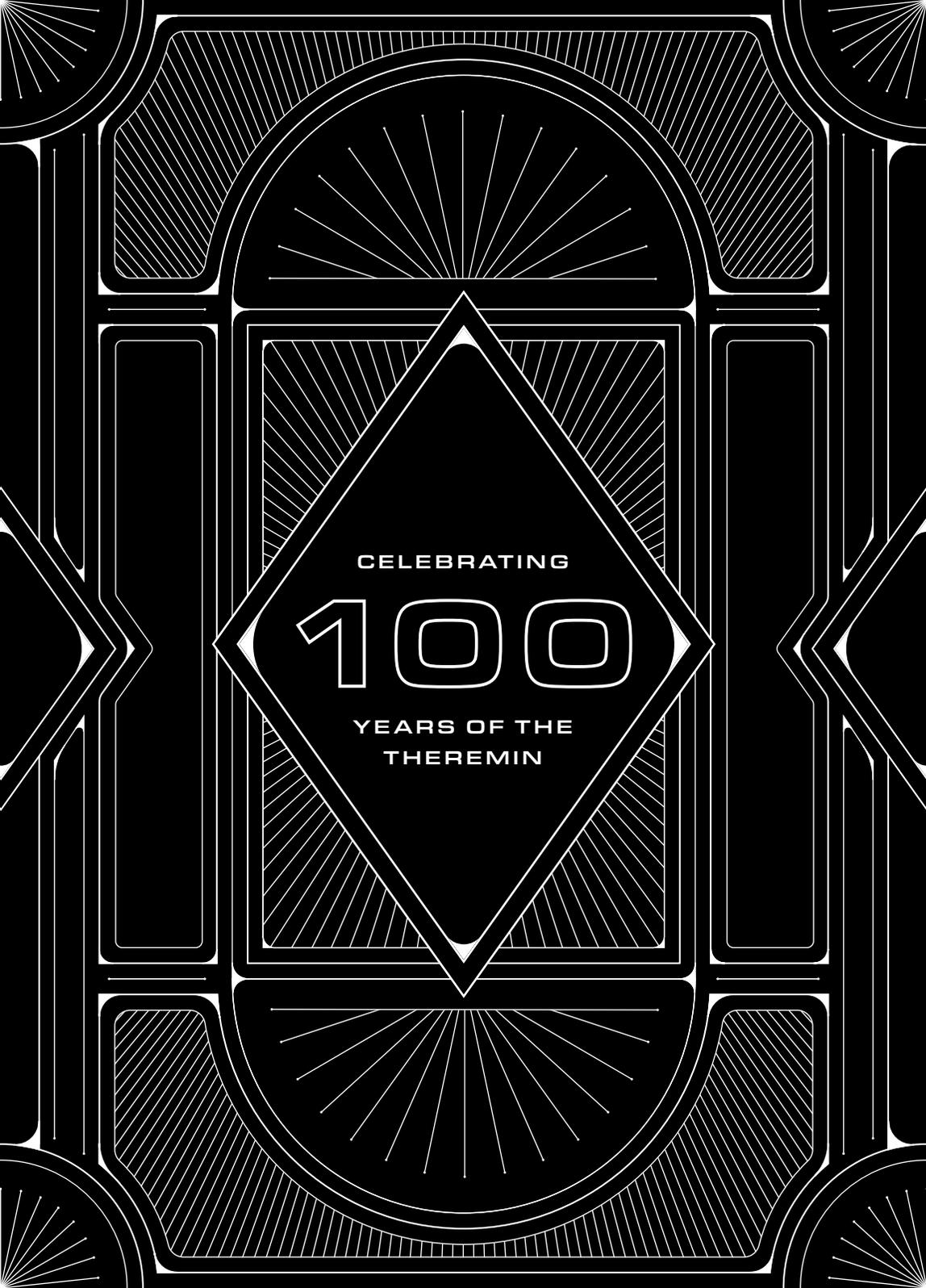




# *Claravox Centennial*

USER'S MANUAL

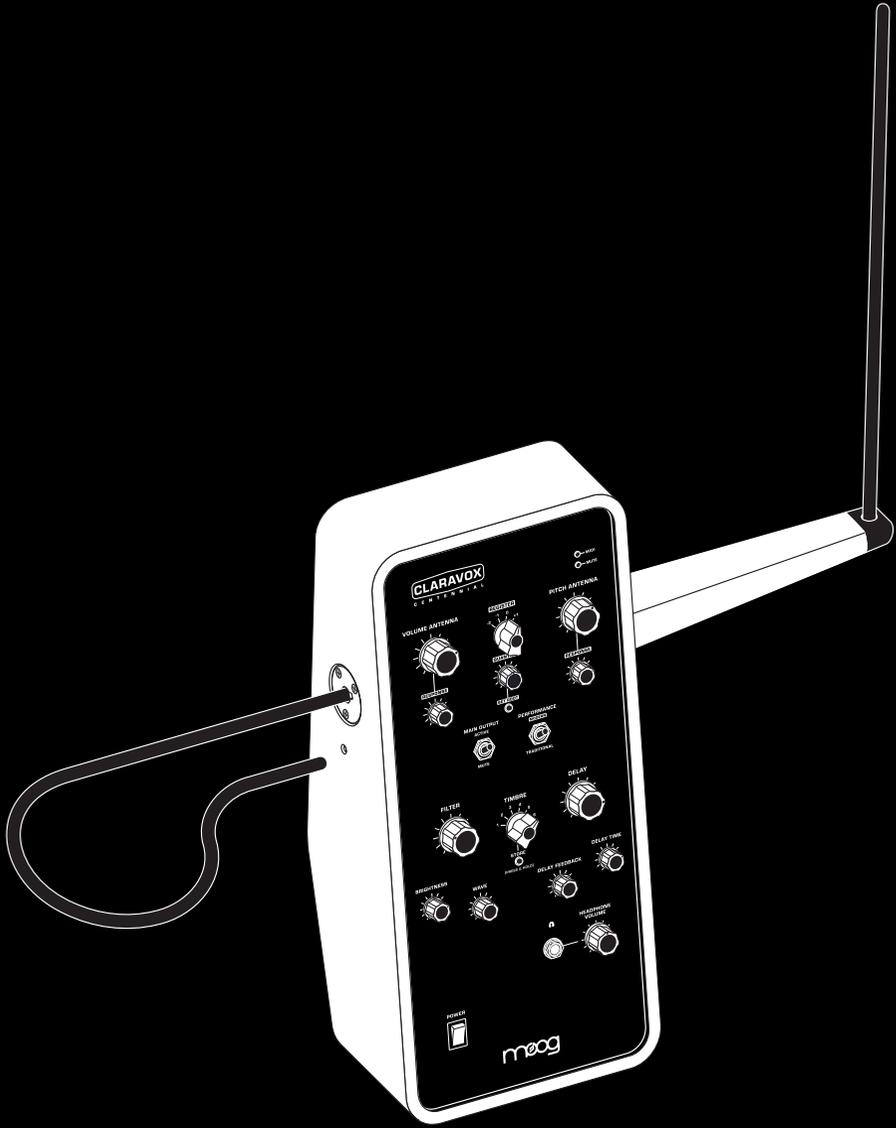




CELEBRATING

100

YEARS OF THE  
THEREMIN



---

*“Before you do anything, you have to have music in your soul. You also have to have courage. Playing the theremin is like being a trapeze artist without a net. You don’t know if you’ll land correctly or not, but you take a risk and you jump.”*

◇ *Clara Rockmore* ◇

---

# IMPORTANT SAFETY INFORMATION

**WARNING:** *When using electronic instruments, these basic precautions should always be followed.*

Read all the instructions before using the instrument.

Do not use this instrument near water – including, but not limited to, near a bathtub, washbowl, or kitchen sink; in a wet basement; or near a swimming pool. This instrument, in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable. The instrument should be located so that its location does not interfere with its proper ventilation. The instrument should be located away from heat sources such as radiators, heat registers, or other instruments that produce heat. No naked flame sources (such as candles, lighters, etc.) should be placed near this instrument. Do not operate in direct sunlight. The instrument should be connected to a power supply only of the type described in the operating instructions or as marked on the instrument. The power supply cord of the instrument should be unplugged from the outlet when left unused for a long period of time or during lightning storms. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

There are no user serviceable parts inside. Refer all servicing to qualified personnel only.

**NOTE:** *This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following:*

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**CAUTION:** *Please note that any changes or modifications made to this instrument not expressly approved by Moog Music Inc. could void the user's authority granted by the FCC to operate the equipment.*

# UNPACKING AND INSPECTION

Be careful when unpacking your new Claravox Centennial so that nothing is lost or damaged. Moog recommends saving the carton and all packing materials in case you ever need to ship the instrument for any reason.

## **Moog Claravox Centennial ships with the following items:**

- Claravox Centennial Theremin
- Pitch Antenna (Straight Tube)
- Pitch Antenna Arm
- Volume Antenna (Loop Tube)
- Microphone Stand Adapter
- Power Supply
- Owner's Manual
- Registration Card
- Inductor Coil Adjustment Tool

***Regarding the Inductor Coil Adjustment Tool:***  
*This tool is provided as a convenience for any potential future calibration adjustments. Over the lifetime of the instrument, your theremin's coils may need adjustment at some point. If such a time ever arises, you may find yourself advised by Moog's Service Department to perform a simple recalibration. In the event of such a situation, an "Inductor Coil Adjustment Tool" has been provided. Do not use the Inductor Coil Adjustment Tool without direction from Moog Music.*

## **What you will need:**

- A microphone stand capable of supporting your Claravox Centennial or the optional Moog Claravox stand.
- A 1/4" instrument cable and amplified speaker, or headphones with a 1/4" plug.
- A properly wired and grounded/earthed AC outlet.

***NOTE: Generally, the lowest setting on a standard mic stand is around 36 inches (~92 cm). The Claravox Centennial antennas sit about a foot higher than the top of the mic stand, or at about 48 inches (122 cm) in this position. Those with a playing height below 48 inches (122 cm) may want to consider a short-scale mic stand or the optional Claravox Centennial Stand.***

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*Clara Rockmore PR  
photo with theremin,  
New York, 1932*



## LEON, BOB & CLARA

The theremin is a magical instrument. Invented in 1920 by Russian physicist Leon Theremin (Lev Sergeyevich Termen), the story of how the theremin ventured from the science lab and the concert stage to hit records and Hollywood soundtracks is as fascinating as the instrument itself. For with the theremin, there is no string to pluck, no key to press, no bow to scrape. Instead, the theremin is controlled entirely through gestures of the hands and body. For some, the theremin may conjure images of mad scientists and sci-fi movies. For others, the tone and technique is reminiscent of an expert violin solo.

Early on, composers such as Joseph Schillinger, Edgard Varèse, Percy Granger, and Dmitri Shostakovich wrote concert pieces that featured the theremin. Along with these compositions and classical applications from professional musicians like Clara Rockmore, after whom your Claravox Centennial theremin is named, the theremin has made its mark on popular culture through film scores, television references, and more. The instrument was used to create other-

worldly audio effects in mid-century films such as *The Day the Earth Stood Still* and Alfred Hitchcock's *Spellbound*, was used in music by Led Zepelin, and provided the sounds that accompanied Neil Armstrong on the first trip to the Moon.

In 1949, a teenager by the name of Bob Moog first learned of the theremin in an issue of *Electronics World*, and shortly after built his first model of the instrument. By 1954, when he was just 19 years old, he and his father were building and selling theremins out of their home in Queens, NY. “I became a designer of electronic musical instruments because of my fascination with the theremin,” Bob wrote in his foreword to Albert Glinsky's *Theremin: Ether Music and Espionage*, the definitive biography of Leon Theremin. “Using the experience and insights I gained by designing theremins, I started designing and building synthesizers.”

Throughout his life, the theremin remained near and dear to Bob—as did the artists who helped shape the instrument and bring it to life.

## Introduction



*Clara Reisenberg (later Clara Rockmore) and Lev Sergeyevich Termen, New York, 1932. Still photo from the Sherman/Rockmore Family home movies – courtesy of Nadia Reisenberg/Clara Rockmore Foundation.*

One of those artists was the original theremin virtuosa, Clara Rockmore. Through their mutual love of this instrument, Bob Moog and Clara Rockmore were fast friends; in 1977, Bob recorded and produced *The Art of the Theremin* LP featuring Rockmore, accompanied by her sister, Nadia Reisenberg, on piano. In 1989, Bob Moog personally restored Clara's 1938 "Lev-built" custom theremin. After her death in 1998, Bob also restored Clara's 1929 RCA

Theremin, a gift from Leon Theremin, which now resides in the Artist Gallery of the Musical Instrument Museum in Phoenix, Arizona.

Your new Claravox Centennial theremin represents 100 years of electronic music innovation. We're humbled to share this instrument and incredible milestone – honoring Leon, Bob, and Clara – with you.



## MEET CLARAVOX CENTENNIAL

Claravox Centennial is a celebration of the theremin's past, present, and future. Designed to commemorate the 100th anniversary of the invention of the theremin, Claravox Centennial distills decades of expertise into a once-in-a-lifetime instrument. Created with exceptional playability to satisfy the most skillful theremin players, Claravox Centennial combines the unprecedented control and the high quality of sound needed for deep artistic exploration.

In the **TRADITIONAL** mode, Claravox Centennial provides the artist with a classic analog theremin experience. The heterodyne voice circuit feeds into an Analog Waveshaper, where the wave, brightness, and filter can be adjusted to taste. This Waveshaper is a direct descendant of Bob Moog's designs for the Etherwave Pro, which was in turn created to closely mimic the tonality Bob Moog had helped to create

for Clara Rockmore's theremin. In addition, a deep, smooth analog delay has been added to allow Claravox Centennial to create its own sonic space.

**NOTE:** Refer to page 69 for the **TRADITIONAL mode signal flow diagram**.

Moving to the **MODERN** mode unlocks an advanced digital engine featuring two oscillators. These multimode oscillators provide essential wave shapes and wavetable generated options. The first oscillator (OSC 1) feeds into the Analog Waveshaper circuitry. The second oscillator (OSC 2) passes through a multimode filter (along with a variable noise component) before re-joining OSC 1 and passing through the Analog BBD Delay. The **MODERN** mode also unlocks a host of additional Claravox Centennial parameters found on the front panel. To begin with,

# CLARA ROCKMORE

THEREMIN  
RECITAL



Assisted by  
NADIA REISENBERG  
at the piano

**TOWN  
HALL**

THURS. EVE.  
**OCT. 27, 1938**  
at 8:45 o'clock

(PROGRAM OVERLEAF)

*Clara Rockmore Recital  
Poster, 1938*



*Clara Rockmore taking a break during the rehearsal for her last public performance on the theremin, Merkin Concert Hall, New York, September 28, 1989*

## Introduction

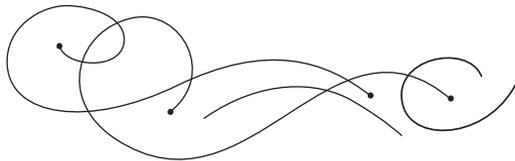
further refinement to the response of the Pitch and Volume antennas allow the user to create and save their own personal response curves for exceptional control. Pitch processing circuitry allows the selection of one of four template scales, a root note, the octave range, and the amount of pitch quantization. Changing the octave range allows the artist to define an effective playing range.

**NOTE:** Refer to page 70 for the **MODERN** mode signal flow diagram.

A third layer of control is available through the Claravox Centennial software (available for download at [moogmusic.com](http://moogmusic.com)), which includes control of the **MODERN** mode waveshapes, pitch offset, filter type, filter cutoff, filter resonance, noise parameters, and more. Nearly every knobbed parameter on the front panel (except for the **TIMBRE** and **REGISTER** ro-

tary switches) can send and receive MIDI data, either via DIN MIDI connectors, or via USB MIDI. This software can also act as a librarian for Timbres and Timbre Sets, loading to and saving from the six **TIMBRE** slots accessible from the Claravox Centennial front panel, as well as Scales and Scale Sets loaded into four available **SCALE** slots accessible via the Claravox Centennial front panel. The Claravox Centennial software is a convenient addition, but it is not required. MIDI data can be freely sent from your DAW, hardware controllers, or other MIDI control sources.

As with all theremins, Claravox Centennial remains a performance instrument. The versatile rear panel provides flexible Control Voltage jacks, foot switch and expression pedal control, DIN-style MIDI IN and OUT connectors, plus a USB port.





## SETUP AND CONNECTIONS

Let's begin by getting Claravox Centennial properly positioned, attaching the antennas, making the right connections, and then adjusting the antenna tuning so that you can begin to enjoy playing your instrument.

### Placement

The preferred method of playing Claravox Centennial is to mount the instrument on the optional Claravox Stand, or on a low-profile microphone stand with a 5/8"-27 UNS mount.

***NOTE: Claravox Centennial is not designed to sit upright without a stand and should never be placed directly onto a table or other flat surface for playing.***

Once mounted to its stand, no objects should be within a foot or two of the instrument. Clar-

avox Centennial should be positioned away from walls and other large stationary objects.

### Using the Mounting Plate/ Stand Adapter

***Refer to Figure 1***

The mounting plate was created to make setup quicker and more efficient. No tools are needed. The mounting plate consists of a small metal oval that fits into a recess in the bottom of the instrument. In the center of the mounting plate is a threaded hole. On either side are two smaller holes containing captive thumbscrews. These thumbscrews attach the mounting plate to the Claravox Centennial body.

This design allows the adapter plate to remain attached to the stand. The stand and mounting plate remain stationary, and the thumbscrews

are used to attach Claravox Centennial and hold it all in place.

## Attaching a Stand

Refer to Figure 1

### Step 1

Claravox Centennial is shipped with the mounting plate attached for safety during transport. When you first unpack Claravox Centennial, loosen the two captive thumbscrews and remove the mounting plate from the body of your instrument.

### Step 2

With the tips of the captive thumbscrews facing up, attach the mounting plate to the stand by matching up the threads and spinning the mounting plate in a clockwise direction, until tight.

### Step 3

Place Claravox Centennial on top of the stand and adapter assembly. While steadying Claravox Centennial with one hand, use the other hand to first tighten one of the captive thumbscrews. Use your fingers to tighten this thumbscrew. Next, tighten the second captive thumbscrew. Claravox Centennial is now mounted to the stand via the adapter plate.

**NOTE:** Double check to make sure both captive thumbscrews are tightened securely. There is no need to tighten them more than finger-tight; remember, you will most likely be taking them out again.

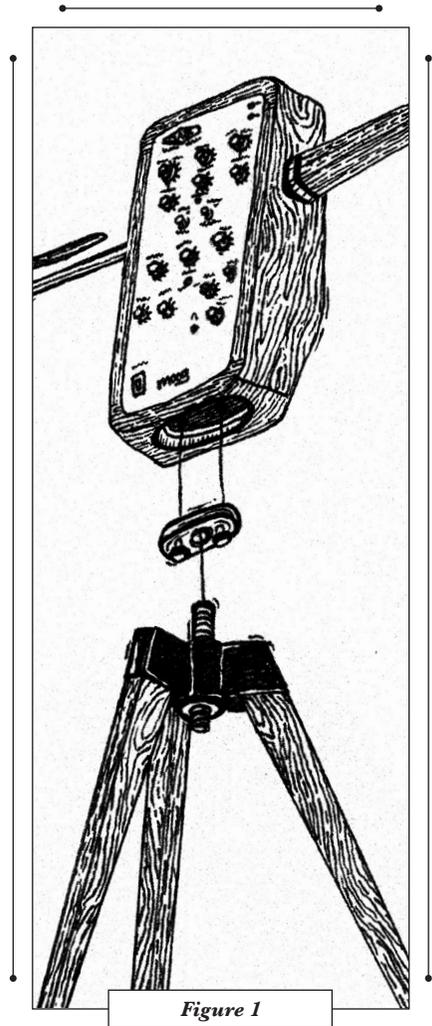


Figure 1

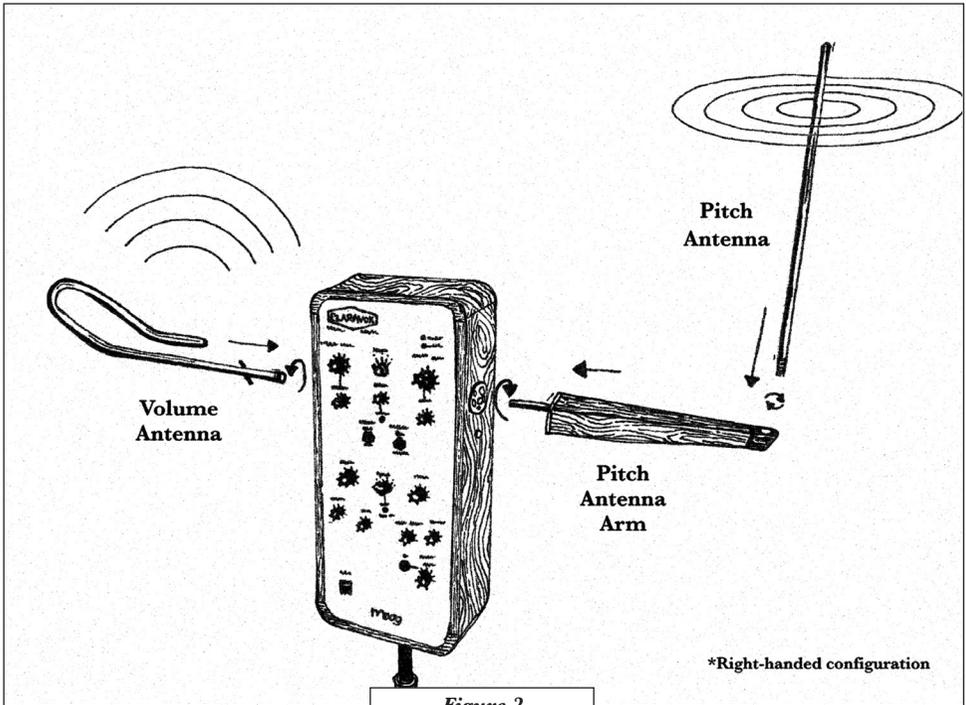


Figure 2

## Attaching the Antennas

Refer to Figure 2

Before proceeding, now is a good time to mention that Claravox Centennial is available in both right-handed and left-handed versions. Please verify you have the correct model for your needs before attempting to attach the antennas.

### *Left-Handed Adjustments:*

*If your instrument is left-handed, your antenna assembly will be the opposite of what is shown.*

## Pitch Antenna Arm

Refer to Figure 3

The Pitch Antenna, which is the straight brass tube, does not attach to Claravox Centennial directly, but to a fixture called the Pitch Antenna Arm, which places the Pitch Antenna in the proper playing position. The Pitch Antenna Arm securely connects to Claravox Centennial via a brass shaft and two shoulder screws. With the threaded hole for the Pitch Antenna facing up and toward you, insert the shaft into the receiving fixture on the right side of the instrument.

Line up the shoulder screws with the slots on the receiving fixture so that the shaft is fully inserted, and rotate the entire Pitch Antenna Arm one-eighth of a turn away from you to lock it into place, and to bring the threaded hole for the Pitch Antenna into the upright position.

***Left-Handed Adjustments:***

*When attaching the Pitch Antenna Arm to a Claravox Centennial configured for a left-handed player, begin with the threaded hole for the Pitch Antenna facing up and away from you. Insert the shaft into the receiving fixture on the left side of the instrument. Line up the shoulder screws with the slots on the receiving fixture so that the shaft is fully inserted, and rotate the entire Pitch Antenna Arm one-eighth of a turn toward you to lock it into place, and to bring the threaded hole for the Pitch Antenna into the upright position.*

## **Pitch Antenna**

*Refer to Figure 2*

The Pitch Antenna, which is the long straight tube, is sealed at one end and threaded at the other end. Carefully line up the threads of the Pitch Antenna with the threaded hole on the Pitch Antenna Arm, and rotate the antenna to secure it into position, so that it sticks straight up like the mast on a boat. Ensure that the antenna is seated snugly, but don't overtighten it.

## **Volume Antenna**

*Refer to Figure 4*

The long end of the Volume Antenna, which is the looped brass tube, connects to the receiving

fixture on the left side of Claravox Centennial. A retaining pin is fixed through the Volume Antenna near where it connects to Claravox Centennial. With the loop, or bulge, facing up and toward you, insert the Volume Antenna into the receiving fixture on the left side of the instrument. Line up the retaining pin with the slot on the receiving fixture so that the shaft is fully inserted, and rotate the Volume Antenna one-eighth of a turn toward you to lock it into place.

***Left-Handed Adjustments:***

*When attaching the Volume Antenna to a Claravox Centennial configured for a left-handed player, insert the long end of the Volume Antenna into the receiving fixture on the right side of the instrument. Line up the retaining pin with the slot on the receiving fixture so that the Volume Antenna is fully inserted, and rotate it one-eighth of a turn toward you to lock it into place.*

## **Removing Claravox Centennial**

To remove the instrument from the stand, first remove the Volume Antenna, the Pitch Antenna, and the Pitch Antenna Arm. Holding Claravox Centennial with one hand, loosen the two captive thumbscrews using your free hand, and carefully lift Claravox Centennial from the mounting plate and stand.

## **Power**

Plug the included power adapter into the +12V DC power jack on the rear panel of your Claravox Centennial. Connect the other end to a properly wired and grounded AC outlet. Press-

ing the top half of the **POWER** switch on the front panel turns the instrument on. The LED indicator in the **POWER** switch will remain lit (red) to show that the instrument is powered on.

***NOTE:** Because the player's entire body interacts with the circuitry at the heart of the theremin, a properly grounded connection is required for stable operation.*

### Main Out

First, plug one end of a 1/4" instrument cable into the **MAIN OUT** jack on the rear panel. Then plug the other end into an amplified speaker or mixing console input.

### Phones Out

Claravox Centennial includes a convenient 1/4" headphone jack on the front panel, complete with a dedicated **HEADPHONE VOLUME** knob. Keep the headphone cable secured so that it does not interfere with the Pitch Antenna.

***NOTE:** This headphone jack is unaffected by the status of the **MAIN OUTPUT** switch (see page 38-39).*

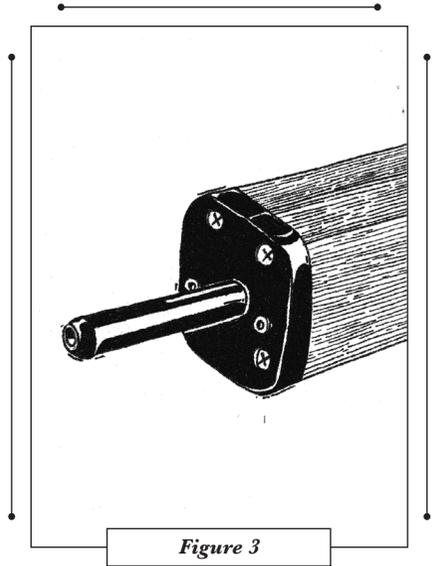
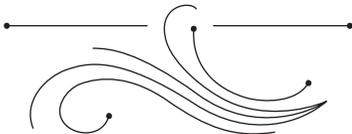


Figure 3

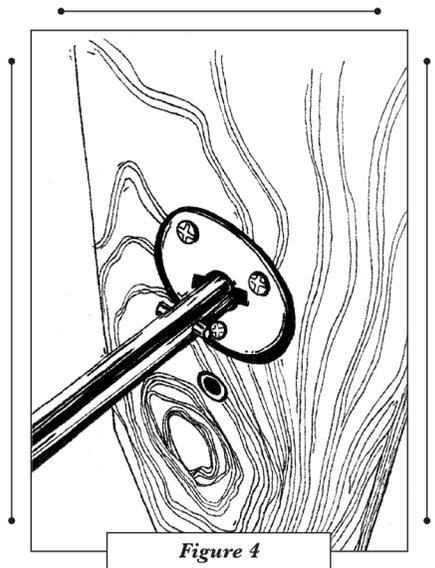
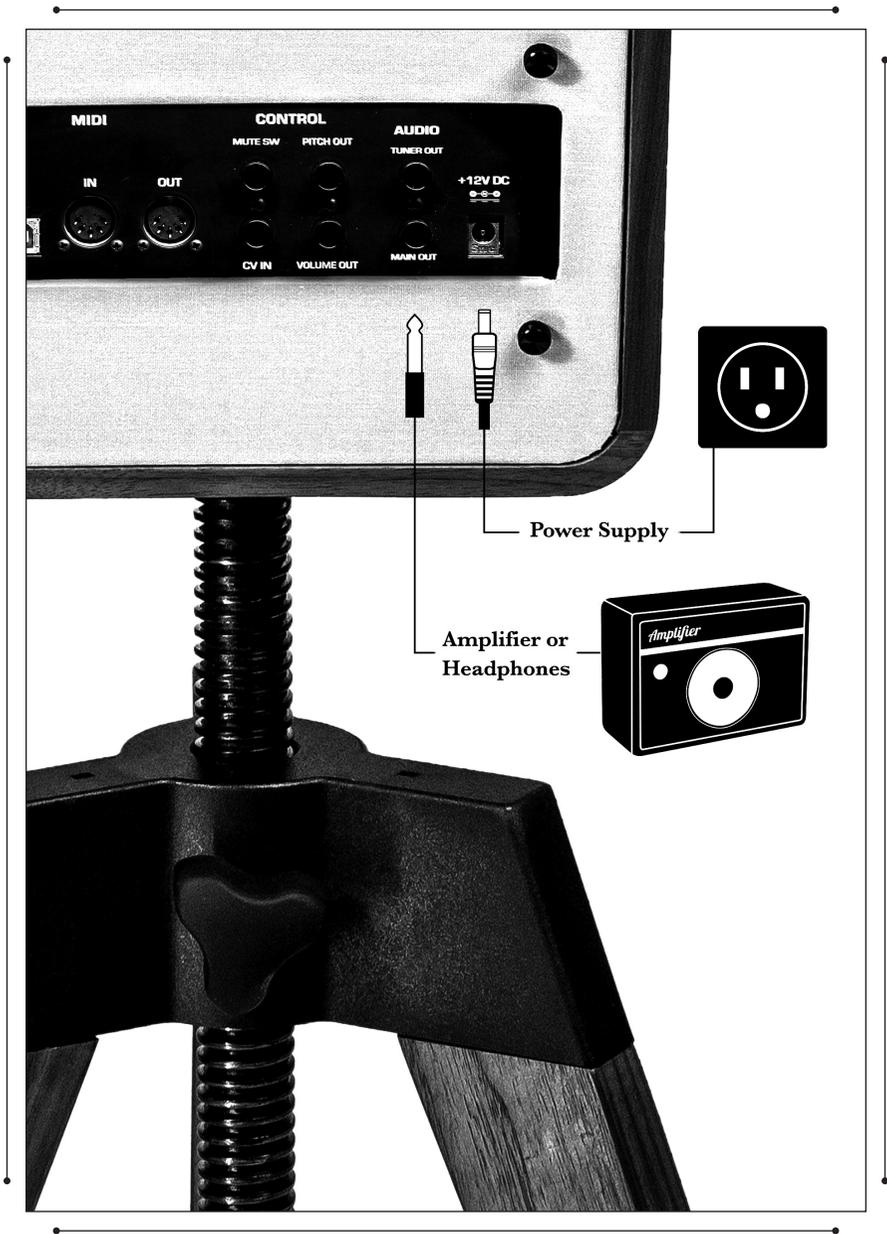


Figure 4





## TUNING

Tuning each antenna is an important part of being able to perform on your Claravox Centennial with precision, while achieving the highest order of control. Please note that all theremins are sensitive to their immediate surroundings, and these tuning steps should be performed every time you turn the unit on and get ready to play. As you and Claravox Centennial become more acquainted, performing these tuning steps will become second nature to your theremin experience.

In order to tune up correctly, power up the instrument and allow 20 minutes for the circuits to warm up. Begin with the **PERFORMANCE** switch set to the **TRADITIONAL** position. Set the **FILTER** knob to its maximum (full clockwise) position. Set the **WAVE** and **BRIGHTNESS** knobs to their midpoint (12 o'clock position). Also, set the **DELAY** knob to its minimum value (fully counterclockwise).

***NOTE:** A more complete explanation of adjusting the response of each antenna can be found later in this manual on page 34.*

### Tuning the Volume Antenna

*Refer to Figure 5*

Begin with the **VOLUME ANTENNA** knob in the midpoint (12 o'clock position) and your volume hand floating just above the Volume Antenna so that no sound is heard. Move your volume hand up and down at varied speeds and notice the way Claravox Centennial responds to these changes in volume. Using your pitch hand, turn the **VOLUME ANTENNA** knob counterclockwise to introduce slower, smoother dynamics and clockwise to experience faster dynamics approaching a staccato style.

Once you have found the setting that best suits your personal playing style and the music being performed, move your hand away from the

Volume Antenna and adjust your sound system so that this note is playing at the loudest level you want to reach.

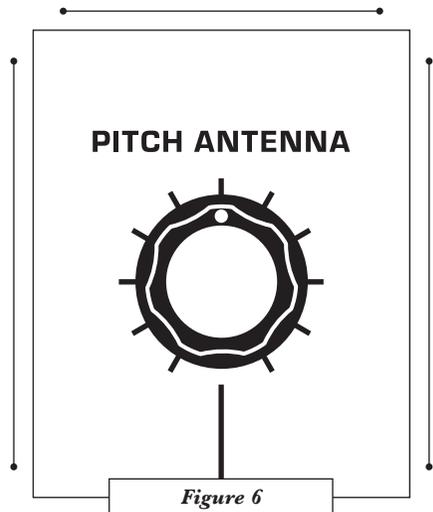
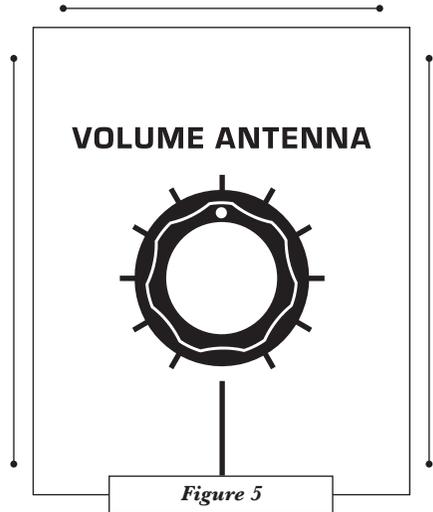
## Tuning the Pitch Antenna

*Refer to Figure 6*

As with the Volume Antenna, begin with the **PITCH ANTENNA** knob in the midpoint (12 o'clock) position. Without touching the Pitch Antenna, rotate the **PITCH ANTENNA** knob fully counterclockwise. A high-pitched note will begin to emerge. Rotate the **PITCH ANTENNA** knob very slowly in the clockwise direction. As you do, you will hear the note drop in pitch.

When the pitch reaches about an octave below Middle C, step back from your Claravox Centennial. The pitch will continue to decrease until the tone stops completely (null point). This null point indicates where you – the performer – are no longer affecting the pitch. With your right shoulder about 24" (61 cm) from the Pitch Antenna and your arm and hand flat at your side, carefully adjust the **PITCH ANTENNA** knob so that the pitch of the note is more than two octaves below Middle C. Now your antenna settings are optimized for performance.

**TIP:** An electronic tuner connected to the **TUNER OUT** jack can be useful for this operation. Two octaves below Middle C is the lowest note on a cello, and about a Major Third below the lowest note on a six-string guitar.





## QUICKSTART

### a. Antenna Control

Tune the Antennas to match your body, your hands, and the environment. When in **MODERN** mode, the Response knobs adjust the linearity of the Antenna(s) to suit your style.

### b. Root Note & Scale

**MODERN** mode parameters allow you to select an Octave Range, a Root Note (Key), and a Scale for your Claravox performance – and to set the quantization amount.

### c. MIDI

Claravox can send and receive MIDI data using DIN ports (In and Out) or via USB. CV and pedal jacks are also provided.

### d. Performance

In the **MODERN** mode, Claravox Centennial is a cutting-edge theremin with powerful performance features. Switch to the **TRADITIONAL** mode for a world-class analog theremin experience.

### e. Analog Waveshaping

Tweak your sound with control of the Filter, the Brightness, and the Wave parameters.

### f. Analog Delay

The analog Moog BBD (Bucket Brigade Device) Delay adds depth, warmth, and motion. Freely adjust the Amount, Delay Time, and Delay Feedback.

### g. Timbre Memory

Create, tweak, and save your Claravox Centennial settings as one of six easily recalled Timbres. More Timbres and Timbre sets can be saved and reloaded via software.

### h. 🎧 (Headphone Out)

The Headphone Out has its own Headphone Volume control. The Headphone and Tuner Outs are not affected by the Main Output Switch.

# CLARAVOX

CENTENNIAL

**c**

- MIDI
- MUTE

**a**

VOLUME ANTENNA

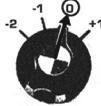


RESPONSE



**b**

REGISTER



QUANTIZE



SET ROOT



PITCH ANTENNA



RESPONSE



MAIN OUTPUT

ACTIVE



MUTE

**d**

PERFORMANCE

MODERN



TRADITIONAL

**e**

FILTER



BRIGHTNESS

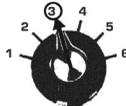


WAVE



**g**

TIMBRE



STORE



(PRESS & HOLD)

**f**

DELAY



DELAY TIME



DELAY FEEDBACK



**h**



HEADPHONE VOLUME





*Claravox Centennial  
Moog Music Inc.*

## About Claravox Centennial

Claravox Centennial has two distinct **PERFORMANCE** modes, providing a deep set of sound-creation parameters and delivering a lush vocabulary of sonic possibilities. In the **TRADITIONAL** mode, Claravox Centennial presents itself as a true, legacy theremin, drawing on Bob Moog's classic Waveshaper circuit (the Filter, Brightness, and Wave controls), which was in turn informed by his work on Clara Rockmore's original theremin.

Selecting the **MODERN** mode engages a digital engine (in place of the **TRADITIONAL** mode's analog oscillator) equipped with two advanced signal generators (oscillator/wavetable type), noise, and a multi-mode filter. The **MODERN** mode also unlocks powerful Antenna Response controls, as well as Quantization, Key, Scale, and Register parameters. The built-in Moog analog BBD delay enhances the sound in either mode.

MIDI (DIN and USB) and CV jacks are provided, and USB computer access allows for even more expansion via the Claravox Centennial software (free download from moogmusic.com). Finally, Claravox Centennial is housed in a walnut cabinet, and is highlighted by rich brass antennas.

**Traditional and Modern Modes:** Operates as a traditional theremin, or enhanced with expanded sonic and creative potential.

**Six Timbre Locations:** Quickly select from six timbres – full parameter configurations – that you have created, modified, or loaded from a computer for instant access.

**Classic Waveshaping:** Freely adjust the Filter, Brightness, and Wave parameters to create a custom sound.

**Onboard Moog Analog Delay:** The variable BBD (Bucket Brigade Device) Delay adds depth and motion to your performance.

**Set the Root Note and Scale:** Use the **MODERN** mode to set the root, scale, quantization, and octave range.

**Main Output Switch:** Mutes only the **MAIN OUT** jack and leaves the (**HEADPHONE OUT**) and **TUNER OUT** jacks unaffected – ideal for tweaking and tuning live.

**CV, DIN MIDI, and USB Connections:** Claravox Centennial can integrate with all your studio gear, and provide MIDI and USB control.

**Performance Design:** The vertical panel provides easy access to important controls. A mounting plate/stand adapter is included.

**Claravox Centennial Software:** Convenient editor for front panel controls, under-the-hood features, Timbre management, and more. Free download available at moogmusic.com.



## LEARNING HOW TO PLAY

Claravox Centennial is traditionally played by interacting with two electronic antennas using subtle hand gestures. The horizontal loop antenna is used to control the volume, and the vertical rod antenna is used to control the pitch. Bringing your hand near the Volume Antenna will decrease volume, while bringing your hand near the Pitch Antenna will increase the pitch.

The following sections contain helpful information and practice exercises for developing your theremin skills. These suggested techniques are intended to guide your experimentation as you discover and establish your own unique playing style. There is no right or wrong approach; as you get to know the instrument, trust your instincts to lead the way.

### Volume Antenna

The Volume Antenna controls the volume level of Claravox Centennial. Lift your hand up and away from the Volume Antenna to raise the volume of your Claravox Centennial. Lowering your hand, or increasing its proximity to the Volume Antenna loop, will make Claravox Cen-

tennial quieter. When your hand is very close, Claravox Centennial will be muted. You can use changes in the volume to accentuate, to play, or to not play notes.

### Pitch Antenna

The Pitch Antenna controls the pitch or frequency that Claravox Centennial is playing. Extend your arm outward, bringing your hand closer to the Pitch Antenna to raise the pitch. Pulling your hand back, or reducing its proximity to the Pitch Antenna rod, lowers the frequency. You can use changes in proximity to play different notes.

### Getting Started: Classic Theremin

1. Set your Claravox Centennial knobs to the positions shown in the illustration on *page 23*.
2. Stand facing the Claravox Centennial front panel, with your body about 12" (30 cm) back.
3. Adjust your position so that you are about an arm's length away from the Pitch Antenna.

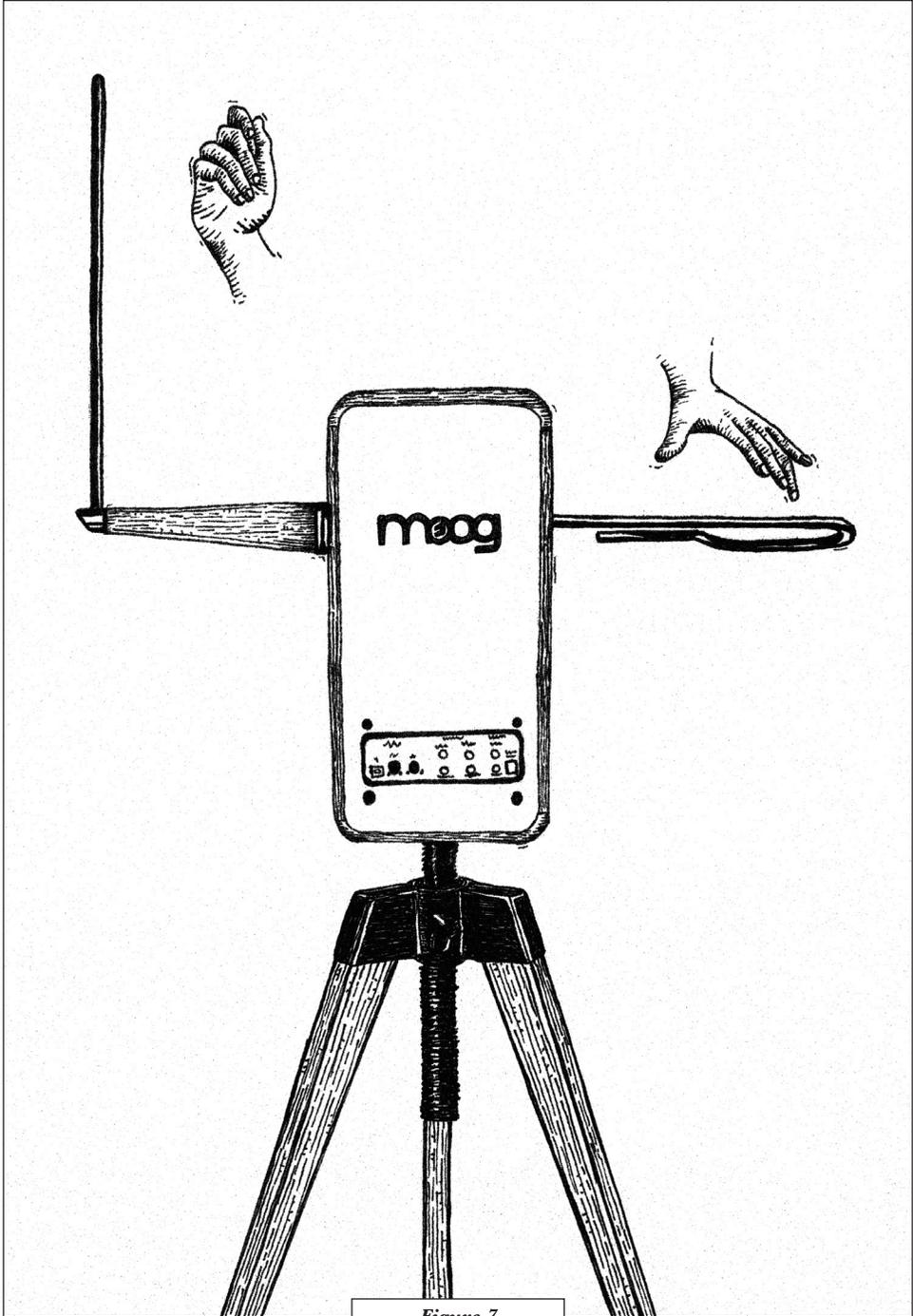
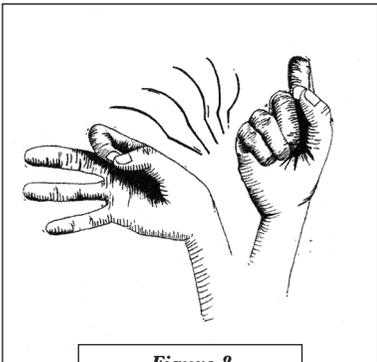
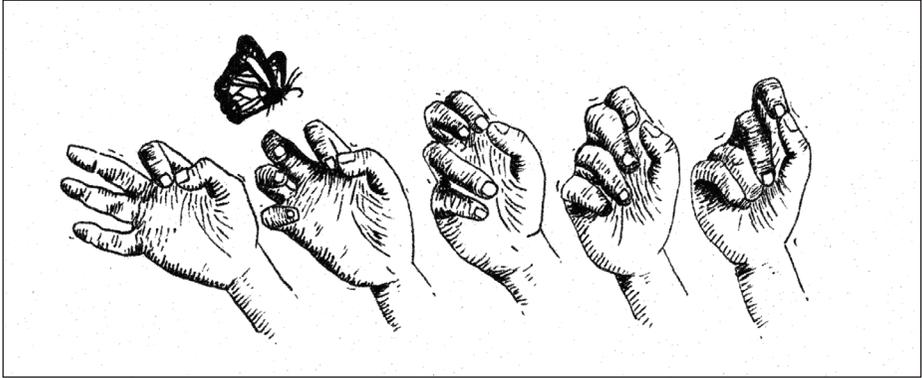
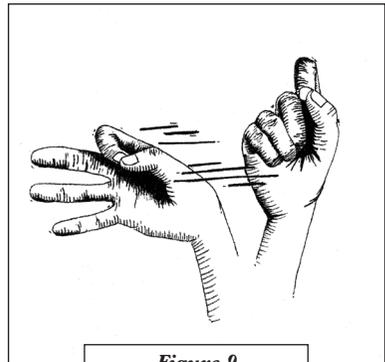


Figure 7



*Figure 8*



*Figure 9*

4. Place your legs slightly apart to keep your body as still as possible.

5. Relax your shoulders and drop your elbows to your waist.

6. Hold your volume hand just above the Volume Antenna, while positioning your other hand in a rest position, with your pointer finger resting on your thumb. **Refer to Figure 7.**

7. Slowly raise your volume hand to hear your Claravox Centennial. Notice that it only takes incredibly small movements with your pitch hand to play a range of nearby notes. Subtly moving a knuckle or slightly extending your pinky is all that is required to move to the next note, while opening your fist and spreading out your fingers can raise the pitch of your Claravox Centennial a full octave.

Clara Rockmore, widely regarded as the most skillful thereminist in history, utilized a technique with tiny knuckle extensions. She would start with a loosely closed fist, uncurling her pinky, ring, and middle fingers outward in small steps while keeping her index finger resting on the thumb. As a beginning player, this is a good place to start.

**NOTE:** *Avoid large, forceful hand gestures, and focus on delicate movements. Imagine tickling butterflies rather than clutching guitar strings.*

## Playing Exercises and Techniques

The theremin has been described as one of the most difficult instruments to play due to the lack of a physical interface. Unlike an instrument that provides physical feedback as to where each note is, the thereminist must rely strictly on their ears to determine where each note lies. The most difficult obstacle to overcome is learning to control both the pitch and volume simultaneously. While each gesture by itself is quite simple, the two motions performed at the same time can feel a bit awkward. Fortunately, all it takes is a little practice. If you use your hands to hold utensils while you eat, you'll be fine.

### Playing Glissando Style

**Refer to Figure 8**

1. Hum a note. Moving only your pitch hand, try to find that same note. When you find it, hold it steady and hum another note just a few tones higher.

2. Now gradually extend your fingers to raise the pitch and 'glide' to the new note. This glide is called a glissando.

3. Now slide back down to the first note.

**NOTE:** *You can use an instrument tuner (connected to the Claravox Centennial TUNER OUT jack) as a visual aid to help guide you, but more importantly, listen to the change and distinct sound of each note.*

4. Now hum a third note that is slightly higher than the second. Play the first note, slide to the second, pause, and then glide to the third.

5. Start at the third note and then play down to the first.

Practice this a bit, going up and down, making sure to hit the same three notes. Gradually speed up, while keeping your movements smooth and graceful. Pay attention to how much movement is needed to reach each note. Try to repeat the same movements and finger positions.

*When you can consistently glide back and forth across three notes, try this:*

## **Playing Legato Style**

*Refer to Figure 9*

1. Start at the first note again, but rather than gliding up, make a quick jump to the second note. This will require snapping your hand into the second note position with an abrupt change. This creates the stepped sound of two distinct notes.

2. Playing notes together like this, with no space in between, is referred to as legato. Practice snapping the three notes in order, up and down; then, try larger jumps – snapping quickly from note to note.

3. Experiment by mixing combinations of legato and glissando.

## **Volume Hand Exercises**

*Refer to Figure 10*

Now that you've gotten your pitch hand in shape, let's work on your volume hand. Keep your pitch hand still and use only the Volume Antenna to articulate notes.

Play any note and slowly raise your volume hand to raise the volume. Gradually lower your hand toward the Volume Antenna to reduce the volume.

**NOTE:** *Keep the motion mainly in your wrist as opposed to raising your whole forearm.*

Practice making your movements as smooth as possible. The start of the note is called the “attack” and the end is the “decay.” This exercise is an example of a slow attack and slow decay. Try it again, but this time, make your movement as quick as possible, so there is a dramatic jump in volume.

A fast attack gives you the ability to pluck out sharper sounding staccato notes and rhythms. Practice playing notes with a fast attack and fast decay in groups of three or more; then, try mixing it up by playing notes with a slow attack and fast decay, or with a fast attack and slow decay.

## **Expressive Volume**

*Refer to Figure 11*

There is a wide range of loudness that the thereminist can employ to liven up their playing. Try playing with your volume hand about

three-quarters of the way up. From here, just a casual raising of your hand or fingers makes the volume swell; dipping your fingers or wrist slightly makes the volume drop. This variation in volume adds articulation and depth to your playing, while also highlighting specific notes or passages of music.

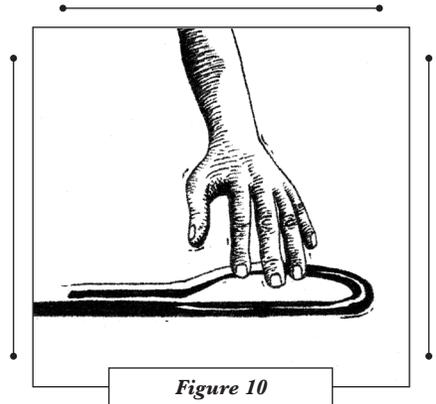
Try attenuating the volume to emphasize the mood in your playing, making some sections soft and others loud. If you find that your volume sensitivity range is too small or too big for you to easily control, you can adjust the **VOLUME ANTENNA** knob to control the distance between the near volume and the far volume to suit your needs.

Ideally, you should be able to go from mute to maximum loudness with just a flip of the wrist.

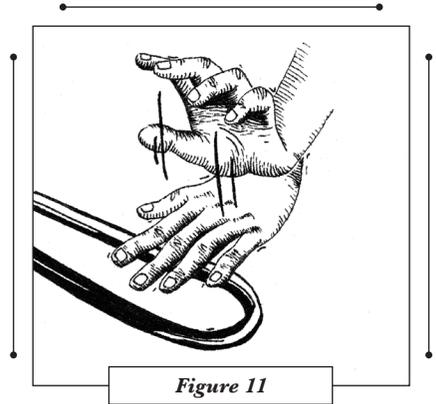
## **Vibrato**

*Refer to Figure 12*

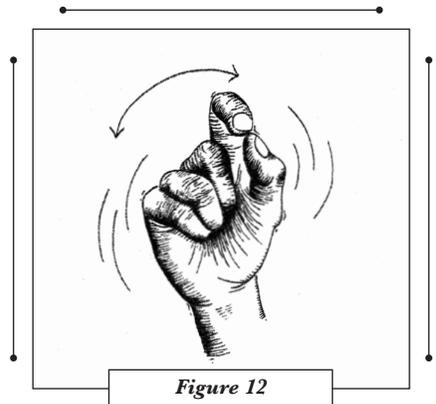
Vibrato is an effect created by shaking your hand and rhythmically “bending” notes back and forth, causing a vibration of the pitch frequency. This can make certain passages seem more mysterious or interesting. A strong, fast vibrato will add tension or drama to a passage, while a slow and delicate vibrato creates a subtle movement that can soften or sweeten a passage. To perform vibrato, simply give your pitch hand a slight wiggle. The trick is learning to sync the back-and-forth motions in a way that is musically appropriate to what you are playing. Keep your movements small and gentle. You are bending



*Figure 10*



*Figure 11*



*Figure 12*

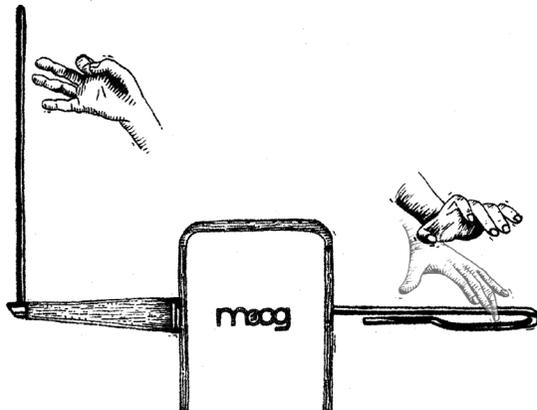
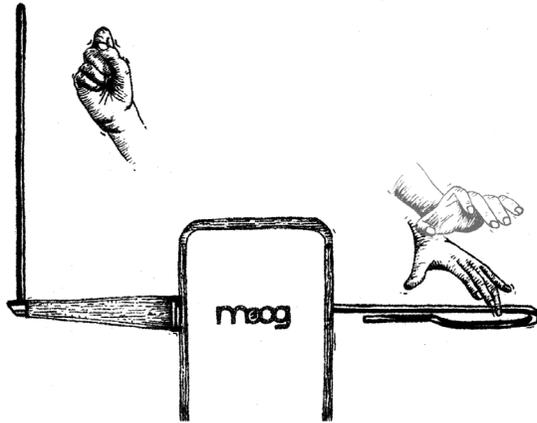
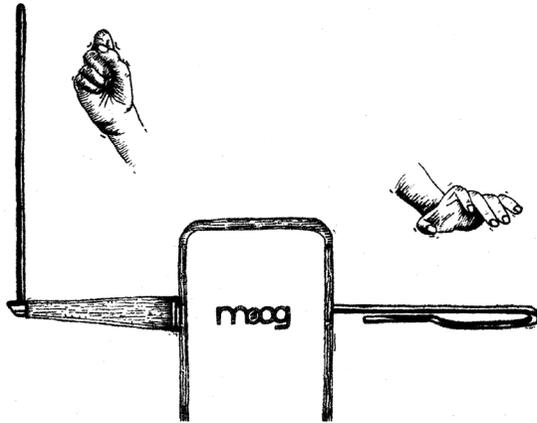


Figure 13

the note up and down just slightly. Vibrato that is too wide, covering several steps, is a trill and generally doesn't sound as pleasant. There is no "correct" way to perform vibrato, but generally you want to find a technique that is both precise and physically comfortable to sustain.

Using only your wrist to provide the necessary back-and-forth motion can become painful even after just a few minutes. Instead, try leaving your wrist relaxed and flexible, using mainly forearm movements to shake your hand.

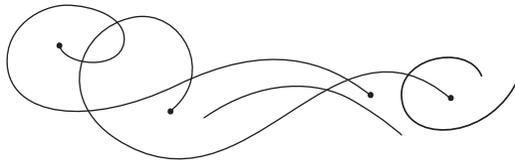
## **Pitch and Volume Exercises**

*Refer to Figure 13*

Now it's time to practice both hands working in concert.

1. Hum a note and play it aloud.
2. This time, before sliding to the second note, slowly mute the volume.
3. Raise your volume hand just after your pitch hand has glided to the second note.

Do this again, syncing a dip of your volume hand as you glide between the second to the third note. Don't get frustrated if you find it difficult to keep both hands moving accurately at the same time; just keep practicing!





## FRONT PANEL CONTROLS & FUNCTIONS

The controls on the front panel of your Claravox Centennial are laid out by section, or function, in a way that is intuitive to both the experienced theremin player and the avid synthesist. The top section is home to the Pitch Antenna and Volume Antenna controls; the lower section controls the Timbre and Delay functions. In the middle is the **PERFORMANCE** mode switch for selecting the **TRADITIONAL** or **MODERN** mode, as well as the **MAIN OUTPUT** switch with **ACTIVE** and **MUTE** options. Further down is the **(HEADPHONE OUT)** jack paired to the **HEADPHONE VOLUME** knob, and the **POWER** switch.

***TIP:** Parameters labeled in reverse-color text are accessible only in the **MODERN** mode.*

### Volume Antenna Controls

*Refer to Figure 14*

In the theremin world, one hand is used to control the volume and articulation of each note. Bringing the hand closer to the Volume Antenna (Horizontal Loop) will decrease the volume, until eventually, with the hand inside the loop, there is no sound. Moving the hand further away will increase the volume. These two actions control the behavior of the Volume Antenna with regard to the performer's hand gestures.

### Volume Antenna

Raising the value of this parameter, by rotating the knob clockwise, will increase the sensitivity of how the Volume Antenna responds to the natural capacitance of the performer's hand.

## Response [Modern Mode Only]

Lowering the value of this parameter by rotating the knob counterclockwise will give the Volume Antenna a wide and classical response. Raising the value of this parameter by rotating the knob clockwise will give the Volume Antenna a tight and dynamic response.

**TIP:** In the MODERN mode, the RESPONSE knob is used to augment the VOLUME ANTENNA behavior.

## Pitch Antenna Controls

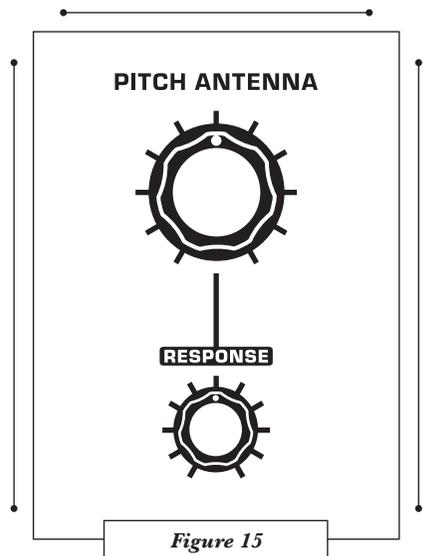
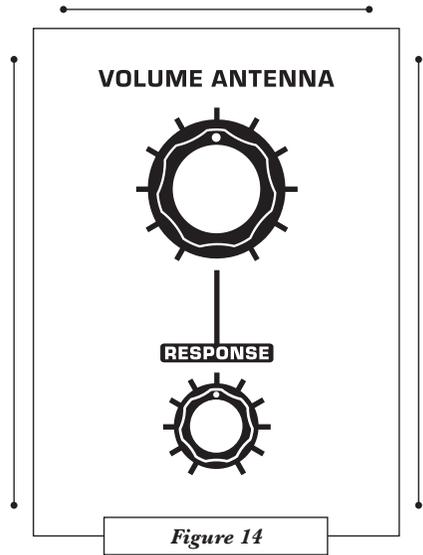
Refer to Figure 15

Conversely, the other hand is used to control the pitch of each note. Bringing the pitch hand closer to the Pitch Antenna will raise the pitch; moving the hand further away will lower the pitch, until eventually there is no sound. These two actions control the behavior of the Pitch Antenna with regard to the performer's hand (and finger) gestures.

### Pitch Antenna

This parameter allows the performer to set up a useful playing range by setting the pitch of the “null point” – that is, the pitch that will sound when the performer's hand, arm, or body is no longer affecting the pitch.

**NOTE:** After moving through this null point, the pitch will begin to rise again as you move further and further away. This is a natural behavior of the heterodyne process.



## Response [Modern Mode Only]

The value of this parameter adjusts the linearity of the change in pitch caused by the distance of the performer's hand. In the center position, the response is identical to the **TRADITIONAL** mode Pitch Antenna response; that is, moving the hand the same distance will create the same amount of pitch change. Raising the value of this parameter by turning the knob clockwise will cause the upper registers to experience more change in pitch, and will cause the lower registers to experience less change in pitch. Conversely, turning this knob counterclockwise will cause the upper registers to experience less change in pitch, and will cause the lower registers to experience more change in pitch.

***TIP:** In the MODERN mode, the RESPONSE knob is used to augment the PITCH ANTENNA behavior.*

## Pitch Controls [Modern Mode Only]

*Refer to Figure 16*

Switching Claravox Centennial to the **MODERN** mode will unlock a host of pitch-related parameters that can greatly add to the control and articulation of your theremin experience.

### Register (-2; -1; 0; +1)

This four-position knob resets the pitch, in octave units, of the voice circuit. In addition to the obvious use for this parameter, you could also effectively limit the pitch range, by select-

ing one of the lower octave settings and then using the **PITCH** knob to set the “null point” in a low register as well.

## Quantize

One of the signature characteristics of all theremins, including Claravox Centennial, is the continuous slide through a range of pitches. Using quantization allows this continuous slide to be broken up into individual notes. But quantization is not an on or off function, and different amounts of quantization can create different effects. With the **QUANTIZE** knob rotated all the way to the left (counterclockwise), no quantization is applied and the Claravox Centennial performs exactly as a traditional theremin. With the **QUANTIZE** knob all the way to the right (clockwise), the maximum amount of quantization is applied as you move from pitch to pitch. But with the **QUANTIZE** knob set in between these extreme values, the pitch will have a tendency to find a quantized value, falling to the amount of “gravity” given to a note. These middle values allow a note to be found quickly, but still allow the freedom to add expressive vibrato and pitch bending as part of the performance.

## Set Root

The **SET ROOT** button is used to select a root note (or key) and to choose a scale for Claravox Centennial. It is this scale and key that Claravox Centennial will play and quantize to, based on the settings of the **QUANTIZE** knob.

### Setting the Root Note (key)

To access the Root Note parameter, press the **SET ROOT** button. The **SET ROOT** button will stay lit during this operation.

As long as the **SET ROOT** button remains lit, rotating the **QUANTIZE** knob will play a chromatic scale (C3 - C4). You can choose a root note from this chromatic scale, either by ear or with the aid of a chromatic tuner connected to the **TUNER OUT** jack. Rotate the **QUANTIZE** knob to the desired Root Note. To leave **SET ROOT** mode, press the **SET ROOT** button again and the button will no longer be illuminated.

### Selecting a Scale

To enter Select Scale mode, press and hold the **SET ROOT** button for a half second until the button's LED begins blinking. While the **SET ROOT** button is blinking, select between 4 available scales by rotating the **QUANTIZE** knob:

**Chromatic Scale:** Quantize position 1

**Ionian (Major) Scale:** Quantize position 2

**Pentatonic Scale:** Quantize position 3

**Fifths:** Quantize position 4

By choosing a Scale and a Root Note, it is possible to access many more than just 4 scales. For example, by choosing the Ionian (Major) Scale, one can have an Ionian scale in any of twelve keys, or if your selected Root Note is "D", then you could play in the key of E Dorian. Alternatively, if you have the Pentatonic scale selected,

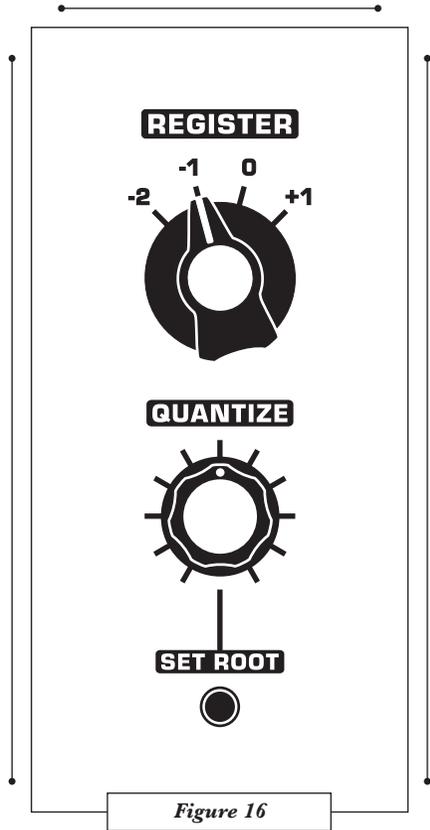


Figure 16

you would either have D major Pentatonic or B minor Pentatonic (or even altered extensions). Explore the music theory concepts of modes and relative major/relative minor to deepen your understanding of this concept.

***NOTE:** The four scales given are the default settings; users can also use the Claravox Centennial software to assign other custom scales to the four scale slots. This assignment is saved per preset.*

## Main Output

*Refer to Figure 17*

Normally, this switch will be in the **ACTIVE** position, and Claravox Centennial will provide an audio signal via three separate outputs: the **AUDIO OUT** jack, **TUNER OUT** jack, and (**HEADPHONE OUT**) jack. Setting this **MAIN OUTPUT** switch to the **MUTE** position will silence the **MAIN OUT** jack. The (**HEADPHONE OUT**) jack and **TUNER OUT** jack remain unaffected. In this way, the output to the amplifier or sound system can be interrupted, while the (**HEADPHONE OUT**) jack and **TUNER OUT** jack remain available for tweaking the sound, checking the tuning, selecting a new root note (key) or scale, etc.

***TIP:** There is a **MUTE LED** indicator in the upper right area of the front panel (just below the **MIDI LED** indicator) that will remain lit while the **MAIN OUTPUT** switch is in the **MUTE** position. If using an optional footswitch to control the Mute*

*setting, the **MUTE LED** will reflect the true Mute status and may not always match the position of the front panel **MUTE** switch.*

## Performance (Mode Switch)

*Refer to Figure 18*

Claravox Centennial delivers the best of both worlds, as defined by the setting of the **PERFORMANCE** switch. For the theremin purist, setting this **PERFORMANCE** switch to the **TRADITIONAL** position allows Claravox Centennial to operate in the **TRADITIONAL** mode. For the advanced artist, setting the **PERFORMANCE** switch to the **MODERN** position places Claravox Centennial in the **MODERN** mode and unlocks a host of enhanced theremin features.

### Modern (Modern Mode)

The **MODERN** mode is powered by an advanced digital sound engine driven by two dual-mode oscillators (OSC 1 and OSC 2). OSC 1 and OSC 2 offer essential oscillator waveforms and wavetable generated selections. OSC 1 follows the same signal path as the sole analog oscillator in the **TRADITIONAL** mode. OSC 2 (along with a variable noise component) passes through a single-pole multimode (Low Pass, Band Pass, High Pass, Notch) filter and rejoins OSC 1 before passing through the VCA and then the Delay. Only the **MODERN** mode provides the enhanced Pitch parameters (Register, Quantize, Root Note, and Scale) and the optimized antenna response parameters (Volume

Response and Pitch Response).

*NOTE: Many of the OSC, Noise, and multimode filter parameters of the MODERN mode can only be accessed via MIDI, or by using the Claravox Centennial Software.*

### Traditional (Traditional Mode)

**TRADITIONAL** does not mean stripped-down features or bare-bones performance. In the **TRADITIONAL** mode, Claravox Centennial achieves the highest order of sound, behavior, and playability available in a traditional theremin. Sound is generated using a heterodyne circuit, and the volume is controlled using a rectifier circuit. Even in the **TRADITIONAL** mode, Claravox Centennial provides direct control of the Filter, Brightness, and Wave Adjust parameters, as well as the analog BBD delay.

*NOTE: The performance of the Claravox Centennial is intended to be transparent between TRADITIONAL and MODERN modes. Due to the fact, though, that you are working with the actual oscillator frequencies, the setting of the PITCH and VOLUME parameters may not be identical when switching between modes.*

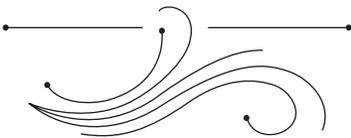


Figure 17



Figure 18

## Analog Waveshaper Parameters

These three parameters are available in both the **TRADITIONAL** mode and the **MODERN** mode. Use these controls to modify or transform the sound of your Claravox Centennial. Each one has its own function, but all are part of the Analog Waveshaper circuitry.

### Filter

*Refer to Figure 19*

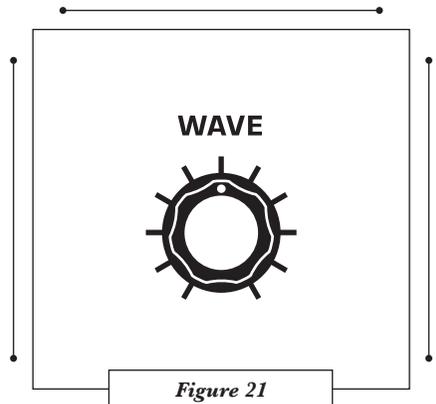
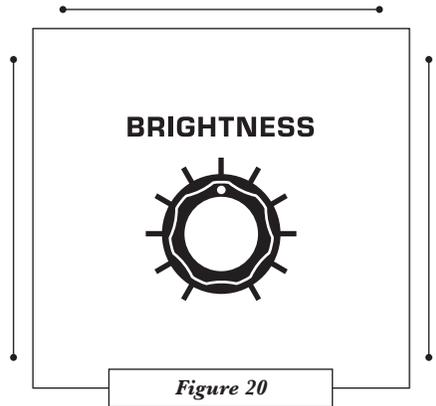
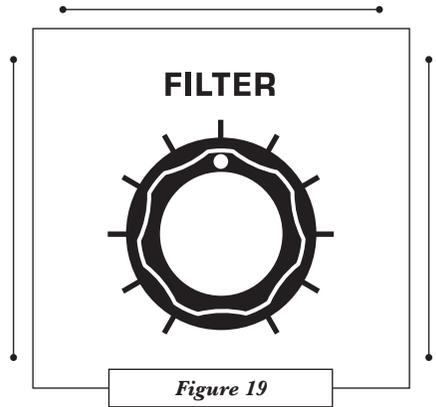
Claravox Centennial is equipped with a low-pass (2-pole/-12dB per octave) filter, based on the Etherwave Pro filter. This knob changes the value of the cutoff frequency of the Filter. Rotating the **FILTER** knob clockwise will raise the cutoff frequency (or open the Filter), allowing higher frequencies to pass through the Filter, resulting in a brighter sound. Rotating the **FILTER** knob counterclockwise will lower the cutoff frequency of the Filter (or close the Filter), attenuating the higher frequencies, resulting in a darker sound.

*TIP: The Filter will naturally open as the Pitch gets higher (Pitch Tracking). This is a natural behavior of theremins.*

### Brightness

*Refer to Figure 20*

Unlike the Filter, which attenuates and limits harmonic content, the Brightness parameter modifies the transient time (or slew) of the edges of the wave itself to alter the harmonic content. Rotating the **BRIGHTNESS** knob



clockwise will increase the “sharpness” of the edges of the wave, adding more overtones and increasing the harmonic content. Rotating the **BRIGHTNESS** knob counterclockwise will produce a “rounder” edge to the wave, resulting in fewer overtones, and decreasing the harmonic content.

### Wave

#### *Refer to Figure 21*

Although this is the last knob for adjusting the tonality of the sound, it actually affects the shape of the wave before the **BRIGHTNESS** and **FILTER** controls. The **WAVE** control introduces asymmetry to the input waveform by adding (clockwise) or subtracting (counterclockwise) an offset to the signal. At the center position, no offset is added, so the symmetry of the waveform is identical to the input. As you move the knob counterclockwise, the first "half" of the waveform becomes more dominant, and as you move the knob clockwise, the second "half" of the waveform becomes more dominant – this is similar to the Pulse Width function in many analog synthesizers.

## Analog Delay Parameters

These three parameters are available in both the **TRADITIONAL** mode and the **MODERN** mode. Each one has its own function, but all are part of the analog BBD (Bucket Brigade Device) Delay Circuitry. The analog Delay is perfect for adding texture, ambience, and depth to the sound of your Claravox Centen-

nial. In this way, it can be best to think of the analog Delay as an integral part of the Claravox Centennial sound – and not as simply an add-on effect.

### Delay

#### *Refer to Figure 22*

The **DELAY** knob sets the mix between the original Claravox Centennial signal (dry) and the delayed signal (wet). By rotating the knob to the fully counterclockwise position, only the original (dry) Claravox Centennial signal will be heard, with no delay added. As the value of the **DELAY** knob is increased by rotating the knob clockwise, more of the delayed signal (wet) will be mixed with the original. If the knob is rotated to the maximum clockwise position, only the delayed signal will be present.

### Delay Time

#### *Refer to Figure 23*

The Delay Time is adjustable from 20ms to 700ms. Rotate the **DELAY TIME** knob to the right (clockwise) to increase the Delay Time; rotate the **DELAY TIME** knob to the left (counterclockwise) to decrease the Delay Time.

***NOTE:** At the maximum Delay Time setting, the clocking noise of the BBD circuitry may become audible; a normal artifact of the analog BBD circuit design.*

## Delay Feedback

*Refer to Figure 24*

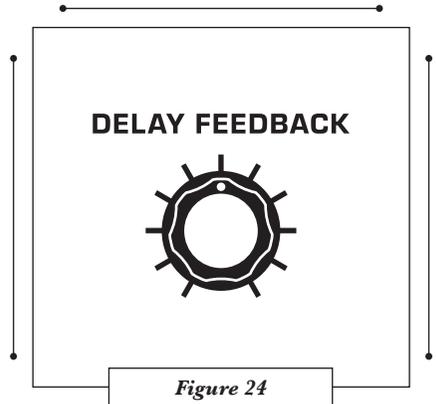
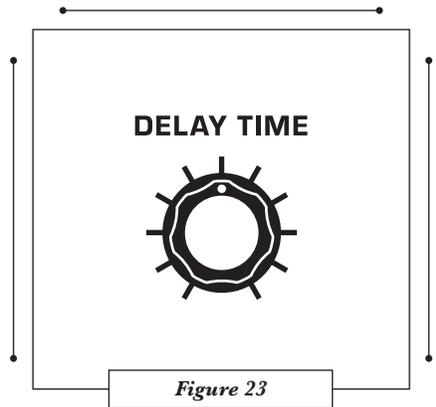
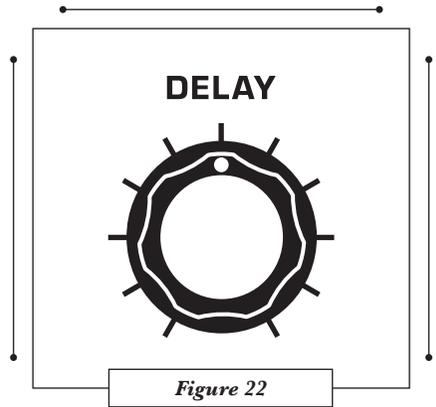
This parameter controls how much signal from the output of the delay is fed back to the input of the delay. In the minimum position (with the **DELAY FEEDBACK** knob rotated fully counterclockwise), no feedback is present, so you will hear only the original signal and one instance of the delayed signal. As the **DELAY FEEDBACK** knob is rotated in the clockwise direction, the delayed signal will regenerate more and more. As the **DELAY FEEDBACK** knob approaches the maximum (fully clockwise) position, the delay circuit will begin to self-oscillate, creating infinite levels of feedback, along with the signature distortion of an analog BBD delay.

*TIP: The design and circuitry of an analog BBD will naturally color the sound. Typically, you lose a bit of the high frequencies each time the signal is passed through the delay. Each pass can also add a bit of distortion. As a result, the more Feedback you add, the more distorted and “dark” the delayed signal will sound.*

## Timbres

*Refer to Figure 25*

Claravox Centennial provides immediate access to six Timbres from the front panel. Each Timbre is the summation of all available parameters – both those accessible from the front panel, and those only accessible through software. This allows for great versatility during performance. For example, using the pitch processing param-



eters in the **MODERN** mode can allow each Timbre to play a different scale in a different key, and using a different octave range. In addition, a new Timbre can be made from scratch – or by modifying an existing one – and quickly stored in one of the six Timbre slots.

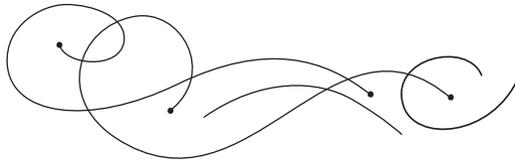
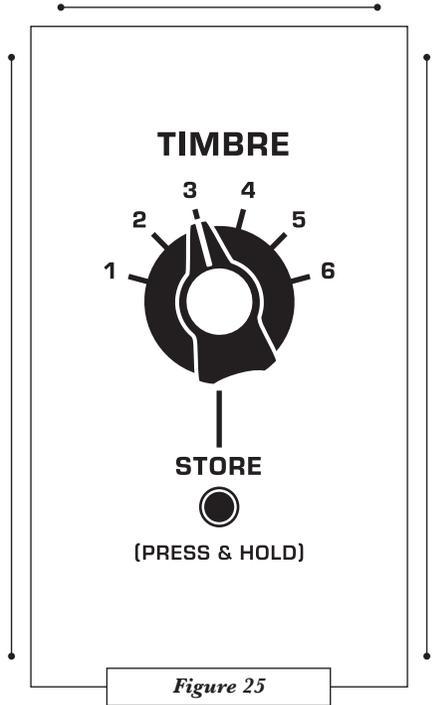
***NOTE:** Many more than six Timbres (and Timbre Sets) can be created, stored, and recalled through software.*

### Select a Timbre

Rotate this six-position knob to select one of the available Timbres. The selected Timbre may be used as is, or can serve as a starting point for modifying and creating a customized Timbre which can be saved to the same location using the Store function defined below.

### Store a Timbre

To save an edited Timbre to the current Timbre location, press and hold the **STORE** button. The **STORE** button LED will blink three times indicating that the Timbre has been stored; the **STORE** button may now be released.



## Headphones

A 1/4" jack for headphone use is conveniently located on the Claravox Centennial front panel, making it easily accessible during performance. The **(HEADPHONE OUT)** jack is equipped with its own independent **VOLUME** knob and affects only the **(HEADPHONE OUT)** level.

## ⌂ (Headphone Out)

*Refer to Figure 26*

Connect a pair of headphones to this jack in order to monitor your performance, and/or to adjust the tuning, key, and other settings, even while the **MAIN OUTPUT** switch is set to **MUTE**.

## Headphone Volume

*Refer to Figure 27*

This dedicated **VOLUME** knob affects only the **(HEADPHONE)** level. Rotating the knob clockwise raises the Volume level; rotating the **VOLUME** knob counterclockwise lowers the Volume level.

## Power

*Refer to Figure 28*

This switch turns your Claravox Centennial on and off. The red LED indicates that it is currently On. Before setting this switch to the On position, be sure that the correct power supply is already connected, and that the volume of any amplifier or monitoring system has been turned down. You may also wish to lower the amplifier or monitoring system volume level before switching Claravox Centennial Off.

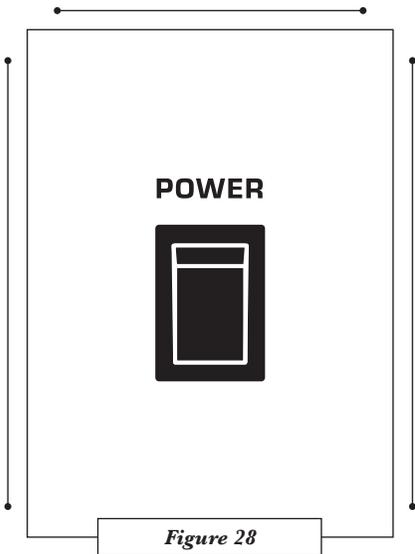
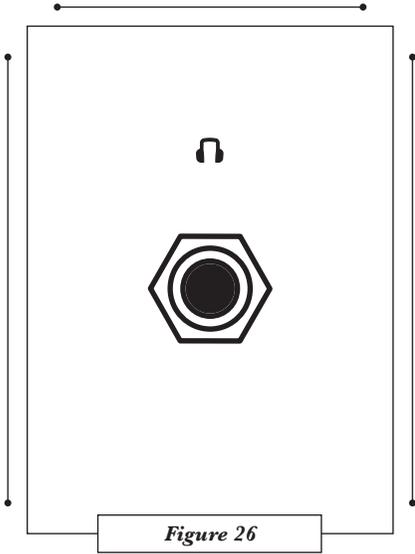
## MIDI Indicator

*Refer to Figure 29*

Claravox Centennial features a highly visible MIDI indicator LED. This LED will blink whenever a MIDI signal is being received. This is useful for verifying that any MIDI data being sent to Claravox Centennial is actually being received.



*Controls & Functions*



## REAR PANEL CONNECTIONS

Claravox Centennial provides a number of jacks, ports, and connectors located on the rear panel that can greatly enhance your Claravox Centennial experience. These connections are grouped together by function under the headings MIDI, CONTROL, and AUDIO. The connection port for the Claravox Centennial power supply is also located on this panel.

### MIDI Ports

#### *Refer to Figure 30*

Both DIN and USB ports are provided for receiving and transmitting MIDI data. The DIN-style **MIDI IN** and **MIDI OUT** ports can connect to an interface, or directly to other MIDI instruments and equipment. The **USB** port can receive MIDI data directly from a computer DAW or instrument rig. In addition, the Claravox Centennial Software can communicate with your Claravox Centennial via MIDI in order to access the software-only functions, to load and save an individual Timbre or Timbre Sets, and

other features. It is important to know that every front-panel parameter can both send and receive MIDI data. Claravox Centennial can play other instruments via MIDI; Claravox Centennial can be played by other instruments via MIDI.

### CV Control Jacks

#### *Refer to Figure 31*

Using these 1/4" CV (control voltage) jacks, Claravox Centennial can interface directly with other modular and semi-modular synthesizers.

### Mute SW

A sustain-style (momentary) footswitch connected to this input jack will mute the **MAIN OUT** when the pedal is pressed. This control, combined with the headphone output (which remains active during Mute), makes it easy to preview your pitch and monitor adjustments while you are muted to the audience.

**MUTE SW (TS):** The **MUTE SW** is a TS jack.

moog

MIDI		CONTROL		AUDIO	
	IN	MUTE SW	PITCH OUT	TUNER OUT	+12V DC
	C G G C				
		CV IN	VOLUME OUT	MAIN OUT	
					

### CV In (Expression Pedal Input)

An external control voltage connected to this jack can change the value of the assigned parameter. The default parameter is the Front Panel **FILTER** knob. This assignment can be changed via the Claravox Centennial software. In addition, a +5 Volt signal is provided to the Ring component of the TRS connector allowing an expression pedal to affect the assigned parameter.

**CV IN (TRS):** -5V to +5V; 0V to +5V

**Default Value:** -5V to +5V

### Pitch Out

The value of the 1 Volt/Octave control voltage available at this output is determined by the current pitch, and can be used as a CV source for other synthesizer equipment. This output voltage can be specified as continuous or quantized, via software. In addition, the range can be specified via software.

**PITCH OUT (TS):** 0V to +5V; 0V to +10V;

-5V to +5V

**Default Value:** 0V to +5V

### Volume Out

The value of the control voltage available at this output is determined by the current volume, and can be used as a CV source for other synthesizer equipment. The range of this output voltage can be specified via software.

**VOLUME OUT (TS):** 0V to +5V; 0V to +10V;

-5V to +5V

**Default Value:** 0V to +5V

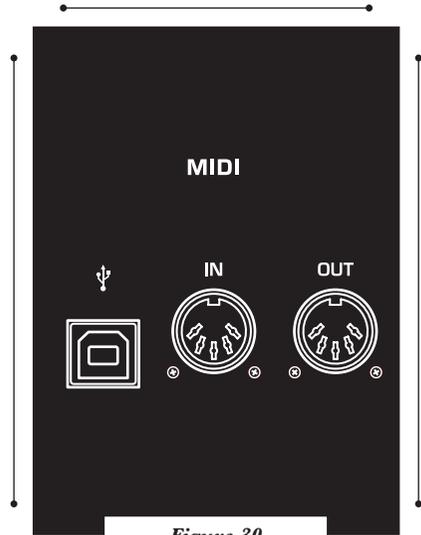


Figure 30

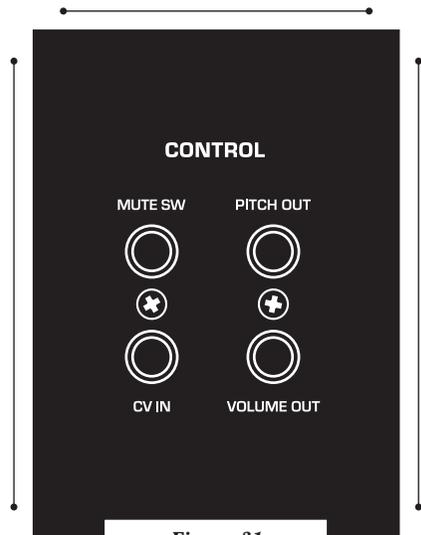


Figure 31

## Audio Outputs

Refer to Figure 32

Of the three audio outputs found on Claravox Centennial, two are found here on the Rear Panel (**TUNER OUT**, **MAIN OUT**). The third audio output, the (**HEADPHONE OUT**) output, is located on the Front Panel.

### Tuner Out

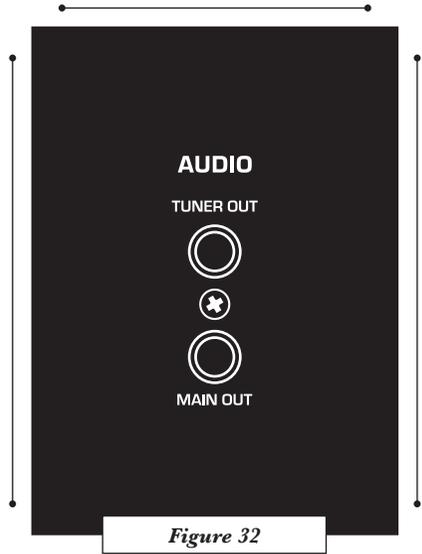
This output provides a direct feed of the audio signal at constant volume (tapped directly after the heterodyne output in **TRADITIONAL** mode and the OSC 1 output in **MODERN** mode. With a tuner connected, this provides a strong signal for the tuner to grab onto and is especially convenient when changing the Root Note and Scale, checking tuning, and other tasks while the audience hears silence.

**TUNER OUT (TS):** Mono Signal; Line Level; pre-VCA

### Main Out

This is the main instrument output. The signal available here will be sent to an amplifier, monitoring system, or recording console. No signal is sent from this output when the Front Panel **OUTPUT** switch is set to the **MUTE** position.

**TIP:** The **TUNER OUT** can be used for “pitch preview” by connecting a set of earbuds equipped with a volume control, or in-ear monitors equipped with a gain control.



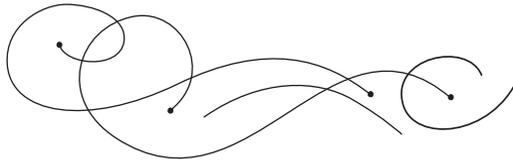
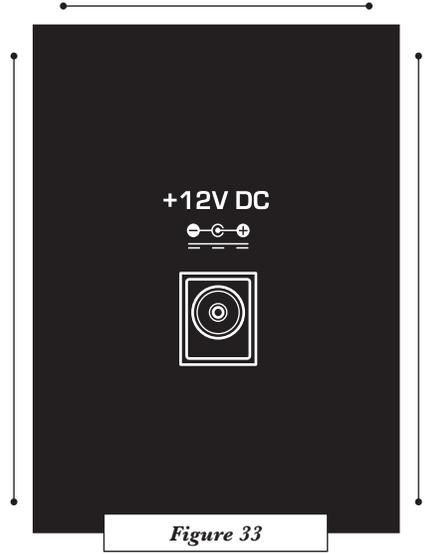
## Power Connection

Refer to Figure 33

### +12VDC

Plug only the power supply that came with your Claravox Centennial into this connector. Connect the other end to a properly wired and grounded wall outlet.

*NOTE: This was mentioned earlier in this manual, but it is worth repeating: because the player's entire body interacts with the circuitry at the heart of the theremin, a properly grounded connection is required for stable operation. However, when using a well-grounded (earthed) Claravox Centennial with a well-grounded (earthed) amplifier, it is possible to introduce a ground loop. In this case, it may be necessary to use a ground-lifting device on either Claravox Centennial or the amplifier – but not both – to eliminate the ground loop.*





## WORKING WITH OTHER GEAR

Claravox Centennial is a complete, standalone instrument. That said, Claravox Centennial is fully capable of interfacing – and interacting – with other musical gear in your setup or studio. Claravox Centennial can communicate via MIDI, and Claravox Centennial can send CV (Control Voltage) to other modular, semi-modular, or Eurorack synthesizers and systems.

### MIDI

*Refer to pages 55-62 for MIDI tables.*

In addition to all of the parameters available in the **TRADITIONAL** and **MODERN** modes using the front panel, an additional set of parameters is accessible via MIDI and through the Claravox Centennial software. The Claravox Centennial software is a convenient addition, however MIDI data can be freely sent from your DAW, hardware controllers, or other MIDI control sources. The tables on **pages 55-62** reveal the parameters that can be accessed and controlled using MIDI Control Change (CC#) and Non-Registered Parameter Numbers (NRPN#).

### Controlling Moog Synthesizers

Claravox Centennial can connect to any modular or semi-modular analog synthesizer – or really any Control Voltage capable musical or audio device. This Control Voltages (CV) concept is central to the development of the synthesizer, and to electronic music in general.

### How It All Works

A Control Voltage is an analog signal of a specific or changing voltage generated by one synthesizer – or synthesizer module – that is used to control another synthesizer or synthesizer module. Claravox Centennial produces two control voltage signals. One is derived from the operation of the Pitch Antenna and related settings. The second is derived from the operation of the Volume Antenna and related settings. These control voltages are derived from the Pitch and Volume parameters, but these same voltages can be used to modify the filter brightness, the envelope release time, etc. These control voltage signals can be used collectively in playing another instrument in its entirety, or patched individually

in order to effect changes to different parameters on different components and even different instruments. Using Claravox Centennial to control other modules and instruments can provide amazing levels of expression. Moog semi-modular instruments are excellent expanders for your Claravox Centennial.

### **Pitch Out CV**

The voltage value available via this jack is derived from the pitch being played, and can be used to set the value of the pitch being played by another module or synthesizer. Keep in mind that Claravox Centennial can generate not just notes, but continuous changes in pitch as well as true vibratos. This control signal can also be used to control any other parameter that can be voltage controlled – envelope timing, filter resonance, oscillator mix, noise amount, etc.

### **Volume Out CV**

As with the **PITCH OUT** jack, the value of the voltage available via this jack is derived from the Claravox Centennial performance. This control signal can be used to vary the volume level of another module or synthesizer. This control signal can also be used to control any other parameter that can be voltage controlled – attack time, cutoff frequency, effect depth, etc.

***NOTE:** An offset voltage can be added to or subtracted from the value of this output using MIDI CC# 30 / NRPN# 430.*

## **Examples of Using Voltage Control**

Here are just a couple of examples of how you can use Claravox Centennial to enhance or modify other instruments. The Gestural Control used when playing Claravox Centennial can enrich nearly any synthesizer session. The possibilities are limited only by your imagination – and, of course, the specifications of each output and input. Explore and seek out new ways to integrate Claravox Centennial into your rig, and into your performance.

***CAUTION:** Be sure you understand the operating levels of the equipment involved before making connections.*

### **Using Claravox Centennial to Control a Grandmother Sequence or Arpeggio**

In this example, you can use your Claravox Centennial performance to modify the playback of a sequence or arpeggio generated by a Moog Grandmother semi-modular synthesizer.

1. Connect the Claravox Centennial **PITCH OUT CV** out jack to the **CUTOFF IN** jack on Grandmother.
2. Connect the Claravox Centennial **VOLUME OUT CV** jack to the **VCA AMT IN** jack on Grandmother.

3. Set the Grandmother **VCA TYPE** switch to **DRONE**.

*NOTE: The Claravox Centennial **PITCH OUT** and **VOLUME OUT** jacks are 1/4" jacks, and Grandmother uses 1/8" (3.5mm) jacks, so adapters will be needed.*

4. Set Grandmother to play a Sequence or Arpeggio pattern.

As you move your volume hand away from the Volume Antenna, you should hear Grandmother begin to sound. Moving your pitch hand closer and further from the Pitch Antenna will open and close Grandmother's filter by changing the Cutoff Frequency. You can use Claravox Centennial strictly to control Grandmother, or you can play Claravox Centennial as you control Grandmother to create a spontaneous – and interactive – duet.

## Using Claravox Centennial to Control Subharmonic Timing

In this example, you can use your Claravox Centennial as a controller for a Moog Subharmonic semi-modular synthesizer performance.

1. Connect the Claravox Centennial **PITCH OUT CV** out jack to the Subharmonic **RHYTHM 1** input jack.

2. Connect the Claravox Centennial **VOLUME OUT CV** jack to the Subharmonic **RHYTHM 2** input jack.

*NOTE: The Claravox Centennial **PITCH OUT** and **VOLUME OUT** jacks are 1/4" jacks, and Subharmonic uses 1/8" (3.5mm) jacks, so adapters will be needed.*

Set your Subharmonic to play as you normally would.

As you move your pitch hand closer to and further from the Pitch Antenna, you should hear the timing of **RHYTHM 1** change. As you move your volume hand closer to and further from the Volume Antenna, you should hear the timing of **RHYTHM 2** change. In this way, you can use your Claravox Centennial performance to interact with the patterns produced by your Subharmonic.

## Playing External Instruments with MIDI Note Data

Claravox Centennial can play external instruments via MIDI using two distinct modes. **Fixed Mode** utilizes MIDI Pitch Bend messages for continuous control of the destination instrument. **Chromatic Mode** uses quantized MIDI Note Numbers which reflect the scale settings of the active preset.

### Fixed Mode

In this mode, only one MIDI Note Number is sent during performance, along with a stream of MIDI Pitch Bend messages that correspond to the Pitch Antenna CV. To begin using Fixed Mode, first navigate to MIDI Settings in the

## *Working With Other Gear*

Claravox Centennial software, select Fixed Mode, and enable MIDI Pitch Out. Use the Note Number parameter to select the base MIDI Note Number from which pitch will bend up and down. Then, an initial Note On message must be sent in order for Claravox to begin sending a continuous stream of Pitch Bend messages.

To send a Note On message, begin with your volume hand inside of the Volume Antenna loop and raise. When properly calibrated, a Note On message will be sent when the volume hand is approximately 1 cm above the Volume Antenna.

To send a Note Off message, place your hand back inside the Volume Antenna loop. Finally, adjust the Pitch Bend Range parameter to determine the sensitivity of MIDI Pitch Bend values to Pitch Antenna CV changes. High Pitch Bend Range amounts result in a wider playable range with lower resolution, Low Pitch Bend Range amounts result in a narrower playable range with higher resolution.

***NOTE:*** *If the receiving device is able to respond to MIDI RPN 0 (Pitch Bend Sensitivity), Claravox will automatically configure the correct pitch bend relationship for that device.*

### **Chromatic Mode**

In this mode, quantized MIDI Note Numbers are sent without any Pitch Bend data. The Note Numbers that are sent reflect the Quantize Scale settings of the active preset. To begin using Chromatic Mode, first navigate to MIDI

Settings in the Claravox Centennial software, select Chromatic Mode, and enable MIDI Pitch Out. Then, an initial Note On message must be sent in order for Claravox to begin sending Quantized MIDI Note data. To send a Note On message, begin with your volume hand inside of the Volume Antenna loop and raise. When properly calibrated, a Note On message will be sent when the volume hand is approximately 1 cm above the Volume Antenna. To send a Note Off message, place your hand back inside the Volume Antenna loop. Claravox will only send MIDI Note Numbers while Note is On.

***NOTE:*** *Since Note Number and Pitch Bend Range parameters have no effect in this mode, those parameters will become inactive in the Claravox Centennial software while in Chromatic Mode.*

## MIDI PARAMETERS

Parameter	MIDI CC#	MIDI NRPN#	Range	Notes
<b>Volume Response</b>	12	412	0 – 16383	<b>Bipolar (Center Value = 0)</b> Adjusts the linearity of the Volume Antenna response [concave to convex].
<b>Pitch Response</b>	13	413	0 – 16383	<b>Bipolar (Center Value = 0)</b> Adjusts the linearity of the Pitch Antenna response [concave to convex].
<b>Quantize Amount</b>	16	416	0 – 16383	Determines the level of quantization.
<b>Quantize (ROOT)</b>	85	485	0 = C 11 = C# [D b] 21 = D 32 = D# [E b] 43 = E 53 = F 64 = F# [G b] 75 = G 85 = G# [A b] 96 = A 107 = A# [B b] 117 = B	Selects the root note [key] of the scale used for quantization.

Parameter	MIDI CC#	MIDI NRPN#	Range	Notes
<b>Quantize Scale</b>	86	486	0 = Chromatic 6 = Ionian 12 = Minor Pentatonic 17 = Fifth 23 = Dorian 29 = Phrygian 35 = Lydian 41 = Mixolydian 47 = Aeolian 52 = Locrian 58 = Major Blues 64 = Minor Blues 70 = Diminished 76 = Major Pentatonic 81 = Spanish 87 = Roma 93 = Arabian 99 = Egyptian 105 = Ryukyu 111 = Wholetone 116 = Major Third 122 = Minor Third	Selects the scale used for quantization.
<b>Register</b>	75	475	0 = [-2] 32 = [-1] 64 = [0] 96 = [+1]	Octave Offset for the Pitch Antenna.
<b>Filter Cutoff</b>	19	419	0 – 16383	Analog VCF (Oscillator 1 only)
<b>Brightness</b>	17	417	0 – 16383	Analog Harmonic Enhancement (Oscillator 1 only)
<b>Wave</b>	18	418	0 – 16383	Analog Waveshaper (Oscillator 1 only)
<b>Delay Time</b>	20	420	0 – 16383	Adjusts the Delay Time (70ms to 700ms).
<b>Delay Mix</b>	21	421	0 – 16383	Adjusts the Delay Wet/Dry mix.
<b>Delay Feedback</b>	22	422	0 – 16383	Adjusts the Delay Feedback amount.

Parameter	MIDI CC#	MIDI NRPN#	Range	Notes
<b>Pitch Antenna Scan Freq Mod Amount</b>	72	472	0 – 127	<b>Bipolar (Center Value = 0)</b> This parameter controls the depth of the PITCH CV signal used to modulate the frequency at which the oscillators' wavetable is scanned.
<b>Pitch Antenna Scan Pos Mod Amount</b>	73	473	0 – 127	<b>Bipolar (Center Value = 0)</b> This parameter controls the depth of the PITCH CV signal used to modulate the scan position of the oscillators' wavetable.
<b>Oscillator 1 Mode</b>	81	481	0 = Sine 32 = Triangle 64 = Saw 96 = Wavetable	Selects the mode for Oscillator 1.
<b>Oscillator 1 Level</b>	25	425	0 – 16383	Selects the level for Oscillator 1.
<b>Oscillator 1 Wavetable</b>	83	483	0 = Wavetable 1 16 = Wavetable 2 32 = Wavetable 3 48 = Wavetable 4 64 = Wavetable 5 80 = Wavetable 6 96 = Wavetable 7 112 = Wavetable 8	Selects the Wavetable in use for Oscillator 1, when the Oscillator 1 MODE is set to Wavetable [102].
<b>Oscillator 1 Scan Position (Center)</b>	87	487	0 – 127	Specifies the starting position for scanning back and forth through the selected Wavetable.
<b>Oscillator 1 Scan Frequency</b>	23	423	0 – 16383	Adjusts the rate for scanning back and forth through the selected Wavetable (0.1 Hz to 100 Hz).

Parameter	MIDI CC#	MIDI NRPN#	Range	Notes
<b>Oscillator 1 Scan Amount (Width)</b>	89	489	0 – 127	Sets the width of the Wavetable scanning window [0 to full frame].
<b>Oscillator 2 Beat Frequency</b>	28	428	0 – 127	<b>Bipolar (Center Value = 0)</b> Linear offset [-10Hz to +10Hz] for the secondary oscillator frequency relative to the primary.
<b>Oscillator 2 Semitone Offset</b>	27	427	0 – 127	<b>Bipolar (Center Value = 0)</b> Musical-pitch offset [-12 semitones to +12 semitones] for the secondary oscillator relative to the primary.
<b>Oscillator 2 Level</b>	26	426	0 – 16383	Specifies the level of Oscillator 2.
<b>Noise Level</b>	9	409	0 – 16383	Specifies the level of the Noise source sent to the Filter of Oscillator 2.
<b>Oscillator 2 Wavetable</b>	82	482	0 = Wavetable 1 16 = Wavetable 2 32 = Wavetable 3 48 = Wavetable 4 64 = Wavetable 5 80 = Wavetable 6 96 = Wavetable 7 112 = Wavetable 8	Selects the Wavetable in use for Oscillator 2, when the Oscillator 2 MODE is set to Wavetable [102].
<b>Oscillator 2 Scan Position (Center)</b>	88	488	0 – 127	Specifies the starting position for scanning back and forth through the selected Wavetable.
<b>Oscillator 2 Scan Frequency</b>	24	424	0 – 16383	Adjusts the rate for scanning back and forth through the selected Wavetable [0.1 Hz to 100 Hz].

Parameter	MIDI CC#	MIDI NRPN#	Range	Notes
<b>Oscillator 2 Scan Amount (Width)</b>	90	490	0 – 127	Sets the width of the Wavetable scanning window (0 to full frame).
<b>Oscillator 2 Filter Offset</b>	8	408	0 – 16383	Sets the Cutoff Frequency of the two-pole State-Variable Filter (SVF) affecting Oscillator 2 and Noise.
<b>Oscillator 2 Filter Mode</b>	91	491	0 = Low Pass 32 = High Pass 64 = Band Pass 96 = Notch (Band Reject)	Sets the Filter mode of the two-pole State-Variable Filter (SVF) affecting Oscillator 2 and Noise.
<b>Oscillator 2 Filter Resonance (Q)</b>	10	410	0 – 16383	Sets the Resonance Amount of the two-pole State-Variable Filter (SVF) affecting Oscillator 2 and Noise.
<b>Oscillator 2 Filter Enable</b>	103	503	0 = Off 64 = On	Determines whether or not the Oscillator 2 Filter is applied to Oscillator 2 and the Noise Source.
<b>Oscillator 1 Pitch Filter Tracking Amount</b>	2	402	0 – 16383	<b>Bipolar (Center Value/MSB 64 = 0)</b> Determines how much the Pitch Antenna value changes the Cutoff Frequency of the Oscillator 1 Filter.
<b>Oscillator 2 Pitch Filter Tracking Amount</b>	3	403	0 – 16383	<b>Bipolar (Center Value/MSB 64 = 0)</b> Determines how much the Pitch Antenna value changes the Cutoff Frequency of the Oscillator 2 Filter.

Parameter	MIDI CC#	MIDI NRPN#	Range	Notes
<b>Oscillator 1 Volume Filter Tracking Amount</b>	4	404	0 – 16383	<b>Bipolar (Center Value/MSB 64 = 0)</b> Determines how much the Volume Antenna value changes the Cut-off Frequency of the Oscillator 1 Filter.
<b>Oscillator 2 Filter Tracking Amount</b>	5	405	0 – 16383	<b>Bipolar (Center Value/MSB 64 = 0)</b> Determines how much the Volume Antenna value changes the Cut-off Frequency of the Oscillator 2 Filter.
<b>Note Number Mode</b>	110	510	0 = Fixed 64 = Chromatic	Determines whether MIDI pitch control messages will be sent via Fixed mode or Chromatic mode.
<b>MIDI Pitch Out Enable</b>	108	508	0 = Off 64 = On	Determines whether or not MIDI Pitch data corresponding with Volume and Pitch antenna CV will be sent.
<b>Fixed Mode MIDI Note Number</b>	109	509	0 – 127	Set the base Note Number that will be used for MIDI Note On when in Pitch Move mode.
<b>Volume CV Output Scale</b>	30	430	0 – 16383	<b>Bipolar (Center Value = 0)</b> Attenuates the max CV Output level available to the selected Volume CV Out Range. Negative values invert the output range.
<b>Volume CV Output Range</b>	104	504	0 = -5V to +5V 43 = 0V to +5V 86 = 0V to +10V	Sets the CV range found at the VOLUME OUT jack.

Parameter	MIDI CC#	MIDI NRPN#	Range	Notes
<b>Pitch CV Output Range</b>	93	493	0 = -5V to +5V 43 = 0V to +5V 86 = 0V to +10V	Sets the voltage range for the PITCH OUT CV jack.
<b>Pitch CV Out Quantize</b>	95	495	0 = Pre-Quantization 64 = Post-Quantization	Selects if the value of the PITCH OUT CV jack is determined before or after any quantization.
<b>CV In Scale</b>	14	414	0 – 16383	Scales the voltage of the CV IN jack plus/minus 100%; Center value = 0 output.
<b>CV In Offset</b>	29	429	0 – 16383	<b>Bipolar (Center Value = 0)</b> This parameter provides an offset voltage that is added or subtracted from the CV Input Range.
<b>CV In Range</b>	92	492	0 = -5V to +5V 64 = 0V to +10V	Sets the expected voltage range of the CV IN jack.
<b>Mute Mode</b>	107	507	0 = Latching 64 = Momentary	Determines whether the panel MUTE jack toggles MUTE on/off with successive presses (latching), or mutes on press/unmutes on release (momentary).

Parameter	MIDI CC#	MIDI NRPN#	Range	Notes
<b>MIDI Note On Threshold</b>	111	511	0 – 16383	Determines the Volume Antenna CV level at which a Note On/Off message will be sent. Note will remain On as long as Volume Antenna CV is above threshold, and will remain Off as long as Volume Antenna CV is below threshold.
<b>Volume Antenna Control Mode</b>	113	513	0 = Volume Antenna Enabled 43 = Enabled + Automute 86 = Volume Antenna Disabled	Determines whether the Volume Antenna is active, active with automute enabled, or disabled with external MIDI CC# 7 control of Volume enabled.
<b>Volume Antenna MIDI CC# Selection</b>	n/a	2501	0 = No Volume Antenna CC Output 1-31 = Selects corresponding value for Volume Antenna CC Out #	Determines which MIDI CC# is used to send values corresponding with Volume Antenna CV.



## CALIBRATION

Claravox Centennial arrives calibrated and ready to play. However, there are a handful of user-accessible calibration settings that can be useful for matching the performance of Claravox Centennial to the environment, and to your own playing preferences.

### Pitch Null Calibration (Traditional; Modern)

This procedure calibrates the frequency of the Fixed Oscillator so that your **NULL** position falls into the middle of the **PITCH** knob range. This is useful for matching your settings to a wide range of environments. The Pitch Null Calibration is performed separately for the **TRADITIONAL** mode and for the **MODERN** mode. You will not need to perform this calibration often – only if you are having difficulty finding the correct playing range.

***NOTE:** You will need to adjust the **PITCH** knob after performing this calibration procedure in order to hear the results.*

### Pitch Null Calibration Procedure (Traditional Mode)

1. Set the **TIMBRE** knob to the 1 position; set the **PERFORMANCE** switch to the **TRADITIONAL** mode.
2. Enter the Calibration mode by simultaneously holding the **STORE** and **SET ROOT** buttons. Both LED indicators will begin to blink together, once per second.
3. Stand in your playing position, and place your pitch hand up to the **NULL** position (this is where you want to calibrate the note to go so low that you cannot hear it).
4. Standing very still, use your other hand to press the **STORE** button, and remain still.
5. The **STORE** and **SET ROOT** LEDs will continue to blink until calibration is complete. Once calibration is complete, Claravox Centennial will return to the normal playing mode, and you are free to move normally.

*TIP: Once in the Calibration mode, you can press the **SET ROOT** button (prior to hitting the **STORE** button in Step 4) to exit the Calibration mode without making any changes.*

### Pitch Null Calibration Procedure (Modern Mode)

1. Set the **TIMBRE** knob to the 1 position; set the **PERFORMANCE** switch to the **MODERN** mode.
2. Enter the Calibration mode by simultaneously holding the **STORE** and **SET ROOT** buttons. Both LED indicators will begin to blink together, once per second.
3. Stand in your playing position, and place your pitch hand up to the **NULL** position (this is where you want to calibrate the note to go so low that you cannot hear it).
4. Standing very still, use your other hand to press the **STORE** button, and remain still.
5. The **STORE** and **SET ROOT** LEDs will continue to blink until calibration is complete. Once calibration is complete, Claravox Centennial will return to the normal playing mode, and you are free to move normally.

*TIP: Once in the Calibration mode, you can press the **SET ROOT** button (prior to hitting the **STORE** button in Step 4) to exit the Calibration mode without making any changes.*

### Volume Range Calibration (Modern Mode)

In the **MODERN** mode, you can use the Volume Calibration routine to set the **NEAR** (mute point) and the **FAR** (maximum volume) points to suit your playing. Claravox Centennial comes set up with a standard playing range, but you may want to change where the effective “off” position is, or change the response from a very short amount of range to a large amount of range. The normal **VOLUME** knob and **VOLUME RESPONSE** knob still determine the contour of the response within the desired range.

### Volume Far Position Calibration Procedure (Modern Mode)

1. Set the **TIMBRE** knob to the 2 position; set the **MAIN OUTPUT** switch to **ACTIVE**.
2. Enter the Calibration mode by simultaneously holding the **STORE** and **SET ROOT** buttons. Both LED indicators will begin to blink together, once per second.
3. Stand in your playing position, and place your volume hand up where you would like to achieve the maximum volume (farther away from the volume loop).
4. Standing very still, use your other hand to press the **STORE** button, and remain still.
5. The **STORE** and **SET ROOT** LEDs will continue to blink until calibration is complete. Once calibration is complete, Claravox Centennial will return to the normal playing mode, and you are free to move normally.

## Calibration

nial will return to the normal playing mode, and you are free to move normally.

***TIP:** Once in the Calibration mode, you can press the **SET ROOT** button (prior to hitting the **STORE** button in Step 4) to exit the Calibration mode without making any changes.*

### Volume Near Position Calibration Procedure (Modern Mode)

1. Set the **TIMBRE** knob to the 2 position; set the **MAIN OUTPUT** switch to **MUTE**.

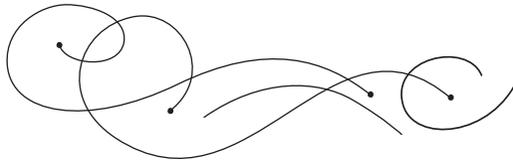
2. Enter the Calibration mode by simultaneously holding the **STORE** and **SET ROOT** buttons. Both LED indicators will begin to blink together, once per second.

3. Stand in your playing position, and place your volume hand down where you would like to achieve the minimum volume (closer to the volume loop).

4. Standing very still, use your other hand to press the **STORE** button, and remain still.

5. The **STORE** and **SET ROOT** LEDs will continue to blink until calibration is complete. Once calibration is complete, Claravox Centennial will return to the normal playing mode, and you are free to move normally.

***TIP:** Once in the Calibration mode, you can press the **SET ROOT** button (prior to hitting the **STORE** button in Step 4) to exit the Calibration mode without making any changes.*





*Clara Rockmore PR photo  
playing theremin, New York,  
mid to late 1930s*

# SPECIFICATIONS

## Traditional Mode

### Pitch Circuit

Pitch Adjust (**PITCH ANTENNA** knob)

Pitch Oscillator *LC (Inductance/Capacitance) Tank - 320kHz nominal*

Fixed Oscillator

Heterodyne Circuit + Filter

### Volume Circuit

Volume Adjust (**VOLUME ANTENNA** knob)

Volume Oscillator *LC (Inductance/Capacitance) Tank - 510kHz nominal*

Volume Rectifier and Filter

VCA (Voltage Controlled Amplifier)

### Analog Waveshaper Circuit

Filter Cutoff Frequency (**FILTER** knob)

Brightness (**BRIGHTNESS** knob)

Wave Symmetry (**WAVE ADJUST** knob)

### Analog Delay Circuit

Delay Amount (**DELAY AMOUNT** knob): 0% to 100%

Delay Time (**DELAY TIME** knob): 20ms to 700ms

Delay Feedback (**DELAY FEEDBACK** knob): 0% to 100%

### Timbre

Timbre Select 1-6 (**TIMBRE** knob)

Timbre Store (**STORE** button)

### Main Output Switch

Active: All Outputs Active [**MAIN OUT, TUNER OUT, (HEADPHONE OUT)**]

Mute: **MAIN OUT** muted; **TUNER OUT & (HEADPHONE OUT)** active;

LED status indicator lit

### Performance Mode Switch

Traditional: Analog Theremin Circuitry

Modern: Analog & Digital circuitry; **MODERN** Mode features

### Headphone

(**HEADPHONE OUT**): 1/4" TRS jack

Level controlled by the **HEADPHONE VOLUME** knob

### Power

On/Off switch with LED indicator

### MIDI Indicator

LED indicates incoming MIDI data

# SPECIFICATIONS

## Modern Mode Additions

### Pitch Processing Circuit

Pitch Response (**PITCH RESPONSE** knob): Pinched Lows (CCW); Linear (Center);  
Pinched Highs (CW)

Wave Shape (Via Software): Sine, Triangle, Saw, and Wavetable

Octave Range (**REGISTER** knob): -2, -1, 0, +1

Root Note (**QUANTIZE** knob; **SET ROOT** button): C3 to C4, Chromatic.

Scale Select (**REGISTER** knob, **SET ROOT** button) Default: Chromatic, Ionian (Major),  
Pentatonic; Fifths

Quantize Amount (**QUANTIZE** knob): 0% to 100%

### Modern Mode Oscillators

OSC1 (SINE, TRI, SAW, WAVETABLE): passed to analog waveshaper circuit

OSC2 (SINE, TRI, SAW, WAVETABLE): passed directly to analog VCA

NOISE (White Noise): passed directly to analog VCA

OSC2 and NOISE passed through State-Variable Filter (Low-Pass, High-Pass, Band-Pass,  
Band-Reject)

### Volume Processing Circuit

Volume Response (**VOLUME RESPONSE** knob): Large, classical motion (CCW);  
Fast, dynamic motion (CW)

## Rear Panel

Audio: **MAIN OUT**; **TUNER OUT**

CV: **MUTE SWITCH**; **CV IN**; **PITCH OUT**; **VOL OUT**

MIDI: **MIDI IN (DIN)**; **MIDI OUT (DIN)**; **MIDI IN/OUT (USB)**

Power: Power Supply connection

## Dimensions

Size (W x D x H): 23" x 12.25" x 5.5" with antennas

Size (W x D x H): 6" x 16.75" x 8" without antennas

Weight: 8.4 lbs.

## Power Supply (Included)

Style: Wall adapter; barrel connection; center-pin positive

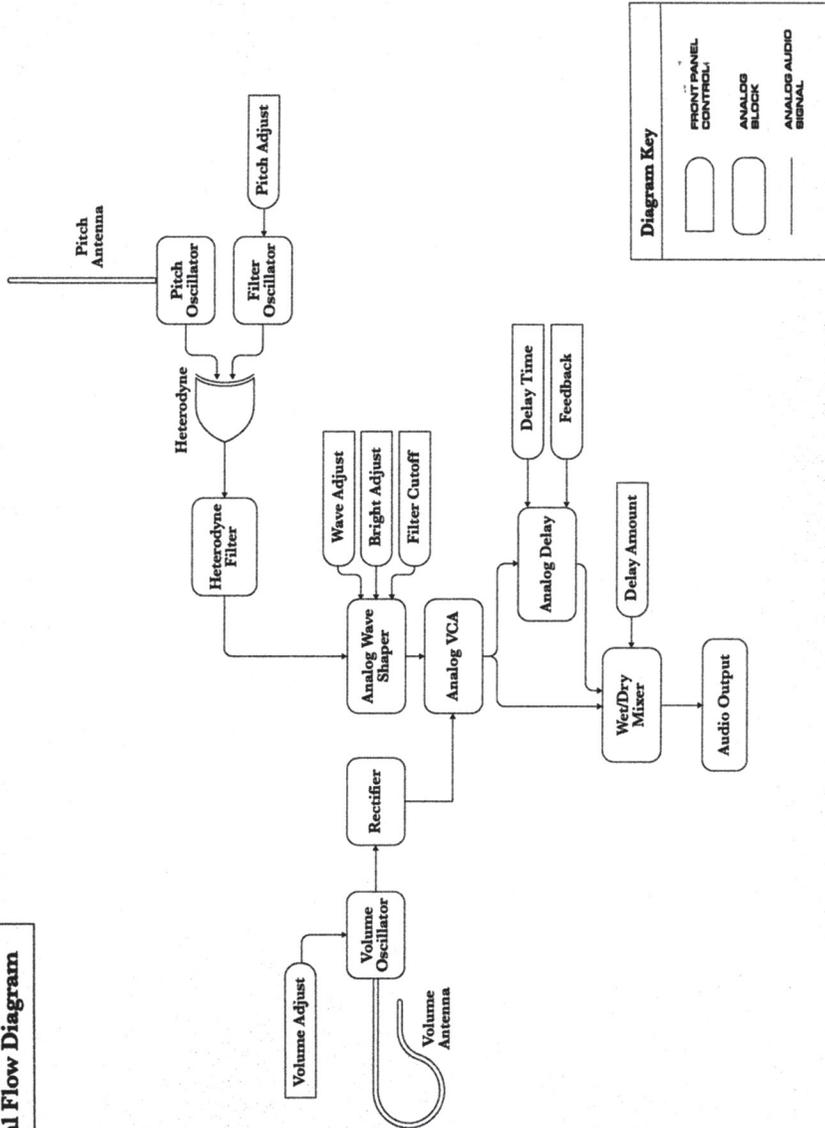
Input: 100 – 240VAC; 50 Hz – 60 Hz

Output: +12VDC; 2A

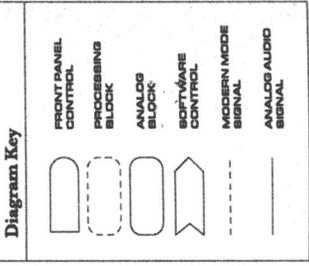
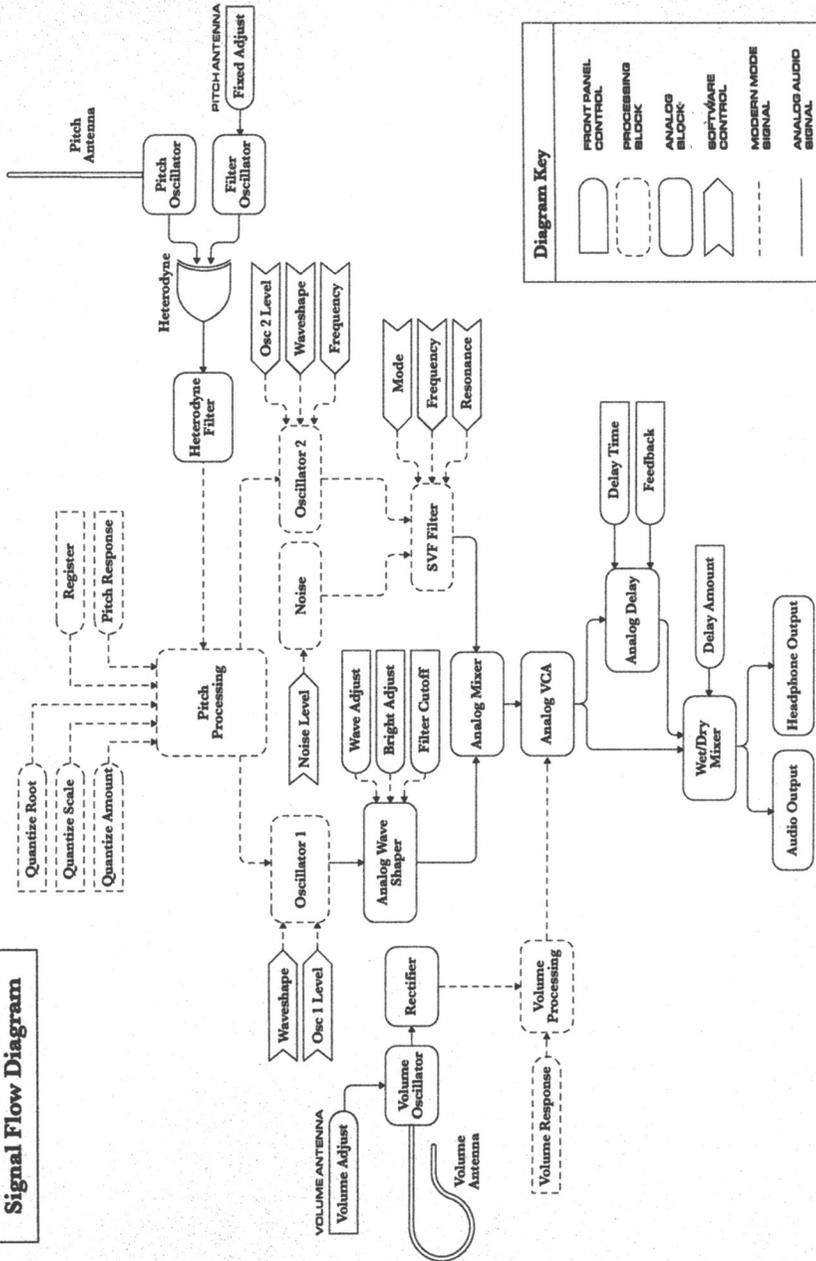
## Power Consumption

Typical: 4.8 Watts

### Traditional Mode Signal Flow Diagram



# Modern Mode Signal Flow Diagram



# SERVICE & SUPPORT INFORMATION

## **Moog's Standard Warranty**

Moog warrants its instruments to be free of defects in materials or workmanship and conforming to specifications at the time of shipment. The Warranty Period is one year from the date of purchase. If, in Moog's determination, it has been more than five years since the instrument shipped from our factory, it will be at Moog's discretion whether or not to honor the warranty without regard to the date of the purchase.

During the Warranty Period, any defective instruments will be repaired or replaced, at Moog's option, on a return-to-factory basis. This warranty covers defects that Moog determines are no fault of the user.

The Moog Limited Warranty applies to USA purchasers only. Outside the USA the warranty policy and associated service is determined by the laws of the country of purchase and supported by our local authorized distributor. A listing of our authorized distributors is available on [moogmusic.com](http://moogmusic.com).

If you purchase outside of your country, you can expect to be charged for warranty as well as non-warranty service by the service center in your country.

## **Returning Your Instrument to Moog Music**

You must obtain prior approval in the form of an RMA (Return Material Authorization) number from Moog before returning any instrument. Email [techsupport@moogmusic.com](mailto:techsupport@moogmusic.com) for the RMA number via email or call us at (828) 251-0090. All instruments must be packed carefully and shipped with the Moog supplied power adapter. Claravox Centennial must be returned in the original inner packing including the foam inserts. Sorry, the warranty will not be honored if the instrument is not properly packed. Once you have received the RMA number and carefully packed your Moog instrument, ship the instrument to Moog Music Inc. with transportation and insurance charges paid, and include your return shipping address.

### **MOOG MUSIC**

160 Broadway St.  
Asheville NC, 28801

# SERVICE & SUPPORT INFORMATION

## What We Will Do

Once received, we will examine the instrument for any obvious signs of user abuse or damage as a result of transport. If the instrument was abused, damaged in transit, or is out of warranty, we will contact you with an estimate of the repair cost. Warranty work will be performed, and Moog will ship and insure your instrument to your United States address free of charge.

## How to Initiate Your Warranty

Please initiate your warranty online at [www.moogmusic.com/register](http://www.moogmusic.com/register). If you do not have web access, please call (828) 251-0090 to register your instrument.

## Caring for Claravox Centennial

Clean Claravox Centennial with a soft, dry cloth only. Heed the safety warnings at the beginning of the manual. Don't drop the unit.

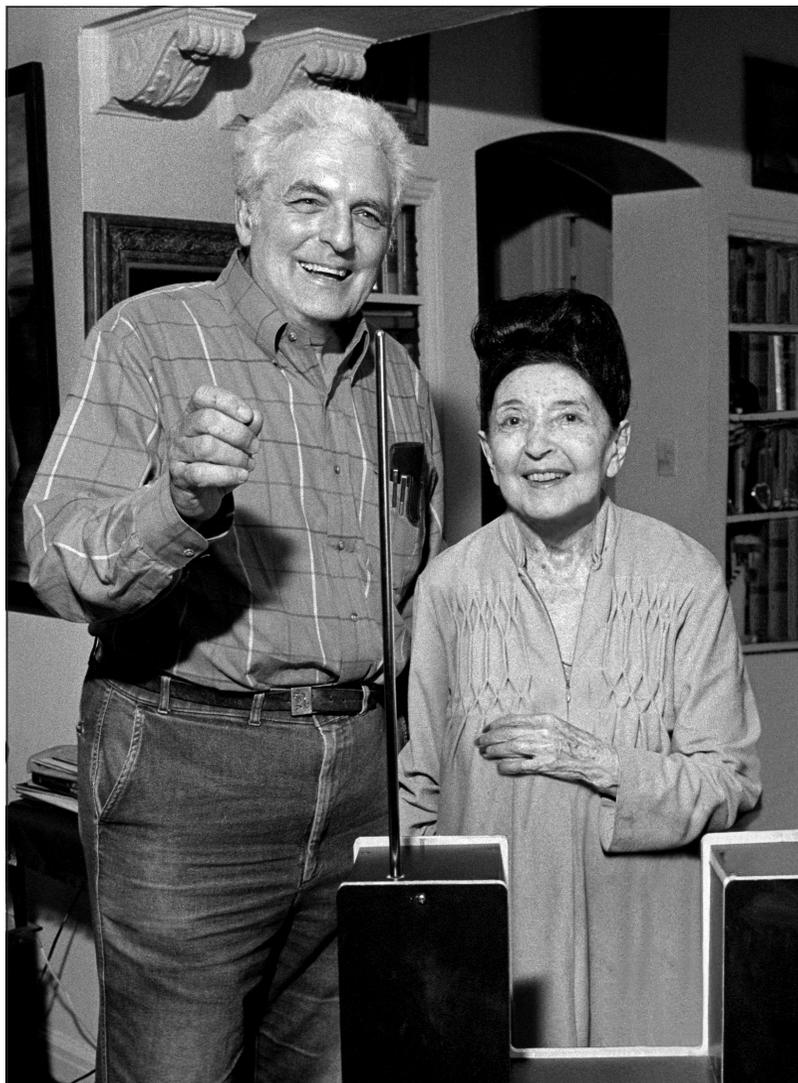
***AN IMPORTANT NOTE ABOUT SAFETY: There are no user serviceable parts in the Claravox Centennial. Refer all servicing to qualified personnel only.***

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## Claravox Centennial User Manual Version 1

For the most up-to-date user manual and firmware updates, visit [www.moogmusic.com/claravox](http://www.moogmusic.com/claravox).

**Phone:** +1 (828) 251-0090 | **Email:** [info@moogmusic.com](mailto:info@moogmusic.com) | **Website:** [www.moogmusic.com](http://www.moogmusic.com)



*Robert Moog demonstrates his latest theremin to  
theremin virtuosa Clara Rockmore in Clara's home.  
New York, April 24, 1993.*

## SPECIAL THANK YOU

### **Thank you to Steve J. Sherman, Robert Sherman, and The Nadia Reisenberg/Clara Rockmore Foundation.**

Established to preserve and enhance the legacies of these two incredible musical sisters, the Foundation to date has enabled the release of more than a dozen albums of Nadia Reisenberg and Clara Rockmore performances. Learn more at: [www.nadiareisenberg-clararockmore.org](http://www.nadiareisenberg-clararockmore.org)

We are honored to have worked closely with them on this project and look forward to continuing to celebrate Clara's genius over the next 100 years.

**-Moog Music**

### **Thank you to Moog Music Inc.**

The Nadia Reisenberg / Clara Rockmore Foundation, and the family of these two great and inspirational women, are ever grateful to Moog Music and truly touched by this incredible honor to name this centennial theremin after Clara. Clara's lifelong devotion to furthering the true musical potential of the theremin mirrors Bob Moog's innovative vision for the world of electronic music.

Together, their legacies now give us the Claravox.

**-Steve J. Sherman**

## PHOTO CREDITS

All photos listed below are reprinted with the permission of  
Steve J. Sherman & The Nadia Reisenberg/Clara Rockmore Foundation.

[www.stevejsherman.com](http://www.stevejsherman.com)

*Page 7 | Photo by: Renato Toppo, courtesy of The Nadia Reisenberg/Clara Rockmore Foundation*

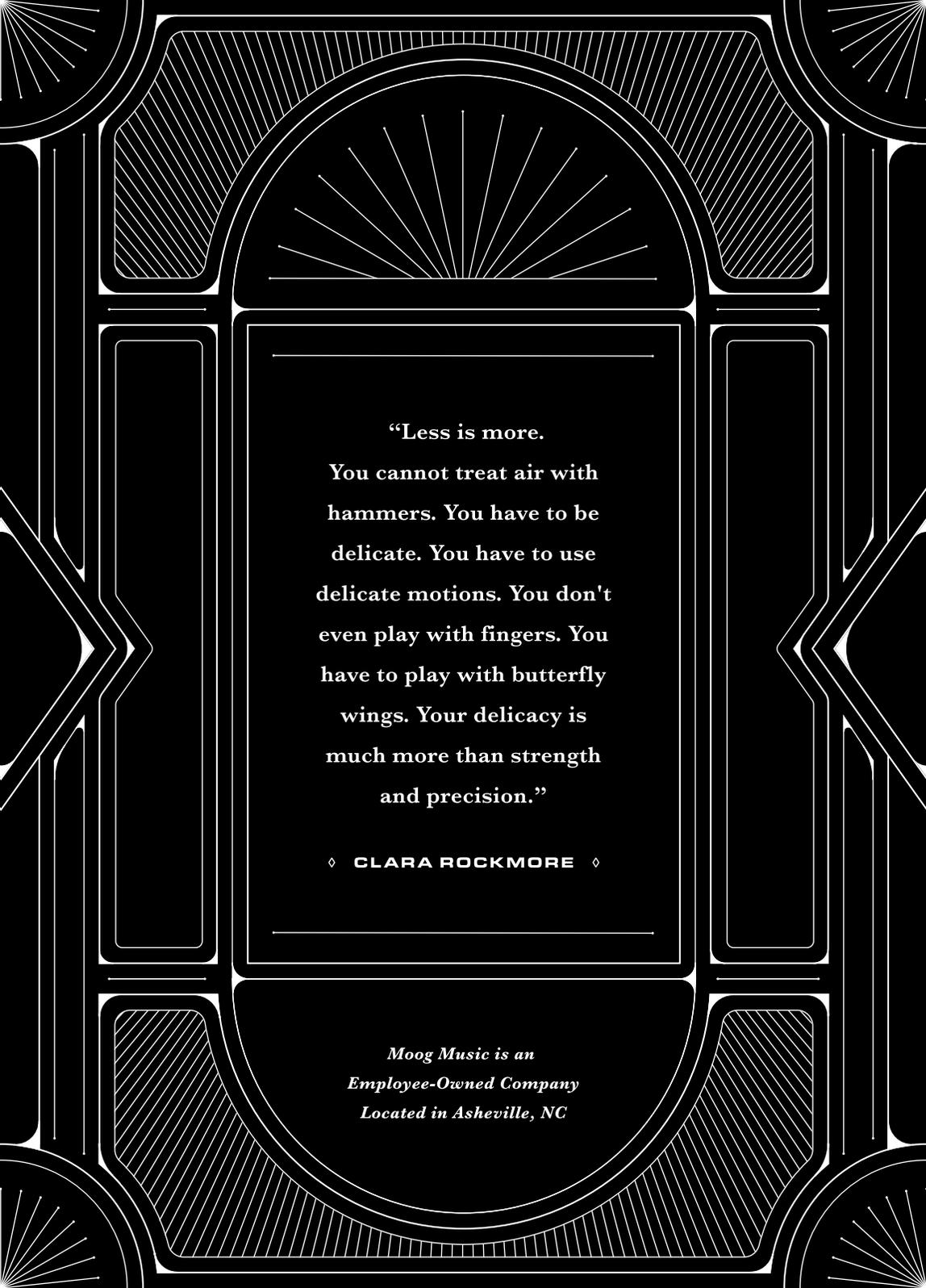
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*Page 12 | Photo by: © Steve J. Sherman, courtesy of the photographer*

*Page 66 | Photo courtesy of The Nadia Reisenberg/Clara Rockmore Foundation*

*Page 73 | Photo by: © Steve J. Sherman, courtesy of the photographer*



**“Less is more.  
You cannot treat air with  
hammers. You have to be  
delicate. You have to use  
delicate motions. You don't  
even play with fingers. You  
have to play with butterfly  
wings. Your delicacy is  
much more than strength  
and precision.”**

**◇ CLARA ROCKMORE ◇**

*Moog Music is an  
Employee-Owned Company  
Located in Asheville, NC*



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