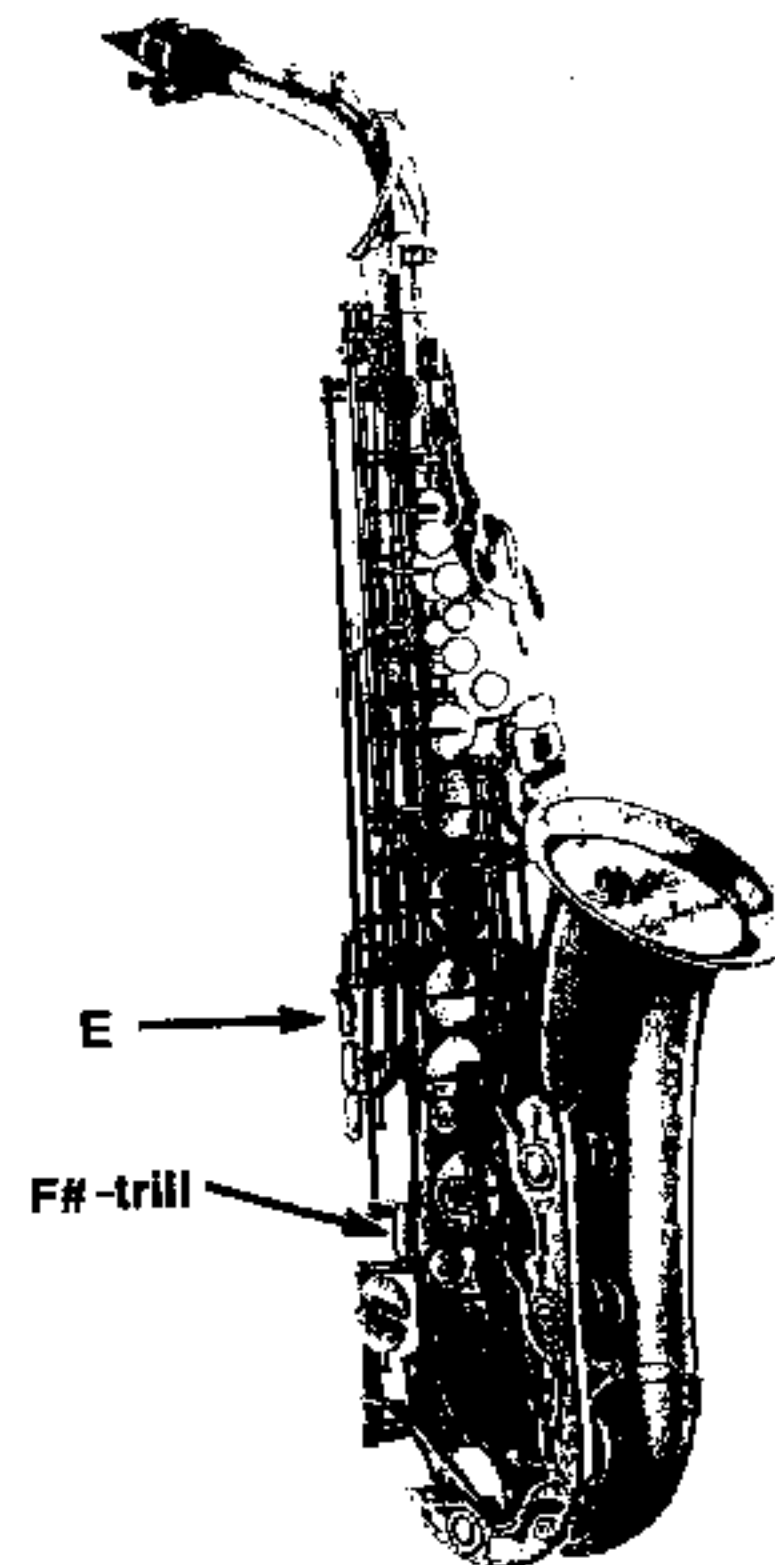
When a suitable configuration for playing a sound has been found, it can be stored to the currently selected PATCH memory. The previous contents of that memory are overwritten.

**Press side-E & F#-trill** ---> store current settings to selected patch-memory location

The memory data are retained after power down by a built in rechargeable battery.

### MUSICAL APPLICATIONS

(s. 3.5 Patch selection)





### 3.7 TOTAL MEMORY RESET

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Total memory resetting is only recommended when planning for all new patches.  
This function will reset your instrument to "factory conditions".

**Caution: this action will cancel out all previously stored PATCHES!**

Switch OFF power first...

then:

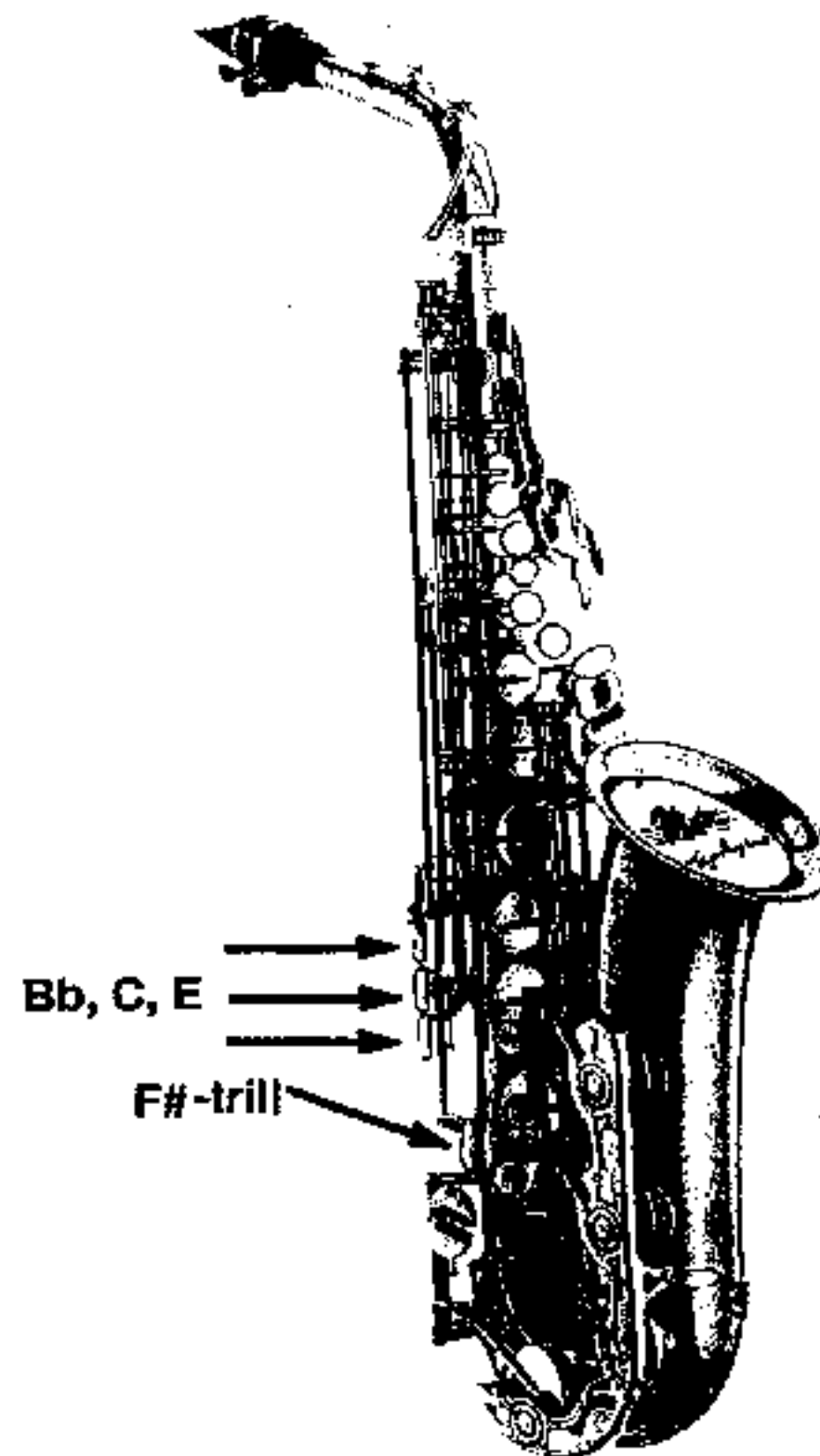
Hold PANIC & F#-trill while switching ON power... ---> memory is reset

- Now all 32 memory locations are reset to identical settings.
- Their parameters are now the same as after using the PANIC FUNCTION (s. 3.1).
- Patch #1 contains program change #1, patch #2 contains program change #2, etc...
- All patches are now set for MIDI channel #1

#### MUSICAL APPLICATIONS

(s. 3.5 Patch selection)

### TOTAL MEMORY RESET



3.8 MODULATION CONTROL

(MIDI Code Bn 01 yy)

Your synthesizer(s) can be programmed to produce vibrato. The lip pressure applied to the reed on your mouthpiece controls the **intensity of the vibrato** much like a **MOD WHEEL** on a MIDI keyboard. On the SYNTHOPHONE, six intensity levels are available for variable vibrato control from your reed.

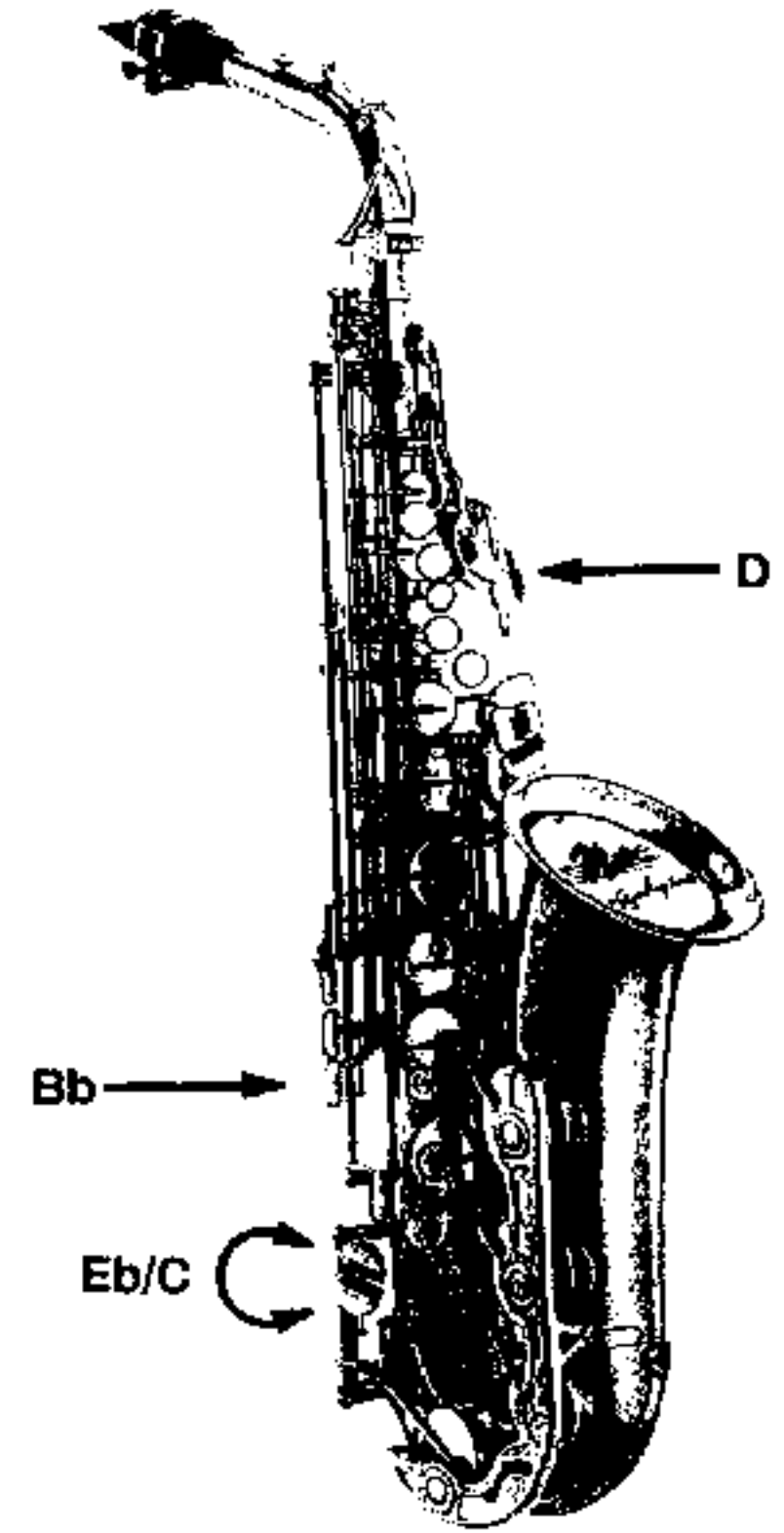
- side-Bb, D & press Eb	----> increases MOD level +1
- side-Bb, D & press C	----> decreases MOD level -1
- side-Bb, D & press Eb/C	----> resets MOD to level 0

level 5	full range modulation control
level 4	1/2 range modulation control
level 3	1/4 range modulation control
level 2	1/8 range modulation control
level 1	1/16 range modulation control
level 0	no modulation control

The panic function resets modulation control to level 2.

MUSICAL APPLICATIONS

*If you play a sound that does not need any vibrato, set modulation to level 0.  
If you need a more intensive vibrato, increase the modulation level and engage it using your lip pressure.*



3.9 PITCH BEND CONTROL

(MIDI Code En xx yy)

Lip pressure can be assigned to control PITCH BEND. There are 3 types of PITCH BEND control selectable in 6 sensitivity levels each. Upper B) and lower C) PITCH BEND settings can be freely combined to obtain best results: i.e. upper level = 3, lower level = 1

**A) Symmetrical PITCH BEND** (similar to keyboard pitch wheel action)

- side C, F & Eb ----> increases symmetrical PITCH BEND
- side C, F & C ----> decreases symmetrical PITCH BEND
- side C, F & Eb/C ----> resets PITCH BEND to level 0

**B) PITCH BEND UP only** (guitar like pitch bend action)

- side C, E, F & Eb --> increases PITCH BEND up
- side C, E, F & C --> decreases PITCH BEND up
- side C, E, F & Eb ----> resets PITCH BEND UP to level 0

**C) PITCH BEND DOWN only** (drop off action)

- side C, Bb, F & Eb ----> increases PITCH BEND down
- side C, Bb, F & C ----> decreases PITCH BEND down
- side C, Bb, F & Eb/C ----> resets PITCH BEND DOWN to level 0

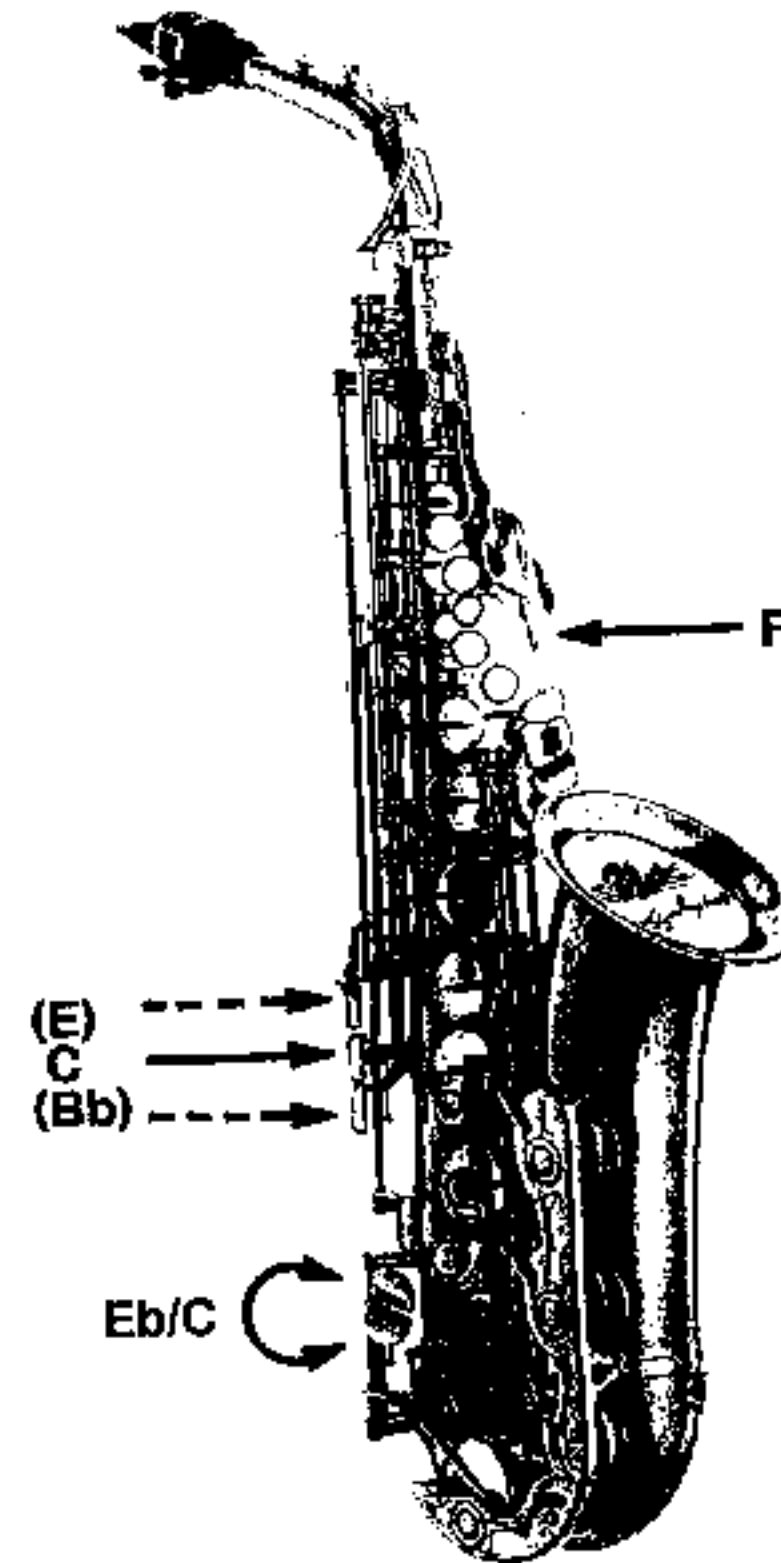
- level 5 full range PITCH BEND control
- level 4 1/2 range PITCH BEND control
- level 3 1/4 range PITCH BEND control
- level 2 1/8 range PITCH BEND control
- level 1 1/16 range PITCH BEND control
- level 0 no PITCH BEND control

The panic function resets PITCH BEND to level 0.

Thumb-X-press (s. 5.1) can be simultaneously used for pitch bending.

**MUSICAL APPLICATIONS**

To obtain smooth PITCH BEND responses, it is generally a good idea to set the PITCH BEND range on your synthesizer to 1 or 2 semitones first and then select an appropriate sensitivity level from the Synthophone.



## 3.10 BREATH CONTROL

(MIDI Code Bn 02 yy)

Wind pressure can be assigned to BREATH control. Typically with physical modelling or FM synthesizers, BREATH can be used to cause interesting timbral changes. Other synthesizers may be programmed to generate vibrato or tremolo from BREATH control. Still others simply ignore this MIDI message. Check your synthesizer manual for most effective use.

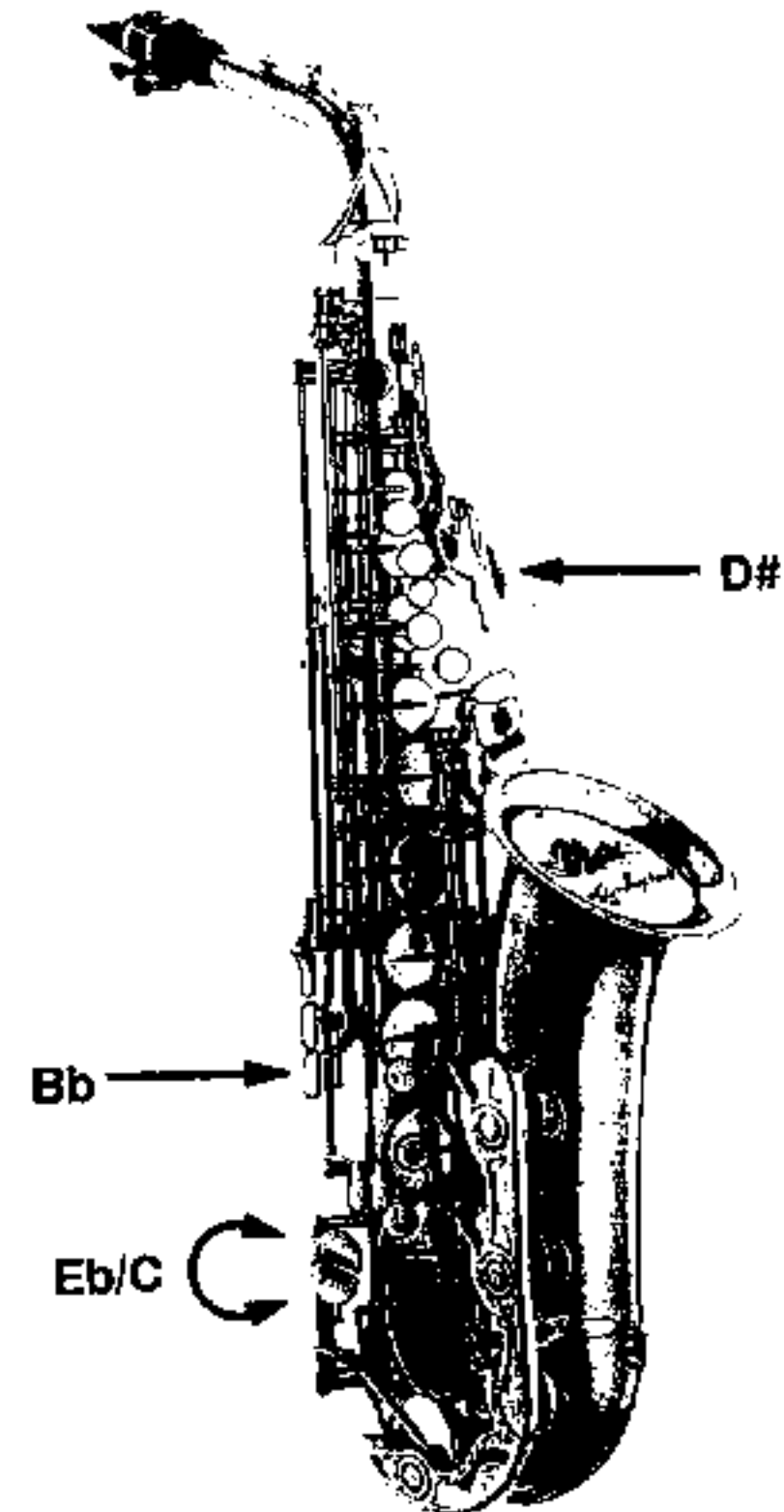
- side Bb, D# & Eb	---> increase BREATH level +1
- side Bb, D# & C	---> decrease BREATH level -1
- side Bb, D# & Eb/C	---> reset BREATH to level 0

level 5	full range BREATH control
level 4	1/2 range BREATH control
level 3	1/4 range BREATH control
level 2	1/8 range BREATH control
level 1	1/16 range BREATH control
level 0	no BREATH data

The panic function sets BREATH control to level 5 (full range).

## MUSICAL APPLICATIONS

*If your synthesizer responds to BREATH control with a vibrato, then you may adjust its level for best musical results. If your FM synthesizer changes too drastically in timbre, decrease BREATH control or adjust the sensitivity in your synthesizer program in order to produce the best musical result.*



## 3.11 VOLUME CONTROL

(MIDI Code Bn 07 yy)

In order to give a natural feel, MIDI volume cannot simply have a linear response to wind pressure. The SYNTHOPHONE therefore provides you with six different exponential curves with different dynamic responses.

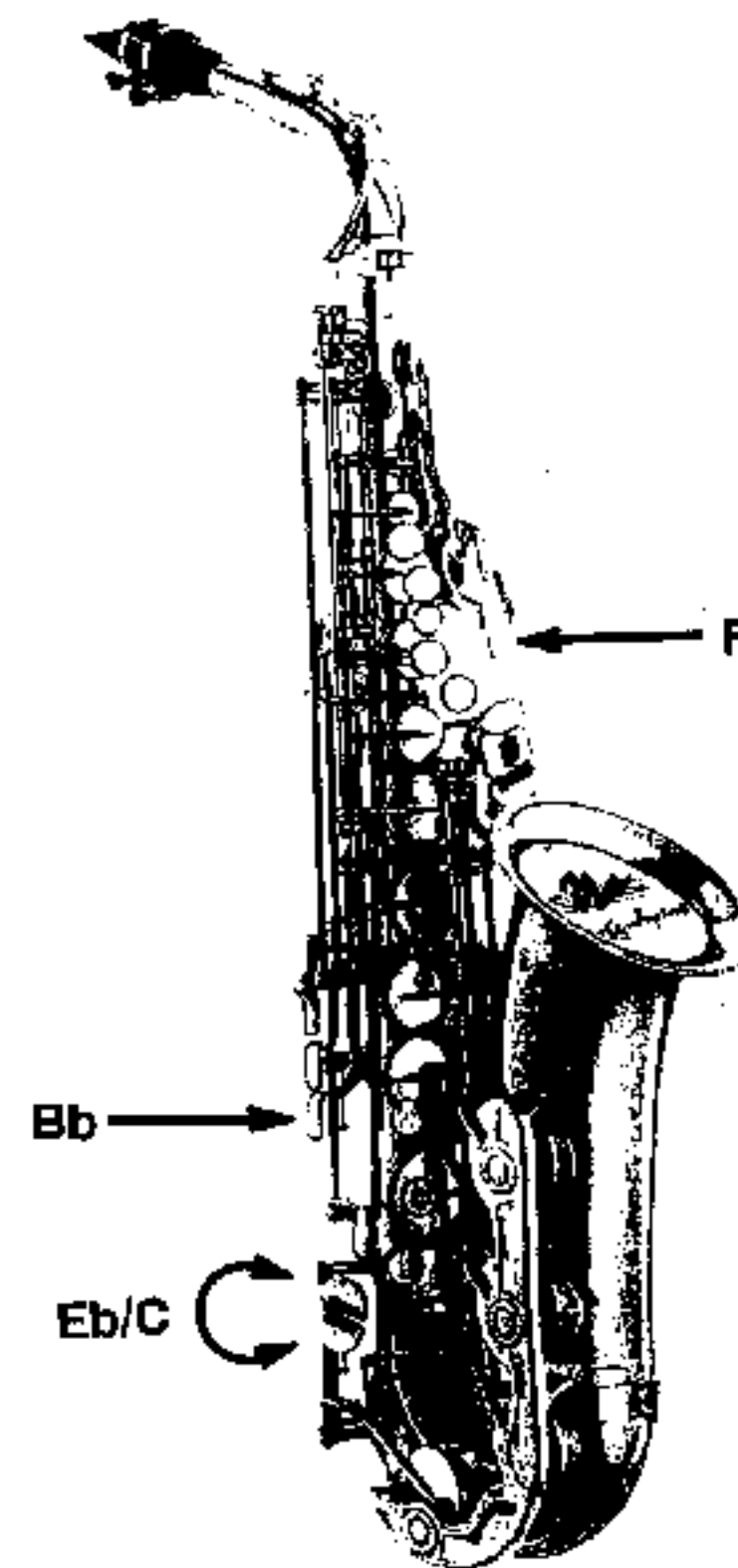
- side Bb, F & Eb	---> increase VOLUME level + 1
- side Bb, F & C	---> decrease VOLUME level -1
- side Bb, F & Eb/C	---> reset VOLUME to level 0

level 5	constant VOLUME at		ff
level 4	VOLUME range from	f	< ff
level 3	VOLUME range from	mf	< ff
level 2	VOLUME range from	mp	< ff
level 1	VOLUME range from	p	< ff
level 0	VOLUME range from	pp	< ff

The panic function resets VOLUME to level 2.

**MUSICAL APPLICATIONS**

*If you want total dynamic control (i.e. clarinet) then select volume level 0. If you play percussive sounds, level 5 will yield more idiomatic results. Setting the volume to level 5 will allow you to trigger sounds with a very light tonguing technique. If you play string ensemble sounds, try level 3 or 4. You will still get a certain amount of dynamic control, but also provide enough volume support to pass by some of the decaying sound. When using BREATH control as your dynamics controller, volume should be typically set to level 5 (maximum)*



## 3.12 AFTERTOUC CONTROL

(MIDI Code Dn xx)

Wind pressure can be assigned to AFTERTOUC control. Most commonly, synthesizers will respond with vibrato intensity much like with modulation control (s. 3.8), but now your vibrato control comes from the wind rather than from the lip pressure.

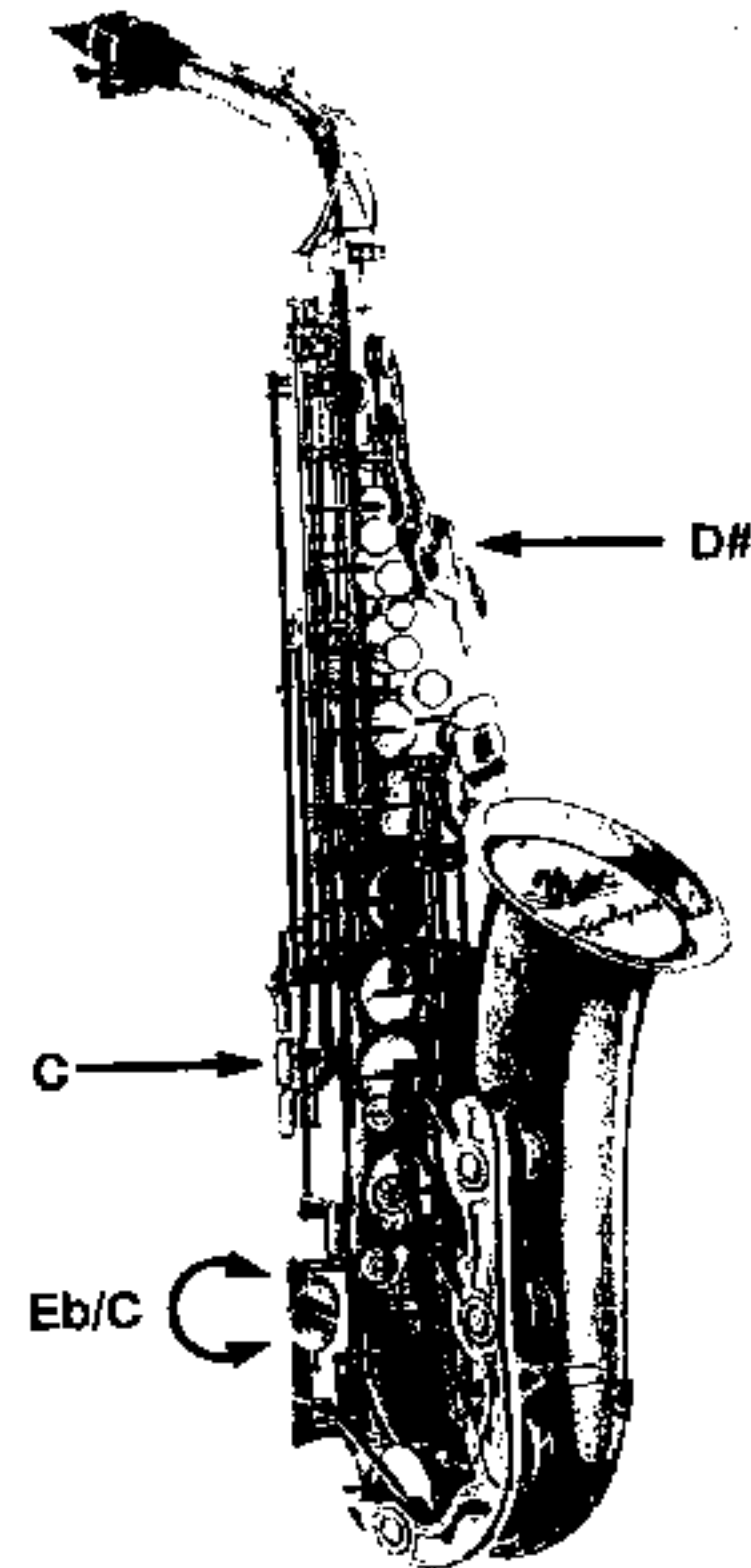
- side C, D# & Eb	--> increase AFTERTOUC level +1
- side C, D# & C	--> decrease AFTERTOUC level -1
- side C, D# & Eb/C	--> reset AFTERTOUC to level 0

level 5	full range AFTERTOUC control
level 4	1/2 range AFTERTOUC control
level 3	1/4 range AFTERTOUC control
level 2	1/8 range AFTERTOUC control
level 1	1/16 range AFTERTOUC control
level 0	no AFTERTOUC data

The panic function resets AFTERTOUC to level 0.  
Thumb-X-press (s.5.1) can simultaneously be used for AFTERTOUC.

**MUSICAL APPLICATIONS**

*Some sounds develop their vibrato only when playing intensely. Use the proper amount of aftertouch to obtain best musical results. Aftertouch and modulation control can be combined, in order to produce vibrato that reacts to wind and lip pressure individually. More recent synthesizers (physical modeling etc.) allow for interesting timbral changes when receiving aftertouch.*



### 3.13 VELOCITY RANGE

(MIDI Code 9n xx yy)

Every "note on" command has its associated velocity value that represents the speed the key that has just been depressed. For MIDI wind controllers this value is much less meaningful than for keyboards, as woodwind tones typically continue to develop their contours long after their attack phase. However, most synthesizer "factory" sounds are programmed to depend heavily on velocity levels for variation and therefore there is an interest in being able to adjust the velocity values of the SYNTHOPHONE output to a specific range that works best with a given sound.

To adjust to a specific velocity level, use the fingerings below:

- low D, E, F & side-Bb & C	---> decreases the velocity level
- low D, E, F & side-Bb & Eb	---> increases the velocity level
- low D, E, F & side-Bb & Eb/C	---> resets to the highest velocity level

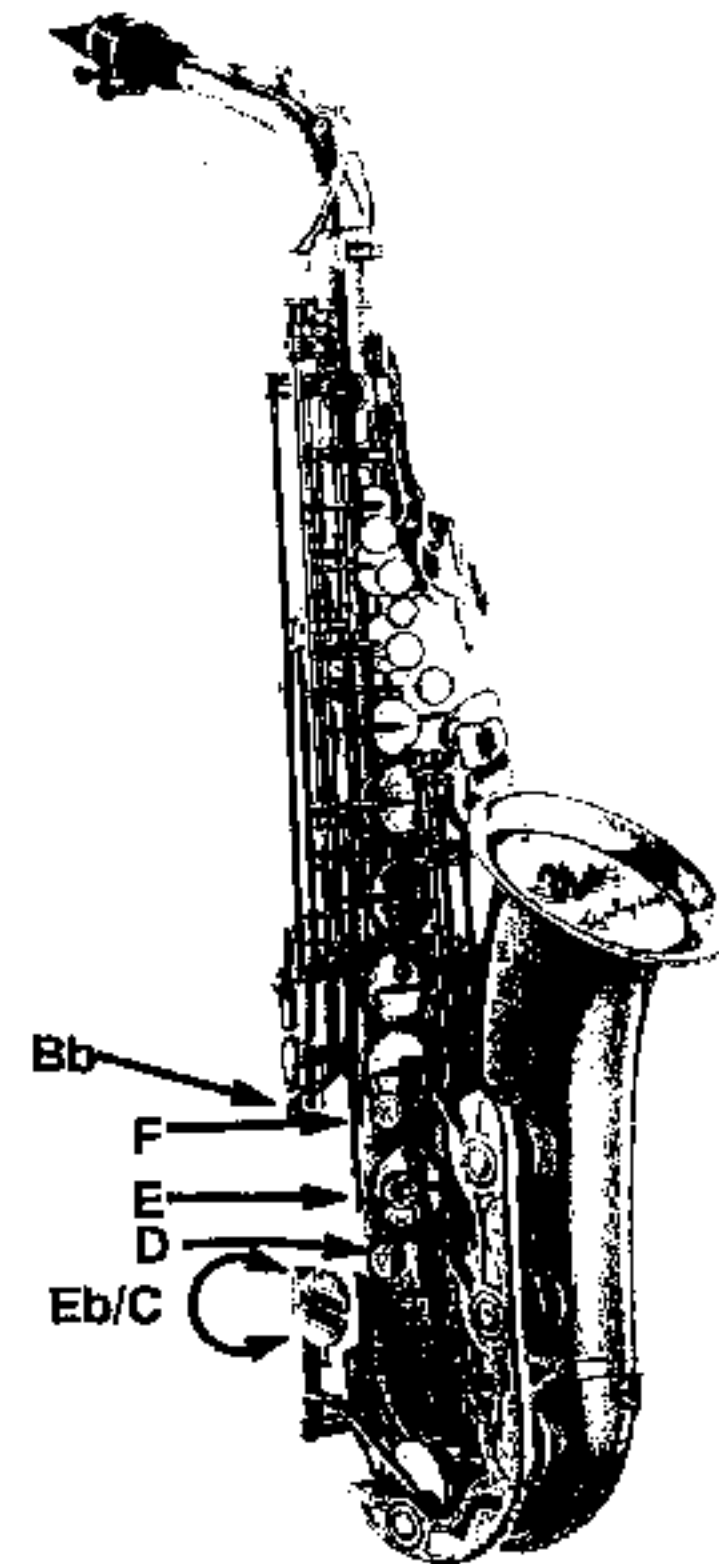
level 5	velocity values range from 95 - 127 (maximum)
level 4	velocity values range from 76 - 108
level 3	velocity values range from 57 - 89
level 2	velocity values range from 38 - 70
level 1	velocity values range from 19 - 51
level 0	velocity values range from 01 - 32 (minimum)

The panic function resets the velocity range to level 5 (maximum)

#### MUSICAL APPLICATIONS

When playing chords (s.4.1), the SYNTHOPHONE sends out a slightly higher velocity level for the lead note than for the rest of the chord notes in order to "distinguish" the lead line from the lower voices.

Velocity is automatically derived from lip pressure when attacking new notes, and from wind pressure when playing legato.



## 3.14 KEY SPEED CONTROL

When playing large intervals, or when playing from C# to D (across the octave break point), unwanted short (in between) notes may be sounding due to the Synthophone's accurate key tracking. You can slow down (or speed up) the key response time of the Synthophone to match it up to your sounds for best performance results.

To adjust the key speed, use the fingerings below:

- high D, D# & side-Bb & Eb	---> slow down key response time
- high D, D# & side-Bb & C	---> speed up key response time
- high D, D# & side-Bb & Eb/C	---> reset key speed to normal

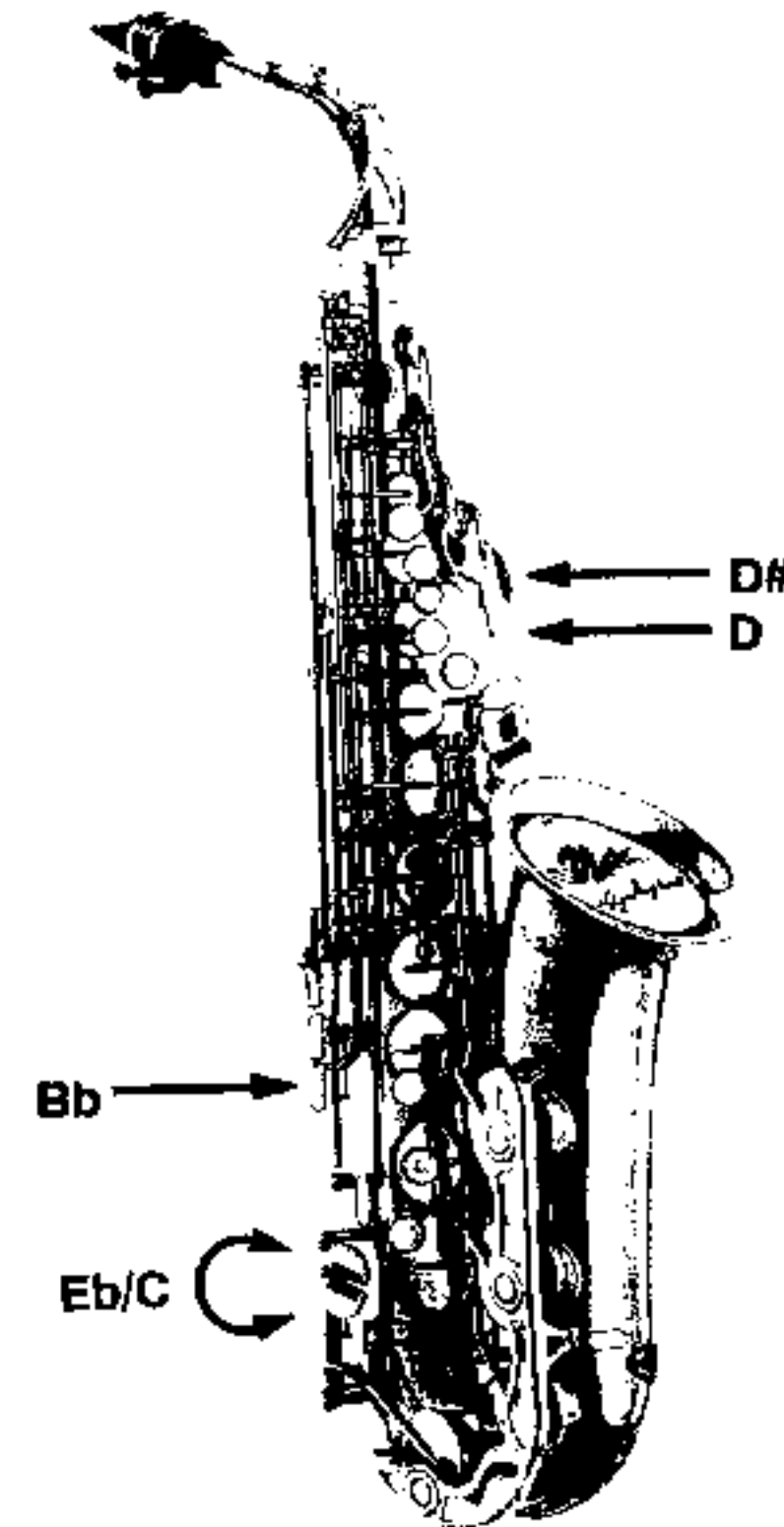
level 4	slowest key speed response time
level 3	slow key speed response time
level 2	normal key speed response time
level 1	fast key speed response time
level 0	fastest key speed response time

The panic function sets key speed control to level 2 (normal)

## MUSICAL APPLICATIONS

*Parcussive sounds and plucked strings sounds are best played at slower key speed responses times: set to key speed levels 2 - 4.*

*Wind sounds and bowed strings etc. typically work well at faster key response times: set to key speed levels 2 - 0.*





3.15 TRANSPOSITION IN OCTAVES

The SYNTHOPHONE can be transposed up or down by 2 OCTAVES from its normal pitch. This, in addition to TOP / SUB-OCTAVES (s. 3.15) and the THUMB-X-PRESS OCTAVE OPTION (s. 5.1), produces a playing range of slightly more than 9 OCTAVES.

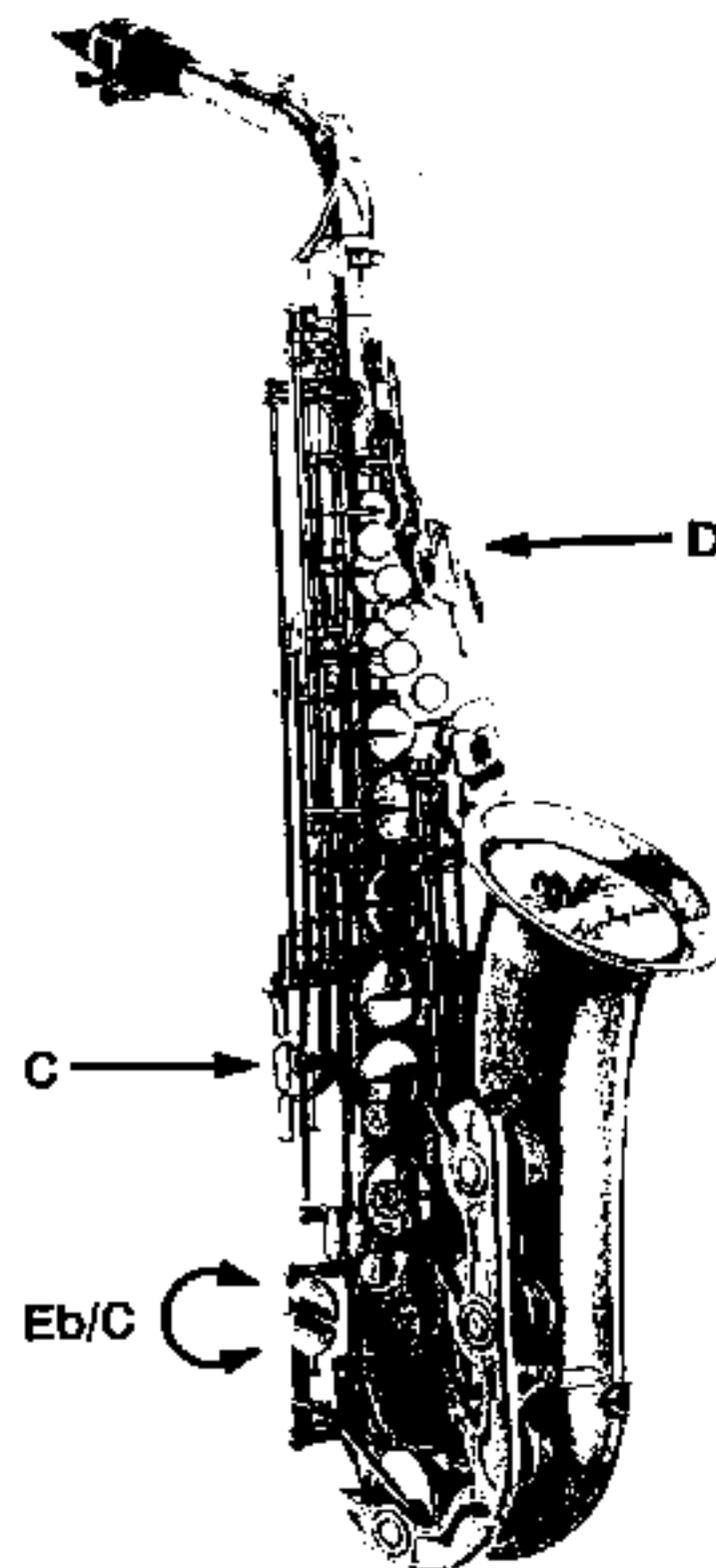
- side C, D & Eb	--> raise by one OCTAVE
- side C, D & C	--> lower by one OCTAVE
- side C, D & Eb/C	---> reset to middle OCTAVE

level 4	+ 2 OCTAVES
level 3	+ 1 OCTAVES
level 2	middle OCTAVE
level 1	- 1 OCTAVE
level 0	- 2 OCTAVES

The panic function resets transposition to the middle OCTAVE

MUSICAL APPLICATIONS

Try playing your favorite sounds in the extreme ranges, to find some surprisingly interesting results. With multi-sampled sounds or with split-keyboard configurations, different sets of sounds or split zones can easily be accessed through manipulation of the OCTAVE settings from the SYNTHOPHONE. As with all other parameters, transposition is stored in memory along with the selected patch.



## 3.16 EXTENDED PLAYING RANGE

The normal range of the SYNTHOPHONE can be extended through the use of the F#-trill and low-C-keys respectively as additional OCTAVE KEYS.

## TOP-OCTAVE-KEY

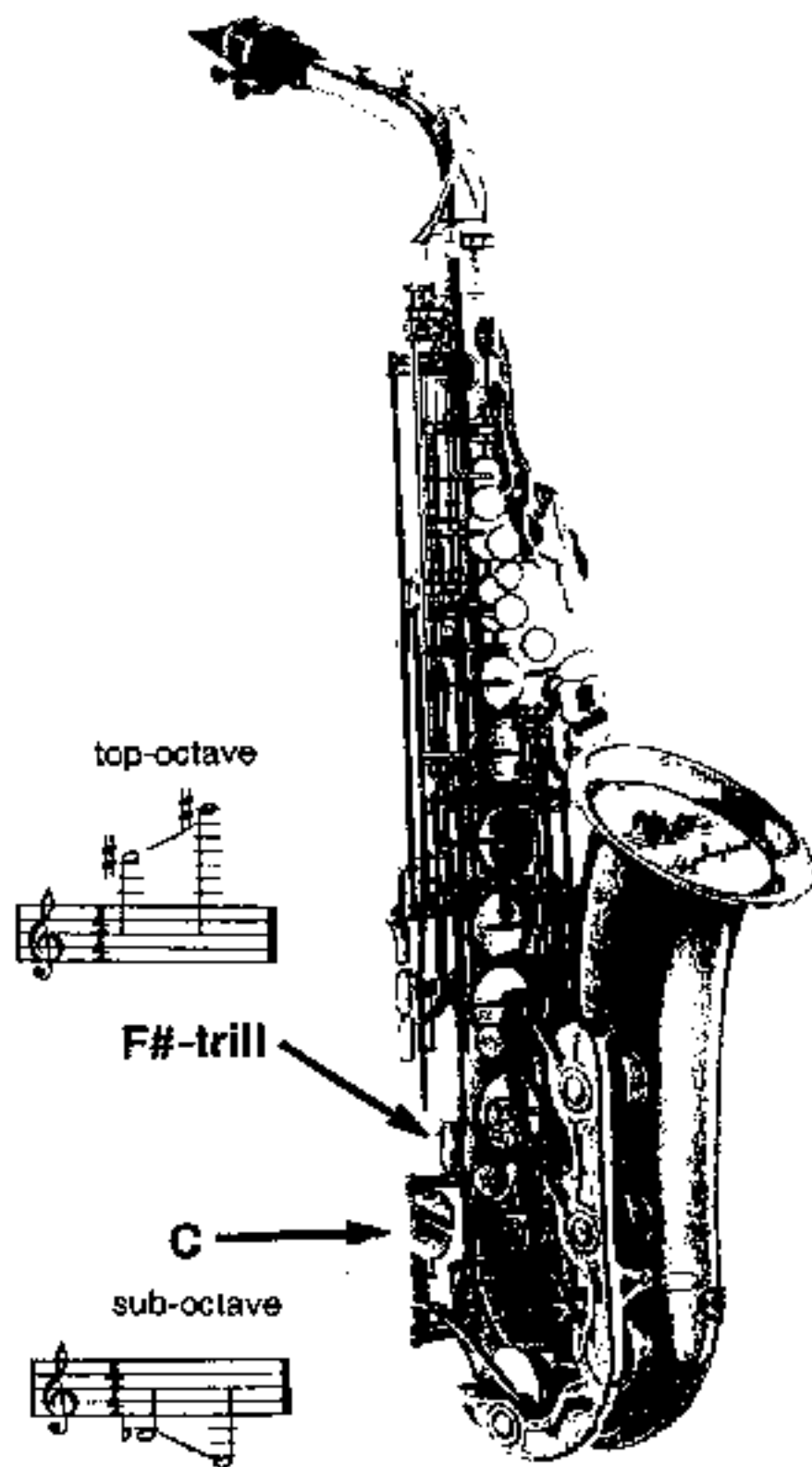
The F#-trill can be used as an additional OCTAVE-UP-KEY when playing in the range above high F. Simply play another octave using standard fingerings, but hold down F#-trill in addition. Note, that the regular F#-trill-key function is retained for F to F#.

## SUB-OCTAVE-KEY

The right hands C-key can be used as an additional OCTAVE-DOWN-KEY to reach below Bb. Simply hold down this key while playing normal fingerings down to low E. This extends the low range by 6 halfsteps. Note, that below E, the the key is a regular C-key.

## MUSICAL APPLICATIONS

- The top octave feature will allow you to play easily in the range of a flute part, avoiding difficult altissimo fingerings.
- The low octave feature provides for low notes in the clarinet range.



## 3.17 START / STOP / CONTINUE

The following REALTIME MESSAGES are useful for remote control of sequencers:

Start	(MIDI Code \$FA)
Continue	(MIDI Code \$FB)
Stop	(MIDI Code \$FC)

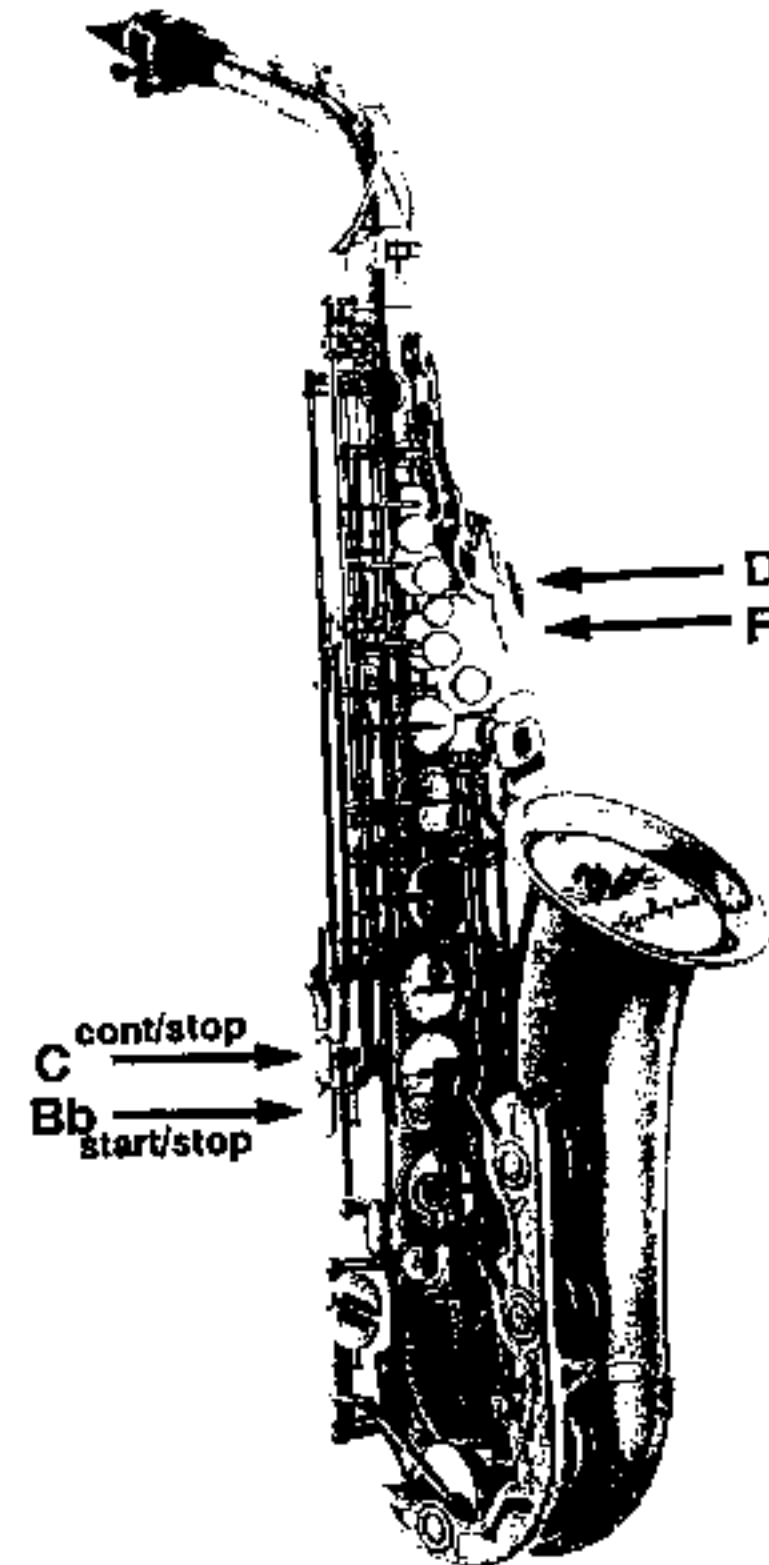
There are 2 fingerings that are used in an ON / OFF "toggle switch" manner:

- high D, F & side Bb	---> Start
- high D, F & side Bb again	---> Stop - following start
- high D, F & side C	---> Continue
- high D, F & side C again	---> Stop - following continue

Please note that the CLOCK IN may have to be activated on your sequencer in order to respond to the above messages. See in the manual of your sequencer.

**MUSICAL APPLICATIONS**

*With these commands you can play along with a sequencer or MIDI file player, without ever taking your hands off your instrument.*



## 4. DYNAMIC HARMONY

### 4.1 PLAY UP TO 5-PART HARMONY

Now for the first time, you can play chords using a monophonic wind instrument. It is possible to add a second, third, or even a fourth additional voice to accompany your melodic lines. The addition of extra voices is controlled by the command fingerings described below. The resulting harmonic structures are not simply at fixed intervals but change to remain diatonic to a key area that you select (s. 4.2). In addition, inversions of each structure may be played by varying the lip pressure against the reed. By applying variable pressure on the reed while repeatedly playing the same note, you are experiencing changes of inversions. Tight lip pressure produces a close position, while lighter lip pressure causes the inversion to shift to more open voicings. You may appreciate the musical potential of this control more easily if you begin with a two note structure and work up toward the maximum of 5 voices.

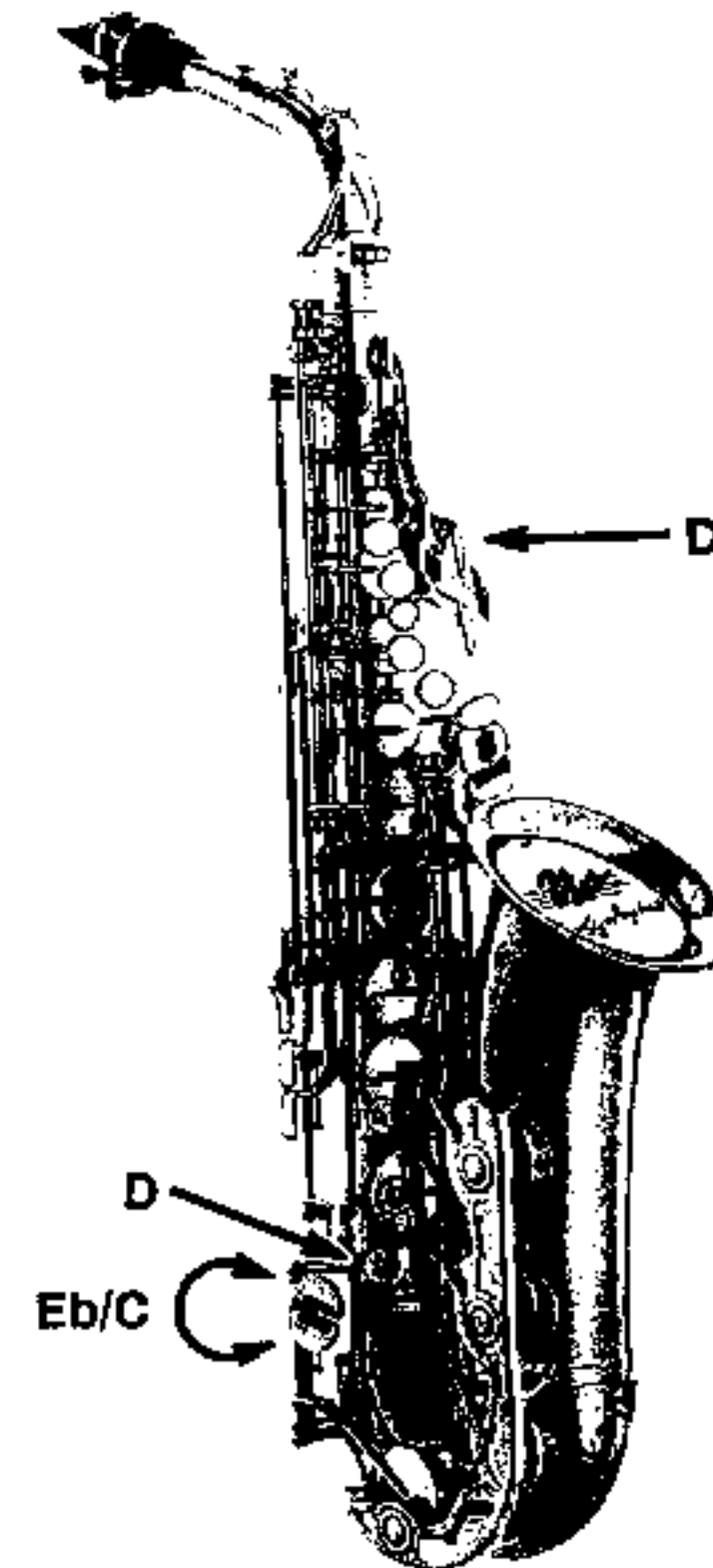
- |                        |                                                 |
|------------------------|-------------------------------------------------|
| - side D, low D & Eb   | ---> add one voice                              |
| - side D, low D & C    | ---> subtract one voice                         |
| - side D, low D & Eb/C | ---> cancel harmony - back to single voice mode |

The panic function resets harmony to single voice mode.

### MUSICAL APPLICATIONS

*Four and five-part-harmony lets you create the sound of a full horn section that perfectly follows your lead lines. Two- and three-part-voicings can be great for riffs or soloing. DYNAMIC HARMONY can be used with percussion sounds as well as with more conventional horns and strings on your synthesizer(s).*

PLAY UP TO 5-PART HARMONY



## 4.2 CHOOSING NEW TONALITY

You can specify a reference tonality, so that DYNAMIC HARMONY generates chord structures diatonic to the key of your choice. Chords result from that reference tonality, the actual note played and the momentary lip pressure (for their inversion).

If you relate your playing to a minor key, simply indicate its relative major key. For example, for DYNAMIC HARMONY to refer to D-minor, finger in tonality key of F-major.

**Select tonality by "normally fingering" (\*) the respective note & press Eb/C keys.**

(\*) "Normal fingering" means that the note should be fingered so it would sound on a regular saxophone. (The notes to be used are strictly from middle E to high D# as shown in the next page.) As regular fingerings can be used to indicate tonality - with a little practice - it is possible to finger in new tonalities quickly, even between short musical phrases. You may not want to play bebop that way - changing keys every bar - but in modal tunes this technique may be perfectly manageable.

The panic function resets tonality to the key of C major.

### MUSICAL APPLICATIONS

*Try to do reharmonisations for one repeatedly played note or musical line by changing tonality. The resulting chords or patterns will modulate to their changing reference tonality. Tonality can be part of a PATCH in memory, too. This way, it is possible to store similar patches in a series where the only difference is the selected tonality. Now, through simple patch exchange, it is possible to play harmonies relating to different keys in quick succession.*

normal fingerings



Eb/C



### 4.3 USING FREEZE HARMONY

---

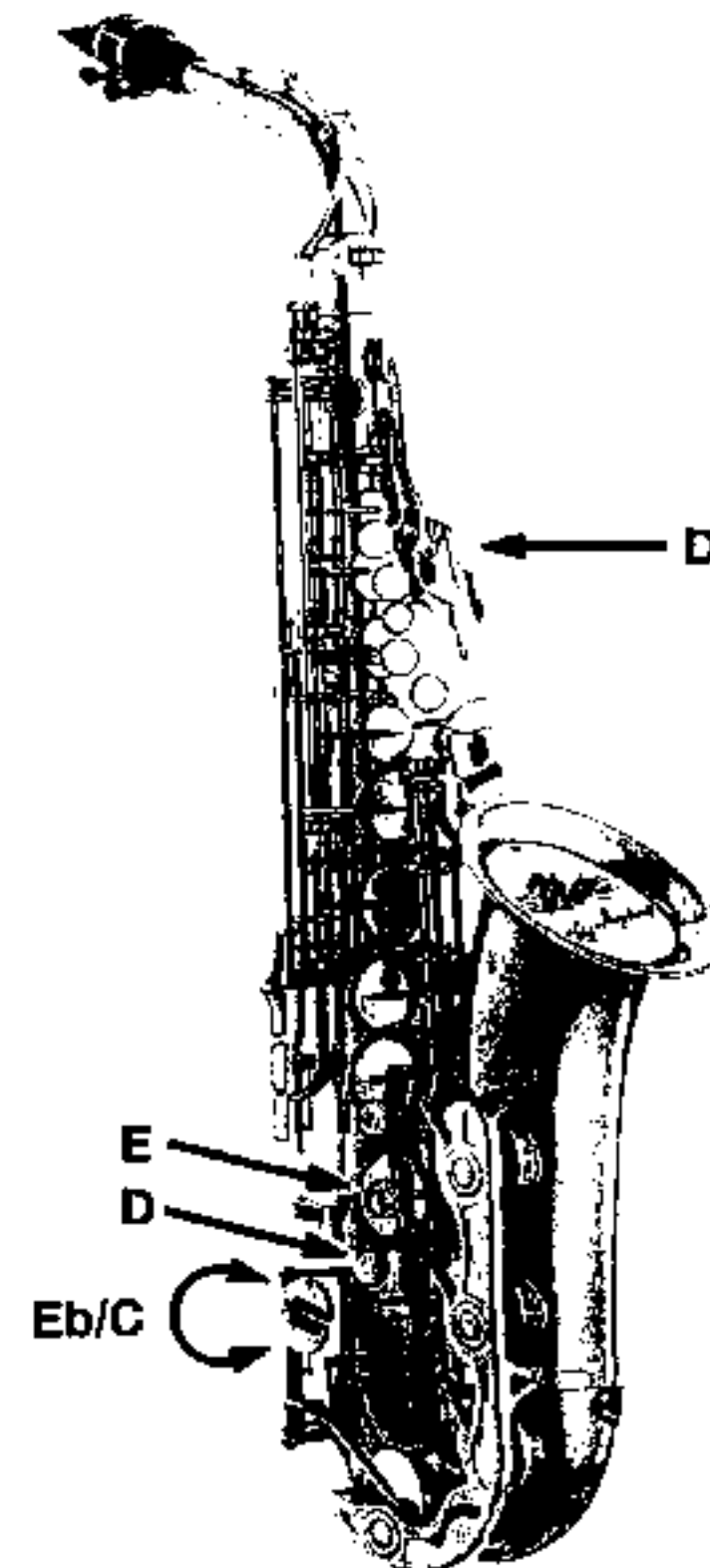
You may - for a change in flavor - want to move all voices in parallel motion. FREEZE HARMONY does just this. The last chord played will be memorized and played in the same intervallic relation over the full range of the instrument. You may still change the number of voices while in the FREEZE HARMONY mode.

- |                         |                              |
|-------------------------|------------------------------|
| - side D, low D, E & Eb | ---> sets FREEZE HARMONY on  |
| - side D, low D, E & C  | ---> sets FREEZE HARMONY off |

The panic function sets FREEZE HARMONY off.

### MUSICAL APPLICATIONS

*Constant structures are much used by arrangers/composers for writing intros and endings or for creating a noticeable change in the harmonic flow of a piece. Now you can use them as a player on stage.*



## 4.4 SELECT new HARMONY TABLES

There are three different harmonisation tables available from the EPROM and another six harmony tables reside in USER modifiable RAM memory (s. 4.5). The basic chord materials are shown in the appendix of this manual (s. 9.3).

Use the following fingerings to select any of 9 harmonic tables:

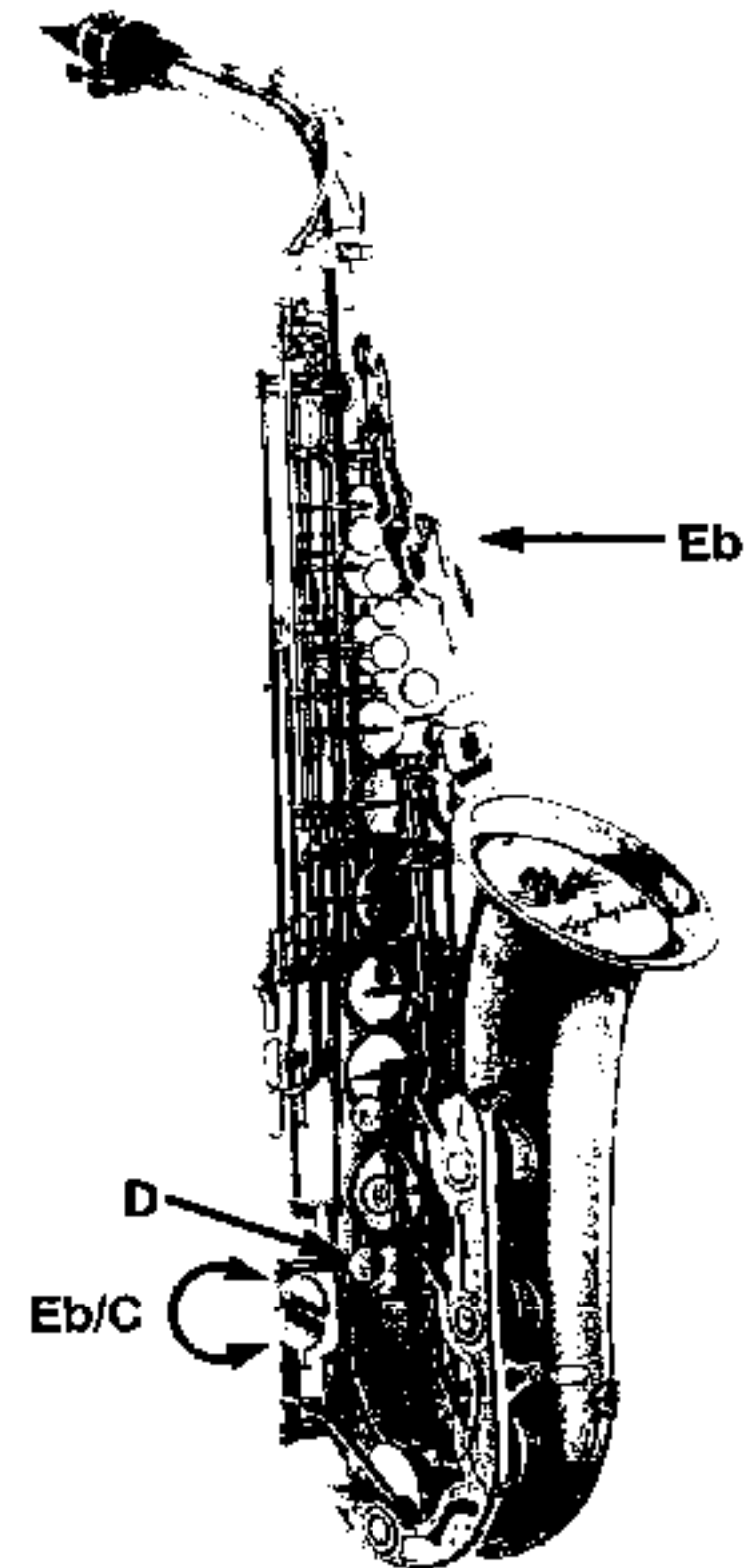
- |                                  |                                 |
|----------------------------------|---------------------------------|
| - low D & palm Eb and press Eb   | ---> to next harmony table      |
| - low D & palm Eb and press C    | ---> to previous harmony table  |
| - low D & palm Eb and press Eb/C | ---> return to harmony table #1 |

harmony table 1	(EPROM)	chords in thirds (like DYNAMIC HARMONY)
harmony table 2	(EPROM)	chords in fourth (often used in modal music)
harmony table 3	(EPROM)	chords in seconds (more dissonant)
harmony table 4	(user RAM)	user chords - ident. w/table 1 when initialized
harmony table 5	(user RAM)	user chords - ident. w/table 2 when initialized
harmony table 6	(user RAM)	user chords - ident. w/table 3 when initialized
harmony table 7	(user RAM)	user chords - ident. w/table 1 when initialized
harmony table 8	(user RAM)	user chords - ident. w/table 2 when initialized
harmony table 9	(user RAM)	user chords - ident. w/table 3 when initialized

The panic function resets to harmony table 1

### MUSICAL APPLICATION

*Every harmony table generates a very different harmonization with a given melodic line. When applying additional harmony variations (s. 4.6) some extremely complex and highly variable voicing techniques can be achieved.*



The harmony tables in user RAM (tables 4 - 9) can be personalized by simply inputting 5 new notes for each chord in the scale:

Follow these easy steps:

- a) Use the panic function to reset the instrument to well-known conditions first (s. 3.1)
- b) Now activate 5-part DYNAMIC HARMONY (s. 4.1)
- c) Select a harmony table in user RAM (tables 4 -9) that you intend to modify (s. 4.4)
- d) Play some chords to familiarize yourself with the selected harmonization technique and to find out which chord(s) you would like to modify.
- e) Now activate the INPUT fingering:

**- low D, low Bb & press Eb/C at once ---> get ready for note input**

- f) Now (one by one) play 5 STACCATO notes in the following order:

- lead voice (melody note)
- 3rd voice (!)
- 2nd voice (!)
- 4th voice
- 5th voice

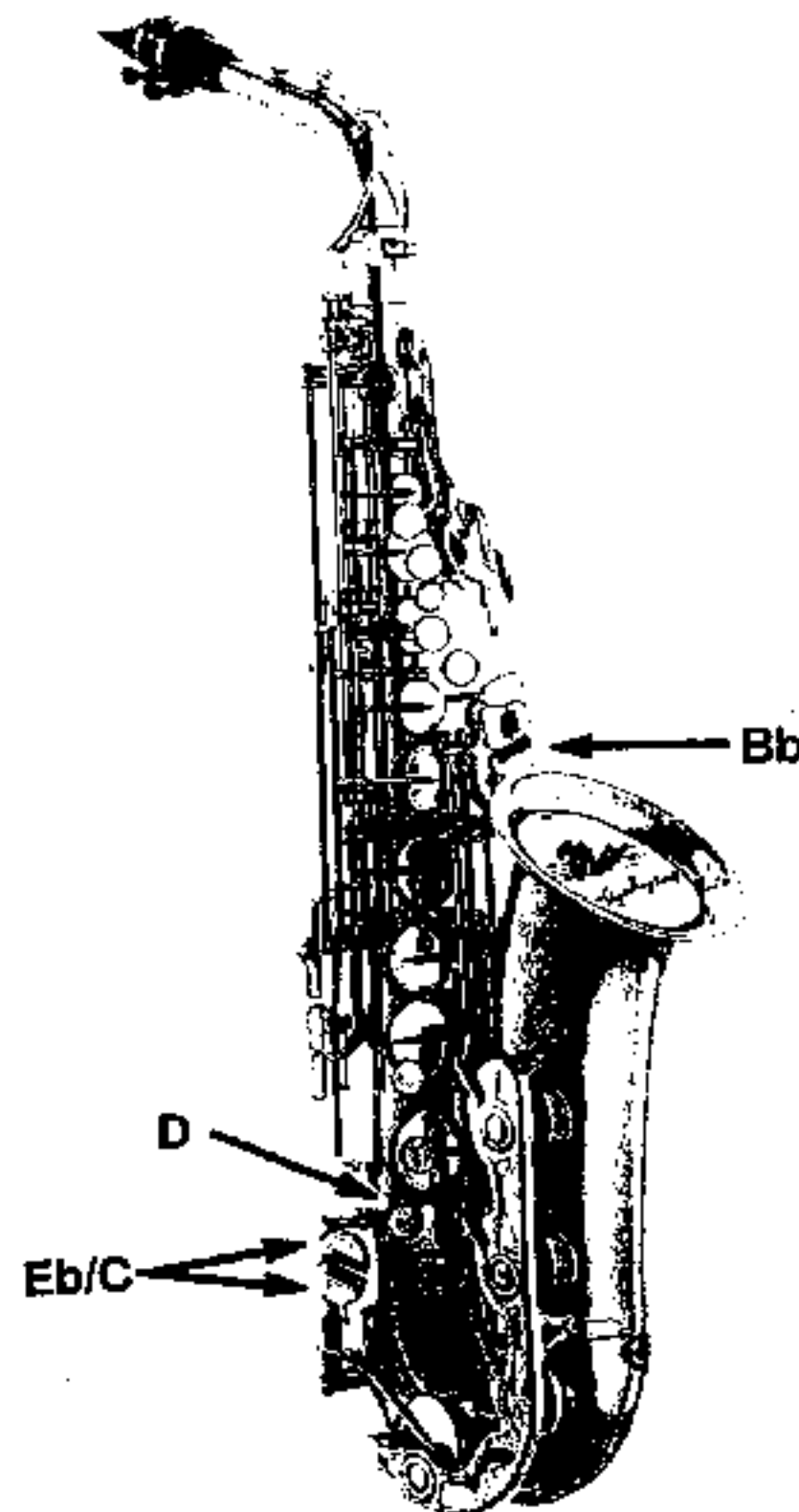
- g) Finally repeat the same lead note and listen to the resulting chord that you have just built! - If the resulting chord is not exactly what you intended, just repeat steps e) through g) until the new chord lives up to your expectations.

**Attention:**

- (!) The 3rd voice has to be played prior to the 2nd voice in order to be correctly used with 2-voice and 3 voice playing.
- (!) User input chords are stored to memory instantly and replace any previous chord at that space.
- (!) A Total Memory Reset (s. 3.7) restores all original chords by copying the EPROM into the user RAM, so that at any point, factory settings can be restored.

### MUSICAL APPLICATIONS

*A tremendous field for experimentation opens up with Personal Harmony. Please note, that every chord that has just been established can be applied with all other chord variation techniques given in that book. Individual notes or in fact all harmony voices can also be input ABOVE the melody note. A special case is unison, where all (identical) input notes are layered to thicken one sound.*





## 4.6. CHORD VARIATIONS through LIP PRESSURE

Chords can be varied according to your lip pressure in five different ways. Select any of the five methods below with the following fingerings:

- |                         |                        |
|-------------------------|------------------------|
| - low D & palm F & Eb   | ---> to next level     |
| - low D & palm F & C    | ---> to previous level |
| - low D & palm F & Eb/C | ---> back to level 1   |

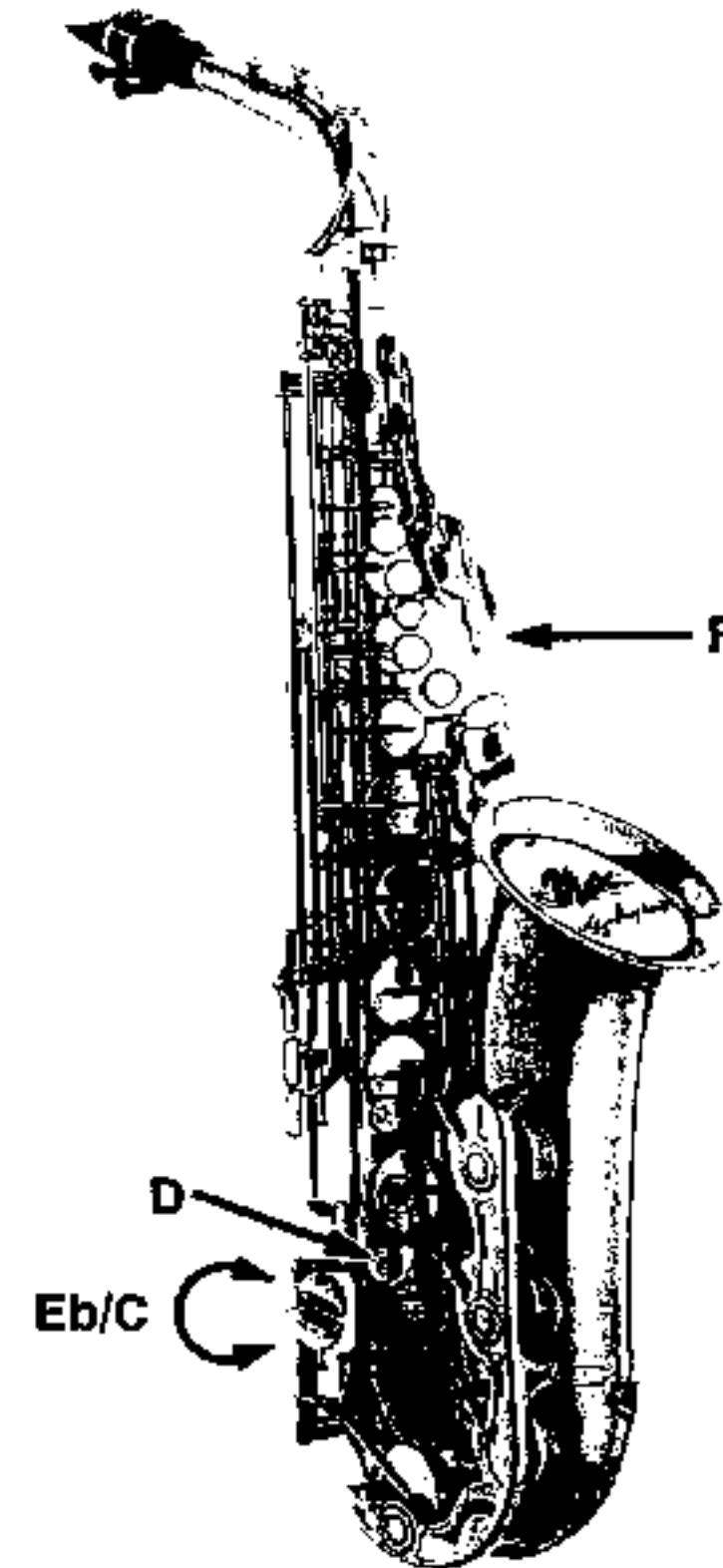
- |                |                                                                     |
|----------------|---------------------------------------------------------------------|
| <b>level 1</b> | <b>INVERSIONS - (DYNAMIC HARMONY)</b>                               |
| level 2        | b-II SUBSTITUTE functions on high lip pressure                      |
| level 3        | variable NUMBER OF VOICES (more lip pressure decreases # of voices) |
| level 4        | variable NUMBER OF VOICES (more lip pressure increases # of voices) |
| level 5        | chords / unison (loose = chords, tight = unison)                    |
| level 6        | unison / chords (loose = unison, tight = chords)                    |

The panic function resets to level 1 (DYNAMIC HARMONY)

### MUSICAL APPLICATIONS

Level 2 allows for chromatic "escapes" from the momentary key the harmony is in.  
Level 3 to 6 are providing a flexible way of lipping the number of voices you want to go along with your melodic line. Naturally the maximum number of voices should be chosen (s. 4.1) before.

## CHORD VARIATIONS through LIP PRESSURE



#### 4.7. HARMONY TABLE EXCHANGE through LIP PRESSURE

With your lip pressure you can interchange chords from three harmonizing techniques for each note that you play. So different voicing techniques can be applied to every note in the scale.

Use the following fingering to activate / deactivate this function:

- high Eb, low D, E, & C	---> OFF	chords from same harmony table
- high Eb, low D, E, & Eb	---> ON	chords from 3 consecutive harmony tables

When activated, chords are selected from harmony tables as follows:

- loose lip pressure:	selected harmony table	(i.e. thirds)
- medium lip pressure:	selected harmony table +1	(i.e. fourths)
- high lip pressure:	selected harmony table +2	(i.e. seconds)

Any of the 9 given harmony tables can be selected as your basic chord table (s. 4.4)

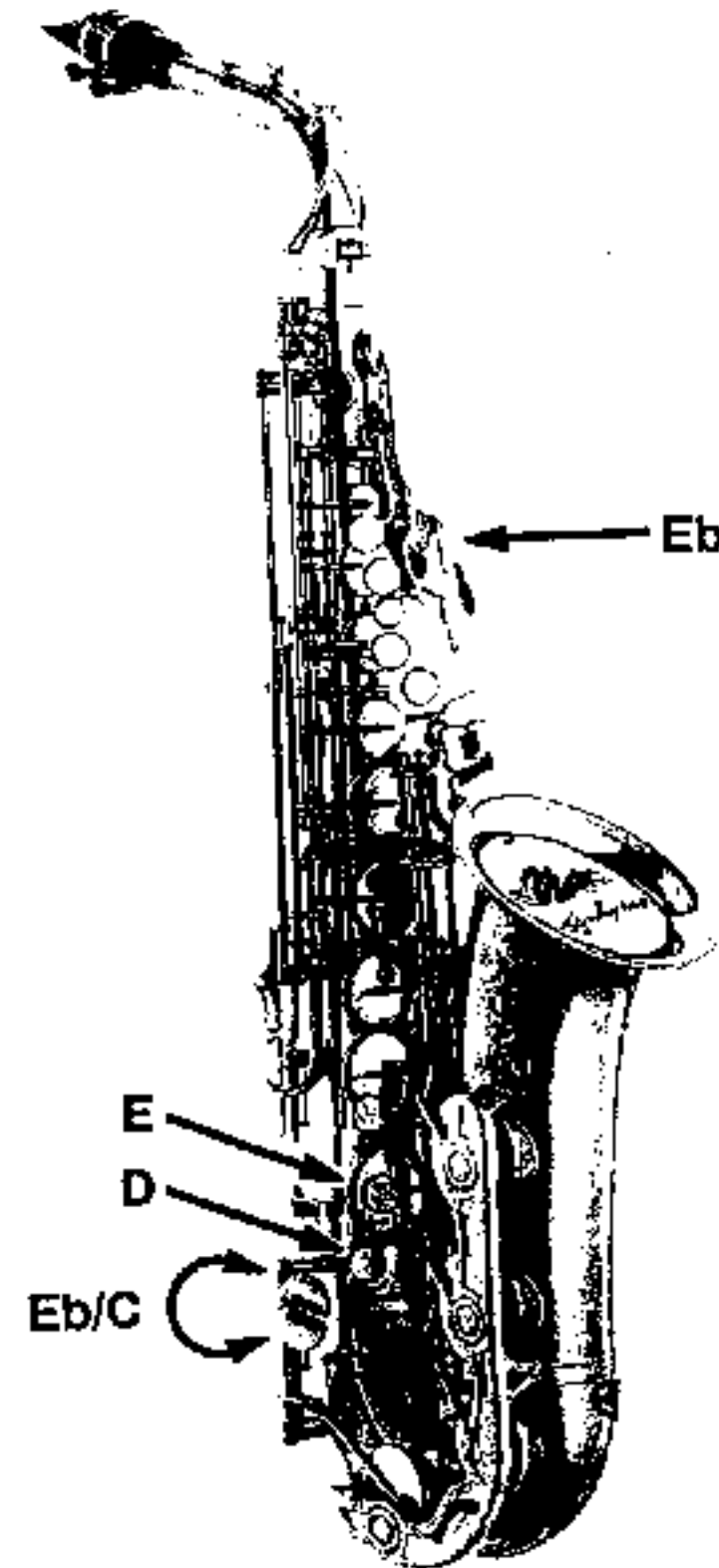
As a result, you have a choice of many possibilities:

Lip pressure:	low	medium	high
	(1) thirds1	(2) fourths1	(3) seconds1
	(2) fourths1	(3) seconds1	(4) thirds2(*)
	(3) seconds1	(4) thirds2(*)	(5) fourths2(*)
	(4) thirds2(*)	(5) fourths2(*)	(6) seconds2(*)
	(5) fourths2(*)	(6) seconds2(*)	(7) thirds3(*)
	(6) seconds2(*)	(7) thirds3(*)	(8) fourths3(*)
	(7) thirds3(*)	(8) fourths3(*)	(9) seconds3(*)
	(8) fourths3(*)	(9) seconds3(*)	(1) thirds1
	(9) seconds3(*)	(1) thirds1	(2) fourths1

(\*) = user definable harmony tables

#### MUSICAL APPLICATIONS

Choosing chords from various harmony tables through lip pressure is probably one of the most powerful ways to deal with DYNAMIC HARMONY. Without leaving the current harmonic context you can come up with some very extensive reharmonization techniques.



## 4.8. MULTICHANNEL MODE

The SYNTHOPHONE is capable of playing each voice of a chord on a different MIDI channel. This is of interest if your synthesizer can be set to MULTI mode, or when working with notation programs on computers, where your entry of harmonized passages can be printed out on paper. Since all voices in MULTI mode are arranged on separate MIDI channels, it may be easier to separate them onto individual staves of your score.

- low D, E, high F & C	----> POLY mode
- low D, E, high F, & Eb	----> MULTI mode

- In POLY mode, all notes of a chord are output on the same MIDI channel

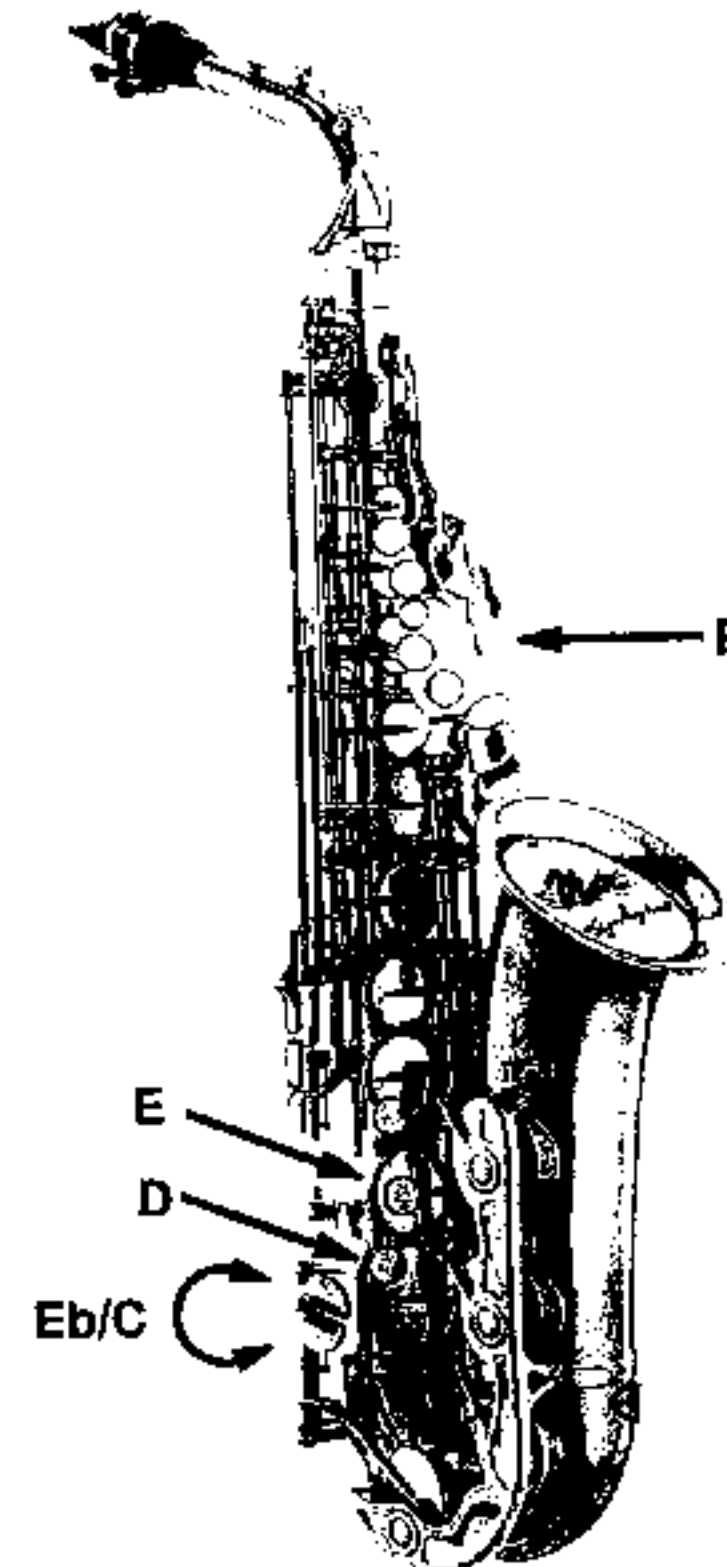
- In MULTI mode, chord notes are output on consecutive MIDI channels, as illustrated in the following example:

1st voice	on the selected channel	(flute)
2nd voice	on the selected channel + 1	(clar)
3rd voice	on the selected channel + 2	(oboe)
4th voice	on the selected channel + 3	(bassoon)
5th voice	on the selected channel + 4	(french horn)

The panic function resets this function to POLY mode

## MUSICAL APPLICATIONS

*In MULTI mode the lead voice receives all MIDI controllers like modulation, aftertouch and pitch bend. The lower (harmony) voices only receive note on/off and their respective volume data. It is therefore possible to distinguish the lead voice over the rest of the voices. Nevertheless POLY mode will be used most frequently.*



## 5. ADDITIONAL CONTROL FUNCTIONS

### 5.1 "THUMB-X-PRESS" FUNCTIONS

*thumb-X-press* is an optional add-on device for the SYNTHOPHONE that opens a whole new dimension of control over sound... at the touch of your right hand thumb! This highly dynamic pressure sensor is multi-functional, i.e. it can be programmed to act as an additional octave key or a pitch bending device, as a harmony switch or a sustain pedal, and it can also produce aftertouch (see below for details).

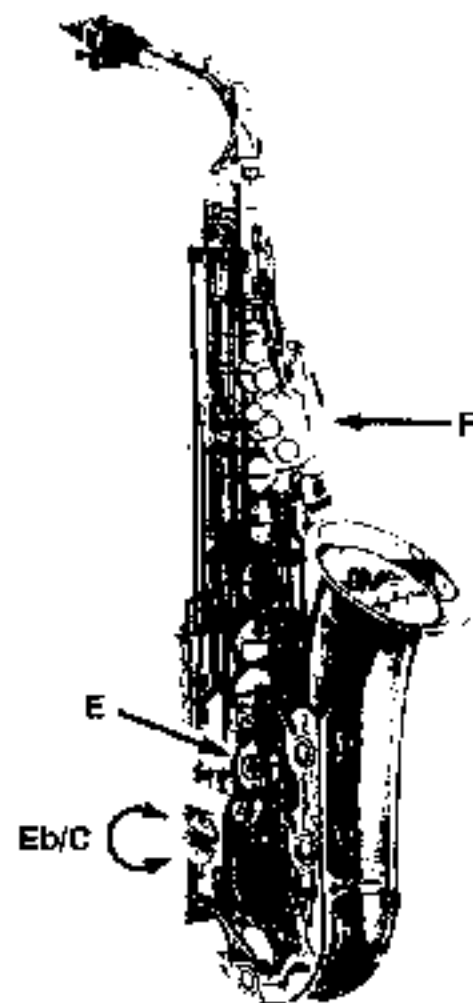
To turn on *thumb-X-press*, simply select a sound on your synthesizer first, and then choose an appropriate function for *thumb-X-press*. The settings for *thumb-X-press* are stored along with all the other SYNTHOPHONE settings when storing a patch to the internal memory (s. 3.6). Consequently, preselected patches are immediately playable with their respective *thumb-X-press* functions.

Select any of the following levels for *thumb-X-press* using the control fingerings listed below:

- hold palm F and low E & press Eb	---> to next higher level
- hold palm F and low E & press C	---> to next lower level
- hold palm F and low E & press Eb/C	---> to level 0 = Off

Level 0	Off
Level 1	Octave Key
Level 2	Pitch Bend
Level 3	Aftertouch
Level 4	Number of Voices in Chords
Level 5	Lower/Upper MIDI Channel
Level 6	bit-Substitute Chords
Level 7	Freeze Harmony
Level 8	Sustain On/Off

The panic function resets *thumb-X-press* to level 0 = off



### "THUMB-X-PRESS" FUNCTIONS

**Level 0 —> Off**  
*thumb-X-press* is turned off by activating the "Panic" fingering (3.1). Since the "Panic" function is usually employed to "clear the deck" for a new patch, this is also a good starting point for work with *thumb-X-press*.

**Level 1 —> Octave Key**  
After resetting parameters using the "Panic" fingering, advance *thumb-X-press* to level 1 and play a few notes. Touching the *thumb-X-press* membrane with your right thumb will cause notes to be played an octave higher than their normal setting. They will return to the normal octave when thumb pressure is released.

**Level 2 —> Pitch Bend**  
Applying pressure to *thumb-X-press* results in upper pitch bending. It can be used simultaneously with lip pressure, doing a pitch vibrato. The two pitch bending informations are internally combined.

**Level 3 —> Aftertouch**  
Applying pressure to *thumb-X-press* results in sending aftertouch data. It can be used simultaneously with wind pressure, that may also be assigned to generate aftertouch. The two aftertouch sources are internally combined.

**Level 4 —> Number of Voices in Chords**  
Begin by making a harmony selection and playing some chords using lip control (i.e. Dynamic Harmony). Now advance *thumb-X-press* to level 4. You should be able to control the number of voices in a chord using thumb pressure. More pressure adds more voices up to your predetermined limit. Zero thumb pressure equals unison, with gradual increasing thumb pressure bringing in extra voices whenever you want them.

**Level 5 —> Lower/Upper MIDI Channel Selection**  
Advance *thumb-X-press* to level 5. No pressure on *thumb-X-press* plays the sound on the original MIDI channel. Applying pressure to *thumb-X-press* instantly reassigns your performance to the next higher MIDI channel. Release of pressure on *thumb-X-press* instantly returns you to the original MIDI channel. To experience this effect you must set your synthesizer to receive on multiple channels and select a separate sound for each channel. Separate synthesizer units set to receive on adjacent channels will accomplish a similar result. See your synthesizer manual for details on multitimbral operation.

**Level 6 —> bit-Substitute Chords**  
Advance *thumb-X-press* to level 6. Pressure on *thumb-X-press* produces the same harmonic variations as those achieved with lip pressure set to Dynamic Harmony level 2 (see 4.6). Remember to select this level of harmony control and assign at least two part harmony in order to hear this powerful arranger's tool.

**Level 7 —> Freeze Harmony**  
Advance *thumb-X-press* to level 7. Pressure on *thumb-X-press* captures the last chord played and causes it to move in parallel motion. Once *thumb-X-press* is released, the chords returns to diatonic structures in your chosen key.

**Level 8 —> Sustain On/Off**  
Advance *thumb-X-press* to level 8. Sustain pedal effects is turned on and off by applying and releasing pressure to *thumb-X-press*. Remember that volume control (derived from wind pressure) may also affect the decay of sustained sounds. If desired, the wind volume control can be set to maximum (s.3.11) in order to have total control of sustain assigned to *thumb-X-press*.

## 5.2 LIP SWITCHING FUNCTIONS

Your lip pressure can be applied for "switching" on / off certain performance qualities, using the fingerings below:

- hold low F & palm F & Eb	---> to next higher level
- hold low F & palm F and press C	---> to next lower level
- hold low F & palm F and press Eb/C	---> back to level 1

- level 0** OFF (no switching function)
- level 1** Play on either of 2 MIDI channels through change of your lip pressure.  
(loose lip ---> basic channel / tight lip ---> basic channel +1)  
Switch back and forth between a clarinet and a flute sound with your lip!  
Naturally these sounds will have to be selected first (\*) and your synthesizer set to MULTI mode.
- level 2** Identical with level 1, but now Note Offs will NOT occur, when playing legato WHILE switching channels with your lip. This will allow for TRUE OBLIGATO two voice playing.
- Level 3** SUSTAIN (works like a foot switch on a piano)
- Level 4** PORTAMENTO (generates glissandi, if the sound is programmed for that)
- Level 5** FREEZE (last chord played becomes to be a parallel structure, as long as high lip pressure is applied)

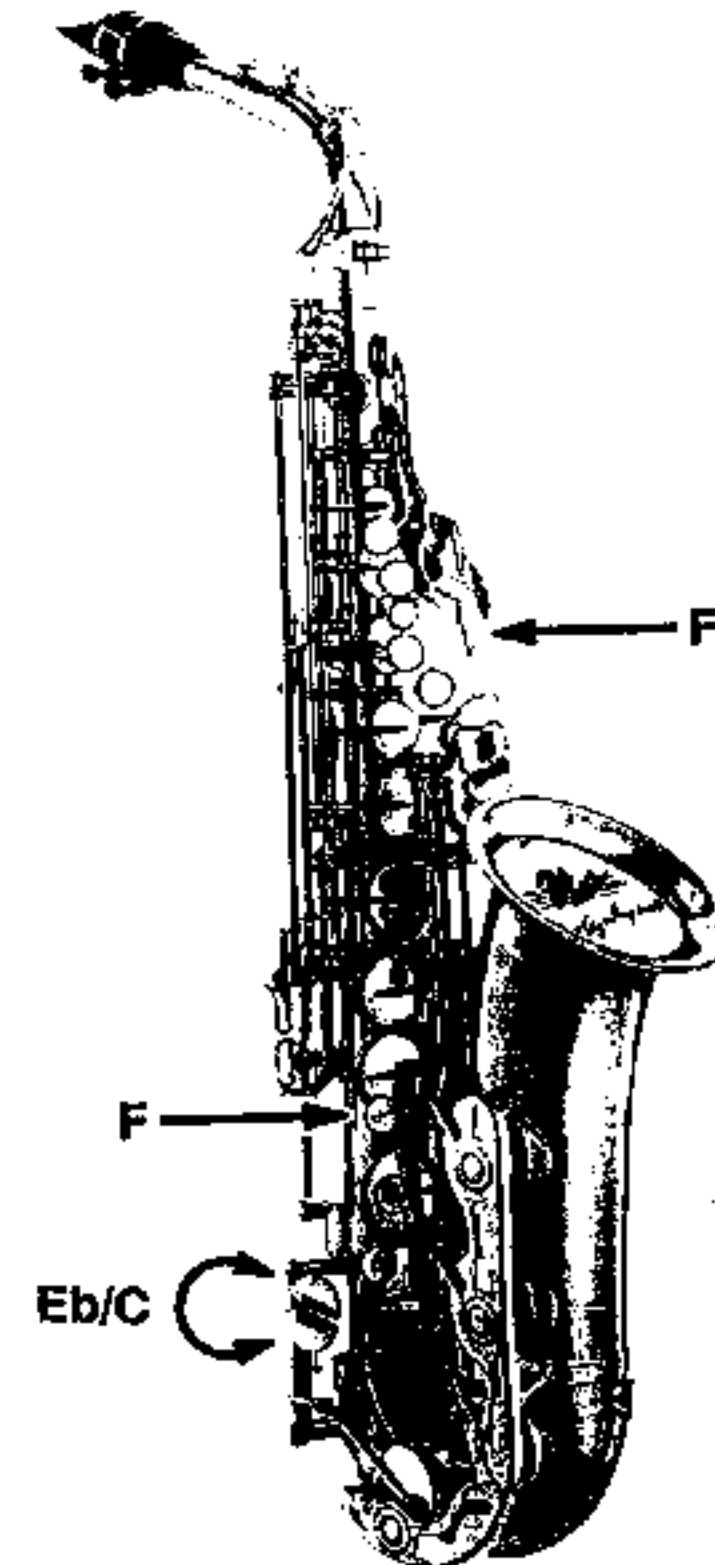
The panic function resets to level 0 (= OFF)

(\*) in levels 1 & 2 you can select sounds separately for both MIDI channels:

- select sound on LOWER channel:	preset selection (s.3.3) WITHOUT octave key
- select sound on UPPER channel:	preset selection (s.3.3) WITH octave key

### MUSICAL APPLICATIONS

Levels 1 & 2 are made to play DUOs on one single instrument. Since you can combine this switching function with all DYNAMIC HARMONY features, chords on one channel could be opposed to single voice on the other, etc. Just experiment with it!



## 5.3 ADDITIONAL PERFORMANCE FACILITIES

---

### a) "Standard" Altissimo fingerings

The following "standard" altissimo fingerings have been implemented:  
(s. also altissimo fingering chart 9.2)

- high F (fork fingering in front) & side Bb	---> high F#
- high F bis key (left hand 1st finger only)	---> high G
- high F bis key (left hand 1st finger only) & side Bb	---> high G#

b) **PATCH CHANGE** (s. 3.5) can now be used with / without sending a **PRESET CHANGE**. This allows the use of different **SYNTHOPHONE** patches with one and the same sound. To avoid sending out a preset change when changing **PATCHES**:

- lift up the left hand middle finger when applying patch change fingerings.

c) **Chords In FREEZE** mode can now be stored in **PATCHES**. Therefore a maximum of 32 parallel chord structures can be stored to memory.

d) "fingered **PORTAMENTO**", a feature mostly found on FM-synthesizers, can now be used, anytime a sound is programmed to perform that way. Fingered portamento generates **GLISSANDI** between legato notes, but regular step movement when playing staccato!

## 6. SOUND DESIGN CONSIDERATIONS

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### 6.1 PROGRAMMING EXPRESSIVE VOICES

---

The **SYNTHOPHONE** is a powerful MIDI wind controller for sax players. The sounds of this expressive instrument however depend on the programming of your synthesizer(s). When referring to the MIDI implementation chart in this manual, you will see that for the most part, things look very similar to keyboard data. The special thing about the **SYNTHOPHONE** though, is the use of the various mouthpiece MIDI controllers. Modulation, breath, volume, aftertouch, pitch bend and velocity are all derived from breath and lip pressure simultaneously, and your MIDI output is musically different from keyboard players, manipulating the **MOD-** and **PITCH-**wheels.

Breath and lip pressure are constantly producing highly dynamic and well-coordinated MIDI informations. Choosing synthesizers which are sensitive to these controls will insure the most "wind instrumental" results.

Therefore, you may want to check your synthesizer manuals for these informations:

- How flexible is the use of modulation, breath and aftertouch for shaping a sound?
- Does your synthesizer respond well to MIDI volume?
- Is the pitch bend range programmable?
- Can individual synthesizer voices be freely edited, layered etc.?

The details above are valuable but not essential for playing your gear with the **SYNTHOPHONE**.

## 6.2 SOUND ENHANCEMENT WITH EXTERNAL SIGNAL PROCESSING

---

Play your most exciting sounds through some reverb, delay or other external processor. Do some harmonizing. There are even programmable sound signal processors which allow for MIDI preset changes - you can change effects along with your synthesizer sounds by simply changing presets from your SYNTHOPHONE.

More complex effect units can even change some of their parameters dynamically, according to some MIDI controller. Imagine changing the reverb time constantly by changing your lip pressure. Some MIDI mixers will give you the power to change total mixing setups using preset change commands, others will accept MIDI continuous controllers to do equalisation, panning or volume control.

## 6.3 MIDI EVENT PROCESSING

---

MIDI data can be stored, transformed and reproduced in almost unlimited ways. There are a number of hardware units (Yamaha MEP4, Digital Music Corp. MX-8, MIDI-Temp, MIDI Solutions, Anatek, etc.) to do just this. Try them with your SYNTHOPHONE.

Typical features of these MIDI EVENT PROCESSORS are:

- MIDI delays
- Keyboard splits, transpositions
- Preset and MIDI channel reassignments
- MIDI data conversions and scaling
- MIDI data filtering (etc.)

## 6.4 SEQUENCING WITH THE SYNTHOPHONE

---

The SYNTHOPHONE data can be sequenced much like any keyboard, but it sends out much more MIDI data and will therefore fill up any small sequencer memory in a matter of seconds, if you do not observe the following rules:

- **Disable all continuous controllers, when not needed.**
- **If dynamics are not critical, set volume to a higher level - less data is generated.**

In general, computer based sequencers have bigger memories than dedicated hardware sequencers. Some can filter out unnecessary data even after recording tracks. Check out the editing possibilities before you buy.

When doing multi-tracking in MIDI, you will notice that your sequencer not only will fill up fairly quickly, but not replay more than 2 or 3 tracks without "choking". Remember that the SYNTHOPHONE sends out volume data. Two tracks on the same MIDI channel will probably try to send out different volume information at the same time and your synthesizer will get "confused".

Keep each track on a separate MIDI channel and use either multiple synthesizers or multi-timbral synthesizers, that receive on several channels at once. Even then MIDI may be overloaded by mixing several tracks to one MIDI output. Use if necessary, a multiport MIDI interface with your computer and hook up each individual synthesizer to a separate MIDI port, to avoid overloaded MIDI transmission.

## 7. SYNTHOPHONE CARE & CUSTOMISING

### 7.1 CLEANING YOUR MOUTHPIECE.

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Switch off power and pull off the mouthpiece from the neck. Remove the reed, and then wash your mouthpiece, while holding your thumb over the back opening in order to protect the socket from the water. Then shake the mouthpiece to get out any residual water and remount the reed. It may be necessary to adjust the height of the reed's metal tongue by that occasion (s. 2.3) Make sure the mouthpiece is put on firmly onto its connector and then switch on the instrument - in that instant, lip and wind sensors are recalibrated automatically by the processor.

### 7.2 GETTING YOUR PERSONAL ALTISSIMO FINGERINGS

---

Most experienced sax players have their own ALTISSIMO fingerings. If you want to use yours on the SYNTHOPHONE, fill in the altissimo fingering chart provided in this manual (s. 9.2) and send it to SOFTWIND INSTRUMENTS, Switzerland.

We will program your custom EPROM chip - and we do this service **free of charge** during the warranty period.

### 7.3 INSTALLING NEW SOFTWARE

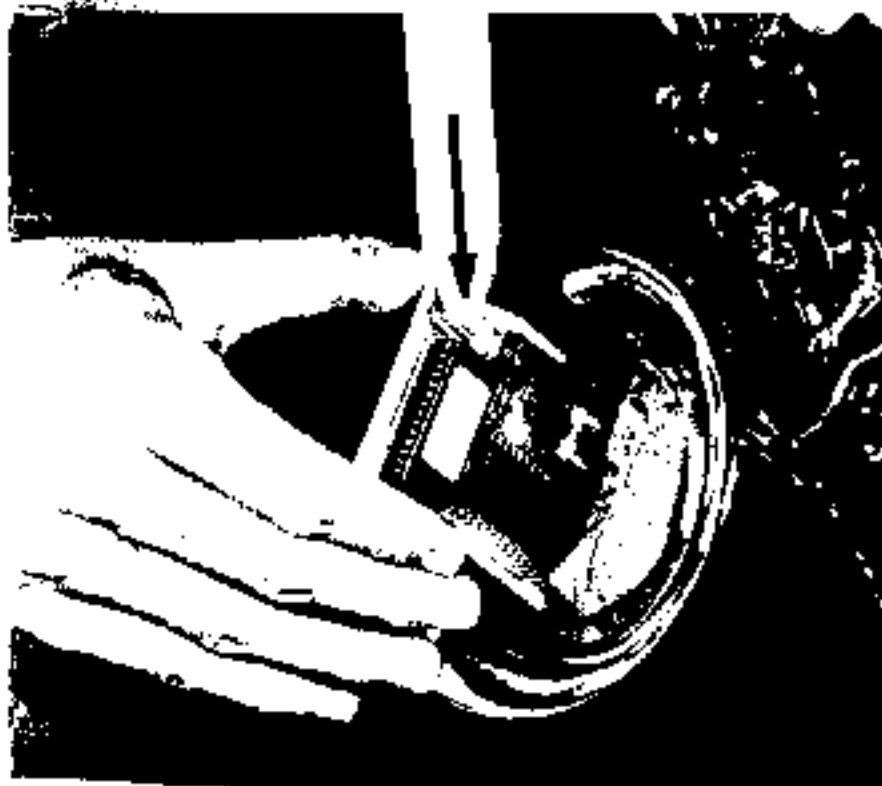
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**Ask a local technician to do this for you, if you are uncertain about these things.**

In order to replace EPROM chips take the following steps:

**Switch off power.** Remove the cover with the corresponding screwdriver supplied. Pull out the processor board by approximately 3 inches. With the flat screwdriver, lift - alternatingly from both sides - the old EPROM chip out of its socket (see illustration). Now observing polarity - there is a notch at one end - carefully insert the new EPROM into the socket. **It is IMPORTANT that all pins go in straight.** Carefully move back the processor board back in its original position and close the instrument with its cover. Switch back on and play your altissimo fingerings to check them out.

**The SYNTHOPHONE is designed to grow with future MIDI capabilities.** Periodically there will be software updates, which will be sent to all customers who have returned their warranty cards. Updates within the warranty period are free of charge.





## 8. TROUBLE SHOOTING GUIDE

### Problem: NO SOUND IS PRODUCED

- Check power lamp on power box of your SYNTHOPHONE.
- Check for power to all the rest of your equipment.
- Switch off and back on everything in your setup.
- If the MIDI - L.E.D. is mostly on while playing, then most likely the problem is NOT originating from the SYNTHOPHONE.
- If the MIDI - L.E.D. is never on while playing, the MIDI cable connecting the SYNTHOPHONE to its power supply is probably defective. Replace it with an other cable. Note that it has to be a 5-pole (fully wired) MIDI cable.
- Make sure all other cables are well connected and working.
- Replace each one selectively with a spare cable.
- Make sure, that the spiral cable of the neck is firmly plugged into its socket inside the upper opening of the SYNTHOPHONE body.
- Check that your synthesizer and Synthophone are set to the same MIDI channel.
- Test your synthesizer(s) with some other MIDI input (i.e. keyboard or sequencer).

### Problem: LIP CONTROL ISN'T WORKING (properly)

- Play another sound - maybe your previous sound is just not sensitive to modulation or pitch bend data.
- Do the panic function (while not applying any lip pressure) - to calibrate your reed - then set for a high pitch bend level to check on the action of the reed again.
- Inspect your reed and the height of the metal tongue (s. 2.3). Correct it if necessary or exchange the reed with a new one from the box and then repeat steps above once more.

### Problem: WIND CONTROL ISN'T WORKING (properly)

- Is MIDI volume (cntrl. 07) received by your synthesizer(s)? On some older units this parameter is not available at all. In certain cases, dynamics are played with breath data.
- See the respective user manual for more details.
- If the volume behaves somewhat irregularly, get rid of the water in the mouthpiece by shaking it out.

### Problem: SOME OF THE KEYS ARE DEAD...

- Change to different sound programs. Maybe the sounds themselves are limited in range (split-sounds, sample-range etc.).
- You may accidently have bent one of the key sensors inside the instrument.

### DO NOT ATTEMPT TO ADJUST ANY OF THE KEY SENSORS BY YOURSELF.

For any further problems, please call SOFWIND INSTRUMENTS, Switzerland. We will give you our best possible support with all questions concerning the SYNTHOPHONE. Thank you!

## 9. APPENDIX

### 9.1 MIDI IMPLEMENTATION CHART

n = MIDI channel number, all 16 channels are selectable.  
xx = first data byte  
yy = second data byte

#### MIDI TRANSMIT DATA

NOTE OFF	9n xx 00	velocity = 0
----------	----------	--------------

NOTE ON	9n xx yy	velocity derived from wind pressure
---------	----------	-------------------------------------

#### CONTROL CHANGES

Modulation	Bn 01 yy	available in 6 levels
Breath	Bn 02 yy	available in 6 levels
Volume	Bn 07 yy	available in 6 levels
Sustain	Bn 40 7F	
Portamento	Bn 41 7F	
Freely assignable controllers	Bn 50 7F - Bn 5F 7F	

PRESET CHANGE	Cn xx	128 presets available
---------------	-------	-----------------------

AFTERTOUCH	Dn xx	available in 6 levels
------------	-------	-----------------------

PITCH BEND	En xx yy	available in 6 levels (3 modes)
------------	----------	---------------------------------

ALL NOTES OFF	Fn F7 00	
---------------	----------	--

REAL TIME MESSAGE	FA	Start
	FB	Continue
	FC	Stop

MIDI RECEIVE DATA	none
-------------------	------

All specifications are subject to change without further notice.