

INSTRUCTION MANUAL

Lyncon II

**Computone Inc.
Norwell, Mass.**

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INSTRUCTION MANUAL

LYRICON II

INTRODUCTION

In order to gain a clear understanding of the capabilities of Lyricon II, a brief review of exactly what constitutes a musical sound may be helpful.

All musical sounds are composed of overtones. Each overtone, if analyzed separately, has exactly the same tonal quality regardless of the type of instrument being played. What makes a trumpet sound different from a clarinet, for example, is the number of overtones present (1st, 2nd, 3rd, 4th, 5th, etc.) in the sound plus the amount of energy contained in each overtone. Strings, brass, wind instruments, even percussive instruments, all generate overtones which determine their respective tonal personalities (timbre) under "long tone" conditions.

The Importance of Control

Most music theorists assign a great deal of importance to long-tone overtone structure. They fail, however, to give adequate attention to the transient or changing nature of musical overtones which is as much a character of the instrument being played as its long-tone characteristics. The same string will provide a unique and distinct musical event depending solely on whether it is plucked, bowed, or struck (i.e., changing its turn-on characteristics).

We define the ability of a musical instrument to respond to the player's commands (whether blown, struck, plucked, or bowed) as its degree of control sensitivity. The ease with which a musical instrument reacts to the player's demands for expression determines whether the instrument has a high or low degree of control sensitivity. Obviously, this degree of control sensitivity directly relates to musical phrasing; subtle timbre changes, dynamics, etc., -- in a word, expression.

Control Sensitivity

Musical synthesists have long been intrigued with the subject of control sensitivity. The ADSR of keyboard synthesizers reflects the efforts of synthesizer designers to simulate the high degree of control sensitivity present in the solo acoustic instruments. (violin, saxophone, trumpet, etc.) Without the ADSR (Attack, Decay, Sustain, Release) controls, the monophonic keyboard

synthesizer would be, for all practical purposes, an organ with single note capabilities. The addition of the ADSR gives the keyboard synthesist the means to substantially alter the turn-on, sustain, and turn-off characteristics of the note.

The keyboard synthesizer is not without limitations, however. The ADSR or envelope generator is difficult to change in the middle of a note or phrase; hence, most ADSR's are fixed for an entire performance creating a situation where the attack, decay, and release are exactly the same for every note played. The keyboard synthesizer player usually relies on footpedals to achieve some degree of control over levels, tonecolors, etc., which are helpful, but tend to be unnatural and difficult to coordinate. Pressure sensitive pads, tone wheels and joysticks also help but lack the spontaneity essential for creative phrasing and articulation.

Sounds with Control

Since all sounds that the ear reacts to are "acoustic" (whether generated by a vibrating tube, string, metal disc or loudspeaker!), the often voiced complaint that electronic music sounds too "mechanical" or expressionless must relate to the degree of control inherent in keyboard synthesizers.

Lyricon II is an exciting new musical instrument that brings the unparalleled control of Lyricon to the colorful sound dynamics of the two-voice synthesizer. The Lyricon II player may pitch bend, wah-wah, articulate, phrase, change loudness and attack, etc. comfortably -- naturally -- without touching a knob, switch, or footpedal.

Lyricon II and its companions, Lyricon I and the Wind Synthesizer Driver, give to the musician instant command over all the musical elements essential to expressive performance. Attack, loudness, timbre, pitch, and decay are all instantaneously under the control of the player satisfying the most demanding musician's desire for expression.

The dynamic control capabilities of the Lyricon in concert with the enormous tonecolor flexibility of its electronic sound generating systems make the Lyricon family of electronic musical instruments unmatched as performance instruments in the music world of today.

CONTROL CONSOLE

The Lyricon II control console is composed of 5 distinct sections separated into groups for ease of recognition.

VCO 1

The main oscillator section contains controls for tuning, wave-shape, mode, and threshold adjustments.

SYNC

The Sync section includes the off/on switch used for synchronizing or electrically forcing VCO 1 and VCO 2 to play at the same pitch. The lower subsection of the Sync section contains the low frequency oscillator speed control knob (LFO). The bend up "reed" trim screwdriver adjustment is also located in the "sync" section.

VCO 2

VCO 2 is identical in operation to VCO 1. The "Threshold" control is dependent on the adjustment of the VCO 1 "Threshold"; so, please familiarize yourself with the proper adjustment as described under Threshold in the Panel Controls section.

VCF

The Voltage Controlled Filter section consists of the controls for adjusting filter frequency, filter resonance, and filter mode. The mixer slider control allows the player to vary and mix the contribution of sound from VCO 1 and VCO 2 or to select VCO 1 or VCO 2 output signal independently.

OUTPUT

The Output Section contains the loudness control, low and high gain output jacks, a monaural earphone output jack, and a patch connector and trim controls for driving an external auxiliary synthesizer.

INPUT

The Input Section contains the power on/off switch and the female receptacle coupling the body to the control console.

PANEL CONTROLS

VCO 1 SECTION

Range:

Shifts 3 octave range of body up or down one octave from "mid" position. (Total 5 octaves)

Tuning:

In coarse position (pushed down) tunes body up or down approximately $\frac{1}{2}$ octave from concert pitch (C). In fine tune position (up or released) tunes instrument approximately $\frac{1}{2}$ tone up or down from coarse setting. (Pushing knob halfway will "slip" knob for adjusting knobpointer to center position.)

Mode:

Position determines whether the pitch of VCO 1 will be controlled by the reed or the LFO (low frequency oscillator).




Modulation (%):



Works in conjunction with mode switch. Zero effect with knob pointing straight up. With mode switch in "reed" position, turning the modulation control to the right of center (zero) will enable pitch bend up with reed from loose lip. Turning knob to the left of center will enable pitch bend down with reed from tight lip.

With the mode switch in LFO position, the pitch of VCO 1 will change up or down an amount corresponding to the setting of the "modulation" knob. No effect will occur at zero position (pointing up). The speed of the pitch change will be determined by the setting of the LFO knob.

Wave:

The wave switch determines the timbre or tonal quality of the sound available from VCO 1.


With the wave switch in  position, the "pulsewidth" knob will change the timbre from "reedy" full left  , to "string like" full right  .

With the wave switch in  position the sound will be "brassy" with the proper filter settings. The pulsewidth knob has no effect on the timbre with the switch in  position.

Osc:

The osc switch turns VCO 1 sound on or off without disturbing settings for quick sound changes during performance.

Threshold:

The setting of the threshold control of VCO 1 controls the amount of wind required before a sound is obtained from the instrument. VCO 1 threshold is the master control for both VCO 1 and VCO 2. With VCO 1 threshold set too far left () VCO 2 threshold will not operate and a sound will not be obtained from VCO 2. Start with both thresholds in the 12:00 o'clock position (straight up). If either VCO 1 or VCO 2 make a sound without blowing into the body, turn VCO 1 threshold slightly to the left until the sound stops.

VCO 2 SECTION



With the exception of the threshold control (see above), the controls and switches in the VCO 2 section work exactly the same as the corresponding VCO 1 controls and switches.

Remember that if VCO 1 "threshold" knob is set too far to the left, VCO 2 threshold will not operate properly.

VCF SECTION

VCO 1/VCO 2 Slider Control

The slider knob mixes the sound proportionately from VCO 1 and VCO 2. With the slider full up (towards top of console), all the sound originates from VCO 1. With the slider full down (towards bottom of console), all sound originates from VCO 2. Approximately in the middle of the slider range, one half the sound is obtained from each oscillator.

The Lyricon II console creates its sounds by first generating sound waves (pulse , sawtooth ) in the oscillator sections (VCO 1, VCO 2) and then modifying these soundwaves in the filter section (VCF). The filters eliminate or reduce

certain information from the soundwaves fed to them thereby producing distinctive sounds. The oscillators act like the reed or string of an acoustic instrument while the filter (VCF) acts like a "tunable" acoustic instrument body or sound box. The "Lp Bp Hp" switch, the "frequency" knob and the "resonance" knob are all related and interact with each other.

The "Lp" stands for low pass and as its name implies allows low pitched sounds to pass and reduces or rejects high-pitched sounds.

The "Bp" stands for band pass where a particular band of musical information is passed through. Sounds below or above the band are rejected.

The "Hp" stands for high pass and again as the name implies allows high pitched sounds to pass and tends to reject sounds below a certain pitch.

Frequency Control

The frequency or "pitch" of the filter is tunable by changing the "frequency" knob. The frequency knob works with the "Lp-Bp-Hp" switch to determine what overtones will be allowed to pass through the filter.

Resonance Control

The "resonance" knob setting determines how much the overtones are emphasized as they pass through the filter. With a high setting of the resonance control, the overtones will become very pronounced and "ring" as they pass through the filter.

LFO Wind Reed/%

The "LFO wind reed" switch determines how filter effects are to be controlled. In the "wind" position, changes in wind pressure effect the filter. In the "reed" position the filter is controllable with lip motion. In the LFO position, the filter effects will waver at a speed determined by the setting of the LFO control. The "%" control directly below the LFO wind reed switch determines how much the filter will be effected by changes in LFO, lip, or wind. The "%" control has zero effect when pointing up (0). Moving the % knob to the right allows the overtones to be accented in an upward (higher pitch) direction. Moving the % knob to the left of center allows the overtones to be accented in a downward (lower pitch) direction.

OUTPUT SECTION

Loudness

The "loudness" or level control is used to adjust for wind comfort in conjunction with the external amplifier volume. Room volume requirements should be accommodated by increasing or decreasing the external amplifier volume control. Start with the loudness control at halfway and decrease while blowing into the instrument until wind resistance is comfortable to you. Increase the external amplifier volume until the dynamics are adequate and controllable.

Hi Lo Outputs



Both high signal and low signal outputs are available to accommodate external amplifier variations as well as variations in attachments that may be used such as phase shifters, echo's, etc.

Earphone jack

The earphone jack is designed to drive low impedance (monaural, 8 ohm) headsets. Stereo headsets may be driven also by using a stereo to monaural adapter available at most radio stores (mini plug to phone plug).

Reed Bend-Up Adjustment

Located in the center of the "sync" section is the reed bend-up screwdriver adjustment. It is set at the factory but should further adjustment be desired please proceed as follows:

- a) Turn up Threshold control in VCO 1 section until a tone is obtained.
- b) Lay instrument body down in such a way that the reed is not touching anywhere. (Reed should be in its normal open or relaxed position.)
- c) Turn VCO 1 modulation control full up to the right  . Turn VCO 1 mode switch to reed position.
- d) Locate the "reed" screwdriver adjustment in the sync section.
- e) With a small screwdriver, turn the reed adjustment to the left  until the pitch begins to go higher. Then turn adjustment to the right to the point where the pitch stops changing. Continue to turn the adjustment beyond the point where the pitch stops changing slightly (a few degrees).

The amount you turn the reed adjustment to the right beyond the point where the pitch stops changing determines how much your lip will have to close before the bend up action takes place.

Turn VCO 1 threshold control back until tone stops. Turn modulation knob until you can bend up a half tone by tightening your lip. While blowing into instrument, tighten and loosen your lip and see if you are able to control a half-tone bend up comfortably. Turn reed adjustment slightly either way if desired until your vibrato and pitch bend are comfortable.

Using the Sync Switch

Although VCO 1 and VCO 2 are designed to track each others pitch accurately, no two oscillators will play exactly in tune over a wide range any more than two acoustic instruments will play exactly in tune. If you wish to have VCO 2 play exactly in tune with VCO 1 you may use the "sync" switch as follows:

- a) Turn VCO 1 and VCO 2 thresholds up, with the slider control in approximately the middle, so that a tone is heard from both VCO 1 and VCO 2 at the same time.
- b) Tune the pitch of VCO 2 to match VCO 1.
- c) Move the "sync" switch to on.
- d) Turn VCO 2 tuning knob in # direction (to the right) until the pitch of the two oscillators lock together.

To tune the two oscillators in octaves, follow the same procedure with VCO 2 range switch in low or high position with VCO 1 range in mid position.

Some unusual effects may be obtained by locking the two oscillators at different harmonics. Turn VCO 2 tuning knob slowly through its range (press down for coarse) and experiment with the harmonic variations while playing.

How To Tune Reed

The pitch of each oscillator may be changed up or down independently. In some cases it is desirable to have the pitch of each oscillator change the same with lip motion. Tune as follows:

- a) Turn both threshold knobs up with slider in middle until a tone is heard from each oscillator.
- b) Tune VCO 2 to match pitch of VCO 1.
- c) Turn VCO 1 modulation knob to right until a $\frac{1}{2}$ tone pitch bend up is obtained when reed is squeezed closed with fingers.
- d) Hold reed closed with your fingers and turn VCO 2 modulation knob to right until pitch matches VCO 1.

Both oscillators should now pitch bend in tune with each other.

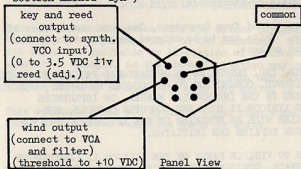
To adjust for pitch bend down. Hold reed shut while tuning VCO 2 and VCO 1. Release reed and turn VCO 1 modulation knob to left the desired amount. With reed released, turn VCO 2 modulation knob to left until VCO 2 matches pitch of VCO 1.

How to Patch in External Synthesizer

If you wish to expand the capability of Lyricon II by driving an additional synthesizer or synthesizer module, we urge that you first discuss the matter with a reputable synthesizer dealer. Bring this manual with you for dealer reference.

Since synthesizers vary widely regarding patches, supplied with Lyricon II is an unwired male connector which your synthesizer dealer will need to make the proper patches.

The outputs provided are shown below: (connector in output section marked "syn")



Three screwdriver adjustments are provided in the output section for synthesizer matching.

Reed

Adjusts the amount of reed signal output available from the Lyricon II console for pitch bend purposes.

Threshold

Determines how much wind is required before external synthesizer turns on.

VCO

Adjusts for scale variations in synthesizers. Provides control over the 1 volt/octave pitch signal required to achieve proper intonation with the external synthesizer.

WARRANTY

This limited warranty covers all internal electronic components of the Lyricon II instrument body and control console for a period of one (1) year from the date of recorded purchase. Should any of the said components prove to be defective in material or workmanship within the one year warranty period, Computone, Inc. at its factory will repair or replace the defective components(s). THE WARRANTY CARD MUST BE COMPLETED AND RETURNED BY THE CONSUMER WITHIN TEN DAYS OF PURCHASE IN ORDER FOR THIS LIMITED WARRANTY TO BE IN EFFECT. This limited warranty is extended only to the original consumer purchaser and is not transferable or assignable.

Shipping charges to and from Computone, Inc. are the responsibility of the consumer. Units are to be shipped prepaid and will be returned freight collect.

SHOULD COMPUTONE, INC. DETERMINE AN OPERATIONAL FAILURE TO BE THE RESULT OF NEGLIGENCE, CONNECTION TO UNGROUNDED EQUIPMENT, USE OTHER THAN AS DESCRIBED IN THE INSTRUCTION MANUAL, OR INFLUENCES EXTERNAL TO THE LYRICON II BODY AND COMPUTER CONSOLE, THE CONSUMER OR DEALER WILL BE NOTIFIED OF THE ESTIMATED COST FOR THE REPAIR BEFORE REPAIRS ARE INITIATED.

COSMETIC DAMAGE TO VISIBLE PARTS OF THE LYRICON II (INSTRUMENT BODY, KEYS, SURFACE, CONSOLE PANEL, KNOBS, CASE) ARE NOT COVERED BY THIS LIMITED WARRANTY UNLESS, IN THE OPINION OF COMPUTONE, INC., THE DAMAGE WAS THE RESULT OF FAULTY CONSTRUCTION.

Computone, Inc. warrants that the instrument supplied in conjunction with this limited warranty conforms to the following description and will be of merchantable quality.

THE LYRICON II IS A MUSICAL INSTRUMENT DESIGNED TO BE PLAYED BY A MUSICIAN IN A MANNER DESCRIBED IN THE ACCOMPANYING INSTRUCTION MANUAL ENTITLED INSTRUCTION MANUAL, LYRICON II AND THIS LIMITED WARRANTY APPLIES ONLY WHEN THE LYRICON II IS SO USED.

The Lyricon II must be properly connected to a grounded power source operating within the voltage and frequency ranges specified on the label adjacent to the console power receptacle and connected to an external output system as described in the instruction manual.

WARRANTY Continued

USE OTHER THAN AS A MUSICAL INSTRUMENT OR USE OTHER THAN AS DESCRIBED ABOVE MAY VOID THIS LIMITED WARRANTY.

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DESIGN SPECIFICATIONS OF THE LYRICON II MAY BE ALTERED FROM TIME TO TIME WITHOUT ADVANCE NOTICE. COMPUTONE, INC. ASSUMES NO OBLIGATION TO UPDATE EXISTING EQUIPMENT ALREADY IN USE.

The terms described above form the entire obligation and liability of Computone, Inc. to the consumer. Some States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you. No agent other than Computone, Inc. may alter this limited warranty or agree to terms not stated in this warranty.

This warranty gives you specific legal rights and you may have other rights which vary from State to State.

TECHNIQUE

Wind Technique

Developing a proper blowing technique when playing the Lyricon II is essential to its mastery. The Lyricon II wind section is a mechanical system that has definite physical limits. Blowing too hard into the mouthpiece will cause the wind system to "bottom" thereby eliminating any additional effects through changes in wind pressure. The wind levels required to achieve a particular result become more obvious as the player gains proficiency with the Lyricon II. Blowing gently in the early stages of playing enables the player to obtain more quickly the variations in sounds available.

Lip Technique

Traditional lip technique is not necessary since the body is not acoustic. Variations in lip configuration and/or facial muscles have no effect on intonation or timbre unless programmed by the player. Proper positioning of the reed lever is essential in order to obtain reed effects from the synthesizer. Be sure that the reed lever is operating properly as described in the instruction manual.

The external fiber cane reed of Lyricon II serves two important purposes. First, it acts as a self-springing lever to modulate or control the air stream reaching the wind transducer. Secondly, it engages the reed lever, the position of which determines the magnitude of the electrical signal reaching the lip circuits. A fiber cane material reed is used since it lasts a great deal longer than cane and is not easily damaged. The jaw should be held loosely and comfortably while experimenting with the amount of glissando (pitch bend) available.

Psychology of Imitation

Although it is not key to your understanding of the instrument it is, nevertheless, an interesting exercise to see just how close you can come to imitating other instruments. If you are attempting to imitate a trumpet or French Horn, for example, you must think as that horn player would as you play.

Pick a tune that is normally associated with that instrument and be careful that you articulate and phrase as the musician would on that particular instrument. Attempting a violin sound, for example, obviously requires substantially different phrasing and attack than for a French Horn. You will find as you progress that the actual sound quality produced is sometimes not nearly as important as the phrasing and attack characteristics that you impart to Lyricon II.

CARE AND MAINTENANCE

The Lyricon II is a quality instrument of rugged construction that should give many years of faithful service if properly cared for. It should be treated as you would any fine musical instrument.

Special Precautions:

1. Do not attempt to take body section apart.
2. Be sure you are plugged into a properly grounded power source within the specifications indicated on the label next to the Power Connector on the console.
3. Do not use excessive force on any connectors.
4. Avoid spilling liquids or foodstuffs on the instrument body or control console.
5. Consult with the factory before attempting repairs.

The barrel joint or upper section of the body contains the wind and lip electronic sensing systems. The main body contains the pitch determining circuits and interpose logic circuits. IMPORTANT! Do not attempt to twist or remove the sections of the body other than as described under removal of mouthpiece or the reed lever adjustment.

Each key is actually a switch that consists of a silver pad (mounted under each key) which completes the circuit through a silver contact mounted on an insulated pad on the body when a key is depressed.

Note: The pivot rod lubricant and pad adhesive used are conductive. Therefore, no repairs of the mechanical part of the body should be attempted except by the factory or by an authorized service center.

Cleaning the Contacts

Although the contacts are silver material and excellent conductors, surface contamination may occur (because of pollutant in the air) resulting in erratic or noisy key activity. Cleaning may be quickly accomplished as follows:

Using a reasonably clean or new dollar bill, (or business card) fold in half and slide under each key between the pad and the contact on the body. Press gently down on the key and at the same time gently slide the dollar bill out from between the two contacts. Be sure to clean all contacts including the octave keys. In severe cases, where a coating on the key contacts is not removed by simple cleaning, it may be necessary to use a piece of crocus cloth in place of the paper. Special burnishing tools are available from the factory.

Mouthpiece and Reed

The mouthpiece of Lyricon II is a modified tenor saxophone mouthpiece. The reed used is a standard tenor saxophone plastic reed (Fibercane) with its base trimmed to fit Lyricon II. Should the reed require replacement, care should be taken to insure that the reed lever is not bent out of position. Proper adjustment of the reed lever may be checked as follows:

- a) Set up VCO 1 for pitch bend down operation. (Mode switch on "reed", modulation control to left of center at approximately 9:00 o'clock.)
- b) Turn threshold control to the right until a tone is obtained.
- c) Place your thumb on the external reed and slowly close it shut. As you close the reed the pitch should raise. With the reed nearly flat against the mouthpiece, turn the VCO modulation control full left and back to zero. Little or no pitch change

should be heard. If the pitch changes noticeably with the reed held tightly closed, the reed lever will require adjustment as described in the following section.

Reed Lever Adjustment

Note: The Reed Lever should not require adjustment unless it has been accidentally bent out of position.

CAUTION Do not attempt to adjust the reed lever without following these instructions carefully. Always be careful not to bend or force the reed lever in any way when cleaning the mouthpiece or changing reeds. Forcing the reed lever out of its normal position may damage the internal reed lever mechanism necessitating factory repair.

1. Set up VCO 1 for pitch bend down operation. (Mode switch on "reed", modulation knob to left at approximately 9:00 o'clock.) Turn VCO 1 threshold to right until a tone is heard.
2. Remove the ligature and reed. With your thumb, push the reed lever flat against the inside of the mouthpiece and listen for a change in pitch. Release the reed lever and repeat until you are able to see where the reed lever tonal activity occurs.
3. With the reed lever closed, (fig. 2) turn the modulation control full left and back to zero. No noticeable pitch change should occur. If the pitch does change, the reed lever has been bent inwards slightly towards the mouthpiece. If so, proceed as follows:
 - a) Grasp the mouthpiece taking care not to disturb the reed lever, twist slightly back and forth and remove.
 - b) Holding the instrument body with the rear of it (Thumb Keys) facing you, grip the bottom of the reed lever with a pair of small pliers and with your thumb and forefinger, bend the reed lever very slightly towards you. Replace the mouthpiece taking care not to disturb the reed lever and repeat #3 (see fig. 4).

4. If step 3 appears satisfactory but no tonal change is obtained when replacing the mouthpiece and reed, the reed lever is bent too far towards the reed. If so repeat step 3b but bend the reed lever slightly away from you.

The reed lever adjustment appears complex but it is not. Once done correctly it is simple and quick to repeat any time it is required. The final test for correct reed lever position is to replace the mouthpiece, ligature and reed and move the reed with your lip while varying the amount of "Bend Down" and observe if the response is as described in #3. It should not be necessary to repeat the reed adjustment unless the reed lever has been accidentally bent out of position.

The proper position for the external reed (unlike in conventional singel reeds) is approximately 1/8 inch below the tip of the mouthpiece. (With the reed adjusted too close to the tip of the mouthpiece, the air flow may be restricted or shut-off with a tight embouchure.)

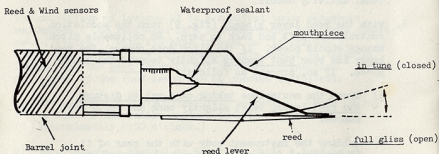


Fig. 1 Cutaway view of mouthpiece

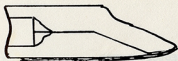


Fig. 2 In tune position
(tight embouchure)

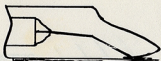
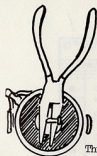


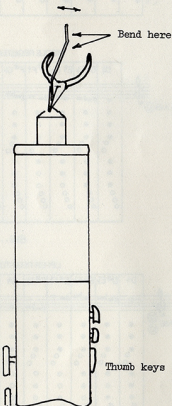
Fig. 3 Full glissando position
(approx. one octave lower
in pitch with max. setting
of glissando control)

Top View



Thumb keys
and rest

Sideview



Secure the bottom of the reed lever firmly before bending. Bend only in the directions shown. Do not rotate or twist reed lever. Bend upper portion of reed lever with thumb and forefinger. Bend the lever very slightly in the proper direction. Just a fraction of an inch change may be all that is required for proper adjustment.

Fig. 4. Adjusting Reed Lever

Fingering Chart

LOW REGISTER (MODIFIED BOEHM SYSTEM)

THUMB (R) 1
LEFT HAND FINGERS 2, 3, 4, 5
RIGHT HAND FINGERS 6, 7, 8, 9, 10

MIDDLE REGISTER (MODIFIED BOEHM SYSTEM)

THUMB (L) 12

8va.....

UPPER REGISTER (MODIFIED BOEHM SYSTEM)

THUMB (L) 12, 13



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