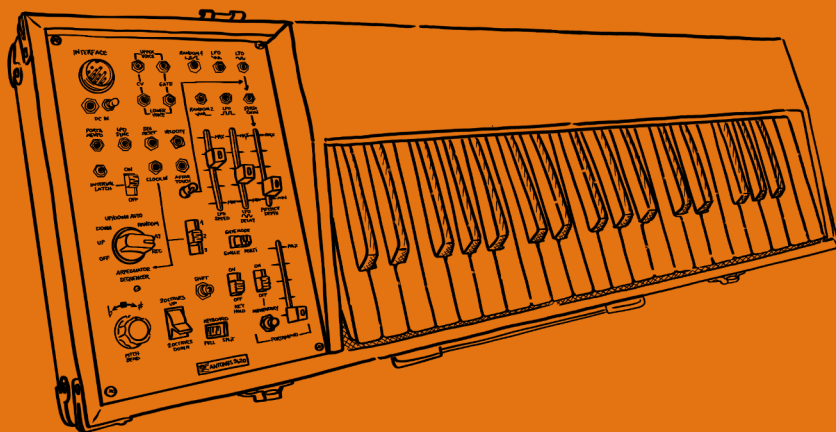




ANTONIUS 3620

USER MANUAL



User Manual

Antonius 3620



Acknowledgments

We would like to thank everyone who has helped bring the **Antonius 3620** keyboard to life. First, thanks to all the users who have trusted Antonus equipment since 2015, from the creation of the custom-built **Antonius 2600**, which marked the beginning of a long and passionate journey. Now, with our keyboard, it becomes a complete system together with the **Step Brother** and **SidecArp** units. Without your support and trust we would not have been able to develop this keyboard, a project that represents a huge challenge and effort for a small family business to both, develop and sell.

As you may imagine, manufacturing keyboards is neither a common nor an easy task but thanks to all the encouragement and support we had received, we have succeeded.

We would like to thank **Alan R. Pearlman** for his work, which served as the inspiration for ours. Also, we would like to thank **Dina Pearlman's ARP Foundation** for their present work and effort to keep ARP's legacy and history alive.

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To the development team behind the project and the manual, as well as to all the other professionals who collaborated on different stages and processes, thank you.

Thanks to all the friends who, over the years, have helped and shared their time on the adventures that involve a project like this one; with ideas, inspiration, moral support, love and all kinds of true help.

And last but not least, thank you, user of the Antonus 3620 keyboard, for making this instrument concept possible.

Patron Support Program

Special thanks and reference to all **Patron users**, whose patronage has made the creation of the **Antonus 3620** possible. Thanks for their trust and support.

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Prologue

The wonderful **Antonius 3620** is a sophisticated **keyboard, sequencer** and **CV/MIDI controller**, which has been designed to be an expressive, powerful, logical and intuitive tool. It includes some of the most important characteristics that have related the synthesizer's origin and development to the foundational **electronic music** and **traditional music**. These characteristics (synthesizer's signal control by a classic traditional keyboard with expanded functions, a programmable sequential system and the generation of periodic and random oscillatory voltages), have, all together, some peculiarities, potentialities and contradictions (as well as troubles and feedbacks) related not only to the appearance of electronic musical instruments (beginning of the XX century) but also to the origin of electro-acoustic music (middle of the XX century) which are important to analyse.

One of the first **electro-acoustic sound art** identities - institutionalized in 1957 with the foundation of significant laboratories in *Paris* and *Cologne*- is based on the use of **electricity** (which is not direct sound matter) as an **audio signal**, to create sound pieces that were not necessarily structured to be interpreted with musical instruments. Their organization and composition was done from the direct work over recorded material, with the use of mix, collage and montage technique (specifically with magnetophone tape technology). This was achieved through **assembly** and recorded sound **manipulation**; which was originated not only from microphoned acoustic sources but also from **oscillating electronic** sources.



This **creative** and **technical** method is radically different from the **millenary musical practices** and will soon lead to the development of the voltage and digital controlled **synthesizer** as the device to optimise electronic and electro-acoustic music composition, with the use of electricity's properties not only to generate and process sound signals but also to generate and process control signals and therefore, compose, shape and synthesize, working on sound signal's temporal evolution in complex and interactive ways.

The work with **audio** and **control electric signals**, combined and transformed later into sound, offers exclusive qualities: the **development** and **evolution** of **sounds** in a time lapse that no human being could physically perform neither with a musical instrument nor through body movements.

The use of **sequencers** and **random**, periodic or eventual generators -in all frequencies- to apply control and modulation over electric signals result in unprecedented articulations, sound qualities and structures that are not necessarily linked to historic traditional music. The **keyboard's** incorporation as a control source for electric generated tones started with the first electric and electronic musical instruments such as the *Telharmonium* (1906), the *Dèsilets organ*, the *Ondes Martenot* (1928), the *Hammond organ* (1935), etc., but its incorporation to the synthesizer is probably one of the most important, transcendental and controversial inflection points in the history of electronic music. This is because on the one hand, it was the device, a recognizable interface, that allowed connecting the synthesizer and its new technology (that came from the radio and telecommunications, computers, recording and aerospace engineering) with *traditional music*. On the other

hand, it was the first step to make electronic music lose its original identity, allowing more ruled, structured and conventional characteristics of the musical practice. It is also important to highlight that in the emergence of electronic music, many traditional music hypothesis were challenged, opening a way for the emancipation of tones, noises and soundscapes.

Robert Moog made the first synthesizer prototype in 1964, which incorporated a control keyboard, suggested by *Herbert Deutsch*, who wanted an instrument for electronic music composition. It was also de result of a debate over the advantage of using a **classic interface** as part of an **integral modular** system, which possibilities were far from acoustic, electric, or electronic instruments conventional **sounds** and **articulations**, designed to be “played”. It was a system thought as a **programmable** and **generative** composition and performance tool.

In conversations between *Herb Deutsch* and *Bob Moog*, the idea of the keyboard's incorporation was an option to boost the synthesizer's expansion, something that was rejected by other advisors, such as electronic music composers *Vladimir Ussachevsky* and *Gustav Ciamaga* (who were head of *Columbia-Princeton* and *Toronto University Laboratories* and were responsible for promoting the ADSR envelope -*Ussachevsky*- and the voltage controlled filter -*Ciamaga*- designed by *Moog*). These composers saw the addition to the keyboard as the main potential danger for the dissolution of the identity of the newly emerged electro-acoustic sound art. In the creation of the **Buchla** modular system, also by mid 60's, the same dilemma appeared between *Donald Buchla*, *Morton Subotnick* and *Pauline*

Oliveros, who considered the musical keyboard an inadequate association as a physical controller, with *Ramon Sender*, who considered it appropriate.

Two particularly successful **albums** recorded in the *United States* by the end of the 60's set the synthesizer's future evolutionary course and highlighted these differences and dilemmas: "*Silver Apples of The Moon*", by *Morton Subotnick* (recorded with a Buchla modular system) and "*Switched-On-Bach*", by *Wendy Carlos* (recorded with a Moog modular system). *Subotnick's album*, with its characteristic **experimental, atonal, sequential** and **random** atmosphere, goes one step forward in the opening of timbral and expressive possibilities allowed by a **voltage controlled** system, interpreted in **real time** (which includes sequencers and random generators); as opposed to electro-acoustic composition's indirect system with collage and assembly technique, common in tape electronic music previous to the creation of the synthesizer. But Carlos's album broke all molds, going deep into a path in which electronic music had no experience by that time: classical music and popular music in all their dimensions...

After its launch on *July 1967*, "*Silver Apples Of The Moon*" was an unexpected success for the *Nonesuch* record company, turning into a **classical-contemporary** best seller and also becoming very popular as an **experimental** album in wider circles. This categorized it as an underground success, praised by the international review.

But "*Switched-On-Bach*" directly turned into an all-time **classical musical** best seller. It reached number 10 on the *US Billboard 200* chart and topped the *Billboard Classical Albums* chart from 1969 to 1972.). It was the **first** classical

album to certified platinum and also won *Grammy Awards* for Best Classical Album, Best Classical Performance – Instrumental Soloist or Soloists (With or Without Orchestra), and Best Engineered Classical Recording. It was **massive** and influenced plenty of musicians out from experimental music circles (particularly in rock, cinema and advertising environments), definitely contributing to the widespread of synthesizers, that soon started to be manufactured in simpler, cheaper and more portable versions, mainly oriented to more traditional musical uses.

Keyboards became a habitual synthesizer's control **interface** and the **MiniMoog**, which started being commercialized in 1970, was the first synthesizer which had a keyboard integrated to the cabinet, featuring its modules interconnected by the manufacturer, with no possibility to be patched by the user. Also, it was the first synthesizer to be sold in musical stores.

The album "*Switched-On-Bach*" caught engineer *Alan Robert Pearlman's* attention, who have been interested in electronic, music and sound since he was a child. By studying *Moog* and *Buchla's* equipment, *Pearlman* decided to combine and improve these system's qualities, in both, the electronic music expansive sense and the traditional music expressive sense, creating the **ARP-Tonus** Company. It became a leader brand in mid 70s synthesizers and also the first inspiration for the creation of Antonus. **ARP's** 1972 catalogue exemplifies, with its four products, the very different perspectives that already shared space in the synthesizer's universe: the big *modular 2500* system (one of the most advanced and complete synthesizers of the time, which includes keyboards, sequencers, random generators, 4 and 5 stages envelopes, oscillators with accurate and stable



tuning, ring modulators, multi mode filters, etc.), the *classical 2600* (created as a true electro-acoustic musical laboratory, self-contained, patchable and portable, mainly designed for educational purposes, for small studios and concerts), the *Pro Soloist* (an instrument with an expressive keyboard, the first with aftertouch sensitivity but with very limited synthesis, fixed configuration based on presets (mainly imitation of musical instruments, oriented to keyboard players who would want to enhance their sound diversity) and *Odyssey* (a very flexible instrument, thought as a professional keyboard synthesizer useful for recording and concerts, that, despite not having patching possibilities, it features a very clever routing that combines musical performance with the generative properties of electronic music and its vast modulation and control resources).

This synthesizer's adaptation to conventional **musical practices** -with its implied resulting programming and range limitations-, together with the emergence of polyphonic synthesizers which featured memories and the popularity of digital technology (Yamaha DX, samplers and MIDI's kingdom) by the end of the 70's and beginning of the 80's, made sound synthesis more **imitative** and **practical**, turning the development of new tools into a market of devices that were more functional to commercial music production.

Of course that the incorporation of a conventional musical keyboard -with its centenary history- to a device which resulted from less than two decades of electro-acoustic sound art, generated a conflict between the weight of the **tradition** and the **new paradigm** emerging with the synthesizer's technology but also the keyboard was the inflection point for the **expansion** and **popularization** of the synthesizer as an important part of the keyboardist's

equipment and inspired a great number of artists to experiment with new resources that enriched the spectrum of all types of music. *Moog* and *ARP* synthesizers started to occupy relevant places, mixed with electronic organs, electric pianos, electrified clavichords, Mellotrons, etc. The heterodox use of the **chromatic keyboard** as a voltage-controlled system in the 70's also boosted creative explorations like inverted and microtonal scales or real time sequence transpositions.

As the synthesizer's popularity increased, some of its original potentialities were left apart to turn it into an **imitative** device, advertised as a musical instrument or even musicians substitute (noticeable in the absence of programming panels with a knob per function for real time synthesis, in workstation designs like the *Korg M1*, and in the *General MIDI* standard norm) and as an "effects" generator too, features present in most of the late 80's and beginning of the 90's synthesizers. Few synthesizers designs from that era escaped this homogenizing trend (thanks to new developments in synthesis, accessible interfaces, and alternative applications of the MIDI language).

During the same period of time, parallel to the mainstream enhancement of the **digital system's** virtues, a tendency to recover the forgotten analogue technologies starts to emerge -particularly derived from underground and experimental scenes from cities all over the world- including **synthesizers**, keyboards, rhythm machines, sequencers, and processors from the 60's, 70's and beginning of the 80's which have been obsolete and out-dated. **Analogue audio** characteristics and the possibility to use panels full of controls in **real time** to perform with synthesis parameters, together with the fact that you could get them at a very low price because they were

antiquated, lead to a new turn which broke the lineal inertia which presupposed that only modern technologies were aesthetically valid at contemporary music.

In 1994, *Dieter Doepfer* launches the rack analogue and MIDI synthesizer, *MS-404* (inspired in the *Roland TB303 Bass Line* synthesizer/sequencer, which has been a fail twelve years later but by that time it was being revitalized in house, acid and techno music scenes) and in 1995 he starts to sell the *Doepfer Modular A-100* line (analogue and hybrid modules in Eurorack format) giving a new and unexpected impulse to the “abandoned” modular world. The **enhancement** of analogue equipment, the new versions of classic machines and the resurgence of patchable devices in electro-acoustic art are key connections to the origin of **Antonius** products line and the **3620** keyboard.

Out from the tradition represented by the musical keyboard, the majority of the most important first original **tools** incorporated to the synthesizer came from technologies that did not strictly belong to the musical world, as that of **telecommunications** and radio, analogue and digital computing, air navigation, etc., and within these ones, the sequencer and random signals generator are the key components of the foundational electronic music differential identity, together with the tape assembly technique.

The **sequencer** was first integrated into a voltage controlled synthesis system in the *Buchla* Modular system in 1965 and in 1967 *Moog* adds the *960 Sequential Controller* and the *962 Sequential Switch* to its modular line (In 1956, the 22 year-old *Bob Moog* visited *Raymond Scott*’s electronic music studio and was impressed by, among other things, the electro mechanical sequencer developed by *Scott* himself, which was

thought to generate rhythms, melodies and diverse background music) and in 1970, the ARP 2500 incorporated wide **sequencing** capabilities and **random signal** generators (most of these qualities will be materialized later in the ARP *Sequencer*, foundational inspiration of the sophisticated *Antonius Step Brother Sequencer-Expander*). By the beginning of the 70's, EMS starts to sell the first digital sequencers that allow CV recording in real time and the following years, *Oberheim*, *Sequential Circuits* and *Roland*, develop sequencers and arpeggiators with similar characteristics as that present in *Antonius 3620*.

Sequencers and random generators as tools for evolutive signal control **programmable events** (sequential, probabilistic and random) set an exclusive electronic music personality, very different from **human interpretations** and **instrumental articulations** (the departure point for plenty of contemporary musical genres), opening a creative personal electronic path which was also associated to certain rigidity, coldness, repetition, inconsistency or lack of expressiveness by some critics or conservative musicians.

The keyboard's **incorporation** is, on the one hand, the decision that linked electronic music with expressive sensibility typical of human interpretation (also expanded them) and, on the other hand, the adaptation responsible of the synthesizer's restraint from electro acoustic art because of the demand of pre-existent musical tradition characteristics (as it is polyphony, tempered scale, strength sensibility as an expressive resource, standardization of sounds with traditional instrumental characteristics, etc.).

The path between **hybridity** and **dialogue** between tradition and innovation becomes very sinuous until it



reaches our days, in which languages, techniques and technologies' coexist more than ever.

The **Antonius 3620** keyboard/sequencer is one of the devices that evince the combination of these **integration**, intersection and feedback tendencies in analogue and digital technologies together with human expressive musical articulation over electronic "gesture"; by incorporating within the same instrument, sensible keyboard control, a versatile sequencing system and the possibility of random and periodic oscillating signals generation. This allows us to associate the synthesizer to a centenary **artistic gradient** and also to new **interaction** possibilities with exclusively electronic qualities.

The **Antonius 3620** keyboard/sequencer was created to interact with all types of voltage controlled or MIDI devices, with modular systems, rack or desktop synthesizers/samplers and computers, and allows us to use the keyboard and sequencer's possibilities for much more than articulate or produce "notes", because it can be used to control any device with a CV input. For example, apart from adjusting VCO's tuning and envelope's triggering, the 3620 can manage wave shapers, filters, dry-wet mixes, panning, frequencies, modulation amplitudes, sample & holds and any other voltage controlled modular function. It generates **varied signals** related to the **interpretative language** (activation - gate-, different DC values with key-notes, dynamic values related to after touch and velocity) as well as periodic, sequential and random movement signals (to create different types of low-frequency and audio modulations) or patterns and the possibility to use the sequencer as a **probabilistic generator** controlled by random clocks.

The **Antonius 3620** allows a wide variety of combined creative uses that represent the fascinating evolution and future of the infinite electronic music universe, characteristics that, together with its solid artisanal quality, guarantees us a lot of exploration, expression and inspiration time.

Ernesto Romeo



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1. Introduction

Since we launched Antonus in 2015, specifically after producing several Antonus 2600 and Step Brother models, in 2023 we decided to take a step further by asking ourselves: what if we recreate the classic ARP3620 keyboard that accompanies the ARP2600, completing the Antonus system? Almost two years have passed since that idea came to us and, although the journey has been long, today we are **proud to launch the Antonus 3620 Keyboard.**

This instrument was originally intended to be a replica of the ARP3620 keyboard, but it has evolved to incorporate new features and connections with modern technologies. It has been designed for a broad audience, with the main goal of being functional, musical, and inspiring, offering an intuitive and agile experience when creating music or exploring new sounds.

1.1 Versatility and Control

The Antonius 3620 offers the possibility of two ways of use—which can coexist simultaneously—: as a **MIDI controller** or as a **control voltage (CV) keyboard**.

- **Control Voltage:** This "analog" dimension of the keyboard is monophonic or duophonic in nature, and allows the use of different patch points for control voltage inputs and outputs.

- **MIDI:** This "digital" dimension has a polyphonic nature with no voice restriction (determined by the controlled synthesizer) and allows the use of MIDI messages at input and output.

Both control technologies operate simultaneously; therefore, it is possible to control both a CV/GATE system and a MIDI system at the same time.

We firmly believe that it is the perfect complement to enhance the 2600 system, any type of modular system, or any other MIDI and/or CV instrument. It is a musical versatile tool, suitable for both live performance and studio use, with a classic, high-quality aesthetic finish.

Congratulations on purchasing your Antonius 3620!



2. Safety Instructions

- **Do not use** your 3620 near water, in excessively humid environments or near heat sources.
- **Use only** the power supply included or one with identical technical specifications.
- **Unplug** the keyboard if you will not use it for an extended period of time.
- If the device does not function properly, **do not attempt to open or repair the unit yourself.** Contact Antonus technical support directly.
- **Do not directly expose the keyboard** to sunlight during prolonged time.

3. Box Content

Inside the package, you will find the following items:

- 3620 Keyboard.
- 12V DC power supply.
- User manual.

Please ensure that all items are included. If something is missing, contact Antonus immediately.

4. Quick Start Guide

Your keyboard requires a 12V power supply. For optimal performance, follow these steps:

1. **Connect** the power supply cable to the keyboard's power input.
2. **Plug** the power supply into an outlet.
3. **Turn** on the keyboard with the power switch.
4. **Connect** via CV or MIDI to your preferred synthesizer.
5. **It's time to play, create and enjoy!**



5. Human Engineering

The *ARP3620* keyboard which inspired us represented, at that time, an evolution of its predecessor, the *ARP3604*. It raised the concept of keyboard performance to something more than just playing notes or sliding between tones. The 3620 introduced the possibility of duophonic performance as opposed to the prevailing monophony of the era. It featured more ergonomic dynamic pitch bend control, quick transpose, vibrato expression via built-in additional LFO outputs and control over the multi-note triggering type.

The **Antonius 3620** keyboard represents, in turn, an evolution and update of that concept, based on the following points:

- **Operational independence:** Unlike the original 3620, which required a connection to the ARP 2600, the Antonius 3620 is completely self-contained and capable of working with other synthesizers without the need of a 2600.
- **Expanded polyphony management:** an additional biphonic mode has been added.
- **Greater expressiveness:** Includes Key Velocity and Aftertouch functions (a feature first introduced by the *ARP Soloist* in 1971), as well as the possibility to use it in SPLIT mode.
- **Programmable automated sequential performance:** Includes a versatile arpeggiator and a sequencer with user memories.

- **Expanded experimental dimension:**

Introduction of random and probabilistic functions, as well as additional external controls.

- **Modern and backward-compatible connectivity:** Implementation of MIDI and USB digital technologies with CV and Gate/Trigger.



6. About This Manual

The purpose of this manual is to explain in detail the keyboard's control functions and how it integrates with other instruments and devices.

The **Antonius 3620** keyboard is very easy to use for those who know about synthesis and control voltage (CV). If that applies to you, you will probably start experimenting as soon as you take it out of the box. However, be sure you **read this manual completely**, because, apart from explaining the basics, it describes advanced features and the different ways you can integrate this powerful controller into your system.

You will discover that the 3620 keyboard is an endless source of musical and creative inspiration.

Don't forget to visit our website, where you will find links to tutorials and frequently asked questions (FAQs).

We will leave you now with **your 3620 keyboard**—you have to create great music with it.

INTERFACE



DC IN



PORTAMENTO



LFO SYNC



SEQ RESET

VELOCITY



INTERVAL LATCH



ON

OFF



CLOCK IN



AFTER TOUCH



UP/DOWN AUTO

DOWN RANDOM

UP

OFF

PLAY REC

ARPEGGIATOR SEQUENCER

2 OCTAVES UP

2 OCTAVES DOWN

PITCH BEND

2 OCTAVES UP

2 OCTAVES DOWN

PITCH BEND

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2 OCTAVES DOWN

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PITCH BEND



UPPER VOICE

LOWER VOICE

CV

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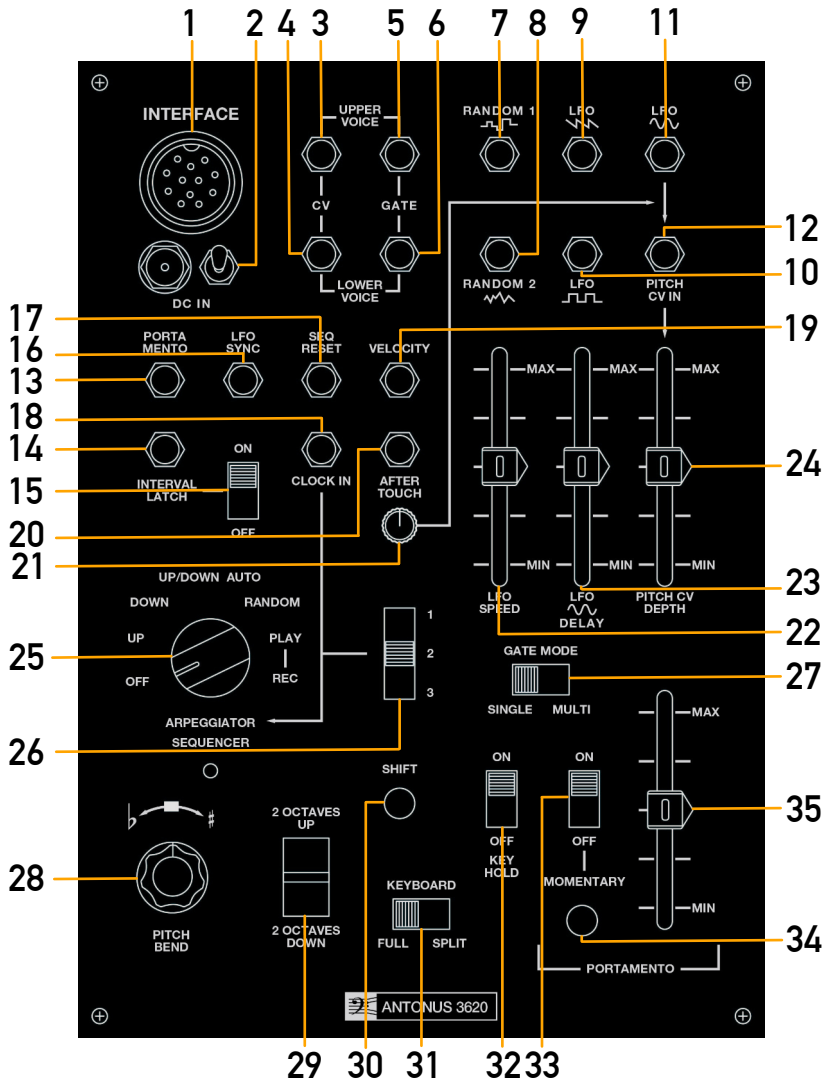
ANTONUS 3620

Antonius 3620



7.1. Control Panel

Overview



1. **Interface connector:** Allows you to connect the keyboard to a MIDI / USB device or vintage ARP 2600 with the use of special cables.
2. **DC IN / Power:** Power input and on/off switch.
3. **Upper voice CV:** Upper Voice Control voltage (CV) output.
4. **Lower voice CV:** Lower Voice Control voltage (CV) output.
5. **Upper voice gate:** Upper voice gate output.
6. **Lower voice gate:** Lower voice gate output.
7. **Random 1:** Random waveform one CV output.
8. **Random 2:** Random waveform two CV output.
9. **LFO Ramp:** Ramp waveform LFO voltage output.
10. **LFO Square:** Square waveform LFO voltage output.
11. **Delayed Sine:** Sine waveform LFO voltage output.
12. **Pitch CV IN:** Internal (sine) modulation input replacement with external signal.
13. **Portamento:** Portamento input; allows activation via external device.
14. **Interval Latch:** Enable/disable interval/chord latch input.

- 15. Interval Latch Switch:** Permanently enables/disables interval latch.
- 16. LFO Sync:** Sync input; it resets and synchronizes the LFO phase with external signal.
- 17. SEQ Reset:** Sequence or arpeggio reset input via external signal.
- 18. Clock IN:** Sequencer and arpeggiator external clock input.
- 19. Velocity:** Velocity CV output.
- 20. Aftertouch:** Aftertouch CV output.
- 21. Aftertouch Knob:** Adjusts aftertouch depth control on vibrato.
- 22. LFO Speed:** Adjusts low-frequency oscillator (LFO) speed or frequency.
- 23. LFO (Sin) Delay:** Determines sine wave delay time after a key is pressed.
- 24. Pitch CV Depth:** Controls pitch modulation depth.
- 25. Sequencer / Arpeggiator:** Arpeggiator and sequencer activation selector.
- 26. Buttons 1-2-3:** Arpeggio octave range selection or sequencer memory position.
- 27. Gate Mode (Single/Multi):** Note articulation mode (legato or re-trigger) selection.

- 28. Pitch Bend:** Continuous pitch variation.
- 29. 2 Octaves Up/ 2 Octaves Down:** Keyboard's tonal range extension.
- 30. Shift:** access to keyboard's global settings and advanced functions.
- 31. Keyboard Full/Split:** two-zone keyboard split for two independent performances.
- 32. Key Hold:** hold down notes and arpeggiator/sequencer playback.
- 33. Portamento Switch:** enables or disables portamento effect permanently.
- 34. Portamento Button:** enables or disables portamento momentarily.
- 35. Portamento Slider:** glide time adjustment between notes.

7.2 Connection Options

The **Antonius keyboard** was designed with both purposes, to preserve the original ARP model spirit and to integrate modern technologies for additional versatility and dynamism.

As a result, users can operate the keyboard in two simultaneous ways: via **control voltage (CV)** or via **MIDI**. We are convinced that this feature provides two distinct approaches and experiences, combining the best of both worlds.

In the following sections, we will study the concepts of control voltage and MIDI in detail, to understand your keyboard's possibilities in the best way.

7.2.1 Control Voltage

When we talk about control voltage, we refer to the technique of using an electric signal to control the operation of another electric signal. This voltage is measured in **volts (V)**, and generally speaking, the higher the voltage is, the more intense or pronounced the signal or the change in the parameter being controlled will be.

Control voltage allows us to constantly manipulate any parameter; this is what we generally refer to as **CV (control voltage)**. Unlike step-based digital systems, CV has the ability to take any intermediate value and hold it.

This system allows you to control and automate analogue equipment using electric signals. Thanks

to this, it is possible to manipulate pitch, cut-off frequencies, amplitude, or other parameters, all in real time. By the comprehension of its nature, you will be able to connect your analogue hardware setup in a much more organic, variable, personalized, creative, and direct way than with MIDI.

In this specific case, you can connect your keyboard to control the pitch of the upper and lower voices (**Upper and Lower Voice CV**) among other things, and manage functions such as portamento, LFO sync, etc.

The keyboard features several voltage-controlled inputs you can use to enhance the quality and sophistication of your performance. These include **Upper** and **Lower Voice**, **Portamento**, **Interval Latch**, **Ext Pitch Mod In**, **LFO Sync**, **SEQ Reset inputs**, and **LFO** (square and ramp), **Random 1**, **Random 2**, **Velocity**, and **Aftertouch** outputs.

Note: To connect these functions and explore their capabilities, you must use **3.5 mm (1/8) mini-jack cables**.

7.2.2. MIDI

The acronym MIDI stands for Musical Instrument Digital Interface. It is a standardized digital communication protocol for interfaces, connectors, and various hardware and software devices. It allows multiple instruments, electronic devices, or computers to interconnect and communicate with one another, transmitting and receiving data and commands for music creation.

This protocol was developed in the early 1980s to standardize communication between different instruments. Its creation was necessary to facilitate conventional musical uses, which involved multiple voices, as control voltage could be extremely complex to implement in polyphonic synthesizers.

It is essential to understand that **MIDI does not transmit analogue audio signals**; it is a digital protocol for sending and receiving data. This data can consist of event control messages or information that the receiving device will interpret according to its programming.

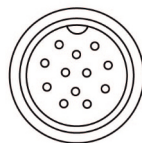
MIDI connection can transmit messages known as **channel** and **voice** messages. This enables polyphonic transmission of notes and musical events across **sixteen independent channels**, numbered 1 to 16.

In this case, the keyboard is capable of transmitting MIDI messages to any synthesizer or device equipped with this interface. As mentioned, response will depend on the connected device. For example, if you connect the keyboard to a synthesizer with six-voice polyphony (**such as the Bree 6 by GS Music**), only up to six simultaneous notes will be transmitted and played back, since the synthesizer is limited by its number of voices.

7.2.3. Interface Connector

The Antonius 3620 is a keyboard that supports various connection types: CV, MIDI, USB, and/or direct connection to the original ARP2600. The 3620's panel enables CV and gate connections with mini-jack patch cables, allowing extensive control

INTERFACE



options over synthesizers that support this standard. Nevertheless, the 3620 offers a world of MIDI connectivity accessible via interface connection. This is a 12-pin GX20 connector that provides the following options: MIDI IN/OUT via DIN-5 cable, MIDI IN/OUT via USB interface and update port, and direct connection to a vintage ARP2600. At the moment you order your 3620, you can specify which cable configuration you need to complete your system.

Here we list the available options:

■ **Multipin to two DIN-5 female connectors:** This cable allows you to connect the keyboard, via the multipin output, to the MIDI synthesizer of your choice. Since this cable is short, you can extend it with a standard longer MIDI cable.



■ **Multipin to USB:** Suitable for direct connection to computers or synthesizers with no DIN-5 input.



■ **Multipin to CINCH JONES:** This cable is designed for users who own an original ARP2600. This allows you to connect your keyboard directly to the classic model. With this connection, the 3620 can be powered without the need of an external power supply.

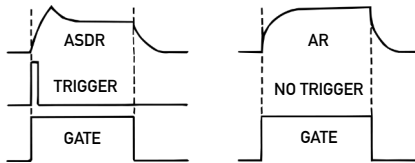




Key Concepts for New Section

When you work with keyboard-controlled analogue synthesizers, you will see that two signals are typically generated each time a key is pressed to produce the equivalent of a musical note:

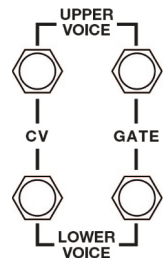
- **Pitch CV:** Determines the pressed note's reference voltage, which controls the pitch (frequency/tone) of one or more voltage-controlled oscillators (VCOs).
- **Gate:** A pulse signal that controls when a note is active (while held down, a specific voltage is generated, always the same regardless the note played) or inactive (when released, the voltage returns to 0). The **trigger** also serves to activate a signal, but with a predetermined duration of a few milliseconds (useful for resets, retriggers, advances, etc.).



7.3. Control Functions

As we mentioned before, the keyboard can control different synthesizers by generating four control signals, each serving a different purpose:

1. Upper-Voice Gate Signal
2. Lower-Voice Gate Signal
3. Upper-Voice CV
4. Lower-Voice CV



Gate Signal

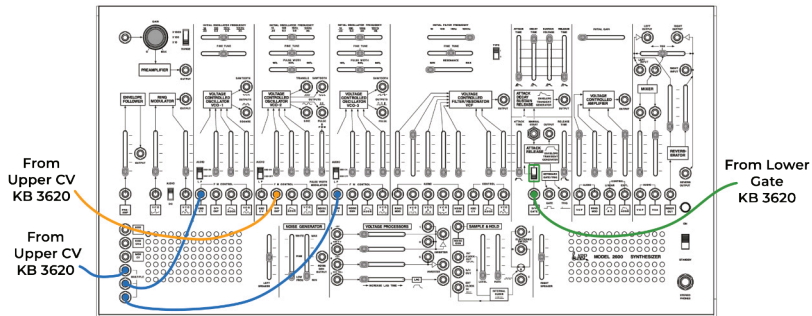
This is a binary “on/off” signal. It typically works in conjunction with control voltage (CV) and functions as a **temporary trigger**. When a key is pressed, a 10V high gate signal is sent, which remains active the time the key is pressed. When the key is released, the signal returns to 0 volts, signalling the envelope generators (AR and ADSR), for example, that the key has been released. The envelope starts when gate voltage is active, and release phase begins as soon as that signal disappears.

Unlike the original 2600 and 3620 models, which required two signals—TRIGGER and GATE—for activation, the Antonus 3620 simplifies connection and operation by using only a GATE signal.

The vast majority of ARP keyboards required these two signals: TRIGGER to initiate the envelope’s attack phase and GATE to determine its duration. Additionally, the amplitude of this signal must be high, at least 10V.

In order to use the Antonus’s GATE signal accurately on synthesizers that require TRIGGER + GATE buses, you must use a splitter. This will allow you to split the GATE signal and route it equally to both buses (TRIGGER and GATE). You can use the 2600 included splitter or use passive splitters, stackable cables, or other similar solutions.

The following example shows how to operate the Korg Model 2600 properly, as it lacks interfaces for easy and accurate control voltage envelope triggering.



7.3.1. CV use in the Keyboard

The keyboard generates two control voltage signals for pitch, related to the **lowest** and **highest** played notes. This enables **duophonic** performance.

- **Monophonic Mode:** If only one note is played, both voltages will be identical. The higher note “copies” the value of the lower note, which results in a monophonic articulation (a single tone).

- **Duophonic Mode:** To achieve this effect, you must press two keys simultaneously. When two notes are pressed, the **CV of the lower voice** (Lower) will produce the lower pitch, and the **CV of the upper voice** (Upper) will produce the higher pitch.

Note: If more than two keys are pressed (for example, a triad), the notes between the highest and lowest ones will be ignored. The system prioritizes only the extremes.

7.3.2. Duophony

As we mentioned before, the 3620 keyboard is **duophonic**. Duophony is the ability to play two notes simultaneously with a certain degree of independent articulation. It differs from **monophony** (a single note) and **polyphony** (where three or more notes can be played simultaneously, according to the synthesizer's capabilities). In this keyboard, duophony is achieved when you use **control voltage (CV)** connection. If the keyboard is connected via **MIDI**, you can play as many notes as it is allowed in the synthesizer you are controlling.

Both Voices Use

To use both keyboard voices, connect the **CV Upper, CV Lower, and Gate** outputs to your synthesizer's related inputs.

Note for Antonus 2600 users: Connect the instrument's CV and gate inputs from the side panels. We recommend you to connect the lower voice (**Lower-Voice**).

***Important:** If you connect just one voice, the sound will be monophonic. True duophonic effect is achieved only by making both connections (see note priority).

If you want your keyboard to respond to both key press and pitch, you must always connect both CV and Gate.

- **CV:** Allows pitch change when different keys are played. The standard used is **1V per octave** (this is the ARP standard and the most common in

analogue systems).

- **GATE:** When this output is connected, the synthesizer will trigger each time you press a key.

7.3.3. Duophonic Modes

The Antonius 3620 features three duophony modes:

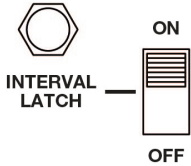
- **Mode 1:** In this mode the **Lower** and **Upper CV** outputs send the same value, unless a second key is pressed. In that case, **Lower CV** will send the lower note's pitch and **Upper CV**, the higher note's pitch. When just one note remains pressed, **Upper CV** will follow the value of **Lower CV**. The **GATE 2** output will only activate when two or more notes are active.

- **Mode 2:** In this mode the **Lower** and **Upper CV** outputs maintain the same value unless a second key is pressed. In that case, **Lower CV** assigns the lower note's pitch and **Upper CV** that of the higher note. If a key is released and just one remains pressed, **Upper CV** will maintain its last value until a new key is pressed. This is very useful when you use sounds with long release on the VCA, as it prevents abrupt pitch jumps of the oscillator controlled by **Upper CV**. Consequently, the keyboard will match the **Lower CV's** pitch to keep the interval during sound's decay. **GATE 2** will only activate when two or more notes are active.

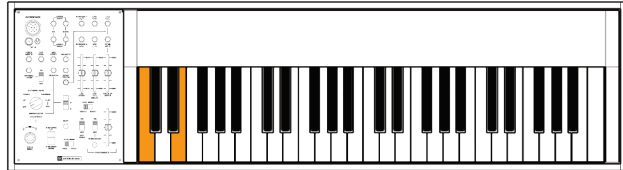
- **Mode 3:** Commonly referred to as **Biphonic Mode**. This mode is inspired by polyphonic synthesizer voice rotation systems, which alternate voices pitch and **gate** signals, according to the

order in which they are played, rather than keyboard position.

7.4. Interval Latch



The Interval Latch was one of the keyboard's most innovative features when it was first released in 1970. Unlike the original model, this version does not require a footswitch for activation, as it includes its own switch on the panel itself. This feature consists of a store memory for a note interval or a chord, according to the keyboard's connection mode. Once the set of notes is stored, you can trigger it by pressing a single key. This provides great versatility and offers additional resources for creative performance.



Interval



Reproduction

- **Lower note:** Relates to the melody you play.
- **Upper note:** Fixed interval.

7.4.1. Operation

To activate the interval latch, follow these steps:

1. **Hold** the notes (interval or chord) you want to store.
2. **Set** the Interval Latch switch to **ON** position while notes are held.
3. **When you play** a single note, you will hear the previously stored set of notes played back.

To deactivate the function, simply set the switch to **OFF**.

If you want to record a new interval, repeat the previous procedure. If you turn on the interval latch function with no notes pressed it will recall the last interval memory stored.

Note: While the switch is in **ON** position, you can play the stored interval by pressing a single key. This function is very useful if you want to maintain orchestral instrumentation with fixed intervals (such as perfect fifths or octaves) during a performance.

7.4.2. Methods of use

Interval latch can be controlled both via **Control Voltage (CV)** or **MIDI**.

- **Via Control Voltage (CV):** In this mode, the system can store up to two notes (an interval), allowing the keyboard to operate in duophonic mode. This is consistent with the analogue nature of the 3620 keyboard, which, as we have seen, can

be duophonic via CV. All functions remain available in this mode. For example, you can activate the **arpeggiator** after storing an interval to generate complex and dynamic harmonic sequences.

- **Via MIDI connection:** When you use MIDI connection, the **Interval Latch** allows you to store chords **polyphonically**. Note limit will depend on the device's or synthesizer's polyphony. This feature is equivalent to the **"Chord Memory"** function found on many modern synthesizers. Its behaviour is identical to CV mode, with the advantage that memory playback allows for larger groups of notes.

7.4.3. Interval Latch Input

On the keyboard's left panel, next to the switch, you will find a patch input. You can use it to connect a **footswitch** to momentarily activate the Interval Latch without using the manual switch, just as the original ARP keyboard design.

The circuit is designed for standard footswitches:

- **Open circuit:** Disabled function.
- **Closed circuit (grounded):** Enabled function.

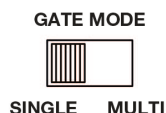
7.4.4. Extra function: Monophonic Mode Latch

In addition to memorizing chords, this function allows you to force the keyboard into **absolute monophonic mode**, both in CV and MIDI.

To do this, **press a single key** when you activate the **Interval Latch (ON)**. From that moment on, the system will play a single note per voice, ignoring the usual duophonic response. This is especially useful if you want to change the touch response and nature of the keyboard to play purely monophonic bass lines or leads.

7.5. Gate Mode

The **Gate Mode** selector determines how trigger signals are generated when more than one key is pressed simultaneously. There are two control modes for the trigger signal: **MULTI** and **SINGLE**.



7.5.1. MULTI MODE (Trigger)

In **MULTI** mode, the trigger gate activates the envelope every time a new key is pressed, no matter how many keys are already held down. In other words, the envelope will reset with each new note.

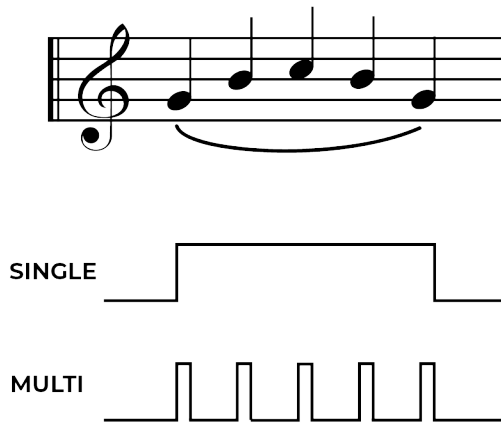
This mode allows very defined phrasing, as each played note has its own distinct attack articulation. It is ideal for playing **trills** or fast passages, simulating a guitar's picking technique or a string plucking, where each new note has a clear and distinct articulation.

7.5.2. SINGLE MODE (Legato)

In **SINGLE** mode, only the first played note generates a gate signal. As long as at least one key remains pressed, subsequent notes will not trigger the envelope again.

The result is a **legato articulation**. This means that the pitch will change when new keys are pressed, but the volume and/or filter (or anything controlled by the envelopes) will not restart their attack cycle. To trigger a new envelope cycle, you must release all keys before pressing the following one.

Note: This mode is exclusive to CV mode; it has no effect in MIDI mode.



Gate and Trigger Signals

The **Gate** is a binary signal used to control the start and duration of an event (such as a key press). It determines exactly when an ADSR envelope starts and ends its cycle, based on how long a key or button is held down. The **Trigger** also serves to activate a signal, but this signal has a predetermined duration of a few milliseconds.

7.5.3. Note Priority: High, Low y Last Note Priority

This concept, which dates from early monophonic synthesizers, defines which note will be preferred when multiple keys are pressed simultaneously. Since a monophonic system can produce only one tone at a time, it must choose one based on a logical criterion. There are three types of priority:

- **Highest Note Priority:** the system prioritizes the highest note among all those being played.
- **Lowest Note Priority:** the system prioritizes the lowest note among all those currently being played.
- **Last Note Priority:** the system prioritizes the most recently played note, ignoring the previous ones.

For the **3620 keyboard**, these priorities are applied exclusively via **control voltage (CV)** connection and vary according to the type of connection:

1. **Lower-note priority:** If only the **Lower Voice** outputs are used (for both CV and Gate), the keyboard will prioritize the lowest note.
2. **Higher-note priority:** If the **Upper Voice** output is used for **CV (pitch)** and the **Lower Voice** output for **Gate**, the keyboard will prioritize the highest note.

- 3. Last-note priority:** To activate this mode, set the **Interval Latch** switch to the **ON** position.

Note: This mode is only effective when the keyboard is used in monophonic mode.

Remember: *In these configurations, the pitch of the note is usually defined by the CV output. For a proper monophonic mode function of the keyboard, the trigger signal must always be taken from the lower voice (**Lower Gate**) regardless of upper or lower CV use. This is because the Lower Gate is always triggered by the first key press, while the Upper Gate is only triggered when a second key is pressed simultaneously. Therefore, for a monophonic CV connection use, you'd better choose the Lower Gate.*



7.6. Low-Frequency Oscillator

The **LFO** is essentially a periodic signal generator **used as a control voltage source**.

It is a type of oscillator designed primarily to produce frequencies below the audible range (below 20 Hz), typically used for **modulation, CV or triggering**. The adjustable parameters of an LFO are usually its frequency or oscillation speed.

In the case of the **Antonius 3620**, the frequency range spans from very slow cycles—30 seconds per cycle—ideal for evolving modulations, to audio frequencies reaching 110 Hz, which allows the generation of frequency modulation (FM) effects.

The available waveforms are: **sine, falling ramp, square, hard random**, and **soft random**.

Although the keyboard's LFO outputs are designed as **control** signals, it is possible to use the additional outputs as audio sources as well, since the **Antonius's LFO frequency** range extends beyond 20 Hz and includes waveforms with steep slopes (such as sawtooth, square, and pulse, which allow the generation of percussive signals audible even at low frequencies).

However, keep in mind that its frequency can be adjusted only manually via the corresponding knob, as there is no input for LFO speed variation via **CV**. Nevertheless, creative use of the sync function can produce interesting sonic experiments.

7.6.1. From Vibrato to Pitch CV

To take full advantage of the keyboard's modulation capabilities, it is essential to understand its nature. When ARP launched the 3620 keyboard, they chose to signal the “vibrato” as a pitch modulation form, a very common musical technique. To achieve this, ARP used the standard sine wave output on the pitch control (originally the vibrato depth control). However, vibrato is just one of the many sound and musical effects that can be achieved thanks to the keyboard's CV capabilities.

When we began to develop the **Antonius 3620**, we noticed the conceptual limitations involved when we define this control as a vibrato. So, we have revised the terminology to make it easier for users to understand. By integrating new connections and ranges, we have truly expanded the possibilities of modulation and made the pitch control a more clear and extensive concept, so that

users can take full advantage of the instrument's great versatility.

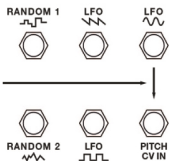
Vibrato is just one sonic result among many; in fact, it is the combination of that sine-wave LFO specific frequency range with a subtle amount of modulation amplitude. The moment the frequency moves outside that range or that modulation amplitude increases, the sensation of vibrato disappears.

You can access a wide range of possibilities by using the external control input, the different LFO waveforms or any type of external signal; it is infinite. Details and examples of how to use this unique control will be shown later.



Vibrato: a gentle modulation of a note's pitch through a cyclic oscillation—between 2 and 7 Hz—typical of expressive techniques on instruments such as cello, violin or the human voice.

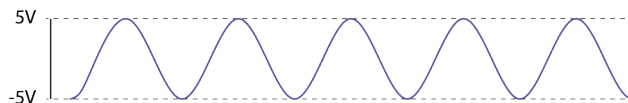
7.6.2. LFO Waveforms



The Antonus 3620's LFO features several outputs with different simultaneous waveforms, including: Delayed Sine, Square, Falling Ramp, Random 1, and Random 2.

LFO
~

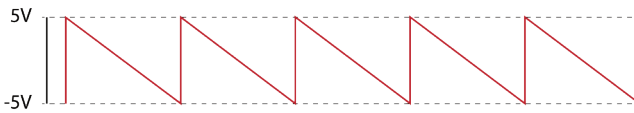
Sine



This is a periodic and symmetrical waveform characterized by the absence of sharp edges. Its

progression throughout its cycle is completely smooth. It is ideal for effects such as vibrato or continuous and smooth modulation cycles without abrupt changes. Its function is bipolar with a range of $\pm 5V$. This signal is amplitude-controlled by the delay factor, which will be described later.

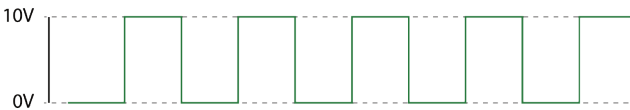
Falling Ramp



LFO


This is a periodic waveform characterized by an immediate rise in voltage to its maximum value, followed by a linear drop to its absolute minimum. It is well suited for creating special tone effects or for simulating decay envelope cycles when used in filters or amplifiers, achieving tremolo or “auto-sequencing” effects. Its function is bipolar with a range of $\pm 5V$.

Square



LFO


This is a periodic waveform that instantly alternates between two extreme values without passing through intermediate values. It is like a switch that cycles on and off. Its function is unipolar with a range of 0 to 10V. This allows a trigger or clock signal use, to trigger or synchronize external devices. When it is applied to the pitch, it is useful for trine effects.

RANDOM 1**Random 1**

This is a waveform whose values change abruptly, immediately, and randomly, following the frequency determined by the LFO. This results in a succession of square waves of varying heights.

Its function is bipolar with amplitude of $\pm 5V$.

RANDOM 2**Random 2**

This is a random signal, but unlike Random 1, it is smoothed through a lag processor, which results in smooth transitions between values.

Here, random voltage changes occur in a linked manner and, mathematically speaking, through an integration process. Smoothing times adapt to the LFO frequency, which result in longer low frequencies linking times and shorter high frequencies ones. Its function is bipolar with a range of $\pm 5V$.

Note: that the values between the two Random outputs are independent.



**PITCH
CV IN**

7.6.3. Pitch CV IN

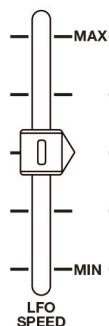
By the use of this external input, you can replace the LFO's sine wave signal—which is connected by default to the keyboard's control voltage—with a different source.

To do this, simply connect a **CV** signal to the **Pitch CV IN** input, either from the keyboard itself—such as the LFO's square wave output—or from an

external device, such as another oscillator, envelopes, offset, etc. Note that this signal's control range is determined by the associated level, the **Pitch CV Depth** slider. At the minimum position, there would not be any pitch control and at the maximum position, the result will be a one-volt per octave range, which is very useful when we use it as a tuned transposer.

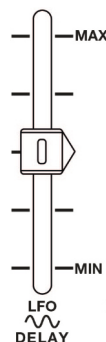
7.6.4. LFO Speed

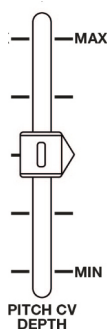
This slider controls the speed (frequency) of the LFO's oscillation. Additionally, this parameter acts by default as the internal clock for the arpeggiator and sequencer, so it also controls the sequences and arpeggios' speed or tempo (see Arpeggiator section, page 70 or Sequencer section, page 74).



7.6.5. LFO Delay

This slider controls the attack time of the LFO sine wave's amplitude until it reaches its maximum value. This effect is commonly referred to in audio as a fade-in. In practical terms, this parameter determines the beginning of the increase in sine wave modulation. If the slider is in its lowest position, there will be no delay and the sine wave will immediately reach its maximum amplitude. Conversely, in the highest position, when a key is pressed, the sine wave's amplitude will start from zero and will grow both, progressively and gradually.





7.6.6. Pitch CV Depth

This slider determines the pitch modulation's depth. When it is set to the lowest position, the control signal has no effect on the pitch; conversely, when it is set to the highest position, control has its maximum effect on the pitch.

When depth control is at maximum, pitch **CV** range is equivalent to **1V/Octave**. Consequently, this input can be used as a pitch transposer, which is very useful, for example, when you work with external **CV** sequencers that also transpose the notes played on the keyboard.

LFO
SYNC



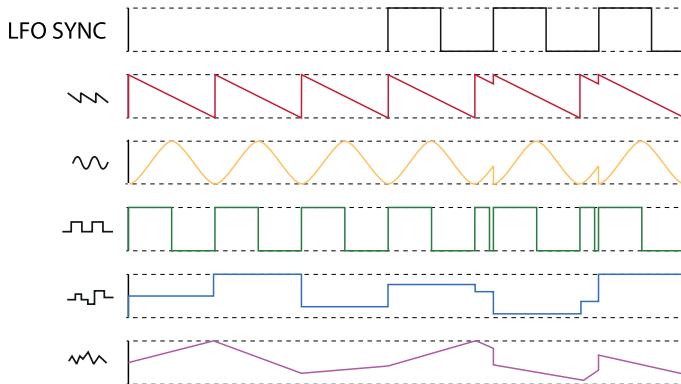
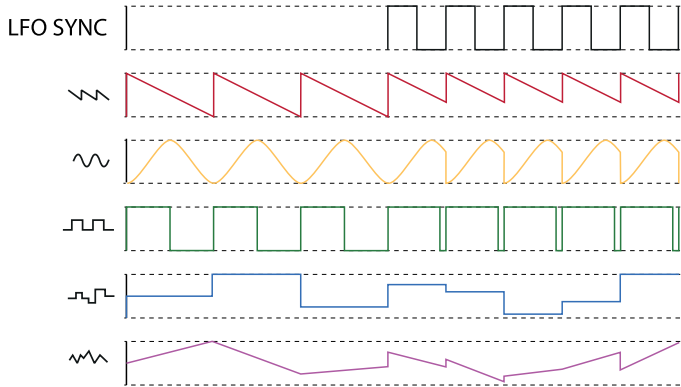
7.6.7. LFO SYNC

Synchronization (or **sync**) is the process of resetting the LFO cycle's phase using an external signal, such as another sequencer's clock, a drum machine, or each time a key is pressed.

This allows the LFO cycle to stay "in time" with a rhythm or musical performance, preventing rhythmic misalignment.

LFO synchronization is based on pulse signals; this function offers better results with a square wave or a trigger pulse. Through this input you can connect, for example, an external signal to synchronize with the LFO's phase. Once synchronized, the LFO's speed adjusts to time subdivisions and it is forced to reset with each trigger or clock pulse. The following graph shows in detail the behaviour of the different waveforms when they receiving a sync signal.

Note: In the Random 1 and 2 waveforms, each synchronization pulse triggers a new random state change.



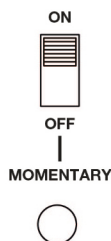
7.7. Portamento

This involves a smooth, continuous pitch glide between two consecutive notes rather than an abrupt jump. This produces a fluid melodic transition, allowing the pitch to evolve from one note to the next in a connected manner. On other synthesizers, this parameter is also referred to as **GLIDE**.

Portamento features the following controls:

- **Portamento ON/OFF Switch:** Enables or disables the effect globally.
- **Momentary Control:** Portamento is active only while the button is held down.
- **Portamento Input:** Located at the left top of the panel, it allows you to connect an external device to control the effect, such as a footswitch.
- **Portamento Slider:** Adjusts the effects' duration or intensity.

7.7.1. Button and Switch



The **fixed switch permanently** enables or disables the portamento. When it is in the OFF position, the duration control slider has no effect on the sound.

The **momentary button** activates the function only temporarily while it is held down; when it is released, the portamento is deactivated. This mode is especially recommended for performances where gliding is a specific expressive element of

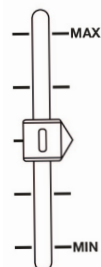
the melody rather than a sound's constant characteristic.

It is important to note that the momentary button acts as an **inverse of the fixed switch**:

1. If the fixed switch is set to **OFF**, the button activates portamento.
2. If the fixed switch is **ON**, the button deactivates portamento while it is held down.

7.7.2. Portamento Slider

This slider adjusts the time it takes for the pitch to move from one note to the following. A high setting will create a slower, longer sound transition, while a low setting will result in a faster, shorter transition between notes.



7.7.3. Portamento Input

The external portamento control input functions identically to the momentary button: a high **voltage** level is equivalent to pressing the button, while a low **voltage** level is equivalent to the release of it.



Note: If the Portamento Time slider is set to minimum, there will be no noticeable difference between activating and deactivating the effect.



7.8. Pitch Bend

The pitch bend control is mainly designed for live performance, though it includes two basic functions: pitch bending and overall tuning.

The chief use allows the musician to “stretch” notes and add expressiveness to the performance, similar to the guitar bending technique.

A secondary use is as tuning corrector. This is particularly useful because it allows you to tune the set of oscillators precisely rather than correct them one by one.

The pitch bend knob rest position is the centre, the so-called “**dead zone.**” At this point, turning the knob slightly in either direction produces no change in pitch (or just a minimal one). This

feature is very useful because it allows you to locate the neutral position while playing just by touch, avoiding the action of looking at the panel.

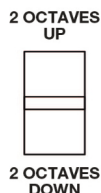
7.8.1. Operation according to connection

- **Via CV:** If the keyboard is used through the **CV** outputs, pitch bend transposes by one octave (up or down) by default. However, it is possible to set the range of action according to the performance’s needs, for more precise inflections. The available ranges are: **Tone, Minor Third, Fifth, Seventh** and **Octave**. These adjustments can be made with the **Shift** functions (see page 82).

- **Via MIDI:** If the keyboard is used via **MIDI** connection, the pitch bend range will depend on the connected external instrument or software's settings. For this reason, we recommend to read the MIDI section of the controlled synthesizer.

7.9. 2 Octaves Up / 2 Octaves Down

This switch allows you to transpose the keyboard by octaves, ranging from two octaves above and two below the centre position. This extends the instrument's tonal range significantly in both directions.



7.9.1. Keyboard Range

According to the model you had purchased, the covered range is as follows:

- **49-key model:** Offers a range from **C0 to C8**. Additionally, depending on pitch bend setting, this frequency range can be extended even further.

- **37-key model:** Provides a wide tonal range going from **C1 to C8**.

7.9.2. Operation

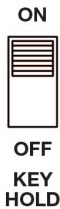
To use the transposition function, simply slide the switch up or down according to how you wish to shift the keyboard range.

It is important to note that this function acts directly on the key logic and not independently on

the **CV**. This implies the following:

- **Held notes:** If a note is pressed and the transposition is changed while it is held down, the pitch will not change in real time.
- **New notes:** The transposition will only affect notes played after the switch has been moved.
- **Arpeggiator and Sequencer:** Similarly, if an arpeggio or a sequence is playing, the transposer will not update the pitch of those notes that are already producing sound; it will only affect notes triggered after the change has been made.

This behaviour also applies to **MIDI** messages transmitted to other devices by the keyboard.



7.10. Key Hold

The Key Hold function on your Antonus 3620 is an essential tool. When the switch is set to ON, pressed notes will continue to sound indefinitely; when you press a new key or keys, they will automatically replace the previous one.

To return to standard playback mode, set the switch to OFF. This function is especially useful for the sustain of background drones or to enhance the use of the arpeggiator and sequencer.

7.11. Full - Split

The keyboard can be split into two independent sections. This allows you to assign particular octave ranges to different instruments or sounds, providing multitimbral performance.

Using the **Keyboard** switch, you can select two modes:

- **Full:** The keyboard functions as a single unit, without any division.
- **Split:** The keyboard is divided into two sections:
 - Lower: Dedicated to low register.
 - Upper: Dedicated to high register.

Note on the Octave Transposer: The availability of these zones depends on the position of the **Transpose switch**:

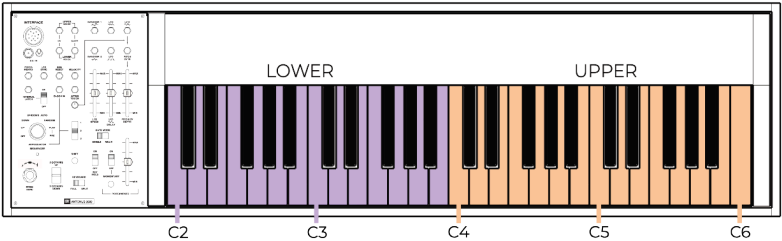
- 2 octaves down (-2): Only the Lower section will be available.
- 2 octaves up (+2): Only the Upper section can be used.
- Centre position (neutral): Both sections are available simultaneously (50% split).

This **Split** function gives the instrument a multitimbral expressiveness that goes a step forward on conventional polyphony.

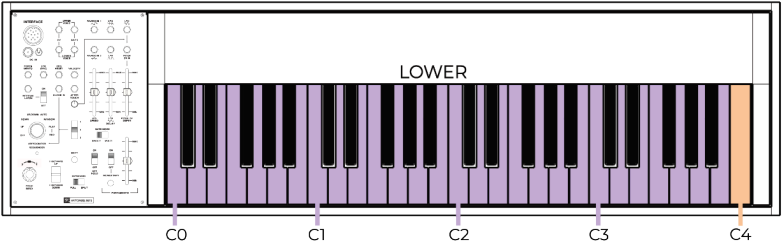
The attached diagram details the zones layout according to the transposer for the 49-key and 37-key models.

Keyboard 49 keys

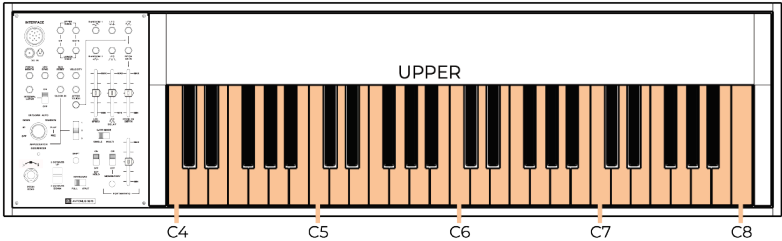
CENTRAL POSITION



2 OCTAVES DOWN

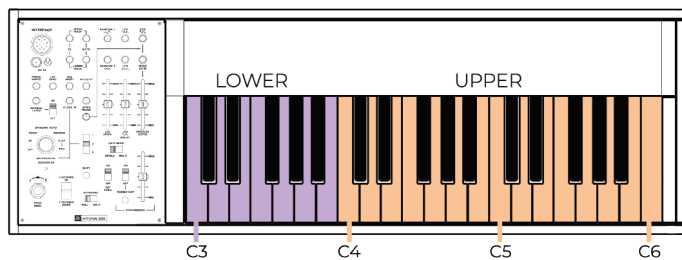


2 OCTAVES UP

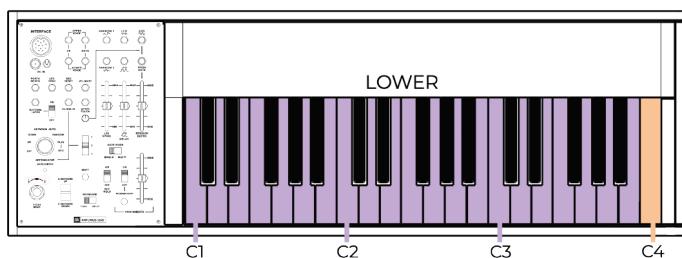


Keyboard 37 keys

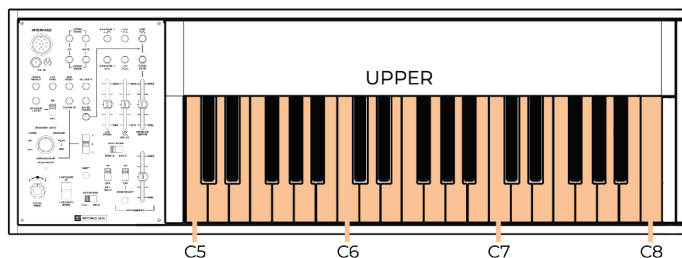
CENTRAL POSITION



2 OCTAVES DOWN



2 OCTAVES UP



7.11.1. Features of Each Section

- **Upper Section:** Designed for melodic and expressive playing. Therefore, in Split mode, control and expression functions are assigned to this zone: pitch bend, portamento, vibrato, aftertouch, and velocity. In other words, all parameters involved in expressive performance.

- **Lower Section:** This section is designed for more structural or rhythmic use, ideal for creating bases, sequences, bass lines or sequencer transpositions.

7.11.2. Methods of Use

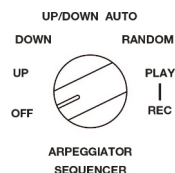
- **Via CV:** When the keyboard is used through its CV outputs, the Lower voice is assigned to the lower section and the Upper voice to the upper section. In this configuration, the system functions as if you are controlling two independent monophonic synthesizers.

- **Via MIDI:** Unlike CV mode, there are no voice restrictions in the MIDI connection, so both sections (Upper and Lower) are polyphonic. However, there are two exceptions:

- Interval Latch: If this function is active in MIDI mode, the Lower section will behave monophonically.
- Arpeggiator: If you activate the arpeggiator you will have monophonic operation in the assigned section.

7.12. Arpeggiator

An **arpeggiator** is a device that breaks a chord into its individual notes and plays them one after another in a sequence. In practical terms: when you play a chord, the arpeggiator will play each of its notes in a **specific order**.



7.12.1. Operation

To start the arpeggiator, use the selector knob located on the right side of the central panel.

1. **Turn** the selector to choose one of the available modes.
2. **Play** a group of notes on the keyboard.
3. **The arpeggiator will start** playing the notes in succession. The playback order will depend on the selected mode.

To disable the function, set the knob to the OFF position. In this state, the keyboard will return to standard manual performance mode. The arpeggiator is limitless in the number of simultaneous notes (beyond total keys on the instrument), so you can use as many notes as you like in both MIDI and CV.

7.12.2. Arpeggio Modes

The selector knob allows you to choose from the following playback patterns:

- **UP (Ascending):** The arpeggiator plays the notes from the lowest to the highest. When it reaches the highest note, the cycle restarts from the bottom.
- **DOWN (Descending):** The notes are played from the highest to the lowest, restarting the cycle from the top when it finishes.
- **UP/DOWN (Pendulum):** The arpeggiator plays the notes from the lowest to the highest, then immediately plays them in reverse order back to the lowest note before restarting.
- **AUTO (Strike Order):** In this mode, the arpeggiator plays the notes in exactly the same order they were played on the keyboard.
- **RANDOM (Random):** The selected notes are played without a predictable pattern. The same note may be repeated more than once before moving on to the next one.

2 OCTAVES
UP



2 OCTAVES
DOWN

7.12.3. Octaves and Transposition

You can vary the arpeggiator's range using the Transpose switch. If you change octaves while holding a chord, the arpeggiator will continue to play the notes in the original range; the change in pitch range will only appear when a new chord or group of notes is played.

ON



OFF
KEY
HOLD

7.12.4. Playback Modes (Key Hold)

The Key Hold switch controls the behaviour of the notes at the moment you release the keys:

- **Key Hold OFF:** By default, when you lift your hands off the keyboard, the arpeggiator stops playing.

- **Key Hold ON:** The arpeggiator will continue to play the sequence even after you release the keys. This allows you to free your hands to adjust other synthesizer parameters while the sequence remains active.

7.12.5. Arpeggio Ranges

By default, the arpeggiator plays notes within the octave in which they are played. However, the switch labelled 1-2-3 allows you to extend this range:



- **Position 1:** The arpeggio remains within a one-octave range (the original notes).

- **Position 2:** The arpeggiator plays notes within a two-octave range.

- **Position 3:** The arpeggiator extends the sequence across three octaves.

7.12.6. Arpeggio Speed

The arpeggiator's default speed is linked to the keyboard's LFO. To adjust it, use the LFO Speed slider: the speed will increase as you move it toward the maximum (MAX) and decrease as you move it toward the minimum (MIN). You can also sync the arpeggiator to an external clock through the Clock IN input (see the Clock In section, page 79).

7.12.7. How to Use

- **Via CV:** Operation relies on the keyboard's voice capabilities, in monophonic or duophonic mode, depending on the route setting.
- **Via MIDI:** The arpeggiator has no voice limitations and will operate in polyphonic mode, according to the receiving device's capabilities.

7.12.8. Interval Latch in the Arpeggiator

The Interval Latch function can be used combined with the arpeggiator to expand its capabilities. This function allows you to store chords or note intervals depending on the type of connection (see Interval Latch section, page 47).

To use both simultaneously, follow these steps:

1. **Store the desired set of notes** or interval using the **Interval Latch** function before you activate the Arpeggiator.
2. **Activate** the arpeggiator.

Once activated, the arpeggiator will play both the note(s) pressed on the keyboard and the interval or chord stored in the latch memory. This combination allows you to generate extremely complex and varied arpeggios with great harmonic richness.

A unique feature of interval latch mode is that you cannot store a new chord while any of the arpeggiator modes are active. Instead, it allows you to enable and disable the previously stored interval, making it possible to commute the interval effect

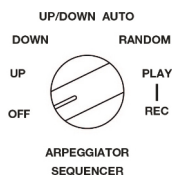
while the arpeggio is playing. The only way you can record new intervals is outside the arpeggiator and sequencer modes.

How to Use

- **Via CV:** Due to the system's monophonic nature, when you use the interval latch together with SPLIT mode, the Lower section will be unable for intervals, as the Upper section remains reserved.
- **Via MIDI:** The interval/chord latch affects the lower section and it is available to the Arpeggiator in SPLIT mode. It has no effect on the upper section in SPLIT mode. In HOLD mode, it is active only in the Lower section.

7.13. Sequencer

A sequencer is a device that allows you to record, program and subsequent playback a sequence of voltages (typically to produce a sequence of notes). The Antonius keyboard's sequencer enables an intuitive management of these patterns, providing three memory banks to store sequences of up to 512 steps each.



7.13.1. Operation

As you may have noticed, our keyboard features a purely analogue interface, with no screens or encoders, highlighting real-time performance. Therefore, to access sequence mode, you must use the step selector knob. When it is in either REC or PLAY positions, sequencer mode is active.

Recording

To record a sequence, follow these steps:

1. **Set the knob to REC position** and select the memory bank where you want to store it (1, 2, 3).
2. **Start playing the notes** for the sequence (each new played note advances the sequence recording by one step). Since the capacity is 512 steps, it is not necessary to fill them all; the sequencer will automatically interpret that the sequence ends with the last played note.
3. **Once the recording is finished**, set the knob to PLAY position and press the note on which you want the sequence to be transposed and played back.
4. **The sequencer** will begin **playback**, following the tempo set by the LFO (internal clock) or by an external clock, as applicable.

Note: It is essential to understand that a step sequencer does not capture a live performance, but rather the manual entry of notes, rests, and ties.

Exit PLAY/REC mode

To deactivate the sequencer and return to normal manual performance, set the control to its neutral position.



For best results, it is essential to understand the device's nature. The sequencer requires a brief time gap between notes; therefore, we recommend leaving space when you record so that note values

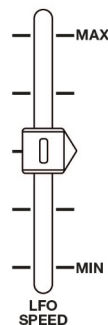
do not overlap and the system can process your performance accurately. Rather than “playing” the sequence expressively, it is better to enter the notes clearly. Taking into account these gap times, especially when you use a MIDI connection, you will ensure accurate chord recording.

7.13.2. LFO Speed

The speed is controlled by the LFO Speed slider, since the sequencer's clock is, by default, the LFO itself. If you change this parameter you will simultaneously modify the speed of both the sequence and the arpeggiator.

- **MIN:** Playback at the minimum speed is 30 seconds per step.
- **MAX:** Playback at the maximum speed allowed is 110 steps per second.

Note: If you wish to use an external sync source, connect the clock signal to the **CLOCK IN input**.



7.13.3. Playback Modes

The sequencer's behaviour depends on the Key Hold switch:

- **ON:** The sequence will continue to play indefinitely even if you release the key. When you press a new key, the sequence will continue without resetting.
- **OFF:** The sequence will stop playing as soon as you release the key. When you press a new key, the sequence starts from the beginning.

This tool gives you more freedom when you play with our keyboard.



7.13.4. Memory Management

It features three independent banks that you can switch between using the 1, 2, 3 switch. If you want to record a new sequence into a memory bank that already contains data, simply start recording and the previous sequence will be automatically overwritten.

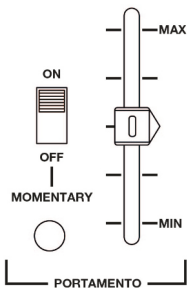
SHIFT



7.13.5. Shift in the Sequencer

In the sequencer mode, the Shift function allows you to insert rests and extend the duration of notes (tie). Each Shift button press corresponds to one step in the sequence, with the following functions:

- **Rests:** If you press the Shift button without playing a note during recording, the sequencer will record a rest in that step.
- **Hold Note (Sustain):** If you hold down a note and press Shift simultaneously, you will extend the duration of the note to as many steps as you keep pressing the button.



7.13.6. Portamento in Sequences

It is possible to record portamento behaviour within the sequence. To do this, hold down the Momentary button while you press the following note in the sequence, in REC mode. The effect will be permanently recorded in the recorded sequence. Note that what would be recorded is the active portamento event, not the portamento time factor. Portamento time will always be determined by the position of the portamento slider.

7.13.7. Methods of Use

- **MIDI:** With this connection, the sequencer operates in polyphonic mode (limited only by the capabilities of the connected external device). This provides incredible versatility for your compositions.

- **CV:** When connected via CV, the sequencer operates in duophonic mode, allowing you to record up to two notes simultaneously. In this mode, it is essential to program intervals or chords precisely step by step, so that the system interprets the set as a block and not as separate notes (see [Duophony section, page 45](#)). If you use SPLIT mode, intervals cannot be played via CV, as the lower CV will be the only actor in the sequence.

7.13.8. Interval Latch in Sequencer

Interval latch will have no effect in the sequencer mode, as the monophonic or polyphonic setting of the recorded sequence will prevail.

7.13.9. Sequence Transpose

When you playback the sequence, it is important to note that the playback mode depends on which note is used to start. If the C3 key (the lowest C without transposition) is used, playback will occur in the original key. However, if any other key is used to start playback, the result will be: the sequence transposed by the number of semitones that differ from C3.

7.13.10. Memory Selector Creative Use

You can switch memory banks during playback; in this case, the newly selected sequence will automatically restart from the beginning.

SEQ
RESET



7.13.11. SEQ Reset

As the LFO Sync, SEQ Reset is a clock or pulse control input. Both are pulse signals that allow you to reset the keyboard's sequence or arpeggiator, synchronizing it with the connected external signal.

7.14. SYNC FUNCTIONS

CLOCK IN



7.14.1. Clock IN

This input allows you to connect an external clock to sync the arpeggiator and sequencer with an incoming signal. If no signal is connected to this input, the internal LFO will act as the clock source to synchronize both the arpeggiator and the sequencer.

Since the clock operates in steps, if a cable is connected to this input without an active pulse signal or with widely spaced pulses, the sequencer will not advance. Playback will only resume when it receives a pulse that triggers the next step.

7.14.2. Clock MIDI

The Antonus 3620 can sync the Arpeggiator and Sequencer via MIDI Clock. To enable this mode,

please refer to the internal setup guide in the MIDI section.

Once MIDI Clock MODE is activated, the device will synchronize with the MIDI signal, avoiding default synchronization of the internal LFO as well as the CLOCK IN input.

7.15. Dynamic and Expressive Features

7.15.1. Aftertouch

Aftertouch is a system that detects pressure on the keyboard, very common in synthesizers and MIDI. The company ARP pioneered the integration of this feature into their synthesizers with the Soloist and Pro Soloist models, in the early 1970s. The inclusion of the aftertouch in the **Antonius 3620** keyboard is related to those early ARP models. Thanks to this expressive resource, the sound of a synthesizer or other MIDI device can be altered while notes are held. A keyboard with aftertouch will generate MIDI data based on the force with which the keys are pressed and that value will be kept for the entire note's duration. If the pressure on the key is varied while the note is held, variable aftertouch control data will be generated. It is possible to vary this value in real time.

The keyboard features aftertouch for both connection types, MIDI and CV.



7.15.2. Aftertouch Control

The Aftertouch rotary control determines the intensity with which aftertouch affects the amplitude of the sine wave LFO that modulates the keyboard pitch. The resulting modulation is added to the control signal that comes from the External Pitch CV input.

In a MIDI environment, this control adjusts the range or sensitivity of the aftertouch data sent via its corresponding CC (Control Change). If you set control to the minimum position, the keyboard will not transmit aftertouch messages.

7.15.3. Aftertouch CV Output

Above the aftertouch knob, you'll find a specific output. This is a CV output with a range from 0 to 5 V. This output allows multiple uses: you can send aftertouch to various CV inputs and, by applying pressure to the keys, vary the parameter in real time.

This output is not affected by the Aftertouch rotary control, as it delivers the signal directly without undergoing any attenuation or prior processing.

For example: you can connect the Aftertouch output to a CV input on your synthesizer's oscillator.

This way, you will perceive a fixed pitch bend. Additionally, you can connect this output to the filter's CV input to open or close it via keyboard pressure, or to control a VCA that is receiving a signal from the LFO and route its output to a VCO.

In this way, the aftertouch controls the LFO's modulation amplitude on the VCO.

7.15.4. Velocity CV Output

VELOCITY

The concept of velocity originates in MIDI terminology and refers to the force/speed with which a key is pressed on a MIDI instrument. The resulting sound is a variation in the instrument's dynamics.

On the keyboard panel, you'll find a velocity output with a range of 0 to 5 V. With this, you can modify various parameters simply by playing the keys with greater or lesser force. Velocity is polyphonic by nature, but in CV it is monophonic, what means that in CV the value corresponds to the last played note.

For example: you can send the velocity output to a CV filter input; thus, depending on how hard you press the key, you will open the filter more or less.

Data generated by this control is also transmitted via MIDI, allowing external devices' automation and control.

7.16. Shift (Global Settings)

SHIFT

This parameter allows you to adapt different keyboard functions to your needs. Important: To use the [SHIFT] key as a configuration modifier, the device must not be in sequence recording mode.

This configuration mode is designed for the pre-set of the instrument, not for real-time manipulation

during a performance. The activation of the [SHIFT] function provides access to global parameters such as MIDI channel assignment, transposition, pitch bend range; duophony modes and MIDI clock synchronization.

Note: As noted in the Sequencer section (see separate section, page 74), this control's behaviour differs in that mode; however, for all other functions, [SHIFT] acts as the primary setting modifier.

7.16.1. Access to Settings

To enter the keyboard settings, press the Shift button + a key.

Depending on the octave and key you press, various keyboard settings will change. The procedure for parameter edition with the [SHIFT] button is detailed below:

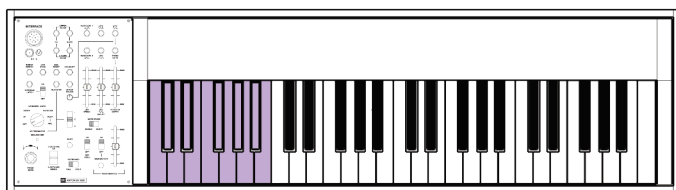
7.16.2. Keyboard Transpose

The keys from C0 to B0 can be used to transpose the keyboard up to a major seventh. The procedure is similar to the previous one: press the Shift key and the desired key to transpose as you like.

The transposition map is as follows:

- **C0:** Does not transpose (returns to the original position).
- **C#0:** One semitone.
- **D0:** Major second.
- **D#0:** Minor third.
- **E0:** Major third.

- **F0:** Perfect fourth.
- **F#0:** Diminished fifth (tritone).
- **G0:** Perfect fifth.
- **G#0:** Minor sixth.
- **A0:** Major sixth.
- **A#0:** Minor seventh.
- **B0:** Major seventh.



Note: Transposition will also be reflected in the MIDI notes that are being sent.

***Important:** Note that on the 37-key keyboard, configuration changes occur one octave higher; if any doubt, check the global configuration table. (page 91).

7.16.3. MIDI Channel

How to access:

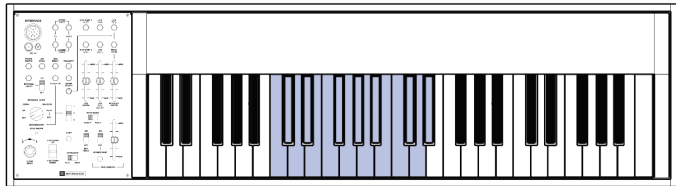
To change the MIDI channel, set the keyboard to its lowest octaves using the Transpose function.

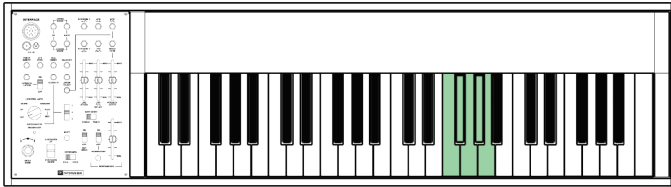
This places us where it would be the default 0 key. Note that transmit and receive channels are assigned simultaneously.

When the keyboard is in Split Mode, the selected

channel (N) will be assigned to Lower, and Upper will be (N+1). If channel 16 is selected, Upper will be 1.

In musical terms, from the keyboard's second octave, C1 up to D#2 on the keyboard, you will find MIDI channels 1 through 16.

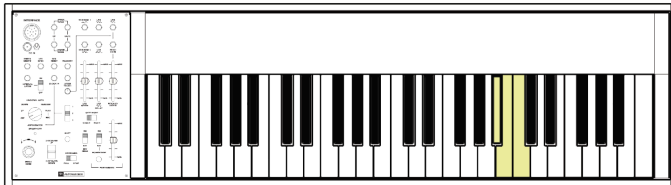




7.16.5. Duophonic Modes

Here you can access the different duophony modes settings. As you may remember there are three, ranging from the notes A#2 to C3.

- **A#2:** Mode 1.
- **B2:** Mode 2.
- **C3:** Mode 3.



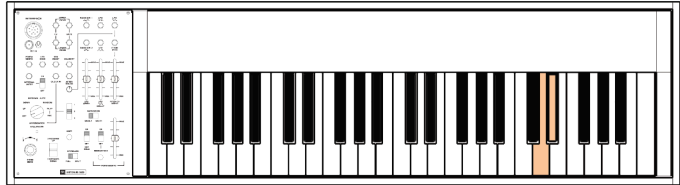
7.16. 6. MIDI CLOCK

With these keys, you can enable or disable MIDI CLOCK MODE. This setting ranges from the notes:

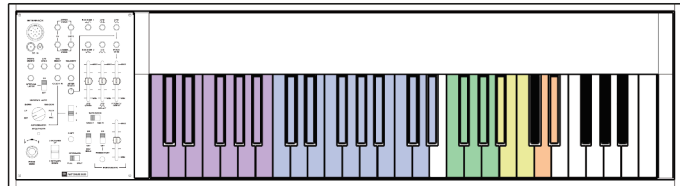
- **D3:** MIDI CLOCK IN ON
- **D#3:** MIDI CLOCK IN OFF

Once MIDI Clock mode is activated, the Arpeggiator and Sequencer will synchronize with the MIDI signal, ignoring default synchronization of

the internal LFO as well as the CLOCK IN input. When MIDI CLOCK IN is deactivated, the device will return to its normal sync operation.



Finally, we have included the **complete chart** as a guide to the keyboard's functions configuration with the Shift key.



7.17. MIDI IN

The 3620 model supports the reception of MIDI messages, allowing it to be played via external devices.

MIDI data received on the 3620's MIDI channel enables interaction with panel controls. In fact, because controls send MIDI messages, it is possible to record control movement for later playback.

It is important to note that incoming data is combined with data generated during

performance, acting as a MIDI *merge*. Note messages received while the arpeggiator or sequencer is active will not be retransmitted as they were originally, but will be interpreted as manual performance.

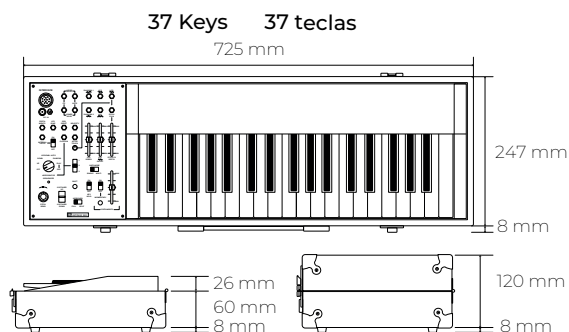
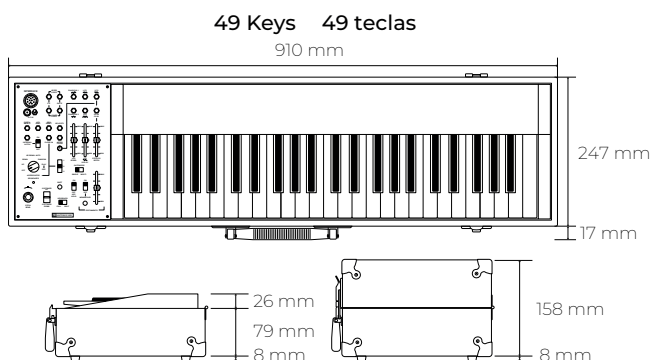
8. Specifications

Connections	Multipin
Source	Input: 100-240 V 50/60 Hz 1.2A Output: DC 12 V 3A
VC Outputs	Upper VC, Lower VC, Random 1, Random 2, LFO square, LFO saw tooth, LFO senoidal delayed, Velocity, Aftertouch
VC Inputs	EXT Vibrato IN, Portamento, Interval Latch, LFO Sync, Seq Reset, Clock IN
Sliders	LFO Speed, Vibrato Delay, Vibrato Depth, Portamento Min-Max.
Switches	Keyboard Full- Split, Portamento Momentary, Key Hold, Trigger Multi, 1-2-3, Interval Latch, Transpose.
Power Consumption	2V
Knobs	Arp/ Seq, Pitch Bend, Aftertouch
Buttons	Portamento Momentary, Shift
Weight	Tolex 37': 7.5 kg Tolex 49': 10 kg
Dimensions 49	910x247x170 mm
Dimensions 37	725x247x128 mm

8.1. Voltage Chart

CV Upper, CV Lower, Random 1,2, LFO Delayed, ramp, PITCH CV IN	+5 V
Gate Lower y Upper, LFO Square, Clock IN, LFO Sync, SEQ Reset	0 a 10 V
Velocity, Aftertouch	0 a 5 V
Interval Latch in, Portamento In	V. Trig

8.2. Dimensions



8.3. GLOBAL SETTINGS CHART

KEY 49	KEY 37	FUNCTION	Specification
C0	C1	Transpose	No transposition, returns to original position
C#0	C#1	Transpose	Semitone
D0	D1	Transpose	Second Major
D#0	D#1	Transpose	Third Minor
E0	E1	Transpose	Third Major
F0	F1	Transpose	Perfect Fourth
F#0	F#1	Transpose	Diminished Fifth
G0	G1	Transpose	Perfect Fifth
G#0	G#1	Transpose	Minor Sixth
A0	A1	Transpose	Major Sixth
A#0	A#1	Transpose	Minor Seventh
B0	B1	Transpose	Major Seventh
C1	C2	MIDI Channel	1
C#1	C#2	MIDI Channel	2
D1	D2	MIDI Channel	3
D#1	D#2	MIDI Channel	4
E1	E2	MIDI Channel	5
F1	F2	MIDI Channel	6
F#1	F#2	MIDI Channel	7
E1	E2	MIDI Channel	8
E#1	E#2	MIDI Channel	9
A1	A2	MIDI Channel	10
A#1	A#2	MIDI Channel	11
B1	B2	MIDI Channel	12
C2	C3	MIDI Channel	13
C#2	C#3	MIDI Channel	14
D2	D3	MIDI Channel	15
D#2	D#3	MIDI Channel	16
E2	E3	Empty	Empty
F2	F3	Pitchbend	Second Major
F#2	F#3	Pitchbend	Minor Third
E2	E3	Pitchbend	Perfect Fifth
E#2	E#3	Pitchbend	Seventh
A2	A3	Pitchbend	Octave
A#2	A#3	Duophony Modes	Mode 1
B2	B3	Duophony Modes	Mode 2
C3	C4	Duophony Modes	Mode 3 (Biphony)
C#3	C#4	Reserved	
D3	D4	MIDI CLOCK	Ext
D#3	D#4	MIDI CLOCK	Int

8.4. MIDI FUNCTION CHART

FUNCTION	TRANSMITED	RECOGNIZED
Midi Channel	1-16	1-16
Note number	0-127	0-127
Velocity note on	O	O
Velocity note off	X	X
Channel Aftertouch	O	O
Pitch Bend	O	O
Control Change	X	X
System Exclusive	O	O
MIDI Clock	X	O
All notes off	O	O

8.5. MIDI CONTROL MAP

FUNCTION	CC NAME	CC NUMBER
Pitch CV Depth	Modwheel	1
LFO Speed	0-127	0-127
LFO Sine Delay	Undefined	28
Aftertouch amount	Undefined	20
Pitch Bend	PB is not CC	-
Portamento ON/OFF	Portamento ON	65
Portamento Time	Portamento time	5
Hold ON/OFF	Hold Pedal	64
Interval Latch ON/OFF	Sostenuto	66

9. Updating the 3620

The Antonus 3620 can be updated via Sysex files using the MIDI port (DIN-5 or USB connector).

You can use for example MIDIOX for Windows or Sysex Librarian for MACOS. Any other program that manages Sysex can work.

For enter in update mode:

1. With 3620 turned off press and hold **Shift** and **Portamento**.
2. Without releasing **Shift** and **Portamento**, turn **on** the device.
3. Keep **Shift** and **Portamento pressed** until the **Clock and LFO LEDs** begin to blink alternately.
4. Once they **begin blinking** alternately, send the **SysEx** command via **MIDI-OX** or any program that sends SysEx.
5. After receiving **the first SysEx message**, the LFO LED will blink every 2 seconds, while the Clock LED will become a MIDI monitor (it will light up when receiving MIDI).
6. Once the **firmware is transferred**, several things can happen:
 - If the firmware transfer was successful, the device will exit update mode and resume normal operation.
 - If there was a problem and the firmware transfer was not completed, it will remain in

bootloader mode indefinitely.

- If the firmware flashing process was successful but a hash error occurred (corrupted firmware), both the clock and LFO LEDs will remain lit, indicating an error.
- If the firmware flashing was not successful (cases b or c), the device must be powered off and the procedure repeated. Check at cables or connector.

The **3620** has a **firmware protection**, so any problem during data transfer will make the update abort, to prevent a corrupt update and brick failure.

Sysex files are available for download at **Antonius web site:** www.antonius-synths.com.

10. Support

At Antonus, we are committed to providing you with excellent support for our products, both during the warranty period and later on.

If you are experiencing any problem with your 3620 keyboard or if you have any question about how it works, please do not hesitate to contact us. Our support team is available to assist you with troubleshooting, repairs or any other inquiries.

For assistance, you can contact us by email at: *info@antonus-synths.com*.

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