AN1x

CONTROL SYNTHESIZER
ANALOG PHYSICAL MODELING

Owner's Manual



- VCO, VCF, and VCA control
- 8 assignable real-time Control knobs
- Assignable X-Z ribbon and other controllers
- 2 sound "Scenes" per voice with Scene morphing
- Split, Dual or Unison play at the touch of a button
- Control Matrix makes any type of control possible
- Free EG provides automatic "hand drawn" parameter changes
- Arpeggiator & Step Sequencer with separate MIDI channel transmit
- 3 programmable multi-effects plus 3-band stereo EQ

YAMAHA

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PRECAUTIONS

PLEASE READ CAREFULLY BEFORE PROCEEDING

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

WARNING

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

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

CAUTION

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

- Do not place the AC adaptor cord near heat sources such as heaters or radiators, and do not excessively bend or otherwise damage the cord, place heavy objects on it, or place it in a position where anyone could walk on, trip over, or roll anything over it.
- When removing the electric plug from an outlet, always hold the plug itself and not the cord.
- Do not connect the instrument to an electrical outlet using a multiple-connector. Doing so can result in lower sound quality, or possibly cause overheating in the outlet.
- Remove the adaptor plug from the outlet when the instrument is not to be used for extended periods of time, or during electrical storms.
- Before connecting the instrument to other electronic components, turn off the power for all components. Before turning the power on or off for all components, set all volume levels to minimum.
- Do not expose the instrument to excessive dust or vibrations, or extreme cold or heat (such as in direct sunlight, near a heater, or in a car during the day) to prevent the possibility of panel disfiguration or damage to the internal components.
- Do not use the instrument near other electrical products such as televisions, radios, or speakers, since this might cause interference which can affect proper operation of the other products.
- Do not place the instrument in an unstable position where it might accidentally fall over.
- Before moving the instrument, remove all connected adaptor and other cables.
- When cleaning the instrument, use a soft, dry cloth. Do not use paint thinners, solvents, cleaning fluids, or chemical-impregnated wiping cloths. Also, do not place vinyl or plastic objects on the instrument, since this might discolor the panel or keyboard.
- Do not rest your weight on, or place heavy objects on the instrument, and do not use excessive force on the buttons, switches or connectors.
- Do not operate the instrument for a long period of time at a high or uncomfortable volume level, since this can cause permanent hearing loss. If you experience any hearing loss or ringing in the ears, consult a physician.

■ REPLACING THE BACKUP BATTERY

- This instrument contains a non rechargeable internal backup battery which permits internal data to remain stored even when the power is off. When the backup battery needs replacing, the message "Battery Low" will display in the LCD. When this happens, immediately back up your data (using an external device such as the floppy disk-based Yamaha MIDI Data Filer MDF2), then have qualified Yamaha service personnel replace the backup battery.
- Do not attempt to replace the backup battery yourself, in order to prevent the possible serious hazards. Always have qualified Yamaha service personnel replace the backup battery.
- Never place the backup battery in a location that a child can reach, since a child might accidentally swallow the battery. If this should happen, consult a physician immediately.

■ SAVING USER DATA

- Save all data to an external device such as the Yamaha MIDI Data Filer MDF2, in order to help prevent the loss of important data due to a malfunction or user operating error.

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

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

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

INTRODUCTION 0 0

Congratulations! And thank you for choosing Yamaha. You are now the proud owner of the AN1x Control Synthesizer, a fully-professional digital keyboard with powerful sound and versatile real-time control features. The AN1x is a modern music dynamo capable of faithfully delivering the warm, fat, punchy sounds of the legendary analog synths—with the same familiar oscillator, filter and other sound creation elements and intuitive, "hands on" style of operation—plus all the sophisticated flexibility you'd expect from a professional digital synthesizer.

How To Use This Manual

This owner's manual provides your basic keys to unlocking the power of the AN1x Control Synthesizer. It is divided into the following sections:

INTRODUCTION Provides a brief rundown of the AN1x's main features and description of all front and rear panel controls along with information about the AN1x's memory structure. We recommend you take a few minutes and read the INTRODUCTION section carefully before you get started in order to familiarize yourself with the basic features and capabilities of the AN1x.

ANALOG PHYSICAL MODELING SYNTHESIS Provides an overview of the basic concept of the tone generation technology, plus descriptions of basic terminology and a signal flow block diagram, in order to give you an understanding of what's going on inside the instrument as you twiddle the knobs and set parameters.

GETTING STARTED Provides a basic overview of how to set up your AN1x and quickly familiarize yourself with all its key features and operations. We recommend you actually be sitting in front of your AN1x as you read through the GETTING STARTED section, so you can try out each feature along the way to get a thorough understanding of how the AN1x works.

FEATURE REFERENCE Provides a comprehensive explanation of all AN1x features. This is in essence a dictionary which you can refer to any time you need to know the details about any given feature.

APPENDIX Provides information related to MIDI, troubleshooting, and more.

A separate Data List book provides voice, Arpeggiator Type, Effect Type and other lists and information.

Main Features

The AN1x Control Synthesizer is a truly innovative professional keyboard with enormously flexible sound and performance capabilities. Following is a brief rundown of the main features:

Analog Physical Modeling synthesis

The AN1x generates amazingly high quality synth sounds in much the same way as traditional legendary analog synthesizers—using voltage controlled oscillators and filters, low frequency oscillators, ring modulator and voltage controlled amplifiers—but with the additional benefits of digital multi-effects, MIDI control and much more.

128 voices and maximum 10 notes polyphony

The AN1x comes with an impressive array of 128 voices preprogrammed and ready to play, each of which can be edited and overwritten to store your own. Ten notes of polyphony provide for versatile SINGLE, DUAL and SPLIT play options.

Intuitive interface with "hands on" voice editing and multiple assignable real-time controllers

The AN1x's eight CONTROL knobs and panel Edit matrix give you direct and instant access to many parameters as you play. All controllers are assignable, including [PITCH] and [MODULATION] wheels and various foot pedals, plus the [RIBBON] controller with horizontal slide (X) and pressure (Z) control of filter, LFO, delay and more. The Control Matrix function permits easy assignment of up to 16 sets of "source" controllers (MW, FC, Key Touch, etc.) to destination parameters (VCA, Filter, LFO, etc.) for each Scene, all of which can be stored as voice data for each voice.

2 Scene memories for each voice, with real-time morphing between Scenes

Each voice has two Scenes, each of which can be selected by pressing a [SCENE] switch. This provides two distinct sounds within each voice available for instant recall as you play. You can press both [SCENE] switches to activate the "Scene Control" function, and roll the [MODULATION] wheel (or press a foot pedal or use any other continuous controller) to morph, or cross-fade between the sounds of Scene 1 and Scene 2 as you play.

Six types of Layers to choose from for each voice

SINGLE, UNISON, DUAL, DUAL UNISON, SPLIT, and SPLIT UNISON Layer modes give you a wide choice for control over how the two Scenes are configured to play in relation to each other for each voice.

Arpeggiator with 30 patterns and various play options, plus MIDI data output

The Arpeggiator lets you play perfect arpeggiated chords at the simple press of a key. You can have the Arpeggiator play only one or both Scenes, or play one Scene to the left of the Split Point while you play the other Scene normally to the right. You can choose from various types of arpeggio patterns, including Up, Down, and Up&Down across one or more octaves, plus various special patterns including Techno, House, Random, and more. The arpeggio pattern data can be output via MIDI on its own MIDI channel.

Easy-play / edit "Step Sequencer" with 128 Voice Patterns and 128 User Patterns

The Step Sequencer permits quick, easy creation of highly sophisticated looped patterns which can be triggered from the keyboard in a variety of ways. Each individual step event (Note, Velocity, Gate Time, and Control Change) can be accessed and edited by a specific CONTROL knob, over a maximum of 16 steps. There are a variety of handy Step Sequencer edit and play options, including "Play Effects" which give you detailed control over the "feel" of your sequence. Pattern event data can be output via MIDI on its own MIDI channel.

4-track "Free EG" records and plays real-time changes of knob positions for up to four different parameters

The 4-track Free EG lets you record real-time CONTROL knob movements, in order to "hand draw" filter, resonance, LFO and many other available parameters over time—and have them play back automatically by simply playing a voice. You can control up to four different parameters independently, each recorded into its own Free EG track. Ideal for those times when you wish you had an extra couple of pairs of hands, the Free EG lets you build up an incredibly complex, completely unique voice.

Programmable multi-effects and 3-band EQ for each voice

The AN1x has three types of programmable multi-effects plus EQ built into the voice architecture, which lets you customize the effects configuration for each voice. There are 8 Reverb effects, 5 Delay effects, 14 Variation effects (which includes Chorus, Auto Pan, Pitch Change, Compressor, Distortion effects and more), and a stereo 3-band Equalizer. An Effect Bypass function lets you bypass all effects or specific ones at the press of a switch.

The AN1x A

Front Panel

[SCENE] switches

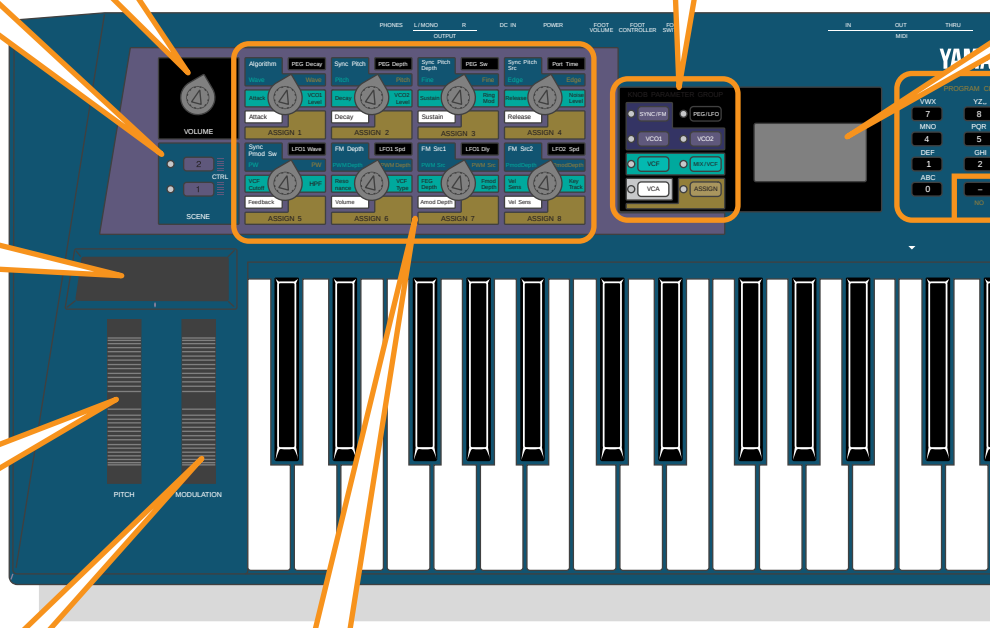
Each of the AN1x's 128 voices has two Scene memories, each of which are instantly accessible by pressing the [SCENE 1] or [SCENE 2] switch. Each Scene can have its own distinct sound. Pressing both [SCENE] switches simultaneously activates the Scene Control function, which lets you "morph", or cross-fade between Scenes in real-time using the assignable [MODULATION] wheel, an assignable Foot Controller, or any other continuous controller.

[VOLUME] knob

This knob controls the AN1x's overall volume level output from the PHONES and OUTPUT jacks. Turn the [VOLUME] between left-most (minimum) and right-most (maximum) positions to set the proper listening level whether using headphones or amplified speakers.

KNOB PARAMETER GROUP switches

These switches determine which set of parameters are controlled by the CONTROL knobs. The switches are color coded in cross-reference to the parameter names as printed in the same color on the panel beside each knob. Whenever you select a voice, the [ASSIGN] switch is automatically selected, to give you instant access to your assigned CONTROL knob parameters.



[RIBBON] controller

The assignable [RIBBON] controller gives you horizontal slide (X) and pressure (Z) control of designated controllable parameters as you play, including filter cutoff, resonance, LFO, panpot, reverb, and more.

[PITCH] wheel

The [PITCH] wheel lets you bend the pitch up or down as you play. It is spring-loaded to automatically return to center position when you let go of it. You can use the Control Matrix to designate specific Pitch Bend parameters for the upper and lower bend ranges for each Scene.

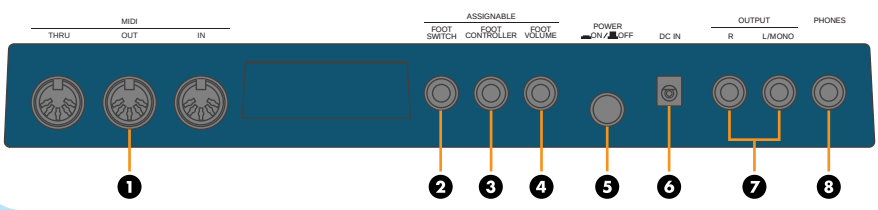
[MODULATION] wheel

The assignable [MODULATION] wheel lets you apply modulation or another designated controllable parameter as you play, or morph between Scenes when the Scene Control function is active (and the [MODULATION] wheel is designated as the source controller).

CONTROL knobs with push-switch (knob parameters)

The eight assignable CONTROL knobs are used for real-time control and edit of the various tone generator parameters, depending on which KNOB PARAMETER GROUP select switch is currently selected, plus instant access to each step event when the [EDIT ROTARY] switch is set to the SEQ EDIT/SETUP menu. Press a CONTROL knob (push-switch) to confirm the current parameter in the LCD. Turn a CONTROL knob left to decrease values or right to increase them. Make fine edit adjustments by turning a knob while pressing it. Since all CONTROL knobs are assignable, you can have each one access one of many different available parameters to give you maximum real-time control over specific aspects of your sound, including versatile control of external instruments via MIDI output.

Rear Panel



❶ MIDI terminals

MIDI [IN], [OUT] and [THRU] terminals let you connect external MIDI devices such as a MIDI keyboard, tone generator, sequencer or computer or others, using a MIDI cable. [IN] is for input of MIDI data, including data dumps from another AN1x or MIDI data storage device. [OUT] is for output of MIDI data, including data dumps to another AN1x or MIDI data storage device. [THRU] is for "daisy-chain" connection of additional MIDI instruments, as the MIDI data received at the AN1x's [IN] terminal is passed along unchanged to the [THRU] terminal.

At A Glance

LCD

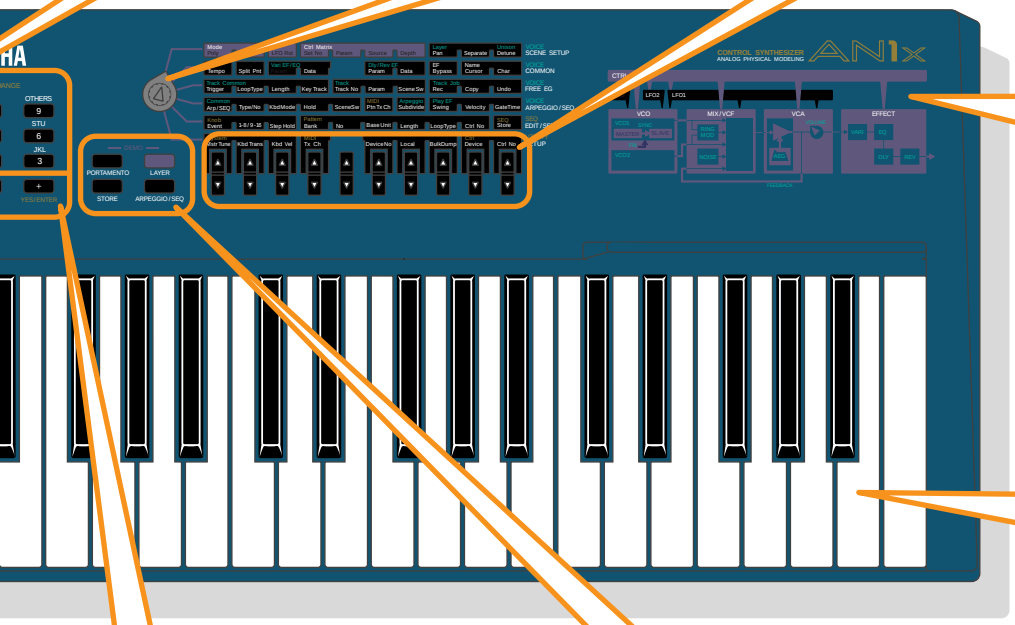
The back-lit LCD (Liquid Crystal Display) provides various types of information which clearly indicates the current operating status of the AN1x as you select voices, turn knobs and press switches.

[EDIT ROTARY] switch

The 6-position [EDIT ROTARY] switch lets you designate one of the six Edit menus, as printed on the panel to the right of each menu.

Parameter value [UP/DOWN] switches

These ten switches are used to access and edit specific parameters (as printed on the panel), depending on which Edit menu is currently selected with the [EDIT ROTARY] switch. Pressing the upper area of a parameter value [UP/DOWN] switch increments the parameter value or setting, and pressing the lower area decrements it. Simply pressing a switch once will display the parameter name and current value or setting in the LCD. Thereafter, pressing or holding the upper or lower area of the switch will change the value or setting accordingly.



Synthesis Block Diagram

The Analog Physical Modeling synthesis block diagram provides a handy visual reference or reminder of how the signal flows through the key blocks, or components of the AN1x's tone generation architecture, which is helpful when manipulating the various parameters during voice editing or real-time sound control.

Keyboard

The 61-key touch-sensitive keyboard features Initial (velocity) and After Touch (pressure) control.

PROGRAM CHANGE keypad

The PROGRAM CHANGE keypad is primarily used for selecting a voice or confirming the currently selected voice name and number. Other functions include selecting letters when naming a User voice, and confirming ([YES]) or canceling ([NO]) specific store and other operations.

[PORTAMENTO] switch

For turning the portamento function on and off.

[LAYER] switch

For selecting one of the six Layer modes.

[STORE] switch

For initiating Store operations.

[ARPEGGIO/SEQ] switch

For turning the Arpeggiator or Step Sequencer on and off.

DEMO

Pressing [PORTAMENTO] and [LAYER] simultaneously lets you access the Demonstration songs.

❷ [FOOTSWITCH] jack

An optional Yamaha FC4 or FC5 Footswitch connected to the [FOOTSWITCH] jack can be used to control hold on/off, Portamento on/off and other discrete controllers.

❸ [FOOT CONTROLLER] jack

An optional Yamaha FC7 foot controller connected to the [FOOT CONTROLLER] jack can be used for control of various continuous or discrete controllers, depending on controller assignment.

❹ [FOOT VOLUME] jack

An optional Yamaha FC7 foot controller connected to the [FOOT VOLUME] jack can be used to regulate overall volume (or any other assigned continuous controller function.).

❺ [POWER] switch

Press the [POWER] switch to turn the AN1x on and off.

❻ [DC IN] terminal

Connect the supplied Yamaha PA-3B Power Adaptor to the [DC IN] terminal. (CAUTION: Do not attempt to use an AC adaptor other than the Yamaha PA-3B or equivalent, since the use of an incompatible adaptor may cause irreparable damage to the AN1x, and may even pose a serious shock hazard.)

❼ OUTPUT jacks

The stereo OUTPUT jacks let you connect the AN1x to an external stereo amplifier/speaker system. When using a mono system, connect it to the [L/MONO] jack.

❽ [PHONES] jack

The [PHONES] jack lets you connect a set of stereo headphones to the AN1x for private listening.

The Making Of A Modern Classic

The classic analog synth sound is back with a vengeance and more popular than ever. Vintage analog synthesizers are hot items, recirculating and finding their way into the arsenals of the world's most innovative music makers, many of whom weren't even born when the voltage controlled synthesizer was coming of age more than a quarter of a century ago.

Enter the Yamaha AN1x Control Synthesizer—a modern classic in its own right—complete with the VCO, VCF, and VCA blocks, or "modules" that give retro synths that famously fat, rich, warm sound, plus multiple knobs for controlling every nuance of the sound, and even an on-board Arpeggiator and Step Sequencer for generating pattern loops at the press of a key.

What's much more, however, is that the AN1x incorporates features that vintage synths could only dream about—like three on-board programmable digital multi-effects units and a 3-band stereo EQ, a multiple controller-to-parameter assignment architecture, a 4-track Free EG for "hand drawing" real-time knob position movements of up to four different tone generator parameters, plus real-time morphing between two different sounds, and more—all of which can be customized for each of the 128 voices and stored as individual voice data.

The History...

Why is the "analog sound" so popular in a digital age? What long and winding road had to be traveled—just to end up right back where we started from? Let's take a quick look at how we got from there to here, and where here really is, anyway.

Electronic music synthesis has been around in one form or another since the beginning of the 20th Century. But it wasn't until the early 1970s that developments in voltage controlled synthesis technology made the concept practical—and affordable.

As such, the voltage controlled synthesizer became less and less an experimental curiosity in the world's great universities and sound labs and more and more a valid—and revolutionary—musical instrument in its own right. It quickly became a staple in professional recording studios, and its myriad sounds started gracing the ears of millions through popular recordings in literally all genres of music.

Then came the 1980s, and the introduction of wildly popular, affordable-for-the-masses, great-sounding and easy-to-use digital synths like the famous Yamaha DX7. What followed was the MIDI revolution, which drove the rapid development of ever-more-sophisticated multi-timbral digital synthesizers and tone generators, along with the overwhelming acceptance of digital sampling which has literally changed the way we create and listen to music. And all of which have gone hand-in-hand with the desktop music revolution.

Most recently there has been the introduction of breakthrough physical modeling synthesis technology, which has been successfully applied to the accurate reproduction of acoustic instrument sounds through purely electronic means, as well as the creation of new "hybrid-type" acoustic-oriented sounds.

Enter Analog Physical Modeling...

The classic analog synth never fell out of favor with the world's most innovative musicians. That's because it has a special punch, power, plus important elements of interactivity that digital synths and samplers have tended to lack by comparison.

And now, with the demand for that "classic analog sound" due to the global popularity of techno, trance, and other modern forms of dance music, it's hardly surprising that Yamaha—a company consistently at the very pinnacle of electronic musical instrument technology—would react to that demand and create a completely new performance-oriented "control synthesizer" that takes the company's original breakthroughs in physical modeling synthesis and uses it to digitally "model" the analog sound-generating components which gives voltage controlled synthesis its unique character and virtually unlimited range of sound.

And package it with a host of digital extras to bring the technology full circle with a completeness and utility never before possible.

In short, the AN1x is a logical—and timely—development in the evolution of electronic musical instrument history, based on the modern needs and demands of the world's cutting-edge musicians. And once again, as is often the case with creations from Yamaha, music history will never be the same.

All the tools are in the box. The rest is up to you....

What Is A Voice?

Over the years, the meaning of the term “voice”, when applied to synthesizers, has varied depending on manufacturers and models. In general, it means a sound, which in some synths is called a “patch”, and in others a “program”.

With the AN1x, a voice is a configuration of all tone generator and other parameter settings, including effects setups and data for a single Voice Pattern, but excluding system settings or the bank of Step Sequencer User Patterns. Therefore, each of the 128 voices in memory can have its own unique configuration of all main parameters.

AN1x Memory Structure

The AN1x has a simple and straightforward memory structure. There are only two main types of data: voice data and system data. There is also a separate memory for the Step Sequencer User Pattern bank.

Voice Data

Voice data is comprised of the various parameter settings which make up each of the 128 User voices, as follows:

- Tone generator settings based on CONTROL knob positions for each KNOB PARAMETER GROUP parameter, PORTAMENTO switch status, Scene status and Scene-related parameters, including Control Matrix assignments, Mode settings and Variation Effect Dry:Wet setting.
- LAYER mode setting and Layer parameters including Pan, Separation and Detune settings.
- VOICE COMMON (i.e., parameters which affect both Scenes) settings including Tempo, Split Point, Effect configurations and voice Name.
- Free EG parameter settings and track data and other settings.
- ARPEGGIO/SEQ switch status and the various Arpeggiator and Step Sequencer parameter settings, including Play Effect settings, plus Step Sequencer Voice Pattern data.

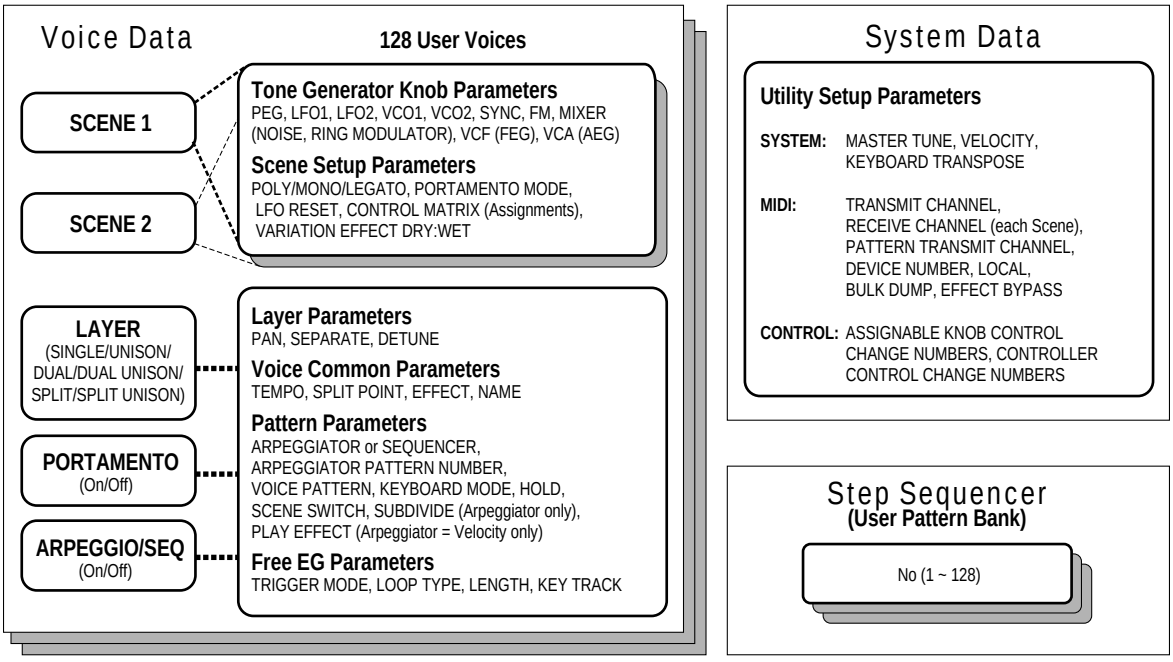
System Data

System data is made up of the various “global” parameter settings which remain in effect regardless of which voice is selected, as follows:

- UTILITY SETUP parameters, including the settings for System tuning and keyboard transposition and velocity, MIDI-related parameters, and Control device and number assignments.

User Pattern Data

User Pattern data is made up of the Step Sequencer User Pattern bank which holds 128 User Patterns.



ANALOG PHYSICAL MODELING SYNTHESIS

AN1x Tone Generator

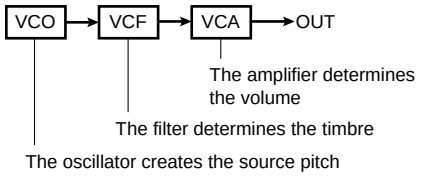
As the AN1x Tone Generator Block Diagram illustrates, the VCO module generates the basic signal, then passes it along the signal path to the MIX/VCF module, which processes the signal in a variety of ways before passing it on to the VCA module, which amplifies the signal before passing it along the signal path to the EFFECT module comprised of three multi-effects units and a stereo equalizer, after which the signal is output from the AN1x's stereo outputs. Along the way, various real-time and other controllers can be applied to each module in a variety of ways.

Oscillators, Filters And Amplifiers

What does it take to make a sound? And how does the AN1x generate sounds?

In the simplest of terms, there are three basic elements which make up a sound: pitch, or how low or high it is; tone, or what its overall quality, or timbre is like; and amplitude, or how loud the volume level is.

Synthesizers rely on three key electronic components to generate sounds and electronically imitate the soundwaves of familiar musical instruments, as well as create entirely unique sounds. In traditional analog synthesis, the source sound pitch is generated by an oscillator; its tone is created by a filter; and its volume is determined by an amplifier. With the AN1x, these three elements are termed the VCO (voltage controlled oscillator), the VCF (voltage controlled filter), and the VCA (voltage controlled amplifier).



The “signal path” starts at the VCO, flows to the VCF, then flows to the VCA. The signal is “processed” at each block, or “module” along the way to the final output.

1 VCO

The VCO module is where the original sound waveform gets generated. Although a single oscillator is enough to generate the basic sawtooth, pulse (square) or other waves required for different types of musical instrument sounds, the AN1x’s VCO module is much more complex.

First, there’s a VCO1 which includes an additional saw2 and mix wave, and which can be configured with one of three “sync algorithms” that syncs “master” and “slave” oscillators within the VCO1, and can be modulated by FM according to the algorithm. Thus, when the sync is on, the VCO1 is actually two oscillators in one, and three additional “inner” waves are available.

The VCO1 is always fixed as the FM carrier, but the carrier can either be the master or slave oscillator depending on the selected algorithm. The FM modulator can be selected from a second VCO (VCO2), the PEG, FEG, LFO1, LFO2 or others. The Pitch Envelope Generator (PEG) lets you determine how the pitch of the VCO changes over time, and the LFO can be used to modulate the VCO to create vibrato.

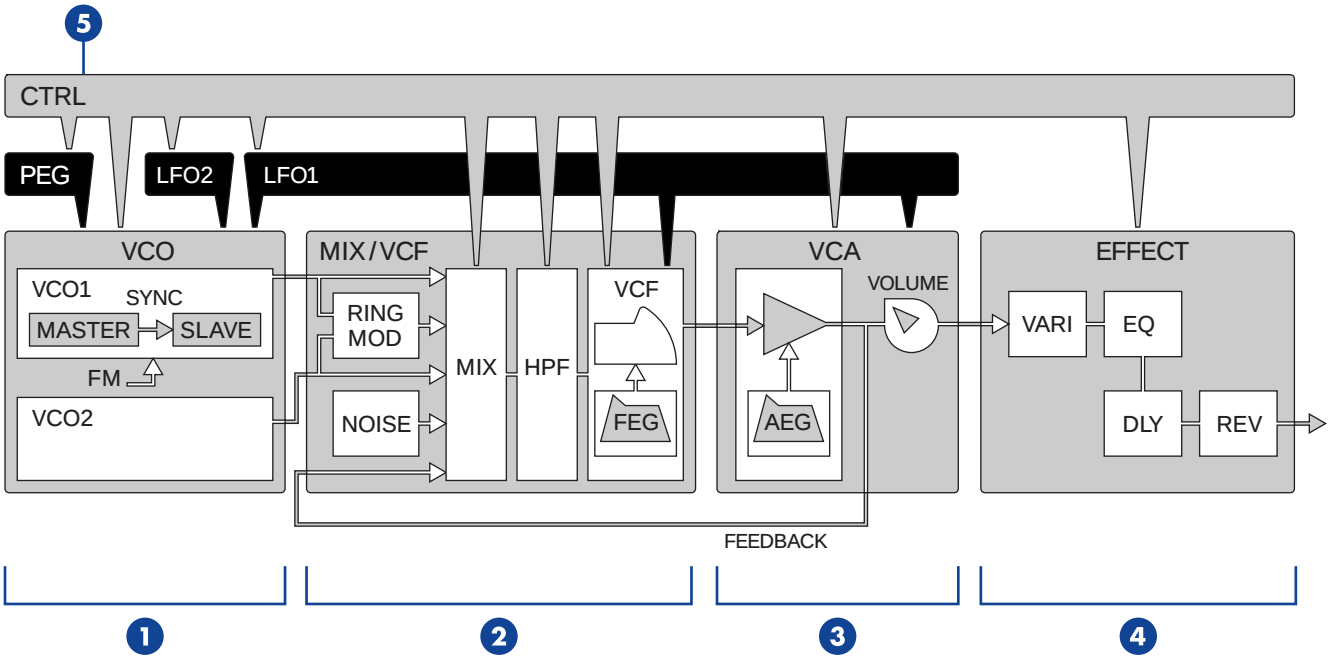
For more information, see as follows:
VCO1 — page 61
VCO2 — page 63
SYNC/FM — page 58
PEG/LFO — page 54

2 MIX / VCF

The MIX/VCF module is where the mixing of VCO1, VCO2, Ring Modulator, Noise and Feedback signals take place, which can then be filtered by the VCF High Pass Filter (HPF), Low Pass Filter (LPF), Band Pass Filter (BPF) and Band Eliminate Filter (BEF). You can determine the cutoff frequency of the VCF, as well as amount of Resonance, or emphasis around the frequency cutoff point. The Filter Envelope Generator (FEG) lets you determine how the timbre of the signal changes over time, and the LFO1 can be used to modulate the VCF to create wah.

For more information, see as follows:
MIX/VCF — page 66
VCF — page 64
HPF — page 67

AN1x Tone Generator Block Diagram



LPF, HPF, BPF, BEF — page 67
FEG — page 31
PEG/LFO — page 54
RING MODULATOR — page 66
NOISE — page 66

3 VCA

The VCA module is where the overall output level of the signal gets determined, as well as the Feedback level which gets "fed back" to the mixer in the MIX/VCF module. The Amplitude Envelope Generator (AEG) lets you determine how the volume of the signal changes over time, and the LFO1 can be used to modulate the VCA to create tremolo.

For more information, see as follows:
VCA — page 68
VOLUME — page 69
FEEDBACK — page 69
AEG — page 32
PEG/LFO — page 54

4 EFFECT

The EFFECT module is where three different types of programmable effects, as well as programmable 3-band EQ, can be applied. The 14 Variation Effects include Chorus, Flanger, Phaser, Auto Pan, Rotary Speaker, Pitch Change, Aural Exciter, Compressor, Distortion, Overdrive, Amp Simulator and more. The 5 Delay effects include Delay LCR, Delay LR, Echo, and Tempo Delay, which automatically matches the delay time to the current tempo setting. The 8 Reverb effects include various Hall, Room and Stage types and more. Delay and Reverb effects can be configured in a serial or parallel connection, and specified effects or all effects (excluding the EQ) can be bypassed at will. Controllers can be designated to control specific effect parameters.

For more information, see as follows:
Vari EF/EQ — page 77
Dly/Rev EF — page 79
EF Bypass — page 80

5 CONTROL

Specific parameters of the VCO, MIX/VCF, VCF, VCA and EFFECT modules, as well as the PEG, LFO1 and LFO2 can be controlled by many different types of real-time controllers, including [MODULATION] wheel, [RIBBON] controller X- or Z-axis, the eight assignable CONTROL knobs, a connected [FOOT CONTROLLER], keyboard After Touch, and more, including MIDI Control Change messages received at the MIDI [IN] terminal.

The AN1x's Control Matrix and UTILITY SETUP Control Assign function work together flexibly to give you complete authority over which on-board or external controller controls which individual internal or external parameter.

For more information, see as follows:
Control Features — page 49
Control Matrix — pages 51, 73
Utility Control Assign — pages 50, 95

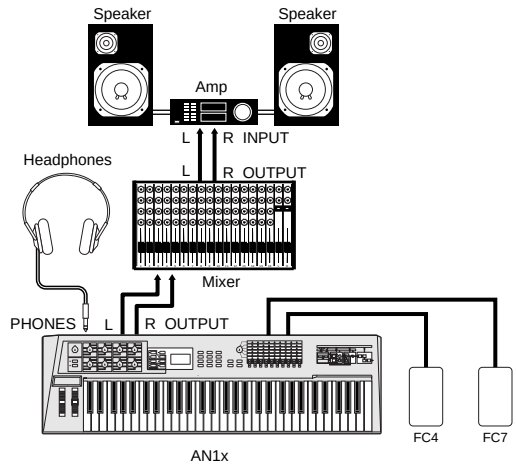
GETTING STARTED

System Examples

There are many ways to incorporate the AN1x into a simple or expanded music system. Following are a few of the most common examples.

The AN1x By Itself

At the simplest level, all you need to do is connect stereo headphones to the [PHONES] jack located on the rear panel, and you're ready to go. To use the AN1x as a stand-alone performance instrument, simply connect it to amplified speakers and optional FC Foot Controller and Footswitch pedals as shown in the diagram at right.



CAUTION

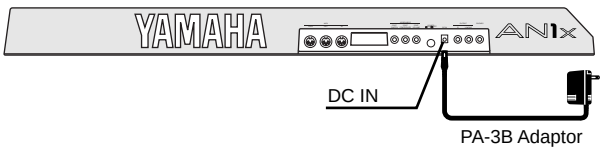
To avoid possible damage to the speakers or other connected electronic devices, before switching on the power of any device, make sure the AN1x's [VOLUME] level and the volume levels of the connected equipment are set to minimum positions.

Setting Up Your AN1x

The AN1x Control Synthesizer is an ideal stand-alone performance-based electronic musical instrument as well as a powerful component in an expanded MIDI music system. Following are instructions for proper setup of the AN1x and connection to external devices.

1. **After carefully taking your new AN1x out of the box, place it on a keyboard stand or on top of a sturdy table or desk.**

2. **Next, connect the supplied Yamaha PA-3B (or equivalent) Adaptor to the AN1x's [DC IN] connector located on the rear panel. Then connect the adaptor to the nearest electrical outlet.**



3. **Before switching on the power, connect any peripheral devices such as amplified speakers, FC Foot Controller or Footswitch pedals, or external MIDI instruments.**

CAUTION

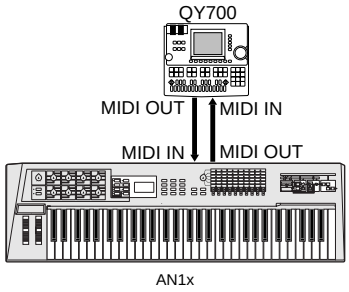
Do not attempt to use an AC adaptor other than the PA-3B (or equivalent). Use of an incompatible adaptor may result in irreparable damage to the AN1x, and could even pose a serious shock hazard.

CAUTION

Always be sure to disconnect the power adaptor from the electrical outlet when the AN1x is not in use.

The AN1x In A MIDI System

It's easy to create a simple but powerful MIDI music system with only a few basic components. The illustration below shows how to connect the AN1x to a Yamaha QY700 Music Sequencer.

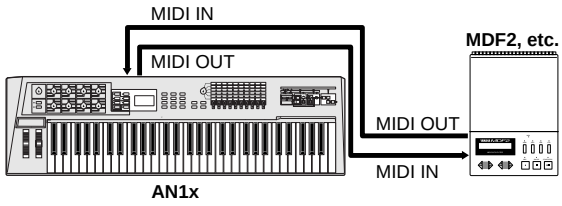


You can have the AN1x's Tempo setting control the external sequencer's clock, or the sequencer's clock control the speed of the AN1x's Arpeggiator or Step Sequencer.

NOTE For details about assigning AN1x MIDI transmit and receive channels, see page 93. For details about assigning MIDI channels and other settings for the external sequencer or other devices which may be connected, consult the owner's manual for each. For more information about MIDI, see the APPENDIX, page 109.

Connecting The AN1x To A MIDI Data Storage Device

You can connect the AN1x to a MIDI data storage device, such as the Yamaha MDF2 MIDI Data Filer, in order to "bulk dump", or save AN1x voice, Step Sequencer and other data to floppy disks. This lets you build up complete libraries of your favorite sounds, sequences and settings, which you can easily load back into the AN1x whenever you wish.



NOTE For information about how to perform Bulk Dump operations, see page 94.

Switching On The Power

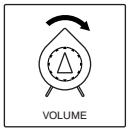
Once all connections have been properly made, you're ready to switch on the power and start making music with your AN1x.

1. **Set the AN1x's [VOLUME] knob to minimum position.**

2. **Press the [POWER] switch, located on the rear panel.**

After a brief greeting message which appears in the LCD, the AN1x will power up and be ready to go.

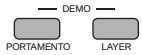
3. **Gradually turn the [VOLUME] knob to the right while playing the keyboard until you achieve a comfortable listening level.**



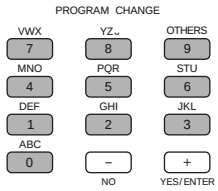
Playing The Demo Songs

The AN1x comes preprogrammed with demonstration songs which provide dynamic examples of just how powerful the AN1x really is. To select and play a Demo, perform the following operation:

1. **Press the [PORTAMENTO] and [LAYER] switches simultaneously. The word "DEMO" will appear in the LCD.**



2. **Press a PROGRAM CHANGE switch (0 - 9) to select one of the 10 Demo songs. After a brief moment the Demo song will begin, and continue playing until the end.**



3. **When the Demo is finished, simply press [-/NO] to return to normal operating status.**

NOTE The Demo song will continue playing repeatedly until you stop it. You can stop the Demo song in the middle of play by pressing [-/NO].

Basic Operation

You'll find the process of getting to know the AN1x to be fun and inspiring—especially if you keep a few fundamental things in mind as you select and play the voices, try out the various controls and experiment with the panel features for the first time. Following are some important aspects about basic operation of the AN1x which will help you keep things in their proper context from the very start.

AN1x Operating Modes

For the most part, except when performing a specific Store or MIDI bulk dump operation, the AN1x is basically always in Voice Play/Edit mode. This means that during play, as you turn the various CONTROL knobs, change the parameter values or settings using the Edit matrix [UP/DOWN] switches, select a Layer mode, etc., you are actually editing the voice. (The "EDIT" mark will appear in reverse type in the lower left area of the LCD the first time any voice data is changed.)

However, these changes only remain in effect as long as the voice is selected, unless you store the newly edited voice using a Voice Store operation before selecting another voice. If you don't store the changes, they will be lost when you select a different voice.

The AN1x is a very forgiving instrument, however. A Voice Recall function (see page 96) lets you retrieve the edited data. Plus, if you turn the power off before storing an edited voice, when you turn the power back on the edited parameter settings will still be retained in the voice edit buffer.

There are various other modes, but these are simply sub-modes of Voice Play/Edit mode (such as Step Sequencer mode for creating and editing Voice and User Patterns; see page 37), since virtually all panel settings—including Scene, Layer, Effects, Arpeggiator, Step Sequencer settings, and more—are stored as voice data for each voice (excluding system-related settings).

Selecting Voices

The AN1x comes with 128 voices already preprogrammed and ready to play. Not only are these voices first-rate and highly useful in their own right, they form a dynamic living example of the AN1x's vast sonic range and power, as well as provide an excellent basis for study of how voices are constructed.

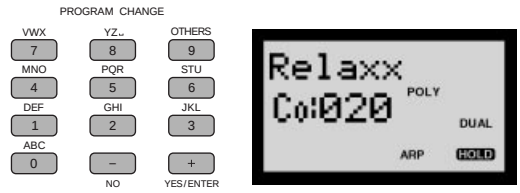
They are also great for use as a starting point for creating your own voices—by making slight or significant modifications to suit your needs or taste—which you can then store in the AN1x's memory for instant recall at any time.

Of course, if you want to roll up your sleeves and get your hands on the VCO, VCF and VCA to build up an original voice from scratch, you can easily initialize a voice (i.e., reset each parameter value to its initial setting) and start from there. The AN1x even provides a few handy templates which save you time and all the tedious effort by making all the basic settings for certain types of sounds for you, so you can pick up from there and concentrate on just the fun and creative stuff. (See page 30).

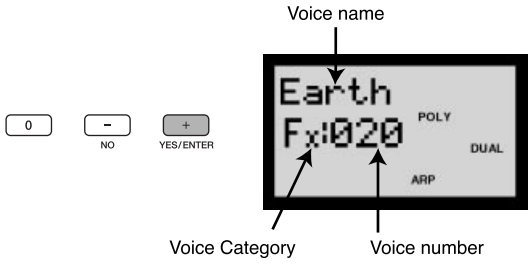
Voice Select Operation

Each of the 128 voices has a Program Number between 001 and 128. You select a voice using the PROGRAM CHANGE keypad. There are two ways to do so, as follows:

METHOD 1
Input a number between 1 and 128, then press [ENTER].



METHOD 2
Press [+] or [–] to increment or decrement through the voices sequentially.



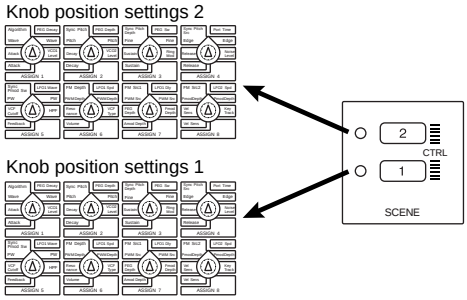
The voice name, as well as voice Category and Program Number, appears in the LCD.

Voice Categories

Voices can be organized into Category types and assigned a two-letter Category code during the voice Name operation. For a list of the available Category types, see page 81.

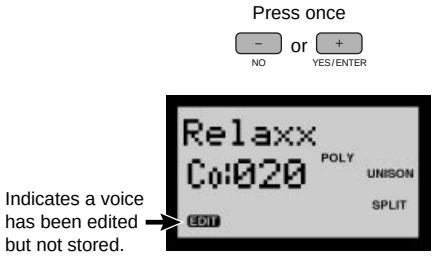
Scenes

Each voice has two "Scenes", or two distinct sounds available for instant recall at the press of a [SCENE] switch. Since the specific Scene on/off status is stored as voice data, when you select a voice an LED beside one of the [SCENE] switches will light to indicate which Scene is active. (If both Scene LEDs light, the Scene Control on status has been stored as part of the voice, which means you can morph, or cross-fade between Scenes using the assignable [MODULATION] wheel or any other assigned continuous controller as you play.) For more information about Scenes, see page 19.



Voice Name Display

As you edit a voice by turning the knobs or changing parameters in the Edit menu, the information in the screen changes accordingly. To display the voice name and number in the LCD at any time, press [-] or [+] once.



Voice Recall

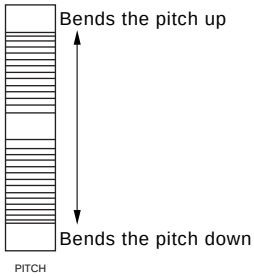
If you're editing a voice, and inadvertently select another voice before performing a Voice Store operation, or simply change your mind, you can recall the most recently edited voice data using the Voice Recall function. For more information, see page 96.

Using The Controllers

The AN1x has various on-board controllers which let you control specific parameters in real-time as you play. Besides keyboard Initial and After Touch, these include [PITCH] wheel, [MODULATION] wheel and [RIBBON] controller, as well as the eight assignable CONTROL knobs.

PITCH Wheel

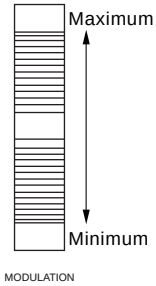
The [PITCH] wheel lets you bend the pitch up or down by an assignable amount. The pitch bend "depth" (range) can be different for each Scene, as set in the Control Matrix.



NOTE The pitch bend range can be different for each Scene in each voice. You can also use the [PITCH] wheel to control other parameters. For information, see page 51.

MODULATION Wheel

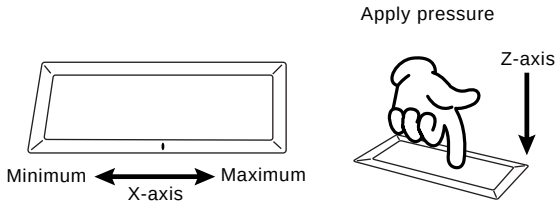
The [MODULATION] wheel lets you apply varying amounts of modulation to the sound as you play, depending on assignment by the Utility Control Assign function (see page 50) or in the Control Matrix (see page 51).



NOTE You can also assign volume, pan or one of many other parameters to be controlled by the [MODULATION] wheel. For information, see page 95. The [MODULATION] wheel can also be used to "morph" between Scenes when the Scene Control function is activated. For information, see page 20.

RIBBON Controller

The [RIBBON] controller lets you control two different assignable parameters as you play. You can control one parameter by sliding your finger along the X-axis, and another by applying pressure to the Z-axis. You can assign parameters to the [RIBBON] controller using the Utility Assign Control function (see page 50) or the Control Matrix (see page 51).



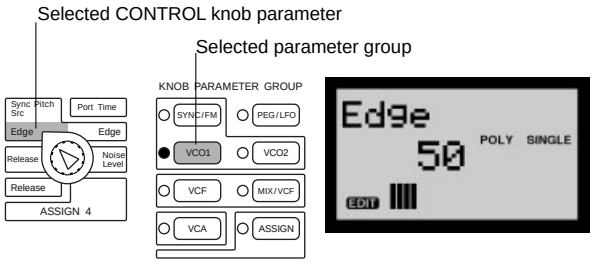
NOTE You can assign different parameters to the [RIBBON] controller for each voice. For information, see page 75.

NOTE To activate the Z-axis you must apply considerable pressure. A light touch will only apply to the X-axis.

NOTE When you release your finger from the [RIBBON] controller, the value may remain at the same position as at the time of release, or reset to the center position depending on the Control Matrix setting. (See page 73.)

CONTROL Knobs And Parameter Groups

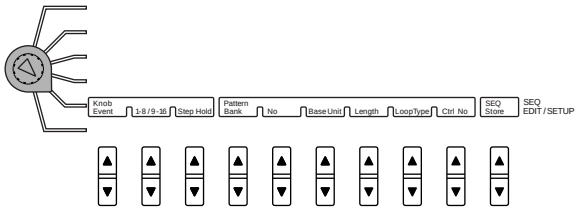
Which parameter is edited by each CONTROL knob for each Scene depends on which KNOB PARAMETER GROUP switch is currently selected, indicated by a lit LED to the left of it. Pressing a CONTROL knob (push-switch) or turning a knob will cause its parameter name and value to display in the LCD.



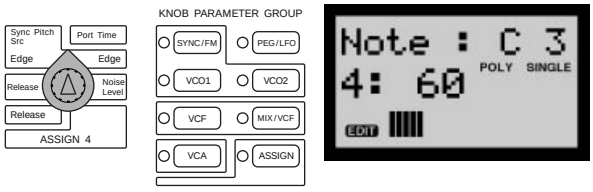
When you select a voice the [ASSIGN] switch will automatically be selected (unless the [EDIT ROTARY] switch is set to SEQ EDIT/SETUP), which lets you access the eight parameters assigned to the respective CONTROL knobs.

NOTE For more information about the Utility Control Assign function, see pages 50, 95.

When you set the [EDIT ROTARY] switch to the 5th position (SEQ EDIT/SETUP menu), the CONTROL knobs will be dedicated to the event parameters of the various steps (beats) of the Step Sequencer.



In this situation, no LED will be lit in the KNOB PARAMETER GROUP section, and the name of the current step event parameters will appear in the LCD when you turn or press a knob.



Simply pressing a KNOB PARAMETER GROUP switch will revert the status back to normal tone generator parameter control, as will selecting a different Edit menu with the [EDIT ROTARY] switch. As long as the [EDIT ROTARY] switch is still set to the SEQ EDIT/SETUP menu, however, you can press the selected KNOB PARAMETER GROUP switch again to revert to Step Sequencer control by the knobs (i.e., you can toggle back and forth between knob parameter control and step event data edit by pressing the switch.)

NOTE For more information about the KNOB PARAMETER GROUP switches, see page 16. For more information about the CONTROL knobs, see page 16. For information about the Step Sequencer, see page 37.

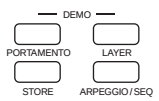
Foot Controllers

The AN1x features [FOOT CONTROLLER], [FOOT VOLUME], and [FOOTSWITCH] jacks for connecting various foot pedals, each of which can be assigned to control one of many types of available on-board and external parameters.

NOTE For more information about assigning controllers, see page 49.

Layer Modes And Portamento

One of six Layer modes can be assigned to each voice by pressing the [LAYER] switch, and Portamento on/off status can be set by pressing the [PORTAMENTO] switch.



NOTE For more information about Layer modes, see page 22. For more information about portamento, see page 24.

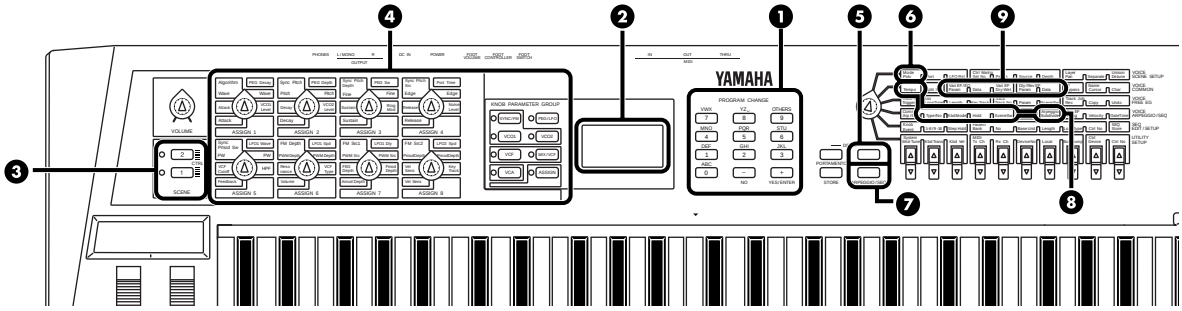
AN1x Quick Tour

This section provides a "hand's on" journey through the key features you'll access regularly as you select voices, tweak sounds and adjust settings for the various parameters.

Exploring The Factory-set Voices

Taking the time to systematically explore various aspects of the 128 factory-set voices is an excellent way to get a thorough understanding of the AN1x's sonic range and power. It's also a natural way to quickly familiarize yourself with some of the fundamental operations you'll use during performance as well as in voice, Arpeggiator, Step Sequencer and Free EG creation and editing sessions.

Try the simple operations which follow as you select and play each preset voice, and take note of what happens to the sound as you change the various settings. If, along the way, you stumble upon a sound you want to keep, simply perform a Voice Store operation (see page 98). If, however, you mess up a sound too much, there's no need to worry: Just reselect the same voice to retrieve the original sound data and start over again! Unless you perform a Voice Store operation, no changes you make will be permanent. Even if you do decide to store a voice, you need not worry about losing any of the factory-set voices permanently, because the entire bank can be recalled (see page 100).



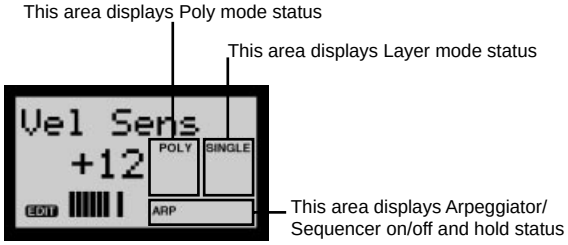
❶ Select a voice.

- Use the PROGRAM CHANGE keypad to select a voice (1 - 128).

NOTE For information about selecting voices, see Basic Operation, page 14.

❷ Check LCD status.

- When you select a voice, first take a look at the information which appears in the LCD, such as Poly mode ("POLY", "MONO", "LEGATO"), Layer mode ("SINGLE", "UNISON", "DUAL", "SPLIT", etc.), and whether the Arpeggiator ("ARP") or Sequencer ("SEQ") is on. This reveals the fundamental nature of a voice at-a-glance.



❸ Compare Scenes, and morph between Scenes using Scene Control.

- When you select a voice, the LED beside the [SCENE 1] or [SCENE 2] switch (or both LEDs) will be lit, indicating the Scene status which was stored as voice data. Press each switch to compare the difference between the sound of Scene 1 and Scene 2.

- Press both [SCENE] switches simultaneously to activate the Scene Control function, then roll the [MODULATION] wheel forward and back to morph, or cross-fade between Scenes as you play.

NOTE For more information about Scenes and Scene morphing, see page 19.

❹ Turn the CONTROL knobs.

- Press a KNOB PARAMETER GROUP switch and turn each CONTROL knob as you play each Scene to hear how it affects the sound. There are eight different groups of parameters assigned to the knobs at the factory. These let you edit the tone generator parameters as printed on the panel beside each knob. Notice how easy it is to edit and drastically change the voice.

NOTE For more information about using the CONTROL knobs, see page 26.

❺ Compare Layer modes.

- Press the [LAYER] switch to compare the difference of each of the six Layer modes as you play, one at a time.

NOTE For more information about Layer modes, see page 22.

❻ Change Poly mode setting.

- To hear how the keyboard Poly setting affects how the voice can be played, set the [EDIT ROTARY] switch to the VOICE SCENE SETUP menu and press the Poly [UP/DOWN] switch to select POLY, MONO or LEGATO. Then play the keyboard.

NOTE For more information about Poly mode, see page 72.

❼ Turn [ARPEGGIO/SEQ] on and off.

- If the voice uses the Arpeggiator ("ARP" appears in the LCD) or Sequencer ("SEQ" appears in the LCD), press the [ARPEGGIO/SEQ] switch to turn it off and hear how the voice sounds without the pattern.

- Pay attention to how the arpeggio or sequence is triggered—either across the entire length of the keyboard, or only to the left of the Split Point. In the case of the Step Sequencer, some voices are programmed to let you trigger a different pattern from each key to the left of the Split Point.

- Set the [EDIT ROTARY] switch to the VOICE ARPEGGIO/SEQ menu and press KbdMode [UP/DOWN] once to confirm the setting which determines how the pattern is triggered. Next, set the [EDIT ROTARY] switch to the VOICE SCENE SETUP menu and press Poly [UP/DOWN] and compare the way the different Poly mode settings affect the pattern as you play the keyboard.

- If the voice does not use the Arpeggiator or Step Sequencer, press [ARPEGGIO/SEQ] to turn on the Arpeggiator or Step Sequencer and hear how notes and chords are affected.

NOTE For more information about the Arpeggiator, see page 33. For information about the Step Sequencer, see page 37.

❽ Change arpeggio Tempo, Pattern Type, Subdivision, and Hold status.

- To speed up or slow down the Arpeggiator pattern (or sequence), set the [EDIT ROTARY] switch to the VOICE COMMON menu and press Tempo [UP/DOWN] until you achieve the desired rate.

NOTE For more information about Tempo, see page 77.

- To try out the 30 different preset Arpeggiator pattern types, set the [EDIT ROTARY] switch to the VOICE ARPEGGIO/SEQ menu and press the Type/No [UP/DOWN] switch and step through each pattern.

NOTE For more information about the Type/No parameter, see page 34.

- To hear how the timing resolution of a pattern changes with the 10 different Subdivide settings, set the [EDIT ROTARY] switch to the VOICE ARPEGGIO/SEQ menu and press Arpeggio Subdivide [UP/DOWN] to step through each.

NOTE For more information about Arpeggio Subdivide, see page 34.

❾ Change Effects and adjust EQ.

- To hear the different Variation and EQ effects and settings, set the [EDIT ROTARY] switch to the VOICE COMMON menu and press Vari EF/EQ Param [UP/DOWN] and Data [UP/DOWN] switches accordingly. Also press the Vari EF Dry:Wet [UP/DOWN] to change the balance between "dry" (normal) and "wet" (effected) signals.

NOTE For more information about Vari EF/EQ, see page 77.

- To hear the different Delay and Reverb effects and settings, press Dly/Rev EF Param [UP/DOWN] and Data [UP/DOWN] switches accordingly.

NOTE For more information about Dly/Rev EF mode, see page 79.

- To bypass specific or all effects and hear how the voice sounds in its pristine state, press EF Bypass [UP/DOWN] and change the status accordingly.

NOTE EF Bypass is a system parameter, and therefore will remain as you set it regardless of which voice is selected. For more information, see page 80.

Assignable Real-time Controllers

You can assign specific parameters to the assignable controller of your choice, including the eight CONTROL knobs, [MODULATION] wheel, [RIBBON] controller (X-axis and Z-axis) and keyboard After Touch, as well as (optional) [FOOT VOLUME], [FOOT CONTROLLER] and [FOOTSWITCH] pedals. Controller and parameter assignments are made using the Control Matrix (see page 73) and the Utility Control Assign function (see page 95).

NOTE For more information about controllers, see Using The Control Features, page 49.

Selecting Scenes And Scene Morphing

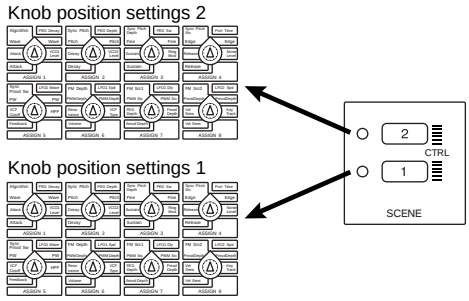
The AN1x's Scene select and play functions offer an exciting range of sophisticated and convenient real-time sound control options that let you express yourself musically in completely unique ways. The [SCENE] switches let you select a Scene or activate the Scene Control function.

Parameters Stored In Each Scene

- All parameter group CONTROL knob position settings (except for the [ASSIGN] group).
- VOICE SCENE SETUP Menu Mode and Control Matrix (excluding common) parameter settings.
- VOICE COMMON menu Vari EF Dry:Wet settings.

Scene Memories

Each voice has two Scene memories, each of which can have a different edit using the CONTROL knobs. Either Scene can be recalled at any time during play by pressing [SCENE 1] or [SCENE 2]. An LED to the left of the selected switch will light to indicate the active Scene.

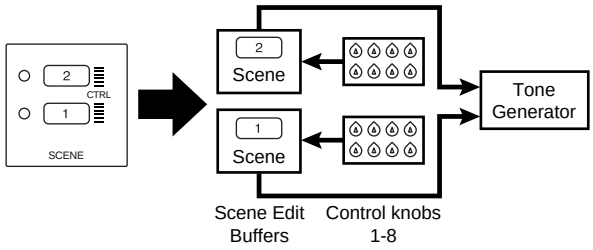


Due to the virtually unlimited number of results possible by selecting KNOB PARAMETER GROUP switches and turning the CONTROL knobs, each of the two Scenes can be as similar or radically different as you want. This gives you two specific sounds to choose from at any time within each of the 128 voices, at the simple press of a [SCENE] switch.

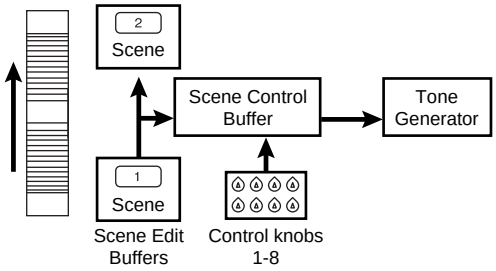
Scenes are especially handy for creating slight variations on the same sound for use during different parts of a song—say, one with fast attack that cuts through the mix during rhythmic phrases, and one with a slower attack that's more suitable for a pad. And of course, if the two Scenes are completely different from each other—say one sound prepared for verse and chorus, and another for a solo break—it's a lot simpler to switch back and forth between Scenes than it is to switch between voices, especially under the pressure of a live situation.

Scene Edit Buffers

When you select a voice, the two Scenes are loaded into the Scene edit buffers. Since each Scene has its own buffer, you can "work" on each Scene separately. For example, if [SCENE 1] is selected and you edit its parameters by turning the knobs, this data will be maintained in Scene 1 even if you select [SCENE 2] and start editing it. When you switch back to Scene 1, it will recall your edited data (and not the original Scene 1 data stored with the voice).



There's also a Scene Control buffer, where parameter changes by moving the [MODULATION] wheel (as well as CONTROL knob positions when Scene Control is active) take place. This sound can be stored in either Scene edit buffer at any time using the Scene Store operation.



Since Scene editing, as well as Scene Store, Load and Swap operations (see pages 21, 22), are taking place in the Scene edit buffers, you need not worry about losing your original Scene data as stored with the selected voice, unless you perform a Voice Store operation to the same voice location.

However, since the Scene buffer is volatile, you will lose your edited Scene data unless you perform a Voice Store operation before selecting another voice.

NOTE For information about performing a Voice Store operation, see page 98.

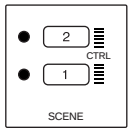
Scene Control

The Scene Control function lets you "morph", or cross-fade between the two Scenes by rolling the assignable [MODULATION] wheel, or using an assignable Foot Controller or any other continuous controller.

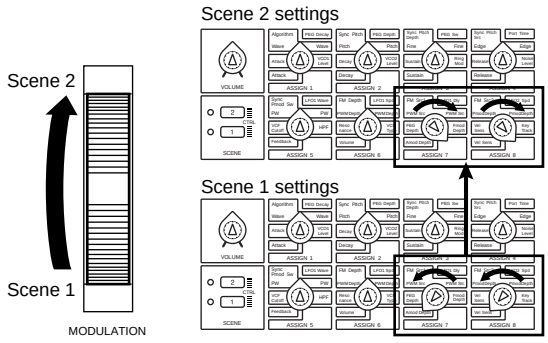
NOTE For information about assigning controllers, see page 95.

The procedure for activating the Scene Control function is as follows:

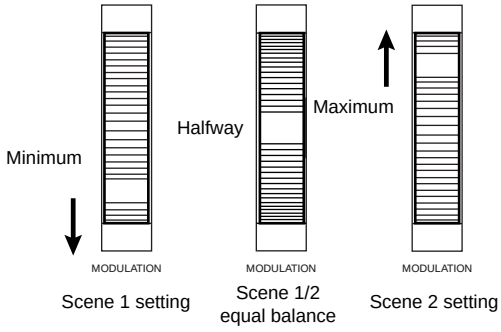
1. **Press both [SCENE] switches simultaneously. The LEDs to the left of both switches will light to indicate that Scene Control is active.**



2. **Roll the [MODULATION] wheel forward and back (or use a Foot Controller, etc.) as you play.**



The minimum value of the [MODULATION] wheel (or Foot Controller, etc.) plays Scene 1; the maximum value plays Scene 2; any position between the two extremes (between a range of 0 and 127) will play a blend of both Scenes accordingly.



Depending on how different each Scene is, a considerable number of parameters may get changed simultaneously as you do the cross-fade. As such, you have an enormous palette of sound textures available which you can apply in real-time as you play. Also, you can select KNOB PARAMETER GROUP switches and turn the CONTROL knobs to edit the data during the Scene Control. All parameter changes when both [SCENE] switches are activated take place in the Scene Control edit buffer.

As you morph between the two Scenes and turn the CONTROL knobs, you may create a killer sound you simply must save before risking losing it. Performing a Scene Store operation lets you store it to one of the Scenes right then and there.

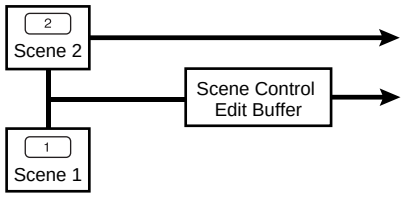
NOTE During Scene Control, Control Matrix settings and some of the Switch parameters (e.g., VCF Type, LFO Wave, VCO Wave, etc.) will not change. For these parameters, the Scene 1 settings will remain in effect.

Scene Control In DUAL And SPLIT Modes

Depending on whether the Layer mode is set to DUAL or SPLIT, the Scene Control will morph in different ways.

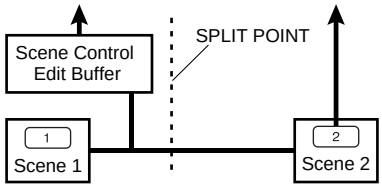
In DUAL mode, the Scene Control will morph from the Scene 1 sound to the Scene 2 sound.

Layer mode = DUAL



In SPLIT mode, the Scene Control will morph from the Scene 1 sound to the Scene 2 sound when the keyboard is played to the left of the Split Point only. When the keyboard is played to the right of the Split Point, only the Scene 2 sound will be played.

Layer mode = SPLIT



NOTE For more information about Layer modes, see page 22.

Confirming Controller Assigned To Scene Control

You can confirm at any time which controller is assigned to perform Scene Control. Simply press and hold both [SCENE] switches, and the name of the currently assigned controller will display in the LCD.



NOTE For information about assigning a controller for Scene Control, see page 95.

Scene Store Function

The Scene Store function lets you store the data in one Scene Edit buffer to the other, or the data created during Scene Control to either of the Scene edit buffers.

1. Hold [STORE] and press the [SCENE 1] or [SCENE 2] switch, depending on which one you want to store the current Scene setting into. "SURE?[Y/N]" flashes in the LCD.



2. Press [YES/ENTER] to execute the Scene Store operation, or [NO] to cancel it.

NOTE Since the Scene Store function stores the data to a Scene edit buffer, be sure to execute a Voice Store operation before selecting another voice.

Scene Load Function

The Scene Load function lets you load Scene data from a Scene in any voice to the corresponding Scene in the currently selected voice. This lets you, for example, load the Scene 1 parameters of one voice to Scene 1 of the currently selected voice, and load the Scene 2 parameters of another voice to Scene 2 of the currently selected voice.

1. **Hold [SCENE 1] (or [SCENE 2]) and enter the number of the voice whose Scene data you want to copy. The selected voice number flashes in the LCD.**



2. **Press [YES/ENTER] to execute the Scene Load operation, or [NO] to cancel it.**

Data which is loaded:

- All knob parameter settings (excluding [ASSIGN] group)
- VOICE SCENE SETUP Mode and Control Matrix parameters
- VOICE COMMON Vari EF Dry:Wet parameter

Scene Swap Function

The Scene Swap function lets you exchange the data in one Scene edit buffer with the other.

1. **Hold [STORE] and press both [SCENE 1] and [SCENE 2] switches. "SURE?[Y/N]" flashes in the LCD.**



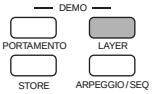
2. **Press [YES/ENTER] to execute the Scene Swap operation, or [NO] to cancel it.**

Data which is exchanged:

- All knob parameter settings (excluding [ASSIGN] group)
- VOICE SCENE SETUP Mode and Control Matrix parameters
- VOICE COMMON Vari EF Dry:Wet parameter
- VOICE FREE EG Track SceneSw parameter
- VOICE ARPEGGIO/SEQ Common SceneSw parameter

Selecting Layer Modes

The LAYER switch is used for selecting a Layer mode from the six available. Every time you press the switch, a different Layer mode is selected. The selected Layer at the time of a Voice Store operation is saved as voice data.



Each Layer mode determines how Note On messages from either the AN1x's keyboard or external MIDI devices (as received at the AN1x's MIDI [IN] terminal) are handled. Depending on which Layer mode is selected, either one or both Scenes will be played, and the Scene Control function will behave in specific ways. The selected Layer also affects available polyphony, and determines multitimbral status.

Layer Modes

SINGLE

This is the normal play mode for a voice. The sound is determined by the data of the currently selected Scene. In this mode the AN1x plays with maximum 10 notes polyphony.



UNISON

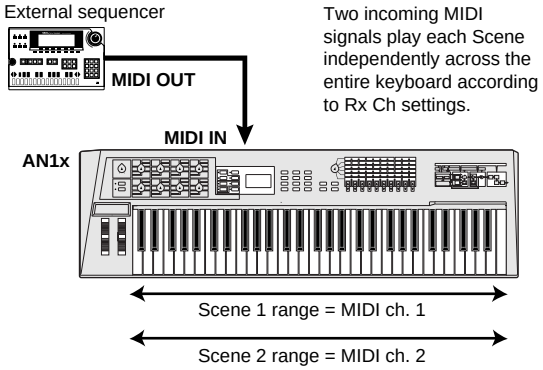
This mode is great for getting those "fat" analog-type sounds of the legendary vintage synths. In Unison mode, the data of the currently selected Scene is multiplied. Polyphony is determined by the Poly mode setting (see page 72). For example, if Poly mode is set to "mono" or "legato", then one Note On message will use five notes of polyphony; if it is set to "poly", then one Note On message will use two notes of polyphony.



NOTE The Unison Detune function (see page 76) lets you decide the detuning for the Unison in order to fatten the sound.

DUAL

This mode layers the two sounds of Scene 1 and Scene 2—i.e., it plays both Scenes simultaneously. In this mode, the AN1x is capable of multitimbral play (max. 2 sounds), where an external MIDI sequencer or device can play each Scene on separate MIDI channels, as set by the UTILITY SETUP Rx Ch (Receive Channel) parameter (see page 93).



NOTE To select a Scene for MIDI channel assignment, simply press a [SCENE] switch.

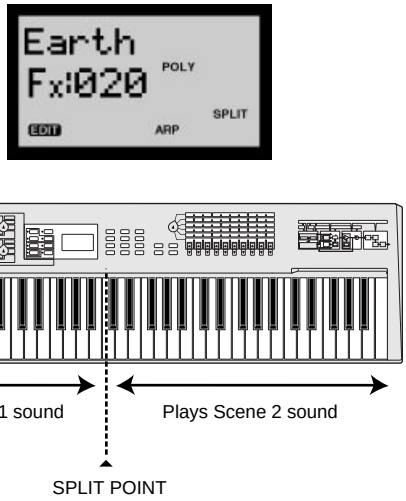
DUAL UNISON

In this mode, each Dual layer plays in Unison (one Note On message uses five notes of polyphony) when the Poly mode is set to “mono” or “legato”. If both Scenes are set to “poly”, the result is the same as DUAL mode. Multitimbral play from an external MIDI source (max. 2 sounds) is also possible, as set by the UTILITY SETUP Rx Ch (Receive Channel) parameter (see page 93).

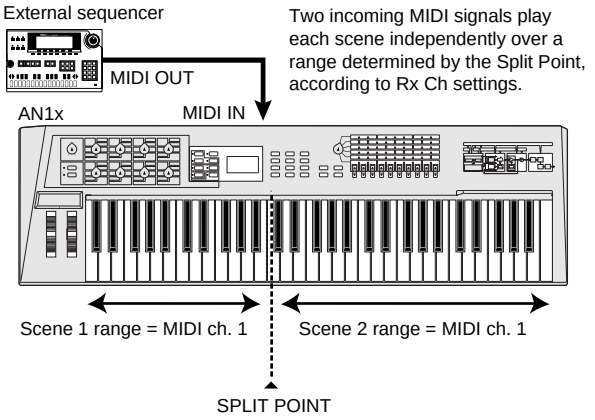


SPLIT

In this mode, Scene 1 is assigned to the keys to the left of the variable Split Point (see page 77), and Scene 2 is assigned to the keys to the right.



In SPLIT mode the AN1x is capable of multitimbral play (max. 2 sounds).



SPLIT UNISON

In this mode, each Scene on each side of the variable Split Point plays in Unison (One Note On message uses five notes of polyphony) when Poly mode is set to “mono” or “legato”. If both Scenes are set to “poly”, the result is the same as SPLIT mode.



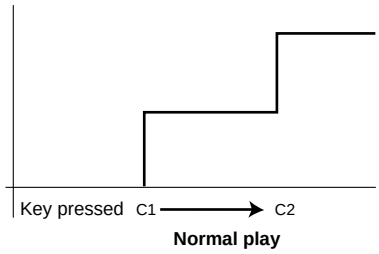
Multitimbral play from an external MIDI source (max. 2 sounds) is also possible, determined by the UTILITY SETUP Rx Ch (Receive Channel) settings.

Layer Parameters

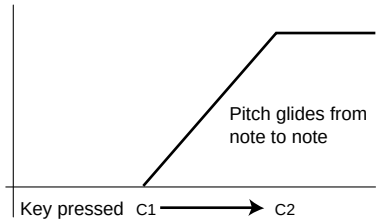
The AN1x features Layer parameters in the VOICE SCENE SETUP menu which let you detune the Unison or Dual layers when UNISON mode or DUAL mode is selected, or separate the panning between the two layers when UNISON mode, DUAL mode or SPLIT mode is selected. For more information, see page 76.

Portamento Play

Portamento is an effect commonly used in singing or when playing a bowed instrument (glissando), where the sound is carried in a continuous glide from one note to the next, through all the intermediate pitches.



Normal play

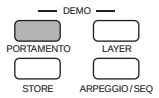


Portamento

The portamento is applied not only to the AN1x's voice as audio output from the internal tone generator, portamento data is also output from the MIDI [OUT] terminal, which means it can affect a voice of an external tone generator assigned to the same MIDI channel as the AN1x, or be recorded as Control Change data in an external MIDI sequencer.

Turning PORTAMENTO On And Off

Pressing the [PORTAMENTO] switch turns the portamento on or off. Portamento on/off status is stored as voice data.





Pressing [PORTAMENTO] outputs a Control Change message via the MIDI [OUT] terminal, which can be recorded as Control Change data in an external MIDI sequencer.

You can designate the assignable Footswitch to turn the portamento on and off by foot, using the UTILITY SETUP Control function (see page 95).

Setting Portamento Time

You can determine the Portamento time by pressing [PEG/LFO] and turning CONTROL knob 4.

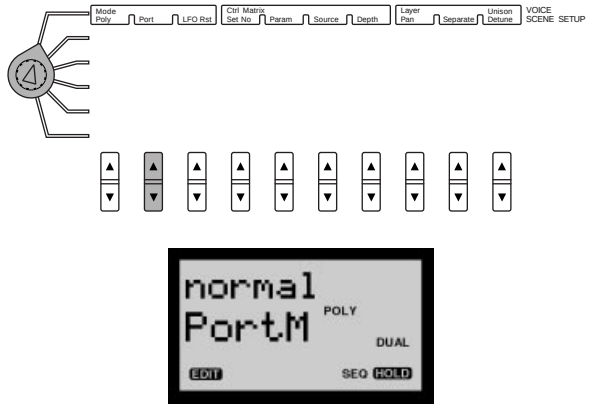


NOTE When the [PORTAMENTO] switch is turned off, "– – –" will flash in the LCD.

NOTE For more information, see page 56.

Selecting Portamento Modes

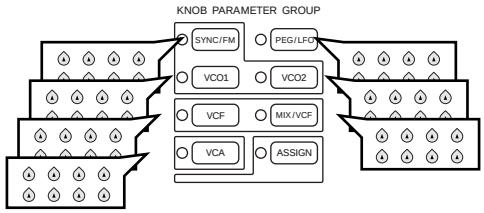
There are various Portamento modes available depending on Poly mode setting. These are accessed by the VOICE SCENE SETUP menu.



NOTE For more information, see page 73.

Selecting Parameter Groups

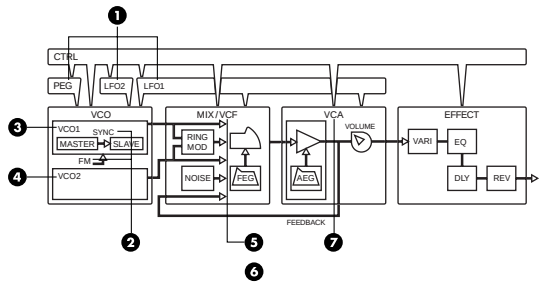
The KNOB PARAMETER GROUP switches determine which group of tone generator parameters you can edit by turning the CONTROL knobs. You can change the voice drastically by editing the various parameters. Simply press a switch to access a group of parameters. The selected switch will be indicated by a lit LED to the left of it.



The name of each parameter in the group is printed on the panel next to the knob by which it is edited, color coded and arranged in relation to each KNOB PARAMETER GROUP switch. A description of each parameter group, along with available parameters and settings available within each group, is provided in the REFERENCE section.

For details, see as follows:

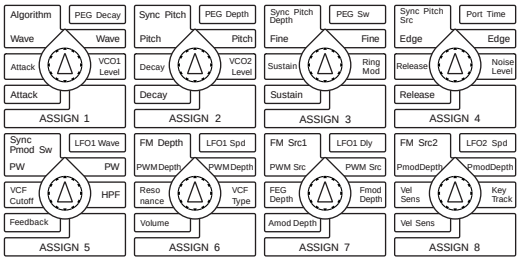
❶PEG/LFO — page 54
❷SYNC/FM — page 58
❸VCO1 — page 61
❹VCO2 — page 63
❺VCF — page 64
❻MIX/VCF — page 66
❼VCA — page 68
(ASSIGN — page 70)



NOTE For details about assigning parameters to CONTROL knobs, see page 95. For information about the AN1x's tone generator, see page 10.

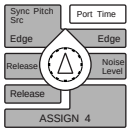
Using The CONTROL Knobs

The eight CONTROL knobs give you direct access to dozens of tone generator parameters that let you coax literally an unlimited range of sounds from the AN1x in real-time. They also let you access and edit the individual events in each step of the Step Sequencer (when the [EDIT ROTARY] switch is set to the SEQ EDIT/SETUP menu).



The CONTROL knobs are assignable, so you can designate a specific parameter to be controlled by each knob. You can use the Control Matrix to designate each knob parameter for each Scene in each voice. Plus, you can use the UTILITY SETUP menu Control function to designate specific Control Change parameters to be controlled by each knob when the [ASSIGN] switch is selected, which not only is routed to the internal tone generator, but is output via the MIDI [OUT] terminal, and therefore can be used to simultaneously control an external MIDI device.

When you turn a knob to edit a parameter, its parameter name and value will automatically appear in the LCD, and the knob data graph will track knob movements accordingly. If you simply press a knob (push-switch) without turning it, the parameter name and value will appear in the LCD for visual confirmation, without changing its value.





Turning a knob left decreases numeric values (or scrolls toward the top of a list of available parameters), and turning a knob right increases numeric values (or scrolls toward the bottom of a list of available parameters).

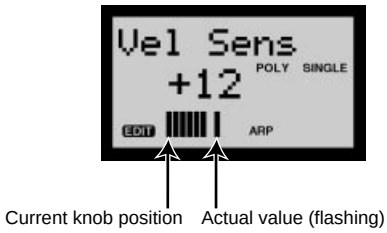
NOTE For information about assigning controllers, see page 95.

If the [EDIT ROTARY] switch is set to positions 1 - 4 or position 6, when you select a voice the [ASSIGN] switch will automatically be selected (the LED beside it will light), which means the group of parameters assigned to the knobs by the UTILITY SETUP menu Control function can be edited or controlled by turning the CONTROL knobs. To access another group of knob parameters, simply press a KNOB PARAMETER GROUP switch.

NOTE For more information about the knob parameters, see page 54.

The Knob Data Graph

During tone generator or sequence event parameter editing, a horizontal 11-segment "knob data graph" appears in the lower area of the LCD. When you press a knob's push-switch for data confirmation (before turning the knob), the data graph provides you with a visual reference of the parameter value in relation to the current physical position of the knob.



A flashing segment in the data graph indicates the actual value of the parameter, whereas shaded segments to the left or right of the flashing segment indicate the current physical position of the knob. As you turn the knob to the left or right, the data graph will move left or right in accordance with the knob movements.

Coarse/Fine Edit

You can edit CONTROL knob parameters in coarse or fine increments and decrements, depending on how you turn the knob. The knob data graph will display differently for each method.

Simply turning a knob will increase or decrease the parameter value in coarse (large) amounts. In this case, the flashing indicator in the knob data graph will be canceled. Turning a knob while pressing it will increase or decrease the parameter value in fine (small) amounts. In this case, the flashing indicator in the knob data graph will position as you turn the knob, and will remain flashing when you release the knob.

Assigning Parameters To Knobs

You can assign one of many available Control Change parameters to each knob. After pressing the [ASSIGN] switch, these parameters will be available for edit in real-time using the CONTROL knobs.

Knob assignments are made using the Control function (Device and Control Number) parameters located in the UTILITY SETUP menu. When you press [ASSIGN] and turn a CONTROL knob, the MIDI Control Change data is sent to both the internal tone generator as well as to MIDI [OUT], where it can control external devices. The Control function assignments are system parameter settings, which means they will remain as set and be available regardless of which voice is selected.



You can also assign various other parameters to the knobs using the Control Matrix located in the VOICE SCENE SETUP menu, which only affects parameters for the internal tone generator (as well as incoming MIDI messages). And since Control Matrix parameters are voice settings, they are stored as voice data, which means that each voice can have customized knob assignments for each Scene!

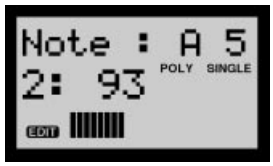


NOTE For details on how to assign Control function parameters to the CONTROL knobs, see page 95. For details on how to assign Control Matrix parameters to the CONTROL knobs, see page 73.

NOTE For a list of available parameters which can be assigned to each CONTROL knob, see the separate Data List book.

Step Sequencer Event Edit

If you set the [EDIT ROTARY] switch to the SEQ EDIT/SETUP menu (position 5), or if you select a voice when the [EDIT ROTARY] switch is already set there, no LED will be lit beside a KNOB PARAMETER GROUP switch, and turning a CONTROL knob will edit the selected event data of the Sequencer step assigned to that knob.



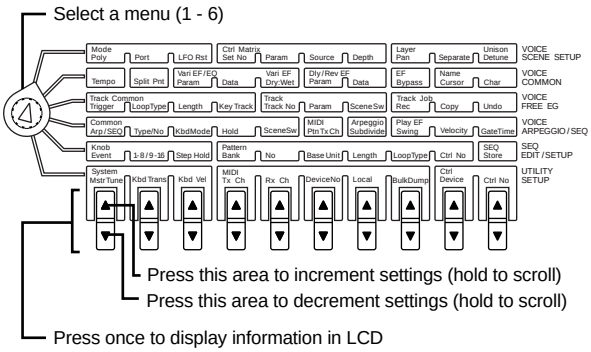
When you turn a knob to edit an event, the step event name and value (and step number) will automatically appear in the LCD, and the knob data graph will track knob movements accordingly. Also, if you simply press a knob (push-switch) without turning it, the information will display in the LCD for confirmation.

Pressing a KNOB PARAMETER GROUP switch will activate its group of tone generator parameters (its LED will light), and pressing the same switch again will return to Step Sequencer edit status. Setting the [EDIT ROTARY] switch to another position will also disengage Step Sequencer edit.

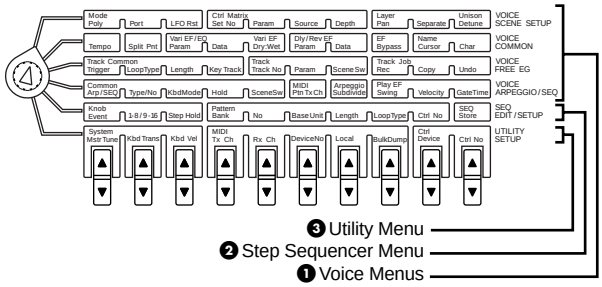
NOTE For more information about the Step Sequencer, see page 37.

Using The Panel Edit Matrix

The AN1x's panel matrix of Edit menus gives you quick and easy access to hundreds of parameter settings. All you have to do is set the [EDIT ROTARY] switch to one of the six menus and press the parameter value [UP/DOWN] switch located beneath the name of the parameter you want to edit.



Press the [UP/DOWN] switch once to display the name of the parameter and current value setting in the LCD. Press the upper or lower area of the switch repeatedly to increment or decrement through the settings, or hold the upper or lower area of the switch to scroll through the settings.



❶ Voice Menus

The four Voice menus are primarily dedicated to parameters which affect the tone generator.

VOICE SCENE SETUP Includes Scene Mode and Control Matrix parameters plus Layer-related parameters for the voice.

VOICE COMMON Includes Tempo, Split Point, Effect and voice naming parameters which are common to both Scenes, and Variation Effect Dry:Wet balance parameter which can be set for each Scene.

VOICE FREE EG Includes Trigger and Length setting, Track and Parameter select, plus recording and other parameters related to the Free EG function.

VOICE ARPEGGIO/SEQ Includes common and specific parameters related to the Arpeggiator and Step Sequencer.

NOTE For a description of each parameter and available settings, see the REFERENCE section, page 72. For information about the Arpeggiator, see page 33.

❷ Step Sequencer Menu

The SEQ EDIT/SETUP menu includes Knob event and sequence editing-related parameters, as well as Pattern Bank and Number select, and other parameters related to the Step Sequencer.

NOTE For a description of each parameter and available settings, see the REFERENCE section, page 89. For information about the Step Sequencer, see page 37.

❸ Utility Menu

The UTILITY SETUP menu includes "global" parameters, including System tuning and keyboard transpose and velocity parameters, MIDI channel transmit, receive and other settings, and Control function assignment-related parameters.

NOTE For a description of each parameter and available settings, see the REFERENCE section, page 92. For more information about the Control function, see page 50.

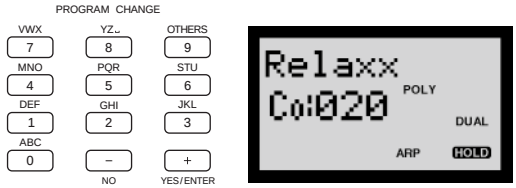
Editing Voices

If you've read through all the preceding sections, and especially if you've been trying out the various features along the way, you should have a pretty solid grounding in how the AN1x creates and enhances sound, as well as how the various controls work to manipulate the many features. This section provides an overview of the steps required for the procedure of editing a voice, along with the key procedures required to build up your own voices from scratch.

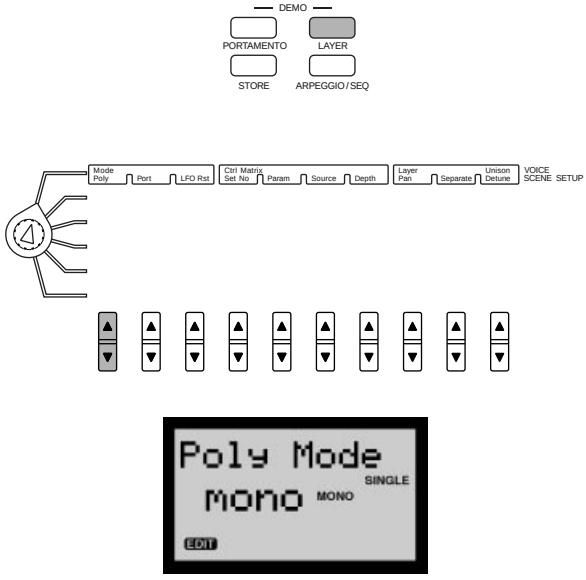
Voice Edit Procedure

The AN1x is so naturally intuitive, the procedure for editing a voice is extremely simple. There are only a few basic steps, as follows:

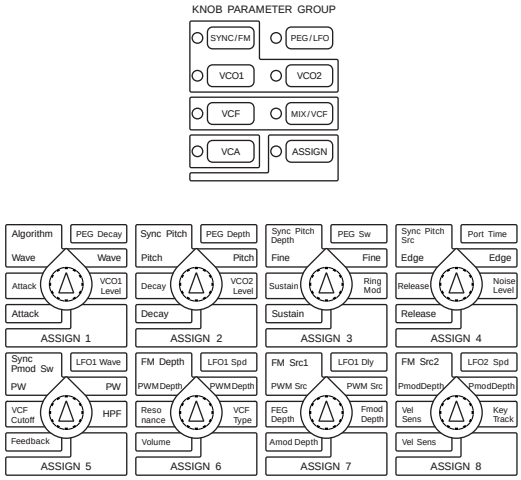
1. Select a voice using the PROGRAM CHANGE keypad.



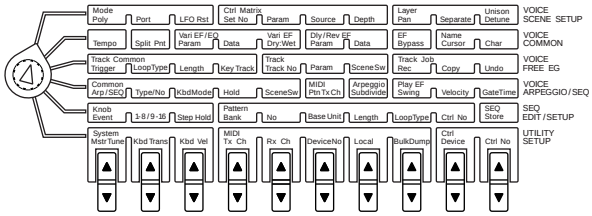
2. Set the status of Layer mode with the [LAYER] switch and Poly mode (located in the VOICE SCENE SETUP menu).



3. Edit the various tone generator parameters for each Scene, using the KNOB PARAMETER GROUP switches and CONTROL knobs.



4. Depending on your needs, use the panel Edit matrix to designate effects configuration and settings, record real-time knob movements for one or more parameters using the 4-track Free EG function, designate Arpeggiator settings, create a Step Sequence, assign Control Matrix sets, and set any other voice parameters.



5. Store the voice data to a voice memory location (1 - 128) using the Voice Store operation (see page 98).



NOTE Parameters which you can edit at any time but which are not stored as voice data include system-related parameters accessible from the UTILITY SETUP menu, as well as Effect Bypass status (VOICE COMMON menu) and MIDI Pattern Transmit Channel (VOICE ARPEGGIO/SEQ menu). As such, they will remain as set regardless of which voice is selected.

CREATING ORIGINAL VOICES

Following is an overview of the key procedures required to build up your own voices from scratch. For step-by-step examples of how to create specific types of voices, including analog synth classics like Synth Bass and Synth Brass, as well as traditional Electronic Organ and Electric Piano voices and more, see page 101.

Tone Generator and Panel Parameter Editing

By editing the tone generator parameters you can determine the fundamental characteristics of the voice. These are accessed by pressing a KNOB PARAMETER GROUP switch and turning specific CONTROL knobs. There are four key steps in the process of editing the tone generator parameters, as follows:

1. **VCO edit to select the fundamental waveform and determine the pitch**
2. **VCF edit to apply filtering and determine the tone, or timbre**
3. **VCA edit to apply amplification to the voice**
4. **LFO edit to apply modulation to the VCO, VCF and VCA**

NOTE Tone generator parameter editing affects the selected Scene (loaded in the Scene edit buffer) or the Scene Control sound (in the Scene Control buffer). For details, see page 20.

By editing the various panel Edit menu parameters you can determine a voice's keyboard and Scene related modes, configure effect types and settings, record Free EG tracks, create and assign Step Sequencer patterns or configure the Arpeggiator. (For details, see page 71.)

NOTE Certain panel parameters apply to individual Scenes or both Scenes equally for the voice. For details about each menu and available parameters, see page 72.

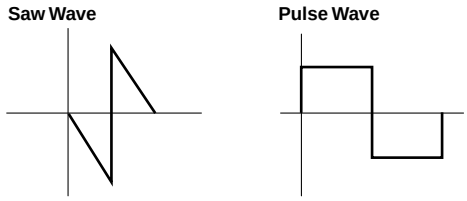
1. VCO Edit

Pressing the [VCO1] KNOB PARAMETER GROUP switch gives you access to the main voltage controlled oscillator parameters, which let you select the basic waveform and determine the fundamental pitch of the sound. Pressing the [VCO2] switch gives you access to the second oscillator, which contains the same set of parameters as VCO1, and lets you add extra dimension to the voice.

NOTE No sound will be produced if the VCO1 Level or VCO2 Level settings in the [MIX/VCF] group are too low.

Wave

By turning CONTROL knob 1 you can select the waveform for the VCO1 oscillator—from a list which includes sawtooth, square (pulse) and a variety of others—which determines the fundamental characteristics of the voice.



NOTE For details about the available waves, see page 61.

Pitch And Fine

By turning CONTROL knobs 2 (Pitch) and 3 (Fine) you can determine the fundamental pitch of the wave. Using both oscillators you can slightly "detune" the pitch of each with the Fine parameter to fatten the sound, or create intervals by setting different Pitch parameters for each.

NOTE For details about the Pitch and Fine parameters, see pages 61, 62.

Edge, Pulse Width And Pmod Depth

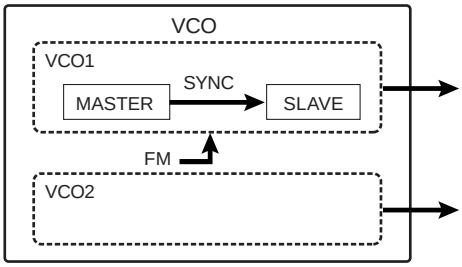
By turning CONTROL knob 4 you can adjust how sharp or smooth the "edge" of the wave is. CONTROL knob 5 lets you determine the width of the wave's pulse to control the amount of harmonics present. CONTROL knob 8 lets you adjust the Pitch Modulation Depth to create a vibrato effect. Other parameters let you apply modulation to the pulse width with the LFO1 and other waves.

NOTE For details about the Edge, Pulse Width and Pmod Depth parameters, see pages 62, 63.

Sync Algorithm

Pressing the [SYNC/FM] KNOB PARAMETER GROUP switch lets you use the CONTROL knobs to access the parameters which affect the "master" and "slave" oscillators which are part of the VCO1, as well as configure how the FM (Frequency Modulation) signal is applied to the master and/or slave oscillators. When the "sync" is enabled VCO1 literally becomes two oscillators in one, with the slave synced to the master.

By turning CONTROL knob 1 you can configure the sync Algorithm, which either turns off the sync and makes only the FM signal available, or lets you apply the FM signal to either master or slave or both oscillators. CONTROL knob 2 lets you access the Sync Pitch parameter to create a difference in pitch between the master and slave oscillators and control the resulting harmonic interval. Other parameters available let you apply modulation to the VCO1 oscillators with the LFO1 and other waves.



NOTE For details about the [SYNC/FM] parameters, see page 58.

PEG

Pressing the [PEG/LFO] KNOB PARAMETER GROUP switch let you use the CONTROL knobs to access parameters which control the Pitch Envelope Generator (PEG), which determines how the pitch of a voice changes over time—from when a key is pressed, held, then release, and how long it takes for the sound to terminate. CONTROL knob 2 lets you set the PEG Depth, or pitch in semitones. CONTROL knob 1 lets you adjust the PEG Decay, or time required for the sound to reach its basic pitch from the PEG Depth setting. CONTROL knob 3 lets you set the PEG Switch to determine which VCO the PEG is applied to.

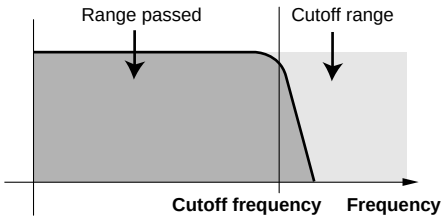
NOTE For more information about PEG Depth, PEG Decay, and PEG Switch parameters, see page 55.

2. VCF Edit

Pressing the [VCF] KNOB PARAMETER GROUP switch gives you access to the voltage controlled filter parameters, which let you determine the characteristics of the tone, or timbre of the voice, and configure the Filter Envelope Generator (FEG).

VCF Cutoff And Resonance

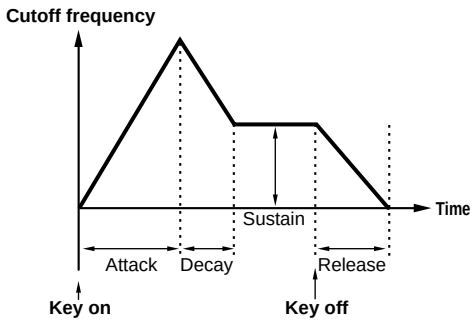
By turning CONTROL knob 5 you can set the cutoff frequency of the VCF Type (as designated in the MIX/VCF group), which determines the point at which specified frequencies are passed or cut off—i.e., filtered out. CONTROL knob 6 lets you boost the harmonics near the cutoff frequency to apply resonance. These two parameters are critical in determining the timbre of the voice.



VCF Type = Low Pass Filter

FEG

CONTROL knobs 1-4 let you determine the Attack, Decay, Sustain and Release values, respectively, to give you precision control over how the timbre of the voice changes over time—from when a key is pressed, held, then released, and subsequently how long it takes for the sound to terminate. CONTROL knob 7 lets you set the FEG Depth, or range of movement of the cutoff frequency.



NOTE For more information about [VCF] parameters, see page 64.

Ring Modulator, Noise And Mixer

Pressing the [MIX/VCF] KNOB PARAMETER GROUP switch lets you use CONTROL knobs 1-4 to determine the levels of the VCO1, VCO2, Ring Modulator and Noise signals, respectively. CONTROL knob 5 lets you determine the cutoff frequency of the High Pass Filter applied to the signal which is output from the mixer, and CONTROL knob 6 lets you select the VCF filter type (LPF, HPF, BPF, BEF) which is controlled by the VCF Cutoff frequency (in the [VCF] parameter group). CONTROL knob 7 lets you adjust the Filter Modulation Depth to create a wah effect.

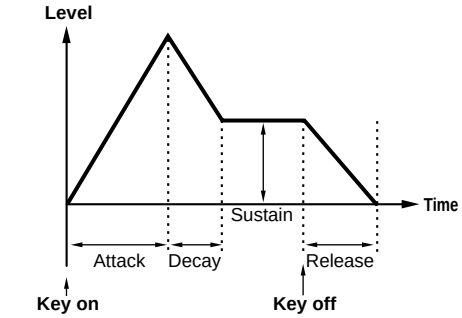
NOTE For more information about [MIX/VCF] parameters, see page 66.

3. VCA Edit

Pressing the [VCA] KNOB PARAMETER GROUP switch gives you access to the voltage controlled amplifier parameters, which let you determine the volume of the sound and configure the Amplitude Envelope Generator (AEG).

AEG

CONTROL knobs 1-4 let you determine the Attack, Decay, Sustain and Release values, respectively, to give you precision control over how the volume of the voice changes over time—from when a key is pressed, held, then released, and subsequently how long it takes for the sound to terminate. The diagrams which follow show the difference in envelope generator characteristics for some common instruments.



NOTE For more information, see page 68.

Amod Depth And Vel Sens

CONTROL knob 7 lets you adjust Amplitude Modulation Depth to create a tremolo effect by using LFO1. CONTROL knob 8 lets you set the Velocity Sensitivity to determine the amplitude of the VCA in relation to playing strength, to either increase dynamic range with a heavier or lighter touch.

NOTE For more information about Amod Depth and Vel Sens parameters, see page 70.

Feedback And Volume

CONTROL knob 5 lets you determine the feedback level which is output from the VCA and then "fed back" into the input of the mixer, causing the signal to become fat. CONTROL knob 6 lets you determine the overall output level from the VCA before the signal passes to the Effect block.

NOTE For more information about Feedback and Volume parameters, see page 69.

4. LFO Edit

The Low Frequency Oscillator is an oscillator which generates low frequency signals to let you apply a modulation signal to specific aspects of the voice. For example, applying the LFO to the VCO creates vibrato, applying it to the VCF creates wah, and applying it to the VCA creates tremolo. The AN1x has two separate LFOs which give you a wide range of control over modulation.

Wave And Speed

Pressing the [PEG/LFO] KNOB PARAMETER GROUP switch lets you use CONTROL knob 5 to select the LFO1 Wave from 21 types available. CONTROL knob 6 lets you adjust LFO1 Speed, and CONTROL knob 7 lets you determine the LFO1 Delay time of the modulation. CONTROL knob 8 lets you adjust the LFO2 Speed for the LFO2 wave, which is fixed to a triangle wave.

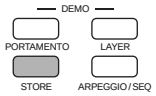
NOTE For more information about LFO parameters, see page 54.

Storing A Voice

As you edit your voice, depending on whether you're working on Scene 1, Scene 2 or the Scene Control sound, you may want to perform Voice Store operations.

Store Operations

The [STORE] switch is used for performing Voice Store operations.



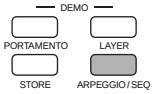
For information about performing a Voice Store operation, see page 98.

NOTE For information about types of data stored in a voice, see page 9.

NOTE For information about Scene-related Store functions, see page 21. For information about SEQ Store, see page 46.

Turning ARPEGGIO/SEQ On And Off

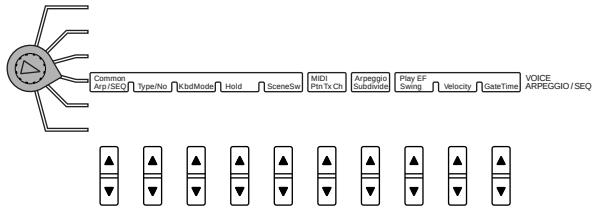
The [ARPEGGIO/SEQ] switch is used to turn the Arpeggiator or Step Sequencer on and off. Either "ARP" or "SEQ" will appear in the LCD to indicate which one is active for the voice, determined by the Common Arp/SEQ setting in the VOICE ARPEGGIO/SEQ menu.



NOTE For information about the Arpeggiator, see page 33. For information about the Step Sequencer, see page 37. For information about the Arp/SEQ setting, see page 85.

Using The Arpeggiator

The Arpeggiator lets you play arpeggiated chord patterns at the simple press of a key. There are 30 arpeggio pattern Types to choose from. Between the 10 Arpeggio Subdivide (timing resolution) settings, Play Effect Velocity parameter and number of notes played, you have a wide range of control and customization over length, rhythm and feel of a voice's arpeggio.



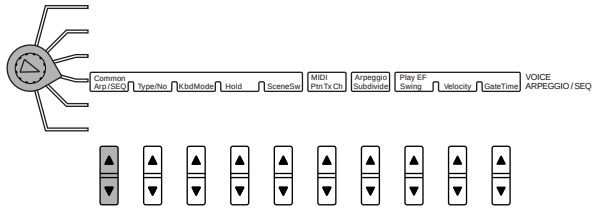
You can control which Scene plays the arpeggiated patterns, turn the Arpeggio Hold function on and off at will, and even designate an independent MIDI channel on which to output the Arpeggiator pattern data.

The specific Arpeggiator-related parameters are available in the VOICE ARPEGGIO/SEQ menu, but a few others will also have a bearing on your arpeggiated performances, including Tempo and Poly mode settings, and depending on Layer mode, the Split Point assignment as well.

NOTE For information about each VOICE ARPEGGIO/SEQ menu parameter, see page 85.

Arpeggiator On/Off

The Arpeggiator can only be activated when the Arp/SEQ parameter (VOICE ARPEGGIO/SEQ menu) is set to "Arpeggio".



You can turn the Arpeggiator on and off by pressing the [ARPEGGIO/SEQ] switch. When the Arpeggiator is turned on, "ARP" will appear in the lower right area of the LCD.



Setting The Arpeggiator Tempo

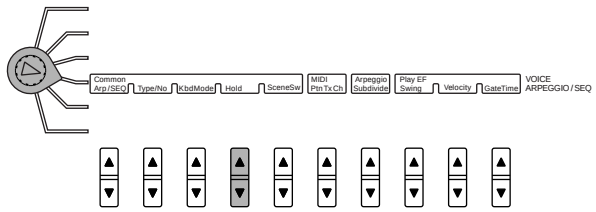
Set the [EDIT ROTARY] switch to VOICE COMMON and press Tempo [UP/DOWN] to set the tempo of the Arpeggiator in BPM (Beats Per Minute).



If you want the clock of an external MIDI sequencer or drum machine to control the AN1x's tempo, then set the Tempo to "MIDI" (the first value located before "40") so that the two devices will play in synchronization with each other.

Arpeggio Hold Function

Pressing Hold [UP/DOWN] lets you turn the Arpeggio Hold function on and off. When Hold is set to "on", "HOLD" will appear in reverse type in the lower right corner of the LCD. After triggering the Arpeggiator by playing the keyboard, the arpeggio will continue playing automatically when you release the keys, until you switch the Hold setting to "off", or press [ARPEGGIO/SEQ] to stop the Arpeggiator. When set to "off", the Arpeggiator will stop when you release the keys.

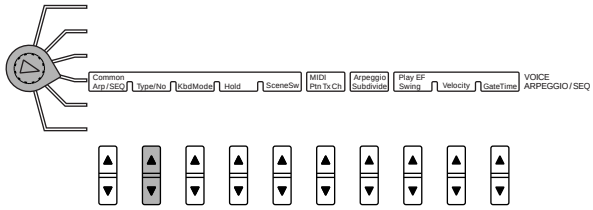




The Arpeggio Hold function is especially useful during live performances when the Layer mode is set to "SPLIT" and Keyboard Mode is set to "chrd&norm" (see page 35), since you can trigger the arpeggio with notes to the left of the Split Point, and use both hands to play chords or fills to the right. Arpeggio Hold is also handy when trying out different Arpeggiator Types or Subdivide settings, and is literally indispensable for tweaking the tone generator parameters for your arpeggios with the CONTROL knobs.

Arpeggio Pattern Types

The 30 arpeggio pattern Types are selected by pressing Type/No [UP/DOWN]. The available Types are basically divided into two groups, separated chords (Types 1-15), and special arpeggios (Types 16-30).



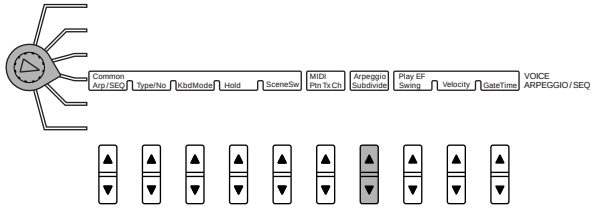


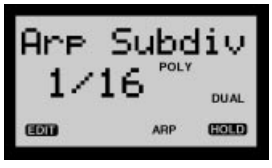
Types 1-15 separate the chords you play in a variety of ways, either generating arpeggios which occur up, down, up and down, or randomly—over one, two or four octaves. Types 16-30 are special types which vary in tone or add subtle shifts or more complex dynamics and rhythmic elements to the arpeggio.

NOTE For more information about Type/No, see page 85. For a list of available Arpeggiator Types, see the Arpeggiator Type List in the separate Data List book.

Arpeggio Subdivide

Pressing Arpeggio Subdivide [UP/DOWN] lets you designate one of the ten timing subdivision (rhythm resolution) settings for the Arpeggiator pattern.





Available Subdivide settings are as follows:

3/8=𝅗𝅥., 1/4=𝅗𝅥, 3/16=♪., 1/6=$\overset{3}{\text{♫}}$, 1/8=♪, 3/32=𝅘𝅥𝅯., 1/12=$\overset{3}{\text{♫}}$, 1/16=𝅘𝅥𝅯, 1/24=$\overset{3}{\text{♬}}$, 1/32=𝅘𝅥𝅰

NOTE For more information about Arpeggio Subdivide, see page 88.

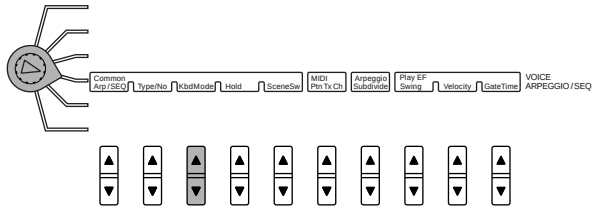
Playing Arpeggiated Chords

Trying out the various arpeggios is a lot of fun. Turn on the Arpeggio Hold function, play an even-numbered note chord, and see how the different pattern Types and Subdivide settings react. Then play an odd-numbered note chord and repeat the process.

There are a wealth of combinations available at your fingertips—with relatively straightforward or even unconventional results awaiting you. And only by rolling up your sleeves and exploring all the options at hand can you become an expert at how to get just the right arpeggio for just the right track.

Keyboard Mode

Press KbdMode [UP/DOWN] to designate how the Arpeggiator patterns respond to notes played on the keyboard. Select “chrd” (Chord) if you want to play arpeggiated chords across the entire keyboard. Select “chrd&norm” (Chord & Normal) if you want to play arpeggiated chords to the left of the Split Point and normal chords to the right.

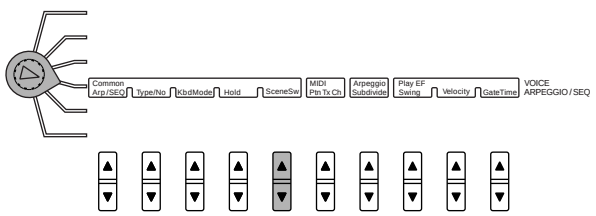




NOTE For information about setting the Split Point, see page 77.

Scene Switch

Press SceneSw [UP/DOWN] to designate which Scene will play the Arpeggiator pattern. Scenes will play in accordance with Layer mode and Keyboard Mode settings.



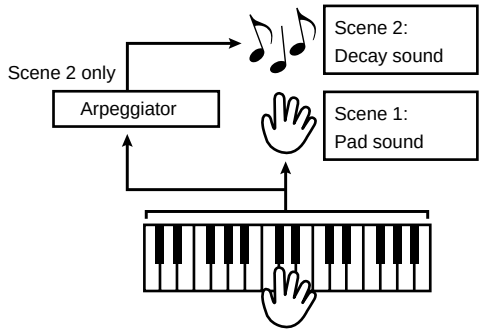
“scne1” or “scne2”



When the Scene Switch is set to “scne1” or “scne2”, Scene 1 or Scene 2 will play as follows:

Layer mode = DUAL

- If KbdMode is set to “chrd”, you can play both Scenes simultaneously across the entire keyboard. The selected Scene plays the arpeggio, and the other plays normally.



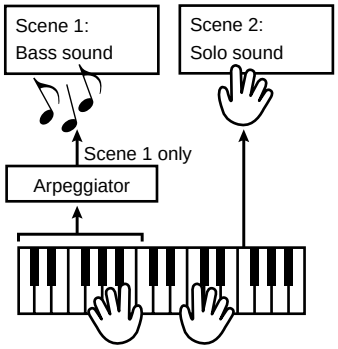
- If KbdMode is set to "chrd&norm", you can play both Scenes simultaneously across the entire keyboard. The selected Scene plays arpeggios when you play chords to the left of the Split Point, and plays the Dual voice normally when you play to the right of the Split Point.

Layer mode = SPLIT

- If “scne1” is selected and KbdMode is set to “chrd”, you can play arpeggios with Scene 1 to the left of the Split Point, and arpeggios with Scene 1 and normal chords with Scene 2 to the right.

- If “scne2” is selected and KbdMode is set to “chrd”, you can play arpeggios with Scene 2 and normal chords with Scene 1 to the left of the Split Point, and arpeggios with Scene 2 to the right.

- If “scne1” is selected and KbdMode is set to “chrd&norm”, you can play arpeggios with Scene 1 to the left of the Split Point, and play normally with Scene 2 to the right.



- If “scne2” is selected and KbdMode is set to “chrd&norm”, you can play arpeggios with Scene 2 and normal chords with Scene 1 to the left of the Split Point, and play normally with Scene 2 to the right.

Layer mode = SINGLE

- If KbdMode is set to “chrd”, you can play arpeggios with the selected [SCENE] switch only (or Scene Control sound) across the entire keyboard.

- If KbdMode is set to “chrd&norm”, you can play arpeggios with the sound of the selected [SCENE] switch only (or Scene Control sound) to the left of the Split Point and normal chords with the sound of the selected [SCENE] switch only (or Scene Control sound) to the right.

“both”



When the Scene Switch is set to “both”, both Scenes will play as follows:

Layer mode = DUAL

- If KbdMode is set to “chrd”, you can play arpeggios with Scene 1 and Scene 2 across the entire keyboard.

- If KbdMode is set to “chrd&norm”, you can play arpeggios with Scene 1 and Scene 2 to the left of the Split Point, and play normally with Scene 1 and Scene 2 to the right.

Layer mode = SPLIT

- If KbdMode is set to “chrd”, you can play arpeggios with Scene 1 to the left of the Split Point, and play normally with Scene 2 to the right.

- If KbdMode is set to “chrd&norm”, you can play arpeggios with Scene 1 to the left of the Split Point and normal chords to the right.

NOTE When SceneSw “both” is set in SPLIT mode, depending on selected arpeggio Type, as well as Split Point setting and the position at which you play the keys, certain notes of the arpeggiated chords may cross the Split Point, i.e., lower notes will play Scene 1 and higher notes will play Scene 2.

Layer mode = SINGLE

(Same as for “scne1” or “scne2”, page 35.)

Arpeggio Pattern Length

The length of an AN1x arpeggio pattern is determined by three factors which work together simultaneously: Arpeggio Type, Arpeggio Subdivide setting, and the total number of notes you play for an arpeggiated chord.

For example, say you play an arpeggiated pattern with a four-note chord, such as a C major triad with an octave in the root. If Subdivide is set to “1/8”, the Arpeggiator breaks down the chord into 8ths, and then arpeggiates it based on the Type setting. If Type is set to “UpOct2” the arpeggio will climb over two octaves, and will repeat after four beats. Then, if you change Subdivide to “1/16”, the arpeggio will repeat after 2 beats. Furthermore, if you then change Type to “UpOct1”, the arpeggio will repeat after only one beat.

Because the number of notes you play in the chord has a direct relationship on the pattern length based on Subdivide resolution, sometimes unwanted syncopations may be generated. As a general rule, you can avoid this by choosing an even number of chord notes for even-numbered subdivide resolutions (1/4, 1/8, 1/16 and 1/32) and an odd number of notes (e.g., three-note or five-note chords) with odd-numbered resolutions (1/6, 1/12, 1/24).

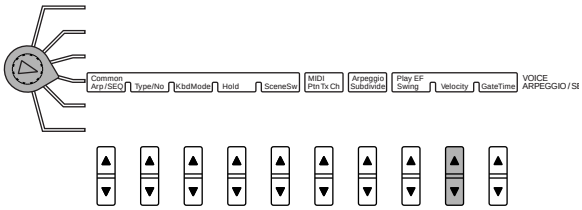
However, this doesn’t apply for dotted note rhythms (3/8, 3/16 and 3/32). These resolutions are particularly interesting for odd-numbered beats (e.g., 3/8 or 6/8), so you will need to play chords with an even number of notes to correctly play back these three-part rhythms.

As an example, set Type to “UpOct2” and Subdivide to “3/8” resolution. Playing a triad will place the root note on the first beat in the 4th bar, generating irregular cycles. A four-note chord, however, generates symmetrical 4 bar cycles. The root note will be repeated after the first cycle on bar 3, after the second cycle on bar 5 and after the third cycle on bar 7, and so on, always landing on the first beat.

In the case of the special Arpeggiator Types (16-30), you will notice that these aren’t particularly effective with triplet rhythms. Best results are achieved with a 4/4 beat and a Subdivide resolution of “1/16”, “1/8” or “1/32”.

Play Effect Velocity

Press the Play Effect Velocity [UP/DOWN] switch to set the ratio between the lower and higher velocity values of the Arpeggiator pattern, over a range between 1% and 200%.

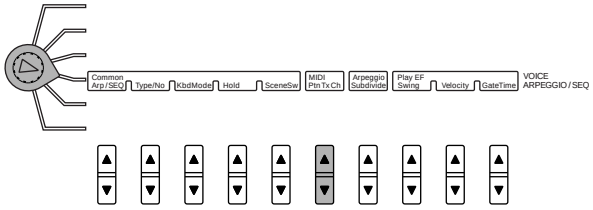




A setting of “100%” maintains the original velocity relationship between the notes. Lower values adjust velocities downward at playback, and higher values adjust velocities upward at playback. A setting of “real” (Real-time) will cause the velocity values of the pattern to be determined by the velocity at which you play the keyboard.

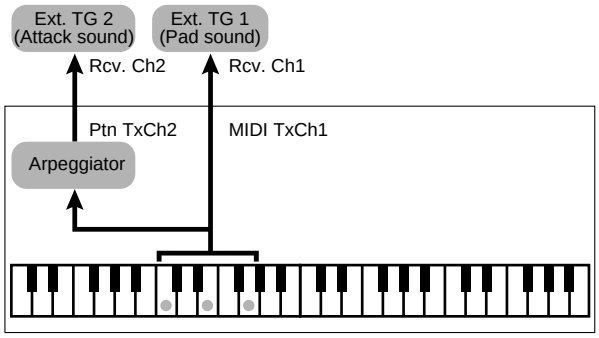
Arpeggio MIDI Output

You can use the MIDI Pattern Transmit Channel (“PtnTxCh”) parameter to designate a MIDI channel on which to output the Arpeggiator pattern data, to either play an external tone generator or record the data into a MIDI sequencer or computer.





This setting is independent from the MIDI Transmit Channel (“MIDI Tx Ch”) setting in the UTILITY SETUP menu (see page 93), but you can either set them both to the same channel or different channels, depending on your requirements. The diagram below shows an example of how they can be set to different channels to control two different external tone generators.

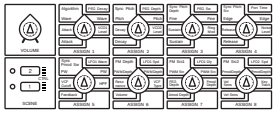


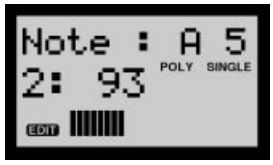
NOTE For information about setting the MIDI Pattern Transmit Channel (“MIDI PtnTxCh”), see page 87.

NOTE The MIDI PtnTxCh setting is a system parameter, and will not be saved as voice data.

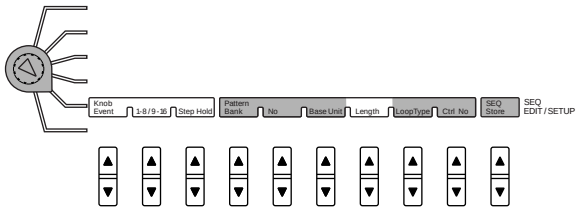
Using The Step Sequencer

The Step Sequencer lets you create your own 16-step looped patterns by setting Note, Velocity, Gate Time and Control Change event values for each step (beat) in the sequence using the CONTROL knobs, where each knob gives you access to the events in a specific step when the [EDIT ROTARY] switch is set to the SEQ EDIT/SETUP menu.





Each of the 128 voices has its own “Voice” Pattern memory for storing a single sequence. There is also a separate bank of 128 “User” Patterns. Patterns can be triggered from the keyboard in a variety of ways.

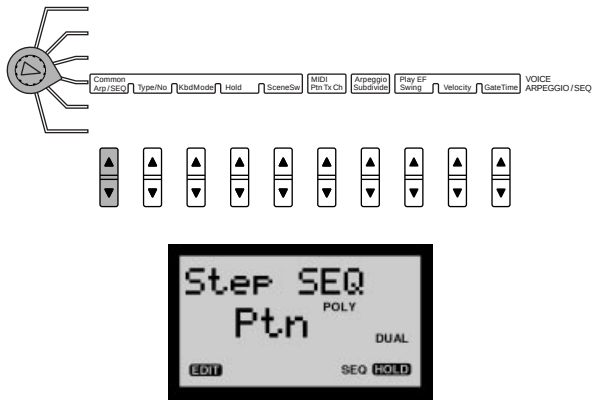


The specific Step Sequencer-related parameters are available in the SEQ EDIT/SETUP menu. Also, Pattern Number, Keyboard Mode, Hold, Scene Switch and Play Effect parameters in the VOICE ARPEGGIO/SEQ menu have special functions related to the Step Sequencer. Other settings which will have a bearing on your sequences include Tempo and Poly mode settings, and depending on Layer mode, the Split Point assignment as well.

NOTE For information about each SEQ EDIT/SETUP menu parameter, see page 89.

Step Sequencer On/Off

The Step Sequencer can only be activated when the Arp/SEQ parameter (VOICE ARPEGGIO/SEQ menu) is set to "Step SEQ".

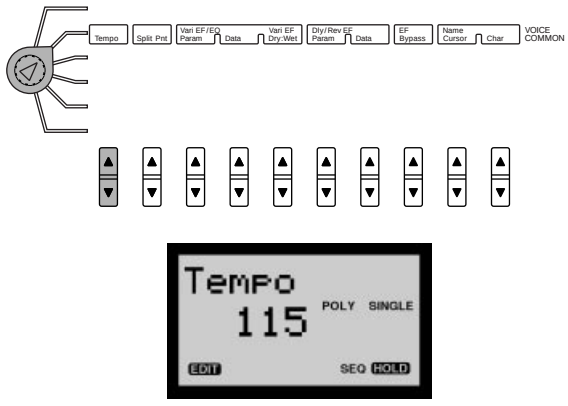


You can turn the Step Sequencer on and off by pressing the [ARPEGGIO/SEQ] switch. When the Step Sequencer is turned on, "SEQ" will appear in the lower right area of the LCD.

NOTE When Arp/SEQ is set to "Arpeggio", the various parameters in the SEQ EDIT/SETUP menu cannot be accessed.

Setting The Step Sequencer Tempo

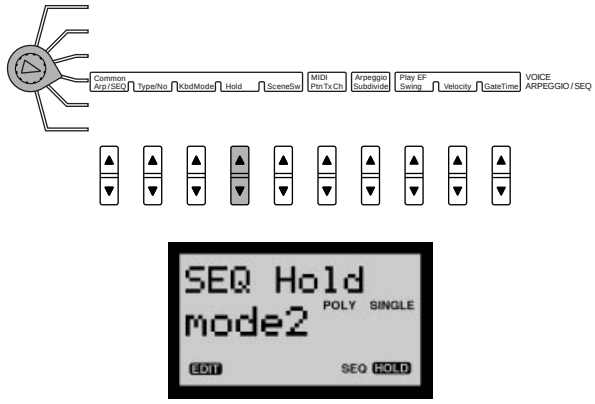
Set the [EDIT ROTARY] switch to VOICE COMMON and press Tempo [UP/DOWN] to set the tempo of the Step Sequencer in BPM (Beats Per Minute).



If you want the clock of an external MIDI sequencer or drum machine to control the AN1x's tempo, then set the Tempo to "MIDI" (the first value located before "40"), so that the two devices will play in synchronization with each other.

Step Sequencer Hold Modes

Pressing Hold [UP/DOWN] lets you turn the SEQ Hold function on and off. Depending on Keyboard Mode setting, there are two additional Hold modes.



When SEQ Hold is set to "on", "HOLD" will appear in reverse type in the lower right corner of the LCD. After triggering the Step Sequencer by playing the keyboard, the sequence will continue playing automatically when you release the key, until you switch the Hold setting to "off", or press [ARPEGGIO/SEQ] to stop the Step Sequencer.

When KbdMode is set to "sel&norm" or "sel&shift", two additional SEQ Hold mode settings are available: "mode1", which triggers a pattern every time a key is pressed, and "mode2", which triggers a pattern after the current sequence finishes, even if you press a key during the middle of the current sequence.

The SEQ Hold function, used in conjunction with Layer mode and Keyboard Mode settings, greatly expands your live performance options. It's also indispensable for searching for Voice and User Patterns, as well as for editing a pattern or tweaking various tone generator parameters for your sequence sound with the CONTROL knobs.

Voice Pattern And User Pattern Banks

In addition to the voice-related data stored in a voice memory location, each voice has "Voice Pattern" data for a single Step Sequencer pattern. Since there are 128 voices in memory, the collection of 128 patterns as stored in the voices is called the Voice Pattern bank. In addition to the Voice Pattern bank, there is a separate bank of 128 "User Patterns" called the User Pattern bank.

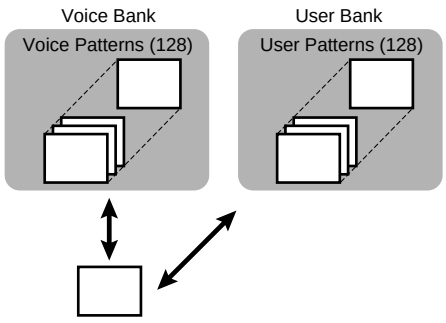
The Voice and User Patterns can be played from the keyboard in a variety of ways, depending on the Keyboard Mode setting in the VOICE ARPEGGIO/SEQ menu. The individual Keyboard Mode settings are explained on page 41, but first let's take a look at the two main methods of Step Sequencer play—Single Pattern Play and Pattern Select Play—and see what's happening inside the AN1x's memory structure as you select, edit and store patterns.

Single Pattern Play

During Single Pattern Play, you can play a single Step Sequencer pattern from the keyboard. For Single Pattern Play, the Keyboard Mode parameter (VOICE ARPEGGIO/SEQ menu) must be set to either "norm" or "shift&norm".

As the Single Pattern Play diagram illustrates, when you select a voice with the PROGRAM CHANGE keypad, Voice Pattern data is loaded into the Voice Pattern edit buffer.

SINGLE PATTERN PLAY



When you press a key on the keyboard, you are tiggering the Voice Pattern stored with the voice, located in the buffer. You can set the [EDIT ROTARY] switch to the VOICE EDIT SETUP menu and press Bank [UP/DOWN] to select either the Voice or User Pattern bank, and every time you press No [UP/DOWN] to select a pattern number, that pattern will load into the Voice Pattern edit buffer.

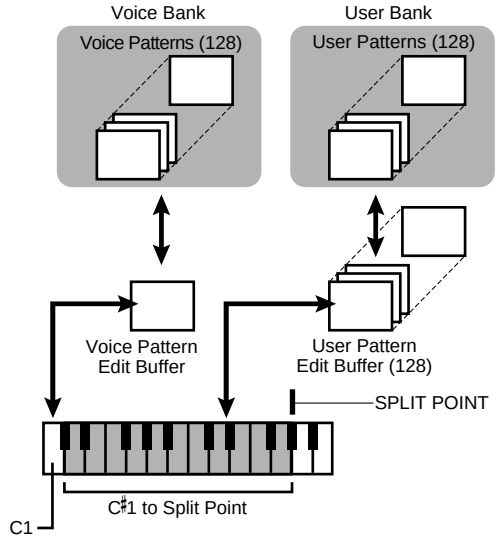
All editing of the pattern will of course be taking place in the buffer. If you want, you can use SEQ Store [UP/DOWN] to store the edited pattern to any User Pattern bank memory (1 - 128). If you perform a Voice Store operation, the edited voice will become the new Voice Pattern for the voice.

Pattern Select Play

During Pattern Select Play, you can trigger more than one Step Sequencer pattern from the keyboard. Each pattern is assigned to a different key. For Pattern Select Play, the Keyboard Mode parameter (VOICE ARPEGGIO/SEQ menu) must be set to either "sel&norm" or "sel&shift".

As the Pattern Play Select diagram illustrates, when you select a voice with the PROGRAM CHANGE keypad, Voice Pattern data is loaded into the Voice Pattern edit buffer, and all 128 User Patterns are loaded into the User Pattern Edit buffer.

PATTERN SELECT PLAY



Pressing different keys on the keyboard will "select" different patterns, and C1 will always play the Voice Pattern for the current voice. C#1 and above will select and trigger different User Patterns in ascending order across the Key Code (keyboard notes) up to the Split Point, based on which User Pattern number is assigned to C#1. If you set the [EDIT ROTARY] switch to the SEQ EDIT/SETUP menu and press (Pattern) No [UP/DOWN] once, the pattern number will appear in the LCD each time you press the corresponding key.



Since the triggered Voice and User Patterns are selected and played from edit buffers, you can edit any pattern at will—i.e., you can trigger one pattern and edit it, trigger a second pattern and edit it, go back to the first one and tweak it some more, and so on, in order to edit various patterns in context with each other.

If you want, you can use SEQ Store [UP/DOWN] to store any edited pattern to any User Pattern bank memory (1 - 128). If the User Pattern has been edited, the "All Ptn" (All Patterns) store confirmation message will appear in the LCD, and you can press [YES/ENTER] to overwrite all patterns, or press [NO] to cancel the operation.

C#1 Assign

C#1 is always the base note assignment for the first User Pattern to be selected. As shown in the Pattern Select Play diagram (page 39), if “Usr001” (User 001) is assigned to C#1, then pressing C#1 selects User Pattern 001, pressing D1 selects Pattern 002, pressing D#1 selects Pattern 003, and so on. The User Patterns are always selected in ascending order according to pattern number (001 - 128).

The C#1 Assign feature lets you “shift” the starting pattern number. For example, if you assign “Usr003” to C#1, then pressing C#1 selects User Pattern 003, pressing D1 selects Pattern 004, pressing D#1 selects Pattern 005, and so on.



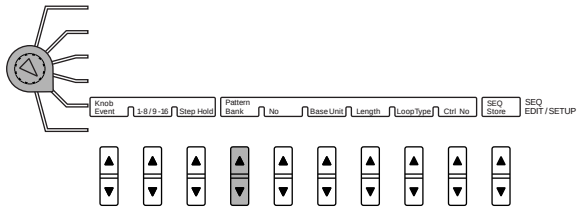
To assign a User Pattern number to C#1, set the [EDIT ROTARY] switch to VOICE ARPEGGIO/SEQ and press Type/No [UP/DOWN]. Arp SEQ must be set to “Step SEQ”, and KbdMode must be set to “sel&norm” or “sel&shift”. (See page 85.)

Playing Step Sequencer Patterns

The AN1x comes with 128 Voice Patterns and 128 User Patterns ready to go. All patterns can be overwritten to store your own.

Selecting Pattern Banks And Numbers

To select a Pattern Bank, set the [EDIT ROTARY] switch to SEQ EDIT/SETUP and press Bank [UP/DOWN]. During Single Pattern Play, either the Voice or User Pattern bank can be selected. During Pattern Select Play, only the User Pattern bank can be selected.

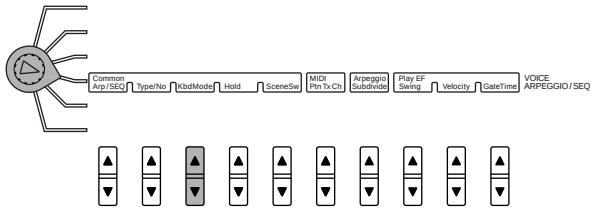




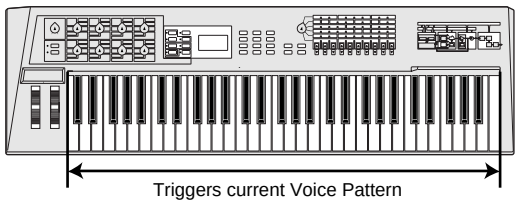
To select a Pattern Number, press No [UP/DOWN]. You can select from 128 patterns in each bank.

Keyboard Mode

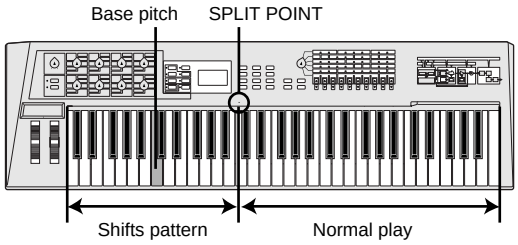
The Keyboard Mode setting (VOICE ARPEGGIO/SEQ menu) determines Single Pattern Play (“norm” or “shift&norm”) or Pattern Select Play (“sel&norm” or “sel&shift”) status.



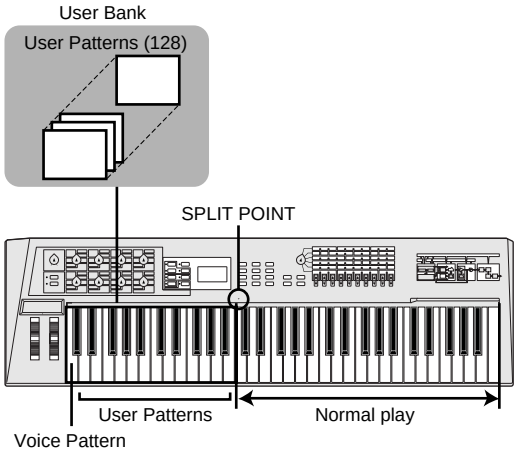
norm (Normal): Lets you play the Voice Pattern of the currently selected voice at its base pitch from any key on the keyboard. You can play regular notes and chords across the keyboard while the sequence is looping.



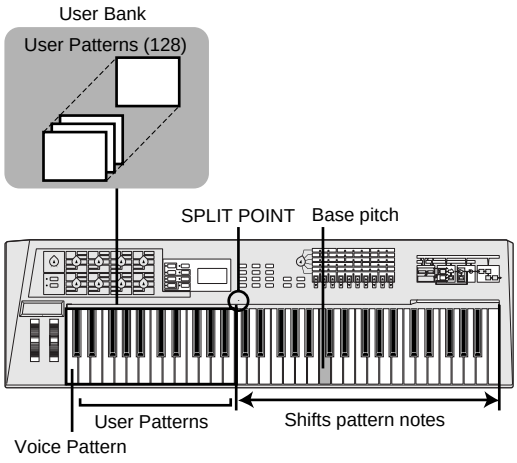
shift&norm (Shift & Normal): Playing a key to the left of the Split Point will shift the pitch of the Voice Pattern accordingly (with C2 as the original base pitch), and playing keys to the right of the Split Point will play notes normally, without affecting the sequence. If you set the Split Point to a very high setting (above C6, for example), you can shift the pattern from any key, with C2 as the base pitch of the programmed pattern.



sel&norm (Select & Normal): Playing a key to the left of the Split Point will trigger ("select") a specific User Pattern based on C#1 Assign setting (C1 will trigger the Voice Pattern for the current voice), and playing keys to the right of the Split Point will play notes normally, without affecting the sequence. Each User Pattern will play at its programmed pitch. If you set the Split Point to a very high setting (above C6, for example), you can select a different pattern from any key.



sel&shift (Select & Shift): Playing a key to the left of the Split Point will trigger ("select") a specific User Pattern based on C#1 Assign setting (C1 will trigger the Voice Pattern for the current voice), and playing keys to the right of the Split Point will shift the pitch of the selected pattern accordingly. C4 always determines the base pitch of the selected pattern. For example, if the Split Point is set to C3, then C1 plays the Voice Pattern for the selected voice, and 23 different User Patterns can be selected by playing keys C#1 ~ B2, and shifted in pitch by pressing C3 and above, with C4 triggering the original base pitch of the sequence.

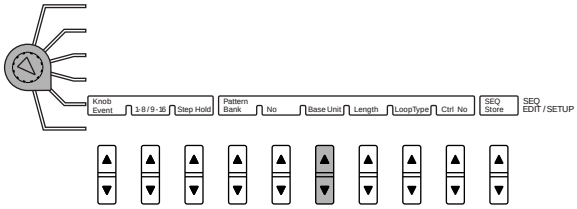


NOTE When "sel&shift" is selected and the Split Point is assigned above C4, then sequence pitch can only be shifted above the base pitch.

NOTE For more information about Keyboard Mode, see page 86. For information about assigning the Split Point, see page 77.

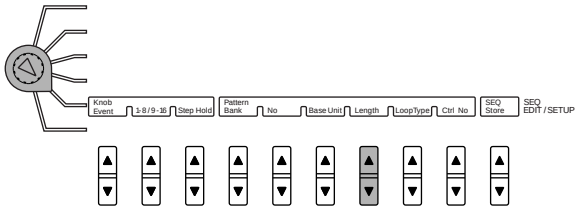
Base Unit And Length

The Base Unit parameter, together with the current Tempo setting (see page 77) designates and completes the timing resolution for the sequence pattern.





The Length parameter setting determines the length of the sequence pattern based on number of steps. One step is equivalent to one note, so based on the Base Unit setting, you can also select odd-numbered steps to create odd-numbered beats (such as setting the Length to "3" for 3/4-time, or to "5" for 5/4-time), as well as create completely unconventional rhythms.

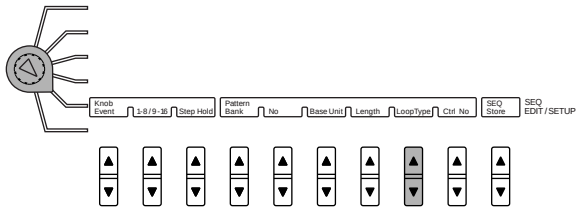




NOTE For more information about Base Unit and Length, see page 91. Also see the section on Arpeggio Subdivide, which is similar to Base Unit, page 34.

Loop Type

The Loop Type parameter lets you determine the type of loop cycle for the sequence pattern. The pattern always loops, and you can designate it to loop either forward, backward, or designate one of two alternating forward/backward types.





NOTE For more information about Loop Type, see page 91.

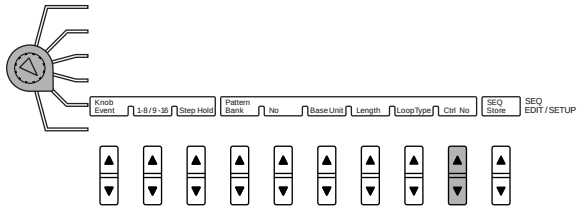
Scene Switch

The Scene Switch setting (in the VOICE ARPEGGIO/SEQ menu) determines whether the Step Sequencer Pattern will play Scene 1, Scene 2, or both Scenes. The current Scene status will also affect how the Scenes play.



Control Number

The Control Number setting determines the type of MIDI Control Change message which can be output by each event upon sequencer play. Once the Control Number is set, the Control Change event is selected with (Knob) Event [UP/DOWN], and the value to be output via each step is edited with the corresponding CONTROL knob.



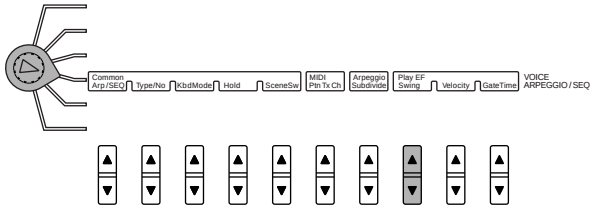


NOTE For more information, see page 91. For more information about MIDI Control Change messages, see page 109.

Play Effects

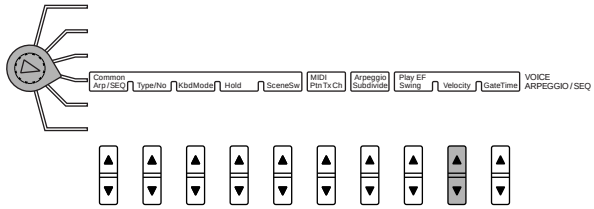
The Play Effect ("Play EF") parameters let you designate settings which can permit the Step Sequencer pattern to obtain a more human "feel". (Or even a less one, if that's what you're going for!) There are three Play Effect parameters, Swing, Velocity and Gate Time.

Swing: Lets you create a "swing" feel by slightly shifting certain beats.



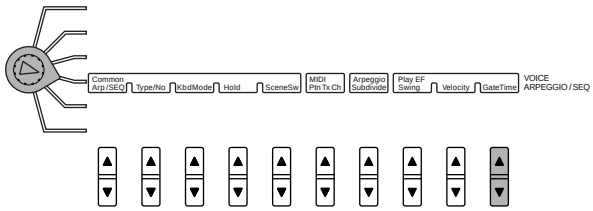


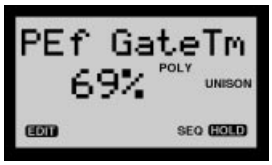
Velocity: Lets you set the ratio between lower and higher velocity values of each step.





Gate Time: Lets you adjust the note length (the duration of the note) either shorter or longer, as a percentage of the original.





NOTE For more information about Play Effects and available settings, see page 88.

Exploring The Factory-set Patterns

To help get a clearer understanding of how the various Step Sequencer-related parameters and settings work, you may want to take some time and systematically examine the details of some of the factory-set voices which are specially programmed to demonstrate the power and range of the Step Sequencer, and change the various settings to analyze the possible effects.

As an example, use the PROGRAM CHANGE keypad to select "Sq:011 Alan", then trigger the pattern.



This voice uses the Hold function, so the pattern will play repeatedly as you check the various settings, as follows:

1. **Notice which Layer mode appears in the LCD. Check KbdMode and Scene Switch settings, as well as Play Effect settings in the VOICE ARPEGGIO/SEQ menu.**

2. **Check the Split Point in the VOICE COMMON menu.**

3. **Set the [EDIT ROTARY] switch to the SEQ EDIT/SETUP menu and check the Base Unit, Length and Loop Type settings.**

4. **Repeat the basic process above for each voice which uses the Step Sequencer.**

While you're at it, why not go ahead and step through some of the factory-set Voice and User Pattern while the sequence is looping? Press (Pattern) Bank [UP/DOWN] to select the Voice or User Pattern bank, then press (Pattern) No [UP/DOWN] to select and listen to each pattern.

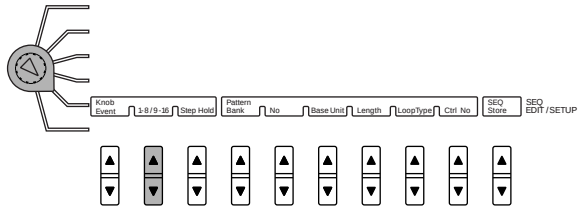
And don't be shy about playing around with the different parameter settings and see what effect they have on the sequence. If you stumble upon something that sounds good along the way, you might want to go ahead and store the edited voice to another voice location before you lose it! If things get too far out of hand, simply reselect the same voice with the PROGRAM CHANGE keypad and start over! It won't take too long to get a clear understanding of how the different settings work together to let you create and play your own hot sequences.

Step Sequencer Edit

Creating your own Step Sequencer patterns is a simple and straightforward process. When the [EDIT ROTARY] switch is set to the SEQ EDIT/SETUP menu, each CONTROL knob is used to edit Note, Velocity, Gate Time and Control Change values for a single step.

First decide the Base Unit and Length for the sequence pattern. Then, editing each step is simple.

Each knob as positioned on the panel (1-8) relates to the corresponding sequence step (either 1-8 or 9-16, respectively). Press 1-8/9-16 [UP/DOWN] to toggle back and forth between which series of steps are available for data entry using the eight CONTROL knobs.





Simply pressing a CONTROL knob will display the currently selected step and Knob Event parameter name, as well as the current parameter value setting, in the LCD. Turning a knob will edit the value.

Event parameter name:
Select with (Knob) Event parameter

Step number:
Depends on selected knob and (Knob) 1-8/9-16 setting

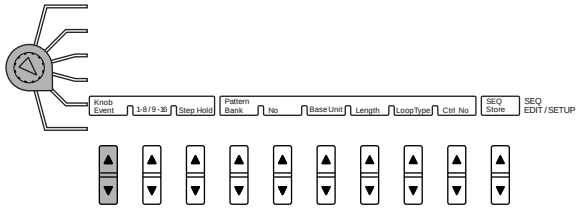


Event parameter value:
Turn the knob to edit

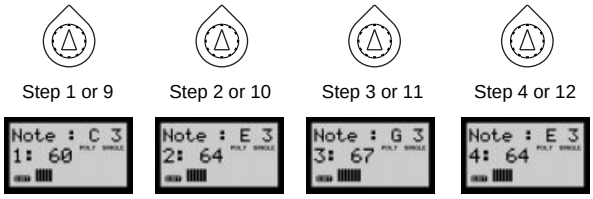
Knob Event Parameters

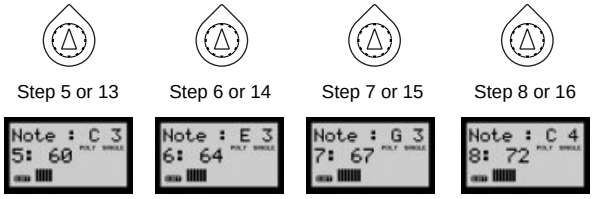
To designate which type of event to edit by the CONTROL knobs, set the [EDIT ROTARY] switch to the SEQ EDIT/SETUP menu and press Event [UP/DOWN]. There are four types of events to choose from.

Note (C-2 ~ G8): Lets you select the note for the step.









NOTE You can choose a note to assign to each step by turning the knobs during Step Sequencer playback.

Velocity (0 ~ 127): Lets you set the velocity level for the step.



Gate Time (1 ~ 200%): Lets you determine the note duration for the step.



Control Change (0 ~ 127): Lets you set the value of the MIDI Control Change message to be output by the step.

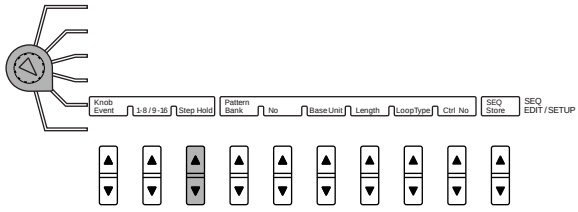


NOTE Control Change setting (off, CC1~95, After Touch) is determined by the Control No (Number) parameter in the SEQ EDIT/SETUP menu. For more information, see page 91.

NOTE For more information about Event parameters, see page 89.

Step Hold

The Step Hold function is used during step event editing. When you press Step Hold [UP/DOWN] and set it to "on", a single step will play repeatedly, based on the Tempo and Pattern Base Unit settings, in order to fine-tune the events for the specific step. This lets you adjust the various event settings in context with the speed and resolution of the sequence.





Each time you press a different CONTROL knob's push switch while Step Hold is active, that step will be played, and its information will appear in the LCD. Turning a CONTROL knob will edit the current event value of the selected step.

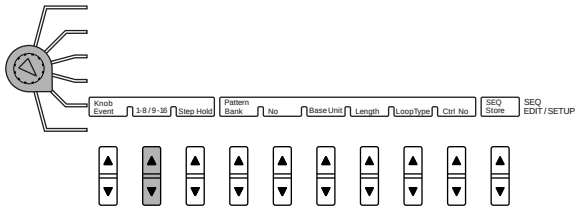
While Step Hold is active, you can press Event [UP/DOWN] to select the type of event you want to edit, then turn the CONTROL knob accordingly.

To turn the Step Hold function off, simply press Step Hold [UP/DOWN] again and switch it to "off".

NOTE For more information, see page 89.

1-8 / 9-16

Press 1-8/9-16 [UP/DOWN] to choose the step series within which the step you want to edit is, then press a CONTROL knob's push-switch to select a specific step. Current information about the step will display in the LCD.





Storing Step Sequences

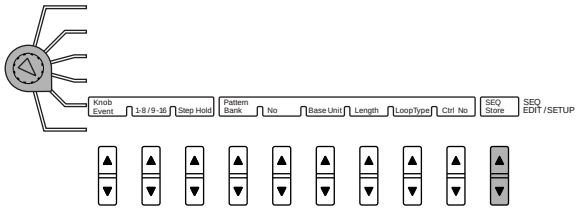
Depending on whether the Step Sequencer is in Single Pattern Play or Pattern Select Play status, you can do the following:

- Perform a Voice Store operation to store the current Voice Pattern data in the Voice edit buffer as voice data (in Single Pattern Play status).

NOTE For information about performing a Voice Store operation, see page 98.

- Perform a Sequence Store operation to store the currently selected pattern to any User Pattern memory (in Single Pattern Play or Pattern Select Play status).

SEQ Store Operation





1. **Press SEQ Store [UP/DOWN] to select the user pattern location. "SURE? [Y/N]" and "Bank User" flash alternately in the LCD.**



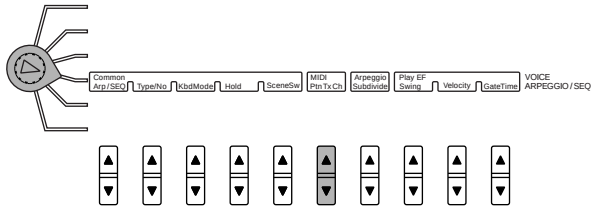
2. **Press [YES/ENTER] to store the pattern, or [NO] to cancel the operation**



NOTE The SEQ Store operation temporarily stores the pattern currently playing to the pattern edit buffer, so be sure to perform a Voice Store operation (see page 98) before selecting another voice.

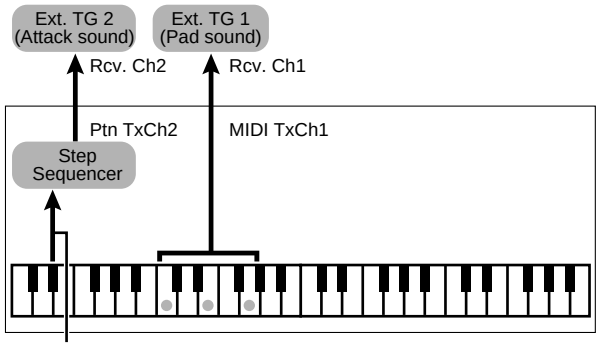
Step Sequencer MIDI Output

You can use the MIDI Pattern Transmit Channel ("PtnTxCh") parameter to designate a MIDI channel on which to output the Step Sequencer pattern data, to either play an external tone generator or record the data into a MIDI sequencer or computer.





This setting is independent from the MIDI Transmit Channel ("MIDI Tx Ch") in the UTILITY SETUP menu (see page 93), but you can either set them both to the same channel or different channels, depending on your requirements. The diagram below shows an example of how they can be set to different channels to control two different external tone generators.



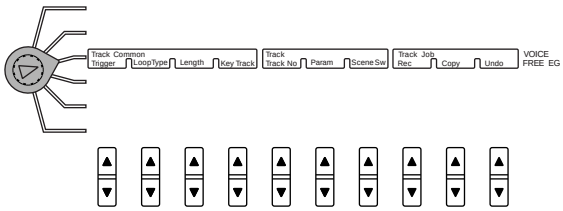
(Depends on Keyboard Mode setting)

NOTE For information about setting the MIDI Pattern Transmit Channel ("MIDI PtnTxCh"), see page 87.

NOTE The MIDI PtnTxCh setting is a system parameter, and will not be saved as voice data.

Using The Free EG

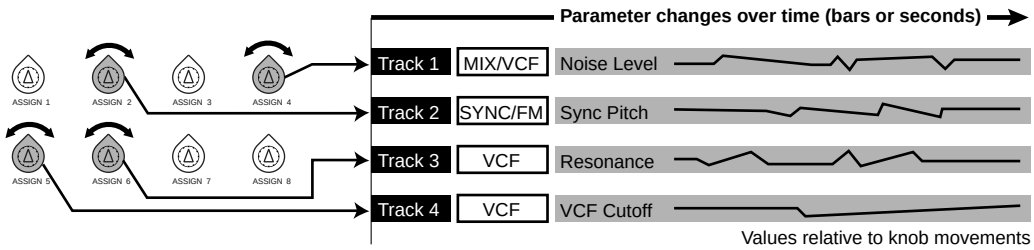
The Free EG is a special 4-track recorder for recording real-time knob position movements, one parameter per track. Subsequently, when you play the voice, the data of the parameter assigned to each track will automatically change in accordance with the way you recorded it.



The Free EG is extremely flexible. You can record each parameter in separate track passes, or all tracks simultaneously in one pass. You can specify the length of time the Free EG will record or play back, either in measures (up to eight bars, based on Tempo setting), or "absolute" time (up to 16.0 seconds), as well as have the Free EG loop in one of four ways as you hold the keys.

You can copy Free EG data from another track to the current track, within the same voice as well as from another voice. And since Free EG track data and settings are voice parameters, they are stored as voice data when you perform a Voice Store operation.

NOTE For information about the Free EG recording procedure, see page 84.

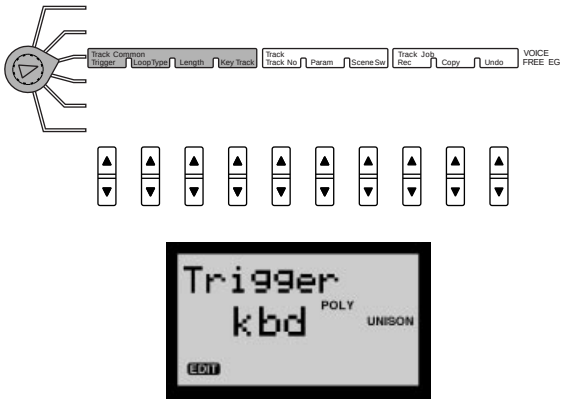


Free EG Parameters

There are three categories of Free EG parameters: (1) Track Common, which includes settings that affect all four tracks of data for recording and play; (2) Track, or settings which determine the current Free EG track, the parameter assigned to each track, and which Scene the Free EG will play; and (3) Track Job, for recording a track (or all tracks) and performing track copy operations. Following is a brief description of parameters available in each category.

Track Common Parameters

Trigger: Determines how the track playback is triggered, either by pressing a key on the AN1x's keyboard after selecting a voice ("free"), a Note On message from the keyboard or an external MIDI device ("kbd"), or by a Note On message from either the keyboard, an external device, the Arpeggiator or Step Sequencer ("all").



NOTE For more information, see page 81.

Loop Type: Determines the type of loop for play of the Free EG sequence, either to play once but not loop (“off”), to loop forward from beginning to end (“fwd”), to loop forward from middle to end (“half”), to Alternate, i.e., loop from beginning to end then end to beginning (“alt”), or to Half Alternate, i.e., loop from middle to end then end to middle (“half”).



NOTE For more information, see page 82.

Length: Determines the time for recording and play of the Free EG sequence, either by number of measures (between 1/2 and 8 bars; determined by Tempo setting) or in absolute time (between 1.0 and 16.0 seconds).



NOTE For more information, see page 82.

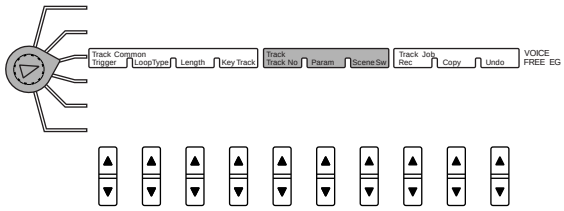
Key Track: Determines the length of the Free EG in relation to notes played on the keyboard, using C3 as the basic note length, where positive values decrease the length when you play in the higher register, and negative values decrease the length when you play in the lower register. (A setting of “0” has no effect.)



NOTE For more information, see page 82.

Track Parameters

Track No (Track Number): Selects a Free EG track (“Trk1” ~ “Trk4”).





NOTE For more information, see page 83.

Param (Parameter): Determines which knob parameter will be played by the data in the track.



NOTE For more information, see page 83.

NOTE Only one parameter can be selected for a track. For information about available parameters, see the separate Data List book.

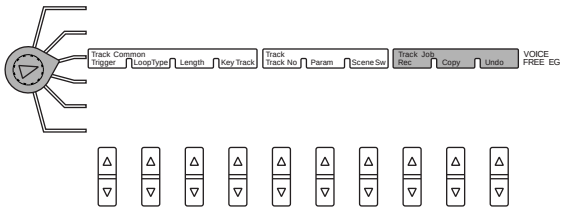
SceneSw (Scene Switch): Determines which Scene (or if both Scenes) will be played by the selected Free EG track.



NOTE For more information, see page 83.

Track Job Parameters

Rec (Record): Determines how a Free EG record operation will be executed (i.e., either the selected track or all tracks). Pressing a key on the keyboard starts recording.





NOTE For more information, see page 83.

Copy: For copying the Free EG data of a track in the current voice to the currently selected track, or copying the data of any track in any voice to the currently selected track of the current voice.



NOTE For more information, see page 83.

Undo: Lets you "undo" as well as "redo" the most previous Free EG copy or record operation.



NOTE For more information, see page 84.

NOTE When copying a track, only track data is copied. Scene status is not copied.

Free EG Base Position

Knob positions are recorded in a Free EG track as increases (positive values) and decreases (negative values) to the "base" position of the knob, or the position at which the knob is located when you first move it. After Free EG recording, if you change the knob parameter, you also change the base position accordingly. For example, if the knob base position is set too high, the Free EG data changes may occur out of the range of the assigned track parameter. Therefore, take care not to set the knob base position too high.

Using The Control Features

The AN1x is equipped with a variety of control features that can be used while playing (or editing) the instrument, and flexible controller assignment features which determine the parameter that will be controlled by any given controller. These functions work together to give you sophisticated expressive control over the sound of both the AN1x itself as well as any connected MIDI instruments.

Real-time Control

The AN1x's real-time controllers include all on-board sound control features manipulated by hand or foot, which also can output continuous Control Change data via MIDI, including the eight CONTROL knobs, the [MODULATION] wheel, the [PITCH] wheel, the [RIBBON] controller (with both horizontal X-axis and Z-axis push control), and [FOOT CONTROLLER], [FOOT VOLUME] and controllers (as assigned in the Utility Control Assign function).

Also included are the various switches, such as the [FOOTSWITCH] and [PORTAMENTO] and other panel switches, which output a specific discrete (on/off) MIDI Control Change message each time they are pressed. The PROGRAM CHANGE keypad outputs MIDI Program Change messages each time a voice is selected.

Continuous And Discrete Controllers

Continuous type controllers send a continuous stream of Control Change data (between 000, or minimum, and 127, or maximum) as you move them.

The [FOOT CONTROLLER] and [FOOT VOLUME] jacks on the AN1x's rear panel is for use with "continuous" Foot Controllers (such as the Yamaha FC7). The [FOOTSWITCH] jack is for use with "discrete" on/off Footswitches (such as the Yamaha FC4 or FC5). These can be used to control various AN1x functions as well as external MIDI devices.

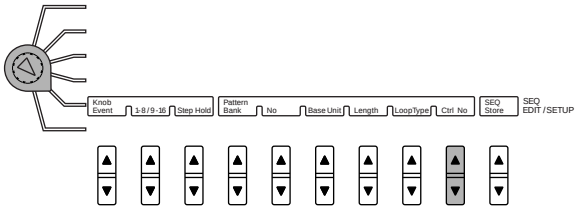
Continuous parameters which can be controlled include Modulation Depth, Volume, Panpot, Expression, Pitch Control, Attack, Decay, Release, Vibrato Speed, Pan Range, Effect Depth, Reverb Depth, and much more, if you make appropriate settings in the Control Matrix.

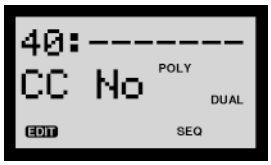
Continuous/discrete parameters which can be controlled include Sustain, Sostenuto and Soft.

You can use a continuous controller to send discrete messages, where 000~063 represents "off" and 064~127 represents "on", but for best results and ease of operation, use an on/off Footswitch.

Step Sequencer Event Control

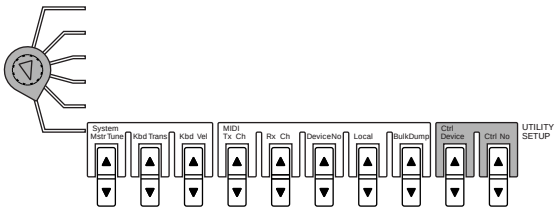
The Step Sequencer's Ctrl No (Control Number) parameter lets you determine the type of MIDI Control Change which can be output upon sequencer play. Once the Control Number is set, the Control Change event is selected with Knob Event parameter [UP/DOWN] and the value to be output via each step is edited with the CONTROL knobs. For more information, see page 91.





Utility Control Assign Function

Control parameters in the UTILITY SETUP menu let you designate the type of Control Change messages which can be controled by the [MODULATION] wheel, each of the eight CONTROL knobs, the [RIBBON] controller (X-axis and Z-axis), etc., by assigning Control Change numbers to specific "Device" controllers. For more information, see page 95.



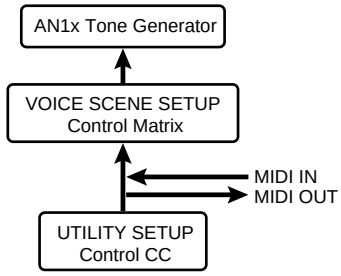


Based on settings in the Control Assign function as well as in the Control Matrix, you can use a single controller to control one parameter of the internal tone generator and another parameter of an external MIDI device, both at the same time. It also lets you determine which device (MW, FC, etc.) to use for Scene Control (see page 20).

Controllers which can be assigned using the UTILITY SETUP Control function:

MW — Modulation Wheel
FV — Foot Volume
FC — Foot Controller
FS — Footswitch
RbnX — Ribbon Controller X-axis
RbnZ — Ribbon Controller Z-axis
Knob1~8 — Assign group knobs 1 ~ 8
SCENE — Scene Control controller

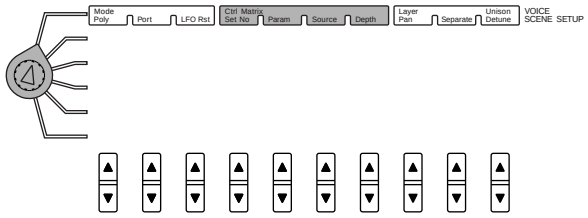
Between the Control Assign function (system) knob assignments and Control Matrix (voice) knob assignments, you can configure a monster knob control system where each knob simultaneously controls either the same Control Change parameter for the internal tone generator as for an external tone generator, or different parameters for the internal and external tone generator.



NOTE For more information about each parameter, see the separate Data List book. For information about the procedure for assigning controllers, see page 95.

Control Matrix

Control Matrix parameters apply to the internal tone generator only. It determines how MIDI Control Change messages generated by the on-board controllers (eight CONTROL knobs, [MODULATION] wheel, [FOOT CONTROLLER], [RIBBON] controller, etc.), as well as messages generated by external devices received at the MIDI [IN] terminal, are routed to the AN1x's tone generator, as well as the depth range of control.

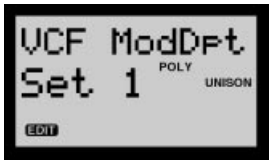


The Control Matrix is a configuration of 16 Sets of control setup, plus Pitch Bend parameters and two sets of Common parameters. The 16 parameter Sets and Pitch Bend parameters apply to each Scene separately, and the Common parameters apply to the voice. Following is a brief description of each.

Set No: For selecting Pitch Bend Pitch Up and Down (each Scene), the number of the Set (1-16; for each Scene), and Common (1 and 2; both Scenes) parameter assignments.



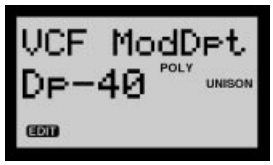
Parameter: Determines which parameter is assigned to the Scene Set Number (1-16) or Pitch Bend, or Common Set (1-2).



Source: Determines which controller (by Control Change number) is assigned to control the corresponding Parameter.



Depth: Determines the control range of the Source controller. When set to "Dirct" (0 setting), the Direct Control function is activated, and you can directly edit the parameter assigned to the controller within its original range. For more information, see page 75.



NOTE For more information about each parameter, available settings, and how to assign parameters and controllers using the Control Matrix, see page 73.

NOTE For information about MIDI and MIDI Control Change messages, see page 109.

FEATURE REFERENCE

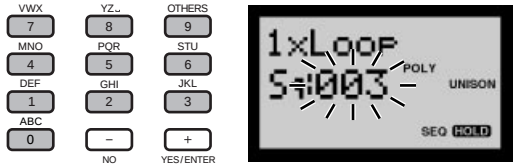
This section provides a list of the many AN1x parameters and a description of each for reference purposes. Check the CONTENTS or INDEX to locate the page number of the parameter you need.

Voice Select

You can select a voice for play from among the 128 voices in memory. There are two procedures for doing so, as listed below.

Procedure 1

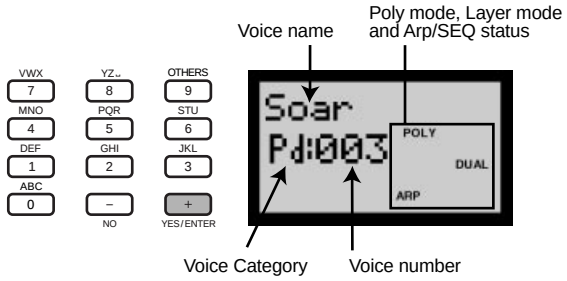
1. **Enter a number between [1] and [128] in the PROGRAM CHANGE keypad. The voice number that you enter will start flashing in the LCD.**



NOTE When the voice number is flashing, pressing [NO] will cancel the voice select operation and the LCD will revert to the previous condition.

2. **When the voice number is flashing, pressing [YES/ENTER] will call up the voice assigned to the number which you entered.**

The voice name, voice Category and voice number will display in the LCD, along with the Poly mode, Layer mode and Arpeggiator/Sequencer (on/off) status.



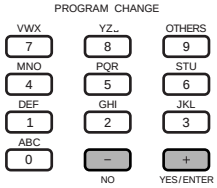
NOTE For additional information see Poly mode, page 72, Layer mode, page 22, Arpeggiator, page 33, and Step Sequencer, page 37.

Procedure 2

1. **Press [+] to increment through the voices sequentially.**

2. **Press [-] to decrement through the voices sequentially.**

In this case you do not need to press [YES/ENTER], as the voice is called up with each press of the [+] or [-] key.



When a voice is selected, a MIDI Program Change message is transmitted to the AN1x's internal tone generator and the MIDI [OUT] terminal. Voice numbers 001 ~ 128 correspond to Program Change numbers 000 ~ 127, respectively. (For information about MIDI, see page 109.)

Knob Edit

The eight CONTROL knobs let you edit various characteristics of each voice in real-time. Edited data of the selected voice can be stored to any voice memory (1 ~ 128).

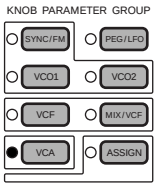
The function of each knob depends on which KNOB PARAMETER GROUP switch is selected. Available parameter groups are as follows:

SYNC/FM: Sync function/Frequency Modulation
PEG/LFO: Pitch Envelope Generator/Low Frequency Oscillator
VCO1: Voltage Controlled Oscillator 1
VCO2: Voltage Controlled Oscillator 2
VCF: Voltage Controlled Filter
MIX/VCF: Mixer/Voltage Controlled Filter
VCA: Voltage Controlled Amplifier
ASSIGN: Assigned knob parameters

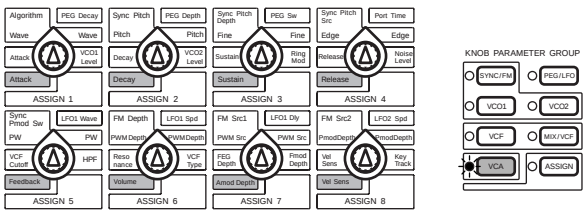
NOTE For more information about the CONTROL knobs, see page 26.

NOTE A blank chart for writing down parameter values of user voices is provided on page 114.

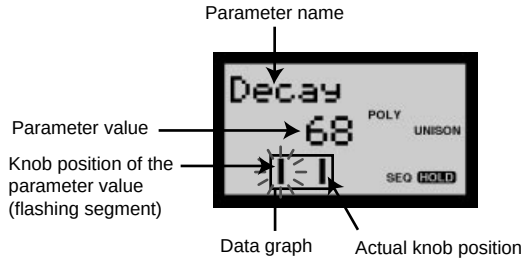
1. Press a KNOB PARAMETER GROUP switch. The LED to the left of the selected switch lights.



The parameter available to control or edit for each knob is printed on the panel by each knob, color coded to match the related KNOB PARAMETER GROUP switch. For example, if [VCA] (white switch) is selected, each knob accesses the parameter printed in the white area to the lower left of the knob: Attack, Decay, Sustain, Release, Feedback, Volume, Amod Depth, and Vel Sens, respectively.

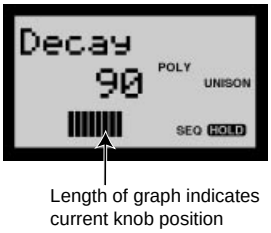


2. Press a CONTROL knob without turning it.
The parameter name, current value and a horizontal knob data graph will display in the LCD. A flashing segment in the data graph indicates the value position of the knob, whereas shaded segments indicate the actual current position of the knob.



3. Turn the knob one way or the other to edit the value of the parameter.
Turning the knob to the right increases the value and turning it to the left decreases the value.

The knob data graph provides a visual reference of the current knob position as you turn the knob. Leftward positions are indicated by a shorter horizontal bar, and rightward positions are indicated by a longer bar.



NOTE You can omit step 2 and edit the parameter directly by turning the knob. Edit information will display in the LCD accordingly.

NOTE Simply turning a knob will increase or decrease the parameter value in coarse values (large amounts), and will cancel the flashing indicator. Turning a knob while pressing it will increase or decrease the parameter value in fine values (small amounts), and will position the flashing indicator, which will remain flashing when you subsequently release the knob. The range will be narrower than that available by coarse edit.

4. Edit other parameters.
To confirm and edit other parameters in the same group, simply repeat steps 2 and 3. To edit parameters in other groups, repeat steps 1 through 3.

NOTE All the changes made here take place in the selected Scene.

5. Store the edited voice.

When you've completed the editing procedure and wish to store the edited knob parameters, you can store it as a new voice in any desired voice location (1 ~ 128). For details, see Voice Store, page 98.

NOTE If you turn off the AN1x, or if the adaptor gets disconnected by accident, your edited data will still remain in memory when you turn the power back on. Always be sure to store important voice data.

NOTE Always be sure to store your edited voice before selecting a different voice, or you will lose your edited data (see Voice Store, page 98). If you should inadvertently forget to store your edited data before selecting a different voice, you can use the Voice Recall function to retrieve the edited data. For details, see page 96.

NOTE While you're editing, you can confirm the current voice number and name at any time by pressing [+] or [-] once to display it in the LCD. Subsequently, you can continue editing by pressing or turning a knob.

Edit Mark

When a voice parameter is changed, the Edit mark will display in reverse type in the LCD. The Edit mark indicates that voice data has been changed from the original but has not yet been stored.



Voice Recall

If you select a different voice before storing important voice data, you can use the Voice Recall function to retrieve the edited voice data. For details, see page 96.

Knob Parameters

This section provides a description of each parameter available for control or edit in each KNOB PARAMETER GROUP.

KNOB PARAMETER GROUP

PEG/LFO	PEG Decay	PEG Depth	PEG Sw	Port Time	LFO1 Wave	LFO1 Spd	LFO1 Dly	LFO2 Spd
SYNC/FM	Algorithm	Sync Pitch	Sync Pitch Depth	Sync Pitch Src	Sync Pmod Sw	FM Depth	FM Src 1	FM Src 2
VCO1	Wave	Pitch	Fine	Edge	PW	PWM Depth	PWM Src	PmodDepth
VCO2	Wave	Pitch	Fine	Edge	PW	PWM Depth	PWM Src	PmodDepth
VCF	Attack	Decay	Sustain	Release	VCF Cutoff	Resonance	FEG Depth	Vel Sens
MIX/VCF	VCO1 Level	VCO2 Level	Ring Mod	Noise Level	HPF	VCF Type	Fmod Depth	Key Track
VCA	Attack	Decay	Sustain	Release	Feedback	Volume	Amod Depth	Vel Sens
ASSIGN	ASSIGN 1	ASSIGN 2	ASSIGN 3	ASSIGN 4	ASSIGN 5	ASSIGN 6	ASSIGN 7	ASSIGN 8

PEG / LFO

When KNOB PARAMETER GROUP switch [PEG/LFO] is selected, the eight CONTROL knobs will access specific Pitch Envelope Generator- and Low Frequency Oscillator-related parameters.

The PEG controls the envelope of how the pitch of a voice changes over time, from when a key is pressed, held, then released, and how long it takes for the sound to terminate.

The LFO is an oscillator that generates low frequency signals used to modulate the VCO (for pitch modulation, or vibrato), the VCF (for filter modulation, or wah) or the VCA (for amplitude modulation, or tremolo). The AN1x has two separate LFOs, LFO1 and LFO2.

NOTE For more information about the PEG and LFOs, see pages 31, 32.

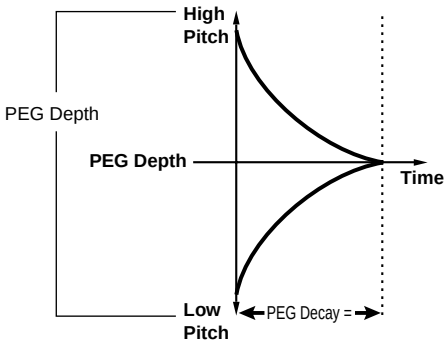
PEG Decay

The PEG Decay setting determines the time required for a sound to reach its basic pitch from the PEG Depth level while the key is held.



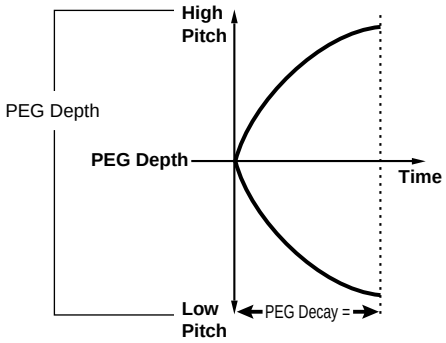
The following graph shows how the decay changes when a key is pressed if a positive PEG Decay value is set.

PEG Decay = Positive setting



The following graph shows how the decay changes when a key is pressed if a negative PEG Decay value is set.

PEG Decay = Negative setting



Settings: -64 ~ 0 ~ +63

PEG Depth

The PEG Depth setting determines the pitch in semitones. When PEG Decay (see above) is set to a positive value, the PEG Depth setting represents the start pitch. When PEG Decay is set to a negative value, the PEG Depth setting represents the end pitch.



Turning the knob to the left lowers the pitch, while turning it to the right raises the pitch. When the knob is set to center position (basic pitch), the pitch will not change.

Settings: -64 ~ 0 (basic pitch) ~ +63

NOTE See the PEG Decay graphs (at left) for an illustration of the relationship between PEG Depth and PEG Decay.

PEG Sw (PEG Switch)

The PEG Switch setting determines which VCO the PEG is applied to, VCO1, VCO2, or both VCO1 and VCO2. Applying the PEG to the VCO1 or VCO2 can simulate the delicate pitch change of a wind instrument.



Settings: VCO1, VCO2, both

Port Time **(Portamento Time)**

Portamento is an effect commonly used in singing or when playing a bowed instrument, where the sound is carried in a continuous glide from one note (or more) to the next, through all the intermediate pitches.

The Portamento Time setting determines the time it takes for the pitch to reach the subsequent note played. Lower values result in a faster pitch change, and higher values result in a slower pitch change.



Settings: 0 ~ 127

NOTE For more information about Portamento, see page 24.

NOTE When the Portamento is turned off (by the [PORTAMENTO] switch), "– – –" will flash in the LCD, to indicate that the portamento function is not available for confirmation.

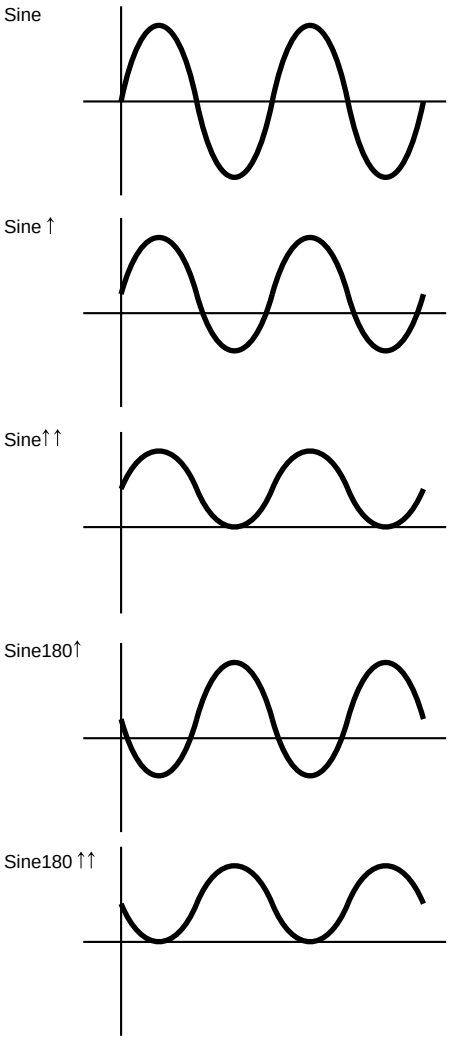
LFO1 Wave

The LFO1 Wave setting determines the type of wave for LFO1. The wave set here determines the characteristics of the modulation applied to the VCO (vibrato), VCF (wah) and VCA (tremolo). There are 21 wave types, as shown at right and the following pages.



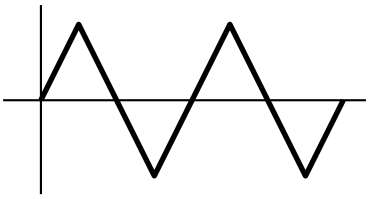
Settings:
sine, sine↑, sine ↑↑, sine180↑, sine180↑↑, tri, tri↑, tri↑↑, tri180↑, tri180↑↑, squ, squ↑↑, squ180↑↑, saw dwn, saw dwn↑↑, saw up, saw up ↑↑, s/h, s/h↑↑, s/h2, s/h2↑↑

Sine Wave

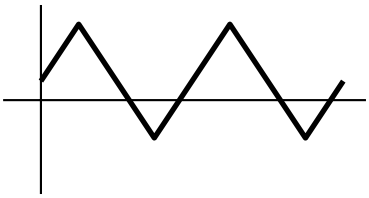


Tri (Triangle) Wave

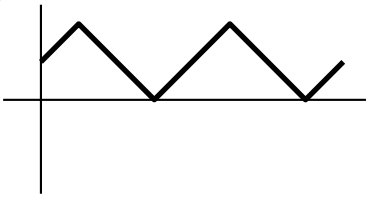
Triangle



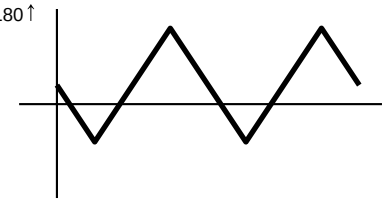
Triangle ↑



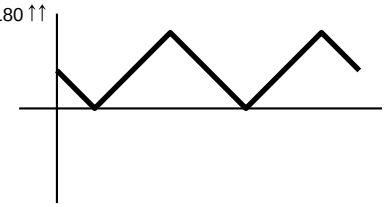
Triangle ↑↑



Triangle180 ↑

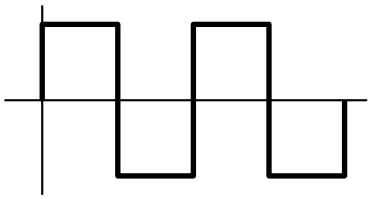


Triangle180 ↑↑

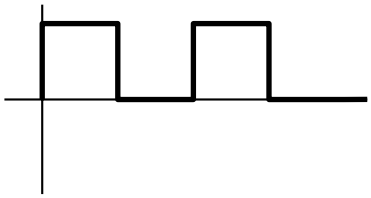


Squ (Square) Wave

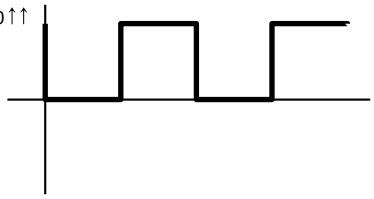
Square



Square ↑↑

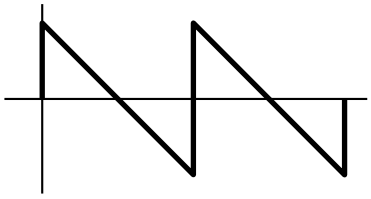


Square180 ↑↑

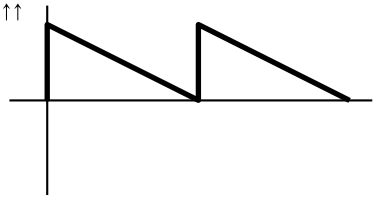


Saw (Sawtooth) Wave

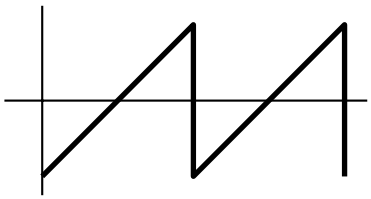
Saw down



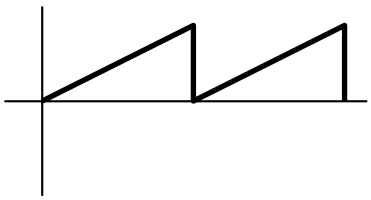
Saw down ↑↑



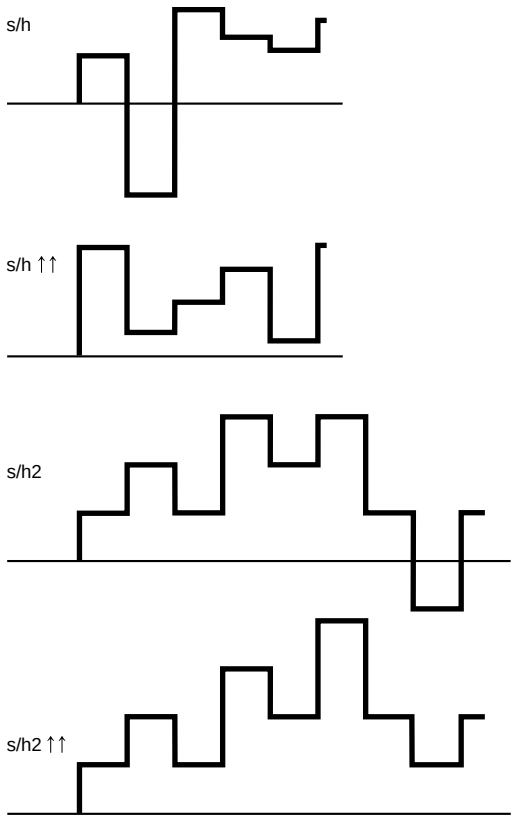
Saw up



Saw up ↑↑



s/h (Sample & Hold) Wave



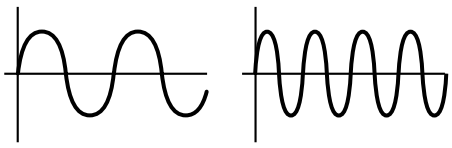
NOTE Compared with "s/h", s/h2 is biased to the positive range.

LFO1 Spd (LFO1 Speed)

The LFO1 Speed setting determines the rate of LFO1. Turning the knob to the left results in slower rates and turning it to the right results in faster rates. (For details about the LFO Reset function, see page 73.)



Slow Speed **Fast Speed**



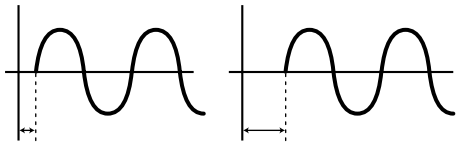
Settings: 1 ~ 256

LFO1 Dly (LFO1 Delay)

The LFO1 Delay setting determines the delay time of the modulation. Turning the knob to the left results in shorter LFO1 Delay times, and turning it to the right results in longer Delay times.



Short Delay **Long Delay**



Settings: 0 ~ 127

LFO2 Spd (LFO2 Speed)

Description, parameters and values for LFO2 Speed are the same as for LFO1 Speed, above.

NOTE The LFO2 wave is fixed to "triangle", and cannot be changed.

SYNC/FM

When KNOB PARAMETER GROUP switch [SYNC/FM] is selected, the eight CONTROL knobs will access specific Sync function- and Frequency Modulation-related parameters.

Sync parameters are related to the synchronization status of the two VCO1 oscillators (master and slave), which are the fundamental waveform generating elements in the AN1x.

A Frequency Modulation (FM) signal ("modulator") can be applied to the VCO1 in one of several ways to change its frequency, in which case the output of the oscillator will become the modulated signal ("carrier").

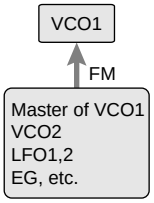
NOTE For more information about Sync and FM, pages 31, 59.

Algorithm

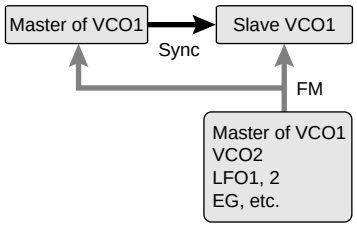
The Algorithm setting determines how the two VCO1 oscillators (master and slave) are connected in relation to the FM signal. There are four types of connections, or “algorithms”, as shown in the diagrams below.

Settings: only FM, Sync+FMbth, Sync+FMmst, Sync+FMslv

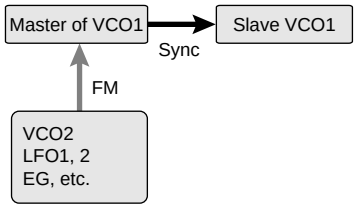
only FM (Sync is disabled)



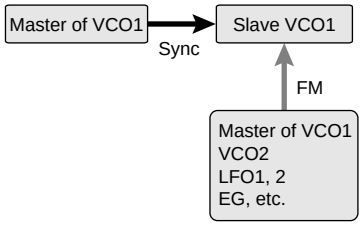
Sync+FMbth (Sync is enabled and FM is applied to both master and Slave oscillators)



Sync+FMmst (Sync is enabled and FM is applied to the master oscillator)



Sync+FMslv (Sync is enabled and FM is applied to the slave oscillator)



NOTE When set to "only FM", the master and slave oscillators are disabled and the VCO1 becomes a single oscillator.

NOTE For more information about Sync and FM, see pages 31, 59.

Sync Pitch

The Sync Pitch setting determines the pitch of the slave oscillator in semitones, available only when the Sync is on. This lets you create a difference in pitch between master and slave oscillators and control the resulting harmonic interval.

When the knob is in the center position, the pitch is the same as the master oscillator. Turning the knob to the right increases the interval, and turning it to the left results in a softer sound.



Settings: -64 ~ 0 ~ + 63

NOTE To achieve a discernible result, make sure the VCO1 Level (page 66) is turned up high enough.

NOTE The Sync Pitch function is effective only when the Algorithm type is set to one besides "only FM".

Sync Pitch Depth

The Sync Pitch Depth setting determines the amount of depth of control from the Sync Pitch Source (determined by the Sync Pitch Source setting, below) over time. Turning the knob to the right increases the Depth.



Settings: -64 ~ 0 ~ + 63

Sync Pitch Src (Sync Pitch Source)

The Sync Pitch Source setting determines the source which applies the modulation over time to the slave oscillator.



Settings: fixed, PEG, FEG, LFO1, LFO2

NOTE When set to "fixed", there is no change in modulation over time.

Sync Pmod Sw (Sync Pitch Modulation Switch)

The Sync Pitch Modulation Switch setting determines which oscillator (master, slave, or both) is modulated by the LFO1. Depth rate is determined by the VC01 Pmod Depth setting (see page 63).



Settings: mastr, slave, both

NOTE Pitch Modulation cannot be controlled by LFO2.

FM Depth

The FM Depth setting determines the amount of modulation created by FM Source 1 (see next parameter). Turning the knob to the right increases the Depth.



Settings: -64 ~ 0 ~ +63

NOTE This is a different type of parameter than that used in the Yamaha DX-series FM synthesizers. Too deep of a setting will change the pitch of the voice. Adjust the pitch using the VCO1 Pitch and Fine parameters (see pages 61, 62).

FM Src1 (FM Source 1)

The FM Source 1 setting determines the modulation source which controls the FM Depth (see previous parameter).



Settings: fixed, PEG, FEG, LFO1, LFO2

NOTE When set to "fixed", there is no change in modulation over time.

FM Src2 (FM Source 2)

The FM Source 2 setting determines the source wave which modulates the VCO1 wave.



Settings: VCO2, VCO1, VCO1s (sub oscillator), PEG, FEG, LFO1, LFO2

VCO 1

When KNOB PARAMETER GROUP switch [VCO1] is selected, the eight CONTROL knobs will access specific Voltage Controlled Oscillator 1-related parameters, including wave selection, pitch specification and wave control.

NOTE For more information about VCO1, see pages 10, 30.

Wave

The Wave setting determines the VCO1 wave. Available waves depend on the current SYNC status (on/off).



Settings:

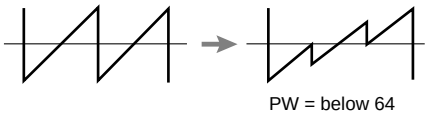
When SYNC = off: saw, pulse, saw2, mix

When SYNC = on: saw, pulse, Innrl, Innr2, Innr3

NOTE The difference between saw/pulse Sync on and Sync off is only a slight nuance in sound which becomes especially distinctive when the Pulse Width (see page 62) is set to a value other than 64.

saw (Sawtooth)

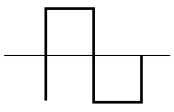
The saw (sawtooth) wave derives its name from its shape, and is used to create a trumpet or violin sound. Since it contains all harmonics in the spectrum, it produces a full, rich sound. When used with the Pulse Width function (see page 62), increasing the even harmonics can raise the pitch to a maximum of a full octave.



PW = below 64

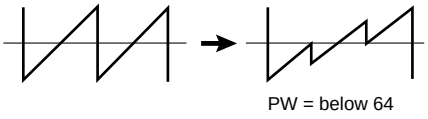
pulse (Square)

The pulse (square) wave is used to make woodwind (clarinet-type) sounds. Its spectrum is similar to a sawtooth wave, but since every second (even-numbered) harmonic is missing, the waveform contains only odd-numbered harmonics when Pulse Width (see page 62) is set to "64".



saw2 (Sawtooth2)

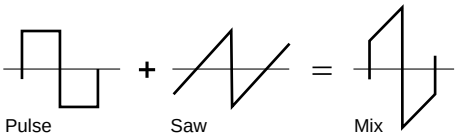
The spectrum of the saw2 wave is created by a sawtooth wave combined with a pulse wave, and therefore is slightly different than the saw1 wave. When the Pulse Width (see page 62) is set to 64, the shape of the wave is the same as saw1. Even if you increase the even-numbered harmonics by the Pulse Width, the basic pitch remains the same.



PW = below 64

mix

The mix wave is formed by a combination of saw and pulse waves.



innr1, innr2, innr3

When SYNC is set to “on”, three “inner” waves (Innr1-3) are available. This wave is effective when used with Pulse Width (see page 62).

Pitch

The Pitch setting determines the pitch of the VCO1 in semitones. Turning the knob to the right raises the Pitch, while turning it to the left lowers the Pitch. The center position (value = 0) is the basic pitch.



Settings: -64 ~ 0 ~ +63

Fine

The Fine (fine tune) setting determines the pitch of the VCO1 in 1-cent steps over a range of 100 cents, or one semitone. Turning the knob to the right raises the pitch, while turning it to the left lowers the pitch. The center position (value = 0) is the basic pitch.

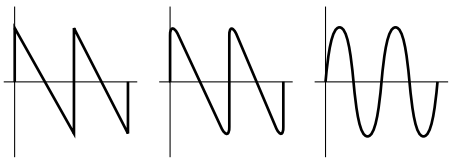


Settings: -50 ~ 0 ~ +50 (cents)

Edge

The Edge setting adjusts the sharpness or smoothness of the edge of the VCO1 wave. Turning the knob to the right produces a sharper wave, resulting in a harsher sound. Turning it to the left produces a rounder wave, resulting in a softer sound. A value of "0" results in a sine wave.





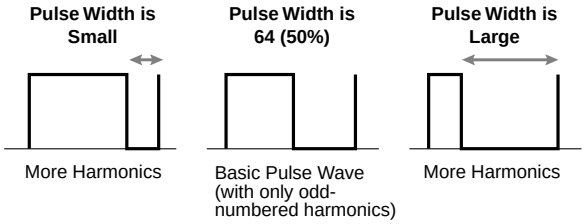
Sharper wave | Rounder wave | Sine wave

Settings: 0 ~ 127

PW (Pulse Width)

The PW setting determines the width of the VCO1 pulse wave. Turning the knob to the right produces more harmonics, resulting in a fatter sound. In general, pulse width is used to control the pulse wave; however, the AN1x can use PW with other waves as well, for a wider possible variety of sounds than usual.





When set to 64, the Pulse Width is equally balanced, generating only odd-numbered harmonics.

Settings: 0 ~ 64 ~ 127 (0% ~ 50% ~ 99%)

PWM Depth (Pulse Width Modulation Depth)

The PWM Depth setting determines the amount of depth of the pulse width modulation of the VCO1, based on the PWM Source wave (see next page). Turning the knob to the right produces a deeper modulation.



Settings: -64 ~ +63

PWM Src **(Pulse Width Modulation Source)**

The PWM source setting selects the source wave which changes the VCO1's pulse width over time, thus determining the behavior of the pulse width.



Settings: fixed, PEG, FEG, LFO1, LFO2, LFO2p, LFO2f

NOTE When set to "fixed", there is no change in modulation over time.

NOTE The Low Frequency Oscillator 2 Phase (LFO2p) shifts the LFO2 wave later by 60 degrees. The Low Frequency Oscillator 2 Fast (LFO2f) slightly speeds up the LFO2 cycle.

PmodDepth **(Pitch Modulation Depth)**

The Pitch Modulation depth setting determines the depth of the pitch modulation of VCO1 by the LFO1. Pitch Modulation adds a cyclical change to the pitch to create a vibrato effect. Turning the knob to the right widens the range of the pitch change. Negative value settings reverse the phase of the LFO1 by 180 degrees.



Settings: -127 ~ +127

VCO2

When KNOB PARAMETER GROUP switch [VCO2] is selected, the eight CONTROL knobs will access specific Voltage Controlled Oscillator 2-related parameters, including wave selection, pitch specification and wave control.

NOTE For more information about VCO2, see pages 10, 30.

Wave

The Wave setting determines the VCO2 wave when the SYNC (see page 59) is turned off.



Settings: saw, pulse, saw2, mix

NOTE Available waves are the same as for VCO1. For a description, see page 61.

Pitch

Fine

Edge

PW

PWMDepth

PWM Src

PmodDepth

(All parameter descriptions are the same as for VCO1; see page 61.)

VCF

When KNOB PARAMETER GROUP switch [VCF] is selected, the eight CONTROL knobs will access specific Voltage Controlled Filter-related parameters.

The VCF is a filter which permits a specific range of frequencies to pass, while cutting off the rest, thus giving you considerable control over many aspects of the timbre. Available parameters include cutoff frequency range of the VCF and range of the resonance.

The VCF can also be controlled by the attack time, decay time, sustain level and release time of the FEG (Filter Envelope Generator), which lets you shape how the timbre of the voice changes over time, from when a key is pressed, held, then released, and subsequently how long it takes for the sound to terminate.

NOTE For more information about the VCF and FEG, see page 31.

Attack

The Attack setting determines the attack time of the FEG, which is the time it takes for the signal to reach its maximum cutoff frequency level after a key is pressed (key on). Turning the knob to the right produces a longer Attack time.



Settings: 0 ~ 127

Decay

The Decay setting determines the decay time of the FEG, which is the time it takes for the signal to reach its sustain level from the maximum level while a key is held. Turning the knob to the right produces a longer Decay time.



Settings: 0 ~ 127

Sustain

The Sustain setting determines the level of sustain of the FEG, which is the fixed level of the cutoff frequency maintained as long as the key is held. Turning the knob to the right increases the Sustain level.



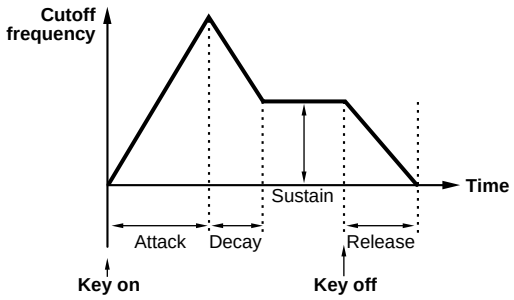
Settings: 0 ~ 127

Release

The Release setting determines the release time of the FEG, which is the time it takes for the signal to reach a level of "0" after a key is released (key off). Turning the knob to the right increases the Release time.



Settings: 0 ~ 127

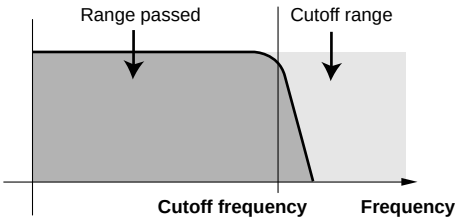


VCF Cutoff

The VCF Cutoff setting determines the cutoff frequency of the VCF. The value set here is related to the assigned VCF Type in the MIX/VCF parameter group (see page 67).

For example, when the filter type is set to Low Pass Filter, the lower frequencies are passed while higher frequencies are cut off. Turning the knob to the right increases the VCF Cutoff frequency, as shown in the graph below.





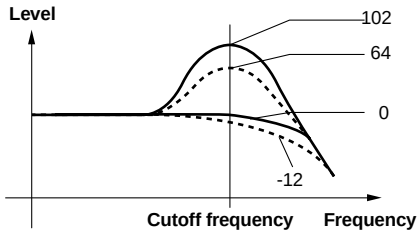
VCF Type = Low Pass Filter

Settings: 0 ~ 127

Resonance

The Resonance setting determines the amount of resonance boost, or emphasis of harmonics near the cutoff frequency. Turning the knob to the right produces a higher resonant peak (producing sharper high tones), while turning it to the left produces a relatively flat response. A setting of "0" applies no resonance.



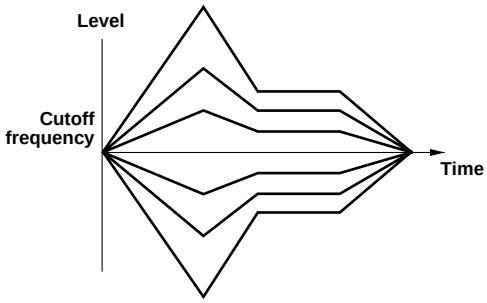


Settings: -12 ~ 0 ~ +102

FEG Depth

The FEG Depth setting determines the range of movement of the cutoff frequency. Turning the knob to the right increases the FEG Depth. Negative values reverse the shape of the envelope. When not using the FEG, set the value to "0".

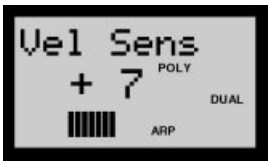




Settings: -128 ~ +127

Vel Sens (Velocity Sensitivity)

The Velocity Sensitivity setting determines how the VCF responds to velocity, or keyboard playing strength. Turning the knob to the right increases dynamic range according to how hard you strike the keys, and turning it to the left produces the opposite effect (i.e., a lighter touch increases the dynamic range and a heavier touch decreases it). A setting of "0" creates no change in dynamic range by playing strength.



Settings: -64 ~ 0 ~ +63

MIX / VCF **(Mixer/VCF)**

When KNOB PARAMETER GROUP switch [MIX/VCF] is selected, the eight CONTROL knobs will access specific Mixer- and Voltage Controlled Filter-related parameters, including VCO1 and VCO2 signal level, Noise and Ring Modulator levels, VCF Type and HPF (High Pass Filter), and Key Track settings, and depth of frequency modulation.

NOTE For more information about the VCF, see page 31.

VCO1 Level

The VCO1 Level setting determines the balance of the VCO1 level in relation to the VCO2, Ring Modulator, Noise, and VCA Feedback levels. Turning the knob to the right increases the VCO1 Level. When using the VCO2 only, set this value to “0”.



Settings: 0 ~ 127

VCO2 Level

The VCO2 Level setting determines the balance of the VCO2 level in relation to the VCO1, Ring Modulator, Noise, and VCA Feedback levels. Turning the knob to the right increases the VCO2 Level. When using the VCO1 only, set this value to “0”.



Settings: 0 ~ 127

Ring Mod **(Ring Modulator Level)**

The Ring Modulator setting controls the balance of the Ring Modulator level in relation to the VCO1, VCO2, Noise, and VCA Feedback levels. Turning the knob to the right increases the Ring Modulator level. When not using the Ring Modulator, set this value to “0”.



Settings: 0 ~ 127

NOTE The Ring Modulator combines the VCO1 and VCO2 signals and outputs the sums and differences of all the frequency components of both inputs. It is particularly effective for producing dissonant interval sounds with a clangorous, or metallic effect.

Noise Level

The Noise Level setting determines the balance of the Noise signal in relation to the VCO1, VCO2, Ring Modulator, and VCA Feedback levels. Turning the knob to the right increases the Noise Level. When not using Noise, set the level value to “0”.



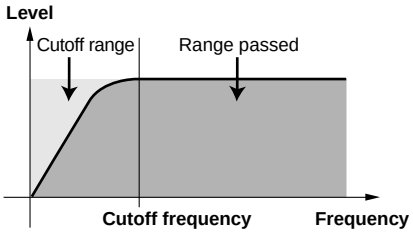
NOTE By mixing in Noise and selecting an appropriate Filter Type (VCF, HPF, etc.), you can create a wide variety of unique “special effect” sounds.

Settings: 0 ~ 127

HPF (High Pass Filter Cutoff)

The HPF setting determines the cutoff frequency of the High Pass Filter. Frequencies above the setting are passed while those below are cut off. Turning the knob to the right increases the HPF Cutoff frequency, resulting in a brighter sound.





Settings: 0 ~ 127

NOTE This High Pass Filter is applied to the signal after the mixer, and is different than the one available in the VCF Type.

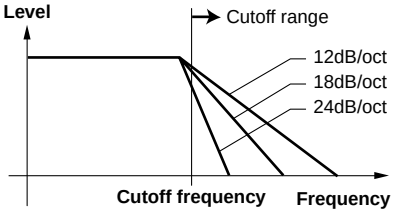
VCF Type

The VCF Type setting determines the type of filter used by the VCF. The VCF passes only a specified range of frequencies while cutting off the rest, to give you versatile control over the timbre. There are six types of filters, as described below.

Settings: LPF24, LPF18, LPF12, BPF, HPF12, BEF

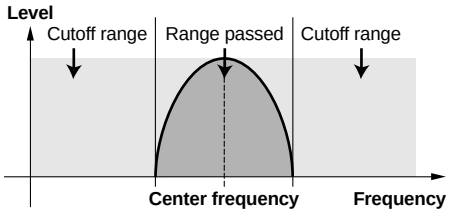
LPF24, LPF18, LPF12

The Low Pass Filter passes only those frequencies below the specified cutoff point. A cutoff curve of 24dB/octave (LPF24), 18dB/octave (LPF18) and 12dB/octave (LPF12) can be selected.



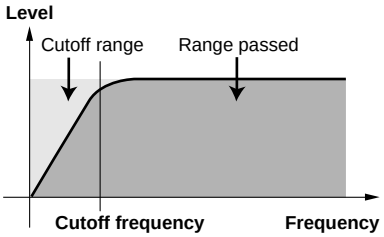
BPF

The Band Pass Filter passes only those frequencies in the specified range, with a cutoff curve of 12dB/octave.



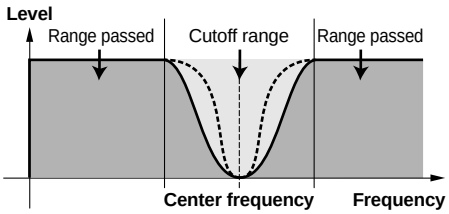
HPF12

The High Pass Filter passes only those frequencies above the specified cutoff point, with a cutoff curve of 12dB/octave.



BEF

The Band Eliminate Filter passes only those frequencies outside the specified frequency range. The Resonance setting (see page 65) determines the eliminate range.



NOTE The filters listed above apply to the signal output from the HPF located between the Mixer and VCA. For more information about the signal path, see page 10.

Fmod Depth **(Filter Modulation Depth)**

The Filter Modulation Depth setting determines the depth of the filter modulation of the VCF by the LFO1. Filter Modulation adds a cyclical change to the filter cutoff frequency to create a wah effect. Turning the knob to the right widens the range of the cutoff frequency change. Negative value settings reverse the phase of the LFO1 by 180 degrees.



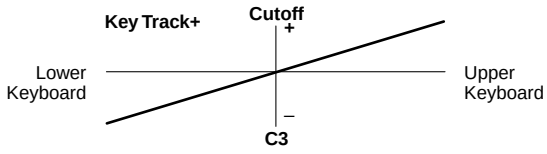
Settings: -64 ~ +63

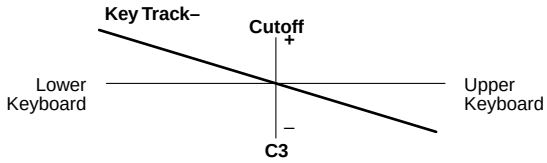
Key Track

The Key Track setting determines the key tracking of the VCF, raising or lowering the cutoff frequency point in accordance with the notes played on the keyboard. When Key Track is applied, the cutoff range shifts accordingly at every note, with C3 as the base.

Turning the knob to the right (positive values) will cause higher notes to have a higher cutoff point. Turning it to the left (negative values) causes higher notes to have a lower cutoff frequency. A value setting of "0" will apply no key tracking.







Settings: -32 ~ +63

VCA

When KNOB PARAMETER GROUP switch [VCA] is selected, the eight CONTROL knobs will access specific Voltage Controlled Amplifier-related parameters.

The VCA is an amplifier used to increase the gain of the input signal as received from the VCF, which is then passed to the Effect block in the signal path. Available parameters include level controls for feedback, volume and keyboard velocity sensitivity, as well as depth control for amplitude modulation.

The VCA can also be controlled by the attack time, decay time, sustain level and release time of the AEG (Amplitude Envelope Generator), to let you shape how the volume level changes over time, from when a key is pressed, held, then released, and subsequently how long it takes for the sound to terminate.

NOTE For more information about the VCA, see pages 11, 32.

Attack

The Attack setting determines the attack time of the AEG, which is the time it takes for the signal to reach its maximum volume level after a key is pressed (key on). Turning the knob to the right produces a longer Attack time.



Settings: 0 ~ 127

Decay

The Decay setting determines the decay time of the AEG, which is the time it takes for the signal to reach the sustain level from a maximum volume level while the key is held. Turning the knob to the right produces a longer Decay time.



Settings: 0 ~ 127

Sustain

The Sustain setting determines the level of sustain of the AEG, which is the level at which the volume will be maintained for as long as a key is held. Turning the knob to the right increases the Sustain level.



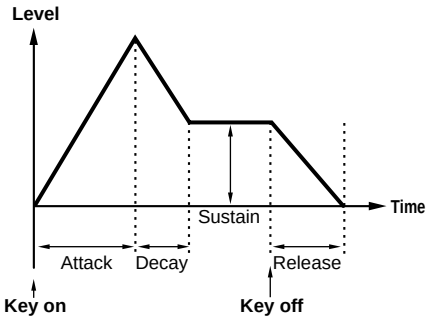
Settings: 0 ~ 127

Release

The Release setting determines the release time of the AEG, which is the time it takes for the signal to reach a level of "0" after a key is released (key off). Turning the knob to the right increases the Release time.



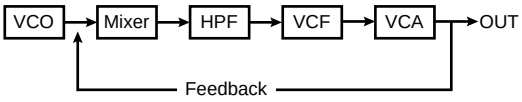
Settings: 0 ~ 127



Feedback

The Feedback setting determines the level of feedback output from the VCA and "fed back" into the input of the mixer, causing the signal to build up in amplitude according to the level you set. Turning the knob to the right increases the Feedback level, resulting in a fatter sound.





Settings: 0 ~ 127

NOTE Feedback should be applied slowly and with caution. Too much feedback can create extremely high frequencies, potentially resulting in damage to your speakers.

NOTE Too much feedback may drastically change the VCF characteristics.

Volume

The Volume setting determines the overall output level from the VCA before the signal passes to the Effect block. Turning the knob to the right increases Volume level.



Settings: 0 ~ 127

Amod Depth (Amplitude Modulation Depth)

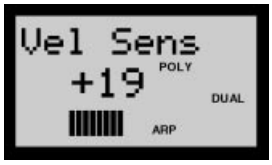
The Amplitude Modulation Depth setting determines the depth of the amplitude modulation of the VCA by the LFO1. Amplitude Modulation adds a cyclical change to the volume level to create a tremolo effect. Turning the knob to the right widens the range of the volume change. Negative value settings reverse the phase of the LFO1 by 180 degrees.



Settings: -64 ~ +63

Vel Sens (Velocity Sensitivity)

The Velocity Sensitivity setting determines the amplitude range of the VCA according to playing strength, or how fast you strike the keys. Turning the knob to the right (positive values) results in a higher sensitivity, requiring greater playing strength to increase amplitude. Turning it to the left (negative values) requires a lighter touch to increase amplitude. A value setting of "0" maintains the same amplitude regardless of playing strength.



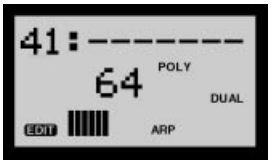
Settings: -64 ~ 0 ~ +63

ASSIGN

When KNOB PARAMETER GROUP switch [ASSIGN] is selected, each of the eight CONTROL knobs can be used as an individual controller for specified Control Change parameters which can be freely assigned.

Assign 1-8

As MIDI controllers, knob movements output control data from the MIDI [OUT] terminal. Turning each knob to the right increases the value setting for the assigned parameter. Turning it to the left decreases the value setting.



Settings: 0 ~ 127

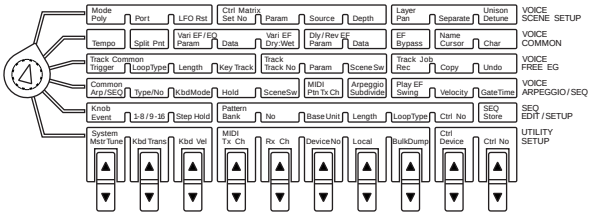
NOTE A Control Change parameter can be assigned to each CONTROL knob using the Control Device and Control Number parameters located in the UTILITY SETUP menu. For details, see page 95.

NOTE You can assign Tempo and Data Entry to be controlled directly by the CONTROL knobs.

NOTE You can confirm the parameter name by pressing the knob's push-switch.

Panel Parameter Edit

The AN1x's matrix of panel Edit parameters gives you quick and easy access to voice, Scene, Free EG, Arpeggiator, Step Sequencer and System parameters. All voice-related parameters can be stored as voice data in each of the 128 user voices.



There are six menus of Edit parameters, as follows:

VOICE SCENE SETUP: Includes Scene- and Layer-related parameters for the voice.

VOICE COMMON: Includes Tempo, Effect and other parameters common to the voice.

VOICE FREE EG: Includes Track select, recording and other parameters related to the Free EG function.

VOICE ARPEGGIO/SEQ: Includes common and specific parameters related to the Arpeggiator and Step Sequencer.

SEQ EDIT/SETUP: Includes Knob and Pattern parameters related to the Step Sequencer.

UTILITY SETUP: Includes "global" parameters which affect the AN1x's system, including MIDI settings, Control Change-related assignments and others.

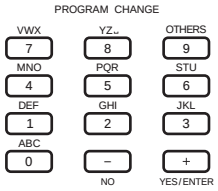
NOTE Utility parameter settings cannot be stored as voice data.

NOTE For a blank chart of all available parameters which you can use when editing your own voices, see page 114.

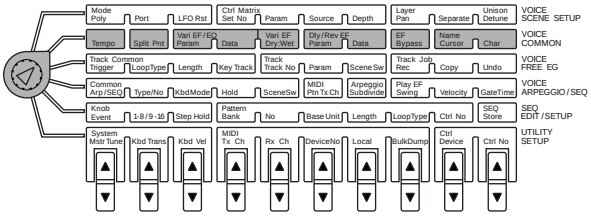
Edit Procedure

The procedure for editing a voice is outlined below.

1. **Select a voice using the PROGRAM CHANGE keypad.**
   Enter the number of the voice you want, followed by [YES/ENTER], or select the voice by pressing [+] / [-].



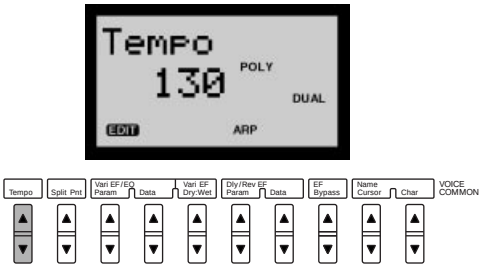
2. **Select the edit menu.**
   Set the [EDIT ROTARY] switch to the menu with the parameter that you want to edit.



3. **Select the parameter that you want to edit.**
   Press the [UP/DOWN] switch located beneath the parameter name once to display the parameter name and current value or setting in the LCD.



4. **Set the parameter value or setting.**
   Each time you press the upper area of the [UP/DOWN] switch the parameter or value setting will increment by a unit, and each time you press the lower area of the switch the parameter or value setting will decrement by a unit. Holding down the upper or lower area of the switch lets you quickly scroll through the values or settings.



5. Select another parameter and set the value for it.

Repeat steps 3 and 4, above, to select and set other parameters in the same menu.

6. Execute a Store operation.

When you've finished editing the data, you can store the voice to a user voice memory (1 - 128) using the Voice Store operation. You can also store Scene-related parameters for the voice to Scene 1 or Scene 2 at any time using a Scene Store operation. For information about storing voices, see page 98. For information about storing Scenes, see page 99.

NOTE Edited voice data will be retained in memory even if you switch off the power before storing the voice. When you turn the power back on, you can continue editing the voice.

NOTE Be sure to store your edited voice before selecting a different voice, or you could lose your edited data (see page 98). If you forget to store your edited data before selecting another voice, use the Voice Recall function (see page 96).

NOTE During the editing process, you can confirm the name and number of the current voice at any time by pressing [-] or [+] once to display the information in the LCD. You can then continue editing by selecting an Edit menu and pressing an [UP/DOWN] switch.

Edit Mark

The first time a voice parameter is changed, the Edit mark will display in reverse type in the LCD. The Edit mark indicates that voice data has been changed from the original but has not yet been stored.

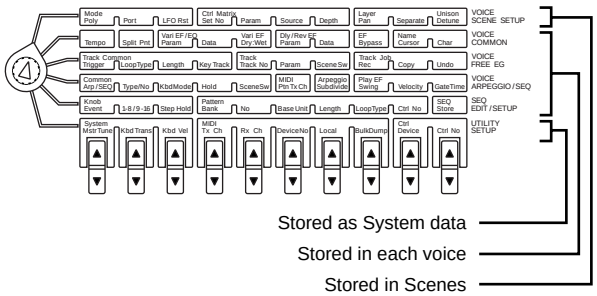


Voice Recall

If you select a different voice before storing important voice data, you can use the Voice Recall function to retrieve the edited voice data. For details, see page 96.

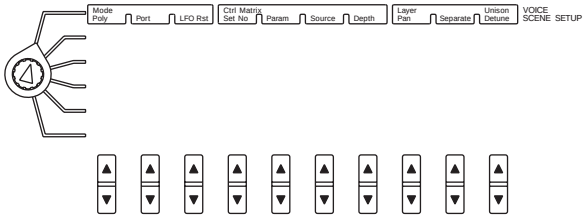
Edit Parameters

Following is a description of each parameter in each of the six Edit menus, along with a listing of available settings.



VOICE SCENE SETUP

This menu includes Mode, Control Matrix and Layer parameters, which can be set and stored as voice data. Mode and Control Matrix parameters can be stored as Scene data for each voice.



NOTE A Scene memory is simply a "snapshot" of the parameters as set by the eight CONTROL knobs. There are two Scene memories which you can store in each voice, and easily recall by pressing the [SCENE 1] or [SCENE 2] switch as you play. For more information about Scenes, see page 19.

Mode

Mode settings determine the way the AN1x's tone generator responds as you play the keyboard. There are three groups of parameters, including Poly mode setting, Portamento characteristics, and LFO Reset setting.

● Poly

The Poly mode setting determines the polyphony, or number of notes the tone generator will sound when notes are played on the keyboard or Note On messages are received at the MIDI [IN] terminal. There are three Poly mode settings.



Settings:

poly: You can play maximum 10 notes polyphony when Layer mode is set to SINGLE.

mono: Plays one (monophonic) note.

legat (Legato): Plays one (monophonic) note, and provides for legato phrasing, or solo passages played without any perceptible interruption between notes. Legato occurs when you press the next key before releasing the preceding key.

● Port **(Portamento)**

The Portamento mode setting determines the characteristics of the portamento (sometimes called glissando), or how the tone glides from one tone to the next through all the intermediate pitches, when the PEG/LFO Portamento Time (see page 56) is set to a value other than "0". Available parameters depend on the Poly mode setting.



NOTE To enable the Portamento function, press the [PORTAMENTO] switch on the panel (see page 24). If the PEG/LFO Portamento Time parameter (see page 56) is set to "0", Portamento will have no effect.

Settings:

When Poly = Poly:

normal: Normal portamento play.

sus-key: With this setting, the Hold tone (by a sustain pedal) is specified as the starting pitch of the portamento.

When Poly = Mono, Legato:

fingerd (Fingered): Portamento is only enabled by legato performance.

full time: Portamento is always enabled.

NOTE The Portamento setting mode here is effective and can be heard when the panel [PORTAMENTO] switch is set to "ON".

● LFO Rst **(LFO Reset)**

The LFO Reset mode setting determines the start point of the LFO1 and LFO2 cycle.



Settings:

off: LFO1 and LFO2 do not reset, but modulate continuously.

ky-on (Key On): LFO1 and LFO2 reset every time a key is pressed.

Ctrl Matrix **(Control Matrix)**

Control Matrix ("Ctrl Matrix") parameter settings determine which MIDI Control Change number "source" controller (eight panel CONTROL knobs, Modulation Wheel, Foot Controller, Ribbon-X, Keyboard After Touch, etc.) is assigned to control which AN1x "parameter" (VCF Cutoff, Resonance, FEG Depth, Variation Effect Wet:Dry balance, etc.).

The Control Matrix gives you the freedom to configure sources and parameters for each voice. You can, for example, configure the AN1x to use After Touch to apply vibrato, or the Modulation Wheel to change the resonance while you play, determine the range for both Pitch Bend up and down, and much more.

The Control Matrix is a configuration of 16 sets of control setup parameters and 2 sets of common parameters. The 16 parameter sets apply to each Scene and the common parameters apply to the voice. Each set consists of Set Number, Parameter, Source, and Depth parameters.

NOTE A blank chart is available for writing down Parameter and Source settings of the Control Matrix; see page 114.

Convenient Parameter Control

You can use the Control Matrix sets to assign a single controller to control more than one parameter, or multiple controllers to control the same parameter.

[Ex. 1]

One controller to control more than one parameter

Set	Param	Source	Depth
1	VCF Cutoff	A.MW	+25
2	Resonance	A.MW	+30

[Ex. 2]

Multiple controllers to control the same parameter

Set	Param	Source	Depth
1	VCF Cutoff	A.MW	+20
2	VCF Cutoff	A.RbX	-10

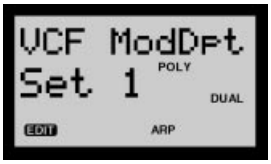
Procedure For Using The Control Matrix

1. **Select the Set No (1-16).**
2. **Select the Parameter you want to control.**
3. **Select the Source (controller) for the parameter control.**
4. **Set the Depth value.**
5. **Repeat steps 1-4 to assign additional controller sets.**

NOTE For more information about the Control Matrix, the separate Data List book.

● Set No **(Set Number)**

The Set Number parameter lets you select Pitch Bend Pitch Up and Down, the number of the Set (1-16), and Common (1 and 2) parameter assignments.



Settings:

PB Pitch ↑: Selects the Pitch Bend Up parameter for setting the range over which the pitch bends up (above a value of 64) when rolling the Pitch Bend wheel between center and maximum forward position (for the selected Scene).

PB Pitch ↓: Selects the Pitch Bend Down parameter for setting the range over which the pitch bends down (below a value of 64) when rolling the Pitch Bend wheel between center and maximum back position (for the selected Scene).

Set 1 ~ 16: Selects the Set Number to which you want to assign Parameter, Source and Depth settings (for the selected Scene).

Comn 1 ~ 2 (Common Set 1 ~ 2): Selects the Common Set number to which you want to assign Parameter (Off, Common Volume, Common Pan, Variation Parameter, Delay Return, Reverb Return), Source and Depth settings (applied to both Scenes).

● Parameter

The Parameter setting determines which parameter is assigned to the Set Number (1-16) or Common Set (1-2). When Set No is set to "PB↑" or "PB↓" you don't need to select the Parameter because these are the parameters for Pitch Bend.



Settings:

For a list of Control Matrix parameters, see the separate Data List book.

● Source

The Source setting determines which controller (by Control Change number) is assigned to control the corresponding Parameter.



NOTE You can set the source by Control Change number or by controller name, as shown in the Settings listed below.

Settings:

CcOff: No controller assigned.

CC1 ~ 95: Selects the Source controller according to Control Change number, when received by on-board controllers or incoming MIDI messages.

AT (After Touch): For controlling with keyboard After Touch.

PB (Pitch Bend): For controlling with the Pitch Bend wheel.

KyTrk (Key Track): For controlling with note number messages generated by pressing the keys.

Vel (Velocity): For controlling with keyboard velocity, or the strength with which you strike the keys.

KyRnd (Key Random): For controlling with random note number messages generated by pressing the keys.

A.MW (Assign Modulation Wheel): For controlling with the Modulation Wheel, and/or by incoming MIDI messages with the same Control Change number as assigned to the MW.

A.FV (Assign Foot Volume): For controlling with a connected Foot Volume controller, and/or by incoming MIDI messages with the same Control Change number as assigned to the FV.

A.FC (Assign Foot Control): For controlling with a connected foot controller, and/or by incoming MIDI messages with the same Control Change number as assigned to the FC.

A.FS (Assign Footswitch): For controlling with a connected Footswitch, and/or by incoming MIDI messages with the same Control Change number as assigned to the FS.

A.RbX (Assign Ribbon Controller-X): For controlling with the Ribbon controller X-axis (left and right), and/or by incoming MIDI messages with the same Control Change number as assigned to the RbX.

A.RbZ (Assign Ribbon Controller-Z): For controlling with the Ribbon controller Z-axis (push), and/or by incoming MIDI messages with the same Control Change number as assigned to the RbZ.

Kn1~8 (Knob 1 ~ 8): For controlling with a specified CONTROL knob (when KNOB PARAMETER GROUP [ASSIGN] is on).

NOTE Depending on selected Parameter, the available Source for assignment may be different. For details of available parameters, see the table of Control Matrix parameters in the separate Data List book.

NOTE You cannot assign the same Source controller and Parameter to more than one set. If you attempt to, lower-numbered sets will take priority, and "– – –" will appear in the LCD for higher-numbered sets.

NOTE When you select [RIBBON] controller "A.RbX" as the "Source" controller and Pitch Up/Pitch Down as the "Parameter", the [RIBBON] controller value will be reset to the center position when you release your finger from the [RIBBON]. The sets with different Parameters (other than Pitch Up/Pitch Down) keep the position at which you release your finger.

● Depth

The Depth setting determines the control range of the Source controller.



Settings:

Depending on the selected Parameter, the available settings may be different. For details, see the table of Control Matrix parameters in the separate Data List book.

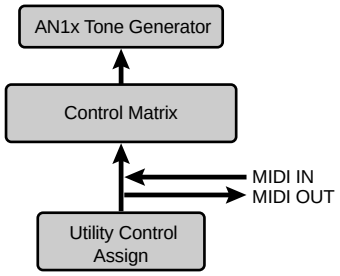
Direct Control Function

When Depth "Dirct" is selected (0 setting), the Direct Control function is activated, and you can directly edit the parameter assigned to the controller within its original range.

Relationship Between Control Matrix And Utility Control Assign Function

There are two types of Control Change assignment functions—the Control Matrix and the Utility Control Assign function. Between the Control Matrix and Utility Control Assign function (see page 95), you can configure a sophisticated controller setup to control specific parameters of the internal tone generator and an external tone generator at the same time by the eight CONTROL knobs and other controllers. Control Change assignments made in the Utility Control Assign function are sent to both MIDI [OUT] as well as the Control Matrix, where it can be rerouted at will before reaching the internal tone generator. External Control Change signals received at MIDI [IN] can be routed through the Control Matrix to control the AN1x tone generator parameter of your choice.

Control Signal Flow



Layer

Layer parameter settings apply to the selected Layer mode, and affect both Scenes. These settings are stored as voice data. There are three parameters, including Pan, Separate, and Unison Detune.

NOTE For more information about Layer modes, see page 22.

● Pan

The Pan parameter sets the type of stereo panning, or the way the sound moves between the left and right speakers.



Settings:

off: When Layer mode is set to SINGLE (see page 22), Pan control does not function. When set to DUAL, DUAL UNISON, SPLIT or SPLIT UNISON, you can change the pan width for Scene 1 and Scene 2 using the Separate function (see below).

alt (Alternate): Causes the sound to alternate between left, right and center each time a key is played. Use the Separate function to determine pan width.

rnd (Random): Causes the sound to move at random. Use the Separate function to determine pan width.

● Separate

The Separate parameter adjusts the amount of amplitude between left and right outputs. The result depends on Pan type setting (see above).



Settings: 0 (no effect) ~ 32

If Pan setting = "off":

- When Layer mode (see page 22) is set to SINGLE, the panning will have no effect.
- When Layer mode is set to UNISON, higher values create a wider stereo dimension by separating the two to up to five sounds. (Poly mode generates two sounds with each key pressed, and Mono/Legato mode generates five sounds with each key pressed.)
- When Layer mode is set to DUAL/DUAL UNISON, or SPLIT/SPLIT UNISON, higher values create a wider stereo dimension by separating Scene 1 and Scene 2 sounds.

If Pan setting = "alt" or "rnd":

- The Separate setting adjusts the Pan separation range. Higher values result in a wider separation. When the value is set to maximum setting ("32"), then left, center and right are completely separated.

NOTE The Separate function does not apply to the Vari EF Wet signals, so if the Wet setting is too high, the Separate effect will be weakened.

● Unison Detune

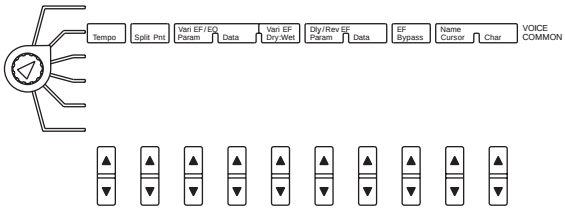
When UNISON mode is selected (see Layer mode, page 22), multiple sounds are played, with the pitch of each sound slightly detuned. Unison Detune adjusts the detuning of the VCO1 pitch in fine increments, letting you create an even thicker UNISON sound by applying higher settings, but be careful not to apply too much or you'll change the basic pitch of the voice. (This function only works when Layer mode is set to UNISON, DUAL UNISON or SPLIT UNISON.)



Settings: 1 ~ 32

VOICE COMMON

This menu includes parameters common to the voice (both Scenes) including Tempo for Arpeggiator and Step Sequencer, plus Effect-related settings and voice naming parameters. The Vari EF Dry:Wet parameter can be edited for each Scene.



Tempo

The Tempo setting determines the tempo for the AN1x's internal clock in beats per minute (BPM), between a range of 40 and 240 BPM. The Tempo setting controls both Arpeggiator and Step Sequencer play.



Settings: MIDI, 40 ~ 240

NOTE When Tempo is set to "MIDI", the AN1x's clock can be controlled by the clock of an external MIDI device such as a music sequencer, connected to the MIDI [IN] terminal.

NOTE When the Free EG Length parameter is set to "bar", the Free EG sequence will be synchronized with the Tempo set here. For more information, see page 82.

Split Pnt (Split Point)

The Split Point setting determines the note at which the keyboard divides into lower (Scene 1) and upper (Scene 2) zones for Split mode play (SPLIT/SPLIT UNISON mode). It also determines the division for the Arpeggiator or Step Sequencer depending on Keyboard Mode setting.

NOTE For information about Split modes, see page 23.



Settings: C-2 ~ G8

Vari EF/EQ (Variation Effect/Equalizer)

Variation Effect/Equalizer settings determine the Variation Effect type and data settings, as well as EQ data settings, for the voice. There are three parameters, including Param (Parameter), Data, and Variation Effect Dry:Wet.

NOTE The signal enters the Effect block from the VCA output, and passes to the Variation Effect and Equalizer in a serial connection. For more information, see page 11. Also see the separate Dat List book.

● Param (Parameter)

The Parameter setting determines the Variation Effect type and select parameters of the selected effect as well as the EQ.



● Data

The Data parameter lets you select the Variation Effect type and change data values of the selected effect or EQ Parameter.



Settings:
For information about each Parameter and available settings, see the Effect Type List in the separate Data List book.

Setting the Variation Effect

1. **Press the lower area of the Param [UP/DOWN] switch to select Variation Effect.**



2. **Press Data [UP/DOWN] to select the type of Variation Effect. (There are 14 types; see the Data List book.)**



3. **Press Param [UP/DOWN] again to select the specific parameter that you want to set. (The parameters for the Variation Effect which you selected in step 2 will be available.)**

4. **Press Data [UP/DOWN] again to set the Parameter value.**

5. **Repeat steps 3 and 4, above, to set data values for other parameters of the selected Variation Effect.**

NOTE For more information about the Variation Effect, see the separate Data List book.

Setting the Equalizer

1. **Press Param [UP/DOWN] to select an EQ parameter. (There are seven EQ parameters; see the separate Data List book.)**



2. **Press Data [UP/DOWN] to set the value of the selected parameter as desired.**



3. **Repeat steps 1 and 2, above, as many times as necessary to select other parameters and set their data values.**

NOTE For more information about the EQ parameters, see the separate Data List book.

● Vari EF Dry:Wet

The Variation Effect Dry:Wet setting determines the balance between wet (effect) and dry (original) signal levels. A setting of “D63” will pass the dry signal only, and a setting of “W63” will pass the wet signal only. A setting of “D=W” represents an equal balance of wet and dry signals.



Settings: D63 ~ D=W ~ W63

NOTE When Vari EF Param type is set to “AuralExc” or “Comprssr”, Data “dry” and “wet” settings are available. When Vari EF Param type is set to “OvrDrive” or “Amp Sim”, Data “dry”, “both” and “wet” settings are available.

NOTE Aural Exciter is a registered trademark of and is manufactured under license from Aphex Systems Ltd.

Dly/Rev EF **(Delay/Reverb Effect)**

Delay/Reverb Effect settings determine the Delay and Reverb effect types and data settings. There are two parameters available, Param (Parameter) and Data.

NOTE The Delay and Reverb effects are located after the EQ output, and can be connected in series or parallel. For more information, see the separate Data List book.

● Param **(Parameter)**

The Parameter setting lets you select the Connect, Delay effect (and parameters) and Reverb effect (and parameters).



● Data

The Data parameter lets you select the Connect settings, Delay type (and change data values for Delay parameters) and Reverb type (and change data values for Reverb parameters).



Settings:

For information about available parameters and value settings for Delay and Reverb effects, see the separate Data List book.

Setting Delay and Reverb

1. **Press the lower area of the Param [UP/DOWN] switch to select the Connect parameter.**



2. **Press Data [UP/DOWN] to select serial (“seri”) or parallel (“para”) and set the configuration of the Delay and Reverb effects.**



3. **Press Param [UP/DOWN] again to select either the Delay (“DlyEF”) or Reverb (“RevEF”) page.**

When Delay is selected, “DlyEF” appears here



4. **Press Data [UP/DOWN] again to select the Delay type (1 ~ 5) or Reverb type (1 ~ 8; see the Data List book).**



5. **Press Param [UP/DOWN] again and select the Delay or Reverb parameter to set (depending on selected Delay or Reverb type, available parameters will be different).**

6. **Press Data [UP/DOWN] again to set the parameter value as desired.**

7. **Repeat steps 5 and 6, above, as many times as necessary to set all parameter values.**

EF Bypass **(Effect Bypass)**

Effect Bypass settings let you bypass specific effects, which is convenient when creating an original voice. Bypassed effects will not be applied to the original sound, and when the EF Bypass is “off”, the signal will flow through all effects units.

You can choose to bypass all effects, or only Delay and Reverb, or only Reverb. Since EF Bypass is a system parameter, it will not be saved as voice data, and therefore will remain as you set it regardless of which voice is selected.



Settings:

off: Turns off the Effect Bypass, so the signal flow will bypass the effects units.

OnlyRev: Only the Reverb effect will be bypassed.

Only Dly: Only the Delay effect signal will be bypassed.

Dly&Rev: Both Delay and Reverb effects will be bypassed.

AllEF: The signal bypasses all effects in the Effect block, including Variation Effect, Delay and Reverb (excluding EQ).

Effect Bypass Mark

The Effect Bypass mark will appear in the LCD when the Effect Bypass is active.



Name

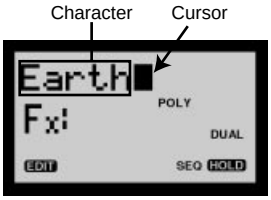
Name parameters let you select a voice Category and up to ten characters to give a customized name to your edited voice. There are two parameters, Cursor and Char (Character).

● Cursor

The Cursor parameter lets you position the cursor at the voice Category field or any of the ten character fields for the voice name.

● Char **(Character)**

The Character parameter lets you select a voice Category (when the cursor is positioned at the voice category field) or a character (when the cursor is positioned at a voice name character field).



Available characters:

ABCDEFGHIJKLMNOPQRSTUVWXYZ“abcdefghijklmnop
qrstuvwxyz0123456789*_!”#$%&’()+,-= (space)

Naming A Voice

1. **Press the lower area of the Cursor [UP/DOWN] switch to position the cursor at the voice Category field (the current cursor position will be flashing).**

2. **Press Char [UP/DOWN] to select the two-letter voice category code.**

#	LCD	Category
0	--	No category
1	Pf	Piano
2	Cp	Chromatic Percussion
3	Or	Organ
4	Gt	Guiter
5	Ba	Bass
6	St	Strings/Orchestral
7	En	Ensamble
8	Br	Brass
9	Rd	Reed
10	Pi	Pipe
11	Ld	Synth Lead
12	Pd	Synth Pad
13	Fx	Synth Effect
14	Et	Ethnic
15	Pc	Percussive
16	Se	Sound effect
17	Dr	Drums
18	Sc	Synth Comp
19	Vo	Vocal
20	Co	Combination
21	Wv	Material Wave
22	Sq	Sequence

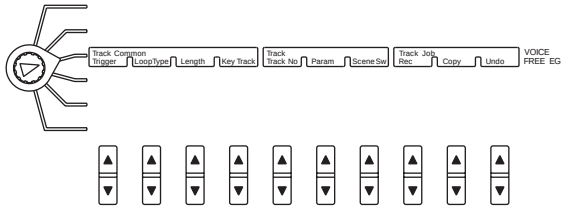
3. **Press Cursor [UP/DOWN] again as many times as necessary to position the cursor at a voice name character field, then press Char to select an alphabet, numeric or symbol character.**

You can also use the PROGRAM CHANGE keypad to enter alphabet and numeric characters, by pressing each 0-9 key once or more, as indicated above each key. For example, pressing the 0 key toggles repeatedly between the following characters: 0-A-B-C-a-b-c-0, etc.

VOICE FREE EG

This menu includes Track Recording and other parameters relating to the Free EG function. The Free EG is a special 4-track recorder that lets you record up to four tracks (one parameter per track) of real-time changes of CONTROL knob position data (all knobs) over a specified length of time, either in measures or seconds.

The parameter changes associated with the recorded knob movements will automatically play back as recorded when you subsequently play the voice from the keyboard. You can select time length in bars (up to 8 measures) or absolute time (up to 16.0 seconds), as well as designate a loop type, or copy track data within the same voice or from another voice. Free EG parameters and data are stored as voice data.



NOTE For information about how to record the Free EG, see page 84.

Track Common

Track Common parameters include settings which affect all four tracks of data for recording or play. There are four parameters, including Trigger, Loop Type, Length and Key Track.

● Trigger

The Trigger setting determines how the track recording or play is triggered.



Settings:

free: After selecting a voice, the first key pressed on the keyboard triggers the Free EG.

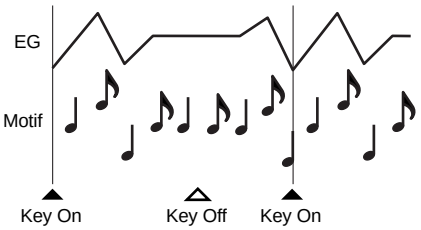
kbd (Keyboard & MIDI): The Free EG is triggered by a note on message from the keyboard or an external MIDI device.

all: The Free EG is triggered by either a Note On message from the keyboard, or an external MIDI device, or from the Arpeggiator or Step Sequencer.

Triggering The Free EG With Patterns

The Free EG can be used in conjunction with the Arpeggiator or Step Sequencer. When the Trigger is set to "kbd", the Free EG will be applied to the pattern.

Hold = "on"



Each time you press a key the Free EG will be retriggered. When the Trigger is set to "all", the Free EG will be retriggered whenever the Arpeggiator or Step Sequencer is played.

● Loop Type

The Loop Type setting determines the type of loop for play of the Free EG sequence.



Settings:

off: The Free EG sequence plays once but does not loop. The parameter settings at the end of the Free EG sequence remain in effect.

fwd: The Free EG sequence loops from start to end.

half: The Free EG sequence loops from the middle to the end.

alt (Alternate): The Free EG sequence loops from start to end, then end to start.

half (Half Alternate): The Free EG sequence loops from middle to end, then end to middle.

● Length

The Length setting determines the time for recording and play of the Free EG sequence. There are two Length types, including length determined by number of measures or by absolute time (seconds).



Settings:

bar (number of measures): 1/2, 1, 3/2, 2, 3, 4, 6, 8

s (seconds): 1.0 ~ 16.0

NOTE When set to "bar", the Free EG record and play time is determined by the Tempo setting in the VOICE COMMON menu. This synchronizes the Free EG movement with the Arpeggiator or Step Sequencer.

● Key Track

The Key Track setting determines the length of the Free EG in relation to notes played on the keyboard, using C3 as the basic note length. When set to "0", the length will be the same for all notes across the entire keyboard. Negative values will cause the Free EG length to decrease when you play in the lower register, and positive values will cause the Free EG length to decrease when you play in the higher register.



Settings: -64 ~ +63

Track

Track settings determine the current Free EG track, the parameter assigned to each track, and which Scene the Free EG will play. There are three Track parameters, including Track No (Number), Param (Parameter) and SceneSw (Switch).

NOTE When you start recording the Free EG, the parameter of the first knob you move, along with the current Scene setting, will be assigned to the track Parameter (i.e., that parameter will be recorded in the track). This is convenient for initiating a Free EG recording immediately, without making all settings beforehand.

Track Confirm and Assignment Procedure

1. **Using Track No [UP/DOWN], set the track you want to record or play.**
2. **Using Param [UP/DOWN], select the parameter which you want to record in the track.**
3. **Using SceneSw [UP/DOWN], set the Scene (Scene 1, Scene 2, or both Scenes) which you want the Free EG to affect.**
4. **If necessary, repeat steps 1 through 3, above, for selecting other tracks and assigning parameters to them.**

NOTE You cannot assign the same parameter to more than one track. If you attempt to do so, the latest recorded track takes priority, while other tracks will automatically be turned off for the Scene Switch.

● Track No **(Track Number)**

The Track Number parameter lets you select the Free EG track.



Settings: Trk1 ~ Trk4

NOTE The selected track will record knob movement data when Free EG recording is initiated. When the [EDIT ROTARY] switch is set to the VOICE FREE EG menu, an empty track will automatically be selected.

● Param **(Parameter)**

The Parameter setting determines which knob parameter will be played by the data in the selected Free EG track.



Settings:
Only one parameter can be selected for a track.

NOTE For information about available parameters, see the separate Data List book.

● SceneSw **(Scene Switch)**

The Scene Switch setting determines which Scene will be played by the selected Free EG track.



Settings: off, Scene1, Scene2, both (Scenes 1 and 2)

Track Job

Track Job parameters let you record a selected Free EG track, perform track copy operations and undo/redo a Free EG recording or copy operation. There are three parameters, including Rec (Record), Copy and Undo.

● Rec **(Record)**

The Record parameter lets you determine how a Free EG record operation (of knob movement data) will be executed.

NOTE After recording a track, the next highest numbered track will automatically be selected for recording.



Settings:

REC OFF: Free EG is not recording.

REC STBY Trk: Standby situation for the selected track. The Free EG is ready to record based on the Trigger setting.

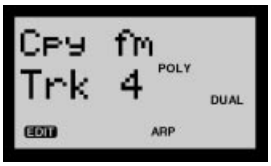
REC STBY All: Standby situation for recording on all four tracks at the same time (a different parameter for each). The Free EG is ready to record based on the Trigger setting.

Free EG Base Position

Knob positions are recorded in a Free EG track as increases (positive values) and decreases (negative values) to the "base" position of the knob, or the position at which the knob is located when you first move it. After Free EG recording, if you change the knob parameter, you also change the base position accordingly. For example, if the knob base position is set too high, the Free EG data changes may occur out of the range of the assigned track parameter. Therefore, take care not to set the knob base position too high.

● Copy

The Copy function lets you copy the Free EG data (knob movements) of another track in the current voice to the currently selected track, or copy the data of any track in any voice to the currently selected track of the current voice.



Settings: Trk 1 ~ Trk 4; (Voice) 1 ~ 128 Trk 1 ~ Trk 4

Copy Procedure

1. **Press Track No [UP/DOWN] to select the track to which you want to copy Free EG data to (destination).**

2. **Press Copy [UP/DOWN] to select the track from which you want to copy Free EG data (source).**

The Copy operation is completed.

When the "Cpy fm" (Copy from) page is displayed in the LCD, you can press Copy [UP/DOWN] to select a track from either the current voice or from another voice. As you select a track, you can play the keyboard to hear how the new Free EG data affects the voice.

When the new track number is selected (step 2), the copy operation is completed.

NOTE There is no specific copy confirmation function, but you can retrieve the original track Free EG data using the Undo function.

NOTE Remember that Free EG data consists of knob movement data and not actual parameter values. This means that the parameter controlled can be anything you set for the Track Number using the Param setting.

● Undo

The Undo function lets you "undo" as well as "redo" the most previous Free EG copy or record operation.



After a copy or record operation, simply press Undo (/Redo) [UP/DOWN] to toggle back and forth between the new data and the original data.

Free EG Recording Procedure

1. **Press the Rec [UP/DOWN] switch and enter Record Standby (Track or All) mode.**





NOTE In Record Standby mode, Length and Track Number parameters are available, but others cannot be accessed. (Also, MIDI control will be ineffective.)

NOTE In Record Standby mode or during recording, you can stop the record operation by turning the [EDIT ROTARY] switch, and return to the REC OFF status.

NOTE If you want to record in the selected track, choose REC STBY Trk. If you want to record in all four tracks, choose REC STBY All.

2. **Change the Free EG Length (see page 82), or select a Track Number for the selected Parameter (see page 83).**

When the Length parameter is set to "bar", the length is determined by the Tempo setting, and a click will sound (in quarter-note beats) to use as a timing guide.

3. **When you press a key on the keyboard, recording will begin, so you can start moving the knob (or knobs) as desired.**

NOTE Recording time is visually displayed by the horizontal data graph in the LCD.

NOTE When the KNOB PARAMETER GROUP [ASSIGN] switch is selected, knob movements will not be recorded in the track.



In step 1, above, if REC STBY Trk is selected, the knob most recently moved is already designated as available for recording. If REC STBY All is selected, the four most recently moved knobs are already designated as available for recording.

NOTE When you start recording the Free EG, the currently selected Scene will be automatically assigned to the Scene Switch (for the selected track), and the parameter of the first knob you move will be assigned to track Parameter (i.e., that parameter will be recorded in the track). This is convenient for initiating a Free EG recording immediately, without making all settings beforehand.

NOTE When Scene Control is activated, setting the Free EG to Record Standby mode automatically selects Scene 1.

4. **Recording automatically stops when the end of the set Length is reached.**



VOICE ARPEGGIO/SEQ

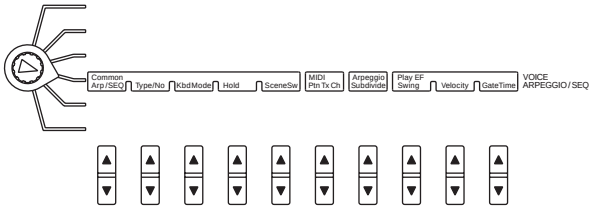
This menu includes common and specific parameters related to the Arpeggiator and Step Sequencer. Arpeggiator and Step Sequencer parameter settings are voice data saved in each voice.

The Arpeggiator lets you play arpeggiated chord patterns at the press of a key. There are 30 Arpeggiator patterns to choose from for each voice, and Arpeggio Subdivide plus Play Effect parameters give you a wide range of control and customization over the arpeggio pattern.

The Step Sequencer lets you create your own 16-step arpeggiated patterns by assigning note, velocity and other events to each step (beat) in the looped sequence. You can create a Voice Pattern for each voice, as well as create and store a total of 128 User Patterns. You can trigger the patterns from the keyboard in a variety of ways.

NOTE Step Sequencer record, edit and play parameters are available in the SEQ EDIT/SETUP menu. For details, see page 89.

NOTE To start the Arpeggiator or Step Sequencer pattern, press the [ARPEGGIO/SEQ] switch.



NOTE For information about how to use the Arpeggiator, see page 33. For information about how to use the Step Sequencer, see page 37.

Common

Common parameters are related to both the Arpeggiator and Step Sequencer. There are five parameters available, including Arp/SEQ, Type/No (Number), KbdMode (Keyboard Mode), Hold, and SceneSw (Scene Switch).

● Arp/SEQ **(Arpeggiator/Sequencer)**

The Arp/SEQ setting designates either the Arpeggiator or the Step Sequencer to play when the [ARPEGGIO/SEQ] switch is on. Either one or the other can be designated to play for each voice.

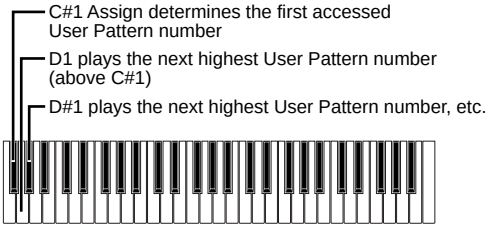


Settings: Arpeggio (Arpeggiator), Step SEQ (Step Sequencer)

● Type/No **(Type/Number)**

For selecting an Arpeggiator pattern type when "Arpeggio" is designated in Arp/SEQ. When "Step SEQ" is designated in Arp/SEQ and KbdMode is set to "sel&norm" or "sel&shift", you can assign a User pattern number to the C#1 key for Pattern Select play (see C#1 Assign, page 40). When "Step SEQ" is designated in Arp/SEQ and KbdMode is set to "norm" or "shift&norm", "SEQ" will be displayed in the LCD, and no setting can be made. Step Sequencer patterns are designated in the SEQ EDIT/SETUP menu (see page 89).





Settings:

When Arp/SEQ is set to Arpeggio: Arp 01 ~ 30

You can select one Arpeggio pattern from the 30 available patterns. For a list of available patterns, see the Arpeggio Pattern List in the separate Data List book.

When Arp/SEQ is set to Step Sequencer and KbdMode is set to "sel&norm" or "sel&shift":
C#1: Usr001-128

You can assign the first User Pattern number to play at the C#1 key. For example, if you designate "Usr025", then pressing C#1 will trigger User Pattern number 25, pressing D1 will trigger User Pattern number 26, pressing D#1 will trigger User Pattern number 27, and so on. (For more information, see C#1 Assign, page 40.)

● KbdMode **(Keyboard Mode)**

The Keyboard Mode setting designates how the Arpeggiator or Step Sequencer patterns respond to notes played on the keyboard. Depending on the setting in Arp/SEQ, available parameters will be different.

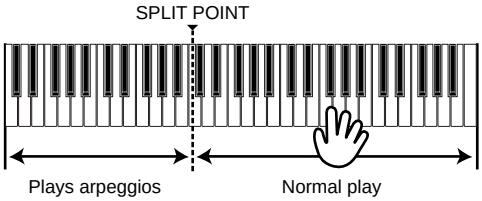


Settings:

When Arp/SEQ is set to Arpeggio:

chrd (Chord): Arpeggiated chords can be played across the entire keyboard.

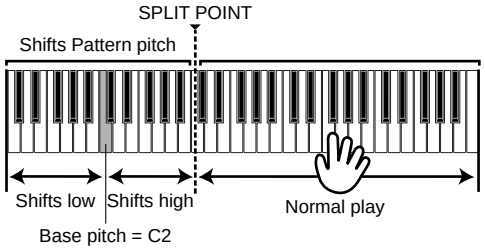
chrd&norm (Chord & Normal): Arpeggiated chords can be played by keys to the left of the current Split Point (see page 77), and you can play normally to the right.



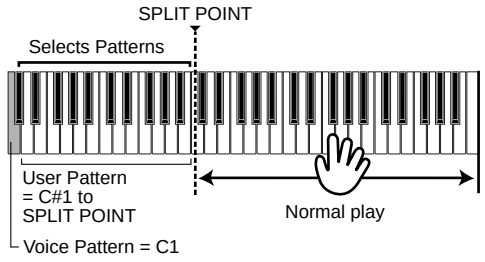
When Arp/SEQ is set to Step Sequencer:

norm (Normal): For triggering the Voice Pattern of the currently selected voice at its base pitch from any key on the keyboard, and playing the voice normally across the keyboard. If Hold is set to "off", then the pattern will start each time you press a key.

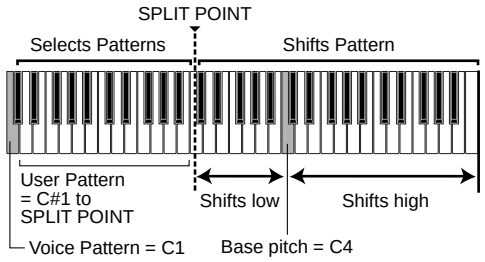
shift&norm (Shift & Normal): Playing a key to the left of the Split Point will shift the pitch of the pattern accordingly, and playing keys to the right of the Split Point will play notes normally, without affecting the sequence. For example, if the Split Point is set to C3, then you can shift the pitch of the sequencer pattern with C1 ~ B2, with C2 as the base pitch, and play normal notes to the right. (For more information about the Split Point, see page 77.)



sel&norm (Select & Normal): Playing a key to the left of the Split Point will trigger ("select") a specific User Pattern, and playing keys to the right of the Split Point will play notes normally, without affecting the sequence. For example, if the Split Point is set to C3, then C1 plays the Voice Pattern for the selected voice, and 23 different User Patterns can be selected by playing keys C#1 ~ B2. (For more information about the Split Point, see page 77.)



sel&shift (Select & Shift): Playing a key to the left of the Split Point will trigger ("select") a specific User Pattern, and playing keys to the right of the Split Point will shift the pitch of the selected pattern accordingly. For example, if the Split Point is set to C3, then C1 plays the Voice Pattern for the selected voice, and 23 different User Patterns can be selected by pressing keys C#1 ~ B2. (For more information about the Split Point, see page 77.) C4 always determines the base pitch.



NOTE For more information about triggering and assigning the User Patterns to "select", see page 39.

● Hold

The Hold parameter designates the Hold setting for the Arpeggiator and Step Sequencer. The Pattern Hold function causes the Arpeggiator or Sequencer pattern to continue playing after releasing the keys. Basically the Hold parameter either turns Hold on or off, but when Keyboard Mode is set to "sel&norm" or "sel&shift", there are two types of hold modes for the Step Sequencer.



Settings:

When Arpeggiator is selected: on, off

When Step Sequencer is selected and KbdMode is set to "norm" or "shift&norm": on, off

When Step Sequencer is selected and KbdMode is set to "sel&norm" or "sel&shift": off, mode1, mode2

- **mode1:** A pattern will be triggered every time a key is pressed.
- **mode2:** A pattern will be triggered after the current sequence finishes, even if you press a key during the middle of the current sequence.

● SceneSw **(Scene Switch)**

The Scene Switch setting designates which Scene the Arpeggiator or Step Sequencer pattern will play.



Settings: scene1, scene2, both (Both Scenes)

MIDI PtnTxCh **(Pattern Transmit Channel)**

The MIDI Pattern Transmit Channel parameter lets you designate the MIDI channel on which to transmit the Arpeggiator or Step Sequencer pattern data, to be output via the MIDI [OUT] terminal.

This lets you, for example, record the pattern note and other data played by the Arpeggiator or Step Sequencer into an external MIDI sequencer, or have the AN1x's pattern data trigger an external tone generator. (Since this setting is a system parameter, it cannot be stored as voice data, and therefore remains as set regardless of which voice is selected.)

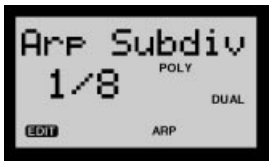


Settings: off, 1 ~ 16

Arpeggio Subdivide

The Arpeggio Subdivide parameter lets you designate the timing subdivision (resolution) value for the Arpeggiator pattern. When Arp/SEQ is set to "Step SEQ", this parameter is not available. (For information about timing resolution for the Step Sequencer, see pages 42, 91.)

NOTE When Arp/SEQ is set to "SEQ", the Subdivide function cannot be accessed, and "– – –" will appear in the LCD.



Settings: 3/8=𝅗𝅥., 1/4=𝅗𝅥, 3/16=♪., 1/6=𝅘𝅥𝅘𝅥𝅘𝅥³, 1/8=♪, 3/32=♪., 1/12=𝅘𝅥𝅘𝅥³, 1/16=♪, 1/24=𝅘𝅥𝅘𝅥³, 1/32=𝅘𝅥𝅯

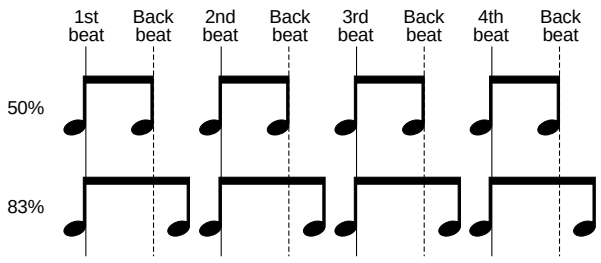
Play EF (Play Effect)

The Play Effect parameters let you designate settings which can permit the Arpeggiator or Step Sequencer pattern to obtain a more human "feel". There are three Play Effect parameters, including Swing, Velocity and Gate Time.

● Swing

The Swing parameter lets you apply a Swing rate to the Step Sequencer pattern to slightly shift certain beats in order to create a "swing" feel. A setting of "50%" produces no Swing and "83%" produces maximum Swing. For information about how the Swing levels affect the rhythm of the pattern, see the chart below.





Settings: 50 ~ 83%

NOTE The Swing parameter is not available when Arp/SEQ is set to "Arpeggio" (Arpeggiator).

● Velocity

The Velocity parameter sets the ratio between the lower and higher velocity values of the Arpeggiator or Step Sequencer pattern, over a range between 1% and 200%. A setting of "100%" maintains the original velocity relationship between the notes. Lower values adjust velocities downward at playback, and higher values adjust velocities upward at playback. A setting of "real" (Real-time) will cause the velocity values of the pattern to be determined by the velocity at which you play the keyboard, in relation to the VCA Vel Sens setting.



Settings: real (Real-time), 1 ~ 200%

● GateTime

The Gate Time parameter adjusts the note length (the duration of the note) either shorter or longer, as a percentage of the original. This lets you, for example, set the note to play staccato, so that its sound switches off well before its step time is over. Or you can have the note hold right up to the start of the subsequent step so that it slurs (legato) into the next note. A setting of "100%" maintains the original relationship between notes. Lower values decrease Gate Time, and higher values increase Gate Time.



Settings: 1 ~ 200%

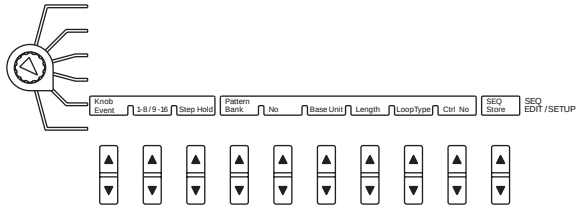
NOTE The Gate Time parameter is not available when Arp/SEQ is set to "Arpeggio" (Arpeggiator).

NOTE If the Gate Time setting exceeds the original note length, then the Gate Time percentage will automatically be adjusted so the note length will not interfere with the legato.

SEQ EDIT / SETUP

This menu includes parameters and settings related to creation and play of Step Sequencer patterns. You can create a Voice Pattern for each voice, as well as create and store a total of 128 User Patterns. Step Sequencer settings are stored as voice data.

NOTE When the [EDIT ROTARY] switch is set to the SEQ EDIT/SETUP menu, the eight CONTROL knobs are used to set event data for each of the 16 steps. For information about using the Step Sequencer, see page 37.



Knob

Knob parameters are related to the 16 sequencer steps. There are three parameters available, including Event, 1-8/9-16, and Step Hold.

● Event

The Event parameters let you designate the type of event data to input using the eight CONTROL knobs.



Settings: Note (0 ~ 127 (C-2 ~G8)), Velocity (0 ~ 127), Gate Time (1 ~ 200%), Control Change (off, 1 ~ 95, AT)

NOTE Control Change setting (off, CC1~95, After Touch) is determined by the Control Number parameter in the same menu row (see page 91).

● 1-8 / 9-16

This parameter lets you designate which series of steps (1-8 or 9-16) are available for data entry using the eight CONTROL knobs. Each knob as positioned on the panel (1-8) relates to the corresponding sequence step (either 1-8 or 9-16, respectively), depending on this setting.

NOTE Pressing a knob for parameter confirmation or turning it for data input will display its step number in the LCD, to the left of the value setting.



Settings: 1-8, 9-16

● Step Hold

The Step Hold parameter lets you turn the Step Hold function on and off. When Step Hold is set to “on”, the note of the currently selected step will play repeatedly, based on the Tempo and Pattern Base Unit settings. This lets you adjust the various Event settings in context with the speed and timing of the sequence.

NOTE When Step Hold is set to “on”, you can select and check a step parameter by pressing a knob’s push-switch or turning it.



Settings: on, off

Pattern

Pattern parameters let you designate which pattern to play by the Step Sequencer, as well as set timing resolution, sequence length, type of loop and event control number. There are six parameters available, including Bank, No (Number), Base Unit, Length, Loop Type and Control Number.

● Bank

The Bank parameter lets you select the Voice pattern or User pattern bank, when Common KbdMode is set to “norm” or “shift&norm”. If Common KbdMode is set to “sel&norm” or “sel&shift”, the User Pattern bank is designated, and the Voice Pattern bank cannot be accessed.

NOTE For more information, see page 40.



Settings: Vce (Voice), User

● No **(Number)**

The Number parameter lets you select a Voice Pattern or User Pattern number (1-128), depending on which bank is designated with the Bank parameter, above. You can select from 128 patterns in each bank.

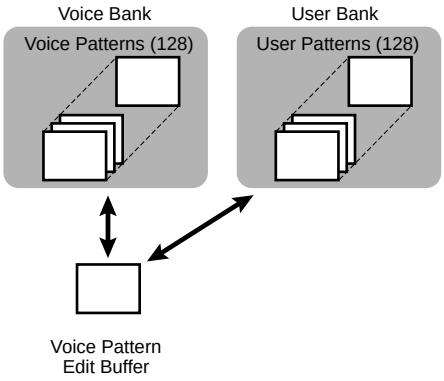
For a list of patterns, see the Sequence Pattern List in the separate Data List book.



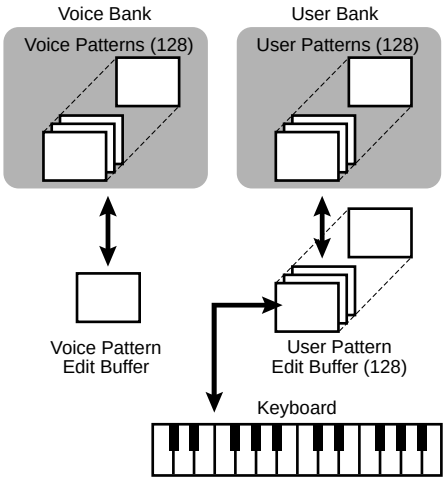
Settings: 1 ~ 128

Sequence Patterns and Banks

When you select a voice which has the Common KbdMode parameter set to “norm” or “shift&norm”, Voice Pattern data for the voice is loaded. Subsequently, you can select a Voice Pattern bank or number or User Pattern bank or number, and then edit the pattern.



When you select a voice which has the Common KbdMode parameter set to “sel&norm” or “sel&shift”, the Voice Pattern data for the voice is loaded. Subsequently, pressing a key to the left of the Split Point loads the pattern assigned to that note number, and then you can edit the pattern.



● Base Unit

The Base Unit parameter designates the timing resolution for the sequence pattern. This, together with the current Tempo setting (see page 77), determines the interval between steps.



Settings: 3/8=𝅗𝅥., 1/4=𝅗𝅥, 3/16=♪., 1/6=𝅘𝅥𝅯³, 1/8=♪, 3/32=♪., 1/12=𝅘𝅥𝅯³, 1/16=♪, 1/24=𝅘𝅥𝅯³, 1/32=𝅘𝅥𝅰

● Length

The Length parameter setting determines the length of the sequence pattern based on number of steps.

One step is equivalent to one note, so based on the Base Unit setting (see above), you can also select odd-numbered steps to create odd-numbered beats (such as setting the Length to "3" for 3/4-time, or to "5" for 5/4-time), as well as create completely unconventional rhythms.



Settings: 1 ~ 16 (Steps)

● LoopType

The Loop Type parameter lets you determine the type of loop cycle for the sequence pattern. The pattern always loops, and you can designate one of four ways for it to do so.



Settings:

forward: The pattern loops from first step to last repeatedly.

backward: The pattern loops from last step to first repeatedly.

alternateA: The pattern plays from first step to last (forward), then from last step to first (backward), then loops in this manner repeatedly (e.g., 1-2-3-4-4-3-2-1-1-etc.).

alternateB: The pattern plays from first step to last (forward), then reverses starting from the next to last step, then loops in this manner repeatedly (e.g., 1-2-3-4-3-2-1-2-3-4-3-etc.).

● Ctrl No **(Control Number)**

The Control Number setting determines the type of MIDI Control Change which can be output upon sequencer play. Once the Control Number is set, the Control Change event is selected with Knob Event parameter [UP/DOWN] and the value to be output via each step is edited with the CONTROL knobs.

For example, if you set the Control Number to “CC No 10: Pan Pot”, then selecting a different Control Change event value setting at each step lets you position the individual pattern notes from left to right in the stereo field.



Settings: 0 (off), Control Change (1 ~ 95), After Touch

NOTE For more information about MIDI and MIDI Control Change messages, see page 109.

SEQ Store **(Sequence Store)**

Sequence Store lets you store your edited Step Sequence pattern in one of the User bank pattern locations.



NOTE The Sequence Store operation stores the pattern currently held in the edit buffer in the User Pattern bank. This is different from the Voice Store operation (see page 98).

1. Press SEQ Store [UP/DOWN] to select a User pattern number. "SURE?[Y/N]" will start flashing in the LCD.



2. Press [YES/ENTER] to execute the Sequence Store operation. The LCD returns to the Pattern Bank/Number display.

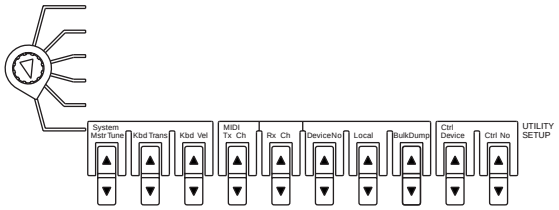


To cancel the Sequence Store operation after step 1, press [NO].

UTILITY SETUP

The Utility menu is dedicated to "global" parameters which affect the AN1x's system, including tuning, keyboard velocity and MIDI settings.

NOTE System parameters cannot be stored as voice data, and therefore will remain as set regardless of which voice is selected.



System

System settings are related to the AN1x's tone generator tuning and keyboard transposition and velocity sensitivity. There are three parameters available, including MstrTune (Master Tune), KbdTrans (Keyboard Transpose), and Kbd Vel (Keyboard Velocity).

● MstrTune **(Master Tune)**

The Master Tune parameter determines the master tuning pitch for the AN1x's tone generator in approx. 0.3 cent values (100 cents = 1 semitone).



Settings: -100 ~ 0 ~ +100

● KbdTrans **(Keyboard Transpose)**

The Keyboard Transpose parameter determines the transposition setting for the keyboard in semitones.



Settings: -36 ~ 0 (basic pitch) ~ +36

● Kbd Vel **(Keyboard Velocity)**

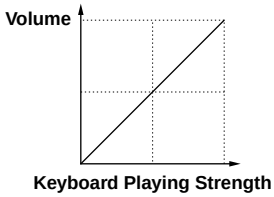
The Keyboard Velocity parameter sets the keyboard velocity curve which determines the way the AN1x's tone generator responds to keyboard playing strength.

NOTE The default factory setting is "wide", which provides for the widest possible dynamic range.

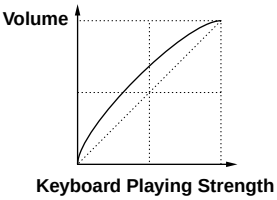


Settings: norm, soft1, soft2, easy, wide, hard, Vel Fix (1 ~ 127)

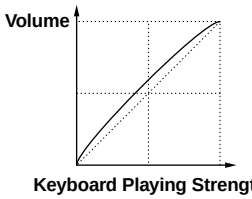
norm (Normal): The velocity is in proportion to the strength (how hard you play the keyboard).



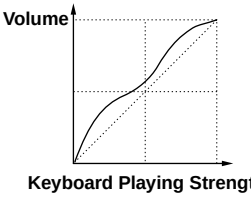
soft1: This curve increases the volume level with a softer playing style, and is suitable for players with a light key touch.



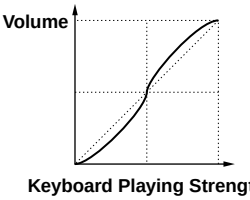
soft2: This curve also increases the volume level with a softer playing style, but is closer to the Normal curve compared to Soft1.



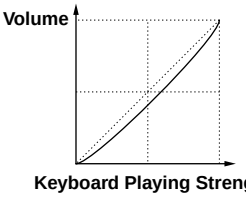
easy: This curve also increases the volume level with a softer playing style, but the volume level is stable in all registers since the velocity curve in the middle register of the keyboard is close to Normal.



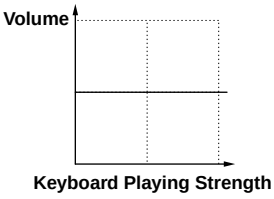
wide: This curve decreases the volume level with a softer playing style and increases the volume with a stronger playing style, resulting in a wider dynamic range overall.



hard: This curve increases the volume level with a stronger playing style, and is suitable for people with a heavy key touch.



Vel Fix (Velocity Fix) 1 ~ 127: This sets the velocity of the AN1x's keyboard to a specific value, which lets you play the sound at a fixed velocity regardless of playing strength.



MIDI

MIDI parameters are related to transmission and reception of MIDI messages to and from an external MIDI device. There are five parameters available, including Tx Ch (Transmit Channel), Rx Ch (Receive Channel), Device Number, Local, and Bulk Dump.

● Tx Ch **(Transmit Channel)**

The Transmit Channel parameter sets the MIDI channel on which the AN1x's keyboard, controllers and switches transmit MIDI messages. When not transmitting to an external device, set Tx Ch to "off".

NOTE Although MIDI Tx Ch and MIDI PtnTxCh can be set to the same channel, the notes played on the keyboard may interfere with the notes of the Arpeggiator or Step Sequencer pattern. Therefore, it is best to set each to a different channel number.



Settings: 1 ~ 16, off

NOTE The AN1x can play and control (and be controlled by) other MIDI devices such as tone generators, sequencers, and more. For information about MIDI, see page 109.

● Rx Ch **(Receive Channel)**

The Receive Channel parameter sets the MIDI channel on which the AN1x's tone generator receives MIDI note, controller and other messages. When Layer mode is set to SINGLE or UNISON, the current Scene setting determines which Scene is played by external MIDI signals.

Each Scene can be assigned its own MIDI channel and be played independently by incoming MIDI signals (when Layer mode is set to SPLIT/SPLIT UNISON or DUAL/DUAL UNISON). When not receiving from an external device, set Rx Ch to "off".



Settings:

SINGLE/UNISON: 1 ~ 16, off

SPLIT/SPLIT UNISON/DUAL/DUAL UNISON:
Scene 1: 1 ~ 16, off; Scene 2: 1 ~ 16, off

NOTE When Layer mode is set to SINGLE or UNISON, the receive channel for Scene 1 and Scene 2 are the same, and you cannot select a different receive channel for each.

● DeviceNo **(Device Number)**

The Device Number parameter lets you set the MIDI device number when performing bulk dump operations, or when transmitting and receiving System Exclusive messages. Both devices should be set to the same channel number.



Settings: 1 ~ 16, all, off

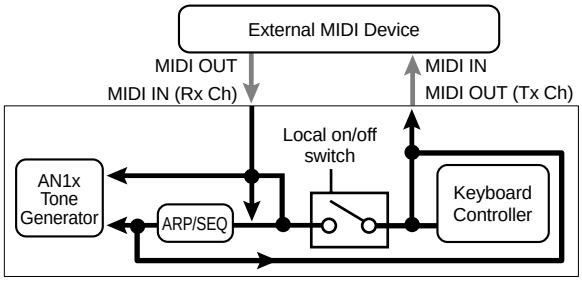
● Local

The Local parameter lets you designate the AN1x's keyboard to play the internal tone generator or not.

When set to "on", playing the AN1x's keyboard will cause the internal tone generator to sound. When set to "off", playing the keyboard will not play the internal tone generator, but will output note data via MIDI [OUT] to play an external tone generator or record into an external sequencer.

Normally this will be set to "on" unless you are using the AN1x as a master keyboard controller for recording note data into an external MIDI sequencer, and having the output of the sequencer determine whether the AN1x's tone generator plays or not, by signals received at MIDI [IN].





Settings: on, off

● Bulk Dump

The Bulk Dump parameter lets you initiate bulk dump operations when offloading AN1x data to an external MIDI data storage device (such as the Yamaha MDF2 MIDI Data Filer) or another AN1x. Bulk dump operations let you back up your important voice, Free EG, pattern and system data for safekeeping, and then load them back into the AN1x whenever you wish.



NOTE Before initiating a bulk dump operation, you must set up the external device for bulk dump send and/or receive. You'll also need to match the Device Number of the AN1x and the external device. For information, see the owner's manual which came with the external device.

Send Bulk Dump

1. **Press BulkDump [UP/DOWN] to select the type of data to be sent.**

Available types:

1scene: Sends the data of the currently selected Scene.

1vce: Sends the data of the currently selected Voice.

1-64 vce: Sends data for voice set 1 ~ 64.

65-128 vce: Sends data for voice set 65 ~ 128.

all voices: Sends data for all 128 voices.

1ptn: Sends data for the pattern currently selected in the Step Sequencer.

1-64 ptn: Sends data for the User Pattern bank 1-64.

65-128 ptn: Sends data for the User Pattern bank 65-128.

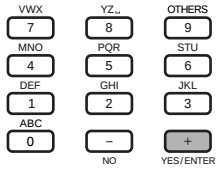
all ptn: Sends all Step Sequencer User Pattern data.

system: Sends all system parameter data.

all: Sends all data in memory.



2. **Press [YES/ENTER] to initiate the bulk dump. When the operation is finished, "End" will appear briefly in the LCD, which will then return to its prior display.**





To stop a bulk dump operation in progress, press [NO]. The LCD will return to its prior status.

Receive Bulk Dump

A Receive Bulk Dump operation lets you load data back into the AN1x from an external MIDI device.

The type of data which can be received depends on the current mode. For more information, see the MIDI data format, in the separate Data List book.

Before initiating a Receive Bulk Dump operation, the Device Number for both devices must be matched. (For more information, see Device No, on the previous page.)

Ctrl (Control)

Control parameters let you designate the type of Control Change messages which can be controlled by the [MODULATION] Wheel, each of the eight CONTROL knobs, the [RIBBON] Controller, etc., by assigning Control Change numbers to specific controllers ("devices"). There are two parameters available, Device and Control Number.

Based on settings made here as well as in the Control Matrix (see pages 51, 73), you can use a single controller to control one parameter of the internal tone generator and another parameter of an external MIDI device, both at the same time. It also lets you determine which device (MW, FC, etc.) to use for Scene Control.

● Device

The Device parameter lets you select the controller to which you want to assign a Control Number.

● Ctrl No (Control Number)

The Control Number parameter lets you designate the Control Change number (type of parameter) which the Device (controller) will control.

NOTE For information about MIDI and MIDI Control Change messages, see page 109.

Settings: 0 (off), CC 1 ~ 95, After Touch

Procedure

1. **Press Device [UP/DOWN] to select the name of the controller to which you want to assign a controller number.**



Controllers:

MW: Modulation Wheel

FV: Foot Volume

FC: Foot Controller

FS: Footswitch

RbnX: Ribbon Controller X-axis

RbnZ: Ribbon Controller Z-axis

Knob1~8: Assign group knobs 1 ~ 8

SCENE: Scene Control controller

2. Press Ctrl No [UP/DOWN] to select the control function. The control function name appears beside the available control numbers.



NOTE When set to a Knob (1 ~ 8), Tempo and Data Entry can also be selected for control.

NOTE For a list of available controllers, see the separate Data List book.

3. Repeat steps 1 and 2, above, to assign all controllers as desired.

Scene Control Assign

(1) Press Device [UP/DOWN] and select "Scene".

(2) Press Ctrl No [UP/DOWN] to select a Control Change number to control Scene Control.

(3 Press Device [UP/DOWN] again to select the controller you want to use.

(4) Press Ctrl No [UP/DOWN] again to select the same Control Change number as selected in step 2, above.

Control Change Modes

The AN1x has two Control Change modes. Mode 1 is the official MIDI standard, which is set at the factory. Mode 2 is a special list of Control Change parameter settings unique to the AN1x.

To change between modes, first turn off the power. Then, press and hold [ASSIGN] and press the [POWER] switch. Either “mode1” or “mode2” will appear in the LCD at the start-up procedure to indicate which mode is activated.

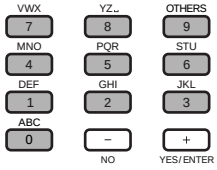
NOTE When using Mode 2, take care when making Control Change assignments since the behavior will be different from the MIDI standard.

NOTE For a list of Control Change types for each mode, see the separate Data List book.

Voice Recall

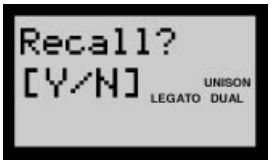
If you edit a voice and then inadvertently select another voice before storing the edited voice, you can retrieve the edited data using the Voice Recall function.

1. Enter [129] in the PROGRAM CHANGE keypad. The number 129 begins flashing in the LCD.





2. Press [YES/ENTER]. “Recall?[Y/N]” appears in the LCD.



3. Press [YES/ENTER] again to recall the previously edited voice data.

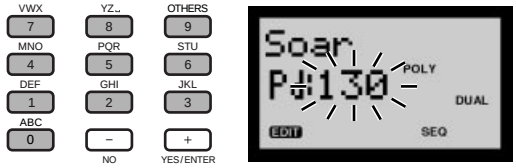
NOTE After step 2, pressing [NO] will cancel the Voice Recall operation and the LCD will display the previously selected voice name and number.

Voice Initialize

The Voice Initialize function lets you "reset" a voice to its initial setting, which is handy when you want to create a voice from "scratch".

NOTE The initialized setting loads into the edit buffer, so after performing the Voice Initialize operation, be sure to store the voice using the Voice Store operation.

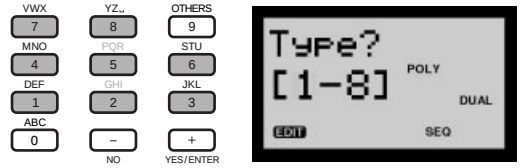
1. Enter [130] in the PROGRAM CHANGE keypad. The number 130 begins flashing in the LCD.



2. Press [YES/ENTER]. "Init?[Y/N]" appears in the LCD.



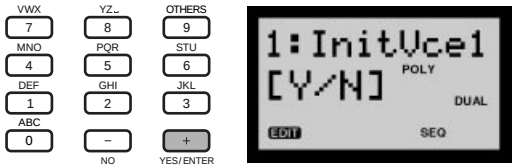
3. Press [YES/ENTER] again. "Type? 1-8" appears in the LCD. Select the template Type (1-8) by pressing the corresponding number key in the PROGRAM CHANGE keypad. The number and name appear in the LCD.



You can choose from eight types of initial voice settings, each with the basic settings programmed for specific types of voices, as follows:

1 - Normal (all settings normalized)
2 - Bass
3 - Brass
4 - Strings
5 - E.Piano
6 - Organ
7 - Sync mono (for solo lead type voices)
8 - PWM (for pad type voices)

4. Press [YES/ENTER] to initialize the voice data.



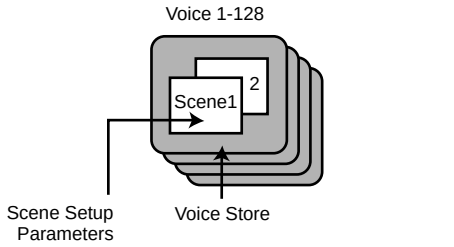
The initialized voice settings are loaded into the edit buffer. You should change the name using the Name function in the VOICE COMMON menu (see page 80), and store the voice by performing a Voice Store operation (see page 98).

NOTE After step 1, pressing [NO] will cancel the Voice Initialize operation and the LCD will display the previously selected voice name and number.

NOTE You can give the voice a name using the Name function in the VOICE COMMON menu. For information, see page 80.

Store

Store lets you perform Voice Store or Scene Store operations.



- Layer Mode
- Portamento On/Off
- Arpeggiator/Step Sequencer On/Off
- Voice Common Parameters
- Voice Pattern Parameters
- Free EG Parameters

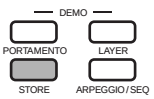
Voice Store

The Voice Store operation lets you store edited voice data (including Scene 1 and 2 settings) to any memory location (1 ~ 128).

NOTE When you perform a Voice Store operation, the original voice data in the memory location will be overwritten, so be sure to save all important voices beforehand to an external MIDI data storage device such as the Yamaha MDF2 MIDI Data Filer. You can recall all factory voices at any time (see page 100).

NOTE To change the name of an edited voice, see the Name function in the VOICE COMMON menu, page 80.

1. After editing a voice (the EDIT mark will be displayed in the LCD), press the [STORE] switch. The STORE mark will display in the LCD.





2. Enter a number (1 ~ 128) using the PROGRAM CHANGE keypad representing the location in which you want to store the edited voice, followed by [ENTER], or select the location with [-] / [+]. The voice name flashes alternately with "HIT[STORE]".



NOTE Step 2 can be omitted if you want to store the voice to the same location number. In such a case, go straight to step 3.

3. Press the store switch again. "SURE?[Y/N]" appears in the LCD.



NOTE If a User Pattern has been edited, "All Ptns?[Y/N]" appears in the LCD. To overwrite all User Patterns, press [YES/ENTER]. To cancel the operation, press [NO].

4. Press [YES/ENTER] to execute the Voice Store operation. The LCD then returns to the normal voice name and number display.

After steps 1-3, pressing [NO] will cancel the Voice Store operation, and the LCD will display the previously selected voice name and number.

NOTE When you execute a Voice Store operation, Scene 1 and Scene 2 on/off status, Layer mode setting, ARPEGGIO/SEQ on/off status, Portamento on/off status, and all other voice parameters are stored to the designated voice number.

NOTE If you already know which location you want to store the voice in, simply enter the number in the PROGRAM CHANGE keypad and press the [STORE] switch.

Scene Store

Scene Store is handy for storing the knob position settings created during Scene Control to one of the [SCENE] switches.

NOTE Scene Store loads the data into the Scene edit buffer, so you will need to perform a Voice Store operation to store the Scene parameters as voice data.

The procedure is as follows:

1. **Hold [STORE] and press the [SCENE 1] or [SCENE 2] switch, depending on which one you want to store the current setting into. "SURE?[Y/N]" flashes in the LCD.**



2. **Press [YES/ENTER] to execute the Scene Store operation. The LCD then returns to the prior display.**

After steps 1-2, pressing [NO] will cancel the Scene Store operation, and the LCD will return to the prior condition.

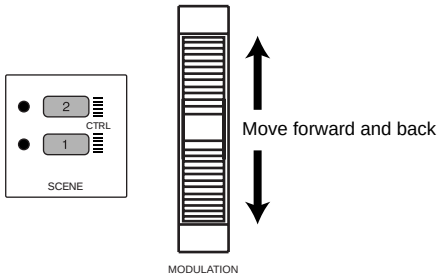
3. **Execute a Voice Store operation to store the Scene data as part of the voice, along with Scene on/off status.**

Scene Select

After selecting a voice, press [SCENE 1] or [SCENE 2] to select the desired scene. The LED appears beside the selected switch to indicate the active Scene. (At least one Scene is active at all times.)

Scene Control

Press both [SCENE] switches to activate the Scene Control function, which can be controlled with the MW or FC, or any other assignable continuous controller, in order to "morph", or crossfade between Scene 1 and 2 sounds. (For more information, see page 20.)



Scene Swap And Scene Load

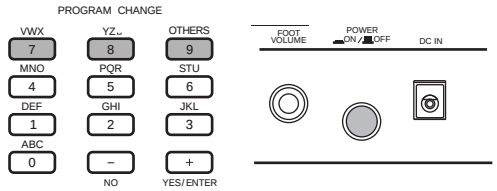
A Scene Swap function lets you exchange the data in the two Scenes for the currently selected voice (see page 22), and a Scene Load function lets you load Scene data from a Scene in another voice into a Scene in the currently selected voice (see page 22).

Factory Settings

You can recall all of the original voices, plus scene, Step Sequencer, system, MIDI, and other parameter settings which were programmed at the factory.

NOTE This operation resets the settings in memory, so be sure to offload any important data first to a MIDI data storage device before execution.

1. After turning off the power, hold [7], [8] and [9] in the PROGRAM CHANGE keypad and turn the power back on.



2. The "Fact Set? [1-9]" display will appear in the LCD.



You can choose from the following factory sets:

1 - 1-64 voice (loads voices 1-64)
2 - 65-128 voice (loads voices 65-128)
3 - all voice (loads all 128 voices)
4 - sorted voice (loads all voices sorted by voice Category)
5 - 1-64 user pattern (loads User Patterns 1-64)
6 - 65-128 user pattern (loads User Patterns 65-128)
7 - all pattern (loads all User Patterns)
8 - system (loads system data)
9 - all (loads all voice, User Pattern and system data)

3. Press the number on the PROGRAM CHANGE keypad ([1] ~ [9]) corresponding to the factory data set you want to recall. The number and name of the set appears in the LCD.



4 Press [YES/ENTER] to recall the set.

Voice Creation Examples

Following are examples for creating some of the most common synthesizer sounds, including Synth Bass, Strings, Electric Piano, Electronic Organ, Synth Brass and Synth Lead. Taking the time to work through the simple steps to create each will give you a deeper understanding of how the various tone generator parameters work together, as well as how to practically apply the Control Matrix.

Synth Bass

First let's create the fundamental sound...

1. Select a voice that you don't mind writing over.
Perform a Type 1 (Normal) Voice Initialize operation.

2. Set the oscillator with a low interval for bass.
Press KNOB PARAMETER GROUP switch [VCO1], then press CONTROL knob 2 once to display the Pitch parameter in the LCD. Turn the knob to set a value of "-12", which is an octave lower than the basic pitch.

3. Filter out the roughness.
Press KNOB PARAMETER GROUP switch [VCF], then press CONTROL knob 5 once to display the VCF Cutoff parameter in the LCD. Turn the knob to set a value somewhere near "60", which results in a much rounder, or smoother sound.

4. Tighten up the sustain.
Press CONTROL knob 3 to display the Sustain parameter in the LCD. Turn the knob to set a value near "0", which will get rid of the flabbiness of the sound.

5. Beef up the volume.
Press KNOB PARAMETER GROUP switch [VCA], then press CONTROL knob 6 once to display the Volume parameter in the LCD. Turn the knob to set a value near "110" to increase the overall level of the sound.

Next let's tweak a few parameters to add extra depth and dimension to the sound...

6. Fine-adjust the sensitivity, filter and FEG.
Press KNOB PARAMETER GROUP switch [VCF], then press CONTROL knob 8 once to display the Vel Sens (Velocity Sensitivity) parameter in the LCD. Turn the knob to set a value of about "+30", to increase the sensitivity applied to the VCF with playing strength.

Next, use CONTROL knob 5 to further adjust the VCF Cutoff. Use knob 7 to set the FEG Depth to your liking, and use knob 8 to further define the Vel Sens according to your playing style.

NOTE The Velocity Sensitivity setting affects the rate of change of the FEG Depth. The FEG Depth setting determines the range of the change.

7. Set up the synth bass sound for legato play.
Set the [EDIT ROTARY] switch to the VOICE SCENE SETUP menu and press Poly [UP/DOWN] to set the Poly mode to "legat" (legato). Playing the keyboard produces only a monophonic note, and you can slur the bass notes into each other.

8. Fatten up the sound with Unison play.
Press the [LAYER] switch once to select the Unison mode. ("UNISON" appears accordingly in the right area of the LCD.) This produces a much thicker sound when you play, stacking up five sounds with each note.

9. Boost the filter resonance.
Press KNOB PARAMETER GROUP switch [VCF] and press CONTROL knob 6 to display the Resonance parameter in the LCD. Turn the knob to set a value of about "60", which will emphasize the harmonics near the cutoff frequency.

10. Apply vibrato to the voice.

Press KNOB PARAMETER GROUP switch [VCO1] and press CONTROL knob 8 to display the Pmod Depth (Pitch Modulation Depth) parameter in the LCD. Turn the knob to set a value near "+20". This applies the vibrato effect to the voice when you play.

Next, let's set up the vibrato to be applied by the [MODULATION] wheel, in order to control the amount of vibrato as you play. Change the Pmod Depth setting back to "0".

We'll use one of the 16 sets in the Control Matrix to assign the VCO1 Pitch Modulation Depth parameter to the [MODULATION] wheel.

Set the [EDIT ROTARY] switch to the VOICE SCENE SETUP menu.

- Press Set No [UP/DOWN] to display "Set 1" in the LCD.
- Press Param [UP/DOWN] to display "VCO1 PmodDp" in the LCD.
- Press Source [UP/DOWN] to display "A.MW" in the LCD.

NOTE You can also assign a Control Change number to the Source, by which to control the Parameter. In this case the Control Change number must match the setting in the UTILITY SETUP menu's Control Device and Control Number.

You can control the vibrato by moving the [MODULATION] wheel. To further define the range of vibrato control, press Depth [UP/DOWN] to set the value of about "Dp+20".

There are many other parameters you may want to adjust to get just the right sound you want. When you're finished with the editing process, perform a Voice Store operation to store your creation. For information, see page 98.

Strings

First let's create the fundamental sound...

1. Select a voice that you don't mind writing over.

Perform a Type 1 (Normal) Voice Initialize operation.

2. To achieve the sound of multiple players, we'll use both VCO1 and VCO2 oscillators.

Press KNOB PARAMETER GROUP switch [MIX/VCF], then press CONTROL knob 2 once to display the VCO2 Level parameter in the LCD. Turn the knob to set a value of "127" so that the VCO2 can be heard.

3. Adjust the interval between the oscillators.

Press KNOB PARAMETER GROUP switch [VCO2], then press CONTROL knob 3 once to display the Fine Tune parameter. Turn the knob to set a value of about "+7" to create a slight interval.

4. Soften the attack of the sound.

Press KNOB PARAMETER GROUP switch [VCA], then press CONTROL knob 1 once to display the Attack parameter in the LCD. Turn the knob to set a value near "50" to provide a slight delay between the time you press the key and the sound starts.

5. Increase the release time of the sound.

Press CONTROL knob 4 once to display the Release parameter in the LCD. Turn the knob to set a value near "60" so that the sound lingers for a short time when you release a key.

Next let's tweak a few parameters to add extra depth and dimension to the sound...

6. Multiply the string sounds with Unison Detune.

Press the [LAYER] switch once to select the Unison mode. ("UNISON" appears accordingly in the right area of the LCD.) Set the [EDIT ROTARY] switch to the VOICE SCENE SETUP menu and press Unison Detune [UP/DOWN] to set a value of about "12" to increase the detuning between the Unison notes.

7. Apply the Chorus effect to the sound.

Set the [EDIT ROTARY] switch to the VOICE COMMON menu and press Vari EF Dry:Wet [UP/DOWN] to set the balance between original and Chorus to about "D<W10". (Chorus 1 is already assigned as the current Variation Effect.)

8. Set the velocity sensitivity of the VCA.

Press KNOB PARAMETER GROUP switch [VCA], then press CONTROL knob 8 to display the Vel Sens (Velocity Sensitivity) parameter in the LCD. Turn the knob to set a value near "+15" to increase the sensitivity.

9. Adjust the cutoff frequency and set the velocity sensitivity of the VCF.

Press KNOB PARAMETER GROUP switch [VCF], then press CONTROL knob 5 once to display the VCF Cutoff parameter in the LCD. Turn the knob to set a value near "75" to soften the sound.

Press CONTROL knob 8 once to display the Vel Sens (Velocity Sensitivity) parameter in the LCD. Turn the knob to set a value near "+15", to increase the sensitivity applied to the VCF with playing strength.

Next, use CONTROL knob 5 to further adjust the VCF Cutoff. Use knob 7 to set the FEG Depth to your liking, and use knob 8 to further define the Vel Sens according to your playing style.

NOTE The Velocity Sensitivity setting affects the rate of change of the FEG Depth. The FEG Depth setting determines the range of the change.

10. Apply vibrato to the voice.

Press KNOB PARAMETER GROUP switch [VCO1] and press CONTROL knob 8 to display the Pmod Depth (Pitch Modulation Depth) parameter in the LCD. Turn the knob to set a value of about "+20". This applies the vibrato effect to the voice when you play.

Next, let's set up the vibrato to be applied by the [MODULATION] wheel, in order to control the amount of vibrato as you play. Change the Pmod Depth setting back to "0".

We'll use one of the 16 sets in the Control Matrix to assign the VCO1 Pitch Modulation Depth parameter to the [MODULATION] wheel.

Set the [EDIT ROTARY] switch to the VOICE SCENE SETUP menu.

- Press Set No [UP/DOWN] to display "Set 1" in the LCD.
- Press Param [UP/DOWN] to display "VCO1 PmodDp" in the LCD.
- Press Source [UP/DOWN] to display "A.MW" in the LCD.

NOTE You can also assign a Control Change number to the Source, by which to control the Parameter. In this case the Control Change number must match the setting in the UTILITY SETUP menu's Control Device and Control Number.

You can control the vibrato of the VCO1 by moving the [MODULATION] wheel. To further define the range of vibrato control, press Depth [UP/DOWN] to set a value of "Dp+20".

We'll use another Control Matrix set to assign the VCO2 Pitch Modulation Depth parameter also to the [MODULATION] wheel.

- Press Set No [UP/DOWN] to display "Set 2" in the LCD. "Param Off" will also be indicated.
- Press Param [UP/DOWN] to display "VCO2 PmodDp" in the LCD.
- Press Source [UP/DOWN] to display "A.MW" in the LCD.

You can control the vibrato of the VCO2 by moving the [MODULATION] wheel. To further define the range of vibrato control, press Depth [UP/DOWN] to set a value of "Dp+20".

NOTE Try setting different Control Matrix Depth values to the VCO1 and VCO2 to hear the effect produced.

There are many other parameters you may want to adjust to get just the right sound you want. When you're finished with the editing process, perform a Voice Store operation to store your creation. For information, see page 98.

Electric Piano

First let's create the fundamental sound...

1. Select a voice that you don't mind writing over.
Perform a Type 1 (Normal) Voice Initialize operation.

2. Set up the basic characteristics of the electric piano.
Press KNOB PARAMETER GROUP switch [VCO1], then press CONTROL knob 4 once to display the Edge parameter in the LCD. Turn the knob to set a value of about "50" to smooth out the sound.

Press KNOB PARAMETER GROUP switch [SYNC/FM].
- Turn CONTROL knob 1 to set the Algorithm parameter to "Sync+FMbth", which enables the sync and applies FM to both master and slave oscillators of VCO1.

NOTE Other settings (except for "only FM") will also produce effective results.

- Turn CONTROL knob 2 to set the Sync Pitch parameter to a value of about "+33". The sound will become very tinny.

3. Set up the VCO2 to fill out the sound.
Press KNOB PARAMETER GROUP switch [VCO2], then press CONTROL knob 4 once to display the Edge parameter in the LCD. Turn the knob to set a value of about "50".

Press KNOB PARAMETER GROUP switch [MIX/VCF], then press CONTROL knob 2 to display the VCO2 Level parameter in the LCD. Turn the knob to set a value of about "127" in order to hear the VCO2.

4. Fine-tune the AEG and VCA velocity sensitivity.
Press KNOB PARAMETER GROUP switch [VCA].
- Turn CONTROL knob 3 to set the Sustain parameter to a value of "0".
- Turn CONTROL knob 2 to set the Decay parameter to a value of about "83".
- Turn CONTROL knob 8 to set the Vel Sens (Velocity Sensitivity) parameter to about "+30", to increase the sensitivity level.

5. Fine-tune the FEG Sustain and Decay parameters.
Press KNOB PARAMETER GROUP switch [VCF].
- Turn CONTROL knob 3 to set the Sustain parameter to a value of about "40".
- Turn CONTROL knob 2 to set the Decay parameter to a value of about "85".

6. Set the VCF cutoff for a mellow EP sound.
In the [VCF] group, turn CONTROL knob 5 to set the VCF Cutoff parameter to a value of about "70".

7. Set the velocity senstivity of the filter.
In the [VCF] group, turn CONTROL knob 8 to set the Vel Sens (Velocity Sensitivity) to a value of about "+40". This lets you bring out the highs with greater playing strength.

8. Widen the sound with a chorus effect.
Set the [EDIT ROTARY] knob to the VOICE COMMON menu. Press Vari EF Dry:Wet [UP/DOWN] and set a value of about "D<W10". (Chorus 1 is already set as the current Variation Effect.)

9. Apply reverberation to the sound.
In the VOICE COMMON menu, press Dly/Rev EF Param [UP/DOWN] to display "Rev Return" in the LCD. Press Data [UP/DOWN] to set a value of about "20".

Next let's tweak a few parameters to add extra control and subtle dimension to the sound...

10. Set up the Control Matrix to control the AEG Decay by key tracking.
With key tracking you can make the AEG Decay quicker in the upper range and slower in the lower range, for a more natural electronic piano sound.

Set the [EDIT ROTARY] switch to the VOICE SCENE SETUP menu.
- Press Set No [UP/DOWN] to display "Set 1" in the LCD.
- Press Param [UP/DOWN] to display "AEG Decay" in the LCD.
- Press Source [UP/DOWN] to display "KyTrk" (Key Track) in the LCD.
- Press Depth [UP/DOWN] to set a value of "Dp+ 9".

11. Use the Control Matrix to control the FEG Decay by key tracking.
With key tracking you can also make the FEG Decay quicker in the upper range and slower in the lower range, for a more natural electronic piano sound.

In the VOICE SCENE SETUP menu, perform the following operations:
- Press Set No [UP/DOWN] to display "Set 2" in the LCD.
- Press Param [UP/DOWN] to display "FEG Decay" in the LCD.
- Press Source [UP/DOWN] to display "KyTrk" (Key Track) in the LCD.
- Press Depth [UP/DOWN] to set a value of "Dp+ 5".

12. Use the Control Matrix to control the Sync Pitch by key tracking.

With key tracking you can mellow out the Sync Pitch in the upper range and bring out the grit in the lower range.

In the VOICE SCENE SETUP menu, perform the following operations:

- Press Set No [UP/DOWN] to display “Set 3” in the LCD.
- Press Param [UP/DOWN] to display “Sync Pitch” in the LCD.
- Press Source [UP/DOWN] to display “KyTrk” (Key Track) in the LCD.
- Press Depth [UP/DOWN] to set a value of “Dp-18”.

Finally, let's adjust the PEG to add a harder attack to the electronic piano sound. Press KNOB PARAMETER GROUP switch [PEG/LFO].

- Turn CONTROL knob 1 and set the PEG Decay parameter to about “+3”.
- Turn CONTROL knob 2 and set the PEG Depth parameter to about “10”.

There are many other parameters you may want to adjust to get just the right sound you want. When you’re finished with the editing process, perform a Voice Store operation to store your creation. For information, see page 98.

Electronic Organ

First let’s create the fundamental sound...

1. Select a voice that you don't mind writing over.

Perform a Type 1 (Normal) Voice Initialize operation.

2. Select the pulse wave for a basic organ sound.

Press KNOB PARAMETER GROUP switch [VCO1]. Turn CONTROL knob 1 to set the Wave parameter to "pulse". Turn CONTROL knob 4 to set the Edge parameter to a value of about “30”. This smooths out the rough edge of the sound.

Press KNOB PARAMETER GROUP switch [SYNC/FM].

- Turn CONTROL knob 1 to set the Algorithm parameter to “Sync+FMbth”, which enables the sync and applies FM to both master and slave oscillators of VCO1.

NOTE Other settings (except for “only FM”) will also produce effective results.

- Turn CONTROL knob 2 to set the Sync Pitch parameter to a value of about “+17”.

3. Set up the VCO2 an octave down to add fullness to the organ sound.

Press KNOB PARAMETER GROUP switch [VCO2].

- Turn CONTROL knob 4 to set the Edge parameter to a value of about “40”.
- Turn CONTROL knob 2 to lower the Pitch parameter to a value of “-12”, which is a full octave down.

Press KNOB PARAMETER GROUP switch [MIX/VCF].

- Turn CONTROL knob 2 to set the VCO2 Level to a value of “127” so that the VCO2 can be heard.
- Turn CONTROL knob 1 to decrease the VCO1 Level to a value of about “70”.

4. Add a rotary speaker effect to the organ sound.

Set the [EDIT ROTARY] switch to the VOICE COMMON menu.

- Press Vari EF/EQ Param [UP/DOWN] to display “VarEF” in the LCD.
- Press Data [UP/DOWN] to select the “RotarySp” effect.
- Press Vari EF Dry:Wet [UP/DOWN] to increase the effect level to a value of about “D<W10”.

Next let's tweak a few parameters to add extra control over and dimension to the sound...

5. Set up the [MODULATION] wheel to control the speed of the rotary speaker.
Set the [EDIT ROTARY] switch to the VOICE SCENE SETUP menu.
- Press Control Matrix Set No [UP/DOWN] to select "Comn1" (Common 1).
- Press Param [UP/DOWN] to select "Vari Param" (Variation Parameter).
- Press Source [UP/DOWN] to select "A.MW" (Modulation Wheel). When you move the [MODULATION] wheel, the speed of the rotary speaker will change accordingly.
- Press Depth [UP/DOWN] to set the value to "Dp+10".

6. Add the organ click to the sound using the PEG.
Press KNOB PARAMETER GROUP switch [PEG/LFO].
- Turn CONTROL knob 1 to set the PEG Decay parameter to a value between "+1" and "+4".
- Turn CONTROL knob 2 to set the PEG Depth parameter to a value of about "+20". This creates the click.

There are many other parameters you may want to adjust to get just the right sound you want. When you're finished with the editing process, perform a Voice Store operation to store your creation. For information, see page 98.

Synth Brass

First let's create the fundamental sound...

1. Select a voice that you don't mind writing over.
Perform a Type 1 (Normal) Voice Initialize operation.

2. To achieve the sound of multiple players, we'll use both VCO1 and VCO2 oscillators.
Press KNOB PARAMETER GROUP switch [MIX/VCF], then press CONTROL knob 2 once to display the VCO2 Level parameter in the LCD. Turn the knob to set a value of "127" so that the VCO2 can be heard.

3. Adjust the interval between the oscillators.
Press KNOB PARAMETER GROUP switch [VCO2], then press CONTROL knob 3 once to display the Fine Tune parameter. Turn the knob to set a value of about "-4" to create a slight interval.

4. Set up the FEG, VCF Cutoff and FEG Depth for a characteristic brass sound.
Press KNOB PARAMETER GROUP switch [VCF].
- Turn CONTROL knob 1 to set the Attack parameter to about "40".
- Turn CONTROL knob 2 to set Decay to about "55".
- Turn CONTROL knob 3 to set Sustain to about "40".
- Turn CONTROL knob 5 to set the VCF Cutoff to about "55".
- Turn CONTROL knob 7 to set the FEG Depth to about "+55".

Next let's tweak a few parameters to add extra depth and dimension to the sound...

5. Emphasize the brass characteristics of VCO1 with the PEG.
Press KNOB PARAMETER GROUP switch [PEG/LFO].
- Turn CONTROL knob 1 and set the PEG Decay value to about "+15".
- Turn CONTROL knob 2 and set the PEG Depth parameter to about "-2".
- Turn CONTROL knob 3 and set the PEG Sw (Switch) to "VCO1".

6. Apply vibrato to the voice.

Press KNOB PARAMETER GROUP switch [VCO1] and press CONTROL knob 8 to display the Pmod Depth (Pitch Modulation Depth) parameter in the LCD. Turn the knob to set a value near "+20". This applies the vibrato effect to the voice when you play.

Next, let's set up the vibrato to be applied by the [MODULATION] wheel, in order to control the amount of vibrato as you play. Change the Pmod Depth setting back to "0".

We'll use one of the 16 sets in the Control Matrix to assign the VCO1 Pitch Modulation Depth parameter to the [MODULATION] wheel.

Set the [EDIT ROTARY] switch to the VOICE SCENE SETUP menu.

- Press Set No [UP/DOWN] to display "Set 1" in the LCD.
- Press Param [UP/DOWN] to display "VCO1 PmodDp" in the LCD.
- Press Source [UP/DOWN] to display "A.MW" in the LCD.

NOTE You can also assign a Control Change number to the Source, by which to control the Parameter. In this case the Control Change number must match the setting in the UTILITY SETUP menu's Control Device and Control Number.

You can control the vibrato of the VCO1 by moving the [MODULATION] wheel. To further define the range of vibrato control, press Depth [UP/DOWN] to set a value of "Dp+20".

7. Apply reverberation to the sound.

Set the [EDIT ROTARY] switch to the VOICE COMMON menu, then press Dly/Rev EF Param [UP/DOWN] to display "Rev Return" in the LCD. Press Data [UP/DOWN] to set a value of about "30".

There are many other parameters you may want to adjust to get just the right sound you want. When you're finished with the editing process, perform a Voice Store operation to store your creation. For information, see page 98.

Synth Lead

First let's create the fundamental sound...

1. Select a voice that you don't mind writing over.

Perform a Type 1 (Normal) Voice Initialize operation.

2. Set up the Sync Algorithm for a slow movement of the sound.

Press KNOB PARAMETER GROUP switch [SYNC/FM].

- Turn CONTROL knob 1 and set the Algorithm parameter to "Sync+FMbth", which enables the sync and applies FM to both master and slave oscillators of VCO1.

NOTE Other settings (except for "only FM") will also produce effective results.

- Turn CONTROL knob 2 and set the Sync Pitch parameter to a value of about "+10".
- Turn CONTROL knob 3 and set the Sync Pitch Depth parameter to a value of about "+20".
- Turn CONTROL knob 4 and set the Pitch Source to "LFO1".

3. Slow down the speed of the LFO1.

Press KNOB PARAMETER GROUP switch [PEG/LFO], then press CONTROL knob 6 once to display the LFO1 Speed parameter in the LCD. Turn the knob to set a value of about "8".

4. Change the LFO1 wave.

Press CONTROL knob 5 once to display the LFO1 Wave parameter in the LCD. Turn the knob to select "sine↑↑", which shifts the entire wave above the 0 line. This creates a more typical synth lead sound.

Next let's tweak a few parameters to add extra depth and dimension to the sound...

5. Set up the sound for portamento play.

In the [PEG/LFO] group, press CONTROL knob 4 to display the Port (Portamento) Time parameter in the LCD. Turn the knob to set a value of about "60".

NOTE If "– – –" is flashing alternately with the Port Time value in the LCD, this means the portamento is turned off. To turn the portamento on, press the [PORTAMENTO] switch once.

6. Set up the Synth Lead sound for legato play.

Set the [EDIT ROTARY] switch to the VOICE SCENE SETUP menu and press Poly [UP/DOWN] to set the Poly mode to "legat" (legato). Playing the keyboard produces only a monophonic note, and you can slur the lead notes into each other.

7. Thicken the sound with Unison play.

Press the [LAYER] switch once to select the Unison mode. ("UNISON" appears accordingly in the right area of the LCD.) This produces a much thicker sound when you play, stacking up five sounds with each note.

8. Add a delay effect to the sound.

Set the [EDIT ROTARY] switch to the VOICE COMMON menu, then press Dly/Rev EF Param [UP/DOWN] to display "Dly Return" in the LCD. Press Data [UP/DOWN] to set a value of about "30".

There are many other parameters you may want to adjust to get just the right sound you want. When you're finished with the editing process, perform a Voice Store operation to store your creation. For information, see page 98.

About MIDI

MIDI is an acronym that stands for Musical Instrument Digital Interface, which allows electronic musical instruments to communicate with each other, by sending and receiving compatible Note, Control Change, Program Change and various other types of MIDI data, or messages. The AN1x can control a MIDI device by transmitting note related data and various types of controller data. The AN1x can be controlled by the incoming MIDI messages which automatically select MIDI channels, voices and effects, and change parameter values.

MIDI Messages Transmitted And Received By The AN1x

MIDI messages can be divided into two groups: Channel messages and System messages. Below is an explanation of the various types of MIDI messages which the AN1x can receive and transmit.

1.CHANNEL MESSAGES

Channel messages are the data related to the performance on the keyboard for the specific channel.

Note On/Note Off (Key On/Key Off)

Messages which are generated when the keyboard is played.

Reception note range = C-2 (0) - G8 (127), C3 = 60

Velocity range = 1 - 127 (Only the Note On velocity is received)

Note On: Generated when a key is pressed.

Note Off: Generated when a key is released.

Each message includes a specific note number which corresponds to the key which is pressed, plus a velocity value based on how hard the key is struck.

Control Change

Control Change messages let you select a voice bank, control volume, panning, modulation, portamento time, brightness and various other controller parameters, through specific Control Change numbers which correspond to each of the various parameters.

Modulation (Control #001)

Messages which control vibrato depth using the Modulation Wheel.

Setting the value to 127 produces maximum vibrato and 0 results in vibrato off.

Portamento Time (Control #005)

Messages which control the duration of portamento, or a continuous pitch glide between successively played notes.

When the parameter Portamento Switch is set to on, the value set here can adjust the speed of pitch change. Setting the value to 127 produces maximum portamento time and 0 results in minimum portamento time.

Data Entry MSB (Control #006)

Data Entry LSB (Control #038)

Messages which set the value for the parameter specified by RPN MSB/LSB. Parameter value is determined by combining MSB and LSB.

Main Volume (Control #007)

Messages which control the volume of the AN1x.

Setting the value to 127 produces maximum volume and 0 results in volume off. The message 007 (Main Volume) will be transmitted using an optional controller connected to the FOOT VOLUME jack on the rear panel according to the factory-set.

Pan (Control #010)

Messages which control the stereo panning position of each voice (for stereo output).

Setting the value to 127 positions the sound to the far right and 0 positions the sound to the far left.

Expression (Control #011)

Messages which control intonation expression of each voice during performance.

Setting the value to 127 produces maximum volume and 0 results in volume off.

Sustain Switch (Control #064)

Messages which control sustain on/off.

Setting the value between 64 - 127 turns the sustain on, between 0 - 63 turns the sustain off.

Portamento Switch (Control #065)

Messages which control portamento on/off.

Setting the value between 64 -127 turns the portamento on, between 0 - 63 turns the portamento off.

Harmonic Content (Control #071)

Messages which adjust the VCF resonance set for each voice.

Higher values will result in a more characteristic, resonant sound. Depending on the voice, the effective range may be narrower than the range available for adjustment.

Release Time (Control #072)

Messages which directly adjust the AEG release time set for each voice.

Attack Time (Control #073)

Messages which directly adjust the AEG attack time set for each voice.

Brightness (Control #074)

Messages which directly adjust the VCF cutoff frequency set for each voice.

Lower values will result in a softer sound. Depending on the voice, the effective range may be narrower than the range available for adjustment.

Effect1 Depth (Reverb) (Control #091)

Messages which adjust the send level for the Reverb effect.

Effect3 Depth (Variation [Chorus]) (Control #093)

Messages which adjust the dry/wet balance for the Chorus Variation Effect.

Effect4 Depth (Delay Depth) (Control #094)

Messages which adjust the send level for the Delay effect.

Data Increment (Control #096)

Decrement (Control #097) for RPN

Messages which increase or decrease the MSB value of pitch bend sensitivity.

You must assign one of those parameters using the RPN in the external device in advance.

The data byte is ignored.

When the maximum value or minimum value is reached, the value will not be incremented or decremented further. (Incrementing the fine tune will not cause the coarse tune to be incremented.)

RPN (Registered Parameter Number) LSB (Control #100)

RPN (Registered Parameter Number) MSB (Control #101)

Messages which offset, or add or subtract values from a voice's pitch bend sensitivity.

First send the RPN MSB and RPN LSB to specify the parameter which is to be controlled. Then use Data Increment/Decrement to set the value of the specified parameter.

Note that once the RPN has been set for a channel, subsequent data entry will be recognized as the same RPN's value change. Therefore after you use the RPN, you should set a Null (7FH, 7FH) value to avoid an unexpected result.

Messages which can be received are as follows:

RPN MSB	RPN LSB	PARAMETER
00	00	Pitch Bend Sensitivity
00	01	Fine Tune
00	02	Coarse
7F	7F	Null

Channel Mode Messages

The following Channel Mode Messages can be received.

2nd BYTE	3rd BYTE	MESSAGE
120	0	All Sounds Off
121	0	Reset All Controllers
123	0	All Notes Off
126	0 ~ 16	Mono
127	0	Poly

All Sounds Off (Control #120)

Clears all sounds currently sounding on the specified channel. However, the status of channel messages such as Note On and Hold On is maintained.

Reset All Controllers (Control #121)

The values of the following controllers will be reset to the defaults: Pitch Bend, Channel Pressure, Sustain Switch, Modulation, Expression, Portamento, RPN*, Volume, Pan, Effect Send Level 1, 3, 4.

* Number not specified; internal data will not change.

All Notes Off (Control #123)

Clears all notes currently on for the specified channel.

However, if Sustain Switch is on, notes will continue sounding until these are turned off.

Mono (Control #126)

Performs the same function as when an All Sounds Off message is received, and if the 3rd byte (mono number) is in the range of 0 - 16, sets the corresponding channel to Mono Mode (Mode 4 : m = 1).

Poly (Control #127)

Performs the same function as when an All Sounds Off message is received, and sets the corresponding channel to Poly Mode (Mode 3).

Program Change

Messages which select voices.

Channel Aftertouch

Messages which let you control the sounds by the pressure you apply to the keys after the initial striking of the keys, over the entire channel.

Pitch Bend

Pitch Bend messages are continuous controller messages that allow the pitch of designated notes to be raised or lowered by a specified amount over a specified duration.

2. SYSTEM MESSAGES

System messages are the data related to the overall system of the device.

System Exclusive Messages

System Exclusive messages control various functions of the AN1x, including master volume and master tuning, effect type and various other parameters.

Master Volume

When received, the Volume MSB will be effective for the System Parameter.

F0 7F 7F 04 01 ll mm F7 (Hexadecimal)

* mm(MSB) = appropriate volume value, ll(LSB) = ignored

Active Sensing

Once FE (Active Sensing) has been received, if no MIDI data is subsequently received for longer than an interval of approximately 300msec, the AN1x will perform the same function as when All Sounds Off, All Notes Off, and Reset All Controllers messages are received, and will then return to a status in which FE is not monitored.

Refer to the MIDI Data Format in the separate Data List book for more information about the various messages.

Control Change Modes

The AN1x has two Control Change modes. Mode 1 corresponds to the list of Control Change parameters according to the MIDI standard. Mode 2 is a special list of Control Change parameters unique to the AN1x.

For information about changing modes, see page 96. For a list of Control Change parameters for each mode, see the separate Data List book.

Error Messages

The following messages may appear during operation, indicating problems or incorrect operation, or to provide information. These are explained below.

Battery Low

The memory backup battery is low, and memory cannot be backed up. Store the necessary data to a MIDI data storage device and have the battery changed by your local Yamaha dealer or any other authorized Yamaha service personnel.

Device No.=off Error

Cannot send MIDI bulk data since the Device Number is set to off.

Device Number Error

Cannot receive MIDI bulk data due to improper Device Number setting. Match the device numbers for both the AN1x and the external device.

Not Scene Ctrl

System Exclusive message could not be received since the Scene Control function is not activated. Press both Scene switches to activate Scene Control.

Illegal Data

Error occurred during MIDI data receive. Start the transmit operation once again.

MIDI Buffer Full!

Too much MIDI information received. Eliminate unnecessary MIDI data.

SysEx Adrs Error

Received System Exclusive message address is incorrect. Confirm the address of the transmitted data.

SysEx Data Error

Received System Exclusive message data is incorrect. Confirm the contents of the transmitted data (such as necessary MSB, LSB data, etc.).

SysEx Size Error

Received System Exclusive message size is incorrect. Confirm the size of the transmitted data.

Chek Sum Error

Received System Exclusive Check Sum message is incorrect. Confirm the Check Sum message of the transmitted data.

Receiving Bulk

Displays when receiving bulk data.

Troubleshooting

Following is a list of troubleshooting hints and page references for some common problems you may encounter during operation. Usually, most problems are simply the result of incorrect settings. Before calling a professional service representative, refer to the throubleshooting advice below to see if you can identify and correct the cause of the problem.

No Sound

- Is the volume turned up high enough?
- If a Foot Controller is connected to the [FOOT VOLUME] jack, is the Foot Volume pressed down?
- Is the VCA Volume high enough? (Page 69)
- Is the Mixer VCO level high enough? (Page 66)
- Is the VCF Cutoff set to low? (Page 65)
- Is the VCO Pulse Width setting correct? (Page 62)
- Are the effect settings incorrect? (Pages 77, 79)
- Is the MIDI receive channel turned off? (Page 93)
- Are the speakers or other audio components connected properly? (Page 12)
- Is the keyboard Local setting turned off? (Page 94)
- If you are playing back song data using an external device, are the volume or expression related settings for the song appropriate?
- Is the Velocity setting high enough? (Page 92)
- Is the Split Point set properly? (Page 77)

No Arpeggiator or Step Sequencer sound

- Is the Velocity setting high enough? (Page 70)
- Is the [ARPEGGIO/SEQ] switch on? (Page 33)
- Is the current Scene the same as that set in the ARPEGGIO/SEQ SETUP menu? (Page 87)
- Is the Keyboard Mode and Split Point settings appropriate? (Pages 77, 86)

Distorted sounds

- Are the effect settings appropriate? (Pages 77, 79)
- Is the volume set too high?
- Are the oscillator SYNC/FM settings correct? (Page 58)
- Is the VCA Feedback level too high? (Page 69)
- Is the Noise Level too high? (Page 66)

Sound is too low

- Is the MIDI volume or MIDI expression set too low?
- Is the UTILITY SETUP menu Keyboard Velocity parameter set too low? (Page 92)
- Is the HPF Cutoff set too high? (Page 67)

The pitch is off

- Are the tuning related parameters set to "0"? See VCO Pitch, Fine (pages 61, 62), Master Tune (page 92), Keyboard Transpose (page 92)?
- Are the oscillator SYNC/FM settings appropriate? (Page 59)

The sound is choppy and interrupted

- Have the maximum number of notes of polyphony been exceeded?
- Is the Free EG changing the volume or cutoff frequency as you play? (Page 83)
- Are the Step Sequencer Note and Velocity event settings appropriate? (Page 89)

Only one note sounds at a time

- Is the Poly mode set to Legato or Mono? (Page 72)

Can't hear the effects

- Is the Effect Bypass switch turned on? (Page 80)

No portamento

- Is the [PORTAMENTO] switch set to "ON"? (Page 24)

Cannot perform store operation

- Is the Free EG set to Record Standby? (Page 83)

Blank Chart

Voice No. **Voice Name**

Common

Layer		Unison	SCENE SELECT	PORTAMENTO	LAYER	ARPEGGIO/SEQ			Dly/Rev Connection
Pan	Separate	Detune					Tempo	Split Pnt	

Variation Effect Type

Effect Type		
	Param	Data
1		
2		
3		
4		
5		
6		
elm	Dry:Wet	

3 Band Equalizer

Effect Type	3 Band Equalizer	
	Param	Data
1	Low Freq	
2	Low Gain	
3	Mid Freq	
4	Mid Gain	
5	Mid Reso	
6	High Freq	
7	High Gain	

Delay Effect Type

Effect Type		
	Param	Data
1		
2		
3		
4		
5		
6		
7		
	Return	

Reverb Type

Effect Type		
	Param	Data
1		
2		
3		
4		
5		
6		
7		
	Return	

Voice Free EG

Track Common			
Trigger	Loop Type	Length	Key Track

Track		
Track No	Param	Scene Sw
1		
2		
3		
4		

Voice Arpeggio Sequencer

Common				
Arp/SEQ	Type/No	KbdMode	Hold	SceneSw
Arp Seq				

Arpeggio	Play EF		
Subdivide	Swing	Velocity	Gate Time
/	%	%	%

Voice Step Sequencer

Event \ Step	1	2	3	4	5	6	7	8
	9	10	11	12	13	14	15	16
Ctrl Chng								
Gate Time								
Velocity								
Note								

Pattern			
Base Unit	Length	LoopType	Ctrl No

Photocopy this Blank Chart and fill in your voice settings.

Voice Scene Setup

	Mode		
	Poly	Port	LFO Rst
Scene			

Control Matrix

Ctrl Matrix			
Set No	Param	Source	Depth
Pitch Up			
Pitch Down			
Set 1			
Set 2			
Set 3			
Set 4			
Set 5			
Set 6			
Set 7			
Set 8			

Ctrl Matrix			
Set No	Param	Source	Depth
Set 9			
Set 10			
Set 11			
Set 12			
Set 13			
Set 14			
Set 15			
Set 16			
Common 1			
Common 2			

Knob Parameter Type

SYNC/FM

Algorithm	Sync Pitch	Sync Pitch Depth	Sync Pitch Src
Sync Pmod Sw	FM Depth	FM Src1	FM Src2

PEG/LFO

PEG Decay	PEG Depth	PEG Sw	Port Time
LFO1 Wave	LFO1 Spd	LFO Dly	LFO2 Spd

VCO1

Wave	Pitch	Fine	Edge
PW	PWM Depth	PWM Src	PmodDepth

VCO2

Wave	Pitch	Fine	Edge
PW	PWM Depth	PWM Src	PmodDepth

VCF

Attack	Decay	Sustain	Release
VCF Cutoff	Resonance	FEG Depth	Vel Sens

MIX/VCF

VCO1 Level	VCO2 Level	Ring Mod	Noise Level
HPF	VCF Type	Fmod Depth	Key Track

VCA

Attack	Decay	Sustain	Release
Feedback	Volume	Amod Depth	Vel Sens

ASSIGN

ASSIGN 1	ASSIGN 2	ASSIGN 3	ASSIGN 4
ASSIGN 5	ASSIGN 6	ASSIGN 7	ASSIGN 8

Photocopy this Blank Chart and fill in your Scene settings.

Specifications

KEYBOARD	61Keys (Initial/After Touch),
TONE GENERATOR	Analog Physical Modeling, 2 VCOs (Sync, FM)/Ring Mod/Noise/2 LFOs/PEG/VCF (FEG)/VCA (AEG)
POLYPHONY	10 notes (maximum)
MULTI TIMBRES	2 timbres maximum (with polyphony of 5 + 5 notes)
EFFECT	Variation: 14, EQ: 1 (Stereo 3-Band), Delay: 5, Reverb: 8
VOICE MEMORIES	User 128
ARPEGGIATOR	30 Preset patterns
STEP SEQUENCER	Voice Pattern for each Voice plus 128 User Patterns
FREE EG	No. of Tracks : 4 Parameter tracks per voice (16.0 sec maximum per track)
CONTROLLERS	Pitch Bend Wheel, Modulation Wheel (Assignable), X-Z Ribbon Controller (Assignable) Edit Rotary Switch (6 segment), Control Knobs (with push-switch) x 8 (Assignable), Volume Knobs
PANEL SWITCHES	Knob Parameter Group Select x 8 (PEG/LFO, VCO1, VCO2, SYNC/FM, MIX/VCF, VCF, VCA, ASSIGN), Data x 20, Layer x 1, Portamento x 1 (on/off), Arpeg/SEQ x 1 (on/off), Store x 1, Voice Select x 2 (–/NO, +/YES/ENTER), Data Entry x 10 (0-9), Scene x 2 (Scene1, 2)
DISPLAY	LCD Custom (15 Characters with LED Backlight), LED Scene x 2 (Red), LED Knob Parameter Group Select x 8 (Red)
CONNECTORS	Head Phones (L / R Stereo), Stereo Output L (Mono) / R, Phone x 2, Foot Controller (Assignable), Foot Volume (Assignable), Footswitch (Assignable), MIDI IN / OUT / THRU
OUTPUT LEVEL	Phones – 2.9 ± 2.0dBm (330 Ω), Stereo Output +4.0 ± 2.0dBm (10kΩ)
POWER REQUIREMENTS	AC Adaptor PA-3B or equivalent
DIMENSIONS	986 (W) x 285 (D) x 103 (H) mm
WEIGHT	7.5 kg
ACCESSORIES	Owner's Manual, Data List Book, AC Adaptor (PA-3B)

Specifications and descriptions in this owner's manual are information purposes only. Yamaha Corp. reserves the right to change or modify products or specifications at any time without prior notice. Since specifications, equipment or options may not be the same in every locale, please check with your Yamaha dealer.

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For details of products, please contact your nearest Yamaha or the authorized distributor listed below.

Pour plus de détails sur les produits, veuillez-vous adresser à Yamaha ou au distributeur le plus proche de vous figurant dans la liste suivante.

Die Einzelheiten zu Produkten sind bei Ihrer unten aufgeführten Niederlassung und bei Yamaha Vertragshändlern in den jeweiligen Bestimmungsländern erhältlich.

Para detalles sobre productos, contacte su tienda Yamaha más cercana o el distribuidor autorizado que se lista debajo.

NORTH AMERICA

CANADA
Yamaha Canada Music Ltd.
135 Milner Avenue, Scarborough, Ontario, M1S 3R1, Canada
Tel: 416-298-1311

U.S.A.
Yamaha Corporation of America
6600 Orangethorpe Ave., Buena Park, Calif. 90620, U.S.A.
Tel: 714-522-9011

MIDDLE & SOUTH AMERICA

MEXICO
Yamaha De Mexico S.A. De C.V., Departamento de ventas
Javier Rojo Gomez No.1149, Col. Gpe Del Moral, Deleg. Iztapalapa, 09300 Mexico, D.F.
Tel: 686-00-33

BRASIL
Yamaha Musical Do Brasil LTDA.
Ave. Reboucas 2636, São Paulo, Brasil
Tel: 011-853-1377

PANAMA
Yamaha De Panama S.A.
Edificio Interseco, Calle Elvira Mendez no.10, Piso 3, Oficina #105, Ciudad de Panama, Panama
Tel: 507-69-5311

OTHER LATIN AMERICAN COUNTRIES AND CARIBBEAN COUNTRIES
Yamaha Music Latin America Corp.
6101 Blue Lagoon Drive, Miami, Florida 33126, U.S.A.
Tel: 305-261-4111

EUROPE

THE UNITED KINGDOM
Yamaha-Kemble Music (U.K.) Ltd.
Sherbourne Drive, Tilbrook, Milton Keynes, MK7 8BL, England
Tel: 01908-366700

IRELAND
Danfay Ltd.
61D, Sallynoggin Road, Dun Laoghaire, Co. Dublin
Tel: 01-2859177

GERMANY/SWITZERLAND
Yamaha Europa GmbH.
Siemensstraße 22-34, 25462 Rellingen, F.R. of Germany
Tel: 04101-3030

AUSTRIA
Yamaha Music Austria
Schleiergasse 20, A-1100 Wien Austria
Tel: 0222-60203900

THE NETHERLANDS
Yamaha Music Nederland
Kanaalweg 18G, 3526KL, Utrecht, The Netherlands
Tel: 030-2828411

BELGIUM
Yamaha Music Belgium
Keiberg Imperiastraat 8, 1930 Zaventem, Belgium
Tel: 02-7258220

FRANCE
Yamaha Musique France, Division Professionnelle
BP 70-77312 Marne-la-Valée Cedex 2, France
Tel: 01-64-61-4000

ITALY
Yamaha Musica Italia S.P.A., Combo Division
Viale Italia 88, 20020 Lainate (Milano), Italy
Tel: 02-935-771

SPAIN
Yamaha-Hazen Electronica Musical, S.A.
Jorge Juan 30, 28001, Madrid, Spain
Tel: 91-577-7270

PORTUGAL
Valentim de Carvalho CI SA
Estrada de Porto Salvo, Paço de Arcos 2780 Oeiras, Portugal
Tel: 01-443-3398/4030/1823

GREECE
Philippe Nakas S.A.
Navarinou Street 13, P.Code 10680, Athens, Greece
Tel: 01-364-7111

SWEDEN
Yamaha Scandinavia AB
J. A. Wettergrens Gata 1
Box 30053
S-400 43 Göteborg, Sweden
Tel: 031 89 34 00

DENMARK
YS Copenhagen Liaison Office
Generatorvej 8B
DK-2730 Herlev, Denmark
Tel: 44 92 49 00

FINLAND
Warner Music Finland OY/Fazer Music
Aleksanterinkatu 11, P.O. Box 260
SF-00101 Helsinki, Finland
Tel: 0435 011

NORWAY
Narud Yamaha AS
Grini Næringspark 17
N-1345 Østerås, Norway
Tel: 67 14 47 90

ICELAND
Skifan HF
Skeifan 17 P.O. Box 8120
IS-128 Reykjavik, Iceland
Tel: 525 5000

OTHER EUROPEAN COUNTRIES
Yamaha Europa GmbH.
Siemensstraße 22-34, 25462 Rellingen, F.R. of Germany
Tel: 04101-3030

AFRICA

Yamaha Corporation, International Marketing Division
Nakazawa-cho 10-1, Hamamatsu, Japan 430
Tel: 053-460-2312

MIDDLE EAST

TURKEY/CYPRUS
Yamaha Europa GmbH.
Siemensstraße 22-34, 25462 Rellingen, F.R. of Germany
Tel: 04101-3030

OTHER COUNTRIES
Yamaha Corporation, International Marketing Division
Nakazawa-cho 10-1, Hamamatsu, Japan 430
Tel: 053-460-2312

ASIA

HONG KONG
Tom Lee Music Co., Ltd.
11/F., Silvercord Tower 1, 30 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: 730-1098

INDONESIA
PT. Yamaha Music Indonesia (Distributor)
PT. Nusantik
Gedung Yamaha Music Center, Jalan Jend. Gatot Subroto Kav. 4, Jakarta 12930, Indonesia
Tel: 21-520-2577

KOREA
Cosmos Corporation
#131-31, Neung-Dong, Sungdong-Ku, Seoul Korea
Tel: 02-466-0021~5

MALAYSIA
Yamaha Music Malaysia, Sdn., Bhd.
16-28, Jalan SS 2/72, Petaling Jaya, Selangor, Malaysia
Tel: 3-717-8977

PHILIPPINES
Yupangco Music Corporation
339 Gil J. Puyat Avenue, P.O. Box 885 MCPO, Makati, Metro Manila, Philippines
Tel: 819-7551

SINGAPORE
Yamaha Music Asia Pte., Ltd.
Blk 17A Toa Payoh #01-190 Lorong 7
Singapore 1231
Tel: 354-0133

TAIWAN
Kung Hsue She Trading Co., Ltd.
No. 322, Section 1, Fu Hsing S. Road, Taipei 106, Taiwan. R.O.C.
Tel: 02-709-1266

THAILAND
Siam Music Yamaha Co., Ltd.
865 Phornprapha Building, Rama I Road, Patumwan, Bangkok 10330, Thailand
Tel: 2-215-3443

THE PEOPLE'S REPUBLIC OF CHINA AND OTHER ASIAN COUNTRIES
Yamaha Corporation, International Marketing Division
Nakazawa-cho 10-1, Hamamatsu, Japan 430
Tel: 053-460-2317

OCEANIA

AUSTRALIA
Yamaha Music Australia Pty. Ltd.
17-33 Market Street, South Melbourne, Vic. 3205, Australia
Tel: 3-699-2388

NEW ZEALAND
Music Houses of N.Z. Ltd.
146/148 Captain Springs Road, Te Papapa, Auckland, New Zealand
Tel: 9-634-0099

COUNTRIES AND TRUST TERRITORIES IN PACIFIC OCEAN
Yamaha Corporation, International Marketing Division
Nakazawa-cho 10-1, Hamamatsu, Japan 430
Tel: 053-460-2317

HEAD OFFICE **Yamaha Corporation, Electronic Musical Instrument Division**
Nakazawa-cho 10-1, Hamamatsu, Japan 430
Tel: 053-460-2445

FCC INFORMATION (U.S.A)

1. IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!

This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.

2. IMPORTANT: When connecting this product to accessories and/or another product use only high quality shielded cables.

Cable/s supplied with this product MUST be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.

3. NOTE: This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the user's manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures :

Relocate either this product or the device that is being affected by the interference.

Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/s.

In the case of radio or TV interference, relocate/reorient the antenna.

If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to co-axial type cable.

If these corrective measures do not produce satisfactory results, please contact the your local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Ave, Buena Park, CA 90620

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

ADVARSEL!
Lithiumbatteri—Eksplosionsfare ved fejiatig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandoren.

VARNING
Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

VAROITUS
Paristo voi räjähtää, jos se on virheellisesti asennttu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

NEDERLAND
NETHERLAND

- Dit apparaat bevat een lithium batterij voor geheugen back-up.
- This apparatus contains a lithium battery for memory back-up.

- Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat ann het einde van de levensduur afdankt of de volgende Yamaha Service Afdeiing:
  Yamaha Music Nederland Service Afdeiing
  Kanaalweg 18-G, 3526 KL UTRECHT
  Tel. 030-2828425
- For the removal of the battery at the moment of the disposal at the end of the service life please consult your retailer or Yamaha Service Center as follows:
  Yamaha Music Nederland Service Center
  Address : Kanaalweg 18-G, 3526 KL UTRECHT
  Tel : 030-2828425

- Gooi de batterij niet weg, maar lever hem in als KCA.
- Do not throw away the battery. Instead, hand it in as small chemical waste.

SPECIAL MESSAGE SECTION (USA)

This product utilizes batteries or an external power supply (adapter). DO NOT connect this product to any power supply or adapter other than one described in the manual, on the name plate, or specifically recommended by Yamaha.

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

This Product should be used only with the components supplied or; a cart, rack, or stand that is recommended by Yamaha. If a cart, etc., is used, please observe all safety markings and instructions that accompany the accessory product.

SPECIFICATIONS SUBJECT TO CHANGE:
The information contained in this manual is believed to be correct at the time of printing. However, Yamaha reserves the right to change or modify any of the specifications without notice or obligation to update existing units.

This product, either alone or in combination with an amplifier and headphones or speaker/s, may be capable of producing sound levels that could cause permanent hearing loss. DO NOT operate for long periods of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.

IMPORTANT: The louder the sound, the shorter the time period before damage occurs.

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

NOTICE:
Service charges incurred due to lack of knowledge relating to how a function or effect works (when the unit is operating as designed) are not covered by the manufacturer's warranty, and are therefore the owners responsibility. Please study this manual carefully and consult your dealer before requesting service.

ENVIRONMENTAL ISSUES:
Yamaha strives to produce products that are both user safe and environmentally friendly. We sincerely believe that our products and the production methods used to produce them, meet these goals.
In keeping with both the letter and the spirit of the law, we want you to be aware of the following:

Battery Notice:
This product MAY contain a small non-rechargeable battery which (if applicable) is soldered in place. The average life span of this type of battery is approximately five years. When replacement becomes necessary, contact a qualified service representative to perform the replacement.

This Product may also use "household" type batteries. Some of these may be rechargeable. Make sure that the battery being charged is a rechargeable type and that the charger is intended for the battery being charged.

When installing batteries, do not mix old batteries with new, or with batteries of a different type. Batteries MUST be installed correctly. Mismatches or incorrect installation may result in overheating and battery case rupture.

Warning:
Do not attempt to disassemble, or incinerate any battery. Keep all batteries away from children. Dispose of used batteries promptly and as regulated by the laws in your area.

Note: Check with any retailer of household type batteries in your area for battery disposal information.

Disposal Notice:
Should this Product become damaged beyond repair, or for some reason its useful life is considered to be at an end, please observe all local, state, and federal regulations that relate to the disposal of products that contain lead, batteries, plastics, etc. If your dealer is unable to assist you, Please contact Yamaha directly.

NAME PLATE LOCATION:
The name Plate is located on the bottom of the product. The model number, serial number, power requirements, etc., are located on this plate. You should record the model number, serial number, and the date of purchase in the spaces provided below and retain this manual as a permanent record of your purchase.

Model _____

Serial No. _____

Purchase Date _____

PLEASE KEEP THIS MANUAL

92-BP